



Hardware and System Software Specification (Bill of Materials)

Cisco Unified Intelligent Contact Management Cisco Unified Contact Center Enterprise & Hosted Editions Release 7.2(x)

Revision 1.30

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Hardware and System Software Specification (Bill of Materials) for Cisco Unified Intelligent Contact Management/Unified Contact Center Enterprise & Hosted, Release 7.2(x)

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1 Overview

This Hardware and System Software Specification was formerly known as the ICM/IPCC Bill of Materials (BOM). It has been renamed to better reflect its content and purpose. That purpose is to specify the hardware and system software compatible with, and required for, the Cisco Unified Intelligent Contact Management (Unified ICM) and Cisco Unified Contact Center (Unified CC) product¹ for Release 7.2(1) and subsequent 7.2(x) Maintenance Releases (MR).

This document is applicable to both the Enterprise and Hosted options of the Unified ICM and Unified Contact Center solutions.

The information contained herein is intended for use by Certified Partners and Cisco sales and system engineers, for pre-sales hardware planning and third-party software selection, as well as for incremental system updates. In all cases, the reader is assumed to be familiar with the Unified ICM /Unified CC product at an overview level, and to understand high level deployment models and essential application server types such as Logger and PG.

Document content will be updated periodically for technical clarification and to align with subsequently qualified hardware and third-party software. Document updates are typically synchronized with minor and maintenance releases and include updated support policy details for Microsoft Service Pack support qualified for the release. Note that while newly available hardware may be added to this document following initial publication, existing hardware server specifications originally published for a specific configuration will not be rendered obsolete by any subsequent release 7.2(x) specification update.

Release Terminology: Major, Minor, and Maintenance Releases

Release 7.2(1) is a minor software release for the Enterprise and Hosted editions of Unified ICM and Unified CC. A minor release includes incremental new functionality in addition to software defect fixes, delivered in an automated patch installer that includes full rollback capability. Release 7.2(1) is the second minor release update to major Release 7.0(0).

Note that minor Release 7.2(1) and subsequent maintenance releases to 7.2(1) are referenced generically in this document as Release 7.2(x)—except where a distinction is necessary.

Unified ICM /Unified CC 7.0(x) or 7.1(x) installation is a prerequisite to 7.2(1) and subsequent MRs.

Hardware, System Software², and Capacity Sizing

To simplify mapping of the hardware server configurations across various deployments, server hardware is identified as a “server class” for both MCS and vendor-sourced (“generic”) servers. A server class contains one or more hardware types, based on category of processor family, memory, and hard drive configuration appropriate for the specified application. Server classes are detailed in Appendix A – Server Classes.

Hardware and associated system software are specified by Unified ICM/Unified CC system server configuration with consideration for both the overall deployment model and the specific server software component configuration. Capacity sizing is an integral factor in proper requirement specification. Where requirements are tiered by system sizing, defined operating conditions and representative sizing thresholds (such as the maximum number of supported agents) are indicated. Special consideration is provided for installations being upgraded to Release 7.0(0) on existing hardware. A summary of system configuration boundaries is also provided, followed by specific Unified ICM /Unified CC solution deployments and the applicable corresponding hardware and software requirements, by server node type and capacity range. Each configuration is prefaced with a representative set of primary operating conditions on which sizing is based, with exceptions and special considerations called out under applicable server node.

Cisco strives to enhance the usefulness of this document by ensuring accurate detailed technical information backed by an extensive in-house testing and qualification effort. We have increased the amount of sizing and system boundary

¹ See the Note on Cisco Product Names on page 4.

² System software consists of the operating system, database server, and other 3rd party applications.

information to more accurately portray expected capacity and sizing limitations of specific deployments. The reader must recognize, however, that the Unified ICM and Unified CC systems are by design highly scalable and complex distributed systems, and it is often difficult to characterize representative configuration and workload /call flow scenarios – particularly for the high end Unified ICM Enterprise and Unified ICM Hosted customer. Cisco often defaults to a conservative stance in sizing limitations to arrive at capacities that have the broadest level of applicability. For this reason, the system sizing and configuration limitation information contained herein should be considered as guidelines which are applicable to the vast majority of customers, but which may also have exceptions. Where specific circumstances and/or complex system designs dictate, Cisco strongly encourages Partners and customers to consult with our Advanced Services / World Wide Voice Practice teams for further analysis and approval of specific deployments.

1.1 Updated Information in this Document

Table 1-1: Updates Made for July 2008 Republication

This document updates the previous version with the following changes (note that substantive changes from the previous version of this document are indicated by highlighting):

Rev.	Section	Notes
1.30	5.2.1	Updated Maximum Campaigns and Campaign Skill Groups in table.
1.28	5.8.14	Updated the link to the manual <i>Integrating CAD 6.0 Into a Citrix Thin Client Environment</i> .
1.26	5.1	Reverted the changes made during revision 1.20. Modified the maximum number of PIMs supported on a VRU PG from 8 to 10.
1.25	5.9.6	Windows Vista support for CAD
1.24	5.9.6	Windows XP Professional SP3 supported by CTI OS 7.2(7) and above.
1.23	5.9.8	CSA 5.0 Policy 3.0.x has been upgraded to CSA 5.2 Policy 4.0.x
	5.9.6	Windows XP Professional SP3 supported by CAD
1.22	5.8.7	Split VRU PG table into New/Tech. Refresh and Common Ground; increased capacity
1.21	5.9.10	Remove SP2 from supported operating system service packs for CCMP
1.20	5.3	Added notes that CAD Server must be installed co-located with PG components. Deleted Tables 5.9 and 5.14 that showed capacity numbers for (now unsupported) separate CAD server.
	5.8.18	New section and content: CRM Connectors
	5.3.5	New section and content: Remote Silent Monitoring (RSM)
	5.4	Added clarifying tables for System CCE – server disk requirements
	4.1, 5.6.1	Clarification of disk drive configuration and server requirements for CCMP
	5.3.2 and 5.3.3	Removed the statement “The maximum number of Outbound-only (non-blended) agents is two times the number of dialer ports.”
	5.8.3	Changed maximum report data set size from 4,000 to 3,000
	5.9.1	Added explicit statement that 64-bit editions of Windows Server are <u>not</u> supported.
	5.1	Changed maximum VRU PIMs per VRU PG from 10 to 8.
4	Clarified NAS and SAN support.	
1.10	All	Changed version references of 7.2(1) to 7.2(x) to designate that all 7.2 MRs are indicated. General cleanup with reformatting of capacity tables to simplify and clarify.
	Appendix A	Added server GEN-50-005-Class (which replaces GEN-50-004-Class) and updated AW/HDS tables accordingly to include this server class. Removed GEN-30-001-

Rev.	Section	Notes
		Class, GEN-10-002 to GEN-10-004 classes. Grayed out flavors of server classes that are no longer available for purchase. Updated GEN-10-005-Class and GEN-20-004-Class specifications. Added a GEN-30-002-Class server specification.
	Table 5.1	Changes: <ul style="list-style-type: none"> • “Number of dialers per PG” to “Number of dialers per PG pair (side A + side B) • Added “Max Outbound dialers per system” and comment • Added comment for “All-event clients (CTI Server)
	Table 5.2 et. al.	Changed ECC Usage (bytes) to ECC Variables indicating the maximum number of scalars per deployment vs. bytes. Removed ECC columns from other tables.
	Outbound Servers	Deleted the (old) tables for Outbound Option Servers – Tables. 5.9 and 5.14.
	Tables 5.28 and 5.45	Updated Eicon PCI card details

2 References

Cisco Unified Intelligent Contact Management / Unified Contact Center Enterprise and Hosted product information can be found on www.cisco.com.

Product documentation, including planning, upgrade, install, configuration, reporting, reference, and developer documentation, is available at [Cisco Product Support](#).

Other useful documents include:

- ◆ *Cisco ICM Software ACD Supplements*
http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_technical_reference_list.html
- ◆ *Cisco ICM ACD PG Supportability Matrices*
http://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/icm_enterprise/acd_supplements/icmacdmx.pdf
- ◆ *Cisco IPCC Enterprise Edition Compatibility Guide for IPCC*
http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_implementation_design_guides_list.html
- ◆ Cisco End of Life and End of Sales Notices
http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_eol_notices_list.html
- ◆ *Contact Center Enterprise Solution Reference Network Design (SRND)*
http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_implementation_design_guides_list.html

Note: The documents listed above are not necessarily updated on the same schedule as the *Hardware and System Software Specification (Bill of Materials)*. For that reason, specification data may differ between this document and the references cited.

2.1 Note on Cisco Product Names

Cisco ICM Enterprise Edition is renamed “Cisco Unified Intelligent Contact Management Enterprise” (abbreviated as Unified ICME).

Cisco ICM Hosted Edition is renamed “Cisco Unified Intelligent Contact Management Hosted” (abbreviated as Unified ICMH).

Cisco IP Contact Center (IPCC) Enterprise Edition and Cisco IPCC Hosted Edition are renamed “Cisco Unified Contact Center Enterprise” (abbreviated as Unified CCE) and “Cisco Unified Contact Center Hosted” (abbreviated as Unified CCH), respectively. Cisco System IPCC is renamed “Cisco Unified System Contact Center Enterprise” (abbreviated as Unified SCCE).

The use of the generic abbreviation “ICM” is intended to include both Unified ICMH and Unified ICME.

The use of the generic abbreviation “CC” is intended to include Unified CCH, Unified CCE and Unified SCCE.

3 Servers for Cisco Contact Center Applications

The Unified ICM/Unified CC solutions are fully supported on the Cisco 7800 Series Media Convergence Server (MCS) family of Intel-based, high performance hardware servers. The MCS 7800 family is an integral part of a complete and scalable Cisco Voice architecture solution for the enterprise, thoroughly tested for compatibility and optimal performance with the Unified ICM/Unified CC product. MCS servers have a proven track record of high reliability, offer a common consistent architecture across Cisco Voice applications, and accommodate value-added support services such as Cisco's SMARTnet (technical support services).

The range of MCS server sizes aligns with specific Unified ICM/Unified CC server node types and the corresponding anticipated capacity of a given solution. As explained in Section 1 and listed in [Appendix A – Server Classes](#), MCS servers are categorized in this document by “server class” designation. Specific class(es) are, in turn, listed as applicable to a given Unified ICM/Unified CC server node type and capacity in Section 5.2.2 [Unified ICM/Unified CC Hardware and Software Requirements](#). Where specific Unified ICM/Unified CC component server requirements dictate certain hardware capabilities (e.g. SCSI disk drives for high transaction SQL Server or Oracle deployment, or dual processor configurations to achieve specific system performance metrics), the applicable MCS server(s) is depicted.

Full detail on the range of MCS servers and their features can be found at the following reference: <http://www.cisco.com/go/mcs>.

Unlike the Cisco Call Manager (CCM) and associated products, MCS servers ordered for Unified ICM/Unified CC deployments do not include a customized distribution of the operating system. Users ordering MCS for Unified ICM/Unified CC must also order the appropriate editions of Windows Server 2003 and, for database, SQL Server 2000. Unified ICM/Unified CC MCS customers assume primary maintenance responsibility for their Windows environment. Cisco does, however, provide as a service ongoing Microsoft security patch certification for Unified ICM/Unified CC; see the *Security Best Practices for Intelligent Contact Management Software* guide, available at:

http://www.cisco.com/en/US/customer/products/sw/custcosw/ps1001/prod_technical_reference_list.html

Cisco strongly recommends the use of MCS servers for all applicable Unified ICM Enterprise and Hosted solution applications. For a 7.2(x) release, the MCS server solution is required for all Unified CC Enterprise (including System CCE) deployments. Only exact-match OEM equivalent servers from Cisco-selected manufacturers may be substituted for Cisco MCS servers for Unified CC deployments. This requirement applies to new deployments and expansions. Consult Cisco for additional details. <http://www.cisco.com/go/swonly>.

If you have non-MCS hardware, you may upgrade to a 7.2(x) release and remain on that hardware as long as your hardware specifications comply with [Appendix A – Server Classes](#), and your contact center capacity requirements are within the capacity limits listed in Section 5. For Unified ICME and Unified ICMH customers, non-MCS (“generic”) servers that essentially match MCS specifications for a given server class may be deployed; these are separately specified in [Appendix A – Server Classes](#). Note that high end carrier-class generic servers are specified for specific applications that have no current MCS equivalent.

4 Server Hardware Configuration Guidelines

This section provides system integrators and customers with guidelines, supported and unsupported server hardware, and storage configurations. Cisco MCS servers pre-package a number of the specified options; however Cisco Unified ICM and Unified CC applications require special consideration to meet the high performance demands of the system. Whether acquiring Cisco MCS servers or 3rd party hardware, special care should be given to choose the appropriate level of hardware redundancy and a storage solution specific to the application nodes for which the servers are intended. Of particular importance are the storage controller, number (and capacity) of disks, and RAID configuration available. Furthermore, for customers with large configurations and/or long historical data retention period requirements, additional guidelines are provided.

Note that Cisco does not currently fully support deployment of the Unified ICM/Unified CC solution on a server “blade” chassis form factor. Evaluation of blade deployment is under consideration; in the interim, customers interested in pursuing blade deployments have an option available to them that provides flexibility but limits Cisco support liability should hardware or chassis control software negatively affect Unified ICM/Unified CC operation (including fault tolerant recovery). Refer to Cisco’s policy paper on the topic for more information:

http://www.cisco.com/en/US/partner/products/sw/custcosw/ps1001/prod_bulletin0900aecd802d04e5.html

Recommended Redundant Hardware

Supported components:

- ◆ Power supplies
- ◆ Fans
- ◆ Memory
- ◆ Storage controllers
- ◆ Disks (RAID)

Unsupported components:

- ◆ Redundant network interface cards

Caution

Using network interface card teaming or other forms of redundant Ethernet adapters has been proven to introduce packet delivery/reception problems capable of generating latency sufficient to cause application problems.

Central Processing Unit

Cisco has qualified and now supports dual-core Intel processors on its full range of products. Each individual core in a multi-core processor does not count as a processor towards server requirements given in [Appendix A - Server Classes](#). A processor is considered a single physical CPU, regardless of the number of cores.

Network Interface Card (NIC) Speed/Duplex Configuration

NIC Capability ↓	Switch Port Capability	
	10/100 Mbps	1000 Mbps
10/100 Mbps	10/100 Mbps Full Duplex	10/100 Mbps Full Duplex
1000 Mbps	10/100 Mbps Full Duplex	Auto

Severe network communication problems are likely when 10/100 Mbps NICs and switch ports are not BOTH explicitly set to the capable speed in Full Duplex operation.

Cisco highly recommends the use of gigabit (1000 Mbps) server network interface cards and gigabit network switches.

Storage Hardware

Cisco Unified ICM and Unified CC are I/O intensive applications that handle call routing, process logging, and historical archiving. I/O write operation capacity is of particular criticality. The use of SCSI hard disk drives is the default required

unless otherwise specified. Components where Serial or Parallel ATA drive use is acceptable are explicitly identified in the applicable node's hardware specifications.

Required controllers:

- SCSI/SAS
 - Ultra160/3 (minimum)
 - Ultra320 (recommended)
 - SAS 3.0Gb/s (highly recommended)³
- ATA
 - Serial (recommended)
 - Parallel

Disk Speed:

- SCSI/SAS
 - 3.5" Form Factor
 - 15,000 RPM for Cisco Unified ICM and Unified CC Loggers, Historical Data Servers and other database servers
 - 10,000 RPM (minimum) for all other nodes
 - 2.5" Form Factor
 - 15,000 RPM preferred for database servers (if available)
 - 10,000 RPM (standard) for all other nodes
- ATA
 - 7,200 RPM

Configuration guidelines:

- A dedicated on-board or add-in RAID controller must be used with a minimum of 128 MB of battery backed cache.
- Increasing the number of physical drives increases the overall fault tolerance of the disk array.
- Use multi-channel controllers connected to discrete drive bays or backplanes.

Note:

Multiple controller channels can be of significant advantage when there are multiple drive bays and backplane connections. Each channel of the controller can connect to a separate backplane connection, and arrays split between the channels and backplanes can take advantage of the increased throughput as well as increased resiliency.

- Two channels per external storage enclosure.
- Multiple external storage enclosures are desirable (when needed) for increased performance and fault tolerance.
- External storage enclosures with dedicated RAID controllers are supported with MCS server systems.

Supported configurations:

- Fibre Channel is supported only in a point-to-point topology deployment.
- Dedicated on-board or add-in RAID controllers are required to use any of the RAID levels supported.
- RAID 1 (Mirroring and Duplexing) – This is the minimum RAID level for all critical Unified ICM and Unified Contact Center components. See [Appendix B – RAID Configuration Requirements](#) for details. Mirroring is typically used for boot drives on all servers to prevent loss of data and down time in the event of a disk failure.

³ Serial Attached SCSI. This is a new SCSI interface and is applicable to all SCSI requirements found in this document.

- RAID 10 (A Stripe of Mirrors) – This is the required RAID level for all medium to large Unified ICM/Unified CC Logger and HDS nodes. RAID 10 offers the highest performance needed to meet the demands of SQL Server and the Logger or HDS, while still maintaining a safe level of redundancy.

Unsupported configurations:

- Fibre Channel Arbitrated Loop (FC - AL) fabric topology
- Software based RAID provided by the operating system or other software
- Proprietary RAID solutions
- RAID 5 (Block Interleaved Distributed Parity)
- RAID 0 (Striped Disk Array without Fault Tolerance)
- RAID 0+1 (A Mirror of Stripes)

Caution

Typically used for redundancy in file server applications, RAID 5 has been observed in product testing to manifest considerable performance degradation in write intensive applications. RAID 5 is thus not supported for new deployments. When “technology refresh” upgrading, configure the target server array (that which is replacing the existing RAID 5 array) for RAID 10.

RAID 0 is not supported due to the lack of fault tolerance. If one drive fails, then all data in the array is lost.

RAID 0+1 is not supported due to increased risks of data loss or down time in the event of a failure.

- Network Attached Storage (NAS)

NAS solutions pose unacceptable risk due to the variability of the interface between the server and the NAS device; specifically, latency and bandwidth of the network link can introduce performance delays that put the solution at risk. Because of this variability, Cisco cannot support NAS for Unified ICM or Unified Contact Center.

Alternative storage option:

Unified ICM and Unified CC server components are qualified and tuned for optimal operation on a dedicated storage solution – direct attached (internal/external) SCSI or SAS. However, recognizing that some deployments have data retention needs that exceed the storage capabilities of direct attached disk arrays, Cisco is prepared to endorse the use of a Storage Area Network (SAN) under the following conditions:

1. The SAN must be dedicated to Unified ICM/CC only; the SAN may not be shared with other applications.
2. The SAN may be used for historical databases (HDS) only.
3. The SAN host interface (e.g. Fibre Channel) must meet or exceed the performance specifications of supported (direct attached) SCSI/SAS interfaces (see *Storage Hardware, Required Controllers* above).
4. Each individual drive in the SAN array must meet or exceed the performance specifications of supported (direct attached) disk drives (see *Storage Hardware, Disk Speed* above). (Note: SATA drives are not supported.)
5. The SAN disk array must be configured as RAID 10, for added performance and fault tolerance.

SAN solutions are typically deployed in a shared environment where multiple applications are contending for storage access. Because of the real-time nature of the Unified ICM/Unified CC application, such an environment cannot be supported; the conditions listed above are necessary to ensure that the deployment performs within published capacity limits. If the SAN storage deployment is identified as affecting the functions of the contact center solution, the customer will be required to deploy a direct attached storage solution instead. Moreover, if in the process of troubleshooting, the SAN itself is identified as the problem, the customer must contact the system integrator or the SAN vendor for resolution.

Unqualified backup options:

- Backup device option decisions are left to the end customer; no backup products are explicitly qualified by Cisco.

Caution

For performance reasons, backups must be performed outside of business hours or during periods of lowest activity. Cisco does not provide recommendations for specific backup devices or products, but internal and other direct-attached devices may have restrictions on what platforms they are compatible with. Consult your hardware vendor to determine options for internal or external storage.

4.1 Unified Contact Center Management Portal Data Storage and Backup

Storage Hardware

- SCSI/SAS
- Serial ATA (small systems only)
 - NCQ controllers
 - 7200rpm

Configuration Guidelines

- Single Server System / Secure System - Web Application Server
 - Six disks: Disks 1-2: OS, program executables, Windows page file: RAID 1
Disks 3-6: Database files and transaction log: RAID 10
- Secure System – Database Server
 - Eight Disks: Disks 1-2: OS, program executables, Windows page file: RAID 1
Disks 3-8: Database files and transaction log: RAID 10

Backup Options

The database backup strategy may be set by the customer according to their own in-house strategies.

The suggested policy for backup of the Portal is:

- Nightly incremental backup
- Weekly full backup

4.1.1 Database Sizing

The size of the RDBMS is calculated by the following formula:

$4 * \text{Cisco Unified ICM size} * (\text{Desired retention period} / \text{Cisco purge period})$

For example, if the Cisco HDS is sized at 1GB for 8 weeks of storage and the customer wishes to retain data for 52 weeks, the formula would then be:

$4 * 1\text{GB} * 52/8 = 26\text{GB}.$

5 Software Upgrade Considerations

Upgrading an Unified ICM/Unified CC installation from Release 5.0 or 6.0 requires that you first upgrade the entire system to 7.0(0). You can then install a 7.2(x) release on your upgraded 7.0(0) system. See also the Overview on page 1.

This section describes the considerations for this process.

5.1 Upgrading to Unified ICM/Unified Contact Center Release 7.0(0)

Upgrading to Unified ICM/Unified CC Release 7.0(0) is explained in the *Upgrade Guide for Cisco Unified ICM/Unified CC Enterprise & Hosted Editions*. This section highlights some of the considerations to be aware of.

There are two distinct approaches for upgrading an existing Unified ICM/Unified CC installation to the 7.0(0) release of the software:

- **Technology Refresh:** Install and configure the system and product software on newly acquired hardware, migrating historical and configuration data from the prior hardware environment.
- **Common Ground:** Upgrade software in-place on pre-existing hardware, migrating data in-place.

In both the above cases, the Unified ICM/Unified CC database is migrated using a newly introduced migration utility known as the Enhanced Database Migration Tool (EDMT). EDMT streamlines the upgrade process by migrating data and schema efficiently in bulk (usually over the course of a single maintenance window) and with an improved user interface. This replaces the prolonged “shadow copy” process of prior upgrades. Both EDMT and detailed procedures for the overall upgrade and migration can be found in the *Upgrade Guide for Cisco Unified ICM/Unified CC Enterprise & Hosted Editions*.

Deciding on the appropriate upgrade path depends in part on whether a customer’s existing hardware is suitable for the 7.0(0) deployment. Cisco recognizes the importance of protecting a customer’s investment in recent generation hardware, and for that reason ongoing qualification of the Unified ICM/Unified CC product is extended to address older hardware. At the same time, given significant strides in processor speeds (and multiple cores) as well as increasing computational demand from both the system and application software, a level of relative concurrency in supported hardware is maintained. As a guideline, Cisco minimally certifies and supports the current release hardware that met the corresponding product Hardware and System Software Specification (Bill of Materials) when purchased new two major releases back. Capacity and sizing numbers differ between those for “minimum recommended” and currently available hardware models – and capacity profiles presented in Section 5.2.2, [Unified ICM/Unified CC Hardware and Software Requirements](#), reflect that difference between capacities shown for new deployments (and technology refresh) versus common ground upgrades. The current generation (new deployment) hardware specified is strongly encouraged for all upgrades, to fully exploit the call processing capacity designed into the Unified ICM/Unified CC product.

Unified ICM/Unified CC Release 7.2(x) is optimized for the Windows Server 2003 operating system (both Standard and Enterprise Edition), and all new installs must be performed on that operating system. Ongoing support for Release 7.0(0) (Unified ICM and Unified CC) running on Windows 2000 Server effectively ended in October 2006 (one year following the General Availability date of the Windows Server 2003-compatible 7.0 product)⁴.

Recognizing the significant impact of an operating system deployment in the upgrade scenario, Cisco continues to provide for updates to the 7.1(x) version of the product on the Windows 2000 Server platform, provided customers subsequently migrate to Windows Server 2003 *within 30 days of the upgrade*. This policy will NOT continue with any subsequent version updates beyond 7.1(x), either major (e.g. 8.0(x)) or minor (7.2(x)) versions — which will require Windows Server 2003 as prerequisite to their installation.

⁴ Windows 2000 mainstream support from Microsoft ended on June 30, 2005. Microsoft offers Extended Support for five (5) years after the end of mainstream support, or for two (2) years after the second successor product (N+2) is released—whichever is longer. Refer to the *Windows Product Family Lifecycle* at <http://www.microsoft.com/lifecycle> for the latest information.

Although PGs are supported back two previous versions, to eliminate defects and add feature enhancements, the PGs should be upgraded to the same version as the Central Controller. In addition, to minimize upgrade complications Cisco recommends all components be at the same version prior to performing the upgrade.

Hosted Note: Assure Central Site PGs are the first PGs to be upgraded. All other sites can be subsequently upgraded due to the sheer volume of PGs that are involved.

An equally important consideration for hardware compatibility requirements are those derived from the Microsoft operating system and system software (most notably SQL Server 2000). Note that the Unified ICM/Unified CC solution requirements outlined in this document match and in some cases exceed like requirements from Microsoft. For example, while Microsoft SQL Server 2000 Enterprise Edition is not technically required (over SQL Server Standard Edition) with a total of 4GB of physical memory and four or fewer processors, there are mission critical, high database load scenarios where Enterprise Edition is suitable with the Unified ICM/Unified CC application. (Because Cisco performs all SQL Server Enterprise Edition qualification on Windows Server 2003 Enterprise Edition, the latter is likewise required whenever SQL Server Enterprise Edition is itself deployed.) Details are covered in [Section 5.9.2](#). In all cases, the Microsoft operating system and SQL Server software Service Pack (SP) updates must be applied to meet the levels specified herein. This is important for operational integrity as well as for security. Cisco tests extensively against published Service Pack support levels, and each new Service Release is tested against all relevant security updates.

Additional important upgrade information follows:

- ◆ A Unified ICM/Unified CC system is always upgraded from a prior release starting with the central controller (Router and Logger) servers.
- ◆ Upgrades of duplexed systems are typically done one “side” at a time.
- ◆ As with any major release upgrade, Release 7.0(0) requires that the HDS systems be themselves upgraded to coincide with the Logger to which they communicate.
- ◆ Peripheral Gateway (PG) nodes are typically the last servers to be upgraded; the 7.0(0) upgrade will support 4.6.2 PGs through the upgrade transition, but all PGs must be running a minimum of release 5.0(0) for a fully supported system configuration. (Release 7.x(x)) PGs are strongly encouraged, allowing the customer to take advantage of several key PG enhancements made in the area of supportability, scalability, and feature support.)
- ◆ Unified ICM Hosted and Unified CC Hosted customers may, as with prior major releases, upgrade their NAM and CICM servers in either order to best suit their operational requirements. Also like prior releases, however, the NAM-to-CICM protocol support inherent in the Hosted Edition software supports only a single major back-level release. For Unified ICM/Unified CC Hosted 7.0(0), this means the interface opposite that being upgraded must itself be at release 7.0(0) (or later).
- ◆ The documented procedures for upgrading to Unified ICM/Unified CC Release 7.0(0) require a starting baseline of ICM/IPCC 5.0(0) or 6.0(0), running on the Microsoft Windows 2000 Server operating system (SP4) with Microsoft SQL Server 2000 (SP3a or SP4). Upgrade customers currently deploying releases earlier than release 5.0(0) will need to provide a transitional upgrade to 5.0(0) or 6.0(0) as a staging release. This step will require database migration from the earlier release to 5.0(0)/6.0(0), and for that reason the upgrade requires stabilization on the transitional release and is thus not a multi-step process accomplished in a single maintenance window.
- ◆ Microsoft Windows 2000 Update Rollup 1 for Service Pack 4 is supported by the various components of Cisco Unified ICM/Unified CC 7.0(0) SR1 or later during the upgrade period. Update Rollup 1 is an elective add-on to SP4 that is supported where Windows 2000 itself is supported.

- ◆ Upgrades from ICM/IPCC 5.0(0) or 6.0(0) to Unified ICM/Unified CC 7.2(x) require an upgrade to 7.0(0) and an upgrade of the operating system to Microsoft Server 2003 prior to installation of a 7.2(x) minor release.

Caution: If the computer has certain earlier non-Plug and Play ISA, EISA, or MCA SCSI controllers installed, when you restart a computer after you install Update Rollup 1 for Microsoft Windows 2000 Service Pack 4 (SP4), you may receive something similar to the following Stop error message:
***Stop 0x0000001e {0xc0000005,0x804a1a51,0x00000000,0x000000b0}

KMODE_EXCEPTION_NOT_HANDLED

This stop condition results from a problem in the Scsiport.sys driver that is included in Update Rollup 1 for Windows 2000 SP4. For details on this problem, and to obtain a Microsoft hotfix that deals with the problem, see the Microsoft Knowledge Base on "Update Rollup 1 for Windows 2000 SP4 and known issues" (Article ID 891861).

5.2 Installing Unified ICM/Unified Contact Center Maintenance Releases

For all ICM Releases 7.1(2) and later, service releases (SR) are being renamed as Maintenance Releases (MR). Cisco Unified ICM/Unified CC Enterprise & Hosted. maintenance releases are cumulative updates to previous releases. As a result, applying Release 7.1(5) installs all the functionality contained in Unified ICM/Unified CC 7.0(0) SR1 through SR4, 7.1(1), 7.1(2), 7.1(3), 7.1(4) as well as the new 7.1(5) content. Due to this, ensure you read the relevant Release Notes prior to installing Release 7.1(5).

Maintenance Release 7.1(5) can be installed over Unified ICM/Unified CC 7.0(0) FCS, 7.0(0) SR1 through SR4, 7.1(1), 7.1(2), 7.1(3) or 7.1(4). Refer to the *Installation Guide for Cisco Unified ICM/Unified CC Enterprise & Hosted Editions, Release 7.1(1)* for detailed installation instructions.

5.2.1 Unified ICM/Unified Contact Center Configuration Limits and Scalability Constraints

The following table specifies the configuration limits and scalability constraints for the Unified ICM/Unified CC products. These configuration limits are part of the Unified ICM/Unified CC product design constraints and were utilized for system sizing characteristics as tested by Cisco. Most of these system parameters (or combinations of these system parameters) form contribution factors which impact system capacity.

When you design your contact center, take special care to ensure your design is deployed within these limits. Please see applicable specific comments in the table below for additional detail. Consult Cisco if you have special configuration requirements that may exceed specific parameter(s).

The check mark in the table indicates that a given parameter is applicable to the indicated Unified ICM/Unified CC product edition.

Table 5-1: Configuration Limits and Scalability Constraints, Unified ICM, Unified CC

Limit	Value	Unified SCCE	Unified CCE	Unified ICME	Unified CCH	Unified ICMH	Comments
Maximum ECC (Extended Context Call) Variables Size (bytes) ⁵	2,000	✓	✓	✓	✓	✓	CVP, CEM, and Outbound rely on a subset of this max limit for integration with Unified ICM.
Number of Peripheral Variables (Call Variables)	10	✓	✓	✓	✓	✓	Also known as User Variables in System CCE.
Maximum Peripheral Variable Length (characters)	40	✓	✓	✓	✓	✓	
Maximum VRU PIMs per VRU PG	10	N/A	✓	✓	✓	✓	
Maximum VRU PIMs per Generic PG	8	N/A	✓	N/A	✓	N/A	
Maximum VRU PIMs per System PG	5	✓	✓	N/A	N/A	N/A	
Maximum TDM PIMs per PG	5	N/A	N/A	✓	N/A	✓	Multiple PIMs on a PG can impact performance, thus lowering the total number of agents and IVR ports and call volume supported when compared to a single PIM per PG. There is a maximum of one PIM per TDM PG with CTI OS co-resident.
Maximum MR PIMs per PG	10	N/A	✓	✓	✓	✓	
Maximum MR PIMs per PG in System CCE	1	✓	N/A	c	N/A	N/A	
Number of PGs per server	2	N/A	✓	N/A	N/A	✓	This is not applicable to multi-instance CTI OS in a Unified CCH environment.

⁵ The maximum indicated is independent from the number of ECC variables used, with each representing approximately 50 bytes additional storage per record. Note also that with the introduction of selective ECC variable persistence in Unified ICM/Unified CC 7.1, the maximum includes both persistent and non-persistent variables.

Limit	Value	Unified SCCE	Unified CCE	Unified ICME	Unified CCH	Unified ICMH	Comments
Number of PGs per CICM instance	80	N/A	N/A	N/A	✓	N/A	This is only applicable to Unified CCH with multi-instance CTI OS deployment.
Number of PGs per server for System CCE	1	✓	N/A	N/A	N/A	N/A	
Number of duplex PGs per ICM instance	80	N/A	✓	✓	✓	✓	
Maximum VRU operations per second per VRU PG	100	N/A	✓	✓	✓	✓	Using Service Control Interface and 4 IVR operations per call.
Maximum HDS Servers per Logger side	2	✓	✓	✓	✓	✓	
Maximum instances per CICM platform	25	N/A	N/A	N/A	✓	✓	This assumes that the total offered load for all instances and their configurations are within the limit of a maximum capacity of a single instance.
Maximum CICMs per NAM platform	75	N/A	N/A	N/A	✓	✓	The maximum CICM physical servers per NAM are six. Consult your Cisco representative if you need more than six.
Maximum CTI OS per PG	1	✓	✓	✓	N/A	✓	
Maximum instances per PG/CG/CTI OS server	10	N/A	N/A	N/A	✓	N/A	
Maximum HDS instances per Hosted Distributor server	10	N/A	N/A	N/A	✓	✓	
Maximum number of reskilling “saves” per hour	120	✓	✓	✓	✓	✓	Agent Reskilling Tool – maximum number of save operations across all AWs in the solution in a 1-hour period

Limit	Value	Unified SCCE	Unified CCE	Unified ICME	Unified CCH	Unified ICMH	Comments
Maximum number of dialers per PG pair (Side A + Side B)	2	N/A	✓	✓	✓	✓	
Maximum number of dialers per PG pair (Side A + Side B) for System CCE	1	✓	N/A	N/A	N/A	N/A	
Maximum number of dialers per system (total)	32	✓	✓	✓	✓	✓	Note: When the number of dialers per system exceeds 16, the Logger and HDS must be updated to GEN-50-005-Class.
Campaigns per system	100	✓	✓	—	✓	—	Campaigns per system
Campaign skill groups per system	100	✓	✓	—	✓	—	Total skill groups from all campaigns
Campaign skill groups per campaign	20	✓	✓	—	✓	—	Limitation on skill groups for any given campaign (as long as the max 100 campaign skill groups per system not exceeded)
All-event clients (CTI Server)	7	✓	✓	✓	✓	✓	In the case where CTI OS is used, the number available decreases to 5 since CTI OS will use 2 of the 7 maximum.

Note: For Unified CCH, there is only one instance of dialer per CICM with a maximum of 2 Dialers per machine.

5.2.2 Unified ICM/Unified Contact Center Hardware and Software Requirements

Unified ICM/Unified Contact Center Operating Conditions

Except when explicitly specified, the Unified ICM/Unified CC hardware selection described in this section is based on the following operating conditions. In determining how to size a Unified ICM or Unified CC software implementation, it is important to consider the factors listed here. While there are additional variables that would impact system capacity, Cisco has chosen a representative subset and provided a set of values on which the sizing limitations herein are based.

Table 5-2: Operating Conditions, Unified ICM, Unified CC

Operating Condition	Value	Unified CCE	Unified ICME	Unified CCH	Unified ICMH	Comments
Maximum Number of CTI OS Servers per PG	1	✓	✓	✓	✓	Simplex CTI OS System
	2	✓	✓	✓	✓	Duplex CTI OS System

Average skill groups per agent per team	5	✓	✓	✓	✓	Does not include default skill group Assumes 17 stats per skill group enabled
Number of Supervisors	10%	✓	N/A	✓	N/A	10% of total agent population
Number of Teams	10%	✓	N/A	✓	N/A	10% of total agent population (9 agents and one supervisor per team)
Monitor mode applications (CTI OS)	2	✓	✓	N/A	✓	
	10	N/A	N/A	1 per instance	N/A	
All-event clients (CTI Server) with single processor server	4	✓	✓	✓	✓	
ECC Variables	5 scalars	✓	✓	✓	✓	40 bytes each
Call Flow Traffic on straight Calls	85%	✓	✓	✓	✓	
Call Flow Traffic on transfer Calls	10%					
Call Flow Traffic on conference Calls	5%					

5.3 Unified Contact Center Enterprise Hardware Requirements

This section assists you in selecting the hardware servers for your Unified CC solution, including both the Unified CCE and Unified System CCE deployment models.

Note: VRU ports for Agent PG and System PG should not exceed half of the maximum supported agents listed in the capacity column. This is applicable to both Unified CCE and Unified System CCE. Additional VRU PGs can be deployed to accommodate a greater number of VRU ports. VRU PG can be found in section 5.8.7 [VRU Peripheral Gateway \(PG\)](#). (Additional VRU PGs are not applicable to System CCE).

Agent PG Configuration Options

The following table illustrates various configuration options for the Agent PG. Agent PG capacity varies based on specific component configuration.

Table 5-3: Agent PG Configuration Options with CTI OS, Unified CCE

All-in-one	With Generic PG or Unified CCE System PG	With Unified Call Manager PG	With Outbound
CCM PG (CCM PIM)	Generic PG (CCM PIM and VRU PIM)	CCM PG (CCM PIM)	Generic PG (CCM PIM and VRU PIM)
VRU PG			
CTI Server	CTI Server	CTI Server	CTI Server
CTI OS	CTI OS	CTI OS	CTI OS
			MR PG
			Dialer

Table 5-4: Agent PG Configuration Options with Cisco Agent Desktop, Unified CCE

All-in-one	With Generic PG or Unified CCE System PG	With Unified Call Manager PG	With Outbound
CCM PG (CCM PIM)	Generic PG (CCM PIM and VRU PIM)	CCM PG (CCM PIM)	Generic PG (CCM PIM and VRU PIM)
VRU PG			
CTI Server	CTI Server	CTI Server	CTI Server
CTI OS	CTI OS	CTI OS	CTI OS
			MR PG
			Dialer
CAD Services	CAD Services	CAD Services	CAD Services

5.3.1 Notes on Agent Capacity Calculation

For the following sections, the agent count in the capacity specification refers to the number of concurrently logged-in agents.

Consider the following factors when sizing call center resources:

CTI OS

Agent Capacity is decreased by 25% when CTI OS Security is enabled.

Mobile Agents

The Mobile Agent feature is introduced for Unified CC in 7.1(x). Agent capacity is decreased for mobile agents.

Mobile Agents are defined as agents using phones not directly controlled by Unified CC, irrespective of their physical location. (The term local agent refers to an agent who uses a phone that is under control of Unified CC, irrespective of physical location.)

Mobile agents can be configured using either of two delivery modes. The weighting of the decreased capacity is based on the call delivery mode.

- Call by Call – In this mode, the mobile agent’s phone is dialed for each incoming call. When the call ends, the mobile agent’s phone is disconnected before being made ready for the next call.
- Nailed Connection – In this mode, the agent is called once at login, and the line stays connected through multiple customer calls.

For more details about sizing Mobile agents please refer to Cisco Unified Contact Center Enterprise 7.x Solution Reference Network Design (SRND) at <http://www.cisco.com/go/srnd>

New Server Classes

In tables showing capacity for New Deployments and Technology Refresh, for the new server classes MCS-40-006 and MCS-30-004, capacity is the same as that of the preceding class (for example, capacity for the MCS-40-006 is identical to capacity for the MCS-40-005).

5.3.2 New Deployments and Technology Refresh

Option 1 - Supports up to 450 Agents

The Progger configuration consists of Unified CCE Router, Unified CCE Logger, Agent PG (CCM PIM, VRU PIM, CG, CTI OS, and CAD Services when CAD is required) on the same server.

Table 5-5: Progger Servers, Unified CCE, New Deployment/Tech Refresh

Server Class	Capacity (agents)	
	Progger with no options	Progger with CAD Services
MCS-30-004-Class	100	N/A
MCS-40-005-Class	450	297

NOTE: To determine Outbound Option agent capacity for Progger server, use the following formula:

$$\text{Max agents} = (\text{Maximum Progger agent capacity}) - (8 \times (\text{number of dialer ports}))$$

Option 2 - Supports from 500 to 8000 Agents

Server configuration options:

- **Option 2.1: Rogger Configuration** – this server has the Unified CCE Router and Unified CCE Logger collocated. Consider this option if the expected growth of your contact center will not exceed 2,000 agents.

Table 5-6: Rogger Servers, Unified CCE, New Deployment/Tech Refresh

Server Class	Capacity (agents)
	Rogger
MCS-30-004-Class	500
MCS-40-005-Class	2000

- **Option 2.2: Standalone Router and Standalone Logger.** Consider this option if the expected growth of your contact center will exceed 2,000 agents.

Table 5-7: Router/Logger Servers, Unified CCE, New Deployment/Tech Refresh

Server Class	Capacity (agents)	
	Router	Logger
MCS-40-005-Class	8000	N/A
MCS-40-007-Class	“	6000
GEN-50-005-Class	“	8000

Table 5-8: Agent PG Servers, Unified CCE, New Deployment/Tech Refresh

Server Class	Capacity (agents)	
	Agent PG with no options	Agent PG with CAD Services
MCS-30-004-Class	450	297
MCS-40-005-Class	2000	1000

NOTES:

- The CAD Server component (if CAD services are required) should be co-located on the Agent PG server. For prior installations where CAD server was installed on a separate server, capacity numbers will remain the same (as shown below) regardless of whether it is co-located or separate.
- Agent capacity is decreased by 25% from the above when CTI OS Security is enabled.
- Agent capacity is further decreased for mobile agents. The weighting of the decreased capacity is based on the call delivery mode for the mobile agent.
 For more details about sizing Mobile agents please refer to Cisco Unified Contact Center Enterprise 7.x Solution Reference Network Design (SRND) at <http://www.cisco.com/go/srnd>.
- To determine Outbound Option agent capacity for Agent PGs, use the following formula:
Max agents = (Maximum PG agent capacity) – (8 x (number of dialer ports))

- All outbound call scenarios are supported when a mobile agent is deployed using nailed-up call delivery mode. Outbound call scenarios are not supported when a mobile agent is deployed using call-by-call call delivery mode.
- See section 5.8.19 [CAD Agent and Supervisor Desktops](#) for hardware and system software requirements.

5.3.3 Common Ground Upgrade

Option 1 - Supports up to 450 Agents

The Progger configuration consists of Unified CCE Router, Unified CCE Logger, Agent PG (CCM PIM, VRU PIM, CG, CTI OS, and CAD Services if CAD is required) on the same server.

Table 5-9: Progger Servers, Unified CCE, Common Ground Upgrade

Server Class	Capacity (agents)	
	Progger with no options	Progger with CAD Services**
MCS-30-002-Class	85	N/A
MCS-30-003-Class	100	N/A
MCS-40-002-Class	270	85
MCS-40-003-Class	450	297

NOTE: To determine Outbound Option agent capacity for Progger server, use the following formula:

$$\text{Max agents} = (\text{Maximum Progger agent capacity}) - (8 \times (\text{number of dialer ports}))$$

Option 2 - Supports from 300 to 5100 Agents

Server configuration options:

- **Option 2.1: Rogger Configuration** – this server has the Unified CCE Router and Unified CCE Logger collocated.

Table 5-10: Rogger Servers, Unified CCE, Common Ground Upgrade

Server Class	Capacity (agents)
	Rogger
MCS-30-002-Class	300
MCS-30-003-Class	425
MCS-40-002-Class	900
MCS-40-003-Class	1275

- **Option 2.2: Standalone Router and Standalone Logger**

Table 5-11: Standalone Router/Logger Servers, Unified CCE, Common Ground Upgrade

Server Class	Capacity (agents)	
	Router	Logger
MCS-40-002-Class	3600	3000
MCS-40-003-Class	5100	4250
GEN-50-002-Class	“	3600
GEN-50-003-Class	“	5100

Table 5-12: Agent PG Servers, Unified CCE, Common Ground Upgrade

Server Class	Capacity (agents)	
	Agent PG with no options	Agent PG with CAD Services**
MCS-30-002-Class	270	178
MCS-30-003-Class	382	252
MCS-40-002-Class	1200	600
MCS-40-003-Class	1700	850

NOTES:

- The CAD Server component (if CAD services are required) should be co-located on the Progger server. For prior installations where CAD server was installed on a separate server, capacity numbers will remain the same (as shown below) regardless of whether it is co-located or separate.
- Agent Capacity is decreased by 25% when CTI OS Security is enabled.
- Agent capacity is further decreased for mobile agents. The weighting of the decreased capacity is based on the call delivery mode for the mobile agent.
 For more details about sizing Mobile agents please refer to Cisco Unified Contact Center Enterprise 7.x Solution Reference Network Design at <http://www.cisco.com/go/srmd>.
- To determine Outbound Option agent capacity for Agent PGs, use the following formula:
Max agents = (Maximum PG agent capacity) – (8 x (number of dialer ports))
- All outbound call scenarios are supported when a mobile agent is deployed using nailed-up call delivery mode. Outbound call scenarios are not supported when a mobile agent is deployed using call-by-call call delivery mode.

5.3.4 Unified Contact Center Management Portal

Although Unified Contact Center Management Portal is included as a part of Unified CC Hosted, it can also be purchased as an option for Unified CC Enterprise. The hardware requirements are the same in both cases. Please see the details supplied in Section 5.6.1.

5.3.5 Remote Silent Monitoring

Remote Silent Monitoring (RSM) is available with Cisco Unified Contact Center Enterprise and Unified Contact Center Hosted. The following tables define the system requirements for both the basic and enhanced environments for RSM.

Basic Environment - Supports less than 750 agents

Table 5-13: Remote Silent Monitoring, Basic Environment, Unified CCE, Unified CCH

Server Class	Capacity	Other requirements and Remarks
MCS-30-004-Class	Less than 40 simultaneous monitoring sessions	Windows Server 2003 or R2, SP1 or SP2 4 GB RAM ¹ 2x72GB SAS Hard Disk Drive in RAID 1 configuration

¹ Note: An additional 2 GB RAM must be ordered separately. The Remote Silent Monitoring server must have 4 GB RAM installed.

Enhanced Environment - Supports 750 agents or more

Table 5-14: Remote Silent Monitoring, Enhanced Environment, Unified CCE, Unified CCH

Server Class	Capacity	Other requirements and Remarks
MCS-40-005-Class	Less than 40 simultaneous monitoring sessions	Windows Server 2003 or R2, SP1 or SP2 4 GB RAM 2x72GB SAS Hard Disk Drive in RAID 1 configuration

5.4 Unified System Contact Center Enterprise Hardware Requirements

NOTE: Agent capacity is further decreased for mobile agents. For more details about sizing mobile agents please refer to Cisco Unified Contact Center Enterprise 7.x Solution Reference Network Design (SRND) at <http://www.cisco.com/go/srnd>.

Option 1 - Supports up to: 450 agents

This solution requires the following servers:

1. Central Controller + Agent/IVR Controller – Router, Logger, Outbound Campaign Manager + System CCE System PG, CTI OS, and optionally CAD Services co-located
2. Administration and Reporting – Administrative Workstation, WebView, HDS, System CC Web Administration Server

Table 5-15: Central Controller + Agent/IVR Controller Servers, Unified SCCE, up to 450 Agents

Server Class	Capacity (agents)	
	Central Controller + Agent/IVR Controller (without CAD Services)	Central Controller + Agent/IVR Controller (with CAD Services)
MCS-30-004-Class	100	N/A
MCS-40-005-Class	450	100

Option 2 - Supports up to: 2000 agents

This solution requires the following servers:

1. Central Controller – Contains the Router, Logger, Outbound Campaign Manager
2. Agent/IVR Controller – System CCE System PG, CTI OS, and optionally CAD Services co-located
3. Administration and Reporting – Administrative Workstation, WebView, HDS, Unified CC Web Administration Server

Table 5-16: Central Controller, Agent/IVR Controller Servers, Unified SCCE, up to 2000 Agents

Server Class	Capacity (agents)		
	Central Controller server	Agent/IVR Controller (without CAD Services)	Agent/IVR Controller (with CAD services)
MCS-30-004-Class	N/A	450	297
MCS-40-005-Class	2000	2000	1000

Central Controller and/or Agent PG Server

Table 5-17: Central Controller, Agent/IVR Controller Disk Configuration, Unified SCCE

Server Class	Disk Configuration
MCS-30-004-Class	<p><u>Disk Configuration - 2 disks</u> Disks 1-2: OS, ICM, SQL Server and other 3rd party software, ICM Database Transaction Log(s), Database files - RAID 1</p>
MCS-40-005-Class	<p><u>Disk Configuration - 4 or more disks</u> Disks 1-*: OS, ICM, SQL Server and other 3rd party software, ICM Database Transaction Log(s), Database files - RAID 10.</p>

Note: Unified System Contact Center Enterprise supports only one disk partition.

Administration and Reporting Server

An Administration and Reporting server is required whether you choose Option 1 or Option 2.

Table 5-18: Administration and Reporting Server Disk Configuration, Unified SCCE

Server Class	Capacity	Other requirements
	Reporting Users	
MCS-30-004-Class	5	<p><u>Disk Configuration – 2 disks</u> Disks 1-2: OS, ICM, SQL Server and other 3rd party software, Database files, ICM Database Transaction Log(s) - RAID 1</p>
MCS-40-005-Class	10	<p><u>Disk Configuration – 4 or more disks</u> Disks 1-*: OS, ICM, SQL Server and other 3rd party software, ICM Database Transaction Log(s) - RAID 10</p>

5.5 Unified ICM Enterprise Hardware Requirements

This section assists you in selecting hardware servers for Unified ICM Enterprise, including new deployments and technology refresh as well as common ground upgrade.

5.5.1 Note on Agent Capacity

Agent capacity numbers are based on the assumption that 'Enable agent reporting' is *unchecked* on the Agent Distribution tab for the PG configuration (which is the default). When 'Enable agent reporting' is *checked*, agent capacity numbers for central controller servers are virtually identical to Unified Contact Center Enterprise – the Progger and Standalone Router/Logger capacity tables in section 5.3.2 (New Deployments and Technology Refresh) and section 5.3.3 (Common Ground Upgrade) are applicable instead of those that follow.

5.5.2 New Deployments and Technology Refresh

Table 5-19: Rogger Servers, Unified ICME, New Deployment/Tech. Refresh

Server Class	Capacity (agents)
MCS-40-005-Class	2000

Note: The Rogger server has the Unified ICM Router and Unified ICM Logger collocated.

Table 5-20: Standalone Router/Logger Servers, Unified ICME, New Deployment/Tech. Refresh

Server Class		Capacity	
Router	Logger	BHCA	Agents
MCS-30-004-Class	MCS-40-005-Class	30,000	1000
		18,000	1800
		12,000	2400
MCS-40-005-Class	MCS-40-006-Class	150,000	5000
MCS-40-005-Class	GEN-50-005-Class	360,000	12000
		216,000	21600
		144,000	28800

PG Servers, ICME: Please see the “[TDM ACD Peripheral Gateway \(PG\)](#)” section for TDM ACD PG server requirements.

Table 5-21: MR PG Servers (Standalone), Unified ICME, New Deployment/Tech. Refresh

Server Class	Capacity (agents)	Other requirements and remarks
MCS-30-004-Class	1000	Maximum of 5 MR-PIMs per MR PG
MCS-40-005-Class	2000	Maximum of 10 MR-PIMs per MR PG

5.5.3 Common Ground Upgrade

Table 5-22: Rogger Servers, Unified ICME, Common Ground Upgrade

Server Class	Capacity (agents)
MCS-40-002-Class	1200
MCS-40-003-Class	1700

Note: The Rogger server has the Unified ICM Router and Unified ICM Logger collocated.

Table 5-23: Standalone Router/Logger, Unified ICME, Common Ground Upgrade

Server Class		Capacity	
Router	Logger	BHCA	Agents
MCS-30-002-Class	MCS-40-002-Class	18,000	600
		10,800	1080
		7,200	1440
MCS-30-003-Class	MCS-40-003-Class	25,500	850
		15,300	1530
		10,200	2040
MCS-40-002-Class	MCS-40-002-Class ¹	90,000	3000
MCS-40-003-Class	MCS-40-003-Class ¹	127,500	4250
MCS-40-002-Class	GEN-50-002-Class	216,000	7200
		129,600	12960
		86,400	17280
MCS-40-003-Class	GEN-50-003-Class	306,000	10200
		183,600	18360
		122,400	24480

¹ Requires 6 disks. See section 5.8.2 [ICM Logger](#) for 6 disk configuration.

Table 5-24: Logger with Other Generic Hardware, Unified ICME, Common Ground Upgrade

Server Class	Capacity	
	BHCA	Agents
GEN-30-002-Class (< 10GB of data)	1,500	50
GEN-40-002-Class	7,500	250
GEN-40-003-Class	30,000	1000

PG Servers, ICME: Please see the “[TDM ACD Peripheral Gateway \(PG\)](#)” section for TDM ACD PG server requirements.

Table 5-25: MR PG (Standalone) Servers, Unified ICME, Common Ground Upgrade

Server Class	Capacity (agents)	Other requirements and remarks
MCS-30-002-Class	600	Maximum of 5 MR-PIMs per MR PG
MCS-30-003-Class	850	Maximum of 5 MR-PIMs per MR PG
MCS-40-002-Class	1200	Maximum of 10 MR-PIMs per MR PG
MCS-40-003-Class	1700	Maximum of 10 MR-PIMs per MR PG

Table 5-26: CTI OS Servers, Unified ICME, Common Ground Upgrade

Server Class	Capacity (agents)
MCS-30-002-Class	60
MCS-30-003-Class	85
MCS-40-002-Class	1200
MCS-40-003-Class	1600

5.6 Unified Contact Center Hosted Hardware Requirements

This section assists you in selecting hardware servers for Unified CC Hosted, including new deployments / technology refresh and common ground upgrade. (The following are minimum requirements.)

Table 5-27: NAM Rogger Servers, Unified CCH

Server Class	Capacity (cps)
GEN-50-002-Class	32
GEN-50-005-Class	38

Table 5-28: CICM Router/Logger Servers, Unified CCH, New Deployment/Tech. Refresh

Server Class		Capacity	
CICM Router	CICM Logger	Agents	Instances
MCS-40-005-Class	MCS-40-006-Class	3750	3
	MCS-40-007-Class	3750	10
GEN-50-005-Class	GEN-50-005-Class	4500	25

Table 5-29: CICM Router/Logger Servers, Unified CCH, Common Ground Upgrade

Server Class		Capacity	
CICM Router	CICM Logger	Agents	Instances
MCS-40-002-Class	MCS-40-002-Class	2250	3
MCS-40-003-Class	MCS-40-003-Class	3190	3
MCS-40-003-Class	MCS-40-004-Class	3750	3
MCS-40-003-Class	GEN-50-002-Class	3750	10
GEN-50-003-Class	GEN-50-003-Class	3825	25
GEN-50-005-Class	GEN-50-005-Class	4500	25

Table 5-30: Multi-Instance Agent PG with CTI OS Servers, Unified CCH

Server Class	Capacity (agents)	Operating Conditions
MCS-40-003-Class	1600	CTI OS Security Disabled
MCS-40-003-Class	1200	CTI OS Security Enabled

Notes:

For more details about sizing mobile agents please refer to Cisco Unified Contact Center Enterprise 7.x Solution Reference Network Design (SRND) at <http://www.cisco.com/go/srnd>.

5.6.1 Unified Contact Center Management Portal Hardware Requirements

Each of the deployment models described in this section assumes the possibility of an n-sided server configuration that replicates data between sites.

With regard to resource management, the best practice is to map folder structure to organizational structure.

Table 5-31: Hardware Requirements, Unified CC Management Portal

Server Class	Capacity					Server Role
	Agents	Portal Users	Ops/ Hour	Folders	Folder Depth	
MCS-40-006-Class	1500	150	100	200	5	Single Server System
	6000	600	600	N/A	N/A	Secure System Web Application Server
MCS-40-007-Class	3000	300	400	300	6	Secure System DB Server
	6000	600	600	600	6	Secure System DB Server

Note: With RAID configured systems Windows 2000 disk write caching is disabled, and therefore the write caching has to be set in the RAID controller BIOS available on boot-up (before the operating system loads).

5.6.1.1 Drive Partition Layout

Table 5-32: Physical Drive Layout, Unified CC Management Portal

Drive	Disk Array Minimum Size	Function
C:	72 GB	Windows operating system, program executables and Windows page file
D:	144 GB	Database data files and transaction log
Z:	N/A	CD/DVD-ROM

5.6.1.2 Network

Shared network connections such as WANs must be carefully checked and the Unified Contact Center Management Portal data throttled to avoid large bow-waves saturating the link to the detriment of other applications.

Network Recommendations

- Windows Load Balancing Service (optional)
 - 100 Base-T/1000 Base-T NIC connected to a suitable layer-3 switch
- or
- Multiple network cards within a Unified Contact Center Management Portal server

5.7 Unified ICM Hosted Hardware Requirements

This section assists you in selecting hardware servers for ICM Hosted,⁶ covering new deployments and technology refresh as well as common ground upgrade. (These are minimum requirements.)

For clarity, only MCS family processors are specified below for the NAM and CICM Router nodes. Where non-MCS hardware is deployed (or being purchased), the equivalent type / number of processors (including speed), available memory (RAM), disk (capacity and controller architecture), and overall server capacity profile must meet or exceed that of the corresponding MCS model. Refer to [Appendix A – Server Classes](#) for full server class explanatory detail.

Table 5-33: NAM Router and NAM Logger Servers, Unified ICMH

Server Class		Capacity (cps)	Other Requirements
NAM Router	NAM Logger		
MCS-40-002-Class	GEN-50-002-Class	180	NAM Routers requires the addition of a 3 rd Network Interface Card for connecting to a Signaling Access Network. Refer to the “ <i>Setup and Configuration Guide for Cisco Unified ICM Hosted</i> ”.
MCS-40-003-Class	GEN-50-003-Class	255	
MCS-40-003-Class	GEN-50-005-Class	300	

Table 5-34: CICM Router and CICM Logger Servers, Unified ICMH

Server Class		Capacity (agents)	
CICM Router	CICM Logger	BHCA	Agents
MCS-40-002-Class	GEN-50-002-Class	216,000	7200
		129,600	12960
		86,400	17280
MCS-40-003-Class	GEN-50-003-Class	306,000	10200
		183,600	18360
		122,400	24480
MCS-40-003-Class	GEN-50-005-Class	360,000	12000
		216,000	21600
		144,000	28800

Note: A quad processor class server should be substituted for the CICM Router server where greater than ten (10) customer instances are deployed.

⁶ The Multiple-NAM deployment model, which provides for NAM pair redundancy for high availability and increased scalability, is outside the scope of this document. Consult Cisco directly for capacity and sizing consultation with Multiple-NAM configurations.

5.8 Unified ICM/Unified Contact Center Common Component Server Requirements

This section describes the Unified ICM/Unified CC common standalone server requirements. These Unified ICM/Unified CC components can be used in various Unified ICM/Unified CC product editions.

5.8.1 Unified ICM/Unified Contact Center Router

The following table contains the Router hardware requirements for network interface required for pre-routing in Unified ICM Enterprise and Unified ICM Hosted.

Table 5-35: Network Interface Requirements, Unified ICM Router Servers

Network Interface	Hardware	
For Ethernet Carrier Network Interfaces (MCI, AT&T, etc.)	+1 x 10/100/1000 Ethernet port	
STENTOR Network Interface	1 (2 if duplexed) x DSG Run-Time 4.2 license(s) from NE Technologies, Inc.	
SPRINT Network Interface	<ul style="list-style-type: none"> ▪ 3 (5 if simplex) x Eiconcard: 	
	PCI 2.2 (normal PCI slot)	S94 66MHz <ul style="list-style-type: none"> • Motorola 68360 @ 33MHz • 1 MB Flash & 8MB DRAM • Bus Type: PCI 2.2 64bit / 66 MHz (3V)
		S94 V2 <ul style="list-style-type: none"> • Motorola Freescale 852T @ 98 MHz • 16 MB SDRAM • Bus Type: PCI 2.2 64bit / 66 MHz (3.3V)
	PCIe (PCI Express)	S94 PCI Express <ul style="list-style-type: none"> • Motorola Freescale 852T @ 98 MHz • 16 MB SDRAM • PLX 8111 Express Interface • Bus Type: Single lane PCIe 1.0a 2.5Gbit/Sec • Two VHSI connectors
	<ul style="list-style-type: none"> ▪ 5 (10 if simplex) x VHSI V.35 DCE cable (Eicon #300-076) ▪ Eicon “Connections for Windows Server 2003 and Windows XP software V6R5” 	

Please see Unified ICM/Unified CC Hardware and Software Requirements for information on Router server selection based on system capacity requirements.

5.8.2 Unified ICM/Unified Contact Center Logger

Please see Unified ICM/Unified CC Hardware and Software Requirements for information on Logger server hardware selection based on capacity requirements. This section provides Logger server disk configuration information based on the hardware you selected, and other Logger configuration information.

Operating System and Database Requirements

- Microsoft Windows Server 2003 Standard Edition or R2, Service Pack 1 or Service Pack 2
- Microsoft SQL Server 2000 Standard Edition, Service Pack 4

Note: High load/performance environments that reach the 2 GB maximum boundary—including carrier class customers deploying quad processor servers—require the deployment of Microsoft Windows Server 2003 Enterprise Edition (with the /3GB switch) and SQL Server 2000 Enterprise Edition, to address additional server memory.

For Remote Management/Support

A 56K V. Everything/V.90 external modem is needed for remote management and support. See section 0 [Supported Third Party Software](#).

5.8.2.1 New Deployment and Technology Refresh Upgrade

Table 5-36: Logger Servers, Unified ICM/CC, New Deployment/Tech. Refresh

Server Class	Other requirements and remarks
MCS-40-005-Class	<p><u>Disk Configuration - 4 disks</u></p> <p>Disks 1-2: OS, ICM, SQL Server and other 3rd party software, ICM Database Transaction Log(s) RAID 1</p> <p>Disks 3-4, Database files RAID 1 (alternately RAID 10 can be used to gain better write performance by adding 2 additional disks).</p>
MCS-40-006-Class	<p><u>Disk Configuration - 6 disks</u></p> <p>Disks 1-2: OS, ICM, SQL Server and other 3rd party software, RAID 1</p> <p>Disks 3-6, Database files, ICM Database Transaction Log(s), RAID 10</p>
MCS-40-007-Class GEN-50-005-Class	<p><u>Disk Configuration – 8 or more disks</u></p> <p>Disks 1-2: OS, ICM, SQL Server and other 3rd party software, RAID 1.</p> <p>Disks 3-*, Database files, ICM Database Transaction Log(s) RAID 10. Dedicated 2 channel external RAID Controller, min 256 MB cache with battery backup.</p>

5.8.2.2 Common Ground Upgrade

Table 5-37: Logger Servers, Unified ICM/CC, Common Ground Upgrade

Server Class	Other requirements and remarks
GEN-30-002-Class MCS-30-002-Class MCS-30-003-Class	<u>Disk Configuration - 2 disks</u> Disk 1-2, 2 x 72 GB Drives, RAID 1
MCS-40-002-Class MCS-40-003-Class	<u>Disk Configuration - 4 disks</u> Disks 1-2, 2 x 72 GB Drives: OS, ICM, SQL Server and other 3 rd party software, ICM Database Transaction Log(s) RAID 1 Disks 3-4, 2 x 72 GB Drives: Database files RAID 1
GEN-40-002-Class MCS-40-004-Class	<u>Disk Configuration - 6 disks</u> Disks 1-2, 2 x 72 GB Drives: OS, ICM, SQL Server and other 3 rd party software, RAID 1 Disks 3-6, 4 x 72 GB Drives: Database files, ICM Database Transaction Log(s), RAID 10
GEN-40-003-Class GEN-50-002-Class GEN-50-003-Class	<u>Disk Configuration – 8 or more disks</u> Disks 1-2, 2 x 72 Drives: OS, ICM, SQL Server and other 3 rd party software, RAID 1. Disks 3-*, Database files, ICM Database Transaction Log(s) RAID 10. Dedicated 2 channel external RAID Controller, minimum of 256 MB cache with battery backup

5.8.3 AW – Distributor, HDS, and WebView Server

For Unified CC Enterprise and Unified CC Hosted, Internet Script Editor is optional, and unlike in previous releases, it is no longer required that a WebView Server be installed on an AW/HDS. This option increases reporting scalability for large and hosted customers. Separating a database server and web server is also an important security consideration.

In order to deploy a standalone WebView server, an HDS-enabled AW must be accessible via TCP/IP for database connectivity. Thus, you have two options:

- AW – Real-Time Distributor, HDS, and co-resident WebView
- Real-Time Distributor, HDS, and separate dedicated WebView Server(s)

For a Unified System Contact Center Enterprise Deployment, Internet Script Editor is part of the standard installation and WebView is co-resident on the AW Distributor.

These hardware requirements are based on the following usage patterns.

The average reporting user is running:

- 2 concurrent real time reports
 - Each report returns less than 50 rows.
 - Equivalent to running or monitoring a script via Script Editor or Internet Script Editor.
- 1 historical report every hour, with each report defined as:
 - Queries working with data set size of 3,000 or less. Data sets size is determined by multiplying # of entities by two times the number of hours chosen by end-user while running the historical report. See table for calculation of data sets.
 - Queries resulting in less than or equal to 800 rows of data on half hour or daily historical reports

Determine the size of the data set by calculating the number of entities times hours multiplied by 2.

Table 5-38: WebView Reporting Data Set

Report	Calculation	Data Set Size	½ Report, Rows Returned	Daily Report, Rows Returned
Call Type Report: 10 Call Types for 20 hours	10 X 20 X 2	400	160	10
Agent Skill Group Report: 10 Agents, each in 5 Skill Groups for 8 hours	10 X 5 X 8 x 2	800	800	50

Note: Each reporting user is the equivalent of 1 Script Editor monitoring user (using Internet Script Editor or Client AW). See [AW – Real-Time Distributor](#) section 5.8.4 for sizing of a distributor only running Internet Script Editor Server or serving Client AWs.

Graphics Card and Monitor for Unified ICM AW

Graphics card capable of 1024 x 768 x 64K color or better
 17" or larger display

For Unified Contact Center Hosted

This server can be used in a Unified CC Hosted multi-instance environment. It can be configured with up to 10 instances with 5 users.

5.8.3.1 New Deployment and Technology Refresh Upgrade

5.8.3.1.1 AW – Real-Time Distributor, HDS and with co-resident WebView

Operating System and Database Requirements

- Microsoft Windows Server 2003 Standard Edition or R2, Service Pack 1 or Service Pack 2
- Microsoft SQL Server 2000 Standard Edition, Service Pack 4

Table 5-39: AW, HDS, co-resident WebView Servers, New Deployment/Tech. Refresh

Server Class	Capacity	Other requirements
	Reporting Users Per HDS	
MCS-30-004-Class	5	<u>Disk Configuration – 2 Disks</u> Disks 1-2: OS, ICM, SQL Server and other 3 rd party software, Database files, ICM Database Transaction Log(s) - RAID 1
MCS-40-005-Class	10	<u>Disk Configuration – 4 Disks</u> Disks 1-2: OS, ICM, SQL Server and other 3 rd party software, ICM Database Transaction Log(s) - RAID 1 25GB DB: Disks 3-4: Database files - RAID 1
MCS-40-006-Class	20	<u>Disk Configuration – 6 Disks</u> Disks 1-2: OS, ICM, SQL Server and other 3 rd party software, ICM Database Transaction Log(s) - RAID 1 50GB DB: Disks 3-6 Database files - RAID 10
MCS-40-007-Class	25	<u>Disk Configuration – 8 Disks</u> Disks 1-2: OS, ICM, SQL Server and other 3 rd party software - RAID 1 100GB DB: Disks 3-8, Database files, ICM Database Transaction Log(s) - RAID 10. Dedicated 2 channel RAID Controller, min 256 MB cache with battery backup. (Alternately, the ICM Database Transaction Log(s) can be moved to a dedicated drive to limit disk contention).
GEN-50-005-Class	50	

5.8.3.1.2 AW – Real-Time Distributor, HDS and with separate dedicated WebView Server(s)

Operating System and Database Requirements

- Microsoft Windows 2003 Standard Edition or R2, Service Pack 1 or Service Pack 2
- Microsoft SQL Server 2000 Standard Edition, Service Pack 4

Note: High load/performance constrained by the SQL Server 2 GB memory boundary require the deployment of Microsoft Windows Server 2003 Enterprise Edition (with the /3GB switch) and SQL Server 2000 Enterprise Edition, to address additional server memory.

Table 5-40: AW, HDS, separate WebView Servers, New Deployment/Tech. Refresh

Server Class	Capacity		Other requirements
	Reporting Users Per HDS	WebView Servers Per HDS, each supporting 50 users	
GEN-50-005-Class	50	1	<u>Disk Configuration – 8 Disks</u> Disks 1 – 2: OS, ICM, SQL Server and other 3 rd party software - RAID 1 100 GB DB: Disks 3 – *, Database files, ICM Database Transaction Log(s) - RAID 10. Dedicated 2 channel RAID Controller, min 256 MB cache with battery backup. (Alternately, the ICM Database Transaction Log(s) can be moved to a dedicated drive to limit disk contention).
	100	2	
	200	4	

5.8.3.2 Common Ground Upgrade

5.8.3.2.1 AW – Real-Time Distributor, HDS and with co-resident WebView

Operating System and Database Requirements

- Microsoft Windows 2000 Server, Service Pack 4 with subsequent upgrade to Windows Server 2003 or R2, Service Pack 1 or Service Pack 2.
- Microsoft SQL Server 2000 Standard Edition, Service Pack 4

Table 5-41: AW, HDS, co-resident WebView Servers, Common Ground Upgrade

Server Class	Capacity	Other requirements and remarks
	Reporting Users Per HDS	
MCS-30-002-Class MCS-30-003-Class	5	<u>Disk Configuration – 2 Disks</u> 10GB DB: Disks 1-2, 2 x 72 GB Drives - RAID 1
MCS-40-002-Class MCS-40-003-Class	10	<u>Disk Configuration – 4 Disks</u> Disks 1-2, 2 x 72 GB Drives: OS, ICM, SQL Server and other 3 rd party software, ICM Database Transaction Log(s) - RAID 1 20GB DB: Disks 3-4, 2 x 72 GB Drives: Database files - RAID 1
GEN-40-002-Class MCS-40-004-Class	25	<u>Disk Configuration – 6 Disks</u> Disks 1-2, 2 x 72 GB Drives: OS, ICM, SQL Server and other 3 rd party software - RAID 1 60GB DB: Disks 3-6, 4 x 72 GB. Database files, ICM Database Transaction Log(s) - RAID 10

GEN-50-002-Class GEN-50-003-Class	25	<u>Disk Configuration – 8 Disks</u> Disks 1-2, 2 x 72 GB Drives: OS, ICM, SQL Server and other 3 rd party software - RAID 1 100GB DB: Disks 3-8, Database files, ICM Database Transaction Log(s) - RAID 10. Dedicated 2 channel RAID Controller, min 256 MB cache with battery backup. (Alternately, the ICM Database Transaction Log(s) can be moved to a dedicated drive to limit disk contention).
	50	

5.8.3.2.2 AW – Real-Time Distributor, HDS and with separate dedicated WebView Server(s)

Operating System and Database Requirements

- Microsoft Windows 2000 Server, Service Pack 4 with subsequent upgrade to Windows Server 2003 or R2, Service Pack 1 or Service Pack 2.
- Microsoft SQL Server 2000 Standard Edition, Service Pack 4

Note: High load/performance constrained by the SQL Server 2 GB memory boundary require the deployment of Microsoft Windows 2000 Advanced Server (with the /3GB switch) or Microsoft Windows Server 2003 Enterprise and SQL Server 2000 Enterprise Edition, to address additional server memory.

Table 5-42: AW, HDS, separate WebView Servers, Common Ground Upgrade

Server Class	Capacity		Other requirements and remarks
	Reporting Users Per HDS	WebView Servers Per HDS, each supporting 50 users	
GEN-50-002-Class GEN-50-003-Class	50	1	<u>Disk Configuration – 8 Disks</u> Disks 1 - 2, 2 x 72 GB Drives: OS, ICM, SQL Server and other 3 rd party software - RAID 1 100GB DB: Disks 3 - *, Database files, ICM Database Transaction Log(s) - RAID 10. Dedicated 2 channel RAID Controller, min 256 MB cache with battery backup. (Alternately, the ICM Database Transaction Log(s) can be moved to a dedicated drive to limit disk contention).
	100	2	
	200	4	

5.8.3.3 Dedicated WebView Server

Table 5-43: Dedicated WebView Servers

Server Class	Other requirements and remarks
MCS-40-003-Class MCS-40-005-Class	IIS 6.0 (ships with Windows Server 2003). Windows Server 2003 Enterprise Edition is <i>not</i> required for the dedicated WebView Server.

5.8.4 AW – Real-Time Distributor

- Internet Script Editor (ISE) Optional
- Without HDS

Table 5-44: AW – Real-Time Distributor Servers

Server Class	Capacity (Client AWs and/or ISE users)	Other requirements and remarks
MCS-10-002-Class MCS-10-003-Class MCS-10-004-Class	10	IIS 6.0 (Required for Internet Script Editor)
MCS-20-002-Class MCS-20-003-Class MCS-20-004-Class	25	Other hardware requirements Graphics card capable of 1024 x 768 x 64K color or better 17" or larger display
MCS-30-002-Class MCS-30-003-Class MCS-30-004-Class	50	

Note: The Script Editor or ISE user is assumed to be monitoring Unified ICM or Unified CC scripts in real-time. The default settings on the server only allow for 10 users to simultaneously reload configuration at the client.

5.8.5 AW – Real-Time Client only (Client AW)

As an option, you can install the **Cisco Support Tools Server** on the AW – Real time Client machine.

Table 5-45: AW – Real-Time Client Servers (Client AW)

Server Class	Hardware, software requirements and remarks
MCS-10-002-Class MCS-10-003-Class MCS-10-004-Class	Other hardware Requirements ATA/IDE acceptable RAID 1 recommended for Cisco Support Tools Server Graphics card capable of 1024 x 768 x 64K color or better 17" or larger display Operating system and other software Microsoft Windows Server 2003 or R2, Service Pack 1 or Service Pack 2 Microsoft Windows XP Professional, Service Pack 2

5.8.6 WebView Client and Internet Script Editor

The WebView client is a desktop or laptop from which a user can access the WebView Server via the Internet Explorer web browser. A user can optionally purchase Sybase InfoMaker to create custom templates to deploy onto

the WebView server. InfoMaker must NOT be installed on the WebView server or on a distributor AW. Install InfoMaker on a separate machine that has network connections to the WebView server and to the distributor.

Internet Script Editor is a standalone application that runs on a desktop or laptop system.

Table 5-46: WebView Client and Internet Script Editor Servers

Server Class	Hardware, software requirements and remarks
GEN-10-005-Class	<p><u>Other hardware Requirements</u> Internal CD-ROM or DVD-ROM drive Graphics card capable of 1024 x 768 x 64K color or better</p> <p><u>Operating system and other software</u> Microsoft Windows Server 2003 or R2, Service Pack 1 or Service Pack 2 Microsoft Windows XP Professional, Service Pack 2</p> <p><u>Additional requirements for WebView Clients</u> Microsoft Internet Explorer</p> <p>♦ If creating custom templates is required: Install Sybase InfoMaker 10.2, build 7516. (Qualified with ICM 7.0 and 7.1, all SRs)</p>

5.8.7 VRU Peripheral Gateway (PG)

The following VRU PG capacities are based upon 5 VRU transactions per port per call.

Table 5-47: VRU PG Servers – New Deployments / Tech. Refresh

Server Class	Capacity (ports)	Max VRU PIMs	Max Call Rate (cps)
MCS-30-004-Class	600	10	5
MCS-40-005-Class	4,800	10	20

Table 5-48: VRU PG Servers - Common Ground Upgrade

Server Class	Capacity (ports)	Max VRU PIMs
MCS-30-002-Class	360	10
MCS-30-003-Class	510	10
MCS-40-002-Class	720	10
MCS-40-003-Class	1,020	10

5.8.8 Unified Contact Center Gateway

Unified CC Gateway enables a parent/child deployment model; the parent is Unified ICME and the child can be Unified CCE, Unified System CCE, and Unified CC Express.

Table 5-49: Unified CC Gateway Servers

Server Class	Capacity (agents)	Other requirements and remarks
MCS-30-003-Class	450	-
MCS-40-003-Class	2000	Total number of agents is applicable to one or more Unified System CCEs.

5.8.9 TDM ACD Peripheral Gateway (PG)

The following information is applicable to Unified ICM Enterprise and Unified ICM Hosted only.

Note: Agent Capacity is decreased by 25% when CTI OS Security is enabled.

Table 5-50: TDM ACD PG Servers, Unified ICME, New Deployments/Tech. Refresh

Server Class	Capacity (agents)		
	TDM ACD PG with MR PG, Dialer (with outbound option agents only)	TDM ACD PG with CTI OS	TDM ACD PG without other options
MCS-30-004-Class	100	250	1000
MCS-40-005-Class	200	1000	1000+

Table 5-51: TDM ACD PG Servers, Unified ICME, Common Ground Upgrade

Server Class	Capacity (agents)		
	TDM ACD PG with MR PG, Dialer (For outbound option agents only)	TDM ACD PG with CTI OS	TDM ACD PG without other options
MCS-30-002-Class	60	150	600
MCS-30-003-Class	85	213	850
MCS-40-002-Class	120	600	600+
MCS-40-003-Class	170	850	850+

Table 5-52: Avaya PG Servers for Large Enterprise Deployments

Server Class	Avaya PG with PG and CTI Server without CTI OS			
	Capacity (agents)	BHCA	All Events Clients	Skill Groups Per Agent
MCS-40-003-Class	2000	60,000	4	10
MCS-40-002-Class	1700	51,000	4	10
MCS-40-002-Class	1200	36,000	4	10

Other TDM ACD PG Requirements

Please see the Cisco Unified ICM Software ACD Supplements and “CISCO ICM ACD PG Supportability Matrices” for more information on TDM ACD PG configuration options and limits, available at:

http://www.cisco.com/en/US/partner/products/sw/custcosw/ps1001/prod_technical_reference_list.html

Table 5-53: TDM ACD PG Hardware and Software Requirements

Hardware, software requirements and remarks
<p><u>For Redundant PG Installation</u></p> <p>+1 x 100/1000 Ethernet port (if Peripheral does not reside on visible LAN)</p> <p><u>For Unified ICM Enterprise: Interfacing with TDM ACDs</u></p> <p><u>FOR NORTEL DMS-100 V.24/V.35 INTERFACE</u></p> <p>1 x Eiconcard S94 66MHz or Eiconcard S94 V2 (for PCI 2.2) or Eiconcard S94 PCI Express (PCIe) (See Table 5.28 for Eiconcard specifications)</p> <p>2 x VHSI V.35 DCE cable (Eicon #300-076) Eiconcard Connections for Windows Server 2003 and Windows XP software V6R5</p> <p><u>FOR ROCKWELL SPECTRUM SERIAL INTERFACE</u></p> <p>1 x Eiconcard S94 66MHz or Eiconcard S94 V2 (for PCI 2.2) or Eiconcard S94 PCI Express (PCIe) (See Table 5.28 for Eiconcard specifications)</p> <p>1 x 25' DB25 male to DB25 male cable (Alternative Tech EIC007-25) Synchronous null modem adapter (Belkin A4 A602-16298) 1 x DB25 male to DB9 female null modem cable (Black Box EVMBPC-0025) Eiconcard Connections for Windows Server 2003 and Windows XP</p> <p><u>FOR ROCKWELL SPECTRUM TCP/IP INTERFACE</u></p> <p>1 x DB25 male to DB9 female null modem cable (Black Box EVMBPC-0025)</p> <p><u>FOR SIEMENS ROLM 9751 INTERFACE</u></p> <p>1 x Digi AccelePort Xp 2, 4, or 8-port adapter Cables for above terminating in DTE 232 male connector</p> <p><u>FOR NEC NEAX 2400/7400 INTERFACE</u></p> <p>1 x CTI Dongle (NEC part)</p>

Refer to Unified ICM/Unified CC Hardware and Software Requirements for information on PG server selection based on system capacity for different Unified ICM/Unified CC product editions.

5.8.10 Unified ICM/Unified CC SS7 Network Interface Option

Table 5-54: SS7 Gateway Servers (Includes AT&T Network Gateway)

Server Class	Other requirements and remarks
GEN-20-002-Class GEN-20-003-Class GEN-20-004-Class	<p><u>SS7 Card</u> 1 x 4 port Cisco PCI SS7 card(s) Many server types require an optional riser card/adaptor to support the 3.3V PCI card. Note that the 5V card has reached EOL (with a last sale date of June 30, 2006). Note also that a maximum of 3 cards can be installed on the server.</p>

5.8.11 Unified ICM Outbound Option

This section is applicable to Unified ICM Enterprise and Unified ICM Hosted only.

Note that there can be only one instance of Outbound Option per CICM for Unified ICM Hosted.

Table 5-55: Outbound Option Servers, Unified ICM

Server Class	Capacity (Outbound agents)	Remarks	Other requirements and remarks
MCS-30-002-Class	180	Standalone Outbound Agent Dialer	<p><u>For Avaya Based Deployments</u> – Standalone Dialer Required – 1 (or more) x Intel Dialogic board (D/120JCT-L-S, D/240SC, D/160SC, D/480JCT, D/240PCI-T1, D/240JCT-T1, D/300PCI-E1, D/300JCT-E1) Dialogic System Release 6.0 and GlobalCall Protocol Package 4.2.</p>
MCS-30-003-Class	255		
MCS-30-004-Class	300		
MCS-40-002-Class	360		
MCS-40-003-Class	510		
MCS-40-005-Class	600		
MCS-30-002-Class	120	Outbound Agent Dialer Co-Resident with TDM ACD PG (Applicable to Unified ICM Enterprise only)	See sections below for additional dialer information.
MCS-30-003-Class	170		
MCS-30-004-Class	200		
MCS-40-002-Class	240		
MCS-40-003-Class	340		
MCS-40-005-Class	400		

Required Dialogic Software

The following Dialogic software must be installed in order to use the Outbound Option Dialer component:

- Intel Dialogic System Release 6.0
- Intel Dialogic GlobalCall Protocol Package 4.2

Dialogic Card Requirements

Dialogic telephony cards are an integral part of Outbound Option. These cards reserve agents and place customer calls as well as detect voice, signal tones, and answering machines. Dialogic offers many different types of cards with varying numbers of ports, bus types, and connection methods. Refer to the Dialogic documentation for information about compatibility between Dialogic hardware/software and Microsoft Windows operating systems.

Operating System Requirement

The Outbound Option server is supported on the Microsoft Windows Server 2003 operating system. See page 10 for the [operating system migration support policy](#).

ACD Requirements

Outbound Option currently supports integration to the following ACDs, which must be configured on Unified ICM software:

- Avaya DEFINITY (refer to the *Cisco Unified ICM Software ACD Supplement for DEFINITY*)

5.8.12 CTI OS Server

For new installations beginning with release 7.0(0), Cisco specifies that the CTI OS server co-reside within the PG according to the Agent PG Configuration. When upgrading CTI OS from release 6.0 or earlier, where CTI OS was installed on standalone server(s), the upgrade may be applied to the standalone server. It is strongly encouraged however, that the CTI OS server be migrated to co-reside on the PG as soon as possible to reduce bandwidth requirements on the network. Standalone CTI OS server(s) are supported during the upgrade and migration period.

Also, beginning with release 7.0(1), the number of configured CTI OS peer servers is limited to one (1). Refer to Unified ICM/Unified CC Hardware and Software Requirements for sizing guidelines.

Standalone CTI OS servers are not supported for Unified CC Hosted deployments.

See [CTI Supported Platforms](#) for operation system requirements for the CTI OS server.

5.8.13 Silent Monitor Service for CTI OS

The silent monitor service is a single executable that can be deployed in two different ways:

1. Standalone server which is called Silent Monitor Server
2. Co-resident with any CTI OS Client Toolkit application which is called Silent Monitor Service for Unified CC Toolkit

Silent Monitor Server

The silent monitor server is a standalone server that provides silent monitor functionality for a set of mobile agents. When the silent monitor service is deployed as a standalone server, it must not be co-resident with any other CTI OS or Unified ICM components.

Silent Monitor Service for Unified CC Toolkit

The silent monitor service can also be configured to provide silent monitor functionality for a single Unified CC agent. In this configuration, the silent monitor service runs on the same computer as the agent or supervisor's desktop. In a Citrix environment, the silent monitor service runs on the same computer as the agent or supervisor's Citrix client.

Table 5-56: Silent Monitor Service Servers

Server Class	Capacity (sessions)	Server Type	Other requirements and remarks
MCS-40-003-Class	40	Silent Monitor Server	See CTI Supported Platforms
MCS-30-003-Class	20		

5.8.14 Citrix MetaFrame Presentation Server 4.0

Citrix MetaFrame Presentation server 4.0 and Microsoft Terminal Services are a Server Based Computing (SBC) platforms that enable hosting of Cisco's CTI desktops applications and allow the deployment of thin clients rather than the entire Desktop.

Release 7.0(0) of the CTI OS Agent and Supervisor Desktops and Cisco Agent Desktop supports the Citrix MetaFrame Presentation Server 4.0 and Microsoft Terminal Services environments (with some known caveats and limitations). Release 7.1(x) further delivers native support for the Citrix and Microsoft Terminal Services environments, eliminating many of the caveats of Release 7.0(0). **The agent desktop application capacity of the Citrix MetaFrame Presentation Server and Microsoft Terminal Services depends on the number and type of applications in use. Consult Citrix Professional Services and a Microsoft Certified IT professional for guidance.**

Configuration details and usage limitations for Cisco Agent Desktop/Citrix implementations are documented in the manual *Integrating CAD 6.0 Into a Citrix Thin Client Environment*, located at:

http://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/cad_enterprise/cadenterprise7_2/installation/guide/CADCitrixMTS.pdf

Configuration details and usage limitations for Cisco CTI Toolkit Desktop/Citrix implementations are documented in the manual *Integrating CTI OS Into a Citrix Thin Client Environment*, located at:

<http://www.cisco.com/univercd/cc/td/doc/product/icm/icmentpr/icm70doc/ctidoc7/ctios7d/cticitrx.pdf>

5.8.15 CTI OS Agent and Supervisor Desktops

Table 5-57: CTI OS Agent and Supervisor Desktop Servers

Server Class	Type	Other requirements and remarks
GEN-10-005-Class	CTI OS Supervisor Desktop	Windows compatible full-duplex sound card (if using Cisco IP Communicator and/or Silent Monitoring) See CTI Supported Platforms
GEN-10-005-Class	CTI OS Agent Desktop	Windows compatible full-duplex sound card (if using Cisco IP Communicator) See CTI Supported Platforms
GEN-10-005-Class	CTI OS Monitor Mode Application	See CTI Supported Platforms

Note: CTI OS supports the G.711 and G.729 codecs for the MTU soft phone.

Table 5-58: CTI OS Silent Monitoring Hardware Requirements

Compatible Ethernet NIC	Refer to Cisco.com for more information Silent Monitoring NIC Compatibility Matrix Qualifying Ethernet Cards for Cisco Agent Desktop Monitoring
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5.8.16 CTI Driver for Siebel

For supported Siebel versions, see the CTI Compatibility matrix:
<http://www.cisco.com/univercd/cc/td/doc/product/icm/index.htm>

The CTI Driver for Siebel is installed on the Siebel Communications Manager Server and must operate stand alone from all other Unified ICM/Unified CC systems. Agent capacity and performance for Siebel Call Centers can vary dramatically based on the deployment topology and configuration of the Siebel components and the complexity of the Siebel applications and scripts in use. For more details on performance tuning Siebel deployments, consult Siebel Technical Support or a Siebel Certified Configuration Engineer.

Table 5-59: CTI Driver for Siebel Servers

Server Class	Capacity * (agents)	Type	Call Rate (calls / sec.)	Other requirements and remarks
MCS-40-003-Class	700	Siebel Communications Manager Server (SCM)	3.75	The Siebel deployment model tested had each server component (SCM and OM) installed stand-alone on its own server host. See CTI Supported Platforms
		Siebel Call Center Object Manager (OM)		

* The capacity was determined on an Siebel environment that met the following configuration conditions:

- 1) Siebel component groups enabled during the capacity determination:

- System Management
- Siebel Call Center
- Workflow management
- Communication Management

The following components in the group were disabled

- Communications Configuration Manager
- Communications Inbound Processor
- Communications Inbound Receiver
- Communications Outbound Manager
- Smart Answer Manager

- 2) No Siebel Scripting involved.
- 3) No activity records being created.
- 4) No Siebel Workflows activated.

5.8.17 Cisco Data Store

The Cisco Data Store server must be deployed standalone and cannot be installed on any Unified ICM or Siebel Communication Server.

Table 5-60: Cisco Data Store Servers

Server Class	Capacity (agents)	Type	Other requirements and remarks
MCS-40-003-Class	20,000	CDS for Siebel	Maximum 50 CTI Drivers for Siebel can connect to the CDS Server See: CTI Supported Platforms

5.8.18 CRM Connector

For additional CTI compatibility information, please refer to the CTI Compatibility matrix which can be found at: http://cco/en/US/products/sw/custcosw/ps14/prod_technical_reference_list.html

5.8.18.1 CRM Connector for Salesforce.com, PeopleSoft and Microsoft CRM 3.0

5.8.18.1.1 CRM Connector Server

The CRM Connector server provides the Unified CC Enterprise solution connectivity for CRM Adapters for the Salesforce.com, PeopleSoft and Microsoft CRM 3.0; it must be deployed on a standalone system. It must not be co-resident with other Unified CC Enterprise solution components.

See [CRM Connector Supported Platforms](#) for operating system requirements for the CRM Connector server.

Table 5-61: CRM Connector Server

Server Class	*Capacity (agents)	Call Rate (calls / sec.)	Other requirements and remarks
MCS-30-004-Class	900	7.5	See: CRM Connector Supported Platforms
MCS-40-005-Class	1800	15	See: CRM Connector Supported Platforms

* The above dimensioning guidelines and parameters were developed in a lab testing environment that included a test CRM system setup or an equivalent CRM simulator. Actual quality of service (delays, responsiveness, etc.) experienced by the contact center agents may vary from the above dimensioning guidelines/parameters. These variations include structure and size of the CRM database, overall level of the CRM tuning, intensity of the contact processing workflow(s), as well as other CRM configuration and topology variables outside of the scope of the Cisco connector. It is for this reason that Cisco highly recommends an in-house load test early in a connector deployment project to make sure that the total quality of service under load is satisfactory.

5.8.18.1.2 CRM Connector Server Administration Tool

The Administration Tool is usually installed on the CRM Connector Server. See CRM Connector Server for system requirements.

5.8.18.1.3 CRM Connector Adapter for Salesforce.Com

The Salesforce.com adapter is used in conjunction with the CRM Connector Server, which is a separate component of the Unified CC Enterprise solution. This Adapter is installed on the agent desktop and connects to the CRM Connector Server via .NET remoting.

Table 5-62: CRM Connector Adapter for Salesforce.com

Server Class	Type	Hardware, software requirements and remarks
GEN-10-005-Class	CRM Adapter client.	<p><u>Operating system and other software</u> See: CRM Connector Supported Platforms</p> <p><u>Other hardware Requirements</u> 100/1000 Ethernet port</p>

For additional information on the Salesforce.com CRM visit the <http://www.salesforce.com/> web site.

5.8.18.1.4 CRM Connector Adapter for PeopleSoft

The PeopleSoft adapter is used in conjunction with the CRM Connector Server, which can be a part of the Unified CC Enterprise solution configuration. This adapter is installed with the PeopleSoft CRM product.

Table 5-63: CRM Connector Adapter for PeopleSoft

*Server Class	Type	Hardware, software requirements and remarks
MCS-30-004-Class MCS-40-005-Class	CRM Adapter Server	<u>Operating system and other software</u> See: CRM Connector Supported Platforms <u>Other hardware Requirements</u> 100/1000 Ethernet port

* The selection of MCS system class should be based on the PeopleSoft server requirements for the given customer's required level of performance. For more information on the PeopleSoft CRM visit the <http://www.oracle.com/applications/peoplesoft-enterprise.html> web site.

5.8.18.1.5 CRM Connector Adapter for Microsoft CRM 3.0

Microsoft CRM 3.0 adapter is used in conjunction with the CRM Connector Server, which can be a part of the Unified CC Enterprise solution configuration. This adapter is installed with the Microsoft CRM 3.0 product.

Table 5-64: CRM Connector Adapter for Microsoft CRM 3.0

*Server Class	Type	Hardware, software requirements and remarks
MCS-30-004-Class MCS-40-005-Class	CRM Adapter Server	<u>Operating system and other software</u> See: CRM Connector Supported Platforms <u>Other hardware Requirements</u> 100/1000 Ethernet port

* The selection of the class of MCS system should be based on the Microsoft CRM sever requirements for the given customers required level of performance. For more information on the Microsoft CRM 3.0 product visit the <http://www.microsoft.com/dynamics/crm/default.mspx> web site.

5.8.18.2 CRM Connector for SAP

The Cisco Unified CRM Connector for SAP integrates the SAP CRM application with Cisco Unified Contact Center Enterprise; it can be deployed either co-resident with other Unified CC Enterprise solution components or can be deployed on a standalone system.

The maximum supported Unified CRM Connectors for SAP collocated per PG is 1.

The maximum supported Unified CRM Connectors for SAP on a dedicated server connected to the same PG is 1.

CTI OS Supervisor Desktop should be used for supervisory features. This will require CTI OS Server installed on the PG.

Table 5-65: CRM Connector for SAP

Server Class	* Capacity (agents)	Call Rate (calls / sec)	Hardware, software requirements and remarks
MCS-30-004-Class	250	3	<u>Operating system and other software</u> See: CRM Connector Supported Platforms

* The above dimensioning guidelines and parameters were developed in a lab testing environment that included a test CRM system setup or an equivalent CRM simulator. Actual quality of service (delays, responsiveness, etc.) experienced by the contact center agents may vary from the above dimensioning guidelines/parameters. These variations include structure and size of the CRM database, overall level of the CRM tuning, intensity of the contact processing workflow(s), as well as other CRM configuration and topology variables outside of the scope of the Cisco connector. It is for this reason that Cisco highly recommends an in-house load test early in a connector deployment project to make sure that the total quality of service under load is satisfactory.

5.8.18.3 CRM Connector Supported Platforms

Table 5-66: CRM Connector Supported Platforms and Requirements

CRM Connector	Operating System			Additional Software						
	Windows Server 2003 SP1 or SP2	Windows XP Professional SP2	Windows Vista	Microsoft .NET Framework V2.0	Microsoft Message Queuing (MSMQ)	Microsoft Internet Information Server (IIS)	Microsoft SQL Server	DCOM	ASP.NET 2.0	JRE 1.6.3
Server	✓	N/A	N/A	✓	✓	✓	N/R	✓	✓	N/R
Server Administration Tool	✓	N/A	N/A	✓	N/R	✓	✓*	✓	✓	N/R
Oracle PeopleSoft Adapter ¹	✓	N/A	N/A	✓	N/R	N/R	N/R	N/R	N/R	✓
Microsoft CRM 3.0 Adapter ¹	✓	N/A	N/A	✓	N/R	✓	✓	N/R	✓	N/R
Salesforce.com Adapter ¹	N/A	✓	✓	✓	N/R	N/R	N/R	✓	N/R	N/R
SAP ²	✓	N/A	N/A	N/R	N/R	N/R	N/R	N/R	N/R	N/R

* The Admin tool can use Microsoft SQL Server Express which is freely available from Microsoft.

¹ Consult the *Cisco Unified CRM Connector Implementation and Administration Guide for Microsoft CRM, Oracle PeopleSoft and Salesforce.com* guide for detailed implementation and installation information for these CRM Connector products.

² Consult the *Installation and Configuration Guide: Cisco Unified CRM Connector for SAP, Release 1.0(1)* for the CRM Connector for SAP.

N/A = Not Available

N/R = Not Required

5.8.19 CAD Agent and Supervisor Desktops

CAD agent and supervisor desktops are used in conjunction with the CAD server, which can be a part of the Unified CC Enterprise solution configuration.

Table 5-67: CAD Agent and Supervisor Desktop Servers

Server Class	Type	Hardware, software requirements and remarks
GEN-10-005-Class	CAD Supervisor Desktop (CSD) CAD Desktop Administrator (CDA)	<u>Operating system and other software</u> Windows compatible full-duplex sound card (if using Cisco IP Communicator and/or Silent Monitor) See CTI Supported Platforms
GEN-10-005-Class	CAD Agent Desktop	<u>Other hardware Requirements</u> 100/1000 Ethernet port <u>Operating system and other software</u> Windows compatible full-duplex sound card (if using Cisco IP Communicator) See CTI Supported Platforms

5.8.20 Remote Monitoring Suite (RMS)

RMS is highly scalable and deployed in a number of configurations. Most typically, the LGMapper and LGArchiver nodes are deployed as co-resident in a single server. The Listener is separately deployed; a fault tolerant duplexed configuration is supported. Multiple Alarm Tracker client nodes may be served from a single LGMapper/LGArchiver pair.

Separate physical disks are required in the Listener server, allowing for segregation of o/s and “phone home” customer database. 2GB memory is required for the small system configuration, and a full 4GB for larger (<25 customer) systems.

Special consideration must be given to migration of Windows 2000 to Windows Server 2003 RMS-monitored customers, and of the Listener node itself. Consult the *Cisco Remote Monitoring Suite Administration Guide, Release 2.1* for full detail.

Note: RMS is not supported with Unified System CCE deployments.

Table 5-68: Remote Monitoring Suite Servers

Server Class	Capacity	Type	Other requirements and remarks
MCS-20-004-Class MCS-20-003-Class MCS-20-002-Class	25 customers	RMS Listener	<u>For Modem Bank Use</u> Multi-port serial adapter and modems (Digi AccelePort Xp) Dedicated customer file database drive required.
MCS-30-004-Class MCS-30-003-Class MCS-30-002-Class	75 customers		
MCS-40-005-Class MCS-40-003-Class MCS-40-002-Class	150 customers		
MCS-30-004-Class MCS-30-003-Class MCS-30-002-Class	10 AlarmTracker clients	RMS LGMapper RMS LGArchiver	
MCS-40-005-Class MCS-40-003-Class MCS-40-002-Class	25 AlarmTracker clients		
GEN-10-005-Class	N/A	RMS AlarmTracker Client	ATA/IDE acceptable Microsoft Windows XP with Service Pack 2

5.8.21 Cisco Collaboration Server (CCS)

Unified ICM/Unified CC Release 7.2(x) is compatible with Cisco Collaboration Server 5.0(0) and its latest Service Release. Please see ICM 6.0(0) BOM for Cisco Collaboraton Server requirements at:

<http://www.cisco.com/univercd/cc/td/doc/product/icm/ccbubom/index.htm>

Please see the “Cisco Collaboration Server Installation Guide” for detailed information on Collaboration Server configuration, capability, and limitations.

5.8.22 Cisco Media Blender (CMB) for Web Collaboration Option

Unified ICM/Unified CC Release 7.2(x) is compatible with Cisco Media Blender 5.0(0) and its latest Service Release.

Note that running the Blender on the PG is only possible with 6.0 PGs. If you are deploying a new 7.x system or are upgrading to 7.x, you cannot co-load the Blender on a PG due to operating system incompatibility—the Media Blender requires Windows 2000 Server and the PG requires Windows Server 2003 (or R2).

Please see ICM 6.0(0) BOM for Cisco Media Blender Server requirements at:

<http://www.cisco.com/univercd/cc/td/doc/product/icm/ccbubom/index.htm>

Please see the “Cisco Media Blender Installation Guide” for detailed information on Media Blender Server configuration, capability, and limitations.

5.8.23 Cisco Unified Web Interaction Manager (WIM)

Please see the Cisco Interaction Manager System Requirements Guide and the Cisco Interaction Manager Planning Guide at: <http://www.cisco.com/univercd/cc/td/doc/product/icm/intermgr/webint/wrel411/index.htm> for system requirements, server configurations, capabilities, and limitations of the Cisco Unified Web Interaction Manager.

5.8.24 Dynamic Content Adapter (DCA) for Web Collaboration Option

Please see ICM 6.0(0) BOM Dynamic Content Adapter Server requirements at:

<http://www.cisco.com/univercd/cc/td/doc/product/icm/ccbubom/index.htm>

Please see document “Cisco Collaboration Server Dynamic Content Adapter release 2.01 Installation and Integration Guide” for detailed information on DCA Server configuration, capability and limitations.

5.8.25 Cisco E-Mail Manager (CEM) Option

Release 7.2(x) is compatible with Cisco E-Mail Manager 5.0(0) and its latest Service Release.

Please see the ICM 6.0(0) BOM for Cisco E-Mail Manager Server requirements at:

<http://www.cisco.com/univercd/cc/td/doc/product/icm/ccbubom/index.htm>

5.8.26 Cisco Unified E-mail Interaction Manager (EIM)

Please see the Cisco Interaction Manager System Requirements Guide and the Cisco Interaction Manager Planning Guide at: <http://www.cisco.com/univercd/cc/td/doc/product/icm/intermgr/emailint/erel411/index.htm> for system requirements, server configurations, capabilities, and limitations of the Cisco Unified E-mail Interaction Manager.

5.8.27 Cisco Support Tools Server

Table 5-69: Cisco Support Tools Servers

Server Class	Other requirements and remarks
MCS-10-002-Class MCS-10-003-Class MCS-10-004-Class	<p><u>Supported Applications</u> Unified ICM/Unified CC (CUCM, CCS, CEM, IP- IVR, Unified CC Express, CVP)⁷</p> <p><u>Other Hardware</u> ATA/IDE acceptable. Graphics card capable of 1024 x 768 x 64K color or better (17" or larger display)</p> <p><u>Operating System</u> Microsoft Windows Server 2003 Standard Edition or R2 with Service Pack 1 or Service Pack 2 Microsoft Windows 2000 Server with Service Pack 4 Microsoft Windows XP Professional with Service Pack 2</p> <p>All other required software is installed as part of the Support Tools Server Installation</p>

When selecting a system on which to install the Support Tools Server, consider the following:

- 1) Do you plan on supporting more than 25 Cisco Unified application servers using one Support Tools server?
- 2) Do you plan on saving information in the Support Tools repository on a regular basis?
- 3) Do you plan on running the registry compare tool and/or the log collection merge tool frequently?

If you answered yes to any of these questions, you must install the Support Tools Server on a system **dedicated** for use by the Support Tools Server application. Otherwise, you may choose to deploy the Support Tools Server co-resident with an Administrative Workstation or a Client AW, if one is used.

5.8.28 Cisco Support Tools Node Agent

The Support Tools Node Agent may be installed on any node specified in this document **except** for the Agent desktop products⁸. **It is not necessary to install this node agent** on a Support Tools Server node as it has the node agent functionality built-in.

In addition to the nodes specified in this document, the Support Tools Node Agent may be installed on a CCM, CCS, CEM, IP IVR, Unified CC Express and CVP system, when, that system is part of the Unified ICM/Unified CC solution.

As a convenience, and to improve future supportability, the Release 7.2(x) installer will automatically install the Support Tools Node Agent on all Unified ICM/Unified CC systems that it's installed on. If there was an existing node agent installed, an upgrade will be performed. If there was no previous version of the node agent installed, the node agent service will be disabled.

⁷ The Support Tools Node Agent should only be installed one of these systems when it is used as part of a solution that contains a Unified ICM or a Unified CC Enterprise/Hosted product.

⁸ Specifically, do not install the node agent on the CAD Agent and Supervisor desktops and the CTI Agent desktops. They are not supported.

5.9 Unified ICM/Unified Contact Center System Software Requirements

5.9.1 Microsoft Windows Server 2003

In most cases, Microsoft Windows Server 2003 Standard Edition is adequate for use with Unified ICM/Unified CC 7.x(x). In some circumstances, however, high end system deployments must deploy Microsoft Windows Server 2003 Enterprise Edition on some Unified ICM/Unified CC components, such as the logger and the HDS. You should be aware of the following distinction between the editions.

Customers should perform a clean Windows install from the Microsoft media.

Microsoft Windows Server 2003 Standard Edition

- Supports up to four processors on one server
- Maximum 4 GB of RAM

Microsoft Windows Server 2003 Enterprise Edition

- Supports up to eight processors on one 32-bit server
- Maximum 32 GB of RAM

IMPORTANT: Unified ICM/Unified CC is qualified to work only on a standard, retail (or OEM) packaged installation of Windows Server 2003 (Standard or Enterprise, or R2), with or without Cisco Security hardening. Cisco provides its own security hardening policy to secure the standard Windows image for Unified ICM/Unified CC. Cisco does **not** support Unified ICM/Unified CC on a customized Windows image (e.g. a corporate image) or when custom security hardening has been applied. Using a customized image of the Windows operating system or custom security hardening can cause the Unified ICM/Unified CC application to fail.

Microsoft Windows Server 2003 R2

Unified ICM/Unified CC 7.2(x) requires Windows Server 2003 or Windows Server 2003 R2; Service Pack 1 (SP1) or Service Pack 2 (SP2) must be applied on all Windows Server 2003 systems. Cisco qualifies Unified ICM/Unified CC using Windows Server 2003 Service Pack 2.

Microsoft has introduced Windows Server 2003 R2, an update to the Windows 2003 operating system that logically installs atop SP1, and is distributed as a second CD. Server 2003 R2 provides a number of elective add-on features such as identity and access management, storage management, enhanced Web technologies, and the like. Windows Server 2003 R2 is applicable to both Standard and Enterprise editions of Windows for Unified ICM/Unified CC customers.

NOTE that Windows Server 2003 R2 is supported only with the optional features NOT selected.

Cisco has completed qualification of Unified ICM/Unified CC 7.x(x) on Server 2003 R2. Customers currently deploying Windows Server 2003 SP1 may upgrade to R2 on their Unified ICM/Unified CC 7.x(x) servers. This can be accomplished as follows:

- 1) Insert the Windows Server 2003 R2 disk 2 media CD.
- 2) When prompted for the Product Key, enter your R2 key value. The setup procedure will guide you through completion of the full R2 installation process.

64-Bit Windows

Cisco Unified Contact Center and Unified Intelligent Contact Management are **not** supported on 64-bit editions of Windows Server 2003. Only 32-bit Windows is supported.

5.9.2 Microsoft SQL 2000 Server

Microsoft SQL Server 2000 Standard Edition

- Supports up to four processors on one server
- Supports up to 2 GB of RAM

Microsoft SQL Server 2000 Standard Edition can run on the following operating systems:

- Microsoft Windows Server 2003, Standard Edition
- Microsoft Windows 2000 Server
- Microsoft Windows Server 2003, Enterprise Edition
- Microsoft Windows 2000 Advanced Server

Microsoft SQL Server 2000 Enterprise Edition

- Supports more than 4 CPUs
- Supports more than 2 GB of RAM

NOTE: Microsoft SQL Server 2000 Enterprise Edition is not required (vs. SQL Server Standard Edition) for servers with 4 GB or more of physical memory and/or four or more processors / processor cores. SQL Server Enterprise Edition is *only* necessary if performance needs demand its use.

Microsoft SQL Server 2000 Enterprise Edition can run on the following operating systems:

- Microsoft Windows Server 2003, Enterprise Edition
- Microsoft Windows 2000 Advanced Server

Microsoft Service Packs

- Unified ICM/Unified CC 7.0(0), 7.1(x) and 7.2(1) require SQL Server 2000 Service Pack 4 to be applied on SQL Server 2000.

Purchasing SQL Server 2000

Customers can still acquire SQL Server 2000 licenses by taking advantage of the SQL Server 2005 "downgrade rights." The downgrade rights enable you to purchase server plus device CALs, server plus user CALs, or processor licenses for SQL Server 2005 and install and use the previous version. Please refer to <http://www.microsoft.com/sql/howtobuy/default.msp#EXE> for more information.

Follow these steps to acquire SQL Server 2000 media. This assumes that customers license SQL Server under one of the Microsoft Volume Licensing programs.

Open License: Call Microsoft Fulfillment at 1-800-248-0655. Request the SQL Server 2000 media and pay a nominal S&H charge.

Select License: Contact a Microsoft software reseller and request the SQL Server 2000 media.

Enterprise Agreement: Contact the Microsoft Representative for your company.

5.9.3 Licensing Requirements

Unified ICM/Unified CC software runs on Windows Server 2003 operating system and uses the services of SQL Server 2000 database management system. As such, Unified ICM/Unified CC deployments are to meet the licensing requirements for Windows Server 2003 and SQL Server 2000.

5.9.3.1 Windows Server 2003 Licensing

Cisco Unified CC Enterprise and Hosted customers are encouraged to consult Microsoft resources and documentation to determine the licensing that best fits their environment. In many cases, customers may already be licensed for Windows Server 2003 under an existing agreement with Microsoft. In such cases, there is no need to obtain additional licensing for Unified ICM-/Unified CC-based servers.

Customers are responsible for ensuring they are in compliance with Microsoft Licensing terms. Cisco does not currently OEM Windows Server 2003 for Enterprise or Hosted contact center solutions. MCS server purchases may include the following retail offerings:

WIN2003-STD-ENG	Windows Server 2003 - Standard Edition (10 CALs)
WIN2003-ENT-ENG	Windows Server 2003 - Enterprise Edition (25 CALs)

Licensing Unified ICM and Unified CC servers for Windows Server 2003 depends on the licensing model adopted by the customer and the direction this customer's IT Organization has taken in licensing the servers and workstations in the environment.

Microsoft states that customers "can choose to purchase a Windows Device CAL for every device accessing their servers, or can purchase a Windows User CAL for every named user accessing these servers. By having two types of Windows CALs, [customers] are able to use the model that makes sense for their organization. For example, purchasing a Windows User CAL might make more sense if a company has a need for employees to have roaming access using multiple devices. Windows Device CALs may make more sense if a company has multiple-shift workers who share devices."

See <http://www.microsoft.com/windowsserver2003/howtobuy/licensing/overview.mspx> for more information.

Assuming each of the agent desktops or agents accessing the contact center servers have either User or Device CALs, the servers only need a Windows server license. The Windows Server 2003 packages Cisco re-sells with MCS servers include 10 CALs/Standard or 25 CALs/Enterprise which can be allocated to either devices (i.e. PCs) or users (i.e. Agents). For example, if a contact center has 270 agents manning 90 PCs over three different shifts it would make sense to assign those 90 PCs to Device CALs.

In many cases, agents (users) or agents' desktop computers (devices) are already licensed thus not requiring the acquisition of additional Windows CALs when Cisco's Customer Contact solutions are implemented.

More questions may be directed to ask-icm-platform@cisco.com

5.9.3.2 SQL Server 2000 Licensing

The following is provided as general guidelines to help determine the appropriate licensing methods needed for the deployment of Cisco Unified ICM/Unified CC Enterprise and Hosted software. SQL Server licenses are not included in the cost of Unified ICM or Unified CC agent licenses.

Microsoft provides a number of different licensing options that apply to enterprises as well as service providers. SQL Server can be licensed through multiple programs including but not limited to Volume Licensing and Service Provider License Agreements (SPLA).

Refer to <http://www.microsoft.com/sql/howtobuy> and <http://www.microsoft.com/serviceproviders/licensing/default.mspx> for information on SQL Server Licensing.

The following are SQL Server 2000 licensing options that apply to Cisco Unified ICM/Unified CC Enterprise and Hosted (Microsoft definition):

Server plus Device (or User) CALs: Under this model, a server license is required for each operating system environment running an instance of SQL Server, as well as a CAL for each client device (or user) that accesses a system running SQL Server.

Processor Licensing Model: Under this model, a license is required for each physical processor accessed by an operating system environment running SQL Server. This License does not require any device or user client access licenses (CALs).

Service Provider License Agreement (SPLA): The Service Provider License Agreement (SPLA) enables service providers and ISVs with a hosted offering to license Microsoft products on a monthly basis to provide services and hosted applications to their end customers.

As they pertain to SQL Server licensing with Unified ICM/Unified CC, users, devices, servers and processors are defined as the following:

- A *user* is a person who interacts with the Unified ICM/Unified CC software. Unified ICM/Unified CC agents, supervisors, and system and contact center administrators are among such users. The number of users, as it pertains to SQL Server 2000 licensing, is the cumulative and not the concurrent count.
- A *device* is client device used by a human user to interact with the Unified ICM/Unified CC software. The number of client devices, as it pertains to SQL Server 2000 licensing, is the cumulative and not the concurrent count.
- A *server* is a type of computer that runs SQL Server 2000. In Unified ICM/Unified CC deployments, Logger, AW and HDS are examples of components that require SQL Server 2000. For the complete listing of Unified ICM/Unified CC components that require SQL Server 2000, refer to section “Operating System and Database requirements” of this document.
- A *processor* is described as a single physical Central Processing Unit (CPU).

SQL Server 2000 licensing is required for any and all Unified ICM/Unified CC deployments. Customers must determine the appropriate licensing methods based on the size of the deployment. It is not uncommon for a contact center environment to have more agent personnel than stations so the most appropriate method of licensing in this case would be using device CALs versus user CALs. In large installations, the cost of the total amount of user or device CALs required may surpass the cost of processor licensing so the latter may be the appropriate licensing method. A processor license for each of the processors on the database servers would be required.

Note: A license is required for every user of the system regardless of whether the deployment is distributed (for example, WebView and HDS on separate nodes). For more information, see <http://www.microsoft.com/sql/howtobuy/multiplexing.msp>

In deployment scenarios where Cisco Unified CC Hosted or Unified ICM Hosted is used by service providers, Microsoft’s Service Provider License Agreement (SPLA) would apply in lieu of other licensing models. Under SPLA, SQL Server 2000 is licensed on a monthly basis to end customers of the service providers. Service providers should consult with Microsoft to determine the appropriate licensing model for their SQL Server 2000 deployments.

Cisco Unified ICM or Unified CC (Enterprise and Hosted) customers are encouraged to consult Microsoft documentation and other resources to determine the licensing that best fits their specific Unified ICM/Unified CC deployment. In many cases, Unified ICM/Unified CC customers may already have the necessary SQL Server licenses under an existing agreement with Microsoft. Consult your IT or Legal organization for more information.

Microsoft Licensing terms are subject to change. Customers are ultimately responsible for ensuring their SQL Server licensing is in compliance with Microsoft’s End User License Agreement (EULA).

The following table provides supplemental information.

Table 5-70: SQL Server Licensing Guide

Node	SQL Server Licensing Model	Note
Central Controllers		
LoggerA (or RoggerA) or Central Controller (Unified System CCE)	Processor License	For dual-processor servers, it is more cost effective to acquire a processor license for each physical processor than it is to purchase individual CALs when the number of users (incl. agents/supervisors) exceeds approximately 25 or fewer users per processor for Standard Edition and 75 or fewer users per processor for Enterprise Edition.
LoggerB (or RoggerB) or Central Controller (Unified System CCE)	Server License only	LoggerB is used for failover purposes and therefore does not require a license as long as it has the same or fewer processors than LoggerA (when per-processor licensing is used). Where Outbound Option is deployed, the same stipulations apply.
Router	None	While the Router node does not host a database it may act as a client to a remote database using the dbworker or appgw processes. Customers should follow vendor guidelines for licensing those remote database servers.
Distributors		
AW Distributor (AWD) (Primary and/or Secondary)	Server License plus one User CAL for each application administrator and one Device CAL for each Client AW	Application administrators can be Script Editor or Configuration Manager users. Each AW Distributor should have a Device CAL allocated for each active Client AW (standby connections do not require a license).
AW Distributor (AWD) + Internet Script Editor Option	Server License plus one User CAL for each Internet Script Editor user	
AW Distributor (AWD) + Agent-Reskilling Option	Server License plus one User CAL for each Supervisor	
AW Distributor (AWD) + CMS	Server License plus one Device CAL for each Multi-channel (CCS or CEM) server	
Unified System CCE Administration and Reporting Server	Server License plus one User CAL for each user, agent and supervisor	In Unified System CCE, an Administration and Reporting Server includes the AWD, WebView, HDS, and Unified CC Web Administration Server functions.

Historical Data Server (AWD/HDS)	Same as for AWD plus one User CAL for each WebView user	In a kiosk environment where multiple users are accessing WebView from a single or more workstations, a Device CAL is required for each workstation.
Multi-Channel		
Email-Manager Option (Database Server)	Processor License or User CAL (per E-Mail Agent)	Choosing one licensing model versus another depends on system size.
Email-Manager Option (CIR DB Server)	Server License plus one User CAL for each WebView user	A WebView user can be an application administrator or supervisor.
Web Collaboration Server Option (Database Server)	Processor License or User CAL	This will depend on the number of Web Collaboration Agents.
Other		
Client AW	None	Client AW does not host a SQL Server database. Use Client AW versus AW Distributors to reduce licensing costs.
WebView (WV) Server (standalone)	None	Standalone WV servers do not host a SQL Server database.
Peripheral Gateway (PG) or Agent/IVR Controller	None	PGs do not host a SQL Server database.
CAD Server	None	CAD uses MSDE which does not require Client Access Licenses.
RMS LGMapper/LGArchiver	Server License plus one Device CAL for each monitored server and AlarmTracker Client	

Note: Because the Processor licensing model does not require any device or user client access licenses it may be most appropriate to choose for all database servers (except for redundant servers) to simplify the licensing of SQL Server. Customers will not need to determine how many users the system may have or grow to which will impact the number of licenses to be acquired at any given time.

5.9.4 Microsoft Software Localizations

The following table lists supported localized versions of Microsoft Windows and SQL Server that may be used with Cisco Unified ICM/Unified CC Enterprise and Hosted system components and Unified System CC Enterprise.

For a detailed list of language localizations implemented for different portions of this release, refer to the Cisco Unified ICM/Unified Contact Center Product and System Localization Matrix available at:

http://www.cisco.com/application/vnd.ms-excel/en/us/guest/products/ps1846/c1225/ccmigration_09186a008068770f.xls.

Table 5-71: Microsoft Software Localizations, Unified ICM/CC

Microsoft Software *	Supported Microsoft Software Localization	SQL Server Collation
Windows and SQL Server	<ul style="list-style-type: none"> • Danish (MUI only) • Dutch • English • French • German • Italian • Portuguese (Brazil) • Russian • Spanish • Swedish 	Latin1
	<ul style="list-style-type: none"> • Chinese (Simplified) • Chinese (Traditional) 	Chinese_PRC
	<ul style="list-style-type: none"> • Korean 	Korean_Wansung
	<ul style="list-style-type: none"> • Japanese 	Japanese

* Microsoft Windows and SQL Server must be of the same language version on a given computer.

Important: In all cases, the Internet Explorer locale at the WebView Client must use the same date format as the locale at the WebView Server. For example, if the WebView Server has the US English locale (with the format MM/DD/YYYY), then the WebView Client must also use a browser locale with the MM/DD/YYYY format.

In addition, a WebView Client can employ Microsoft Windows and Internet Explorer localized in a language that meets one of these two criteria:

1. The WebView Server that it connects to uses English Microsoft Windows (without MUI language selection). For example, a Russian WebView Client may connect to an English Windows WebView Server.
2. The WebView Server that it connects to uses a language for Microsoft Windows that is included in the same native character set as the WebView Client's Microsoft Windows language. (Character set corresponds to SQL Server Collation indicator above.) For example, an Italian WebView Client may connect to a German Windows WebView Server because both Italian and German are included in the Latin1 character set.

5.9.5 Operating System and Database Requirements

The tables below present operating system requirements specific to Unified ICM/Unified CC server type. The second table covers those Unified ICM/Unified CC servers and client desktop deployments requiring special consideration, while the third table addresses Unified System CCE.

Table 5-72: Operating System and Database Requirements, Unified ICME/ICMH/CCE/CCH

Unified ICM/Unified CC Server	Microsoft Windows Server 2003 Standard or R2, Service Pack 1 or 2	Microsoft SQL Server 2000 Standard Service Pack 4
ICM Router NAM Router CICM Router	✓	N/A
Progger (Unified CCE)	✓	✓
Rogger (Unified CCE)	✓	✓
NAM Rogger (Unified CC Hosted)	✓	✓
AW – Distributor	✓	✓
WebView Server	✓	N/A
All PGs, includes Agent PG TDM ACD PG VRU PG MR PG	✓	N/A ⁹
Unified CC Enterprise Gateway	✓	N/A
SS7 Network Interface Server	✓	N/A
RMS LGMapper RMS LGArchiver	✓	✓

Table 5-73: Special Considerations (OS and DB Requirements), Unified ICME/ICMH/CCE/CCH

Unified ICM/Unified CC Server	Operating System Requirements
CEM, CMB, CCS, DCA	Multi-channel application servers require Windows 2000 Server. They do not support Windows Server 2003.
RMS Listener	Microsoft Windows Server 2003 Standard Edition or R2 with Service Pack 1 or Service Pack 2 For monitoring ICM prior to release 5.0(0), RMS Listener server needs to have Microsoft Windows 2000 Server with Service Pack 4 that supports NetBEUI.
RMS AlarmTracker Client	See: Remote Monitoring Suite
ICM Logger NAM Logger	See: ICM Logger

⁹ Unless CAD is installed, in which case SQL Server is required

Unified ICM/Unified CC Server	Operating System Requirements
CICM Logger	
AW – Distributor, HDS with WebView Server	See: AW – Distributor, HDS, and WebView Server
AW – Real Time Client	See: AW – Real-Time Client only (Client AW)
WebView Client	See: WebView Client and Internet Script Editor
Outbound Option Dialer	See: ICM Outbound Option Go to the following link for Cisco Outbound Option Data Sheet and Cisco Outbound Option Technical Reference. http://www.cisco.com/en/US/partner/products/sw/custcosw/ps524/products_data_sheets_list.html
CTI OS Desktops	See: CTI Supported Platforms
CTI OS	See: CTI Supported Platforms
Cisco Support Tools	See: Cisco Support Tools Server

Table 5-74: Operating System and Database Requirements, Unified SCCE

Unified System CC Enterprise Server	Microsoft Windows Server 2003 Standard or R2, Service Pack 1 or 2	Microsoft SQL Server 2000 Standard Service Pack 4
Central Controller + Agent/IVR Controller	✓	✓
Central Controller	✓	✓
Agent IVR Controller	✓	N/A

Unified System CC Enterprise supports the AW – Real-Time Distributor, HDS and with co-resident WebView configuration. For operating system and database requirements of this server, please see [AW – Distributor, HDS, and WebView Server](#) and [AW – Real-Time Distributor, HDS and with co-resident WebView](#) for details.

5.9.6 CTI Supported Platforms

Table 5-75: CTI Supported Platforms

CTI Option	Operating System							
	Server Platform		Client Platform					
	Windows Server 2003 or R2 SP1/SP2	Windows 2000 Server SP4	Windows 2000 Professional SP4	Windows XP Professional SP1a	Windows XP Professional SP2	Windows XP Professional SP3 ¹⁰	Red Hat Enterprise Linux V4.0	Windows Vista Enterprise or Business Editions
CTI OS 7.0(0) and 7.1(x) Server	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cisco Data Store	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silent Monitor Server (Standalone)	✓	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Silent Monitor Service for Unified CC Toolkit	N/A	N/A	✓	✓	✓	✓	N/A	N/A
CTI Driver for Siebel	✓	✓	N/A	N/A	N/A	N/A	N/A	N/A
CTI OS - CTI toolkit Unified CC Supervisor Desktop	N/A	N/A	✓	✓	✓	✓	N/A	N/A
CTI OS - CTI toolkit Agent Desktop	N/A	N/A	✓	✓	✓	✓	N/A	N/A

¹⁰ CTI OS support for Windows XP Professional SP3 begins with 7.2(7).

CTI OS - CTI toolkit Combo Desktop .NET	N/A	N/A	✓	✓	✓	✓	N/A	N/A
CTI OS - Custom Apps using C++ or COM CIL	N/A	N/A	✓	✓	✓	✓	N/A	N/A
CTI OS - Custom Apps using Java CIL	N/A	N/A	✓	✓	✓	✓	✓	N/A
CTI OS - Custom Apps using .NET CIL	N/A	N/A	✓	✓	✓	✓	N/A	N/A
CTI OS – Monitor Mode Apps using C++, COM, or .NET CIL	N/A	N/A	✓	✓	✓	✓	N/A	N/A
CTI OS – Monitor Mode Apps using Java CIL	N/A	N/A	✓	✓	✓	✓	✓	N/A
CTI Desktop (GeoDCS) V4.7 only	N/A	N/A	✓	✓	✓	N/A	N/A	N/A
Custom Apps using GeoDCS or CtiClient32, V4.7 only	N/A	N/A	✓	✓	✓	N/A	N/A	N/A
CAD	✓	✓	✓	✓	✓	✓	N/A	✓

5.9.7 Supported Third Party Software

Table 5-76: Supported Third Party Software

Function	Software
Remote Administration	<ul style="list-style-type: none"> ◆ Windows 2000 Server - Windows Terminal Services¹¹ (Remote Administration Mode) ◆ Windows Server 2003 Remote Desktop¹² ◆ Symantec pcANYWHERE 12.0 ◆ RealVNC 4.1
Anti-Virus software	<ul style="list-style-type: none"> ◆ McAfee VirusScan Enterprise 7.1 ◆ McAfee VirusScan Enterprise 8.5i ◆ Symantec AntiVirus Corporate Edition 10.1 ◆ Symantec Endpoint Protection 11 ◆ Trend Micro ServerProtect version 5.58+
Internet Browser	<ul style="list-style-type: none"> ◆ Internet Explorer 6.0 (Service Pack 1 or greater) ◆ Internet Explorer 7.0
Zip Utility	<ul style="list-style-type: none"> ◆ WinZIP 9.x
Acrobat Reader	<ul style="list-style-type: none"> ◆ Adobe Acrobat Reader 7.0
Sybase InfoMaker	See WebView Client and Internet Script Editor .

Remote Management and Support

Remote management capability allows Cisco TAC support or Cisco partners to provide system maintenance and system troubleshooting from a remote site.

You can provide remote management and remote support capability in one of the two ways:

- Provide secured VPN to your network where your Unified ICM/Unified CC server resided.
- Provide remote access point through a 56K V.Everything/V.90 external modem.
The modems are typically installed on the Unified ICM/Unified CC Logger and on the PGs.

5.9.8 Cisco Security Agent (CSA)

Cisco strongly encourages the installation of Cisco Security Agent for Cisco Unified ICM/Unified CC Release 7.2(x) on all Unified ICM/Unified CC server nodes. This provides added security protection for your operating environment. You can download the CSA standalone agent free of charge from the following location:

<http://tools.cisco.com/support/downloads/go/PlatformList.x?sftType=Cisco%20Security%20Agent%20for%20Contact%20Center%20Products&mdfid=268439622&treeName=Customer%20Contact&mdfLevel=SERIES&url=null&modeIName=Cisco%20Unified%20Contact%20Center%20Enterprise&isPlatform=N&treeMdfid=268439682>

¹¹Remote Desktop (Terminal Services) may be used for remote administration of Unified ICM-CCE-CCH server considering that it is used with `/admin` option (or `/console` in older version clients).

¹²Remote Desktop is not supported for software installation or upgrade tasks.

CSA for Cisco Unified ICM/Unified CC Enterprise and Hosted based on CSA engine version 5.2 Policy 4.0.x should be used for Unified ICM/Unified CC Enterprise & Hosted Release 7.2(x). CSA 4.5.1, which was supported on prior releases of Unified ICM/Unified CC Enterprise, is not supported in Release 7.2(x). Hence, you must uninstall CSA 4.5.1 prior to upgrading to Release 7.2(1). For more details refer to the *ICM Upgrade Guide for Cisco ICM/IPCC Enterprise & Hosted Editions*.

5.9.9 Server Virtualization

Cisco does not currently support production deployments of its Customer Contact solution on VMWare or Microsoft Virtual Server. However, customers may choose to use virtualization technology in lab or non production environments to functionally test the application. The main caveat is that there should not be any expectations of performance especially under any level of call load or stress use. Cisco TAC will only be able to support the application and not the environment under which it operates. Any issues experienced on non production environments where a Virtualization product is used and for which Essential Operate Services are purchased can only be diagnosed at the application level. Please note any application in the solution that requires a special Operating System load for a specific hardware platform (e.g. Cisco Unified IP IVR) cannot be guaranteed to work in a Virtual Machine configuration.

5.9.10 Unified Contact Center Management Portal Software Requirements

Note: For a Single Server system, the software prerequisites and Portal components for both Web Application Server and Database Server must be installed on the single server. A Single Server system is not supported for any but the smallest deployments.

Table 5-77: Unified Contact Center Management Portal Software Requirements

Type of Software	Server	Software
Operating System	All	Microsoft Windows Server 2003 and R2, SP1 only
Prerequisite Software	All	Microsoft .NET framework Windows Installer 3.1 Microsoft .NET Framework 2.0 Microsoft Windows Server 2003 Application Server and ASP .NET components Microsoft Message Queuing
	Web Application Server	Microsoft SQL 2000 Reporting Services Microsoft .NET Framework 1.1 Microsoft WSE 2.0 SP3 Microsoft Internet Explorer 6.0+ Microsoft Script Host Adobe Reader 7.0
	Database Server	JSE Runtime Environment 5.0 SOAP Toolkit 2.0 SOAP Toolkit 3.0 Microsoft SQL Server 2000 Enterprise Edition SP4 Microsoft XML 4.0 SP2 Parser

Cisco Unified Contact Center Management Portal Software Components	Web Application Server	Audit Reporting Application Web
	Database Server	Database Data Import Provisioning

Appendix A – Server Classes

The server classes defined in this section are used in various Cisco contact center application deployment options. Please note the conventions and notes listed at the end of section. Note too that shading designates End of Sale (EOS) status for selected 7800 Series Media Convergence Server (MCS) models, as indicated on the applicable server status page of Cisco.com:

http://www.cisco.com/en/US/products/hw/voiceapp/ps378/prod_eol_notices_list.html

Processor Types

P3	Intel® Pentium® 3
P4	Intel® Pentium® 4
PD	Intel® Pentium® D
C2D	Intel® Core™2 Duo
Xeon	Intel® Xeon

Table A.0-1: Series ‘40’ of MCS Server Classes (Dual Processor)

Server Class	Model	Proc. Type	CPU Speed (GHz)	CPUs	CPU Cores	RAM (GB)	Disk (GB)	Disk Controller	Ethernet Ports	See Notes
MCS-40-002-Class	MCS-7845H-3.0-CC1	Xeon	3.06	2	1	4	4 x 72	SCSI	2	1,4,5,7
MCS-40-003-Class	MCS-7845-I1-CC1 MCS-7845-H1-CC1	Xeon	3.4	2	1	4	4 x 72	SCSI	2	1,4,5,7
MCS-40-004-Class	MCS-7845-I1-CC1 MCS-7845-H1-CC1	Xeon	3.4	2	1	4	6 x 72	SCSI	2	1,3,4,5,7
MCS-40-005-Class	MCS-7845-H2-CCE1 MCS-7845-I2-CCE1	Xeon	2.33	2	2	4	4 x 72	SAS	2	1,4
MCS-40-006-Class	MCS-7845-H2-CCE1 MCS-7845-I2-CCE1	Xeon	2.33	2	2	4	6 x 72	SAS	2	1,3
MCS-40-007-Class	MCS-7845-H2-CCE1 MCS-7845-I2-CCE1	Xeon	2.33	2	2	4	8 x 72	SAS	2	1,3

Table A.0-2: Series ‘30’ of MCS Server Classes (Single Processor)

Server Class	Model	Proc. Type	CPU Speed (GHz)	CPUs	CPU Cores	RAM (GB)	Disk (GB)	Disk Controller	Ethernet Ports	See Notes
MCS-30-002-Class	MCS-7835H-3.0-CC1 MCS-7835I-3.0-CC1	Xeon	3.06	1	1	2	2 x 72	SCSI	2	1,4,7
MCS-30-003-Class	MCS-7835-H1-CC1 MCS-7835-I1-CC1	Xeon	3.4	1	1	2	2 x 72	SCSI	2	1,4,7
MCS-30-004-Class	MCS-7835-H2-CCE1 MCS-7835-I2-CCE1	Xeon	2.33	1	2	2	2 x 72	SAS	2	1,4

Table A.0-3: Series ‘20’ of MCS Server Classes (Single Processor)

Server Class	Model	Proc. Type	CPU Speed (GHz)	CPUs	CPU Cores	RAM (GB)	Disk (GB)	Disk Controller	Ethernet Ports	See Notes
MCS-20-002-Class	MCS-7825H-3.0-CC1 MCS-7825I-3.0-CC1	P4	3.06	1	1	1	1 x 40	ATA	2	1,7
MCS-20-003-Class	MCS-7825-I1-CC1 MCS-7825-H1-CC1	P4	3.4	1	1	2	2 x 80	ATA	2	1,7
MCS-20-004-Class	MCS-7825-I2-CCE1 MCS-7825-H2-CCE1	PD	2.8	1	2	2	2 x 80	SATA	2	6

Table A.0-4: Series ‘10’ of MCS Server Classes (Single Processor Desktops)

Server Class	Model	Proc. Type	CPU Speed (GHz)	CPUs	CPU Cores	RAM (GB)	Disk (GB)	Disk Controller	Ethernet Ports	See Notes
MCS-10-002-Class	MCS-7815I-3.0-CC1	P4	3.06	1	1	1	1 x 80	SATA	1	1,7
MCS-10-003-Class	MCS-7815-I1-CC2	P4	3.06	1	1	2	1 x 80	SATA	1	1,7
MCS-10-004-Class	MCS-7815-I2-CCE1	PD	2.8	1	2	2	1 x 80	SATA	1	6

Table A.0-5: Series ‘50’ of Generic Server Classes (Quad Processor)

Server Class	Model	Proc. Type	CPU Speed (GHz)	CPUs	CPU Cores	RAM (GB)	Disk (GB)	Disk Controller	Ethernet Ports	See Notes
GEN-50-002-Class	(Generic)	Xeon	1.8	1	4	4	8 x 72	SCSI	2	1,4,5,7
GEN-50-003-Class	(Generic)	Xeon	2.0	1	4	4	8 x 72	SCSI	2	1,4,5,7
GEN-50-004-Class	(Generic)	Xeon	2.6 or better	1/2	4	4	8 x 72	SCSI	2	1,4,5,6,8
GEN-50-005-Class	(Generic)	Xeon	2.6 or better	2	4	4	8 x 72	SAS	2	1,4,5,6

Table A.0-6: Series ‘40’ of Generic Server Classes (Dual Processor)

Server Class	Model	Proc. Type	CPU Speed (GHz)	CPUs	CPU Cores	RAM (GB)	Disk (GB)	Disk Controller	Ethernet Ports	See Notes
GEN-40-002-Class	(Generic)	Xeon	1.8	2	1	2	6 x 72	SCSI	2	1,4,5,7
GEN-40-003-Class	(Generic)	Xeon	1.8	2	1	4	8 x 72	SCSI	2	1,4,5,7

Table A.0-7: Series ‘30’ of Generic Server Classes (Single Processor)

Server Class	Model	Proc. Type	CPU Speed (GHz)	CPUs	CPU Cores	RAM (GB)	Disk (GB)	Disk Controller	Ethernet Ports	See Notes
GEN-30-002-Class	(Generic)	Xeon	3.06	1	1	2	2 x 72	SCSI	2	1,4,7

Table A.0-8: Series ‘20’ of Generic Server Classes (Single Processor)

Server Class	Model	Proc. Type	CPU Speed (GHz)	CPUs	CPU Cores	RAM (GB)	Disk (GB)	Disk Controller	Ethernet Ports	See Notes
GEN-20-002-Class	(Generic)	P4	3.06	1	1	1	1 x 40	ATA	2	2,7
GEN-20-003-Class	(Generic)	P4	3.4	1	1	2	2 x 80	ATA	2	2,7
GEN-20-004-Class	(Generic)	PD, C2D	2.0 or better	1	2	2	2 x 80	SATA	2	2,6

Table A.0-9: Generic Server Classes for Client Software

Server Class	Model	Proc. Type	CPU Speed (GHz)	CPUs	CPU Cores	RAM (MB)	Disk (MB)	Disk Controller	Ethernet Ports	See Notes
GEN-10-005-Class	(Generic)	P3,P4, PD, C2D	1.0 or better	1	1/2	256+	250+	SATA	1/2	2,6

Notes

1. Enable processor Hyper-Threading (if possible). (Enable Hyper-Threading only on Windows Server 2003 or Windows XP/Vista.)
2. The disk should have this amount of available disk space for the applications.
3. The MCS base model comes with 4 hard drives. Additional drives must be separately purchased for this server class of hardware.
4. You may need more Ethernet ports for servers that have the Router software component. See section 5.8.1 [Unified ICM/CC Router](#) for details.
5. Two disks are sufficient for ‘40’ and ‘50’ class machines used for Routers, PGs, and other database-less processes.
6. Cisco has qualified and now supports dual-core Intel processors on its full range of products. Each individual core in a multi-core processor does not count as a processor towards server requirements given in [Appendix A - Server Classes](#). A processor is considered a single physical CPU, regardless of the number of cores.
7. No longer available for purchase (grayed)
8. The GEN-50-004-Class server has been replaced by the GEN-50-005-Class server.

Other Server requirements

- All servers should support 100/1000 Ethernet ports.
- All servers should have a CD/DVD drive.

Class Name Convention

The class name contains self-described meaningful information about the server class. This allows you to refer to the class of server without looking up the class table across this document and other documents.

The class name has the following format: AAA-BB-CCC-Class, where:

- AAA: a sequence of alphabetic letters that describes the class, such as MCS for Cisco Media Convergence Server, or GEN for Generic.
- BB: digits that associate the performance class, such as 10, 20, 30, 40, and 50. “00” means no performance association.
- CCC: version number for this class, starts with 001, then 002, 003 ...
- Class: indicates that this is a server class, not a server model number, nor a part number.

Appendix B – RAID Configuration Requirements

Table B.0-1: RAID Configuration Requirements

Unified ICM/Unified CC Server	RAID Configuration Requirements
Unified CC Enterprise Progger	RAID 1, RAID 10
Unified CC Enterprise Rogger	RAID 1, RAID 10
Unified System CC Enterprise Central Controller	RAID 1, RAID 10
Unified System CC Enterprise Agent/IVR Controller	RAID 1
Unified System CC Enterprise Central Controller + Agent/IVR Controller	RAID 1, RAID 10
Unified System CC Enterprise Administration and Reporting Server	RAID 10
Unified ICM Router	RAID 1
Unified ICM Logger	See section 5.8.2 ICM Logger
AW – Distributor, HDS, and WebView Server	See section AW – Distributor, HDS, and WebView Server
Dedicated WebView Server	RAID 1
AW – Real-Time Distributor	RAID 1
AW – Real-Time Client only (Client AW)	N/A
WebView Client	N/A
Peripheral Gateway – Including Agent PG, TDM ACD PG, VRU PG, MR PG	RAID 1
Unified CC Gateway	RAID 1
Unified ICM/Unified CC SS7 Network Interface Option	N/A
Unified ICM Outbound Option	RAID 1
CTI OS Server	RAID 1
CTI OS Agent and Supervisor Desktops	N/A
CAD Server	RAID 1
CAD Agent and Supervisor Desktops	N/A
RMS Listener, LGMapper, LGArchiver	RAID 1
RMS AlarmTracker Client	N/A
Cisco Support Tools Server	N/A

Appendix C – Acronyms and Terms

Table C.0-1: Acronyms and Terms

Acronyms or Terms	Description
ACD	Automatic Call Distributor
AD	Active Directory
ATA	Internal storage interconnect interface
AW	Administration Workstations
BOM	The Unified ICM/Unified CC Bill of Materials document that has been renamed to “ <i>Hardware and System Software Specification (Bill of Materials)</i> ”.
CAD	Cisco Agent Desktop
CCBU	Cisco Customer Contact Business Unit
CCM	Cisco CallManager
CCS	Cisco Collaboration Server
CDA	CAD Desktop Administrator
CEM	Cisco E-Mail Manager
Central Controller	A Unified ICM/Unified CC server configuration that contains the Unified ICM Router and Unified ICM Logger.
CG	CTI Gateway, also known as CTI Server
CICM	Customer ICM, a software sever used in Unified ICM/Unified CC Hosted Editions
CIL	Client Interface Library
CMB	Cisco Media Blender
Common Ground Upgrade	Upgrade software in-place on pre-existing hardware, migrating data in-place.
cps	Calls per second
CSA	Cisco Security Agent
CSD	CAD Supervisor Desktop
CTI	Computer Telephony Interface
CTI OS	Cisco CTI Object Server
CVP	Cisco Customer Voice Portal
DCA	Dynamic Content Adapter
ECC variables	Expanded Call Context (ECC) variables
EDMT	Enhanced Database Migration Tool
EE	Enterprise Edition
EH	Hosted Edition
HDS	Historical Database Server
ICM	Cisco Intelligent Contact Management Software
IPCC	IP Contact Center (renamed to Unified Contact Center)
ISE	Internet Script Editor
IVR	Interactive Voice Response

Acronyms or Terms	Description
MCS	Cisco Media Convergence Server
MR PG	Media Routing PG
MR-PIM	Media Routing PIM
NAM	Cisco Network Applications Manager – Unified ICM/Unified CC Hosted
NAS	Network Attached Storage
PG	Peripheral Gateway
PIM	Peripheral Interface Manager – a software component in the PG.
RMS	Remote Monitoring Suite
SAN	Storage Area network
SATA	Serial ATA
SP	Service Pack
SRND	<i>IPCC Solution Reference Network Design Guide</i>
SS7	Signaling System 7 – a telecommunication protocol
Unified System CCE	Unified CC Enterprise Edition deployment model featuring simplified installation and integrated web-based configuration
TAC	Cisco Technical Assistance Center
Technology Refresh	Install and configure the system and product software on newly acquired hardware, migrating historical and configuration data from the prior hardware environment.
TDM	Time Division Multiplexing
VPN	Virtual Private Network
VRU	Voice Response Unit