WorldGSM™

BSS

Configuration and User Guide

2.4.3

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1. About This Document

1.1 Purpose

This document provides the details of various managed elements of base station subsystem (BSS) that you can add, modify, or delete by using operations management center (OMC). In addition, this document describes how to add and configure the BSS node.

1.2 Intended Audience

The intended target groups for this document are:

- Alarm Operators
- Fault Manager Administrator
- System Administrators
- Installation Engineers

1.3 Document Conventions

The different conventions used in this document are explained in the following table:

Table 1: Document Conventions

Convention	Description
ⓘ	**Note**: Provides information about important features or instructions.
⃠	**Caution**: Alerts you to potential damage to a program, device, or

Convention	Description
	system.
	**Warning**: Alerts you to potential injury or fatality. It may also alert you to potential electrical hazards.
`file/directory names`	All courier new.
Bold font	Any option that needs to be selected or typed in the user interface is represented using bold font.

1.4 Terms and Abbreviations

The different terms and abbreviations used in this document are explained in the following table:

Table 2: Terms and Abbreviations

Terms / Abbreviations	Description / Expansion
BSC	Base Station Controller
BSS	Base Station Subsystem
BVCI	BSSGP Virtual Connection Identifier
CIC	Circuit Identity Code
CPU	Central Processing Unit
CS	Circuit Switch

Terms / Abbreviations	Description / Expansion
DLA	Dynamic Link Adaptation
DLCI	Data Link Connection Identifier
DSP	Digital Signaling Processing
FCAPS	Fault Configuration Accounting Performance and Security
FCPS	Fault Configuration Performance Security
FR	Frame Relay
FTP	File Transfer Protocol
GPRS	General Packet Radio Service
GUI	Graphical User Interface
HSN	Hopping Sequence Number
I/O	Input/Output
LAN	Local Area Network
LAPD	Link Access Protocol – Channel D
LEP	Local End Point
MAIO	Mobile Allocation Index Offset
MO	Managed Object
ME	Managed Element

Terms / Abbreviations	Description / Expansion
MSC	Mobile Switching Center
NM	Network Management
NM/EM	Network Management/Element Management
NMS	Network Management System
NOC	Network Operation Center
NSVC	Network Service Virtual Connection
OID	Object Identifier
OMC	Operations Management Center
OSS	Operations Support Systems
PA	Process Administration
PDCH	Packet Data Channel
PS	Packet Switch
PID	Process ID
RA	Routing Area
REP	Remote End Point
SACCH	Slow Associated Control Channel
SDCCH	Stand-alone Dedicated Control Channel
SNMP	Simple Network Management Protocol

Terms / Abbreviations	Description / Expansion
URL	Uniform Resource Locator

1.5 References

- OMC Add Remove NE Import Export Guide
- OMC Base Guide
- OMC Installation Guide

2. BSS Overview

The base station subsystem (BSS) is responsible for setting up, maintaining, and terminating the radio connections towards the mobile station (MS). BSS is a common resource where the same equipment and frequencies are used for both packet-switched and circuit-switched traffic. It can handle GSM 850, 900, 1800, and 1900 bands.

The WorldGSM™ BSS supports both transmission distribution mode (TDM) and internet protocol (IP) interfaces. This facilitates easy integration into the existing systems of the operators in the GSM architecture.

It also supports logical channels, which are separated into traffic channels and signaling channels. The traffic channels are half and full rate traffic channels (TCH) (TCH - HR/FR). The signaling channels are subdivided into the following three categories:

- Broadcast channels (BCH)
- Common control channels (CCCH)
- Dedicated control channels (DCCH)

The GSM specification permits only certain channel combinations of logical channels, which WorldGSM™ also supports.

BSS Components

The BSS comprises of nodes and functionality related to the radio access network within GSM and performs all radio related functions.

It consists of the following two components:

- Base station controller (BSC)
- Base transceiver station (BTS)

BSC

The BSC provides all the control functions and physical links between the mobile switching center (MSC) and BTS. BSC is a high-capacity switch that provides capabilities such as handover, cell configuration data, and control of radio frequency (RF) power levels in BTSs. In an area, the BTS connects to the BSC through the Abis interface.

The BSC 500i is a table-top equipment. It draws power from the battery as it is deployed in exchanges.

BTS

The BTS is the radio equipment (transceivers and antennas) that provides radio access to the mobile stations. It is required to service each cell in a network. BSS controls a group of BTSs.

You can configure and monitor BTS and BSC elements in a network by using operations management center (OMC).

2.1 BSS and OMC Workflow

VNL® OMC can operate all nodes of the BSS, transmission, and power system. The OMC is a functional entity from where the network operator monitors and controls the BSS. The purpose of OMC is to offer a cost-effective support for centralized, regional, local operational, and maintenance activities that are required for a GSM network.

Each network element supports or implements one or more network management functions used by OMC.

The network management supports the configuration, supervision, and the maintenance of the network resources and services. VNL® network management provides the necessary input to higher service-level management, business support systems, and other administrative systems.

The OMC offers the following functions:

- Configuration management
- Software management
- Fault management
- Performance management

Note: Please refer to "*OMC Base Guide*" for more information.

Some of the key features of the OMC are:

- Reconcile feature
- Data sync
- Search ME in hierarchy

2.1.1 Reconcile Feature

In reconcile operation, the OMC fetches the existing configuration data from the node and updates it on the OMC. This ensures that you view the latest status of the managed element (ME). It is recommended that you should perform the reconcile operation (screen based and not on full BSS) before and after every modification in BSS.

In addition, OMC server also reconciles BSS node periodically.

Note: All view tables should be reconciled before proceeding further.

You can configure the time period for the reconciliation of a node. This periodic reconciliation of nodes is an automatic feature, which is on by default.

Follow the below steps to configure the time period for the automatic reconciliation of node:

1. Open the Network Explorer window.
2. Select a node for which you want to configure the reconciliation time period.
3. Click **Configuration**, select **Options**, and click **Reconcile Configuration**.
4. In the Configuration - Reconcile Time Interval dialog box, type numbers in the Time Interval text box. This value is in minutes.
5. Click **Ok** to save the changes.

2.1.2 Data Sync

When you reconcile the BSS Node, all data is synchronized between BSC and OMC. This means that the network element sends the data to OMC.

2.1.3 Search ME in Hierarchy

Hierarchies show all the assigned and unassigned nodes. You can search nodes and MEs in hierarchies.

Follow below steps to search a ME in hierarchies in the Network Explorer window:

1. Click the BSS node, click the **Configuration** menu, select **Configuration**, select **Modify Node**, and click **Node Configuration**.

The Configuration – Modify Node window appears.

2. Right-click any node and click **Search.**

The Search Element dialog box appears.

3. Type the name of the element in the Enter Element Name text box.
4. Click **Find Next** to search for the element mentioned in the text box.

Note: Click **Find Next** again, to search next instance of the mentioned text.

2.2 Administrative and Operational States of ME

You can change the administrative state of MEs. Changes in administrative states are required to modify MEs. The operational state of a ME is based on the actions performed on the ME.

2.2.1 Administrative States

The administrative state of a ME indicates whether it is locked or not. You can change the administrative state of MEs using OMC. This is required when you want to change the configuration of a ME. The following states are present:

- Lock: In this state, you can modify or delete a ME. If you want to delete a ME then lock all the sub-managed elements of that ME. After you lock all the sub-managed elements, lock the ME, and then delete it. All the sub-managed elements of the deleted ME are also deleted. In locked state, the ME is in disabled state.

Note: Not all modifications require a node lock. For modifications that require a node lock, you should unlock the

ME after performing the action. This changes the operational state of the ME to enable.

- Unlock: In this state, you cannot perform any action on the ME. However, there is an exception with the cell table. You can modify the handover and power control parameters in unlocked state.

2.2.2 Operational States

Operational state of a ME tells you the functional state of that ME. The change in the operational state of a ME depends on the internal working of BSC. In addition, the operational state of ME changes only when you change its administrative state. You can only view the operational state of a ME in OMC. The states are as follows:

- Enabled: The ME is operable. Enabled state of a ME refers that it is working and communicating with the BSC.
- Disabled: The ME is inoperable because it is not installed, defective, or because of some other resource upon which it depends is not available (locked by operator or operational state is disabled due to internal failure). In addition, connectivity failure between the ME and BSS makes the ME disabled.

2.2.2.1 Administrative Operations

In addition to the administrative states, you can perform the given below operations on a ME:

- Reset Active: Used to restart the selected ME.
- Reset Stand by: Used to restart the ME, which is in standby mode.
- Connect: Used to connect a ME to a network.

- Disconnect: Used to disconnect a ME from a network.
- Shut Down Active: Used to shutdown a ME, which is in active state. The standby card becomes active. This puts the card in hot swap state (meant for maintenance purpose) and you can jack-out the card. This is also called as graceful shutdown of the processes.
- Shut Down Standby: Used to shutdown a ME, which is in standby mode. This puts the card in hot swap state (meant for maintenance purpose) and you can jack-out the card. This is also called as graceful shutdown of the processes.
- Block: Used to block a ME from accessing or using a network.

2.3 BSS Configuration Workflow

The figure below depicts the workflow for configuring the BSS node:

After assigning the BSS node to OMC, you should configure trunkport so that BSC, BTS, and MSC can communicate with each other.

You can configure stack, radio, and software after configuring BSC.

In addition, you should follow the procedure given in the following sections of this document to successfully configure and manage the BSS node.

3. Managing the BSS Node

This section describes the procedure to add the BSS node in OMC. In addition, this section describes the different modes for viewing the BSS node and configuration of trunkport.

3.1 Adding a BSS Node

The addition of BSS node in OMC is a two-step process:

1. The registration of BSS node with the OMC server.
2. Assigning the BSS node to hierarchy.

Registration is an automatic process that BSS node initiates. The BSS node appears in the unAssigned hierarchy on completion of the registration process. You need to assign the BSS node to another hierarchy. This process or approach of adding BSS node is also called bottom-up approach.

You can configure the BSS node only after assigning the node to another hierarchy from unAssigned hierarchy.

ⓘ**Note**: For more information on hierarchies, please refer to "*OMC Add Remove NE Import Export Guide-Managing Hierarchies"*.

Refer "*Approaches for Adding BSS Node*" to know the different approaches for adding the BSS node.

3.1.1 Registering the BSS Node

When you start (power-up) the BSS node, it initiates the registration process and sends its information to the OMC server. The IP address of the communicating OMC server is in the default factory settings of the BSS node. The following steps take place during the registration of the BSS node:

1. When BSS node is powered-up, it tries to connect to the designated OMC over transmission control protocol (TCP) interface.
2. If the two-way communication is successful, BSS and OMC starts exchanging registration messages over TCP interface.
3. BSS provides its information in the registration request message.
4. OMC provides file transfer protocol (FTP) and simple network management protocol (SNMP) related information. For example, FTP user name, FTP password, SNMP agent port, SNMP manager trap port, SNMP read/write community, and other related information.
5. OMC starts fetching data from BSS over SNMP.

Note: BSS is preconfigured with OMC IP address default factory settings.

After configuration of BSS with FTP and SNMP, the BSS registers with the OMC and appears in the unAssigned hierarchy of the OMC GUI.

3.1.2 Assigning the BSS Node to Hierarchy

You can view the settings and configure the BSS node after moving the BSS node from unAssigned hierarchy to another hierarchy.

The following are the steps to assign the BSS node to the default hierarchy:

1. Open the Network Explorer window and double-click **unAssigned** hierarchy.

All the existing unAssigned nodes appear in right-pane.

2. Right-click a desired node and click **Assign Node** to open the Node Operations – Assign Mode screen.

Note: You can also drag the BSS node from unAssigned hierarchy to any other hierarchy.

3. Click the **Browse** button to select a hierarchy or view object to which you want to assign the selected node.
4. In the Node Operations – Browse Destination dialog box, select a hierarchy or view to which you want to assign the node and click **Ok.**
5. Click **Ok** to save the changes.
6. Double-click the hierarchy or view object name in which you have assigned the node to view the BSS node.

3.2 BSS Viewing and Modifying Mode

You can view and/or modify the configuration details of a BSS node in the OMC GUI. When you open a BSS node in viewing or modifying mode, the IP of the node replaces the name of the node.

3.2.1 Viewing Mode

In this mode, you can only view the configuration details of a BSS node. You cannot edit any ME or fields of a ME.

Follow the below steps to open a BSS node in the viewing mode:

1. Open the Network Explorer window.
2. Click the BSS node, click the **Configuration** menu, select **Configuration**, select **View Node**, and click **Node Configuration**.

Alternatively,

2. Right-click a BSS node, select **View Node**, and click **Node Configuration**.

The Configuration – View Node window appears.

Note: The newly added node has some preconfigured data. The above figure shows the node with preconfigured data.

3.2.2 Modifying Mode

In this mode, you can modify the configuration details of a BSS node. You can configure the settings of any ME in this mode.

Follow the below steps to open a node in the modify mode:

1. Open the Network Explorer window.
2. Click the BSS node, click the **Configuration** menu, select **Configuration**, select **Modify Node**, and click **Node Configuration**.

Alternatively,

2. Right-click a node, select **Modify Node**, and click **Node Configuration**.

The Configuration – Modify Node window appears.

3. Double-click **BSS:<IP address>** to view the MEs.

3.3 Configuring Trunkport

A trunkport is an entity that connects switching centers or nodes in a communication network and handles many signals simultaneously. Trunkport facilitates the communication between any two network nodes (such as MSC-BSC, BSC-BTS, and so on) over E1. This section explains how you can configure trunkports.

3.3.1 Viewing Trunkport Details

Perform the following to view trunkport configuration:

1. Open the BSS node in the modify mode.
2. Expand **Inventory**, expand **Hardware**, and click **Chassis**.

The following table provides the details of the fields in the TrunkPort Config tabbed page:

Table 3: Fields in TrunkPort Config Tab

Name	Description	Values
TrunkPorts		
T0 to T39	Specifies the various trunkports.	• T0 to T7 associate with the ICC card. • T8 to T39

Name	Description	Values
		associate with the EIC card.
Options		
Activate TrunkPort	Activates a trunkport.	-
Deactivate TrunkPort	Deactivates a trunkport.	-
TrunkPort Configuration		
Trunk Type	Specifies the type of trunkport.	trunk_E1_Type/trunk_T1_Type
Framing Option	Determines the framing format to be used for E1 or T1.	bpm_Framing_Opt_Crc4/bpm_Framing_Opt_NoCrc4
Encode Type	Determines the line encoding and the zero suppression mechanism to be used on T1 or E1.	• bpm_Lc_Hdb3 for E1 • bpm_B8zs for T1
Usage Type	Specifies the type of traffic to be carried by the trunk connected	trunk_Usage_Aif/trunk_Usage_Free/trunk_Usage_AbisIf

Name	Description	Values
	to this trunkport.	

At start-up, the usage type of all trunkports is free and is in deactivated state.

Understanding Trunkport States

The color scheme differentiates the trunkport states. The following colors are associated with the trunkport states:

- Green: Trunkport is activated and enabled.
- Blue: Trunkport is activated but disabled.
- Red: Trunkport is deactivated and disabled.

You can only activate or deactivate a trunkport but you cannot enable or disable the trunkport. When you activate a trunkport from OMC, only the activation process is performed. The enabling or disabling process is carried out by BSC internally. Therefore, there may be a case, when you activate a trunkport but the status still shows activated and disabled for a trunkport (in blue color).

ⓘ**Note**: Some trunkport numbers are displayed in grey color, which indicates they are physically absent and you cannot perform any action on them.

3.3.2 Locking/Unlocking Trunk

You can lock a trunk only if it is unlocked. Similarly, you can unlock a trunk only if it is in locked state.

Perform the below steps to lock/unlock a trunk:

1. Open the BSS node in the modify mode.
2. Expand **Inventory**, expand **Hardware**, and click **Chassis**.
3. Click the **Trunk Config** tab.

4. Select a trunk and click **Modify**.

The lock or unlock option is automatically selected when you select a trunk. For example, for a locked trunk, the Unlock option is selected automatically.

On successful lock or unlock, appropriate message appears.

ⓘ**Note**: You cannot unlock a trunk with usage type free.

3.3.3 Activating Trunkport

You should activate a trunkport before configuring other MEs of the BSS node. When you add a ME, for example, BTS or A-Interface link, the trunkport field for these MEs automatically populates if a trunkport is available and in active state. If no trunkport is available then the trunkport field of these MEs has no trunkport entry and you cannot add them.

Perform the below steps to activate a trunkport:

1. Open the BSS node in the modify mode.
2. Expand **Inventory**, expand **Hardware**, and click **Chassis**.
3. Select a trunkport that you want to activate.
4. Click **Activate TrunkPort** in the Options panel.
5. Select the desired values of framing option, encode type, and usage type from the corresponding drop-down lists.

ⓘ**Notes:**

You can change the value of Usage Type field only if trunk is in locked state and remains independent of physical state. The key noticeable points are:

- If you want to change usage type of a trunkport, which is of usage type Abis, to usage type free or AIF then there

should not be any BTS configured on Abis for that trunkport. The usage type of all internal trunkports is Abis.

- Similarly, if you want to change usage type AIF to free or ABIS then these conditions should match:
  - AIF trunk must be in administratively locked state.
  - Message transfer part (MTP) link must not be configured on this AIF trunk.
  - Multilink point to point protocol (MLPPP) link must not be configured on this AIF trunk.
  - No clock source configuration on the AIF trunk.
- In addition, the operator needs to deactivate the trunkport first and then activate it again (with modified values) for reconfiguration of the following fields:
  - Framing Option
  - Encode Type

6. Click **Modify** to save the changes.

The Confirmation message box appears.

7. Click **Ok**.

3.3.4 Deactivating Trunkport

A trunkport can be deactivated (physical trunkport state = deactivate) only if the administrative state of the trunkport is locked.

Perform the below steps to deactivate a trunkport:

1. Open the BSS node in the modify mode.
2. Expand **Inventory**, expand **Hardware**, and click **Chassis**.
3. Lock trunkport, which you want to deactivate.

4. Click an active trunkport.
5. Click **Deactivate TrunkPort** in the Options panel.
6. Click **Modify** to deactivate the trunkport.

The Confirmation message box appears.

7. Click **Ok**.

3.4 Configuring MLPPP

MLPPP is a communication protocol that enables a computer to use two point-to-point ports as a single port of greater bandwidth. Point-to-point protocol (PPP) is a full-duplex protocol that uses a serial interface for communication between systems. PPP offers error correction and can handle synchronous as well as asynchronous data. For example, if you combine two modems and connect to the Internet then the data transfer rate increases. Similarly, MLPPP increases the data transfer rate.

The data transfer rates of the two links should be similar. Otherwise, the slower link decreases the overall throughput.

After installing MLPPP drivers, you can configure MLPPP in OMC. For more details on the installation procedure, please refer to "*OMC Installation Guide- Appendix A*". You configure MLPPP for each trunkport by assigning timeslots.

ⓘ**Note**: You should always configure MLPPP from OMC only. Failure to do so may introduce inconsistencies.

Perform the below steps to configure MLPPP:

1. Open the BSS node in the modify mode.
2. Right-click **IPConfig** and click **Add MLPPP**.

The Configuration -Add Row dialog box appears.

3. Provide the details such as Node Ip, OMC Ip of the remote system, TrunkPort Number, and Time Slots.

ⓘ**Note**: You can configure maximum eight Time Slots.

4. Click **Ok** to add MLPPP.

4. BSC Configuration

This section explains the procedure of adding BSC node and configuring timers. It also describes how you can perform modifications on the BSC node.

4.1 Adding BSC

You can add only one BSC for a BSS node.

Perform the following steps to add a BSC:

1. Open the BSS node in the modify mode.
2. Right-click the root node and click **Add Element**.
3. Select **BSC** from the ME Type drop-down list and click **Ok**.

The Configuration - Add Row dialog box appears.

The following table describes the configurable fields of the Configuration – Add Row dialog box for BSC:

Table 4: BSC Add Row Field Values

Name	Description	Values
Bsc ID	Indicates the BSC Id.	0 to 65535
Admin State	Indicates the administrative state of the BSC. This is a read-only field.	locked/unlocked
BSC Reset	Indicates the flag whether the BSS can be rebooted or not. It allows you to reboot the BSS. If this parameter is set to true, then	no_Reset/active_ICC_Card_Active/Standby_ICC_Card

Name	Description	Values
	OAM sets this parameters to false before it triggers platform to initiate a reboot of BSS. This is a read-only field.	_Reset/active_ICC_Card_Shutdown/Standby_ICC_Card_Shutdown
Enable GPRS	Defines whether BSS is supporting GPRS service or not. If set to false, Gb interface and PS cells cannot be provisioned.	false/true
Enable Call Re-Est	Indicates that the call reestablishment is allowed or not.	allowed, not_Allowed
Enable IMSI Attach/Detach	Indicates whether attach-detach is allowed.	allowed/not_Allowed
Timer T3212	Indicates the T3212 timeout value field. It is coded as the binary representation of the timeout value for periodic location updating. Its unit is deci-hours. The value 0 is used for infinite timeout value that is periodic updating cannot be used within the cell.	0 to 255
MCC	Refers to the mobile country code.	0 to 9
MNC	Refers to the mobile network code.	If 2-digit MNC is used : 00F-99F; if 3-digit MNC is used: 000-999

Name	Description	Values
NCC	Indicates the network color code, which is part of the BSIC. The BSIC is a local color code that allows a MS to distinguish between different neighboring base stations. Cell specific BCC is derived from 'bcc' from the cell table. Attribute is conveyed to BTS during configuration.	0 to 7
NCC Permitted	Provides a definition of the allowed NCCs on the BCCH carriers. This is reported in the measurement report message by the mobile stations in the cell.	0 to 255
DL DTX	Indicates whether the discontinuous transmission (DTX) on downlink TCHs is used, if the MSC does not explicitly forbid the usage of DTX for the specific call.	downLink_DTX_Not_Used
UL DTX	Indicates DTX uplink availability.	ms_May_Use_DTX, ms_Shall_Use_DTX, ms_DTX_Not_Used

Name	Description	Values
Min Freq Channel Gap	While assigning multiple frequencies to a cell, it is required to maintain a difference. For example, f1, f2, f3, f4 frequencies are assigned to one cell (all non BCCH). f1 < f2 < f3 < f4. Also, f2 – f1, f3 – f2, f4 – f3 should be >Min Freq Channel Gap.	1 to 123
Tx Integer Value	Indicates the number of slots to spread transmission on RACH (number of slots in multi frame needed for transmission). • 0: 3 slots • 1: 4 slots • … • 9: 12 slots • 10: 14 slots • 11: 16 slots • 12: 20 slots • 13: 25 slots • 14: 32 slots • 15: 50 slots	0 to 15
RadioLink Timeout Value	Indicates the timeout before the MS is disconnected from a call, in case of repeated failures to decode the SACCH messages. RadioLink Time out value has a relation	0 to 15

Name	Description	Values
	to circuit switch (CS) application used.	
Max Retrans Value	Indicates the maximum number of retransmission on RACH. • 0: Maximum 1 retransmission • 1: Maximum 2 retransmissions • 2: Maximum 4 retransmissions • 3: Maximum 7 retransmissions	0 to 3
tWaitCellBlock	Indicates the timer for cell shutdown procedure. Also, refer to "*Administrative Operations*".	30 to1800 sec
CIC Master	Defines which entity allocates the CIC that is BSS or MSC. In this release: only MSC is master.	bsc/msc
HO Reqd Interval	Minimum interval between two consecutive handover required messages related to the same connection.	0 to 10
Timer T8	Indicates handover guard timer in originating cell for MSC controlled handover.	15 to 60
Timer T7	Indicates timer is started in BSC after	1 to 60

Name	Description	Values
	sending the handover-required message to MSC.	
tWaitTrxBlock	Indicates the maximum allowed time after which TRX is forcefully blocked.	30 to1800 sec

4. In the Configuration – Add Row dialog box, provide the values and click **Ok**.

This adds the BSC successfully in the selected BSS node.

4.2 Viewing BSC Details

You can view and modify the details (fields) of BSC, which you have added. You can view the field either in Configuration – View Node window or in Configuration – Modify Node window. In the former, you can only view the fields but in the latter, you can view and edit the fields.

Follow the below steps to view the configuration details of the BSC node:

1. Open the BSS node in the view mode.
2. Click **BSC** and click **BSC: <IP address>** in the left-pane.

The right-pane displays the BSS CS and BSS PS tabs as shown below:

Refer to "*Table 4*" for details about the fields in the BSS CS tab.

The BSS PS tab contains configurable packet switch (PS) parameters, which are applicable on BSS. To configure these parameters, refer to "*Modifying BSC Details*".

The following table explains the various fields in the BSS PS tab:

Table 5: Fields in BSS PS Tab

Name	Description	Values
Network Mode Of Operation	Indicates the operation mode of the network.	nmo_1/nmo_2
Release of SGSN	Indicates the release number of serving GPRS support node (SGSN).	release_99_or_higher/release_98_or_older
T_AVG_W	Indicates the signal strength filter period for power control in packet idle mode.	0 to 25
T_AVG_T	Indicates the signal strength filter period for power control in packet transfer mode.	0 to 25
N_AVG_I	Indicates the parameter for MS output power control.	0 to 15
Max Active PDCH	Indicates the maximum number of active PDCH in BSS. This is determined by the bandwidth available at Gb and Abis interface.	0 to 256

4.3 Setting Administrative State of BSC

There are different administrative states of BSC that you can set based on your requirement. For example, modifying the fields of BSC requires that the administrative state of BSC should be locked.

Follow the below steps to perform any administrative action or to change administrative state of BSC:

1. Open the BSS node in the modify mode.
2. Expand **BSC** and right-click **BSC: <IP address>**.
3. Select **Actions** and click the desired option.

A dialog box appears based on the selection. For example, the lock dialog box is shown below:

4. Click **Ok** to set the state of the BSC ME.

Note: You cannot perform the Lock action, if BSC is already in locked state.

4.4 Modifying BSC Details

You can change the configuration data of a BSC node based on your requirement. The value of the Admin State field of the BSC should be locked for modifying BSC fields.

Follow the below steps to modify the desired BSC fields:

1. Open the BSS node in the modify mode.
2. Change the Admin State of the BSC to lock.
3. Expand **BSC** and click **BSC :<IP address>**.
4. Click the desired tab and edit the required fields.
5. Click **Modify** to save the changes.

The Confirmation message box appears.

6. Click **Ok**.

After modifying the fields, you should unlock the BSC to make the BSC operational.

If the administrative state of BSC is unlocked then you cannot modify any fields of the BSC. In the unlocked state, the BSC is in operational state, which implies that BSC is communicating with BTS.

4.5 Configuring Timers

Timers are preconfigured during factory setup. However, you can also configure the timers. Locking of any object is not required for modifying the timer values. However, in case of modification, you should provide values in all the fields of a timer. These are the timers:

- Base station subsystem application part (BSSAP) timers
- Message transfer part (MTP3) timers
- PDC timers
- Signaling connection control part (SCCP) timers

Follow the below steps to modify values/fields of any timer listed above:

1. Open the BSS node in the modify mode.
2. Click the **TimersConfig** ME.
3. In the left-pane, click any timer that you want to modify.
4. In the right-pane, edit the fields of the selected timer.
5. Click **Modify** to modify the values.

The Confirmation message box appears.

6. Click **Ok**.

The below sections give the description of fields of all timers.

4.5.1 BSSAP Timers

BSSAP timers show the BSSAP stack timer values. You can change the field values within the given range for each field.

The following table provides the details of the BSSAP timers:

Table 6: BSSAP Timers Fields

Field Name	Description	Values (seconds)
T1	BSSAP timer value T1 time to receipt of (UN)BLOCKING ACKNOWLEDGE message at the BSS.	1 to300
T4	BSSAP timer value T4 time to receipt of RESET ACKNOWLEDGE message at the BSS.	
T10	Time to return of ASSIGNMENT COMPLETE message.	
T11	Maximum allowed queuing time for assignment.	

Field Name	Description	Values (seconds)
T13	BSSAP timer value T13 reset guard period at the BSS to send RESET-ACK mesasge to MSC.	
T17	Overload timer for access class barring procedure.	
T18	Overload timer for access class unbarring procedure.	
T19	BSSAP timer value T19 time to receipt of RESET CIRCUIT ACKNOWLEDGE message at the BSS.	
T20	BSSAP timer value T20 time to receipt of CIRCUIT GROUP BLOCKING ACKNOWLEDGE message at the BSS.	

4.5.2 MTP3 Timers

MTP3 Timers shows the MTP3 timer configuration used by CS MTP3 stack. You can change the field values within the given range for each field.

The following table provides the details of the MTP3 timers:

Table 7: MTP3 Timers Fields

Field name	Description	Values
T1	Specifies the MTP3 timer value T1.	5 to 12 msec
T2	Specifies the MTP3 timer value T2.	7 to 20 msec
T3	Specifies the MTP3 timer value T3.	5 to12 msec
T4	Specifies the MTP3 timer value T4.	
T5	Specifies the MTP3 timer value T5.	
T6	Specifies the MTP3 timer value T6.	
T7	Specifies the MTP3 timer value T7.	10 to 20 msec
T8	Specifies the MTP3 timer value T8.	8 to12 msec
T9	Specifies the MTP3 timer value T9.	0 sec
T10	Specifies the MTP3 timer value T10.	300 to 600 sec

Field name	Description	Values
T11	Specifies the MTP3 timer value T11.	300 to 900 msec
T12	Specifies the MTP3 Timer value T12.	8 to15 msec
T13	Specifies the MTP3 Timer value T13.	
T14	Specifies the MTP3 Timer value T14.	20 to 30 sec
T15	Specifies the MTP3 timer value T15.	
T16	Specifies the MTP3 timer value T16.	14 to 20 msec
T17	Specifies the MTP3 timer value T17.	8 to15 msec
T18	Specifies the MTP3 timer value T18.	20 to 500 sec
T19	Specifies the MTP3 timer value T19.	670 to 6000 sec
T20	Specifies the MTP3 timer value T20.	590 to 610 sec
T21	Specifies the MTP3 timer value T21.	630 to 1200 sec
T22	Specifies the MTP3	10 to 3600 sec

Field name	Description	Values
	timer value T22.	
T23	Specifies the MTP3 timer value T23.	
T24	Specifies the MTP3 timer value T24.	10 to 3600 msec
T25	Specifies the MTP3 timer value T25.	300 to 350 sec
T26	Specifies the MTP3 timer value T26.	120 to150 sec
T27	Specifies the MTP3 timer value T27.	20 to 50 sec
T28	Specifies the MTP3 timer value T28.	30 to350 sec
T29	Specifies the MTP3 timer value T29.	600 to 650 sec
T30	Specifies the MTP3 timer value T30.	300 to 350 sec
T31	Specifies the MTP3 timer value T31.	1 to 200 sec
T32	Specifies the MTP3 timer value T32.	1 to100 sec
T33	Specifies the MTP3 timer value T33.	300 to 1200 sec

Field name	Description	Values
T34	Specifies the MTP3 timer value T34.	1 to100 sec

4.5.3 PDC Timers

You can change the field values within the given range for each field. To modify the fields of the PDC Timers tabbed page, node lock is not required.

The following table provides the details of the PDC timers:

Table 8: PDC Timers Configuration Fields

Field Name	Description	Values
PDC General Timer	Indicates the PDC timer value.	10_min/15_min/20_min/30_min/60_min
Max File Size	Indicates the maximum size of all the files.	100 to10240 bytes

4.5.4 SCCP Timers

SCCP Timers shows the SCCP timer configuration used by CS SCCP stack. You can change the field values within the given range for each field.

The following table provides the details of the BSSAP timers:

Table 9: SCCP Timers Fields

Field Name	Description	Values (seconds)
Stat Info	Indicates the retry for SST timer.	5 to1200
Coord Chg	Indicates the wait for grant of SS to go out of service, timer.	60 to120
Ig0reSST	Indicates the difference between the actual and the received grant of SS to go out of service.	30 to 60
TgStatInfo	Indicates the T_rtgstat_info timer value.	30 to 60
Conn	Indicates the incoming connection timer.	60 to120
Release	Indicates the release timer.	10 to 20
Reset	Indicates the reset timer.	10 to 20
Rias	Indicates the transmit inactivity timer.	1 to 600
Riar	Indicates the receive inactivity timer.	1 to 1260

Field Name	Description	Values (seconds)
Guard	Indicates the restart guard timer.	60 to 660
Reassembly	Indicates the reassembly timer.	10 to 20
Interval	Indicates the interval timer.	1 to 60
Repeat Release	Indicates the repeat release timer.	1 to 20

5. Stack Configuration

This section describes the configuration of signaling system (SS) number7 stack. You can add, remove, or modify MEs in the stack.

5.1 Configuring SS7 Stack

SS 7 provides the basis for the signaling traffic on all network switching subsystems (NSSs) and A-Interface to the layers 1 to 3 of the open systems interconnection (OSI) model.

Note: BSC should be in locked state to add, modify, or delete the stack configuration.

Follow these steps to add stack configuration:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, right-click **SS7 Stack**, and click **Add SS7 StackConfig**.

The Configuration – Add Row dialog box appears.

The configurable fields of the Configuration - Add Row dialog box are described in the following table:

Table 10: Stack Configuration Fields

Field Name	Description	Values
Index	Indicates the index value.	1
OPC	Indicates the local point	1 to 16383

Field Name	Description	Values
	code.	
Family	Specifies the standard. **Note**: Only SS7_FAMILY_ITU family supported.	itu/ansi
Alarm Level	Indicates the alarm level to be set.	alarm_Level_Info/alarm_Level_Major/alarm_Level_Minor/alarm_Level_Critical

3. Provide the values in the specified fields and click **Ok** to configure the stack.

Note: You can configure only one stack for a BSC.

5.1.1 Adding A-Interface

The configuration of stack requires the addition of A-Interface before adding any other ME in stack because interface creation is a pre-requisite before configuring SS7 stack. You can add only one A-Interface for a BSS node because BSC communicates only with one MSC. You can view the operational state of the A-Interface after adding the A-Interface.

Follow these steps to add A-Interface:

1. Open the BSS node in the modify mode.

2. Expand **StackConfig**, right-click **SS7 Stack**, and click **Add AInterface**.

The Configuration- Add Row dialog box appears.

The configurable fields of the AInterface Add Row dialog box are described in the following table:

Table 11: AInterface Configuration Fields

Field Name	Description	Value
Interface ID	Refers to the unique identifier to identify an interface.	1 to 127
Interface Name	Indicates the name of the interface for display purposes.	1 to 20
Interface Type	Indicates the type of interface. **Note**: Only if_type_aif is supported.	if_type_aif
Point code of MSC	Indicates the destination point code (point code of MSC).	1 to 16383
Trunk Group ID	Indicates the trunk group Id belonging to this interface.	0 to 65536
Operational State	Indicates the operational state of the A-Interface. This is a read-only field.	disable/enable

3. Provide the values in the fields and click **Ok** to add AInterface.

Note: You can perform only add or delete functions on AInterface table and can add maximum one row for A-Interface.

5.1.2 Configuring TrunkGroup

Trunk group is the collection of trunks/lines that carry incoming and outgoing traffic in order to establish connection between switching systems.

This section describes how you can configure TrunkGroup.

5.1.2.1 Adding TrunkGroup

The TrunkGroup automatically adds in the AIF ME when you add AInterface.

Note: All fields of the TrunkGroup ME are read-only.

5.1.2.2 Adding AIFTrunk

You should add AIFTrunk to configure circuit identity code (CIC) card on an AInterface trunkport. CIC is used to identify the trunk circuit to be connected.

You cannot modify the fields of AIFTrunk. AIFTrunk lists all CIC card with the timeslot and CIC id.

Follow these steps to add AIFTrunk configuration:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, expand **SS7 Stack**, expand **AIF**, click **AInterface: <IP address>**, click **TrunkGroup**, right-click **TrunkGroup :<IP address>**, and click **Add Element**.

The Add Element dialog box appears.

3. Select the ME Type as **AIFTrunk** and click **Ok.**

The Configuration - Add Row dialog box appears.

The configurable fields for the trunk configuration are described in the following table:

Table 12: AIFTrunk Configuration Fields

Field Name	Description	Values
Interface Id	Uniquely identifies an interface.	-
Trunk Group Id	Indicates the trunk group id to which this E1 belongs.	-
Trunk Port ID	Indicates the trunkport id.	0 to 39
Trunk Type	Indicates the type of trunk that is E1 or T1.	trunk_E1_Type /trunk_T1_Type
Start Cic	Indicates the value of starting CIC.	1 to 65535
End Cic	Indicates the value of end CIC. This is a read-only field.	1 to 65535
Time Slots	Indicates the TimeSlot on trunk.	-

4. Provide the values in the specified fields and click **Ok.**

5.1.3 Adding LinkSet

There is only one linkset between BSC and MSC. Therefore, you cannot add more than one linkset.

Follow these steps to add a linkset:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, expand **SS7 Stack**, right-click **AIF**, and select **Add LinkSet**.

The Configuration – Add Row dialog box appears.

The configurable fields of the Configuration – Add Row dialog box for the LinkSet configuration are described in the following table:

Table 13: LinkSet Configuration Fields

Field Name	Description	Values
Link Set ID	Indicates the id of the linkset.	1 to 250
Display String	ASCII string to identify linkset.	1 to 20 characters
Interface ID	Indicates the interface id with which this linkset is associated.	-
Point code of MSC	Indicates the adjacent point code.	-
Network Indicator	Indicates the linkset network indicator.	national/international/ national_reserved/ine

Field Name	Description	Values
		rnational_Reserved

3. Provide the values in the specified fields.
4. Click **Ok** to add the link.

Note: Operation state of link is set to automatic startup (operational state field).

5.1.3.1 Adding Link

Link shows MTP2 link related fields. A trunkport with usage type AIF should be enabled and in active state to add a link. The Trunk Port ID field of Link Configuration dialog box automatically populates. Therefore, if no trunkport is available then you cannot add a link. Refer "*Configuring Trunkport*" to know how to enable and activate a trunkport.

You can perform add/modify/delete operations on link.

Follow these steps to add a link:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, expand **SS7 Stack**, expand **AIF**, expand **SS7 Configuration**, right-click **Linkset:<IP address>**, and select **Add Element**.
3. Select **Link** as ME type from the ME Type drop-down list.
4. Click **Ok**.

The Configuration – Add Row dialog box appears.

The configurable fields of the Link Configuration - Add Row dialog box are described in the following table:

Table 14: Link Configuration Fields

Field Name	Description	Values
Link Set ID	Indicates the linkset id. This is a read-only field.	-
Link ID	Indicates the link id.	0 to 15
SLC	Indicates the signaling link code. This is a read-only field.	0 to 15
Trunk Port ID	Trunkport id carrying MTP2 link.	0 to 39
Time Slot	Indicates the timeslot on the trunkport id carrying MTP2 link.	If TrunkType is E1: 1 to 31 If TrunkType is T1: 1 to 23
Slot ID	Indicates ICC card slot id (active or mate card) responsible for managing the MTP2 link. **Note**: In case of redundant hardware, operator must configure MTP2 links on both the cards.	-
CRC Flag	Indicates the CRC status that is enabled or not.	crc_enable/crc_disable
Admin State	Indicates the administrative state of the link. This is a	locked/unlocked

Field Name	Description	Values
	read-only field.	
Satellite Flag	Indicates that whether satellite link is enabled or not.	false/true

5. Provide the required values and click **Ok** to add link.

5.1.3.2 Locking/Unlocking Link

You can perform lock or unlock action on a link by following the below steps:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, expand **SS7 Stack**, expand **AIF**, expand **SS7 Configuration**, expand **LinkSet**, click **LinkSet :<IP address>**, and click **Link**.
3. Right-click **Link :<IP address>** and select **Actions**.
4. Select either **Lock** or **Unlock** command to lock or unlock the link respectively.
5. Click **Ok** to lock or unlock the link.

5.1.3.3 Modifying Link

You can edit only three fields TrunkPort ID, Satellite Flag, and TimeSlot of the link after the addition of link. All other fields are non-editable. The administrative state of the link should be locked to perform delete or modify operation on the link.

Follow these steps to modify these fields:

1. Lock Link. Refer "*Locking/Unlocking Link* "for more details.

2. Expand **Link** and click **Link :<IP address>**.
3. In the Link tab, select values from TrunkPort ID, Satellite Flag and Time Slot drop-down lists for trunkport id, satellite flag, and time slot respectively.
4. Click **Modify** to save the changes.

You should change the administrative state to unlock after saving the changes. The operational state changes to enabled when you change the administrative state to unlock.

Note: If the administrative state of link is unlocked then you cannot change any field of the link. Operational state may not change to enabled after unlock. For example, if link is not present physically.

5.1.4 Adding SS7 Route

Perform the following steps to add a SS7 route:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, expand **SS7 Stack**, expand **AIF**, expand **SS7 Configuration**, expand **LinkSet**, and expand **LinkSet: <IP address>**.
3. Right-click **SS7 Route** and click **Add SS7 Route**.

The SS7 Route – Configuration dialog box appears.

The configurable fields of the Configuration – Add Row dialog box of the SS7 Route configuration are described in the following table:

Table 15: SS7 Route Configuration Fields

Field Name	Description	Values
Link Set ID	Indicates the link set ID. This	-

Field Name	Description	Values
	is a read-only field.	
Route ID	Indicates the unique route ID.	1 to 100
Route Name	Indicates the name of the route to be displayed.	1 to 19
Style	Defines the route parameter as destination point code-service indicator octet (SIO) and subsystem number (SSN).	dpc-ni/dpc-sio-ssn
DPC	Indicates the destination point code.	1 to 16383
Interface Type	Indicates the type of interface. This is a read-only field.	if_Type_Aif
SIO	Indicates the service information octet.	0 to 255
RSSN	Indicates the remote subsystem number.	ssn_BSSAP
LSSN	Indicates the local sub system number.	ssn_BSSAP
Network Indicator	Indicates the network.	0 to 255
SST Test On	Indicates if the secondary state for maintenance	enable/disable

Field Name	Description	Values
	procedure is to be enabled or not. Its value depends on the Style field with the following condition: • If Style= dpc-ni then SST Test On = disable • If Style= dpc-sio-ssn then SST Test On= enable	

4. Provide the values in the specified fields and click **Ok**.

Note: You have to add two SS7 routes for A-Interface.

5.2 Deleting SS7 Stack

This section explains the procedure of deleting the SS7 Route, LinkSet, Link and, A-Interface.

5.2.1 Locking/Unlocking CIC

All CIC are listed in the AIFTrunk. You can lock or unlock all or individual CIC.

Follow these steps to lock/unlock CIC:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, expand **SS7 Stack**, expand **AIF**, expand **AInterface: <IP address>**, expand **TrunkGroup**, expand **TrunkGroup :<IP address>**, expand **AifTrunk**, expand **AIFTrunk :<IP address>**, click **CIC**, and right-click **CIC :<IP address>**.
3. Click the desired option.

Here, as an example, the Lock option is selected which opens the Lock dialog box.

4. Click **Ok** to close the Lock dialog box.

5.2.2 Deleting AIFTrunk

The administrative state of all CIC in the AIFTrunk should be locked. Follow these steps to delete AIFTrunk:

1. Lock all CIC in the AIFTrunk. Refer "*Locking/Unlocking CIC*"for more details.
2. Right click **AIFTrunk** and click **Delete**.
3. Click **Yes**.

5.2.3 Deleting LinkSet

The administrative state of link should be locked if you want to delete linkset. In addition, if you delete linkset then Link and SS7 route are automatically deleted.

Follow these steps to delete linkset:

1. Lock Link. Refer "*Locking/Unlocking Link* "for more details.
2. Right click **LinkSet** and click **Delete**.
3. Click **Yes** to delete the LinkSet.

5.2.4 Deleting SS7 Route

You should lock link before deleting SS7 route. Deleting a row from SS7 Route tab deletes the selected route.

Follow these steps to delete a SS7 route:

1. Lock Link. Refer "*Locking/Unlocking Link* "for more details.

2. Expand **SS7 Route**, right-click a **SS7Route :<IP address>**, and click **Delete**.

Alternatively, in the SS7Route tab, click **Delete**.

5.2.5 Deleting Link

You should lock the link before deleting it. Follow these steps to delete link:

1. Lock Link. Refer "*Locking/Unlocking Link* "for more details.
2. Right click **Link** and click **Delete**.
3. Click **Yes**.

5.2.6 Deleting A-Interface

The administrative state of all CIC should be locked, if you want to delete A-Interface. Deleting A-Interface automatically deletes TrunkGroup and AIFTrunk.

Follow these steps to delete an A-Interface:

1. Lock all CIC. Refer "*Locking/Unlocking CIC*" for more details.
2. Right click **AInterface: <IP address>** and click **Delete**.
3. Click **Yes**.

6. Radio Network Configuration

This section describes the configuration of radio network MEs. You can add, remove, or modify MEs in the RadioConfig ME.

6.1 Configuring ARFCN

The absolute radio frequency channel number (ARFCN) specifies a pair of physical radio carriers and channels used for transmission and reception on the Um interface, one for the uplink and one for the downlink signal.

6.1.1 Adding ARFCN

You can only add or delete ARFCN. The following combination of bands is allowed:

- GSM900+GSM1800: 124+374=498 ARFCNs
- GSM850+GSM1900: 124+299=423 ARFCNs

Perform the below steps to add a new ARFCN:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig** and click **ARFCN**.
3. In the Absolute Radio Frequency Channel Number tab, click **Add**.

The Configuration- Add Row dialog box appears.

4. Provide the values.
5. Click **Ok** to add the new ARFCN value and frequency band.

6.1.2 Viewing ARFCN

You can view the details of ARFCN by following the below steps:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig** and click **ARFCN** to view the Absolute Radio Frequency Channel Number tabbed page.

The following table lists valid ARFCN values for different frequency bands:

Table 16: Valid ARFCN Values

Frequency Band	ARFCN Value Range
gsm850	128 to 251
gsm900	1 to 124
gsm1800	512 to 885
gsm1900	512 to 810

6.1.3 Deleting ARFCN

You can delete rows from ARFCN, which are not attached to a channel group. Deletion of a row indicates the deletion of ARFCN.

ⓘ**Note**: To delete ARFCN associated with a channel group, you first have to delete that channel group.

Follow the below steps to delete a row from the ARFCN:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig** and click **ARFCN**.

3. In the Absolute Radio Frequency Channel Number tab, select a row and click **Delete**.
4. Click **Yes** to delete the selected row.

6.2 Configuring CsExternalCell

The CsExternalCell ME shows list of external CS cells. The cell ids of external cells, which are neighbor to CS cells, are added to 'CSNeighCells' relation table. You can add, delete, or modify fields of the CsExternalCell ME without locking the BSS.

6.2.1 Adding CsExternalCell

You can add rows in the CsExternalCell tab of CsExternalCell ME. The row represents a CsExternalCell.

Follow the below steps to add a CsExternalCell ME:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig** and click **CsExternalCell**.
3. Click **Add**.
4. In the Configuration – Add Row dialog box provide the values.

The configurable fields of the Configuration – Add Row dialog box are described in the following table:

Table 17: CsExternalCell Fields

Field Name	Description	Values
MCC	Indicates the mobile country code.	0 to 9

Field Name	Description	Values
MNC	Indicates the mobile network code.	0 to 9
LAC	Indicates the location area code.	1to 65533, 65535
External CellId	CS external (cell belongs to other BSS or network) cell identifier.	0 to 65535
BCC	Indicates the base station color code (BCC). This is a part of the BSIC. The BSIC is a local color code that allows a MS to distinguish between different neighboring base stations. The BCC is used to distinguish between different neighboring cells using the same frequency.	0 to 7
NCC	Indicates the network color code. This is a part of the BSIC. The BSIC is a local color code that allows a MS to distinguish between different neighboring base stations.	0 to 7
BCCH ARFCN	Indicates the absolute radio frequency channel number of the BCCH of neighbor cell ‘n’.	1 to 124, 512 to 885, 128 to 251 GSM 900: 1 to 124

Field Name	Description	Values
	This frequency is used by an idle MS for cell reselection.	GSM 1800: 512 to 885
Frequency Band	Indicates the frequency band of the BCCH frequency supported by the cell.	gsm900/gsm1800/gsm850/gsm1900
MS_TXPWR_MAX	Indicates the maximum TX power a MS is permitted to use on a dedicated control channel or a traffic channel within the cell. This parameter is used for handover decision in the BSC. GSM900/GSM850 • 2: 39 dBm • 3: 37 dBm • .. .. • 18: 7 dBm • 19: 5 dBm GSM1800/ GSM1900 • 0: 30 dBm 30dBm • 1: 28 dBm 28dBm •	0 to 15, 5 to 19 GSM 900: 0 to 15 GSM 1800: 5 to 19

Field Name	Description	Values
	.. • 14: 2 dBm 2 dBm • 15: 0 dBm 0 dBm • 29: 36 dBm N/A • 30: 34 dBm 34 dBm • 31: 32 dBm 32 dBm	

5. Click **Ok** to add the new row.

6.2.2 Modifying CsExternalCell

You can change the values of fields of a CsExternalCell.

Perform the below steps to modify fields of the CsExternalCell ME:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig** and click **CsExternalCell**.
3. Select a row from the table.
4. Double-click a column to edit the value.
5. Click **Modify** to save the changes.

The Confirmation message box appears.

6. Click **Ok**.

6.2.3 Deleting CsExternalCell

You can delete a CsExternalCell based on your requirement. The deletion of a row from CsExternalCell deletes the corresponding CsExternalCell.

Perform the below steps to delete a CsExternalCell ME:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig** and click **CsExternalCell**.
3. Select a row from the table and click **Delete**.
4. Click **Yes** to delete the selected row.

6.3 Configuring LAC

Location area code (LAC) provides the list of location area codes, which BSS supports. Each LAC has one or more CS cells associated with it.

6.3.1 Adding LAC

You can add LAC to indicate the CS cell location. You should lock BSS before adding a LAC.

Follow these steps to add a LAC:

1. Open the BSS node in the modify mode.
2. Right-click **RadioConfig** and click **Add LAC**.
3. In the Configuration – Add Row dialog box provide the value.

The field of the LAC tabbed page is described in the following table:

Table 18: LAC Fields

Field Name	Description	Values
LAC	Indicates the location area code.	1 to 65533, 65535

4. Click **Ok** to add the new LAC.

As shown in the figure given below the LAC has no data to modify, it has only index value that cannot be modified.

Similarly, you can delete a LAC by clicking **Delete** in the LAC tab.

6.4 Configuring Cell

Cell is the unit of radio coverage area. You can add, modify, or delete the fields of this ME only when the administrative state of the cell is locked. The administrative state of cell, by default, is locked when it is added to BSS. You should configure handover and power control parameters after adding a cell because unlocking a cell requires configuration of these parameters.

Note: If you have not configured the handover and power control parameters and you try to unlock the cell then OMC gives a generic error message that consistency check has failed.

6.4.1 Adding Cell

A LAC can have more than one cell and one cell can have many channel groups.

Follow the below steps to add cell element:

1. Open the BSS node in the modify mode.

2. Expand **RadioConfig** and click **LAC.**
3. Right-click **LAC :<IP address>** and click **Add Element**.
4. In the Add Element dialog box, select **CELL** from the ME Type list and click **Ok**.
5. In the Configuration – Add Row dialog box provide the values.

The configurable fields of the Configuration – Add Row dialog box are described in the following table:

Table 19: Cell Fields

Field Name	Description	Values
LAC	Indicates the location area code of the cell.	1 to 65533, 65535
Cell ID	Indicates the cell identifier.	0 to 65535
Admin State	Indicates the administrative state of the cell. This is a read-only field.	locked/unlocked/block
Antenna ID	Refers to the antenna identifier.	0 to 4294967295
BCCH ARFCN	Indicates the ARFCN of the BCCH carrier of this cell. ⓘ**Note**: This should be same as ARFCN1 in CHNGRP, which contains the BCCH.	0 to 65535
BCCH Freq Band	Indicates the frequency band of the BCCH frequency supported by the cell.	gsm900/gsm1800/gsm850/gsm1900
BCC	Indicates the base station color code (BCC) which is a part of the BSIC.	0 to 7

Field Name	Description	Values
BCCH Power Level	Defines the downlink power of the BCCH carrier.	0 to 127
MS_TXPWR_MAX	Indicates the maximum TX power an MS is permitted to use on a dedicated control channel or a traffic channel within the serving cell. For power control, this parameter and the power class of the MS determines the maximum power level that the BSC instructs the MS to use on a dedicated control channel or a traffic channel. This parameter is used for power control and handover decision in the BSC. It is not send to the MS but influences the power control commands for the MS. This parameter should be set to a value that is needed as maximum power level in the cell. This allows the MS to communicate with the BTS, at every place in the cell even under bad radio conditions. GSM900/GSM850: • 2: 39 dBm • 3: 37 dBm • .. .. • 18: 7 dBm • 19: 5 dBm	0 to 15, 5 to 19

Field Name	Description	Values
	GSM1800 GSM1900: • 0: 30 dBm 30dBm • 1: 28 dBm 28dBm • .. .. .. • 14: 2 dBm 2 dBm • 15: 0 dBm 0 dBm • 29: 36 dBm N/A • 30: 34 dBm 34 dBm • 31: 32 dBm 32 dBm	
MS_TXPWR_Max_C	Indicates the maximum transmit power level an MS may use in the cell when accessing on the common control channel. This parameter is also used for the C1 cell (re)selection criteria. GSM900/GSM850: • 2: 39 dBm • 3: 37 dBm • .. .. • 18: 7 dBm • 19: 5 dBm GSM1800 GSM1900 • 0: 30 dBm 30dBm • 1: 28 dBm 28dBm •	0 to 15, 5 to19

Field Name	Description	Values
	• 14: 2 dBm 2 dBm • 15: 0 dBm 0 dBm • 29: 36 dBm N/A • 30: 34 dBm 34 dBm • 31: 32 dBm 32 dBm	
FrameNum Offset	Frame number offset is used to decrease interference of synchronized neighbor cells in case of frequency hopping.	0 to 25
psAllowed	This indicates whether PS is allowed in this cell or not.	notAllowed/allowed
Cell_Bar_Access	Indicates whether cell is barred for access or not.	cell_Not_Barred/cell_Barred
Access Control Class	This is access control class, call barred access control parameter. A 2-octet field, where bit 0 indicates the access for class 0, bit 1 for class 1. A value of 1 at respective position means this access class is barred.	0 to 65535
BS_AG_BLKS_RES	Indicates that the BS_AG_BLKS_RES field is coded as the binary representation of the number of blocks reserved for access grant.	0 to 1

Field Name	Description	Values
BS_PA_MFRMS	Indicates the number of multi frames period for transmission of paging request messages to the same paging subgroup. (Number of multi frames = BS_PA_MFRMS + 2)	0 to 7
CELL_RESELECT_HYST	Indicates the dB RXLEV hysteresis for LA re-selection.	0 to 7
RXLEV-ACCESS-MIN	Indicates that the RXLEV-ACCESS-MIN field is coded as the binary representation of the minimum received signal level at the MS for which it is permitted to access the system. • 0: < -110 dBm • 1: -110dBm.-109dBm • 2: -109dBm.-108dBm • 62: -49dBm.-48dBm • 63: >-48dBm	0 to 63
Power Offset	Indicates that power offset is used only by DCS 1800 Class 3 MSs to add a power offset to the value of MS_TXPWR_MAX_CCH used for its random access attempts. It is also used by the MS in its calculation of C1 and C2 parameters. 0: 0 dB power offset	0 to 3

Field Name	Description	Values
	1: 2 dB power offset 2: 4 dB power offset 3: 6 dB power offset	
Cell Bar Qualify	Cell bar qualify is used by the network to control mobile station cell selection and reselection.	0 to 1
CELL_RESELECT_OFFSET	Used by the mobile station to apply a positive or negative offset to the value of C2 as defined in 3GPP TS 23.022 and 3GPP TS 45.008.	0 to 63
TEMPORARY_OFFSET	Used by the mobile station as part of its calculation of C2 for the cell reselection process as described in 3GPP TS 45.008.	0 to 7
PENALTY_TIME	Defines the length of time for which TEMPORARY_OFFSET is active.	0 to 31
cellName	Indicates the name of the cell. You can type any name for the cell. It is recommended that you should type the location of the cell as cell name because the same content is sent to mobile subscribers when you send cell information message by using the cell broadcast service.	1 to 25
AMR Support	Indicates whether the adaptive multiple rate service is supported or not. AMR –	amr_Hr_Only/amr_Not_Supported

Field Name	Description	Values
	HR provides the option of utilizing the same timeslots (8) for more number of users. This is a read-only field.	
Initial AMR Codec Rate	Refers to the codec, which AMR uses. This is set to 5.90 and you cannot modify it.	amr_590
FR to HR Switch Percentage	You can select the percentage of full or half rate while using AMR.	0 to100, 255
Max value of Timing Advance	Indicates to the maximum value of acceptable timing advance. Timing advance (TA) gives the distance between MS and BTS and is calculated by BTS.	0 to 63
maxNumFreeHr	Maximum number of timeslots kept with single free sub-slot at CS call establishment.	1 to 3

6. Click **Ok** to add the cell.

6.4.2 Setting Administrative State of Cell

There are different administrative states of a cell that you can set as required. For example, modifying the fields of cell requires that the administrative state of cell should be locked. The various administrative states of cell are:

- Lock
- Unlock
- Block

Follow these steps to set the administrative state of cell:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, and right-click the desired cell.
3. Select **Actions**.
4. Click the required state.

Lock, Block, or Unlock dialog box appears based on the selection. Here, the Unlock dialog box is shown.

5. Click **Ok** to lock/unlock/block the cell.

6.4.3 Viewing Cell Operational State

You can view the operational status of the cell in the Operational State tab of cell. Reconcile the table to get the latest status from network element. All the fields of the Operational State tab of the cell are read-only.

6.4.4 Adding Neighbor Cell

You can add a new neighbor cell – internal or external, to an existing cell.

Follow these steps to add a new cell:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, expand **LAC :<IP address>**, click **CELL :<IP address>**, and click **Neighbour Info** tab.
3. In the right-pane, click **Add**.
4. You can add internal or external neighbor cell. Select **internal** or **external** from the Neighbour Type drop-down list to add an internal or external neighbor cell.

The Configuration – Add Row dialog box appears.

The configurable fields for configuring the internal neighbor cell are described in the following table:

Table 20: Internal Neighbor Cell Fields

Field Name	Description	Values
LAC	Indicates the location area code.	1 to 65533, 65535
Neighbour MCC	Indicates the neighbor cell mobile country code.	0 to 999
Relation Type	Indicates the relation type.	actidle
RX Level MinN	Indicates the minimum BCCH receive level for neighbor cell (n). This must be reported for a respective neighboring cell 'n' before the MS is allowed to handover to this particular cell. • 0: < -110 dBm • 1: -110dBm.-109dBm • 2: -109dBm.-108dBm • 62: -49dBm.-48dBm • 63: >-48dBm	0 to 63
HO MarginN	Indicates the handover margin for neighbor cell N.	-128 to 127
Neighbour MNC	Indicates the neighbor cell mobile network code.	For 2-digit MNC : 00F-99F For 3-digit MNC: 000-999

Field Name	Description	Values
Neighbour Cell ID	Indicates the neighbor cell identifier.	0 to 65535

Given below is the figure for the external cell neighbor and its field description:

The fields of the external neighbor cell are described in the following table:

Table 21: External Neighbor Cell Fields

Field Name	Description	Values
LAC	Indicates the location area code of serving cell.	1 to 65533, 65535
Cell ID	Indicates the cell identifier of serving cell.	0 to 65535
Neighbour MCC	Indicates the mobile country code of the neighbor cell.	0 to 999
Neighbour MNC	Indicates the neighbor cell mobile network code.	For 2-digit MNC : 00F-99F For 3-digit MNC: 000-999
Neighbour LAC	Indicates the LAC of the neighbor cell.	1 to 65533, 65535
Neighbour Cell ID	Indicates the neighbor cell identifier.	0 to 65535
Relation Type	Indicates the relation type.	actidle

Field Name	Description	Values
Rx Level Min	Indicates the minimum BCCH receive level for neighbor cell (n) which must be reported for a respective neighboring cell 'n' before the MS is allowed to handover to this particular cell. 0: < -110 dBm 1: -110dBm.-109dBm 2: -109dBm.-108dBm 62: -49dBm.-48dBm 63: >-48dBm	0 to 63
Ho Margin N	Indicates the handover margin for neighbor cell N.	-128 to 127

5. Provide values in the specified fields and click **Ok**.

6.4.5 Deleting Neighbor Cell

Deletion of a row from the Neighbour Info tab deletes the corresponding neighbor cell.

Follow the below steps to delete a neighbor cell:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, click **LAC :<IP address>**, click **CELL :<IP address>**, and click **Neighbour Info** tab.
3. Select a row.
4. Click **Delete**.
5. Click **Yes** to delete the selected neighbor cell.

6.4.6 Configuring Cell Handover

You can configure handover parameters for a cell. The HandOver tab allows you to add, modify, or delete the fields of the Handover tab for cell. Cell lock is not required for modifying cell parameters. Cell lock is required to delete a cell. In addition, handover parameters are added in cell locked state. If you do not add the handover parameters then cell unlock fails.

In addition to the values provided for a field in the HandOver tab, the consistency condition should match in order to change the values of handover fields. For example, if you want to change the value of WindowSize RxLev field (refer "*Table 12*") then these two conditions should match:

- The value of WindowSize RxLev should be between 1 and 10.
- The windowSizeRxLevH ≥ windowSizeRxLevP and windowSizeRxLevH ≥ windowSizeNcell

If both the above conditions match then only you can change the value of WindowSize RxtLev field.

Follow the below steps to add handover:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, click **LAC :<IP address>**, and click **CELL :<IP address>**.
3. Click the **HandOver** tab. Refer "**Error! Reference source not found.**".
4. Click **Add**.

The Configuration – Add Row dialog box appears.

The configurable fields of the HandOver tabbed page are described in the following table:

Table 22: Handover Configuration Fields

Field Name	Description	Values
LAC	Indicates the location area code of the cell.	1 to 65533, 65535
Cell ID	Refers to the cell identifier.	0 to 65535
Enable HO RxLev	Enables handover based on receive level (enables both uplink and downlink).	true/false
Enable HO RxQual	Enables handover based on receive quality (enables both uplink and downlink).	true/false
Enable HO PwrBdgt	Enables handover based on power budget.	true/false
WindowSize RxLev	Indicates the size of the averaging windows for RXLEV_DL and RXLEV_UL. **Consistency Conditions**: WindowSize RxLev ≥ windowSizeRxLevP (size of averaging window for RXLEV values) WindowSize RxLev ≥ WindowSize RxLev_Ncell	1 to 10
WindowSize RxQual	Indicates the size of the averaging windows for RXQUAL_DL and RXQUAL_UL. **Consistency Conditions**: WindowSize RxQual ≥ windowSizeRxQualP (size of averaging window for RXQUAL	1 to 10

Field Name	Description	Values
	values) WindowSize RxQual ≥ WindowSize RxLev_Ncell	
WindowSize RxLev_Ncell	Indicates the size of the averaging windows for RXLEV_NCELL for all neighbor cells. **Consistency Conditions**: WindowSize RxLev_Ncell ≤ WindowSize RxLev WindowSize RxLev_Ncell ≤ WindowSize RxQual	1 to 10
Min Rx Lev DL HO	Indicates the handover threshold for downlink receive level (RXLEV_DL). • 0: measured signal level < -110 dBm • 1: -110 dBm < measured signal level < -109 dBm • 2: -109 dBm < measured signal level < -108 dBm • 62: -49 dBm < measured signal level < -48 dBm • 63: -48 dBm < measured signal level **Consistency Conditions**: Min Rx Lev DL HO < Min Rx Lev DL per cell[lac/cellId]:	0 to 63

Field Name	Description	Values
	Min Rx Lev DL HO < RX Level MinN (CsNeighCells) of all configured neighbor cells of this cell	
Min Rx Lev UL HO	Indicates the handover threshold for uplink receive level (RXLEV_UL). • 0: measured signal level < -110 dBm • 1: -110 dBm < measured signal level < -109 dBm • 2: -109 dBm < measured signal level < -108 dBm. • 62: -49 dBm < measured signal level < -48 dBm • 63: -48 dBm < measured signal level **Consistency Conditions**: Min Rx Lev UL HO < Min Rx Lev UL	0 to 63
Min Rx Qual Lev DL HO	Indicates the handover threshold for downlink receive quality (RXQUAL_DL). • 0: BER <0.2 % • 1: 0.2 % < BER <0.4 % • 2: 0.4 % < BER <0.8 % • 3: 0.8 % < BER <1.6 % • 4: 1.6 % < BER < 3.2 % • 5: 3.2 % < BER < 6.4 %	0 to 7

Field Name	Description	Values
	• 6: 6.4 % < BER < 12.8 % • 7: 12.8 % < BER **Consistency Conditions**: Min Rx Qual Lev DL HO > Max Rx Qual UL	
Min Rx Qual Lev UL HO	Indicates the handover threshold for uplink receive quality. • 0: BER < 0.2 % • 1: 0.2 % < BER < .4 % • 2: 0.4 % < BER < 0.8 % • 3: 0.8 % < BER < 1.6 % • 4: 1.6 % < BER < 3.2 % • 5: 3.2 % < BER < 6.4 % • 6: 6.4 % < BER < 12.8 % • 7: 12.8 % < BER **Consistency Conditions**: Min Rx Qual Lev UL HO > Min Rx Qual UL	0 to 7
Wt Serving Cell	Indicates the weight for the serving cell in power- budget handover decision to avoid ping-pong handover.	0 to 63
Multiband Reporting	Indicates the reporting values. • 0: normal reporting of six strongest cell • 1: report 1 strongest cell from other band	0 to 3

Field Name	Description	Values
	• 2: report 2 strongest cells from other band • 3: report 3 strongest cells from other band	
Enable Incoming HO	Enables or disables incoming handovers.	0 to 1

5. Edit the fields.
6. Click **Ok** to add the handover details.

Note: Similarly, you can modify the fields of the HandOver tab. In order to modify any field, edit the required fields and click **Modify** to save the changes.

Similarly, you can also delete all the handover details of a cell by clicking **Delete** in the HandOver tab.

Note: Cell should be in locked state to delete the handover parameter.

6.4.7 Configuring Cell Power Control

You can configure the power control parameters of a cell. You can add, modify, or delete fields of the Power Control tab of the cell-ME.

Follow the below steps to add the power control fields:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, expand **LAC :<IP address>**, and click **CELL :<IP address>**.
3. Click the **Power Control** tab. Refer "**Error! Reference source not found.**".

4. Click **Add**.

The configurable fields of the Power Control tabbed page are described in the following table:

Table 23: Cell Power Control Fields

Field Name	Description	Values
LAC	Indicates the location area code of the cell.	1 to 65533, 65535
Cell ID	Refers to the cell identifier.	0 to 65535
Enable MS PWR CTRL	Controls, if UL power control (that is control of MS Tx power) is activated/deactivated in a cell.	true/false
Enable BS PWR CTRL	Controls if DL power control (that is control of BS Tx power) is activated/deactivated in a cell.	true/false
Min Rx Lev UL	Indicates the lower threshold for the Rx power level measured on uplink. If the BTS/TRX reports a lower level, the uplink power is increased. • 0: measured signal level < -110 dBm • 1: -110 dBm < measured signal level < -109 dBm • 2: -109 dBm < measured signal level < -108 dBm • ... • 62: -49 dBm < measured signal level < -48 dBm • 63: -48 dBm < measured signal	0 to 63

Field Name	Description	Values
	level **Consistency Conditions**: Min Rx Lev UL < Max Rx Lev UL Max Rx Lev UL - Min Rx Lev UL > incrStepSizeP Max Rx Lev UL - Min Rx Lev UL > safetyMarginP Min Rx Lev UL HO < Min Rx Lev UL	
Max Rx Lev UL	Indicates the upper threshold for the Rx power level measured on uplink. If the BTS/TRX reports a higher level, the uplink power is reduced. • 0: measured signal level < -110 dBm • 1: -110 dBm < measured signal level < -109 dBm • 2: -109 dBm < measured signal level < -108 dBm • ... • 62: -49 dBm < measured signal level < -48 dBm • 63: -48 dBm < measured signal level **Consistency Conditions**: Min Rx Lev UL < Max Rx Lev UL Max Rx Lev UL - Min Rx Lev UL >	0 to 63

Field Name	Description	Values
	incrStepSizeP Max Rx Lev UL - Min Rx Lev UL > safetyMarginP	
Min Rx Qual UL	Refers to the threshold that defines lowest acceptable quality measured on the uplink. If the BTS/TRX reports a lower quality, the uplink power is increased. • 0: BER < 0.2 % • 1: 0.2 % < BER < 0.4 % • 2: 0.4 % < BER < 0.8 % • 3: 0.8 % < BER < 1.6 % • 4: 1.6 % < BER < 3.2 % • 5: 3.2 % < BER < 6.4 % • 6: 6.4 % < BER < 12.8 % • 7: 12.8 % < BER **Consistency Conditions**: Min Rx Qual UL > Max Rx Qual UL Min Rx Qual Lev UL HO > Min Rx Qual UL	0 to 7
Max Rx Qual UL	Refers to the threshold that defines good quality measured on the uplink. If the BTS/TRX reports a better quality, the uplink power is reduced. • 0: BER < 0.2 % • 1: 0.2 % < BER < 0.4 %	0 to 7

Field Name	Description	Values
	• 2: 0.4 % < BER < 0.8 % • 3: 0.8 % < BER < 1.6 % • 4: 1.6 % < BER < 3.2 % • 5: 3.2 % < BER < 6.4 % • 6: 6.4 % < BER < 12.8 % • 7: 12.8 % < BER **Consistency Condition**: Min Rx Qual UL > Max Rx Qual UL	
Min Rx Lev DL	Indicates the lower threshold for the Rx power level measured on the downlink. If the MS reports a lower level, the downlink power can be increased. • 0: measured signal level < -110 dBm • 1: -110 dBm < measured signal level < -109 dBm • 2: -109 dBm < measured signal level < -108 dBm • 62: -49 dBm < measured signal level < -48 dBm • 63: -48 dBm < measured signal level **Consistency Conditions**: Min Rx Lev DL < Max Rx Lev DL Max Rx Lev DL - Min Rx Lev DL >	0 to 63

Field Name	Description	Values
	incrStepSizeP Max Rx Lev DL - Min Rx Lev DL > safetyMarginP Min Rx Lev DL HO < Min Rx Lev DL	
Max Rx Lev DL	Indicates the upper threshold for the Rx power level measured on the downlink. If the MS reports a higher level, the downlink power is reduced. • 0: measured signal level < -110 dBm • 1: -110 dBm < measured signal level < -109 dBm • 2: -109 dBm < measured signal level < -108 dBm • 62: -49 dBm < measured signal level < -48 dBm • 63: -48 dBm < measured signal level **Consistency Conditions**: Min Rx Lev DL < Max Rx Lev DL Max Rx Lev DL - Min Rx Lev DL > incrStepSizeP Max Rx Lev DL - Min Rx Lev DL > safetyMarginP	0 to 63
Min Rx Qual DL	Refer to the threshold that defines lowest acceptable quality measured on the downlink. If	0 to 7

Field Name	Description	Values
	the MS reports a lower quality, the downlink power is increased. • 0: BER < 0.2 % • 1: 0.2 % < BER < 0.4 % • 2: 0.4 % < BER < 0.8 % • 3: 0.8 % < BER < 1.6 % • 4: 1.6 % < BER < 3.2 % • 5: 3.2 % < BER < 6.4 % • 6: 6.4 % < BER < 12.8 % • 7: 12.8 % < BER **Consistency Conditions**: Min Rx Qual DL > Max Rx Qual DL Min Rx Qual Lev DL HO > Min Rx Qual DL	
Max Rx Qual DL	Refers to the threshold that defines good quality measured on the uplink. If the MS reports a better quality, the downlink power is reduced. • 0: BER < 0.2 % • 1: 0.2 % < BER < 0.4 % • 2: 0.4 % < BER < 0.8 % • 3: 0.8 % < BER < 1.6 % • 4: 1.6 % < BER < 3.2 % • 5: 3.2 % < BER < 6.4 %	0 to 7

Field Name	Description	Values
	• 6: 6.4 % < BER < 12.8 % • 7: 12.8 % < BER **Consistency Condition**: Max Rx Qual DL > Min Rx Qual UL	

5. Click **Ok** to add the details.

Note: Similarly, you can modify the fields in the Power Control tab. In order to modify any field, edit the required fields and click **Modify** to save the changes.

Similarly, you can also delete all the power control details of a cell by clicking **Delete** in the Power control tab.

Note: Cell should be in locked state to delete the power control parameter.

6.4.8 Modifying Configuration Data

You can modify the configuration data of cell.

Note: The administrative state of cell should be locked, if you want to modify any field of the cell.

Follow the below steps to modify the fields of the cell:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, click **LAC :<IP address>**, and click **CELL :<IP address>**.
3. Click **Configuration Data** tab. Refer "**Error! Reference source not found.**".
4. Edit the required values.
5. Click **Modify** and click **Ok** to save the changes.

6.4.9 Configuring Channel Group

Channel group (CHNGRP) is a list of channels based on their common characteristics. Each cell can have multiple channel groups associated with it. You can add, modify, or delete the fields in the CHNGRP tab of the CHNGRP ME.

Note: Lock the cell to perform add, delete, or modify operations.

6.4.9.1 Adding Channel Group

Follow the below steps to add channel group:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, expand **LAC :<IP address>**, right-click **CELL :<IP address>**, and click **Add Element**.
3. In the Add Element dialog box, select **CHNGRP** from the ME Type drop-down list and click **Ok**.

The Configuration – Add Row dialog box appears.

The configurable fields of the CHNGRP are described in the following table:

Table 24: Channel Group Fields

Field Name	Description	Values
LAC	Indicates the location area code of the cell. This field is not editable.	1 to 65533, 65535
Cell ID	Refers to the cell identifier. This field is not editable.	0 to 65535
Channel	Refers to the channel group identifier.	0 to 65535

Field Name	Description	Values
Group Id		
BCCH Ccch Sdcch4	Refers to the number of combined BCCH + SDCCH/4.	0 to 1
Bcch Ccch	Indicates the number of standalone BCCH/CCCH.	0 to1
SDCCH8	Indicates the number of SDCCH8.	0 to 2
dualTraffic	Indicates the number of dual traffic channels (TCHs and PDCHs).	0 to 47
HSN	Indicates the hopping sequence number.	0 to 63 (0 = Cyclic hopping, 1-63 = Random hopping)
MAX_TX_PWR	Defines the maximum downlink power for traffic channel timeslots in dBm. **Consistency Conditions**: MAX_TX_PWR <= BCCH Power Level (in cell table)	0 to 127
TSC	Indicates the training sequence code to be used. ⓘ**Note**: The TSC of BCCH ChnGrp must be equal to 'bcc' in the cell table.	0 to 7
Freq Band	Indicates the frequency band of this channel group.	gsm900/gsm1800/gsm850/gsm1900

Field Name	Description	Values
Num of Valid Arfcns	Defines the number of valid ARFCNs of subsequent list.	1 to 17
ARFCN1	Indicates the absolute radio frequency number.	1 to 124, 512 to 885, 128 to 251, 512 to 810, 65535 GSM 900: 1 to 124 GSM 1800: 512 to 885 GSM 1900: 512-810, GSM 850: 128-251
….		
ARFCN17	Indicates the absolute radio frequency number. **Note** : Cell can have maximum of 18 ARFCNs including BCCH ARFCN but BCCH ARFCN cannot be a part of the hopping system.	1 to 124, 512 to 885, 128 to 251, 512 to 810, 65535 GSM 900: 1 to 124 GSM 1800: 512 to 885 GSM 1900: 512-810, GSM 850: 128-

Field Name	Description	Values
		251
CBCH	Allows cell broadcast service in the selected cell. If set to false then cell broadcast service is disabled in the selected cell. It should be set to true if you want to enable cell broadcast service in the selected cell.	true/false
MAIO	Specifies the mobile allocation index offset (MAIO). The MAIO is a time delay separating the traffic channels (with the same HSN), which hop over the same frequencies in the same order.	0 to 16

4. Provide the required values and click **Ok** to add channel group.

6.4.9.2 Modifying Channel Group

You can modify the fields of the channel group.

Note: The administrative state of cell should be locked to modify any field of the channel group.

Follow the below steps to modify fields of the channel group:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, expand **LAC :<IP address>**, expand **CELL :<IP address>**, and click **CHNGRP**.
3. In the CHNGRP tab, modify the required fields.
4. Click **Modify** to save the changes.

6.4.9.3 Deleting Channel Group

You can delete the channel group.

Note: The administrative state of cell should be locked to delete the channel group.

Follow the below steps to delete the channel group:

1. Open the BSS node in the modify mode
2. Expand **RadioConfig**, expand **LAC**, expand **LAC :<IP address>**, expand **CELL :<IP address>**, right-click a **CHNGRP** and click **Delete**.

Alternatively,

2. Click **Delete** from the CHNGRP tab.
3. Click **Yes** to delete the CHNGRP.

6.4.10 Deleting Cell

You can delete a cell only if its administrative state is locked.

Follow the below steps to delete a cell:

1. Open the BSS node in modify mode.
2. Expand **RadioConfig**, expand **LAC**, expand **LAC :<IP address>**, right-click **CELL :<IP address>** and click **Delete**.
3. Click **Yes** in the Delete Data message box.

Note: Deleing a cell, also deletes the CHNGRPs with it.

6.5 Configuring BTS

You can add, delete, and modify BTS parameters in a BSS node by using OMC. You can also add or delete BTS TRX, modify BTS TRX, and set administrative states of BTS TRX.

6.5.1 Adding BTS

A trunkport with usage type Abis should be enabled and in active state to add a BTS. The Trunk Port ID field of Configuration - Add Row dialog box automatically populates. Therefore, if no trunkport is configured then you cannot add BTS. Refer "*Configuring Trunkport*" to know how to enable and activate a trunkport.

A BSS can have one or more BTS. An ABIS interface is implemented between the BSC and each BTS.

Follow these steps to add BTS:

1. Open the BSS node in the modify mode.
2. Right-click **BSS :<IP address>** and click **Add Element**.

The Add Element dialog box appears.

3. Select ME type as **BTS** from the ME Type drop-down list.

The Configuration – Add Row dialog box appears.

The given below table describes the fields of the BTS Configuration – Add Row dialog box.

Table 25: BTS Fields

Name	Description	Values
BTS ID	Indicates the BTS id.	1 to 4294967294
Number of Trx	Indicates the number of TRXs that can be added for the BTS.	0 to 2
Trunk ID	Indicates the trunk identifier of the Abis Trunk to which this BTS is supposed to be connected. 0 to 39 indicate external trunks	0 to 39, 51 to 58

Name	Description	Values
	and 51 to 58 indicate internal trunks.	
Admin State	Indicates the administrative state of BTS. This is a read-only field.	locked/unlocked
BTS type	Identifies the type of BTS.	r2_BTS
BTS Name	Indicates the operator specified display string to identify a BTS by name.	1 to 19 characters
Connectivity State	Indicates the operator specified BTS connectivity state. This means whether BTS is allowed to connect or disconnect with the BSC. Change of value is allowed only if BTS is in locked state.	connect/disconnect
Satellite Flag	Indicates if the satellite link is enabled or disabled. If set to true then link is enabled. If set to false then link is disabled.	false/true

4. Specify BTS id, maximum number of trx this BTS can have, trunk id, BTS type, BTS name, and connectivity state of the BTS. The administrative state is set to lock initially.
5. Click **Ok**.

6.5.2 Setting Administrative State of BTS

BTS has the following two administrative states:

- Lock
- Unlock

In addition, you can perform these actions on BTS:

- Disconnect: This means that BTS is not connected to BSC as the BTS link access protocol-channel D (LAPD) link is down.
- Connect: This means that BTS is connected to the BSC.
- Reset BTS: This is used to restart/reset the BTS.

Follow these steps to set any of the above state or perform any action on BTS:

1. Open the BSS node in the modify mode.
2. Expand **BTS-IF**, right-click the desired BTS, and click **Actions**.
3. Click the desired option.

Here, as an example, the dialog-box corresponding to Unlock is shown.

4. Click **Ok** to set the state of the BTS.

6.5.3 Viewing BTS Configuration Data

You can view the BTS configuration details and can change the value of Satellite Flag field.

Follow these steps to view the BTS configuration data:

1. Open the BSS node in the modify mode.
2. Expand **BTS-IF** and click the desired **BTS :<IP address>**.
3. Click the **Configuration Data** tab.

Note: You can select appropriate value for the Satellite Flag field.

6.5.4 Adding TRX

You can add the same number of TRX that you have specified during the addition of BTS. If you have not specified any TRX for a BTS then you cannot add any TRX for the BTS. In addition, you cannot modify the Number of Trx field of BTS after the addition of BTS. Therefore, you can only add the number of TRX as specified in BTS configuration.

Follow these steps to add a TRX:

1. Open the BSS node in the modify mode.
2. Expand **BTS-IF**, right-click **BTS :<IP address>**, and select **Add Element**.
3. In the Add TRX dialog box, select **TRX** as ME type and click **Ok**.

The Configuration – Add Row dialog box appears.

ⓘ**Note**: You may receive an error that no more rows can be added because the maximum number of TRX that can be added in BTS should not exceed the value specified in the Number of TRX field in BTS configuration window.

The configurable fields for TRX configuration are described in the following table:

Table 26: TRX Fields

Field Name	Description	Values
BTS ID	Indicates the BTS ID.	0 to 4294967294
Ptrx ID	Indicates the physical TRX ID.	1 to 40
Admin State	Indicates the administrative status of	locked/unlocked

Field Name	Description	Values
	the TRX. This is a read-only field.	
TRX Location	Defines the location of TRX whether in the frame or with R2 BTS. This is a read-only field.	r2_BTS
Antenna ID	Antenna identifier for association of TRX with a cell.	0 to 4294967295
TRX Position	Specifies the position of the TRX within a BTS.	1 to 2
RF PathGain	Adds all positive and negative attenuation gains.	-32768 to 32767

4. Provide the values in the given fields and click **Ok.**

6.5.5 View TRX Configuration Data

You can view the configuration data, status, traffic, and TimeSlot usage of a TRX that you have added. Follow these steps to view the details:

1. Open the BSS node in the modify mode.
2. Expand **BTS-IF**, expand **BTS :<IP address>**, click **TRX**, and click **TRX :<IP address>**.
3. Click the **TRX** tab in the right-pane.

The right-pane shows the configuration, status, traffic, and timeslot usage of TRX in the TRX tab in the Configuration, Status, Traffic, and TimeSlot usage panel respectively. You can edit the Antenna ID and RF PathGain fields.

6.5.6 Settings Administrative State of TRX

You can lock, unlock, reset (TRX should be locked and is applicable for the non BCCH TRX), and block a TRX.

Follow these steps to lock/unlock the TRX:

1. Open the BSS node in the modify mode.
2. Expand **BTS-IF**, expand **BTS :<IP address>**,click **TRX**, and right-click **TRX :<IP address>**.
3. Select **Actions** and select the state that you want to select for the TRX from the short-cut menu.

A dialog box corresponding to the selected state appears.

4. Click **Ok** to set the state of the TRX.

6.5.7 Modifying TRX

You can modify the antenna id and RF Pathgain for TRX. Follow these steps to modify these fields:

1. Open the BSS node in the modify mode.
2. Expand **BTS-IF**, expand **BTS :<IP address>**,expand **TRX**, and click **TRX :<IP address>**.
3. Type values in the editable fields.
4. Click the **Modify** button to save the changes.

A message appears confirming the successful modification.

Note: The TRX should be in a locked state to modify its attributes.

6.5.8 Deleting TRX

You can delete a TRX of a BTS from the hierarchy or from the TRX tab.

Note: To delete you should first lock the TRX.

Follow these steps to delete BTS TRX:

1. Open the BSS node in the modify mode.
2. Expand **BTS-IF**, expand **BTS :<IP address>**, and click **TRX**.
3. Right-click **TRX :<IP address>** and select **TRX** that you want to delete or click **Delete** from the TRX tab.

The Delete Data dialog box appears.

4. Click **Yes** to delete the selected TRX.

6.5.9 Deleting BTS

Follow these steps to delete a BTS node:

1. Open the BSS node in the modify mode.
2. Expand **BTS-IF** and click an instance of BTS in the left-pane.
3. Click the **Delete** button in the Configuration Data tab.
4. Click **Yes** to delete the BTS.

Alternatively, you can also delete BTS from the hierarchy.

1. Right-click the specific instance of BTS in the left-pane.
2. Click **Delete** and click **Yes** to delete the BTS.

Note: The administrative state of both BTS and TRX should be locked to delete BTS. Deleting a BTS, also deletes the TRXs with it.

7. GPRS Configuration

General packet radio service (GPRS) introduces packet switching to the GSM network. It integrates with the existing GSM systems; reuses the GSM radio network infrastructure and the same transmission links (with few more links such as Gb, Gs, Gr, and others) between the GSM network nodes. This section explains how you can configure GPRS in the BSS.

The following flow chart depicts the steps for configuring GPRS:

7.1 Configuring RA

Routing area (RA) is the packet-switch domain equivalent of a LA. It consists of one or more cells within a GSM location area. One LA may contain one or more RAs. This section explains the procedure of adding or deleting a RA in the BSS.

7.1.1 Adding RA

You can add a RA by following the below steps:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig** and click **LAC.**
3. Right-click **LAC :<IP address>**and click **Add Element**.

The Add Element dialog box appears.

4. Select **RA** from the ME Type drop-down list and click **Ok**.

The Configuration – Add Row dialog box appears.

The above two fields are explained below:

Table 27: Fields in RA Configuration

Field	Description	Values
LAC	Indicates the location area code to which the RAC belongs. This is a read-only field.	1 to 65533, 65535
RA	Indicates the routing area code.	0 to 255

5. Provide valid values in the LAC and RA text boxes.
6. Click **Ok**.

RA is added in the left pane.

The various fields in the PsCell tabbed page are explained in "*Table 28*".

7.1.2 Deleting RA

You can delete RA in a LAC by following the below steps:

1. Delete the details in the GPRS Data tabbed page. For more details, refer "*Deleting GPRS Data*".

The data in PsCell tabbed page becomes blank.

2. In the Configuration – Modify Node window, click **RadioConfig** and click **LAC.**
3. Click the **RA :<IP address>**and click **Delete**.

7.2 Configuring Cell Level GPRS Data

You can add, modify, or delete the fields of this ME only when the administrative state of the cell is locked. The subsequent sections explain the procedure of adding, modifying, and deleting GRPS details in the BSS.

7.2.1 Adding Cell Level GPRS Data

Follow the below steps to add GPRS details:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, expand **LAC: <IP address>**, and click **CELL: <IP address>**.
3. Click **GPRS Data** tab and click **Add**.

The Configuration – Add Row dialog box appears.

The various fields in the Configuration – Add Row dialog box are explained below:

Table 28: Fields in GPRS Configuration Dialog Box

Field	Description	Values
Lac ID	Indicates the location area code. This value should be same as defined for the corresponding CS cell in "*Table 19*". This is a read-only field.	1 to 65533, 65535
Cell ID	Indicates the cell ID. This value should be same as defined for the	0 to 65535

Field	Description	Values
	corresponding CS cell in "*Table 19*". This is a read-only field.	
Routing Area Code	Indicates the routing area code.	0 to 255
RA Color	Indicates the routing area color. If the mobile station receives different values of the RA Color field in two cells belonging to the same LA or there are two cells belonging to different LAs, the MS interprets the cell re-selection information as if the two cells belong to different routing areas. Otherwise, the MS interprets the cell re-selection information as if the two cells belong to the same routing area.	0 to 7
BVCI ID	Indicates the identifier that identifies a cell over the Gb Interface. It must be unique per BSS.	2 to 65535
Min PDCH	Indicates the minimum number of physical	0 to 47

Field	Description	Values
	channels that are reserved for PDCH in the cell.	
Max TBF	Indentifies the maximum number of TBFs per direction that can be multiplexed on a PDCH in this PS cell.	1 to 7
SSB	Indicates the intended received signal strength of a block at the BTS for GPRS uplink open loop power control.	0 to 63
Priority Access	Indicates the allowed priority of packet access in the cell.	0 to 7
GPRS DLA Enable	Defines whether dynamic link adaptation (DLA) is supported in the cell. If set to false, all RLC data blocks of a TBF are coded with the CS given by GPRS CS Initial.	true/false
GPRS CS Max	Specifies the maximum coding scheme to be used by the DLA algorithm for the cell.	cs_1, cs_2, cs_3, cs_4

Field	Description	Values
	Consistency Conditions: GPRS CS Initial<= GPRS CS Max	
GPRS CS Initial	Provides the initial coding scheme to be used in a TBF. If DLA is disabled, the initial coding scheme is used for all RLC data blocks of a TBF. **Consistency Conditions:** GPRS CS Initial<= GPRS CS Max	cs_1, cs_2, cs_3, cs_4
percFreeCsChannels	Defines the relative percentage of all configured dual service timeslots except timeslots reserved for minimum PDCH, which is kept free for CS usage.	0..100
percsFreeCsChannelsHyst	The percentage of free dual service timeslots has to exceed `numFreeCsChannels` by this value `numFreeCsChannelsHyst` to allow PDCH	0 to 100

Field	Description	Values
	activation after a previous PDCH reduction was triggered. An absolute number `numFreeCsChannelsHyst` can be calculated out of `percFreeCsChannelsHyst`. This is rounded-up to the next integer value, but is always less than the number of all configured dual service timeslots.	

4. Provide valid values in relevant fields and click **Ok**.

Notes:

- Dual service channel signifies the type of radio timeslots that can be used for CS or PS service.
- PDCH reduction feature is used to support the priority of CS traffic over PS traffic within a cell. This is achieved by freeing one of the busy PDCHs in a cell by re-organizing or releasing one or more TBFs running on that PDCH. It is triggered during establishment or handover of a CS call or due to an OAM event, if the number of free dual traffic radio channels for CS falls below the threshold `numFreeCsChannels` and more than `minNumPdchCell` PDCHs are found active. An absolute number `numFreeCsChannels` can be calculated out of

`percFreeCsChannels` and `minNumPdchCell`, rounded up to the next integer value.

7.2.2 Setting Administrative States of PS Cell

You can perform the following actions on the PS cell:

- Block
- Lock
- Unlock

Follow the below steps to perform any of the above actions:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, expand **LAC: <IP address>**, right-click **CELL: <IP address>**, and select the desired option.

Here, as an example, the block action is shown. The Block dialog box appears.

3. Click **Ok** to block the desired cell.

7.2.3 Modifying Cell Level GPRS Data

Follow the below steps to modify the details in the GPRS Data tabbed page:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, expand **LAC: <IP address>**, and click **CELL: <IP address>**.
3. Click **GPRS Data** tab, modify the required fields, and click **Modify**.

This modifies the existing values of the fields in the GPRS Data tabbed page.

7.2.4 Deleting Cell Level GPRS Data

Follow the below steps to delete the details in the GPRS Data tabbed page:

1. Open the BSS node in the modify mode.
2. Expand **RadioConfig**, expand **LAC**, expand **LAC: <IP address>**, and click **CELL: <IP address>**.
3. Click **GPRS Data** tab and click **Delete**.

This deletes the details in the GPRS Data tabbed page.

7.3 Configuring Gb Interface

The Gb interface exists between the BSS and serving GPRS support node (SGSN) in a GPRS network. The transmission protocols that can be used on this interface are frame relay (FR) or IP.

This section explains the procedure of configuring the two protocols within the Gb interface.

7.3.1 Viewing Gb Interface Details

You view the details of the various fields in the GB Interface tab in OMC by following the below steps:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig** and click **GB Interface**.

The GB Interface tabbed page appears in the right pane.

The following table explains the various fields in the GB Interface tabbed page:

Table 29: Fields in GB Interface Tab

Field Name	Description	Values
nsei	Indicates the network service entity identifier.	0 to 65535
Max Number of NSVCs over FR	Indicates the maximum number of NSVCs that can be provisioned for the system, when FR transport is used.	1 to 26
Max Number of NSVCs over IP	Indicates the maximum number of NSVCs that can be provisioned for the system, when IP transport is used.	1 to 65535
Max Number of LEPs	Indicates the maximum number of LEPS that can be provisioned for the system, when IP transport is used.	1 to 255
Max Number of REPs	Indicates the maximum number of REPs that can be provisioned for the system, when IP transport is used.	1 to 255
Transport Type	Maps to the underlying transport at the Gb interface.	fr, ip_dyanmic, ip_static

Field Name	Description	Values
tFcC	Timer C for Gb flow control. It indicates the minimum interval between sending of subsequent flow control PDUs for a given BVC or MS. This value needs to be aligned with the SGSN settings. **Consistency Conditions**: tFcTh > tFcC	1 to 10
tFcTh	Timer Th for Gb flow control. Within this time BSS has to resend a flow control message to SGSN, otherwise SGSN uses its own calculated values for sending DL data for this particular MS. This value needs to be aligned with the SGSN settings. **Consistency Conditions**: tFcTh > tFcC	5 to 6000
tFcSup	Indicates the timer guarding the reception of flow control acknowledgment.	1 to 99

Field Name	Description	Values
	Unit: 100 ms **Consistency Conditions**: tFcSup* (nMaxFcRep+1) < tFcC	
nMaxFcRep	Indicates the maximum number of repetitions for flow control message. **Consistency Conditions**: tFcSup* (nMaxFcRep +1) < tFcC	1 to 3
tWaitConfig	Guards the SGSN initiated configuration procedure when transport type is ip_dyanmic.	10 to 100
Operational Status	Indicates the Gb operational state. This is set to enabled, after BVC Reset for signaling BVC is complete.	disabled/enabled
Current Bucket Level	Indicates whether the SGSN supports the 'current bucket level' feature, which is negotiated during Gb startup procedure. Attribute has only relevance when	cbl_disabled, cbl_enabled

Field Name	Description	Values
	Operational Status filed is enabled.	

Note: The data present in the GB Interface tabbed page is preconfigured and is read from the BSS.

7.3.2 Modifying Gb Interface Details

You must lock the GB Interface to modify it. You can modify the details in the GB Interface tab by following the below steps:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig** and click **GB Interface**.
3. Change the values in the required field and click **Modify**.

Note: You cannot delete the details in the GB Interface tabbed page.

7.3.3 Configuring FR

FR is a common protocol that is used in many packet-switched networks.

This section explains the procedure of adding, modifying, and deleting FRLink and network service virtual connection (NSVC) in a BSS node.

7.3.3.1 Adding FRLink

You can add an FRLink by following the below steps:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, right-click **GB Interface**, and click **Add FR**.

The Configuration – Add Row dialog box appears.

The various fields are explained in the following table:

Table 30: FR Fields

Field Name	Description	Values
FR Channel ID	Indicates the unique FR channel identifier.	1 to maximum number of NSVC per BSS
trunkIdFrLinkTable	Indicates the external trunk to be used for FR.	0 to 7
Start Timeslot	Indicates the start timeslot within the E1 to be used for PVC identified by data link connection identifier (DLCI). This is automatically filled when selecting timeslots.	1 to 31
Number of Timeslots	Indicates the number of contiguous E1 timeslots. This is automatically filled when selecting timeslots.	

3. Provide valid values in the fields and click **Ok**.

7.3.3.2 Adding NSVC

Network service virtual connection (NSVC) exists between the BSS and the SGSN. The network service (NS) layer is responsible for managing these NSVCs and transfer of upper layer packets.

You can add NSVC by following the below steps:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, right-click **GB Interface**, and click **Add NSVC**.

The Configuration – Add Row dialog box appears.

The various fields are explained in the following table:

Table 31: NSVC Fields

Field Name	Description	Values
NSVC ID	Indicates the NSVC identifier that uniquely identifies NSVC within BSS and SGSN.	0 to 65535
Admin State	Indicates the administrative state of the NSVC. This is a read-only field.	locked/unlocked
FR Channel ID	Indicates the unique FR channel identifier.	1 to 26
dlci	Indicates the data link connection identifier of the PVC of FR link.	16 to 991

3. Provide valid values in the fields and click **Ok**.

7.3.3.3 Setting Administrative State of NSVC

You can perform the following actions on the NSVC ME:

- Lock
- Unlock

Follow the below steps to perform any of the above actions:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, expand **GB Interface**, expand **FR**, expand **NSVC**, right-click **NSVC: <IP address>**, and select the desired option.

   Here, as an example, the unlock action is shown. The Unlock dialog box appears.
3. Click **Ok** to unlock the NSVC.

7.3.3.4 Modifying FRLink/NSVC

You can modify FRLink or NSVC in a BSS node. As an example, the modification of NSVC is shown.

Follow the below steps to modify NSVC:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, expand **GB Interface**, expand **FR**, expand **NSVC**, and click **NSVC : <IP address>**.
3. Change the values in the required fields and click **Modify.**

Note: You can modify NSVC, only if its administrative state is locked.

7.3.3.5 Deleting FRLink/NSVC

You can delete FRLink or NSVC in a BSS node. Here, as an example, the deletion of NSVC is shown.

Follow the below steps to delete NSVC:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, expand **GB Interface**, expand **FR**, expand **NSVC**, and click **NSVC : <IP address>**.
3. Click **Delete**.

Alternatively, right-click **NSVC: <IP address>** and click **Delete**.

Note: You can delete NSVC, only if its administrative state is locked.

7.3.4 Configuring IP

Internet protocol (IP) is the most popular communication protocol used for transmitting packets from the source to the destination based on their addresses.

This section explains the procedure of adding, modifying, and deleting local end point (LEP) and remote end point (REP) in a BSS node.

Note: To add, modify, or delete LEP/REP, the administrative state of BSC should be locked.

7.3.4.1 Adding LEP

You can add only one LEP. Follow the below steps to add LEP:

1. Open the BSS node in the modify mode.

2. Expand **StackConfig**, right-click **GB Interface**, and click **Add LEP**.

The Configuration – Add Row dialog box appears.

The various fields are explained below:

Table 32: LEP Configuration Fields

Field Name	Description	Values
LEP	Indicates the local IP address used over the Gb link. **Note**: Currently, only IPv4 addresses are supported.	(IP address x.x.x.x)
LEP Port	Indicates the local port number used for Gb IP interface communication.	1024 to 65535
signallingWt	Indicates the weight attached to this LEP for load sharing of the signaling traffic among multiple such LEPs.	0 to 255
datWt	Indicates the weight attached to this LEP for load sharing of the data among multiple such LEPS.	0 to 255

3. Provide valid values in the fields and click **Ok**.

7.3.4.2 Adding REP

You can add any number of REPs. Follow the below steps to add REP:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, right-click **GB Interface**, and click **Add REP**.

The Configuration – Add Row dialog box appears.

The various fields are explained below:

Table 33: REP Configuration Fields

Field Name	Description	Values
REP ID	Indicates the unique numeric identity of this REP.	1 to 65535
REP	Indicates the remote SGSN IP address used for the Gb link. **Note**: Currently, only IPv4 addresses are supported.	(IP address x.x.x.x)
REP Port	Indicates the remote SGSN port number used for Gb interface communication.	1024 to 65535
signallingWt	Indicates the weight attached to this REP for load sharing if the signaling traffic among multiple such	0 to 255

Field Name	Description	Values
	REPs.	
datWt	Indicates the weight attached to this REP for load sharing of the data traffic among multiple such REPs.	0 to 255

3. Provide valid values in the fields and click **Ok**.

7.3.4.3 Modifying LEP/REP

You can modify the details of LEP or REP. Here, as an example, the modification of LEP is shown.

Follow the below steps to modify LEP:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, expand **GB Interface**, expand **IP**, expand **LEP**, and click **LEP : <IP address>**.
3. Change the values in the required fields and click **Modify**.

7.3.4.4 Deleting LEP/REP

You can delete LEP or REP. Here, as an example, the deletion of LEP is shown.

Follow the below steps to delete LEP:

1. Open the BSS node in the modify mode.
2. Expand **StackConfig**, expand **GB Interface**, expand **IP**, expand **LEP**, and click **LEP : <IP address>**.
3. Click **Delete**.

Alternatively right-click **LEP: <IP address>** and click **Delete**.

8. Cell Broadcast Service

This section describes the cell broadcast service (CBS), which provides you the option of sending messages from CBS server to mobile subscribers (MS).

8.1 Overview of CBS

CBS provides the option of sending messages to multiple MSs at any time. You can write a promotional message, advertisement, or any text that you want to send to multiple users. The CBS server sends the messages to BSS, which in turn broadcasts the messages to MS. You can send messages in a single cell or in multiple cells. You can configure CBS server for all BSS nodes separately.

You can send a message at regular time interval for n number of times. In addition, CBS provides you the option of displaying cell location in the mobile handset of a MS. Cell location show the current location of MS to a user.

You can view the Configuration window of CBS by using OMC. Follow the below steps to open the CBS window:

1. In Network Explorer window, select the BSS node for which you want to start CBS.
2. Click **CBS** and click **Launch CBS**.

The Cell Broadcast Service window appears.

8.2 Configuring the CBS Server

You need to configure the CBS server before sending any message to MS. You can use an internal or external CBS server.

8.2.1 Configuring the Internal CBS Server

You can use the internal CBS server, which means that OMC server is acting as CBS server.

Follow the below steps to configure the internal CBS server.

1. Open Cell Broadcast Service window.
2. Click **CBS** and click **Configuration**.

Refer "**Error! Reference source not found.**".

3. In the Configuration tab, select the **OMC – CBS** check box.
4. Click **OK** to save the changes.

The message for successul configuration is displayed in the Cell Broadcast Service window.

8.2.2 Configuring the External CBS Server

You can configure an external CBS server from OMC. You should know the IP address and port number to access the external server. In addition, you should know the username, password, and keys to authorize your identity to the external server.

Follow the below steps to configure an external server:

1. Open Cell Broadcast Service window.
2. Click **CBS** and click **Configuration**.

Refer “**Error! Reference source not found.**”.

3. Clear **OMC-CBS** checkbox.

The following table provides details of the various fields:

Table 34: Fields in CBS Configuration Tab

Field Name	Description
IP Address	Specifies the IP address of the external CBD server.
Port	Specifies the port number of external server on which your system connects.
User Name	Specifies the user name provided to you by external service provider
Password	Specifies the password provided to you by external service provider.
Keys	Specifies the keys provided to you by external service provider to access the server.

4. Provide the desired values in the respective fields.
5. Click **OK** to configure the external CBS server.

The message similar to “**Error! Reference source not found.**” is displayed in the Cell Broadcast Service window.

8.2.2.1 Checking External Server Status

You can check the status of external CBS server whether it is working or not by following the below steps:

1. Open Cell Broadcast Service window.
2. Click **CBS** and click **CBS Status**.

The CBS STATUS tab of the CBS window shows the external CBS server status.

The following table explains the two fields in the CBS STATUS tab:

Table 35: Fields in CBS STAUTS Tab

Field Name	Description	Values
Link Status	Indicates the connectivity status with the CBS server.	Link_up/Link_down
Bind Status	Indicates the bind status with CBS server.	success/fail

Note: In case of internal CBS server, CBS status option is grayed out.

8.3 Configuring and Sending Message

You can send messages to a single LAC, single cell, or multiple cells in a single LAC. In addition, you can configure the time-period after which the message can be sent again and how many times the message should be broadcasted.

The following are the pre-requisites before you can send any message to a cell:

- The value of cell broadcast channel (CBCH) should be 'true'.
- The cell should be in enabled state to which you want to broadcast the message.

You can send the following two types of cell broadcast message:

- Write replace: This message type is send only to the enabled cells.
- Cell info: This is the default message type, which is send to both enabled and disabled cells.

Follow the below steps to configure and send a message:

1. Open Cell Broadcast Service window.
2. Click **CBS** and click **Write/Replace**.

   The WRITE REPLACE tab of CBS window shows the configuration option for message.

   The given below table describes the fields of the WRITE REPLACE tab:

Table 36: Message Configuration

Field	Description	Values
Message Detail		
Message ID	Provides the message id for the type of message you want to send. Please refer the 3GPP specification for the message id for the corresponding message type.	0 to 65535
Message Identifier		
Geographical Scope	Three geographical	0 to 3

Field	Description	Values
	scope values are available: • 0: Specifies that the message can be broadcasted to the selected cell only. • 1: Specifies that the message can be broadcasted to the selected LAC and cells only. • 2: Specifies that the message can be broadcasted to the selected LAC only. • 3: Specifies that the message can be broadcasted to selected cell or LAC only.	
Message	Indicates the code of the message.	0 to 1023

Field	Description	Values
Code	Please refer the 3GPPP specification for the message code for the corresponding message type.	
Update Number	Each message type has a unique number for the corresponding message.	0 to 15
Message Occurrence		
Repetition Counter	Indicates the time period after which the message is broadcasted again.	1 to 1024
No of Broadcast	Indicates the number of times that you can send a message repeatedly. For example, iff you define the repetition counter unit to 2 and number of broadcast to 100	0 to 65535

Field	Description	Values
	then it means the message can be broadcasted 100 times at an interval of 2*1.883 sec.	
Other Details		
LAC Information	Indicates the LAC number.	-
Category	Indicates the message severity level. If you select one message as normal and another as high then the high priority message is send first.	Normal/High/ Background
Message Content		
	In this text box, you should type the real content of the message that you want to send to MS.	-

3. Provide the values as described in the above table.

You can select the cells to which you want to send the message. When you provide the LAC information, the Select Cell (s) dialog box appears.

4. Select the cells to which you want to send the message. Click **OK** to close the Select Cells(s) dialog box.

In addition, you can select the **Select All Cells** checkbox to send message to all the cells of the selected LAC.

5. Click **Send** to send the message.

   The confirmation for the successful sending of the message appears.

8.3.1 Message Broadcasting Report

You can check the status of the message that you have broadcasted in the CB Report tab of the CBS window. The messages that have been successfully sent and their number of broadcast counter is over are not shown in this tab. In addition, report contains information about messages, which are not broadcasted due to failure on node.

Messages that are being broadcasted and those with failed status are shown in this tab. The broadcasting status can change to failed if cell is disabled during broadcast of the message. In addition, the status can change to broadcast from failure if the broadcast timer has not expired.

You can stop the broadcasting of a message to a cell or LAC by using this tab.

Follow the below steps to view and stop broadcasting a message:

1. Open Cell Broadcast Service window.

2. Click **CBS** and click **Report**.

The CB REPORT tab of the CBS window shows all the messages that are in the broadcasting process.

3. Click **KILL** to stop the broadcasting of a message.
4. Close the CBS window to exit from the CBS application.

8.4 Broadcasting Cell Information

You can broadcast the information of a cell to mobile stations. The broadcasting of cell information displays the location of the cell in the mobiles of the mobile subscribers.

You should remember these points before sending a cell information message:

- The value of CBCH field in the channel group table (please refer "*Table 24*") should be true.
- Cell name or cell info for that cell should not be empty while configuring the cell, by default 0 is the value filled by OMC.
- There should not be any message already sent on the cell. This is not applicable for write replace message type.

You can select a LAC and specific cells of the selected LAC to send the cell information message.

Follow the below steps to broadcast cell information message:

1. Open Cell Broadcast Service window.
2. Click **CBS**, select **Cell Info Display** and click **Cell Info Display Message**.

The CELL INFO DISPLAY MESSAGE tab of the CBS window shows the configuration settings of the cell information broadcast message.

3. Select the **LAC** from the LAC drop-down list.
4. Type message code in the Message Code text box.

Check 3GPP specification for the message code that you want to broadcast.

5. In the Cell ID list, check the cell ids to which you want to broadcast the message.
6. Click **Send**.

The confirmation message for the successful broadcasting of the message appears.

7. Close the CBS window to close the CBS application.

8.4.1 Stopping Cell Information Message

You can stop the cell information message at any time. You can select specific cells or all cells in a LAC such that the message is not broadcast in the selected cell.

Follow the below steps to stop cell information broadcast message:

1. Open Cell Broadcast Service window.
2. Click **CBS**, select **Cell Info Display**, and click **Cell Info Display Report**.

The CELL INFO DISPLAY REPORT tab shows the status of the cell information broadcast message.

3. Check the cell ids of the cells in which you want to stop the cell information message.

4. Click **Stop** to stop the broadcasting of message in the selected cells.
5. Close the CBS window to exit the CBS application.

9. Software Configuration

This section describes the procedure to view the latest software available for BSC, TRX, EIC, R2 BTS, and DSP. In addition, this section also describes the procedure to download and update the software for these MEs.

9.1 Software Offer Process

You can download and activate a new software release from the file transfer protocol (FTP) server. You need to provide the software offer to the ME.

Software offer means that a new release of the software is available for the ME. When the software offer is available to the ME, a new row adds to the Software Management tab that confirms that offer is available to the ME. You have to download the software and then activate the software for the ME.

You can upgrade MEs software by using the Software Offer tab of the Software ME window. You can download the software from OMC/FTP server to BSC card (for node type BSC, DSP, and BTS). When you download a new software version, a new row adds to the Software Download/Activation and Software Management tab.

The software download process can be either successful or failed. An alarm is generated for the successful or failed download process by OMC.

OMC fills the details of the default FTP server. You can provide a different FTP server address. The upgrade

directory of node's file system should have the release binary of the software upgrade file in it. If the file is in your client system then download the file from your client system to FTP server.

Follow these steps to upgrade the software:

1. Open the BSS node in modify mode.
2. Expand **Inventory**, click **Software**, and click **Software Offer** tab.
3. Provide the FTP server details.
4. In the Software Image Details panel, select a node type from the Node Type list.
5. Type the version of the software in the Upgrade Version text box.
6. Click the **Browse** button to open the FTP file browser.

The FTP File Browser dialog box appears which displays the local file system in left-pane and the FTP server file system in the right-pane.

7. Click the **Connect** button to connect to the FTP server.

All directories of the FTP server are listed in the left side box.

8. Double-click the directory in which the new software release is stored.

Note: If the release binary is unavailable then copy it from OMC client's local file system to the remote file system by using >>.

9. Click the software release from the Look in box. Click **OK**.
10. The Software Offer tab shows the file path, checksum (MD5), and size in kilobytes of the selected file.

You have successfully provided the software offer to the ME.

The fields of the Software Offer tab are described in the following table:

Table 37: Software Offer Fields

Field Name	Description
FTP Server Details	
FTP Server Address	Indicates the IP address of the FTP server.
Server Login	Indicates the login name for the FTP server.
Server Password	Indicates the password for the FTP server.
Software Image Details	
Node Type	Identifies the network element type, which is using this software image.
Frame ID	Indicates the chassis id.
Slot ID	Indicates the slotid of the card.
Upgrade Version	Identifies the version of software image. **Note**: The swVersion provided from OMC as xyz.abc.def string with no leading zeros in the subfields and value (subfields) <= 255. For the time being the length is 12 (including NULL char). At interface to BTS and BSC platform, the swVersion is provided as I_U8 [3].

Field Name	Description
Tar File Path	Indicates the name of the tar file (containing the image) to be downloaded from FTP server. Example: `/target/upgrade/bsc.tar`
Checksum (MD5)	Indicates the checksum (md5sum) of tar file to be downloaded from server.
Size (KB)	Indicates the size of the tar file in KB.

You can directly activate the software for EIC, DSP, and BSC after the successful software offer process. However, you need to download and then activate the software for TRX, BIC, and R2 BTS after the successful software offer.

9.2 Downloading Software

You can download the software after the successful software offer. A new row is added in the Software Management and Software Download/Activation tab after the software offer is made to the ME. You need to check the node type for which the software is offered.

Follow these steps to view the node type:

1. Open the BSS node in the modify mode.
2. Expand **Inventory**, click **Software**, and click **Software Management** tab.
3. View the software version that you have typed in the Software Offer tab.
4. In the Node Type column, view the node name.

After you check the node type for which software is offered, follow the below steps to download the software on the ME:

1. Click **Software Download**/**Activation** tab.
2. In the SW Action column, select **SW_DOWNLOAD** for the node type for which software is offered.
3. The software release version appears automatically in the New SW Version column.

Note: For a single MLPPP time slot, the TU image upgrade should be sequential as it takes around 35 min for download of a TU image. In case of a parallel upgrade, it may take several hours.

9.3 Activating Software

After the software offer process and download, you need to activate the software. This is mandatory in case of TRX, BIC, and R2 BTS. For EIC, DSP, and BSC you can directly activate after the software offer process.

The column New SwVersion in the Software Download/Activation tab shows the new software version that you can activate for BSC, BTS, EIC, and DSP.

Note: BSS lock is required for software activation of BSC, EIC, DSP, and BTS.

For the node type BTS, if sw_action is SW_DOWLOAD then new_sw_version have a drop-down list that contains the downloaded software version on BSC card for BTS node type. Also, for the BTS release, LAPD link should be up.

Follow the below steps to activate the software:

1. Open the BSS node in the modify mode.

2. Expand **Inventory**, click **Software** and click **Software Downaload/Activation** tab.
3. Click **SW_Action** column.
4. Select **sw_ACTIVATION** from the SW Action drop-down list.

9.4 Creating BTS Software Release

Follow these steps to create software release of BTS card:

1. Create a directory with name sr. <version> on FTP server machine.
2. Move the BTS release that is in (.ldr) format in sr. <version> directory.
3. Rename the BTS release (that is in .ldr format) in .bz2 format (for example, BTS_loadmodule_bts_023.ldr replaced with name BTS_loadmodule_bts_023.bz2).
4. Create the tar of sr. <version> directory.

Appendix.A Approaches for Adding BSS Node

At OMC, you can add BSS node in the following two ways:

- Bottom-up approach
- Top-down approach

VNL® recommends that you add a new BSS node by using the bottom-up approach because in this approach the node registers automatically with the OMC.

However, while adding a BSS node by using bottom-up or top-down approach the node should have a reachable IP. Otherwise, the OMC is not able to register the new node.

When you add/register a BSS node in the OMC, it extracts the BSS details from the BSS card and automatically adds the details to the OMC. Hierarchies show these details in the left-pane of the OMC Network Explorer window. The hierarchy displays the default/factory settings for the newly added BSS node. The root of the tree structure is the IP of the newly added node.

Appendix.B Suggested Practice

You should take the backup of `home` directory and `/home/dbdata` directory on the host machine, twice a week with some time interval before configuring or performing maintenance activity on a site. Both the folders are stored in the root directory. You can check their location by executing the following command at root:

```
$ls
```

Perform the following steps for system backup:

1. On the host machine make a directory in the root by the given below command:

```
mkdir <directory_name>
```

2. Change to newly create directory by the given below command:

```
cd <directory_name>
```

3. Copy the home folder to this directory from the system where OMC is installed by using the below command:

```
scp -r [<user@><from-host>:]<source-file>
[<user@><to-host>:][<destination-file>]
```

4. If connection is successful, the system prompts for password. Provide the password of the system.

Similarly, you can copy the dbdata folder.

5. After copying, convert folders to tar files. The command for converting folders to tar is as follows:

```
tar -cvf <name of folder.tar>
<source_file_or_folder>
```


Appendix.C Chassis Details

You can view the details of chassis, EIC, and ICC cards by using OMC. You cannot modify any field of these cards.

C.1 Viewing Chassis Details

Follow the below steps to view chassis details:

1. Open the BSS node in the modify mode.
2. Expand **Inventory**, expand **Hardware**, expand **Chassis**, and click **Chassis :<IP address>**.

The field description of the Chassis tab is given below:

Table 38: Chassis Fields

Field Name	Description
Frame ID	Indicates the chassis frame id.
Number of Cards	Indicates the total number of ICC and EIC cards.
Number of Remote Cards	Indicates the total number of EIC cards.
System Type	Indicates the type of system.

C.2 Viewing EIC Details

Follow the below steps to view chassis details:

1. Open the BSS node in the modify mode.

2. Expand **Inventory**, expand **Hardware**, expand **Chassis**, expand **EIC**, and click **EIC :<IP address>** to view EIC card details.

The field description of the EIC tab is given below:

Table 39: EIC Fields

Field Name	Description
Frame ID	Indicates the chassis id.
Slot ID	Indicates the slot id of the card.
Card Type	Indicates the type of the card. Supported value: EIC card
Serial Number	Indicates the serial number of the card.
Physical Present State	Indicates the physical state of the card.
Operational State	Indicates the current state of the card.
Trunk Port Number	Indicates the total number of available TrunkPorts on this EIC card.
CPLD Major version	Indicates the major version of CPLD.
CPLD Minor Version	Indicates the minor version of CPLD.
CPLD Revision Version	Indicates the revision version of CPLD.
MC Major Version	Indicates the major version of

Field Name	Description
	microcontroller.
MC Minor Version	Indicates the minor version of microcontroller.
MC Revision Version	Indicates the revision version of microcontroller.
Kernel Major Version	Indicates the major version of kernel.
Kernel Minor Version	Indicates the minor version of kernel.
Kernel Revision Version	Indicates the revision version of kernel.
uBoot Major Version	Indicates the major version of uboot.
uBoot Minor Version	Indicates the minor version of uboot.
uBoot Revision Version	Indicates the revision version of uboot.
RamDisk Major Version	Indicates the major version of ramdisk.
RamDisk Minor Version	Indicates the minor version of ramdisk.
Ramdisk Revision Version	Indicates the revision number of ramdisk.

C.3 Viewing ICC Details

Follow the below steps to view ICC card details:

1. Open the BSS node in the modify mode.
2. Expand **Inventory**, expand **Hardware**, expand **Chassis**, expand **ICC**, and click **ICC :<IP address>** to view ICC card details.

The field description of ICC tab is given in the below table:

Table 40: ICC Fields

Field Name	Description
Chassis Frame ID	Indicates the chassis id.
Slot ID	Indicates the slot id of the card
Card Type	Indicates the type of the card. Supported value is ICC card only.
Card Serial Number	Indicates serial number of the card.
Physical Present State	Indicates the physical state of the card.
Card Operational State	Indicates the current state of the card.
One P2 Power Module Voltage Status	Indicates the 1.2V status on the card. (Normal/Below Normal/Above Normal)
Two P5 Power Module Voltage Status	Indicates the 2.5V status on the card.(Normal/Below Normal/Above Normal)

Field Name	Description
One P2 DSP Voltage Status	Indicates the 1.2V status of DSP chip on the card. (Normal/Below Normal/Above Normal)
Two P5 Power Module Temperature Status	Indicates the temperature status of 2.5V module on the card.
Three P3 Power Module Temperature Status	Indicates the temperature status of 3.3V module on the card.
Hot Swap Power Good1 Status	Indicated the power good signal 1status. (Normal/Faulty)
Hot Swap Power Good 3 Status	Indicates the power good signal 3 status (Normal/Faulty).
Cpld version Major	Indicates the major version of the CPLD.
CPLD Minor Version	Indicates the minor version of the CPLD.
Cpld Version Revision	Indicates the revision version of the CPLD.
Uc Version Major	Indicates the major version of the microcontroller.
Uc Version Minor	Indicates the minor version of the microcontroller.
Uc Version Revision	Indicates the revision version of the microcontroller.

Field Name	Description
Active Kernel Version Major	Indicates the major version of the active kernel.
Active Kernel Version Minor	Indicates the minor version of the active kernel.
Active Kernel Version Revision	Indicates the revision version of the active kernel.
Backup Kernel Version Major	Indicates the major version of the backup kernel.
Backup Kernel Version Minor	Indicates the minor version of the backup kernel.
Backup Kernel Version Revision	Indicates the revision version of the kernel.
U Boot Version Major	Indicates the major version of the uboot.
U Boot Version Minor	Indicates the minor version of the uboot.
U Boot Version Revision	Indicates the revision number of the uboot.
Active Ramdisk Version Major	Indicates the major version of the active ramdisk.
Active Ramdisk Version Minor	Indicates the minor version of the active ramdisk.
Active Ramdisk	Indicates the revision number of the active

Field Name	Description
Version Revision	ramdisk.
Backup Ramdisk Version Major	Indicates the major version of the backup ramdisk.
Backup Ramdisk Version Minor	Indicates the minor version of the backup ramdisk.
Backup Ramdisk Version Revision	Indicates the revision number of the backup ramdisk.

C.4 Viewing Fan Tray Details

There are two fan trays in the chassis. Upper fan tray has two fans and lower fan tray has six fans. You can view the fan details such as fan speed, running status of fan.

Follow the below steps to view fan tray information:

1. Open the BSS node in the modify view.
2. Expand **Inventory**, expand **Hardware**, expand **Chassis**, expand **FanTray**, expand **FanTray :<IP address>**, expand **FanInfo**, and click **FanInfo :<IP address>**.

The fields of the FanInfo tab are described in the following table:

Table 41: Fan Tray Fields

Field name	Description
Frame ID	Indicates the frame id.
Fan Tray ID	Indicates the fan tray id.
Fan ID	Indicates the fan id.

Field name	Description
Fan Speed	Indicates the speed of fan.
Fan Status	Indicates the status of the fan.
Physical Present State	Indicates the state of the fan if it is present or not.

C.5 Viewing Power Supply Card Details

There are two power supply cards in the chassis. You can view the details of the power supply card by following the below steps:

1. Open the BSS node in the modify mode.
2. Expand **Inventory**, expand **Hardware**, expand **Chassis**, click **PowerSupply**, and click **PowerSupply :<IP address>**.

The fields of the PowerSupply tab are described in the following table:

Table 42: Power Supply Fields

Field name	Description
Frame ID	Indicates the frame id.
Slot ID	Indicates the slot id.
Card Type	Indicates the type of card.
Serial Number	Indicates the serial number of the card.
Operational State	Indicates the operational status of the card.

Field name	Description
MC Major Version	Indicates the major version of MC.
MC Minor Version	Indicates the minor version of MC.
MC Revision Version	Indicates the revision version of MC.
Peer Card Present	Indicates whether peer card is present or not.
Physical Present State	Indicates the physical status of the card.

C.6 Viewing SwitchOver Details

You can view the details of all the cards and their operational states by following the below steps:

1. Open the BSS node in the modify mode.
2. Expand **Inventory**, expand **Hardware**, expand **Chassis**, and click **SwitchOver**.

The fields in the SwitchOver tab are explained in the following table:

Table 43: Fields in SwitchOver Tab

Field name	Description
Chassis Frame ID	Indicates the chassis frame id.
Slot ID	Indicates the slot id.

Field name	Description
Card Type	Indicates the type of card.
Operational State	Indicates the operational status of the card.

Note: The ICC card at slot id 3 appears in the SwitchOver tab even when the card is in standby state.

Appendix.D Notice

These devices comply with Part 15 of the FCC rules. Operation is subject to following two conditions:

1. **These devices may not cause harmful interference and**
2. **These devices must accept any interference received including interference that may cause undesired operation of this device.**

FCC Caution:

- **Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.**
- **The following equipment should be installed and operated with minimum distance between the radiator & your body.**
  -RBTS 850 --------- 121cm
  -RBTS 1900 -------- 94 cm
  -VBTS 850 ---------- 330.75 cm
  -VBTS 1900 --------- 330.75 cm

The RBTS 1900, RBTS 850, VBTS 1900 and VBTS 850 equipment had been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

The RBTS 1900, RBTS 850, VBTS 1900 and VBTS 850 generate, use and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.

This antenna used for this transmitter is 23-dBi gain, must be installed to provide a separation distance of at least 330.75 cms from all persons, and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance. This equipment should be installed and operated with minimum distance between the radiators (antennae) & any by-stander.

Glossary

Term	Definition
DLA	Dynamic layer adaptation is a method in which cellular networks can dynamically adapt a radio link according to changing conditions of interference. In this, transmitter is able to detect whether the quality of the link is improving or not and based on this information switches to a higher or lower transmission rate, respectively.
DSP	Digital signal processing involves the representation of signals by sequence of numbers or symbols and the processing of these signals. The main applications of DSP are audio signal processing, audio compression, speech processing, digital communications, and many others.

Term	Definition
FCAPS	FCAPS is a network management functional model that divides the network management into five functional areas: network device and application fault management, network device and application configuration management, network utilization and accounting management, network performance management, and security management. There are many network management technologies (such as SNMP)and protocols, which address some of the FCAPS functions.
NOC	A network operation center (NOC) is a place from which a network is supervised, monitored, and maintained. Enterprises with large networks as well as large network service providers typically have a network operations center, a room

Term	Definition
	containing visualizations of the network or networks that are being monitored, workstations at which the detailed status of the network can be seen, and the necessary software to manage the networks. The network operations center is the focal point for network troubleshooting, software distribution and updating, performance monitoring.

