

To monitor your voice network, use the following sections:

- [Periodic Monitoring Tasks](#)
- [Tools for Monitoring the VoIP Network](#)

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## Periodic Monitoring Tasks

Use **show** commands to monitor your network.

The **show** commands are powerful monitoring and troubleshooting tools. You can use the **show** commands to perform a variety of functions:

- Monitor router behavior during initial installation
- Monitor normal network operation
- Isolate problem interfaces, nodes, media, or applications
- Determine when a network is congested
- Determine the status of servers, clients, or other neighbors

The following are some of the most commonly used **show** commands:

- **show version**-Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images.
- **show running-config**-Displays the router configuration currently running.
- **show startup-config**-Displays the router configuration stored in nonvolatile RAM (NVRAM).

- **show interfaces**-Displays statistics for all interfaces configured on the router or access server. The resulting output varies, depending on the network for which an interface has been configured.
- **show controllers**-Displays statistics for interface card controllers.
- **show flash**-Displays the layout and contents of Flash memory.
- **show buffers**-Displays statistics for the buffer pools on the router.
- **show memory summary**-Displays memory pool statistics and summary information about the activities of the system memory allocator, and gives a block-by-block listing of memory use.
- **show process cpu**-Displays information about the active processes on the router.
- **show stacks**-Displays information about the stack utilization of processes and interrupt routines, as well as the reason for the last system reboot.
- **show cdp neighbors**-Provides reachability information for directly connected Cisco devices. This is an extremely useful tool for determining the operational status of the physical and data link layers. Cisco Discovery Protocol (CDP) is a proprietary data link layer protocol.
- **show debugging**-Displays information about the type of debugging that is enabled for your router.

You can always use the ? at the command line for a list of subcommands.

Like the **debug** commands, some of the **show** commands listed previously are accessible only at the router's privileged EXEC mode (enable mode), which is explained in the [Debug Command Output on Cisco IOS Voice Gateways](#) articles.

Hundreds of other **show** commands are available. For details on using and interpreting the output of specific **show** commands, refer to the [Cisco IOS command references](#).

## Tools for Monitoring the VoIP Network

The following tools can be used to monitor VoIP networks:

- [Cisco Voice Manager](#)
- [Quality of Service Device Manager](#)
- [Cisco Service Assurance Agent](#)
- [CiscoWorks Voice Health Monitor](#)
- [Cisco Gateway Management Agent](#)
- [Cisco QoS Policy Manager](#)

### CiscoWorks Voice Manager

CiscoWorks Voice Manager (CVM) is a client-server, web-based voice management solution used by network administrators to configure and manage voice ports and create and modify dial plans on voice-enabled Cisco routers. Using CVM, network administrators can:

- Manage the configuration of FXO, FXS, E&M, and ISDN voice interfaces on voice-enabled routers
- Create and manage local (POTS) dial plans on voice-enabled routers
- Create and manage VoIP, VoFR, and VoATM network dial plans on voice-enabled routers
- Generate detailed reports using Telemate.net Quickview

For more information, see the [CiscoWorks Voice Manager documentation](#).

### Quality of Service Device Manager

Cisco Quality of Service Device Manager (QDM) provides an easy-to-use application for configuring and monitoring advanced IP-based Quality of Service (QoS) functionality within Cisco routers and switches. The

QDM application is stored in Flash memory on the Cisco product and can be run from any workstation with proper support. QDM runs in a web browser as a Java applet. The QDM application uploads when the client web browser makes a connection to the embedded web server of the router or switch.

Once the QDM application is uploaded, the context-sensitive online help embedded within the application is designed to provide technical help associated with a particular QoS-related task. For information on the various QoS functions that can be configured in QDM, consult the online help within the QDM application. The Online Help Table of Contents can always be accessed by clicking the Help button in the upper-right corner of the QDM screen and then clicking Table of Contents. A glossary is also available as part of the online help.

QDM can be downloaded from Cisco.com and is available free of charge.

For more information, see the [Quality of Service Device Manager documentation](#).

### **Cisco Service Assurance Agent**

Cisco Service Assurance Agent (CSAA) is an application-aware synthetic operation agent that monitors network performance by measuring response time, network resource availability, application performance, jitter (interpacket delay variance), connect time, throughput, and packet loss. Performance can be measured between any Cisco device that supports this feature and any remote IP host (server), Cisco routing device, or mainframe host. Performance measurement statistics provided by this feature can be used for troubleshooting, for problem analysis, and for designing network topologies.

CSAA can be especially useful for enterprise and service provider networks, because it provides expanded measurement and management capabilities. In particular, the CSAA is a reliable mechanism for accurately monitoring the metrics in service level agreements (SLAs).

Because CSAA is accessible through Simple Network Management Protocol (SNMP), it can also be used in performance monitoring applications for Network Management Systems (NMSs) such as CiscoWorks2000 (CiscoWorks Blue) and the Internetwork Performance Monitor (IPM). CSAA notifications also can be enabled via Systems Network Architecture (SNA) network management vector transport (NMVT) for applications such as NetView.

SNMP notifications based on the data gathered by the CSAA allow the router to receive alerts when performance drops below a specified level and again when problems are corrected. The CSAA utilizes the Cisco Round Trip Time Monitor (RTTMON) MIB for interaction between external NMS applications and the CSAA running on the Cisco devices. For a complete description of the object variables referenced by the CSAA feature, refer to the text of the CISCO-RTTMON-MIB.my file, available from the Cisco MIB website.

For more information, refer to [Using Cisco Service Assurance Agent and Internetwork Performance Monitor to Manage Quality of Service in Voice over IP Networks](#).

### **CiscoWorks Voice Health Monitor**

CiscoWorks Voice Health Monitor (VHM) helps network administrators and network operators set and maintain the stability of the VoIP network within their enterprise. VHM achieves this goal by using:

- A series of availability and health checks on the VoIP equipment in the network.
- A fault detection and escalation system to notify the users of any faults or exceptions detected.

VHM integrates with network management systems (NMSs) such as HP OpenView Network Node Manager.

With VHM, you can:

- Discover VoIP network devices and applications on a user-entered schedule
- Monitor faults in voice and data networks
- Run synthetic transaction tests, to check Cisco CallManager functions
- Check the availability and health of VoIP equipment and applications
- Obtain the status of each voice device group, such as Voice Cluster, Voice Gateway, Phone Access Switches, and Work Flow Applications
- Discover and manage Ethernet ports that have IP Phones connected to them
- Monitor IP phones in the network

For more information about VHM, refer to the [CiscoWorks Voice Health Monitor documentation](#).

### **Cisco Gateway Management Agent**

The Cisco Gateway Management Agent (CGMA) is the only real-time management Cisco IOS software agent and protocol for VoIP. The CGMA is a new gateway Cisco IOS agent that provides real-time call-state information for all VoIP calls. CGMA supports a push protocol, in which certain call-state changes result in a message being sent out of CGMA by the gateways. The interface from the CGMA is the Real Time Management Protocol (RTMP). RTMP is a lightweight XML-based protocol that uses TCP as the transport protocol. This solution allows service providers to monitor their calls (session initiation protocol (SIP) and H.323 networks) and to view call detail records (CDRs) and trunk utilization in real time. The validated gateways for the CGMA include the Cisco 2600 series, the Cisco 3600 series, and the Cisco Catalyst 5000 series. The Cisco IOS release that has been validated on all gateways is the 12.2(2)Xb mainline release.

### **CiscoWorks QoS Policy Manager**

QoS Policy Manager (QPM) lets you analyze traffic throughput by application or service class, and then leverage that information to configure QoS policies to differentiate traffic and to define the QoS functions to be applied to each type of traffic flow.

By simplifying QoS policy definition and deployment, QPM makes it easier for you to create and manage end-to-end differentiated services in your network, thus making more efficient and economical use of your existing network resources. For example, you can use policies that ensure that your mission-critical applications always get the bandwidth they require.

QPM is suitable for large-scale enterprise deployments and IP telephony deployments, consisting of hundreds or thousands of devices. QPM facilitates management of large networks by providing advanced user authorization capabilities through integration with Cisco Access Control Server (ACS).

You can partition the network into administrative and deployment domains. QPM allows you to organize policies in separate deployment groups, and it supports best practices for phased deployments. Using separate deployment groups, you can also use QPM to test what-if scenarios, and run time-based deployment.

For more information about CiscoWorks QPM, refer to the [CiscoWorks QoS Policy Manager documentation](#).

For more information about VoIP QoS troubleshooting, refer to [Monitoring Voice over IP Quality of Service, document 17962](#).