Technical Specification Group Services and System Aspects
Meeting #19, Birmingham, UK, 17-20 March 2003

TSGS#19(03)0041

Source:	**SA5 (Telecom Management)**
Title:	**Draft Rel-6 TS 32140 v200 Telecommunication management; Services operations management; Subscription management requirements**
Document for:	**Approval**
Agenda Item:	**7.5.3**

Presentation of Technical Specification to TSG SA

Presentation to:	**TSG SA Meeting #19**
Document for presentation:	**TS 32.140, Version 2.0.0** **Subscription Management Requirements**
Presented for:	**Approval**

Abstract of document:

This Technical specification defines the requirements for Subscription Management (SM).

Subscription Management

is a feature that permits Service Providers, Value Added Service Providers, and Mobile Operators to provision services for a specific subscriber.
This TS provides supporting information for future SM needs, e.g. B2B trading. However, for pragmatic reasons the scope of Rel-6 has been restricted.
SM is necessary to allow Service Providers and Operators to provision, control, monitor and bill the configuration of services that they offer to their subscribers.
SM focuses on the OAM processes to manage subscription information. These correspond to the 'Fulfillment' Process areas of the TeleManagement Forum Telecom Operations Map.
SM is an area of Service Operation Management that sets a complex challenge for Service Providers and Operators in their support of new or existing subscribers during their every day network operation.

Release 6 Scope

The present document is oriented towards a standardized interface into the Home Subscriber Server (HSS) in order that services can be provisioned and maintained.
The present document includes information applicable to Network Operators, content providers, and terminal and network manufacturers.
The present document contains the core requirements for Subscription Management, which are sufficient to provide management services.
The method by which applications subscribe to Open Services Access (OSA) is not within the scope of the present document.

Outstanding Issues:

Contentious Issues:

None.

3GPP TS 32.140 V2.0.0 (2003-03)

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; Services operations management; Subscription management requirements (Release 6)

Keywords
UMTS, service, Telecomm Management

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

Introduction

Subscription Management is a feature that permits Service Providers, Value Added Service Providers and Mobile Operators to provision services for a specific subscriber. The feature is necessary to allow Service Providers and Operators to provision, control, monitor and bill the configuration of services that they offer to their subscribers. Subscription Management focuses on the OAM processes to manage subscription information. These correspond to the 'Fulfillment' Process areas of the TeleManagement Forum Telecom Operations Map [3].

Subscription Management is an area of Service Operation Management that sets a complex challenge for Service Providers and Operators in their support of new or existing subscribers during their every day network operation.

In 2G solutions the main repository of the subscription information is in the Home Locations Register (HLR). However the management and administration interfaces for controlling this information is proprietary to each vendor. The use of proprietary interfaces is inconvenient for those Operators using multiple vendors' equipment since their provisioning systems have to accommodate multiple proprietary interfaces, which perform essentially identical functions. Moreover, it makes it more difficult to generate customer self care applications that allow subscribers to provision, and amend subscription data.

The 3G environment requires more complex service delivery mechanisms than in 2G and Subscription Management is no longer simply an internal matter for a single operator but a capability that is achieved by linking together features across multiple Service Providers and Operators Operations Support Systems (OSS). Historically, the services provided by Operators have been defined within standards groups such as ETSI or 3GPP. With the advent of Open Services Access (OSA) being adopted by 3GPP the User Service Definitions will be replaced by Service Capabilities traded amongst Service Providers and Network Operators. This will allow Operators and Service Providers to define customized service environments that roam with users as they move amongst networks - this is the Virtual Home Environment (VHE) 3GPP TR 22.121 [9]. This customized service environment means that subscription information is held in a number of locations including the Home Network, the Visited Network, the User Equipment, Application VASP Equipment (e.g. servers accessed by the subscriber for content and information based services) and the Operations Systems of the Service Providers, and Operators supporting the subscriber's service subscription.

Service delivery and support across multiple vendors' solutions and organizations is a feature of other industries, and the solutions adopted are secure supply chain solutions based upon mainstream e-commerce principles, methods and technologies.

There is a relationship between this feature and the PS Domain, CS Domain, IP Multimedia Subsystem (IMS), Authentication Center (AuC), Open Services Access (OSA) and Generic User Profile (GUP) documented in other 3GPP specifications.

Integration Reference Points (IRPs) are specified in separateTSs.

1 Scope

The present document defines the service requirements and high-level architecture for Subscription Management.

Subscription management is expected evolve in stages over several releases of 3GPP specifications.

The present document provides additional supporting material, which whilst not within the scope of this release, provides an insight towards the future evolution. This is in order that initial work may be done with an appreciation of the wider context expected in future releases of 3GPP specifications.

Subscription management for 3GPP is primarily concerned with the ability to define subscription profiles and associate the profile with subscribers, users and services that are authorized by agreements. The subscription profile may be used in the process of configuring various network resources (access and core) to make the service a reality for the user.

The management capabilities extend to the creation, modification, synchronization, and re application of subscription profiles.

The present document is oriented towards a standardized interface into the Home Subscriber Server (HSS) in order that services can be provisioned and maintained.

The present document includes information applicable to Network Operators, content providers, and terminal and network manufacturers.

The present document contains the core requirements for Subscription Management, which are sufficient to provide management services.

The method by which applications subscribe to OSA is not within the scope of the present document.

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*.

NOTE: The present document may contain references to pre-Release-5 specifications. These references shall be taken to refer to the Release 6 version where that version exists.

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

[2] 3GPP TS 23.002: "Network architecture (Release 5)".

[3] GB910 Telecom Operations Map v 2.1 (TeleManagement Forum).

[4] MWIF MTR-002 (Annex A): "Architecture requirements".

[5] ebXML Transport Routing and Packaging Overview and Requirements 26th May 2000 v0-96.

[6] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".

[7] 3GPP TS 23.008: "Organisation of subscriber data".

[8] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[9] 3GPP TR 22.121: "Service aspects; The Virtual Home Environment; Stage 1".

[10] 3GPP TS 29.198-3: "Open Service Access (OSA); Application Programming Interface (API); Part 3: Framework".

[11] 3GPP TS 22.240: "Service requirements for 3GPP Generic User Profile (GUP); Stage 1".

[12] 3GPP TS 23.240: "3GPP generic user profile requirements; Stage 2; Architecture

[13] 3GPP TS 23.241: "3GPP Generic User Profile (GUP) requirements; Stage 2; Data description framework".

[14] 3GPP TS 24.241: "3GPP Generic User Profile (GUP) requirements; Stage 3; Access; Common objects".

[15] 3GPP TS 22.041: "Operator Determined Call Barring".

[16] 3GPP TS 23.015: "Technical realisation of Operator Determined Barring (ODB)".

[17] 3GPP TS 32.102: "Telecommunication management; Architecture".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply:

actor: entity, party, person or organization playing one or more Roles

role: defined by a set of properties or attributes that describe the capabilities of an entity that can be performed on behalf of other Role(s)
An activity performed by an Actor. Each Actor can play many Roles.

subscriber: See 3GPP TR 21.905 [1].

service: See 3GPP TR 21.905 [1].

Integration Reference Point (IRP): See 3GPP TS 32.102 [17].

user: See 3GPP TR 21.905 [1].

Network Operator: See 3GPP TR 21.905 [1].

organization: 'legal entity' that may perform one or more 'business roles' when interacting with other Organizations

PLMN Operator: See 3GPP TR 21.905 [1].

retailer: organization that sells 3GPP User Equipment and Services to retail customers

Reseller Service Provider: Actor that resells Services provided and defined technically by another service provider
The reseller may re-brand the Service or offer a modified tariff package to its customers.

Service Profile (Sprof): A service specific subscription profile component.

Service Provider (SP): See 3GPP TR 21.905 [1].

Service Integrator: organization that takes a set of services from other providers and derives an end-to-end set of services
It has responsibility for the end to end service QoS to the Customer.

subscription: See 3GPP TR 21.905 [1].

Subscription management: set of capabilities that allow Operators, Service Providers, and indirectly subscribers, to provision, control, monitor the Subscription Profile

Subscription Profile: The set of data managed and stored by network domains and subsystems for the operation and execution of the services provided to subscribers

Subscription Profile Component: discrete subset of the Subscription Profile that may be stored or managed separately from other subsets e.g. components that may be stored in different domains, subsystems or replicated using different synchronization rules.

Value Added Service Provider (VASP): See 3GPP TR21.905 [1].

Trusted Third Party: organization that performs an agreed role on behalf of two or more other organizations (e.g. authentication, trust, market place services etc.)

3.2 Abbreviations

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

2G	Second Generation Mobile
3G	Third Generation Mobile
API	Application Programming Interface
ASP	Application Service Provider
AuC	Authentication Center
B2B	Business to Business
CS	Circuit Switch
DDM	Data Definition Method
EIR	Equipment Identity Register
GTT	Global Text Telephony
GUP	Generic User Profile
HLR	Home Location Register
HSS	Home Subscriber Server
IMS	IP Multimedia Subsystem
IRP	Integration Reference Point [17]
ISP	Internet Service Provider
MWIF	Mobile Wireless Internet Forum
NPDB	Number Portability Data Base
OAM	Operations, Administration and Maintenance
OSA	Open Services Access
OSS	Operations Support System
PS	Packet Switch
SLA	Service Level Agreement
SOM	Service Operation Management
SP	Service Provider
SuM	Subscription Management
TMN	Telecommunication Management Network
TR-IRP	Trading Partner IRP
TS	Technical Specification
UICC	Universal Integrated Circuit Card
USIM	Universal Subscriber Identity Module
VASP	Value Added Service Provider
VHE	Virtual Home Environment

4 General description

4.1 Subscription Management Concept

The 3G environment requires more complex service delivery mechanisms than in 2G. The following drivers are leading to a need to standardize Subscription Management Interfaces:

- Use of different vendor's equipment for 2G/2.5G and 3G.

- The trend in 2/2.5G toward the support of Virtual Network Operators and Content Providers requiring standardized interfaces amongst them.

Service delivery and support across multiple vendors' solutions and organizations is a feature of other industries, and the solutions are adopted are secure supply chain solutions based upon mainstream e-commerce principles, methods and technologies.

Subscription Management is an area of Service Operation Management that permits Service Providers and Operators to provision services for a specific customer service subscription.

Specific 3G areas that Subscription Management requirements must address are:

- Subscription information is distributed across in a number of locations including the Home Network, the Visited Network, the User Equipment, Application VASP equipment (e.g. servers accessed by the subscriber for content and information based services).
- Subscription Management will allow Service Providers and Operators to provision, control and monitor the subscription information.
- Subscription Management is not simply an internal matter for a single operator but a capability that is achieved by linking together features across multiple Operators' Operations Support Systems.
- Subscription Management will need to manage subscription information in e.g. the OSSs, HSS, UEM, OSA, AuC, and IMS subsystems.
- The common components between the Generic User Profile and the Subscription Profile.

The conceptual model for Subscription Management is illustrated in figure 1.

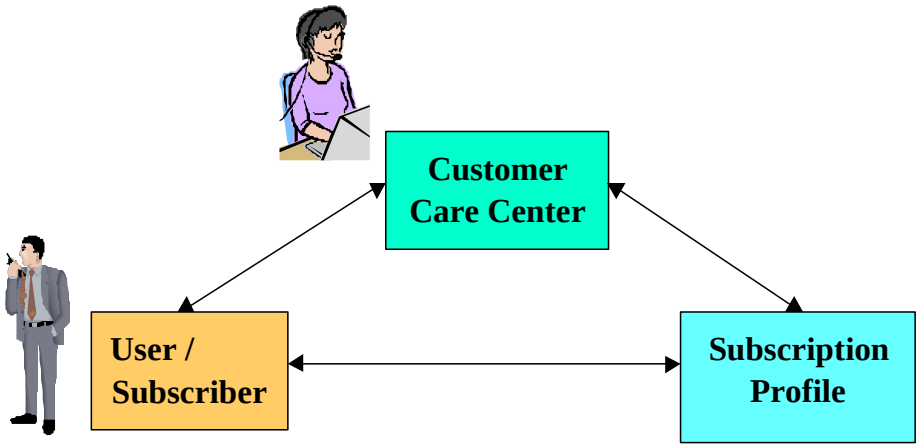

Figure 1: High level view of Subscription Management

Subscription Management is concerned with provisioning the Subscription Profile throughout all the systems and trading partners needed to realize the customer service, Subscription Management provides specifications that define the interfaces and the procedures that interconnect the three points of the subscription management triangle: Customer Care Center, the User and the network (s) where the Subscription Profile resides (such as HSS, USIM, etc.).

4.2 The partnership with the TMFs Telecom Operations Map

The TMF Telecom. Operations Map as defined in GB910 [3] provides a comprehensive framework for operating and running a network. The TOM model introduced the concept and flows of information through a Fulfillment Assurance and Billing (FAB) process. TOM also addresses the need to forecast growth and plan the network evolution and growth.

Subscription management, in particular the configuration of resources, aligns with subset of the TOM model in the area of fulfillment.

Table 1: Relationship between Subscription Management and the TMF TOM model GB 910 [3]

Functions within the TOM Fulfillment Process	Applicable to Subscription Management	Refer to the Telecom Operations Map (TOM) GB910 [3]; Fulfillment being depicted in figure 6.1 of TOM.
Sales Enquiry	**No**	Subscription management in release 6 does not extend to publishing the set of potential services or capabilities a subscriber can negotiate to use.
Order Handling (status and completion)	**No**	Supply chain management is not within the scope of Subscription management
Service Configuration	**Yes**	This extends to provisioning resources within the home network.
Customer re-configuration	**Yes**	This is to support the concepts of customer Self-service and customer self care.
Network Provisioning	**Yes**	
Network Inventory Management	**No**	No functions exist within subscription management to ensure that the resources are available to support and create a new service.
Network Configuration and Routing	**No**	
Installation	**No**	
Access Security	**Yes**	
Test Management	**No**	

4.3 Subscription Management: Operations Viewpoint

Figure 2 positions Subscription Management from the viewpoint of operations management.

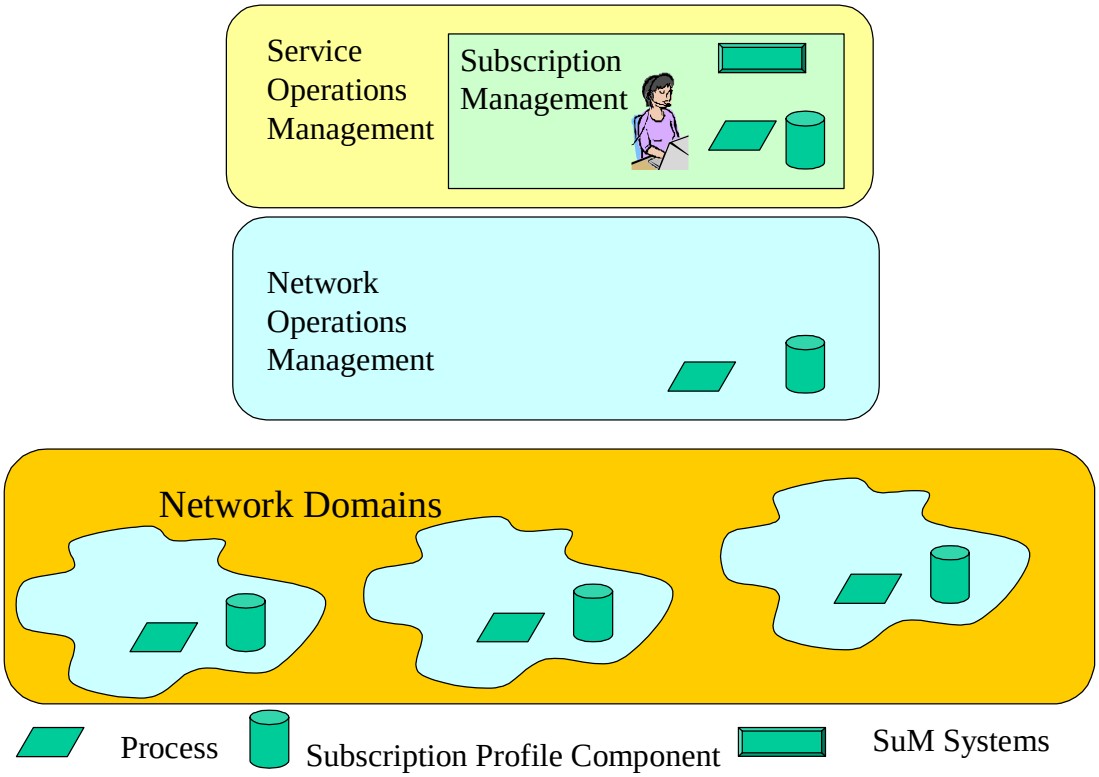

Figure 2: Subscription Management context within Operations Management

Subscription Management manages Subscriptions in the form of Subscription Profile components. The Subscription Profile components may be distributed across Service Operations, Network Operations Management and Network domains in order to easily configure resources and support services at the Network Operations Management level.

4.3.1 Functional Overview

As the telecommunications now entering into the 3G, more powerful terminal and access technology allows the telecommunications networks to offer new wireless Multimedia and Internet services.

Accordingly, SuM (Subscription Management) is a telecommunications management framework that allows the Operators to leverage their network resources to:

- Validate (register, authenticate, and authorise.) a request for service from a user;
- Collect, store, update, and distribute the service profile information for the user;
- Select the trusted network resources to manage access, distribution, and control of the profile data information for the user; and
- Direct the network resources to promptly deliver the service requested to the user according to said profile information.

SuM fulfils the following essential 3G requirements:

- The "**Device Diversity**" allows access to telecommunications networks by a variety of UE's and devices that are available for the user at the time.
- The "**Access Diversity**" allows the telecommunications networks to offer a variety of access network options such as UTRAN, GERAN, WLAN, etc. to the user.
- The "**Service Diversity**" allows the Telecommunications networks to provide a variety of services delivered to the user from third party application Service Providers (VASP) or from other telecommunications networks (V PMN).

4.4 Management of Subscription Profiles

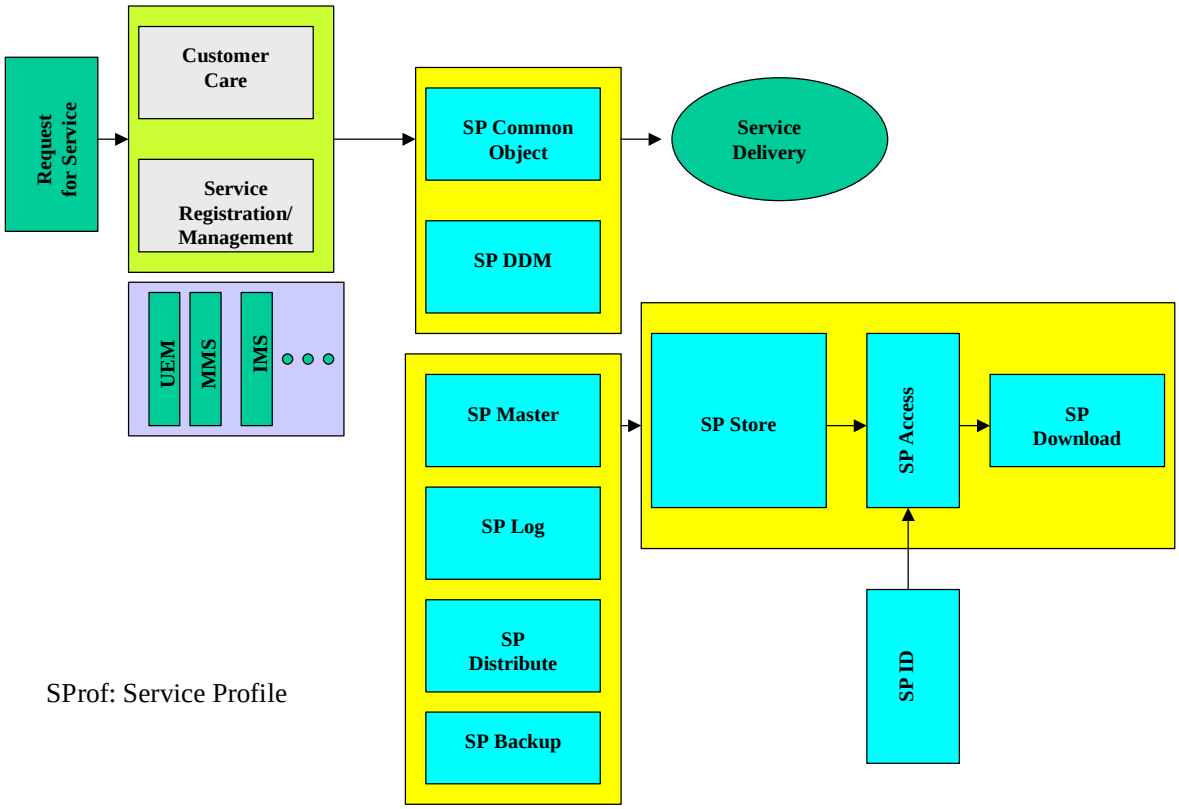

Figure 3: Architecture for management of Subscription Profile components

4.4.1 Requirements for Subscription Profile Component Management

Subscription management does not extend to the management of services.

However it is necessary to provide network entities with the subscription profile components needed for service fulfillment:

1. Subscription profile management shall support the fulfillment of requests for service from users, application services, and user equipment.
2. Subscription profile management shall support requests for subscription creation, modification and deletion. These requests may originate from users, subscribers, Network Operators, and Service Providers.
3. The above requests may be associated with the service entities in this release such as the MMS, IMS etc.
4. It shall be possible to relate each request for service with the corresponding Service Profile (SProf) information
5. The subscription profile information shall be maintained in the HSS.
6. In order to fulfill services, subscription profile information shall be distributed among the various network entities.
7. A subscription profile log shall be created to track changes related to creation and modification of subscription profiles and subscription profile components.
8. A back up copy of the subscription profile shall be created.
9. Subscription profile information shall be secured by authorised access and control mechanisms.

4.4.2 Requirements for Network and Terminal Provisioning

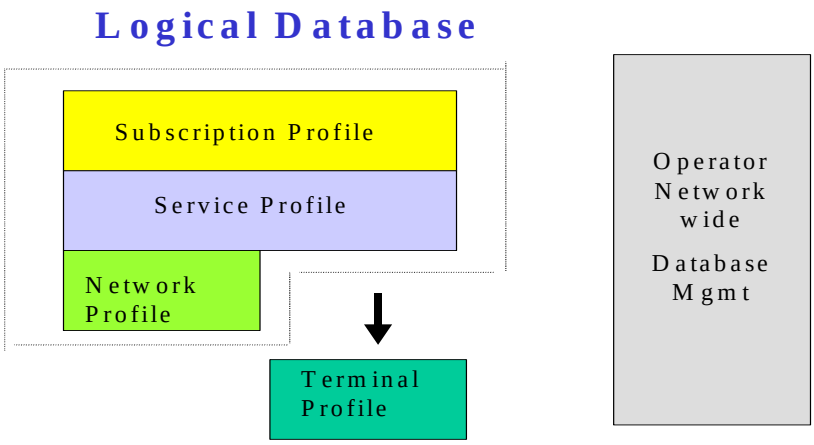

Figure 4: Subscription management network and service provisioning

The following steps define a logical sequence of events required for granting a request for service.

a) A request for service is issued by a user (via the UE).

b) Network receives the request for service and attempts to locate a subscriber ID.

c) Once a subscriber ID is identified, it is authenticated if there has not already been an initial authentication.

d) A request for service shall be denied if the subscriber cannot be identified and authenticated.

e) For those requests for service that are authenticated, the corresponding subscription profile components are obtained if they have not already been obtained at initial authorization.

f) The subscription profile component provides information on the services that are available to the subscriber and correlate the service request with a specific subscribed service.

The service is properly set up according to the profile (e.g. QoS, etc.) in order to prepare for the fulfillment and delivery of the service·

4.4.3 Profile Management Evolution

For subsequent releases there will be several external entities including 3rd party Service Providers, visited operator networks, etc., and additional requirements for access control will be needed to ensure security.

For SuM stage 2 or 3, SP can expand from the current definition of subscriber data (3GPP TS 23.008 [7]), GUP data (3GPP TS 22.240 [11]), etc. when appropriate.

Subscription Profile supports:

- Preference management;
- Service customization;
- Terminal management;
- Information sharing;
- Access permission via a unique key identifier.

The profile data will be distributed (using the service profile download capability) to configure the necessary architectural entities (UE, Servers etc.).

Future releases of Subscription Profile will include the Service Profile for VASPs.

Subscription profile data needs to be consistently managed across all the entities within the network that use the profile. The data may be controlled from a central point, or be distributed, hence the logical database depicted in figure 4. The management capabilities relate to the definition, modification and synchronization of the data mainly in core network entities. This may extend to data that needed in terminal devices, network elements, core network entities and Application Servers.

4.5 Subscription Management: relationship to Network Entities and Other Subsystems

4.5.1 General

The Subscription Management Feature provides management functions for subsystems, domains and components some of which are defined in the 3GPP Network Architecture 3GPP TS 23.002 [2]. However the Network Architecture does not address the Mobile Equipment or the Open Services Architecture nor non 3GPP defined subsystems. Figure 5 shows this relationship with these entities, many of which are closely related to the Home Subscriber Server (HSS).

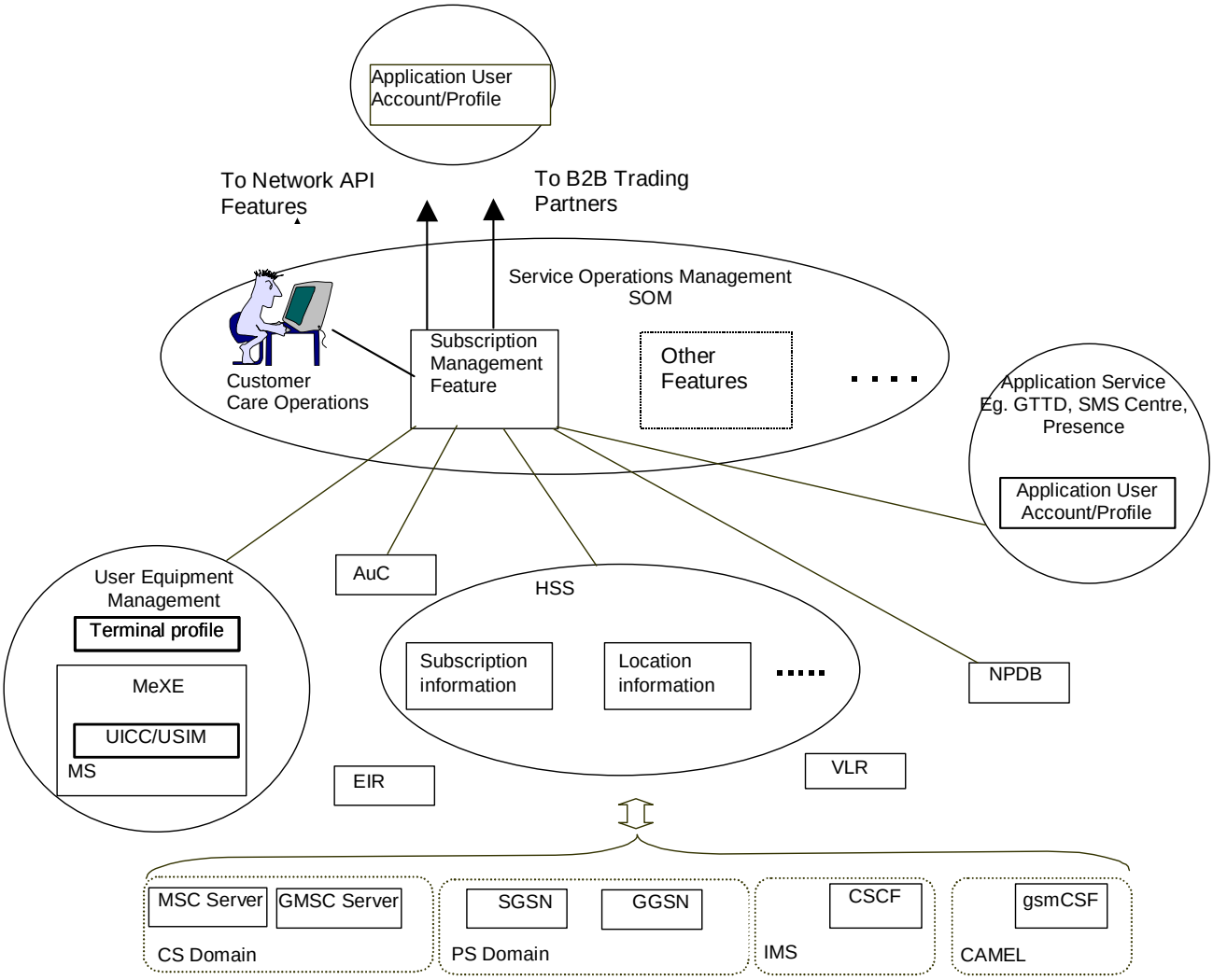

Figure 5: Examples of Subscription Management relationships with Network Architecture

Figure 5 is based upon entities identified in the 3GPP Network Architecture 3GPP TS 23.002 [2].

The Network Architecture identifies a number of entities that use Subscription Profile information for their operation.

The Subscription Management feature provisions and audits the Subscription Profile information (either directly, or indirectly):

- Core Network entities:
  - Home Subscriber Server (HSS) including Home Location Register (HLR),; Authentication Center (AuC) and HSS Logical functions;
  - Visitor Location Register (VLR)
  - Equipment Identity Register (EIR);
  - SMS.- GMSC;
  - SMS Interworking MSC.
- Circuit Switched Domain:
  - MSC Server;
  - Gateway MSC (GMSC).
- User Equipment/Mobile Station .
  - Specific entities of the Mobile System as:
    - IP Multimedia System (IMS);
    - CAMEL Entities;
    - Number Portability Database (NPDB);
    - Global Text Telephony (GTT) entities.

Subscription Management also provides capabilities to support B2B trading interfaces to other trading partners: VASP, Virtual mobile Operators etc.

Figure 5 also implies a set of relationships from Subscription Management to:

- User Equipment Management that is assumed to configure and provision all aspects of the User Equipment and Terminals, including the possibility of configuring UICC/USIM profile information, using MeXe where appropriate.
- Application Service provided by third parties including trusted third parties that may configure some USIM via network interfaces, for example banks and other financial institutions. These services may also be provided by the Network Operator performing the role of Application Service provider.
- Network Service provided by Network Operators (e.g. SMS, presence).

4.5.2 Relationship to Generic User Profile (GUP)

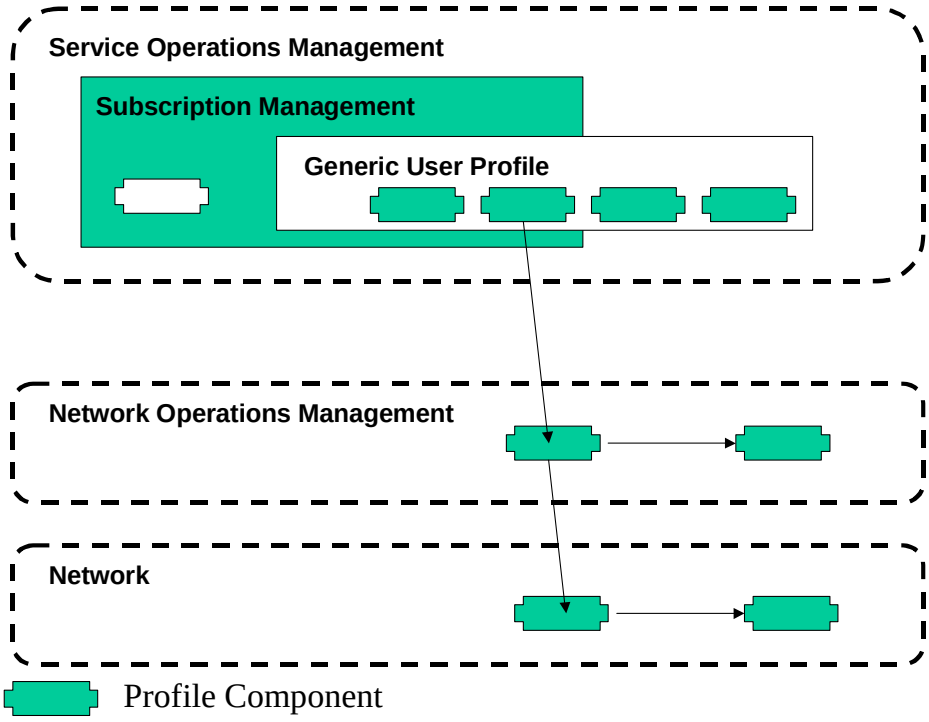

Figure 6: Relationship between Subscription Management and Generic User Profiles

- The concept of a Generic User Profile is defined in 3GPP TS 22.240 [11].

The main focus is on the definition of:

- A User profile constructed from one or more User Profiles Components.
- Each User Profile Components that comprise one or more data types with formal definition.

The emphasis is on defining data types especially those that have to be held or replicated in User Equipment.

GUP assumes that User Profile Components may be distributed and replicated across a number of network domains and systems. Subscription Management is a feature that allows Subscription Profile Components to be distributed across Systems and Network Domains. Some Subscription Profile Components and some Generic Use Profile components are common. These common components affect the user experience and hence are part of the GUP. Subscription Management Processes are supported by processes and functions provided in ,the Service Operations, the Network Operations and Network Domains.

Subscription Management provides the management means to create, read, modify and delete data. It also provides for the management of the integrity of the Subscription Profile Components - and implicitly those common with GUP - by providing the mechanisms for the its distribution and synchronization across Systems and Network Domains.

5 Subscription Management Assumptions and Methods

The following assumptions are made in developing the Subscription Management requirements.

5.1 Business model assumptions

1. The provider of the service package to the subscriber may be different from either the Service Provider or the Network Operator.
2. The model shall allow for retailers, distributors and third parties that are independent of the Service Provider and the Network Operator.

5.2 Network and control assumptions

1. The invocation of a service feature in real time shall be the responsibility of the network and any associated control.

5.3 Use Case Method

5.3.1 Subscription Management Task Characteristics

During the development of use cases tasks and activities are identified. It is emphasized that different tasks have different needs i.e. they are not equal in all aspects of performance requirements, execution sequence priority scheduling which may be assumed.

5.3.2 Objectives

To apply use cases to analysis of real network scenarios and so define requirements and solution architectures, and ensure due consideration is given to task categorization.

The means that tasks shall be considered with respect to the following aspects:

- Performance requirements and categorization as real time, near real time, and non-real time.
- Execution sequence.
- Priority.

5.3.3 Task Categorization Guideline

Tasks and activities are categorized as being one of "Pre-condition", "Action", "Data Prep", and "Post Condition" categories.

"Pre-condition" tasks

These tasks are not time critical but must be completed and ready prior to the subscriber, application/service, or user equipment launches a service request.

"Action" tasks

Some of these activities are time critical tasks (which have to be performed in near real time) necessary to fulfill each Service Request, and have to be consistently performed irrespective of which entity initiates the request

"Data Prep" tasks

These are the activities that take place in the network related to updating, synchronizing, and distributing subscription profile data.

"Post-condition" tasks

These are not time critical activities the follow-up activities and have to be completed, after the subscriber, application, or the UE service request has been completed.

An illustrative use case using the method can be found in annex C.

6 High level requirements

6.1 General

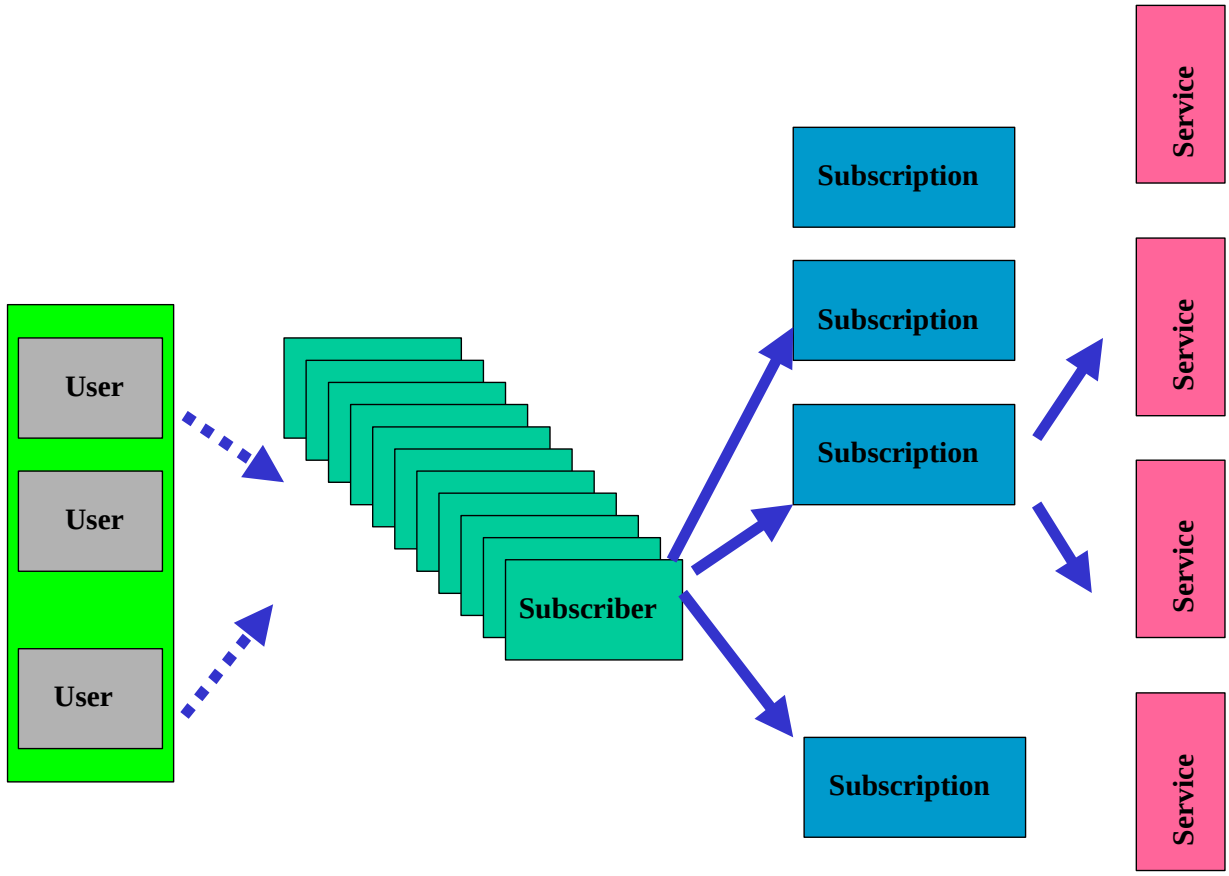

Figure 7: SuM Entities - Relations

Figure 7 shows the relationships between users, subscribers, subscriptions and services.

According to the way in which Operators do business:

- Each Operator has many subscribers;
- Each subscriber can have several users; and

- Users can request a service. The request will be granted if for the user. a contract for the requested service, has been signed between the service provider and a subscriber.

6.1.1 Pre-Requisites for Service

These assertions address some of the operator's concerns, prior to granting a service request to a user:

1. find a subscriber entity that can match with the user;
2. identify and verify the subscriber's subscription profile; and
3. ensure the request for service is consistent with the subscription profile.

6.2 Feature Requirements

Subscription Management shall provide:

1. The management of the Subscription Profile information in the home PLMN.
2. It shall be possible to replicate and distribute the Subscription Profile Components.
   - Support for Subscription Profile information across administrative, network and systems domains (e.g. VLR in visited networks).
3. The control and modification of Subscription Profile information consistent with the customer care needs including self help, self diagnosis and fault diagnosis.
   - Subscription Management shall provide a process to support subscribers wishing to check their Subscription Configuration (e.g. support self care).

6.2.1 Requirements on HSS/HLR

The HSS/HLR is the master database where Subscription Profile Components are stored is in the HSS/HLR, which is used by the network for distribution and replication of this data in other subsystems such as the PS and CS Domains, CAMEL, etc.

1. Subscription Management shall allow for the creating, reading, updating and deleting of Subscription Profile data in the HSS/HLR.
2. Subscription Management shall support the data described in 3GPP TS 23.008 [7].

6.2.1.1 PS Domain

1. Subscription Management shall manage Subscription Profile components within the HSS for the PS Domain.

6.2.1.2 CS Domain

1. Subscription Management shall manage Subscription Profile Components within the HSS for the CS Domain.

6.2.1.3 IM CN Sub-system

1. Subscription Management shall manage Subscription Profile components within the HSS for the IMS defined in reference 3GPP TS 23.228 [8].

6.2.1.4 Authentication Center (AuC)

1. Subscription Management shall be able to manage Subscription Profile components in the HSS for the Authentication Center.

6.2.1.5 Equipment Identity Register (EIR)

1. Subscription Management shall be able to manage relevant Subscription Profile components in the HSS for the EIR

2. Subscription management shall support Subscription Data defined in reference 3GPP TS 22.041 [15], 3GPP TS 23.015 [16].

6.3 Security

1. Specific local, national, and regional security regulations shall be complied with.

2. Subscription Management data shall be safeguarded against unapproved disclosure or usage.

3. Subscription Management data shall be provided in a secure and reliable manner that ensures the information is neither lost nor corrupted.

4. Access to Subscription Management data shall only be permitted in an authorised and secure manner

5. Secure mechanisms shall be available for the transfer of Subscription Management data to, from or between authorised entities. The secure mechanisms to be applied shall be appropriate to the level of confidentiality of the data, the endpoints of the transfer and the routes that are available for the transfer of the data.

6. Audit records should be maintained for all Subscription Management transactions to facilitate resolution of security violations.

Annex A (informative): Business Model

A.1 Processes

Processes involved in Subscription Management can be described by the e-Business Telecom Operations Map (TOM) version 2.1. It is the Fulfilment part that describes those processes. The present document mainly focus on the Development and Operations Process, Network and System Management Processes and on the Network Element Management process.

The MWIF business model MTR-002 [4] shows an organizational model for Trading partners co-operating to provide wireless mobile services, the terms used in this example may not coincide exactly with those used in other parts of the present document, e.g. Subscriber and Customer are believed to be equivalent.

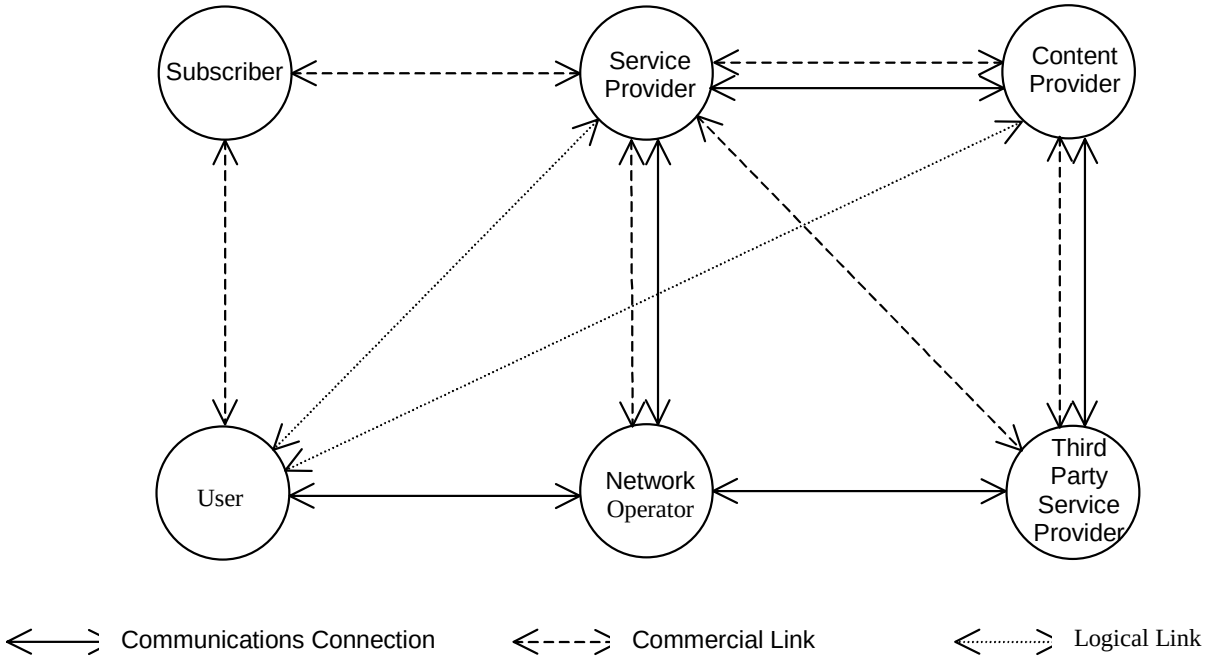

Figure A.1: Assumed Business Model

In this business model the Subscriber is a customer of the Service Provider (SP).

Commercial agreements are set up and maintained between them for the provision of services from the SP to the User via the Network Operator.

The Subscriber may have contracts with multiple SPs and maintains these on behalf of one or more users.

The Subscriber informs the SP which services each user should have access to and may choose to set limits on how much a User can use a particular service. For instance the Subscriber may authorize $x a day of video calls with a high QoS and unlimited video calls with a lower QoS.

The SP must enter into contract(s) with one or more Network Operators in order to deliver services to Users. Other companies may wish to sell services without having a contract with a Network Operator. This can be achieved by adopting the role of Third Party Service Provider and selling service via the SP. Other Companies may wish to sell just content. This is made possible by developing a commercial relationship with either a SP or a Third Party Service Provider.

It is important to note that Service Use, Customer Service Negotiation, etc are roles , and that one Actor may adopt more than one role. For instance an individual may adopt the roles of both Service Use and Customer Service Negotiation. A Company may adopt the roles of Network Operator, SP and Content Provider.

A user initiates a service by requesting it from the Service Provider, not the Network Operator. On receipt of a service request the Service Provider uses Network Operators and Third Party Service Providers to service the request in the best way possible. In the example of the video call the Service Provider may choose to use different Network Operators for high and low QoS calls.

Taking the VHE concept, where HE, HE-VASP are defined and VASP is used:

- The roles Service Provider and Network Operator can be mapped to the actor HE (See 3GPP TS 22.121 [9]).
- The role Service Provider can be mapped to the actor VASP.
- The role Third Party Service Provider can be mapped to the actor HE-VASP, because they both provide services on behalf of an actor having the Service Provider role.

The Subscriber-to-Service Provider relation (indicated as a Commercial Link between Service Provider and Subscriber) defines the agreements under which the Service Provider provides services to a Subscriber. The users associated to the Subscriber consume these services. (See Subscriber definition in 3GPP TR 21.905 [1].)

There are also Business-to-Business relations in the picture, where several actors may be involved in the delivery of services. Examples of such are the Commercial Link between Service Provider and Third Party Service Provider, the Commercial Link between Third Party Service Provider and Content Provider and the Commercial Link between Service Provider and Network Operator.

The present document has the focus on the Subscriber-Service Provider role relation.

A.2 Assumptions concerning Actors and Roles

Below follows assumptions originated from figure A.1:

- An actor taking the role as a Service Provider offers services to one or several Subscribers.
- An actor Network Operator can take the role as a Service Provider and provide access network services (e.g. PLMN services according to 3GPP TR 21.905 [1] definition) to one or several Subscribers.
- An actor Service Provider may fulfil his role and provide value added services to one or several Subscribers. He can do so by:
  - A pure value added service offering, which may result in established B2B agreements with Network Operators.
  - An aggregated offering of access network services (Network Operator role) and value added services (offering a home environment).
- An actor Service Provider may establish B2B agreements with Network Operators and become an MVNO.
- An actor Service Provider may have B2B agreements with one or several Content Providers, from which he can provide content based services.
- An actor Service Provider may have B2B agreements with and one or several 3rd party Service Providers, from which he can package and provide services from.
- An actor 3rd party Service Provider may have B2B agreements with one or several Content Providers, which can provide content.
- An actor taking the role as a Service Provider may establish one or several subscriptions with a Subscriber.
- When, based on an agreement between a Subscriber and a Service Provider, an access to a provided service exists; it can be associated to a subscription.

- A User consumes services, where the user role in this context is defined by the service consumed.

A.3 SUM scope from actor/role model

Subscription Management is about managing subscriptions tied to one actor taking the Service Provider Role. Systems affected are those within the Service Provider domain (systems that a Service Provider controls and manages) and those systems outside that take part in the service delivery to the user of the service provided. The latter means: Actors having those systems have B2B agreements with a Service Provider for the purpose of delivering services (examples are: 3rd party Service Providers, Content Providers and Network Operators).

A.4 Business Model Requirements

1. Subscription Management feature shall support the distribution of Subscription Management components across intra operator organizations and administrative domains to support industry business model.
   Annex A provides an example business model from MWIF MTR-002 [4].

2. Subscription Management shall allow for the optional use of third parties to facilitate trading relationship between organizations. This requirement is needed for trusted third parties but not limited to trusted third parties

Annex B (informative): Example Use Case

There are an expanding number of services that 3G can offer. The network and infrastructure resources that are needed to support the new services are complex, and require a systematic technique to consider the many factors involved.

Use cases provide an iterative analysis technique helpful in determining market potential, business transactions, and the user interactions, etc.

When a use case has been developed (i.e. become stable), possible network solution(s) may be developed.

It is anticipated that future complex services will require a systematic analysis method to evaluate the network impacts.

There is a desire to migrate away from developing a solution for each service opportunity on an individual case-by-case basis, and to deploy a consistent approach in order that the network architecture solution may be used to provide many different service needs.

B.1 Use case for subscribing to service

Priority	Objective Action
PreCondition (Off-line)	A subscriber (a user or a list of users) wants a mobile phone(s) that works from the beginning, including all its services (e.g. subscription, SMS, GPRS, MMS, MMS Value Added Services (VAS) **Access Diversity** Different user have accesses from a number of networks and network types **Device Diversity** Different user have different user terminals (UE) and user terminal types that have different methods of configuration and a widely varying capabilities **Multi-Vendor Environment** Operators using multiple vendors' equipment and have problem with proprietary interfaces and the need to support different access-, configuration methods etc in parallel New Services and Configurations Operators have problem to introduce new subscription and services without complicated user configurations in a secure manner **Self Care** Operators have problem to create customer self care centre applications (e.g. SuM) **VASP Interface** Virtual Network Operators, VASPs, and content providers etc requiring standardised interfaces amongst them **Contract & Setting** No settings or commercial relationships are made between the subscriber and Network Operator. **SuM Profile DDM** The data description is standardized and can be shared (used) by many applications without manual mapping between different data formats of the same information

Priority	Objective Action
Action (On-Line)	**Service Reg.** An one-line service registration or customer care centre sets up a subscriber service registration **SUM PROFILE DDM** The user preferences for subscription and services are established **SUM PROFILE Access** The operator (service– or value added services provider) use a standardised SUM PROFILE mechanism to create-, access-, and manage user-related data in different entities **SUM PROFILE Store** One master SUM PROFILE (per subscription) is created **SUM PROFILE Logging** One associated master Subscription Profile is created and historical logged for the new subscriber (a user or a list of users) **SUM PROFILE Component Update** New Subscription Profile components containing the working subscription parameters are created. **Common Object** New "Common Objects" are created of common SUM PROFILE and Subscription Management components **SUM PROFILE Key** An alias (public user identity) is created as a key to access user profile information **SUM PROFILE Download** SUM PROFILE and Subscription Profile content is downloaded over the air, via local link or similar to the terminal (using WAP UAProf, SyncML Device Management etc) **SUM PROFILE Store** The SUM PROFILE and Subscription Profile are stored in the home network environment and additionally storage can be extended to the UE. **SUM PROFILE Replicate/Distribute** The subscription components may (based on rules, and local privacy regulations) be replicated and distributed across several administrative domains **SUM PROFILE Backup** A backup of the SUM PROFILE and Subscription Profile may be created
Data Prep Off-Line	SuM Profile Preparation **SUM PROFILE DDM** The collection of subscriber related data in the user profile (described by DDM) includes general subscriber (a user or a list of users) information (e.g. Name, bill info, users). The collection of user related data in the user profile (described by DDM) includes general user (a user or a list of users) information (e.g. Name, address, age, sex, ID), privacy- and billing policy.
Post Condition (Off-Line)	**Post Condition** The user experience that the terminal is ready to use for calls and SMS without major user complicated configuration. The user can check their subscription configuration. The new subscriber (a user or a list of users) may be addressed. The new Public User Identity is set to the user. Note that a user may have several Public User IDs. The subscription is ready to including other services (e.g. GPRS, MMS, MMS VAS). The access to subscription components is permitted in a authorized and secure manner

Annex C (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
Mar 2002	SA_15	SP-020012	--	--	Submitted to SA#15 as v1.0.0 for Information	1.0.0	--
Dec 2002	SA_18	SP-020728	--	--	Submitted to SA#18 as v1.1.1 for Information	1.1.1	--
Mar 2003	SA_19	SP-030041	--	--	Submitted to SA#19 as v2.0.0 for Approval	2.0.0	