



Release Notes for Cisco 12000 Manager (Release 2.2)

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Introduction

Cisco 12000 Manager (C12kM) is an Element Manager (EM) that works in conjunction with the Cisco Element Management Framework (Cisco EMF) to enable service providers to plan, provision, configure, and monitor network services on Cisco 12000 series Internet routers. C12kM is designed to meet the operator business requirements for the control and operation of the Cisco 12000 series Internet routers. C12kM eases and accelerates device deployment and enables efficient operation of Cisco 12000 series Internet router network environments; for example, by supporting template-based QoS interface configuration and complex fault isolation applications for efficient maintenance of Cisco 12000 series Internet router based services.



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C12kM Features

C12kM features include the following:

- AutoDiscovery—Automatically discovers existing Cisco 12000 series Internet routers and uses Sub-chassis discovery to determine the physical chassis contents, such as line cards and interfaces
- C12kM deployment—Eases deployment of large networks by enabling template-based network element configuration
- Interface profiles—Enables you to apply the same parameters to a large number of objects at one time
- Layer 3 QoS support—Includes Committed Access Rate (CAR), Weighted Random Early Detection (WRED), and Modified Deficit Round Robin (MDRR)
- Configuration Backup/Restore—Backs up and saves the running configuration of a device and its modules so that if a hardware failure occurs, you can restore configuration
- Configuration Editor—Uploads and saves the running configuration on a device for editing
- Configuration operations—Performs in bulk to numerous Cisco 12000 series Internet routers
- C12kM windows and wizards—Eliminate the need for operators to have detailed Cisco IOS and SNMP-based knowledge for individual interface or system parameter commands
- Comprehensive fault management system—Manages chassis, line card, and interface levels.
 - Inventory and Capacity Planning—Provides details of the Cisco 12000 series Internet routers in the network and performance statistics for planning and diagnostics
- Line cards and interfaces— Supports various line cards and interfaces, such as packet-over-SONET (POS), Asynchronous Transfer Mode (ATM), Digital Signal 3 (DS3), Dynamic Packet Transport (DPT), Spatial Reuse Protocol (SRP) and Gigabit and Fast Ethernet
- Cisco IOS releases—Easily downloads new software releases from C12kM onto devices
- PVCs and associated QoS profiles—Uploads existing PVCs and associated QoS profiles from any device into C12kM
- VLAN Support—Includes VLAN deployment, synchronization and configuration

C12kM delivers these management functions within Cisco EMF. Cisco EMF provides consistency across a common user interface, operational event management, auto map building, and common data management for various Cisco element managers. Cisco EMF also provides a robust foundation and toolkit for building scalable CORBA-based provisioning integration modules for customer's specific Operational Support System (OSS) environments.

C12kM and Cisco EMF are part of the Cisco Service Management (CSM) suite, a strategic component of Cisco's products and solutions for New World Operations.



Note

C12kM release 2.2 has not been validated to co-exist with any other Cisco EMF EM. A programme of inter-operability testing is in progress and customers should contact Cisco to determine if they can load C12kM with another EM on the same Cisco EMF system.

New Features in C12kM Release 2.2

Release 2.2 of C12kM adds the following functionality to release 2.1.1:

- The additional linecards supported in C12kM Release 2.2 are:
 - Support for 1 Port OC12 SRP Line card
 - Support for 1 Port OC48 SRP Line card
 - Support for 6/12 Port E3 card
 - Support for OC48 ISE (engine (3)) POS card
 - Support for NGRP Line card
- RPR Plus Support for chassis management
- Support for WRED ToFab policy
- ATM Connection Synchronization
- Support for VLAN (Deployment, Configuration and Synchronization)
- Support for SRP Interface Management

New Traps in C12kM Release 2.2

The traps that are additionally supported in C12kM Release 2.2 are:

- SRP RingWrapped
- SRP Ring Restored
- RPR+ Cold Start
- Authentication Failure
- BGP Established
- BGP Connection Broken
- RSVP New Flow
- RSVP Lost Flow
- PVC Failure Trap, and
- Flash Change Trap

System Requirements

Table 1 details the system requirements for C12kM release 2.2.

Table 1 System Requirements for C12kM Release 2.2

Server System Requirements	<p>C12kM can be deployed in a number of different configurations, from a single hardware system to a multi-site distributed management system.</p> <p>Use Sun Ultra 60 or enterprise-class server such as Sun Enterprise 450, configured as follows:</p> <ul style="list-style-type: none"> • 17-inch color monitor • 6 x 9 GB 10,000-rpm disks on 3 Ultra SCSI controllers • 4 GB memory • 2 GB swap • 24-bit Sun graphics card • Miscellaneous Resources: CD-ROM drive, DAT tape backup
Client System Requirements (Optional)	<p>Use Sun Ultra 60, configured as follows:</p> <ul style="list-style-type: none"> • 17-inch color monitor • 2 x 9 GB internal disks • 1 x 9 GB 10,000-rpm external disk • 256 MB memory (minimum) • 2 x 360 MHz processors • 2 GB swap • Operating Environment - Common Desktop Environment (CDE)



Note

In lab trials, it is possible to run Cisco EMF v3.2 and C12kM release 2.2 on the Sun Ultra 60 workstation, with the reduced specifications for RAM memory. Note, however, that the applications may appear slow.

Please contact Cisco for advice and constancy on planning large scale deployments (>50 Cisco 12000 series Internet routers).



Caution

It is particularly important that any Sun workstation running Cisco EMF release 3.2 EMs, such as C12kM, has sufficient swap space (2GB) and RAM (512 MB Minimum). Do not install this software on machines without this minimum specification.



Note

Use the Solaris commands `swap -s` and `prtconf` to determine the available amount of swap and RAM (respectively) on your machine.

Software Compatibility

This software release has been tested on release 2.6 of the Solaris operating environment, for Sun SPARC workstations, and for Year 2000 Compliance.

[Table 2](#) details software compatibility for C12kM release 2.11.

Table 2 *Software Compatibility for C12kM Release 2.2*

Compatibility	
	<ul style="list-style-type: none"><li data-bbox="553 493 1513 556">• Cisco EMF 3.2, CEMF_3.2_PATCH_170001-19, CEMF_3.2_PATCH_190101-10 and CEMF_3.2_PATCH_190105-09<li data-bbox="553 567 1513 630">• Supports Cisco 12000 series Internet routers with Cisco IOS releases: 12.0(19)S, 12.0(19)ST1, 12.0(21)S1, 12.0(21)S2 and 12.0(21)ST1<li data-bbox="553 640 1513 703">• Cisco 12000 Manager runs on Sun® hardware running Solaris operating environment 2.6

Table 2 Software Compatibility for C12kM Release 2.2

Chassis Support	<ul style="list-style-type: none"> • Cisco 12416, Cisco 12410, Cisco 12406, Cisco 12404, Cisco 12016, Cisco 12012 and Cisco 12008
Line Card Support	<p>Backbone Line Cards:</p> <ul style="list-style-type: none"> • OC3 (STM1)—4 Port POS • OC12 (STM4)—1 Port POS • OC12 (STM4)—4 Port POS • OC48 (STM16)—1 Port POS • OC192 (STM64)—1 Port POS • OC48 (STM16)— 4 Port POS • OC3 (STM1)—16 Port POS (ISE) • OC12 (STM4)—4 Port POS (ISE) • OC48 ISE (engine (3)) POS card <p>Ethernet Line Cards:</p> <ul style="list-style-type: none"> • Fast Ethernet—8 Port • Gigabit Ethernet—1 Port • Gigabit Ethernet—3 Port • Gigabit Ethernet—10 Port <p>Edge Line Cards:</p> <ul style="list-style-type: none"> • DS3—6 and 12 Port • E3—6 and 12 Port • OC3 (STM1)—8 Port POS • OC3 (STM1)—16 Port POS <p>SRP Line Cards:</p> <ul style="list-style-type: none"> • OC12—1 Port • OC48—1 Port <p>ATM Line Cards:</p> <ul style="list-style-type: none"> • OC3 (STM1)—4 Port ATM • OC12 (STM4)—1 Port ATM • OC12 (STM4)—4 Port ATM <p>NGRP Line Card</p>

Determining the Software Version

To determine installed Cisco EMF packages, and version numbers, use the Cisco EMF command:

```
<CEMFROOT>/bin/cemf install -show
```



Note

<CEMFROOT> is the convention adopted in Cisco EMF documentation to indicate the installation directory for Cisco EMF and the C12kM software. This default location is: `/opt/cemf`

Version Supported

For this C12kM release, the following components must be installed:

- Cisco EMF v3.2
- CEMF_3.2_PATCH_170001-19
(On CCO, the filename corresponding to this patch is CEMF3.2P1.tar.Z)
- CEMF_3.2_PATCH_190101-10
(On CCO, the filename corresponding to this patch is CEMF3.2P1.1.tar.Z)
- CEMF_3.2_PATCH_190105-09
(On CCO, the filename corresponding to this patch is CEMF3.2P1.5.tar.Z)



Note

Cisco EMF v3.2 installation instructions can be found in the Installation and Administration Guide at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/cemf/3_2/install/index.htm

Cisco EMF patches are available for download at the following URL:

<http://www.cisco.com/cgi-bin/tablebuild.pl/cemf-sp32>

Known Limitations in this Release

The following Cisco 12000 series Internet router modules are **not** supported by this release:

- TAZ Card
- Tango Cards
- Channelized line cards

Important Notes: Adding Additional Swap Space

C12kM release 2.2 running on Cisco EMF v3.2 requires 2GB of swap space. In general, if your machine requires additional swap space, you are advised to re-partition one of the disks to allocate a new swap partition.

Use the Solaris command format (1M) and in particular, the partition option of this command to partition appropriate swap space.



Note

Please consult a Solaris system administrator if you must re-partition an existing disk in order to increase swap space, as re-partitioning a disk means that you will lose all data on that disk.

A simple, but less efficient (in performance terms) method of increasing swap space is to create a file and add it to your available swap. The following example shows how to add 1GB swap to your Sun workstation (assuming sufficient available free disk space):

```
mkfile 1000m /opt/MY_EXTRA_SWAP_FILE
```

```
swap -a /opt/MY_EXTRA_SWAP_FILE
```

To ensure that this file is added to your swap after a system reboot, please remember to add it to the `/etc/vfstab` file on your machine. If in doubt, please consult a Solaris system administrator.



Note

This is not a particularly efficient swap file system, and will result in slower application performance.

Caveats

This section describes known issues with C12kM Release 2.2.

C12kM Issues

This section describes the known C12kM issues.

CSCat20411

Problem: There must be a provision to determine the alarms that have been raised from within EM as opposed to which have been raised from receiving traps. Currently, the domain is always being shown as internal.

Workaround: none

CSCdx53849

Problem: If an attempt is made to delete any existing Cos Queue Group or ToFab Policy from a decommissioned interface or module through Map Viewer, then the usage count is decremented even though Cancel operation is selected in the deletion dialog. On recommissioning and applying a different CosQ Group or ToFab Policy, there are more than 1 object under the interface or module.

Workaround: Cancel should not be used while deleting CosQ groups/ToFab policies.

CSCdx63758

Problem: If an attempt is made to associate a new ToFab policy that already exists on the device, then instead of overwriting the existing entries, it just appends to the existing list of destination-slot entries.

Workaround: Manually delete the slot-table entries and associate through the EM.

CSCdu18374

Problem 1: Download fails when the vi editor (popped up during upload) is not quit after saving the changes and before doing Download.

Problem 2: The modified config file gets copied to the running config but not to the start up config even after a successful download. So the startup config is not updated for these changes.

Workaround: Force the writeMem operation on the selected chassis from the chassis configuration dialog.

CSCdt70964

Problem: If the tftp directory is full, then the Configuration Editor's Upload action will not work and does not give any Error messages.

Workaround: Ensure that the tftp directory has got enough space to save the Running-Configuration file of the Cisco 12000 series Internet router by deleting any unwanted files.

CSCdx37917

Problem: As the GRP module is modelled as a Generic module, the interface services and the logical services are not available under the C12kM Management menu.

Workaround: Launch the interface and logical services from the chassis or the shelf level.

CSCdw91837

Problem: A Critical alarm with description "Module commissioning failed" is raised against the ToFab instance available under a module after performing an Online Insertion and Removal (OIR) sequence of the particular module.

Workaround: Launch the Event Browser against the ToFab instance and manually clear the Critical Alarm.

CSCdx68771

Problem: When an Online Insertion and Removal (OIR) is performed on the Primary RP of a dual-RP GSR Chassis, then there is a slight possibility that the Chassis might get stuck in the "discovery" state.

Workaround: none

CSCdw93008

Problem: When a decommissioned chassis object is deleted from the Map Viewer application, the corresponding shelf object is not deleted.

Workaround: After deleting a chassis object, the corresponding shelf object needs to be manually removed.

CSCat20605

Problem: The Deployment wizard allows selection of SNMPV3 as an option for SNMP support.

Workaround: Select only SNMPV2c, from the deployment wizard.

Upgrade Issues

This section describes the issues with Upgrading C12kM software.

CSCdx56524

Problem: The IP Manager process exits when applying an unsupported CAR policy to an Engine-2 linecard.

Workaround: Only supported CAR policies should be applied to a linecard.

CSCdx61385

Problem: The usage count of Applied CAR Policies gets decremented by 2 instead of 1 while deleting some CAR policies. This behavior is observed when existing CAR policies that were present before the upgrade are removed from the interfaces. The usage count gets decremented correctly while removing newly applied CAR policies after upgrade.

Workaround: None

CSCdx65070

Problem: Validations are not performed, for the login and exec password fields in the Chassis Management Information dialog, for an upgraded machine, when the passwords are saved using the Save button. Different values for the login and confirm login passwords are accepted. Same is the case with the exec password field.

Workaround: Fill in the confirm login and confirm exec password fields. Instead of using save icon on the dialog use the Save Locally button. This does the password validation if the login and confirm login passwords are different and gives an error message.

CSCdx60203

Problem: In an upgraded machine, when a chassis is commissioned, the SRP module gets discovered as a Generic module with no SRP interfaces and side interfaces.

Workaround: After commissioning the chassis, decommission the SRP module and commission it once again. Now, the SRP interfaces and side interfaces are discovered for the SRP module.

Chassis Manager

This section describes the known Chassis Manager issues.

CSCat21053

Problem: Unable to select Multiple chassis objects from the Chassis Management Information window for performing bulk operations.

Workaround: none

CSCdt70955

Problem: The Backup operation is successful even while the tftp directory is full. The Backup file is created with 0 bytes.

Workaround: Verify that enough memory space is available under tftp directory before initiating a Backup operation.

CSCat21054

Problem: Unable to select multiple chassis objects from the object selector list from the Chassis Backup Restore window to perform bulk operation.

Workaround: none

CSCat21055

Problem: Unable to select multiple chassis objects from the object selector box in the SNMP Management window.

Workaround: none

CSCdu39404

Problem: The web console does not open, while launching the web console application from the Client system.

Workaround: none

CSCdx55174

Problem: If two chassis are selected and the writemem action operation is initiated, the action is successful in only one of the chassis. But the action report indicates that the write mem operation is successful for both the chassis.

Work Around: Initiate the writemem operation on a single chassis.

CSCdu36232

Problem: The chassis object does not move to the performance polling state from the download state after a successful IOS image download. Instead, the chassis returns to the normal state whereas the modules and interfaces under the chassis are moved to the performance polling state.

Workaround: Restart the Performance Polling for the chassis.

CSCat21374

Problem: The commissioning and configuration of the chassis and its components does not work properly, if SNMPV1 is used with the version of C12kM.

Workaround: Use only SNMPV2c version

Generic Module

This section describes the known generic module issues.

CSCdw72708

Problem: If show connection action is selected for an ATM interface that does not have any ATM connections in the router, from the ATM interface status dialog, CiscoModuleCon exits.

Workaround: The Show Connections action should not be selected in the above scenario.

Generic Interface

This section describes the known generic interface issues.

CSCdv14860

Problem: When the Shutdown command is issued for an interface in the Cisco 12000 series Internet router that is carrying out Performance polling in the EM, then the state of the object will be moved to Error. When issuing No Shutdown the state of the object will not be moved to performance polling state immediately even when the traps are configured.

Workaround: The interface object state will be changed to Performance Polling after the Status polling for the interface is done by the EM.

CSCdx33124

Problem: When a 16-port ISE OC-3 POS module is commissioned through the discovery process, an additional interface of format "Generic <SlotNumber-PortNumber> " is being identified. As a result, there are 17 interfaces under the module instead of 16 interfaces.

Workaround: Decommission the interface of format "Generic <SlotNumber-PortNumber> " and then delete it.

ATM Connection Manager

This section describes known ATM connection manager issues.

CSCdw94362

Problem: After having successfully uploaded the ATM connections, if any of the uploaded PVCs are decommissioned and the VPI/VCI value is modified, then performing an upload again does not create a new PVC object but the upload summary displays that the object has been submitted for creation. Also, further ATM connections are not uploaded on the device.

Workaround: Do not change the VPI/VCI values for any uploaded connections after decommissioning the same. If it is done, delete the connection objects from the EM.

CSCdx53825

Problem: C12kM allows the user to create duplicate PVCs and SVCs. The duplicate objects also get moved to the normal state during a connect action, though in the router, only one connection is available.

Workaround: Avoid creating duplicate PVCs and SVCs under the same interface or sub-interface.

CSCuk26784

Problem: Bulk deployment of PVC will fail due to naming conventions followed, if carried out more than once under the same interface.

Workaround: Change the default PVC name for each bulk deployment by either changing the prefix or by making sure that the increment number is greater than all other PVCs that have been bulk deployed previously.

CSCds28762

Problem: In PVC Status Dialog, only Last Change and Operational State attributes populate values and the rest of the fields do not display any information.

Workaround: none

IP

This section describes known IP issues.

CSCdw36447

Problem: Instances of CAR Policies under interfaces can be deleted after re-commissioning (i.e. Decommission and Commission again) the corresponding Module. This causes problems in the usage count of corresponding Access Lists and CAR Policies. Even though the CAR Policy is deleted, the corresponding usage counts are not decremented.

Workaround: Do not delete CAR Policies which are present under interfaces whose modules have been re-commissioned.

CSCdx20886

Problem: In the IP Configuration Dialog, when only the IP Address field or the Subnet Mask fields are modified and saved, the changes are not updated in the router correctly.

Workaround: Modify both the IP address and Subnet Mask fields and save the configuration.

CSCdv55016

Problem: Engine 4 linecard (10 Port GigabitEthernet and 1 Port OC-192 Linecard) has got limitations on CAR Policy configurations.

Workaround: Since the 10 Port GigabitEthernet and 1 Port OC-192 linecard supports only the following options to configure a CAR Policy, the user needs to ensure that none other than the following options have been configured in the Selected CAR Policy before applying to a 10 Port GigabitEthernet or 1 Port OC-192 interface.

The options supported are:

1. Traffic Direction restricted to Input Only.
2. ACL can be only IP-Precedence (ACL Index can have only 1-99).
3. Rate limited ACLs can be only IP-Precedence (ACL Index can have only 1-99).
4. Confirm-Action can be: Drop, Transmit or Set Prec. to X transmit only.
5. Exceed-Action can be: Drop, Transmit or Set Prec. to Y transmit only.

CSCuk31598

Problem: The field "Interface State" in the IP Configuration Dialog does not populate correctly according to the selected interface's administrative status, but the same field can be configured successfully.

Workaround: Use the generic interface status dialog to view the administrative status for the selected interface.

CSCuk22774

Problem: The CAR policy status dialog is not updated dynamically.

Workaround: Select a different interface and re-select the original interface to get the "Current CAR Policies" field updated correctly.

Cisco IOS

CSCdt50500

Problem: CosQ group gets applied to all the interfaces of the ATM module even though it has been applied to the first interface.

Workaround: none.

DS3

This section describes known DS3 issues.

CSCdu39489

Problem: In the E3 Performance tab of the performance window of the DS3 card, the interval E3 Status attributes do not get populated.

Workaround: none.

ATM

This section describes known ATM issues.

CSCdu39492

Problem: In the ATM Interface Status window, the attribute “physical port” always populates as “oc3multimode fiber”. This might not always be correct.

Workaround: none

CSCdx17448

Problem: When a profile is applied to an interface in the ATM Interface Configuration Dialog, the values are applied to the interface, however the dialog is not refreshed with the new values.

Workaround: Pressing refresh button after applying any profile updates the dialog with correct values. Wait for next update cycle to refresh values from device.

CSCdx17400

Problem: When multiple ATM Dialogs are launched with ATM interfaces selected in each dialog, all the dialogs may not get populated with values.

Workaround: Launch each ATM Dialog separately and close any existing ATM Dialogs before launching any new ATM dialogs.

Ethernet/HSRP

This section describes the known Ethernet/HSRP issues.

CSCuk33279

Problem: HSRP functionality does not configure the group number and so the configuration overwrites the previous HSRP config at the global interface level in the IOS.

Workaround: none

CSCdx35448

Problem: Applying HSRP profile does not refresh the HSRP timers in the HSRP config tab.

Workaround: After manual refresh, the HSRP config tab will be refreshed correctly.

CSCdx52685

Problem: HSRP Group Number is not populated in the HSRP config tab if it is configured via the IOS CLI.

Workaround: The HSRP parameters will be populated correctly, if configured from the configuration dialog.

IOSDRep

This section describes known IOSDRep issues.

CSCdx20895

Problem: In any Interface configuration dialog that uses IOSDRep for configuring the values, if one of the values cannot be set on the device while modifying a set of attributes, then an incorrect failure information is displayed that indicates the failure for all the fields. Also, the running configuration is not copied to the startup configuration.

Workaround: After the failure message, click on button "writeMem" in the Chassis Configuration Dialog for the particular Chassis to copy running configuration to startup configuration.

CSCdx47590

Problem: In a chassis with RPR+ mode (where you can have only one "conf t" session at a time i.e. simultaneous configuration in the device is not allowed), if the "conf t" mode is locked and the user tries to save any of the IOS attributes through the EM Dialog, then the get/set does not function in any of the EM Dialogs.

Workaround: Exit the "conf t" mode so that the "get" works fine.

POS

This section describes known POS issues.

CSCdu75763

Problem: When the APS Status dialog is launched against a chassis having more than eight APS configurations, the details are not shown correctly in the APS Status dialog.

Workaround: Use **sh aps** command in the IOS CLI for viewing the APS circuits.

CSCdw90475

Problem: The initial display of Revert Mode field is incorrect when Protect radio button is selected in the APS Configuration Dialog. The field Revert Mode is populated as "NotApplicable" where as valid values are "Revertive" or "Non-Revertive".

Workaround: Modify the Revert Mode to correct value after selecting Protect radio button.

CSCdx47600

Problem: POS SPE Scrambling field is not refreshed in the POS config dialog while applying a POS profile.

Workaround: Perform a manual Refresh to get all the attributes populated correctly.

VLAN

This section describes the known VLAN issues.

CSCdw70027

Problem: C12kM allows the users to deploy more than one sub-interface with the same vlan id under a main interface.

Workaround: Use unique vlan ids for sub-interfaces deployed under a main interface.

CSCdw75175

Problem: If the VLAN Performance dialog is launched against a chassis having more than 50 VLANs, the dialog displays junk characters.

Workaround: None

CSCdw83600

Problem: If you select a large number of sub-interfaces for deletion (for e.g. 100), it takes a long time for the action report to come back.

Workaround: Delete sub-interfaces in smaller chunks.

Cisco EMF

This section describes the known Cisco EMF issues.

In the bottom part of every window there is a status bar that displays full hierarchy of the object that is managed by the form, with the status of every object of the hierarchy: this message is truncated so that only the first part of the hierarchy is fully readable.

CSCdu29988

Problem: MAC address values such as 222.2233.4455 are sometimes converted to junk values, for example, '""3.DU'. This happens when, MAC addresses are represented internally as a six bytes string. The junk values only appear if all six bytes of the MAC address are “displayable”. In this case Cisco EMF sometimes treats the MAC address as a displayable string. Cisco EMF considers the following (hexadecimal) byte values as displayable: 09, 0A, 0B, 0C, 0D. Any value in the range 20-7E. However, if any of your six MAC address bytes is outside this set then this problem does not apply.

Workaround: Avoid creating CAR policy with MAC access list.

Related Documentation

The documentation supporting this release is:

- *Cisco 12000 Manager User Guide (OL-2482-01)*
 - http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/c12km/2_2/user/index.htm
- *Cisco 12000 Manager Installation Guide (OL-2483-01)*
 - http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/c12km/2_2/install/index.htm
- *Cisco Element Management Framework Installation and Administration Guide Release 3.2 (78-12539-01)*
 - http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/cemf/3_2/install/index.htm
- *Cisco Element Management Framework User Guide Release 3.2 (78-12536-01)*
 - http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/cemf/3_2/user/index.htm

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

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http://www.cisco.com/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:
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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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Cisco Systems
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170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

Cisco.com

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- Resolve technical issues with online support

- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

You can self-register on Cisco.com to obtain customized information and service. To access Cisco.com, go to the following URL:

<http://www.cisco.com>

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.

This document is to be used in conjunction with the documents listed in the “[Related Documentation](#)” section.

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