

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

NP-020591

Source: TSG CN WG4
Title: Correction of the SPI on IP-based Multimedia Services
Agenda item: 8.1
Document for: APPROVAL

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
29.228	022		N4-021547	Rel-5	Correction of the SPI	F	5.1.0
29.328	014		N4-021548	Rel-5	Correction of the SPI	F	5.1.0

CHANGE REQUEST

⌘ **29.228 CR 022** ⌘ 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 of the SPI		
Source:	⌘ CN4		
Work item code:	⌘ IMS-CCR	Date:	⌘ 13/11/2002
Category:	⌘ F	Release:	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)	2 (GSM Phase 2)	
	A (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	B (addition of feature),	R97 (Release 1997)	
	C (functional modification of feature)	R98 (Release 1998)	
	D (editorial modification)	R99 (Release 1999)	
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .	Rel-4 (Release 4)	
		Rel-5 (Release 5)	
		Rel-6 (Release 6)	

Reason for change:	⌘ According to the approved CN1 CR033 to 23.218 (N1-022297), the Request-URI can be used as an SPI.		
Summary of change:	⌘ A new SPI "Request-URI" is proposed to be included in the trigger point definition.		
Consequences if not approved:	⌘ Inconsistency between TS 23.218 and TS 29.228.		

Clauses affected:	⌘ Annex B.2.3, Annex E and CxDataType.xsd										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td>X</td> <td></td> </tr> <tr> <td></td> <td>X</td> </tr> <tr> <td></td> <td>X</td> </tr> </table>	Y	N	X			X		X	Other core specifications	⌘ CR 29.328-014
Y	N										
X											
	X										
	X										
		Test specifications									
		O&M Specifications									
Other comments:	⌘ The agreed changes of the CR 29.228-010 (N4-021163) and the CR 29.228-014 (N4-021512) are incorporated to the CxDataType.xsd, which is proposed here.										

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 first modified section-----

B.2.3 Trigger Point

The following picture gives an outline of the UML model of Filter Criteria class:

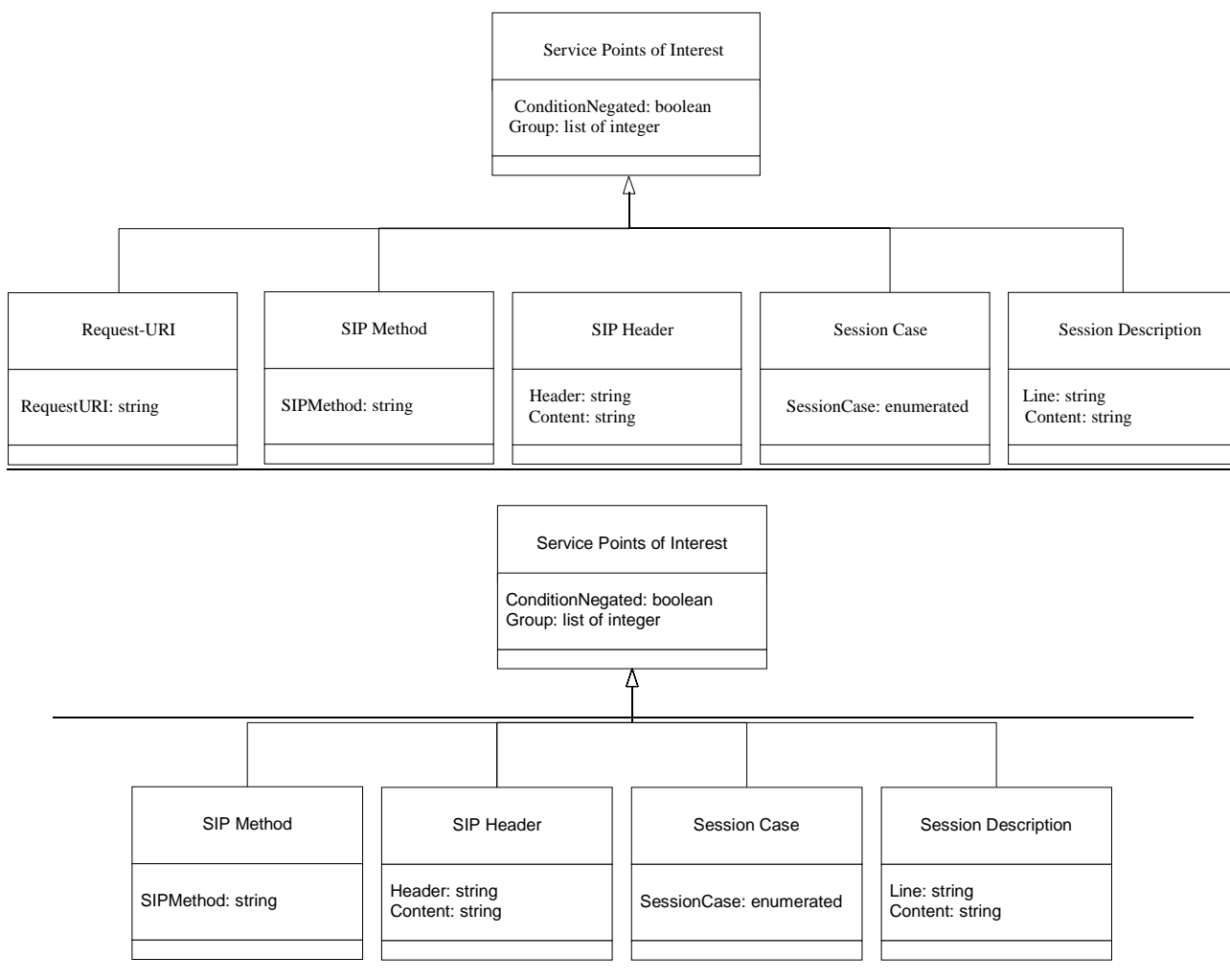


Figure B.2.3.1: Trigger Point

The attribute Group of the class Service Points of Interest allows the grouping of SPIs that will configure the sub-expressions inside a CNF or DNF expression. For instance, in the following CNF expression (A+B).(C+D), A+B and C+D would correspond to different groups.

In CNF, the attribute Group identifies the Ored sets of SPI instances. If the SPI belongs to different Ored sets, SPI can have more than one Group values assigned. At least one Group must be assigned for each SPI.

In DNF, the attribute Group identifies the ANDed sets of SPI instances. If the SPI belongs to different ANDed sets, SPI can have more than one Group values assigned. At least one Group must be assigned for each SPI.

The attribute ConditionNegated of the class Service Points of Interest defines whether the individual SPI instance is negated (i.e. NOT logical expression).

Request-URI class defines SPI for the Request-URI. Request-URI contains attribute RequestURI.

SIP Method class defines SPI for the SIP method. SIP Method contains attribute SIPMethod which can evaluate to any existent SIP method.

SIP Header class defines SPI for the presence or absence of any SIP header or for the content of any SIP header. SIP Header contains attribute SIP Header which identifies the SIP Header, which is the SPI, and the Content attribute defines the value of the SIP Header if required. The value of the Content attribute is a string that shall be interpreted as a regular expression. Perl-like regular expressions shall be taken as a model for legal regular expressions for this function. A regular expression would be as simple as a literal (e.g. "john") or a more elaborated one, allowing to match a string "containing" a substring, beginning with a substring, etc. Examples of regular expressions valid for the "Match" attribute could be:

- (1 "Joe": meaning that a given header matches exactly with the string "Joe".
- (1 "^ (Jo).*": meaning that a given header contains a value that begins with "Jo".
- (1 ".*Jo.*": meaning that a given header contains the substring "Jo" at any position.

The absence of the Content attribute and ConditionNegated = TRUE indicates that the SPI is the absence of a determined SIP header.

Session Case class represents an enumerated type, with possible values "Originating", "Terminating", "Terminating_Unregistered" indicating if the filter should be used by the S-CSCF handling the Originating, Terminating or Terminating for an unregistered end user services.

Session Description Information class defines SPI for the content of any SDP field within the body of a SIP Method. The Line attribute identifies the line inside the session description. Content is a string defining the content of the line identified by Line. Perl-like regular expressions shall be taken as a model for regular expressions for this function (as described above).

-----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	<u>RequestURI</u> , Method, Header, Content, Line	string	
tBool	ConditionTypeCNF, ConditionNegated	enumerated	Possible values: 0 (FALSE) 1 (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	RequestURI	tString	1
			Method	tString	1
			SIPHeader	tHeader	1
			SessionCase	tDirectionOfRequest	1
			SessionDescription	tSessionDescription	1
tHeader	SIPHeader	Header	tString	1	
		Content	tString	(0 to 1)	
tSessionDescription	SessionDescription	Line	tString	1	
		Content	tString	(0 to 1)	
tApplicationServer	ApplicationServer	ServerName	tSIP_URL	1	
		DefaultHandling	tDefaultHandling	(0 to 1)	
		ServiceInfo	tServiceInfo	(0 to 1)	

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

-----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">
  <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:restriction>
  </xs:simpleType>

```



```

        </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:simpleType>
<xs:simpleType name="tSIP_URL" final="list restriction">
  <xs:restriction base="xs:anyURI"/>
</xs:simpleType>
<xs:simpleType name="tTEL_URL" final="list restriction">
  <xs:restriction base="xs:anyURI"/>
</xs:simpleType>
<xs:simpleType name="tIdentity" final="list restriction">
  <xs:union memberTypes="tSIP_URL tTEL_URL"/>
</xs:simpleType>
<xs:simpleType name="tServiceInfo" final="list restriction">
  <xs:restriction base="xs:string">
    <xs:minLength value="0"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="tString" final="list restriction">
  <xs:restriction base="xs:string">
    <xs:minLength value="0"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="tBool">
  <xs:restriction base="xs:boolean">
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="tIMSSubscription">
  <xs:sequence>
    <xs:element name="PrivateID" type="tPrivateID"/>
    <xs:element name="ServiceProfile" type="tServiceProfile"
maxOccurs="unbounded"/>
    <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="tServiceProfile">
  <xs:sequence>
    <xs:element name="PublicIdentity" type="tPublicIdentity"
maxOccurs="unbounded"/>
    <xs:element name="InitialFilterCriteria" type="tInitialFilterCriteria"
maxOccurs="unbounded"/>
    <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="tInitialFilterCriteria">
  <xs:sequence>
    <xs:element name="Priority" type="tPriority"/>
    <xs:element name="TriggerPoint" type="tTrigger" minOccurs="0"/>
    <xs:element name="ApplicationServer" type="tApplicationServer"/>
  </xs:sequence>

```

```

        <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tTrigger">
    <xs:sequence>
        <xs:element name="ConditionTypeCNF" type="tBool"/>
        <xs:element name="SPI" type="tSiPoInt" minOccurs="0"
maxOccurs="unbounded" />
        <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tSiPoInt">
    <xs:sequence>
        <xs:element name="ConditionNegated" type="tBool" default="0"
minOccurs="0" />
        <xs:element name="Group" type="tGroupID" maxOccurs="unbounded" />
        <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded" />
    <xs:choice>
        <xs:element name="RequestURI" type="tString" />
        <xs:element name="Method" type="tString" />
        <xs:element name="SIPHeader" type="tHeader" />
        <xs:element name="SessionCase" type="tDirectionOfRequest" />
        <xs:element name="SessionDescription" type="tSessionDescription" />
    </xs:choice>
</xs:sequence>
</xs:complexType>
<xs:complexType name="tHeader">
    <xs:sequence>
        <xs:element name="Header" type="tString" />
        <xs:element name="Content" type="tString" minOccurs="0" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tSessionDescription">
    <xs:sequence>
        <xs:element name="Line" type="tString" />
        <xs:element name="Content" type="tString" minOccurs="0" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tApplicationServer">
    <xs:sequence>
        <xs:element name="ServerName" type="tSIP_URL" />
        <xs:element name="DefaultHandling" type="tDefaultHandling"
minOccurs="0" />
        <xs:element name="ServiceInfo" type="tServiceInfo" minOccurs="0" />
        <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tPublicIdentity">
    <xs:sequence>
        <xs:element name="BarringIndication" type="tBool" default="0"
minOccurs="0" />
        <xs:element name="Identity" type="tIdentity" />
    </xs:sequence>
</xs:complexType>
    <xs:element name="IMSSubscription" type="tIMSSubscription" />
</xs:schema>

```

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

CHANGE REQUEST

⌘ **29.328 CR 014** ⌘ 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 of the SPI		
Source:	⌘ CN4		
Work item code:	⌘ IMS-CCR	Date:	⌘ 13/11/2002
Category:	⌘ F	Release:	⌘ Rel-5
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	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

Reason for change:	⌘ According to the approved CN1 CR033 to 23.218 (N1-022297), the Request-URI can be used as an SPI.		
Summary of change:	⌘ A new SPI "Request-URI" is proposed to be included in the trigger point definition.		
Consequences if not approved:	⌘ Inconsistency between TS 23.218 and TS 29.328.		

Clauses affected:	⌘ Annex D, ShDataType.xsd										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;">X</td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;">X</td> </tr> </table>	Y	N	X			X		X	Other core specifications	⌘ CR 29.228-022
Y	N										
X											
	X										
	X										
		Test specifications									
		O&M Specifications									
Other comments:	⌘ The agreed changes of the CR 29.328-007 (N4-021164) and the CR 29.328-009 (N4-021520) are incorporated to the ShDataType.xsd, which is proposed here.										

How to create CRs using this form:

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

Annex D (normative): XML schema for the Sh interface user profile

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

Tables D.1 and D.2 describe the data types and the dependencies among them that configure the XML schema.

Table D.1: XML schema for Sh 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)
tIMSUserState	IMSUserState	Enumerated	Possible values: 0 (NOT_REGISTERED) 1 (REGISTERED) 2 (REGISTERED_UNREG_SERVICES) 3 (AUTHENTICATION_PENDING)
tCSUserState	CSUserState	Enumerated	Possible values (as defined in 3GPP TS 23.078): 0 (CAMELBusy) 1 (NetworkDeterminedNotReachable) 2 (AssumedIdle) 3 (NotProvidedfromVLR)
tPSUserState	PSUserState	Enumerated	Possible values (as defined in 3GPP TS 23.078): 0 (Detached) 1 (AttachedNotReachableForPaging) 2 (AttachedReachableForPaging) 3 (ConnectedNotReachableForPaging) 4 (ConnectedReachableForPaging) 5 (NotProvidedFromSGSN)
tLocationNumber	LocationNumber	string	Syntax described in ITU-T Q.763 (base 64

			encoded according to RFC 2045). Length ≥ 4 and ≤ 16 (multiples of 4).
tGlobalCellId	GlobalCellId	string	Syntax described in 3GPP TS 29.002 (base 64 encoded according to RFC 2045). Length = 12.
tServiceAreaId	ServiceAreaId	string	Syntax described in 3GPP TS 29.002 (base 64 encoded according to RFC 2045). Length = 12.
tLocationAreaId	LocationAreaId	string	Syntax described in 3GPP TS 29.002 (base 64 encoded according to RFC 2045). Length = 8.
tRoutingAreaId	RoutingAreaId	string	Syntax described in 3GPP TS 29.002 (base 64 encoded according to RFC 2045). Length = 8.
tGeographicalInformation	GeographicalInformation	string	Syntax described in 3GPP TS 29.002 (base 64 encoded according to RFC 2045). Length = 12.
tGeodeticInformation	GeodeticInformation	string	Syntax described in 3GPP TS 29.002 (base 64 encoded according to RFC 2045). Length = 16.
tAgeOfLocationInformation	AgeOfLocationInformation	integer	≥ 0 , ≤ 32767
tAddressString	AddressString	string	Syntax described in 3GPP TS 29.002 (base 64 encoded according to RFC 2045). Length ≥ 4 and ≤ 28 (multiples of 4).
tMSISDN	MSISDN	string	Syntax described in 3GPP TS 23.003.
tSIP_URL	PublicIdentity	anyURI	Syntax described in RFC 3261
tTEL_URL	PublicIdentity	anyURI	Syntax described in RFC 2806
tIMSPublicIdentity	IMSPublicIdentity	(union)	Union of tSIP_URL and tTEL_URL
tServiceInfo	ServiceInfo	string	
tString	RequestURL, Method, Header, Content, Line	string	
tBool	ConditionTypeCNF, ConditionNegated	enumerated	Possible values: 0 (FALSE)

			1 (TRUE)
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Table D.2: XML schema for Sh interface: complex data types

Data type	Tag	Compound of		
		Tag	Type	Cardinality
tSh-Data	Sh-Data	PublicIdentifiers	tPublicIdentity	0 to 1
		RepositoryData	tTransparentData	0 to 1
		Sh-IMS-Data	tShIMSData	0 to 1
		LocationInformation	tLocationInformation	0 to 1
tTransparentData	RepositoryData	ServiceIndication	string	1
		ServiceData	string	1
tShIMSData	Sh-IMS-Data	SCSCFName	tSIP_URL	0 to 1
		InitialFilterCriteria	tInitialFilterCriteria	0 to 10
		IMSUserState	tIMSUserState	0 to 1
tCSLocationInformation	CSLocationInformation	LocationNumber	tLocationNumber	0 to 1
		CellGlobalId	tGlobalCellId	0 to 1
		ServiceAreaId	tServiceAreaId	0 to 1
		LocationAreaId	tLocationAreaId	0 to 1
		GeographicalInformation	tGeographicalInformation	0 to 1
		GeodeticInformation	tGeodeticInformation	0 to 1
		VLRNumber	tISDNAddress	0 to 1
		MSCNumber	tISDNAddress	0 to 1
		CurrentLocationRetrieved	tBool	0 to 1
		AgeOfLocationInformation	tAgeOfLocationInformation	0 to 1

tPSLocationInformation	PSLocationInformation	CellGlobalId	tGlobalCellId	0 to 1	
		ServiceAreaId	tServiceAreaId	0 to 1	
		LocationAreaId	tLocationAreaId	0 to 1	
		RoutingAreaId	tRoutingAreaId	0 to 1	
		GeographicalInformation	tGeographicalInformation	0 to 1	
		GeodeticInformation	tGeodeticInformation	0 to 1	
		SGSNNumber	tISDNAddress	0 to 1	
		CurrentLocationRetrieved	tBool	0 to 1	
		AgeOfLocationInformation	tAgeOfLocationInformation	0 to 1	
tPublicIdentity	PublicIdentity	IMSPublicIdentity	tIMSPublicIdentity	0 to 20	
		MSISDN	tMSISDN	0 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	
		Cr	<u>RequestURI</u>	<u>tString</u>	<u>1</u>
			Method	tString	1
			SIPHeader	tHeader	1

		SessionCase	tDirectionOfRequest	1
		SessionDescription	tSessionDescription	1
tHeader	SIPHeader	Header	tString	1
		Content	tString	0 to 1
tSessionDescription	SessionDescription	Line	tString	1
		Content	tString	0 to 1
tApplicationServer	ApplicationServer	ServerName	tSIP_URL	1
		DefaultHandling	tDefaultHandling	0 to 1
		ServiceInfo	tServiceInfo	0 to 1

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

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

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:simpleType name="tSIP_URL" final="list restriction">
    <xs:restriction base="xs:anyURI"/>
  </xs:simpleType>
  <xs:simpleType name="tTEL_URL" final="list restriction">
    <xs:restriction base="xs:anyURI"/>
  </xs:simpleType>
  <xs:simpleType name="tIMSPublicIdentity" final="#all">
    <xs:union memberTypes="tSIP_URL tTEL_URL"/>
  </xs:simpleType>
  <xs:simpleType name="tServiceInfo" final="list restriction">
    <xs:restriction base="xs:string">
      <xs:minLength value="0"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tString" final="list restriction">
    <xs:restriction base="xs:string">
      <xs:minLength value="0"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tMSISDN" final="list restriction">
    <xs:restriction base="xs:string">
      <xs:minLength value="0"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tIMSUserState" final="list restriction">
    <xs:restriction base="xs:unsignedByte">
      <xs:maxInclusive value="3"/>
      <xs:enumeration value="0">

```

```

    <xs:annotation>
      <xs:documentation>
        <label xml:lang="en">NOT_REGISTERED</label>
        <definition xml:lang="en">Not registered</definition>
      </xs:documentation>
    </xs:annotation>
  </xs:enumeration>
  <xs:enumeration value="1">
    <xs:annotation>
      <xs:documentation>
        <label xml:lang="en">REGISTERED</label>
        <definition xml:lang="en">Registered</definition>
      </xs:documentation>
    </xs:annotation>
  </xs:enumeration>
  <xs:enumeration value="2">
    <xs:annotation>
      <xs:documentation>
        <label xml:lang="en">REGISTERED_UNREG_SERVICES</label>
        <definition xml:lang="en">Registered, with services for
unregistered</definition>
      </xs:documentation>
    </xs:annotation>
  </xs:enumeration>
  <xs:enumeration value="3">
    <xs:annotation>
      <xs:documentation>
        <label xml:lang="en">AUTHENTICATION_PENDING </label>
        <definition xml:lang="en">Pending of authentication</definition>
      </xs:documentation>
    </xs:annotation>
  </xs:enumeration>
</xs:restriction>
</xs:simpleType>
<xs:simpleType name="tCSUserState" final="list restriction">
  <xs:restriction base="xs:unsignedByte">
    <xs:maxInclusive value="3"/>
    <xs:enumeration value="0">
      <xs:annotation>
        <xs:documentation>
          <label xml:lang="en">CAMELBusy</label>
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="1">
      <xs:annotation>
        <xs:documentation>
          <label xml:lang="en">NetworkDeterminedNotReachable</label>
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="2">
      <xs:annotation>
        <xs:documentation>
          <label xml:lang="en">AssumedIdle</label>
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
    <xs:enumeration value="3">
      <xs:annotation>
        <xs:documentation>
          <label xml:lang="en">NotProvidedFromVLR</label>
        </xs:documentation>
      </xs:annotation>
    </xs:enumeration>
  </xs:restriction>

```

```

        </xs:annotation>
    </xs:enumeration>
</xs:restriction>
</xs:simpleType>
<xs:simpleType name="tPSUserState" final="list restriction">
    <xs:restriction base="xs:unsignedByte">
        <xs:maxInclusive value="5"/>
        <xs:enumeration value="0">
            <xs:annotation>
                <xs:documentation>
                    <label xml:lang="en">Detached </label>
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="1">
            <xs:annotation>
                <xs:documentation>
                    <label xml:lang="en">AttachedNotReachableForPaging</label>
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="2">
            <xs:annotation>
                <xs:documentation>
                    <label xml:lang="en">AttachedReachableForPaging</label>
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="3">
            <xs:annotation>
                <xs:documentation>
                    <label xml:lang="en">ConnectedNotReachableForPaging</label>
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="4">
            <xs:annotation>
                <xs:documentation>
                    <label xml:lang="en">ConnectedReachableForPaging</label>
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
        <xs:enumeration value="5">
            <xs:annotation>
                <xs:documentation>
                    <label xml:lang="en">notProvidedFromSGSN</label>
                </xs:documentation>
            </xs:annotation>
        </xs:enumeration>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="tLocationNumber" final="list restriction">
    <xs:restriction base="xs:string">
        <xs:minLength value="4"/>
        <xs:maxLength value="16"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="tCellGlobalId" final="list restriction">
    <xs:restriction base="xs:string">
        <xs:length value="12"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="tServiceAreaId" final="list restriction">

```

```

    <xs:restriction base="xs:string">
      <xs:length value="12"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tLocationAreaId" final="list restriction">
    <xs:restriction base="xs:string">
      <xs:length value="8"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tRoutingAreaId" final="list restriction">
    <xs:restriction base="xs:string">
      <xs:length value="8"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tGeographicalInformation" final="list restriction">
    <xs:restriction base="xs:string">
      <xs:length value="12"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tGeodeticInformation" final="list restriction">
    <xs:restriction base="xs:string">
      <xs:length value="16"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tAddressString" final="list restriction">
    <xs:restriction base="xs:string">
      <xs:minLength value="4"/>
      <xs:maxLength value="28"/>
    </xs:restriction>
  </xs:simpleType>
  <xs:simpleType name="tSelectedLSAIdentity" final="list restriction">
    <xs:restriction base="xs:string">
      <xs:length value="4"/>
    </xs:restriction>
  </xs:simpleType>
  <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="tID" final="list restriction">
    <xs:restriction base="xs:int">
      <xs:minInclusive value="0"/>
    </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="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="tAgeOfLocationInformation" final="list restriction">
  <xs:restriction base="xs:int">
    <xs:minInclusive value="0"/>
    <xs:maxInclusive value="32767"/>
  </xs:restriction>
</xs:simpleType>
<xs:simpleType name="tBool">
  <xs:restriction base="xs:boolean">
  </xs:restriction>
</xs:simpleType>
<xs:complexType name="tSh-Data">
  <xs:sequence>
    <xs:element name="PublicIdentifiers" type="tPublicIdentity"
minOccurs="0"/>
    <xs:element name="RepositoryData" type="tTransparentData" minOccurs="0"/>
    <xs:element name="Sh-IMS-Data" type="tShIMSData" minOccurs="0"/>
    <xs:element name="CSLocationInformation" type="tCSLocationInformation"
minOccurs="0"/>
    <xs:element name="PSLocationInformation" type="tPSLocationInformation"
minOccurs="0"/>
    <xs:element name="CSUserState" type="tCSUserState" minOccurs="0"/>
    <xs:element name="PSUserState" type="tPSUserState" minOccurs="0"/>
    <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
  </xs:sequence>

```



```

</xs:complexType>
<xs:complexType name="tTransparentData">
  <xs:sequence>
    <xs:element name="ServiceIndication" type="tString"/>
    <xs:element name="ServiceData">
      <xs:complexType>
        <xs:sequence>
          <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
        </xs:sequence>
      </xs:complexType>
    </xs:element>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="tShIMSData">
  <xs:sequence>
    <xs:element name="SCSCFName" type="tSIP_URL" minOccurs="0"/>
    <xs:element name="InitialFilterCriteria" type="tInitialFilterCriteria"
minOccurs="0" maxOccurs="unbounded"/>
    <xs:element name="IMSUserState" type="tIMSUserState" minOccurs="0"/>
    <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="tCSLocationInformation">
  <xs:sequence>
    <xs:element name="LocationNumber" type="tLocationNumber" minOccurs="0"/>
    <xs:choice>
      <xs:element name="CellGlobalId" type="tCellGlobalId" minOccurs="0"/>
      <xs:element name="ServiceAreaId" type="tServiceAreaId" minOccurs="0"/>
      <xs:element name="LocationAreaId" type="tLocationAreaId"
minOccurs="0"/>
    </xs:choice>
    <xs:element name="GeographicalInformation"
type="tGeographicalInformation" minOccurs="0"/>
    <xs:element name="GeodeticInformation" type="tGeodeticInformation"
minOccurs="0"/>
    <xs:element name="VLRNumber" type="tISDNAddress" minOccurs="0"/>
    <xs:element name="MSCNumber" type="tISDNAddress" minOccurs="0"/>
    <xs:element name="CurrentLocationRetrieved" type="tBool" minOccurs="0"/>
    <xs:element name="AgeOfLocationInformation"
type="tAgeOfLocationInformation" minOccurs="0"/>
    <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="tPSLocationInformation">
  <xs:sequence>
    <xs:choice>
      <xs:element name="CellGlobalId" type="tCellGlobalId" minOccurs="0"/>
      <xs:element name="ServiceAreaId" type="tServiceAreaId" minOccurs="0"/>
      <xs:element name="LocationAreaId" type="tLocationAreaId"
minOccurs="0"/>
    </xs:choice>
    <xs:element name="RoutingAreaId" type="tRoutingAreaId" minOccurs="0"/>
    <xs:element name="GeographicalInformation"
type="tGeographicalInformation" minOccurs="0"/>
    <xs:element name="GeodeticInformation" type="tGeodeticInformation"
minOccurs="0"/>
    <xs:element name="SGSNNumber" type="tISDNAddress" minOccurs="0"/>
    <xs:element name="CurrentLocationRetrieved" type="tBool" minOccurs="0"/>
    <xs:element name="AgeOfLocationInformation"
type="tAgeOfLocationInformation" minOccurs="0"/>
  </xs:sequence>
</xs:complexType>

```

```

        <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tISDNAddress">
    <xs:sequence>
        <xs:element name="Address" type="tAddressString" maxOccurs="9" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tPublicIdentity">
    <xs:sequence>
        <xs:element name="IMSPublicIdentity" type="tIMSPublicIdentity"
minOccurs="0" maxOccurs="unbounded" />
        <xs:element name="MSISDN" type="tMSISDN" minOccurs="0"
maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tInitialFilterCriteria">
    <xs:sequence>
        <xs:element name="Priority" type="tPriority" />
        <xs:element name="TriggerPoint" type="tTrigger" minOccurs="0" />
        <xs:element name="ApplicationServer" type="tApplicationServer" />
        <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tTrigger">
    <xs:sequence>
        <xs:element name="SPI" type="tSiPoInt" minOccurs="0"
maxOccurs="unbounded" />
        <xs:element name="ConditionTypeCNF" type="tBool" />
        <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tSiPoInt">
    <xs:sequence>
        <xs:element name="ConditionNegated" type="tBool" minOccurs="0" />
        <xs:element name="Group" type="tGroupID" maxOccurs="unbounded" />
        <xs:choice>
            <xs:element name="RequestURI" type="tString" />
            <xs:element name="Method" type="tString" />
            <xs:element name="SIPHeader" type="tHeader" />
            <xs:element name="SessionCase" type="tDirectionOfRequest" />
            <xs:element name="SessionDescription" type="tSessionDescription" />
        </xs:choice>
        <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tSessionDescription">
    <xs:sequence>
        <xs:element name="Line" type="tString" />
        <xs:element name="Content" type="tString" minOccurs="0" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tHeader">
    <xs:sequence>
        <xs:element name="Header" type="tString" />
        <xs:element name="Content" type="tString" minOccurs="0" />
    </xs:sequence>
</xs:complexType>
<xs:complexType name="tApplicationServer">

```

```
<xs:sequence>
  <xs:element name="ServerName" type="tSIP_URL"/>
  <xs:element name="DefaultHandling" type="tDefaultHandling"
minOccurs="0"/>
  <xs:element name="ServiceInfo" type="tServiceInfo" minOccurs="0"/>
  <xs:any namespace="##Other" processContents="lax" minOccurs="0"
maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>
<xs:element name="Sh-Data" type="tSh-Data"/>
</xs:schema>
```

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