

Cell Broadcast Center - SBc Interface

- Feature Summary and Revision History, on page 1
- Feature Description, on page 2
- How It Works, on page 2
- Configuring SBc Interface, on page 4
- Monitoring SBc Services, on page 6

Feature Summary and Revision History

Summary Data

Applicable Product(s) or Functional Area	MME
Applicable Platform(s)	• ASR 5000 • ASR 5500 • VPC-DI • VPC-SI
Feature Default	Enabled - Configuration Required
Related Changes in This Release	Not Applicable
Related Documentation	• *Command Line Interface Reference* • *MME Administration Guide* • *Statistics and Counters Reference*

Revision History

Important Revision history details are not provided for features introduced before releases 21.2 and N5.1.

Revision Details	Release
MME is enhanced to show two new failure message types. Session manager and MME manager facility stack are updated to handle the PWS failure and restart indications.	21.28
Enhancement to SBc and S1-AP interfaces	21.12
First introduced	Pre 19.0

Feature Description

The MME uses the SBc interface, between the MME and the Cell Broadcast Center (CBC), for warning message delivery and control functions.

The MME provides support for Commercial Mobile Alert System (CMAS) — SBc interface and underlying protocols. Warning Messages can be received from a CBC over the SBc-AP interface and relayed to all relevant eNodeBs over the S1-AP interface.

MME upon receiving Public Warning System (PWS) failure or restart indication starts a CBC transaction to notify MME on the failure or restart.

Session manager and MME manager facility stack are updated to handle the PWS failure and restart indications.

The CMAS functionality is enabled in the networks to provide warning notifications to subscribers.



Important A valid license key is required to enable the SBc interface. Contact your Cisco account representative for information on how to obtain a license.

For more information see the *Cell Broadcast Center - SBc Interface* chapter in the *MME Administration Guide*.

How It Works

The MME accepts incoming SBc associations coming from multiple CBCs.

The MME is responsible for the delivery of the Warning Messages received from CBC to all relevant eNodeBs serving the given TAI list. In the absence of TAI list in the received Warning Message, MME sends the Warning Message to all connected eNodeBs.

The MME acknowledges to CBC when it has started distributing the Warning Message to all relevant eNodeBs. If a response is not received from any eNodeB, it shall not result in any exclusive error messaging to CBC.

Even if the MME node is experiencing congestion, Warning Messages are forwarded and not dropped.

When connected to multiple CBCs, the uniqueness of Warning Messages as identified by Message Type, Message Identifier and Serial Number, must be ensured across these CBCs.

DSCP Marking for SBc Interface

SBc services support the Differentiated Services Code Point (DSCP) marking functionality. DSCP marking helps in packet traffic management. DSCP marking can be performed on both IPv4 and IPv6 packets leaving the SBc interface.

Either the predefined DSCP values can be used for marking or any arbitrary value ranging from 0x01 to 0x3F can be assigned. The default DSCP value is 0x00 or be (Best Effort). The default DSCP value is automatically set when the configuration is disabled.

```
config
  context context_name
    sbc-service service_name
      [ no ] ip qos-dscp dscp_value
      end
```

NOTES:

- **ip**: Defines the Internet Protocol parameters for the packets leaving through the SBc interface.
- **qos-dscp**: Designates the Quality of Service - Differentiated Services Code Point value to the packet leaving through the SBc interface.
- *dscp_value*: Value assigned to the packet for DSCP marking. The value can be a predefined DSCP value or an arbitrary value ranging from 0x01 to 0x3F.

Warning Message Call Flows

In compliance with 3GPP TS 29.168 v15.1.0, the MME supports the following procedures:

- Write-Replace Warning Procedure
- Stop Warning Procedure
- Error Indication Procedure
- Write-Replace Warning Indication Procedure
- Stop Warning Indication Procedure
- PWS Failure Indication
- PWS Restart Indication

Limitations

This section describes the known limitations for the Cell Broadcast Center feature:

- The size of the SBc message supported by MME is a maximum of 50K bytes. If MME receives the WRITE-REPLACE WARNING REQUEST over 50K bytes, the message cannot be processed, and a warning syslog is generated.
- MME supports only up to 256 maximum elements in PWS Restart-TAI-List. If the eNodeB sends more than 256 elements, the PWS Restart Indication message does not get relayed to the CBC.

Standards Compliance

The Cell Broadcast Center feature complies with the following standards:

- 3GPP TS 22.268 v10.4.0: Public Warning System
- 3GPP TS 23.041 v10.6.0: Technical realization of Cell Broadcast Service (CBS)
- 3GPP TS 29.168 v15.1.0: Cell Broadcast Centre Interfaces with the Evolved Packet Core
- 3GPP TS 36.413 v15.3.0: S1-AP Interface

Configuring SBc Interface

This section describes how to configure the SBc interface on MME.

Creating and Configuring SBc Service

An SBc service must be created within a context to configure the SBc-AP interface to accept connections from one or more CBCs.



Important A valid license key is required to access the commands used to configure and manage the SBc interface. Contact your Cisco account representative for license information.

Use the following configuration to create and configure the SBc service.

```
configure
  context ctxt_name
    sbc-service sbc_svc_name
      associate sctp-param-template sctp_param_template_name
     bind ipv4/v6-address ipv4/v6_address_value1 ipv4-address ipv4_address_value2

      cbc-associations maximum number
      sbc-mme sctp port port_num
      end
```

NOTES:

- Up to 8 SGs + MME + SBc + SLs services can be configured on the system. The SBc service name must be unique across all contexts.
- Associating the SBc service to the SCTP parameter template is not required for the SBc service to be operational. However, if a template is associated, the template must exist before the SBc service is associated to it.
- The SBc service must be bound to at least 1 IP address. Up to 2 IPv4 or 2 IPv6 addresses can be specified for multihoming purposes.
- The **cbc-associations** command is used to define the maximum number of CBC connections allowed for this SBc service. The default setting is 1. Up to 2 connections are allowed per SBc service.

- The default SCTP port used is 29168. The MME listens for incoming SBc-AP connections from an CBC on this port.

Associating the SBc Service with the MME Service

Use the following configuration to associate the SBc service to an MME service.

```
configure
  context ctxt_name
    mme-service mme_svc_name
      associate sbc-service sbc_svc_name [ context ctxt_name ]
      end
```

NOTES:

- Each MME service can be associated with one unique SBc service.
- The SBc service is **not** a critical parameter for the MME service. Removing this configuration will **not** restart the MME service.
- The MME will always check for a valid SBc service that is up and connected to a CBC before performing any meaningful operations on the Warning Messages received on the S1-AP interface (like attempting to forward the messages).
- Use the optional **context** keyword if the SBc service and MME service are configured in separate contexts.
- The SBc service is not operationally STARTED unless the MME service to which it is associated is in a STARTED state.

Configuring ENB Response Aggregate Timer

Use the following configuration timeout values for aggregating responses received from eNB at MME.

```
config
   context context_name
        sbc-service service_name
          enb-response-aggr-timer timeout_value
         [ default ] enb-response-aggr-timer
         end
```

- **enb-response-aggr-timer** *timeout_value*: Configures the timeout value in seconds for aggregating responses received from eNB at MME.
- *timeout_value* : must be an integer between 4 and 120.
- **default** : Sets the default timeout value for aggregating responses received from eNB at MME. Default value is 10 seconds.

Configuring Send Warning Indication

Use the following configuration to enable or disable the warning indication messages towards CBC from MME.

```
config
   context context_name
         sbc-service service_name
           [ no | default ] send stop-warning-ind
           [ no | default ] send write-replace-warning-ind
          end
```

- **send stop-warning-ind** : Enables the stop warning indication messages towards CBC from MME.
- **send write-replace-warning-ind** : Enables the write-replace-warning indication messages towards CBC from MME.
- **no**: Removes the configuration of sending the warning indication [stop warning / write replace warning] messages towards CBC from MME.
- **default** : Sets the default configuration of sending the warning indication [stop warning / write replace warning] messages towards CBC from MME. By default sending of warning indication messages are disabled.

Verifying the SBc Service Configuration

The following command displays configuration information for all SBc services, for the specified for the specified SBc service, or for the specified Cell Broadcast Center.

```
show sbc-service { all | cbc-associations { all | sbc-service-name
sbc_svc_name [ path-info | summary ] } | sbc-service-name sbc_svc_name }
```

The following command displays the SBc Service name and SBc Service Context which has been associated with each MME service.

```
show mme-service all
```

The following command displays configuration errors and warnings related to all SBc services on the MME:

```
show configuration errors section sbc-service verbose
```

Monitoring SBc Services

This section lists the SNMP traps, bulk statistics, and show commands that display operational statistics relating to SBc services.

SNMP Traps

The following traps are available to track status and conditions relating to the SBc service.

- **starSBCServiceStart**: An SBc Service has started.
- **starSBCServiceStop**: An SBc Service has stopped.

The following traps are generated to track status and conditions of individual CBC associations.

- **starCBCAssocDown**: A CBC Association is down.
- **starCBCAssocUp**: A CBC Association is up.

SBc Bulk Statistics

SBc service related bulk statistics are provided within the **SBc** schema.

Use the following command to display a list of all variables available within this schema:

show bulkstats variables sbc

For more information about these statistics, refer to the **SBc Schema** chapter of the *Statistics and Counters Reference*.

SBc Service Show Commands and Outputs

show sbc statistics

The following command displays all statistics related to the SBc service. These statistics can be filtered based on CBC association (peer-id) or SBc service name.

show sbc statistics { all | peer-id *peer_id* **| sbc-service-name** *sbc_svc_name* **}**

show mme-service statistics s1ap

The following command displays S1-AP statistics related to the SBc interface. See the lines for Kill Request and Kill Response in the example below:

```
S1AP Statistics:
   Transmitted S1AP Data:

       Kill Request: 0    Write-Replace Warning Request: 0
   Received S1AP Data:

       Kill Response: 0   Write-Replace Warning Response: 0
```

Event Logging

Event logging for the SBc interface can be enabled using the following command:

logging filter active facility sbc level *severity_level*

See the *System Logs* chapter of the *System Administration Guide* for more information about event logging.