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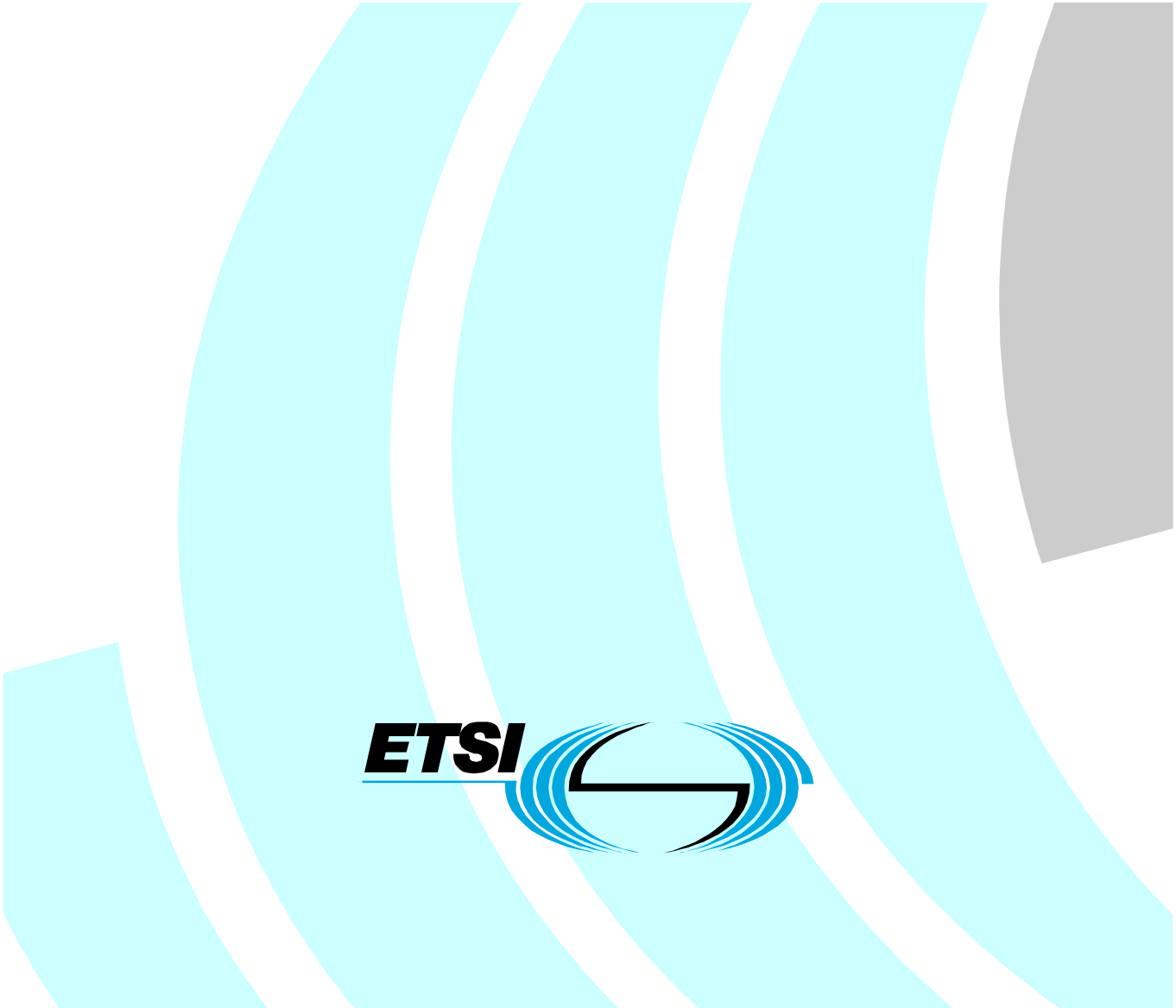
Technical Specification

Smart Cards;
Smart Card Platform Requirements
Stage 1
(Release 7)



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650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
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Foreword

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Introduction

The present document specifies the requirements for Release 7 onwards of the TC SCP.

1 Scope

The present document specifies the additional requirements for Release 7 onwards of the TC SCP with respect to earlier releases.

The present document covers all the Stage 1 requirements which are not covered by other TC SCP stage 1 documents.

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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

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NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

[1] ETSI TS 102 221: "Smart Cards; UICC-Terminal interface; Physical and logical characteristics (Release 7)".

[2] ETSI TS 102 223: "Smart cards; Card Application Toolkit (CAT) (Release 6)".

[3] ETSI TS 122 038: " Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); USIM Application Toolkit (USAT/SAT); Service description; Stage 1 (3GPP TS 22.038 Release 7)".

[4] ETSI TS 151 011: "Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM-ME) interface (3GPP TS 51.011)".

[5] ETSI TS 131 102: "Universal Mobile Telecommunications System (UMTS); Characteristics of the USIM application (3GPP TS 31.102 Release 6)".

[6] ISO/IEC 7816-4: "Identification cards - Integrated circuit cards - Part 4: Organization, security and commands for interchange".

[7] Trusted Computing Group (2003): "TPM Main Part 1 Design Principles, specification version 1.2".

NOTE: Available at https://www.trustedcomputinggroup.org/downloads/tpmwg-mainrev62_Part1_Design_Principles.pdf.

[8] ISO/IEC 14443: "Identification cards - Contactless integrated circuit(s) cards - Proximity cards".

[9] ISO/IEC 18092:"Information technology - Telecommunications and information exchange between systems - Near Field Communication - Interface and Protocol (NFCIP-1)".

[10] ISO/IEC 15693: "Identification cards - Contactless integrated circuit(s) cards - Vicinity cards".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

CLF: contactless front-end, circuitry in the terminal which:

- Handles the analog part of the contactless communication.
- May handle some layers of the contactless protocol.
- May exchange data with the terminal and the UICC.

CLFI (CLF Interface): physical interface between the UICC and the CLF

CLFIP (CLFI Protocol): communication protocol between the UICC and the CLF carried over the CLFI

HSP: high speed protocol running on top of the NUT interface

ME/TE owner: entity having the right to configure or administrate a CAD and/or remote terminal

terminal: entity with which the Smart Card can establish a secure channel

EXAMPLE 1: Card Acceptance Device such as a mobile handset i.e. in the case of a wired Smart Card to terminal (such as PDA or handset) communication.

EXAMPLE 2: A Remote Terminal is a terminal communicating to a CAD, which can access the UICC resources, for example a PC connect over a local link to handset.

NOTE: In the present document a distinction will be made between a CAD and a Remote Terminal only where applicable, in case this distinction is not relevant the generic term terminal will be used.

terminal end point: point for terminating the secure channel from the UICC point of view, which could be a Mobile Terminal or a Remote Terminal

EXAMPLE: A remote terminal can be a Set-top box, a PC, or even a Bluetooth earpiece connected to a Mobile Terminal.

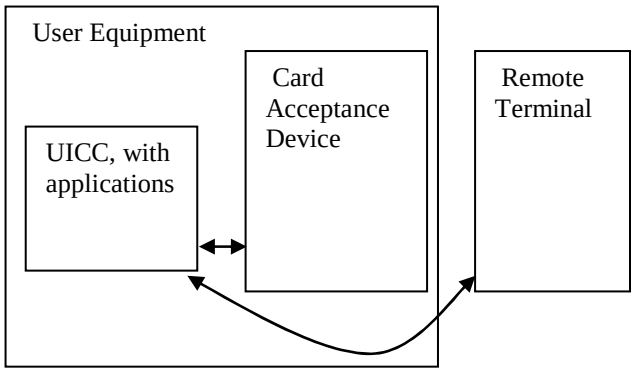

Figure 1: Possible secure channels with a UICC

trusted device: device which is not infected by malevolent code, whether because it is compliant to the requirements defined in TCG [7] or because the user/owner/administrator guarantees device integrity by giving verifiable evidence

NOTE: A more exact definition is out of scope of SCP.

UICC powering modes:

- Battery powered:
  - Mode where the UICC and the CLF are powered from the battery of the terminal.
- Not Battery powered:
  - Mode where the UICC and the CLF are not powered from the battery of the terminal.

3.2 Abbreviations

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

ADF	Application Dedicated File
API	Application Program Interface
CAD	Card Acceptance Device
CAT	Card Application Toolkit
CAT-TP	Card Application Toolkit - Transport Protocol
CEK	Content Encryption Key
CPU	Central Processing Unit
DF	Dedicated File
DM	Device Management
DRM	Digital Rights Management
DRM_UA	Digital Rights Management User Agent
EAP	Extensible Authentication Protocol
EF	Elementary File
GPRS	General Packet Radio Service
HTTP	HyperText Transfer Protocol
HTTPS	Secure HyperText Transfer Protocol
IMS	IP Multimedia Services
IP	Internet Protocol
ISIM	IMS SIM
JSR	Java Specification Request
ME	Mobile Equipment
MNO	Mobile Network Operator
MO	(Device) Management Object
MT	Mobile Termination
NUT	New UICC-Terminal
OMA	Open Mobile Alliance
OTA	Over The Air
PDA	Personal Digital Assistance
PIN	Personal Identification Number
PKI	Public Key Infrastructure
POP	Post Office Protocol
POS	Point Of Sale
RFID	Radio Frequency Identification
RO	Rights Object
SC	Smart Card
SCWS	Smart Card Web Server
SMTP	Simple Mail Transfer Protocol
TCG	Trusted Computing Group
TLS	Transport Layer Security
TMP	Trusted Media Player
UA	(Digital Rights Management) User Agent
UE	User Equipment
UMTS	Universal Mobile Telecommunications System
URL	Uniform Resource Locator
USIM	Universal Subscriber Identity Module
USSM	UICC Security Service Module
WIM	Wireless Identity Module

4 Requirements

The present document specifies:

- run time environment timing constraints;
- launch application command;
- mapped file support on the UICC;
- extension of logical channels;
- secure channel to secure local terminal interfaces;
- authenticate command longer than 255 bytes;
- CAT mechanisms to indicate the bearer connection status;
- New UICC-Terminal (NUT) interface;
- Smart Card Web Server running in UICC;
- API for applications registered to a Smart Card Web Server;
- specific UICC environmental conditions;
- introduction of high density memory technology in UICC;
- power supply indication mechanism;
- Internet Connectivity up to UICC applications;
- Contactless UICC Services.

4.1 Run time environment timing constraints

4.1.1 Abstract (informative)

SCP specifications up to Release 6 do not put any restrictions to the run time behaviour of Smart Card applications on the CAT layer and on the application layer. However, an example for a situation which requires a defined runtime behaviour of the UICC is given in a note in Release 6 of TS 102 223 [2]: The maximum work time of applications before sending a MORE TIME proactive command to the terminal should not exceed a certain amount of time. This remark is made in the context of the network authentication command and it is not normative. To avoid future problems due to this undefined behaviour, the requirements in this clause aim at providing the infrastructure needed to achieve standardized behaviour in situations like those described above from Release 7 onwards.

4.1.2 Background (informative)

4.1.2.1 Use case - Network authentication

An application may not block a UICC with a USIM application longer than a well defined period of time in order to be able to process network authentication commands within a time limit which is a network parameter (TS 102 223 [2]).

4.1.3 Requirements

Identifier	Requirement
REQ-7-01-01-01	The UICC shall provide a mechanism to assign a maximum work time to an application. The time value might be network specific.
REQ-7-01-01-02	The UICC shall not be blocked by an application for an amount of time exceeding the configured maximum work time.
REQ-7-01-01-03	In addition, the application itself shall be able to assign its own maximum work time value.
REQ-7-01-01-04	The application shall be suspended by the run time environment after the work time has expired and control shall be given back to run time environment.
REQ-7-01-01-05	The run time environment shall return control to the application if no other task with higher priority (e.g. network authentication) is pending.
REQ-7-01-01-06	The task switch procedure shall be transparent to the application.
REQ-7-01-01-07	Any security related to the tasks shall not be weakened by the task switch.

4.1.4 Interaction with existing features (informative)

(none)

4.2 Launch Application command

4.2.1 Abstract (informative)

(none)

4.2.2 Background (informative)

The present document presents a stage 1 requirement and high-level description for the Launch Application feature.

The requirements are based on an existing requirement in the 3GPP stage 1 specification for toolkit feature TS 122 038 [3].

As the applications to be launched are mainly independent of the air interface, it is appropriate to standardize this feature in TC-SCP rather in 3GPP. This will also make this feature available to other telecom standards.

Example of terminal applications for such a feature:

- E-mail:

  CAT can launch an e-mail client on the terminal, providing parameters such as POP server, SMTP server, login, password, etc.

- Network management optimization:

  CAT launches an application in the mobile that reports to the USIM; channels and application metrics, for network performance monitoring.

- Proactive synchronization:

  CAT application, triggered by suitable events, may command the start of a data synchronization process (e.g. for subscriber related parameters or ME configuration data) that may involve data entities in the UE and in a synchronization server.

- Streaming:

  CAT may launch a streaming client in the terminal to stream a video clip with the address (e.g. URL) provided by the CAT.

4.2.3 Requirements

Identifier	Requirement
REQ-7-02-01-01	The CAT shall be able to start a terminal application, providing its name and initial parameters.
REQ-7-02-01-02	The terminal shall inform the card (e.g. through events) about the terminal applications that can be launched by the CAT, with the corresponding information on the needed parameters to launch each terminal application.
REQ-7-02-01-03	The informing of the card shall be done after each start of card session and as soon as possible after such an eligible application is added to, or removed from the terminal.
REQ-7-02-01-04	The user of the terminal shall be able to choose when he should be prompted for the issuance of the CAT LAUNCH APPLICATION command. The prompt possibilities shall be: • The user is prompted for each application to be launched. • The user is prompted for those applications only that the user has selected, the other applications are launched without being prompted. The user is never prompted, i.e. all the applications are always launched.
REQ-7-02-01-05	Once launched, the application may interact with the user or another application, as though the user launched the application.
REQ-7-02-01-06	If the handset is not able to launch the requested application, an error mechanism shall be specified to inform the CAT, which shall include a reason code and details as to whether the error is temporary or not.
REQ-7-02-01-07	Each application shall have a unique identifier or reference.
REQ-7-02-01-08	The format of the identifier shall be standardized.
REQ-7-02-01-09	There shall be the possibility to provide the application identifier in a standardized way (SCP decides for the identifier value), or in a proprietary way (application provider decides for the identifier value).
REQ-7-02-01-10	An application parameter shall be uniquely identified.
REQ-7-02-01-11	This requirement shall be implemented as a letter class feature.

Following are additional information to enhance the general comprehension of the requirements (informative):

Depending on the terminal application A:

- The user may have a complete, partial or restricted control over the launched terminal application A. This control is not linked to the CAT capacity, but is inherent to the application A itself.

Examples of eligible applications with complete or partial user control are web browsers, email application, etc.

- Another ME application B may have a complete, partial or restricted control over the launched terminal application A. This control is not linked to the CAT capacity, but is inherent to the application A itself.

Examples of eligible applications with complete or partial control by an other ME application are synchronization application, terminal functionality tuning, etc.

4.2.4 Interaction with existing features (informative)

The release 7 Launch Application feature may be used to extend the LAUNCH BROWSER command in specific cases where it procures an advantage.

Other pre-release 7 features should not be impacted.

4.3 Mapped file support on the UICC

4.3.1 Abstract (informative)

(none)

4.3.2 Background (informative)

When comparing the file structure of a SIM in TS 151 011 [4] with that of a USIM in TS 131 102 [5] it appears that many EFs not only have the same name and file identifier (although under different DFs) but are entirely equal by size and content parameters. This generally allows, for memory efficient implementation, to perform file mapping between SIM and USIM files as these files can be shared by both applications, i.e. necessary storage capacity is only required once.

The same is true concerning the mapping of files between multiple USIMs if the UICC is intended to be used by a single user, i.e. all user relevant files (that can be updated by the user) could be mapped.

This is why it seems necessary to standardize the mechanism to map these files.

4.3.3 Requirements

Identifier	Requirement
REQ-7-03-01-01	It shall be possible to map the content of EFs that are identical by type, size and content (i.e. the necessary storage capacity is only required once) at personalization or "over the air".
REQ-7-03-01-02	It shall be possible to setup a security rule to prevent a file from being mapped and thus prevent any illicit access to an existing file.
REQ-7-03-01-03	The fact that an EF is mapped with another EF shall not restrict the operations allowed on the file i.e. the file can be deleted, resized, updated, etc. EXAMPLE: File1, File2 and File3 are mapped. When File1 is updated, the content of File2 and File3 is changed accordingly. This is obvious because they share the same storage. It is possible to delete any of these 3 files in any order for example first delete File1 and after File3, the content of File2 remains unchanged.. After, when deleting the third file i.e. File2, the resources held by the file shall be released and the memory used by this file shall be set to the logical erased state.
REQ-7-03-01-04	It shall be possible to have different security attributes for files that are mapped.
REQ-7-03-01-05	It shall be possible to have different life cycles for files that are mapped.

4.3.4 Interaction with existing features (informative)

(none)

4.4 Extension of logical channels

4.4.1 Abstract (informative)

TS 102 221 [1] currently specifies up to 3 logical channels in addition to the basic logical channel 0. It means that only four logical channels are currently specified.

4.4.2 Background (informative)

4.4.2.1 Typical problem situation

A situation can be that a UICC has an USIM application, an ISIM (or several) application, a WIM application, an application (or several) using the JSR 177 communication capabilities and a banking application, each of these applications use a different logical channel. If there are only 4 logical channels this is not possible.

In the same way a file (EF, DF, ADF) can be accessed using different logical channels at the same time, currently it is limited to 4 logical channels.

In the latest ISO/IEC 7816-4 [6] specification's revision, 16 additional channels have been added. This allows better flexibility when several applications run simultaneously.

4.4.2.2 Possible problem solution

The best solution is to extend the number of the logical channels, in line with ISO/IEC 7816-4 [6].

4.4.2.3 Use cases

4.4.2.3.1 Use case - JSR 177 applications

It is possible to have multiple applications running on the terminal talking to the Smart Card at the same time. For example multiple Java applications using JSR 177.

4.4.2.3.2 Use case - PC connection

A UICC connected to a PC may need to open multiple secured connections to different entities through different logical channels.

4.4.3 Requirements

4.4.3.1 General requirements

Identifier	Requirement
REQ-7-04-01-01	An optional mechanism shall be introduced that allows the extension of the number of logical channels available in addition to the basic channel (i.e. channel 0) and to the three already possible additional channels.
REQ-7-04-01-02	The mechanism introduced shall be ISO/IEC 7816-4 [6] compliant.

4.4.3.2 Backward compatibility requirements

Identifier	Requirement
REQ-7-04-02-01	A release 7 UICC supporting extended channels shall not prevent a pre release 7 terminal to use the release 6 logical channel functionality.
REQ-7-04-02-02	A release 7 terminal supporting extended channels shall not prevent a pre release 7 UICC to use the release 6 logical channel functionality.

4.4.4 Interaction with existing features (informative)

(none)

4.5 Secure channel to secure local terminal interfaces

4.5.1 Abstract (informative)

This clause defines requirements for a generic solution of a secure channel between the UICC and an end point terminal. Several applications will be able to rely on this generic solution to offer an end to end security.

- Providing mutual authentication between a UICC and a terminal end point.
- Providing integrity and confidentiality (encryption) protection of the interface between a UICC and a terminal end point.

The use cases in this clause will justify the need of a secure channel between a UICC and a terminal; it also lists the requirements that this secure channel shall fulfil to address all the use cases described herein.

Standardization efforts have been undergone and are at present being made to define secure channels between communicating applications running on distant platforms.

4.5.2 Background (informative)

System security can be obtained only if end-to-end protection is achieved. For Smart Card to terminal communication, this involves:

- Secure end on the Smart Card side. This is true by assumption; the Smart Card is a tamper resistant device.
- Secure end on the terminal side. This is attainable when trusted devices are employed. For example TCG [7] is specifying trusted device features and architectures.
- Secure communication between end devices, that is, the Smart Card and the terminal.

Multiple scenarios exist in which a secure communication between Smart Card and terminal is necessary. Smart cards are resource-limited devices, whose main purpose is to safeguard user identities and secret keys, and to perform sensitive cryptographic computations. Smart card use greatly depends on the environment in which they are deployed. For example, in banking, user information includes identity, account information, and possibly information on the latest transactions made and secret keys used in security functions. The operations allowed encompass card holder authentication, automatic transaction registration, transaction non-repudiation. In mobile communications, user information includes identity, personal information such as address book, operator related information, and again secret keys used in security functions. Functions executed comprehend user authentication, voice encryption, as well as data access to user's private information.

Smart cards were designed to be economic, portable and therefore small and light, yet secure. There are no peripherals that allow user direct access, such as a keyboard or a screen: Smart Card access must go through a terminal, and, unless the communication is secure end-to-end, this may constitute a security weakness. System security is that of the weakest link and, unless strengthened, attackers may target the terminal or the data exchange with the terminal to get round the robustness of the tamper resistant device.

The definition and use of trusted terminals is out of the scope of this submission. In the following clauses we will assume the terminal is not infected by malevolent code, whether because it is compliant to the requirements defined in TCG [7] or because the user/owner/administrator guarantees device integrity by giving verifiable evidence.

Multiple use cases justify the need for a Smart Card to terminal secure communication. In the following parts, we cover use cases linked with User Interface, Device Management (DM), Digital Right Management (DRM).

4.5.2.1 Use case - User interface

A large amount of information currently flows in GSM/3G network-enabled services that make use of application server software and toolkit applications. In most of these services, at least a part of the information flow has no protection from eavesdropping or tampering: if we focus on the communication between the UICC and the terminal, the information flowing from the card to the terminal, and vice versa, is in plain text [2].

In this respect, let us consider the two cases in the following:

- When an application on the UICC requires the user to enter a PIN to access a service, the PIN itself is not protected. Therefore, when PIN data is sent from the handset to the UICC, it may be stolen or maliciously altered in order to deny the service to the end user.
- When an application on the UICC sends data to the terminal to display to the user, the data is displayed in plain text. Such data may involve, for example, fees to be paid or acceptance of onerous conditions for the use of a software/service. If data is tampered with, the user may take upon him/herself a burden different from that which has been notified. Issues may be raised on how "legally binding" for a user is the acceptance of conditions that have no protection against malicious alteration before submission to the user itself.

The implementation of a secure channel will allow a secure data exchange between the end user and the service provider.

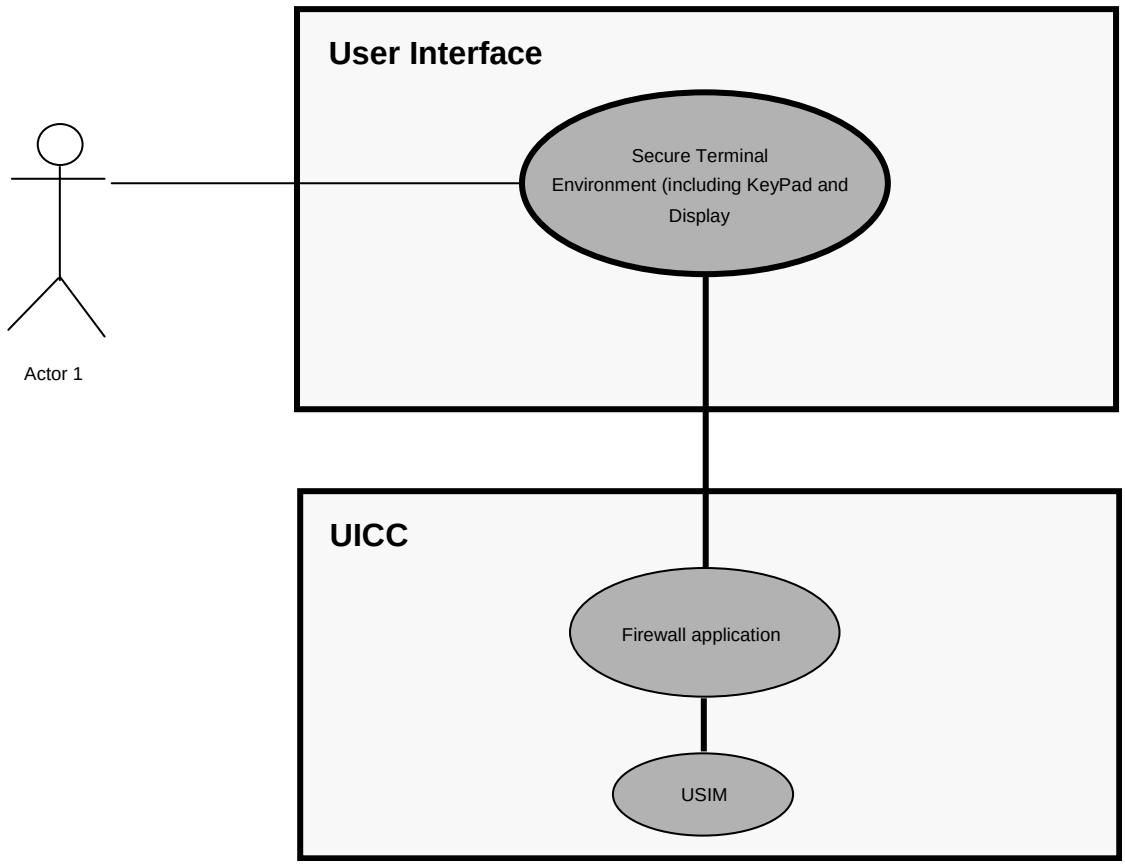

Figure 2: User Interfaces

4.5.2.2 Use case - UICC as a control point for device management

Device Management, or DM, specified in OMA, intends to provide the protocols and mechanisms allowing to remotely achieve management of devices. The Device Management includes:

- Setting initial configuration information in devices.
- Subsequent installation and updates of persistent information in devices (firmware update).
- Retrieval of management information from devices.
- Processing events and alarms generated by devices.

In this environment, the Smart Card inserted in the device is expected to play a role at least in the following cases:

- Dynamic provisioning of the device with up-to-date information.
- Handling of a part of the security during the update of device firmware (service access controlled by the operator, authentication of the origin, etc.).

It means that the Smart Card (SC) shall store DM objects (Management Objects, or MO) accessible by the device through the SC to device interface and also manageable by a remote server (through the device). This interface is currently not ciphered and DM information will be exchanged without protection. It is easy to imagine some of the possible threats occurring during these exchanges:

- When the provisioning data is extracted from the SC by the device, some man-in-the-middle application or element could intercept and change some data in order to alter the device configuration or compel the device to connect to a fraudulent DM server. The data should therefore be ciphered.

An unauthorized server or device agent could try to modify the information stored into the SC leading to a later bad provisioning of the device. Therefore, only authorized and authenticated device agents or remote servers should be able to update or modify or add DM data in the SC.

The availability of a secure channel will allow to secure and protect the communications occurring between the device DM user agent and the Smart Card.

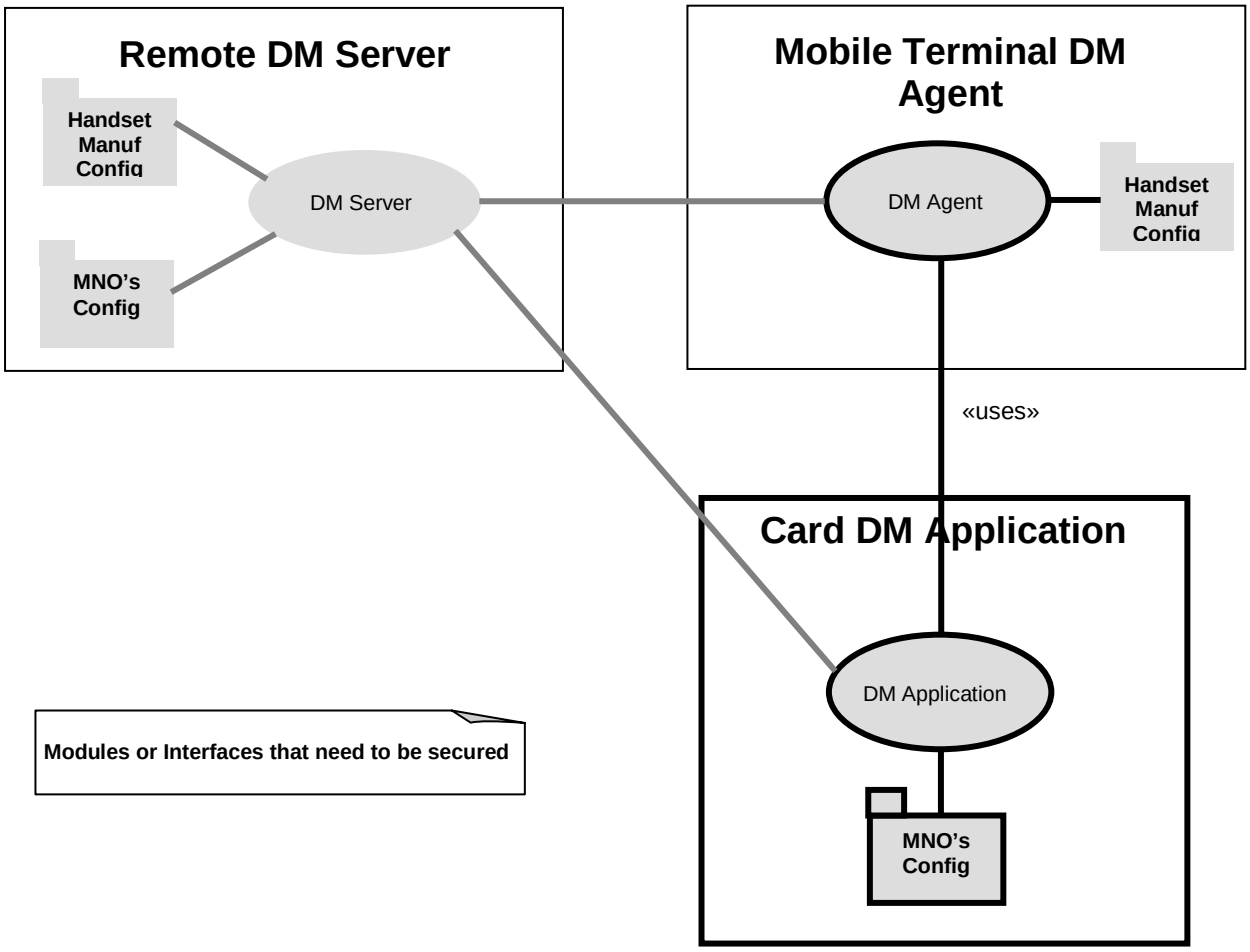

Figure 3: Device Management (DM)

4.5.2.3 Use case - DRM and distributed applications

Digital Rights Management (DRM) is meant to secure media content owned by a service provider; the end-user has a limited set of rights to use the content. Usually, media content is supposed to be rendered on any type of compatible terminal (e.g. CD audio on any CD player) so that the user can transport his content wherever he wants. Adding security should not change this user experience.

In the event the user is a Mobile Network Operator (MNO) subscriber, Open Mobile Alliance (OMA) DRM specifies a model where the rights are bound to a device, not to a user. This implies that when the user needs to change the player (i.e., the handset), the rights have to be downloaded onto the new device and the certificates are to be recalculated with the new terminal ID. This scheme works well as long as a network connection is available and/or the terminal belongs to the same user domain.

A different scheme is proposed, in order to link the rights to a user rather than to the handset: the Rights Object (RO) might be stored in the user's UICC together with part of the DRM user agent. This implies that when the user needs to change the player (i.e., the handset), the rights do not have to be downloaded onto the new terminal. This solution has the following advantages:

1) The user can play content in any MT containing a genuine media player (OMA compatible) and accepting the UICC.

2) The user would not require a network connection. This is useful for situations where the user does not have network coverage (e.g. underground station; plane).

3) The MNO stores its RO in a tamper-resistant device, which is under its control (administration via OTA platform).

This scenario is only possible thanks to the secure channel between a trusted execution environment in the handset and the UICC based DRM User Agent (UA) providing the Content Encryption Key (CEK).

Given that the RO is stored in the UICC, the access to the right can be done directly if the rendering device is the mobile handset (CAD) or, indirectly when the rendering device is a remote terminal (e.g., a Set-Top-Box asking for rights stored in the UICC).

UICC based DRM_UA: the DRM user agent stored in the UICC is there to manage the RO associated to a media content, by managing the parameters and the decryption key (CEK) and by deciding if a content is authorized to be rendered or not.

The session starts by a mutual authentication between the trusted execution environment in the CAD or remote terminal (where the media player is executed) and the UICC based DRM_UA, ending in the opening of a secure channel. Some parameters have to be securely sent to the UICC (trusted time, media content id, etc) so that the DRM_UA can handle the right accordingly (usage counter decrease, etc) and then securely provide the decrypted CEK to the Trusted Media Player (TMP).

Then the TMP can play the content.

The session is finished when the content has been rendered and the secure channel is closed.

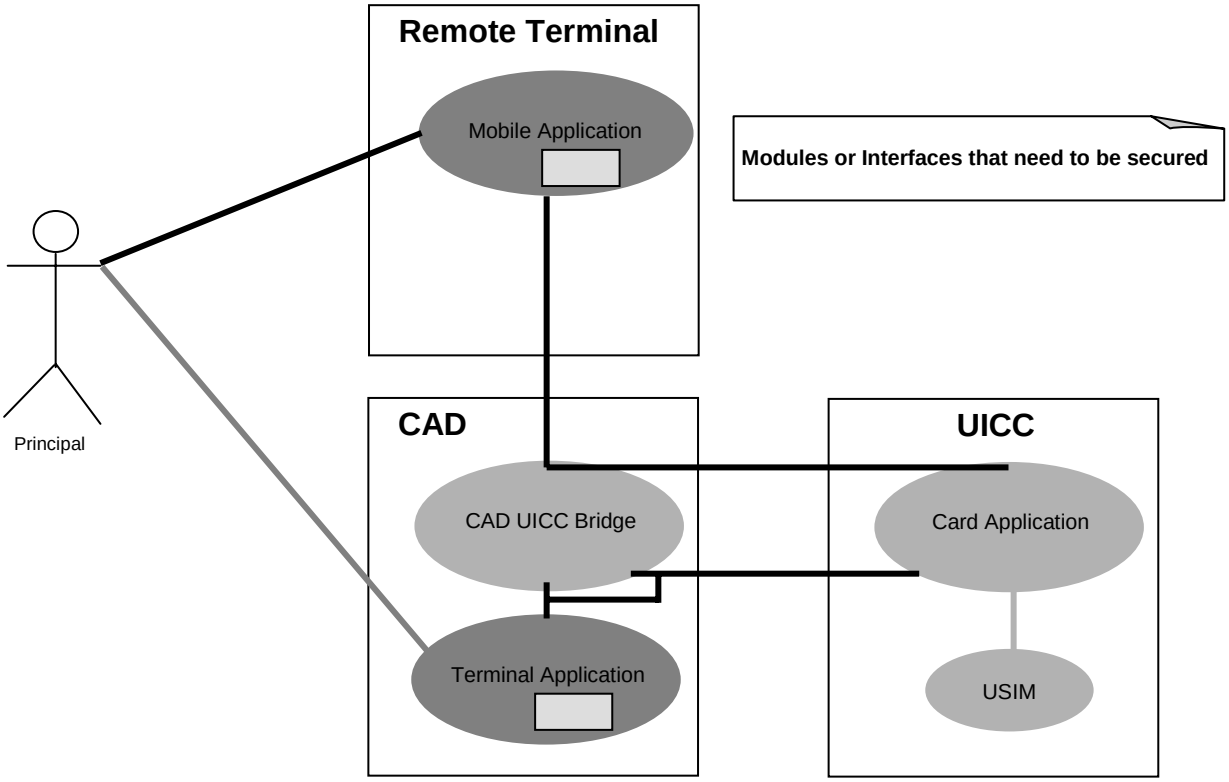

Figure 4: Distributed application

4.5.3 Requirements

This clause describes secure channel's requirements that fit the use cases above.

4.5.3.1 End point requirements

Identifier	Requirement
REQ-7-05-01-01	Applications on the UICC shall be able to establish a secure channel with applications on a terminal (CAD and/or remote terminal). A secure channel in this context is defined in the requirements that follow (see use cases in clauses 4.5.2.1 to 4.5.2.3).
REQ-7-05-01-02	There shall be two different types of end points: • the UICC interface handler and the terminal interface handler (interface end points); • the UICC application and terminal application (application end points).
REQ-7-05-01-03	Through the end points, it shall be possible to establish a Secure Channel per application (see use cases in clauses 4.5.2.1 to 4.5.2.3).
REQ-7-05-01-04	Through the interface end points, several applications on the same terminal shall be able to share the same secure channel with an application on the UICC (see use cases in clauses 4.5.2.1 to 4.5.2.3).
REQ-7-05-01-05	Once a secure channel has been setup between two end points, all communications between those end points shall go via the secure channel.

4.5.3.2 Integrity requirements

Identifier	Requirement
REQ-7-05-02-01	The secure channel shall allow the integrity of the data to be verified (see use cases in clauses 4.5.2.1 to 4.5.2.3).

4.5.3.3 Confidentiality requirements

Identifier	Requirement
REQ-7-05-03-01	Data sent through the secure channel shall be confidentiality-protected depending on the conditions set by the policy (see use cases in clauses 4.5.2.1 to 4.5.2.3).

4.5.3.4 Authentication requirements

Identifier	Requirement
REQ-7-05-04-01	End points of a secure channel shall be able to authenticate each other (see use cases in clauses 4.5.2.1 to 4.5.2.3).
REQ-7-05-04-02	By means of a common trusted third entity, it shall be possible for the UICC end point and terminal end point to agree the keys to be used.
REQ-7-05-04-03	Once keys have been setup, these may be reused, depending on their expiration, to setup a secure channel without reference to a third entity.

4.5.3.5 Audit/Compliance requirements

Identifier	Requirement
REQ-7-05-05-01	The terminal end point shall be a trusted device (see clause 4.5.2).
REQ-7-05-05-02	Evidence shall be provided on the trust ability level of the device. I.e., assessment of the trust ability level shall be possible, for example according to a security certification scheme (see clause 4.5.2).

4.5.3.6 Policy requirements

Identifier	Requirement
REQ-7-05-06-01	An anti-replay mechanism shall be present and active depending on the policy.
REQ-7-05-06-02	It shall be possible to control (e.g. through policy files) what functionality/privileges/access is given to a Terminal end point that has authenticated itself to the UICC end point.
REQ-7-05-06-03	It shall be possible for the terminal owner to control (e.g. through policy files) what functionality/privileges/access is given to a UICC end point that has authenticated itself to the terminal end point.

4.5.3.7 Transport Protocol requirements

Identifier	Requirement
REQ-7-05-07-01	The Secure Channel Protocol should be transport protocol neutral (see use cases in clauses 4.5.2.1 to 4.5.2.3).

4.5.4 Interaction with existing features (informative)

4.5.4.1 Logical Channels

As logical channels exist over the same physical interface, when a secure channel is setup between the UICC interface handler and the terminal interface handler, all communication on any logical channel will go through this secure channel.

4.6 Authenticate command longer than 255 bytes

4.6.1 Abstract (informative)

TS 102 221 [1] specifies only a short length for commands and, therefore large amount of data must be split in several commands, each one no longer than 255 bytes. In this case the protocol becomes inefficient. The situation becomes critical when an authenticate command must be performed.

4.6.2 Background (informative)

4.6.2.1 Use case - EAP packet exchange

A typical situation will be the handling of EAP methods when the EAP packets exceed 255 bytes (e.g. EAP TLS where the packet may be up to 65 536 bytes). This issue can not be managed today without the definition of a dedicated mechanism or the definition of the extended length command.

Furthermore, the length of the AUTHENTICATE command data is continuously increasing as security needs change.

4.6.3 Requirements

4.6.3.1 General requirements

Identifier	Requirement
REQ-7-06-01-01	A mechanism shall allow the UICC and the Terminal to use an authenticate command even if the data message is longer than 255 bytes.
NOTE: The mechanism introduced should be ISO/IEC 7816-4 [6] compliant.	

4.6.3.2 Backward compatibility requirements

Identifier	Requirement
REQ-7-06-02-01	The authenticate command specified in release 6 and before shall be fully supported by the UICC supporting the new mechanism.
REQ-7-06-02-02	The support of the new mechanism by the UICC shall be indicated to the Terminal.

4.6.4 Interaction with existing features (informative)

(none)

4.7 CAT mechanisms to indicate the bearer connection status

4.7.1 Abstract (informative)

This requirement introduces a new standardized, reliable mechanism in TS 102 223 [2] to provide the UICC with information about the availability of a bearer connection. By means of this new mechanism the UICC knows when it is feasible to start a network related proactive command like Send SM or Setup Call.
Current specifications allow the UICC to use several bearers for communication with servers in the network, e.g. SMS and GPRS. The new mechanism shall provide means to indicate and query the status of bearers.

4.7.2 Background (informative)

4.7.2.1 Use case - Availability of network bearers

There are several applications in the field that want to send SM(s) to a server once a mobile station is switched on. One example is an application which checks if the terminal has changed and sends a SMS to a server for Device Management purposes. This type of application needs to be reliably informed at the earliest point in time during the startup of the mobile station when the SM can be sent successfully, i.e. when the network is available. Currently the typical indicator for startup is a Terminal Profile. At the point of time, when the Terminal Profile is sent, some mobiles are neither able to handle proactive commands nor is it guaranteed that access to the network is already available.

4.7.2.2 Use case - Network connection temporarily lost

There are situations where the availability and quality of network connections changes often, e.g. when driving through tunnels or urban areas in a car or in a train. Mobile services which rely on network connections (e.g. in a smartphone or in a PDA equipped with a GSM or UMTS data module) may want to know if a particular network and/or bearer is available or which networks and/or bearers are available before establishing connections and transferring data.

4.7.2.3 Use case - Availability of local bearers

The current standards allow to use local bearers like Infrared, Bluetooth and WLAN to communicate with office equipment in the vicinity. Availability of connections to such equipment may change often when the position of the terminal is changed due to the short range of the connection technology. Mobile applications (e.g. in a smartphone or in a PDA equipped with a GSM or UMTS data module) may want to use these bearers to connect to the office equipment. Having accurate and up-to-date information about the availability of these bearers will simplify the development of applications and will improve the user experience.

4.7.3 Requirements

4.7.3.1 Requirement 1 - Network bearer connection status

Identifier	Requirement
REQ-7-07-01-01	For all supported bearers it shall be possible to set up a list of bearers to monitor connection status.
REQ-7-07-01-02	For all supported bearers it shall be possible to query the status of bearers.

4.7.3.2 Requirement 2 - Local bearer connection status

Identifier	Requirement
REQ-7-07-02-01	For all supported local bearers, indicated in TERMINAL PROFILE, it shall be possible to set up an event to monitor connection status.
REQ-7-07-02-02	For all supported local bearers, indicated in TERMINAL PROFILE, it shall be possible to query the connection status.

4.7.4 Interaction with existing features (informative)

(none).

4.8 New UICC-Terminal interface

4.8.1 Abstract (informative)

Recently UICC memory size has had a very fast growth, from Kbytes up to Megabytes cards that are almost ready for the market today. Certainly this trend will continue in the near future allowing operators to set up a completely new services portfolio.

Next generation services will surely be based on multimedia contents management and the chance to store them inside the card, such as MMS storage on a Rel-6 USIM, will be a key feature. Moreover services related to large data transfer to and from the card, streaming through the card, personalization and control of external devices will need not only large storage capabilities on UICC, but also a fast data access to avoid time latency in service usage granting a better level of user experience and higher connectivity to remote service inside or outside the terminal.

In order to provide these services, some key protocols between UICC and terminal have to be provided.

Although UICC memory and multimedia capabilities have been going to evolve, current UICC-Terminal interfaces did not follow the same evolutionary trend.

Taking into account the above mentioned services evolution, current UICC-Terminal interfaces and protocol stacks shall be revised and New UICC-Terminal interfaces shall be defined and standardized to manage large-sized cards, multimedia Smart Card contents in a faster way and easy connectivity to Internet infrastructure. This new interface shall also be backward compatible with the existing interfaces.

Though the size of storage memory is out of scope of the present document it is felt necessary to warn that memory technologies used in UICCs supporting the new interface might be power hungry and therefore a power negotiation mechanism should be considered necessary.

4.8.2 Background (informative)

Hereafter some use-cases requiring a high-speed dedicated channel between UICC and terminal have been shortly described.

4.8.2.1 Use case - multimedia file management

As the UICC will be able to store and encrypt/decrypt multimedia files (such as MMS, pictures, MP3 files, video clips) customer's usability and Quality User Experience cannot be compromised by a too long wait for the data download/upload. For example it could be of interest to associate an image, a sound and eventually a short video to the information relative to each contact in order to display all the images and video when accessing the phonebook.

4.8.2.2 Use case - MMI on UICC

Large-sized Smart Cards offer the possibility to store card issuer's MMI in the UICC. During initialization process, the terminal can detect the type of UICC (which operator, which service providers, which features) and upload the whole MMI that the card issuer has defined for its purposes and its services. This operation should be performed only if a New UICC is detected by the terminal. This operation shall be performed as fast as customer's experience would not be affected. A mechanism to identify the detection of a new UICC should be standardized.

4.8.2.3 Use case - real-time multimedia data encryption/decryption

UICC can be used to directly encrypt/decrypt data stream (such as protected voice communications or streamed video and music). For example the user should be able to receive multimedia files (e.g. Audio or Video) encrypted using rights stored inside the UICC. Both the content and its decryption key should be stored in the UICC and also the decryption process could be executed inside the card. The decrypted content could be offered via a streaming protocol in order to increase the level of security. In addition the user could also store personal contents in the UICC and send them after having protected them through encryption features of the UICC.

An additional use case requiring very similar capabilities of the interface is the signature of multimedia documents, as it is not necessary for the UICC to store the document in order to compute the signature as the document is streamed through.

4.8.2.4 Use case - storage of terminal applications on the UICC

UICC could be used to store and distribute applications that could be uploaded by the terminal during the initialization phase or later. The uploading from the UICC to the terminal (or vice versa) of the applications should happen dynamically according to user rights purchased from the operator. This enables efficient management of operator-related applications on the terminal and easy deployment of innovative services on the field.

4.8.2.5 Use case - direct and indirect UICC connection to a PC

As it is now possible for some devices it should be possible either to insert a UICC directly into a PC laptop or to connect the handset to PC laptop in order to download/retrieve some personal data (MMS, pictures, movies, applications, etc.) to/from the card in a very quick time but also to easily execute cryptographic operations for accessing a secure environment (e.g. PKI for e-commerce). The user should consider the UICC as his trusted storage device, ensuring acceptable performances for the targeted use.

In case of an indirect connection to a PC, the UICC to PC connection should be targeted to be independent from the host operating system. Security of the UICC to PC link shall be guaranteed.

4.8.2.6 Use case - web server on Smart Card

UICC can be considered like a web server to which an Internet connection can be established with a usual Internet browser. Such a solution removes the needs of deployment of middleware to interface the functionality of the UICC as standard browsers and protocols would be used to access UICC contents and applications.

Contents will be both stored and dynamically generated on the Smart Card and then transferred to the terminal: the aim is to reuse standard graphic features of handsets to allow mobile operators to offer attractive and secure services. A quick communication interface between the terminal and the UICC will enhance the web server performances; TCP/IP based communication allows internal pages (in the UICC) to be served locally and remotely using standard protocols and methods. The operation of insert, delete or modify shall be performed in a very fast way so that customer's experience would not be affected.

Through a web server it will be possible to offer a new range of services such as the possibility to access UICC files (e.g. the phonebook, the MP3 and videos list) via a web interface in order to consult or modify them.

4.8.2.7 Use case - antivirus on UICC

The usage of the UICC as a storage device or the downloading on it of new applications and services lead to the need of antivirus running on the UICC itself, like it happens in a PC environment. The UICC could be able to perform auto-scan, to update virus signature or managing user rights and the New UICC-Terminal interface should not affect this functionality with a too slow definition files download.

4.8.2.8 Use case - big phonebook management from the UICC

Big memory cards will offer the opportunity to provide big phonebooks portability with some additional parameters (such as voice activated dialling). The usage of this extra UICC capability should be transparent for the end user thanks to a fast exchange of data between the UICC and the terminal. The phonebook data needs to be accessible through each of the interfaces of the UICC allowing for administration through either interface.

4.8.2.9 Use case - reduce personalization time

As memory of the card increases, more data needs to be written during personalization e.g. prior to card issuance. The new interface can be used to personalize the card, e.g. to load Smart Card applications to the UICC in a reasonable time.

4.8.2.10 Use case - generic TCP/IP connectivity

Many services can be built using the user's UICC as a trust-enabling device. From that standpoint, it is highly beneficial that the New UICC-Terminal interface provides support of TCP/IP as this enables the use and integration of the UICC in IP networks as an endpoint. The Smart Card Web Server and the Liberty Alliance use-cases are good candidates for the use of such generic TCP/IP connectivity.

4.8.3 Requirements

4.8.3.1 General requirements

Identifier	Requirement
REQ-7-08-01-01	The New UICC-Terminal (NUT) interface parameters shall be capable of providing 8 Mbps (net interface speed without protocol overheads and re-transmissions).
REQ-7-08-01-02	The New UICC-Terminal interface shall offer technical solutions to evolve to higher speed rates with backward compatibility, and be open for future needs (SCP release 8 and onward).
REQ-7-08-01-03	A mechanism shall be provided to detect the presence of the NUT interface. If no NUT interface is detected, the terminal shall select the ISO/IEC interface.
REQ-7-08-01-04	If both the terminal and the card support the NUT interface, the terminal shall select the NUT interface.
REQ-7-08-01-05	The NUT interface shall provide a proactive mechanism to initiate communication with the terminal and/or the network.
REQ-7-08-01-06	At least one of the plug-in and mini UICC form factors from a dimensional point of view (width, height and thickness) shall be able to accommodate the NUT interface.
REQ-7-08-01-07	The NUT interface shall be able to support the use of higher level protocols (such as HTTP and TCP/IP) in order to provide connectivity to existing infrastructures.
REQ-7-08-01-08	After the NUT interface has been activated by the terminal, a higher power consumption can be negotiated.
REQ-7-08-01-09	An UICC supporting the NUT interface shall support the ISO/IEC interface.
REQ-7-08-01-10	The NUT interface shall be able to support streaming data.
REQ-7-08-01-11	It shall be possible to run authentication commands through the NUT interface without affecting the existing timing constraints.
REQ-7-08-01-12	The NUT interface being present on a UICC shall not conflict with the possibility of having an additional contact-less connectivity solution.
REQ-7-08-01-13	The NUT interface being active shall not prevent activity taking place on additional connectivity solutions (if present) nor affect responsiveness on this connectivity solution (e.g. swipe mode contact-less transactions).
REQ-7-08-01-14	The New UICC-Terminal interface shall not degrade security on the UICC.
REQ-7-08-01-15	When the NUT interface is used to run only pre-Rel-7-commands, the default UICC power shall not exceed what is specified in TS 102 221 [1] specifications.
REQ-7-08-01-16	The introduction of the NUT interface shall not modify the existing form factors (as defined in TS 102 221 [1]) causing a separate reader to be required.
REQ-7-08-01-17	The power consumption of the UICC including the interface when all activities are stopped shall not exceed the currently specified value for clock stop mode.
REQ-7-08-01-18	To introduce a NUT interface, no new contacts in addition to the 8 contacts specified in ISO/IEC 7816-4 [6] series are to be added to the UICC.
REQ-7-08-01-19	The use of some of the currently assigned contacts in the SCP specification and non-assigned contacts (C4, C6, C8) should be negotiable to allow the limited resources available to be used in the most flexible way.
REQ-7-08-01-20	There shall be a mechanism to negotiate power consumption of the NUT interface based on the used speed.
REQ-7-08-01-21	The NUT interface parameters shall offer a predictable scalability mechanism.
REQ-7-08-01-22	A UICC supporting the NUT interface shall be able to be activated under class C operating conditions/supply voltage until adequate operating conditions are negotiated between the UICC and the terminal if needed.

4.8.3.2 Backward compatibility requirements

Identifier	Requirement
REQ-7-08-02-01	The New UICC-Terminal interface shall be backward compatible with the existing interfaces. It shall be possible to use a new interface-based UICC with a pre-Release 7 terminal according to pre-Release 7 specifications.
REQ-7-08-02-02	For backward compatibility reasons and in order to preserve the handset's battery time, the UICC shall keep its power consumption within the range defined in TS 102 221 [1] Release 6 unless the New UICC-Terminal interface is activated.
REQ-7-08-02-03	The assignment and use of currently non-specified contacts in SCP specifications (C4, C6, C8) is not to cause unpredicted operation of the UICC when inserted into an existing terminal, the fact that some contacts are left unconnected or connected to a specific level shall not cause operational problems.

4.8.4 Interaction with existing features (informative)

(none).

4.9 UICC based application acting as a server

4.9.1 Abstract (informative)

A connectivity solution to the hosting device is required to enable a client in the terminal to retrieve data from a web server running in the UICC.

4.9.2 Background (informative)

A Smart Card Web Server can be used to transfer static pages to be displayed to the user.

A Smart Card Web Server can be used to dynamically generate some pages to be displayed to the user.

Content stored in the Smart Card Web Server can be updated by a client in the terminal.

4.9.3 Requirements

Identifier	Requirement
REQ-7-09-01-01	A connectivity solution shall be provided to enable a client in the terminal request data from a web server in the UICC.
REQ-7-09-01-02	This connectivity solution shall provide a general transport mechanism for HTTP and HTTPS.
REQ-7-09-01-03	This connectivity solution shall not reduce the security of other UICC applications (e.g. SIM, USIM, ISIM…).
REQ-7-09-01-04	This connectivity solution shall not prevent Card application toolkit sessions from operating simultaneously with the Smart Card Web Server sessions.
REQ-7-09-01-05	This connectivity solution shall be able to handle multiple simultaneous sessions to the UICC.
REQ-7-09-01-06	This connectivity solution shall allow to transport HTTP requests and responses which are longer than 255 bytes.

4.9.4 Interaction with existing features (informative)

(none).

4.10 API for applications registered to a Smart Card Web Server

4.10.1 Abstract (informative)

A Web Server on the Smart Card (SCWS) receives requests from a client and provides HTML content as a response. This content can either be static or dynamic.

Dynamic content can be created by the web server itself or by special applications in the Smart Card (servlet-like applications). In order to extend the functionality of the SCWS it is necessary to load these special applications (which create dynamic content on behalf of the web server) to the Smart Card after issuance.

4.10.2 Background (informative)

A service provider wants to use the Smart Card of a user as an authentication device. He develops an application, which computes the response to a challenge using a key in the application and asks his operator to install it in the Smart Card of the user.

The user browses a page of the service provider and receives a page with a link to the Smart Card Web Server. When the user clicks on this link, a request is issued to the SCWS, where the URL contains the name of the application and the challenge as a parameter.

The Smart Card invokes the application of the service provider, which computes the response to the challenge and returns a page to the web server, which is returned to the browser and displayed. This returned page contains a link to the service provider, which includes the response to the challenge in the URL. When the user clicks on this link, the response is sent within the URL to the service provider.

4.10.2.1 Registration of an application to the SCWS

When the operator installs the application of the service provider it registers under a given name to the Smart Card Web Server.

4.10.2.2 Data exchange between SCWS and application

When the application is invoked by the SCWS the challenge is passed to the application.

After the dynamic content is created by the application, it is passed back to the SCWS. The SCWS returns this response page as the result of the request.

4.10.3 Requirements

Identifier	Requirement
REQ-7-10-01-01	There shall be a mechanism to register and de-register an application to a Smart Card Web Server.
REQ-7-10-01-02	It shall be possible to perform registration/de-registration of an application separately from its installation/un-installation (not necessarily excluding the possibility for a combined register/install or de-register/uninstall mechanism).
REQ-7-10-01-03	There shall be a secure mechanism to allow a Smart Card Web Server to invoke a registered application.
REQ-7-10-01-04	There shall be a secure mechanism to allow a Smart Card Web Server to pass parameters to a registered application.
REQ-7-10-01-05	There shall be a secure mechanism to allow a registered application to return data to a Smart Card Web Server.
REQ-7-10-01-06	These mechanisms shall be available in form of an API for Java Card Applets.

4.10.4 Interaction with existing features (informative)

(none).

4.11 Specific UICC environmental conditions

4.11.1 Abstract (informative)

The mobile telecommunication industry is extending its business beyond the existing communication services offered by normal handsets. For example, automotive service, machine-to-machine communication and RFID are possible services and estimated to become a large market in the near future. For such new business areas, various types of mobile terminals are required to be developed for each environment and those terminals are likely to be used at times in a harsh environment compared to the normal handset. For a harsh environment such as in cars, machines and outdoors, electrical equipment is generally required to have much reliability to conform to its usage environment, which is also applicable to the UICC.

The use cases and requirements for specific UICC environmental conditions listed below are optional features of the UICC.

4.11.2 Background (informative)

This clause lists use cases relevant to specific UICC environmental conditions.

4.11.2.1 Use case - Automotive service

Mobile communication integration with automotive service will be expected to become a large market in the future. A mobile terminal embedded in the car navigation system can offer various services such as interactive information (traffic and shop, etc) services, remote car diagnosis services, automatic emergency reporting and remote navigation using video call.

4.11.2.2 Use case - Remote monitoring camera

Remote images can be monitored in real-time by setting a camera with a mobile terminal at a certain location. Examples of these types of demands are monitoring of children in the nursery school, pets left at home, monitoring of mountains, rivers and coastal regions for disasters such as typhoon, flood, volcano and earthquake. In some cases, these terminals are placed outdoor and exposed to the open air conditions.

4.11.2.3 Use case - Remote stock monitoring for vending machines

The mobile terminal is embedded in a vending machine, which can communicate with the monitoring server. When stocks become low, the machine automatically conveys this to the server, so that the staff can replenish the product in the vending machine. The terminal has to be able to work in outdoor conditions.

4.11.2.4 Use case - Online electronic advertising board

Advertising contents can be automatically managed and updated by a delivery server using a mobile communication network. The electronic board can be set anywhere, e.g. on top of the buildings, on the street or in the station.

4.11.3 Considerations (informative)

The UICC is the key component in the mobile terminal. If it does not operate due to temperature or ambient harsh environment, mobile communication service itself can not be offered. Therefore the reliability on environmental conditions should be taken into consideration.

4.11.4 Requirements

4.11.4.1 Requirement 1: Temperature range

Identifier	Requirement
REQ-7-11-01-01	The temperature range for specific environmental conditions shall be classified according to its range.
REQ-7-11-01-02	The temperature class A shall be defined as the temperature range for card operation specified in TS 102 221 [1].
REQ-7-11-01-03	The temperature class B for full UICC operational use and storage shall be between -40°C and +85°C.
REQ-7-11-01-04	The temperature class C for full UICC operational use and storage shall be between -40°C and +105°C.
REQ-7-11-01-05	The temperature class D for full UICC operational use and storage shall be between -40°C and +125°C.
REQ-7-11-01-06	Temperature classes other than class A shall be optional, allowing manufacturers to choose the class according to the application.
REQ-7-11-01-07	It shall be possible for the UICC to indicate its temperature class to the terminal. If there is no indication of temperature class, that shall be interpreted as temperature class A.

4.11.4.2 Requirement 2: Humidity

Identifier	Requirement
REQ-7-11-02-01	Optionally it should be possible to qualify the operation of the UICC in an environment with high humidity.
REQ-7-11-02-02	The qualification shall be for operational usage and storage of the UICC at 90 % to 95 % Relative humidity throughout the temperature range up to +85°C.

4.11.5 Interaction with existing features (informative)

(none).

4.12 Introduction of high density memory technology in UICC

4.12.1 Abstract (informative)

The addition of a high-speed interface to the card will enable proper user-experience regarding any service dealing with a large amount of data stored on the card. Therefore, such large memory cards will appear and they will need to be manufactured using available memory technology.

There is a strong expectation from the handset manufacturers to use voltage class "C" in the future.

Today, these memory technologies do not allow for compliance with existing UICC power constraints (both current and class "C" voltage).

In order to be able to use such cards, additional electrical conditions may be needed.

4.12.2 Background (informative)

4.12.2.1 Use case - Enhanced UICC features

The card provides the subscriber with a larger amount of memory, allowing for enhanced UICC features:

- Addition of new fields in the phonebook.
- Larger amount of phonebook entries.
- Storage of large files such as multimedia files, messages.
- Other personal information.

4.12.3 Requirements

Identifier	Requirement
REQ-7-12-01-01	A mechanism shall be defined or adapted if necessary so that the UICC is able to indicate its electrical needs (current and voltage) to the terminal.
REQ-7-12-01-02	A mechanism shall be defined or adapted if necessary so that the UICC is informed of the capability of the terminal to support its electrical needs (current and voltage).
REQ-7-12-01-03	The mechanisms defined in REQ-7-12-01-01 and REQ-7-12-01-02 shall be included in the initialization of the UICC.
REQ-7-12-01-04	For backward compatibility, the UICC shall be compliant with pre-Rel-7 features, and in particular with the electrical characteristics, if the mechanism defined in REQ-7-12-01-02 is not supported by the terminal or if the terminal cannot provide the voltage and/or current values required by the UICC. In this last case the UICC functionality based on high density memory shall not be available if it exceeds pre-Rel-7 (TS 102 221 [1] R6) voltage and current requirement.
REQ-7-12-01-05	In case a new voltage class is introduced the system impact shall be analysed and the impact kept to a minimum.

4.12.4 Interaction with existing features (informative)

(none).

4.13 Power supply indication mechanism

4.13.1 Abstract (informative)

Currently TS 102 221 [1] specifies that a UICC application may specify its own maximum power consumption values up to a maximum value as specified in the table 6.3. In the same clause it also states that a terminal shall be able to supply at least the values of power consumption indicated in the table 6.4. It means that there are terminals in the field which supply the power consumption to the UICC in a range from the minimum (see TS 102 221 [1], table 6.4) up to the maximum (see TS 102 221 [1], table 6.3). If the terminal is not able to supply the power consumption requested by the UICC then the application may not work properly. In order to avoid this problem it is mandatory that the UICC application requires a value of power consumption which the mobile is able to supply. The problem is that there is no mechanism which informs the UICC application about the maximum value of power consumption the terminal is able to supply.

In the case where the terminal is not able to supply the value of power consumption requested by the UICC application it is useful if the UICC application can reduce its power consumption requirements by deactivating power consuming parts of its application or by lowering its performance to stay operational. Therefore the UICC application need to be informed before its selection about the available power supply of the terminal to react accordingly.

4.13.2 Background (informative)

4.13.2.1 Use case - generic situation

A typical situation will be that on the UICC several applications (e.g. USIM, ISIM, WIM, toolkit applications, etc.) are installed. If one or more applications need a value of power consumption higher than the minimum one specified in TS 102 221 [1], table 6.4 (but still within the range defined in TS 102 221 [1], table 6.3), then the application has to indicate in the response of a SELECT or STATUS command the power consumption value needed. If the terminal is not capable of delivering this power supply then a mechanism to inform the UICC is missing and therefore the application cannot work properly and no mobile communication is possible.

4.13.2.2 Use case - USIM application with toolkit applications

The most important application on an UICC within a 3G mobile phone is the USIM application necessary for mobile communication. Even if under normal circumstances this application requires a value of power consumption inside the range of TS 102 221 [1], table 6.4, typically additional toolkit applications associated with the USIM application are installed to provide additional services to the mobile phone user. Such toolkit applications could require an increase of the overall power consumption to a value higher than the guaranteed minimum supplied by the terminal (e.g. application using USSM for asymmetric cryptography). As the toolkit applications are not directly selected by the terminal, the USIM application would, in this case, have to request a higher power consumption during its selection.

In a situation where the USIM would require a power consumption higher than the maximum value indicated by the terminal, the USIM application shall remain operational and has to provide basic network functionality.

If the application running on the UICC can identify the maximum possible power supply delivered by the terminal then it may adjust its maximum power consumption inside of terminals with limited power supply by one of the following actions to guarantee its operation:

a) It deactivates application parts consuming more power (e.g. toolkit application).

b) It reduces its performance of power consuming parts (e.g. by dividing the CPU clock).

4.13.3 Requirements

4.13.3.1 General Requirements

Identifier	Requirement
REQ-7-13-01-01	A mechanism shall be introduced that informs the UICC about the maximum power consumption supported by the terminal.
REQ-7-13-01-02	The power consumption indication mechanism shall be mandatory for a Release 7 terminal (or higher) able to provide more than the minimum power consumption.
REQ-7-13-01-03	The power consumption indication mechanism shall be optional for Release 7 terminal (or higher) providing only the minimum power consumption (see note).
REQ-7-13-01-04	In the case where the power consumption indication mechanism is supported by the terminal, the UICC shall be informed about the maximum power consumption before the first application selection command.
NOTE: It is recommended that Release 7 terminal with minimum power supply offer the power consumption indication mechanism.	

4.13.3.2 Backward compatibility requirements

Identifier	Requirement
REQ-7-13-02-01	The power consumption indication shall not generate backward compatibility issues with pre-release 7 UICCs and terminals.
REQ-7-13-02-02	A UICC capable of receiving this indication shall stay with the minimum power consumption if no indication is given by the terminal.

4.13.4 Interaction with existing features (informative)

(none).

4.14 Internet Connectivity up to UICC applications

4.14.1 Abstract (informative)

There is a need to define a new way to connect UICC applications to other Internet applications.

If this can be achieved in multiple technical ways, it is clear that there is a need to rationalize the way the UICC will exchange data with the external world and ease the integration into terminals by avoiding the need to translate in a terminal middleware from one protocol to another.

4.14.2 Use Cases (informative)

The operators want to use the UICC with the following services, e.g.:

- Access (for modification or consultation) to the end user personal data stored in the UICC.
- Access from a personal computer using a local link.
- Access from a remote entity to an authentication application running on the card.

4.14.2.1 Use Case - Card OTA management

Remote management of the UICC by operators is complex and has limitations due to today's connection method (SMS or CAT-TP). UICCs with large amounts of memory are hitting the market. As an example, a basic phone personalization file containing menus, icons, screen savers, background pictures may be 1 Megabyte. A full update of this kind of file could be performed with a fast and efficient protocol between the remote management server and the UICC. Widely used internet protocols for large file transfer or synchronization may be used up to the card, using existing web infrastructures and software.

The card may act as server, in which case the remote management system will take the initiative to establish the connection to the card. Establishing such a remote connection to the card is the most efficient way to enable instantaneous updates.

If the card acts as a client, the remote management system will have to trigger an update from the card or have to rely on a periodic inquiry from the card, which leads to inefficient bandwidth usage and unpredictable update delays. SMS or WAP push may be used to trigger synchronization.

4.14.2.2 Use Case - User local access from the terminal to a card server

UICC contains a web server to which an internet connection can be established with a browser in the terminal. This allows to address content management on the UICC without installing specific drivers on the host terminals.

Content is both stored and dynamically generated on the smart card and then transferred to the terminal: The aim is to re-use standard graphic features of handsets to allow mobile operators to offer attractive and secure services. The operations of insert, delete or modify shall be performed on user data such as phonebook entries so that customer's experience is not affected.

It will be possible to offer a new range of services, such as the possibility to access UICC files (e.g. the phonebook, the MP3 and videos list) through a web server via a web interface in order to consult or modify them. Some examples are listed below.

a) Dick wants to purchase a gift for his father's birthday while he is in public transportation coming back from work. While browsing the internet on his mobile terminal in search for a gift, he finds a book that is well suited to his father's interests. Dick just has to click on the "payment" icon. His UICC transparently initiates a strong mutual authentication with the payment server securing the transaction. The UICC requests Dick to enter his PIN code to perform the authentication and secure the purchase process with the back-end server. While Dick is browsing, a small UICC icon appears on his browser (like the padlock on PC browsers) to let him know that the transaction is secured by the UICC. Nothing has been stored on the handset during the transaction. Dick can lend his handset to a friend without any worry**.**

b) Jack has been offered a new handset. As this handset was not part of an operator's bundle, no setup was performed in the factory for Jack's network operator. Jack inserts his UICC and displays the help topics from his UICC with the handset's browser. A nice animated tutorial tells Jack about the way to input the parameters that have not already been synchronized from the UICC to the handset. Jack can now take full advantage of his handset on his operator's network.

c) Mike's new UICC comes out with some advertising web pages (e.g. the operator agreed selling advertising space to other companies) preloaded, that may also be accessed offline. Since it is appealing Mike is induced to browse the web pages available on the UICC. If he finds/needs some service/information related to the advertising service he asks for it and the connection is established at this stage.

4.14.2.3 Use Case - Remote access to an identity server in the card

The UICC is the primary carrier for digital user identity. A connected UICC will be used as an identity provider not only on the wireless network but on the wide internet allowing operators to offer new applications and business models. There is a need for the UICC to enable to authenticate the remote entity.

Relevant use cases are addressed separately.

4.14.2.4 Use Case - User access from a locally connected device to a card service

Access to the UICC from a PC connected to the wireless terminal will expand the use cases of the UICC up to the PC and the IT world. Support for standard protocols such as HTTP or SyncML will allow an easy management of SIM content from a user's PC without deployment of phone vendor specific applications. The UICC must be able to authenticate the attached PC and to be able to filter requests based on connection identifiers.

Relevant use cases are addressed separately.

4.14.3 Requirements

Identifier	Requirement
REQ-7-14-01-01	It shall be possible to establish an IP based connection to the UICC from a local entity.
REQ-7-14-01-02	It shall be possible to establish an IP based connection to the UICC from a remote entity.
REQ-7-17-01-03	It shall be possible to use an end-to end Internet security protocol with the UICC (e.g. IPSEC or TLS).
REQ-7-14-01-04	UICC applications shall be able to act in client mode and in server mode.
REQ-7-14-01-05	Establishing a connection with the UICC should preferably not require any changes to existing internet infrastructures and applications running on remote entities that want to establish connections with the UICC.

4.14.4 Interaction with existing features (informative)

(none).

4.15 Contactless UICC services

4.15.1 Abstract (informative)

Contactless card technology is gaining importance on the market. Recent developments also allow mobile terminals and the UICC contained in the terminals to take part in contactless communication.

This clause lists the use cases and resulting requirements for a contactless enabled UICC, where the latter acts as a trusted device in the contactless environment.

4.15.2 Background (informative)

This clause lists use cases relevant for Contactless UICC Services.

Implementing contactless services in the mobile and the UICC enhances the user experience, for example by adding MMI capabilities, and it enables remote administration of these services (application download, personalization, administration, etc.).

4.15.2.1 Use case - Access

4.15.2.1.1 System aspects of use case

Contactless Access Systems exist today. These are based on a wide range of contactless technologies; a significant number of which are based on ISO/IEC 14443 [8] types A and B. There are few standards in this area, these systems vary by supplier and may be customized for specific customers.

The Access Systems can be categorized into 2 groups:

a) Access device tolerated unavailability - These systems have secure entry and/or exit using a contactless device or via an alternative process (e.g. The user is tolerant to the contactless device being unavailable).

b) Access device mandated availability - These systems have secure entry and/or exit using a contactless device only (e.g. The user is not tolerant to the contactless device being unavailable).

4.15.2.1.2 UICC role in use case

The UICC based device has the ability to operate as three types of device within this use case:

Card Emulation Cases:

a) Access Request Device - Access device tolerated unavailability. This device is carried by the user and is used by the user to request access to the areas that the user is allowed in. In this instance the device operates in Contactless card emulation mode and it is expected that any required user interface will be part of the reader device. There are many different access schemes that the UICC needs to be compatible with to deliver this use case, so it is important that the Access Request Device is highly customizable. To aid this customization, information about the air interface used and the terminal capabilities need to be available to the UICC application environment. The user expects the application to inform them of any issues when it is a new terminal configuration.

   In this use case, it is acceptable to the user to use alternative access methods if the Terminal - UICC combination are not in "normal operation" mode for the terminal. This use case does not mandate operation under special operating conditions (such as no terminal power).

b) Access Request Device - Access device mandated availability. This device is carried by the user and is used by the user to request access to the areas that the user is allowed in. In this instance the device operates in Contactless card emulation mode and it is expected that any required user interface will be part of the reader device. There are many different access schemes that the UICC needs to be compatible with to deliver this use case, so it is important that the Access Request Device is highly customizable. To aid this customization, information about the air interface used and the terminal capabilities need to be available to the UICC application environment. The user expects the application to inform them of any issues when it is a new terminal configuration.

   In this use case, the user requires the Terminal - UICC combination to have a comparable functionality and user experience whatever the power state of the host device (i.e. mobile handset containing the UICC).

Reader Emulation Case:

c) Access Manager Device - This device is used by a manager of the access system to manage the system and the devices within it. There are typically fewer instances of the Access Manager Device in a system compared to the Access Request Device. In this instance the Access Manager Device operates in Contactless card reader mode or "peer to peer" mode and it is expected that any required user interface will be part of the Terminal - ICC device. There are many different access schemes that the UICC need to be compatible with to deliver this use case and many different types of "system manager", so it is important that the Access Manager Device is highly customizable. To aid this customization, information about the air interface used and the terminal capabilities need to be available to the UICC application environment.

As the terminal user interface is being used, the user only expects the Access Manager Device to operate under "normal operating conditions" (e.g. The user does not expect operation when the terminal power is unavailable).

The user expects that the Access Manager Device can communicate with all Access Grant Devices without the need for additional power connection.

UICC applications written to implement the Access Manager Device may require interaction with other parts of the access infrastructure. Therefore this use case expects that the Contactless aspect of the Terminal - UICC device and the Terminal - UICC devices air interfaces shall be available simultaneously.

For all access use cases, the UICC contains the application and data required for continuous or temporary access to a secured area like company buildings. The data and applications may be loaded, pre-configured or revoked using an off-line device or provisioned remotely through the telecom network.

4.15.2.2 Use case - tickets

The Ticket Use case can be split into two types of Contactless ticketing with different properties:

- Transport ticketing:
  Many public transport schemes now use contactless readers and cards for access to and use of, the transport system. These are based on a wide range of standards (ISO/IEC 14443-A, ISO/IEC 14443-B [8], Philips MiFare, Felica, etc.).

- Event ticketing:
  There is growing number of venues using contactless ticketing for events (e.g. Sporting venues and exhibition venues). There are no clear standards in this area.

Both ticketing schemes have two potentially conflicting priorities to be accounted for in the UICC, which are detailed below as two corresponding scenarios:

- Speed of throughput - getting people through a gate as fast as possible, typically using low cost tickets.

- Fraud protection, usually associated with medium or high priced tickets - Preventing loss of money due all types of fraud, particularly identity fraud. (e.g. someone "borrowing" somebody else's season ticket). In this scenario tickets can be either:

  - stored in the ticketing infrastructure and the identity of the user in the UICC, it should be kept in mind that there is typically a high volume of tickets in a ticketing system;

  - stored in the UICC.

4.15.2.2.1 System aspects of throughput ticketing scenario

Tickets can be purchased and stored securely on the UICC. A single purchase can result in multiple tickets. Tickets are typically of low value. The systems associated with this type of scenario do not typically allow tickets to be exchanged between cards.

UICC based Throughput Ticketing offers both the transport systems and the mass event systems (e.g. large attendance sports events) cheaper way of implementing a contactless ticketing system (fewer issued contactless cards and potentially less retailer commissions) and the user a more convenient way to carry a contactless ticket and more flexible purchase experience.

4.15.2.2.2 System aspects of high priced ticketing scenario

Tickets can be purchased and stored securely on the UICC. In view of the (medium to) high value of the tickets, The UICC based implementation must provide adequate protection mechanisms (e.g. to make it useless to steal someone's phone to enter an event). The UICC based ticket may need the system to authenticate itself before each ticket can be viewed, used or deleted. The ability to view and legitimately and securely transfer tickets is potentially an added benefit for tickets stored in a UICC (as compared with a "classical" Contactless card).

For this type of scenario, UICC based ticketing offers to the issuers of these tickets a cheaper way of implementing a contactless ticketing systems (a one off contactless smartcard may be too expensive for a single event, or for every individual high priced transport ticket/pass type) thus enabling the advantages of smartcard over paper tickets. For the user, UICC based ticketing should offer a more convenient and secure way to carry ticket and more flexible purchase experience.

4.15.2.2.3 UICC role in use case

The UICC based device has the ability to operate as three types of device within this use case:

Card Emulation Cases:

a) Throughput ticket device. This device is carried by the user and is used by the user to access an event or use transport. The user interface and mechanisms for this ticket are focused on speed of access. In this instance the device operates in Contactless card emulation mode and it is expected that any required user interface will be part of the reader device. There are many different existing ticketing schemes that the UICC needs to be compatible with to deliver this use case, so it is important that the Access Request Device is highly customizable. To aid this customization, information about the air interface used and the terminal capabilities need to be available to the UICC application environment. The user expects the application to inform them of any issues when it is a new terminal configuration.

   The UICC is used to store and manage tickets securely in this use case, so there is a need for secure storage of potentially a large number of tickets and authentication mechanisms to validate reader requests.

   In this use case, it is not acceptable to the user to use alternative access methods if the Terminal - UICC combination are not in "normal operation" mode for the terminal. This use case requires operation under special operating conditions (such as no terminal power).

b) High value ticket device. This device is carried by the user and is used by the user to access an event or use transport. The user interface and mechanisms for this ticket are focused on protecting the ticket and the system from illegal activity. In this instance the device operates in Contactless card emulation mode and it is expected that the terminal user interface my be used to validate the identity of the user using the ticket or to manage/view the ticket. There are many different access schemes that the UICC needs to be compatible with to deliver this use case, so it is important that the Access Request Device is highly customizable. To aid this customization, information about the air interface used and the terminal capabilities need to be available to the UICC application environment. The user expects the application to inform them of any issues when it is a new terminal configuration.

   The UICC is used to store and manage tickets securely in this use case, so there is a need for secure storage of potentially a large number of tickets and authentication mechanisms to validate reader requests and the user. Additionally, mechanisms to allow the transfer of tickets from one user to another are needed along with a prevention mechanism to stop this transfer if the system forbids it.

   In this use case, the user requires the Terminal - UICC combination to have a comparable functionality and user experience whatever the power state of the host device (i.e. mobile handset containing the UICC) unless additional security is being offered.

Reader Emulation Case:

c) Ticket Management Device - This device is used by an inspector verify a ticket and the identity of its holder (where applicable). There are typically much fewer instances of the Ticket Management Device in a system compared to the Throughput Ticket Device and High Value Ticket Device. In this instance the Ticket Management Device operates in Contactless card reader mode or "peer to peer" mode. It is expected that any required user interface will be part of the Terminal - UICC device and that the UICC will have the identity, authentication and validation mechanisms required. There are many different access schemes that the UICC need to be compatible with to deliver this use case and many different types of "system manager", so it is important that the Access Manager Device is highly customizable. To aid this customization, information about the air interface used and the terminal capabilities need to be available to the UICC application environment.

   As the terminal user interface is being used, the user only expects the Ticket Management Device to operate under "normal operating conditions" (e.g. The user does not expect operation when the terminal power is unavailable).

The user expects that the Ticket Management Device can communicate with all scheme Ticket Devices (both UICC based and non-UICC based) without the need for additional power connection.

UICC applications written to implement the Ticket Management Device may require interaction with other parts of the access infrastructure. Therefore this use case expects that the Contactless aspect of the Terminal-UICC device and the Terminal - UICC devices air interfaces shall be available simultaneously.

For all ticket use cases, the UICC contains the application and ticket/identity information. The data and applications may be loaded, pre-configured or revoked using an off-line device or provisioned remotely through the telecom network.

4.15.2.3 Use case - digital rights

4.15.2.3.1 System aspects of contactless digital rights

DRM systems can allow the content to be stored separately from the rights. The UICC is an ideal secure environment to allow a user to carry their digital rights. To use these rights, users need to be able to communicate with content players equipped with Contactless DRM. Additionally, users need the ability to legally transfer (gift) these rights to other users (where allowed). An easy way to facilitate the transfer/exchange of rights is via a contactless interface.

4.15.2.3.2 UICC role in use case

A mobile handset with UICC based Contactless provision has the ability to operate as two types of device within this use case:

Card emulation case:

a) DRM Store device. This device is carried by the user and is placed within range of a supporting content player to allow content to be played that the user has paid for. In this instance the device operates in Contactless card emulation mode and but it is expected that any required user interface will be part of the UICC - Terminal device.

   The UICC is used to store and manage DRM rights securely in this use case, so there is a need for secure storage of potentially a large number of rights and authentication mechanisms to validate reader requests.

   In this use case, it is acceptable to the user to use alternative access methods if the Terminal - UICC combination are not in "normal operation" mode for the terminal. This use case does not require operation under special operating conditions (such as no terminal power).

   Existing secure OTA mechanisms together with UICC based applications may be used to process the payment and download digital rights onto the UICC.

b) DRM Transfer device - This device is used by a user to transfer DRM rights to another user (where allowed). In this instance the DRM Transfer Device operates in Contactless card reader mode or "peer to peer" mode. It is expected that any required user interface will be part of the Terminal - UICC device and that the UICC will have the identity, authentication and validation mechanisms required.

   As the terminal user interface is being used, the user only expects the Ticket Management Device to operate under "normal operating conditions" (e.g. The user does not expect operation when the terminal power is unavailable).

   UICC applications written to implement the Ticket Management Device may require interaction with other parts of the access infrastructure. Therefore this use case expects that the Contactless aspect of the Terminal - UICC device and the Terminal - UICC devices air interfaces shall be available simultaneously.

4.15.2.4 Use case - payment application

Card emulation mode:

- The UICC contains the application and data required for contactless payment application.

  The terminal containing the UICC in this scenario has two possibilities:

  - It can act like a contactless payment application to pay at a contactless-enabled Point Of Sale (POS).

- It can act as a proxy for a payment account in which a third party performs a debit transaction, passing the payment to the merchant.

Existing secure OTA mechanisms together with UICC based applications may be used to load, modify or update payment application information on the UICC, depending on permissions.

Reader emulation mode:

- The UICC may not contain the application and data required for a contactless payment application use, but rather the merchant credentials. The actual data and application for a payment application is contained in another contactless card external to the terminal. In this case, the mobile terminal may operate in reader mode and be used as a remote PIN pad when the contactless payment card is close to the terminal.

4.15.2.5 Use case - loyalty application

Card emulation mode:

- The UICC contains the application and data required for loyalty application.
- The terminal containing the UICC can act like a contactless loyalty application at a contactless-enabled Point Of Sale (POS).
- Existing secure OTA mechanisms together with UICC based applications may be used to load, modify or update loyalty application information on the UICC, depending on permissions.
- The service would have the same basic loyalty functionality whatever the UICC powering mode.

Reader emulation mode:

- The UICC may not contain the application and data required for a loyalty application use, but rather the merchant credentials. The actual data and application for a loyalty application is contained in another contactless card external to the terminal. In this case, the mobile terminal may operate in reader mode and be used as a remote PIN pad when the contactless loyalty card is close to the terminal.

4.15.2.6 Use case - health care application

Card emulation mode:

- The UICC contains the application and data required for a health care application.
- The terminal containing this UICC is used to store medical and health insurance data. These essential data would be available whatever the powering mode of the UICC. The use of the contactless interface may occur in places where strict security or safety rules apply (e.g. regulations requiring a terminal to be switched off in a hospital).

Reader emulation mode:

- Moreover, the handset device, through the contactless interface, may transfer specific credentials and data from medical equipment to the UICC, allowing patients to keep this data up to date and transfer data between doctors or hospitals. This would only work if the UICC is battery powered. Of course, this data may be read, written or updated according to security rules.

4.15.3 Requirements

4.15.3.1 Physical interface requirements

Identifier	Requirements
REQ-7-15-01-01	The CLFI being present on the UICC shall not conflict with the possibility of having a high-speed solution.
REQ-7-15-01-02	The CLFI being present on the UICC shall not conflict with the possibility of having a TS 102 221 [1] solution.
REQ-7-15-01-03	The solution shall be compatible with the existing form factors as defined in TS 102 221 [1].
REQ-7-15-01-04	The CLFI shall be compatible with the battery powered mode.
REQ-7-15-01-05	The CLFI shall be compatible with the not battery powered mode in card emulation mode.
REQ-7-15-01-06	There shall be a means for the UICC to detect the nature of its power source.
REQ-7-15-01-07	The CLFI shall allow for optimized power management.

4.15.3.2 Multi-protocol concurrent operation requirements

Identifier	Requirements
REQ-7-15-02-01	The UICC shall be capable of managing concurrently communication using both legacy protocol defined in TS 102 221 [1] and the CLFIP.
REQ-7-15-02-02	The UICC shall be capable of managing concurrently communication using both HSP and the CLFIP.

4.15.3.3 Contactless communication modes requirements

Identifier	Requirements
REQ-7-15-03-01	The CLFI and the CLFIP shall allow the system consisting of the UICC and the terminal to behave as a contactless card.
REQ-7-15-03-02	The CLFI and the CLFIP shall allow the system consisting of the UICC and the terminal to behave as a contactless reader.
REQ-7-15-03-03	The CLFI and the CLFIP shall allow the system consisting of the UICC and the terminal to support "peer to peer" mode as specified in ISO/IEC 18092 [9].

4.15.3.4 Compatibility with existing contactless systems requirements

Identifier	Requirements
REQ-7-15-04-01	The CLFIP shall allow the transport of data of communication protocols compatible with existing infrastructures based on the following standards: • ISO/IEC 14443 [8] -A and -B. • ISO/IEC 18092 [9].
REQ-7-15-04-02	The CLFIP shall be flexible enough to transport data for other RF protocols than those listed in REQ-7-Y-04-01. • Example: ISO/IEC 15693 [10].
REQ-7-15-04-03	The system consisting of the UICC and the CLF shall consider multi-cards and multi-applications environments.

4.15.3.5 Parameters to be transported by the CLFIP requirements

Identifier	Requirements
REQ-7-15-05-01	The CLFIP shall be capable of providing the UICC with RF field state: • Example: presence of field.
REQ-7-15-05-02	The CLFIP shall provide a parameter negotiation mechanism: • Example: speed, protocol type, automatic interface detection, power modes supported, RF mode capabilities.

4.15.3.6 Application integration requirements

Identifier	Requirements
REQ-7-15-06-01	It shall be possible to activate and deactivate the accessibility and visibility of the contactless based applications on the UICC.

4.15.3.7 Terminal and user interaction requirements

Identifier	Requirements
REQ-7-15-07-01	In battery powered mode, it shall be possible for the CLFIP to signal that the UICC request to start a proactive session at any time, or that a user interaction is required.
REQ-7-15-07-02	The CLFIP shall allow the transport of a request for CLF allocation.

4.14.3.8 Interoperability requirements

Identifier	Requirements
REQ-7-15-08-01	Interoperability between the UICC and the CLF shall be guaranteed.
REQ-7-15-08-02	If the card reader mode is using the CLFIP, the same protocol stack shall be used for both card emulation and reader modes if possible (with the exception of mode-specific commands).

4.15.4 Interaction with existing features (informative)

The dedicated hardware link for the CLFI has direct impact on the current discussion for a high speed interface between the terminal and the UICC, because there is only a limited number of currently unused contacts on the UICC.

Annex A (informative): Requirement numbering scheme

This annex summarizes the decision made at ETSI SCP #26 on how to standardize requirements from Release 8 onwards.

In this scheme Release 8 of the present document will contain all the new requirements starting with Release 7.

NOTE: The requirements numbering scheme already includes an indication of the release for which each requirement is introduced.

The numbering of requirements will not be altered if a requirement is made void. When additional requirements are added to an existing set of requirements the "last digit" of the new requirement will be consecutive from the existing requirement.

To clarify how this can be achieved and how different types of change should be presented, examples are given below.

EXAMPLE 1: A new requirement.

Identifier	Requirement
REQ-7-0X-0Y-01	The UICC shall ……
REQ-8-0X-0Y-02	The UICC shall not be ……

- A new feature will have its own new section.
- Additions to existing use cases or requirements will be added to the existing clause.

EXAMPLE 2: Modification of a Release 7 requirement for Release 8.

This example is when the original Release 7 requirement is unmodified at Release 7 but changed for Release 8.

Identifier	Requirement
REQ-7-04-05-02	The UICC shall ……
REQ-8-04-05-03	The UICC shall ……
REQ-7-04-05-04	The UICC shall ……

- The Release 7 requirement is replaced by the modified content and now becomes a Release 8 requirement.

EXAMPLE 3: Essential correction to a Release 7 requirement.

This example is when an earlier release of the present document is changed due to an essential correction.

Identifier	Requirement
REQ-7-04-05-03	The UICC shall ……
REQ-7-04-05-04	The UICC shall ……

- The later releases of the present document are changed to accurately reflect the changes of the earlier releases. (The changes in this example still show as being Release 7 requirements).

Annex B (informative): Change history

The table below indicates changes that have been incorporated into the present document since it was created by TC SCP.

Meeting	Plenary Tdoc	Old Version	CR	REV	CAT	SUBJECT	Resulting Version
SCP-22	SCP-050304	2.1.0					7.0.0
	SCP-050306	7.0.0	001		B	Requirement for Secure channel between the UICC and a terminal end point	7.1.0
SCP-23	SCP-050467	7.1.0	004		B	Introduction of a mechanism to perform authenticate command longer than 255 bytes	7.2.0
			006		B	Requirement for new CAT mechanisms to indicate the bearer connection status	
			007		B	Introduction of a New UICC-Terminal interface	
	SCP-050514		008		B	Power supply indication mechanism by the terminal	
	SCP-050515		002		B	Terminal network connectivity for a UICC based application acting as a server	
	SCP-050517		005		B	API for registration of applications to a Smart Card Web Server and for Data Exchange with a Smart Card Web Server	
	SCP-050526		003	2	B	Requirements for specific UICC environmental conditions	
	SCP-050530		009		B	Introduction of high density memory capability for UICC	
SCP-24	SCP-060031	7.2.0	010		D	Clean up of the abbreviations clause	7.3.0
SCP-25	SCP-060115	7.3.0	011		B	CR for UICC Internet connectivity	7.4.0
	SCP-060161		012	1	B	Requirement for Contactless UICC Services	
SCP-26	SCP-060263	7.4.0	013		C	Modification of the optional relative humidity requirement in the Specific UICC environmental conditions Requirement	7.5.0
	SCP-060293		014		C	Proposal to complete the secure channel requirements	
	SCP-060295		015		D	Recommended working procedure for requirements in Release 8 (onwards)	
SCP-27	SCP-060454	7.5.0	016		D	Clarification of secure channels interaction with logical channels	7.6.0

History

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