



# CiscoWorks IP Telephony Environment Monitor Version 1.3

The CiscoWorks IP Telephony Environment Monitor (ITEM) Version 1.3 (formerly VoIP Health Monitor) is a suite of management applications that help ensure the manageability of converged networks that support IP telephony and IP telephony applications based on Cisco Systems technology.

CiscoWorks ITEM tracks the health of Cisco IP telephony environments by proactively monitoring the Cisco elements that support voice in the network to alert operations personnel of potential problems and minimize IP telephony service interruption.

CiscoWorks ITEM provides “dashboard” views that demonstrate the real-time health of Cisco CallManager applications, gateways, and switches (including those supporting inline power) that implement IP telephony in the monitored network. ITEM also uses synthetic traffic to replicate key forms of network activity associated with IP telephony to enable round-the-clock monitoring of key voice elements in the network. This technique highlights areas of concern to operations personnel and provides alerts to specific situations known to affect IP telephony before they become significant problems.

CiscoWorks ITEM consists of Voice Health Monitor (VHM), Device Fault Manager (DFM), and CiscoView (CD One). ITEM is available as a complete, standalone bundle (VHM, DFM, and CD One) as well as an add-on product (VHM only) for existing CiscoWorks LAN Management Solution (LMS) customers. Several drop-in modules are also available via download from Cisco.com that enhance the value and availability of management information from an IP telephony environment.

CiscoWorks ITEM is intended for Microsoft Windows 2000 environments. All three applications in the CiscoWorks ITEM suite (VHM, DFM, and CD One) run on windows. Customers who use Solaris platforms can run DFM and CD One on Solaris but must run VHM on Windows 2000.



## Managing the IP Telephony Challenge

As the capabilities and dependencies of converged voice and data networks continue to grow, managing your infrastructure effectively is imperative. Using open Internet standards and the inherent capabilities of Cisco devices, CiscoWorks ITEM enables network managers to oversee their converged networks while maintaining confidence that their IP telephony environments are performing as expected. CiscoWorks ITEM provides real-time, detailed fault analysis designed specifically for Cisco devices in the IP telephony environment. This focus on Cisco devices enables ITEM to monitor Cisco IP telephony technology-based networks for a variety of fault conditions, analyze these conditions, and notify network managers via intelligent traps detailing the problem that has occurred.

CiscoWorks ITEM also generates synthetic traffic to evaluate the general health of the IP telephony environment in the monitored network. CiscoWorks ITEM makes use of Device Fault Manager while providing sophisticated capabilities of its own to ensure timely information about the health of IP telephony environments. Using several data collection and analysis techniques, VHM and DFM generate intelligent traps that can be forwarded to other event-management systems installed in the network, sent to e-mail or pager gateways, or displayed in alarm windows and on the VHM network-health dashboard display.

## Solution Components

### **Voice Health Monitor**

The Voice Health Monitor (VHM) application tracks the health of IP telephony environments by proactively monitoring Cisco voice elements in the network to alert operations personnel to potential problems and to help minimize IP telephony service downtime. VHM employs the services of DFM while providing sophisticated capabilities of its own to ensure timely information about the health of IP telephony environments.

VHM is designed to work out of the box. It supports most Cisco routers, switches, access servers, and other devices commonly used in IP telephony implementations. In particular, VHM supports the health monitoring of Cisco CallManager applications, IP telephony applications and platforms, the gateways and gatekeepers, and in-line power switches. For each of the supported devices, VHM automatically looks for a range of predefined problems at the device and network levels and does not require users to write rules or set polling or threshold values. As IP telephony traffic grows, VHM detects changes in the number and type of Cisco devices installed and adjusts its analysis accordingly.

VHM features include:

- Problem-focused fault analysis
- Synthetic traffic generation and monitoring
- Real-time dashboard display
- Integration with CiscoWorks desktop
- Integration with enterprise management systems
- Incremental device support



## **Device Fault Manager**

The Device Fault Manager (DFM) application provides real-time fault detection and determination about the underlying Cisco IP fabric on which the IP telephony implementation executes. DFM reports faults that occur on Cisco network devices, often identifying problems before users of network services realize that a problem exists.

DFM works out of the box, supporting almost 200 of the most popular Cisco routers, switches, access servers, and hubs. For each of these supported devices, DFM automatically looks for a broad spectrum of common problems at the device and virtual LAN (VLAN) level, all without ever requiring operations managers to write rules or set polling or threshold values. As the network grows and changes, DFM detects changes in Cisco devices and adjusts its analysis accordingly.

DFM features include:

- Problem-focused fault analysis
- Integration with the CiscoWorks desktop
- Integration with enterprise management systems
- Support for Layer 2 and Layer 3 network devices
- Device support updates

## **CiscoView**

CiscoView is a Web-based graphical device management technology that is the standard for managing Cisco devices, providing front- and back-panel displays. Features include real-time monitoring of key information relating to device performance, traffic, and usage, with metrics such as utilization percentage, frames transmitted and received, errors, and a variety of other device-specific indicators.

## **Optional Drop-In Modules**

### **CiscoWorks Fault History**

Fault History is an optional, drop-in module (downloadable from Cisco.com) that provides a Web-based tool to access historical fault and alert data from the ITEM database. The operator has several filtering options that can facilitate searching for specific information.

### **CiscoWorks IP Phone Information Utility**

The IP Phone Information Utility is an optional, drop-in module (downloadable from Cisco.com) that provides a Web-based tool to show detailed information about an individual IP Phone. The operator can access the IP Phone information by using its extension number, IP address, or Media Access Control (MAC) address.

### **CiscoWorks IP Phone Help Desk Utility**

The IP Phone Help Desk Utility is an optional applet downloadable from Cisco.com that provides a Windows 2000 desktop tool to show summary information about an individual IP phone. The help desk operator can access the IP phone information by using its extension number (or can configure the application to search by IP or MAC address).



### **CiscoWorks Gateway Statistics Utility (Available fall 2002)**

When available, the Gateway Statistics Utility will be an optional drop-in module (downloadable from Cisco.com) that provides a Web-based tool to collect performance and behavior statistics about Cisco CallManager (CCM) controlled IP telephony gateways. This statistical information can be subsequently exported for processing by reporting packages for capacity planning and management and for trend information.

### CiscoWorks ITEM Features and Capabilities

#### **Problem-Focused Fault Analysis**

VHM and DFM actively monitor a wide range of problems that can affect the operation of IP telephony services in the monitored IP network environment. Depending on the type of Cisco internetworking equipment, VHM actively monitors different conditions via Internet Control Message Protocol (ICMP) polling, Simple Network Management Protocol (SNMP) Management Information Base (MIB) interrogation, and SNMP trap reception, and it tracks only those conditions known to contribute to higher-level problems in that particular device.

If VHM receives information from the device that is not a known condition of a higher-level problem, it ignores the information, eliminating the need for operations managers to look at every network event. This allows operations managers to manage Cisco IP telephony environments more productively. VHM recognizes whether several events from a device are related. For example, if several ports on a switch are down, instead of flooding operations personnel with port-down traps, VHM recognizes that the ports are on the same module and informs them that the module is down. VHM continually analyzes the availability of Cisco devices and ports on the devices, but it also looks for specific problems with specific devices of interest to IP telephony, including:

#### *Cisco CallManager*

- Status of disk arrays
- Status of system memory
- Status of system input/output
- Status of power supplies
- Status of network interface cards
- Temperature status
- Layer 2 network errors

#### *Gateways*

- Status of CPU
- Status of Public Switched Telephone Network (PSTN) gateway cards
- Status of power supplies
- Temperature status



DFM continually analyzes the availability of Cisco devices and ports on network devices, but it also looks for specific problems within the device, including:

- *Chassis*—Backplane utilization
- *Fan*—Fan state not normal
- *Memory*—Excessive fragmentation, buffer miss rate, buffer utilization, free memory
- *Network adapters*—Backup activated, error rates at the system and VLAN level, broadcast rates, collision rates, discard rates, flapping, maximum uptime, queue drop rates, and utilization
- *Power supplies*—Voltage out of range
- *Processors*—Utilization
- *SNMP Agent*—Unresponsive
- *System*—Excessive restarts
- *Temperature*—Temperature out of range

### **Synthetic Traffic Generation and Monitoring**

VHM uses synthetic traffic that replicates key forms of network activity associated with IP telephony functionality to enable around-the-clock monitoring of key voice elements in the network. It highlights areas of concern to operations personnel and provides alerts to specific situations known to affect IP telephony before they become significant problems. Some of the areas that are evaluated include:

- IP availability
- SNMP availability
- Application availability
- Operational availability (ability for phones to connect)
- Gateway interface availability
- Server interface availability

### **Real-Time Dashboard Display**

VHM provides dashboard views that demonstrate the real-time health of Cisco CallManager applications, gateways and gatekeepers, and switches (including those supporting in-line power) that enable IP telephony services in the monitored network.

### **Integration with CiscoWorks Desktop**

CiscoWorks ITEM works with the all other CiscoWorks products; integration includes:

- Taking advantage of CiscoWorks security roles
- Using CiscoWorks server process and backup management services
- Automatically importing (via DFM) Cisco devices from CiscoWorks Resource Manager Essentials (RME) for local and remote installations of DFM and RME



## Integration with Enterprise Management Systems

VHM and DFM can be used as a Cisco fault subsystem generating intelligent traps to other event-management systems installed in the network. Cisco has worked closely with a range of enterprise management systems, enabling these intelligent Cisco traps to be displayed properly in their respective event systems.

## Incremental Device Updates

As new Cisco IP-telephony-enabling devices are added to the network, VHM and DFM can be updated easily with an incremental device update capability available from the Cisco Software Center. Operations managers do not need to write rules for any new devices added through incremental updates for CiscoWorks ITEM to analyze and report voice-related faults in the Cisco network.

## Support for Layer 2 and Layer 3 Network Devices

DFM analyzes Layer 2 and Layer 3 devices, monitoring them individually but also recognizing which ports are members of specific VLANs and automatically monitoring each VLAN as a group of devices.

## Specifications

- CiscoWorks ITEM is intended for Windows 2000 environments. All three applications (VHM, DFM, and the CiscoWorks server) will run on a windows server. Because some customers have Solaris platforms, DFM and the CiscoWorks server on Solaris are supported, but Windows 2000 is required for VHM. The software and documentation for both environments is included with the product. For customers who choose the add-on product, only VHM software and documentation is included.

## Server System Requirements

### Hardware and Operating System

#### *UNIX (If DFM is on UNIX platform)*

- *System:* Sun UltraSPARCIII (Sun Blade 1000 Workstation or Sun Fire 280R Workgroup Server) running Solaris v2.8 (Dual processor system required for hosting multiple management solutions)
- *Memory:* 1 GB RAM for workstations, 2 GB RAM for servers, 8 MB e-cache
- *Available disk:* 36 GB internal FC-AL disk drive for workstation and dual drives of this type for server configurations

#### *Windows*

- *System:* dedicated IBM PC-compatible with 1-GHz or higher Pentium IV processor running Windows 2000 Server or Professional Edition with Service Pack 2
- *Memory:* 2 GB RAM
- *Available disk:* 20 GB with 2 GB swap recommended

## Client Browser System Requirements

### Hardware and Operating System

#### Windows

- *System:* IBM PC-compatible computer with 300 MHz or higher Pentium processor
  - Windows NT 4 (workstation and server) with Service Pack 6a, Windows 98 or Windows 2000 Professional Edition and Server with Service Pack 2
- *Memory:* 256 MB
- *Windows*
  - Windows 98/NT/2000: Netscape v4.77, v4.78, v4.79
  - Windows 98/NT/2000: Internet Explorer v5.5 with Service Pack 2, v6.0

#### Service and Support

CiscoWorks products are eligible for coverage under the Cisco Software Application Service (SAS) program. This service program offers customers contract-based 24x7 access to the Cisco Technical Assistance Center (TAC), full Cisco.com privileges, and software maintenance updates. A Software Application Service contract ensures that customers have easy access to the information and services needed to stay current with newly supported device packages, patches, and minor updates. For further information on service and support offerings, contact your local sales office.

#### Ordering Information

CiscoWorks ITEM is available for purchase through normal Cisco sales and distribution channels worldwide. CiscoWorks ITEM includes all the necessary components needed for an independent installation.

#### For More Information

For more information on the CiscoWorks IP Telephony Environment Monitor see:

<http://cisco.com/warp/public/cc/pd/wr2k/>

If you have further questions, please email the CiscoWorks team at: [CiscoWorks@cisco.com](mailto:CiscoWorks@cisco.com)



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