

## Cisco Unified Operations Manager 1.1

Cisco<sup>®</sup> Unified Operations Manager 1.1 is part of the Cisco Unified Communications Management Suite. It provides a real-time service-level view of the entire unified communications solution and presents the current operational status of each element in the Cisco Unified Communications solution, including the underlying transport infrastructure. The application remotely polls and collects data from the various devices and provides diagnostic capabilities for faster trouble isolation and resolution. It continuously monitors the different elements such as Cisco Unified CallManager, Cisco Unified CallManager Express, Cisco Unity<sup>®</sup> software, Cisco Unity Express, Cisco Unity Connection, Cisco Unified Contact Center, Cisco Unified Contact Center Express, and Cisco Unified MeetingPlace<sup>®</sup> Express, as well as Cisco gateways, routers, switches, and IP phones. Cisco Unified Operations Manager does not deploy any agent software on the devices being monitored and thus is completely non-disruptive to system operations.

### PRODUCT OVERVIEW

Cisco Unified Operations Manager is part of the Cisco Unified Communications Management Suite, which provides a comprehensive and efficient solution for network management, provisioning, and monitoring of Cisco Unified Communications deployments while:

- Lowering management costs through intuitive, easy-to-use products
- Increasing productivity through contextual diagnostic tools that accelerate trouble isolation and troubleshooting
- Maximizing network reliability with network-wide operational tests and voice-quality monitoring and diagnostic tests

Cisco Unified Operations Manager 1.1 (Operations Manager 1.1) monitors and evaluates the current status of all the components of the Cisco Unified Communications solution including the underlying transport infrastructure. It remotely polls and collects data from the various devices in the deployment. It does not deploy any agent software on the devices being monitored and thus is completely non-disruptive to system operations. Operations Manager 1.1:

- Presents the current operational status of the Cisco Unified Communications solution and provides visibility through real-time service-level views of the entire solution.
- Increases the productivity of network managers by providing contextual diagnostic tools to accelerate trouble isolation and troubleshooting
  - Through diagnostic tests, performance, and connectivity details about different elements of the unified communications solution
  - Using synthetic tests that replicate end-user activity and verify gateway availability as well as other configuration aspects of the unified communications infrastructure
  - Through IP Service Level Agent (SLA)–based diagnostic tests that can measure the performance of WAN links and measure node-to-node service quality
  - By providing actionable information in notification messages through context-sensitive links to more detailed information about service outages
  - By context-sensitive links to CiscoWorks products and Cisco Systems<sup>®</sup> management systems (when those are deployed), to provide the user with the broad and deep array of diagnostics capabilities
- Presents service-quality alerts by using the information available through Cisco Unified Service Monitor 1.1 when the latter is deployed. It displays mean opinion scores (MOS) associated with service quality between pairs of endpoints (the endpoints can be IP phones, messaging systems, conferencing systems, or voice gateways) at specified times involved in the monitored call segment and other

associated details about the service-quality problem. When Cisco Unified Service Monitor reports a MOS threshold violation, Operations Manager 1.1 can further perform a probable path trace between the two endpoints and can report on any outages or impairments associated with intermediate nodes in the path.

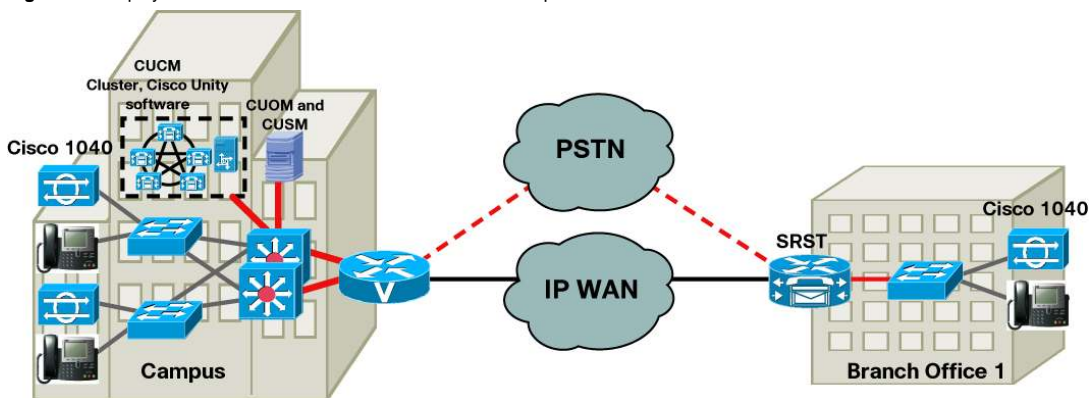
- Provides current information about connectivity-related and registration-related outages affecting IP phones (both Session Initiation Protocol [SIP] and Skinny Client Control Protocol [SCCP]-based phones) in the network and provides additional contextual information to determine the location and identification of the IP phones.
- Enables tracking of devices and IP phone inventory, tracks IP phone status changes, and creates a variety of reports that document move, add, and change operations associated with IP phones in the network.
- Provides flexible north-bound interfaces using Simple Network Management Protocol (SNMP) traps, syslog messages, and e-mails that let Operations Manager 1.1 report the status of the network being monitored to a higher-level entity (typically a manager of managers).
- Operations Manager continues its industry-leading support for the Cisco Unified Communications family of products by adding support for newly released Cisco products such as Cisco Unified CallManager 5.0/4.2, Cisco Unity Connection 1.1, Cisco Unified MeetingPlace Express, Cisco SIP Proxy Server, and Cisco Unified Presence Server. Additionally, Operations Manager can discover and continuously monitor SIP phones in the unified communications deployment. In addition to discovering these SIP phones, Operations Manager can also support diagnostic tests to SIP phones and present an inventory of all the SIP phones in the deployment.

## APPLICATIONS

### Small and Medium-Sized Enterprises

For small and medium-sized deployments (generally less than 1000 phones), the software component of Cisco Unified Service Monitor 1.1 (Service Monitor 1.1) can co-reside with Operations Manager 1.1 on a single platform. A single installation process installs all the necessary components. Operations Manager can monitor the deployment out of the box without the need to configure any rules or settings. Operations Manager 1.1 provides real-time notifications using SNMP traps, syslog notifications, and e-mail that report the status of the network being monitored to a higher-level entity. Figure 1 shows the deployment model for small and medium-sized enterprises.

Figure 1. Deployment Model for Small and Medium-Sized Enterprises



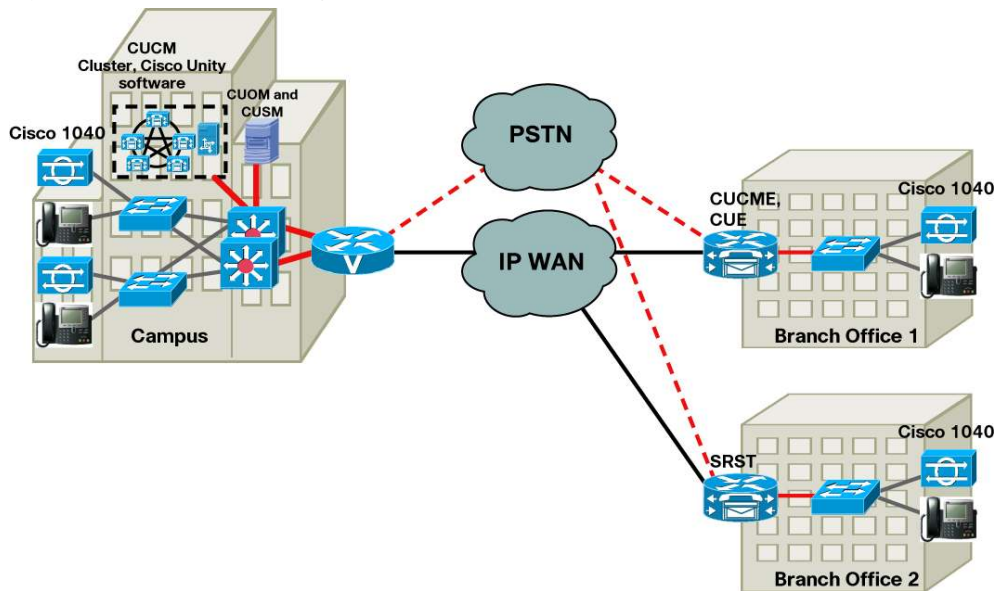
CUCM—Cisco Unified CallManager, CUOM—Cisco Unified Operations Manager, CUSM—Cisco Unified Service Monitor, SRST—Survivable Remote Site Telephony, PSTN—Public Switched Telephone Network

### Large Enterprises

For large enterprise deployments (generally more than 1000 phones), it is recommended that Operations Manager 1.1 and the software component of Service Monitor 1.1 be deployed on separate platforms. Operations Manager 1.1 can be deployed centrally or in a distributed manner to scale to different deployment sizes. Each instance of Operations Manager 1.1 can manage multi-site and multi-cluster IP Communications environments. Operations Manager 1.1 can monitor the deployment out of the box without the need to configure any

rules or settings. This software can also provide real-time notifications using SNMP traps, syslog notifications, and e-mail that report the status of the network being monitored to a higher-level entity. Operations Manager 1.1 can also share device credential information with other CiscoWorks products if they happen to be deployed in the enterprise, providing better coordination for troubleshooting and resulting in reduced administrative overhead for network managers. Figure 2 shows the deployment model for large enterprises.

**Figure 2.** Deployment Model for Large Enterprises



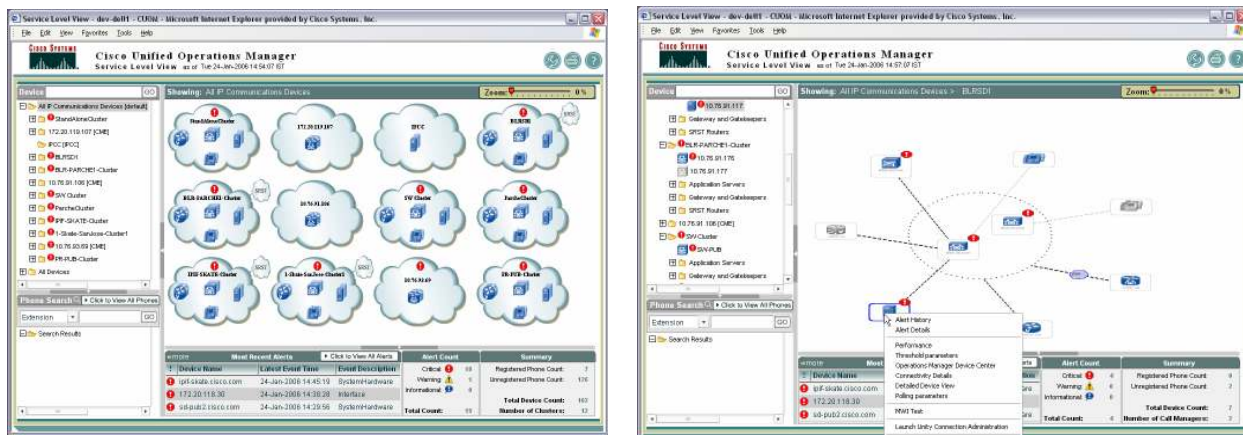
*CUCM—Cisco Unified CallManager, CUOM—Cisco Unified Operations Manager, CUSM—Cisco Unified Service Monitor, CUCME—Cisco Unified CallManager Express, CUE—Cisco Unity Express, SRST—Survivable Remote Site Telephony, PSTN—Public Switched Telephone Network*

## KEY FEATURES AND BENEFITS

### Service-Level View

The service-level view in Operations Manager 1.1 allows network managers to visualize their entire Cisco Unified Communications deployment. The service-level view is a real-time auto-refresh display that provides status information about all the unified communications clusters and the elements of the clusters in the deployment. Drill down views show the operational status of each element and its inter-relationships with other elements of the solution. This display serves as the central point to initiate a variety of actions that are available in Operations Manager 1.1. A context-sensitive right-click menu is provided through which network managers can get detailed status as well as historical information about the alerts on each of the elements. It is also possible to select each of the devices and initiate a variety of diagnostic tests, get access to graphical performance-monitoring and capacity-monitoring information, or get IP connectivity details for a selected device by launching a neighbor topology view that shows Layer 2 physical connectivity from the selected device. Operations Manager 1.1 also makes available a set of context-sensitive tools outside the application that can aid in further troubleshooting or diagnostics. Figure 3 shows the service-level view and its details for a multi-cluster unified communications deployment.

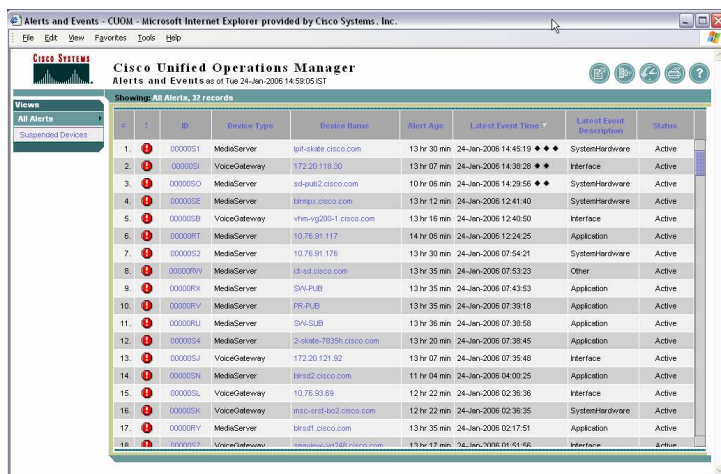
**Figure 3. Service-Level View and Details for a Typical Multi-Cluster Deployment**



### Real-Time Alerts

Operations Manager 1.1 comes with built-in intelligence that can understand the role of every device in a Cisco Unified Communications deployment, and it monitors those devices for any kind of faults or outages. There is no need to write any rules to start monitoring; all the rules are built into the product. It also comes with factory-defined thresholds (which can be further tuned by network administrators) and an analysis engine that can detect the violation of any of these thresholds and immediately alert network managers through multiple means. These alerts are presented to the user through the Alerts and Events Display, which refreshes periodically to present the most up-to-date status of the monitored devices. A separate display called the Phone Status Display provides instant access to IP phone outage information. Two types of outages are monitored: signaling-related outages and IP connectivity-related outages. It is also possible to get information about an IP phone's switch and port, allowing administrators to troubleshoot problems that may have wider scope (at the switch level) than just the IP phone. Figure 4 shows real-time alerts in the Alerts and Events Display.

**Figure 4. Real-Time Alerts as Displayed in the Alerts and Events Display**



### Diagnostic Tests

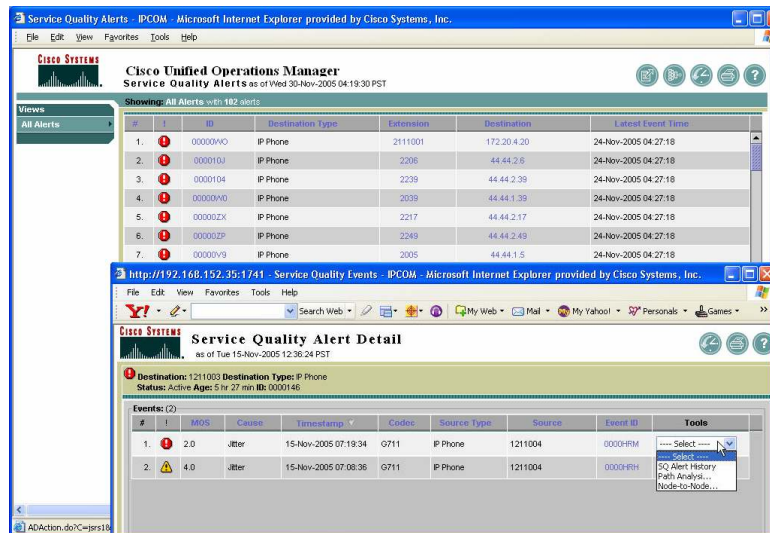
Operations Manager 1.1 comes with a rich set of diagnostic tests that can be used to aid in trouble isolation and resolution. There are primarily three types of tests: synthetic tests, phone status tests, and node-to-node IP SLA tests. The synthetic tests serve to replicate user activity (getting dial tone, making phone calls, leaving voice mail, and creating or joining conference calls). These tests can verify the functional availability of the supporting infrastructure and validate different configuration aspects such as route patterns, route lists, inter-cluster trunks, and gateway dial peers. Such synthetic tests can be performed using both the SIP and the SCCP signaling protocols. The

phone status tests can be used to determine the current operational status of the IP phones in terms of signaling (SIP and SCCP) and IP connectivity. The node-to-node tests use the services of the Cisco IP Service Level Agent (IP SLA, formerly known as Service Assurance Agent [SAA]) in Cisco routers to simulate traffic in the network and then determine network characteristics such as reachability status, response time, latency, jitter, packet loss, and network quality. Each of these tests can be run in a continuous monitoring mode as well as scheduled or on-demand modes. For example, the quality of a WAN link between different sites can be tested using the node-to-node tests and when the quality of the link drops below a certain threshold, an alert can be generated. Similarly, end-user tests can be set up that place test calls between different sites in an automated routine. The results of these diagnostics tests are presented through a variety of reports, and alerts can be triggered based on key thresholds being exceeded.

## Service-Quality Reporting

Operations Manager 1.1 can use the information provided by Service Monitor 1.1 to present service-quality (such as quality-of-voice) alerts on a real-time basis. The service-quality alerts are associated with IP phones or unified communications devices that are currently monitored by Operations Manager 1.1 and present that information in the Service Quality Alerts Display. Details about IP connectivity of the IP phones and devices are available to enable further troubleshooting. It is also possible to initiate a probable path trace between the endpoints that helps network managers identify any potential problems in intermediate nodes that could influence service quality. Figure 5 shows service quality alerts.

**Figure 5.** Service Quality Alerts



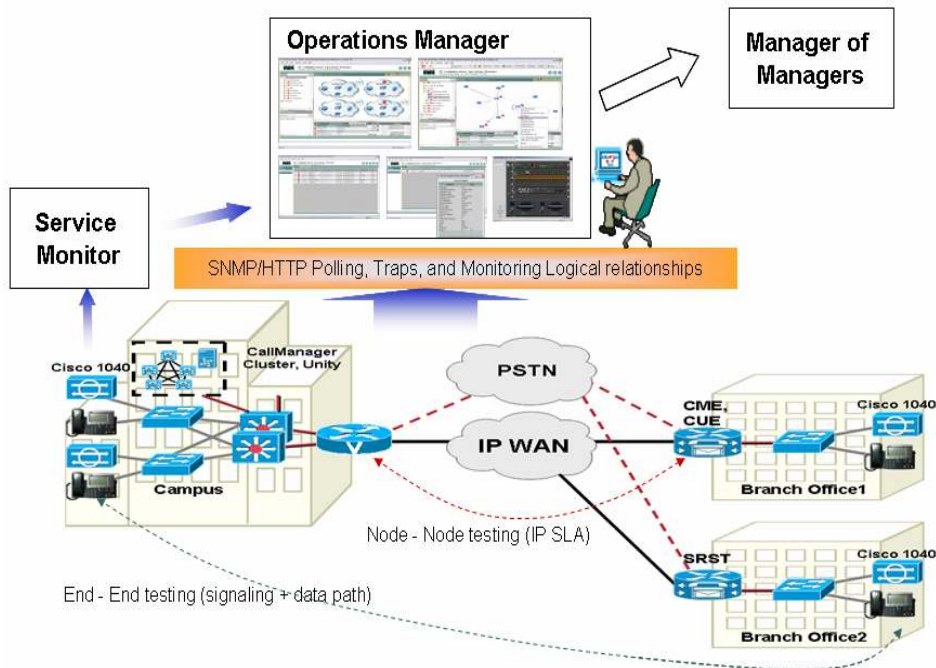
## Reports

Operations Manager 1.1 provides an extensive set of reports that help network managers maintain information about their Cisco Unified Communications deployment. The historical alert, event, and service-quality reports maintain information about all the alerts and events reported by Operations Manager 1.1 for up to 30 days. This enables network managers to document any past outage and have access to it for long-term trending purposes. The IP phone inventory reports give network managers instant access to status information about every IP phone deployed in the network. Extensive information on signaling details and IP connectivity details is maintained and reported. These reports also track changes in phone status and thus serve to document move, add, and change operations on these IP phones. Such reports are available for both SIP- and SCCP-based IP phones. The customizable reports let network managers choose what type of information they want and create a daily report that is available by e-mail or the Operations Manager 1.1 GUI.

## PRODUCT ARCHITECTURE

Operations Manager 1.1 is a Web-based application. It uses open standards-based access to gather operating status information from Cisco Unified Communications applications and Cisco IOS® Software to provide the information required to manage increasingly complex unified communications environments. Operations Manager 1.1 does not deploy any agent software on any platform it monitors. It uses open interfaces such as SNMP and HTTP (AVVID XML Layer—AXL) to remotely (and periodically) poll the devices being monitored and thus collect status information. It also performs several diagnostic tests (based on SCCP, SIP, and Cisco IP SLA) and uses the results to determine the operational status of the monitored devices. The user interface is browser-based to enable remote login from anywhere in the network and allow instant access to real-time information on the current status of the devices. Different levels of user access can be set up locally or in conjunction with Cisco Secure Access Control Server, which controls access to information in Operations Manager 1.1. Figure 6 shows the product architecture of Operations Manager 1.1.

Figure 6. Cisco Unified Operations Manager 1.1 Architecture



## PRODUCT SPECIFICATIONS

Table 1 shows Cisco Unified Operations Manager 1.1 product specifications

Table 1. Product Specifications

Description	Specification
Product compatibility	Cisco Unified Communications deployments consisting of Cisco Unified CallManager (including CallManager 5.0/4.2), Cisco Unity, Cisco Unity Connection, Cisco Unified Contact Center, Cisco Unified MeetingPlace Express, Cisco Unified CallManager Express, Cisco Unity Express, Cisco Unified Contact Center Express, Cisco Conference Connection, Cisco Personal Assistant, Cisco Emergency Responder, routers, gateways, switches, and IP phones
Software compatibility	<ul style="list-style-type: none"> <li>Windows 2003 Server</li> <li>The user interface can be accessed using Microsoft Internet Explorer 6.0 on Windows 2003 and Windows XP platforms.</li> </ul>
Protocols	Uses SNMP, SCCP, and HTTP (Cisco AVVID XML layer-based) to monitor the unified communications deployment

<b>Features and functions</b>	Automatic device and phone discovery, service-level view, real-time alerts, diagnostic tests, service-quality alerting, endpoint status and endpoint status change reports, north-bound interfaces, performance and utilization monitoring, historical alerts, event and service-quality reports, context-sensitive launch of CiscoWorks products
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## SYSTEM CAPACITY

**Table 2.** System Capacity (per Operations Manager Instance)

<b>System Parameter</b>	<b>Capacity</b>		
Monitored phones	1000	10,000	30,000
Monitored devices	300	1000	2000
Monitored Cisco Unified CallManager clusters	10	15	30
Monitored Cisco Unified CallManager Express routers	100	250	500
Monitored Survivable Remote Site Telephony (SRST) routers	10	100	500
Concurrent synthetic tests	25	100	250
Concurrent node-to-node (Cisco IP SLA) tests	25	100	250
Concurrent client (browser) logons	5	5	5

For unified communications deployments of more than 30,000 phones, multiple Operations Manager 1.1 servers can be deployed. These servers can share device and credential information between them and administrators can perform centralized device and credential management. By integrating the Operations Manager with a Cisco Secure Access Control Server, administrators can centrally control user access. Each of these Operations Manager servers will roll up the status of the network being monitored to a higher-level entity (typically a manager of managers) through SNMP traps and syslog notifications.

### Features

- Automatic device and phone discovery
- Service-level view of the complete Cisco Unified Communications deployment with current status information on all monitored elements
- Real-time alerting on all the monitored unified communications devices
- Diagnostic tests such as end-to-end synthetic tests, node-to-node Cisco IP SLA tests, and phone status tests
- Service-quality alerting based on information from Cisco Unified Service Monitor 1.1 or Cisco Unified Service Monitor 1.0
- Endpoint status and endpoint status change reports (for both SIP- and SCCP-based IP phones)
- Northbound interfaces using SNMP traps, syslogs, and e-mail notifications with context-sensitive links to more detailed information
- Performance and usage monitoring of various Cisco Unified Communications devices
- Historical alert, event, and service-quality reports
- Context-sensitive launch of CiscoWorks products if they are deployed

## SYSTEM REQUIREMENTS

**Table 3.** System Requirements

<b>Description</b>	<b>Specification</b>		
<b>System Parameters</b>	Up to 1000 phones	Up to 10,000 phones	Up to 30,000 phones
<b>Processor</b>	Pentium 4 processor > 2 GHz	Dual Pentium 4 or Xeon processor > 3 GHz	Dual Pentium 4 or Xeon processor > 3 GHz

<b>Memory</b>	3 GB RAM	4 GB RAM	4 GB RAM
<b>Swap file</b>	4 GB swap file	8 GB swap file	8 GB swap file
<b>Disk space</b>	60 GB recommended	60 GB recommended	60 GB recommended
<b>Hardware</b>	Server platform	Server platform	Server platform
<b>Software</b>	Windows 2003 Server	Windows 2003 Server	Windows 2003 Server
<b>Client Requirements</b>			
<b>Processor</b>	Pentium 4 processor > 1 GHz		
<b>Memory</b>	512 MB RAM (1 GB recommended)		
<b>Swap file</b>	1 GB swap file		
<b>Hardware</b>	Any PC/server platform		
<b>Software</b>	<ul style="list-style-type: none"> <li>• Microsoft Internet Explorer 6.0</li> <li>• Macromedia Flash Player 8.0</li> <li>• Windows XP Home, Windows XP Professional, Windows 2003 Server platforms</li> </ul>		

The requirements in Table 3 outline the minimum hardware configuration needed to operate Operations Manager 1.1 at different scalability levels. The client requirements dictate the platform from which the user interfaces (Internet browser-based) are invoked. For unified communications deployments of more than 30,000 phones, multiple Operations Manager 1.1 servers can be deployed. These servers can share device and credential information between them and administrators can perform centralized device and credential management. By integrating the Operations Manager with a Cisco Secure Access Control Server, administrators can centrally control user access. Each of these Operations Manager servers will roll up the status of the network being monitored to a higher-level entity (typically a manager of managers) through SNMP traps and syslog notifications.

## ORDERING INFORMATION

Cisco Unified Operations Manager 1.1 can be licensed at different deployment scales and is appropriate for enterprises of all sizes. Licensing is controlled by means of a license file, and network administrators can upgrade the license as they grow their Cisco Unified Communications deployment without disrupting the monitoring or having to decommission their server. Upgrading the license is as simple as logging onto the Cisco Website, procuring a new license, and deploying it on the server. Licenses are available for monitoring 1000 phones, 2000 phones, 5000 phones, and increments of 5000 phones up to a maximum of 30,000 phones per Operations Manager 1.1 server. Depending on the license installed on the server, server hardware requirements and scalability limits are enforced to help ensure acceptable performance. The appropriate features are enabled when the license is installed. The two different licensing options are (1) Cisco Unified Operations Manager 1.1 and (2) Cisco Unified Operations Manager 1.1 with Cisco Unified Service Monitor 1.1 on a single server.

To place an order, visit the [Cisco Ordering Home Page](#). Table 4 shows ordering information.

**Table 4.** Ordering Information

<b>Part Number</b>	<b>Product Name</b>
<b>CUOM-1.1-K9</b>	Cisco Unified Operations Manager 1.1
<b>CUOM-1.1-1K-K9</b>	Usage license for up to 1000 phones
<b>CUOM-1.1-2K-K9</b>	Usage license for up to 2000 phones
<b>CUOM-1.1-5K-K9</b>	Usage license for up to 5000 phones
<b>CUOM-1.1-10K-K9</b>	Usage license for up to 10,000 phones
<b>CUOM-1.1-15K-K9</b>	Usage license for up to 15,000 phones



<b>CUOM-1.1-20K-K9</b>	Usage license for up to 20,000 phones
<b>CUOM-1.1-25K-K9</b>	Usage license for up to 25,000 phones
<b>CUOM-1.1-30K-K9</b>	Usage license for up to 30,000 phones
<b>CUOMUP-1.1-K9</b>	Cisco Unified Operations Manager 1.1—Upgrade from CiscoWorks IP Telephony Environment Monitor (ITEM), CiscoWorks Voice Health Monitor (VHM)
<b>CUOMUP-1.1-1K-K9</b>	Usage license for up to 1000 phones
<b>CUOMUP-1.1-2K-K9</b>	Usage license for up to 2000 phones
<b>CUOMUP-1.1-5K-K9</b>	Usage license for up to 5000 phones
<b>CUOMUP-1.1-10K-K9</b>	Usage license for up to 10,000 phones
<b>CUOMUP-1.1-15K-K9</b>	Usage license for up to 15,000 phones
<b>CUOMUP-1.1-20K-K9</b>	Usage license for up to 20,000 phones
<b>CUOMUP-1.1-25K-K9</b>	Usage license for up to 25,000 phones
<b>CUOMUP-1.1-30K-K9</b>	Usage license for up to 30,000 phones
<b>CUOM-1.1-MMB-K9</b>	Cisco Unified Management Mid-Market Bundle (Cisco Unified Operations Manager 1.1—with usage license for up to 1000 phones plus Cisco Unified Service Monitor 1.1 software with 2 Cisco 1040 sensors and usage license for up to 10 sensors)
<b>CUOM-1.1-ENT-K9</b>	Cisco Unified Management Enterprise Bundle (Cisco Unified Operations Manager 1.1—with usage license for up to 5000 phones plus Cisco Unified Service Monitor 1.1 software with 6 Cisco 1040 sensors and usage license for up to 10 sensors)

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## FOR MORE INFORMATION

For more information about Cisco Unified Operations Manager 1.1, please visit <http://www.cisco.com/en/US/products/ps6535/index.html>, contact your local account representative, or send e-mail to the Cisco Systems® product marketing group at [ask-ipc-management@cisco.com](mailto:ask-ipc-management@cisco.com).



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