General Service Subscription Management

Technical Specification

Candidate Version 1.0 – 22 Oct 2009

Open Mobile Alliance

OMA-TS-GSSM-V1_0-20091022-C

Contents

Figures

Tables

1. Scope

This document represents the complete Technical Specification of the General Service Subscription Management (GSSM) 1.0 Enabler of the Open Mobile Alliance™, and contains specifications of the GSSM.PEM-1, GSSM.PEM-2, GSSM-1, and GSSM-2 interfaces described in the GSSM Architecture Document [GSSM-AD].

The following items are within the scope of this Technical Specification of the GSSM 1.0 Enabler:
- A GSSM template for the GSSM.PEM-1 interface [PEM1-TS].
- Guidelines for the use of the GSSM.PEM-2 [PEM2-TS] interface and PEL [PEL-TS] in the GSSM Enabler.
- The specification of messages to be exchanged over the GSSM-1 and GSSM-2 interfaces [GSSM-AD].

The following items fall outside the scope of this Technical Specification of the GSSM 1.0 Enabler:

- The specification of messages to be exchanged with Other Resources [GSSM-AD].
- The specification of specific Subscription Validation Criteria.

This Technical Specification defines the GSSM 1.0 interfaces as XML Schema.

2. References

2.1 Normative References

[GSSM-AD]	"General Service Subscription Management Architecture", Version 1.0, Open Mobile Alliance™, OMA-AD-GSSM-V1_0, URL:http://www.openmobilealliance.org/
[GSSM-RD]	"General Service Subscription Management Requirements", Version 1.0, Open Mobile Alliance™, OMA-RD-GSSM-V1_0, URL:http://www.openmobilealliance.org/
[HTTP]	"Hypertext Transfer Protocol -- HTTP/1.1", RFC 2616, URL: http://www.ietf.org/rfc/rfc2616.txt
[OMA-DICT]	"Dictionary for OMA Specifications", Version 2.7, Open Mobile Alliance™, OMA-ORG-Dictionary-V2_7, URL:http://www.openmobilealliance.org/
[PEL-TS]	"PEEM Policy Expression Language Technical Specification", Open Mobile Alliance™, OMA-TS-PEEM_PEL-V1_0, URL:http://www.openmobilealliance.org/
[PEM1-TS]	"Policy Evaluation, Enforcement and Management Callable Interface (PEM-1) Technical Specification", Open Mobile Alliance™, OMA-TS-PEEM_PEM1-V1_0, URL:http://www.openmobilealliance.org/
[PEM2-TS]	"Policy Evaluation, Enforcement and Management – Management Interface (PEM-2) Technical Specification", Open Mobile Alliance™, OMA-TS-PEEM_PEM2-V1_0, URL:http://www.openmobilealliance.org/
[RFC2119]	"Key words for use in RFCs to Indicate Requirement Levels", S. Bradner, March 1997, URL:http://www.ietf.org/rfc/rfc2119.txt
[XMLSchema]	XML Schema, Second Edition, W3C Recommendation 28 October 2004, URL: http://www.w3.org/XML/Schema#dev

2.2 Informative References

3. Terminology and Conventions

3.1 Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC2119].

All sections and appendixes, except "Scope" and "Introduction", are normative, unless they are explicitly indicated to be informative.

3.2 Definitions

Service	See [OMA-DICT]
Service Provider	See [OMA-DICT]
Subscriber	See [OMA-DICT]
Subscription	See [OMA-DICT]
Subscription Data Owner	Any system, entity or process that owns the subscription data associated to a subscriber and may be responsible for business or operational processes resulting from changes or request for change of the data. BSS (Business Support Systems) is an example of subscription data owner for subscriber subscription data,
Subscription Profile	The set of information required for describing a service subscription, e.g. the subscriber identity, subscribed service, service preferences and/or service usage constraints.
Subscription Validation	Subscription validation is the process of checking for the existence of a subscription and evaluating that the service delivery request is within the limits defined by the Subscription Profile prior to service delivery.
User	See [OMA-DICT]

3.3 Abbreviations

GSSM	General Service Subscription Management
MSISDN	Mobile Station International Subscriber Directory
OMA	Open Mobile Alliance
PEEM	Policy Evaluation, Enforcement and Management
PHS	Personal Handyphone System
PSTN	Public Switched Telephony Network
SMSC	Short Message Service Center
WAP	Wireless Application Protocol
XML	Extensible Markup Language

4. Introduction

The GSSM enabler allows an authorized principal to setup, terminate, change, query his/her subscriptions, and the ability to setup subscription preferences and/or service usage constraints for associated users(s). The main objective of this enabler is to specify a set of common functions for all of the service subscriptions within the service provider's domain and thus avoids the unnecessary complexity of a silo approach to subscription management.

The requirements fulfilled by the GSSM Enabler are contained in [GSSM-RD].

The GSSM Enabler architecture describes three components [GSSM-AD]:

1. a *Subscription Validation Component* which provides the subscription validation function (to check the service subscription) to the Subscription Validation Requestor via GSSM.PEM-1 as well as the subscription validation criteria management function to the Validation Criteria Management Requestor via GSSM.PEM-2;

2. a *Subscription Profile Component* which provides aggregated data access functions (i.e. only read) for subscription profile data to Subscription Profile Requestor;

3. a *Subscription Management Component* which provides the subscription management function (e.g. subscribing to a service, unsubscribing from a service, change an existing subscription) received from the Subscription Management Requestor

The remainder of this Technical Specification is organized as follows:

*   Section 5.1 specifies how the GSSM.PEM-1 interface is re-used for access to the GSSM Subscription Validation Component. The GSSM Enabler reuses the PEM-1 interface from the Policy Evaluation, Enforcement Management [PEEM-AD] Enabler of the Open Mobile Alliance™. Section 5.1 provides a template with GSSM parameters for GSSM.PEM-1.

*   Section 5.2 specifies how the GSSM.PEM-2 interface is reused to provide management of Subscription Validation Criteria. The GSSM Enabler reuses the PEM-2 interface from the Policy Evaluation, Enforcement Management [PEEM-AD] Enabler of the Open Mobile Alliance™.

*   Section 5.3 introduces a framework for the GSSM-1 and GSSM-2 interfaces.

*   Section 5.4 contains the specification the GSSM-1 interface, which provides the subscription management functions (e.g. subscribing to a service, un-subscribing a service, changing an existing subscription, etc.) to the Subscription Management Requestor;

*   Section 5.5 specifies the GSSM-2 interface for subscription profile data access, (i.e. read).

5. GSSM Technical Specification

5.1   GSSM.PEM-1 Interface

The Subscription Validation Component is an instance of the PEEM Enabler [PEEM-RD, PEEM-AD, PEL-TS, PEM1-TS, PEM2-TS] that evaluates and possibly enforces GSSM Validation Criteria. The interface by which to request Subscription relationship validation is therefore the standard PEM-1 interface with a GSSM template. Sections 5.1.1 and 5.1.2 define the input and output template for the GSSM Validation request and reply, respectively.

5.1.1   GSSM Input Template

The `templateID` to be used for the GSSM template for GSSM.PEM-1 SHALL be `OMA_GSSM_Suscription_Validation_Input` and the `templateVersion` for this template SHALL be `V1.0.0`

The GSSM input template is specified as a file named `gssm_pem1InputTemplate-v1_0.xsd` with the following contents:

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
           xmlns:pem1-i="urn:oma:xml:peem:pem1-input-template:1.0"
           xmlns="urn:oma:xml:gssm:pem1-input-template:1.0"
           targetNamespace="urn:oma:xml:gssm:pem1-input-template:1.0">

  <xs:import namespace="urn:oma:xml:peem:pem1-input-template:1.0"
           schemaLocation="http://www.openmobilealliance.org/tech/profiles/
                   PEM_1_GenericInputTemplateData-v1_0.xsd"/>

  <xs:complexType name="GSSMpem1InputTemplate-V1_0Type">
    <xs:complexContent>
      <xs:extension base="pem1-i:inputTemplateType">
        <xs:sequence>
          <xs:element name="validationRequest">
            <xs:complexType>
              <xs:sequence>
                <xs:element name="requestorID" type="StringWithIDType"/>
                <xs:element name="subscriberID" type="StringWithIDType" minOccurs="0">
                <xs:element name="serviceID" type="xs:string" minOccurs="0"/>
                <xs:element name="serviceInformation" type="AttributeEntry" minOccurs="0"/>
              </xs:sequence>
            </xs:complexType>
          </xs:element>
        </xs:sequence>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>

<xs:complexType name="StringWithIDType">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="type" type="xs:string" use="optional"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

  <xs:complexType name="AttributeEntry">
    <xs:sequence>
      <xs:element name="serviceAttribute" minOccurs="0" maxOccurs="unbounded">
        <xs:complexType>
          <xs:simpleContent>
            <xs:extension base="xs:string">
              <xs:attribute name="name" type="xs:string" />
```

```
            </xs:extension>
          </xs:simpleContent>
        </xs:complexType >
      </xs:element>
    </xs:sequence>
  </xs:complexType >
</xs:schema>
```

This XML Schema defines a complex type `GSSMpem1InputTemplate-V1_0Type` which is an extension of the PEM-1 abstract `inputTemplateType`. The `GSSMpem1InputTemplate-V1_0Type` has one top level element, `validationRequest`.

The `validationRequest` element contains a sequence of the following:

- A MANDATORY `requestorID` element to provide the information of the Subscription Validation Requestor. The `requestorID` includes the terminal type(e.g. SMSC, WAP or Business Hall) and ID of the requestor

- An OPTIONAL `subscriberID` element to provide the information of the subscriber. The element has an attribute named "type" that indicates the terminal type of user who subscribes the service.

- An OPTIONAL serviceID element to provide the identifier of the service.

- An OPTIONAL serviceInformation element to provide the information of the service. The `serviceInformation` SHALL be expressed as a list of `serviceAttribute` elements. Each `serviceAttribute` element has an attribute named "`name` " that indicates the name of service's attribute.

An (informative) example of a valid GSSM.PEM-1 input template is:

```
<?xml version="1.0" encoding="UTF-8"?>
<pem1-i:policyInputData
                xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                xmlns:gssm1-i="urn:oma:xml:gssm:pem1-input-template:1.0"
                xmlns:pem1-i="urn:oma:xml:peem:pem1-input-template:1.0"
                xsi:schemaLocation="urn:oma:xml:gssm:pem1-input-template:1.0
                          http://www.openmobilealliance.org/tech/profiles/
                          gssm_pem1InputTemplate-v1_0.xsd">

  <policyInputTemplate xsi:type="gssm1-i:GSSMpem1InputTemplate-V1_0Type"
                    templateID="OMA_GSSM_Subscription_Validation_input"
                    templateVersion="V1.0.0">
    <validationRequest>
      <requestorID type="SMSC">
        34528943
      </requestorID>
      <subscriberID type="MOBILE">
        +8615800158000
      </subscriberID>
      <serviceID>tqyb</serviceID>
      <serviceInformation>
        <serviceAttribute name="desUser">+8615800158000</serviceAttribute>
        <serviceAttribute name="desUserType">MOBILE</serviceAttribute>
        <serviceAttribute name="serviceName">Weather-forecast</serviceAttribute>
        <serviceAttribute name="mode">AOMT</serviceAttribute>
      </serviceInformation >
    </validationRequest>
  </policyInputTemplate>
</pem1-i:policyInputData >
```

Disclaimer: please note that OMA does not specify the contents of the `requestorID`, `subscriberID`, `serviceID` and `serviceInformation` elements and the type attribute of the requestorID and subscriberID element.

This example describes a request to subscription validation component to verify if the action the service provider , providing the service of "Weather-forecast" with the unique identifier of "tqyb", sending a message to the user "+8615800158000" should be permitted or not.

5.1.2   GSSM Output Template

The `templateID` to be used for the GSSM output template for GSSM.PEM-1 SHALL be `OMA_GSSM_Subscription_Validation_Output` and the `templateVersion` for this template SHALL be `V1.0.0`

The GSSM output template is specified as a file named `gssm_pem1OutputTemplate-v1_0.xsd` with the following contents:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema""
           xmlns:pem1-o="urn:oma:xml:peem:pem1-output-template:1.0"
           xmlns="urn:oma:xml:gssm:pem1-output-template:1.0"
           targetNamespace="urn:oma:xml:gssm:pem1-output-template:1.0">

<xs: import namespace="urn:oma:xml:peem:pem1-output-template:1.0"
schemaLocation="http://www.openmobilealliance.org/tech/profiles/
                                PEM_1_GenericOutputTemplateData-v1_0.xsd" />
<xs:complexType name="GSSMOutputTemplate-V1_0Type">
  <xs:complexContent>
    <xs:extension base="pem1-o:outputTemplateType" >
      <xs:sequence>
        <xs:element name="validationResultCode" type="xs:unsignedShort"/>
        <xs:element name="validationResultText" type="xs:string" minOccurs="0"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
</xs:schema>
```

The GSSM output template describes a pair of output elements, `validationResultCode` and `validationResultText`.

The MANDATORY `validationResultCode` attribute indicates the result code as specified in section 5.6 applicable for this interface. The OPTIONAL `validationResultText` element specifies the detailed explanation of the result, and its content SHOULD comply with section 5.6.

In case the code 200 "OK" is returned, the PEM-1 Status code SHALL be set to 2101 (ALLOW decision). In case other codes are returned, the PEM-1 Status code SHALL be set to 2401 (DENY decision).

In case of error 447 "Service specific information is invalid", a sequence of colon (":"), space (" ") and an indication of the invalid `serviceInformation` entry MAY be appended to the text of the error message.

An (informative) example of a valid GSSM.PEM-1 template is:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<pem1-o:policyOutputData
                  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                  xmlns:gssm1-o="urn:oma:xml:gssm:pem1-output-template:1.0"
                  xmlns:pem1-o="urn:oma:xml:peem:pem1-output-template:1.0"

                  xsi:schemaLocation="urn:oma:xml:gssm:pem1-output-template:1.0
                                http://www.openmobilealliance.org/tech/profiles/
                                 gssm_pem1OutputTemplate-v1_0.xsd">

  <policyOutputTemplate xsi:type="gssm1-o:GSSMOutputTemplate-V1_0Type"
                    templateID = "OMA_GSSM_Suscription_Validation output"
                    templateVersion = "V1.0.0">
```

```
    <StatusCode>2401</StatusCode >
    <StatusText>DENY</StatusText >
    <validationResultCode>559</validationResultCode>
    <validationResultText>
       The operator policy denies this service usage
    </validationResultText>
  </policyOutputTemplate>
</policyOutputData>
```

This example indicates that the Subscription Validation Component has evaluated but denied the operation .

5.2   GSSM.PEM-2 Interface

The GSSM.PEM-2 interface allows the Validation Criteria Management Requestor to request a management function   from the Subscription Validation Component, the GSSM.PEM-2 interface SHOULD support following functions:

- Create a new validation criteria

- Modify a existing validation criteria

- Delete a existing validation criteria

- View existing validation criteria.

The GSSM.PEM-2 interface SHALL comply with [PEM2-TS]. The Validation criteria SHALL be expressed as PEEM Policies [PEL-TS].

5.3   Generic Request/Response framework for GSSM-1 and GSSM-2 Interfaces

The GSSM-1 and GSSM-2 protocols are application level protocols with two types of messages: request and response. Each request message carries either a GET or a SET request. The GSSM Request/Response framework is data type agnostic. It allows to define instantiations by other OMA Enablers or by actual deployments. Further, in sections 5.3.3 and 5.3.4, GSSM defines request and response messages based on this framework which MUST be supported by GSSM implementations.

The generic framework specifies three items:

(1) the characteristics of the operation (GET or SET)

(2) a container for the actual parameters to be exchanged

(3) the identifier and optionally the location of the data schema under which the contents of that container is to be interpreted.

The mechanisms provided by XMLSchema [XMLSchema] are used for that purpose.

5.3.1   Generic GSSM Request

A generic GSSM request is defined as follows:

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
          xmlns="urn:oma:xml:gssm:queries:1.0"
          targetNamespace="urn:oma:xml:gssm:queries:1.0">

    <xs:complexType name="GenericRequestType">
        <xs:sequence>
            <xs:element name="access">
```

```
                    <xs:simpleType>
                        <xs:restriction base="xs:string">
                            <xs:enumeration value="get"/>
                            <xs:enumeration value="set"/>
                        </xs:restriction>
                    </xs:simpleType>
                </xs:element>
                <xs:element name="params" type="xs:anyType"/>
            </xs:sequence>
        </xs:complexType>

    <xs:element name="GSSMRequest" type="GenericRequestType"/>
</xs:schema>
```

Such generic GSSM Request is a request that defines the characteristic of the operation (GET, SET) in the MANDATORY `access` element and allows carrying any set of parameters in the MANDATORY `params` element. Using the `xsi:type` construct from XML Schema instance, the identifier and optionally the location of an XML Schema can be associated with the `params` element to define its structure. For GSSM 1.0 structures, these definitions can be found in sections 5.3.3 and 5.3.4.

5.3.2   Generic GSSM Response

A generic GSSM response is defined as follows:

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
           xmlns="urn:oma:xml:gssm:queries:1.0"
           targetNamespace="urn:oma:xml:gssm:queries:1.0">

    <!-- Generic GSSM Response -->
    <!-- a response with any set of parameters which may be instantiated -->
    <!-- allows naming and optionally referencing a schema for params via xsi:type and
schemaLocation mechanisms of XML -->
    <!-- params may be missing in error case -->
    <xs:complexType name="GenericResponseType">
        <xs:sequence>
            <xs:element name="resultCode" type="xs:integer"/>
            <xs:element name="resultText" type="xs:string" minOccurs="0"/>
            <xs:element name="params" type="xs:anyType" minOccurs="0"/>
        </xs:sequence>
    </xs:complexType>

    <xs:element name="GSSMResponse" type="GenericResponseType"/>
</xs:schema>
```

Such generic GSSM Response is a response that describes the result of the operation in the MANDATORY `resultCode` and OPTIONAL `resultText` elements. It allows carrying any set of parameters in the OPTIONAL `params` element which MAY be omitted in error cases or if no information needs to be returned in addition to the result code. The structure of the data inside the `params` element is defined in analogy with that in the request.

5.3.3   General OMA GSSM 1.0 Data Sructures

So far, the generic framework defined does not make any statement about data structures. This section defines the basic structures to which all OMA GSSM 1.0 related messages on GSSM-1 and GSSM-2 have to adhere.

Any request and response MUST include a request ID which is used to uniquely identify the request and associated response in an ongoing session. Therefore, the requestor is responsible for creating IDs that are unique within an ongoing session, and

the Server MUST echo the requestID in the associated response(s). The `AbstractGSSMRequestResponseType` below defines the `requestID` for all requests and responses.

Further, to identify its originator, each request MUST include a `requestorID` for which OPTIONALLY also a `type` attribute can be given. This is modelled by the `StringWithIDType` and `AbstractGSSMRequestType` type declarations below. The `NameValuePairType` type provides a structure to pass additional deployment-specific information.

Actual GSSM requests and responses are modelled by deriving from the types `AbstractGSSMRequestResponseType` (for responses) and `AbstractGSSMRequestType` (for requests). Also, for requests that modify data ("set" access), a derived type MUST include a string element named "operation" that defines the actual operation to be performed, and MUST specify a name (or a set of names) for the operation (or set of operations).

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
           xmlns="urn:oma:xml:gssm:queries:1.0"
          targetNamespace="urn:oma:xml:gssm:queries:1.0">

    <xs:complexType name="AbstractGSSMRequestResponseType" abstract="true">
        <xs:sequence>
            <xs:element name="requestID" type="xs:string"/>
        </xs:sequence>
    </xs:complexType>


    <xs:complexType name="AbstractGSSMRequestType" abstract="true">
        <xs:complexContent>
            <xs:extension base="AbstractGSSMRequestResponseType">
                <xs:sequence>
                    <xs:element name="requestorID" type="StringWithIDType"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>


    <xs:complexType name="StringWithIDType">
        <xs:simpleContent>
            <xs:extension base="xs:string">
                <xs:attribute name="type" type="xs:string" use="optional"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>

    <xs:complexType name="NameValuePairType">
            <xs:attribute name="name" use="required"/>
            <xs:attribute name="value" use="required"/>
    </xs:complexType>

</xs:schema>
```

5.3.4   Illustration of using the framework (Informative)

For the GSSM-1 and GSSM-2 interfaces, types will be derived from the two abstract types `AbstractGSSMRequest-ResponseType` and `AbstractGSSMRequestResponseType`. The namespace and identifier of these types are referenced using xsi:type in the `params` element of the generic GSSM request and response in order to define the structure of that element, like in the following example:

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
    xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns="urn:oma:xml:gssm:gssm1:1.0"
    targetNamespace="urn:oma:xml:gssm:gssm1:1.0">

    <xs:complexType name="AccessRequestType">
        <xs:complexContent>
            <xs:extension base="gssm:AbstractGSSMRequestType">
                <xs:sequence>
                    <xs:element name="userID" type="gssm:StringWithIDType"/>
                    <xs:element name="serviceID" type="xs:string" minOccurs="0"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
</xs:schema>
```

The type `gssm1:AccessRequestType` is defined as a derived type based on AbstractGSSMRequestType to inherit the fields that are common to all requests, and adds the mandatory field userID and the optional field serviceID which are specific to Access requests. This type defines the structure of the `params` element for Access requests.

```
<gssm:GSSMRequest xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm1="urn:oma:xml:gssm:gssm1:1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="urn:oma:xml:gssm:gssm1:1.0
                        http://www.openmobilealliance.org/tech/profiles/gssm_gssm1-v1_0.xsd">

    <access>get</access>
    <params xsi:type="gssm1:AccessRequestType">
        <requestID>ABCD-4711-0815</requestID>
        <requestorID type="component">SMSC23</requestorID>
        <userID type="msisdn">+491733081234</userID>
    </params>
</gssm:GSSMRequest>
```

The `xsi:type` attribute declares the type of the `params` element and therefore defines its structure for this particular request, based on the definition of `gssm1:AccessRequestType`. The optional `xsi:schemaLocation` attribute allows specifying a link to the data schema, which is not needed if the definition of `gssm1:AccessRequestType` is known to both Server as well as requestor.

5.4   GSSM-1 Interface

5.4.1   Overview

The GSSM-1 interface allows the Subscription Management Requestor to request a management function from the Subscription Management Component. The GSSM-1 interface supports the following functions:

- Access subscription profile

- Subscribe service

- Unsubscribe service

- Suspend subscription

- Resume subscription

- Change parameters of an existing subscription.

The protocol on this interface is essentially a request-response protocol that carries user/subscriber/service identity in the request, and the result (result code and a list of zero or more profile(s)) in the response. The subscription management request message can include:

- o Identity of the Subscription Management Requestor.

- o Identity of the subscriber of the service subscription

- o Identity of user(s) of the service subscription

- o Identifier/descriptor of the service

- o Subscription specific parameters, e.g. service delivery time, preferred service delivery method(s).

- o Subscription activation time

- o Subscription expiry time/subscription duration

The following figure specifies the flow of subscription management (e.g. subscribing to a service, un-subscribing from a service, changing an existing subscription, etc.).
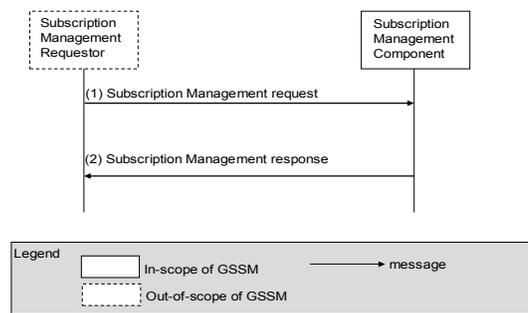
Figure 1: Subscription Management

Description:

1) The Subscription Management Requestor uses the GSSM-1 interface to send a request for subscription management to the Subscription Management Component;

2) A response for the subscription management is returned from the Subscription Management Component to the Subscription Management Requestor.

The approach to the specification of GSSM-1 is the following: this section provides an abstract, implementation neutral specification of the GSSM-1 messages based on XML. That is, it specifies only the GSSM-1 request and response message parameters based on the generic framework in section 5.3, but not the request-response protocol used to transfer these.

5.4.2   GSSM-1 Requests and Responses

A GSSM-1 request can be used to request listings of subscription profiles, or for subscribing , unsubscribing or modifying these. GSSM-1 requests and responses are specializations of the generic GSSM request and response data structures defined in section 5.3.3.

The following operations are defined by the following XML Schema type definitions:

- Access (Access Request/Response Type, „get" access)

- Subscribe (Subscribe Request/Response Type, „set" access, „subscribe" operation)

- Unsubscribe (SubscriptionTimeChange Request/Response Type, „set" access, „unsubscribe" operation)

- Suspend (SubscriptionTimeChange Request/Response Type, „set" access, „suspend" operation)

- Resume (SubscriptionTimeChange Request/Response Type, „set" access, „resume" operation)

- Modify (SubscriptionModify Request/Response Type, „set" access, „modify" operation)

The `resultCode` element in the response provides the requestor with information about the status of the response. The `resultCode` element SHALL contain one of the GSSM-1 result codes listed in section 5.6 as valid for this interface.

5.4.2.1   Access Operation

The "ACCESS" operation can be used to request access to the Subscription profile with the access parameters.

For the request, the following operation-specific parameters are specified: the MANDATORY `userID` identifies the user of the service, and the OPTIONAL `type` attribute defines the type of this identity, e.g. "Mobile", "PHS", "PSTN", "Group". The OPTIONAL `serviceID` defines the identity of the service (or a list of service identities). If this item is omitted, this means that listing of all the subscription profiles of the user is requested; otherwise, listing of only the profile(s) of the appointed service(s) is requested.

The structure of the `parameters` element in the **GSSMRequest** for "ACCESS" is defined below, and the `access` element SHALL be set to "`get`".

```
<xs:complexType name="AccessRequestType">
    <xs:complexContent>
        <xs:extension base="gssm:AbstractGSSMRequestType">
            <xs:sequence>
                <xs:element name="userID" type="gssm:StringWithIDType"/>
                <xs:element name="serviceID" type="xs:string" minOccurs="0"
                            maxOccurs="unbounded"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
```

For the response, the following operation-specific parameters are specified. Zero or more `subscriptionProfile` elements MAY be included in the response, each containing the following fields. The MANDATORY `subscriberID` defines the identity of the subscriber. It MAY have a `type` attribute identifying the type of ID, e.g. MSISDN. The MANDATORY `userID` defines the identity of the service user. It MAY also have a `type` attribute. The MANDATORY `serviceID` is a string identifying the service, and the MANDATORY `status` field is a string describing the current status of the subscription, e.g. active, suspended, etc. The MANDATORY `subscribeTime` specifies the time when the requestor initiated the subscription operation. The MANDATORY `activationTime` specifies the time when the subscription took effect. The OPTIONAL `expiryTime` specifies the time when the subscription expires, if any. The OPTIONAL `suspendTime` specifies the time when the subscription relationship was suspended, if applicable. The OPTIONAL `resumeTime` specifies the time when the suspended subscription relationship was resumed, if applicable. Further, a list of zero or more name-value pairs MAY be given as `privateData` parameters. Those private data could include service specific subscription parameters, e.g. service delivery time or preferred service delivery method(s).

The structure of the `parameters` element in the **GSSMResponse** for "ACCESS" is defined below.

```
<xs:complexType name="GSSM1SubscriptionProfileType">
    <xs:sequence>
        <xs:element name="subscriberID" type="gssm:StringWithIDType"/>
```

```
                <xs:element name="userID" type="gssm:StringWithIDType"/>
                <xs:element name="serviceID" type="xs:string"/>
                <xs:element name="status" type="xs:string"/>
                <xs:element name="subscribeTime" type="xs:dateTime"/>
                <xs:element name="activationTime" type="xs:dateTime"/>
                <xs:element name="expiryTime" type="xs:dateTime" minOccurs="0"/>
                <xs:element name="suspendTime" type="xs:dateTime" minOccurs="0"/>
                <xs:element name="resumeTime" type="xs:dateTime" minOccurs="0"/>
                <xs:element name="privateData" type="gssm:NameValuePairType" minOccurs="0"
                           maxOccurs="unbounded"/>
        </xs:sequence>
    </xs:complexType>

    <xs:complexType name="AccessResponseType">
        <xs:complexContent>
            <xs:extension base="gssm:AbstractGSSMRequestResponseType">
                <xs:sequence>
                    <xs:element name="subscriptionProfile" minOccurs="0"
                                maxOccurs="unbounded" type="GSSM1SubscriptionProfileType">
                    </xs:element>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
```

The following examples illustrate ACCESS request and ACCESS response.

```
<?xml version="1.0" encoding="UTF-8"?>
<gssm:GSSMRequest xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm1="urn:oma:xml:gssm:gssm1:1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <access>get</access>
    <params xsi:type="gssm1:AccessRequestType" >
        <requestID>ABCD-4711-0815</requestID>
        <requestorID type="component">SMSC23</requestorID>
        <userID type="msisdn">+491733081234</userID>
        <serviceID>dataservice</serviceID>
    </params>
</gssm:GSSMRequest>
<?xml version="1.0" encoding="UTF-8"?>
<gssm:GSSMResponse xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm1="urn:oma:xml:gssm:gssm1:1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <resultCode>200</resultCode>
    <params xsi:type="gssm1:AccessResponseType" >
        <requestID>ABCD-4711-0815</requestID>
        <subscriptionProfile>
            <subscriberID type="msisdn">+491733081234</subscriberID>
            <userID type="msisdn">+491733081234</userID>
            <serviceID>dataservice</serviceID>
            <status>active</status>
            <subscribeTime>2009-07-03T12:00:00</subscribeTime>
            <activationTime>2009-07-03T12:01:33</activationTime>
            <privateData name="inclusive_volume" value="20"/>
        </subscriptionProfile>
    </params>
</gssm:GSSMResponse>
```

5.4.2.2   Subscribe Operation

The "SUBSCRIBE"operation can be used to add a new subscription relationship for the subscriber (identified by subscriberID) to a service (identified by serviceID), so that the user (identified by userID) can use the service. Notice the

subscriber can or can not be be the same principal as the user. The user could be a single principal or a group as implied by the type attribute of userID.

The following paragraph describes the operation-specific "SUBSCRIBE" request parameters. The MANDATORY `subscriberID` represents the identity of the subscriber, e.g. the MSISDN. An OPTIONAL type attribute MAY be given to define the type of the ID. The MANDATORY `userID` describes the identity of the user, e.g. MSISDN or ID of the group. Again, an OPTIONAL `type` attribute MAY be given to define the type of the ID. The MANDATORY `serviceID` defines the identity of the service to be subscribed to. A list of zero or more name-value pairs MAY be given as `privateData` parameters. Those private data could include subscription specific parameters, e.g. service delivery time or preferred service delivery method(s).

The structure of the `parameters` element in the **GSSMRequest** for "SUBSCRIBE" is defined below, the `access` element SHALL be set to "`set`", and the `operation` element SHALL be set to "`subscribe`".

```
<xs:complexType name="SubscribeRequestType">
    <xs:complexContent>
        <xs:extension base="gssm:AbstractGSSMRequestType">
            <xs:sequence>
                <xs:element name="operation">
                    <xs:simpleType>
                        <xs:restriction base="xs:string">
                            <xs:enumeration value="subscribe"/>
                        </xs:restriction>
                    </xs:simpleType>
                </xs:element>
                <xs:element name="subscriberID" type="gssm:StringWithIDType"/>
                <xs:element name="userID" type="gssm:StringWithIDType"/>
                <xs:element name="serviceID" type="xs:string"/>
                <xs:element name="privateData" type="gssm:NameValuePairType"
                            minOccurs="0" maxOccurs="unbounded"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
```

The following paragraph describes the operation-specific "SUBSCRIBE" response parameters. The MANDATORY `activationTime` specifies the time when the subscription takes effect. The OPTIONAL `expiryTime` defines the time when the subscription will expire.

The structure of the `parameters` element in the **GSSMResponse** for "SUBSCRIBE" is defined below.

```
<xs:complexType name="SubscribeResponseType">
    <xs:complexContent>
        <xs:extension base="gssm:AbstractGSSMRequestResponseType">
            <xs:sequence>
                <xs:element name="activationTime" type="xs:dateTime"/>
                <xs:element name="expiryTime" type="xs:dateTime" minOccurs="0"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
```

The following examples illustrate SUBSCRIBE request and SUBSCRIBE response.

```
<?xml version="1.0" encoding="UTF-8"?>
<gssm:GSSMRequest xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm1="urn:oma:xml:gssm:gssm1:1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <access>set</access>
    <params xsi:type="gssm1:SubscribeRequestType" >
        <requestID>ABCD-4711-0815</requestID>
        <requestorID type="component">SMSC23</requestorID>
```

```
            <operation>subscribe</operation>
            <subscriberID type="msisdn">+491733081234</subscriberID>
            <userID type="msisdn">+491733081234</userID>
            <serviceID>dataservice</serviceID>
        </params>
</gssm:GSSMRequest>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<gssm:GSSMResponse xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm1="urn:oma:xml:gssm:gssm1:1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <resultCode>200</resultCode>
    <params xsi:type="gssm1:SubscribeResponseType">
        <requestID>ABCD-4711-0815</requestID>
        <activationTime>2009-07-03T20:00:00</activationTime>
    </params>
</gssm:GSSMResponse>
```

5.4.2.3   Unsubscribe / Suspend / Resume Operations

The operations "UNSUBSCRIBE", "SUSPEND" and "RESUME" are very similar as they provide a time from which on the subscription status is requested to be changed (OPTIONAL `time` field), and receive an acknowledgement of that time (or a modified time) in the response. If the `time` field is missing in the request then it is assumed that the operation is requested to take immediate effect. All three operations are described therefore by the same structure, distinguished by the value of the `operation` field in the request and by the name of the time field returned in the response.

The structure of the `parameters` element in the **GSSMRequest** for "UNSUBSCRIBE", "SUSPEND", "RESUME" is defined below, the `access` element SHALL be set to "set", and the `operation` element SHALL be set to one of "unsubscribe", "suspend", "resume".

```
    <xs:complexType name="SubscriptionTimeChangeRequestType">
        <xs:complexContent>
            <xs:extension base="gssm:AbstractGSSMRequestType">
                <xs:sequence>
                    <xs:element name="operation">
                        <xs:simpleType>
                            <xs:restriction base="xs:string">
                                <xs:enumeration value="unsubscribe"/>
                                <xs:enumeration value="suspend"/>
                                <xs:enumeration value="resume"/>
                            </xs:restriction>
                        </xs:simpleType>
                    </xs:element>
                    <xs:element name="subscriberID" type="gssm:StringWithIDType"/>
                    <xs:element name="userID" type="gssm:StringWithIDType"/>
                    <xs:element name="serviceID" type="xs:string" minOccurs="0"
                                maxOccurs="unbounded"/>
                    <xs:element name="time" type="xs:dateTime" minOccurs="0"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
```

The "UNSUBSCRIBE" operation request can be used to delete an existing subscription relationship. The "SUSPEND" operation is different – it doesn't delete the subscription relationship, but changes the status of the relationship to "suspended" such that the user can't use the service until the subscription relationship is resumed. The "RESUME" operation request can be used to change the status of an existing suspended subscription to "resumed" in order to allow the user to be able to use the service again.

All three operations have the same set of parameters. They modify the status of subscriptions of a requesting subscriber (defined by `subscriberID`) to one or more services (identified by the instance(s) of `serviceID`) or to all the services (no `serviceID` given) for a user (defined by `userID`) effective at the time specified by the `time` field or immediately (no `time` field given). A type attribute MAY be assigned to `subscriberID` and `userID` in order to determine the type of the identifier. Notice that the requesting subscriber can or can not be the same principal as the user. When the requesting subscriber is different from the user, the requesting subscribed MUST be the same principal as the subscriber who originally subscribed to the service. If the requesting subscriber is the same principal as the user and not the principal who originally subscribed, it SHOULD be determined by the operator policy or the subscriber's preference whether the requested modification is allowed. The user could be a single principal or a group which could be identified by the `type` attribute of `userID`.

The structure of the `parameters` element in the **GSSMResponse** for "UNSUBSCRIBE", "SUSPEND", "RESUME" is defined below. The `expiryTime` element SHALL be returned in case of the "UNSUBSCRIBE" operation, the `suspend-EffectiveTime` element in case of the "SUSPEND" operation and the `resumeEffectiveTime` in case of the "RESUME" operation.

```xml
<xs:complexType name="SubscriptionTimeChangeResponseType">
    <xs:complexContent>
        <xs:extension base="gssm:AbstractGSSMRequestResponseType">
            <xs:choice>
                <xs:element name="expiryTime" type="xs:dateTime"/>
                <xs:element name="suspendEffectiveTime" type="xs:dateTime"/>
                <xs:element name="resumeEffectiveTime" type="xs:dateTime"/>
            </xs:choice>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
```

The following examples illustrate SUSPEND request and SUSPEND response.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<gssm:GSSMRequest xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm1="urn:oma:xml:gssm:gssm1:1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <access>set</access>
    <params xsi:type="gssm1:SubscriptionTimeChangeRequestType" >
        <requestID>ABCD-4711-0815</requestID>
        <requestorID type="component">SMSC23</requestorID>
        <operation>suspend</operation>
        <subscriberID type="msisdn">+491733081234</subscriberID>
        <userID type="msisdn">+491733081234</userID>
        <serviceID>dataservice</serviceID>
    </params>
</gssm:GSSMRequest>
```

```xml
<?xml version="1.0" encoding="UTF-8"?>
<gssm:GSSMResponse xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm1="urn:oma:xml:gssm:gssm1:1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <resultCode>200</resultCode>
    <params xsi:type="gssm1:SubscriptionTimeChangeResponseType" >
        <requestID>ABCD-4711-0815</requestID>
        <suspendEffectiveTime>2009-07-03T20:00:00</suspendEffectiveTime>
    </params>
</gssm:GSSMResponse>
```

5.4.2.4 Modify Operation

The "MODIFY" operation request can be used to change the existed subscription relationship's preference settings for the user when using a service. The three MANDATORY parameters `subscriberID`, `userID` and `serviceID` are the same as described in the previous section. For the identified subscription of the identified service, the preferences are given as one or more attribute-value pairs signaled in the `privateData` element.

The structure of the `parameters` element in the **GSSMRequest** for "MODIFY" is defined below, the `access` element SHALL be set to "`set`", and the `operation` element SHALL be set to "`modify`".

```
<xs:complexType name="SubscriptionModifyRequestType">
    <xs:complexContent>
        <xs:extension base="gssm:AbstractGSSMRequestType">
            <xs:sequence>
                <xs:element name="operation">
                    <xs:simpleType>
                        <xs:restriction base="xs:string">
                            <xs:enumeration value="modify"/>
                        </xs:restriction>
                    </xs:simpleType>
                </xs:element>
                <xs:element name="subscriberID" type="gssm:StringWithIDType"/>
                <xs:element name="userID" type="gssm:StringWithIDType"/>
                <xs:element name="serviceID" type="xs:string"/>
                <xs:element name="privateData" type="gssm:NameValuePairType"
                            maxOccurs="unbounded"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
```

The structure of the `parameters` element in the **GSSMResponse** for "MODIFY" is defined below. The `modificationEffectiveTime` element describes the time at which the requested modification takes effect.

```
<xs:complexType name="SubscriptionModifyResponseType">
    <xs:complexContent>
        <xs:extension base="gssm:AbstractGSSMRequestResponseType">
            <xs:choice>
                <xs:element name="modificationEffectiveTime" type="xs:dateTime"/>
            </xs:choice>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>
```

The following examples illustrate MODIFY request and MODIFY response.

```
<?xml version="1.0" encoding="UTF-8"?>
<gssm:GSSMRequest xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm1="urn:oma:xml:gssm:gssm1:1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <access>set</access>
    <params xsi:type="gssm1:SubscriptionModifyRequestType" >
        <requestID>ABCD-4711-0815</requestID>
        <requestorID type="component">SMSC23</requestorID>
        <operation>modify</operation>
        <subscriberID type="msisdn">+491733081234</subscriberID>
        <userID type="msisdn">+491733081234</userID>
        <serviceID>dataservice</serviceID>
        <privateData name="inclusive_volume" value="200"/>
    </params>
</gssm:GSSMRequest>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<gssm:GSSMResponse xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm1="urn:oma:xml:gssm:gssm1:1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
    <resultCode>200</resultCode>
    <params xsi:type="gssm1:SubscriptionModifyResponseType" >
        <requestID>ABCD-4711-0815</requestID>
        <modificationEffectiveTime>2009-07-03T20:00:00</modificationEffectiveTime>
    </params>
</gssm:GSSMResponse>
```

5.5   GSSM-2 Interface

5.5.1   Overview

The GSSM-2 interface is the data access interface for subscription profile based on a template. The GSSM-2 interface allows the the Subscription Profile Requestor to request subscription profile from the Subscription Profile Component. The template is given as an XML Schema complex type.

The protocol on this interface is essentially a request-response protocol that carries conditions of the data request (e.g. user identity, service identity) and a profile data template (either a profile data template definition or a profile data template ID as reference) in the request, and the result of a list of zero or more subscription profile(s) in the response.

The following Figure specifies the flow of request subscription profile.
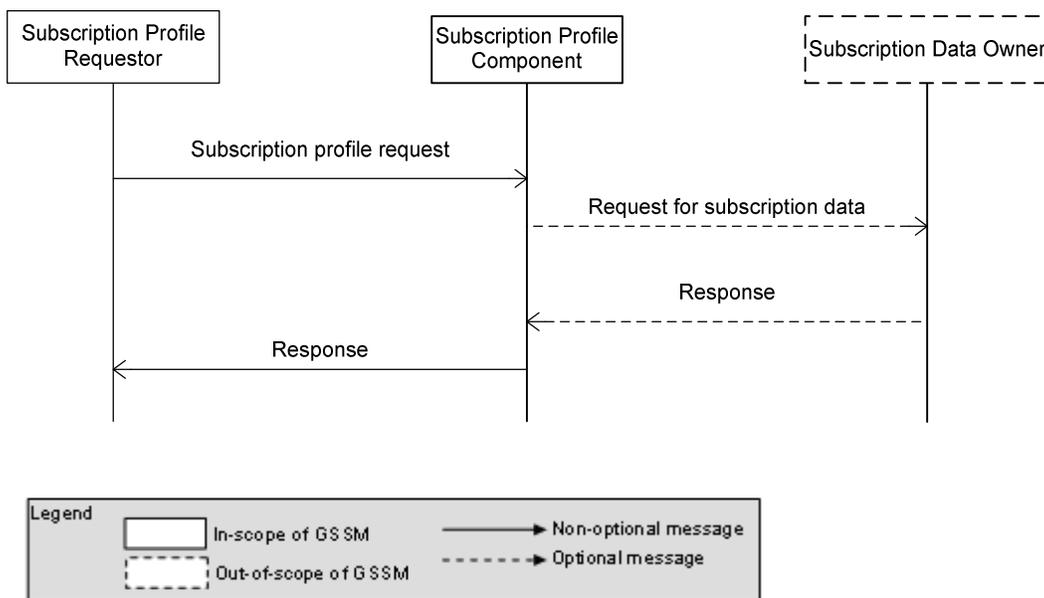
Figure 2: Subscription Profile

Description:

   1)   The Subscription Profile Requestor uses GSSM-2 interfaces to send a request for subscription profile to the GSSM Subscription Profile Component;

   2)   The GSSM Subscription Profile Component requests the subscription profile from the Subscription Data Owner;

   3)   Subscription Data Owner returns the response to the GSSM Subscription Profile Component;

    4) A response for the subscription profile is returned from the Subscription Profile Component to the Subscription Profile Requestor.

The approach to the specification of GSSM-2 is the following: this section provides an abstract, implementation neutral specification of the GSSM-2 messages. That is, it specifies only the GSSM-2 request and response messages but allows arbitrary response data structures to be described by the use of XML Schema.

This section uses XML Schema as defined in [XMLSchema].

The GSSM-2 protocol is an application level protocol with two types of messages: request and response. It is based on the generic GSSM messages as specified in section 5.3.

The following paragraphs specify the GSSM-2 request and response structures in detail.

5.5.2   GSSM-2 Request

A GSSM-2 request can be used to request lists of subscription profiles. The GSSM-2 request carries a request ID, conditions of the data request and a profile data template.

The XML Schema fragment definition of the GSSM-2 request parameters is given below. It defines the structure of the `params` element in the generic GSSM Request as defined in section 5.3.1 and extends the GSSM-1 Access Request by the additional option of defining a template for the response.

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
    xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm1="urn:oma:xml:gssm:gssm1:1.0"
    xmlns="urn:oma:xml:gssm:gssm2:1.0"
    targetNamespace="urn:oma:xml:gssm:gssm2:1.0">

    <!-- GSSM2 Request  -->
    <xs:complexType name="SubscriptionProfileRequestType">
        <xs:complexContent>
            <xs:extension base="gssm1:AccessRequestType">
                <xs:sequence>
                    <xs:choice>
                        <xs:element name="templateID" type="xs:string"/>
                        <xs:element ref="xs:complexType"/>
                    </xs:choice>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
</xs:schema>
```

The following informative example illustrates a possible request instance. This instance declares three fields to be included into the response: a `serviceName` field of type `string`, a `subscriptionStart` field of type `dateTime` and a `subscriptionStatus` field of a user-defined type that can only assume the two values "active" and "suspended".

```
<?xml version="1.0" encoding="UTF-8"?>
<gssm:GSSMRequest xmlns:gssm2="urn:oma:xml:gssm:gssm2:1.0"
    xmlns:xs="http://www.w3.org/2001/XMLSchema"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xmlns:gssm="urn:oma:xml:gssm:queries:1.0">

    <access>get</access>
    <params xsi:type="gssm2:SubscriptionProfileRequestType">
        <requestID>ABCD-4711-0815</requestID>
        <requestorID type="component">SMSC23</requestorID>
```

```
            <userID type="msisdn">+491733081234</userID>
        <xs:complexType name="theTypeOfTheResponseEntry">
            <xs:sequence>
                <xs:element  name="serviceName" type="string"/>
                <xs:element  name="subscriptionStart" type="dateTime"/>
                <xs:element  name="subscriptionStatus">
                    <xs:simpleType>
                        <xs:restriction>
                            <xs:enumeration value="active"/>
                            <xs:enumeration value="suspended"/>
                        </xs:restriction>
                    </xs:simpleType>
                </xs:element>
            </xs:sequence>
        </xs:complexType>
    </params>
</gssm:GSSMRequest>
```

The requestID element is used to uniquely identity each request. The request ID is created by the requestor and MUST be unique during the whole session between the GSSM requestor and the GSSM server. In each response, the GSSM Server MUST echo the ID that has been passed in the according request.

The requestID element is followed by conditions of the data request, i.e. a requestor identifier, a user identifier and an OPTIONAL service identifier. Requestor identifier and user idenetifier MAY instantiate a type attribute.

The data template which determines the format of the response is either inlined as XML Schema complexType definition or referenced via a templateID element. The complexType definition defines the fields and the type of the elements in the subscription profile in the response, using the syntax and semantic of XML Schema [XMLSchema]. In order to create a valid XML instance this element MUST have a "name" attribute; however, the value of this attribute MAY be ignored by the SubscriptionProfileComponent. The template ID is used to uniquely identify a profile data template that has either been predefined or passed in an earlier request. The Server MAY cache a template that is passed in a request for a certain time. In **Error! Reference source not found.** there is an error code defined for the case that the templateID provided in the request does not match any template known to the server.

5.5.3   GSSM-2 Response

The GSSM-2 response contains a request ID, a result code, a template ID and a (possibly empty) vector of subscription profiles.

The GSSM-2 response is defined by the following XML Schema fragment, based on the basic framework defined in section 5.3.2.

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
    xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm1="urn:oma:xml:gssm:gssm1:1.0"
    xmlns="urn:oma:xml:gssm:gssm2:1.0"
    targetNamespace="urn:oma:xml:gssm:gssm2:1.0">


    <!-- GSSM2 Response  -->
    <xs:complexType name="SubscriptionProfileResponseType">
        <xs:complexContent>
            <xs:extension base="gssm:AbstractGSSMRequestResponseType">
                <xs:sequence>
                    <xs:element name="templateID" type="xs:string"/>
                    <xs:element name="subscriptionProfile" minOccurs="0"
                                maxOccurs="unbounded" type="xs:anyType"/>
                </xs:sequence>
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>
```

```
</xs:schema>
```

The following informative example illustrates a possible response instance, which matches the data template defined in the example instance above.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<gssm:GSSMResponse xmlns:gssm="urn:oma:xml:gssm:queries:1.0"
    xmlns:gssm2="urn:oma:xml:gssm:gssm2:1.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

    <resultCode>200</resultCode>
    <params xsi:type="gssm2:SubscriptionProfileResponseType">
        <requestID>ABCD-4711-0815</requestID>
        <templateID>smsc23.example.com/ABCD-4711-0815/1</templateID>
        <subscriptionProfile>
            <serviceName>MyBasicService</serviceName>
            <subscriptionStart>2006-10-19T12:00:00</subscriptionStart>
            <subscriptionStatus>active</subscriptionStatus>
        </subscriptionProfile>
        <subscriptionProfile>
            <serviceName>MyOtherService</serviceName>
            <subscriptionStart>2009-06-26T00:32:00</subscriptionStart>
            <subscriptionStatus>suspended</subscriptionStatus>
        </subscriptionProfile>
    </params>
</gssm:GSSMResponse>
```

The `requestID` element is used to refer to the corresponding request command for the response message. A response message MUST contain the same `requestID` value as the corresponding request.

The `resultCode` element provides the requestor with information about the status of the response. The `resultCode` element SHOULD contain one of the GSSM-2 result codes listed in section 5.6 as valid for this interface.

The `templateID` element is used to identify a data template. If the request message carries a `templateID`, the `templateID` value in the response MUST be equal with the `templateID` value in the corresponding request. If the request message carries a data template, the response message MUST contain a `templateID` with a value generated by the GSSM Subscription Profile Component.

In case the XML namespace identifier for gssm1 is passed as the template id (urn:oma:xml:gssm: gssm2:1.0), the subscriptionProfile element(s) in the response SHALL have the same structure as defined in section 5.4.2.1 for the complex type GSSM1SubscriptionProfileType.

The list of subscriptionProfile elements contains the corresponding subscription profiles (zero or more) returned to the requestor. The subscription profile entries MUST match the criteria given in the condition element in the request, and MUST be formatted according to the used data template referenced or embedded in the request.

5.6   GSSM Result Codes and Error Messages

GSSM specifies result codes to be returned in responses, plus optional message texts conveying the meaning of the codes. The table below lists all code standardized for the GSSM Enabler, and indicates for which interfaces they are valid.

Note that for the interface GSSM.PEM-2, result codes are defined by [PEM2-TS], and no additional codes are introduced in this specification.

Code	Message	Applicable for Interface		
		GSSM.PEM-1	**GSSM-1**	**GSSM-2**
200	OK	X	X	X
201-210	(reserved, or in scope of HTTP)			

Table 1: GSSM result codes indicating normal operation (normative)

Code	Message	Applicable for Interface		
		GSSM.PEM-1	**GSSM-1**	**GSSM-2**
400	Bad request	X	X	X
401-439	(reserved, or in scope of HTTP)			
440	Requestor type is invalid	X	X	X
441	Requestor ID is invalid	X	X	X
442	Subscriber type is invalid	X	X	
443	Subscriber ID is invalid	X	X	
444	User type is invalid		X	X
445	User ID is invalid		X	X
446	Service ID is invalid	X	X	X
447	Service-specific information is invalid	X		
448	Bad data template			X
449	Bad template ID			X

Table 2: GSSM result codes indicating client errors (normative)

Code	Message	Applicable for Interface		
		GSSM.PEM-1	**GSSM-1**	**GSSM-2**
500	Server error	X	X	X
501-549	(reserved, or in scope of HTTP)			
550	Service doesn't exist	X	X	
551	Service status is abnormal	X	X	
552	Subscription doesn't exist	X	X	
553	Subscription is suspended	X		
554	Subscription status is abnormal	X	X	
555	Subscriber doesn't exist		X	
556	Subscriber's status is abnormal		X	
557	User doesn't exist	X	X	
558	User's status is abnormal	X	X	
559	Out of credit	X	X	
560	The operator policy denies this service usage	X		
561	Server does not support requested data template			X
562	No data template matching template ID			X
563	Request denied		X	

Table 3: GSSM result codes indicating server errors (normative)

Appendix A.   History   (Informative)

A.1   Approved Version History

Reference	Date	Description
n/a	n/a	No prior version –or- No previous version within OMA

A.2   Draft/Candidate Version 1.0 History

Document Identifier	Date	Sections	Description
Draft Versions OMA-TS-GSSM-V1_0	08 Oct 2008		Initial draft of baseline TS; OMA-ARC-GSSM-2008-0055-INP_GSSM_TS_baseline_for_review
	12 Nov 2008		See: OMA-ARC-GSSM-2008-0073R01-INP_PEM_2_Interface OMA-ARC-GSSM-2008-0074R02-INP_PEM_1_Interface
	05 Dec2008		See： OMA-ARC-GSSM-2008-0083R03-INP_Proposal_TS_Sections_1_2_3_and_4
	08 Jan 2009		See： OMA-ARC-GSSM-2008-0090-CR_Fixing_TS OMA-ARC-GSSM-2008-0078R05-INP_Change_PEM_1_Template_XML_Schema OMA-ARC-GSSM-2008-0087R01-INP_Definitions OMA-ARC-GSSM-2008-0094-INP_SCR
	24 Feb 2009		See: OMA-ARC-GSSM-2008-0071R02-INP_GSSM_1_Interface_Draft_Definition
	10 Apr 2009		Some minor changes: Yellow guidance boxes from the TS Template are removed/addressed throughout the document; Editor notes on ABNF and LA DST are removed; Change PEM-1 and PEM-2 to GSSM.PEM-1 and GSSM.PEM-2;
	15 Jun 2009		See： OMA-ARC-GSSM-2009-0012R01-CR_Fixing_TS_Error_Codes OMA-ARC-GSSM-2009-0018-CR_XML_fixes_GSSM_TS
	22 Jul 2009		Implemented CRs OMA-ARC-GSSM-2009-0031R01-CR_GSSM1_Interface_Proposal_XML OMA-ARC-GSSM-2009-0030R01-INP_GSSM2_Interface_Proposal_XML Clerical changes (Cross references etc.)
	04 Sep 2009	5.4.1 5.4.2.3	Implemented agreed changes: OMA-ARC-GSSM-2009-0036R01-CR_Resolution_for_ZTE_Comments_on_TS_Section_5.4.1 OMA-ARC-GSSM-2009-0040-CR_Clarification_on_definition_of_data_schemas_closing_B004 Editorial fixes: 2009 copyright History table Cross-references added

Document Identifier	Date	Sections	Description
	24 Sep 2009	2.1 5 5.1.1 1	Implemented agreed changes: OMA-ARC-GSSM-2009-0041R01-CR_Making_Error_Codes_consistent_closing_C027_C028_C0037_C0038 OMA-ARC-GSSM-2009-0044-CR_Resolution_for_CONR_Comments_on_TS_Section_5.1.1. OMA-ARC-GSSM-2009-0046-CR_clerical_XML_syntax_fix Implemented resolution ofcomments from OMA-CONRR-GSSM-V1_0-20090921-D: • C001/C006 • C008/C013 • C016 • C018/C026 • C028/C031 • C036 • C039/C040 • C042 • C047/C048 • C050-C052
	25 Sep 2009	3.3 5.1 5.3.1 5.5.1	Implemented resolution ofcomments from OMA-CONRR-GSSM-V1_0-20090921-D • C008 • C014 • C017 • C041 • C033
Candidate Version: OMA-TS-GSSM-V1_0	22 Oct 2009	All	Status changed to Candidate by TP: OMA-TP-2009-0488-INP_GSSM_V1_0_ERP_for_Candidate_Approval

Appendix B.   Static Conformance Requirements   (Normative)

B.1   SCR for GSSM.PEM-1 Client

GSSM.PEM-1 Client equivalents as Subscription Validation Requestor in the OMA GSSM Architecture, see [GSSM-AD] Fig. 1

Item	Function	Reference	Requirement
GSSM-PEM1-Client-C-001-M	Support for the PEM-1 interface [PEM1-TS]	5.1.1	
GSSM-PEM1-Client-C-002-M	Support Subscription validation request	[GSSM-AD] 5.4.3	
GSSM-PEM1-Client-C-003-M	Support Group Subscription Validation request	[GSSM-AD] 5.4.4	

B.2   SCR for GSSM.PEM-1 Server

GSSM.PEM-1 Server equivalents as Subscription Validation Component in the OMA GSSM Architecture, see [GSSM-AD] Fig. 1

Item	Function	Reference	Requirement
GSSM-PEM1-SUPPORT-S-001-M	Support for the PEM-1 interface [PEM1-TS]	5.1.1	
GSSM-PEM1-Server-S-001-M	Subscription validation response	5.1.1	
GSSM-PEM1-Server-S-002-M	Group Subscription validation response	5.1.1	

B.3   SCR for GSSM.PEM-2 Client

GSSM.PEM-2 Client equivalents as Validation Criteria Management Requestor in the OMA GSSM Architecture see [GSSM-AD] Fig. 1

Item	Function	Reference	Requirement
GSSM-PEM2-SUPPORT-C-001-M	Support for Validation Criteria request	[GSSM-AD] 5.3.4	

B.4   SCR for GSSM.PEM-2 Server

GSSM.PEM-2 Server equivalents as Subscription Validation Component in the OMA GSSM Architecture, see [GSSM-AD] Fig. 1

Item	Function	Reference	Requirement
GSSM-PEM2-SUPPORT-C-001-M	Support for management of validation criteria	[GSSM-AD] 5.3.4	

B.5   SCR for GSSM-1 Client

GSSM GSSM-1 Client equivalents as Subscription Management Requestor in the OMA GSSM Architecture, see [GSSM-AD] Fig. 1

Item	Function	Reference	Requirement
GSSM-GSSM1-C-001-O	Support for subscription Modification request	[GSSM-AD] 5.4.5	
GSSM-GSSM1-C-002-	Support for un-	[GSSM-AD]	

Item	Function	Reference	Requirement
O	subscription request	5.4.6	

B.6   SCR for GSSM-1 Server

GSSM GSSM-1 Server equivalents as Subscription Management Component in the OMA GSSM Architecture, see [GSSM-AD] Fig. 1

Item	Function	Reference	Requirement
GSSM-GSSM1-S-001-O	Support for subscription Modification request	[GSSM-AD] 5.4.5	
GSSM-GSSM1-S-002-O	Support for un-subscription request	[GSSM-AD] 5.4.6	

B.7   SCR for GSSM-2 Client

GSSM GSSM-2 Client equivalents as Subscription Profile Requestor in the OMA GSSM Architecture, see [GSSM-AD] Fig. 1

Item	Function	Reference	Requirement
GSSM-GSSM2- CLIENT-C-001-O	Support for subscription Profile Request	[GSSM-AD] 5.4.4	

B.8   SCR for GSSM-2 Server

GSSM GSSM-2 Client equivalents as Subscription Profile Component in the OMA GSSM Architecture, see [GSSM-AD] Fig. 1

Item	Function	Reference	Requirement
GSSM-GSSM2- Server-S-001-M	Support for subscription Profile Request response	[GSSM-AD] 5.4.4	