3GPP TSG CN Plenary Meeting #18 **NP-020587**
4th – 6th December 2002 New Orleans, USA.

Source: TSG CN WG4

Title: Corrections on IP-based Multimedia Services Cx/Dx-interface

Agenda item: 8.1

Document for: APPROVAL

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
23.008	058		N4-021160	Rel-5	Addition of Barring Indication of multimedia public identities	F	5.2.0
29.228	010		N4-021163	Rel-5	Removal of upper bounds in Cx i/f user profile	F	5.1.0
29.228	011		N4-021183	Rel-5	S-CSCF Assignment	F	5.1.0
29.228	012		N4-021231	Rel-5	NAS-Session-Key AVPs in MAA command	F	5.1.0
29.228	008	2	N4-021281	Rel-5	Rejection of registration of a Temporary Public Identity without active implicit registration	F	5.1.0
29.228	017		N4-021372	Rel-5	Correction to HSS initiated update of user profile	F	5.1.0
29.228	013	1	N4-021511	Rel-5	Correction to detailed behaviour of user registration status query	F	5.1.0
29.228	014	1	N4-021512	Rel-5	Removing the DDF dependencies from Cx interface	F	5.1.0
29.228	015	1	N4-021513	Rel-5	Clarification of SERVER_CHANGE de-registration reason code	F	5.1.0
29.228	021	1	N4-021519	Rel-5	Re-allocation of S-CSCF	F	5.1.0
29.229	006		N4-021158	Rel-5	Addition of User-Name AVP to SAA	F	5.1.0
29.229	007		N4-021232	Rel-5	Editorial correction of SIP-Auth-Data-Item AVP definition	F	5.1.0

3GPP TSG CN WG4 Meeting #16 **N4-021160**
Miami, USA, 23rd – 27th September 2002

CR-Form-v7

CHANGE REQUEST

⌘ **23.008** **CR** **058** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

*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:	⌘	Addition of Barring Indication of multimedia public identities
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	21/08/02
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	In CN4#14 we added, as a request from SA2 (N4-020667) the possibility to bar an IMPU from access to sessions in the IMS domain. We forgot to add the corresponding definition to TS 23.008. Essential correction.
Summary of change:	⌘	Addition of a new subclause with the definition of the barring indication of a public identity
Consequences if not approved:	⌘	The definition of the barring indication would be missing from the description of the subscriber data stored in the HSS and S-CSCF.

Clauses affected:	⌘	3.1.3 (new section)

		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.

New Section

3.1.3 Barring indication

Flag associated to each public identity to indicate that the identity is barred for the initiation or termination of sessions in the IMS domain.

The Barring indication is permanent subscriber data and is stored in the HSS and in the S-CSCF.

End of New Section

Modified Section

5.3 IP Multimedia Service Data Storage

Table 3: Overview of data used for IP Multimedia services

PARAMETER	Subclause	HSS	S-CSCF	AS	TYPE
Private User Identity	3.1.1	M	M	-	P
Public Identity	3.1.2	M	M	-	P
Barring Indication	3.1.3	M	M	-	P
Registration Status	3.2.1	M	-	-	T
S-CSCF Name	3.2.2	M	-	-	T
Diameter Client Address of S-CSCF	3.2.3	M	-	-	T
Diameter Server Address of HSS	3.2.3	-	M	-	T
RAND, XRES, CK, IK and AUTN	3.3.1	M	C	-	T
Server Capabilities	3.4.1	C	C	-	P
Initial Filter Criteria	3.5.2	C	C	-	P
Service Indication	3.5.4	M	-	M	P

End of Modified Section

3GPP TSG CN WG4 Meeting #16 **N4-021281**
Miami, USA, 23rd – 27th September 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** **CR** **008** ⌘ **rev** **2** ⌘ Current version: **5.1.0** ⌘

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

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

Title:	⌘	Rejection of registration of a Temporary Public Identity without active implicit registration
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	25/09/2002
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),*
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R96 (Release 1996)
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R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change: ⌘ In TS 23.228, chapter 5.2.1a.1 we can read:

5.2.1a.1 Implicit Registration for UE without ISIM

In case an UE is registering in the IMS without ISIM, it shall require the network's assistance to register atleast one public user identity, which is used for session establishment & IMS signalling. Implicit registration shall be used as part of a mandatory function for these ISIM-less UEs to register the public user identity(s). In addition to the functions defined in section 5.2.1a, the following additional functions are required for this scenario.

- The Temporary public identity shall be used for initial registration process
- It shall be defined in HSS that if the user does not have implicit registration activated then the user shall not be allowed to register in the IMS using the Temporary public user identity.

If the public identity received in a Cx-Query operation is barred for the establishment of multimedia sessions (i.e. it is a Temporary public identity) and it doesn't have any other identity configured in the HSS to be registered implicitly, the HSS must reject the registration request.

Essential correction.

Summary of change: ⌘ When the HSS receives a Cx-Query with a Temporary public identity (i.e. barred for the establishment of multimedia sessions) the HSS shall check whether there are other public identities to be implicitly registered with that one or not. If there

		aren't the registration request is rejected.
Consequences if not approved:	⌘	Mis-alignment with stage-2. A registration attempt for a temporary public identity without implicit registration active would not be rejected by the HSS.

Clauses affected:	⌘	6.1.1.1			
		Y	**N**		
Other specs affected:	⌘		**X**	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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

6.1.1.1 Detailed behaviour

The HSS shall, in the following order (in case of an error in any of the steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.229 [5]):

1. Check that the user exists in the HSS. If not Vendor-Specific-Result shall be set to DIAMETER_ERROR_USER_UNKNOWN.

2. Check that the private and public identities received in the request belong to the same user. If not Vendor-Specific-Result shall be set to DIAMETER_ERROR _IDENTITIES_DONT_MATCH.

3. Check whether the public identity received in the request is barred for the establishment of multimedia sessions.

+ If it is, the HSS shall check whether there are other non-barred public identities to be implicitly registered with that one.

-- If so, continue to step 4.

-- If not, Vendor-Specific-Result shall be set to DIAMETER_AUTHORIZATION_REJECTED.

~~3~~4. Check the User-Authorization-Type received in the request:

+ If it is REGISTRATION or if User-Authorization-Type is absent from the request, the HSS shall check that the user is allowed to roam in the visited network (if not Vendor-Specific-Result shall be set to DIAMETER_ERROR _ROAMING_NOT_ALLOWED) and authorized to register (if not Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED). Continue to step 5~~4~~.

+ If it is DE_REGISTRATION, the HSS may not perform any check regarding roaming. Continue to step 5~~4~~.

+ If it is REGISTRATION_AND_CAPABILITIES, the HSS shall check that the user is allowed to roam in the visited network (if not Vendor-Specific-Result shall be set to DIAMETER_ERROR _ROAMING_NOT_ALLOWED) and authorized to register (if not Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED). The HSS shall return the list of S-CSCF capabilities, which enables the I-CSCF to select an S-CSCF. The returned capabilities must satisfy the most restrictive service profile of the user. The list of capabilities may be empty, to indicate to the I-CSCF that it can select any available S-CSCF. Result-Code shall be set to DIAMETER_SUCCESS. The HSS shall not return any S-CSCF name. Stop processing.

~~4~~5. Check the state of the public identity received in the request:

+ If it is registered or unregistered (i.e. registered as a consequence of a terminating call or there is a S-CSCF keeping the user profile stored), the HSS shall return the stored S-CSCF name and Vendor-Specific-Result set to DIAMETER_SUBSEQUENT_REGISTRATION. The HSS shall not return any S-CSCF capabilities.

+ If it is not registered yet, the HSS shall check if at least there is at least one identity of the user with an S-CSCF name assigned.

-- If so the HSS shall check the value of User-Authorization-Type received in the request:

-- If it is equal to DE_REGISTRATION, then the HSS shall not return any S-CSCF name or S-CSCF capabilities. The HSS shall set the Vendor-Specific-Result to DIAMETER_ERROR_IDENTITY_NOT_REGISTERED in the response.

-- If it is different from DE_REGISTRATION, then the HSS shall return the S-CSCF name assigned for the user and Vendor-Specific-Result set to DIAMETER_SUBSEQUENT_REGISTRATION. The HSS shall not return any S-CSCF capabilities

If the HSS cannot fulfil received request, e.g. due to database error, it shall set Result-Code to DIAMETER_UNABLE_TO_COMPLY. No S-CSCF name or S-CSCF capabilities shall be present in the response.

3GPP TSG CN WG4 Meeting #16 **N4-021163**
Miami, USA, 23rd – 27th September 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** **CR** **010** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	Removal of upper bounds in Cx i/f user profile
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	16/09/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	Following CN1's advice in N1-021832, there is no need to include either a maximum or minimum number of parameters in the specifications. The interoperability problems that we claimed when introducing these upper bounds are not such. Essential correction.
Summary of change:	⌘	Deletion of upper bounds of parameters on the Cx interface user profile definition.
Consequences if not approved:	⌘	The artificial upper bounds introduced may limit the development of services.

Clauses affected:	⌘	Annex E, attached XML schema

Other specs affected: ⌘	Y	N	
		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.

Beginning of modified section

Annex E (normative): XML schema for the Cx interface user profile

…

[Text removed for clarity]

Table E.2: XML schema for Cx interface: complex data types

Data type	Tag	Compound of		
		Tag	Type	Cardinality
tIMSSubscription	IMSSubscription	PrivateID	tPrivateID	1
		ServiceProfile	tServiceProfile	(1 to ~~20~~n)
tServiceProfile	ServiceProfile	PublicIdentity	tPublicIdentity	(1 to ~~20~~n)
		InitialFilterCriteria	tInitialFilterCriteria	(1 to ~~10~~n)
tInitialFilterCriteria	InitialFilterCriteria	Priority	tPriority	1
		TriggerPoint	tTrigger	(0 to 1)
		ApplicationServer	tApplicationServer	1
tTrigger	Trigger	SPI	tSiPoInt	(0 to ~~25~~n)
		ConditionTypeCNF	tBool	1
tSiPoInt	SPI	ConditionNegated	tBool	(0 to 1)
		Group	tGroupID	(1 to ~~25~~n)
		Choice of: Method	tString	1
		Choice of: SIPHeader	tHeader	1
		Choice of: SessionCase	tDirectionOfRequest	1
		Choice of: 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)

NOTE: “n” shall be interpreted as non-bounded.

End of modified section

Beginning of changes in CxDataTypes.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="DDF_Schemas\3GPPdatatype2Xsd.xsl"?>
<datatypes xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="DDF_Schemas\3GPPdatatype.xsd">
   <atomicType name="tPriority">
     <restriction base="int">
       <minInclusive value="0"/>
     </restriction>
   </atomicType>
   <atomicType name="tGroupID">
     <restriction base="int">
       <minInclusive value="0"/>
     </restriction>
   </atomicType>
   <atomicType name="tDefaultHandling">
     <restriction base="unsignedByte">
       <maxInclusive value="1"/>
       <enumeration value="0">
         <semantic>
           <label lang="en">SESSION_CONTINUED</label>
           <definition lang="en">Session Continued</definition>
         </semantic>
       </enumeration>
       <enumeration value="1">
         <semantic>
           <label lang="en">SESSION_TERMINATED</label>
           <definition lang="en">Session Terminated</definition>
         </semantic>
       </enumeration>
     </restriction>
   </atomicType>
   <atomicType name="tDirectionOfRequest">
     <restriction base="unsignedByte">
       <maxInclusive value="3"/>
       <enumeration value="0">
         <semantic>
           <label lang="en">ORIGINATING_SESSION</label>
           <definition lang="en">Originating Session</definition>
         </semantic>
       </enumeration>
       <enumeration value="1">
         <semantic>
           <label lang="en">TERMINATING_SESSION</label>
           <definition lang="en">Terminating Session</definition>
         </semantic>
       </enumeration>
       <enumeration value="2">
         <semantic>
           <label lang="en">TERMINATING_UNREGISTERED</label>
           <definition lang="en">Terminating Session for unregistered
user</definition>
         </semantic>
       </enumeration>
     </restriction>
   </atomicType>
   <atomicType name="tPrivateID">
     <!--NAI-->
```

```
      <restriction base="anyURI"/>
        <maxLength value="256"/>
      </restriction>
    </atomicType>
    <atomicType name="tSIP_URL">
      <!--Syntax described in RFC 3261.-->
      <restriction base="anyURI"/>
        <maxLength value="256"/>
      </restriction>
    </atomicType>
    <atomicType name="tTEL_URL">
      <!--Syntax described in RFC 2806.-->
      <restriction base="anyURI"/>
        <maxLength value="256"/>
      </restriction>
    </atomicType>
    <atomicType name="tIdentity">
      <union>
        <member datatype="tSIP_URL"/>
        <member datatype="tTEL_URL"/>
      </union>
    </atomicType>
    <atomicType name="tServiceInfo">
      <!--TBD-->
      <restriction base="string">
        <minLength value="0"/>
      </restriction>
    </atomicType>
    <atomicType name="tString">
      <restriction base="string">
        <minLength value="0"/>
      </restriction>
    </atomicType>
    <atomicType name="tBool">
      <restriction base="boolean">
        <enumeration value="0">
          <semantic>
            <label lang="en">FALSE</label>
            <definition lang="en">False</definition>
          </semantic>
        </enumeration>
        <enumeration value="1">
          <semantic>
            <label lang="en">TRUE</label>
            <definition lang="en">True</definition>
          </semantic>
        </enumeration>
      </restriction>
    </atomicType>
    <recordType name="IMSSubscription">
      <fieldVector name="PrivateID" datatype="tPrivateID" minOccurs="1"
maxOccurs="1"/>
      <fieldVector name="ServiceProfile" datatype="tServiceProfile" minOccurs="1"
maxOccurs="20"/>maxOccurs="unbounded"/>
    </recordType>
    <recordType name="tServiceProfile">
      <fieldVector name="PublicIdentity" datatype="tPublicIdentity" minOccurs="1"
maxOccurs="20"/>maxOccurs="unbounded"/>
      <fieldVector name="InitialFilterCriteria" datatype="tInitialFilterCriteria"
minOccurs="1" maxOccurs="10"/>maxOccurs="unbounded"/>
    </recordType>
    <recordType name="tInitialFilterCriteria">
```

```
     <fieldVector name="Priority" datatype="tPriority" minOccurs="1"
maxOccurs="1"/>
     <fieldVector name="TriggerPoint" datatype="tTrigger" minOccurs="0"
maxOccurs="1"/>
     <fieldVector name="ApplicationServer" datatype="tApplicationServer"
minOccurs="1" maxOccurs="1"/>
   </recordType>
   <recordType name="tTrigger">
     <fieldVector name="SPI" datatype="tSiPoInt" minOccurs="0"
~~maxOccurs="25"/>~~maxOccurs="unbounded"/>
     <fieldVector name="ConditionTypeCNF" datatype="tBool" minOccurs="1"
maxOccurs="1"/>
   </recordType>
   <recordType name="tSiPoInt">
     <fieldVector name="ConditionNegated" datatype="tBool" minOccurs="0"
maxOccurs="1"/>
     <fieldVector name="Group" datatype="tGroupID" minOccurs="1"
~~maxOccurs="25"/>~~maxOccurs="unbounded"/>
     <fieldVector name="Method" datatype="tString" minOccurs="1" maxOccurs="1"/>
     <fieldVector name="SIPHeader" datatype="tHeader" minOccurs="1"
maxOccurs="1"/>
     <fieldVector name="SessionCase" datatype="tDirectionOfRequest"
minOccurs="1" maxOccurs="1"/>
     <fieldVector name="SessionDescription" datatype="tSessionDescription"
minOccurs="1" maxOccurs="1"/>
   </recordType>
   <recordType name="tHeader">
     <fieldVector name="Header" datatype="tString" minOccurs="1" maxOccurs="1"/>
     <fieldVector name="Content" datatype="tString" minOccurs="0"
maxOccurs="1"/>
   </recordType>
   <recordType name="tSessionDescription">
     <fieldVector name="Line" datatype="tString" minOccurs="1" maxOccurs="1"/>
     <fieldVector name="Content" datatype="tString" minOccurs="0"
maxOccurs="1"/>
   </recordType>
   <recordType name="tApplicationServer">
     <fieldVector name="ServerName" datatype="tSIP_URL" minOccurs="1"
maxOccurs="1"/>
     <fieldVector name="DefaultHandling" datatype="tDefaultHandling"
minOccurs="0" maxOccurs="1"/>
     <fieldVector name="ServiceInfo" datatype="tServiceInfo" minOccurs="0"
maxOccurs="1"/>
   </recordType>
   <recordType name="tPublicIdentity">
     <fieldVector name="Identity" datatype="tIdentity" minOccurs="1"
maxOccurs="1"/>
     <fieldVector name="BarringIndication" datatype="tBool" minOccurs="0"
maxOccurs="1"/>
   </recordType>
</datatypes>
```

End of changes in CxDataTypes.xml

Beginning of changes in CxDataType.xsd

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
elementFormDefault="qualified" attributeFormDefault="unqualified">
   <xs:simpleType name="tPriority" final="list restriction">
```

```
    <xs:restriction base="xs:int">
      <xs:minInclusive value="0"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tGroupID" final="list restriction">
    <xs:restriction base="xs:int">
      <xs:minInclusive value="0"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tDefaultHandling" final="list restriction">
    <xs:restriction base="xs:unsignedByte">
      <xs:maxInclusive value="1"/>
      <xs:enumeration value="0">
        <xs:annotation>
          <xs:documentation>
            <label xml:lang="en">SESSION_CONTINUED</label>
            <definition xml:lang="en">Session Continued</definition>
          </xs:documentation>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="1">
        <xs:annotation>
          <xs:documentation>
            <label xml:lang="en">SESSION_TERMINATED</label>
            <definition xml:lang="en">Session Terminated</definition>
          </xs:documentation>
        </xs:annotation>
      </xs:enumeration>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tDirectionOfRequest" final="list restriction">
    <xs:restriction base="xs:unsignedByte">
      <xs:maxInclusive value="3"/>
      <xs:enumeration value="0">
        <xs:annotation>
          <xs:documentation>
            <label xml:lang="en">ORIGINATING_SESSION</label>
            <definition xml:lang="en">Originating Session</definition>
          </xs:documentation>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="1">
        <xs:annotation>
          <xs:documentation>
            <label xml:lang="en">TERMINATING_SESSION</label>
            <definition xml:lang="en">Terminating Session</definition>
          </xs:documentation>
        </xs:annotation>
      </xs:enumeration>
      <xs:enumeration value="2">
        <xs:annotation>
          <xs:documentation>
            <label xml:lang="en">TERMINATING_UNREGISTERED</label>
            <definition xml:lang="en">Terminating Session for unregistered
user</definition>
          </xs:documentation>
        </xs:annotation>
      </xs:enumeration>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tPrivateID" final="list restriction">
    <xs:restriction base="xs:anyURI"/>
      <xs:maxLength value="256"/>
```

```
~~    </xs:restriction>~~
    </xs:simpleType>
    <xs:simpleType name="tSIP_URL" final="list restriction">
      <xs:restriction base="xs:anyURI"/>
~~      <xs:maxLength value="256"/>~~
~~    </xs:restriction>~~
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~~      <xs:maxLength value="256"/>~~
~~    </xs:restriction>~~
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    </xs:simpleType>
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```

```
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```

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      <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
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          </xs:simpleContent>
        </xs:complexType>
      </xs:element>
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          </xs:simpleContent>
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              <xs:extension base="tString">
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            </xs:simpleContent>
          </xs:complexType>
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        <xs:element name="SIPHeader">
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```

```
            </xs:extension>
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      </xs:element>
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  </xs:sequence>
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```

```
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maxOccurs="unbounded"/>
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            </xs:simpleContent>
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        <xs:element name="Identity">
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            <xs:simpleContent>
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              </xs:extension>
            </xs:simpleContent>
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      </xs:sequence>
    </xs:complexType>
    <xs:element name="IMSSubscription" type="tIMSSubscription"/>
</xs:schema>
```

End of changes in CxDataType.xsd

3GPP TSG CN WG4 Meeting #16 **N4-021183**
Miami, USA, 23rd – 27th September 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** **CR** **011** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

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

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

Title:	⌘	S-CSCF Assignment
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	16/09/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	To correct an implementation error. Text already agreed at CN4#14 (Budapest) was not correctly implemented. See Tdoc N4-020725. Note: At that time 29.228 was not under change control.
Summary of change:	⌘	Modify text as already agreed in CN4#14
Consequences if not approved:	⌘	confusion

Clauses affected:	⌘	6.7

		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.

6.7 S-CSCF ~~Selection by the I-CSCF~~Assignment

The list of mandatory and optional capabilities received by an I-CSCF from the HSS ~~The contents of this IE shall~~ allows operators to distribute users between S-CSCFs ~~attending to mandatory and optional capabilities required per user by each operator~~, depending on the different capabilities (features, role, etc.) that each S-CSCF may have. Alternatively, an operator has the possibility to steer users to certain S-CSCFs.

The operator shall define (possibly based on the functionality offered by each S-CSCF installed in the network) the exact meaning of the mandatory and optional capabilities. It is a configuration task for the operator to ensure that the I-CSCF has a correct record of the capabilities of each S-CSCF available in his network. The I-CSCF does not need to know the semantic of the capabilities received from the HSS. This semantic is exclusively an operator issue.

~~The I-CSCF shall match the required capabilities to the capabilities of each S-CSCF of which it has knowledge.~~ As a first choice, t~~T~~he I-CSCF shall ~~first try to~~ select an S-CSCF that has all the mandatory and optional capabilities ~~required~~ for the ~~subscriber~~user. Only if that is not possible shall the I-CSCF apply a 'best-fit' algorithm. If more than one S-CSCF is identified that supports all mandatory capabilities the I-CSCF may then consider optional capabilities in selecting a specific S-CSCF. The 'best-fit' algorithm is implementation dependent and out of the scope of this specification.

~~The operator shall define (possibly based on the functionality offered by each S-CSCF installed in the network) the exact meaning of the mandatory and optional capabilities. It is a configuration task for the operator to ensure that the I-CSCF has a correct record of the capabilities of each S-CSCF available in his network. The I-CSCF does not need to know the semantic of the capabilities received from the HSS. This semantic is exclusively an operator issue.~~

It is the responsibility of the operator to ensure that there are S-CSCFs which have the ~~meet the "~~mandatory~~" requirements~~ capabilities indicated by the HSS for any given user. However, configuration errors may occur. If such errors occur and they prevent the I-CSCF from selecting an S-CSCF which meets the ~~"~~mandatory~~" requirements~~capabilities indicated by the HSS, the I-CSCF shall inform the HSS via the O&M subsystem.

~~In additionAlternatively to the possibility~~ As an alternative to selecting an S-CSCF based on the list of capabilities received from the HSS, it is possible to steer users to certain S-CSCFs. ~~In order to~~To do this, the operator ~~would~~may include one or more S-CSCF names as part of the capabilities of the user profile. ~~This is an operator issue; t~~The reason for the selection (e.g. all the users belonging to the same company/group could be in the same S-CSCF to implement a VPN service) and the method of selection are operator issues and out of the scope of this specification.

3GPP TSG CN WG4 Meeting #16 **N4-021231**
Miami, USA, 23rd – 27th September 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** **CR** **012** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	NAS-Session-Key AVPs in MAA command
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	16/09/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	The descriptions of confidentiality and integrity key elements in authentication data content are not consistent with the definition of NAS-Session-Key AVP defined in NASREQ IETF Internet Draft <draft-ietf-aaa-diameter-nasreq-09.txt>.
Summary of change:	⌘	It is proposed to replace the NAS-Key AVP with the NAS-Key-Data AVP in the descriptions of confidentiality and integrity keys.
Consequences if not approved:	⌘	Inconsistency between the original defintion of the NAS-Session-Key and the TS 29.228.
Clauses affected:	⌘	6.3

		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.

6.3 Authentication procedures

This procedure is used between the S-CSCF and the HSS to exchange information to support the authentication between the end user and the home IMS network. The procedure is invoked by the S-CSCF, corresponds to the combination of the operations Cx-AV-Req and Cx-Put (see 3GPP TS 33.203 [3]) and is used:

- To retrieve authentication vectors from the HSS.
- To resolve synchronization failures between the sequence numbers in the UE and the HSS.

This procedure is mapped to the commands Multimedia-Auth-Request/Answer in the Diameter application specified in 3GPP TS 29.229 [5]. Tables 6.3.1 – 6.3.5 detail the involved information elements.

Table 6.3.1: Authentication request

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.2)	Public-Identity	M	This information element contains the public identity of the user
Private User Identity (See 7.3)	User-Name	M	This information element contains the user private identity
Number Authentication Items (See 7.10)	SIP-Number-Auth-Items	M	This information element indicates the number of authentication vectors requested
Authentication Data (See 7.9)	SIP-Auth-Data-Item	M	See Tables 6.3.2 and 6.3.3 for the contents of this information element. The content shown in table 6.3.2 shall be used for a normal authentication request; the content shown in table 6.3.3 shall be used for an authentication request after synchronization failure.
S-CSCF Name (See 7.4)	Server-Name	M	This information element contains the name (SIP URL) of the S-CSCF.
Routing Information (See 7.13)	Destination-Host	C	If the S-CSCF knows the HSS name this AVP shall be present. This information is available if the MAR belongs to an already existing registration, e.g. in case of the re-registration, where the HSS name is stored in the S-CSCF. The HSS name is obtained from the Origin-Host AVP, which is received from the HSS, e.g. included in the MAA command. This information may not be available if the command is sent in case of the initial registration. In this case the Destination-Host AVP is not present and the command is routed to the next Diameter node, e.g. SLF, based on the Diameter routing table in the client.

Table 6.3.2: Authentication Data content – request

Information element name	Mapping to Diameter AVP	Cat.	Description
Authentication Scheme (See 7.9.2)	SIP-Authentication-Scheme	M	This information element indicates the authentication scheme. For 3GPP R5 it shall contain “Digest-AKAv1-MD5”.

Table 6.3.3: Authentication Data content – request, synchronization failure

Information element name	Mapping to Diameter AVP	Cat.	Description
Authentication Scheme (See 7.9.2)	SIP-Authentication-Scheme	M	Authentication scheme. For 3GPP R5 it shall contain "Digest-AKAv1-MD5".
Authorization Information (See 7.9.4)	SIP-Authorization	M	It shall contain the concatenation of nonce and AUTS, base 64 encoded. S-CSCF shall include the nonce sent to the terminal and the auts directive received from the terminal. See 3GPP TS 33.203 [3] for further details about RAND and AUTS. See [7] for further details about based 64 encoding. One example of content is: 'nonce=" dcd98b7102dd2f0e8b11d0f600bfb0c06629fae49393a05397450978507c4ef1 ", auts="5ccc069c403ebaf9f0171e9517f40e41"' where nonce "dcd98b7102dd2f0e8b11d0f600bfb0c093" contains, base 64 encoded, RAND (dcd98b7102dd2f0e8b11d0f600bfb0c0) and AUTN (6629fae49393a05397450978507c4ef1) and auts "5ccc069c403ebaf9f0171e9517f40e41" contains, base 64 encoded, AUTS.
Routing Information (See 7.13)	Destination-Host	M	In this case the MAR belongs to an already existing registration, where the HSS name is stored in the S-CSCF. The HSS name is obtained from the Origin-Host AVP, which is received from the HSS, e.g. included in the MAA command.

Table 6.3.4: Authentication answer

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.2)	Public-Identity	M	User public identity
Private User Identity (See 7.3)	User-Name	M	User private identity
Number Authentication Items (See 7.10)	SIP-Number-Auth-Items	M	Number of authentication vectors delivered in the Authentication Data information element
Authentication Data (See 7.9)	SIP-Auth-Data-Item	C	If the SIP-Number-Auth-Items AVP is equal to zero then this AVP shall not be present. See Table 6.3.5 for the contents of this information element.
Result (See 7.6)	Result-Code / Vendor-Specific-Result	M	Result of the operation

Table 6.3.5: Authentication Data content – response

Information	Mapping to	Cat.	Description

element name	Diameter AVP		
Item Number (See 7.9.1)	SIP-Item-Number	C	This information element shall be included present in a SIP-Auth-Data-Item grouped AVP in circumstances where there are multiple occurrences of SIP-Auth-Data-Item AVPs, and the order in which they should be processed is significant. In this scenario, SIP-Auth-Data-Item AVPs with a low SIP-Item-Number value should be processed before SIP-Auth-Data-Items AVPs with a high SIP-Item-Number value.
Authentication Scheme (See 7.9.2)	SIP-Authentication-Scheme	M	Authentication scheme. For 3GPP R5 it shall contain "Digest-AKAv1-MD5".
Authentication Information (See 7.9.3)	SIP-Authenticate	M	It shall contain, Base 64 encoded, the concatenation of the authentication challenge RAND and the token AUTN. See 3GPP TS 33.203 [3] for further details about RAND and AUTN. One example of the format of the SIP-Authenticate AVP is: 'nonce=" dcd98b7102dd2f0e8b11d0f600bfb0c06629fae49393a05397450978507c4ef1 "' where the nonce " dcd98b7102dd2f0e8b11d0f600bfb0c06629fae49393a05397450978507c4ef1 " contains, base 64 encoded, RAND (dcd98b7102dd2f0e8b11d0f600bfb0c0) and AUTN (6629fae49393a05397450978507c4ef1).
Authorization Information (See 7.9.4)	SIP-Authorization	M	In shall contain, base 64 encoded, the expected response XRES. See 3GPP TS 33.203 [3] for further details about XRES. One example of the format of the SIP-Authorization AVP is: 'response="6629fae49393a05397450978507c4ef1"' where response="6629fae49393a05397450978507c4ef1" contains, base64 encoded, XRES.
Confidentiality Key (See 7.9.5)	NAS-Session-Key	O	This information element may contain the confidentiality key. NAS-Session-Key is a grouped AVP. When present the following describes its content: - NAS-Key-Direction equal to BIDIRECTIONAL. - NAS-Key-Type equal to CIPHER_KEY. - NAS-Key-Data ~~is~~ contains the confidentiality key.
Integrity Key (See 7.9.6)	NAS-Session-Key	M	This information element shall contain the integrity key. NAS-Session-Key is a grouped AVP. When present the following describes its content: - NAS-Key-Direction equal to BIDIRECTIONAL. - NAS-Key-Type equal to INTEGRITY_KEY. - NAS-Key-Data ~~is~~ contains the integrity key.

3GPP TSG CN WG4 Meeting #17 **N4-021511**
Bangkok, THAILAND, 11th – 15th November 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** **CR** **013** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

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

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

Title:	⌘	Correction to detailed behaviour of user registration status query
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	13/11/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	The detailed behaviour of user registration status query does not contain the cases, when the user has no S-CSCF assigned for any of the identities. In addition, the layout of the subclause 6.1.1.1 is not implemented correctly according to the CR 29.228-002r1.
Summary of change:	⌘	It is proposed to add the missing UAR cases to the specification. The inaccurate implementation of the CR 29.228-002r1 is also corrected.
Consequences if not approved:	⌘	Incomplete specification.

Clauses affected:	⌘	6.1.1.1

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

⌘

Other comments: ⌘ The N4-021281 shall be implemented before this CR.

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.

6.1.1 User registration status query

This procedure is used between the I-CSCF and the HSS during SIP registrations. The procedure is invoked by the I-CSCF, corresponds to the combination of the functional level operations Cx-Query and Cx-Select-Pull (see 3GPP TS 23.228 [1]) and is used:

- To authorize the registration of the user, checking multimedia subsystem access permissions and roaming agreements.
- To perform a first security check, determining whether the public and private identities sent in the message belong to the same user.
- To obtain either the S-CSCF where the user is registered or unregistered (i.e. registered as a consequence of a terminating call or there is a S-CSCF keeping the user profile stored), or the list of capabilities that the S-CSCF has to support.

This procedure is mapped to the commands User-Authorization-Request/Answer in the Diameter application specified in 3GPP TS 29.229 [5]. Tables 6.1.1.1 and 6.1.1.2 detail the involved information elements.

Table 6.1.1.1 : User registration status query

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.2)	Public-Identity	M	User public identity to be registered
Visited Network Identifier (See 7.1)	Visited-Network-Identifier	M	Identifier that allows the home network to identify the visited network
Type of Authorization (See 7.14)	User-Authorization-Type	C	Type of authorization requested by the I-CSCF. If the request corresponds to a de-registration, i.e. Expires field in the REGISTER method is equal to zero, this AVP shall be present in the command and the value shall be set to DE-REGISTRATION. If the request corresponds to an initial registration or a re-registration, i.e. Expires field in the REGISTER method is not equal to zero then this AVP may not be present in the command. If present its value shall be set to REGISTRATION.
Private User Identity (See 7.3)	User-Name	M	User private identity
Routing Information (See 7.13)	Destination-Host, Destination-Realm	C	If the I-CSCF knows HSS name Destination-Host AVP shall be present in the command. Otherwise, only Destination-Realm AVP shall be present and the command shall be routed to the next Diameter node, e.g. SLF, based on the Diameter routing table in the I-CSCF.

Table 6.1.1.2 : User registration status response

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7.6)	Result-Code / Vendor-Specific-Result	M	Result of the operation

S-CSCF capabilities (See 7.5)	Server-Capabilities	O	Required capabilities of the S-CSCF to be assigned to the user.
S-CSCF Name (See 7.4)	Server-Name	C	Name of the assigned S-CSCF.

6.1.1.1 Detailed behaviour

The HSS shall, in the following order (in case of an error in any of the steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.229 [5]):

1. Check that the user exists in the HSS. If not Vendor-Specific-Result shall be set to DIAMETER_ERROR_USER_UNKNOWN.

2. Check that the private and public identities received in the request belong to the same user. If not Vendor-Specific-Result shall be set to DIAMETER_ERROR _IDENTITIES_DONT_MATCH.

3. Check the User-Authorization-Type received in the request:

   + If it is REGISTRATION or if User-Authorization-Type is absent from the request, the HSS shall check that the user is allowed to roam in the visited network (if not Vendor-Specific-Result shall be set to DIAMETER_ERROR _ROAMING_NOT_ALLOWED) and authorized to register (if not Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED). Continue to step 4.

   + If it is DE_REGISTRATION, the HSS may not perform any check regarding roaming. Continue to step 4.

   + If it is REGISTRATION_AND_CAPABILITIES, the HSS shall check that the user is allowed to roam in the visited network (if not Vendor-Specific-Result shall be set to DIAMETER_ERROR _ROAMING_NOT_ALLOWED) and authorized to register (if not Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED). The HSS shall return the list of S-CSCF capabilities, which enables the I-CSCF to select an S-CSCF. The returned capabilities must satisfy the most restrictive service profile of the user. The list of capabilities may be empty, to indicate to the I-CSCF that it can select any available S-CSCF. Result-Code shall be set to DIAMETER_SUCCESS. The HSS shall not return any S-CSCF name.

4. Check the state of the public identity received in the request:

   + If it is registered or unregistered (i.e. registered as a consequence of a terminating call or there is a S-CSCF keeping the user profile stored), the HSS shall return the stored S-CSCF name and Vendor-Specific-Result set to DIAMETER_SUBSEQUENT_REGISTRATION. The HSS shall not return any S-CSCF capabilities.

   + If it is not registered yet, the HSS shall check the value of User-Authorization-Type received in the request:

     -- If the value of User-Authorization-Type is equal to DE_REGISTRATION, then the HSS shall not return any S-CSCF name or S-CSCF capabilities. The HSS shall set the Vendor-Specific-Result to DIAMETER_ERROR_IDENTITY_NOT_REGISTERED in the response.

     -- If the value of User-Authorization-Type is different from DE_REGISTRATION, then the HSS shall check if ~~at least~~ there is at least one identity of the user with an S-CSCF name assigned.

        --- If ~~so~~ there is at least one identity of the user with an S-CSCF name assigned, ~~the HSS shall check the value of User-Authorization-Type received in the request:~~

        ~~If it is equal to DE_REGISTRATION, then the HSS shall not return any S-CSCF name or S-CSCF capabilities. The HSS shall set the Vendor-Specific-Result to DIAMETER_ERROR_IDENTITY_NOT_REGISTERED in the response.~~

        ~~If it is different from DE_REGISTRATION, then~~ the HSS shall return the S-CSCF name assigned for the user and Vendor-Specific-Result set to DIAMETER_SUBSEQUENT_REGISTRATION. The ~~-~~HSS shall not return any S-CSCF capabilities.

        --- If there is not any identity of the user with an S-CSCF name assigned, then the HSS shall return the list of S-CSCF capabilities, which enables the I-CSCF to select an S-CSCF. The returned capabilities ~~must~~shall

satisfy the most restrictive service profile of the user. The list of S-CSCF capabilities may be empty, to indicate to the I-CSCF that it ~~can~~may select any available S-CSCF. Vendor-Specific-Result shall be set to DIAMETER_FIRST_REGISTRATION. The HSS shall not return any S-CSCF name.

If the HSS cannot fulfil received request, e.g. due to database error, it shall set Result-Code to DIAMETER_UNABLE_TO_COMPLY. No S-CSCF name or S-CSCF capabilities shall be present in the response.

3GPP TSG CN WG4 Meeting #17 **N4-021512**
Bangkok, THAILAND, 11th – 15th November 2002

CR-Form-v7

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

Title:	⌘	Removing the DDF dependencies from Cx interface
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	13/11/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)

Reason for change:	⌘	The current XML presentation used in Cx is based on the Data Description Framework (DDF) and it was selected mainly because of the synergy with the GUP. However the data description method of GUP is currently open in T2 GUP work group. There have been presented two alternatives: GUP DDF and GUP Schema mechanism (see for example TP-020239). Because the future of DDF is uncertain and no clear synergy reasons can be pointed out any longer, the dependencies on the DDF shall be avoided in the Cx specifications. The schema contains two errors related to simple types tIdentity and tBool.
Summary of change:	⌘	The DDF dependencies are proposed to be removed throughout the 29.228 and attached XML files. The errors related to tIdentity and tBool are corrected in the XML schema.
Consequences if not approved:	⌘	DDF dependencies remain in the Cx interface making the XML definitions more difficult to manage.

Clauses affected:	⌘	Annex C, Annex E, Annex F, CxDataTypes.xml and CxDataType.xsd
Other specs affected:	⌘	Y / N ☐ / X Other core specifications ☐ / X Test specifications ☐ / X O&M Specifications
Other comments:	⌘	Similar changes are proposed to Sh interface in N4-021368. The agreed changes of CR010 to 29.228 (N4-021163) are incorporated to the CxDataType.xsd, which is proposed here.

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---------Beginning of first modified section----------

Annex C (informative): Conjunctive and Disjunctive Normal Form

A Trigger Point expression is constructed out of atomic expressions (i.e. Service Points of Interest) linked by Boolean operators AND, OR and NOT. Any logical expression constructed in that way can be transformed to forms called Conjunctive Normal Form (CNF) and Disjunctive Normal Form (DNF).

A Boolean expression is said to be in Conjunctive Normal Form if it is expressed as a conjunction of disjunctions of literals (positive or negative atoms), i.e. as an AND of clauses, each of which is the OR of one of more atomic expressions.

Taking as an example the following trigger:

Method = “INVITE” OR Method = “MESSAGE” OR (Method=”SUBSCRIBE” AND NOT Header = “from” Match = “joe”)

The trigger can be split into the following atomic expressions:
- Method=”INVITE”
- Method=”MESSAGE”
- Method=”SUBSCRIBE”
- NOT header=”from” Match=”joe”

Grouping the atomic expressions, the CNF expression equivalent to the previous example looks like:

(Method=”INVITE” OR Method = “MESSAGE” OR Method=”SUBSCRIBE”) AND (Method=”INVITE” OR Method = “MESSAGE” OR (NOT Header = “from” Match = “joe”))

This result in two “OR” groups linked by “AND” (CNF):
- (Method=”INVITE” OR Method = “MESSAGE” OR Method=”SUBSCRIBE”)
- (Method=”INVITE” OR Method = “MESSAGE” OR (NOT Header = “from” Content = “joe”))

The XML representation of the trigger is:

```
<?xml version=”1.0” encoding=”UTF-8”?>
<testDatatype xmlns:xsi=”http://www.w3.org/2001/XMLSchema-instance” xsi:noNamespaceSchemaLocation=”D:\
\CxDataType.xsd”>
        <IMSSubscription>
          <PrivateID index=”0”>IMPI1@homedomain.com</PrivateID>
          <ServiceProfile index=”0”>
              <PublicIdentity index=”0”>
                  <BarringIndication index=”0”>1</BarringIndication>
                  <Identity index=”0”> sip:IMPU1@homedomain.com </Identity>
              </PublicIdentity>
              <PublicIdentity index=”0”>
                  <Identity index=”0”> sip:IMPU2@homedomain.com </Identity>
              </PublicIdentity>
”””””         <InitialFilterCriteria index=”0”>
””              <Priority index=”0”>0</Priority>
                <TriggerPoint index=”0”>
                    <ConditionTypeCNF index=”0”>1</ConditionTypeCNF>
                    <SPI index=”0”>
                        <ConditionNegated index=”0”>0</ConditionNegated>
                        <Group index=”0”>0</Group>
                        <Method index=”0”>INVITE</Method>
                    </SPI>
```

```
                    <SPI index="0">
                        <ConditionNegated index="0">0</ConditionNegated>
                        <Group index="0">0</Group>
                        <Method index="0">MESSAGE</Method>
                    </SPI>
                    <SPI index="0">
                        <ConditionNegated index="0">0</ConditionNegated>
                        <Group index="0">0</Group>
                        <Method index="0">SUBSCRIBE</Method>
                    </SPI>
                    <SPI index="0">
                        <ConditionNegated index="0">0</ConditionNegated>
                        <Group index="0">1</Group>
                        <Method index="0">INVITE</Method>
                    </SPI>
                    <SPI index="0">
                        <ConditionNegated index="0">0</ConditionNegated>
                        <Group index="0">1</Group>
                        <Method index="0">MESSAGE</Method>
                    </SPI>

                    <SPI index="0">
                        <ConditionNegated index="0">1</ConditionNegated>
                        <Group index="0">1</Group>
                        <SIPHeader index="0">
                            <Header index="0">From</Header>
                            <Content index="0">"joe"</Content>
                        </SIPHeader>
                    </SPI>
                </TriggerPoint>
                <ApplicationServer index="0">
                    <ServerName index="0">sip:AS1@homedomain.com</ServerName>
                    <DefaultHandling index="0">0</DefaultHandling>
                </ApplicationServer>
            </InitialFilterCriteria>
        </ServiceProfile>
    </IMSSubscription>
</testDatatype>
```

A Boolean expression is said to be in Disjunctive Normal Form if it is expressed as a disjunction of conjuctions of literals (positive or negative atoms), i.e. as an OR of clauses, each of which is the AND of one of more atomic expressions.

The previous example is already in DNF, composed by the following groups:

- Method="INVITE"
- Method="MESSAGE"
- Method="SUBSCRIBE" AND (NOT header="from" Match="joe")

The XML representation of the trigger is:

```
<?xml version="1.0" encoding="UTF-8"?>
<testDatatype xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="D:\
CxDataType.xsd">
    <IMSSubscription>
      <PrivateID index="0">IMPI1@homedomain.com</PrivateID>
      <ServiceProfile index="0">
        <PublicIdentity index="0">
            <BarringIndication index="0">1</BarringIndication>
            <Identity index="0"> sip:IMPU1@homedomain.com </Identity>
        </PublicIdentity>
        <PublicIdentity index="0">
            <Identity index="0"> sip:IMPU2@homedomain.com </Identity>
```

```
            </PublicIdentity>""""""
            <InitialFilterCriteria index="0">
""              <Priority index="0">0</Priority>
                <TriggerPoint index="0">
                    <ConditionTypeCNF index="0">0</ConditionTypeCNF>
                    <SPI index="0">
                        <ConditionNegated index="0">0</ConditionNegated>
                        <Group index="0">0</Group>
                        <Method index="0">INVITE</Method>
                    </SPI>
                    <SPI index="0">
                        <ConditionNegated index="0">0</ConditionNegated>
                        <Group index="0">1</Group>
                        <Method index="0">MESSAGE</Method>
                    </SPI>
                    <SPI index="0">
                        <ConditionNegated index="0">0</ConditionNegated>
                        <Group index="0">2</Group>
                        <Method index="0">SUBSCRIBE</Method>
                    </SPI>
                    <SPI index="0">
                        <ConditionNegated index="0">1</ConditionNegated>
                        <Group index="0">2</Group>
                        <SIPHeader index="0">
                            <Header index="0">From</Header>
                            <Content index="0">"joe"</Content>
                        </SIPHeader>
                    </SPI>
                </TriggerPoint>
                <ApplicationServer index="0">
                    <ServerName index="0">sip:AS1@homedomain.com</ServerName>
                    <DefaultHandling index="0">0</DefaultHandling>
                </ApplicationServer>
            </InitialFilterCriteria>
        </ServiceProfile>
    </IMSSubscription>
</testDatatype>
```

---------End of first modified section----------

---------Beginning of second modified section----------

Annex E (normative): XML schema for the Cx interface user profile

The file CxDataType.xsd, attached to this specification, contains the XML schema for the Cx interface user profile. Such XML schema details all the data types on which XML documents containing Cx profile information shall be based. The XML schema file is intended to be used by an XML parser.

Table E.1 describes the data types and the dependencies among them that configure the XML schema.

Table E.1: XML schema for Cx interface: simple data types

Data type	Tag	Base type	Comments
tPriority	Priority	integer	>= 0
tGroupID	Group	integer	>= 0
tDefaultHandling	DefaultHandling	enumerated	Possible values: 0 (SESSION_CONTINUED) 1 (SESSION_TERMINATED)
tDirectionOfRequest	SessionCase	enumerated	Possible values: 0 (ORIGINATING_SESSION) 1 TERMINATING_SESSION 2 (TERMINATING_UNREGISTERED)
tPrivateID	PrivateID	anyURI	Syntax described in RFC 2486
tSIP_URL	PublicIdentity	anyURI	Syntax described in RFC 3261
tTEL_URL	PublicIdentity	anyURI	Syntax described in RFC 2806
tPublicIdentity	PublicIdentity	(union)	Union of tSIP_URL and tTEL_URL
tServiceInfo	ServiceInfo	string	
tString	Method, Header, Content, Line	string	
tBool	ConditionTypeCNF, ConditionNegated	~~enumerated~~boolean	Possible values: 0 (~~FALSE~~false) 1 (~~TRUE~~true)

Table E.2: XML schema for Cx interface: complex data types

Data type	Tag	Compound of		
		Tag	Type	Cardinality
tIMSSubscription	IMSSubscription	PrivateID	tPrivateID	1
		ServiceProfile	tServiceProfile	(1 to 20)
tServiceProfile	ServiceProfile	PublicIdentity	tPublicIdentity	(1 to 20)
		InitialFilterCriteria	tInitialFilterCriteria	(1 to 10)
tInitialFilterCriteria	InitialFilterCriteria	Priority	tPriority	1
		TriggerPoint	tTrigger	(0 to 1)
		ApplicationServer	tApplicationServer	1
tTrigger	Trigger	SPI	tSiPoInt	(0 to 25)
		ConditionTypeCNF	tBool	1
tSiPoInt	SPI	ConditionNegated	tBool	(0 to 1)
		Group	tGroupID	(1 to 25)
		Choice of: Method	tString	1
		Choice of: SIPHeader	tHeader	1
		Choice of: SessionCase	tDirectionOfRequest	1
		Choice of: 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)

---------End of second modified section----------

---------Beginning of third modified section----------

Annex F (informative): XML document for the Cx interface user profile

The file CxDataTypes~~.xml~~.xsd, attached to this specification, contains the XML schema document with the data description for Cx interface~~, compliant with the Data Description Framework~~.

---------End of third modified section----------

---------Beginning of changes to CxDataTypes.xml file----------

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-stylesheet type="text/xsl" href="DDF_Schemas\3GPPdatatype2Xsd.xsl"?>
<datatypes xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="DDF_Schemas\3GPPdatatype.xsd">
  <atomicType name="tPriority">
    <restriction base="int">
      <minInclusive value="0"/>
    </restriction>
  </atomicType>
  <atomicType name="tGroupID">
    <restriction base="int">
      <minInclusive value="0"/>
    </restriction>
  </atomicType>
  <atomicType name="tDefaultHandling">
    <restriction base="unsignedByte">
      <maxInclusive value="1"/>
      <enumeration value="0">
        <semantic>
          <label lang="en">SESSION_CONTINUED</label>
          <definition lang="en">Session Continued</definition>
        </semantic>
      </enumeration>
      <enumeration value="1">
        <semantic>
          <label lang="en">SESSION_TERMINATED</label>
          <definition lang="en">Session Terminated</definition>
        </semantic>
      </enumeration>
    </restriction>
  </atomicType>
  <atomicType name="tDirectionOfRequest">
    <restriction base="unsignedByte">
      <maxInclusive value="3"/>
      <enumeration value="0">
        <semantic>
          <label lang="en">ORIGINATING_SESSION</label>
          <definition lang="en">Originating Session</definition>
```

```
          </semantic>
        </enumeration>
        <enumeration value="1">
          <semantic>
            <label lang="en">TERMINATING_SESSION</label>
            <definition lang="en">Terminating Session</definition>
          </semantic>
        </enumeration>
        <enumeration value="2">
          <semantic>
            <label lang="en">TERMINATING_UNREGISTERED</label>
            <definition lang="en">Terminating Session for unregistered
user</definition>
          </semantic>
        </enumeration>
      </restriction>
    </atomicType>
    <atomicType name="tPrivateID">
      <!--NAI-->
      <restriction base="anyURI">
        <maxLength value="256"/>
      </restriction>
    </atomicType>
    <atomicType name="tSIP_URL">
      <!--Syntax described in RFC 3261.-->
      <restriction base="anyURI">
        <maxLength value="256"/>
      </restriction>
    </atomicType>
    <atomicType name="tTEL_URL">
      <!--Syntax described in RFC 2806.-->
      <restriction base="anyURI">
        <maxLength value="256"/>
      </restriction>
    </atomicType>
    <atomicType name="tIdentity">
      <union>
        <member datatype="tSIP_URL"/>
        <member datatype="tTEL_URL"/>
      </union>
    </atomicType>
    <atomicType name="tServiceInfo">
      <!--TBD-->
      <restriction base="string">
        <minLength value="0"/>
      </restriction>
    </atomicType>
    <atomicType name="tString">
      <restriction base="string">
        <minLength value="0"/>
      </restriction>
    </atomicType>
    <atomicType name="tBool">
      <restriction base="boolean">
        <enumeration value="0">
          <semantic>
            <label lang="en">FALSE</label>
            <definition lang="en">False</definition>
          </semantic>
        </enumeration>
        <enumeration value="1">
          <semantic>
            <label lang="en">TRUE</label>
```

```
            <definition lang="en">True</definition>
          </semantic>
        </enumeration>
      </restriction>
    </atomicType>
    <recordType name="IMSSubscription">
      <fieldVector name="PrivateID" datatype="tPrivateID" minOccurs="1"
maxOccurs="1"/>
      <fieldVector name="ServiceProfile" datatype="tServiceProfile" minOccurs="1"
maxOccurs="20"/>
    </recordType>
    <recordType name="tServiceProfile">
      <fieldVector name="PublicIdentity" datatype="tPublicIdentity" minOccurs="1"
maxOccurs="20"/>
      <fieldVector name="InitialFilterCriteria" datatype="tInitialFilterCriteria"
minOccurs="1" maxOccurs="10"/>
    </recordType>
    <recordType name="tInitialFilterCriteria">
      <fieldVector name="Priority" datatype="tPriority" minOccurs="1"
maxOccurs="1"/>
      <fieldVector name="TriggerPoint" datatype="tTrigger" minOccurs="0"
maxOccurs="1"/>
      <fieldVector name="ApplicationServer" datatype="tApplicationServer"
minOccurs="1" maxOccurs="1"/>
    </recordType>
    <recordType name="tTrigger">
      <fieldVector name="SPI" datatype="tSiPoInt" minOccurs="0" maxOccurs="25"/>
      <fieldVector name="ConditionTypeCNF" datatype="tBool" minOccurs="1"
maxOccurs="1"/>
    </recordType>
    <recordType name="tSiPoInt">
      <fieldVector name="ConditionNegated" datatype="tBool" minOccurs="0"
maxOccurs="1"/>
      <fieldVector name="Group" datatype="tGroupID" minOccurs="1"
maxOccurs="25"/>
      <fieldVector name="Method" datatype="tString" minOccurs="1" maxOccurs="1"/>
      <fieldVector name="SIPHeader" datatype="tHeader" minOccurs="1"
maxOccurs="1"/>
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minOccurs="1" maxOccurs="1"/>
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minOccurs="1" maxOccurs="1"/>
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    <recordType name="tHeader">
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      <fieldVector name="Content" datatype="tString" minOccurs="0"
maxOccurs="1"/>
    </recordType>
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maxOccurs="1"/>
    </recordType>
    <recordType name="tApplicationServer">
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maxOccurs="1"/>
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minOccurs="0" maxOccurs="1"/>
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maxOccurs="1"/>
    </recordType>
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```

~~<fieldVector name="Identity" datatype="tIdentity" minOccurs="1" maxOccurs="1"/>~~
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~~</recordType>~~
~~</datatypes>~~

---------End of changes to CxDataTypes.xml file----------

---------Beginning of changes to CxDataType.xsd file----------

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
elementFormDefault="qualified" attributeFormDefault="unqualified">
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      <xs:minInclusive value="0"/>
    </xs:restriction>
  </xs:simpleType>
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    <xs:restriction base="xs:int">
      <xs:minInclusive value="0"/>
    </xs:restriction>
  </xs:simpleType>
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          <xs:documentation>
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          </xs:documentation>
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      </xs:enumeration>
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          <xs:documentation>
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```

```
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```

```
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              </xs:extension>
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              </xs:extension>
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```

```
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```

```
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```

```
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```

```
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      </xs:sequence>
  </xs:complexType>
  <xs:element name="IMSSubscription" type="tIMSSubscription"/>
</xs:schema>
```

---------End of changes to CxDataType.xsd file----------

3GPP TSG CN WG4 Meeting #17 **N4-021513**
Bangkok, THAILAND, 11th – 15th November 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** **CR** **015** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

*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 SERVER_CHANGE de-registration reason code
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	13/11/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	The HSS behaviour in case of the SERVER_CHANGE de-registration reason code is not specified.
Summary of change:	⌘	The SERVER_CHANGE de-registration reason code shall be used when the user's S-CSCF capabilities are changed in HSS or when the S-CSCF indicates that it has not enough memory for the updated User Profile.
Consequences if not approved:	⌘	Unclear specification.

Clauses affected:	⌘	6.1.3.1

	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.

6.1.3 Network initiated de-registration by the HSS, administrative

In case of network initiated de-registration of the user initiated by the HSS, the HSS shall de-register the user and send a notification to the S-CSCF indicating the identities that shall be de-registered. The procedure is invoked by the HSS, corresponds to the functional level operation Cx-Deregister (see 3GPP TS 23.228 [1]).

HSS may decide to de-register:

- Only one public identity or a list of public identities
- All the public identities of a user.

This procedure is mapped to the commands Registration-Termination-Request/Answer in the Diameter application specified in 3GPP TS 29.229 [5]. Tables 6.1.3.1 and 6.1.3.2 describe the involved information elements.

Table 6.1.3.1 : Network Initiated Deregistration by HSS request

Information element name	Mapping to Diameter AVP	Cat.	Description
User Identity (See 7.2)	Public-Identity	O	It contains the list of public user identities that are de-registered, in the form of SIP URL or TEL URL.
Private User Identity (See 7.3)	User-Name	M	It contains the private user identity in the form of a NAI.
Reason for de-registration (See 7.11)	Deregistration -Reason	M	The HSS shall send to the S-CSCF a reason for the de-registration. The de-registration reason is composed of two parts: one textual message (if available) that is intended to be forwarded to the user that is de-registered, and one reason code (see 3GPP TS 29.229 [5]) that determines the behaviour of the S-CSCF.
Routing Information (See 7.13)	Destination-Host	M	It contains the name of the S-CSCF which originated the last update of the name of the multimedia server stored in the HSS for a given multimedia user. The address of the S-CSCF is the same as the Origin-Host AVP in the message sent from the S-CSCF.

Table 6.1.3.2 : Network Initiated Deregistration by HSS response

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7.6)	Result-Code / Vendor-Specific-Result	M	This information element indicates the result of de-registration.

6.1.3.1 Detailed behaviour

The HSS shall de-register the affected identities and invoke this procedure to inform the S-CSCF. The HSS can determine in different cases that the user (only one public identity, one or more public identities or all the public identities registered) has to be de-registered.

The HSS may de-register:

- Only one public identity or a list of public identities. In this case the S-CSCF shall remove all the information stored in the S-CSCF for those public identities.

- The user with all his/her public identities (no public identity sent in the Cx-Deregister request). In this case the S-CSCF shall remove all the information stored for that user.

The HSS shall send in the Deregistration-Reason AVP the reason for the de-registration, composed by a textual message (if available) aimed for the user and a reason code that determines the action the S-CSCF has to perform. The possible reason codes are:

- PERMANENT_TERMINATION: The IMS subscription or service profile(s) has been permanently terminated. The S-CSCF should start the network initiated de-registration towards the user.

- NEW_SERVER_ASSIGNED: A new S-CSCF has been allocated to the user due to some reason, e.g. an error case, where the SIP registration is terminated in a new S-CSCF. The S-CSCF shall not start the network initiated de-registration towards the user but only clears its registration state and information regarding the user, i.e. all service profiles are cleared.

- SERVER_CHANGE: A new S-CSCF shall be allocated to the user when the user's S-CSCF capabilities are changed in the HSS or when the S-CSCF indicates that it has not enough memory for the updated User Profile. The S-CSCF should start the network initiated de-registration towards the user, i.e. all registrations are de-registered and the user is asked to re-register to all existing registrations.

- REMOVE_S-CSCF: The HSS indicates to the S-CSCF that the S-CSCF should no longer be used for a given user. The S-CSCF shall not start the network initiated de-registration towards the user when the user is not currently registered but clears all information regarding the user and responds to the HSS. The HSS then removes the S-CSCF for that user.

3GPP TSG CN WG4 Meeting #17 **N4-021372**
Bangkok, THAILAND, 11th – 15th November 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** **CR** **017** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	Correction to HSS initiated update of user profile
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	24/10/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	According to the current specification only one error code DIAMETER_UNABLE_TO_COMPLY is supported in failure cases of Push Profile Request. In reality it is needed to have more precise information about the reasons of failure and therefore an error code for "unknown user" case should be valid also in Push Profile Answer.
Summary of change:	⌘	It is proposed to add the result code DIAMETER_ERROR_USER_UNKNOWN.
Consequences if not approved:	⌘	The detailed reason of failure is not available in HSS.

Clauses affected:	⌘	6.2.2.1

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.

6.2.2 HSS initiated update of User Profile

This procedure is initiated by the HSS to update user profile information in the S-CSCF. This procedure corresponds to the functional level operation Cx-Update_Subscr_Data (see 3GPP TS 23.228 [1]).

This procedure is mapped to the commands Push-Profile-Request/Answer in the Diameter application specified in 3GPP TS 29.229 [5]. Tables 6.2.2.1 and 6.2.2.2 describe the involved information elements.

Table 6.2.2.1: User Profile Update request

Information element name	Mapping to Diameter AVP	Cat.	Description
Private User Identity (See 7.3)	User-Name	M	User private identity.
User profile (See 7.7)	User-Data	M	Updated service profile, with the format defined in chapter 8.8.
Routing Information (See 7.13)	Destination-Host	M	It contains the name of the S-CSCF which originated the last update of the name of the multimedia server stored in the HSS for a given multimedia user. The address of the S-CSCF is the same as the Origin-Host AVP in the message sent from the S-CSCF.

Table 6.2.2.2: User Profile Update response

Information element name	Mapping to Diameter AVP	Cat.	Description
Result (See 7.6)	Result-Code / Vendor-Specific-Result	M	This information element indicates the result of the update of User Profile in the S-CSCF.

6.2.2.1 Detailed behaviour

The HSS shall make use of this procedure to update relevant user profile information in the S-CSCF.

The S-CSCF shall overwrite, for the identities indicated in the request, current information with the information received from the HSS. Table 6.2.2.1.1 details the valid result codes that the S-CSCF can return in the response.

Table 6.2.2.1.1: User profile response valid result codes

Result-Code AVP value	Condition
DIAMETER_SUCCESS	The request succeeded.
DIAMETER_SUCCESS_NOT SUPPORTED_USER_DATA	The request succeeded. However, the S-CSCF informs the HSS that the received subscription data contained information, which was not recognised or supported.
DIAMETER_ERROR_USER_UNKNOWN	The request failed because the user is not found in S-CSCF.
DIAMETER_UNABLE_TO_COMPLY	The request failed.

3GPP TSG-CN4 Meeting #17
Bangkok, Thailand, 11th-15th November, 2002

Tdoc ⌘N4-021519

CR-Form-v7

CHANGE REQUEST

⌘ **29.228** **CR** **021** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

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

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

Title:	⌘	Re-allocation of S-CSCF
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	12/11/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	Current specification of Cx interface does not allow to assign at first registration a different S-CSCF than the one that was assigned as a consequence of session initiation to an unregistered user.
Summary of change:	⌘	When a user is unregistered, upon reception of a first registration, the HSS shall return the S-CSCF name that was assigned. The HSS may also return the S-CSCF capabilities to allow the assignment of a different S-CSCF. The I-CSCF shall interpret the presence of both S-CSCF name and capabilities as the need to perform a new assignment, which may result in the assignment of a different S-CSCF.
Consequences if not approved:	⌘	It would not be possible to assign at registration a S-CSCF different from the one assigned as a consequence of session initiation to unregistered user.

Clauses affected:	⌘	6.1.1.1

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

⌘

Other comments:	⌘	To be implemented after 29.228 CR013r1 (N4-021511)

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.

Beginning of modified section

6.1.1.1 Detailed behaviour

The HSS shall, in the following order (in case of an error in any of the steps the HSS shall stop processing and return the corresponding error code, see 3GPP TS 29.229 [5]):

1. Check that the user exists in the HSS. If not Vendor-Specific-Result shall be set to DIAMETER_ERROR_USER_UNKNOWN.

2. Check that the private and public identities received in the request belong to the same user. If not Vendor-Specific-Result shall be set to DIAMETER_ERROR _IDENTITIES_DONT_MATCH.

3. Check the User-Authorization-Type received in the request:

   + If it is REGISTRATION or if User-Authorization-Type is absent from the request, the HSS shall check that the user is allowed to roam in the visited network (if not Vendor-Specific-Result shall be set to DIAMETER_ERROR _ROAMING_NOT_ALLOWED) and authorized to register (if not Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED). Continue to step 4.

   + If it is DE_REGISTRATION, the HSS may not perform any check regarding roaming. Continue to step 4.

   + If it is REGISTRATION_AND_CAPABILITIES, the HSS shall check that the user is allowed to roam in the visited network (if not Vendor-Specific-Result shall be set to DIAMETER_ERROR _ROAMING_NOT_ALLOWED) and authorized to register (if not Result-Code shall be set to DIAMETER_AUTHORIZATION_REJECTED). The HSS shall return the list of S-CSCF capabilities, which enables the I-CSCF to select an S-CSCF. The returned capabilities must satisfy the most restrictive service profile of the user. The list of capabilities may be empty, to indicate to the I-CSCF that it can select any available S-CSCF. Result-Code shall be set to DIAMETER_SUCCESS. The HSS shall not return any S-CSCF name.

4. Check the state of the public identity received in the request:

   + If it is registered ~~or unregistered (i.e. registered as a consequence of a terminating call or there is a S-CSCF keeping the user profile stored)~~, the HSS shall return the stored S-CSCF name and Vendor-Specific-Result set to DIAMETER_SUBSEQUENT_REGISTRATION. The HSS shall not return any S-CSCF capabilities.

   + If it is unregistered (i.e registered as a consequence of a terminating call or there is a S-CSCF keeping the user profile stored), the HSS shall return the stored S-CSCF name and Vendor-Specific-Result set to DIAMETER_SUBSEQUENT_REGISTRATION. If it may be necessary to select a new S-CSCF, the HSS shall also return S-CSCF capabilities. Considering the information received from the HSS, the I-CSCF shall determine whether it has or not to select a new S-CSCF.

   + If it is not registered yet, the HSS shall check the value of User-Authorization-Type received in the request:

     -- If the value of User-Authorization-Type is equal to DE_REGISTRATION, then the HSS shall not return any S-CSCF name or S-CSCF capabilities. The HSS shall set the Vendor-Specific-Result to DIAMETER_ERROR_IDENTITY_NOT_REGISTERED in the response.

     -- If the value of User-Authorization-Type is different from DE_REGISTRATION, then the HSS shall check if there is at least one identity of the user with an S-CSCF name assigned.

        --- If there is at least one identity of the user ~~with an S-CSCF name assigned~~that is registered, the HSS shall return the S-CSCF name assigned for the user and Vendor-Specific-Result set to DIAMETER_SUBSEQUENT_REGISTRATION. The HSS shall not return any S-CSCF capabilities.

        --- If there is at least one identity of the user that is unregistered (i.e registered as a consequence of a terminating call or there is a S-CSCF keeping the user profile stored), the HSS shall return the stored S-CSCF name and Vendor-Specific-Result set to DIAMETER_SUBSEQUENT_REGISTRATION. If it may be necessary to select a new S-CSCF, the HSS shall also return S-CSCF capabilities. Considering the information received from the HSS, the I-CSCF shall determine whether it has or not to select a new S-CSCF.

--- If there is not any identity of the user with an S-CSCF name assigned, then the HSS shall return the list of S-CSCF capabilities, which enables the I-CSCF to select an S-CSCF. The returned S-CSCF capabilities shall satisfy the most restrictive service profile of the user. The list of S-CSCF capabilities may be empty, to indicate to the I-CSCF that it may select any available S-CSCF. Vendor-Specific-Result shall be set to DIAMETER_FIRST_REGISTRATION. The HSS shall not return any S-CSCF name.

If the HSS cannot fulfil received request, e.g. due to database error, it shall set Result-Code to DIAMETER_UNABLE_TO_COMPLY. No S-CSCF name or S-CSCF capabilities shall be present in the response.

End of modified section

3GPP TSG CN WG4 Meeting #16 **N4-021158**
Miami, USA, 23rd – 27th September 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.229** **CR** **006** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	Addition of User-Name AVP to SAA
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	21/08/02
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	The procedure defined in TS 29.228, 6.1.2, S-CSCF registration/deregistration notification response includes Private User Identity as a mandatory parameter. The corresponding Diameter command in TS 29.228, Server-Assignment-Answer (SAA) does not include the necessary AVP to transport the Private User Identity (i.e. User-Name). Essential correction.
Summary of change:	⌘	Addition of User-Name AVP to command SAA.
Consequences if not approved:	⌘	Mis-alignment between TS 29.228 and TS 29.229.

Clauses affected:	⌘	6.1.4

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:
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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.

6.1.4 Server-Assignment-Answer (SAA) Command

The Server-Assignment-Answer (SAA) command, indicated by the Command-Code field set to 2 and the 'R' bit cleared in the Command Flags field, is sent by a server in response to the Server-Assignment-Request command. The Result-Code or Vendor-Specific-Result AVP may contain one of the values defined in section 6.2 in addition to the values defined in [6]. If Result-Code or Vendor-Specific-Result does not inform about an error, the User-Data AVP shall contain the information that the S-CSCF needs to give service to the user.

Message Format

```
<Server-Assignment-Answer> ::=      < Diameter Header: 10415: 2 >
                                    < Session-Id >
                                    { Vendor-Specific-Application-Id }
                                    [ Result-Code ]
                                    [ Vendor-Specific-Result ]
                                    { Auth-Session-State }
                                    { Origin-Host }
                                    { Origin-Realm }
                                    { User-Name }
                                    [ User-Data ]
                                    [ Charging-Information ]
                                    *[ AVP ]
                                    *[ Proxy-Info ]
                                    *[ Route-Record ]
```

3GPP TSG CN WG4 Meeting #16 **N4-021232**
Miami, USA, 23rd – 27th September 2002

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CHANGE REQUEST

⌘ **29.229** **CR** **007** ⌘ **rev** **-** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	Editorial correction of SIP-Auth-Data-Item AVP definition.
Source:	⌘	CN4
Work item code:	⌘	IMS-CCR
Date:	⌘	17/09/2002
Category:	⌘	**F**
Release:	⌘	Rel-5

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

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

Reason for change:	⌘	The definition of SIP-Auth-Data-Item is not correct.
Summary of change:	⌘	The Authentication-Data-Item is proposed to be replaced with SIP-Auth-Data-Item.
Consequences if not approved:	⌘	
Clauses affected:	⌘	6.3.13

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

Other comments: ⌘

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

6.3.13 SIP-Auth-Data-Item AVP

The SIP-Auth-Data-Item (AVP code 13) is of type Grouped, and contains the authentication and/or authorization information for the Diameter client.

AVP format

~~Authentication-Data-Item~~SIP-Auth-Data-Item :: = < AVP Header : TBD >

[SIP-Item-Number]

[SIP-Authentication-Scheme]

[SIP-Authenticate]

[SIP-Authorization]

[SIP-Authentication-Context]

*[NAS-Session-Key]

* [AVP]