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Introduction

This article provides specifics and examples to aid in sizing Unified Communications applications for the UCS B-series and C-series servers.

OVAs, VMs, Users and Servers

What is an OVA? A virtual machine template defines the configuration of the virtual machine's virtual hardware, or the "**VM configuration**". Open Virtualization Format (OVF) is an open standard for describing a VM configuration, and Open Virtualization Archive (OVA) is an open standard to package and distribute these templates. Files in OVA format have an extension of ".ova". Cisco Collaboration applications produce a file in OVA format containing all the required/supported VM configurations for that application.

Does Cisco require use of OVA files provided by the Collaboration apps? To be TAC-supported, Virtual Machines for Cisco Unified Communications applications **must** use a VM configuration from the OVA file provided by that application.

- They represent what the UC apps have been validated with.
- It is the only way to ensure UC apps are deployed on "aligned" disks for SAN deployments (i.e. pre-aligned filesystem disk partitions for the VM's vDisks).
- Use the readme of the OVA download file as authoritative source of information on supported VM configurations. When in doubt, or if there is a conflict between readme text and online web pages, use the readme.
- **Changes to the VM configuration are NOT allowed** unless specifically allowed in technical documentation. This includes virtual hardware specs, vnic adapter types, virtual SCSI adapter types, file system alignment and all other configuration aspects with the exception of vRAM and vDisk increases. If any modifications to vRAM are made, these resources should be reserved according to

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OVA policies and the sum of all virtual machines' vRAM and ESXi memory reservation may not exceed the total physical memory on the physical server. Note that Cisco VOS (Voice Operating System) platforms do not support "re-sizing" of the vDisk due to the VMFS file system alignment. The vDisk for Cisco VOS platforms are pre aligned to VMFS's 64k boundary and there are no tools built in to expand the vDisk and keep the VMFS's 64k boundary intact. Customers should increase the vDisk on Cisco VOS platform by deploying a new VM and choosing the deployment with the larger vDisk then restore their data to it. In general, the "adding" of resources like vRAM and vDisk would be accepted and approved by UC applications providing that the usage of the increased resources still does not over subscribe the Host physical resources and still preserve the intent of the UC OVA's.

Where do I download these OVA files from? / Each Collaboration application posts its OVA file on Download Software on www.cisco.com. The product pages on www.cisco.com/go/uc-virtualized provide a link to the folder containing these files. For more information on how to download these files once there, see [Downloading OVA Templates for UC Applications](#)

What does the term "users" mean in a sizing context? Many of the Collaboration apps use "users" in the label of a particular VM configuration. "Users" means a specific user count at a particular BHCA, with a particular number of devices per user, feature mix per VM, device mix per VM, etc. Use the sizing tools and design guides at www.cisco.com/go/uc-virtualized to establish how many devices are able to be supported by a given VM configuration. Actual user capacity and total supported devices will be design-dependent; please follow all rules in the design guides and sizing tools for what your application can actually support.


'What is the max user or max device count of a physical server?' This is a concept from physical appliances where 1 physical server ran 1 application instance. With virtualization, 1 physical server runs many application instances, so the net max user/device count will vary and depends on the max users/devices per VM and the max VM count per physical server. Use the Plan/Design Workflow on www.cisco.com/go/uc-virtualized to help you figure this out for your deployment.

Application Co-residency Support Policy

Cisco UC virtualization only supports application co-residency under the specific conditions described below and as clarified in [TAC Technote Document ID: 113520](#).

This policy only covers the rules for physical/virtual hardware sizing, co-resident application mix and maximum VM count per physical server. All other UC virtualization rules still apply (e.g supported VMware vSphere ESXi versions or hardware options). Co-residency rules apply equally to all hardware options:

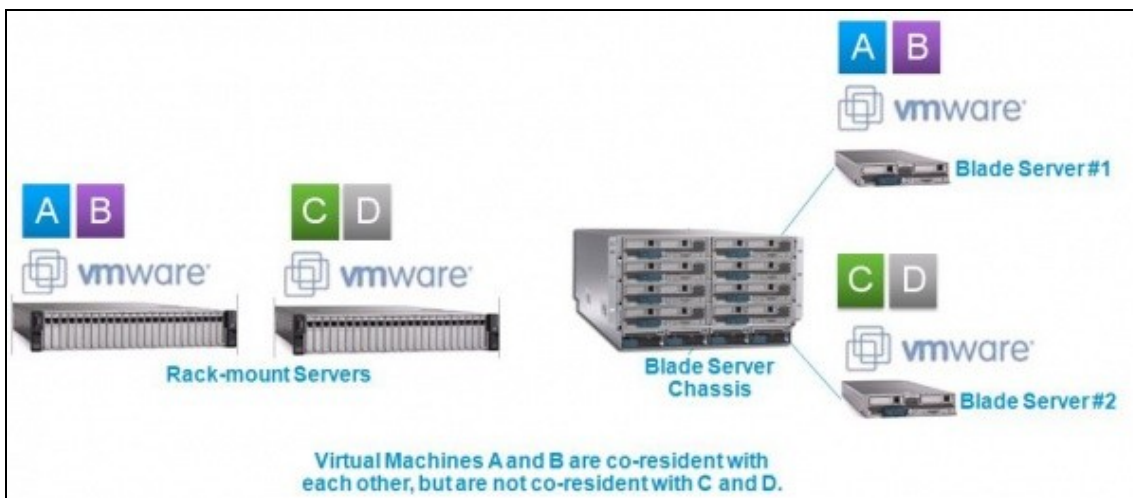
- [UC on UCS Tested Reference Configuration](#)
- [UC on UCS Specs-based](#)
- [Third-party Server Specs-based](#)

 **Note:** UC app VM performance is only guaranteed when installed on a [UC on UCS Tested Reference Configuration](#), and only if all other conditions in this policy are followed.

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"Application co-residency" in this UC support policy is defined as VMs sharing the same physical server and the same virtualization software host:

- E.g. VMs running on the same VMware vSphere ESXi host on the same physical rack-mount server, such as Cisco UCS C-Series.
- E.g. VMs running on the same VMware vSphere ESXi host on the same physical blade server in the same blade server chassis, such as Cisco UCS B-Series.
- "Co-resident application mix" in this UC support policy refers to the set of VMs sharing a physical server and a virtualization software host.
- VMs running on different virtualization hosts and different physical servers are not co-resident.
 - ◆ E.g. VMs running on two different Cisco UCS C-Series rack-mount servers are not co-resident.
 - ◆ E.g. VMs running on two different Cisco UCS B-Series blade servers in the same UCS 5100 blade server chassis are not co-resident.




Virtual Machines (VMs) are categorized as follows for purposes of this UC support policy:

- Cisco UC app VMs (or simply **UC app VMs**): a VM for one of the Cisco UC apps at Unified Communications Virtualization Supported Applications.
- Cisco non-UC app VMs (or simply **non-UC VMs**): a VM for a Cisco application not listed at Unified Communications Virtualization Supported Applications, such as the VM for Cisco Nexus 1000V's VSM.
- 3rd-party application VMs (or simply **3rd-party app VMs**): a VM for a non-Cisco, application, such as VMware vCenter, 3rd-party Cisco Technology Developer Program applications, non-Cisco-provided TFTP/SFTP/DNS/DHCP servers, Directories, Groupware, File/print, CRM, customer home-grown applications, etc.

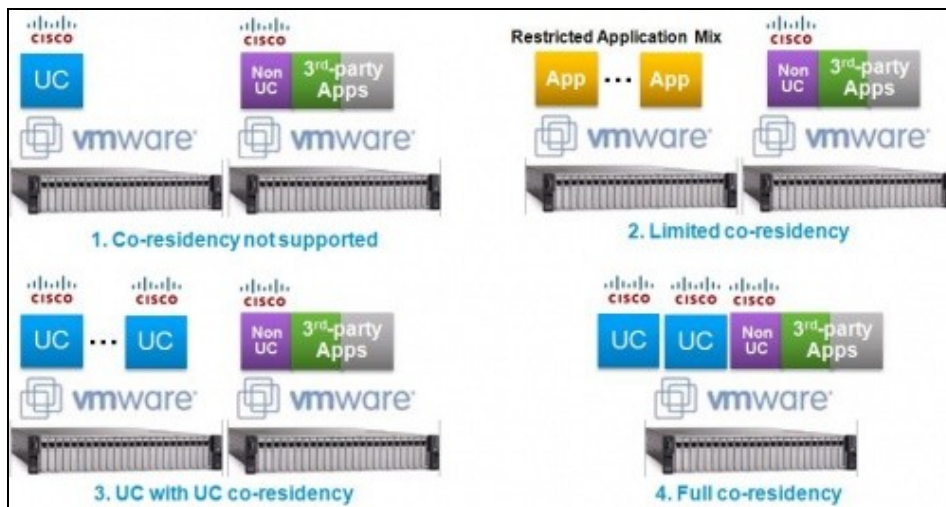
 **Note:** If you are using the virtualization software called "Cisco UC Virtualization Hypervisor" or "Cisco UC Virtualization Foundation" (as described at Unified Communications VMware Requirements), there are restrictions on allowed non-UC and 3rd-party application VMs. You may be required to instead deploy on VMware vSphere Standard, Enterprise or Enterprise Plus Edition.

Each Cisco UC app supports one of the following four types of co-residency:

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 **Note:** Troubleshooting UC VMs co-resident with non-UC/3rd-party app VMs may require the changes described at [TAC TechNote Document ID #113520](#). To be supported by Cisco TAC, customers must agree to these changes if required by Cisco TAC.

1. **None:** Co-residency is not supported. The UC app only supports a single instance of itself in a single VM on the virtualization host / physical server. No co-residency with ANY other VM is allowed, whether Cisco UC app VM, Cisco non-UC VM, or 3rd-party application VM.
2. **Limited:** The co-resident application mix is restricted to specified VM combinations only. Click on the "Limited" entry in the tables below to see which VM combinations are allowed. Co-residency with any VMs outside these combinations - including other Cisco VMs - is not supported (these applications must be placed on a separate physical server). The deployment must also follow the [General Rules for Co-residency and Physical/Virtual Hardware Sizing](#) listed below.
3. **UC with UC only:** The co-resident application mix is restricted to VMs for UC apps listed at [Unified Communications Virtualization Supported Applications](#). Co-residency with Cisco non-UC VMs and/or 3rd-party application VMs is not supported; those VMs must be placed on a separate physical server. The deployment must also follow the [General Rules for Co-residency and Physical/Virtual Hardware Sizing](#) rules below.
4. **Full:** The co-resident application mix may contain UC app VMs with Cisco non-UC VMs with 3rd-party application VMs. The deployment must follow the [General Rules for Co-residency and Physical/Virtual Hardware Sizing](#) rules below. The deployment must also follow the [Special Rules for non-UC and 3rd-party Co-residency](#) below.



General Rules for Co-residency and Physical/Virtual Hardware Sizing

See the tables after the rules for the co-residency policy of each UC app.

 **Note:** Remember that virtualization and co-residency support varies by UC app **version**, so don't forget to double-check inter-UC-app version compatibility, see [Cisco Unified Communications System Documentation](#).

"Matching" Support Policies

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All co-resident applications must "match" in the following areas:

- Same "server" support for compute/network/storage hardware (see [Unified Communications Virtualization Supported Applications](#))
 - ◆ E.g. if you want to host co-resident apps on UCS C260 M2 TRC#1, all co-resident apps must have a hardware support policy that permits this.
 - ◆ E.g. if you want to deploy instead as [UC on UCS Specs-based](#) with a diskless UCS C260 M2 and a SAN/NAS storage array, all co-resident apps must support this.
 - ◆ You must pick a hardware option that all the co-resident apps can support. For example, some UC apps do not support [Specification-Based Hardware Support | Specs-based for UC on UCS or 3rd-party Servers](#)], some UC apps do not support certain Tested Reference Configurations such as UC on UCS C200 M2 TRC#1 (as opposed to [UC on UCS C200 M2 specs-based](#)).
- Same support for virtualization software product and version.
 - ◆ E.g. one app supports vSphere 5.0, the other app only supports vSphere 4.1. vSphere 5.0 may not be used for this co-resident application mix.
- All apps must support a co-residency policy that permits the desired co-resident application mix.
 - ◆ E.g. one app has a "Full" policy, another app has "UC with UC" policy. Co-resident non-UC or 3rd-party app VMs are not allowed.
 - ◆ E.g. one app has a "UC with UC" policy, another app has "Limited" policy. Even though all apps will be UC, the desired combination may not be allowed by the "Limited" app.
 - ◆ E.g. one app has "None" policy. No other apps can be co-resident with this app regardless of their policies.
- If support policies of a given co-resident app mix do not match, then the "least common denominator" is required.

Virtual Machine Templates

All UC applications must use a supported virtual machine OVA template from [Unified Communications Virtualization Downloads \(including OVA/OVF Templates\)](#).

No Hardware Oversubscription

All VMs require a one to one mapping between virtual hardware and physical hardware. See specifics below.

CPU

- Make sure your Tested Reference Configuration or Specs-based CPU is the right [CPU Type](#) for the particular UC VMs. E.g. for Cisco Unified Communications Manager, the 2.5K user, 7.5K user and 10K user VMs may only run on a server with a ["Full UC Performance" CPU Type](#).
- Must map 1 VM vCPU core to 1 physical CPU core.
 - ◆ For example, if you have a host with 12 total physical cores, then you can deploy any combination of virtual machines where the total number of vCPU on those virtual machines adds up to 12.
 - ◆ The requirement is based on *physical* cores, not *logical* cores.
 - ◇ Logical cores may exceed physical cores if CPU hyperthreading is used. See [UC Virtualization Supported Hardware](#) for recommendation on hyperthreading and other BIOS settings. See screenshot below for physical cores vs. logical cores (as viewed from either VMware vCenter or vSphere Client) for a UCS C220 M3S server with CPU hyperthreading DISABLED. If hyperthreading is ENABLED, you will see 16

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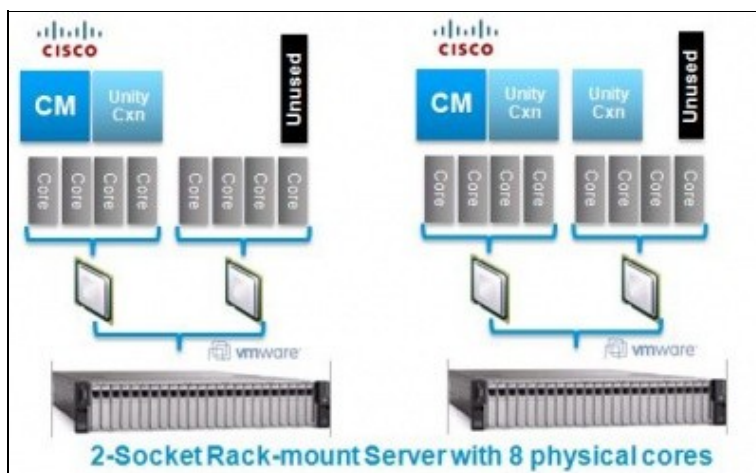
logical cores despite only 8 physical cores, but UC sizing rules are still limited by 8 physical cores.

General	
Manufacturer:	Cisco Systems Inc
Model:	UCSC-C220-M3S
CPU Cores:	8 CPUs x 3.299 GHz
Processor Type:	Intel(R) Xeon(R) CPU E5-2643 0 @ 3.30GHz
License:	VMware vSphere 5 Enterprise Plus - Licensed for 2 physic...
Processor Sockets:	2
Cores per Socket:	4
Logical Processors:	8
Hyperthreading:	Inactive
Number of NICs:	6
State:	Connected
Virtual Machines and Templates:	0
vMotion Enabled:	Yes
VMware EVC Mode:	Disabled <input type="checkbox"/>
vSphere HA State:	<input checked="" type="radio"/> N/A
Host Configured for FT:	No <input type="checkbox"/>
Active Tasks:	
Host Profile:	Rack Servers NFS storage
Image Profile:	ESXi-5.0.0-20120302001-st...

Total Physical Cores = 8 →

Hyperthreading disabled.
Total Logical Cores = 8 ←

- ◆ The requirement is based on physical cores on CPU architectures that Cisco has verified have equivalent performance ([click here for details](#)). E.g. for UC sizing purposes, one core on E5-2600 at 2.5+ GHz is equivalent to one core on E7-2800 at 2.4+ GHz, which are both equivalent to one core on 5600 at 2.53+ GHz.
- Cisco Unity VMs also require VMware CPU Affinity.
- If there is at least one live Unity Connection VM on the physical server, then one CPU core per physical server must be left unused (it is actually being used by ESXi scheduler).
 - ◆ For example, if you have a host with 12 total physical cores and one or more of the VMs on that host will be Unity Connection, then you can deploy any combination of virtual machines where the total number of vCPU on those virtual machines adds up to 11, with the 12th core left unused. This is regardless of how many Unity Connection VMs are on that host.



- CPU reservations on the VMs are not required, allowed or supported. Use of CPU reservations in lieu of one-vcpu-to-one-physical-CPU-core mapping is not supported.
 - ◆ Even if some of the virtual machines have a reservation, the above one-to-one vCPU to physical core rule still applies? it overrides the reservation.
 - ◆ For example, if you have a host with a total of 4 physical cores, and you want to run the CUCM 2500 user OVA (which has 800 MHz reservation and requires 1 vCPU) along with

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other virtual machines, you still must deploy the VMs with a one to one mapping of vCPU to physical core. If you do not follow this rule, your deployment is unsupported.

Memory/RAM

- Must map 1 GB of VM vRAM to 1 GB of physical RAM. Memory oversubscription is not supported for Cisco UC VMs.
- The sum of virtual machines' vRAM may not exceed the total physical memory on the physical server.
- Additional physical RAM must be provisioned for VMware vSphere ESXi itself (this is to cover ESXi overhead to run VMs; for more details see "[Understanding Memory Overhead](#)" on [vmware.com](#)).

◇ 4 GB for version 5.5 of VMware vSphere ESXi

◇ 2 GB for versions 4.0, 4.1, 5.0, 5.1 of VMware vSphere ESXi

Storage

The following apply to supported DAS, SAN and NAS storage

- Must map 1 GB of VM vDisk to 1 GB of physical storage.
 - ◆ Storage thin provisioning is not recommended (whether at VM layer or storage array layer).
 - ◆ Any other form of storage oversubscription is not supported.
 - ◆ The sum of virtual machines' vDisks may not exceed the physical disk space of the physical server's logical volume capacity (i.e. capacity net of overhead for the VM itself, VMFS in vSphere and physical RAID configuration).
 - ◆ Cisco recommends 10% buffer on top of vDisk values to handle overhead within the VM (such as swap files which are the size of the VM's vRAM). See [Shared Storage Considerations](#) for more details.
- The DAS, NAS or SAN storage solution must also supply enough performance to handle the total load of the VMs.
 - ◆ Must provide enough IOPS to handle sum of the VMs.
 - ◆ Kernel command latency must not exceed 2-3 milliseconds.
 - ◆ Physical device command latency must not exceed 15-20 milliseconds.
 - ◆ See [Shared Storage Considerations](#) and [Storage Performance Requirements](#) for more details.
- If the above capacity or performance requirements are not met, the storage system is overloaded and must be "fixed" by either moving virtual machines to alternate storage, or improving storage hardware.

Network/LAN

- The aggregate networking load of the co-resident virtual machines must be met with the physical networking interface(s) on the host.
- See the UC application design guides (<http://www.cisco.com/go/srnd>) to size network utilization by UC app VMs. In general, most UC app VMs will not saturate a 1GbE link. Deployments leveraging

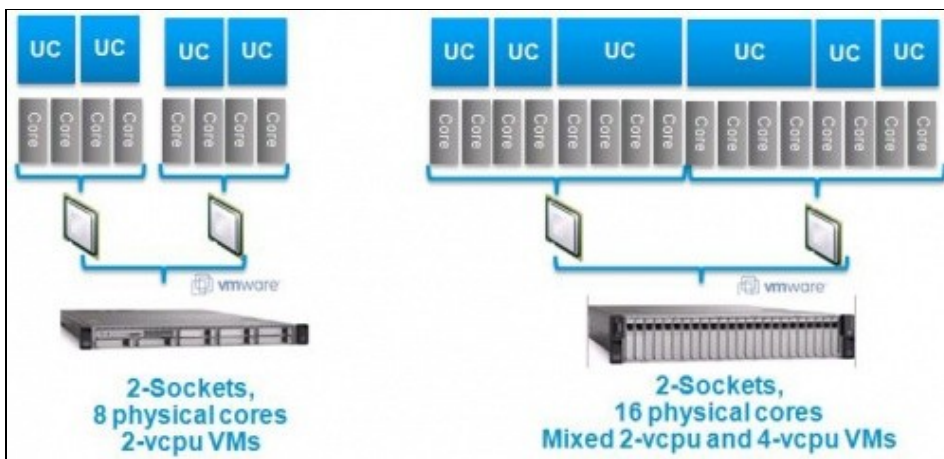
Unified_Communications_Virtualization_Sizing_Guidelines

non-FC-storage (iSCSI, NFS or Unified Fabric/FCoE including UCS B-Series FEX) must account for network traffic from both VM LAN access and VM storage access.

- For other network hardware best practices, see [QoS Design Considerations for Virtual UC with UCS](#).
- If the above capacity or performance requirements are not met, the networking hardware is congested and must be "fixed" by either moving virtual machines to a host with different network access, or provisioning more physical network interfaces.

Maximum VM Count per Physical Server

- For hardware other than UCS C200 M2 TRC#1, you may mix and match Cisco UC app VM size and quantity as long as you follow all of the sizing rules described above. The maximum number of virtual machines per physical server that can be supported depends on several factors:
- "Capacity" of physical server hardware vs. the quantity and resource usage of [VM OVA templates](#).
 - ◆ E.g. using the above physical/virtual sizing rules for CPU, a physical server with 8 total physical cores can only host 4 of the "CUCM 7.5K user OVAs" since those are 2 vCPU each. If the physical server instead had 20 total physical cores, it could host 10 of these VMs (assuming memory, network and storage hardware are also sufficient using the UC sizing rules immediately below).
 - ◆ All [UC on UCS Tested Reference Configurations](#) are sized for co-residency except for UCS C210 M1 Tested Reference Configuration #1 (which is only sized to host a single CUCM VM of 7500 user capacity). Note UCS C200 M2 Tested Reference Configuration #1 has special restrictions on choice of UC VM, and its allowed VMs are at lower capacity per VM than for other Tested Reference Configurations.
 - ◆ [UC on UCS Specs-based and 3rd-party Server Specs-based](#) deployments allow hardware options that may support a higher or lower max VM count than a [UC on UCS Tested Reference Configuration](#). E.g. UCS C210 M2 TRC#1 is a dual-4-core CPU, but UCS C210 M2 specs-based could be configured with dual-6-core (for possibly more VMs) or a single 4-core (for possibly a single VM).
- Note the max VM count may also be further restricted by UC apps that only support "Limited" co-residency as described in the tables after the rules.



Special Requirements for UCS C200 M2 TRC#1 or UCS C220 M3 SFF TRC#2 Hardware

Note:

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This section is only for UC on UCS C200 M2 Tested Reference Configuration #1 which uses Intel E5506 / 2.13 GHz CPU. UCS C200 M2 configured with a faster CPU (via Specification-Based Hardware Support) does not need to follow the rules in this section.

- These TRCs use a "Restricted UC Performance" CPU Type, so there are restrictions on which VM configurations may be used. The C200 M2 or C220 M3 SFF configured with a different CPU allowed by "Full UC Performance" CPU Type does not have these restrictions on choice of VM configuration.

Follow these rules for TRCs with a "Restricted UC Performance" CPU Type:

- ♦ The only supported virtual machine OVA templates are:
 - ◇ The list of VM configuration allowed for Cisco Business Edition 6000
 - ◇ In addition, CUC or UCxn - Unity Connection 500 users and 5000 users
 - ◇ Other unlisted VM configurations are not supported on C200 M2 TRC #1.
- ♦ Otherwise at this time the following co-residency scenarios are supported:
 - ◇ Any combination allowed by Cisco Business Edition 6000.
 - ◇ Any other combination provided you follow the General Rules for Co-residency and Physical/Virtual Hardware Sizing, and only use the VM configurations allowed on a "Restricted UC Performance" CPU Type..

Special Rules for non-UC and 3rd-party Co-residency

See the tables after these rules for the co-residency policy of each Cisco UC app.

Choice of virtualization software license may restrict choice of non-UC and/or 3rd-party application VMs, and how many of those VMs may reside on a particular host. See Virtualization Software Requirements.

Non-UC VMs and 3rd-party app VMs that will be co-resident with Cisco UC app VMs are also required to align with all of the following:

- TAC Technote Document ID: 113520. For other details on co-resident application performance troubleshooting, see Troubleshooting and Performance Monitoring Virtualized Environments.
- General Rules for Co-residency and Physical/Virtual Hardware Sizing
- All of the special rules below.

"Matching" Support Policies

All co-resident VMs must follow the "**Matching**" Support Policies rule in General Rules for Co-residency and Physical/Virtual Hardware Sizing. www.cisco.com/go/uc-virtualized does not describe policies for Cisco non-UC apps or 3rd-party apps

Virtual Machine Templates

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Cisco non-UC VMs and 3rd-party app VMs own definition of their supported VM OVA templates (or specs for one to be created), similar to what Cisco UC app VMs require in General Rules for Co-residency and Physical/Virtual Hardware Sizing. <http://www.cisco.com/go/uc-virtualized> does not describe VM templates for Cisco non-UC apps or 3rd-party apps.

CPU

All co-resident VMs - including non-UC VMs and 3rd-party app VMs - must follow the **No Hardware Oversubscription** rules for **CPU** in General Rules for Co-residency and Physical/Virtual Hardware Sizing.

Memory/RAM

- ◇ To enforce "no memory oversubscription", each co-resident VM - whether UC, non-UC or 3rd-party - must have a reservation for vRAM that includes all the vRAM of the virtual machine. For example, if you have a virtual machine that is configured with 4GB of vRAM, then that virtual machine must also have a reservation of 4 GB of vRAM.
- ◇ Otherwise all co-resident VMs - including non-UC VMs and 3rd-party app VMs - must follow the **No Hardware Oversubscription** rules for **Memory/RAM** in General Rules for Co-residency and Physical/Virtual Hardware Sizing. The 2 GB for VMware vSphere is in addition to the sum of the vRAM reservations for the VMs.

Storage

- ◇ Non-UC VMs and 3rd-party app VMs must define their storage capacity requirements (ideally in an OVA template) and storage performance requirements. These requirements are not captured at <http://www.cisco.com/go/uc-virtualized>.
- ◇ All co-resident VMs - including non-UC VMs and 3rd-party app VMs - must follow the **No Hardware Oversubscription** rules for **Storage** in General Rules for Co-residency and Physical/Virtual Hardware Sizing, including provisioning sufficient disk space, IOPS and low latency to handle the total VM load.
- ◇ If DAS storage is to be used with non-UC / 3rd-party app VMs, it is highly recommended that pre-deployment testing be conducted, where all VMs are pushed to their highest level of IOPS generation. This is due to DAS environments being more capacity/performance-constrained in general, more dependent on adapter caches in RAID controllers, and Cisco DAS testing only done for UC apps on UCS Tested Reference Configurations.

Network/LAN

- ◇ Non-UC VMs and 3rd-party app VMs must define the network capacity/performance requirements of their VM OVA templates. These requirements are not captured at <http://www.cisco.com/go/uc-virtualized>.
- ◇ All co-resident VMs - including non-UC VMs and 3rd-party app VMs - must follow the **No Hardware Oversubscription** rules for **Network/LAN** in General Rules for Co-residency and Physical/Virtual Hardware Sizing, including provisioning sufficient physical interfaces.


Table of Co-residency Support Policy by Cisco UC Application

Call Processing and System Management Applications

UC Application	Co-residency Support
Unified Communications Manager (1)	See Virtualization for Cisco Unified Communications Manager (CUCM)
Cisco Business Edition 6000	See Cisco Business Edition 6000
Cisco Emergency Responder	See Virtualization for Cisco Emergency Responder
Session Manager Edition	See Virtualization for Cisco Unified CM - Session Management Edition
Intercompany Media Engine	See Virtualization for Cisco Intercompany Media Engine
Unified Attendant Consoles	See Virtualization for Cisco Unified Attendant Consoles
UC Management Suite (OM, SM, SSM, PM)	Full

(1) Applicable for publishers, subscribers, standalone TFTP and standalone multicast MOH nodes.

Messaging and Presence Applications

UC Application	Co-residency Support
Cisco Unity Connection	See Virtualization for Cisco Unity Connection
Cisco Unity	See Virtualization for Cisco Unity  Note: Cisco Unity requires CPU Affinity which may not be desirable for other applications co-resident with Unity.
Cisco Unified Presence	See Virtualization for Cisco Unified Presence

Contact Center Applications

UC Application	Co-residency Support
Unified Contact Center Express / IP IVR	See Virtualization for Cisco Unified Contact Center Express
Cisco Unified Workforce Optimization (WFO) components (WFM, OM, AOM, CR, etc.)	See Virtualization for Cisco Unified Work Force Optimization Suite for Cisco Unified Contact Center Express
Unified Contact Center Enterprise components and deployment models	See Virtualization for Unified CCE
Unified Intelligence Center	See Virtualization for Cisco Unified Intelligence Center
Unified Contact Center Management Portal	See Virtualization for Cisco Unified Contact Center Management Portal
Unified Customer Voice Portal (all components)	See Virtualization for Cisco Unified Customer Voice Portal

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[Cisco MediaSense](#)

See [Virtualization for Cisco MediaSense](#)

[Cisco SocialMiner](#)

See [Virtualization for Cisco SocialMiner](#)

[Cisco Finesse](#)

See [Virtualization for Cisco Finesse](#)

[Cisco Unified Email Interaction Manager and Web Interaction Manager](#)

See [Virtualization for Cisco Unified Email Interaction Manager - Web Interaction Manager](#)

TelePresence Applications

UC Application

Co-residency Support

1.9.0:

Cisco TelePresence Manager

- Up to 4 CTS-Manager instances can be installed on a single server, for service provider deployments with no more than 50 endpoints under management per instance of CTS-Manager.
- 1 CTS-Manager and 1 CTMS can be installed on a single UCS server.

1.9.0:

Cisco TelePresence Multipoint Switch

- 2 CTMS instances can be installed on a single UCS server.
- 1 CTMS and 1 CTS-Manager can be installed on a single UCS server.

Cisco TelePresence Video Communication Server (Cisco VCS)

See [Virtualization for Cisco TelePresence Video Communications Server](#)

Cisco TelePresence Conductor

See [Virtualization for Cisco TelePresence Conductor](#)

Redundancy and Failover Considerations

Application-layer considerations (such as Unified CM Cluster over WAN or Unified CCE Remote Redundancy) are the same for virtualized (UC on UCS) or non-virtualized (MCS 7800) deployments.

However, since there is no longer a 1:1 relationship between hardware and application instances, "placement logic" must be taken into account to minimize the impact of hardware unavailability or unreachability:

- Avoid placing a primary VM and a backup VM on the same server, chassis or site
- For failover groups, avoid placing all actives on the same server, chassis or site
- Avoid placing all VMs of the same role on the same server, chassis or site

Network, QoS and Shared Storage Design Considerations

See [QoS Design Considerations for Virtual UC with UCS](#) and [Storage System Design Requirements](#).

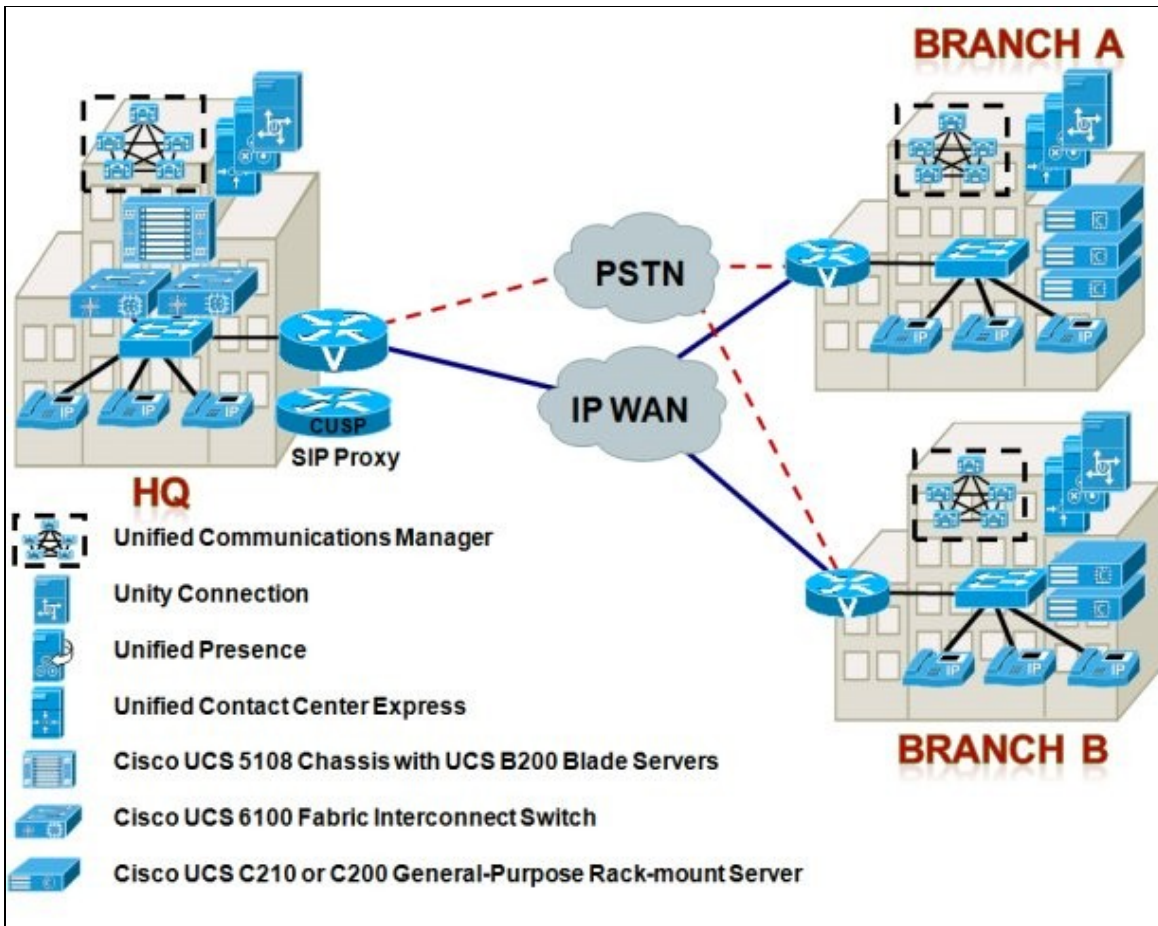
Sizing Examples

This section shows a sample system configuration based on following the [High-level Checklist for Design and Implementation](#) for the following set of customer requirements:

- **General Requirements**
 - ◆ Three sites - Headquarters (HQ) and two Branches (A and B)
 - ◆ CUCM and Applications located at each site
 - ◆ Up to 30,000 lines per sites
 - ◆ 100+ sites
 - ◆ Transparent use of PSTN if IP WAN unavailable
- **Headquarters (HQ) Requirements**
 - ◆ 12K Phones, use Cisco TFTP server
 - ◆ 10K Messaging users
 - ◆ 10K users equipped with Cisco Unified Personal Communicator (CUPC)
 - ◆ Contact Center with 240 agents and 10 supervisors
- **Branch A Requirements**
 - ◆ 2K Phones, use Cisco TFTP server
 - ◆ 2K Messaging users
 - ◆ 2K users equipped with Cisco Unified Personal Communicator (CUPC)
 - ◆ Contact Center with 145 agents and 5 supervisors
- **Branch B Requirements**
 - ◆ 500 Phones, use Cisco TFTP server
 - ◆ 500 Messaging users
 - ◆ 500 users equipped with Cisco Unified Personal Communicator (CUPC)
 - ◆ Contact Center with 45 agents and 5 supervisors

After going through the design process, the following servers were selected to host the virtualized UC applications:

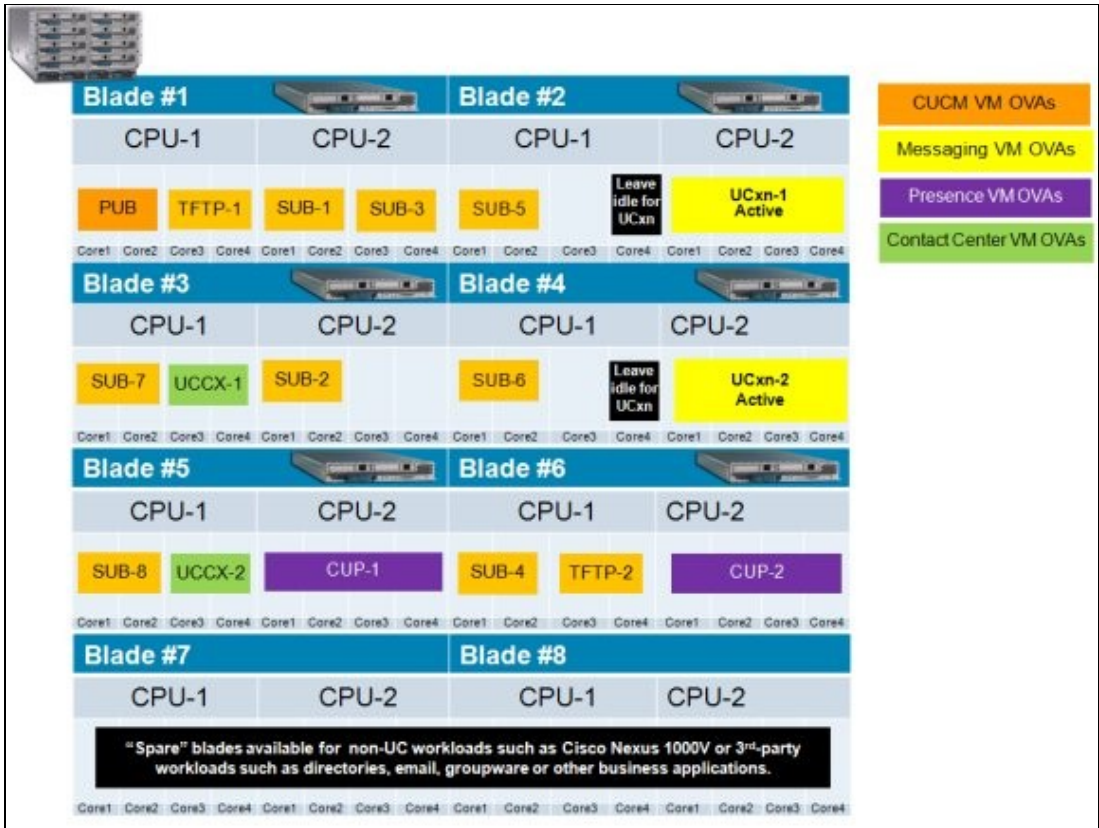
- Six Cisco UCS B200 Blade Servers for HQ (running in a UCS 5100 Chassis connected to UCS 6100 Fabric Interconnect Switches), using TRC#1 (UCS-B200M2-VCS1).
- Three Cisco UCS C210 General-Purpose Rack-Mount Servers for Branch A, using TRC#1 (UCS-C210M2-VCD2)
- Two Cisco UCS C200 General-Purpose Rack-Mount Servers for Branch B, using TRC#1 (UCS-C200M2-VCD2)
- Note this example does not include non-UC applications (such as [Cisco Nexus 1000V](#) or Cisco Network Registrar) or 3rd-party applications such as customer-provided DNS / DHCP / TFTP servers, directories, email, groupware or other business applications. These applications need to run on separate physical servers and are not allowed to be co-resident with UC at this time. See the Co-residency section on this page for more details.



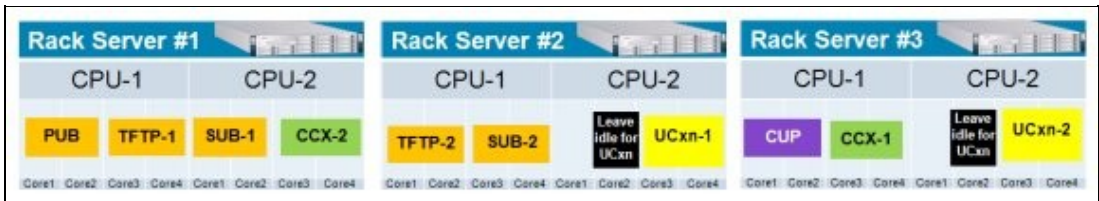
See below for details on the server layout and application/VM placement at each site. Note that Branch B is using UCS C200 M2 TRC #1 so has restrictions on which VM OVA's were able to be used.

HQ server detail:

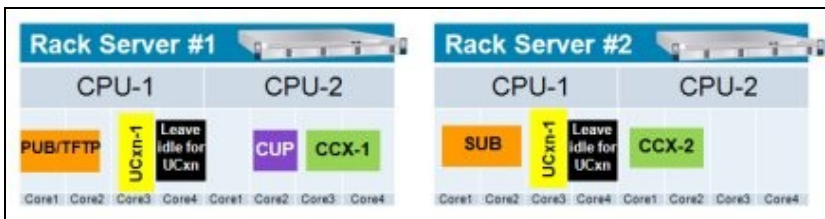
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Branch A server detail:



Branch B server detail:



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