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Foreword

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Introduction

User Data Convergence (UDC) presents a layered architecture where user data is accessible at a logically unique repository called User Data Repository (UDR). One or more dataless applications access the user data that is stored in the UDR. In this context, applications can be front ends, for example an HSS-FE or an HLR-FE, or application servers. In order to support UDC, a Common Baseline Information Model is defined in this specification.

1 Scope

The present document specifies a Common Baseline Information Model for UDC [2]. This information model denotes an abstract, formal representation of entity types that are common to many applications using the UDR. CBIM describes the basic IOCs of UDC, their properties and their relationships. Detailed requirements for the specification of this Common Baseline Information Model are given in 3GPP TR 22.985 [2] and 3GPP TS 22.101 [3].

From the Common Baseline Information Model specialized information models and data models can be derived. All these derived models are out of the scope of this specification.

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 TR 22.985: "Service requirement for the User Data Convergence (UDC)".
- [3] 3GPP TS 22.101: "Service aspects; Service principles".
- [4] 3GPP TS 32.151: "Integration Reference Point (IRP) Information Service (IS) template (Release 8)".
- [5] 3GPP TS 32.152: "Integration Reference Point (IRP) Information Service (IS) Unified Modelling Language (UML) repertoire (Release 8)".
- [6] 3GPP TS 23.003: "Numbering, addressing and identification; (Release 8)".
- [7] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2; (Release 8)".
- [8] ITU-T Recommendation E.164: "The International Public Telecommunication Numbering Plan".
- [9] IETF RFC 4282: "The Network Access Identifier".
- [10] IETF RFC 3966: "The tel URI for Telephone Numbers".
- [11] IETF RFC 3261: "SIP: Session Initiation Protocol".
- [12] 3GPP TS 32.181: "User Data Convergence; Framework for Model Handling and Management".

3 Definitions and abbreviations

3.1 Definitions

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

Common Baseline Information Model: an abstract, formal representation of entity types common to many applications using the UDR. CBIM describes the basic IOCs of UDC, their properties and their relationships, so that these IOCs constitute the baseline for any given application. Therefore, CBIM provides flexibility (in its data structure and content), extensibility and multi-application approach. In particular, CBIM provides support for the concepts of Subscription, Service Profile, End User, Identifiers, End User Group, and End Device, among others. CBIM does not define the models that are associated with each application and that are under their responsibility.

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].

CBIM	Common Baseline Information Model
UE	User Equipment
FE	Front End
IRP	Integration Reference Point
IMPI	IP Multimedia Private User Identity
IMPU	IP Multimedia Public User Identity
IMS	IP Multimedia Subsystem
IMSI	International Mobile Subscriber Identity
ISDN	Integrated Services Digital Network
IS	Information Service
ISIM	IM Services Identity Module
MSISDN	Mobile Subscriber ISDN Number
NAI	Network Access Identifier
UDC	User Data Convergence
UDR	User Data Repository
UML	Unified Modelling Language
URI	Uniform Resource Identifier

4 Modelling Approach

The CBIM is not an Integration Reference Point (IRP) as it is not used for a management interface; however this specification follows the IRP IS template specified in 3GPP TS 32.151 [4] and reuses the UML repertoire described in 3GPP TS 32.152 [5].

NOTE: The intention of CBIM is to provide the basic common IOCs of UDC, including their definitions and relationships. Attributes of the IOCs are not intended to be part of this specification.

5 Information Object Classes

5.1 Imported Information Entities and Local Labels

5.2 Class Diagram

5.2.1 Attributes and relationships

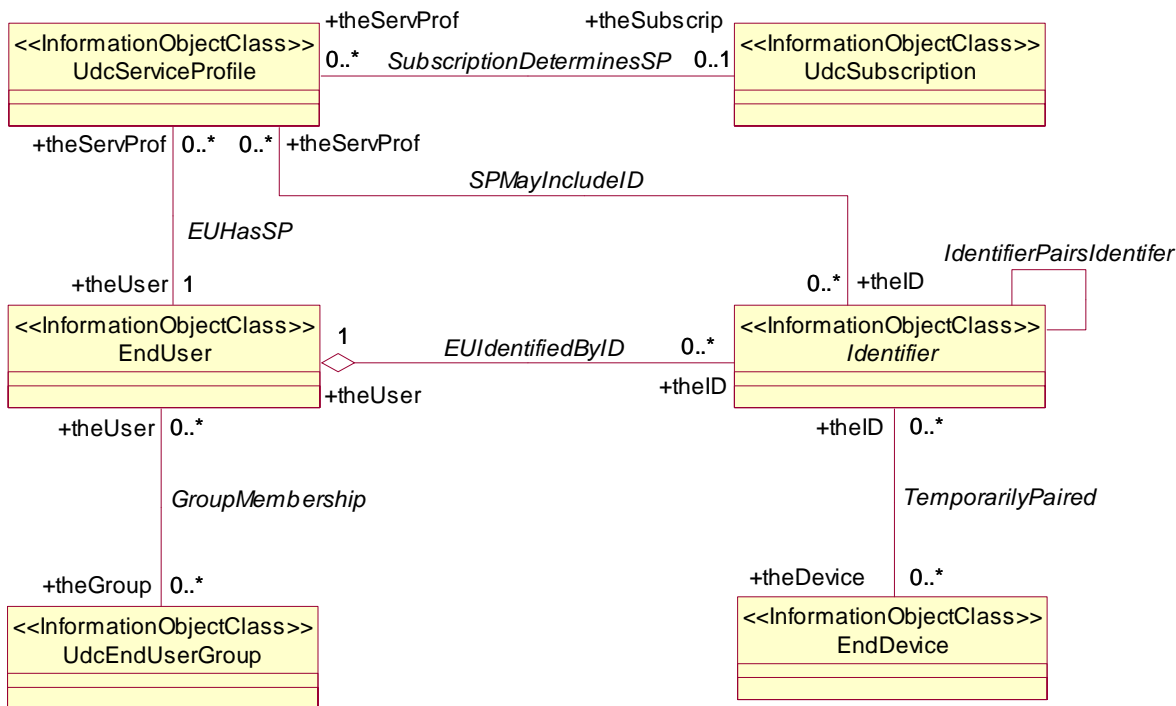


Figure 5.2.1-1: UDC CBIM Core View

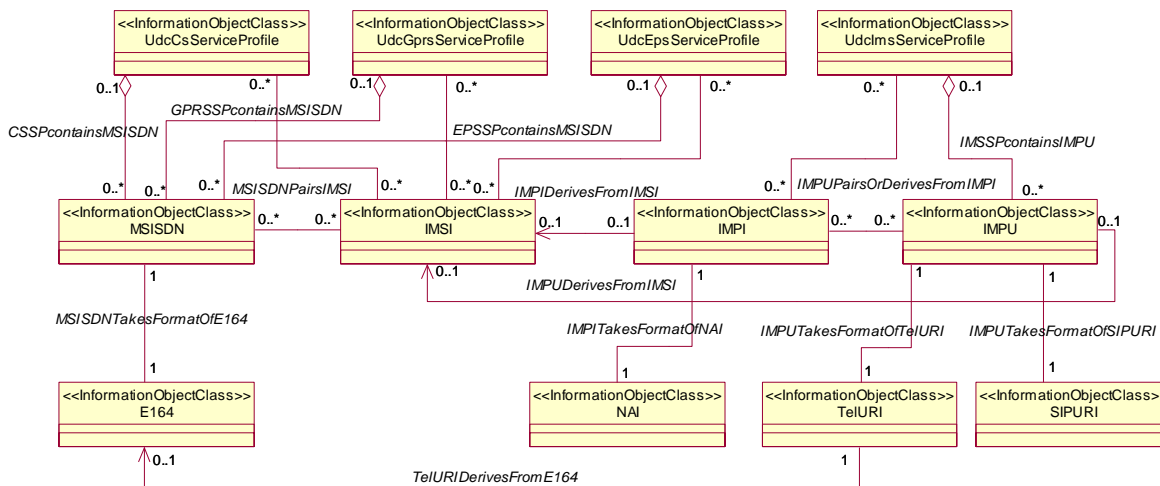


Figure 5.2.1-2: Identifiers

5.2.2 Inheritance

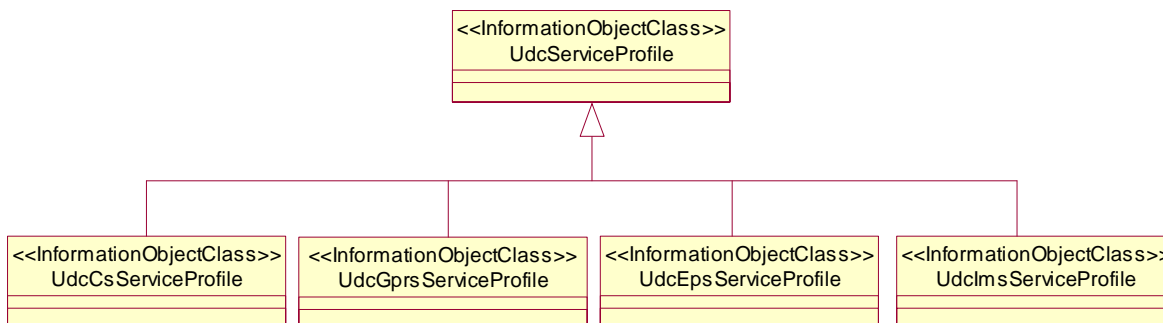


Figure 5.2.2-1: UdcServiceProfile inheritance

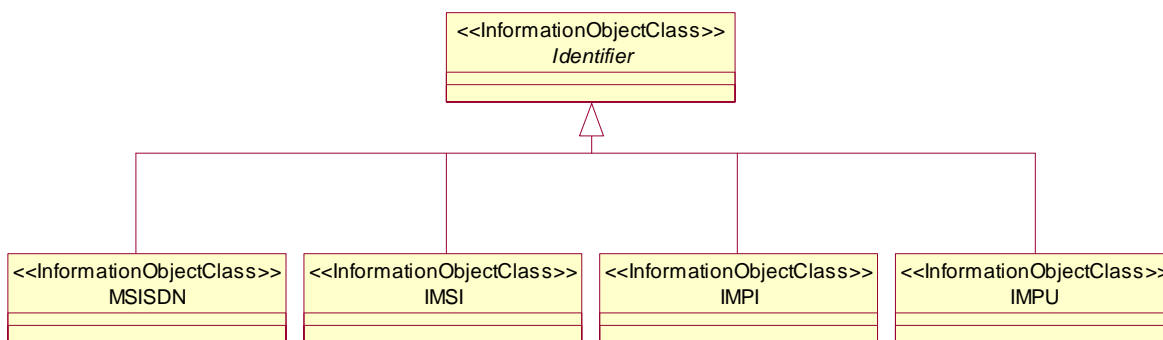


Figure 5.2.2-2: Identifier inheritance

5.3 Information Object Class Definitions

5.3.1 EndUser

5.3.1.1 Definition

In this context this object class represents an End User (as per 3GPP TS 21.905 [1]). This class represents the view that the telecommunication network has about the end user and contains the valid parameters that define the End User from UDC point of view. An `EndUser` object class has an End-User Identity attribute (EUI), which is described in 3GPP TS 21.905 [1].

5.3.2 Identifier

5.3.2.1 Definition

This abstract object class represents an end user identifier that is used within the network so that the different network functionalities can be used (mobility management, authentication, and service usage). This is an abstract IOC that can be inherited by the real identifier used in the network, like IMSI, MSISDN, IMPI, IMPU, etc.

NOTE: This object does not include identities that are not associated to a user, such as an IMEI, hostID, etc.

5.3.3 UdcServiceProfile

5.3.3.1 Definition

This object class represents the data characterizing a service assigned to an `EndUser`. It includes service preferences and settings chosen for an `EndUser`. The service profile contains the permanent and temporary data pertaining to an end user that is subscribed to a service. This IOC can be inherited by different service profiles, such as CS, GPRS, EPS, IMS service profiles and so on.

5.3.4 EndDevice

5.3.4.1 Definition

This object class represents a composite of hardware and software that implements service terminal functions and that the `EndUser` operates in order to get access to telecommunication services.

5.3.5 UdcCsServiceProfile

5.3.5.1 Definition

This object class represents the part of the `UdcServiceProfile` that contains data related to Circuit-Switched services. An example of further specialization of this object class, including attributes, is provided in 3GPP TS 32.181 [12].

5.3.6 UdcGprsServiceProfile

5.3.6.1 Definition

This object class represents the part of the `UdcServiceProfile` that contains data related to Packet-Switched services. An example of further specialization of this object class, including attributes, is provided in 3GPP TS 32.181 [12].

5.3.7 UdcEpsServiceProfile

5.3.7.1 Definition

This object class represents the part of the `UdcServiceProfile` that contains data related to the Evolved Packet System services. An example of further specialization of this object class, including attributes, is provided in 3GPP TS 32.181 [12].

5.3.8 UdcImsServiceProfile

5.3.8.1 Definition

This object class represents the part of the `UdcServiceProfile` that contains data related to IMS services. An example of further specialization of this object class, including attributes, is provided in 3GPP TS 32.181 [12].

5.3.9 MSISDN

5.3.9.1 Definition

In this context this object class represents a Mobile Subscriber Integrated Services Digital Network Number (as per 3GPP TS 23.003 [6]). An MSISDN is allocated from an E.164 numbering plan.

5.3.10 IMSI

5.3.10.1 Definition

In this context this object class represents an International Mobile Subscriber Identity (as per 3GPP TS 23.003 [6]).

5.3.11 IMP I

5.3.11.1 Definition

In this context this object class represents an IMS Private User Identity (as per 3GPP TS 23.228 [7]). The Private User Identity takes the form of a Network Access Identifier (NAI), which is defined in IETF RFC 4282 [9]. It is possible for a representation of the IMSI to be contained within the NAI for the private user identity.

5.3.12 IMPU

5.3.12.1 Definition

In this context this object class represents an IMS Public User Identity (as per 3GPP TS 23.228 [7]). An IMPU takes the form of either a SIP URI (see IETF RFC 3261 [11]) or a Tel URI (see IETF RFC 3966 [10]). For UEs that are not equipped with an ISIM application, it is possible to derive a temporary IMPU from the IMSI (see 3GPP TS 23.003 [6] for details).

5.3.13 E164

5.3.13.1 Definition

This object class represents a telephone number crafted according to ITU-T Recommendation E.164 [8].

5.3.14 NAI

5.3.14.1 Definition

This object class represents a Network Access Identifier (as per IETF RFC 4282 [9]).

5.3.15 TelURI

5.3.15.1 Definition

This object class represents a telephone URI (as per IETF RFC 3966 [10]).

5.3.16 SIPURI

5.3.16.1 Definition

This object class represents a SIP URI (as per IETF RFC 3261 [11]).

5.3.17 UdcEndUserGroup

5.3.17.1 Definition

This IOC represents a grouping of several End Users by the operator. The IOC includes information that describes the grouping and criteria for membership.

Examples of `UdcEndUserGroup` may include the following: Closed User Group, VPN, and market segments.

5.3.18 UdcSubscription

5.3.18.1 Definition

This IOC represents common data shared by a group of `UdcServiceProfile` instances. This IOC exists due to the relationship of a subscriber to the service provider. The end user can be attached to different UDC subscriptions through UDC Service Profiles for different service usage (e.g. for a private and a professional service usage).

Editor's Note: The relationship between `Identifier` and `UdcSubscription` is left for further study.

5.4 Information Relationship Definitions

5.4.1 SubscriptionDeterminesSP

5.4.1.1 Definition

This represents the association established between `UdcSubscription` and `UdcServiceProfile` due to common data shared by a group of `UdcServiceProfile` instances.

5.4.2 SPMayIncludeID

5.4.2.1 Definition

This represents the association established between `Identifier` and `UdcServiceProfile`.

5.4.3 EUHasSP

5.4.3.1 Definition

This represents the association established between `UdcServiceProfile` and `EndUser` due to the fact that any end user who is receiving a service has a service profile associated to it.

5.4.4 IdentifierPairsIdentifier

5.4.4.1 Definition

This represents the relation established by instances of `Identifier` with other instances of `Identifier`. For example, one instance of `Identifier` can be an `IMPU` IOC, and the other an `IMPI` IOC. The relation of both is generically described by this relationship.

5.4.5 EUIdentifiedByID

5.4.5.1 Definition

This represents an instance of `EndUser` that aggregates instances of `Identifier`.

5.4.6 GroupMembership

5.4.6.1 Definition

This represents the association established between `EndUser` and `UdcEndUserGroup` determined due to the operator selecting instances of `EndUser` belonging to `UdcEndUserGroup`.

5.4.7 TemporarilyPaired

5.4.7.1 Definition

This represents the temporarily association established between `EndDevice` and `Identifiers`, and vice versa. The relation is determined by an identifier (such as an `MSISDN` or an `IMPU`) being used from end devices, and from an end device being used by identifiers.

5.4.8 CSSPcontainsMSISDN

5.4.8.1 Definition

This represents an aggregation from `UdcCsServiceProfile` to `MSISDN`.

5.4.9 GPRSSPcontainsMSISDN

5.4.9.1 Definition

This represents an aggregation from `UdcGprsServiceProfile` to one or more instances of `MSISDN`.

5.4.10 EPSSPcontainsMSISDN

5.4.10.1 Definition

This represents an aggregation from `UdcEpsServiceProfile` to `MSISDN`.

5.4.11 IMSSPcontainsIMPU

5.4.11.1 Definition

This represents an aggregation from `UdcImsServiceProfile` to `IMPU`.

5.4.12 MSISDNPairsIMSI

5.4.12.1 Definition

This represents the association established between MSISDN and IMSI. This might be the case when an MSISDN uses IMSIs included in a SIM application for authentication purposes.

5.4.13 IMPIDerivesFromIMSI

5.4.13.1 Definition

This represents the association established when an IMPI is built from the contents of an IMSI. This might be the case when a UE that is accessing IMS services is not equipped with a ISIM application, but just a USIM application in the UICC. See details of the derivation process in 3GPP TS 23.003 [6].

5.4.14 IMPUPairsOrDerivesFromIMPI

5.4.14.1 Definition

This represents the association established when an IMPU is paired with an IMPI, where the IMPI is used for authentication purposes of that IMPU.

5.4.15 IMPUDerivesFromIMSI

5.4.15.1 Definition

This represents the association established when an IMPU is derived from an IMSI. This might be the case when a UE that is accessing IMS services is not equipped with an ISIM application, but a USIM application in the UICC. See details of the derivation process in 3GPP TS 23.003 [6].

5.4.16 MSISDNTakesFormatOfE164

5.4.16.1 Definition

This represents the association established when an MSISDN is created from an E.164 number.

5.4.17 IMPITakesFormatOfNAI

5.4.17.1 Definition

This represents the association established when the IMPI takes the format of a NAI. See details in 3GPP TS 23.003 [6].

5.4.18 IMPUTakesFormatOfTelURI

5.4.18.1 Definition

This represents the association established when an IMPU takes the format of a Tel URI. See details in 3GPP TS 23.003 [6].

5.4.19 IMPUTakesFormatOfSIPURI

5.4.19.1 Definition

This represents the association established when an IMPU takes the format of a SIP URI. See details in 3GPP TS 23.003 [6].

5.4.20 TelURIDerivesFromE164

5.4.20.1 Definition

This represents the association established when a Tel URI is derived from an E.164 number.

Annex A (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2009-12	SA#46	SP-090727	--	--	Presentation to SA for information	---	1.0.0
2010-03	SA#47	SP-100067	--	--	Presentation to SA for Approval	1.0.0	2.0.0
2010-03	--	--	--	--	Publication of SA approved version	2.0.0	9.0.0
2011-03	-	-	-	-	Update to Rel-10 version (MCC)	9.0.0	10.0.0
2012-09	-	-	-	-	Update to Rel-11 version (MCC)	10.0.0	11.0.0
2014-10	-	-	-	-	Update to Rel-12 version (MCC)	11.0.0	12.0.0
2016-01	-	-	-	-	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
2018-06	-	-	-	-	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
2022-03	-	-	-	-	Update to Rel-17 version (MCC)	16.0.0	17.0.0

History

Document history		
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