



# CHAPTER 1

## Prerequisites

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This chapter describes the prerequisites for installing Cisco Prime Unified Operations Manager (with Cisco Prime Unified Service Monitor) on a Windows system. It contains the following sections:

- [Server Requirements, page 1-1](#)
- [Client Requirements, page 1-16](#)
- [Cisco Prime Unified Computing System, page 1-17](#)
- [Other System Software, page 1-18](#)
- [System Capacity, page 1-18](#)
- [Supported Devices and Software, page 1-19](#)

For additional requirements before you begin your installation, see [Preparing to Install Prime UOM, page 2-1](#). If you are migrating to Operations Manager 9.0 from an earlier release, see [Upgrading to Prime UOM 9.0 from 8.7 and 8.6, page 2-16](#).

For an overview of the product features and updates, see the [User Guide for Cisco Prime Unified Operations Manager](#) or the release notes.

## Server Requirements

This section covers the server requirements including:

- [Installation Server System Minimum Requirements for Prime UOM, Table 1-1 on page 1-2](#)
- [Coresidence Guidelines, page 1-4](#)
- [Coexistence Guidelines, page 1-9](#)
- [Increasing the Paging File Size, page 1-13](#)
- [Firewall Updates to Avoid Denial of Service Attacks, page 1-13](#)
- [Terminal Server Support for Windows 2003 and 2008, page 1-14](#)

Table 1-1 lists the minimum server system requirements for installing Operations Manager 9.0. If you plan to run Service Monitor or any other IP Communications Management software on the same server as Prime UOM or in a virtualization environment, see [Coexistence Guidelines, page 1-4](#) for more information.

For additional details on virtualization, see [Best Practices for Cisco Prime Unified Communications Management Suite on Virtualization](#). For details on supported devices and software, see the [Supported and Interoperable Devices and Software for Cisco Prime Unified Operations Manager 9.0](#).

**Table 1-1** Installation Server System Minimum Requirements for Prime UOM

Requirement Type	Minimum Requirements for Deployment of up to...		
	1,000 Phones and 300 IP Devices	10,000 Phones and 1,000 IP Devices	60,000 Phones and 2,500 IP Devices
Processor	Two processors or dual core, 2 GHz minimum each	Two processors or dual core, 2 GHz minimum each	<ul style="list-style-type: none"> <li>Four processors, quad core or (2) dual core, 2 GHz minimum each</li> </ul>
Memory (RAM)	Minimum: 3 GB <sup>1</sup>	Minimum: 8 GB	Minimum: 8 GB <sup>1</sup>
Page File Space <sup>2</sup>	8 GB	8 GB	12 GB
Disk Space <sup>3</sup>	<ul style="list-style-type: none"> <li>84 GB recommended.</li> </ul>		
Hardware	<ul style="list-style-type: none"> <li>NTFS file system (required for secure operation).</li> <li>At least 16 MB in Windows temporary directory (%TEMP%).</li> <li>Color monitor.</li> </ul> <p>For optimum viewing on the Prime UOM display, we recommend that you use the highest native resolution supported by the client PC and monitor.</p> <p>A large, high-resolution display will also allow for less scrolling through information presented and increase operator efficiency. The minimum resolution recommended is 1440 x 900.)</p> <ul style="list-style-type: none"> <li>CD-ROM drive.</li> <li>Support for one or two 1-GB NICs (one is required, and the second is for failover support; both NIC cards must have the same IP address). Prime UOM supports NIC teaming in Fault Tolerance mode alone. NIC teaming for load balancing is not supported.</li> </ul>		
Software <sup>4,5,6,7,8</sup>	<p>One of the following:</p> <ul style="list-style-type: none"> <li>Windows Server 2003 Enterprise Edition (32 bit) with Service Pack 1 or 2</li> <li>Windows Server 2008 (R1) Standard or Enterprise Edition (32/64 bit) with Service Pack 2.</li> <li>Windows Server 2008 (R2) Standard or Enterprise Edition (64 bit) with Service Pack 1.</li> <li>Microsoft .NET Framework must be uninstalled for Prime UOM to work properly. If you have Service Pack 2, Microsoft .NET is automatically installed and must be uninstalled permanently.</li> <li>ODBC Driver Manager<sup>9</sup> 3.5.10 or later.</li> <li>(Optional) VMware ESXi 4.x or ESXi 5.0. For more details, see <a href="#">Table 1-4 lists the minimum requirements for Prime UOM and Service Monitor coexistent installation., page 1-9</a>.</li> <li>(Optional) NTP—If you plan to use Service Monitor, configure the server to use Network Time Protocol (NTP) to synchronize with the time server that is used by Cisco Unified Communications Managers in your network. See <a href="#">NTP Configuration Notes, page 2-29</a>.</li> </ul> <p>Inline upgradation of Windows is not supported.</p>		

The following list explains the footnotes from Table 1-1, “Installation Server System Minimum Requirements for Prime UOM”:

1. If server RAM size is less than 4 GB, then a warning message appears. For details on enabling the full 4 GB of RAM on Windows, see [Enabling the Full 4 GB of RAM, page 2-6](#).
2. While configuring the page file, you should set both the minimum and maximum file parameters to same size. Page size also needs to be changed from automatic to manual. This ensures that Windows creates a page file of the required size. See [Increasing the Paging File Size, page 1-13](#). For 45,000 phones, the minimum page file size should be 12 GB.
3. Disc Space:
  - The OS space requirement is exclusive of the specified value.
  - The disc space must be 100 GB(exclusive of the HDD space), for 60,000 phones.
  - Do not install Prime UOM on a FAT file system.
4. You must install Prime UOM on a dedicated system. Do not install Prime UOM on a Primary Domain Controller (PDC) or Backup Domain Controller (BDC). Do not install Prime UOM in an encrypted directory. Prime UOM does not support directory encryption.
5. The Operations Manager system can be part of a Windows server domain.
6. Immediately after installation, the TCP/IP stack should be hardened to avoid denial of service attacks. Ensure these steps are taken before using the product.
  - Apply Windows security patches. See Microsoft Security Updates for Denial of Service Attacks for details. The system that you use for your Prime UOM server should meet all security guidelines that Microsoft recommends for Windows 2003 or 2008 Server. (CSCsy83124) See the NSA website for security guidance: <http://www.nsa.gov>.  
  
Specifically, the TCP/IP stack should be hardened to avoid denial of service attacks. Refer to the section "Security Consideration for Network Attacks" on page 121 of the The Windows Server 2003 - Security Guide, v2.1 which can be downloaded from the NSA website.
  - On the Windows Server 2003 Enterprise Edition or 2008 Standard or Enterprise Edition server, block remote access to all TCP/UDP ports except for those ports used by Prime UOM required for external access. See [Firewall Updates to Avoid Denial of Service Attacks, page 1-13](#).
7. The default locale for your Windows operating system must be set to US-English.
8. Windows Terminal Services is supported in Remote Administration mode only. Use of Windows Terminal Services or Remote Desktop and Virtual Network Computing (VNC) to remotely control the server is not recommended for performing day-to-day operations (for example, running reports, keeping dashboards open, and so on). For more information, see [Terminal Server Support for Windows 2003 and 2008, page 1-14](#).
9. To verify the version of ODBC Driver Manager, from the Windows desktop, choose **Start > Settings > Control Panel > Administrative Tools > Data Sources (ODBC)**. Select the **About** tab. If necessary, install Microsoft Data Access Component (MDAC) 2.5 or later.

Installing Prime UOM will install Service Monitor also. The Service Monitor is installed with Prime UOM but it is not configured. So it does not consume any resources. Do not install Service Monitor again.



**Note**

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IPV6, DHCP Client, and Firewall should be disabled before installing Prime UOM.

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## Coresidence Guidelines


**Note**

For supported configurations in a virtualization environment, see [Table 1-4 lists the minimum requirements for Prime UOM and Service Monitor coexistent installation.](#), page 1-9.

[Table 1-2](#) provides the minimum requirements for Prime UOM, Service Monitor, Service Statistics Manager, and Provisioning Manager coresident installation.

**Table 1-2** *Installation Server System Minimum Requirements for Operations Manager, Service Monitor, Service Statistics Manager, and Provisioning Manager Coresidence*

Requirement Type	Minimum Requirements for Coresident Deployment of up to	
	2,000 Phones	10,000 Phones
Processor	One quad-core processors greater than 3 GHz. A quad-core processor is a system that contains four processors.	Two quad-core processors greater than 3 GHz. Two quad-core processor is a system that contains eight processors.
Memory (RAM)	8 GB	16 GB (PAE enabled).
Page File Space <sup>1</sup>	12 GB	16 GB.
Disk Space <sup>2</sup>	<ul style="list-style-type: none"> <li>84 GB recommended.</li> <li>At least 4 MB in Windows temporary directory (%TEMP%).</li> </ul>	<ul style="list-style-type: none"> <li>84 GB recommended. (Minimum four SAS drivers.)</li> <li>For optimal I/O throughput, you must have a Battery Backed Write Cache (BBWC); we also recommend two I/O controllers (with two disks on each controller).</li> <li>NTFS file system (required for secure operation).</li> <li>At least 16 MB in Windows temporary directory (%TEMP%).</li> </ul>
Hardware	<ul style="list-style-type: none"> <li>Color monitor. For optimum viewing on the Prime UOM display, we recommend that you use the highest native resolution supported by the client PC and monitor). A large, high-resolution display ensures less scrolling and increases operator efficiency. The minimum resolution recommended is 1440 x 900.</li> <li>CD-ROM drive.</li> </ul>	<ul style="list-style-type: none"> <li>Color monitor. For optimum viewing on the Prime UOM display, we recommend that you use the highest native resolution supported by the client PC and monitor).</li> <li>A large, high-resolution display ensures less scrolling and increases operator efficiency. The minimum resolution recommended is 1440 x 900.</li> <li>CD-ROM drive.</li> <li>Support for one or two 1-GB NICs (one is required, and the second is for failover support. Both NIC cards must have the same IP address).</li> </ul>

**Table 1-2** *Installation Server System Minimum Requirements for Operations Manager, Service Monitor, Service Statistics Manager, and Provisioning Manager Coresidence (continued)*

Requirement Type	Minimum Requirements for Coresident Deployment of up to	
	2,000 Phones	10,000 Phones
Software <sup>3,4,5,6,7</sup>	<ul style="list-style-type: none"> <li>Windows Server 2003 Enterprise Edition with Service Pack 2.</li> </ul>	<ul style="list-style-type: none"> <li>One of the following:               <ul style="list-style-type: none"> <li>Windows Server 2003 Enterprise Edition with Service Pack 2.</li> <li>Windows Server 2008 Enterprise Edition with Service Pack 2 (32 bit and 64 bit for R1 edition).</li> <li>Windows Server 2008 Enterprise Edition with Service Pack 2 (64 bit for R2 edition).</li> </ul> </li> <li>ODBC Driver Manager 3.5.10 or later<sup>8</sup>.</li> <li>(Optional) NTP—If you plan to use Service Monitor, configure the server to use Network Time Protocol (NTP) to synchronize with the time server that is used by Cisco Unified Communications Managers in your network. See <a href="#">NTP Configuration Notes, page 2-29</a>.</li> </ul>

Table 1-3 lists the minimum requirements for Prime UOM and Service Monitor coresident installation.

**Table 1-3** *Installation Server System Minimum Requirements for Prime UOM and Service Monitor Coresidence*

Requirement Type	Minimum Requirements for Coresident Deployment of up to			
	1,000 Phones and 300 IP Devices	10,000 Phones and 1,000 IP Devices	30,000 Phones and 2,500 IP Devices	60,000 Phones (Including 45,000 Phones) and 2500 IP Devices
Processor	Two processors or dual core, 2 GHz minimum each	Two processors or dual core, 2 GHz minimum each	Four processors, quad core or (2) dual core, 2 GHz minimum each	Eight processors, quad core or (4) dual core, 2 GHz minimum each
Memory (RAM)	3 GB	8 GB (PAE enabled).	8 GB (PAE enabled).	20 GB (PAE enabled).
Page File Space <sup>1</sup>	8 GB	8 GB	8 GB	20 GB

**Table 1-3** *Installation Server System Minimum Requirements for Prime UOMand Service Monitor Coresidence*

Requirement Type	Minimum Requirements for Coresident Deployment of up to			
	1,000 Phones and 300 IP Devices	10,000 Phones and 1,000 IP Devices	30,000 Phones and 2,500 IP Devices	60,000 Phones (Including 45,000 Phones) and 2500 IP Devices
Disk Space <sup>2</sup>	<ul style="list-style-type: none"> <li>84 GB recommended.</li> <li>At least 4 MB in Windows temporary directory (%TEMP%).</li> </ul>	<ul style="list-style-type: none"> <li>84 GB recommended. (Minimum four SAS drivers.)</li> </ul> <p>For optimal I/O throughput, you must have a Battery Backed Write Cache (BBWC).</p> <p>We also recommend two I/O controllers (with two disks on each controller).</p> <ul style="list-style-type: none"> <li>NTFS file system (required for secure operation).</li> <li>At least 16 MB in Windows temporary directory (%TEMP%).</li> </ul>	<ul style="list-style-type: none"> <li>84 GB recommended. (Minimum four SAS drivers.)</li> </ul> <p>For optimal I/O throughput, you must have a Battery Backed Write Cache (BBWC).</p> <p>We also recommend two I/O controllers (with two disks on each controller).</p> <ul style="list-style-type: none"> <li>NTFS file system (required for secure operation).</li> <li>At least 16 MB in Windows temporary directory (%TEMP%).</li> </ul>	<ul style="list-style-type: none"> <li>100 GB recommended. (Minimum four SAS drivers.)</li> </ul> <p>For optimal I/O throughput, you must have a Battery Backed Write Cache (BBWC).</p> <p>We also recommend two I/O controllers (with two disks on each controller).</p> <ul style="list-style-type: none"> <li>NTFS file system (required for secure operation).</li> <li>At least 16 MB in Windows temporary directory (%TEMP%).</li> </ul>

Table 1-3 Installation Server System Minimum Requirements for Prime UOM and Service Monitor Coresidence

Requirement Type	Minimum Requirements for Coresident Deployment of up to			
	1,000 Phones and 300 IP Devices	10,000 Phones and 1,000 IP Devices	30,000 Phones and 2,500 IP Devices	60,000 Phones (Including 45,000 Phones) and 2500 IP Devices
Hardware	<ul style="list-style-type: none"> <li>Color monitor (For optimum viewing on the Prime UOM display, we recommend that you use the highest native resolution supported by the client PC and monitor).</li> <li>A large, high-resolution display ensures less scrolling and increases operator efficiency.</li> <li>The minimum resolution recommended is 1440 x 900.</li> <li>CD-ROM drive.</li> </ul>	<ul style="list-style-type: none"> <li>Color monitor (For optimum viewing on the Prime UOM display, we recommend that you use the highest native resolution supported by the client PC and monitor).</li> <li>A large, high-resolution display ensures less scrolling and increases operator efficiency.</li> <li>The minimum resolution recommended is 1440 x 900.</li> <li>CD-ROM drive.</li> <li>Support for one or two 1-GB NICs (One of these is required, and the second is for failover support).</li> <li>Both NIC cards must have the same IP address.</li> </ul>	<ul style="list-style-type: none"> <li>Color monitor (For optimum viewing on the Prime UOM display, we recommend that you use the highest native resolution supported by the client PC and monitor).</li> <li>A large, high-resolution display ensures less scrolling and increases operator efficiency.</li> <li>The minimum resolution recommended is 1440 x 900.</li> <li>CD-ROM drive.</li> <li>Support for one or two 1-GB NICs (One of these is required, and the second is for failover support).</li> <li>Both NIC cards must have the same IP address.</li> </ul>	<ul style="list-style-type: none"> <li>Color monitor (For optimum viewing on the Prime UOM display, we recommend that you use the highest native resolution supported by the client PC and monitor).</li> <li>A large, high-resolution display ensures less scrolling and increases operator efficiency.</li> <li>The minimum resolution recommended is 1440 x 900.</li> <li>CD-ROM drive.</li> <li>Support for one or two 1-GB NICs (One of these is required, and the second is for failover support).</li> <li>Both NIC cards must have the same IP address.</li> </ul>
Software <sup>3,4,5,6,7</sup>	<ul style="list-style-type: none"> <li>One of the following: <ul style="list-style-type: none"> <li>Windows Server 2003 Enterprise Edition with Service Pack 2.</li> <li>Windows Server 2008 Enterprise Edition with Service Pack 2 (32 bit and 64 bit for R1 edition).</li> <li>Windows Server 2008 Enterprise Edition with Service Pack 2 (64 bit for R2 edition).</li> </ul> </li> <li>ODBC Driver Manager 3.5.10 or later<sup>8</sup>.</li> <li>(Optional) NTP—If you plan to use Service Monitor, configure the server to use Network Time Protocol (NTP) to synchronize with the time server that is used by Cisco Unified Communications Managers in your network. See <a href="#">NTP Configuration Notes, page 2-29</a>.</li> </ul>			
CDR processing rate (records per minute) <sup>9</sup>	Upto 50	Upto 200	Upto 600	Upto 800 for 60,000 phones Upto 600 for 45,000 phones

The following list explains the footnotes from [Table 1-2](#) and [Table 1-3](#):

1. When configuring the page file, you should set both the minimum and maximum file size parameters equal to the page file size mentioned above.
2. Disk Space:
  - The OS space requirement is exclusive of the specified value.
  - The disc space must be 100 GB(exclusive of the HDD space), for 60,000 phones.
  - Do not install Prime UOM on a FAT file system.
3. Do not install Prime UOM on a Primary Domain Controller (PDC) or Backup Domain Controller (BDC). Do not install Prime UOM in an encrypted directory. Prime UOM does not support directory encryption.
4. The Operations Manager system can be part of a Windows server domain.
5. The system that you use for your Prime UOM server should meet all the security guidelines that Microsoft recommends for Windows 2003 or 2008 Server. See the NSA website for security guidance: <http://www.nsa.gov/>.

Specifically, the TCP/IP stack should be hardened to avoid denial of service attacks. Refer to the section "Security Consideration for Network Attacks" on page 121 of the The Windows Server 2003 - Security Guide, v2.1 which can be downloaded from the NSA website.
6. The default locale for your Windows operating system must be set to US-English.
7. Windows Terminal Services is supported in Remote Administration mode only. Use of Windows Terminal Services or Remote Desktop and Virtual Network Computing (VNC) to remotely control the server is not recommended for performing day-to-day operations (for example, running reports, keeping dashboards open, and so on). For more information, see [Terminal Server Support for Windows 2003 and 2008, page 1-14](#).
8. To verify the version of ODBC Driver Manager, from the Windows desktop, choose **Start > Settings > Control Panel > Administrative Tools > Data Sources (ODBC)**. Select the **About** tab. If necessary, install Microsoft Data Access Component (MDAC) 2.5 or later.
9. For 30,000, 45,000 and 60,000 phones, busy call rate is 1500 CDRs per minute for 2 hours per day.

**Note**

- Install each application along with its databases on a separate drive. You can install one of the applications on the system drive (C:). However, if you have a sufficient number of drives, we recommend that none of the applications be installed on the system drive.
- Install applications in this order (recommended, not required):
  1. Prime UOM (includes Service Monitor)
  2. Service Statistics Manager
  3. Provisioning Manager (in Advanced mode)

If you have already installed Provisioning Manager, before you install Prime UOM on the same server, perform the tasks in [Preparing a Server Where Provisioning Manager Has Already Been Installed, page 2-5](#).



## Coexistence Guidelines

Table 1-4 lists the minimum requirements for Prime UOM and Service Monitor coexistent installation.

**Table 1-4** Installation Server System Minimum Requirements for Prime UOM and Service Monitor Coexistence

Requirement Type	Minimum Requirements for Coexistent Deployment of up to			
	1,000 Phones and 300 IP Devices	10,000 Phones and 1,000 IP Devices	30,000 Phones and 2,500 IP Devices	60,000 Phones (Including 45,000 Phones) and 2,500 IP Devices
Processor	Two processors or dual core, 2 GHz minimum each	Two processors or dual core, 2 GHz minimum each	Four processors, quad core or (2) dual core, 2 GHz minimum each	Eight processors, quad core or (4) dual core, 2 GHz minimum each
Memory (RAM)	3 GB	8 GB (PAE enabled).	8 GB (PAE enabled).	12 GB (PAE enabled).
Page File <sup>1</sup> . Space	8 GB	8 GB	8 GB	16 GB
Disk Space <sup>2</sup> .	<ul style="list-style-type: none"> <li>84 GB recommended.</li> <li>At least 4 MB in Windows temporary directory (%TEMP%).</li> </ul>	<ul style="list-style-type: none"> <li>84 GB recommended. (Minimum four SAS drivers.)</li> <li>For optimal I/O throughput, you must have a Battery Backed Write Cache (BBWC).</li> <li>We also recommend two I/O controllers (with two disks on each controller).</li> <li>NTFS file system (required for secure operation).</li> <li>At least 16 MB in Windows temporary directory (%TEMP%).</li> </ul>	<ul style="list-style-type: none"> <li>84 GB recommended. (Minimum four SAS drivers.)</li> <li>For optimal I/O throughput, you must have a Battery Backed Write Cache (BBWC).</li> <li>We also recommend two I/O controllers (with two disks on each controller).</li> <li>NTFS file system (required for secure operation).</li> <li>At least 16 MB in Windows temporary directory (%TEMP%).</li> </ul>	<ul style="list-style-type: none"> <li>100 GB recommended. (Minimum four SAS drivers.)</li> <li>For optimal I/O throughput, you must have a Battery Backed Write Cache (BBWC).</li> <li>We also recommend two I/O controllers (with two disks on each controller).</li> <li>NTFS file system (required for secure operation).</li> <li>At least 16 MB in Windows temporary directory (%TEMP%).</li> </ul>

Table 1-4 Installation Server System Minimum Requirements for Prime UOM and Service Monitor Coexistence

Requirement Type	Minimum Requirements for Coexistent Deployment of up to			
	1,000 Phones and 300 IP Devices	10,000 Phones and 1,000 IP Devices	30,000 Phones and 2,500 IP Devices	60,000 Phones (Including 45,000 Phones) and 2,500 IP Devices
Hardware	<ul style="list-style-type: none"> <li>Color monitor (For optimum viewing on the Prime UOM display, we recommend that you use the highest native resolution supported by the client PC and monitor).</li> </ul> <p>A large, high-resolution display ensures less scrolling and increases operator efficiency.</p> <p>The minimum resolution recommended is 1440 x 900.</p> <ul style="list-style-type: none"> <li>CD-ROM drive.</li> </ul>	<ul style="list-style-type: none"> <li>Color monitor (For optimum viewing on the Prime UOM display, we recommend that you use the highest native resolution supported by the client PC and monitor).</li> </ul> <p>A large, high-resolution display ensures less scrolling and increases operator efficiency.</p> <p>The minimum resolution recommended is 1440 x 900.</p> <ul style="list-style-type: none"> <li>CD-ROM drive.</li> <li>Support for one or two 1-GB NICs (One of these is required, and the second is for failover support).</li> </ul> <p>Both NIC cards must have the same IP address.</p>	<ul style="list-style-type: none"> <li>Color monitor (For optimum viewing on the Prime UOM display, we recommend that you use the highest native resolution supported by the client PC and monitor).</li> </ul> <p>A large, high-resolution display ensures less scrolling and increases operator efficiency.</p> <p>The minimum resolution recommended is 1440 x 900.</p> <ul style="list-style-type: none"> <li>CD-ROM drive.</li> <li>Support for one or two 1-GB NICs (One of these is required, and the second is for failover support).</li> </ul> <p>Both NIC cards must have the same IP address.</p>	<ul style="list-style-type: none"> <li>Color monitor (For optimum viewing on the Prime UOM display, we recommend that you use the highest native resolution supported by the client PC and monitor).</li> </ul> <p>A large, high-resolution display ensures less scrolling and increases operator efficiency.</p> <p>The minimum resolution recommended is 1440 x 900.</p> <ul style="list-style-type: none"> <li>CD-ROM drive.</li> <li>Support for one or two 1-GB NICs (One of these is required, and the second is for failover support).</li> </ul> <p>Both NIC cards must have the same IP address.</p>

**Table 1-4** Installation Server System Minimum Requirements for Prime UOM and Service Monitor Coexistence

Requirement Type	Minimum Requirements for Coexistent Deployment of up to			
	1,000 Phones and 300 IP Devices	10,000 Phones and 1,000 IP Devices	30,000 Phones and 2,500 IP Devices	60,000 Phones (Including 45,000 Phones) and 2,500 IP Devices
Software <sup>3.4.5.6.7.</sup>	<p>One of the following:</p> <ul style="list-style-type: none"> <li>Windows Server 2003 Enterprise Edition (32 bit) with Service Pack 1 or 2</li> <li>Windows Server 2008 (R1) Standard or Enterprise Edition (32/64 bit) with Service Pack 2.</li> <li>Windows Server 2008 (R2) Standard or Enterprise Edition (64 bit) with Service Pack 1.</li> <li>Microsoft .NET Framework must be uninstalled for Prime UOM to work properly. If you have Service Pack 2, Microsoft .NET is automatically installed and must be uninstalled permanently.</li> <li>ODBC Driver Manager<sup>8.</sup> 3.5.10 or later.</li> <li>(Optional) VMware ESXi 4.x or ESXi 5.0. For more details, see <a href="#">Table 1-4 lists the minimum requirements for Prime UOM and Service Monitor coexistent installation., page 1-9.</a></li> <li>(Optional) NTP—If you plan to use Service Monitor, configure the server to use Network Time Protocol (NTP) to synchronize with the time server that is used by Cisco Unified Communications Managers in your network. See <a href="#">NTP Configuration Notes, page 2-29.</a></li> </ul> <p>Inline upgradation of Windows is not supported.</p>			
CDR processing rate (records per minute) <sup>9.</sup>	Upto 50	Upto 200	Upto 600	Upto 800 for 60,000 phones Upto 600 for 45,000 phones

The following list explains the footnotes from [Table 1-4](#):

- When configuring the page file, you should set both the minimum and maximum file size parameters equal to the page file size set above
- Disk Space:
  - The OS space requirement is exclusive of the specified value.
  - The disc space must be 100 GB(exclusive of the HDD space), for 60,000 phones.
  - Do not install Prime UOM on a FAT file system.
- Do not install Prime UOM on a Primary Domain Controller (PDC) or Backup Domain Controller (BDC). Do not install Prime UOM in an encrypted directory. Prime UOM does not support directory encryption.
- The Operations Manager system can be part of a Windows server domain.
- The system that you use for your Prime UOM server should meet all the security guidelines that Microsoft recommends for Windows 2003 or 2008 Server. See the NSA website for security guidance: <http://www.nsa.gov/>.  
Specifically, the TCP/IP stack should be hardened to avoid denial of service attacks. Refer to the section "Security Consideration for Network Attacks" on page 121 of the The Windows Server 2003 - Security Guide, v2.1 which can be downloaded from the NSA website.
- The default locale for your Windows operating system must be set to US-English.

7. Windows Terminal Services is supported in Remote Administration mode only. Use of Windows Terminal Services or Remote Desktop and Virtual Network Computing (VNC) to remotely control the server is not recommended for performing day-to-day operations (for example, running reports, keeping dashboards open, and so on). For more information, see [Terminal Server Support for Windows 2003 and 2008, page 1-14](#).
8. To verify the version of ODBC Driver Manager, from the Windows desktop, choose **Start > Settings > Control Panel > Administrative Tools > Data Sources (ODBC)**. Select the **About** tab. If necessary, install Microsoft Data Access Component (MDAC) 2.5 or later.
9. For 30,000, 45,000 and 60,000 phones, busy call rate is 1500 CDRs per minute for 2 hours per day.

## VMware Guidelines

Prime UOM supports VMware ESX 3.5, ESXi 4.x, and ESXi 5.0. Prime UOM must have the same system resources available to it, inside the virtualization environment that it has for a standard (nonvirtual) installation.

While determining the performance of Prime UOM in your virtual setup, you should be aware that the VMware instance will use some system resources that would normally be available to Prime UOM in a standard installation. Additional requirements for running Prime UOM in a virtualization environment might vary with your environment and system load.

Prime UOM can be installed on a virtual machine with dynamic MAC address for evaluation. However, you must configure the virtual machine with a static MAC address to purchase the permanent license for Prime UOM.

The static MAC address is required because licensing uses node-locking technology. The license file can only be used with the static MAC address that you supply.



### Note

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The static MAC address must be within the following range: 00:50:56:00:00:00 to 00:50:56:3F:FF:FF.

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To set up a static MAC address:

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- Step 1** Power down the virtual machine.
  - Step 2** In the Inventory panel, select the virtual machine.
  - Step 3** Click the Summary tab and then click **Edit Settings**.
  - Step 4** In the Hardware list, select **Network Adapter**.
  - Step 5** For MAC address, select **Manual**.
  - Step 6** Change the current MAC address of the virtual machine to a static MAC address in the following range: 00:50:56:00:00:00 to 00:50:56:3F:FF:FF.
  - Step 7** Click **OK**.
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For more information, see *Best Practices for Cisco Unified Communications Management Suite on Virtualization* at this URL:

[http://www.cisco.com/en/US/prod/collateral/netmgtsw/ps6491/ps6705/ps6535/white\\_paper\\_c11-651585.html](http://www.cisco.com/en/US/prod/collateral/netmgtsw/ps6491/ps6705/ps6535/white_paper_c11-651585.html)

For details on ordering additional licenses, see

[http://www.cisco.com/en/US/products/ps6535/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/ps6535/products_data_sheets_list.html).

## Increasing the Paging File Size

When installing on Windows Server 2008, you must configure the paging file. You must change the configuration from Auto to Manual and set file sizes as specified in this procedure.

- 
- Step 1** From the Windows Start menu, choose **Start > Control Panel > System**.
- Step 2** Select the **Advanced** tab and under Performance, click **Settings**.
- Step 3** Select the **Advanced** tab and under Virtual memory, click **Change**.
- Step 4** Under Paging file size for the selected drive:
- Click **Custom size**
  - Enter the same value in both the Initial size (MB) and Maximum size (MB) boxes.  
Virtual memory size must be twice the amount of RAM.
  - Click **Set**.
- Step 5** Click **OK**.




---

**Note** Do not select “Automatically manage paging file size”.

---

## Firewall Updates to Avoid Denial of Service Attacks

Firewall of all types and domain levels must be in disabled state. The Cisco Unified Operations Manager will not work in coexistence with Firewalls.

If you have Windows Server 2003 or Windows Server 2008, use the following procedure to block remote access to all TCP/UDP ports, except for those required for external access by Prime UOM.

The list of ports required for Prime UOM external access are listed in the procedure.

- 
- Step 1** Open Control Panel for Windows Firewall.
- Step 2** Select **On** to block all outside sources from connecting to this computer.  
The exceptions to this rule are documented below.
- Step 3** Select the Exceptions tab and select any services you may want to open for remote access.  
For example, Remote Desktop or File and Print Sharing.
- Step 4** Click **Add Port** to enter your port exceptions.
- Step 5** In the Add a Port window, enter each of the following TCP/UDP ports one at a time and click **OK**:

Description of Service	Protocol	Port Number <sup>1</sup>
CUOM Web Server	TCP	1741
CUOM HTTPS	TCP	443 <sup>2</sup>

Description of Service	Protocol	Port Number <sup>1</sup>
CUSM SFTP Server	TCP	22
CUOM Trap Listener	UDP	161
CUOM Trap Listener	UDP	162
CUOM Syslog Receiver	UDP	514
CUSM Syslog Receiver	UDP	5666

1. Note that external and internal port numbers are the same for all the services that require external access.
2. In certain instances, Prime UOM should not use port number 443. See [Ensuring that Service Statistics Manager Uses the Correct HTTPS Port to Contact Prime UOM, page 2-6](#)

Repeat [Step 5](#) until all ports are entered.

**Step 6** Click **OK** in the Windows Firewall window to close it.

**Step 7** Restart the server for the firewall settings to take effect, if required.

## Terminal Server Support for Windows 2003 and 2008

You can install Prime UOM on a system with Terminal Services enabled in Remote Administration mode. However, you must not install Prime UOM on a system with Terminal Services enabled in Application mode.

If you have enabled Terminal Services in Application mode, you should disable the Terminal Server, reboot the system, and start the installation again.

[Table 1-5](#) summarizes the Terminal Services features on a Windows 2003 or 2008 Server.

**Table 1-5** *Terminal Services on a Windows 2003 or 2008 Server*

Windows 2003/2008 Server	Features
Terminal Server	Remote access and virtual system. Each client has its own virtual OS environment.
Remote Desktop Administration	Remote access only. All clients use the same (and the only) operating system.  Do not use terminal services to perform day-to-day tasks in Cisco Prime Unified Management Communications Suite applications, such as viewing the real-time Fault Monitor in Prime UOM or viewing reports in Service Monitor.

## Enabling and Disabling Terminal Services on a Windows Server

To enable or disable the Terminal Server, go to **Manage Your Server > Add or Remove a Role > Terminal Server**.

To enable or disable remote desktop administration, go to **Control Panel > System > Remote**.

## Enabling and Disabling FIPS on a Windows Server

Sometimes, Federal Information Processing Standard (FIPS)-compliant encryption algorithms are enabled for Group security policy on a Windows server.

When FIPS compliance is enabled, SSL authentication may fail on the Prime UOM server. For Prime UOM to work properly, you must disable FIPS compliance.

To enable or disable FIPS compliance on a Windows server:

- 
- Step 1** Go to **Start > Settings > Control Panel > Administrative tools > Local Security Policy**.  
The Local Security Policy window appears.
- Step 2** Click **Local Policies > Security Options**.
- Step 3** Choose **System cryptography: Use FIPS compliant algorithms for encryption, hashing, and signing**.
- Step 4** Right-click the selected policy and select **Properties**.
- Step 5** Select **Enabled or Disabled to enable or disable FIPS-compliant algorithms**.
- Step 6** Click **Apply**.  
You must reboot the server for the changes to take effect.
- 

## Disabling IPv6

You must disable IPv6 before you install Prime UOM. To disable IPv6:

- 
- Step 1** Type regedit in the Start Search box, and then click regedit.exe in the Programs list.
- Step 2** In the User Account Control dialog box, click Continue.
- Step 3** In Registry Editor, locate and then click the following registry subkey:  
HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip6\Parameters \
- Step 4** Double-click DisabledComponents to modify the DisabledComponents entry.  
If the DisabledComponents entry is unavailable, you must create it. To do this, follow these steps:
- In the Edit menu, point to New, and then click DWORD (32-bit) Value.
  - Type DisabledComponents, and then press ENTER.
  - Double-click DisabledComponents.
  - Re-start Windows 2008 Server.

Type 0xffffffff to disable all IPv6 components, except the IPv6 loopback interface. This value also configures Windows to prefer using Internet Protocol version 4 (IPv4) over IPv6 by modifying entries in the prefix policy table.

For more information about how to disable IPv6 for your operating system version, see the Microsoft Support website at:

<http://support.microsoft.com/kb/929852>

# Client Requirements

Table 1-6 shows the minimum system requirements for Prime UOM clients.

If a client system is available, it is recommended that you perform all configurations and day-to-day activities on the client system. If a client system is not available, the Prime UOM server must also meet all the system requirements for a client system (see Table 1-6).


**Note**

Five clients can connect simultaneously to Prime UOM in Enterprise deployment. Seven clients can simultaneously connect to Prime UOM in multiple end-customer deployment.

**Table 1-6** Client System Requirements

Requirement Type	Minimum Requirements
System hardware	<ul style="list-style-type: none"> <li>Any PC or MAC with an dual-core processor greater than 2.0 GHz minimum.</li> <li>The minimum screen resolution recommended is 1440 x 900.</li> </ul>
System software	<ul style="list-style-type: none"> <li>Microsoft Internet Explorer<sup>1</sup> 8.x or 9.0</li> <li>Firefox 10.0.5 ESR and 13.0</li> </ul> <p><b>Note</b> Operations Manager uses popup dialog boxes at many places. If you have a popup-blocker enabled in your browser, none of these popups will appear. Therefore, you should disable the popup-blocker if you have installed it.</p> <ul style="list-style-type: none"> <li>One of the following: <ul style="list-style-type: none"> <li>Windows Server 2003 Enterprise Edition without Windows Terminal Services.</li> <li>Windows Server 2003 R2.</li> <li>Windows Server 2008 SP2</li> <li>Windows Server 2008 R1 (32/64 bit)</li> <li>Windows Server 2008 R2 (64 bit).</li> <li>Windows XP Professional with SP2.</li> </ul> </li> <li>Adobe Flash Player 11.x. Downloading Flash from the Adobe website requires that you install ActiveX cookies on the system.</li> </ul> <p>An offline installation of Flash may be required if Internet Explorer security patches are present on a newly installed Prime UOM server.</p>
Memory (RAM)	4 GB minimum.
Page file space	2 GB.
Environment	<p>Clients must be able to access Prime UOM:</p> <ul style="list-style-type: none"> <li>From outside a firewall—Refer to documentation for your firewall for how to configure client access.</li> <li>Across a Virtual Private Network (VPN)—The VPN tunnel should connect the client and a VPN router or similar device.</li> </ul>



**Table 1-7** Prime UOM Co-existence Setup - Client System Requirements

Requirement Type	Minimum Requirements
System hardware	<ul style="list-style-type: none"> <li>Any PC or MAC with an dual-core processor greater than 2.0 GHz minimum.</li> <li>The minimum screen resolution recommended is 1440 x 900.</li> </ul>
System software	<ul style="list-style-type: none"> <li>Microsoft Internet Explorer<sup>1</sup> 8.x or 9.0</li> <li>Firefox 10.0.5 ESR and 13.0</li> </ul> <p><b>Note</b> Operations Manager uses popup dialog boxes at many places. If you have a popup-blocker enabled in your browser, none of these popups will appear. Therefore, you should disable the popup-blocker if you have installed it.</p> <ul style="list-style-type: none"> <li>One of the following: <ul style="list-style-type: none"> <li>Windows Server 2003 Enterprise Edition without Windows Terminal Services.</li> <li>Windows Server 2003 R2.</li> <li>Windows Server 2008 SP2</li> <li>Windows Server 2008 R1 (32/64 bit)</li> <li>Windows Server 2008 R2 (64 bit).</li> <li>Windows XP Professional with SP2.</li> </ul> </li> <li>Adobe Flash Player 11.x. Downloading Flash from the Adobe website requires that you install ActiveX cookies on the system.</li> </ul> <p>An offline installation of Flash may be required if Internet Explorer security patches are present on a newly installed Prime UOM server.</p>
Memory (RAM)	4 GB minimum.
Page file space	2 GB.
Environment	<p>Clients must be able to access Prime UOM:</p> <ul style="list-style-type: none"> <li>From outside a firewall—Refer to documentation for your firewall for how to configure client access.</li> <li>Across a Virtual Private Network (VPN)—The VPN tunnel should connect the client and a VPN router or similar device.</li> </ul>

1. Your browser's Internet security level must be set to Medium. To check the current level in Internet Explorer, select **Tools > Internet Options**, and click the **Security** tab.

## Cisco Prime Unified Computing System

Prime UOM can be installed on a Cisco Prime Unified Computing System. If you are going to install Prime UOM on a Cisco Prime Unified Computing System, make sure that the system has the latest firmware installed.

For more information, see [Best Practices for Cisco Prime Unified Communications Management Suite on Virtualization](#).

## Other System Software

Ensure that any prerequisites for interoperable software (such as Service Monitor or Service Statistics Manager) are reviewed and acted upon before installing or upgrading Prime UOM 9.0.

For information on preparing to install, see [Preparing the Prime UOM Serve, page 2-2](#). See the latest information on supported devices and interoperable software at [http://www.cisco.com/en/US/products/ps6535/products\\_device\\_support\\_tables\\_list.html](http://www.cisco.com/en/US/products/ps6535/products_device_support_tables_list.html).

Prime UOM has undergone interoperability testing with McAfee Virus Scan Enterprise 8.0.

While using Prime UOM on a system with virus protection software, it is recommended that you enable virus protection only after the installation is complete. After the installation is complete, we recommend you to [exclude](#) the *NMSROOT* directory, its sub folders and files from virus scanning and on-access scanning.

Problems can arise when Operation Manager files are locked because of virus scanning. Do not schedule active scanning of drives and memory to occur during peak hours. You may experience delays, and performance may be degraded, when the virus scan software is scanning all files.

## System Capacity

[Table 1-8](#) lists the maximum capacity of Prime UOM when it is installed on a system that meets the requirements for the deployment (see [Table 1-1](#)).

**Table 1-8 System Capacity**

System Parameters	Deployment up to:
	2,500 IP Devices and 60,000 Phones
Voice network IP devices <sup>1</sup>	2,500
Access ports <sup>2</sup>	60,000
Trunk ports and interfaces <sup>3</sup>	7,500
Cisco Unified Communications Manager (Unified Communications Manager) clusters	Up to 20
Unified Communications Managers	5-10 per cluster (total Unified Communications Manager nodes should not be more than 100)
Cisco Unified Communications Manager Express and Cisco Unity Express	Up to 600
Survivable Remote Site Telephony (SRST) Devices	Up to 1,000
Route lists and route groups	2,200
Phone status tests	1,000
Phone tests <sup>4</sup>	1,000
Synthetic tests	250
Node-to-node tests/IPSLA tests	500
SRST monitoring	Up to 1,000
Sustained event rate per minute <sup>5</sup>	60

**Table 1-8 System Capacity**

System Parameters	Deployment up to:
	2,500 IP Devices and 60,000 Phones
High event rate per minute <sup>6</sup>	200
Burst events <sup>7, 8</sup>	1,500
Concurrent client (browser) logins	5 clients for enterprise deployment. 7 clients for multi-customer deployment
Phone Access Switch	Upto 1250

1. Upto 500 phone license scales to 100 IP devices. The 501-10,000 phone license scales to 2000 IP devices. The licenses for more than 10,000 phones scale to 2500 IP devices.
2. By default, Prime UOM does not manage access ports; however, it discovers the phones connected to these ports.
3. You can use the `sm_tpmgr` command to view the number of ports and interfaces in your inventory. See the tip below for information on how to use this command in Cisco Prime UOM. The FXO, FXS and T1PRI interfaces are included in the total count. However, the SIP trunks are not included.
4. Phone test scale is for sequential execution in a batch test. Parallel phone tests are not supported in this release.
5. Sustained events are event rates handled by the system on a continuous basis.
6. High events are event rates handled by the system during high activity periods that last for a short duration (up to one hour).
7. Burst events are event rates handled by the system for a one-time high activity period.
8. This is a process event count that includes poll events, traps, syslogs, and service quality traps.

To find out how many trunk and access ports are currently in the Prime UOM inventory, use the `sm_tpmgr` command:

```
#NMSROOT\objects\smarts\bin\sm_tpmgr.exe --server=DFM --sizes
```

Locate the line in the output that is similar to the following:

```
Total Number of Ports: 655 [42/42]
```

In this example, 665 ports were discovered in the server, of which 42 are monitored for connectivity and 42 are monitored for performance.

## Supported Devices and Software

Device adapter packages for all supported devices are installed when you install Prime UOM. Information about device support can be found on Cisco.com at [http://www.cisco.com/en/US/products/ps6535/products\\_device\\_support\\_tables\\_list.html](http://www.cisco.com/en/US/products/ps6535/products_device_support_tables_list.html).

For details on how to configure Cisco devices to be monitored by Prime UOM.

For details on how to configure Cisco software applications (such as Service Monitor, Provisioning Manager, or Service Statistics Manager).



### Caution

Be sure to read the important sections on steps to take before installing Prime UOM. For prerequisite installation steps, see [Preparing to Install Prime UOM, page 2-1](#). For prerequisite migration steps, see [Upgrading the Operating System, page 2-20](#).

# Virtual Voice Application Support

The following Unified Communications applications on Unified Computing Systems can be monitored by Prime UOM:

- Unified Communications Manager
- Unity Connection
- Unified Contact Center Enterprise
- Unified Presence Server
- Voice Portal

Prime UOM supports Unified Communications Manager and Unity Connection 8.0, 8.5, 8.6 and 9.0 running on a virtualized host, with the following caveats:

- Prime UOM treats the virtualized host as a media server. It does not group virtual hosts separately or have separate polling and threshold settings.
- Environment parameters such as temperature sensor, fan, and power supply are not monitored. As a result, related traps and events are not applicable.
- These virtual voice applications are treated as native voice applications. For example, Service Level View displays generic voice application icons and Events Details, use the media server device type.
- Detailed Device View displays the default values for platform attributes. It does not display platform-specific parameters such as environment and system.
- For auto-discovery, device import, or manual discovery, Prime UOM will provide the IP address of the virtual host.
- Unity Connection 8.0 running on a virtualized host does not monitor system processor or CPU usage as System Parameters. As a result, any related traps and events are not applicable.