ETSI TS 126 150 V9.1.0 (2010-04)

Technical Specification

Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Syndicated Feed Reception (SFR) within 3GPP environments; Protocols and codecs (3GPP TS 26.150 version 9.1.0 Release 9)

Reference
RTS/TSGS-0426150v910

Keywords
GSM, LTE, UMTS

ETSI

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
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

Individual copies of the present document can be downloaded from:
http://www.etsi.org

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at
http://portal.etsi.org/tb/status/status.asp

If you find errors in the present document, please send your comment to one of the following services:
http://portal.etsi.org/chaircor/ETSI_support.asp

Copyright Notification

ETSI

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://webapp.etsi.org/IPR/home.asp).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

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

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Contents

Foreword

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

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

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

Syndicated feeds, using technologies such as Atom and Really Simple Syndication (RSS), are widely used on today's Internet for various scheduled pull applications such as podcast. There are a number of non-compatible proprietary extensions and a number of different RSS variants that may need to be installed and updated.

OMA DCD has defined Channel and Content Metadata and related mechanisms for content delivery (including RSS and ATOM feeds) using Content Metadata XML extensions independently of any bearers. As a consequence there are no specific optimizations for 3GPP services/bearers. OMA DCD specification allows embedding of OMA DCD XML namespace elements into RSS and Atom document (RSS and Atom feed "content packaging formats"). The OMA DCD Channel and Content Metadata are intended to offer different content delivery alternatives to receivers.

The Syndicated Feed Reception (SFR) specification intents to define the optimized reception for any existing syndicated feeds using 3GPP specific bearers. SFR re-uses OMA DCD procedures and metadata for client server transactions.

1   Scope

The present document defines a set of media codecs, formats and transport/application protocols to enable syndicated feed reception within the 3GPP system.

The present document includes information applicable to network operators, service providers and manufacturers.

2   References

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

-    References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

-    For a specific reference, subsequent revisions do not apply.

-    For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

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

[2]   3GPP TS 41.001: "GSM Specification set".

[3]   RSS Advisory Board: "Really Simple Syndication 2.0".

[4]   IETF RFC 4287: "The Atom Syndication Format".

[5]   Open Mobile Alliance:: "OMA Dynamic Content Delivery V1.0", June 2009.

[6]   3GPP TS 26.234: "Transparent end-to-end Packet-switched Streaming Service (PSS); Protocols and codecs".

[7]   3GPP TS 26.244: "Transparent end-to-end packet switched streaming service (PSS); 3GPP file format (3GP)".

[8]   3GPP TS 26.346: "Multimedia Broadcast/Multicast Service (MBMS); Protocols and codecs".

[9]   Open Mobile Alliance: "OMA Push V2.2", June 2009.

[10]   IETF RFC 4281: "The Codecs Parameter for Bucket Media Types", Gellens R., Singer D. and Frojdh P., November 2005.

[11]   Open Mobile Alliance: "User Agent Profile Version 2.0", February 2006.

3   Definitions and abbreviations

3.1   Definitions

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

Syndicated Feed: A document, formatted according to RSS, ATOM, DCD or other syndicated feed formats, which is frequently updated with new content updates.

Syndicated Feed Reader: The client, which receives and processes one or more syndicated feed formats.

Syndicated feed URI: A Uniform Resource Identifier, pointing to the document, which is formatted according to RSS, ATOM or other syndicated feed formats.

Syndicated Feed Provider: A content provider, which uses HTTP servers to provide syndicated feeds for download.

SFR enabled Feed Reader: A feed reader, which is able to use optimized receptions and/or optimized enclosure handling as defined in the specification.

SFR Server: Server, which offers methods for optimized reception of syndicated feeds for SFR enabled Feed Readers.

3.2 Abbreviations

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

GPRS   General Packet Radio Service
IP   Internet Protocol
DCD   Dynamic Content Delivery
MBMS   Multimedia Broadcast/Multicast Service
PSS   Packet Switch Streaming
RSS   Really Simple Syndication
SFR   Syndicated Feed Reception
UE   User Equipment
URI   Uniform Resource Identifier
URL   Uniform Resource Locator
XML   eXtensible Markup Language

4 System description

4.1 Functional overview

The following diagram (see Figure 1) illustrates the overall system for syndicated feed reception (SFR). The system is subdivided into an SFR enabled Feed Reader, a SFR server and Syndicated Feed Provider.

SFR enabled Feed Readers are clients, which provide all the functionality to parse, process and (opt.) present syndicated feeds. The SFR enabled Feed Reader can interact with any legacy syndicated feed server (e.g. RSS or Atom) using HTTP. Additionally, those clients are also able to optimize the syndicated feed reception and/or optimize the handling of enclosures as defined in this specification. SFR enabled Feed Readers may support one or more syndicated feed formats such as RSS or Atom. From an implementation/deployment perspective, the SFR enabled Feed Reader can be shared by multiple ATOM/RSS-based applications or could be incorporated as a part of such an application.

SFR enabled Feed Readers, which include "optimized reception" of feed updates and/or enclosures support interactions with SFR servers.

SFR servers offer the SFR enabled Feed Reader with functions to optimize the reception of feed updates, attached media and enclosures. SFR servers interact with one or more syndicated feed servers. The interaction protocols and procedures of SFR server with Syndicated feed servers are out of scope of this specification. The SFR server is a profiled OMA DCD server dedicated to optimize syndicated feed delivery.

Syndicated feed providers are legacy functions, which use HTTP to offer their syndicated feeds.
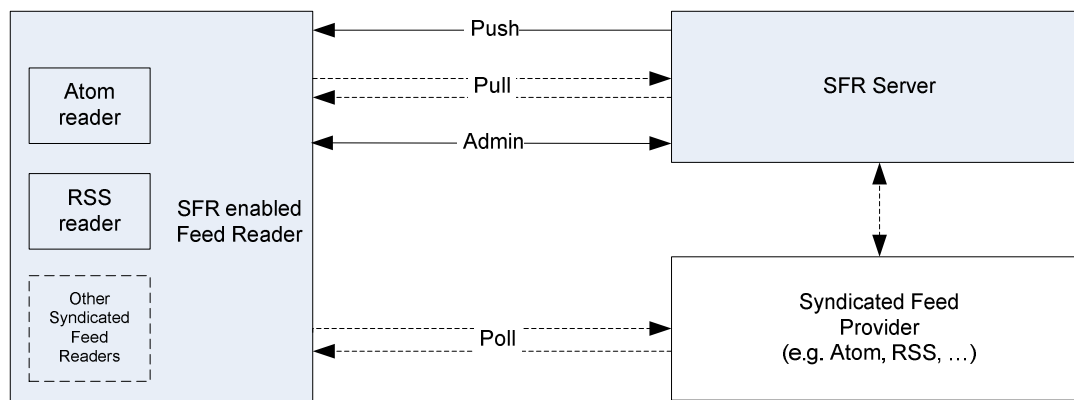
Figure 1: Overall SFR System

The SFR enabled Feed Reader interacts with the SFR server in order to get an optimized reception of syndicated feeds using the "Admin" reference point. The SFR server provides the SFR enabled Feed Reader with feed content using OMA Push or MBMS download delivery using the "Push" reference point. The "Pull" reference point is used, when the SFR enabled Feed Reader pull content from the SFR server. The "Admin", "Push" and "Pull" reference points are realized using a subset of the OMA DCD-3, DCD-2 and DCD-1 reference points [5].

The "Admin" transactions between SFR enabled Feed Reader and SFR server re-use a subset of the OMA DCD-3 transactions. The "Push" procedures between SFR server and SFR enabled Feed Reader re-use the OMA DCD-2 transactions (see section 5.6) and extend them to cover MBMS delivery via direct binding. The "Pull" Interface to the SFR Server corresponds to "DCD-1". The "Pull" procedures between SFR server and SFR enabled Feed Reader re-use a subset of OMA DCD-1 transactions (See section 5.6). The SFR enabled Feed Reader implements a profile of the DCD client and supports some of the DCD Enabled Client Application (DECA) functionalities.

The "Poll" interface to the syndicated feed provider (dashed line) corresponds to the stateless pull of legacy syndicated feed readers using HTTP. The "Poll" interface is not in scope of this specification.

The profiling of DCD [5] is defined in section 5.7.

4.2 Operations overview

Syndicated Feed Reader, which want to use "optimized reception" as defined in this specification must first activate and register with the SFR server to establish a session and then initiate the optimized reception of desired Syndicated Feeds (i.e. also called channels).

The SFR server provides the SFR enabled Feed Reader with a session-id as value of the Session-ID field in the activation response message that corresponds to a successful activation. This session-id is used during all later transactions. One or more syndicated feed reception channels may be added to or removed from the session at any point in time.

The SFR enabled Feed Reader use the Syndicated Feed URI (content address) of the syndicated feed to initiate the optimized reception. The SFR Server shall use the content address of the syndicated feed as value for the Channel-ID field. The Channel-ID value is used to identify specific syndicated feeds during later transactions. The Channel-ID value is present at any syndicated feed related transaction.

The session is persistent, even if the UE is switched-off. However, all or some channels can be suspended. The UE may suspend some or all syndicated feeds when roaming in foreign networks by sending a channel suspend request to the SFR server. The SFR enabled Feed Reader may also indicate as part of the channel subscription procedure that while roaming, content delivery shall automatically be suspended. In that case and upon detection that the UE is roaming, the SFR server shall suspend the delivery.

Each transaction on the "Admin", "Push" and "Pull" reference point is uniquely identified by a transaction-identifier, which is provided with the value of the Message-ID field. The value of the Message-ID field is composed of a unique transaction-id identifier followed by two numeric characters for message index within the transaction. The transaction identifier is the same for all related messages of a transaction within a session.

The SFR enabled Feed Reader can find e.g. the response to a certain request message based on the transaction-identifier. All messages belonging to the same transaction shall use the same transaction identifier value in the Message-ID field.

Example of message-id:

Transaction id= 01178AC32

Message id = 01178AC3200 for the first message, and message id = 01178AC3201 for the second message.

5 Protocols and procedures for optimized feed reception

5.1 Introduction

SFR is a profile of the DCD enabler [5] dedicated to ATOM, RSS content delivery and reception.

5.2 Syndicated Feed Discovery

Syndicated feed discovery refers to methods for the UE to obtain a list of available syndicated feeds with the intent to activate the reception of one or more syndicated feeds. As part of the optimized delivery of SFR, two methods for discovering a feed (internal discovery and external discovery) are specified.

The UE may discover syndicated feeds either through the SFR enabled Feed Reader, an external UE application (such as the browser) or an external device (such as a browser on a PC). Syndicated feeds can also be discovered through an external device (such as a PC browser) and the syndicated feed reader in the UE may be notified to initiate the reception. This external reception initiation is further defined in section 5.4.3.

Using an external UE application for syndicated feed discovery is defined in 5.2.1. The syndicated feed URI is given to the SFR enabled Feed Reader.

Using the SFR enabled Feed Reader for syndicated feed discovery is defined in section 5.2.2. The Syndicated Feed reader retrieves information about all available feeds from the SFR server.

5.2.1 Feed Discovery using an external UE application

The user discovers available syndicated feeds using an external UE application such as a UE browser. The external UE application makes the feed URI available to the SFR enabled feed reader.

The SFR enabled Feed Reader gets the feed URI as input and then needs to determine if it is an SFR optimized feed or if it is a regular ATOM/RSS feed. Details for the syndicated feed subscription are defined in section 5.4.

An example of feed discovery using an external UE application is described in clauses A.1 and A.4.

The feed can be available at a new SFR server with which the SFR enabled Feed Reader is not configured. In such case the SFR enabled feed reader needs to activate to the new SFR server in order to receive feeds. This activation process is specified in sections 5.3.2.2, 5.3.3 and 6.1.1 of [5].

5.2.2 Feed Discovery using the SFR enabled Feed Reader

The SFR enabled Feed Reader includes methods for feed discovery. The SFR enabled Feed Reader is already activated and registered to an existing SFR server. The syndicated feed reader receives a list of available syndicated feeds from the SFR server. An initial list, the Channel-Guide List, of syndicated feeds is received with the ApplicationRegistrationResponse message (see section 5.3).
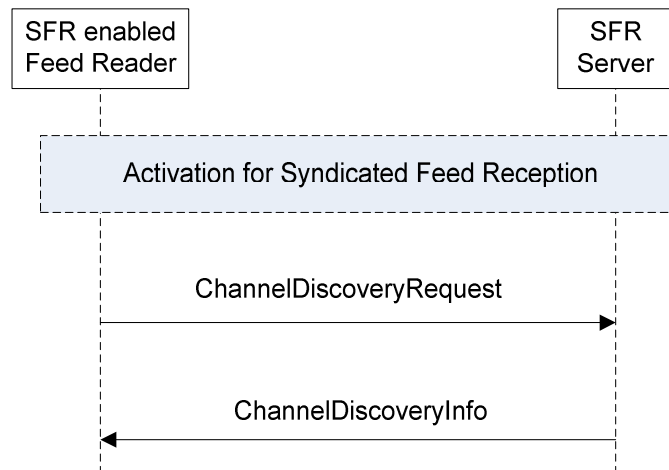
Figure 2: Channel Discovery

The SFR enabled Feed Reader uses a subset of Channel Discovery methods defined in section 7.1.3.10 of [5].

Information Elements (IE) of the ChannelDiscoveryRequest Message:

- Message-ID: Mandatory in OMA DCD and SFR.

- Session-ID; Mandatory in OMA DCD and SFR.

- Channel-Metadata: Mandatory in OMA DCD and SFR. The relevant subset for SFR is defined in section 5.7.

Information Elements (IE) of the ChannelDiscoveryInfo Message:

- Session-ID; Mandatory in OMA DCD and SFR.

- Message-ID: Mandatory in OMA DCD and SFR.

- Channels-added: Conditional in OMA DCD and SFR.

- Channels-removed: Conditional in OMA DCD and SFR.

- Channels-updated: Conditional in OMA DCD and SFR.

An example of feed discovery using the SFR enabled Feed Reader is described in Annex A.2.

5.3 Activation for Syndicated Feed Reception

5.3.1 Introduction

Reception activation procedures of OMA DCD [5] are re-used to activate optimized reception of syndicated feeds.

5.3.2 Activation triggered by the client

5.3.2.1 Activation to a default SFR server.

The SFR enabled Feed Reader is configured to a default SFR server. See section 5.1 of [5] and perform the activation to that SFR server. Details of the activation parameters are described in section 5.3.2.3

5.3.2.2 Discovery of a new SFR server via URI scheme

The SFR enabled Feed Reader shall be able to identify whether this feed is an SFR feed or a legacy ATOM/RSS feed. The syndicated feed URI follows a predefined URI scheme in order to identify the SFR server and provide relevant

connection parameters associated with the SFR server. If such a feed URI is identified the SFR enabled Feed Reader uses the SFR parameters contained in the URI scheme to send an activation request to the SFR server.

Example of flow:

```
                    ┌─────────┐   ┌───────────┐        ┌────────┐   ┌────────┐   ┌────────┐
                    │ Browser │   │SFR enabled│        │  SFR   │   │  Web   │   │  Feed  │
                    │         │   │Feed Reader│        │ Server │   │ Server │   │ Server │
                    └─────────┘   └───────────┘        └────────┘   └────────┘   └────────┘
```
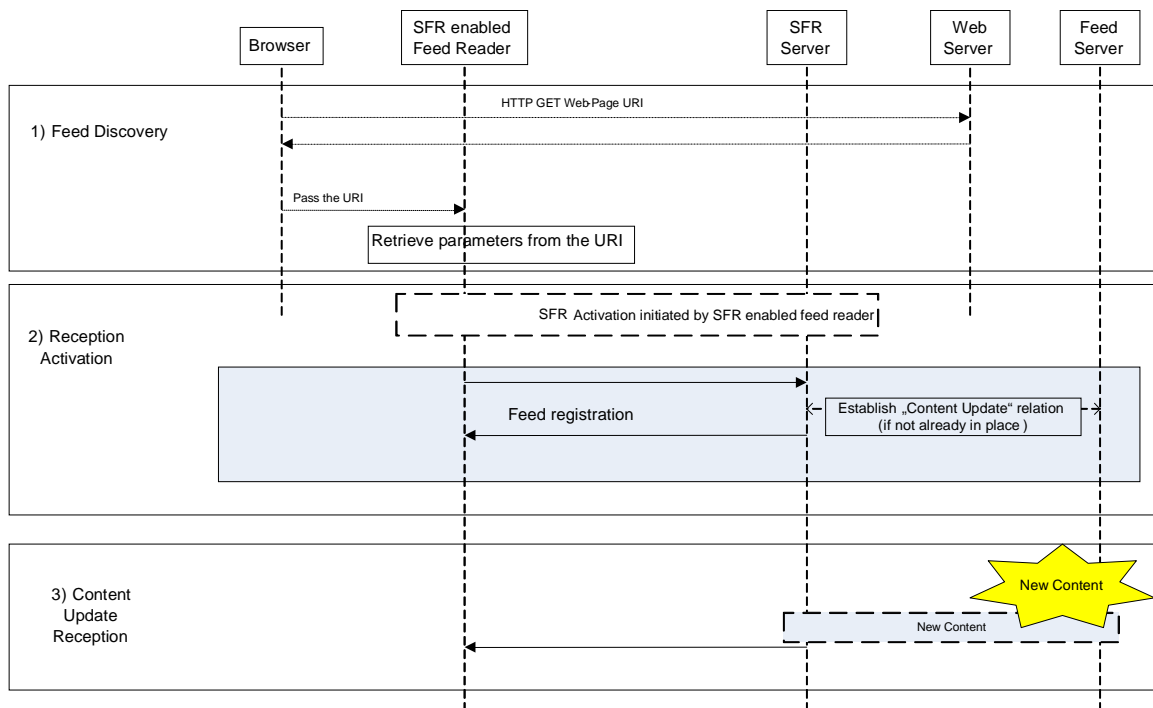

Figure 3: Discovery of a new SFR server via URI scheme

In order for SFR enabled Feed Reader to connect to a new SFR server the following parameters shall be included in the URI (based on DCD-3 connection profile see Section 8.1.2 of [5]):

- SFR server address: address (URL) of the SFR server with which the SFR enabled Feed Reader should activate.

- Proxy: address (IP address or hostname) of the proxy that should be used for communications with SFR server. This parameter may be omitted if no proxy is required to connect to the SFR server.

- Data connection details: Additional bearer-network-specific connection details e.g. APN, data connection username/password, etc. This parameter may be omitted if no additional data connection details are required to connect to the SFR server.

Example of SFR URI:

<http://www.SFR.org/abcTopNews ? server-address='10.24.122.26:8080' >

Upon reception of these parameters, the SFR enabled Feed Reader shall send an activation request message as specified in section 7.1.3.1 of [5] to the server address retrieved as part of the URI parameters. Once the SFR enabled Feed Reader activation is complete, an SFR enabled Feed Reader sends registration and channel subscription request(s), as specified in [5].

The SFR enabled Feed Reader may combine all 3 requests into a single request using multipart HTTP requests. With this approach the assumption is that authentication (basic, digest, or TLS) associated with activation request is sufficient to facilitate registration and subscription combined into the single transaction with activation. In other words, as registration and subscription requests are bundled with authenticated activation request there's no need to send session ID with these requests.

Details of the activation process are described in 5.3.2.3

5.3.2.3   Activation process

Each SFR enabled Feed Reader must perform at least once the "Activation for Syndicated Feed Reception" procedure as defined in this section before using any other syndicated feed optimization procedure.
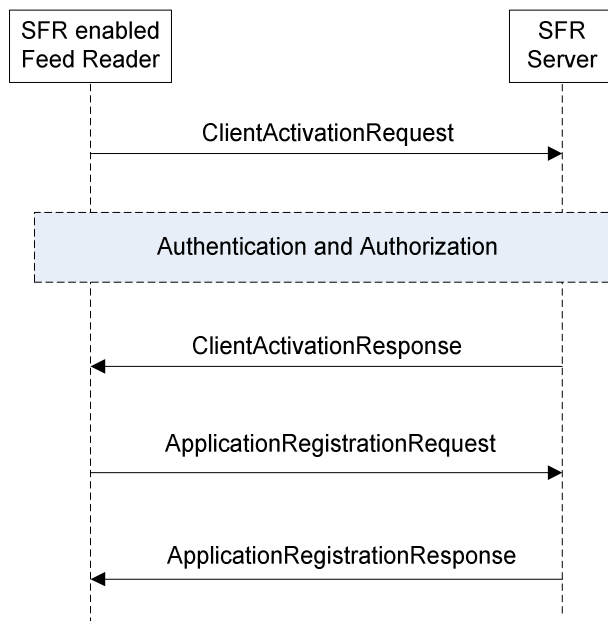
Figure 4: Activation and registration Procedure

The procedure uses a subset of OMA DCD procedures, namely the Client Activation (defined in section 7.1.3.1 of [5]) and the Application Registration (defined in section 7.1.3.3 of [5]) procedures. Client activation procedure and application registration procedure are separate transactions to allow an OMA DCD like implementation of syndicated feed reception.

Information Elements (IE) of the ClientActivationRequest Message:

- Device-ID: Optional in OMA DCD and SFR.

- Version: The Version IE is mandatory in OMA DCD and SFR. The Version shall take the value "SFR1.0".

Information Elements of the ClientActivationResponse Message

- Session-ID: Conditional in OMA DCD and SFR. The SFR server provides the Session-ID in case of successful client activation. The "Session-ID" is used in subsequent transactions with the SFR server.

Information Elements of the ApplicationRegistrationRequest message:

- Session-ID: Mandatory in OMA DCD. The Session-ID value is provided during ClientActivationResponse. Usage for SFR is mandatory.

- Application-Profile including the channel-selection-metadata: Mandatory in DCD. Relevant subset of DCD metadata for SFR is defined in section 5.7.

Information Elements of the ApplicationRegistrationResponse message:

- Session-ID: Mandatory in OMA DCD and SFR.

- Message-ID: Mandatory in OMA DCD and SFR.

- Channel-Guide including general-channel-metadata: Mandatory in OMA DCD and SFR. Relevant subset of the general channel metadata for SFR is defined in section 5.7.

The activation procedure may include authentication and authorization transactions. Authentication and Authorization shall follow "HTTP Digest Authentication" as defined in section 10.1.1.2 of [5].

The SFR enabled Feed Reader may combine multiple requests (ClientActivationRequest, ApplicationRegistrationRequest and ChannelSubscriptionRequest (see section 5.4) into a single request using multipart HTTP requests. With this approach the assumption is that authentication (basic, digest, or TLS) associated with activation request is sufficient to facilitate registration and subscription combined into the single transaction with activation. In other words, as registration and subscription requests are bundled with authenticated activation request there's no need to send session ID with these requests.

5.3.2.4 Deactivation process

The deactivation process can be initiated by the SFR enabled Feed Reader or by the SFR server.

The process for SFR enabled Feed Reader initiated deactivation process is specified in section 7.1.3.2 of [5] and the information elements contained in the ClientDeactivationRequest and ClientDeactivationResponse messages are specified in section 7.1.3.2.1 of [5]

The process for SFR server initiated deactivation process is specified in section 7.1.3.2.2 of [5].

5.3.3 Activation triggered by the network

Upon discovery of an external feed, the SFR enabled Feed Reader is provided with a feed URI. The SFR enabled Feed Reader shall be able to identify whether this feed is associated with a new SFR server.

The SFR enabled Feed Reader fetches the feed URI and provides the SFR UAProf parameters as part of the request. Upon reception of such parameters, the SFR server initiates the activation process with the SFR enabled Feed Reader.

The SFR enabled Feed Reader shall pass the UAProf with the following SFR extensions when sending the HTTP GET discovery request message to the feed URI.

Attribute   = SFR Version
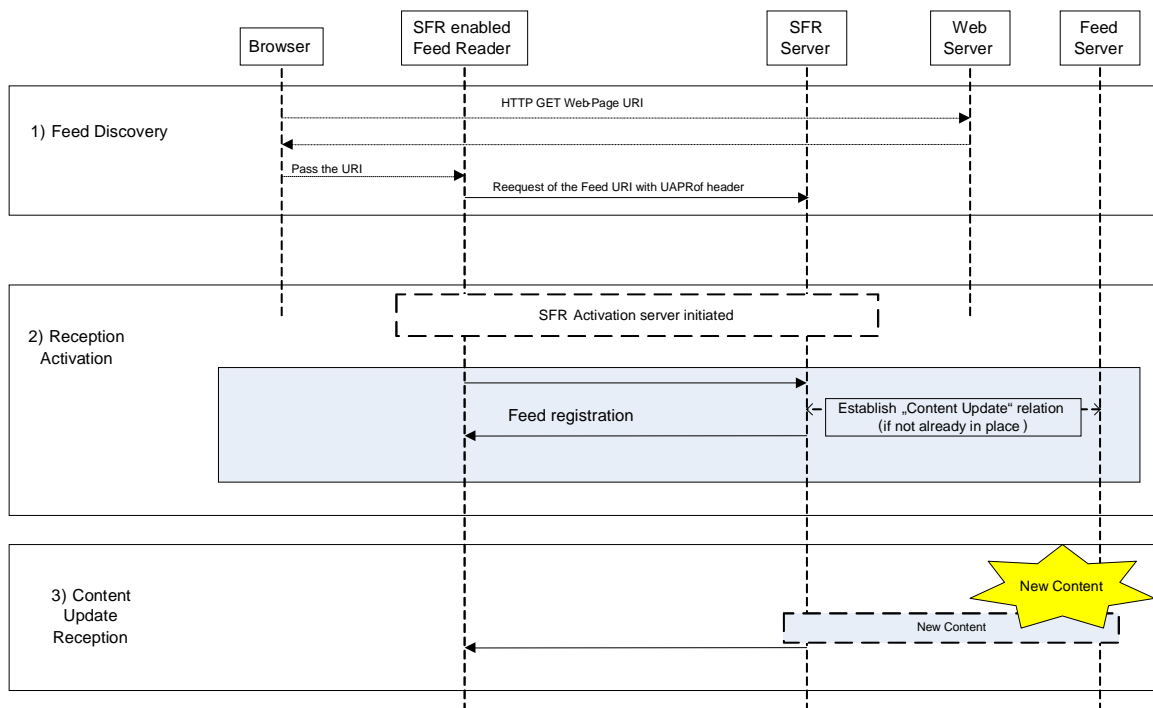
Attribute   = DeviceID

Figure 5: Activation triggered by the network

Upon receipt of the extended UAProf, the new SFR server shall send to the SFR enabled Feed Reader a RequestForClientActivation message as specified in section 7.1.3.1.2 of [5]. This is followed by a ClientActivationRequest and ClientActivationResponse as specified in section 5.3.2.3. Upon completion of the

activation process the SFR enabled Feed Reader registration and channel subscription request as specified in sections 7.1.3.3 and 7.1.3.7 of [5] are issued.

The SFR enabled Feed Reader may combine all 3 requests into a single request using multipart HTTP requests. With this approach the assumption is that authentication (basic, digest, or TLS) associated with activation request is sufficient to facilitate registration and subscription combined into the single transaction with activation. In other words, as registration and subscription requests are bundled with authenticated activation request there's no need to send session ID with these requests.

Information Elements (IE) of the RequestForClientActivation Message:

If the feed is available at an SFR server with which the SFR enabled Feed Reader is configured with; the RequestForClientActivation message shall contain only the dcd-3-connection-profile-name parameter specified in section 7.1.3.1.2 of [5] shall be used.

If the feed is available at a new SFR server, the RequestForClientActivation message shall only contain the dcd-3-connection-profile parameters specified in section 7.1.3.1.2 of [5].

Information Elements (IE) of the SFR enabled Feed Reader registration and channel subscription request messages are specified in sections 5.2.2 and 5.3.2.3.

5.4 Optimized reception initiation of a syndicated feed

5.4.1 Introduction

The sections below specify the methods for initiating the optimised reception of feeds, whether the initiation is triggered by an external component,by the SFR enabled Feed Reader, or by the SFR server.

5.4.2 Optimized reception initiation triggered by the UE

The reception initiation for optimized reception procedure may be triggered when a UE subscribes to a syndicated feed. A UE subscribes to a syndicated feed, when it is interested in the content updates provided in this syndicated feed.

The SFR enabled Feed Reader registers with the SFR server to enable optimized reception of syndicated feed updates and its enclosures and attachments (e.g. images). The "activation for syndicated feed reception" procedure (section 5.3) shall be executed at least once before the reception initiation procedure.

The SFR server may need to establish a relation with the Syndicated Feed Provider to become aware about new content. If the Syndicated Feed Provider is a DCD Content Provider, then the SFR server should use procedures as defined in section 7.2.1 of [5] for the OMA CPR interface. In a scenario whereby the syndicated feed provider is not a "DCD Content Provider" and does not support the OMA-CPR interface, the SFR server retrieves the content from the syndicated feed provider via an HTTP GET request and inserts the relevant metadata in the feed both for optimised handling of enclosures and for optimised delivery.
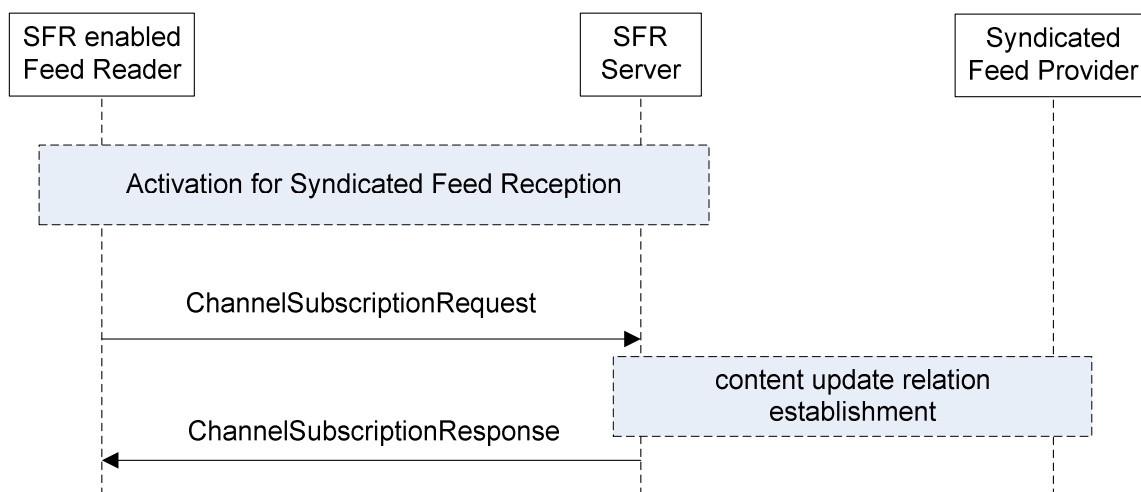
Figure 6: Reception Initiation triggered by the UE

The Reception Initiation procedure (see figure 6) uses a subset of the OMA DCD Channel Subscription Procedure (see section 7.1.3.7 of [5]).

Information Elements of the ChannelSubscriptionRequest message:

- Session-ID: Mandatory in OMA DCD and SFR.

- Message-ID: Mandatory in OMA DCD and SFR.

- Delivery-personalization-Metadata: Conditional in OMA DCD and SFR. Delivery-personalization-metadata contains at least the Channel-ID. In SFR the Channel-ID shall take the value of the feed address. The relevant subset of delivery personalization metadata for SFR is defined in section 5.7.

- Channel-ID: Conditional in OMA DCD and SFR.

- Subscription-ID Conditional in OMA DCD and SFR (issued upon subscription personalization).

Information Elements of the ChannelSubscriptionResponse message:

- Session-ID: Mandatory in OMA DCD and SFR.

- Message-ID: Mandatory in OMA DCD and SFR.

- Channel-Metadata (delivery-preference-metadata): Optional in OMA DCD and SFR. If delivery-preference-metadata is return, the feed address is provided as the value of the channel-id. Relevant subset of the delivery-preference metadata for SFR is defined in section 5.7.

NOTE: The Channel-Metadata is used to describe the type of "Push" bearer used for syndicated feed delivery. The dcd-interface attribute has the value "DCD-2/Point-to-Point" when OMA Push is used for reception. Other values to indicate the usage of MBMS Download are described in section 5.7.

The delivery over MBMS might be done via the DCD OMA-BCAST adaptation specification or as an MBMS direct adaptation specification as described in section 5.6.

5.4.3 External triggered optimized reception initiation

The user discovers a feed via other means (e.g. from an operator's web portal) and subscribes the UE externally (e.g. using a PC) for optimized syndicated feed reception. The user provides the relevant information (e.g. MSISDN) to receive the syndicated feed on its UE.
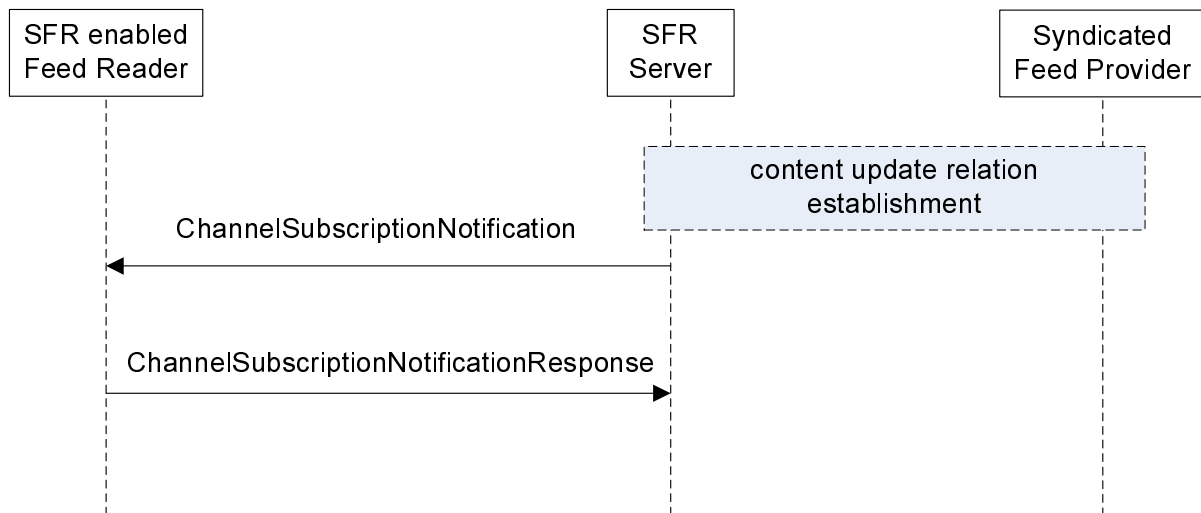
Figure 7: Reception Initiation triggered by an external device

If an external device triggers the Reception Initiation through the SFR server, a subset of the OMA DCD Channel Subscription Notification Procedure (see section 7.1.3.9 of [5]) is used (see figure 7).

Information Elements of the ChannelSubscriptionNotification message:

- Session-ID: Mandatory in OMA DCD and SFR.

- Message-ID: Mandatory in OMA DCD and SFR.

- Application -ID: Mandatory in OMA DCD and SFR.

- Subscription-ID Conditional in OMA DCD and SFR (if issued upon subscription personalization).

- Channel-Metadata: General-channel-metadata are mandatory, delivery-preference-metadata are conditional. Relevant subset of the channel metadata defined in section 5.7.

Information Elements of the ChannelSubscriptionNotificationResponse message:

- Session-ID: Mandatory in OMA DCD and SFR.

- Message-ID: Mandatory in OMA DCD and SFR.

- Channel-Metadata (delivery-personalization-metadata): Mandatory in OMA DCD and SFR. The relevant subset of the delivery-personalization-metadata is defined in section 5.7.

NOTE: To perform the subscription, the client must be activated as specified in section 5.4.

5.5   Reception Termination

Reception termination corresponds to the procedure, when a UE decides to discontinue optimized reception of syndicated feed updates.

Figure 8: Reception Termination

The Reception Termination procedure (see figure 8) uses a subset of the OMA DCD Channel Unsubscription Procedure (see section 7.1.3.8 of [5]).

Information Elements of the ChannelUnsubscriptionRequest message:

- Session-ID: Mandatory in OMA DCD and SFR.

- Message-ID: Mandatory in OMA DCD and SFR.

- Channel-ID: Mandatory in OMA DCD and SFR...

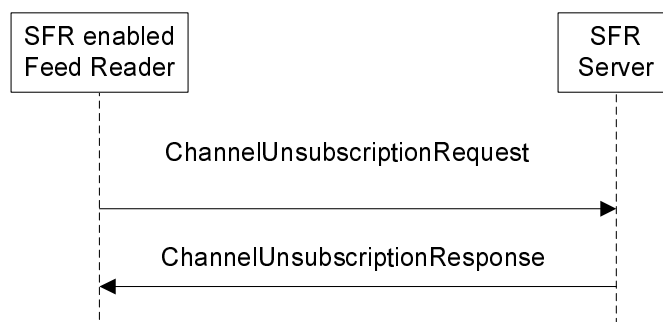   NOTE: The Channel-ID takes the value of the "Content Address" (i.e. the Syndicated feed URI).

Information Elements of the ChannelUnsubscriptionResponse message:

- Session-ID: Mandatory in OMA DCD and SFR.

- Message-ID: Mandatory in OMA DCD and SFR.

5.6   Content Reception

The SFR enabled Feed Reader uses the "Push" interface for optimized reception. The "Push" interface uses the DCD-2 interface and related procedures. Note that DCD-2 transactions are partly built on DCD-1 transactions:

- Content Update Push procedure: ContentUpdate Push message and optionally ContentDeliveryConfirmation message

- Content Update Notification procedure: ContentUpdateNotification message, ContentUpdateRequest message, ContentUpdateResponse message and optionally ContentDeliveryConfirmation message.

The DCD-2 interface binds to:

- OMA-PUSH as specified in [5]. SFR enabled Feed Reader shall support OTA-WSP notifications and may support other OMA-Push features. The SFR server shall use OTA-WSP for the content update push procedure and the Content Update Notification procedure for larger transmissions. The SFR server may support other OMA-Push features.

- MBMS delivery if supported:

  - Via DCD adaptation to BCAST. This is optional to support for both the SFR server and SFR enabled Feed Reader.

  - Via MBMS direct adaptation specification for DCD procedures as follow:

    o   When MBMS is supported, the SFR enabled Feed Reader and the SFR server shall support the mbms-access-info parameters in the DCD-2-broadcast-profile element as described in section 5.9

    o   Via OTA-PTM (if supported)

The SFR enabled Feed Reader may use the "Pull" interface for optimized reception. This can be used when the content provider specify that the content can be retrieved in "pull" as per the content network-preference metadata. The "Pull"

interface uses a sub-set of DCD-1 interface that corresponds to the Content Update procedure, wich is widely aligned with the Content Update Notification procedure of the "Push" interface. The Content Update procedure consists of the ContentUpdateRequest, ContentUpdateResponse and optionally the ContentUpdateConfirmation messages.request, ContentUpdate response and ContentUpdateConfirmation as specified in section 7.1.1.1.

Other DCD procedures (e.g. Content Submission procedure) specified for the DCD-1 interface may be supported by some implementations but are not required for SFR enabled Feed Readers and SFR servers 1.0.

5.7   SFR profile of DCD

5.7.1   Procedure

The SFR profile defines the set of DCD procedures that an SFR enabled Feed Reader and an SFR server supports:

SFR enabled Feed Reader and an SFR server shall support the following DCD procedures:

- Channel Discovery (section 7.1.3.10.3 of [5])

- Activation (section 7.1.3.1 of [5]) and deactivation (section 7.1.3.2 of [5])

- Application Registration (section 7.1.3.3 of [5]) and deregistration (section 7.1.3.4 of [5])

- Channel Subscription (section 7.1.3.7 of [5]) and un-subscription (section 7.1.3.8 of [5])

- Channel Suspend and Channel Resume (section 7.1.3.11 of [5])

- Syndicated Feed Delivery over DCD-2 using OMA Push and MBMS if these delivery methods are supported on the device

- Syndicated Feed Delivery over DCD-1

- Embedding DCD metadata into RSS and Atom feeds as per sections 9.2 and 9.3 of [5]

Other DCD procedures may be supported but are not required for this specification:

- Content Submission

- Usage tracking report

- Channel Subscription Update

- Content Repair

- Contextual Information Update

- Channel Metadata update

- All procedures between DCD client and DCD enabled Client Application

- All procedures between DCD servers and DCD content providers

5.7.2   Metadata

5.7.2.1   Application Profile Metadata

The SFR enabled Feed Reader and the SFR server shall support the following subset of DCD application profile metadata as specified in section 8.1.2 of [5]:

- "application-profile" element with the following attributes:

    - "application-id"

    - "dcd-channel-selection-metadata" element

5.7.2.2 Channel Selection Metadata

The SFR enabled Feed Reader and the SFR server shall support all Channel Selection metadata as specified in section 8.2.2.1.1 of [5].

5.7.2.3 Delivery Personalisation Metadata

Channel Delivery personalisation metadata listed below, as specified in section 8.2.2.1.2 of [5], with specific values for particular parameters. The Channel delivery personalization metadata is always sent from client to server:

- "channel-id" attribute: either RSS URL or value of "atom:id"

- "content-availability-notification" attribute: The SFR enabled Feed Reader should set this to"true"

- "delivery-when-roaming" attribute: default False

"dcd-2-broadcast-profile" element with the following additional sub-parameters (Mbms-access-info and usd-description) to support the direct binding to MBMS:

dcd-2-broadcast-profile	E2	0..1	A set of parameters that define how the DCD Client receives content via the DCD-2 interface for specific transports (note: WAP Push requires no special configuration). Contains the following **attributes**: cell-broadcast-message-id Contains the following **sub-elements**: bcast-access-info mbms-acess-info	Structure	DC
Mbms-access-info	E3	0..1	MBMS specific connection details for file delivery session over which the SFR Enabled feed Reader should expect DCD-2 interface data to be delivered via MBMS Contains the following sub-elements: Sdp-description	Structure	DS, DC
usd-description	A	1	URI to the MBMS User Service Description Fragment	String	DS, DC

5.7.2.4 General Channel Metadata

The SFR enabled Feed Reader and the SFR server shall support the following DCD general channel metadata as specified in section 8.2.2.2.1 of [5] with the following values. The general channel metadata is provided from the SFR server to the SFR enabled Feed Reader:

- DCD Channel-ID: SFR server or SFR Feed provider shall use the DCD Channel ID for identification of the RSS feed. The value of Channel ID shall be identical to the RSS feed URL. In the case of Atom feed, the DCD Channel ID shall take the value of the "atom:id" element.

- DCD Content-type : This metadata parameter is provided by SFR server and used by SFR enabled Feed Reader to filter available syndicated feeds in the channel guide. It is used at channel/feed discovery stage to enable the SFR server to match application preferences and available feeds and to create a subset of channels/feeds that correspond to the preferences of installed SFR enabled applications. This subset is returned to device during channel discovery and the SFR client enables subscription to the particular feeds. The DCD content-type corresponds to the rss category or atom:category fields.

- DCD Mime-type: This metadata parameter is provided to indicate needed mime type support to correctly receive the syndicated feed. This parameter is used at channel/feed discovery stage e.g. filtering relevant channels and content for the UE:

  - By SFR enabled Feed Reader to announce capabilities (i.e. supported mime-types).

- By SFR server to announce types of syndicated feeds and of media content included in the enclosures of the syndicated feeds in the channel. RFC 4281 shall be used to indicate the mime-type.

The SFR enabled Feed Reader and the SFR server may support the following DCD general channel metadata, as specified in section 8.2.2.2.1 of [5], that corresponds to some ATOM or RSS feed metadata. If these DCD metadata are supported, the value of equivalent parameters in ATOM or RSS shall be used as values for the corresponding DCD metadata:

- DCD Channel-name: This DCD channel metadata corresponds to the RSS Channel Title and/or to the ATOM Feed.title parameter.

- DCD Updated: This DCD channel metadata corresponds to the RSS channel lastbuildDate and/or to the ATOM feed.updated parameter.

- DCD channel-description: This DCD channel metadata corresponds to the RSS channel description and/or to the ATOM feed.subtitle parameter.

- DCD genre: This DCD channel metadata corresponds to the RSS channel category and/or to the ATOM feed.category.

- DCD channel-icon: This DCD channel metadata corresponds to the RSS channel image and/or to the ATOM feed.icon/ feed.logo. The DCD Channel-icon provides a mime-type attribute that is not available in ATOM and RSS.

Other general channel metadata as described in [5] and not listed above may be supported but are not required for SFR.

5.7.2.5 Delivery preference metadata

The delivery preference metadata listed below, as specified in section 8.2.2.2.3 of [5], with specific values for particular parameters, shall be supported. Delivery preference metadata are provided either by feed provider or SFR server:

- "channel-id" attribute: either RSS URL or value of "atom:id"

- "dcd-interface":

    - "DCD-2/point-to-point": OMA-Push with point-to-point bearers

    - "DCD-2/Broadcast": Content delivery with MBMS Download delivery method in case of direct MBMS binding

    - "DCD-1/HTTP(S)": Content reception using unicast UMTS bearer services

- "dcd-2-broadcast-profile" with the additional element "Mbms-access-info" define in section 5.7.2.3.

5.7.2.6 Content Metadata

Content Metadata are provided by the feed provider. In SFR, content metadata are RSS and ATOM metadata and may consist of DCD Content metadata. The SFR server can update or add some DCD metadata to the content metadata received from the feed provider.

If the syndicated feed provider uses the DCD content metadata, or if the SFR server extends the feed metadata with DCD metadata, then the following shall apply:

The SFR enabled Feed Reader and the SFR server shall support the DCD content metadata as specified in section 8.3.2 of [5] and with the particular limitations described below:

- DCD mime-type: This parameter shall be used by SFR to indicate the expected mime-type of the content item and of the enclosure in the item. RFC 4281 shall be used to indicate the mime-type.

- DCD replace-content-id: this parameter shall be used by SFR to indicate which content item shall be replaced by the content item for which a content-id (RSS item guid and/or ATOM feed.entry.id) is provided in the same message.

The SFR enabled Feed Reader and the SFR server may support the following DCD content metadata as specified in section 8.3.2 of [5] that corresponds to some ATOM or RSS entry metadata. If these DCD metadata are supported, the value of equivalent parameters in ATOM or RSS shall be used as values for the corresponding DCD metadata:

- DCD content-id: This DCD content metadata corresponds to the RSS item guid and/or to the ATOM feed.entry.id parameter.

- DCD content-name: This DCD content metadata corresponds to the RSS item title and/or to the ATOM feed.entry.title parameter.

- DCD content-update: This DCD content metadata corresponds to the ATOM feed.entry.updated parameter. There is no equivalent parameter in RSS.

5.7.2.7 Other DCD Metadata

Other DCD metadata may be supported but are not required for SFR v1.0:

- Charging metadata as specified in section 8.2.2.2.1 of [5]

6 Optimized handling of enclosure

6.1 Introduction

SFR provides a method of advertising, before retrieval, all required codecs/profiles/levels within a media file reference. SFR also allows the description of either alternative enclosures or the definition of tailored syndicated feeds for specific devices capabilities..

Unless the client on the UE requests a special SFR defined alternate enclosure the handling of enclosure is independent of optimized reception, hence a regular ATOM/RSS server may be capable of providing feeds with optimized enclosure.

6.2 RSS enclosure

RSS schema has dedicated XML element for enclosure. "Enclosure" element in RSS [3] has three required attributes: "url", "length", and "type".

An SFR feed provider shall use the type attribute to specify the relevant 3GPP Mime type and Codec as specified in RFC 4281 of the referenced content that is in a 3GP format.

An SFR parser shall determine from the type attribute the mime type and codec associated with the referenced content and, upon determining whether the content is usable on the UE, retrieve it, if usable.

Example of RSS enclosure using RFC 4281 and TS 26.244:

<enclosure url="http://www.scripting.com/videos/weatherReportSuite.3gp" length="12216320" type="video/3gp; codecs=" s263, samr "" />

6.3 ATOM enclosure

Enclosure in ATOM [4] is specified by using the 'link' element with the "rel" attribute value set to "enclosure". The other three attributes of the 'link' element used to specify enclosure parameters are "type", "length" and "href".

An SFR feed provider shall use the type attribute to specify the relevant 3GPP Mime type and Codec as specified in RFC 4281 of the referenced content that is in a 3GP format.

An SFR parser shall determine from the type attribute the mime type and codec associated to the referenced content and, upon determining whether the content is usable on the UE, retrieve it, if usable.

Example of ATOM enclosure using RFC 4281 and TS 26.244:

link rel="enclosure" type="audio/3gp; codec=" samr " " length="1337"
href=http://example.org/audio/ph34r_my_podcast.3gp

6.4 Providing alternative enclosures

Content Provider can publish media content in multiple formats, some matching UE capabilities, some not. There are three methods to provide tailored enclosures for UE capabilities:

- Alternative description in the syndicated feeds: The syndicated feed is extended to include multiple versions of the same content. An example is provided below for ATOM. Other ways are possible for both ATOM and RSS.

- Alternative syndicated feed channels: The feed aggregator creates tailored syndicated feeds, which all match the device capabilities.

- Alternative delivery of enclosure based on the requesting device: The server selects the correct version of the content, when the device requests the enclosure.

The feed provider or the SFR server may offer syndicated feeds tailored for device classes. The SFR server in case of optimized delivery can use the DCD content type and DCD-Mime Types parameters to associate the registering device to the matching tailored syndicated feed.

Additionally, the syndicated feed server may offer alternative versions of media content, either based on the knowledge of UE capabilities or just based on alternative version availability.

In such a case, the enclosure support in ATOM/RSS will be reused for primary enclosure as per section 6.2 and 6.3 above.

Alternative enclosures could be used to specify alternative formats for the media content.

An syndicated feed server may include alternative enclosure in the RSS feed:

- if it is aware of the UE capabilities and there are multiple available versions of the same media content in formats usable by the UE. This applies both to the optimised and non optimised delivery mode.

- or if the SFR server is not aware of the UE capabilities and the format of media content in primary enclosure may not be usable by the UE. This may apply to the non optimized delivery mode.

An SFR enabled Feed Reader should add the UAProf header [11] to all HTTP requests. If a feed provider or SFR server wants to personalize the response to device capabilities, the server should interpret the UAProf header and send an according response, e.g. enclosure codecs settings, which match the device capabilities.

It is also possible to describe multiple enclosures in the syndicated feeds. For instance, the ATOM format [4] allows providing multiple enclosure links in a single entry for the purpose of providing alternative media formats or content formats relating to the Entry.

An alternative enclosure in SFR for ATOM can be defined as follow:

- Multiple "rel" attributes with values set to "enclosure" are used in a single parent entry element.

- The "type" attribute value in the enclosure links are specified according to section 6.1

Example of alternative enclosure in ATOM:

```
<entry>

        <id>urn:uuid:1225c695-cfb8-4ebb-aaaa-80da344efa6a</id>

        <link rel="enclosure" type="audio/aac" length="1337
        href=http://example.org/audio/ph34r_my_podcast.aac/>

        <link rel="enclosure" type="audio/3gp; codec=&quot; samr &quot;"
        href=rtsp://example.org/audio/ph34r_my_podcast.sdp/>

</entry>
```

7 Media codecs and formats for syndicated feeds

7.1 Media Transport for enclosures

This section defines the media transport formats for Syndicated Feed Reception.

Syndicated Feed Reception supports progressive reception and rendering of 3GP files received using HTTP and packet switched streaming (PSS) sessions. A UE including reception support for 3GP files as defined in 3GPP TS 26.234 [6] should support Basic profile, Extended-presentation profile and Progressive-download profile as defined 3GPP TS 26.244 [7]. The UE shall support the mime type parameters as defined in RFC 4281[10] and should support Annex A of 3GPP TS 26.244 [7],

Syndicated Feed Reception supports RTP streaming sessions as defined in Packet Switched Streaming (PSS) with URIs as enclosures. A UE including a Packet Switched Streaming (PSS) client as defined in 3GPP TS 26.234 [6] should accept Packet Switched Streaming RTSP URIs as enclosures.

The Syndicated Feed Reader may receive linked files over MBMS and OMA Push.

7.2 Media codecs and formats

This section defines the default media formats and codecs supported syndicated feed reception.

PSS Media codecs and formats decoding capabilities defined in 3GPP TS 26.234 [6] are applicable to the present syndicated feeds, including in particular text and image, graphics codecs and formats.

Annex A (informative):
Interaction examples

This annex contains a set of informative interaction examples between SFR enabled Feed Readers, SFR server and feed servers. There are several alternatives to discover and subscribe to syndicated feeds.

- Feed Discovery using the UE Browser

- Feed Discovery using the Syndicated Feed Reader

- SFR Server Discovery triggered by Feed Discovery

- Feed Discovery using the PC Browser

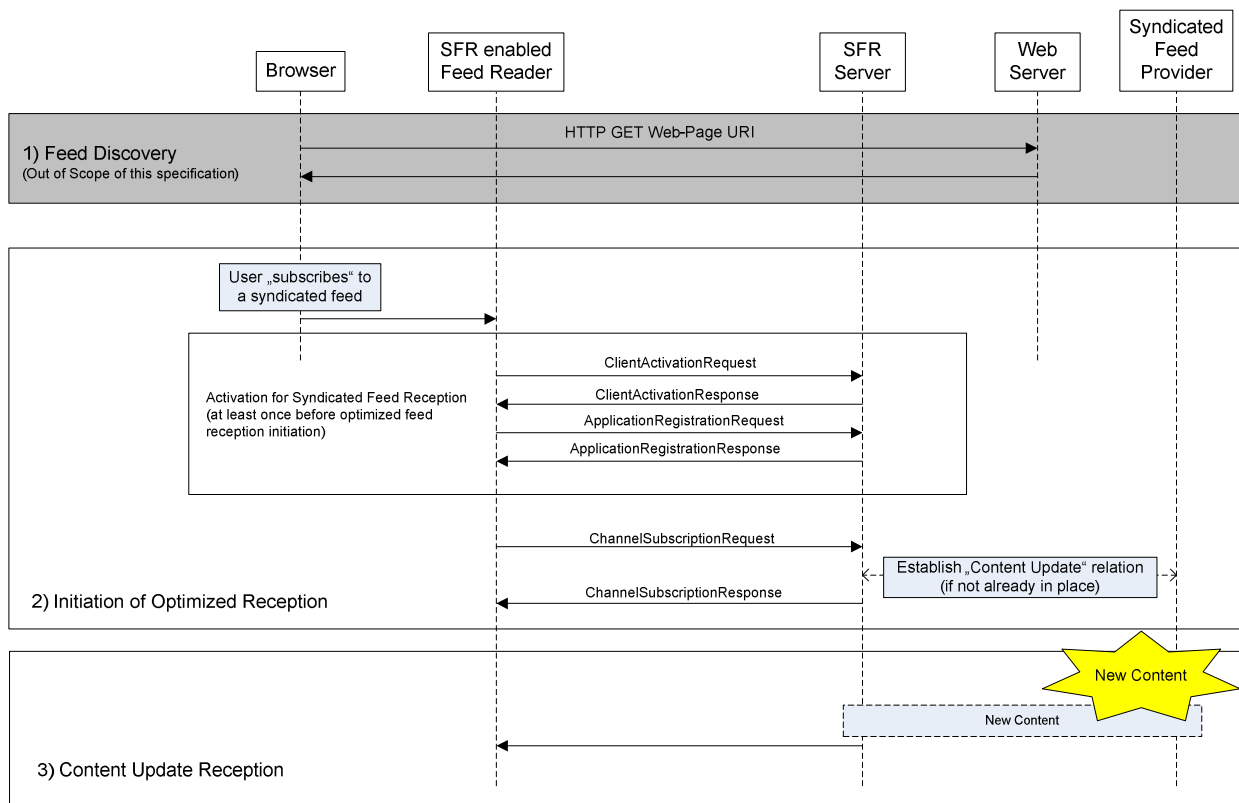# A.1   Feed Discovery using the UE browser

This informative example scenario assumes syndicated feed discovery through the UE browser (example external application). The scenario assumes that the SFR enabled Feed Reader has configured a "default" SFR server. It also assumes that feed announcement and the actual syndicated feed are served from different HTTP servers.

The UE browser is used in this example to discover the syndicated feed. Syndicated feeds may use the auto-discovery techniques to simplify identification of syndicated feed URI for the browser. One or more auto-discovery tags are added into the head-section of the HTML file. An example of an auto-discovery tag is given below.

```
<html>
  <head>
     <title>…</title>
     <link rel="alternate" type="application/rss+xml" title="Example Feed"
      href="http://feeds.example.com/ExampleNewsFeed.rss">
  </head>
  <body>
     <!-- the web page's contents -->
  </body>
</html>
```

This example auto-discovery tag announces the URI of an RSS feed with the title "Example Feed" and the MIME Type "application/rss+xml".

The following figure depicts the sequence flow for the feed discovery using a browser. It includes also the Reception Activation transaction and a Content Update Reception.

Figure A.1: Feed Discovery using the UE Browser

1. The user uses a browser to find syndicated feeds. Note: syndicated feed discovery using the UE browser is one realization of syndicated feed discovery and not in scope of this specification.

2. When the user finds a syndicated feed of interest and subscribes to it, the browser hands-over the feed URI to the SFR enabled Feed Reader. If the client has not performed the activation procedure with the server, it runs the "activation for syndicated feed reception" procedure as defined in section 5.3.

   When the client has run the activation procedure with the SFR server, the client initiates the optimized feed reception as defined in section 5.4. The syndicated feed URI (received from the browser) is used as "Channel-ID" or "Content-Address" in the reception initiation procedure.

   The ChannelSubscriptionResponse contains the Channel-Metadata structure. If content update notification is delivered using OMA push, then the "dcd-interface" element in the channel metadata contains the value "DCD-2/Point-To-Point".

   If content update notification is delivered using MBMS, then the "dcd-interface" element in the channel metadata contains the value "DCD-2/Broadcast". The "network-preferences" element shall contain the string "MBMS" in that case.

   The SFR server has established a "Content update" relation with the desired syndicated feed server. In a scenario whereby the syndicated feed provider is not a "DCD Content Provider" and does not support the CPR interface and messages exchanged over the CPR interface, the SFR server retrieves the content from the syndicated feed provider via an HTTP GET request and inserts the relevant metadata in the feed both for optimised handling of enclosures and for optimised delivery.

3. Content Updates are received.

A.2 Feed Discovery using the Syndicated Feed Reader

The SFR enabled Feed Reader may provide a build-in function to select and subscribe to syndicated feeds. The SFR enabled Feed Reader fetches the list of available feeds from the SFR server.
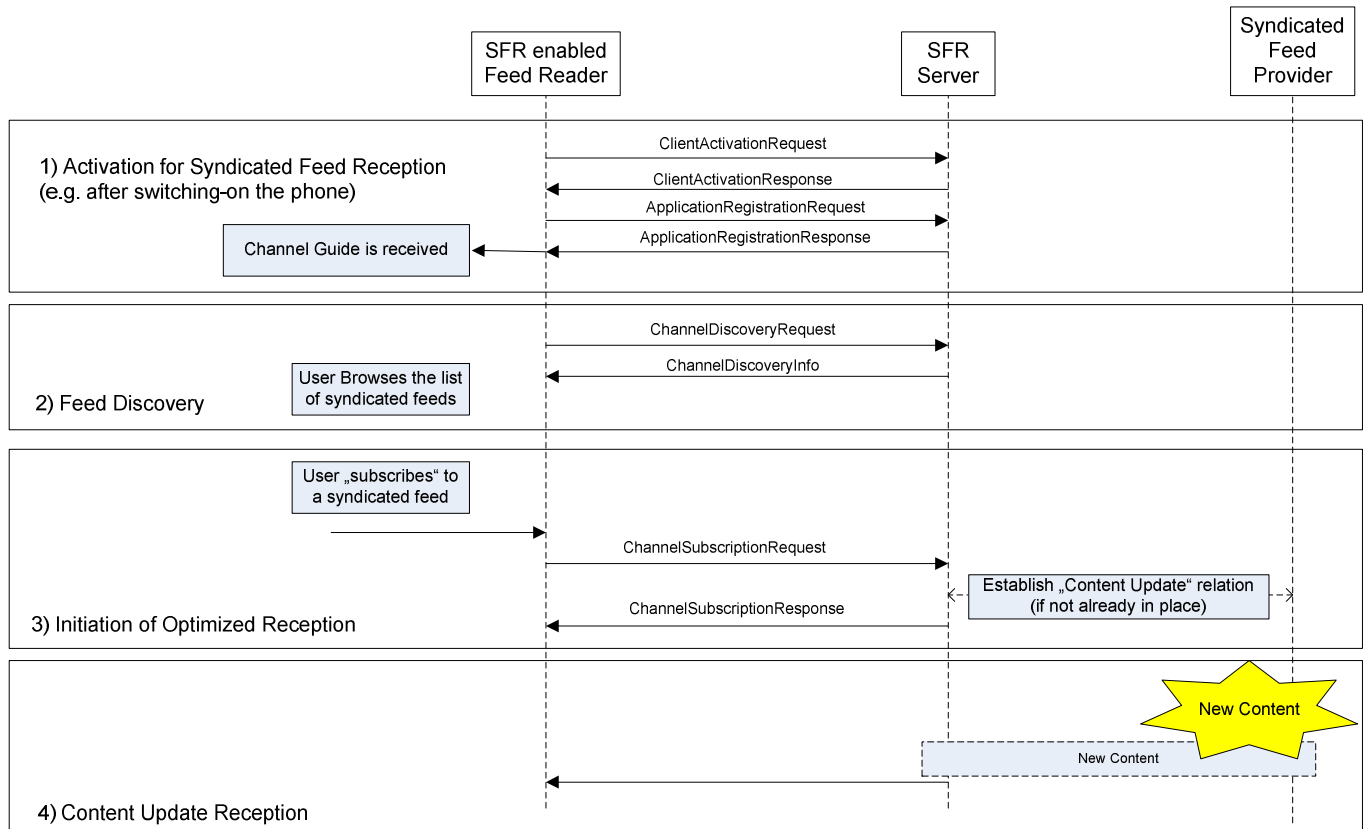
Figure A.2: Feed Discovery using the SFR enabled Feed Reader

1. The SFR enabled Feed Reader must have previously executed once the OMA DCD activation and registration procedures. The SFR enabled Feed Reader gets a list of available syndicated feeds in the ApplicationActivationResponse message.

2. The SFR enabled Feed Reader may send a request to update the list of syndicated feeds, when a user starts browsing the available syndicated feeds.

3. When the user finds a syndicated feed of interest, the SFR enabled Feed Reader sends the ChannelSubscriptionRequest message to the SFR server to initiate the optimized reception of the feed. The Content Address contains the URI of the syndicated feed.

The ChannelSubscription Response contains a Channel Metadata. If content update notification is delivered using OMA push, then the "dcd-interface" element in the channel metadata contains the value "DCD-2/Point-To-Point". Other channel metadata are defined for OMA DCD.

If content update notification is delivered using MBMS, then the "dcd-interface" element in the channel metadata contains the value "DCD-2/Broadcast". The "network-preferences" element shall contain the string "MBMS" in that case.

The SFR server has established a "Content update" relation with the desired syndicated feed server. In a scenario whereby the syndicated feed provider is not a "DCD Content Provider" and does not support the CPR interface and messages exchanged over the CPR interface, the SFR server retrieves the content from the syndicated feed provider via an HTTP GET request and inserts the relevant metadata in the feed both for optimised handling of enclosures and for optimised delivery.

A.3 SFR Server Discovery triggered by Feed Discovery

The syndicated feed is served through a new SFR server. The terminal needs to discover the new SFR server or needs to be discovered as an SFR capable terminal by this new SFR server. It may also happen that the UE has no "default" SFR server configured.

The SFR enabled Feed Reader can activate and register to a new SFR server when the SFR feed URI contains the SFR server connection information as specified in section 5.3.2.2.
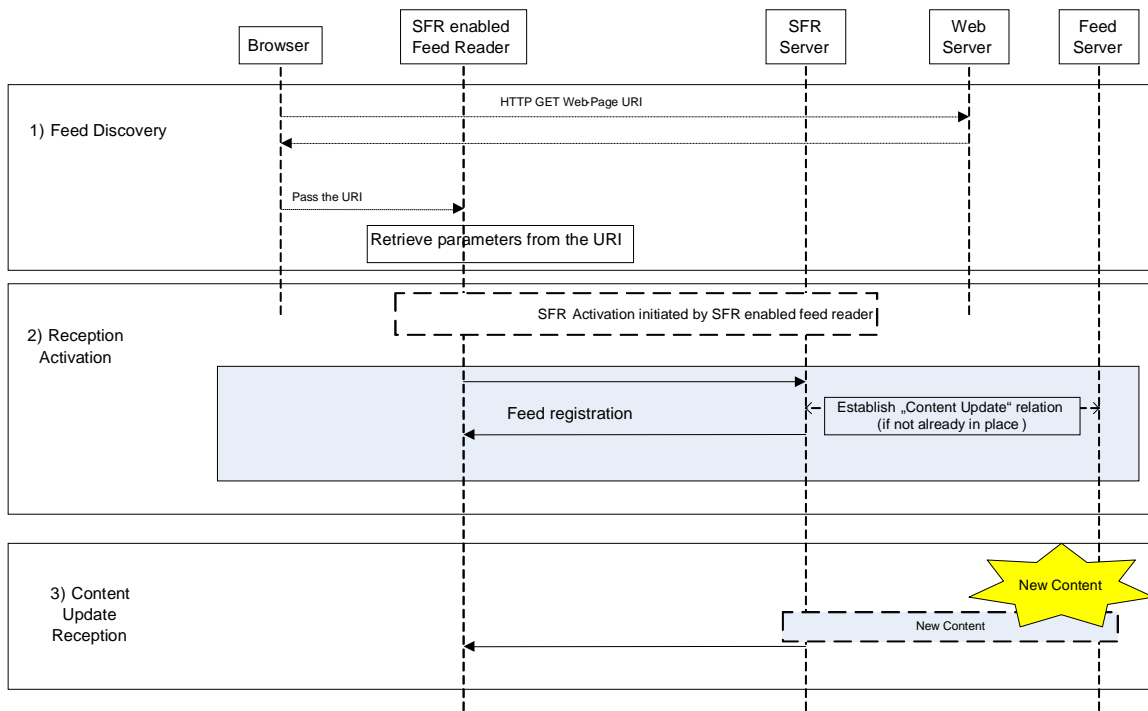
Figure A.3: SFR Server Discovery triggered by Feed Discovery

4. The user browses and discovers a feed URI. The browser pass the URI to the SFR enabled Feed Reader. The SFR enabled Feed Reader retrieves from the URI the SFR server parameters.

5. The SFR enabled Feed Reader uses the SFR server connection parameters to activate and further register to the SFR server and provide the feed URI to the SFR server. The SFR server establishes a content update relation with the feed server if not already in place.

6. Content updates are received.

Alternatively, the SFR enabled Feed Reader can be activated by a new SFR server as the SFR enabled Feed Reader provides its SFR UAProf capabilities when fetching the feed URI as specified in section 5.3.3.
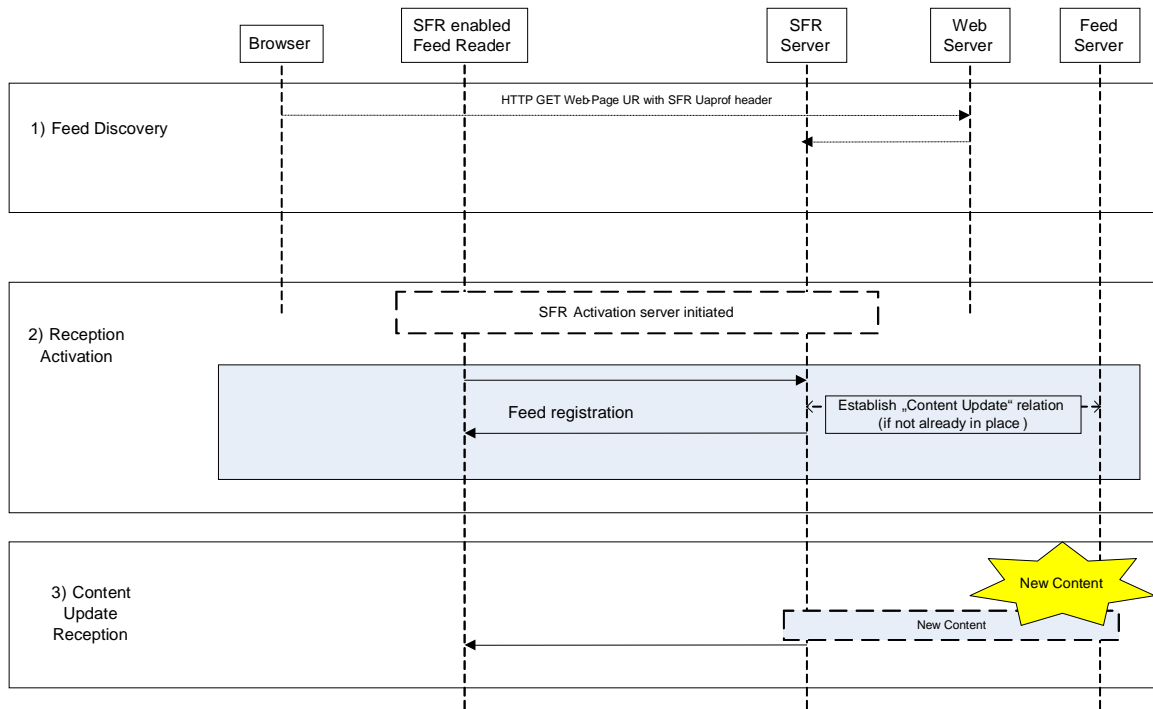
**Figure A.4: activation triggered by SFR Server**

1. The terminal fetches a feed URI and provides its SFR UAprof parameters as part of the request. The web server forward these information to the SFR server. Alternatively, as per figure 5 in section 5.3.3, upon reception of the feed URI, the SFR enabled Feed Reader requests the feed to the SFR server and provides itq SFR capabilities as part of the UAprof information element.

2. The SFR server sends a request for activation notification to the SFR enabled Feed Reader (e.g. via SMS message).

3. Upon completion of the activation/registration process, content updates are received.

A.4 Feed Discovery using the PC browser

This informative example assumes syndicated feed discovery through the PC browser (example external application). The example requires, that the SFR enabled Feed Reader has configured a "default" SFR server.

The user discovers a feed via other means (e.g. from a web portal) and provides the relevant information (i.e. a delivery context) to receive the feed on its SFR terminal. The feed is routed via the SFR server to which the terminal is connected. (For instance, if a phone number is identified as belonging to a particular mobile network operator the feed provider knows the SFR server of that carrier)

The figure bellow illustrates the flow for external subscription to an external feed and corresponds to DCD figure 9, flow 3 as described in [5].
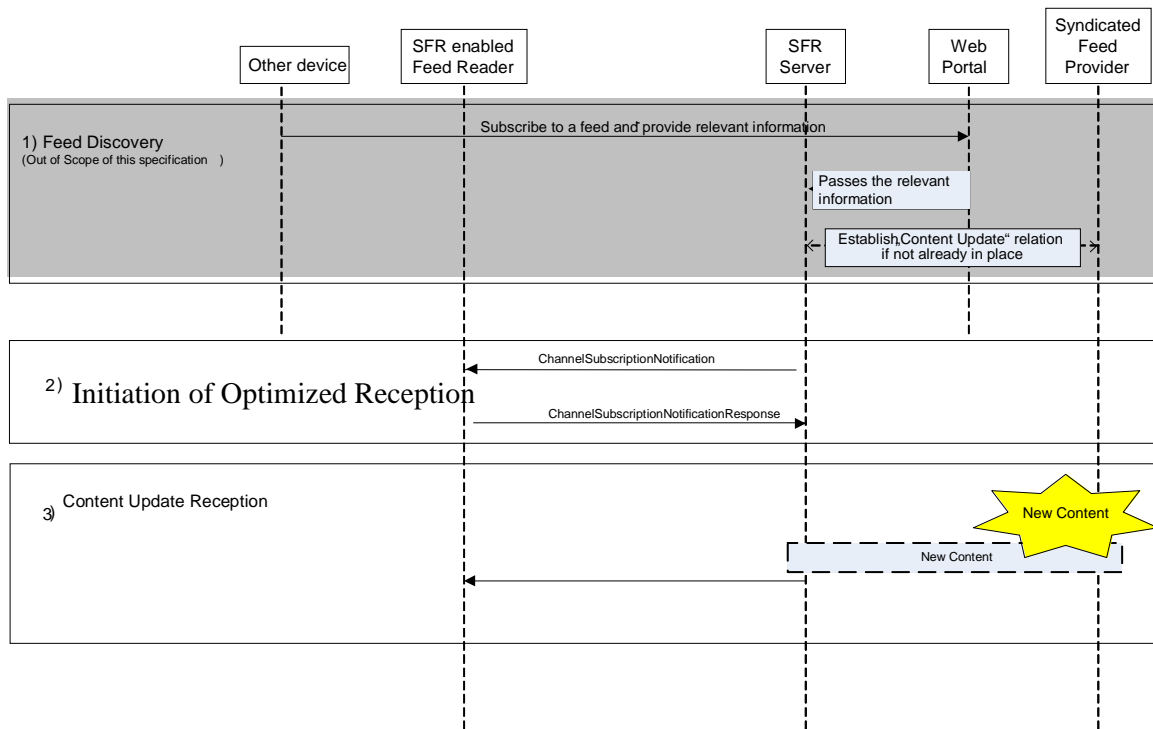
Figure A.5: Feed Discovery using an external device

Upon reception of the some subscription notification from the web portal, the SFR server sends a ChannelSubscriptionNotification message to the SFR enabled Feed Reader via the DCD-3 interface as specified in section 7.1.3.9 of [5].

The SFR enabled Feed Reader processes this message and returns a ChannelSubscriptionNotificationResponse to the SFR server as specified in section 7.1.3.9 of [5].

1) The user uses a browser to find and subscribe to syndicated feeds on the service provider's portal. Note: syndicated feed discovery using the PC browser is one realization of syndicated feed discovery and not in scope of this specification. The assumption is that the UE is configured with the SFR server associated with the service provider's portal. The user provides as part of the subscription process some information allowing to identify the UE (e.g. MSISDN). Upon completion of the subscription process, the SFR server is provided with the feed address and the UE information.

2) The SFR server sends a ChannelSubscriptionNotification message to the UE as specified in section 7.1.3.9 of [5]. (e.g. this may be done via an SMS message) The user confirms the channel subscription and a ChannelSubscriptionNotificationResponse is sent from the UE to the SFR server as specified in section 7.1.3.9.1 of [5]

3) content updates are received.

Annex B (informative):
Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2009-12	46	SP-090713			Presented to TSG SA#46 for approval		1.0.0
2009-12	46				Approved at TSG SA#46 Plenary	1.0.0	9.0.0
2010-03	47	SP-100026	0001	1	Editorial Corrections to SFR Specification	9.0.0	9.1.0

History

Document history		
V9.0.0	January 2010	Publication
V9.1.0	April 2010	Publication