



Release Notes for the Voice Services Provisioning Tool Release 2.1

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Introduction

This document contains pertinent information on installing, configuring, and using the Cisco Voice Services Provisioning Tool (VSPT) Release 2.1 software. For more information on the Cisco VSPT software, please visit Cisco's website at: <http://www.cisco.com> > Software Center > Voice Software > Voice Services Provisioning Tool or <http://www.cisco.com/cgi-bin/tablebuild.pl/vspt>.

This document outlines the latest information about the Cisco VSPT Release 2.1. VSPT Release 2.1 helps you create configuration files across multiple devices including the Cisco PGW 2200, Cisco Media Gateway for SS7 PRI Gateway and the Tandem Offload Solutions.



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The Cisco VSPT can help avoid common errors that might arise if devices are provisioned independently. This package eliminates the need to enter duplicate data and enables you to import configurations to and export configurations from the PGW 2200. It also generates the configuration files you need to provision the PGW 2200—including the following provisioning information:

- Signaling
- Trunk groups
- Trunks
- Routes
- Dial plans

Software Release History

This section contains information only for the current and previous releases. For information on earlier releases, please refer to a previous version's release notes.

Release 2.1

Version 2.1 supports the MGC Mistral release 9.1(5) software release. It allows you to:

- Show and modify the states of various MGC configuration elements, (signaling services, trunk groups, trunks, etc).
- Query the administrative and desired states for numerous MGC components.
- Send commands to take elements in and out of service.

This is helpful when deleting trunks that are in service. From the new state management functionality, you can take those trunks out of service from VSPT, and then issue provisioning commands to delete them.

The following SPRs were resolved:

Table 1 *Resolved Caveats for Software Release 1.6(1)*

Identifier	Severity	Component	Description
CSCdt36942	1	provision	Can't configure DS0s above 480 in E1 mode
CSCdt81092	2	provision	Cujo config with E1s imported as T1s
CSCdt81543	2	other	"more" button not working when adding trunks.

Release 2.0

- Tandem Offload using 5300 gateways solution
- Tandem Offload using VISM gateways solution
- Support for SS7 PRI Gateway (North America) solution
 - Media Gateway: MGX 8260, Releases 1.1 and 1.2
 - Media Gateway Controller Software: MGC software Release 7.4 (10)B (minimal release for Release 7)
- Support for SS7 PRI Gateway (EMEA) solution

- Media Gateway: MGX 8260, Releases 1.1 and 1.2
- Media Gateway Controller software: MGC software Release 7.4(10)B (minimal release for Release 7)
- SS7 Interconnect for Access Servers
- SS7 Interconnect for Voice Gateways
- Support for Billing and Measurement Server (BAMS) configuration
BAMS Phase II, Release 2.62 and above

Release 1.5(4) Level 01

The following SPR was resolved:

Table 2 *Resolved Caveats for Software Release 1.5(4) Level 01*

Identifier	Severity	Component	Description
CSCdt36493	2	bams	VSPT 1.5 does not import SS7 sigpath from SC2200 into BAMS

The following issue was resolved:

Updated the configEditor.properties file to specify additional SS7 signaling path MDO dialects.

Release 1.5

- Support for SS7 PRI Gateway solution configuration
Media Gateway: MGX 8260, Releases 1.1 and 1.2
- Support for SS7 PRI Gateway solution configuration
Media Gateway Controller software: MGC software Release 7.4(10)B (minimal release for Release 7)
- Support for Billing and Measurement Server (BAMS) configuration
BAMS Phase II, Release 2.62 and above

Release 1.1.2

This release corrected the MGX 8260 commands required for MGCP connections.

Version 1.1

- Initial release
- Support for SS7 PRI Gateway solution configuration
Media Gateway: MGX 8260, Release 1.1.1
- Support for Tandem Transit solution configuration
Media Gateway: MGX 8850/VISM cards, Release 2.0.1
- Support for PGW 2200, Release 7.4(8)C

System Requirements

The following is the minimum hardware you need to run the Cisco VSPT software:

- Sun Ultra-5 Workstation (333 MHz or faster)
- Sun Solaris 2.6 (Cisco VSPT 2.1 does not work with Solaris 2.7 or greater)
 - May 1998 release recommended
 - Openwindows with the Common Desktop Environment (CDE)
 - Latest Solaris 2.6 recommend patch set (<http://sunsolve.sun.com>; click **Patches**)
- 8-bit video graphics card
- 128 MB of System RAM
- 128 MB of free disk space (in installation directory)
- 128 MB of free swap space
- Approximately 4 MB of disk space in the /var partition required for each installation session

Supported Network Elements

The following network elements have been tested and verified to work with this release of the Cisco VSPT.



Note

All other versions of network element software have not been tested and are *not* supported with this version.

- Cisco Media Gateway (MGX):
 - MGX8260: 1.1 or SCC_r01.01.a04 as reported by version command and 1.2
 - MGX8850: Voice Interworking Service Module (VISM) Release 2.0.1
- Cisco VSPT software (releases as specified in Table 1):

Table 3 Supported VSPT Software Releases

VSPT Release	Minimum Requirement for MGC Release 7
1.5(1)	7.4(10)B
1.5(2)	7.4(10)B
1.5(3)	7.4(11)

- Cisco BAMS Phase II, Release 2.62 and above

Caveats

Contact your Cisco representative to obtain status on problem reports. Caveats are sorted by severity, then identifier, then component. Only severity 1, 2, and 3 caveats are listed.

Table 4 *Resolved Caveats*

Identifier	Severity	Component	Description
CSCdt86681	1	other	MGC version 9.0.2 is less than minimum version 9.0(1) error.
CSCdt35632	2	other	Deleting SessionSet did not remove corresponding IpFas and D-Chan.
CSCdt95428	2	other	Dropdown list for DS1 number incorrect in append trunks pane.
CSCdt50530	3	other	SessionSet: peerAddr2 after import.
CSCdt60844	3	provision	VSPT does not check VISM line type installed.
CSCdt60864	3	provision	Cannot provision required VISM parameters in VSPT.
CSCds55590	3	other	Need to check assignment of path before delete.
CSCdt34576	3	other	ACC: MCL threshold only supported by prov-ed.
CSCdt52148	3	other	Import dat file from VSC incorrect.
CSCdt66880	3	provision	Cannot deploy a TG profile without any properties.
CSCdt67781	3	provision	Can modify service name when a result is connected to it.
CSCdt30492	3	other	Launching VSPT failes if Java Home env variable set.
CSCdt60881	3	provision	VSPT does not set ISDN lapd type in VISM.
CSCdt60894	3	provision	VSPT sends incorrect session parameters to VISM.
CSCdt69742	3	provision	Redundancy for VISM is not allowed in VSPT.
CSCdt88046	3	other	VISM against Indiana: no or yes expected after cnflnsig.
CSCdt88811	3	other	VISM: Error getting casInfo from traffic part.
CSCdt88979	3	other	VISM: Delete ipfas causes deployment error.
CSCdt90133	3	other	VISM: Decrease number of T1 causes deployment error.
CSCdt90621	3	other	Adding trunks to multiple visms: unnecessary warning window
CSCdt97566	3	other	Unable to append trunks on AS5000
CSCdu00357	3	other	trkGrp incremental: property missed
CSCuk22199	3	other	PB: Dart will not import from 9.0.2 VSC
CSCuk22331	3	provision	Clicking more on trunk addition screen prevents trunk addition

There are no open caveats for VSPT 2.1.

Known Issues and Operational Recommendations

Using the Cisco AS5x00 as a Media Gateway

If you use Cisco AS5x00 as media gateways, you must update the DEFDS1TYPE flag to either E1 or T1 (in the configEditor.properties) based on the type of card used in the AS5x00 devices.

MGCP endpoint names for IOS devices do not indicate either T1 or E1 endpoints. When importing a configuration from the MGC, this property setting is used to inform VSPT of which type of cards are in use on the AS5x00 device.

```
<VSPT_INSTALL_DIR>/classes/com/cisco/transpath/dart/editor
```



Note

To obtain the VSPT_INSTALL_DIR enter the following command:
pkgparam _DART_PKG_NAME_ BASEDIR

Determining a Set of Incremental Commands to be Deployed

When determining a set of incremental commands to be deployed, VSPT makes a best-attempt at the incremental commands. However, some operations are not supported by the MGC. In those instance, it is recommended that you visually inspect the commands to be deployed and modify them accordingly. Also, you have the ability to cancel the deployment and redeploy as a New config.

Performing an Incremental Deployment

When performing an incremental deployment, the user can specify the based on config as [LAST UPDATE]. This computes a set of incremental commands against the last config that was imported.

This is a useful mechanism when you want to import from an MGC, make a series of modifications, and then redeploy the changes only. To accomplish this, use [LAST UPDATE] as the config to compare against.

Customizable Properties

VSPT has startup properties that can be modified to customize the behavior of the application. The property file is named configEditor.properties, and is located in the //classes/com/cisco/transpath/dart/editor directory.

The following items should be noted:

- Minimum required MGC version for operation: MinMgcVersion.elan=7.4(10)
- When VSPT attempts to deploy to the MGC, it tries to obtain a provisioning session. If the provisioning session is in use, VSPT deployment waits, then retries to deploy to the MGC. The following values indicate the number of retry attempts, and wait time in seconds.

```
Deploy.Retry=3  
Deploy.WaitPOM=45
```

- When adding trunks to the configuration, VSPT checks to ensure that appropriate resources are added to the media gateway, (NAS, MGX-8260, VISM card, etc). If the resources do not exist, the trunks are not added. To disable this check, use the property value:

```
MGW_RES_CHECK=false
```

- Default values for graphical screens can be specified using values in the properties file.
- VSPT uses MML commands to activate and synchronize configurations with a standby MGC. During periods of high network usage, the MGC's prov-dply and prov-sync commands can fail with an error stating:

```
mml> prov-dply
MGC-01 - Media Gateway Controller 2001-04-10 18 ;40 ;43
M DENY
SROF
"PROV-DPLY: error transferring data files"
/* Status, Requested Operation Failed on the component */
;
```

If this occurs, retry the operation from VSPT by activating the MGC Viewer located under the Tools menu option.

When the list of configurations is shown, select the name of the configuration that you created. Then select Configuration > Activate to retry activating the configuration. You can also perform a Configuration > Synchronize to request that the MGC synchronize its configuration with its standby MGC.

DialPlan Configuration Creation and Maintenance

To make the creation and maintenance of configurations easier, VSPT allows you to enter range input for A/B digtree tables.

The implementation of this feature in VSPT is structured to accommodate overdecadic numbering as well as ordinary numbering. If you wish to enter multiple ranges, you can use commas to separate entries.

Some examples of range input for A/B digtree tables follow:

To create digitstring entries from 300 to 399, you can enter:

```
3[0-9][0-9]
```

If you input:

```
1234ff,234[0-8],89[0-7]5[6-f]
```

VSPT generates digitstring entries for the numbers:

```
1234ff
```

```
2340, 2341, ..., 2348
```

```
89056, 89057, ..., 8905f, 89156, 89157 ... 8975f
```



Note

and * are not considered part of a range; if either is specified in a range input, for example, [*-9], an error is returned.

Screening File Creation

You can create screening files within VSPT. To create a screening file, do the following:

-
- Step 1** From the main window, click **Number Analysis**.
 - Step 2** Add a dialplan and expand it.
 - Step 3** Click the **Screening tree** node.
 - Step 4** On the right hand side of the window, choose a screening file type.
 - Step 5** In the File name text field, enter a new file name.
 - Step 6** Click **Add**.
A new tree node is created under Screening node.
 - Step 7** Click the **new tree** node.
On the right hand side of the window, the Edit File button is enabled.
 - Step 8** Click the **Edit File** button to open the Screen file editor window where you can add entries to the new file. Range input is also supported to allow you to input multiple numbers at one time.
-

Dial Plan Changes

To ease the provisioning and incremental changes for screening numbers, a new Screening Editor tool is added to this version. You launch it from the menu bar Tool > Screening Editor. This tool allows you to:

- Add, modify, and delete A/B/White/Black screening numbers using the GUI. For example, to remove screening numbers from the VSC, do the following:

-
- Step 1** Launch the Screening Editor tool (Tool > Screening Editor).
 - Step 2** At the VSC, click **Command** > Rtrv #s.
The screening numbers are retrieved from the VSC.
 - Step 3** Highlight the number(s) that you want to remove.
 - Step 4** Click **Edit** > Set selected #s to Delete.
 - Step 5** Click **Command** > Send selected.
-

- Import screening numbers from the VSC for an active configuration. You can save the screening numbers to files, and read them back in using the menu items in the File menu. All or a subset of the screening numbers created in the GUI can be deployed to the VSC. Using the VSPT main window, you specify which VSC is used to provision screening numbers.

Multiuser Provisioning

The VSC allows only one provisioning session at a time. VSPT accomplishes multiuser provisioning by placing a provisioning attempt (initiated with the Tools > Deploy menu option) on hold if a provisioning session is already in progress.

After a 45 second timeout, VSPT retries the operation up to three times. Timeout and retry values are specified in the configEditor.properties file located in the directory:

```
/<install-dir>/classes/com/cisco/transpath/dart/editor.
```

To change these settings, modify the following lines:

```
Deploy.Retry=3  
Deploy.WaitPOM=45
```

Disabling the Resource Check

When you add trunks to a configuration, VSPT checks to ensure that appropriate resources have been added to the media gateway (NAS, MGX-8260, VISM card, etc). If the resources do not exist, VSPT does not allow the trunks to be added.

You may want to disable this feature if you are making frequent changes to trunk information and do not want to take the time to first specify each change on the media gateway. You may also want to disable it if you are frequently importing configurations from the VSC. The VSC does not retain complete information about media gateway resources, and so a resource check will result in the operation failing.

To disable the resource check, modify the MGW_RES_CHECK flag in the configEditor.properties file located in the directory:

```
/<install-dir>/classes/com/cisco/transpath/dart/editor
```

as follows:

```
MGW_RES_CHECK=false
```

To resume resource checking, reset the flag to true.

Multiple Trunk Group Format Support

VSPT supports multiple trunk group formats. It can parse 57, 60, and 62 column trunk group files; the default for this feature is 62-columns.

As a feature of provisioning, VSPT produces a flat file that contains trunk group information. The format of the flat file has been modified to allow for support of different trunk group properties. Depending on the software release in use, you may need to indicate which format of the trunk group file should be generated.

To change the trunk group format, modify the tgTemplate property in the following directory:

```
<VSPT_INSTALL_DIR>/classes/com/cisco/transpath/dart/editor/configEditor.properties
```

The value specified in `tgTemplate` identifies the name of the template file that specifies the trunk group properties and their associations.

Table 5 *tgTemplate Values*

For a trunk group file with:	tgTemplate should be:
57 column format	901057
60 column format	902060
62 column format	903062



Note

To determine which template is in use in a generated trunk group file, use the `prov-exp MML` command to export a configuration and examine its format.

GUI Interface for Backup and Restore

VSPT provides a graphic user interface (GUI) for the following devices:

- MGC host (active configuration)
- BAMS Phase 2 (active configuration)
- BAMS Phase 3 (active configuration)
- SLT2600 (running configuration and image on flash)
- CAT5500 (configuration and image on flash)
- CAT2900XL (running configuration and image on flash)

You can create, modify, and delete backup and restore schedules on an hourly, daily, weekly, or monthly basis; all the schedules are pushed onto the crontab of the Solaris system. Additionally, you can trigger backup and restore operations on demand.

To launch the backup and restore GUI:

At the VSPT main window, click on **Tools > Backup and Restore**.

- Because all the schedules are pushed onto the crontab, you cannot view or modify schedules created by a user with a different login. VSPT only allows one dedicated UNIX login to launch the Backup and Restore GUI. You are prompted for this login at installation. You can modify the dedicated UNIX login in `configEditor.properties` file under:

```
Backup.unixID=
```

- Login, password, and enable password of all devices are encrypted in the crontab file.
- To provide status of each backup and restore operation, VSPT generates status logs for you to review. If an operation is triggered on demand, status is shown after the operation. If an operation is triggered by cron, status is appended to the log file associated to the schedule ID. You can view the log file by highlighting a schedule entry in the add/view schedule table, and clicking the show status button.
- You can also acknowledge the log file to save disk space. Status file consists of operation time, successful/fail(with failure reason), file name on TFTP server(if backup), directory of config files (if restore for MGC and BAMS), image file name(if restore image for SLT, Cat5500, or Cat2900XL). For verbose log, the status log contains step-by-step commands issued by VSPT and system feedback from the device.

To reduce errors when entering information in the <filename> text field, the add/modify schedule GUI has *select/view files on TFTP* and *select/view images on flash* buttons. You can use these buttons or type in a filename.

New Features and Enhancements

Redirecting Number and Original Called Number

VSPT support to provision redirecting number and original called number on the MGC. To provide this minimal support, an addition of a switch or flag added to the software allows the passing of the Original Called Number (OCN) or the Redirecting Number to the Redirecting Number field in the NI2+ protocol. The following outlines the logic for passing the appropriate field to the Redirecting Number in the NI2+ field:

If flag is true:

Table 6 *Redirecting Number and Original Called Number Mappings for Flag is True*

Fields Present in Incoming Message	
OCN & Redirecting	Map OCN to Redirecting Number
OCN only	Map OCN to Redirecting Number
Redirecting only	Map Redirecting to Redirecting Number

If flag is false:

Table 7 *Redirecting Number and Original Called Number Mappings for Flag is False*

Fields Present in Incoming Message	
OCN & Redirecting	Map Redirecting to Redirecting Number
OCN only	Map OCN to Redirecting Number
Redirecting only	Map Redirecting to Redirecting Number

Adding and Removing A Numbers from Screening Database Without Opening a Provisioning Session

This tool, launched by selecting the Screening Editor from the Tool menu, allows you to Add/Modify/Delete A/B/White/Black screening numbers through the GUI. You can save the created numbers to files and read them back in by clicking the menu items in the File menu. All or a subset of screening numbers can be deployed to VSC without occupying a provisioning session, for example, you do not need to do a Prov-sta::srever or prov-stp. The VSC to which you are provisioning screening numbers is the one you specified in the VSPT main window. This tool also allows you to import screening numbers from the VSC.

Result Types Enhancements

This enhancement involves opening up result types which were allowed only under A or B analysis, to both A and B analysis areas.

Modification of digits and number A results for A and B number analysis should be a possible result type during analysis of the opposite number. Preanalysis also was enhanced. This allows the user to apply certain result types for A and B numbers, during analysis of the opposite number, depending on certain conditions.

Provisioning and Operating Capability to return to Number Analysis from Cause Analysis.

This enhancement enables allows you to modify the B-number from cause analysis, and then enter number analysis with the modified B-number.

Call Cut-off Timer

This enhancement starts a global timer, after answer for every call, and runs for a pre-configured time. When the timer expires for a call, the call is released in both directions. The timer can be set on a system wide basis, or can be set using a result type with a timer value, in number analysis. The timer can be configured for a minimum of 1 hour and maximum of 48 hours. This feature is common in TDM switches to remove fraud due to long calls, which exceed credit rating, for example, with prepaid services.

Support for Redundant IP Connectivity Between the MGC and MGs With a Single IP Address

To support IP routing enhancement, two parameters, next hop address and subnet mask address, were added to the C7IPLNKs, IPLNKs, IPSESSIONs, and SS7SGIPLNKs objects.

- Next hop address—IP address or hostname of the next hop (router)
- Subnet mask—Network mask, in IP address format, used to derive the subnet address of the remote host.

To support redundancy for MG with one IP address, such as the VISM, the ability to configure multiple routes to the same destination has been added. VSPT now supports this feature on the MGC.

Additional Option for ITU CIC Selection Method for European Interconnect Compliance

This feature is used in some European countries where ITU-T Method 2 is employed on the interconnect. Specifically this is required in Denmark for interconnect with Most Idle/Least Idle selection on two separate groups (even and odd CICs). VSPT now supports this feature on the MGC. This feature is not supported on the MGC in 9.1(5).

Multiple Dial Plans Support

This feature allows the MGC (in both VSC & SC2200 configurations) to support multiple dialplans. More specifically, this means supporting the ability to be able to move from one dial plan to another. VSPT does support import and export of the VSC supporting this feature, however, VSPT will not fully support this until 2.1(2).

Advice of Charge

This requirement describes the Advice of charge capabilities required for deployment of the VSC or signalling controller into the German marketplace. The German specifications are derived from ETSI standard (reference [4]) and on this basis, the functionality introduced is expected to meet other European marketplace requirements for this service.

The requirement can be separated into the following two parts:

- The transit of advice of charging information through the VSC where ingress and egress are both ISUP variants that support the APM message (which is used to convey AOC information).
- The VSC acts as a charge determination point, calculating the tariff required and invoking AOC by the construction and transmission of APM messages back to the ingress switch and the treatment of the associated responses.

Troubleshooting

- The X-Windows DISPLAY environment variable must be set in order for you to install the Cisco VSPT:

During installation, the X-Windows DISPLAY environment variable must be set properly. If this variable is not set properly, the installation program exits with a Java error message or simply appears to stop responding. Use the following examples to set your X-Windows DISPLAY environment variable. Replace the value <hostname> with your machine's hostname:

In csh or tcsh:

```
setenv DISPLAY <hostname>:0
```

In sh or ksh:

```
DISPLAY=<hostname>:0 ; export $DISPLAY
```

- If you experience problems or errors deploying to or communicating with a remote machine, check the following points:
 - Ensure that the machine is alive and responding to the **ping** command.
 - Ensure that correct login/passwords have been specified.
- If you experience errors when deploying to the PGW 2200, check the following:
 - The PGW 2200 supports only one provisioning session at a time. When deploying to the PGW 2200, ensure that no other provisioning sessions are active.
 - When activating a configuration on the PGW 2200, the PGW 2200 might require that some signaling components are taken out of service before the configuration is activated. If you do not take the component out of service, you receive an MML error message. You can take the component out of service from MML manually, and after that you can activate the configuration.

- Enter the following command to determine where Cisco VSPT is installed:

```
/usr/bin/pkgparam _DART_PKG_NAME_ BASEDIR
```
- CSCOVsp stores configuration files in the `/var/<install directory>/data` directory. Each `_DART_PKG_NAME_` configuration is stored in a separate directory; the directory name is the same as the configuration name.

In the examples below, the assumption is that CSCOVsp16 was installed in the directory `/opt/CSCOVsp16`, thus = `/opt/CSCOVsp16`

- To rename a configuration, simply rename the directory under `/var/opt/_DART_PKG_NAME_/data`
- To remove a configuration, remove the directory under `/var/opt/_DART_PKG_NAME_/data`
- To determine where the data directory is located, search for `DartStoreDir` in the `configEditor.properties` file:

```
/usr/bin/grep DartStoreDir  
/opt/_DART_PKG_NAME_/classes/com/cisco/transpath/dart/editor/configEditor.properties
```

**Note**

As a safety precaution, the deinstallation procedure does not remove configuration data. The data must be removed manually.

Obtaining Documentation

The following sections explain how to obtain documentation from Cisco Systems.

World Wide Web

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

<http://www.cisco.com>

Translated documentation is available at the following URL:

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

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Ordering Documentation

Cisco documentation is available in the following ways:

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- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

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Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

The Cisco TAC Web Site allows you to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to the following URL:

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

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to the following URL to register:

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

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered user, you can open a case online by using the TAC Case Open tool at the following URL:

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

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; these classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following URL:

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

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled; for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). In addition, please have available your service agreement number and your product serial number.

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