



Release Notes for Cisco Voice Interworking Service Module Release 3.0(0)

These release notes are part number OL-2523-01 Rev. B0, January 9, 2004.

The Cisco Voice Interworking Service Module (VISM) product is supported by MGX Voice Media Gateways. Refer to these release notes for Media Gateway and version level support guidelines.

The software Release 3.0(0) for VISM/VISM-PR is a major upgrade from the VISM Release 2.2(0). The new features in VISM Release 3.0(0) are described in the [“VISM Features” section on page 2](#). The new, modified, and deprecated MIB objects and CLI commands are listed in the [“Important Notes” section on page 13](#).

The software Release 3.0(0) for VISM/VISM-PR is supported by the *Cisco VISM Installation and Configuration Guide Release 3.0*, which is available on cisco.com

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VISM Features

This section describes the new hardware and the new software features introduced in software Release 3.0(0) for VISM/VISM-PR.

Hardware Introduced in Software Release 3.0(0) for VISM/VISM-PR

Software Release 3.0(0) for VISM/VISM-PR introduces a new card—VISM-PR. You can use the VISM-PR card in combination with any of the following MGX 8000 Series switch Processor Module cards:

- PXM1
- PXM1E
- PXM45

[Table 1](#) describes the configuration requirements for VISM/VISM-PR in combination with the MGX 8000 Series switches and supported processor modules.

Table 1 VISM/VISM-PR and MGX 8000 Series Switch Support

VISM Module	MGX 8230 with PXM1	MGX 8250 with PXM1	MGX 8850 with PXM1	MGX 8850 with PXM1E	MGX 8850 with PXM45
MGX-VISM-8T1	Yes	Yes	Yes	No	No
MGX-VISM-8E1	Yes	Yes	Yes	No	No
MGX-VISM-PR-8T1	Yes	Yes	Yes	Yes	Yes
MGX-VISM-PR-8E1	Yes	Yes	Yes	Yes	Yes

Refer to the *Cisco MGX 8850 Hardware Installation Guide, Release 3* for information on installing and maintaining the PXM1, PXM1E, and PXM45 cards.



Note

You cannot use the VISM card in combination with either the PXM1E or PXM45 card.

The VISM-PR card supports 144 channels when used with the G.723.1 codec. The VISM card does not support the G.723.1 codec.

The following software Release 3.0(0) for VISM/VISM-PR features require either the PXM1E or PXM45 card and are not supported if you are using PXM1 cards in your MGX 8000 Series switch chassis:

- [Call Agent-Controlled VoATM AAL1 and AAL2 SVC](#)
- [AAL1 SVC-Based TDM Hairpinning](#)
- [Expanded Clock Source Selection](#)



Note

Clock source configuration support and procedures are not changed from previous releases of software if you are using a PXM1 card in your MGX 8000 Series switch chassis.

- [Private Network-to-Network Interface Priority Routing](#)
- [Additional SPVC Connection Management Capabilities](#)

See the “[Software Features Introduced in Software Release 3.0\(0\) for VISM/VISM-PR](#)” section on [page 3](#) for more information on these features. Refer to the *Cisco VISM Installation and Configuration Guide* for more information on VISM and VISM-PR card installation procedures.

Software Features Introduced in Software Release 3.0(0) for VISM/VISM-PR

New and modified CLI commands allow you to use the following software Release 3.0(0) for VISM/VISM-PR features in their indicated application modes:

- [Call Agent-Controlled VoATM AAL1 and AAL2 SVC](#), for VoIP
- [AAL1 SVC-Based TDM Hairpinning](#), for VoIP
- [High Complexity Codec Support for VISM-PR—G.723.1](#), for VoIP
- [Announcement File System](#), for VoIP
- [Call Agent-Controlled T.38 Fax](#), for VoIP
- [Additional Support for MGCP 1.0](#), for ATM and VoIP
- [RSVP-Based Admission Control](#), for VoIP
- [Clock Slip Counters](#), for ATM and VoIP
- [RTP Connection Statistics](#), for ATM and VoIP
- [CAS Immediate Start and Ground Start Glare Handling](#), for VoIP
- [Grooming for Local Traffic](#), for VoIP
- [MGX 8000 Series Implementation Enhancements](#):
 - [Additional VBR Enhancements](#), for ATM and VoIP
 - [Expanded Clock Source Selection](#), for ATM and VoIP
 - [Private Network-to-Network Interface Priority Routing](#), for ATM and VoIP
 - [Additional SPVC Connection Management Capabilities](#), for ATM and VoIP
 - [192 T1/248 E1 DS0 Support with High Complexity Codecs on VISM-PR](#), for ATM and VoIP
 - [Channel Alarm Enhancement](#), for ATM and VoIP
 - [VISM TDM Line Statistics Collection](#), for ATM and VoIP



Note

Refer to the “[Software Release 3.0\(0\) for VISM/VISM-PR CLI Commands](#)” section on [page 23](#) for a listing of the new and modified commands for software Release 3.0(0) for VISM/VISM-PR. Refer to the *Cisco VISM Installation and Configuration Guide* for a description and usage guidelines for the new and modified commands.

Call Agent-Controlled VoATM AAL1 and AAL2 SVC

The following operating modes are supported with software Release 3.0(0) for VISM/VISM-PR:

- VoAAL1 switched virtual circuit (SVC), supported with the G.711 codec and clear channel.



Note VAD is not supported in combination with AAL1 SVCs.

- VoAAL2 SVC, supported with the G.711, G.726, G.729a, G.729ab, and G723 codecs and ITU profiles 1, 2, 3, 7, 8, and custom profiles 100, 101, 110, and 200.



Note CAS is not supported in combination with switched virtual circuits.

Use the **cnfvismmode** command to configure VISM operating modes.



Note This feature requires you to use a PXM1E or PXM45 in your MGX 8000 Series switch chassis.

AAL1 SVC-Based TDM Hairpinning

VoAAL1 switched virtual circuit (SVC) operating mode is supported with the G.711 codec and clear channel. The AAL1 SVC operating mode supports TDM hairpinning.



Note VAD is not supported in combination with AAL1 SVCs. CAS is not supported in combination with SVCs

Use the **cnfvismmode** command to configure VISM operating modes.



Note This feature requires you to use a PXM1E or PXM45 in your MGX 8000 Series switch chassis.

High Complexity Codec Support for VISM-PR—G.723.1

The high complexity codec G.723.1 is introduced with this release. The VISM-PR card supports this codec in the newly introduced template number 4. Template number 4 supports all the codecs in template number 3 and the following:

- G.723.1 high rate (6.3 Kbps)—G.723.1-H
- G.723.1 high rate with VAD—G.723.1a-H
- G.723.1 low rate (5.3 Kbps)—G.723.1-L
- G.723.1 low rate with VAD—G.723.1a-L

The G.723.1 codec, used in combination with the VISM-PR card, supports 144 channels. Refer to [Table 2](#) for a description of VISM-PR DS0 density when the cards are used in combination with supported codecs.

Several CLI commands have been modified to allow you to use the G.723.1 codec and template number 4. See [Table 4](#) for a complete list of modified commands for this release.



Note

The G.723.1 codecs are not supported for VISM cards.

Announcement File System

This release allows VISM to play prerecorded local announcements in switched VoIP connections. Under the control of a call agent, announcements can be played toward any IP endpoint or toward any VISM endpoint.

Up to 125 different announcements may be cached on the VISM card for immediate playout. A persistent announcement storage area exists in the packet network. Announcements are downloaded on demand from the announcement storage area and remain on the VISM card until they have reached expiry or are replaced. If the 125 announcement maximum is reached, subsequent requests for announcements not on the VISM card result in the replacement of “cached” announcements.

Announcements can be played over established connections in any VISM supported codec, but they must exist on the announcement file server in the desired encoding.



Note

You must play announcements in the exact codec in which they have been recorded.

VISM announcements require the support of the MGCP 0.1/1.0 call agent.

Announcement Timeouts

VISM uses a provisionable timeout value of 5 seconds. If an announcement cannot start playing within the timeout value of receiving the request, the action is canceled and, if requested by the call agent, an “of” event is reported. If the call agent specifies a timeout value in the request, this value will be ignored.

Announcement Direction

Announcements can be played toward the packet network or toward the TDM network (not both). The direction is determined by the notation of the MGCP S: line. Announcement direction examples:

```
S: a/ann(all-lines-busy.au)
```

Explanation Indicates that all-lines-busy.au is to be played toward the TDM network.

```
S: a/ann@connid(all-lines-busy.au)
```

Explanation Indicates that all-lines-busy.au is to be played toward the packet network.

Broadcast Announcements

VISM supports announcement requests for a single endpoint or connection. The request may only specify a single announcement to be played on a single endpoint in a single direction. Broadcast announcements are not supported.

Multiple Announcement Requests for the Same Endpoint

If an announcement is being played on an endpoint (in one direction) and a subsequent announcement request is received for the same endpoint (in the same direction), the playing announcement will continue and the new announcement request is ignored.

If an announcement is being played on an endpoint (in one direction) and a subsequent announcement request is received for the same endpoint (in the other direction), the playing announcement is stopped and the new announcement is then played. Events are not generated for the stopped announcement.

Announcement File Server

Announcements are contained in an announcement file server, which resides on an IP network reachable from the VISM using Trivial File Transfer Protocol (TFTP).

Announcement File Server Name

You can configure the announcement file server node name on the VISM the same way that you configure a node name for the TFTP server.

Announcement File Server Directory Structure

You may use any directory or path on the file server as the main directory for storing announcement files. If you do not provision an announcement path prefix on VISM, the main announcement file directory is the default TFTP directory on the server. If a path prefix is provisioned, this prefix is used as the main announcement directory. If the prefix is not absolute (does not begin with a forward slash (/)), the prefix is relative to the default TFTP directory.

You can configure codec subdirectories under the main announcement directory on the announcement file server. A codec subdirectory exists for each codec used for announcement files. The subdirectories may be one or more of the following:

- g711u/
- g711a/
- g726_32k/
- g726_24k/
- g726_16k/
- g729_a/
- g7231_high_rate/
- g7231_a_high_rate/
- g7231_low_rate/
- g7231_a_low_rate/

When the call agent requests that an announcement is to be played toward the TDM network on an unconnected endpoint, you can specify the codec to be used.

Another level of directories might be configured to group announcement files by language. These directories would be specified by the call agent (or when provisioning the VISM) as part of the announcement file name. For example, the call agent might specify the announcement file name to be english/ann1.au. If the file was encoded in G.729a and the prefix was /tftpboot, the file would reside at /tftpboot/g729_a/english/ann1.au.

VISM Announcement Cache Management

VISM maintains an announcement cache in resident memory. When an announcement is requested to be played, it is retrieved from the announcement file server and placed in the on-board announcement cache. Subsequent requests for the same announcement do not require retrieval of the announcement file from the announcement file server.



Note

An announcement in one encoding is a different file than the same announcement in a different encoding.

Announcement Expiry

You can provision an announcement aging policy. Once an announcement has aged (reached expiry) in the on-board cache, it is refreshed—retrieved again from the announcement file server. This provides you with the means to balance the cost of file server access with the time before an announcement changed on the file server is propagated to the VISM. In addition, you can delete dynamic files from the announcement cache at any time.

Permanent Announcements

You can provision permanent announcements for VISM. A permanent announcement is retrieved from the announcement file server and installed permanently in the VISM announcement file cache. Permanent announcements are excluded from aging (and being automatically refreshed) and excluded from being replaced if the announcement cache becomes full. Permanent announcements can only be removed from the cache explicitly by using a CLI command. If VISM is reset or fails over to a standby card, permanent announcements are retrieved as soon as the card becomes active. The announcement encoding must be specified when provisioning or deleting permanent announcements.

Use the following new CLI commands to configure the announcement file system feature:

- **addannpermanent**
- **cnfannagetime**
- **cnfanndn**
- **cnfannpathprefix**
- **cnfannprefcodec**
- **cnfannreqtimeout**
- **delannalldynamic**
- **delanndynamic**
- **delannpermanent**
- **dspannagetime**
- **dspanncache**
- **dspanncontrols**
- **dspanndn**
- **dspannpathprefix**
- **dspannpermanents**

- **dspannprefcodec**
- **dspannreqtimeout**

Call Agent-Controlled T.38 Fax

The call agent-controlled T.38 fax feature is an additional operational mode for MGCP 1.0 to request T.38. This addition allows VISM to interoperate with H.323 and non-Cisco gateways, and is supported for VoIP calls. This feature is activated based on the fax tone and signaling carried with the call agent. The modified **cnft38fxlco** command allows you to configure the local connection option fax preamble response to off. All previous options are valid.

Additional Support for MGCP 1.0

This release expands the support for the Media Gateway Control Protocol (MGCP) 1.0, which was introduced in VISM 2.2. The following are implemented for the MGCP 1.0 feature support:

- Restart in Progress command disconnect procedure wait delay timer value specification for the following:
 - Initial
 - Minimum
 - Maximum
- Call agent redundancy group protocol configuration for the following:
 - Quarantine handling method for persistent events
 - Default quarantine handling method for each protocol
 - Ability to keep events from previous lists, until explicitly requested to be removed
 - Ability to send provisional responses
 - Ability to send response acknowledgments
 - Ability to provide a disconnect method
 - Ability to cancel previously issued graceful restart commands

Use the following new CLI commands to configure the MGCP 1.0 feature:

- **cnfdisctimers**
- **cnfmgcsrpprotocol**

Use the following new CLI command to display the MGCP 1.0 feature:

- **dspdisctimers**

You can also use the following modified commands to configure the MGCP 1.0 feature:

- **addmgcsrpprotocol**
- **cnfxgcppeer**
- **delmgcsrpprotocol**

RSVP-Based Admission Control

This release introduces Resource Reservation Protocol (RSVP)-based admission control signaling with MGCP to allow for quality VoIP connections. For the connections, the RSVP-MGCP interaction results in the following:

- Establish or originate unidirectional resource reservation for sending voice packets for connections established and controlled by MGCP.
- Accept unidirectional resource reservations for receiving voice packets from MGCP controlled connections.
- Tear down originated or established unidirectional resource reservations.
- Tear down accepted resource reservations.



Note

VISM supports RSVP in the VoIP switching operating mode only, with a 5 calls per second limitation; RSVP is not supported in the VoIP trunking operating mode.

In previous releases of VISM software, the following connection data is returned in response to the call agent initiated DLCX, and gateway initiated DLCX or AUCX commands:

- Number of packets sent
- Number of octets sent
- Number of packets received
- Number of octets received

VISM Release 3.0(0) provides the following additional connection data:

- Number of packets lost
- Inter-arrival jitter—If a DSP is configured to operate in the adaptive jitter buffer mode, the jitter data provided indicates the delay that the jitter-algorithm is adapted to. If a DSP is configured to operate in the fixed jitter buffer mode, the jitter data provided indicates the value that was configured when the channel was opened.



Note

For adaptive mode you can use the value to indicate that the configured initial delay value is too low or too high, since the algorithm adapts according to the actual network jitter.

- Average transmission delay (latency)

Use the following new commands to configure the RSVP-based admission control feature:

- **cnfrsvp**
- **cnfrsvprefreshmiss**

See [Table 3](#) for a complete list of new commands introduced with this release.

Clock Slip Counters

The clock counter information feature allows you to clear the current frame slip counters for a specified VISM or VISM-PR card line and display the current frame slip counters for a specified VISM or VISM-PR card line. Use the new **clrslipcnt** and **dpslipcnt** to use this feature.

RTP Connection Statistics

Real-Time Transport Protocol (RTP) connection statistics are collected for individual endpoints and sent to the call agent. Use the new **dsrtpconnstat** command to display collected RTP connection statistics.

Jitter delay data collection at call completion is on a per call basis. Jitter delay data and number of packets sent and received, and number of octets sent and received, are reported to the call agent through MGCP.

CAS Immediate Start and Ground Start Glare Handling

CAS Immediate Start—This release supports the CAS variants immediate start and immediate start, multifrequency. Use the **addcasvar** command to configure CAS variants.



Note

The immediate start protocol does not define glare handling procedures—do not use the immediate start protocol on incoming or outgoing endpoints only. Endpoints are added as bidirectional by default. To make them incoming or outgoing, use the **cnfcasglarepolicy** command. If the endpoints are left as bidirectional, configured for immediate start operation, and glare occurs, the results may be unpredictable.

Ground Start Glare Handling—This release supports CAS glare condition handling according to RFC 3064. The VISM sends a NACK message in response to the call agent's request for ringing with error code 401 (off hook) in the event of a glare condition.

On receiving the request for ringing from call control, CAS transmits a seize signal to the PBX and starts the glare timer, returning a provisional response code to call control indicating that CAS is still processing the request. If the timer expires (normal case) or an incoming seizure is observed on the endpoint, CAS generates an asynchronous response code to call control that is comparable to an MGCP response code of 200 or 401, respectively.

Grooming for Local Traffic

This release of VISM supports the grooming feature controlled by the call agent. Grooming allows VISM to avoid routing local traffic through the IP network. Voice packets from a local connection are switched locally in the ATM switch.

A call agent determines if a call needs to be set up as local. To set up a local call, the call agent selects an ATM connection over a VoIP connection. The VISM card, as a gateway, receives the connection request message from the call agent for an ATM connection. The VISM card allows VoIP calls and VoAAL1 SVC calls to coexist and allows provisioning of VoIP and ATM simultaneously.

To achieve this, VISM uses VoIP and Switched ATM AAL1 SVC as local switching mode. VISM receives an ATM AAL1 SVC call setup request from the call agent for local calls.

You must use the **cnfvismmode** command and select the VoIP and switched ATM AAL1 SVC operating mode to use the grooming feature. Using this mode does not change any other settings on your card. The type of connection for a call is determined by the connection request (CRCX) from the call agent or by the bearer type configuration.

MGX 8000 Series Implementation Enhancements

The following enhancements are supported with this release with additional implementation of your MGX 8000 Series switch:

- [Additional VBR Enhancements](#)
- [Expanded Clock Source Selection](#)
- [Private Network-to-Network Interface Priority Routing](#)
- [Additional SPVC Connection Management Capabilities](#)
- [192 T1/248 E1 DS0 Support with High Complexity Codecs on VISM-PR](#)
- [Channel Alarm Enhancement](#)
- [VISM TDM Line Statistics Collection](#)

Additional VBR Enhancements

Setting connections between a VISM-PR card and an RPM-PR card in your MGX 8000 Series switch chassis requires you to use the new VBR (NRT) 3 connection type. Use the modified **addcon** or **cnfcon** commands to configure this connection type. In addition, the following new connection service types can be configured with the modified commands in this release:

- VBR (RT) 2
- VBR (RT) 3
- VBR (NRT) 2

Expanded Clock Source Selection

An expanded clock source selection allows you to configure any VISM-PR card line as the clock source. You cannot delete a VISM-PR line that is configured as the clock source; you must configure a different line as the clock source and then you can delete the original clock source line. The previously released CLI commands allow you to use this feature.



Note

This feature requires you to use a PXM1E or PXM45 in your MGX 8000 Series switch chassis.

Private Network-to-Network Interface Priority Routing

The Private Network-to-Network Interface (PNNI) routing priority feature allows you to specify connections with a routing priority. The PNNI controller uses your configuration selections to route the higher priority connections before routing the lower priority connections. Use the **cnfprcon** command to configure a routing priority for a specified connection.



Note

This feature requires you to use a PXM1E or PXM45 in your MGX 8000 Series switch chassis.

Additional SPVC Connection Management Capabilities

Use the Processor Module 1E card (PXM1E) or the PXM45 card in combination with the VISM-PR card in an MGX 8000 Series switch chassis to specify a connection up or down. Specifying a connection up allows you to direct traffic to the specified connection. Specifying a connection down allows you to prevent traffic from being directed to a specified connection. Use the **upcon** and **dncon** commands to use this feature.



Note

This feature requires you to use a PXM1E or PXM45 in your MGX 8000 Series switch chassis.

192 T1/248 E1 DS0 Support with High Complexity Codecs on VISM-PR

VISM-PR T1 lines support up to 192 DS0 channels and VISM-PR E1 lines support up to 248 DS0 channels, with clear channel and the following codec types:

- G.711
- G.726
- G.729a
- G.729ab

[Table 2](#) describes the VISM/VISM-PR DS0 density when the cards are used in combination with clear channel and the supported codecs.

Table 2 VISM/VISM-PR DS0 Density with Codec Support

Codec	VISM		VISM-PR	
	T1	E1	T1	E1
G.711	192	248	192	248
G.723.1	—	—	144	144
G.726	145	145	192	248
G.729a/ab	145	145	192	248
Clear channel	192	248	192	248

Channel Alarm Enhancement

The channel alarm enhancement feature uses the modified **dsponent** command, which allows you to view the channel status bit map data.

VISM TDM Line Statistics Collection

You can configure VISM to collect Time Division Multiplex (TDM) line statistics. Use the **dspalment** command to collect and display TDM line statistics. Use the **cnfalment** command to configure the thresholds for TDM line statistics.

Important Notes

This section describes the following elements of software Release 3.0(0) for VISM/VISM-PR:

- “VISM Management Information Base” section on page 13
- “Software Release 3.0(0) for VISM/VISM-PR CLI Commands” section on page 23
- “VISM Redundancy” section on page 27
- “VISM Call Rate” section on page 27
- “Compatibility” section on page 27
- “Limitations and Restrictions” section on page 30

VISM Management Information Base

The VISM Management Information Base (MIB) Version 0.0.30 is provided with the delivery of software Release 3.0(0) for VISM/VISM-PR, which bundles with the Cisco MGX 8230, Cisco MGX 8250, and Cisco MGX 8850 software and is located on the Web at the following location:

<http://www.cisco.com/kobayashi/sw-center/beta/>

When the selected FW *.tar file or FW*.zip file is downloaded, untar or unzip the file and you will find all the latest MIBs bundled with this release.

The MIB is in standard ASN.1 form and can be compiled with most standards-based MIB compilers. Refer to the MIB release notes on CCO.

MIB Changes for Software Release 3.0(0) for VISM/VISM-PR

This section describes new, modified, and deprecated MIB objects, and new and modified traps for software Release 3.0(0) for VISM/VISM-PR.

New MIB Objects

The following MIB objects are added for software Release 3.0(0) for VISM/VISM-PR:

- MIB objects contained in cwAnnounceControlGrp:
 - cwAnnMaximumSize
 - cwAnnFileServerName
 - cwAnnAgeTime
 - cwAnnPreferenceCodec
 - cwAnnPrefixPath
 - cwAnnReqTimeout
- MIB objects contained in cwAnnounceTable:
 - cwAnnounceNumber
 - cwAnnFileStatus
 - cwAnnFileName

- cwAnnFileCodec
- cwAnnRowStatus
- MIB objects contained in rsvpGenObjects:
 - rsvpSessionNewIndex
 - rsvpBadPackets
 - rsvpResvNewIndex
 - rsvpResvFwdNewIndex
- MIB objects contained in rsvpSessionTable:
 - rsvpSessionNumber
 - rsvpSessionType
 - rsvpSessionDestAddr
 - rsvpSessionDestAddrLength
 - rsvpSessionProtocol
 - rsvpSessionPort
 - rsvpSessionSenders
 - rsvpSessionReceivers
 - rsvpSessionRequests
- MIB objects contained in rsvpSenderTable:
 - rsvpSenderNumber
 - rsvpSenderType
 - rsvpSenderDestAddr
 - rsvpSenderAddr
 - rsvpSenderDestAddrLength
 - rsvpSenderAddrLength
 - rsvpSenderProtocol
 - rsvpSenderDestPort
 - rsvpSenderPort
 - rsvpSenderFlowId
 - rsvpSenderHopAddr
 - rsvpSenderHopLih
 - rsvpSenderInterface
 - rsvpSenderTSpecRate
 - rsvpSenderTSpecPeakRate
 - rsvpSenderTSpecBurst
 - rsvpSenderTSpecMinTU
 - rsvpSenderTSpecMaxTU
 - rsvpSenderInterval
 - rsvpSenderRSVPHop

- rsvpSenderLastChange
- rsvpSenderPolicy
- rsvpSenderAdspecBreak
- rsvpSenderAdspecHopCount
- rsvpSenderAdspecPathBw
- rsvpSenderAdspecMinLatency
- rsvpSenderAdspecMtu
- rsvpSenderAdspecGuaranteedSvc
- rsvpSenderAdspecGuaranteedBreak
- rsvpSenderAdspecGuaranteedCtot
- rsvpSenderAdspecGuaranteedDtot
- rsvpSenderAdspecGuaranteedCsum
- rsvpSenderAdspecGuaranteedDsum
- rsvpSenderAdspecGuaranteedHopCount
- rsvpSenderAdspecGuaranteedPathBw
- rsvpSenderAdspecGuaranteedMinLatency
- rsvpSenderAdspecGuaranteedMtu
- rsvpSenderAdspecCtrlLoadSvc
- rsvpSenderAdspecCtrlLoadBreak
- rsvpSenderAdspecCtrlLoadHopCount
- rsvpSenderAdspecCtrlLoadPathBw
- rsvpSenderAdspecCtrlLoadMinLatency
- rsvpSenderAdspecCtrlLoadMtu
- rsvpSenderStatus
- rsvpSenderTTL
- MIB object contained in rsvpSenderOutInterfaceTable:
 - rsvpSenderOutInterfaceStatus
- MIB objects contained in rsvpResvTable:
 - rsvpResvNumber
 - rsvpResvType
 - rsvpResvDestAddr
 - rsvpResvSenderAddr
 - rsvpResvDestAddrLength
 - rsvpResvSenderAddrLength
 - rsvpResvProtocol
 - rsvpResvDestPort
 - rsvpResvPort
 - rsvpResvHopAddr

- rsvpResvHopLih
- rsvpResvInterface
- rsvpResvService
- rsvpResvTSpecRate
- rsvpResvTSpecPeakRate
- rsvpResvTSpecBurst
- rsvpResvTSpecMinTU
- rsvpResvTSpecMaxTU
- rsvpResvRSpecRate
- rsvpResvRSpecSlack
- rsvpResvInterval
- rsvpResvScope
- rsvpResvShared
- rsvpResvExplicit
- rsvpResvRSVPHop
- rsvpResvLastChange
- rsvpResvPolicy
- rsvpResvStatus
- rsvpResvTTL
- rsvpResvFlowId
- MIB objects contained in rsvpResvFwdTable:
 - rsvpResvFwdNumber
 - rsvpResvFwdType
 - rsvpResvFwdDestAddr
 - rsvpResvFwdSenderAddr
 - rsvpResvFwdDestAddrLength
 - rsvpResvFwdSenderAddrLength
 - rsvpResvFwdProtocol
 - rsvpResvFwdDestPort
 - rsvpResvFwdPort
 - rsvpResvFwdHopAddr
 - rsvpResvFwdHopLih
 - rsvpResvFwdInterface
 - rsvpResvFwdService
 - rsvpResvFwdTSpecRate
 - rsvpResvFwdTSpecPeakRate
 - rsvpResvFwdTSpecBurst
 - rsvpResvFwdTSpecMinTU

- rsvpResvFwdTSpecMaxTU
- rsvpResvFwdRSpecRate
- rsvpResvFwdRSpecSlack
- rsvpResvFwdInterval
- rsvpResvFwdScope
- rsvpResvFwdShared
- rsvpResvFwdExplicit
- rsvpResvFwdRSVPHop
- rsvpResvFwdLastChange
- rsvpResvFwdPolicy
- rsvpResvFwdStatus
- rsvpResvFwdTTL
- rsvpResvFwdFlowId
- MIB objects contained in rsvpIfTable:
 - rsvpIfUdpNbrs
 - rsvpIfIpNbrs
 - rsvpIfNbrs
 - rsvpIfEnabled
 - rsvpIfUdpRequired
 - rsvpIfRefreshBlockadeMultiple
 - rsvpIfRefreshMultiple
 - rsvpIfTTL
 - rsvpIfRefreshInterval
 - rsvpIfRouteDelay
 - rsvpIfStatus
- MIB objects contained in rsvpNbrTable:
 - rsvpNbrAddress
 - rsvpNbrProtocol
 - rsvpNbrStatus
- MIB objects contained in mgcRedundancyGrpProtocolTable:
 - mgcRedGrpProtPersistEvtPolicy
 - mgcRedGrpProtQuarantinePolicy
 - mgcRedGrpProtSigEvtOnOffPolicy
 - mgcRedGrpProtProvisionalResponse
 - mgcRedGrpProtResponseAckAttr
 - mgcRedGrpProtDisconnectProcedure
 - mgcRedGrpProtCancelGraceful

- MIB objects contained in vismXgcpEnhancementObjects:
 - vismXgcpRestartInProgressTdinit
 - vismXgcpRestartInProgressTdmin
 - vismXgcpRestartInProgressTdmax
- MIB object contained in vismChanApplication:
 - vismConnAdminStatus
- MIB object contained in vismChanStateGrpTable:
 - vismChanStatusBitMap

Modified MIB Objects

The following MIB objects are modified for software Release 3.0(0) for VISM/VISM-PR:

- MIB object modified in cardInformation:
 - functionModuleType
- MIB object modified in shelfEntry:
 - shelfFunctionModuleType
- MIB objects modified in smRedMapEntry:
 - redPrimaryType
 - redSecondaryType
- MIB object modified in entPhysicalEntry:
 - entPhysicalVendorType
- MIB objects modified in vismCodecCnfTable:
 - vismCodecCnfIndex
 - vismCodecName
 - vismCodecPktPeriod
 - vismCodecPreference
 - vismCodecString
 - vismCodecIanaType
- MIB objects modified in vismCodecTemplateCnfGrpTableA:
 - vismCodecTemplateNum
 - vismCodecSupported
 - vismCodecTemplateMaxChanCount
- MIB objects modified in vismCodecGenParmTable:
 - vismCodecIndex
 - vismCodecJitterDelayMode
 - vismCodecJitterInitialDelay
- MIB objects modified in vismRtpConnGrpTable:
 - vismRtpCodecType
 - vismRtpPktPeriod

- MIB object modified in vismAal2CidCnfTable:
 - vismAal2CidCodecType
- MIB objects modified in aal2ProfilesGrpTable:
 - aal2ProfileType
 - aal2ProfileNumber
 - aal2ProfilePreference
 - aal2ProfileVoiceCodec
 - aal2ProfileVoiceVAD
- MIB objects modified in vismRtpConnGrpTable:
 - vismRtpLcn
 - vismRtpFailReason
- MIB object modified in vismAal2CidCnfTable:
 - vismAal2CidFailReason
- MIB object modified in vismTrapObjGrp:
 - vismConfigChangeTypeBitMap
- MIB objects modified in vismAal2CidCnfTable:
 - vismAal2CidProfileType
 - vismAal2CidRowStatus
 - vismAal2CidState
- MIB objects modified in vismChanCnfGrpTable:
 - vismRoutingPriority
 - vismConnPercentUtil
 - vismConnRemotePercentUtil
 - vismChanApplication
- MIB object modified in vismPortCnfGrpEntry:
 - vismPortNum
- MIB object modified in vismPortResPartCnfGrpEntry:
 - vismResPartPortNum
- MIB object modified in vismChanCnfGrpEntry:
 - vismChanPortNum
- MIB object modified in vismChanCnfGrpTable:
 - vismConnServiceType
- MIB object modified in vismSystemGrp:
 - vismMode
- MIB object modified in srcpAdminRetyObject:
 - srcpRequestMaxTimeout

- MIB objects modified in vismTonePlanTable:
 - tonePlanEntryStatus
 - tonePlanProvisionFlag
- MIB objects modified in t38FaxRelayGrpTable:
 - t38FxlCO
 - t38Redundancy
- MIB objects modified in inFlow:
 - lastSequenceNumber
 - shelfNodeName
 - shelfNum
 - moduleSlotNumber
 - moduleTrapAlarmSeverity
 - functionModuleType
 - genericTimeStamp
 - intSrvFlowStatus
 - rsvpSessionDestAddr
 - rsvpResvFwdStatus
 - rsvpResvStatus
 - rsvpSenderStatus
- MIB objects modified in lostFlow:
 - lastSequenceNumber
 - shelfNodeName
 - shelfNum
 - moduleSlotNumber
 - moduleTrapAlarmSeverity
 - functionModuleType
 - genericTimeStamp
 - intSrvFlowStatus
 - rsvpSessionDestAddr
 - rsvpResvFwdStatus
 - rsvpResvStatus
 - rsvpSenderStatus
- MIB object modified in ciscoWanVismMgCapabilityV2R00:
 - mediaGatewayControllerGroup2
- MIB object modified in ciscoWanVismMgCapabilityV2R02:
 - mediaGatewayControllerGroup2

- MIB objects modified in ciscoWanVismSrcpCapabilityV2R00:
 - srcpConfigurationGroup3
 - srcpStatisticsGroup2
- MIB objects modified in ciscoWanVismSrcpCapabilityV2R0:
 - srcpConfigurationGroup3
 - srcpStatisticsGroup2
- MIB object modified in the file vismCardSpecific.my:
 - vismNsapAddress
- MIB object modified in vismChanStateGrpTable:
 - vismChanStatusBitMap
- MIB object modified in vismPortCnfGrpTable:
 - vismPortSpeed
- MIB objects modified in vismXgcpCoreObjects:
 - vismXgcpPort
 - vismXgcpPeerPort
- MIB objects modified in vismXgcpPeerTable:
 - vismXgcpPort
 - vismXgcpPeerPort
- MIB objects modified in trapVismConDown:
 - vismChanStatusBitMap
 - vismChanStatusBitMap
- MIB objects modified in trapVismConUp:
 - vismChanStatusBitMap
 - vismChanStatusBitMap
- MIB object modified in vismChanCnfGrpTable:
 - vismMaxCost

Deprecated MIB Objects

The following MIB objects are deprecated from software Release 3.0(0) for VISM/VISM-PR:

- MIB objects deprecated from t38FaxRelayGrpTable:
 - t38FaxInfoFieldSize
 - t38ErrCorrection

New Traps

The following traps are added for software Release 3.0(0) for VISM/VISM-PR:

- cwAnnFileAddStarted
Uses varbind: vismTrapIntIndex1, cwAnnFileName, cwAnnFileCodec, and cwAnnFileStatus

- cwAnnFileLoadComplete
Uses varbind: vismTrapIntIndex1, cwAnnFileName, cwAnnFileCodec, and cwAnnFileStatus
- cwAnnFileLoadFailed
Uses varbind: vismTrapIntIndex1, cwAnnFileName, cwAnnFileCodec, and cwAnnFileStatus
- cwAnnFileDeleted
Uses Added varbind: vismTrapIntIndex1
- newFlow
Uses varbind: intSrvFlowStatus, svpSessionDestAddr, rsvpResvFwdStatus, rsvpResvStatus, rsvpSenderStatus
- lostFlow
Uses varbind: intSrvFlowStatus, svpSessionDestAddr, rsvpResvFwdStatus, rsvpResvStatus, rsvpSenderStatus
- mgcRedundancyGrpParamEntryAdded
Uses varbind: vismTrapIntIndex1
- mgcRedundancyGrpParamEntryDeleted
Uses varbind: vismTrapIntIndex1
- srcpPeerGrpParamEntryAdded
Uses varbind: vismTrapIntIndex1
- srcpPeerGrpParamEntryDeleted
Uses Added varbind: vismTrapIntIndex1
- trapVismConDown
First time using an existing trap. Added varbind: vismChanStatusBitMap. Uses varbind: genericLineNum, vismCnfChanNum, vismChanRowStatus, and vismChanStatusBitMap.

Modified Traps

The following traps are modified for software Release 3.0(0) for VISM/VISM-PR:

- vismRtpConnAdded
Added varbind: vismRtpLcn
- vismRtpConnDeleted
Added varbind: vismRtpLcn
- vismRtpConnStateChg
Added varbind: vismRtpLcn and vismRtpFailReason
- trapVismCidState
Added varbind: vismAal2CidFailReason

- `trapVismChanFailed`
First time using an existing trap. Added varbind: `vismChanStatusBitMap`. Uses varbind: `genericLineNum`, `vismCnfChanNum`, `vismChanPortNum`, and `vismChanStatusBitMap`.
- `trapVismConUp`
First time using an existing trap. Added varbind: `vismChanStatusBitMap`. Uses varbind: `genericLineNum`, `vismCnfChanNum`, `vismChanRowStatus`, and `vismChanStatusBitMap`.

Software Release 3.0(0) for VISM/VISM-PR CLI Commands

Software Release 3.0(0) for VISM/VISM-PR includes many new, modified, and deprecated command line interface (CLI) commands. The syntax and use of these commands is described in the *Cisco VISM Installation and Configuration Guide* for software Release 3.0(0) for VISM/VISM-PR.

New, Modified, and Deprecated CLI Commands

Table 3 describes the new CLI commands contained in software Release 3.0(0) for VISM/VISM-PR.

Table 3 New CLI Commands for Software Release 3.0(0) for VISM/VISM-PR

Command	Description
addannpermanent	Configures an announcement server file and associated codec type as permanent.
clrslipcnt	Clears current clock slip counters for a specified VISM card line.
cnfalmt	Configures the collection of TDM line statistics.
cnfannagetime	Configures the time that a nonpermanent announcement is to remain valid after it is placed into the VISM announcement cache.
cnfanndn	Designates an announcement file server domain name.
cnfannpathprefix	Designates the main prefix directory path from which to retrieve announcement files from the announcement file server.
cnfannprefcodec	Configures the codec type used for announcements played on unconnected TDM endpoints.
cnfannreqtimeout	Configures the expiration time for announcements to begin playing after the VISM receives the announcement signal (request) from the call agent.
cnfdisc timers	Configures the Restart in Progress command disconnect type method wait delay times.
cnfmgcgrp protocol	Configures call agent group protocol data.
cnfrsvp	Configures RSVP for a specified connection.
cnfrsvpprefreshmiss	Configures the number of times VISM waits for a missed RSVP soft-state mechanism refresh message for a specified connection.
delannalldynamic	Deletes all announcement files and their associated codec types from the temporary announcement files currently saved in the VISM card.
delann dynamic	Deletes an announcement file and associated codec type from the temporary announcement files currently saved in the VISM card.

Table 3 New CLI Commands for Software Release 3.0(0) for VISM/VISM-PR (continued)

Command	Description
delannpermanent	Deletes a permanent announcement file and its associated codec type from the announcement file server.
dncon	Configures a specified connection down, preventing traffic from being passed to it.
dspannagetime	Displays the time that a nonpermanent announcement is to remain valid after it is placed into the VISM announcement cache.
dspanncache	Displays all available temporary announcement file names, and associated age times before being refreshed from the announcement file server.
dspanncontrols	Displays a summary list of all provisionable announcement file variables, including variables associated with all announcement file CLI commands.
dspanndn	Displays the announcement file server domain name.
dspannpathprefix	Displays the main prefix directory path from which VISM retrieves announcement files from the announcement file server.
dspannpermanents	Displays all available permanent announcement files with their associated codec types and identifying index numbers.
dspannprefcodec	Displays the codec type used for announcements played on unconnected TDM endpoints.
dspannreqtimeout	Displays the expiration time for announcements to begin playing before being aborted.
dspdismetimers	Displays the Restart in Progress command disconnect type method wait delay times.
dsprsvpif	Displays the RSVP status of a specified connection.
dsprsvpreq	Displays the data associated with a specified RSVP request.
dsprsvpreqs	Displays all RSVP-known requests on the current VISM card.
dsprsvpresv	Displays all data associated with an RSVP bandwidth reservation.
dsprsvpresvs	Displays all incoming RSVP-known reservations on the current VISM card.
dsprsvpsender	Displays all data associated with a specified RSVP path state.
dsprsvpsenders	Displays all RSVP-known path states on the current VISM card.
dsprtpconnstat	Displays the RTP connection statistics for a specified endpoint.
dspslipent	Displays the current clock slip counters for a specified VISM card line.
upcon	Configures a specified connection up, allowing traffic to be passed to the specified connection.

Table 4 describes the modified CLI commands contained in software Release 3.0(0) for VISM/VISM-PR.

Table 4 Modified CLI Commands for Software Release 3.0(0) for VISM/VISM-PR

Command	Name
addcid	Adds an AAL2 CID on a VISM card.
addcon	Adds a PVC connection between a VISM card and any SM or PXM card.
addendpt	Adds an endpoint on a VISM card.
addendptloop	Places an endpoint in a loopback condition in the TDM direction.
addendpts	Adds multiple consecutive numbers of endpoints to a VISM card.
addmgcgrpprotocol	Associates a call agent redundancy group to a gateway control protocol.
addport	Adds a virtual port between a VISM and PXM cards.
addrscrptn	Adds a resource partition for a virtual port.
addrtpon	Adds a static RTP VoIP trunking connection.
clrmngcidcnt	Clears AAL2 counters.
cnfcascode	Configures CAS idle code and seized code parameters for an endpoint.
cnfcasdialogdelay	Configures the VISM wait time (dial delay) for outpulsing digits to the PBX after sending an off-hook event.
cnfcasendpt	Associates an endpoint with a CAS variant.
cnfcasflashtime	Configures the minimum and maximum CAS on-hook time periods for incoming flash hooks on a specified endpoint.
cnfcasglareattrib	Configures the direction of CAS calls and the glare policy for a specified endpoint.
cnfcasglaretime	Configures the CAS glare time for an endpoint.
cnfcasguardtime	Configures the CAS guard time for an endpoint.
cnfcasoffhooktime	Configures a minimum presence time, on an endpoint, for a CAS off-hook pattern to be recognized as an off-hook signal.
cnfcasonhooktime	Configures a minimum presence time, on an endpoint, for a CAS on-hook pattern to be recognized as an on-hook signal.
cnfcaspackage	Configures MGCP packages to notify persistent observed CAS events in the context of incoming and outgoing CAS calls on a specified endpoint.
cnfcasparamsource	Configures an endpoint's CAS-related timer parameters source.
cnfcaswinktime	Configures the CAS wink time parameters—minimum and maximum make times, and minimum break time—for an endpoint.
cnfcodecjtrdelay	Configures the jitter delay mode and initial delay value for a specified codec.
cnfcodeparams	Configures codec parameters—codec packetization period, preference, IANA registered codec type, and xGCP codec string—for AAL1 and IP calls.
cnfcodectmpl	Assigns a codec template to an entire VISM card.
cnfcon	Configures a connection between a VISM card and an MGX 8000 Series switch PXM card.
cnfendptcadence	Configures cadence (digit tone) times for an endpoint.

Table 4 Modified CLI Commands for Software Release 3.0(0) for VISM/VISM-PR (continued)

Command	Name
cnfjtrinitdelay	Configures the jitter buffer size.
cnfpncon	Sets priority routing for a specified connection.
cnfprofelemvbd	Configures the VBD profile element for a profile.
cnfprofelemvoice	Configures the voice profile element for a profile.
cnfprofparams	Configures a profile preference.
cnfrtpcon	Modifies an existing static RTP VoIP trunking connection.
cnfvbdcodec	Configures the VBD upspeed codec.
cnfvismmode	Configures the initial operating mode for a VISM card.
cnfxgcppeer	Configures the UDP port number used to send gateway-initiated messages to the call agent.
delendpt	Deletes an endpoint from a VISM card.
delendptloop	Takes an endpoint out of a loopback condition.
delendpts	Deletes a consecutive number of endpoints on the VISM card.
delmgcgrpprotocol	Deletes an MGCP from a specified call agent redundancy group.
delpport	Deletes a virtual port between a VISM and PXM cards.
dspaal2profile	Displays AAL2 profile type and profile number data.
dspalcnf	Displays the threshold data about the alarm statistics being collected.
dspalment	Displays the alarm counters and statistics on a line.
dspcasglareattrib	Displays the direction of CAS calls and the glare policy for a specified endpoint.
dspcaspackage	Displays the MGCP packages configured to notify persistent observed CAS events in the context of incoming and outgoing CAS calls on a specified endpoint.
dspcasparamsource	Displays an endpoint's currently configured CAS-related timer source.
dspcastimers	Displays the currently configured CAS timers for a specified endpoint.
dspconcnt	Displays the counter configuration data of a connection.
dspendpt	Displays data about a specified endpoint on a VISM card.
dspmngcident	Displays the managed CID count for a specified endpoint.
dspmonecanendpt	Monitors ECAN activity for a specified endpoint.

VISM Redundancy

Table 5 lists the support level for 1:N Service Module Redundancy (N = 1 through 11).

Table 5 Service Module Redundancy

Front Card Model Number	Redundancy Support
MGX-VISM-8T1	1:N redundancy (bulk mode support for T1 lines only).
MGX-VISM-8E1	1:N redundancy (bulk mode support for E1 lines only).
MGX-VISM-PR-8T1	1:N redundancy (bulk mode support for T1 lines only).
MGX-VISM-PR-8E1	1:N redundancy (bulk mode support for E1 lines only).



Note

You can use a VISM-PR card as a redundant card for a VISM card, but a VISM card cannot be used as a redundant card for a VISM-PR card. The PXM45 does not provide redundancy support for VISM cards.

VISM/VISM-PR cards support bulk distribution using the SRM-3T3 and SRM-E (OC3) cards. In a redundancy configuration VISM/VISM-PR cards in bulk distribution mode do not require any backcards.

VISM Call Rate

Software Release 3.0(0) for VISM/VISM-PR handles at least 10 CAS, SS7, or PRI calls per second per VISM card.

Compatibility

Table 6 lists VISM software interoperability with MGX 8850, MGX 8250, and MGX 8230 platform software.

Table 6 VISM Software Interoperability

Product	CW2000 Name	Latest Firmware	Min. Firmware
AUSM-8E1/B	AUSM-8E1/B	20.0.1.0	1.0.02
AUSM-8T1/B	AUSM-8T1/B	20.0.1.0	1.0.02
AX-CESM-8E1	CESM-8E1	10.2.00	10.0.22
AX-CESM-8T1	CESM-8T1	10.2.00	10.0.22
AX-FRSM-8E1/E1-C	FRSM-8E1	20.0.1.0	10.0.23
AX-FRSM-8T1/T1-C	FRSM-8T1	20.0.1.0	10.0.23
AXSM-1-2488	AXSM-1-2488	3.0.0	3.0.0
AXSM-1-2488/B	AXSM-1-2488/B	3.0.0	3.0.0
AXSM-16-155	AXSM-16-155	3.0.0	3.0.0
AXSM-16-155/B	AXSM-16-155/B	3.0.0	3.0.0

Table 6 VISM Software Interoperability (continued)

Product	CW2000 Name	Latest Firmware	Min. Firmware
AXSM-16-T3/E3	AXSM-16-T3/E3	3.0.0	3.0.0
AXSM-16-T3/E3/B	AXSM-16-T3/E3/B	3.0.0	3.0.0
AXSM-16-T3E3-E	AXSM-16-T3E3-E	3.0.0	3.0.0
AXSM-2-622-E	AXSM-2-622-E	3.0.0	3.0.0
AXSM-32-T1E1-E	AXSM-32-T1E1-E	3.0.0	3.0.0
AXSM-4-622	AXSM-4-622	3.0.0	3.0.0
AXSM-4-622/B	AXSM-4-622/B	3.0.0	3.0.0
AXSM-8-155-E	AXSM-8-155-E	3.0.0	3.0.0
BPX/IGX	BPX/IGX	9.3.40	9.2.41
CESM-8E1	CESM-8E1	20.0.1.0	1.0.02
CESM-8T1/B	CESM-8T1/B	20.0.1.0	1.0.02
CWM	—	10.5.10	10.4.10 ¹
FRSM-12-T3E3	FRSM-12-T3E3	3.0.0	3.0.0
MGX-AUSM-8E1/B	AUSMB-8E1	10.2.00	10.0.23
MGX-AUSM-8T1/B	AUSMB-8T1	10.2.00	10.0.23
MGX-CESM-8T1/B	CESM-8T1/B	10.2.00	—
MGX-CESM-E3	CESM-E3	10.2.00	10.0.22
MGX-CESM-T3	CESM-T3	10.2.00	10.0.22
MGX-FRSM-2CT3	FRSM-2CT3	10.2.00	10.0.23
MGX-FRSM-2T3E3	FRSM-2T3	10.2.00	10.0.23
MGX-FRSM-2T3E3	FRSM-2E3	10.2.00	10.0.23
MGX-FRSM-HS1/B	FRSM-HS1/B	10.2.00	10.0.23
MGX-FRSM-HS2	FRSM-HS2	10.2.00	10.0.23
MGX-FRSM-HS2/B	FRSM-HS2/B	20.0.1.0	—
MGX-RPM-XF-512	MGX-RPM-XF-512	12.2(8)YP	12.2(8)YP
MGX-SRM-3T3/B	SRM-3T3	—	—
MGX-SRM-E	SRM-E	—	—
MGX-VISM-8E1	VISM-8E1	3.0(0)	1.5
MGX-VISM-8T1	VISM-8T1	3.0(0)	1.5
MGX-VISM-PR-8E1	VISM-PR-8E1	3.0(0)	3.0(0)
MGX-VISM-PR-8T1	VISM-PR-8T1	3.0(0)	3.0(0)
PXM1	PXM-1	1.2.10	1.1.40 and 1.2.0
PXM1-1-622	PXM1-OC12	1.2.10	1.1.40 and 1.2.0
PXM1-2-T3E3	PXM1-2T3E3	1.2.10	1.1.40 and 1.2.0
PXM1-4-155	PXM1-4OC3	1.2.10	1.1.40 and 1.2.0
PXM1E ²	PXM1E	3.0.0	3.0.0

Table 6 *VISM Software Interoperability (continued)*

Product	CW2000 Name	Latest Firmware	Min. Firmware
PXM45 ²	PXM45	3.0.0	3.0.0
RPM	RPM	12.2(8)T4	12.2(8)T4
RPM IOS	RPM IOS	12.2(8)T4	—
RPM/B	RPM/B	12.2(8)T4	12.2(8)T4
RPM-PR	RPM-PR	12.2(8)T4	12.2(8)T4
SES	SES	3.0.00	1.0.16

1. CWM Release 10.4 does not support all of the new MIBs listed in the “[VISM Management Information Base](#)” section on page 13.
2. This card is not compatible with VISM cards.

[Table 7](#) describes VISM software interoperability with other Cisco products.

Table 7 *Software Release 3.0(0) for VISM/VISM-PR Interoperability with Other Cisco Products*

Cisco 3810	12.2(8)T1
AS5400	122-10.7
Virtual Switch Controller Software	VSC 9.1.2/9.1.5

[Table 8](#) describes the software images available for Release 3.0(0) for VISM/VISM-PR.

Table 8 *Software Images for Release 3.0(0) for VISM/VISM-PR*

Product Name	Software Image	Firmware	Description
MGX-VISM-SW3000	003.000.000	vism_8t1e1_003.000.000.000.fw	This image does not support the CALEA ¹ feature.
MGX-VISM-LISW3000	003.050.000	vism_8t1e1_003.050.000.000.fw ²	Use this image for CALEA ¹ feature support.

1. CALEA = Commission on Accreditation for Law Enforcement Agencies.
2. The CALEA implementation supports the CALEA law intercept confirmation interface.

[Table 9](#) describes the software boot code and run-time firmware requirements for software Release 3.0(0) for VISM/VISM-PR.

Table 9 *Software Release 3.0(0) for VISM/VISM-PR Software Boot and Run-time Firmware Requirements*

Board Pair	Latest Boot Code Version	Minimum Boot Code Version
MGX-VISM-8T1	vism_8t1e1_VI8_BT_3.1.00.fw	vism_8t1e1_VI8_BT_3.1.00.fw
MGX-VISM-8E1	vism_8t1e1_VI8_BT_3.1.00.fw	vism_8t1e1_VI8_BT_3.1.00.fw
MGX-VISM-PR-8T1	vism_8t1e1_VI8_BT_3.1.00.fw	vism_8t1e1_VI8_BT_3.1.00.fw
MGX-VISM-PR-8E1	vism_8t1e1_VI8_BT_3.1.00.fw	vism_8t1e1_VI8_BT_3.1.00.fw

**Note**

Loading this release of the backup bootcode is required for existing VISM cards not using this new release.

Limitations and Restrictions

The following limitations and restrictions are valid for software Release 3.0(0) for VISM/VISM-PR:

- The switched AAL2 PVC operating mode is not supported for VISM Release 3.0(0).
- Software Release 3.0(0) for VISM/VISM-PR requires you to use 64 Mb VISM cards or VISM-PR cards exclusively.
- The switched AAL2 PVC operating mode is not supported in software Release 3.0(0) for VISM/VISM-PR.
- Cisco recommends that you use the **cnfcodecjrtdelay** command to configure the *jitter-delay* argument to 20 ms when using DSP firmware versions 3.4 and 3.6.

[Table 10](#) describes the design constraint which is identified in software Release 3.0(0) for VISM/VISM-PR.

Table 10 Known Design Constraint

DDTs Issue	Description
CSCdv37382	The addcid command can put VISM into the fail state. If non-AAL5 cells are sent to an AAL5 PVC of VISM, this can cause the VISM SAR chip to hang and VISM to go into failed state. This is because, in case of AAL5, the last bit of the Payload type indicator is used to determine which cell contains the end of that payload. All cells which have this bit set to 0 are held in the reassembly buffer until the cell with this bit set to 1 arrives. In case of non-AAL5 cells, this bit will never get set to 1, and ultimately this buffer will overflow. So, care should be taken that only AAL5 cells are sent to AAL5 PVCs of VISM.

Installation and Upgrade Procedures

This section describes the following installation and upgrade procedures:

- [“VISM to VISM-PR Upgrade Procedure” section on page 31](#)
- [“VISM Firmware Download Procedure for PXM1” section on page 32](#)
- [“Installing VISM Software Updates with PXM1 Cards” section on page 33](#)
- [“VISM Boot Code Upgrade Procedure with PXM1 Cards” section on page 36](#)
- [“VISM Downgrade Procedure” section on page 37](#)
- [“Caveats” section on page 38](#)

**Caution**

If you are upgrading the VISM software from 1.5(x), refer to the [“Caveats” section on page 38](#). VISM Release 2.1(0) does not provide a graceful upgrade procedure from 1.5(x) to 2.1(x).

VISM to VISM-PR Upgrade Procedure

Software Release 3.0(0) for VISM/VISM-PR introduces the new VISM-PR card. Complete the following steps to gracefully upgrade from VISM cards to VISM-PR cards. You must ensure that the VISM and VISM-PR software versions are the same—ensure that you have the version with Commission on Accreditation for Law Enforcement Agencies (CALEA), if you use the CALEA feature.

The following versions of VISM software Release 3.0(0) are available:

- 003.000.000—without CALEA
- 003.050.000—with CALEA



Note

You do not have to complete these instructions in order to use software Release 3.0(0) for VISM/VISM-PR; however, see the “[VISM Features](#)” section on page 2 for a list of features that are not available to you if you do not perform this upgrade procedure.

VISM cards and VISM-PR cards use the same back cards. There are no new back cards introduced with this release. In the following procedure:

- Remove your VISM cards and replace them with VISM-PR cards.
- Two VISM-PR cards are involved, one initially active and one initially standby. In this procedure description, the initially standby VISM-PR card is identified as VISM-PR-1 and the initially active VISM-PR as VISM-PR-2.
- Old-rev refers to the firmware before the upgrade (2.2).
- New-rev refers to the firmware after the upgrade (3.0).

Step 1 Log in to the active PXM card (slot 7 or 8).



Note In these steps, PXM card refers to the type of PXM card you have. It can be a PXM1, PXM1E, or PXM45 card.

Step 2 Save the existing configuration as a contingency plan by entering:

```
savesmconf <SM slot#>
```

This saves the existing configuration in the c:cnf directory. This file can be used during the downgrade procedure, if necessary.

Step 3 Execute the PXM **install** command:

```
install sm <SM slot#> <new-rev>
```

where:

SM slot# is the slot number of the standby VISM-PR-1 card and new-rev is the file name of the new firmware (for example, vism_8t1e1_003.000.000.000.fw).

This command causes the standby VISM-PR-1 card to reset and come up in the “standby” state, running the new-rev firmware. The active VISM-PR-2 card is unaffected by this command. At this point, the primary firmware is still the old-rev and the secondary firmware is new-rev.

Step 4 Execute the PXM **newrev** command:

```
newrev sm <SM slot#> <new-rev>
```

where:

SM slot# is the slot number of the standby VISM-PR-1 card and new-rev is the filename of the new firmware.

This command causes the VISM-PR-1 to become the active VISM running the new-rev firmware. The previously active VISM-PR-2 changes to a “standby” state and is still running the old-rev firmware. The primary and secondary firmware switches with the new-rev becoming the primary firmware.

Step 5 Execute the PXM **commit** command:

```
commit sm <SM slot#> <new-rev>
```

where:

SM slot# is the slot number of the hold-state VISM-PR-2 and new-rev is the filename of the new firmware.

This command causes both VISM cards to run the new-rev firmware. At first, VISM-PR-1 is the active card with VISM-PR-2 remaining in the hold state. After a short time, the cards switch automatically with VISM-PR-2 becoming the active card and VISM-PR-1 the standby card.

The two VISM-PR cards are now back to their original condition except that both cards are now running the new-rev firmware.

Step 6 Log in to the active VISM-PR card and use the display commands (dspdpts, dspcasvar, etc.) to confirm that the configuration has been preserved through the upgrade process.

It is also recommended that a further verification be performed by making some minor modifications to the configuration, checking that the changes have been executed correctly, and then changing the configuration back again.

**Note**

If the VISM-PR card is not part of a redundancy group, [Step 1](#) to [Step 3](#) are sufficient.

VISM Firmware Download Procedure for PXM1

Step 1 Download the selected revision of service module firmware into the service module in the selected slot.

```
tftp <node_name or IP address>
bin
put <backup boot> POPEYE@SM_1_<slot#>.BOOT
quit
tftp <node_name or IP address>
```

Step 2 Proceed to [Step 2a.](#) to upgrade all VISM cards or proceed to [Step 2b.](#) to upgrade an individual VISM card.

```
a. put <FW file> POPEYE@SM_1_0.FW
quit
```


- b. `put <FW file> POPEYE@SM_1_<slot number of card to upgrade>.FW`
`quit`



Note Do not enter two `put` commands in the same TFTP session.

- Step 3** Proceed to the [“Installing VISM Software Updates with PXM1 Cards”](#) section on page 33 to install the download.

VISM Firmware Download Procedure for PXM1E and PXM45

- Step 1** Access the image on the Cisco Website in order to download the image.
- Step 2** Use the `ftp node-ip` command, where *node-ip* is the IP address of the node to which you want to download the image, to download the image.
- Step 3** Enter your username and password.
- Step 4** Type `cd C:FW` to access the appropriate directory.
- Step 5** Type `bin`.
- Step 6** Use the `put image-version`, where *image-version* is the downloaded image from [Step 1](#), to download the image to your C:FW directory.
- Step 7** Type `bye` to exit the download procedure.

Installing VISM Software Updates with PXM1 Cards

Software Release 3.0(0) for VISM/VISM-PR provides a procedure for the graceful upgrade (one in which the existing VISM configuration is preserved throughout the upgrade procedure) from the earlier VISM 2.0 release.



Caution Installing VISM software updates from VISM Release 2.2 with CALEA to VISM Release 3.0 without CALEA is not graceful.



Caution Temporary traffic loss occurs during [Step 4](#) and [Step 5](#) of the VISM graceful upgrade procedure of the [Upgrade Procedure](#) for software Release 3.0(0) for VISM/VISM-PR.

Initial Conditions

The following initial conditions are required before the graceful upgrade procedure can be started:

- The MGX 8000 Series shelf must be configured with at least two VISM cards in a redundant configuration (refer to the add redundancy, **addred**, command in the MGX 8850, MGX 8250, and MGX 8230 command references for more information).
- The VISM cards must be running VISM 2.0 and be configured to the desired configuration.
- The software Release 3.0(0) for VISM/VISM-PR must have been already downloaded to the MGX shelf.
- Ensure that you have the version of VISM software that supports CALEA, if you are using the CALEA feature.

Upgrade Procedure

Upgrades are available for the following releases:

- From VISM 1.5 to VISM 3.0
- From VISM 2.1 to VISM 3.0
- From VISM 2.2 to VISM 3.0

In the following procedure:

- Two VISM cards are involved, one initially active and one initially standby. In this procedure description, the initially active VISM is identified as VISM 1 and the initially standby VISM as VISM 2.
- Old-rev refers to the firmware before the upgrade (2.2).
- New-rev refers to the firmware after the upgrade (3.0).

Complete the following steps to upgrade the VISM cards:

Step 1 Log in to the active PXM card (slot 7 or 8).

Step 2 Save the existing configuration as a contingency plan by entering:

```
savesmconf <SM slot#>
```

This will save the existing configuration in the c:cnf directory. This file can be used during the downgrade procedure, if necessary.

Step 3 Execute the PXM **install** command:

```
install sm <SM slot#> <new-rev>
```

where:

SM slot# is the slot number of the VISM 2 card and new-rev is the file name of the new firmware (for example, vism_8t1e1_003.000.000.000.fw).

This command causes the standby VISM 2 to reset and come up in the “hold” state, running the new-rev firmware. The active VISM 1 is unaffected by this command. At this point, the primary firmware is still the old-rev and the secondary firmware is new-rev.

Step 4 Execute the PXM **newrev** command:

```
newrev sm <SM slot#> <new-rev>
```

where:

SM slot# is the slot number of the VISM 2 and new-rev is the filename of the new firmware.

This command causes the VISM 2 to become the active VISM running the new-rev firmware. The previously active VISM 1 changes to a “hold” state and is still running the old-rev firmware. The primary and secondary firmware switches with the new-rev becoming the primary firmware.

Step 5 Execute the PXM **commit** command:

```
commit sm <SM slot#> <new-rev>
```

where:

SM slot# is the slot number of the standby VISM 1 and new-rev is the filename of the new firmware.

This command causes both VISM cards to run the new-rev firmware. At first, VISM 2 is the active VISM with VISM 1 remaining in the hold state. After a short time, the cards switch automatically with VISM 1 becoming the active card and VISM 2 the standby card.

The two VISM cards are now back to their original condition except that both cards are now running the new-rev firmware.

Step 6 Log in to the active VISM card and use the display commands (dspentpts, dspcasvar, etc.) to confirm that the configuration has been preserved through the upgrade process.

It is also recommended that a further verification be performed by making some minor modifications to the configuration, checking that the changes have been executed correctly, and then changing the configuration back again. Proceed to the [VISM Boot Code Upgrade Procedure with PXM1 Cards](#), page 36.



Note

If the VISM card is not part of a redundancy group, [Step 1](#) to [Step 3](#) are sufficient.

Installing VISM Software Updates with PXM1E or PXM45 Cards

Complete the following steps to update the VISM software when you are using PXM1E or PXM45 cards in your MGX 8000 Series chassis:

Step 1 Log on to the active PXM1E or PXM45 card.

Step 2 Ensure that the VISM/VISM-PR card is in the redundant mode, where the active card is the primary card.

Step 3 Use the **savescmf** command to save the existing configuration as a contingency plan.

Step 4 Use the **loadrev sm-primary-slot-num new-rev** command, where *sm-primary-slot-num* is the slot number of the VISM/VISM-PR card you want to install the new software, and *new-rev* is the new firmware version number for the VISM software.

- Step 5** Use the **runrev** *sm-primary-slot-num new-rev* command to execute the download.
- Step 6** Use the **commitrev** *sm-primary-slot-num new-rev* command to commit the new download to the VISM/VISM-PR card.

You have completed the steps. Proceed to the [VISM Boot Code Upgrade Procedure with PXM1E and PXM45 Cards, page 37](#).

VISM Boot Code Upgrade Procedure with PXM1 Cards

There is a new backup boot code change from VISM Release 2.2(0) to software Release 3.0(0) for VISM/VISM-PR. Complete the following steps to upgrade the new backup boot code when you are using PXM1 cards in your MGX 8000 Series chassis:



Note This procedure reprograms the VISM boot code for previous VISM cards using the VISM runtime image version 1.0 to 2.0.

- Step 1** Telnet to MGX shelf and use the **cc** command to access the VISM card.



Note VISM must be in the active state in order to update the VISM boot code.

- Step 2** Access the server where the VISM boot code resides and use TFTP to download the VISM boot code to the VISM card with the following procedure:

- a. Type **tftp** <IP address of the MGX shelf>
- b. Type **bin** at the tftp prompt.



Caution Ensure that you perform [Step 2b](#).—if you do not perform [Step 2b](#), the boot code will be corrupted and not recoverable.

- c. Type **put** <vism-backup-boot.fw> **POPEYE@SM_1_** <vism_slot_number>.**BOOT**
where NN = the slot number where the VISM card is inserted.



Caution Do not touch the VISM card until the status comes back ('Sent xxx bytes in yyy seconds'). Failure to follow this recommendation will corrupt the boot code and will not be recoverable.

When the boot code is being written to PROM, you will see comments displayed at the VISM prompt. This is normal and expected behavior.

- Step 3** Use the **resetcd** command for VISM from the PXM card for the latest boot take effect.
- Step 4** (Optional) Type the **version** command to verify the correct boot code.

You have completed upgrading the new VISM backup boot code.

VISM Boot Code Upgrade Procedure with PXM1E and PXM45 Cards

There is a new backup boot code change from VISM Release 2.2(0) to software Release 3.0(0) for VISM/VISM-PR. Complete the following steps to upgrade the new backup boot code when you are using PXM1E or PXM45 cards in your MGX 8000 Series chassis:

-
- Step 1** Complete the steps in the [VISM Firmware Download Procedure for PXM1E and PXM45, page 33](#).
- Step 2** Log on to the PXM1E or PXM45 card.
- Step 3** Use the **burnboot** *sm-primary-slot-num new-rev* command, where *sm-primary-slot-num* is the slot number of the VISM/VISM-PR card you want to upgrade and *new-rev* is the firmware version number of the new VISM software, to upgrade the VISM/VISM-PR boot code.
- The VISM/VISM-PR card automatically resets and becomes active with the latest boot code image. You have completed the boot code upgrade procedure.
-

VISM Downgrade Procedure

Use this procedure to downgrade VISM software from software Release 3.0(0) for VISM to the earlier VISM Releases 2.2, 2.1, and 2.0. By following the downgrade procedure described here, the configurations will be retained after downgrade.



Note It is important to note that the configurations that existed with old-rev firmware should have been saved earlier. You cannot downgrade from VISM-PR to VISM.

Complete the following steps to downgrade the VISM software from software Release 3.0(0) for VISM/VISM-PR to Release 2.2, 2.1, or 2.0:

-
- Step 1** If the VISM card is in a redundancy group, remove the redundancy.
- ```
delred <SM slot#>
```
- Step 2** Download the old-rev firmware onto the MGX shelf.
- Step 3** Execute the PXM **clrsmcnf** command:
- ```
clrsmcnf <SM slot#>
```
- where:
- SM slot# is the slot number of the VISM card to be downgraded.
- The VISM card will be reset on executing this command. Wait for the card to come active.

Step 4 Execute the PXM **restoresmcnf** command:

```
restoresmcnf -f <filename> -s <SM slot#>
```

where:

The filename is the name of the old configuration file that was saved while the old-rev firmware was running. The file can be found in the C:CNF directory on the MGX shelf.

The SM slot# is the slot number of the VISM card to be downgraded.

The VISM card will be reset again. When the card comes active, it will have the old-rev firmware running and will have the old configuration.

Step 5 Reconfigure redundancy group, if required.

Caveats

This section describes resolved and open software caveats for this release of VISM. Caveats describe unexpected behavior or defects in VISM software.

Resolved Caveats

[Table 11](#) describes the caveats issued against VISM software that have been resolved in software Release 3.0(0) for VISM/VISM-PR.

Table 11 Resolved Caveats for Software Release 3.0(0) for VISM/VISM-PR

DDTs Issue	Description
CSCdu11130	<p>Title: CAS endpoint does not go idle after a failed call.</p> <p>Description: When the terminating VISM is dialing the digits out (in immediate and wink start) and times out waiting for DSPs acknowledgment (that the digits were dialed out), CAS initiates a DLCX (E: could not dial digits) and goes to the wait for idle signal from PBX state.</p> <p>Workaround: None.</p>
CSCdv20426	<p>Title: The cnfgwoos 2 (2 = forceful) CLI command string fails to delete some connections under error conditions.</p> <p>Description: Upon a network COT failure—when network COT is initiated by the terminating gateway—the terminating gateway sends DLCX to the call agent. If the call agent, upon receiving DLCX from the terminating gateway, sends DLCX with R: (empty list in requested events) to the originating gateway to delete the connection. The originating gateway fails to delete the connection and NACKs the DLCX. The connection is hung in this situation. Now, after this failed operation, the originating gateway does not delete the connection with the cnfgwoos 2 CLI command string and the connection stays hung.</p> <p>Workaround: None.</p>

Table 11 Resolved Caveats for Software Release 3.0(0) for VISM/VISM-PR (continued)

DDTs Issue	Description
CSCdv25846	<p data-bbox="565 310 1500 373">Title: Codec negotiation fails when certain specific strings are configured as codec names.</p> <p data-bbox="565 390 1500 453">Description: VISM rejects the call with the "admission failed to identify admitted codec" error message when the codec string has a specific parameter.</p> <p data-bbox="565 470 1500 533">Workaround: You should not use the following codec names in the cnfcodeparams CLI command:</p> <ul data-bbox="581 550 792 1297" style="list-style-type: none"> • G.729 • G.729-cisco • G.729a-cisco • G.729b • G.728 • G.723.1-H • G.723.1a-H • G.723.1-L • G.723.1a-L • G.GSM-F • G.GSM-H • G.GSM-eF • G.GSM-eH • image/t38 • telephone-event • X-NSE • X-cisco-rtsp
CSCdw89042	<p data-bbox="565 1308 1500 1373">AAL2 SVC, fax and modem calls not working with G.729a and G.729ab codecs. Bearer traffic works, but cannot transmit fax and modem traffic across the connection.</p>

Open Caveats

Table 12 describes possible unexpected behavior by software Release 3.0(0) for VISM/VISM-PR.

Table 12 Open Caveats for Software Release 3.0(0) for VISM/VISM-PR

DDTs Issue	Description
CSCds66369	<p>Title: VISM telnet sessions lock, unable to cc to card until reset.</p> <p>Description: The VISM card allows up to two sessions. Both of these sessions have become locked, which prevents the user from being able to use the cc command to access the card. This condition has been reported twice and is not reproducible in the lab.</p> <p>Workaround: Reset the card.</p>
CSCdt62553	<p>Title: XRBK/CO4 does not work with subcell muxing enabled for some calls.</p> <p>Description: Start calls on 48 endpoints with ground start CAS variant and subcell muxing enabled. Calls were Inter-VISM and Intra-MGX. Some calls failed with the “Network COT test failure” error. When running calls with subcell muxing disabled, it works fine.</p> <p>Workaround: Disable subcell muxing.</p>
CSCdt85106	<p>Title: G.726-16k, 24k and 40k cannot be configured as Vbdcodec.</p> <p>Description for VISM 2.2: G.726-16K, G.726-24K, and G.726-40K should not be configured as Vbdcodec for upspeeding during fax/modem calls. This feature is not available in VISM Release 2.2.</p> <p>Workaround: If configuring with VISM CLI commands, do not configure G.726-16K, G.726-24K, and G.726-40K with cnfvbdcodec. If configuring with SNMP, do not configure G.726-16K, G.726-24K, and G.726-40K for the vismUpspeedCodec MIB object.</p> <p>Description for VISM 2.1: VISM does not allow G.726-16K, G.726-24K, and G.726-40K to be configured as Vbdcodec for upspeeding during fax/modem calls.</p> <p>Workaround: None.</p>
CSCdx24153	OAM cells drop in AAL2 trunking with G.711u codec, and VAD disabled in combination with VISM-PR E1 cards.
CSCdx65569	AAL2 SVC upspeed to clear channel fails when there are more than 24 CIDs.
CSCdx68992	AAL1 SVC-DSP failed to detect tones in AAL1 encapsulation. Mid-call DTMF is not working for AAL1 SVC grooming solution. Tones are transmitted to the other end instead of to the call agent.
CSCdx73578	VISM 1:N redundancy on AAL2 SVC call setup fails when reverting to a VISM-PR card. Calls fail in AAL2 SVC mode after the failed card is returned to primary status.

Related Documentation

The following documents contain information that may be useful to software Release 3.0(0) for VISM/VISM-PR:

- *Cisco VISM Installation and Configuration Guide, Release 3.0*
- *Cisco MGX 8850 and MGX 8950 Switch Command Reference*
- *Cisco MGX 8850 Hardware Installation Guide, Release 3*
- *Cisco MGX 8850, MGX 8950, MGX 8830 Software Configuration Guide, Release 3 (PXM45, PXM45/B, and PXM1E)*

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

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http://www.cisco.com/public/countries_languages.shtml

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San Jose, CA 95134-9883

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Cisco TAC Website

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<http://www.cisco.com/tac>

Accessing all the tools on the Cisco TAC website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a login ID or password, register at this URL:

<http://tools.cisco.com/RPF/register/register.do>

Opening a TAC Case

Using the online TAC Case Open Tool is the fastest way to open P3 and P4 cases. (P3 and P4 cases are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Case Open Tool automatically recommends resources for an immediate solution. If your issue is not resolved using the recommended resources, your case will be assigned to a Cisco TAC engineer. The online TAC Case Open Tool is located at this URL:

<http://www.cisco.com/tac/caseopen>

For P1 or P2 cases (P1 and P2 cases are those in which your production network is down or severely degraded) or if you do not have Internet access, contact Cisco TAC by telephone. Cisco TAC engineers are assigned immediately to P1 and P2 cases to help keep your business operations running smoothly.

To open a case by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)
EMEA: +32 2 704 55 55
USA: 1 800 553-2447

For a complete listing of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

TAC Case Priority Definitions

To ensure that all cases are reported in a standard format, Cisco has established case priority definitions.

Priority 1 (P1)—Your network is “down” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Priority 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Priority 3 (P3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

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- The Cisco *Product Catalog* describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the Cisco Product Catalog at this URL:
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- *Packet* magazine is the Cisco quarterly publication that provides the latest networking trends, technology breakthroughs, and Cisco products and solutions to help industry professionals get the most from their networking investment. Included are networking deployment and troubleshooting tips, configuration examples, customer case studies, tutorials and training, certification information, and links to numerous in-depth online resources. You can access Packet magazine at this URL:
<http://www.cisco.com/packet>
- *iQ Magazine* is the Cisco bimonthly publication that delivers the latest information about Internet business strategies for executives. You can access iQ Magazine at this URL:
<http://www.cisco.com/go/iqmagazine>

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:
<http://www.cisco.com/ipj>
- Training—Cisco offers world-class networking training. Current offerings in network training are listed at this URL:
<http://www.cisco.com/en/US/learning/index.html>

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