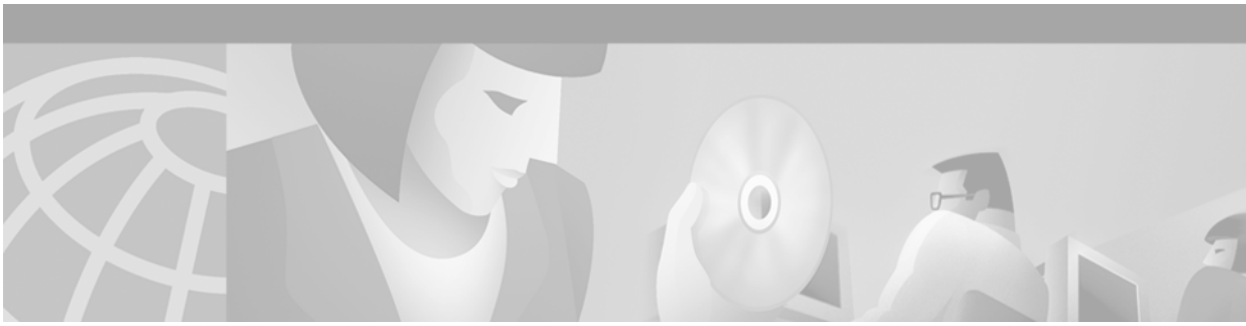

Cisco Signaling Link Terminal G.732 Support

Feature History

Release	Modification
12.2(2)T	This feature was introduced.

This document describes the Cisco Signaling Link Terminal G.732 Support feature in Cisco IOS Release 12.2(2)T. It includes the following sections.

Feature Overview

The addition of ITU-T G.732 support to the Cisco Signaling Link Terminal (SLT) is a fundamental requirement for passing homologation in many European countries. As an integral part of the Cisco Signaling Controller 2200 (SC2200) and the Cisco VSC3000 Virtual Switch Controller (VSC3000) architecture, the Cisco SLT provides the Cisco Signaling System 7 (SS7) connectivity into the SC or VSC node.

The Cisco SLT enables service providers to reliably transport Signaling System 7 (SS7) protocols across an IP network. The Cisco SLT uses the Cisco IOS SS7 SLT feature set, providing reliable interoperability with the Cisco SC2200 or the Cisco VSC3000. The Cisco SLT is responsible for terminating the Message Transfer Part (MTP) 1 and MTP 2 layers of the SS7 protocol stack. Using the Cisco Reliable User Datagram Protocol (RUDP), the Cisco SLT backhauls, or transports, upper-layer SS7 protocols across an IP network to the Cisco SC2200 or the CiscoVSC3000. The Cisco SLT is supported only on the Cisco 2611 router.

ITU-T G.732 is an extract from the ITU-T blue book describing characteristics of primary Pulse Code Modulation (PCM) multiplex equipment operating at 2048 kbit/s (E1). The requirements describing excessive bit error ratios detected by monitoring the frame alignment signal (loss of frame alignment fault conditions) and subsequent alarming actions relate to the Cisco SLT.

Benefits

SS7 Link Termination on a High-availability Platform

SS7 network access and interconnection requires a higher degree of reliability in the signaling links and associated equipment. The Cisco SLT provides the reliability of a dedicated signaling link terminal device and maximizes the availability of the SS7 Signaling links.

Distributed SS7 MTP Processing

Processor-intensive parts of the SS7 message transfer parts (levels 1 and 2) are off-loaded from the media gateway controller to the Cisco SLT. This distributed MTP model allows the controller to better utilize its resources to provide optimal call control.

Call Control

Signaling backhaul provides a means for combining gateways into a virtual switch with the call control intelligence centralized in the media gateway controller.

Standard Physical Interfaces

Interconnection with SS7 network elements is supported using the following SS7 physical interface standards: T1, E1, V.35, EIA/TIA-449, and EIA/TIA-530.

Restrictions

- Only the following interface cards are supported. No other cards, or Cisco 2600 series or Cisco 3600 series network modules, are supported.
  - 1-port T1 multiflex trunk interface (VWIC-1MFT-T1)
  - 1-port E1 multiflex trunk interface (VWIC-1MFT-E1)
  - 2-port T1 multiflex trunk interface (VWIC-2MFT-T1)
  - 2-port E1 multiflex trunk interface (VWIC-2MFT-E1)
  - 2-port T1 multiflex trunk interface with Drop-and-Insert (VWIC-2MFT-T1-DI)
  - 2-port E1 multiflex trunk interface with Drop-and-Insert (VWIC-2MFT-E1-DI)
  - 1-port high-speed serial interface (WIC-1T)
  - 2-port high-speed serial interface (WIC-2T)
- Only SS7 serial interfaces and protocols are supported. There is no support for HDLC, PPP, Frame Relay, ATM, X.25, or other nonSS7 serial WAN protocols.
- Only two SS7 signaling links are supported per Cisco SLT.

Related Documents

For additional information on how to install and configure a Cisco 2600 series modular access router, see the documentation that ships with the product.

The following documents, available from Cisco.com, provide information about the router and VWIC interfaces:

- *Quick Start Guide Cisco 2600 Series Cabling and Setup*
- *Cisco 2600 Series Hardware Installation Guide*
- *Software Configuration Guide*
- *Cisco 2600 Series Configuration Notes*
- *Cisco IOS Release Notes*
- *Cisco WAN Interface Cards Hardware Installation Guide*
- *Cisco Signaling Link Terminal*

Supported Platforms

Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a particular set of features and which features are supported in a particular Cisco IOS image.

Feature Navigator is available 24 hours a day, 7 days a week. To access Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, e-mail the Contact Database Administration group at cdbadmin@cisco.com. If you do not have an account on Cisco.com, go to http://www.cisco.com/register and follow the directions to establish an account.

To use Feature Navigator, you must have a JavaScript-enabled web browser such as Netscape 3.0 or later, or Internet Explorer 4.0 or later. Internet Explorer 4.0 always has JavaScript enabled. To enable JavaScript for Netscape 3.x or Netscape 4.x, follow the instructions provided with the web browser. For JavaScript support and enabling instructions for other browsers, check with the browser vendor.

Feature Navigator is updated when major Cisco IOS software releases and technology releases occur. You can access Feature Navigator at the following URL:

http://www.cisco.com/go/fn

- Cisco 2611 routers

Supported Standards, MIBs, and RFCs

Standards

None.

MIBs

None.

To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB web site on Cisco.com at http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml.

RFCs

- RFC 1406, *Definitions of Managed Objects for the DS1 and E1 Interface Types*

Prerequisites

- Minimal product configuration of the Cisco 2611
- Cisco IOS Release 12.2(2)T or higher image is required

Configuration Tasks

See the following sections for configuration tasks for this feature. Each task in the list is identified as either optional or required:

- Configuring the SLT G.732 feature (required)
- Verifying SLT G.732 Configuration (optional)

Configuring the SLT G.732 feature

	Command	Purpose
Step 1	`Router# configure terminal`	Enters global configuration mode.
Step 2	`Router(config)# controller e1 0/0`	Enters controller configuration mode for E1 interface 0/0.
Step 3	`Router(config-controller)# g732 ber`	Enables G.732 bit error ratio detection.

Verifying SLT G.732 Configuration

Step 1 Enter the **show controller e1 0/0** command.

```
Router# show controller e1 0/0
E1 0/0 is up.
    Applique type is Channelized E1 - balanced
    No alarm detected.
    alarm-trigger is not set
    Version info Firmware:20000612, FPGA:8
    Framing is CRC4, Line Code is HDB3, Clock Source is Line.
→   G732 BER detection enabled.
    Data in current interval (110 seconds elapsed):
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
```

Configuration Examples

This section provides the following configuration examples:

- G732 BER

G732 BER

In the following example, the SLT G.732 bit error ratio detection is enabled.

```
G732 BER detection enabled.
Data in current interval (110 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
```

Command Reference

This section documents the new g732 ber command. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

- **g732 ber**

g732 ber

To enable G.732 processing and reporting for the E1 controller, use the **g732 ber** controller configuration command. To disable processing and reporting, use the **no** form of this command.

g732 ber

no g732 ber

Syntax Description

This command has no arguments or keywords.

Defaults

G.732 is disabled.

Command Modes

Controller configuration

Command History

Release	Modification
12.2(2)T	This command was introduced on the Cisco 2611.

Usage Guidelines

By default, G.732 reporting is disabled. This prevents a change in E1 behavior for sites that do not want G.732 reporting.

Examples

The following example enables G.732 processing and reporting for E1 controller 0/0:

```
Router(config)# controller e1 0/0
Router(config-controller)# g732 ber
```

Glossary

AIS—Alarm Indication Signal (blue alarm).

BER—bit error ratio greater than 10^{-3}.

ITU-T—International Telecommunications Union-Telecommunication

LOF—loss of frame (red alarm).

LOS—loss of signal (red alarm).

maintenance alarm—G.732 refers to a maintenance alarm for notification that facilities performance is below acceptable standards. For the Cisco SLT implementation, console and syslogs are generated.

MGP—media gateway controller.

MTP—message transfer part.

service alarm—G.732 refers to a service alarm for notification of service availability. For the Cisco SLT implementation, RFC 1406 SNMP traps are generated. The trap is generated for LOS, LOF, AIS, and BER.

SLT—signaling link terminal.

SS7—signaling system 7. It typically employs a dedicated 64kbit data circuit to carry packetized machine language messages about each call connected between and among machines of a network to achieve connection control.