Hardware and System Software Specification (Bill of Materials) for Cisco Unified ICM/ Contact Center Enterprise & Hosted

Release 8.5(x)

Revision 1.15

Last Updated:September 21, 2012

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1 Overview

The purpose of this document 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) products* for Release 8.5(1) and subsequent 8.5(x) Maintenance Releases (MR).

***Note:** See the note on Contact Center Product Names in the References section on page4.

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/Contact Center 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 (SP) support qualified for the release. New server hardware may be added to this document following initial publication; existing server hardware will not be rendered obsolete by these additions.

1.1 *Hardware, System Software*, 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.

***Note:** System software consists of the operating system, database server, and other third-party applications

This document does not list Cisco Unified Computing System (UCS) hardware on which only virtualized Unified Contact Center components may be installed. Please refer to the Unified Communications Virtualization DocWiki page at: http://docwiki.cisco.com/wiki/Unified_Communications_Virtualization for detailed guidance on deploying Cisco Unified Communications products on UCS hardware.

Hardware and associated system software are specified by Unified ICM/Contact Center 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 upgrading to Release 8.5(x) on existing hardware.A summary of system configuration boundaries is also provided, followed by specific Unified ICM/Contact Center 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 the 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 information to more accurately portray expected capacity and sizing limitations of specific deployments. The reader must recognize, however, that the Unified ICMand Unified Contact Center 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 ICMEnterprise 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 might also have exceptions.Where specific circumstances 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.

1.2 *Updated Information in this Document*

The following table provides information on publication updates for this document.

Table 1-1: Publication Updates

Rev.	Section	Notes
1.15	Table 6-41 updated	Note added about setting HTTP keep alive timer.
1.14	Table 5-1 updated.	New values were populated in the PIMs per system (total), Duplex PGs per ICM instance, and MR PIMs per MR PGs rows.
1.13	Table 5-1 updated.	New values were populated in the VRUs per Generic PG and PIMs per system (total) rows.
1.12	Table 5-1 updated.	New values were populated in the ECC and user variables size (bytes) row.
1.11	Section 7.5 updated.	Note added to indicate that adding a custom DB on a Logger or HDS is not supported.
1.10	Sections 5.3, 6.1, 6.6, and 7.6 updated.	Updated sections to include information about Cisco Finesse.
1.09	Sections 6.1.1.1 and 6.1.1.5 Outbound Option Scalability updated.	Note added to indicate that the Outbound Option can be installed on Progger but that agent capacity will be reduced.
1.08	Section 6.3 Unified Contact Center Management Portal.Section 5.1 updated and 6.1.1.4 added.	Agent Self Re-skilling and Provisioning Batch Processing sections added. Sections updated and added with information on the capability for having up to 12,000 agents.
1.07	Section 6.6.1.4Common Ground Upgrade	Minor updates
1.06	Section 6.6.1.3New Deployments and Technology Refresh and Section 6.6.1.4Common Ground Upgrade	Updated the tables for 8.5(x)
1.05	Section 0Citrix XenApp Server 5 with Microsoft Windows Server(32-bit and 64-bit R2) Support for CTI OS	Included Windows 2008 (64bit) R2 support for a platform of Citrix XenApp Server 5
1.04	Section 7.3Microsoft SQL Server 2005 7.5Operating System and Database Requirements	Clarified that SQL Server 2005 32-bit is required for Windows Server 2003 and 2008.
1.03	5.1Unified	Added scalability constraints for call type skill groups and configured

Rev.	Section	Notes
	ICM/Contact Center Configuration Limits & Scalability Constraints	call types.
1.02		Added 8.5(2) support for Microsoft Windows Server 2008 R2, Agent Greeting, and additional 8.5(2) changes. Removed(dated) Microsoft licensing detail. For licensing implications and CAL allocation, refer directly to Microsoft.
1.00	-	Initial revision for 8.5(1) release. All references to WebView reporting are removed in this document since WebView is no longer supported as of release 8.5(1). See section 2 for references to the *Cisco Unified Intelligence CenterSystem Software Specification (Bill of Materials)*.

2 References

Cisco Unified Intelligent Contact Management/Unified Contact Center Enterprise and Hosted (Unified ICME and Unified ICMH) 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 Unified ICM Software ACD Supplements*
  http://www.cisco.com/en/US/products/sw/custcosw/ps1844/prod_technical_reference_list.html
- *Cisco Unified ICM ACD PG Supportability Matrices*
  http://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/ipcc_enterprise/ipccenterprise8_0_1/compatibility_matrices/guide/icmacdmx.pdf
- *Cisco Unified Contact Center Enterprise Software Compatibility Guide*
  http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_device_support_tables_list.html
- Cisco End-of-Life and End-of-Sale Notices
  http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_eol_notices_list.html
- *Cisco Unified Contact Center Enterprise 8.5(1) Solution Reference Network Design (SRND)*http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_implementation_design_guides_list.html
- *Virtualization Guide for Cisco Unified Intelligent Contact Management and Contact Center Enterprise*
  https://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/icm_enterprise/icm_enterprise_7_5/user/guide/VirtualizationGde753.pdf
- *Bill Of Material Guide for Cisco Unified Intelligence Center (CUIC)*
  http://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/intelligence_suite/intelligence_suite_80/user/guide/is80bom.pdf
- *Cisco Unified Customer Voice Portal Solution Reference Network Design (SRND)*
  http://www.cisco.com/en/US/products/sw/custcosw/ps1006/products_implementation_design_guides_list.html
- *Cisco Unified Customer Voice Portal Hardware and System Software Specification*
  http://www.cisco.com/en/US/products/sw/custcosw/ps1006/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 might differ between this document and the references cited. For Unified ICM/CC 8.5, see the most recent revision of these documents or those revisions listed within the specific Unified ICM/CC release heading on Cisco.com.

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

The use of the generic abbreviation “Unified CC” in this document is intended to include Unified CCH and Unified CCE, but *not* Unified Contact Center Express (Unified CCX).

3 Servers for Cisco Contact Center Products

The Unified Contact Center Enterprise 8.5(x) product is fully supported on Cisco Unified Computing System (UCS) servers in a virtualized environment. Please see section Appendix A – Server ClassesAppendix A – Server Classesfor more details about this deployment option.

The Unified ICM/Contact Center 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/Contact Center product. MCS servers have a proven track record of high reliability, offer a common consistent architecture across Cisco Voice applications, and accommodate value-added Cisco support services such as SMARTnet (technical support services).

The range of MCS server sizes aligns with specific Unified ICM/Contact Center server node types and the corresponding anticipated capacity of a given solution. As explained in the Overview section, and as listed in Appendix A – Server Classes, MCS servers are categorized in this document by "server class" designation. Specific classes are, in turn, listed as applicable to a given Unified ICM/Contact Center server node type and capacity in the section, Unified ICM/Unified Contact Center Operating Conditions. Where specific Unified ICM/Contact Center component server requirements dictate certain hardware capabilities (for example, 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 Unified Communications Manager (Unified CM) and associated products, MCS servers ordered for Unified ICM/Contact Center deployments do not include a customized distribution of the operating system. Users ordering MCS for Unified ICM/Contact Center must also order the appropriate editions of Microsoft Windows Server 2003 (or R2), or Microsoft Windows Server 2008 R2, and, for database, SQL Server 2005 32-bit. *Unified ICM/Contact Center 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/Contact Center; see the *Security Best Practices for Cisco Unified ICM/Contact Center Enterprise & Hosted, Release 7.x(y)* guide, available at:

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

For therelease 8.5, a virtualized UCS server solution or a MCS server solution is required for all Unified Contact Center Enterprise deployments. Only exact-match OEM servers from Cisco-selected manufacturers (See http://www.cisco.com/go/swonly for details), or generic hardware for those components specifically indicated, can be substituted for Cisco UCS or MCS servers for Unified Contact Center deployments. **This requirement applies to new deployments and expansionson physical servers as well as on ESX server**.

If you have non-MCS hardware, you can upgrade to an 8.5 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 the section titled, Software Constraints and Operating Conditions.For Unified ICME and Unified ICMH customers, non-MCS ("generic") servers that essentially match MCS specifications for a given server class can 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.

3.1 *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 third-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/Contact Center solution on a third-party server "blade" chassis form factor.

Note: A "technology refresh"upgrade planned for a Peripheral Gateway should ensure atleast 40 GB of hard disk space free to ensure that the OPC capture serviceability feature, when enabled, will have sufficient disk space available. This capability is vital for troubleshooting PG related issues.

Recommended Redundant Hardware

The following table contains recommendations for redundant hardware.

Table 3-1: Recommended Redundant Hardware

Supported components	Unsupported components
◆ Power supplies ◆ Fans ◆ Memory ◆ Storage controllers ◆ Disks (RAID)	Redundant network interface cards (NICs). **Caution:** Using NIC 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.

CPU

Each individual core in a multicore 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.

Note: If you run Microsoft Windows Server 2008 R2, 64-bit hardware is required.

NIC Speed/Duplex Configuration

The following table contains information on network interface card (NIC) Speed/Duplex Configuration.

Table 3-2: NIC Speed/Duplex Configuration

NIC Capability⇩	Switch Port Capability	
	10/100 MB/s	**1000 MB/s**
10/100 MB/s	10/100 MB/s Full Duplex	10/100 MB/s Full Duplex
1000 MB/s	10/100 MB/s Full Duplex	Auto

Note: Severe network communication problems are likely when 10/100 MB/s NICs and switch ports are not *both* explicitly set to the capable speed in *Full Duplex* operation.We highly recommend the use of gigabit (1000 MB/s) 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 required unless otherwise specified. Components where Serial or Parallel ATA (Advanced Technology Attachment) drive use is acceptable are explicitly identified in the applicable node's hardware specifications.

The following table provides information on storage hardware requirements.

Table 3-3: Storage Hardware Requirements

Required controllers	**SCSI/SAS** • Ultra160/3 (minimum) • Ultra320 (recommended) • SAS 3.0Gb/s (minimum)* • SAS 6.0Gb/s (highly recommended)
	ATA • Serial (recommended) • Parallel
Disk Drives	**SCSI/SAS** • 3.5 in. 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 in. Form Factor ▪ 15,000 RPM preferred for database servers ▪ 10,000 RPM (standard) for all other nodes
	ATA7,200 RPM
Additional Media	DVD drive (for software installation)

***Note:**Serial Attached SCSI

Configuration Guidelines

See the following list for guidelines on storage configuration:

- 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 may increase the overall fault tolerance of the disk array.
- Use controllers with multiple channels connected to discrete drive bays or backplanes.

Note: Multiple controller channels can be significantly advantageous 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.

3.1.1.1 Supported Configurations

The following list provides information on 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.
- RAID 5 (Block-level striping with distributed parity)–This is the minimum RAID level required for medium to large Unified ICM/Contact Center Rogger, Logger and AW-HDS(-DDS) database components (virtual machine guests) on Cisco Unified Computing System (UCS) hardware; RAID 5 is only supported on UCS.

  Caution: Some disk I/O performance degradation is likely when one disk in a RAID 5 array fails. Failed disks must be replaced at the earliest appropriate opportunity to avoid system impairment or loss of data. It is recommended that a hot-standby be allocated for a potential disk failure so that a rebuild can be initiated as soon as practical. A disk rebuild will degrade disk I/O performance during the actual rebuild (degradation level is dependent on the configured priority of a disk rebuild); choose your rebuild time window accordingly (for example,*not* during the busy hour).

- RAID 10 (A Stripe of Mirrors) – This is an additional RAID level option for medium to large Unified ICM/Contact Center Rogger, Logger and AW-HDS(-DDS) database components (virtual machine guests) on UCS hardware and the required RAID level for the same database components, as well as CCMP, on direct-attached storage (i.e. local disk) on Media Convergence Server (MCS) hardware. RAID 10 offers the highest level of disk I/O performance and redundancy.

3.1.1.2 Unsupported Configurations

The following storage configurations are not supported:

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

Caution: 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

Netwrok Attached Storage (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 deployments.

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 does endorse the use of a Storage Area Network (SAN) under the following conditions:

1. A SAN RAID group must be dedicated to Unified ICM/CC database components; these SAN RAID groups must not be shared by other applications.
2. The SAN host interface (for example, Fibre Channel) must meet or exceed the performance specifications of supported (direct attached) SCSI/SAS interfaces. See the section titled, Storage Hardware, Required Controllers.
3. Each individual drive in the SAN array must meet or exceed the performance specifications of supported (direct attached) disk drives. See the section titledStorage Hardware, Disk Speed.

Note: SATA drives are not supported with SAN.

4. The SAN disk array must be configured as RAID 5 or 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/Contact Center application, a shared disk environment cannot be supported (e.g. Unified CCE application component sharing a LUN with another application); 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/software option decisions (and procedures) 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 might have restrictions on which platforms they are compatible with. Consult your backup product vendor to determine options for internal or external backup storage.

4 Software Upgrade and Installation Considerations

Upgrading to Unified ICM/Contact Center, Release 8.5(1) is explained in the *Upgrade Guide for ICM and CTI OS for Cisco Unified Contact Center Enterprise, Release 8.5(1)*. For additional information on Release 8.5(1) upgrade and installation, see also the *Release Notes for Cisco Unified Contact Center Enterprise, Release 8.5(1).*

Upgrading to Unified ICM/Contact Center, Release 8.5(2) is explained in the *Upgrade Guide for ICM and CTI OS for Cisco Unified Contact Center Enterprise, Release 8.5(2)*. For additional information on Release 8.5(2) upgrade and installation, see also the *Release Notes for Cisco Unified Contact Center Enterprise, Release 8.5(2).*

5 Software Scalability, Constraints and Operating Conditions

5.1 *Unified ICM/Contact Center Configuration Limits & Scalability Constraints*

The following tables specify the configuration limits and scalability constraints for the Unified ICM/Contact Center products. These configuration limits are part of the Unified ICM/Contact Center product design constraints and were used 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. (See applicable specific comments in the table below for additional detail.) Consult Cisco if you have special configuration requirements that might exceed specific parameter(s).

The check mark in the table indicates that a given parameter is applicable to the indicated Unified ICM/Contact Center product edition. Please observe the notes at the end of this table.

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

Maximum Limit	Limit Value		Unified CCE	Unified ICME	Unified CCH	Unified ICMH	Comments
	<=450 agents (UCCE only)	>450, <12,000 agents					
ECC (Extended Context Call) and User variables size (bytes) [1]	2,000	2,000	✓	✓	✓	✓	CVP and Outbound Option rely on a subset of this maximum limit for integration with Unified ICM
Number of Peripheral Variables (Call Variables)	10	10	✓	✓	✓	✓	
Peripheral Variable length (characters)	40	40	✓	✓	✓	✓	40 characters, excluding terminating NULL
VRU PIMs per VRU PG	N/A	10	✓	✓	✓	✓	7845 class only
VRU PIMs per Generic PG	2	8	✓	✓	✓	—	7845 class only
VRU PIMs per System PG	N/A	5	✓	—	—	—	IP-IVR PIMsonly

Maximum Limit	Limit Value		Unified CCE	Unified ICME	Unified CCH	Unified ICMH	Comments
	<=450 agents (UCCE only)	>450, <12,000 agents					
TDM PIMs per PG	N/A	5	—	✓	—	✓	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 coresident
MR PIMs per MR PG	1	2	✓	✓	✓	✓	
PGs per server	1	2	✓	✓	✓	✓	This is not applicable to multi-instance CTI OS in a Unified CCH environment.
PGs per CICM instance	N/A	80	—	—	✓	—	This is only applicable to Unified CCH with multi-instance CTI OS deployment
Duplex PGs per ICM instance	1	250	✓	✓	✓	✓	For <= 450 agents with outbound, there will be an additional MR PG
PIMs per system (total)	4	250	✓	✓	✓	✓	One agent PIM, two VRU PIMs, and one MR PIM (applies to <= 450 agents only)
Configured agents per system (total)[2]	N/A	65,000	—	✓	✓	✓	
Configured agents per system (total)[2]	3000	76,000	✓	—	—	—	
Configured agents per peripheral	3000	2 x agent capacity	✓	✓	✓	✓	Example: For a 2,000 agent capacity peripheral gateway, the maximum configured agents for that peripheral is 4,000
Skill groups per peripheral gateway	1500	3000	✓	✓	✓	✓	
Skill groups per system	1500	27000	✓				
HDS servers per Logger side	2	4	✓	✓	✓	✓	Detailed HDS deployment constraints are described in Chapter 2, Cisco Unified

Maximum Limit	Limit Value		Unified CCE	Unified ICME	Unified CCH	Unified ICMH	Comments
	<=450 agents (UCCE only)	>450, <12,000 agents					
							Contact Center Enterprise 8.5 Solution Reference Network Design (SRND) SeeDeployment-specific limits forAW and HDS Servers per Logger Side for deployment specific limits.
Instances per CICM complex	N/A	25	—	—	✓	✓	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.
CICMs per NAM platform	N/A	75	—	—	✓	✓	The maximum CICM physical servers per NAM are six (6). Consult your Cisco representative if you need more than six
CTI OS per PIM	1	1	✓	✓	✓	✓	
Instances per PG/CG/CTI OS/SIP Dialer server	N/A	10	—	—	✓	—	This assumes that the total load is for all instances and that their configurations are within the limit of maximum capacity of a single instance.
HDS instances per Hosted ADS	N/A	10	—	—	✓	✓	This assumes that the total load is for all instances and that their configurations are within the limit of maximum capacity of a single instance.
Provisioning operations per hour	30	120	✓	✓	✓	✓	For Configuration Manager, Web reskilling, CCMP, or AAS – maximum number of save operations across all ADSs in the solution in a 1-hour period. 200 changes per provisioning operation.
SCCP dialer ports per dialer	N/A	120	✓	—	✓	—	

Maximum Limit	Limit Value		Unified CCE	Unified ICME	Unified CCH	Unified ICMH	Comments
	<=450 agents (UCCE only)	>450, <12,000 agents					
SCCP dialers per PG pair (Side A + Side B)	N/A	2	✓	—	✓	—	Only one kind of dialer (SCCP or SIP) can be installed per PG
SIP dialer ports per dialer	N/A	1,500	✓	—	✓	—	This assumes the model is distributed, numbers vary based on deployment
SIP dialers per PG pair (Side A + Side B)	N/A	1	✓	—	✓	—	Only one kind of dialer (SCCP or SIP) can be installed per PG
SIP dialer Ports per server (total)	N/A	1,500	—	—	✓	—	In multi-instance deployment
Dialer ports per system (total)	N/A	4,000	✓	—	✓	—	
Dialers per system (total)	N/A	32	✓	—	✓	—	***Note**:* When the number of dialer ports per system exceeds 1,600, the Logger and HDS must be upgraded to GEN-50-005-Class
Campaigns per system (SCCP)	N/A	100	✓	—	✓	—	
Campaigns skill groups per system (SCCP)	N/A	100	✓	—	✓	—	
Campaigns per system (SIP)	N/A	300	✓	—	✓	—	This is applicable only when router and logger are deployed on separate machines.[1]
Campaigns skill groups per system (SIP)	N/A	300	✓	—	✓	—	This is applicable only when router and logger are deployed on separate machines.
Campaign skill groups per campaign	N/A	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)	1	5	✓	✓	✓	✓	

[1] For the SIP dialer, this option is available from UCCE 8.5(4) onwards, and the value of EMSUserData for both Dialer and CampaignManager should be set to FF.

Maximum Limit	Limit Value		Unified CCE	Unified ICME	Unified CCH	Unified ICMH	Comments
	<=450 agents (UCCE only)	>450, <12,000 agents					
Dialed numbers per system	1,500	240,000	✓				
Labels configured per system	500	160,000	✓				
Call type skill groups per interval	1,000	30,000	✓	✓	✓	✓	Total call type skill group records
Configured call types	500	10,000	✓	✓	✓	✓	Total call types configured
Active call types	250	8,000	✓	✓	✓	✓	
Routing scripts configured per system	500	2,000	✓	✓	✓	✓	
Active Routing Scripts at any point in time	250	300	✓				

[1]**Note:** The maximum indicated is independent from the number of ECC and user 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/Contact Center 7.1, the maximum includes both persistent and non-persistent variables.

[2]**Note:** Deployments approaching these limits are at risk of performance degradation and failed call routing, especially if one or more contending capacity limitations are themselves approaching maximum thresholds. For this reason, Cisco strongly recommends partner and/or professional services engagement for expert assistance with capacity-related system planning. The set of most impacting related parameters with large numbers of configured agents include total number of system peripherals, routes, number of active (vs. configured) agents, and overall call load. The point at highest risk for degradation are busy hours and the half-hour update period, during which PG-generated reporting data is sent to the Central Controller. System administrators can lessen their exposure to these issues by purging unused configured agents, retiring inactive peripherals, and maintaining systems at current maintenance release levels.

Note: For Unified CCH running with SCCP dialer, there is only one instance of Outbound Option per CICM platform/complex with a maximum of twodialers per PG pair.

Deployment-specific limits forAW and HDS Servers per Logger Side

Additional AWs can only be deployed by reducing an equal number of AW-HDSs

Capacity/Component	450	4,000	8,000	12,000
HDS-DDS per logger side	1	1	1	1
AW-HDS per logger side	1	1	3	4
AW only per logger side	0	1	1	2

5.2 *Unified ICM/Unified Contact Center Operating Conditions*

Except when explicitly specified, the Unified ICM/Contact Center 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. These valuesare provided in the following table.

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

Operating Condition	Value		Unified CCE	Unified ICME	Unified CCH	Unified ICMH	Comments
	<=450 agents	>450, <12,000 agents					
Maximum number of CTI OS Servers per PG	1	1	✓	✓	✓	✓	Simplex CTI OS system (not for production systems)
	2	2	✓	✓	✓	✓	Duplex CTI OS system
Maximum number of Cisco Finesse servers per PG	2	2	✓	✓	✓	✓	
Average skill groups per agent per team	5	5	✓	✓	✓	✓	Does not include default skill group; assumes 17 stats per skill group enabled
Number of supervisors	10%	10%	✓	—	✓	—	10% of total agent population
Number of teams	Agents/10	10%	✓	—	✓	—	10% of total agent population (9 agents and 1 supervisor per team)
Monitor mode applications (CTI OS)	2	2	✓	✓	—	✓	
	N/A	10	—	—	1 per instance	—	
All-event clients (CTI Server) with single processor server	2	4	✓	✓	✓	✓	
ECC variables	5 scalars	5 scalars	✓	✓	✓	✓	40 bytes each
Call flow traffic on straight calls	85%	85%	✓	✓	✓	✓	

Operating Condition	Value		Unified CCE	Unified ICME	Unified CCH	Unified ICMH	Comments
	<=450 agents	>450, <12,000 agents					
Call flow traffic on transfer calls	10%	10%					
Call flow traffic on conference calls	5%	5%					
Outbound dialer call transfer rate	N/A	30%	✓	—	✓	—	Percentage of the calls transferred to agent or IVR

5.3 *Unified ICM/Unified Contact Center Scalability*

This section describes the impacts on Unified ICM/Unified Contact Center scalability and capacity calculations based on the contact center configuration.

CTI OS Security Scalability

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

Mobile Agents Scalability

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.

- 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.

Note: 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, see the *Cisco Unified Contact Center Enterprise Solution Reference Network Design (SRND)* at:http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_implementation_design_guides_list.html.

Outbound Option Scalability

To estimate Outbound Option agent capacity for Agent PGs, use the following formula:

Max agents = (Maximum PG agent capacity) – (4 x (number of SCCP dialer ports))

or

Max agents = (Maximum PG agent capacity) – (1.33 x (number of SIP dialer ports))

These formulas indicate platform capacity; they are not an indicator of outbound resources in terms of how many agents can be kept busy by the number of dialer ports in the deployment. A quick but inexact rule of thumb is 2 ports required for each outbound agent, but your outbound resources may vary depending on hit rate, abandon limit, and talk time for the campaigns in the deployment. Use the sizing tool to determine outbound resources required for your campaigns.

See the Outbound Option chapter of the SRND at:
http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_implementation_design_guides_list.html
for more details.

Note: Outbound Option SIP dialer is compatible only with IOS Release 15.1(x)T.

Agent Greeting Scalability

For deployments implementing the Agent Greeting feature, component scalability is impacted by this feature. For more details about sizing Agent Greeting deployments, see the *Cisco Unified Contact Center EnterpriseRelease8.5(1) Solution Reference Network Design (SRND)* at:http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_implementation_design_guides_list.html.

Cisco Finesse Scalability

Cisco Finesse only supports deployments where there is a single PIM per agent PG.

6 Server Hardware Requirements

6.1 *Unified Contact Center Enterprise*

This section assists you in selecting the hardware servers for your Unified Contact Center solution, including both the Unified CCE and its associated deployment models.

VRU ports for Agent PG and System PG should not exceed half of the maximum supported agents listed in the capacity column. Additional VRU PGs can be deployed to accommodate a greater number of VRU ports. For VRU PG capacities, see theVRU Peripheral Gateway (PG) section.

Important 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–For information about CTI OS capacity impact, see theCTI OS Security Scalability section.

Outbound Option –For information about determining Agent PGOutbound Option agent capacity, see the Outbound Option Scalabilitysection.

> **Note**: All outbound call scenarios are supported when a mobile agent is deployed using nailed connection call delivery mode. Outbound call scenarios are not supported when a mobile agent is deployed using call-by-call call delivery mode.

Mobile Agents–See the Mobile Agents Scalabilitysection for factors that affect its scalability.

Agent Greeting–For information about the impact of the Agent Greeting feature on deployment scalability, see theAgent Greeting Scalabilitysection.

Agent PG Configuration Options

The following tables illustrate various configuration options for the Agent PG (which components are necessary for each PG configuration). Agent PG capacity varies based on specific component configuration.

Table 6-1: Agent PG Configuration Options with CTI OS, Unified CCE

Unified CM + VRU	With Generic PG or Unified CCE System PG	With Unified Communications Manager PG	With Outbound Option
CM PG (CM PIM)	Generic PG (CM PIM + VRU PIM)	CM PG (CM PIM)	Generic PG (CM PIM + VRU PIM)
VRU PG (VRU PIM)		CM PG (2) (CM PIM)	
CTI Server	CTI Server	CTI Server	CTI Server
CTI OS	CTI OS	CTI OS	CTI OS
		CTI OS (2)	MR PG
			Dialer

Table 6-2: Agent PG Configuration Options with Cisco Agent Desktop, Unified CCE

Unified CM + VRU	With Generic PG or Unified CCE System PG	With Unified Communications Manager PG	With Outbound Option
CM PG (CM PIM)	Generic PG (CM PIM + VRU PIM)	CM PG (CM PIM)	Generic PG (CM PIM + VRU PIM)
VRU PG (VRU PIM)			
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

Table 6-3: Agent PG Configuration Options with Cisco Finesse, Unified CCE

Unified CM + VRU	With Unified Communications Manager PG
CM PG (CM PIM)	CM PG (CM PIM)
VRU PG (VRU PIM)	
CTI Server	CTI Server

New Deployments and Technology Refresh

Note: These capacities assume that each agent is handling 30 calls per hour.

6.1.1.1 Option 1: Supports up to 450 Agents

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

Note: The Outbound option can also be installed on the Progger, however the number of agents supported will be reduced. For more details, see the Outbound Option Scalability section.

Table 6-4: Progger Servers, Unified CCE, New Deployments / Tech. Refresh

Server Class	Capacity (agents)	
	Progger with CTI OS	Progger with CAD Services
MCS-30-005-Class	100	—
MCS-40-011-Class	450	297

Note: Cisco Finesse must be installed in a VMware Virtual Machine, on a separate physical server that meets the requirements of the Finesse OVA template. For more information, see the DocWiki page Virtualization for Cisco Finesse.

6.1.1.2 Option 2: Supports up to 4,000 Agents

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 4,000 agents.

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

Server Class	Capacity (agents)
	Rogger
MCS-30-005-Class	500
MCS-40-013-Class	4,000

6.1.1.3 Option 3: Supports up to 8,000 Agents

Standalone Router and Standalone Logger: Consider this option if the expected growth of your contact center will exceed 4,000 agents.

Table 6-6: Router/Logger Servers, Unified CCE, New Deployments / Tech. Refresh

Server Class	Capacity (agents)	
	Router	Logger
MCS-40-011-Class	8,000	*N/A*
MCS-40-016-Class	*N/A*	6,000
GEN-50-005-Class	*N/A*	8,000

Table 6-7: Agent PG Servers, Unified CCE, New Deployments / Tech. Refresh

Server Class	Capacity (agents)			Operating Requirements	
	Agent PG with CTI OS	Agent PG with CAD Services	Agent PG with Standalone Cisco Finesse	# of UCM PIMs	# of CTI OS Servers
MCS-30-005-Class	450	297	450	1	1
MCS-40-011-Class	2,000	1,000	2,000	1	1
MCS-40-011-Class	4,000	—	—	2–10 [1]	2–10 [2]

Notes:

- [1]A PIM has a maximum agent capacity of 2,000 agents
- [2]The combined agents for all PIMs on a single PG cannot exceed the PG maximum of 4,000, nor can any single PIM exceed the maximum of 2,000 agents.
- The CAD Server component (if CAD services are required) should be collocated 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 collocated or separate.
- For hardware and system software requirements, see the Cisco Agent and Supervisor Desktops section.
- Cisco Finesse must be installed on a separate physical host that meets the requirements of the Finesse OVA template. The capacity for the Agent PG corresponds to the class of MCS hardware in the preceding table. For more information, see the DocWiki page Virtualization for Cisco Finesse.

6.1.1.4 Option 4: Supports up to 12,000 Agents

New servers released with 8.5(3) enable customers to have up to 12,000 agents on the Router or Logger.

Refer to the virtualization docwiki for virtualized deployments.

Standalone Router and Standalone Logger: Consider this option if the expected growth of your contact center will exceed 8,000 agents.

Table 6-8: Router/Logger Servers, Unified CCE New Deployments

Server Class	Capacity (Agents)	
	Router	Logger
MCS-40-014-Class	12,000	N/A
GEN-50-006-Class	N/A	12,000

Note: Maximum BHCA supported for the 12000 agent deployment is 360,000.

Table 6-9: Server Class Hardware Requirements and Capacity Limitations for Deployments of up to 12,000 Agents

Server Class	Hardware		Capacity	
AW	Processors	RAM	Reporting Users per AW-HDS	Other requirements
GEN-50-006-Class	4	8	200	Disk Configuration – 10 (or more) Disks 1–2: OS, ICM, SQL Server and other third-party software; RAID 1 Disks 3–*: Database files, ICM Database Transaction Log(s); RAID 10. Dedicated 2 channel RAID Controller, min 512 MB cache with battery backup. (Alternately, the ICM Database Transaction Log(s) can be moved to a dedicated drive to limit disk contention.

Common Ground Upgrade

6.1.1.5 Option 1 - Supports up to 450 Agents

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

Note: The Outbound option can also be installed on the Progger, however the number of agents supported will be reduced. For more details, see the Outbound Option Scalability section.

Table 6-10: Progger Servers, Unified CCE, Common Ground Upgrade

Server Class	Capacity (agents)	
	Progger with CTI OS	Progger with CAD Services
MCS-30-003-Class	85	—
MCS-30-004-Class	100	—
MCS-40-003-Class	270	85

MCS-40-005-Class	450	297

Note: Cisco Finesse must be installed in a VmWare virtual machine on a separate physical server that meets the requirements of the Finesse OVA template. For more information, see the DocWiki page Virtualization for Cisco Finesse.

6.1.1.6 Option 2 - Supports up to 1,275 Agents

Rogger Configuration: This server has the Unified CCE Router collocated with the Unified CCE Logger, and separate agent PGs.

Table 6-11: Rogger Servers, Unified CCE, Common Ground Upgrade

Server Class	Capacity (agents)
	Rogger
MCS-30-003-Class	300
MCS-30-004-Class	425
MCS-40-003-Class	900
MCS-40-005-Class	1,275

Note: For agent counts exceeding 1,275, separate Router and Logger servers are required - Option 3.

6.1.1.7 Option 3 - Supports up to 5,100 Agents

Standalone Router and Standalone Logger: This option has the Unified CCE Router and Unified CCE Logger on separate servers and also separate agent PGs.

Table 6-12: Standalone Router/Logger Servers, Unified CCE, Common Ground Upgrade

Server Class	Capacity (agents)	
	Router	Logger
MCS-40-003-Class	3,600	3,000
GEN-50-004-Class	5,100	5,100
MCS-40-005-Class	5,100	4,250

6.1.1.8 Agent PGs

The following capacities apply to both Option 2 and Option 3.

Table 6-13: Agent PG Servers, Unified CCE, Common Ground Upgrade

Server Class	Capacity (agents)	
	Agent PG with CTI OS	Agent PG with CAD Services
MCS-30-003-Class	270	178
MCS-30-004-Class	382	252
MCS-40-003-Class	1,200	600
MCS-40-005-Class	2,000	1,000

Notes:

The CAD Server component (if CAD services are required) should be collocated 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 collocated or separate.

Cisco Finesse must be installed in a VMware virtual machine on a separate physical server that meets the requirements of the Finesse OVA template. For more information, see the DocWiki page Virtualization for Cisco Finesse.

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 (the hosting server).

6.1.1.9 Basic Environment for RSM: Supports less than 750 agents

Table 6-14: Remote Silent Monitoring, Basic Environment, Unified CCE, Unified CCH

Server Class	Capacity	Other requirements and Remarks
MCS-30-004-Class MCS-30-005-Class	Less than **40** simultaneous monitoring sessions	Windows Server 2003 or R2; 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.

6.1.1.10 Enhanced Environment for RSM: Supports 750 agents or more

Table 6-15: Remote Silent Monitoring, Enhanced Environment, Unified CCE, Unified CCH

Server Class	Capacity	Other requirements and Remarks
MCS-40-005-Class MCS-40-011-Class	Less than **80** simultaneous monitoring sessions	Windows Server 2003 or R2; SP2 4 GB RAM 2x72GB SAS Hard Disk Drive in RAID 1 configuration

Note: When RSM is used with CVP, the gateway 'IVR prompt streaming for HTTP' needs to be enabled. Note that this setting is not recommended for other CVP applications. Therefore RSM requires a dedicated VXML gateway. This gateway must not be used for other CVP applications. Also, 1GB of gateway memory is recommended for use with RSM. This will support up to 40 concurrent monitoring sessions per gateway.

6.2 *Unified Contact Center Hosted*

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

Table 6-16: NAM Rogger Servers, Unified CCH

Server Class	Capacity (calls / second)

GEN-50-003-Class	120
GEN-50-004-Class	170
GEN-50-005-Class	200

Table 6-17: CICM Router/Logger Servers, Unified CCH, New Deployments / Tech. Refresh

Server Class		Capacity	
CICM Router	**CICM Logger**	**Total Agents Across all Instances**	**Instances**
MCS-40-014-Class	GEN-50-006-Class	12,000	1
MCS-40-011-Class	MCS-40-015-Class	8,000	3
	MCS-40-016-Class	6,400	10
GEN-50-005-Class	GEN-50-005-Class	6,400	25

Table 6-18: CICM Router/Logger Servers, Unified CCH, Common Ground Upgrade

Server Class		Capacity	
CICM Router	**CICM Logger**	**Agents**	**Instances**
MCS-40-003-Class	MCS-40-003-Class	3,190	3
MCS-40-005-Class	MCS-40-004-Class	3,190	3
MCS-40-005-Class	MCS-40-005-Class	3,750	3
MCS-40-005-Class	GEN-50-003-Class	3,750	10
GEN-50-004-Class	GEN-50-004-Class	3,825	25

Table 6-19: Multi-Instance Agent PG with CTI OS Servers, Unified CCH

Server Class	Capacity (agents)	Operating Conditions
MCS-40-005-Class	1,600	CTI OS Security Disabled
MCS-40-005-Class	1,200	CTI OS Security Enabled

Notes:

- See the Mobile Agents Scalability section for factors that affect its scalability.
- See the Outbound Option Scalability section for information about determining Agent PG Outbound Option agent capacity.
- For Unified CCH running with SCCP dialer, there is only one instance of Outbound Option per CICM platform/complex with a maximum of two Dialers per PG pair.
- All outbound call scenarios are supported when a mobile agent is deployed using nailed connection call delivery mode. Outbound call scenarios are not supported when a mobile agent is deployed using call-by-call call delivery mode.
- Unified Contact Center Hosted supports a NAM deployed either as a Rogger, or as separate Router and Logger servers. For more information on separate servers, please see the Unified ICM Hosted section.

6.3 *Unified Contact Center Management Portal*

This section assists you in selecting hardware servers for Cisco Unified Contact Center Management Portal (Unified CCMP) for both Contact Center Hosted and Enterprise environments.

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.

Hardware Requirements

Table 6-20: Hardware Requirements, Unified CCMP

Server Class[5]	Capacity					Server Role	Intended Use
	Agents	CCMP Users[1]	Provisioning Ops/ Hour[2]	Folders	Folder Depth		
MCS-40-012-Class	200[3]	5	120	100	5	Co-Located	Lab or PoC
	1,500[4]	150	120	200	5	Single Server	Standard Deployment
MCS-40-011-Class	8,000[4]	800	120	—	—	Dual-Server Web Server	Large Systems
MCS-40-015-Class				600	6	Dual-Server DB Server	

[1] This number is configured users, not concurrent.

[2] Provisioning Operations are any configuration changes, such as Add, Edit or Delete that can be performed with any of the following configuration tools on an Administration & Data Server or a Administration Client: the Configuration Manager, Web Reskilling, CCMP, or AAS. This limit reflects the results of laboratory tests of throughput. Exceeding this limit will have a detrimental impact on the Administration and Data Server. If you are using the CCMP Agent SelfReskilling feature, see the "Agent Self Reskilling and the Provisioning Service" section of the Administration Manual for Unified Contact Center Management Portal for further details on the provisioning operations limit.

[3] Collocated systems support 200 Named agents, not concurrent.

[4] For Single- and Dual-Server systems, this is the number of concurrent agents.

[5]You can upgrade Unified CCMP, Release 7.5 (on existing hardware) to Unified CCMP, Release 8.5.

Additional Limitations

In addition to the limitationsdescribed in the preceding sections, the following standard limits apply to all deployment models:

Table 6-21: Additional Resource Limitations, Unified CCMP

Resource	Limit (items)
IP Phone for Agent Use	2,000
Labels	30,000
Additional Resources (e.g. Skill Groups, Agent Teams, Dialed Numbers, etc.)	15,000

Systems exceeding these published limits should be referred to Cisco via the A2Q process or before by the Cisco Project Team. Larger (even much larger) deployments are possible but require careful configuration to avoid an unsatisfactory user experience.

Agent Self Re-skilling

For information relating to enabling Agent Self Re-Skilling, please refer to the "Agent Self Re-Skilling and the Provisioning Service" section of the Administration Manual for Unified Contact Center Management Portal.

Provisioning Batch Processing

Configuration changes made through Unified CCMP are committed to the CCE environment through the CCE ConAPI interface. This interface includes a batch mechanism that allows multiple changes to be committed to CCE in a single transaction, thereby reducing the load on the AW when multiple changes are committed. Unified CCMP takes advantage of the ConAPI batch technique when provisioning changes to Agent/ Skill Group and Agent/ Agent Team relationships.

By default, Unified CCMP will generate batches of 100 memberships. However, for larger deployments, the Provisioning Server throttle may be configured to increase capacity to enable up to 250 bulk relationships to be provisioned every 30 seconds.

Re-Skill requests through CCMP interface are grouped in batches of 250 requests to ensure the overall performance of the UCCE system under a fully loaded system is not compromised and can be appropriately throttled by CCMP for requests submitted by multiple users of the re-skilling tool. The CCMP server will manage the throttling of requests before submitting the requests.

This configuration information is held in the Provisioning Server configuration file which is typically located at the following location:
C:\Program Files\Management Portal\Provisioning Server\Exony.Provisioning.Service.exe.config

The configuration file contains the following properties:

```
<setting name="ProvisioningCycleDelay" serializeAs="String">
<value>00:00:05</value>
</setting>
<setting name="IcmConapiMaxBatchSize" serializeAs="String">
<value>100</value>
</setting>
```

To allow for greater throughput of Re-Skilling changes, these settings should be updated as follows:

```
<setting name="ProvisioningCycleDelay" serializeAs="String">
<value>00:00:30</value>
</setting>
<setting name="IcmConapiMaxBatchSize" serializeAs="String">
<value>250</value>
</setting>
```

This allows 250 re-skilling operations to be sent to ConAPI every 30 seconds. It also means that any other changes made through the Unified CCMP will be sent through at a rate of one change every 30 seconds.

Once the configuration has been updated and saved, the Windows Provisioning Service must be restarted using the following process:

- Click **Start > Run**
- Type **Services.msc**
- Locate the **UCCMP: Provisioning Server** service in the list
- Right-click and select **Restart**

Server Configuration

Table 6-22: Server Configuration, Unified CCMP

CCMP Server Type	Server Configuration
Single Server System	**Disk Configuration – 6 Disks** Disks 1–2: OS, program executables, Windows page file: RAID 1 Disks 3–6: Database files and transaction log: RAID 10
Dual Server System - Web Application Server	**Disk Configuration – 4 Disks** Disks 1–2: OS, program executables, Windows page file: RAID 1
Dual Server System – Database Server	**Disk Configuration – 6 Disks** Disks 1–2: OS, program executables, Windows page file: RAID 1 Disks 3–6: Database files and transaction log: RAID 10

Note: Resilient systems will require duplicate hardware, with identical systems being specified on both sides of the deployment.

Drive Partition Layout

Table 6-23: Physical Drive Layout, Unified CCMP

CCMP Server Type	Drive	Disk Array Minimum Size	Function
Single Server System	C:	146 GB	Windows operating system, program executables and Windows page file
	D:	292 GB	Database data files and transaction log
	Z:	—	CD/DVD-ROM
Dual Server System – Web Application Server	C:	146 GB	Windows operating system, program executables and Windows page file
	Z:	—	CD/DVD-ROM
Dual Server System – Database Server	C:	300 GB	Windows operating system, program executables and Windows page file
	D:	600 GB	Database data files and transaction log
	Z:	—	CD/DVD-ROM

Network Recommendations

LAN – CCMP systems should be connected to Unified ICM/Contact Center and other servers via gigabit (1000 Base-T) connections.

WAN – CCMP systems connecting to Unified ICM/Contact Centeror a distributed CCMP deployment across a WAN should be allocated a dedicated link of at least 1.5 MB/s capacity.

Load Balancing—Distributed CCMP Systems may use a Load Balancer to distribute load across the sites. We recommend that this is done using a dedicated Load Balancer, rather than using Windows built-in functionality. It is also required that any load balancing solution supports sticky connections to maintain web session information between requests.

6.4 *Unified ICM Enterprise*

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

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 listed in the sections titled, 0*New Deployments and Technology Refresh* and 0*Common Ground Upgrade*. Those sections are applicable instead of those that follow.

New Deployments and Technology Refresh

Table 6-24: Rogger Servers, Unified ICME, New Deployments / Tech. Refresh

Server Class	Capacity (agents)
MCS-40-011-Class	2,000

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

Table 6-25: Standalone Router/Logger Servers, Unified ICME, New Deployments / Tech. Refresh

Server Class		Capacity	
Router	**Logger**	**BHCA**	**Agents**
MCS-30-005-Class	MCS-40-011-Class	30,000	1,000
		18,000	1,800
		12,000	2,400
MCS-40-011-Class	MCS-40-012-Class	150,000	5,000
MCS-40-011-Class	GEN-50-005-Class	360,000	12,000
		216,000	21,600
		144,000	28,800

Note: Busy Hour Call Attempts (BHCA) or calls per second (cps) computes the total number of route requests received by the central controller. This might include pre-route requests, new calls arriving into the system, post-route requests, translation route requests, call transfers, or conference calls.

See the section titled, TDM ACD Peripheral Gateway (PG) for TDM ACD PG server requirements.

Common Ground Upgrade

Table 6-26: Rogger Servers, Unified ICME, Common Ground Upgrade

Server Class	Capacity (agents)
MCS-40-003-Class	1,200
MCS-40-005-Class	1,700

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

Table 6-27: Standalone Router/Logger Servers, Unified ICME, Common Ground Upgrade

Server Class		Capacity	
Router	**Logger**	**BHCA**	**Agents**
MCS-30-003-Class	MCS-40-003-Class	25,500	850
		15,300	1,530
		10,200	2,040
MCS-30-004-Class	MCS-40-004-Class	25,500	850
		15,300	1,530
		10,200	2,040
MCS-40-003-Class	MCS-40-003-Class [1]	127,500	4,250
MCS-40-005-Class	MCS-40-005-Class [1]	127,500	4,250
MCS-40-003-Class	GEN-50-003-Class	216,000	7,200
		129,600	12,960
		86,400	17,280
MCS-40-005-Class	GEN-50-004-Class	306,000	10,200
		183,600	18,360
		122,400	24,480

[1]Requires 6 disks. See the section titled Unified ICM/Unified Contact Center Loggerfor 6 disk configuration.

Table 6-28: Logger on 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	1,000

See the section titled, TDM ACD Peripheral Gateway (PG) for TDM ACD PG server requirements.

Table 6-29: CTI OS Servers, Unified ICME, Common Ground Upgrade

Server Class	Capacity (agents)
MCS-30-003-Class	85
MCS-30-004-Class	85
MCS-40-003-Class	1,600
MCS-40-005-Class	1,600

6.5 *Unified ICM Hosted*

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

***Note:** 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.

For clarity, only MCS family servers 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. See the section titled, Appendix A – Server Classes for full server class explanatory detail.

Table 6-30: NAM Router Servers, Unified ICMH

Server Class	Capacity (calls / second)	Other Requirements
MCS-40-003-Class	255	NAM Routers require addition of a third network interface card to connect to a Signaling Access Network. See the *Setup and Configuration Guide for Cisco Unified ICM Hosted*.
MCS-40-005-Class MCS-40-011-Class	300	

Table 6-31: NAM Logger Servers, Unified ICMH

Server Class	Capacity (calls / second)
GEN-50-003-Class	180
GEN-50-004-Class	255
GEN-50-005-Class	300

Table 6-32: CICM Router and CICM Logger Servers, Unified ICMH

Server Class		Capacity (agents)	
CICM Router	**CICM Logger**	**BHCA**	**Agents**
MCS-40-003-Class MCS-40-005-Class MCS-40-011-Class	GEN-50-003-Class	216,000	7,200
		129,600	12,960
		86,400	17,280
	GEN-50-004-Class	306,000	10,200
		183,600	18,360
		122,400	24,480
	GEN-50-005-Class	360,000	12,000
		216,000	21,600
		144,000	28,800

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

6.6 *Unified ICM/Unified Contact Center Common Components*

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

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.

Note: Stentor and Sprint NICs are not supported with Microsoft Windows Server 2008 R2

Table 6-33: Network Interface Requirements, Unified ICM Router Servers

Network Interface	Hardware (For Signaling Access Networks)	
For Ethernet Carrier Network Interfaces (Verizon Business, 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	▪ 3 (5 if simplexed) x Eiconcard:	
	PCI 2.2	S94 V2 • Motorola Freescale 852 T @ 98 MHz • 16 MB SDRAM • Bus Type: PCI 2.2 64bit / 66 MHz (3.3 V)

Network Interface	Hardware (For Signaling Access Networks)	
	PCIe (PCI Express)	S94 PCI Express • Motorola Freescale 852 T @ 98 MHz • 16 MB SDRAM • PLX 8111 Express Interface • Bus Type: Single lane PCIe 1.0a 2.5Gbit/Sec • Two VHSI connectors
	▪ 5 (10 if simplexed) x VHSI V.35 DCE cable (Eicon #300-076) ▪ Eicon "Connections for Windows Server 2003 and Windows XP software V6R8"	

See the Unified ICM/Contact Center Hardware and Software Requirementsfor information on Router server selection based on system capacity requirements.

Unified ICM/Unified Contact Center Logger

See the Unified ICM/Contact Center Hardware and Software Requirements for information on Logger server hardware selection based on capacity requirements. Thetables in this section provide Logger server disk configuration information based on the hardware you selected, and other Logger configuration information.

SQL Server 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). Microsoft SQL Server 2005 Standard and Enterprise Editions are not limited by the maximum memory boundary.

6.6.1.1 New Deployments and Technology Refresh

Table 6-34: Logger Servers, Unified ICM/CC, New Deployments / Tech. Refresh

Server Class	Other requirements and remarks
MCS-40-011-Class	**Disk Configuration - 4 disks** Disks 1–2: OS, ICM, SQL Server and other third-party software, ICM Database Transaction Log(s) RAID 1 Disks 3–4: Database files RAID 1 (alternately RAID 10 can be used to gain better write performance by adding additional disks – see below).

MCS-40-012-Class	**Disk Configuration - 6 disks** Disks 1–2: OS, ICM, SQL Server and other third-party software, RAID 1 Disks 3–6: Database files, ICM Database Transaction Log(s), RAID 10
MCS-40-013-Class	**Disk Configuration – 8 disks** Disks 1–2: OS, ICM, SQL Server and other third-party software, RAID 1 Disks 3–8: Database files, ICM Database Transaction Log(s), RAID 10
GEN-50-005-Class	**Disk Configuration – 8 or more disks** Disks 1–2: OS, ICM, SQL Server and other third-party software, RAID 1 Disks 3–8: Database files, ICM Database Transaction Log(s), RAID 10 with dedicated 2 channel external RAID Controller, minimum of 256 MB cache with battery backup.
GEN-50-006-Class	**Disk Configuration –10 or more disks** Disks 1–2: OS, ICM, SQL Server and other third-party software, RAID 1 Disks 3–8: Database files, ICM Database Transaction Log(s), RAID 10 with dedicated 2 channel external RAID Controller, minimum of 512 MB cache with battery backup.

6.6.1.2 Common Ground Upgrade

Table 6-35: Logger Servers, Unified ICM/CC, Common Ground Upgrade

Server Class	Other requirements and remarks
GEN-30-002-Class MCS-30-003-Class MCS-30-004-Class	**Disk Configuration - 2 disks** Disk 1–2: 2 x 72 GB Drives, RAID 1
MCS-40-003-Class MCS-40-005-Class	**Disk Configuration - 4 disks** Disks 1–2: 2 x 72 GB Drives: OS, ICM, SQL Server and other third-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-40-006-Class MCS-40-009-Class	**Disk Configuration - 6 disks** Disks 1–2: 2 x 72 GB Drives: OS, ICM, SQL Server and other third-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-50-003-Class GEN-50-004-Class	**Disk Configuration – 8 or more disks** Disks 1–2: 2 x 72 GB Drives: OS, ICM, SQL Server and other third-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.

Administration & Data Server

Beginning with Unified CCE 8.0(1), the Distributor AW (with or without HDS) is renamed as Administration & Data Server. The Administration & Data Server now offers several roles (a.k.a. deployments) based on the functionality and amount of reporting data that it can handle. This section specifies the hardware requirements for an Administration & Data Server with the following roles:

- Administration Server and Real-time Data Server

- Configuration-Only Administration Server

Please note that these roles do not include the HDS/DDS. Also note that you have an option to install the Internet Script Editor (ISE) on this server.

For detailed description on Administration & Data Server deployment options (roles), see the Installation Guide and theCisco Unified Contact Center Enterprise 8.0 Solution Reference Network Design (SRND).

Table 6-36: Administration Server and Real-Time Data Server (AW)

Server Class	Capacity (Administration Clients and/or ISE users)	Other requirements and remarks
MCS-20-004-Class MCS-20-005-Class MCS-20-006-Class	25	IIS 6.0 (Required for Internet Script Editor) **Other hardware requirements** Graphics card capable of 1024 x 768 x 64K color or better 17" or larger display
MCS-30-003-Class MCS-30-004-Class MCS-30-005-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.

Administration & Data Server – Historical and Detail Data Servers

The Administration & Data Server now offers several roles (a.k.a. deployments) based on the functionality and amount of reporting data that it can handle. This section specifies the hardware requirements for an Administration & Data Server that will be used with a reporting server (Cisco Unified Intelligence Center) including those with the following roles:

- Administration Server, Real-time and Historical Data Server, and Detail Data Server (AW-HDS-DDS)
- Administration Server and Real-time and Historical Data Server (AW-HDS)
- Historical Data Server and Detail Data Server (HDS-DDS)

For detailed description on Administration & Data Server deployment options (roles), see the Installation Guide and theCisco Unified Contact Center Enterprise 8.0 Solution Reference Network Design (SRND).

Hardware requirements are based on the following usage patterns.

The average reporting user is running:

- Two 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.
- One 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 (as shown in the following table).

Table 6-37: 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 Administration Client). For sizing of a distributor only running Internet Script Editor Server or serving Administration Clients, see the Administration & Data Serversection.

Graphics Card and Monitor for Administration & Data Serversand Administration Clients

- 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 per Administration & Data Server.

6.6.1.3 New Deployments and Technology Refresh

Table 6-38: Historical / Detail Data Server, New Deployments / Tech. Refresh

Server Class	Capacity	Other requirements
	CUIC Reporting Users Per AW-HDS	
MCS-40-011-Class MCS-40-014-Class	25	**Disk Configuration – 4 Disks** Disks 1–2: OS, ICM, SQL Server and other third-party software, ICM Database Transaction Log(s); RAID 1 Disks 3–4: Database files; RAID 1
MCS-40-012-Class MCS-40-013-Class	50	**Disk Configuration – 6 (or more) Disks** Disks 1–2: OS, ICM, SQL Server and other third-party software, ICM Database Transaction Log(s); RAID 1 Disks 3–*: Database files; RAID 10
MCS-40-015-Class MCS-40-016-Class	100	**Disk Configuration – 6 (or more) Disks** Disks 1–2: OS, ICM, SQL Server and other third-party software, ICM Database Transaction Log(s); RAID 1 Disks 3–*: Database files; RAID 10
GEN-50-005-Class	200	**Disk Configuration – 10 (or more) Disks** Disks 1–2: OS, ICM, SQL Server and other third-party software; RAID 1 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.)

6.6.1.4 Common Ground Upgrade

Note: Microsoft Windows Server 2003 Enterprise Edition (with the /3GB switch) is required when high load/performance environments exceed the 2 GB maximum boundary.

Thefollowing table describes Historical/Detail Data Server, common ground upgrade.

Table 6-39: Historical / Detail Data Server, Common Ground Upgrade

Server Class	Capacity CUIC Reporting Users Per AW-HDS	Other requirements
MCS-40-005-Class MCS-40-008-Class	20	**Disk Configuration – 4 Disks** Disks 1–2: OS, ICM, SQL Server and other third-party software, ICM Database Transaction Log(s); RAID 1 Disks 3–4: Database files; RAID 1
MCS-40-006-Class MCS-40-007-Class	40	**Disk Configuration – 6 (or more) Disks** Disks 1–2: OS, ICM, SQL Server and other third-party software, ICM Database Transaction Log(s); RAID 1 Disks 3–*: Database files; RAID 10
MCS-40-009-Class MCS-40-010-Class	80	**Disk Configuration – 6 (or more) Disks** Disks 1–2: OS, ICM, SQL Server and other third-party software, ICM Database Transaction Log(s); RAID 1 Disks 3–*: Database files; RAID 10
GEN-50-003-Class GEN-50-004-Class	160	**Disk Configuration – 8 (or more) Disks** Disks 1–2: OS, ICM, SQL Server and other third-party software; RAID 1 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.)

Administration Client

Table 6-40: Administration Client

Server Class	Hardware, software requirements and remarks
MCS-20-004-Class MCS-20-005-Class MCS-20-006-Class	**Other hardware Requirements** ATA/IDE acceptable 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;SP2 Microsoft Windows Server 2008 R2 SP1; Microsoft Windows XP Professional; SP2 Microsoft Windows 7 (Professional, Enterprise and Ultimate) Microsoft Vista (Business and Enterprise)

Internet Script Editor

Table 6-41: Internet Script Editor Client Hardware/Software Requirements

Server Class	Hardware, software requirements and remarks
GEN-10-005-Class	**Other hardware requirements** Internal CD-ROM or DVD-ROM drive Graphics card capable of 1024 x 768 x 64K color or better **Note**: ISE is not supported for use on the secondary monitor of a dual-monitor desktop **Operating system and other software** Microsoft Windows Server 2003 or R2; SP2 Microsoft Windows Server 2008 R2 SP1; Microsoft Windows XP Professional; SP2 Microsoft Windows 7 (Professional, Enterprise and Ultimate) Microsoft Vista (Business and Enterprise) **Note**: In order for ISE to work properly, the "Enable HTTP Keepalive" box on the web site tab of Internet Information Services Manager/Default Web Site Properties needs to be checked.

VRU Peripheral Gateway (PG)

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

Table 6-42: VRU PG Servers, New Deployments / Tech. Refresh

Server Class	Capacity (ports)	Max VRU PIMs	Max Call Rate (cps)
MCS-30-005-Class	1,200	4	10
MCS-40-011-Class	9,600	10	40

Table 6-43: VRU PG Servers, Common Ground Upgrade

Server Class	Capacity (ports)	Max VRU PIMs	Max Call Rate (cps)
MCS-30-003-Class	720	2	6
MCS-30-004-Class	960	3	8
MCS-40-003-Class	5,760	6	24
MCS-40-005-Class	7,680	8	32

Unified Contact Center Gateway

Unified Contact Center Gateway enables a parent/child deployment model; the parent is Unified ICME and the child can be Unified CCEnterprise or Unified CC Express. When deployed on a separate server, a Unified CCE Gateway PG can manage multiple child Unified CCE peripherals or multiple child Unified CCX systems, with

up to five child systems. Note that the Unified CCE Gateway PG does not support Unified CCE System PG and Unified CCX integration on the same PG instance.

Table 6-44: Unified Contact Center Gateway Servers

Server Class	Capacity (agents)	Other requirements and remarks
MCS-30-003-Class MCS-30-004-Class MCS-30-005-Class	450	
MCS-40-005-Class MCS-40-008-Class MCS-40-011-Class	2,000	

TDM ACD Peripheral Gateway (PG)

6.6.1.5 TDM ACD PG

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

Note: See section CTI OS Security Scalability for information about its capacity impact.

Table 6-45: TDM ACD PG Servers, Unified ICME/H, New Deployments / Tech. Refresh

Server Class	Capacity (agents)		
	TDM ACD PG with MR PG	TDM ACD PG with CTI OS	TDM ACD PG without options
MCS-30-005-Class	100	250	1,000
MCS-40-011-Class	200	2,000	2,000

Table 6-46: TDM ACD PG Servers, Unified ICME/H, Common Ground Upgrade

Server Class	Capacity (agents)		
	TDM ACD PG with MR PG	TDM ACD PG with CTI OS	TDM ACD PG without options
MCS-30-003-Class	60	150	600
MCS-30-004-Class	85	200	800
MCS-40-003-Class	120	1,200	1,200
MCS-40-005-Class	170	1,600	1,600

Table 6-47: Avaya TDM ACD PG Servers, Unified ICME/H, New Deployments / Tech. Refresh, CTI OS

Server Class	Desktops Connecting to CTI OS	
	Capacity (agents)	Skill Groups Per Agent
MCS-40-011-Class	3,000	5
MCS-40-011-Class	2,500	10

MCS-40-011-Class	2,000	15
MCS-40-011-Class	1,500	20

Note: CTI OS Monitor Mode applications are not supported with Avaya and CTI OS.

Table 6-48: Avaya TDM ACD PG Servers, Unified ICME/H, Common Ground Upgrade, No CTI OS

Server Class	Desktops Connecting to CTI Server (without CTI OS)			
	Capacity (agents)	BHCA	All Events Clients	Skill Groups Per Agent
MCS-40-003-Class	1,700	51,000	4	10
MCS-40-005-Class	2,000	60,000	4	10

6.6.1.6 Other TDM ACD PG Requirements

See the Cisco Unified ICM Software ACD Supplements and Cisco ICM ACD PG Supportability Matrices for more information about TDM ACD PG configuration options and limits, available at:
http://www.cisco.com/en/US/products/sw/custcosw/ps1844/prod_technical_reference_list.html

Table 6-49: TDM ACD PG Hardware and Software Requirements

Hardware, software requirements and remarks
Avaya: ICM 8.5(2) Avaya PG is supported in Microsoft Windows Server 2008 R2. The Avaya PG running on Microsoft Windows Server 2008 R2requires CVLAN version 6.1, which is integrated with Release 8.5(2). **Aspect and Rockwell Spectrum are not supported on Microsoft Windows Server 2008** **For Redundant PG Installation** +1 x 100/1000 Ethernet port (if Peripheral does not reside on visible LAN) **For Unified ICM Enterprise: Interfacing with TDM ACDs** *FOR ROCKWELL SPECTRUM SERIAL INTERFACE* 1 x Eiconcard S94 V2 (for PCI 2.2) or Eiconcard S94 PCI Express (PCIe) (See Table 6-30 for Eiconcard specifications) 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 EVMTBPC-0025) Eiconcard Connections for Windows Server 2003 and Windows XP *FOR ROCKWELL SPECTRUM TCP/IP INTERFACE* 1 x DB25 male to DB9 female null modem cable (Black Box EVMBPC-0025) *FOR NEC NEAX 2400/7400 INTERFACE* 1 x CTI Dongle (NEC part)

See the Unified ICM/Contact Center Hardware and Software Requirements for information on PG server selection based on system capacity for different Unified ICM/Contact Center product editions.

Unified ICM/Contact Center SS7 Network Interface Option

For new installations beginning with release 8.0(1), Cisco has developed Sigtran variants of all supported SS7 Network Gateway interfaces(SS7 Network Gateways are still supported in 8.x for upgrade and refresh.). ITU(Sigtran) and ATT (Sigtran) may be deployed co-resident on the Router server (section 0). INAP (Sigtran) must be deployed on a separate server (see the following table).

Table 6-50: Network Gateway Servers

Server Class	Network Gateway	Requires SS7 Card[2]	May be co-resident with Router/NIC	Associated Network Interface Controller (NIC)
GEN-20-002-Class GEN-20-003-Class GEN-20-004-Class	ITU (SS7)	Yes	No	SS7InNic
	ITU (Sigtran)	No	Yes	
	INAP (SS7)	Yes	No	TIMNic UnisourceNIC CWCNIC
	INAP (Sigtran)	No	No	
	ATT (SS7)	Yes	No	ATTNic
	ATT (Sigtran)	No	Yes	

SS7 Gateways are bandwidth/cps limited by the TDM SS7 links, and the calculation for required links/bandwidth is deployment specific. The Sigtran Gateways, however, can support the maximum cps (calls / second) for any BOM compliant Router installation.

CTI OS Server

Cisco requires that the CTI OS server component be collocatedon the PG according to the Agent PG configuration.

Standalone CTI OS servers are not supported.

See CTI Supported Platforms for system requirements for the CTI OS server.

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]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.

5V card has reached End of Sale (with a last sale date of June 30, 2006) but is still supported.

3.3V card has reached End of Sale (with a last sale date of November, 2009) but is still supported.

A maximum of 3 cards can be installed on a single server.

SS7 cards are not supported on Microsoft Windows Server 2008.

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

6.6.1.7 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 collocated with any other CTI OS or Unified Contact Center components.

See the following table for information on silent monitor service servers.

Table 6-51: Silent Monitor Service Servers

Server Class	Capacity (sessions)	Server Type	Other requirements and remarks
MCS-40-003-Class	40	Silent Monitor Server	See Section CTI Supported Platforms
MCS-30-003-Class MCS-30-004-Class	20		

6.6.1.8 Silent Monitor Service for Unified CC Toolkit

The silent monitor service can also be configured to provide silent monitor functionality for a single Unified Contact Center 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.

Citrix MetaFrame Presentation Server

Citrix MetaFrame Presentation server and Microsoft Terminal Services are 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. They provide native support for Citrix MetaFrame Presentation Server 4.0 and 4.5, and Microsoft Terminal Services environments.

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 and CTI Toolkit Desktop with Citrix implementations are documented in the manuals located at:
http://www.cisco.com/en/US/products/sw/custcosw/ps427/products_implementation_design_guides_list.html.

Citrix XenApp Server 5 with Microsoft Windows Server(32-bit and 64-bit R2) Support for CTI OS

Starting with the CTI OS 7.5(9) release, you can access the CTI OS Client with Citrix XenApp Server 5 on Microsoft Windows Server (32-bit or 64-bit R2).

Detailed CTI OS Client installation and configuration instructions are available in the *CTI OS System Manager's Guide* at
http://www.cisco.com/en/US/products/sw/custcosw/ps1844/prod_installation_guides_list.html

Citrix XenApp Server 5 with Windows 7 Support for CTI OS

Starting with the CTI OS 8.0(1a) release, you can access the CTI OS Client with Citrix XenApp Server 5 on Windows 7(64-bit).

Detailed CTI OS Client installation and configuration instructions are available in the *CTI OS System Manager's Guide* at
http://www.cisco.com/en/US/products/sw/custcosw/ps1844/prod_installation_guides_list.html

Windows 7 (64-bit) Support for CTI OS

Starting with CTI OS Release 8.5(2), you can access the CTI OS Client on Windows 7 64-bit.

Note: The 8.0(1a) installer is required.

Detailed CTI OS Client installation and configuration instructions are available in the *CTI OS System Manager's Guide* at

http://www.cisco.com/en/US/products/sw/custcosw/ps1844/prod_installation_guides_list.html

CTI OS Agent and Supervisor Desktops

The following table provides information on CTI OS agent and supervisor desktop servers.

Table 6-52: 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 Section CTI Supported Platforms
GEN-10-005-Class	CTI OS Agent Desktop	Windows compatible full-duplex sound card (if using Cisco IP Communicator) See Section CTI Supported Platforms
GEN-10-005-Class	CTI OS Monitor Mode Application	See Section CTI Supported Platforms

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

Table 6-53: CTI OS Silent Monitoring Hardware Requirements

Compatible Ethernet NIC	See Cisco.com for more information: Silent Monitoring NIC Compatibility Matrix Qualifying Ethernet Cards for Cisco Agent Desktop Monitoring

Siebel

6.6.1.9 CTI Driver for Siebel

For supported Siebel versions, see the *Cisco Unified Contact Center Enterprise (Unified CCE) Software Compatibility Guide* at:
http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_device_support_tables_list.html

The CTI Driver for Siebel is installed on the Siebel Communications Manager Server and must operate stand alone from all other Unified ICM/Contact Center 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 6-54: 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 a Siebel environment that met the following configuration conditions:

1) Siebel component groups enabled during the capacity determination:

- System Management
- Siebel Call Canter
- 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.

6.6.1.10 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 6-55: 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

CRM Connector

For additional CTI compatibility information, see the *Cisco Unified Contact Center Enterprise (Unified CCE) Software Compatibility Guide* at http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_device_support_tables_list.html

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

6.6.1.11.1 CRM Connector Server

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

See the section titled, CRM Connector Supported Platforms for operating system requirements for the CRM Connector server.

Table 6-56: CRM Connector Server

Server Class	*Capacity (agents)	Call Rate (calls / sec.)	Other requirements and remarks
MCS-30-004-Class MCS-30-005-Class	900	7.5	See CRM Connector Supported Platforms
MCS-40-005-Class MCS-40-011-Class	1,800	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 might 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.

6.6.1.11.2 CRM Connector Server Administration Tool

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

6.6.1.11.3 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 6-57: CRM Connector Adapter for Salesforce.com

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

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

6.6.1.11.4 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 Contact Center Enterprise solution configuration. This adapter is installed with the PeopleSoft CRM product.

Table 6-58: CRM Connector Adapter for PeopleSoft

*Server Class	Type	Hardware, software requirements and remarks
MCS-30-004-Class MCS-30-005-Class MCS-40-005-Class MCS-40-011-Class	CRM Adapter Server	**Operating system and other software** See: CRM Connector Supported Platforms **Other hardware Requirements** 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 about the PeopleSoft CRM, visit the http://www.oracle.com/applications/peoplesoft-enterprise.html web site.

6.6.1.11.5 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 Contact Center Enterprise solution configuration. This adapter is installed with the Microsoft CRM 3.0 product.

Table 6-59: CRM Connector Adapter for Microsoft CRM 3.0

*Server Class	Type	Hardware, software requirements and remarks
MCS-30-004-Class MCS-30-005-Class MCS-40-005-Class MCS-40-011-Class	CRM Adapter Server	**Operating system and other software** See CRM Connector Supported Platforms **Other hardware Requirements** 100/1000 Ethernet port

* The selection of the class of MCS server should be based on the Microsoft CRM server requirements for the given customer's required level of performance. For more information about the Microsoft CRM 3.0 product visit the **http://www.microsoft.com/dynamics/crm/default.mspx** web site.

6.6.1.12 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 collocated with other Unified Contact Center 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 that CTI OS Server is installed on the PG.

Table6-60: CRM Connector for SAP

Server Class	* Capacity (agents)	Call Rate (calls / sec)	Hardware, software requirements and remarks
MCS-30-004-Class MCS-30-005-Class	250	3	**Operating system and other software** See Section CRM Connector Supported Platforms

* The above dimensioning guidelines and parameters were developed in a lab testing environment that included a testCRM system setup or an equivalent CRM simulator. Actual quality of service (delays, responsiveness, etc.)experienced by the contact center agents might vary from the above dimensioning

guidelines/parameters.Thesevariations include structure and size of the CRM database, overall level of the CRM tuning, intensity of the contactprocessing workflow(s), as well as other CRM configuration and topology variables outside of the scope of the Ciscoconnector. It is for this reason that Cisco highly recommends an in-house load test early in a connector deploymentproject to make sure that the total quality of service under load is satisfactory.

6.6.1.13 CRM Connector Supported Platforms

Table 6-61: CRM Connector Supported Platforms and Requirements

CRM Connector		Operating System		Additional Software						
	Windows Server 2003 or R2; SP2	Windows XP Pro; 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 Admin 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

Cisco Agent and Supervisor Desktops

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

Table 6-62: CAD Agent and Supervisor Desktop Servers

Server Class	Type	Hardware, software requirements and remarks
GEN-10-005-Class	**Cisco Supervisor Desktop (CSD)** Cisco Desktop Administrator (Web Client) (CDA)	**Operating system and other software** Windows compatible full-duplex sound card (if using Cisco IP Communicator and/or Silent Monitor) SeeCTI Supported Platforms
GEN-10-005-Class	**Cisco Agent Desktop**	**Other hardware Requirements**

Server Class	Type	Hardware, software requirements and remarks
		100/1000 Ethernet port **Operating system and other software** Windows compatible full-duplex sound card (if using Cisco IP Communicator) See CTI Supported Platforms

Cisco Media Blender (CMB) for Web Collaboration Option

Cisco Unified ICM/Contact Center Release 8.5(x) is compatible with Cisco Media Blender 7.1and its latest Service Release. Note that running the Blender on the PG is only possible with release 6.0 PGs. If you are deploying a new 8.5(x) system or are upgrading to 8.5(x), you cannot collocate 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).

See the *Cisco Intelligent Contact Management Release 6.0(0) Bill of Materials* for Cisco Media Blender hardware and software requirements at:
http://www.cisco.com/en/US/products/sw/custcosw/ps1001/products_user_guide_list.html

See the *Cisco Media Blender Installation Guide* for detailed information on Cisco Media Blender server configuration, capability, and limitations.

See Chapter 5 of *Cisco Unified Web and E-Mail Interaction Manager Solution Reference NetworkDesign Guide*for detailed information on sizing requirements.

Unified Web Interaction Manager (WIM)

See the *Hardware and System Software Specification for Cisco Unified Web and E-Mail Interaction Manager* at:http://www.cisco.com/en/US/products/ps7233/prod_technical_reference_list.htmlfor system requirements, server configurations, capabilities, and limitations of the Cisco Unified Web Interaction Manager.

Unified E-mail Interaction Manager (EIM)

See the *Hardware and System Software Specification for Cisco Unified Web and E-Mail Interaction Manager* at:http://www.cisco.com/en/US/products/ps7236/prod_technical_reference_list.htmlfor system requirements, server configurations, capabilities, and limitations of the Cisco Unified E-mail Interaction Manager.

Unified Expert Advisor

Cisco Unified Expert Advisor is an optional feature for Cisco Unified Contact Center Enterprise. It extends the contact center so that expert advisors can handle certain incoming calls. For example, there might be a call for which the contact center agent and the caller require a discussion with, or advice from, a specialist who is not employed by the contact center—but who agrees to be 'on call' to provide services as a consultant. That person is the expert advisor.

Expert advisors establish their presence and availability to take a call by the state of their instant messaging (IM) client; the expert advisor IM client effectively serves as the "agent desktop". Once an expert's availability and acceptance of the message request are confirmed, the call is routed to the expert. The contact center agents can also conference the expert into a customer call.

The latest version of the content found in this guide is available in the Administration and Configuration Guide for Cisco Unified Expert Advisor at: http://www.cisco.com/go/ea .

Note that Expert Advisor is supported in ICM 8.0(x) but is NOT supported in ICM 8.5(x).

Cisco FinesseServer

Cisco Finesse requires Unified Contact Center Enterprise Release 8.5(3) and Unified Communications Manager 8.6(1).

The Cisco Finesse server supports installation only as a virtual machine running under VMware ESXi 4.1. For more information, see the DocWiki page Virtualization for Cisco Finesse.

The Cisco Finesse server can be co-located on the same hardware with the Agent PG if the server class meets the Finesse server requirements and the Finesse OVA requirements are met.

See CTI Supported Platforms for system requirements for Cisco Finesse clients.

Cisco Finesse Desktops

Cisco Finesse provides a browser-based desktop for agents and supervisors. The following table lists supported operating systems and browsers for Cisco Finesse.

Table 6-63: Cisco Finesse Agent Desktop

Client OS	Client Browser
Windows XP Pro SP3 Windows 7	Internet Explorer 8.0

7 System Software Requirements

7.1 *Microsoft Windows Server 2003*

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

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/Contact Center is qualified to work only on a standard, retail (or OEM) packaged installation of Windows Server 2003 (Standard or Enterprise), with or without Cisco Security hardening. Cisco provides its own security hardening policy to secure the standard Windows image for Unified ICM/Contact Center. Cisco does not support Unified ICM/Contact Center on a customized Windows image (for example, 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/Contact Center application to fail.

Unified ICM/Contact Center 8.5(x) requires Windows Server 2003 or Windows Server 2003 R2; SP2 must be applied on all Windows Server 2003 systems. Cisco qualifies Unified ICM/Contact Center using Windows Server 2003 SP2 and Windows Server 2003 R2 SP2 (Standard and Enterprise).

Unified CCMP 8.5(2) does not support Windows Server 2003 and must be installed on Windows Server 2008 R2 (64-bit).

Note: Windows Server 2003 R2 is supported only with the optional R2 features NOT elected.

OEM Versions of Microsoft Windows Server 2003 R2 Standard Edition

Unified ICM/Contact Center 8.5(x) supports Cisco OEM versions of Microsoft Windows Server 2003 R2 Standard Edition for the IBM version and HP version of the MCS servers. The following sections describe the MCS servers supported by the OEM Windows Server 2003 Standard OS recovery media. Since this is an OS recovery media, it can be used for fresh install or recovery of a machine. However, you cannot use it to upgrade from an older version of Microsoft Windows Operating System.

IBM OEM Recovery Media

The following lists the server configuration that the IBM OEM recovery media - *IBM Svrs Disk 1 and 2* labeled *"Cisco Unified Contact CenterMicrosoft(TM) WinSvr 2003 w/SP2"* and *"Cisco Unified Contact Center Microsoft(TM) WinSvr 2003 w/SP2 Multilang Pack"* support:

- MCS-7845-I2-CCE1
- MCS-7845-I2-CCE2
- MCS-7845-I2-CCE3
- MCS-7845-I2-CCE4
- MCS-7835-I2-CCE1
- MCS-7835-I2-CCE2
- MCS-7845-I3-CCE1
- MCS-7845-I3-CCE2
- MCS-7835-I3-CCE1
- MCS-7825-I4-CCE1
- MCS-7825-I3-CCE1
- MCS-7845-I1-CC1
- MCS-7835-I1-CC1
- VMware ESX 3.5 Virtual Machine on MCS-40-010-Class and MCS-40-016-Class of IBM Servers
- VMware ESXi 4.0 and 4.1 are supported with 8.5(2)

HP OEM Recovery Media

The following lists the server configuration that the HP OEM recovery media - *HP Svrs Disk 1 and 2* labeled *"Cisco Unified Contact CenterMicrosoft(TM) WinSvr 2003 w/SP2"* and *"Cisco Unified Contact Center Microsoft(TM) WinSvr 2003 w/SP2 Multilang Pack"* support:

- MCS-7845-H2-CCE1
- MCS-7845-H2-CCE2
- MCS-7845-H2-CCE3
- MCS-7845-H2-CCE4
- MCS-7835-H2-CCE1
- MCS-7835-H2-CCE2
- MCS-7825-H4-CCE1
- MCS-7825-H3-CCE1
- MCS-7845-H1-CC1
- MCS-7835-H1-CC1
- VMware ESX 3.5 Virtual Machine on MCS-40-010-Class of HP Servers
- VMware ESXi4.0 and 4.1 are supported with 8.5(2)

7.2 *Microsoft Windows Server 2008 R2*

Microsoft Windows Server 2008 R2 is supported with 8.5(2) and up. It is not supported with 8.5(1). You should be aware of the following distinction between the editions.

Special Notes:

- *When upgrading to 8.5(2),and when the intention is to usethe Windows Server 2008 R2 to provide support, the existing system(CTI OS and Unified CCE) must be upgraded to 8.0(1a) first.*
- *8.0(1a) itself doesnot require Win2K8 or 64-bit hardware, but it is a prerequisite to installing the 8.5(2) maintenance release (as the operating system requires 64-bit hardware).*
- *Currently only SP1 for Microsoft Windows Server 2008 R2 is supported.*

Microsoft Windows Server 2008 Standard Edition

- Supports up to 4 processors on one 64-bit server
- Maximum 32 GB of RA

Microsoft Windows Server 2008 Enterprise Edition

- Supports up to 8 processors on one 64-bit server
- Maximum 2Terabytes (TB) of RAM

Note: Unified Intelligent Contact Management running in 64-bit Microsoft Windows Server 2008 R2, Enterprise Edition supports Active Directory for 64-bit Microsoft Windows Server 2008 R2, Enterprise Edition.

Important: Unified ICM/Contact Center is qualified to work only on a standard, retail (or OEM) packaged installation of Microsoft Windows Server 2008R2 (Standard or Enterprise), with or without Cisco Security hardening. Elective UCCE security is only provided for Windows 2003 Server and CSA is not supported with the Windows Server 2008 R2. Cisco provides its own security hardening policy to secure the standard Windows image for Unified ICM/Contact Center. Cisco does not support Unified ICM/Contact Center on a customized Windows image (for example, 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/Contact Center application to fail.

7.3 *Microsoft SQL Server 2005 32-bit*

Microsoft SQL Server 2005 Standard Edition 32-bit

- CPU: Supports up to four processors on one server
- RAM: No operating system maximum

Microsoft SQL Server 2005 Standard Edition 32-bit can run on the following operating systems:

- Microsoft Windows Server 2003, Standard Edition
- Microsoft Windows Server 2003, Enterprise Edition
- Microsoft Windows Server 2008 R2, Standard Edition
- Microsoft Windows Server 2008 R2, Enterprise Edition

Microsoft SQL Server 2005 Enterprise Edition 32-bit

- CPU: No operating system maximum
- RAM: No operating system maximum

Note: SQL Server Enterprise Edition (versus SQL Server Standard Edition) is only necessary if performance needs demand its use.

Cisco OEM version of Microsoft SQL Server 2005 Standard Edition 32-bit is also available.

OEM Version of Microsoft SQL Server 2005 Standard Edition 32-bit

- CPU: Supports up to four processors on one server
- RAM: No operating system maximum

OEM Version of SQL Server 2005 32-bit can run on the following operating systems:

- Microsoft Windows Server 2003, Standard Edition
- Microsoft Windows Server 2003, Enterprise Edition
- Microsoft Windows Server 2008 R2, Standard Edition
- Microsoft Windows Server 2008 R2, Enterprise Edition
- Cisco OEM versions of Microsoft Windows Server 2003 R2 Standard Edition

Microsoft Service Packs

- SP3 or higher Service Pack is required for Microsoft SQL Server 2005.
- SP4 or higher Service Pack is required for Microsoft SQL Server 2005 when using Microsoft Windows Server 2008 R2.

Purchasing Microsoft SQL Server 2005 32-bit

Follow these steps to acquire Microsoft SQL Server 2005 32-bit 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 2005 media and pay a nominal shipping and handling charge.

Select License: Contact a Microsoft software reseller and request the SQL Server 2005 media.

Enterprise Agreement: Contact the Microsoft Representative for your company.

SQL Server 2005 is also available in OEM and retail channels as well. Note that Microsoft also sells a "per-CPU" version of SQL Server for certain transaction-intensive applications that might benefit from such an option. Contact your Microsoft representative to discuss whether this option is appropriate for your installation.

Note:	Microsoft Mainstream Support for SQL Server 2005 ended in April 2011.

7.4 *Microsoft Windows Localization Support*

The following table lists supported localized versions of Microsoft Windows and SQL Server that can 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, see the *Cisco Unified ICM/Unified Contact Center Product and System Localization Matrix* available at: http://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/icm_enterprise/localization_matrix/guide/G11nMap.xls

Table 7-1: Supported Microsoft Software Localizations

Microsoft Software	Windows Language	SQL Server Collation Setting
Windows and SQL Server	• Danish * • Dutch • English • French • German • Italian • Portuguese (Brazil) • Spanish • Swedish	Latin1_General
	• Russian	Cyrillic General
	• Chinese (Simplified)	Chinese_PRC
	• Chinese (Traditional)	Chinese_Taiwan_Stroke
	• Korean	Korean_Wansung
	• Japanese	Japanese
	• Turkish	Turkish
	• Polish	Polish

***Note:** Microsoft did not provide Danish LanguagePack for Windows 2003 server.

7.5 *Operating System and Database Requirements*

The following table present operating system requirements that are specific to Unified ICM/Contact Center server type. The next table covers those Unified ICM/Contact Center servers and client desktop deployments that require special consideration.

Table 7-2: Operating System and Database Requirements, Unified ICME/ICMH/CCE/CCH

Unified ICM/Contact Center Server	**Microsoft Windows Server 2003, Standard Edition (R2,SP) Or Microsoft Windows Server 2008 R2, Standard or Enterprise Edition (SP1)**	**Microsoft SQL Server 2005, Standard EditionSP3 32-bit (x86) (SP4 is required when installed with Microsoft Windows Server 2008)**
ICM Router NAM Router CICM Router	✓	—
Progger (Unified CCE)	✓	✓
Rogger (Unified CCE)	✓	✓
NAM Rogger (Unified CC Hosted)	✓	✓
Administration & Data Server	✓	✓

All PGs, includes CCE Agent PG TDM ACD PG VRU PG MR PG	✓	—*
Unified CCEnterprise Gateway PG	✓	—
SS7 or Sigtran Gateway	✓	—
ICM Logger NAM Logger CICM Logger	✓	✓
HDS & DDS	✓	✓

Note: SQL Server 2005 with Service Pack 2 is supported for the DBLookup feature. Creating a custom DB on the Logger or HDS is not supported.

***Note:** Unless CAD is installed, in which case SQL Server is an option for CAD—not a requirement. By default, CAD uses flat files and data is simultaneously written to both the A and B sides. However, if one side fails, it is possible that it will be missing report data (agent state logs, call logs, and recording data in the Supervisor Record Viewer) upon recovery. Consequently, if replication of the report data is desired, SQL Server must be used.

Table 7-3: Special Considerations (OS and DB Requirements), Unified ICME/ICMH/CCE/CCH

Unified ICM/Contact Center Server	Operating System Requirements
Administration Client	See the section, Administration Client
CUIC Client	See CUIC BOM specification documentation at: http://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/intelligence_suite/intelligence_suite_80/user/guide/is80bom.pdf
Outbound Option Dialer	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 the section, CTI Supported Platforms
CTI OS	See the section, CTI Supported Platforms

7.6 *CTI Supported Platforms*

Table 7-4: CTI Supported Platforms

CTI Option	Operating System					
	Server Platform	Client Platform				
	Microsoft Windows Server 2003, Standard, (R2,SP2) OR Microsoft Windows Server 2008 R2 Standard or Enterprise (SP1)	Windows XP Professional; SP2	Windows XP Professional; SP3	Windows Vista (Business or Enterprise)	Windows 7 (Pro, Enterprise and Ultimate) [1]	Red Hat Enterprise Linux
CTI OS Server	✓	—	—	—	—	—
Cisco Data Store	✓	—	—	—	—	—
Silent Monitor Server (Standalone)	✓	—	—	—	—	—
Silent Monitor Service for Unified CC Toolkit	—	✓	✓	✓	✓	—
CTI Driver for Siebel	✓[7]	—	—	—	—	—
CTI OS - CTI toolkit Unified CC Supervisor Desktop	—	✓[3]	✓[3]	✓[3]	✓[3]	—
CTI OS - CTI toolkit Agent Desktop[2]	—	✓[3]	✓[3]	✓[3]	✓[3]	—
CTI OS - CTI toolkit Combo Desktop .NET	—	✓[3]	✓[3]	✓[3]	✓[3]	—
CTI OS - Custom Apps using C++ or COM CIL	—	✓	✓	✓	✓	—
CTI OS - Custom Apps using Java CIL	—	✓	✓	✓	✓	✓ v5.0
CTI OS - Custom Apps using .NET CIL	—	✓	✓	✓	✓	—
CTI OS – Monitor Mode Apps using C++, COM, or .NET CIL	—	✓	✓	✓	✓	—
CTI OS – Monitor Mode Apps using Java CIL	—	✓	✓	✓	✓	✓ v5.0
CTI Desktop (GeoDCS) V4.7 only	—	✓	—	—	—	—
Custom Apps using GeoDCS orCtiClient32, V4.7 only	—	✓	—	—	—	—
CAD[4]	✓	✓	✓	✓	✓[5]	✓ v4.0 or 5.0 [6]
Cisco Finesse[8]	—	—	✓	—	✓[9]	—

Notes:
[1] Any customizations to the CTIOS toolkit must be compiled under the development environment supported in release 8.5(1) and then deployed on Windows 7. For further information, refer to the CTIOS Developer's Guide. Existing customized CTI OS desktops can be moved to Windows 7 without the need for recompilation. Visual Studio 2008 is NOT supported.

[2]VMware View (previously known as Virtual Desktop Infrastructure (VDI)) is supported with CTI OS desktops. However, with VMware View, CTI OS based Silent Monitoring (SM) is not supported due to physical limitations (the agent machine must be connected to the network via the phone hard-set).

[3] Also supports 64-bit (WoW only)

[4] CAD supports Internet Explorer 7.0 and 8.0

[5]CAD supports Windows 7 32-bit and 64-bit (via WoW)

[6]CAD-BE only using Firefox 3.5 or higher with JRE 6.0 update 11

[7] The CTI Driver for Siebel is supported only on Microsoft Windows 2003 Server R2.

[8] Cisco Finesse supports only Internet Explorer 8.0.

[9] Cisco Finesse supports both Windows 7 32-bit and 64-bit.

7.7 *Supported Third-Party Software*

Table 7-5: Supported Third-Party Software

Function	Software
Remote Administration	♦ Windows Server 2003 Remote Desktop[1] 6.1 and Windows Server 2008 Remote Desktop[1] ♦ Symantec pcANYWHERE 12.5 (Windows Server 2003 only) ♦ RealVNC 4.1.3 (Windows Server 2003 only)
Anti-virus software	♦ McAfee Virus Scan Enterprise 8.7i / 8.8i ♦ Symantec Endpoint Protection 11.0 / 12.1 ♦ Trend Micro ServerProtect version 5.7 / 5.8
Internet Browser	♦ Internet Explorer 7.0 ♦ Internet Explorer 8.0 ♦ Mozilla Firefox 3.6 For the latest details on browser support see the UCCE Browsers DocWiki page at http://docwiki.cisco.com/wiki/UCCE_Browsers.

[1]**Note:** Remote Desktop is not supported for software installation or upgrade. For Remote Desktop usage information, see section Remote Administration in "Security Best Practices Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted."

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 following two ways:

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

7.8 *Cisco Security Agent (CSA)*

Cisco encourages the installation of Cisco Security Agent for Cisco Unified ICM/Contact Center Release 8.5(x) on all Unified ICM/Contact Center server nodes.

However, CSA is not supported on Windows Server 2008 R2 and therefore does not apply to 8.5(2) or later when used on that platform.

This application provides added security protection for your operating environment. You can download the CSA standalone agent free of charge at:

http://www.cisco.com/cisco/software/release.html?mdfid=268439622&softwareid=280840579

On the page that displays, log in.

- On the next page that displays, click: Customer Contact
- Click: Cisco Unified Contact Center Products
- Click: Unified Contact Center Enterprise
- On the next page that displays, click: Cisco Security Agent for Contact Center Products.

Be sure to select themost recent standalone version of CSA for Cisco Unified Contact Center Enterprise, based on CSA engine version 6.0, for Unified Contact Center Enterprise Release 8.5(1). Older releases of CSA, which were supported on prior releases of Unified ICM/Contact Center Enterprise, are not supported in Release 8.5(1). Therefore, you must uninstall prior releases of CSA before upgrading to Release 8.5(1). For more details see the *Upgrade Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted Editions* and *Cisco Security Agent Installation/Deployment Guide for Unified ICM/CCE/CCH*.

7.9 *Server Virtualization*

Server virtualization allows customers to reduce data center footprint and introduces VMware deployment and management tools into the contact center. The following sections describe virtualization options for Cisco MCS and UCS series servers. Cisco supports specific Unified ICM/CC components on virtual machines. However, Cisco does not provide technical support for VMware products. Contact VMware or VMware partners for product support and training for all VMware products.

VMware infrastructure training is required and the necessary knowledge and experience regarding deployment and management of virtual machines must be acquired before attempting to deploy Unified ICM/CC components on VMware virtual machines.

If you desire 24/7 VMware support, subscribe to VMware Platinum Support & Subscription Service from VMware. For more information on VMware support, see:
www.vmware.com (http://www.vmware.com/support/services/Platinum.html)

Caution: Virtual machine snapshots are not supported in production environments since they have significant impact on system performance.

Virtualization with Media Convergence Servers (MCS)

To consolidate servers, you can deploy a virtualization solution with VMware on MCSs. Unified ICM and Unified Contact Center 8.0(1) and later support Administrative Clients and Peripheral Gateways deployedin VMware guests on specific MCSs; supported PGs require TCP/IP (vs. special I/O) to connect to peripherals. The following Peripheral Gateway types are supported virtualized on MCSs:

- Cisco Unified Communications Manager (Unified CM) PG
- Cisco Unified CCE Generic PG
- Cisco Unified CCE System PG
- Cisco Unified ICM Agent Routing Service (ARS) PG
- Cisco Unified Customer Voice Portal (CVP) PG
- Cisco Voice Response Unit (VRU) PG
- Cisco Media Routing (MR) PG (for multichannel applications)
- Cisco Contact Center Gateway
- Aspect PG
- Avaya PG
- Symposium PG

The Spectrum PG isnot supported on the VMware platform due to its special interface requirements.

Computing Resource Requirements and Capacities

Please refer to the Unified Communications Virtualization Doc Wiki at http://docwiki.cisco.com/wiki/Unified_Communications_Virtualization for information about computing resource requirements for PGs. You may use the published OVAs thereon to create the virtual machines for the PG components listed above on MCS hardware; published agent PG capacities apply to TDM PGs as well (with the exception of the Avaya TDM ACD PG – see below for specific capacity details for Avaya PGs).

Published OVAs for Administrative Clients may also be used for virtualized Admin Clients on MCS hardware. Computing resource requirements and capacity for Admin Clients is published on the Unified Communications Virtualization Doc Wiki as well.

Avaya TDM ACD PG

A single Avaya TDM ACD PG virtual machine (with two virtual CPUs) cannot support as many agents as an Avaya ACD PG on an MCS-40-xxx-Class server. The following table shows the specific capacity limits for Avaya TDM ACD PG virtual machines:

Table 7-6: Virtualized Avaya TDM ACD PG Requirements

Host Server Class	VM Resource Allocation		Desktops Connecting to CTI OS		Additional Requirements
	vCPUs	RAM	Capacity (agents)	Skill Groups Per Agent	
MCS-40-016-Class	2	4GB	2,000	5	***Note***: CTI OS Monitor Mode applications are not supported with Avaya and CTI OS
	2	4GB	1,600	10	
	2	4GB	1,300	15	
	2	4GB	1,000	20	

Hardware Requirements:

The Unified ICM/Unified Contact Center virtualization solution for MCS hardware requires the virtual machines to be run on the following Cisco MCS-7845 class server:

MCS-40-016-Class

The MCS-40-016-Class server comes with 8GB RAM. An additional 16GB RAM (either a 2x8 or two 2x4 kits) must be added for a total of 24GB of RAM.

The MCS-40-016-Class server comes with 2 Ethernet ports. Two additional dual port gigabit network adapters must be added for a total of six Ethernet ports. For the PGs, one adapter connects to the ICM public network, another one connects to the ICM private network. For the Administration Clients, both of the adapters connect to the ICM public network. An Ethernet port can support up to five Administration Client virtual machines. See section Servers for Cisco Contact Center Products for the requirements of using exact-match OEM servers from Cisco-selected manufacturers.

Software Requirements

Please refer to the requirements published on the Unified Communications Virtualization Doc Wiki at: http://docwiki.cisco.com/wiki/Unified_Communications_Virtualization for virtualization software requirements —these VMware software requirements apply to both MCS-based and UCS-based virtualized deployments.

Migration of Virtual Machines from MCS to UCS

Existing TDM PGs and Administrative Clients deployed in VMware virtual machine guests on MCS servers may be migrated to Unified Computing System hardware using the "technology refresh" upgrade method. Upon migrating to UCS, all requirements published on the Unified Communications Virtualization Doc Wiki at http://docwiki.cisco.com/wiki/Unified_Communications_Virtualization apply to the deployment (e.g. hardware/software requirements, computing resource allocation, etc.). Please refer to this Doc Wiki for guidance on the migration process.

Virtualization with Cisco UCS

Starting with ICM/CC Release 8.0(2), you can deploy a virtualization solution for certain Unified CCE components on Cisco Unified Computing System (UCS) hardware. Additionally, certain TDM PGs may be deployed virtualized on UCS hardware. For detailed information on Unified Communications applications running in virtual machines on UCS hardware, please see the Unified Communications Virtualization Doc Wiki page at: http://docwiki.cisco.com/wiki/Unified_Communications_Virtualization.

This Doc Wiki page contains links to information on:

- UCS hardware requirements
- VMware software requirements
- Currently supported and unsupported Unified CCE components running in virtual machines on UCS or MCS hardware
- Migration of existing TDM PGs from MCS to UCS and new deployments of TDM PGs on UCS
- Explanation of hybrid deployment options (e.g. deploying non-virtualized components with virtualized components)
- Unified CCE application capacity information and virtualization sizing guidelines.

7.10 *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 7-7: Unified Contact Center Management Portal Software Requirements

Type of Software	Server	Software
Operating System	All	• Microsoft Windows Server 2008 R2; SP1

Prerequisite Software	Web Application Server	• Microsoft Windows Configuration:
		  ○ Application Server Role
		  ○ Microsoft .NET Framework 3.5 SP1 feature
		  ○ Web Server (IIS) role
		• Microsoft ASP .NET 2.0 AJAX Extensions 1.0
		• Microsoft WSE 2.0 SP3 (runtime only)
		• Microsoft SQL 2005 Standard or Enterprise Edition (32-bit):
		  ○ Reporting Services Components
		  ○ Workstation Components
		• Microsoft SQL Server 2005 SP4

	Database Server	• Microsoft Windows Configuration: ○ Microsoft .NET Framework 3.5 SP1

Type of Software	Server	Software
		feature • J2SE Runtime Environment 6.0, update 11 (64-bit) • Microsoft SQL 2005 Standard or Enterprise Edition (32-bit): o Database Server Components o Workstation Components • Microsoft SQL Server 2005 SP4 • Microsoft SQL Server 2005 SMO 64-bit
Cisco Unified Contact Center Management Portal Software Components	Web Application Server	• Web Server Component • Application Server Component
	Database Server	• Database Component • Data Import Server Component • Provisioning Server Component

Appendix A – Server Classes

The server classes defined in this section are used in various Cisco contact center application deployment options.

Note: The conventions and notes listed at the end of the section. The 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

P4	Intel® Pentium® 4
PD	Intel® Pentium® D
C2D	Intel® Core™2 Duo
Xeon	Intel® Xeon®
XE5504	Intel® Xeon® E5504
XE5540	Intel® Xeon® E5540

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	Net Ports	Notes
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	1,4,7
	MCS-7845-H2-CCE2 MCS-7845-I2-CCE2	Xeon	2.33	2	2	4	4 x 146	SAS	2	1,4,7
MCS-40-006-Class	MCS-7845-H2-CCE1 MCS-7845-I2-CCE1	Xeon	2.33	2	2	4	6 x 72	SAS	2	1,3,7
MCS-40-007-Class	MCS-7845-H2-CCE1 MCS-7845-I2-CCE1	Xeon	2.33	2	2	4	8 x 72	SAS	2	1,3,7
MCS-40-008-Class	MCS-7845-H2-CCE3 MCS-7845-I2-CCE3	Xeon	2.33	2	4	4	4 x 146	SAS	2	1,4,7
MCS-40-009-Class	MCS-7845-H2-CCE3 MCS-7845-I2-CCE3	Xeon	2.33	2	4	4	6 x 146	SAS	2	1,3,7
MCS-40-010-Class	MCS-7845-H2-CCE4 MCS-7845-I2-CCE4	Xeon	2.33	2	4	4	8 x 146	SAS	2	1,3,7,9
MCS-40-011-Class	MCS-7845-I3-CCE1	XE5540	2.53	1	4	6	4 x 146	SAS	2	1,3
MCS-40-012-Class	MCS-7845-I3-CCE1	XE5540	2.53	1	4	6	6 x 146	SAS	2	1,3
MCS-40-013-Class	MCS-7845-I3-CCE1	XE5540	2.53	1	4	6	8 x 146	SAS	2	1,3
MCS-40-014-Class	MCS-7845-I3-CCE2	XE5540	2.53	2	4	8	4 x 300	SAS	2	1,3
MCS-40-015-Class	MCS-7845-I3-CCE2	XE5540	2.53	2	4	8	6x 300	SAS	2	1,3
MCS-40-016-Class	MCS-7845-I3-CCE2	XE5540	2.53	2	4	8	8 x 300	SAS	2	1,3,9

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	Net Ports	Notes
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	1,4,7
	MCS-7835-H2-CCE2 MCS-7835-I2-CCE2	Xeon	2.33	1	2	2	2 x 146	SAS	2	1,4,7
MCS-30-005-Class	MCS-7835-I3-CCE1	XE5504	2.0	1	4	4	2 x 146	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	Net Ports	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	6,7
MCS-20-005-Class	MCS-7825-I3-CCE1 MCS-7825-H3-CCE1	Xeon	2.13	1	2	2	2x 160	SATA	2	6,7
MCS-20-006-Class	MCS-7825-I4-CCE1	C2D	3.0	1	2	2	2x 250	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	Net Ports	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-7816-I3-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	Net Ports	Notes
GEN-50-003-Class	(Generic)	Xeon	2.0	4	1	4	8 x 72	SCSI	2	1,4,5,7
GEN-50-004-Class	(Generic)	Xeon	2.6+	4	2	4	8 x 72	SCSI	2	1,4,5,6,8
GEN-50-005-Class	(Generic)	Xeon	2.5+	4	4	4	8 x 72+	SAS	2	1,4,5,6
GEN-50-006-Class	(Generic)	Xeon	2.1+	4	8	8	10 x 146+	SAS	2	1,4,5,6,10

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	Net Ports	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	Net Ports	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	Net Ports	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+	1	2 / 4	2	2 x 80	SATA	2	2,6

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

Server Class	Model	Proc. Type	CPU Speed (GHz)	CPUs	CPU Cores	RAM (GB)	Disk (GB)	Disk Controller	Net Ports	Notes
GEN-10-005-Class (Minimum requirements)	(Generic)	P4, PD, C2D	2.0	1	1/2/4	1	10	SATA	1/2	2,6

Notes:

1. Enable processor Hyper-Threading (if possible). (Enable Hyper-Threading only on a Microsoft Windows Server 2003/2008 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 or more hard drives. Additional drives must be separately purchased for this server class of hardware.
4. You might need more Ethernet ports for servers that have the Router software component installed. See the section titled, 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 multi-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 this appendix. 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.
9. As a VMware ESX host machine, an additional 16GB of RAM (with either a 2x8 or two 2x4 kits, for a total of 20GB for the MCS-40-010-Class and a total of 24GB for the MCS-40-016-Class) is required and two additional dual port gigabit server adapters (for a total of 6 Ethernet ports).

10. Processor support is limited to Intel Xeon E7-4800/8800 or later series processors of equal or better specifications than indicated.
11. For information about supported hardware for Cisco Finesse, see the DocWiki page Virtualization for Cisco Finesse.

Other Server requirements

- All servers must support 100 or 1000 MB/s Ethernet ports.
- All servers should have a 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 throughout 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/Contact Center Server	RAID Configuration Requirements	
	OS & Application Software	Database
Unified CCE Progger	RAID 1	
Unified CCE Rogger – small deployment	RAID 1	
Unified CCE Rogger – medium deployment [1]	RAID 1	RAID 10
Unified ICM/CCE Router[1]	RAID 1	—
Unified ICM/CCE Logger – small deployment	RAID 1	RAID 1
Unified ICM/CCE Logger – medium/large deployment[1]	RAID 1	RAID 10
Unified ICM/CCE Administration and Data Server – AW-HDS, AW-HDS-DDS, HDS-DDS; small deployment	RAID 1	
Unified ICM/CCE Administration and Data Server – AW-HDS, AW-HDS-DDS, HDS-DDS; medium/large deployment	RAID 1	RAID 10
Unified ICM/CCE Administration Server and Real-Time Data Server [1]	RAID 1	
Unified ICM/CCE Configuration-Only Administration Server[1]	RAID 1	
Peripheral Gateway – Including CCE Agent PG or TDM ACD PG, VRU PG, MR PG, CTI Server, CTI OS Server and optionally CAD Server, Outbound Option Dialer [1]	RAID 1	—
Unified CCMP – Single Server or Dual Server System Database Server	RAID 1	RAID 10
Unified CCMP – Dual Server System Web Application Server	RAID 1	—
Unified CC Gateway	RAID 1	—

CAD Server	RAID 1	—
Unified Expert Advisor Server	RAID 1	—
Remote Silent Monitoring Server	RAID 1	—
Silent Monitor Server	RAID 1	—
Cisco Data Store Server	RAID 1	—
CTI Driver for Siebel Servers	RAID 1	—
CRM Connector Servers	RAID 1	—

[1] **Note**: These components are supported in virtual machine guests on Cisco Unified Computing System hardware on storage configured as a RAID 5 array.

The following Unified ICM/Contact Center components do not require a system with a RAID controller/array:

- Administration Client
- CTI OS Agent and Supervisor Desktops
- CAD Agent and Supervisor Desktops
- Unified ICM/Contact Center SS7 or Sigtran Gateway Servers
- CRM Connector Adapter Clients

Appendix C – Acronyms and Terms

Table C.0-1: Acronyms and Terms

Acronym or Term	Description
ACD	Automatic Call Distributor
AD	Active Directory
ADS	Administration & Data Server
ATA	Advanced Technology Attachment - internal storage interconnect interface
AW	Administration Workstations
BHCA	Busy Hour Call Attempts
BOM	The Unified ICM/Contact Center Bill of Materials document that has been renamed to *Hardware and System Software Specification (Bill of Materials)*
CAD	Cisco Agent Desktop
CCBU	(Cisco) Customer Contact Business Unit
CCE	Contact Center Enterprise
CCS	Cisco Collaboration Server
CDA	CAD Desktop Administrator
Central Controller	A Unified ICM/Contact Center 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 server used in Unified ICM/Contact Center Hosted
CIL	Client Interface Library
CIM	Cisco Interaction Manager (replacement for CEM, CCS)
CMB	Cisco Media Blender
Common Ground Upgrade	Upgrade software in-place on pre-existing hardware, migrating data in-place
cps	Calls per second

Acronym or Term	Description
CSA	Cisco Security Agent
CSD	CAD Supervisor Desktop
CTI	Computer Telephony Interface
CTI OS	(Cisco) CTI Object Server
CVP	(Cisco Unified) Customer Voice Portal
DCA	Dynamic Content Adapter
DDS	Detail Data Server
ECC variables	Expanded Call Context (ECC) variables
EDMT	Enhanced Database Migration Tool
EIM	E-mail Interaction Manager (replacement for CEM)
HDS	Historical Data Server
ICM	(Cisco Unified) Intelligent Contact Management
ICME	(Cisco Unified) Intelligent Contact Management Enterprise
ICMH	(Cisco Unified) Intelligent Contact Management Hosted
IPCC	IP Contact Center (renamed to Unified Contact Center)
ISE	Internet Script Editor
IVR	Interactive Voice Response
MCS	Cisco Media Convergence Server
MR PG	Media Routing PG
MR-PIM	Media Routing PIM
NAM	Cisco Network Applications Manager – Unified ICM/Contact Center Hosted
NAS	Network Attached Storage
PG	Peripheral Gateway
PIM	Peripheral Interface Manager – a software component in the PG
SAN	Storage Area Network
SATA	Serial ATA
Sigtran	A set of standards to implement SS7 transport functionality over an IP network.
SP	Service Pack
SRND	*Solution Reference Network Design Guide*
SS7	Signaling System 7 – a telecommunication protocol
Unified System CCE (SCCE)	A CCE deployment model featuring simplified installation and integrated web-based configuration
TAC	(Cisco) Technical Assistance Center
Technology Refresh	An installation or upgrade procedure whereby software is installed and configured on newly acquired hardware, migrating historical and configuration data from the prior hardware environment
TDM	Time Division Multiplexing
UCCE	(Cisco) Unified Contact Center Enterprise
UCCH	(Cisco) Unified Contact Center Hosted
UCM	(Cisco) Unified Communications Manager

Acronym or Term	Description
UCS	Unified Computing System
VPN	Virtual Private Network
VRU	Voice Response Unit
WIM	Web Interaction Manager (replacement for CCS)