



interoperability
connectivity
reliability

EdgeIQ
Release 7.0

Configuration Guide

June 2009



Your partner in critical communications

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1 About This Document

This document describes the provisioning tasks for EdgeIQ products. This document is of interest to you if you are

- installing an EdgeIQ platform
- configuring cards and services for an EdgeIQ platform
- supporting or maintaining a telephony solution involving an EdgeIQ platform

1.1 How to use this Document

This document provides the necessary information to allow you to configure an EdgeIQ media gateway consisting of T1, E1, VoIP, and SS7 cards. The document is divided into the following topics:

- [Command Line Interface \(CLI\)](#) - page 3
- [Configuration from a User Application](#) - page 8
- [Before You Configure Your Cards](#) - page 9
- [Configuration Commands](#) - page 17
- [Initializing and assigning the H.110 telephony buses](#) - page 22
- [Profiles, trunk groups, and route sets](#) - page 27
- Configuring your cards:
 - [Configuring T1 cards](#) - page 30
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- The one minute configurator:
 - [Sample system level configuration script](#) - page 88

- [Sample script to obtain your system configuration](#) - page 90
- Configuring your SIP gateway controllers.

Configuration commands allow you to define the operational parameters of the EdgeIQ components. Commands can be executed from the IQadmin graphical user interface or from the Command Line Interface (CLI).

Each command and its associated parameters are fully described in the Configuration Reference document. Sample configuration scripts are provided in this document. You can modify these scripts to suit your needs.

1.2 References

Other product documentation that may be used along with this guide includes the following:

- *EdgeIQ Configuration Reference*

This document details each command used to configure the EdgeIQ. These commands can be invoked from either the CLI or IQadmin (if you are running IQscript and IQprobe applications). Both interfaces allow you to execute Operation, Administration, Maintenance, and Provisioning (OAM&P) API functions without having to develop an OAM&P application.

- *Operations, Administration, Maintenance, & Provisioning API*

This document details the OAM&P API functions used by the application developer to retrieve and modify configuration settings and perform maintenance functions on the EdgeIQ. The OAM&P API provides functions related to communication management, device state control, and system configuration related to hardware, trunk groups, bearer route set, log file, SS7, VoIP, ISDN, CAS, display and other miscellaneous items.

- *Managed API*

This document details the API functions used by the application developer to control and monitor the EdgeIQ. The Managed API Reference provides functions related to stream management, redundancy, reliability, call processing, and events.

2 Command Line Interface (CLI)

The CLI allows you to quickly configure the system with a sequence of commands. This section provides information on the following topics:

- Using the CLI
- Commands that require a software restart
- Executing Configuration Scripts
- Command Log Files

2.1 Using the CLI

2.1.1 Starting the CLI - Windows

To start the CLI, select the shortcut on the Windows Start menu:

Double click on the Start menu shortcut under SolaCom Technologies (or Versatel for older installations).

As an alternative, double-click the *CLI.exe* file in Windows Explorer. The path to the executable is either “C:\EdgeIQ\Applications\CLI.exe” or “C:\Versatel\Applications\CLI.exe”.

2.1.2 Starting the CLI - Solaris

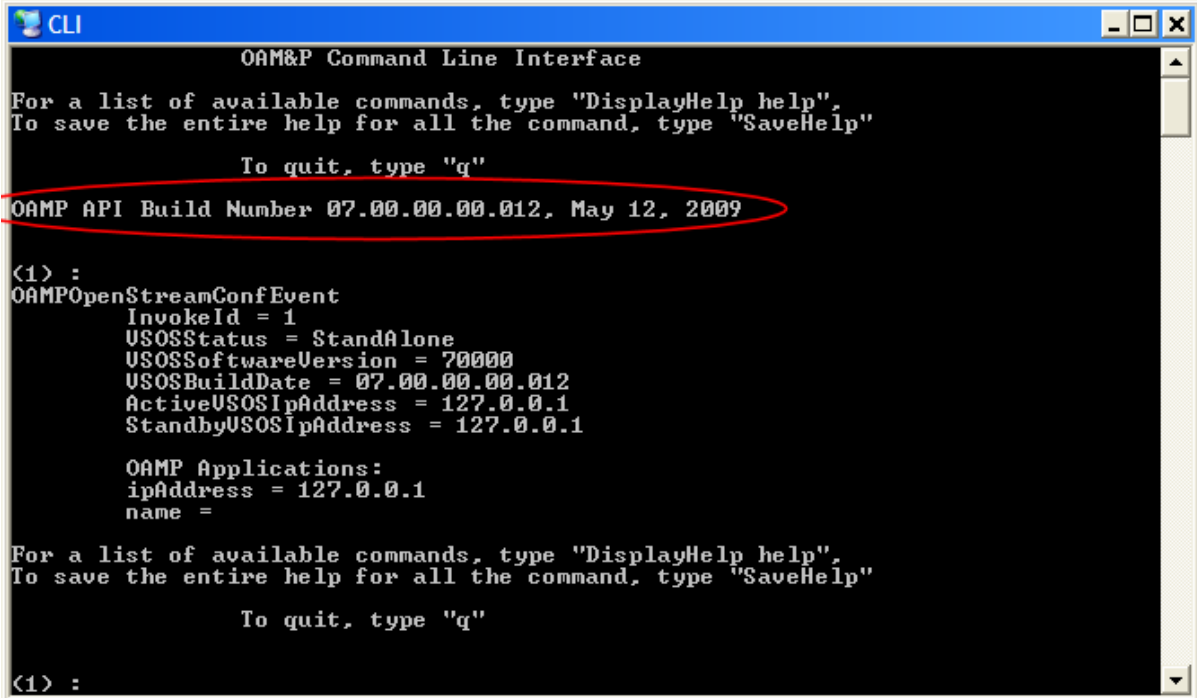
To start the CLI, enter the following from the directory where the CLI is installed:

```
> cd applications
> cli
```

The default installation directory is `/export/home/API`.

2.1.3 OAM&P API version

The build number and date of the OAMP API are now displayed in the CLI window. Sample output is shown below:



```
CLI
OAMP&P Command Line Interface
For a list of available commands, type "DisplayHelp help",
To save the entire help for all the command, type "SaveHelp"

To quit, type "q"
OAMP API Build Number 07.00.00.00.012, May 12, 2009

<1> :
OAMPOpenStreamConfEvent
  InvokeId = 1
  USOSStatus = StandAlone
  USOSSoftwareVersion = 70000
  USOSBuildDate = 07.00.00.00.012
  ActiveUSOSIpAddress = 127.0.0.1
  StandbyUSOSIpAddress = 127.0.0.1

  OAMP Applications:
  ipAddress = 127.0.0.1
  name =

For a list of available commands, type "DisplayHelp help",
To save the entire help for all the command, type "SaveHelp"

To quit, type "q"

<1> :
```

2.1.4 Quitting the CLI

To quit from the CLI, enter `q` or `Q` at the CLI prompt.

2.1.5 Configuring your System Online and Offline

You can configure your cards online through the VSOS or offline when the system is not operational.

2.1.5.1 Online Configuration

To enter configuration commands online, launch VSOS and then launch the CLI. Sample display output is shown below:

```
OAMPOpenStreamConfEvent

    InvokeId = 1
    VSOSStatus = StandAlone
    VSOSSoftwareVersion = 560
    VSOSBuildDate = December 22, 2004
    ActiveVSOSIpAddress = 172.16.0.100
    StandbyVSOSIpAddress = 172.16.0.201

    OAMP Applications:
    ipAddress = 172.16.0.101
    name =

(1) :
```

2.1.5.2 Offline Configuration

To enter configuration commands offline, launch the CLI and use the *Connectdb* command to establish a connection to the database server without going through the VSOS. A sample command and system response is shown below:

```
connectdb nexus

Command #1: CONFIRMED (OFFLINE)

(2) :
```

The *DSN name* of the database server, usually *Nexus*, is defined in the *MesowareDSN* field of the *Mesoware.ini* file.

2.1.6 CLI Help

Typing *DisplayHelp*, *help*, or *? help* at the CLI prompt displays the full list of CLI commands.

The CLI responds to keywords, so if you enter a string of one or more letters, the commands containing the specified string are displayed. For example, to display all commands containing the string *span*, enter the following:

```
span
```

Sample output is shown below:

```
COMMANDNAME
-----
ConfigureSpan
DisableBWSpan
DisableSpan
DisplayBWSpan
DisplaySpan
DisplaySpansWithCASProfile
EnableBWSpan
EnableSpan
GetSpanStatistics
LoopbackSpan
MoveSpanToTrunkGroup
RemoveSpanFromTrunkGroup
```

To get help on a specific command such as *AddCard*, enter the following:

```
? AddCard
```

Sample output is shown below:

```
COMMANDNAME:
AddCard

DESCRIPTION:
Adds a card to the configuration data so that it can be recognized by the
system.

ARGUMENTS:
CardType { T1,E1,VOIP512 } ; ShelfNumber { 0..31 } ; SlotNumber { 0..15 } ;
Signaling { CAS,ISDN,CLEARCHANNEL } ; BackPlaneEncodingType { mu_Law,a_Law } ;
BackupSlotNumber { -1..15 } ; VirtualIpAddress T(15) { } ; Note: E1 CardType
must be initialized with SignalingStandard CLEARCHANNEL or ISDN. E1 with
SignalingStandard ISDN also supports CLEARCHANNEL. T1 CardType must be
initialized with SignalingStandard CAS,ISDN or CLEARCHANNEL. T1 with
SignalingStandard ISDN/CAS also supports CLEARCHANNEL. To support ISDN/CAS on
the same T1 card, SignalingStandard must be initialized with CLEARCHANNEL.
VOIP512 CardType must be initialized with SignalingStandard CLEARCHANNEL. The
BackPlaneEncodingType parameter applies to the type of PCM used on the H110
bus. If the audio of the cards are interconnected, the same encoding type must
be used. When a T1 card is present, mu_Law should be used. When an E1 card is
present, a_Law should be used. If both are present, use the encoding type for
the greater number of cards. Backup card is only available for a T1 or E1 card.
If no backup card exists, set BackupSlotNumber to -1 and VirtualIpAddress to
0.0.0.0.

EXAMPLE:
AddCard T1,31,2,ISDN,mu_Law,3,172.17.31.12
```

2.1.7 CLI Command Format

The general format for entering a command is to enter the command name followed by the required parameters, each parameter value must be separated by a comma.

For example:

```
AddCard VOIP512, 31, 6, CLEARCHANNEL, mu_Law, -1, 0.0.0.0
```

The above command requests the addition of a VoIP card in shelf number 31 slot number 6 with Clear Channel Signaling, mu-Law encoding, and no backup card. For information on the configuration commands and their parameters, refer to the Configuration Reference document.

When specifying a character string for a parameter value, the string must not contain any spaces.

If a CLI command is not processed, you are notified by a message in the CLI window along with its related diagnostic log message. For example:

```
(3) AddCard T1,25,2,ISDN,mu_Law,-1,0.0.0.0
```

```
Command #3: No BusH110 Was Allocated For This Card. Please Use the
             ConfigureBusH110 Command to allocate the H110 Buses. You Must
             Allocate 3 H110 Buses For A T1 Card And 4 H110 Buses For An E1 or
             a VOIP512 Card.
```

The response to the successful execution of a command is shown below:

```
(7) AddCard T1,25,2,ISDN,mu_Law,-1,0.0.0.0
```

```
Command #7: CONFIRMED (OFFLINE)
```

2.2 Executing Configuration Scripts

To execute configuration scripts from the CLI, use the < command. A sample command to run the *Myscript.txt* script is shown below:

```
< c:\Myscript.txt
```

This command executes the contents of the *Myscript.txt* file line by line. You must specify the entire path and the file name.

To execute a portion of a script, simply copy the required lines from an existing script file and paste the contents at the CLI prompt. Use the right mouse button to paste the text.

2.3 Command Log Files

Executed commands are stored in command log files. The filename format is *CMDSmmdd.txt* where *mm* is the month and *dd* is the day of the month. The files are stored in the same directory as the application.

2.4 Configuring From a User Application

A user application, with calls to the OAM&P API, can also configure the system. The user application must open a stream, issue OAM&P API function calls, handle return values from the API functions, and close the communication stream. An example of an OAM&P API command to request the same VoIP card setup as described in section 2.1.7 CLI Command Format on page 7 is shown below:

```
oampAddCard (1, VOIP512, 31, 6, CLEARCHANNEL, mu_Law), -1, 0.0.0.0;
```

The first argument is the *invokeld*. The *invokeld* is returned by the EdgeIQ in a confirmation event or error message, ensuring command execution. The *invokeld* can be used by the application to associate confirmation events and error messages with the original command. In this manner, an application can issue and manage multiple commands simultaneously.

You can configure your cards online through the VSOS or offline when the system is not operational. Most functions have an associated offline function to allow you to configure the system while offline. For example, the *oampAddCard* function parameters can be configured offline with the *oampAddCardOffline* function. The offline function has the same arguments as the online function. To access an offline function, simply add the word *Offline* to the function.

For information on the OAM&P API and its associated functions, refer to the OAM&P API Reference document.

3 Before Configuring Your Cards

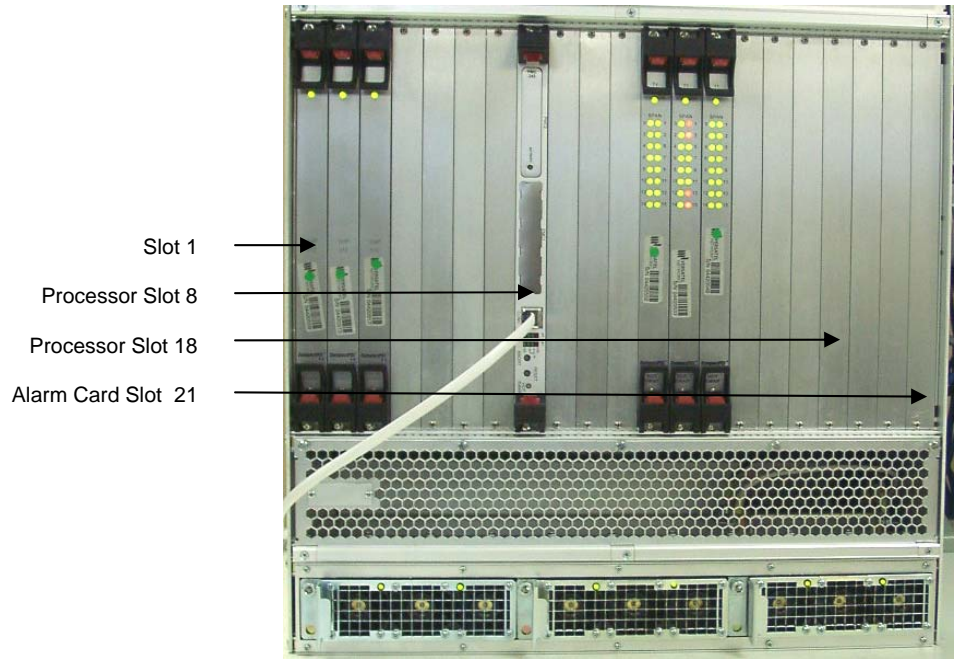
Before you configure your cards you should be familiar with the following:

- [Your chassis configuration](#)
- [IP address configuration](#)
- [Basic system interconnections](#)
- [Basic system specifications](#)

3.1 Chassis Configuration

The shelf and slot numbers associated with each card must be known prior to configuring your system. Physical slot assignments for the IQ4000, IQ1500, and IQ500 chassis are shown below:

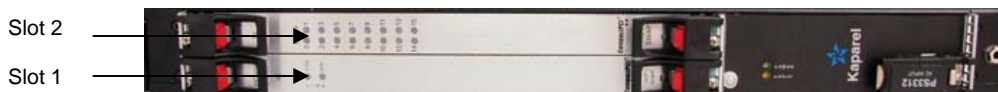
IQ4000 Chassis - Front View



IQ1500 Chassis - Front View



IQ500 Chassis - Front View



3.1.1 Shelf Identifier

Each shelf is configured with a shelf identifier at the factory. The range is 0 to 31 and is set with jumpers. Byte 5 of the card's MAC address is derived from the shelf identifier.

3.1.2 Slot Identifier

Each card slot is hard-wired with a slot identifier. Slots are identified from left to right (or bottom to top) starting at 1 when the chassis is viewed from the front. The IQ500 has 2 slots, the IQ1500 has 6 slots, and IQ4000 systems have 16 valid slots. Byte 6 of the card's MAC address is derived from the slot identifier.

3.1.3 MAC Addresses

The MAC address is defined as shown below:

| MAC Addresses for Interface Cards | |
|-----------------------------------|---|
| 00-09-D0-00-Shelf-Slot | Base MAC address for the cards. |
| Shelf | The shelf identifier of the chassis. Hexadecimal notation 00-1F corresponding to decimal notation 0-31. |
| Slot | The slot number where the card resides. Hexadecimal notation 01-10 corresponding to decimal notation 1-16. |

For example:

Preconfigured base MAC address: 00-09-D0-00

Shelf Identifier is set to 31: 1F

Card installed in slot 1 of the chassis: 1

The derived MAC address for the card is 00-09-D0-00-1F-01.

3.2 IP Address Acquisition

3.2.1 Intranet Addresses

Your DHCP server must be configured to assign fixed IP addresses to the interface cards. At startup, interface cards broadcast a BOOTP request that specifies the card's MAC address. In response to the request, the system provides the following to the interface cards:

- IP address to be used by the card.

The derived IP address for an interface card (T1, E1, and VoIP) is based on the default base IP address of 172.16, the shelf identifier, and the slot identifier of the card. For example, a card in slot 1 of shelf 31 will have a default IP address of 172.16.31.1.

- Address of the TFTP server installed with the VSOS. Usually the same address as the VSOS.
- The name of the VSOS initialization file (Mesoware.ini).

The card uses the specified TFTP server to download the specified file (Mesoware.ini), obtain the VSOS address(es), and download its own software (*.bin and *.elf files).

- Subnet mask (only if a router/IP gateway is used, otherwise it is set to 0.0.0.0)

The subnet mask must be configured in the DHCP server.

- Router (only if one is being used, otherwise it is set to 0.0.0.0)

The router IP address must be programmed in the DHCP server.

It is recommended that one DHCP server be setup for every instance of VSOS. Consult your specific DHCP server documentation for configuration details. The recommended DHCP/TFTP server is the HaneWin 2.0.20.

Note that if a Router is used, the computers running the VSOS(s) and its clients must be configured with the proper routes.

Typical IP address assignments for the intranet are 172.16.0.0 with a subnet of 255.255.0.0. Hence the address range is 172.16.0.0 to 172.16.255.255.

3.2.2 Internet Addresses

You must acquire a range of IP addresses and a subnet mask from your Internet Service Provider (ISP). For example, if you require 16 addresses, you may receive the following from your ISP:

- IP address range: 127.0.0.0 to 127.0.0.15
- Subnet mask: 255.255.255.240
- Network ID: 127.0.0.0
- Broadcast address: 127.0.0.15

3.3 Sample System Interconnections and IP Address Assignments

To help you visualize your setup, sample IQ1500 and IQ4000 system interconnection diagrams and IP address assignments are shown below.

Mesoware.ini

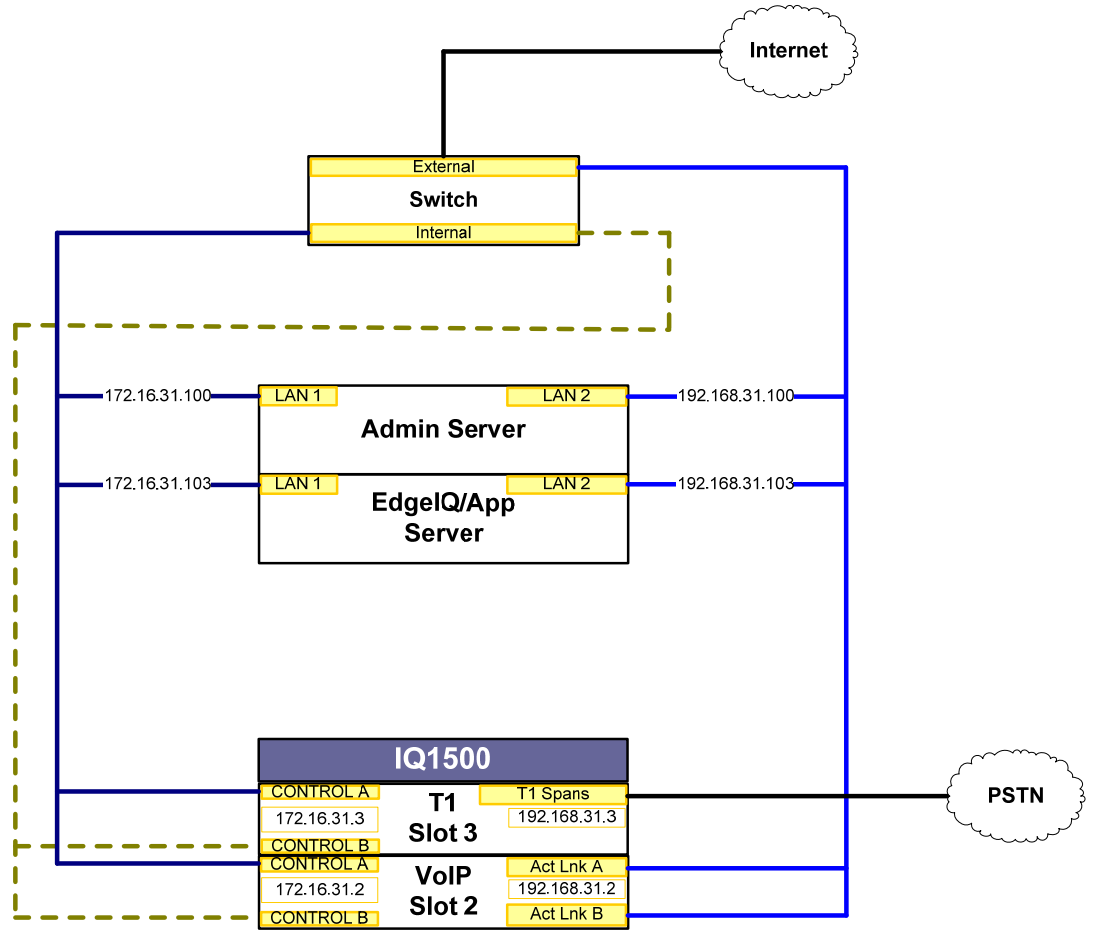
```

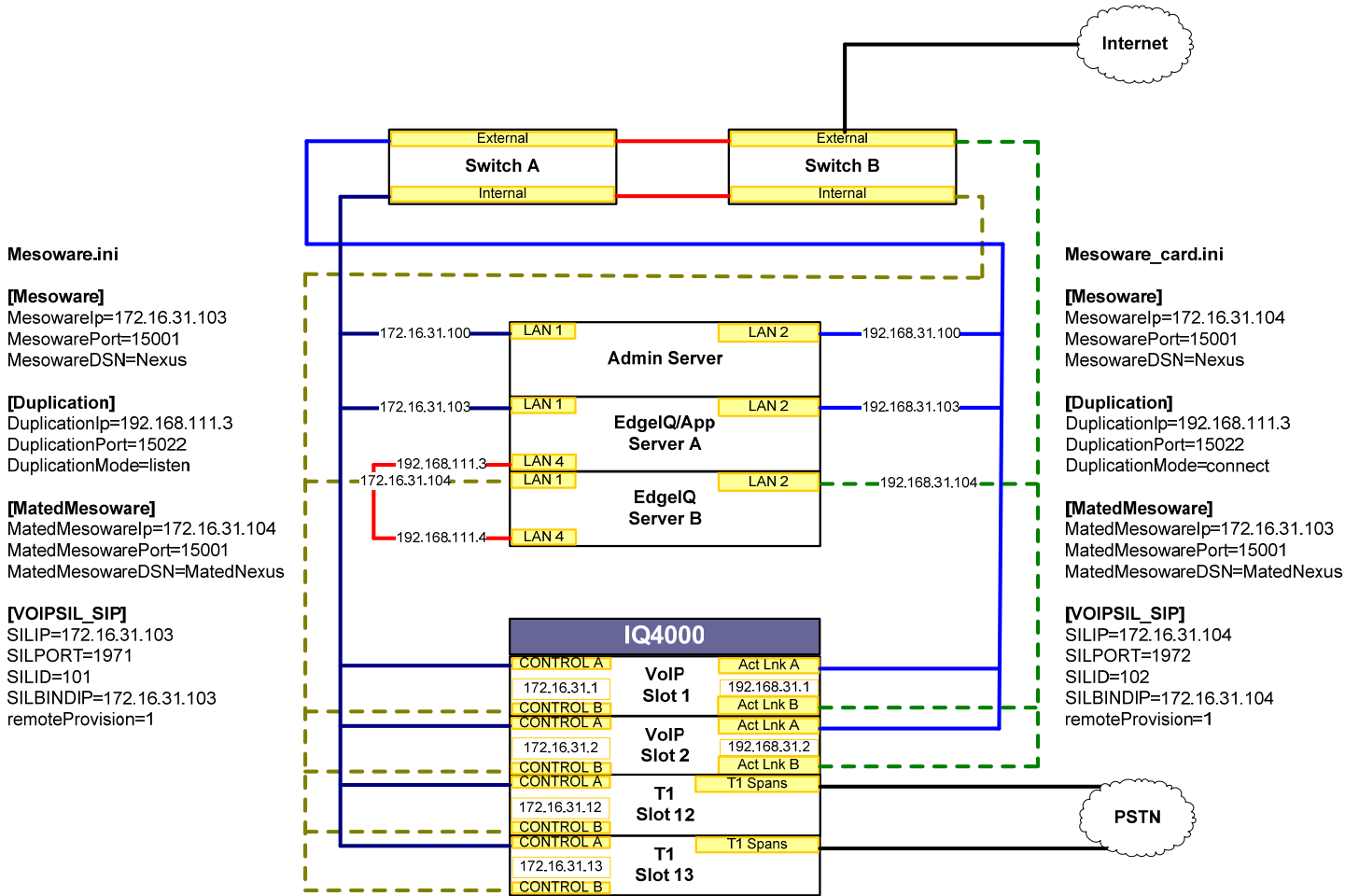
[Mesoware]
MesowareIp=172.16.31.103
MesowarePort=15001
MesowareDSN=Nexus

[Duplication]
DuplicationIp=192.168.111.3
DuplicationPort=15022
DuplicationMode=none

[MatedMesoware]
MatedMesowareIp=172.16.31.104
MatedMesowarePort=15001
MatedMesowareDSN=MatedNexus

[VOIPSIL_SIP]
SILIP=172.16.31.103
SILPORT=1971
SILID=101
SILBINDIP=172.16.31.103
remoteProvision=1
    
```





3.4 Basic Specifications

The basic specifications that relate to system configuration are listed below:

- General:
 - Maximum of 8 shelves controlled by one VSOS
 - Maximum of 8 applications connected to VSOS - only 1 application can be active
 - Maximum of 6 bladewares can be configured on a VSOS platform
- IQ4000 Chassis:
 - Maximum of 2 Processor cards (Slots 8 and 18)
 - One SS7 Module on each processor card
 - Maximum of 14 T1, E1, VoIP and Media cards - (Slots 1 to 7 and 9 to 15)
 - Shelf identifier range is 0 to 31
- IQ1500 Chassis:
 - One processor card (Slot 1)
 - One SS7 Module on the processor card
 - Maximum of 5 cards (T1, E1, and VoIP) - (Slots 2 to 6)
 - Shelf identifier range is 0 to 31
- IQ500 Chassis:
 - No processor cards
 - Maximum of 2 cards (T1, E1, and VoIP)
 - Shelf identifier range is 0 to 31
- Trunk Groups and Route Sets
 - The maximum number of trunk groups that can be added to a route set is 8
 - The maximum number of route sets that can be configured is 2048
- T1 card:
 - 16 spans (0 to 15)
 - 24 channels/span (0 to 23)
 - Mu Law Encoding on the H.110 bus
 - ISDN and CAS signaling (mutually exclusive on a given card)
 - PRI, PRINFAS, and CAS trunk groups
 - Redundant Ethernet control links (Control A and Control B)
 - Three H.110 Bus streams are required (384 channels)
 - A single D-channel can control up to 20 T1 spans

- E1 card:
 - 16 spans (0 to 15)
 - 32 channels/span (0 to 31)
 - A Law Encoding on the H.110 bus
 - ISDN and Clear Channel signaling
 - PRI and Clear Channel trunk groups
 - Redundant Ethernet control links (Control A and Control B)
 - Four H.110 Bus streams are required (512 channels)
- VoIP card:
 - 1 span (0)
 - 256, 300, 399, or 512 channels (Codec specific and defined by card type and dipswitch settings)
 - Mu Law or A Law encoding on the H.110 bus
 - SIP and H.323 SILs can coexist on a single card
 - Supported codecs are G711 Mu Law, G711 A Law, G726 at 32 Kbps, G729a, G729ab, G723 at 5.3 Kbps, and G723 at 6.3 Kbps
 - T.38 maximum fax rate is 14.4 Kbps
 - Redundant Ethernet control links (Control A and Control B)
 - Four H.110 Bus streams are required (512 channels)
- Log Files
 - Minimum log directory size 100 Mbytes
 - Maximum log directory size 1 Gbyte
 - Minimum number of days to keep the log files is 2 days
 - Maximum number of days to keep the log files is 30 days

4 Configuration Commands Overview

A list of configuration commands by topic is shown in the following pages.

Application Links

ConfigureApplLinkMode

Bladewares

AddBW / RemoveBW
 ConfigureVOIPBW
 ConfigureVOIPBWFaxModemPayload
 ConfigureVOIPBWH323
 ConfigureVOIPBWSIP
 CreateVolPBladewareTrunkGroup
 CreateVolPBWTrunkGroup
 DisableBWspan / EnableBWspan
 ResetBW

Cards

AddCard / RemoveCard
 ResetCard

CAS

ConfigureCASProfile
 ConfigureCASSpill
 ConfigureCASStage
 CreateCASTrunkGroup
 RemoveCASProfile

Channels

ConfigureChannelGain
 ConfigureChannelIDIE
 ConfigureDChannelProtocol
 CreateClearChannelTrunkGroup
 CreateVOIPChannelProfileId
 CreateVOIPClearChannelTrunkGroup
 DisableChannel / EnableChannel
 GetChannelStatistics
 MoveChannelToTrunkGroup
 RemoveChannelFromTrunkGroup
 RemoveVOIPChannelProfileId
 EnableRangeOfChannels
 DisableRangeOfChannels
 MoveRangeOfChannelsToTrunkGroup

Clock

ConfigureClock
 RemoveClock

Disable / Enable

DisableBWspan / EnableBWspan
 DisableChannel / EnableChannel
 DisableSpan / EnableSpan

Gain

ConfigureChannelGain
 ConfigureGain

H.110 Bus

ConfigureBusH110
 ConfigureH110Control

Help

HelpConvertSS7DestPointCodeToVersatelDPCValue
 HelpConvertVersatelDPCValueToSS7DestPointCode

Logs

ConfigureClientLog
 ConfigureLogPath
 ConfigureVersatelLog

Primary Rate

ConfigurePRITimer
CreatePRIIE
CreatePRINFASTrunkGroup
CreatePRITrunkGroup
RemovePRIIE

Spans

ConfigureSpan
ConfigureVOIPSpan
DisableBWspan/ EnableBWspan
DisableSpan/ EnableSpan
EnableBWspan
EnableSpan
MoveSpanToTrunkGroup
RemoveSpanFromTrunkGroup

Tones

ConfigureGeneratedTone
ConfigureVoIPOutOfBandTone
RemoveGeneratedTone

Remove Components

RemoveBearerRouteSet
RemoveBW
RemoveCard
RemoveCASProfile
RemoveChannelFromTrunkGroup
RemoveClock
RemoveGeneratedTone
RemovePRIIE
RemoveSpanFromTrunkGroup
RemoveSS7IE
RemoveTrunkGroup
RemoveTrunkGroupFromRouteSet
RemoveVOIPChannelProfileId

System

ConfigureSysParm

Trunk Groups

CreateCASTrunkGroup
CreateClearChannelTrunkGroup
CreatePRINFASTrunkGroup
CreatePRITrunkGroup
CreateSS7TrunkGroup
CreateVOIPBWTrunkGroup
CreateVOIPClearChannelTrunkGroup
MoveChannelToTrunkGroup
MoveSpanToTrunkGroup

Route Sets

AddTrunkGroupToRouteSet
ConfigureBearerRouteSet
RemoveBearerRouteSet
RemoveTrunkGroupFromRouteSet

T1 Card

AddCard
 AddTrunkGroupToRouteSet
 ConfigureBearerRouteSet
 ConfigureCASProfile
 ConfigureCASSpill
 ConfigureCASStage
 ConfigureChannelGain
 ConfigureClock
 ConfigureDChannelProtocol
 ConfigurePRITimer
 ConfigureSpan
 CreateCASTrunkGroup
 CreateClearChannelTrunkGroup
 CreatePRINFASTrunkGroup
 CreatePRITrunkGroup
 DisableChannel
 DisableSpan
 EnableChannel
 EnableSpan
 GetSpanStatistics
 LoopbackSpan
 MoveChannelToTrunkGroup
 MoveSpanToTrunkGroup
 RemoveBearerRouteSet
 RemoveCard
 RemoveCASProfile
 RemoveClock
 RemoveChannelFromTrunkGroup
 RemoveSpanFromTrunkGroup
 RemoveTrunkGroup
 RemoveTrunkGroupFromRouteSet
 ResetCard

E1 Card

AddCard
 AddTrunkGroupToRouteSet
 ConfigureBearerRouteSet
 ConfigureChannelGain
 ConfigureClock
 ConfigureDChannelProtocol
 ConfigurePRITimer
 ConfigureSpan
 CreateClearChannelTrunkGroup
 CreatePRITrunkGroup
 DisableChannel
 DisableSpan
 EnableChannel
 EnableSpan
 GetSpanStatistics
 LoopbackSpan
 MoveChannelToTrunkGroup
 MoveSpanToTrunkGroup
 RemoveBearerRouteSet
 RemoveCard
 RemoveClock
 RemoveChannelFromTrunkGroup
 RemoveSpanFromTrunkGroup
 RemoveTrunkGroup
 RemoveTrunkGroupFromRouteSet
 ResetCard

VoIP512 Card

AddCard
 AddTrunkGroupToRouteSet
 ConfigureBearerRouteSet
 ConfigureCallParameterDNS*
 ConfigureCallParameterPrefix*
 ConfigureChannelGain
 ConfigureClock
 ConfigureRTPDestinationParameters
 ConfigureRTPSourceParameters
 ConfigureSpan
 ConfigureVOIPCause
 ConfigureVoIPOutOfBandTone
 ConfigureVOIPECAN**
 ConfigureVOIPOutOfBandTone**
 ConfigureVOIPProgress
 ConfigureVOIPRTCPPackets**
 ConfigureVOIPRTTPPackets**
 ConfigureVOIPRTTPPayloadTypeMapping**
 ConfigureVOIPSilentSuppression**
 ConfigureVOIPSpan
 ConfigureVOIPVoicePackets**
 CreateVoIPBWTrunkGroup
 CreateVOIPChannelProfileId
 CreateVoIPClearChannelTrunkGroup
 DisableChannel
 DisableSpan
 EnableChannel
 EnableSpan
 GetChannelStatistics
 MoveChannelToTrunkGroup
 MoveSpanToTrunkGroup
 RemoveBearerRouteSet
 RemoveCard
 RemoveClock
 RemoveChannelFromTrunkGroup
 RemoveSpanFromTrunkGroup
 RemoveTrunkGroup
 RemoveTrunkGroupFromRouteSet
 RemoveVOIPChannelProfileId
 ResetCard

VoIP Bladeware

AddBW
 ConfigureVOIPBW
 ConfigureVOIPBWFaxModemPayload
 ConfigureVOIPBWH323
 ConfigureVOIPBWSIP
 CreateVoIPBladewareTrunkGroup
 CreateVoIPBWTrunkGroup
 DisableBWspan / EnableBWspan
 RemoveBW
 ResetBW

Display

Enter ? *CommandName* to get help on a command, as in ? *AddCArd*

Enter a *string* of characters to display commands containing the *string*, as in *reset*

To display a configuration, replace the string *Configure* of a configuration command with the string *Display* as in *DisplayCard*.

*For these VoIP512 card commands, replace the string *ConfigureCall Parameter* with *DisplayVoIP* as in *DisplayVoIPDNS*

**For these VoIP512 card commands, add *Cfg* to the end of the command as in *DisplayVOIPECANCFg*,

Display (part 1)

DisplayAppLinkMode
 DisplayBearerCapabilityIE
 DisplayBearerRouteSet
 DisplayBearerRouteSetTrunkGroups
 DisplayBusH110
 DisplayBW
 DisplayBWSpan
 DisplayCalledPartyIE
 DisplayCalledPartySubaddressIE
 DisplayCallingPartyIE
 DisplayCallingPartySubaddressIE
 DisplayCard
 DisplayCASProfile
 DisplayCASSignalingProfile
 DisplayCASSpill
 DisplayCASStage
 DisplayCauseIE
 DisplayChannel
 DisplayChannelGain
 DisplayChannelIDIE
 DisplayChannelStateProfile
 DisplayClientLog
 DisplayClock
 DisplayDChannelProtocol
 DisplayDChannelsWithIEId
 DisplayGain
 DisplayGeneratedTone
 DisplayH110Control
 DisplayHelp
 DisplayHighLayerCompatibilityIE
 DisplayISDNtnsIE
 DisplayLogPath
 DisplayLowLayerCompatibilityIE
 DisplayNetworkSpecificIE
 DisplayPRITimer
 DisplayProgressIndicatorIE
 DisplayPublicIE

Display (part 2)

DisplayRTPDestinationParameters
 DisplayRTPSourceParameters
 DisplaySignalIE
 DisplaySpan
 DisplaySpansWithCASProfile*
 DisplaySS7BackwardCallIndicatorIE
 DisplaySS7CalledPartyNumberIE
 DisplaySS7CallingPartyCategoryIE
 DisplaySS7CallingPartyNumberIE
 DisplaySS7CauseIE
 DisplaySS7EventInformationIE
 DisplaySS7ForwardCallIndicatorIE
 DisplaySS7NatureOfConnectionIE
 DisplaySS7UserServiceInfoIE
 DisplaySS7XnsIE
 DisplaySysParm
 DisplayTrunkGroup
 DisplayTrunkGroupChannels*
 DisplayLog
 DisplayVOIPBW
 DisplayVOIPBWFaxModemPayload
 DisplayVOIPBWH323
 DisplayVOIPBWSIP
 DisplayVOIPCallerIE
 DisplayVOIPCause
 DisplayVOIPChannelProfileIds
 DisplayVOIPDNS
 DisplayVOIPECANCFg
 DisplayVOIPFaxModemPacketsIE
 DisplayVOIPOutOfBandToneCfg
 DisplayVOIPPrefix
 DisplayVOIPProgress
 DisplayVOIPRTCPacketsCfg
 DisplayVOIPRTPPacketsCfg
 DisplayVOIPRTPPacketsSizeInBytes*
 DisplayVOIPRTPPayloadTypeMappingCfg
 DisplayVOIPSilentSuppressionCfg
 DisplayVOIPSpan
 DisplayVOIPTnsIE
 DisplayVOIPVoicePacketsCfg

* These *Display* commands do not have an associated *Configure* command.

Operation and Maintenance

DisableBWSpan/ EnableBWSpan
 DisableChannel/ EnableChannel
 DisableSpan/ EnableSpan
 GetChannelStatistics
 GetCardStatus
 GetShelfStatus
 GetSpanStatistics
 LoopbackSpan
 ResetBW
 ResetCard
 ResumeDiagnostic
 SuspendDiagnostic
 Trace

Information Elements

ConfigureBearerCapabilityIE
 ConfigureCalledPartyIE
 ConfigureCalledPartySubaddressIE
 ConfigureCallingPartyIE
 ConfigureCallingPartySubaddressIE
 ConfigureCauseIE
 ConfigureChannelIDIE
 ConfigureHighLayerCompatibilityIE
 ConfigureISDNtnsIE
 ConfigureLowLayerCompatibilityIE
 ConfigureProgressIndicatorIE
 ConfigurePublicIE
 ConfigureSignalIE
 ConfigureSS7BackwardCallIndicatorIE
 ConfigureSS7CalledPartyNumberIE
 ConfigureVoIPCallerIE
 ConfigureSS7CallingPartyCategoryIE
 ConfigureSS7CallingPartyNumberIE
 ConfigureSS7CauseIE
 ConfigureSS7EventInformationIE
 ConfigureSS7ForwardCallIndicatorIE
 ConfigureSS7NatureOfConnectionIE
 ConfigureSS7UserServiceInfoIE
 ConfigureSS7XnsIE
 ConfigureVOIPFaxModemPacketsIE
 ConfigureVoIPTnsIE
 CreatePRIIE
 CreateSS7IE

4.1 Commands that Require a Software Restart

Some commands take effect immediately, while others take effect after the VSOS software is reset. The commands that require a software reset are listed below:

- ConfigureApplinkMode
- ConfigureBusH110
- ConfigureClientLog
- ConfigureGain
- ConfigureGeneratedTone
- ConfigureH110Control
- ConfigureLogPath
- ConfigureLog
- RemoveGeneratedTone

5 Initializing and Assigning H.110 Telephony Bus Streams

The H.110 bus is a time division multiplexed bus of 4096 timeslots subdivided into 32 streams of 128 time-slots. Each timeslot provides a throughput of 64 kbits/s. The H.110 timeslots are used to transport media between cards connected to the backplane.

Bus identifiers (BusId) are used to identify streams. The BusID argument of the *ConfigureBusH110* and *DisplayBusH110* commands ranges from 0 to 31.

5.1 Initializing the H.110 Bus

For a new system, you must deallocate all 4,096 H.110 bus timeslots. The following procedure deallocates all timeslots from the 32 streams:

```
ConfigureBusH110 0, -1, -1
ConfigureBusH110 1, -1, -1
ConfigureBusH110 2, -1, -1
ConfigureBusH110 3, -1, -1
ConfigureBusH110 4, -1, -1
ConfigureBusH110 5, -1, -1
ConfigureBusH110 6, -1, -1
ConfigureBusH110 7, -1, -1
ConfigureBusH110 8, -1, -1
ConfigureBusH110 9, -1, -1
ConfigureBusH110 10, -1, -1
ConfigureBusH110 11, -1, -1
ConfigureBusH110 12, -1, -1
ConfigureBusH110 13, -1, -1
ConfigureBusH110 14, -1, -1
ConfigureBusH110 15, -1, -1
ConfigureBusH110 16, -1, -1
ConfigureBusH110 17, -1, -1
ConfigureBusH110 18, -1, -1
ConfigureBusH110 19, -1, -1
ConfigureBusH110 20, -1, -1
ConfigureBusH110 21, -1, -1
ConfigureBusH110 22, -1, -1
ConfigureBusH110 23, -1, -1
ConfigureBusH110 24, -1, -1
ConfigureBusH110 25, -1, -1
ConfigureBusH110 26, -1, -1
ConfigureBusH110 27, -1, -1
```

```
ConfigureBusH110 28, -1, -1  
ConfigureBusH110 29, -1, -1  
ConfigureBusH110 30, -1, -1  
ConfigureBusH110 31, -1, -1
```


5.2 H.110 Bus Assignments for T1, E1, and VoIP Cards

Before using the *AddCard* command to add a T1, E1, or VoIP card to a slot, you must use the *ConfigureBusH110* command to allocate H.110 buses to these slots. Once configured, you can use the *DisplayBusH110* command to view the configuration. If the H.110 timeslots are not configured and the *AddCard* command is invoked, an error message and a diagnostic log are generated.

The following table lists the H.110 bus and timeslot assignments required to provide non-blocking operation:

| Card Type | Number of timeslots | Number of buses (n X 128 Timeslots) |
|-----------|------------------------------|--|
| T1 | 16 spans x 24 channels = 384 | 3 |
| E1 | 16 spans x 32 channels = 512 | 4 |
| VoIP512 | 512 | 4 |

Valid BusIds for the above cards are 0 to 31.

5.2.1 Sample H.110 Bus Configuration Commands for T1, E1, and VoIP Cards

In this example, we are planning for a shelf with one T1 card, one E1 card, and one VoIP512 card. The desired configuration is shown below:

Configure the T1 card for Bus identifiers 0, 1, 2 of shelf 25 slot 2:

```
ConfigureBusH110 0, 25, 2
ConfigureBusH110 1, 25, 2
ConfigureBusH110 2, 25, 2
```

Configure the E1 card for Bus identifiers 4, 5, 6, and 7 of shelf 25 slot 3:

```
ConfigureBusH110 4, 25, 3
ConfigureBusH110 5, 25, 3
ConfigureBusH110 6, 25, 3
ConfigureBusH110 7, 25, 3
```

Configure the VoIP512 card for Bus identifiers 8, 9, 10, and 11 of shelf 25 slot 4:

```
ConfigureBusH110 8, 25, 4
ConfigureBusH110 9, 25, 4
ConfigureBusH110 10, 25, 4
ConfigureBusH110 11, 25, 4
```

5.3 Determining the Available H.110 Buses

To determine the available buses for a given shelf, say shelf 25, use the commands shown below:

```
DisplayBusH110 -1 -1, -1
DisplayCard -1, -1
DisplayBW -1
```

Sample output from the display commands is shown below:

DisplayBusH110 -1

| BusId | ShelfNumber | SlotNumber |
|-------|-------------|------------|
| ----- | ----- | ----- |
| 0 | 25 | 2 |
| 1 | 25 | 2 |
| 2 | 25 | 2 |
| 3 | -1 | -1 |
| 4 | 25 | 3 |
| 5 | 25 | 3 |
| 6 | 25 | 3 |
| 7 | 25 | 3 |
| 8 | -1 | -1 |
| 9 | 25 | 4 |
| 10 | 25 | 4 |
| 11 | 25 | 4 |
| 12 | 25 | 4 |
| 13 | -1 | -1 |
| 14 | -1 | -1 |
| 15 | -1 | -1 |
| 16 | -1 | -1 |
| 17 | -1 | -1 |
| 18 | -1 | -1 |
| 19 | -1 | -1 |
| 20 | -1 | -1 |
| 21 | -1 | -1 |
| 22 | -1 | -1 |
| 23 | -1 | -1 |
| 24 | -1 | -1 |
| 25 | -1 | -1 |
| 26 | -1 | -1 |
| 27 | -1 | -1 |
| 28 | -1 | -1 |
| 29 | -1 | -1 |
| 30 | -1 | -1 |
| 31 | -1 | -1 |

DisplayCard -1, -1

| CardType | CardNumber | Shelf | Slot | SignalingStandard | EncodingStandard | BackUpSlot | VirtualIpAddr |
|----------|------------|-------|-------|-------------------|------------------|------------|---------------|
| ----- | ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| T1 | 1 | 25 | 2 | ISDN | mu_Law | -1 | 0.0.0.0 |
| E1 | 2 | 25 | 3 | ISDN | a_Law | -1 | 0.0.0.0 |
| VOIP512 | 4 | 25 | 4 | CLEARCHANNEL | mu_Law | -1 | 0.0.0.0 |

```
displaybw -1
```

| CardType | CardNumber | BladeWareId | SignalingStandard | Shelf | Slot |
|----------|------------|-------------|-------------------|-------|------|
| VoIPSi1 | 5 | 101 | SIP | 222 | 50 |
| VoIPSi1 | 6 | 201 | H323 | 223 | 51 |

The *DisplayBusH110* command displays unassigned buses with a -1 in the shelf and slot fields. The *DisplayCard* command displays the configured cards in the system. The *DisplayBW* command displays the configured bladewares. To show the buses as assigned, you must explicitly assign them with the *ConfigureBusH110* command.

You can correlate the results of these three display commands to determine available slots and H.110 buses.

If a bus is incorrectly assigned, you must unassign it with the *ConfigureBusH110* command. Refer to the section below for details.

5.4 Unassigning Cards and H.110 Buses

If a card is incorrectly assigned, you must remove it with the *RemoveCard* command. All spans must be disabled before using the *RemoveCard* command. For example:

```
DisableSpan 25, 2, -1, ON
RemoveCard 25, 2
```

The above command removes a card's configuration data associated with shelf 25 slot 2.

If an H.110 bus is incorrectly assigned, you must unassign it with the *ConfigureBusH110* command. For example:

```
ConfigureBusH110 0, -1, -1
ConfigureBusH110 1, -1, -1
ConfigureBusH110 2, -1, -1
```

The above command unassigns H.110 buses 0, 1, and 2.

6 Profiles, Trunk Groups, and Route Sets

6.1 Profiles

Profiles allow you to define a set of system parameters and link them to one or more trunk groups. To simplify maintenance you should define one profile for each trunk group.

6.1.1 VoIP Profiles

The *CreateVoIPChannelProfileId* command links parameters from several commands into a single profile. Parameters from the following commands are linked to a single VoIP channel profile identifier:

- *ConfigureVoIPCause*
- *ConfigureVoIPProgress*
- *configureVoIPECAN*
- *ConfigureVoIPSilentSuppression*
- *ConfigureVoIPVoicePackets*
- *ConfigureVoIPRTTPackets*
- *ConfigureVoIPRTCPPackets*
- *ConfigureVoIPOutOfBandTone*
- *ConfigureVoIPRTTPayloadTypeMapping*
- *ConfigureCallParameterDNS*
- *ConfigureCallParameterPrefix*
- *CreateVoIPBWTrunkGroup*
- *ConfigureVoIPFaxModemPacketsIE*

The default VoIP profile is *VoIPChannelProfile 0*. The parameter values for this profile are shown in section 9.3 Obtaining the Default Configuration on page 62.

6.1.2 Channel Associated Signaling (CAS) Profiles

CAS profiles, created with the *ConfigureCASProfile* command, allow you to define timing parameters and a CAS protocol to be used for T1 channels. Nineteen predefined CAS profiles are available. You can modify the existing profiles or create new ones. The predefined profiles are labeled 0 to 18 and are described in section 7.7 Configuring Channel Associated Signaling (CAS) on page 42.

6.1.3 PRI Information Elements Profiles

The PRI information elements (IEs) are linked to a common identifier created with the *CreatePRIIE* command. ISDN D-channels are linked to an IE Id with the *ConfigureDChannelProtocol* command. To simplify modifications to IE parameters for a given D-Channel, you should create an IE Id for each D-Channel. There are 20 predefined profiles based on default profile 0 (0 to 19). Refer to section 7.6 Configuring PRI Information Elements Profiles on page 38.

6.1.4 SS7 Information Elements Profiles

The SS7 information elements (IEs) are linked to a common identifier created with the *CreateSS7IE* command. SS7 spans are linked to an IE Id with the *CreateSS7TrunkGroup* command. There are 11 preconfigured SS7 IE profiles (0 to 10). Refer to section 10.2 Obtaining the Default Configuration on page 80.

6.2 Trunk Groups

A trunk group is defined as a collection of circuits comprising a unique physical connection between the EdgeIQ and another network element, whereby all bearer channels share identical signaling characteristics.

For example, if the trunk group is PRI, all bearer circuits in the group use the same D-channel (23). If the trunk group is CAS, all circuits share the same CAS timing parameters and signaling protocol.

To eliminate glare conditions the system should be partitioned in trunk groups that are used exclusively for incoming calls and trunk groups that are use exclusively for outgoing calls. If this is not practical, the VSOS trunk groups should be configured for round robin backward hunting.

6.2.1 Creating Trunk Groups

To create a trunk group, you can first create an empty trunk group and then assign channels and spans to the trunk group with the *MoveChannelToTrunkGroup* or *MoveRangeOfChannelsToTrunkGroup* and the *MoveSpanToTrunkGroup* commands. These commands also link the channel or span to a profile.

Trunk group channels or spans can be moved between trunk groups of the same type using the *MoveChannelToTrunkGroup* or *MoveRangeOfChannelsToTrunkGroup* and the *MoveSpanToTrunkGroup* commands. You can remove channels and spans from trunk groups using the *RemoveChannelFromTrunkGroup* and *RemoveSpanFromTrunkGroup* commands. Note that moving channels is supported on VoIP cards only. E1 and T1 cards support moving spans.

6.3 Route Sets

A route set allows different physical paths in a network to be selected for a given dialed number depending on network congestion, least cost, time-of-day, shortest path, preferred carrier, or other considerations. Physical paths within a route set can have different signaling characteristics. As such,

individual trunk groups (encapsulating the physical path) can be added to a route set for the purpose of network path selection.

Use the *ConfigureBearerRouteSet* command to create and configure a route set. Trunk groups in a route set are searched based upon an order value assigned using the *AddTrunkGroupToRouteSet* command. To remove a trunk group from a route set, use the *RemoveTrunkGroupFromRouteSet* command. To delete a route set, use the *RemoveBearerRouteSet* command.

The maximum number of trunk groups that can be added to a route set is 128. The maximum number of route sets that can be configured is 2048.

6.3.1 Route Sets for VoIP Incoming Trunk Groups

To route incoming VoIP calls, first use *ConfigureBearerRouteSet* and then assign the incoming VoIP trunk group to a route set with the *AddTrunkGroupToRouteSet* command.

7 Configuring T1 Cards

This section details the configuration aspects for a T1 card. The topics are listed below:

- Prerequisites
- Obtaining the Default Configuration
- Configuring Your T1 Card
- Viewing the T1 Configuration
- Configuring CAS Profiles
- Other T1 Commands

7.1 Prerequisites

Before configuring a T1 card, ensure that the Control and PSTN links are connected to the rear transition board.

7.2 T1 Interconnections

The interconnections associated with a T1 card are shown in section 3.3 Sample System Interconnections and IP Address Assignments on page 13.

7.3 Obtaining the Default Configuration

After adding a card with the *AddCard* command, you can view the default configuration. To view the default configuration for a T1 card installed in shelf 25 slot 2, enter the following command

```
DisplaySpan 25,2,-1
```

Sample output is shown below:

| CardNumber | CardType | SpanNumber | SpanType | Framing | Coding | LBO | LocalLoop | RemoteLoop | State | IOLoopback |
|------------|----------|------------|----------|---------|--------|----------|-----------|------------|----------|------------|
| 2 | T1 | 0 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 1 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 2 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 3 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 4 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 5 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 6 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 7 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 8 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 9 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 10 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 11 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 12 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 13 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 14 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
| 2 | T1 | 15 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |

7.4 Configuring Your T1 Card

This section provides a list of the basic commands required to set up a T1 card. The desired configuration is shown below:

| | |
|------------------------------|--|
| Shelf identifier: | 25 |
| T1 card slot: | 2 |
| H.110 Bus assignments: | 0, 1, and 2 |
| Signaling type: | ISDN |
| Encoding type: | mu Law |
| Clock: | Priority 0 (highest), sourced from Span 0 |
| PRI D Channel: | Span 0, channel 23 for Network side and far end protocol is National ISDN-2 (NI2) |
| Span Configuration: | Extended Super Frame (ESF) framing, bipolar 8-zero substitution (B8ZS) line coding, 0-133 foot line build out, Local Loopback off, Remote Loopback off, and I/O Loopback off |
| Incoming T1 PRI Trunk group: | PRI Number 301, named INCOMING_T1_PRI_TG, to contain span 0 with the hunting algorithm set to <i>Most Idle</i> |
| Outgoing T1 PRI Trunk group: | PRI Number 302, named OUTGOING_T1_PRI_TG, to contain span 1 with the hunting algorithm set to <i>Most Idle</i> |
| Incoming T1 CC Trunk group: | PRI Number 303, clear channel TG named INCOMING_T1_CC_TG, to contain span 2 with the hunting algorithm set to <i>First Available</i> |
| Outgoing T1 CC Trunk group: | PRI Number 304, clear channel TG named OUTGOING_T1_CC_TG, to contain span 3 with the hunting algorithm set to <i>First Available</i> |

The commands are listed below:

```
ConfigureBusH110 0, 25, 2
ConfigureBusH110 1, 25, 2
ConfigureBusH110 2, 25, 2
AddCard T1, 25, 2, ISDN, mu_Law, -1, 0.0.0.0
ConfigureClock 25,2,0,1,ADD
ConfigureDChannelProtocol 25, 2, 0, 23, 0, network, ni2, 1, 1
ConfigureDChannelProtocol 25, 2, 1, 23, 0, user, ni2, 1, 1
CreatePRITrunkGroup 301, INCOMING_T1_PRI_TG, 25, 2, 0, MOST_IDLE
CreatePRITrunkGroup 302, OUTGOING_T1_PRI_TG, 25, 2, 1, MOST_IDLE
CreateClearChannelTrunkGroup 303, INCOMING_T1_CC_TG, 25, 2, 2, first_available
CreateClearChannelTrunkGroup 304, OUTGOING_T1_CC_TG, 25, 2, 3, first_available
EnableSpan 25, 2, 0
EnableSpan 25, 2, 1
EnableSpan 25, 2, 2
EnableSpan 25, 2, 3
```

To change the default span configuration, use the *ConfigureSpan* command. To create a PRI Non-Facility Associated Signaling (NFAS) trunk group use the *CreatePRINFASTrunkGroup* command. CAS and ISDN signaling cannot coexist on a T1 card.

7.5 Viewing the T1 Card Configuration

To ensure that all commands were executed successfully, you can review the CLI output or request formatted output using a set of CLI Display commands. To view the card configuration associated with the above example, use the following Display commands:

```
DisplayBusH110 -1
DisplayCard -1,-1
DisplayClock -1,-1
DisplayTrunkGroup 301
DisplayTrunkGroup 302
DisplayTrunkGroup 303
DisplayTrunkGroup 304
DisplayTrunkGroupChannels 301
DisplayTrunkGroupChannels 302
DisplayTrunkGroupChannels 303
DisplayTrunkGroupChannels 304
DisplayDChannelProtocol 25,2,-1
DisplaySpan 25,2,-1
```

Sample output is shown on the following pages.

DisplayBusH110 -1

| BusId | ShelfNumber | SlotNumber |
|-------|-------------|------------|
| 0 | 25 | 2 |
| 1 | 25 | 2 |
| 2 | 25 | 2 |
| ... | | |
| 31 | -1 | -1 |

DisplayCard -1,-1

| CardType | CardNumber | Shelf | Slot | SignalingStandard | EncodingStandard | BackUpSlot | VirtualIpAddr |
|----------|------------|-------|------|-------------------|------------------|------------|---------------|
| T1 | 1 | 25 | 2 | ISDN | mu_Law | -1 | 0.0.0.0 |

DisplayClock -1,-1

| Shelf | Priority | Slot | Ref |
|-------|----------|------|--------|
| 25 | 0 | 2 | Span 1 |

DisplayTrunkGroup 301

| Name | Num | TrunkGroupType | HuntingAlgorithm | DS0s |
|----------------------------|-----|----------------|------------------|------|
| INCOMING_T1_PRI_TRUNKGROUP | 301 | ISDN | MOST_IDLE | 23 |

DisplayTrunkGroup 302

| Name | Num | TrunkGroupType | HuntingAlgorithm | DS0s |
|----------------------------|-----|----------------|------------------|------|
| OUTGOING_T1_PRI_TRUNKGROUP | 302 | ISDN | MOST_IDLE | 23 |

DisplayTrunkGroup 303

| Name | Num | TrunkGroupType | HuntAlgorithm | DS0s |
|---------------------------|-----|----------------|-----------------|------|
| INCOMING_T1_CC_TRUNKGROUP | 303 | CLEARCHANNEL | FIRST_AVAILABLE | 24 |

DisplayTrunkGroup 304

| Name | Num | TrunkGroupType | HuntAlgorithm | DS0s |
|---------------------------|-----|----------------|-----------------|------|
| OUTGOING_T1_CC_TRUNKGROUP | 304 | CLEARCHANNEL | FIRST_AVAILABLE | 24 |

DisplayTrunkGroupChannels 301

| ShelfNumber | SlotNumber | SpanNumber | ChannelNumber | InterfaceId | SpanState |
|-------------|------------|------------|---------------|-------------|-----------|
| 25 | 2 | 0 | 0 | 0 | ENABLED |
| 25 | 2 | 0 | 1 | 0 | ENABLED |
| 25 | 2 | 0 | 2 | 0 | ENABLED |
| 25 | 2 | 0 | 3 | 0 | ENABLED |
| 25 | 2 | 0 | 4 | 0 | ENABLED |
| 25 | 2 | 0 | 5 | 0 | ENABLED |
| 25 | 2 | 0 | 6 | 0 | ENABLED |
| 25 | 2 | 0 | 7 | 0 | ENABLED |
| 25 | 2 | 0 | 8 | 0 | ENABLED |
| 25 | 2 | 0 | 9 | 0 | ENABLED |
| 25 | 2 | 0 | 10 | 0 | ENABLED |
| 25 | 2 | 0 | 11 | 0 | ENABLED |
| 25 | 2 | 0 | 12 | 0 | ENABLED |
| 25 | 2 | 0 | 13 | 0 | ENABLED |
| 25 | 2 | 0 | 14 | 0 | ENABLED |
| 25 | 2 | 0 | 15 | 0 | ENABLED |
| 25 | 2 | 0 | 16 | 0 | ENABLED |
| 25 | 2 | 0 | 17 | 0 | ENABLED |
| 25 | 2 | 0 | 18 | 0 | ENABLED |
| 25 | 2 | 0 | 19 | 0 | ENABLED |
| 25 | 2 | 0 | 20 | 0 | ENABLED |
| 25 | 2 | 0 | 21 | 0 | ENABLED |
| 25 | 2 | 0 | 22 | 0 | ENABLED |

DisplayTrunkGroupChannels 302

| ShelfNumber | SlotNumber | SpanNumber | ChannelNumber | InterfaceId | SpanState |
|-------------|------------|------------|---------------|-------------|-----------|
| 25 | 2 | 1 | 0 | 0 | ENABLED |
| 25 | 2 | 1 | 1 | 0 | ENABLED |
| 25 | 2 | 1 | 2 | 0 | ENABLED |
| 25 | 2 | 1 | 3 | 0 | ENABLED |
| 25 | 2 | 1 | 4 | 0 | ENABLED |
| 25 | 2 | 1 | 5 | 0 | ENABLED |
| 25 | 2 | 1 | 6 | 0 | ENABLED |
| 25 | 2 | 1 | 7 | 0 | ENABLED |
| 25 | 2 | 1 | 8 | 0 | ENABLED |
| 25 | 2 | 1 | 9 | 0 | ENABLED |
| 25 | 2 | 1 | 10 | 0 | ENABLED |
| 25 | 2 | 1 | 11 | 0 | ENABLED |
| 25 | 2 | 1 | 12 | 0 | ENABLED |
| 25 | 2 | 1 | 13 | 0 | ENABLED |
| 25 | 2 | 1 | 14 | 0 | ENABLED |
| 25 | 2 | 1 | 15 | 0 | ENABLED |
| 25 | 2 | 1 | 16 | 0 | ENABLED |
| 25 | 2 | 1 | 17 | 0 | ENABLED |
| 25 | 2 | 1 | 18 | 0 | ENABLED |
| 25 | 2 | 1 | 19 | 0 | ENABLED |
| 25 | 2 | 1 | 20 | 0 | ENABLED |
| 25 | 2 | 1 | 21 | 0 | ENABLED |
| 25 | 2 | 1 | 22 | 0 | ENABLED |

DisplayTrunkGroupChannels 303

| ShelfNumber | SlotNumber | SpanNumber | ChannelNumber | InterfaceId | SpanState |
|-------------|------------|------------|---------------|-------------|-----------|
| 25 | 2 | 2 | 0 | -1 | ENABLED |
| 25 | 2 | 2 | 1 | -1 | ENABLED |
| 25 | 2 | 2 | 2 | -1 | ENABLED |
| 25 | 2 | 2 | 3 | -1 | ENABLED |
| 25 | 2 | 2 | 4 | -1 | ENABLED |
| 25 | 2 | 2 | 5 | -1 | ENABLED |
| 25 | 2 | 2 | 6 | -1 | ENABLED |
| 25 | 2 | 2 | 7 | -1 | ENABLED |
| 25 | 2 | 2 | 8 | -1 | ENABLED |
| 25 | 2 | 2 | 9 | -1 | ENABLED |
| 25 | 2 | 2 | 10 | -1 | ENABLED |
| 25 | 2 | 2 | 11 | -1 | ENABLED |
| 25 | 2 | 2 | 12 | -1 | ENABLED |
| 25 | 2 | 2 | 13 | -1 | ENABLED |
| 25 | 2 | 2 | 14 | -1 | ENABLED |
| 25 | 2 | 2 | 15 | -1 | ENABLED |
| 25 | 2 | 2 | 16 | -1 | ENABLED |
| 25 | 2 | 2 | 17 | -1 | ENABLED |
| 25 | 2 | 2 | 18 | -1 | ENABLED |
| 25 | 2 | 2 | 19 | -1 | ENABLED |
| 25 | 2 | 2 | 20 | -1 | ENABLED |
| 25 | 2 | 2 | 21 | -1 | ENABLED |
| 25 | 2 | 2 | 22 | -1 | ENABLED |
| 25 | 2 | 2 | 23 | -1 | ENABLED |

DisplayTrunkGroupChannels 304

| ShelfNumber | SlotNumber | SpanNumber | ChannelNumber | InterfaceId | SpanState |
|-------------|------------|------------|---------------|-------------|-----------|
| 25 | 2 | 3 | 0 | -1 | ENABLED |
| 25 | 2 | 3 | 1 | -1 | ENABLED |
| 25 | 2 | 3 | 2 | -1 | ENABLED |
| 25 | 2 | 3 | 3 | -1 | ENABLED |
| 25 | 2 | 3 | 4 | -1 | ENABLED |
| 25 | 2 | 3 | 5 | -1 | ENABLED |
| 25 | 2 | 3 | 6 | -1 | ENABLED |
| 25 | 2 | 3 | 7 | -1 | ENABLED |
| 25 | 2 | 3 | 8 | -1 | ENABLED |
| 25 | 2 | 3 | 9 | -1 | ENABLED |
| 25 | 2 | 3 | 10 | -1 | ENABLED |
| 25 | 2 | 3 | 11 | -1 | ENABLED |
| 25 | 2 | 3 | 12 | -1 | ENABLED |
| 25 | 2 | 3 | 13 | -1 | ENABLED |
| 25 | 2 | 3 | 14 | -1 | ENABLED |
| 25 | 2 | 3 | 15 | -1 | ENABLED |
| 25 | 2 | 3 | 16 | -1 | ENABLED |
| 25 | 2 | 3 | 17 | -1 | ENABLED |
| 25 | 2 | 3 | 18 | -1 | ENABLED |
| 25 | 2 | 3 | 19 | -1 | ENABLED |
| 25 | 2 | 3 | 20 | -1 | ENABLED |
| 25 | 2 | 3 | 21 | -1 | ENABLED |
| 25 | 2 | 3 | 22 | -1 | ENABLED |
| 25 | 2 | 3 | 23 | -1 | ENABLED |

DisplayDChannelProtocol 25,2,-1

| ShelfNumber | SlotNumber | CardNumber | SpanNumber | IEID | SwitchType | SideType | SignalingChannel | RestartControl |
|-------------|------------|------------|------------|------|------------|----------|------------------|----------------|
| 25 | 2 | 1 | 0 | 0 | NI2 | NETWORK | 23 | 1 |
| 25 | 2 | 1 | 1 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 4 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 5 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 6 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 7 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 8 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 9 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 10 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 11 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 12 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 13 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 14 | 0 | NI2 | USER | 23 | 1 |
| 25 | 2 | 1 | 15 | 0 | NI2 | USER | 23 | 1 |

MultipleInterface

```

-----
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1

```

DisplaySpan 25,2,-1

| CardNumber | CardType | SpanNumber | SpanType | Framing | Coding | LBO | LocalLoop | RemoteLoop | State | IO | L |
|------------|----------|------------|--------------|---------|--------|----------|-----------|------------|----------|-----|-----|
| 1 | T1 | 0 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | ENABLED | OFF | OFF |
| 1 | T1 | 1 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | ENABLED | OFF | OFF |
| 1 | T1 | 2 | CLEARCHANNEL | ESF | B8ZS | _0_133FT | OFF | OFF | ENABLED | OFF | OFF |
| 1 | T1 | 3 | CLEARCHANNEL | ESF | B8ZS | _0_133FT | OFF | OFF | ENABLED | OFF | OFF |
| 1 | T1 | 4 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF | OFF |
| 1 | T1 | 5 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF | OFF |
| 1 | T1 | 6 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF | OFF |
| 1 | T1 | 7 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF | OFF |
| 1 | T1 | 8 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF | OFF |
| 1 | T1 | 9 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF | OFF |
| 1 | T1 | 10 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF | OFF |
| 1 | T1 | 11 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF | OFF |
| 1 | T1 | 12 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF | OFF |
| 1 | T1 | 13 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF | OFF |
| 1 | T1 | 14 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF | OFF |

| | | | | | | | | | | |
|---|----|----|------|-----|------|----------|-----|-----|----------|-----|
| 1 | T1 | 15 | ISDN | ESF | B8ZS | _0_133FT | OFF | OFF | DISABLED | OFF |
|---|----|----|------|-----|------|----------|-----|-----|----------|-----|

7.6 Configuring PRI Information Elements Profiles

The PRI information elements (IEs) are linked to a common identifier created with the *CreatePRIIE* command. ISDN D-channels are linked to an IE Id with the *ConfigureDChannelProtocol* command.

ISDN Information Elements (IEs) can be dynamically changed by an application for a given call. You can, however, configure the default values through configuration commands. The IE configuration commands and their associated display commands are listed below:

| | |
|-----------------------------------|-----------------------------------|
| ConfigureCalledPartyIE | DisplayCalledPartyIE 0 |
| ConfigureCallingPartyIE | DisplayCallingPartyIE 0 |
| ConfigureCalledPartySubaddressIE | DisplayCalledPartySubaddressIE 0 |
| ConfigureCallingPartySubaddressIE | DisplayCallingPartySubaddressIE 0 |
| ConfigureCauseIE | DisplayCauseIE 0 |
| ConfigureProgressIndicatorIE | DisplayProgressIndicatorIE 0 |
| ConfigureHighLayerCompatibilityIE | DisplayHighLayerCompatibilityIE 0 |
| ConfigureLowLayerCompatibilityIE | DisplayLowLayerCompatibilityIE 0 |
| ConfigureSignalIE | DisplaySignalIE 0 |

To view the remaining 19 profiles, simply substitute the 0 in the above Display commands for the desired profile identifier.

For information on how to configure these IEs from an application, refer to the Managed API Reference document.

7.6.1 Sample PRI IE Configuration

A sample configuration of a new PRI IE profile based on the default profile 0 is shown below. The new profile is labeled as profile 20.

```
CreatePRIIE 20

ConfigureCalledPartyIE 20,UNKNOWN,UNKNOWN
ConfigureCallingPartyIE 20,INTERNATIONAL,ISDN_TELEPHONY,RESTRICTED,USER_NOT_SCREENED
ConfigureCalledPartySubaddressIE 20,USER_SPECIFIED,ODD
ConfigureCallingPartySubaddressIE 20,USER_SPECIFIED,ODD
ConfigureCauseIE 20,CCITT,PRIVATE_NET_LOCAL_USER,Q931,11
ConfigureProgressIndicatorIE 20,CCITT,USER_SPECIFIED,NOT_ISDN
ConfigureHighLayerCompatibilityIE
```

```
20,CCITT,FIRST_HIGH_LAYER_CHARACTERISTIC,HIGH_LAYER_PROTOCOL_PROFILE  
ConfigureLowLayerCompatibilityIE 20,CCITT,AUDIO_3KHZ,OUT_BAND_POSSIBLE,CIRCUIT,64Kbits/S  
ConfigureSignalIE 20, DIAL_TONE_ON
```


To display the output use the following display commands:

```

DisplayCalledPartyIE 20
DisplayCallingPartyIE 20
DisplayCalledPartySubaddressIE 20
DisplayCallingPartySubaddressIE 20
DisplayCauseIE 20
DisplayProgressIndicatorIE 20
DisplayHighLayerCompatibilityIE 20
DisplayLowLayerCompatibilityIE 20
DisplayNetworkSpecificIE 20
DisplaySignalIE 20

```

Sample display output for the above configuration is shown below:

DisplayCalledPartyIE 20

| CalledPartyIE | NumberType | NumberingPlan |
|---------------|------------|---------------|
| 20 | UNKNOWN | UNKNOWN |

DisplayCallingPartyIE 20

| CallingPartyIE | NumberType | NumberingPlan | Presentation | Screening |
|----------------|------------|---------------|--------------|-------------------|
| 20 | UNKNOWN | UNKNOWN | ALLOWED | USER_NOT_SCREENED |

DisplayCalledPartySubaddressIE 20

| CalledPartySubaddressIE | SubaddressType | OddEven |
|-------------------------|----------------|---------|
| 20 | USER_SPECIFIED | EVEN |

DisplayCallingPartySubaddressIE 20

| CallingPartySubaddressIE | SubaddressType | OddEven |
|--------------------------|----------------|---------|
| 20 | USER_SPECIFIED | ODD |

DisplayCauseIE 20

| CauseIE | Coding | Location | Recommendation | Cause |
|---------|--------|-----------------------|----------------|-------|
| 20 | CCITT | PUBLIC_NET_LOCAL_USER | Q931 | 16 |

DisplayProgressIndicatorIE 20

| ProgressIndicatorIE | Coding | Location | Description |
|---------------------|--------|----------------|-------------|
| 20 | CCITT | USER_SPECIFIED | NOT_ISDN |

DisplayHighLayerCompatibilityIE 20

| HighLayerCompatibilityIE | CodingStandard | Interpretation |
|-----------------------------|----------------|---------------------------------|
| ----- | ----- | ----- |
| 20 | CCITT | FIRST_HIGH_LAYER_CHARACTERISTIC |
| Presentation | | |
| ----- | | |
| HIGH_LAYER_PROTOCOL_PROFILE | | |

DisplayLowLayerCompatibilityIE 20

| LowLayerCompatibilityIEID | CodingStandard | TransferCapability | NegotiationIndicator |
|---------------------------|----------------|--------------------|-----------------------|
| ----- | ----- | ----- | ----- |
| 20 | CCITT | AUDIO_3KHZ | OUT_BAND_NOT_POSSIBLE |
| TransferMode | TransferRate | | |
| ----- | ----- | | |
| CIRCUIT | 64Kbits/S | | |

DisplayNetworkSpecificIE 20

| NetworkSpecificIE | NetworkIdentificationType | NetworkIdentificationPlan |
|-------------------|---------------------------|---------------------------|
| ----- | ----- | ----- |
| 20 | USER_SPECIFIC | UNKNOWN |

DisplaySignalIE 20

| SignalIE | SignalValue |
|----------|--------------|
| ----- | ----- |
| 20 | DIAL_TONE_ON |

7.7 Configuring Channel Associated Signaling (CAS)

Channel Associated Signaling (CAS) is the transmission of signaling information within the information band, also known as in-band signaling and robbed-bit signaling. Voice signals and signalling information travel on the same channels. As there are 24 channels on a full T1 span, CAS interleaves signaling packets within voice packets and allows all 24 channels to be used for voice. CAS signaling also processes Dialed Number Identification Service (DNIS) and automatic number identification (ANI) information. A CAS profile is assigned to a T1 span with the *CreateCASTrunkGroup* command.

A CAS profile defines a signalling protocol that can be applied to one or more T1 spans. A CAS profile is defined with the following commands:

- *ConfigureCASProfile*
- *ConfigureCASStage*
- *ConfigureCASSpill*

You can use these commands to configure your own profiles. Alternately, once a CAS signaling type is configured for a T1 card, see the *AddCard* command, you can access a set of 18 preconfigured CAS signaling profiles. The profiles can be displayed with the *DisplayCASSignalingProfile* command.

7.7.1 Profile, Stage, and Spill parameters

A profile consists of a minimum of one stage and one spill. Each profile, stage, and spill has a unique numerical identifier and a set of parameters. A summary of the parameters for each command is shown below:

ConfigureCASProfile

- Wink timing (transmit and receive)
- On-hook duration (receive)
- Off-hook duration (receive)
- Spill receive timeout
- Spill delimiter
- Tone type (multi frequency of dual tone multifrequency)
- The number of stages
- Minimum flash length detection
- Maximum flash length detection
- Length of flash
- GuardtimePeriod

ConfigureCASStage

- Associated CAS Profile identifier
- Number of spills in the stage

ConfigureCASSpill

- Associated CAS Profile identifier
- Associated CAS Stage identifier

- Spill type
- Digit configuration

7.7.2 CAS Configuration Sequence

To configure CAS signalling, the following sequence of CLI commands is necessary:

1. Use the *DisplayCard -1,-1* command to view the existing cards in your shelf. Sample output is shown below:

```
displaycard -1,-1
```

| CardType | CardNumber | Shelf | Slot | SignallingStandard | EncodingStandard | BackUpSlot | VirtualIpAddr |
|----------|------------|-------|------|--------------------|------------------|------------|---------------|
| T1 | 0 | 31 | 2 | ISDN | mu_Law | -1 | 0.0.0.0 |

2. If the card's signalling standard is not CAS, you must first disable the card's spans and remove the card. For the above example, proceed as follows:

```
disablespan 31,2, -1, ON
removecard 31,2
```

3. Use the *AddCard* command to add a new T1 card definition. For a card in shelf 31 slot 2, proceed as follows:

```
AddCard T1,31,2,CAS,mu_Law,-1,0.0.0.0
```

4. Use the *DisplayCASSignalingProfile* command to view the existing profiles. Sample output is shown below:

```
(5) : displaycassignalingprofile
```

| CASProfileTypeId | Description |
|------------------|----------------------|
| 0 | Feature GRP D |
| 1 | CAMA-ANI |
| 2 | Feature GRP B |
| 3 | Feature GRP B ANI |
| 4 | ERKSN |
| 5 | MF/ANI/DN |
| 6 | DTMF/FGD1 |
| 7 | DTMF/FGD2 |
| 8 | MF/DN |
| 9 | Cell/Tandem |
| 10 | TOPS |
| 11 | INTL FTR GRP D |
| 12 | LastWinkIsOffHook MF |
| 13 | Immediate MF |
| 14 | unknow dtmf |
| 15 | unknow mf |
| 16 | lastwinkisoffhook DT |
| 17 | immediate DTMF |

5. Use the *DisplayCasProfile* command to view the specifics of a profile. For example, to view the parameters associated with profile 0, enter *DisplayCasProfile 0*. Sample output is shown below:

```
displaycasprofile 0
```

```

CASProfileId   Description   Delimiter   ToneType   LastWinkOffHook   DecoderTimeout
-----
          0   Feature GRP D           ST           MF           FALSE           20000

MinLengthOfRxWink   MaxLengthOfRxWink   LengthOfTxWink   LengthOfRxOffHook
-----
          100           350           210           70

LengthOfRxOnHook   WinkTimeout   GuardTimePeriod   MinLengthFlashDetect
-----
          400           5000           2000           0

MaxLengthFlashDetect   LengthFlashGeneration   CanGoDisable   NumberOfStages
-----
          0           0           FALSE           2

```

Information on each parameter is provided in the EdgeIQ Configuration Reference document.

6. Use the *DisplayCasStage* command to view the stages associated with the profile. For example, to view the stages associated with CAS profile identifier 0, enter *DisplayCasStage 0,-1*. Sample output is shown below:

```
displaycasstage 0,-1
```

```

StageId   NumberOfSpills
-----
          0           2
          1           1

```

In the above example, Stage 0 has 2 spills and Stage 1 has 1 spill.

Use the *DisplayCasSpill* command to view the spill parameters associated with a spill. For example, to view the spill parameters for Stage 0, enter *DisplayCasSpill*










7.7.3 On-hook, Off-hook, and Wink

A wink is a transition from *on-hook* to *off-hook* to *on-hook* and is used to indicate that the terminating side is ready to receive addressing information. The state changes equivalent to a logic signal 0 and 1 states for the on-hook, off-hook, and wink signals is shown below:



7.7.4 Stages

A stage is a transaction between the calling end and the network. A typical single stage transaction is defined as an off-hook from the calling end followed by a wink from the network and a transfer of addressing information (one or more spills) from the calling end to the network. The exchange is shown below:

| Single Stage | | |
|---------------------|--|----------------|
| Calling end | Send Off-hook  | Network |
| Calling end | Send wink  | Network |
| Calling end | Send addressing information  | Network |
| Two Stage | | |
| Calling end | Send Off-hook  | Network |
| Calling end | Send wink  | Network |
| Calling end | Send addressing information  | Network |
| Calling end | Send Off-hook  | Network |
| Calling end | Send wink  | Network |
| Calling end | Send addressing information  | Network |

7.7.5 Spills

A spill is the addressing information enclosed in a set of delimiters. Sample spills for MF and DTMF tone types are shown below:

MF

KP8197710011ST

DTMF

8197710011

KP is the starting delimiter tone and *ST* is the inter-spill delimiter tone (also the end delimiter in this case). The addressing information is 8197710011. The inter-spill delimiter tone is defined by the *ConfigureCASProfile* command.

A two-spill stage, used for MF tone types, contains two sets of addresses as shown below:

KP8197710011ST KP6138393271ST

The spill type can be ANI (calling number), DIAL (called number), ANI_DIAL (calling and called number), DIAL_ANI (called and calling number), or unknown.

7.7.6 Channel Associated Signaling (CAS) Overview

The number of stage spill characteristics and timing parameters of various CAS protocols is configurable through the following set of commands:

- ConfigureCASProfile
- ConfigureCASStage
- ConfigureCASSpill

You can use these commands to configure your own profiles. Alternately, once a CAS signaling type is configured for a T1 card, see the *AddCard* command, you can access a set of 19 preconfigured CAS signaling profiles. The profiles can be displayed with the *DisplayCASSignalingProfile* command. The current default CAS profiles and their description are provided below:

| Profile Identifier | Name | Description |
|--------------------|-------------------|--|
| 0 | Feature GRP D | Wink start, MF Stage 1: ANI and Dialed Number Stage 2: Acknowledge wink. |
| 1 | CAMA-ANI | wink start, MF, Stage 1: Dialed number Stage 2: ANI |
| 2 | Feature GRP B | Wink start, MF Stage 1: Dialed number |
| 3 | Feature GRP B ANI | Wink start, MF Stage 1: Dialed number Stage 2: ANI |
| 4 | ERKSN | Wink start, MF Stage 1: ANI and Dialed Number Stage 2: Acknowledge wink |
| 5 | MF/ANI/DN | Wink start, MF Stage 1: ANI and Dialed Number Stage 2: Acknowledge wink |
| 6 | DTMF/FGD1 | Wink start, DTMF Stage 1: Dialed Number and ANI in same spill |
| 7 | DTMF/FGD2 | Wink start, DTMF Stage 1: ANI and Dialed Number in same spill |
| 8 | MF/DN | Wink start, MF Stage 1: Dialed Number |
| 9 | Cell/Tandem | Wink start, MF Stage 1: ANI and Dialed Number in same spill |
| 10 | TOPS | Wink start, MF Stage 1: Dialed number Stage 2: ANI |
| 11 | INTL FTR GRP D | Wink start, MF |

| Profile Identifier | Name | Description |
|--------------------|---|---|
| | | Stage 1: Carrier code only present for international call Stage 2: ANI and Dialed Number Stage 3: Acknowledge wink |
| 12 | LastWinkIsOffHook MF | Wink start, MF Stage 1: ANI Stage 2: Dialed number and offhook signal |
| 13 | Immediate MF | Immediate start, MF Stage 1: ANI and Dialed Number in same spill |
| 14 | Unknown DTMF | Wink start, DTMF Stage 1: Dialed Number |
| 15 | Unknown MF | Wink start, MF Stage 1: Dialed Number |
| 16 | Lastwinkisoffhook DT | Wink start, DTMF Stage 1: ANI, Dialed number and offhook signal |
| 17 | Immediate DTMF | Immediate start, DTMF Stage 1: ANI and Dialed number |
| 18 | Enhanced FGD (also known as NENA feature group D) | Wink start, MF Stage 1: 1 Spill : ANI 2 Spill (optional): dialed number/Pseudo ANI Stage 2: Acknowledge wink One or two spills can be generated or received. When two spills are receive/generated the last MF digit of the first spill is an STprime if not it is an ST. For transmission of a single ten digit ANI, the switch begins MF outpulsing the ANI information to the PSAP in the form KP II NPA NXX YYYY STP. For transmission of two, ten digit numbers, MF outpulsing begins in the form KP II NPA NXX YYYY (calling party number) ST KP NPA NXX YYYY (dialed number or pseudo ANI) ST. |

To view the configuration of each profile use the following commands:

- DisplayCASProfile
- DisplayCASSpill
- DisplayCASStage

7.7.7 CAS Configuration Example

This section details the basic configuration of a CAS profile to extract digits 3, 4, and 5 from the first spill of an MF string and extract digits 5, 6, and 7 from the second spill. For example, if the incoming string is:

```
KP1819ST KP6137771212ST
```

The desired output is:

- 819 for the calling party number
- 777 for the called party number.

First we must create a CAS trunk group with the *CreateCASTrunkGroup* command. Then we must either create a CAS profile or select an existing CAS profile that matches our requirements. In this case, CAS profile number 5 meets our requirements. This profile has the following characteristics:

- Makes use of *ST* as the delimiter
- Detects MF tones
- Has a predefined stage with 2 spills (Stage ID 0)

We must however, modify the CAS Spills for Stage ID 0 of this profile to meet our requirements. Use the *ConfigureCASSpill* command to change the CAS Spills as shown below:

```
CASProfileArrayId 5
StageIdx          0
SpillType         ANI
StartOfMiddleDigit 0
LengthOfMiddleDigit 0
NumOfDigitInFront 2
NumOfDigitInBack  1
NumOfDigit        0
```

This configuration allows the string 819 to be extracted from the *KP1819ST* string. The *NumOfDigitInFront* parameter indicates the number of digits to remove from the front of the input string. In this case we specified 2 digits corresponding to the KP digit and the 1. The *NumOfDigitInBack* parameter indicates the number of digits to remove from the end of the input string. In this case we specified 1 digit corresponding to the ST digit.

```
CASProfileArrayId 5
StageIdx          0
SpillIndex        1
SpillType         DIAL
StartOfMiddleDigit 0
LengthOfMiddleDigit 0
NumOfDigitInFront 4
NumOfDigitInBack  5
NumOfDigit        0
```

This configuration allows the string 777 to be extracted from the *KP6137771212ST* string. The *NumOfDigitInFront* parameter indicates the number of digits to remove from the front of the input string. In this case we specified 4 digits corresponding to *KP613*. The *NumOfDigitInBack* parameter indicates

the number of digits to remove from the end of the input string. In this case we specified 5 digits corresponding to *1212ST*.

7.8 Other T1 Commands

Other commands associated with the T1 cards are shown in section 4 Configuration Commands on page 17.

8 Configuring E1 Cards

This section details the configuration aspects for an E1 card. The topics are listed below:

- Prerequisites
- Obtaining the Default Configuration
- Configuring Your E1 Card
- Viewing the E1 Configuration
- Other E1 Commands

8.1 Prerequisites

Before configuring an E1 card, ensure that the Control and PSTN links are connected to the rear transition board.

8.2 E1 Interconnections

The interconnections associated with an E1 card are shown in section 3.3 Sample System Interconnections and IP Address Assignments on page 13.

8.3 Obtaining the Default Configuration

After adding a card with the *AddCard* command, you can view the default configuration. To view the default configuration for an E1 card installed in shelf 25, slot 4, enter the following command:

```
DisplaySpan 25,4,-1
```

Sample output is shown below:

| CardNumber | CardType | SpanNumber | SpanType | Framing | Coding | LBO | LocalLoop | RemoteLoop | State | IOLoopback |
|------------|----------|------------|----------|---------|--------|------------|-----------|------------|----------|------------|
| 7 | E1 | 0 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 1 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 2 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 3 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 4 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |

| | | | | | | | | | | |
|---|----|----|------|-------|------|------------|-----|-----|----------|-----|
| 7 | E1 | 5 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 6 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 7 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 8 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 9 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 10 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 11 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 12 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 13 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 14 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 7 | E1 | 15 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |

8.4 Configuring Your E1 card

This section provides a list of the basic commands required to set up an E1 card. The desired configuration is shown below:

| | |
|------------------------------|---|
| Shelf identifier: | 25 |
| E1 card slot: | 3 |
| H.110 Bus assignments: | 4, 5, 6, and 7 |
| Signaling type: | ISDN |
| Encoding type: | A Law |
| Clock: | Priority 1 (second highest), sourced from Span 0 |
| PRI D Channel: | Set to span 0, channel 16 for Network side and far end protocol is ETSI (defined by the European Telecommunications Standards Institute) |
| Span Configuration: | FRAME framing, High Density Bipolar 3 (HDB3) line coding, 133-266 line build out, Local Loopback off, Remote Loopback off, and I/O Loopback off |
| Incoming E1 PRI Trunk group: | PRI Number 305, named INCOMING_E1_PRI_TG, to contain span 0 with the hunting algorithm set to <i>Most Idle</i> |
| Outgoing E1 PRI Trunk group: | PRI Number 306, named OUTGOING_E1_PRI_TG, to contain span 1 with the hunting algorithm set to <i>Most Idle</i> |
| Incoming E1 CC Trunk group: | PRI Number 307, clear channel TG named INCOMING_E1_CC_TG, to contain span 2 with the hunting algorithm set to <i>First Available</i> |
| Outgoing E1 CC Trunk group: | PRI Number 308, clear channel TG named OUTGOING_E1_CC_TG, to contain span 3 with the hunting algorithm set to <i>First Available</i> |

The commands are listed below:

```
ConfigureBusH110 4, 25, 3
ConfigureBusH110 5, 25, 3
ConfigureBusH110 6, 25, 3
ConfigureBusH110 7, 25, 3
AddCard E1, 25, 3, ISDN, A_Law, -1, 0.0.0.0
ConfigureClock 25, 3, 1, 2, ADD
ConfigureDChannelProtocol 25, 3, 0, 16, 0, network, etsi, 1, 1
ConfigureDChannelProtocol 25, 3, 1, 16, 0, user, etsi, 1, 1
CreatePRITrunkGroup 305, INCOMING_E1_PRI_TG, 25, 3, 0, MOST_IDLE
CreatePRITrunkGroup 306, OUTGOING_E1_PRI_TG, 25, 3, 1, MOST_IDLE
CreateClearChannelTrunkGroup 307, INCOMING_E1_CC_TG, 25, 3, 2, first_available
CreateClearChannelTrunkGroup 308, OUTGOING_E1_CC_TG, 25, 3, 3, first_available
EnableSpan 25, 3, 0
EnableSpan 25, 3, 1
EnableSpan 25, 3, 2
EnableSpan 25, 3, 3
```

To change the default span configuration, use the *ConfigureSpan* command. CAS signaling is not available for E1 cards.

8.5 Viewing the E1 Card Configuration

To ensure that all commands were executed successfully, you can review the CLI output or request formatted output using a set of Display commands. To view the card configuration, use the following commands:

```
DisplayBusH110 -1
DisplayCard -1,-1
DisplayClock -1,-1
DisplayTrunkGroup 305
DisplayTrunkGroup 306
DisplayTrunkGroup 307
DisplayTrunkGroup 308
DisplayTrunkGroupChannels 305
DisplayTrunkGroupChannels 306
DisplayTrunkGroupChannels 307
DisplayTrunkGroupChannels 308
DisplayDChannelProtocol 25,3,-1
DisplaySpan 25,3,-1
```

Sample output is shown on the following pages.

DisplayBusH110 -1

| BusId | ShelfNumber | SlotNumber |
|-------|-------------|------------|
| 0 | 25 | 2 |
| 1 | 25 | 2 |
| 2 | 25 | 2 |
| 3 | 25 | 3 |
| 4 | 25 | 3 |
| 5 | 25 | 3 |
| 6 | 25 | 3 |
| ... | | |
| 31 | -1 | -1 |

DisplayCard -1,-1

| CardType | CardNumber | Shelf | Slot | SignalingStandard | EncodingStandard | BackUpSlot | VirtualIpAddr |
|----------|------------|-------|------|-------------------|------------------|------------|---------------|
| T1 | 1 | 25 | 2 | ISDN | mu_Law | -1 | 0.0.0.0 |
| E1 | 2 | 25 | 3 | ISDN | a_Law | -1 | 0.0.0.0 |

DisplayClock -1,-1

| Shelf | Priority | Slot | Ref |
|-------|----------|------|--------|
| 25 | 0 | 2 | Span 1 |
| 25 | 1 | 3 | Span 1 |

DisplayTrunkGroup 305

| Name | Num | TrunkGroupType | HuntingAlgorithm | DS0s |
|----------------------------|-----|----------------|------------------|------|
| INCOMING_E1_PRI_TRUNKGROUP | 305 | ISDN | MOST_IDLE | 32 |

DisplayTrunkGroup 306

| Name | Num | TrunkGroupType | HuntingAlgorithm | DSOs |
|----------------------------|-----|----------------|------------------|------|
| OUTGOING_E1_PRI_TRUNKGROUP | 306 | ISDN | MOST_IDLE | 32 |

DisplayTrunkGroup 307

| Name | Num | TrunkGroupType | HuntAlgorithm | DSOs |
|-------------------------------|-----|----------------|-----------------|------|
| INCOMING_E1_PRI_CC_TRUNKGROUP | 307 | CLEARCHANNEL | FIRST_AVAILABLE | 32 |

DisplayTrunkGroup 308

| Name | Num | TrunkGroupType | HuntAlgorithm | DSOs |
|-------------------------------|-----|----------------|-----------------|------|
| OUTGOING_E1_PRI_CC_TRUNKGROUP | 308 | CLEARCHANNEL | FIRST_AVAILABLE | 32 |

DisplayTrunkGroupChannels 305

| ShelfNumber | SlotNumber | SpanNumber | ChannelNumber | InterfaceId | SpanState |
|-------------|------------|------------|---------------|-------------|-----------|
| 25 | 3 | 0 | 0 | 0 | ENABLED |
| 25 | 3 | 0 | 1 | 0 | ENABLED |
| 25 | 3 | 0 | 2 | 0 | ENABLED |
| 25 | 3 | 0 | 3 | 0 | ENABLED |
| 25 | 3 | 0 | 4 | 0 | ENABLED |
| 25 | 3 | 0 | 5 | 0 | ENABLED |
| 25 | 3 | 0 | 6 | 0 | ENABLED |
| 25 | 3 | 0 | 7 | 0 | ENABLED |
| 25 | 3 | 0 | 8 | 0 | ENABLED |
| 25 | 3 | 0 | 9 | 0 | ENABLED |
| 25 | 3 | 0 | 10 | 0 | ENABLED |
| 25 | 3 | 0 | 11 | 0 | ENABLED |
| 25 | 3 | 0 | 12 | 0 | ENABLED |
| 25 | 3 | 0 | 13 | 0 | ENABLED |
| 25 | 3 | 0 | 14 | 0 | ENABLED |
| 25 | 3 | 0 | 15 | 0 | ENABLED |
| 25 | 3 | 0 | 16 | 0 | ENABLED |
| 25 | 3 | 0 | 17 | 0 | ENABLED |
| 25 | 3 | 0 | 18 | 0 | ENABLED |
| 25 | 3 | 0 | 19 | 0 | ENABLED |
| 25 | 3 | 0 | 20 | 0 | ENABLED |
| 25 | 3 | 0 | 21 | 0 | ENABLED |
| 25 | 3 | 0 | 22 | 0 | ENABLED |
| 25 | 3 | 0 | 23 | 0 | ENABLED |
| 25 | 3 | 0 | 24 | 0 | ENABLED |
| 25 | 3 | 0 | 25 | 0 | ENABLED |
| 25 | 3 | 0 | 26 | 0 | ENABLED |
| 25 | 3 | 0 | 27 | 0 | ENABLED |
| 25 | 3 | 0 | 28 | 0 | ENABLED |
| 25 | 3 | 0 | 29 | 0 | ENABLED |
| 25 | 3 | 0 | 30 | 0 | ENABLED |
| 25 | 3 | 0 | 31 | 0 | ENABLED |

DisplayTrunkGroupChannels 306

| ShelfNumber | SlotNumber | SpanNumber | ChannelNumber | InterfaceId | SpanState |
|-------------|------------|------------|---------------|-------------|-----------|
| 25 | 3 | 1 | 0 | 0 | ENABLED |
| 25 | 3 | 1 | 1 | 0 | ENABLED |
| 25 | 3 | 1 | 2 | 0 | ENABLED |
| 25 | 3 | 1 | 3 | 0 | ENABLED |
| 25 | 3 | 1 | 4 | 0 | ENABLED |
| 25 | 3 | 1 | 5 | 0 | ENABLED |
| 25 | 3 | 1 | 6 | 0 | ENABLED |
| 25 | 3 | 1 | 7 | 0 | ENABLED |
| 25 | 3 | 1 | 8 | 0 | ENABLED |
| 25 | 3 | 1 | 9 | 0 | ENABLED |
| 25 | 3 | 1 | 10 | 0 | ENABLED |
| 25 | 3 | 1 | 11 | 0 | ENABLED |
| 25 | 3 | 1 | 12 | 0 | ENABLED |
| 25 | 3 | 1 | 13 | 0 | ENABLED |
| 25 | 3 | 1 | 14 | 0 | ENABLED |
| 25 | 3 | 1 | 15 | 0 | ENABLED |
| 25 | 3 | 1 | 16 | 0 | ENABLED |
| 25 | 3 | 1 | 17 | 0 | ENABLED |
| 25 | 3 | 1 | 18 | 0 | ENABLED |
| 25 | 3 | 1 | 19 | 0 | ENABLED |
| 25 | 3 | 1 | 20 | 0 | ENABLED |
| 25 | 3 | 1 | 21 | 0 | ENABLED |
| 25 | 3 | 1 | 22 | 0 | ENABLED |
| 25 | 3 | 1 | 23 | 0 | ENABLED |
| 25 | 3 | 1 | 24 | 0 | ENABLED |
| 25 | 3 | 1 | 25 | 0 | ENABLED |
| 25 | 3 | 1 | 26 | 0 | ENABLED |
| 25 | 3 | 1 | 27 | 0 | ENABLED |
| 25 | 3 | 1 | 28 | 0 | ENABLED |
| 25 | 3 | 1 | 29 | 0 | ENABLED |
| 25 | 3 | 1 | 30 | 0 | ENABLED |
| 25 | 3 | 1 | 31 | 0 | ENABLED |

DisplayTrunkGroupChannels 307

| ShelfNumber | SlotNumber | SpanNumber | ChannelNumber | InterfaceId | SpanState |
|-------------|------------|------------|---------------|-------------|-----------|
| 25 | 3 | 2 | 0 | -1 | ENABLED |
| 25 | 3 | 2 | 1 | -1 | ENABLED |
| 25 | 3 | 2 | 2 | -1 | ENABLED |
| 25 | 3 | 2 | 3 | -1 | ENABLED |
| 25 | 3 | 2 | 4 | -1 | ENABLED |
| 25 | 3 | 2 | 5 | -1 | ENABLED |
| 25 | 3 | 2 | 6 | -1 | ENABLED |
| 25 | 3 | 2 | 7 | -1 | ENABLED |
| 25 | 3 | 2 | 8 | -1 | ENABLED |
| 25 | 3 | 2 | 9 | -1 | ENABLED |
| 25 | 3 | 2 | 10 | -1 | ENABLED |
| 25 | 3 | 2 | 11 | -1 | ENABLED |
| 25 | 3 | 2 | 12 | -1 | ENABLED |
| 25 | 3 | 2 | 13 | -1 | ENABLED |
| 25 | 3 | 2 | 14 | -1 | ENABLED |
| 25 | 3 | 2 | 15 | -1 | ENABLED |
| 25 | 3 | 2 | 16 | -1 | ENABLED |
| 25 | 3 | 2 | 17 | -1 | ENABLED |
| 25 | 3 | 2 | 18 | -1 | ENABLED |
| 25 | 3 | 2 | 19 | -1 | ENABLED |
| 25 | 3 | 2 | 20 | -1 | ENABLED |
| 25 | 3 | 2 | 21 | -1 | ENABLED |
| 25 | 3 | 2 | 22 | -1 | ENABLED |
| 25 | 3 | 2 | 23 | -1 | ENABLED |
| 25 | 3 | 2 | 24 | -1 | ENABLED |
| 25 | 3 | 2 | 25 | -1 | ENABLED |
| 25 | 3 | 2 | 26 | -1 | ENABLED |
| 25 | 3 | 2 | 27 | -1 | ENABLED |
| 25 | 3 | 2 | 28 | -1 | ENABLED |
| 25 | 3 | 2 | 29 | -1 | ENABLED |
| 25 | 3 | 2 | 30 | -1 | ENABLED |
| 25 | 3 | 2 | 31 | -1 | ENABLED |

DisplayTrunkGroupChannels 308

| ShelfNumber | SlotNumber | SpanNumber | ChannelNumber | InterfaceId | SpanState |
|-------------|------------|------------|---------------|-------------|-----------|
| 25 | 3 | 3 | 0 | -1 | ENABLED |
| 25 | 3 | 3 | 1 | -1 | ENABLED |
| 25 | 3 | 3 | 2 | -1 | ENABLED |
| 25 | 3 | 3 | 3 | -1 | ENABLED |
| 25 | 3 | 3 | 4 | -1 | ENABLED |
| 25 | 3 | 3 | 5 | -1 | ENABLED |
| 25 | 3 | 3 | 6 | -1 | ENABLED |
| 25 | 3 | 3 | 7 | -1 | ENABLED |
| 25 | 3 | 3 | 8 | -1 | ENABLED |
| 25 | 3 | 3 | 9 | -1 | ENABLED |
| 25 | 3 | 3 | 10 | -1 | ENABLED |
| 25 | 3 | 3 | 11 | -1 | ENABLED |
| 25 | 3 | 3 | 12 | -1 | ENABLED |
| 25 | 3 | 3 | 13 | -1 | ENABLED |
| 25 | 3 | 3 | 14 | -1 | ENABLED |
| 25 | 3 | 3 | 15 | -1 | ENABLED |
| 25 | 3 | 3 | 16 | -1 | ENABLED |
| 25 | 3 | 3 | 17 | -1 | ENABLED |
| 25 | 3 | 3 | 18 | -1 | ENABLED |
| 25 | 3 | 3 | 19 | -1 | ENABLED |
| 25 | 3 | 3 | 20 | -1 | ENABLED |
| 25 | 3 | 3 | 21 | -1 | ENABLED |
| 25 | 3 | 3 | 22 | -1 | ENABLED |
| 25 | 3 | 3 | 23 | -1 | ENABLED |
| 25 | 3 | 3 | 24 | -1 | ENABLED |
| 25 | 3 | 3 | 25 | -1 | ENABLED |
| 25 | 3 | 3 | 26 | -1 | ENABLED |
| 25 | 3 | 3 | 27 | -1 | ENABLED |
| 25 | 3 | 3 | 28 | -1 | ENABLED |
| 25 | 3 | 3 | 29 | -1 | ENABLED |
| 25 | 3 | 3 | 30 | -1 | ENABLED |
| 25 | 3 | 3 | 31 | -1 | ENABLED |

DisplayDChannelProtocol 25,3,-1

| ShelfNumber | SlotNumber | CardNumber | SpanNumber | IEID | SwitchType | SideType | SignalingChannel | RestartControl |
|-------------|------------|------------|------------|------|------------|----------|------------------|----------------|
| 25 | 3 | 2 | 0 | 0 | ETSI | NETWORK | 16 | 1 |
| 25 | 3 | 2 | 1 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 4 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 5 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 6 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 7 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 8 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 9 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 10 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 11 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 12 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 13 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 14 | 0 | ETSI | USER | 16 | 1 |
| 25 | 3 | 2 | 15 | 0 | ETSI | USER | 16 | 1 |

MultipleInterface

```

-----
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1
1

```

DisplaySpan 25,3,-1

| CardNumber | CardType | SpanNumber | SpanType | Framing | Coding | LBO | LocalLoop | RemoteLoop | State | IO L |
|------------|----------|------------|--------------|---------|--------|------------|-----------|------------|----------|------|
| 2 | E1 | 0 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | ENABLED | OFF |
| 2 | E1 | 1 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | ENABLED | OFF |
| 2 | E1 | 2 | CLEARCHANNEL | FRAME | HDB3 | _133_266FT | OFF | OFF | ENABLED | OFF |
| 2 | E1 | 3 | CLEARCHANNEL | FRAME | HDB3 | _133_266FT | OFF | OFF | ENABLED | OFF |
| 2 | E1 | 4 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 2 | E1 | 5 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 2 | E1 | 6 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 2 | E1 | 7 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 2 | E1 | 8 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 2 | E1 | 9 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 2 | E1 | 10 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 2 | E1 | 11 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 2 | E1 | 12 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 2 | E1 | 13 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 2 | E1 | 14 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |
| 2 | E1 | 15 | ISDN | FRAME | HDB3 | _133_266FT | OFF | OFF | DISABLED | OFF |

8.6 Other E1 Commands

Other commands associated with the E1 cards are shown in section 4 Configuration Commands on page 17.

9 Configuring VoIP Cards

This section details the configuration aspects for a VoIP card. The topics are listed below:

- Prerequisites
- Obtaining the Default Configuration
- Configuring Your VoIP Card
- Viewing the VoIP Configuration
- Other VoIP Commands

The bearer channels in a VoIP clear channel must be associated with a VoIP signaling trunk group. The association between bearer channels and their signaling channel is made through the *CreateVoIPBWTrunkGroup* command. A single VoIP signaling channel can control one span with up to 512 VoIP bearer channels. Two signaling schemes are supported; H.323 and Session Initiated Protocol (SIP).

The SolaCom Signaling Interface Layer (SIL) supports a gateway controller interface to external IP signaling components. One signaling span can exist for each VoIP SIL interface. One or more instances of a SIL can connect to the VSOS, each having different gateway controller capabilities.

9.1 Prerequisites

Before configuring a VoIP card, ensure that you have configured the *mesoware.ini* file. You card's Control and RTP links should also be connected to the appropriate Ethernet switches.

9.2 VoIP Card Interconnections

The interconnections associated with a VoIP card and SIL bladewares are shown in section 3.3 Sample System Interconnections and IP Address Assignments on page 13.

9.3 Obtaining the Default Configuration

Once you configured a bladeaware with the *AddBW* command, the default channel profile is assigned to the bladeaware. The default *VoIPChannelProfileId* is 0. To view the default assignments with the display commands, you must first define a SIP or H.323 bladeaware as shown below:

```
AddBW VOIPSIL, 244, SIP, 25, 222, NONE
```

OR

```
AddBW VOIPSIL, 244, H323, 25, 223, NONE
```

Default values for VoIP parameters stored under channel profile identifier 0 are shown below:

```
DisplayVoIPChannelProfileIDs
```

```
VoIPChannelProfileId
```

```
0
```

```
Displaybw -1
```

| CardType | CardNumber | BladeWareId | SignalingStandard | Shelf | Slot | EncodingStandard |
|----------|------------|-------------|-------------------|-------|-------|------------------|
| ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| VoIPSil | 5 | 244 | SIP | 25 | 222 | NONE |

```
DisplayVOIPBW 244,0
```

| BWId | SpanNumber | GWExternalPort | GWExternalIp | RouteSet | EarlyMedia |
|------|------------|----------------|--------------|----------|------------|
| 244 | 0 | 5060 | 127.0.0.1 | -1 | ON |

```
DisplayVOIPBWFaxModemPayload 244,0
```

| BWId | SpanNumber | T38MaxBitRate |
|----------------------|----------------------|-----------------------|
| 244 | 0 | 14400 |
| T38FaxVersion | T38FaxMaxBuffer | T38FaxMaxDatagram |
| 0 | 76 | 316 |
| T38FaxFillBitRemoval | T38FaxTranscodingMMR | T38FaxTranscodingJBIG |
| 0 | 0 | 0 |
| T38Mode | T38FaxRateManagement | T38FaxUdpEC |
| n/a | n/a | n/a |

DisplayVOIPBWSIP 244, 0 (Use DisplayVOIPBWH323 if you defined an H.323 bladeaware)

| BWId | SpanNumber | GWDebug |
|--------------------------|-----------------------|--------------------------|
| 244 | 0 | 0 |
| GWName | GWProxyAddress | GWProxyRealm |
| cml@versatelnetworks.com | 127.0.0.1 | cml@versatelnetworks.com |
| GWProxyUserName | GWProxyPassword | GWProxyRegExpire |
| cml@versatelnetworks.com | J8Z1W1 | 0 |
| GWUseContactAsSrcDomain | GWProxyEnabled | GwForwardSDP |
| 0 | 0 | 0 |
| GwSendTelephoneEvent | GwProxyIsStrictRouter | GwTerminationEvent |
| 1 | 0 | test01 |

DisplayVOIPCause 0

| VOIPChannelProfileId | CAUSE |
|----------------------|-------|
| 0 | 0 |

DisplayVOIPDNS 0

| VOIPChannelProfileId | DNS |
|----------------------|-----|
| 0 | |

DisplayVOIPECANCfg 0

| VOIPChannelProfileId | ECAN168 | ECANNonLinearProcessor | ECANTail |
|---------------------------------|---------|------------------------|----------|
| 0 | ON | ON | 64Msec |
| WorstCaseExpectedEchoReturnLoss | 6db | | |

DisplayVOIPFaxModemPacketsIE 0

| VOIPChannelProfileId | FaxMaxJitter | FaxMaxDelay | FaxCEDDuration |
|-------------------------|----------------|-----------------------|----------------|
| 0 | 150 | 200 | 3000 |
| FaxCNGDoneDelay | FaxCNGDuration | NumRedundantImagePkts | |
| 3000 | 500 | 3 | |
| NumRedundantControlPkts | ReorderDelay | | |
| 3 | 200 | | |

DisplayVOIPOutOfBandToneCfg 0

| VOIPChannelProfileId | Rfc2833 | FaxRelay | DTMFMode | DTMFRelay |
|----------------------|---------|-------------|----------|-----------|
| 0 | ON | T38FaxRelay | RFC2833 | ON |

DisplayVOIPprefix 0

| VOIPChannelProfileId | PREFIX |
|----------------------|--------|
| 0 | |

DisplayVOIPProgress 0

| VOIPChannelProfileId | PROGRESS |
|----------------------|----------|
| 0 | 0 |

DisplayVOIPRTCPpacketsCfg 0

| VOIPChannelProfileId | TxRTCPpackets | TxRTCPInterval |
|----------------------|---------------|----------------|
| 0 | OFF | 5000 |

| UseFarEndAltIpAddressForRTCP | RtcpCName |
|------------------------------|-----------|
| OFF | 127.0.0.1 |

DisplayVOIPRTPpacketsCfg 0

| VOIPChannelProfileId | Codec1 | Codec2 | Codec3 | Codec4 |
|----------------------|--------|-----------|-----------|----------|
| 0 | G729a | G711_uLaw | G711_aLaw | G726_32K |

| PktPeriodCodec1 | PktPeriodCodec2 | PktPeriodCodec3 | PktPeriodCodec4 |
|-----------------|-----------------|-----------------|-----------------|
| 20 | 20 | 20 | 20 |

| TxIpTypeOfService | TxIpTimeToLive | RxUdpChecksumCalculation |
|-------------------|----------------|--------------------------|
| 184 | 255 | ON |

| TxUdpChecksumCalculation | RxRtpRedundant | TxRtpRedundant |
|--------------------------|----------------|----------------|
| ON | OFF | OFF |

| NatTraversal | RTPMonitoring | RTPMonitoringTimer |
|---------------------|---------------|--------------------|
| SecuredNatTraversal | ON | 60000 |

DisplayVOIPRTTPayloadTypeMappingCfg 0

| VOIPChannelProfileId | RedundantPT | G711uLawPT | G711aLawPT | G726_16KPT |
|----------------------|-------------|------------|----------------------|------------|
| 0 | 102 | 0 | 8 | 96 |
| G726_24KPT | G726_32KPT | G726_40KPT | G729aPT and G729abPT | G723_1PT |
| 97 | 2 | 98 | 18 | 4 |
| Rfc2833PT | | | | |
| 127 | | | | |

DisplayVOIPSilentSuppressionCfg 0

| VOIPChannelProfileId | CNGMode | VADType | GenericVADMode |
|----------------------|------------|----------------|----------------|
| 0 | HOTH_NOISE | BUILT_IN_CODEC | CONSERVATIVE |

DisplayVOIPVoicePacketsCfg 0

| VOIPChannelProfileId | JitterBufferLengthAdapt | JitterMin | JitterMax |
|----------------------|-------------------------|-----------|-----------|
| 0 | ON | 0 | 100 |
| JitterTarget | RxPktGain | TxPktGain | |
| 20 | 0 | 0 | |

9.3.1 Creating New VoIPChannelProfileIds

If you need to change a parameter value associated with the default channel profile, you must first use the *CreateVoIPChannelProfileId* command to create a new profile. The new profile is based on the default profile.

VoIP channels are assigned to specific profiles with the *MoveSpanToTrunkGroup*, *MoveChannelToTrunkGroup*, and *MoveRangeOfChannelsToTrunkGroup* commands.

9.4 Configuring Your VoIP Card

The VoIP512 card supports high-density, carrier-grade VoIP technology and allows IP-based media services. Each VoIP512 card supports one span of up to 512 full-duplex channels for each IP connection. Voice packets are sent via RTP/RTCP (Real-time Transport Protocol and Real-time Transport Control Protocol) on a full-duplex stream socket that is identified by an IP address and port number. Speech packets between two or more entities are transmitted through VoIP clear channels. The VoIP signaling channel is not on the same span as the bearer channels.

VoIP SILs are configured with the `add bladeware` (*AddBW*) command. This command allows you to add a VoIPSIL, assign a bladeware identifier (*BWId*), and link it to a processor card or separate host external to the EdgeIQ chassis. Additional parameters are configured with the *ConfigureVoIPBW*, *ConfigureVoIPBWSIP*, and *ConfigureVoIPBWH323* commands.

This section provides a list of the basic commands required to set up a VoIP card and VoIP SILs. The desired configuration is shown below:

| | |
|------------------------|---|
| Shelf identifier: | 25 |
| VoIP card slot: | 4 |
| H.110 Bus assignments: | 8, 9, 10, and 11 |
| Signaling type: | Clear Channel |
| Encoding type: | mu Law |
| Clock: | Sourced internally |
| One SIP SIL: | Bladeware 101 |
| One CC trunk group: | Clear channel TG number 500 with channels 0-9 using the ROUND_ROBIN_FORWARD hunting algorithm |
| One H.323 SIL: | Bladeware 102 |
| One CC trunk group: | Clear channel TG number 501 with channels 200-209 using the ROUND_ROBIN_FORWARD hunting algorithm |

The card level commands are listed below:

```
ConfigureBusH110 8, 25, 4
ConfigureBusH110 9, 25, 4
ConfigureBusH110 10, 25, 4
ConfigureBusH110 11, 25, 4
AddCard VoIP512, 25, 4, CLEARCHANNEL, mu_Law, -1, 0.0.0.0
ConfigureClock 25, 4, 0, INTERNAL, ADD
```

The remaining commands have an associated paragraph describing the command purpose. Full parameter details for each command are given in the Configuration Reference document.

- Add a VoIP SIP SIL bladeware with identifier 101. The SIL resides on an external host as indicated by an assigned shelf number greater than 99 (222 in this case).

```
AddBW VOIPSIL, 101, SIP, 222, 4, NONE
```

- Configure the SIP SIL gateway port and IP address. Link the bladeware to Route Set 1 and enable Early Media.

```
ConfigureVOIPBW 101,0,5060,127.0.0.4,1,ON
```

- Configure the SIP gateway parameters. See the Configuration Reference document for parameter details.

```
ConfigureVOIPBWSIP 101, 0, 1, n/a,n/a,n/a,n/a,n/a, 0, 0, 0, 0, 1, 0, test01
```

- Create an empty VoIP signaling trunk group associated with VoIP SIP SIL bladeware 101

```
CreateVOIPBWTrunkGroup 500, VOIP_SIP, -1, -1, -1, 101,
ROUND_ROBIN_FORWARD, 0
```

- Move VoIP channels 0 to 9 to Trunk Group 500. Channels 10 to 511 remain unassigned.

```
MoveChannelToTrunkGroup 25, 4, 0, 0, 500
MoveChannelToTrunkGroup 25, 4, 0, 1, 500
MoveChannelToTrunkGroup 25, 4, 0, 2, 500
MoveChannelToTrunkGroup 25, 4, 0, 3, 500
MoveChannelToTrunkGroup 25, 4, 0, 4, 500
MoveChannelToTrunkGroup 25, 4, 0, 5, 500
MoveChannelToTrunkGroup 25, 4, 0, 6, 500
MoveChannelToTrunkGroup 25, 4, 0, 7, 500
MoveChannelToTrunkGroup 25, 4, 0, 8, 500
MoveChannelToTrunkGroup 25, 4, 0, 9, 500
```

- Configure the network gateway IP address and define the subnet mask for the specified RTP stream.

```
ConfigureVoIPSpan 25, 4, 0, 127.0.0.1, 255.255.255.240
```

- Configure the default source (local) IP address and UDP port from which RTP and RTCP packets are sent over a VoIP clear channel.

```
ConfigureRTPSourceParameters 25, 4, 0, -1, 5000, 127.0.0.5, 0
```

- Add the BW Trunk Group to Route Set 1 and set the hunt order to 0.

```
AddTrunkGroupToRouteSet 1, 500, 0
```

- Specify how to encode and transmit voice samples as RTP packets over a VoIP bearer channel that is associated with VoIP channel profile Id 0.

```
ConfigureVOIPRTPPackets 0, G711_uLaw, NONE, NONE, NONE, 20, -1, -1, -1,
184, 255, ON, ON, OFF, OFF, NoNatTraversal, OFF, 60000
```

- Repeat the above steps for the H.323 SIL:

```
AddBW VOIPSIL, 201, H323, 223, 4, NONE
ConfigureVOIPBW 201, 0, 1720, 127.0.0.4, 1, ON
CreateVOIPChannelProfileId 2
```

```
ConfigureVOIPBWH323 201,0,1,H323Zone,1,1,0,n/a,0,n/a,
0,0,0,0,0,0,0,0,0,0,0,0,0,0,3,5,0,n/a,0,test01
```

```
CreateVOIPBWTrunkGroup 501,VOIP_H323,-1,-1,-1,201,ROUND_ROBIN_FORWARD,2
```

```
MoveChannelToTrunkGroup 25, 4, 0, 200, 501
MoveChannelToTrunkGroup 25, 4, 0, 201, 501
MoveChannelToTrunkGroup 25, 4, 0, 202, 501
MoveChannelToTrunkGroup 25, 4, 0, 203, 501
MoveChannelToTrunkGroup 25, 4, 0, 204, 501
MoveChannelToTrunkGroup 25, 4, 0, 205, 501
MoveChannelToTrunkGroup 25, 4, 0, 206, 501
MoveChannelToTrunkGroup 25, 4, 0, 207, 501
MoveChannelToTrunkGroup 25, 4, 0, 208, 501
MoveChannelToTrunkGroup 25, 4, 0, 209, 501
```

```
AddTrunkGroupToRouteSet 2, 501, 0
```

```
ConfigureVOIPRTTPackets 2, G711_uLaw, NONE, NONE, NONE, 20, -1, -1, -1, 184,
255, ON, ON, OFF, OFF, NoNatTraversal, OFF, 60000
```

- Enable the VoIP card's span, the SIP SIL, and the H.323 SIL:

```
EnableSpan 25, 4, -1
EnableBWspan 101, -1
EnableBWspan 201, -1
```

9.5 Viewing the VoIP Configuration

To ensure that all commands were executed successfully, you can review the CLI output or request formatted output using a set of Display commands. To view the entered card configuration, use the following commands:

```
DisplayCard -1,-1
DisplayBusH110 -1
DisplayBW -1
DisplayVoIPBW 101, 0
DisplayVoIPBW 201,0
DisplayVoIPBWSIP 101, 0
DisplayVoIPBWH323 201, 0
DisplayVoIPBWFaxModemPayload 101, 0
DisplayVoIPBWFaxModemPayload 201, 0
DisplayClock -1,-1
DisplayTrunkGroup 500
DisplayTrunkGroup 501
DisplayTrunkGroupChannels 500
DisplayTrunkGroupChannels 501
DisplayVoIPSpan 25,4,-1
```

To view the remaining VoIP configuration items, enter the following commands:

```
DisplayVoIPCause 0
DisplayVoIPChannelProfileIds
DisplayVoIPDNS 0
DisplayVoIPECANCfg 0
DisplayVoIPFaxModemPacketsIE 0
DisplayVoIPOutofBandToneCfg 0
DisplayVoIPPrefix 0
DisplayVoIPProgress 0
DisplayVoIPRTCPPacketsCfg 0
DisplayVoIPRTTPacketsCfg 0
DisplayVoIPRTTPacketsSizeInBytes G711_uLaw, -1
DisplayVoIPRTTPayloadTypeMappingCfg 0
DisplayVoIPSilentSuppressionCfg 0
DisplayVoIPVoicePacketsCfg 0
```

Sample output is shown on the following pages.

DisplayCard -1,-1

| CardType | CardNumber | Shelf | Slot | SignalingStandard | EncodingStandard | BackUpSlot | VirtualIpAddr |
|----------|------------|-------|------|-------------------|------------------|------------|---------------|
| VoIP512 | 1 | 25 | 4 | CLEARCHANNEL | mu_Law | -1 | 0.0.0.0 |

DisplayBusH110 -1

| BusId | ShelfNumber | SlotNumber |
|-------|-------------|------------|
| ---- | ----- | ----- |
| 0 | -1 | -1 |
| 1 | -1 | -1 |
| 2 | -1 | -1 |
| 3 | -1 | -1 |
| 4 | -1 | -1 |
| 5 | -1 | -1 |
| 6 | -1 | -1 |
| 7 | -1 | -1 |
| 8 | 25 | 4 |
| 9 | 25 | 4 |
| 10 | 25 | 4 |
| 11 | 25 | 4 |
| 12 | -1 | -1 |
| 13 | -1 | -1 |
| 14 | -1 | -1 |
| 15 | -1 | -1 |
| 16 | -1 | -1 |
| 17 | -1 | -1 |
| 18 | -1 | -1 |
| 19 | -1 | -1 |
| 20 | -1 | -1 |
| 21 | -1 | -1 |
| 22 | -1 | -1 |
| 23 | -1 | -1 |
| 24 | -1 | -1 |
| 25 | -1 | -1 |
| 26 | -1 | -1 |
| 27 | -1 | -1 |
| 28 | -1 | -1 |
| 29 | -1 | -1 |
| 30 | -1 | -1 |
| 31 | -1 | -1 |

DisplayBW -1

| CardType | CardNumber | BladeWareId | SignalingStandard | Shelf | Slot | EncodingStandard |
|----------|------------|-------------|-------------------|-------|-------|------------------|
| ----- | ----- | ----- | ----- | ----- | ----- | ----- |
| VoIPSil | 2 | 101 | SIP | 222 | 50 | NONE |
| VoIPSil | 3 | 201 | H323 | 223 | 51 | NONE |

DisplayVoIPBW 101, 0

| BWId | SpanNumber | GWExternalPort | GWExternalIp | RouteSet | EarlyMedia |
|------|------------|----------------|--------------|----------|------------|
| ---- | ----- | ----- | ----- | ----- | ----- |
| 101 | 0 | 5060 | 127.0.0.4 | 1 | ON |

DisplayVoIPBW 201,0

| BWId | SpanNumber | GWExternalPort | GWExternalIp | RouteSet | EarlyMedia |
|------|------------|----------------|--------------|----------|------------|
| ---- | ----- | ----- | ----- | ----- | ----- |
| 201 | 0 | 1720 | 127.0.0.4 | 2 | ON |

DisplayVoIPBWSIP 101, 0

| BWId | SpanNumber | GWDebug |
|--------------------------|-----------------------|--------------------------|
| 101 | 0 | 0 |
| GWName | GWProxyAddress | GWProxyRealm |
| cml@versatelnetworks.com | 127.0.0.1 | cml@versatelnetworks.com |
| GWProxyUserName | GWProxyPassword | GWProxyRegExpire |
| cml@versatelnetworks.com | J8Z1W1 | 0 |
| GWUseContactAsSrcDomain | GWProxyEnabled | GwForwardSDP |
| 0 | 0 | 0 |
| GwSendTelephoneEvent | GwProxyIsStrictRouter | GwTerminationEvent |
| 1 | 0 | test01 |

DisplayVoIPBWH323 201, 0

| BWId | SpanNumber | GWDebug | GWZone | GWAcceptNonFastStart | GWUseFastStart |
|---------------------------|--------------------------|------------------------|---------------------|----------------------|----------------|
| 201 | 0 | 1 | H323Zone | 1 | 1 |
| GWGkEnabled | GWGkAddress | GWUseH245Tunneling | GWGId | GWUseT38Fax | |
| 0 | 127.0.0.1 | 0 | cml@vers.com | 0 | |
| GWH450Enabled | GWForwardNSD | GWUseSignalForTone | | | |
| 0 | 0 | 0 | | | |
| GWSignallingChannelCallTO | GWControlChannelStartTO | | | | |
| | 0 | | | 0 | |
| GWMasterSlaveDeterminTO | GWCapabilityExchangeTO | GWLogicalChannelTO | | | |
| | 0 | | | 0 | 0 |
| GWGatekeeperRequestTO | GWRasRequestTO | GWAliveTimer | GWGkRegisterRetries | | |
| | 0 | 0 | 0 | | 3 |
| GWGkRegisterPeriod | GWEnableLocalCallLogging | GWLocalCallLoggingFile | | | |
| | 5 | 0 | | | n/a |
| GWGkPrefixCount | GwTerminationEvent | | | | |
| | 0 | test01 | | | |

DisplayVOIPBWFaxModemPayload 101,0

| BWId | SpanNumber | T38MaxBitRate | T38FaxVersion | T38FaxMaxBuffer |
|-----------------------|------------|----------------------|----------------------|-----------------|
| 101 | 0 | 14400 | 0 | 76 |
| T38FaxMaxDatagram | | T38FaxFillBitRemoval | T38FaxTranscodingMMR | |
| 316 | | 0 | 0 | |
| T38FaxTranscodingJBIG | | Reserved1 | Reserved2 | Reserved3 |
| 0 | | n/a | n/a | n/a |

DisplayVOIPBWFaxModemPayload 201,0

| BWId | SpanNumber | T38MaxBitRate | T38FaxVersion | T38FaxMaxBuffer |
|-----------------------|------------|----------------------|----------------------|-----------------|
| 101 | 0 | 14400 | 0 | 76 |
| T38FaxMaxDatagram | | T38FaxFillBitRemoval | T38FaxTranscodingMMR | |
| 316 | | 0 | 0 | |
| T38FaxTranscodingJBIG | | Reserved1 | Reserved2 | Reserved3 |
| 0 | | n/a | n/a | n/a |

DisplayClock -1,-1

| Shelf | Priority | Slot | Ref |
|-------|----------|------|----------|
| 25 | 0 | 4 | INTERNAL |

DisplayTrunkGroup 500

| Name | Num | TrunkGroupType | HuntAlgorithm | VoIpChannelProfileId | DS0s |
|----------|-----|----------------|---------------------|----------------------|------|
| VOIP_SIP | 500 | VOIPSILTG | ROUND_ROBIN_FORWARD | 0 | 10 |

DisplayTrunkGroup 501

| Name | Num | TrunkGroupType | HuntAlgorithm | VoIpChannelProfileId | DS0s |
|-----------|-----|----------------|---------------------|----------------------|------|
| VOIP_H323 | 501 | VOIPSILTG | ROUND_ROBIN_FORWARD | 2 | 10 |

DisplayTrunkGroupChannels 500

| ShelfNumber | SlotNumber | SpanNumber | ChannelNumber | InterfaceId | SpanState |
|-------------|------------|------------|---------------|-------------|-----------|
| 25 | 4 | 0 | 0 | -1 | ENABLED |
| 25 | 4 | 0 | 1 | -1 | ENABLED |
| 25 | 4 | 0 | 2 | -1 | ENABLED |
| 25 | 4 | 0 | 3 | -1 | ENABLED |
| 25 | 4 | 0 | 4 | -1 | ENABLED |
| 25 | 4 | 0 | 5 | -1 | ENABLED |
| 25 | 4 | 0 | 6 | -1 | ENABLED |
| 25 | 4 | 0 | 7 | -1 | ENABLED |
| 25 | 4 | 0 | 8 | -1 | ENABLED |
| 25 | 4 | 0 | 9 | -1 | ENABLED |

DisplayTrunkGroupChannels 501

| ShelfNumber | SlotNumber | SpanNumber | ChannelNumber | InterfaceId | SpanState |
|-------------|------------|------------|---------------|-------------|-----------|
| 25 | 4 | 0 | 200 | -1 | ENABLED |
| 25 | 4 | 0 | 201 | -1 | ENABLED |
| 25 | 4 | 0 | 202 | -1 | ENABLED |
| 25 | 4 | 0 | 203 | -1 | ENABLED |
| 25 | 4 | 0 | 204 | -1 | ENABLED |
| 25 | 4 | 0 | 205 | -1 | ENABLED |
| 25 | 4 | 0 | 206 | -1 | ENABLED |
| 25 | 4 | 0 | 207 | -1 | ENABLED |
| 25 | 4 | 0 | 208 | -1 | ENABLED |
| 25 | 4 | 0 | 209 | -1 | ENABLED |

DisplayVoIPSpan 25,4,-1

| CardNumber | SpanNumber | GatewayIp | SubnetMask |
|------------|------------|-----------|-----------------|
| 1 | 0 | 127.0.0.1 | 255.255.255.240 |

The remaining VoIP configuration items are shown below:

DisplayVoIPCause 0

| VOIPChannelProfileId | CAUSE |
|----------------------|-------|
| ----- | ----- |
| 0 | 0 |

DisplayVoIPChannelProfileIds

| VOIPChannelProfileId |
|----------------------|
| ----- |
| 0 |
| 2 |

DisplayVoIPDNS 0

| VOIPChannelProfileId | DNS |
|----------------------|-----|
| ----- | --- |
| 0 | |

DisplayVoIPECANCfg 0

| VOIPChannelProfileId | ECAN168 | ECANNonLinearProcessor | ECANTail |
|----------------------|---------|------------------------|----------|
| 0 | ON | ON | 64Msec |

WorstCaseExpectedEchoReturnLoss

6db

DisplayVoIPFaxModemPacketsIE 0

| VOIPChannelProfileId | FaxMaxJitter | FaxMaxDelay | FaxCEDDuration | FaxCNGDoneDelay |
|----------------------|--------------|-------------|----------------|-----------------|
| 0 | 150 | 200 | 3000 | 3000 |

| FaxCNGDuration | NumRedundantImagePkts | NumRedundantControlPkts | ReorderDelay |
|----------------|-----------------------|-------------------------|--------------|
| 500 | 3 | 3 | 200 |

DisplayVoIPOutOfBandToneCfg 0

| VOIPChannelProfileId | Rfc2833 | FaxRelay | DTMFMode | DTMFRelay |
|----------------------|---------|-------------|----------|-----------|
| ----- | ----- | ----- | ----- | ----- |
| 0 | ON | T38FaxRelay | RFC2833 | ON |

DisplayVoIPPrefix 0

| VOIPChannelProfileId | PREFIX |
|----------------------|--------|
| ----- | ----- |
| 0 | |

DisplayVoIPProgress 0

| VOIPChannelProfileId | PROGRESS |
|----------------------|----------|
| ----- | ----- |
| 0 | 0 |

DisplayVoIPRTCPpacketsCfg 0

| VOIPChannelProfileId | TxRTCPpackets | TxRTCPInterval | UseFarEndAltIpAddrForRTCP |
|----------------------|---------------|----------------|---------------------------|
| 0 | OFF | 5000 | OFF |

RtcpCName

127.0.0.1

DisplayVoIPRTPpacketsCfg 0

| VOIPChannelProfileId | Codec1 | Codec2 | Codec3 | Codec4 |
|----------------------|-----------------|-----------------|-----------------|--------|
| 0 | G711_uLaw | None | None | None |
| PktPeriodCodec1 | PktPeriodCodec2 | PktPeriodCodec3 | PktPeriodCodec4 | |
| 20 | -1 | -1 | -1 | |

| TxIpTypeOfService | TxIpTimeToLive | RxUdpChecksumCalculation |
|-------------------|----------------|--------------------------|
| 184 | 255 | ON |

| TxUdpChecksumCalculation | RxRtpRedundant | TxRtpRedundant |
|--------------------------|----------------|----------------|
| ON | OFF | OFF |

| NatTraversal | RTPMonitoring | RTPMonitoringTimer |
|---------------------|---------------|--------------------|
| SecuredNatTraversal | ON | 60000 |

DisplayVoIPRTPpacketsSizeInBytes G711_uLaw, -1

| Codec | PktPeriod_ms | PktPeriod_byte |
|-----------|--------------|----------------|
| ----- | ----- | ----- |
| G711_ULAW | 5 | 40 |
| G711_ULAW | 10 | 80 |
| G711_ULAW | 15 | 120 |
| G711_ULAW | 20 | 160 |
| G711_ULAW | 25 | 200 |
| G711_ULAW | 30 | 240 |

DisplayVoIPRTPPayloadTypeMappingCfg 0

| VOIPChannelProfileId | RedundantPT | G711uLawPT | G711aLawPT | G726_16KPT | |
|----------------------|-------------|------------|----------------------|------------|-----------|
| 0 | 102 | 0 | 8 | 96 | |
| G726_24KPT | G726_32KPT | G726_40KPT | G729aPT_and_G729abPT | G723_1PT | Rfc2833PT |
| 97 | 2 | 98 | 18 | 4 | 127 |

DisplayVoIPSilentSuppressionCfg 0

| VOIPChannelProfileId | CNGMode | VADType | GenericVADMode |
|----------------------|------------|----------------|----------------|
| ----- | ----- | ----- | ----- |
| 0 | HOTH_NOISE | BUILT_IN_CODEC | CONSERVATIVE |

DisplayVoIPVoicePacketsCfg 0

| VOIPChannelProfileId | JitterBufferLengthAdapt | JitterMin | JitterMax |
|----------------------|-------------------------|-----------|-----------|
| 0 | | ON | 0 |
| | | | 100 |

| JitterTarget | RxPktGain | TxPktGain |
|--------------|-----------|-----------|
| 20 | 0 | 0 |

9.6 Other VoIP Commands

Other commands associated with VoIP cards and VoIP blade wares are shown in section 4 Configuration Commands on page 17.

10 Configuring SS7 Information Elements

The SS7 information elements (IEs) are linked to a common identifier created with the *CreateSS7IE* command. SS7 spans are linked to an IE Id with the *CreateSS7TrunkGroup* command. To simplify modifications to IE parameters for a given trunk group, you should assign a unique IE Id for each SS7 trunk group.

The IEs that can be associated with an IE Id are configured with the following commands:

- `ConfigureSS7BackwardCallIndicatorIE`
- `ConfigureSS7CalledPartyNumberIE`
- `ConfigureSS7CallingPartyCategoryIE`
- `ConfigureSS7CallingPartyNumberIE`
- `ConfigureSS7CauseIE`
- `ConfigureSS7EventInformationIE`
- `ConfigureSS7ForwardCallIndicatorIE`
- `ConfigureSS7NatureOfConnectionIE`
- `ConfigureSS7UserServiceInfoIE`

SS7 Information Elements (IEs) can be dynamically changed by an application for a given call. You can however configure the default values through configuration commands. The IEs and their associated display commands are listed below:

| | |
|-------------------------------------|-------------------------------------|
| ConfigureSS7BackwardCallIndicatorIE | DisplaySS7BackwardCallIndicatorIE 0 |
| ConfigureSS7CalledPartyNumberIE | DisplaySS7CalledPartyNumberIE 0 |
| ConfigureSS7CallingPartyCategoryIE | DisplaySS7CallingPartyCategoryIE 0 |
| ConfigureSS7CallingPartyNumberIE | DisplaySS7CallingPartyNumberIE 0 |
| ConfigureSS7CauseIE | DisplaySS7CauseIE 0 |
| ConfigureSS7EventInformationIE | DisplaySS7EventInformationIE 0 |
| ConfigureSS7ForwardCallIndicatorIE | DisplaySS7ForwardCallIndicatorIE 0 |
| ConfigureSS7NatureOfConnectionIE | DisplaySS7NatureOfConnectionIE 0 |
| ConfigureSS7UserServiceInfoIE | DisplaySS7UserServiceInfoIE 0 |

To view the remaining profiles, simply substitute the 0 in the above Display commands for the desired profile identifier.

For information on how to configure these IEs from an application, refer to the Managed API Reference document.

10.1 Prerequisites

Before configuring an SS7 module, ensure that you have connected the T1 cables to Line 1 and Line 2 of the signaling interface ports and that the other ends of the T1 cables are connected to the SS7 network. The process also ensures that the SS7 software is configured.

10.2 Obtaining the Default Configuration

There are 11 preconfigured SS7 IE profiles (0 to 10). You can view the default configuration of each profile with a set of display commands. For example, to view the default profile 0 parameters, use the following display commands:

```
DisplaySS7BackwardCallIndicatorIE 0
DisplaySS7CalledPartyNumberIE 0
DisplaySS7CallingPartyCategoryIE 0
DisplaySS7CallingPartyNumberIE 0
DisplaySS7CauseIE 0
DisplaySS7EventInformationIE 0
DisplaySS7ForwardCallIndicatorIE 0
DisplaySS7NatureOfConnectionIE 0
DisplaySS7UserServiceInfoIE 0
```

Sample output is shown below:

DisplaySS7BackwardCallIndicatorIE 0

```

SS7BackwardCallIndicatorIE      charge  calledPartyStatus  calledPartyCategory  endToEndMethod
-----
0 NO_INDICATION                 NO_INDICATION      NO_INDICATION        NO_END_TO_END

interworking  iamSegmentation  isdnUserPart      holding  isdnAccess  echoControlDevice  sccpMethod
-----
NO_INTERWORKING  NO_INDICATION  NOT_ISDN  NOT_REQUIRED  NOT_ISDN  NO_ECHO_DEVICE  NO_INDICATION

```

DisplaySS7CalledPartyNumberIE 0

```

SS7CalledPartyNumberIE  natureOfAddress  numberingPlan
-----
0 NATIONAL           ISDN

```

DisplaySS7CallingPartyCategoryIE 0

```

SS7CallingPartyCategoryIE  callingPartyCategory
-----
0 ORDINARY_SUBSCRIBER

```

DisplaySS7CallingPartyNumberIE 0

```

SS7CallingPartyNumberIE  natureOfAddress  numberingPlan  presentation  screening
-----
0 NATIONAL           ISDN          ALLOWED      USER_PROVIDED

```

DisplaySS7CauseIE 0

```

SS7CauseIE  codingStandard  location  cause
-----
0          CCITT      LOCAL_LOCAL  16

```

DisplaySS7EventInformationIE 0

```

SS7EventInformationIE  EventInformation
-----
0          PROGRESS

```

DisplaySS7ForwardCallIndicatorIE 0

```

SS7ForwardCallIndicatorIE  incomingInternationalCall  endToEndMethod  interworking  isdnUserPart
-----
0          NOT_INTERNATIONAL  NO_END_TO_END  NO_INTERWORKING  NOT_ISDN

isdnUserPartPreference  isdnAccess  sccpMethod  portedNumberTranslation  queryOnReleaseAttempt
-----
ISDN_PREFERRED  NOT_ISDN  NO_INDICATION  NOT_TRANSLATED  NO_QOR

```

DisplaySS7NatureOfConnectionIE 0

```

SS7NatureOfConnectionIE  satelliteIndicator  continuityIndicator  echoControlDeviceIndicator
-----
0          NO_SATELLITE  NOT_REQUIRED  NO_ECHO_DEVICE

```

DisplaySS7UserServiceInfoIE 0

```

SS7UserServiceInfoIE  codingStandard  infoTransferCapability  userInfoLayer1Protocol
-----
0          CCITT          SPEECH  G.711

```

To view the remaining 10 profiles, simply substitute the 0 for the desired profile identifier in the list of display commands.

11 Configuring SS7 COT: Continuity Test

The platform supports receiving and sending to SS7 COT messages, individually or within a call request.

11.1 Defining COT tones

The tones played in a continuity tests are defined on the SS7Trunk group. The SS7Trunk group settings includes a LocalTxCOTToneID and a RemoteTxCOTToneID. Those are tones from the GeneratedTone table that will be played on the trunkgroup when a ContinuityTest will be performed. If the initiator of the ContinuityTest is local, then the LocalTxCOTToneID is played. If the initiator of the ContinuityTest is remote, then the RemoteTxCOTToneID is played.

To determine the tone ids used in COT responses, use DisplaySS7TrunkGroup. Sample output is shown below:

```
displaytrunkgroup 171201
```

| Name | Num | TrunkGroupType | HuntAlgorithm | ProfileID | DPC | DS0s | LocalTxCOTToneID | RemoteTxCOTToneID | PercentageOfOutgoingCOT |
|----------------|--------|----------------|---------------------|-----------|--------|------|------------------|-------------------|-------------------------|
| SS7_SAT_TRUNKS | 171201 | SS7 | ROUND_ROBIN_FORWARD | 0 | 460809 | 96 | 61 | 62 | 0 |

To change the remote tone id used in COT responses, use RemoveTrunkGroup/CreateSS7TrunkGroup. Sample commands are shown below:

```
disablespan 17,12,8, ON
```

```
removetrunkgroup 171201
```

```
CreateSS7TrunkGroup 171201,SS7_SAT_TRUNKS,460809,17,12,8,24,ROUND_ROBIN_FORWARD,0,0,61,62,50
```

```
enablespan 17,12,8
```

11.2 Receiving COT requests

Upon reception of a COT request, automatic or manual, the platform will play the remote tone id configured on the SS7 trunk group. No additional configuration is required.

11.3 Sending COT request manually

COT requests can be sent by the platform either manually or automatically within a call request. To send a COT request manually, use PerformSS7COT. Sample command is shown below:

```
PerformSS7COT 17,12,8,0
```

The platform will play the local tone id configured in the SS7 trunk group. Once the continuity test is completed, the result will be provided in an OAMPSS7COTResultEvent. Sample output shown below:

```
OAMPSS7COTResultEvent 17, 12, 8, 0, success
```

11.4 Sending COT request automatically

COT requests can be sent by the platform either manually or automatically within a call request. To have COT requests included automatically in call requests:

1. configure a non-zero percentage on the SS7 Trunk Group
2. ensure the continuity indicator is set on the Nature of Connection IE.

To display the percentage of COT requests on a SS7 Trunk Group, use DisplaySS7TrunkGroup. To display the continuity indicator setting, use DisplaySS7NatureOfConnectionIE. Sample commands are shown below:

```
displaytrunkgroup 171201
```

| Name | Num | TrunkGroupType | HuntAlgorithm | ProfileID | DPC | DS0s | LocalTxCOTToneID | RemoteTxCOTToneID | PercentageOfOutgoingCOT |
|----------------|--------|----------------|---------------------|-----------|--------|------|------------------|-------------------|-------------------------|
| SS7_SAT_TRUNKS | 171201 | SS7 | ROUND_ROBIN_FORWARD | 0 | 460809 | 96 | 61 | 62 | 50 |

```
DisplaySS7NatureOfConnectionIE 0
```

| SS7NatureOfConnectionIE | satelliteIndicator | continuityIndicator | echoControlDeviceIndicator |
|-------------------------|--------------------|---------------------|----------------------------|
| 0 | NO_SATELLITE | REQUIRED | NO_ECHO_DEVICE |

To change the percentage of COT requests on a SS7 Trunk Group, use RemoveTrunkGroup/CreateSS7TrunkGroup. To change the continuity indicator setting, use ConfigureSS7NatureOfConnectionIE. Sample commands are shown below:

```
disablespan 17,12,8, ON
```

```
removetrunkgroup 171201
```

```
CreateSS7TrunkGroup 171201,SS7_SAT_TRUNKS,460809,17,12,8,24,ROUND_ROBIN_FORWARD,0,0,61,62,50
```

```
ConfigureSS7NatureOfConnectionIE 0, NO_SATELLITE, REQUIRED, NO_ECHO_DEVICE
```

```
enablespan 17,12,8
```

11.5 Leaving COT under control of the application

The platform can be configured such as to leave the control of COT to the application. To do so:

1. set the SS7 Trunk Group COT percentage to 100%
2. set the Nature of Connection IE continuity indicator to NOT REQUIRED.

12 Command Specifics

12.1.1 Specifics on the *AddCard* Command

A shelf can support VoIP, T1, and E1 cards. Spans are initialized in the disabled state (see the *EnableSpan* and *DisableSpan* commands).

Supported signaling types for each card is shown below:

- T1: CAS, ISDN and Clear Channel
- E1: ISDN and Clear Channel
- VoIP: Clear channel
- SS7: Clear Channel

T1 Trunk Cards configured for ISDN have their spans automatically configured as 23B+D with channel 23 configured as the D-Channel and channels 0-22 configured as the ISDN bearer circuits.

E1 Trunk Cards configured for ISDN have their spans automatically configured as 30B+D with channel 0 used for framing, channel 16 configured as the D-channel, and channels 1-15 and 17-31 configured as the ISDN bearer circuits.

Some compactPCI shelves can have up to 21 slots (0-20), but only the first 16 slots (0-15) are supported by the VSOS.

T1 and E1 cards can be protected by a standby card. A virtual IP address is used for a pair of redundant cards. At boot up, the first card that connects to the VSOS and becomes “Configured and Ready”, while that second card boots and remains in standby mode. In the event of a main card failure, the standby card takes over to serve the same spans and channels as the main card and take any new calls, i.e. current calls are dropped and new calls can be established after about 20 seconds. Both cards are configured in DHCP and independent as per standard configuration, however, physically, they are connected to the same T1 or E1 span via a SCSI “Y” cable.

All OAMP commands should target the main card (e.g. *MoveSpanToTrunkGroup*, *enable/disableSpan*, *configureDchannelProtocol*) and the effect is automatically applied to the backup card. Attempting to use these commands on the backup card directly would fail.

All Managed-API should target to the main card (e.g MakeDirectedCall) and will automatically be applied to the backup card if it is the one active at the time.

12.1.2 Specifics on the *ConfigureClock* Command

By default, if there are no clock sources configured, the system clock is generated by the first Trunk Card that connects to the VSOS.

The system uses one clock source only at a time. A clock source is selected according to its Priority number (the clock source with Priority 0 has the highest priority). When you assign a priority to a clock source, a new record is created.

If a priority number has already been assigned to one clock source (through an *ADD* action) and you assign the same priority number to a different clock source (through a *MOD* action), the new priority assignment is recorded and the previous priority record is deleted.

The VoIP card must obtain its clock internally.

12.1.3 Specifics on the *CreatePRITrunkGroup* Command

The *CreatePRITrunkGroup* command creates a standard Facility Associated Signaling (FAS) ISDN-PRI trunk group.

The T1 trunk card spans are automatically configured as 23B+D with channel 23 configured as the D-Channel and channels 0-22 configured as the ISDN bearer circuits.

The E1 trunk card spans are automatically configured as 30B+D with channel 0 used for framing, channel 16 configured as the D-channel, and channels 1-15 and 17-31 configured as the ISDN bearer circuits.

If a span is specified, use the *ConfigureDChannelProtocol* command to configure the D-Channel for that span.

12.1.4 Specifics on the *MoveSpanToTrunkGroup* Command

Each channel in the span is moved to the specified trunk group, provided that all validation checks pass.

This command is not supported for any PRI span that has a D-channel backup associated with it. You must move or remove the backup D span first, see the *RemoveSpanFromTrunkGroup* command. If a backup D span is being moved, its primary D span must be disabled with the *DisableSpan* command and it must not have any bearer spans associated with it.

Note that a T1 card does not support a mixed configuration of ISDN and CAS signaling. The E1 card does not support a mixed configuration of ISDN and Clear Channel signaling.

13 Defining Links to Your Application

Up to eight applications can connect to VSOS. Only one application is active at a given time, the remaining applications (if any) are in standby mode. See the Managed API Reference document for additional information.

The *Mode* parameter must be set to *REDUNDANT*, even if a single application is used. The *SIMPLEX* mode is used for test purposes only. A sample command is shown below:

```
ConfigureApplLinkMode redundant
```


14 Sample Configuration Scripts

Several configuration commands must be executed to configure a card. This section details the basic set of commands you must use to configure a system consisting of a T1, E1, VoIP, and a Media card. For full details on how to configure each card, refer to the following sections:

- [T1 Card](#) on page 30
- [E1 Card](#) on page 51
- [VoIP Card](#) on page 61

14.1 Sample System Level Configuration Script

The sample script is based on the configuration commands provided in each of the configuration sections of this document. This script initializes the H.110 bus, configures the application link, a T1 card, an E1 card, a VoIP card, a VoIP SIP SIL, a VoIP H.323 SIL, and a Media card. After you execute the script, review the CLI output to confirm that all commands were executed successfully. The script is shown below:

```
ConfigureBusH110 0, -1, -1
ConfigureBusH110 1, -1, -1
ConfigureBusH110 2, -1, -1
ConfigureBusH110 3, -1, -1
ConfigureBusH110 4, -1, -1
ConfigureBusH110 5, -1, -1
ConfigureBusH110 6, -1, -1
ConfigureBusH110 7, -1, -1
ConfigureBusH110 8, -1, -1
ConfigureBusH110 9, -1, -1
ConfigureBusH110 10, -1, -1
ConfigureBusH110 11, -1, -1
ConfigureBusH110 12, -1, -1
ConfigureBusH110 13, -1, -1
ConfigureBusH110 14, -1, -1
ConfigureBusH110 15, -1, -1
ConfigureBusH110 16, -1, -1
ConfigureBusH110 17, -1, -1
ConfigureBusH110 18, -1, -1
ConfigureBusH110 19, -1, -1
ConfigureBusH110 20, -1, -1
ConfigureBusH110 21, -1, -1
ConfigureBusH110 22, -1, -1
ConfigureBusH110 23, -1, -1
```

```

ConfigureBusH110 24, -1, -1
ConfigureBusH110 25, -1, -1
ConfigureBusH110 26, -1, -1
ConfigureBusH110 27, -1, -1
ConfigureBusH110 28, -1, -1
ConfigureBusH110 29, -1, -1
ConfigureBusH110 30, -1, -1
ConfigureBusH110 31, -1, -1

```

```
ConfigureApplLinkMode redundant
```

```

ConfigureBusH110 0, 25, 2
ConfigureBusH110 1, 25, 2
ConfigureBusH110 2, 25, 2
AddCard T1, 25, 2, ISDN, mu_Law, -1, 0.0.0.0
ConfigureClock 25,2,0,1,ADD
ConfigureDChannelProtocol 25,2,0,23,0,network,ni2,1,1
ConfigureDChannelProtocol 25,2,1,23,0,user,ni2,1,1
CreatePRITrunkGroup 301, INCOMING_T1_PRI_TG, 25, 2, 0, MOST_IDLE
CreatePRITrunkGroup 302, OUTGOING_T1_PRI_TG, 25, 2, 1, MOST_IDLE
CreateClearChannelTrunkGroup 303,INCOMING_T1_CC_TG,25,2,2,first_available
CreateClearChannelTrunkGroup 304,OUTGOING_T1_CC_TG,25,2,3,first_available
EnableSpan 25, 2, 0
EnableSpan 25, 2, 1
EnableSpan 25, 2, 2
EnableSpan 25, 2, 3

ConfigureBusH110 4, 25, 3
ConfigureBusH110 5, 25, 3
ConfigureBusH110 6, 25, 3
ConfigureBusH110 7, 25, 3
AddCard E1, 25, 3, ISDN, A_Law, -1, 0.0.0.0
ConfigureClock 25, 3, 1, 2, ADD
ConfigureDChannelProtocol 25,3,0,23,0,network,etsi,1,1
ConfigureDChannelProtocol 25,3,1,23,0,user,etsi,1,1
CreatePRITrunkGroup 305, INCOMING_E1_PRI_TG, 25, 3, 0, MOST_IDLE
CreatePRITrunkGroup 306, OUTGOING_E1_PRI_TG, 25, 3, 1, MOST_IDLE
CreateClearChannelTrunkGroup 307,INCOMING_E1_CC_TG,25,3,2,first_available
CreateClearChannelTrunkGroup 308,OUTGOING_E1_CC_TG,25,3,3,first_available
EnableSpan 25, 3, 0
EnableSpan 25, 3, 1
EnableSpan 25, 3, 2
EnableSpan 25, 3, 3

ConfigureBusH110 8, 25, 4
ConfigureBusH110 9, 25, 4
ConfigureBusH110 10, 25, 4
ConfigureBusH110 11, 25, 4
AddCard VoIP512, 25, 4, CLEARCHANNEL, mu_Law, -1, 0.0.0.0
ConfigureClock 25, 4, 0, INTERNAL, ADD

AddBW VOIPSIL, 101, SIP, 222, 4, NONE
ConfigureVOIPBW 101,0,5060,127.0.0.4,1,ON
ConfigureVOIPBWSIP 101,0,1,n/a,n/a,n/a,n/a,n/a,0,0,0,1,0,test01
CreateVOIPBWTrunkGroup 500, VOIP_SIP, -1, -1, 101, ROUND_ROBIN_FORWARD, 0
MoveChannelToTrunkGroup 25, 4, 0, 0, 500
MoveChannelToTrunkGroup 25, 4, 0, 1, 500
MoveChannelToTrunkGroup 25, 4, 0, 2, 500
MoveChannelToTrunkGroup 25, 4, 0, 3, 500
MoveChannelToTrunkGroup 25, 4, 0, 4, 500
MoveChannelToTrunkGroup 25, 4, 0, 5, 500
MoveChannelToTrunkGroup 25, 4, 0, 6, 500
MoveChannelToTrunkGroup 25, 4, 0, 7, 500

```

```

MoveChannelToTrunkGroup 25, 4, 0, 8, 500
MoveChannelToTrunkGroup 25, 4, 0, 9, 500
ConfigureVoIPSpan 25, 4, 0, 127.0.0.1, 255.255.255.240
ConfigureRTPSourceParameters 25, 4, 0, -1, 5000, 127.0.0.5, 0
AddTrunkGroupToRouteSet 1, 500, 0
ConfigureVOIPRTTPackets 0,G711_uLaw,NONE,NONE,NONE,20,-1,-1,-1,184,255,ON,ON,OFF,OFF,
NoNatTraversal,OFF,60000

```

```

AddBW VOIPSIL, 201, H323, 223, 4, NONE
ConfigureVOIPBW 201, 0, 1720, 127.0.0.4, 1, ON
CreateVOIPChannelProfileId 2

```

```

ConfigureVOIPBWH323 201,0,1,H323Zone,1,1,0,n/a,0,n/a,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,3,5,0,n/a,0,test01
CreateVOIPBWTrunkGroup 501, VOIP_H323, -1, -1, -1, 201, ROUND_ROBIN_FORWARD, 2

```

```

MoveChannelToTrunkGroup 25, 4, 0, 200, 501
MoveChannelToTrunkGroup 25, 4, 0, 201, 501
MoveChannelToTrunkGroup 25, 4, 0, 202, 501
MoveChannelToTrunkGroup 25, 4, 0, 203, 501
MoveChannelToTrunkGroup 25, 4, 0, 204, 501
MoveChannelToTrunkGroup 25, 4, 0, 205, 501
MoveChannelToTrunkGroup 25, 4, 0, 206, 501
MoveChannelToTrunkGroup 25, 4, 0, 207, 501
MoveChannelToTrunkGroup 25, 4, 0, 208, 501
MoveChannelToTrunkGroup 25, 4, 0, 209, 501

```

```

AddTrunkGroupToRouteSet 2, 501, 0

```

```

ConfigureVOIPRTTPackets 2, G711_uLaw, NONE, NONE, NONE, 20, -1, -1, -1, 184, 255, ON, ON, OFF,
OFF, NoNatTraversal, OFF, 60000

```

```

EnableSpan 25, 4, -1
EnableBWspan 101, -1
EnableBWspan 201, -1

```

14.2 Sample Script for Retrieving the EdgeIQ Configuration

Once you have configured your system, you should create a log of the EdgeIQ configuration parameters. This is accomplished with a series of Display commands executed at the CLI prompt. You can also use the Logical View in IQadmin. The list of commands below will display all the necessary parameters. Italicized Display command parameters must be substituted to match your configuration.

Note that a command history is stored in the command log files.


```

DisplayApplLinkMode
DisplayBearerRouteSet -1
DisplayBusH110 -1
DisplayBW -1
DisplayBWSpan BWId, -1
DisplayCard -1, -1
DisplayCASSignalingProfile
DisplayChannel shelf, slot, span, -1
DisplayChannelGain shelf, slot, span, -1
DisplayChannelStateProfile
DisplayClientLog
DisplayClock -1, -1
DisplayDChannelProtocol -1, -1, -1
DisplayGain -1
DisplayGeneratedTone -1
DisplayH110Control
DisplayLogPath
DisplayRTPDestinationParameters shelf, slot, span, -1
DisplayRTPSourceParameters shelf, slot, span, -1
DisplaySpan shelf, slot, -1
DisplayTrunkGroup All
DisplayTrunkGroupChannels TrunkGroupNumber
DisplayVersatelLog
DisplayVOIPBW BWId, 0
DisplayVOIPBWFaxModemPayload BWId, 0
DisplayVOIPBWH323 BWId, 0
DisplayVOIPBWSIP BWId, 0
DisplayVOIPCause VoIPChannelProfileId
DisplayVOIPChannelProfileIds
DisplayVOIPDNS VoIPChannelProfileId
DisplayVOIPECANCFg VoIPChannelProfileId
DisplayVOIPOutOfBandToneCfg VoIPChannelProfileId
DisplayVOIPPrefix VoIPChannelProfileId
DisplayVOIPProgress VoIPChannelProfileId
DisplayVOIPRTCPacketsCfg VoIPChannelProfileId
DisplayVOIPRTTPacketsCfg VoIPChannelProfileId
DisplayVOIPRTTPacketsSizeInBytes Codec, -1
DisplayVOIPRTTPayloadTypeMappingCfg VoIPChannelProfileId
DisplayVOIPSilentSuppressionCfg VoIPChannelProfileId
DisplayVOIPSpan shelf, slot, -1
DisplayVOIPVoicePacketsCfg VoIPChannelProfileId

```

To obtain the parameter values for your system, execute the commands listed below:

- Shelf/slot: Use *DisplayCard -1, -1* and *DisplayBw -1* to view configured shelves and slots
- Span: Use 0 for VoIP and 0 to 15 for T1 and E1
- BWId: Use *DisplayBw -1* to view the assigned blade wares
- Codec: Use *? ConfigureVoIPRTTPackets* to view the available codec types.
- TimerId: Use *? DisplayPRITimer* to view the available timer identifiers.
- TrunkGroupNumber: Use *DisplayTrunkGroup All* to view the defined trunk group numbers
- VoIPChannelProfileId: Use *DisplayVoIPChannelProfileIDs* to view the assigned profiles

15 Configuring your SIP gateway controllers

SIP gateway controllers can be configured at startup time using an initialization file located in the directory pointed to by the `VERSATEL_PATH` environment variable. The filename is `SIPConf.ini` and the parameters are:

- *inviteTimeout* (default is 31 seconds):
 - Definition: Time-limit, in seconds, to receive a response to an invite.
 - Range: 1 to 65535 seconds.
 - Invoking the default value: Set to -1 or use the semicolon (;*inviteTimeout*) to specify the default value.
 - Timeout response: Failure to receive a response within the time-limit results in a cause code 38 *Network out of order* being generated and stored in the VSOS log file.

- *waitResonseTimeout* (default is 62 seconds):
 - Definition: An additional time-limit, in seconds, to wait for a response from the end device when a call is routed through a proxy server. This timeout period starts when a response to an invite is received from a proxy server.
 - Range: 1 to 65535 seconds.
 - Invoking the default value: Set to -1 or use the semicolon (;*waitResonseTimeout*) to specify the default.
 - Timeout response: Failure to receive a response within the time-limit results in a cause code 27 *Destination out of order* being generated and stored in the VSOS log file.

- *disableRemotePartyId* (default is 1):

- Definition: Determines if the remote party identifier is sent to the destination device.
- Range: 0 or 1.
When set to false (0), the remote party identifier is sent to the end device.
(CALL ID displays ANONYMOUS).
When set to true (1), the remote party identifier is **NOT** sent to the end device.
(CALL ID displays the ANI).
- Invoking the default value: Use the semicolon (;*disableRemotePartyId*) to specify the default value of 1.

Conditions that invoke the default values for the GWC parameters are listed below:

- When the *SIPConf.ini* file is not found. Note that the filename is case sensitive. The file must be located in the directory pointed to by the VERSATEL_PATH environment variable. The default is *C:\SolaCom*.
- When the VoIP SIL tag is not found in the *versatelSIPConf.ini* file. The VoIP tag must match the tag found in the *Mesoware.ini* file. The tag is **NOT** case sensitive. Sample tags are *[VOIPSIL_SIP]* and *[VOIPSIL_H323]*.
- When the parameter name is not found. Note that the parameter names are case sensitive.
- When the parameter values are set to -1.
- When either the *inviteTimeout* OR the *waitResonseTimeout* parameter is set to 0, -1, or has a semicolon in front of the parameter name, both parameters will be set to their respective default values.
- When either the *inviteTimeout* OR the *waitResonseTimeout* is not specified, both parameters will be set to their respective default values.

Note: When a default timeout value is selected, the timeout values are displayed as -1. When a timeout is forced to the default value as stated above, the parameter value in the *SIPConf.ini* file will be displayed in the GWC window. See the example below.

A single file is used to define the parameters for all gateway controllers running on a server. A header tag is used to identify the gateway controller. The tag must match the tag listed in the *Mesoware.ini* file.

Sample file content is shown below:

```
[VOIPSIL_SIP]
inviteTimeout=33
waitResponseTimeout=33
disableRemotePartyId=2
```

15.1 SIP GWC configuration example

A sample GWC configuration for a given *Mesoware.ini* file is shown below:

Excerpt from a *Mesoware.ini* file

```
...
[VOIPSIL_SIP1]                ;tag
SILID=101
SILIP=127.0.0.1
SILPORT=1971
SILBINDIP=172.16.31.22
remoteProvision=1

[VOIPSIL_SIP2]                ;tag
SILID=102
SILIP=127.0.0.1
SILPORT=1970
SILBINDIP=172.16.31.24
remoteProvision=1
...
```

A sample *SIPConf.ini* file for the above SIP GWCs is shown below:

```
[VOIPSIL_sip1]
inviteTimeout=3
waitResonseTimeout=6
;disableRemotePartyId=0      (selects the default)

[VOIPSIL_sip2]
inviteTimeout=-1             (selects the default)
waitResonseTimeout=20       (selects the default due to inviteTimeout being set
                             to the default value)
disableRemotePartyId=0
```

The configuration parameters are loaded upon startup of the GWC and are displayed in the GWC window. Sample output for the above example is shown below:

SIP1 GWC

```
SIPGWC: waiting for remote provisioning...
SIPGWC: enableLayer3Ip      0
SIPGWC: enableReqLineURL   0
SIPGWC: disableEscaping    0
SIPGWC: disableUserPhone   0
SIPGWC: waitResponseTimeout 6
SIPGWC: inviteTimeout      3
SIPGWC: disableRemotePartyId 1
```

SIP2 GWC

```
SIPGWC: waiting for remote provisioning...
SIPGWC: enableLayer3Ip      0
SIPGWC: enableReqLineURL   0
SIPGWC: disableEscaping    0
SIPGWC: disableUserPhone   0
SIPGWC: waitResponseTimeout 20
SIPGWC: inviteTimeout      -1
SIPGWC: disableRemotePartyId 0
```

Note: The *waitResponseTimeout* of the SIP2 GWC is displayed as 20 even though the default value of 62 is used. See section 15 *Configuring your SIP gateway controllers* on page 93 for details.

The current *SIPConf.ini* file and its contents are preserved during an upgrade of the GWC.

Typical values for the parameters are shown below:

```
[VOIPSIL_SIP]
inviteTimeout=3
waitResonseTimeout=6
disableRemotePartyId=1
```

To reinitialize the GWC with new parameter values, you must restart the GWC.