

Server Sizing Matrix for Vocera Voice 4.3 and 4.4



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Vocera System and Configuration Requirements

This section provides the configuration and hardware requirements for Voice Server and other Vocera software components.

Determining the Site Size for Your Environment

Use the table below to help you determine the site size for your implementation of Vocera Server. This information is needed in order to setup and plan your environment with the correct configuration and server size.

	Small Installation	Large Installation
Maximum Simultaneous Users	450	5,000
Entities (Spoken Name Count) ¹	0 - 6,000	6,000 or greater

Vocera Recommended Configuration Guidelines

The table in this section shows the hardware requirements for the Voice Server and other Vocera software components.

Physical Hardware	VMware
Vocera Server For 450 maximum users: CPU(s) with at least 2 physical cores Intel Xeon(R) E5-2660 v2 or better recommended At least 4 GB RAM Dedicated hard drive for application - 80 GB or larger (Vocera recommends RAID 10) ² Windows 2003 or Windows 2008 R2 Windows 2012 R2 (4.4.2 or later)	Vocera Server See VS VMware Requirements on page 7
Vocera Server For 450 to 5000 users: CPU(s) with at least 4 physical cores Intel Xeon(R) E5-2660 v2 or better recommended At least 8 GB RAM Dedicated hard drive for application - 120 GB or larger (Vocera recommends RAID 10) ^{3,4} Windows 2003 or Windows 2008 R2 Windows 2012 R2 (4.4.2 or later)	Vocera Server See VS VMware Requirements on page 7

¹ Spoken Name Count includes user names, group names, alternate spoken names, *locations*, *address book entries*, and department names.

² Vocera does not recommend usage of a NAS or SAN infrastructure for the Vocera Server.

³ Vocera does not recommend usage of a NAS or SAN infrastructure for the Vocera Server.

⁴ Testing shows improved performance with solid state drives.

Physical Hardware	VMware
Vocera SIP Telephony Gateway (VSTG) CPU(s) with at least 2 physical cores At least 2 GB RAM At least 40 GB HD Windows 2003 or Windows 2008 R2 Windows 2012 R2 (4.4.2 or later)	Vocera SIP Telephony Gateway (VSTG) See VMware Requirements for Optional Vocera Software Components on page 9
Vocera Report Server (VRS) CPU(s) with at least 2 physical cores At least 4 GB RAM At least 100 GB HD Windows 2003 or Windows 2008 R2 Windows 2012 R2 (4.4.2 or later)	Vocera Report Server (VRS) See VMware Requirements for Optional Vocera Software Components on page 9
Vocera Client Gateway (VCG) CPU(s) with at least 2 physical cores At least 2 GB RAM At least 40 GB HD Windows 2003 or Windows 2008 R2 Windows 2012 R2 (4.4.2 or later)	Vocera Client Gateway (VCG) See VMware Requirements for Optional Vocera Software Components on page 9
Badge Configuration Computer (BCU) Windows XP, Windows 7, Windows 2003, Windows 2008 R2, or Windows 2012 R2	Badge Configuration Computer (BCU) Not supported
Motorola Mobility Services Platform (MSP) CPU(s) with at least 2 physical cores At least 2 GB RAM At least 40 GB HD Windows 2003 Standard or Windows 2008 Standard ⁵	At least 1 vCPU At least 2 GB RAM At least 40GB HD Windows 2003 Standard or Windows 2008 Standard
Vocera Staging Server CPU(s) with at least 2 physical cores At least 2 GB RAM At least 40 GB HD Windows 2003 or Windows 2008 R2 Windows 2012 R2 (4.4.2 or later)	Vocera Staging Server 1 vCPU, 2 GB RAM, 40 GB HD Windows 2012 R2
Vocera Recognition Server Not recommended	Vocera Recognition Server See VMware Requirements for Optional Vocera Software Components on page 9
Vocera Telephony Server CPU(s) with at least 2 physical cores At least 4 GB RAM At least 80 GB HD Full-length, full-height PCI, PCI-X, or PCI-Express slot for Dialogic board Windows 2003 or Windows 2008 R2	Vocera Telephony Server Not supported

⁵ MSP 3.3 is NOT supported on Windows 2008 R2.

Vocera Support and Recommendations for VMware Products

Vocera supports the following products running in a VMware virtualized environment:

- Vocera Server (VS)
- Vocera SIP Telephony Gateway (VSTG)
- Vocera Rauland Integration SIP Gateway (RSIP)
- Vocera Client Gateway (VCG)
- Vocera Report Server (VRS)

In addition, Motorola supports the running of Mobility Services Platform (MSP) on VMware.

VMware Platforms

The table below shows the VMware platforms supported by the Vocera server products.

Server	VMware Platforms Supported
VS, VSTG, VCG, RSIP and VRS	VMware vSphere 5 with ESXi 5.0 and later

The ESXi hosts in this environment must be managed by a VMware vCenter Server, using a minimum of Standard licensing for both ESXi and vCenter.



Important: Vocera does not support other virtualization platforms, including VMware Workstation, Citrix XenServer, Red Hat KVM and Microsoft Hyper-V.

VMware Feature Recommendations

Vocera recommends that you **do not** use VMware vMotion, DRS, Storage vMotion, or Storage DRS features on certain Vocera Servers (VS, VCG, VSTG, or RSIP). These features have the potential to disrupt real-time communication. VM Override rules or Affinity/Anti-Affinity rules should be used if possible, or selectively disabling some of these features, to prevent these actions. Performing vMotion on a running Vocera server is likely to cause some or all of the following:

- Cluster failover (all active badge calls will be dropped)
- Badges displaying the Searching For Server error and not able to make calls
- Gateway disconnects (all active gateway calls will be dropped)
- Interruption in communication (badge-to-server communication such as speech recognition and call setup)

VS VMware Requirements

Component	Requirements 4.3 SP3, 4.3 SP4, 4.4.0, and 4.4.1	Requirements for 4.4.2 and later
Processors per VM	4	4
Minimum RAM	8 GB	8 GB
Resource Reservation	See CPU Oversubscription on page 7 and see Memory Oversubscription on page 8	See CPU Oversubscription on page 7 and see Memory Oversubscription on page 8
Network Interface	VMXNET 3	VMXNET 3
Minimum Disk Space	120 GB (thick provisioned)	120 GB (thick provisioned)
Guest Operating System	Windows 2008 R2 Standard or Enterprise	Windows 2012 R2 Standard, or Windows 2008 R2 Standard or Enterprise

Important: Vocera has validated that the Vocera Server works with the above requirements. However, we understand that every virtual infrastructure has unique characteristics. Consequently, you may need to deviate from the required configuration. If you encounter performance issues with virtualized Vocera Servers, Vocera Technical Support will work with your VMware administrator to help identify the cause of the problem and make recommendations to help fix or mitigate the problem. The recommendation could be to move the Vocera Server to a host with more available resources or higher performing disk capabilities. In some cases, Vocera Technical Support may recommend migrating to physical hardware if the virtual environment is not able to maintain the level of performance required by the Vocera solution.

Disk Oversubscription

- No disk oversubscription is allowed on the host
- All virtual disks should use a “thick” provisioning method
- Only direct-attached storage is recommended

Recommendation: If you are using NAS or SAN the maximum disk latency should be in line with the best practices for a real-time Voice application. For more information, see [VMware vSphere® 5.5 Documentation Center](#).

CPU Oversubscription

- No CPU oversubscription is allowed on the host
- The amount of provisioned vCPU's should be one less than the amount of physical processor cores available in the hypervisor (ESXi host)
- CPU affinity is not required or recommended
- Hyper-threading can be enabled but additional logical processors made available via the hyper-threading feature do not count toward the provisioning totals

Example:

Host machine contains 2 quad-core processors with hyper-threading enabled.

- Physical CPUs = 8
- Logical processors = 16
- Maximum vCPU's allowed = 7 (8 – 1 available for hypervisor use)

Memory Oversubscription

- No memory oversubscription is allowed on the host
- Provisioned memory of all virtual machines combined should equal 1GB less than the amount of memory installed in the hypervisor

Example:

Host machine contains 24 GB of RAM

$24 - 1 = 23$ GB of RAM available for guest VMs memory allocation

Applications Running on the Same Physical Host

The following applications are supported running on the same host as a virtualized Vocera Server:

- VS (staging)
- VSTG
- VCG
- VRS
- VMP
- VCTS
- VAM
- RSIP



Important: For hardware redundancy, Vocera recommends a separate physical host for each Vocera Server cluster node.

VMware Requirements for Optional Vocera Software Components

Component	Requirements		
	VSTG / RSIP	VCG	VRS
Virtual Processors (vCPU's) per VM	1	1	2
Minimum RAM	4 GB	4 GB	8 GB
Resource Reservation		CPU: 500 MHz RAM: 512 MB	
Network Interface		VMXNET 3	
Minimum Disk Space	40 GB	40 GB	100 GB
Guest Operating System		Windows 2008 R2 Windows 2012 R2	

VSTG, RSIP and VCG Recommendations

You can install multiple VSTG, RSIP and VCG servers, also known as an array, to take advantage of high availability features. Vocera recommends the following best practices for high availability:

- Set up 2 separate VMware ESXi servers for redundancy
- Install VSTG on each VMware ESXi server
- For VSTG only: Allocate the total number of SIP lines evenly between the VSTG servers



Important: (For VSTG only) When you configure the Number of Lines field on the Telephony > Basic Info page of the Vocera Administration Console, enter the number of lines available to a *single* VSTG server, not the total number of lines available to all servers. For example, if you purchased a license with 6 lines and you have 2 VSTG servers, assign 3 lines to each VSTG server.

VCG Recommendations

You can install up to 4 VCG servers for your Vocera system to take advantage of high availability features. Vocera recommends the following best practices for high availability:

- Set up 2 separate VMware ESXi servers for redundancy.
- Install VCG on each VMware ESXi server.

VSTG, RSIP, and VCG Limits

Number of lines supported by a single VSTG	128
Number of SIP calls supported by a single RSIP	2500

Number of simultaneous audio sessions supported by a single RSIP	256
Number of clients supported by a single VCG	2500
Number of simultaneous audio sessions supported by a single VCG	256

Managing CPU and Memory Resources

When setting up VMs for Vocera servers, make sure you specify CPU and memory resource reservations. A reservation specifies the guaranteed minimum allocation for a VM. CPU and memory resource reservations ensure that the VM will have enough CPU and memory resources provided by the host or cluster. If you don't specify CPU and memory resource reservations, the VM environment could become stressed, causing the clock on the VM to slow down or speed up, which could cause a Vocera SIP Telephony Gateway or Vocera Client Gateway to disconnect from its Vocera Server.

Vocera VMware Architecture

The following diagram shows two VMware ESXi hosts for a Vocera Server cluster. The hosts also include VMs for VSTG, RSIP, VCG, VRS and a Vocera Server staging server. Based on server load, you can add more VCG, VSTG and RSIP VMs.

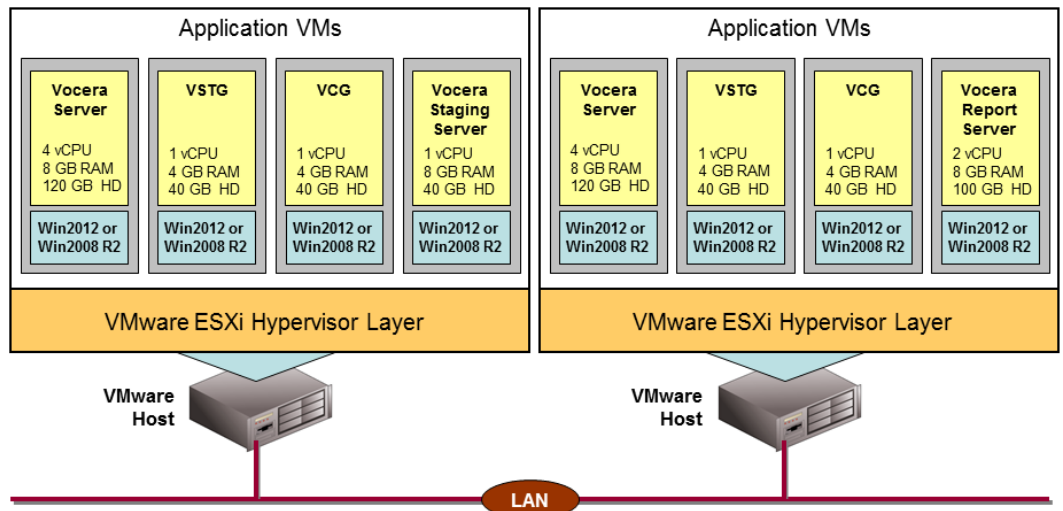


Figure 1: Vocera VMware architecture



More Information

For more information on server sizing guidelines, refer to the following Cisco and VMware documents:

- [vSphere Resource Management Guide](#)
- [Performance Best Practices for VMware vSphere® 5.5](#)
- [Unified Communications Virtualization Sizing Guidelines](#)



Note: Cisco server sizing guidelines formed the basis for Vocera's recommendations for the Vocera Voice Server.