



eRAN TDD

SRVCC Feature Parameter Description

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Contents

1 About This Document.....	1
1.1 Scope.....	1
1.2 Intended Audience.....	1
1.3 Change History.....	2
1.4 Differences Between eNodeB Types.....	2
2 Overview.....	3
2.1 Definition.....	4
2.2 Benefits.....	4
2.3 Architecture.....	4
2.3.1 SRVCC.....	4
2.3.2 eSRVCC.....	6
3 SRVCC Principles.....	8
3.1 Triggering.....	8
3.2 Measurements and Decision-making.....	9
3.2.1 Basic Measurements and Decision-making.....	9
3.3 Execution.....	10
3.3.1 SRVCC to UTRAN.....	10
3.3.2 SRVCC to GERAN.....	13
3.3.3 Retry and Penalty.....	15
4 Signaling Procedure.....	16
5 Related Features.....	19
5.1 Features Related to TDLOFD-001022 SRVCC to UTRAN.....	19
5.2 Features Related to TDLOFD-001023 SRVCC to GERAN.....	19
6 Network Impact.....	21
6.1 TDLOFD-001022 SRVCC to UTRAN.....	21
6.2 TDLOFD-001023 SRVCC to GERAN.....	21
7 Engineering Guidelines.....	23
7.1 TDLOFD-001022 SRVCC to UTRAN.....	23
7.1.1 When to Use SRVCC to UTRAN.....	23
7.1.2 Required Information.....	23
7.1.3 Process.....	23

7.1.4 Requirements.....	23
7.1.5 Data Preparation and Feature Activation.....	24
7.1.5.1 Data Preparation.....	24
7.1.5.2 Using the CME.....	27
7.1.5.3 Using MML Commands.....	27
7.1.5.4 MML Command Examples.....	29
7.1.6 Activation Observation.....	29
7.1.7 Deactivation.....	31
7.1.7.1 Using the CME.....	31
7.1.7.2 Using MML Commands.....	31
7.1.7.3 MML Command Examples.....	31
7.1.8 Performance Monitoring.....	32
7.1.9 Parameter Optimization.....	34
7.2 TDLOFD-001023 SRVCC to GERAN.....	35
7.2.1 When to Use SRVCC to GERAN.....	35
7.2.2 Required Information.....	35
7.2.3 Process.....	35
7.2.4 Requirements.....	35
7.2.5 Data Preparation and Feature Activation.....	36
7.2.5.1 Data Preparation.....	36
7.2.5.2 Using the CME.....	39
7.2.5.3 Using MML Commands.....	39
7.2.5.4 MML Command Examples.....	42
7.2.6 Activation Observation.....	42
7.2.7 Deactivation.....	43
7.2.7.1 Using the CME.....	43
7.2.7.2 Using MML Commands.....	43
7.2.7.3 MML Command Examples.....	43
7.2.8 Performance Monitoring.....	43
7.2.9 Parameter Optimization.....	45
7.3 Troubleshooting.....	45
7.3.1 Fault 1.....	45
7.3.2 Fault 2.....	46
8 Parameters.....	48
9 Counters.....	70
10 Glossary.....	78
11 Reference Documents.....	79

1 About This Document

1.1 Scope

This document describes single radio voice call continuity (SRVCC), including its technical principles, related features, network impact, and engineering guidelines.

This document covers the following features:

- TDLOFD-001022 SRVCC to UTRAN
- TDLOFD-001023 SRVCC to GERAN

Any managed objects (MOs), parameters, alarms, or counters described herein correspond to the software release delivered with this document. Any future updates will be described in the product documentation delivered with future software releases.

This document applies only to LTE TDD. Any "LTE" in this document refers to LTE TDD, and "eNodeB" refers to LTE TDD eNodeB.

This document applies to the following types of eNodeBs.

eNodeB Type	Model
Macro	DBS3900 LTE TDD
LampSite	DBS3900 LampSite TDD
Micro	BTS3205E

1.2 Intended Audience

This document is intended for personnel who:

- Need to understand the features described herein
- Work with Huawei products

1.3 Change History

This section provides information about the changes in different document versions. There are two types of changes:

- Feature change
Changes in features and parameters of a specified version as well as the affected entities
- Editorial change
Changes in wording or addition of information Editorial change does not specify the affected entities.

eRAN TDD 11.1 01 (2016-03-07)

This issue does not include any changes.

eRAN TDD 11.1 Draft A (2015-12-30)

Compared with Issue 01 (2015-09-20) of eRAN TDD 11.0, Draft A (2015-12-30) of eRAN TDD 11.1 includes the following changes.

Change Type	Change Description	Parameter Change	Affected Entity
Feature change	Added cell-level switch parameters for coverage-based SRVCC. For details, see 3.1 Triggering .	Added the following information: <ul style="list-style-type: none"> ● UtranSrvccSwitch of the CellHoParaCfg.HoModeSwitch parameter ● GeranSrvccSwitch of the CellHoParaCfg.HoModeSwitch parameter 	Macro, micro, and LampSite eNodeBs
Editorial change	Optimized the CME-related operation description in Engineering Guidelines.	None	N/A

1.4 Differences Between eNodeB Types

When triggering CS+PS SRVCC, macro and LampSite eNodeBs act in a different way than micro eNodeBs. For details, see [3.3.1 SRVCC to UTRAN](#).

2 Overview

In the early phase of E-UTRAN deployment, when UEs running voice services move out of an E-UTRAN network, the voice services can continue by means of the following solutions.

- UEs running VoIP services can be handed over to the UTRAN or GERAN using PS handover. This requires support from the UTRAN or GERAN and UEs.
- UEs running VoIP services can be handed over to the UTRAN or GERAN using SRVCC, which transforms the VoIP services into CS services.

This document describes SRVCC. SRVCC is a means of inter-RAT handover. For details, see section 4.1.2 "Architectural Principles for 3GPP UTRAN/GERAN SRVCC and vSRVCC" in 3GPP TS 23.216 V11.1.0.

2.1 Definition

SRVCC enables VoIP services to be carried in the circuit switched (CS) domain, ensuring voice service continuity.

2.2 Benefits

Before the E-UTRAN is deployed across coverage areas, SRVCC is used to ensure voice service continuity.

2.3 Architecture

2.3.1 SRVCC

SRVCC consists of the following activities. [Figure 2-1](#) shows the SRVCC network architecture.

- SRVCC consists of the following activities:
- Access-stratum handover between bearer networks

To support SRVCC, the Sv interface is introduced between the MSC server and MME. The MSC server is used for signaling interaction for SRVCC handovers. The overall SRVCC procedure is as follows:

1. The MME informs the MSC server through the Sv interface that a VoIP service is to be handed over to the CS domain.
2. The MSC server instructs the UTRAN or GERAN to prepare for the handover.
3. The MSC server requests that the media gateway (MGW) provide the new media-plane information, including the IP address and port number. It then notifies the service centralization and continuity application server (SCC AS) that the media stream is to be changed.
4. The SCC AS notifies the UE of the new media-plane information. The UE establishes a new media stream to the MGW and releases the original media stream.
5. When the UE uses the VoIP voice calls, the MGW needs to convert the media stream to achieve interworking between the CS voice stream and VoIP voice stream. The conversion occurs in protocol stacks and voice coding.

Figure 2-1 SRVCC network architecture

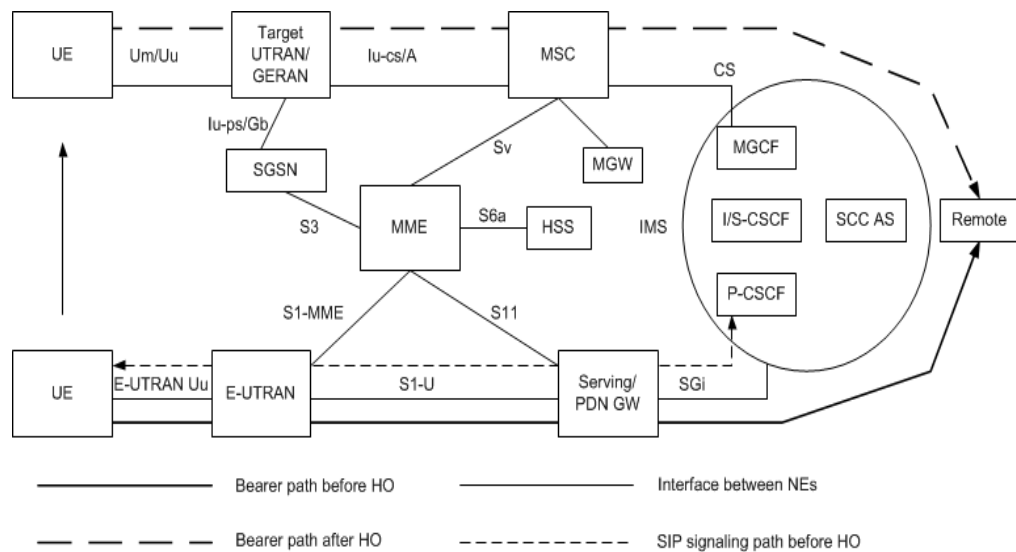


Table 2-1 lists the elements of the network architecture in **Figure 2-1**.

Table 2-1 Elements of SRVCC network architecture

Element	Function
Sv interface	Supports signaling interaction for SRVCC handovers as an interface between the MME and MSC server.
E-UTRAN	Supports the SRVCC procedure, which in the E-UTRAN is similar to a PS handover procedure. During the SRVCC procedure, the E-UTRAN sends an SRVCC indication to the MME, notifying the MME of whether the target cell supports SRVCC and concurrent CS and PS handovers.
UTRAN/GERAN	<ul style="list-style-type: none"> Supports incoming CS handovers for CS-only SRVCC. Supports concurrent incoming CS and PS handovers for CS-and-PS SRVCC.
MME	<ul style="list-style-type: none"> Provides the bearer splitting function to separate the voice bearer from non-voice bearers. Initiates an SRVCC procedure over the Sv interface for an emergency call and includes an emergency indication in the transmitted message. Selects the MSC server that supports SRVCC based on the domain name server (DNS) procedures or local configuration.
MSC problem analysis	Processes CS handovers and session transfers.
SGSN	Processes PS handovers for CS-and-PS SRVCC.
P-CSCF	Acts as the first contact point for UEs in the IMS that provides the proxy function by accepting and forwarding service requests, but does not change the Request URI field in the INVITE message.

Element	Function
S-CSCF	Acts as the control center of the IMS, implements UE registration and authentication and session control, and provides basic session routing for calling and called parties on the IMS.
I-CSCF	Assigns S-CSCFs to UEs, supports route query, and forwards SIP requests to another IMS domain.
MGCF	Enables interworking between the IMS control plane and the legacy CS network.
SCC AS	Ensures the centralization and continuity of VoIP services on the E-UTRAN network.

2.3.2 eSRVCC

Although the signaling-plane handover of an SRVCC procedure can be completed within 300 ms, the session transfer cannot. As a result, the total service interruption period during SRVCC does not meet the following requirement: The service interruption period during the handover of a real-time service between the E-UTRAN and the UTRAN or GERAN must be less than 300 ms. For details about this requirement, see section 8.4 "Co-existence and interworking with 3GPP RAT" in 3GPP TS 25.913 V8.0.0. To shorten the service interruption time, 3GPP Release 10 proposes eSRVCC.

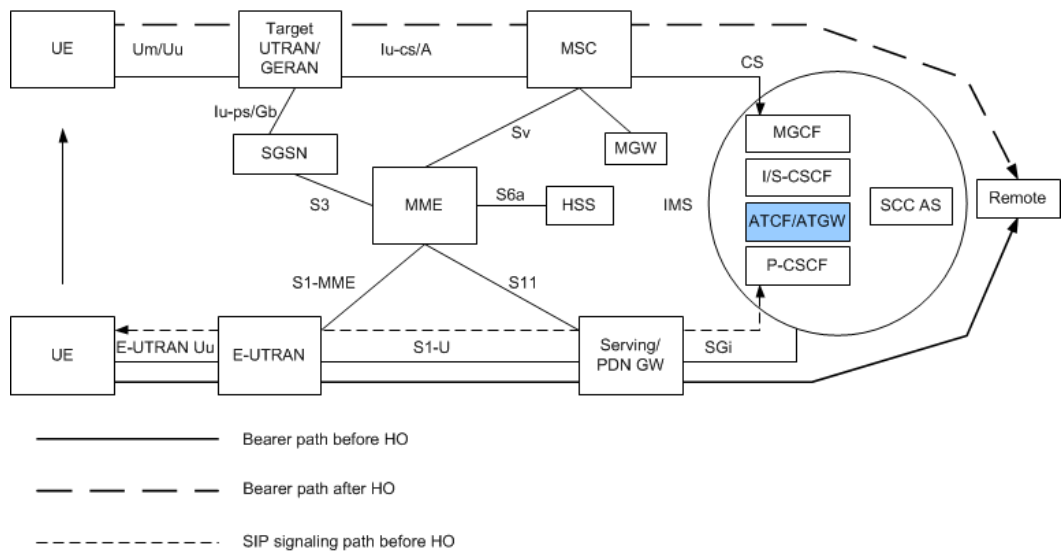
eSRVCC focuses on reducing the time for session transfer because session transfer prolongs the service interruption period for SRVCC, especially when the calling and called parties are being served by different networks or when a UE is roaming.

eSRVCC is implemented by adding the ATCF or ATGW functional entity between the P-CSCF and I-CSCF or S-CSCF. [Figure 2-2](#) shows the eSRVCC network architecture.

- Access Transfer Control Function (ATCF)
The ATCF acts as an anchor point for the signaling plane before and after handovers. To reduce delay, the ATCF must be deployed on the serving network. (The visited network is the serving network for roaming UEs.) In this manner, the MSC server can be located close to the ATCF to shorten the time for signaling routing from the MSC server to the ATCF in roaming scenarios.
- Access Transfer Gateway (ATGW)
The ATGW acts as a media-plane anchor point for VoIP services before and after handovers. The media plane of the VoIP service is anchored to the ATGW. When an SRVCC procedure is initiated for this UE, the media-plane information is updated only on the ATGW, but not on the peer UE, to shorten the handover duration. This avoids the incurred media-plane interruption period.

For a UE running a voice service that may require SRVCC later, the media plane of the service is anchored to the ATGW. When an SRVCC procedure is initiated for this UE, the media-plane information is updated only on the ATGW, but not on the peer UE, to shorten the handover duration.

Figure 2-2 eSRVCC network architecture



NOTE

This document focuses on eNodeB functions, which are the same for SRVCC and eSRVCC. Therefore, the following sections do not distinguish between SRVCC and eSRVCC. On live networks, eSRVCC is used.

3 SRVCC Principles

3.1 Triggering

Common Causes

Several factors may trigger SRVCC to UTRAN. For detailed measurement triggering, see the documents listed in [Table 3-1](#).

Table 3-1 Mapping between documents and features/functions

Feature/Function	Switch for SRVCC to UTRAN	Switch for SRVCC to GERAN	Document
Coverage-based SRVCC	UtranSrvccSwitch of the CellHoParaCfg.HoModeSwitch parameter	GeranSrvccSwitch of the CellHoParaCfg.HoModeSwitch parameter	<i>Inter-RAT Mobility Management in Connected Mode Feature Parameter Description</i>
Service-based SRVCC	UtranServiceHoSwitch under the ENodeBAlgoSwitch.HoAlgoSwitch parameter	GeranServiceHoSwitch under the ENodeBAlgoSwitch.HoAlgoSwitch parameter	
Distance-based SRVCC	UTRAN under the CellAlgoSwitch.DistanceBasedHoSwitch and DistBasedHO.DistanceBasedMeasObjType parameters	GERAN under the CellAlgoSwitch.DistanceBasedHoSwitch and DistBasedHO.DistanceBasedMeasObjType parameters	
Uplink-quality-based SRVCC	UIQualityInterRATHoSwitch under the ENodeBAlgoSwitch.HoAlgoSwitch parameter		

Feature/Function	Switch for SRVCC to UTRAN	Switch for SRVCC to GERAN	Document
Load-based SRVCC	UtranMlbSwitch under the CellAlgoSwitch.MlbAlgoSwitch parameter	GeranMlbSwitch under the CellAlgoSwitch.MlbAlgoSwitch parameter	<i>MLB Feature Parameter Description</i>
SPID-based SRVCC	InterPlmnHoSwitch under the SpidCfg.HoBackToHPLMNSwitch and ENodeBAlgoSwitch.HoAlgoSwitch parameters		<i>Flexible User Steering Feature Parameter Description</i>

 **NOTE**

In addition, coverage-based SRVCC is controlled by the **UtranSrvccSwitch** option of the **ENodeBAlgoSwitch.HoModeSwitch** parameter or the **GeranSrvccSwitch** option of the **ENodeBAlgoSwitch.HoModeSwitch** parameter.

If the option of the eNodeB-level parameter is selected, the option of the cell-level parameter does not take effect. If the option of the eNodeB-level parameter is cleared, the option of the cell-level parameter takes effect.

The eNodeB-level parameter will no longer be used in later versions. Therefore, you are advised to use the cell-level parameter.

Location Service (LCS)

LCS-based SRVCC is controlled by **LcsSrvccSwitch** under the **ENodeBAlgoSwitch.HoModeSwitch** parameter. It also depends on the UTRAN or GERAN LCS capability, which is controlled by the **CSFallbackBlindHoCfg.UtranLcsCap** or **CSFallbackBlindHoCfg.GeranLcsCap** parameter, respectively.

LCS-based SRVCC is used when a UE triggers LCS in an LCS-incapable E-UTRAN network. When the UE triggers LCS, the MME delivers a CS Fallback Indicator to the eNodeB. The eNodeB performs SRVCC to hand the UE over to the CS domain for LCS while ensuring voice service continuity.

The target cell signal requirements for LCS-based SRVCC are the same as those for CSFB to UTRAN or GERAN. For details about the requirements, see *CS Fallback Feature Parameter Description*.

3.2 Measurements and Decision-making

3.2.1 Basic Measurements and Decision-making

The procedures of coverage-, service-, distance-, and UL-quality-based SRVCC measurements and handover target selection are the same as those defined in inter-RAT mobility management in connected mode. For details, see sections "Measurements" and "Decision-making" in *Overview of Mobility Management in Connected Mode*.

The coverage-based measurement of SRVCC to GERAN is enhanced. This enhancement is controlled by the **GSM_MEAS_DEL_INTERFREQ_SW** option of the

CellAlgoSwitch.MeasOptAlgoSwitch parameter. When this option is selected, perform the following operations:

- When the UE is performing VoIP services, the eNodeB releases the inter-frequency measurement after the coverage-based GSM measurement is triggered.
- When the UE starts VoIP services after the coverage-based GSM measurement is triggered, the eNodeB releases all the inter-frequency measurement.

After the coverage-based GERAN measurement is triggered, inter-frequency measurement is prohibited if VoIP services exist.

For details about the procedure of load-based SRVCC measurements and handover target selection, see *MLB Feature Parameter Description*.

If SRVCC is triggered by the SPID-based inter-RAT handover function, the SPID-based filter is applied during measurement control and target cell selection. For details, see *Flexible User Steering Feature Parameter Description*.

3.3 Execution

If SRVCC to UTRAN and SRVCC to GERAN are supported on the network, the eNodeB delivers measurement configurations, instructing the UEs to measure neighboring UTRAN and GERAN cells. Cells in the first valid measurement report are selected as target cells for SRVCC.

3.3.1 SRVCC to UTRAN

Figure 3-1 shows the handover policy selection process to UTRAN when bearers of QCI 1 exist. The handover selection sequence is as follows:

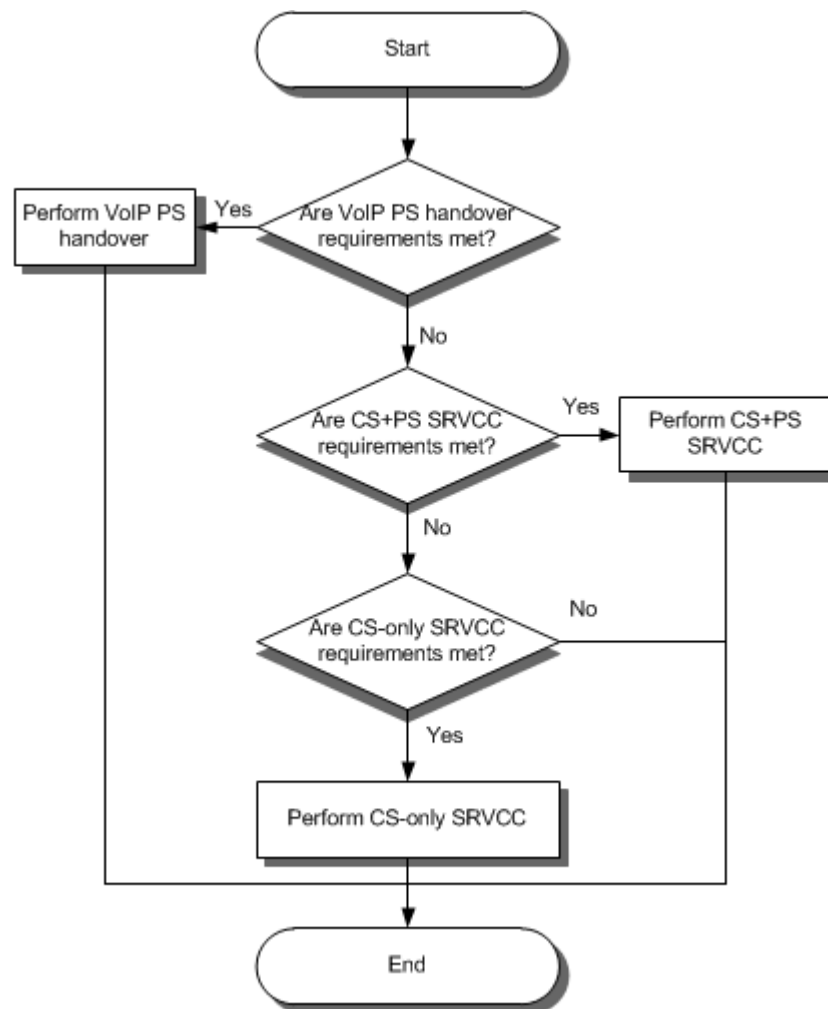
1. VoIP PS handover
2. CS+PS SRVCC
3. CS-only SRVCC

If requirements of the preceding three handovers are not met, no handover is performed.

NOTE

The redirection cannot function as the handover policy for QCI 1 VoIP services. Otherwise, call drops occur. The redirection handover is controlled by the **REDIRECTION** option of the **InterRatPolicyCfgGroup.UtranHoCfg** parameter.

Figure 3-1 SRVCC policy selection process from E-UTRAN to UTRAN



VoIP PS Handover

The VoIP PS handover from E-UTRAN to UTRAN is controlled by the **UtranVoipCapSwitch** option of the **ENodeBAlgoSwitch.HoModeSwitch** parameter.

CS+PS SRVCC

To trigger CS+PS SRVCC, you must perform the following operations:

- Enable SRVCC from E-UTRAN to UTRAN, which is controlled by the **UtranSrvccSwitch** option of the cell-level parameter **CellHoParaCfg.HoModeSwitch**.

NOTE

In addition, this function is controlled by the **UtranSrvccSwitch** option of the eNodeB-level parameter **ENodeBAlgoSwitch.HoModeSwitch**.

If the option of the eNodeB-level parameter is selected, the option of the cell-level parameter does not take effect. If the option of the eNodeB-level parameter is cleared, the option of the cell-level parameter takes effect.

The eNodeB-level parameter will no longer be used in later versions. Therefore, you are advised to use the cell-level parameter.

- Enable PS handover from E-UTRAN to UTRAN, which is controlled by the **UtranPsHoSwitch** option of the cell-level parameter **CellHoParaCfg.HoModeSwitch**.

 NOTE

In addition, this function is controlled by the **UtranPsHoSwitch** option of the eNodeB-level parameter **ENodeBAlgoSwitch.HoModeSwitch**.

If the option of the eNodeB-level parameter is selected, the option of the cell-level parameter does not take effect. If the option of the eNodeB-level parameter is cleared, the option of the cell-level parameter takes effect.

The eNodeB-level parameter will no longer be used in later versions. Therefore, you are advised to use the cell-level parameter.

- Select the **SRVCC** and **PS_HO** options of the **InterRatPolicyCfgGroup.UtranHoCfg** parameter. Set the **StandardQci.InterRatPolicyCfgGroupId** or **ExtendedQci.InterRatPolicyCfgGroupId** parameter to configure the handover policy for the corresponding QCI.

If services with different QCIs exist, the handover policy for the highest-priority QCI prevails. The handover policy priority of each QCI is controlled by the **CellStandardQCI.QciPriorityForHo** parameter. You are advised to set the handover policy priority of QCI 1 to 1 (highest) and that of QCI 5 to 9 (lowest).

 NOTE

- For mandatory handovers, for example, coverage-based and UL-quality-based handovers, SRVCC can be triggered when SRVCC is configured in the inter-RAT handover policy groups for the highest-priority QCI.
- For optional handovers, for example, load-based, service-based, and CSFB-based handovers, SRVCC can be triggered when SRVCC is configured in the inter-RAT handover policy groups for all QCIs.
- Enable UTRAN cell CS and PS handover indication, which is controlled by the **UtranExternalCell.CsPsHOInd** parameter. If this parameter is set to **BOOLEAN_FALSE(False)**, the external UTRAN cell does not support SRVCC for concurrent CS and PS services. If this parameter is set to **BOOLEAN_TRUE(True)**, the external UTRAN cell supports SRVCC for concurrent CS and PS services.

For macro and LampSite eNodeBs, when triggering SRVCC for CS+PS services, the eNodeB decides whether to check CS and PS handover indication of the external UTRAN cell based on the **CnOperatorHoCfg.SrvccWithPsBasedCellCapSw** parameter.

- When this parameter is set to **ON**, the eNodeB does not check the **CsPsHOInd** parameter of external UTRAN cells.
- When this parameter is set to **OFF**, the eNodeB checks the **CsPsHOInd** parameter of external UTRAN cells.

For micro eNodeBs, when triggering SRVCC for CS and PS services, the eNodeB does not support the **CnOperatorHoCfg.SrvccWithPsBasedCellCapSw** parameter and checks CS and PS handover indication of the external UTRAN cell directly.

CS-only SRVCC

To trigger CS-only SRVCC, you must perform the following operations:

- Enable SRVCC from E-UTRAN to UTRAN, which is controlled by the **UtranSrvccSwitch** option of the cell-level parameter **CellHoParaCfg.HoModeSwitch**.

 NOTE

In addition, this function is controlled by the **UtranSrvccSwitch** option of the eNodeB-level parameter **ENodeBAlgoSwitch.HoModeSwitch**.

If the option of the eNodeB-level parameter is selected, the option of the cell-level parameter does not take effect. If the option of the eNodeB-level parameter is cleared, the option of the cell-level parameter takes effect.

The eNodeB-level parameter will no longer be used in later versions. Therefore, you are advised to use the cell-level parameter.

- Select the **SRVCC** option of the **InterRatPolicyCfgGroup.UtranHoCfg** parameter. Set the **StandardQci.InterRatPolicyCfgGroupId** or **ExtendedQci.InterRatPolicyCfgGroupId** parameter to configure the handover policy for the corresponding QCI.

If services with different QCIs exist, the handover policy for the highest-priority QCI prevails. The handover policy priority of each QCI is controlled by the **CellStandardQCI.QciPriorityForHo** parameter. You are advised to set the handover policy priority of QCI 1 to 1 (highest) and that of QCI 5 to 9 (lowest).

 NOTE

- For mandatory handovers, for example, coverage-based and UL-quality-based handovers, SRVCC can be triggered when SRVCC is configured in the inter-RAT handover policy groups for the highest-priority QCI.
- For optional handovers, for example, load-based, service-based, and CSFB-based handovers, SRVCC can be triggered when SRVCC is configured in the inter-RAT handover policy groups for all QCIs.

3.3.2 SRVCC to GERAN

Figure 3-2 shows the handover policy selection process to GERAN when bearers with QCI of 1 exist. The handover selection sequence is as follows:

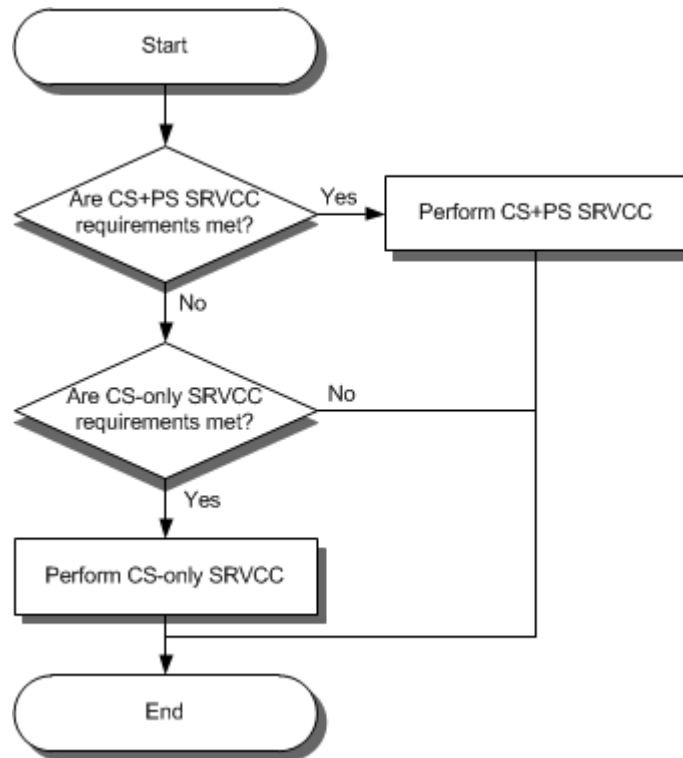
1. CS+PS SRVCC
2. CS-only SRVCC

If requirements of the preceding two handovers are not met, no handover is performed.

 NOTE

If bearers with a QCI of 1 are used to carry VoIP services and the redirection handover for QCI 1 is enabled, a call drop may occur during redirection. Therefore, the redirection cannot function as the handover policy for QCI 1 VoIP services. The redirection handover is controlled by the **REDIRECTION** option of the **InterRatPolicyCfgGroup.GeranGprsEdgeHoCfg** parameter.

Figure 3-2 SRVCC policy selection process from E-UTRAN to GERAN



CS+PS SRVCC

To trigger CS+PS SRVCC, you must perform the following operations:

- Select the **GeranSrvccSwitch** option of the **ENodeBAlgoSwitch.HoModeSwitch** parameter.
- Select the **GeranPsHoSwitch** option of the **ENodeBAlgoSwitch.HoModeSwitch** parameter.
- Select the **SRVCC** and **PS_HO** options of the **InterRatPolicyCfgGroup.GeranGprsEdgeHoCfg** parameter. Set the **StandardQci.InterRatPolicyCfgGroupId** or **ExtendedQci.InterRatPolicyCfgGroupId** parameter to configure the handover policy for the corresponding QCI.

If services with different QCIs exist, the handover policy for the highest-priority QCI prevails. The handover policy priority of each QCI is controlled by the **CellStandardQCI.QciPriorityForHo** parameter. You are advised to set the handover policy priority of QCI 1 to 1 (highest) and that of QCI 5 to 9 (lowest).

NOTE

- For mandatory handovers, for example, coverage-based and UL-quality-based handovers, SRVCC can be triggered when SRVCC is configured in the inter-RAT handover policy groups for the highest-priority QCI.
- For optional handovers, for example, load-based, service-based, and CSFB-based handovers, SRVCC can be triggered when SRVCC is configured in the inter-RAT handover policy groups for all QCIs.
- Enable GERAN cell capability identity, which is controlled by the **GeranExternalCell.CsPsHOInd** parameter.

CS-only SRVCC

To trigger CS-only SRVCC, you must perform the following operations:

- Select the **GeranSrvccSwitch** option of the **ENodeBAlgoSwitch.HoModeSwitch** parameter.
- Select the **SRVCC** option of the **InterRatPolicyCfgGroup.GeranGsmHoCfg** parameter and the **SRVCC** option of the **InterRatPolicyCfgGroup.GeranGprsEdgeHoCfg** parameter. Set the **StandardQci.InterRatPolicyCfgGroupId** or **ExtendedQci.InterRatPolicyCfgGroupId** parameter to configure the handover policy for the corresponding QCI.

If services with different QCIs exist, the handover policy for the highest-priority QCI prevails. The handover policy priority of each QCI is controlled by the **CellStandardQCI.QciPriorityForHo** parameter. You are advised to set the handover policy priority of QCI 1 to 1 (highest) and that of QCI 5 to 9 (lowest).

 **NOTE**

- For mandatory handovers, for example, coverage-based and UL-quality-based handovers, SRVCC can be triggered when SRVCC is configured in the inter-RAT handover policy groups for the highest-priority QCI.
- For optional handovers, for example, load-based, service-based, and CSFB-based handovers, SRVCC can be triggered when SRVCC is configured in the inter-RAT handover policy groups for all QCIs.

3.3.3 Retry and Penalty

Table 3-2 describes retry and penalty mechanisms for SRVCC triggered by various causes.

Table 3-2 Retry and penalty mechanisms for SRVCC triggered by different features or functions

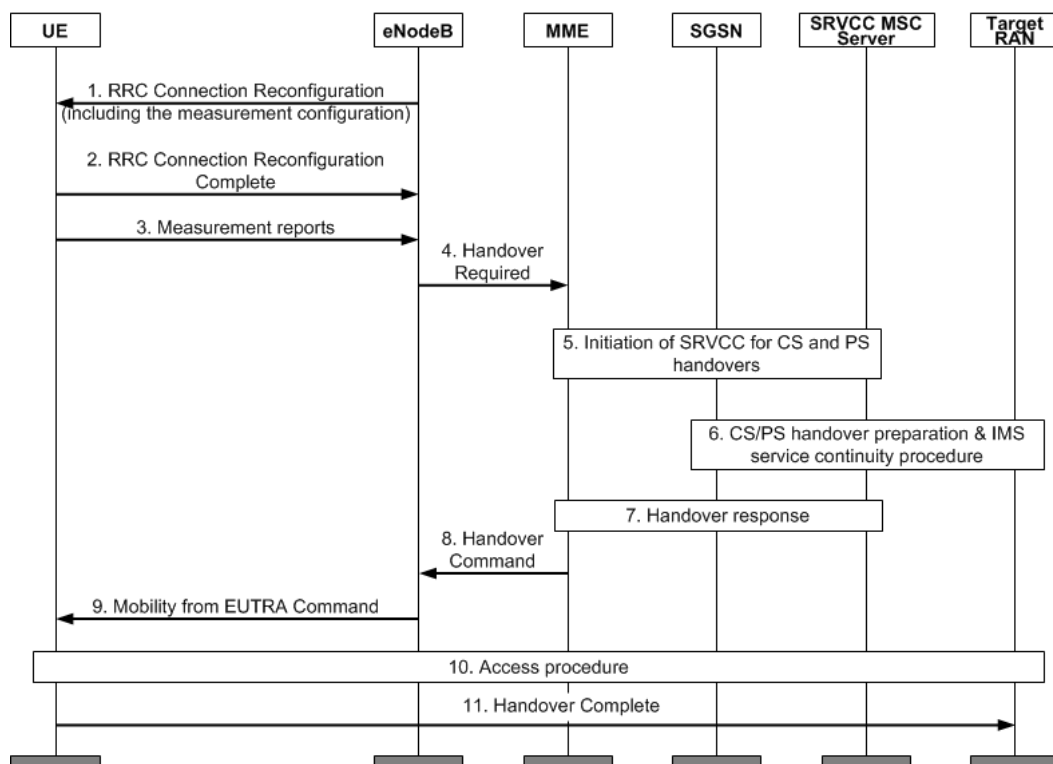
Triggering Cause	Retry and Penalty Mechanism
<ul style="list-style-type: none"> ● Coverage-based inter-RAT handover to UTRAN ● Service based inter-RAT handover from E-UTRAN to UTRAN ● Distance based Inter-RAT handover to UTRAN ● UL-quality-based inter-RAT handover to UTRAN ● Coverage-based inter-RAT handover to GERAN ● Service based inter-RAT handover to GERAN ● Distance based inter-RAT handover to GERAN ● UL-quality-based inter-RAT handover to GERAN ● SPID-based inter-RAT handover 	Mobility Management in Connected Mode
<ul style="list-style-type: none"> ● Load-based inter-RAT handover to UTRAN ● Load-based inter-RAT handover to GERAN 	Inter-RAT Mobility Load Balancing

4 Signaling Procedure

SRVCC Triggered by Common Causes

Figure 4-1 shows the signaling procedure for SRVCC from E-UTRAN to UTRAN. (The procedure for SRVCC from E-UTRAN to GERAN is the same.) (The procedure for SRVCC to GERAN is the same.) For details, see section 6.2 "E-UTRAN and 3GPP GERAN/UTRAN SRVCC" in 3GPP TS 23.216 V9.4.0.

Figure 4-1 Signaling procedure for SRVCC to UTRAN/GERAN



1. The eNodeB delivers the inter-RAT measurement configuration to the UE.
2. The UE responds to the eNodeB with an RRC Connection Reconfiguration Complete message.

3. After detecting that a neighboring cell meets the condition for triggering an inter-RAT handover, the UE sends a measurement report to the eNodeB.
4. The eNodeB determines that a handover should be performed and sends a Handover Required message containing an SRVCC HO Indication to the MME.
5. The MME splits voice bearers from non-voice bearers, and then transmits a Relocation Request message to both the MSC and the target SGSN.
6. After receiving the Relocation Request message, target SGSN prepares for a handover of PS services, which is the same as an inter-RAT PS handover procedure. The UE media plane is then transferred on the IMS.

 **NOTE**

If the value of the SRVCC HO Indication information element (IE) is "CS Only" in the Handover Required message sent from the eNodeB to the MME, the MME instructs only the MSC server to prepare for a handover. If the value of the SRVCC HO Indication IE is "PS and CS", the MME instructs both the MSC server and SGSN to prepare for a handover.

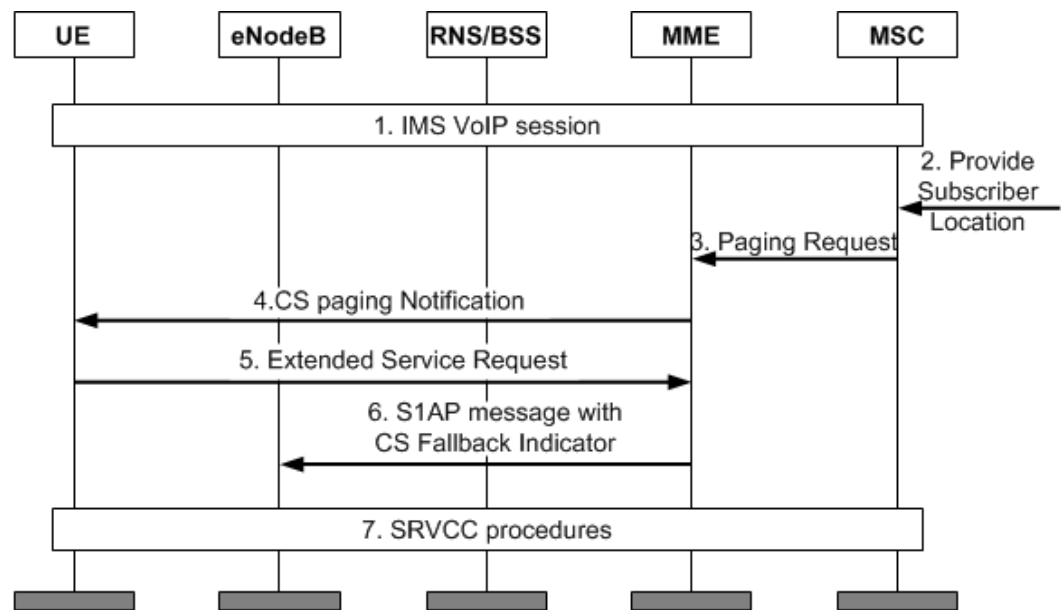
For a CS-only SRVCC procedure, if the target network is UTRAN, the PS services of the UE resume during a routing area update (RAU) procedure in the UTRAN. If the target network is GERAN, PS service handling depends on whether the UE and BSC support Dual Transfer Mode (DTM). If both the UE and BSC support DTM, the PS services of the UE resume during an RAU procedure in the GERAN. If either the UE or the BSC is DTM-incapable, the PS services of the UE are suspended.

7. The MME acts based on the following scenarios:
 - In the CS-only SRVCC scenario, the MME makes a response after receiving a handover preparation complete indication from the target MSC server.
 - In the CS+PS SRVCC scenario, the MME makes a response after receiving a handover preparation complete indication from the target MSC server or target SGSN.
8. The MME delivers a handover command to the eNodeB.
9. The eNodeB delivers a handover command to the UE.
10. After receiving the handover command, the UE accesses the target network.
11. The UE sends the target radio access network (RAN) a Handover Complete message, indicating that the handover procedure for SRVCC is complete.

LCS-based SRVCC

Figure 4-2 shows the signaling procedure for LCS-based SRVCC.

Figure 4-2 Signaling procedure for LCS-based SRVCC



Steps in the preceding figure are described as follows:

1. Steps 1 to 5: A CSFB procedure is triggered in an LCS-incapable E-UTRAN network when a UE performing VoIP services triggers an LCS. The procedure for CSFB to E-UTRAN is the same as that for CSFB to UTRAN. For details, see *CS Fallback Feature Parameter Description*.
2. Step 6: The MME sends an S1-AP message with a CS fallback indicator to the eNodeB. The eNodeB learns that the UE is performing VoIP services with a QIC of 1 and the S1-AP message is intended to hand over the UE to another LCS-capable network. Therefore, the eNodeB instructs the UE to measure the LCS-based system and select a target cell.
3. Step 7: The eNodeB determines the target cell and initiates an SRVCC procedure to hand over the UE to the inter-RAT cell that supports LCS.

5 Related Features

5.1 Features Related to TDLOFD-001022 SRVCC to UTRAN

Prerequisite Features

Feature ID	Feature Name	Description
TDLOFD-001019	PS Inter-RAT Mobility between E-UTRAN and UTRAN	CS+PS SRVCC depends on TDLOFD-001019 PS Inter-RAT Mobility between E-UTRAN and UTRAN.

Mutually Exclusive Features

None

Impacted Features

None

5.2 Features Related to TDLOFD-001023 SRVCC to GERAN

Prerequisite Features

None

Mutually Exclusive Features

None

Impacted Features

None

6 Network Impact

6.1 TDLOFD-001022 SRVCC to UTRAN

System Capacity

No impact.

Network Performance

If the target network of a CS-only SRVCC procedure is a UTRAN, only the bearer with QCI 1 is diverted to the CS domain of the target network. Bearers with other QCIs can be reestablished in the PS domain of the target network only after an RAU procedure. The CS-only SRVCC procedure results in a service interruption period of several seconds for PS services. However, the PS+CS SRVCC procedure has a service interruption period of only hundreds of milliseconds for PS services.

6.2 TDLOFD-001023 SRVCC to GERAN

System Capacity

No impact.

Network Performance

If the target network of a CS-only SRVCC procedure is a DTM-supporting GERAN, only the bearer with QCI 1 is diverted to the CS domain of the target network; bearers with other QCIs complete the RAU procedure and re-establish the PS service in the target network. Otherwise, the bearer with QCI 1 is diverted to GERAN using SRVCC and the PS service is suspended.

During SRVCC to GERAN, the function of releasing inter-frequency measurements after the GSM measurement is triggered improves the call drop rate in the following scenarios:

- The serving cell is not under inter-frequency coverage of an LTE network.
- The serving cell is under coverage of a GSM network.

- The signal of the serving cell attenuates quickly and maintains at least 2s.

This function may increase the call drop rate and the number of handovers to GSM, and decrease the number of inter-frequency handovers and number of reestablishments in the following scenarios:

- The serving cell is under inter-frequency coverage of an LTE network.
- The serving cell is under coverage of a GSM network.
- The signal of the serving cell attenuates quickly and maintains at most 3s.

7 Engineering Guidelines

7.1 TDLOFD-001022 SRVCC to UTRAN

7.1.1 When to Use SRVCC to UTRAN

Use SRVCC to UTRAN if the operator provides IMS-based VoLTE services in an E-UTRAN network and voice services in a legacy UTRAN CS network and while E-UTRANs are not fully deployed across the operator's coverage areas.

For details about when to use VoLTE, see *VoLTE Feature Parameter Description*.

7.1.2 Required Information

1. Operating frequencies, coverage areas, and configurations of E-UTRAN and UTRAN cells.
2. Versions and configurations of the NEs in the E-UTRAN, UTRAN, and core networks. Ensure that they all support SRVCC.
3. Operating frequency bands, supported measurement events, and SRVCC capabilities of UMTS+LTE UEs on live networks.

7.1.3 Process

To deploy SRVCC to UTRAN, you must complete the following steps:

1. Formulate a neighboring cell plan and configure the neighboring cells accordingly when both UMTS and LTE networks are deployed.
2. Configure parameters of handover thresholds related to SRVCC to UTRAN.
3. Prepare the license file related to SRVCC to UTRAN and configure feature switches related to SRVCC to UTRAN.

7.1.4 Requirements

Operating Environment

- For the Huawei EPC, the EPC version for eRAN6.0 is required. If the EPC version is not for eRAN6.0, messages may not be parsed.

- For a third party's EPC, the EPC must support SRVCC complying with 3GPP Release 8. Check that software versions for the EPC are correct.

License

The operator has purchased and activated the license for the feature listed in the following table.

Table 7-1 License control item for SRVCC to UTRAN

Feature ID	Feature Name	Model	License Control Item	NE	Sales Unit
TDLOFD-001022	SRVCC to UTRAN	LT1STR VCCU00	SRVCC to UTRAN	eNodeB	per RRC Connected User

NOTE

For SRVCC to UTRAN for combined services, if the UTRAN uses Huawei devices, corresponding licenses need to be activated on the UTRAN. For details, see the engineering guidelines for **WRFD-150215 SRVCC from LTE to UMTS with PS Handover** in *Interoperability Between UMTS and LTE Feature Parameter Description*.

7.1.5 Data Preparation and Feature Activation

7.1.5.1 Data Preparation

This section describes the data that you need to collect for setting parameters. Required data is data that you must collect for all scenarios. Collect scenario-specific data when necessary for a specific feature deployment scenario.

There are three types of data sources:

- Network plan (negotiation not required): parameter values planned and set by the operator
- Network plan (negotiation required): parameter values planned by the operator and negotiated with the EPC or peer transmission equipment
- User-defined: parameter values set by users

Required Data

Before configuring SRVCC to UTRAN, collect the data related to neighbor relationships with UTRAN cells. This section provides only the information about managed objects (MOs) related to neighboring UTRAN cells. For more information about how to collect data for the parameters in these MOs, see *Inter-RAT Mobility Management in Connected Mode*. Collect data for the parameters in the following MOs:

1. **UtranNFreq**: used to configure a neighboring UTRAN frequency.
2. **UtranExternalCell**: used to configure external UTRAN cells. If CS+PS SRVCC is enabled, you need to set the **UtranExternalCell.Rac** parameter.

3. **UtranExternalCellPlmn**: used to configure additional PLMN IDs for each shared external UTRAN cell. This MO is required only if the NodeB that serves the external UTRAN cell works in RAN sharing with common carriers mode and multiple operators share the external UTRAN cell.
4. **UtranNCell**: used to configure the neighboring relationship with a UTRAN cell.

Scenario-specific Data

The following table describes the parameter that must be set in the **CellHoParaCfg** MO to enable SRVCC to UTRAN.

Table 7-2 SRVCC to UTRAN switch

Parameter Name	Parameter ID	Data Source	Setting Notes
Handover Mode switch	CellHoParaCfg.HoModeSwitch	Network plan (negotiation not required)	To enable SRVCC to UTRAN, select the UtranSrvccSwitch(UtranSrvccSwitch) option of this parameter.

The following table describes the parameters that must be set in the **InterRatPolicyCfgGroup** MO to configure an inter-RAT handover policy group.

Table 7-3 Inter-RAT handover policy group

Parameter Name	Parameter ID	Data Source	Setting Notes
InterRAT policy config group ID	InterRatPolicyCfgGroup.InterRatPolicyCfgGroupId	Network plan (negotiation not required)	Set this parameter to the value of the StandardQci.InterRatPolicyCfgGroupId parameter described in Table 7-4 .
UTRAN handover policy configuration	InterRatPolicyCfgGroup.UtranHoCfg	Network plan (negotiation not required)	Select the SRVCC option of this parameter.
No handover flag	InterRatPolicyCfgGroup.NoHoFlag	Network plan (negotiation not required)	It is recommended that the default value be used if there is no special requirement for forbidding certain handovers.

The following table describes the parameters that must be set in the **StandardQci** MO to configure a QCI-based inter-RAT handover policy group.

Table 7-4 Inter-RAT handover policy group for a QCI

Parameter Name	Parameter ID	Data Source	Setting Notes
QoS Class Indication	StandardQci.Qci	Network plan (negotiation not required)	Set this parameter based on site conditions. For example, set this parameter to QC1(QCI 1) .
InterRAT policy config group ID	StandardQci.InterRatPolicyCfgGroupId	Network plan (negotiation not required)	Set this parameter to the value of the InterRatPolicyCfgGroup.InterRatPolicyCfgGroupId parameter described in Table 7-3 .

The following table describes the parameter that must be set in the **CellStandardQci** MO to configure the QCI priority used by each QCI-based handover algorithm.

Table 7-5 QCI priority for handovers

Parameter Name	Parameter ID	Data Source	Setting Notes
QCI Priority For Handover	CellStandardQci.QciPriorityForHo	Network plan (negotiation not required)	It is recommended that this parameter be set to the highest priority (1).

The following table describes the parameters that must be set to configure LCS-based SRVCC. If LCS is required when a UE is performing a service with a QCI of 1 in an E-UTRAN network that supports IMS but does not support LCS, the UE needs to fall back to a CS domain to perform LCS by using an SRVCC procedure.

Table 7-6 Parameters for LCS-based SRVCC

Parameter Name	Parameter ID	Data Source	Setting Notes
Handover Mode switch	ENodeBAlgoSwitch.HoModeSwitch	Network plan (negotiation not required)	Select the LcsSrvccSwitch(LcsSrvccSwitch) option of this parameter.
UTRAN LCS capability	CSFallbackBlindHoCfg.UtranLcsCap	Network plan (negotiation not required)	Set this parameter to ON(On) .

The following table describes the **SRVCC handover switch based on UE capability** parameter that must be set to exempt the eNodeB from checking whether the eNodeB obtains

the SRVCC feasibility indicator when the UE initiates SRVCC and the eNodeB cannot obtain the SRVCC feasibility indicator specified by the SRVCC Operation Possible IE.

The parameter is in the **GlobalProcSwitch** MO.

Table 7-7 SRVCC handover switch based on UE capability

Parameter Name	Parameter ID	Data Source	Setting Notes
SRVCC handover switch based on UE capability	GlobalProcSwitch.ProtocolMsgOptSwitch	Network plan (negotiation not required)	It is recommended that the SRVCCHoBasedUeCapSwitch option of the GlobalProcSwitch.ProtocolMsgOptSwitch parameter be selected when the UMTS-to-LTE PS HO feature is activated on the live network and UEs performing UMTS services do not report SRVCC capability information to the CN.

 **NOTE**

SRVCCHoBasedUeCapSwitch triggers SRVCC only based on the UE SRVCC capability. It is enabled on the premise that the CN supports SRVCC and the UE has STN-SR registration information when it is defined on the HSS.

7.1.5.2 Using the CME

For detailed operations, see CME-based Feature Configuration.

7.1.5.3 Using MML Commands

- Scenario 1: CS-only SRVCC to UTRAN

Step 1 Add neighboring UTRAN frequencies and neighbor relationships with UTRAN cells, and set parameters for inter-RAT measurements. For details about parameter settings, see *Inter-RAT Mobility Management in Connected Mode*.

Step 2 Run the **MOD CELLHOPARACFG** command with the **UtranSrvccSwitch(UtranSrvccSwitch)** option of the **Handover Mode switch** parameter selected.

 **NOTE**

This function is also controlled by the **UtranSrvccSwitch(UtranSrvccSwitch)** option of the eNodeB-level parameter **ENodeBAlgoSwitch.HoModeSwitch**.

If the option of the eNodeB-level parameter is selected, the option of the cell-level parameter does not take effect. If the option of the eNodeB-level parameter is cleared, the option of the cell-level parameter takes effect.

The eNodeB-level parameter will no longer be used in later versions. Therefore, you are advised to use the cell-level parameter.

- Step 3** Run the **MOD INTERRATPOLICYCFGGROUP** command with the **InterRAT policy config group ID** parameter set to **0**, with only the **SRVCC** option of the **UTRAN handover policy Configuration** parameter selected, and with the **No handover flag** parameter set to **PERMIT_HO_ENUM(Permit Ho)**.
- Step 4** Run the **MOD STANDARDQCI** command with the **InterRAT policy config group ID** parameter set to **0** for QCI 1.
- Step 5** Run the **MOD CELLSTANDARDQCI** command with the **QCI priority for handover** parameter specified for QCI 1 and run this command with the **QCI priority for handover** parameter specified for QCI 5. Ensure that the priority for QCI 1 is higher than that for QCI 5.
- Step 6** (Optional) Run the **MOD GLOBALPROCSWITCH** command with the **SRVCCHoBasedUeCapSwitch** option of the **Protocol Message Optimization Switch** parameter selected. The eNodeB triggers SRVCC only if the UE supports SRVCC.

----End

- Scenario 2: CS-and-PS SRVCC to UTRAN

- Step 1** Add neighboring UTRAN frequencies and neighbor relationships with UTRAN cells, and set parameters for inter-RAT measurements. For details about parameter settings, see *Inter-RAT Mobility Management in Connected Mode*.
- Step 2** Run the **MOD CELLHOPARACFG** command with the **UtranSrvccSwitch(UtranSrvccSwitch)** and **UtranPsHoSwitch(UtranPsHoSwitch)** options of the **Handover Mode switch** parameter selected.

 **NOTE**

In addition, this function is controlled by the **UtranSrvccSwitch(UtranSrvccSwitch)** option of the **ENodeBAlgoSwitch.HoModeSwitch** parameter.

If the option of the eNodeB-level parameter is selected, the option of the cell-level parameter does not take effect. If the option of the eNodeB-level parameter is cleared, the option of the cell-level parameter takes effect.

The eNodeB-level parameter will no longer be used in later versions. Therefore, you are advised to use the cell-level parameter.

- Step 3** Run the **MOD INTERRATPOLICYCFGGROUP** command with the **InterRAT policy config group ID** parameter set to **0**, with only the **SRVCC** and **PS_HO** options of the **UTRAN handover policy Configuration** parameter selected, and with the **No handover flag** parameter set to **PERMIT_HO_ENUM(Permit Ho)**.
- Step 4** Run the **MOD STANDARDQCI** command with the **InterRAT policy config group ID** parameter set to **0** for QCI 1.
- Step 5** Run the **MOD CELLSTANDARDQCI** command with the **QCI priority for handover** parameter specified for QCI 1 and run this command with the **QCI priority for handover** parameter specified for QCI 5. Ensure that the priority for QCI 1 is higher than that for QCI 5.

Step 6 Run the **MOD CnOperatorHoCfg** command with the **SrvccWithPsBasedCellCapSw** parameter set to **OFF(Off)**. Run the **MOD UTRANEXTERNALCELL** command with the **CsPsHOInd** parameter set to **YES**.

Step 7 (Optional) Run the **MOD GLOBALPROCSWITCH** command with the **SRVCCHoBasedUeCapSwitch** option of the **Protocol Message Optimization Switch** parameter selected. The eNodeB triggers SRVCC only if the UE supports SRVCC.

----End

- Scenario 3: LCS-based SRVCC to UTRAN. When CS-only SRVCC or CS+PS SRVCC is enabled, perform the following operations:

Step 1 Run the **MOD ENODEBALGOSWITCH** command with the **LcsSrvccSwitch** option of the **Handover Mode switch** parameter selected.

Step 2 Run the **MOD CSFALLBACKBLINDHOCFG** command with the **UTRAN LCS capability** parameter set to **ON(On)**.

----End

7.1.5.4 MML Command Examples

- Scenario 1: CS-only SRVCC to UTRAN

```
MOD CELLHOPARACFG: LocalCellId=0, HoModeSwitch=UtranSrvccSwitch-1;
MOD INTERRATPOLICYCFGGROUP: InterRatPolicyCfgGroupId=0,
UtranHoCfg=SRVCC-1&PS_HO-0&REDIRECTION-0, NoHoFlag=PERMIT_HO_ENUM-1;
MOD STANDARDQCI: Qci=QCI1, InterRatPolicyCfgGroupId=0;
MOD CELLSTANDARDQCI: LocalCellId=0, Qci=QCI1, QciPriorityForHo=1;
MOD CELLSTANDARDQCI: LocalCellId=0, Qci=QCI5, QciPriorityForHo=9;
MOD UTRANEXTERNALCELL: Mcc="460", Mnc="20", RncId=48, CellId=12,
RacCfgInd=CFG, Rac=89,CsPsHOInd=BOOLEAN_FALSE;
(Optional) MOD GLOBALPROCSWITCH:
ProtocolMsgOptSwitch=SRVCCHoBasedUeCapSwitch-1;
```

- Scenario 2: CS-and-PS SRVCC to UTRAN

```
MOD CELLHOPARACFG:
LocalCellId=0, HoModeSwitch=UtranPsHoSwitch-1&UtranSrvccSwitch-1;
MOD INTERRATPOLICYCFGGROUP: InterRatPolicyCfgGroupId=0,
UtranHoCfg=PS_HO-1&SRVCC-1&REDIRECTION-0, NoHoFlag=PERMIT_HO_ENUM-1;
MOD STANDARDQCI: Qci=QCI1, InterRatPolicyCfgGroupId=0;
MOD CELLSTANDARDQCI: LocalCellId=0, Qci=QCI1, QciPriorityForHo=1;
MOD CELLSTANDARDQCI: LocalCellId=0, Qci=QCI5, QciPriorityForHo=9;
MOD UTRANEXTERNALCELL: Mcc="460", Mnc="20", RncId=48, CellId=12,
RacCfgInd=CFG, Rac=89,CsPsHOInd=BOOLEAN_TRUE;
(Optional) MOD GLOBALPROCSWITCH:
ProtocolMsgOptSwitch=SRVCCHoBasedUeCapSwitch-1;
```

- Scenario 3: LCS-based SRVCC to UTRAN

```
MOD ENODEBALGOSWITCH: HoModeSwitch=LcsSrvccSwitch-1;
MOD CSFALLBACKBLINDHOCFG: UtranLcsCap=ON;
```

7.1.6 Activation Observation

Tracing Signaling Messages of a Single UE

Perform standard S1 interface tracing for a single UE. If the traced Handover Required message, as shown in [Figure 7-1](#), contains the SRVCC HO Indication IE, SRVCC to UTRAN has been activated.

Figure 7-1 SRVCC HO Indication IE contained in the Handover Required message

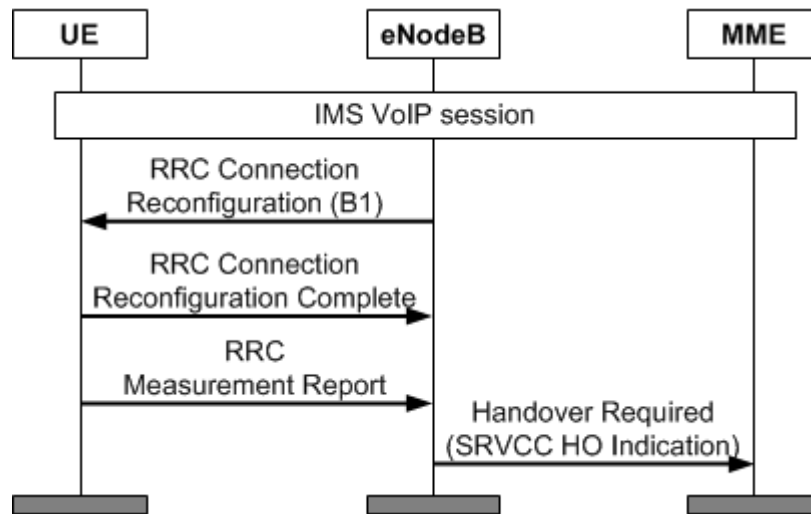


Figure 7-2 CS-and-PS SRVCC signaling tracing

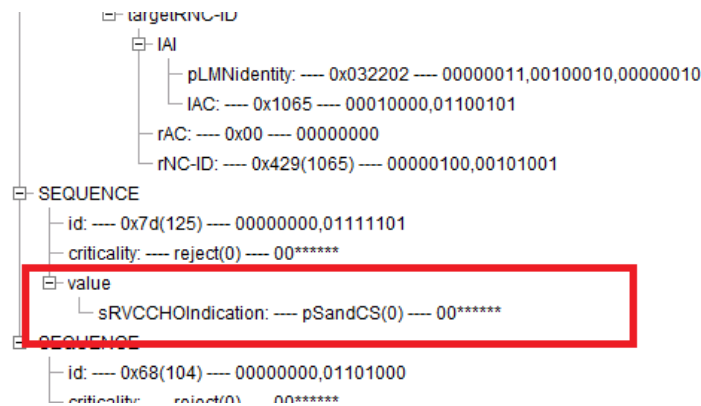
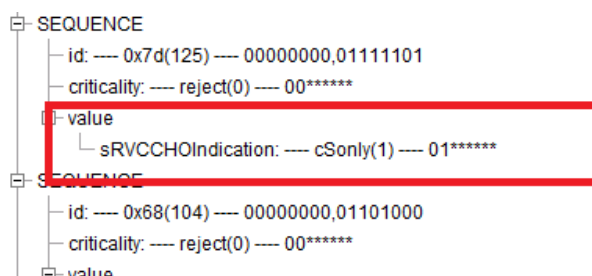


Figure 7-3 CS-only SRVCC signaling tracing



Performance Counter

Observe the counters described in [Table 7-8](#). If the value of a counter is not 0, the related feature or function has been activated.

Table 7-8 SRVCC-related counters

Feature/Function	Counter ID	Counter Name	Counter Description
SRVCC to UTRAN	1526728400	L.IRATHO.SRVC C.E2W.PrepareAttOut	Number of EUTRAN-to-WCDMA handover attempts for SRVCC
SRVCC to UTRAN	1526728401	L.IRATHO.SRVC C.E2W.ExecAttOut	Number of SRVCC-based outgoing handover executions from E-UTRAN to WCDMA network for ultra-flash CSFB
SRVCC to UTRAN	1526728402	L.IRATHO.SRVC C.E2W.ExecSuccessOut	Number of successful EUTRAN-to-WCDMA handovers for SRVCC

7.1.7 Deactivation

Table 7-9 provides the parameter used to deactivate this feature.

Table 7-9 Parameters for SRVCC to UTRAN

MO	Parameter Group	Setting Notes
CellAlgoSwitch	HoModeSwitch	Set UtranSrvccSwitch under the HoModeSwitch parameter to 0 .

This feature can be deactivated using the CME or MML commands.

7.1.7.1 Using the CME

For detailed operations, see CME-based Feature Configuration.

7.1.7.2 Using MML Commands

Run the **MOD CELLALGOSWITCH** command with the **UtranSrvccSwitch(UtranSrvccSwitch)** option of the **Handover Mode switch** parameter cleared.

7.1.7.3 MML Command Examples

```
MOD CELLALGOSWITCH: LocalCellId=0, HoModeSwitch=UtranSrvccSwitch=0;
```

7.1.8 Performance Monitoring

Table 7-10 lists the performance counters for monitoring SRVCC to UTRAN. For the voice interruption delay and PS service interruption delay, you need to obtain and analyze logs on the UE side.

Table 7-10 Performance counters for monitoring SRVCC to UTRAN

Counter ID	Counter Name	Description
1526728400	L.IRATHO.SRVCC.E2W.PrepAttOut	Number of EUTRAN-to-WCDMA handover attempts for SRVCC
1526728401	L.IRATHO.SRVCC.E2W.ExecAttOut	Number of EUTRAN-to-WCDMA handover executions for SRVCC
1526728402	L.IRATHO.SRVCC.E2W.ExecSuccOut	Number of successful EUTRAN-to-WCDMA handovers for SRVCC
1526728406	L.IRATHO.SRVCC.E2T.PrepAttOut	Number of EUTRAN-to-TDSCDMA handover attempts for SRVCC
1526728407	L.IRATHO.SRVCC.E2T.ExecAttOut	Number of EUTRAN-to-TDSCDMA handover executions for SRVCC
1526728408	L.IRATHO.SRVCC.E2T.ExecSuccOut	Number of successful EUTRAN-to-TDSCDMA handovers for SRVCC
1526728894	L.IRATHO.SRVCC.E2W.MMEAbnormRsp	Number of responses for abnormal causes received by the eNodeB from the MME during inter-RAT handover executions from E-UTRAN to WCDMA network for SRVCC
1526728896	L.IRATHO.SRVCC.E2T.MMEAbnormRsp	Number of responses for abnormal causes received by the eNodeB from the MME during inter-RAT handover executions from E-UTRAN to TD-SCDMA network for SRVCC

Table 7-11 lists the performance counters for monitoring LCS-based SRVCC when UEs are running services with QCI 1.

Table 7-11 Performance counters for monitoring LCS-based SRVCC

Counter ID	Counter Name	Description
1526728409	L.CSFB.LCS.PrepAtt	Number of LCS-triggered CS fallback indicators received by the eNodeB

Counter ID	Counter Name	Description
1526728410	L.CSFB.LCS.PrepSucc	Number of responses sent from the eNodeB to MMEs for CSFB triggered by LCS
1526728753	L.IRATHO.SRVCC.LCS.E2W.PrepAttOut	Number of LCS-based EUTRAN-to-WCDMA handover attempts for SRVCC
1526728754	L.IRATHO.SRVCC.LCS.E2W.ExecAttOut	Number of LCS-based EUTRAN-to-WCDMA handover executions for SRVCC
1526728755	L.IRATHO.SRVCC.LCS.E2W.ExecSuccOut	Number of successful LCS-based EUTRAN-to-WCDMA handovers for SRVCC
1526728759	L.IRATHO.SRVCC.LCS.E2T.PrepAttOut	Number of LCS-based EUTRAN-to-TDSCDMA handover attempts for SRVCC
1526728760	L.IRATHO.SRVCC.LCS.E2T.ExecAttOut	Number of LCS-based EUTRAN-to-TDSCDMA handover executions for SRVCC
1526728761	L.IRATHO.SRVCC.LCS.E2T.ExecSuccOut	Number of successful LCS-based EUTRAN-to-TDSCDMA handovers for SRVCC

Table 7-12 lists the performance counters for monitoring SRVCC triggered for emergency calls.

Table 7-12 Performance counters for monitoring SRVCC triggered for emergency calls

Counter ID	Counter Name	Description
1526729517	L.EMC.SRVCC.E2W.PrepAttOut	Number of EUTRAN-to-WCDMA handover attempts for SRVCC triggered for emergency calls
1526729518	L.EMC.SRVCC.E2W.ExecAttOut	Number of EUTRAN-to-WCDMA handover executions for SRVCC triggered for emergency calls
1526729519	L.EMC.SRVCC.E2W.ExecSuccOut	Number of successful EUTRAN-to-WCDMA handovers for SRVCC triggered for emergency calls

Counter ID	Counter Name	Description
1526729523	L.EMC.SRVCC.E2T.PreAttOut	Number of EUTRAN-to-TDSCDMA handover attempts for SRVCC triggered for emergency calls
1526729524	L.EMC.SRVCC.E2T.ExecAttOut	Number of EUTRAN-to-TDSCDMA handover executions for SRVCC triggered for emergency calls
1526729525	L.EMC.SRVCC.E2T.ExecSuccOut	Number of successful EUTRAN-to-TDSCDMA handovers for SRVCC triggered for emergency calls

Calculate SRVCC preparation and execution success rates. If the results do not meet the SRVCC performance requirements of an operator, fault isolation and diagnosis are required. Take monitoring the performance of SRVCC to UTRAN as an example. The formulas for calculating other success rates are similar to the following:

- $(L.IRATHO.SRVCC.E2W.ExecSuccOut - L.IRATHO.SRVCC.E2W.MMEAbnormRsp) / L.IRATHO.SRVCC.E2W.ExecAttOut$
- $L.IRATHO.SRVCC.E2W.ExecAttOut / L.IRATHO.SRVCC.E2W.PreAttOut$

7.1.9 Parameter Optimization

Different event A2 or B1 thresholds for VoIP and other services can be set to achieve flexible control.

The following table lists threshold parameters:

Event A2 Threshold	Event B1 Threshold
InterRatHoCommGroup.InterRatHoA2ThdRsrp	InterRatHoUtranGroup.InterRatHoUtranB1ThdEcn0
InterRatHoCommGroup.InterRatHoA2ThdRsrq	InterRatHoUtranGroup.InterRatHoUtranB1ThdRscp

A larger event A2 threshold indicates a higher probability of triggering SRVCC, improving the SRVCC handover success rate and decreasing the call drop rate. A smaller value results in the opposite effects.

A larger event B1 threshold indicates a lower probability of triggering SRVCC to UTRAN, improving the handover success rate and increasing the call drop rate. A smaller value results in the opposite effects.

7.2 TDLOFD-001023 SRVCC to GERAN

7.2.1 When to Use SRVCC to GERAN

Use SRVCC to GERAN if the operator provides IMS-based VoLTE services in an E-UTRAN network and voice services in a legacy GERAN CS network and while E-UTRANs are not fully deployed across the operator's coverage areas.

For details about when to use VoLTE, see *VoLTE Feature Parameter Description*.

7.2.2 Required Information

1. Operating frequencies, coverage areas, and configurations of E-UTRAN and GERAN cells.
2. Versions and configurations of the NEs in the E-UTRAN, GERAN, and core networks. Ensure that they all support SRVCC.
3. Operating frequency bands, supported measurement events, and SRVCC capabilities of GSM+LTE UEs on live networks.

7.2.3 Process

To deploy SRVCC to GERAN, you must complete the following steps:

- Formulate a neighboring cell plan and configure the neighboring cells accordingly when both GSM and LTE networks are deployed.
- Configure parameters of handover thresholds related to SRVCC to GERAN.
- Prepare the license file related to SRVCC to GERAN and configure algorithm switches related to SRVCC to GERAN.

7.2.4 Requirements

Operating Environment

- For the Huawei EPC, the EPC version for eRAN6.0 is required. If the EPC version is not for eRAN6.0, messages may not be parsed.
- For a third party's EPC, SRVCC complying with 3GPP Release 8 must be supported. Check that software versions for the EPC are correct.

License

The operator has purchased and activated the license for the feature listed in the following table.

Table 7-13 License control item for SRVCC to GERAN

Feature ID	Feature Name	Model	License Control Item	NE	Sales Unit
TDLOFD-01023	SRVCC to GERAN	LT1STRV CCG00	SRVCC to GERAN (TDD)	eNodeB	Number of RRC Connected Users

7.2.5 Data Preparation and Feature Activation

7.2.5.1 Data Preparation

This section describes the data that you need to collect for setting parameters. Required data is data that you must collect for all scenarios. Collect scenario-specific data when necessary for a specific feature deployment scenario.

There are three types of data sources:

- Network plan (negotiation not required): parameter values planned and set by the operator
- Network plan (negotiation required): parameter values planned by the operator and negotiated with the EPC or peer transmission equipment
- User-defined: parameter values set by users

Required Data

Before configuring SRVCC to GERAN, collect the data related to neighbor relationships with GERAN cells. This section provides only the information about MOs related to neighboring GERAN cells. For more information about how to collect data for the parameters in these MOs, see *Inter-RAT Mobility Management in Connected Mode Feature Parameter Description*. Collect data for the parameters in the following MOs:

1. Collect data for the parameters in the following MOs: **GeranNfreqGroup**: used to configure GERAN carrier frequency groups.
2. **GeranNfreqGroupArfcn**: used to configure absolute radio frequency channel numbers (ARFCNs) in each GERAN carrier frequency group.
3. **GeranExternalCell**: used to configure external GERAN cells. If CS+PS SRVCC is enabled, you need to set the **GeranExternalCell.Rac** and **GeranExternalCell.CsPsHOInd** parameters.
4. (Optional) **GeranExternalCellPlmn**: used to configure additional PLMN IDs for each shared external GERAN cell. This MO is required only if the BTS that serves the external GERAN cell works in RAN sharing with common carriers mode and multiple operators share the external GERAN cell.
5. **GeranNcell**: used to configure neighbor relationships with GERAN cells.

Scenario-specific Data

The following table describes the parameter that must be set in the **CellHoParaCfg** MO to enable SRVCC to GERAN.

Table 7-14 SRVCC to GERAN switch

Parameter Name	Parameter ID	Data Source	Setting Notes
Handover Mode switch	CellHoParaCfg.HoModeSwitch	Network plan (negotiation not required)	To enable SRVCC to GERAN, select the GeranSrvccSwitch(GeranSrvccSwitch) option of this parameter.

The following table describes the parameters that must be set in the **InterRatPolicyCfgGroup** MO to configure an inter-RAT handover policy group.

Table 7-15 Inter-RAT handover policy group

Parameter Name	Parameter ID	Data Source	Setting Notes
InterRAT policy config group ID	InterRatPolicyCfgGroup.InterRatPolicyCfgGroupId	Network plan (negotiation not required)	Set this parameter to the value of the StandardQci.InterRatPolicyCfgGroupId parameter described in Table 7-16 .
GERAN GSM handover policy Configuration	InterRatPolicyCfgGroup.GeranGsmHoCfg	Network plan (negotiation not required)	Select the SRVCC option of this parameter.
GERAN GPRS EDGE handover policy Configuration	InterRatPolicyCfgGroup.GeranGprsEdgeHoCfg	Network plan (negotiation not required)	Select the SRVCC option of this parameter.
No handover flag	InterRatPolicyCfgGroup.NoHoFlag	Network plan (negotiation not required)	It is recommended that the default value be used if there is no special requirement for forbidding certain handovers.

The following table describes the parameters that must be set in the **StandardQci** MO to configure a QCI-based inter-RAT handover policy group.

Table 7-16 Inter-RAT handover policy group for a QCI

Parameter Name	Parameter ID	Data Source	Setting Notes
QoS Class Indication	StandardQci.Qci	Network plan (negotiation not required)	Set this parameter based on site conditions. For example, set this parameter to QCI1(QCI 1) .

Parameter Name	Parameter ID	Data Source	Setting Notes
InterRAT policy config group ID	StandardQci.InterRatPolicyCfgGroupId	Network plan (negotiation not required)	Set this parameter to the value of the InterRatPolicyCfgGroup.InterRatPolicyCfgGroupId parameter described in Table 7-15 .

The following table describes the parameter that must be set in the **CellStandardQci** MO to configure the QCI priority used by each QCI-based handover algorithm.

Table 7-17 QCI priority for handovers

Parameter Name	Parameter ID	Data Source	Setting Notes
QCI Priority For Handover	CellStandardQci.QciPriorityForHo	Network plan (negotiation not required)	It is recommended that this parameter be set to the highest priority (1).

The following table describes the parameters that must be set to configure LCS-based SRVCC. If LCS is required when a UE is performing a service with a QCI of 1 in an E-UTRAN network that supports IMS but does not support LCS, the UE needs to fall back to a CS domain to perform LCS by using an SRVCC procedure.

Table 7-18 Parameters for LCS-based SRVCC

Parameter Name	Parameter ID	Data Source	Setting Notes
Handover Mode switch	ENodeBAlgoSwitch.HoModeSwitch	Network plan (negotiation not required)	Select the LcsSrvccSwitch(LcsSrvccSwitch) option of this parameter.
GERAN LCS capability	CSFallbackBlindHoCfg.GeranLcsCap	Network plan (negotiation not required)	Set this parameter to ON(On) .

The following table describes the parameter that must be set in the **CellAlgoSwitch** MO to select the **GSM_MEAS_DEL_INTERFREQ_SW** option.

Parameter Name	Parameter ID	Data Source	Setting Notes
Measurement Optimization Algorithm Switch	CellAlgoSwitch.MeasOptAlgoSwitch	Network plan (negotiation not required)	Select the GSM_MEAS_DEL_INTERFREQ_SW option.

The following table describes the **SRVCC handover switch based on UE capability** parameter that must be set to exempt the eNodeB from checking whether the eNodeB obtains the SRVCC feasibility indicator when the UE initiates SRVCC and the eNodeB cannot obtain the SRVCC feasibility indicator specified by the SRVCC Operation Possible IE.

The parameter is in the **GlobalProcSwitch** MO.

Table 7-19 SRVCC handover switch based on UE capability

Parameter Name	Parameter ID	Data Source	Setting Notes
SRVCC handover switch based on UE capability	GlobalProcSwitch.ProtocolMsgOptSwitch	Network plan (negotiation not required)	It is recommended that the SRVCCHoBasedUeCapSwitch option of the GlobalProcSwitch.ProtocolMsgOptSwitch parameter be selected when the GSM-to-LTE PS HO feature is activated on the live network and UEs performing UMTS services do not report SRVCC capability information to the CN.

 **NOTE**

SRVCCHoBasedUeCapSwitch triggers SRVCC only based on the UE SRVCC capability. It is enabled on the premise that the CN supports SRVCC and the UE has STN-SR registration information when it is defined on the HSS.

7.2.5.2 Using the CME

For detailed operations, see CME-based Feature Configuration.

7.2.5.3 Using MML Commands

- Scenario 1: CS-only SRVCC to GERAN

Step 1 Add neighboring GERAN frequencies and neighbor relationships with GERAN cells, and set parameters for inter-RAT measurements. For details about parameter settings, see *Inter-RAT Mobility Management in Connected Mode*.

Step 2 Run the **MOD CELLALGOSWITCH** command with the **GeranSrvccSwitch(GeranSrvccSwitch)** option of the **Handover Mode switch** parameter selected.

 **NOTE**

In addition, this function is controlled by the **GeranSrvccSwitch(GeranSrvccSwitch)** option of the **ENodeBAlgoSwitch.HoModeSwitch** parameter.

If the option of the eNodeB-level parameter is selected, the option of the cell-level parameter does not take effect. If the option of the eNodeB-level parameter is cleared, the option of the cell-level parameter takes effect.

The eNodeB-level parameter will no longer be used in later versions. Therefore, you are advised to use the cell-level parameter.

Step 3 Run the **MOD INTERRATPOLICYCFGGROUP** command with the **InterRAT policy config group ID** parameter set to **0**, with the **SRVCC** option of the **GERAN GSM handover policy Configuration** parameter selected, with only the **SRVCC** option of the **GERAN GPRS EDGE handover policy Configuration** parameter selected, and with the **No handover flag** parameter set to **PERMIT_HO_ENUM(Permit Ho)**.

Step 4 Run the **MOD STANDARDQCI** command with the **InterRAT policy config group ID** parameter set to **0** for QCI 1.

Step 5 Run the **MOD CELLSTANDARDQCI** command with the **QCI priority for handover** parameter specified for QCI 1 and QCI 5. Ensure that the priority for QCI 1 is higher than that for QCI 5.

Step 6 (Optional) Run the **MOD GlobalProcSwitch** command with the **IratMeasCfgTransSwitch** option of the **Protocol Message Optimization Switch** parameter selected for fast return from GERAN to E-UTRAN after SRVCC to take effect.

Step 7 (Optional) Run the **MOD GLOBALPROCSWITCH** command with the **SRVCCHoBasedUeCapSwitch** option of the **Protocol Message Optimization Switch** parameter selected. The eNodeB triggers SRVCC only if the UE supports SRVCC.

Step 8 (Optional and required when some operators or neighboring GERAN cells do not support SRVCC to GERAN) Run the **ADD GERANNETWORKCAPCFG** command with the **SrvccCapCfg** option of the **NetworkCapCfg** parameter cleared and with the **Mcc**, **Mnc**, and **Lac** parameters set.

Step 9 (Optional) Run the **MOD CELLALGOSWITCH** command with the **GeranSepOpMobilitySwitch(GeranSepOpMobilitySwitch)** option of the **Handover Allowed Switch** parameter selected.

---End

- Scenario 2: CS+PS SRVCC to GERAN

Step 1 Add neighboring GERAN frequencies and neighbor relationships with GERAN cells, and set parameters for inter-RAT measurements. For details about parameter settings, see *Inter-RAT Mobility Management in Connected Mode*.

Step 2 Run the **MOD CELLHOPARACFG** command with the **UtranSrvccSwitch(UtranSrvccSwitch)** and **UtranPsHoSwitch(UtranPsHoSwitch)** options of the **Handover Mode switch** parameter selected.

 **NOTE**

In addition, this function is controlled by the **GeranSrvccSwitch(GeranSrvccSwitch)** option of the **ENodeBAlgoSwitch.HoModeSwitch** parameter.

If the option of the eNodeB-level parameter is selected, the option of the cell-level parameter does not take effect. If the option of the eNodeB-level parameter is cleared, the option of the cell-level parameter takes effect.

The eNodeB-level parameter will no longer be used in later versions. Therefore, you are advised to use the cell-level parameter.

- Step 3** Run the **MOD ENODEBALGOSWITCH** command with the **GeranPsHoSwitch(GeranPsHoSwitch)** option of the **Handover Mode switch** parameter selected.
- Step 4** Run the **MOD INTERRATPOLICYCFGGROUP** command with the **InterRAT policy config group ID** parameter set to **0**, with the **SRVCC** option of the **GERAN GSM handover policy Configuration** parameter selected, with only the **SRVCC** and **PS_HO** options of the **GERAN GPRS EDGE handover policy Configuration** parameter selected, and with the **No handover flag** parameter set to **PERMIT_HO_ENUM(Permit Ho)**.
- Step 5** Run the **MOD STANDARDQCI** command with the **InterRAT policy config group ID** parameter set to **0** for QCI 1.
- Step 6** Run the **MOD CELLSTANDARDQCI** command with the **QCI priority for handover** parameter specified for QCI 1 and QCI 5. Ensure that the priority for QCI 1 is higher than that for QCI 5.
- Step 7** Run the **MOD GERANEXTERNALCELL** command with the **CS and PS handover indicator** parameter set to **BOOLEAN_TRUE(True)**.
- Step 8** (Optional) Run the **MOD GlobalProcSwitch** command with the **IratMeasCfgTransSwitch** option of the **Protocol Message Optimization Switch** parameter selected for fast return from GERAN to E-UTRAN after SRVCC to take effect.
- Step 9** (Optional) Run the **MOD GLOBALPROCSWITCH** command with the **SRVCCHoBasedUeCapSwitch** option of the **Protocol Message Optimization Switch** parameter selected. The eNodeB triggers SRVCC only if the UE supports SRVCC.
- Step 10** (Optional and required when some operators or neighboring GERAN cells do not support SRVCC to GERAN) Run the **ADD GERANNETWORKCAPCFG** command with the **SrvccCapCfg** option of the **NetworkCapCfg** parameter cleared and with the **Mcc**, **Mnc**, and **Lac** parameters set.
- Step 11** (Optional) Run the **MOD CELLALGOSWITCH** command with the **GeranSepOpMobilitySwitch(GeranSepOpMobilitySwitch)** option of the **Handover Allowed Switch** parameter selected.

----End

- Scenario 3: LCS-based SRVCC to GERAN

- Step 1** Run the **MOD ENODEBALGOSWITCH** command with the **LcsSrvccSwitch** option of the **Handover Mode switch** parameter selected.
- Step 2** Run the **MOD CSFALLBACKBLINDHOCFG** command with the **GERAN LCS capability** parameter set to **ON(On)**.
- Step 3** (Optional and required when some operators or neighboring GERAN cells do not support SRVCC to GERAN) Run the **ADD GERANNETWORKCAPCFG** command with the

SrvccCapCfg option of the **NetworkCapCfg** parameter cleared and with the **Mcc**, **Mnc**, and **Lac** parameters set.

Step 4 (Optional) Run the **MOD CELLALGOSWITCH** command with the **GeranSepOpMobilitySwitch(GeranSepOpMobilitySwitch)** option of the **Handover Allowed Switch** parameter selected.

----End

7.2.5.4 MML Command Examples

- Scenario 1: CS-only SRVCC to GERAN

```
MOD CELLALGOSWITCH: LocalCellId=0, HoModeSwitch=GeranSrvccSwitch-1;
MOD INTERRATPOLICYCFGGROUP: InterRatPolicyCfgGroupId=0,
GeranGsmHoCfg=SRVCC-1, GeranGprsEdgeHoCfg=SRVCC-1&PS_HO-0&REDIRECTION-0,
NoHoFlag=PERMIT_HO_ENUM-1;
MOD STANDARDQCI: Qci=QCI1, InterRatPolicyCfgGroupId=0;
MOD CELLSTANDARDQCI: LOCALCELLID=0, QCI=QCI1, QCIPRIORITYFORHO=1;
MOD CELLSTANDARDQCI: LOCALCELLID=0, QCI=QCI5, QCIPRIORITYFORHO=9;
MOD GERANEXTERNALCELL: Mcc="460", Mnc="20", GeranCellId=15, Lac=12,
RacCfInd=NOT_CFG, BandIndicator=GSM_dcs1800, CsPsHOInd=BOOLEAN_FALSE;
MOD GlobalProcSwitch: ProtocolMsgOptSwitch=IratMeasCfgTransSwitch-1;
(Optional) MOD GLOBALPROCSWITCH:
ProtocolMsgOptSwitch=SRVCCoBasedUeCapSwitch-1;
```

- Scenario 2: CS+PS SRVCC to GERAN

```
MOD CELLALGOSWITCH: LocalCellId=0, HoModeSwitch=GeranSrvccSwitch-1;
MOD ENODEBALGOSWITCH: HoModeSwitch=GeranPsHoSwitch-1;
MOD INTERRATPOLICYCFGGROUP: InterRatPolicyCfgGroupId=0,
GeranGsmHoCfg=SRVCC-1, GeranGprsEdgeHoCfg=PS_HO-1&SRVCC-1&REDIRECTION-0,
NoHoFlag=PERMIT_HO_ENUM-1;
MOD STANDARDQCI: Qci=QCI1, InterRatPolicyCfgGroupId=0;
MOD CELLSTANDARDQCI: LOCALCELLID=0, QCI=QCI1, QCIPRIORITYFORHO=1;
MOD CELLSTANDARDQCI: LOCALCELLID=0, QCI=QCI5, QCIPRIORITYFORHO=9;
MOD GERANEXTERNALCELL: Mcc="460", Mnc="20", GeranCellId=15, Lac=12,
RacCfInd=CFG, BandIndicator=GSM_dcs1800, CsPsHOInd=BOOLEAN_TRUE;
MOD GlobalProcSwitch: ProtocolMsgOptSwitch=IratMeasCfgTransSwitch-1;
(Optional) MOD GLOBALPROCSWITCH:
ProtocolMsgOptSwitch=SRVCCoBasedUeCapSwitch-1;
```

- Scenario 3: LCS-based SRVCC to GERAN

```
MOD ENODEBALGOSWITCH: HoModeSwitch=LcsSrvccSwitch-1;
MOD CSFALLBACKBLINDHOCFG: GeranLcsCap=ON;
```

7.2.6 Activation Observation

You can observe feature activation by tracing the signaling messages of a single UE and observing performance counters. Tracing the signaling messages of a single UE for SRVCC to GERAN is the same as that for SRVCC to UTRAN. For details, see [7.1.6 Activation Observation](#).

Observe the counters described in [Table 7-20](#). If the value of a counter is not 0, the related feature or function has been activated.

Table 7-20 Mapping between counters and features/functions

Feature/Function	Counter ID	Counter Name	Counter Description
SRVCC to GERAN	1526728403	L.IRATHO.SRVC C.E2G.PrepAttOut	Number of inter-RAT handover attempts from E-UTRAN to GERAN for SRVCC
CS-only SRVCC	1526730097	L.IRATHO.SRVC C.CSonly.E2G.Pre pAttOut	Number of CS-only SRVCC-based outgoing handover attempts from E-UTRAN to GERAN

7.2.7 Deactivation

Table 7-21 provides the parameter used to deactivate this feature.

Table 7-21 Parameters for SRVCC to GERAN

MO	Sheet in the Summary Data File	Parameter Group	Remarks
CellAlgoSwitch	User-defined sheet. CellAlgoSwitch is recommended.	HoModeSwitch	Set GeranSrvccSwitch under the HoModeSwitch parameter to 0 .

This feature can be deactivated using the CME or MML commands.

7.2.7.1 Using the CME

For detailed operations, see CME-based Feature Configuration.

7.2.7.2 Using MML Commands

Run the **MOD CELLALGOSWITCH** command with the **GeranSrvccSwitch(GeranSrvccSwitch)** option of the **Handover Mode switch** parameter cleared.

7.2.7.3 MML Command Examples

```
MOD CELLALGOSWITCH: LocalCellId=0, HoModeSwitch=GeranSrvccSwitch=0;
```

7.2.8 Performance Monitoring

Table 7-22 lists the performance counters for monitoring SRVCC to GERAN.

Table 7-22 Performance counters for monitoring SRVCC to GERAN

Counter ID	Counter Name	Description
1526728403	L.IRATHO.SRVCC.E2G.PrepAttOut	Number of inter-RAT handover attempts from E-UTRAN to GERAN for SRVCC
1526728404	L.IRATHO.SRVCC.E2G.ExecAttOut	Number of inter-RAT handover executions from E-UTRAN to GERAN for SRVCC
1526728405	L.IRATHO.SRVCC.E2G.ExecSuccOut	Number of successful inter-RAT handovers from E-UTRAN to GERAN for SRVCC
1526728895	L.IRATHO.SRVCC.E2G.MMEAbnormRsp	Number of responses for abnormal causes received by the eNodeB from the MME during inter-RAT handover executions from E-UTRAN to GERAN for SRVCC

Table 7-23 lists the performance counters for monitoring LCS-based SRVCC when UEs are performing services with a QCI of 1.

Table 7-23 Performance counters for monitoring LCS-based SRVCC

Counter ID	Counter Name	Description
1526728409	L.CSFB.LCS.PrepAtt	Number of LCS-triggered CS fallback indicators received by the eNodeB
1526728410	L.CSFB.LCS.PrepSucc	Number of responses sent from the eNodeB to MMEs for CSFB triggered by LCS
1526728756	L.IRATHO.SRVCC.LCS.E2G.PrepAttOut	Number of CSFB-based handover attempts from E-UTRAN to GERAN for SRVCC
1526728757	L.IRATHO.SRVCC.LCS.E2G.ExecAttOut	Number of CSFB-based handover executions from E-UTRAN to GERAN for SRVCC
1526728758	L.IRATHO.SRVCC.LCS.E2G.ExecSuccOut	Number of successful CSFB-based handovers from E-UTRAN to GERAN for SRVCC

Table 7-24 lists the performance counters for monitoring SRVCC triggered for emergency calls.

Table 7-24 Performance counters for monitoring SRVCC triggered for emergency calls

Counter ID	Counter Name	Description
1526729520	L.EMC.SRVCC.E2G.PreAttOut	Number of handover attempts from E-UTRAN to GERAN for SRVCC triggered for emergency calls
1526729521	L.EMC.SRVCC.E2G.ExecAttOut	Number of handover executions from E-UTRAN to GERAN for SRVCC triggered for emergency calls
1526729522	L.EMC.SRVCC.E2G.ExecSuccOut	Number of successful handovers from E-UTRAN to GERAN for SRVCC triggered for emergency calls

Calculate SRVCC preparation and execution success rates. If the results do not meet the SRVCC performance requirements of an operator, perform fault isolation and diagnosis. The formulas for calculating other success rates are similar to the following:

- $(L.IRATHO.SRVCC.E2G.ExecSuccOut - L.IRATHO.SRVCC.E2G.MMEAbnormRsp) / L.IRATHO.SRVCC.E2G.ExecAttOut$
- $L.IRATHO.SRVCC.E2G.ExecAttOut / L.IRATHO.SRVCC.E2G.PreAttOut$

7.2.9 Parameter Optimization

If the E-UTRAN and UE support SRVCC to UTRAN and SRVCC to GERAN, the eNodeB will deliver both UTRAN and GERAN neighboring cell measurement configuration to the UE. The eNodeB uses the first cell in the MR reported by the UE to perform SRVCC. To enable preferential SRVCC to a specified RAT, you can set the **CnOperatorHoCfg.UtranA2ThdRsrpOffset** and **CnOperatorHoCfg.GeranA2ThdRsrpOffset** parameters for the UE to preferentially report event A2 of the UTRAN or GERAN.

7.3 Troubleshooting

7.3.1 Fault 1

Fault Description

The performance monitoring results show that the SRVCC handover preparation success rate does not meet the operator requirement.

- The number of handover execution attempts for SRVCC: includes the number of SRVCC-based outgoing handover executions from E-UTRAN to WCDMA, number of SRVCC-based outgoing CS-only handover executions from E-UTRAN to TD-SCDMA, and number of SRVCC-based outgoing handover executions from E-UTRAN to GERAN.

- The number of handover preparation attempts for SRVCC: includes the number of SRVCC-based outgoing handover attempts from E-UTRAN to WCDMA, number of SRVCC-based outgoing CS-only handover attempts from E-UTRAN to TD-SCDMA, and number of SRVCC-based outgoing handover attempts from E-UTRAN to GERAN.

Fault Handling

Use performance counters to identify the cause of the fault. Counters for diagnosing faults in SRVCC to GERAN or TD-SCDMA networks are similar to those for diagnosing faults in SRVCC to WCDMA networks. The following is the procedure for diagnosing faults in SRVCC to WCDMA networks:

- Step 1** Collect the statistics of the performance counters listed in the following table to identify the fault cause.

Counter ID	Counter Name	Description
1526730082	L.IRATHO.E2W.SRVCC.Pre p.FailOut.MME	Number of SRVCC-based outgoing handover preparation failures from E-UTRAN to WCDMA network because of the MME side causes
1526730083	L.IRATHO.E2W.SRVCC.Pre p.FailOut.PreparationFailure	Number of SRVCC-based outgoing handover preparation failures from E-UTRAN to WCDMA network because of the response of handover preparation failure from WCDMA network
1526730084	L.IRATHO.E2W.SRVCC.Pre p.FailOut.NoReply	Number of SRVCC-based outgoing handover preparation failures from E-UTRAN to WCDMA network because of no response from WCDMA network

- Step 2** Rectify the fault based on the cause.

For example, if a counter indicates that the number of SRVCC-based outgoing handover preparation failures from E-UTRAN to WCDMA increases because of core network reasons, you can locate the causes from the MME side. You can check whether the MME supports SRVCC, features related to SRVCC-based handovers are activated, or the license supports these features, and then further trace S1 signaling logs or CHRs to view detailed failure cause values.

----End

7.3.2 Fault 2

Fault Description

The performance monitoring results show that the SRVCC handover success rate does not meet the operator requirement. The SRVCC handover success rate is calculated according to the following formula: SRVCC handover success rate = (Number of successful inter-RAT

handovers for SRVCC - Number of responses for abnormal causes received by the eNodeB from the MME during inter-RAT handover executions for SRVCC)/Number of SRVCC-based outgoing handover executions for ultra-flash CSFB.

- The number of successful handover executions for SRVCC: includes the number of successful SRVCC-based outgoing handovers from E-UTRAN to WCDMA, number of successful SRVCC-based outgoing CS-only handovers from E-UTRAN to TD-SCDMA, and number of successful SRVCC-based outgoing handovers from E-UTRAN to GERAN.
- The number of handover execution attempts for SRVCC: includes the number of SRVCC-based outgoing handover executions from E-UTRAN to WCDMA, number of SRVCC-based outgoing CS-only handover executions from E-UTRAN to TD-SCDMA, and number of SRVCC-based outgoing handover executions from E-UTRAN to GERAN.

Fault Handling

Step 1 In the target system of handovers, check the counters related to incoming inter-RAT handovers to find out whether the UEs accessed the target system.

If the UEs accessed the target network, go to **Step 2**.

Step 2 Check the counters related to failed inter-RAT handovers in the target system to identify whether the fault resides in the peer RAN or core network.

For details about the counters in the target system, see section "Monitoring" in *Interoperability Between UMTS and LTE Feature Parameter Description* and section "Performance Counters" in *Interoperability Between GSM and LTE Feature Parameter Description*. You can locate the failure scope based on related traffic statistics changes and check related signaling logs or CHRs to view detailed failure cause values.

----End

8 Parameters

Table 8-1 Parameters

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellHoP araCfg	HoMode Switch	MOD CELLH OPARA CFG LST CELLH OPARA CFG	LOFD-0 01022 / TDLOF D-00102 2 LOFD-0 01023 / TDLOF D-00102 3 LOFD-0 01033 / TDLOF D-00103 3 LOFD-0 01034 / TDLOF D-00103 4 LOFD-0 01019 / TDLOF D-00101 9 LOFD-0 01020 / TDLOF D-00102 0	SRVCC to UTRAN SRVCC to GERAN CS Fallback to UTRAN CS Fallback to GERAN PS Inter- RAT Mobility between E- UTRAN and UTRAN PS Inter- RAT Mobility between E- UTRAN and GERAN	<p>Meaning: Indicates the handover method switches based on which the eNodeB determines handover policies. BlindHoSwitch: This option specifies whether to enable blind handover for CSFB. Bind handover for CSFB is enabled only if this option is selected. A blind handover for CSFB can be triggered only if both this option and the BlindHoSwitch option of the HoModeSwitch parameter in the ENodeBAlgoSwitch MO are selected.</p> <p>UtranPsHoSwitch: PS handover to UTRAN is supported only if this option is selected. This option takes effect only if the eNodeB-level option UtranPsHoSwitch of the HoModeSwitch parameter in the ENodeBAlgoSwitch MO is deselected.</p> <p>UtranSrvccSwitch: SRVCC to UTRAN is supported only if this option is selected. This option takes effect only if the eNodeB-level option UtranSrvccSwitch of the HoModeSwitch parameter in the ENodeBAlgoSwitch MO is deselected.</p> <p>GeranSrvccSwitch: SRVCC to GERAN is supported only if this option is selected. This option takes effect only if the eNodeB-level option GeranSrvccSwitch of the HoModeSwitch parameter in the ENodeBAlgoSwitch MO is deselected.</p> <p>UtranRedirectSwitch: Redirection to UTRAN is supported only if this option is selected. This option takes effect only if the eNodeB-level option UtranRedirectSwitch of the HoModeSwitch parameter in the ENodeBAlgoSwitch MO is deselected.</p> <p>GeranRedirectSwitch: Redirection to GERAN is supported only if this option is selected. This option</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
			TDLOF D-081223	Ultra-Flash CSFB to UTRAN	<p>takes effect only if the eNodeB-level option GeranRedirectSwitch of the HoModeSwitch parameter in the ENodeBAlgoSwitch MO is deselected. UFCsfbBlindHoDisSwitch: If both this option and the BlindHoSwitch option of the same parameter are selected, a UE is handed over to a UTRAN or GERAN cell based on measurement results using ultra-flash CS fallback. If this option is deselected and the BlindHoSwitch option of the same parameter is selected, a UE can be blindly handed over to a UTRAN or GERAN cell using ultra-flash CS fallback. This option applies only to LTE TDD cells.</p> <p>GUI Value Range: BlindHoSwitch(BlindHoSwitch), UtranPsHoSwitch(UtranPsHoSwitch), UtranSrvccSwitch(UtranSrvccSwitch), GeranSrvccSwitch(GeranSrvccSwitch), UtranRedirectSwitch(UtranRedirectSwitch), GeranRedirectSwitch(GeranRedirectSwitch), UFCsfbBlindHoDisSwitch(UFCsfbBlindHoDisSwitch)</p> <p>Unit: None</p> <p>Actual Value Range: BlindHoSwitch, UtranPsHoSwitch, UtranSrvccSwitch, GeranSrvccSwitch, UtranRedirectSwitch, GeranRedirectSwitch, UFCsfbBlindHoDisSwitch</p> <p>Default Value: BlindHoSwitch:Off, UtranPsHoSwitch:Off, UtranSrvccSwitch:Off, GeranSrvccSwitch:Off, UtranRedirectSwitch:Off, GeranRedirectSwitch:Off, UFCsfbBlindHoDisSwitch:Off</p>
			TDLOF D-081203	Ultra-Flash CSFB to GERAN	

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
ENodeB AlgoSwitch	HoMode Switch	MOD ENODE BALGO SWITCH H LST ENODE BALGO SWITCH H	LOFD-0 01022 / TDLOF D-00102 2	SRVCC to UTRAN SRVCC to GERAN	Meaning: Indicates whether to enable or disable different types of handovers, based on which the eNodeB determines handover policies. UtranVoipCapSwitch: If this switch is on, UTRAN supports VoIP. If this switch is off, UTRAN does not support VoIP.
			LOFD-0 01023 / TDLOF D-00102 3	CS Fallback to UTRAN	Cdma1xRttVoipCapSwitch: If this switch is on, CDMA2000 1xRTT supports VoIP. If this switch is off, CDMA2000 1xRTT does not support VoIP.
			LOFD-0 01033 / TDLOF D-00103 3	CS Fallback to GERAN	UtranPsHoSwitch: If this switch is on, UTRAN supports PS handovers. If this switch is off, UTRAN does not support PS handovers.
			LOFD-0 01034 / TDLOF D-00103 4	PS Inter- RAT Mobility between E- UTRAN and UTRAN	GeranPsHoSwitch: If this switch is on, GERAN supports PS handovers. If this switch is off, GERAN does not support PS handovers.
			LOFD-0 01019 / TDLOF D-00101 9	PS Inter- RAT Mobility between E- UTRAN and UTRAN	CdmaHrpdNonOptimisedHoSwitch: If this switch is on, non-optimized handovers to CDMA2000 HRPD are enabled. If this switch is off, non-optimized handovers to CDMA2000 HRPD are disabled.
			LOFD-0 01020 / TDLOF D-00102 0	PS Inter- RAT Mobility between E- UTRAN and GERAN	CdmaHrpdOptimisedHoSwitch: If this switch is turned on, optimized handovers to CDMA2000 HRPD are enabled. If this switch is off, optimized handovers to CDMA2000 HRPD are disabled.
			LOFD-0 01021 / TDLOF D-00102 1	PS Inter- RAT Mobility between E- UTRAN and GERAN	GeranNaccSwitch: This switch does not take effect if GeranCcoSwitch is off. If this switch is on, the GERAN supports network assisted cell change (NACC). If this switch is off, the GERAN does not support NACC.
			TDLOF D-00105 2	PS Inter- RAT Mobility between E- UTRAN and CDMA2 000	GeranCcoSwitch: If this switch is on, the GERAN supports cell change order (CCO). If this switch is off, the GERAN does not support CCO.
			TDLOF D-00108 8	Flash CS Fallback to UTRAN	UtranSrvccSwitch: If this switch is on, the UTRAN supports SRVCC. If this switch is off, the UTRAN does not support SRVCC.
			TDLOF D-00104 3	Flash CS Fallback to UTRAN CS Fallback	GeranSrvccSwitch: If this switch is on, the GERAN supports SRVCC. If this switch is off, the GERAN does not support SRVCC. Cdma1xRttSrvccSwitch: If this switch is on, the CDMA2000 1xRTT supports SRVCC. If this switch is off, the CDMA2000 1xRTT does not support SRVCC.

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
			TDLOF D-001072	Steering to UTRAN	UtranRedirectSwitch: If this switch is on, redirection to UTRAN is enabled. If this switch is turned off, redirection to UTRAN is disabled.
			TDLOF D-001046	Service based Inter-RAT handover to UTRAN	GeranRedirectSwitch: If this switch is on, redirection to GERAN is enabled. If this switch is off, redirection to GERAN is disabled.
			TDLOF D-001073	Distance based Inter-RAT handover to UTRAN	CdmaHrpdRedirectSwitch: If this switch is on, redirection to CDMA2000 HRPD is enabled. If this switch is off, redirection to CDMA2000 HRPD is disabled.
			Service based Inter-RAT handover to GERAN	Distance based Inter-RAT handover to GERAN	Cdma1xRttRedirectSwitch: If this switch is on, redirection to CDMA2000 1xRTT is enabled. If this switch is off, redirection to CDMA2000 1xRTT is disabled.
					BlindHoSwitch: If this switch is on, blind handovers for CSFB are enabled. If this switch is off, blind handovers for CSFB are disabled. If both this option and the BlindHoSwitch option of the Handover Mode switch parameter of the CellHoParaCfg MO are selected, blind CSFB handovers for CSFB are enabled.
					LcsSrvccSwitch: If this switch is on, an SRVCC procedure is triggered when a UE receives a CSFB instruction during a VoIP service. If this switch is off, an SRVCC procedure is not triggered when a UE receives a CSFB instruction during a VoIP service.
					AutoGapSwitch: If this switch is on and UEs support automatic measurement gap configurations on the target frequency, the eNodeB does not deliver gap configurations to UEs. If this switch is off, the eNodeB delivers gap configurations to UEs during all inter-frequency and inter-RAT measurements.
					UeVoipOnHspaCapSwitch: If this switch is on and the eNodeB attempts to hand over UEs using voice services to UTRAN, the eNodeB checks UE capabilities when determining whether PS handover is applied. UEs must support voiceOverPS-HS-UTRA-FDD-r9 if the target UTRAN cell works in FDD mode or voiceOverPS-HS-UTRA-TDD128-r9 if the target UTRAN cell works in TDD mode. If this switch is off, the eNodeB does not check UE capabilities when handing over UEs to UTRAN based on PS handovers.
					UtranFddb1CapSwitch: If this switch is on, the setting of bit 41 of FGI specifying the UE capability

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					<p>of event B1 measurement on FDD UTRAN cells must be considered. If this switch is off, the setting of bit 41 of FGI does not need to be considered.</p> <p>CdmaHrpdNonOptMeaHoSwitch: If this switch is on, measurement-based non-optimized handovers to CDMA2000 HRPD are enabled. If this switch is off, measurement-based non-optimized handovers to CDMA2000 HRPD are disabled.</p> <p>GUI Value Range: UtranVoipCapSwitch(UtranVoipCapSwitch), Cdma1xRttVoipCapSwitch(Cdma1xRttVoipCapSwitch), UtranPsHoSwitch(UtranPsHoSwitch), GeranPsHoSwitch(GeranPsHoSwitch), CdmaHrpdNonOptimisedHoSwitch(CdmaHrpdNonOptimisedHoSwitch), CdmaHrpdOptimisedHoSwitch(CdmaHrpdOptimisedHoSwitch), GeranNaccSwitch(GeranNaccSwitch), GeranCcoSwitch(GeranCcoSwitch), UtranSrvccSwitch(UtranSrvccSwitch), GeranSrvccSwitch(GeranSrvccSwitch), Cdma1xRttSrvccSwitch(Cdma1xRttSrvccSwitch), UtranRedirectSwitch(UtranRedirectSwitch), GeranRedirectSwitch(GeranRedirectSwitch), CdmaHrpdRedirectSwitch(CdmaHrpdRedirectSwitch), Cdma1xRttRedirectSwitch(Cdma1xRttRedirectSwitch), BlindHoSwitch(BlindHoSwitch), LcsSrvccSwitch(LcsSrvccSwitch), AutoGapSwitch(AutoGapSwitch), UeVoipOnHspaCapSwitch(UeVoipOnHspaCapSwitch), UtranFddB1CapSwitch(UtranFddB1CapSwitch), CdmaHrpdNonOptMeaHoSwitch(CdmaHrpdNonOptMeaHoSwitch)</p> <p>Unit: None</p> <p>Actual Value Range: UtranVoipCapSwitch, Cdma1xRttVoipCapSwitch, UtranPsHoSwitch, GeranPsHoSwitch, CdmaHrpdNonOptimisedHoSwitch, CdmaHrpdOptimisedHoSwitch, GeranNaccSwitch, GeranCcoSwitch, UtranSrvccSwitch, GeranSrvccSwitch, Cdma1xRttSrvccSwitch, UtranRedirectSwitch, GeranRedirectSwitch, CdmaHrpdRedirectSwitch, Cdma1xRttRedirectSwitch, BlindHoSwitch, LcsSrvccSwitch, AutoGapSwitch, UeVoipOnHspaCapSwitch, UtranFddB1CapSwitch, CdmaHrpdNonOptMeaHoSwitch</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					Default Value: UtranVoipCapSwitch:Off, Cdma1xRttVoipCapSwitch:Off, UtranPsHoSwitch:Off, GeranPsHoSwitch:Off, CdmaHrpdNonOptimisedHoSwitch:Off, CdmaHrpdOptimisedHoSwitch:Off, GeranNaccSwitch:Off, GeranCcoSwitch:Off, UtranSrvccSwitch:Off, GeranSrvccSwitch:Off, Cdma1xRttSrvccSwitch:Off, UtranRedirectSwitch:Off, GeranRedirectSwitch:Off, CdmaHrpdRedirectSwitch:Off, Cdma1xRttRedirectSwitch:Off, BlindHoSwitch:Off, LcsSrvccSwitch:Off, AutoGapSwitch:Off, UeVoipOnHspaCapSwitch:Off, UtranFddB1CapSwitch:Off, CdmaHrpdNonOptMea-HoSwitch:Off
CSFallBackBlindHoCfg	UtranLcsCap	MOD CSFAL LBACK BLIND HOCFG LST CSFAL LBACK BLIND HOCFG	LOFD-01033 / TDLOFD-001033	CS Fallback to UTRAN	Meaning: Indicates the LCS capability of the UTRAN. If this parameter is set to ON, the UTRAN supports LCS. If this parameter is set to OFF, the UTRAN does not support LCS. GUI Value Range: OFF(Off), ON(On) Unit: None Actual Value Range: OFF, ON Default Value: OFF(Off)
CSFallBackBlindHoCfg	GeranLcsCap	MOD CSFAL LBACK BLIND HOCFG LST CSFAL LBACK BLIND HOCFG	LOFD-01034 / TDLOFD-001034	CS Fallback to GERAN	Meaning: Indicates the LCS capability of the GERAN. If this parameter is set to ON, the GERAN supports LCS. If this parameter is set to OFF, the GERAN does not support LCS. GUI Value Range: OFF(Off), ON(On) Unit: None Actual Value Range: OFF, ON Default Value: OFF(Off)

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellAlgoSwitch	MeasOptAlgoSwitch	MOD CELLA LGOSW ITCH LST CELLA LGOSW ITCH	LOFD-0 01023 / TDLOF D-00102 3 LBFD-0 02018 / TDLBF D-00201 8 LOFD-0 01019 / TDLOF D-00101 9 LOFD-0 01020 / TDLOF D-00102 0 TDLOF D-00103 4 TDLOF D-08120 3	SRVCC to GERAN Mobility Manage ment PS Inter- RAT Mobility between E- UTRAN and UTRAN PS Inter- RAT Mobility between E- UTRAN and GERAN CS Fallback to GERAN Ultra- Flash CSFB to GERAN	<p>Meaning:</p> <p>Indicates whether to enable measurement-related optimization algorithms.</p> <p>GSM_MEAS_DEL_INTERFREQ_SW: Indicates whether to cancel inter-frequency measurements after a GSM measurement is triggered when the UE is performing VoIP services. If the UE is performing VoIP services and this option is selected, the eNodeB cancels all inter-frequency measurements when a GSM measurement is triggered. This reduces the GSM measurement reporting delay. If the UE is performing VoIP services and this option is deselected, the eNodeB does not cancel inter-frequency measurements when the GSM measurement is triggered.</p> <p>MEAS_OBJ_PREEMPT_SW: Indicates whether to enable preemption when the number of measurement objects of a UE reaches the specified threshold. If this option is selected and the number of measurement objects of the UE reaches the specified threshold, preemption is enabled to ensure that measurements of algorithms with high priority can be delivered. If this option is deselected and the number of measurement objects of the UE reaches the specified threshold, preemption is disabled and the measurements of algorithms that are triggered later cannot be delivered.</p> <p>CSFB_MEAS_DEL_INTERFREQ_SW: Indicates whether to terminate inter-frequency measurements after a GSM frequency measurement starts for an E-UTRAN-to-GERAN CS fallback process. If this option is selected, the eNodeB terminates all inter-frequency measurements when a GSM frequency measurement is triggered during the CS fallback process, reducing the GSM frequency measurement reporting delay. If this option is deselected, the eNodeB does not terminate inter-frequency measurements when a GSM frequency measurement is triggered during the CSFB process. This parameter applies only to LTE TDD cells.</p> <p>GUI Value Range: GSM_MEAS_DEL_INTERFREQ_SW(Gsm Meas Del Interfreq Switch), MEAS_OBJ_PREEMPT_SW(Meas Obj Preempt Switch), CSFB_MEAS_DEL_INTERFREQ_SW(Csfb Meas Del Interfreq Switch)</p> <p>Unit: None</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					Actual Value Range: GSM_MEAS_DEL_INTERFREQ_SW, MEAS_OBJ_PREEMPT_SW, CSFB_MEAS_DEL_INTERFREQ_SW Default Value: GSM_MEAS_DEL_INTERFREQ_SW:Off, MEAS_OBJ_PREEMPT_SW:Off, CSFB_MEAS_DEL_INTERFREQ_SW:Off
InterRat PolicyCfgGroup	UtranHoCfg	ADD INTER RATPOLICYCFGGROUP MOD INTER RATPOLICYCFGGROUP LST INTER RATPOLICYCFGGROUP	LOFD-01022 / TDLOFD-001022 LOFD-01019 / TDLOFD-001019	SRVCC to UTRAN PS Inter-RAT Mobility between E-UTRAN and UTRAN	Meaning: Indicates the policy of handovers to UTRAN. PS_HO: indicates whether to allow PS handovers to UTRAN. SRVCC: indicates whether to allow transfers to UTRAN in SRVCC mode. REDIRECTION: indicates whether to allow redirection to UTRAN. GUI Value Range: PS_HO, SRVCC, REDIRECTION Unit: None Actual Value Range: PS_HO, SRVCC, REDIRECTION Default Value: PS_HO:On, SRVCC:Off, REDIRECTION:Off
UtranExternalCell	CsPsHOInd	ADD UTRAN EXTERNALCELL MOD UTRAN EXTERNALCELL LST UTRAN EXTERNALCELL	LOFD-01022 / TDLOFD-001022 LOFD-01019 / TDLOFD-001019 TDLOFD-001078	SRVCC to UTRAN PS Inter-RAT Mobility between E-UTRAN and UTRAN E-UTRAN to UTRAN CS/PS steering	Meaning: Indicates whether the external UTRAN cell supports single radio voice call continuity (SRVCC) for concurrent CS and PS services. If this parameter is set to BOOLEAN_FALSE, the external UTRAN cell does not support SRVCC for concurrent CS and PS services. GUI Value Range: BOOLEAN_FALSE(False), BOOLEAN_TRUE(True) Unit: None Actual Value Range: BOOLEAN_FALSE, BOOLEAN_TRUE Default Value: BOOLEAN_FALSE(False)

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CnOperatorHoCfg	SrvccWithPsBasedCellCapSw	MOD CNOPE RATOR HOCFG LST CNOPE RATOR HOCFG	LOFD-001022 / TDLOFD-001022	SRVCC to UTRAN	<p>Meaning: Indicates whether the eNodeB checks the CS+PS handover capability of external UTRAN cells when initiating SRVCC for concurrent CS and PS services. If this parameter is set to ON(On), the eNodeB does not check the capability indicated by the setting of the CsPsHOInd parameter in the UtranExternalCell MOs. If this parameter is set to OFF(Off), the eNodeB needs to check this capability.</p> <p>GUI Value Range: OFF(Off), ON(On)</p> <p>Unit: None</p> <p>Actual Value Range: OFF, ON</p> <p>Default Value: OFF(Off)</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
UtranExternalCell	Rac	ADD UTRAN EXTER NALCE LL	LOFD-0 01019 / TDLOF D-00101 9	PS Inter- RAT Mobility between E- UTRAN and UTRAN CS Fallback to GERAN	Meaning: Indicates the routing area code. GUI Value Range: 0~255 Unit: None Actual Value Range: 0~255 Default Value: 0
		MOD UTRAN EXTER NALCE LL	LOFD-0 01034 / TDLOF D-00103 4	UTRAN and UTRAN CS Fallback to GERAN	
		LST UTRAN EXTER NALCE LL	LOFD-0 01052 / TDLOF D-00105 2	Flash CS Fallback to UTRAN	
			TDLOF D-00103 3	CS Fallback to UTRAN	
			TDLOF D-00104 3	CS Fallback to UTRAN	
			TDLOF D-00107 2	Service based Inter- RAT handove r to UTRAN	
			TDLOF D-00107 8	Distance based Inter- RAT handove r to UTRAN	
				E- UTRAN to UTRAN CS/PS steering	

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
InterRat PolicyCfgGroup	InterRat PolicyCfgGroupId	ADD INTER RATPOLICYCFGROUP LST INTER RATPOLICYCFGROUP MOD INTER RATPOLICYCFGROUP RMV INTER RATPOLICYCFGROUP	LOFD-01022 / TDLOFD-001022 LOFD-01023 / TDLOFD-001023 LOFD-01019 / TDLOFD-001019 LOFD-01020 / TDLOFD-001020 LOFD-01021 / TDLOFD-001021	SRVCC to UTRAN SRVCC to GERAN PS Inter-RAT Mobility between E-UTRAN and UTRAN PS Inter-RAT Mobility between E-UTRAN and GERAN PS Inter-RAT Mobility between E-UTRAN and CDMA2000	Meaning: Indicates the group ID of the parameters related to the inter-RAT handover with a specific QCI. GUI Value Range: 0~39 Unit: None Actual Value Range: 0~39 Default Value: None

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
Standard Qci	InterRatPolicyCfgGroupId	MOD STAND ARDQCI LST STAND ARDQCI	LOFD-0 01019 / TDLOF D-00101 9 LOFD-0 01020 / TDLOF D-00102 0 LOFD-0 01021 / TDLOF D-00102 1 TDLOF D-00102 2 TDLOF D-00102 3	PS Inter- RAT Mobility between E- UTRAN and UTRAN PS Inter- RAT Mobility between E- UTRAN and GERAN PS Inter- RAT Mobility between E- UTRAN and CDMA2 000 SRVCC to UTRAN SRVCC to GERAN	Meaning: Indicates the ID of a parameter group related to inter-RAT handover. GUI Value Range: 0~39 Unit: None Actual Value Range: 0~39 Default Value: 0

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
InterRat PolicyCf gGroup	NoHoFlag	ADD INTER RATPO LICYCF GGROUP P MOD INTER RATPO LICYCF GGROUP P LST INTER RATPO LICYCF GGROUP P	LOFD-0 01019 / TDLOF D-00101 9 LOFD-0 01020 / TDLOF D-00102 0 LOFD-0 01021 / TDLOF D-00102 1 TDLBF D-00201 801 TDLOF D-00102 2 TDLOF D-00102 3 TDLOF D-00103 3 TDLOF D-00103 4	PS Inter- RAT Mobility between E- UTRAN and UTRAN PS Inter- RAT Mobility between E- UTRAN and GERAN PS Inter- RAT Mobility between E- UTRAN and CDMA2 000 Coverag e Based Intra- frequenc y Handov er SRVCC to UTRAN SRVCC to GERAN CS Fallback to UTRAN CS Fallback to GERAN	Meaning: Indicates whether to permit or forbid the inter-RAT handover under the QCI. GUI Value Range: PERMIT_HO_ENUM(Permit Ho), FORBID_HO_ENUM(Forbid Ho) Unit: None Actual Value Range: PERMIT_HO_ENUM, FORBID_HO_ENUM Default Value: PERMIT_HO_ENUM(Permit Ho)

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
Standard Qci	Qci	LST STAND ARDQCI MOD STAND ARDQCI	LOFD-0 0101502 / TDLOF D-00101 502 TDLBF D-00202 5 TDLOF D-00101 5	Dynami c Scheduli ng Basic Scheduli ng Enhance d Scheduli ng	<p>Meaning: Indicates the QoS Class Identifier (QCI) of an EPS bearer. Different QCIs represent different QoS specifications such as the packet delay budget, packet error loss rate, and resource type (whether the service is a GBR service or not). For details, see Table 6.1.7 in 3GPP TS 23.203.</p> <p>GUI Value Range: QCI1(QCI 1), QCI2(QCI 2), QCI3(QCI 3), QCI4(QCI 4), QCI5(QCI 5), QCI6(QCI 6), QCI7(QCI 7), QCI8(QCI 8), QCI9(QCI 9)</p> <p>Unit: None</p> <p>Actual Value Range: QCI1, QCI2, QCI3, QCI4, QCI5, QCI6, QCI7, QCI8, QCI9</p> <p>Default Value: None</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CellStandardQci	QciPriorityForHo	MOD CELLS TANDAR DQCI LST CELLS TANDAR DQCI	LBFD-0 0201801 LBFD-0 0201802 LBFD-0 0201804 LBFD-0 0201805 LOFD-0 01072 LOFD-0 01073	Coverage Based Intra-frequency Handover Coverage Based Inter-frequency Handover Distance Based Inter-frequency Handover Service Based Inter-frequency Handover Distance based Inter-RAT handover to UTRAN Distance based Inter-RAT handover to GERAN	<p>Meaning: Indicates the QCI priority used by each QCI-based handover algorithm. A larger value of this parameter indicates a lower priority. This parameter applies to handover parameter selection based on QCI priorities, target frequency selection in service-based inter-frequency handovers, and inter-RAT handover policy selection. For a service that involves all the preceding selection, the setting of this parameter determines the handover parameter, target frequency, and handover policy corresponding to a QCI.</p> <p>GUI Value Range: 1~9</p> <p>Unit: None</p> <p>Actual Value Range: 1~9</p> <p>Default Value: 9</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
GlobalProtocolSwitch	ProtocolMsgOptSwitch	MOD GLOBALPROC SWITCH LST GLOBALPROC SWITCH	LOFD-01022/ TDLOFD-001022 LOFD-01023/ TDLOFD-001023 LOFD-081283/ TDLOFD-081203 LOFD-01053/ TDLOFD-001053 LOFD-01020/ TDLOFD-001020	SRVCC to UTRAN SRVCC to GERAN Ultra-Flash CSFB to GERAN Flash CS Fallback to GERAN PS Inter-RAT Mobility between E-UTRAN and GERAN	<p>Meaning:</p> <p>Indicates whether to optimize protocol messages sent by the eNodeB. This parameter includes the following options:</p> <p>RrcSetupOptSwitch: If this option is selected, the optimization of RRCConnectionSetup messages is enabled. In this case, IEs with protocol-defined default values are no longer included in the RRCConnectionSetup message. For details about the protocol-defined default settings, see 3GPP TS 36.331.</p> <p>IucsRrcRecfgMcCombSwitch: If this option is selected, the eNodeB includes the radio resource configuration and measurement configuration for a UE in one RRCConnectionReconfiguration message during initial access.</p> <p>RcrpRrcRecfgMcCombSwitch: If this option is selected, the eNodeB includes the radio resource configuration and measurement configuration for a UE in one RRCConnectionReconfiguration message during RRC connection reestablishment. The option will not take effect on the interaction of RRC connection reestablishment and other signaling procedures.</p> <p>RrcRecfgMcOptSwitch: If this option is selected, the cell measurement configurations with the CIO of 0 (indicated by cellIndividualOffset) are no longer included in the measurement configurations delivered to UEs.</p> <p>IdleCsfRedirectOptSwitch: If this option is selected and the preferred CSFB policy for UEs in idle mode is redirection, the eNodeB no longer activates security mode or performs RRC connection reconfiguration, but sends a redirection message.</p> <p>UINasBufferSwitch: If this option is selected, the eNodeB buffers uplink NAS messages sent by the UE before the UE-associated logical S1 connection is available and sends these messages after the UE-associated logical S1 connection is available. If this option is deselected, the eNodeB releases this UE after the procedures finish.</p> <p>IratMeasCfgTransSwitch: If this option is selected, the Handover Required message that the eNodeB sends to</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					<p>a BSC contains the IE IRAT Measurement Configuration.</p> <p>GeranAnrMcOptSwitch: This option controls whether measurement configuration optimization takes effect when ANR with GERAN is enabled. If this option is deselected, the optimization does not take effect. That is, when an eNodeB delivers measurement configuration to UEs to perform CGI reading for ANR with GERAN, the carrierFreqs IE can contain multiple GERAN frequencies. If this option is selected, the optimization takes effect, and the carrierFreqs IE contains only one GERAN frequency.</p> <p>InactDiscardSwitch: This option specifies whether to terminate the ongoing signaling flow when the UE inactivity timer expires. If this option is deselected, the ongoing flow is terminated and the eNodeB directly releases the UE. If this option is selected, the ongoing flow is not terminated and the timer is restarted.</p> <p>SRVCCHoBasedUeCapSwitch: If this option is selected, the eNodeB determines whether to trigger an SRVCC based only on UE's SRVCC capabilities, not the SRVCCOperationPossible IE that the MME sends to the eNodeB. If this option is deselected, the eNodeB determines whether to trigger an SRVCC-based handover based on the SRVCCOperationPossible IE that the MME sends to the eNodeB.</p> <p>L2GPLMNChooseOptSwitch: This option specifies whether to enable target PLMN ID optimization for handovers to GERAN. If this option is selected, the eNodeB takes the NCL-defined PLMN IDs and includes them in the handover request messages or RIM request messages. If this option is deselected, the optimization is not activated.</p> <p>HoInRrcRecfgMcCombSwitch: If this option is selected, after a UE is handed over to a cell, the cell delivers the radio resource configuration and measurement configuration in a single RRC Connection Reconfiguration message to the UE during the resource reconfiguration procedure.</p> <p>GUI Value Range: RrcSetupOptSwitch, IucsRrcRecfgMcCombSwitch, RcrpRrcRecfgMcCombSwitch, RrcRecfgMcOptSwitch, IdleCsfbRedirectOptSwitch, UINasBufferSwitch, IratMeasCfgTransSwitch,</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
					<p>GeranAnrMcOptSwitch, InactDiscardSwitch, SRVCCHoBasedUeCapSwitch, L2GPLMNChooseOptSwitch, HoInRrcRecfgMcCombSwitch, UeCapEnquiryCombSwitch, UeTraceOptSwitch</p> <p>Unit: None</p> <p>Actual Value Range: RrcSetupOptSwitch, IucsRrcRecfgMcCombSwitch, RcrpRrcRecfgMcCombSwitch, RrcRecfgMcOptSwitch, IdleCsfbRedirectOptSwitch, UINasBufferSwitch, IratMeasCfgTransSwitch, GeranAnrMcOptSwitch, InactDiscardSwitch, SRVCCHoBasedUeCapSwitch, L2GPLMNChooseOptSwitch, HoInRrcRecfgMcCombSwitch, UeCapEnquiryCombSwitch, UeTraceOptSwitch</p> <p>Default Value: RrcSetupOptSwitch:Off, IucsRrcRecfgMcCombSwitch:Off, RcrpRrcRecfgMcCombSwitch:Off, RrcRecfgMcOptSwitch:Off, IdleCsfbRedirectOptSwitch:Off, UINasBufferSwitch:Off, IratMeasCfgTransSwitch:Off, GeranAnrMcOptSwitch:Off, InactDiscardSwitch:Off, SRVCCHoBasedUeCapSwitch:Off, L2GPLMNChooseOptSwitch:Off, HoInRrcRecfgMcCombSwitch:Off, UeCapEnquiryCombSwitch:Off, UeTraceOptSwitch:Off</p>
GeranExternalCell	Rac	ADD GERAN EXTERNALCELL MOD GERAN EXTERNALCELL LST GERAN EXTERNALCELL	LOFD-01034 / LOFD-01034 LOFD-01053 LOFD-01020 / TDLOFD-001020	CS Fallback to GERAN Flash CS Fallback to GERAN PS Inter-RAT Mobility between E-UTRAN and GERAN	<p>Meaning: Indicates the routing area code.</p> <p>GUI Value Range: 0~255</p> <p>Unit: None</p> <p>Actual Value Range: 0~255</p> <p>Default Value: 0</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
GeranExternalCell	CsPsHoiInd	ADD GERAN EXTERNALCELL MOD GERAN EXTERNALCELL LST GERAN EXTERNALCELL	LOFD-01023 / TDLOFD-001023	SRVCC to GERAN	<p>Meaning: Indicates whether the external GERAN cell supports single radio voice call continuity (SRVCC) for concurrent CS and PS services. If this parameter is set to <code>BOOLEAN_FALSE</code>, the external GERAN cell does not support SRVCC for concurrent CS and PS services.</p> <p>GUI Value Range: <code>BOOLEAN_FALSE</code>(False), <code>BOOLEAN_TRUE</code>(True)</p> <p>Unit: None</p> <p>Actual Value Range: <code>BOOLEAN_FALSE</code>, <code>BOOLEAN_TRUE</code></p> <p>Default Value: <code>BOOLEAN_FALSE</code>(False)</p>
InterRatPolicyCfgGroup	GeranGsmHoCfg	ADD INTERRATPOLICYCFGROUP MOD INTERRATPOLICYCFGROUP LST INTERRATPOLICYCFGROUP	LOFD-01023 / TDLOFD-001023 LOFD-01020 / TDLOFD-001020	SRVCC to GERAN PS Inter-RAT Mobility between E-UTRAN and GERAN	<p>Meaning:</p> <p>Indicates the switch used to enable or disable the single radio voice call continuity (SRVCC) handover to GERAN GSM.</p> <p>If this switch is set to on, the UE can perform the SRVCC handover to the GERAN GSM cell.</p> <p>If this switch is set to off, the UE cannot perform the SRVCC handover to the GERAN GSM cell.</p> <p>GUI Value Range: SRVCC</p> <p>Unit: None</p> <p>Actual Value Range: SRVCC</p> <p>Default Value: SRVCC:On</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
InterRat PolicyCf gGroup	GeranG prsEdge HoCfg	ADD INTER RATPO LICYCF GGROUP MOD INTER RATPO LICYCF GGROUP LST INTER RATPO LICYCF GGROUP	TDLOF D-00102 3 LOFD-0 01020 / TDLOF D-00102 0	SRVCC to GERAN PS Inter- RAT Mobility between E- UTRAN and GERAN	<p>Meaning:</p> <p>Indicates the policy of handovers to GPRS/EDGE networks.</p> <p>PS_HO:</p> <p>Indicates whether PS handovers to neighboring GPRS/EDGE cells are allowed.</p> <p>CCO_HO:</p> <p>Indicates whether CCO to neighboring GPRS/EDGE cells is allowed.</p> <p>SRVCC:</p> <p>Indicates whether SRVCC to neighboring GPRS/EDGE cells is allowed.</p> <p>REDIRECTION:</p> <p>Indicates whether redirections to neighboring GPRS/EDGE cells are allowed.</p> <p>GUI Value Range: PS_HO, CCO_HO, SRVCC, REDIRECTION</p> <p>Unit: None</p> <p>Actual Value Range: PS_HO, CCO_HO, SRVCC, REDIRECTION</p> <p>Default Value: PS_HO:On, CCO_HO:Off, SRVCC:Off, REDIRECTION:Off</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CnOperatorHoCfg	UtranA2ThdRsrpOffset	MOD CNOPE RATOR HOCFG LST CNOPE RATOR HOCFG	LOFD-001019 / TDLOFD-001019	PS Inter-RAT Mobility between E-UTRAN and UTRAN	<p>Meaning:</p> <p>Indicates the offset of the RSRP threshold for UTRAN inter-RAT handover event A2 relative to the RSRP threshold for inter-RAT handover event A2 (which is specified by InterRatHoA2ThdRsrp). The value of this parameter plus the value of the InterRatHoA2ThdRsrp parameter equals the RSRP threshold of UTRAN handover event A2.</p> <p>If the UtranA2ThdRsrpOffset and GeranA2ThdRsrpOffset parameters are set to the same value excluding the value -100, inter-RAT event A2 is delivered directly without considering UTRAN and GERAN measurement priorities in coverage-based inter-RAT measurement scenarios, and the RSRP threshold of inter-RAT event A2 equals the value of the InterRatHoA2ThdRsrp parameter plus the value of the UtranA2ThdRsrpOffset or GeranA2ThdRsrpOffset parameter.</p> <p>If both the UtranA2ThdRsrpOffset and GeranA2ThdRsrpOffset parameters are set to -100, inter-RAT event A2 is delivered directly without considering UTRAN and GERAN measurement priorities in coverage-based inter-RAT measurement scenarios, and the RSRP threshold is the value of the InterRatHoA2ThdRsrp parameter.</p> <p>If the UtranA2ThdRsrpOffset parameter is set to -100 and the GeranA2ThdRsrpOffset parameter is not set to -100, coverage-based UTRAN measurement is not triggered, and the eNodeB delivers only the RSRP threshold of GERAN event A2, which is used to enable coverage-based GERAN measurement. The RSRP threshold of GERAN event A2 equals the value of the InterRatHoA2ThdRsrp parameter plus the value of the GeranA2ThdRsrpOffset parameter.</p> <p>GUI Value Range: -100,-20~20 Unit: dBm Actual Value Range: -100,-20~20 Default Value: 0</p>

MO	Parameter ID	MML Command	Feature ID	Feature Name	Description
CnOperatorHoCfg	GeranA2ThdRsrpOffset	MOD CNOPE RATOR HOCFG LST CNOPE RATOR HOCFG	LOFD-001020 / TDLOFD-001020	PS Inter-RAT Mobility between E-UTRAN and GERAN	<p>Meaning:</p> <p>Indicates the offset of the RSRP threshold for GERAN inter-RAT handover event A2 relative to the RSRP threshold for inter-RAT handover event A2 (which is specified by InterRatHoA2ThdRsrp). The value of this parameter plus the value of the InterRatHoA2ThdRsrp parameter equals the RSRP threshold of GERAN handover event A2.</p> <p>If the UtranA2ThdRsrpOffset and GeranA2ThdRsrpOffset parameters are set to the same value excluding the value -100, inter-RAT event A2 is delivered directly without considering UTRAN and GERAN measurement priorities in coverage-based inter-RAT measurement scenarios, and the RSRP threshold of inter-RAT event A2 equals the value of the InterRatHoA2ThdRsrp parameter plus the value of the UtranA2ThdRsrpOffset or GeranA2ThdRsrpOffset parameter.</p> <p>If both the UtranA2ThdRsrpOffset and GeranA2ThdRsrpOffset parameters are set to -100, inter-RAT event A2 is delivered directly without considering UTRAN and GERAN measurement priorities in coverage-based inter-RAT measurement scenarios, and the RSRP threshold is the value of the InterRatHoA2ThdRsrp parameter.</p> <p>If the GeranA2ThdRsrpOffset parameter is set to -100 and the UtranA2ThdRsrpOffset parameter is not set to -100, coverage-based GERAN measurement is not triggered, and the eNodeB delivers only the RSRP threshold of UTRAN event A2, which is used to start coverage-based UTRAN measurement. The RSRP threshold of UTRAN event A2 equals the value of the InterRatHoA2ThdRsrp parameter plus the value of the UtranA2ThdRsrpOffset parameter.</p> <p>GUI Value Range: -100,-20~20 Unit: dBm Actual Value Range: -100,-20~20 Default Value: 0</p>

9 Counters

Table 9-1 Counters

Counter ID	Counter Name	Counter Description	Feature ID	Feature Name
1526728400	L.IRATHO.SRVCC.E2W.PrepAttOut	Number of inter-RAT handover attempts from E-UTRAN to WCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022 LOFD-070202 TDLOFD-081223	SRVCC to UTRAN SRVCC to UTRAN Ultra-Flash CSFB to UTRAN Ultra-Flash CSFB to UTRAN
1526728401	L.IRATHO.SRVCC.E2W.ExecAttOut	Number of inter-RAT handover executions from E-UTRAN to WCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022 LOFD-070202 TDLOFD-081223	SRVCC to UTRAN SRVCC to UTRAN Ultra-Flash CSFB to UTRAN Ultra-Flash CSFB to UTRAN
1526728402	L.IRATHO.SRVCC.E2W.ExecSuccOut	Number of successful inter-RAT handovers from E-UTRAN to WCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022 LOFD-070202 TDLOFD-081223	SRVCC to UTRAN SRVCC to UTRAN Ultra-Flash CSFB to UTRAN Ultra-Flash CSFB to UTRAN

Counter ID	Counter Name	Counter Description	Feature ID	Feature Name
1526728403	L.IRATHO.SRVCC .E2G.PrepAttOut	Number of inter-RAT handover attempts from E-UTRAN to GERAN for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001023 TDLOFD-001023 LOFD-081283 TDLOFD-081203	SRVCC to GERAN SRVCC to GERAN Ultra-Flash CSFB to GERAN Ultra-Flash CSFB to GERAN
1526728404	L.IRATHO.SRVCC .E2G.ExecAttOut	Number of inter-RAT handover executions from E-UTRAN to GERAN for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001023 TDLOFD-001023 LOFD-081283 TDLOFD-081203	SRVCC to GERAN SRVCC to GERAN Ultra-Flash CSFB to GERAN Ultra-Flash CSFB to GERAN
1526728405	L.IRATHO.SRVCC .E2G.ExecSuccOut	Number of successful inter-RAT handovers from E-UTRAN to GERAN for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001023 TDLOFD-001023 LOFD-081283 TDLOFD-081203	SRVCC to GERAN SRVCC to GERAN Ultra-Flash CSFB to GERAN Ultra-Flash CSFB to GERAN
1526728406	L.IRATHO.SRVCC .E2T.PrepAttOut	Number of inter-RAT handover attempts from E-UTRAN to TD-SCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526728407	L.IRATHO.SRVCC .E2T.ExecAttOut	Number of inter-RAT handover executions from E-UTRAN to TD-SCDMA for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN

Counter ID	Counter Name	Counter Description	Feature ID	Feature Name
1526728408	L.IRATHO.SRVCC.E2T.ExecSuccOut	Number of successful inter-RAT handovers from E-UTRAN to TD-SCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526728409	L.CSFB.LCS.PrepAtt	Number of LCS-triggered CS fallback indicators received by the eNodeB	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022 LOFD-001023 TDLOFD-001023	SRVCC to UTRAN SRVCC to UTRAN SRVCC to GERAN SRVCC to GERAN
1526728410	L.CSFB.LCS.PrepSucc	Number of responses sent from the eNodeB to MMEs for CSFB triggered by LCS	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022 LOFD-001023 TDLOFD-001023	SRVCC to UTRAN SRVCC to UTRAN SRVCC to GERAN SRVCC to GERAN
1526728753	L.IRATHO.SRVCC.LCS.E2W.PrepAttOut	Number of CSFB-based handover attempts from E-UTRAN to WCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526728754	L.IRATHO.SRVCC.LCS.E2W.ExecAttOut	Number of CSFB-based handover executions from E-UTRAN to WCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN

Counter ID	Counter Name	Counter Description	Feature ID	Feature Name
1526728755	L.IRATHO.SRVCC.LCS.E2W.ExecSucOut	Number of successful CSFB-based handovers from E-UTRAN to WCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526728756	L.IRATHO.SRVCC.LCS.E2G.PrepAttOut	Number of CSFB-based handover attempts from E-UTRAN to GERAN for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001023 TDLOFD-001023	SRVCC to GERAN SRVCC to GERAN
1526728757	L.IRATHO.SRVCC.LCS.E2G.ExecAttOut	Number of CSFB-based handover executions from E-UTRAN to GERAN for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001023 TDLOFD-001023	SRVCC to GERAN SRVCC to GERAN
1526728758	L.IRATHO.SRVCC.LCS.E2G.ExecSucOut	Number of successful CSFB-based handovers from E-UTRAN to GERAN for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001023 TDLOFD-001023	SRVCC to GERAN SRVCC to GERAN
1526728759	L.IRATHO.SRVCC.LCS.E2T.PrepAttOut	Number of CSFB-based handover attempts from E-UTRAN to TD-SCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526728760	L.IRATHO.SRVCC.LCS.E2T.ExecAttOut	Number of CSFB-based handover executions from E-UTRAN to TD-SCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN

Counter ID	Counter Name	Counter Description	Feature ID	Feature Name
1526728761	L.IRATHO.SRVCC .LCS.E2T.ExecSuc cOut	Number of successful CSFB-based handovers from E-UTRAN to TD-SCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526728894	L.IRATHO.SRVCC .E2W.MMEAbnor mRsp	Number of responses for abnormal causes received by the eNodeB from the MME during inter-RAT handover executions from E-UTRAN to WCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526728895	L.IRATHO.SRVCC .E2G.MMEAbnorm Rsp	Number of responses for abnormal causes received by the eNodeB from the MME during inter-RAT handover executions from E-UTRAN to GERAN for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001023 TDLOFD-001023	SRVCC to GERAN SRVCC to GERAN
1526728896	L.IRATHO.SRVCC .E2T.MMEAbnorm Rsp	Number of responses for abnormal causes received by the eNodeB from the MME during inter-RAT handover executions from E-UTRAN to TD-SCDMA network for SRVCC	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN

Counter ID	Counter Name	Counter Description	Feature ID	Feature Name
1526729517	L.EMC.SRVCC.E2 W.PrepareAttOut	Number of handover attempts from E-UTRAN to WCDMA network for SRVCC triggered for emergency calls	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526729518	L.EMC.SRVCC.E2 W.ExecAttOut	Number of handover executions from E-UTRAN to WCDMA network for SRVCC triggered for emergency calls	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526729519	L.EMC.SRVCC.E2 W.ExecSuccOut	Number of successful handovers from E-UTRAN to WCDMA network for SRVCC triggered for emergency calls	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526729520	L.EMC.SRVCC.E2 G.PrepareAttOut	Number of handover attempts from E-UTRAN to GERAN for SRVCC triggered for emergency calls	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001023 TDLOFD-001023	SRVCC to GERAN SRVCC to GERAN
1526729521	L.EMC.SRVCC.E2 G.ExecAttOut	Number of handover executions from E-UTRAN to GERAN for SRVCC triggered for emergency calls	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001023 TDLOFD-001023	SRVCC to GERAN SRVCC to GERAN
1526729522	L.EMC.SRVCC.E2 G.ExecSuccOut	Number of successful handovers from E-UTRAN to GERAN for SRVCC triggered for emergency calls	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001023 TDLOFD-001023	SRVCC to GERAN SRVCC to GERAN

Counter ID	Counter Name	Counter Description	Feature ID	Feature Name
1526729523	L.EMC.SRVCC.E2 T.PrepareAttOut	Number of handover attempts from E-UTRAN to TD-SCDMA network for SRVCC triggered for emergency calls	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526729524	L.EMC.SRVCC.E2 T.ExecAttOut	Number of handover executions from E-UTRAN to TD-SCDMA network for SRVCC triggered for emergency calls	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526729525	L.EMC.SRVCC.E2 T.ExecSuccOut	Number of successful handovers from E-UTRAN to TD-SCDMA network for SRVCC triggered for emergency calls	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022	SRVCC to UTRAN SRVCC to UTRAN
1526730082	L.IRATHO.E2W.S RVCC.Prepare.FailOut .MME	Number of SRVCC-based outgoing handover preparation failures from E-UTRAN to WCDMA network because of the MME side causes	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022 LOFD-070202 TDLOFD-081223	SRVCC to UTRAN SRVCC to UTRAN Ultra-Flash CSFB to UTRAN Ultra-Flash CSFB to UTRAN
1526730083	L.IRATHO.E2W.S RVCC.Prepare.FailOut .PrepareFailure	Number of SRVCC-based outgoing handover preparation failures from E-UTRAN to WCDMA network because of the response of handover preparation failure from WCDMA network	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022 LOFD-070202 TDLOFD-081223	SRVCC to UTRAN SRVCC to UTRAN Ultra-Flash CSFB to UTRAN Ultra-Flash CSFB to UTRAN

Counter ID	Counter Name	Counter Description	Feature ID	Feature Name
1526730084	L.IRATHO.E2W.SRVCC.Prep.FailOut.NoReply	Number of SRVCC-based outgoing handover preparation failures from E-UTRAN to WCDMA network because of no response from WCDMA network	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001022 TDLOFD-001022 LOFD-070202 TDLOFD-081223	SRVCC to UTRAN SRVCC to UTRAN Ultra-Flash CSFB to UTRAN Ultra-Flash CSFB to UTRAN
1526730097	L.IRATHO.SRVCC.CSonly.E2G.PrepAttOut	Number of CS-only SRVCC-based outgoing handover attempts from E-UTRAN to GERAN	Multi-mode: None GSM: None UMTS: None LTE: LOFD-001023 TDLOFD-001023	SRVCC to GERAN SRVCC to GERAN

10 Glossary

For the acronyms, abbreviations, terms, and definitions, see *Glossary*.

11 Reference Documents

1. 3GPP TS 23.216, "Single Radio Voice Call Continuity (SRVCC)"
2. 3GPP TS 23.272, "Circuit Switched (CS) fallback in Evolved Packet System (EPS)"
3. 3GPP TS 25.913, "Requirements for Evolved UTRA (E-UTRA) and Evolved UTRAN (E-UTRAN)"
4. *CS Fallback Feature Parameter Description*
5. *Inter-RAT Mobility Management in Connected Mode Feature Parameter Description*
6. *Flexible User Steering Feature Parameter Description*
7. *VoLTE Feature Parameter Description*