Source: TSG CN WG4

Title: Corrections on IMS Sh-interface

Agenda item: 8.1

Document for: APPROVAL

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
29.329	031		N4-040104		Add MSISDN to set of Data that may be downloaded	F	5.4.1
29.328	044	2	N4-040358		Clarification of which Public Identities are downloaded	F	5.6.0
29.328	045	2	N4-040359		Clarification of which Public Identities are downloaded	F	6.0.0

CR-Form-v7

CHANGE REQUEST

⌘ **29.329** CR **031** ⌘ **rev** **1** ⌘ Current version: **5.4.1** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Add MSISDN to set of Data that may be downloaded	
Source:	⌘	CN4	
Work item code:	⌘ IMS-CCR	**Date:** ⌘	30/01/2004
Category:	⌘ **F**	**Release:** ⌘	Rel-5

Use one of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	To define MSISDN as a Data type.
Summary of change:	⌘	MSISDN is added as a Data type. **This is an essential correction.**
Consequences if not approved:	⌘	MSISDN cannot be downloaded from the HSS.

Clauses affected:	⌘	6.3.4		

		Y	N		
Other specs affected:	⌘	X		Other core specifications	⌘ 29.328 CR 044
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6.3.4 Data-Reference AVP

The Data-Reference AVP (AVP code 103) is of type Enumerated, and indicates the type of the requested user data in the operation UDR and SNR. Its exact values and meaning is defined in 3GPP TS 29.328 [1]. The following values are defined (more details are given in 3GPP TS 29.328 [1]):

RepositoryData (0)

IMSPublicIdentityfiers (10)

This value is used to request the read or notification of changes in the IMS public identities fields

IMSUserState (11)

S-CSCFName (12)

InitialFilterCriteria (13)

This value is used to request initial filter criteria relevant to the requesting AS

LocationInformation (14)

UserState (15)

ChargingInformation (16)

MSISDN (xx)

CR-Form-v7

CHANGE REQUEST

⌘ **29.328** CR **044** ⌘**rev** **3** ⌘ Current version: **5.6.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐   ME ☐ Radio Access Network ☐ Core Network **X**

Title: ⌘	Clarification of which Public Identities are downloaded
Source: ⌘	CN4
Work item code:⌘ IMS-CCR	***Date:*** ⌘ 20/01/2004

Category: ⌘ **F**   ***Release:*** ⌘ Rel-5

Use <u>one</u> of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Use <u>one</u> of the following releases:
2   *(GSM Phase 2)*
R96   *(Release 1996)*
R97   *(Release 1997)*
R98   *(Release 1998)*
R99   *(Release 1999)*
Rel-4   *(Release 4)*
Rel-5   *(Release 5)*
Rel-6   *(Release 6)*

Reason for change: ⌘	In section 7.6.2, the following text is found;- 'This information element contains the list of public identities of the user'. In this situation, the user is identified by a public identifier. It is not clear if 'the user' for whom a list of Public Identifiers is to be downloaded is the private identity associated with the public identity (in which case the list of public identities to download should be all associated with the Private-Id) or just that public identity (in which case the list is just those that would be implicitly registered with that public-id).
	Further, there is misalignment between Annex C and Annex D about the definition of IMSPublicIdentity. In Annex C, the UML illustration of PublicIdentifiers shows IMSPublicIdentity as being SIP_URL, TEL_URL or MSISDN, but the schema in Annex D shows IMSPublicIdentity as being only SIP_URL or TEL_URL and PublicIdentifiers as being IMSPublicIdentity or MSISDN.
	This is an essential correction.
Summary of change:⌘	Annex C is changed to align with Annex D, defining IMSPublicIdentity as only being SIP_URL or TEL_URL, and defining PublicIdentifiers as being made up of a list of 0…n occurences of IMSPublicIdentity and 0…n occurences of MSISDN. This allows table 7.6.1 to be updated to have Data Ref 10 defined as IMSPublicIdentity and to define a distinct Data Ref for MSISDN. It is clarified that IMS Public Identity in 7.6.2 is the set of non-bared IMS Public identities that would be implicitly registered with the IMS Public identity in the User-Identityfield. The description in 7.6.2 is modified accordingly and a description of MSISDN is added. In addition, 6.1.1 is updated to have User-Identity defined as IMS Public Identity.

Consequences if not approved:	⌘	Scope for differing interpretation in the specs may lead to interworking issues. Misalignment between UML and XML schema provides scope for incorrect implementation.

Clauses affected:	⌘	6.1.1, 7.6, Annex C		
		Y	**N**	
Other specs affected:	⌘		**X**	Other core specifications ⌘
			X	Test specifications
			X	O&M Specifications
Other comments:	⌘			

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6   Procedure Descriptions

6.1   User data handling procedures

6.1.1   Data read (Sh-Pull)

This procedure is used between the AS and the HSS. The procedure is invoked by the AS and is used:

-   To read transparent and/or non-transparent data for a specified user from the HSS.

This procedure is mapped to the commands User-Data-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.1.1 and 6.1.1.2 detail the involved information elements.

Table 6.1.1.1: Sh-Pull

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	IMS Public Identity or MSISDN of the user for whom the data is required.
Requested data (See 7. 3)	Data-Reference	M	This information element indicates the reference to the requested information. The set of valid reference values are defined in 7. 6.
Requested domain (See 7.2)	Requested-Domain	C	This information element indicates the domains to which the operation is applicable. Check table 7.6.1 to see when it is applicable.
Current Location (See 7.8)	Current-Location	C	This information element indicates whether an active location retrieval has to be initiated or not. It shall be present if Location Information is requested. If this information element takes the value InitiateActiveLocationRetrieval (1) the HSS shall indicate to the MSC/VLR and/or SGSN the need to initiate an active location retrieval.
Service Indication (See 7. 4)	Service-Indication	C	IE that identifies, together with the User-Identity and Data-Reference, the set of service related transparent data that is being requested..
Application Server Identity (See 7.9)	Origin-Host	M	IE that identifies the AS originator of the request and that is used to check the AS permission list.
Application Server Name	Server-Name	C	IE that is used, together with the user identity and Data-Reference, as key to identify the filter criteria. This element shall be present when the Data-Reference value is InitialFilterCriteria (13).

Table 6.1.1.2: Sh-Pull Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7. 5)	Result-Code / Experimental_ Result	M	Result of the request. Result-Code AVP shall be used for errors defined in the Diameter Base Protocol. Experimental-Result AVP shall be used for Sh errors. This is a grouped AVP which contains the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP.
Data (See 7. 6)	User-Data	O	Requested data.

6.1.1.1   Detailed behaviour

The conditions for the inclusion of Requested-Domain as an additional key to the requested data are described in table 7.6.1. If repository data is requested, Service-Indication shall be present in the request. If initial filter criteria are requested, the Server-Name AVP shall contain the SIP URL of the AS that initiates the request; requests for initial filter criteria are limited to those initial filter criteria which are relevant to the requesting AS.

Upon reception of the Sh-Pull request, the HSS shall, in the following order:

1. Check that the AS sending the request (identified by the Origin-Host AVP) has Sh-Pull permission in the AS Permissions List (See 6.2). If not, Experimental-Result-Code shall be set to DIAMETER_ERROR_OPERATION_NOT_ALLOWED in the Sh-Pull Response.

2. Check that the user for whom data is asked exists in HSS. If not, Experimental-Result-Code shall be set to DIAMETER_ERROR_USER_UNKNOWN in the Sh-Pull Response.

3. Check that the requested user data is allowed to be read by the AS.

   - If the data referenced in the request is not allowed to be read, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_DATA_CANNOT_BE_READ in the Sh-Pull Response.

4. Check whether or not the data that is requested to be downloaded by the AS is currently being updated by another entity. If there is an update of the data in progress, the HSS shall delay the Sh-Pull-Resp message until the update has been completed and shall include in the Sh-Pull-Resp message the updated data requested.

If there is an error in any of the above steps then the HSS shall stop processing and shall return the error code specified in the respective step (see 3GPP TS 29.329 [5] and 3GPP TS 29.229 [7] for an explanation of the error codes). Otherwise, the requested operation shall take place and the HSS shall return the Result-Code AVP set to DIAMETER_SUCCESS and the requested data identified by User-Identity and Data-Reference in the Sh-Pull Response message.

****** Next Changed Section******

7.6   Data

This information element contains an XML document conformant to the XML schema defined in Annex D.

Annex C specifies the UML logical model of the data downloaded via the Sh interface.

Table 7.-6.1 defines the reference values, access key and recommended access rights for the data accessible via the Sh interface. It is a matter of operator policy to further restrict the access rights defined in table 7.6.1.

Table 7.6.1: Data accessible via Sh interface

Data Ref.	XML tag	Defined in	Access key	May be included in the operations:
0	RepositoryData	7.6.1	User-Identity + Data-Reference + Service-Indication	Sh-Pull, Sh-Update, Sh-Subs-Notif
10	~~PublicIdentifiers~~IMSPublicIdentity	7.6.2	User-Identity + Data-Reference	Sh-Pull
11	IMSUserState	7.6.3		Sh-Pull, Sh-Subs-Notif
12	S-CSCFName	7.6.4		Sh-Pull, Sh-Subs-Notif
13	InitialFilterCriteria	7.6.5	User-Identity + Data-Reference + Server-Name	Sh-Pull, Sh-Subs-Notif
14	LocationInformation	7.6.6	User-Identity + Data-Reference+ Requested-Domain	Sh-Pull
15	UserState	7.6.7		Sh-Pull
16	Charging information	7.6.8		Sh-Pull
XX	MSISDN	7.6.X	User-Identity + Data-Reference	Sh-Pull

…

7.6.2 ~~PublicIdentifiers~~IMSPublicIdentity

This information element contains ~~the list of~~an ~~non barred~~ IMS public identity that would be ~~wh~~either

- associated~~implicitly registered~~ with the ~~User~~Private Identity of the subscriber for whom the IMS Public Identity is included in the request or

- ~~related~~ associated with~~to~~ the MSISDN present in the request.

~~ies of the user.~~ Multiple instances of this information element may be included in the message.

…

7.6.X   MSISDN

This information element contains an MSISDN that is associated with the User Identity (Public Identity or MSISDN) present in the request. All valid instances of this information element shall be included in the message.

****** Next Changed Section******

C.2 PublicIdentifiers

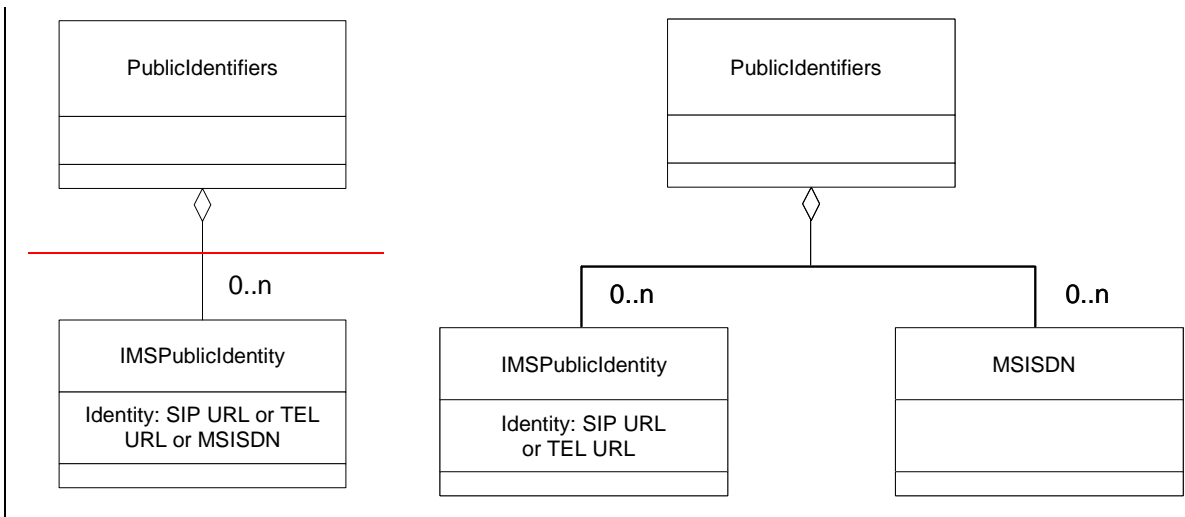The following picture details the UML model of the class PublicIdentifiers:

Figure C.2.1: The UML model of the class PublicIdentifiers

Class PublicIdentifiers contains 0 to n user public identities which may be either of class IMSPublicIdentity or of class MSISDN. The identifiers are of format SIP URL, TEL URL or MSISDN.

CR-Form-v7

CHANGE REQUEST

⌘   **29.328** CR **045**   ⌘ **rev** **3** ⌘   Current version: **6.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐   ME ☐   Radio Access Network ☐   Core Network **X**

Title: ⌘	Clarification of which Public Identities are downloaded		
Source: ⌘	Nortel Networks		
Work item code: ⌘	IMS-CCR	***Date:*** ⌘	20/01/2004
Category: ⌘	**F**	***Release:*** ⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
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Use one of the following releases:
2   *(GSM Phase 2)*
R96   *(Release 1996)*
R97   *(Release 1997)*
R98   *(Release 1998)*
R99   *(Release 1999)*
Rel-4   *(Release 4)*
Rel-5   *(Release 5)*
Rel-6   *(Release 6)*

Reason for change: ⌘	In Release 6 it is now possible to have a Public-Id defined against multiple Private-Ids which causes problems with the downloading of Public Identifiers according to the current definition. It is also not clear exactly which identifiers should be downloaded when PublicIdentifiers is required. In section 7.6.2, the following text is found;- 'This information element contains the list of public identities of the user'. In this situation, the user is identified by a public identifier. It is not clear if 'the user' for whom a list of Public Identifiers is to be downloaded is the private identity associated with the public identity (in which case the list of public identities to download should be all associated with the Private-Id) or just that public identity (in which case the list is just those that would be implicitly registered with that public-id). Further, there is misalignment between Annex C and Annex D about the definition of IMSPublicIdentity. In Annex C, the UML illustration of PublicIdentifiers shows IMSPublicIdentity as being SIP_URL, TEL_URL or MSISDN, but the schema in Annex D shows IMSPublicIdentity as being only SIP_URL or TEL_URL and PublicIdentifiers as being IMSPublicIdentity or MSISDN. **This is an essential correction.**
Summary of change: ⌘	Annex C is changed to align with Annex D, defining IMSPublicIdentity as only being SIP_URL or TEL_URL, and defining PublicIdentifiers as being made up of a list of 0…n occurences of IMSPublicIdentity and 0…n occurences of MSISDN. This allows table 7.6.1 to be updated to have Data Ref 10 defined as IMSPublicIdentity and to define a distinct Data Ref for MSISDN. It is clarified that

IMS Public Identity in 7.6.2 is the set of non-bared IMS Public identities that would be implicitly registered with the IMS Public identity in the User-Identityfield. The description in 7.6.2 is modified accordingly and a description of MSISDN is added.

In addition, 6.1.1 is updated to have User-Identity defined as IMS Public Identity and a new parameter is added to allow the AS to identify the set of user identities it wishes to download.

Consequences if not approved:	⌘	Scope for differing interpretation in the specs may lead to interworking issues. Misalignment between UML and XML schema provides scope for incorrect implementation.

Clauses affected:	⌘	6.1, 7.6, 7.X (new), Annex C.2				

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	29.328 CR xxx
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6.1 User data handling procedures

6.1.1 Data read (Sh-Pull)

This procedure is used between the AS and the HSS. The procedure is invoked by the AS and is used:

- To read transparent and/or non-transparent data for a specified user from the HSS.

This procedure is mapped to the commands User-Data-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.1.1 and 6.1.1.2 detail the involved information elements.

Table 6.1.1.1: Sh-Pull

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	IMS Public Identity or MSISDN of the user for whom the data is required.
Requested data (See 7. 3)	Data-Reference	M	This information element indicates the reference to the requested information. The set of valid reference values are defined in 7.6.
Requested Identity set (See 7.x)	Identity-Set	C	If Data-Reference indicates that IMS Public Identities is the requested data set to be downloaded, this information element shall be included. When this information element takes the value IMPLICIT_IDENTITIES, the HSS shall provide all IMS Public Identities that are implicitly registered with the IMS Public Identity included in the message in the User-Identity AVP. When this information element takes the value REGISTERED_IDENTITIES, the HSS shall provide all IMS Public Identities whose state is registered, belonging to all Private Identities that the IMS Public Identity in the User-Identity AVP is associated with. When this information element takes the value ALL_IDENTITIES, , the HSS shall provide all IMS Public Identities, belonging to all Private Identities that the IMS Public Identity in the User-Identity AVP is associated with. If Data-Reference indicates that IMS Public Identities is the requested data set to be downloaded and this information element is not included, the HSS shall download the set of IMS Public Identities that would be downloaded if the value of this information element had been ALL~~IMPLICIT~~ IDENTITIES.
Requested domain (See 7.2)	Requested-Domain	C	This information element indicates the domains to which the operation is applicable. Check table 7.6.1 to see when it is applicable.
Current Location (See 7.8)	Current-Location	C	This information element indicates whether an active location retrieval has to be initiated or not. It shall be present if Location Information is requested. If this information element takes the value InitiateActiveLocationRetrieval (1) the HSS shall indicate to the MSC/VLR and/or SGSN the need to initiate an active location retrieval.
Service Indication (See 7. 4)	Service-Indication	C	IE that identifies, together with the User-Identity and Data-Reference, the set of service related transparent data that is being requested..
Application Server Identity (See 7.9)	Origin-Host	M	IE that identifies the AS originator of the request and that is used to check the AS permission list.
Application Server Name	Server-Name	C	IE that is used, together with the user identity and Data-Reference, as key to identify the filter criteria. This element shall be present when the Data-Reference value is InitialFilterCriteria (13).

Table 6.1.1.2: Sh-Pull Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7. 5)	Result-Code / Experimental_ Result	M	Result of the request. Result-Code AVP shall be used for errors defined in the Diameter Base Protocol. Experimental-Result AVP shall be used for Sh errors. This is a grouped AVP which contains the 3GPP Vendor ID in the Vendor-Id AVP, and the error code in the Experimental-Result-Code AVP.
Data (See 7. 6)	User-Data	O	Requested data.

6.1.1.1   Detailed behaviour

The conditions for the inclusion of Requested-Domain as an additional key to the requested data are described in table 7.6.1. If repository data is requested, Service-Indication shall be present in the request. If initial filter criteria are requested, the Server-Name AVP shall contain the SIP URL of the AS that initiates the request; requests for initial filter criteria are limited to those initial filter criteria which are relevant to the requesting AS.

Upon reception of the Sh-Pull request, the HSS shall, in the following order:

1. Check that the AS sending the request (identified by the Origin-Host AVP) has Sh-Pull permission in the AS Permissions List (See 6.2). If not, Experimental-Result-Code shall be set to DIAMETER_ERROR_OPERATION_NOT_ALLOWED in the Sh-Pull Response.

2. Check that the user for whom data is asked exists in HSS. If not, Experimental-Result-Code shall be set to DIAMETER_ERROR_USER_UNKNOWN in the Sh-Pull Response.

3. Check that the requested user data is allowed to be read by the AS.

   - If the data referenced in the request is not allowed to be read, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_DATA_CANNOT_BE_READ in the Sh-Pull Response.

4. Check whether or not the data that is requested to be downloaded by the AS is currently being updated by another entity. If there is an update of the data in progress, the HSS shall delay the Sh-Pull-Resp message until the update has been completed and shall include in the Sh-Pull-Resp message the updated data requested.

If there is an error in any of the above steps then the HSS shall stop processing and shall return the error code specified in the respective step (see 3GPP TS 29.329 [5] and 3GPP TS 29.229 [7] for an explanation of the error codes). Otherwise, the requested operation shall take place and the HSS shall return the Result-Code AVP set to DIAMETER_SUCCESS and the requested data identified by User-Identity and Data-Reference in the Sh-Pull Response message..

******Next Changed Section******

7.6   Data

This information element contains an XML document conformant to the XML schema defined in Annex D.

Annex C specifies the UML logical model of the data downloaded via the Sh interface.

Table 7.-6.1 defines the reference values, access key and recommended access rights for the data accessible via the Sh interface. It is a matter of operator policy to further restrict the access rights defined in table 7.6.1.

Table 7.6.1: Data accessible via Sh interface

Data Ref.	XML tag	Defined in	Access key	May be included in the operations:
0	RepositoryData	7.6.1	User-Identity + Data-Reference + Service-Indication	Sh-Pull, Sh-Update, Sh-Subs-Notif
10	~~PublicIdentifiers~~IMSPublicIdentity	7.6.2	User-Identity + Data-Reference + Identity-Set	Sh-Pull
11	IMSUserState	7.6.3	User-Identity + Data-Reference	Sh-Pull, Sh-Subs-Notif
12	S-CSCFName	7.6.4		Sh-Pull, Sh-Subs-Notif
13	InitialFilterCriteria	7.6.5	User-Identity + Data-Reference + Server-Name	Sh-Pull, Sh-Subs-Notif
14	LocationInformation	7.6.6	User-Identity + Data-Reference+ Requested-Domain	Sh-Pull
15	UserState	7.6.7		Sh-Pull
16	Charging information	7.6.8		Sh-Pull
XX	MSISDN	7.6.X	User-Identity + Data-Reference	Sh-Pull

…

7.6.2   ~~PublicIdentifiers~~IMSPublicIdentity

This information element contains ~~the list of~~an ~~non barred~~ IMS public identity that would be either

-    associated with the Private Identity of the subscriber for whom the IMS Public Identity is included in the request or

-    associated with the MSISDN present in the request.

 Multiple instances of this information element may be included in the message.

~~whether implicitly registered with the Public User Identity or related to the MSISDN preset in the requesties of the user. Multiple instances of this information element may be included in the message.~~

…

7.6.X   MSISDN

This information element contains an MSISDN that is associated with the User Identity (Public Identity or MSISDN) present in the request. All valid instances of this information element shall be included in the message.

****** New Section******

7.X   Requested Identity Set

This information element indicates the set of IMS Public Identities that the AS wishes to download. See 3GPP TS 29.329 [5] for the detailed definition of the AVP.

C.2 PublicIdentifiers

The following picture details the UML model of the class PublicIdentifiers:
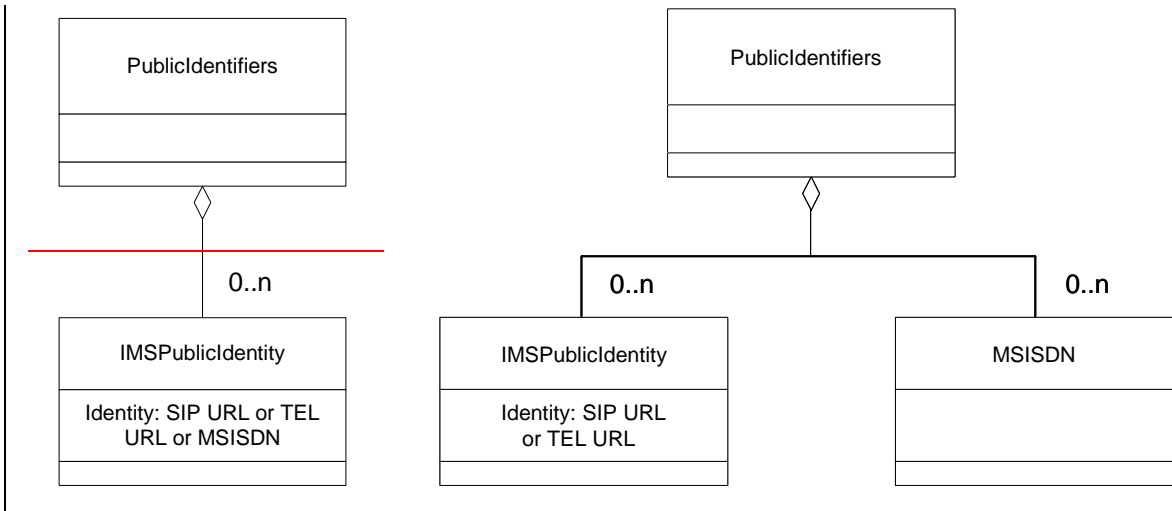

Figure C.2.1: The UML model of the class PublicIdentifiers

Class PublicIdentifiers contains 0 to n user public identities which may be either of class IMSPublicIdentity or of class MSISDN. The identifiers are of format SIP URL, TEL URL or MSISDN.