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Study on User Data Convergence (UDC) data model

(Release 16)

** 

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# Foreword

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

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

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x the first digit:

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

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

# 1 Scope

The present document analyses and evaluates the definition of a Reference Data Model (RDM) for Ud interface between Front-Ends (FEs) for the HSS application and the User Data Repository (UDR).

The stage 3 of the Ud interface in the User Data Convergence (UDC architecture) is defined in 3GPP TS 29.335 [2].

The Reference Data Model (RDM) shall comply with the Common Baseline Information Model for UDC as defined in 3GPP TS 32.182 [3] and it shall follow the concepts of the Framework for Model Handling and Management as defined in 3GPP TS 32.181 [4].

The analysis will comprise the general considerations impacting the RDM for HSS.

The analysis will comprise the following topics:

- The general considerations impacting the RDM for HSS;

- Attributes definition: names, syntax, semantics;

- Object classes & Directory Information Tree: object classes names, attributes grouping, LDAP entries, Distinguished Names and Relative Distinguished Names.

Directory information trees, object classes and attributes in this report should be considered informative since they are subject to additions and/or modification depending on the specific implementation as illustrated in the presented alternatives in this technical report. Even the assignment of attributes to object classes may be redistributed, for example,because the normalization of object classes across different domains may result in attributes being moved to a superclass. Naming is provisional. Diagrams used and naming convention are not standardized.

# 2 References

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

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

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

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

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

[2] 3GPP TS 29.335: "User Data Convergence (UDC);User Data Repository Access Protocol over the Ud interface"

[3] 3GPP TS 32.182: "Telecommunication management; User Data Convergence (UDC); Common Baseline Information Model"

[4] 3GPP TS 32.181: "User Data Convergence; Framework for Model Handling and Management"

[5] 3GPP TS 23.008: "Organization of subscriber data"

[6] IETF RFC 4517: "Syntaxes and Matching Rules"

[7] 3GPP TS 23.003: "Numbering, addressing and identification"

[8] IETF RFC 4291: "IP Version 6 Addressing Architecture"

[9] 3GPP TS 29.214: "Policy and Charging Control over Rx reference point"

[10] 3GPP TS 32.251: "Telecommunication management; Charging management; Packet Switched (PS) domain charging"

[11] 3GPP TS 32.298: "Telecommunication management; Charging management; Charging Data Record (CDR) parameter description"

[12] 3GPP TS 29.272: "Evolved Packet System (EPS); Mobility Management Entity (MME) and Serving GPRS Support Node (SGSN) related interfaces based on Diameter protocol"

[13] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access"

[14] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service description; Stage 2"

[15] 3GPP TS 36.413: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); S1 Application Protocol (S1AP)"

[16] 3GPP TS 29.212: "Policy and Charging Control over Gx reference point"

[17] IETF RFC 1035: "DOMAIN NAMES - IMPLEMENTATION AND SPECIFICATION"

[18] 3GPP TS 23.015: "Technical realization of Operator Determined Barring (ODB)"

[19] 3GPP TS 29.364: "IP Multimedia Subsystem (IMS) Application Server (AS) service data descriptions for AS interoperability"

[20] IETF RFC 3261 "SIP: Session Initiation Protocol"

[21] IETF RFC 2396: "Uniform Resource Identifiers (URI): generic syntax"

[22] IETF RFC 3966 "The tel URI for Telephone Numbers"

[23] IETF RFC 4282: "The Network Access Identifier"

[24] 3GPP TS 29.228: "IP Multimedia (IM) Subsystem Cx and Dx interface; signalling flows and message contents"

[25] 3GPP TS 23.845: "Study on User Data Convergence (UDC) evolution"

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

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

**Reference Data Model for HSS:** Reference Data Model for HSS is an Application Data Model that operations on Ud interfaces supporting HSS applications shall comply to.

## 3.2 Abbreviations

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

CB Call Barring

CDIV Call Diversion

LDAP Lightweight Directory Access Protocol

MMTEL Multimedia Telephony

RDM Reference Data Model

TAS Telephony Application Server

UDC User Data Convergence

# 4 General considerations

## 4.1 General syntax definitions

The LDAP attributes in this document are defined as having a syntax specified in IETF RFC 4517 [6] or a derived syntax that will be specified in this section. The description of a derived syntax will contain the name of the IETF RFC 4517 [6] syntax from which it was derived as well as any additional structure and value constraints. Syntax names should follow the rules set by IETF RFC 4517 [6] (mixed case with first letter of word capitalized), e.g. NumericString.

|  |  |
| --- | --- |
| Derived Syntax name | Description |
| UInt8 | This syntax is derived from the Integer syntax [6]. The structure is further constrained to a maximum length of 1 and the values are further constrained from 0 to 255. |
| UInt16 | This syntax is derived from the Integer syntax syntax [6]. The structure is further constrained to a maximum length of 2 and the values are further constrained from 0 to 65535. |
| UInt32 | This syntax is derived from the Integer syntax syntax [6]. The structure is further constrained to a maximum length of 4 and the values are further constrained from 0 to 4294967295. |
| HexString | This syntax is derived from the PrintableString syntax [6]. The values are further constrained to the decimal digits (0 through 9), characters "a" to "f" or characters "A" to "F". |
| HexString32 | This syntax is derived from the HexString syntax. The structure is further constrained to a maximum length of 32 characters. |
| FQDN | This syntax is used to represent an Fully Qualified Domain Name (FQDN) (see IETF RFC1035 [17]) and is derived from the PrintableString syntax [6]. The structure is further constrained to a maximum length of 255 and the values are further constrained to one or more labels separated by the period (".") character. Each label consists of the decimal digits (0 through 9), characters "a" to "z", characters "A" to "Z", the hyphen ("-) character and has a maximum length of 63 characters. CaseIgnore |
| IPv4Address | This syntax is derived from the PrintableString syntax [6] and is used to represent IPv4 addresses formatted in dot-decimal notation without leading zeros. The structure is further constrained to a maximum length of 15 and values are further constrained to the decimal digits (0 through 9) and the period (.) character. |
| IPv6Address | This syntax is derived from the PrintableString syntax [6] and is used to represent IPv6 addresses formatted in hexadecimal colon-separated notation without leading zeros in each group and with the largest run of consecutive zero groups collapsed into a single empty group (see IETF RFC 4291 [8]). The structure is further constrained to a maximum length of 39 and the values are further constrained to the decimal digits (0 through 9), characters "a" to "f" or characters "A" to "F" and the colon (:) character. |
| IPv6Prefix | This syntax is derived from the PrintableString syntax [6] and is used to represent an IPv6 prefix formatted in CIDR (Classless Inter-domain Routing) notation, i.e. an IPv6 address (formatted in IPv6Address syntax), a slash (/) character and a decimal value indicating the size in bits of the address prefix (see IETF RFC 4291 [8]). The structure is further constrained to a maximum length of 43 and the values are further constrained to the decimal digits (0 through 9), characters "a" to "f" or characters "A" to "F", the colon (:) character and the slash (/) character. |
| Name10 | This syntax is derived from the PrintableString syntax [6]. The structure is further constrained to a maximum length of 10 characters. CaseIgnore. |
| String | This syntax corresponds to Printable String syntax according to IETF RFC 4517 [6]. |
| Enumerated | This syntax corresponds to Numeric String syntax according to IETF RFC 4517 [6], where the maximum length is defined by the number of included numerals. |

Table 4.1-1

## 4.2 MMTEL data

### 4.2.1 Introduction

The specification of the MMTEL data in the Reference Data Model over Ud has to define for which Application FEs it will be applied. Two cases are identified.

- MMTEL data specification over Ud applies to the Ud interface between a Telephony Application Server Front-end (TAS-FE) and the UDR.

- MMTEL data specification over Ud applies to the Ud interface between a HSS-FE (supporting IMS) and the UDR.

### 4.2.2 MMTEL data with a TAS-FE

The Ud interface supported by a TAS is an alternative way to store its MMTEL data in a UDR instead of using the Sh interface and an HSS-FE. For this purpose another protocol (i.e. reusing Ud protocol) to centrally store MMTEL Data in addition to Sh has to be assessed and confirmed. This is out of the scope in the present release of the specifications.

### 4.2.3 MMTEL data with an HSS-FE

With a HSS-FE, SMMTEL data are transported over a Sh interface as transparent data within repository data. Then, regarding to the storage on the UDR by the HSS-FE, two sub-cases are identified:

- It is normally stored as transparent data in the UDR in the same way as any other transparent data coming from an AS over Sh, so not requiring a data modelling of the MMTEL data over the Ud between a HSS-FE and the UDR.

- The transparent data is analysed by the HSS-FE application logic and translated into data complying with the MMTEL RDM over Ud. In the other way, the HSS-FE application logic builds a Sh transparent data from the MMTEL data retrieved from the UDR and complying with the MMTEL RDM over Ud. It is to be noted that the concept of transparent data that still applies to Sh is no more applied on the transparent storage in the HSS in this sub-case.

To address the second sub-case, the HSS-FE will rely on the standardisation of MMTEL Data over Sh in 3GPP TS 29.364 [19]. Two coding options are defined, a binary one and a XML one. An objective is that the same MMTEL RDM over Ud can be mapped with both options. The same MMTEL RDM should also be applicable to the case described in 4.2.2. This is out of the scope in the present release of the specifications.

With the XML option, the data configuring each of the CDIV and CB MMTEL Services is structured in a set of multiple rules, each rule may contain multiple conditions and an action, structure that was not retained for the binary option aimed to handle the subset of MMTEL services corresponding to PSTN/ISDN and CS supplementary services.

How the MMTEL RDM over Ud can address the configuration data for CDIV and CB services for both the XML and the binary option is out of the scope in the present release of the specifications.

### 4.2.4 MMTEL Data and CS Supplementary Services data

In some cases, the supplementary services execution and/or their configuration when user is in the CS domain may have to rely on the CS supplementary services and not MMTEL ones. It may drive to maintain the consistency between the MMTEL services and the CS supplementary services. Two approaches that impact RDM for Ud may be considered:

- MMTEL Data and CS supplementary Service data are considered as separate data in the RDM for Ud, considering that their consistency will be handled by the concerned application logics. This approach may be more in line with current 3GPP specifications where CS supplementary Services and MMTEL services are defined in different 3GPP specifications.

- A subset of MMTEL data and CS supplementary service data are merged in the RDM over Ud and describe a supplementary service independently of the access (CS or PS). This approach may impact stage 1 and stage 2 specifications on supplementary services.

Which one of the two approaches is the most relevant and if it impacts existing specifications on supplementary services (CS and MMTEL) is out of the scope in the present release of the specifications.

### 4.2.5 Supplementary Services RDM principle

It should be possible to define the Supplementary Services that are common to MMTEL and CS only once and not separately in the Reference Data Model. Using this approach the synchronization of common MMTEL and CS Supplementary Services is implicitly reached. At the same time, it should be possible to have separate Supplementary Services data for MMTEL and CS in order that the operators could provide differentiated services. The operator has to choose between these alternatives. The RDM specification for MMTEL and CS Supplementary services should allow these two approaches.

Only a subset of MMTEL Supplementary Services defined in [19] is shared with the Circuit domain.

Here are described three possible structures of the RDM.



Figure 4.2.5-1: Reference Data Model referring to MMTEL services



Figure 4.2.5-2: Reference Data Model referring to CS services



Figure 4.2.5-3: Reference Data Model referring to the common services

Depending on the implementation any of the above data structures for MMTEL and CS SS or a combination of them can be selected for the RDM.

# 5 Identifier

## 5.1 Object classes and their attributes

Table 5.1-1

|  |  |
| --- | --- |
| Derived Syntax name | Description |
| IMSI | This syntax is used to represent international mobile subscriber identity (IMSI) [7] and is derived from the NumericString syntax [6]. The structure is further constrained to a maximum length of 15 and the values are further constrained to decimal digits (0 through 9) only. |
| PublicIdentity | This syntax is used to represent the public identity of a user in the IMS and is derived from the PrintableString syntax [6]. The structure is further constrained to a SIP URI (with the format defined in IETF RFC 3261 [20] and IETF RFC 2396 [21]) or a TEL URI (with the format defined in IETF RFC 3966 [22]). Both SIP URI and TEL URI shall be in canonical form, as described in 3GPP TS 23.003 [7]. |
| PrivateIdentity | This syntax is used to represent the private identity of a user in the IMS and is derived from the PrintableString syntax [6]. The structure is further constrained to a NAI with the form username@realm as specified in IETF RFC 4282 [23]. |
| E164Number | This syntax is used to represent an E.164 Number and is derived from the NumericString syntax [6]. The structure is further constrained to a maximum length of 15 and the values are further constrained to decimal digits (0 through 9) only. |

# 6 UDC Service Profile

## 6.1 Object classes and their attributes

Object classes and attributes for UDC Service Profile are out of scope of the present release.

## 6.2 Directory Information Tree

### 6.2.1 Alternative A



Figure 6.2.1-1: DIT Structure for UDC with alternative A

For definition of End User see 3GPP TS 32.182 [3].

### 6.2.2 Alternative B

In this alternative, the parent of the different domain data entities is a Subscription entity. This Subscription entity may be not limited to one user, for example, IMS data belongs to a IMS subscription that, according to TS 23.228, may be multiuser. How to support subscription with several IMS users is not described in the present clause.

It introduces privateIdentityAlias and publicIdentityAlias entities that cover Private and Public Service Identities as well as Private and Public User Identities.



Figure 6.2.2-1: DIT Structure for UDC with alternative B

### 6.2.3 Alternative C

In alternative C, as for alternative B, the diagram contains Subscription, privateIdentityAlias and publicIdentityAlias entities. How to support subscription with several IMS users is not described in the present clause.

The different domains for data are organised differently. This alternative allows attributes that are applicable to several domains to be defined once. For example:

- an attribute that is the same in the GPRS and EPS domains should be defined in the entity PS-Data

- an attribute that is the same in the CS and PS domains should be defined in the entity Access-Data.

The compatibility with new 3GPP releases extending the use of data defined for a domain to other domains is out of the scope of the present document.



Figure 6.2.3-1: DIT Structure for UDC with alternative C

### 6.2.4 Alternative D

In this alternative, the parent of the different domain data entities is a Subscription entity. This Subscription entity may not limited to one user, for example, IMS data belongs to a IMS subscription that, according to 3GPP TS 23.228, may be multiuser.

The RDN of the Individual user data classes AuC-Data, CS-Data, PS-Data and EPS-Data is defined with the IMSI + svcType in order to allow for multiuser.

The Alias MSISDN class, in addition to providing a reference to the Subscription object, also contain an IMSI attribute. This is done to assist in MSISDN based message processing, such as MAP Send Routing Info. i.e., such a request would have to search for the Alias MSISDN object to obtain the subscriber's IMSI prior to obtaining the specific SvcType class associated with the IMSI.



Figure 6.2.4-1: DIT Structure for UDC with alternative D

# 7 UDC Service Data shared by several domains

The data defined in this section are examples of data shared by several domains.

Data sharing among multiple domains may impact data model and is out of the scope of the present document.

## 7.1 Object classes and their attributes

### 7.1.1 AuC Subscriber Data

Table 7.1.1-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | ACSUBDATA | | | |
| Type of Obect Class | tbd | | | |
| Description | This class represents the Data Container for all Subscriber Data relevant to the AuC | | | |
| Superior OCL | tbd | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| imsi | IMSI | read | Naming Attribute  mandatory  single-valued | International Mobile Subscriber Identity. See 3GPP TS 23.003. |
| acSubscrType | UInt8 | read | optional  single-valued | Type of Subscriber. Possible values:  0 - GSM  1 - UMTS |
| acEncKey | HexString32 | read | optional  single-valued | The subscriber's encrypted long term secret key. This is a hexadecimal string with fixed length of 32 bytes.  For definition of a UMTS subscriber's long term secret key K see 3GPP TS 33.102.  For definition of a GSM subscriber's long term secret key Ki see 3GPP TS 43.020. |
| acSeqNum | HexString32 | read, write | optional  single-valued | Sequence Number for UMTS subscriber. This is a hexadecimal string with fixed length of 12 bytes.  For definition of a UMTS subscriber's Sequence Number SQNHE see 3GPP TS 33.102. |
| acAMF | HexString32 | read | optional  single-valued | Authentication Management Field for UMTS subscriber. This is a hexadecimal string with fixed length of 4 bytes  For definition of a UMTS subscriber's Authentication Management Field AMF see 3GPP TS 33.102. |
| acKdbId | Uint16 | read | optional  single-valued | The reference to the key used to encrypt the subscriber's long term secret key. tbc. |
| acAlgorithId | Uint16 | read | optional  single-valued | AC Algorithm Identifier. Specifies the algorithm used for the generation of authentication vectors. tbc. |

# 8 UDC CS Service Data

Object classes, attributes and Directory Information Tree for CS Service Data are out of scope of the present release.

# 9 UDC GPRS Service Data

Object classes, attributes and Directory Information Tree for GPRS Service Data are out of scope of the present release.

# 10 UDC EPS Service Data

Object classes, attributes and Directory Information Tree for EPS Service Data are out of scope of the present release.

# 11 UDC IMS Service Data

## 11.1 Object classes and their attributes

### 11.1.1 General

The application of the common data concept described in 3GPP TR 23.845 [25] may bring a significant optimisation and may impact the structure of the object classes described in the presented hereafter alternatives.

In the following sub-sections more attributes of some object class may be needed and are left to implementations. Different alternatives are described in order to show how different implementations may differ.

### 11.1.2 Alternative A

#### 11.1.2.1 IMS Data

Table 11.1.2.1-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | ImsData | | | |
| Description | This class represents the Data Container for subscriber-specific IMS Data | | | |
| Superior OCL | tbd | | | |
| Class Type | STRUCTURAL | | | |
| Direct Superclass(es) | tbd | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| imsDataId | Unt8 | read | Naming Attribute  mandatory  single-valued | Fixed "1" |
| mdtrCap | UInt32 | read | optional  multi-valued | Mandatory capabilities of S-CSCF |
| optCap | UInt32 | read | optional  multi-valued | Optional capabilities of S-CSCF |
| authorizedCscf | String | read | optional  multi-valued | S-CSCF names that may be delivered to the I-CSCF |
| scscfName | String | read, write | optional  single-valued | S-CSCF Name assigned |
| primaryChargeId | UInt16 | read | optional  single-valued | Identification of the primary charging server |
| secondaryChargeId | UInt16 | read | optional  single-valued | Identification of the primary charging server |
| primaryEventId | UInt16 | read | optional  single-valued | Identification of the primary event server |
| SecondaryEventId | UInt16 | read | optional  single-valued | Identification of the primary event server |

#### 11.1.2.2 Service Profile Data

##### 11.1.2.2.1 Service Profile

Table 11.1.2.2.1-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | ServiceProfile | | | |
| Description | This class represents the Data Container for a Service Profile | | | |
| Superior OCL | ImsData | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| serviceProfileId | UInt32 | read | Naming Attribute  mandatory  single-valued | The service profile identification associated with the public user identity |
| subscribedMediaProfiIed | String | read | optional  single-valued | Subscribed media profile identification |
| serviceIdList | UInt32 | read | optional  multi-valued | List of service identifications |
| sharedIfcList | UInt16 | read | optional  multi-valued | List of shared IFC identifications |

##### 11.1.2.2.2 Initial Filter Criteria

Table 11.1.2.2.2-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | IFC | | | |
| Description | This class represents the Data Container for an Initial Filter Criteria | | | |
| Superior OCL | ServiceProfile | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| ifcId | UInt16 | read | Naming Attribute  mandatory  single-valued | IFC identification |
| asServerNameId | tbd | read | mandatory  single-valued | AS identification |
| ifcPriority | UInt32 | read | mandatory  single-valued | Priority of the IFC |
| profilePartIndicator | UInt8 | read | optional  single-valued | Indicator of the Profile Type with 3 values according if applicable to  Registered  or Unregistered  or both |
| tpParams | String | read | optional  single-valued | Trigger Points description |
| defaultHandling | UInt8 | read | optional  single-valued | Default Handling |
| svcInfo | String | read | optional  single-valued | Transparent information related to the trigger points only used by the application server |

#### 11.1.2.3 Implicit Registration Set

Table 11.1.2.3-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | IRSET | | | |
| Description | This class represents the Data Container for Implicit Registration Set | | | |
| Superior OCL | ImsData | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| irSetId | UInt32 | read | Naming Attribute  mandatory  single-valued | Implicit registration set identification |
| irsPuidList | tbd | read | mandatory  multi-valued | List of identifications of public identities sharing the implicit registration set |
| registrationStatus | Uint8 | read, write | mandatory  single-valued | Registration status of the implicit registration set |

#### 11.1.2.4 Public Identity

Table 11.1.2.4-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | PublicIdentity | | | |
| Description | This class represents the Data Container for Public Identity | | | |
| Superior OCL | ImsData | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| puidId | tbd | read | Naming Attribute  mandatory  single-valued | Identification of the public identity |
| puidUsername | String | read | mandatory  single-valued | User name part of the public identity |
| puidDomainname | String | read | optional  Single-valued | Domain name part of the public identity |
| irSetId | UInt32 | read | optional  Single-valued | Identification of the implicit registration set |
| puidType | UInt8 | read | mandatory  single-valued | Type of the public identity. Possible values:  0: IMPU  1: PSI  2: wildcard PSI  3: wildcard IMPU |
| serviceProfileId | Uint32 | read | mandatory  single-valued | Identification of the service profile associated to the public identity |
| pridList | tbd | read | mandatory  multi-valued | List of the identifications of the private identities the public identity is associated with |
| barringIndication | boolean | read | optional  single-valued | The barring indication of the public user identity |
| unregSvcInd | Boolean |  |  | Indicates whether the public user identity has in unregistered state |
| aliasGroupId | UInt8 | read | optional  single-valued | Identification of the Alias Group associated to the public user identity |

#### 11.1.2.5 Private Identity

Table 11.1.2.5-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | PrivateIdentity | | | |
| Description | This class represents the Data Container for Private Identity | | | |
| Superior OCL | ImsData | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| pridId | tbd | read | Naming Attribute  mandatory  single-valued | Identification of the private identity |
| pridUsername | String | read | mandatory  single-valued | User name part of the private identity |
| pridDomainname | String | read | optional  Single-valued | Domain name part of the private identity |
| puidList | tbd | read | mandatory  multi-valued | List of the identification s of the public identities the private identity is associated with |
| puidRegistrationStatusList | tbd | read, write | optional  multi-valued | Registration status of a Prid Puid pair |
| authSchema | Uint8 | read | mandatory single-valued | Authentication scheme associated to the private identity |

### 11.1.3 Alternative B

#### 11.1.3.1 IMS Data

Table 11.1.3.1-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | ImsData | | | |
| Description | This class represents the Data Container for subscriber-specific IMS Data | | | |
| Superior OCL | tbd | | | |
| Class Type | STRUCTURAL | | | |
| Direct Superclass(es) | tbd | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| svcType | Name10 | read | Naming Attribute  mandatory  single-valued | Fixed "IMS". |
| mandatoryCapabilities | UInt32 | read | optional  multi-valued | Mandatory capabilities of S-CSCF used by I-CSCF to select a S-CSCF. |
| optionalCapabilities | UInt32 | read | optional  multi-valued | Optional capabilities of S-CSCF used by I-CSCF to select a S-CSCF. |
| serverNames | String | read | optional  multi-valued | Statically configured S-CSCF names to be selected by the I-CSCF. |
| assignedSCSCF | String | read. write | optional  single-valued | Assigned S-CSCF for a user. |
| primaryECFName | FQDN | read | optional  single-valued | Address of the Primary Online Charging Function. |
| secondaryECFName | FQDN | read | optional  single-valued | Address of the Secondary Online Charging Function. |
| PrimaryCCFName | FQDN | read | optional  single-valued | Address of the Primary Charging Data Function. |
| secondaryCCFName | FQDN | read | optional  single-valued | Address of the Primary Charging Data Function. |

#### 11.1.3.2 Service Profile Data

##### 11.1.3.2.1 Service Profile

Table 11.1.3.2.1-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | ServiceProfile | | | |
| Description | This class represents the Data Container for a Service Profile | | | |
| Superior OCL | tbd | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| serviceProfileID | UInt32 | read | Naming Attribute  mandatory  single-valued | The service profile Identification associated with the public user identity. |
| coreNet-SubscribedMediaProfileId | UInt32 | read | optional  Single-valued | Subscribed media profile Identification which identifies a media profile in the S-CSCF for the authorization of media parameters. |
| coreNet-ServiceIdList | String | read | optional  multi-valued | List of Service Ids which identify the IMS Communication Service Identifiers that the subscriber is authorized to use. |
| sharedFilterCriteriaSets | UInt32 | read | optional  mandatory  multi-valued | The Shared iFC Set ID ist. |

##### 11.1.3.2.2 Initial Filter Criteria

Table 11.1.3.2.2-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | InitialFilterCriteria | | | |
| Description | This class represents the Data Container for an Initial Filter Criteria | | | |
| Superior OCL | tbd | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| initialFilterCriteriaId | UInt32 | read | Naming Attribute  mandatory  single-valued | The Identification of the associated initial filter criteria. |
| applicationServerName | String | read | mandatory  single-valued | SIP URI of the application server to contact if the corresponding trigger points are met. |
| priority | UInt32 | read | mandatory  single-valued | Priority of the IFC. |
| profilePartIndicator | UInt8 | read | optional  single-valued | Indicator of the Profile Type as defined in the 3GPP TS 29.228 [24], i.e. whether the iFC is part of the registered or unregistered user profile. Possible values:  0 - UNREGISTERED  1 - REGISTERED |
| triggerPoints | String | read | optional  single-valued | Trigger Points as defined in the 3GPP TS 29.228 [24]. |
| defaultHandling | UInt8 | read | optional  single-valued | Default Handling as defined in the 3GPP TS 29.228 [24]. Possible values:  0 - SESSION\_CONTINUED  1 - SESSION\_TERMINATED |
| serviceInfo | String | read | optional  single-valued | Transparent information related to the trigger points only used by the application server. |

#### 11.1.3.3 Implicit Registration Set Data

##### 11.1.3.3.1 Implicit Registration Set

Table 11.1.3.2.2-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | ImplicitRegistrationSet | | | |
| Description | This class represents the Data Container for Implicit Registration Set | | | |
| Superior OCL | Tbd | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| implicitRegistrationSetID | UInt32 | read | Naming Attribute  mandatory  single-valued | Indentification of the corresponding Implicit Registration Set. |
| publicIdList | PublicIdentity | read | mandatory  multi-valued | Public User Identities belonging to the implicit registration set. |

##### 11.1.3.3.2 Alias Group

Table 11.1.3.3.2-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | AliasGroup | | | |
| Description | This class represents the Data Container for Alias Group | | | |
| Superior OCL | Tbd | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| aliasGroupID | UInt32 | read | Naming Attribute  mandatory  single-valued | Indentification of the corresponding Alias Group. |
| publicIdList | PublicIdentity | read | mandatory  multi-valued | Public User Identities belonging to the alias group. |

#### 11.1.3.3 Public Identity

Table 11.1.3.3.3-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | PublicIdentity | | | |
| Description | This class represents the Data Container for Public Identity | | | |
| Superior OCL | tbd | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| publicId | PublicIdentity | read | Naming Attribute  mandatory  single-valued | Public Identity of the subscriber. |
| idType | UInt8 | read | mandatory  single-valued | Type of Public Identity. Possible values:  0 - IMPU  1 - PSI |
| barringIndication | UInt8 | read | optional  single-valued | The Barring Indicator of the IMPU. Possible values:  0 - NOT BARRED  1 - BARRED |
| implicitRegistritionSetID | UInt32 | read | optional  single-valued | Identification of the Implicit Registration Set the Public User Identity belongs to. This attribute only applies to the Public User Identity. |
| serviceProfileID | UInt32 | read | mandatory  single-valued | Identification of the Service Profile the Public Identity is associated with. |
| privateIdList | PrivateIdentity | read | mandatory  multi-valued | Private Identities the Public Identity is associated with. |
| registrationStatus | UInt8 | read, write | mandatory  multi-valued | The registration status related to the Public Identity. Possible values:  0 - NOT REGISTERED  1 - UNREGISTERED  2 - REGISTERED |
| registeredPrivateIdList | PrivateIdentity | read, write | optional  multi-valued | Private Identities the Public Identity is registered with. |
| aliasGroupID | UInt32 | read | optional  single-valued | Identification of the Alias Group the public user identity belongs to. It only applies to the Public User Identity. |

#### 11.1.3.4 Repository Data

Table 11.1.3.3.4-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | RepositoryData | | | |
| Description | This class represents the Data Container for Repository Data | | | |
| Superior OCL | tbd | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| serviceIndication | String | read, write | Naming Attribute  mandatory  single-valued | Identifier of one set of service related transparent data. |
| sequenceNumber | UInt32 | read, write | optional  single-valued | Sequence number of the Repository data updated. |
| serviceData | OctetString | read, write | optional  single-valued | The corresponding service data. |

#### 11.1.3.5 Private Identity

Table 11.1.3.3.5-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | PrivateIdentity | | | |
| Description | This class represents the Data Container for Private Identity | | | |
| Superior OCL | tbd | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| privateId | PrivateIdentity | read | Naming Attribute  mandatory  single-valued | Private Identity of the subscriber. |
| idType | UInt8 | read | mandatory  single-valued | Type of Public Identity. Possible values:  0 - IMPI  1 - PSI |
| publicIdList | PublicIdentity | read | mandatory  multi-valued | Public Identities the Private Identity is associated with. |
| pendingStatus | UInt8 | read, write | Optional  single-valued | The authentication pending flag. Possible values:  0 - NOT PENDING  1 - PENGDING |
| lineIdentifier | OctetString | read | optional  multi-valued | Fixed broadband access line identifiers associated to the user. |
| userName | String | read | optional  single-valued | The user name related to the IMPI, which is used to calculate HA1 |
| password | String | read | optional  single-valued | The password related to the IMPI, which is used to calculate HA1 |
| Realm | String | read | optional  single-valued | The password related to the IMPI, which is used to calculate HA1 |
| ipv4Addr | IPv4Address | read | optional  single-valued | IPv4 address related to the IMPI for GIBA. |
| ipv6Prefix | IPv6Prefix | read | optional  single-valued | IPv6 prefix related to the IMPI for GIBA. |
| iPv6Addr | IPv6Address | read | optional  single-valued | IPv6 address related to the IMPI for GIBA. |

#### 11.1.3.6 Reference Location Information

Table 11.1.3.3.6-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | ReferenceLocationInfor | | | |
| Description | This class represents the Data Container for Reference Location Information | | | |
| Superior OCL | tbd | | | |
| Attribute Name | Type | FE access rights | Properties | Description |
| referenceLocationInforId | UInt8 | read | Naming Attribute  mandatory  single-valued | Identifier of one set of reference location information. |
| accessType | String | read | optional  single-valued | The type of access (e.g. ADSL). |
| accessInfo | String | read | optional  single-valued | The type of the access information (e.g. dsl-location). |
| accessValue | String | read | optional  single-valued | The location information (e.g. line identifier in fixed access networks). |

### 11.1.4 Alternative C

#### 11.1.4.1 IMS Subscription

Table 11.1.4.1-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | IMS-Subscription | | | |
| Description | This class represents the root node for IMS subscription specific data | | | |
| Superior OCL | IMS-Data | | | |
| Class Type | STRUCTURAL | | | |
| Direct Superclass(es) | top | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| subscriptionId | tbd | read | Naming Attribute  mandatory  single-valued | UDR-Internal identification of an IMS-Subscription. |
| sharedIFCsupport | Boolean | read, write | optional single-valued | Indicates whether the assigned S-CSCF (if any) supports shared iFCs. |
| scscfMandCap | tbd | read | optional  multi-valued | Mandatory Capabilities an S-CSCF must support to serve the subscription |
| scscfOptCap | tbd | read | optional  multi-valued | Optional Capabilities an S-CSCF may support to serve the subscription |
| scscfHost | FQDN | read, write | optional  single valued | Diameter Identity of the assigned S-CSCF |
| scscfRealm | FQDN | read, write | optional  single valued | Diameter Identity of the assigned S-CSCF |
| ccfPrim | FQDN | read | mandatory single valued | Diameter Identity of the Primary Charging Collection Function |
| ccfSec | FQDN | read | mandatory single valued | Diameter Identity of the Secondary Charging Collection Function |
| ecfPrim | FQDN | read | mandatory single valued | Diameter Identity of the Primary Event Charging Function |
| ecfSec | FQDN | read | mandatory single valued | Diameter Identity of the Secondary Event Charging Function |

#### 11.1.4.2 Service Profile

Table 11.1.4.2-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | ServiceProfile | | | |
| Description | This class represents service profiles | | | |
| Superior OCL | IMS-Subscription | | | |
| Class Type | STRUCTURAL | | | |
| Direct Superclass(es) | top | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| serviceProfileId | tbd | read | Naming Attribute  mandatory  single-valued | UDR-Internal identification of a Service Profile. |
| sharedFilterIDs | tbd | read | optional multi-valued | List of pointers to shared IFCs within CommonData |
| subMediaProfId | tbd | read | optional single-valued | Core Network Service Authorization: Subscribed Media Profile Id |
| serviceId | tbd | read | optional multi-valued | Core Network Service Authorization:  List of Service Ids |

#### 11.1.4.3 Initial Filter Criteria

Table 11.1.4.3-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | Filter | | | |
| Description | This class represents user specific filter | | | |
| Superior OCL | ServiceProfile | | | |
| Class Type | STRUCTURAL | | | |
| Direct Superclass(es) | top | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| initialFilterCriteriaId | tbd | read | Naming Attribute  mandatory  single-valued | UDR-Internal identification of a Filter. |
| profilePartInd | tbd | read | optional single-valued | Profile Part Indicator |
| priority | tbd | read | optional single-valued | Priority |
| applicationServer | tbd | read | optional single-valued | SIP URL of the Applicatio Server |
| serviceInfo | tbd | read | optional single-valued | Service Information |
| triggerPoint | tbd | read | optional  single-valued | The Filter's trigger point |

#### 11.1.4.4 Implicit Registration Set

Table 11.1.4.4-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | ImplicitRegistrationSet | | | |
| Description | This class represents Implicit Registration Sets | | | |
| Superior OCL | IMS-Subscription | | | |
| Class Type | STRUCTURAL | | | |
| Direct Superclass(es) | top | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| implicitRegistrationSetId | tbd | read | Naming Attribute  mandatory  single-valued | UDR-Internal identification of an Implicit Registration Set. |
| authenticationPending | Boolean | read, write | mandatory single-valued | Authentication-Pending flag |
| registrationStatus | tbd | read, write | mandatory single-valued | Registration Status |
| privateIdentity | tbd | read | mandatory multi-valued | List of Private User Identities |
| forbiddenPLMNsId | tbd | read | optional single-valued | pointer to a list of forbidden PLMNs within CommonData |

#### 11.1.4.5 Public Identity

Table 11.1.4.5-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | PublicIdentity | | | |
| Description | This class represents IMS Public Identities | | | |
| Superior OCL | ImplicitRegistrationSet | | | |
| Class Type | STRUCTURAL | | | |
| Direct Superclass(es) | top | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| publicIdentity | tbd | read | Naming Attribute  mandatory  single-valued | Public User Identity or Public Service Identity |
| barredIndicator | Boolean | read | mandatory single-valued | Indicates whether the PublicIdentity is barred |
| defaultIndicator | Boolean | read | mandatory single-valued | Indicates whether the public identity is the default public identity within the implicit registrationset |
| serviceProfileId | tbd | read | optional single-valued | Name of the service profile associated to the public identity |
| displayName | tbd | read | optional single-valued |  |
| aliasId | tbd | read | optional single-valued | Identifies the alias group to which the public identity belongs |
| psiIndicator | Boolean | read | mandatory single-valued | Indicates whether the public identity is a PSI |

#### 11.1.4.6 Repository Data

Table 11.1.4.6-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | RepositoryData | | | |
| Description | This class represents Repository Data | | | |
| Superior OCL | PublicIdentity | | | |
| Class Type | STRUCTURAL | | | |
| Direct Superclass(es) | top | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| serviceIndication | tbd | create, delete | Naming Attribute  mandatory  single-valued | Identifies the Transparent Data |
| version | tbd | read, write | mandatory single-valued | Version of the Transparent Data |
| data | tbd | read, write | optional single-valued | Transparent Data |

#### 11.1.4.7 Alias Group

Table 11.1.4.7-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | AliasGroup | | | |
| Description | This class represents Alias Groups | | | |
| Superior OCL | ImplicitRegistrationSet | | | |
| Class Type | STRUCTURAL | | | |
| Direct Superclass(es) | top | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| aliasGroupId | tbd | read | Naming Attribute  mandatory  single-valued | Identifies the Alias Group |
| serviceProfileId | tbd | read | mandatory single-valued | Name of the service profile associated to the alias group |

#### 11.1.4.8 Private Identity

Table 11.1.4.8-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | PrivateIdentity | | | |
| Description | This class represents Private Identities | | | |
| Superior OCL | IMS-Subscription | | | |
| Class Type | STRUCTURAL | | | |
| Direct Superclass(es) | top | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| privateIdentity | tbd | read | Naming Attribute  mandatory  single-valued | Identifies the Private Identity |
| authScheme | tbd | read | mandatory single-valued |  |
| imsi | tbd | read | optional single-valued |  |
| digestHa1 | tbd | read | optional single-valued |  |
|  |  |  |  |  |

### 11.1.5 Alternative D

#### 11.1.5.1 IMS Private Identity

Table 11.1.5.1-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | ImsImpi | | | |
| Description | This class represents the Data Container for IMS Private Identity | | | |
| Superior OCL | IMS-Data | | | |
| Class Type | tbd | | | |
| Direct Superclass(es) | tbd | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| ImsImpiId | tbd | Read | Naming Attribute  Mandatory  Single-valued | This attribute identifies this Object Class. |
| ImsPassw | String | Read | Optional  Single-valued | This attribute contains the password to be used for SIP Digest authentication |
| ImsAuthSchMask | Enumerated | Read | Mandatory | This attribute indicates IMS supported authentication mechanisms. |
| ImsRoamAllow | Boolean | Read | Mandatory  Single-valued | This attribute indicates whether the user is allowed to roam.  Possible values are:  TRUE – The user is allowed to roam  FALSE – The user is not allowed to roam |

#### 11.1.5.2 IMS Public Identity

Table 11.1.5.2-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | ImsImpu | | | |
| Description | This class represents the Data Container for IMS Public Identity | | | |
| Superior OCL | IMS-Data | | | |
| Class Type | tbd | | | |
| Direct Superclass(es) | tbd | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| IMPU | tbd | Read | Naming Attribute  Mandatory  Single-valued | This attribute identifies this Object Class |
| ImsAssocImpi | tbd | Read | Optional  Single-valued | This attribute indicates the Private Identity associated to this Public Identity |
| ImsServProfId | String | Read | Optional  Single-valued | This attribute indicates the Service Profile associated to this IMS Public  Identity. |
| AliasGroupId | String | Read | Optional  Single-valued | This attribute identifies corresponding Alias Group, if any. |
| ImsIrs | UInt16 | Read | Mandatory  Single-valued | This attribute indicates to which implicit registration set (IRS) the IMS Public Identity belongs to. See 3GPP TS 23.008 [5], section 3.1.6.  If the Public Identity does not belong to an IRS, the value of this attribute shall be 0. |
| ImsSessBarrInd | Boolean | Read | Mandatory  Single-valued | This attribute indicates whether the IMPU is barred for session establishment. See 3GPP TS 23.008 [5], section 3.1.3.  Possible values are:  TRUE – Identity is barred  FALSE – Identity is not barred |
| ImsIsDefault | Boolean | Read | Mandatory  Single-valued | This attribute indicates whether this Public Identity is the default one within the IRS. See 3GPP TS 23.008 [5], section 3.1.7.  Possible values are:  TRUE – The identity is the default within the IRS  FALSE – The identity is not the default within the IRS |

#### 11.1.5.3 IMS Service Profile

Table 11.1.5.3-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | IMS ServiceProfile | | | |
| Description | This class represents the Data Container for Service Profile | | | |
| Superior OCL | IMS-Data | | | |
| Class Type | tbd | | | |
| Direct Superclass(es) | tbd | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| ImsServProfId | String | Read | Naming Attribute  Mandatory  single-valued | This attribute identifies this Object Class |
| AliasGroupId | String | Read | Optional  Single-valued | This attribute identifies corresponding Alias Group, if any. |

#### 11.1.5.4 Alias Group

Table 11.1.5.4-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Object Class | AliasGroup | | | |
| Description | This class represents the Data Container for Alias Group | | | |
| Superior OCL | IMS-Data | | | |
| Class Type | tbd | | | |
| Direct Superclass(es) | tbd | | | |
| Attribute Name | Type | HSS-FE access rights | Properties | Description |
| AliasGroupId | String | Read | Naming Attribute  Mandatory  Single-valued | This attribute identifies this Object Class |
| ImsServProfId | String | read | Mandatory  single-valued | This attribute indicates the Service Profile associated to this Alias Group. |

## 11.2 Directory Information Tree

### 11.2.0 General

In the following sub-sections more object classes may be needed and are left to implementations. Different alternatives are described in order to show how different implementations may differ.

### 11.2.1 Alternative A



Figure 11.2.1-1: DIT Structure for IMS-Data with Alternative A

The dotted arrow indicates the relationship between PublicIdentity and PrivateIdentity which is expressed by the attributes PrivateIdList and PublicIdList.

The superior OCL description of the ImsData object class and some more detailed description of object classes and attributes are FFS.

### 11.2.2 Alternative B



Figure 11.2.2-1: DIT Structure for IMS-Data with Alternative B

CoreNet-SubscribedMediaProfileId, CoreNet-ServiceIdList and SharedFilterCriteriaSets are optional attributes in Service Profile entry.

The dotted arrow indicates the relationship between PublicIdentity and PrivateIdentity which is expressed by the attributes PrivateIdList and PublicIdList.

Multiple instances of ReferenceLocInfo (refLocInfo=xxx) is for future releases.

### 11.2.3 Alternative C



Figure 11.2.3-1: DIT Structure for IMS-Data with Alternative C

If an ImplicitRegistrationSet contains a PublicIdentity which is a PSI then it shall not contain any other PublicIdentity.

If an ImplicitRegistrationSet contains a single PublicIdentity, this Public Identity is not implicitly registered with any other Public Identity and therefore in stage 2 terms is not considered to belong to an Implicit Registration Set.

The concept of multiple IMS-Subscriptions within IMS-Data is not described in the present document.

### 11.2.4 Alternative D



Figure 11.2.4-1: DIT Structure for IMS-Data with Alternative D

## 11.3 UML model

This section covers the information model for IMS Data and all its permanent data entities. The term IMS Data may also include temporary data as shown in the corresponding DITs.

Some data entities are already defined in 3GPP TS 32.182 [3].

Figure 11.3-1 covers some basic IMS entities with two possible approaches:

- Approach A: where IMPU and PSI are considered as different basic entities;

- Approach B: where a Public Identity basic IMS entity may identify a Public User Identity or a Public Service Identity and a Private Identity basic IMS entity may identify a Private User Identity or a Private Service Identity. The rational of Approach B is that Public User Identity and Public Service Identity have many common points. They have the same inheritance diagram with SIP URI or Tel URI. Public User Identity or Public Service Identity have compatible associations with other entities such as IMS Data or IMS Service profile. This modelling reduces the number of IMS basic entities and associations. Then, the differentiation between a Public User Identity and a Public Service Identity may be done by an attribute within the Public identity.

It is left to implementation to identify the most suited approach according to the further model inputs.



Figure 11.3-1A Information model for some IMS entities with approach A



Figure 11.3-1B Information model for some IMS entities with approach B

Figure 11.3-2 covers IMS Public User Identity and its relationship with other IMS data entities.



Figure 11.3-2 Information model for IMS Public User Identity and some surrounding entities

Figure 11.3-3 covers IMS Public Service Identity and its relationship with other IMS data entities.



Figure 11.3-3 Information model for IMS Public Service Identity and some surrounding entities

Figure 11.3-4 covers IMS Public User Identity Implicit Registration Set and its relationship with Alias Group, and IMS Public User Identity.

NOTE: Alias Group is used as a simplification of the 3GPP TS 23.228 defined term Alias Public User Identities. In 3GPP TS 23.228 this is referred sometimes as well as Alias Public User Identity Group or Alias Public User Identity Set.

Following constrains apply:

- All Public User Identities of an Implicit Registration set must be associated to the same Private User Identities.

- Each IMPU can only be included in one Alias Group



Figure 11.3-4 Information model for IMS Public User Identity Implicit Registration Set and its relationship with IMS Public User Identity and Alias Group

Figure 11.3-5 covers IMS Data and its relationship with Public Identity that provides coherence between approach A and approach B, since IMPU and PSI are derived entities from the more generic Public Identity

The figure implies that a Public Identity can not exist without IMS Data. On the other hand, IMS Data is defined for IMPU(s) or PSI(s), but not for both at the same time.



Figure 11.3-5 Information model for Public Identity

Figure 11.3-6 covers IMS Alias Group information model.



Figure 11.3-6 Information model for Alias Group

# 12 Conclusion and Recommendation

The present study, although focused on IMS data model and not fully completed, has shown that different alternatives for UDC Service Profile (section 7) and UDC IMS Service Data (section 12) are supported in current deployments and implementations and that a common base could not be found. This is mainly due to the fact that existing FE application logics may be impacted when changing the data model and this has been evaluated as not acceptable during the work.

For the above reasons a standardized Reference Data Model (RDM) for the Ud interface between Front-Ends for the HSS application (HSS-FEs) and the User Data Repository (UDR) is not agreeable.

It is therefore recommended not to start normative specification work on the definition of a Reference Data Model.

It is further recommended to add text to 3GPP TS 29.335 indicating that specifying a standardized RDM is out of scope of 3GPP specifications and hence Ud data model is proprietary.

For multivendor interoperability between FEs and UDR specific integration projects are needed in order to accommodate data required by different vendors FEs into UDR. To this end the present document may represent a valid example of data models implementation in operator's network.

Annex A:  
Change history

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **TSG #** | **TSG Doc.** | **CR** | **Rev** | **Subject/Comment** | **Old** | **New** |
| 2012-09 | CT#57 | CP-120484 |  |  | Presented for approval | 2.0.0 | 11.0.0 |
| 2014-09 | - | - | - | - | Update to Rel-12 version (MCC) | 11.0.0 | 12.0.0 |
| 2015-12 | - | - | - | - | Update to Rel-13 version (MCC) | 12.0.0 | 13.0.0 |
| 2017-03 | - | - | - | - | Update to Rel-14 version (MCC) | 13.0.0 | 14.0.0 |
| 2018-10 | - | - | - | - | Update to Rel-15 version (MCC) | 14.0.0 | 15.0.0 |
| 2020-07 | - | - | - | - | Update to Rel-16 version (MCC) | 15.0.0 | 16.0.0 |