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3GPP Sv interface (MME to MSC, and SGSN to MSC)
for SRVCC
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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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1 Scope

The present document describes the Sv interface between the Mobility Management Entity (MME) or Serving GPRS Support Node (SGSN) and 3GPP MSC server enhanced for SRVCC. Sv interface is used to support Inter-RAT handover from VoIP/IMS over EPS to CS domain over 3GPP UTRAN/GERAN access or from UTRAN (HSPA) to 3GPP UTRAN/GERAN access.

If there is no specific indication, the term "MSC server" denotes 3GPP MSC server enhanced for SRVCC as defined in 3GPP TS 23.216 [2].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TR 23.216: "Single Radio Voice Call Continuity (SRVCC)".

[3] 3GPP TS 29.274: "Evolved GPRS Tunnelling Protocol for Control Plane (GTPv2-C)".

[4] 3GPP TS 23.003: "Numbering, addressing and identification".

[5] 3GPP TS 23.007: "Restoration Procedures".

[6] 3GPP TS 33.401: "3GPP System Architecture Evolution (SAE): Security architecture".

[7] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[8] 3GPP TS 48.008: "Mobile Switching Centre – Base Station System (MSC - BSS) interface; Layer 3 specification".

[9] 3GPP TS 25.413: "UTRAN Iu interface Radio Access Network Application Part (RANAP) signalling".

[10] 3GPP TS 33.102: "3G Security; Security architecture".

[11] 3GPP TS 29.002: "Mobile Application Part (MAP) specification; Stage 3".

[12] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet".

[13] 3GPP TS 23.237: "IP Multimedia Subsystem (IMS) Service Continuity: Stage 2".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

3.2 Symbols

For the purposes of the present document, the following symbols apply:

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

STN-SR	Session Transfer Number for SRVCC: see 3GPP TS 23.003 [4].
MME/SGSN	MME or SGSN.
C-MSISDN	Correlation MSISDN.

4 General Description

This document describes the Sv interface related procedures, message parameters and protocol specifications. The Sv messages are based on GTP. The message format, IE coding, and protocol error handling for Sv is per GTP as specified in 3GPP TS 29.274 [3].

The general rules for IP address and UDP port number handling for the GTP messages on the Sv interface is per 3GPP TS 29.274 [3].

5 Sv Messages and Information Elements

5.1 Introduction

The Sv application defines a set of messages between the MME/SGSN and MSC Server to provide SRVCC as defined in 3GPP TS 23.216 [2]. The Sv message header is defined in 3GPP TS 29.274 [3]. The messages to be used and the information elements are described in the following sections.

5.2 Sv Messages

5.2.1 General

Sv Message Type value is defined in 3GPP TS 29.274 [3]. The message format is coded as per GTP in 3GPP TS 29.274 [3].

Table 5.2.1: Message types for Sv interface

Message Type value (Decimal)	Message	Reference	Initial	Triggered
0	Reserved	3GPP TS 29.274 [3]		
1	Echo Request	3GPP TS 29.274 [3]	X	
2	Echo Response	3GPP TS 29.274 [3]		X
3	Version Not Supported Indication	3GPP TS 29.274 [3]		X
4-24	Reserved for S101 interface	3GPP TS 29.274 [3]		
25	SRVCC PS to CS Request	5.2.2	X	
26	SRVCC PS to CS Response	5.2.3		X
27	SRVCC PS to CS Complete Notification	5.2.4	X	
28	SRVCC PS to CS Complete Acknowledge	5.2.5		X
29	SRVCC PS to CS Cancel Notification	5.2.6	X	
30	SRVCC PS to CS Cancel Acknowledge	5.2.7		X
31	For future Sv interface use	-		
32-255	Reserved for GTPv2	3GPP TS 29.274 [3]		

The GTPv2-C messages shall be sent per UE on the Sv interface.

There shall be one pair of TEID-C per UE on the Sv interface. The same tunnel shall be shared for the control messages related to the same UE operation.

The TEID field in the SRVCC PS to CS Request message header shall be set to "0" because this is the first message the the MME/SGSN sends to the MSC server to establish the tunnel for a UE.

The TEID field in the SRVCC PS to CS Cancel Notification message header shall be set to "0" if the message is sent before reception of the acceptance response to the SRVCC PS to CS Request. If the MME/SGSN sends the SRVCC PS to CS Cancel Notification message after the acceptance response to the SRVCC PS to CS Request, the TEID field of the SRVCC PS to CS Cancel Notification message may be set to the MSC Server"s TEID value received in the SRVCC PS to CS Response message. Therefore the MSC Server shall be able to accept the SRVCC PS to CS Cancel Notification messages with "0" or non-zero TEID in the message header.

5.2.2 SRVCC PS to CS Request

A SRVCC PS to CS Request message shall be sent across Sv interface from the MME/SGSN to the target MSC server as part of the MME/SGSN SRVCC procedure in 3GPP TS 23.216 [2].

Table 5.2.2 specifies the presence requirements and conditions of the IEs in the message.

Table 5.2.2: Information Elements in a SRVCC PS to CS Request

Information elements	P	Condition / Comment	IE Type	Ins.
IMSI	C	This IE shall be included in the message except for the cases: • The UE is emergency attached and it is UICCless • The UE is emergency attached and the IMSI is not authenticated	IMSI	0
ME Identity (MEI)	C	This IE shall be included in the message for the following cases: • The UE is emergency attached and it is UICCless • The UE is emergency attached and the IMSI is not authenticated	MEI	0
	CO	This IE shall be included for all SRVCC calls if available in the MME or SGSN (NOTE 2).		
Sv Flags	C	The following flags are applicable: • EmInd: this flag shall be sent if this session is for an emergency call. • ICS: this flag shall be sent to request IMS Centralized Service support.	Sv Flags	0
MME/SGSN Sv Address for Control Plane	M	This IE specifies the address for control plane Initial message which is chosen by the source MME/SGSN. The target MSC Server shall send subsequent control plane Initial messages related to the GTP tunnel for this UE towards this address.	IP-Address	0
MME/SGSN Sv TEID for Control Plane	M	This IE specifies the tunnel for control plane message which is chosen by the source MME/SGSN. The target MSC Server shall include this TEID in the GTP header of all control plane messages related to the GTP tunnel for this UE.	TEID-C	0
C-MSISDN	C	The MME/SGSN shall include C-MSISDN IE in the message except for the cases: • The UE is emergency attached and it is UICCless • The UE is emergency attached and the IMSI is not authenticated The C-MSISDN is defined in 3GPP TS 23.003 [4].	MSISDN	0
STN-SR	C	The MME/SGSN shall include STN-SR IE if this session is not for an emergency call.	STN-SR	0
MM Context for E-UTRAN SRVCC	C	The MME shall include mobile station classmarks, supported codecs, and CS Security key in MM Context for SRVCC for E-UTRAN SRVCC. The derivation of the CS security keys shall follow the procedures defined 3GPP TS 33.401[7].	MM Context for E-UTRAN SRVCC	0
MM Context for UTRAN SRVCC	C	The SGSN shall include mobile station classmarks, supported codecs, and CS Security key in MM Context for SRVCC for UTRAN (HSPA) SRVCC. The derivation of the CS security keys shall follow the procedures defined 3GPP TS 33.102[10].	MM Context for UTRAN SRVCC	0
Source to Target Transparent Container	M	The MME or SGSN shall include Source to Target Transparent Container IE	Source to Target Transparant Container IE	0
Target RNC ID	C	This IE shall be used to identify the target access for SRVCC handover to UTRAN (NOTE 1).	Target RNC ID	0
Target Cell ID	C	This IE shall be used to identify the target access for SRVCC handover to GERAN (NOTE 1).	Target Global Cell ID	0
Source SAI	CO	The SGSN shall include this IE during a SRVCC Handover from UTRAN to GERAN and shall set it as per the SAI of the Source ID IE received from the source RNC (see 3GPP TS 25.413 [9]). See NOTE 3.	Service Area Identifier	0
Private Extension	O	None	Private Extension	VS
NOTE1: Based upon the SRVCC Handover procedure, either Target RNC ID or Target Cell ID shall be present in this message NOTE2: An MME or SGSN supporting the Sv interface should attempt to get the ME Identity for all SRVCC				

	calls for interception, charging or Automatic Device Detection in the MSC.
NOTE 3:	The Source SAI is sent in BSSMAP Handover Request during a SRVCC Handover from UTRAN to GERAN. A default SAI configured in the MSC Server enhanced for SRVCC is sent in BSSMAP Handover Request during a SRVCC Handover from E-UTRAN to GERAN. The default SAI for E-UTRAN should be different from the SAIs used in UTRAN.

5.2.3 SRVCC PS to CS Response

A SRVCC PS to CS Response message shall be sent across Sv interface as a response to SRVCC PS to CS Request by the MSC server during SRVCC procedure in 3GPP TS 23.216 [2].

Table 5.2.3 specifies the presence requirements and conditions of the IEs in the message.

Cause IE indicates if the SRVCC PS to CS request has been accepted, or not. The request has not been accepted by the target MSC server if the Cause IE value differs from "Request accepted".

Table 5.2.3: Information Elements in a SRVCC PS to CS Response

Information elements	P	Condition / Comment	IE Type	Ins.
Cause	M		Cause	0
SRVCC rejected Cause	CO	This IE shall be sent if Cause value differs from "Request accepted". MSC Server shall include this information element to indicate the reason for rejecting SRVCC PS to CS request	SRVCC Cause	0
MSC Server Sv Address for Control Plane	O	If the Cause IE contains the value" Request accepted", the target MSC server may include MSC server Sv Address for Control Plane IE in SRVCC PS to CS Response message if target MSC Server decides to use different IP address for the subsequent communication. The source MME/SGSN shall store this MSC server address and use it when sending subsequent control plane messages to this GTP-C tunnel.	IP Address	0
MSC Server Sv TEID for Control Plane	C	The target MSC server shall include MSC server Sv Tunnel Endpoint Identifier for Control Plane IE in SRVCC PS to CS Response message if the Cause IE contains the value "Request accepted". The source MME/SGSN shall include this TEID-C in the GTP-C header of all subsequent uplink control plane messages from the source MME/SGSN to the target MSC servers.	TEID-C	0
Target to Source Transparent Container	C	If the Cause IE contains the value "Request accepted ", this IE shall be included and shall carry the Target to Source Transparent Container to be sent within the Handover command or the Relocation Command towards the source access network.	Target to Source Transparant Container IE	0
Private Extension	O	None	Private Extension	VS

5.2.4 SRVCC PS to CS Complete Notification

A SRVCC PS to CS Complete Notification message shall be sent across Sv interface to the source MME/SGSN during SRVCC procedure as specified in 3GPP TS 23.216 [2]:

- to indicate the SRVCC handover with CS Domain has been successfully finished;
- or to indicate the SRVCC handover with CS Domain has finished (i.e. HO Complete / Relocation Complete message has been received from the target RAN) but the IMS Session Transfer procedure completion in 3GPP TS 23.237 [13] has failed by including the appropriate SRVCC post failure Cause value.

Table 5.2.4 specifies the presence requirements and conditions of the IEs in the message.

Table 5.2.4: Information Elements in a SRVCC PS to CS Complete Notification

Information elements	P	Condition / Comment	IE Type	Ins.
IMSI	C	This IE shall be included in the message except for the cases: • The UE is emergency attached and it is UICCless • The UE is emergency attached and the IMSI is not authenticated	IMSI	0
SRVCC post failure Cause	CO	This IE shall be sent if a call is to be released locally in the MSC Server due to IMS session leg establishment failure. The MSC Server shall include this IE to indicate the nature of the failure (i.e, permanent or temporary)	SRVCC Cause	0
Private Extension	O	None	Private Extension	VS

5.2.5 SRVCC PS to CS Complete Acknowledge

A SRVCC PS to CS Complete Acknowledge message shall be sent across Sv interface as a response to SRVCC PS to CS Complete Notification during SRVCC handover with CS Domain in 3GPP TS 23.216 [2].

Table 5.2.5 specifies the presence requirements and conditions of the IEs in the message.

Table 5.2.5: Information Elements in a SRVCC PS to CS Complete Acknowledge

Information elements	P	Condition / Comment	IE Type	Ins.
Cause	M	None	Cause	0
Private Extension	O	None	Private Extension	VS

5.2.6 SRVCC PS to CS Cancel Notification

A SRVCC PS to CS Cancel Notification message shall be sent across Sv interface from the MME/SGSN to the target MSC server to request the cancellation of an ongoing SRVCC handover.

Table 5.2.6 specifies the presence requirements and conditions of the IEs in the message.

Table 5.2.6: Information Elements in a SRVCC PS to CS Cancel Notification

Information elements	P	Condition / Comment	IE Type	Ins.
IMSI	C	This IE shall be included in the message except for the cases: • The UE is emergency attached and it is UICCless • The UE is emergency attached and the IMSI is not authenticated	IMSI	0
Cancel Cause	M	MME/SGSN indicates the reason for Handover cancellation	SRVCC Cause	0
ME Identity (MEI)	C	This IE shall be included in the message for the following cases: • The UE is emergency attached and it is UICCless • The UE is emergency attached and the IMSI is not authenticated	MEI	0
Private Extension	O	None	Private Extension	VS

5.2.7 SRVCC PS to CS Cancel Acknowledge

A SRVCC PS to CS Cancel Acknowledge message shall be sent across Sv interface as a response to SRVCC PS to CS Cancel Notification.

Table 5.2.7 specifies the presence requirements and conditions of the IEs in the message.

Table 5.2.7: Information Elements in a SRVCC PS to CS Cancel Acknowledge

Information elements	P	Condition / Comment	IE Type	Ins.
Cause	M	None	Cause	0
Sv Flags	C	The following flags are applicable: • STI: this flag shall be sent if the MSC Server has started the IMS session transfer procedure.	Sv Flags	0
Private Extension	O	None	Private Extension	VS

5.3 Path Management Messages

5.3.1 Introduction

The following GTP-C v2 messages support path management for the Sv interface:

- Echo Request
- Echo Response
- Version Not Supported

These messages are defined for GTP-Cv2 and the handling and definition shall also be as defined in GTP-Cv2, see 3GPP TS 29.274 [3].

5.3.2 Echo Request message

3GPP TS 29.274 [6] specifies the information elements included in the Echo Request message.

5.3.3 Echo Response message

3GPP TS 29.274 [3] specifies the information elements included in the Echo Response message.

5.3.4 Version Not Supported message

3GPP TS 29.274 [3] specifies the detailed handling and information elements included in the Version Not Supported message.

5.4 Reliable Delivery of Signalling Messages

This is performed as according to GTPv2 in 3GPP TS 29.274 [3].

5.5 Error Handling

This is performed as according to GTPv2 in 3GPP TS 29.274 [3].

5.6 Restoration and Recovery

This is performed as according to GTPv2 in 3GPP TS 23.007 [5].

6 Sv Information Elements

6.1 General

IE type value used in Sv Message is defined in TS 29.274 [3]. The IE format is coded as per GTP in TS 29.274 [3].

Table 6.1 shows the IEs used for SRVCC. Within information elements, certain fields may be described as spare. These bits shall be transmitted with the value set to 0. To allow for future features, the receiver shall not evaluate these bits.

Table 6.1-1: Information Elements for SRVCC

IE Type value (Decimal)	Information elements	Comment / Reference	Number of Fixed Octets
0	Reserved	3GPP TS 29.274 [3]	3GPP TS 29.274 [3]
1	International Mobile Subscriber Identity (IMSI)	3GPP TS 29.274 [3]	3GPP TS 29.274 [3]
2	Cause	3GPP TS 29.274 [3]	3GPP TS 29.274 [3]
3	Recovery (Restart Counter)	3GPP TS 29.274 [3]	3GPP TS 29.274 [3]
4-50	Reserved for S101 interface	3GPP TS 29.274 [3]	3GPP TS 29.274 [3]
51	STN-SR	Variable Length / 6.2	Not Applicable
52	Source to Target Transparent Container	Variable Length / 6.3	Not Applicable
53	Target to Source Transparent Container	Variable Length / 6.4	Not Applicable
54	MM Context for E-UTRAN SRVCC	Variable Length / 6.5	Not Applicable
55	MM Context for UTRAN SRVCC	Variable Length / 6.6	Not Applicable
56	SRVCC Cause	Fixed Length / 6.7	1
57	Target RNC ID	Variable Length / 6.8	Not Applicable
58	Target Global Cell ID	Variable Length / 6.9	Not Applicable
59	TEID-C	Extendable / 6.10	4
60	Sv Flags	Extendable / 6.11	1
61	Service Area Identifier	Extendable / 6.12	7
62-70	For future Sv interface use	-	
71-73	Reserved for GTPv2	3GPP TS 29.274 [3]	3GPP TS 29.274 [3]
74	IP Address	3GPP TS 29.274 [3]	3GPP TS 29.274 [3]
75	Mobile Equipment Identity (MEI)	3GPP TS 29.274 [3]	3GPP TS 29.274 [3]
76	MSISDN	3GPP TS 29.274 [3]	3GPP TS 29.274 [3]
77-254	Reserved for GTPv2	3GPP TS 29.274 [3]	3GPP TS 29.274 [3]
255	Private Extension	3GPP TS 29.274 [3]	3GPP TS 29.274 [3]
NOTE: The size of the TLI (Type, Length and Instance) fields, i.e "4" octets, has been subtracted from the number of the fixed octets of the "Fixed Length" and "Extendable" IEs.			

6.2 STN-SR

STN-SR is defined in 3GPP TS 23.003 [4]. STN-SR is transferred via GTP tunnels. The sending entity copies the value part of the STN-SR into the Value field of the STN-SR IE. The STN-SR IE is coded as depicted in Figure 6.2-1. Octet 5 contains the Nature of Address and Numbering Plan Indicator (NANPI) of the "AddressString" ASN.1 type (see 3GPP TS 29.002 [11]). Octets 6 to (n+4) contain the actual STN-SR (digits of an address encoded as a TBCD-STRING as in the "AddressString" ASN.1 type). For an odd number of STN-SR digits, bits 8 to 5 of the last octet are encoded with the filler "1111".

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 51 (decimal)							
2 to 3	Length = n							
4	Spare				Instance			
5	NANPI							
6	Digit 2				Digit 1			
…								
n+4	Digit m				Digit (m-1)			

Figure 6.2-1: STN-SR

6.3 Source to Target Transparent Container

The Source to Target Transparent Container contains information that shall be transferred transparently by CN entities from the source RAN to the target RAN.

When the target network is GERAN, the Transparent container field contains the value part of the *Old BSS to New BSS Information* IE defined in 3GPP TS 48.008 [8], i.e. octets 3 to n, excluding octet 1 (Element ID) and octet 2 (Length).

When the target network is UTRAN, this container carries the *Source RNC to Target RNC Transparent Container* IE defined in 3GPP TS 25.413 [9]. The Transparent container field contains a *transparent copy* of the corresponding ASN.1/PER IE (see subclauses 8.2.2 and 8.48 in 3GPP TS 29.274 [3].

The receiver of this Information Element shall ignore the length of the transparent container encoded in octet 5 and shall derive the actual length of the container from the length encoded in octets 2 to 3 minus 1.

For backward compatibility, the sender of this Information Element shall set the octet 5 to the actual length of the transparent container if the size of the container is smaller or equal to 255 octets, and to the value "255" otherwise.

	Bits							
Octets	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
1	Type = 52 (decimal)							
2 to 3	Length = n (decimal)							
4	Spare				Instance			
5	Length of the Transparent container							
6 to (n+4)	Transparent container							

Figure 6.3-1: Source to Target Transparent Container

6.4 Target to Source Transparent Container

The Target to Source Transparent Container contains information that shall be transferred transparently by CN entities from the target RAN to the source RAN.

When the target network is GERAN, the Transparent container field contains the value part of the *Layer 3 Information* IE defined in 3GPP TS 48.008 [8], i.e., octets 3 to n, excluding octet 1 (Element ID) and octet 2 (Length).

When the target network is UTRAN, this container carries the *Target RNC to Source RNC Transparent Container* IE defined in 3GPP TS 25.413 [9]. The Transparent container field contains a *transparent copy* of the corresponding ASN.1/PER IE (see subclauses 8.2.2 and 8.48 in 3GPP TS 29.274 [3]).

The receiver of this Information Element shall ignore the length of the transparent container encoded in octet 5 and shall derive the actual length of the container from the length encoded in octets 2 to 3 minus 1.

For backward compatibility, the sender of this Information Element shall set the octet 5 to the actual length of the transparent container if the size of the container is smaller or equal to 255 octets, and to the value "255" otherwise.

	Bits							
Octets	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**
1	Type = 53 (decimal)							
2 to 3	Length = n							
4	Spare				Instance			
5	Length of the Transparent container							
6 to (n+4)	Transparent container							

Figure 6.4-1: Target to Source Transparent Container

6.5 MM Context for E-UTRAN SRVCC

The MM Context information element contains mobile station classmarks, supported codec list, and the security parameters that are necessary for the MSC server to setup the ciphering connection (and integrity protection for 3G) with the target access for SRVCC. CS ciphering keys parameters: CK_{SRVCC}, $IK_{SRVCC,}$ and eKSI for E-UTRAN SRVCC are defined in 3GPP TS 33.401 [6].

Mobile Station Classmark 2, Mobile Station Classmark 3, and Supported Codec List information Elements indicate the supported encryption algorithms for GERAN access and CS supported codecs. The coding of Mobile Station Classmarks and Supported Codec List fields include the IE value part as it is specified in 3GPP TS 24.008 [7].

eKSI shall be coded as bits 1 to 3 of the NAS Key Set Identifier IE in TS 24.301 [12].For an emergency call without an authenticated IMSI, the source MME shall set the key sequence value of the eKSI to the value '111' and CK_{SRVCC} and IK_{SRVCC} to all 0"s in binary.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 54 (decimal)							
2 to 3	Length = n							
4	Spare				Instance			
5	Spare				eKSI			
6 to 21	CK_{SRVCC}							
22 to 37	IK_{SRVCC}							
38	Length of the Mobile Station Classmark 2							
39 to a	Mobile Station Classmark 2							
b	Length of the Mobile Station Classmark 3							
(b+1) to c	Mobile Station Classmark 3							
d	Length of the Supported Codec List							
(d+1) to (n+4)	Supported Codec List							

Figure 6.5-1: MM Context for E-UTRAN SRVCC

6.6 MM Context for UTRAN SRVCC

The MM Context information element contains mobile station classmarks, supported codec list, and the security parameters that are necessary for the MSC server to setup the ciphering connection (and integrity protection for 3G) with the target access for SRVCC. The usage of $CK"_{CS}$, $IK"_{CS}$, $KSI"_{CS}$, Kc", $CKSN"_{CS}$ are defined in 3GPP TS 33.102 [10].

Mobile Station Classmark 2, Mobile Station Classmark 3, and Supported Codec List information Elements indicate the supported encryption algorithms for GERAN access and CS supported codecs. The coding of Mobile Station Classmarks and Supported Codec List fields include the IE value part as it is specified in 3GPP TS 24.008 [7].

$CKSN'_{cs}$ shall be coded as bits 1 to 8 of the CKSN IE in TS 24.008 [7]. The KSI'_{cs} shall be coded as bits 1 to 4 of the CKSN IE in TS 24.008 [7].

The source SGSN will send to the MSC Server enhanced for SRVCC either the $KSI'_{cs}/CK'_{cs}/IK'_{cs}$ for an UMTS subscriber or the $CKSN'_{cs}$/Kc' for a GSM subscriber (see 3GPP TS 33.102 [10]):

- when transferring $KSI'_{cs}/CK'_{cs}/IK'_{cs}$, the source SGSN shall set the key sequence value of the $CKSN'_{cs}$ to the value '111' and Kc" to all 0"s in binary;

- when transferring $CKSN'_{cs}$/Kc', the source SGSN shall set the key sequence value of the $KSI"_{cs}$ to the value '111', and $CK"_{cs}$ and $IK"_{cs}$ to all 0"s in binary.

For an emergency call without an authenticated IMSI, the source SGSN shall set the key sequence value of the $CKSN'_{cs}$ and KSI'_{cs} to all 1"s, and Kc", $CK"_{cs}$ and $IK"_{cs}$ to all 0"s in binary.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 55 (decimal)							
2 to 3	Length = n							
4	Spare				Instance			
5	Spare				KSI"$_{CS}$			
6 to 21	CK"$_{CS}$							
22 to 37	IK"$_{CS}$							
38 to 45	Kc"							
46	CKSN"$_{CS}$							
47	Length of the Mobile Station Classmark 2							
48 to a	Mobile Station Classmark 2							
b	Length of the Mobile Station Classmark 3							
(b+1) to c	Mobile Station Classmark 3							
d	Length of the Supported Codec List							
(d+1) to (n+4)	Supported Codec List							

Figure 6.6-1: MM Context for UTRAN SRVCC

6.7 SRVCC Cause

SRVCC Cause IE is coded as this is depicted in Figure 6.7-1.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 56 (decimal)							
2 to 3	Length = 1							
4	Spare				Instance			
5	SRVCC Cause value							

Figure 6.7-1: SRVCC Cause

The SRVCC Cause value indicates the reason for cancellation or the rejection of the SRVCC PS to CS Request.

Table 6.7-1: SRVCC Cause values

Cause value (decimal)	Meaning
0	Reserved. Shall not be sent and if received the Cause shall be treated as an invalid IE
1	Unspecified
2	Handover/Relocation cancelled by source system
3	Handover /Relocation Failure with Target system
4	Handover/Relocation Target not allowed
5	Unknown Target ID
6	Target Cell not available
7	No Radio Resources Available in Target Cell
8	Failure in Radio Interface Procedure
9	Permanent session leg establishment error
10	Temporary session leg establishment error
11-255	Spare. This value range is reserved for SRVCC Cause values

6.8 Target RNC ID

This IE shall contain the identity of the target RNC. The encoding of this IE is defined in 3GPP TS 29.002 [11].

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 57 (decimal)							
2 to 3	Length = n (decimal)							
4	Spare				Instance			
5 to (n+4)	RNC ID							

Figure 6.8-1: Target RNC ID

6.9 Target Global Cell ID

This IE shall contain the identity of the target GSM Cell ID. The encoding of this IE is defined in 3GPP TS 29.002 [11].

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 58 (decimal)							
2 to 3	Length = n (decimal)							
4	Spare				Instance			
5 to (n+4)	Cell ID							

Figure 6.9-1: Target Cell ID

6.10 Tunnel Endpoint Identifier for Control Plane (TEID-C)

Tunnel Endpoint Identifier for Control Plane (TEID-C) is coded as depicted in Figure 6.10-1.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 59 (decimal)							
2-3	Length = n (decimal)							
4	Spare				Instance			
5-8	Tunnel Endpoint Identifier for Control Plane (TEID-C)							
9-(n+4)	These octet(s) is/are present only if explicitly specified							

Figure 6.10-1: Tunnel Endpoint Identifier for Control Plane (TEID-C)

6.11 Sv Flags

Sv Flags is coded as depicted in Figure 6.11-1.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 60 (decimal)							
2 to 3	Length = n							
4	Spare				Instance			
5	Spare	Spare	Spare	Spare	Spare	STI	ICS	EmInd
6-(n+4)	These octet(s) is/are present only if explicitly specified							

Figure 6.11-1: Sv Flags

The following bits within Octet 5 indicate:

- Bit 1 – EmInd (Emergency Indicator): This flag is used to indicate the IMS emergency session.
- Bit 2 – ICS (IMS Centralized Service): This flag is used to request ICS support.
- Bit 3 – STI (Session Transfer Indicator): This flag is used to indicate IMS session transfer has been invoked.

6.12 Service Area Identifier

This IE shall contain the identifier of a service area. The encoding of this IE is defined in Figure 6.12-1.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 61 (decimal)							
2-3	Length = n							
4	Spare				Instance			
5	MCC digit 2				MCC digit 1			
6	MNC digit 3				MCC digit 3			
7	MNC digit 2				MNC digit 1			
8 to 9	Location Area Code (LAC)							
10 to 11	Service Area Code (SAC)							
12-(n+4)	These octet(s) is/are present only if explicitly specified							

Figure 6.12-1: Service Area Identifier

The Location Area Code (LAC) consists of 2 octets. Bit 8 of Octet 8 is the most significant bit and bit 1 of Octet 9 the least significant bit. The coding of the location area code is the responsibility of each administration. Coding using full hexadecimal representation shall be used.

The Service Area Code (SAC) consists of 2 octets. Bit 8 of Octet 10 is the most significant bit and bit 1 of Octet 11 the least significant bit. The SAC is defined by the operator. See 3GPP TS 23.003 [4] subclause 12.5 for more information.

Annex A (informative): Change history

Date	TSG #	TSG Doc	CT4 Doc	CR	Rev	Cat	Subject/Comment	Old	New
2008-12	CT#42	CP-080715					V2.0.0 approved in CT#42	2.0.0	8.0.0
2009-03	CT#43	CP-090047	C4-090919	0001	3	F	Finalizing Sv spec	8.0.0	8.1.0
2009-09	CT#45	CP-090544	C4-091655	0003			Definition of TEID-C IE	8.1.0	8.2.0
2009-09	CT#45	CP-090544	C4-091860	0004			Cleanup of ENs		
2009-09	CT#45	CP-090544	C4-092117	0005	2		HSPA security parameter alignment		
2009-09	CT#45	CP-090561	C4-091939	0006	2		IMEI Changes for SRVCC	8.2.0	9.0.0
2009-12	CT#46	CP-090777	C4-094068	0011	1		MSISDN Correction	9.0.0	9.1.0
2009-12	CT#46	CP-090825	-	0012	2		Alignment with stage 2 for SRVCC HO cancellation procedure		
2010-03	CT#47	CP-100027	C4-1000422	0015		F	TEID-C, IP Address and UDP Port handling on Sv interface	9.1.0	9.2.0
		CP-100027	C4-100432	0018		F	IE type value correction		
		CP-100047	C4-100425	0016		F	IMSI IE presence corrections		
2010-06	CT#48	CP-100280	C4-101534	0020	1	F	Session continuity terminology is not correct	9.2.0	9.3.0
2010-09	CT#49	CP-100457	C4-102409	0021	2	F	IMEI over the Sv Interface	9.3.0	9.4.0
2010-12	CT#50	CP-100667	C4-103287	0023	1	F	MM Context for UTRAN SRVCC	9.4.0	9.5.0
2011-03	CT#51	CP-110043	C4-110371	0027	1	A	Length of the Transparent container	9.5.0	9.6.0
		CP-110052	C4-110403	0024	2	F	Target to Source Transparent Container in the SRVCC PS to CS Response message		
2011-03							Update to Rel-10 version (MCC)	9.6.0	10.0.0
2011-06	CT#52	CP-110363	C4-111587	0031	1	A	Source SAI during SRVCC HO from UTRAN to GERAN	10.0.0	10.1.0
2011-06	CT#52	CP-110355	C4-111548	0034	1	A	IE Type Extendable Corrections	10.0.0	10.1.0
2011-06	CT#52	CP-110353	C4-111644	0037	3	A	STN-SR encoding clarification	10.0.0	10.1.0
2011-09	CT#53	CP-110565	C4-112201	0038	2	F	"MME/SGSN Sv Address for Control Plane" IE in SRVCC PS to CS Request	10.1.0	10.2.0
2011-12	CT#54	CP-110779	C4-112848	0046		A	Coding of Source to Target Transparent Container	10.2.0	10.3.0
2011-12	CT#54	CP-110784	C4-112525	0042	2	F	Handing of Extendable IEs	10.2.0	10.3.0
2012-06	CT#56	CP-120227	C4-121332	0048	3	F	SRVCC cause values	10.3.0	10.4.0
2014-06	CT#64	CP-140232	C4-141210	0071	4	A	Transparent container ambiguity	10.4.0	10.5.0

History

Document history		
V10.0.0	May 2011	Publication
V10.1.0	June 2011	Publication
V10.2.0	October 2011	Publication
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