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Mission Critical (MC) services over LTE;
Part 7: Mission Critical Data (MCData) User Equipment (UE) Protocol conformance specification
(3GPP TS 36.579-7 version 16.1.0 Release 16)

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Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, modal verbs have the following meanings:

shall indicates a mandatory requirement to do something

shall not indicates an interdiction (prohibition) to do something

The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

should indicates a recommendation to do something

should not indicates a recommendation not to do something

may indicates permission to do something

need not indicates permission not to do something

The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

can indicates that something is possible

cannot indicates that something is impossible

The constructions "can" and "cannot" are not substitutes for "may" and "need not".

will indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

will not indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

might indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

might not indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

is (or any other verb in the indicative mood) indicates a statement of fact

is not (or any other negative verb in the indicative mood) indicates a statement of fact

The constructions "is" and "is not" do not indicate requirements.

Introduction

The present document is part 7 of a multi-part deliverable covering conformance test specification for Mission Critical Services over LTE consisting of:

3GPP TS 36.579-1 [2]: "Mission Critical (MC) services over LTE protocol conformance testing; Part 1: Common test environment"

3GPP TS 36.579-2 [24]: " Mission Critical (MC) services over LTE; Part 2: Mission Critical Push To Talk (MCPTT) User Equipment (UE) Protocol conformance specification";

3GPP TS 36.579-3 [3]: " Mission Critical (MC) services over LTE; Part 3: Mission Critical Push To Talk (MCPTT) Server Application test specification";

3GPP TS 36.579-4 [4]: " Mission Critical (MC) services over LTE; Part 4: Test Applicability and Implementation Conformance Statement (ICS)";

3GPP TS 36.579-5 [5]: " Mission Critical (MC) services over LTE; Part 5: Abstract test suite (ATS)";

3GPP TS 36.579-6 [25]: " Mission Critical (MC) services over LTE; Part 6: Mission Critical Video (MCVideo) User Equipment (UE) Protocol conformance specification";

3GPP TS 36.579-7: " Mission Critical (MC) services over LTE; Part 7: Mission Critical Data (MCData) User Equipment (UE) Protocol conformance specification" (the present document).

1 Scope

The present document specifies the protocol conformance testing for testing a MCData Client for compliance to the Mission Critical Video (MCData) over LTE protocol requirements defined by 3GPP.

In particular the present document contains:

- the overall test structure;
- the test configurations;
- the conformance requirement and reference to the core specifications;
- the test purposes; and
- a brief description of the test procedure, the specific test requirements and short message exchange table.

The present document is valid for MCData Clients implemented according to 3GPP releases starting from Release 13 up to the Release indicated on the cover page of the present document.

The following information relevant to testing specified in the present document could be found in accompanying specifications:

- default setting of the test parameters TS 36.579-1 [2];
- Implementation Conformance Statement (ICS) TS 36.579-4 [4] and Implementation eXtra Information for Testing (IXIT) TS 36.579-5 [5];
- the applicability of each test case TS 36.579-4 [4].

The test cases are expected to be executed through the 3GPP radio interface. The present document does not specify the protocol conformance testing for the EPS (LTE) bearers which carry the MCData data sent or received by the MCData Client and which are required to be supported by the UE in which the MCData Client is installed. This is defined in TS 36.523-1 [6].

According to 3GPP drafting rules, the references clause shall list only documents that are explicitly mentioned in the deliverable. This reference is not used within the document and thus shall be removed from references clause.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 36.579-1: "Mission Critical (MC) services over LTE; Part 1: Common test environment".

[3] 3GPP TS 36.579-3: " Mission Critical (MC) services over LTE; Part 3: Mission Critical Push To Talk (MCPTT) Server Application test specification".

[4] 3GPP TS 36.579-4: " Mission Critical (MC) services over LTE; Part 4: Test Applicability and Implementation Conformance Statement (ICS).

[5] 3GPP TS 36.579-5: "Mission Critical (MC) services over LTE; Part 5: Abstract test suite (ATS)".

[6] 3GPP TS 36.523-1: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification; Part 1: Protocol conformance specification".

[7] Void

[8] Void

[9] 3GPP TS 24.379: "Mission Critical Push To Talk (MCPTT) call control; Protocol specification".

[10] Void

[11] 3GPP TS 24.481: "Mission Critical Services (MCS) group management; Protocol specification".

[12] 3GPP TS 24.482: "Mission Critical Services (MCS) identity management; Protocol specification".

[13] 3GPP TS 24.483: "Mission Critical Services (MCS) Management Object (MO)".

[14] 3GPP TS 24.484: "Mission Critical Services (MCS) configuration management; Protocol specification".

[15] 3GPP TS 33.179: " Security of Mission Critical Push To Talk (MCPTT) over LTE ".

[16] 3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[17] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[18] Void

[19] 3GPP TS 36.509: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Special conformance testing functions for User Equipment (UE)".

[20] 3GPP TS 36.508: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access (E-UTRAN); Common Test Environments for User Equipment (UE) Conformance Testing".

[21] OpenID Connect 1.0: "OpenID Connect Core 1.0 incorporating errata set 1", http://openid.net/specs/openid-connect-core-1_0.html.

[22] 3GPP TS 33.310: "Network Domain Security (NDS); Authentication Framework (AF)".

[23] Void

[24] 3GPP TS 36.579-2: "Mission Critical (MC) services over LTE; Part 2: Mission Critical Push To Talk (MCPTT) User Equipment (UE) Protocol conformance specification".

[25] 3GPP TS 36.579-6: "Mission Critical (MC) services over LTE; Part 6: Mission Critical Video (MCVideo) User Equipment (UE) Protocol conformance specification ".

[26] Void

[27] Void

[28] Void

[29] Void

[30] 3GPP TS 33.180: "Security of the mission critical service".

[31] 3GPP TS 24.282: "Mission Critical Data (MCData) signalling control; Protocol specification".

[32] 3GPP TS 24.582: "Mission Critical Data (MCData) media plane control; Protocol specification".

[33] 3GPP TS 23.282: "Functional architecture and information flows to support Mission Critical Data (MCData); Stage 2".

[34] 3GPP TS 22.282: "Mission Critical Data over LTE. Status: Under change control".

[35] Void

[36] IETF RFC 4826 (May 2007): "Extensible Markup Language (XML) Formats for Representing Resource Lists".

[37] IETF RFC 4122 (July 2005): "A Universally Unique IDentifier (UUID) URN Namespace".

[38] IETF RFC 2046: "Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types".

3 Definitions of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the terms given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

For the purpose of the present document, the following terms given in TS 23.282 [33] apply:

Auto-receive
Conversation identifier
Data stream
FD disposition
MCData client
MCData group
MCData group affiliation
MCData group communication
MCData group de-affiliation
MCData ID
MCData server
MCData service
MCData UE
MCData user
Reception control
Reply identifier
SDS data
SDS disposition
Standalone communication
Transaction identifier
Transmission control

For the purpose of the present document, the following terms given in TS 22.282 [34] apply:

Conversation
Conversation ID
MCData Conversation Hang Time
MCData System

For the purpose of the present document, the following terms given in 3GPP TS 33.180 [30] apply:

Client Server Key (CSK)
Private Call Key (PCK)
Signalling Protection Key (SPK)
XML Protection Key (XPK)

3.2 Symbols

For the purposes of the present document, the following symbols apply:

None.

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

CSK	Client-Server Key
DS	Data Streaming
ECGI	E-UTRAN Cell Global Identification
FD	File Distribution
FFS	For Further Study
ICS	Implementation Conformance Statement
IOPS	Isolated E-UTRAN Operation for Public Safety
IUT	Implementation Under Test
IXIT	Implementation eXtra Information for Testing
MBMS	Multimedia Broadcast and Multicast Service
MBSFN	Multimedia Broadcast multicast service Single Frequency Network
MC	Mission Critical
MCData	Mission Critical Data
MCData group ID	MCData group Identity
MCPTT	Mission Critical Push To Talk
MCS	Mission Critical Service
MCVideo	Mission Critical Video
MDEA	MCData Emergency Alert
MIME	Multipurpose Internet Mail Extensions
MONP	MC service Off-Network Protocol
NAT	Network Address Translation
PCC	Policy and Charging Control
PCCB	Private Call Call-Back
PCRF	Policy and Charging Rules Function
PLMN	Public Land Mobile Network
QCI	QoS Class Identifier
RTP	Real-time Transport Protocol
SAI	Service Area Identifier
SDP	Session Description Protocol
SDS	Short Data Service
SIP	Session Initiation Protocol
SPK	Signalling Protection Key
SS	System Simulator
SSRC	Synchronization SouRCe
TGI	Temporary MCVideo Group Identity
TMGI	Temporary Mobile Group Identity
TP	Transmission Point
TP	Test Purpose
UE	User Equipment
UM	Unacknowledged Mode
URI	Uniform Resource Identifier
XPK	XML Protection Key

4 General

4.1 Test methodology

4.1.1 Testing of optional functions and procedures

Any function or procedure which is optional, may be subject to a conformance test if it is implemented in the MCData Client.

A declaration by the MCData Client supplier (to use the Implementation Conformance Statement (ICS) proforma specified in TS 36.579-4 [4]) is used to determine whether an optional function/procedure has been implemented.

4.1.2 Test interfaces and facilities

Detailed descriptions of the MCData

Client test interfaces and special facilities for testing are provided in 3GPP TS 36.509 [19].

4.2 Implicit testing

For some 3GPP MCData protocol features conformance is not verified explicitly in the present document. This does not imply that correct functioning of these features is not essential, but that these are implicitly tested to a sufficient degree in tests which are not explicitly dedicated to test the feature.

4.3 Repetition of tests

As a general rule, the test cases specified in the present document are highly reproducible and do not need to be repeated unless otherwise stated.

4.4 Handling of differences between conformance requirements in different releases of cores specifications

The conformance requirements which determine the scope of each test case are explicitly copy-pasted from relevant core specifications in the especially dedicated for this clause of each test with the title 'Conformance requirements'.

NOTE: When in the copy/pasted text there are references to other specifications the reference numbers will not match the reference numbers used in the present document. This approach has been taken in order to allow easy copy and then search for conformance requirements in those specifications.

When differences between conformance requirements in different releases of the cores specifications have impact on the Pre-test conditions, Test procedure sequence or/and the Specific message contents, the Conformance requirements related to different releases are specified separately with clear indication of the Release of the spec from which they were copied.

When there is no Release indicated for a conformance requirement text, this should be understood either as the Conformance requirements in the latest version of the spec with release = the TC Applicability release (which can be found in TS 36.579-4 [4], Table 4-1: Applicability of tests and additional information for testing, column 'Release'), or, as the Conformance requirements in the latest version of the spec of the release when the feature was introduced to the core specs.

4.5 Reference conditions

The reference environments used by all signalling and protocol tests is specified in TS 36.579-1 [2]. Where a test requires an environment that is different, this will be specified in the test itself.

For all test cases in this document unless specified otherwise the condition MCDATA applies for all message contents.

4.6 Generic setup procedures

A set of basic generic procedures for MCData Client-Server communication are described in TS 36.579-1 [2]. These procedures will be used in numerous test cases throughout the present document.

5 MCData Client Configuration

5.1 Configuration / Authentication / User Authorization / UE Configuration / User Profile / Key Generation

5.1.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) attached to EPS services }
ensure that {
  when { the MCData User activates an MCData application and requests MCData initialisation }
    then { UE (MCDATA Client) performs MCData User Authentication }
            }
```

(2)

```
with { UE (MCDATA Client) user authenticated }
ensure that {
  when { the UE (MCDATA Client) has established a secure HTPP tunnel }
    then { UE (MCDATA Client) performs key management authorization and obtains identity management
key material }
            }
```

(3)

```
with { UE (MCDATA Client) has obtained identity management key material }
ensure that {
  when { the UE (MCDATA Client) requests user service authorization }
    then { UE (MCDATA Client) sends a user authorization request to the MCData Server }
            }
```

(4)

```
with { UE (MCDATA Client) authorized for user services }
ensure that {
  when { the UE (MCDATA Client) requests configuration management authorization}
    then { UE (MCDATA Client) requests subscription to multiple documents simultaneously and request
the retrieval of the MCData UE Configuration document, the MCData User Profile Configuration
Document and the MCData Service Configuration Document }
            }
```

(5)

```
with { UE (MCDATA Client) having obtained user configuration data }
ensure that {
  when { the UE (MCDATA Client) requests group management authorization }
    then { UE (MCDATA Client) receives the group profile including group traffic keys }
            }
```

(6)

```
with { UE (MCDATA Client) having obtained all required configuration data }
ensure that {
  when { the UE (MCDATA Client) requires to refresh its service settings }
    then { UE (MCDATA Client) sends a SIP PUBLISH request }
```

}

5.1.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.482 clause 6.2.1 and Annex A.2.1.2, TS 24.484 clauses 4.2.1, 4.2.2.1, 6.2.2, 6.3.1.1, 6.3.2.1, 6.3.2.2, 6.3.3.2.1, 6.3.3.2.2, 6.3.13.2.1 and 6.3.13.2.2, TS 24.481 clauses 6.2.2.2, 6.2.3, 6.3.3.2.1, 6.3.3.2.2 and 6.3.13.2.1, TS 24.282 clauses 7.2.1, 7.2.1A, 7.2.2 and 7.2.3, TS 33.180 clauses 5.1.3.1, 5.3.3, 6.1.2, and Annex D. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated these are Rel-14 requirements.

[TS 24.482, clause 6.2.1]

Upon an indication from the MC service client to initiate MC service user authentication, the IdM client shall perform the user authentication procedure according to 3GPP TS 33.180 [17] with the following clarifications:

1) shall establish a TLS tunnel to the authorisation endpoint of the IdM server as specified in 3GPP TS 33.180 [17] using the configured URL of the authorisation endpoint of the IdM server as specified in the "/<x>/OnNetwork/AppServerInfo/IDMSAuthEndpoint" leaf node defined in 3GPP TS 24.483 [11] and the clarifications in annex A;

2) shall generate an OIDC Authentication Request message as specified in the OpenID Connect 1.0 [6] and IETF RFC 6749 [5] with the following clarifications:

   a) shall generate an HTTP GET request method according to IETF RFC 2616 [4];

   b) shall include the configured parameter IdM client id as the client_id parameter specified in 3GPP TS 33.180 [17] in the query component of the authorization endpoint's URI using the "application/x-www-form-urlencoded" format as specified in W3C.REC-html401-19991224 [7]; and

NOTE 1: The configuration of client_id is specified in 3GPP TS 24.483 [11].

   c) shall include the remaining required parameters as specified in 3GPP TS 33.180 [17] in the query component of the authorization endpoint's URI using the "application/x-www-form-urlencoded" format as specified in W3C.REC-html401-19991224 [7]; and

3) shall send the HTTP GET request method towards the IdM server.

NOTE 2: The OpenID Connect 1.0 [6] specification allows for an alternative mechanism for sending the OIDC Authentication request message using an HTTP POST request method which can be used in place of steps 1, 2, and 3 above.

Upon receipt of an HTTP 200 (OK) response from the IdM server, the IdM client:

1) shall prompt the MC service user for their username and password;

NOTE 3: Other types of authentication are supported and are not defined by the OIDC specifications. 3GPP TS 33.180 [17] has defined username and password as a mandatory authentication method to be supported, hence a procedure to realize that method is included here.

2) shall generate an HTTP POST request method containing the MC service user's username and password; and

3) shall send the HTTP POST request method towards the IdM server.

Upon receipt of an OIDC Authentication Response message, the IdM client:

1) shall establish a TLS tunnel to the token endpoint of the IdM server as specified in 3GPP TS 33.180 [17] using the configured URL of the token endpoint of the IdM server as specified in the "/<x>/OnNetwork/AppServerInfo/IDMSTokenEndpoint" leaf node defined in 3GPP TS 24.483 [11] and the clarifications in annex A;

2) shall generate an OIDC Token Request message as specified in OpenID Connect 1.0 [6] and IETF RFC 6749 [5] with the following clarifications:

   a) shall generate an HTTP POST request method according to IETF RFC 2616 [4]; and

b) shall include the grant_type parameter set to a value of "authorization_code" and the other required parameters in the entity body of the HTTP POST request method using the using the "application/x-www-form-urlencoded" format as specified in 3GPP TS 33.180 [17]; and

3) shall send the HTTP POST request method towards the IdM server.

Upon receipt of an OIDC Token Response message, the IdM client:

1) shall validate the id_token, access_token and refresh token in the received OIDC Token Response message as specified in the OpenID Connect 1.0 [6] specification; and

2) shall provide the id_token and access_token in the received OIDC Token Response message to the MC service client.

NOTE 4: The method in which the IdM client provides the id_token and access_token to the MC service client is implementation specific.

The MC UE may repeat the entire procedure in this clause as needed to obtain the necessary authorisation tokens for the MC service clients, depending on the scope parameter in the Authentication Request message as specified in 3GPP TS 33.180 [17].

[TS 24.482, Annex A.2.1.2]

The HTTP client in the UE shall support the client role defined in IETF RFC 2818 [10].

The HTTP client in the UE shall support transport layer security (TLS) as specified in 3GPP TS 33.180 [17].

The HTTP client in the UE is configured with the following parameters:

1) a home HTTP proxy FQDN;

2) a home HTTP proxy port;

3) a TLS tunnel authentication method. The TLS tunnel authentication method parameter is set to one of the following:

   a) one-way authentication of the HTTP proxy based on the server certificate;

   b) mutual authentication based on certificates; and

   c) mutual authentication based on pre-shared key;

   as specified in 3GPP TS 33.180 [17];

4) if the TLS tunnel authentication method is the mutual authentication based on certificates:

   a) TLS tunnel authentication X.509 certificate; and

5) if the TLS tunnel authentication method is the mutual authentication based on pre-shared key;

   a) TLS tunnel authentication pre-shared key.

The HTTP client in the UE shall establish a TCP connection towards the home HTTP proxy FQDN and the home HTTP proxy port, unless the specific TCP connection is to be used for the IdM client to IdM server procedures described in clause 6.2 and subclause 6.3 in the present document, in which case the HTTP client shall establish a TCP connection towards the IdM server.

The HTTP client in the UE shall establish a TLS tunnel via the TCP connection as specified in 3GPP TS 33.180 [17]. When establishing the TLS tunnel, the HTTP client in the UE shall act as a TLS client and the UE shall perform the TLS tunnel authentication using the TLS authentication method indicated by the TLS tunnel authentication method parameter according to 3GPP TS 33.180 [17]. The UE shall use the configured TLS tunnel authentication X.509 certificate and the configured TLS tunnel authentication pre-shared key when applicable for the used TLS authentication method. In order to prevent man-in-the-middle attacks, the HTTP client in the UE shall check the home HTTP proxy FQDN against the server's identity as presented in the received server's certificate message if the TCP connection terminates on the HTTP proxy. The HTTP client in the UE shall not check the portion of dereferenced HTTP URL against the server's identity as presented in the received server's certificate message if the TCP connection terminates on the HTTP proxy, but shall do so if the TCP connection terminates on the IdM server.

NOTE: The TLS tunnel can be terminated in the HTTP proxy (rather than in the HTTP server providing the dereferenced HTTP URL).

The HTTP client in the UE shall send and receive all HTTP messages via the TLS tunnel.

If the HTTP client in the UE has an access token of the "bearer" token type as specified in IETF RFC 6750 [14], the HTTP client in the UE shall include an Authorization header field with the "Bearer" authentication scheme as specified in IETF RFC 6750 [14] in HTTP requests.

[TS 33.180, Annex D.1]

This annex specifies the key management procedures between the KMS and the key management client that allows keys to be provisioned to the key management client based on an identity. It describes the requests and responses for the authorization following provisioning messages:

- KMS Initialize.
- KMS KeyProvision.
- KMS CertCache.

All KMS communications are made via HTTPS. The key management client is provisioned via XML content in the KMS's response. The XML content is designed to be extendable to allow KMS/client providers to add further information in the XML. Where the interface is extended, a different XML namespace should be used (so that may be ignored by non-compatible clients).

It is assumed that transmissions between the KMS and the key management client are secure and that the KMS has authenticated the identity of the key management client.

Additionally, to allow the transmission of key material securely between a secure element within the KMS and a secure element within the key management client, a security extension is defined which allows messages to be signed and key material to be encrypted using a shared Transport Key (TrK).

[TS 33.180, clause 5.1.3.1]

This clause expands on the MCX user service authorization step shown in figure 5.1.1-1 step C.

MCX User Service Authorization is the function that validates whether or not a MCX user has the authority to access certain MCX services. In order to gain access to MCX services, the MCX client in the UE presents an access token (acquired during user authentication as described in subclause 5.1.2) to each service of interest (i.e. Key Management, MCX server, Configuration Management, Group Management, etc.). If the access token is valid, then the user is granted the use of that service. Figure 5.1.3.1-1 shows the flow for user authorization which covers key management authorization, MCX user service authorization, configuration management authorization, and group management authorization.

NOTE: All HTTP traffic between the UE and HTTP proxy, and all HTTP traffic between the UE and KMS (if not going through the HTTP proxy) is protected using HTTPS.

For key management authorization, the KM client in the UE presents an access token to the KMS over HTTP. The KMS validates the access token and if successful, provides one or more sets of user specific key material back to the UE KM client based on the MC service ID(s) present in the access token (MCPTT ID, MCVideo ID and/or MCData ID). User specific key material includes identity based key information for media and signalling protection. This key management authorisation may be repeated for each KM service the user is authorised to use (MCPTT, MCVideo, MCData).

For MCPTT user service authorization, the MCPTT client in the UE presents an access token to the MCPTT server over SIP. The MCPTT server validates the access token and if successful, authorizes the user for full MCPTT services and sends an acknowledgement back to the MCPTT client. The MCPTT server then maps and maintains the IMPU to MCPTT ID association. The MCPTT ID to IMPU association shall only be known to the application layer. The SIP message used to convey the access token from the MCPTT client to the MCPTT server may be either a SIP REGISTER or SIP PUBLISH message.

For MCVideo service authorization, the MCVideo client in the UE presents an access token to the MCVideo server over SIP. The MCVideo server validates the access token and if successful, authorizes the user for full MCVideo services and sends an acknowledgement back to the MCVideo client. The MCVideo server then maps and maintains the

IMPU to MCVideo ID association. The MCVideo ID to IMPU association shall only be known to the application layer. The SIP message used to convey the access token from the MCVideo client to the MCVideo server may be either a SIP REGISTER or SIP PUBLISH message.

For MCData user service authorization, the MCData client in the UE presents an access token to the MCData server over SIP. The MCData server validates the access token and if successful, authorizes the user for full MCData services and sends an acknowledgement back to the MCData client. The MCData server then maps and maintains the IMPU to MCData ID association. The MCData ID to IMPU association shall only be known to the application layer. The SIP message used to convey the access token from the MCData client to the MCData server may be either a SIP REGISTER or SIP PUBLISH message.

The UE can now perform configuration management authorization and download the user profile for the service(s) (MCPTT, MCVideo, MCData). Following the flow described in subclause 10.1.4.3 of 3GPP TS 23.280 [36] " MC service user obtains the MC service user profile(s) from the network ", the Configuration Management (CM) client in the UE sends an access token in the user profile query to the Configuration Management server over HTTP. The CM server receives the request and validates the access token, and if valid, the CM server uses the identity from the access token (MCPTT ID, MCVideo ID, MCData ID) to obtain the user profile from the MCX user database. The CM server then sends the user profile back to the CM client over HTTP. This configuration management authorisation may be repeated for each CM service the user is authorised to use (MCPTT, MCVideo, MCData).

Upon receiving each user profile, the Group Management (GM) client in the UE can now perform group management authorization. The GM client obtains the user's group membership information from the user profile, and following the flow shown in clause 10.1.5.2 of 3GPP TS 23.280 [36] "Retrieve group configurations at the group management client", the Group Management (GM) client in the UE sends an access token in the Get group configuration request to the host GM server of the group membership over HTTP. The GM server validates the access token, and if valid, completes the flow. As part of group management authorization, group key information is provided as per subclause 5.7 of the present document. This group management authorisation may be repeated for each GM service the user is authorised to use (MCPTT, MCVideo, MCData).

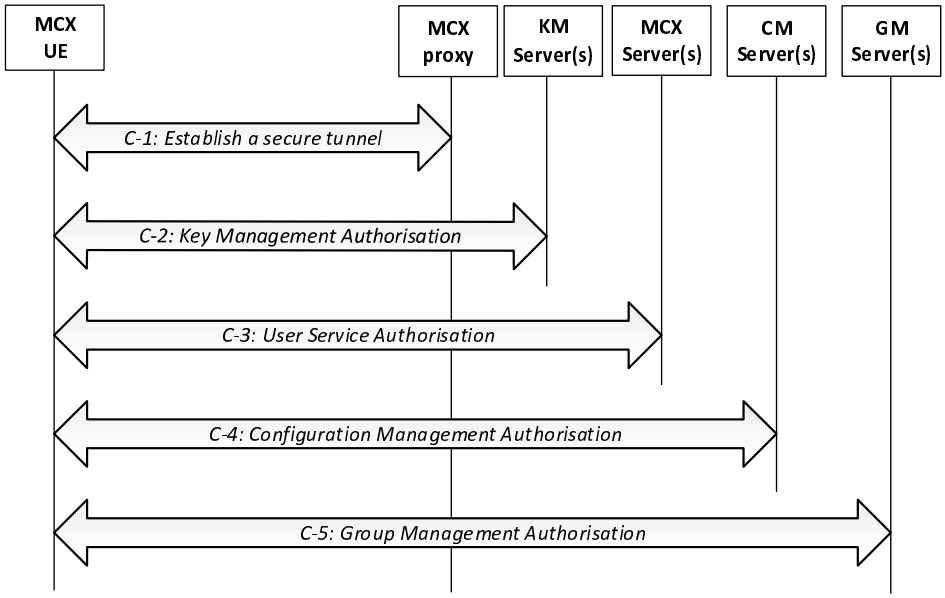

Figure 5.1.3.1-1: MCX user service authorization

The user authorization procedure in Step C of Figure 5.1.1-1 is further detailed into 5 sub steps that comprise the MCX user service authorization process:

Step C-1: If not already done, establish a secure HTTP tunnel using HTTPS between the MCX UE and MCX proxy server. Subsequent HTTP messaging makes use of this tunnel (with the possible exception of the KMS client to KMS server interface).

Step C-2: The KMS client in the UE presents an access token to the KMS over HTTP. The KMS authorizes the user for key management services based upon the MC service ID(s) provided and replies to the client with identity specific key information. This step may be repeated to authorise the user with additional KM services (MCPTT, MCVideo, MCData) as necessary.

Step C-3: The MCX client in the UE presents an access token to the MCX server over SIP as defined in clause 5.1.3.2 of the present document. This step may be repeated to authorise the user with additional MCX services (MCPTT, MCVideo, MCData) as necessary.

Step C-4: The CM client in the UE follows the "MCX user obtains the user profile (UE initiated)" flow from clause 10.1.4.3 of 3GPP TS 23.280 [36], presenting an access token in the Get MCX user profile request over HTTP. If the token is valid, then the CM server authorizes the user for configuration management services. Completion of this step results in the CM server providing the user's profile to the CM client. This step may be repeated as necessary to obtain the user profile for additional services (MCPTT, MCVideo, or MCData).

Step C-5: The GM client in the UE follows the "Retrieve group configurations at the group management client" flow as shown in clause 10.1.5.2 of 3GPP TS 23.280 [36], presenting an access token in the Get group configuration request over HTTP. If the token is valid, the GMS authorizes the user for group management services. Completion of this step results in the GMS sending the user's group policy information and group key information to the GM client. This step may be repeated to authorise the user for additional group services (MCPTT, MCVideo, MCData) as necessary.

[TS 33.180, clause 5.3.3]

The procedure for the provision of identity-specific key material when the HTTP proxy is supported between the KMS and the KMS client is described in figure 5.3.3-1. The procedure is the same whether the key management client in the MC UE, an MCX Server or a Group Management Server is making the request.

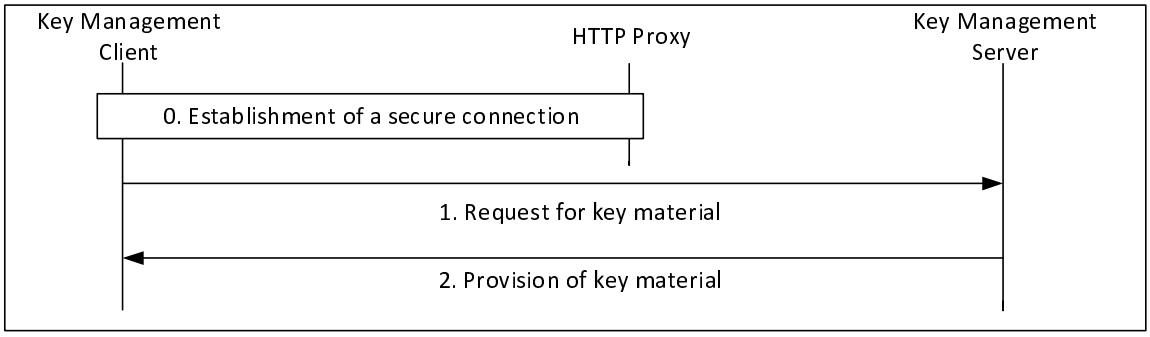

Figure 5.3.3-1: Provisioning of key material via the HTTP proxy

The procedure in figure 5.3.3-1 is now described step-by-step.

0) The key management client establishes a connection to the KMS. As with other elements in the Common Services Core, the connection is routed via, and secured by, the HTTP Proxy. The message flow below is within this secure connection.

NOTE: Additionally, the connection between the KMS and the HTTP Proxy is secured according to clause 6.1.

1) The key management client makes a request for user key material from the KMS. The request contains an access token to authenticate the user as defined in clause 5.1. There are three types of request (as defined in Annex D):

   a) KMSInit Request. This request is the first request sent to the KMS to setup the user.

   b) KMSKeyProv Request: This request is to obtain new key material from the KMS. The request may contain details of a specific identity (e.g. MCPTT ID) required for key management, and may contain a specific time for which the key material is required.

c) KMSCertCache Request: This request is to obtain external KMS certificates associated with external security domains (managed by another KMS). The request may contain details of the latest version of the cache received by the client.

2) The KMS provides a response based upon the authenticated user and the user's request. For public safety use, the key material itself shall be encrypted using a 256-bit transport key (TrK). The response may also be signed by the TrK or the InK. The TrK and InK are initially distributed via an out-of-band mechanism along with their 32-bit identifiers, the TrK-ID and InK-ID, respectively. The responses are:

a) KMSInit Response. This response contains domain parameters and optionally, a new TrK and/or a new InK.

b) KMSKeyProv Response: This response provides new key material to the user and optionally, a new TrK.

c) KMSCertCache Response: This response contains new or updated home KMS certificates and/or external KMS certificates required by the user for communications with external security domains.

The procedure for the provisioning of identity-specific key material when the HTTP proxy is not used between the KMS and the KMS client is as described in Figure 5.3.3-2.

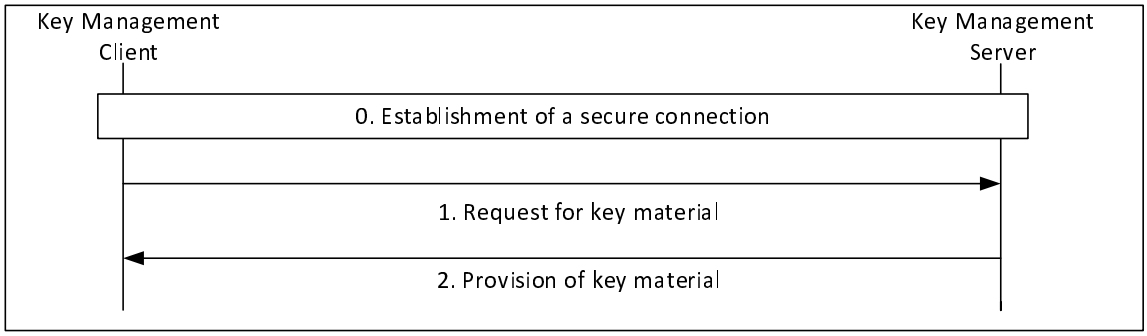

Figure 5.3.3-2: Provisioning of key material without a proxy

The procedure in Figure 5.3.3-2 is now described step-by-step:

0) The key management client establishes a direct HTTPS connection to the KMS. The following message flow is within this secure connection.

1) The key management client makes a request to the KMS. The same requests can be made as defined above with a proxy.

2) The KMS provides a response based upon the authenticated user and the user's request. Optionally, the key material itself may also be encrypted using a 256-bit transport key (TrK). The response may also be signed using the TrK or the InK. The TrK and InK are initially distributed via an out-of-band mechanism along with their 32-bit identifiers (TrK-ID and InK-ID respectively).

As a result of this procedure, the key management client has securely obtained key material for use within the MC system.

[TS 24.484, clause 4.2.1]

Upon start up the MC UE bootstraps the required information (e.g. FQDN or IP address) to locate the configuration management server for configuration of the MCS UE initial configuration management object (MO) and the default MCPTT user profile configuration management object (MO).

In order to obtain access to MC services the UE needs to obtain configuration data either online via the network or offline using some external device (e.g. a laptop). As part of the bootstrap process the MC UE needs to discover either:

1. the online configuration management server in the network that configures the MCS UE initial configuration MO and the default MCS user profile configuration MO(s), then the MC UE:

a) using the URI of the configuration management server obtained from the MCS UE initial configuration MO, obtains for each MCS that is enabled:

- the appropriateMCS UE configuration document;
- the appropriateMCS user profile configuration document; and
- the appropriateMC service configuration document; and

b) using the URI of the group management server obtained from the MCS UE initial configuration MO obtain the MCS group document; or

2. the:

a) offline configuration management server on the external device that configures the MC UE with the:

- MCS UE initial configuration MO;
- appropriate MCS UE configuration MO(s);
- appropriate MCS user profile MO(s); and
- appropriate MCS service configuration MO(s); and

b) offline group management server on the external device that configures the MC UE with the MCS group MO.

The mechanism to discover the online or offline configuration management server is dependent on the protocol used to manage and configure the MO and is out of scope of the present document.

[TS 24.484, clause 4.2.2.1]

The format of the MCS UE initial configuration MO downloaded to the MC UE during online configuration is defined in 3GPP TS 24.483 [4].

The format of the MCS group document downloaded to the MC UE during online configuration is defined in 3GPP TS 24.481 [5].

Figure 4.2.2-1 shows the MCPTT UE online configuration time sequence.

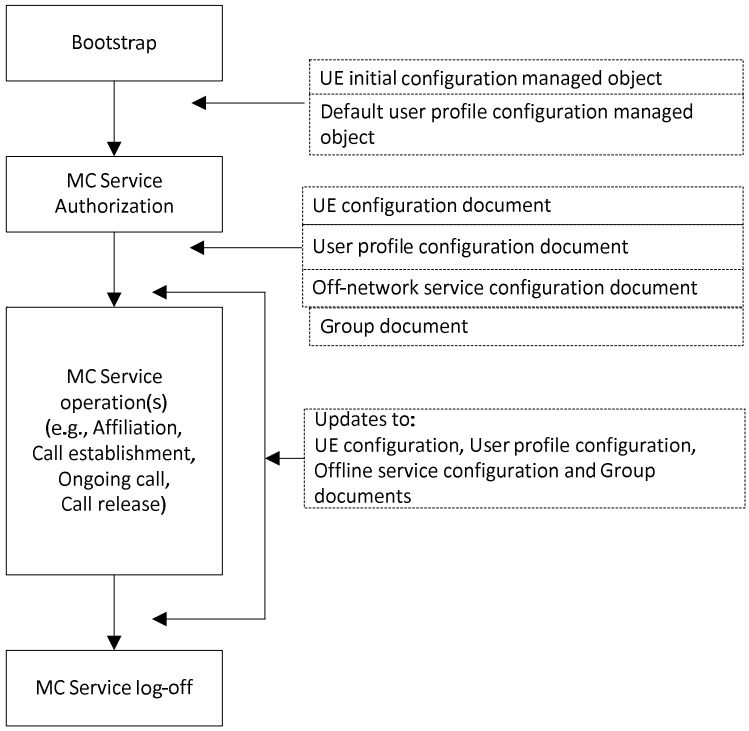

Figure 4.2.2-1 MC UE online configuration time sequence

If the MCS UE initial configuration MO has changed from the version stored in the MC UE, the updated MC UE initial configuration MO is downloaded to the MCPTT UE.

If the MCS UE initial configuration MO contains a <default-user-profile> element and the identified default MCS user profile configuration MO(s) have changed from the version stored in the MC UE, the updated default MCS user profile configuration MO(s) are downloaded to the MC UE.

NOTE 1: The default MCS user profile configuration MO(s) define the default identity(s) for the enabled mission critical service(s) and the profile of services available to the user (e.g. emergency MCPTT services) prior to user authentication.

The MC UE contacts the identity management server using the HTTPS URI stored in the MCS UE initial configuration MO and performs MC User authentication as specified in 3GPP TS 24.482 [6].

The MC UE, using the identities obtained during MC user authentication, subscribes to the MCS UE configuration document, the MCS user profile configuration document and the MCS service configuration document for each enabled MCS using the procedure for subscribing to multiple documents simultaneously using the subscription proxy function specified in subclause 6.3.13.2.2(i.e., the CMS acts as a Subscription Proxy) and subscribes to the MCS group document using the procedure specified in 3GPP TS 24.481 [5]. If these documents have been updated since the current version stored in the MC UE, then the MC UE will receive a SIP NOTIFY request with an XCAP Diff document (see IETF RFC 5875 [11]), in which case the CMC updates its local document copies . Retrieval by the MC UE using the notified HTTPS URI of the MCS group document is performed as specified in 3GPP TS 24.481 [5].

NOTE 2: The MC UE can be notified of changes to an configuration documents at any time while using the MCS.

[TS 24.484, clause 6.2.2]

The CMC shall send the HTTP request over TLS connection as specified for the HTTP client in the UE in annex A of 3GPP TS 24.482 [6].

[TS 24.484, clause 6.3.1.1]

A CMC shall support subclause 6.1.1 "*Document Management*" of OMA OMA-TS-XDM_Core-V2_1 [2] and subclause 6.3.13.2.2 for subscribing to configuration management documents.

[TS 24.484, clause 6.3.3.2.1]

In order to retrieve a configuration management document, a GC shall send an HTTP GET request with the Request URI that references the document to be updated to the network according to procedures specified in IETF RFC 4825 [14] "*Retrieve a Document*".

[TS 24.484, clause 6.3.3.2.2]

In order to retrieve a configuration management document, a CMC shall perform the procedures in subclause 6.3.3.2.1 specified for GC. The CMC shall set the Request-URI of the HTTP GET request to the "CMSXCAPRootURI" configured as per 3GPP TS 24.483 [4] and include the "auid" as per the appropriate application usage in clause 7.

Subclause 7.5 specifies which configuration management documents can be retrieved from the CMS over the CSC-4 reference point.

[TS 24.484, clause 6.3.13.2.1]

This procedure enables the CMC to subscribe to notification of changes of one or more configuration management documents defined.

This procedure enables the MCS server to subscribe to notification of changes of the MCPTT service configuration document.

[TS 24.484, clause 6.3.13.2.2]

In order to subscribe to Configuration management document, a CMC shall send an initial SIP SUBSCRIBE request to the network according to the UE originating procedures specified in 3GPP TS 24.229 [22] and IETF RFC 5875 [11]. In the initial SIP SUBSCRIBE request, the CMC:

…

b) if subscription to multiple documents simultaneously using the subscription proxy function is used:

   1) shall include an application/resource-lists+xml MIME body. In the application/resource-lists+xml MIME body, the CMC shall include one <entry> element for each document or element to be subscribed to, such that the "uri" attribute of the <entry> element contains a relative path reference:

      A) with the base URI being equal to the "CMSXCAPRootURI" configured in the CMC as per 3GPP TS 24.483 [4]; and

      B) with the "auid" parameter set to the appropriate application usage identifying a configuration management document;

   2) shall set the Request-URI to the configured public service identity for performing subscription proxy function of the CMS;

c) shall include an application/vnd.3gpp.mcptt-info+xml MIME body with the <mcptt-access-token> element set to the value of the access token received during authentication procedure as described in 3GPP TS 24.482 [6];

d) if identity hiding is required:

   1) shall perform the confidentiality protection procedures and integrity protection procedures defined in 3GPP TS 24.379 [9] for MCPTT client on the application/vnd.3gpp.mcptt-info+xml MIME body and on the application/resource-lists+xml MIME body; and

   2) shall include an application/mikey MIME body with the CSK as specified in 3GPP TS 24.379 [9];

e) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcptt" (coded as specified in 3GPP TS 24.229 [22]), in a P-Preferred-Service header field according to IETF RFC 6050 [23]; and

f) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcptt" in the Contact header field.

Upon receiving a SIP NOTIFY request associated with a subscription created as result of the sent initial SIP SUBSCRIBE request:

1) if identity hiding is required, the CMC shall perform the confidentiality protection procedures and integrity protection procedures defined in 3GPP TS 24.379 [9] for MC client; and

2) shall handle the SIP NOTIFY request according to IETF RFC 5875 [11].

In order to re-subscribe to notification of changes of a modified list of one or more configuration management documents; a CMC shall send a SIP re-SUBSCRIBE request to the network according to the UE originating procedures specified in 3GPP TS 24.229 [22] and IETF RFC 5875 [11]. In the SIP re-SUBSCRIBE request, the CMC:

a) if direct subscription is used, shall set the Request URI to a SIP URI containing:

   1) the base URI being equal to the "CMSXCAPRootURI" configured in the CMC as per 3GPP TS 24.483 [4]; and

   2) the "auid" parameter set to the appropriate application usage identifying a configuration management document as described in clause 7;

b) if subscription to multiple documents simultaneously using the subscription proxy function is used:

   1) shall include an application/resource-lists+xml MIME body. In the application/resource-lists+xml MIME body, the CMC shall include one <entry> element for each document or element to be subscribed to, such that the "uri" attribute of the <entry> element contains a relative path reference:

      A) with the base URI being equal to the "CMSXCAPRootURI" configured in the CMC as per 3GPP TS 24.483 [4]; and

      B) with the "auid" parameter set to the appropriate application usage identifying a configuration management document as described in clause 7;

c) if identity hiding is required, shall perform the confidentiality protection procedures and integrity protection procedures defined in 3GPP TS 24.379 [9] for MC client on the application/vnd.3gpp.mcptt-info+xml MIME body and on the application/resource-lists+xml MIME body using the CSK included in the initial SIP SUBSCRIBE request; and

d) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcptt" in the Contact header field.

[TS 24.481, clauses 6.2.2.2]

In order to address an existing group document defining a group ID known by GC, the GC shall set the Request-URI of an HTTP request to a XCAP URI identifying a group document addressed by a group ID as described in subclause 7.2.10.2, where the group ID is set to the group ID known by GC and where the XCAP root URI is the XCAP root URI configured in the GC.

[TS 24.481, clauses 6.2.3]

The GMC shall send the HTTP request over a TLS connection as specified for the HTTP client in the UE in annex A of 3GPP TS 24.482 [10].

The GMC shall perform the procedures in subclause 6.2.2 specified for GC.

[TS 24.481, clauses 6.3.3.2.1]

In order to retrieve a group document, a GC shall send an HTTP GET request with the Request URI that references the document to be retrieved to the network according to procedures specified in IETF RFC 4825 [22] "*Fetch a Document*".

[TS 24.481, clauses 6.3.3.2.2]

In order to retrieve a group document, a GMC shall perform the procedures in subclause 6.3.3.2.1 specified for GC.

[TS 24.481, clauses 6.3.13.2.1]

In order to subscribe to notification of changes of:

a) one or more MCData group documents of MCData groups identified by MCData group IDs;

…

a GMC shall send an initial SIP SUBSCRIBE request to the network according to the UE originating procedures specified in 3GPP TS 24.229 [12] and IETF RFC 5875 [13]. In the initial SIP SUBSCRIBE request, the GMC:

a) shall include an application/resource-lists+xml MIME body. In the application/resource-lists+xml MIME body, the GMC shall include one <entry> element for each document or element to be subscribed to, such that the "uri" attribute of the <entry> element:

   1) contains a relative path reference:

      A) with the base URI being equal to the XCAP root URI configured in the GMC; and

      B) identifying a group document addressed by a group ID as described in subclause 7.2.10.2 where the group ID is set to the MCData group ID; or

   ...

b) shall set the Request-URI to the configured public service identity for performing subscription proxy function of the GMS;

c) shall include an application/vnd.3gpp.mcptt-info+xml MIME body with the <mcptt-access-token> element set to the value of the access token received during authentication procedure as described in 3GPP TS 24.482 [49];

d) if identity hiding is required:

   1) shall perform the confidentiality protection procedures and integrity protection procedures defined in 3GPP TS 24.379 [5] for MCPTT client on the application/vnd.3gpp.mcptt-info+xml MIME body and on the application/resource-lists+xml MIME body; and

2) shall include an application/mikey MIME body with the CSK as specified in 3GPP TS 24.379 [5];

e) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcptt" (coded as specified in 3GPP TS 24.229 [12]), in a P-Preferred-Service header field according to IETF RFC 6050 [14]; and

f) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcptt" in the Contact header field.

Upon receiving a SIP NOTIFY request associated with a subscription created as result of the sent initial SIP SUBSCRIBE request:

1) if identity hiding is required, the GMC shall perform the confidentiality protection procedures and integrity protection procedures defined in 3GPP TS 24.379 [5] for MCPTT client; and

2) shall handle the SIP NOTIFY request according to IETF RFC 5875 [13].

[TS 24.282, clause 7.2.1]

When the MCData client performs SIP registration for service authorisation the MCData client shall perform the registration procedures as specified in 3GPP TS 24.229 [5].

The MCData client shall include the following media feature tags in the Contact header field of the SIP REGISTER request:

1) the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata";

2) if SDS is supported then:

   a) the g.3gpp.mcdata.sds media feature tag; and

   b) the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds"; and

3) if FD service is supported then:

   a) the g.3gpp.mcdata.fd media feature tag; and

   b) the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd".

NOTE 1: If the MCData client logs off from the MCData service but the MCData UE remains registered the MCData UE performs a re-registration as specified in 3GPP TS 24.229 [5] without the supported g.3gpp.mcdata media feature tags and the g.3gpp.icsi-ref media feature tag containing the supported MCData service ICSIs in the Contact header field of the SIP REGISTER request.

If the MCData client, upon performing SIP registration:

1) has successfully finished the user authentication procedure as described in 3GPP TS 24.482 [24];

2) has available an access-token;

3) based on implementation decides to use SIP REGISTER for service authorization;

4) confidentiality protection is disabled as specified in subclause 6.5.2.3.1; and

5) integrity protection is disabled as specified in subclause 6.5.3.3.1;

then the MCData client shall include an application/vnd.3gpp.mcdata-info+xml MIME body as defined in Annex F.1 with the <mcdata-access-token> element set to the value of the access token received during the user authentication procedures, in the SIP REGISTER request.

NOTE 2: the access-token contains the MCData ID of the user.

If the MCData client, upon performing SIP registration:

1) has successfully finished the user authentication procedure as described in 3GPP TS 24.482 [24];

2) has an available access-token;

3) based on implementation decides to use SIP REGISTER for service authorization; and

4) either confidentiality protection is enabled as specified in subclause 6.5.2.3.1 or integrity protection is enabled as specified in subclause 6.5.3.3.1;

then the MCData client:

1) shall include an application/mikey MIME body with the CSK as MIKEY-SAKKE I_MESSAGE as specified in 3GPP TS 33.180 [26] in the body of the SIP REGISTER request;

2) if confidentiality protection is enabled as specified in subclause 6.5.2.3.1, shall encrypt the received access-token using the CSK and shall include in the body of the SIP REGISTER request, an application/vnd.3gpp.mcdata-info+xml MIME body with the <mcdata-access-token> element set to the encrypted access-token, as specified in subclause 6.5.3.3.1;

3) if confidentiality protection is disabled as specified in subclause 6.5.2.3.1, shall include an application/vnd.3gpp.mcdata-info+xml MIME body as defined in Annex F.1 with the <mcdata-access-token> element set to the value of the access token received during the user authentication procedures; and

4) if integrity protection is enabled as specified in subclause 6.5.3.3.1, shall use the CSK to integrity protect the application/vnd.3gpp.mcdata-info+xml MIME body by following the procedures in subclause 6.6.3.3.3.

[TS 24.282, clause 7.2.1A]

This procedure is only referenced from other procedures.

When populating the SIP PUBLISH request, the MCData client shall:

1) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user;

2) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7];

3) shall set the Event header field to the "poc-settings" value; and

4) shall set the Expires header field according to IETF RFC 3903 [34], to 4294967295, if the MCData user is not removing the MCData service settings, otherwise to remove the MCData service settings the MCData client shall set the Expires header field to zero.

NOTE 1: 4294967295, which is equal to 2^{32}-1, is the highest value defined for Expires header field in IETF RFC 3261 [4].

NOTE 2: The expiration timer of the MCData client service settings is only applicable for the MCData client service settings from the MCData client that matches the Instance Identifier URN. The expiration timer of MCData user service settings is also updated in the MCData server if expiration timer of MCData client service settings is updated in the MCData server.

NOTE 3: Removing the MCData service settings by setting the Expires header field to zero, logs off the MCData client from the MCData service.

[TS 24.282, clause 7.2.2]

If based on implementation the MCData client decides to use SIP PUBLISH for MCData server settings to also perform service authorization and

1) has successfully finished the user authentication procedure as described in 3GPP TS 24.482 [24]; and

2) has available an access-token;

then the MCData client:

1) shall perform the procedures in subclause 7.2.1A;

2) if confidentiality protection is disabled as specified in subclause 6.5.2.3.1 and integrity protection is disabled, shall include in the body of the SIP PUBLISH request, an application/vnd.3gpp.mcdata-info+xml MIME body as

specified in Annex F.1 with the <mcdata-access-token> element set to the value of the access token received during the user authentication procedures;

3) if either confidentiality protection is enabled as specified in subclause 6.5.2.3.1 or integrity protection is enabled as specified in subclause 6.5.3.3.1 shall include an application/mikey MIME body with the CSK as MIKEY-SAKKE I_MESSAGE as specified in 3GPP TS 33.180 [26] in the body of the SIP PUBLISH request;

4) if confidentiality protection is enabled as specified in subclause 6.5.2.3.1, shall include in the body of the SIP PUBLISH request an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <mcdata-access-token> element set to the received access-token encrypted using the CSK, as specified in subclause 6.5.2.3.3; and

   b) the <mcdata-client-id> element set to the encrypted MCData client ID of the originating MCData client, as specified in subclause 6.5.2.3.3;

5) if confidentiality protection is disabled as specified in subclause 6.5.2.3.1, shall include in the body of the SIP PUBLISH request, an application/vnd.3gpp.mcdata-info+xml MIME body as specified in Annex F.1 with:

   a) the <mcdata-access-token> element set to the value of the access token received during the user authentication procedures in the body of the SIP PUBLISH request; and

   b) the <mcdata-client-id> element set to the value of the MCData client ID of the originating MCData client;

6) shall include an application/poc-settings+xml MIME body as defined in 3GPP TS 24.379 [10] containing:

   a) the <selected-user-profile-index> element set to the value contained in the "user-profile-index" attribute of the selected MCData user profile as defined in 3GPP TS 24.484 [12]; and

7) if integrity protection is enabled as specified in subclause 6.5.3.3.1, shall use the CSK to integrity protect the application/vnd.3gpp.mcdata-info+xml MIME body and application/poc-settings+xml MIME body by following the procedures in subclause 6.5.3.3.3.

The MCData client shall send the SIP PUBLISH request according to 3GPP TS 24.229 [5].

[TS 24.282, clause 7.2.3]

To set, update, remove or refresh the MCData service settings, the MCData client shall generate a SIP PUBLISH request according 3GPP TS 24.229 [5], IETF RFC 3903 [34] and IETF RFC 4354 [35]. In the SIP PUBLISH request, the MCData client:

1) shall perform the procedures in subclause 7.2.1A;

2) if confidentiality protection is enabled as specified in subclause 6.5.2.3.1, shall include in the body of the SIP PUBLISH request, an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <mcdata-request-uri> element set to the targeted MCData ID encrypted using the CSK, as specified in subclause 6.5.2.3.3; and

   b) the <mcdata-client-id> element set to the encrypted MCData client ID of the originating MCData client, as specified in subclause 6.5.2.3.3;

3) if confidentiality protection is disabled as specified in subclause 6.5.2.3.1, shall include an application/vnd.3gpp.mcdata-info+xml MIME body as specified in Annex F.1 with:

   a) the <mcdata-request-uri> set to the cleartext targeted MCData ID; and

   b) the <mcdata-client-id> element set to the value of the MCData client ID of the originating MCData client;

4) shall include an application/poc-settings+xml MIME body as defined in 3GPP TS 24.379 [10] containing:

   a) the <selected-user-profile-index> element set to the value contained in the "user-profile-index" attribute of the selected MCData user profile as defined in 3GPP TS 24.484 [12]; and

5) if integrity protection is enabled as specified in subclause 6.5.3.3.1, shall use the CSK to integrity protect the application/vnd.3gpp.mcdata-info+xml MIME body and application/poc-settings+xml MIME body by following the procedures in subclause 6.5.3.3.3.

The MCData client shall send the SIP PUBLISH request according to 3GPP TS 24.229 [5].

On receiving the SIP 200 (OK) response to the SIP PUBLISH request the MCData client may indicate to the MCData User the successful communication of the MCData service settings to the MCData server.

[TS 33.180, clause 6.1.2]

The support of Transport Layer Security (TLS) on HTTP-1 is mandatory. The profile for TLS implementation and usage shall follow the provisions given in 3GPP TS 33.310 [5], annex E.

If the PSK TLS based authentication mechanism is supported, the HTTP client in the MC UE and the HTTP Proxy shall support the TLS version, PSK ciphersuites and TLS Extensions as specified in the TLS profile given in 3GPP TS 33.310 [5], annex E. The usage of pre-shared key ciphersuites for TLS is specified in the TLS profile given in 3GPP TS 33.310 [5], annex E.

5.1.3 Test description

5.1.3.1 Pre-test conditions

Same pre-test conditions as for MCPTT test case 5.1 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData".

5.1.3.2 Test procedure sequence

Same test procedure sequence as for MCPTT test case 5.1 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData".

5.1.3.3 Specific message contents

Same specific message contents as for MCPTT test case 5.1 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData".
- Condition MCDATA is used for all messages.

5.2 Configuration / Group Creation / Group ReGroup Creation / Group ReGroup Teardown

5.2.1 Test Purpose (TP)

(1)

```
with { UE (MCData Client) attached to EPS services }
ensure that {
  when { the UE (MCData Client) requests formation of a new MCData group }
    then { on successful group creation the UE (MCData Client) has access to the new group }
            }
```

(2)

```
with { UE (MCData Client) having access to at least two MCData groups }
ensure that {
  when { the UE (MCData Client) requests the groups to be combined }
    then { on successful group regrouping the UE (MCData Client) has access to the temporary group }
            }
```

(3)

```
with { UE (MCData Client) having access to a temporary group }
ensure that {
  when { the UE (MCData Client) requests temporary group tear down }
```

```
    then { on successful group tear down the UE (MCData Client) removes the temporary group }
           }
```

5.2.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.481 clauses 6.3.2.2.1, 6.3.2.2.2, 6.3.14.1, 6.3.14.2, 6.3.15.1 and 6.3.15.2; TS 33.180, clause 7.3.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated these are Rel-14 requirements.

[TS 24.481, clause 6.3.2.2.1]

In order to create a group document, a GC shall create an XML document of the application usage specified in subclause 7.2.1 and shall send the XML document to the network according to procedures specified in IETF RFC 4825 [22] "*Create or Replace a Document*". The GC shall set the Request-URI of the HTTP PUT request to an XCAP URI in users tree where the XUI is set to a group creation XUI configuration parameter.

[TS 24.481, clause 6.3.2.2.2]

In order to create a group document, a GMC shall perform the procedures in subclause 6.3.2.2.1 specified for GC.

[TS 24.481, clause 6.3.14.1]

This procedure enables a GMC to initiate creation of a temporary MCS group by combining MCS groups.

NOTE: The temporary MCS group formation procedure does not ensure that the MCSs of the temporary MCS group are the same as MCSs of each constituent MCS group of the temporary MCS group.

[TS 24.481, clause 6.3.14.2]

In order to form a temporary MCS group, a GMC shall send a HTTP POST request according to procedures specified in IETF RFC 2616 [21] and subclause 6.2.3. In the HTTP POST request, the GMC:

a) shall set the Request-URI to an XCAP URI:

   1) in users tree where the XUI is set to a group creation XUI configuration parameter; and

   2) with the document selector identifying the temporary MCS group to be created; and

b) shall include an application/vnd.3gpp.GMOP+xml MIME body containing a GMOP document requesting group regroup creation specified in subclause 7.3.4.3, with a <group> element containing a group document for an MCS group. In the group document, the GMC shall include the <on-network-temporary> element according to subclause 7.2. In the <on-network-temporary> element, the GMC shall include <constituent-MCPTT-group-IDs> element according to subclause 7.2. In the <constituent-MCPTT-group-IDs> element, the GMC shall include one <constituent-MCPTT-group-ID> element according to subclause 7.2 for each MCS group to be combined.

Upon reception of an HTTP 2xx response to the sent HTTP POST request, the GMC shall consider the temporary MCS group formation as successful.

Upon reception of an HTTP 409 (Conflict) response with at least one <alt-value> element in the <uniqueness-failure> error element, the GMC may repeat procedures of the present subclause and identify the temporary MCS group being formed with an MCS Group ID indicated in an <alt-value> element.

[TS 24.481, clause 6.3.15.1]

This procedure enables a GMC to initiate tear down of a temporary MCS group.

[TS 24.481, clause 6.3.15.2]

In order to tear down a temporary MCS group, the GMC shall send an HTTP DELETE request with Request-URI with an XCAP URI identifying a group document of the temporary MCS group according to procedures specified in IETF RFC 4825 [22] "*Delete an Element*".

[TS 33.180, clause 7.3.2]

The group creation procedure is described in clause 10.2.3 of 3GPP TS 23.280 [36] and applies to the MCPTT scenario of normal group creation by an MC administrator and user regrouping operations by an authorized user/dispatcher. To establish the security context for the group, the GMS follows the procedures in clause 5.7 to create a new GMK and GMK-ID.

The encapsulated GMK and GUK-ID is sent to group members by the GMS within a notification message (step 4 in clause 10.2.3 of 3GPP TS 23.280 [36]). The procedure is equivalent to that described in clause 5.7 of this specification.

5.2.3 Test description

5.2.3.1 Pre-test conditions

Same pre-test conditions as for MCPTT test case 5.2 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"

5.2.3.2 Test procedure sequence

Same test procedure sequence as for MCPTT test case 5.2 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"

5.2.3.3 Specific message contents

Same specific message contents as for MCPTT test case 5.2 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"
- Condition MCDATA is used for all messages.

5.3 Configuration / Group Affiliation / Remote change / De-affiliation / Home MCData system

5.3.1 Test Purpose (TP)

(1)

```
with { UE (MCData Client) already provisioned with the group information or a pointer to the group
information, that the UE (MCData Client) is allowed to be affiliated }
ensure that {
  when { MCData User requests for current affiliation status and to subscribe to affiliation status
changes for the MCData User }
    then { UE (MCData Client) requests to subscribe to affiliation status changes for the MCData
User by sending the SS (MCData Server) a SIP SUBSCRIBE message and starts informing the MCData User
of any affiliation status changes for the MCData User after the subscription is accepted }
            }
```

(2)

```
with { UE (MCData Client) already provisioned with the group information or a pointer to the group
information, that the UE (MCData Client) is allowed to be affiliated }
ensure that {
  when { MCData User requests to affiliate to an MCData group }
    then { UE (MCData Client) requests to affiliate to a MCData group by sending the SS (MCData
Server) a SIP PUBLISH message }
            }
```

(3)

```
with { UE (MCData Client) already provisioned with the group information or a pointer to the group
information, that the UE (MCData Client) is allowed to be affiliated }
ensure that {
  when { MCData User requests for current affiliation status and to subscribe to affiliation status
changes for a target user }
```

then { UE (MCData Client) requests to subscribe to affiliation status changes for the target user by sending the SS (MCData Server) a SIP SUBSCRIBE message **and** starts informing the MCData User of any affiliation status changes for the target user after the subscription is accepted }
}

(4)

with { UE (MCData Client) already provisioned with the group information or a pointer to the group information that the UE (MCData Client) is allowed to make affiliation changes for another user }
ensure that {
when { MCData User requests that a target user be affiliated to an MCData group via mandatory mode }
then { UE (MCData Client) requests that a target user be affiliated to an MCData group via mandatory mode by sending the SS (MCData Server) a SIP PUBLISH message }
}

(5)

with { UE (MCData Client) already provisioned with the group information or a pointer to the group information that the UE (MCData Client) is allowed to make affiliation changes for another user }
ensure that {
when { MCData User requests that a target user be de-affiliated to an MCData group via mandatory mode }
then { UE (MCData Client) requests that a target user be de-affiliated to an MCData group via mandatory mode by sending the SS (MCData Server) a SIP PUBLISH message }
}

(6)

with { UE (MCData Client) already provisioned with the group information or a pointer to the group information that the UE (MCData Client) is allowed to make affiliation changes for another user }
ensure that {
when { MCData User requests that a target user be affiliated to an MCData group via negotiated mode }
then { UE (MCData Client) requests that a target user be affiliated to an MCData group via negotiated mode by sending the SS (MCData Server) a SIP MESSAGE message }
}

(7)

with { UE (MCData Client) already provisioned with the group information or a pointer to the group information, that the UE (MCData Client) is allowed to be affiliated }
ensure that {
when { MCData User requests to de-subscribe to affiliation status changes for a target user }
then { UE (MCData Client) requests to de-subscribe to affiliation status changes for a target user by sending the SS (MCData Server) a SIP SUBSCRIBE message }
}

(8)

with { UE (MCData Client) already affiliated with a MCData group }
ensure that {
when { MCData User requests to de-affiliate from an MCData group }
then { UE (MCData Client) requests to de-affiliate from an MCData group by sending the SS (MCData Server) a SIP PUBLISH message }
}

(9)

with { UE (MCData Client) already provisioned with the group information or a pointer to the group information, that the UE (MCData Client) is allowed to be affiliated }
ensure that {
when { MCData Server requests that the MCData User choose to affiliate to an MCData group via negotiated mode by sending a SIP MESSAGE message }
then { UE (MCData Client) accepts to affiliate to a MCData group by sending the SS (MCData Server) a SIP PUBLISH message }
}

5.3.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 8.2.2, 8.2.3, 8.2.4, and 8.2.5. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 8.2.2]

In order:

- to indicate that an MCData user is interested in one or more MCData group(s) at an MCData client;
- to indicate that the MCData user is no longer interested in one or more MCData group(s) at the MCData client;
- to refresh indication of an MCData user interest in one or more MCData group(s) at an MCData client due to near expiration of the expiration time of an MCData group with the affiliation status set to the "affiliated" state received in a SIP NOTIFY request in subclause 8.2.3;
- to send an affiliation status change request in mandatory mode to another MCData user; or
- any combination of the above;

the MCData client shall generate a SIP PUBLISH request according to 3GPP TS 24.229 [5], IETF RFC 3903 [34], and IETF RFC 3856 [39].

In the SIP PUBLISH request, the MCData client:

1) shall set the Request-URI to the public service identity identifying the originating participating MCData function serving the MCData user;
2) shall include an application/vnd.3gpp.mcdata-info+xml MIME body. In the application/vnd.3gpp.mcdata-info+xml MIME body, the MCData client shall include the <mcdata-request-uri> element set to the MCData ID of the MCData user;
3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7];
4) if the targeted MCData user is interested in at least one MCData group at the targeted MCData client, shall set the Expires header field according to IETF RFC 3903 [34], to 4294967295;

NOTE 1: 4294967295, which is equal to 2^{32}-1, is the highest value defined for Expires header field in IETF RFC 3261 [4].

5) if the targeted MCData user is no longer interested in any MCData group at the targeted MCData client, shall set the Expires header field according to IETF RFC 3903 [34], to zero; and
6) shall include an application/pidf+xml MIME body indicating per-user affiliation information according to subclause 8.4.1. In the MIME body, the MCData client:
   a) shall include all MCData groups where the targeted MCData user indicates its interest at the targeted MCData client;
   b) shall include the MCData client ID of the targeted MCData client;
   c) shall not include the "status" attribute and the "expires" attribute in the <affiliation> element; and
   d) shall set the <p-id> child element of the <presence> root element to a globally unique value.

The MCData client shall send the SIP PUBLISH request according to 3GPP TS 24.229 [5].

[TS 24.282, clause 8.2.3]

NOTE 1: The MCData UE also uses this procedure to determine which MCData groups the MCData user successfully affiliated to.

In order to discover MCData groups:

1) which the MCData user at an MCData client is affiliated to; or

2) which another MCData user is affiliated to;

the MCData client shall generate an initial SIP SUBSCRIBE request according to 3GPP TS 24.229 [5], IETF RFC 3856 [39], and IETF RFC 6665 [36].

In the SIP SUBSCRIBE request, the MCData client:

1) shall set the Request-URI to the public service identity identifying the originating participating MCData function serving the MCData user;

2) shall include an application/vnd.3gpp.mcdata-info+xml MIME body. In the application/vnd.3gpp.mcdata-info+xml MIME body, the MCData client shall include the <mcdata-request-uri> element set to the MCData ID of the targeted MCData user;

3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7];

4) if the MCData client wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [36], to 4294967295;

NOTE 2: 4294967295, which is equal to 2^{32}-1, is the highest value defined for Expires header field in IETF RFC 3261 [4].

5) if the MCData client wants to fetch the current state only, shall set the Expires header field according to IETF RFC 6665 [36], to zero; and

6) shall include an Accept header field containing the application/pidf+xml MIME type; and

7) if requesting MCData groups where the MCData user is affiliated to at the MCData client, shall include an application/simple-filter+xml MIME body indicating per-client restrictions of presence event package notification information according to subclause 8.4.2, indicating the MCData client ID of the MCData client.

In order to re-subscribe or de-subscribe, the MCData client shall generate an in-dialog SIP SUBSCRIBE request according to 3GPP TS 24.229 [5], IETF RFC 3856 [39], and IETF RFC 6665 [36]. In the SIP SUBSCRIBE request, the MCData client:

1) if the MCData client wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [36], to 4294967295;

NOTE 3: 4294967295, which is equal to 2^{32}-1, is the highest value defined for Expires header field in IETF RFC 3261 [4].

2) if the MCData client wants to de-subscribe, shall set the Expires header field according to IETF RFC 6665 [36], to zero; and

3) shall include an Accept header field containing the application/pidf+xml MIME type.

Upon receiving a SIP NOTIFY request according to 3GPP TS 24.229 [5], IETF RFC 3856 [39], and IETF RFC 6665 [36], if SIP NOTIFY request contains an application/pidf+xml MIME body indicating per-user affiliation information constructed according to subclause 8.4.1, then the MCData client shall determine affiliation status of the MCData user for each MCData group at the MCData client(s) in the MIME body. If the <p-id> child element of the <presence> root element of the application/pidf+xml MIME body of the SIP NOTIFY request is included, the <p-id> element value indicates the SIP PUBLISH request which triggered sending of the SIP NOTIFY request.

[TS 24.282, clause 8.2.4]

NOTE: Procedure for sending affiliation status change request in negotiated mode to several target MCData users is not supported in this version of the specification.

Upon receiving a request from the MCData user to send an affiliation status change request in negotiated mode to a target MCData user, the MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6]. In the SIP MESSAGE request, the MCData client:

1) shall set the Request-URI to the public service identity identifying the originating participating MCData function serving the MCData user;

2) shall include an application/vnd.3gpp.mcdata-info+xml MIME body. In the application/vnd.3gpp.mcdata-info+xml MIME body, the MCData client shall include the <mcdata-request-uri> element set to the MCData ID of the target MCData user;

3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

4) shall include an application/vnd.3gpp.mcdata-affiliation-command+xml MIME body as specified in Annex D.3; and

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

On receiving a SIP 2xx response to the SIP MESSAGE request, the MCData client shall indicate to the user that the request has been delivered to an MCData client of the target MCData user.

[TS 24.282, clause 8.2.5]

Upon receiving a SIP MESSAGE request containing:

1) the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata" (coded as specified in 3GPP TS 24.229 [5]), in a P-Asserted-Service header field according to IETF RFC 6050 [7]; and

2) an application/vnd.3gpp.mcdata-affiliation-command+xml MIME body with a list of MCData groups for affiliation under the <affiliate> element and a list of MCData groups for de-affiliation under the <de-affiliate> element;

then the MCData client:

1) shall send a 200 (OK) response to the SIP MESSAGE request;

2) shall seek confirmation of the list of MCData groups for affiliation and the list of MCData groups for de-affiliation, resulting in an accepted list of MCData groups for affiliation and an accepted list of MCData groups for de-affiliation; and

3) if the user accepts the request:

   a) shall perform affiliation for each entry in the accepted list of MCData groups for affiliation for which the MCData client is not affiliated, as specified in subclause 8.2.2; and

   b) shall perform de-affiliation for each entry in the accepted list of MCData groups for de-affiliation for which the MCData client is affiliated, as specified in subclause 8.2.2.

5.3.3 Test description

5.3.3.1 Pre-test conditions

Same pre-test conditions as for MCPTT test case 5.3 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"

5.3.3.2 Test procedure sequence

Same test procedure sequence as for MCPTT test case 5.3 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"

5.3.3.3 Specific message contents

Same specific message contents as for MCPTT test case 5.3 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"

- Condition MCDATA is used for all messages.

5.4 Configuration / Determination of MCData Service Settings / Current Active MCData Settings / De-subscribe

5.4.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { MCData User requests to verify the currently active MCData service settings or to discover
MCData service settings }
    then { UE (MCData Client) sends a SIP SUBSCRIBE message to find the MCData service settings and
responds to the SIP NOTIFY message with a SIP 200 (OK) message }
            }
```

(2)

```
with { UE (MCDATA Client) having already subscribed to find the MCData service settings }
ensure that {
  when { MCData User requests to re-subscribe for MCData service settings }
    then { UE (MCData Client) sends a SIP SUBSCRIBE message to re-subscribe for the MCData service
settings and responds to the SIP NOTIFY message with a SIP 200 (OK) message }
            }
```

(3)

```
with { UE (MCDATA Client) having already subscribed to find the MCData service settings }
ensure that {
  when { MCData User requests to de-subscribe for MCData service settings }
    then { UE (MCData Client) sends a SIP SUBSCRIBE message to de-subscribe for the MCData service
settings and responds to the SIP NOTIFY message with a SIP 200 (OK) message }
            }
```

5.4.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.282 clause 7.2.4. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated these are Rel-14 requirements.

[TS 24.282, clause 7.2.4]

In order to discover MCData service settings of another MCData client of the same MCData user or to verify the currently active MCData service settings of this MCData client, the MCData client shall generate an initial SIP SUBSCRIBE request according to 3GPP TS 24.229 [5], IETF RFC 6665 [36], and IETF RFC 4354 [35].

In the SIP SUBSCRIBE request, the MCData client:

1) shall set the Request-URI to the public service identity identifying the originating participating MCData function serving the MCData user;

2) shall include an application/vnd.3gpp.mcdata-info+xml MIME body. In the application/vnd.3gpp.mcdata-info+xml MIME body, the MCData client shall include the <mcdata-request-uri> element set to the MCData ID of the MCData user;

3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7];

4) shall set the Event header field to the 'poc-settings' value;

5) shall include an Accept header field containing the "application/poc-settings+xml" MIME type;

6) if the MCData client wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [36], to 4294967295; and

NOTE 1: 4294967295, which is equal to 2^{32}-1, is the highest value defined for Expires header field in IETF RFC 3261 [4].

7) if the MCData client wants to fetch the current state only, shall set the Expires header field according to IETF RFC 6665 [36], to zero.

In order to re-subscribe or de-subscribe, the MCData client shall generate an in-dialog SIP SUBSCRIBE request according to 3GPP TS 24.229 [5], IETF RFC 6665 [36], IETF RFC 4354 [35]. In the SIP SUBSCRIBE request, the MCData client:

1) shall set the Event header field to the 'poc-settings' value;

2) shall include an Accept header field containing the "application/poc-settings+xml" MIME type;

3) if the MCData client wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [36], to 4294967295; and

NOTE 2: 4294967295, which is equal to 2^{32}-1, is the highest value defined for Expires header field in IETF RFC 3261 [4].

4) if the MCData client wants to de-subscribe, shall set the Expires header field according to IETF RFC 6665 [36], to zero.

Upon receiving a SIP NOTIFY request according to 3GPP TS 24.229 [5], IETF RFC 6665 [36] and IETF RFC 4354 [35], that contains an application/poc-settings+xml MIME body the MCData client shall cache:

1) the <am-settings> element of the poc-settings+xml MIME body for each MCData client identified by the "id" attribute according to IETF RFC 4354 [35] as the current Answer-mode indication of that MPCTT client; and

2) the <selected-user-profile-index> element of the poc-settings+xml MIME body for each MCData client identified by the "id" attribute according to IETF RFC 4354 [35] as the active MCData user profile of that MCData client.

5.4.3 Test description

5.4.3.1 Pre-test conditions

Same pre-test conditions as for MCPTT test case 5.5 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"

5.4.3.2 Test procedure sequence

Same test procedure sequence as for MCPTT test case 5.5 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"

5.4.3.3 Specific message contents

Same specific message contents as for MCPTT test case 5.5 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"

- Condition MCDATA is used for all messages.

5.5 Configuration / Pre-established Session Establishment / Pre-established Session Release

5.5.5 Test Purpose (TP)

(1)

```
with { UE (MCData client) registered and authorized for MCData Service }
ensure that {
  when { MCData User requests the creation of a pre-established session }
    then { UE (MCData client) requests the creation of a pre-establish session by sending a SIP
INVITE message }
            }
```

(2)

```
with { the MCData client already having a pre-stablished session created }
ensure that {
  when { MCData User requests the release of a pre-established session }
    then { UE (MCData client) requests the release of a pre-establish session by sending a SIP BYE
message }
            }
```

(3)

```
with { the MCData client already having a pre-stablished session created }
ensure that {
  when { MCData Server requests the release of a pre-established session by sending a SIP BYE
message }
    then { UE (MCData client) responds to the pre-established session release request by sending a
SIP 200 (OK) message }
            }
```

5.5.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 18.3.2.1, 18.3.3.1.1, 18.3.3.1.2. Unless otherwise stated, these are Rel-13 requirements.

[TS 24.282, clause 18.3.2.1]

When the MCData client initiates a pre-established session the MCData client shall:

1) gather ICE candidates according to IETF RFC 5245 [50]; and

NOTE: ICE candidates are only gathered on interfaces that the MCData UE uses to obtain MCData service.

2) generate an initial SIP INVITE request by following the UE originating session procedures specified in 3GPP TS 24.229 [5], with the clarifications given below.

The MCData client:

1) shall set the Request-URI of the SIP INVITE request to the public service identity of the participating MCData function serving the MCData user;

2) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

3) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP INVITE request according to IETF RFC 3840 [16];

4) shall include an Accept-Contact header field with the media feature tag g.3gpp.mcdata.sds along with parameters "require" and "explicit" according to IETF RFC 3841 [8];

5) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP INVITE request;

6) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref set to the value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with parameters "require" and "explicit" according to IETF RFC 3841 [8];

7) shall include the "timer" option tag in the Supported header field;

8) should include the Session-Expires header field according to IETF RFC 4028 [38] and should not include the "refresher" header field. The "refresher" header field parameter shall be set to "uac" if included;

9) shall include in the application/vnd.3gpp.mcdata-info+xml MIME body with the <mcdataInfo> element containing the <mcdata-Params> element with the <anyExt> element an <pre-established-session-ind> element set to a value of "true";

10) shall include an SDP offer according to 3GPP TS 24.229 [5] with the clarifications given in subclause 18.3.1.1, and include ICE candidates in the SDP offer as per IETF RFC 5245 [50]; and

11) shall send the SIP INVITE request according to 3GPP TS 24.229 [5].

Upon receiving a SIP 2xx response to the SIP INVITE request the MCData client:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15].

[TS 24.282, clause 18.3.3.1.1]

NOTE: The MCData client needs to be prepared to release the pre-established session when receiving a SIP BYE request generated by the SIP core (e.g. due to network release of media plane resources).

When a MCData client needs to release a pre-established session as created in subclause 18.3.2, the MCData client shall perform the procedure as described in subclause 13.2.2.2.2.1.

[TS 24.282, clause 18.3.3.1.2

Upon receiving a SIP BYE request from the participating MCData function within a pre-established session the MCData client shall check whether there are any MCData sessions using the pre-established session, and:

1) if there is an established MCData session then the MCData client shall remove the MCData client from the MCData session by performing the procedures for session release for each MCData session as specified in 3GPP TS 24.582 [15]; and

2) if there is no MCData session using the pre-established session, then the MCData client shall follow the procedure described in subclause 13.2.3.2.2.

5.5.3 Test description

5.5.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.

- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

- UE States at the end of the preamble

  - The UE is in E-UTRA Registered, Idle Mode state.

  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

5.5.3.2 Test procedure sequence

Table 5.5.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) initiate establishment of a pre-established session for one-to-one standalone SDS using the media plane. (NOTE 1)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure 'MCX pre-established session establishment' as described in TS 36.579-1 [2] Table 5.3.3.3-1 to create a pre-established session?	-	-	1	P
3	Make the UE (MCData client) release the pre-established session. (NOTE 1)	-	-	-	-
4	Check: Does the UE (MCData client) correctly perform procedure 'MCX CO call release' as described in TS 36.579-1 [2] Table 5.3.10.3-1 to release the pre-established session?	-	-	2	P
5	Make the UE (MCData client) initiate establishment of a pre-established session for one-to-one standalone SDS using the media plane. (NOTE 1)	-	-	-	-
6	Procedure 'MCX pre-established session establishment' as described in TS 36.579-1 [2] Table 5.3.3.3-1 is performed to create a pre-established session.	-	-	-	-
7	Check: Does the UE (MCData client) correctly perform procedure 'MCX CT call release' as described in TS 36.579-1 [2] Table 5.3.12.3-1 to release the pre-established session?	-	-	3	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

5.5.3.3 Specific message contents

Table 5.5.3.3-1: SIP BYE from the UE (step 4, Table 5.5.3.2-1; step 1, TS 36.579-1 [2] Table 5.3.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.2.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Request-Line				
Request-URI	tsc_MCX_SessionID_B	The URI that identifies the pre-established session		

Table 5.5.3.3-2: SIP BYE from the SS (step 7, Table 5.5.3.2-1; step 1, TS 36.579-1 [2] Table 5.3.12.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.2.2-1, condition MO_CALL				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Request-Line				
Request-URI	tsc_MCX_SessionID_B	The URI that identifies the pre-established session		

5.6 Configuration / Download CSK

5.6.1 Test Purpose (TP)

(1)

```
with { UE (MCData Client) registered and authorised for MCData Service }
ensure that {
  when { MCData Client receives a CSK key download message via a SIP MESSAGE message }
    then { UE (MCData Client) responds with a SIP 200 (OK) message and replaces the existing CSK and
CSK-ID associated with the participating MCData function and uses the new CSK information with a SIP
MESSAGE message when prompted to initiate a call }
            }
```

(2)

```
with { UE (MCDATA Client) having sent a standalone one-to-one SDS message }
ensure that {
  when { UE (MCDATA Client receives a disposition response via a SIP MESSAGE message from the SS
(MCDATA Server) }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

5.6.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.282 clause 7.2.5, TS 33.180 clause 9.2.1.4, TS 24.582 clause 10.1. Unless otherwise stated these are Rel-16 requirements.

[TS 24.282, clause 7.2.5]

When the MCData client receives a SIP MESSAGE request containing:

1) a P-Asserted-Service header field containing the "urn:urn-7:3gpp-service.ims.icsi.mcdata"; and

2) an application/mikey MIME body;

Then, if the key identifier within the CSB-ID of the MIKEY payload is a CSK-ID (4 most-significant bits have the value '2'), the MCData client:

1) shall follow the security procedures in subclause 9.2.1 of 3GPP TS 33.180 [26] to extract the CSK. The client:

   a) if the initiator field (IDRi) has type 'URI' (identity hiding is not used), the client:

      i) shall extract the initiator URI from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26]. If the initiator URI deviates from the public service identity of the participating MCData function serving the MCData user, shall reject the SIP MESSAGE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9.2 and shall not continue with the rest of the steps; and

      ii) shall convert the initiator URI to a UID as described in 3GPP TS 33.180 [26];

   b) if the initiator field (IDRi) has type 'UID' (identity hiding in use), the client:

i) shall convert the public service identity of participating MCData function serving the MCData user to a UID as described in 3GPP TS 33.180 [26]; and

ii) shall compare the generated UID with the UID in the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26]. If the two initiator UIDs deviate from each other, shall reject the SIP MESSAGE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9.2 and shall not continue with the rest of the steps;

c) shall use the UID to validate the signature of the I_MESSAGE as described in 3GPP TS 33.180 [26];

d) if authentication verification of the I_MESSAGE fails, shall reject the SIP MESSAGE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.4 and shall not continue with the rest of the steps;

e) shall extract and decrypt the encapsulated CSK using the participating MCData function's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26];

f) shall extract and store the algorithm to be used to protect the MCData signalling fields; and

g) shall extract the CSK-ID, from the payload as specified in 3GPP TS 33.180 [26]; and

2) Upon successful extraction, the client shall replace the existing CSK and CSK-ID associated with the participating MCData function, with the extracted CSK and CSK-ID in the 'key download' message.

[TS 33.180, clause 9.2.1.4]

The MCX Server may decide to update an existing CSK at any time. This may be due to CSK revocation or expiry.

The CSK shall be updated by the MCX Server using the 'key download' procedure, defined in clause 5.8. Upon receipt of a CSK via a 'key download' procedure, the MC client shall identify the type of key as a CSK via the 4 most significant bits of the CSK-ID. The MC client shall:

- discard any previous CSKs associated with the MC Server FQDN, and
- use the new CSK for uplink signalling with the MC Server.

[TS 24.582, clause 10.1]

Media plane security provides integrity and confidentiality protection for the MCData media information and media plane control information transmitted using media plane. Media plane security also provides the authentication of MCData media information.

The media plane security is based on 3GPP MCData security solution including key management as defined in 3GPP TS 33.180 [15].

NOTE: In 3GPP TS 33.180 [15] media information is denoted as MCData Data Payload and media plane control information is denoted as MCData Data signalling Payload.

Various keys and associated key identifiers protect the media information and media plane control information carried in the body of an MSRP SEND message.

The media plane control information may be:

1. SDS SIGNALLING PAYLOAD; or
2. SDS NOTIFICATION.

The media information may be:

1. DATA PAYLOAD; or
2. File or file portion.

In an on-network MCData communication for an MCData group, if protection of media is negotiated, the GMK and the GMK-ID of the MCData group shall be used for protecting the media sent and received by MCData clients.

In an on-network one-to-one MCData communication, if protection of media is negotiated, the PCK and the PCK-ID shall be used for protecting the media sent and received by MCData clients.

If protection of media control information sent using unicast between the MCData client and the participating MCData function serving the MCData client is negotiated, the CSK and the CSK-ID shall be used for protecting the media control information sent and received using unicast by the MCData client and by a participating MCData function.

If protection of media control information between the participating MCData function and the controlling MCData function is configured, the SPK and the SPK-ID shall be used for protecting the media control information sent and received between the participating MCData function and the controlling MCData function.

The GMK and the GMK-ID are distributed to the MCData clients using the group document subscription and notification procedure specified in 3GPP TS 24.481 [4].

The PCK and the PCK-ID are generated by the MCData client initiating the standalone one-to-one SDS using media plane or one-to-one SDS session or one-to-one FD using media plane and provided to the MCData client receiving the SIP signalling according to 3GPP TS 24.282 [8].

The CSK and the CSK-ID are generated by the MCData client and provided to the participating MCData function serving the MCData client using SIP signalling according to 3GPP TS 24.282 [8].

The SPK and the SPK-ID are configured in the participating MCData function and the controlling MCData function.

The key material for creating and verifying the authentication signature (SSK, PVT and KPAK) is provisioned to the MCData clients by the KMS as specified in 3GPP TS 33.180 [15].

5.6.3 Test description

5.6.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- E-UTRA related parameters are set to the default parameters for the basic single cell environment, as defined in TS 36.508 [20] clause 4.4.

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCData User with the Server as active user at the Client.

5.6.3.2 Test procedure sequence

Table 5.6.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure 'MCX SIP MESSAGE CT' as described in TS 36.579-1 [2] Table 5.3.33.3-1 requesting to update the existing CSK?.	-	-	1	P
2	Make the UE (MCData client) send a standalone one-to-one SDS message with disposition request "DELIVERY". (NOTE 1)	-	-	-	-
3-5	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of procedure 'CO SDS or FD message transfer using signalling plane' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 to send a standalone one-to-one SDS message with disposition request "DELIVERY"? (NOTE 2)	-	-	1	P
6	Check: Does the UE (MCData client) correctly perform procedure 'MCX SIP MESSAGE CT' as described in TS 36.579-1 [2] Table 5.3.33.3-1 to receive the disposition notification for the SDS message sent at step 4?	-	-	2	P
7	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	2	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: The RRC connection is not released at the end of the procedure.					

5.6.3.3 Specific message contents

Table 5.6.3.3-1: SIP MESSAGE from the SS (step 1, Table 5.6.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-2				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
P-Asserted-Service			TS 24.282 [31] clause 7.3.7	
Service-ID	"urn:urn-7:3gpp-service.ims.icsi.mcdata"			
Content-Type				
media-type	"application/mikey"			
Message-body				
MIKEY message	base64 encoded MIKEY message as described in TS 36.579-1 [2], Table 5.5.9.1-1A	MIKEY message, containing the updated CSK		

Table 5.6.3.3-2: SIP MESSAGE from the UE (step 4, Table 5.6.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MIKEY, MCDATA_SIGNALLING, MCDATA_PAYLOAD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 5.6.3.3-3			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 5.6.3.3-4			
MIME body part		**MCData Data message**		
MIME-part-body	DATA PAYLOAD as described in Table 5.6.3.3-5			

Table 5.6.3.3-3: MCData-Info (Table 5.6.3.3-2)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_1to1

Table 5.6.3.3-4: SDS SIGNALLING PAYLOAD (Table 5.6.3.3-2)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 5.6.3.3-5: DATA PAYLOAD (Table 5.6.3.3-2)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-1

Table 5.6.3.3-6: SIP MESSAGE from the SS (step 6, Table 5.6.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 5.6.3.3-7			

Table 5.6.3.3-7: SDS NOTIFICATION (Table 5.6.3.3-6)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

5.7 Configuration / Functional Alias / Functional alias status determination / Activate functional alias / Deactivate functional alias

5.7.1 Test Purpose (TP)

(1)

```
with { UE (MCData Client) registered and authorised for MCData Service }
ensure that {
  when { MCData User requests to determine the current status of a functional alias and later
notification of status changes of a functional alias }
    then { UE (MCData Client) sends a SIP SUBSCRIBE message to determine the current status of a
functional alias and later notification of status changes of a functional alias and responds to the
SIP NOTIFY message with a SIP 200 (OK) message }
            }
```

(2)

```
with { UE (MCData Client) having already subscribed to determine the status of a functional alias }
ensure that {
  when { MCData User requests to activate a functional alias }
    then { UE (MCData Client) sends a SIP PUBLISH message to activate a functional alias and
responds to the SIP NOTIFY message with a SIP 200 (OK) message }
            }
```

(3)

```
with { UE (MCData Client) having already subscribed to determine the status of a functional alias }
ensure that {
  when { MCData User requests to deactivate a functional alias }
    then { UE (MCData Client) sends a SIP PUBLISH message to deactivate a functional alias and
responds to the SIP NOTIFY message with a SIP 200 (OK) message }
            }
```

(4)

```
with { UE (MCData Client) having already subscribed to determine the status of a functional alias }
ensure that {
  when { MCData User requests to de-subscribe from determining the status of a functional alias }
    then { UE (MCData Client) sends a SIP SUBSCRIBE message to de-subscribe from determining the
status of a functional alias and responds to the SIP NOTIFY message with a SIP 200 (OK) message }
            }
```

5.7.2 Conformance requirements

References: The conformance requirements covered in the present TC are specified in: TS 24.282 clause 22.2.1.2, 22.2.1.3. Unless otherwise stated these are Rel-16 requirements.

[TS 24.282, clause 22.2.1.2]

In order:

- to indicate that an MCData user requests to activate one or more functional aliases;
- to indicate that the MCData user requests to deactivate one or more functional aliases;
- to refresh indication of an MCData user interest in one or more functional aliases due to near expiration of the expiration time of a functional alias with the status set to the "activated" state received in a SIP NOTIFY request in subclause 22.2.1.3;
- to indicate that the MCData client entering into or exiting from a location area triggers one or more functional aliases to be activated;
- to indicate that the MCData client entering into or exiting from a location area triggers one or more functional aliases to be deactivated; or

- any combination of the above;

the MCData client shall generate a SIP PUBLISH request according to TS 24.229 [5], IETF RFC 3903 [34], and IETF RFC 3856 [39].

When the MCData user requests to deactivate a functional alias, the MCData client shall first check the <manual-deactivation-not-allowed-if-location-criteria-met> element within the <anyExt> element of the <entry> element corresponding to the functional alias within the <FunctionalAliasList> list element of the <anyExt> element of the <OnNetwork> element of the MCData user profile document (see the MCData user profile document in TS 24.484 [12]). If the functional alias has been activated due to a location area trigger and the <manual-deactivation-not-allowed-if-location-criteria-met> element is set to a value of "true", the MCData client shall suppress the MCData user's request.

NOTE 1: If the request is suppressed, a notification message can be displayed to the user.

In the SIP PUBLISH request, the MCData client:

1) shall set the Request-URI to the public service identity identifying the originating participating MCData function serving the MCData user;

2) shall include an application/vnd.3gpp.mcdata-info+xml MIME body. In the application/vnd.3gpp.mcdata-info+xml MIME body, the MCData client shall include the <mcdata-request-uri> element set to the MCData ID of the MCData user;

3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata" (coded as specified in TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7];

4) if the MCData client requests to activate one or more functional aliases, shall set the Expires header field according to IETF RFC 3903 [34], to 4294967295;

NOTE 2: 4294967295, which is equal to 2^{32}-1, is the highest value defined for Expires header field in IETF RFC 3261 [4].

5) if the MCData client requests to deactivate one or more functional aliases, shall set the Expires header field according to IETF RFC 3903 [34], to zero; and

NOTE 3: Activation and deactivation of functional alias cannot be performed with the same PUBLISH request.

6) shall include an application/pidf+xml MIME body indicating per-user functional alias information according to subclause 22.3.1. In the MIME body, the MCData client:

   a) shall include all functional aliases where the MCData user requests activation for the MCData ID;

   b) shall include the MCData client ID of the targeted MCData client;

   c) shall not include the "status" attribute and the "expires" attribute in the <functionalalias> element;

   d) if the MCData client has received an indication that take over of a functional alias is possible and intends to take over a functional alias, shall include a <take-over> child element set to "true"; and

   e) shall set the <p-id-fa> child element of the <presence> root element to a globally unique value.

The MCData client shall send the SIP PUBLISH request according to TS 24.229 [5].

[TS 24.282, clause 22.2.1.3]

NOTE 1: The MCData UE also uses this procedure to determine which functional alias have been successfully activated for the MCData ID.

In order to discover functional aliases:

1) which are activated for the MCData user; or

2) which another MCData user has activated;

the MCData client shall generate an initial SIP SUBSCRIBE request according to TS 24.229 [5], IETF RFC 3856 [39], and IETF RFC 6665 [36].

In the SIP SUBSCRIBE request, the MCData client:

1) shall set the Request-URI to the public service identity identifying the originating participating MCData function serving the MCData user;

2) shall include an application/vnd.3gpp.mcdata-info+xml MIME body. In the application/vnd.3gpp.mcdata-info+xml MIME body, the MCData client shall include:

   a) the <mcdata-request-uri> element set to the MCData ID of the targeted MCData user; and

   b) the <request-type> element in the <mcdata-Params> element of the <mcdatainfo> element set to the value "functional-alias-status-determination";

3) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata" (coded as specified in TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7];

4) if the MCData client wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [36], to 4294967295;

NOTE 2: 4294967295, which is equal to 2^{32}-1, is the highest value defined for Expires header field in IETF RFC 3261 [4].

5) if the MCData client wants to fetch the current state only, shall set the Expires header field according to IETF RFC 6665 [36], to zero;

6) shall include an Events header field set to "presence"; and

7) shall include an Accept header field containing the application/pidf+xml MIME type.

In order to re-subscribe or de-subscribe, the MCData client shall generate an in-dialog SIP SUBSCRIBE request according to TS 24.229 [5], IETF RFC 3856 [39], and IETF RFC 6665 [36]. In the SIP SUBSCRIBE request, the MCData client:

1) if the MCData client wants to receive the current status and later notification, shall set the Expires header field according to IETF RFC 6665 [36], to 4294967295;

NOTE 3: 4294967295, which is equal to 2^{32}-1, is the highest value defined for Expires header field in IETF RFC 3261 [4].

2) if the MCData client wants to de-subscribe, shall set the Expires header field according to IETF RFC 6665 [36], to zero;

3) shall include an Events header field set to "presence"; and

4) shall include an Accept header field containing the application/pidf+xml MIME type.

Upon receiving a SIP NOTIFY request according to TS 24.229 [5], IETF RFC 3856 [39], and IETF RFC 6665 [36], if SIP NOTIFY request contains an application/pidf+xml MIME body indicating per-user functional alias information constructed according to subclause 22.3.1, then the MCData client shall determine the status of the MCData user for each functional alias in the MIME body. If the <p-id-fa> child element of the <presence> root element of the application/pidf+xml MIME body of the SIP NOTIFY request is included, the <p-id-fa> element value indicates the SIP PUBLISH request which triggered sending of the SIP NOTIFY request.

If the MCData client detected a functional alias activation or deactivation, it shall perform the procedure specified in subclause 8.2.6.

5.7.3 Test description

5.7.3.1 Pre-test conditions

Same pre-test conditions as for MCPTT test case 5.8 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"

5.7.3.2 Test procedure sequence

Same test procedure sequence as for MCPTT test case 5.8 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"

5.7.3.3 Specific message contents

Same specific message contents as for MCPTT test case 5.8 (TS 36.579-2 [24]) with the following exception(s):

- The term "MCPTT" is replaced with "MCData"
- Condition MCDATA is used for all messages.

6 On-Network Test Scenarios

6.1 Short Data Service

6.1.1 On-network / Short Data Service (SDS) / Standalone SDS Using Signalling Control Plane / One-to-one Standalone SDS / Client Originated (CO)

6.1.1.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a standalone one-to-one SDS message with a disposition of
only Delivery }
    then { UE (MCDATA Client) sends a standalone one-to-one SDS message with a disposition of only
Delivery via a SIP MESSAGE message }
            }
```

(2)

```
with { UE (MCDATA Client) having sent a standalone one-to-one SDS message }
ensure that {
  when { UE (MCDATA Client receives a disposition response via a SIP MESSAGE message from the SS
(MCDATA Server) }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

(3)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a standalone one-to-one SDS message with a disposition of
only Read }
    then { UE (MCDATA Client) sends a standalone one-to-one SDS message with a disposition of only
Read via a SIP MESSAGE message }
            }
```

(4)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a standalone one-to-one SDS message with a disposition of
both Read and Delivery }
    then { UE (MCDATA Client) sends a standalone one-to-one SDS message with a disposition of both
Read and Delivery via a SIP MESSAGE message }
            }
```

6.1.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.2.2.1, 6.2.2.1, 6.2.4.1, 12.2.1.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.2.2.1]

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) if a one-to-one standalone SDS message is to be sent, shall insert in the SIP MESSAGE request:

   a) an application/resource-lists+xml MIME body with the MCData ID of the target MCData user, according to rules and procedures of IETF RFC 4826 [9];

   b) an application/vnd.3gpp.mcdata-info+xml MIME body with a <request-type> element set to a value of "one-to-one-sds"; and

   c) if end-to-end security is required and the security context does not exist or if the existing security context has expired, an application/mikey MIME body with the MIKEY-SAKKE I_MESSAGE as specified in 3GPP TS 33.180 [26]. The MCData client:

      i) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [26];

      ii) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [26];

      iii) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect one-to-one communications and with the remaining twenty eight bits being randomly generated as described in 3GPP TS 33.180 [26];

      iv) shall encrypt the PCK to a UID associated to the MCData client using the MCData ID of the invited user and a time related parameter as described in 3GPP TS 33.180 [26];

      v) shall generate a MIKEY-SAKKE I_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [26]; and

      vi) shall add the MCData ID of the originating MCData to the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

      vii) shall sign the MIKEY-SAKKE I_MESSAGE using the originating MCData user's signing key provided in the keying material together with a time related parameter; and

      viii) shall include the MIKEY-SAKKE I_MESSAGE in an application/mikey MIME body as specified in 3GPP TS 33.180 [26];

      …

4) shall generate a standalone SDS message as specified in subclause 6.2.2.1; and

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.2.1]

In order to generate an SDS message, the MCData client:

1) shall generate an SDS SIGNALLING PAYLOAD message as specified in subclause 15.1.2;

2) shall generate a DATA PAYLOAD message as specified in subclause 15.1.4;

3) shall include in the SIP request, the SDS SIGNALLING PAYLOAD message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1; and

4) shall include in the SIP request, the DATA PAYLOAD message in an application/vnd.3gpp.mcdata-payload MIME body as specified in subclause E.2.

When generating an SDS SIGNALLING PAYLOAD message as specified in subclause 15.1.2, the MCData client:

1) shall set the Date and time IE to the current time as specified in subclause 15.2.8;

2) if the SDS message starts a new conversation, shall set the Conversation ID IE to a newly generated Conversation ID value as specified in subclause 15.2.9;

3) if the SDS message continues an existing unfinished conversation, shall set the Conversation ID IE to the Conversation ID value of the existing conversation as specified in subclause 15.2.9;

4) shall set the Message ID IE to a newly generated Message ID value as specified in subclause 15.2.10;

5) if the SDS message is in reply to a previously received SDS message, shall include the InReplyTo message ID IE with the Message ID value in the previously received SDS message;

6) if the SDS message is for user consumption, shall not include an Application ID IE as specified in subclause 15.2.7;

7) if the SDS message is intended for an application on the terminating MCData client, shall include an Application ID IE with an Application ID value representing the intended application as specified in subclause 15.2.7;

NOTE: The value chosen for the Application ID value is decided by the mission critical organisation.

8) if only a delivery disposition notification is required shall include a SDS disposition request type IE set to "DELIVERY" as specified in subclause 15.2.3;

9) if only a read disposition notification is required shall include a SDS disposition request type IE set to "READ" as specified in subclause 15.2.3; and

10) if both a delivery and read disposition notification is required shall include a SDS disposition request type IE set to "DELIVERY AND READ" as specified in subclause 15.2.3.

When generating an DATA PAYLOAD message for SDS as specified in subclause 15.1.4, the MCData client:

1) shall set the Number of payloads IE to the number of Payload IEs that needs to be encoded, as specified in subclause 15.2.12;

2) if end-to-end security is required for a one-to-one communication, shall include the Security parameters and Payload IE with security parameters as described in 3GPP TS 33.180 [26]. Otherwise, if end-to-end security is not required for a one-to-one communication, shall include the Payload IE as specified in subclause 15.1.4; and

3) for each Payload IE included:

   a) if the payload is text, shall set the Payload content type as "TEXT" as specified in subclause 15.2.13;

   b) if the payload is binary data, shall set the Payload content type as "BINARY" as specified in subclause 15.2.13;

   c) if the payload is hyperlinks, shall set the Payload content type as "HYPERLINKS" as specified in subclause 15.2.13;

   d) if the payload is location, shall set the Payload content type as "LOCATION" as specified in subclause 15.2.13; and

   e) shall include the data to be sent in the Payload data.

[TS 24.282, clause 6.2.4.1]

This subclause is referenced from other procedures.

In a SIP MESSAGE request, the MCData client:

1) when sending SDS messages or SDS disposition notifications:

   a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

   b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

   c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

   …

3) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [5]; and

4) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user.

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

6.1.1.3 Test description

6.1.1.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element shall not be present in the MCData Service Configuration document so that according to TS 24.484 [24] there is no size limit imposed for the use of C-plane procedures for the SDS message.

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.

- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

- UE States at the end of the preamble

  - The UE is in E-UTRA Registered, Idle Mode state.

  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.1.3.2 Test procedure sequence

Table 6.1.1.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a standalone one-to-one SDS message with disposition request "**DELIVERY**". (NOTE 1)	-	-	-	-
2-2B	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of procedure '**CO SDS or FD message transfer** using signalling plane' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a standalone one-to-one SDS message with disposition request "DELIVERY"**? (NOTE 2)	-	-	1	P
3	Void	-	-	-	-
4	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive the disposition notification** for the SDS message sent at step 2A?	-	-	2	P
5	Void	-	-	-	-
6	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	2	P
7	Make the UE (MCData client) send a standalone one-to-one SDS message with disposition request "**READ**". (NOTE 1)	-	-	-	-
8	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer** using signalling plane' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a standalone one-to-one SDS message with disposition request "READ"**?	-	-	3	P
9	Void	-	-	-	-
10	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive the disposition notification** for the SDS message sent at step 8?	-	-	2	P
11	Void	-	-	-	-
12	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	2	P
13	Make the UE (MCData client) send a standalone one-to-one SDS message with disposition request "**DELIVERY AND READ**". (NOTE 1)	-	-	-	-
14	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer** using signalling plane' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a standalone one-to-one SDS message with disposition request "DELIVERY AND READ"**?	-	-	4	P
15	Void	-	-	-	-
16	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive the disposition notification** for the SDS message sent at step 14?	-	-	2	P
17	Void	-	-	-	-
18	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	2	P

NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: The RRC connection is not released at the end of the procedure.

6.1.1.3.3 Specific message contents

Table 6.1.1.3.3-1: SIP MESSAGE from the UE (step 2A, Table 6.1.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MIKEY, MCDATA_SIGNALLING, MCDATA_PAYLOAD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.1.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 6.1.1.3.3-3			
MIME body part		**MCData Data message**		
MIME-part-body	DATA PAYLOAD as described in Table 6.1.1.3.3-4			

Table 6.1.1.3.3-2: MCData-Info (Table 6.1.1.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_1to1

Table 6.1.1.3.3-3: SDS SIGNALLING PAYLOAD (Table 6.1.1.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.1.3.3-4: DATA PAYLOAD (Table 6.1.1.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-1

Table 6.1.1.3.3-5: SIP MESSAGE from the SS (step 4, Table 6.1.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.1.3.3-7			

Table 6.1.1.3.3-6: Void

Table 6.1.1.3.3-7: SDS NOTIFICATION (Table 6.1.1.3.3-5)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

Table 6.1.1.3.3-8: Void

Table 6.1.1.3.3-9: SIP MESSAGE from the UE (step 8, Table 6.1.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MIKEY, MCDATA_SIGNALLING, MCDATA_PAYLOAD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	As described in Table 6.1.1.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 6.1.1.3.3-10			
MIME body part		**MCData Data message**		
MIME-part-body	DATA PAYLOAD as described in Table 6.1.1.3.3-4			

Table 6.1.1.3.3-10: SDS SIGNALLING PAYLOAD (Table 6.1.1.3.3-9)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1. condition READ

Table 6.1.1.3.3-11: SIP MESSAGE from the SS (step 10, Table 6.1.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.1.3.3-12			

Table 6.1.1.3.3-12: SDS NOTIFICATION (Table 6.1.1.3.3-11)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition READ

Table 6.1.1.3.3-13: SIP MESSAGE from the UE (step 14, Table 6.1.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MIKEY, MCDATA_SIGNALLING, MCDATA_PAYLOAD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.1.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 6.1.1.3.3-14			
MIME body part		**MCData Data message**		
MIME-part-body	DATA PAYLOAD as described in Table 6.1.1.3.3-4			

Table 6.1.1.3.3-14: SDS SIGNALLING PAYLOAD (Table 6.1.1.3.3-13)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED_READ

Table 6.1.1.3.3-15: SIP MESSAGE from the SS (step 16, Table 6.1.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION described in Table 6.1.1.3.3-16			

Table 6.1.1.3.3-16: SDS NOTIFICATION (Table 6.1.1.3.3-15)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED_READ

6.1.2 On-network / Short Data Service (SDS) / Standalone SDS Using Signalling Control Plane / One-to-one Standalone SDS / Client Terminated (CT)

6.1.2.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
```

```
  when { the MCDATA User receives a standalone one-to-one SDS message with a disposition request of
"DELIVERY" }
    then { UE (MCDATA Client) confirms the reception of the SDS message by sending a SIP 200 (OK)
message, followed by a SIP MESSAGE with a disposition notification of "DELIVERED" and renders the
contents of the Payload IE to the MCDATA User }
            }
```

(2)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a standalone one-to-one SDS message with a disposition request of
"READ" }
    then { UE (MCDATA Client) confirms the reception of the SDS message by sending a SIP 200 (OK)
message, and, renders the contents of the Payload IE to the MCDATA User, and, then sends a SIP
MESSAGE message with a disposition notification of "READ" }
            }
```

(3)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a standalone one-to-one SDS message with a disposition request of
"DELIVERY AND READ" with pre-set timer TDU1 (delivery and read) }
    then { UE (MCDATA Client) sends a delivered and read notification after the message is rendered
to the user if the timer TDU1 (delivery and read) has not expired at this time, or, if the timer
TDU1 (delivery and read) expires before the message is rendered to the user sends first a delivered
notification and after the message is rendered to the user a read notification }
            }
```

6.1.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.2.2.2, 9.2.1.2, 9.2.1.3, 12.2.1.1, 6.2.3.1, 6.2.4.1. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.2.2.2]

Upon receipt of a "SIP MESSAGE request for standalone SDS for terminating MCData client", the MCData client:

1) may reject the SIP MESSAGE request if there are not enough resources to handle the SIP MESSAGE request;

2) if the SIP MESSAGE request is rejected in step 1), shall respond toward participating MCData function with a SIP 480 (Temporarily unavailable) response and skip the rest of the steps of this subclause;

3) if the SIP MESSAGE request contains an application/mikey MIME body containing a MIKEY-SAKKE I_MESSAGE:

   a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

   b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

   c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

   d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP MESSAGE request with a SIP 606 (Not Acceptable) response, and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

   e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

      i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

      ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to exchange end-to-end secure message.

4) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

5) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5]; and

6) shall handle the received message as specified in subclause 9.2.1.2.

[TS 24.282, clause 9.2.1.2]

When a MCData client has received a SIP request containing:

- an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1; and
- an application/vnd.3gpp.mcdata-payload MIME body as specified in subclause E.2;

the MCData Client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body;

2) shall decode the contents of the application/vnd.3gpp.mcdata-payload MIME body;

3) if the SDS SIGNALLING PAYLOAD message contains a new Conversation ID, shall instantiate a new conversation with the Message ID in the SDS SIGNALLING PAYLOAD identifying the first message in the conversation thread;

4) if the SDS SIGNALLING PAYLOAD message contains an existing Conversation ID and:

   a) if the SDS SIGNALLING PAYLOAD message does not contain an InReplyTo message ID, shall use the Message ID in the SDS SIGNALLING PAYLOAD to identify a new message in the existing conversation thread; and

   b) if the SDS SIGNALLING PAYLOAD message contains an InReplyTo message ID, shall associate the message to an existing message in the conversation thread as identified by the InReplyTo message ID in the SDS SIGNALLING PAYLOAD, and use the Message ID in the SDS SIGNALLING PAYLOAD to identify the new message;

5) shall identify the number of Payload IEs in the DATA PAYLOAD message from the Number of payloads IE in the DATA PAYLOAD message;

6) if the SDS SIGNALLING PAYLOAD message does not contain an Application ID IE:

   a) shall determine that the payload contained in the DATA PAYLOAD message is for user consumption

   b) may notify the MCData user; and

   c) shall render the contents of the Payload IE(s) to the MCData user;

7) if the SDS SIGNALLING PAYLOAD message contains an Application ID IE:

   a) shall determine that the payload contained in the DATA PAYLOAD message is not for user consumption,

   b) shall not notify the MCData user;

   c) if the Application ID value is unknown, shall discard the SDS message; and

   d) if the Application ID value is known, shall deliver the contents of the Payload IE(s) to the identified application;

NOTE 1: If required, the MCData client decrypts the Payload IEs before rendering the SDS message to the user or delivering the SDS message to the application.

NOTE 2: The actions taken when the payload contains application data not meant for user consumption or command instructions are based upon the contents of the payload. If the payload content is addressed to a non-MCData application that is not running, the MCData client starts the local non-MCData application and delivers the payload to that application.

NOTE 3: User consent is not required before accepting the data.

8) may store the message payload in local storage along with the Conversation ID, Message ID, InReplyTo message ID and Date and time; and

9) if the received SDS SIGNALLING PAYLOAD message contains an SDS disposition request type IE shall follow the procedures in subclause 9.2.1.3.

[TS 24.282, clause 9.2.1.3]

To handle the disposition requests, the MCData client:

1) If the SDS disposition request type IE is set to:

   a) "DELIVERY" then, shall send a delivered notification as described in subclause 12.2.1.1;

   b) "READ", shall send a read notification as described in subclause 12.2.1.1, when a display indication is received; or

   c) "DELIVERY AND READ" then, shall start timer TDU1 (delivery and read).

Upon receiving a display indication before timer TDU1 (delivery and read) expires, the MCData client:

1) shall stop timer TDU1 (delivery and read); and

2) shall send a delivered and read notification as described in subclause 12.2.1.1.

Upon expiry of timer TDU1 (delivery and read), the MCData client:

1) shall send a delivered notification as described in subclause 12.2.1.1; and

2) upon receiving a display indication, send a read notification as described in subclause 12.2.1.1.

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or

- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the controlling MCData function that sent the SDS or FD message request. The MCData client determines the controlling MCData function from the contents of the <mcdata-controller-psi> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request;

- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and

- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];

4) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with an <mcdata-controller-psi> element containing the PSI of the controlling MCData function;

5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;

6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

7) if requiring to send an FD notification, shall generate an FD NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.2; and

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.3.1]

In order to generate an SDS notification, the MCData client:

1) shall generate an SDS NOTIFICATION message as specified in subclause 15.1.5; and

2) shall include in the SIP request, the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1.

When generating an SDS NOTIFICATION message as specified in subclause 15.1.5, the MCData client:

1) if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED" as specified in subclause 15.2.5;

2) if sending a read notification, shall set the SDS disposition notification type IE as "READ" as specified in subclause 15.2.5;

3) if sending a delivered and read notification, shall set the SDS disposition notification type IE as "DELIVERED AND READ" as specified in subclause 15.2.5;

4) if the SDS message could not be delivered to the user or application (e.g. due to lack of storage), shall set the SDS disposition notification type IE as "UNDELIVERED" as specified in subclause 15.2.5;

5) shall set the Date and time IE to the current time to as specified in subclause 15.2.8;

6) shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message as specified in subclause 15.2.9;

7) shall set the Message ID to the value of the Message ID that was received in the SDS message as specified in subclause 15.2.10;

8) if the SDS message was destined for the user, shall not include an Application ID IE as specified in subclause 15.2.7; and

9) if the SDS message was destined for an application, shall include an Application ID IE set to the value of the Application ID that was included in the SDS message as specified in subclause 15.2.3.

[TS 24.282, clause 6.2.4.1]

This subclause is referenced from other procedures.

In a SIP MESSAGE request, the MCData client:

1) when sending SDS messages or SDS disposition notifications:

   a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

   b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

   c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

…

3) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [5]; and

4) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user.

6.1.2.3 Test description

6.1.2.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element shall not be present in the MCData Service Configuration document so that according to TS 24.484 [24] there is no size limit imposed for the use of C-plane procedures for the SDS message.

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.

- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

- UE States at the end of the preamble

  - The UE is in E-UTRA Registered, Idle Mode state.

  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.2.3.2 Test procedure sequence

Table 6.1.2.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1-1B	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive a standalone one-to-one SDS message with disposition request "DELIVERY"**? (NOTE 3)	-	-	1	P
2	Void	-	-	-	-
3	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a disposition notification of "DELIVERED"**?	-	-	1	P
4	Void	-	-	-	-
5	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 2) The exact expected content is' as described in TS 36.579-1 [2], Table 5.5.3.10-2	-	-	1	P
6	Make the UE (MCData client) close the message application. (NOTE 2, NOTE 5)	-	-	-	-
7-7B	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive a standalone one-to-one SDS message with disposition request "READ"**? (NOTE 3)	-	-	2	P
8	Void	-	-	-	-
-	EXCEPTION: In parallel to the event described in step 9 the events described in Table 6.1.2.3.2-2 take place. (NOTE 1)	-	-	-	-
9	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 2) The exact expected content is' as described in TS 36.579-1 [2], Table 5.5.3.10-2.	-	-	2	P
10	Make the UE (MCData client) close the message application. (NOTE 2, NOTE 5)	-	-	-	-
11-11B	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive a standalone one-to-one SDS message with disposition request "DELIVERY AND READ"**? (NOTE 3, 4)	-	-	2	P
12	Void	-	-	-	-
-	EXCEPTION: In parallel to the event described in step 13 the events described in Table 6.1.2.3.2-3 take place. (NOTE 1)	-	-	-	-
13	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user before expiry of timer TDU1 (delivery and read)? (NOTE 2) The exact expected content is' as described in TS 36.579-1 [2], Table 5.5.3.10-2.	-	-	4	P
14	Make the UE (MCData client) close the message application. (NOTE 2, NOTE 5)	-	-	-	-

NOTE 1: The behaviour is handled through parallel actions to allow for implementations which first indicate to the user that there is a message available, but render the message to the user only after the user takes an action to open the message.
NOTE 2: This is expected to be done via a suitable implementation dependent MMI.
NOTE 3: The RRC connection is not released at the end of the procedure.
NOTE 4: Timer TDU1 (delivery and read) is started upon receipt of the SIP MESSAGE message that contains a "DELIVERY AND READ" disposition request. Timer TDU1 (delivery and read)=120ms according to the default value defined in TS 24.282 [31].
NOTE 5; The message application shall be closed to avoid unexpected behaviour at the UE when receiving a next message.

Table 6.1.2.3.2-2: Parallel Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a disposition notification of "READ"**?	-	-	2	P

Table 6.1.2.3.2-3: Parallel Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
-	EXCEPTION: Steps 1a1-1b1 describe behaviour that depends on the UE implementation in regard to how quick the UE (MCData client) will render the contents of the Payload IE to the MCData user and the value of Timer TDU1.	-	-	-	-
1a1-1a2	Check: Does the UE (MCData client) correctly perform steps 2-3 of procedure '**CO SDS or FD message transfer using signalling** plane' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a disposition notification of "DELIVERED"**?	-	-	3	P
1a3	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a disposition notification of "READ"**?	-	-	3	P
1b1	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a disposition notification of "DELIVERED AND READ"**?	-	-	3	P

6.1.2.3.3 Specific message contents

Table 6.1.2.3.3-1: SIP MESSAGE from the SS (step 1A, Table 6.1.2.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MIKEY, MCDATA_SIGNALLING, MCDATA_PAYLOAD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.2.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 6.1.2.3.3-3			
MIME body part		**MCData Data message**		
MIME-part-body	DATA PAYLOAD as described in Table 6.1.2.3.3-4			

Table 6.1.2.3.3-2: MCData-Info (Table 6.1.2.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_1to1

Table 6.1.2.3.3-3: SDS SIGNALLING PAYLOAD (Table 6.1.2.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED

Table 6.1.2.3.3-4: DATA PAYLOAD (Table 6.1.2.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-2

Table 6.1.2.3.3-5: Void

Table 6.1.2.3.3-6: SIP MESSAGE from the UE (step 3, Table 6.1.2.3.2-1, step 1a1, Table 6.1.2.3.2-3; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData-Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.2.3.3-7			

Table 6.1.2.3.3-7: SDS NOTIFICATION (Table 6.1.2.3.3-6)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

Table 6.1.2.3.3-8: SIP MESSAGE from the SS (step 7A, Table 6.1.2.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MIKEY, MCDATA_SIGNALLING, MCDATA_PAYLOAD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.2.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 6.1.2.3.3-9			
MIME body part		**MCData Data message**		
MIME-part-body	DATA PAYLOAD as described in Table 6.1.2.3.3-4			

Table 6.1.2.3.3-9: SDS SIGNALLING PAYLOAD (Table 6.1.2.3.3-8)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1. condition READ

Table 6.1.2.3.3-10: SIP MESSAGE from the UE (step 1, Table 6.1.2.3.2-2, step 1a3, Table 6.1.2.3.2-3; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData-Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.2.3.3-11			

Table 6.1.2.3.3-11: SDS NOTIFICATION (Table 6.1.2.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition READ

Table 6.1.2.3.3-12: SIP MESSAGE from the SS (step 11A, Table 6.1.2.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MIKEY, MCDATA_SIGNALLING, MCDATA_PAYLOAD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.2.3.3-2			
MIME body part		**MCData Data signalling messag**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 6.1.2.3.3-13			
MIME body part		**MCData Data message**		
MIME-part-body	DATA PAYLOAD as described in Table 6.1.2.3.3-4			

Table 6.1.2.3.3-13: SDS SIGNALLING PAYLOAD (Table 6.1.2.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED_READ

Table 6.1.2.3.3-14: SIP MESSAGE from the UE (step 1b1, Table 6.1.2.3.2-2; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData-Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.2.3.3-15			

Table 6.1.2.3.3-15: SDS NOTIFICATION (Table 6.1.2.3.3-14)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED_READ

6.1.3 On-network / Short Data Service (SDS) / Standalone SDS Using Signalling Control Plane / Group Standalone SDS / Client Originated (CO)

6.1.3.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a group standalone SDS message with a disposition of only
Delivery }
    then { UE (MCDATA Client) sends a group standalone SDS message with a disposition of only
Delivery via s SIP MESSAGE message }
            }
```

(2)

```
with { UE (MCDATA Client) having sent a group standalone SDS message }
ensure that {
  when { the UE (MCDATA Client) receives a disposition response via a SIP MESSAGE message from the
SS (MCDATA Server) }
    then { UE (MCData Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

6.1.3.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.2.2.1, 6.2.2.1, 6.2.4.1, 12.2.1.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.2.2.1]

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

...

3) if a group standalone SDS message is to be sent:

   a) if the "/<*x*>/<x>/Common/MCData/AllowedSDS" leaf node present in the group document of the requested MCData group, configured on the group management client as specified in 3GPP TS 24.483 [42] is set to "false", shall reject the request to send SDS and not continue with the rest of the steps in this subclause; and

   b) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with:

      i) the <request-type> element set to a value of "group-sds";

      ii) the <mcdata-request-uri> element set to the MCData group identity; and

      iii) the <mcdata-client-id> element set to the MCData client ID of the originating MCData client;

4) shall generate a standalone SDS message as specified in subclause 6.2.2.1; and

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.2.1]

In order to generate an SDS message, the MCData client:

1) shall generate an SDS SIGNALLING PAYLOAD message as specified in subclause 15.1.2;

2) shall generate a DATA PAYLOAD message as specified in subclause 15.1.4;

3) shall include in the SIP request, the SDS SIGNALLING PAYLOAD message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1; and

4) shall include in the SIP request, the DATA PAYLOAD message in an application/vnd.3gpp.mcdata-payload MIME body as specified in subclause E.2.

When generating an SDS SIGNALLING PAYLOAD message as specified in subclause 15.1.2, the MCData client:

1) shall set the Date and time IE to the current time as specified in subclause 15.2.8;

2) if the SDS message starts a new conversation, shall set the Conversation ID IE to a newly generated Conversation ID value as specified in subclause 15.2.9;

3) if the SDS message continues an existing unfinished conversation, shall set the Conversation ID IE to the Conversation ID value of the existing conversation as specified in subclause 15.2.9;

4) shall set the Message ID IE to a newly generated Message ID value as specified in subclause 15.2.10;

5) if the SDS message is in reply to a previously received SDS message, shall include the InReplyTo message ID IE with the Message ID value in the previously received SDS message;

6) if the SDS message is for user consumption, shall not include an Application ID IE as specified in subclause 15.2.7;

7) if the SDS message is intended for an application on the terminating MCData client, shall include an Application ID IE with an Application ID value representing the intended application as specified in subclause 15.2.7;

NOTE: The value chosen for the Application ID value is decided by the mission critical organisation.

8) if only a delivery disposition notification is required shall include a SDS disposition request type IE set to "DELIVERY" as specified in subclause 15.2.3;

9) if only a read disposition notification is required shall include a SDS disposition request type IE set to "READ" as specified in subclause 15.2.3; and

10) if both a delivery and read disposition notification is required shall include a SDS disposition request type IE set to "DELIVERY AND READ" as specified in subclause 15.2.3.

When generating an DATA PAYLOAD message for SDS as specified in subclause 15.1.4, the MCData client:

1) shall set the Number of payloads IE to the number of Payload IEs that needs to be encoded, as specified in subclause 15.2.12;

2) if end-to-end security is required for a one-to-one communication, shall include the Security parameters and Payload IE with security parameters as described in 3GPP TS 33.180 [26]. Otherwise, if end-to-end security is not required for a one-to-one communication, shall include the Payload IE as specified in subclause 15.1.4; and

3) for each Payload IE included:

   a) if the payload is text, shall set the Payload content type as "TEXT" as specified in subclause 15.2.13;

   b) if the payload is binary data, shall set the Payload content type as "BINARY" as specified in subclause 15.2.13;

   c) if the payload is hyperlinks, shall set the Payload content type as "HYPERLINKS" as specified in subclause 15.2.13;

   d) if the payload is location, shall set the Payload content type as "LOCATION" as specified in subclause 15.2.13; and

   e) shall include the data to be sent in the Payload data.

[TS 24.282, clause 6.2.4.1]

This subclause is referenced from other procedures.

In a SIP MESSAGE request, the MCData client:

1) when sending SDS messages or SDS disposition notifications:

   a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

   b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

   c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

   …

3) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [5]; and

4) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user.

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

6.1.3.3 Test description

6.1.3.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element shall not be present in the MCData Service Configuration document so that according to TS 24.484 [24] there is no size limit imposed for the use of C-plane procedures for the SDS message.

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.

- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

- UE States at the end of the preamble

  - The UE is in E-UTRA Registered, Idle Mode state.

  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.3.3.2 Test procedure sequence

Table 6.1.3.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a group standalone SDS message with disposition request "DELIVERY". (NOTE 1)	-	-	-	-
2-2B	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a standalone group SDS message with disposition request "DELIVERY"**? (NOTE 2)	-	-	1	P
3	Void	-	-	-	-
4	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive the disposition notification** for the SDS message sent at step 2A?	-	-	2	P
5	Void	-	-	-	-
6	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	2	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: The RRC connection is not released at the end of the procedure.					

6.1.3.3.3 Specific message contents

Table 6.1.3.3.3-1: SIP MESSAGE from the UE (step 2A, Table 6.1.3.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, MCDATA_SIGNALLING, MCDATA_PAYLOAD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.3.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 6.1.3.3.3-2A			
MIME body part		**MCData Data message**		
MIME-part-body	MCData Protected Payload Message containing DATA PAYLOAD as described in Table 6.1.3.3.3-3			

Table 6.1.3.3.3-2: MCData-Info (Table 6.1.3.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_grp

Table 6.1.3.3.3-2A: SDS SIGNALLING PAYLOAD (Table 6.1.3.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.3.3.3-3: DATA PAYLOAD (Table 6.1.3.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.1-1

Table 6.1.3.3.3-4: SIP MESSAGE from the SS (step 4, Table 6.1.3.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	As described in Table 6.1.3.3.3-5			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.3.3.3-6			

Table 6.1.3.3.3-5: MCData-Info (Table 6.1.3.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-calling-group-id> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.2-3A		

Table 6.1.3.3.3-6: SDS NOTIFICATION (Table 6.1.3.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

Table 6.1.3.3.3-7: Void

6.1.4 On-network / Short Data Service (SDS) / Standalone SDS Using Signalling Control Plane / Group Standalone SDS / Client Terminated (CT)

6.1.4.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a standalone group SDS message with a disposition request of
"DELIVERY" }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message and sends a SIP MESSAGE
message with a disposition notification of "DELIVERED" and renders the contents of the Payload IE to
the MCDATA User }
            }
```

6.1.4.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.2.2.2, 9.2.1.2, 9.2.1.3, 12.2.1.1, 6.2.3.1, 6.2.4.1. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.2.2.2]

Upon receipt of a "SIP MESSAGE request for standalone SDS for terminating MCData client", the MCData client:

…

3) if the SIP MESSAGE request contains an application/mikey MIME body containing a MIKEY-SAKKE I_MESSAGE:

   a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

   b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

   c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP MESSAGE request with a SIP 606 (Not Acceptable) response, and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to exchange end-to-end secure message.

4) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

5) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5]; and

6) shall handle the received message as specified in subclause 9.2.1.2.

[TS 24.282, clause 9.2.1.2]

When a MCData client has received a SIP request containing:

- an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1; and
- an application/vnd.3gpp.mcdata-payload MIME body as specified in subclause E.2;

the MCData Client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body;

2) shall decode the contents of the application/vnd.3gpp.mcdata-payload MIME body;

…

5) shall identify the number of Payload IEs in the DATA PAYLOAD message from the Number of payloads IE in the DATA PAYLOAD message;

6) if the SDS SIGNALLING PAYLOAD message does not contain an Application ID IE:

a) shall determine that the payload contained in the DATA PAYLOAD message is for user consumption

b) may notify the MCData user; and

c) shall render the contents of the Payload IE(s) to the MCData user;

7) if the SDS SIGNALLING PAYLOAD message contains an Application ID IE:

a) shall determine that the payload contained in the DATA PAYLOAD message is not for user consumption,

b) shall not notify the MCData user;

c) if the Application ID value is unknown, shall discard the SDS message; and

d) if the Application ID value is known, shall deliver the contents of the Payload IE(s) to the identified application;

NOTE 1: If required, the MCData client decrypts the Payload IEs before rendering the SDS message to the user or delivering the SDS message to the application.

…

NOTE 3: User consent is not required before accepting the data.

8) may store the message payload in local storage along with the Conversation ID, Message ID, InReplyTo message ID and Date and time; and

9) if the received SDS SIGNALLING PAYLOAD message contains an SDS disposition request type IE shall follow the procedures in subclause 9.2.1.3.

[TS 24.282, clause 9.2.1.3]

To handle the disposition requests, the MCData client:

1) If the SDS disposition request type IE is set to:

   a) "DELIVERY" then, shall send a delivered notification as described in subclause 12.2.1.1;

   b) "READ", shall send a read notification as described in subclause 12.2.1.1, when a display indication is received; or

   c) "DELIVERY AND READ" then, shall start timer TDU1 (delivery and read).

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or

- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the controlling MCData function that sent the SDS or FD message request. The MCData client determines the controlling MCData function from the contents of the <mcdata-controller-psi> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request;

- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and

- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];

4) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with an <mcdata-controller-psi> element containing the PSI of the controlling MCData function;

5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;

6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

…

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.3.1]

In order to generate an SDS notification, the MCData client:

1) shall generate an SDS NOTIFICATION message as specified in subclause 15.1.5; and

2) shall include in the SIP request, the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1.

When generating an SDS NOTIFICATION message as specified in subclause 15.1.5, the MCData client:

1) if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED" as specified in subclause 15.2.5;

…

5) shall set the Date and time IE to the current time to as specified in subclause 15.2.8;

6) shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message as specified in subclause 15.2.9;

7) shall set the Message ID to the value of the Message ID that was received in the SDS message as specified in subclause 15.2.10;

8) if the SDS message was destined for the user, shall not include an Application ID IE as specified in subclause 15.2.7; and

[TS 24.282, clause 6.2.4.1]

This subclause is referenced from other procedures.

In a SIP MESSAGE request, the MCData client:

1) when sending SDS messages or SDS disposition notifications:

   a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

   b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

   c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

…

3) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [5]; and

4) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user.

6.1.4.3 Test description

6.1.4.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element shall not be present in the MCData Service Configuration document so that according to TS 24.484 [24] there is no size limit imposed for the use of C-plane procedures for the SDS message.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.4.3.2 Test procedure sequence

Table 6.1.4.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1-1B	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive a standalone group SDS message with disposition request "DELIVERY"**? (NOTE 2)	-	-	1	P
2	Void	-	-	-	-
3	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a disposition notification of "DELIVERED"**?	-	-	1	P
4	Void	-	-	-	-
5	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 1)	-	-	1	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: The RRC connection is not released at the end of the procedure.					

6.1.4.3.3 Specific message contents

Table 6.1.4.3.3-1: SIP MESSAGE from the SS (step 1A, Table 6.1.4.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING, MCDATA_PAYLOAD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.4.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 6.1.4.3.3-3			
MIME body part		**MCData Data message**		
MIME-part-body	MCData Protected Payload Message containing DATA PAYLOAD as described in Table 6.1.4.3.3-3			

Table 6.1.4.3.3-2: MCData-Info (Table 6.1.4.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_grp

Table 6.1.4.3.3-3: SDS SIGNALLING PAYLOAD (Table 6.1.4.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED

Table 6.1.4.3.3-4: DATA PAYLOAD (Table 6.1.4.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.1-2

Table 6.1.4.3.3-5: Void

Table 6.1.4.3.3-6: SIP MESSAGE from the UE (step 3, Table 6.1.4.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-headers	MCData-Info as described in Table 6.1.4.3.3-7			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.4.3.3-8			

Table 6.1.4.3.3-7: MCData-Info (Table 6.1.4.3.3-6)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-request-uri> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.1-3A		

Table 6.1.4.3.3-8: SDS NOTIFICATION (Table 6.1.4.3.3-6)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

6.1.5 On-network / Short Data Service (SDS) / Standalone SDS Using Media Plane / One-to-one Standalone SDS / Client Originated (CO)

6.1.5.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a one-to-one standalone SDS message using the media plane}
    then { UE (MCDATA Client) sends a request to establish an MSRP connection via a SIP INVITE
message and then responds to the SIP 200 (OK) message with a SIP ACK message }
            }
```

(2)

```
with { UE (MCDATA Client) having requested the establishment of a MSRP connection }
ensure that {
  when { UE (MCDATA Client) receives a SIP 200 (OK) message with the a=setup attribute set to
"passive"  from the SS (MCDATA server) }
    then { UE (MCDATA Client) sends a blank MSRP SEND message to bind the MSRP connection and then
sends the one-to-one standalone SDS message via a MSRP SEND message with a disposition of "DELIVERY"
}
            }
```

(3)

```
with { UE (MCDATA Client) having sent a one-to-one standalone SDS message using the media plane }
ensure that {
  when { UE (MCDATA Client receives a MSRP 200 (OK) message in response to the last MSRP SEND
message indicating that the standalone SDS message has been successfully transferred }
    then { UE (MCDATA Client) sends a SIP BYE message }
            }
```

(4)

```
with { UE (MCDATA Client) having sent a one-to-one standalone SDS message using the media plane with
a disposition of "DELIVERY" }
ensure that {
  when { UE (MCDATA Client receives a disposition response via a SIP MESSAGE message from the SS
(MCDATA Server }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

6.1.5.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.3.2.3, 9.2.3.2.1, 13.2.2.2.2.1, 12.2.1.2, TS 24.582 clauses 6.1.1.2.1, 6.1.1.2.2, 6.1.1.2.3, 6.1.1.2.4. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.3.2.3]

The MCData client shall generate a SIP INVITE request in accordance with 3GPP TS 24.229 [5] with the clarifications given below.

The MCData client:

1) shall include the g.3gpp.mcdata.sds media feature tag and the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP INVITE request according to IETF RFC 3840 [16];

2) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

3) shall include an Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

4) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP INVITE request;

5) should include the "timer" option tag in the Supported header field;

6) should include the Session-Expires header field according to IETF RFC 4028 [38]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";

7) if a one-to-one standalone SDS message is to be sent:

   a) shall insert in the SIP INVITE request a MIME resource-lists body with the MCData ID of the invited MCData user, according to rules and procedures of IETF RFC 5366 [18];

   b) shall contain an application/vnd.3gpp.mcdata-info+xml MIME body with the <mcdatainfo> element containing the <mcdata-Params> element with:

      i) the <request-type> element set to a value of "one-to-one-sds"; and

   c) if an end-to-end security context needs to be established and the security context does not exist or if the existing security context has expired, then:

i) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [26];

ii) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [26];

iii) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect one-to-one communications and with the remaining twenty eight bits being randomly generated as described in 3GPP TS 33.180 [26];

iv) shall encrypt the PCK to a UID associated to the MCData client using the MCData ID of the invited user and a time related parameter as described in 3GPP TS 33.180 [26];

v) shall generate a MIKEY-SAKKE I_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [26];

vi) shall add the MCData ID of the originating MCData to the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26]; and

vii) shall sign the MIKEY-SAKKE I_MESSAGE using the originating MCData user's signing key provided in the keying material together with a time related parameter, and add this to the MIKEY-SAKKE payload, as described in 3GPP TS 33.180 [26];

…

9) shall set the Request-URI of the SIP INVITE request to the public service identity identifying the participating MCData function serving the MCData user;

NOTE 2: The MCData client is configured with public service identity identifying the participating MCData function serving the MCData user.

10) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

11) shall include an SDP offer according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.3.2.1; and

12) shall send the SIP INVITE request towards the MCData server according to 3GPP TS 24.229 [5].

On receipt of a SIP 2xx response to the SIP INVITE request, the MCData client:

1) shall send a SIP ACK request as specified in 3GPP TS 24.229 [5];

2) shall start the SIP Session timer according to rules and procedures of IETF RFC 4028 [38]; and

3) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.1.2.

…

On receipt of an indication from the media plane indicating that the standalone SDS message has been successfully transferred, the MCData client shall:

1) shall generate a SIP BYE request according to 3GPP TS 24.229 [5] with:

a) Reason code set to "SIP";

b) cause set to "200"; and

c) text set to "transmission succeeded";

2) shall set the Request-URI to the MCData session identity to release; and

3) shall send a SIP BYE request towards MCData server according to 3GPP TS 24.229 [5].

Upon receiving a SIP 200 (OK) response to the SIP BYE request, the MCData client shall interact with the media plane and indicate to terminate the session, as specified in 3GPP TS 24.582 [15].

[TS 24.282, clause 9.2.3.2.1]

When composing an SDP offer according to 3GPP TS 24.229 [5], IETF RFC 4975 [17], IETF RFC 6135 [19] and IETF RFC 6714 [20] the MCData client:

1) shall include an "m=message" media-level section for the MCData media stream consisting of:

   a) the IP address and the port number;

   b) a protocol field value of "TCP/MSRP", or "TCP/TLS/MSRP" for TLS;

   c) a format list field set to '*';

   d) an "a=sendonly" attribute;

   e) an "a=path" attribute containing its own MSRP URI;

   f) set the content type as "a=accept-types:application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload"; and

   g) set the a=setup attribute as "actpass"; and

2) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the MIKEY-SAKKE I_MESSAGE in an "a=key-mgmt" attribute as a "mikey" attribute value in the SDP offer as specified in IETF RFC 4567 [45].

[TS 24.282, clause 13.2.2.2.2.1]

When the MCData client wants to release a MCData communication established over the media plane, the MCData client:

1) shall generate a SIP BYE request according to 3GPP TS 24.229 [5];

2) shall set the Request-URI to the MCData session identity to be released; and

3) shall send the SIP BYE request towards MCData server according to 3GPP TS 24.229 [5].

Upon receiving a SIP 200 (OK) response to the SIP BYE request, the MCData client shall release all media plane resources corresponding to the MCData communication being released.

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

[TS 24.582, clause 6.1.1.2.1]

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the originating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act according to IETF RFC 6135 [12], as:

   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and

   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11]; and

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;
2. shall generate a SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;
3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4; and
4. shall send the MSRP SEND request on the established MSRP connection.

NOTE: MSRP chunking, if needed, may affect the number of "Content Type" lines in each MSRP SEND message conveying a chunk, as also specified in subclause 6.1.1.2.4.

If MSRP chunking is not used then on receipt of a 200 (OK) response, the MCData client shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary;
2. shall wait for a 200 (OK) response to each MSRP SEND request sent; and
3. on receipt of the last 200 (OK) response shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks;
2. shall indicate to MCData user that the SDS message could not be sent; and
3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving an indication to terminate the session from the signalling plane, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks and may indicate to MCData user that the SDS message could not be sent.

[TS 24.582, clause 6.1.1.2.2]

In order to generate an SDS signalling payload, the MCData client:

1. shall generate an SDS SIGNALLING PAYLOAD message as specified in 3GPP TS 24.282 [8]; and
2. shall include the SDS SIGNALLING PAYLOAD message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in 3GPP TS 24.282 [8]; and

When generating a an SDS SIGNALLING PAYLOAD message, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD message as defined in 3GPP TS 24.282 [8]. In the SDS SIGNALLING PAYLOAD message, the MCData client:
   a. may include and set the Disposition request type IE to:
      i. "DELIVERY", if only delivery disposition is requested;
      ii. "READ", if only read disposition is requested; or
      iii. "DELIVERY AND READ", if both delivery and read dispositions are requested;
   b. shall set Date and time IE to current UTC time;
   c. shall set Conversation ID IE to a universally unique message ID generated as per IETF RFC 4122 [10];

d. shall set Message ID IE to a universally unique message ID generated as per IETF RFC 4122 [10];

e. if indicated that the SDS message is in reply to another SDS message then, shall include the Reply ID IE set to the message identifier of the indicated SDS message; and

f. if indicated that the target recipient of the SDS message is an application then, shall set Application Identifier IE to the application identifier.

[TS 24.582, clause 6.1.1.2.3]

In order to generate SDS data payload, the MCData client:

1. shall generate a DATA PAYLOAD message as specified in 3GPP TS 24.282 [8]; and
2. shall include the DATA PAYLOAD message in an application/vnd.3gpp.mcdata-payload MIME body as specified in 3GPP TS 24.282 [8].

When generating a DATA PAYLOAD message, the MCData client:

1. shall generate a SDS DATA PAYLOAD message as defined in 3GPP TS 24.282 [8]. In the SDS DATA PAYLOAD message, the MCData client:
   a. shall set Number of payloads IE to the total number of payloads being sent; and
   b. for each payload, shall include Payload IE. In the Payload IE:
      i. shall set Payload content type to "TEXT", or "BINARY", or "HYPERLINKS", or "LOCATION" according to the payload type; and
      ii. shall set Payload data IE to actual payload.

[TS 24.582, clause 6.1.1.2.4]

The MCData client shall take the procedures in subclause 6.4.1 into consideration when generating MSRP SEND messages.

The MCData client shall generate MSRP SEND for SDS message requests according to IETF RFC 4975 [11].

When generating an MSRP SEND for SDS message request containing an SDS SIGNALLING PAYLOAD message and an SDS DATA PAYLOAD message, the MCData client

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the first content type as Content-Type = "application/vnd.3gpp.mcdata-signalling";
3. shall set the first body of the MSRP SEND request to the generated SDS SIGNALLING PAYLOAD message;
4. shall set the second Content-Type as "application/vnd.3gpp.mcdata-payload"; and
5. shall set the second body of the MSRP SEND request to the generated SDS DATA PAYLOAD message.

When generating an MSRP SEND for SDS message request containing only an SDS DATA PAYLOAD message, the MCData client:

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the Content-Type as "application/vnd.3gpp.mcdata-payload"; and
3. shall set the body of the MSRP SEND request to the generated SDS DATA PAYLOAD message.

When generating an MSRP SEND for SDS message request containing only an SDS SIGNALLING PAYLOAD, the MCData client.

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the Content-Type as "application/vnd.3gpp.mcdata-signalling"; and
3. shall set the body of the MSRP SEND request to the generated SDS SIGNALLING PAYLOAD message.

6.1.5.3 Test description

6.1.5.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element of the MCData Service Configuration document shall be set to 0 to force the MCData client to send the data using the media plane.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.5.3.2 Test procedure sequence

Table 6.1.5.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a one-to-one standalone SDS message with disposition request "**DELIVERY**". (NOTE 1)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.2.3-1?	-	-	1,2	P
3-6	Void	-	-	-	-
7	Check: Does the UE (MCData client) correctly perform procedure 'CO MSRP message transfer' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 to **send an SDS message with disposition request "DELIVERY"**?	-	-	2	P
8	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.6.3-1?	-	-	3	P
9	Void	-	-	-	-
10	Check: Does the UE (MCData client) correctly perform procedure 'MCX SIP MESSAGE CT' as described in TS 36.579-1 [2] Table 5.3.33.3-1 to **receive the disposition notification** for the SDS message sent at step 7?	-	-	-	-
11	Void	-	-	-	-
12	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	4	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.5.3.3 Specific message contents

Table 6.1.5.3.3-1: SIP INVITE from the UE (step 2, Table 6.1.5.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.1-1, condition MCDATA_SDS, MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	As described in Table 6.1.5.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.5.3.3-3			

Table 6.1.5.3.3-2: SDP for SIP INVITE (Table 6.1.5.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_OFFER, MCD_1to1

Table 6.1.5.3.3-3: MCData-Info (Table 6.1.5.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_1to1

Table 6.1.5.3.3-4: SIP 200 (OK) from the SS (step 2, Table 6.1.5.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.2-1, condition INVITE-RSP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
SDP message	As described in Table 6.1.5.3.3-5			

Table 6.1.5.3.3-5: SDP for SIP 200 (OK) (Table 6.1.5.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_ANSWER

Table 6.1.5.3.3-6: MSRP SEND from the UE (step 7, Table 6.1.5.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message or chunk of message as specified in table 6.1.5.3.3-6A			

Table 6.1.5.3.3-6A: MIME Message (step 7, Table 6.1.5.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.5.3.3-6B			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.5.3.3-7			

Table 6.1.5.3.3-6B: SDS SIGNALLING PAYLOAD (Table 6.1.5.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.5.3.3-7: Data Payload (Table 6.1.5.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-1

Table 6.1.5.3.3-8..9: Void

Table 6.1.5.3.3-10: SIP BYE from the UE (step 8, Table 6.1.5.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.6.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.2.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Reason			RFC 3326 [125]	
reason-value	"SIP"			
protocol-cause	"cause="200""			
reason-text	"text="transmission succeeded""			

Table 6.1.5.3.3-11: Void

Table 6.1.5.3.3-12: SIP MESSAGE from the SS (step 10, Table 6.1.5.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.5.3.3-14			

Table 6.1.5.3.3-13: Void

Table 6.1.5.3.3-14: SDS NOTIFICATION (Table 6.1.5.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

Table 6.1.5.3.3-15: Void

6.1.6 On-network / Short Data Service (SDS) / Standalone SDS Using Media Plane / One-to-one Standalone SDS / Client Terminated (CT)

6.1.6.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a SIP INVITE to initiate a standalone one-to-one SDS message using
the media plane }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

(2)

```
with { UE (MCDATA Client) having responded to the SIP INVITE message that initiated a standalone
one-to-one SDS message using the media plane }
ensure that {
  when { UE (MCDATA Client) receives an MSRP SEND message from the SS (MCDATA Server) }
```

```
    then { UE (MCDATA Client) responds with an MSRP 200 (OK) message and if the MSRP SEND message is
not blank, renders the contents of the Payload IE to the MCDATA User and sends a SIP MESSAGE message
with a disposition notification of "DELIVERED" }
            }
```

(3)

```
with { UE (MCDATA Client) having responded to the MSRP SEND message from the SS (MCDATA server) }
ensure that {
  when { UE (MCDATA Client) receives a SIP BYE message to release communications }
    then { UE (MCDATA Client) responds with a SIP 200 (OK) message }
            }
```

6.1.6.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.3.2.4, 9.2.3.2.2, 13.2.2.2.2.2, 9.2.1.3, 12.2.1.1, 6.2.4.1, 6.2.3.1, TS 24.582 clauses 6.1.1.3.1, 6.1.1.3.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.3.2.4]

Upon receipt of an initial SIP INVITE request, the MCData client shall follow the procedures for termination of multimedia sessions in the IM CN subsystem as specified in 3GPP TS 24.229 [5] with the clarifications below.

The MCData client:

1) may reject the SIP INVITE request if either of the following conditions are met:

   a) MCData client does not have enough resources to handle the call; or

   b) any other reason outside the scope of this specification;

   and skip the rest of the steps after step 2;

2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCData function either with appropriate reject code as specified in 3GPP TS 24.229 [5] and warning texts as specified in subclause 4.9 or with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

3) if the SDP offer of the SIP INVITE request contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:

   a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

   b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

   c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

   d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP INVITE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

   e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

      i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

      ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to create an end-to-end secure session.

3) may display to the MCData user the MCData ID of the inviting MCData user and the type of SDS request;

4) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

5) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

6) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [38]. The "refresher" parameter in the Session-Expires header field shall be set to "uas";

7) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP 200 (OK) response;

8) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP 200 (OK) response;

9) shall include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP INVITE request according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.3.2.2; and

10) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of an SIP ACK message to the sent SIP 200 (OK) message, the MCData client shall:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.1.3.

[TS 24.282, clause 9.2.3.2.2]

When the MCData client receives an initial SDP offer for an MCData standalone SDS, the MCData client shall process the SDP offer and shall compose an SDP answer according to 3GPP TS 24.229 [5] and IETF RFC 4975 [17].

When composing an SDP answer, the MCData client:

1) shall include an "m=message" media-level section for the accepted MCData media stream consisting of:

   a) the port number;

   b) a protocol field value of "TCP/MSRP", or "TCP/TLS/MSRP" for TLS according to the received SDP offer;

   c) a format list field set to '*';

   d) an "a=recvonly" attribute;

   e) an "a=path" attribute containing its own MSRP URI;

   f) set the content type as a=accept-types: application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload; and

   g) set the a=setup attribute according to IETF RFC 6135 [19].

[TS 24.282, clause 13.2.2.2.2.2]

Upon receiving a SIP BYE request, the MCData client:

1) shall send SIP 200 (OK) response towards MCData server according to 3GPP TS 24.229 [5]; and

2) shall release all media plane resources corresponding to the MCData communication being released.

NOTE: Partially received data can be stored and processed.

[TS 24.282, clause 9.2.1.3]

To handle the disposition requests, the MCData client:

1) If the SDS disposition request type IE is set to:

   a) "DELIVERY" then, shall send a delivered notification as described in subclause 12.2.1.1;

b) "READ", shall send a read notification as described in subclause 12.2.1.1, when a display indication is received; or

c) "DELIVERY AND READ" then, shall start timer TDU1 (delivery and read).

Upon receiving a display indication before timer TDU1 (delivery and read) expires, the MCData client:

1) shall stop timer TDU1 (delivery and read); and

2) shall send a delivered and read notification as described in subclause 12.2.1.1.

Upon expiry of timer TDU1 (delivery and read), the MCData client:

1) shall send a delivered notification as described in subclause 12.2.1.1; and

2) upon receiving a display indication, send a read notification as described in subclause 12.2.1.1.

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or

- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the controlling MCData function that sent the SDS or FD message request. The MCData client determines the controlling MCData function from the contents of the <mcdata-controller-psi> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request;

- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and

- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];

4) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with an <mcdata-controller-psi> element containing the PSI of the controlling MCData function;

5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;

6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

7) if requiring to send an FD notification, shall generate an FD NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.2; and

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.4.1]

This subclause is referenced from other procedures.

In a SIP MESSAGE request, the MCData client:

1) when sending SDS messages or SDS disposition notifications:

   a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

   b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

   c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

2) when sending FD messages, FD disposition notifications or FD media storage function discovery messages:

   a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.fd media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

   b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

   c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

3) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [5]; and

4) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user.

[TS 24.282, clause 6.2.3.1]

In order to generate an SDS notification, the MCData client:

1) shall generate an SDS NOTIFICATION message as specified in subclause 15.1.5; and

2) shall include in the SIP request, the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1.

When generating an SDS NOTIFICATION message as specified in subclause 15.1.5, the MCData client:

1) if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED" as specified in subclause 15.2.5;

2) if sending a read notification, shall set the SDS disposition notification type IE as "READ" as specified in subclause 15.2.5;

3) if sending a delivered and read notification, shall set the SDS disposition notification type IE as "DELIVERED AND READ" as specified in subclause 15.2.5;

4) if the SDS message could not be delivered to the user or application (e.g. due to lack of storage), shall set the SDS disposition notification type IE as "UNDELIVERED" as specified in subclause 15.2.5;

5) shall set the Date and time IE to the current time to as specified in subclause 15.2.8;

6) shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message as specified in subclause 15.2.9;

7) shall set the Message ID to the value of the Message ID that was received in the SDS message as specified in subclause 15.2.10;

8) if the SDS message was destined for the user, shall not include an Application ID IE as specified in subclause 15.2.7; and

9) if the SDS message was destined for an application, shall include an Application ID IE set to the value of the Application ID that was included in the SDS message as specified in subclause 15.2.3.

[TS 24.582, clause 6.1.1.3.1]

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the terminating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as an passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP connection is established, the MCData client:

1. on receipt of an MSRP request in an MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData standalone message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.1.3.2.

[TS 24.582, clause 6.1.1.3.2]

The MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body;

2. shall decode the contents of the application/vnd.3gpp.mcdata-payload MIME body;

3. if the SDS SIGNALLING PAYLOAD message contains a new Conversation ID, shall instantiate a new conversation with the Message ID in the SDS SIGNALLING PAYLOAD identifying the first message in the conversation thread;

4. if the SDS SIGNALLING PAYLOAD message contains an existing Conversation ID and:

   a. if the SDS SIGNALLING PAYLOAD message does not contain an InReplyTo Message ID, shall use the Message ID in the SDS SIGNALLING PAYLOAD to identify a new message in the existing conversation thread; and

   b. if the SDS SIGNALLING PAYLOAD message contains an InReplyTo Message ID, shall associate the message to an existing message in the conversation thread as identified by the InReplyTo Message ID in the SDS SIGNALLING PAYLOAD and use the Message ID in the SDS SIGNALLING PAYLOAD to identify the new message;

5. shall identify the number of Payload IEs in the DATA PAYLOAD message from the Number of Payloads IE in the DATA PAYLOAD message;
6. if the SDS SIGNALLING PAYLOAD message does not contain an Application identifier IE:
   a. shall determine that the payload contained in the DATA PAYLOAD message is for user consumption;
   b. may notify the MCData user; and
   c. shall render the contents of the Payload IE(s) to the MCData user;
7. if the SDS SIGNALLING PAYLOAD message contains an Application identifier IE:
   a. shall determine that the payload contained in the DATA PAYLOAD message is not for user consumption;
   b. shall not notify the MCData user;
   c. if the Application identifier value is unknown, shall discard the SDS message; and
   d. if the Application identifier value is known, shall deliver the contents of the Payload IE(s) to the identified application; and
8. if SDS Disposition request type IE is present in the SDS SIGNALLING PAYLOAD message received in subclause 6.1.1.3.1 then, shall send a disposition notification as described in 3GPP TS 24.282 [8] subclause 9.2.1.3.

6.1.6.3 Test description

6.1.6.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element of the MCData Service Configuration document shall be set to 0 to force the MCData client to send the data using the media plane.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.6.3.2 Test procedure sequence

Table 6.1.6.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.3.3-1?	-	-	1,2	P
2-5	Void	-	-	-	-
6	Check: Does the UE (MCData client) correctly perform procedure 'CT MSRP message transfer' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 to **receive an SDS message with disposition request "DELIVERY"**?	-	-	2	P
7	Void	-	-	-	-
8	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.7.3-1?	-	-	3	P
9-10	Void	-	-	-	-
11	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer** using signalling plane' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 to **send a disposition notification of "DELIVERED"**?	-	-	2	P
12	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 1)	-	-	2	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.6.3.3 Specific message contents

Table 6.1.6.3.3-1: SIP INVITE from the SS (step 1, Table 6.1.6.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.1.6.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.6.3.3-3			

Table 6.1.6.3.3-2: SDP for SIP INVITE (Table 6.1.6.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_OFFER, MCD_1to1

Table 6.1.6.3.3-3: MCData-Info (Table 6.1.6.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_1to1

Table 6.1.6.3.3-4: SIP 200 (OK) from the UE (step 1, Table 6.1.6.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.1-1, condition INVITE-RSP, MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
value	"application/sdp"			
Message-body				
SDP message	As described in Table 6.1.6.3.3-5			

Table 6.1.6.3.3-5: SDP for SIP 200 (OK) (Table 6.1.6.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_ANSWER

Table 6.1.6.3.3-6: MSRP SEND from the SS (step 6, Table 6.1.6.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message as specified in table 6.1.6.3.3-6A			

Table 6.1.6.3.3-6A: MIME Message (step 6, Table 6.1.6.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.6.3.3-6B			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.6.3.3-7			

Table 6.1.6.3.3-6B: SDS SIGNALLING PAYLOAD (Table 6.1.6.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED

Table 6.1.6.3.3-7: Data Payload (Table 6.1.6.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-2

Table 6.1.6.3.3-8: SIP BYE from the SS (step 8, Table 6.1.6.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.7.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.2.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Reason			RFC 3326 [125]	
reason-value	"SIP"			
protocol-cause	"cause="200""			
reason-text	"text="transmission succeeded""			

Table 6.1.6.3.3-9: Void

Table 6.1.6.3.3-10: SIP MESSAGE from the UE (step 11, Table 6.1.6.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData-Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.6.3.3-11			

Table 6.1.6.3.3-11: SDS NOTIFICATION (Table 6.1.6.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

6.1.7 On-network / Short Data Service (SDS) / Standalone SDS Using Media Plane / Group Standalone SDS / Client Originated (CO)

6.1.7.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a group standalone SDS message using the media plane}
    then { UE (MCDATA Client) sends a request to establish an MSRP connection via a SIP INVITE
message and then responds to the SIP 200 (OK) message with a SIP ACK message }
            }
```

(2)

```
with { UE (MCDATA Client) having requested the establishment of a MSRP connection }
ensure that {
  when { UE (MCDATA Client) receives a SIP 200 (OK) message with the a=setup attribute set to
"passive" }
    then { UE (MCDATA Client) sends a blank MSRP SEND message to bind the MSRP connection and then
sends the group standalone SDS message via a MSRP SEND message with a disposition of "DELIVERY" }
            }
```

(3)

```
with { UE (MCDATA Client) having sent a group standalone SDS message using the media plane }
```

```
ensure that {
  when { UE (MCDATA Client) receives a MSRP 200 (OK) message in response to the last MSRP SEND
message indicating that the standalone SDS message has been successfully transferred }
    then { UE (MCDATA Client) sends a SIP BYE message }
            }
```

(4)

```
with { UE (MCDATA Client) having sent a group standalone SDS message using the media plane with a
disposition of "DELIVERY" }
ensure that {
  when { UE (MCDATA Client) receives a disposition response via a SIP MESSAGE message }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

6.1.7.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.3.2.3, 9.2.3.2.1, 13.2.2.2.2.1, 12.2.1.2, TS 24.582 clauses 6.1.1.2.1, 6.1.1.2.2, 6.1.1.2.3, 6.1.1.2.4. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.3.2.3]

The MCData client shall generate a SIP INVITE request in accordance with 3GPP TS 24.229 [5] with the clarifications given below.

The MCData client:

1) shall include the g.3gpp.mcdata.sds media feature tag and the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP INVITE request according to IETF RFC 3840 [16];

2) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

3) shall include an Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

4) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP INVITE request;

5) should include the "timer" option tag in the Supported header field;

6) should include the Session-Expires header field according to IETF RFC 4028 [38]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";

7) if a one-to-one standalone SDS message is to be sent:

   a) shall insert in the SIP INVITE request a MIME resource-lists body with the MCData ID of the invited MCData user, according to rules and procedures of IETF RFC 5366 [18];

   b) shall contain an application/vnd.3gpp.mcdata-info+xml MIME body with the <mcdatainfo> element containing the <mcdata-Params> element with:

      i) the <request-type> element set to a value of "one-to-one-sds"; and

   c) if an end-to-end security context needs to be established and the security context does not exist or if the existing security context has expired, then:

      i) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [26];

ii) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [26];

iii) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect one-to-one communications and with the remaining twenty eight bits being randomly generated as described in 3GPP TS 33.180 [26];

iv) shall encrypt the PCK to a UID associated to the MCData client using the MCData ID of the invited user and a time related parameter as described in 3GPP TS 33.180 [26];

v) shall generate a MIKEY-SAKKE I_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [26];

vi) shall add the MCData ID of the originating MCData to the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26]; and

vii) shall sign the MIKEY-SAKKE I_MESSAGE using the originating MCData user's signing key provided in the keying material together with a time related parameter, and add this to the MIKEY-SAKKE payload, as described in 3GPP TS 33.180 [26];

…

9) shall set the Request-URI of the SIP INVITE request to the public service identity identifying the participating MCData function serving the MCData user;

NOTE 2: The MCData client is configured with public service identity identifying the participating MCData function serving the MCData user.

10) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

11) shall include an SDP offer according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.3.2.1; and

12) shall send the SIP INVITE request towards the MCData server according to 3GPP TS 24.229 [5].

On receipt of a SIP 2xx response to the SIP INVITE request, the MCData client:

1) shall send a SIP ACK request as specified in 3GPP TS 24.229 [5];

2) shall start the SIP Session timer according to rules and procedures of IETF RFC 4028 [38]; and

3) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.1.2.

…

On receipt of an indication from the media plane indicating that the standalone SDS message has been successfully transferred, the MCData client shall:

1) shall generate a SIP BYE request according to 3GPP TS 24.229 [5] with:

   a) Reason code set to "SIP";

   b) cause set to "200"; and

   c) text set to "transmission succeeded";

2) shall set the Request-URI to the MCData session identity to release; and

3) shall send a SIP BYE request towards MCData server according to 3GPP TS 24.229 [5].

Upon receiving a SIP 200 (OK) response to the SIP BYE request, the MCData client shall interact with the media plane and indicate to terminate the session, as specified in 3GPP TS 24.582 [15].

[TS 24.282, clause 9.2.3.2.1]

When composing an SDP offer according to 3GPP TS 24.229 [5], IETF RFC 4975 [17], IETF RFC 6135 [19] and IETF RFC 6714 [20] the MCData client:

1) shall include an "m=message" media-level section for the MCData media stream consisting of:

   a) the IP address and the port number;

   b) a protocol field value of "TCP/MSRP", or "TCP/TLS/MSRP" for TLS;

   c) a format list field set to '*';

   d) an "a=sendonly" attribute;

   e) an "a=path" attribute containing its own MSRP URI;

   f) set the content type as "a=accept-types:application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload"; and

   g) set the a=setup attribute as "actpass"; and

2) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the MIKEY-SAKKE I_MESSAGE in an "a=key-mgmt" attribute as a "mikey" attribute value in the SDP offer as specified in IETF RFC 4567 [45].

[TS 24.282, clause 13.2.2.2.2.1]

When the MCData client wants to release a MCData communication established over the media plane, the MCData client:

1) shall generate a SIP BYE request according to 3GPP TS 24.229 [5];

2) shall set the Request-URI to the MCData session identity to be released; and

3) shall send the SIP BYE request towards MCData server according to 3GPP TS 24.229 [5].

Upon receiving a SIP 200 (OK) response to the SIP BYE request, the MCData client shall release all media plane resources corresponding to the MCData communication being released.

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

[TS 24.582, clause 6.1.1.2.1]

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the originating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act according to IETF RFC 6135 [12], as:

   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and

   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11]; and

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;
2. shall generate a SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;
3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4; and
4. shall send the MSRP SEND request on the established MSRP connection.

NOTE: MSRP chunking, if needed, may affect the number of "Content Type" lines in each MSRP SEND message conveying a chunk, as also specified in subclause 6.1.1.2.4.

If MSRP chunking is not used then on receipt of a 200 (OK) response, the MCData client shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary;
2. shall wait for a 200 (OK) response to each MSRP SEND request sent; and
3. on receipt of the last 200 (OK) response shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks;
2. shall indicate to MCData user that the SDS message could not be sent; and
3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving an indication to terminate the session from the signalling plane, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks and may indicate to MCData user that the SDS message could not be sent.

[TS 24.582, clause 6.1.1.2.2]

In order to generate an SDS signalling payload, the MCData client:

1. shall generate an SDS SIGNALLING PAYLOAD message as specified in 3GPP TS 24.282 [8]; and
2. shall include the SDS SIGNALLING PAYLOAD message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in 3GPP TS 24.282 [8]; and

When generating a an SDS SIGNALLING PAYLOAD message, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD message as defined in 3GPP TS 24.282 [8]. In the SDS SIGNALLING PAYLOAD message, the MCData client:
    a. may include and set the Disposition request type IE to:
        i. "DELIVERY", if only delivery disposition is requested;
        ii. "READ", if only read disposition is requested; or
        iii. "DELIVERY AND READ", if both delivery and read dispositions are requested;
    b. shall set Date and time IE to current UTC time;
    c. shall set Conversation ID IE to a universally unique message ID generated as per IETF RFC 4122 [10];
    d. shall set Message ID IE to a universally unique message ID generated as per IETF RFC 4122 [10];

e. if indicated that the SDS message is in reply to another SDS message then, shall include the Reply ID IE set to the message identifier of the indicated SDS message; and

f. if indicated that the target recipient of the SDS message is an application then, shall set Application Identifier IE to the application identifier.

[TS 24.582, clause 6.1.1.2.3]

In order to generate SDS data payload, the MCData client:

1. shall generate a DATA PAYLOAD message as specified in 3GPP TS 24.282 [8]; and
2. shall include the DATA PAYLOAD message in an application/vnd.3gpp.mcdata-payload MIME body as specified in 3GPP TS 24.282 [8].

When generating a DATA PAYLOAD message, the MCData client:

1. shall generate a SDS DATA PAYLOAD message as defined in 3GPP TS 24.282 [8]. In the SDS DATA PAYLOAD message, the MCData client:
   a. shall set Number of payloads IE to the total number of payloads being sent; and
   b. for each payload, shall include Payload IE. In the Payload IE:
      i. shall set Payload content type to "TEXT", or "BINARY", or "HYPERLINKS", or "LOCATION" according to the payload type; and
      ii. shall set Payload data IE to actual payload.

[TS 24.582, clause 6.1.1.2.4]

The MCData client shall take the procedures in subclause 6.4.1 into consideration when generating MSRP SEND messages.

The MCData client shall generate MSRP SEND for SDS message requests according to IETF RFC 4975 [11].

When generating an MSRP SEND for SDS message request containing an SDS SIGNALLING PAYLOAD message and an SDS DATA PAYLOAD message, the MCData client

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the first content type as Content-Type = "application/vnd.3gpp.mcdata-signalling";
3. shall set the first body of the MSRP SEND request to the generated SDS SIGNALLING PAYLOAD message;
4. shall set the second Content-Type as "application/vnd.3gpp.mcdata-payload"; and
5. shall set the second body of the MSRP SEND request to the generated SDS DATA PAYLOAD message.

When generating an MSRP SEND for SDS message request containing only an SDS DATA PAYLOAD message, the MCData client:

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the Content-Type as "application/vnd.3gpp.mcdata-payload"; and
3. shall set the body of the MSRP SEND request to the generated SDS DATA PAYLOAD message.

When generating an MSRP SEND for SDS message request containing only an SDS SIGNALLING PAYLOAD, the MCData client.

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the Content-Type as "application/vnd.3gpp.mcdata-signalling"; and
3. shall set the body of the MSRP SEND request to the generated SDS SIGNALLING PAYLOAD message.

6.1.7.3 Test description

6.1.7.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element of the MCData Service Configuration document shall be set to 0 to force the MCData client to send the data using the media plane.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.7.3.2 Test procedure sequence

Table 6.1.7.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a group standalone SDS message with disposition request "**DELIVERY**". (NOTE 1)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.2.3-1?	-	-	1,2	P
3-6	Void	-	-	-	-
7	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send an SDS message with disposition request "DELIVERY"**?	-	-	2	P
8	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.6.3-1?	-	-	3	P
9	Void	-	-	-	-
10	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive the disposition notification** for the SDS message sent at step 7?	-	-	4	P
11	Void	-	-	-	-
12	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	4	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.7.3.3 Specific message contents

Table 6.1.7.3.3-1: SIP INVITE from the UE (step 2, Table 6.1.7.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.1-1, condition MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	As described in Table 6.1.7.3.3-1A			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.7.3.3-2			

Table 6.1.7.3.3-1A: SDP for SIP INVITE (Table 6.1.7.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_OFFER

Table 6.1.7.3.3-2: MCData-Info (Table 6.1.7.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_grp

Table 6.1.7.3.3-3: SIP 200 (OK) from the SS (step 2, Table 6.1.7.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.2-1, condition INVITE-RSP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
SDP message	As described in Table 6.1.7.3.3-4			

Table 6.1.7.3.3-4: SDP for SIP 200 (OK) (Table 6.1.7.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_ANSWER

Table 6.1.7.3.3-5: MSRP SEND from the UE (step 7, Table 6.1.7.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message or chunk of message as specified in table 6.1.7.3.3-5A			

Table 6.1.7.3.3-5A: MIME Message (step 7, Table 6.1.7.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.7.3.3-5B			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	MCData Protected Payload Message containing DATA PAYLOAD as described in Table 6.1.7.3.3-6			

Table 6.1.7.3.3-5B: SDS SIGNALLING PAYLOAD (Table 6.1.7.3.3-5A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.7.3.3-6: Data Payload (Table 6.1.7.3.3-5A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.1-1

Table 6.1.7.3.3-7..8: Void

Table 6.1.7.3.3-9: SIP BYE from the UE (step 8, Table 6.1.7.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.6.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.2.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Reason			RFC 3326 [125]	
reason-value	"SIP"			
protocol-cause	"cause="200""			
reason-text	"text="transmission succeeded""			

Table 6.1.7.3.3-10: Void

Table 6.1.7.3.3-11: SIP MESSAGE from the SS (step 10, Table 6.1.7.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	As described in Table 6.1.7.3.3-12			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.7.3.3-13			

Table 6.1.7.3.3-12: MCData-Info (Table 6.1.7.3.3-11)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-calling-group-id> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.2-3A		

Table 6.1.7.3.3-13: SDS NOTIFICATION (Table 6.1.7.3.3-11)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

Table 6.1.7.3.3-14: Void

6.1.8 On-network / Short Data Service (SDS) / Standalone SDS Using Media Plane / Group Standalone SDS / Client Terminated (CT)

6.1.8.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a SIP INVITE to initiate a standalone group SDS message using the
media plane }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }

 (2)
with { UE (MCDATA Client) having responded to the SIP INVITE message that initiated a standalone
group SDS message using the media plane }
ensure that {
  when { UE (MCDATA Client) receives an MSRP SEND message }
    then { UE (MCDATA Client) responds with an MSRP 200 (OK) message and if the MSRP SEND message is
not blank, renders the contents of the Payload IE to the MCDATA User and sends a SIP MESSAGE message
with a disposition notification of "DELIVERED" }
            }
```

(3)

```
with { UE (MCDATA Client) having responded to the MSRP SEND message from the SS (MCDATA server) }
ensure that {
  when { UE (MCDATA Client) receives a SIP BYE message to release communications }
    then { UE (MCDATA Client) sends a SIP 200 (OK) message }
            }
```

6.1.8.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.3.2.4, 9.2.3.2.2, 13.2.2.2.2.2, 9.2.1.3, 12.2.1.1, 6.2.4.1, 6.2.3.1, TS 24.582 clauses 6.1.1.3.1, 6.1.1.3.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.3.2.4]

Upon receipt of an initial SIP INVITE request, the MCData client shall follow the procedures for termination of multimedia sessions in the IM CN subsystem as specified in 3GPP TS 24.229 [5] with the clarifications below.

The MCData client:

1) may reject the SIP INVITE request if either of the following conditions are met:

   a) MCData client does not have enough resources to handle the call; or

   b) any other reason outside the scope of this specification;

   and skip the rest of the steps after step 2;

2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCData function either with appropriate reject code as specified in 3GPP TS 24.229 [5] and warning texts as specified in subclause 4.9 or with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

3) if the SDP offer of the SIP INVITE request contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:

   a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

   b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP INVITE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to create an end-to-end secure session.

3) may display to the MCData user the MCData ID of the inviting MCData user and the type of SDS request;

4) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

5) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

6) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [38]. The "refresher" parameter in the Session-Expires header field shall be set to "uas";

7) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP 200 (OK) response;

8) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP 200 (OK) response;

9) shall include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP INVITE request according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.3.2.2; and

10) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of an SIP ACK message to the sent SIP 200 (OK) message, the MCData client shall:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.1.3.

[TS 24.282, clause 9.2.3.2.2]

When the MCData client receives an initial SDP offer for an MCData standalone SDS, the MCData client shall process the SDP offer and shall compose an SDP answer according to 3GPP TS 24.229 [5] and IETF RFC 4975 [17].

When composing an SDP answer, the MCData client:

1) shall include an "m=message" media-level section for the accepted MCData media stream consisting of:

a) the port number;

b) a protocol field value of "TCP/MSRP", or "TCP/TLS/MSRP" for TLS according to the received SDP offer;

c) a format list field set to '*';

d) an "a=recvonly" attribute;

e) an "a=path" attribute containing its own MSRP URI;

f) set the content type as a=accept-types: application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload; and

g) set the a=setup attribute according to IETF RFC 6135 [19].

[TS 24.282, clause 13.2.2.2.2.2]

Upon receiving a SIP BYE request, the MCData client:

1) shall send SIP 200 (OK) response towards MCData server according to 3GPP TS 24.229 [5]; and

2) shall release all media plane resources corresponding to the MCData communication being released.

NOTE: Partially received data can be stored and processed.

[TS 24.282, clause 9.2.1.3]

To handle the disposition requests, the MCData client:

1) If the SDS disposition request type IE is set to:

   a) "DELIVERY" then, shall send a delivered notification as described in subclause 12.2.1.1;

   b) "READ", shall send a read notification as described in subclause 12.2.1.1, when a display indication is received; or

   c) "DELIVERY AND READ" then, shall start timer TDU1 (delivery and read).

Upon receiving a display indication before timer TDU1 (delivery and read) expires, the MCData client:

1) shall stop timer TDU1 (delivery and read); and

2) shall send a delivered and read notification as described in subclause 12.2.1.1.

Upon expiry of timer TDU1 (delivery and read), the MCData client:

1) shall send a delivered notification as described in subclause 12.2.1.1; and

2) upon receiving a display indication, send a read notification as described in subclause 12.2.1.1.

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or

- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the controlling MCData function that sent the SDS or FD message request. The MCData client determines the controlling MCData function from the contents of the <mcdata-controller-psi> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request;

- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and

- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];

4) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with an <mcdata-controller-psi> element containing the PSI of the controlling MCData function;

5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;

6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

7) if requiring to send an FD notification, shall generate an FD NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.2; and

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.4.1]

This subclause is referenced from other procedures.

In a SIP MESSAGE request, the MCData client:

1) when sending SDS messages or SDS disposition notifications:

   a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

   b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

   c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

2) when sending FD messages, FD disposition notifications or FD media storage function discovery messages:

   a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.fd media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

   b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

   c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

3) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [5]; and

4) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user.

[TS 24.282, clause 6.2.3.1]

In order to generate an SDS notification, the MCData client:

1) shall generate an SDS NOTIFICATION message as specified in subclause 15.1.5; and

2) shall include in the SIP request, the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1.

When generating an SDS NOTIFICATION message as specified in subclause 15.1.5, the MCData client:

1) if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED" as specified in subclause 15.2.5;

2) if sending a read notification, shall set the SDS disposition notification type IE as "READ" as specified in subclause 15.2.5;

3) if sending a delivered and read notification, shall set the SDS disposition notification type IE as "DELIVERED AND READ" as specified in subclause 15.2.5;

4) if the SDS message could not be delivered to the user or application (e.g. due to lack of storage), shall set the SDS disposition notification type IE as "UNDELIVERED" as specified in subclause 15.2.5;

5) shall set the Date and time IE to the current time to as specified in subclause 15.2.8;

6) shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message as specified in subclause 15.2.9;

7) shall set the Message ID to the value of the Message ID that was received in the SDS message as specified in subclause 15.2.10;

8) if the SDS message was destined for the user, shall not include an Application ID IE as specified in subclause 15.2.7; and

9) if the SDS message was destined for an application, shall include an Application ID IE set to the value of the Application ID that was included in the SDS message as specified in subclause 15.2.3.

[TS 24.582, clause 6.1.1.3.1]

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the terminating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as an passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP connection is established, the MCData client:

1. on receipt of an MSRP request in an MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData standalone message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.1.3.2.

[TS 24.582, clause 6.1.1.3.2]

The MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body;

2. shall decode the contents of the application/vnd.3gpp.mcdata-payload MIME body;

3. if the SDS SIGNALLING PAYLOAD message contains a new Conversation ID, shall instantiate a new conversation with the Message ID in the SDS SIGNALLING PAYLOAD identifying the first message in the conversation thread;

4. if the SDS SIGNALLING PAYLOAD message contains an existing Conversation ID and:

   a. if the SDS SIGNALLING PAYLOAD message does not contain an InReplyTo Message ID, shall use the Message ID in the SDS SIGNALLING PAYLOAD to identify a new message in the existing conversation thread; and

   b. if the SDS SIGNALLING PAYLOAD message contains an InReplyTo Message ID, shall associate the message to an existing message in the conversation thread as identified by the InReplyTo Message ID in the SDS SIGNALLING PAYLOAD and use the Message ID in the SDS SIGNALLING PAYLOAD to identify the new message;

5. shall identify the number of Payload IEs in the DATA PAYLOAD message from the Number of Payloads IE in the DATA PAYLOAD message;

6. if the SDS SIGNALLING PAYLOAD message does not contain an Application identifier IE:

   a. shall determine that the payload contained in the DATA PAYLOAD message is for user consumption;

   b. may notify the MCData user; and

   c. shall render the contents of the Payload IE(s) to the MCData user;

7. if the SDS SIGNALLING PAYLOAD message contains an Application identifier IE:

   a. shall determine that the payload contained in the DATA PAYLOAD message is not for user consumption;

   b. shall not notify the MCData user;

   c. if the Application identifier value is unknown, shall discard the SDS message; and

   d. if the Application identifier value is known, shall deliver the contents of the Payload IE(s) to the identified application; and

8. if SDS Disposition request type IE is present in the SDS SIGNALLING PAYLOAD message received in subclause 6.1.1.3.1 then, shall send a disposition notification as described in 3GPP TS 24.282 [8] subclause 9.2.1.3.

6.1.8.3 Test description

6.1.8.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element of the MCData Service Configuration document shall be set to 0 to force the MCData client to send the data using the media plane.

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.8.3.2 Test procedure sequence

Table 6.1.8.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.3.3-1?	-	-	1,2	P
2-5	Void	-	-	-	-
6	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 to **receive an SDS message with disposition request "DELIVERY"**?	-	-	2	P
7	Void	-	-	-	-
8	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.7.3-1?	-	-	3	P
9-10	Void	-	-	-	-
11	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 to **send a disposition notification of "DELIVERED"**?	-	-	2	P
12	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 1)	-	-	2	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.8.3.3 Specific message contents

Table 6.1.8.3.3-1: SIP INVITE from the SS (step 1, Table 6.1.8.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.1.8.3.3-1A			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.8.3.3-2			

Table 6.1.8.3.3-1A: SDP for SIP INVITE (Table 6.1.8.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_OFFER

Table 6.1.8.3.3-2: MCData-Info (Table 6.1.8.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_grp

Table 6.1.8.3.3-3: SIP 200 (OK) from the UE (step 1, Table 6.1.8.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.1-1, condition INVITE-RSP, MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
value	"application/sdp"			
Message-body				
SDP message	As described in Table 6.1.8.3.3-4			

Table 6.1.8.3.3-4: SDP for SIP 200 (OK) (Table 6.1.8.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_ANSWER

Table 6.1.8.3.3-5: MSRP SEND from the SS (step 6, Table 6.1.8.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message as specified in table 6.1.8.3.3-5A			

Table 6.1.8.3.3-5A: MIME Message (step 6, Table 6.1.8.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp.mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.8.3.3-5B			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp.mcdata-payload"			
MIME-part-body	MCData Protected Payload Message containing DATA PAYLOAD as described in Table 6.1.8.3.3-6			

Table 6.1.8.3.3-5B: SDS SIGNALLING PAYLOAD (Table 6.1.8.3.3-5A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED

Table 6.1.8.3.3-6: Data Payload (Table 6.1.8.3.3-5A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.1-2

Table 6.1.8.3.3-7: SIP BYE from the SS (step 8, Table 6.1.8.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.7.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.2.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Reason			RFC 3326 [125]	
reason-value	"SIP"			
protocol-cause	"cause="200""			
reason-text	"text="transmission succeeded""			

Table 6.1.8.3.3-8: Void

Table 6.1.8.3.3-9: SIP MESSAGE from the UE (step 11, Table 6.1.8.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.8.3.3-10			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.6.3.3-11			

Table 6.1.8.3.3-10: MCData-Info (Table 6.1.8.3.3-9)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-request-uri> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.1-3A		

Table 6.1.8.3.3-11: SDS NOTIFICATION (Table 6.1.8.3.3-9)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

6.1.9 On-network / Short Data Service (SDS) / SDS Session / One-to-one SDS Session / Client Originated (CO)

6.1.9.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to initiate a one-to-one SDS session using the media plane}
    then { UE (MCDATA Client) sends a request to establish a one-to-one SDS session and a MSRP
connection via a SIP INVITE message and then responds to the SIP 200 (OK) message with a SIP ACK
message }
            }
```

(2)

```
with { UE (MCDATA Client) having received a SIP 200 (OK) message with the a=setup attribute set to
"passive" in response to a SIP INVITE message}
ensure that {
  when { UE (MCDATA Client) responds to the SIP 200 (OK) message with a SIP ACK message }
    then { UE (MCData Client) sends a blank MSRP SEND message to bind the MSRP connection and then
sends the one-to-one session SDS message via a MSRP SEND message with a disposition of "DELIVERY" }
            }
```

(3)

```
with { UE (MCDATA Client) having sent a one-to-one session SDS message using the media plane with a
disposition of "DELIVERY" }
ensure that {
  when { UE (MCDATA Client) receives a disposition response via a MSRP SEND message }
    then { UE (MCDATA Client) responds to the MSRP SEND message by sending a MSRP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

(4)

```
with { UE (MCDATA Client) having established a one-to-one SDS session and a MSRP connection }
ensure that {
  when { UE (MCDATA Client) receives an MSRP SEND message with a disposition of "READ" }
    then { UE (MCDATA Client) responds with a MSRP 200 (OK) message and then renders the contents of
the Payload IE to the MCDATA User and then sends a MSRP SEND message with a disposition notification
of "READ" }
            }
```

(5)

```
with { UE (MCDATA Client) having established a one-to-one SDS session }
ensure that {
  when { the MCDATA User requests to release the one-to-one SDS session }
    then { UE (MCDATA Client) sends a SIP BYE message }
            }
```

6.1.9.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.4.2.3, 9.2.4.2.1, 13.2.2.2.2.1, TS 24.582 clauses 6.1.2.2.1, 6.1.2.4, 6.1.2.5.1, 6.1.2.5.2, 6.1.2.5.3, 6.1.2.6. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.4.2.3]

The MCData client shall generate a SIP INVITE request in accordance with 3GPP TS 24.229 [5] with the clarifications given below.

The MCData client:

1) shall include the g.3gpp.mcdata.sds media feature tag and the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP INVITE request according to IETF RFC 3840 [16];

2) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

3) shall include an Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

4) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP INVITE request;

5) should include the "timer" option tag in the Supported header field;

6) should include the Session-Expires header field according to IETF RFC 4028 [38]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";

7) if a one-to-one SDS session is requested:

   a) shall insert in the SIP INVITE request a MIME resource-lists body with the MCData ID of the invited MCData user, according to rules and procedures of IETF RFC 5366 [18];

b) shall contain an application/vnd.3gpp.mcdata-info+xml MIME body with the <mcdatainfo> element containing the <mcdata-Params> element with:

i) the <request-type> element set to a value of "one-to-one-sds-session"; and

c) if an end-to-end security context needs to be established and the security context does not exist or if the existing security context has expired, then:

i) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [26];

ii) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [26];

iii) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect one-to-one communications and with the remaining twenty eight bits being randomly generated as described in 3GPP TS 33.180 [26];

iv) shall encrypt the PCK to a UID associated to the MCData client using the MCData ID of the invited user and a time related parameter as described in 3GPP TS 33.180 [26];

v) shall generate a MIKEY-SAKKE I_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [26];

vi) shall add the MCData ID of the originating MCData to the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26]; and

vii) shall sign the MIKEY-SAKKE I_MESSAGE using the originating MCData user's signing key provided in the keying material together with a time related parameter, and add this to the MIKEY-SAKKE payload, as described in 3GPP TS 33.180 [26];

…

9) shall set the Request-URI of the SIP INVITE request to the public service identity identifying the participating MCData function serving the MCData user;

NOTE 2: The MCData client is configured with public service identity identifying the participating MCData function serving the MCData user.

10) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

11) shall include an SDP offer according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.4.2.1; and

12) shall send the SIP INVITE request towards the MCData server according to 3GPP TS 24.229 [5].

On receipt of a SIP 2xx response to the SIP INVITE request, the MCData client:

1) shall send a SIP ACK request as specified in 3GPP TS 24.229 [5];

2) shall start the SIP Session timer according to rules and procedures of IETF RFC 4028 [38]; and

3) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.2.2.

[TS 24.282, clause 9.2.4.2.1]

When composing an SDP offer according to 3GPP TS 24.229 [5], IETF RFC 4975 [17], IETF RFC 6135 [19] and IETF RFC 6714 [20] the MCData client:

1) shall include an "m=message" media-level section for the MCData media stream consisting of:

a) the port number;

b) a protocol field value of "TCP/MSRP" or "TCP/TLS/MSRP" for TLS;

c) an "a=sendrecv" attribute;

d) an "a=path" attribute containing its own MSRP URI;

e) set the content type as "a=accept-types:application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload"; and

f) set the a=setup attribute as "actpass"; and

2) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the MIKEY-SAKKE I_MESSAGE in an "a=key-mgmt" attribute as a "mikey" attribute value in the SDP offer as specified in IETF RFC 4567 [45].

[TS 24.282, clause 13.2.2.2.2.1]

When the MCData client wants to release a MCData communication established over the media plane, the MCData client:

1) shall generate a SIP BYE request according to 3GPP TS 24.229 [5];

2) shall set the Request-URI to the MCData session identity to be released; and

3) shall send the SIP BYE request towards MCData server according to 3GPP TS 24.229 [5].

Upon receiving a SIP 200 (OK) response to the SIP BYE request, the MCData client shall release all media plane resources corresponding to the MCData communication being released.

[TS 24.582, clause 6.1.2.2.1]

Upon receiving an indication to establish MSRP connection for SDS session as the originating MCData client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act according to IETF RFC 6135 [12], as:

   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and

   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP session is established, the MCData client:

1. on receipt of an MSRP request in the MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData SDS message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.2.6.

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client can generate and send an SDS message as specified in subclause 6.1.2.4, or can generate and send an SDS disposition notification for a received SDS message as specified in subclause 6.1.2.5, if requested.

Received content and disposition requests shall be handled as specified in subclause 6.1.2.6.

[TS 24.582, clause 6.1.2.4]

An MCData client is allowed to send an one-to-one SDS message only if

1. the <allow-transmit-data> element of an <actions> element is present with a value "true" (see the MCData user profile document in 3GPP TS 24.484 [7]);

2. the size of the SDS message is less than or equal to the value of the <max-data-size-sds-bytes> element in the MCData service configuration document as specified in 3GPP TS 24.484 [7]; and

3. the size of the SDS message is less than or equal to the value of <MaxData1To1> element of the MCData user profile document (see the MCData user profile document in 3GPP TS 24.484 [7]).

An MCData client is allowed to send a group SDS message only if

1. the <mcdata-allow-transmit-data-in-this-group> element of an <action> element is present with a value "true" as defined in the MCData group document for this MCData group as specified in 3GPP TS 24.481 [4];

2. the size of the SDS message is less than or equal to the value contained in the <mcdata-on-network-max-data-size-for-SDS> as defined in the MCData group document for this MCData group as specified in 3GPP TS 24.481 [4]; and

3. the size of the SDS message is less than or equal to the value contained in the <mcdata-max-data-in-single-request> element of the <entry> element of the MCData group document for this MCData group as specified in 3GPP TS 24.481 [11].

If the above mentioned conditions satisfy, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;

2. shall generate a SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;

3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4, with the following clarification;

   a. shall set To-Path header according to the MSRP URI in the received SDP; and

4. shall send the MSRP SEND request on the established MSRP connection.

NOTE: MSRP chunking, if needed, may affect the number of "Content Type" lines in each MSRP SEND message conveying a chunk, as also specified in subclause 6.1.1.2.4.

[TS 24.582, clause 6.1.2.5.1]

To send an SDS disposition notification, the MCData client:

1. shall generate a SDS NOTIFICATION as specified in subclause 6.1.2.5.2;

2. shall include the SDS NOTIFICATION in an MSRP SEND request as specified in subclause 6.1.2.5.3, with the following clarification;

   a. shall set To-Path header according to the MSRP URI in the received SDP; and

3. shall send the MSRP SEND request on the established MSRP connection.

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary.

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks; and

2. shall indicate to MCData user that the SDS message or the SDS disposition notification could not be sent.

[TS 24.582, clause 6.1.2.5.2]

In order to generate an SDS notification, the MCData client:

1. shall generate an SDS NOTIFICATION message as specified in 3GPP TS 24.282 [8]; and

2. shall include the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in 3GPP TS 24.282 [8].

When generating an SDS NOTIFICATION message, the MCData client:

1. if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED";
2. if sending a read notification, shall set the SDS disposition notification type IE as "READ";
3. if sending a delivered and read notification, shall set the SDS disposition notification type IE as "DELIVERED AND READ";
4. if the SDS message could not be delivered to the user or application (e.g. due to lack of storage), shall set the SDS disposition notification type IE as "UNDELIVERED";
5. shall set the Date and time IE to the current time;
6. shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message;
7. shall set the Message ID to the value of the Message ID that was received in the SDS message;
8. if the SDS message was destined for the user, shall not include an Application ID IE; and
9. if the SDS message was destined for an application, shall include an Application ID IE set to the value of the Application ID that was included in the SDS message.

[TS 24.582, clause 6.1.2.5.3]

The MCData client shall generate MSRP SEND requests for SDS disposition notification according to IETF RFC 4975 [11].

When generating an MSRP SEND request for SDS disposition notification containing an SDS NOTIFICATION message, the MCData client

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the content type as Content-Type = "application/vnd.3gpp.mcdata-signalling"; and
3. shall set the body of the MSRP SEND request to the generated SDS NOTIFICATION message.

[TS 24.582, clause 6.1.2.6]

Upon receiving an SDS message, the MCData client:

1. shall follow the procedure defined in subclause 6.1.1.3.2, with the following clarification:
    a. if SDS Disposition request type IE is present in the received SDS SIGNALLING PAYLOAD message then, shall send an SDS disposition notification as described in subclause 6.1.2.5.

Upon receiving an SDS disposition notification, the MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and
2. shall deliver the notification to the user or application.

6.1.9.3 Test description

6.1.9.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4.

The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.9.3.2 Test procedure sequence

Table 6.1.9.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a one-to-one session SDS message with disposition request "**DELIVERY**". (NOTE 1)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.2.3-1?	-	-	1,2	P
3-6	Void	-	-	-	-
7	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send an SDS message with disposition request "DELIVERY"**?	-	-	2	P
8	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive the disposition notification** for the SDS message sent at step 7?	-	-	3	P
9	Void	-	-	-	-
10	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	3	P
11	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive an SDS message with disposition request "READ"**?	-	-	4	P
12	Void	-	-	-	-
-	EXCEPTION: In parallel to the event described in step 13 the events described in Table 6.1.9.3.2-2 take place. (NOTE 2)	-	-	-	-
13	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 1)	-	-	4	P
14-15	Void	-	-	-	-
16	Make the UE (MCData client) release the one-to-one session. (NOTE 1)	-	-	-	-
17	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.6.3-1?	-	-	3	P
18	The SS releases the RRC connection	-	-	-	-

NOTE 1: This is expected to be done via a suitable implementation dependent MMI.
NOTE 2: The behaviour is handled through parallel actions to allow for implementations which first indicate to the user that there is a message available, but render the message to the user only after the user takes an action to open the message.

Table 6.1.9.3.2-2: Parallel Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send a disposition notification of "READ"**?	-	-	2	P

6.1.9.3.3 Specific message contents

Table 6.1.9.3.3-1: SIP INVITE from the UE (step 2, Table 6.1.9.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.1-1, condition MCDATA_SDS, MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	As described in Table 6.1.9.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.9.3.3-3			

Table 6.1.9.3.3-2: SDP for SIP INVITE (Table 6.1.9.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_OFFER, SDS_SESSION, MCD_1to1

Table 6.1.9.3.3-3: MCData-Info (Table 6.1.9.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-sds-session"			

Table 6.1.9.3.3-4: SIP 200 (OK) from the SS (step 2, Table 6.1.9.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.2-1, condition INVITE-RSP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
SDP message	As described in Table 6.1.5.9.3-5			

Table 6.1.9.3.3-5: SDP for SIP 200 (OK) (Table 6.1.9.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_ANSWER, SDS_SESSION

Table 6.1.9.3.3-6: MSRP SEND from the UE (step 7, Table 6.1.9.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message or chunk of message as specified in table 6.1.9.3.3-6A			

Table 6.1.9.3.3-6A: MIME Message (step 7, Table 6.1.9.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.9.3.3-6B			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.9.3.3-7			

Table 6.1.9.3.3-6B: SDS SIGNALLING PAYLOAD (Table 6.1.9.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.9.3.3-7: Data Payload (Table 6.1.9.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-1

Table 6.1.9.3.3-8..9: Void

Table 6.1.9.3.3-10: MSRP SEND from the SS (step 8, Table 6.1.9.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp. mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.9.3.3-11			

Table 6.1.9.3.3-11: SDS NOTIFICATION (Table 6.1.9.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

Table 6.1.9.3.3-12: MSRP SEND from the SS (step 11, Table 6.1.9.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message as specified in table 6.1.9.3.3-12A			

Table 6.1.9.3.3-12A: MIME Message (step 11, Table 6.1.9.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.9.3.3-13			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.9.3.3-13A			

Table 6.1.9.3.3-13: SDS SIGNALLING PAYLOAD (Table 6.1.9.3.3-12A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition READ

Table 6.1.9.3.3-13A: Data Payload (Table 6.1.9.3.3-12A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-2

Table 6.1.9.3.3-14: MSRP SEND from the UE (step 1, Table 6.1.9.3.2-2; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp.mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.9.3.3-15			

Table 6.1.9.3.3-15: SDS NOTIFICATION (Table 6.1.9.3.3-14)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition READ

Table 6.1.9.3.3-16..17: Void

6.1.10 On-network / Short Data Service (SDS) / SDS Session / One-to-one SDS Session / Client Terminated (CT)

6.1.10.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a SIP INVITE to initiate a one-to-one SDS session using the media
plane }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

(2)

```
with { UE (MCDATA Client) having responded to the SIP INVITE message that initiated a one-to-one SDS
session using the media plane }
ensure that {
  when { UE (MCDATA Client) receives an MSRP SEND message }
    then { UE (MCDATA Client) responds with an MSRP 200 (OK) message and if the MSRP SEND message is
not blank, renders the contents of the Payload IE to the MCDATA User and sends a SIP MESSAGE message
with a disposition notification of "DELIVERED" }
            }
```

(3)

```
with { UE (MCDATA Client) being in a one-to-one SDS session initiated by the SS (MCDATA server) }
ensure that {
  when { the MCDATA User requests to send a one-to-one SDS Session message with a disposition of
"READ" }
    then { UE (MCDATA Client) sends a one-to-one session SDS message via a MSRP SEND message with a
disposition of "DELIVERY" }
            }
```

(4)

```
with { UE (MCDATA Client) having sent a one-to-one SDS session message using the media plane with a
disposition of "READ" }
ensure that {
  when { UE (MCDATA Client) receives a disposition response via a MSRP SEND message }
```

```
    then { UE (MCDATA Client) responds to the MSRP SEND message by sending a MSRP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

(5)

```
with { UE (MCDATA Client) being in a one-to-one SDS session initiated by the SS (MCDATA server) }
ensure that {
  when { UE (MCDATA Client) receives a SIP BYE message }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

6.1.10.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.4.2.4, 9.2.4.2.2, 13.2.2.2.2.2, TS 24.582 clauses 6.1.2.3.1, 6.1.2.3.1, 6.1.2.4, 6.1.2.5.1, 6.1.2.5.2, 6.1.2.5.3, 6.1.2.6. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.4.2.4]

Upon receipt of an initial SIP INVITE request, the MCData client shall follow the procedures for termination of multimedia sessions in the IM CN subsystem as specified in 3GPP TS 24.229 [5] with the clarifications below.

The MCData client:

1) may reject the SIP INVITE request if either of the following conditions are met:

   a) MCData client does not have enough resources to handle the call; or

   b) any other reason outside the scope of this specification;

   and skip the rest of the steps after step 2;

2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCData function either with appropriate reject code as specified in 3GPP TS 24.229 [5] and warning texts as specified in subclause 4.9 or with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

3) if the SDP offer of the SIP INVITE request contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:

   a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

   b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

   c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

   d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP INVITE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

   e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

      i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

      ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to create an end-to-end secure session.

4) may display to the MCData user the MCData ID of the inviting MCData user and the type of SDS request;

5) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

6) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

7) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [38]. The "refresher" parameter in the Session-Expires header field shall be set to "uas";

8) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP 200 (OK) response;

9) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP 200 (OK) response;

10) shall include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP INVITE request according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.4.2.2; and

11) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of an SIP ACK message to the sent SIP 200 (OK) message, the MCData client shall:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.2.3.

To send a disposition notification after the media plane is released, the MCData client:

1) shall follow the procedures described in subclause 12.2.1.1.

[TS 24.282, clause 9.2.4.2.2]

When the MCData client receives an initial SDP offer for an MCData SDS session, the MCData client shall process the SDP offer and shall compose an SDP answer according to 3GPP TS 24.229 [5] and IETF RFC 4975 [17].

When composing an SDP answer, the MCData client:

1) shall include an "m=message" media-level section for the accepted MCData media stream consisting of:

   a) the port number;

   b) a protocol field value of "TCP/MSRP" or "TCP/TLS/MSRP" for TLS according to the received SDP offer;

   c) an "a=sendrecv" attribute;

   d) an "a=path" attribute containing its own MSRP URI;

   e) set the content type as a=accept-types: application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload; and

   f) set the a=setup attribute according to IETF RFC 6135 [19].

[TS 24.282, clause 13.2.2.2.2.2]

Upon receiving a SIP BYE request, the MCData client:

1) shall send SIP 200 (OK) response towards MCData server according to 3GPP TS 24.229 [5]; and

2) shall release all media plane resources corresponding to the MCData communication being released.

NOTE: Partially received data can be stored and processed.

[TS 24.582, clause 6.1.2.3.1]

Upon receiving an indication to establish MSRP connection for SDS session as the terminating MCData client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as an passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP session is established, the MCData client:

1. on receipt of an MSRP request in the MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData SDS message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.2.6.

On receiving MSRP 200 (OK) response to the first MSRP SEND request sent as "active" endpoint, or after sending MSRP 200 (OK) response to the first MSRP SEND request received as "passive" endpoint, the MCData client can generate and send an SDS message as specified in subclause 6.1.2.4, or can generate and send an SDS disposition notification for a received SDS message as specified in subclause 6.1.2.5, if requested.

Received content and disposition requests shall be handled as specified in subclause 6.1.2.6.

[TS 24.582, clause 6.1.2.4]

An MCData client is allowed to send an one-to-one SDS message only if

1. the <allow-transmit-data> element of an <actions> element is present with a value "true" (see the MCData user profile document in 3GPP TS 24.484 [7]);

2. the size of the SDS message is less than or equal to the value of the <max-data-size-sds-bytes> element in the MCData service configuration document as specified in 3GPP TS 24.484 [7]; and

3. the size of the SDS message is less than or equal to the value of <MaxData1To1> element of the MCData user profile document (see the MCData user profile document in 3GPP TS 24.484 [7]).

An MCData client is allowed to send a group SDS message only if

1. the <mcdata-allow-transmit-data-in-this-group> element of an <action> element is present with a value "true" as defined in the MCData group document for this MCData group as specified in 3GPP TS 24.481 [4];

2. the size of the SDS message is less than or equal to the value contained in the <mcdata-on-network-max-data-size-for-SDS> as defined in the MCData group document for this MCData group as specified in 3GPP TS 24.481 [4]; and

3. the size of the SDS message is less than or equal to the value contained in the <mcdata-max-data-in-single-request> element of the <entry> element of the MCData group document for this MCData group as specified in 3GPP TS 24.481 [11].

If the above mentioned conditions satisfy, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;

2. shall generate a SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;

3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4, with the following clarification;

   a. shall set To-Path header according to the MSRP URI in the received SDP; and

4. shall send the MSRP SEND request on the established MSRP connection.

NOTE: MSRP chunking, if needed, may affect the number of "Content Type" lines in each MSRP SEND message conveying a chunk, as also specified in subclause 6.1.1.2.4.

[TS 24.582, clause 6.1.2.5.1]

To send an SDS disposition notification, the MCData client:

1. shall generate a SDS NOTIFICATION as specified in subclause 6.1.2.5.2;
2. shall include the SDS NOTIFICATION in an MSRP SEND request as specified in subclause 6.1.2.5.3, with the following clarification;
    a. shall set To-Path header according to the MSRP URI in the received SDP; and
3. shall send the MSRP SEND request on the established MSRP connection.

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary.

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks; and
2. shall indicate to MCData user that the SDS message or the SDS disposition notification could not be sent.

[TS 24.582, clause 6.1.2.5.2]

In order to generate an SDS notification, the MCData client:

1. shall generate an SDS NOTIFICATION message as specified in 3GPP TS 24.282 [8]; and
2. shall include the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in 3GPP TS 24.282 [8].

When generating an SDS NOTIFICATION message, the MCData client:

1. if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED";
2. if sending a read notification, shall set the SDS disposition notification type IE as "READ";
3. if sending a delivered and read notification, shall set the SDS disposition notification type IE as "DELIVERED AND READ";
4. if the SDS message could not be delivered to the user or application (e.g. due to lack of storage), shall set the SDS disposition notification type IE as "UNDELIVERED";
5. shall set the Date and time IE to the current time;
6. shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message;
7. shall set the Message ID to the value of the Message ID that was received in the SDS message;
8. if the SDS message was destined for the user, shall not include an Application ID IE; and
9. if the SDS message was destined for an application, shall include an Application ID IE set to the value of the Application ID that was included in the SDS message.

[TS 24.582, clause 6.1.2.5.3]

The MCData client shall generate MSRP SEND requests for SDS disposition notification according to IETF RFC 4975 [11].

When generating an MSRP SEND request for SDS disposition notification containing an SDS NOTIFICATION message, the MCData client

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;

2. shall set the content type as Content-Type = "application/vnd.3gpp.mcdata-signalling"; and

3. shall set the body of the MSRP SEND request to the generated SDS NOTIFICATION message.

[TS 24.582, clause 6.1.2.6]

Upon receiving an SDS message, the MCData client:

1. shall follow the procedure defined in subclause 6.1.1.3.2, with the following clarification:

   a. if SDS Disposition request type IE is present in the received SDS SIGNALLING PAYLOAD message then, shall send an SDS disposition notification as described in subclause 6.1.2.5.

Upon receiving an SDS disposition notification, the MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2. shall deliver the notification to the user or application.

6.1.10.3 Test description

6.1.10.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.

- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

- UE States at the end of the preamble

  - The UE is in E-UTRA Registered, Idle Mode state.

  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.10.3.2 Test procedure sequence

Table 6.1.10.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.3.3-1?	-	-	1,2	P
2-5	Void	-	-	-	-
6	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive an SDS message with disposition request "DELIVERY"**?	-	-	2	P
7	Void	-	-	-	-
8	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send a disposition notification of "DELIVERED"**?	-	-	2	P
9	Void	-	-	-	-
10	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 1)	-	-	2	P
11	Make the UE (MCData client) send a one-to-one session SDS message over the media plane with disposition request "READ". (NOTE 1)	-	-	-	-
12	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send an SDS message with disposition request "READ"**?	-	-	3	P
13	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive the disposition notification** for the SDS message sent at step 12?	-	-	4	P
14	Void	-	-	-	-
15	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	4	P
16	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.7.3-1?	-	-	5	P
17	The SS releases the RRC connection	-	-	-	-
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.10.3.3 Specific message contents

Table 6.1.10.3.3-1: SIP INVITE from the SS (step 1, Table 6.1.10.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.1.10.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.10.3.3-3			

Table 6.1.10.3.3-2: SDP for SIP INVITE (Table 6.1.10.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_OFFER, MCD_1to1, SDS_SESSION

Table 6.1.10.3.3-3: MCData-Info (Table 6.1.10.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-sds-session"			

Table 6.1.10.3.3-4: SIP 200 (OK) from the UE (step 1, Table 6.1.10.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.1-1, condition INVITE-RSP, MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
value	"application/sdp"			
Message-body				
SDP message	As described in Table 6.1.10.3.3-5			

Table 6.1.10.3.3-5: SDP for SIP 200 (OK) (Table 6.1.10.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_ANSWER, SDS_SESSION

Table 6.1.10.3.3-6: MSRP SEND from the SS (step 6, Table 6.1.10.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message as specified in table 6.1.10.3.3-6A			

Table 6.1.10.3.3-6A: MIME Message (step 6, Table 6.1.10.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.10.3.3-6B			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.10.3.3-7			

Table 6.1.10.3.3-6B: SDS SIGNALLING PAYLOAD (Table 6.1.10.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED

Table 6.1.10.3.3-7: Data Payload (Table 6.1.10.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-2

Table 6.1.10.3.3-8: MSRP SEND from the UE (step 8, Table 6.1.10.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp. mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.10.3.3-9			

Table 6.1.10.3.3-9: SDS NOTIFICATION (Table 6.1.10.3.3-8)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

Table 6.1.10.3.3-10: MSRP SEND from the UE (step 12, Table 6.1.10.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message or chunk of message as specified in table 6.1.10.3.3-10A			

Table 6.1.10.3.3-10A: MIME Message (step 12, Table 6.1.10.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.10.3.3-11			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.10.3.3-12			

Table 6.1.10.3.3-11: SDS SIGNALLING PAYLOAD (Table 6.1.10.3.3-10A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition READ

Table 6.1.10.3.3-12: Data Payload (Table 6.1.10.3.3-10A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-1

Table 6.1.10.3.3-13..14: Void

Table 6.1.10.3.3-15: MSRP SEND from the SS (step 13, Table 6.1.10.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp.mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.10.3.3-16			

Table 6.1.10.3.3-16: SDS NOTIFICATION (Table 6.1.10.3.3-15)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition READ

Table 6.1.10.3.3-17..18: Void

6.1.11 On-network / Short Data Service (SDS) / SDS Session / Group SDS Session / Client Originated (CO)

6.1.11.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to initiate a group SDS session using the media plane}
    then { UE (MCDATA Client) sends a request to establish a group SDS session and a MSRP connection
via a SIP INVITE message and then responds to the SIP 200 (OK) message with a SIP ACK message }
            }
```

(2)

```
with { UE (MCDATA Client) having received a SIP 200 (OK) message with the a=setup attribute set to
"passive" }
ensure that {
  when { UE (MCDATA Client) responds to the SIP 200 (OK) message with a SIP ACK message }
    then { UE (MCDATA Client)  sends a blank MSRP SEND message to bind the MSRP connection and then
sends the group session SDS message via a MSRP SEND message with a disposition of "DELIVERY" }
            }
```

(3)

```
with { UE (MCDATA Client) having sent a group session SDS message using the media plane with a
disposition of "DELIVERY" }
ensure that {
  when { UE (MCDATA Client) receives a disposition response via a MSRP SEND message }
    then { UE (MCDATA Client) responds to the MSRP SEND message by sending a MSRP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

(4)

```
with { UE (MCDATA Client) having established a group SDS session and a MSRP connection }
ensure that {
  when { UE (MCDATA Client) receives an MSRP SEND message with a disposition of "DELIVERY AND READ"
}
    then { UE (MCDATA Client) responds with a MSRP 200 (OK) message }
            }
```

(5)

```
with { UE (MCDATA Client) having responded with a MSRP 200(OK) message to a group SDS session
message with a disposition of "DELIVERY AND READ" and timer TDU1 (delivery and read) not yet expired
}
ensure that {
  when { the UE (MCDATA Client) determines that the payload contained in the DATA PAYLOAD message is
for user consumption and before timer TDU1 (delivery and read) expires }
    then { the UE (MCDATA Client) renders the contents of the Payload IE to the MCDATA User and then
sends a MSRP SEND message with a disposition notification of "DELIVERED AND READ" }
            }
```

(6)

```
with { UE (MCDATA Client) having responded with a MSRP 200(OK) message to a group SDS session
message with a disposition of "DELIVERY AND READ" and the UE (MCDATA Client) not yet rendering the
contents of the Payload IE to the MCDATA User }
ensure that {
  when { timer TDU1 (delivery and read) expires }
    then { UE (MCDATA Client) sends a MSRP SEND message with a disposition notification of
"DELIVERED" and then renders the contents of the Payload IE to the MCDATA User and then sends a MSRP
SEND message with a disposition notification of "READ" }
            }
```

(7)

```
with { UE (MCDATA Client) having established a group SDS session }
ensure that {
  when { the MCDATA User requests to release the group SDS session }
    then { UE (MCDATA Client) sends a SIP BYE message }
            }
```

6.1.11.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.4.2.3, 9.2.4.2.1, 13.2.2.2.2.1, TS 24.582 clauses 6.1.2.2.1, 6.1.2.3.1, 6.1.2.4, 6.1.2.5.1, 6.1.2.5.2, 6.1.2.5.3, 6.1.2.6. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.4.2.3]

The MCData client shall generate a SIP INVITE request in accordance with 3GPP TS 24.229 [5] with the clarifications given below.

The MCData client:

1) shall include the g.3gpp.mcdata.sds media feature tag and the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP INVITE request according to IETF RFC 3840 [16];

2) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

3) shall include an Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

4) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP INVITE request;

5) should include the "timer" option tag in the Supported header field;

6) should include the Session-Expires header field according to IETF RFC 4028 [38]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";

…

8) if a group SDS session is requested:

   a) if the "/<*x*>/<x>/Common/MCData/AllowedSDS" leaf node present in the group document of the requested MCData group, configured on the group management client as specified in 3GPP TS 24.483 [42] is set to "false", shall reject the request to send SDS and not continue with the rest of the steps in this subclause; and

   b) shall contain in an application/vnd.3gpp.mcdata-info+xml MIME body with the <mcdatainfo> element containing the <mcdata-Params> element with:

      i) the <request-type> element set to a value of "group-sds-session";

      ii) the <mcdata-request-uri> element set to the MCData group identity; and

      iii) the <mcdata-client-id> element set to the MCData client ID of the originating MCData client;

NOTE 1: The MCData client does not include the MCData ID of the originating MCData user in the body, as this will be inserted into the body of the SIP INVITE request that is sent from the originating participating MCData function.

9) shall set the Request-URI of the SIP INVITE request to the public service identity identifying the participating MCData function serving the MCData user;

NOTE 2: The MCData client is configured with public service identity identifying the participating MCData function serving the MCData user.

10) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

11) shall include an SDP offer according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.4.2.1; and

12) shall send the SIP INVITE request towards the MCData server according to 3GPP TS 24.229 [5].

On receipt of a SIP 2xx response to the SIP INVITE request, the MCData client:

1) shall send a SIP ACK request as specified in 3GPP TS 24.229 [5];

2) shall start the SIP Session timer according to rules and procedures of IETF RFC 4028 [38]; and

3) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.2.2.

[TS 24.282, clause 9.2.4.2.1]

When composing an SDP offer according to 3GPP TS 24.229 [5], IETF RFC 4975 [17], IETF RFC 6135 [19] and IETF RFC 6714 [20] the MCData client:

1) shall include an "m=message" media-level section for the MCData media stream consisting of:

   a) the port number;

   b) a protocol field value of "TCP/MSRP" or "TCP/TLS/MSRP" for TLS;

   c) an "a=sendrecv" attribute;

   d) an "a=path" attribute containing its own MSRP URI;

   e) set the content type as "a=accept-types:application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload"; and

   f) set the a=setup attribute as "actpass"; and

2) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the MIKEY-SAKKE I_MESSAGE in an "a=key-mgmt" attribute as a "mikey" attribute value in the SDP offer as specified in IETF RFC 4567 [45].

[TS 24.282, clause 13.2.2.2.2.1]

When the MCData client wants to release a MCData communication established over the media plane, the MCData client:

1) shall generate a SIP BYE request according to 3GPP TS 24.229 [5];

2) shall set the Request-URI to the MCData session identity to be released; and

3) shall send the SIP BYE request towards MCData server according to 3GPP TS 24.229 [5].

Upon receiving a SIP 200 (OK) response to the SIP BYE request, the MCData client shall release all media plane resources corresponding to the MCData communication being released.

[TS 24.582, clause 6.1.2.2.1]

Upon receiving an indication to establish MSRP connection for SDS session as the originating MCData client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act according to IETF RFC 6135 [12], as:

   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and

   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP session is established, the MCData client:

1. on receipt of an MSRP request in the MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData SDS message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.2.6.

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client can generate and send an SDS message as specified in subclause 6.1.2.4, or can generate and send an SDS disposition notification for a received SDS message as specified in subclause 6.1.2.5, if requested.

Received content and disposition requests shall be handled as specified in subclause 6.1.2.6.

[TS 24.582, clause 6.1.2.3.1]

Upon receiving an indication to establish MSRP connection for SDS session as the terminating MCData client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as an passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP session is established, the MCData client:

1. on receipt of an MSRP request in the MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData SDS message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.2.6.

On receiving MSRP 200 (OK) response to the first MSRP SEND request sent as "active" endpoint, or after sending MSRP 200 (OK) response to the first MSRP SEND request received as "passive" endpoint, the MCData client can generate and send an SDS message as specified in subclause 6.1.2.4, or can generate and send an SDS disposition notification for a received SDS message as specified in subclause 6.1.2.5, if requested.

Received content and disposition requests shall be handled as specified in subclause 6.1.2.6.

[TS 24.582, clause 6.1.2.4]

An MCData client is allowed to send an one-to-one SDS message only if

1. the <allow-transmit-data> element of an <actions> element is present with a value "true" (see the MCData user profile document in 3GPP TS 24.484 [7]);

2. the size of the SDS message is less than or equal to the value of the <max-data-size-sds-bytes> element in the MCData service configuration document as specified in 3GPP TS 24.484 [7]; and

3. the size of the SDS message is less than or equal to the value of <MaxData1To1> element of the MCData user profile document (see the MCData user profile document in 3GPP TS 24.484 [7]).

An MCData client is allowed to send a group SDS message only if

1. the <mcdata-allow-transmit-data-in-this-group> element of an <action> element is present with a value "true" as defined in the MCData group document for this MCData group as specified in 3GPP TS 24.481 [4];

2. the size of the SDS message is less than or equal to the value contained in the <mcdata-on-network-max-data-size-for-SDS> as defined in the MCData group document for this MCData group as specified in 3GPP TS 24.481 [4]; and

3. the size of the SDS message is less than or equal to the value contained in the <mcdata-max-data-in-single-request> element of the <entry> element of the MCData group document for this MCData group as specified in 3GPP TS 24.481 [11].

If the above mentioned conditions satisfy, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;

2. shall generate a SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;

3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4, with the following clarification;

   a. shall set To-Path header according to the MSRP URI in the received SDP; and

4. shall send the MSRP SEND request on the established MSRP connection.

NOTE: MSRP chunking, if needed, may affect the number of "Content Type" lines in each MSRP SEND message conveying a chunk, as also specified in subclause 6.1.1.2.4.

[TS 24.582, clause 6.1.2.5.1]

To send an SDS disposition notification, the MCData client:

1. shall generate a SDS NOTIFICATION as specified in subclause 6.1.2.5.2;

2. shall include the SDS NOTIFICATION in an MSRP SEND request as specified in subclause 6.1.2.5.3, with the following clarification;

a. shall set To-Path header according to the MSRP URI in the received SDP; and

3. shall send the MSRP SEND request on the established MSRP connection.

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary.

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks; and

2. shall indicate to MCData user that the SDS message or the SDS disposition notification could not be sent.

[TS 24.582, clause 6.1.2.5.2]

In order to generate an SDS notification, the MCData client:

1. shall generate an SDS NOTIFICATION message as specified in 3GPP TS 24.282 [8]; and

2. shall include the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in 3GPP TS 24.282 [8].

When generating an SDS NOTIFICATION message, the MCData client:

1. if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED";

2. if sending a read notification, shall set the SDS disposition notification type IE as "READ";

3. if sending a delivered and read notification, shall set the SDS disposition notification type IE as "DELIVERED AND READ";

4. if the SDS message could not be delivered to the user or application (e.g. due to lack of storage), shall set the SDS disposition notification type IE as "UNDELIVERED";

5. shall set the Date and time IE to the current time;

6. shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message;

7. shall set the Message ID to the value of the Message ID that was received in the SDS message;

8. if the SDS message was destined for the user, shall not include an Application ID IE; and

9. if the SDS message was destined for an application, shall include an Application ID IE set to the value of the Application ID that was included in the SDS message.

[TS 24.582, clause 6.1.2.6]

Upon receiving an SDS message, the MCData client:

1. shall follow the procedure defined in subclause 6.1.1.3.2, with the following clarification:

   a. if SDS Disposition request type IE is present in the received SDS SIGNALLING PAYLOAD message then, shall send an SDS disposition notification as described in subclause 6.1.2.5.

Upon receiving an SDS disposition notification, the MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2. shall deliver the notification to the user or application.

6.1.11.3 Test description

6.1.11.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.11.3.2 Test procedure sequence

Table 6.1.11.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a group session SDS message with disposition request "**DELIVERY**". (NOTE 1)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.2.3-1?	-	-	1,2	P
3-6	Void	-	-	-	-
7	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send an SDS message with disposition request "DELIVERY"**?	-	-	2	P
8	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive the disposition notification** for the SDS message sent at step 7?	-	-	3	P
9	Void	-	-	-	-
10	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	3	P
11	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive an SDS message with disposition request "DELIVERY AND READ"**? (NOTE 3)	-	-	4	P
12	Void	-	-	-	-
-	EXCEPTION: In parallel to the event described in step 13 the events described in Table 6.1.11.3.2-2 take place. (NOTE 2)	-	-	-	-
13	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 1)	-	-	4	P
14	Make the UE (MCData client) release the group session. (NOTE 1)	-	-	-	-
15	Check: Does the UE (MCData client) correctly perform procedure 'CO MCData call release' as described in TS 36.579-1 [2] Table 5.3C.6.3-1?	-	-	3	P
16	The SS releases the RRC connection	-	-	-	-

NOTE 1: This is expected to be done via a suitable implementation dependent MMI.
NOTE 2: The behaviour is handled through parallel actions to allow for implementations which first indicate to the user that there is a message available, but render the message to the user only after the user takes an action to open the message.
NOTE 3: Timer TDU1 (delivery and read) is started upon receipt of the SIP MESSAGE message that contains a "DELIVERY AND READ" disposition request. Timer TDU1 (delivery and read)=120ms according to the default value defined in TS 24.282 [31].

Table 6.1.11.3.2-2: Parallel Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
-	EXCEPTION: Steps 1a1-1b2 describe behaviour that depends on the timing of UE execution; the "lower case letter" identifies a step sequence that takes place if the UE receives a display indication before (step 1a1) or after (steps 1b1-1b2) timer TDU1 (delivery and read) expires.	-	-	-	-
1a1	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send a disposition notification of "DELIVERED AND READ"**?	-	-	3	P
1b1	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send a disposition notification of "DELIVERED"**?	-	-	3	P
1b2	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send a disposition notification of "READ"**?	-	-	3	P

6.1.11.3.3 Specific message contents

Table 6.1.11.3.3-1: SIP INVITE from the UE (step 2, Table 6.1.11.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.1-1, condition MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	As described in Table 6.1.11.3.3-1A			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.11.3.3-2			

Table 6.1.11.3.3-1A: SDP for SIP INVITE (Table 6.1.11.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_OFFER, SDS_SESSION

Table 6.1.11.3.3-2: MCData-Info (Table 6.1.11.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-sds-session"			

Table 6.1.11.3.3-3: SIP 200 (OK) from the SS (step 2, Table 6.1.11.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.2-1, condition INVITE-RSP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
SDP message	As described in Table 6.1.11.3.3-4			

Table 6.1.11.3.3-4: SDP for SIP 200 (OK) (Table 6.1.11.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_ANSWER, SDS_SESSION

Table 6.1.11.3.3-5: MSRP SEND from the UE (step 7, Table 6.1.11.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message or chunk of message as specified in table 6.1.11.3.3-5A			

Table 6.1.11.3.3-5A: MIME Message (step 7, Table 6.1.11.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.11.3.3-5B			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	MCData Protected Payload Message containing DATA PAYLOAD as described in Table 6.1.11.3.3-6			

Table 6.1.11.3.3-5B: SDS SIGNALLING PAYLOAD (Table 6.1.11.3.3-5A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.11.3.3-6: Data Payload (Table 6.1.11.3.3-5A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.1-1

Table 6.1.11.3.3-7..8: Void

Table 6.1.11.3.3-9: MSRP SEND from the SS (step 8, Table 6.1.11.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp.mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.11.3.3-10			

Table 6.1.11.3.3-10: SDS NOTIFICATION (Table 6.1.11.3.3-9)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

Table 6.1.11.3.3-11: MSRP SEND from the SS (step 11, Table 6.1.11.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message as specified in table 6.1.11.3.3-11A			

Table 6.1.11.3.3-11A: MIME Message (step 11, Table 6.1.11.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.11.3.3-12			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	MCData Protected Payload Message containing DATA PAYLOAD as described in Table 6.1.11.3.3-12A			

Table 6.1.11.3.3-12: SDS SIGNALLING PAYLOAD (Table 6.1.11.3.3-11A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED_READ

Table 6.1.11.3.3-12A: Data Payload (Table 6.1.11.3.3-11A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.1-2

Table 6.1.11.3.3-13: MSRP SEND from the UE (step 1a1, Table 6.1.11.3.2-2; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp. mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.11.3.3-14			

Table 6.1.11.3.3-14: SDS NOTIFICATION (Table 6.1.11.3.3-13)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED_READ

Table 6.1.11.3.3-15: MSRP SEND from the UE (step 1b1, Table 6.1.11.3.2-2; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp. mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.11.3.3-16			

Table 6.1.11.3.3-16: SDS NOTIFICATION (Table 6.1.11.3.3-15)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

Table 6.1.11.3.3-17: MSRP SEND from the UE (step 1b2, Table 6.1.11.3.2-2; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp. mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.11.3.3-18			

Table 6.1.11.3.3-18: SDS NOTIFICATION (Table 6.1.11.3.3-17)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition READ

Table 6.1.11.3.3-19..20: Void

6.1.12 On-network / Short Data Service (SDS) / SDS Session / Group SDS Session / Client Terminated (CT)

6.1.12.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a SIP INVITE to initiate a group SDS session using the media plane
}
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

(2)

```
with { UE (MCDATA Client) having responded to the SIP INVITE message that initiated a group SDS
session using the media plane }
ensure that {
```

```
  when { UE (MCDATA Client) receives an MSRP SEND message }
    then { UE (MCDATA Client) responds with a MSRP 200 (OK) message and if the MSRP SEND message is
not blank, renders the contents of the Payload IE to the MCDATA User and sends a MSRP SEND message
with a disposition notification of "DELIVERED" }
            }
```

(3)

```
with { UE (MCDATA Client) being in a group SDS session initiated by the SS (MCDATA server) }
ensure that {
  when { the MCDATA User requests to send a group SDS Session message with a disposition of
"DELIVERY AND READ" }
    then { UE (MCDATA Client) sends a group session SDS message via a MSRP SEND message with a
disposition of "DELIVERY AND READ" }
            }
```

(4)

```
with { UE (MCDATA Client) having sent a group SDS session message using the media plane with a
disposition of "DELIVERY AND READ" }
ensure that {
  when { UE (MCDATA Client) receives a disposition response via a MSRP SEND message }
    then { UE (MCDATA Client) responds to the MSRP SEND message by sending a MSRP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

(5)

```
with { UE (MCDATA Client) being in a group SDS session initiated by the SS (MCDATA Server) }
ensure that {
  when { UE (MCDATA Client) receives a SIP BYE message }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

6.1.12.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.4.2.4, 9.2.4.2.2, 13.2.2.2.2.2, TS 24.582 clauses 6.1.2.3.1, 6.1.2.3.1, 6.1.2.4, 6.1.2.5.1, 6.1.2.5.2, 6.1.2.5.3, 6.1.2.6. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 9.2.4.2.4]

Upon receipt of an initial SIP INVITE request, the MCData client shall follow the procedures for termination of multimedia sessions in the IM CN subsystem as specified in 3GPP TS 24.229 [5] with the clarifications below.

The MCData client:

1) may reject the SIP INVITE request if either of the following conditions are met:

   a) MCData client does not have enough resources to handle the call; or

   b) any other reason outside the scope of this specification;

   and skip the rest of the steps after step 2;

2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCData function either with appropriate reject code as specified in 3GPP TS 24.229 [5] and warning texts as specified in subclause 4.9 or with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

3) if the SDP offer of the SIP INVITE request contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:

   a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

   b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP INVITE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to create an end-to-end secure session.

4) may display to the MCData user the MCData ID of the inviting MCData user and the type of SDS request;

5) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

6) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

7) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [38]. The "refresher" parameter in the Session-Expires header field shall be set to "uas";

8) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP 200 (OK) response;

9) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP 200 (OK) response;

10) shall include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP INVITE request according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.4.2.2; and

11) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of an SIP ACK message to the sent SIP 200 (OK) message, the MCData client shall:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.2.3.

To send a disposition notification after the media plane is released, the MCData client:

1) shall follow the procedures described in subclause 12.2.1.1.

[TS 24.282, clause 9.2.4.2.2]

When the MCData client receives an initial SDP offer for an MCData SDS session, the MCData client shall process the SDP offer and shall compose an SDP answer according to 3GPP TS 24.229 [5] and IETF RFC 4975 [17].

When composing an SDP answer, the MCData client:

1) shall include an "m=message" media-level section for the accepted MCData media stream consisting of:

a) the port number;

b) a protocol field value of "TCP/MSRP" or "TCP/TLS/MSRP" for TLS according to the received SDP offer;

c) an "a=sendrecv" attribute;

d) an "a=path" attribute containing its own MSRP URI;

e) set the content type as a=accept-types: application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload; and

f) set the a=setup attribute according to IETF RFC 6135 [19].

[TS 24.282, clause 13.2.2.2.2.2]

Upon receiving a SIP BYE request, the MCData client:

1) shall send SIP 200 (OK) response towards MCData server according to 3GPP TS 24.229 [5]; and

2) shall release all media plane resources corresponding to the MCData communication being released.

NOTE: Partially received data can be stored and processed.

[TS 24.582, clause 6.1.2.3.1]

Upon receiving an indication to establish MSRP connection for SDS session as the terminating MCData client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as an passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP session is established, the MCData client:

1. on receipt of an MSRP request in the MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData SDS message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.2.6.

On receiving MSRP 200 (OK) response to the first MSRP SEND request sent as "active" endpoint, or after sending MSRP 200 (OK) response to the first MSRP SEND request received as "passive" endpoint, the MCData client can generate and send an SDS message as specified in subclause 6.1.2.4, or can generate and send an SDS disposition notification for a received SDS message as specified in subclause 6.1.2.5, if requested.

Received content and disposition requests shall be handled as specified in subclause 6.1.2.6.

[TS 24.582, clause 6.1.2.4]

An MCData client is allowed to send an one-to-one SDS message only if

1. the <allow-transmit-data> element of an <actions> element is present with a value "true" (see the MCData user profile document in 3GPP TS 24.484 [7]);

2. the size of the SDS message is less than or equal to the value of the <max-data-size-sds-bytes> element in the MCData service configuration document as specified in 3GPP TS 24.484 [7]; and

3. the size of the SDS message is less than or equal to the value of <MaxData1To1> element of the MCData user profile document (see the MCData user profile document in 3GPP TS 24.484 [7]).

An MCData client is allowed to send a group SDS message only if

1. the <mcdata-allow-transmit-data-in-this-group> element of an <action> element is present with a value "true" as defined in the MCData group document for this MCData group as specified in 3GPP TS 24.481 [4];

2. the size of the SDS message is less than or equal to the value contained in the <mcdata-on-network-max-data-size-for-SDS> as defined in the MCData group document for this MCData group as specified in 3GPP TS 24.481 [4]; and

3. the size of the SDS message is less than or equal to the value contained in the <mcdata-max-data-in-single-request> element of the <entry> element of the MCData group document for this MCData group as specified in 3GPP TS 24.481 [11].

If the above mentioned conditions satisfy, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;

2. shall generate a SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;

3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4, with the following clarification;

   a. shall set To-Path header according to the MSRP URI in the received SDP; and

4. shall send the MSRP SEND request on the established MSRP connection.

NOTE: MSRP chunking, if needed, may affect the number of "Content Type" lines in each MSRP SEND message conveying a chunk, as also specified in subclause 6.1.1.2.4.

[TS 24.582, clause 6.1.2.5.1]

To send an SDS disposition notification, the MCData client:

1. shall generate a SDS NOTIFICATION as specified in subclause 6.1.2.5.2;

2. shall include the SDS NOTIFICATION in an MSRP SEND request as specified in subclause 6.1.2.5.3, with the following clarification;

   a. shall set To-Path header according to the MSRP URI in the received SDP; and

3. shall send the MSRP SEND request on the established MSRP connection.

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary.

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks; and

2. shall indicate to MCData user that the SDS message or the SDS disposition notification could not be sent.

[TS 24.582, clause 6.1.2.5.2]

In order to generate an SDS notification, the MCData client:

1. shall generate an SDS NOTIFICATION message as specified in 3GPP TS 24.282 [8]; and

2. shall include the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in 3GPP TS 24.282 [8].

When generating an SDS NOTIFICATION message, the MCData client:

1. if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED";

2. if sending a read notification, shall set the SDS disposition notification type IE as "READ";

3. if sending a delivered and read notification, shall set the SDS disposition notification type IE as "DELIVERED AND READ";

4. if the SDS message could not be delivered to the user or application (e.g. due to lack of storage), shall set the SDS disposition notification type IE as "UNDELIVERED";

5. shall set the Date and time IE to the current time;
6. shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message;
7. shall set the Message ID to the value of the Message ID that was received in the SDS message;
8. if the SDS message was destined for the user, shall not include an Application ID IE; and
9. if the SDS message was destined for an application, shall include an Application ID IE set to the value of the Application ID that was included in the SDS message.

[TS 24.582, clause 6.1.2.5.3]

The MCData client shall generate MSRP SEND requests for SDS disposition notification according to IETF RFC 4975 [11].

When generating an MSRP SEND request for SDS disposition notification containing an SDS NOTIFICATION message, the MCData client

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the content type as Content-Type = "application/vnd.3gpp.mcdata-signalling"; and
3. shall set the body of the MSRP SEND request to the generated SDS NOTIFICATION message.

[TS 24.582, clause 6.1.2.6]

Upon receiving an SDS message, the MCData client:

1. shall follow the procedure defined in subclause 6.1.1.3.2, with the following clarification:
    a. if SDS Disposition request type IE is present in the received SDS SIGNALLING PAYLOAD message then, shall send an SDS disposition notification as described in subclause 6.1.2.5.

Upon receiving an SDS disposition notification, the MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and
2. shall deliver the notification to the user or application.

6.1.12.3 Test description

6.1.12.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

- UE States at the end of the preamble

  - The UE is in E-UTRA Registered, Idle Mode state.

  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.12.3.2 Test procedure sequence

Table 6.1.12.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.3.3-1?	-	-	1,2	P
2-5	Void	-	-	-	-
6	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive an SDS message with disposition request "DELIVERY"**?	-	-	2	P
7	Void	-	-	-	-
8	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send a disposition notification of "DELIVERED"**?	-	-	2	P
9	Void	-	-	-	-
10	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 1)	-	-	2	P
11	Make the UE (MCData client) send a group session SDS message over the media plane with disposition request "DELIVERY AND READ". (NOTE 1)	-	-	-	-
12	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send an SDS message with disposition request "DELIVERY AND READ"**?	-	-	3	P
13	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive the disposition notification** for the SDS message sent at step 12?	-	-	4	P
14	Void	-	-	-	-
15	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	4	P
16	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.7.3-1?	-	-	5	P
17	The SS releases the RRC connection	-	-	-	-
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.12.3.3 Specific message contents

Table 6.1.12.3.3-1: SIP INVITE from the SS (step 1, Table 6.1.12.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.1.12.3.3-1A			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.12.3.3-2			

Table 6.1.12.3.3-1A: SDP for SIP INVITE (Table 6.1.12.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_OFFER, SDS_SESSION

Table 6.1.12.3.3-2: MCData-Info (Table 6.1.12.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-sds-session"			

Table 6.1.12.3.3-3: SIP 200 (OK) from the UE (step 1, Table 6.1.12.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.1-1, condition INVITE-RSP, MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
value	"application/sdp"			
Message-body				
SDP message	As described in Table 6.1.12.3.3-4			

Table 6.1.12.3.3-4: SDP for SIP 200 (OK) (Table 6.1.12.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_ANSWER, SDS_SESSION

Table 6.1.12.3.3-5: MSRP SEND from the SS (step 6, Table 6.1.12.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message as specified in table 6.1.12.3.3-5A			

Table 6.1.12.3.3-5A: MIME Message (step 6, Table 6.1.12.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.12.3.3-5B			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	MCData Protected Payload Message containing DATA PAYLOAD as described in Table 6.1.12.3.3-6			

Table 6.1.12.3.3-5B: SDS SIGNALLING PAYLOAD (Table 6.1.12.3.3-5A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED

Table 6.1.12.3.3-6: Data Payload (Table 6.1.12.3.3-5A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.1-2

Table 6.1.12.3.3-7: MSRP SEND from the UE (step 8, Table 6.1.12.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp. mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.12.3.3-8			

Table 6.1.12.3.3-8: SDS NOTIFICATION (Table 6.1.12.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

Table 6.1.12.3.3-9: MSRP SEND from the UE (step 12, Table 6.1.12.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message or chunk of message as specified in table 6.1.12.3.3-9A			

Table 6.1.12.3.3-9A: MIME Message (step 12, Table 6.1.12.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.12.3.3-10			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	MCData Protected Payload Message containing DATA PAYLOAD as described in Table 6.1.12.3.3-11			

Table 6.1.12.3.3-10: SDS SIGNALLING PAYLOAD (Table 6.1.12.3.3-9A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED_READ

Table 6.1.12.3.3-11: Data Payload (Table 6.1.12.3.3-9A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.1-1

Table 6.1.12.3.3-12..13: Void

Table 6.1.12.3.3-14: MSRP SEND from the SS (step 13, Table 6.1.12.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp.mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.12.3.3-15			

Table 6.1.12.3.3-15: SDS NOTIFICATION (Table 6.1.12.3.3-14)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED_READ

Table 6.1.12.3.3-16..17: Void

6.1.13 On-network / Short Data Service (SDS) / Standalone SDS Using Media Plane / One-to-one Standalone SDS / Pre-established session / Client Originated (CO)

6.1.13.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a one-to-one standalone SDS message using the media plane
and using the pre-established session }
    then { UE (MCDATA Client) sends a request to establish an MSRP connection via a SIP REFER
message and responds to the SIP re-INVITE message with a SIP 200 (OK) message and delivers the
notification to the MCDATA User about successful communication establishment and sends a blank MSRP
SEND message to bind the MSRP connection }
            }
```

(2)

```
with { UE (MCDATA Client) having sent a blank MSRP SEND message to bind the MSRP connection }
ensure that {
  when { UE (MCDATA Client) receives an MSRP 200 (OK) message in response to the blank MSRP SEND
message }
    then { UE (MCDATA Client) sends the one-to-one standalone SDS message via a MSRP SEND message
with a disposition of "DELIVERY" }
            }
```

(3)

```
with { UE (MCDATA Client) having sent a one-to-one standalone SDS message using the media plane }
ensure that {
  when { UE (MCDATA Client receives a MSRP 200 (OK) message in response to the last MSRP SEND
message indicating that the standalone SDS message has been successfully transferred }
    then { UE (MCDATA Client) sends a SIP REFER message to release the MCData session and keep the
pre-established session and responds to the SIP re-INVITE message with a SIP 200 (OK) message and
delivers the notification to the MCDATA User about successful termination }
            }
```

(4)

```
with { UE (MCDATA Client) having sent a one-to-one standalone SDS message using the media plane with
a disposition of "DELIVERY" }
ensure that {
  when { UE (MCDATA Client receives a disposition response via a SIP MESSAGE message from the SS
(MCDATA Server }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
           }
```

6.1.13.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.5.2.1.1, 9.2.3.2.1, 9.2.5.4.1.1, 12.2.1.2, TS 24.582 clauses 12.1, 6.1.1.2.1, 6.1.1.2.2, 6.1.1.2.3, 6.1.1.2.4. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-16 requirements.

[TS 24.282, clause 9.2.5.2.1.1]

Upon receiving a request from an MCData user to initiate one-to-one standalone SDS using media plane or one-to-one SDS session within the pre-established session, the MCData client shall generate a SIP REFER request outside a dialog as specified in IETF RFC 3515 [51] as updated by IETF RFC 6665 [36] and IETF RFC 7647 [52], and in accordance with the UE procedures specified in 3GPP TS 24.229 [5], with the clarifications given below.

The MCData client:

1) shall set the Request URI of the SIP REFER request to the session identity of the pre-established session;

2) shall set the Refer-To header field of the SIP REFER request as specified in IETF RFC 3515 [51] with a Content-ID ("cid") Uniform Resource Locator (URL) as specified in IETF RFC 2392 [33] that points to an application/resource-lists MIME body as specified in IETF RFC 5366 [18], and with the Content-ID header field set to this "cid" URL;

3) if an end-to-end security context needs to be established and the security context does not exist or if the existing security context has expired, then:

   i) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [26];

   ii) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [26];

   iii) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect one-to-one communications and with the remaining twenty-eight bits being randomly generated as described in 3GPP TS 33.180 [26];

   iv) shall encrypt the PCK to a UID associated to the MCData client using the MCData ID of the invited user and a time related parameter as described in 3GPP TS 33.180 [26];

   v) shall generate a MIKEY-SAKKE I_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [26];

   vi) shall add the MCData ID of the originating MCData to the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26]; and

   vii) shall sign the MIKEY-SAKKE I_MESSAGE using the originating MCData user's signing key provided in the keying material together with a time related parameter, and add this to the MIKEY-SAKKE payload, as described in 3GPP TS 33.180 [26];

4) shall include in the application/resource-lists MIME body a single <entry> element containing a "uri" attribute set to MCData ID of the called user, extended with the following parameters in the headers portion of the SIP URI:

NOTE: Characters that are not formatted as ASCII characters are escaped in the following parameters in the headers portion of the SIP URI.

a) an hname "body" parameter populated with:

i) an application/sdp MIME body containing an SDP offer with media attributes specified in subclause 9.2.3.2.1, if a one-to-one standalone SDS message is requested;

ii) an application/vnd.3gpp.mcdata-info MIME body with:

A) if a one-to-one standalone SDS message is requested, the <request-type> element set to a value of "one-to-one-sds". If a one-to-one SDS session is requested, the <request-type> element set to a value of "one-to-one-sds-session";

B) the <mcdata-client-id> element set to the MCData client ID of the originating MCData client; and

C) if the MCData client is aware of active functional aliases and if an active functional alias is to be included in the SIP REFER request, the <functional-alias-URI> element set to the URI of the used functional alias;

5) shall include a P-Preferred-Service header field set to the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), according to IETF RFC 6050 [7];

6) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

7) shall include the following according to IETF RFC 4488 [53]:

a) the option tag "norefersub" in the Supported header field; and

b) the value "false" in the Refer-Sub header field;

8) shall include a Target-Dialog header field as specified in IETF RFC 4538 [54] identifying the pre-established session;

9) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP REFER request according to IETF RFC 3840 [16]; and

10) shall send the SIP REFER request according to 3GPP TS 24.229 [5].

On receiving a final SIP 2xx response to the SIP REFER request, the MCData client:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15].

On receiving a SIP re-INVITE request within the pre-established session targeted by the sent SIP REFER request, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-success":

i) shall notify MCData user about successful the MCData communication establishment;

2) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-fail":

i) shall notify MCData user about the MCData communication establishment failure; and

3) shall interact with the media plane as specified in 3GPP TS 24.582 [15].

[TS 24.282, clause 9.2.3.2.1]

When composing an SDP offer according to 3GPP TS 24.229 [5], IETF RFC 4975 [17], IETF RFC 6135 [19] and IETF RFC 6714 [20] the MCData client:

1) shall include an "m=message" media-level section for the MCData media stream consisting of:

a) the port number;

b) a protocol field value of "TCP/MSRP", or "TCP/TLS/MSRP" for TLS;

c) a format list field set to '*';

d) an "a=sendonly" attribute;

e) an "a=path" attribute containing its own MSRP URI;

f) set the content type as "a=accept-types:application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload"; and

g) set the a=setup attribute as "actpass"; and

2) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the MIKEY-SAKKE I_MESSAGE in an "a=key-mgmt" attribute as a "mikey" attribute value in the SDP offer as specified in IETF RFC 4567 [45].

[TS 24.282, clause 9.2.5.4.1.1]

Upon receiving a request from an MCData user to leave an MCData session within a pre-established session, the MCData client:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15];

2) shall generate an initial SIP REFER request outside a dialog in accordance with the procedures specified in 3GPP TS 24.229 [5], IETF RFC 4488 [53] and IETF RFC 3515 [51] as updated by IETF RFC 6665 [36] and IETF RFC 7647 [r7647];

3) shall set the Request-URI of the SIP REFER request to the public service identity identifying the pre-established session on the MCData server serving the MCData user;

4) shall include the Refer-Sub header field with value "false" according to rules and procedures of IETF RFC 4488 [53];

5) shall include the Supported header field with value "norefersub" according to rules and procedures of IETF RFC 4488 [53];

6) shall set the Refer-To header field of the SIP REFER request to the MCData session identity to leave;

7) shall include the "method" SIP URI parameter with the value "BYE" in the URI in the Refer-To header field;

8) shall include a Target-Dialog header field as specified in IETF RFC 4538 [54] identifying the pre-established session; and

9) shall send the SIP REFER request according to 3GPP TS 24.229 [5].

Upon receiving a SIP 2xx response to the SIP REFER request, the MCData client shall interact with media plane as specified in 3GPP TS 24.582 [15].

On receiving a SIP re-INVITE request within the pre-established session targeted by the sent SIP REFER request, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "terminated":

   i) shall notify MCData user about successful the MCData communication termination.

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

[TS 24.582, clause 12.1]

Upon establishing one-to-one or group SDS using media plane or one-to-one or group SDS session using pre-established call, the MCData client shall follow procedures as descried in subclause 6.1.

[TS 24.582, clause 6.1.1.2.1]

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the originating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];
2. shall act according to IETF RFC 6135 [12], as:
   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and
   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";
3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11]; and
4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;
2. shall generate a SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;
3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4; and
4. shall send the MSRP SEND request on the established MSRP connection.

If MSRP chunking is not used then on receipt of a 200 (OK) response, the MCData client shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary;
2. shall wait for a 200 (OK) response to each MSRP SEND request sent; and
3. on receipt of the last 200 (OK) response shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks;
2. shall indicate to MCData user that the SDS message could not be sent; and
3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving an indication to terminate the session from the signalling plane, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks and may indicate to MCData user that the SDS message could not be sent.

[TS 24.582, clause 6.1.1.2.2]

In order to generate an SDS signalling payload, the MCData client:

1. shall generate an SDS SIGNALLING PAYLOAD message as specified in 3GPP TS 24.282 [8]; and

2. shall include the SDS SIGNALLING PAYLOAD message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in 3GPP TS 24.282 [8]; and

When generating a an SDS SIGNALLING PAYLOAD message, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD message as defined in 3GPP TS 24.282 [8]. In the SDS SIGNALLING PAYLOAD message, the MCData client:

   a. may include and set the Disposition request type IE to:

      i. "DELIVERY", if only delivery disposition is requested;

      ii. "READ", if only read disposition is requested; or

      iii. "DELIVERY AND READ", if both delivery and read dispositions are requested;

   b. shall set Date and time IE to current UTC time;

   c. shall set Conversation ID IE to a universally unique message ID generated as per IETF RFC 4122 [10];

   d. shall set Message ID IE to a universally unique message ID generated as per IETF RFC 4122 [10];

   e. if indicated that the SDS message is in reply to another SDS message then, shall include the Reply ID IE set to the message identifier of the indicated SDS message;

   f. if indicated that the target recipient of the SDS message is an application then, shall set Application Identifier IE to the application identifier; and

   g) shall set the Sender MCData user ID to its own MCData user ID as specified in subclause 15.2.15 of 3GPP TS 24.282 [8].

[TS 24.582, clause 6.1.1.2.3]

In order to generate SDS data payload, the MCData client:

1. shall generate a DATA PAYLOAD message as specified in 3GPP TS 24.282 [8]; and

2. shall include the DATA PAYLOAD message in an application/vnd.3gpp.mcdata-payload MIME body as specified in 3GPP TS 24.282 [8].

When generating a DATA PAYLOAD message, the MCData client:

1. shall generate a SDS DATA PAYLOAD message as defined in 3GPP TS 24.282 [8]. In the SDS DATA PAYLOAD message, the MCData client:

   a. shall set Number of payloads IE to the total number of payloads being sent; and

   b. for each payload, shall include Payload IE. In the Payload IE:

      i. shall set Payload content type to "TEXT", or "BINARY", or "HYPERLINKS", or "LOCATION" according to the payload type; and

      ii. shall set Payload data IE to actual payload.

[TS 24.582, clause 6.1.1.2.4]

The MCData client shall take the procedures in subclause 6.4.1 into consideration when generating MSRP SEND messages.

The MCData client shall generate MSRP SEND for SDS message requests according to IETF RFC 4975 [11].

When generating an MSRP SEND for SDS message request containing an SDS SIGNALLING PAYLOAD message and an SDS DATA PAYLOAD message, the MCData client

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;

2. shall include two MIME bodies in accordance with subclause 6.4.1 where:

a. in the first body the Content-Type header field is set to "application/vnd.3gpp.mcdata-signalling" and the generated SDS SIGNALLING PAYLOAD message is included; and

b. in the second body the Content-Type header field is set to "application/vnd.3gpp.mcdata-payload" and the generated SDS DATA PAYLOAD message is included.

When generating an MSRP SEND for SDS message request containing only an SDS DATA PAYLOAD message, the MCData client:

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the Content-Type as "application/vnd.3gpp.mcdata-payload"; and
3. shall set the body of the MSRP SEND request to the generated SDS DATA PAYLOAD message.

When generating an MSRP SEND for SDS message request containing only an SDS SIGNALLING PAYLOAD, the MCData client.

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the Content-Type as "application/vnd.3gpp.mcdata-signalling"; and
3. shall set the body of the MSRP SEND request to the generated SDS SIGNALLING PAYLOAD message.

6.1.13.3 Test description

6.1.13.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element of the MCData Service Configuration document shall be set to 0 to force the MCData client to send the data using the media plane.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The UE has performed procedure 'MCX pre-established session establishment' as specified in TS 36.579-1 [2] clause 5.3.3.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.13.3.2 Test procedure sequence

Table 6.1.13.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a one-to-one standalone SDS message using the pre-established session with disposition request "**DELIVERY**". (NOTE 1)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData call establishment using a pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.12.3-1?	-	-	1	P
3	Check: Does the UE (MCData client) notify the user about successful MCData communication establishment? (NOTE 1)	-	-	1	P
4	Check: Does the UE (MCData client) correctly perform procedure 'CO MSRP message transfer' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 to **send an SDS message with disposition request "DELIVERY"**?	-	-	2	P
5	Check: Does the UE (MCData client) correctly perform procedure '**MCData CO call release keeping the pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.13.3-1?	-	-	3	P
6	Check: Does the UE (MCData client) provide a notification to the MCData user about successful MCData communication termination? (NOTE 1)	-	-	3	P
7	Check: Does the UE (MCData client) correctly perform procedure 'MCX SIP MESSAGE CT' as described in TS 36.579-1 [2] Table 5.3.33.3-1 to **receive the disposition notification** for the SDS message sent at step 7?	-	-	-	-
8	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	4	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.13.3.3 Specific message contents

Table 6.1.13.3.3-1: SIP REFER from the UE (step 2, Table 6.1.13.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.12.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.12-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**Resource list**		
MIME-part-body	Resource-lists as described in Table 6.1.13.3.3-2			

Table 6.1.13.3.3-2: Resource-lists in SIP REFER (Table 6.1.13.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.3.1-3, condition PRE-ESTABLISH, MCD_1to1 with the uri attribute of the entry extended with the SIP URI header fields as specified in Table 6.1.13.3.3-3

Table 6.1.13.3.3-3: SIP header fields extending the uri attribute of the resource-lists' single entry (Table 6.1.13.3.3-2)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.12-2				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
body				
MIME body part		**SDP Message**		
MIME-part-headers				
Content-Type	"application/sdp"			
MIME-part-body	SDP Message as described in Table 6.1.13.3.3-4			
MIME body part		**MCData-Info**		
MIME-part-body	MCdata-Info as described in Table 6.1.13.3.3-5			

Table 6.1.13.3.3-4: SDP in SIP header fields (Table 6.1.13.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition PRE_ESTABLISHED_SESSION, SDP_OFFER, MCD_1to1, MCDATA_SDS

Table 6.1.13.3.3-5: MCData-Info in SIP header fields (Table 6.1.13.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-client-id	Encrypted (NOTE 1) <mcdata-client-id> with mcdataString set to the mcdata-client-id as provided by the UE at registration		TS 24.282 [31] clause 9.2.5.2.1.1	
NOTE 1: Encrypted element as described in TS 36.579-1 [2] Table 5.5.3.2.1-3A				

Table 6.1.13.3.3-6: MSRP SEND from the UE (step 4, Table 6.1.13.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message or chunk of message as specified in table 6.1.13.3.3-7			

Table 6.1.13.3.3-7: MIME Message (step 4, Table 6.1.13.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp.mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.13.3.3-8			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp.mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.13.3.3-9			

Table 6.1.13.3.3-8: SDS SIGNALLING PAYLOAD (Table 6.1.13.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.13.3.3-9: Data Payload (Table 6.1.13.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-1

Table 6.1.13.3.3-10: SIP MESSAGE from the SS (step 7, Table 6.1.13.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.13.3.3-11			

Table 6.1.13.3.3-11: SDS NOTIFICATION (Table 6.1.13.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

6.1.14 On-network / Short Data Service (SDS) / Standalone SDS Using Media Plane / One-to-one Standalone SDS / Pre-established session / Client Terminated (CT)

6.1.14.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a SIP re-INVITE message to initiate a standalone one-to-one SDS
message using the media plane and using a pre-established session }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

(2)

```
with { UE (MCDATA Client) having responded to the SIP re-INVITE message that initiated a standalone
one-to-one SDS message using the media plane and using a pre-established session }
ensure that {
  when { UE (MCDATA Client) receives an MSRP SEND message }
    then { UE (MCDATA Client) responds with an MSRP 200 (OK) message and if the MSRP SEND message is
not blank, renders the contents of the Payload IE to the MCDATA User and sends a SIP MESSAGE message
with a disposition notification of "DELIVERED" }
            }
```

(3)

```
with { UE (MCDATA Client) having responded to the MSRP SEND message from the SS (MCDATA server) }
ensure that {
  when { UE (MCDATA Client) receives a SIP re-INVITE message to release communications }
    then { UE (MCDATA Client) responds with a SIP 200 (OK) message }
            }
```

6.1.14.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.5.2.1.2, 9.2.3.2.4, 9.2.5.4.1.2, 9.2.1.3, 12.2.1.1, 6.2.4.1, 6.2.3.1, TS 24.582 clauses 6.1.1.3.1, 6.1.1.3.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-16 requirements.

[TS 24.282, clause 9.2.5.2.1.2]

Upon receiving a SIP re-INVITE request within a pre-established Session without an associated MCData session, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-request":

   i) if the <request-type> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "one-to-one-sds", shall follow the procedures in subclause 9.2.3.2.4; and

   ii) if the <request-type> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "one-to-one-sds-session", shall follow the procedures in subclause 9.2.4.2.4.

[TS 24.282, clause 9.2.3.2.4]

Upon receipt of an "initial SIP INVITE request for standalone SDS over media plane for terminating MCData client" request, the MCData client shall follow the procedures for termination of multimedia sessions in the IM CN subsystem as specified in 3GPP TS 24.229 [5] with the clarifications below.

The MCData client:

1) may reject the SIP INVITE request if either of the following conditions are met:

a) MCData client does not have enough resources to handle the call; or

b) any other reason outside the scope of this specification;

and skip the rest of the steps after step 2;

2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCData function either with appropriate reject code as specified in 3GPP TS 24.229 [5] and warning texts as specified in subclause 4.9 or with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

3) if the SDP offer of the SIP INVITE request contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:

a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP INVITE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to create an end-to-end secure session.

3) may display to the MCData user the MCData ID of the inviting MCData user and the type of SDS request;

4) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

5) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

6) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [38]. The "refresher" parameter in the Session-Expires header field shall be set to "uas";

7) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP 200 (OK) response;

8) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP 200 (OK) response;

9) shall include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP INVITE request according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.3.2.2; and

10) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of an SIP ACK message to the sent SIP 200 (OK) message, the MCData client shall:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.1.3.

[TS 24.282 clause 9.2.5.4.1.2]

Upon receiving a SIP re-INVITE request within a pre-established Session without an associated MCData session, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "terminate-request":

   i) shall send SIP 200 (OK) response towards MCData server according to 3GPP TS 24.229 [5]; and

   ii) shall release all media plane resources corresponding to the MCData communication being released.

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or

- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and

- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];

4) void;

5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;

6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

7) if requiring to send an FD notification, shall generate an FD NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.2; and

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.4.1]

This subclause is referenced from other procedures.

In a SIP MESSAGE request, the MCData client:

1) when sending SDS messages or SDS disposition notifications:

a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

2) when sending FD messages, FD disposition notifications or FD media storage function discovery messages:

a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.fd media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

3) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [5]; and

4) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user.

[TS 24.282, clause 6.2.3.1]

In order to generate an SDS notification, the MCData client:

1) shall generate an SDS NOTIFICATION message as specified in subclause 15.1.5; and

2) shall include in the SIP request, the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1.

When generating an SDS NOTIFICATION message as specified in subclause 15.1.5, the MCData client:

1) if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED" as specified in subclause 15.2.5;

2) if sending a read notification, shall set the SDS disposition notification type IE as "READ" as specified in subclause 15.2.5;

3) if sending a delivered and read notification, shall set the SDS disposition notification type IE as "DELIVERED AND READ" as specified in subclause 15.2.5;

4) if the SDS message could not be delivered to the user or application (e.g. due to lack of storage), shall set the SDS disposition notification type IE as "UNDELIVERED" as specified in subclause 15.2.5;

5) shall set the Date and time IE to the current time to as specified in subclause 15.2.8;

6) shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message as specified in subclause 15.2.9;

7) shall set the Message ID to the value of the Message ID that was received in the SDS message as specified in subclause 15.2.10;

8) if the SDS message was destined for the user, shall not include an Application ID IE (as specified in subclause 15.2.7) and shall not include an Extended application ID IE (as specified in subclause 15.2.24); and

9) if the SDS message was destined for an application, shall include:

a) an Application ID IE set to the value of the Application ID that was included in the SDS message as specified in subclause 15.2.3; or

b) an Extended application ID IE set to the value of the Extended application ID that was included in the SDS message as specified in subclause 15.2.24.

[TS 24.582, clause 6.1.1.3.1]

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the terminating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as an passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP connection is established, the MCData client:

1. on receipt of an MSRP request in an MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData standalone message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.1.3.2.

[TS 24.582, clause 6.1.1.3.2]

The MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body;

2. shall decode the contents of the application/vnd.3gpp.mcdata-payload MIME body;

3. if the SDS SIGNALLING PAYLOAD message contains a new Conversation ID, shall instantiate a new conversation with the Message ID in the SDS SIGNALLING PAYLOAD identifying the first message in the conversation thread;

4. if the SDS SIGNALLING PAYLOAD message contains an existing Conversation ID and:

   a. if the SDS SIGNALLING PAYLOAD message does not contain an InReplyTo Message ID, shall use the Message ID in the SDS SIGNALLING PAYLOAD to identify a new message in the existing conversation thread; and

   b. if the SDS SIGNALLING PAYLOAD message contains an InReplyTo Message ID, shall associate the message to an existing message in the conversation thread as identified by the InReplyTo Message ID in the SDS SIGNALLING PAYLOAD and use the Message ID in the SDS SIGNALLING PAYLOAD to identify the new message;

5. shall identify the number of Payload IEs in the DATA PAYLOAD message from the Number of Payloads IE in the DATA PAYLOAD message;

6. if the SDS SIGNALLING PAYLOAD message does not contain an Application identifier IE:

   a. shall determine that the payload contained in the DATA PAYLOAD message is for user consumption;

   b. may notify the MCData user; and

   c. shall render the contents of the Payload IE(s) to the MCData user;

7. if the SDS SIGNALLING PAYLOAD message contains an Application identifier IE:
   a. shall determine that the payload contained in the DATA PAYLOAD message is not for user consumption;
   b. shall not notify the MCData user;
   c. if the Application identifier value is unknown, shall discard the SDS message; and
   d. if the Application identifier value is known, shall deliver the contents of the Payload IE(s) to the identified application; and
8. if SDS Disposition request type IE is present in the SDS SIGNALLING PAYLOAD message received in subclause 6.1.1.3.1 then, shall send a disposition notification as described in 3GPP TS 24.282 [8] subclause 9.2.1.3.

6.1.14.3 Test description

6.1.14.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element of the MCData Service Configuration document shall be set to 0 to force the MCData client to send the data using the media plane.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The UE has performed procedure 'MCX pre-established session establishment' as specified in TS 36.579-1 [2] clause 5.3.3.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.14.3.2 Test procedure sequence

Table 6.1.14.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.3.3-1? NOTE: The SS (MCData server) sends a SIP re-INVITE request within a pre-established Session to initiate a one-to-one standalone SDS using the media plane.	-	-	1,2	P
2	Check: Does the UE (MCData client) correctly perform procedure 'CT MSRP message transfer' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 to **receive an SDS message with disposition request "DELIVERY"**?	-	-	2	P
3-7	Check: Does the UE (MCData client) correctly perform step 3 to 7 of procedure '**MCData CO call release keeping the pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.13.3-1? NOTE: The SS (MCData server) sends a SIP re-INVITE request to release the MCData call while keeping the pre-established Session.	-	-	3	P
8	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer** using signalling plane' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 to **send a disposition notification of "DELIVERED"**?	-	-	2	P
9	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 1)	-	-	2	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.14.3.3 Specific message contents

Table 6.1.14.3.3-1: SIP INVITE from the SS (step 1, Table 6.1.14.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS, re_INVITE				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Request-Line				
Request-URI	tsc_MCX_SessionID_B	session identity of the pre-established session	TS 24.282 [31] clause 9.2.5.2.2.2	
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.1.14.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.14.3.3-3			

Table 6.1.14.3.3-2: SDP for SIP INVITE (Table 6.1.14.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_OFFER, MCD_1to1, PRE_ESTABLISHED_SESSION

Table 6.1.14.3.3-3: MCData-Info (Table 6.1.14.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
anyExt				
mcdata-communication-state	"establish-request"		TS 24.282 [31] clause 9.2.5.2.2.2	

Table 6.1.14.3.3-4: SIP 200 (OK) from the UE (step 1, Table 6.1.14.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.1-1, condition INVITE-RSP, MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
value	"application/sdp"			
Message-body				
SDP message	As described in Table 6.1.14.3.3-5			

Table 6.1.14.3.3-5: SDP for SIP 200 (OK) (Table 6.1.14.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_ANSWER, PRE_ESTABLISHED_SESSION

Table 6.1.14.3.3-6: MSRP SEND from the SS (step 2, Table 6.1.14.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message as specified in table 6.1.14.3.3-7			

Table 6.1.14.3.3-7: MIME Message (Table 6.1.14.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.14.3.3-8			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.14.3.3-9			

Table 6.1.14.3.3-8: SDS SIGNALLING PAYLOAD (Table 6.1.14.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED

Table 6.1.14.3.3-9: Data Payload (Table 6.1.14.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-2

Table 6.1.14.3.3-10: SIP re-INVITE from the SS (step 3, Table 6.1.14.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.13.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS, re_INVITE				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Request-Line				
Request-URI	tsc_MCX_SessionID_B	session identity of the pre-established session	TS 24.282 [31] clause 9.2.5.4.2.1	
Message-body				
MIME body part	not present	**SDP message**		
MIME body part		**MCData Info**		
MIME-part-body	MCData-Info message as described in Table 6.1.14.3.3-11			

Table 6.1.14.3.3-11: MCData-Info (Table 6.1.14.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-request-uri	not present			
mcdata-calling-user-id	not present			
anyExt				
mcdata-communication-state	"terminate request"		TS 24.282 [31] clause 9.2.5.4.2.2	

Table 6.1.14.3.3-12: SIP MESSAGE from the UE (step 8, Table 6.1.14.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData-Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.14.3.3-13			

Table 6.1.14.3.3-13: SDS NOTIFICATION (Table 6.1.14.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

6.1.15 On-network / Short Data Service (SDS) / SDS Session / One-to-one SDS Session / Pre-established session / Client Originated (CO)

6.1.15.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to initiate a one-to-one SDS session using the media plane and
using the pre-established session }
    then { UE (MCDATA Client) sends a request to establish a one-to-one SDS session and a MSRP
connection via a SIP REFER message and responds to the SIP re-INVITE message with a SIP 200 (OK)
message and delivers the notification to the MCDATA User about successful communication
establishment and sends a blank MSRP SEND message to bind the MSRP connection }
            }
```

(2)

```
with { UE (MCDATA Client) having sent a blank MSRP SEND message to bind the MSRP connection }
ensure that {
  when { UE (MCDATA Client) receives an MSRP 200 (OK) message in response to the blank MSRP SEND
message }
    then { UE (MCDATA Client) sends the one-to-one session SDS message via a MSRP SEND message with
a disposition of "DELIVERY" }
            }
```

(3)

```
with { UE (MCDATA Client) having sent a one-to-one session SDS message using the media plane with a
disposition of "DELIVERY" }
ensure that {
  when { UE (MCDATA Client) receives a disposition response via a MSRP SEND message }
    then { UE (MCDATA Client) responds to the MSRP SEND message by sending a MSRP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

(4)

```
with { UE (MCDATA Client) having established a one-to-one SDS session using the pre-established
session }
ensure that {
  when { the MCDATA User requests to release the one-to-one SDS session while keeping the pre-
established session }
    then { UE (MCDATA Client) sends a SIP REFER message to release the MCData session and keep the
pre-established session and responds to the SIP re-INVITE message with a SIP 200 (OK) message and
delivers the notification to the MCDATA User about successful termination }
            }
```

6.1.15.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.5.2.1.1, 9.2.3.2.1, 9.2.5.4.1.1, TS 24.582 clauses 12.1, 6.1.2.2.1, 6.1.2.6. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-16 requirements.

[TS 24.282, clause 9.2.5.2.1.1]

Upon receiving a request from an MCData user to initiate one-to-one standalone SDS using media plane or one-to-one SDS session within the pre-established session, the MCData client shall generate a SIP REFER request outside a dialog as specified in IETF RFC 3515 [51] as updated by IETF RFC 6665 [36] and IETF RFC 7647 [52], and in accordance with the UE procedures specified in 3GPP TS 24.229 [5], with the clarifications given below.

The MCData client:

1) shall set the Request URI of the SIP REFER request to the session identity of the pre-established session;

2) shall set the Refer-To header field of the SIP REFER request as specified in IETF RFC 3515 [51] with a Content-ID ("cid") Uniform Resource Locator (URL) as specified in IETF RFC 2392 [33] that points to an application/resource-lists MIME body as specified in IETF RFC 5366 [18], and with the Content-ID header field set to this "cid" URL;

3) if an end-to-end security context needs to be established and the security context does not exist or if the existing security context has expired, then:

   i) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [26];

   ii) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [26];

   iii) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect one-to-one communications and with the remaining twenty eight bits being randomly generated as described in 3GPP TS 33.180 [26];

   iv) shall encrypt the PCK to a UID associated to the MCData client using the MCData ID of the invited user and a time related parameter as described in 3GPP TS 33.180 [26];

   v) shall generate a MIKEY-SAKKE I_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [26];

   vi) shall add the MCData ID of the originating MCData to the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26]; and

vii) shall sign the MIKEY-SAKKE I_MESSAGE using the originating MCData user's signing key provided in the keying material together with a time related parameter, and add this to the MIKEY-SAKKE payload, as described in 3GPP TS 33.180 [26];

4) shall include in the application/resource-lists MIME body a single <entry> element containing a "uri" attribute set to MCData ID of the called user, extended with the following parameters in the headers portion of the SIP URI:

NOTE: Characters that are not formatted as ASCII characters are escaped in the following parameters in the headers portion of the SIP URI.

a) an hname "body" parameter populated with:

i) an application/sdp MIME body containing an SDP offer with media attributes specified in subclause 9.2.3.2.1, if a one-to-one standalone SDS message is requested;

ii) an application/vnd.3gpp.mcdata-info MIME body with:

A) if a one-to-one standalone SDS message is requested, the <request-type> element set to a value of "one-to-one-sds". If a one-to-one SDS session is requested, the <request-type> element set to a value of "one-to-one-sds-session";

B) the <mcdata-client-id> element set to the MCData client ID of the originating MCData client; and

C) if the MCData client is aware of active functional aliases and if an active functional alias is to be included in the SIP REFER request, the <functional-alias-URI> element set to the URI of the used functional alias;

5) shall include a P-Preferred-Service header field set to the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), according to IETF RFC 6050 [7];

6) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

7) shall include the following according to IETF RFC 4488 [53]:

a) the option tag "norefersub" in the Supported header field; and

b) the value "false" in the Refer-Sub header field;

8) shall include a Target-Dialog header field as specified in IETF RFC 4538 [54] identifying the pre-established session;

9) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP REFER request according to IETF RFC 3840 [16]; and

10) shall send the SIP REFER request according to 3GPP TS 24.229 [5].

On receiving a final SIP 2xx response to the SIP REFER request, the MCData client:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15].

On receiving a SIP re-INVITE request within the pre-established session targeted by the sent SIP REFER request, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-success":

i) shall notify MCData user about successful the MCData communication establishment;

2) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-fail":

i) shall notify MCData user about the MCData communication establishment failure; and

3) shall interact with the media plane as specified in 3GPP TS 24.582 [15].

[TS 24.282, clause 9.2.3.2.1]

When composing an SDP offer according to 3GPP TS 24.229 [5], IETF RFC 4975 [17], IETF RFC 6135 [19] and IETF RFC 6714 [20] the MCData client:

1) shall include an "m=message" media-level section for the MCData media stream consisting of:

   a) the port number;

   b) a protocol field value of "TCP/MSRP", or "TCP/TLS/MSRP" for TLS;

   c) a format list field set to '*';

   d) an "a=sendonly" attribute;

   e) an "a=path" attribute containing its own MSRP URI;

   f) set the content type as "a=accept-types:application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload"; and

   g) set the a=setup attribute as "actpass"; and

2) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the MIKEY-SAKKE I_MESSAGE in an "a=key-mgmt" attribute as a "mikey" attribute value in the SDP offer as specified in IETF RFC 4567 [45].

[TS 24.282, clause 9.2.5.4.1.1]

Upon receiving a request from an MCData user to leave an MCData session within a pre-established session, the MCData client:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15];

2) shall generate an initial SIP REFER request outside a dialog in accordance with the procedures specified in 3GPP TS 24.229 [5], IETF RFC 4488 [53] and IETF RFC 3515 [51] as updated by IETF RFC 6665 [36] and IETF RFC 7647 [r7647];

3) shall set the Request-URI of the SIP REFER request to the public service identity identifying the pre-established session on the MCData server serving the MCData user;

4) shall include the Refer-Sub header field with value "false" according to rules and procedures of IETF RFC 4488 [53];

5) shall include the Supported header field with value "norefersub" according to rules and procedures of IETF RFC 4488 [53];

6) shall set the Refer-To header field of the SIP REFER request to the MCData session identity to leave;

7) shall include the "method" SIP URI parameter with the value "BYE" in the URI in the Refer-To header field;

8) shall include a Target-Dialog header field as specified in IETF RFC 4538 [54] identifying the pre-established session; and

9) shall send the SIP REFER request according to 3GPP TS 24.229 [5].

Upon receiving a SIP 2xx response to the SIP REFER request, the MCData client shall interact with media plane as specified in 3GPP TS 24.582 [15].

On receiving a SIP re-INVITE request within the pre-established session targeted by the sent SIP REFER request, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "terminated":

   i) shall notify MCData user about successful the MCData communication termination.

[TS 24.582, clause 12.1]

Upon establishing one-to-one or group SDS using media plane or one-to-one or group SDS session using pre-established call, the MCData client shall follow procedures as descried in subclause 6.1.

[TS 24.582, clause 6.1.2.2.1]

Upon receiving an indication to establish MSRP connection for SDS session as the originating MCData client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];
2. shall act according to IETF RFC 6135 [12], as:
   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and
   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";
3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11];
4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP session is established, the MCData client:

1. on receipt of an MSRP request in the MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];
2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData SDS message before delivering the content to the application; and
3. shall handle the received content as described in subclause 6.1.2.6.

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client can generate and send an SDS message as specified in subclause 6.1.2.4, or can generate and send an SDS disposition notification for a received SDS message as specified in subclause 6.1.2.5, if requested.

Received content and disposition requests shall be handled as specified in subclause 6.1.2.6.

[TS 24.582, clause 6.1.2.6]

Upon receiving an SDS message, the MCData client:

1. shall follow the procedure defined in subclause 6.1.1.3.2, with the following clarification:
   a. if SDS Disposition request type IE is present in the received SDS SIGNALLING PAYLOAD message then, shall send an SDS disposition notification as described in subclause 6.1.2.5.

Upon receiving an SDS disposition notification, the MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and
2. shall deliver the notification to the user or application.

6.1.15.3 Test description

6.1.15.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4.

The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The UE has performed procedure 'MCX pre-established session establishment' as specified in TS 36.579-1 [2] clause 5.3.3.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.15.3.2 Test procedure sequence

Table 6.1.15.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a one-to-one session SDS message using the pre-established session with disposition request "**DELIVERY**". (NOTE 1)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData call establishment using a pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.12.3-1?	-	-	1	P
3	Check: Does the UE (MCData client) notify the user about successful MCData communication establishment? (NOTE 1)	-	-	1	P
4	Check: Does the UE (MCData client) correctly perform procedure 'CO MSRP message transfer' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 to **send an SDS message with disposition request "DELIVERY"**?	-	-	2	P
5	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive the disposition notification** for the SDS message sent at step 3?	-	-	3	P
6	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	3	P
7	Make the UE (MCData client) release the one-to-one session while keeping the pre-established session. (NOTE 1)	-	-	-	-
8	Check: Does the UE (MCData client) correctly perform procedure '**MCData CO call release keeping the pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.13.3-1?	-	-	4	P
9	Check: Does the UE (MCData client) provide a notification to the MCData user about successful MCData communication termination? (NOTE 1)	-	-	4	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.15.3.3 Specific message contents

Table 6.1.15.3.3-1: SIP REFER from the UE (step 2, Table 6.1.15.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.12.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.12-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**Resource list**		
MIME-part-body	Resource-lists as described in Table 6.1.15.3.3-2			

Table 6.1.15.3.3-2: Resource-lists in SIP REFER (Table 6.1.15.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.3.1-3, condition PRE-ESTABLISH, MCD_1to1 with the uri attribute of the entry extended with the SIP URI header fields as specified in Table 6.1.15.3.3-3

Table 6.1.15.3.3-3: SIP header fields extending the uri attribute of the resource-lists' single entry (Table 6.1.15.3.3-2)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.12-2				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
body				
MIME body part		**SDP Message**		
MIME-part-headers				
Content-Type	“application/sdp”			
MIME-part-body	SDP Message as described in Table 6.1.15.3.3-4			
MIME body part		**MCData-Info**		
MIME-part-body	MCdata-Info as described in Table 6.1.15.3.3-5			

Table 6.1.15.3.3-4: SDP in SIP header fields (Table 6.1.15.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition PRE_ESTABLISHED_SESSION, SDP_OFFER, MCD_1to1, MCDATA_SDS, SDS_SESSION

Table 6.1.15.3.3-5: MCData-Info in SIP header fields (Table 6.1.15.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-sds-session"		TS 24.282 [31] clause 9.2.5.2.1.1	
mcdata-client-id	Encrypted (NOTE 1) <mcdata-client-id> with mcdataString set to the mcdata-client-id as provided by the UE at registration		TS 24.282 [31] clause 9.2.5.2.1.1	
NOTE 1: Encrypted element as described in TS 36.579-1 [2] Table 5.5.3.2.1-3A				

Table 6.1.15.3.3-6: MSRP SEND from the UE (step 4, Table 6.1.15.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message or chunk of message as specified in table 6.1.15.3.3-7			

Table 6.1.15.3.3-7: MIME Message (step 4, Table 6.1.15.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp.mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.15.3.3-8			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp.mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.15.3.3-9			

Table 6.1.15.3.3-8: SDS SIGNALLING PAYLOAD (Table 6.1.15.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.15.3.3-9: Data Payload (Table 6.1.15.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-1

Table 6.1.15.3.3-10: MSRP SEND from the SS (step 5, Table 6.1.15.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp.mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.15.3.3-11			

Table 6.1.15.3.3-11: SDS NOTIFICATION (Table 6.1.15.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

6.1.16 On-network / Short Data Service (SDS) / SDS Session / One-to-one SDS Session / Pre-established session / Client Terminated (CT)

6.1.16.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a SIP re-INVITE message to initiate to initiate a one-to-one SDS
session using the media plane and using a pre-established session }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

(2)

```
with { UE (MCDATA Client) having responded to the SIP re-INVITE message that initiated a one-to-one
SDS session using the media plane and using a pre-established session }
ensure that {
  when { UE (MCDATA Client) receives an MSRP SEND message }
    then { UE (MCDATA Client) responds with an MSRP 200 (OK) message and if the MSRP SEND message is
not blank, renders the contents of the Payload IE to the MCDATA User and sends a MSRP SEND message
with a disposition notification of "DELIVERED" }
            }
```

(3)

```
with { UE (MCDATA Client) being in a one-to-one SDS session initiated by the SS (MCDATA server) and
using a pre-established session }
ensure that {
  when { UE (MCDATA Client) receives a SIP re-INVITE message to release communications }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

6.1.16.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.5.2.1.2, 9.2.4.2.4, 9.2.5.4.1.2, TS 24.582 clauses 12.1, 6.1.2.3.1, 6.1.2.6, 6.1.1.3.2, 6.1.2.5.1, 6.1.2.5.2, 6.1.2.5.3. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-16 requirements.

[TS 24.282, clause 9.2.5.2.1.2]

Upon receiving a SIP re-INVITE request within a pre-established Session without an associated MCData session, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-request":

   i) if the <request-type> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "one-to-one-sds", shall follow the procedures in subclause 9.2.3.2.4; and

   ii) if the <request-type> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "one-to-one-sds-session", shall follow the procedures in subclause 9.2.4.2.4.

[TS 24.282, clause 9.2.4.2.4]

Upon receipt of an "initial SIP INVITE request for SDS session for terminating MCData client"request, the MCData client shall follow the procedures for termination of multimedia sessions in the IM CN subsystem as specified in 3GPP TS 24.229 [5] with the clarifications below.

The MCData client:

1) may reject the SIP INVITE request if either of the following conditions are met:

   a) MCData client does not have enough resources to handle the call; or

b) any other reason outside the scope of this specification;

and skip the rest of the steps after step 2;

2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCData function either with appropriate reject code as specified in 3GPP TS 24.229 [5] and warning texts as specified in subclause 4.9 or with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

3) if the SDP offer of the SIP INVITE request contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:

a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP INVITE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to create an end-to-end secure session.

4) may display to the MCData user the MCData ID of the inviting MCData user and the type of SDS request;

5) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

6) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

7) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [38]. The "refresher" parameter in the Session-Expires header field shall be set to "uas";

8) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP 200 (OK) response;

9) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP 200 (OK) response;

10) shall include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP INVITE request according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.4.2.2; and

11) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of an SIP ACK message to the sent SIP 200 (OK) message, the MCData client shall:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.2.3.

To send a disposition notification after the media plane is released, the MCData client:

1) shall follow the procedures described in subclause 12.2.1.1.

[TS 24.282, clause 9.2.5.4.1.2]

Upon receiving a SIP re-INVITE request within a pre-established Session without an associated MCData session, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "terminate-request":

   i) shall send SIP 200 (OK) response towards MCData server according to 3GPP TS 24.229 [5]; and

   ii) shall release all media plane resources corresponding to the MCData communication being released.

[TS 24.582, clause 12.1]

Upon establishing one-to-one or group SDS using media plane or one-to-one or group SDS session using pre-established call, the MCData client shall follow procedures as descried in subclause 6.1.

[TS 24.582, clause 6.1.2.3.1]

Upon receiving an indication to establish MSRP connection for SDS session as the terminating MCData client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as an passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP session is established, the MCData client:

1. on receipt of an MSRP request in the MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData SDS message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.2.6.

On receiving MSRP 200 (OK) response to the first MSRP SEND request sent as "active" endpoint, or after sending MSRP 200 (OK) response to the first MSRP SEND request received as "passive" endpoint, the MCData client can generate and send an SDS message as specified in subclause 6.1.2.4, or can generate and send an SDS disposition notification for a received SDS message as specified in subclause 6.1.2.5, if requested.

Received content and disposition requests shall be handled as specified in subclause 6.1.2.6.

[TS 24.582, clause 6.1.2.6]

Upon receiving an SDS message, the MCData client:

1. shall follow the procedure defined in subclause 6.1.1.3.2, with the following clarification:

   a. if SDS Disposition request type IE is present in the received SDS SIGNALLING PAYLOAD message then, shall send an SDS disposition notification as described in subclause 6.1.2.5.

Upon receiving an SDS disposition notification, the MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2. shall deliver the notification to the user or application.

[TS 24.582, clause 6.1.1.3.2]

The MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body;
2. shall decode the contents of the application/vnd.3gpp.mcdata-payload MIME body;
3. if the SDS SIGNALLING PAYLOAD message contains a new Conversation ID, shall instantiate a new conversation with the Message ID in the SDS SIGNALLING PAYLOAD identifying the first message in the conversation thread;
4. if the SDS SIGNALLING PAYLOAD message contains an existing Conversation ID and:
    a. if the SDS SIGNALLING PAYLOAD message does not contain an InReplyTo Message ID, shall use the Message ID in the SDS SIGNALLING PAYLOAD to identify a new message in the existing conversation thread; and
    b. if the SDS SIGNALLING PAYLOAD message contains an InReplyTo Message ID, shall associate the message to an existing message in the conversation thread as identified by the InReplyTo Message ID in the SDS SIGNALLING PAYLOAD and use the Message ID in the SDS SIGNALLING PAYLOAD to identify the new message;
5. shall identify the number of Payload IEs in the DATA PAYLOAD message from the Number of Payloads IE in the DATA PAYLOAD message;
6. if the SDS SIGNALLING PAYLOAD message does not contain an Application identifier IE:
    a. shall determine that the payload contained in the DATA PAYLOAD message is for user consumption;
    b. may notify the MCData user; and
    c. shall render the contents of the Payload IE(s) to the MCData user;
7. if the SDS SIGNALLING PAYLOAD message contains an Application identifier IE:
    a. shall determine that the payload contained in the DATA PAYLOAD message is not for user consumption;
    b. shall not notify the MCData user;
    c. if the Application identifier value is unknown, shall discard the SDS message; and
    d. if the Application identifier value is known, shall deliver the contents of the Payload IE(s) to the identified application; and
8. if SDS Disposition request type IE is present in the SDS SIGNALLING PAYLOAD message received in subclause 6.1.1.3.1 then, shall send a disposition notification as described in 3GPP TS 24.282 [8] subclause 9.2.1.3.

[TS 24.582, clause 6.1.2.5.1]

To send an SDS disposition notification, the MCData client:

1. shall generate a SDS NOTIFICATION as specified in subclause 6.1.2.5.2;
2. shall include the SDS NOTIFICATION in an MSRP SEND request as specified in subclause 6.1.2.5.3, with the following clarification;
    a. shall set To-Path header according to the MSRP URI in the received SDP; and
3. shall send the MSRP SEND request on the established MSRP connection.

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary.

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks; and
2. shall indicate to MCData user that the SDS message or the SDS disposition notification could not be sent.

[TS 24.582, clause 6.1.2.5.2]

In order to generate an SDS notification, the MCData client:

1. shall generate an SDS NOTIFICATION message as specified in 3GPP TS 24.282 [8]; and
2. shall include the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in 3GPP TS 24.282 [8].

When generating an SDS NOTIFICATION message, the MCData client:

1. if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED";
2. if sending a read notification, shall set the SDS disposition notification type IE as "READ";
3. if sending a delivered and read notification, shall set the SDS disposition notification type IE as "DELIVERED AND READ";
4. if the SDS message could not be delivered to the user or application (e.g. due to lack of storage), shall set the SDS disposition notification type IE as "UNDELIVERED";
5. shall set the Date and time IE to the current time;
6. shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message;
7. shall set the Message ID to the value of the Message ID that was received in the SDS message;
8. if the SDS message was destined for the user, shall not include an Application ID IE;
9. if the SDS message was destined for an application, shall include an Application ID IE set to the value of the Application ID that was included in the SDS message; and
10. shall set the Sender MCData user ID to its own MCData user ID as specified in subclause 15.2.15 of 3GPP TS 24.282 [8].

[TS 24.582, clause 6.1.2.5.3]

The MCData client shall generate MSRP SEND requests for SDS disposition notification according to IETF RFC 4975 [11].

When generating an MSRP SEND request for SDS disposition notification containing an SDS NOTIFICATION message, the MCData client

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the content type as Content-Type = "application/vnd.3gpp.mcdata-signalling"; and
3. shall set the body of the MSRP SEND request to the generated SDS NOTIFICATION message.

6.1.16.3 Test description

6.1.16.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The UE has performed procedure 'MCX pre-established session establishment' as specified in TS 36.579-1 [2] clause 5.3.3.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.16.3.2 Test procedure sequence

Table 6.1.16.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.3.3-1? NOTE: The SS (MCData server) sends a SIP re-INVITE request within a pre-established Session to initiate a one-to-one SDS session using the media plane.	-	-	1,2	P
2	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive an SDS message with disposition request "DELIVERY"**?	-	-	2	P
3	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send a disposition notification of "DELIVERED"**?	-	-	2	P
4	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 1)	-	-	2	P
5-9	Check: Does the UE (MCData client) correctly perform step 3 to 7 of procedure '**MCData CO call release keeping the pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.13.3-1? NOTE: The SS (MCData server) sends a SIP re-INVITE request to release the MCData call while keeping the pre-established Session.	-	-	3	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.16.3.3 Specific message contents

Table 6.1.16.3.3-1: SIP INVITE from the SS (step 1, Table 6.1.16.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS, re_INVITE				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Request-Line				
Request-URI	tsc_MCX_SessionID_B	session identity of the pre-established session	TS 24.282 [31] clause 9.2.5.2.2.2	
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.1.16.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.16.3.3-3			

Table 6.1.16.3.3-2: SDP for SIP INVITE (Table 6.1.16.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_OFFER, MCD_1to1, SDS_SESSION, PRE_ESTABLISHED_SESSION

Table 6.1.16.3.3-3: MCData-Info (Table 6.1.16.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-sds-session"		TS 24.282 [31] clause 9.2.5.2.2.2	
anyExt				
mcdata-communication-state	"establish-request"		TS 24.282 [31] clause 9.2.5.2.2.2	

Table 6.1.16.3.3-4: SIP 200 (OK) from the UE (step 1, Table 6.1.16.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.1-1, condition INVITE-RSP, MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
value	"application/sdp"			
Message-body				
SDP message	As described in Table 6.1.16.3.3-5			

Table 6.1.16.3.3-5: SDP for SIP 200 (OK) (Table 6.1.16.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_ANSWER, SDS_SESSION, PRE_ESTABLISHED_SESSION

Table 6.1.16.3.3-6: MSRP SEND from the SS (step 2, Table 6.1.16.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message as specified in table 6.1.16.3.3-7			

Table 6.1.16.3.3-7: MIME Message (step 2, Table 6.1.16.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.16.3.3-8			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.16.3.3-9			

Table 6.1.16.3.3-8: SDS SIGNALLING PAYLOAD (Table 6.1.16.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED

Table 6.1.16.3.3-9: Data Payload (Table 6.1.16.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-2

Table 6.1.16.3.3-10: MSRP SEND from the UE (step 3, Table 6.1.16.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp. mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.16.3.3-11			

Table 6.1.16.3.3-11: SDS NOTIFICATION (Table 6.1.16.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

Table 6.1.16.3.3-12: SIP re-INVITE from the SS (step 5, Table 6.1.16.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.13.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS, re_INVITE				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Request-Line				
Request-URI	tsc_MCX_SessionID_B	session identity of the pre-established session	TS 24.282 [31] clause 9.2.5.4.2.1	
Content-Type			RFC 5621 [58]	
media-type	"application/vnd.3gpp. mcdata-info+xml"		TS 24.282 [31] clause 9.2.5.4.2.1	
Message-body				
MCData-Info Message	MCData-Info message as described in Table 6.1.14.3.3-13			

Table 6.1.16.3.3-13: MCData-Info (Table 6.1.16.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-request-uri	not present			
mcdata-calling-user-id	not present			
anyExt				
mcdata-communication-state	"terminate request"		TS 24.282 [31] clause 9.2.5.4.2.2	

6.1.17 On-network / Short Data Service (SDS) / Standalone SDS Using Media Plane / Group Standalone SDS / Pre-established session / Client Originated (CO)

6.1.17.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a group standalone SDS message using the media plane and
using the pre-established session }
    then { UE (MCDATA Client) sends a request to establish an MSRP connection via a SIP REFER
message and responds to the SIP re-INVITE message with a SIP 200 (OK) message and delivers the
notification to the MCDATA User about successful communication establishment and sends a blank MSRP
SEND message to bind the MSRP connection }
            }
```

(2)

```
with { UE (MCDATA Client) having sent a blank MSRP SEND message to bind the MSRP connection }
ensure that {
  when { UE (MCDATA Client) receives an MSRP 200 (OK) message in response to the blank MSRP SEND
message }
    then { UE (MCDATA Client) sends the group standalone SDS message via a MSRP SEND message with a
disposition of "DELIVERY" }
            }
```

(3)

```
with { UE (MCDATA Client) having sent a group standalone SDS message using the media plane }
ensure that {
  when { UE (MCDATA Client receives a MSRP 200 (OK) message in response to the last MSRP SEND
message indicating that the standalone SDS message has been successfully transferred }
    then { UE (MCDATA Client) sends a SIP REFER message to release the MCData session and keep the
pre-established session and responds to the SIP re-INVITE message with a SIP 200 (OK) message and
delivers the notification to the MCDATA User about successful termination }
            }
```

(4)

```
with { UE (MCDATA Client) having sent a group standalone SDS message using the media plane with a
disposition of "DELIVERY" }
ensure that {
  when { UE (MCDATA Client receives a disposition response via a SIP MESSAGE message from the SS
(MCDATA Server }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

6.1.17.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.5.3.1.1, 9.2.3.2.1, 9.2.5.4.1.1, 12.2.1.2, TS 24.582 clauses 12.1, 6.1.1.2.1, 6.1.1.2.2, 6.1.1.2.3, 6.1.1.2.4. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-16 requirements.

[TS 24.282, clause 9.2.5.3.1.1]

Upon receiving a request from an MCData user to initiate group SDS session within the pre-established session, the MCData client shall generate a SIP REFER request outside a dialog as specified in IETF RFC 3515 [51] as updated by IETF RFC 6665 [36] and IETF RFC 7647 [52], and in accordance with the UE procedures specified in 3GPP TS 24.229 [5], with the clarifications given below.

The MCData client:

1) shall set the Request URI of the SIP REFER request to the session identity of the pre-established session;

2) shall set the Refer-To header field of the SIP REFER request as specified in IETF RFC 3515 [51] with a Content-ID ("cid") Uniform Resource Locator (URL) as specified in IETF RFC 2392 [33] that points to an application/resource-lists MIME body as specified in IETF RFC 5366 [18], and with the Content-ID header field set to this "cid" URL;

3) shall include in the application/resource-lists MIME body a single <entry> element containing a "uri" attribute set to the MCData group identity, extended with the following parameters in the headers portion of the SIP URI:

NOTE: Characters that are not formatted as ASCII characters are escaped in the following parameters in the headers portion of the SIP URI.

   a) an hname "body" parameter populated with:

      i) an application/sdp MIME body containing an SDP offer with media attributes specified in subclause 9.2.3.2.1, if a group standalone SDS message is requested;

      ii) an application/vnd.3gpp.mcdata-info MIME body with:

         A) if a group standalone SDS message is requested, the <request-type> element set to a value of "group-sds". If a group SDS session is requested, the <request-type> element set to a value of "group-sds-session";

         B) the <mcdata-request-uri> element set to the MCData group identity;

         C) the <mcdata-client-id> element set to the MCData client ID of the originating MCData client; and

D) if the MCData client is aware of active functional aliases and if an active functional alias is to be included in the SIP REFER request, the <functional-alias-URI> element set to the URI of the used functional alias;

4) shall include a P-Preferred-Service header field set to the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), according to IETF RFC 6050 [7];

5) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

6) shall include the following according to IETF RFC 4488 [53]:

   a) the option tag "norefersub" in the Supported header field; and

   b) the value "false" in the Refer-Sub header field;

7) shall include a Target-Dialog header field as specified in IETF RFC 4538 [54] identifying the pre-established session;

8) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP REFER request according to IETF RFC 3840 [16]; and

9) shall send the SIP REFER request according to 3GPP TS 24.229 [5].

On receiving a final SIP 2xx response to the SIP REFER request, the MCData client:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15].

On receiving a SIP re-INVITE request within the pre-established session targeted by the sent SIP REFER request, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-success":

   i) shall notify MCData user about successful the MCData communication establishment;

2) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-fail":

   i) shall notify MCData user about the MCData communication establishment failure; and

3) shall interact with the media plane as specified in 3GPP TS 24.582 [15].

[TS 24.282, clause 9.2.3.2.1]

When composing an SDP offer according to 3GPP TS 24.229 [5], IETF RFC 4975 [17], IETF RFC 6135 [19] and IETF RFC 6714 [20] the MCData client:

1) shall include an "m=message" media-level section for the MCData media stream consisting of:

   a) the port number;

   b) a protocol field value of "TCP/MSRP", or "TCP/TLS/MSRP" for TLS;

   c) a format list field set to ‘*’;

   d) an "a=sendonly" attribute;

   e) an "a=path" attribute containing its own MSRP URI;

   f) set the content type as "a=accept-types:application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload"; and

   g) set the a=setup attribute as "actpass"; and

2) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the MIKEY-SAKKE I_MESSAGE in an "a=key-mgmt" attribute as a "mikey" attribute value in the SDP offer as specified in IETF RFC 4567 [45].

[TS 24.282, clause 9.2.5.4.1.1]

Upon receiving a request from an MCData user to leave an MCData session within a pre-established session, the MCData client:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15];

2) shall generate an initial SIP REFER request outside a dialog in accordance with the procedures specified in 3GPP TS 24.229 [5], IETF RFC 4488 [53] and IETF RFC 3515 [51] as updated by IETF RFC 6665 [36] and IETF RFC 7647 [r7647];

3) shall set the Request-URI of the SIP REFER request to the public service identity identifying the pre-established session on the MCData server serving the MCData user;

4) shall include the Refer-Sub header field with value "false" according to rules and procedures of IETF RFC 4488 [53];

5) shall include the Supported header field with value "norefersub" according to rules and procedures of IETF RFC 4488 [53];

6) shall set the Refer-To header field of the SIP REFER request to the MCData session identity to leave;

7) shall include the "method" SIP URI parameter with the value "BYE" in the URI in the Refer-To header field;

8) shall include a Target-Dialog header field as specified in IETF RFC 4538 [54] identifying the pre-established session; and

9) shall send the SIP REFER request according to 3GPP TS 24.229 [5].

Upon receiving a SIP 2xx response to the SIP REFER request, the MCData client shall interact with media plane as specified in 3GPP TS 24.582 [15].

On receiving a SIP re-INVITE request within the pre-established session targeted by the sent SIP REFER request, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "terminated":

   i) shall notify MCData user about successful the MCData communication termination.

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

[TS 24.582, clause 12.1]

Upon establishing one-to-one or group SDS using media plane or one-to-one or group SDS session using pre-established call, the MCData client shall follow procedures as descried in subclause 6.1.

[TS 24.582, clause 6.1.1.2.1]

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the originating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];
2. shall act according to IETF RFC 6135 [12], as:
   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and
   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";
3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11]; and
4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;
2. shall generate a SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;
3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4; and
4. shall send the MSRP SEND request on the established MSRP connection.

If MSRP chunking is not used then on receipt of a 200 (OK) response, the MCData client shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary;
2. shall wait for a 200 (OK) response to each MSRP SEND request sent; and
3. on receipt of the last 200 (OK) response shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks;
2. shall indicate to MCData user that the SDS message could not be sent; and
3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving an indication to terminate the session from the signalling plane, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks and may indicate to MCData user that the SDS message could not be sent.

[TS 24.582, clause 6.1.1.2.2]

In order to generate an SDS signalling payload, the MCData client:

1. shall generate an SDS SIGNALLING PAYLOAD message as specified in 3GPP TS 24.282 [8]; and
2. shall include the SDS SIGNALLING PAYLOAD message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in 3GPP TS 24.282 [8]; and

When generating a an SDS SIGNALLING PAYLOAD message, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD message as defined in 3GPP TS 24.282 [8]. In the SDS SIGNALLING PAYLOAD message, the MCData client:
   a. may include and set the Disposition request type IE to:
      i. "DELIVERY", if only delivery disposition is requested;

ii. "READ", if only read disposition is requested; or

iii. "DELIVERY AND READ", if both delivery and read dispositions are requested;

b. shall set Date and time IE to current UTC time;

c. shall set Conversation ID IE to a universally unique message ID generated as per IETF RFC 4122 [10];

d. shall set Message ID IE to a universally unique message ID generated as per IETF RFC 4122 [10];

e. if indicated that the SDS message is in reply to another SDS message then, shall include the Reply ID IE set to the message identifier of the indicated SDS message;

f. if indicated that the target recipient of the SDS message is an application then, shall set Application Identifier IE to the application identifier; and

g) shall set the Sender MCData user ID to its own MCData user ID as specified in subclause 15.2.15 of 3GPP TS 24.282 [8].

[TS 24.582, clause 6.1.1.2.3]

In order to generate SDS data payload, the MCData client:

1. shall generate a DATA PAYLOAD message as specified in 3GPP TS 24.282 [8]; and

2. shall include the DATA PAYLOAD message in an application/vnd.3gpp.mcdata-payload MIME body as specified in 3GPP TS 24.282 [8].

When generating a DATA PAYLOAD message, the MCData client:

1. shall generate a SDS DATA PAYLOAD message as defined in 3GPP TS 24.282 [8]. In the SDS DATA PAYLOAD message, the MCData client:

   a. shall set Number of payloads IE to the total number of payloads being sent; and

   b. for each payload, shall include Payload IE. In the Payload IE:

      i. shall set Payload content type to "TEXT", or "BINARY", or "HYPERLINKS", or "LOCATION" according to the payload type; and

      ii. shall set Payload data IE to actual payload.

[TS 24.582, clause 6.1.1.2.4]

The MCData client shall take the procedures in subclause 6.4.1 into consideration when generating MSRP SEND messages.

The MCData client shall generate MSRP SEND for SDS message requests according to IETF RFC 4975 [11].

When generating an MSRP SEND for SDS message request containing an SDS SIGNALLING PAYLOAD message and an SDS DATA PAYLOAD message, the MCData client

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;

2. shall include two MIME bodies in accordance with subclause 6.4.1 where:

   a. in the first body the Content-Type header field is set to "application/vnd.3gpp.mcdata-signalling" and the generated SDS SIGNALLING PAYLOAD message is included; and

   b. in the second body the Content-Type header field is set to "application/vnd.3gpp.mcdata-payload" and the generated SDS DATA PAYLOAD message is included.

When generating an MSRP SEND for SDS message request containing only an SDS DATA PAYLOAD message, the MCData client:

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;

2. shall set the Content-Type as "application/vnd.3gpp.mcdata-payload"; and

3. shall set the body of the MSRP SEND request to the generated SDS DATA PAYLOAD message.

When generating an MSRP SEND for SDS message request containing only an SDS SIGNALLING PAYLOAD, the MCData client.

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the Content-Type as "application/vnd.3gpp.mcdata-signalling"; and
3. shall set the body of the MSRP SEND request to the generated SDS SIGNALLING PAYLOAD message.

6.1.17.3 Test description

6.1.17.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element of the MCData Service Configuration document shall be set to 0 to force the MCData client to send the data using the media plane.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The UE has performed procedure 'MCX pre-established session establishment' as specified in TS 36.579-1 [2] clause 5.3.3.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.17.3.2 Test procedure sequence

Table 6.1.17.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a group standalone SDS message using the pre-established session with disposition request "**DELIVERY**". (NOTE 1)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData call establishment using a pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.12.3-1?	-	-	1	P
3	Check: Does the UE (MCData client) notify the user about successful MCData communication establishment? (NOTE 1)	-	-	1	P
4	Check: Does the UE (MCData client) correctly perform procedure 'CO MSRP message transfer' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 to **send an SDS message with disposition request "DELIVERY"**?	-	-	2	P
5	Check: Does the UE (MCData client) correctly perform procedure '**MCData CO call release keeping the pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.13.3-1?	-	-	3	P
6	Check: Does the UE (MCData client) provide a notification to the MCData user about successful MCData communication termination? (NOTE 1)	-	-	3	P
7	Check: Does the UE (MCData client) correctly perform procedure 'MCX SIP MESSAGE CT' as described in TS 36.579-1 [2] Table 5.3.33.3-1 to **receive the disposition notification** for the SDS message sent at step 7?	-	-	-	-
8	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	4	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.17.3.3 Specific message contents

Table 6.1.17.3.3-1: SIP REFER from the UE (step 2, Table 6.1.17.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.12.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.12-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**Resource list**		
MIME-part-body	Resource-lists as described in Table 6.1.17.3.3-2			

Table 6.1.17.3.3-2: Resource-lists in SIP REFER (Table 6.1.17.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.3.1-3, condition PRE-ESTABLISH, MCD_grp with the uri attribute of the entry extended with the SIP URI header fields as specified in Table 6.1.17.3.3-3

Table 6.1.17.3.3-3: SIP header fields extending the uri attribute of the resource-lists' single entry (Table 6.1.17.3.3-2)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.12-2, condition GROUP-CALL				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
body				
MIME body part		**SDP Message**		
MIME-part-headers				
Content-Type	“application/sdp”			
MIME-part-body	SDP Message as described in Table 6.1.17.3.3-4			
MIME body part		**MCData-Info**		
MIME-part-body	MCdata-Info as described in Table 6.1.17.3.3-5			

Table 6.1.17.3.3-4: SDP in SIP header fields (Table 6.1.17.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition PRE_ESTABLISHED_SESSION, SDP_OFFER, MCDATA_SDS

Table 6.1.17.3.3-5: MCData-Info in SIP header fields (Table 6.1.17.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_grp

Table 6.1.17.3.3-6: MSRP SEND from the UE (step 4, Table 6.1.17.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message or chunk of message as specified in table 6.1.17.3.3-7			

Table 6.1.17.3.3-7: MIME Message (step 4, Table 6.1.17.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.17.3.3-8			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.17.3.3-9			

Table 6.1.17.3.3-8: SDS SIGNALLING PAYLOAD (Table 6.1.17.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.17.3.3-9: Data Payload (Table 6.1.17.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-1

Table 6.1.17.3.3-10: SIP MESSAGE from the SS (step 7, Table 6.1.17.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.17.3.3-11			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.17.3.3-12			

Table 6.1.17.3.3-11: MCData Info (Table 6.1.17.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-calling-group-id> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.2-3A		

Table 6.1.17.3.3-12: SDS NOTIFICATION (Table 6.1.17.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

6.1.18 On-network / Short Data Service (SDS) / Standalone SDS Using Media Plane / Group Standalone SDS / Pre-established session / Client Terminated (CT)

6.1.18.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a SIP re-INVITE message to initiate a group standalone SDS message
using the media plane and using a pre-established session }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

(2)

```
with { UE (MCDATA Client) having responded to the SIP re-INVITE message that initiated a standalone
group SDS message using the media plane and using a pre-established session }
ensure that {
  when { UE (MCDATA Client) receives an MSRP SEND message }
    then { UE (MCDATA Client) responds with an MSRP 200 (OK) message and if the MSRP SEND message is
not blank, renders the contents of the Payload IE to the MCDATA User and sends a SIP MESSAGE message
with a disposition notification of "DELIVERED" }
            }
```

(3)

```
with { UE (MCDATA Client) having responded to the MSRP SEND message from the SS (MCDATA server) }
ensure that {
  when { UE (MCDATA Client) receives a SIP re-INVITE message to release communications }
    then { UE (MCDATA Client) responds with a SIP 200 (OK) message }
            }
```

6.1.18.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.5.3.1.2, 9.2.3.2.4, 9.2.5.4.1.2, 9.2.1.3, 12.2.1.1, 6.2.4.1, 6.2.3.1, TS 24.582 clauses 6.1.1.3.1, 6.1.1.3.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-16 requirements.

[TS 24.282, clause 9.2.5.3.1.2]

Upon receiving a SIP re-INVITE request within a pre-established Session without an associated MCData session the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-request":

   i) if the <request-type> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "group-sds", shall follow the procedures in subclause 9.2.3.2.4;

   ii) if the <request-type> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "group-sds-session", shall follow the procedures in subclause 9.2.4.2.4;

[TS 24.282, clause 9.2.3.2.4]

Upon receipt of an "initial SIP INVITE request for standalone SDS over media plane for terminating MCData client" request, the MCData client shall follow the procedures for termination of multimedia sessions in the IM CN subsystem as specified in 3GPP TS 24.229 [5] with the clarifications below.

The MCData client:

1) may reject the SIP INVITE request if either of the following conditions are met:

   a) MCData client does not have enough resources to handle the call; or

   b) any other reason outside the scope of this specification;

   and skip the rest of the steps after step 2;

2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCData function either with appropriate reject code as specified in 3GPP TS 24.229 [5] and warning texts as specified in subclause 4.9 or with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

3) if the SDP offer of the SIP INVITE request contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:

   a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

   b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

   c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

   d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP INVITE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

   e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

      i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

      ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to create an end-to-end secure session.

3) may display to the MCData user the MCData ID of the inviting MCData user and the type of SDS request;

4) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

5) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

6) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [38]. The "refresher" parameter in the Session-Expires header field shall be set to "uas";

7) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP 200 (OK) response;

8) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP 200 (OK) response;

9) shall include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP INVITE request according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.3.2.2; and

10) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of an SIP ACK message to the sent SIP 200 (OK) message, the MCData client shall:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.1.3.

[TS 24.282 clause 9.2.5.4.1.2]

Upon receiving a SIP re-INVITE request within a pre-established Session without an associated MCData session, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "terminate-request":

   i) shall send SIP 200 (OK) response towards MCData server according to 3GPP TS 24.229 [5]; and

   ii) shall release all media plane resources corresponding to the MCData communication being released.

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or

- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and

- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];

4) void;

5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;

6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

7) if requiring to send an FD notification, shall generate an FD NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.2; and

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.4.1]

This subclause is referenced from other procedures.

In a SIP MESSAGE request, the MCData client:

1) when sending SDS messages or SDS disposition notifications:

   a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

   b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

   c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

2) when sending FD messages, FD disposition notifications or FD media storage function discovery messages:

   a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.fd media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

   b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

   c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

3) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [5]; and

4) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user.

[TS 24.282, clause 6.2.3.1]

In order to generate an SDS notification, the MCData client:

1) shall generate an SDS NOTIFICATION message as specified in subclause 15.1.5; and

2) shall include in the SIP request, the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1.

When generating an SDS NOTIFICATION message as specified in subclause 15.1.5, the MCData client:

1) if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED" as specified in subclause 15.2.5;

2) if sending a read notification, shall set the SDS disposition notification type IE as "READ" as specified in subclause 15.2.5;

3) if sending a delivered and read notification, shall set the SDS disposition notification type IE as "DELIVERED AND READ" as specified in subclause 15.2.5;

4) if the SDS message could not be delivered to the user or application (e.g. due to lack of storage), shall set the SDS disposition notification type IE as "UNDELIVERED" as specified in subclause 15.2.5;

5) shall set the Date and time IE to the current time to as specified in subclause 15.2.8;

6) shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message as specified in subclause 15.2.9;

7) shall set the Message ID to the value of the Message ID that was received in the SDS message as specified in subclause 15.2.10;

8) if the SDS message was destined for the user, shall not include an Application ID IE (as specified in subclause 15.2.7) and shall not include an Extended application ID IE (as specified in subclause 15.2.24); and

9) if the SDS message was destined for an application, shall include:

   a) an Application ID IE set to the value of the Application ID that was included in the SDS message as specified in subclause 15.2.3; or

   b) an Extended application ID IE set to the value of the Extended application ID that was included in the SDS message as specified in subclause 15.2.24.

[TS 24.582, clause 6.1.1.3.1]

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the terminating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as an passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP connection is established, the MCData client:

1. on receipt of an MSRP request in an MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData standalone message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.1.3.2.

[TS 24.582, clause 6.1.1.3.2]

The MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body;

2. shall decode the contents of the application/vnd.3gpp.mcdata-payload MIME body;

3. if the SDS SIGNALLING PAYLOAD message contains a new Conversation ID, shall instantiate a new conversation with the Message ID in the SDS SIGNALLING PAYLOAD identifying the first message in the conversation thread;

4. if the SDS SIGNALLING PAYLOAD message contains an existing Conversation ID and:

a. if the SDS SIGNALLING PAYLOAD message does not contain an InReplyTo Message ID, shall use the Message ID in the SDS SIGNALLING PAYLOAD to identify a new message in the existing conversation thread; and

b. if the SDS SIGNALLING PAYLOAD message contains an InReplyTo Message ID, shall associate the message to an existing message in the conversation thread as identified by the InReplyTo Message ID in the SDS SIGNALLING PAYLOAD and use the Message ID in the SDS SIGNALLING PAYLOAD to identify the new message;

5. shall identify the number of Payload IEs in the DATA PAYLOAD message from the Number of Payloads IE in the DATA PAYLOAD message;

6. if the SDS SIGNALLING PAYLOAD message does not contain an Application identifier IE:

   a. shall determine that the payload contained in the DATA PAYLOAD message is for user consumption;

   b. may notify the MCData user; and

   c. shall render the contents of the Payload IE(s) to the MCData user;

7. if the SDS SIGNALLING PAYLOAD message contains an Application identifier IE:

   a. shall determine that the payload contained in the DATA PAYLOAD message is not for user consumption;

   b. shall not notify the MCData user;

   c. if the Application identifier value is unknown, shall discard the SDS message; and

   d. if the Application identifier value is known, shall deliver the contents of the Payload IE(s) to the identified application; and

8. if SDS Disposition request type IE is present in the SDS SIGNALLING PAYLOAD message received in subclause 6.1.1.3.1 then, shall send a disposition notification as described in 3GPP TS 24.282 [8] subclause 9.2.1.3.

6.1.18.3 Test description

6.1.18.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element of the MCData Service Configuration document shall be set to 0 to force the MCData client to send the data using the media plane.

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.

- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

- The UE has performed procedure 'MCX pre-established session establishment' as specified in TS 36.579-1 [2] clause 5.3.3.

- UE States at the end of the preamble

  - The UE is in E-UTRA Registered, Idle Mode state.

  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.18.3.2 Test procedure sequence

Table 6.1.18.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.3.3-1? NOTE: The SS (MCData server) sends a SIP re-INVITE request within a pre-established Session to initiate a group standalone SDS using the media plane.	-	-	1,2	P
2	Check: Does the UE (MCData client) correctly perform procedure 'CT MSRP message transfer' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 to **receive an SDS message with disposition request "DELIVERY"**?	-	-	2	P
3-7	Check: Does the UE (MCData client) correctly perform step 3 to 7 of procedure '**MCData CO call release keeping the pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.13.3-1? NOTE: The SS (MCData server) sends a SIP re-INVITE request to release the MCData call while keeping the pre-established Session.	-	-	3	P
8	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer** using signalling plane' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 to **send a disposition notification of "DELIVERED"**?	-	-	2	P
9	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 1)	-	-	2	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.18.3.3 Specific message contents

Table 6.1.18.3.3-1: SIP INVITE from the SS (step 1, Table 6.1.18.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS, re_INVITE				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Request-Line				
Request-URI	tsc_MCX_SessionID_B	session identity of the pre-established session	TS 24.282 [31] clause 9.2.5.2.2.2	
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.1.18.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.18.3.3-3			

Table 6.1.18.3.3-2: SDP for SIP INVITE (Table 6.1.18.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_OFFER, PRE_ESTABLISHED_SESSION

Table 6.1.18.3.3-3: MCData-Info (Table 6.1.18.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
anyExt				
mcdata-communication-state	"establish-request"		TS 24.282 [31] clause 9.2.5.2.2.2	

Table 6.1.18.3.3-4: SIP 200 (OK) from the UE (step 1, Table 6.1.18.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.1-1, condition INVITE-RSP, MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
value	"application/sdp"			
Message-body				
SDP message	As described in Table 6.1.18.3.3-5			

Table 6.1.18.3.3-5: SDP for SIP 200 (OK) (Table 6.1.18.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_ANSWER, PRE_ESTABLISHED_SESSION

Table 6.1.18.3.3-6: MSRP SEND from the SS (step 2, Table 6.1.18.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message as specified in table 6.1.18.3.3-7			

Table 6.1.18.3.3-7: MIME Message (Table 6.1.18.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.18.3.3-8			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.18.3.3-9			

Table 6.1.18.3.3-8: SDS SIGNALLING PAYLOAD (Table 6.1.18.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED

Table 6.1.18.3.3-9: Data Payload (Table 6.1.18.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-2

Table 6.1.18.3.3-10: SIP re-INVITE from the SS (step 3, Table 6.1.18.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.13.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS, re_INVITE				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Request-Line				
Request-URI	tsc_MCX_SessionID_B	session identity of the pre-established session	TS 24.282 [31] clause 9.2.5.4.2.1	
Message-body				
MIME body part	not present	**SDP message**		
MIME body part		**MCData Info**		
MIME-part-body	MCData-Info message as described in Table 6.1.18.3.3-11			

Table 6.1.18.3.3-11: MCData-Info (Table 6.1.18.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-request-uri	not present			
mcdata-calling-user-id	not present			
anyExt				
mcdata-communication-state	"terminate request"		TS 24.282 [31] clause 9.2.5.4.2.2	

Table 6.1.18.3.3-12: SIP MESSAGE from the UE (step 8, Table 6.1.18.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.18.3.3-13			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.18.3.3-14			

Table 6.1.18.3.3-13: MCData-Info (Table 6.1.18.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-request-uri> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.1-3A	TS 24.282 [31] clause 12.2.1.1	

Table 6.1.18.3.3-14: SDS NOTIFICATION (Table 6.1.18.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

6.1.19 On-network / Short Data Service (SDS) / SDS Session / Group SDS Session / Pre-established session / Client Originated (CO)

6.1.19.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to initiate a group SDS session using the media plane and using
the pre-established session }
```

```
    then { UE (MCDATA Client) sends a request to establish a group SDS session and a MSRP connection
via a SIP REFER message and responds to the SIP re-INVITE message with a SIP 200 (OK) message and
delivers the notification to the MCDATA User about successful communication establishment and sends
a blank MSRP SEND message to bind the MSRP connection }
            }
```

(2)

```
with { UE (MCDATA Client) having sent a blank MSRP SEND message to bind the MSRP connection }
ensure that {
  when { UE (MCDATA Client) receives an MSRP 200 (OK) message in response to the blank MSRP SEND
message }
    then { UE (MCDATA Client) sends the group session SDS message via a MSRP SEND message with a
disposition of "DELIVERY" }
            }
```

(3)

```
with { UE (MCDATA Client) having sent a group session SDS message using the media plane with a
disposition of "DELIVERY" }
ensure that {
  when { UE (MCDATA Client) receives a disposition response via a MSRP SEND message }
    then { UE (MCDATA Client) responds to the MSRP SEND message by sending a MSRP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

(4)

```
with { UE (MCDATA Client) having established a group SDS session using the pre-established session }
ensure that {
  when { the MCDATA User requests to release the group SDS session while keeping the pre-established
session }
    then { UE (MCDATA Client) sends a SIP REFER message to release the MCData session and keep the
pre-established session and responds to the SIP re-INVITE message with a SIP 200 (OK) message and
delivers the notification to the MCDATA User about successful termination }
            }
```

6.1.19.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.5.3.1.1, 9.2.3.2.1, 9.2.5.4.1.1, TS 24.582 clauses 12.1, 6.1.2.2.1, 6.1.2.6. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-16 requirements.

[TS 24.282, clause 9.2.5.3.1.1]

Upon receiving a request from an MCData user to initiate group SDS session within the pre-established session, the MCData client shall generate a SIP REFER request outside a dialog as specified in IETF RFC 3515 [51] as updated by IETF RFC 6665 [36] and IETF RFC 7647 [52], and in accordance with the UE procedures specified in 3GPP TS 24.229 [5], with the clarifications given below.

The MCData client:

1) shall set the Request URI of the SIP REFER request to the session identity of the pre-established session;

2) shall set the Refer-To header field of the SIP REFER request as specified in IETF RFC 3515 [51] with a Content-ID ("cid") Uniform Resource Locator (URL) as specified in IETF RFC 2392 [33] that points to an application/resource-lists MIME body as specified in IETF RFC 5366 [18], and with the Content-ID header field set to this "cid" URL;

3) shall include in the application/resource-lists MIME body a single <entry> element containing a "uri" attribute set to the MCData group identity, extended with the following parameters in the headers portion of the SIP URI:

NOTE: Characters that are not formatted as ASCII characters are escaped in the following parameters in the headers portion of the SIP URI.

   a) an hname "body" parameter populated with:

i) an application/sdp MIME body containing an SDP offer with media attributes specified in subclause 9.2.3.2.1, if if a group standalone SDS message is requested;

ii) an application/vnd.3gpp.mcdata-info MIME body with:

A) if a group standalone SDS message is requested, the <request-type> element set to a value of "group-sds". If a group SDS session is requested, the <request-type> element set to a value of "group-sds-session";

B) the <mcdata-request-uri> element set to the MCData group identity;

C) the <mcdata-client-id> element set to the MCData client ID of the originating MCData client; and

D) if the MCData client is aware of active functional aliases and if an active functional alias is to be included in the SIP REFER request, the <functional-alias-URI> element set to the URI of the used functional alias;

4) shall include a P-Preferred-Service header field set to the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), according to IETF RFC 6050 [7];

5) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

6) shall include the following according to IETF RFC 4488 [53]:

a) the option tag "norefersub" in the Supported header field; and

b) the value "false" in the Refer-Sub header field;

7) shall include a Target-Dialog header field as specified in IETF RFC 4538 [54] identifying the pre-established session;

8) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP REFER request according to IETF RFC 3840 [16]; and

9) shall send the SIP REFER request according to 3GPP TS 24.229 [5].

On receiving a final SIP 2xx response to the SIP REFER request, the MCData client:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15].

On receiving a SIP re-INVITE request within the pre-established session targeted by the sent SIP REFER request, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-success":

i) shall notify MCData user about successful the MCData communication establishment;

2) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-fail":

i) shall notify MCData user about the MCData communication establishment failure; and

3) shall interact with the media plane as specified in 3GPP TS 24.582 [15].

[TS 24.282, clause 9.2.3.2.1]

When composing an SDP offer according to 3GPP TS 24.229 [5], IETF RFC 4975 [17], IETF RFC 6135 [19] and IETF RFC 6714 [20] the MCData client:

1) shall include an "m=message" media-level section for the MCData media stream consisting of:

a) the port number;

b) a protocol field value of "TCP/MSRP", or "TCP/TLS/MSRP" for TLS;

c) a format list field set to '*';

d) an "a=sendonly" attribute;

e) an "a=path" attribute containing its own MSRP URI;

f) set the content type as "a=accept-types:application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload"; and

g) set the a=setup attribute as "actpass"; and

2) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the MIKEY-SAKKE I_MESSAGE in an "a=key-mgmt" attribute as a "mikey" attribute value in the SDP offer as specified in IETF RFC 4567 [45].

[TS 24.282, clause 9.2.5.4.1.1]

Upon receiving a request from an MCData user to leave an MCData session within a pre-established session, the MCData client:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15];

2) shall generate an initial SIP REFER request outside a dialog in accordance with the procedures specified in 3GPP TS 24.229 [5], IETF RFC 4488 [53] and IETF RFC 3515 [51] as updated by IETF RFC 6665 [36] and IETF RFC 7647 [r7647];

3) shall set the Request-URI of the SIP REFER request to the public service identity identifying the pre-established session on the MCData server serving the MCData user;

4) shall include the Refer-Sub header field with value "false" according to rules and procedures of IETF RFC 4488 [53];

5) shall include the Supported header field with value "norefersub" according to rules and procedures of IETF RFC 4488 [53];

6) shall set the Refer-To header field of the SIP REFER request to the MCData session identity to leave;

7) shall include the "method" SIP URI parameter with the value "BYE" in the URI in the Refer-To header field;

8) shall include a Target-Dialog header field as specified in IETF RFC 4538 [54] identifying the pre-established session; and

9) shall send the SIP REFER request according to 3GPP TS 24.229 [5].

Upon receiving a SIP 2xx response to the SIP REFER request, the MCData client shall interact with media plane as specified in 3GPP TS 24.582 [15].

On receiving a SIP re-INVITE request within the pre-established session targeted by the sent SIP REFER request, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "terminated":

   i) shall notify MCData user about successful the MCData communication termination.

[TS 24.582, clause 12.1]

Upon establishing one-to-one or group SDS using media plane or one-to-one or group SDS session using pre-established call, the MCData client shall follow procedures as descried in subclause 6.1.

[TS 24.582, clause 6.1.2.2.1]

Upon receiving an indication to establish MSRP connection for SDS session as the originating MCData client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act according to IETF RFC 6135 [12], as:

   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and

   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP session is established, the MCData client:

1. on receipt of an MSRP request in the MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData SDS message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.2.6.

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client can generate and send an SDS message as specified in subclause 6.1.2.4, or can generate and send an SDS disposition notification for a received SDS message as specified in subclause 6.1.2.5, if requested.

Received content and disposition requests shall be handled as specified in subclause 6.1.2.6.

[TS 24.582, clause 6.1.2.6]

Upon receiving an SDS message, the MCData client:

1. shall follow the procedure defined in subclause 6.1.1.3.2, with the following clarification:

   a. if SDS Disposition request type IE is present in the received SDS SIGNALLING PAYLOAD message then, shall send an SDS disposition notification as described in subclause 6.1.2.5.

Upon receiving an SDS disposition notification, the MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2. shall deliver the notification to the user or application.

6.1.19.3 Test description

6.1.19.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The UE has performed procedure 'MCX pre-established session establishment' as specified in TS 36.579-1 [2] clause 5.3.3.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.19.3.2 Test procedure sequence

Table 6.1.19.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a group session SDS message using the pre-established session with disposition request "**DELIVERY**". (NOTE 1)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData call establishment using a pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.12.3-1?	-	-	1	P
3	Check: Does the UE (MCData client) notify the user about successful MCData communication establishment? (NOTE 1)	-	-	1	P
4	Check: Does the UE (MCData client) correctly perform procedure 'CO MSRP message transfer' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 to **send an SDS message with disposition request "DELIVERY"**?	-	-	2	P
5	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive the disposition notification** for the SDS message sent at step 3?	-	-	3	P
6	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	3	P
7	Make the UE (MCData client) release the group session while keeping the pre-established session. (NOTE 1)	-	-	-	-
8	Check: Does the UE (MCData client) correctly perform procedure '**MCData CO call release keeping the pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.13.3-1?	-	-	4	P
9	Check: Does the UE (MCData client) provide a notification to the MCData user about successful MCData communication termination? (NOTE 1)	-	-	4	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.19.3.3 Specific message contents

Table 6.1.19.3.3-1: SIP REFER from the UE (step 2, Table 6.1.19.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.12.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.12-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**Resource list**		
MIME-part-body	Resource-lists as described in Table 6.1.19.3.3-2			

Table 6.1.19.3.3-2: Resource-lists in SIP REFER (Table 6.1.19.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.3.1-3, condition PRE-ESTABLISH, MCD_grp with the uri attribute of the entry extended with the SIP URI header fields as specified in Table 6.1.19.3.3-3

Table 6.1.19.3.3-3: SIP header fields extending the uri attribute of the resource-lists' single entry (Table 6.1.19.3.3-2)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.12-2				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
body				
MIME body part		**SDP Message**		
MIME-part-headers				
Content-Type	“application/sdp”			
MIME-part-body	SDP Message as described in Table 6.1.19.3.3-4			
MIME body part		**MCData-Info**		
MIME-part-body	MCdata-Info as described in Table 6.1.19.3.3-5			

Table 6.1.19.3.3-4: SDP in SIP header fields (Table 6.1.19.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition PRE_ESTABLISHED_SESSION, SDP_OFFER, MCDATA_SDS, SDS_SESSION

Table 6.1.19.3.3-5: MCData-Info in SIP header fields (Table 6.1.19.3.3-3)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-sds-session"		TS 24.282 [31] clause 9.2.5.2.1.1	

Table 6.1.19.3.3-6: MSRP SEND from the UE (step 4, Table 6.1.19.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message or chunk of message as specified in table 6.1.19.3.3-7			

Table 6.1.19.3.3-7: MIME Message (step 4, Table 6.1.19.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.19.3.3-8			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.19.3.3-9			

Table 6.1.19.3.3-8: SDS SIGNALLING PAYLOAD (Table 6.1.19.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.19.3.3-9: Data Payload (Table 6.1.19.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-1

Table 6.1.19.3.3-10: MSRP SEND from the SS (step 5, Table 6.1.19.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp. mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.19.3.3-11			

Table 6.1.19.3.3-11: SDS NOTIFICATION (Table 6.1.19.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

6.1.20 On-network / Short Data Service (SDS) / SDS Session / Group SDS Session / Pre-established session / Client Terminated (CT)

6.1.20.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a SIP re-INVITE message to initiate to initiate a group SDS
session using the media plane and using a pre-established session }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

(2)

```
with { UE (MCDATA Client) having responded to the SIP re-INVITE message that initiated a group SDS
session using the media plane and using a pre-established session }
ensure that {
  when { UE (MCDATA Client) receives an MSRP SEND message }
    then { UE (MCDATA Client) responds with an MSRP 200 (OK) message and if the MSRP SEND message is
not blank, renders the contents of the Payload IE to the MCDATA User and sends a MSRP SEND message
with a disposition notification of "DELIVERED" }
            }
```

(3)

```
with { UE (MCDATA Client) being in a group SDS session initiated by the SS (MCDATA server) and using
a pre-established session }
ensure that {
  when { UE (MCDATA Client) receives a SIP re-INVITE message to release communications }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

6.1.20.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.5.3.1.2, 9.2.4.2.4, 9.2.5.4.1.2, TS 24.582 clauses 12.1, 6.1.2.3.1, 6.1.2.6, 6.1.1.3.2, 6.1.2.5.1, 6.1.2.5.2, 6.1.2.5.3. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-16 requirements.

[TS 24.282, clause 9.2.5.3.1.2]

Upon receiving a SIP re-INVITE request within a pre-established Session without an associated MCData session the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "establish-request":

   i) if the <request-type> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "group-sds", shall follow the procedures in subclause 9.2.3.2.4;

   ii) if the <request-type> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "group-sds-session", shall follow the procedures in subclause 9.2.4.2.4;

[TS 24.282, clause 9.2.4.2.4]

Upon receipt of an "initial SIP INVITE request for SDS session for terminating MCData client"request, the MCData client shall follow the procedures for termination of multimedia sessions in the IM CN subsystem as specified in 3GPP TS 24.229 [5] with the clarifications below.

The MCData client:

1) may reject the SIP INVITE request if either of the following conditions are met:

   a) MCData client does not have enough resources to handle the call; or

   b) any other reason outside the scope of this specification;

   and skip the rest of the steps after step 2;

2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCData function either with appropriate reject code as specified in 3GPP TS 24.229 [5] and warning texts as specified in subclause 4.9 or with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

3) if the SDP offer of the SIP INVITE request contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:

   a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

   b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

   c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

   d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP INVITE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

   e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

      i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

      ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to create an end-to-end secure session.

4) may display to the MCData user the MCData ID of the inviting MCData user and the type of SDS request;

5) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

6) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

7) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [38]. The "refresher" parameter in the Session-Expires header field shall be set to "uas";

8) shall include the g.3gpp.mcdata.sds media feature tag in the Contact header field of the SIP 200 (OK) response;

9) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP 200 (OK) response;

10) shall include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP INVITE request according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.4.2.2; and

11) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of an SIP ACK message to the sent SIP 200 (OK) message, the MCData client shall:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.2.3.

To send a disposition notification after the media plane is released, the MCData client:

1) shall follow the procedures described in subclause 12.2.1.1.

[TS 24.282, clause 9.2.5.4.1.2]

Upon receiving a SIP re-INVITE request within a pre-established Session without an associated MCData session, the MCData client:

1) if the <mcdata-communication-state> element in the application/vnd.3gpp.mcdata-info+xml MIME body of the SIP INVITE request is set to a value of "terminate-request":

   i) shall send SIP 200 (OK) response towards MCData server according to 3GPP TS 24.229 [5]; and

   ii) shall release all media plane resources corresponding to the MCData communication being released.

[TS 24.582, clause 12.1]

Upon establishing one-to-one or group SDS using media plane or one-to-one or group SDS session using pre-established call, the MCData client shall follow procedures as descried in subclause 6.1.

[TS 24.582, clause 6.1.2.3.1]

Upon receiving an indication to establish MSRP connection for SDS session as the terminating MCData client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as an passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP session is established, the MCData client:

1. on receipt of an MSRP request in the MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the MCData SDS message before delivering the content to the application; and

3. shall handle the received content as described in subclause 6.1.2.6.

On receiving MSRP 200 (OK) response to the first MSRP SEND request sent as "active" endpoint, or after sending MSRP 200 (OK) response to the first MSRP SEND request received as "passive" endpoint, the MCData client can generate and send an SDS message as specified in subclause 6.1.2.4, or can generate and send an SDS disposition notification for a received SDS message as specified in subclause 6.1.2.5, if requested.

Received content and disposition requests shall be handled as specified in subclause 6.1.2.6.

[TS 24.582, clause 6.1.2.6]

Upon receiving an SDS message, the MCData client:

1. shall follow the procedure defined in subclause 6.1.1.3.2, with the following clarification:

   a. if SDS Disposition request type IE is present in the received SDS SIGNALLING PAYLOAD message then, shall send an SDS disposition notification as described in subclause 6.1.2.5.

Upon receiving an SDS disposition notification, the MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and
2. shall deliver the notification to the user or application.

[TS 24.582, clause 6.1.1.3.2]

The MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body;
2. shall decode the contents of the application/vnd.3gpp.mcdata-payload MIME body;
3. if the SDS SIGNALLING PAYLOAD message contains a new Conversation ID, shall instantiate a new conversation with the Message ID in the SDS SIGNALLING PAYLOAD identifying the first message in the conversation thread;
4. if the SDS SIGNALLING PAYLOAD message contains an existing Conversation ID and:
    a. if the SDS SIGNALLING PAYLOAD message does not contain an InReplyTo Message ID, shall use the Message ID in the SDS SIGNALLING PAYLOAD to identify a new message in the existing conversation thread; and
    b. if the SDS SIGNALLING PAYLOAD message contains an InReplyTo Message ID, shall associate the message to an existing message in the conversation thread as identified by the InReplyTo Message ID in the SDS SIGNALLING PAYLOAD and use the Message ID in the SDS SIGNALLING PAYLOAD to identify the new message;
5. shall identify the number of Payload IEs in the DATA PAYLOAD message from the Number of Payloads IE in the DATA PAYLOAD message;
6. if the SDS SIGNALLING PAYLOAD message does not contain an Application identifier IE:
    a. shall determine that the payload contained in the DATA PAYLOAD message is for user consumption;
    b. may notify the MCData user; and
    c. shall render the contents of the Payload IE(s) to the MCData user;
7. if the SDS SIGNALLING PAYLOAD message contains an Application identifier IE:
    a. shall determine that the payload contained in the DATA PAYLOAD message is not for user consumption;
    b. shall not notify the MCData user;
    c. if the Application identifier value is unknown, shall discard the SDS message; and
    d. if the Application identifier value is known, shall deliver the contents of the Payload IE(s) to the identified application; and
8. if SDS Disposition request type IE is present in the SDS SIGNALLING PAYLOAD message received in subclause 6.1.1.3.1 then, shall send a disposition notification as described in 3GPP TS 24.282 [8] subclause 9.2.1.3.

[TS 24.582, clause 6.1.2.5.1]

To send an SDS disposition notification, the MCData client:

1. shall generate a SDS NOTIFICATION as specified in subclause 6.1.2.5.2;
2. shall include the SDS NOTIFICATION in an MSRP SEND request as specified in subclause 6.1.2.5.3, with the following clarification;
    a. shall set To-Path header according to the MSRP URI in the received SDP; and
3. shall send the MSRP SEND request on the established MSRP connection.

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary.

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks; and
2. shall indicate to MCData user that the SDS message or the SDS disposition notification could not be sent.

[TS 24.582, clause 6.1.2.5.2]

In order to generate an SDS notification, the MCData client:

1. shall generate an SDS NOTIFICATION message as specified in 3GPP TS 24.282 [8]; and
2. shall include the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in 3GPP TS 24.282 [8].

When generating an SDS NOTIFICATION message, the MCData client:

1. if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED";
2. if sending a read notification, shall set the SDS disposition notification type IE as "READ";
3. if sending a delivered and read notification, shall set the SDS disposition notification type IE as "DELIVERED AND READ";
4. if the SDS message could not be delivered to the user or application (e.g. due to lack of storage), shall set the SDS disposition notification type IE as "UNDELIVERED";
5. shall set the Date and time IE to the current time;
6. shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message;
7. shall set the Message ID to the value of the Message ID that was received in the SDS message;
8. if the SDS message was destined for the user, shall not include an Application ID IE;
9. if the SDS message was destined for an application, shall include an Application ID IE set to the value of the Application ID that was included in the SDS message; and
10. shall set the Sender MCData user ID to its own MCData user ID as specified in subclause 15.2.15 of 3GPP TS 24.282 [8].

[TS 24.582, clause 6.1.2.5.3]

The MCData client shall generate MSRP SEND requests for SDS disposition notification according to IETF RFC 4975 [11].

When generating an MSRP SEND request for SDS disposition notification containing an SDS NOTIFICATION message, the MCData client

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the content type as Content-Type = "application/vnd.3gpp.mcdata-signalling"; and
3. shall set the body of the MSRP SEND request to the generated SDS NOTIFICATION message.

6.1.20.3 Test description

6.1.20.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The UE has performed procedure 'MCX pre-established session establishment' as specified in TS 36.579-1 [2] clause 5.3.3.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.20.3.2 Test procedure sequence

Table 6.1.20.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.3.3-1? NOTE: The SS (MCData server) sends a SIP re-INVITE request within a pre-established Session to initiate a group SDS session using the media plane.	-	-	1,2	P
2	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive an SDS message with disposition request "DELIVERY"**?	-	-	2	P
3	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send a disposition notification of "DELIVERED"**?	-	-	2	P
4	Check: Does the UE (MCData client) provide the contents of the Payload IE to the user? (NOTE 1)	-	-	2	P
5-9	Check: Does the UE (MCData client) correctly perform step 3 to 7 of procedure '**MCData CO call release keeping the pre-established session**' as described in TS 36.579-1 [2] Table 5.3C.13.3-1? NOTE: The SS (MCData server) sends a SIP re-INVITE request to release the MCData call while keeping the pre-established Session.	-	-	3	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.20.3.3 Specific message contents

Table 6.1.20.3.3-1: SIP INVITE from the SS (step 1, Table 6.1.20.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS, re_INVITE				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Request-Line				
Request-URI	tsc_MCX_SessionID_B	session identity of the pre-established session	TS 24.282 [31] clause 9.2.5.2.2.2	
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.1.20.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.20.3.3-3			

Table 6.1.20.3.3-2: SDP for SIP INVITE (Table 6.1.20.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_OFFER, SDS_SESSION, PRE_ESTABLISHED_SESSION

Table 6.1.20.3.3-3: MCData-Info (Table 6.1.20.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-sds-session"		TS 24.282 [31] clause 9.2.5.2.2.2	
anyExt				
mcdata-communication-state	"establish-request"		TS 24.282 [31] clause 9.2.5.2.2.2	

Table 6.1.20.3.3-4: SIP 200 (OK) from the UE (step 1, Table 6.1.20.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.1-1, condition INVITE-RSP, MCDATA_SDS				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
value	"application/sdp"			
Message-body				
SDP message	As described in Table 6.1.20.3.3-5			

Table 6.1.20.3.3-5: SDP for SIP 200 (OK) (Table 6.1.20.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_ANSWER, SDS_SESSION, PRE_ESTABLISHED_SESSION

Table 6.1.20.3.3-6: MSRP SEND from the SS (step 2, Table 6.1.20.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message as specified in table 6.1.20.3.3-7			

Table 6.1.20.3.3-7: MIME Message (step 2, Table 6.1.20.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.20.3.3-8			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.20.3.3-9			

Table 6.1.20.3.3-8: SDS SIGNALLING PAYLOAD (Table 6.1.20.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED

Table 6.1.20.3.3-9: Data Payload (Table 6.1.20.3.3-6A)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-2

Table 6.1.20.3.3-10: MSRP SEND from the UE (step 3, Table 6.1.20.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp. mcdata-signalling"			
data	MCData Protected Payload Message containing SDS NOTIFICATION as specified in table 6.1.20.3.3-11			

Table 6.1.20.3.3-11: SDS NOTIFICATION (Table 6.1.20.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

Table 6.1.20.3.3-12: SIP re-INVITE from the SS (step 5, Table 6.1.20.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.13.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_SDS, re_INVITE				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Request-Line				
Request-URI	tsc_MCX_SessionID_B	session identity of the pre-established session	TS 24.282 [31] clause 9.2.5.4.2.1	
Content-Type			RFC 5621 [58]	
media-type	"application/vnd.3gpp. mcdata-info+xml"		TS 24.282 [31] clause 9.2.5.4.2.1	
Message-body				
MCData-Info Message	MCData-Info message as described in Table 6.1.14.3.3-13			

Table 6.1.20.3.3-13: MCData-Info (Table 6.1.20.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-request-uri	not present			
mcdata-calling-user-id	not present			
anyExt				
mcdata-communication-state	"terminate request"		TS 24.282 [31] clause 9.2.5.4.2.2	

6.1.21 On-network / Short Data Service (SDS) / Standalone SDS using signalling control plane / One-to-one Standalone SDS / Active functional alias / Client Originated (CO)

6.1.21.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a standalone one-to-one SDS message with a disposition of
only Delivery using an active functional alias }
    then { UE (MCDATA Client) sends a standalone one-to-one SDS message with a disposition of only
Delivery using an active functional alias via a SIP MESSAGE message }
            }
```

(2)

```
with { UE (MCDATA Client) having sent a standalone one-to-one SDS message using an active Functional
Alias }
ensure that {
  when { UE (MCDATA Client receives a disposition response via a SIP MESSAGE message from the SS
(MCDATA Server) }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

6.1.21.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.2.2.1, 6.2.2.1, 6.2.4.1, 12.2.1.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-16 requirements.

[TS 24.282, clause 9.2.2.2.1]

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) if a one-to-one standalone SDS message is to be sent, shall insert in the SIP MESSAGE request:

   a) an application/resource-lists+xml MIME body with the MCData ID of the target MCData user, according to rules and procedures of IETF RFC 4826 [9];

   b) an application/vnd.3gpp.mcdata-info+xml MIME body with:

      i) a <request-type> element set to a value of "one-to-one-sds"; and

      ii) if the MCData client is aware of active functional aliases and if an active functional alias is to be included in the SIP MESSAGE request, the <functional-alias-URI> element set to the URI of the used functional alias; and

   c) if end-to-end security is required and the security context does not exist or if the existing security context has expired, an application/mikey MIME body with the MIKEY-SAKKE I_MESSAGE as specified in 3GPP TS 33.180 [26]. The MCData client:

      i) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [26];

      ii) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [26];

      iii) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect one-to-one communications and with the remaining twenty eight bits being randomly generated as described in 3GPP TS 33.180 [26];

      iv) shall encrypt the PCK to a UID associated to the MCData client using the MCData ID of the invited user and a time related parameter as described in 3GPP TS 33.180 [26];

      v) shall generate a MIKEY-SAKKE I_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [26]; and

      vi) shall add the MCData ID of the originating MCData to the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

      vii) shall sign the MIKEY-SAKKE I_MESSAGE using the originating MCData user's signing key provided in the keying material together with a time related parameter; and

      viii) shall include the MIKEY-SAKKE I_MESSAGE in an application/mikey MIME body as specified in 3GPP TS 33.180 [26];

…

4) shall generate a standalone SDS message as specified in subclause 6.2.2.1; and

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.2.1]

In order to generate an SDS message, the MCData client:

1) shall generate an SDS SIGNALLING PAYLOAD message as specified in subclause 15.1.2;

2) shall generate a DATA PAYLOAD message as specified in subclause 15.1.4;

3) shall include in the SIP request, the SDS SIGNALLING PAYLOAD message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1; and

4) shall include in the SIP request, the DATA PAYLOAD message in an application/vnd.3gpp.mcdata-payload MIME body as specified in subclause E.2.

When generating an SDS SIGNALLING PAYLOAD message as specified in subclause 15.1.2, the MCData client:

1) shall set the Date and time IE to the current time as specified in subclause 15.2.8;

2) if the SDS message starts a new conversation, shall set the Conversation ID IE to a newly generated Conversation ID value as specified in subclause 15.2.9;

3) if the SDS message continues an existing unfinished conversation, shall set the Conversation ID IE to the Conversation ID value of the existing conversation as specified in subclause 15.2.9;

4) shall set the Message ID IE to a newly generated Message ID value as specified in subclause 15.2.10;

5) if the SDS message is in reply to a previously received SDS message, shall include the InReplyTo message ID IE with the Message ID value in the previously received SDS message;

6) if the SDS message is for user consumption, shall not include an Application ID IE as specified in subclause 15.2.7and shall not include an Extended application ID IE as specified in subclause 15.2.24;

7) if the SDS message is intended for an application on the terminating MCData client, shall include:

   a) an Application ID IE with a Application ID value representing the intended application as specified in subclause 15.2.7; or

   b) an Extended application ID IE with an Extended application ID value representing the intended application as specified in subclause 15.2.24;

NOTE: The value chosen for the Application ID value is decided by the mission critical organisation.

8) if only a delivery disposition notification is required shall include a SDS disposition request type IE set to "DELIVERY" as specified in subclause 15.2.3;

9) if only a read disposition notification is required shall include a SDS disposition request type IE set to "READ" as specified in subclause 15.2.3;

10) if both a delivery and read disposition notification is required shall include a SDS disposition request type IE set to "DELIVERY AND READ" as specified in subclause 15.2.3; and

11) may set the User location IE to the current location of the UE as specified in subclause 15.2.25.

When generating an DATA PAYLOAD message for SDS as specified in subclause 15.1.4, the MCData client:

1) shall set the Number of payloads IE to the number of Payload IEs that needs to be encoded, as specified in subclause 15.2.12;

2) if end-to-end security is required for a one-to-one communication, shall include the Security parameters and Payload IE with security parameters as described in 3GPP TS 33.180 [26]. Otherwise, if end-to-end security is not required for a one-to-one communication, shall include the Payload IE as specified in subclause 15.1.4; and

3) for each Payload IE included:

   a) if the payload is text, shall set the Payload content type as "TEXT" as specified in subclause 15.2.13;

   b) if the payload is binary data, shall set the Payload content type as "BINARY" as specified in subclause 15.2.13;

   c) if the payload is hyperlinks, shall set the Payload content type as "HYPERLINKS" as specified in subclause 15.2.13;

d) if the payload is location, shall set the Payload content type as "LOCATION" as specified in subclause 15.2.13;

e) if payload is enhanced status for a group, shall set the Payload content type as "ENHANCED STATUS" as specified in subclase 15.2.13; and

f) shall include the data to be sent in the Payload data.

[TS 24.282, clause 6.2.4.1]

This subclause is referenced from other procedures.

In a SIP MESSAGE request, the MCData client:

1) when sending SDS messages or SDS disposition notifications:

a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

…

3) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [5]; and

4) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user.

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

6.1.21.3 Test description

6.1.21.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element shall not be present in the MCData Service Configuration document so that according to TS 24.484 [24] there is no size limit imposed for the use of C-plane procedures for the SDS message.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The UE has performed procedure 'UE initiated MCX functional alias status determination and subscription' as specified in TS 36.579-1 [2] clause 5.3.36.
- The UE has performed procedure 'UE initiated MCX functional alias status change' as specified in TS 36.579-1 [2] clause 5.3.37.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.21.3.2 Test procedure sequence

Table 6.1.21.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a standalone one-to-one SDS message with disposition request "**DELIVERY**" using an active Functional Alias. (NOTE 1)	-	-	-	-
2-4	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of procedure '**CO SDS or FD message transfer** using signalling plane' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a standalone one-to-one SDS message with disposition request "DELIVERY"**? (NOTE 2)	-	-	1	P
5	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive the disposition notification** for the SDS message sent at step 2A?	-	-	2	P
6	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	2	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: The RRC connection is not released at the end of the procedure.					

6.1.21.3.3 Specific message contents

Table 6.1.21.3.3-1: SIP MESSAGE from the UE (step 2A, Table 6.1.21.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MIKEY, MCDATA_SIGNALLING, MCDATA_PAYLOAD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.21.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 6.1.21.3.3-3			
MIME body part		**MCData Data message**		
MIME-part-body	DATA PAYLOAD as described in Table 6.1.21.3.3-4			

Table 6.1.21.3.3-2: MCData-Info (Table 6.1.21.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_1to1, FUNCTIONAL_ALIAS

Table 6.1.21.3.3-3: SDS SIGNALLING PAYLOAD (Table 6.1.21.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.21.3.3-4: DATA PAYLOAD (Table 6.1.21.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-1

Table 6.1.21.3.3-5: SIP MESSAGE from the SS (step 5, Table 6.1.21.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.21.3.3-6			

Table 6.1.21.3.3-6: SDS NOTIFICATION (Table 6.1.21.3.3-5)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

6.1.22 On-network / Short Data Service (SDS) / Standalone SDS Using Media Plane / One-to-one Standalone SDS / Active functional alias / Client Originated (CO)

6.1.22.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a one-to-one standalone SDS message using the media plane
using an active functional alias }
    then { UE (MCDATA Client) sends a request to establish an MSRP connection via a SIP INVITE
message and then responds to the SIP 200 (OK) message with a SIP ACK message }
            }
```

(2)

```
with { UE (MCDATA Client) having requested the establishment of a MSRP connection }
ensure that {
  when { UE (MCDATA Client) receives a SIP 200 (OK) message with the a=setup attribute set to
"passive"  from the SS (MCDATA server) }
    then { UE (MCDATA Client) sends a blank MSRP SEND message to bind the MSRP connection and then
sends the one-to-one standalone SDS message via a MSRP SEND message with a disposition of "DELIVERY"
}
            }
```

(3)

```
with { UE (MCDATA Client) having sent a one-to-one standalone SDS message using the media plane }
ensure that {
  when { UE (MCDATA Client receives a MSRP 200 (OK) message in response to the last MSRP SEND
message indicating that the standalone SDS message has been successfully transferred }
    then { UE (MCDATA Client) sends a SIP BYE message }
            }
```

(4)

```
with { UE (MCDATA Client) having sent a one-to-one standalone SDS message using the media plane with
a disposition of "DELIVERY" }
ensure that {
  when { UE (MCDATA Client receives a disposition response via a SIP MESSAGE message from the SS
(MCDATA Server }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

6.1.22.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 9.2.3.2.3, 9.2.3.2.1, 13.2.2.2.2.1, 12.2.1.2, TS 24.582 clauses 6.1.1.2.1, 6.1.1.2.2, 6.1.1.2.3, 6.1.1.2.4. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-16 requirements.

[TS 24.282, clause 9.2.3.2.3]

The MCData client shall generate a SIP INVITE request in accordance with 3GPP TS 24.229 [5] with the clarifications given below.

The MCData client:

1) shall include the g.3gpp.mcdata.sds media feature tag and the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" in the Contact header field of the SIP INVITE request according to IETF RFC 3840 [16];

2) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

3) shall include an Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

4) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP INVITE request;

5) should include the "timer" option tag in the Supported header field;

6) should include the Session-Expires header field according to IETF RFC 4028 [38]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";

7) if a one-to-one standalone SDS message is to be sent:

   a) shall insert in the SIP INVITE request a MIME resource-lists body with the MCData ID of the invited MCData user, according to rules and procedures of IETF RFC 5366 [18];

   b) shall contain an application/vnd.3gpp.mcdata-info+xml MIME body with the <mcdatainfo> element containing the <mcdata-Params> element with:

      i) the <request-type> element set to a value of "one-to-one-sds"; and

      ii) if the MCData client is aware of active functional aliases and if an active functional alias is to be included in the SIP INVITE request, the <functional-alias-URI> element set to the URI of the used functional alias; and

NOTE 0: The MCData client learns the functional aliases that are activated for an MCData ID from procedures specified in subclause 22.2.1.3.

   c) if an end-to-end security context needs to be established and the security context does not exist or if the existing security context has expired, then:

      i) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [26];

      ii) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [26];

      iii) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect one-to-one communications and with the remaining twenty eight bits being randomly generated as described in 3GPP TS 33.180 [26];

      iv) shall encrypt the PCK to a UID associated to the MCData client using the MCData ID of the invited user and a time related parameter as described in 3GPP TS 33.180 [26];

      v) shall generate a MIKEY-SAKKE I_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [26];

      vi) shall add the MCData ID of the originating MCData to the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26]; and

      vii) shall sign the MIKEY-SAKKE I_MESSAGE using the originating MCData user's signing key provided in the keying material together with a time related parameter, and add this to the MIKEY-SAKKE payload, as described in 3GPP TS 33.180 [26];

…

9) shall set the Request-URI of the SIP INVITE request to the public service identity identifying the participating MCData function serving the MCData user;

NOTE 2: The MCData client is configured with public service identity identifying the participating MCData function serving the MCData user.

10) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

11) shall include an SDP offer according to 3GPP TS 24.229 [5] with the clarifications given in subclause 9.2.3.2.1; and

12) shall send the SIP INVITE request towards the MCData server according to 3GPP TS 24.229 [5].

On receipt of a SIP 2xx response to the SIP INVITE request, the MCData client:

1) shall send a SIP ACK request as specified in 3GPP TS 24.229 [5];

2) shall start the SIP Session timer according to rules and procedures of IETF RFC 4028 [38]; and

3) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 6.1.1.2.

On receipt of a SIP 4xx response, a SIP 5xx response or a SIP 6xx response to the SIP INVITE request:

1) shall indicate to the MCData user that the SDS message could not be sent; and

2) shall send a SIP ACK request as specified in 3GPP TS 24.229 [5].

On receipt of an indication from the media plane indicating that the standalone SDS message was not sent successfully, the MCData client shall:

1) shall generate a SIP BYE request according to 3GPP TS 24.229 [5] with:

   a) Reason code set to "SIP";

   b) cause set to "480"; and

   c) text set to "transmission failed";

2) shall set the Request-URI to the MCData session identity to release; and

3) shall send a SIP BYE request towards MCData server according to 3GPP TS 24.229 [5].

On receipt of an indication from the media plane indicating that the standalone SDS message has been successfully transferred, the MCData client shall:

1) shall generate a SIP BYE request according to 3GPP TS 24.229 [5] with:

   a) Reason code set to "SIP";

   b) cause set to "200"; and

   c) text set to "transmission succeeded";

2) shall set the Request-URI to the MCData session identity to release; and

3) shall send a SIP BYE request towards MCData server according to 3GPP TS 24.229 [5].

Upon receiving a SIP 200 (OK) response to the SIP BYE request, the MCData client shall interact with the media plane and indicate to terminate the session, as specified in 3GPP TS 24.582 [15].

[TS 24.282, clause 9.2.3.2.1]

When composing an SDP offer according to 3GPP TS 24.229 [5], IETF RFC 4975 [17], IETF RFC 6135 [19] and IETF RFC 6714 [20] the MCData client:

1) shall include an "m=message" media-level section for the MCData media stream consisting of:

   a) the port number;

   b) a protocol field value of "TCP/MSRP", or "TCP/TLS/MSRP" for TLS;

   c) a format list field set to ‘*’;

d) an "a=sendonly" attribute;

e) an "a=path" attribute containing its own MSRP URI;

f) set the content type as "a=accept-types:application/vnd.3gpp.mcdata-signalling application/vnd.3gpp.mcdata-payload"; and

g) set the a=setup attribute as "actpass"; and

2) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the MIKEY-SAKKE I_MESSAGE in an "a=key-mgmt" attribute as a "mikey" attribute value in the SDP offer as specified in IETF RFC 4567 [45].

[TS 24.282, clause 13.2.2.2.2.1]

When the MCData client wants to release a MCData communication established over the media plane, the MCData client:

1) shall generate a SIP BYE request according to 3GPP TS 24.229 [5];

2) shall set the Request-URI to the MCData session identity to be released; and

3) shall send the SIP BYE request towards MCData server according to 3GPP TS 24.229 [5].

Upon receiving a SIP 200 (OK) response to the SIP BYE request, the MCData client shall release all media plane resources corresponding to the MCData communication being released.

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

[TS 24.582, clause 6.1.1.2.1]

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the originating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act according to IETF RFC 6135 [12], as:

   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and

   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11]; and

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;

2. shall generate a SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;

3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4; and

4. shall send the MSRP SEND request on the established MSRP connection.

If MSRP chunking is not used then on receipt of a 200 (OK) response, the MCData client shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary;

2. shall wait for a 200 (OK) response to each MSRP SEND request sent; and

3. on receipt of the last 200 (OK) response shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks;

2. shall indicate to MCData user that the SDS message could not be sent; and

3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving an indication to terminate the session from the signalling plane, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks and may indicate to MCData user that the SDS message could not be sent.

[TS 24.582, clause 6.1.1.2.2]

In order to generate an SDS signalling payload, the MCData client:

1. shall generate an SDS SIGNALLING PAYLOAD message as specified in 3GPP TS 24.282 [8]; and

2. shall include the SDS SIGNALLING PAYLOAD message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in 3GPP TS 24.282 [8]; and

When generating a an SDS SIGNALLING PAYLOAD message, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD message as defined in 3GPP TS 24.282 [8]. In the SDS SIGNALLING PAYLOAD message, the MCData client:

   a. may include and set the Disposition request type IE to:

      i. "DELIVERY", if only delivery disposition is requested;

      ii. "READ", if only read disposition is requested; or

      iii. "DELIVERY AND READ", if both delivery and read dispositions are requested;

   b. shall set Date and time IE to current UTC time;

   c. shall set Conversation ID IE to a universally unique message ID generated as per IETF RFC 4122 [10];

   d. shall set Message ID IE to a universally unique message ID generated as per IETF RFC 4122 [10];

   e. if indicated that the SDS message is in reply to another SDS message then, shall include the Reply ID IE set to the message identifier of the indicated SDS message;

   f. if indicated that the target recipient of the SDS message is an application then, shall set Application Identifier IE to the application identifier; and

   g) shall set the Sender MCData user ID to its own MCData user ID as specified in subclause 15.2.15 of 3GPP TS 24.282 [8].

[TS 24.582, clause 6.1.1.2.3]

In order to generate SDS data payload, the MCData client:

1. shall generate a DATA PAYLOAD message as specified in 3GPP TS 24.282 [8]; and
2. shall include the DATA PAYLOAD message in an application/vnd.3gpp.mcdata-payload MIME body as specified in 3GPP TS 24.282 [8].

When generating a DATA PAYLOAD message, the MCData client:

1. shall generate a SDS DATA PAYLOAD message as defined in 3GPP TS 24.282 [8]. In the SDS DATA PAYLOAD message, the MCData client:
   a. shall set Number of payloads IE to the total number of payloads being sent; and
   b. for each payload, shall include Payload IE. In the Payload IE:
      i. shall set Payload content type to "TEXT", or "BINARY", or "HYPERLINKS", or "LOCATION" according to the payload type; and
      ii. shall set Payload data IE to actual payload.

[TS 24.582, clause 6.1.1.2.4]

The MCData client shall take the procedures in subclause 6.4.1 into consideration when generating MSRP SEND messages.

The MCData client shall generate MSRP SEND for SDS message requests according to IETF RFC 4975 [11].

When generating an MSRP SEND for SDS message request containing an SDS SIGNALLING PAYLOAD message and an SDS DATA PAYLOAD message, the MCData client

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall include two MIME bodies in accordance with subclause 6.4.1 where:
   a. in the first body the Content-Type header field is set to "application/vnd.3gpp.mcdata-signalling" and the generated SDS SIGNALLING PAYLOAD message is included; and
   b. in the second body the Content-Type header field is set to "application/vnd.3gpp.mcdata-payload" and the generated SDS DATA PAYLOAD message is included.

When generating an MSRP SEND for SDS message request containing only an SDS DATA PAYLOAD message, the MCData client:

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the Content-Type as "application/vnd.3gpp.mcdata-payload"; and
3. shall set the body of the MSRP SEND request to the generated SDS DATA PAYLOAD message.

When generating an MSRP SEND for SDS message request containing only an SDS SIGNALLING PAYLOAD, the MCData client.

1. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;
2. shall set the Content-Type as "application/vnd.3gpp.mcdata-signalling"; and
3. shall set the body of the MSRP SEND request to the generated SDS SIGNALLING PAYLOAD message.

6.1.22.3 Test description

6.1.22.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

Preamble:

- The <max-payload-size-sds-cplane-bytes> element of the MCData Service Configuration document shall be set to 0 to force the MCData client to send the data using the media plane.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The UE has performed procedure 'UE initiated MCX functional alias status determination and subscription' as specified in TS 36.579-1 [2] clause 5.3.36.
- The UE has performed procedure 'UE initiated MCX functional alias status change' as specified in TS 36.579-1 [2] clause 5.3.37.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.1.22.3.2 Test procedure sequence

Table 6.1.22.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send a one-to-one standalone SDS message with disposition request "**DELIVERY**" using an active Functional Alias. (NOTE 1)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.2.3-1?	-	-	1,2	P
3	Check: Does the UE (MCData client) correctly perform procedure 'CO MSRP message transfer' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 to **send an SDS message with disposition request "DELIVERY"**?	-	-	2	P
4	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.6.3-1?	-	-	3	P
5	Check: Does the UE (MCData client) correctly perform procedure 'MCX SIP MESSAGE CT' as described in TS 36.579-1 [2] Table 5.3.33.3-1 to **receive the disposition notification** for the SDS message sent at step 3?	-	-	-	-
6	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	4	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

6.1.22.3.3 Specific message contents

Table 6.1.22.3.3-1: SIP INVITE from the UE (step 2, Table 6.1.22.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.1-1, condition MCDATA_SDS, MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	As described in Table 6.1.22.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.1.22.3.3-3			

Table 6.1.22.3.3-2: SDP for SIP INVITE (Table 6.1.22.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_SDS, SDP_OFFER, MCD_1to1

Table 6.1.22.3.3-3: MCData-Info (Table 6.1.22.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_1to1, FUNCTIONAL_ALIAS

Table 6.1.22.3.3-4: SIP 200 (OK) from the SS (step 2, Table 6.1.22.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.2-1, condition INVITE-RSP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
SDP message	As described in Table 6.1.22.3.3-5			

Table 6.1.22.3.3-5: SDP for SIP 200 (OK) (Table 6.1.22.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_SDS, SDP_ANSWER

Table 6.1.22.3.3-6: MSRP SEND from the UE (step 3, Table 6.1.22.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"multipart/mixed"			
data	Message or chunk of message as specified in table 6.1.22.3.3-7			

Table 6.1.22.3.3-7: MIME Message (step 3, Table 6.1.22.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: RFC 2046 [38]				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in table 6.1.22.3.3-8			
MIME body part		**MCData Data message**		
MIME-part-headers				
Content-Type	"application/vnd.3gpp. mcdata-payload"			
MIME-part-body	DATA PAYLOAD as described in Table 6.1.22.3.3-9			

Table 6.1.22.3.3-8: SDS SIGNALLING PAYLOAD (Table 6.1.22.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.1.22.3.3-9: Data Payload (Table 6.1.22.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.2-1

Table 6.1.22.3.3-10: SIP BYE from the UE (step 4, Table 6.1.22.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.6.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.2.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Reason			RFC 3326 [125]	
reason-value	"SIP"			
protocol-cause	"cause="200""			
reason-text	"text="transmission succeeded""			

Table 6.1.22.3.3-11: SIP MESSAGE from the SS (step 5, Table 6.1.22.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.1.22.3.3-12			

Table 6.1.22.3.3-12: SDS NOTIFICATION (Table 6.1.22.3.3-11)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

6.2 File Distribution

6.2.1 On-network / File Distribution (FD) / FD Using HTTP / One-to-one Standalone FD / Non-Mandatory Download / FILE DOWNLOAD REQUEST ACCEPTED / FILE DOWNLOAD COMPLETED / FILE DOWNLOAD REQUEST REJECTED / FILE DOWNLOAD DEFERRED / Client Originated (CO)

6.2.1.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { MCDATA User wants to send a file that is larger than <max-data-size-auto-recv-bytes> via a
standalone one-to-one FD message with a non-mandatory download and with a disposition request of
"FILE DOWNLOAD COMPLETED UPDATE", and, the UE (MCDATA Client) is unaware of the URL of the Media
Storage Function }
    then { UE (MCDATA Client) sends a SIP MESSAGE to find the URL of the Media Storage Function and
responds to a SIP MESSAGE that contains the URL of the Media Storage Function with a SIP 200 (OK)
message }
            }
```

(2)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { MCDATA User wants to send a file that is larger than <max-data-size-auto-recv-bytes> via a
standalone one-to-one FD message with a non-mandatory download and with a disposition request of
```

```
"FILE DOWNLOAD COMPLETED UPDATE", and, the UE (MCDATA Client) is aware of the URL of the Media
Storage Function }
    then { UE (MCDATA Client) uploads the file to the Media Storage Function via an HTTP POST
message and then sends the URL of the file location to the recipient via a SIP MESSAGE message }
            }
```

(3)

```
with { MCDATA User having requesting the sending of a file that is larger than <max-data-size-auto-
recv-bytes> via a standalone one-to-one FD message with a non-mandatory download and with a
disposition request of "FILE DOWNLOAD COMPLETED UPDATE" and the UE (MCDATA Client) having sent the
URL of the file location to the recipient }
ensure that {
  when { UE (MCDATA Client) receives a FD notification via a SIP MESSAGE with disposition
notification type of "FILE DOWNLOAD REQUEST REJECTED" }
    then { UE (MCDATA Client) responds to the SIP MESSAGE with a SIP 200 (OK) message and delivers
the notification that the remote Client has not accepted the download to the MCDATA User }
            }
```

(4)

```
with { MCDATA User having requesting the sending of a file that is larger than <max-data-size-auto-
recv-bytes> via a standalone one-to-one FD message with a non-mandatory download and with a
disposition request of "FILE DOWNLOAD COMPLETED UPDATE" and the UE (MCDATA Client) having sent the
URL of the file location to the recipient }
ensure that {
  when { UE (MCDATA Client) receives a FD notification via a SIP MESSAGE with disposition
notification type of "FILE DOWNLOAD DEFERRED", followed by a SIP MESSAGE with disposition
notification type of "FILE DOWNLOAD REQUEST ACCEPTED", followed by SIP MESSAGE with disposition
notification type of "FILE DOWNLOAD COMPLETED" }
    then { UE (MCDATA Client) responds to each SIP MESSAGE with a SIP 200 (OK) message and delivers
suitable notification on the respective remote Client action to the MCDATA User }
            }
```

6.2.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.1.3.2, 10.2.2.1, 10.2.4.2.1, 12.2.1.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.1.3.2]

To discover the absolute URI of the media storage function, the MCData client shall generate a SIP MESSAGE request towards the participating MCData function, in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with a <request-type> element containing the value "msf-disc-req";

4) if the upload of a file is for a group standalone FD request, shall include in an application/vnd.3gpp.mcdata-info+xml MIME body, the <mcdata-calling-group-id> element set to the required MCData group identity; and

NOTE 1: The absence of a group identity in the <mcdata-calling-group-id> element of the application/vnd.3gpp.mcdata-info+xml MIME body implies that the MCData client intends to upload a file for a one-to-one FD request. In this case, the participating MCData function identifies the MCData ID of the user from the binding between the public user identity and the MCData ID.

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of a "SIP MESSAGE request for absolute URI discovery response", the MCData client:

1) shall store the absolute URI found in the <mcdata-controller-psi> element;

2) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5]; and

3) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 10.2.2.1]

If the media storage client is not aware of the absolute URI of the media storage function, the media storage client shall request the MCData client to discover the absolute URI associated with the media storage function by following the procedures in subclause 10.2.1.3.

The media storage client shall send HTTP requests over a TLS connection as specified for the HTTP client in the UE in annex A of 3GPP TS 24.482 [24].

NOTE 1: The HTTP client encodes the MCData ID in the bearer access token of the Authorization header field of an HTTP request as specified in 3GPP TS 24.482 [24].

NOTE 2: The HTTP client always sends the HTTP requests to an HTTP proxy. Annex A of 3GPP TS 24.482 [24] indicates how the HTTP proxy forwards the HTTP request to the HTTP server.

To upload a file to media storage function, the media storage client:

1) shall generate an HTTP POST request as specified in IETF RFC 7230 [22] and IETF RFC 7231 [23];

2) shall set the Request-URI to the absolute URI identifying the resource on a media storage function;

3) shall set the Host header field to a hostname identifying the media storage function;

4) shall set the Content-Type header field to multipart/mixed and with a boundary delimiter parameter set to any chosen value;

5) if the file upload is for one-to-one file distribution, shall insert an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <request-type> element set to a value of "one-to-one-fd"; and

   b) the <mcdata-calling-user-id> element set to the originating MCData ID;

6) if the file upload is for group file distribution, shall insert an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <request-type> element set to a value of "group-fd";

   b) the <mcdata-request-uri> element set to the MCData group identity; and

   c) the <mcdata-calling-user-id> element set to the originating MCData ID;

7) if end-to-end security is required for a one-to-one communication, the MCData client protects the binary data representing the file and prefixes the protected binary data with security parameters as described in 3GPP TS 33.180 [26];

8) if

   i) end-to-end security is not required for a one-to-one communication, or

   ii) the file upload is for group file distribution;

   shall include the binary data representing the file with Content-Type field set to application/octet-stream and Content-Length field set to the file size; and

9) shall send the HTTP POST request towards the media storage function.

On receipt of a HTTP 201 Created containing a Location header field with a URL identifying the location of the resource where the file has been stored on the media storage function, then the media storage client shall store this information.

[TS 24.282, clause 10.2.4.2.1]

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) if a one-to-one standalone FD message is to be sent shall insert in the SIP MESSAGE request:

   a) an application/resource-lists+xml MIME body with the MCData ID of the target MCData user, according to rules and procedures of IETF RFC 4826 [9]; and

   b) an application/vnd.3gpp.mcdata-info+xml MIME body with a <request-type> element set to a value of "one-to-one-fd";

…

4) shall generate a standalone FD message as specified in subclause 6.2.2.2; and

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

6.2.1.3 Test description

6.2.1.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

- Test File 1 for CO FD as specified in annex A.2.1 and test File 2 for CO FD as specified in Annex A.2.2 are available at the UE for upload.

Preamble:

- In the <on-network> element of the MCData Service Configuration document the <max-data-size-auto-recv-bytes> element of the <tx-and-rx-control> element shall be set to 0 to indicate non-mandatory download independent from the file size.

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.1.3.2 Test procedure sequence

Table 6.2.1.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1-12	Void	-	-	-	-
13	Make the UE (MCData client) send test file 1 (TS 36.579-7 A.2.1) for CO one-to-one FD over HTTP for non-mandatory download and with disposition request "FILE DOWNLOAD COMPLETED UPDATE". (NOTE 1, NOTE 3)	-	-	-	-
14	Check: Does the UE (MCData client) correctly perform procedure '**discovery of the absolute URI of the media storage function (one-to-one communication)**' as described in TS 36.579-1 [2] Table 5.3C.8.3-1 ?	-	-	1	P
15	Check: Does the UE (MCData client) correctly perform procedure '**FD file upload using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.10.3-1?	-	-	2	P
15A	Check: Is the content of the uploaded file the same as specified in annex A.2.1?	-	-	2	P
16-18	Void	-	-	-	-
19	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD REQUEST REJECTED"** for the FD message sent at step 15?	-	-	3	P
20	Void	-	-	-	-
21	Check: Does the UE (MCData client) notify the user that the remote client has rejected the download? (NOTE 1)	-	-	3	P
22	Make the UE (MCData client) send test file 2 (TS 36.579-7 A.2.2) for CO one-to-one FD over HTTP for non-mandatory download and with disposition request "FILE DOWNLOAD COMPLETED UPDATE". (NOTE 1, NOTE 2, NOTE 3)	-	-	-	-
-	EXCEPTION: Step 23a1 describes behaviour that depends on UE implementation.	-	-	-	-
23a1	IF the client needs to discover again the absolute URI of the media storage function THEN the UE (MCData client) performs procedure '**Discovery of the absolute URI of the media storage function (one-to-one communication)**' as described in TS 36.579-1 [2] Table 5.3C.8.3-1.	-	-	-	-
23a2 - 23a4	Void	-	-	-	-
24	Check: Does the UE (MCData client) correctly perform procedure '**FD file upload using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.10.3-1?	-	-	2	P
24A	Check: Is the content of the uploaded file the same as specified in annex A.2.2?	-	-	2	P
25-27	Void	-	-	-	-
28	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD DEFERRED"** for the FD message sent at step 24?	-	-	4	P
29	Void	-	-	-	-

30	Check: Does the UE (MCData client) notify the user that the remote client has deferred the acceptance of the download? (NOTE 1)	-	-	4	P
31	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD REQUEST ACCEPTED"** for the FD message sent at step 24?	-	-	4	P
32	Void	-	-	-	-
33	Check: Does the UE (MCData client) notify the user that the remote client has accepted the download? (NOTE 1)	-	-	4	P
34	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD COMPLETED"** for the FD message sent at step 24?	-	-	4	P
35	Void	-	-	-	-
36	Check: Does the UE (MCData client) notify the user that the remote client has completed the download? (NOTE 1)	-	-	4	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: To avoid unpredicted behaviour at the UE side due to the file upload in the previous steps, the UE shall attempt to upload a different file here. NOTE 3: Test file 1 and 2 for CO FD as specified in annex A.2.1 and A.2.2.					

6.2.1.3.3 Specific message contents

Table 6.2.1.3.3-1..6: Void

Table 6.2.1.3.3-7: HTTP POST from the UE (steps 15, 24, Table 6.2.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.3-1, condition FD_HTTP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.1.3.3-8			

Table 6.2.1.3.3-8: MCData-Info (Table 6.2.1.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-fd"			
mcdata-calling-user-id	px_MCData_ID_User_A	NOTE: the element is not encrypted		

Table 6.2.1.3.3-9..10: Void

Table 6.2.1.3.3-11: HTTP 201 Created from the SS (step 15, Table 6.2.1.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.7-1, condition FD_HTTP

Table 6.2.1.3.3-11A: HTTP 201 Created from the SS (step 24, Table 6.2.1.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.7-1, condition FD_HTTP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Location				
uri	tsc_MCData_MSF_URI & "/file-location-2"			

Table 6.2.1.3.3-12: SIP MESSAGE from the UE (steps 15, 24, Table 6.2.1.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.1.3.3-13			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.1.3.3-13A			

Table 6.2.1.3.3-13: MCData-Info (Table 6.2.1.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-fd"			

Table 6.2.1.3.3-13A: FD SIGNALLING PAYLOAD (Table 6.2.1.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.5-1, condition FD_HTTP

Table 6.2.1.3.3-14: SIP MESSAGE from the SS (step 19, Table 6.2.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.1.3.3-16			

Table 6.2.1.3.3-15: Void

Table 6.2.1.3.3-16: FD NOTIFICATION (Table 6.2.1.3.3-14)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_REJECTED

Table 6.2.1.3.3-17: SIP MESSAGE from the SS (step 28, Table 6.2.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.1.3.3-18			

Table 6.2.1.3.3-18: FD NOTIFICATION (Table 6.2.1.3.3-17)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_DEFERRED

Table 6.2.1.3.3-19: SIP MESSAGE from the SS (step 31, Table 6.2.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.1.3.3-20			

Table 6.2.1.3.3-20: FD NOTIFICATION (Table 6.2.1.3.3-19)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_ACCEPTED

Table 6.2.1.3.3-21: SIP MESSAGE from the SS (step 34, Table 6.2.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.1.3.3-22			

Table 6.2.1.3.3-22: FD NOTIFICATION (Table 6.2.1.3.3-21)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_COMPLETED

6.2.2 On-network / File Distribution (FD) / FD Using HTTP / One-to-one Standalone FD / Non-Mandatory Download / Before TDU2 Timers Expires / FILE DOWNLOAD REQUEST ACCEPTED / FILE DOWNLOAD COMPLETED / FILE DOWNLOAD REQUEST REJECTED / FILE DOWNLOAD DEFERRED / FD Client Terminated (CT)

6.2.2.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { UE (MCDATA Client) receives a SIP MESSAGE message for a standalone one-to-one FD message
with a non-mandatory download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" }
    then { UE (MCDATA Client) responds with a SIP 200 (OK) message and notifies the MCDATA User
about the incoming FD request }
            }
```

(2)

```
with { UE (MCDATA Client) having received a standalone one-to-one FD message with a non-mandatory
download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" }
ensure that {
  when { the MCDATA User requests to accept the FD request }
    then { UE (MCDATA Client) generates an FD NOTIFICATION indicating acceptance of the FD request
and attempts to download the file with an HTTP GET message }
            }
```

(3)

```
with { MCDATA User having accepted an FD request with a disposition of "FILE DOWNLOAD COMPLETE
UPDATE" }
ensure that {
  when { UE (MCDATA Client) has successfully downloaded the file }
    then { UE (MCDATA Client) notifies the MCDATA User that the file has successfully downloaded and
generates an FD NOTIFICATION indicating the successful download of the file }
            }
```

(4)

```
with { UE (MCDATA Client) having received a standalone one-to-one FD message with a non-mandatory
download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" }
ensure that {
```

```
  when { the MCDATA User requests to reject the FD request }
    then { UE (MCDATA Client) generates an FD NOTIFICATION indicating the rejection of the FD
request }
            }
```

(5)

```
with { UE (MCDATA Client) having received a standalone one-to-one FD message with a non-mandatory
download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" }
ensure that {
  when { the MCDATA User requests to defer the FD request before the expiration of the TDU2 (FD non-
mandatory download timer) timer }
    then { UE (MCDATA Client) generates an FD NOTIFICATION indicating the deferral of the FD request
}
            }
```

6.2.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.4.2.2, 10.2.1.2.3, 12.2.1.1, 10.2.3.1. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.4.2.2]

Upon receipt of a "SIP MESSAGE request for FD using HTTP for terminating MCData client", the MCData client:

1) may reject the SIP MESSAGE request if there are not enough resources to handle the SIP MESSAGE request;

2) if the SIP MESSAGE request is rejected in step 1), shall respond towards the participating MCData function with a SIP 480 (Temporarily unavailable) response and skip the rest of the steps of this subclause;

3) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

4) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5]; and

5) shall handle the received message as specified in subclause 10.2.1.2.

[TS 24.282, clause 10.2.1.2.3]

The MCData client:

1) if the FD SIGNALLING PAYLOAD message does not contain an Application ID IE:

   a) shall determine that the payload contained in the Payload IE in the FD SIGNALLING PAYLOAD message is for user consumption;

   b) shall notify the user about the incoming FD request; and

   c) if the FD SIGNALLING PAYLOAD message contains a Metadata IE, shall deliver the contents of the Metadata IE to the user;

2) if the FD SIGNALLING PAYLOAD message contains an Application ID IE:

   a) shall determine that the payload contained in the Payload IE in the FD SIGNALLING PAYLOAD message is not for user consumption;

   b) if the Application ID value is unknown, shall discard the FD message and exit this subclause;

   c) if the Application ID value is known, shall notify the application of the incoming FD request; and

NOTE 1: If FD request is addressed to a non-MCData application that is not running, the MCData client starts the local non-MCData application.

   d) if the FD SIGNALLING PAYLOAD message contains a Metadata IE, shall deliver the contents of the Metadata IE to the application;

3) shall start a timer TDU2 (FD non-mandatory download timer) with the timer value as specified in subclause F.2.3;

4) shall wait for the user or application to request to download the file indicated by file URL in the Payload data in the Payload IE in the FD SIGNALLING PAYLOAD message;

5) if the user or application accepts or rejects or decides to defer the FD request, shall stop timer TDU2 (FD non-mandatory download timer);

6) if the user deferred the FD request while the timer TDU2 (FD non-mandatory download timer) was running, shall generate an FD NOTIFICATION indicating deferral of the FD request as specified in subclause 12.2.1.1;

NOTE 2: Once the timer TDU2 (FD non-mandatory download timer) has expired the FD request can only be accepted or rejected with an appropriate action by the MCData client.

NOTE 3: Once the timer TDU2 (FD non-mandatory download timer) has expired, no action is taken by the MCData client if the FD request is deferred.

7) if the user or application rejects the FD request, shall generate an FD NOTIFICATION indicating rejection of the FD request as specified in subclause 12.2.1.1 and shall exit this subclause; and

8) if the user accepts the FD request:

   a) shall generate an FD NOTIFICATION indicating acceptance of the FD request as specified in subclause 12.2.1.1;

   b) if the FD SIGNALLING PAYLOAD message contains a new Conversation ID, shall instantiate a new conversation with the Message ID in the FD SIGNALLING PAYLOAD identifying the first message in the conversation thread;

   c) if the FD SIGNALLING PAYLOAD message contains an existing Conversation ID and:

      i) if the FD SIGNALLING PAYLOAD message does not contain an InReplyTo message ID, shall use the Message ID in the FD SIGNALLING PAYLOAD to identify a new message in the existing conversation thread; and

      ii) if the FD SIGNALLING PAYLOAD message contains an InReplyTo message ID, shall associate the message to an existing message in the conversation thread as identified by the InReplyTo message ID in the FD SIGNALLING PAYLOAD, and use the Message ID in the FD SIGNALLING PAYLOAD to identify the new message;

   d) may store the Conversation ID, Message ID, InReplyTo message ID and Date and time in local storage;

   e) shall attempt to download the file as identified by the file URL in the Payload IE in the FD SIGNALLING PAYLOAD message, as specified in subclause 10.2.3.1; and

   f) if the received FD SIGNALLING PAYLOAD message contains an FD disposition request type IE requesting a file download completed update, then after the file download has been successfully downloaded, shall generate an FD NOTIFICATION by following the procedures in subclause 12.2.1.1.

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or

- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and

- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];

4) void;

5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;

6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

7) if requiring to send an FD notification, shall generate an FD NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.2; and

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 10.2.3.1]

The media storage client on the MCData client shall send HTTP requests over a TLS connection as specified for the HTTP client in the UE, in annex A of 3GPP TS 24.482 [24].

NOTE 1: The HTTP client encodes the MCData ID in the bearer access token of the Authorization header field of an HTTP request as specified in 3GPP TS 24.482 [24].

NOTE 2: The HTTP client always sends the HTTP requests to an HTTP proxy. Annex A of 3GPP TS 24.482 [24] indicates how the HTTP proxy forwards the HTTP request to the HTTP server.

To download a file from the media storage function on the controlling MCData function, the media storage client on the MCData client:

1) shall generate an HTTP GET request as specified in IETF RFC 7230 [22] and IETF RFC 7231 [23] with a Request-URI set to an absolute URI identifying the URL of the file being requested from the media storage function on the controlling MCData function; and

2) shall send the HTTP GET request towards the media storage function on the controlling MCData function.

On receipt of a HTTP 200 OK response containing the requested file, the MCData client shall notify the user or application that the file has been successfully downloaded.

6.2.2.3 Test description

6.2.2.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- Test files downloaded or received at previous test runs are deleted.

Preamble:

- In the <on-network> element of the MCData Service Configuration document the <max-data-size-auto-recv-bytes> element of the <tx-and-rx-control> element shall be set to 0 to indicate non-mandatory download independent from the file size.
- TDU2 (FD non-mandatory download timer) is set to the default value of 60 seconds.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.2.3.2 Test procedure sequence

Table 6.2.2.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD message for one-to-one file distribution with disposition request "FILE DOWNLOAD COMPLETED UPDATE"**? (NOTE 2)	-	-	1	P
2	Void	-	-	-	-
3	Check: Does the UE (MCData client) notify the user of the incoming FD request? (NOTE 1)	-	-	1	P
4	Make the UE (MCData client) accept the FD request and download the file before timer TDU2 expires. (NOTE 1)	-	-	-	-
5	Check: Does the UE (MCData client) correctly perform procedure '**FD file accept and download using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.11.3-1 to download test file 1? (NOTE 3)	-	-	2,3	P
6-8	Void	-	-	-	-
9	Check: Does the UE (MCData client) notify the user of the file download? (NOTE 1)	-	-	3	P
9A	Check: Has the UE (MCData client) downloaded test file 1 (TS 36.579-7 A.3.1)? (NOTE 1)	-	-	2	P
10-11	Void	-	-	-	-
12	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD message for one-to-one file distribution with disposition request "FILE DOWNLOAD COMPLETED UPDATE"**? (NOTE 2)	-	-	1	P
13	Void	-	-	-	-
14	Check: Does the UE (MCData client) notify the user of the incoming FD request? (NOTE 1)	-	-	1	P
15	Make the UE (MCData client) reject the FD request before timer TDU2 expires. (NOTE 1)	-	-	-	-
16	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD REQUEST REJECTED"?**	-	-	4	P
17	Void	-	-	-	-
18	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD message for one-to-one file distribution with disposition request "FILE DOWNLOAD COMPLETED UPDATE"**? (NOTE 2)	-	-	1	P
19	Void	-	-	-	-

20	Check: Does the UE (MCData client) notify the user of the incoming FD request? (NOTE 1)	-	-	1	P
21	Make the UE (MCData client) defer the FD request before timer TDU2 expires. (NOTE 1)	-	-	-	-
22	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD DEFERRED"?**	-	-	5	P
23	Void	-	-	-	-
24	Make the UE (MCData client) accept the deferred FD request and download the file. (NOTE 1)	-	-	-	-
25	Check: Does the UE (MCData client) correctly perform procedure '**FD file accept and download using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.11.3-1 to download test file 2? (NOTE 3)	-	-	2,3	P
26-28	Void	-	-	-	-
29	Check: Does the UE (MCData client) notify the user of the file download? (NOTE 1)	-	-	3	P
29A	Check: Has the UE (MCData client) downloaded test file 2 (TS 36.579-7 A.3.3)? (NOTE 1)	-	-	2	P
30-31	Void	-	-	-	-

NOTE 1: This is expected to be done via a suitable implementation dependent MMI.
NOTE 2: Timer TDU2 (FD non-mandatory download timer) starts on reception of the FD request via the SIP MESSAGE request.
NOTE 3: Test file 1 and 2 for CT FD as specified in annex A.3.1 and A.3.2.

6.2.2.3.3 Specific message contents

Table 6.2.2.3.3-1: SIP MESSAGE from the SS (steps 1, 12, 18, Table 6.2.2.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.2.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.2.3.3-2A			

Table 6.2.2.3.3-2: MCData-Info (Table 6.2.2.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-fd"			

Table 6.2.2.3.3-2A: FD SIGNALLING PAYLOAD (Table 6.2.2.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.6-1, condition FD_HTTP

Table 6.2.2.3.3-3: Void

Table 6.2.2.3.3-4: SIP MESSAGE from the UE (steps 5, 25, Table 6.2.2.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData-Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.2.3.3-5			

Table 6.2.2.3.3-5: FD NOTIFICATION (Table 6.2.2.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_ACCEPTED

Table 6.2.2.3.3-6: HTTP GET from the UE (steps 5, 25, Table 6.2.2.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.2-1, condition FD_HTTP

Table 6.2.2.3.3-7: HTTP 200 (OK) from the SS (steps 5, 25, Table 6.2.2.3.2-1; step 5, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.6-1, condition FD_HTTP

Table 6.2.2.3.3-8..9: Void

Table 6.2.2.3.3-10: SIP MESSAGE from the UE (steps 5, 25, Table 6.2.2.3.2-1; step 6a1, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData-Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.2.3.3-11			

Table 6.2.2.3.3-11: FD NOTIFICATION (Table 6.2.2.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_COMPLETED

Table 6.2.2.3.3-12: SIP MESSAGE from the UE (step 16, Table 6.2.2.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData-Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.2.3.3-13			

Table 6.2.2.3.3-13: FD NOTIFICATION (Table 6.2.2.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_REJECTED

Table 6.2.2.3.3-14: SIP MESSAGE from the UE (step 22, Table 6.2.2.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData-Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.2.3.3-15			

Table 6.2.2.3.3-15: FD NOTIFICATION (Table 6.2.2.3.3-14)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_DEFERRED

6.2.3 On-network / File Distribution (FD) / FD Using HTTP / Group Standalone FD / Non-Mandatory Download / FILE DOWNLOAD REQUEST ACCEPTED / FILE DOWNLOAD COMPLETED / FILE DOWNLOAD REQUEST REJECTED / Client Originated (CO)

6.2.3.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a Group Standalone FD message with a non-mandatory
download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" and the UE (MCDATA Client) is
unaware of the URL of the Media Storage Function }
    then { UE (MCDATA Client) sends a SIP MESSAGE to find the URL of the Media Storage Function and
responds to a SIP MESSAGE that contains the URL of the Media Storage Function with a SIP 200 (OK)
message }
            }
```

(2)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a Group Standalone FD message with a non-mandatory
download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" and the UE (MCDATA Client) is
aware of the URL of the Media Storage Function }
    then { UE (MCDATA Client) uploads the file to the Media Storage Function via an HTTP POST
message and then sends the URL of the file location to the recipient via a SIP MESSAGE message }
            }
```

(3)

```
with { UE (MCDATA Client) having sent the URL of the file location to the recipient }
ensure that {
  when { UE (MCDATA Client) receives a FD notification via a SIP MESSAGE message }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message with a SIP 200 (OK) message and
delivers the notification to the MCDATA User }
            }
```

6.2.3.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.1.3.2, 10.2.2.1, 10.2.4.2.1, 12.2.1.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.1.3.2]

To discover the absolute URI of the media storage function, the MCData client shall generate a SIP MESSAGE request towards the participating MCData function, in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with a <request-type> element containing the value "msf-disc-req";

4) if the upload of a file is for a group standalone FD request, shall include in an application/vnd.3gpp.mcdata-info+xml MIME body, the <mcdata-calling-group-id> element set to the required MCData group identity; and

NOTE 1: The absence of a group identity in the <mcdata-calling-group-id> element of the application/vnd.3gpp.mcdata-info+xml MIME body implies that the MCData client intends to upload a file for a one-to-one FD request. In this case, the participating MCData function identifies the MCData ID of the user from the binding between the public user identity and the MCData ID.

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of a "SIP MESSAGE request for absolute URI discovery response", the MCData client:

1) shall store the absolute URI found in the <mcdata-controller-psi> element;

2) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5]; and

3) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 10.2.2.1]

If the media storage client is not aware of the absolute URI of the media storage function, the media storage client shall request the MCData client to discover the absolute URI associated with the media storage function by following the procedures in subclause 10.2.1.3.

The media storage client shall send HTTP requests over a TLS connection as specified for the HTTP client in the UE in annex A of 3GPP TS 24.482 [24].

NOTE 1: The HTTP client encodes the MCData ID in the bearer access token of the Authorization header field of an HTTP request as specified in 3GPP TS 24.482 [24].

NOTE 2: The HTTP client always sends the HTTP requests to an HTTP proxy. Annex A of 3GPP TS 24.482 [24] indicates how the HTTP proxy forwards the HTTP request to the HTTP server.

To upload a file to media storage function, the media storage client:

1) shall generate an HTTP POST request as specified in IETF RFC 7230 [22] and IETF RFC 7231 [23];

2) shall set the Request-URI to the absolute URI identifying the resource on a media storage function;

3) shall set the Host header field to a hostname identifying the media storage function;

4) shall set the Content-Type header field to multipart/mixed and with a boundary delimiter parameter set to any chosen value;

5) if the file upload is for one-to-one file distribution, shall insert an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <request-type> element set to a value of "one-to-one-fd"; and

   b) the <mcdata-calling-user-id> element set to the originating MCData ID;

6) if the file upload is for group file distribution, shall insert an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <request-type> element set to a value of "group-fd";

   b) the <mcdata-request-uri> element set to the MCData group identity; and

   c) the <mcdata-calling-user-id> element set to the originating MCData ID;

7) if end-to-end security is required for a one-to-one communication, the MCData client protects the binary data representing the file and prefixes the protected binary data with security parameters as described in 3GPP TS 33.180 [26];

8) if

   i) end-to-end security is not required for a one-to-one communication, or

   ii) the file upload is for group file distribution;

   shall include the binary data representing the file with Content-Type field set to application/octet-stream and Content-Length field set to the file size; and

9) shall send the HTTP POST request towards the media storage function.

On receipt of a HTTP 201 Created containing a Location header field with a URL identifying the location of the resource where the file has been stored on the media storage function, then the media storage client shall store this information.

[TS 24.282, clause 10.2.4.2.1]

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) if a one-to-one standalone FD message is to be sent shall insert in the SIP MESSAGE request:

   a) an application/resource-lists+xml MIME body with the MCData ID of the target MCData user, according to rules and procedures of IETF RFC 4826 [9]; and

   b) an application/vnd.3gpp.mcdata-info+xml MIME body with a <request-type> element set to a value of "one-to-one-fd";

…

4) shall generate a standalone FD message as specified in subclause 6.2.2.2; and

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

6.2.3.3 Test description

6.2.3.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- Test File 1 for CO FD as specified in annex A.2.1 and test File 2 for CO FD as specified in Annex A.2.2 are available at the UE for upload.

Preamble:

- In the MCData Group Configuration document the <mcdata-on-network-max-data-size-auto-recv> shall be set to 0 to indicate non-mandatory download independent from the file size.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.3.3.2 Test procedure sequence

Table 6.2.3.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send test file 1 (TS 36.579-7 A.2.1) for CO group FD over HTTP for non-mandatory download and with disposition request "FILE DOWNLOAD COMPLETED UPDATE". (NOTE 1, NOTE 2)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**Discovery of the absolute URI of the media storage function (one-to-one communication)**' as described in TS 36.579-1 [2] Table 5.3C.9.3-1 ?	-	-	1	P
3	Check: Does the UE (MCData client) correctly perform procedure '**FD file upload using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.10.3-1?	-	-	2	P
3A	Check: Is the content of the uploaded file the same as specified in annex A.2.1?	-	-	2	P
4-6	Void	-	-	-	-
7	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD REQUEST ACCEPTED"** for the FD message sent at step 3?	-	-	3	P
8	Void	-	-	-	-
9	Check: Does the UE (MCData client) notify the user that the remote client has accepted the download? (NOTE 1)	-	-	3	P
10	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD COMPLETED"** for the FD message sent at step 3?	-	-	3	P
11	Void	-	-	-	-
12	Check: Does the UE (MCData client) notify the user that the remote client has completed the download? (NOTE 1)	-	-	3	P
13	Make the UE (MCData client) send test file 2 (TS 36.579-7 A.2.2) for CO group FD over HTTP for non-mandatory download and with disposition request "FILE DOWNLOAD COMPLETED UPDATE". (NOTE 1, NOTE 2)	-	-	-	-
-	EXCEPTION: Step 14a1 describes behaviour that depends on UE implementation.	-	-	-	-
14a1	IF the client needs to discover again the absolute URI of the media storage function THEN the UE (MCData client) performs procedure '**Discovery of the absolute URI of the media storage function (one-to-one communication)**' as described in TS 36.579-1 [2] Table 5.3C.9.3-1.	-	-	-	-
14a2 - 14a4	Void	-	-	-	-
15	Check: Does the UE (MCData client) correctly perform procedure '**FD file upload using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.10.3-1?	-	-	2	P

15A	Check: Is the content of the uploaded file the same as specified in annex A.2.2?	-	-	2	P
16-18	Void	-	-	-	-
19	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD REQUEST REJECTED"** for the FD message sent at step 15?	-	-	3	P
20	Void	-	-	-	-
21	Check: Does the UE (MCData client) notify the user that the remote client has rejected the download? (NOTE 1)	-	-	3	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: Test file 1 and 2 for CO FD as specified in annex A.2.1 and A.2.2.					

6.2.3.3.3 Specific message contents

Table 6.2.1.3.3-1..6: Void

Table 6.2.3.3.3-7: HTTP POST from the UE (steps 3, 15, Table 6.2.3.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.3-1, condition FD_HTTP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.3.3.3-8			

Table 6.2.3.3.3-8: MCData-Info (Table 6.2.3.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-fd"			
mcdata-request-uri	px_MCData_Group_A_ID	NOTE: the element is not encrypted		
mcdata-calling-user-id	px_MCData_ID_User_A	NOTE: the element is not encrypted		

Table 6.2.3.3.3-9: Void

Table 6.2.3.3.3-10: HTTP 201 Created from the SS (step 3, Table 6.2.3.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.7-1, condition FD_HTTP

Table 6.2.3.3.3-10A: HTTP 201 Created from the SS (step 15, Table 6.2.3.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.7-1, condition FD_HTTP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Location				
absoluteURI	tsc_MCData_MSF_URI & "/file-location-2"			

Table 6.2.3.3.3-11: SIP MESSAGE from the UE (steps 3, 15, Table 6.2.3.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.3.3.3-12			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.3.3.3-12A			

Table 6.2.3.3.3-12: MCData-Info (Table 6.2.3.3.3-11)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-fd"			

Table 6.2.3.3.3-12A: FD SIGNALLING PAYLOAD (Table 6.2.3.3.3-11)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.5-1, condition FD_HTTP

Table 6.2.3.3.3-13: SIP MESSAGE from the SS (step 7, Table 6.2.3.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.1.3.3-14			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.3.3.3-15			

Table 6.2.3.3.3-14: MCData-Info (Table 6.2.3.3.3-13)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-calling-group-id> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.2-3A		

Table 6.2.3.3.3-15: FD NOTIFICATION (Table 6.2.3.3.3-13)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_ACCEPTED

Table 6.2.3.3.3-16: SIP MESSAGE from the SS (step 10, Table 6.2.3.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.1.3.3-14			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.3.3.3-17			

Table 6.2.3.3.3-17: FD NOTIFICATION (Table 6.2.3.3.3-16)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_COMPLETED

Table 6.2.3.3.3-18: SIP MESSAGE from the SS (step 19, Table 6.2.3.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.1.3.3-14			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.3.3.3-19			

Table 6.2.3.3.3-19: FD NOTIFICATION (Table 6.2.3.3.3-18)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_REJECTED

6.2.4 On-network / File Distribution (FD) / FD Using HTTP / Group Standalone FD / Non-Mandatory Download / After TDU2 Timers Expires / FILE DOWNLOAD REQUEST ACCEPTED / FILE DOWNLOAD COMPLETED / FILE DOWNLOAD REQUEST REJECTED / Client Terminated (CT)

6.2.4.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { UE (MCDATA Client) receives a SIP MESSAGE message for a group standalone FD message with a
non-mandatory download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" }
    then { UE (MCDATA Client) responds with a SIP 200 (OK) message and notifies the MCDATA User
about the incoming FD request }
            }
```

(2)

```
with { UE (MCDATA Client) having received a group standalone FD message with a non-mandatory
download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" }
ensure that {
  when { the MCDATA User requests to accept the FD request }
    then { UE (MCDATA Client) generates an FD NOTIFICATION indicating acceptance of the FD request
and attempts to download the file with an HTTP GET message }
            }
```

(3)

```
with { MCDATA User having accepted an FD request with a disposition of "FILE DOWNLOAD COMPLETE
UPDATE" }
ensure that {
  when { UE (MCDATA Client) has successfully downloaded the file }
    then { UE (MCDATA Client) notifies the MCDATA User that the file has successfully downloaded and
generates an FD NOTIFICATION indicating the successful download of the file }
            }
```

(4)

```
with { UE (MCDATA Client) having received a group standalone FD message with a non-mandatory
download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" }
ensure that {
  when { the MCDATA User requests to reject the FD request }
    then { UE (MCDATA Client) generates an FD NOTIFICATION indicating the rejection of the FD
request }
            }
```

(5)

```
Void
```

6.2.4.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.4.2.2, 10.2.1.2.3, 12.2.1.1, 10.2.3.1. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.4.2.2]

Upon receipt of a "SIP MESSAGE request for FD using HTTP for terminating MCData client", the MCData client:

1) may reject the SIP MESSAGE request if there are not enough resources to handle the SIP MESSAGE request;

2) if the SIP MESSAGE request is rejected in step 1), shall respond towards the participating MCData function with a SIP 480 (Temporarily unavailable) response and skip the rest of the steps of this subclause;

3) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

4) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5]; and

5) shall handle the received message as specified in subclause 10.2.1.2.

[TS 24.282, clause 10.2.1.2.3]

The MCData client:

1) if the FD SIGNALLING PAYLOAD message does not contain an Application ID IE:

   a) shall determine that the payload contained in the Payload IE in the FD SIGNALLING PAYLOAD message is for user consumption;

   b) shall notify the user about the incoming FD request; and

   c) if the FD SIGNALLING PAYLOAD message contains a Metadata IE, shall deliver the contents of the Metadata IE to the user;

2) if the FD SIGNALLING PAYLOAD message contains an Application ID IE:

   a) shall determine that the payload contained in the Payload IE in the FD SIGNALLING PAYLOAD message is not for user consumption;

   b) if the Application ID value is unknown, shall discard the FD message and exit this subclause;

   c) if the Application ID value is known, shall notify the application of the incoming FD request; and

NOTE 1: If FD request is addressed to a non-MCData application that is not running, the MCData client starts the local non-MCData application.

   d) if the FD SIGNALLING PAYLOAD message contains a Metadata IE, shall deliver the contents of the Metadata IE to the application;

3) shall start a timer TDU2 (FD non-mandatory download timer) with the timer value as specified in subclause F.2.3;

4) shall wait for the user or application to request to download the file indicated by file URL in the Payload data in the Payload IE in the FD SIGNALLING PAYLOAD message;

5) if the user or application accepts or rejects or decides to defer the FD request, shall stop timer TDU2 (FD non-mandatory download timer);

6) if the user deferred the FD request while the timer TDU2 (FD non-mandatory download timer) was running, shall generate an FD NOTIFICATION indicating deferral of the FD request as specified in subclause 12.2.1.1;

NOTE 2: Once the timer TDU2 (FD non-mandatory download timer) has expired the FD request can only be accepted or rejected with an appropriate action by the MCData client.

NOTE 3: Once the timer TDU2 (FD non-mandatory download timer) has expired, no action is taken by the MCData client if the FD request is deferred.

7) if the user or application rejects the FD request, shall generate an FD NOTIFICATION indicating rejection of the FD request as specified in subclause 12.2.1.1 and shall exit this subclause; and

8) if the user accepts the FD request:

a) shall generate an FD NOTIFICATION indicating acceptance of the FD request as specified in subclause 12.2.1.1;

b) if the FD SIGNALLING PAYLOAD message contains a new Conversation ID, shall instantiate a new conversation with the Message ID in the FD SIGNALLING PAYLOAD identifying the first message in the conversation thread;

c) if the FD SIGNALLING PAYLOAD message contains an existing Conversation ID and:

i) if the FD SIGNALLING PAYLOAD message does not contain an InReplyTo message ID, shall use the Message ID in the FD SIGNALLING PAYLOAD to identify a new message in the existing conversation thread; and

ii) if the FD SIGNALLING PAYLOAD message contains an InReplyTo message ID, shall associate the message to an existing message in the conversation thread as identified by the InReplyTo message ID in the FD SIGNALLING PAYLOAD, and use the Message ID in the FD SIGNALLING PAYLOAD to identify the new message;

d) may store the Conversation ID, Message ID, InReplyTo message ID and Date and time in local storage;

e) shall attempt to download the file as identified by the file URL in the Payload IE in the FD SIGNALLING PAYLOAD message, as specified in subclause 10.2.3.1; and

f) if the received FD SIGNALLING PAYLOAD message contains an FD disposition request type IE requesting a file download completed update, then after the file download has been successfully downloaded, shall generate an FD NOTIFICATION by following the procedures in subclause 12.2.1.1.

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or

- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and

- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];

4) void;

5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;

6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

7) if requiring to send an FD notification, shall generate an FD NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.2; and

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 10.2.3.1]

The media storage client on the MCData client shall send HTTP requests over a TLS connection as specified for the HTTP client in the UE, in annex A of 3GPP TS 24.482 [24].

NOTE 1: The HTTP client encodes the MCData ID in the bearer access token of the Authorization header field of an HTTP request as specified in 3GPP TS 24.482 [24].

NOTE 2: The HTTP client always sends the HTTP requests to an HTTP proxy. Annex A of 3GPP TS 24.482 [24] indicates how the HTTP proxy forwards the HTTP request to the HTTP server.

To download a file from the media storage function on the controlling MCData function, the media storage client on the MCData client:

1) shall generate an HTTP GET request as specified in IETF RFC 7230 [22] and IETF RFC 7231 [23] with a Request-URI set to an absolute URI identifying the URL of the file being requested from the media storage function on the controlling MCData function; and

2) shall send the HTTP GET request towards the media storage function on the controlling MCData function.

On receipt of a HTTP 200 OK response containing the requested file, the MCData client shall notify the user or application that the file has been successfully downloaded.

6.2.4.3 Test description

6.2.4.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

- Test files downloaded or received at previous test runs are deleted.

Preamble:

- In the MCData Group Configuration document the <mcdata-on-network-max-data-size-auto-recv> shall be set to 0 to indicate non-mandatory download independent from the file size.

- Timer TDU2 (FD non-mandatory download timer) is configured to be 15 seconds.

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.

- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

- UE States at the end of the preamble

  - The UE is in E-UTRA Registered, Idle Mode state.

  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.4.3.2 Test procedure sequence

Table 6.2.4.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD message for group file distribution with disposition request "FILE DOWNLOAD COMPLETED UPDATE"**? (NOTE 2)	-	-	1	P
2	Void	-	-	-	-
3	Check: Does the UE (MCData client) notify the user of the incoming FD request? (NOTE 1)	-	-	1	P
4	The SS waits 15s for expiry of timer TDU2.	-	-	-	-
4A	Make the UE (MCData client) accept the FD request and download the file. (NOTE 1)	-	-	-	-
5	Check: Does the UE (MCData client) correctly perform procedure '**FD file accept and download using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.11.3-1 to download test file 1? (NOTE 3)	-	-	2,3	P
6-8	Void	-	-	-	-
9	Check: Does the UE (MCData client) notify the user of the file download? (NOTE 1)	-	-	3	P
9A	Check: Has the UE (MCData client) downloaded test file 1 (TS 36.579-7 A.3.1)? (NOTE 1)	-	-	2	P
10-11	Void	-	-	-	-
12	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD message for group file distribution with disposition request "FILE DOWNLOAD COMPLETED UPDATE"**? (NOTE 2)	-	-	1	P
13	Void	-	-	-	-
14	Check: Does the UE (MCData client) notify the user of the incoming FD request? (NOTE 1)	-	-	1	P
15	The SS waits 15s for expiry of timer TDU2.	-	-	-	-
15A	Make the UE (MCData client) reject the FD request. (NOTE 1)	-	-	-	-
16	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD REQUEST REJECTED"?**	-	-	4	P
17	Void	-	-	-	-

NOTE 1: This is expected to be done via a suitable implementation dependent MMI.
NOTE 2: Timer TDU2 (FD non-mandatory download timer) starts on reception of the FD request via the SIP MESSAGE request.
NOTE 3: Test file 1 for CT FD as specified in annex A.3.1.

6.2.4.3.3 Specific message contents

Table 6.2.4.3.3-1: SIP MESSAGE from the SS (steps 1, 12, Table 6.2.4.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.4.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.4.3.3-2A			

Table 6.2.4.3.3-2: MCData-Info (Table 6.2.4.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-fd"			

Table 6.2.4.3.3-2A: FD SIGNALLING PAYLOAD (Table 6.2.2.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.6-1, condition FD_HTTP

Table 6.2.4.3.3-3: Void

Table 6.2.4.3.3-4: SIP MESSAGE from the UE (step 5, Table 6.2.4.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.4.3.3-5			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.4.3.3-6			

Table 6.2.4.3.3-5: MCData-Info (Table 6.2.4.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-request-uri> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.1-3A		

Table 6.2.4.3.3-6: FD NOTIFICATION (Table 6.2.4.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_ACCEPTED

Table 6.2.4.3.3-7: HTTP GET from the UE (step 5, Table 6.2.4.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.2-1, condition FD_HTTP

Table 6.2.4.3.3-8: HTTP 200 (OK) from the SS (step 5, Table 6.2.4.3.2-1; step 5, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.6-1, condition FD_HTTP

Table 6.2.4.3.3-9: Void

Table 6.2.4.3.3-10: SIP MESSAGE from the UE (step 5, Table 6.2.4.3.2-1; step 6a1, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-headers	MCData-Info as described in Table 6.2.4.3.3-5			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.4.3.3-11			

Table 6.2.4.3.3-11: FD NOTIFICATION (Table 6.2.4.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_COMPLETED

Table 6.2.4.3.3-12: SIP MESSAGE from the UE (step 16, Table 6.2.4.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-headers	MCData-Info as described in Table 6.2.4.3.3-5			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.4.3.3-13			

Table 6.2.4.3.3-13: FD NOTIFICATION (Table 6.2.4.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_REJECTED

6.2.5 On-network / File Distribution (FD) / FD Using HTTP / One-to-one Standalone FD / Mandatory Download / With Disposition Request / Client Originated (CO)

6.2.5.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a standalone one-to-one FD message with a mandatory
download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" and the UE (MCDATA Client) is
unaware of the URL of the Media Storage Function }
    then { UE (MCDATA Client) sends a SIP MESSAGE to find the URL of the Media Storage Function and
responds to a SIP MESSAGE that contains the URL of the Media Storage Function with a SIP 200 (OK)
message }
            }
```

(2)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a standalone one-to-one FD message with a mandatory
download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" and the UE (MCDATA Client) is
aware of the URL of the Media Storage Function }
    then { UE (MCDATA Client) uploads the file to the Media Storage Function via an HTTP POST
message and then sends the URL of the file location to the recipient via a SIP MESSAGE message }
            }
```

(3)

```
with { UE (MCDATA Client) having sent the URL of the file location to the recipient }
ensure that {
  when { UE (MCDATA Client) receives a FD notification via a SIP MESSAGE message }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message with a SIP 200 (OK) message and
delivers the notification to the MCDATA User }
            }
```

6.2.5.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.1.3.2, 10.2.2.1, 10.2.4.2.1, 12.2.1.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.1.3.2]

To discover the absolute URI of the media storage function, the MCData client shall generate a SIP MESSAGE request towards the participating MCData function, in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with a <request-type> element containing the value "msf-disc-req";

4) if the upload of a file is for a group standalone FD request, shall include in an application/vnd.3gpp.mcdata-info+xml MIME body, the <mcdata-calling-group-id> element set to the required MCData group identity; and

NOTE 1: The absence of a group identity in the <mcdata-calling-group-id> element of the application/vnd.3gpp.mcdata-info+xml MIME body implies that the MCData client intends to upload a file for a one-to-one FD request. In this case, the participating MCData function identifies the MCData ID of the user from the binding between the public user identity and the MCData ID.

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of a "SIP MESSAGE request for absolute URI discovery response", the MCData client:

1) shall store the absolute URI found in the <mcdata-controller-psi> element;

2) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5]; and

3) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 10.2.2.1]

If the media storage client is not aware of the absolute URI of the media storage function, the media storage client shall request the MCData client to discover the absolute URI associated with the media storage function by following the procedures in subclause 10.2.1.3.

The media storage client shall send HTTP requests over a TLS connection as specified for the HTTP client in the UE in annex A of 3GPP TS 24.482 [24].

NOTE 1: The HTTP client encodes the MCData ID in the bearer access token of the Authorization header field of an HTTP request as specified in 3GPP TS 24.482 [24].

NOTE 2: The HTTP client always sends the HTTP requests to an HTTP proxy. Annex A of 3GPP TS 24.482 [24] indicates how the HTTP proxy forwards the HTTP request to the HTTP server.

To upload a file to media storage function, the media storage client:

1) shall generate an HTTP POST request as specified in IETF RFC 7230 [22] and IETF RFC 7231 [23];

2) shall set the Request-URI to the absolute URI identifying the resource on a media storage function;

3) shall set the Host header field to a hostname identifying the media storage function;

4) shall set the Content-Type header field to multipart/mixed and with a boundary delimiter parameter set to any chosen value;

5) if the file upload is for one-to-one file distribution, shall insert an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <request-type> element set to a value of "one-to-one-fd"; and

   b) the <mcdata-calling-user-id> element set to the originating MCData ID;

6) if the file upload is for group file distribution, shall insert an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <request-type> element set to a value of "group-fd";

   b) the <mcdata-request-uri> element set to the MCData group identity; and

   c) the <mcdata-calling-user-id> element set to the originating MCData ID;

7) if end-to-end security is required for a one-to-one communication, the MCData client protects the binary data representing the file and prefixes the protected binary data with security parameters as described in 3GPP TS 33.180 [26];

8) if

   i) end-to-end security is not required for a one-to-one communication, or

   ii) the file upload is for group file distribution;

   shall include the binary data representing the file with Content-Type field set to application/octet-stream and Content-Length field set to the file size; and

9) shall send the HTTP POST request towards the media storage function.

On receipt of a HTTP 201 Created containing a Location header field with a URL identifying the location of the resource where the file has been stored on the media storage function, then the media storage client shall store this information.

[TS 24.282, clause 10.2.4.2.1]

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) if a one-to-one standalone FD message is to be sent shall insert in the SIP MESSAGE request:

   a) an application/resource-lists+xml MIME body with the MCData ID of the target MCData user, according to rules and procedures of IETF RFC 4826 [9]; and

   b) an application/vnd.3gpp.mcdata-info+xml MIME body with a <request-type> element set to a value of "one-to-one-fd";

…

4) shall generate a standalone FD message as specified in subclause 6.2.2.2; and

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

6.2.5.3 Test description

6.2.5.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

- Test File 1 for CO FD as specified in annex A.2.1 is available at the UE for upload.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.

- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

- UE States at the end of the preamble

  - The UE is in E-UTRA Registered, Idle Mode state.

  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.5.3.2 Test procedure sequence

Table 6.2.5.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send test file 1 (TS 36.579-7 A.2.1) for CO one-to-one FD over HTTP for mandatory download and with disposition request "FILE DOWNLOAD COMPLETED UPDATE". (NOTE 1, NOTE 2)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**Discovery of the absolute URI of the media storage function (one-to-one communication)**' as described in TS 36.579-1 [2] Table 5.3C.8.3-1 ?	-	-	1	P
3	Check: Does the UE (MCData client) correctly perform procedure '**FD file upload using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.10.3-1?	-	-	2	P
3A	Check: Is the content of the uploaded file the same as specified in annex A.2.1?	-	-	2	P
4-6	Void	-	-	-	-
7	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD REQUEST ACCEPTED"** for the FD message sent at step 3?	-	-	3	P
8	Void	-	-	-	-
9	Check: Does the UE (MCData client) notify the user that the remote client has accepted the download? (NOTE 1)	-	-	3	P
10	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD COMPLETED"** for the FD message sent at step 3?	-	-	3	P
11	Void	-	-	-	-
12	Check: Does the UE (MCData client) notify the user that the remote client has completed the download? (NOTE 1)	-	-	3	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: Test file 1 for CO FD as specified in annex A.2.1.					

6.2.5.3.3 Specific message contents

Table 6.2.5.3.3-1..6: Void

Table 6.2.5.3.3-7: HTTP POST from the UE (step 3, Table 6.2.5.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.3-1, condition FD_HTTP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.1.3.3-8			

Table 6.2.5.3.3-8: MCData-Info (Table 6.2.5.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-fd"			
mcdata-calling-user-id	px_MCData_ID_User_A			

Table 6.2.5.3.3-9..10: Void

Table 6.2.5.3.3-11: HTTP 201 Created from the SS (step 3, Table 6.2.5.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.7-1, condition FD_HTTP

Table 6.2.5.3.3-12: SIP MESSAGE from the UE (step 3, Table 6.2.5.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.5.3.3-13			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.5.3.3-14			

Table 6.2.5.3.3-13: MCData-Info (Table 6.2.5.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-fd"			

Table 6.2.5.3.3-14: FD Signalling Payload (Table 6.2.5.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.5-1, condition FD_HTTP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Mandatory download	'0001'B	MANDATORY DOWNLOAD	TS 24.282 [31] clause 15.2.16	

Table 6.2.5.3.3-15: SIP MESSAGE from the SS (step 7, Table 6.2.5.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION from the SS as described in Table 6.2.5.3.3-17			

Table 6.2.5.3.3-16: Void

Table 6.2.5.3.3-17: FD NOTIFICATION (Table 6.2.5.3.3-15)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_ACCEPTED

Table 6.2.5.3.3-18: SIP MESSAGE from the SS (step 10, Table 6.2.5.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION from the SS as described in Table 6.2.5.3.3-19			

Table 6.2.5.3.3-19: FD NOTIFICATION (Table 6.2.5.3.3-18)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_COMPLETED

6.2.6 On-network / File Distribution (FD) / FD Using HTTP / One-to-one Standalone FD / Mandatory Download / With Disposition Request / Client Terminated (CT)

6.2.6.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
```

```
  when { UE (MCDATA Client) receives a SIP MESSAGE message for a standalone one-to-one FD message
with a mandatory download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" }
    then { UE (MCDATA Client) responds with a SIP 200 (OK) message and notifies the MCDATA User
about the incoming FD request and that the file identified by file URL in the Payload data in the
Payload IE will be downloaded automatically and generates an FD NOTIFICATION indicating acceptance
of the FD request and attempts to download the file with an HTTP GET message }
            }
```

(2)

```
with { UE (MCDATA Client) having started to download the file by sending an HTTP GET message }
ensure that {
  when { UE (MCDATA Client) has successfully downloaded the file }
    then { UE (MCDATA Client) notifies the MCDATA User that the file has successfully downloaded and
generates an FD NOTIFICATION indicating the successful download of the file }
            }
```

6.2.6.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.4.2.2, 10.2.1.2.3, 12.2.1.1, 10.2.3.1. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.4.2.2]

Upon receipt of a "SIP MESSAGE request for FD using HTTP for terminating MCData client", the MCData client:

1) may reject the SIP MESSAGE request if there are not enough resources to handle the SIP MESSAGE request;

2) if the SIP MESSAGE request is rejected in step 1), shall respond towards the participating MCData function with a SIP 480 (Temporarily unavailable) response and skip the rest of the steps of this subclause;

3) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

4) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5]; and

5) shall handle the received message as specified in subclause 10.2.1.2.

[TS 24.282, clause 10.2.1.2.3]

The MCData client:

1) if the FD SIGNALLING PAYLOAD message does not contain an Application ID IE:

   a) shall determine that the payload contained in the Payload IE in the FD SIGNALLING PAYLOAD message is for user consumption;

   b) shall notify the user about the incoming FD request; and

   c) if the FD SIGNALLING PAYLOAD message contains a Metadata IE, shall deliver the contents of the Metadata IE to the user;

2) if the FD SIGNALLING PAYLOAD message contains an Application ID IE:

   a) shall determine that the payload contained in the Payload IE in the FD SIGNALLING PAYLOAD message is not for user consumption;

   b) if the Application ID value is unknown, shall discard the FD message and exit this subclause;

   c) if the Application ID value is known, shall notify the application of the incoming FD request; and

NOTE 1: If FD request is addressed to a non-MCData application that is not running, the MCData client starts the local non-MCData application.

   d) if the FD SIGNALLING PAYLOAD message contains a Metadata IE, shall deliver the contents of the Metadata IE to the application;

3) shall start a timer TDU2 (FD non-mandatory download timer) with the timer value as specified in subclause F.2.3;

4) shall wait for the user or application to request to download the file indicated by file URL in the Payload data in the Payload IE in the FD SIGNALLING PAYLOAD message;

5) if the user or application accepts or rejects or decides to defer the FD request, shall stop timer TDU2 (FD non-mandatory download timer);

6) if the user deferred the FD request while the timer TDU2 (FD non-mandatory download timer) was running, shall generate an FD NOTIFICATION indicating deferral of the FD request as specified in subclause 12.2.1.1;

NOTE 2: Once the timer TDU2 (FD non-mandatory download timer) has expired the FD request can only be accepted or rejected with an appropriate action by the MCData client.

NOTE 3: Once the timer TDU2 (FD non-mandatory download timer) has expired, no action is taken by the MCData client if the FD request is deferred.

7) if the user or application rejects the FD request, shall generate an FD NOTIFICATION indicating rejection of the FD request as specified in subclause 12.2.1.1 and shall exit this subclause; and

8) if the user accepts the FD request:

   a) shall generate an FD NOTIFICATION indicating acceptance of the FD request as specified in subclause 12.2.1.1;

   b) if the FD SIGNALLING PAYLOAD message contains a new Conversation ID, shall instantiate a new conversation with the Message ID in the FD SIGNALLING PAYLOAD identifying the first message in the conversation thread;

   c) if the FD SIGNALLING PAYLOAD message contains an existing Conversation ID and:

      i) if the FD SIGNALLING PAYLOAD message does not contain an InReplyTo message ID, shall use the Message ID in the FD SIGNALLING PAYLOAD to identify a new message in the existing conversation thread; and

      ii) if the FD SIGNALLING PAYLOAD message contains an InReplyTo message ID, shall associate the message to an existing message in the conversation thread as identified by the InReplyTo message ID in the FD SIGNALLING PAYLOAD, and use the Message ID in the FD SIGNALLING PAYLOAD to identify the new message;

   d) may store the Conversation ID, Message ID, InReplyTo message ID and Date and time in local storage;

   e) shall attempt to download the file as identified by the file URL in the Payload IE in the FD SIGNALLING PAYLOAD message, as specified in subclause 10.2.3.1; and

   f) if the received FD SIGNALLING PAYLOAD message contains an FD disposition request type IE requesting a file download completed update, then after the file download has been successfully downloaded, shall generate an FD NOTIFICATION by following the procedures in subclause 12.2.1.1.

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or

- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and

- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];

4) void;

5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;

6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

7) if requiring to send an FD notification, shall generate an FD NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.2; and

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 10.2.3.1]

The media storage client on the MCData client shall send HTTP requests over a TLS connection as specified for the HTTP client in the UE, in annex A of 3GPP TS 24.482 [24].

NOTE 1: The HTTP client encodes the MCData ID in the bearer access token of the Authorization header field of an HTTP request as specified in 3GPP TS 24.482 [24].

NOTE 2: The HTTP client always sends the HTTP requests to an HTTP proxy. Annex A of 3GPP TS 24.482 [24] indicates how the HTTP proxy forwards the HTTP request to the HTTP server.

To download a file from the media storage function on the controlling MCData function, the media storage client on the MCData client:

1) shall generate an HTTP GET request as specified in IETF RFC 7230 [22] and IETF RFC 7231 [23] with a Request-URI set to an absolute URI identifying the URL of the file being requested from the media storage function on the controlling MCData function; and

2) shall send the HTTP GET request towards the media storage function on the controlling MCData function.

On receipt of a HTTP 200 OK response containing the requested file, the MCData client shall notify the user or application that the file has been successfully downloaded.

6.2.6.3 Test description

6.2.6.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- Test files downloaded or received at previous test runs are deleted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.6.3.2 Test procedure sequence

Table 6.2.6.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1-1B	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD message for one-to-one file distribution with disposition request "FILE DOWNLOAD COMPLETED UPDATE" and Mandatory Download IE**?	-	-	1	P
2-3	Void	-	-	-	-
4	Check: Does the UE (MCData client) correctly perform procedure '**FD file accept and download using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.11.3-1 to download test file 1? (NOTE 2)	-	-	1,2	P
5-10	Void	-	-	-	-
11	Check: Does the UE (MCData client) notify the user of the incoming FD request and the file download? (NOTE 1)	-	-	1,2	P
12	Check: Has the UE (MCData client) downloaded test file 1 (TS 36.579-7 A.3.1)? (NOTE 1)	-	-	2	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: Test file 1 for CT FD as specified in annex A.3.1.					

6.2.6.3.3 Specific message contents

Table 6.2.6.3.3-1: SIP MESSAGE from the SS (step 1A, Table 6.2.6.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Info**		
MIME-part-body	MCData-Info as described in Table 6.2.6.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.6.3.3-3			

Table 6.2.6.3.3-2: MCData-Info (Table 6.2.6.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-fd"			

Table 6.2.6.3.3-3: FD Signalling Payload (Table 6.2.6.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.6-1, condition FD_HTTP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Mandatory download	'0001'B	MANDATORY DOWNLOAD	TS 24.282 [31] clause 15.2.16	

Table 6.2.6.3.3-4: Void

Table 6.2.6.3.3-5: SIP MESSAGE from the UE (step 4, Table 6.2.6.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.6.3.3-6			

Table 6.2.6.3.3-6: FD NOTIFICATION (Table 6.2.6.3.3-5)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_ACCEPTED

Table 6.2.6.3.3-7: HTTP GET from the UE (step 4, Table 6.2.6.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.2-1, condition FD_HTTP

Table 6.2.6.3.3-8: HTTP 200 (OK) from the SS (step 4, Table 6.2.6.3.2-1; step 5, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.6-1, condition FD_HTTP

Table 6.2.6.3.3-9..10: Void

Table 6.2.6.3.3-11: SIP MESSAGE from the UE (step 4, Table 6.2.6.3.2-1; step 6a1, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.6.3.3-12			

Table 6.2.6.3.3-12: FD NOTIFICATION (Table 6.2.6.3.3-11)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_COMPLETED

6.2.7 On-network / File Distribution (FD) / FD Using HTTP / Group Standalone FD / Mandatory Download / Without Disposition Request / Client Originated (CO)

6.2.7.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a Group Standalone FD message with a mandatory download
and without a disposition request and the UE (MCDATA Client) is unaware of the URL of the Media
Storage Function }
    then { UE (MCDATA Client) sends a SIP MESSAGE to find the URL of the Media Storage Function and
responds to a SIP MESSAGE that contains the URL of the Media Storage Function with a SIP 200 (OK)
message }
            }
```

(2)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a Group Standalone FD message with a mandatory download
and without a disposition request and the UE (MCDATA Client) is aware of the URL of the Media
Storage Function }
    then { UE (MCDATA Client) uploads the file to the Media Storage Function via an HTTP POST
message and then sends the URL of the file location to the recipient via a SIP MESSAGE message }
            }
```

(3)

```
with { UE (MCDATA Client) having sent the URL of the file location to the recipient }
ensure that {
  when { UE (MCDATA Client) receives a FD notification via a SIP MESSAGE message }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message with a SIP 200 (OK) message and
delivers the notification to the MCDATA User }
            }
```

6.2.7.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.1.3.2, 10.2.2.1, 10.2.4.2.1, 12.2.1.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.1.3.2]

To discover the absolute URI of the media storage function, the MCData client shall generate a SIP MESSAGE request towards the participating MCData function, in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with a <request-type> element containing the value "msf-disc-req";

4) if the upload of a file is for a group standalone FD request, shall include in an application/vnd.3gpp.mcdata-info+xml MIME body, the <mcdata-calling-group-id> element set to the required MCData group identity; and

NOTE 1: The absence of a group identity in the <mcdata-calling-group-id> element of the application/vnd.3gpp.mcdata-info+xml MIME body implies that the MCData client intends to upload a file for a one-to-one FD request. In this case, the participating MCData function identifies the MCData ID of the user from the binding between the public user identity and the MCData ID.

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of a "SIP MESSAGE request for absolute URI discovery response", the MCData client:

1) shall store the absolute URI found in the <mcdata-controller-psi> element;

2) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5]; and

3) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 10.2.2.1]

If the media storage client is not aware of the absolute URI of the media storage function, the media storage client shall request the MCData client to discover the absolute URI associated with the media storage function by following the procedures in subclause 10.2.1.3.

The media storage client shall send HTTP requests over a TLS connection as specified for the HTTP client in the UE in annex A of 3GPP TS 24.482 [24].

NOTE 1: The HTTP client encodes the MCData ID in the bearer access token of the Authorization header field of an HTTP request as specified in 3GPP TS 24.482 [24].

NOTE 2: The HTTP client always sends the HTTP requests to an HTTP proxy. Annex A of 3GPP TS 24.482 [24] indicates how the HTTP proxy forwards the HTTP request to the HTTP server.

To upload a file to media storage function, the media storage client:

1) shall generate an HTTP POST request as specified in IETF RFC 7230 [22] and IETF RFC 7231 [23];

2) shall set the Request-URI to the absolute URI identifying the resource on a media storage function;

3) shall set the Host header field to a hostname identifying the media storage function;

4) shall set the Content-Type header field to multipart/mixed and with a boundary delimiter parameter set to any chosen value;

5) if the file upload is for one-to-one file distribution, shall insert an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <request-type> element set to a value of "one-to-one-fd"; and

   b) the <mcdata-calling-user-id> element set to the originating MCData ID;

6) if the file upload is for group file distribution, shall insert an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <request-type> element set to a value of "group-fd";

   b) the <mcdata-request-uri> element set to the MCData group identity; and

   c) the <mcdata-calling-user-id> element set to the originating MCData ID;

7) if end-to-end security is required for a one-to-one communication, the MCData client protects the binary data representing the file and prefixes the protected binary data with security parameters as described in 3GPP TS 33.180 [26];

8) if

i) end-to-end security is not required for a one-to-one communication, or

ii) the file upload is for group file distribution;

shall include the binary data representing the file with Content-Type field set to application/octet-stream and Content-Length field set to the file size; and

9) shall send the HTTP POST request towards the media storage function.

On receipt of a HTTP 201 Created containing a Location header field with a URL identifying the location of the resource where the file has been stored on the media storage function, then the media storage client shall store this information.

[TS 24.282, clause 10.2.4.2.1]

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) if a one-to-one standalone FD message is to be sent shall insert in the SIP MESSAGE request:

a) an application/resource-lists+xml MIME body with the MCData ID of the target MCData user, according to rules and procedures of IETF RFC 4826 [9]; and

b) an application/vnd.3gpp.mcdata-info+xml MIME body with a <request-type> element set to a value of "one-to-one-fd";

…

4) shall generate a standalone FD message as specified in subclause 6.2.2.2; and

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

6.2.7.3 Test description

6.2.7.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- Test File 1 for CO FD as specified in annex A.2.1 is available at the UE for upload.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.7.3.2 Test procedure sequence

Table 6.2.7.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send test file 1 (TS 36.579-7 A.2.1) for CO group FD over HTTP for mandatory download and without disposition request. (NOTE 1, NOTE 2)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**Discovery of the absolute URI of the media storage function (one-to-one communication)**' as described in TS 36.579-1 [2] Table 5.3C.9.3-1 ?	-	-	1	P
3	Check: Does the UE (MCData client) correctly perform procedure '**FD file upload using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.10.3-1?	-	-	2	P
3A	Check: Is the content of the uploaded file the same as specified in annex A.2.1?	-	-	2	P
4-6	Void	-	-	-	-
7	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD REQUEST ACCEPTED"** for the FD message sent at step 3?	-	-	3	P
8	Void	-	-	-	-
9	Check: Does the UE (MCData client) notify the user that the remote client has accepted the download? (NOTE 1)	-	-	3	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: Test file 1 for CO FD as specified in annex A.2.1.					

6.2.7.3.3 Specific message contents

Table 6.2.7.3.3-1..6: Void

Table 6.2.7.3.3-7: HTTP POST from the UE (step 3, Table 6.2.7.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.3-1, condition FD_HTTP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.7.3.3-8			

Table 6.2.7.3.3-8: MCData-Info (Table 6.2.7.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-fd"			
mcdata-request-uri	px_MCData_Group_A_ID	NOTE: the element is not encrypted		
mcdata-calling-user-id	px_MCData_ID_User_A	NOTE: the element is not encrypted		

Table 6.2.7.3.3-9: Void

Table 6.2.7.3.3-10: HTTP 201 Created from the SS (step 3, Table 6.2.7.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.7-1, condition FD_HTTP

Table 6.2.7.3.3-11: SIP MESSAGE from the UE (step 3, Table 6.2.7.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.7.3.3-12			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.7.3.3-13			

Table 6.2.7.3.3-12: MCData-Info (Table 6.2.7.3.3-11)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-fd"			

Table 6.2.7.3.3-13: FD Signalling Payload (Table 6.2.5.3.3-12)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.5-1, condition FD_HTTP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
FD disposition request type	Not present	no disposition request		
Mandatory download	'0001'B	MANDATORY DOWNLOAD	TS 24.282 [31] clause 15.2.16	

Table 6.2.7.3.3-14: SIP MESSAGE from the SS (step 7, Table 6.2.7.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.1.3.3-15			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION from the SS as described in Table 6.2.3.3.3-17			

Table 6.2.7.3.3-15: MCData-Info (Table 6.2.7.3.3-14)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-calling-group-id> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.2-3A		

Table 6.2.7.3.3-16: FD NOTIFICATION (Table 6.2.7.3.3-14)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_ACCEPTED

6.2.8 On-network / File Distribution (FD) / FD Using HTTP / Group Standalone FD / Mandatory Download / Without Disposition Request / Client Terminated (CT)

6.2.8.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { UE (MCDATA Client) receives a SIP MESSAGE message for a group standalone FD message with a
mandatory download and without a disposition request }
    then { UE (MCDATA Client) responds with a SIP 200 (OK) message and notifies the MCDATA User
about the incoming FD request and that the file identified by file URL in the Payload data in the
Payload IE will be downloaded automatically and generates an FD NOTIFICATION indicating acceptance
of the FD request and attempts to download the file with an HTTP GET message }
            }
```

(2)

```
with { UE (MCDATA Client) having started to download the file by sending an HTTP GET message }
ensure that {
  when { UE (MCDATA Client) has successfully downloaded the file }
    then { UE (MCDATA Client) notifies the MCDATA User that the file has successfully downloaded }
            }
```

6.2.8.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.4.2.2, 10.2.1.2.3, 12.2.1.1, 10.2.3.1. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.4.2.2]

Upon receipt of a "SIP MESSAGE request for FD using HTTP for terminating MCData client", the MCData client:

1) may reject the SIP MESSAGE request if there are not enough resources to handle the SIP MESSAGE request;

2) if the SIP MESSAGE request is rejected in step 1), shall respond towards the participating MCData function with a SIP 480 (Temporarily unavailable) response and skip the rest of the steps of this subclause;

3) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

4) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5]; and

5) shall handle the received message as specified in subclause 10.2.1.2.

[TS 24.282, clause 10.2.1.2.3]

The MCData client:

1) if the FD SIGNALLING PAYLOAD message does not contain an Application ID IE:

   a) shall determine that the payload contained in the Payload IE in the FD SIGNALLING PAYLOAD message is for user consumption;

   b) shall notify the user about the incoming FD request; and

   c) if the FD SIGNALLING PAYLOAD message contains a Metadata IE, shall deliver the contents of the Metadata IE to the user;

2) if the FD SIGNALLING PAYLOAD message contains an Application ID IE:

a) shall determine that the payload contained in the Payload IE in the FD SIGNALLING PAYLOAD message is not for user consumption;

b) if the Application ID value is unknown, shall discard the FD message and exit this subclause;

c) if the Application ID value is known, shall notify the application of the incoming FD request; and

NOTE 1: If FD request is addressed to a non-MCData application that is not running, the MCData client starts the local non-MCData application.

d) if the FD SIGNALLING PAYLOAD message contains a Metadata IE, shall deliver the contents of the Metadata IE to the application;

3) shall start a timer TDU2 (FD non-mandatory download timer) with the timer value as specified in subclause F.2.3;

4) shall wait for the user or application to request to download the file indicated by file URL in the Payload data in the Payload IE in the FD SIGNALLING PAYLOAD message;

5) if the user or application accepts or rejects or decides to defer the FD request, shall stop timer TDU2 (FD non-mandatory download timer);

6) if the user deferred the FD request while the timer TDU2 (FD non-mandatory download timer) was running, shall generate an FD NOTIFICATION indicating deferral of the FD request as specified in subclause 12.2.1.1;

NOTE 2: Once the timer TDU2 (FD non-mandatory download timer) has expired the FD request can only be accepted or rejected with an appropriate action by the MCData client.

NOTE 3: Once the timer TDU2 (FD non-mandatory download timer) has expired, no action is taken by the MCData client if the FD request is deferred.

7) if the user or application rejects the FD request, shall generate an FD NOTIFICATION indicating rejection of the FD request as specified in subclause 12.2.1.1 and shall exit this subclause; and

8) if the user accepts the FD request:

a) shall generate an FD NOTIFICATION indicating acceptance of the FD request as specified in subclause 12.2.1.1;

b) if the FD SIGNALLING PAYLOAD message contains a new Conversation ID, shall instantiate a new conversation with the Message ID in the FD SIGNALLING PAYLOAD identifying the first message in the conversation thread;

c) if the FD SIGNALLING PAYLOAD message contains an existing Conversation ID and:

i) if the FD SIGNALLING PAYLOAD message does not contain an InReplyTo message ID, shall use the Message ID in the FD SIGNALLING PAYLOAD to identify a new message in the existing conversation thread; and

ii) if the FD SIGNALLING PAYLOAD message contains an InReplyTo message ID, shall associate the message to an existing message in the conversation thread as identified by the InReplyTo message ID in the FD SIGNALLING PAYLOAD, and use the Message ID in the FD SIGNALLING PAYLOAD to identify the new message;

d) may store the Conversation ID, Message ID, InReplyTo message ID and Date and time in local storage;

e) shall attempt to download the file as identified by the file URL in the Payload IE in the FD SIGNALLING PAYLOAD message, as specified in subclause 10.2.3.1; and

f) if the received FD SIGNALLING PAYLOAD message contains an FD disposition request type IE requesting a file download completed update, then after the file download has been successfully downloaded, shall generate an FD NOTIFICATION by following the procedures in subclause 12.2.1.1.

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or

- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and

- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.8.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];

4) void;

5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;

6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

7) if requiring to send an FD notification, shall generate an FD NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.2; and

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 10.2.3.1]

The media storage client on the MCData client shall send HTTP requests over a TLS connection as specified for the HTTP client in the UE, in annex A of 3GPP TS 24.482 [24].

NOTE 1: The HTTP client encodes the MCData ID in the bearer access token of the Authorization header field of an HTTP request as specified in 3GPP TS 24.482 [24].

NOTE 2: The HTTP client always sends the HTTP requests to an HTTP proxy. Annex A of 3GPP TS 24.482 [24] indicates how the HTTP proxy forwards the HTTP request to the HTTP server.

To download a file from the media storage function on the controlling MCData function, the media storage client on the MCData client:

1) shall generate an HTTP GET request as specified in IETF RFC 7230 [22] and IETF RFC 7231 [23] with a Request-URI set to an absolute URI identifying the URL of the file being requested from the media storage function on the controlling MCData function; and

2) shall send the HTTP GET request towards the media storage function on the controlling MCData function.

On receipt of a HTTP 200 OK response containing the requested file, the MCData client shall notify the user or application that the file has been successfully downloaded.

6.2.8.3 Test description

6.2.8.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- Test files downloaded or received at previous test runs are deleted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.8.3.2 Test procedure sequence

Table 6.2.8.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1-1B	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of the procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD message for group file distribution with disposition request "FILE DOWNLOAD COMPLETED UPDATE" and Mandatory Download IE**?	-	-	1	P
2-3	Void	-	-	-	-
4-4C	Check: Does the UE (MCData client) correctly perform steps 2-5 of procedure '**FD file accept and download using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.11.3-1 to download test file 1? (NOTE 2)	-	-	1,2	P
5-7	Void	-	-	-	-
-	EXCEPTION: In parallel to the events described in step 8 and step 9 the events described in Table 6.2.8.3.2-2 take place.	-	-	-	-
8	Check: Does the UE (MCData client) notify the user of the incoming FD request and the file download? (NOTE 1)	-	-	1,2	P
9	Check: Has the UE (MCData client) downloaded test file 1 (TS 36.579-7 A.3.1)? (NOTE 1)	-	-	2	P
10	The SS releases the RRC connection	-	-	-	-
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: Test file 1 for CT FD as specified in annex A.3.1.					

Table 6.2.8.3.2-2: Parallel Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) send a SIP MESSAGE request for notification of file download completed in parallel to step 8 and step 9 of Table 6.2.8.3.22-1 or at least for 10s?	-->	SIP MESSAGE	-	F

6.2.8.3.3 Specific message contents

Table 6.2.8.3.3-1: SIP MESSAGE from the SS (step 1A, Table 6.2.8.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.8.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.8.3.3-3			

Table 6.2.8.3.3-2: MCData-Info (Table 6.2.8.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-fd"			

Table 6.2.8.3.3-3: FD Signalling Payload (Table 6.2.6.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.6-1, condition FD_HTTP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
FD disposition request type	Not present	no disposition request		
Mandatory download	'0001'B	MANDATORY DOWNLOAD	TS 24.282 [31] clause 15.2.16	

Table 6.2.8.3.3-4: Void

Table 6.2.8.3.3-5: SIP MESSAGE from the UE (step 4, Table 6.2.8.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-headers	MCData-Info as described in Table 6.2.8.3.3-6			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.8.3.3-7			

Table 6.2.8.3.3-6: MCData-Info (Table 6.2.8.3.3-5)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-request-uri> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.1-3A		

Table 6.2.8.3.3-7: FD NOTIFICATION (Table 6.2.8.3.3-5)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_ACCEPTED

Table 6.2.8.3.3-8: HTTP GET from the UE (step 4, Table 6.2.8.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.2-1, condition FD_HTTP

Table 6.2.8.3.3-9: HTTP 200 (OK) from the SS (step 4, Table 6.2.8.3.2-1; step 5, TS 36.579-1 [2] Table 5.3C.11.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.6-1, condition FD_HTTP

Table 6.2.8.3.3-10: Void

6.2.9 On-network / File Distribution (FD) / FD Using Media Plane / One-to-one Standalone FD / Client Originated (CO)

6.2.9.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a one-to-one standalone FD message using the media plane}
    then { UE (MCDATA Client) sends a request to establish an MSRP connection via a SIP INVITE
message and then responds to the SIP 200 (OK) message with a SIP ACK message }
            }
```

(2)

```
with { UE (MCDATA Client) having requested the establishment of a MSRP connection }
ensure that {
  when { UE (MCDATA Client) receives a SIP 200 (OK) message with the a=setup attribute set to
"passive"  from the SS (MCDATA server) }
    then { UE (MCDATA Client) sends a blank MSRP SEND message to bind the MSRP connection and then
sends the one-to-one standalone FD message via a MSRP SEND message }
            }
```

(3)

```
with { UE (MCDATA Client) having sent a one-to-one standalone FD message using the media plane }
ensure that {
  when { UE (MCDATA Client receives a MSRP 200 (OK) message in response to the last MSRP SEND
message indicating that the standalone FD message has been successfully transferred }
    then { UE (MCDATA Client) sends a SIP BYE message }
            }
```

(4)

```
with { UE (MCDATA Client) having sent a one-to-one standalone FD message using the media plane with
a disposition of "FILE DOWNLOAD COMPLETED UPDATE" }
ensure that {
  when { UE (MCDATA Client receives a disposition response via a SIP MESSAGE message from the SS
(MCDATA Server }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

6.2.9.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.5.2.3, 6.2.2.3, 12.2.1.2, TS 24.582 clause 7.1.2.1. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.5.2.3]

The MCData client shall generate a SIP INVITE request in accordance with 3GPP TS 24.229 [5] with the clarifications given below.

The MCData client:

1) shall include the g.3gpp.mcdata.fd media feature tag and the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" in the Contact header field of the SIP INVITE request according to IETF RFC 3840 [16];

2) shall include an Accept-Contact header field containing the g.3gpp.mcdata.fd media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

3) shall include an Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

4) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP INVITE request;

5) should include the "timer" option tag in the Supported header field;

6) should include the Session-Expires header field according to IETF RFC 4028 [38]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";

7) shall generate and contain an application/vnd.3gpp.mcdata-signalling MIME body with the FD SIGNALLING PAYLOAD as described in subclause 6.2.2.3;

8) if a one-to-one file distribution is requested:

   a) shall insert in the SIP INVITE request a MIME resource-lists body with the MCData ID of the invited MCData user, according to rules and procedures of IETF RFC 5366 [18]; and

   b) shall contain an application/vnd.3gpp.mcdata-info+xml MIME body with the <mcdatainfo> element containing the <mcdata-Params> element with:

      i) the <request-type> element set to a value of "one-to-one-fd";

   c) if an end-to-end security context needs to be established and the security context does not exist or if the existing security context has expired, then:

      i) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [26];

      ii) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [26];

iii) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect one-to-one communications and with the remaining twenty eight bits being randomly generated as described in 3GPP TS 33.180 [26];

iv) shall encrypt the PCK to a UID associated to the MCData client using the MCData ID of the invited user and a time related parameter as described in 3GPP TS 33.180 [26];

v) shall generate a MIKEY-SAKKE I_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [26]; and

vi) shall add the MCData ID of the originating MCData to the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26]; and

vii) shall sign the MIKEY-SAKKE I_MESSAGE using the originating MCData user's signing key provided in the keying material together with a time related parameter, and add this to the MIKEY-SAKKE payload, as described in 3GPP TS 33.180 [26];

9) if a group file distribution is requested:

a) if the "/<*x*>/<x>/Common/MCData/AllowedFD" leaf node present in the group document of the requested MCData group, configured on the group management client as specified in 3GPP TS 24.483 [42] is set to "false", shall reject the request for FD and not continue with the rest of the steps in this subclause; and

b) shall contain in an application/vnd.3gpp.mcdata-info+xml MIME body with the <mcdatainfo> element containing the <mcdata-Params> element with:

i) the <request-type> element set to a value of "group-fd";

ii) the <mcdata-request-uri> element set to the MCData group identity; and

iii) the <mcdata-client-id> element set to the MCData client ID of the originating MCData client;

NOTE 1: The MCData client does not include the MCData ID of the originating MCData user in the body, as this will be inserted into the body of the SIP INVITE request that is sent from the originating participating MCData function.

10) shall set the Request-URI of the SIP INVITE request to the public service identity identifying the participating MCData function serving the MCData user;

NOTE 2: The MCData client is configured with public service identity identifying the participating MCData function serving the MCData user.

11) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

12) shall include an SDP offer according to 3GPP TS 24.229 [5] with the clarifications given in subclause 10.2.5.2.1; and

13) shall send the SIP INVITE request towards the MCData server according to 3GPP TS 24.229 [5].

On receipt of a SIP 2xx response to the SIP INVITE request, the MCData client:

1) shall send a SIP ACK request as specified in 3GPP TS 24.229 [5];

2) shall start the SIP Session timer according to rules and procedures of IETF RFC 4028 [38]; and

3) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 10.2.5.1.1..

[TS 24.282, clause 6.2.2.3]

In order to generate an FD message, the MCData client:

1) shall generate an FD SIGNALLING PAYLOAD message as specified in subclause 15.1.3; and

2) shall include in the SIP request, the FD SIGNALLING PAYLOAD message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1.

When generating an FD SIGNALLING PAYLOAD message as specified in subclause 15.1.3, the MCData client:

1) shall set the Date and time IE to the current time as specified in subclause 15.2.8;

2) if the filestarts a new conversation, shall set the Conversation ID IE to a newly generated Conversation ID value as specified in subclause 15.2.9;

3) if the file continues an existing conversation, shall set the Conversation ID IE to the Conversation ID value of the existing conversation as specified in subclause 15.2.9;

4) shall set the Message ID IE to a newly generated Message ID value as specified in subclause 15.2.10;

5) if the files in reply to a previously received SDS message or file, shall include the InReplyTo message ID IE with the Message ID value in the previously received SDS message or file;

6) if the file is for user consumption, shall not include an Application ID IE as specified in subclause 15.2.7;

7) if the file is intended for an application on the terminating MCData client, shall include an Application ID IE with an Application ID value representing the intended application as specified in subclause 15.2.7;

NOTE: The value chosen for the Application ID value is decided by the mission critical organisation.

8) if a file download complete notification is required shall include a FD disposition request type IE set to "FILE DOWNLOAD COMPLETED UPDATE" as specified in subclause 15.2.4; and

9) shall include and set the Mandatory download IE to "MANDATORY DOWNLOAD" as described in subclause 15.2.16.

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

[TS 24.582, clause 6.1.1.2.1]

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the originating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act according to IETF RFC 6135 [12], as:

   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and

   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11]; and

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;

2. shall generate a SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;

3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4; and

4. shall send the MSRP SEND request on the established MSRP connection.

NOTE: MSRP chunking, if needed, may affect the number of "Content Type" lines in each MSRP SEND message conveying a chunk, as also specified in subclause 6.1.1.2.4.

If MSRP chunking is not used then on receipt of a 200 (OK) response, the MCData client shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary;

2. shall wait for a 200 (OK) response to each MSRP SEND request sent; and

3. on receipt of the last 200 (OK) response shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks;

2. shall indicate to MCData user that the SDS message could not be sent; and

3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving an indication to terminate the session from the signalling plane, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks and may indicate to MCData user that the SDS message could not be sent.

[TS 24.582, clause 7.1.2.1]

Upon receiving an indication to establish MSRP connection for file distribution as the originating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act according to IETF RFC 6135 [12], as:

   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and

   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11]; and

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client can send the file. To send the file, the MCData client:

1. shall generate MSRP SEND for file distribution request according to IETF RFC 4975 [11]. When generating an MSRP SEND, the MCData client:

   a. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;

   b. shall set the first content type as Content-Type = "application/vnd.3gpp.mcdata-file"; and

   c. shall set the body of the MSRP SEND request with MSRP payload. MSRP payload is set to the file or part of the file.

2. shall send the MSRP SEND request(s) on the established MSRP connection.

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests containing the file as necessary;
2. shall wait for a 200 (OK) response to each MSRP SEND request sent; and
3. on receipt of the last 200 (OK) response shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks;
2. shall indicate to MCData user that the file could not be distributed; and
3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

6.2.9.3 Test description

6.2.9.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- Test File 1 for CO FD as specified in annex A.2.1 is available at the UE for upload.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.9.3.2 Test procedure sequence

Table 6.2.9.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send test file 1 (TS 36.579-7 A.2.1) for CO one-to-one FD over media plane with disposition notification type "FILE DOWNLOAD COMPLETED UPDATE". (NOTE 1, NOTE 2)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.2.3-1?	-	-	1,2	P
3-6	Void	-	-	-	-
7	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send an FD message containing test file 1 for CO FD**?	-	-	2	P
7A	Check: Is the content of the transferred file the same as specified in annex A.2.1?	-	-	2	P
8	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.6.3-1?	-	-	3	P
9	Void	-	-	-	-
10	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive the disposition notification** for the FD message sent at step 7?	-	-	4	P
11	Void	-	-	-	-
12	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	4	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: Test file 1 for CO FD as specified in annex A.2.1.					

6.2.9.3.3 Specific message contents

Table 6.2.9.3.3-1: SIP INVITE from the UE (step 2, Table 6.2.9.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.1-1, condition MCDATA_FD, MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.2.9.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.9.3.3-3			
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
MIME-Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.9.3.3-3A			

Table 6.2.9.3.3-2: SDP for SIP INVITE (Table 6.2.9.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_FD, SDP_OFFER, MCD_1to1

Table 6.2.9.3.3-3: MCData-Info (Table 6.2.9.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-fd"			

Table 6.2.9.3.3-3A: FD SIGNALLING PAYLOAD (Table 6.2.9.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.5-1, condition FD_MSRP

Table 6.2.9.3.3-4: SIP 200 (OK) from the SS (step 2, Table 6.2.9.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.2-1, condition INVITE-RSP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
SDP message	As described in Table 6.2.9.3.3-5			

Table 6.2.9.3.3-5: SDP for SIP 200 (OK) (Table 6.2.9.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_FD, SDP_ANSWER

Table 6.2.9.3.3-6: MSRP SEND from the UE (step 7, Table 6.2.9.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp. mcdata-file"			
data	As specified in table 6.2.9.3.3-8			

Table 6.2.9.3.3-7: Void

Table 6.2.9.3.3-8: MCData Protected Payload Message (Table 6.2.9.3.3-6)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.10-1, condition PROTECTED_FILE, PCK

Table 6.2.9.3.3-9..10: Void

Table 6.2.9.3.3-11: SIP BYE from the UE (step 8, Table 6.2.9.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.6.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.2.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Reason			RFC 3326 [125]	
reason-value	"SIP"			
protocol-cause	"cause="200""			
reason-text	"text="transmission succeeded""			

Table 6.2.9.3.3-12: Void

Table 6.2.9.3.3-13: SIP MESSAGE from the SS (step 10, Table 6.2.9.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.9.3.3-15			

Table 6.2.9.3.3-14: Void

Table 6.2.9.3.3-15: FD NOTIFICATION (Table 6.2.9.3.3-13)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_COMPLETED

Table 6.2.9.3.3-16: Void

6.2.10 On-network / File Distribution (FD) / FD Using Media Plane / One-to-one Standalone FD / Client Terminated (CT)

6.2.10.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a SIP INVITE to initiate a standalone one-to-one FD message using
the media plane }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

(2)

```
with { UE (MCDATA Client) having responded to the SIP INVITE message that initiated a standalone
one-to-one FD message using the media plane }
ensure that {
  when { UE (MCDATA Client) receives an MSRP SEND message from the SS (MCDATA Server) }
    then { UE (MCDATA Client) responds with an MSRP 200 (OK) message }
            }
```

(3)

```
with { UE (MCDATA Client) having finished receiving the file from the SS (MCDATA server) }
ensure that {
  when { UE (MCDATA Client) receives a SIP BYE message to release communications }
    then { UE (MCDATA Client) responds with a SIP 200 (OK) message and then sends a "FILE DOWNLOAD
COMPLETED" disposition via a SIP MESSAGE message }
            }
```

6.2.10.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.5.2.4, 12.2.1.1, 6.2.3.2, TS 24.582 clauses 7.1.3.1, 7.1.3.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.5.2.4]

Upon receipt of an initial SIP INVITE request, the MCData client shall follow the procedures for termination of multimedia sessions in the IM CN subsystem as specified in 3GPP TS 24.229 [5] with the clarifications below.

The MCData client:

1) may reject the SIP INVITE request if either of the following conditions are met:

   a) MCData client does not have enough resources to handle the call; or

   b) any other reason outside the scope of this specification;

   and skip the rest of the steps after step 2;

2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCData function either with appropriate reject code as specified in 3GPP TS 24.229 [5] and warning texts as specified in subclause 4.9 or with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

3) if the SDP offer of the SIP INVITE request contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:

   a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

   b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP INVITE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to create an end-to-end secure session.

4) may display to the MCData user the MCData ID of the inviting MCData user;

5) may display to the MCData user the file meta-data of the incoming file as described by the SDP included in the received SIP INVITE request;

6) if the Mandatory indication IE of the FD SIGNALLING PAYLOAD contained in the application/vnd.3gpp.mcdata-signalling MIME body received in the SIP INVITE request is set to "MANDATORY", then:

i) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

ii) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

iii) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [38]. The "refresher" parameter in the Session-Expires header field shall be set to "uas";

iv) shall include the g.3gpp.mcdata.fd media feature tag in the Contact header field of the SIP 200 (OK) response;

v) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" in the Contact header field of the SIP 200 (OK) response;

vi) shall include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP INVITE request according to 3GPP TS 24.229 [5] with the clarifications given in subclause 10.2.5.2.2; and

vii) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of an SIP ACK message to the sent SIP 200 (OK) message, the MCData client shall:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 10.2.5.1.2.

On receipt of an indication from the media plane of the successful download of the file and if the received FD SIGNALLING PAYLOAD message contained an FD disposition request type IE requesting a file download completed update indication, then, the MCData client:

1) shall follow the procedures described in subclause 12.2.1.1.

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or
- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the controlling MCData function that sent the SDS or FD message request. The MCData client determines the controlling MCData function from the contents of the <mcdata-controller-psi> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request;
- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and
- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;
2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;
3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];
4) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with an <mcdata-controller-psi> element containing the PSI of the controlling MCData function;
5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;
6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;
7) if requiring to send an FD notification, shall generate an FD NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.2; and
8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.3.2]

In order to generate an FD notification, the MCData client:

1) shall generate an FD NOTIFICATION message as specified in subclause 15.1.6; and
2) shall include in the SIP request, the FD NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1.

When generating an FD NOTIFICATION message as specified in subclause 15.1.6, the MCData client:

1) if sending a file download accept notification, shall set the FD disposition notification type IE as "FILE DOWNLOAD REQUEST ACCEPTED" as specified in subclause 15.2.6;
2) if sending a file download reject notification, shall set the FD disposition notification type IE as "FILE DOWNLOAD REQUEST REJECTED" as specified in subclause 15.2.6;
3) if sending a file download deferred notification, shall set the FD disposition notification type IE as "FILE DOWNLOAD REQUEST DEFERRED" as specified in subclause 15.2.6;

4) shall set the Conversation ID to the value of the Conversation ID that was received in the FD message as specified in subclause 15.2.9;

5) shall set the Date and time IE to the current time as specified in subclause 15.2.8; and

6) if sending a file download completed notification:

   a) shall set the FD disposition notification type IE as "FILE DOWNLOAD COMPLETED" as specified in subclause 15.2.6;

   b) shall set the Message ID to the value of the Message ID that was received in the FD message as specified in subclause 15.2.10;

   c) if the FD message was destined for the user, shall not include an Application ID IE as specified in subclause 15.2.7; and

   d) if the FD message was destined for an application, shall include an Application ID IE set to the value of the Application ID that was included in the FD message as specified in subclause 15.2.3.

[TS 24.582, clause 7.1.3.1]

Upon receiving an indication to establish MSRP connection for file distribution as the terminating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as an passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP session is established, the MCData client:

1. on receipt of an MSRP request in the MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the file before delivering the content to the application; and

3. shall handle the received content as described in subclause 7.1.3.2.

[TS 24.582, clause 7.1.3.2]

Upon receiving a file, the MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-file MIME body; and

2. once all the chunks of the file are successfully received, shall indicate to the signalling plane that the file download is completed.

6.2.10.3 Test description

6.2.10.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- Test files downloaded or received at previous test runs are deleted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.10.3.2 Test procedure sequence

Table 6.2.10.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.3.3-1?	-	-	1,2	P
2-5	Void	-	-	-	-
6	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive an FD message containing** test file 1? (NOTE 2)	-	-	2	P
7	Void	-	-	-	-
8	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.7.3-1?	-	-	3	P
9-10	Void	-	-	-	-
11	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 to **send a disposition notification for the file received at step 6**?	-	-	2	P
12	Void	-	-	-	-
13	Check: Has the UE (MCData client) downloaded test file 1 (TS 36.579-7 A.3.1)? (NOTE 1)	-	-	2	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: Test file 1 for CT FD as specified in annex A.3.1.					

6.2.10.3.3 Specific message contents

Table 6.2.10.3.3-1: SIP INVITE from the SS (step 1, Table 6.2.10.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_FD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.2.10.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.10.3.3-3			
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
MIME-Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.10.3.3-3A			

Table 6.2.10.3.3-2: SDP for SIP INVITE (Table 6.2.10.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_FD, SDP_OFFER, MCD_1to1

Table 6.2.10.3.3-3: MCData-Info (Table 6.2.10.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_1to1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"one-to-one-fd"			

Table 6.2.10.3.3-3A: FD SIGNALLING PAYLOAD (Table 6.2.10.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.6-1, condition FD_MSRP

Table 6.2.10.3.3-4: SIP 200 (OK) from the UE (step 1, Table 6.2.10.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.1-1, condition INVITE-RSP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
value	"application/sdp"			
Message-body				
SDP message	As described in Table 6.2.10.3.3-5			

Table 6.2.10.3.3-5: SDP for SIP 200 (OK) (Table 6.2.10.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_FD, SDP_ANSWER

Table 6.2.10.3.3-6: MSRP SEND from the SS (step 6, Table 6.2.10.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp.mcdata-file"			
data	As specified in table 6.2.10.3.3-8			

Table 6.2.10.3.3-7: Void

Table 6.2.10.3.3-8: MCData Protected Payload Message (Table 6.2.9.3.3-6)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.10-2, condition PROTECTED_FILE, PCK

Table 6.2.10.3.3-9: SIP BYE from the SS (step 8, Table 6.2.10.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.7.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.2.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Reason				
reason-value	"SIP"			
protocol-cause	"cause="200""			
reason-text	"text="transmission succeeded""			

Table 6.2.10.3.3-10: Void

Table 6.2.10.3.3-11: SIP MESSAGE from the UE (step 11, Table 6.2.10.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part	not present	**MCData-Info**		
MIME body part		**MCData Data signalling message**		
MIME-part-body	SDS NOTIFICATION as described in Table 6.2.10.3.3-12			

Table 6.2.10.3.3-12: FD NOTIFICATION (Table 6.2.2.3.3-11)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_COMPLETED

6.2.11 On-network / File Distribution (FD) / FD Using Media Plane / Group Standalone FD / Client Originated (CO)

6.2.11.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a group standalone FD message using the media plane}
```

```
    then { UE (MCDATA Client) sends a request to establish an MSRP connection via a SIP INVITE
message and then responds to the SIP 200 (OK) message with a SIP ACK message }
            }
```

(2)

```
with { UE (MCDATA Client) having requested the establishment of a MSRP connection }
ensure that {
  when { UE (MCDATA Client) receives a SIP 200 (OK) message with the a=setup attribute set to
"passive"  from the SS (MCDATA server) }
    then { UE (MCDATA Client) sends a blank MSRP SEND message to bind the MSRP connection and then
sends the group standalone FD message via a MSRP SEND message }
            }
```

(3)

```
with { UE (MCDATA Client) having sent a group standalone FD message using the media plane }
ensure that {
  when { UE (MCDATA Client receives a MSRP 200 (OK) message in response to the last MSRP SEND
message indicating that the standalone FD message has been successfully transferred }
    then { UE (MCDATA Client) sends a SIP BYE message }
            }
```

(4)

```
with { UE (MCDATA Client) having sent a group standalone FD message using the media plane with a
disposition of "FILE DOWNLOAD COMPLETED UPDATE" }
ensure that {
  when { UE (MCDATA Client receives a disposition response via a SIP MESSAGE message from the SS
(MCDATA Server }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

6.2.11.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.5.2.3, 6.2.2.3, 12.2.1.2, TS 24.582 clause 7.1.2.1. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.5.2.3]

The MCData client shall generate a SIP INVITE request in accordance with 3GPP TS 24.229 [5] with the clarifications given below.

The MCData client:

1) shall include the g.3gpp.mcdata.fd media feature tag and the g.3gpp.icsi-ref media feature tag with the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" in the Contact header field of the SIP INVITE request according to IETF RFC 3840 [16];

2) shall include an Accept-Contact header field containing the g.3gpp.mcdata.fd media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

3) shall include an Accept-Contact header field with the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

4) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP INVITE request;

5) should include the "timer" option tag in the Supported header field;

6) should include the Session-Expires header field according to IETF RFC 4028 [38]. It is recommended that the "refresher" header field parameter is omitted. If included, the "refresher" header field parameter shall be set to "uac";

7) shall generate and contain an application/vnd.3gpp.mcdata-signalling MIME body with the FD SIGNALLING PAYLOAD as described in subclause 6.2.2.3;

8) if a one-to-one file distribution is requested:

   a) shall insert in the SIP INVITE request a MIME resource-lists body with the MCData ID of the invited MCData user, according to rules and procedures of IETF RFC 5366 [18]; and

   b) shall contain an application/vnd.3gpp.mcdata-info+xml MIME body with the <mcdatainfo> element containing the <mcdata-Params> element with:

      i) the <request-type> element set to a value of "one-to-one-fd";

   c) if an end-to-end security context needs to be established and the security context does not exist or if the existing security context has expired, then:

      i) if necessary, shall instruct the key management client to request keying material from the key management server as described in 3GPP TS 33.180 [26];

      ii) shall use the keying material to generate a PCK as described in 3GPP TS 33.180 [26];

      iii) shall use the PCK to generate a PCK-ID with the four most significant bits set to "0001" to indicate that the purpose of the PCK is to protect one-to-one communications and with the remaining twenty eight bits being randomly generated as described in 3GPP TS 33.180 [26];

      iv) shall encrypt the PCK to a UID associated to the MCData client using the MCData ID of the invited user and a time related parameter as described in 3GPP TS 33.180 [26];

      v) shall generate a MIKEY-SAKKE I_MESSAGE using the encapsulated PCK and PCK-ID as specified in 3GPP TS 33.180 [26]; and

      vi) shall add the MCData ID of the originating MCData to the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26]; and

      vii) shall sign the MIKEY-SAKKE I_MESSAGE using the originating MCData user's signing key provided in the keying material together with a time related parameter, and add this to the MIKEY-SAKKE payload, as described in 3GPP TS 33.180 [26];

9) if a group file distribution is requested:

   a) if the "/<*x*>/<x>/Common/MCData/AllowedFD" leaf node present in the group document of the requested MCData group, configured on the group management client as specified in 3GPP TS 24.483 [42] is set to "false", shall reject the request for FD and not continue with the rest of the steps in this subclause; and

   b) shall contain in an application/vnd.3gpp.mcdata-info+xml MIME body with the <mcdatainfo> element containing the <mcdata-Params> element with:

      i) the <request-type> element set to a value of "group-fd";

      ii) the <mcdata-request-uri> element set to the MCData group identity; and

      iii) the <mcdata-client-id> element set to the MCData client ID of the originating MCData client;

NOTE 1: The MCData client does not include the MCData ID of the originating MCData user in the body, as this will be inserted into the body of the SIP INVITE request that is sent from the originating participating MCData function.

10) shall set the Request-URI of the SIP INVITE request to the public service identity identifying the participating MCData function serving the MCData user;

NOTE 2: The MCData client is configured with public service identity identifying the participating MCData function serving the MCData user.

11) may include a P-Preferred-Identity header field in the SIP INVITE request containing a public user identity as specified in 3GPP TS 24.229 [5];

12) shall include an SDP offer according to 3GPP TS 24.229 [5] with the clarifications given in subclause 10.2.5.2.1; and

13) shall send the SIP INVITE request towards the MCData server according to 3GPP TS 24.229 [5].

On receipt of a SIP 2xx response to the SIP INVITE request, the MCData client:

1) shall send a SIP ACK request as specified in 3GPP TS 24.229 [5];

2) shall start the SIP Session timer according to rules and procedures of IETF RFC 4028 [38]; and

3) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 10.2.5.1.1..

[TS 24.282, clause 6.2.2.3]

In order to generate an FD message, the MCData client:

1) shall generate an FD SIGNALLING PAYLOAD message as specified in subclause 15.1.3; and

2) shall include in the SIP request, the FD SIGNALLING PAYLOAD message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1.

When generating an FD SIGNALLING PAYLOAD message as specified in subclause 15.1.3, the MCData client:

1) shall set the Date and time IE to the current time as specified in subclause 15.2.8;

2) if the filestarts a new conversation, shall set the Conversation ID IE to a newly generated Conversation ID value as specified in subclause 15.2.9;

3) if the file continues an existing conversation, shall set the Conversation ID IE to the Conversation ID value of the existing conversation as specified in subclause 15.2.9;

4) shall set the Message ID IE to a newly generated Message ID value as specified in subclause 15.2.10;

5) if the files in reply to a previously received SDS message or file, shall include the InReplyTo message ID IE with the Message ID value in the previously received SDS message or file;

6) if the file is for user consumption, shall not include an Application ID IE as specified in subclause 15.2.7;

7) if the file is intended for an application on the terminating MCData client, shall include an Application ID IE with an Application ID value representing the intended application as specified in subclause 15.2.7;

NOTE: The value chosen for the Application ID value is decided by the mission critical organisation.

8) if a file download complete notification is required shall include a FD disposition request type IE set to "FILE DOWNLOAD COMPLETED UPDATE" as specified in subclause 15.2.4; and

9) shall include and set the Mandatory download IE to "MANDATORY DOWNLOAD" as described in subclause 15.2.16.

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

[TS 24.582, clause 6.1.1.2.1]

Upon receiving an indication to establish MSRP connection for standalone SDS using media plane as the originating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];
2. shall act according to IETF RFC 6135 [12], as:
   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and
   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";
3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11]; and
4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client:

1. shall generate a SDS SIGNALLING PAYLOAD as specified in subclause 6.1.1.2.2;
2. shall generate a SDS DATA PAYLOAD as specified in subclause 6.1.1.2.3;
3. shall include the SDS SIGNALLING PAYLOAD and SDS DATA PAYLOAD in an MSRP SEND request as specified in subclause 6.1.1.2.4; and
4. shall send the MSRP SEND request on the established MSRP connection.

NOTE: MSRP chunking, if needed, may affect the number of "Content Type" lines in each MSRP SEND message conveying a chunk, as also specified in subclause 6.1.1.2.4.

If MSRP chunking is not used then on receipt of a 200 (OK) response, the MCData client shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests as necessary;
2. shall wait for a 200 (OK) response to each MSRP SEND request sent; and
3. on receipt of the last 200 (OK) response shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks;
2. shall indicate to MCData user that the SDS message could not be sent; and
3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving an indication to terminate the session from the signalling plane, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks and may indicate to MCData user that the SDS message could not be sent.

[TS 24.582, clause 7.1.2.1]

Upon receiving an indication to establish MSRP connection for file distribution as the originating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];
2. shall act according to IETF RFC 6135 [12], as:
   a. an "active" endpoint, if a=setup attribute in the received SDP answer is set to "passive"; and
   b. an "passive" endpoint, if a=setup attribute in the received SDP answer is set to "active";

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP answer received in the SIP 200 (OK) response according to IETF RFC 4975 [11]; and

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12].

On receiving MSRP 200 (OK) response to the first MSRP SEND request, the MCData client can send the file. To send the file, the MCData client:

1. shall generate MSRP SEND for file distribution request according to IETF RFC 4975 [11]. When generating an MSRP SEND, the MCData client:

   a. shall set To-Path header according to the MSRP URI(s) received in the answer SDP;

   b. shall set the first content type as Content-Type = "application/vnd.3gpp.mcdata-file"; and

   c. shall set the body of the MSRP SEND request with MSRP payload. MSRP payload is set to the file or part of the file.

2. shall send the MSRP SEND request(s) on the established MSRP connection.

If MSRP chunking is used, the MCData client:

1. shall send further MSRP SEND requests containing the file as necessary;

2. shall wait for a 200 (OK) response to each MSRP SEND request sent; and

3. on receipt of the last 200 (OK) response shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

On receiving a non-200 MSRP response to the MSRP SEND request the MCData client shall handle the error as specified in IETF RFC 4975 [11]. To terminate the MSRP session, the MCData client:

1. if there are further MSRP chunks to send, shall abort transmission of these further MSRP chunks;

2. shall indicate to MCData user that the file could not be distributed; and

3. shall terminate the SIP session as specified in 3GPP TS 24.282 [8].

6.2.11.3 Test description

6.2.11.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

- Test File 1 for CO FD as specified in annex A.2.1 is available at the UE for upload.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.

- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

- UE States at the end of the preamble

  - The UE is in E-UTRA Registered, Idle Mode state.

  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.11.3.2 Test procedure sequence

Table 6.2.11.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send test file 1 (TS 36.579-7 A.2.1) for CO group FD over media plane with disposition notification type "FILE DOWNLOAD COMPLETED UPDATE". (NOTE 1, NOTE 2)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.2.3-1?	-	-	1,2	P
3-6	Void	-	-	-	-
7	Check: Does the UE (MCData client) correctly perform procedure '**CO MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.4.3-1 **to send an FD message containing test file 1 for CO FD**?	-	-	2	P
7A	Check: Is the content of the transferred file the same as specified in annex A.2.1?	-	-	2	P
8	Check: Does the UE (MCData client) correctly perform procedure '**CO MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.6.3-1?	-	-	3	P
9	Void	-	-	-	-
10	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive the disposition notification** for the FD message sent at step 7?	-	-	4	P
11	Void	-	-	-	-
12	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	4	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: Test file 1 for CO FD as specified in annex A.2.1.					

6.2.11.3.3 Specific message contents

Table 6.2.11.3.3-1: SIP INVITE from the UE (step 2, Table 6.2.11.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.1-1, condition MCDATA_FD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.2.11.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.11.3.3-3			
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
MIME-Content-Type	"application/vnd.3gpp. mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.11.3.3-3A			

Table 6.2.11.3.3-2: SDP for SIP INVITE (Table 6.2.11.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_FD, SDP_OFFER

Table 6.2.11.3.3-3: MCData-Info (Table 6.2.11.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-fd"			

Table 6.2.11.3.3-3A: FD SIGNALLING PAYLOAD (Table 6.2.11.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.5-1, condition FD_MSRP

Table 6.2.11.3.3-4: SIP 200 (OK) from the SS (step 2, Table 6.2.11.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.2.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.2-1, condition INVITE-RSP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
SDP message	As described in Table 6.2.11.3.3-5			

Table 6.2.11.3.3-5: SDP for SIP 200 (OK) (Table 6.2.11.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_FD, SDP_ANSWER

Table 6.2.11.3.3-6: MSRP SEND from the UE (step 7, Table 6.2.11.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.4.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp.mcdata-file"			
data	As specified in table 6.2.11.3.3-7			

Table 6.2.11.3.3-7: MCData Protected Payload Message (Table 6.2.11.3.3-6)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.10-1, condition PROTECTED_FILE, GMK

Table 6.2.11.3.3-8..9: Void

Table 6.2.11.3.3-10: SIP BYE from the UE (step 8, Table 6.2.11.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.6.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.2.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Reason			RFC 3326 [125]	
reason-value	"SIP"			
protocol-cause	"cause="200""			
reason-text	"text="transmission succeeded""			

Table 6.2.11.3.3-11: Void

Table 6.2.11.3.3-13: SIP MESSAGE from the SS (step 10, Table 6.2.11.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	As described in Table 6.2.11.3.3-14			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.11.3.3-15			

Table 6.2.11.3.3-14: MCData-Info (Table 6.2.11.3.3-13)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-calling-group-id> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.2-3A		

Table 6.2.11.3.3-15: FD NOTIFICATION (Table 6.2.11.3.3-13)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_COMPLETED

Table 6.2.11.3.3-16: Void

6.2.12 On-network / File Distribution (FD) / FD Using Media Plane / Group Standalone FD / Client Terminated (CT)

6.2.12.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives a SIP INVITE to initiate a standalone group FD message using the
media plane }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message }
            }
```

(2)

```
with { UE (MCDATA Client) having responded to the SIP INVITE message that initiated a standalone
group FD message using the media plane }
ensure that {
  when { UE (MCDATA Client) receives an MSRP SEND message from the SS (MCDATA Server) }
    then { UE (MCDATA Client) responds with an MSRP 200 (OK) message }
            }
```

(3)

```
with { UE (MCDATA Client) having finished receiving the file from the SS (MCDATA server) }
ensure that {
  when { UE (MCDATA Client) receives a SIP BYE message to release communications }
    then { UE (MCDATA Client) responds with a SIP 200 (OK) message and then sends a "FILE DOWNLOAD
COMPLETED" disposition via a SIP MESSAGE message }
            }
```

6.2.12.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.5.2.4, 12.2.1.1, 6.2.3.2, TS 24.582 clauses 7.1.3.1, 7.1.3.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.5.2.4]

Upon receipt of an initial SIP INVITE request, the MCData client shall follow the procedures for termination of multimedia sessions in the IM CN subsystem as specified in 3GPP TS 24.229 [5] with the clarifications below.

The MCData client:

1) may reject the SIP INVITE request if either of the following conditions are met:

   a) MCData client does not have enough resources to handle the call; or

   b) any other reason outside the scope of this specification;

   and skip the rest of the steps after step 2;

2) if the SIP INVITE request is rejected in step 1), shall respond toward participating MCData function either with appropriate reject code as specified in 3GPP TS 24.229 [5] and warning texts as specified in subclause 4.9 or

with SIP 480 (Temporarily unavailable) response not including warning texts if the user is authorised to restrict the reason for failure and skip the rest of the steps of this subclause;

3) if the SDP offer of the SIP INVITE request contains an "a=key-mgmt" attribute field with a "mikey" attribute value containing a MIKEY-SAKKE I_MESSAGE:

   a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

   b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

   c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

   d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP INVITE request with a SIP 488 (Not Acceptable Here) response as specified in IETF RFC 4567 [45], and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

   e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

      i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

      ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to create an end-to-end secure session.

4) may display to the MCData user the MCData ID of the inviting MCData user;

5) may display to the MCData user the file meta-data of the incoming file as described by the SDP included in the received SIP INVITE request;

6) if the Mandatory indication IE of the FD SIGNALLING PAYLOAD contained in the application/vnd.3gpp.mcdata-signalling MIME body received in the SIP INVITE request is set to "MANDATORY", then:

   i) shall accept the SIP INVITE request and generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

   ii) shall include the option tag "timer" in a Require header field of the SIP 200 (OK) response;

   iii) shall include the Session-Expires header field in the SIP 200 (OK) response and start the SIP session timer according to IETF RFC 4028 [38]. The "refresher" parameter in the Session-Expires header field shall be set to "uas";

   iv) shall include the g.3gpp.mcdata.fd media feature tag in the Contact header field of the SIP 200 (OK) response;

   v) shall include the g.3gpp.icsi-ref media feature tag containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.fd" in the Contact header field of the SIP 200 (OK) response;

   vi) shall include an SDP answer in the SIP 200 (OK) response to the SDP offer in the incoming SIP INVITE request according to 3GPP TS 24.229 [5] with the clarifications given in subclause 10.2.5.2.2; and

   vii) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of an SIP ACK message to the sent SIP 200 (OK) message, the MCData client shall:

1) shall interact with the media plane as specified in 3GPP TS 24.582 [15] subclause 10.2.5.1.2.

On receipt of an indication from the media plane of the successful download of the file and if the received FD SIGNALLING PAYLOAD message contained an FD disposition request type IE requesting a file download completed update indication, then, the MCData client:

1) shall follow the procedures described in subclause 12.2.1.1.

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;

- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;

- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or

- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the controlling MCData function that sent the SDS or FD message request. The MCData client determines the controlling MCData function from the contents of the <mcdata-controller-psi> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request;

- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and

- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];

4) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with an <mcdata-controller-psi> element containing the PSI of the controlling MCData function;

5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;

6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

7) if requiring to send an FD notification, shall generate an FD NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.2; and

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.3.2]

In order to generate an FD notification, the MCData client:

1) shall generate an FD NOTIFICATION message as specified in subclause 15.1.6; and

2) shall include in the SIP request, the FD NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1.

When generating an FD NOTIFICATION message as specified in subclause 15.1.6, the MCData client:

1) if sending a file download accept notification, shall set the FD disposition notification type IE as "FILE DOWNLOAD REQUEST ACCEPTED" as specified in subclause 15.2.6;

2) if sending a file download reject notification, shall set the FD disposition notification type IE as "FILE DOWNLOAD REQUEST REJECTED" as specified in subclause 15.2.6;

3) if sending a file download deferred notification, shall set the FD disposition notification type IE as "FILE DOWNLOAD REQUEST DEFERRED" as specified in subclause 15.2.6;

4) shall set the Conversation ID to the value of the Conversation ID that was received in the FD message as specified in subclause 15.2.9;

5) shall set the Date and time IE to the current time as specified in subclause 15.2.8; and

6) if sending a file download completed notification:

   a) shall set the FD disposition notification type IE as "FILE DOWNLOAD COMPLETED" as specified in subclause 15.2.6;

   b) shall set the Message ID to the value of the Message ID that was received in the FD message as specified in subclause 15.2.10;

   c) if the FD message was destined for the user, shall not include an Application ID IE as specified in subclause 15.2.7; and

   d) if the FD message was destined for an application, shall include an Application ID IE set to the value of the Application ID that was included in the FD message as specified in subclause 15.2.3.

[TS 24.582, clause 7.1.3.1]

Upon receiving an indication to establish MSRP connection for file distribution as the terminating client, the MCData client:

1. shall act as an MSRP client according to IETF RFC 6135 [12];

2. shall act either as an active endpoint or as an passive endpoint to open the transport connection, according to IETF RFC 6135 [12];

3. shall establish the MSRP connection according to the MSRP connection parameters in the SDP offer received in the SIP INVITE request according to IETF RFC 4975 [11];

4. if acting as an "active" endpoint, shall send an empty MSRP SEND request to bind the MSRP connection to the MSRP session from the perspective of the passive endpoint according to the rules and procedures of IETF RFC 4975 [11] and IETF RFC 6135 [12];

Once the MSRP session is established, the MCData client:

1. on receipt of an MSRP request in the MSRP session, shall follow the rules and procedures defined in IETF RFC 4975 [11] and in IETF RFC 6714 [13];

2. If an MSRP SEND request indicates the use of chunking, shall wait until all further MSRP SEND requests for the remaining chunks have been received and shall reassemble the entire set of MSRP requests into the file before delivering the content to the application; and

3. shall handle the received content as described in subclause 7.1.3.2.

[TS 24.582, clause 7.1.3.2]

Upon receiving a file, the MCData client:

1. shall decode the contents of the application/vnd.3gpp.mcdata-file MIME body; and

2. once all the chunks of the file are successfully received, shall indicate to the signalling plane that the file download is completed.

6.2.12.3 Test description

6.2.12.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)
- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- Test files downloaded or received at previous test runs are deleted.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.12.3.2 Test procedure sequence

Table 6.2.12.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData Call Establishment**' as described in TS 36.579-1 [2] Table 5.3C.3.3-1?	-	-	1,2	P
2-5	Void	-	-	-	-
6	Check: Does the UE (MCData client) correctly perform procedure '**CT MSRP message transfer**' as described in TS 36.579-1 [2] Table 5.3C.5.3-1 **to receive an FD message containing** test file 1? (NOTE 2)	-	-	2	P
7	Void	-	-	-	-
8	Check: Does the UE (MCData client) correctly perform procedure '**CT MCData call release**' as described in TS 36.579-1 [2] Table 5.3C.7.3-1?	-	-	3	P
9-10	Void	-	-	-	-
11	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 to **send a disposition notification for the file received at step 6**?	-	-	2	P
12	Void	-	-	-	-
13	Check: Has the UE (MCData client) downloaded test file 1 (TS 36.579-7 A.3.1)? (NOTE 1)	-	-	2	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: Test file 1 for CT FD as specified in annex A.3.1.					

6.2.12.3.3 Specific message contents

Table 6.2.12.3.3-1: SIP INVITE from the SS (step 1, Table 6.2.12.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.5.2-1, condition MCDATA_FD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**SDP message**		
MIME-part-body	SDP message as described in Table 6.2.12.3.3-2			
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.12.3.3-3			
MIME body part		**MCData Data signalling message**		
MIME-part-headers				
MIME-Content-Type	"application/vnd.3gpp.mcdata-signalling"			
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.12.3.3-3A			

Table 6.2.12.3.3-2: SDP for SIP INVITE (Table 6.2.12.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.2-3, condition MCDATA_FD, SDP_OFFER

Table 6.2.12.3.3-3: MCData-Info (Table 6.2.12.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-fd"			

Table 6.2.12.3.3-3A: FD SIGNALLING PAYLOAD (Table 6.2.12.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.6-1, condition FD_MSRP

Table 6.2.12.3.3-4: SIP 200 (OK) from the UE (step 1, Table 6.2.12.3.2-1; step 4, TS 36.579-1 [2] Table 5.3C.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.17.1.1-1, condition INVITE-RSP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
value	"application/sdp"			
Message-body				
SDP message	As described in Table 6.2.12.3.3-5			

Table 6.2.12.3.3-5: SDP for SIP 200 (OK) (Table 6.2.12.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.1.1-3, condition MCDATA_FD, SDP_ANSWER

Table 6.2.12.3.3-6: MSRP SEND from the SS (step 6, Table 6.2.12.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.5.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.12.1.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp. mcdata-file"			
data	As specified in table 6.2.12.3.3-7			

Table 6.2.12.3.3-7: MCData Protected Payload Message (Table 6.2.12.3.3-6)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.10-2, condition PROTECTED_FILE, GMK

Table 6.2.12.3.3-8: SIP BYE from the SS (step 8, Table 6.2.12.3.2-1; step 1, TS 36.579-1 [2] Table 5.3C.7.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.2.2-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Reason				
reason-value	"SIP"			
protocol-cause	"cause="200""			
reason-text	"text="transmission succeeded""			

Table 6.2.12.3.3-9: Void

Table 6.2.12.3.3-10: SIP MESSAGE from the UE (step 11, Table 6.2.12.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Info**		
MIME-part-body	MCData-Info as described in Table 6.2.12.3.3-10A			
MIME body part		**MCData Data signalling message**		
MIME-part-body	SDS NOTIFICATION as described in Table 6.2.12.3.3-11			

Table 6.2.12.3.3-10A: MCData-Info (Table 6.2.12.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-request-uri> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.1-3A		

Table 6.2.12.3.3-11: FD NOTIFICATION (Table 6.2.2.3.3-10)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.7-1, condition FD_COMPLETED

6.2.13 On-network / File Distribution (FD) / Accessing list of deferred data group communications / Client Originated (CO)

6.2.13.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a Group Standalone FD message with a non-mandatory
download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" and the UE (MCDATA Client) is
unaware of the URL of the Media Storage Function }
    then { UE (MCDATA Client) sends a SIP MESSAGE to find the URL of the Media Storage Function and
responds to a SIP MESSAGE that contains the URL of the Media Storage Function with a SIP 200 (OK)
message }
            }
```

(2)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send a Group Standalone FD message with a non-mandatory
download and with a disposition of "FILE DOWNLOAD COMPLETE UPDATE" and the UE (MCDATA Client) is
aware of the URL of the Media Storage Function }
    then { UE (MCDATA Client) uploads the file to the Media Storage Function via an HTTP POST
message and then sends the URL of the file location to the recipient via a SIP MESSAGE message }
            }
```

(3)

```
with { UE (MCDATA Client) having sent the URL of the file location to the recipient }
ensure that {
  when { UE (MCDATA Client) receives a FD notification via a SIP MESSAGE message }
    then { UE (MCDATA Client) responds to the SIP MESSAGE message with a SIP 200 (OK) message and
delivers the notification to the MCDATA User }
            }
```

(4)

```
with { UE (MCDATA Client) having received a notification that a sent message was deferred by the
recipient }
ensure that {
  when { MCData User requests to access the list of deferred group communication }
    then { UE (MCDATA Client) sends a SIP MESSAGE message requesting to access the list of deferred
communication and responds to a received SIP MESSAGE message with a SIP 200 (OK message and delivers
the notification to the MCDATA User }
            }
```

6.2.13.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 10.2.1.3.2, 10.2.2.1, 10.2.4.2.1, 12.2.1.2, 11.3.2.1, 11.3.2.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-14 requirements.

[TS 24.282, clause 10.2.1.3.2]

To discover the absolute URI of the media storage function, the MCData client shall generate a SIP MESSAGE request towards the participating MCData function, in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;

3) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with a <request-type> element containing the value "msf-disc-req";

4) if the upload of a file is for a group standalone FD request, shall include in an application/vnd.3gpp.mcdata-info+xml MIME body, the <mcdata-calling-group-id> element set to the required MCData group identity; and

NOTE 1: The absence of a group identity in the <mcdata-calling-group-id> element of the application/vnd.3gpp.mcdata-info+xml MIME body implies that the MCData client intends to upload a file for a one-to-one FD request. In this case, the participating MCData function identifies the MCData ID of the user from the binding between the public user identity and the MCData ID.

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

On receipt of a "SIP MESSAGE request for absolute URI discovery response", the MCData client:

1) shall store the absolute URI found in the <mcdata-controller-psi> element;

2) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5]; and

3) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 10.2.2.1]

If the media storage client is not aware of the absolute URI of the media storage function, the media storage client shall request the MCData client to discover the absolute URI associated with the media storage function by following the procedures in subclause 10.2.1.3.

The media storage client shall send HTTP requests over a TLS connection as specified for the HTTP client in the UE in annex A of 3GPP TS 24.482 [24].

NOTE 1: The HTTP client encodes the MCData ID in the bearer access token of the Authorization header field of an HTTP request as specified in 3GPP TS 24.482 [24].

NOTE 2: The HTTP client always sends the HTTP requests to an HTTP proxy. Annex A of 3GPP TS 24.482 [24] indicates how the HTTP proxy forwards the HTTP request to the HTTP server.

To upload a file to media storage function, the media storage client:

1) shall generate an HTTP POST request as specified in IETF RFC 7230 [22] and IETF RFC 7231 [23];

2) shall set the Request-URI to the absolute URI identifying the resource on a media storage function;

3) shall set the Host header field to a hostname identifying the media storage function;

4) shall set the Content-Type header field to multipart/mixed and with a boundary delimiter parameter set to any chosen value;

5) if the file upload is for one-to-one file distribution, shall insert an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <request-type> element set to a value of "one-to-one-fd"; and

   b) the <mcdata-calling-user-id> element set to the originating MCData ID;

6) if the file upload is for group file distribution, shall insert an application/vnd.3gpp.mcdata-info+xml MIME body with:

   a) the <request-type> element set to a value of "group-fd";

   b) the <mcdata-request-uri> element set to the MCData group identity; and

   c) the <mcdata-calling-user-id> element set to the originating MCData ID;

7) if end-to-end security is required for a one-to-one communication, the MCData client protects the binary data representing the file and prefixes the protected binary data with security parameters as described in 3GPP TS 33.180 [26];

8) if

   i) end-to-end security is not required for a one-to-one communication, or

   ii) the file upload is for group file distribution;

   shall include the binary data representing the file with Content-Type field set to application/octet-stream and Content-Length field set to the file size; and

9) shall send the HTTP POST request towards the media storage function.

On receipt of a HTTP 201 Created containing a Location header field with a URL identifying the location of the resource where the file has been stored on the media storage function, then the media storage client shall store this information.

[TS 24.282, clause 10.2.4.2.1]

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) if a one-to-one standalone FD message is to be sent shall insert in the SIP MESSAGE request:

a) an application/resource-lists+xml MIME body with the MCData ID of the target MCData user, according to rules and procedures of IETF RFC 4826 [9]; and

b) an application/vnd.3gpp.mcdata-info+xml MIME body with a <request-type> element set to a value of "one-to-one-fd";

…

4) shall generate a standalone FD message as specified in subclause 6.2.2.2; and

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

[TS 24.282, clause 11.3.2.1]

Upon receiving a request from the MCData user to access the list of deferred data group communications, the MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

2) shall generate DEFERRED DATA REQUEST message as specified in subclause 15.1.11.1;

3) shall include in the SIP request, the DEFERRED DATA GROUP COMM message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1; and

4) shall send the SIP MESSAGE request towards the participating MCData function according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 11.3.2.2]

Upon receipt of a "SIP MESSAGE response for the list of deferred group communications request", the MCData client:

1) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

2) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5];

3) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body:

a) if the application/vnd.3gpp.mcdata-signalling MIME body contains DEFERRED DATA RESPONSE message as specified in subclause 15.1.12:

i) for each payload, if payload type is set to "FILEURL", shall store the payload data; and

4) shall present to MCData user, the list of file URLs which were deferred.

6.2.13.3 Test description

6.2.13.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- Test File 1 for CO FD as specified in annex A.2.1 is available at the UE for upload.

Preamble:

- In the MCData Group Configuration document the <mcdata-on-network-max-data-size-auto-recv> shall be set to 0 to indicate non-mandatory download independent from the file size.
- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.2.13.3.2 Test procedure sequence

Table 6.2.13.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send test file 1 (TS 36.579-7 A.2.1) for CO group FD over HTTP for non-mandatory download and with disposition request "FILE DOWNLOAD COMPLETED UPDATE". (NOTE 1, NOTE 2)	-	-	-	-
2	Check: Does the UE (MCData client) correctly perform procedure '**Discovery of the absolute URI of the media storage function (one-to-one communication)**' as described in TS 36.579-1 [2] Table 5.3C.9.3-1 ?	-	-	1	P
3	Check: Does the UE (MCData client) correctly perform procedure '**FD file upload using HTTP**' as described in TS 36.579-1 [2] Table 5.3C.10.3-1?	-	-	2	P
3A	Check: Is the content of the uploaded file the same as specified in annex A.2.1?	-	-	2	P
4-6	Void	-	-	-	-
7	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an FD NOTIFICATION with disposition notification type "FILE DOWNLOAD DEFERRED"** for the FD message sent at step 3?	-	-	4	P
8	Void	-	-	-	-
9	Check: Does the UE (MCData client) notify the user that the remote Client has deferred the acceptance of the download? (NOTE 1)	-	-	3	P
10	Make the UE (MCData client) access the list of deferred data group communications. (NOTE 1)	-	-	-	-
11	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE Request - Accept CO**' as described in TS 36.579-1 [2] Table 5.3.30.3-1 **to retrieve the list of deferred data group communication**?	-	-	4	P
12-14	Void	-	-	-	-
15	Check: Does the UE (MCData client) provide the list of file URLs which were deferred to the user? (NOTE 1)	-	-	4	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: Test file 1 for CO FD as specified in annex A.2.1.					

6.2.13.3.3 Specific message contents

Table 6.2.13.3.3-1..6: Void

Table 6.2.13.3.3-7: HTTP POST from the UE (step 3, Table 6.2.13.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.3-1, condition FD_HTTP				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.1.3.3-8			

Table 6.2.13.3.3-8: MCData-Info (Table 6.2.13.3.3-7)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-fd"			
mcdata-request-uri	px_MCData_Group_A_ID	NOTE: the element is not encrypted		
mcdata-calling-user-id	px_MCData_ID_User_A	NOTE: the element is not encrypted		

Table 6.2.13.3.3-9: Void

Table 6.2.13.3.3-10: HTTP 201 Created from the SS (step 3, Table 6.2.13.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.4.7-1, condition FD_HTTP

Table 6.2.13.3.3-11: SIP MESSAGE from the UE (step 3, Table 6.2.13.3.2-1; step 3, TS 36.579-1 [2] Table 5.3C.10.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.13.3.3-12			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD SIGNALLING PAYLOAD as described in Table 6.2.13.3.3-12A			

Table 6.2.13.3.3-12: MCData-Info (Table 6.2.13.3.3-11)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
request-type	"group-fd"			

Table 6.2.13.3.3-12A: FD SIGNALLING PAYLOAD (Table 6.2.13.3.3-11)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.5-1, condition FD_HTTP

Table 6.2.13.3.3-13: SIP MESSAGE from the SS (step 7, Table 6.2.13.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_FD, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.2.1.3.3-14			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing FD NOTIFICATION as described in Table 6.2.13.3.3-15			

Table 6.2.13.3.3-14: MCData-Info (Table 6.2.13.3.3-13)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-calling-group-id> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.2-3A		

Table 6.2.13.3.3-15: FD NOTIFICATION (Table 6.2.13.3.3-13)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.8-1, condition FD_DEFERRED

Table 6.2.13.3.3-16: SIP MESSAGE from the UE (step 11, Table 6.2.13.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.30.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp.mcdata-signalling"			
Message-body				
MCData Signalling message	MCData Protected Payload Message containing DEFERRED DATA REQUEST as described in Table 6.2.13.3.3-17			

Table 6.2.13.3.3-17: DEFERRED DATA REQUEST (Table 6.2.13.3.3-16)

Derivation Path: TS 24.282 [87], clause 15.1.11				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Deferred data request message identity	'00001011'B	Deferred List Access Request	TS 24.282 [87] clause 15.2.2	

Table 6.2.13.3.3-18: SIP MESSAGE from the SS (step 11, Table 6.2.13.3.2-1; step 4, TS 36.579-1 [2] Table 5.3.30.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Content-Type				
media-type	"application/vnd.3gpp.mcdata-signalling"			
Message-body				
MCData Signalling message	MCData Protected Payload Message containing DEFERRED DATA RESPONSE as described in Table 6.2.13.3.3-19			

Table 6.2.13.3.3-19: DEFERRED DATA RESPONSE (Table 6.2.13.3.3-18)

Derivation Path: TS 24.282 [87], clause 15.1.12				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Deferred data response message identity	'00001100'B	Deferred List Access Response	TS 24.282 [87] clause 15.2.2	
Number of payloads	"1"		TS 24.282 [87] clause 15.2.12	
Security parameters and Payload	Not present			
Payload			TS 24.282 [87] clauses 11.3.3.2 and 15.2.13	
Length of Payload contents	Length of the payload contents			
Payload content type	“00000100”	FILEURL		
Payload contents	same URI as assigned by the HTTP 201 (Created) at step 3			
MCData group ID	Not present	Rel-17	TS 24.282 [87] clause 15.2.14	
Deferred FD signalling payload	Not present	Rel-17	TS 24.282 [87] clause 15.2.27	

6.3 Enhanced Status (ES)

6.3.1 On-network / Enhanced Status (ES) / Client Originated (CO)

6.3.1.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User requests to send an Enhanced Status with a disposition of only Delivery }
    then { UE (MCDATA Client) sends an Enhanced Status with a disposition request of only Delivery
via s SIP MESSAGE message }
            }
```

(2)

```
with { UE (MCDATA Client) having sent an Enhanced Status with a disposition request of DELIVERY }
ensure that {
  when { the UE (MCDATA Client) receives a disposition response via a SIP MESSAGE message from the
SS (MCDATA Server) }
    then { UE (MCData Client) responds to the SIP MESSAGE message by sending a SIP 200 (OK) message
and delivers the notification to the MCDATA User }
            }
```

6.3.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 14.2.1.1, 9.2.2.2.1, 6.2.2.1, 6.2.4.1, 12.2.1.2. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-15 requirements.

[TS 24.282, clause 14.2.1.1]

Upon receiving a request from the MCData user to send an enhanced status to an MCData group and the <mcdata-allow-enhanced-status> element under the <list-service> element as defined in 3GPP TS 24.481 [11] is set to "true", the MCData client:

1) shall use the "id" attribute of the MCData user selected operation value from <mcdata-enhanced-status-operational-values> element under <list-service> element as defined in 3GPP TS 24.481 [11], to generate a group standalone SDS message by following the procedure described in clause 9.2.2.2.1.

[TS 24.282, clause 9.2.2.2.1]

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;

...

3) if a group standalone SDS message is to be sent:

   a) if the "/<*x*>/<x>/Common/MCData/AllowedSDS" leaf node present in the group document of the requested MCData group, configured on the group management client as specified in 3GPP TS 24.483 [42] is set to "false", shall reject the request to send SDS and not continue with the rest of the steps in this subclause; and

   b) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with:

      i) the <request-type> element set to a value of "group-sds";

      ii) the <mcdata-request-uri> element set to the MCData group identity; and

      iii) the <mcdata-client-id> element set to the MCData client ID of the originating MCData client;

4) shall generate a standalone SDS message as specified in subclause 6.2.2.1; and

5) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.2.1]

In order to generate an SDS message, the MCData client:

1) shall generate an SDS SIGNALLING PAYLOAD message as specified in clause 15.1.2;

2) shall generate a DATA PAYLOAD message as specified in clause 15.1.4;

3) shall include in the SIP request, the SDS SIGNALLING PAYLOAD message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in clause E.1; and

4) shall include in the SIP request, the DATA PAYLOAD message in an application/vnd.3gpp.mcdata-payload MIME body as specified in clause E.2.

When generating an SDS SIGNALLING PAYLOAD message as specified in clause 15.1.2, the MCData client:

1) shall set the Date and time IE to the current time as specified in clause 15.2.8;

2) if the SDS message starts a new conversation, shall set the Conversation ID IE to a newly generated Conversation ID value as specified in clause 15.2.9;

3) if the SDS message continues an existing unfinished conversation, shall set the Conversation ID IE to the Conversation ID value of the existing conversation as specified in clause 15.2.9;

4) shall set the Message ID IE to a newly generated Message ID value as specified in clause 15.2.10;

5) if the SDS message is in reply to a previously received SDS message, shall include the InReplyTo message ID IE with the Message ID value in the previously received SDS message;

6) if the SDS message is for user consumption, shall not include an Application ID IE as specified in clause 15.2.7and shall not include an Extended application ID IE as specified in clause 15.2.24;

7) if the SDS message is intended for an application on the terminating MCData client, shall include:

a) an Application ID IE with a Application ID value representing the intended application as specified in clause 15.2.7; or

b) an Extended application ID IE with an Extended application ID value representing the intended application as specified in clause 15.2.24;

NOTE: The value chosen for the Application ID value is decided by the mission critical organisation.

8) if only a delivery disposition notification is required shall include a SDS disposition request type IE set to "DELIVERY" as specified in clause 15.2.3;

9) if only a read disposition notification is required shall include a SDS disposition request type IE set to "READ" as specified in clause 15.2.3; and

10) if both a delivery and read disposition notification is required shall include a SDS disposition request type IE set to "DELIVERY AND READ" as specified in clause 15.2.3.

When generating an DATA PAYLOAD message for SDS as specified in clause 15.1.4, the MCData client:

1) shall set the Number of payloads IE to the number of Payload IEs that needs to be encoded, as specified in clause 15.2.12;

2) if end-to-end security is required for a one-to-one communication, shall include the Security parameters and Payload IE with security parameters as described in 3GPP TS 33.180 [26]. Otherwise, if end-to-end security is not required for a one-to-one communication, shall include the Payload IE as specified in clause 15.1.4; and

3) for each Payload IE included:

a) if the payload is text, shall set the Payload content type as "TEXT" as specified in clause 15.2.13;

b) if the payload is binary data, shall set the Payload content type as "BINARY" as specified in clause 15.2.13;

c) if the payload is hyperlinks, shall set the Payload content type as "HYPERLINKS" as specified in clause 15.2.13;

d) if the payload is location, shall set the Payload content type as "LOCATION" as specified in clause 15.2.13;

e) if payload is enhanced status for a group, shall set the Payload content type as "ENHANCED STATUS" as specified in subclause 15.2.13; and

f) shall include the data to be sent in the Payload data.

[TS 24.282, clause 6.2.4.1]

This subclause is referenced from other procedures.

In a SIP MESSAGE request, the MCData client:

1) when sending SDS messages or SDS disposition notifications:

a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

…

3) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [5]; and

4) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user.

[TS 24.282, clause 12.2.1.2]

Upon receipt of a:

"SIP MESSAGE request for SDS disposition notification for terminating MCData client"; or

"SIP MESSAGE request for FD disposition notification for terminating MCData client";

the MCData client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body; and

2) shall deliver the notification to the user or application.

6.3.1.3 Test description

6.3.1.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

- The <max-payload-size-sds-cplane-bytes> element in the MCData service configuration document as specified in 3GPP TS 24.484 [12], shall be large enough to allow the sending of the standalone SDS message using the signalling plane.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.

- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

- UE States at the end of the preamble

  - The UE is in E-UTRA Registered, Idle Mode state.

  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.3.1.3.2 Test procedure sequence

Table 6.3.1.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Make the UE (MCData client) send an enhanced status to Group A using Enhanced Status Id "1" with disposition request "DELIVERY". (NOTE 1)	-	-	-	-
2-2B	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send an Enhanced Status with Enhanced Status Id "1" and disposition request "DELIVERY"**? (NOTE 2)	-	-	1	P
3	Void	-	-	-	-
4	Check: Does the UE (MCData client) correctly perform procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive the disposition notification** for the SDS message sent at step 2A?	-	-	2	P
5	Void	-	-	-	-
6	Check: Does the UE (MCData client) provide the disposition notification to the user? (NOTE 1)	-	-	2	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: The RRC connection is not released at the end of the procedure.					

6.3.1.3.3 Specific message contents

Table 6.3.1.3.3-1: SIP MESSAGE from the UE (step 2A, Table 6.3.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, MCDATA_SIGNALLING, MCDATA_PAYLOAD				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.3.1.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 6.1.3.3.3-2A			
MIME body part		**MCData Data message**		
MIME-part-body	MCData Protected Payload Message containing DATA PAYLOAD as described in Table 6.3.1.3.3-3			

Table 6.3.1.3.3-2: MCData-Info (Table 6.3.1.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3, condition MCD_grp

Table 6.3.1.3.3-2A: SDS SIGNALLING PAYLOAD (Table 6.3.1.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.1-1, condition DELIVERED

Table 6.3.1.3.3-3: DATA PAYLOAD (Table 6.3.1.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.1-1				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Payload				
Payload content type	'00000110'B	ENHANCED STATUS	TS 24.282 [31], Table 15.2.13-2	
Payload data	"1"	The id as defined in the MCData Group Configuration Document	TS 36.579-1 [2], Table 5.5.7.3-1	

Table 6.3.1.3.3-4: SIP MESSAGE from the SS (step 4, Table 6.3.1.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA_SDS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData Info**		
MIME-part-body	As described in Table 6.3.1.3.3-5			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.3.1.3.3-6			

Table 6.3.1.3.3-5: MCData-Info (Table 6.3.1.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-calling-group-id> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.2-3A		

Table 6.3.1.3.3-6: SDS NOTIFICATION (Table 6.3.1.3.3-4)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.4-1, condition DELIVERED

Table 6.3.1.3.3-7: Void

6.3.2 On-network / Enhanced Status (ES) / Client Terminated (CT)

6.3.2.1 Test Purpose (TP)

(1)

```
with { UE (MCDATA Client) registered and authorised for MCDATA Service }
ensure that {
  when { the MCDATA User receives an Enhanced Status with a disposition request of "DELIVERY" }
    then { UE (MCDATA Client) responds by sending a SIP 200 (OK) message and sends a SIP MESSAGE
message with a disposition notification of "DELIVERED" and renders the operational value of the
received Enhanced Status ID as enhanced status to the MCDATA User }
            }
```

6.3.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in: TS 24.282, clauses 14.2.1.2, 9.2.2.2.2, 9.2.1.2, 9.2.1.3, 12.2.1.1, 6.2.3.1, 6.2.4.1. The following represents a copy/paste extraction of the requirements relevant to the test purpose; any references within the copy/paste text should be understood within the scope of the core spec they have been copied from. Unless otherwise stated, these are Rel-15 requirements.

[TS 24.282, clause 14.2.1.2]

Upon receiving a "SIP MESSAGE request for standalone SDS for terminating MCData client", the MCData client:

1) shall follow the procedure defined in clause 9.2.2.2.2;

2) shall match the received value with an "id" attribute of the operational values from the <mcdata-enhanced-status-operational-values> element of the MCData group document as defined in 3GPP TS 24.481 [11]; and

3) if a match is found, shall render the operational value as enhanced status to the MCData user. Otherwise shall discard the received message.

[TS 24.282, clause 9.2.2.2.2]

Upon receipt of a "SIP MESSAGE request for standalone SDS for terminating MCData client", the MCData client:

…

3) if the SIP MESSAGE request contains an application/mikey MIME body containing a MIKEY-SAKKE I_MESSAGE:

   a) shall extract the MCData ID of the originating MCData user from the initiator field (IDRi) of the I_MESSAGE as described in 3GPP TS 33.180 [26];

   b) shall convert the MCData ID to a UID as described in 3GPP TS 33.180 [26];

   c) shall use the UID to validate the signature of the MIKEY-SAKKE I_MESSAGE as described in 3GPP TS 33.180 [26];

   d) if authentication verification of the MIKEY-SAKKE I_MESSAGE fails, shall reject the SIP MESSAGE request with a SIP 606 (Not Acceptable) response, and include warning text set to "136 authentication of the MIKEY-SAKKE I_MESSAGE failed" in a Warning header field as specified in subclause 4.9 and not continue with rest of the steps in this subclause; and

   e) if the signature of the MIKEY-SAKKE I_MESSAGE was successfully validated:

      i) shall extract and decrypt the encapsulated PCK using the terminating user's (KMS provisioned) UID key as described in 3GPP TS 33.180 [26]; and

      ii) shall extract the PCK-ID, from the payload as specified in 3GPP TS 33.180 [26];

NOTE: With the PCK successfully shared between the originating MCData client and the terminating MCData client, both clients are able to exchange end-to-end secure message.

4) shall generate a SIP 200 (OK) response according to rules and procedures of 3GPP TS 24.229 [5];

5) shall send the SIP 200 (OK) response towards the MCData server according to rules and procedures of 3GPP TS 24.229 [5]; and

6) shall handle the received message as specified in subclause 9.2.1.2.

[TS 24.282, clause 9.2.1.2]

When a MCData client has received a SIP request containing:

- an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1; and
- an application/vnd.3gpp.mcdata-payload MIME body as specified in subclause E.2;

the MCData Client:

1) shall decode the contents of the application/vnd.3gpp.mcdata-signalling MIME body;

2) shall decode the contents of the application/vnd.3gpp.mcdata-payload MIME body;

…

5) shall identify the number of Payload IEs in the DATA PAYLOAD message from the Number of payloads IE in the DATA PAYLOAD message;

6) if the SDS SIGNALLING PAYLOAD message does not contain an Application ID IE:

   a) shall determine that the payload contained in the DATA PAYLOAD message is for user consumption

   b) may notify the MCData user; and

   c) shall render the contents of the Payload IE(s) to the MCData user;

7) if the SDS SIGNALLING PAYLOAD message contains an Application ID IE:

   a) shall determine that the payload contained in the DATA PAYLOAD message is not for user consumption,

   b) shall not notify the MCData user;

   c) if the Application ID value is unknown, shall discard the SDS message; and

   d) if the Application ID value is known, shall deliver the contents of the Payload IE(s) to the identified application;

NOTE 1: If required, the MCData client decrypts the Payload IEs before rendering the SDS message to the user or delivering the SDS message to the application.

…

NOTE 3: User consent is not required before accepting the data.

8) may store the message payload in local storage along with the Conversation ID, Message ID, InReplyTo message ID and Date and time; and

9) if the received SDS SIGNALLING PAYLOAD message contains an SDS disposition request type IE shall follow the procedures in subclause 9.2.1.3.

[TS 24.282, clause 9.2.1.3]

To handle the disposition requests, the MCData client:

1) If the SDS disposition request type IE is set to:

   a) "DELIVERY" then, shall send a delivered notification as described in subclause 12.2.1.1;

   b) "READ", shall send a read notification as described in subclause 12.2.1.1, when a display indication is received; or

   c) "DELIVERY AND READ" then, shall start timer TDU1 (delivery and read).

[TS 24.282, clause 12.2.1.1]

The MCData client shall follow the procedures in this subclause to:

- indicate to an MCData client that an SDS message was delivered, read or delivered and read when the originating client requested a delivery, read or delivery and read report;
- indicate to the participating MCData function serving the MCData user that an SDS message was undelivered. The participating MCData function can store the message for later re-delivery;
- indicate to an MCData client that a request for FD was accepted, deferred or rejected; or
- indicate to an MCData client that a file download has been completed;

Before sending a disposition notification the MCData client needs to determine:

- the controlling MCData function that sent the SDS or FD message request. The MCData client determines the controlling MCData function from the contents of the <mcdata-controller-psi> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request;
- the group identity related to an SDS or FD message request received as part of a group communication. The MCData client determines the group identity from the contents of the <mcdata-calling-group-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request; and
- the MCData user targeted for the disposition notification. The MCData client determines the targeted MCData user from the contents of the <mcdata-calling-user-id> element contained in the application/vnd.3gpp.mcdata-info+xml MIME body of the incoming SDS or FD message request.

The MCData client shall generate a SIP MESSAGE request in accordance with 3GPP TS 24.229 [5] and IETF RFC 3428 [6] with the clarifications given below.

The MCData client:

1) shall build the SIP MESSAGE request as specified in subclause 6.2.4.1;
2) shall follow the rules specified in subclause 6.4 for the handling of MIME bodies in a SIP message when processing the remaining steps in this subclause;
3) shall insert in the SIP MESSAGE request an application/resource-lists+xml MIME body containing the MCData ID of the targeted MCData user, according to rules and procedures of IETF RFC 5366 [18];
4) shall insert in the SIP MESSAGE request an application/vnd.3gpp.mcdata-info+xml MIME body with an <mcdata-controller-psi> element containing the PSI of the controlling MCData function;
5) if sending a disposition notification in response to an MCData group data request, shall include an <mcdata-calling-group-id> element set to the MCData group identity in the application/vnd.3gpp.mcdata-info+xml MIME body;
6) if requiring to send an SDS notification, shall generate an SDS NOTIFICATION message and include it in the SIP MESSAGE request as specified in subclause 6.2.3.1;

…

8) shall send the SIP MESSAGE request according to rules and procedures of 3GPP TS 24.229 [5].

[TS 24.282, clause 6.2.3.1]

In order to generate an SDS notification, the MCData client:

1) shall generate an SDS NOTIFICATION message as specified in subclause 15.1.5; and
2) shall include in the SIP request, the SDS NOTIFICATION message in an application/vnd.3gpp.mcdata-signalling MIME body as specified in subclause E.1.

When generating an SDS NOTIFICATION message as specified in subclause 15.1.5, the MCData client:

1) if sending a delivered notification, shall set the SDS disposition notification type IE as "DELIVERED" as specified in subclause 15.2.5;

…

5) shall set the Date and time IE to the current time to as specified in subclause 15.2.8;

6) shall set the Conversation ID to the value of the Conversation ID that was received in the SDS message as specified in subclause 15.2.9;

7) shall set the Message ID to the value of the Message ID that was received in the SDS message as specified in subclause 15.2.10;

8) if the SDS message was destined for the user, shall not include an Application ID IE as specified in subclause 15.2.7; and

[TS 24.282, clause 6.2.4.1]

This subclause is referenced from other procedures.

In a SIP MESSAGE request, the MCData client:

1) when sending SDS messages or SDS disposition notifications:

   a) shall include an Accept-Contact header field containing the g.3gpp.mcdata.sds media feature tag along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8];

   b) shall include an Accept-Contact header field with the media feature tag g.3gpp.icsi-ref containing the value of "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" along with the "require" and "explicit" header field parameters according to IETF RFC 3841 [8]; and

   c) shall include the ICSI value "urn:urn-7:3gpp-service.ims.icsi.mcdata.sds" (coded as specified in 3GPP TS 24.229 [5]), in a P-Preferred-Service header field according to IETF RFC 6050 [7] in the SIP MESSAGE request;

…

3) may include a P-Preferred-Identity header field in the SIP MESSAGE request containing a public user identity as specified in 3GPP TS 24.229 [5]; and

4) shall set the Request-URI to the public service identity identifying the participating MCData function serving the MCData user.

6.3.2.3 Test description

6.3.2.3.1 Pre-test conditions

System Simulator:

- SS (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCDATA operation in the MCDATA configuration document).

IUT:

- UE (MCData client)

- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.

- The <max-payload-size-sds-cplane-bytes> element in the MCData service configuration document as specified in 3GPP TS 24.484 [12], shall be large enough to allow the sending of the standalone SDS message using the signalling plane.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- UE States at the end of the preamble
  - The UE is in E-UTRA Registered, Idle Mode state.
  - The MCData Client Application has been activated and User has registered-in as the MCDATA User with the Server as active user at the Client.

6.3.2.3.2 Test procedure sequence

Table 6.3.2.3.2-1: Main Behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1-1B	Check: Does the UE (MCData client) correctly perform steps 1a1-3 of procedure '**MCX SIP MESSAGE CT**' as described in TS 36.579-1 [2] Table 5.3.33.3-1 **to receive an Enhanced Status with disposition request "DELIVERY" and an enhanced status payload with id=0**? (NOTE 2)	-	-	1	P
3	Check: Does the UE (MCData client) correctly perform procedure '**CO SDS or FD message transfer using signalling plane**' as described in TS 36.579-1 [2] Table 5.3C.1.3-1 **to send a disposition notification of "DELIVERED"**?	-	-	1	P
4	Void	-	-	-	-
5	Check: Does the UE (MCData client) provide the operational value of the enhanced status with id=0 to the user ("going to the operation site")? (NOTE 1)	-	-	1	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI. NOTE 2: The RRC connection is not released at the end of the procedure.					

6.3.2.3.3 Specific message contents

Table 6.3.2.3.3-1: SIP MESSAGE from the SS (step 1A, Table 6.3.2.3.2-1; step 2, TS 36.579-1 [2] Table 5.3.33.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.2-1, condition MCDATA, PRIVATE-CALL				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-body	MCData-Info as described in Table 6.3.2.3.3-2			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS SIGNALLING PAYLOAD as described in Table 6.3.2.3.3-3			
MIME body part		**MCData Data message**		
MIME-part-body	MCData Protected Payload Message containing DATA PAYLOAD as described in TS 36.579-1 [2] Table 6.3.2.3.3-4			

Table 6.3.2.3.3-2: MCData-Info (Table 6.3.2.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.2-3, condition MCD_grp

Table 6.3.2.3.3-3: SDS SIGNALLING PAYLOAD (Table 6.3.2.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.2-1, condition DELIVERED

Table 6.3.2.3.3-4: DATA PAYLOAD (Table 6.3.2.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.9.1-2				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Payload				
Payload content type	'00000110'B	ENHANCED STATUS	TS 24.282 [31], Table 15.2.13-2	
Payload data	"0"	The id as defined in the MCData Group Configuration Document	TS 36.579-1 [2], Table 5.5.7.3-1	

Table 6.3.2.3.3-5: Void

Table 6.3.2.3.3-6: SIP MESSAGE from the UE (step 3, Table 6.3.2.3.2-1; step 2, TS 36.579-1 [2] Table 5.3C.1.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.2.7.1-1, condition MCDATA_SDS, RESOURCE_LISTS, MCDATA_SIGNALLING				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Message-body				
MIME body part		**MCData-Info**		
MIME-part-headers	MCData-Info described in Table 6.3.2.3.3-7			
MIME body part		**MCData Data signalling message**		
MIME-part-body	MCData Protected Payload Message containing SDS NOTIFICATION as described in Table 6.3.2.3.3-8			

Table 6.3.2.3.3-7: MCData-Info (Table 6.3.2.3.3-6)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.2.1-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
mcdata-info				
mcdata-Params				
mcdata-calling-group-id	Encrypted <mcdata-request-uri> with mcdataURI set to px_MCData_Group_A_ID	Encrypted according to TS 36.579-1 [2] Table 5.5.3.2.1-3A		

Table 6.3.2.3.3-8: SDS NOTIFICATION (Table 6.3.2.3.3-6)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.3-1, condition DELIVERED

7 Off-Network Test Scenarios

7.1 Short Data Service (SDS)

7.1.1 Off-network / Short Data Service (SDS) / Standalone SDS using signalling control plane / One-to-one SDS message / Client Originated (CO)

7.1.1.1 Test Purpose (TP)

(1)

```
with { UE (MCData Client) registered and authorized for MCData Service, including authorized for
MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the MCDATA User requests to send a standalone one-to-one SDS message with a disposition
request type of DELIVERY }
    then { UE (MCDATA Client) sends a SDS OFF-NETWORK MESSAGE message, and, initiates counter CFS1
(SDS retransmission) to 1 and starts timer TFS1 (SDS retransmission) }
            }
```

(2)

```
with { UE (MCData Client) having sent a SDS OFF-NETWORK MESSAGE message and started timer TFS1 (SDS
retransmission) }
ensure that {
  when { timer TFS1 (SDS retransmission) expires }
    then { UE (MCData Client) retransmits the SDS OFF-NETWORK MESSAGE message and, stops re-
transmitting if the counter CFS1 (SDS retransmission) has reached its maximum value and TFS1 (SDS
retransmission) has expired }
            }
```

(3)

```
with { UE (MCData Client) registered and authorized for MCData Service, including authorized for
MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the MCDATA User requests to send a standalone one-to-one SDS message with a disposition
request type of READ }
    then { UE (MCDATA Client) sends a SDS OFF-NETWORK MESSAGE message, and, initiates counter CFS1
(SDS retransmission) to 1 and starts timer TFS1 (SDS retransmission) }
            }
```

(4)

```
with { UE (MCData Client) registered and authorized for MCData Service, including authorized for
MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the MCDATA User requests to send a standalone one-to-one SDS message with a disposition
request type of DELIVERY AND READ }
    then { UE (MCDATA Client) sends a SDS OFF-NETWORK MESSAGE message, and, initiates counter CFS1
(SDS retransmission) to 1 and starts timer TFS1 (SDS retransmission) }
            }
```

7.1.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in:

TS 24.282 clauses 9.3.2.2, 9.3.2.3. Unless otherwise stated these are Rel-15 requirements.

[TS 24.282, clause 9.3.2.2]

Upon receiving an indication to send an SDS message, the MCData client:

1) if the request to send the SDS message is for a MCData group, shall check if the value of "/<*x*>/<*x*>/Common/MCData/AllowedSDS" leaf node, present in the group configuration as specified in 3GPP TS 24.483 [42], is set to "false". It the value is set to "false", shall reject the request to send the SDS message and not continue with the remaining procedures in this clause;

2) if:

   a) a one-to-one SDS message is to be sent then, shall store the MCData user ID of the intended recipient as the target MCData user ID; or

   b) a group SDS message is to be sent then, shall store the MCData group ID as the target MCData group ID;

3) may set the stored SDS disposition request type as:

   a) "DELIVERY", if only delivery disposition is requested;

   b) "READ", if only read disposition is requested; or

   c) "DELIVERY AND READ", if both delivery and read dispositions are requested;

4) if an existing conversation is indicated then, shall store the conversation identifier of the indicated conversation as SDS conversation ID. Otherwise, shall generate an UUID as described in IETF RFC 4122 [14] and store SDS conversation ID;

5) shall generate an UUID as described in IETF RFC 4122 [14] and store as the SDS message ID;

6) if indicated that the SDS message is in reply to another SDS message then, shall store the message identifier of the indicated message as SDS reply ID;

7) if indicated that the target recipient of the SDS message is an application then, shall store the application ID of the indicated application as the SDS application ID or as the SDS extended application ID;

8) shall store the received payload as the SDS payload;

9) shall store the received payload type as the SDS payload type;

10) shall store the current UTC time as the SDS transmission time;

11) shall generate a SDS OFF-NETWORK MESSAGE message as specified in clause 15.1.7. In the SDS OFF-NETWORK MESSAGE message, the MCData client:

   a) shall set the Sender MCData user ID IE to its own MCData user ID;

   b) if:

      i) a one-to-one SDS message is to be sent then shall set the Recipient MCData user ID IE to the stored target MCData user ID as specified in clause 15.2.15; or

      ii) a group SDS message is to be sent then, shall set the MCData group ID IE to the stored target MCData group ID as specified in clause 15.2.14;

   c) may set the SDS disposition request type IE to the stored the SDS disposition request type as specified in clause 15.2.3;

   d) shall set the Conversation ID IE to the stored conversation ID as specified in clause 15.2.9;

   e) shall set the Message ID IE to the stored SDS message ID as specified in clause 15.2.10;

   f) shall set the Date and time IE to the stored SDS transmission time as specified in clause 15.2.8;

   g) may include the InReplyTo message ID IE set to the stored SDS reply ID as specified in clause 15.2.11;

   h) may include:

      i) the Application ID IE set to the stored SDS application ID as specified in clause 15.2.7; or

      ii) the Extended application ID IE set to the stored SDS extended application ID as specified in clause 15.2.24;

   i) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the Security parameters and Payload IE with security parameters as described in 3GPP TS 33.180 [26];

   j) if

      i) end-to-end security is not required for a one-to-one communication, or

      ii) sending the SDS OFF-NETWORK MESSAGE message to a MCData group;

      may include the Payload IE as specified in clause 15.2.13 with:

      i) the Payload content type to the stored SDS payload type; and

      ii) the Payload data set to the stored SDS payload;

12) if:

   a) a one-to-one SDS message is to be sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.1; or

   b) a group SDS message is to be sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.2;

13) shall initialise the counter CFS1 (SDS retransmission) with the value set to 1; and

14) shall start timer TFS1 (SDS retransmission).

[TS 24.282, clause 9.3.2.3]

Upon expiry of timer TFS1 (SDS retransmission), the MCData client:

1) shall generate a SDS OFF-NETWORK MESSAGE message as specified in clause 15.1.7. In the SDS OFF-NETWORK MESSAGE message, the MCData client:

   a) shall set the Sender MCData user ID IE to its own MCData user ID;

   b) if:

      i) a one-to-one SDS message is to be sent then, shall set the Recipient MCData user ID IE to the stored target MCData user ID; or

      ii) a group SDS message is to be sent then, shall set the MCData group ID IE to the stored target MCData group ID;

   c) may set the SDS disposition request type IE to the stored the SDS disposition request type as specified in clause 15.2.3;

   d) shall set the Conversation ID IE to the stored conversation ID as specified in clause 15.2.9;

   e) shall set the Message ID IE to the stored SDS message ID as specified in clause 15.2.10;

   f) shall set the Date and time IE to the stored the SDS transmission time as specified in clause 15.2.8;

   g) may include the InReplyTo message ID IE set to the stored SDS reply ID as specified in clause 15.2.11;

   h) may include:

      i) the Application ID IE set to the stored SDS application ID as specified in clause 15.2.7; or

      ii) the Extended application ID IE set to the stored SDS extended application ID as specified in clause 15.2.24;

   i) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the Security parameters IE with security parameters as described in 3GPP TS 33.180 [26]; and

   j) if:

      i) end-to-end security is not required for a one-to-one communication, or

      ii) sending the SDS OFF-NETWORK MESSAGE message to a MCData group;

      may include the Payload IE as specified in clause 15.2.13 with:

      i) the Payload content type to the stored SDS payload type; and

      ii) the Payload data set to the stored SDS payload;

2) if:

   a) a one-to-one SDS message was sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.1; or

   b) a group SDS message was sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.2;

3) shall increment the counter CFS1(SDS retransmission) by 1; and

4) shall start timer TFS1 (SDS retransmission) if the associated counter CFS1 (SDS retransmission) has not reached its upper limit.

7.1.1.3 Test description

7.1.1.3.1 Pre-test conditions

System Simulator:

- SS-UE1 (MCData Client)
  - For the underlying "transport bearer" over which the SS and the UE will communicate, the SS is behaving as SS-UE1 as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.
- GNSS simulator to simulate a location and provide a timing reference for the assistance of E-UTRAN off-network testing.

NOTE 1: For operation in off-network environment, it needs be ensured that after the UE is powered up it considers the Geographical area #1 that is simulated by the GNSS simulator as being one of the geographical areas set in the USIM for operation when UE is "not served by E-UTRAN".

- SS-NW (MCData server)
  - For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCData operation in the MCData configuration document).

NOTE 2: The SS operation as NW (MCData server) is needed only for the preamble if the UE has to perform procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

IUT:

- UE (MCData Client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- For the underlying "transport bearer" over which the SS and the UE will communicate, the UE is behaving as a ProSe enabled UE as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.
- CFS1 (SDS retransmission) is set to the default value of 5.
- TFS1 (SDS retransmission) is set to the default value of 40 ms.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The GNSS simulator is configured to simulate a location in the centre of Geographical area #1 and provide a timing reference, as defined in TS 36.508 [24] Table 4.11.2-2 scenario #1.
- The UE is switched-off.
- UE States at the end of the preamble
  - The UE is in state 'switched-off'.

7.1.1.3.2 Test procedure sequence

Table 7.1.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Power up the UE.	-	-	-	-
2	Trigger the UE to reset UTC time and location. NOTE: The UTC time and location reset may be performed by MMI or AT command (+CUTCR).	-	-	-	-
3	Activate the MCData Client Application and register User A as the MCData User (TS 36.579-5 [5], px_MCX_User_A_username, px_MCX_User_A_password). (NOTE 1)	-	-	-	-
4	Make the MCData User request to send a standalone one-to-one SDS message to a single user with an SDS disposition request type of DELIVERY. (NOTE 1)	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.5 'MCX CO communication over ProSe direct one-to-one communication out of E-UTRA coverage-establishment'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 5-7 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
5	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with a disposition request type of DELIVERY? NOTE: It is expected that the UE - shall initialize the counter CFS1 (SDS retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS1 (SDS retransmission)	-->	SDS OFF-NETWORK MESSAGE	1,2	P
6	Start TFS1 (SDS retransmission) 40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
7	TFS1 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.6 'MCX CT communication over ProSe direct one-to-one communication out of E-UTRA coverage-establishment'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 8-10 are repeated 5 times.	-	-	-	-
8	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition notification type of DELIVERED.	<--	SDS OFF-NETWORK NOTIFICATION	-	-
9	Start 40 millisecond timer.	-	-	-	-

10	40 millisecond timer expires	-	-	-	-
-	EXCEPTION: SS releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.7, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the SS'.	-	-	-	-
11	Make the MCData User request to send a standalone one-to-one SDS message to a single user with an SDS disposition request type of READ. (NOTE 1)	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.5 'MCX CO communication over ProSe direct one-to-one communication out of E-UTRA coverage-establishment'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 12-14 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
12	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with a disposition request type of READ? NOTE: It is expected that the UE - shall initialize the counter CFS1 (SDS retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS1 (SDS retransmission)	-->	SDS OFF-NETWORK MESSAGE	3,2	P
13	Start TFS1 (SDS retransmission) 40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
14	TFS1 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.6 'MCX CT communication over ProSe direct one-to-one communication out of E-UTRA coverage-establishment'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 15-17 are repeated 5 times.	-	-	-	-
15	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition notification type of READ.	<--	SDS OFF-NETWORK NOTIFICATION	-	-
16	Start 40 millisecond timer.	-	-	-	-
17	40 millisecond timer expires	-	-	-	-

-	EXCEPTION: SS releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.7, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the SS'.	-	-	-	-
18	Make the MCData User request to send a standalone one-to-one SDS message to a single user with an SDS disposition request type of DELIVERY AND READ. (NOTE 1)	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.5 'MCX CO communication over ProSe direct one-to-one communication out of E-UTRA coverage-establishment'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 12-14 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
19	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with a disposition request type of DELIVERY AND READ? NOTE: It is expected that the UE - shall initialize the counter CFS1 (SDS retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS1 (SDS retransmission)	-->	SDS OFF-NETWORK MESSAGE	4,2	P
20	Start TFS1 (SDS retransmission) 40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
21	TFS1 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.6 'MCX CT communication over ProSe direct one-to-one communication out of E-UTRA coverage-establishment'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 15-17 are repeated 5 times.	-	-	-	-
22	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition notification type of DELIVERED AND READ.	<--	SDS OFF-NETWORK NOTIFICATION	-	-
23	Start 40 millisecond timer.	-	-	-	-
24	40 millisecond timer expires	-	-	-	-

-	EXCEPTION: SS releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.7, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the SS'.	-	-	-	-
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

7.1.1.3.3 Specific message contents

Table 7.1.1.3.3-1: SDS OFF-NETWORK MESSAGE (step 5, Table 7.1.1.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition DELIVERED, MCD_1to1

Table 7.1.1.3.3-2: SDS OFF-NETWORK NOTIFICATION (step 8, Table 7.1.1.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition DELIVERED

Table 7.1.1.3.3-3: SDS OFF-NETWORK MESSAGE (step 12, Table 7.1.1.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition READ, MCD_1to1

Table 7.1.1.3.3-4: SDS OFF-NETWORK NOTIFICATION (step 15, Table 7.1.1.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition READ

Table 7.1.1.3.3-5: SDS OFF-NETWORK MESSAGE (step 19, Table 7.1.1.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition DELIVERED_READ, MCD_1to1

Table 7.1.1.3.3-6: SDS OFF-NETWORK NOTIFICATION (step 22, Table 7.1.1.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition DELIVERED_READ

7.1.2 Off-network / Short Data Service (SDS) / Standalone SDS using signalling control plane / One-to-one SDS message / Client Terminated (CT)

7.1.2.1 Test Purpose (TP)

(1)

```
with { UE (MCData Client) registered and authorized for MCData Service, including authorized for
MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the UE (MCData Client) receives an SDS OFF-NETWORK MESSAGE message with a disposition of
DELIVERY }
    then { UE (MCDATA Client) sends SDS OFF-NETWORK NOTIFICATION message with a disposition
notification type of DELIVERED and, initiates counter CFS2 (SDS notification retransmission) to 1
and starts timer TFS2 (SDS notification retransmission) }
            }
```

(2)

with { UE (MCData Client) having sent a SDS OFF-NETWORK NOTIFICATION message and started timer TFS2 (SDS notification retransmission) }
ensure that {
  when { TFS2 (SDS notification retransmission) expires }
    then { UE (MCData Client) retransmits the SDS OFF-NETWORK NOTIFICATION message **and**, stops re-transmitting if the counter CFS2 (SDS notification retransmission) has reached its maximum value and TFS2 (SDS notification retransmission) }
            }

(3)

with { UE (MCData Client) registered and authorized for MCData Service, including authorized for MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the UE (MCData Client) receives an SDS OFF-NETWORK MESSAGE message with a disposition of READ }
    then { UE (MCDATA Client) sends a SDS OFF-NETWORK NOTIFICATION message with a disposition notification type of READ upon receiving a display indication for the payload to the MCData User **and,** initiates counter CFS2 (SDS notification retransmission) to 1 and starts timer TFS2 (SDS notification retransmission) }
            }

(4)

with { UE (MCData Client) registered and authorized for MCData Service, including authorized for MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the UE (MCData Client) receives an SDS OFF-NETWORK MESSAGE message with a disposition of DELIVERY AND READ }
    then { UE (MCDATA Client) sends a SDS OFF-NETWORK NOTIFICATION message with a disposition notification type of DELIVERED AND READ after the message is rendered to the user if the timer TFS3 (delivery and read) has not expired, **or**, if the timer TFS3 (delivery and read) expires before the message is rendered to the MCData User, sends first a SDS OFF-NETWORK NOTIFICATION message with a disposition notification type of DELIVERED and then sends a SDS OFF-NETWORK NOTIFICATION message with a disposition notification type of READ after the payload is rendered to the MCData User, **and,** initiates counter CFS2 (SDS notification retransmission) to 1 and starts timer TFS2 (SDS notification retransmission) after each sending of the SDS OFF-NETWORK NOTIFICATION message }
            }

7.1.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in:

TS 24.282 clauses 9.3.2.4, 9.3.2.5, 9.3.2.6, 12.3.2, 12.3.3, 12.3.4, 12.3.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.282, clause 9.3.2.4]

Upon receiving an SDS OFF-NETWORK MESSAGE message with a SDS disposition request type IE, the MCData client:

1) shall store the value of Sender MCData user ID IE as the stored notification target MCData user ID;

2) shall store the value of Conversation ID IE as the stored conversation ID;

3) shall store the value of Message ID IE as the stored SDS message ID;

4) shall store the current UTC time as the stored SDS notification time;

5) if present, shall store the value of Application ID IE as the stored SDS application ID;

6) if present, shall store the value of the Extended application ID IE as the stored SDS extended application ID;

7) if present, shall store the value of MCData group ID IE to the stored target MCData group ID; and

8) if the SDS disposition request type IE is set to:

   a) "DELIVERY" then, shall send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.2;

b) "READ" then, shall send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.3; or

c) "DELIVERY AND READ" then, shall start timer TFS3 (delivery and read).

NOTE: Duplicate messages (re-transmissions) that are received by the MCData client should not be processed again.

[TS 24.282, clause 9.3.2.5]

Upon receiving a display indication before timer TFS3 (delivery and read) expires, the MCData client:

1) shall generate and send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.4.

[TS 24.282, clause 9.3.2.6]

Upon expiry of timer TFS3 (delivery and read), the MCData client:

1) shall generate and send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.2; and

2) upon receiving a display indication, shall generate and send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.3.

[TS 24.282, clause 12.3.2]

To send an off-network SDS delivery notification, the MCData client:

1) shall store "DELIVERED" as the disposition type;

2) shall generate a SDS OFF-NETWORK NOTIFICATION message as specified in clause 15.1.8. In the SDS OFF-NETWORK NOTIFICATION message, the MCData client:

a) shall set the Sender MCData user ID IE to its own MCData user ID as specified in clause 15.2.15;

b) shall set the Conversation ID IE as the stored conversation ID as specified in clause 15.2.9;

c) shall set the Message ID IE as the stored SDS message ID as specified in clause 15.2.10;

d) shall set the Date and time IE as the stored SDS notification time as specified in clause 15.2.8;

e) shall set the SDS disposition notification type IE to the stored disposition type as specified in clause 15.2.5; and

f) may set:

i) the Application ID IE to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE to the stored extended SDS application ID as specified in clause 15.2.24;

3) shall send the SDS OFF-NETWORK NOTIFICATION message to the stored notification target MCData user ID as specified in clause 9.3.1.1;

4) shall initialise the counter CFS2 (SDS notification retransmission) with the value set to 1; and

5) shall start timer TFS2 (SDS notification retransmission).

[TS 24.282, clause 12.3.3]

Upon receiving a display indication for the payload to the user or processing of the payload by the target application, the MCData client:

1) shall store "READ" as the disposition type;

2) shall store the current UTC time as the stored SDS notification time;

3) shall generate SDS OFF-NETWORK NOTIFICATION message as specified in clause 15.1.8. In the SDS OFF-NETWORK NOTIFICATION message, the MCData client:

a) shall set the Sender MCData user ID IE to its own MCData user ID as specified in clause 15.2.15;

b) shall set the Conversation ID IE as the stored conversation ID as specified in clause 15.2.9;

c) shall set the Message ID IE as the stored SDS message ID as specified in clause 15.2.10;

d) shall set the Data and time IE as the SDS notification time as specified in clause 15.2.8;

e) shall set the SDS disposition notification type IE to the stored disposition type as specified in clause 15.2.5; and

f) may set:

i) the Application ID IE set to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE to the stored extended SDS application ID as specified in clause 15.2.24;

4) shall send the SDS OFF-NETWORK NOTIFICATION message to the stored sender MCData user ID as specified in clause 9.3.1.1;

5) shall initialise the counter CFS2 (SDS notification retransmission) with the value set to 1; and

6) shall start timer TFS2 (SDS notification retransmission).

[TS 24.282, clause 12.3.4]

Upon receiving a display indication for the payload to the user or processing of the payload by the target application, the MCData client:

1) shall store "DELIVERED AND READ" as the disposition type and stop the timer TFS3 (display and read);

2) shall store the current UTC time as the stored SDS notification time;

3) shall generate SDS OFF-NETWORK NOTIFICATION message. In the SDS OFF-NETWORK NOTIFICATION message, the MCData client:

a) shall set the Sender MCData user ID IE to its own MCData user ID as specified in clause 15.2.15;

b) shall set the Conversation ID IE as the stored conversation ID as specified in clause 15.2.9;

c) shall set the Message ID IE as the stored SDS message ID as specified in clause 15.2.10;

d) shall set the Date and time IE as the SDS notification time as specified in clause 15.2.8;

e) shall set the SDS disposition notification type IE to the stored disposition type as specified in clause 15.2.5; and

f) may set:

i) the Application ID IE to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE to the stored extended SDS application ID as specified in clause 15.2.24;

4) shall send the SDS OFF-NETWORK NOTIFICATION message to the stored sender MCData user ID as specified in clause 9.3.1.1;

5) shall initialise the counter CFS2 (SDS notification retransmission) with the value set to 1; and

6) shall start timer TFS2 (SDS notification retransmission).

[TS 24.282, clause 12.3.5]

Upon expiry of timer TFS2 (SDS notification retransmission), the MCData client:

1) shall generate a SDS OFF-NETWORK NOTIFICATION message as specified in clause 15.1.8. In the SDS OFF-NETWORK NOTIFICATION message, the MCData client:

a) shall set the Sender MCData user ID IE to its own MCData user ID as specified in clause 15.2.15;

b) shall set the Conversation ID IE as the stored conversation ID as specified in clause 15.2.9;

c) shall set the Message ID IE as the stored SDS message ID as specified in clause 15.2.10;

d) shall set the Date and time IE as the stored SDS notification time as specified in clause 15.2.8;

e) shall set the SDS disposition type IE to the stored disposition type as specified in clause 15.2.5; and

f) may set:

i) the Application ID IE to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE to the stored extended SDS application ID as specified in clause 15.2.24;

2) shall send the SDS OFF-NETWORK NOTIFICATION message to the stored sender MCData user ID as specified in clause 9.3.1.1;

3) shall increment the counter CFS2 (SDS notification retransmission) by 1; and

4) shall start timer TFS2 (SDS notification retransmission) if the associated counter CFS2 (SDS notification retransmission) has not reached its upper limit.

7.1.2.3 Test description

7.1.2.3.1 Pre-test conditions

System Simulator:

- SS-UE1 (MCData Client)
  - For the underlying "transport bearer" over which the SS and the UE will communicate, the SS is behaving as SS-UE1 as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.
- GNSS simulator to simulate a location and provide a timing reference for the assistance of E-UTRAN off-network testing.

NOTE 1: For operation in off-network environment, it needs be ensured that after the UE is powered up it considers the Geographical area #1 that is simulated by the GNSS simulator as being one of the geographical areas set in the USIM for operation when UE is "not served by E-UTRAN".

- SS-NW (MCData server)
  - For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCData operation in the MCData configuration document).

NOTE 2: The SS operation as NW (MCData server) is needed only for the preamble if the UE has to perform procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

IUT:

- UE (MCData Client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- For the underlying "transport bearer" over which the SS and the UE will communicate, the UE is behaving as a ProSe enabled UE as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.
- CFS2 (SDS notification retransmission)is set to the default value of 5.
- TFS2 (SDS notification retransmission)is set to the default value of 40 ms.

- TFS3 (delivery and read)is set to the default value of 120 ms.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The GNSS simulator is configured to simulate a location in the centre of Geographical area #1 and provide a timing reference, as defined in TS 36.508 [24] Table 4.11.2-2 scenario #1.
- The UE is switched-off.
- UE States at the end of the preamble
  - The UE is in state 'switched-off'.

7.1.2.3.2 Test procedure sequence

Table 7.1.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Power up the UE.	-	-	-	-
2	Trigger the UE to reset UTC time and location. NOTE: The UTC time and location reset may be performed by MMI or AT command (+CUTCR).	-	-	-	-
3	Activate the MCData Client Application and register User A as the MCData User (TS 36.579-5 [5], px_MCX_User_A_username, px_MCX_User_A_password). (NOTE 1)	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.6 'MCX CT communication over ProSe direct one-to-one communication out of E-UTRA coverage-establishment'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
4	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition request type of DELIVERY.	<--	SDS OFF-NETWORK MESSAGE	-	-
-	EXCEPTION: Steps 5-7 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
5	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with disposition notification type of DELIVERED? NOTE: It is expected that the UE - shall initialize the counter CFS2 (SDS notification retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS2 (SDS notification retransmission)	-->	SDS OFF-NETWORK NOTIFICATION	1,2	P
6	Start TFS2 (SDS notification retransmission)=40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
7	TFS2 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.6 'MCX CT communication over ProSe direct one-to-one communication out of E-UTRA coverage-establishment'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
8	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition request type of READ.	<--	SDS OFF-NETWORK MESSAGE	-	-
-	EXCEPTION: Steps 9-11 are repeated CFS2=5 times (CFS2 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-

9	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with disposition notification type of READ upon receiving a display indication for the payload to the MCData User? NOTE: It is expected that the UE - shall initialize the counter CFS2 (SDS notification retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS2 (SDS notification retransmission)	-->	SDS OFF-NETWORK NOTIFICATION	3,2	P
10	Start TFS2 (SDS notification retransmission)=40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
11	TFS2 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.6 'MCX CT communication over ProSe direct one-to-one communication out of E-UTRA coverage-establishment'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
12	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition request type of DELIVERY AND READ. NOTE: Timer TFS3 (delivery and read).is started upon receipt of the SDS OFF-NETWORK MESSAGE message that contains a "DELIVERY AND READ" disposition request. TFS3 (delivery and read)=120ms according to the default value defined in TS 24.282 [31] Table F.3.1-1.	<--	SDS OFF-NETWORK MESSAGE	-	-
-	EXCEPTION: Steps 13a1-13b2 describe behaviour that depends on the UE implementation. Steps 13a1-13a6 describe the behaviour of the UE when the timer TFS3 (delivery and read) expires before the contents of the Payload IE are rendered to the MCData User. Steps 13b1-13b3 describe the behaviour of the UE when the contents of the Payload IE are rendered to the MCData User before the timer TFS3 (delivery and read) expires.	-	-	-	-
-	EXCEPTION: Steps 13a1-13a3 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-

13a1	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with disposition notification type of DELIVERED? NOTE: It is expected that the UE - shall initialize the counter CFS2 (SDS notification retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS2 (SDS notification retransmission)	-->	SDS OFF-NETWORK NOTIFICATION	4,2	P
13a2	Start TFS2 (SDS notification retransmission)=40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
13a3	TFS2 expires.	-	-	-	-
-	EXCEPTION: Steps 13a4-13a6 are repeated CFS2=5 times (CFS2 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
13a4	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with disposition notification type of READ upon receiving a display indication for the payload to the MCData User? NOTE: It is expected that the UE - shall initialize the counter CFS2 (SDS notification retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS2 (SDS notification retransmission)	-->	SDS OFF-NETWORK NOTIFICATION	4,2	P
13a5	Start TFS2 (SDS notification retransmission)=40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
13a6	TFS2 expires.	-	-	-	-
-	EXCEPTION: Steps 13b1-13b3 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
13b1	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with disposition notification type of DELIVERED AND READ? NOTE: It is expected that the UE - shall initialize the counter CFS2 (SDS notification retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS2 (SDS notification retransmission)	-->	SDS OFF-NETWORK NOTIFICATION	4,2	P
13b2	Start TFS2 (SDS notification retransmission)=40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
13b3	TFS2 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

7.1.2.3.3 Specific message contents

Table 7.1.2.3.3-1: SDS OFF-NETWORK MESSAGE (step 4, Table 7.1.2.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition DELIVERED, MCD_1to1

Table 7.1.2.3.3-2: SDS OFF-NETWORK NOTIFICATION (steps 5, 13a1, Table 7.1.2.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition DELIVERED

Table 7.1.2.3.3-3: SDS OFF-NETWORK MESSAGE (step 8, Table 7.1.2.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition READ, MCD_1to1

Table 7.1.2.3.3-4: SDS OFF-NETWORK NOTIFICATION (steps 9, 13a4, Table 7.1.2.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition READ

Table 7.1.2.3.3-5: SDS OFF-NETWORK MESSAGE (step 8, Table 7.1.2.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition DELIVERED_READ, MCD_1to1

Table 7.1.2.3.3-6: SDS OFF-NETWORK NOTIFICATION (step 13b1, Table 7.1.2.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition DELIVERED_READ

7.1.3 Off-network / Short Data Service (SDS) / Standalone SDS using signalling control plane / Group SDS message / Client Originated (CO)

7.1.3.1 Test Purpose (TP)

(1)

```
with { UE (MCData Client) registered and authorized for MCData Service, including authorized for
MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the MCDATA User requests to send a standalone group SDS message with a disposition request
type of DELIVERY }
    then { UE (MCDATA Client) sends a SDS OFF-NETWORK MESSAGE message, and, initiates counter CFS1
(SDS retransmission) to 1 and starts timer TFS1 (SDS retransmission) }
            }
```

(2)

```
with { UE (MCData Client) having sent a SDS OFF-NETWORK MESSAGE message and started timer TFS1 (SDS
retransmission) }
ensure that {
  when { timer TFS1 (SDS retransmission) expires }
    then { UE (MCData Client) retransmits the SDS OFF-NETWORK MESSAGE message and, stops re-
transmitting if the counter CFS1 (SDS retransmission) has reached its maximum value and TFS1 (SDS
retransmission) has expired }
            }
```

(3)

```
with { UE (MCData Client) registered and authorized for MCData Service, including authorized for
MCData Service in off-network environment, and, the UE is in an off-network environment }
```

```
ensure that {
  when { the MCDATA User requests to send a standalone group SDS message with a disposition request
type of READ }
    then { UE (MCDATA Client) sends a SDS OFF-NETWORK MESSAGE message, and, initiates counter CFS1
(SDS retransmission) to 1 and starts timer TFS1 (SDS retransmission) }
            }
```

(4)

```
with { UE (MCData Client) registered and authorized for MCData Service, including authorized for
MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the MCDATA User requests to send a standalone group SDS message with a disposition request
type of DELIVERY AND READ }
    then { UE (MCDATA Client) sends a SDS OFF-NETWORK MESSAGE message, and, initiates counter CFS1
(SDS retransmission) to 1 and starts timer TFS1 (SDS retransmission) }
            }
```

7.1.3.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in:

TS 24.282 clauses 9.3.2.2, 9.3.2.3. Unless otherwise stated these are Rel-15 requirements.

[TS 24.282, clause 9.3.2.2]

Upon receiving an indication to send an SDS message, the MCData client:

1) if the request to send the SDS message is for a MCData group, shall check if the value of "/<*x*>/<*x*>/Common/MCData/AllowedSDS" leaf node, present in the group configuration as specified in 3GPP TS 24.483 [42], is set to "false". It the value is set to "false", shall reject the request to send the SDS message and not continue with the remaining procedures in this clause;

2) if:

   a) a one-to-one SDS message is to be sent then, shall store the MCData user ID of the intended recipient as the target MCData user ID; or

   b) a group SDS message is to be sent then, shall store the MCData group ID as the target MCData group ID;

3) may set the stored SDS disposition request type as:

   a) "DELIVERY", if only delivery disposition is requested;

   b) "READ", if only read disposition is requested; or

   c) "DELIVERY AND READ", if both delivery and read dispositions are requested;

4) if an existing conversation is indicated then, shall store the conversation identifier of the indicated conversation as SDS conversation ID. Otherwise, shall generate an UUID as described in IETF RFC 4122 [14] and store SDS conversation ID;

5) shall generate an UUID as described in IETF RFC 4122 [14] and store as the SDS message ID;

6) if indicated that the SDS message is in reply to another SDS message then, shall store the message identifier of the indicated message as SDS reply ID;

7) if indicated that the target recipient of the SDS message is an application then, shall store the application ID of the indicated application as the SDS application ID or as the SDS extended application ID;

8) shall store the received payload as the SDS payload;

9) shall store the received payload type as the SDS payload type;

10) shall store the current UTC time as the SDS transmission time;

11) shall generate a SDS OFF-NETWORK MESSAGE message as specified in clause 15.1.7. In the SDS OFF-NETWORK MESSAGE message, the MCData client:

a) shall set the Sender MCData user ID IE to its own MCData user ID;

b) if:

i) a one-to-one SDS message is to be sent then shall set the Recipient MCData user ID IE to the stored target MCData user ID as specified in clause 15.2.15; or

ii) a group SDS message is to be sent then, shall set the MCData group ID IE to the stored target MCData group ID as specified in clause 15.2.14;

c) may set the SDS disposition request type IE to the stored the SDS disposition request type as specified in clause 15.2.3;

d) shall set the Conversation ID IE to the stored conversation ID as specified in clause 15.2.9;

e) shall set the Message ID IE to the stored SDS message ID as specified in clause 15.2.10;

f) shall set the Date and time IE to the stored SDS transmission time as specified in clause 15.2.8;

g) may include the InReplyTo message ID IE set to the stored SDS reply ID as specified in clause 15.2.11;

h) may include:

i) the Application ID IE set to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE set to the stored SDS extended application ID as specified in clause 15.2.24;

i) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the Security parameters and Payload IE with security parameters as described in 3GPP TS 33.180 [26];

j) if

i) end-to-end security is not required for a one-to-one communication, or

ii) sending the SDS OFF-NETWORK MESSAGE message to a MCData group;

may include the Payload IE as specified in clause 15.2.13 with:

i) the Payload content type to the stored SDS payload type; and

ii) the Payload data set to the stored SDS payload;

12) if:

a) a one-to-one SDS message is to be sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.1; or

b) a group SDS message is to be sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.2;

13) shall initialise the counter CFS1 (SDS retransmission) with the value set to 1; and

14) shall start timer TFS1 (SDS retransmission).

[TS 24.282, clause 9.3.2.3]

Upon expiry of timer TFS1 (SDS retransmission), the MCData client:

1) shall generate a SDS OFF-NETWORK MESSAGE message as specified in clause 15.1.7. In the SDS OFF-NETWORK MESSAGE message, the MCData client:

a) shall set the Sender MCData user ID IE to its own MCData user ID;

b) if:

i) a one-to-one SDS message is to be sent then, shall set the Recipient MCData user ID IE to the stored target MCData user ID; or

ii) a group SDS message is to be sent then, shall set the MCData group ID IE to the stored target MCData group ID;

c) may set the SDS disposition request type IE to the stored the SDS disposition request type as specified in clause 15.2.3;

d) shall set the Conversation ID IE to the stored conversation ID as specified in clause 15.2.9;

e) shall set the Message ID IE to the stored SDS message ID as specified in clause 15.2.10;

f) shall set the Date and time IE to the stored the SDS transmission time as specified in clause 15.2.8;

g) may include the InReplyTo message ID IE set to the stored SDS reply ID as specified in clause 15.2.11;

h) may include:

i) the Application ID IE set to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE set to the stored SDS extended application ID as specified in clause 15.2.24;

i) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the Security parameters IE with security parameters as described in 3GPP TS 33.180 [26]; and

j) if:

i) end-to-end security is not required for a one-to-one communication, or

ii) sending the SDS OFF-NETWORK MESSAGE message to a MCData group;

may include the Payload IE as specified in clause 15.2.13 with:

i) the Payload content type to the stored SDS payload type; and

ii) the Payload data set to the stored SDS payload;

2) if:

a) a one-to-one SDS message was sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.1; or

b) a group SDS message was sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.2;

3) shall increment the counter CFS1(SDS retransmission) by 1; and

4) shall start timer TFS1 (SDS retransmission) if the associated counter CFS1 (SDS retransmission) has not reached its upper limit.

7.1.3.3 Test description

7.1.3.3.1 Pre-test conditions

System Simulator:

- SS-UE1 (MCData Client)
  - For the underlying "transport bearer" over which the SS and the UE will communicate, the SS is behaving as SS-UE1 as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.

- GNSS simulator to simulate a location and provide a timing reference for the assistance of E-UTRAN off-network testing.

NOTE 1: For operation in off-network environment, it needs be ensured that after the UE is powered up it considers the Geographical area #1 that is simulated by the GNSS simulator as being one of the geographical areas set in the USIM for operation when UE is "not served by E-UTRAN".

- SS-NW (MCData server)
  - For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCData operation in the MCData configuration document).

NOTE 2: The SS operation as NW (MCData server) is needed only for the preamble if the UE has to perform procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

IUT:

- UE (MCData Client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- For the underlying "transport bearer" over which the SS and the UE will communicate, the UE is behaving as a ProSe enabled UE as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.
- CFS1 (SDS retransmission) is set to the default value of 5.
- TFS1 (SDS retransmission) is set to the default value of 40 ms.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The GNSS simulator is configured to simulate a location in the centre of Geographical area #1 and provide a timing reference, as defined in TS 36.508 [24] Table 4.11.2-2 scenario #1.
- The UE is switched-off.
- UE States at the end of the preamble
  - The UE is in state 'switched-off'.

7.1.3.3.2 Test procedure sequence

Table 7.1.3.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Power up the UE.	-	-	-	-
2	Trigger the UE to reset UTC time and location. NOTE: The UTC time and location reset may be performed by MMI or AT command (+CUTCR).	-	-	-	-
3	Activate the MCData Client Application and register User A as the MCData User (TS 36.579-5 [5], px_MCX_User_A_username, px_MCX_User_A_password). (NOTE 1)	-	-	-	-
4	Make the MCData User request to send a standalone group SDS message with an SDS disposition request type of DELIVERY. (NOTE 1)	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.11 'MCX CO communication over ProSe direct one-to-many communication out of E-UTRA coverage / Monitoring/Discoverer procedure for group member discovery / One-to-many communication'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 5-7 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
5	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with a disposition request type of DELIVERY? NOTE: It is expected that the UE - shall initialize the counter CFS1 (SDS retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS1 (SDS retransmission)	-->	SDS OFF-NETWORK MESSAGE	1,2	P
6	Start TFS1 (SDS retransmission) 40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
7	TFS1 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.10 'MCX CT communication over ProSe direct one-to-many communication out of E-UTRA coverage / Announcing/Discoveree procedure for group member discovery'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 8-10 are repeated 5 times.	-	-	-	-

8	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition notification type of DELIVERED.	<--	SDS OFF-NETWORK NOTIFICATION	-	-
9	Start 40 millisecond timer.	-	-	-	-
10	40 millisecond timer expires	-	-	-	-
-	EXCEPTION: SS releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.7, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the SS'.	-	-	-	-
11	Make the MCData User request to send a standalone group SDS message with an SDS disposition request type of READ. (NOTE 1)	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.11 'MCX CO communication over ProSe direct one-to-many communication out of E-UTRA coverage / Monitoring/Discoverer procedure for group member discovery / One-to-many communication'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 12-14 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
12	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with a disposition request type of READ? NOTE: It is expected that the UE - shall initialize the counter CFS1 (SDS retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS1 (SDS retransmission)	-->	SDS OFF-NETWORK MESSAGE	3,2	P
13	Start TFS1 (SDS retransmission) 40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
14	TFS1 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.10 'MCX CT communication over ProSe direct one-to-many communication out of E-UTRA coverage / Announcing/Discoveree procedure for group member discovery'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 15-17 are repeated 5 times.	-	-	-	-
15	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition notification type of READ.	<--	SDS OFF-NETWORK NOTIFICATION	-	-

16	Start 40 millisecond timer.	-	-	-	-
17	40 millisecond timer expires	-	-	-	-
-	EXCEPTION: SS releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.7, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the SS'.	-	-	-	-
18	Make the MCData User request to send a standalone group SDS message with an SDS disposition request type of DELIVERY AND READ. (NOTE 1)	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.11 'MCX CO communication over ProSe direct one-to-many communication out of E-UTRA coverage / Monitoring/Discoverer procedure for group member discovery / One-to-many communication'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 12-14 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
19	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with a disposition request type of DELIVERY AND READ? NOTE: It is expected that the UE - shall initialize the counter CFS1 (SDS retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS1 (SDS retransmission)	-->	SDS OFF-NETWORK MESSAGE	4,2	P
20	Start TFS1 (SDS retransmission) 40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
21	TFS1 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.10 'MCX CT communication over ProSe direct one-to-many communication out of E-UTRA coverage / Announcing/Discoveree procedure for group member discovery'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 15-17 are repeated 5 times.	-	-	-	-
22	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition notification type of DELIVERED AND READ.	<--	SDS OFF-NETWORK NOTIFICATION	-	-

23	Start 40 millisecond timer.	-	-	-	-
24	40 millisecond timer expires	-	-	-	-
-	EXCEPTION: SS releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.7, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the SS'.	-	-	-	-
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

7.1.3.3.3 Specific message contents

Table 7.1.3.3.3-1: SDS OFF-NETWORK MESSAGE (step 5, Table 7.1.3.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition DELIVERED, MCD_grp

Table 7.1.3.3.3-2: SDS OFF-NETWORK NOTIFICATION (step 8, Table 7.1.3.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition DELIVERED

Table 7.1.3.3.3-3: SDS OFF-NETWORK MESSAGE (step 12, Table 7.1.3.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition READ, MCD_grp

Table 7.1.3.3.3-4: SDS OFF-NETWORK NOTIFICATION (step 15, Table 7.1.3.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition READ

Table 7.1.3.3.3-5: SDS OFF-NETWORK MESSAGE (step 19, Table 7.1.3.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition DELIVERED_READ, MCD_grp

Table 7.1.3.3.3-6: SDS OFF-NETWORK NOTIFICATION (step 22, Table 7.1.3.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition DELIVERED_READ

7.1.4 Off-network / Short Data Service (SDS) / Standalone SDS using signalling control plane / Group SDS message / Client Terminated (CT)

7.1.4.1 Test Purpose (TP)

(1)

```
with { UE (MCData Client) registered and authorized for MCData Service, including authorized for
MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the UE (MCData Client) receives an SDS OFF-NETWORK MESSAGE message with a disposition of
DELIVERY }
    then { UE (MCDATA Client) sends SDS OFF-NETWORK NOTIFICATION message with a disposition
notification type of DELIVERED and, initiates counter CFS2 (SDS notification retransmission) to 1
and starts timer TFS2 (SDS notification retransmission) }
           }
```

(2)

with { UE (MCData Client) having sent a SDS OFF-NETWORK NOTIFICATION message and started timer TFS2 (SDS notification retransmission) }
ensure that {
  when { TFS2 (SDS notification retransmission) expires }
    then { UE (MCData Client) retransmits the SDS OFF-NETWORK NOTIFICATION message **and**, stops re-transmitting if the counter CFS2 (SDS notification retransmission) has reached its maximum value and TFS2 (SDS notification retransmission) }
            }

(3)

with { UE (MCData Client) registered and authorized for MCData Service, including authorized for MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the UE (MCData Client) receives an SDS OFF-NETWORK MESSAGE message with a disposition of READ }
    then { UE (MCDATA Client) sends a SDS OFF-NETWORK NOTIFICATION message with a disposition notification type of READ upon receiving a display indication for the payload to the MCData User **and,** initiates counter CFS2 (SDS notification retransmission) to 1 and starts timer TFS2 (SDS notification retransmission) }
            }

(4)

with { UE (MCData Client) registered and authorized for MCData Service, including authorized for MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the UE (MCData Client) receives an SDS OFF-NETWORK MESSAGE message with a disposition of DELIVERY AND READ }
    then { UE (MCDATA Client) sends a SDS OFF-NETWORK NOTIFICATION message with a disposition notification type of DELIVERED AND READ after the message is rendered to the user if the timer TFS3 (delivery and read) has not expired, **or**, if the timer TFS3 (delivery and read) expires before the message is rendered to the MCData User, sends first a SDS OFF-NETWORK NOTIFICATION message with a disposition notification type of DELIVERED and then sends a SDS OFF-NETWORK NOTIFICATION message with a disposition notification type of READ after the payload is rendered to the MCData User, **and,** initiates counter CFS2 (SDS notification retransmission) to 1 and starts timer TFS2 (SDS notification retransmission) after each sending of the SDS OFF-NETWORK NOTIFICATION message }
            }

7.1.4.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in:

TS 24.282 clauses 9.3.2.4, 9.3.2.5, 9.3.2.6, 12.3.2, 12.3.3, 12.3.4, 12.3.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.282, clause 9.3.2.4]

Upon receiving an SDS OFF-NETWORK MESSAGE message with a SDS disposition request type IE, the MCData client:

1) shall store the value of Sender MCData user ID IE as the stored notification target MCData user ID;

2) shall store the value of Conversation ID IE as the stored conversation ID;

3) shall store the value of Message ID IE as the stored SDS message ID;

4) shall store the current UTC time as the stored SDS notification time;

5) if present, shall store the value of Application ID IE as the stored SDS application ID;

6) if present, shall store the value of the Extended application ID IE as the stored SDS extended application ID;

7) if present, shall store the value of MCData group ID IE to the stored target MCData group ID; and

8) if the SDS disposition request type IE is set to:

   a) "DELIVERY" then, shall send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.2;

b) "READ" then, shall send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.3; or

c) "DELIVERY AND READ" then, shall start timer TFS3 (delivery and read).

NOTE: Duplicate messages (re-transmissions) that are received by the MCData client should not be processed again.

[TS 24.282, clause 9.3.2.5]

Upon receiving a display indication before timer TFS3 (delivery and read) expires, the MCData client:

1) shall generate and send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.4.

[TS 24.282, clause 9.3.2.6]

Upon expiry of timer TFS3 (delivery and read), the MCData client:

1) shall generate and send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.2; and

2) upon receiving a display indication, shall generate and send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.3.

[TS 24.282, clause 12.3.2]

To send an off-network SDS delivery notification, the MCData client:

1) shall store "DELIVERED" as the disposition type;

2) shall generate a SDS OFF-NETWORK NOTIFICATION message as specified in clause 15.1.8. In the SDS OFF-NETWORK NOTIFICATION message, the MCData client:

a) shall set the Sender MCData user ID IE to its own MCData user ID as specified in clause 15.2.15;

b) shall set the Conversation ID IE as the stored conversation ID as specified in clause 15.2.9;

c) shall set the Message ID IE as the stored SDS message ID as specified in clause 15.2.10;

d) shall set the Date and time IE as the stored SDS notification time as specified in clause 15.2.8;

e) shall set the SDS disposition notification type IE to the stored disposition type as specified in clause 15.2.5; and

f) may set:

i) the Application ID IE to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE to the stored extended SDS application ID as specified in clause 15.2.24;

3) shall send the SDS OFF-NETWORK NOTIFICATION message to the stored notification target MCData user ID as specified in clause 9.3.1.1;

4) shall initialise the counter CFS2 (SDS notification retransmission) with the value set to 1; and

5) shall start timer TFS2 (SDS notification retransmission).

[TS 24.282, clause 12.3.3]

Upon receiving a display indication for the payload to the user or processing of the payload by the target application, the MCData client:

1) shall store "READ" as the disposition type;

2) shall store the current UTC time as the stored SDS notification time;

3) shall generate SDS OFF-NETWORK NOTIFICATION message as specified in clause 15.1.8. In the SDS OFF-NETWORK NOTIFICATION message, the MCData client:

a) shall set the Sender MCData user ID IE to its own MCData user ID as specified in clause 15.2.15;

b) shall set the Conversation ID IE as the stored conversation ID as specified in clause 15.2.9;

c) shall set the Message ID IE as the stored SDS message ID as specified in clause 15.2.10;

d) shall set the Data and time IE as the SDS notification time as specified in clause 15.2.8;

e) shall set the SDS disposition notification type IE to the stored disposition type as specified in clause 15.2.5; and

f) may set:

i) the Application ID IE set to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE to the stored extended SDS application ID as specified in clause 15.2.24;

4) shall send the SDS OFF-NETWORK NOTIFICATION message to the stored sender MCData user ID as specified in clause 9.3.1.1;

5) shall initialise the counter CFS2 (SDS notification retransmission) with the value set to 1; and

6) shall start timer TFS2 (SDS notification retransmission).

[TS 24.282, clause 12.3.4]

Upon receiving a display indication for the payload to the user or processing of the payload by the target application, the MCData client:

1) shall store "DELIVERED AND READ" as the disposition type and stop the timer TFS3 (display and read);

2) shall store the current UTC time as the stored SDS notification time;

3) shall generate SDS OFF-NETWORK NOTIFICATION message. In the SDS OFF-NETWORK NOTIFICATION message, the MCData client:

a) shall set the Sender MCData user ID IE to its own MCData user ID as specified in clause 15.2.15;

b) shall set the Conversation ID IE as the stored conversation ID as specified in clause 15.2.9;

c) shall set the Message ID IE as the stored SDS message ID as specified in clause 15.2.10;

d) shall set the Date and time IE as the SDS notification time as specified in clause 15.2.8;

e) shall set the SDS disposition notification type IE to the stored disposition type as specified in clause 15.2.5; and

f) may set:

i) the Application ID IE to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE to the stored extended SDS application ID as specified in clause 15.2.24;

4) shall send the SDS OFF-NETWORK NOTIFICATION message to the stored sender MCData user ID as specified in clause 9.3.1.1;

5) shall initialise the counter CFS2 (SDS notification retransmission) with the value set to 1; and

6) shall start timer TFS2 (SDS notification retransmission).

[TS 24.282, clause 12.3.5]

Upon expiry of timer TFS2 (SDS notification retransmission), the MCData client:

1) shall generate a SDS OFF-NETWORK NOTIFICATION message as specified in clause 15.1.8. In the SDS OFF-NETWORK NOTIFICATION message, the MCData client:

a) shall set the Sender MCData user ID IE to its own MCData user ID as specified in clause 15.2.15;

b) shall set the Conversation ID IE as the stored conversation ID as specified in clause 15.2.9;

c) shall set the Message ID IE as the stored SDS message ID as specified in clause 15.2.10;

d) shall set the Date and time IE as the stored SDS notification time as specified in clause 15.2.8;

e) shall set the SDS disposition type IE to the stored disposition type as specified in clause 15.2.5; and

f) may set:

i) the Application ID IE to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE to the stored extended SDS application ID as specified in clause 15.2.24;

2) shall send the SDS OFF-NETWORK NOTIFICATION message to the stored sender MCData user ID as specified in clause 9.3.1.1;

3) shall increment the counter CFS2 (SDS notification retransmission) by 1; and

4) shall start timer TFS2 (SDS notification retransmission) if the associated counter CFS2 (SDS notification retransmission) has not reached its upper limit.

7.1.4.3 Test description

7.1.4.3.1 Pre-test conditions

System Simulator:

- SS-UE1 (MCData Client)
  - For the underlying "transport bearer" over which the SS and the UE will communicate, the SS is behaving as SS-UE1 as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.
- GNSS simulator to simulate a location and provide a timing reference for the assistance of E-UTRAN off-network testing.

NOTE 1: For operation in off-network environment, it needs be ensured that after the UE is powered up it considers the Geographical area #1 that is simulated by the GNSS simulator as being one of the geographical areas set in the USIM for operation when UE is "not served by E-UTRAN".

- SS-NW (MCData server)
  - For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCData operation in the MCData configuration document).

NOTE 2: The SS operation as NW (MCData server) is needed only for the preamble if the UE has to perform procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

IUT:

- UE (MCData Client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- For the underlying "transport bearer" over which the SS and the UE will communicate, the UE is behaving as a ProSe enabled UE as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.
- CFS2 (SDS notification retransmission)is set to the default value of 5.
- TFS2 (SDS notification retransmission)is set to the default value of 40 ms.

- TFS3 (delivery and read)is set to the default value of 120 ms.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The GNSS simulator is configured to simulate a location in the centre of Geographical area #1 and provide a timing reference, as defined in TS 36.508 [24] Table 4.11.2-2 scenario #1.
- The UE is switched-off.
- UE States at the end of the preamble
  - The UE is in state 'switched-off'.

7.1.4.3.2 Test procedure sequence

Table 7.1.4.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Power up the UE.	-	-	-	-
2	Trigger the UE to reset UTC time and location. NOTE: The UTC time and location reset may be performed by MMI or AT command (+CUTCR).	-	-	-	-
3	Activate the MCData Client Application and register User A as the MCData User (TS 36.579-5 [5], px_MCX_User_A_username, px_MCX_User_A_password). (NOTE 1)	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.10 'MCX CT communication over ProSe direct one-to-many communication out of E-UTRA coverage / Announcing/Discoveree procedure for group member discovery'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
4	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition request type of DELIVERY.	<--	SDS OFF-NETWORK MESSAGE	-	-
-	EXCEPTION: Steps 5-7 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
5	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with disposition notification type of DELIVERED? NOTE: It is expected that the UE - shall initialize the counter CFS2 (SDS notification retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS2 (SDS notification retransmission)	-->	SDS OFF-NETWORK NOTIFICATION	1,2	P
6	Start TFS2 (SDS notification retransmission)=40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
7	TFS2 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.10 'MCX CT communication over ProSe direct one-to-many communication out of E-UTRA coverage / Announcing/Discoveree procedure for group member discovery'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
8	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition request type of READ.	<--	SDS OFF-NETWORK MESSAGE	-	-
-	EXCEPTION: Steps 9-11 are repeated CFS2=5 times (CFS2 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-

9	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with disposition notification type of READ upon receiving a display indication for the payload to the MCData User? NOTE: It is expected that the UE - shall initialize the counter CFS2 (SDS notification retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS2 (SDS notification retransmission)	-->	SDS OFF-NETWORK NOTIFICATION	3,2	P
10	Start TFS2 (SDS notification retransmission)=40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
11	TFS2 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.10 'MCX CT communication over ProSe direct one-to-many communication out of E-UTRA coverage / Announcing/Discoveree procedure for group member discovery'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
12	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition request type of DELIVERY AND READ. NOTE: Timer TFS3 (delivery and read).is started upon receipt of the SDS OFF-NETWORK MESSAGE message that contains a "DELIVERY AND READ" disposition request. TFS3 (delivery and read)=120ms according to the default value defined in TS 24.282 [31] Table F.3.1-1.	<--	SDS OFF-NETWORK MESSAGE	-	-
-	EXCEPTION: Steps 13a1-13b2 describe behaviour that depends on the UE implementation. Steps 13a1-13a6 describe the behaviour of the UE when the timer TFS3 (delivery and read) expires before the contents of the Payload IE are rendered to the MCData User. Steps 13b1-13b3 describe the behaviour of the UE when the contents of the Payload IE are rendered to the MCData User before the timer TFS3 (delivery and read) expires.	-	-	-	-
-	EXCEPTION: Steps 13a1-13a3 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-

13a1	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with disposition notification type of DELIVERED? NOTE: It is expected that the UE - shall initialize the counter CFS2 (SDS notification retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS2 (SDS notification retransmission)	-->	SDS OFF-NETWORK NOTIFICATION	4,2	P
13a2	Start TFS2 (SDS notification retransmission)=40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
13a3	TFS2 expires.	-	-	-	-
-	EXCEPTION: Steps 13a4-13a6 are repeated CFS2=5 times (CFS2 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
13a4	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with disposition notification type of READ upon receiving a display indication for the payload to the MCData User? NOTE: It is expected that the UE - shall initialize the counter CFS2 (SDS notification retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS2 (SDS notification retransmission)	-->	SDS OFF-NETWORK NOTIFICATION	4,2	P
13a5	Start TFS2 (SDS notification retransmission)=40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
13a6	TFS2 expires.	-	-	-	-
-	EXCEPTION: Steps 13b1-13b3 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
13b1	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with disposition notification type of DELIVERED AND READ? NOTE: It is expected that the UE - shall initialize the counter CFS2 (SDS notification retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS2 (SDS notification retransmission)	-->	SDS OFF-NETWORK NOTIFICATION	4,2	P
13b2	Start TFS2 (SDS notification retransmission)=40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
13b3	TFS2 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

7.1.4.3.3 Specific message contents

Table 7.1.4.3.3-1: SDS OFF-NETWORK MESSAGE (step 4, Table 7.1.4.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition DELIVERED, MCD_grp

Table 7.1.4.3.3-2: SDS OFF-NETWORK NOTIFICATION (steps 5, 13a1, Table 7.1.4.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition DELIVERED

Table 7.1.4.3.3-3: SDS OFF-NETWORK MESSAGE (step 8, Table 7.1.4.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition READ, MCD_grp

Table 7.1.4.3.3-4: SDS OFF-NETWORK NOTIFICATION (steps 9, 13a4, Table 7.1.4.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition READ

Table 7.1.4.3.3-5: SDS OFF-NETWORK MESSAGE (step 8, Table 7.1.4.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition DELIVERED_READ, MCD_grp

Table 7.1.4.3.3-6: SDS OFF-NETWORK NOTIFICATION (step 13b1, Table 7.1.4.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition DELIVERED_READ

7.2 Enhanced Status (ES)

7.2.1 Off-network / Enhanced Status (ES) / Client Originated (CO)

7.2.1.1 Test Purpose (TP)

(1)

```
with { UE (MCData Client) registered and authorized for MCData Service, including authorized for
MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the MCDATA User requests to send an Enhanced Status with a disposition of only Delivery }
    then { UE (MCDATA Client) sends an Enhanced Status with a disposition request of only Delivery
via the SDS OFF-NETWORK MESSAGE message, and, initiates counter CFS1 (SDS retransmission) to 1 and
starts timer TFS1 (SDS retransmission) }
            }
```

(2)

```
with { UE (MCData Client) having sent a SDS OFF-NETWORK MESSAGE message and started timer TFS1 (SDS
retransmission) }
ensure that {
  when { timer TFS1 (SDS retransmission) expires }
    then { UE (MCData Client) retransmits the SDS OFF-NETWORK MESSAGE message and, stops re-
transmitting if the counter CFS1 (SDS retransmission) has reached its maximum value and TFS1 (SDS
retransmission) has expired }
            }
```

7.2.1.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in:

TS 24.282 clauses 14.3.1, 9.3.2.2, 9.3.2.3. Unless otherwise stated these are Rel-15 requirements.

[TS 24.282, clause 14.3.1]

Upon receiving request from MCData user to share enhanced for selected group:

1) if the value of "/<x>/<x>/Common/MCData/AllowedEnhSvc" leaf node present in the group configuration as specified in 3GPP TS 24.483 [4] is set to "true" for the MCData group, the MCData client:

   a) shall use "/<x>/<x>/Common/MCData/EnhSvcOpValues/<x>/EnhSvcOpID" leaf node associated with user selected enhanced status operation value present in the group configuration as specified in 3GPP TS 24.483 [4] to generate a group standalone SDS message by following the procedure described in clause 9.3.2.2.

[TS 24.282, clause 9.3.2.2]

Upon receiving an indication to send an SDS message, the MCData client:

1) if the request to send the SDS message is for a MCData group, shall check if the value of "/<*x*>/<x>/Common/MCData/AllowedSDS" leaf node, present in the group configuration as specified in 3GPP TS 24.483 [42], is set to "false". It the value is set to "false", shall reject the request to send the SDS message and not continue with the remaining procedures in this clause;

2) if:

   a) a one-to-one SDS message is to be sent then, shall store the MCData user ID of the intended recipient as the target MCData user ID; or

   b) a group SDS message is to be sent then, shall store the MCData group ID as the target MCData group ID;

3) may set the stored SDS disposition request type as:

   a) "DELIVERY", if only delivery disposition is requested;

   b) "READ", if only read disposition is requested; or

   c) "DELIVERY AND READ", if both delivery and read dispositions are requested;

4) if an existing conversation is indicated then, shall store the conversation identifier of the indicated conversation as SDS conversation ID. Otherwise, shall generate an UUID as described in IETF RFC 4122 [14] and store SDS conversation ID;

5) shall generate an UUID as described in IETF RFC 4122 [14] and store as the SDS message ID;

6) if indicated that the SDS message is in reply to another SDS message then, shall store the message identifier of the indicated message as SDS reply ID;

7) if indicated that the target recipient of the SDS message is an application then, shall store the application ID of the indicated application as the SDS application ID or as the SDS extended application ID;

8) shall store the received payload as the SDS payload;

9) shall store the received payload type as the SDS payload type;

10) shall store the current UTC time as the SDS transmission time;

11) shall generate a SDS OFF-NETWORK MESSAGE message as specified in clause 15.1.7. In the SDS OFF-NETWORK MESSAGE message, the MCData client:

   a) shall set the Sender MCData user ID IE to its own MCData user ID;

   b) if:

      i) a one-to-one SDS message is to be sent then shall set the Recipient MCData user ID IE to the stored target MCData user ID as specified in clause 15.2.15; or

ii) a group SDS message is to be sent then, shall set the MCData group ID IE to the stored target MCData group ID as specified in clause 15.2.14;

c) may set the SDS disposition request type IE to the stored the SDS disposition request type as specified in clause 15.2.3;

d) shall set the Conversation ID IE to the stored conversation ID as specified in clause 15.2.9;

e) shall set the Message ID IE to the stored SDS message ID as specified in clause 15.2.10;

f) shall set the Date and time IE to the stored SDS transmission time as specified in clause 15.2.8;

g) may include the InReplyTo message ID IE set to the stored SDS reply ID as specified in clause 15.2.11;

h) may include:

i) the Application ID IE set to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE set to the stored SDS extended application ID as specified in clause 15.2.24;

i) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the Security parameters and Payload IE with security parameters as described in 3GPP TS 33.180 [26];

j) if

i) end-to-end security is not required for a one-to-one communication, or

ii) sending the SDS OFF-NETWORK MESSAGE message to a MCData group;

may include the Payload IE as specified in clause 15.2.13 with:

i) the Payload content type to the stored SDS payload type; and

ii) the Payload data set to the stored SDS payload;

12) if:

a) a one-to-one SDS message is to be sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.1; or

b) a group SDS message is to be sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.2;

13) shall initialise the counter CFS1 (SDS retransmission) with the value set to 1; and

14) shall start timer TFS1 (SDS retransmission).

[TS 24.282, clause 9.3.2.3]

Upon expiry of timer TFS1 (SDS retransmission), the MCData client:

1) shall generate a SDS OFF-NETWORK MESSAGE message as specified in clause 15.1.7. In the SDS OFF-NETWORK MESSAGE message, the MCData client:

a) shall set the Sender MCData user ID IE to its own MCData user ID;

b) if:

i) a one-to-one SDS message is to be sent then, shall set the Recipient MCData user ID IE to the stored target MCData user ID; or

ii) a group SDS message is to be sent then, shall set the MCData group ID IE to the stored target MCData group ID;

c) may set the SDS disposition request type IE to the stored the SDS disposition request type as specified in clause 15.2.3;

d) shall set the Conversation ID IE to the stored conversation ID as specified in clause 15.2.9;

e) shall set the Message ID IE to the stored SDS message ID as specified in clause 15.2.10;

f) shall set the Date and time IE to the stored the SDS transmission time as specified in clause 15.2.8;

g) may include the InReplyTo message ID IE set to the stored SDS reply ID as specified in clause 15.2.11;

h) may include:

i) the Application ID IE set to the stored SDS application ID as specified in clause 15.2.7; or

ii) the Extended application ID IE set to the stored SDS extended application ID as specified in clause 15.2.24;

i) if end-to-end security is required for a one-to-one communication and the security context does not exist or if the existing security context has expired, shall include the Security parameters IE with security parameters as described in 3GPP TS 33.180 [26]; and

j) if:

i) end-to-end security is not required for a one-to-one communication, or

ii) sending the SDS OFF-NETWORK MESSAGE message to a MCData group;

may include the Payload IE as specified in clause 15.2.13 with:

i) the Payload content type to the stored SDS payload type; and

ii) the Payload data set to the stored SDS payload;

2) if:

a) a one-to-one SDS message was sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.1; or

b) a group SDS message was sent then, shall send the SDS OFF-NETWORK MESSAGE message as specified in clause 9.3.1.2;

3) shall increment the counter CFS1(SDS retransmission) by 1; and

4) shall start timer TFS1 (SDS retransmission) if the associated counter CFS1 (SDS retransmission) has not reached its upper limit.

7.2.1.3 Test description

7.2.1.3.1 Pre-test conditions

System Simulator:

- SS-UE1 (MCData Client)
  - For the underlying "transport bearer" over which the SS and the UE will communicate, the SS is behaving as SS-UE1 as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.
- GNSS simulator to simulate a location and provide a timing reference for the assistance of E-UTRAN off-network testing.

NOTE 1: For operation in off-network environment, it needs be ensured that after the UE is powered up it considers the Geographical area #1 that is simulated by the GNSS simulator as being one of the geographical areas set in the USIM for operation when UE is "not served by E-UTRAN".

- SS-NW (MCData server)

- For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCData operation in the MCData configuration document).

NOTE 2: The SS operation as NW (MCData server) is needed only for the preamble if the UE has to perform procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

IUT:

- UE (MCData Client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- For the underlying "transport bearer" over which the SS and the UE will communicate, the UE is behaving as a ProSe enabled UE as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.
- CFS1 (SDS retransmission) is set to the default value of 5.
- TFS1 (SDS retransmission) is set to the default value of 40 ms.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The GNSS simulator is configured to simulate a location in the centre of Geographical area #1 and provide a timing reference, as defined in TS 36.508 [24] Table 4.11.2-2 scenario #1.
- The UE is switched-off.
- UE States at the end of the preamble
  - The UE is in state 'switched-off'.

7.2.1.3.2 Test procedure sequence

Table 7.2.1.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Power up the UE.	-	-	-	-
2	Trigger the UE to reset UTC time and location. NOTE: The UTC time and location reset may be performed by MMI or AT command (+CUTCR).	-	-	-	-
3	Activate the MCData Client Application and register User A as the MCData User (TS 36.579-5 [5], px_MCX_User_A_username, px_MCX_User_A_password). (NOTE 1)	-	-	-	-
4	Make the MCDATA User request to send an enhanced status to Group A using Enhanced Status Id "1" with a disposition request type of "DELIVERY". (NOTE 1)	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.11 'MCX CO communication over ProSe direct one-to-many communication out of E-UTRA coverage / Monitoring/Discoverer procedure for group member discovery / One-to-many communication'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 5-7 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
5	Check: Does the UE (MCData Client) send an enhanced status via the SDS OFF-NETWORK MESSAGE message with a disposition request type of DELIVERY? NOTE: It is expected that the UE - shall initialize the counter CFS1 (SDS retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS1 (SDS retransmission)	-->	SDS OFF-NETWORK MESSAGE	1,2	P
6	Start TFS1 (SDS retransmission) 40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
7	TFS1 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.10 'MCX CT communication over ProSe direct one-to-many communication out of E-UTRA coverage / Announcing/Discoveree procedure for group member discovery'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 8-10 are repeated 5 times.	-	-	-	-

8	SS-UE1 (MCData Client) sends a SDS OFF-NETWORK NOTIFICATION message with disposition notification type of DELIVERED.	<--	SDS OFF-NETWORK NOTIFICATION	-	-
9	Start 40 millisecond timer.	-	-	-	-
10	40 millisecond timer expires	-	-	-	-
-	EXCEPTION: SS releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.7, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the SS'.	-	-	-	-
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

7.2.1.3.3 Specific message contents

Table 7.2.1.3.3-1: SDS OFF-NETWORK MESSAGE (step 5, Table 7.2.1.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-1, condition DELIVERED, MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Payload	Payload as described in Table 7.2.1.3.3-2			

Table 7.2.1.3.3-2: Payload in the SDS OFF-NETWORK MESSAGE (Table 7.2.1.3.3-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.9-3				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Data payload message identity	'00000011'B	Data payload	TS 24.282 [87] clause 15.2.2	
Number of payloads	1	1 payload	TS 24.282 [87] clause 15.2.12	
Payload			TS 24.282 [87] clause 15.2.13	
Payload IEI	'78'O			
Length of Payload	length of the content			
Payload content type	'00000110'B	ENHANCED STATUS		
Payload data	"1"	The id as defined in the MCData Group Configuration Document	TS 36.579-1 [2], Table 5.5.7.3-1	

Table 7.2.1.3.3-3: SDS OFF-NETWORK NOTIFICATION (step 8, Table 7.2.1.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.12-1, condition DELIVERED

7.2.2 Off-network / Enhanced Status (ES) / Client Terminated (CT)

7.2.2.1 Test Purpose (TP)

(1)

```
with { UE (MCData Client) registered and authorized for MCData Service, including authorized for
MCData Service in off-network environment, and, the UE is in an off-network environment }
ensure that {
  when { the UE (MCData Client) receives an enhanced status via the SDS OFF-NETWORK MESSAGE message
with a disposition of DELIVERY }
    then { UE (MCDATA Client) sends SDS OFF-NETWORK NOTIFICATION message with a disposition
notification type of DELIVERED and, initiates counter CFS2 (SDS notification retransmission) to 1
```

```
and starts timer TFS2 (SDS notification retransmission), and, renders the operational value of the
received Enhanced Status ID as enhanced status to the MCDATA User }
            }
```

(2)

```
with { UE (MCData Client) having sent a SDS OFF-NETWORK NOTIFICATION message and started timer TFS2
(SDS notification retransmission) }
ensure that {
  when { TFS2 (SDS notification retransmission) expires }
    then { UE (MCData Client) retransmits the SDS OFF-NETWORK NOTIFICATION message and, stops re-
transmitting if the counter CFS2 (SDS notification retransmission) has reached its maximum value and
TFS2 (SDS notification retransmission) }
            }
```

7.2.2.2 Conformance requirements

References: The conformance requirements covered in the current TC are specified in:

TS 24.282 clauses 14.3.2, 9.3.2.4, 12.3.2, 12.3.5. Unless otherwise stated these are Rel-15 requirements.

[TS 24.282, clause 14.3.2]

Upon receipt of a SDS OFF-NETWORK MESSAGE message, the MCData client:

1) shall follow the procedure defined in clause 9.3.2.4;

2) shall attempt to match the received value with a "/<x>/<x>/Common/MCData/EnhSvcOpValues/<x>/EnhSvcOpID" leaf node present in the group configuration as specified in 3GPP TS 24.483 [4]; and

3) if a match is found, shall render the associated operational value from "/<x>/<x>/Common/MCData/EnhSvcOpValues/<x>/EnhSvcOpValue" leaf node as enhanced status to the MCData user.

[TS 24.282, clause 9.3.2.4]

Upon receiving an SDS OFF-NETWORK MESSAGE message with a SDS disposition request type IE, the MCData client:

1) shall store the value of Sender MCData user ID IE as the stored notification target MCData user ID;

2) shall store the value of Conversation ID IE as the stored conversation ID;

3) shall store the value of Message ID IE as the stored SDS message ID;

4) shall store the current UTC time as the stored SDS notification time;

5) if present, shall store the value of Application ID IE as the stored SDS application ID;

6) if present, shall store the value of the Extended application ID IE as the stored SDS extended application ID;

7) if present, shall store the value of MCData group ID IE to the stored target MCData group ID; and

8) if the SDS disposition request type IE is set to:

   a) "DELIVERY" then, shall send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.2;

   b) "READ" then, shall send a SDS OFF-NETWORK NOTIFICATION message as described in clause 12.3.3; or

   c) "DELIVERY AND READ" then, shall start timer TFS3 (delivery and read).

NOTE: Duplicate messages (re-transmissions) that are received by the MCData client should not be processed again.

[TS 24.282, clause 12.3.2]

To send an off-network SDS delivery notification, the MCData client:

1) shall store "DELIVERED" as the disposition type;

2) shall generate a SDS OFF-NETWORK NOTIFICATION message as specified in clause 15.1.8. In the SDS OFF-NETWORK NOTIFICATION message, the MCData client:

   a) shall set the Sender MCData user ID IE to its own MCData user ID as specified in clause 15.2.15;

   b) shall set the Conversation ID IE as the stored conversation ID as specified in clause 15.2.9;

   c) shall set the Message ID IE as the stored SDS message ID as specified in clause 15.2.10;

   d) shall set the Date and time IE as the stored SDS notification time as specified in clause 15.2.8;

   e) shall set the SDS disposition notification type IE to the stored disposition type as specified in clause 15.2.5; and

   f) may set:

      i) the Application ID IE to the stored SDS application ID as specified in clause 15.2.7; or

      ii) the Extended application ID IE to the stored extended SDS application ID as specified in clause 15.2.24;

3) shall send the SDS OFF-NETWORK NOTIFICATION message to the stored notification target MCData user ID as specified in clause 9.3.1.1;

4) shall initialise the counter CFS2 (SDS notification retransmission) with the value set to 1; and

5) shall start timer TFS2 (SDS notification retransmission).

[TS 24.282, clause 12.3.5]

Upon expiry of timer TFS2 (SDS notification retransmission), the MCData client:

1) shall generate a SDS OFF-NETWORK NOTIFICATION message as specified in clause 15.1.8. In the SDS OFF-NETWORK NOTIFICATION message, the MCData client:

   a) shall set the Sender MCData user ID IE to its own MCData user ID as specified in clause 15.2.15;

   b) shall set the Conversation ID IE as the stored conversation ID as specified in clause 15.2.9;

   c) shall set the Message ID IE as the stored SDS message ID as specified in clause 15.2.10;

   d) shall set the Date and time IE as the stored SDS notification time as specified in clause 15.2.8;

   e) shall set the SDS disposition type IE to the stored disposition type as specified in clause 15.2.5; and

   f) may set:

      i) the Application ID IE to the stored SDS application ID as specified in clause 15.2.7; or

      ii) the Extended application ID IE to the stored extended SDS application ID as specified in clause 15.2.24;

2) shall send the SDS OFF-NETWORK NOTIFICATION message to the stored sender MCData user ID as specified in clause 9.3.1.1;

3) shall increment the counter CFS2 (SDS notification retransmission) by 1; and

4) shall start timer TFS2 (SDS notification retransmission) if the associated counter CFS2 (SDS notification retransmission) has not reached its upper limit.

7.2.2.3 Test description

7.2.2.3.1 Pre-test conditions

System Simulator:

- SS-UE1 (MCData Client)
  - For the underlying "transport bearer" over which the SS and the UE will communicate, the SS is behaving as SS-UE1 as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.
- GNSS simulator to simulate a location and provide a timing reference for the assistance of E-UTRAN off-network testing.

NOTE 1: For operation in off-network environment, it needs be ensured that after the UE is powered up it considers the Geographical area #1 that is simulated by the GNSS simulator as being one of the geographical areas set in the USIM for operation when UE is "not served by E-UTRAN".

- SS-NW (MCData server)
  - For the underlying "transport bearer" over which the SS and the UE will communicate Parameters are set to the default parameters for the basic E-UTRA Single cell network scenarios, as defined in TS 36.508 [24] clause 4.4. The simulated Cell 1 shall belong to PLMN1 (the PLMN specified for MCData operation in the MCData configuration document).

NOTE 2: The SS operation as NW (MCData server) is needed only for the preamble if the UE has to perform procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.

IUT:

- UE (MCData Client)
- The test USIM set as defined in TS 36.579-1 [2] clause 5.5.10 is inserted.
- For the underlying "transport bearer" over which the SS and the UE will communicate, the UE is behaving as a ProSe enabled UE as defined in TS 36.508 [24], configured for and operating as ProSe Direct Communication transmitting and receiving device.
- CFS2 (SDS notification retransmission)is set to the default value of 5.
- TFS2 (SDS notification retransmission)is set to the default value of 40 ms.

Preamble:

- The UE has performed procedure 'MCData UE registration' as specified in TS 36.579-1 [2] clause 5.4.2B.
- The UE has performed procedure 'MCX Authorization/Configuration and Key Generation' as specified in TS 36.579-1 [2] clause 5.3.2.
- The GNSS simulator is configured to simulate a location in the centre of Geographical area #1 and provide a timing reference, as defined in TS 36.508 [24] Table 4.11.2-2 scenario #1.
- The UE is switched-off.
- UE States at the end of the preamble
  - The UE is in state 'switched-off'.

7.2.2.3.2 Test procedure sequence

Table 7.2.2.3.2-1: Main behaviour

St	Procedure	Message Sequence		TP	Verdict
		U - S	Message		
1	Power up the UE.	-	-	-	-
2	Trigger the UE to reset UTC time and location. NOTE: The UTC time and location reset may be performed by MMI or AT command (+CUTCR).	-	-	-	-
3	Activate the MCData Client Application and register User A as the MCData User (TS 36.579-5 [5], px_MCX_User_A_username, px_MCX_User_A_password). (NOTE 1)	-	-	-	-
-	EXCEPTION: The E-UTRA/EPC actions which are related to the MCData call establishment are described in TS 36.579-1 [2] clause 5.4.10 'MCX CT communication over ProSe direct one-to-many communication out of E-UTRA coverage / Announcing/Discoveree procedure for group member discovery'. The test sequence below shows only the MCData relevant messages exchanged.	-	-	-	-
-	EXCEPTION: Steps 4-6 are repeated 5 times.	-	-	-	-
4	SS-UE1 (MCData Client) sends an enhanced status via the SDS OFF-NETWORK NOTIFICATION message with disposition request type of DELIVERY.	<--	SDS OFF-NETWORK MESSAGE	-	-
5	Start 40 millisecond timer.	-	-	-	-
6	40 millisecond timer expires	-	-	-	-
-	EXCEPTION: Steps 7-9 are repeated CFS1=5 times (CFS1 defined in 24.282 [31] Table G.3.1-1)	-	-	-	-
7	Check: Does the UE (MCData Client) send a SDS OFF-NETWORK MESSAGE message with disposition notification type of DELIVERED? NOTE: It is expected that the UE - shall initialize the counter CFS2 (SDS notification retransmission) with the value set to 1 on the first transmission, and, increase it by 1 with each re-transmission. - shall start timer TFS2 (SDS notification retransmission)	-->	SDS OFF-NETWORK NOTIFICATION	1,2	P
8	Start TFS2 (SDS notification retransmission)=40 milliseconds as defined in 24.282 [31] Table F.3.1-1.	-	-	-	-
9	TFS2 expires.	-	-	-	-
-	EXCEPTION: UE releases the E-UTRA connection. The E-UTRA/EPC actions which are related to the MCData call release are described in TS 36.579-1 [2] clause 5.4.8, 'MCX communication over ProSe direct one-to-one communication out of E-UTRA coverage - release by the UE'.	-	-	-	-
10	Check: Does the UE (MCDATA Client) render the operational value of the received Enhanced Status ID as enhanced status to the MCDATA User? (NOTE 1)	-	-	1	P
NOTE 1: This is expected to be done via a suitable implementation dependent MMI.					

7.2.2.3.3 Specific message contents

Table 7.2.2.3.3-1: SDS OFF-NETWORK MESSAGE (step 4, Table 7.2.2.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.10-1, condition DELIVERED, MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Payload	Payload as described in Table 7.2.2.3.3-2			

Table 7.2.2.3.3-2: Payload in the SDS OFF-NETWORK MESSAGE (step 4, Table 7.2.2.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.10-3, condition DELIVERED, MCD_grp				
Information Element	**Value/remark**	**Comment**	**Reference**	**Condition**
Data payload message identity	'00000011'B	Data payload	TS 24.282 [87] clause 15.2.2	
Number of payloads	1	1 payload	TS 24.282 [87] clause 15.2.12	
Payload			TS 24.282 [87] clause 15.2.13	
Payload IEI	'78'O			
Length of Payload	length of the content			
Payload content type	'00000110'B	ENHANCED STATUS		
Payload data	"0"	The id as defined in the MCData Group Configuration Document	TS 36.579-1 [2], Table 5.5.7.3-1	

Table 7.2.2.3.3-3: SDS OFF-NETWORK NOTIFICATION (step 7, Table 7.2.2.3.2-1)

Derivation Path: TS 36.579-1 [2], Table 5.5.3.8.11-1, condition DELIVERED

Annex A (normative): Test Files

A.1 Introduction

This annex specifies the test files to be used for the MCData FD test cases specified in present document.

A.2 Test files for client originated file distribution

A.2.1 Test File 1 for CO FD

File type: text/plain

Content:

Test file 1 for MCData client originated file distribution

A.2.2 Test File 2 for CO FD

File type: text/plain

Content:

Test file 2 for MCData client originated file distribution

A.3 Test files for client terminated file distribution

A.3.1 Test File 1 for CT FD

File type: text/plain

Content:

Test file 1 for MCData client terminated file distribution

A.3.2 Test File 2 for CT FD

File type: text/plain

Content:

Test file 2 for MCData client terminated file distribution

Annex B (informative): Change history

Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2018-08	RAN5#80	R5-184608	-	-	-	Introduction of TS 36.579-7	0.0.2
2018-08	RAN5#80	R5-185143	-	-	-	Draft TS 36.579-7 v003	0.0.3
2019-03	RAN5#82	R5-192245	-	-	-	Draft TS 36.579-7 v005	0.0.5
2019-09	RAN5#84	R5-196352	-	-	-	Draft TS 36.579-7 v010	0.1.0
2019-11	RAN5#85	R5-198829	-	-	-	Draft TS 36.579-7 v021	0.2.1
2020-05	RAN5#87	R5-202051	-	-	-	Draft TS 36.579-7 v030	0.3.0
2020-07	RAN#88	RP-200718	-	-	-	Draft version for information purposes to the RAN Plenary	1.0.0
2020-08	RAN5#88	R5-203529	-	-	-	draft TS 36.579-7 v1.1.0	1.1.0
2020-09	RAN#89	RP-201797	-	-	-	Draft version for approval to move the spec under revision control to the RAN Plenary	2.0.0
2020-09	RAN#89	-	-	-	-	upgraded to v14.0.0 with small editorial changes	14.0.0
2020-12	RAN#90	R5-206466	0001	1	F	Update of MCDATA TC 6.1.2	14.1.0
2020-12	RAN#90	R5-206467	0002	1	F	Update of MCDATA TC 6.2.1	14.1.0
2021-03	RAN#91	R5-211355	0003	1	F	Editorial for correcting heading styles	14.2.0
2021-06	RAN#92	R5-213420	0004	1	F	Addition of MCData Test Case 6.2.13	15.0.0
2021-12	RAN#94	R5-216754	0008	-	F	Correction of MCData test case 5.1	15.1.0
2021-12	RAN#94	R5-216755	0009	-	F	Correction of MCDATA Test Case 6.1.1	15.1.0
2021-12	RAN#94	R5-216756	0010	-	F	Correction of MCDATA Test Case 6.1.2	15.1.0
2021-12	RAN#94	R5-216757	0011	-	F	Correction of MCDATA Test Case 6.1.3	15.1.0
2021-12	RAN#94	R5-216758	0012	-	F	Correction of MCDATA Test Case 6.1.4	15.1.0
2021-12	RAN#94	R5-217914	0006	1	F	New Test Case - 6.3.1 MCData Enhanced Status CO	15.1.0
2021-12	RAN#94	R5-217915	0007	1	F	New Test Case - 6.3.2 MCData Enhanced Status CT	15.1.0
2022-03	RAN#95	R5-220495	0014	-	F	Correction of clause 2 - References	15.2.0
2022-03	RAN#95	R5-220496	0015	-	F	Correction of clause 6.1 - Short Data Service	15.2.0
2022-03	RAN#95	R5-220497	0016	-	F	Correction of clause 6.2 - File Distribution Test Cases	15.2.0
2022-03	RAN#95	R5-220498	0017	-	F	Correction of clause 6.3 - Enhanced Status Test Cases	15.2.0
2022-03	RAN#95	R5-220499	0018	-	F	Correction of MCData Test Case 5.2	15.2.0
2022-03	RAN#95	R5-220500	0019	-	F	Correction of MCData Test Case 5.3	15.2.0
2022-03	RAN#95	R5-220501	0020	-	F	Correction of MCData Test Case 5.4	15.2.0
2022-03	RAN#95	R5-220502	0021	-	F	MCData condition clarification	15.2.0
2022-03	RAN#95	R5-221404	0013	1	F	Addition of test files to annex A	15.2.0
2022-04	RAN#95	-	-	-	-	correction of missing changes of R5-220496-7-8	15.2.1
2022-06	RAN#96	R5-222143	0022	-	F	New MCData Test Case 7.1.1 Off-network SDS 1-to-1 call CO	15.3.0
2022-06	RAN#96	R5-222144	0023	-	F	New MCData Test Case 7.1.2 Off-network SDS 1-to-1 call CT	15.3.0
2022-06	RAN#96	R5-222145	0024	-	F	New MCData Test Case 7.1.3 Off-network SDS group call CO	15.3.0
2022-06	RAN#96	R5-222146	0025	-	F	New MCData Test Case 7.1.4 Off-network SDS group call CT	15.3.0
2022-06	RAN#96	R5-222147	0026	-	F	New MCData Test Case 7.2.1 Off-network Enhanced Status CO	15.3.0
2022-06	RAN#96	R5-222148	0027	-	F	New MCData Test Case 7.2.2 Off-network Enhanced Status CT	15.3.0
2022-12	RAN#98	R5-227627	0028	1	F	Correction of clause 6 - On-Network Test Scenarios	15.4.0
2023-03	RAN#99	R5-232005	0029	1	F	Correction of clause 6.1 - Short Data Service	15.5.0
2023-03	RAN#99	R5-232006	0030	1	F	Correction of clause 6.2 - File Distribution	15.5.0
2023-03	RAN#99	R5-232007	0031	1	F	Correction of clause 6.3 - Enhanced Status (ES)	15.5.0
2023-03	RAN#99	R5-232008	0032	1	F	Correction of clause 7 - Off-Network Test Scenarios	15.5.0
2023-06	RAN#100	R5-232594	0034	-	F	Addition of new test case 5.5 for Pre-established Session Configuration	16.0.0
2023-06	RAN#100	R5-232595	0035	-	F	Addition of new test case 5.6 for CSK Download	16.0.0
2023-06	RAN#100	R5-233493	0036	1	F	Addition of new test case 5.7 for Functional Alias	16.0.0
2023-09	RAN#101	R5-233831	0037	-	F	Correction of test case 5.6	16.1.0
2023-09	RAN#101	R5-233832	0038	-	F	Correction of test case 5.7	16.1.0
2023-09	RAN#101	R5-234583	0047	-	F	Addition of new test case 6.1.21 SDS 1-to-1 Signaling Functional Alias	16.1.0
2023-09	RAN#101	R5-235405	0039	1	F	Addition of new test case 6.1.13 Standalone SDS 1-to-1 Pre-established Session CO	16.1.0
2023-09	RAN#101	R5-235406	0040	1	F	Addition of new test case 6.1.14 Standalone SDS 1-to-1 Pre-established Session CT	16.1.0
2023-09	RAN#101	R5-235407	0041	1	F	Addition of new test case 6.1.15 Session SDS 1-to-1 Pre-established Session CO	16.1.0
2023-09	RAN#101	R5-235408	0042	1	F	Addition of new test case 6.1.16 Session SDS 1-to-1 Pre-established Session CT	16.1.0
2023-09	RAN#101	R5-235409	0043	1	F	Addition of new test case 6.1.17 Standalone SDS group Pre-established Session CO	16.1.0
2023-09	RAN#101	R5-235410	0044	1	F	Addition of new test case 6.1.18 Standalone SDS group Pre-established Session CT	16.1.0
2023-09	RAN#101	R5-235411	0045	1	F	Addition of new test case 6.1.19 Session SDS group Pre-established Session CO	16.1.0
2023-09	RAN#101	R5-235412	0046	1	F	Addition of new test case 6.1.20 Session SDS group Pre-established Session CT	16.1.0
2023-09	RAN#101	R5-235413	0048	1	F	Addition of new test case 6.1.22 SDS 1-to-1 Media Functional Alias	16.1.0

History

Document history		
V16.0.0	July 2023	Publication
V16.1.0	October 2023	Publication