3GPP TSG CN Plenary Meeting #27 **NP-050031**
9th – 11th March 2005 Tokyo, JAPAN.

Source: TSG CN WG4

Title: Corrections on Sh-interface Rel-5

Agenda item: 8.1

Document for: APPROVAL

Doc-2nd-Level	Spec	CR	Rev	Phase	Subject	Cat	Ver_C
N4-050119	29.328	112		Rel-5	Align UML Model and the XML schema for Public Identity	F	5.8.0
N4-050120	29.328	113		Rel-6	Align UML Model and the XML schema for Public Identity	A	6.4.0
N4-050121	29.329	65		Rel-5	Incorrect AVP Code for Public-Identity in Table 6.3.1	F	5.8.0
N4-050151	29.328	117		Rel-5	Sh Diameter AVP Mapping Correction	F	5.8.0
N4-050152	29.328	118		Rel-6	Sh Diameter AVP Mapping Correction	A	6.4.0
N4-050318	29.329	63		Rel-5	Sh-Update needs to include Data-Reference to be future proof	F	5.8.0
N4-050319	29.329	64		Rel-6	Sh-Update needs to include Data-Reference to be future proof	A	6.3.0
N4-050320	29.328	115	1	Rel-5	Conditional Service indication in Sh-Subs-Notif	F	5.8.0
N4-050321	29.328	116	1	Rel-6	Conditional Service indication in Sh-Subs-Notif	A	6.4.0
N4-050324	29.329	56	1	Rel-5	Introduction of Failed AVP	F	5.8.0
N4-050325	29.329	57	1	Rel-6	Introduction of Failed AVP	A	6.3.0
N4-050458	29.328	098	3	Rel-5	Sh-Update needs to include Data-Reference to be future proof	F	5.8.0
N4-050459	29.328	099	5	Rel-6	Sh-Update needs to include Data-Reference to be future proof	A	6.4.0
N4-050322	29.328	120	2	Rel-5	Clarification of Sh Access Keys	F	5.8.0
N4-050323	29.328	121	2	Rel-6	Clarification of Sh Access Keys	A	6.4.0

3GPP TSG-CN WG4 Meeting #26 **N4-050119**
Sydney, AUSTRALIA. 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.328** **CR** **112** ⌘ **rev** **-** ⌘ Current version: **5.8.0** ⌘

*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 ☒

Title:	⌘	Align UML Model and the XML schema for Public Identity
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	27/01/2005
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:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	This is an essential correction. The UML Model and the XML schema for Public Identity do not align in the Annexes. This change aligns the tags appropriately.
Summary of change:	⌘	For the data type tPublicIdentity the XML tag is changed to PublicIdentifiers in the Annex.
Consequences if not approved:	⌘	Inconsistent specification leading to mis-implementation.

Clauses affected:	⌘	Table D.2.

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

Other comments:	⌘	The .xsd file is already correct.

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.

Table D.2: XML schema for Sh interface: complex data types

Data type	Tag	Compound of		
		Tag	Type	Cardinality
tSh-Data	Sh-Data	PublicIdentifiers	tPublicIdentity	0 to 1
		RepositoryData	tTransparentData	0 to 1
		Sh-IMS-Data	tShIMSData	0 to 1
		CSLocationInformation	tCSLocationInformation	0 to 1
		PSLocationInformation	tPSLocationInformation	0 to 1
		CSUserState	tCSUserState	0 to 1
		PSUserState	tPSUserState	0 to 1
tTransparentData	RepositoryData	ServiceIndication	string	1
		SequenceNumber	tSequenceNumber	1
		ServiceData	tServiceData	0 to 1
tServiceData	any	any	any	1
tShIMSData	Sh-IMS-Data	SCSCFName	tSIP_URL	0 to 1
		InitialFilterCriteria	tInitialFilterCriteria	0 to n
		IMSUserState	tIMSUserState	0 to 1
		ChargingInformation	tChargingInformation	0 to 1
tCSLocationInformation	CSLocationInformation	LocationNumber	tLocationNumber	0 to 1
		CellGlobalId	tCellGlobalId	0 to 1
		ServiceAreaId	tServiceAreaId	0 to 1
		LocationAreaId	tLocationAreaId	0 to 1
		GeographicalInformation	tGeographicalInformation	0 to 1

		GeodeticInformation	tGeodeticInformation	0 to 1
		VLRNumber	tISDNAddress	0 to 1
		MSCNumber	tISDNAddress	0 to 1
		CurrentLocationRetrieved	tBool	0 to 1
		AgeOfLocationInformation	tAgeOfLocationInformation	0 to 1
tPSLocationInformation	PSLocationInformation	CellGlobalId	tCellGlobalId	0 to 1
		ServiceAreaId	tServiceAreaId	0 to 1
		LocationAreaId	tLocationAreaId	0 to 1
		RoutingAreaId	tRoutingAreaId	0 to 1
		GeographicalInformation	tGeographicalInformation	0 to 1
		GeodeticInformation	tGeodeticInformation	0 to 1
		SGSNNumber	tISDNAddress	0 to 1
		CurrentLocationRetrieved	tBool	0 to 1
		AgeOfLocationInformation	tAgeOfLocationInformation	0 to 1
tPublicIdentity	PublicIdentifiers~~ty~~	IMSPublicIdentity	tIMSPublicIdentity	0 to n
		MSISDN	tMSISDN	0 to n
tInitialFilterCriteria	InitialFilterCriteria	Priority	tPriority	1
		TriggerPoint	tTrigger	0 to 1
		ApplicationServer	tApplicationServer	1
tTrigger	TriggerPoint	ConditionTypeCNF	tBool	1

		SPT		tSePoTri	0 to n
tSePoTri	SPT	ConditionNegated		tBool	0 to 1
		Group		tGroupID	1 to n
		Choice of	RequestURI	tString	1
			Method	tString	1
			SIPHeader	tHeader	1
			SessionCase	tDirectionOfRequest	1
			SessionDescription	tSessionDescription	1
tHeader	SIPHeader	Header		tString	1
		Content		tString	0 to 1
tSessionDescription	SessionDescription	Line		tString	1
		Content		tString	0 to 1
tApplicationServer	ApplicationServer	ServerName		tSIP_URL	1
		DefaultHandling		tDefaultHandling	0 to 1
		ServiceInfo		tServiceInfo	0 to 1
tChargingInformation	ChargingInformation	PrimaryEventChargingFunctionName		tDiameterURI	0 to 1
		SecondaryEventChargingFunctionName		tDiameterURI	0 to 1
		PrimaryChargingCollectionFunctionName		tDiameterURI	1
		SecondaryChargingCollectionFunctionName		tDiameterURI	0 to 1
NOTE: “n” shall be interpreted as non-bounded.					

3GPP TSG-CN WG4 Meeting #26 **N4-050120**
Sydney, AUSTRALIA. 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.328** **CR** **113** ⌘ **rev** **-** ⌘ Current version: **6.4.0** ⌘

*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 ☒

Title:	⌘	Align UML Model and the XML schema for Public Identity
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	27/01/2005
Category:	⌘	**A**
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:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	This is an essential correction. The UML Model and the XML schema for Public Identity do not align in the Annexes. This change aligns the tags appropriately.
Summary of change:	⌘	For the data type tPublicIdentity the XML tag is changed to PublicIdentifiers in the Annex.
Consequences if not approved:	⌘	Inconsistent specification leading to mis-implementation.

Clauses affected:	⌘	Table D.2.

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

Other comments:	⌘	The .xsd file is already correct.

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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.

Table D.2: XML schema for the Sh user profile interface: complex data types

Data type	Tag	Compound of		
		Tag	Type	Cardinality
tSh-Data	Sh-Data	PublicIdentifiers	tPublicIdentity	0 to 1
		RepositoryData	tTransparentData	0 to 1
		Sh-IMS-Data	tShIMSData	0 to 1
		CSLocationInformation	tCSLocationInformation	0 to 1
		PSLocationInformation	tPSLocationInformation	0 to 1
		CSUserState	tCSUserState	0 to 1
		PSUserState	tPSUserState	0 to 1
tTransparentData	RepositoryData	ServiceIndication	string	1
		SequenceNumber	tSequenceNumber	1
		ServiceData	tServiceData	0 to 1
tServiceData	any	any	any	1
tShIMSData	Sh-IMS-Data	SCSCFName	tSIP_URL	0 to 1
		InitialFilterCriteria	tInitialFilterCriteria	0 to n
		IMSUserState	tIMSUserState	0 to 1
		ChargingInformation	tChargingInformation	0 to 1
tCSLocationInformation	CSLocationInformation	LocationNumber	tLocationNumber	0 to 1
		CellGlobalId	tCellGlobalId	0 to 1
		ServiceAreaId	tServiceAreaId	0 to 1
		LocationAreaId	tLocationAreaId	0 to 1
		GeographicalInformation	tGeographicalInformation	0 to 1

		GeodeticInformation	tGeodeticInformation	0 to 1
		VLRNumber	tISDNAddress	0 to 1
		MSCNumber	tISDNAddress	0 to 1
		CurrentLocationRetrieved	tBool	0 to 1
		AgeOfLocationInformation	tAgeOfLocationInformation	0 to 1
tPSLocationInformation	PSLocationInformation	CellGlobalId	tCellGlobalId	0 to 1
		ServiceAreaId	tServiceAreaId	0 to 1
		LocationAreaId	tLocationAreaId	0 to 1
		RoutingAreaId	tRoutingAreaId	0 to 1
		GeographicalInformation	tGeographicalInformation	0 to 1
		GeodeticInformation	tGeodeticInformation	0 to 1
		SGSNNumber	tISDNAddress	0 to 1
		CurrentLocationRetrieved	tBool	0 to 1
		AgeOfLocationInformation	tAgeOfLocationInformation	0 to 1
tPublicIdentity	PublicIdentifiers~~ty~~	IMSPublicIdentity	tIMSPublicIdentity	0 to n
		MSISDN	tMSISDN	0 to n
tInitialFilterCriteria	InitialFilterCriteria	Priority	tPriority	1
		TriggerPoint	tTrigger	0 to 1
		ApplicationServer	tApplicationServer	1
tTrigger	TriggerPoint	ConditionTypeCNF	tBool	1

		SPT		tSePoTri	0 to n
tSePoTri	SPT	ConditionNegated		tBool	0 to 1
		Group		tGroupID	1 to n
		Choice of	RequestURI	tString	1
			Method	tString	1
			SIPHeader	tHeader	1
			SessionCase	tDirectionOfRequest	1
			SessionDescription	tSessionDescription	1
		RegistrationType		tRegistrationType	(0 to 2)
tHeader	SIPHeader	Header		tString	1
		Content		tString	0 to 1
tSessionDescription	SessionDescription	Line		tString	1
		Content		tString	0 to 1
tApplicationServer	ApplicationServer	ServerName		tSIP_URL	1
		DefaultHandling		tDefaultHandling	0 to 1
		ServiceInfo		tServiceInfo	0 to 1
tChargingInformation	ChargingInformation	PrimaryEventChargingFunctionName		tDiameterURI	0 to 1
		SecondaryEventChargingFunctionName		tDiameterURI	0 to 1
		PrimaryChargingCollectionFunctionName		tDiameterURI	1
		SecondaryChargingCollectionFunctionName		tDiameterURI	0 to 1
NOTE: “n” shall be interpreted as non-bounded.					

3GPP TSG-CN WG4 Meeting #26 **N4-050121**
Sydney, AUSTRALIA. 14th to 18th February 2005.

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CHANGE REQUEST

⌘ **29.329** **CR** **65** ⌘ **rev** **-** ⌘ Current version: **5.8.0** ⌘

*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 ☒

Title:	⌘	Incorrect AVP Code for Public-Identity in Table 6.3.1
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	26/01/2005
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:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	This is an esssential correction! An incorrect AVP Code for Public-Identity in Table 6.3.1 is given.
Summary of change:	⌘	The AVP Code for Public-Identity in Table 6.3.1 is correctly changed to 601.
Consequences if not approved:	⌘	AVPs for Sh will be incorrectly identified leading to mass hysteria.

Clauses affected:	⌘	Table 6.3.1

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

Other comments:	⌘	This is already correct in Release 6 29.329 v630.

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

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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.

6.3 AVPs

The following table describes the Diameter AVPs defined for the Sh interface protocol, their AVP Code values, types, possible flag values and whether the AVP may or not be encrypted.

Table 6.3.1: Diameter Multimedia Application AVPs

				AVP Flag rules				
Attribute Name	**AVP Code**	**Section defined**	**Value Type**	**Must**	**May**	**Should not**	**Must not**	**May Encr.**
User-Identity	700	6.3.1	Grouped	M, V				N
MSISDN	701	6.3.2	OctetString	M, V				N
User-Data	702	6.3.3	OctetString	M, V				N
Data-Reference	703	6.3.4	Enumerated	M, V				
Service-Indication	704	6.3.5	OctetString	M, V				N
Subs-Req-Type	705	6.3.6	Enumerated	M, V				N
Requested-Domain	706	6.3.7	Enumerated	M, V				N
Current-Location	707	6.3.8	Enumerated	M, V				N
Server-Name	602	6.3.9	UTF8String	M, V				N
Public-Identity	601~~2~~	6.3.10	UTF8String	M, V				N

NOTE 1: The AVP header bit denoted as 'M', indicates whether support of the AVP is required. The AVP header bit denoted as 'V', indicates whether the optional Vendor-ID field is present in the AVP header. For further details, see 3GPP TS 29.229 [6].

NOTE 2: Depending on the concrete command.

3GPP TSG-CN WG4 Meeting #26 **N4-050151**
Sydney, AUSTRALIA. 14th to 18th February 2005.

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CHANGE REQUEST

⌘ **29.328** **CR** **117** ⌘ **rev** **-** ⌘ Current version: **5.8.0** ⌘

*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 ☒

Title:	⌘	Sh Diameter AVP Mapping Correction
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	02/02/2005
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:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	**This is an essential correction.** The current mapping table in Annex A is incorrect. For example the mapping for Application Server Identity should be Origin-Host.
Summary of change:	⌘	The mapping table is removed from Annex A because the mapping is already described in the main part of the document.
Consequences if not approved:	⌘	The mapping table is incorrect.

Clauses affected:	⌘	A.3

		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.

A.3 VoidSh message parameters to Diameter AVP mapping

The following table gives an overview about the mapping:

Table A.3.1: Sh message parameters to Diameter AVP mapping

Sh parameter	AVP Name
User identity	User-Identity
Requested data, Unauthorized data	Data-Reference
Service Indication	Service-Indication
Result, Data Request Result, Data Update Result	Result-Code / Experimental-Result
Requested Data, Updated data, Changed data	User-Data
Subscription request type	Subs-Req-Type
Unauthorized data	Data-Reference
Requested Domain	Requested-Domain
Current Location	Current-Location
Application Server Identity	Server-Name

3GPP TSG-CN WG4 Meeting #26 **N4-050152**
Sydney, AUSTRALIA. 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.328** **CR** **118** ⌘ **rev** **-** ⌘ Current version: **6.4.0** ⌘

*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 ☒

Title:	⌘	Sh Diameter AVP Mapping Correction
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	02/02/2005
Category:	⌘	**A**
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:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	The current mapping table in Annex A is incorrect. For example the mapping for Application Server Identity should be Origin-Host.
Summary of change:	⌘	The mapping table is removed from Annex A because the mapping is already described in the main part of the document.
Consequences if not approved:	⌘	The mapping table is incorrect.

Clauses affected:	⌘	A.3

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

⌘

Other comments: ⌘

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A.3 VoidSh message parameters to Diameter AVP mapping

The following table gives an overview about the mapping:

Table A.3.1: Sh message parameters to Diameter AVP mapping

Sh parameter	AVP Name
User identity	User-Identity
Requested data, Unauthorized data	Data-Reference
Service Indication	Service-Indication
Result, Data Request Result, Data Update Result	Result-Code / Experimental-Result
Requested Data, Updated data, Changed data	User-Data
Subscription request type	Subs-Req-Type
Unauthorized data	Data-Reference
Requested Domain	Requested-Domain
Current Location	Current-Location
Application Server Identity	Server-Name
Requested Identity Set	Identity-Set

3GPP TSG-CN WG4 Meeting #26 ***N4-050318***

Sydney, Australia - 14th to 18th February 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.329** **CR** **063** ⌘ **rev** ⌘ Current version: **5.8.0** ⌘

*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 ☒

Title:	⌘	Sh-Update needs to include Data-Reference to be future proof
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	15/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
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R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change:	⌘	**This is an Essential Correction!** Sh-Update is only used for Data Ref 0 currentlybut the Data Ref AVP needs to be included to enable this operation to be future proof in later versions of the TS.
Summary of change:	⌘	Data Reference AVP needs to be added to Profile-Update-Request command.
Consequences if not approved:	⌘	The Sh-Update command needs to be made future proof and the current specification and detailed description is inconsistent with regard to the AVPs required for this operation. This could lead to mis-matched implementations.

Clauses affected:	⌘	6.1.3

Other specs affected: ⌘	Y	N		
	X		Other core specifications	⌘ 29.328 CR 98
		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.

6.1.3 Profile-Update-Request (PUR) Command

The Profile-Update-Request (PUR) command, indicated by the Command-Code field set to 307 and the 'R' bit set in the Command Flags field, is sent by a Diameter client to a Diameter server in order to update user data in the server.

Message Format

< Profile-Update-Request > ::= < Diameter Header: 307, REQ, PXY, 16777217 >
< Session-Id >
{ Vendor-Specific-Application-Id }
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
{ Destination-Host }
{ Destination-Realm }
{ User-Identity }
{ Data-Reference }
{ User-Data }
*[AVP]
*[Proxy-Info]
*[Route-Record]

3GPP TSG-CN WG4 Meeting #26 ***N4-050319***

Sydney, Australia - 14th to 18th February 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.329** **CR** **064** ⌘ **rev** ⌘ Current version: **6.3.0** ⌘

*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 ☒

Title:	⌘	Sh-Update needs to include Data-Reference to be future proof
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	15/02/2005
Category:	⌘	**A**
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)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	**This is an Essential Correction!** Sh-Update is only used for Data Ref 0 currentlybut the Data Ref AVP needs to be included to enable this operation to be future proof in later versions of the TS.
Summary of change:	⌘	Data Reference AVP needs to be added to Profile-Update-Request command.
Consequences if not approved:	⌘	The Sh-Update command needs to be made future proof and the current specification and detailed description is inconsistent with regard to the AVPs required for this operation. This could lead to mis-matched implementations.

Clauses affected:	⌘	6.1.3

Other specs affected: ⌘	Y	N		
	X		Other core specifications	⌘ 29.328 CR 99
		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.

6.1.3 Profile-Update-Request (PUR) Command

The Profile-Update-Request (PUR) command, indicated by the Command-Code field set to 307 and the 'R' bit set in the Command Flags field, is sent by a Diameter client to a Diameter server in order to update user data in the server.

Message Format

< Profile-Update-Request > ::= < Diameter Header: 307, REQ, PXY, 16777217 >
< Session-Id >
{ Vendor-Specific-Application-Id }
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
{ Destination-Host }
{ Destination-Realm }
***[Supported-Features]**
{ User-Identity }
{ Data-Reference }
{ User-Data }
*[AVP]
*[Proxy-Info]
*[Route-Record]

3GPP TSG-CN WG4 Meeting #26 **N4-050320**
Sydney, AUSTRALIA. 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.328** **CR** **115** ⌘ **rev** **1** ⌘ Current version: **5.8.0** ⌘

*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 ☒

Title:	⌘	Conditional Service indication in Sh-Subs-Notif
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	16/02/2005
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:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	**This is an essential correction.** Service Indication information element is categorized as Optional in table 6.1.3.1 for the Sh-Subs-Notif procedure. However it should be Conditional in alignment with all other Sh procedures.
Summary of change:	⌘	Category changed to Conditional
Consequences if not approved:	⌘	Interworking problems. An AS could omit the information element and send a request that cannot be fulfilled (the HSS will not know which notifications to send).
Clauses affected:	⌘	6.1.3

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			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.

>>>>>>>>>>> First modified section <<<<<<<<<<<

6.1.3 Subscription to notifications (Sh-Subs-Notif)

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

- To subscribe to Notifications for when particular transparent and/or non-transparent data for a specified user is updated, from the HSS.

This procedure is mapped to the commands Subscribe-Notifications-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.3.1 and 6.1.3.2 detail the information elements involved.

Table 6.1.3.1: Sh-Subs-Notif

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	IMS public identity of the user for whom notifications of data changes are requested.
Requested data (See 7. 3)	Data-Reference	M	This information element includes the reference to the data on which notifications of change are required (valid reference values are defined in 7. 6).
Subscription request type (See 7.7)	Subs-Req-Type	M	This information element indicates the action requested on subscription to notifications.
Service Indication (See 7. 4)	Service-Indication	~~O~~C	IE that identifies, together with the User-Identity and Data-Reference, the set of service related transparent data for which notifications of changes are requested.~~-~~ This element shall be present when the Data-Reference value is RepositoryData (0).
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 6.1.3.2: Sh-Subs-Notif Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Data request 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.

6.1.3.1 Detailed behaviour

The HSS shall take note of the subscription request on the data identified by User-Identity and Data-Reference. If notifications on changes of repository data are requested, Service-Indication shall be present in the request. If notifications on changes of filter criteria are requested, the Server-Name AVP shall be used as key to the filter criteria. The Server-Name AVP shall contain the SIP URL of the AS sending the request.

Upon reception of the Sh-Subs-Notif request, the HSS shall, in the following order (if there is an error in any of the following steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.329 [5] and 3GPP TS 29.229 [7]):

1. Check that the user for whom notifications are asked exists in HSS. If not, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_UNKNOWN in the Sh-Subs-Notif Response.

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

3. Check that Notifications are allowed for the requested user (see table 7.6). If the Notifications of changes in the data referenced in the request are not allowed, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_DATA_CANNOT_BE_NOTIFIED in the Sh-Subs-Notif Response.

>>>>>>>>>>> End of first modified section <<<<<<<<<<<

3GPP TSG-CN WG4 Meeting #26 **N4-050321**
Sydney, AUSTRALIA. 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.328** **CR** **116** ⌘ **rev** **1** ⌘ Current version: **6.4.0** ⌘

*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 ☒

Title:	⌘	Conditional Service indication in Sh-Subs-Notif
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	16/02/2005
Category:	⌘	**A**
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)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Service Indication information element is categorized as Optional in table 6.1.3.1 for the Sh-Subs-Notif procedure. However it should be Conditional in alignment with all other Sh procedures.
Summary of change:	⌘	Category changed to Conditional
Consequences if not approved:	⌘	Interworking problems. An AS could omit the information element and send a request that cannot be fulfilled (the HSS will not know which notifications to send).

Clauses affected:	⌘	6.1.3			
Other specs affected:	⌘	**Y**	**N**	Other core specifications	⌘
			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.

>>>>>>>>>>> First modified section <<<<<<<<<<<

6.1.3 Subscription to notifications (Sh-Subs-Notif)

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

- To subscribe to Notifications for when particular transparent and/or non-transparent data for a specified user is updated, from the HSS.

This procedure is mapped to the commands Subscribe-Notifications-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.3.1 and 6.1.3.2 detail the information elements involved.

Table 6.1.3.1: Sh-Subs-Notif

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	IMS public identity of the user for whom notifications of data changes are requested.
Requested data (See 7.3)	Data-Reference	M	This information element includes the reference to the data on which notifications of change are required (valid reference values are defined in 7. 6).
Subscription request type (See 7.7)	Subs-Req-Type	M	This information element indicates the action requested on subscription to notifications.
Service Indication (See 7.4)	Service-Indication	~~O~~C	IE that identifies, together with the User-Identity and Data-Reference, the set of service related transparent data for which notifications of changes are requested.~~-~~ This element shall be present when the Data-Reference value is RepositoryData (0).
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 6.1.3.2: Sh-Subs-Notif Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Data request 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.

6.1.3.1 Detailed behaviour

The HSS shall take note of the subscription request on the data identified by User-Identity and Data-Reference. If notifications on changes of repository data are requested, Service-Indication shall be present in the request. If notifications on changes of filter criteria are requested, the Server-Name AVP shall be used as key to the filter criteria. The Server-Name AVP shall contain the SIP URL of the AS sending the request.

Upon reception of the Sh-Subs-Notif request, the HSS shall, in the following order (if there is an error in any of the following steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.329 [5] and 3GPP TS 29.229 [7]):

1. In the AS permission list (see section 6.2) the HSS shall check that the AS is allowed to subscribe to notifications (Sh-Subs-Notif) for the requested user data by checking the combination of the identity of the AS sending the request (identified by the Origin-Host AVP) and the supplied Data-Reference.

   - If this AS does not have Sh-Subs-Notif permission for the data referenced, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_DATA_CANNOT_BE_NOTIFIED in the Sh-Subs-Notif Response.

2. Check that the user for whom notifications are asked exists in HSS. If not, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_UNKNOWN in the Sh-Subs-Notif Response.

If the HSS cannot fulfil the received request for reasons not stated in the above steps, e.g. due to database error, it shall stop processing the request and set Result-Code to DIAMETER_UNABLE_TO_COMPLY.

>>>>>>>>>>> End of first modified section <<<<<<<<<<<

3GPP TSG-CN WG4 Meeting #26 **N4-050322**
Sydney, Australia, 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.328** **CR** **120** ⌘ **rev** **2** ⌘ Current version: **5.8.0** ⌘

*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 ☒

Title:	⌘	Clarification of Sh Access Keys
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	16/02/2005
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:
Ph2 *(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)*
Rel-7 *(Release 7)*

Reason for change:	⌘	**This is an Essential Correction** Table 7.6.1 shows that the User Identity is a valid key in all Sh commands. However, only Sh-Pull (Table 6.1.1.1) explicitly states that MSISDN is a valid User-Identity.
Summary of change:	⌘	Correct the Access key column in Table 7.6.1 to identify the Data References for which the MSISDN and or the IMSPublicIdentity are allowed Identifiers. Remove the User-Identity and replace with IMS Public User Identity and MSISDN as applicable.
Consequences if not approved:	⌘	Misalignment between tables 6.1.1.1, 6.1.2.1, 6.1.3.1, 6.1.4.1 and 7.6.1, which may result in misoperation between implementations.

Clauses affected:	⌘	2, 6.1.1, 6.1.2, 6.1.3, 6.1.4, 7.1, 7.6

Other specs Affected:	⌘	Y	N		⌘
			X	Other core specifications	
			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.

*** First Modification ***

2 References

[1] 3GPP TS 23.228: "IP Multimedia (IM) Subsystem – Stage 2".

[2] 3GPP TS 24.228: "Signalling flows for the IP multimedia call control based on SIP and SDP".

[3] 3GPP TS 23.002 "Network architecture".

[4] 3GPP TS 23.218: "IP Multimedia (IM) Session Handling; IP Multimedia (IM) call model"

[5] 3GPP TS 29.329: "Sh Interface based on Diameter – Protocol details"

[6] 3GPP TS 29.228: "IP multimedia (IM) Subsystem Cx Interface; Signalling flows and Message Elements".

[7] 3GPP TS 29.229: "Cx and Dx Interfaces based on the Diameter protocol ; Protocol details"

[8] IETF RFC 3588 "Diameter Base Protocol"

[9] ITU-T recommendation Q.763: "Signalling System No. 7 - ISDN User Part formats and codes"

[10] 3GPP TS 23.018: "Basic Call Handling; Technical realization"

[11] 3GPP TS 23.003: "Numbering, Addressing and Identification"

[12] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)"

[13] 3GPP TS 29.002: "Mobile Application Part (MAP) specification"

[14] 3GPP TS 23.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3 - Stage 2"

[15] RFC 2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies"

[16] RFC 3261: "SIP: Session Initiation Protocol"

[17] RFC 2806: "URLs for Telephone Calls"

[xx] TS 23.012: "Location Management Procedures"

*** Next Modification ***

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 User Identity or MSISDN of the user for whom the data is required. See section 7.1 for the content of this AVP.
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. Check table 7.6.1 to see when it is applicable.
Service Indication (See 7. 4)	Service-Indication	C	IE that identifies, together with the IMS Public User Identity included in the User-Identity AVP and Data-Reference, the set of service related transparent data that is being requested.~~.~~ Check table 7.6.1 to see when it is applicable.
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~~ IMS Public User Identity included in the User-Identity AVP and Data-Reference, as key to identify the filter criteria. Check table 7.6.1 to see when it is applicable.~~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 Modification ***

6.1.2 Data Update (Sh-Update)

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

- To allow the AS to update the transparent (repository) data stored at the HSS for a specified user.

This procedure is mapped to the commands Profile-Update-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.2.1 and 6.1.2.2 detail the involved information elements.

Table 6.1.2.1: Sh-Update

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	IMS Public User Identity of the user which data is updated. See section 7.1 for the content of this AVP.
Data (See 7. 6)	User-Data	M	Updated data.
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.

Table 6.1.2.2: Sh-Update Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7. 5)	Result-Code / Experimental-Result	M	Result of the update of data in the HSS. 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.

6.1.2.1 Detailed behaviour

Within the Sh-Update Request, the keys to determine the updated data are part of the information element Data (See 7.6). When data in the repository is updated (i.e. added, modified or removed) Service-Indication and Sequence-Number are also sent as part of the information element Data.

Newly added transparent data shall be associated with a Sequence Number of 0 in the Sh-Update Request. Sequence Number value 0 is reserved exclusively for indication of newly added transparent data.
Modified and removed transparent data shall be associated within the Sh-Update Request with a Sequence Number of n+1 where n is the original Sequence Number associated with the transparent data before modification or removal. If n equals 65535, then the next modification or deletion of that transparent data shall be associated with a Sequence Number of 1.

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

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

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

3. Check that the user data that is requested to be updated by the AS, is allowed to be updated. If the data is not allowed to be updated, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_DATA_CANNOT_BE_MODIFIED in the Sh-Update Response.

4. Check whether or not the data that is requested to be updated by the AS, as identified by the Service-Indication, is currently being updated by another entity. If there is an update of the data in progress, Experimental-Result Code shall be set to DIAMETER_PRIOR_UPDATE_IN_PROGRESS in the Sh-Update Response.

5. Check whether or not there is any repository data stored at the HSS already for the specified Service-Indication and the associated user.

   - If repository data identified by the Service-Indication is stored at the HSS for the specified user, check the following premises:

     1. Sequence_Number_in_Sh_Update is not equal to 0

     2. (Sequence_Number_in_Sh_Update - 1) is equal to (Sequence_Number_In_HSS modulo 65535)

     - If either of the above premises is false then Experimental-Result-Code shall be set to DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC in the Sh-Update Response.

     - If both of the above premises are true, then check whether or not Service Data is received within the Sh-Update Req.

       - If Service Data is included in the Sh-Update Req, check whether or not the size of the data is greater than that which the HSS is prepared to accept.

         - If there is more data than the HSS is prepared to accept then Experimental-Result-Code shall be set to DIAMETER_ERROR_TOO_MUCH_DATA and the new data shall be discarded.

         - If the HSS is prepared to accept the data, then the repository data stored at the HSS shall be updated with the repository data sent in the Sh-Update Req and the Sequence Number associated with that repository data shall be updated with that sent in the Sh-Update Req. This triggers the sending of Sh-Notif messages to any other ASs that are subscribed to Notifications for updates to the service data for that user (see 6.1.4).

       - If Service Data is not received, the data stored in the repository at the HSS shall be removed, and as a consequence the Service Indication and the Sequence Number associated with the removed data shall also be removed. This triggers the sending of Sh-Notif messages to any other ASs that are subscribed to Notifications for updates to the service data for that user (see 6.1.4). After sending Sh-Notif messages, the subscriptions to Notifications for the removed Repository Data shall be deleted.

- If repository data identified by the Service-Indication is not stored for the user i.e. the Sh-Update Req intends to create a new repository data, check whether or not the Sequence Number in the Sh-Update Req is 0.

  - If the sequence number is not set to 0, Experimental-Result Code shall be set to DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC

  - If the sequence number is set to 0 check whether Service Data is included within the Sh-Update Req.

    - If Service Data is not included in the Sh-Update Req, then Experimental-Result-Code shall be set to DIAMETER_ERROR_OPERATION_NOT_ALLOWED and the operation shall be ignored by the HSS.

    - If Service Data is included in the Sh-Update Req, check whether or not the size of the data is greater than that which the HSS is prepared to accept. If there is more data than the HSS is prepared to accept then Experimental-Result-Code shall be set to DIAMETER_ERROR_TOO_MUCH_DATA and the new data shall be discarded.

    - If the HSS is prepared to accept the data included in the Sh-Update Req, then the data shall be stored inwithin the data repository in the HSS.

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.

NOTE: When an AS receives DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC the AS may attempt to resolve the inconsitency between the version of the repository data that it holds and that stored at the HSS. It may execute a Sh-Pull to retrieve the current version of the data from the HSS or it tmay wait to receive a subsequent Sh-Notif message from the HSS for the affected repository data.

*** Next Modification ***

6.1.3 Subscription to notifications (Sh-Subs-Notif)

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

- To subscribe to Notifications for when particular transparent and/or non-transparent data for a specified user is updated, from the HSS.

This procedure is mapped to the commands Subscribe-Notifications-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.3.1 and 6.1.3.2 detail the information elements involved.

Table 6.1.3.1: Sh-Subs-Notif

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	IMS Public User Identity of the user for whom notifications of data changes are requested. See section 7.1 for the content of this AVP.
Requested data (See 7. 3)	Data-Reference	M	This information element includes the reference to the data on which notifications of change are required (valid reference values are defined in 7. 6).
Subscription request type (See 7.7)	Subs-Req-Type	M	This information element indicates the action requested on subscription to notifications.
Service Indication (See 7. 4)	Service-Indication	O	IE that identifies, together with the ~~User-~~IMS Public User Identity and Data-Reference, the set of service related transparent data for which notifications of changes are 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-~~IMS Public User ~~i~~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 6.1.3.2: Sh-Subs-Notif Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Data request 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.

6.1.3.1 Detailed behaviour

The HSS shall take note of the subscription request on the data identified by ~~User-~~IMS Public User Identity and Data-Reference. If notifications on changes of repository data are requested, Service-Indication shall be present in the request. If notifications on changes of filter criteria are requested, the Server-Name AVP shall be used as key to the filter criteria. The Server-Name AVP shall contain the SIP URL of the AS sending the request.

Upon reception of the Sh-Subs-Notif request, the HSS shall, in the following order (if there is an error in any of the following steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.329 [5] and 3GPP TS 29.229 [7]):

1. Check that the user for whom notifications are asked exists in HSS. If not, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_UNKNOWN in the Sh-Subs-Notif Response.

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

3. Check that Notifications are allowed for the requested user (see table 7.6). If the Notifications of changes in the data referenced in the request are not allowed, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_DATA_CANNOT_BE_NOTIFIED in the Sh-Subs-Notif Response.

*** Next Modification ***

6.1.4 Notifications (Sh-Notif)

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

- To inform the AS of changes in transparent and/or non-transparent data to which the AS has previously subscribed to receive Notifications for, using Sh-Subs-Notif (see 6.1.3).

This procedure is mapped to the commands Push-Notification-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.4.1 and 6.1.4.2 detail the involved information elements.

Table 6.1.4.1: Sh-Notif

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	~~IMS public identity~~IMS Public User Identity of the user which data has changed. See section 7.1 for the content of this AVP.
Requested Data (See 7. 6)	User-Data	M	Changed data.

Table 6.1.4.2: Sh-Notif Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Data request 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.

6.1.4.1 Detailed behaviour

The keys to the updated data are part of the information element User-Data (See Annex C). When data repository is updated Service-Indication is also part of the information element User-Data.

*** Next Modification ***

7.1 User Identity

This information element contains a user ~~public~~ identity ~~(either SIP URL, TEL URL or MSISDN)~~ according to the conditions described in table 7.1.x.

Table 7.1.x: User Identity content

Information element name	Mapping to Diameter AVP	Cat.	Description
IMS Public User Identity (See 7.1.x)	Public-Identity	C	IMS Public User Identity of the user for whom the data is required. If the MSISDN is not included in the User-Identity AVP, the Public-Identity AVP shall be included in Sh messages only for allowed Data References as described in Table 7.6.1.
MSISDN (See 7.1.y)	MSISDN	C	MSISDN of the user for whom the data is required. If the Public-Identity AVP is not included in the User-Identity AVP, the MSISDN AVP shall be included in the Sh-Pull message only for allowed Data References as described in Table 7.6.1.

7.1.x IMS Public User Identity

This information element contains an IMS public user identity (either SIP-URI or TEL-URL).

7.1.y MSISDN

This information element contains a Basic MSISDN (see 3GPP TS 23.012 [xx]).

*** Next Modification ***

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-~~IMS Public User Identity + Data-Reference + Service-Indication	Sh-Pull, Sh-Update, Sh-Subs-Notif
10	IMSPublicIdentity	7.6.2	~~User-~~ IMS Public User ~~IMSPublic~~Identity or MSISDN + Data-Reference	Sh-Pull
11	IMSUserState	7.6.3	IMS Public User ~~IMSPublic~~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-~~ IMS Public User ~~IMSPublic~~Identity + Data-Reference + Server-Name	Sh-Pull, Sh-Subs-Notif
14	LocationInformation	7.6.6	~~User-Identity~~MSISDN + Data-Reference+ Requested-Domain	Sh-Pull
15	UserState	7.6.7		
16	Charging information	7.6.8	~~User-~~ IMS Public User ~~IMSPublic~~Identity or MSISDN + Data-Reference	Sh-Pull
17	MSISDN	7.6.9		Sh-Pull

7.6.1 Repository Data

This information element contains transparent data. A data repository may be shared by more than one AS implementing the same service.

7.6.2 IMSPublicIdentity

This information element contains ~~an IMS public identity~~IMS Public User Identity that would be either:

- associated with the Private Identity of the subscriber for whom the ~~IMS Public Identity~~IMS Public User 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.

7.6.3 IMS User State

This information element contains the IMS User State of the public identifier referenced. Its possible values are:

- REGISTERED,
- NOT_REGISTERED,
- AUTHENTICATION_PENDING,
- REGISTERED_UNREG_SERVICES.

7.6.4 S-CSCF Name

This information element contains the name of the S-CSCF where a multimedia public identity is registered.

7.6.5 Initial Filter Criteria

This information element contains the triggering information for a service.

For a more detailed description, refer to 3GPP TS 23.218 [4] and 3GPP TS 29.228 [6].

7.6.6 Location Information

This information elementcontains the location of the served subscriber in the MSC/VLR if the requested domain is CS, or the location of the served subscriber in the SGSN if the requested domain is PS. If the HSS has to communicate with the MSC/VLR and/or SGSN to retrieve location information, it shall make use of the service MAP-PROVIDE-SUBSCRIBER-INFO.

For both Location Information for CS and Location Information for GPRS, the considerations described in 3GPP TS 23.078 [14] apply.

7.6.6.1 Location information for CS

This information elementconsists of the following subordinate information elements:

- Location number: defined in ITU-T Recommendation Q.763 [9]. Considerations described in 3GPP TS 23.018 apply[10].
- Service area ID: defined in 3GPP TS 23.003 [11].
- Global Cell ID: defined in 3GPP TS 23.003 [11].
- Location area ID: defined in 3GPP TS 23.003 [11].

- Geographical Information: defined in 3GPP TS 23.032 [12]. Considerations described in 3GPP TS 23.018 [10] and 3GPP TS 29.002 [13] apply.
- Geodetic Information: defined in ITU-T Recommendation Q.763 [9]. Considerations described in 3GPP TS 23.018 [10] and 3GPP TS 29.002 [13] apply.
- VLR Number: defined in 3GPP TS 23.003 [11].
- MSC Number: defined in 3GPP TS 23.003 [11].
- Age of location information: defined in 3GPP TS 23.018 [10].
- Current Location Retrieved: shall be present when location information was obtained after a successful paging procedure for Active Location Retrieval.

7.6.6.2 Location information for GPRS

This information element consists of the following subordinate information elements:

- Service area ID: defined in 3GPP TS 23.003 [11].
- Global Cell ID: defined in 3GPP TS 23.003 [11].
- Location area ID: defined in 3GPP TS 23.003 [11].
- Geographical Information: defined in 3GPP TS 23.032 [12]. Considerations described in 3GPP TS 23.018 [10] and 3GPP TS 29.002 [13] apply.
- Geodetic Information: defined in ITU-T Recommendation Q.763 [9]. Considerations described in 3GPP TS 23.018 [10] and 3GPP TS 29.002 [13] apply.
- SGSN Number: defined in 3GPP TS 23.003 [11].
- Routing Area ID: defined in 3GPP TS 23.003 [11].
- Current Location Retrieved: shall be present when location information was obtained after a successful paging procedure for Active Location Retrieval.

7.6.7 User state

This information element indicates the state of the user in the domain indicated by the Requested-Domain (see 7.2), with the values specified in 3GPP TS 23.078 [14] for Subscriber State and PS Domain Subscriber State. The HSS shall make use of the operation MAP-PROVIDE-SUBSCRIBER-INFO towards the MSC/VLR and/or the SGSN to obtain this information.

7.6.8 Charging information

This information element contains the addresses of the charging functions (primary event charging function name, secondary event charging function name, primary charging collection function name, secondary charging collection function name). When a clash occurs between the charging function address(es) received over the ISC interface and those received over the Sh interface, the address(es) received over the ISC interface should take precedence.

NOTE: The use of the Sh interface to retrieve charging function addresses is not intended as a general-purpose alternative to receiving charging function addresses from the ISC interfaces. Rather, it is meant to address a special case where the AS needs to interact with the charging system before initiating a request to a user when the AS has not received the third party REGISTER for that user.

7.6.9 MSISDN

This information element contains a~~n~~ Basic MSISDN (see 3GPP TS 23.012 [xx]) 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.

7.7 Subscription request type

This information element indicates the action requested for subscription to notifications. See 3GPP TS 29.329 [5] for the list of valid values.

7.8 Current Location

This information element indicates whether an active location retrieval has to be initiated or not when an AS requested location information. See 3GPP TS 29.329 [5] for the list of possible values.

7.9 Application Server Identity

This information element contains the identity of the Application Server. It is used for the AS permission check (see 6.2).

7.10 Application Server Name

This information element indicates application server’s SIP URI. See 3GPP TS 29.229 [7] for the detailed definition of the AVP.

3GPP TSG-CN WG4 Meeting #26 **N4-050323**
Sydney, Australia, 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.328** **CR** **121** ⌘ **rev** **2** ⌘ Current version: **6.4.0** ⌘

*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 ☒

Title:	⌘	Clarification of Sh Access Keys
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	16/02/2005
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)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Table 7.6.1 shows that the User Identity is a valid key in all Sh commands. However, only Sh-Pull (Table 6.1.1.1) explicitly states that MSISDN is a valid User-Identity.
Summary of change:	⌘	Correct the Access key column in Table 7.6.1 to identify the Data References for which the MSISDN and or the IMSPublicIdentity are allowed Identifiers. The definition of MSISDN has also been made more clear.
Consequences if not approved:	⌘	Misalignment between tables 6.1.1.1, 6.1.2.1, 6.1.3.1, 6.1.4.1 and 7.6.1, which may result in misoperation between implementations.

Clauses affected:	⌘	2, 6.1.1, 6.1.2, 6.1.3, 6.1.4, 7.1, 7.6			
		Y	**N**		
Other specs Affected:	⌘		X	Other core specifications	⌘
			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.

*** First Modification ***

2 References

[1] 3GPP TS 23.228: "IP Multimedia (IM) Subsystem – Stage 2".

[2] 3GPP TS 24.228: "Signalling flows for the IP multimedia call control based on SIP and SDP".

[3] 3GPP TS 23.002 "Network architecture".

[4] 3GPP TS 23.218: "IP Multimedia (IM) Session Handling; IP Multimedia (IM) call model"

[5] 3GPP TS 29.329: "Sh Interface based on Diameter – Protocol details"

[6] 3GPP TS 29.228: "IP multimedia (IM) Subsystem Cx Interface; Signalling flows and Message Elements".

[7] 3GPP TS 29.229: "Cx and Dx Interfaces based on the Diameter protocol ; Protocol details"

[8] IETF RFC 3588 "Diameter Base Protocol"

[9] ITU-T recommendation Q.763: "Signalling System No. 7 - ISDN User Part formats and codes"

[10] 3GPP TS 23.018: "Basic Call Handling; Technical realization"

[11] 3GPP TS 23.003: "Numbering, Addressing and Identification"

[12] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)"

[13] 3GPP TS 29.002: "Mobile Application Part (MAP) specification"

[14] 3GPP TS 23.078: "Customised Applications for Mobile network Enhanced Logic (CAMEL) Phase 3 - Stage 2"

[15] RFC 2045: "Multipurpose Internet Mail Extensions (MIME) Part One: Format of Internet Message Bodies"

[16] RFC 3261: "SIP: Session Initiation Protocol"

[17] RFC 2806: "URLs for Telephone Calls"

[18] 3GPP TS 23.141: "Presence Service; Architecture and Functional Description"

[xx] TS 23.012: "Location Management Procedures"

*** Next Modification ***

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 User Identity or MSISDN of the user for whom the data is required. See section 7.1 for the content of this AVP.
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 7.11)	Identity-Set	O	If Data-Reference indicates that IMS Public Identities is the requested data set to be downloaded, this information element should 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. The MSISDN user identity is not applicable for this value. 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 or MSISDN 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 or MSISDN 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_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. Check table 7.6.1 to see when it is applicable.
Service Indication (See 7. 4)	Service-Indication	C	IE that identifies, together with the IMS Public User Identity included in the User-Identity AVP and Data-Reference, the set of service related transparent data that is being requested.~~.~~ Check table 7.6.1 to see when it is applicable.
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~~ IMS Public User Identity included in the User-Identity AVP and Data-Reference, as key to identify the filter criteria. Check table 7.6.1 to see when it is applicable.~~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. In the AS permission list (see section 6.2) check that the requested user data is allowed to be read (Sh-Pull) by this AS by checking the combination of the identity of the AS sending the request (identified by the Origin-Host AVP) and the supplied Data-Reference.

   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.

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 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 may 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. The HSS shall ensure that the data returned is not corrupted by this conflict.

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).

If the HSS cannot fulfil the received request for reasons not stated in the above steps, e.g. due to database error, it shall stop processing the request and set Result-Code to DIAMETER_UNABLE_TO_COMPLY.

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 Modification ***

6.1.2 Data Update (Sh-Update)

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

- To allow the AS to update the transparent (repository) data stored at the HSS for a specified user.

This procedure is mapped to the commands Profile-Update-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.2.1 and 6.1.2.2 detail the involved information elements.

Table 6.1.2.1: Sh-Update

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	IMS Public User Identity of the user which data is updated. See section 7.1 for the content of this AVP.
Data (See 7.6)	User-Data	M	Updated data.
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.

Table 6.1.2.2: Sh-Update Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7.5)	Result-Code / Experimental-Result	M	Result of the update of data in the HSS. 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.

6.1.2.1 Detailed behaviour

Within the Sh-Update Request, the keys to determine the updated data are part of the information element Data (See 7.6). When data in the repository is updated (i.e. added, modified or removed) Service-Indication and Sequence-Number are also sent as part of the information element Data.

Newly added transparent data shall be associated with a Sequence Number of 0 in the Sh-Update Request. Sequence Number value 0 is reserved exclusively for indication of newly added transparent data.
Modified and removed transparent data shall be associated within the Sh-Update Request with a Sequence Number of n+1 where n is the original Sequence Number associated with the transparent data before modification or removal. If n equals 65535, then the next modification or deletion of that transparent data shall be associated with a Sequence Number of 1.

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

1. In the AS permission list (see section 6.2) check that the user data that is requested to be updated (Sh-Update) by this AS, is allowed to be updated by checking the combination of the identity of the AS sending the request (identified by the Origin-Host AVP) and the supplied Data-Reference.

   - If the data is not allowed to be updated, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_DATA_CANNOT_BE_MODIFIED in the Sh-Update Response.

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

3. Check whether or not the data that is requested to be updated by the AS, as identified by the Service-Indication, is currently being updated by another entity. If there is an update of the data in progress, Experimental-Result Code shall be set to DIAMETER_PRIOR_UPDATE_IN_PROGRESS in the Sh-Update Response.

4. Check whether or not there is any repository data stored at the HSS already for the specified Service-Indication and the associated user.

   - If repository data identified by the Service-Indication is stored at the HSS for the specified user, check the following premises:

1. Sequence_Number_in_Sh_Update is not equal to 0
2. (Sequence_Number_in_Sh_Update - 1) is equal to (Sequence_Number_In_HSS modulo 65535)

- If either of the above premises is false then Experimental-Result-Code shall be set to DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC in the Sh-Update Response.
- If both of the above premises are true, then check whether or not Service Data is received within the Sh-Update Req.
  - If Service Data is included in the Sh-Update Req, check whether or not the size of the data is greater than that which the HSS is prepared to accept.
    - If there is more data than the HSS is prepared to accept then Experimental-Result-Code shall be set to DIAMETER_ERROR_TOO_MUCH_DATA and the new data shall be discarded.
    - If the HSS is prepared to accept the data, then the repository data stored at the HSS shall be updated with the repository data sent in the Sh-Update Req and the Sequence Number associated with that repository data shall be updated with that sent in the Sh-Update Req. This triggers the sending of Sh-Notif messages to any other ASs that are subscribed to Notifications for updates to the service data for that user (see 6.1.4).
  - If Service Data is not received, the data stored in the repository at the HSS shall be removed, and as a consequence the Service Indication and the Sequence Number associated with the removed data shall also be removed. This triggers the sending of Sh-Notif messages to any other ASs that are subscribed to Notifications for updates to the service data for that user (see 6.1.4). After sending Sh-Notif messages, the subscriptions to Notifications for the removed Repository Data shall be deleted.

- If repository data identified by the Service-Indication is not stored for the user i.e. the Sh-Update Req intends to create a new repository data, check whether or not the Sequence Number in the Sh-Update Req is 0.
  - If the sequence number is not set to 0, Experimental-Result Code shall be set to DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC
  - If the sequence number is set to 0 check whether Service Data is included within the Sh-Update Req.
    - If Service Data is not included in the Sh-Update Req, then Experimental-Result-Code shall be set to DIAMETER_ERROR_OPERATION_NOT_ALLOWED and the operation shall be ignored by the HSS.
    - If Service Data is included in the Sh-Update Req, check whether or not the size of the data is greater than that which the HSS is prepared to accept. If there is more data than the HSS is prepared to accept then Experimental-Result-Code shall be set to DIAMETER_ERROR_TOO_MUCH_DATA and the new data shall be discarded.
    - If the HSS is prepared to accept the data included in the Sh-Update Req, then the data shall be stored inwithin the data repository in the HSS.

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).

If the HSS cannot fulfil the received request for reasons not stated in the above steps, e.g. due to database error, it shall stop processing the request and set Result-Code to DIAMETER_UNABLE_TO_COMPLY.

Otherwise, the requested operation shall take place and the HSS shall return the Result-Code AVP set to DIAMETER_SUCCESS.

NOTE: When an AS receives DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC the AS may attempt to resolve the inconsitency between the version of the repository data that it holds and that stored at the HSS. It may execute a Sh-Pull to retrieve the current version of the data from the HSS or it tmay wait to receive a subsequent Sh-Notif message from the HSS for the affected repository data.

*** Next Modification ***

6.1.3 Subscription to notifications (Sh-Subs-Notif)

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

- To subscribe to Notifications for when particular transparent and/or non-transparent data for a specified user is updated, from the HSS.

This procedure is mapped to the commands Subscribe-Notifications-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.3.1 and 6.1.3.2 detail the information elements involved.

Table 6.1.3.1: Sh-Subs-Notif

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	IMS public identity of the user for whom notifications of data changes are requested. See section 7.1 for the content of this AVP.
Requested data (See 7.3)	Data-Reference	M	This information element includes the reference to the data on which notifications of change are required (valid reference values are defined in 7. 6).
Subscription request type (See 7.7)	Subs-Req-Type	M	This information element indicates the action requested on subscription to notifications.
Service Indication (See 7.4)	Service-Indication	O	IE that identifies, together with the ~~User~~ IMS Public User Identity and Data-Reference, the set of service related transparent data for which notifications of changes are 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~~ IMS Public 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 6.1.3.2: Sh-Subs-Notif Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Data request 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.

6.1.3.1 Detailed behaviour

The HSS shall take note of the subscription request on the data identified by ~~User~~ IMS Public User Identity and Data-Reference. If notifications on changes of repository data are requested, Service-Indication shall be present in the request. If notifications on changes of filter criteria are requested, the Server-Name AVP shall be used as key to the filter criteria. The Server-Name AVP shall contain the SIP URL of the AS sending the request.

Upon reception of the Sh-Subs-Notif request, the HSS shall, in the following order (if there is an error in any of the following steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.329 [5] and 3GPP TS 29.229 [7]):

1. In the AS permission list (see section 6.2) the HSS shall check that the AS is allowed to subscribe to notifications (Sh-Subs-Notif) for the requested user data by checking the combination of the identity of the AS sending the request (identified by the Origin-Host AVP) and the supplied Data-Reference.

   - If this AS does not have Sh-Subs-Notif permission for the data referenced, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_DATA_CANNOT_BE_NOTIFIED in the Sh-Subs-Notif Response.

2. Check that the user for whom notifications are asked exists in HSS. If not, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_UNKNOWN in the Sh-Subs-Notif Response.

If the HSS cannot fulfil the received request for reasons not stated in the above steps, e.g. due to database error, it shall stop processing the request and set Result-Code to DIAMETER_UNABLE_TO_COMPLY.

*** Next Modification ***

6.1.4 Notifications (Sh-Notif)

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

- To inform the AS of changes in transparent and/or non-transparent data to which the AS has previously subscribed to receive Notifications for, using Sh-Subs-Notif (see 6.1.3).

This procedure is mapped to the commands Push-Notification-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.4.1 and 6.1.4.2 detail the involved information elements.

Table 6.1.4.1: Sh-Notif

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	IMS Public User Identity of the user which data has changed. See section 7.1 for the content of this AVP.
Requested Data (See 7.6)	User-Data	M	Changed data.

Table 6.1.4.2: Sh-Notif Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Data request 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.

6.1.4.1 Detailed behaviour

The keys to the updated data are part of the information element User-Data (See Annex C). When data repository is updated Service-Indication is also part of the information element User-Data.

Since authentication pending is a transient state of normally very short duration, notification of an IMS user's state change, to and from the authentication pending state shall not be sent to Application Servers, when the previous state

before authentication pending and next state after authentication pending are the same. If the states are different before the authentication pending state is entered and after the authentication pending state is left then notification is sent to the AS of this new state.

*** Next Modification ***

7.1 User Identity

This information element contains a user ~~public~~ identity ~~(either SIP-URL, TEL-URL or MSISDN)~~ according to the conditions described in table 7.1.x.

Table 7.1.x: User Identity content

Information element name	Mapping to Diameter AVP	Cat.	Description
IMS Public User Identity (See 7.1.x)	Public-Identity	C	IMS Public User Identity of the user for whom the data is required. If the MSISDN is not included in the User-Identity AVP, the Public-Identity AVP shall be included in Sh messages only for allowed Data References as described in Table 7.6.1.
MSISDN (See 7.1.y)	MSISDN	C	MSISDN of the user for whom the data is required. If the Public-Identity AVP is not included in the User-Identity AVP, the MSISDN AVP shall be included in the Sh-Pull message only for allowed Data References as described in Table 7.6.1.

7.1.x IMS Public User Identity

This information element contains an IMS public user identity (either SIP-URI or TEL-URL).

7.1.y MSISDN

This information element contains a Basic MSISDN (see 3GPP TS 23.012 [xx]).

*** Next Modification ***

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 AS permissions (as described in section 6.2) for the data accessible via the Sh interface. It is a matter of operator policy to further restrict the AS permission rights defined in table 7.6.1.

Table 7.6.1: Data accessible via Sh interface

Data Ref.	XML tag	Defined in	Access key	Operations AS may be permitted to use:
0	RepositoryData	7.6.1	~~User-~~IMS Public User Identity + Data-Reference + Service-Indication	Sh-Pull, Sh-Update, Sh-Subs-Notif
10	IMSPublicIdentity	7.6.2	~~User-Identity~~IMS Public User Identity or MSISDN + Data-Reference + Identity-Set	Sh-Pull
11	IMSUserState	7.6.3	~~User-Identity~~IMS Public 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~~IMS Public User Identity + Data-Reference + Server-Name	Sh-Pull, Sh-Subs-Notif
14	LocationInformation	7.6.6	~~User-Identity~~MSISDN + Data-Reference+ Requested-Domain	Sh-Pull
15	UserState	7.6.7		
16	Charging information	7.6.8	~~User-Identity~~IMS Public User Identity or MSISDN + Data-Reference	Sh-Pull
17	MSISDN	7.6.9		Sh-Pull

7.6.1 Repository Data

This information element contains transparent data. A data repository may be shared by more than one AS implementing the same service.

7.6.2 IMSPublicIdentity

This information element contains an IMS P~~p~~ublic User I~~i~~dentity that would be either:

- associated with the Private Identity of the subscriber for whom the IMS Public User 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.

7.6.3 IMS User State

This information element contains the IMS User State of the public identifier referenced. Its possible values are:

- REGISTERED,
- NOT_REGISTERED,
- AUTHENTICATION_PENDING,
- REGISTERED_UNREG_SERVICES.

7.6.4 S-CSCF Name

This information element contains the name of the S-CSCF where a multimedia public identity is registered.

7.6.5 Initial Filter Criteria

This information element contains the triggering information for a service.

For a more detailed description, refer to 3GPP TS 23.218 [4] and 3GPP TS 29.228 [6].

7.6.6 Location Information

This information elementcontains the location of the served subscriber in the MSC/VLR if the requested domain is CS, or the location of the served subscriber in the SGSN if the requested domain is PS. If the HSS has to communicate with the MSC/VLR and/or SGSN to retrieve location information, it shall make use of the service MAP-PROVIDE-SUBSCRIBER-INFO.

For both Location Information for CS and Location Information for GPRS, the considerations described in 3GPP TS 23.078 [14] apply.

7.6.6.1 Location information for CS

This information elementconsists of the following subordinate information elements:

- Location number: defined in ITU-T Recommendation Q.763 [9]. Considerations described in 3GPP TS 23.018 apply[10].
- Service area ID: defined in 3GPP TS 23.003 [11].
- Global Cell ID: defined in 3GPP TS 23.003 [11].
- Location area ID: defined in 3GPP TS 23.003 [11].
- Geographical Information: defined in 3GPP TS 23.032 [12]. Considerations described in 3GPP TS 23.018 [10] and 3GPP TS 29.002 [13] apply.
- Geodetic Information: defined in ITU-T Recommendation Q.763 [9]. Considerations described in 3GPP TS 23.018 [10] and 3GPP TS 29.002 [13] apply.
- VLR Number: defined in 3GPP TS 23.003 [11].
- MSC Number: defined in 3GPP TS 23.003 [11].
- Age of location information: defined in 3GPP TS 23.018 [10].
- Current Location Retrieved: shall be present when location information was obtained after a successful paging procedure for Active Location Retrieval.

7.6.6.2 Location information for GPRS

This information element consists of the following subordinate information elements:

- Service area ID: defined in 3GPP TS 23.003 [11].
- Global Cell ID: defined in 3GPP TS 23.003 [11].
- Location area ID: defined in 3GPP TS 23.003 [11].
- Geographical Information: defined in 3GPP TS 23.032 [12]. Considerations described in 3GPP TS 23.018 [10] and 3GPP TS 29.002 [13] apply.
- Geodetic Information: defined in ITU-T Recommendation Q.763 [9]. Considerations described in 3GPP TS 23.018 [10] and 3GPP TS 29.002 [13] apply.
- SGSN Number: defined in 3GPP TS 23.003 [11].
- Routing Area ID: defined in 3GPP TS 23.003 [11].
- Current Location Retrieved: shall be present when location information was obtained after a successful paging procedure for Active Location Retrieval.

7.6.7 User state

This information element indicates the state of the user in the domain indicated by the Requested-Domain (see 7.2), with the values specified in 3GPP TS 23.078 [14] for Subscriber State and PS Domain Subscriber State. The HSS shall make use of the operation MAP-PROVIDE-SUBSCRIBER-INFO towards the MSC/VLR and/or the SGSN to obtain this information.

7.6.8 Charging information

This information element contains the addresses of the charging functions (primary event charging function name, secondary event charging function name, primary charging collection function name, secondary charging collection function name). When a clash occurs between the charging function address(es) received over the ISC interface and those received over the Sh interface, the address(es) received over the ISC interface should take precedence.

NOTE: The use of the Sh interface to retrieve charging function addresses is not intended as a general-purpose alternative to receiving charging function addresses from the ISC interfaces. Rather, it is meant to address a special case where the AS needs to interact with the charging system before initiating a request to a user when the AS has not received the third party REGISTER for that user.

7.6.9 MSISDN

This information element contains a~~n~~ Basic MSISDN (see 3GPP TS 23.012 [xx]) 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.

7.7 Subscription request type

This information element indicates the action requested for subscription to notifications. See 3GPP TS 29.329 [5] for the list of valid values.

7.8 Current Location

This information element indicates whether an active location retrieval has to be initiated or not when an AS requested location information. See 3GPP TS 29.329 [5] for the list of possible values.

7.9 Application Server Identity

This information element contains the identity of the Application Server. It is used for the AS permission check (see 6.2).

7.10 Application Server Name

This information element indicates application server's SIP URI. See 3GPP TS 29.229 [7] for the detailed definition of the AVP.

7.11 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.

3GPP TSG-CN WG4 Meeting #26 **N4-050324**
Sydney, AUSTRALIA. 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.329** **CR** **56** ⌘ **rev** **1** ⌘ Current version: **5.8.0** ⌘

*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 ☒

Title:	⌘	Introduction of Failed AVP
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	31/01/2005
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:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	This is an Essential Correction 29.328 Release 5 CR109 and Release 6 CR160 introduced the handling of data elements marked Mandatory, Conditional and Optional. Correct handling was defined when one of the information elements is missing. Handling for missing Information Elements which are tagged as Mandatroy or Conditional state that the missing AVP shall be returned in the Failed-AVP AVP. However, the Failed-AVP AVP is not defined in the ABNF.
Summary of change:	⌘	Modify the ABNF to include the Failed-AVP AVP in the UDA, PUA, SNA, PNA messages.
Consequences if not approved:	⌘	Inconsistencies between specifications and the Diameter Base Protocol RFC3588. Reference is made to an undefined AVP. Unclear behaviour for the handling of missing Information Elements that have been tagged as Mandatory or Conditional.

Clauses affected:	⌘	6.1.2, 6.1.4, 6.1.6, 6.1.8

Other specs affected: ⌘	Y	N		⌘
		X	Other core specifications	
		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.

*** First Modification ***

6.1.2 User-Data-Answer (UDA) Command

The User-Data-Answer (UDA) command, indicated by the Command-Code field set to 306 and the 'R' bit cleared in the Command Flags field, is sent by a server in response to the User-Data-Request command. The Result-Code or Experimental-Result AVP may contain one of the values defined in section 6.2 in addition to the values defined in 3GPP TS 29.229 [6].

Message Format

< User-Data-Answer > ::= < Diameter Header: 306, PXY, 16777217 >
< Session-Id >
{ Vendor-Specific-Application-Id }
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
[User-Data]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

*** Second Modification ***

6.1.4 Profile-Update-Answer (PUA) Command

The Profile-Update-Answer (PUA) command, indicated by the Command-Code field set to 307 and the 'R' bit cleared in the Command Flags field, is sent by a client in response to the Profile-Update-Request command. The Result-Code or Experimental-Result AVP may contain one of the values defined in section 6.2 in addition to the values defined in 3GPP TS 29.229 [6].

Message Format

< Profile-Update-Answer > ::=< Diameter Header: 307, PXY, 16777217 >
< Session-Id >
{ Vendor-Specific-Application-Id }
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

*** Third Modification ***

6.1.6 Subscribe-Notifications-Answer (SNA) Command

The Subscribe-Notifications-Answer command, indicated by the Command-Code field set to 308 and the 'R' bit cleared in the Command Flags field, is sent by a client in response to the Subscribe-Notifications-Request command. The Result-Code or Experimental-Result AVP may contain one of the values defined in section 6.2 in addition to the values defined in 3GPP TS 29.229 [6].

Message Format

< Subscribe-Notifications-Answer > ::= < Diameter Header: 308, PXY, 16777217 >
< Session-Id >
{ Vendor-Specific-Application-Id }
{ Auth-Session-State }
[Result-Code]
[Experimental-Result]
{ Origin-Host }
{ Origin-Realm }
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

*** Fourth Modification ***

6.1.8 Push-Notifications-Answer (PNA) Command

The Push-Notifications-Answer (PNA) command, indicated by the Command-Code field set to 309 and the 'R' bit cleared in the Command Flags field, is sent by a client in response to the Push-Notification-Request command. The Result-Code or Experimental-Result AVP may contain one of the values defined in section 6.2 in addition to the values defined in 3GPP TS 29.229 [6].

Message Format

< Push-Notification-Answer > ::=< Diameter Header: 309, PXY, 16777217 >
< Session-Id >
{ Vendor-Specific-Application-Id }
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

3GPP TSG-CN WG4 Meeting #26 **N4-050325**
Sydney, AUSTRALIA. 14th to 18th February 2005.

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.329** **CR** **57** ⌘ **rev** **1** ⌘ Current version: **6.3.0** ⌘

*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 ☒

Title:	⌘	Introduction of Failed AVP
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	31/01/2005
Category:	⌘	**A**
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)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

Ph2	*(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)*
Rel-7	*(Release 7)*

Reason for change:	⌘	29.328 Release 5 CR109 and Release 6 CR160 introduced the handling of data elements marked Mandatory, Conditional and Optional. Correct handling was defined when one of the information elements is missing. Handling for missing Information Elements which are tagged as Mandatroy or Conditional state that the missing AVP shall be returned in the Failed-AVP AVP. However, the Failed-AVP AVP is not defined in the ABNF.
Summary of change:	⌘	Modify the ABNF to include the Failed-AVP AVP in the UDA, PUA, SNA, PNA messages.
Consequences if not approved:	⌘	Inconsistencies between specifications and the Diameter Base Protocol RFC3588. Reference is made to an undefined AVP. Unclear behaviour for the handling of missing Information Elements that have been tagged as Mandatory or Conditional.

Clauses affected:	⌘	6.1.2, 6.1.4, 6.1.6, 6.1.8			
Other specs affected:	⌘	**Y**	**N**		⌘
			X	Other core specifications	
			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.

*** First Modification ***

6.1.2 User-Data-Answer (UDA) Command

The User-Data-Answer (UDA) command, indicated by the Command-Code field set to 306 and the 'R' bit cleared in the Command Flags field, is sent by a server in response to the User-Data-Request command. The Result-Code or Experimental-Result AVP may contain one of the values defined in section 6.2 in addition to the values defined in 3GPP TS 29.229 [6].

Message Format

< User-Data-Answer > ::= < Diameter Header: 306, PXY, 16777217 >
< Session-Id >
{ Vendor-Specific-Application-Id }
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
***[Supported-Features]**
[User-Data]
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

*** Second Modification ***

6.1.4 Profile-Update-Answer (PUA) Command

The Profile-Update-Answer (PUA) command, indicated by the Command-Code field set to 307 and the 'R' bit cleared in the Command Flags field, is sent by a client in response to the Profile-Update-Request command. The Result-Code or Experimental-Result AVP may contain one of the values defined in section 6.2 in addition to the values defined in 3GPP TS 29.229 [6].

Message Format

< Profile-Update-Answer > ::=< Diameter Header: 307, PXY, 16777217 >
< Session-Id >
{ Vendor-Specific-Application-Id }
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

*** Third Modification ***

6.1.6 Subscribe-Notifications-Answer (SNA) Command

The Subscribe-Notifications-Answer command, indicated by the Command-Code field set to 308 and the 'R' bit cleared in the Command Flags field, is sent by a client in response to the Subscribe-Notifications-Request command. The Result-Code or Experimental-Result AVP may contain one of the values defined in section 6.2 in addition to the values defined in 3GPP TS 29.229 [6].

Message Format

< Subscribe-Notifications-Answer > ::= < Diameter Header: 308, PXY, 16777217 >
< Session-Id >
{ Vendor-Specific-Application-Id }
{ Auth-Session-State }
[Result-Code]
[Experimental-Result]
{ Origin-Host }
{ Origin-Realm }
***[Supported-Features]**
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

*** Fourth Modification ***

6.1.8 Push-Notifications-Answer (PNA) Command

The Push-Notifications-Answer (PNA) command, indicated by the Command-Code field set to 309 and the 'R' bit cleared in the Command Flags field, is sent by a client in response to the Push-Notification-Request command. The Result-Code or Experimental-Result AVP may contain one of the values defined in section 6.2 in addition to the values defined in 3GPP TS 29.229 [6].

Message Format

< Push-Notification-Answer > ::=< Diameter Header: 309, PXY, 16777217 >
< Session-Id >
{ Vendor-Specific-Application-Id }
[Result-Code]
[Experimental-Result]
{ Auth-Session-State }
{ Origin-Host }
{ Origin-Realm }
***[Supported-Features]**
*[AVP]
*[Failed-AVP]
*[Proxy-Info]
*[Route-Record]

3GPP TSG-CN WG4 Meeting #26 ***N4-050458***

Sydney, Australia - 14th to 18th February 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.328** **CR** **098** ⌘ **rev** **3** ⌘ Current version: **5.8.0** ⌘

*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 ☒

Title:	⌘	Sh-Update needs to include Data-Reference to be future proof
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	14/02/2005
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:
Ph2 (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)
Rel-7 (Release 7)

Reason for change:	⌘	**This is an Essential Correction!** Table 7.6.1 shows Sh-Update requiring the Data-Reference AVP. Although Sh-Update is only used for Data Ref 0 currently, the Data Ref AVP needs to be included to enable this operation to be future proof in later versions of the TS. Data Ref needs to be added in Table 6.1.2.1. In addition there is confusion over the recommended access rights of operations on the last column. This is clarified by naming the last column to make it generic, i.e. as Operations, and by making the text explicit that the listed operation(s) in this column can only be used with this Data Ref. The error handling text for this is already in the detailed description!
Summary of change:	⌘	Data Ref needs to be added in Table 6.1.2.1. In addition the confusion over the recommended access rights of operations on the last column is made explicit.
Consequences if not approved:	⌘	The Sh-Update command needs to be made future proof and the current specification and detailed description is inconsistent with regard to the AVPs required for this operation. This could lead to mis-matched implementations. In addition, different interpretations of the use of the last column in the table on recommended AS permissions of operations would lead to Sh failure.

Clauses affected:	⌘	6.1.2.1, 7.6, Table 7.6.1			
Other specs	⌘	**Y** ☒ / **N** ☐	Other core specifications	⌘	29.329 CR 63

affected:	X	Test specifications
	X	O&M Specifications
Other comments: ⌘		

How to create CRs using this form:

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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.

6.1.2 Data Update (Sh-Update)

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

- To allow the AS to update the transparent (repository) data stored at the HSS for a specified user.

This procedure is mapped to the commands Profile-Update-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.2.1 and 6.1.2.2 detail the involved information elements.

Table 6.1.2.1: Sh-Update

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	IMS public identity of the user which data is updated.
Requested data (See 7. 3)	Data-Reference	M	This information element includes the reference to the data on which updates are required (possible values of the Data Reference are defined in Table 7.6.1)
Data (See 7. 6)	User-Data	M	Updated data.
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.

Table 6.1.2.2: Sh-Update Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7. 5)	Result-Code / Experimental-Result	M	Result of the update of data in the HSS. 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.

6.1.2.1 Detailed behaviour

Within the Sh-Update Request, the keys to determine the updated data are part of the information element Data (See 7.6). When data in the repository is updated (i.e. added, modified or removed) Service-Indication and Sequence-Number are also sent as part of the information element Data.

Newly added transparent data shall be associated with a Sequence Number of 0 in the Sh-Update Request. Sequence Number value 0 is reserved exclusively for indication of newly added transparent data.
Modified and removed transparent data shall be associated within the Sh-Update Request with a Sequence Number of n+1 where n is the original Sequence Number associated with the transparent data before modification or removal. If n equals 65535, then the next modification or deletion of that transparent data shall be associated with a Sequence Number of 1.

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

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

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

3. Check that the user data that is requested to be updated by the AS, is allowed to be updated. If the data is not allowed to be updated, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_DATA_CANNOT_BE_MODIFIED in the Sh-Update Response.

4. Check whether or not the data that is requested to be updated by the AS, as identified by the Service-Indication, is currently being updated by another entity. If there is an update of the data in progress, Experimental-Result Code shall be set to DIAMETER_PRIOR_UPDATE_IN_PROGRESS in the Sh-Update Response.

5. Check whether or not there is any repository data stored at the HSS already for the specified Service-Indication and the associated user.

   - If repository data identified by the Service-Indication is stored at the HSS for the specified user, check the following premises:

     1. Sequence_Number_in_Sh_Update is not equal to 0

     2. (Sequence_Number_in_Sh_Update - 1) is equal to (Sequence_Number_In_HSS modulo 65535)

     - If either of the above premises is false then Experimental-Result-Code shall be set to DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC in the Sh-Update Response.

     - If both of the above premises are true, then check whether or not Service Data is received within the Sh-Update Req.

       - If Service Data is included in the Sh-Update Req, check whether or not the size of the data is greater than that which the HSS is prepared to accept.

         - If there is more data than the HSS is prepared to accept then Experimental-Result-Code shall be set to DIAMETER_ERROR_TOO_MUCH_DATA and the new data shall be discarded.

         - If the HSS is prepared to accept the data, then the repository data stored at the HSS shall be updated with the repository data sent in the Sh-Update Req and the Sequence Number associated with that repository data shall be updated with that sent in the Sh-Update Req. This triggers the sending of Sh-Notif messages to any other ASs that are subscribed to Notifications for updates to the service data for that user (see 6.1.4).

       - If Service Data is not received, the data stored in the repository at the HSS shall be removed, and as a consequence the Service Indication and the Sequence Number associated with the removed data shall also be removed. This triggers the sending of Sh-Notif messages to any other ASs that are subscribed to Notifications for updates to the service data for that user (see 6.1.4). After sending Sh-Notif messages, the subscriptions to Notifications for the removed Repository Data shall be deleted.

   - If repository data identified by the Service-Indication is not stored for the user i.e. the Sh-Update Req intends to create a new repository data, check whether or not the Sequence Number in the Sh-Update Req is 0.

     - If the sequence number is not set to 0, Experimental-Result Code shall be set to DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC

     - If the sequence number is set to 0 check whether Service Data is included within the Sh-Update Req.

       - If Service Data is not included in the Sh-Update Req, then Experimental-Result-Code shall be set to DIAMETER_ERROR_OPERATION_NOT_ALLOWED and the operation shall be ignored by the HSS.

       - If Service Data is included in the Sh-Update Req, check whether or not the size of the data is greater than that which the HSS is prepared to accept. If there is more data than the HSS is prepared to accept then Experimental-Result-Code shall be set to DIAMETER_ERROR_TOO_MUCH_DATA and the new data shall be discarded.

       - If the HSS is prepared to accept the data included in the Sh-Update Req, then the data shall be stored inwithin the data repository in the HSS.

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.

NOTE: When an AS receives DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC the AS may attempt to resolve the inconsitency between the version of the repository data that it holds and that stored at the HSS. It may execute a Sh-Pull to retrieve the current version of the data from the HSS or it tmay wait to receive a subsequent Sh-Notif message from the HSS for the affected repository data.

Next Modification

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 data reference values and tags, access key and recommended AS permissions (as described in section 6.2) for the operation(s) on the data accessible via the Sh interface, i.e. the listed operation(s) in the Operations column are the only ones allowed to be used with this Data Ref value. It is a matter of operator policy to further restrict the AS permission 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	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		
16	Charging information	7.6.8	User-Identity + Data-Reference	Sh-Pull
17	MSISDN	7.6.9		Sh-Pull

3GPP TSG-CN WG4 Meeting #26 ***N4-050459***

Sydney, Australia - 14th to 18th February 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **29.328** **CR** **099** ⌘ **rev** **5** ⌘ Current version: **6.4.0** ⌘

*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 ☒

Title:	⌘	Sh-Update needs to include Data-Reference to be future proof
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	14/02/2005
Category:	⌘	**A**
Release:	⌘	Rel-6

Use one of the following categories:
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R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*
Rel-7	*(Release 7)*

Reason for change:	⌘	Table 7.6.1 shows Sh-Update requiring the Data-Reference AVP. Although Sh-Update is only used for Data Ref 0 currently, the Data Ref AVP needs to be included to enable this operation to be future proof in later versions of the TS. Data Ref needs to be added in Table 6.1.2.1. In addition there is confusion over the recommended access rights of operations on the last column. This is clarified by naming the last column to make it generic, i.e. as Operations, and by making the text explicit that the listed operation(s) in this column can only be used with this Data Ref. The error handling text for this is already in the detailed description!
Summary of change:	⌘	Data Ref needs to be added in Table 6.1.2.1. In addition the confusion over the recommended access rights of operations on the last column is made explicit.
Consequences if not approved:	⌘	The Sh-Update command needs to be made future proof and the current specification and detailed description is inconsistent with regard to the AVPs required for this operation. This could lead to mis-matched implementations. In addition, different interpretations of the use of the last column in the table on recommended AS permissions of operations would lead to Sh failure.

Clauses affected:	⌘	6.1.2.1, 7.6, Table 7.6.1

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	29.329CR 64
			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.

6.1.2 Data Update (Sh-Update)

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

- To allow the AS to update the transparent (repository) data stored at the HSS for a specified user.

This procedure is mapped to the commands Profile-Update-Request/Answer in the Diameter application specified in 3GPP TS 29.329 [5]. Tables 6.1.2.1 and 6.1.2.2 detail the involved information elements.

Table 6.1.2.1: Sh-Update

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.1)	User-Identity	M	IMS public identity of the user which data is updated.
Requested data (See 7.3)	Data-Reference	M	This information element includes the reference to the data on which updates are required (possible values of the Data Reference are defined in Table 7.6.1).
Data (See 7.6)	User-Data	M	Updated data.
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.

Table 6.1.2.2: Sh-Update Resp

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7.5)	Result-Code / Experimental-Result	M	Result of the update of data in the HSS. 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.

6.1.2.1 Detailed behaviour

Within the Sh-Update Request, the keys to determine the updated data are part of the information element Data (See 7.6). When data in the repository is updated (i.e. added, modified or removed) Service-Indication and Sequence-Number are also sent as part of the information element Data.

Newly added transparent data shall be associated with a Sequence Number of 0 in the Sh-Update Request. Sequence Number value 0 is reserved exclusively for indication of newly added transparent data.
Modified and removed transparent data shall be associated within the Sh-Update Request with a Sequence Number of n+1 where n is the original Sequence Number associated with the transparent data before modification or removal. If n equals 65535, then the next modification or deletion of that transparent data shall be associated with a Sequence Number of 1.

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

1. In the AS permission list (see section 6.2) check that the user data that is requested to be updated (Sh-Update) by this AS, is allowed to be updated by checking the combination of the identity of the AS sending the request (identified by the Origin-Host AVP) and the supplied Data-Reference.

   - If the data is not allowed to be updated, Experimental-Result Code shall be set to DIAMETER_ERROR_USER_DATA_CANNOT_BE_MODIFIED in the Sh-Update Response.

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

3. Check whether or not the data that is requested to be updated by the AS, as identified by the Service-Indication, is currently being updated by another entity. If there is an update of the data in progress, Experimental-Result Code shall be set to DIAMETER_PRIOR_UPDATE_IN_PROGRESS in the Sh-Update Response.

4. Check whether or not there is any repository data stored at the HSS already for the specified Service-Indication and the associated user.

   - If repository data identified by the Service-Indication is stored at the HSS for the specified user, check the following premises:

     1. Sequence_Number_in_Sh_Update is not equal to 0

     2. (Sequence_Number_in_Sh_Update - 1) is equal to (Sequence_Number_In_HSS modulo 65535)

     - If either of the above premises is false then Experimental-Result-Code shall be set to DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC in the Sh-Update Response.

     - If both of the above premises are true, then check whether or not Service Data is received within the Sh-Update Req.

       - If Service Data is included in the Sh-Update Req, check whether or not the size of the data is greater than that which the HSS is prepared to accept.

         - If there is more data than the HSS is prepared to accept then Experimental-Result-Code shall be set to DIAMETER_ERROR_TOO_MUCH_DATA and the new data shall be discarded.

         - If the HSS is prepared to accept the data, then the repository data stored at the HSS shall be updated with the repository data sent in the Sh-Update Req and the Sequence Number associated with that repository data shall be updated with that sent in the Sh-Update Req. This triggers the sending of Sh-Notif messages to any other ASs that are subscribed to Notifications for updates to the service data for that user (see 6.1.4).

       - If Service Data is not received, the data stored in the repository at the HSS shall be removed, and as a consequence the Service Indication and the Sequence Number associated with the removed data shall also be removed. This triggers the sending of Sh-Notif messages to any other ASs that are subscribed to Notifications for updates to the service data for that user (see 6.1.4). After sending Sh-Notif messages, the subscriptions to Notifications for the removed Repository Data shall be deleted.

   - If repository data identified by the Service-Indication is not stored for the user i.e. the Sh-Update Req intends to create a new repository data, check whether or not the Sequence Number in the Sh-Update Req is 0.

     - If the sequence number is not set to 0, Experimental-Result Code shall be set to DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC

     - If the sequence number is set to 0 check whether Service Data is included within the Sh-Update Req.

       - If Service Data is not included in the Sh-Update Req, then Experimental-Result-Code shall be set to DIAMETER_ERROR_OPERATION_NOT_ALLOWED and the operation shall be ignored by the HSS.

       - If Service Data is included in the Sh-Update Req, check whether or not the size of the data is greater than that which the HSS is prepared to accept. If there is more data than the HSS is prepared to accept then Experimental-Result-Code shall be set to DIAMETER_ERROR_TOO_MUCH_DATA and the new data shall be discarded.

         - If the HSS is prepared to accept the data included in the Sh-Update Req, then the data shall be stored inwithin the data repository in the HSS.

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).

If the HSS cannot fulfil the received request for reasons not stated in the above steps, e.g. due to database error, it shall stop processing the request and set Result-Code to DIAMETER_UNABLE_TO_COMPLY.

Otherwise, the requested operation shall take place and the HSS shall return the Result-Code AVP set to DIAMETER_SUCCESS.

NOTE: When an AS receives DIAMETER_ERROR_TRANSPARENT_DATA_OUT_OF_SYNC the AS may attempt to resolve the inconsitency between the version of the repository data that it holds and that stored at the HSS. It may execute a Sh-Pull to retrieve the current version of the data from the HSS or it tmay wait to receive a subsequent Sh-Notif message from the HSS for the affected repository data.

Next Modification

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 data reference values and tags, access key and recommended AS permissions (as described in section 6.2) for the operation(s) on the data accessible via the Sh interface, i.e. the listed operation(s) in the Operations column are the only ones allowed to be used with this Data Ref value. It is a matter of operator policy to further restrict the AS permission rights defined in table 7.6.1.

Table 7.6.1: Data accessible via Sh interface

Data Ref.	XML tag	Defined in	Access key	Operations ~~AS may be permitted to use:~~
0	RepositoryData	7.6.1	User-Identity + Data-Reference + Service-Indication	Sh-Pull, Sh-Update, Sh-Subs-Notif
10	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		
16	Charging information	7.6.8	User-Identity + Data-Reference	Sh-Pull
17	MSISDN	7.6.9		Sh-Pull