



CHAPTER 4

Configuring the Cisco PGW 2200 Softswitch Software

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Introduction

This chapter describes how to configure Release 9.8 of the Cisco PGW 2200 Softswitch software.

Quick Guide to Configuring the Cisco PGW 2200 Softswitch Software



Note

The Cisco PGW 2200 Softswitch software files and processes are located in the `/opt/CiscoMGC` directory.

The following table provides an overview of the Cisco PGW 2200 Softswitch software configuration.

Table 4-1 Quick Guide to Configuring the Cisco PGW 2200 Softswitch Software

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**Note**

For further information on configuring the Cisco PGW 2200 Softswitch software, see the *Cisco PGW 2200 Softswitch Release 9.8 Provisioning Guide*.

Before You Start

Before you start, verify the following:

- Have your company's internal support and Cisco support contact information readily available so you can get help with the installation if needed. (If you have questions or need assistance, see the “[Obtaining Documentation and Submitting a Service Request](#)” section on page x of the Cisco support contact information.)
- Ensure that you have access to the console port on your Cisco PGW 2200 Softswitch host.

**Caution**

The Cisco PGW 2200 Softswitch software is case-sensitive. Ensure that you enter parameter names correctly, or the maximum number of configurations will not be modified.

Software Directory Structure

Table 4-2 shows the Cisco PGW 2200 Softswitch software directory structure.

**Caution**

Do not edit any .dat files (except for the XECfgParm.dat and trigger.dat files). Use MML or the GUI provisioning tool to make changes to your configuration. In addition, only make changes to the call screening database by using MML or the GUI provisioning tool.

Table 4-2 Software Directory Structure

Directory	Contents
/etc/init.d	Control scripts, including scripts used to stop and start the software.
/opt/CiscoMGC	Root location of base software installation.
/opt/CiscoMGC/bin	Stores executable Cisco PGW 2200 Softswitch system files.
/opt/CiscoMGC/license	Cisco PGW 2200 Softswitch license files.
/opt/CiscoMGC/local	User accounts home directory.
/opt/CiscoMGC/etc	Contains active configuration data files and the configuration library.
/opt/CiscoMGC/etc/CONFIG_LIB	Library of all configuration data files.
/opt/CiscoMGC/etc/CONFIG_LIB/new	The initial startup configuration supplied with a new installation of the software.
/opt/CiscoMGC/etc/active_link	The active running configuration that has been committed or deployed.
/opt/CiscoMGC/etc/prov_link	The latest provisioned configuration that has not yet been committed or deployed.
/opt/CiscoMGC/etc/cust_specific	Location of configurations that have been exported using the prov-exp MML command.
/opt/CiscoMGC/lib	System software libraries of *.so object files (including protocol and system libraries).
/opt/CiscoMGC/snmp	SNMP support directory. MIBs are named *.my and are in ASN.1 syntax.

Table 4-2 Software Directory Structure (continued)

Directory	Contents
/opt/CiscoMGC/var	Contains the log, spool, trace, and Coredump file directories.
/opt/CiscoMGC/var/log	Default platform informational and error logs.
/opt/CiscoMGC/var/spool	Spool files for CDRs and measurements.
/opt/CiscoMGC/var/trace	Location of trace files created by using the sta-trc MML command.
/opt/SW	Cisco PGW 2200 Softswitch software patch files. Note This directory is not created by the default Cisco PGW 2200 Softswitch installation, but is recommended for storing Cisco PGW 2200 Softswitch patch files.
/opt/TimesTen	Call screening database files. Do not edit the database.
/opt/Toolkit	The Toolkit application files.
/opt/sun_install	Contains the scripts used to install Solaris patches.

Initial Cisco PGW 2200 Softswitch Software Configuration

The following required configuration parameters in the XECfgParm.dat file (see [Table 4-3](#)) are critical to bringing up the system. For a complete list of the parameters found in the XECfgParm.dat file and how they are used by the Cisco PGW 2200 Softswitch, see [Appendix A, “XECfgParm.dat File Parameters.”](#)



Note

The XECfgParm.dat file must be provisioned with the installation of every system. The file consists of set of parameters that are necessary to bring up the system. This set of required parameters is configured via the MGC Environment Configuration Tool.

When you exit the MGC Environment Configuration Tool, the slave file is sent via FTP to the appropriate system.

During initial Cisco PGW 2200 Softswitch configuration, we recommend that you put an initial configuration on the **active host**, otherwise both the active and standby hosts will remain in the stopped state. Do not start the standby host if the active host is not yet provisioned.

When the initial configuration on the active host is deployed, you must change the **pom.dataSync** parameter to true in the XECfgParm.dat file in the **standby host**. After setting this parameter to true, you can start the Cisco PGW 2200 Softswitch software on the standby host. As the Cisco PGW 2200 Softswitch software comes up, the data on the standby host is synchronized with the data on the active host. Initiate switchover to bring the active host to the standby state.

To accommodate failover conditions where the current active host can become the standby host, you must also set the **pom.dataSync** parameter to true on the **current active host**.

When upgrading the Cisco PGW 2200 Softswitch software: You must set the **pom.dataSync** parameter to false on the **current active host** in order to preserve configuration files.

Table 4-3 shows the Cisco PGW 2200 Softswitch configuration parameters.

Table 4-3 Configuration Parameters

Parameter	Description
*.CPUTimerInterval	<p>Samples the frequency of CPU utilization.</p> <p>Prior to Release 9.4(1), this parameter must be set to 0 during the initial configuration of any platform with a single CPU (including Sun Netra t 100/105, Sun Netra V 120, and Sun Netra 120).</p> <p>Default: 3000 msec (3 seconds)</p> <p>Note During the startup of the Cisco PGW 2200 Softswitch software, this parameter will be set automatically to tune the system for optimal performance.</p> <p>For Release 9.4(1) and later, this parameter is set automatically when you specify a Cisco PGW 2200 Softswitch type in the engine.SysVirtualSwitch parameter. Any attempt to modify this parameter is overwritten.</p>
*.desiredPlatformState	Specifies the operating mode of the Cisco PGW 2200 Softswitch.
*.IP_Addr1 through IP_Addr4	<p>Specify the IP addresses being used by the system.</p> <p>Note that *.IP_AddrLocalA, and *.IP_AddrLocal2 are the same as *.IP_Addr1, and *.IP_Addr2, respectively.</p>
*.IP_AddrLocalA and *.IP_AddrLocalB	The local IP addresses of the Cisco PGW 2200 Softswitch. These addresses should match the value of *.IP_AddrLocalA and *.IP_AddrLocalB.
*.IP_AddrPeerA and *.IP_AddrPeerB	The IP address of Cisco PGW 2200 Softswitch peers used for failover.
*.MGC_CDR_NODE_ID	The Cisco PGW 2200 Softswitch System ID used for Call Data Records (CDRs).
*.ownTranspathId	<p>Contains a unique number that identifies the Cisco PGW 2200 Softswitch's virtual switch controller within the ASN (Auxiliary Signaling Network).</p> <p>Default: 01</p>
*.peerTranspathId	<p>Contains a unique number that identifies a peer virtual switch controller within the ASN (Auxiliary Signaling Network).</p> <p>Default: 02</p>
*.platformId	<p>Identifies the Cisco PGW 2200 Softswitch platform. The default value 1 applies to Fault Tolerant mode and Standalone mode.</p> <p>Default: 1</p>

Table 4-3 Configuration Parameters (continued)

Parameter	Description
*.SysConnectDataAccess	<p>Controls whether data access is enabled or disabled (if the engine attempts to connect to the MMDB or to call screening database at startup).</p> <p>Values:</p> <ul style="list-style-type: none"> • true = connect to MMDB or call screening database • false = do not connect to MMDB or call screening database <p>Default: false</p> <p>Note This parameter must be set to true in calling scenarios where Euro-LNP, A Number Screening, or other features requiring real time database access are required. Otherwise, it can remain false for an increase in the available system memory usable for call processing.</p>
TCAP.avgInvokePerDialog	<p>Sets the average number of Invokes for a TCAP dialog. A single dialog does not necessarily correspond to a single Invoke. The number of Invokes depends on the call flow for the TCAP dialog.</p> <p>Values: 1-10</p> <p>Default: 1</p> <p>Note See the note for the TCAP.maxSsnNum parameter.</p>

Table 4-3 Configuration Parameters (continued)

Parameter	Description
TCAP.maxSsnNum	<p>Defines the maximum number of local subsystem numbers allowed by the PGW for the entire TCAP IOCC subsystem.</p> <p>Value: Any integer from 1 to 10.</p> <p>Default: 10</p> <p>Note The PGW IOCC allocates resources and tracks the TCAP dialogs until the dialog ends. The PGW can support 200000 dialogs and (200000/maxSsnNum) dialogs per SSN. The PGW can support (200000*avgInvokePerDialog) Invokes and (200000*avgInvokePerDialog/maxSsnNum) Invokes per SSN.</p> <p>If the PGW detects repeated NCT/NBT, NoAnswer, RouteSelectFailure, or CalledPartyBusy messages, which then result in a follow-on call, there will be many Invokes for the same TCAP dialog. Therefore, to support higher feature capability, the maximum number of Invokes can be much larger than the maximum number of TCAP dialogs.</p> <p>If you provision the maxSsnNum and avgInvokePerDialog parameters, the maximum number of simultaneous outgoing Invokes per SSN is calculated as (200000*avgInvokePerDialog)/maxSsnNum.</p>
*.transpathId	<p>A unique number that identifies each virtual switch controller within the ASN (Auxiliary Signaling Network).</p> <p>Default: 01</p>
*.Virtual_IP_Addr1 through *.Virtual_IP_Addr2	<p>Specify virtual IP addresses for the Cisco PGW 2200 Softswitch that are used for SIP Failover Support.</p>

Table 4-3 Configuration Parameters (continued)

Parameter	Description
engine.SysVirtualSwitch	<p>Indicates whether the Cisco PGW 2200 Softswitch host functions as a signaling controller or a virtual switch controller.</p> <p>Values:</p> <ul style="list-style-type: none"> • 0—Signaling controller (nailed trunks, no auditing is initiated) • 1—Virtual switch controller (switched trunks) <p>Default: 0</p> <p>Note During the startup of the Cisco PGW 2200 Softswitch software, this parameter is be set automatically to tune the system for optimal performance.</p> <p>Note For Release 9.4(1) and later, the values of the parameters listed below are automatically set based on the Cisco PGW 2200 Softswitch type you select, to maximize performance for that configuration. Any attempt to change the values of these parameters is overwritten.</p> <p>engine.SysMdlMemoryReduction engine.CALL_MEM_BLOCK_SIZE engine.CALL_MEM_CHUNK_SIZE *.CPUTimerInterval *.numberOfThreads</p>
pom.dataSync	<p>Indicates that the Provisioning Object Manager (POM) should synchronize the provisioning data at startup.</p> <p>Values:</p> <ul style="list-style-type: none"> • True— POM does not synchronize provisioning data at startup. • False— POM synchronizes provisioning data at startup. <p>Default: False</p>

Parameters Required for Initial Setup

The following table lists the parameter values that must be defined during the initial installation.



Note

These parameters are located at the top of the XECfgParm.dat file, thus making it easier to find the parameters required for initial setup.

Table 4-4 Parameters Required for Initial Setup

Item	Parameter Name	Default Value	Changed Values
1	*.platformId	1	2, if slave
2	*.transpathId	01	02, if standby
3	*.ownTranspathId	01	02, if standby
4	*.peerTranspathId	02	01, if standby
5	*.MGC_CDR_NODE_ID	MGC-CDR-NO DE-STRING	System Id for Call Data Records (CDRs)
6	*.desiredPlatformState	Standalone	Master,slave,standalone
7	*.SysConnectDataAccess	False	True
8	*.IP_AddrLocalA	0.0.0.0	Ifconfig(bge0)
9	*.IP_AddrLocalB	0.0.0.0	Ifconfig(bge1)
10	*.IP_AddrPeerA	0.0.0.0	Slave(ifconfig(bge0))
11	*.IP_AddrPeerB	0.0.0.0	Slave(ifconfig(bge1))
12	*.IP_Addr1	0.0.0.0	Ifconfig(bge0)
13	*.IP_Addr2	0.0.0.0	Ifconfig(bge1)
14	*.IP_Addr3	0.0.0.0	Ifconfig(bge2)
15	*.IP_Addr4	0.0.0.0	Ifconfig(bge3)
16	StPort	0	7000, if Master or 7001 if Slave
17	Engine.SysVirtualSwitch	0	1 for Switched solution
18	Foverd.ipLocalPortA (con 1)	0	1051, if Master or 1052 if Slave
19	Foverd.ipPeerPortA (con 1)	0	1052, if Master or 1051 if Slave
20	Foverd.ipLocalPortA (con 2)	0	1053, if Master or 1054 if Slave
21	Foverd.ipPeerPortA (con 2)	0	1054, if Master or 1053 if Slave
22	Pom.dataSync	False	True if Master or Slave, both sides
23	Diskmonitor.OptFileSys	<blank>	../var/log
24	NumberOfThreads	0	Determined based on the number of CPUs in the Cisco PGW 2200 Softswitch

**Note**

For an example of an updated configuration file, see the “[Updated Configuration File Sample](#)” section on page D-12.

Using the Cisco MGC Environment Configuration Tool

You must configure the basic parameters required to bring the system to an operational mode. Follow these steps to use the MGC Environment Configuration Tool XECfg program:

Step 1 Log in as **mgcusr**, enter the following at the command prompt, and press **Enter**:

```
% MGC_Setup
```

A dialog box displays, warning that the MGC Environment Configuration Tool is for initial system configuration only.

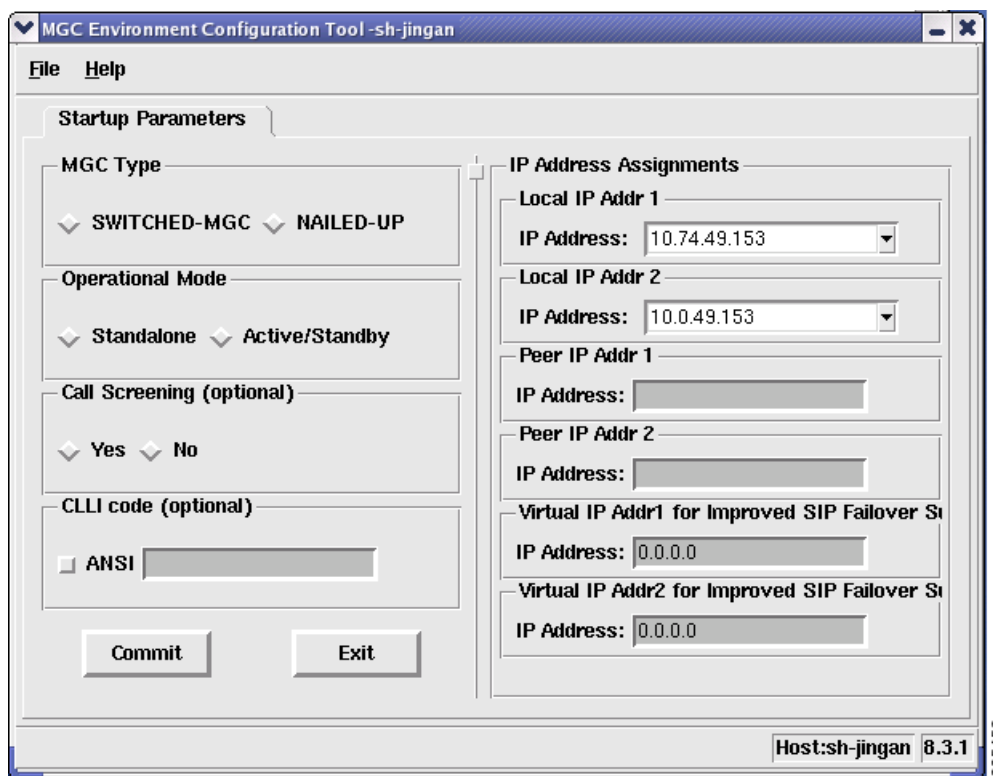


Note To run the MGC Environment Configuration Tool in detail mode, enter the command **MGC_Setup -detail**.

Step 2 Click **Yes** to continue running the XECfg program.

The MGC Environment Configuration Tool screen expands to provide information from the XECfgParm.dat file. [Figure 4-1](#) shows the MGC Environment Configuration Tool screen.

Figure 4-1 MGC Environment Configuration Tool



[Table 4-5](#) explains the startup parameters listed in the MGC Environment Configuration Tool.

Table 4-5 MGC Environment Configuration Tool Startup Parameters

Field	Usage
MGC Type	Indicates whether the Cisco PGW 2200 Softswitch connection type. SWITCHED-MGC specifies a dynamic connection such as a trunk group; NAILED-UP specifies a permanent connection such as a sigpath.
Operational Mode	Indicates the whether the Cisco PGW 2200 Softswitch is operating as a stand-alone system or in a fault-tolerant configuration with an active and standby Cisco PGW 2200 Softswitch. Note If you select Active/Standby, you must provide a peer IP address.

Table 4-5 MGC Environment Configuration Tool Startup Parameters (continued)

Field	Usage
Call Screening	Indicates whether call screening is enabled or disabled on the Cisco PGW 2200 Softswitch. This setting is optional.
CLLI Code	The CLI code identifying the site where the Cisco PGW 2200 Softswitch is located. This setting is optional.
Local IP Address 1	The primary IP address of the Cisco PGW 2200 Softswitch.
Peer IP Address 1	The IP address of the peer Cisco PGW 2200 Softswitch. A peer IP address is required for a fault tolerant (Active/Standby) system.
Virtual IP Address 1	Additional virtual IP address for the Cisco PGW 2200 Softswitch. Virtual IP addresses can improve failover for SIP connections in the event of a hardware failure.
Virtual IP Address 2	Additional virtual IP address for the Cisco PGW 2200 Softswitch. Virtual IP addresses can improve failover for SIP connections in the event of a hardware failure.
Virtual IP Addr1 for Improved SIP Failover Support	Setting 0.0.0.0 to both will disable the improved SIP failover support. Configuring only one will cause the switchover, if the physical interface where it present fails. Must be from *.IP_Addr1 subnet.
Virtual IP Addr2 for Improved SIP Failover Support	Setting 0.0.0.0 to both will disable the improved SIP failover support. Configuring only one will cause the switchover, if the physical interface where it present fails. Must be from *.IP_Addr2 subnet.

Step 3 Click the **Commit** button after you have finished setting the parameters.

**Note**

The required parameters are the MGC type and its operating mode. There are no default parameters defined when you bring up the XECfg program.

The Cisco PGW 2200 Softswitch performs the following actions after you commit the new parameters:

- The XECfg program backs up the current XECfgParm.dat file into the XECfgParm.dat.xyz file, where xyz represents the file version number. The version numbers range from 0 to 19.
- If the operating mode is stand-alone, the Cisco PGW 2200 Softswitch updates the XECfgParm.dat file with new parameters.
- If the operating mode is fault-tolerant, the Cisco PGW 2200 Softswitch updates the XECfgParm.dat file and generates the XECfgParm.data.slave file based on the XECfgParm.dat file.

**Note**

There is no backup for the XECfgParm.dat.slave file.

- The Cisco PGW 2200 Softswitch comments out old parameters and inserts the new parameters. The Cisco PGW 2200 Softswitch inserts a history line to note updated parameters.
- The Cisco PGW 2200 Softswitch moves required parameters to the top of the file for convenience.

**Note**

You can use the comment line to record the file history.

Step 4 Click **Exit** to exit the application.

If you set the Operational Mode to Active/Standby, the XECfg program displays a prompt that allows you to transfer the XECfgParm.dat.slave file to a remote machine when you exit the application. To transfer the file to a remote machine, enter the FTP password. Otherwise, exit the application.

Configuring Groups and Users

You must set up groups and users for the Cisco PGW 2200 Softswitch software on each host server. A user must be a member of the “mgcgrp” group to use certain Cisco PGW 2200 Softswitch software functions, such as Man-Machine Language (MML). (MML is an interface that enables you to communicate with the Cisco PGW 2200 Softswitch. Users with full MML privileges have monitor and control access; users with minimal MML privileges have only monitor access. For more information on MML, see the *Cisco PGW 2200 Softswitch Release 9.8 Provisioning Guide* and the *Cisco PGW 2200 Softswitch Release 9 MML Command Reference*.)

Verifying the mgcgrp Group

To verify the mgcgrp group, complete the following steps:

-
- Step 1** Log in to the Cisco PGW 2200 Softswitch host as root.
 - Step 2** Change to the /etc directory.
 - Step 3** Edit the group file to verify the entry for the mgcgrp group. The file should contain the following line:
mgcgrp : :20000 :
 - Step 4** Save and close the group file.
 - Step 5** Edit the passwd file to verify the entry for the mgcusr user. The file should contain the following line:
mgcusr :x:20000:20000:::/opt/CiscoMGC/local:/bin/csh
- If the file does not contain the line, add it.
- Step 6** Save and close the password file.
-

This completes the procedure for verifying the mgcgrp group.

Adding a User with Full MML Privileges

To add a user with full MML privileges, complete the following steps.



Caution

If your user's home directory differs from /opt/CiscoMGC/local, you must perform [Step 6](#) through [Step 7](#) before using MML.

-
- Step 1** Log in to the Cisco PGW 2200 Softswitch host as root.
 - Step 2** Enter the following command:

```
# useradd -u UID -g mgcgrp -d /opt/CiscoMGC/local -s /bin/csh -m username
```

UID is a user ID that is an integer from 0 through 2147483647 (excluding the numbers 0, 1, 2, 3, 4, 5, 9, 37, 71, 60001, 60002, and 65534, because they are used by the operating system).

Step 3 Add the new username to the *mgcgrp* group in the group file:

```
mgcgrp::20000:username
```



Note The group file is a comma-separated list of user names. If you add more than one user, use commas (with no spaces) to separate one name in the list from another.

Step 4 Enter the following command and press **Enter**:

```
# passwd username
```

Step 5 Type the user's *password* and press **Enter** twice when prompted.

Step 6 Log in to the Cisco PGW 2200 Softswitch as the new user.

Step 7 Enter the following command and press **Enter**:

```
% mml
```

The MML interface launches. To exit MML, type **quit** and press **Enter**.

This completes the procedure for adding a user with full MML privileges.

Adding a User with Minimal MML Privileges

To add a user with full MML privileges, complete the following steps.

Step 1 Log in to the Cisco PGW 2200 Softswitch host as root.

Step 2 Add a group with minimal MML privileges using the following command:

```
# groupadd minmml
```

Step 3 Prepare the *.cshrc* file for the group with minimal MML privileges using the following commands:

```
# mkdir /opt/CiscoMGC/local/minmml
# cp /opt/CiscoMGC/local/.cshrc /opt/CiscoMGC/local/minmml/.cshrc
# chgrp minmml /opt/CiscoMGC/local/minmml/.cshrc
```

Step 4 Add a user to the group with minimal MML privileges using the following command:

```
# useradd -g minmml -d /opt/CiscoMGC/local/minmml -s /bin/csh -m username
```

Step 5 Change the password for the newly added user using the following command.

```
# passwd username
```

Step 6 Type the user's *password* and press **Enter** twice when prompted.

Step 7 Log in to the Cisco PGW 2200 Softswitch as the new user.

Step 8 Enter the following command and press **Enter** to verify the new user's access privileges:

```
% mml
```

Text similar to the following is displayed:

```
Copyright ? 1998-2002, Cisco Systems, Inc.
```

```
User has minimal access privileges
sh-passat mml>
```

To exit MML, type **quit** and press **Enter**.

This completes the procedure for adding a user with minimal MML privileges.

The group and user configuration is now complete. Continue to the [“Configuring SNMP Support Resources” section on page 4-14](#). If you have questions or need assistance, see the [“Obtaining Documentation and Submitting a Service Request” section on page x](#).

Configuring SNMP Support Resources

The Cisco PGW 2200 Softswitch software includes a Simple Network Management Protocol (SNMP) agent subsystem that provides an alarm management interface on the Cisco PGW 2200 Softswitch. It uses SNMP to report events, or traps (such as alarms), to your SNMP Manager and to provide access to the Cisco PGW 2200 Softswitch Management Information Base (MIB).



Note

SNMP MIB measurements are only valid on the active node. They are not replicated on the standby node.

The SNMP agent subsystem reports the following event categories to your SNMP Manager:

1. Communications
2. Quality of Service
3. Processing
4. Equipment
5. Environment

In a fault tolerant configuration, the SNMP agent subsystem runs on both the active and standby machines.



Note

If your system is running Cisco PGW 2200 Softswitch software Release 9.3(2) or later, go to the [“Migrating the SNMP Configuration to a More Secure Environment \(for Cisco PGW 2200 Softswitch Release 9.3\(2\) or Later\)” section on page 4-15](#) for SNMP configuration procedures.



Note

For a sample snmpd.cnf file, see the [“Sample Configured snmpd.cnf File” section on page D-13](#).



Note

Use the config-snmpp utility to configure SNMP community names and trap destinations.

**Note**

SNMP managers such as the Cisco Media Gateway Controller Node Manager (Cisco MNM) or HP OpenView can be used to receive traps.

**Note**

The **config-snmp** utility is case-sensitive. It will accept “name1” and “NAME1” as two different entries.

Migrating the SNMP Configuration to a More Secure Environment (for Cisco PGW 2200 Softswitch Release 9.3(2) or Later)

If your system is running Cisco PGW 2200 Softswitch software version 9.3(2) or later, Cisco recommends that you migrate the SNMP configuration to a more secure environment by running the **config-snmp** utility. Use the **config-snmp** utility to perform the following:

- Modify the **snmpd.cnf** file to automatically migrate old configuration files to a secure environment.
- Facilitate the addition or deletion of the community string and trap destination.

**Note**

There is no limit to the number of community strings that can be added to the configuration.

**Note**

The **config-snmp** script only allows you to add or delete an entry to your **snmpd.cnf** file.

Basic Tasks

The following is an overview of the major tasks you must perform to get the SNMP security provided by the **config-snmp** utility:

1. Run **config-snmp** utility. See the [“Running the config-snmp Utility”](#) section on page 4-16.
2. Add a new `snmpCommunityEntry`. See the [“Adding an SNMP Community Entry”](#) section on page 4-18
3. Make sure that the new `snmpCommunityEntry` string is recognized and can communicate with your Cisco PGW 2200 Softswitch hosts. See the [“Activating the New Settings”](#) section on page 4-24.
4. Delete the old entry that you were using. See the [“Deleting an SNMP COMMUNITY”](#) section on page 4-20.

Before You Run the config-snmp Utility

**Note**

If you have completed a first-time installation of the Cisco PGW 2200 Softswitch software with Release 9.8 and its associated patches, copy the `snmpd.cnf.tmpl` to `snmpd.cnf` before you run the `config-snmp` utility. Users who have upgraded to Release 9.8 from a previous release do not have to perform this procedure. To copy the `snmpd.cnf.tmpl` to the `snmpd.cnf`, perform the following steps:

1. Log in as root and enter the following commands:

```
cd /opt/CiscoMGC/snmp
cp snmpd.cnf.tmpl snmpd.cnf
```

2. Enter the following commands to restart the snmp daemon:

```
ps -ef |grep snmpdm
```

The system will display the process ID for the snmp daemon. Restart the daemon using the following command:

```
kill -9 snmpdm_pid
```

Where *snmpdm_pid* is the process ID for the snmp daemon.

Note that the first instance of ReadAndNotifyToAll in the snmpCommunityEntry will be the only CommunityName used in the Trap.

For example, if your **snmpd.cnf** file has the following snmpCommunityEntry, you will find only the CommunityName of Iron1 in the Trap.

```
#Entry type: snmpCommunityEntry
#Format: snmpCommunityIndex (text)
#       snmpCommunityName (text)
#       snmpCommunitySecurityName (text)
#       snmpCommunityContextEngineID (octetString)
#       snmpCommunityContextName (text)
#       snmpCommunityTransportTag (text)
#       snmpCommunityStorageType (nonVolatile, permanent, readOnly)
snmpCommunityEntry Iron1 ron1 ReadAndNotifyToAll localSnmpID - - nonVolatile
snmpCommunityEntry Iron2 ron2 ReadWriteAll localSnmpID - - nonVolatile
snmpCommunityEntry Iron3 ron3 ReadAndNotifyToAll localSnmpID - - nonVolatile
snmpCommunityEntry admin WbNAGZ54 PGWInternalSignal localSnmpID - localAccess \
nonVolatile
snmpCommunityEntry readonly public ReadAndNotifyToAll localSnmpID - - \
nonVolatile
```

Running the config-snmp Utility

Perform the following steps to run the **config-snmp** utility:

- Step 1** Make sure your system has the latest Cisco PGW 2200 Softswitch patches on both Host A and Host B. See the *Release Notes for Cisco PGW 2200 Softswitch Release 9.8(1)* for detailed information on software patches.
- Step 2** On Host A, log in as **root** user.
- Step 3** Check whether the **snmpdm** or **critagt** process is running.



Note If **snmpdm** or **critagt** are not running, call Cisco TAC or contact your Field Engineer for assistance.

Enter one of the following commands and press **Enter**:

- a. To check **snmpdm**:

```
# ps -ef |grep snmpdm
```

If the **snmpdm** process is running, text similar to the following is displayed:

```
root 12098 27888 0 Jun 16 ?
0:00 /opt/CiscoMGC/snmp/snmpdm -tcplocal -d
```


- b. To check **critagt**:

```
# ps -ef |grep critagt
```

If the **critagt** process is running, text similar to the following is displayed:

```
root 27888      1  0   May 19 ?
0:15 /opt/CiscoMGC/snmp/critagt -d
```

- Step 4** To start the **config-snmp** utility, enter the following commands and press **Enter**:

```
# cd /opt/CiscoMGC/local
# config-snmp
```

The following screen is displayed:

```
Migrating snmpd.cnf into a more secure setting...
```

```
===== SNMPD Configuration Main Menu =====
```

1. View Configuration Entries
2. Add an SNMP Community
3. Delete an SNMP Community
4. Add a Trap Destination
5. Delete a Trap Destination
6. Activate the New Settings

Enter a selection (1 through 6) or 'q' to quit:

- Step 5** To view the configuration entries, enter **1** and press **Enter**.

The Entries Menu is displayed and you are prompted to make a selection:

```
===== Entries Menu =====
```

1. sysDescr
2. sysObjectID
3. sysLocation
4. sysContact
5. sysName
6. snmpEnableAuthenTraps
7. MAX_THREADS
8. MAX_PDU_TIME
9. MAX_OUTPUT_WAITING
10. MAX_SUBAGENTS
11. subagent
12. snmpCommunityEntry
13. snmpEngineBoots
14. snmpEngineID
15. SNMP_ENGINE_ID_SRC
16. usmUserEntry
17. vacmSecurityToGroupEntry
18. vacmAccessEntry
19. vacmViewTreeFamilyEntry
20. snmpNotifyEntry
21. snmpTargetAddrEntry
22. snmpTargetParamsEntry
23. snmpNotifyFilterProfileEntry
24. snmpNotifyFilterEntry
25. httpUserNameEntry

Enter a selection (1 through 25) or 'q' to quit to Main Menu:

- Step 6** Enter your selection number (1 through 25) to view your configuration entries.

Adding an SNMP Community Entry

Continuing from [Step 6](#), above (of the section [Running the config-snmp Utility](#)):

Step 1 Enter **12** to select **snmpCommunityEntry** and view the entries:

Text similar to the following and the SNMPD Configuration Main Menu are displayed.

```
#Entry type: snmpCommunityEntry
#Format: snmpCommunityIndex (text)
#       snmpCommunityName (text)
#       snmpCommunitySecurityName (text)
#       snmpCommunityContextEngineID (octetString)
#       snmpCommunityContextName (text)
#       snmpCommunityTransportTag (text)
#       snmpCommunityStorageType (nonVolatile, permanent, readOnly)
snmpCommunityEntry IT555 T555 ReadWriteAll localSnmpID - - nonVolatile
snmpCommunityEntry Ijammy jammy ReadAndNotifyToAll localSnmpID - - nonVolatile
snmpCommunityEntry admin za8RQzBg PGWInternalSignal localSnmpID - localAccess
nonVolatile
```

```
===== SNMPD Configuration Main Menu =====
```

1. View Configuration Entries
2. Add an SNMP Community
3. Delete an SNMP Community
4. Add a Trap Destination
5. Delete a Trap Destination
6. Activate the New Settings

Enter a selection (1 through 6) or 'q' to quit:

Step 2 You are prompted to make a selection. Enter **2** to add an SNMP Community.

The Add CommunityString Menu is displayed and you are asked if you would like to proceed with adding a community string:

```
===== Add CommunityString Menu =====
```

```
SnmpCommunityName CommunitySecurityName
```

```
cisco cisco
public ReadAndNotifyToAll
```

```
-- Where:
```

```
CommunitySecurityName SecurityModel Read Write Notification
```

```
ReadOnly snmpv1 ApplicationsView - ApplicationsView
ReadOnly snmpv2c ApplicationsView - ApplicationsView
ReadOnly usm ApplicationsView - ApplicationsView
NotifyOnly snmpv1 - - ApplicationsView
NotifyOnly snmpv2c - - ApplicationsView
NotifyOnly usm - - ApplicationsView
ReadWriteAll snmpv1 ApplicationsView ApplicationsView -
ReadWriteAll snmpv2c ApplicationsView ApplicationsView -
ReadWriteAll usm ApplicationsView ApplicationsView -
ReadWriteNotify snmpv1 ApplicationsView ApplicationsView ApplicationsView
ReadWriteNotify snmpv2c ApplicationsView ApplicationsView ApplicationsView
ReadWriteNotify usm ApplicationsView ApplicationsView ApplicationsView
ReadAndNotifyToAll snmpv1 ApplicationsView - ApplicationsView
ReadAndNotifyToAll snmpv2c ApplicationsView - ApplicationsView
```

```
ReadAndNotifyToAll usm ApplicationsView - ApplicationsView
CiscoInternalSignal snmpv1 All All All
CiscoInternalSignal snmpv2c All All All
CiscoInternalSignal usm All All All
```

Would you like to proceed with the Add [n]/[y]?

- Step 3** Enter **y** to proceed (if you enter **n** to cancel the addition, you return to the SNMPD Configuration Main Menu).

The following text is displayed, prompting you to enter an snmpCommunityName.

Enter snmpCommunityName:



Note The snmpCommunityName should be at least three characters in length. The snmpCommunityName can contain numeric characters, but should begin with an alpha character.

- Step 4** Enter an snmpCommunityName (the following name is an example):

```
comname1
```

Text similar to the following is displayed:

```
Enter CommunitySecurityName (ReadAndNotifyToAll or ReadWriteAll):
```

- Step 5** Enter a community security name (the following security name entry is an example):

```
ReadAndNotifyToAll
```



Note The CommunitySecurityName (ReadAndNotifyToAll or ReadWriteAll) is case sensitive.

Text similar to the following text is displayed:

```
snmpCommunityName: comname1 is about to be added. Are you sure that you want to add this
snmpCommunity Name [y]/[n]?
```

- Step 6** Enter **y** to add the **snmpCommunityName** (if you enter **n** to cancel the addition, you return to the SNMPD Configuration Main Menu):

Text similar to the following is displayed:

```
Adding snmpCommunity:
snmpCommunityEntry Icomname1 comname1 ReadAndNotifyToAll localSnmpID - - nonVolatile
```

```
===== SNMPD Configuration Main Menu =====
```

1. View Configuration Entries
2. Add an SNMP Community
3. Delete an SNMP Community
4. Add a Trap Destination
5. Delete a Trap Destination
6. Activate the New Settings

Enter a selection (1 through 6) or 'q' to quit:

- Step 7** Enter a selection number, 1 through 6.

For steps on how to execute the selections from the SNMPD Configuration Main Menu, see the following sections:

- [Adding an SNMP Community Entry, page 4-18](#)
- [Deleting an SNMP COMMUNITY, page 4-20](#)
- [Adding a Trap Destination, page 4-21](#)
- [Deleting a Trap Destination, page 4-23](#)
- [Activating the New Settings, page 4-24](#)
- [Verifying the SNMP Configuration Migration, page 4-25](#)



Note To complete the migration of the SNMP configuration to a more secure environment, see the [“Activating the New Settings” section on page 4-24](#).

The procedure for adding an SNMP Community Entry is now complete.

From the SNMPD Configuration Main Menu, choose option 6 (Activate the New Settings) to commit the changes, or select other options (1 through 5) to add or delete a community name or trap.

Deleting an SNMP COMMUNITY

From the SNMPD Configuration Main Menu:

- Step 1** If you select **3** (Delete an SNMP Community) from the SNMPD Configuration Main Menu, the delete CommunityString Menu is displayed:



Note The SNMP Community Names listed in the following display are examples.

```

===== Delete CommunityString Menu =====

SnmpCommunityName      CommunitySecurityName

comname1                ReadAndNotifyToAll
T555                    ReadWriteAll
jammy                   ReadAndNotifyToAll

-- Where:

CommunitySecurityName  SecurityModel  Read           Write           Notification

ReadWriteAll          snmpv1         AllMibObjects AllMibObjects  -
ReadWriteAll          snmpv2c       AllMibObjects AllMibObjects  -
ReadAndNotifyToAll    snmpv1         AllMibObjects -               AllMibObjects
ReadAndNotifyToAll    snmpv2c       AllMibObjects -               AllMibObjects

```

Would you like to proceed with the Delete [n]/[y]?

- Step 2** Enter **y** to delete SNMP Community (if you enter **n** to cancel the deletion, you return to the SNMPD Configuration Main Menu):

Text similar to the following is displayed:

Enter snmpCommunityName:

- Step 3** Enter an SnmpCommunityName. Select an SnmpCommunityName from the list that is displayed in [Step 1](#). The SnmpCommunityName **T555**, is an example:

T555

Text similar to the following is displayed:

```
snmpCommunityName: T555 is about to be deleted. Are you sure that you want to delete this
snmpCommunity Name [y]/[n]?
```

- Step 4** Enter **y** to confirm the deletion (if you enter **n** to cancel the deletion, you return to the SNMPD Configuration Main Menu).

Text similar to the following is displayed and you are returned to the SNMPD Configuration Main Menu:

```
Deleting snmpCommunity= T555
```

```
===== SNMPD Configuration Main Menu =====
```

```
1. View Configuration Entries
2. Add an SNMP Community
3. Delete an SNMP Community
4. Add a Trap Destination
5. Delete a Trap Destination
6. Activate the New Settings
```

Enter a selection (1 through 6) or 'q' to quit:

- Step 5** Enter your selection. For detailed procedures for your selection, refer to the following list:

- [Adding an SNMP Community Entry, page 4-18](#)
- [Deleting an SNMP COMMUNITY, page 4-20](#)
- [Adding a Trap Destination, page 4-21](#)
- [Deleting a Trap Destination, page 4-23](#)
- [Activating the New Settings, page 4-24](#)
- [Verifying the SNMP Configuration Migration, page 4-25](#)

The procedure for deleting an SNMP Community Entry is now complete. Proceed to the selection you entered in the SNMPD Configuration Main Menu.

Adding a Trap Destination

From the SNMPD Configuration Main Menu:

- Step 1** Select option **4** (Add a Trap Destination) from the SNMPD Configuration Main Menu and press **Enter** to add a Trap Destination.

The Add Trap Menu is displayed:



Note The IP Address (Target Address) listed below is an example of existing Trap entries.

```
===== Add Trap Menu =====
```

```
1. TargetAddress: 6.6.6.6:0 , TargetAddrParams: vlExampleParams , IP Mask:
255.255.255.255:0
```

```
Would you like to proceed with the Add [n]/[y]?
```

Step 2 Enter **y** to add a Trap Destination (if you enter **n** to cancel the addition, you return to the SNMPD Configuration Main Menu).

Text similar to the following is displayed:

```
Enter IP Address (x.x.x.x):
```

Step 3 Enter the IP address listed in [Step 1](#):

```
7.7.7.7
```

Text similar to the following is displayed:

```
Enter Trap Type (v1 or v2c):
```

Step 4 Enter the Trap Type based on your SNMP manager. The following entry is an example:

```
v1
```

Text similar to the following is displayed:

```
'snmpTargetAddrEntry 483 snmpUDPDomain 7.7.7.7:0 100 3 TrapSink vlExampleParams
nonVolatile 255.255.255.255:0 2048
' is about to be added. Are you sure that you want to add this Trap Entry [n]/[y]?
```

Step 5 Enter **y** to add a Trap Destination (if you enter **n** to cancel the addition, you return to the SNMPD Configuration Main Menu).

Text confirming the addition of the Trap Destination is displayed, followed by the SNMPD Configuration Main Menu:

```
Adding Trap: snmpTargetAddrEntry 483 snmpUDPDomain 7.7.7.7:0 100 3 TrapSink
vlExampleParams nonVolatile 255.255.255.255:0 2048
```

```
===== SNMPD Configuration Main Menu =====
```

```
1. View Configuration Entries
2. Add an SNMP Community
3. Delete an SNMP Community
4. Add a Trap Destination
5. Delete a Trap Destination
6. Activate the New Settings
```

```
Enter a selection (1 through 6) or 'q' to quit:
```

```
ENTER YOUR SELECTION.
```

Step 6 Enter your selection. For detailed procedures for your selection, go to the section listed below:

- [Adding an SNMP Community Entry, page 4-18](#)
- [Deleting an SNMP COMMUNITY, page 4-20](#)
- [Adding a Trap Destination, page 4-21](#)
- [Deleting a Trap Destination, page 4-23](#)
- [Activating the New Settings, page 4-24](#)

- [Verifying the SNMP Configuration Migration, page 4-25](#)

The procedure for adding a Trap Destination is now complete. Proceed to the selection you entered in the SNMPD Configuration Main Menu.

Deleting a Trap Destination

From the SNMPD Configuration Main Menu:

Step 1 To delete a Trap Destination, enter **5** (Delete a Trap Destination):

Text similar to the following is displayed:

```
===== Delete Trap Menu =====

1. TargetAddress: 7.7.7.7:0 , TargetAddrParams: v1ExampleParams ,
   IP Mask: 255.255.255.255:0
2. TargetAddress: 6.6.6.6:0 , TargetAddrParams: v1ExampleParams ,
   IP Mask: 255.255.255.255:0
```

Would you like to proceed with the Delete [n]/[y]?

Step 2 Enter **y** to delete a Trap Destination (if you enter **n** to cancel the deletion, you return to the SNMPD Configuration Main Menu):

Text similar to the following is displayed:

Enter a selection (1 through 2):



Note The Target Addresses (1 through 2) shown above are examples only.

Step 3 Enter **1** to select the TargetAddress to be deleted:

Text similar to the following is displayed:

```
Trap is about to be deleted. Are you sure that you want to delete this Trap Entry
[n]/[y]?
```

Step 4 Enter **y** to confirm the deletion (if you enter **n** to cancel the deletion, you return to the SNMPD Configuration Main Menu).

Text confirming the deleted Trap Entry is displayed and you are returned to the SNMPD Configuration Main Menu. Note that **483** (below) is an internal Trap snmpTargetAddrName.

```
Deleting Trap snmpTargetAddrName = 483
```

```
===== SNMPD Configuration Main Menu =====
```

```
1. View Configuration Entries
2. Add an SNMP Community
3. Delete an SNMP Community
4. Add a Trap Destination
5. Delete a Trap Destination
6. Activate the New Settings
```

Enter a selection (1 through 6) or 'q' to quit:

Step 5 Enter your selection. For detailed procedures for your selection, refer to the following list:

- [Adding an SNMP Community Entry, page 4-18](#)
- [Deleting an SNMP COMMUNITY, page 4-20](#)
- [Adding a Trap Destination, page 4-21](#)
- [Deleting a Trap Destination, page 4-23](#)
- [Activating the New Settings, page 4-24](#)
- [Verifying the SNMP Configuration Migration, page 4-25](#)

The procedures for deleting a Trap Destination is now complete. Proceed to the selection you entered in the SNMPD Configuration Main Menu.

Activating the New Settings

From the SNMPD Configuration Main Menu:

Step 1 Enter **6** to activate the new settings:

6

Text similar to the following is displayed:

Backing up the current snmpd.cnf to snmpd.cnf.backup.

snmpd.cnf.backup already exists. Do you want to overwrite the file [y]/[n]?



Note If you choose **n**, your backup file will not be updated.

Step 2 Enter **y** to activate the new settings.

y

Are you sure you would like to Activate the New Settings [y]/[n]?



Note If you choose **y**, your SNMPD.dat file will be updated and you will be exited from the utility.

If you choose **n**, your SNMPD.dat file will not be updated and you will be exited from the utility.

Step 3 Enter **y** to activate the new settings (if you enter **n** to cancel the activation, you return to the SNMPD Configuration Main Menu).

Text similar to the following is displayed:

snmpd.cnf file has been updated.

The procedure for activating the new settings is now complete and you are exited from the config-snmpp utility. Proceed to the following section, [“Verifying the SNMP Configuration Migration”](#).

Verifying the SNMP Configuration Migration

Perform the following steps to verify that your changes were applied by running the **config-snmp** utility:

Step 1 To start the **config-snmp** utility, type the following command and press **Enter**:

```
# config-snmp
```

Text similar to the following is displayed:

```
Migrating snmpd.cnf into a more secure setting...
```

When the SNMPD Configuration Main Menu is displayed, you are prompted to make a selection:

```
===== SNMPD Configuration Main Menu =====
```

1. View Configuration Entries
2. Add an SNMP Community
3. Delete an SNMP Community
4. Add a Trap Destination
5. Delete a Trap Destination
6. Activate the New Settings

```
Enter a selection (1 through 6) or 'q' to quit: 1
```

Step 2 Enter **1** to view the configuration entries.

The Entries Menu is displayed and you are prompted to make a selection:

```
===== Entries Menu =====
```

1. sysDescr
2. sysObjectID
3. sysLocation
4. sysContact
5. sysName
6. snmpEnableAuthenTraps
7. MAX_THREADS
8. MAX_PDU_TIME
9. MAX_OUTPUT_WAITING
10. MAX_SUBAGENTS
11. subagent
12. snmpCommunityEntry
13. communityEntry
14. snmpEngineBoots
15. usmUserEntry
16. vacmAccessEntry
17. vacmSecurityToGroupEntry
18. vacmViewTreeFamilyEntry
19. snmpNotifyEntry
20. snmpTargetAddrEntry
21. snmpTargetParamsEntry
22. snmpNotifyFilterProfileEntry
23. snmpNotifyFilterEntry
24. httpUserNameEntry

```
Enter a selection (1 through 24) or 'q' to quit to Main Menu:
```

- a. If you select 12 from the SNMPD Configuration Main Menu, the `snmpCommunityEntry` is displayed, showing the changes you made:



Note The following entries are examples only.

```
#Entry type: snmpCommunityEntry
#Format: snmpCommunityIndex (text)
#       snmpCommunityName (text)
#       snmpCommunitySecurityName (text)
#       snmpCommunityContextEngineID (octetString)
#       snmpCommunityContextName (text)
#       snmpCommunityTransportTag (text)
#       snmpCommunityStorageType (nonVolatile, permanent, readOnly)
snmpCommunityEntry Icomname1 comname1 ReadWriteAll localSnmpID - - nonVolatile
snmpCommunityEntry Ijammy jammy ReadAndNotifyToAll localSnmpID - - nonVolatile
snmpCommunityEntry admin VD6FZbov PGWInternalSignal localSnmpID - localAccess
nonVolatile
```

- b. If you select 20 from the SNMPD Configuration Main Menu, the Trap Destination information is displayed, showing the changes you made:



Note The following entries are examples only.

```
#Entry type: snmpTargetAddrEntry
#Format: snmpTargetAddrName (text)
#       snmpTargetAddrTDomain (snmpUDPDomain, snmpIPXDomain, etc.)
#       snmpTargetAddrTAddress (transport address, i.e. 192.147.142.254:0)
#       snmpTargetAddrTimeout (integer)
#       snmpTargetAddrRetryCount (integer)
#       snmpTargetAddrTagList (text)
#       snmpTargetAddrParams (text)
#       snmpTargetAddrStorageType (nonVolatile, permanent, readOnly)
#       snmpTargetAddrTMask (transport mask, i.e. 255.255.255.255:0)
#       snmpTargetAddrMMS (integer)
snmpTargetAddrEntry 531 snmpUDPDomain 6.6.6.6:0 100 3 TrapSink v1ExampleParams
nonVolatile 255.255.255.255:0 2048
snmpTargetAddrEntry local snmpUDPDomain 127.0.0.1:0 100 3 localAccess -
nonVolatile 255.255.255.255:0 2048
```

The SNMP support resource configuration is now complete. Continue to the [“Configuring the Execution Environment” section on page 4-26](#) to configure the execution environment. If you have questions or need assistance, see the [“Obtaining Documentation and Submitting a Service Request” section on page x](#).

Configuring the Execution Environment

This section provides instructions for configuring the Cisco PGW 2200 Softswitch software execution environment and contains the following topics:

- [Configuring Basic System Information, page 4-29](#)
- [Specifying IP Addresses, page 4-31](#)
- [Configuring Engine Parameters, page 4-37](#)
- [Enabling Call Screening, page 4-39](#)
- [Configuring Call Detail Record File Output, page 4-40](#)
- [Configuring the Clearing Location and Default Location Parameters, page 4-42](#)
- [Configuring Switchover, page 4-45](#)

- [Initializing the Provisioning Object Manager, page 4-47](#)

The configuration data file, or XECfgParm.dat file (located in /opt/CiscoMGC/etc/XECfgParm.dat), lists all the components in the Cisco PGW 2200 Softswitch software and defines how it operates. You must edit the execution environment parameters in the XECfgParm.dat file to initialize and configure the Cisco PGW 2200 Softswitch software application. For a complete list of the parameters found in the XECfgParm.dat file and how they are used by the Cisco PGW 2200 Softswitch, see [Appendix A, “XECfgParm.dat File Parameters.”](#)

For samples of configured XECfgParm.dat files, see the [“Sample Configured XECfgParm.dat Files for Cisco PGW 2200 Softswitch Release 9.8\(1\)”](#) section on page D-16.



Caution

To ensure that your system works as intended, **edit only the XECfgParm.dat file parameters which are listed below**, and remember that all parameters are case-sensitive.

Do not modify the **processes.dat** file. This XECfgParm.dat file should remain unmodified, as delivered with the Cisco PGW 2200 Softswitch software. If this file is modified, procM may core dump when you start the Cisco PGW 2200 Softswitch software.

Changing XECfgParm.dat File Parameters

For a complete list of the parameters found in the XECfgParm.dat file and how they are used by the Cisco PGW 2200 Softswitch, see [Appendix A, “XECfgParm.dat File Parameters.”](#)

If you have a fault tolerant system with two Cisco PGW 2200 Softswitch hosts, the XECfgParm.dat files are different for each host. For examples of these XECfgParm.dat files, see the [“Sample Configured XECfgParm.dat Files for Cisco PGW 2200 Softswitch Release 9.8\(1\)”](#) section on page D-16.

To change the XECfgParm.dat file parameters, perform the following steps:

-
- Step 1** Log in as root and go to the # prompt.
- Step 2** If the Cisco PGW 2200 Softswitch software is running, enter the following command:
- ```
/etc/init.d/CiscoMGC stop
```
- Wait until the system returns the following response:
- ```
Signalling procM to shut down
...shutdown complete
```
- Step 3** Change to the /opt/CiscoMGC/etc directory, which contains the XECfgParm.dat file used by your system.
- Step 4** Open the XECfgParm.dat file with any text editor, such as vi.
- Step 5** Save your changes and close the editor.
- Step 6** Restart the Cisco PGW 2200 Softswitch software by entering the following command:
- ```
/etc/init.d/CiscoMGC start
```



**Note** Do not restart the software yet if you need to configure SCP queries or initialize the call screening database. Complete the instructions in the appropriate sections of this chapter before restarting the software.

Continue to “[Changing XECfgParm.dat File Parameters in a Running Fault Tolerant System](#)” to change parameters without call interruption. Continue to the “[Configuring SCP Queries](#)” section on page 4-48 to configure Service Control Point (SCP) queries using transaction capabilities application part (TCAP). If you have questions or need assistance, see the “[Obtaining Documentation and Submitting a Service Request](#)” section on page x.

## Changing XECfgParm.dat File Parameters in a Running Fault Tolerant System

To change parameters in a running fault tolerant system without call interruption, perform the following steps:

- 
- Step 1** Log in to the active host (Host X) and make your changes. See “[Changing XECfgParm.dat File Parameters](#)” section on page 4-27 for more specific instructions.
- Step 2** Log in to the standby host (Host Y) as root and stop the Cisco PGW 2200 Softswitch software by entering the following command:
- ```
# /etc/init.d/CiscoMGC stop
```
- Step 3** Restart the Cisco PGW 2200 Softswitch software on the standby box (Host Y) by entering the following command:
- ```
/etc/init.d/CiscoMGC start
```
- Step 4** Perform switchover on the active host (Host X). Log in to the active host (Host X) and stop the Cisco PGW 2200 Softswitch software by entering the following command:
- ```
# /etc/init.d/CiscoMGC stop
```

Stopping the software on Host X causes switchover to the standby, Host Y. Host Y becomes active and takes over call processing.



Tip If Host Y does not take over call processing after switchover, restart the software on Host X to take over the calls. Check the parameters you changed on Host Y and make sure you have the correct values.

- Step 5** Restart the Cisco PGW 2200 Softswitch software on the now standby host, Host X, by entering the following command:
- ```
/etc/init.d/CiscoMGC start
```
- Step 6** On Host Y, the currently active host, enter the following MML command to switch call processing from Host Y to the newly changed Host X. Host X becomes active:
- ```
mml> SW-OVER::CONFIRM
```

**Tip**

If Host X does not take over call processing after switchover, restart the software on Host Y to take over the calls. Check the parameters you changed on Host X and make sure you have the correct values.

Configuring Basic System Information

**Note**

For a complete list of the parameters found in the XECfgParm.dat file and how they are used by the Cisco Cisco PGW 2200 Softswitch, see [Appendix A, “XECfgParm.dat File Parameters.”](#)

To configure basic system information required for your system to function, modify the following parameters in the first section of the XECfgParm.dat file:

Parameter	Modification
*.desiredPlatformState	<p>To determine the desired platform state at initialization, enter one of the following values:</p> <ul style="list-style-type: none"> • master—If you have two (active and standby) Cisco PGW 2200 Softswitch hosts, and you are editing the file on the active host • slave—If you have two (active and standby) Cisco PGW 2200 Softswitch hosts, and you are editing the file on the standby host • standalone—If you have a simplex system <p>Note The value used is site specific. For example, use the values master and slave if you have two (active and standby) Cisco PGW 2200 Softswitch hosts. Enter standalone if you have a single-host system.</p>
*.numberOfThreads	<p>Prior to Release 9.4(1), the number of threads generated by multithreaded processes such as the engine and the log master, is specified by entering one of the following values:</p> <ul style="list-style-type: none"> • 0—Single CPU (default) • 1—Two CPUs • 2—Four CPUs <p>Note If you have a multi-CPU system, the engine.SysGeneratedCode parameter must be left as true (the default).</p> <p>For Release 9.4(1) and up, this parameter is set automatically when you specify a Cisco PGW 2200 Softswitch type in the engine.SysVirtualSwitch parameter. Any attempt to modify this parameter is overwritten.</p>

Parameter	Modification
*.ownTranspathId	<p>To identify the local Cisco PGW 2200 Softswitch host in a fault tolerant system, enter the same value that you used for *.transpathID.</p> <p>Note If you have two Cisco PGW 2200 Softswitch hosts in a fault tolerant system, enter this value in the *.peerTranspathID field in the XECfgParm.dat file on the second host server. If you have a simplex system, leave this value blank.</p>
*.peerTranspathId	<p>To identify the peer Cisco PGW 2200 Softswitch host in a fault tolerant system, enter any one- or two-digit integer. The IDs must be unique in an active and standby pair.</p> <p>Note If you have two Cisco PGW 2200 Softswitch hosts in a fault tolerant system, enter the same value that you used for *.transpathID in the XECfgParm.dat file of the second host server in this field. If you have a simplex system, leave it blank.</p>
*.sipModeSelectionControl	<p>Sets SIP processing mode on the Cisco PGW 2200 Softswitch.</p> <p>Values:</p> <ul style="list-style-type: none"> • 1 (B2BUA/optional mode)—SIP-to-SIP calls are processed in B2BUA mode. You can select proxy mode later using a dial plan (A/B analysis). • 2 (Fixed Proxy Mode)—SIP-to-SIP calls are processed in proxy mode only. <p>Default: 2</p> <p>Note In order to use H.248 Protocol—Phase 2 Feature on Release 9.8(1), you must set this parameter to 1.</p>
*.stPort	<p>Port number used between peer components or processes.</p> <p>Enter any unused port number (for example, 7000). If your configuration uses a Cisco SLT, enter the port number on the Cisco SLT.</p> <p>Note If you have two Cisco PGW 2200 Softswitch hosts in a failover configuration, enter a different number for this value in the XECfgParm.dat file on the secondary host (for example, 7001).</p> <p>Note On a new configuration, we recommend that this parameter be set to 0. This value allows the Cisco ITP-L port to be defined using the PEERPORT parameter of the SESSIONSET.</p> <p>Note SESSIONSET reads the port value that is defined. However, if an *.stPort value other than 0 is defined in XECfgParm.dat (for example, *.stPort=7001), the SESSIONSET value gets overridden by the value in XECfgParm.dat.</p>

Parameter	Modification
*.transpathId	<p>To identify the local Cisco PGW 2200 Softswitch host in a fault tolerant system, enter any one- or two-digit integer.</p> <p>Note If you have two Cisco PGW 2200 Softswitch hosts in a fault tolerant system, this number must be different in the XECfgParm.dat file for each host.</p>
engine.CustSpecificINAPHandling	<p>Controls INAP (Intelligent Network Application Protocol) behavior, including advertised application context.</p> <p>Values:</p> <ul style="list-style-type: none"> • tinap • finap • rinap • sinap <p>Default: Null</p> <p>To enable network transfer and DTMF transfer services, set this parameter to sinap. The following new CS2 application context is populated in the dialogue body of the INAP message:</p> <pre>itu-t(0) recommendation(0) q(17) q1228(1228) cs2(2) ac(3) id-ac-cs2-ssf-scfGenericAC(4) urn:oid:0.0.17.1228.2.3.4</pre>
engine.SysVirtualSwitch	<p>To indicate whether the Cisco PGW 2200 Softswitch host functions as a signaling controller or a virtual switch controller, enter one of the following values:</p> <ul style="list-style-type: none"> • 0—Signaling controller (nailed trunks, no auditing is initiated) • 1—Virtual switch controller (switched trunks) <p>Note During the startup of the Cisco PGW 2200 Softswitch software, this parameter is set automatically to tune the system for optimal performance.</p> <p>Note For Release 9.4(1) and up, the values of the parameters listed below are automatically set based on the Cisco PGW 2200 Softswitch type you select, to maximize performance for that configuration. Any attempt to change the values of these parameters is overwritten.</p> <pre>engine.SysMdlMemoryReduction engine.CALL_MEM_BLOCK_SIZE engine.CALL_MEM_CHUNK_SIZE *.CPUTimerInterval *.numberOfThreads</pre>

Specifying IP Addresses

To specify IP addresses, modify the following parameters in the first section of the XECfgParm.dat file:

**Note**

If there are two Ethernet interfaces defined on the Cisco PGW 2200 Softswitch, it is mandatory to have these on distinct subnets.

For example, consider the following configuration:



```
*.IP_AddrLocalA = 172.22.119.108
*.IP_AddrLocalB = 172.22.119.54
```

This is not a valid combination because they are on the same subnet. The following example illustrates a valid combination:

```
*.IP_AddrLocalA = 172.22.119.108
*.IP_AddrLocalB = 172.22.120.54
```

In this example, the subnet mask is 255.255.255.0 (or 255.255.255.128).

If the two Ethernet interfaces are on the same subnet, then one of them must be physically disconnected from the existing subnet and then connected to a different subnet. The new IP address must be appropriately configured on the system. Refer to the manual pages for the UNIX command **ifconfig** for more information.

Parameter	Modification
*.IP_AddrLocalA	<p>Enter the first local IP address; used for checkpointing and switchover heartbeats.</p> <p> Caution This address is the same value as *.IP_Addr1, and is the bge0 interface.</p> <p> Caution No other machine on the network should have *.IP_AddrLocalA set to 0.0.0.0.</p>
*.IP_AddrPeerA	<p>Enter the first corresponding peer IP address; used for checkpointing and switchover heartbeats.</p> <p>Note If you have two Cisco PGW 2200 Softswitch hosts in a fault tolerant configuration, this value is set to the IP address of the second host.</p>
*.IP_AddrLocalB	<p>Enter the second local IP address; used for checkpointing and switchover heartbeats. This is the address of the bge1 interface.</p> <p>Note If your configuration does not use a secondary Ethernet adapter, leave this address set to the default value, 0.0.0.0.</p>
*.IP_AddrPeerB	<p>Enter the second corresponding peer IP address; used for checkpointing and switchover heartbeats. This is the address of the bge1 interface on the second host.</p> <p>Note If your configuration does not use a secondary Ethernet adapter, leave this address set to the default value, 0.0.0.0.</p>

Parameter	Modification
*.IP_Addr1	Enter the IP address of the bge0 interface.
*.IP_Addr2	Enter the IP address of the bge1 interface (if configured).
*.IP_Addr3	Enter the IP address of the bge2 interface (if configured).
*.IP_Addr4	Enter the IP address of the bge3 interface (if configured).
*.Virtual_IP_Addr1	Enter a virtual IP addresses for the Cisco PGW 2200 Softswitch used for SIP Failover Support (optional).
*.Virtual_IP_Addr2	Enter a virtual IP addresses for the Cisco PGW 2200 Softswitch used for SIP Failover Support (optional).

Configuring Geographic Separation of Active and Standby Hosts

This subsection describes how to configure Cisco PGW 2200 Softswitch hosts that are geographically separated and positioned on different subnets, such as for a campus or WAN.

Table 4-6 presents limitations, implications, and caveats that pertain to remotely locating (physical separation) the Cisco PGW 2200 Softswitch:

Table 4-6 Geographic Separation Requirements

Condition	Requirement
Software release version	Cisco PGW 2200 software 9.3(2) or later (with associated operating system and hardware requirements).
Total end-to-end delay, one way	Delay is the length of time it takes to send a message from a source to a destination, such as from Cisco PGW 2200 to SLT, Cisco PGW2200 to GW, or Cisco PGW 2200 to Cisco PGW 2200. Must be less than 150 milliseconds.
Packet loss	Packet loss is defined as missing packets with a message. Must not exceed 1% (preferably, less than 0.5%). Note For packet loss rates below 0.5%, increase the RUDP receive window size (*. rudpWindowSz) to 64 for increased performance.
Bandwidth limitation	Directly related to end-to-end delay. There are no special requirements.
If improved SIP automatic switchover support is enabled...	Both the Cisco PGW 2200s should be part of the same IP subnet.

Table 4-6 Geographic Separation Requirements (continued)

Condition	Requirement
<p>*.AllISDNLinksFailCausesFailover added in Release 9.5(2)</p>	<p>Controls the severity level of the All ISDN IP Conn Fail alarm.</p> <p>Default: false</p> <p>Valid values: false (alarm severity is Major) and true (alarm severity is Critical).</p> <p>This property should be set to <i>true</i> if your Cisco MGC hosts are in separate geographic locations. You can also set this parameter to <i>true</i> if your system is not processing SS7 calls and you want your system to perform an automatic switchover should all of the ISDN IP connections fail.</p>
<p>*.AllLinksFailCausesFailover added in Release 9.4(1)</p>	<p>Controls the severity level of the following alarms:</p> <ul style="list-style-type: none"> • All C7IP Links Fail • All M3UA Assoc Fail • All SUA Assoc Fail <p>Default: false</p> <p>Valid values: false (alarm severity is Major) and true (alarm severity is Critical).</p> <p>This property should be set to <i>true</i> if your Cisco MGC hosts are in separate geographic locations. You can also set this parameter to <i>true</i> if your system is not processing SS7 calls and you want your system to perform an automatic switchover should all of the links fail.</p>
<p>Setting for XECfgParm.dat parameter replicator.reconnectInterval</p>	<p>This parameter defines the reconnect interval in number of seconds for the replicator during a switchover.</p> <p>Value: Any integer</p> <p>Default: 15 seconds</p> <p>Note Set this value to 0 for a standalone Cisco PGW.</p> <p>For geographically separated Cisco PGW pairs, the following replicator timer values are recommended:</p> <ul style="list-style-type: none"> • On one PGW, replicator.reconnectInterval = 15 seconds • On the other PGW, replicator.reconnectInterval = 20 seconds <p>If the timer settings are the same on both Cisco PGWs, the additional latency between the separated Cisco PGWs may cause a problem in which the replicator links are continually reconnecting and then immediately disconnecting. The timer change prevents this problem.</p>

**Note**

If the Active and Standby PGWs are located in the same subnet, there is no additional configuration required for Geographic Separation of Active and Standby Cisco MGC Hosts.

Specifying IP Addresses for Geographic Separation

To specify IP addresses, modify the XECfgParm.dat file parameters listed.

**Note**

If there are two Ethernet interfaces defined on the Cisco MGC, it is mandatory to have these on separate subnets.

For example, consider the following configuration:

```
*.ipAddrLocalA = 172.22.119.108  
*.ipAddrLocalB = 172.22.119.54
```

This is not a valid combination because they are on the same subnet. The following example illustrates a valid combination:

```
*.ipAddrLocalA = 172.22.119.108  
*.ipAddrLocalB = 172.22.120.54
```

In this example, the subnet mask is 255.255.255.0 (or 255.255.255.128).

When Two Ethernet Interfaces are on the Same Subnet

If two Ethernet interfaces are on the same subnet, then one of them must be physically disconnected from the existing subnet and then connected to a different subnet. The new IP address must be appropriately configured on the system. Refer to the manual pages for the UNIX command **ifconfig** for more information.

Specifying Next Hop Router IP Addresses for Geographic Separation of Active and Standby Cisco MGC Hosts

To specify next hop router IP addresses, modify the XECfgParm.dat file parameters listed in [Table 4-7 on page 4-36](#) and do the following procedures:

Step 1 Determine whether the Active and Standby hosts are in different subnets. Type the following command and press **Enter**:

```
ifconfig -a
```

If the Active and Standby Cisco PGWs are located in different subnets, go to [Step 2](#).

Example:

- Active IP address: 172.22.121.22 (IP_Addr1 in XECfgparm.dat)
- Standby IP address: 172.22.120.22 (IP_Addr1 in XECfgparm.dat)

For the above example, the following next hop address should be configured by editing the XECfgParm.dat parameter as follows:

In the Active PGW XECfgParm.dat parameter:

```
*.IP_NextHop1 = 172.22.121.1
```

In the Standby XECfgparm.dat parameter:

```
*.IP_NextHop1 = 172.22.120.1
```

- Step 2** Configure the next hop router IP address. Use an editor such as vi to configure the next hop router IP address by editing the ***.IP_NextHopx** in the XECfgParm.dat file.

**Note**

You can configure ***.IP_NextHopx** before starting the PGW while configuring the IP address in XECfgParm.dat.

**Note**

Make sure that the next hop router can be reached from both Active and Standby hosts.

XECfgParm.dat file parameters for Specifying IP and Next Hop Router IP Addresses

Table 4-7 XECfgParm.dat File Parameters (Specifying IP and Next Hop Router IP Addresses)



Parameter	Modification
*.ipAddrLocalA	<p>Enter the first local IP address; used for checkpointing and switchover heartbeats.</p> <p> Caution This address is the same value as *.IP_Addr1, and is the hme0 interface.</p> <p> Caution No other machine on the network should have *.ipAddrLocalA set to 0.0.0.0.</p>
*.ipAddrPeerA	<p>Enter the first corresponding peer IP address; used for checkpointing and switchover heartbeats.</p> <p>Note If you have two Cisco MGC hosts in a fault tolerant configuration, this value is set to the IP address of the second host.</p>
*.ipAddrLocalB	<p>Enter the second local IP address; used for checkpointing and switchover heartbeats. This is the address of the hme1 interface.</p> <p>Note If your configuration does not use a secondary Ethernet adapter, leave this address set to the default value, 0.0.0.0.</p>
*.ipAddrPeerB	<p>Enter the second corresponding peer IP address; used for checkpointing and switchover heartbeats. This is the address of the hme1 interface on the second host.</p> <p>Note If your configuration does not use a secondary Ethernet adapter, leave this address set to the default value, 0.0.0.0.</p>
*.IP_Addr1	Enter the IP address of the hme0 interface.

Table 4-7 XECfgParm.dat File Parameters (Specifying IP and Next Hop Router IP Addresses)

Parameter	Modification
*.IP_Addr2	Enter the IP address of the hme1 interface (if configured).
*.IP_Addr3	Enter the IP address of the hme2 interface (if configured).
*.IP_Addr4	Enter the IP address of the hme3 interface (if configured).
*.IP_NextHopx	<p>Enter the next hop router IP address.</p> <p>The next hop router IP address is determined through the *.IP_NextHopx parameter. This parameter allows you to assign eight different next hop router addresses that are different for the active and standby PGWs.</p> <p>The *.IP_NextHopx parameter (where <i>x</i> is any number from 1 to 8 because there are eight entries in XECfgParm.dat) is used with the active and standby PGWs that are on different subnets and therefore have different IP addresses for the routers to get to a given destination.</p> <p>For every destination that needs a different next hop router, an unused *.IP_NextHopx parameter should be chosen. The appropriate IP address to reach the destination should be entered in each PGW's XECfgParm.dat. If a given destination is on a locally connected subnet of one of the PGWs, the *.IP_NextHopx parameter for that PGW would be 0.0.0.0.</p> <p>Default value: 0.0.0.0.</p>

Configuring Engine Parameters

For the engine to run correctly, you must modify the following parameters in the Engine section of the XECfgParm.dat file:

Parameter	Modification
engine.CALL_MEM_BLOCK_SIZE	<p>Block of memory allocated per call.</p> <p>Used by MDL.</p> <p>Set automatically based on the type of Cisco PGW 2200 Softswitch selected in engine.SysVirtualSwitch. Any attempt to modify this value is overwritten.</p>
engine.CALL_MEM_CHUNK_SIZE	<p>Memory chunks allocated from the block of memory designated with engine.CALL_MEM_BLOCK_SIZE.</p> <p>Set automatically based on the type of Cisco PGW 2200 Softswitch selected in engine.SysVirtualSwitch. Any attempt to modify this value is overwritten.</p>

Parameter	Modification
engine.SendHardwareBlock	<p>To enable the Cisco PGW 2200 Softswitch to send hardware-oriented blocking messages for any blocks that originate from the media gateways:</p> <ul style="list-style-type: none"> • true—Sends hardware-oriented blocking messages for any blocks that originate from the media gateways. • false—Sends only maintenance-oriented blocking messages for all blocking cases (default). <p>Note The parameter is automatically added to the XECfgParm.dat file during the patch installation.</p>
engine.SysCdrCollection	<p>Designates the format of CDRs.</p> <p>Values:</p> <ul style="list-style-type: none"> • true—Invalid for Release 7.4 and above. • false—Generates binary format CDRs (default) <p>Default: false</p> <p>Note Do not change this value. Setting this to a value of true for Release 7.4 and higher is not valid and may have deleterious effects on the system.</p>
engine.SysGRSTimerInterval	<p>To specify the interval between blocks of Circuit Group Reset (GRS) messages when the engine.SysGRSBlockSize parameter is used, set to the value required (in milliseconds).</p>
engine.SysGRSBlockSize	<p>Used for flow control of all automatically generated GRS, CGB, and CGU messages which are generated by the Cisco PGW 2200 Softswitch during run time. Typically produced due to propagation of service state changes such as MGCP endpoints changing availability. Specifies the interval, in milliseconds, between blocks of GRS parameters when the engine.SysGRSBlockSize parameter is used. The timer interval runs from the start of sending the first GRS message in each block to the first message in the next block.</p> <p>This parameter operates independently for each SS7 route (each OPC/DPC pair).</p> <p>Value: Any integer</p> <p>Default: 0</p> <p>Example: 1000</p>

Parameter	Modification
engine.SysGeneratedCode	<p>To determine whether compiled or interpreted code is used, enter one of the following values:</p> <ul style="list-style-type: none"> • true—System uses compiled code (default). • false—System uses interpreted code (used only for engineering and debugging). <p>Note Compiled code runs faster than interpreted code. Typically, this value should be true. If your configuration uses multiple CPUs, this value <i>must</i> be true.</p>
*.SysConnectDataAccess	<p>This parameter controls if data access is enabled or disabled and if the engine attempts to connect to the MMDB at startup.</p> <p>Set this parameter to true for calling scenarios where European LNP, A-number screening, or other features requiring real-time database access are used.</p> <p>If you do not need real-time database access, set this parameter to false to increase the available system memory that can be used for call processing.</p>

Setting the Call Cutoff Timer

The Cisco PGW 2200 Softswitch call cutoff timer is disabled by default. To set the call cutoff timer, modify the following parameter in the XECfgParm.dat file:

Parameter	Modification
*.CallCutoffTimer	<p>Provides a global system-wide timer, which is started when a call is answered and runs for the pre-configured time. When it expires the call is released in both directions and the call is cleared. This parameter is not dynamically reconfigurable. You must restart your system.</p> <p>Valid values:</p> <ul style="list-style-type: none"> • Hours: 0 (default), 1–48 (using hour as the unit) • Minutes: 0, 1–2880 (using minute as the unit) • Seconds: 0, 1–1728000 (using second as the unit) <p>Default: 0—Disables the timer.</p> <p>Note You can override this value using the first data word of the CALL_CUTOFF_TIMER result type.</p>



Enabling Call Screening

To initialize the database that stores call screening information, modify the following parameter in the Engine section of the XECfgParm.dat file:

Parameter	Modification
*.SysConnectDataAccess	<p>Controls whether data access is enabled or disabled (whether the engine attempts to connect to the MMDB at startup).</p> <p>Values:</p> <ul style="list-style-type: none"> • true = connect to MMDB • false = do not connect to MMDB <p>Default: false</p> <p>Note In calling scenarios where Euro-LNP, A Number Screening, or other features requiring real time database access are required, this parameter must be set to true. Otherwise, it can remain false for an increase in the available system memory usable for call processing.</p> <p>Note This parameter replaces the SysScreeningCheck parameter.</p>

Configuring Call Detail Record File Output

To configure call detail record (CDR) file output, modify the following parameters in the Data Dumper and Engine sections of the XECfgParm.dat file:

Parameter	Modification
engine.CDRencodingFormat	<p>To specify the call detail record (CDR) file encoding format, enter one of the following values:</p> <ul style="list-style-type: none"> • AnsiCDB—North American (default) • ItuCDB—European • CustCDB—Custom
engine.CDRmessageTypes	<p>To specify the Call Detail Blocks (CDBs are the accounting records written at various points in a call) that are generated during a call, enter one of the following sets of values (each number represents a point in a call):</p> <ul style="list-style-type: none"> • 1010, 1020, 1030, 1040, 1050, 1060, 1070, 1080—These are considered the “event-based” set of values. Use this event-based list when you want to receive all CDR records at predefined points in the call. Although each of these CDBs can be specified independently, Cisco suggests that you use the event-based set as a “package” of CDBs for full accounting purposes. <p> Note The event-based setting is required when operating the Cisco PGW 2200 Softswitch in conjunction with the BAMS adjunct.</p> <ul style="list-style-type: none"> • 1060, 1110—Use this value if you want end-of-call summary-type records only. • 1071—Use this set of values for BAMS measurements. <p>See the “Detailed CDB Description” section in the <i>Cisco PGW 2200 Softswitch Release 9 Billing Interface Guide</i> for details on each CDB.</p>
engine.CDRtimeStamp	<p>Specifies the time stamp unit in seconds or milliseconds.</p> <p>To specify the CDR file time-stamp unit, enter one of the following values:</p> <ul style="list-style-type: none"> • S—Seconds. • M—Milliseconds (default). Use this parameter if your configuration uses TCAP or if you want the millisecond granularity in all of your CDR records. <p> Note The M setting is mandatory when operating the Cisco PGW 2200 Softswitch in conjunction with the Cisco BAMS adjunct. The default is M in Cisco PGW 2200 Softswitch Release 9.8(1).</p>

Configuring the Clearing Location and Default Location Parameters



The ClearingLocation and DefaultLocation parameters are used to determine a call's location value. If you require a value other than the default to be sent to the switch, use these parameters to override the Clearing Location and Default Location fields in the Call Context. For example, if you need to define a customer-specific default location for your system, set this value in the DefaultLocation parameter, which overrides the default location specified in the protocol type definition.



Parameter	Modification
ClearingLocation	<p>This property overrides the Clearing Location field in Call Context. Change this value if you need a value other than the default to be sent to the switch. Valid values are:</p> <ul style="list-style-type: none"> • 0—The Cisco PGW 2200 Softswitch software uses the default Clearing Location in Call Context. • 1—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_USER • 2—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_PRIVATE_LOCAL • 3—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_PUBLIC_LOCAL • 4—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_TRANSIT • 5—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_PUBLIC_REMOTE • 6—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_PRIVATE_REMOTE • 7—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_INTERNATIONAL • 8—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_INTERWORKING • 9—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_LOCAL_INTERFACE • 10—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_LOCAL_LOCAL • 11—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_LOCAL_REMOTE • 12—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_PACKET_MANAGER • 13—The Cisco PGW 2200 Softswitch software overrides the Clearing Location in Call Context with LOCATION_UNKNOWN

Parameter	Modification
DefaultLocation	<p>This property overrides the Default Location field in Call Context. Change this value if you need to define a customer-specific default location for your system that can differ from the default location set in the type definition of the protocol. Valid values are:</p> <ul style="list-style-type: none"> • 0—The Cisco PGW 2200 Softswitch software uses the Default Location in Call Context • 1—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_USER • 2—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_PRIVATE_LOCAL • 3—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_PUBLIC_LOCAL • 4—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_TRANSIT • 5—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_PUBLIC_REMOTE • 6—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_PRIVATE_REMOTE • 7—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_INTERNATIONAL • 8—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_INTERWORKING • 9—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_LOCAL_INTERFACE • 10—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_LOCAL_LOCAL • 11—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_LOCAL_REMOTE • 12—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_PACKET_MANAGER • 13—The Cisco PGW 2200 Softswitch software overrides the Default Location in Call Context with LOCATION_UNKNOWN

Configuring Switchover

To configure switchover, modify the following parameters in the **foverd** section of the XECfgParm.dat file.

Parameter	Modification
foverd.conn1Type	<p>To set the connection type for connection number 1, enter serial or socket.</p> <p>Note Typically, set this value to socket.</p>
foverd.ipLocalPortA	<p>To define the local port number used for IP communication, enter a unique number, keeping the following in mind:</p> <ul style="list-style-type: none"> Typically, if Type is socket, set this value to 1051. If you have two Cisco PGW 2200 Softswitch hosts in a fault tolerant configuration, enter the foverd.ipLocalPortA value in the foverd.ipPeerPortA field in the XECfgParm.dat file on the secondary host. <p> Caution The value of foverd.ipLocalPortA must be unique for every host on the network. Otherwise, active and standby hosts cannot communicate properly. In the instance discussed here, no other machine on the network can have foverd.ipLocalPortA set to 1051. If that happens, the active and standby hosts cannot perform proper switchover.</p>
foverd.ipPeerPortA	<p>To define the peer port number used for IP communication, enter a unique number, keeping the following in mind:</p> <ul style="list-style-type: none"> Typically, if Type is socket, set this value to 1052. If you have two Cisco PGW 2200 Softswitch hosts in a switchover configuration, enter the foverd.ipPeerPortA value in the foverd.ipLocalPortA field in the XECfgParm.dat file on the secondary host. <p> Caution The value of foverd.ipPeerPortA must be unique for every host on the network. Otherwise, active and standby hosts cannot communicate properly. In the instance discussed here, no other machine on the network can have foverd.ipPeerPortA set to 1052. If that happens, the active and standby hosts cannot perform proper switchover.</p>
foverd.conn2Type	<p>To set the connection type for connection number 2, enter serial or socket.</p> <p>Note Typically, set this value to socket.</p>

Parameter	Modification
foverd.ipLocalPortB	<p>To define the secondary local port number used for IP communication, enter a unique number, keeping the following in mind:</p> <ul style="list-style-type: none"> Typically, if Type is socket, set this value to 1053. If you have two Cisco PGW 2200 Softswitch hosts in a switchover configuration, enter this value in the foverd.ipPeerPortB field in the XECfgParm.dat file on the secondary host. <p> Caution The value of foverd.ipLocalPortB must be unique for every host on the network. Otherwise, active and standby hosts cannot communicate properly. In the instance discussed here, no other machine on the network can have foverd.ipLocalPortB set to 1053. If that happens, the active and standby hosts cannot perform proper switchover.</p>
foverd.ipPeerPortB	<p>To define the secondary local port number used for IP communication, enter a unique number, keeping the following in mind:</p> <ul style="list-style-type: none"> Typically, if Type is socket, set this value to 1054. If you have two Cisco PGW 2200 Softswitch hosts in a switchover configuration, enter this value in the foverd.ipLocalPortB field in the XECfgParm.dat file on the secondary host. <p> Caution The value of foverd.ipPeerPortB must be unique for every host on the network. Otherwise, master and slave hosts cannot communicate properly. In the instance discussed here, no other machine on the network can have foverd.ipPeerPortB set to 1054. If that happens, the master and slave hosts cannot perform proper switchover.</p>
foverd.conn3Type	<p>To set the connection type for connection number 3, enter serial or socket.</p> <p>Note Typically, set this value to serial.</p>
foverd.conn3Addr	<p>To specify the address of the peer system, enter a location; for example, /dev/term/a.</p> <p>If your configuration does not use connection number 3, enter /dev/null (default).</p> <p>Note If your configuration uses an 8-port connector as a serial connection for switchover, you must modify the read-write permissions for the connection.</p>


Parameter	Modification
foverd.abswitchPort	To specify the port used for communication with the A/B switch, enter a location; for example, /dev/term/a . Note If your configuration does not use an A/B switch, use the default value (/dev/null).
foverd.heartbeatInterval	Specifies the maximum time in milliseconds between heartbeat messages from the peer switchover daemon. This interval defines the frequency with which the switchover daemon exchanges heartbeat messages with its peer. Default: 1000 milliseconds (1 second).

**Note**

For more information on switchover, see the *Cisco PGW 2200 Softswitch Release 9 Operations, Maintenance, and Troubleshooting Guide*.

Initializing the Provisioning Object Manager

To configure the Provisioning Object Manager (POM), modify the following parameters in the POM section of the XECfgParm.dat file:

Parameter	Modification
pom.dataSync	<p>Used in a fault tolerant system to indicate that the POM should synchronize the provisioning data at startup.</p> <ul style="list-style-type: none"> • If you have a standalone system, set this value to false. • If you have a fault tolerant system, set this value to true. <p> Caution If pom.dataSync is set to true for a fault tolerant system, you must ensure that you are running the same version of the Cisco PGW 2200 Softswitch software on both active and standby machines. Otherwise, the wrong version of your data files may be copied to the other machine.</p> <p>Note When the initial Cisco PGW 2200 Softswitch configuration on the active host is deployed, you must change the pom.dataSync parameter to true in the XECfgParm.dat file in the standby host. After setting this parameter to true, you can start the Cisco PGW 2200 Softswitch software on the standby host. As the Cisco PGW 2200 Softswitch software comes up, the data on the standby host is synchronized with the data on the active host and the active host goes into the standby state.</p> <p>To accommodate failover conditions where the current active host can become the standby host, you must also set the pom.dataSync parameter to true on the current active host.</p>
pom.port	<p>Used in a fault tolerant configuration to indicate the port number that the POM uses to communicate with its peer. Enter any integer from 4001 through 4050, or default.</p> <p>Note This is a platform-specific value and depends on your system installation. You should modify this value only if the default port (4001) is being used by another process or application.</p>

Configuring SCP Queries

The SCP translates routing information for the Advanced Intelligent Network (AIN) database queries over TCAP. This section provides instructions for selecting the type of translation you use to enable SCP database queries. If your site or network requires changes, you can enable SCP queries using the prov-ed:inservice command or by manually editing the parameters in the trigger.dat file. The trigger.dat file (located in /opt/CiscoMGC/etc) contains the message-sending table that contains translation values.

This section contains the following topics:

- [Before You Start, page 4-49](#)

- [Configuring the trigger.dat File Attributes, page 4-49](#)
- [Sample trigger.dat File, page 4-51](#)

**Warning**

Do not edit trigger.dat file parameters that are not listed below, and remember that all parameters are case-sensitive. Otherwise, your system might not work as intended.

**Note**

The following Bellcore Standards are supported for US 800 toll-free services:

IN/1 Toll Free Service support: GR-1428

AIN 0.1 Toll Free Service support: GR-2902

Before You Start

If you are changing an ANSI query and you need a different Translation Type, you need to know the Translationtype value from the Global Title Translation tables on the Signal Transfer Point (STP). Get this value from the administrator of your STP.

Modifying trigger.dat file parameters with provisioning commands

You can use the prov-ed:inservice command to modify the trigger.dat properties without editing the file directly. The command allows you to modify the service key, global title or subsystem number, global title format, or message sending name.

```
mml> prov-ed:inservice:name="ansi-ain-800-npa",skortcv=4,gtorssn="ROUTEBYGT",
gtformat="GTTT",msname="ansi-ain-800-npa"
```

For more information about the prov-ed:inservice command, refer to the *Cisco PGW 2200 Softswitch Release 9 MML Command Reference*.

Configuring the trigger.dat File Attributes

**Note**

The trigger.dat file is not overwritten during software installation. All changes to the trigger.dat file are contained in a file called trigger.template that is installed with the new software. If you modify the trigger.dat file after installing a new software release, you need to view the trigger.template file and copy any changes in that file to your trigger.dat file.

**Caution**

Improper editing of the trigger.dat file can cause service interruption and prevent the Cisco PGW 2200 Softswitch from correctly performing SCP database queries.

You can configure the following Cisco PGW 2200 Softswitch trigger.dat file attributes to perform a Transaction Capabilities Application Part (TCAP) query:

- Translation Type

Configuring the Translation Type Attribute

Perform the following steps to configure the Translation Type (`translationType`) attribute:

-
- Step 1** Back up the `trigger.dat` file.
 - Step 2** Determine the Trigger Number that you need to edit. You can get this information from your network administrator.
 - Step 3** Navigate to directory `/opt/CiscoMGC/etc`.
 - Step 4** Open the trigger definition file in an ASCII text editor and search for the string `$TriggerTable`.
 - Step 5** Starting after the `$TriggerTable` line, count the number of rows equal to the `TriggerType` beginning from the number 1.



Note Do not count any row that is blank or that begins with a pound sign (#).

- Step 6** When you find your row, note down the second number in that row. This number is the index to the `$MessageSending` table.



Caution You must verify that column 2 is equal to 2 or 3 before changing Translation Type. If column 2 is not equal to 2 or 3, this is not an ANSI trigger and Translation Type is not used.

- Step 7** Edit the file as follows:
 - a. In the `$MessageSending` table, select `translationType`, in column 5 (see [Table 4-8](#)).
 - b. In the table for your translation type, change the value for `translationType` to a value from 0 through 255. You can get this information from your network administrator.

- Step 8** Save your changes and close the editor.

- Step 9** For your changes to take effect you must reboot the Cisco PGW 2200 Softswitch by entering the following command:

```
# /etc/init.d/CiscoMGC start
```



Note If you have installed the Solaris DiskSuite package (CSCO023) on your system, the messages below are displayed during system boot-up. They are normal Solaris DiskSuite start-up messages and do not indicate any problem with your system.

```
WARNING force load of misc /md-trans failed
WARNING force load of misc /md-raid failed
WARNING force load of misc /md-hotspares failed
WARNING force load of misc /md-sp failed
```

Table 4-8 \$MessageSending Table Values

F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16
tcapType	stpScpGroupIndex	msg	asn1Encoding	translationType	tcapBodyType	OS1	OS2	OS3	OS4	OS5	OS6	OS7	OS8	OS9	OS10
# MS 1: Customer 1 LNP															
2	0	6	0	255	1	1	0	0	0	0	0	0	0	0	0
# MS 2: Generic LNP															
2	0	6	0	255	1	2	0	0	0	0	0	0	0	0	0
# MS 3: Genesys 800															
1	1	1	0	0	1	3	0	0	0	0	0	0	0	0	0
# MS 4: ANSI AIN 800 NPA															
2	0	6	0	255	1	4	0	0	0	0	0	0	0	0	0
# MS 5: ANSI AIN 800 NPA-NXX															
2	0	6	0	255	1	4	0	0	0	0	0	0	0	0	0
# MS 6: ANSI AIN 800 NPA-NXX-XXX															
2	0	6	0	255	1	4	0	0	0	0	0	0	0	0	0
# MS 7: ANSI AIN 800 Termination information															
2	0	5	0	255	1	5	0	0	0	0	0	0	0	0	0
# MS 8: ANSI PRE AIN 800															
3	0	6	0	254	2	6	0	0	0	0	0	0	0	0	0
# MS 9: ANSI PRE AIN 800 Termination information															
3	0	5	0	254	2	7	0	0	0	0	0	0	0	0	0

Sample trigger.dat File

```

#--//*****
#--//*
#--//* Default Table.trigger
#--//*
#--//*****

# "$Id: Table.trigger,v 1.25 2000/05/30 14:52:20 rjeffers Exp $";
# "Copyright (c) 2004, 2005 by Cisco Systems, Inc.."
# 41647269616E204B696E6773746F6E

#####
$TriggerTable
#####
# All fields are pointers to records of other types
#
# F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12
# MA IN RR1 RR2 RR3 RR4 RR5 RR6 RR7 RR8 RR9 RR10

#-----
# TT 1: Customer 1 LNP
#-----
1 1 1 2 0 0 0 0 0 0 0 0
    
```

```

#-----
# TT 2: Generic LNP
#-----
  2   2   1   3   0   0   0   0   0   0   0   0
#-----
# TT 3: Genesys 800
#-----
  3   3  10   4   5   0   0   0   0   0   0   0
#-----
# TT 4: ANSI AIN 800 NPA
#-----
  4   4  10   6   7   0   0   0   0   0   0   0
#-----
# TT 5: ANSI AIN 800 NPA-NXX
#-----
  4   5  10   6   7   0   0   0   0   0   0   0
#-----
# TT 6: ANSI AIN 800 NPA-NXX-XXXX
#-----
  4   6  10   6   7   0   0   0   0   0   0   0
#-----
# TT 7: ANSI AIN 800 Termination Information
#-----
  5   7  10   0   0   0   0   0   0   0   0   0
#-----
# TT 8: ANSI PRE AIN AIN 800
#-----
  4   8  10   8   9   0   0   0   0   0   0   0
#-----
# TT 9: ANSI PRE AIN 800 Termination Information
#-----
  5   9  10   0   0   0   0   0   0   0   0   0
#-----
# TT 10: ANSI PRE AIN AIN 800 SSN
#-----
  4  10  10  11   9   0   0   0   0   0   0   0
#-----
# TT 11: ANSI PRE AIN 800 Termination Information SSN
#-----
  5  11  10   0   0   0   0   0   0   0   0   0
#-----
# TT 12: CS1/INAP Based CLI Screening
#-----
  6  12  15  12  13  14   0   0   0   0   0   0
#-----
# TT 13: Specialized Resource Report for CS1/INAP Based CLI Screening
#-----
  0  13  15  12   0   0   0   0   0   0   0   0
#-----
# TT 14: INAP Free Phone Service (Service Key = 0)
#-----

```

```

7 14 10 16 0 0 0 0 0 0 0 0
#-----
# TT 15: INAP LNP Service (Service Key = 1)
#-----
7 15 10 16 0 0 0 0 0 0 0 0
#-----
# TT 16: INAP Carrier Pre-Selection Service (Service Key =2)
#-----
7 16 10 16 0 0 0 0 0 0 0 0
#-----
# TT 17: INAP LNP for Norway
#-----
8 17 17 18 0 0 0 0 0 0 0 0
#-----
# TT 18: INAP Prepaid Services InitialDP
#-----
9 18 19 20 24 28 0 0 0 0 0 0
#-----
# TT 19: INAP Prepaid Services ApplyChargingReport(Approaching Time Period Expiry)
#-----
10 19 19 21 0 0 0 0 0 0 0 0
#-----
# TT 20: INAP Prepaid Services EventReportBCSM
#-----
11 20 19 22 23 0 0 0 0 0 0 0
#-----
# TT 21: INAP Prepaid Services ApplyChargingReport (Time Period Expired)
#-----
11 21 19 22 0 0 0 0 0 0 0 0
#-----
# TT 22: INAP Prepaid Services ApplyChargingReport (Final End)
#-----
11 22 0 0 0 0 0 0 0 0 0 0
#-----
# TT 23: INAP LNP for Portugal
#-----
12 23 25 26 27 0 0 0 0 0 0 0
#-----
# TT24 : INAP CS1 Initial DP
#-----
13 24 29 30 31 33 32 0 0 0 0 0
#-----
# TT25 : INAP CS1 Event Report (EventReportBCSM)
#-----
14 26 0 0 0 0 0 0 0 0 0 0
#-----
# TT26 : INAP CS1 DisconnectForwardConnection(re-trigger to restore original trigger)
#-----
0 27 29 34 0 0 0 0 0 0 0 0
#-----
# TT27 : INAP CS1 Final_End(Apply ChargingReport)

```

```

#-----
 14  25  0  0  0  0  0  0  0  0  0  0  0
#-----
# TT28 : INAP CS1 Post temp-connection handling
#-----
 15  0  0  0  0  0  0  0  0  0  0  0  0
#-----
# TT 29 : INAP CS2 Initial DP
#-----
 13  29  29  30  31  33  32  36  37  38  39  0
#-----
# TT 30: ANSI PRE AIN CNAM
#-----
 4  30  41  40  0  0  0  41  0  0  0  0
#-----

#####
$MessageAction
#####
#
# F1  F2  F3  F4  F5  F6  F7  F8  F9  F10
# ACT1 REQ  ACT2 REQ  ACT3 REQ  ACT4 REQ  ACT5 REQ

#-----
# MA 1: Customer 1 LNP
#-----
 1  1  3  0  0  0  0  0  0  0
#-----
# MA 2: Generic LNP
#-----
 1  1  2  1  3  0  0  0  0  0
#-----
# MA 3: Genesys 800
#-----
 1  1  3  0  0  0  0  0  0  0
#-----
# MA 4: ANSI AIN 800 / ANSI PRE AIN 800 /ANSI PRE AIN CNAM
#-----
 1  1  3  0  0  0  0  0  0  0
#-----
# MA 5: ANSI AIN 800 Termination Information / PRE AIN 800 Termination Information
#-----
 4  1  0  0  0  0  0  0  0  0
#-----
# MA 6: CS1/INAP Based CLI Screening InitialDP Query
#-----
 3  0  0  0  0  0  0  0  0  0
#-----
# MA 7: INAP Free Phone, LNP & Carrier Pre-Selection Services
#-----
 3  0  0  0  0  0  0  0  0  0
#-----
# MA 8: INAP LNP for Norway
#-----

```

```

3 0 0 0 0 0 0 0 0 0
#-----
# MA 9: INAP Prepaid Services InitialDP
#-----
3 0 0 0 0 0 0 0 0 0
#-----
# MA 10: INAP Prepaid Services ApplyChargingReport
#-----
0 0 0 0 0 0 0 0 0 0
#-----
# MA 11: INAP Prepaid Services EventReportBCSM
#-----
0 0 0 0 0 0 0 0 0 0
#-----
# MA 12: INAP LNP for Portugal
#-----
3 0 0 0 0 0 0 0 0 0
#-----
# MA 13: INAP CS1 Copy STP_SCP_Index_From_Signal_Data
#-----
3 0 0 0 0 0 0 0 0 0
#-----
# MA 14: INAP CS1 Reinstate Previous trigger
#-----
5 0 0 0 0 0 0 0 0 0
#-----
# MA 15: INAP CS1 Reinstate Previous trigger
#-----
6 0 0 0 0 0 0 0 0 0
#-----
# MA 16: INAP CS1 Provoke SCP Abort
#-----
7 0 0 0 0 0 0 0 0 0

#####
$MessageSendingName
#####
#
# Name                Index
c1-lnp                1
generic-lnp           2
genesys-800           3
ansi-ain-800-mpa      4
ansi-ain-800-mpa-nxx  5
ansi-ain-800-npanxxx  6
ansi-ain-800-ti       7
ansi-pre-ain-800      8
ansi-pre-ain-800-ti   9
ansi-pre-ain-800-ssn 10
ansi-pre-ain-800-ts   11
csl-inap-cli-initdp  12
csl-inap-cli-srr     13
inap-freephon-initdp 14
inap-lnp-initdp      15
inap-precarr-initdp  16

```

```

inap-lnp-norway          17
inap-pp-initdp          18
inap-pp-charge-atexp    19
inap-pp-bcsm            20
inap-pp-charge-texp     21
inap-pp-charge-final    22
inap-lnp-portugal       23
inap-cs1-initdp         24
inap-cs1-dummy-25       25
inap-cs1-dummy-26       26
inap-cs1-dummy-27       27
inap-cs1-dummy-28       28
inap-cs2-initdp         29
ansi-pre-ain-cnam       30

```

```

#####
$MessageSending
#####
#
# F1      F2          F3  F4          F5          F6          F7  F8  F9
F10 F11 F12 F13 F14 F15 F16
# tcapType stpScpGroupIndex msg  asn1Encoding  translationType tcapBodyType OS1  OS2  OS3
OS4  OS5  OS6  OS7  OS8  OS9  OS10

#-----
# MS 1: Customer 1 LNP
#-----
      2      0          6  0          255          1          1  0  0
0  0  0  0  0  0  0  0

#-----
# MS 2: Generic LNP
#-----
      2      0          6  0          255          1          2  0  0
0  0  0  0  0  0  0  0

#-----
# MS 3: Genesys 800
#-----
      1      1          1  0          0          1          3  0  0
0  0  0  0  0  0  0  0

#-----
# MS 4: ANSI AIN 800 NPA
#-----
      2      0          6  0          255          1          4  0  0
0  0  0  0  0  0  0  0

#-----
# MS 5: ANSI AIN 800 NPA-NXX
#-----
      2      0          6  0          255          1          4  0  0
0  0  0  0  0  0  0  0

```



```

#-----
# MS 6: ANSI AIN 800 NPA-NXX-XXX
#-----
      2      0      6      0      255      1      4      0      0
0 0 0 0 0 0 0 0
#-----
# MS 7: ANSI AIN 800 Termination information
#-----
      2      0      5      0      255      1      5      0      0
0 0 0 0 0 0 0 0
#-----
# MS 8: ANSI PRE AIN 800
#-----
      3      0      6      0      254      2      6      0      0
0 0 0 0 0 0 0 0
#-----
# MS 9: ANSI PRE AIN 800 Termination information
#-----
      3      0      5      0      254      2      7      0      0
0 0 0 0 0 0 0 0
#-----
# MS 10: ANSI PRE AIN 800 SSN (Same as MS 8 but with SSN stuff)
#-----
      3      0      6      0      254      2      6      0      0
0 0 0 0 0 0 0 0
#-----
# MS 11: ANSI PRE AIN 800 Termination information (Same as MS 9 but with SSN stuff)
#-----
      3      0      5      0      254      2      7      0      0
0 0 0 0 0 0 0 0
#-----
# MS 12: CS1/INAP Based CLI Screening InitialDP Query
#-----
      1      0      1      0      200      1      8      0      0
0 0 0 0 0 0 0 0
#-----
# MS 13: CS1/INAP Based CLI Screening SpecializedResourceReport
#-----
      1      0      2      0      200      1      9      0      0
0 0 0 0 0 0 0 0

```

```

#-----
# MS 14: INAP InitialDP Query, Free Phone Service
#-----
1      0      1      0      0      0      0      0      0      0      1      110      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0

#-----
# MS 15: INAP InitialDP Query, LNP Service
#-----
1      0      1      0      0      0      0      0      0      0      1      110      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0

#-----
# MS 16: INAP InitialDP Query, Carrier Pre-Selection Service
#-----
1      0      1      0      0      0      0      0      0      0      1      110      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0

#-----
# MS 17: INAP LNP for Norway
#-----
1      0      1      0      0      0      0      0      0      0      1      111      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0

#-----
# MS 18: INAP Prepaid Services InitialDP
#-----
1      0      1      0      0      0      0      0      0      0      1      12      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0

#-----
# MS 19: INAP Prepaid Services ApplyChargingReport (Approaching Time Period Expiry)
#-----
1      0      2      0      0      0      0      0      0      0      3      13      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0

#-----
# MS 20: INAP Prepaid Services EventReportBCSM
#-----
1      0      2      0      0      0      0      0      0      0      1      14      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0

#-----
# MS 21: INAP Prepaid Services ApplyChargingReport (Time Period Expired)
#-----
1      0      2      0      0      0      0      0      0      0      3      13      0      0
0      0      0      0      0      0      0      0      0      0      0      0      0      0

```

```

#-----
# MS 22: INAP Prepaid Services ApplyChargingReport (Final End)
#-----
1      0      3      0      0      3      13      0      0
0      0      0      0      0      0      0      0      0

#-----
# MS 23: INAP LNP for Portugal
#-----
1      0      1      0      0      1      15      0      0
0      0      0      0      0      0      0      0      0

#-----
# MS 24: INAP CS1 InitialDP
#-----
1      0      1      0      0      1      16      0      0
0      0      0      0      0      0      0      0      0

#-----
# MS 25: INAP CS1 Final end (ApplyChargingReport,)
#-----
1      0      2      0      0      3      18      0      0
0      0      0      0      0      0      0      0      0

#-----
# MS 26: INAP CS1 Continue, event report (EventReportBCSM)
#-----
1      0      2      0      0      1      17      0      0
0      0      0      0      0      0      0      0      0

#-----
# MS 27: INAP CS1 (Dummy entry only to permit Message reception operation data access)
#-----
1      0      2      0      0      1      0      0      0      0
0      0      0      0      0      0      0      0      0      0

#-----
# MS 28: INAP CS1 (Dummy entry only to permit Message reception operation data access)
#-----
1      0      2      0      0      1      0      0      0      0
0      0      0      0      0      0      0      0      0      0

#-----
# MS 29: INAP CS2 InitialDP
#-----
1      0      1      0      0      1      16      0      0
0      0      0      0      0      0      0      0      0

```

```

#-----
# MS 30 : ANSI PRE AIN CNAM
# tcapType=PRE AIN, msg=query with permission , asn1Encoding=asn1_definite,
# tcapBodyType=sequence, OS= 19
#-----
      3      0      6      0      5      2      19      0      0      0
0      0      0      0      0      0

#####
$OperationSending
#####
#
# F1      F2      F3      F4      F5      F6
F7
# componentType opClass      opCodeFamily opCodeSpecifier opCodeFlag correlationRequired
PS

#-----
----
# OS 1: Customer 1 LNP
#-----
----
      6      1      100      3      4      0
1

#-----
----
# OS 2: Generic LNP
#-----
----
      6      1      100      3      4      0
2

#-----
----
# OS 3: Genesys 800
#-----
----
      1      1      0      0      1      0
3

#-----
----
# OS 4: ANSI AIN 800
#-----
----
      6      1      100      3      4      0
4

#-----
----
# OS 5: ANSI AIN 800 Termination Information      Should have
correlationRequired = 1
#-----
----
      6      1      103      4      4      0
5

#-----
----
# OS 6: ANSI PRE AIN 800

```

```

#-----
----
 6          1          3          1          3          0
6
#-----
----
# OS 7: ANSI PRE AIN 800 Termination Information
#-----
----
 2          1          0          0          0          0
7
#-----
----
# OS 8: CS1/INAP Based CLI Screening InitialDP Query
#-----
----
 1          1          0          0          1          0
8
#-----
----
# OS 9: CS1/INAP Based CLI Screening SpecializedResourceReport
#-----
----
 1          1          0          49          1          1
0
#-----
----
# OS 10: INAP Free Phone, LNP & Carrier Pre-Selection Services InitialDP Query
#-----
----
 1          1          0          0          1          0
9
#-----
----
# OS 11: INAP LNP for Norway
#-----
----
 1          1          0          0          1          0
10
#-----
----
# OS 12: INAP Prepaid Services InitialDP
#-----
----
 1          2          0          0          1          0
11
#-----
----
# OS 13: INAP Prepaid Services ApplyChargingReport
#-----
----
 1          2          0          36          1          0
12
#-----
----
# OS 14: INAP Prepaid Services EventReportBCSM

```

```

#-----
----
 1          2          0          24          1          0
13

#-----
----
# OS 15: INAP LNP for Portugal
#-----
----
 1          1          0          0          1          0
14

#-----
----
# OS 16: INAP CS1 InitialDP
#-----
----
# componentType opClass      opCodeFamily opCodeSpecifier opCodeFlag correlationRequired
PS
 1          2          0          0          1          0
15

#-----
----
# OS 17: INAP CS1 EventReportBCSM
#-----
----
 1          2          0          24          1          0
16

#-----
----
# OS 18: INAP CS1 ApplyChargingReport
#-----
----
 1          2          0          36          1          0
17

#-----
----
# OS 19: ANSI PRE AIN CNAM
# componentType=invoke last, opClass=success and fail report, opFamily=parameter
# opSpecifier=1 for PRE AIN, opFlag=1.local/3.national/4 private, ps=18
#-----
----
 6          1          129          1          3          0
18
#-----
----

#####
$ParameterSending
#####
#
# F1  F2  F3  F4  F5  F6  F7  F8  F9  F10 F11 F12 F13 F14 F15 F16 F17 F18
F19 F20 F21 F22 F23 F24 F25 F26 F27 F28 F29 F30
# PA1 REQ PA2 REQ PA3 REQ PA4 REQ PA5 REQ PA6 REQ PA7 REQ PA8 REQ PA9 REQ
PA10 REQ PA11 REQ PA12 REQ PA13 REQ PA14 REQ PA15 REQ

#-----
----

```

```

# PS 1: Customer 1 LNP
#-----
100 1 101 1 102 1 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
# PS 2: Generic LNP
#-----
100 1 101 1 102 1 103 1 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
# PS 3: Genesys 800
#-----
200 1 201 1 202 1 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
# PS 4: ANSI AIN 800 (All types)
#-----
100 1 101 1 102 1 103 1 104 1 109 0 110 0 111 0 112 0
113 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
# PS 5: ANSI AIN 800 Termination Information
#-----
105 1 106 1 107 0 108 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
# PS 6: ANSI PRE AIN 800
#-----
17 1 2 1 16 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
# PS 7: ANSI PRE AIN 800 Termination Information
#-----
21 1 20 1 22 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
# PS 8: CS1/INAP Based CLI Screening
#-----
200 1 201 1 202 1 208 1 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----

```

```

# PS 9: INAP Free Phone, LNP & Carrier Pre-Selection Services
#-----
-----
200 1 201 1 202 1 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
-----
# PS 10: INAP LNP for Norway
#-----
-----
200 1 201 1 202 1 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
-----
# PS 11: INAP Prepaid Services InitialDP
#-----
-----
200 1 201 1 202 1 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
-----
# PS 12: INAP Prepaid Services ApplyChargingReport
#-----
-----
214 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
-----
# PS 13: INAP Prepaid Services EventReportBCSM
#-----
-----
217 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
-----
# PS 14: INAP LNP for Portugal
#-----
-----
200 1 201 1 202 1 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
-----
# PS 15: INAP CS1 InitialDP
#-----
-----
200 1 201 1 202 0 208 0 206 0 224 0 219 0 217 0 220 0
221 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
-----
# PS 16: INAP CS1 EventReportBCSM
#-----
-----
217 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
-----

```



```

# PS 17: INAP CS1 ApplyChargingReport
#-----
-----
      214 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0
#-----
-----
# PS 18: ANSI PRE AIN CNAM
# 23=generic name, 17=service key
#-----
-----
      23 1 17 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0
#####
$ReceivedResponse
#####
# All fields are pointers to records of other types
#
# F1 F2
# MR RA
#-----
-----
# RR 1: Customer 1 LNP / Generic LNP Default
#-----
-----
      0 1
#-----
-----
# RR 2: Customer 1 LNP 1st expected
#-----
-----
      1 2
#-----
-----
# RR 3: Generic LNP 1st expected
#-----
-----
      1 3
#-----
-----
# RR 4: Genesys 800 1st expected (Result)
#-----
-----
      2 6
#-----
-----
# RR 5: Genesys 800 2st expected (Error)
#-----
-----
      3 4
#-----
-----
# RR 6: ANSI AIN 800 With termination status notification
#-----
-----
      4 5

```

```

#-----
# RR 7: ANSI AIN 800
#-----
5 6

#-----
# RR 8: ANSI PRE AIN 800 With termination status notification
#-----
6 7

#-----
# RR 9: ANSI PRE AIN 800
#-----
7 8

#-----
# RR 10: ANSI AIN 800 / PRE AIN 800 Default
#-----
0 9

#-----
# RR 11: ANSI PRE AIN 800 With termination status notification SSN
#-----
6 10

#-----
# RR 12: CS1/INAP Based CLI Screening, Expected Response 1, End: Connect
#-----
8 11

#-----
# RR 13: CS1/INAP Based CLI Screening, Expected Response 2, End: ConnectToResource,
PlayAnnouncement
#-----
9 13

#-----
# RR 14: CS1/INAP Based CLI Screening, Expected Response 3, Conintue: ConnectToResource,
PlayAnnouncement
#-----
10 12

#-----
# RR 15: CS1/INAP Based CLI Screening, Expected Response 3, Conintue: ConnectToResource,
PlayAnnouncement

```

```
#-----  
-----  
0 13  
  
#-----  
-----  
# RR 16: INAP Free Phone, LNP & Carrier Pre-Selection Services, Expected Response 1, End:  
Connect  
#-----  
-----  
11 14  
  
#-----  
-----  
# RR 17: INAP LNP for Norway, Unexpected Response (default action)  
#-----  
-----  
0 15  
  
#-----  
-----  
# RR 18: INAP LNP for Norway, Expected Response (End, Connect)  
#-----  
-----  
12 16  
  
#-----  
-----  
# RR 19: INAP Prepaid Services, Unexpected Response (default action)  
#-----  
-----  
0 17  
  
#-----  
-----  
# RR 20: INAP Prepaid Services, Expected Response (Continue, Connect)  
#-----  
-----  
13 18  
  
#-----  
-----  
# RR 21: INAP Prepaid Services, Expected Response (Continue, ApplyCharging)  
#-----  
-----  
14 18  
  
#-----  
-----  
# RR 22: INAP Prepaid Services, Expected Response (Continue, ReleaseCall)  
#-----  
-----  
15 18  
  
#-----  
-----  
# RR 23: INAP Prepaid Services, Expected Response (Continue, Connect)  
#-----  
-----  
16 18  
  
#-----  
-----
```

```

# RR 24: INAP Prepaid Services, Expected Response (Continue, FurnishChargeInformation,
ReleaseCall)
#-----
-----
17 18

#-----
-----
# RR 25: INAP LNP for Portugal, Unexpected Response (default action)
#-----
-----
0 19

#-----
-----
# RR 26: INAP LNP for Portugal, Expected Response (Continue, Continue)
#-----
-----
18 20

#-----
-----
# RR 27: INAP LNP for Portugal, Expected Response (Continue, Connect)
#-----
-----
19 21

#-----
-----
# RR 28: INAP-Based Prepaid Services, Expected Response (End, Connect)
#-----
-----
20 18

#-----
-----
# RR 29: INAP CS1, Unexpected Response (default action)
#-----
-----
0 22

#-----
-----
# RR 30: INAP CS1, Expected Response (Continue, Connect, ApplyCharging,
SendChargingInformation,RequestReportBCSMEEvent, FurnishCharging)
#-----
-----
# MR RA
21 23

#-----
-----
# RR 31: INAP CS1, Expected Response (Continue, CollectInformation +
RequestReportBCSMEEvent)
#-----
-----
22 23

#-----
-----
# RR 32: INAP CS1, Expected Response (Continue, ReleaseCall)
#-----
-----
23 26

```

```

#-----
# RR 33: INAP CS1, Expected Response (Continue, RequestReportBCSMEEvent,
EstablishTemporaryConnection)
#-----
      24      24

#-----
# RR 34: INAP CS1, Expected Response (Continue, DisconnectForwardConnection)
#-----
      25      25

#-----
# RR 35: INAP CS1, Expected Response (Continue, CallGap - not treated, just ignore)
#-----
      0      27

#-----
# RR 36: INAP CS2, Expected Response (DL, SL, MCS,DFCwithArg,RRBE, ML, CWA)
#-----
      26      28

#-----
# RR 37: INAP CS2, Expected Response (CTR, PA,RRBE,CWA)
#-----
      27      29

#-----
# RR 38: INAP CS2, Expected Response (DFCwithArg, ML, CTR, PA, CWA, RRBE)
#-----
      28      30

#-----
# RR 39: INAP CS2, Expected Response (CWA,RRBE,CON,CTR,PA)
#-----
      29      31

#-----
# RR 40: ANSI PRE AIN CNAM Response expected, Take the same action as AIN
#-----
      30      32

#-----
# RR 41: ANSI PRE AIN CNAM Response unexpected
#-----
      0      32

#####
$MessageReceiving
#####

```

```

#
# F1  F2  F3  F4  F5  F6  F7  F8  F9  F10 F11 F12 F13 F14 F15 F16 F17 F18
# F19 F20 F21
# MSG OR1 REQ OR2 REQ OR3 REQ OR4 REQ OR5 REQ OR6 REQ OR7 REQ OR8 REQ OR9
# REQ OR10 REQ

#-----
# MR 1: Customer 1 LNP / Generic LNP
#-----
#-----
#      8   1   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
# 0     0   0
#-----
# MR 2: Genesys 800 (Result)
#-----
#-----
#      3   2   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
# 0     0   0
#-----
# MR 3: Genesys 800 (Error)
#-----
#-----
#      3   3   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
# 0     0   0
#-----
# MR 4: ANSI AIN 800 with termination status notification
#-----
#-----
#      8   4   1   5   1   0   0   0   0   0   0   0   0   0   0   0   0   0
# 0     0   0
#-----
# MR 5: ANSI AIN 800
#-----
#-----
#      8   4   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
# 0     0   0
#-----
# MR 6: ANSI PRE AIN 800 with termination status notification
#-----
#-----
#      8   6   1   7   1   0   0   0   0   0   0   0   0   0   0   0   0   0
# 0     0   0
#-----
# MR 7: ANSI PRE AIN 800
#-----
#-----
#      8   6   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
# 0     0   0
#-----
#-----

```

```

# MR 8: CS1/INAP Based CLI Screening, End Message w/ Connect
#-----
-----
  3   8   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0

#-----
-----
# MR 9: CS1/INAP Based CLI Screening, End Message w/ ConnectToResource, PlayAnnouncement
#-----
-----
  3   9   1  10   1   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0

#-----
-----
# MR 10: CS1/INAP Based CLI Screening, Continue Message w/ ConnectToResource,
PlayAnnouncement
#-----
-----
  2   9   1  10   1   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0

#-----
-----
# MR 11: INAP Free Phone, LNP & Carrier Pre-Selection Services, End Message w/ Connect
#-----
-----
  3  11   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0

#-----
-----
# MR 12: INAP LNP for Norway, Expected Response (End, Connect)
#-----
-----
  3  12   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0

#-----
-----
# MR 13: INAP Prepaid Services, Expected Response (Continue, Connect, ApplyCharging,
RequestReportBCSMEvent, FurnishCharging)
#-----
-----
  2  13   1  14   1  15   1  16   1   0   0   0   0   0   0   0   0   0
0   0   0

#-----
-----
# MR 14: INAP Prepaid Services, Expected Response (Continue, ApplyCharging)
#-----
-----
  2  14   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0

#-----
-----
# MR 15: INAP Prepaid Services, Expected Response (Continue, ReleaseCall)
#-----
-----
  2  17   1   0   0   0   0   0   0   0   0   0   0   0   0   0   0   0
0   0   0

```

```

#-----
# MR 16: INAP Prepaid Services, Expected Response (Continue, Connect)
#-----
2 13 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0

#-----
# MR 17: INAP Prepaid Services, Expected Response (Continue, ReleaseCall,
FurnishChargeInformation)
#-----
2 17 1 16 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0

#-----
# MR 18: INAP LNP for Portugal, Expected Response(Continue, Continue)
#-----
2 18 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0

#-----
# MR 19: INAP LNP for Portugal, Expected Response(Continue, Connect)
#-----
2 19 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0

#-----
# MR 20: INAP-Based Prepaid Services, Expected Response (End, Connect)
#-----
3 13 1 16 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0

#-----
# MR 21: INAP CS1 , Expected Response (Continue, Connect, ApplyCharging,
SendChargingInformation,RequestReportBCSMEEvent, FurnishCharging)
#-----
4 20 0 21 0 22 0 23 0 24 0 0 0 0 0 0 0 0
0 0 0

#-----
# MR 22: INAP CS1 , Expected Response (Continue, CollectInformation +
RequestReportBCSMEEvent)
#-----
4 26 1 27 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0

#-----
# MR 23: INAP CS1 , Expected Response (Continue, ReleaseCall or Continue and optional
RequestReportBCSMEEvent)

```



```

#-----
-----
  4   25  0  30  0  27  0  0  0  0  0  0  0  0  0  0  0  0
0   0  0
#-----
-----
# MR 24: INAP CS1 , Expected Response (RRBE, ETC, FCI)
#-----
-----
  4   23  0  28  1  24  0  0  0  0  0  0  0  0  0  0  0
0   0  0
#-----
-----
# MR 25: INAP CS1 , Expected Response (DFC, CONNECT, RRBE, FCI)
#-----
-----
  4   29  0  20  0  23  0  24  0  0  0  0  0  0  0  0  0
0   0  0
#-----
-----
# MR 26: INAP CS2 , Expected Response (DL, SL, MCS,DFCwithArg,RRBE, ML, CWA)
#-----
-----
  4   32  0  35  0  33  0  38  0  23  0  34  0  31  0  0  0  0
0   0
#-----
-----
# MR 27: INAP CS2 , Expected Response (CTR, PA,RRBE,CWA)
#-----
-----
  4   37  0  36  0  23  0  31  0  0  0  0  0  0  0  0  0
0   0  0
#-----
-----
# MR 28: INAP CS2 , Expected Response (DFCwithArg, ML, CTR, PA, CWA, RRBE)
#-----
-----
  4   38  0  34  0  37  0  36  0  31  0  23  0  0  0  0  0  0
0   0  0
#-----
-----
# MR 29: INAP CS2 , Expected Response (CWA,RRBE,CON,CTR,PA)
#-----
-----
  4   31  0  23  0  20  0  37  0  36  0  0  0  0  0  0  0  0
0   0  0
# 4   23  1  20  0  37  0  36  0  0  0  0  0  0  0  0  0
0   0  0
#-----
-----
# MR 30: ANSI PRE AIN CNAM , msg=response
#-----
-----
  8   39  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
0   0  0

```

```

#####
$OperationReceiving
#####
#
# F1          F2          F3          F4          F5          F6
# componentType opClass      opCodeFamily opCodeSpecifier opCodeFlag PR
#-----
# OR 1: Customer 1 LNP / Generic LNP
#-----
# 6          1          101         1          4          1
#-----
# OR 2: Genesys 800 (Result)
#-----
# 1          1          0          20         1          2
#-----
# OR 3: Genesys 800 (Error)
#-----
# 3          1          0          0          1          3
#-----
# OR 4: ANSI AIN 800
#-----
# 6          1          101         1          4          4
#-----
# OR 5: ANSI AIN 800 Request for status notification
#-----
# 6          1          103         5          4          5
#-----
# OR 6: ANSI PRE AIN 800
#-----
# 6          1          4          1          3          6
#-----
# OR 7: ANSI PRE AIN 800 Request for status notification
#-----
# 6          1          6          1          4          7
#-----
# OR 8: CS1/INAP Based CLI Screening Connect Operation
#-----
# 1          1          0          20         1          8
#-----
# OR 9: CS1/INAP Based CLI Screening ConnectToResource Operation
#-----
# 1          1          0          19         1          0
#-----
# OR 10: CS1/INAP Based CLI Screening PlayAnouncement Operation
#-----
# 1          1          0          47         1          9
#-----
# OR 11: INAP Free Phone, LNP & Carrier Pre-Selection Services Connect Operation
#-----
# 1          1          0          20         1          10
#-----
# OR 12: INAP LNP for Norway, Expected Response (Connect)

```

```

#-----
# 1          1          0          20          1          11
#-----
# OR 13: INAP Prepaid Services, Expected Response (Connect)
#-----
# 1          2          0          20          1          12
#-----
# OR 14: INAP Prepaid Services, Expected Response (ApplyCharging)
#-----
# 1          2          0          35          1          13
#-----
# OR 15: INAP Prepaid Services, Expected Response (RequestReportBCSMEvent)
#-----
# 1          2          0          23          1          14
#-----
# OR 16: INAP Prepaid Services, Expected Response (FurnishCharging)
#-----
# 1          2          0          34          1          15
#-----
# OR 17: INAP Prepaid Services, Expected Response (ReleaseCall)
#-----
# 1          2          0          22          1          16
#-----
# OR 18: INAP LNP for Portugal, Expected Response (Continue)
#-----
# 1          1          0          31          1          17
#-----
# OR 19: INAP LNP for Portugal, Expected Response (Connect)
#-----
# 1          1          0          20          1          18
#-----
# OR 20: INAP CS1 , Expected Response (Connect)
#-----
# componentType opClass      opCodeFamily opCodeSpecifier opCodeFlag PR
# 1              2              0              20              1          19
#-----
# OR 21: INAP CS1 , Expected Response (ApplyCharging)
#-----
# 1          2          0          35          1          20
#-----
# OR 22: INAP CS1 , Expected Response (SendChargingInformation)
#-----
# 1          2          0          46          1          21
#-----
# OR 23: INAP CS1 , Expected Response (RequestReportBCSMEvent)
#-----
# 1          2          0          23          1          22
#-----
# OR 24: INAP CS1, Expected Response (FurnishCharging)
#-----
# 1          2          0          34          1          23

```



```

# componentType opClass      opCodeFamily opCodeSpecifier opCodeFlag PR
# 1             2            0             47              1          32

#-----
# OR 37: INAP CS2, Expected Response (ConnectToResource operation)
#-----
# componentType opClass      opCodeFamily opCodeSpecifier opCodeFlag PR
# 1             2            0             19              1          33

#-----
# OR 38: INAP CS2, Expected Response (DFC With Argument operation)
#-----
# componentType opClass      opCodeFamily opCodeSpecifier opCodeFlag PR
# 1             2            0             86              1          34

#-----
# OR 39: ANSI PRE AIN CNAM
# componentType=Return result(last), opClass=2:only failure report
# opFamily=network management, opSpecifier=spec acg, opFlag=3:national
#-----
# 2             2            7             1              3          35

#####
$ParameterReceiving
#####
#
# F1  F2  F3  F4  F5  F6  F7  F8  F9  F10 F11 F12 F13 F14 F15 F16 F17 F18
# F19 F20 F21 F22 F23 F24 F25 F26 F27 F28 F29 F30 F31 F32 F33 F34 F35 F36
# F37 F38 F39 F40 F41 F42 F43 F44 F45
# PA1 REQ ACT PA2 REQ ACT PA3 REQ ACT PA4 REQ ACT PA5 REQ ACT PA6 REQ ACT
# PA7 REQ ACT PA8 REQ ACT PA9 REQ ACT PA10 REQ ACT PA11 REQ ACT PA12 REQ ACT
# PA13 REQ ACT PA14 REQ ACT PA15 REQ ACT

#-----
#-----
# PR 1: Customer 1 LNP / Generic LNP
#-----
#-----
# 102 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
# 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
# 0 0 0 0 0 0 0 0 0

#-----
#-----
# PR 2: Genesys 800 (Result)
#-----
#-----
# 205 1 1 206 1 1 204 1 3 0 0 0 0 0 0 0 0 0
# 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
# 0 0 0 0 0 0 0 0 0

#-----
#-----
# PR 3: Genesys 800 (Error)
#-----
#-----
#-----

```

```

    205 1 1 206 1 1 204 1 3 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

```

```

#-----
#-----
#-----

```

```
# PR 4: ANSI AIN 800 Result
```

```

#-----
#-----
#-----

```

```

    102 1 1 110 0 2 113 0 2 114 1 2 115 1 2 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

```

```

#-----
#-----
#-----

```

```
# PR 5: ANSI AIN 800 Status request
```

```

#-----
#-----
#-----

```

```

    105 1 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

```

```

#-----
#-----
#-----

```

```
# PR 6: ANSI PRE AIN 800 Result
```

```

#-----
#-----
#-----

```

```

    8 0 2 4 1 1 18 0 2 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

```

```

#-----
#-----
#-----

```

```
# PR 7: ANSI PRE AIN 800 Status request
```

```

#-----
#-----
#-----

```

```

    20 1 4 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

```

```

#-----
#-----
#-----

```

```
# PR 8: CS1/INAP Based CLI Screening Connect Parameters
```

```

#-----
#-----
#-----

```

```

    205 1 1 208 0 1 210 0 1 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

```

```

#-----
#-----
#-----

```

```
# PR 9: CS1/INAP Based CLI Screening PlayAnnouncement Parameters
```



```

#-----
#-----
# PR 15: INAP Prepaid Services FurnishCharging Parameters
#-----
#-----
215 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
#-----
#-----
# PR 16: INAP Prepaid Services ReleaseCall Parameters
#-----
#-----
218 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
#-----
#-----
# PR 17: INAP LNP for Portugal Continue Parameters
#-----
#-----
0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
#-----
#-----
# PR 18: INAP LNP for Portugal Connect Parameters
#-----
#-----
205 1 1 210 1 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
#-----
#-----
# PR 19: INAP CS1 Connect Parameters
#-----
#-----
205 1 1 225 0 2 206 0 1 220 0 1 221 0 1 207 0 1
210 0 1 208 0 1 243 0 1 244 0 1 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0
#-----
#-----
# PR 20: INAP CS1 ApplyCharging Parameters
#-----
#-----

```



```

211 1 1 212 0 1 213 0 1 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

```

```

#-----
#-----

```

```

# PR 21: INAP CS1 SendChargingInformation Parameters
#-----
#-----

```

```

222 1 1 226 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

```

```

#-----
#-----

```

```

# PR 22: INAP CS1 RequestReportBCSMEvent Parameters
#-----
#-----

```

```

216 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

```

```

#-----
#-----

```

```

# PR 23: INAP CS1 FurnishCharging Parameters
#-----
#-----

```

```

215 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

```

```

#-----
#-----

```

```

# PR 24: INAP CS1 ReleaseCall Parameters
#-----
#-----

```

```

218 1 1 245 0 1 246 0 1 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

```

```

#-----
#-----

```

```

# PR 25: INAP CS1 RequestReportBCSMEvent Parameters
#-----
#-----

```

```

216 1 1 247 0 1 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

```

```

#-----
#-----

```

```

# PR 26: INAP CS1 Etc(Establish temporary connection) , Parameter

```

```

# ParameterAssistingSSPIPRoutingAddress, ServiceInteractionIndicators,
ItuAsn1EtcLegIDElem, ItuAsn1EtcCallSegmentIDElem, ItuAsn1EtcCarrierElem
#-----
-----
223 1 1 207 0 1 253 0 1 254 0 1 229 0 1 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

#-----
-----
# PR 27: INAP CS2 ContinueWithArgument parameters(ItuAsn1CwaLegIDElem)
#-----
-----
236 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

#-----
-----
# PR 28: INAP CS2 DisconnectLeg
Parameters (ItuAsn1DlLegToBeReleasedElem/ITU_ASN1_DL_LEG_TO_BE_RELEASED,
ItuAsn1DlCauseElem/ITU_ASN1_DL_CAUSE)
#-----
-----
234 1 1 235 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

#-----
-----
# PR 29: INAP CS2 MergeCallSegments Parameters(SourceCallSegment, TargetCallSegment)
#-----
-----
237 1 1 238 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

#-----
-----
# PR 30: INAP CS2 MoveLeg Parameters(CallSegmentId, LegId)
#-----
-----
241 1 1 242 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

#-----
-----
# PR 31: INAP CS2 SplitLeg Parameters(CallSegmentId ,LegId)
#-----
-----

```

```

239 1 1 240 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

#-----
#-----
# PR 32: INAP CS1 PlayAnnouncement(InformationToSend, RequestAnnouncementComplete, LegId
CallSegmentId)
#-----
#-----
248 1 1 249 0 1 263 0 1 264 0 1 250 0 1 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

#-----
#-----
# PR 33: INAP CS1 ConnectToResource Parameters(serviceInteractionIndicator,
ResourceAddress, )
#-----
#-----
233 0 1 257 0 1 258 0 1 259 0 1 260 0 1 261 0 1
262 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

#-----
#-----
# PR 34: INAP CS1 DFC With Argument Parameters(dfcc legId or DFC callsegment id, party to
disconnect)
#-----
#-----
255 0 1 256 0 1 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0

#-----
#-----
# PR 35: ANSI PRE AIN CNAM Result
# 23=GenericName(copy to CC), 8=carrier, 4=routing number, 18=billing indicators
#-----
#-----
23 0 2 8 0 2 4 0 1 18 0 2 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0

#####
$ResponseAction
#####
#
# F1 F2 F3 F4 F5 F6 F7 F8 F9 F10 F11 F12 F13 F14 F15
# ACT1 REQ DAT ACT2 REQ DAT ACT3 REQ DAT ACT4 REQ DAT ACT5 REQ DAT

#-----
# RA 1: Customer 1 LNP Default & Generic LNP Default
#-----
#-----
4 1 2 0 0 0 0 0 0 0 0 0 0 0 0 0

#-----
# RA 2: Customer 1 LNP 1st Expected

```

```

#-----
 4  1  2  0  0  0  0  0  0  0  0  0  0  0  0
#-----
# RA 3: Generic LNP 1st Expected
#-----
 1  1  0  4  1  2  0  0  0  0  0  0  0  0  0
#-----
# RA 4: Genesys (Error)
#-----
 0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
#-----
# RA 5: ANSI AIN 800 with termination status notification
#-----
 2  0  1  4  1  3  0  0  0  0  0  0  0  0  0
#-----
# RA 6: Genesys & ANSI AIN AIN 800
#-----
 4  1  3  0  0  0  0  0  0  0  0  0  0  0  0
#-----
# RA 7: ANSI PRE AIN 800 with termination status notification
#-----
 2  0  4  4  1  3  0  0  0  0  0  0  0  0  0
#-----
# RA 8: ANSI PRE AIN 800
#-----
 4  1  3  0  0  0  0  0  0  0  0  0  0  0  0
#-----
# RA 9: 800 Default
#-----
 4  1  3  0  0  0  0  0  0  0  0  0  0  0  0
#-----
# RA 10: ANSI PRE AIN 800 with termination status notification SSN
#-----
 2  0  5  4  1  3  0  0  0  0  0  0  0  0  0
#-----
# RA 11: CS1/INAP Based CLI Screening, Connect reponse actions
#-----
 4  1  6  0  0  0  0  0  0  0  0  0  0  0  0
#-----
# RA 12: CS1/INAP Based CLI Screening, Continue PlayAnnouncement reponse actions
#-----
 7  1  7  7  1  8  6  1  9  6  1  10  6  1  11
#-----
# RA 13: CS1/INAP Based CLI Screening, End PlayAnnouncement reponse actions
#-----
 4  1  12 0  0  0  0  0  0  0  0  0  0  0  0
#-----
# RA 14: INAP Free Phone, LNP & Carrier Pre-Selection Services, Connect reponse actions
#-----
 4  1  13 0  0  0  0  0  0  0  0  0  0  0  0
#-----

```

```

# RA 15: INAP LNP for Norway, Unexpected Response
#-----
 4   1   14   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 16: INAP LNP for Norway, Expected Response
#-----
 4   1   15   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 17: INAP Prepaid Services, Unexpected Response
#-----
 4   1   14   8   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 18: INAP Prepaid Services, Expected Response
#-----
 4   1   16   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 19: INAP LNP for Portugal, Unexpected Response
#-----
 4   1   14   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 20: INAP LNP for Portugal, Expected Response
#-----
 4   1   17   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 21: INAP LNP for Portugal, Expected Response
#-----
 4   1   18   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 22: INAP CS1, Unexpected Response
#-----
 4   1   19   8   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 23: INAP CS1, Expected Response
#-----
 4   1   20   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 24: INAP CS1, Expected Response(Continue,EstablishTempConnection, re-trigger)
#-----
 4   1   20   2   1   21   0   0   0   0   0   0   0   0   0
#-----
# RA 25: INAP CS1, Expected Response(Continue,DisconnectForwardConnection, re-trigger)
#-----
 4   1   20   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 26: INAP CS1, Expected Response (In Release)
#-----
 4   1   20   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 27: INAP CS1, Expected Response (No action - ignoring call gap response )
#-----
 0   0   0   0   0   0   0   0   0   0   0   0   0   0   0

```

```

#-----
# RA 28: INAP CS2, Expected Response(DL, SL, MCS,DFCwithArg,RRBE, ML, CWA)
#-----
 4   1   20   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 29: INAP CS2, Expected Response(CTR,PA,RRBE,CWA)
#-----
 4   1   20   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 30: INAP CS2, Expected Response(DFCwithArg, ML, CTR, PA, CWA, RRBE)
#-----
 4   1   20   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 31: INAP CS2, Expected Response(RRBE,CON,CTR,PA)
#-----
 4   1   20   0   0   0   0   0   0   0   0   0   0   0   0
#-----
# RA 32: CNAM ( send action to LCM )
#-----
 4   1   23   0   0   0   0   0   0   0   0   0   0   0   0

#####
$ActionData
#####
#
# F1   F2   F3   F4   F5
#-----

# AD 1: ANSI AIN 800 Data for RESULT_ACTION_RE_TRIGGER_VIA_LCM (to send termination
information)
# Trg Pic   Null Null Null
#-----
 7   13   0   0   0

# AD 2: ANSI LNP Data for RESULT_ACTION_SEND_ACTION_TO_LCM
# Act Null Null Null NULL
#-----
 1   0   0   0   0

# AD 3: ANSI AIN / PRE AIN 800 Data for RESULT_ACTION_SEND_ACTION_TO_LCM
# Act Null Null Null NULL
#-----
 2   0   0   0   0

# AD 4: ANSI PRE AIN 800 Data for RESULT_ACTION_RE_TRIGGER_VIA_LCM (to send termination
information)
# Trg Pic   Null Null Null
#-----
 9   13   0   0   0

# AD 5: ANSI PRE AIN 800 Data for RESULT_ACTION_RE_TRIGGER_VIA_LCM (to send termination
information) SSN
# Trg Pic   Null Null Null
#-----
11   13   0   0   0

# AD 6: CS1/INAP Based CLI Screening Data for RESULT_ACTION_SEND_ACTION_TO_LCM information
# Act Null Null Null Null

```

```

#-----
3 0 0 0 0

# AD 7: CS1/INAP Based CLI Screening Data for RESULT_ACTION_RE_TRIGGER_VIA_LCM_COND
information
# Cond Param Val Trg Pic
#-----
2 209 1 13 10

# AD 8: CS1/INAP Based CLI Screening Data for RESULT_ACTION_RE_TRIGGER_VIA_LCM_COND
information
# Cond Param Trg Pic Null
#-----
0 209 13 10 0

# AD 9: CS1/INAP Based CLI Screening Data for RESULT_ACTION_SEND_ACTION_TO_LCM_COND
information
# Cond Param Val Act Null
#-----
2 209 1 4 0

# AD 11: CS1/INAP Based CLI Screening Data for RESULT_ACTION_SEND_ACTION_TO_LCM_COND
information
# Cond Param Act Null Null
#-----
0 209 4 0 0

# AD 11: CS1/INAP Based CLI Screening Data for RESULT_ACTION_SEND_ACTION_TO_LCM_COND
information
# Cond Param Val Act Null
#-----
2 209 0 5 0

# AD 12: CS1/INAP Based CLI Screening Data for RESULT_ACTION_SEND_ACTION_TO_LCM information
# Act Null Null Null Null
#-----
5 0 0 0 0

# AD 13: INAP Free Phone, LNP & Carrier Pre-Selection Services Data for
RESULT_ACTION_SEND_ACTION_TO_LCM information
# Act Null Null Null Null
#-----
3 0 0 0 0

# AD 14: INAP LNP for Norway Data for RESULT_ACTION_SEND_ACTION_TO_LCM information
(IN_RELEASE)
# Act Null Null Null Null
#-----
5 0 0 0 0

# AD 15: INAP LNP for Norway Data for RESULT_ACTION_SEND_ACTION_TO_LCM information
(IN_ROUTE)
# Act Null Null Null Null
#-----
3 0 0 0 0

# AD 16: INAP Prepaid Services Data for RESULT_ACTION_SEND_ACTION_TO_LCM information
(IN_PREPAID)
# Act Null Null Null Null
#-----
6 0 0 0 0

# AD 17: INAP LNP for Portugal Data for RESULT_ACTION_SEND_ACTION_TO_LCM information
(IN_NONE)

```

```

# Act  Null Null Null Null
#-----
  0   0   0   0   0

# AD 18: INAP LNP for Portugal Data for RESULT_ACTION_SEND_ACTION_TO_LCM information
(IN_ROUTE)
# Act  Null Null Null Null
#-----
  3   0   0   0   0

# AD 19: INAP CS1 Data for RESULT_ACTION_SEND_ACTION_TO_LCM information (IN_RELEASE)
# Act  Null Null Null Null
#-----
  5   0   0   0   0

# AD 20: INAP CS1 Data for RESULT_ACTION_SEND_ACTION_TO_LCM information (IN_INAP CS1)
# Act  Null Null Null Null
#-----
  7   0   0   0   0

# AD 21: INAP CS1 Data for RESULT_ACTION_RE_TRIGGER_VIA_LCM(Trigger26,PIC-Now)
# Act  Null Null Null Null
#-----
 26   10   0   0   0

# AD 22: INAP CS1 Data for RESULT_ACTION_RE_TRIGGER_VIA_LCM(Trigger24,PIC-Now)
# Act  Null Null Null Null
#-----
 24   10   0   0   0

# AD 23: ANSI PRE AIN CNAM Data for RESULT_ACTION_SEND_ACTION_TO_LCM information
(IN_CNAM)
# Act  Null Null Null Null
#-----
 30   0   0   0   0

```

This completes the SCP configuration. Continue to the next section to initialize the call-screening database. If you have questions or need assistance, see the [“Obtaining Documentation and Submitting a Service Request”](#) section on page x.

Initializing the Call Screening Database

This section contains the following topics:

- [.odbc.ini File Information, page 4-89](#)
- [Setting Up Replication, page 4-89](#)
- [Troubleshooting the Main Memory Database Replication, page 4-93](#)



Caution

Cisco does not support the direct use of TimesTen commands (files found in `/opt/TimesTen/32/bin`). Incorrect use of these commands can cause database corruption.

During installation, the installation script (`install.sh`) installs and initializes the Main Memory Database (MMDB) that the Cisco PGW 2200 Softswitch can use for the following:

- Store call-screening information for calling- and called-number analysis

- Ported Numbers
- Number Termination
- Multiple Dial Plan
- Advice of Charge II

You might want to perform white and black list screening to include or exclude calls from certain numbers. You can provision white lists that specify allowed A-numbers (calling numbers) or B-numbers (called numbers). Black lists block specified A-numbers (calling numbers) or B-numbers (called numbers). For more details, see the *Cisco PGW 2200 Softswitch Release 9.8 Dial Plan Guide*.

The call screening database is stored in the `/opt/TimesTen/datastore` directory. The database name is **howdydb**. The maximum database size, 256 MB, is specified in the `.odbc.ini` file shown in the [.odbc.ini File Information](#) section, below.



Caution

Do not change the database name.

.odbc.ini File Information

The `.odbc.ini` file specifies the location of the database storage. Unless you installed the software to other than the default directory, the `.odbc.ini` file is located in the `/opt/CiscoMGC/local` directory. The following is an example of an `.odbc.ini` file:

```
[ODBC Data Sources]
howdydb=TimesTen 4.1 Driver
[howdydb]
Driver=/opt/TimesTen4.1/32/lib/libtten.so
DataStore= /opt/TimesTen4.1/datastore/howdydb
DurableCommits=0
ExclAccess=0
ThreadSafe=1
WaitForConnect=0
Size=256
[ODBC]
Trace=0
TraceFile=
InstallDir=/opt/TimesTen4.1/32
```

Setting Up Replication

If you have two Cisco PGW 2200 Softswitch hosts in a fault tolerant system, you must set up database replication between the two hosts. During replication, any updates applied to the database on one host are replicated on the other. Data is transferred real time and does not require committing or deploying a configuration.

Replication copies data changes to either database after the initial setup. If you have data in one database and want to retain it, go to the host that has the data that you want to retain (usually this is the active host), then follow the procedures below, “[Initializing Database Replication](#)” section on page 4-91.



Note

Before you can initialize the databases, you must install the Cisco PGW 2200 Softswitch software on both machines.

Network Requirements

In most replication schemes, you need to identify the name of the host machine on which your data store resides. The operating system translates this host name to an IP address. This section describes how to configure your host names to ensure they use the correct IP addresses.

Identifying data store hosts (UNIX and VxWorks)

If your Unix or VxWorks host has a single IP address and hostname, you can use the host name returned by the `hostname` command on UNIX or the `hostname()` call on VxWorks. If a host contains multiple network interfaces (with different IP addresses), TimesTen replication tries to connect to the IP address in the same order as returned by the `gethostbyname()` call on UNIX or the `hostGetByName()` call on VxWorks. It will try to connect using the first address; if a connection cannot be established, it tries the remaining addresses in order until a connection is established. TimesTen replication uses this same sequence each time it establishes a new connection to a host. If a connection to a host fails on one IP address, TimesTen replication attempts to re-connect (or fall back) to another IP address for the host in the same manner described above.

There are two basic ways you can configure a host to use multiple IP addresses on UNIX platforms: DNS or `/etc/hosts` files. On VxWorks platforms you use the `hostAdd()` call. For example, the following entry in the `/etc/hosts` file on a UNIX platform describes a server named `Machine1` with two Ethernet IP addresses:

```
10.10.98.102 Machine1
192.168.1.102 Machine1
```

To specify the same configuration for DNS, your entry in the domain zone file would look like:

```
Machine1 IN A 10.10.98.102
IN A 192.168.1.102
```

In either case, you only need to specify `Machine1` as the hostname in your replication scheme and replication will use the first available IP address when establishing a connection. In an environment in which multiple IP addresses are used, you can also assign multiple host names to a single IP address in order to restrict a replication connection to a specific IP address. For example, you might have an entry in your `/etc/hosts` file that looks like:

```
10.10.98.102 Machine1
192.168.1.102 Machine1 RepMachine1
```

Or a DNS zone file that looks like:

```
Machine1 IN A 10.10.98.102
IN A 192.168.1.102
RepMachine1 IN A 192.168.1.102
```

Should you want to restrict replication connections to IP address `192.169.1.102` for this host, you can specify `RepMachine1` as the hostname in your replication scheme. (Another option is to simply specify the IP address as the hostname in the `CREATE REPLICATION` statement used to configure your replication scheme.)

The following are example hosts files from an active Cisco PGW 2200 Softswitch host and an associated peer Cisco PGW 2200 Softswitch host:

Active Cisco PGW 2200 Softswitch Host `/etc/hosts`

```
27.0.0.1 localhost
192.168.11.1 UK-A-Netra1125-1 loghost
192.168.12.1 UK-A-Netra1125-1.hme1
```

```
192.168.11.2 UK-A-Netra1125-2
192.168.12.2 UK-A-Netra1125-2.hme1 UK-A-Netra1125-2 <----- Peer PGW hostname
```

Peer Cisco PGW 2200 Softswitch Host /etc/hosts

```
127.0.0.1 localhost
192.168.11.2 UK-A-Netra1125-2 loghost
192.168.12.2 UK-A-Netra1125-2.hme1
192.168.11.1 UK-A-Netra1125-1 1
192.168.12.1 UK-A-Netra1125-1.hme1 UK-A-Netra1125-1 <----- Peer PGW hostname
```

Initializing Database Replication

To set up the initial replication, perform the following steps:

Step 1 Log in to the active host as **mgcur** and enter the following command:

```
% setup_replication.sh standbyhost active
```

Where *standbyhost* is the name (not IP address) of your standby host. In the example below, the active host is *hostx* and the standby host is *hosty*.



Caution

Do not use IP addresses when setting up database replication. If you do, replication will fail.



Note

If the machine on which the Cisco PGW 2200 Softswitch software is installed has several different names, make sure the argument that you supply to the `setup_replication.sh` script matches the output of the Unix command `hostname`.

Example 4-1 Initializing Database Replication on the Active Host

```
hostx% setup_replication.sh hosty active

Setting up replication to node hosty for DSN howdydb
Adding cisco.whitelist_a
Adding cisco.blacklist_a
Adding cisco.whitelist_b
Adding cisco.blacklist_b
Adding cisco.portednumbers
Adding cisco.numberterm
RAM Residence Policy           : inUse
RAM Residence Grace (Secs)     : 0
Manually Loaded In Ram         : False
Purge Logs for Data Store      : True
Logging Enabled                 : True
Replication Manually Started   : True
```

Step 2 Log in to the standby host as the root user and stop the Cisco PGW 2200 Softswitch software by entering the following UNIX command:

```
# /etc/init.d/CiscoMGC stop
```

Step 3 Log back in to the standby host as **mgcur**.

Step 4 At the standby host, enter the following command:

```
% setup_replication.sh activehost standby
```

where *activehost* is the name (not IP address) of your active host. In the example below, the active host is *hostx* and the standby host is *hosty*.

**Caution**

Do not use IP addresses when setting up database replication. If you do, replication will fail.

Example 4-2 Initializing Database Replication on the Standby Host

```
Configuring replication for DSN=howdydb
Restoring file /opt/TimesTen4.1/datastore/howdydb.ds0 from backup
Restoring file /opt/TimesTen4.1/datastore/howdydb.log0 from backup
RAM Residence Policy           :inUse
Manually Loaded In Ram        :False
Replication Agent Policy      :manual
Replication Manually Started  :True
Oracle Agent Policy           :manual
Oracle Agent Manually Started :False
Replication setup completed.
```

**Note**

If the replication setup on the standby host fails, you must run `delete_replication.sh` on both active and standby hosts. Then change the value of the `TTREPPORT` variable from 2890 to 2891 in the `setup_replication.sh` script on both active and standby hosts and save your changes. Perform the whole procedure again.

Step 5 Start the both active and standby Cisco PGW 2200 Softswitch as root:

```
# /etc/init.d/CiscoMGC start
```

Proceed to [“Verifying Database Replication”](#).

Verifying Database Replication

To verify that replication is working, perform the following steps:

Step 1 Log in to the active host and start an MML session by entering **mml**.

Step 2 Add a test entry into the B white list database using the following MML command.

```
hostx mml>numan-add:bwhite:custgrpId="1111",svcname="testsvc",cli="9998"
```

Text similar to the following is displayed:

```
MGC-01 - Media Gateway Controller 2009-10-19 07:43:22.164 CST
M  COMPLD
   "bwhite"
;
```

Step 3 Log in to the standby host and start an MML session by entering **mml**.

Step 4 Enter the following MML command to verify that the *bwhite* component you added on the active host in Step 2 was replicated to the database on the standby host.

```
hosty mml>numan-rtrv:bwhite:custgrpId="1111",svcname="testsvc",cli="9998"
```

Text similar to the following is displayed:

```
MGC-01 - Media Gateway Controller 2009-10-19 07:48:24.128 CST
M RTRV
  "session=ver20091019:bwhite"
  /* The cli :9998: exists. */
  ;
```

Step 5 Log in to the active host and delete the test entry using the following MML command.

```
hostx mml>numan-dlt:bwhite:custgrpId="1111",svcname="testsvc",cli="9998"
```

Text similar to the following is displayed:

```
MGC-01 - Media Gateway Controller 2009-10-19 08:03:22.994 CST
M COMPLD
  "bwhite"
  ;
```

Step 6 Log in to the standby host and start an MML session by entering **mml**.

Step 7 Enter the following MML command to verify that the entry you deleted in Step 5 was also deleted in the database on the standby host.

```
hosty mml>numan-rtrv:bwhite:custgrpId="1111",svcname="testsvc",cli="9998"
```

Text similar to the following is displayed:

```
MGC-01 - Media Gateway Controller 2009-10-19 08:04:19.391 CST
M RTRV
  "session=ver20091019:bwhite"
  /* The cli :9998: does not exists. */
  ;
```

Troubleshooting the Main Memory Database Replication

If you have problems during replication, try stopping and restarting the replication as follows:

Step 1 Stop the replication by entering:

```
# /etc/init.d/ttreplic stop
```

Step 2 Restart the replication by entering:

```
# /etc/init.d/ttreplic start
```

Displaying the Main Memory Database Replication Status

The script **replication_status.sh** displays the status of the MMDB replication, if it is configured.

Run the script by typing the following command:

```
% ./replication_status.sh
```

The output shows the following replication status:

```
Peer name           Host name           Port   State   Proto
-----
```

HOWDYDB	VA-DEALE	Auto	Start	5	
Last Msg Sent	Last Msg Recv	Latency	TPS	RecordsPS	Logs
-----	-----	-----	-----	-----	-----
-	-	-1.00	-1	-1	1

**Note**

If the value for Last Msg Recv is more than a few seconds, or Logs is more than 1, then this indicates that replication is not occurring.

Verifying Database Synchronization

The script `db_count.sh` provides the number of records configured in each of the database tables. This is useful for checking whether two machines have the same database data configured in them.

Run the script by typing the following command:

```
% ./db_count.sh
```

The output shows the rows counted in each database table:

Counting the rows in each database table.

```
CISCO.ANNOUNCEMENT < 0 >
CISCO.A_CHARGE_ORIGIN < 0 >
CISCO.A_NUMBERDIALPLANSELECTION < 0 >
CISCO.BLACKLIST_A < 0 >
CISCO.BLACKLIST_B < 0 >
CISCO.CBBOOKINGINFO < 0 >
CISCO.CBMONITORINGINFO < 0 >
CISCO.CLIIADDRESS < 0 >
CISCO.CLIPREFIX < 0 >
CISCO.FULLNUMBERTRANSLATION < 0 >
CISCO.H323IDDIVFROM < 0 >
CISCO.LIENTRIES < 0 >
CISCO.NUMBERTERM < 0 >
CISCO.PORTEDENUMBERS < 0 >
CISCO.SCRIPT < 0 >
CISCO.WHITELIST_A < 0 >
CISCO.WHITELIST_B < 0 >
```

Synchronizing Databases

If you have data in the databases in the active and standby hosts, but both databases are out of sync or do not match, re-synchronize both databases by following the steps listed below. Otherwise, contact Cisco TAC for assistance in merging the databases.

Assuming the active host is the "better" database, do the following on the standby host:

-
- Step 1** Log in as `root`.
 - Step 2** Stop the Cisco PGW 2200 Softswitch software by entering the following command:


```
# /etc/init.d/CiscoMGC stop
```
 - Step 3** Stop MMDB replication by entering the following command:


```
# /etc/init.d/ttreplic stop
```

- Step 4** Copy the active host database to the standby host database by entering the following command as mgcsr:
- ```
% setup_replication <active host> standby
```
- Step 5** Start the Cisco PGW 2200 Softswitch by entering the following command:
- ```
# /etc/init.d/CiscoMGC start
```
-

Checking for Installation Errors

If you still have problems, retry the commands listed in the “[Verifying Database Replication](#)” section on [page 4-92](#). If your output differs from the example in that section, or if you suspect problems or errors in the database installation, try the following:

- Step 1** Ensure that the database is installed in the /opt/TimesTen directory.
- Step 2** Check the log file for installation errors. (The log file is in the directory /var/adm/MGC_install.log.)
-

Reinstalling CSCOGa002

If you experience database errors such as an incorrect timestamp after completing the “[Checking for Installation Errors](#)” section on [page 4-95](#), you need to reinstall the CSCOGa002 package, which contains the Cisco PGW 2200 Softswitch database components. Follow these steps to reinstall the CSCOGa002 package:

- Step 1** Remove the CSCOGa002 package as root using the **pkgrm** command. To remove the package file, enter the following command:
- ```
pkgrm CSCOGa002
```
- Step 2** Reinstall the package using the **pkgadd** command by entering the following command:
- ```
# pkgadd -d CSCOGa002.pkg
```
-

This completes the CSCOGa002 package installation. If you have questions or need assistance, see the “[Obtaining Documentation and Submitting a Service Request](#)” section on [page x](#). If you do not need to install or remove patches, proceed to configure your Cisco SLTs.

Configuring Cisco ITP-Ls



Note

For configuration information, refer to the document *Cisco IP Transfer Point - LinkExtender* and the *Release Notes for Cisco PGW 2200 Softswitch Release 9.8(1)*.

Configuring Disk Monitor During Initial Software Configuration

The setting of the disk monitor parameters in the XECfgParm.dat file typically occurs while you are performing the initial configuration procedures for your Cisco PGW 2200 Softswitch software. To configure the disk monitor settings in the XECfgParm.dat file during initial software configuration, perform the following steps:

-
- Step 1** While configuring your settings in the XECfgParm.dat file, find the disk monitor parameters in the file (they are near the end of the file).
 - Step 2** To change the number of days to preserve logged data before trimming is initiated, modify the value of the diskmonitor.Limit parameter. The default value is 7.
 - Step 3** To change the list of optional file systems that are checked by the disk monitor script, modify the value of the diskmonitor.OptFileSys parameter.



Note Files in optional directories are not trimmed by disk monitor.

- Step 4** To change the percentage of disk usage at which alarming and disk trimming is initiated, modify the value of the diskmonitor.Threshold parameter. The default value is 80.
- Step 5** To change the number of days that finished CDR files are kept in the log directory, modify the value of the diskmonitor.CdrRmFinished parameter. The default value is 0, which means that finished CDRs are immediately sent to the spool directory.
- Step 6** If you want to change what action is taken once the number of days threshold set in the diskmonitor.Limit parameter is reached, change the value of the diskmonitor.SoftLimit parameter. If this parameter is set to *true*, disk monitor decrements the value in the diskmonitor.Limit parameter one day at a time (that is, from 7 down to 6 then down to 5 and so on), until the utilization level drops below the threshold. If this parameter is set to *false*, disk monitor exits and the system generates a DISK alarm. The default value is true.
- Step 7** To change the number of days that core dump files are kept in the log directory, modify the value of the diskmonitor.CoreRmDays parameter. The default value is 1, which means that core dump files are kept for one day before disk monitor removes them automatically.
- Step 8** You can control the maximum number of configurations that can be stored in the configuration library using the diskmonitor.CfgRmDirs parameter. The valid values are the range of integers from 3 through 64. The default value is 64. This parameter is not present in the XECfgParm.dat file initially. If you want to modify the value, you must enter the parameter manually into the file.



Note If you want to ensure the proper functioning of the **prov-sync** MML command, set this parameter to a value between 50 and 60.



Note Entering a value outside of the range of valid values (3 through 64) disables monitoring of the number of entries stored in the configuration library.

- Step 9** Save your changes.
-

This completes the procedures for configuring disk space monitoring. If you have questions or need assistance, see the “[Obtaining Documentation and Submitting a Service Request](#)” section on page x.

Configuring the Data Dumper

The data dumper is a Cisco PGW 2200 Softswitch software function that controls the destinations for active and archived log files for CDRs, measurements, and alarms, and controls when the active files are archived. The data dumper runs automatically and works correctly with a default configuration. However, you can customize the dumper settings by editing the **dmprSink.dat** file.

The following is an example of the contents of the dmprSink.dat file:

```
"callDetail" bin "cdr" "../var/log" "../var/spool" 1000 0 15
"measReport" csv "meas" "../var/log" "../var/spool" 500 0 15
"almState" csv "alm" "../var/log" "../var/spool" 500 0 15
```

Table 4-9 lists the fields that can be modified depending on your needs.

Table 4-9 Dumper Sink Log File Parameters

Field Name	Default Value	Description
maxRecs	1000	The maximum number of records a file can contain before it is flushed or moved to the spool area. If this value is set to 0, the number of records is unlimited. You can improve system performance by increasing the value of this record to a larger value, such as 50000. This results in fewer log record files being generated during periods of high call volume.
maxSize	0	The maximum size of the file in Kb before it is moved to the spool area. If this value is set to 0, the size of the file is limited only by the disk space available.
maxTime	15	The maximum time, in minutes, the file is allowed to remain open, before it is flushed or moved to the spool area. If there is no data in the file, it will not be flushed when the time limit expires. If this value is set to 0, there is no time limit.
		Note One or more of the above fields <i>must</i> be set to a value other than zero (0) for each record in the dmprSink.dat file.



Caution Do not modify or change any of the following log file configuration values.

recordFormat	csv	The translation of the records being placed in the capture file. Valid values are csv (comma-separated values) or bin (binary).
logDirectory	/var/log	The directory where the current dumper logs reside.
logSpoolDir	/var/spool	The directory to which historic logs are copied after being closed.

To configure the **dmprSink.dat** file fields, use the following procedure:

-
- Step 1** Log into a Cisco PGW 2200 Softswitch as **root** if you are not already logged in.
- Step 2** Change to the `/opt/CiscoMGC/etc` directory by entering the following UNIX command:
- ```
cd /opt/CiscoMGC/etc
```
- Step 3** Use a text editor, such as `vi`, to open and edit the **dmprSink.dat** file fields you want to change.



**Note** If you are going to use the Cisco BAMS to collect CDRs, proceed to the [“Configuring the Data Dumper to Support Cisco BAMS”](#) section on page 4-98, for information on how to configure the data dumper to support Cisco BAMS.

---

- Step 4** Save your changes and exit the text editor.
- Step 5** Change to the `/opt/CiscoMGC/etc/CONFIG_LIB/new` directory by entering the following UNIX command:
- ```
# cd /opt/CiscoMGC/etc/CONFIG_LIB/new
```
- Step 6** Stop and start the standby host.
- Step 7** Perform `sw-over` on the active host.
- Step 8** Stop and start the newly-standby host (formerly active host).
- Step 9** Repeat [Step 3](#) and [Step 4](#) for the version of `dmprSink.dat` stored in this directory.
- Step 10** Change to the `/opt/CiscoMGC/etc/active_link` directory by entering the following UNIX command:
- ```
cd /opt/CiscoMGC/etc/active_link/
```
- Step 11** Repeat [Step 3](#) and [Step 4](#) for the version of `dmprSink.dat` stored in this directory.
- Step 12** Repeat [Step 1](#) through [Step 10](#) on this second Cisco PGW 2200 Softswitch if your system is equipped with a second Cisco PGW 2200 Softswitch.
- 

This completes the procedures for configuring the data dumper. If your system uses BAMS, continue to the [“Configuring the Data Dumper to Support Cisco BAMS”](#) section on page 4-98. If you have questions or need assistance, see the [“Obtaining Documentation and Submitting a Service Request”](#) section on page x.

## Configuring the Data Dumper to Support Cisco BAMS

If your system will use Cisco BAMS to retrieve CDRs from the Cisco PGW 2200 Softswitch, perform the following procedure to configure the data dumper to support Cisco BAMS:

- 
- Step 1** Log into a Cisco PGW 2200 Softswitch as **root** if you are not already logged in.
- Step 2** Change to the `/opt/CiscoMGC/etc` directory by entering the following UNIX command:
- ```
# cd /opt/CiscoMGC/etc
```
- Step 3** Use a text editor, such as `vi`, to open and edit the **dmprSink.dat** file fields you want to change.
- Step 4** Save your changes and exit the text editor.

- Step 5** Change to the /opt/CiscoMGC/etc/CONFIG_LIB/new directory by entering the following UNIX command:
- ```
cd /opt/CiscoMGC/etc/CONFIG_LIB/new
```
- Step 6** Stop and start the standby host.
- Step 7** Perform sw-over on the active host.
- Step 8** Stop and start the newly-standby host (formerly active host).
- Step 9** Repeat [Step 3](#) and [Step 4](#) for the version of dmprSink.dat stored in this directory.
- Step 10** Change to the /opt/CiscoMGC/etc/active\_link directory by entering the following UNIX command:
- ```
# cd /opt/CiscoMGC/etc/active_link/
```
- Step 11** Repeat [Step 3](#) and [Step 4](#) for the version of dmprSink.dat stored in this directory.
- Step 12** Repeat [Step 1](#) through [Step 10](#) on this second Cisco PGW 2200 Softswitch if your system is equipped with a second Cisco PGW 2200 Softswitch.
-

This completes the procedures for configuring the data dumper to support BAMS. If you have questions or need assistance, see the [“Obtaining Documentation and Submitting a Service Request”](#) section on [page x](#).

