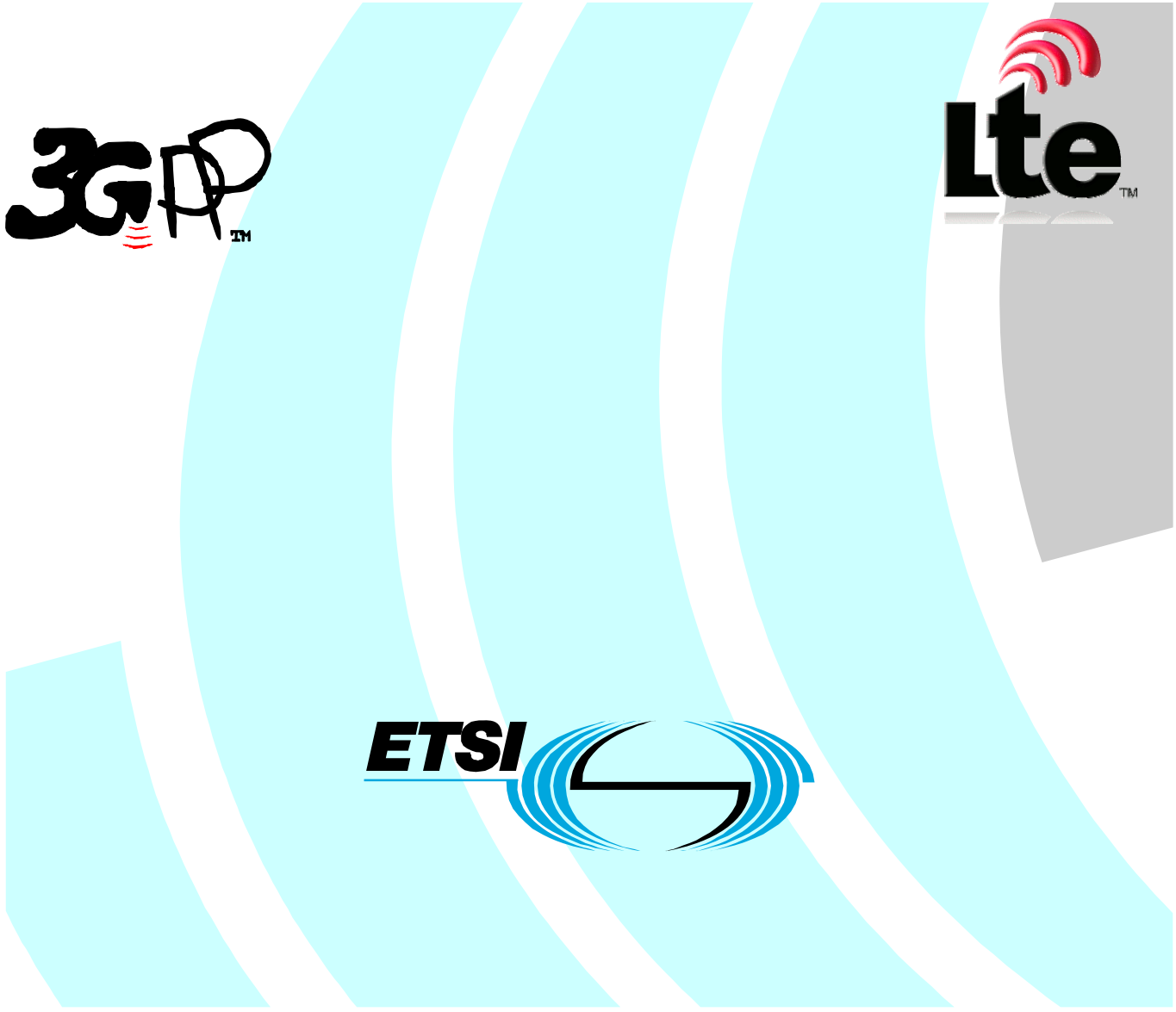
ETSI TS 129 280 V8.0.0 (2009-01)

Technical Specification

Universal Mobile Telecommunications System (UMTS);
LTE;
3GPP EPS Sv interface (MME to MSC) for SRVCC
(3GPP TS 29.280 version 8.0.0 Release 8)



Reference
DTS/TSGC-0429280v800

Keywords
LTE, UMTS

ETSI

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Foreword

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Contents

Foreword

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

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

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- x the first digit:
  - 1 presented to TSG for information;
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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
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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].

Editor's note: The details for splitting the PS bearer may need to be described.

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".

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].

Editor"s note: This section to be completed or removed later.

3.2 Symbols

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

Editor"s note: This section to be completed or removed later.

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.

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].

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
0	Reserved	3GPP TS 29.274 [3]
1	Echo Request	3GPP TS 29.274 [3]
2	Echo Response	3GPP TS 29.274 [3]
3	Version Not Supported Indication	3GPP TS 29.274 [3]
4-24	Reserved for S101 interface	3GPP TS 29.274 [3]
25	SRVCC PS to CS Request	5.2.2
26	SRVCC PS to CS Response	5.2.3
27	SRVCC PS to CS Complete Notification	5.2.4
28	SRVCC PS to CS Complete Acknowledge	5.2.5
29-31	For future Sv interface use	-
32-255	Reserved for GTPv2	3GPP TS 29.274 [3]

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	CR	IE Type
IMSI	M	None	1	IMSI
MME/SGSN Sv Address for Control Plane	M	This IE specifies the address for control plane message which is chosen by the source MME/SGSN	1	IP-Address
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 MM shall include this TEID in the GTP header of all related control plane messages which are related to the requested bearer.	1	TEID-C
MSISDN	M	The MME/SGSN shall include MSISDN IE	1	MSISDN
STN-SR	M	The MME/SGSN shall include STN-SR IE	1	STN-SR
MM Context for SRVCC	M	The MME/SGSN shall include CS Security key in MM Context for SRVCC. The derivation of the CS security keys shall follow the procedures defined 3GPP TS 33.401[7].	1	MM Context for SRVCC
Source to Target Transparent Container	C	FFS	1	FFS
Private Extension	O	None	1	Private Extension

Editor"s note: It is FFS whether there is more Information Element for this message.

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". Possible Cause values are:

- "Request accepted".

Editor's note: Other potential Cause values are FFS.

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

Information elements	P	Condition / Comment	CR	IE Type
Cause	M		1	Cause
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.	1	IP Address
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.	1	TEID-C
Target to Source Transparent Container	C	If the Cause IE contains the value "Request accepted ', this IE is included to carry the Handover command from the target access network.	1	FFS
Private Extension	O	None	1	Private Extension

Editor"s note: It is FFS whether there is more Information Element for this message.

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 to indicate the SRVCC handover with CS Domain has been successfully finished during SRVCC procedure in 3GPP TS 23.216 [2].

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	CR	IE Type
IMSI	M	None	1	IMSI
Private Extension	O	None	1	Private Extension

Editor"s note: It is FFS whether there is more Information Element for this message.

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	CR	IE Type
Cause	M	None	1	Cause
Private Extension	O	None	1	Private Extension

Editor"s note: It is FFS whether there is more Information Element for this message.

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.

Table 6.1: Information Elements for SRVCC

IE Type value (Decimal)	Information elements	Comment / Reference
0	Reserved	3GPP TS 29.274 [3]
1	International Mobile Subscriber Identity (IMSI)	3GPP TS 29.274 [3]
2	Cause	3GPP TS 29.274 [3]
3	Recovery (Restart Counter)	3GPP TS 29.274 [3]
4-50	Reserved for S101 interface	3GPP TS 29.274 [3]
51	STN-SR	6.2
52	Source to Target Transparent Container	6.3
53	Target to Source Transparent Container	6.4
54	MM Context for SRVCC	6.5
55-70	For future Sv interface use	-
71-73	Reserved for GTPv2	3GPP TS 29.274 [3]
74	IP Address	3GPP TS 29.274 [3]
75	Mobile Equipment Identity (MEI)	3GPP TS 29.274 [3]
76	MSISDN	3GPP TS 29.274 [3]
77-83	Reserved for GTPv2	3GPP TS 29.274 [3]
84	TEID-C	3GPP TS 29.274 [3]
85-89	Reserved for GTPv2	3GPP TS 29.274 [3]
90	Fully Qualified Tunnel Endpoint Identifier (F-TEID)	3GPP TS 29.274 [3]
91-2544	Reserved for GTPv2	3GPP TS 29.274 [3]
255	Private Extension	3GPP TS 29.274 [3]

Editor"s note: The "Source to Target Transparent Container" and "Target to Source Transparent Container" will need to be aligned with 3GPP TS 25.413.

6.2 STN-SR

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. STN-SR is defined in 3GPP TS 23.003 [4].

Editor"s note: Type value is to be defined in 3GPP TS 29.274.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 51 (decimal)							
2-3	Length = n (decimal)							
4-(n+3)	STN-SR							

Figure 6.2: STN-SR

6.3 Source to Target Transparent Container

Editors Note: The content of this parameter is FFS. This also could be implemented as an instance.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 52 (decimal)							
2-3	Length = n (decimal)							
4-(n+3)	Transparent container							

Figure 6.3: Source to Target Transparent Container

6.4 Target to Source Transparent Container

Editors Note: The content of this parameter is FFS. This also could be implemented as an instance.

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 53 (decimal)							
2-3	Length = n (decimal)							
4-(n+3)	Transparent container							

Figure 6.4: Target to Source Transparent Container

6.5 MM Context for SRVCC

The MM Context information element contains 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 KSI_{ASME} are defined in TS 33.401 [6].

Mobile Station Classmark 2 and Mobile Station Classmark 3 information Elements indicates the supported encryption algorithm for GERAN access. Mobile Station Classmark is defined in TS 24.008 [7].

Octets	Bits 8	7	6	5	4	3	2	1
1	Type = 52 (decimal)							
2-3	Length = n (decimal)							
4	Spare 11111					KSI_{ASME}		
5-20	CK_{SRVCC}							
21-36	IK_{SRVCC}							
37-41	Mobile Station Classmark 2							
42-m	Mobile Station Classmark 3							

Figure 6.5: MM Context

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

History

Document history		
V8.0.0	January 2009	Publication