

# Vocera Installation Guide

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Version 4.4.4

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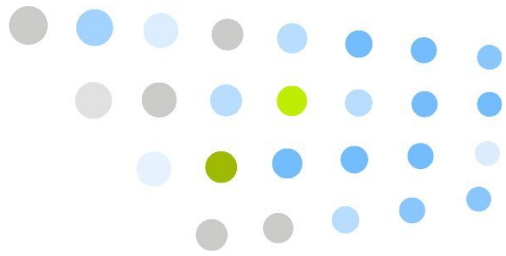
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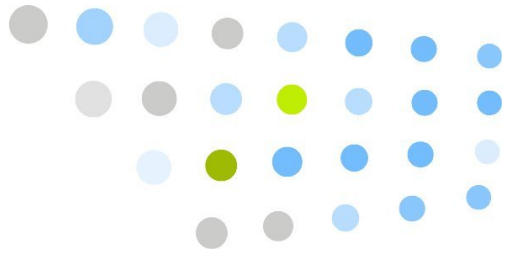


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## What's New

The following topics summarize the changes related to installing and configuring Vocera. See the Release Notes for a complete list of changes for this version.

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### Version 4.4

- **Windows 2012 Support** –The Vocera Server is now supported on the Windows 2012 platform. On Windows 2012, you must use "Run as administrator" to start the Vocera Server and to edit any text files that the server uses. For best results, use the Services window to start the Vocera Server.
- **New Legacy Backup Option** – This version includes a new **Maintenance Legacy Backup** button. The new **Legacy Backup** option is exclusively for restoring data after an upgrade to this release.

For more information see [Upgrading the Vocera Report Server](#) on page 43.

- **Installer branding update** – Product installers have been updated to reflect current branding and product offerings.
- **Updated 3rd Party Software Support** – The following 3rd party software updates are available with this release:
  - The Java Runtime environment has been updated from JRE 5.0 (1.5.0\_10) to JRE 6.0 (1.6.0\_45).
  - Tomcat 7.0.52
  - Apache 2.2.25
  - MySQL 5.1.73

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- **Session 0 Isolation and the Vocera Control Panel** – In Windows Server 2008, and later versions of Windows, the operating system isolates system services, such as Vocera services, in a hidden session called Session 0 to protect them from application attacks. However, Session 0 isolation also makes it more difficult to interact with services. To address this problem, Vocera 4.4 added a Vocera system tray icon that automatically launches the Vocera Control Panel in your user session when you connect to the server remotely. You can use the Vocera Control Panel to manage all the Vocera Voice servers, with the exception of the Vocera Report Server, which uses a web console instead.

For more information about the Vocera Control Panel, see [Using the Vocera Control Panel](#) on page 109.

- **Optimized Entity Prompts** –The Vocera speech recognition parameters have been tuned to eliminate unnecessary silence at the beginning and end of recorded entity prompts, thus making the prompts play faster for a better user experience. Entity prompts are the recorded user names and group names stored in the **\vocera\data\prompts** folder on the Vocera Server. Entity prompts recorded prior to Vocera 4.4 are automatically optimized using a third-party sound processing utility called Sound eXchange, or SoX, which trims silence from the prompts after you upgrade the Vocera Server to Version 4.4.
- **Updated JRE** –The Java Runtime environment has been updated from JRE 5.0 (1.5.0\_10) to JRE 6.0 (1.6.0\_45).
- **Updated Apache Tomcat** –Apache Tomcat has been updated from version 4.0.4 to version 7.0.37.



## Introduction

Vocera Voice Communication enables hands-free, voice-controlled wireless voice communication using the wearable Vocera badge throughout a wireless networked building or campus. For an end user, communication is as easy as pushing a button on the badge and saying, “Call Jodie Lee.”

This guide describes how to install or upgrade a Vocera Voice Communication system. Setting up the system entails installing server software, configuring Vocera badges, and initializing the Vocera Server database with the names of users and groups. If telephony integration is required, you must also install telephony software, either Vocera SIP Telephony Gateway (a software-only solution) or Vocera Telephony Server (which requires additional hardware). Other optional components, such as Vocera Client Gateway, a gateway for smartphones running the Vocera Connect application, and Vocera Report Server, may also be installed.

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### About the Vocera System Software

This section describes the Vocera system software.

#### *Main Components*

The Vocera system software includes the following main components:

- **Vocera Server Program**—provides the central system functionality, and calls on the other components for specific services.
- **Embedded MySQL Database™**—stores user profiles (which contain personal information and badge settings), group and location information, and system settings.
- **Nuance™ Speech Recognition, Verifier, and Vocalizer™ Software**—provides the speech recognition, voiceprint authentication, and text-to-speech engines used by the Vocera voice interface.

- **Apache / Tomcat Web Server**—hosts the browser-based Administration Console and User Console applications.

## *Software Utilities*

The Vocera system software includes the following utilities:

- **Badge Properties Editor**—lets you set values for badge properties so the Vocera badges can connect to the wireless network. See [Using the Badge Properties Editor](#) in the *Vocera Badge Configuration Guide*.
- **Badge Configuration Utility**—downloads the properties you set with the Badge Properties Editor, as well as any firmware upgrades, to your badges. See [Configuring a Test Badge](#) in the *Vocera Badge Configuration Guide*.

## *Specialized Modules*

The Vocera system software includes the following specialized modules:

- The **Vocera System Tray Icon** appears in the server notification area at the right of the taskbar on the Vocera Server, Vocera Telephony Server, Vocera SIP Telephony Gateway, and Vocera Client Gateway. The Vocera system tray icon is blue when the sever is running and gray when it is not running. The system tray provides access to the Vocera Control Panel, which lets you control the server.
- The **Vocera launcher** is a Windows service that starts automatically when the computer boots. The launcher starts the Vocera Server and the associated services it requires, such as the MySQL, Nuance, and Apache/Tomcat components, as well as the optional Vocera Telephony Solution Software, if installed.
- **Administration Console**, a browser-based application, provides the interface to the Vocera Server. See [Using the Administration Console](#) in the *Vocera Administration Guide* or the Administration Console's online help for an overview.
- **User Console**, also a browser-based application, allows individual users to set their own badge preferences and maintain their own contact information. See [User Console Overview](#) in the *Vocera Administration Guide* for information about logging in and granting access. See the *Vocera User Console Guide* for detailed information.

## Optional Software Components

Vocera also offers the following optional software components:

- **Telephony Solution Software** integrates the Vocera Server with your telephone system, allowing badges and telephones to communicate seamlessly. Vocera offers two types of telephony servers:
  - **Vocera SIP Telephony Gateway**—software that provides a Session Initiation Protocol (SIP) telephony gateway between the Vocera Server and an IP PBX or a Voice over Internet Protocol (VoIP) gateway. Vocera SIP Telephony Gateway supports non-SIP enabled PBXs via Dialogic Media Gateway or other SIP/TDM gateway products.
  - **Vocera Telephony Server**—software that works with either an analog or digital T1/E1/PRI line card to allow badge users to place and receive calls, including outside calls and calls from internal extensions, from traditional phone systems.
- **Vocera Client Gateway** supports Vocera Smartphones and Vocera Connect clients, providing a signaling and multimedia gateway from the phones to the Vocera Server for all calls.
- **Report Server Software** uses log files generated by the Vocera Server to create an extensive set of reports. Some reports can help you spot usage trends, keep track of badges, and monitor call volume. Other reports help you diagnose end-user and network issues related to the Vocera system.
- **Vocera Messaging Interface** enables two-way messaging between the Vocera Communications System and third-party applications, such as nurse call systems, patient monitoring systems, supply management systems, point of sale and other store management applications, network management software, HVAC, industrial alarms and other enterprise applications. The VMI supersedes the nurse call interface offered with earlier versions of Vocera.
- **Vocera Administration Interface** is a Java API that enables you to control and administer the Vocera system programmatically.

## *Vocera Technical Support Tools*

When you install the Vocera Server, the installation program also installs tools that can be used to facilitate the exchange of Vocera Server information with Vocera Technical Support to aid in troubleshooting. These tools provide the best way to send server logs and other debugging data to Vocera Technical Support. For more information about these tools, see the **readme.txt** file located in the **\vocera\support** folder on your Vocera Server, or contact Vocera Technical Support.

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## Electronic Software Distribution

Vocera lets you choose one of the following methods of software delivery:

- Electronic software distribution
- DVD media

If you choose electronic software distribution, Vocera sends you an email with a link to download the software.

### ***To download Vocera software:***

1. Open the email from Vocera containing download instructions.
2. Click the download link.
3. Review and accept the End User License Agreement. Make sure the **I confirm I have read and accept the statement** box is checked.
4. Check the files and folders you want to download. Make sure you select the ISO image file (the file with the extension **.iso**), which contains the DVD contents.
5. Click **Download**.
6. Specify a location for the downloaded files.
7. After the download is finished, use a ZIP utility to extract the contents of the ISO image file, or use DVD burning software to burn the ISO image file to a DVD.

**Note:** If you burn a DVD, use DVD+R DL 8.5 GB media.

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## About This Guide

This guide provides installation instructions for Vocera software components. Its purpose is to help you install the software successfully. Once the software is installed, you may not need to refer to this guide again.

The information in this guide is organized into the following parts:

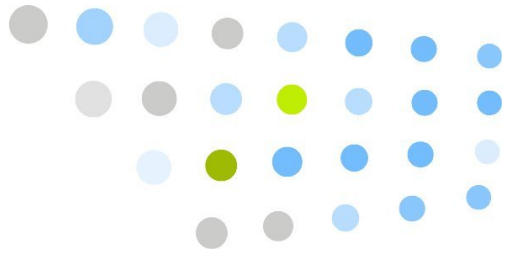
- **System Requirements** on page 17 describes system requirements.
- **Upgrading Your Vocera 4.2 or Vocera 4.3 System** on page 25 describes how to upgrade your Vocera system to Version 4.4.
- **Preparing the Server for a New Installation** on page 61 how to prepare a machine before installing Vocera Voice softwares.
- **Installing Vocera Voice Software** on page 105 describes how to install Vocera Voice software.
- **Additional Vocera Server Setup** on page 121 describes additional Vocera Server setup tasks.
- **Installing Vocera Telephony Server** on page 151 describes how to install the optional Vocera Telephony Server and integrate telephony support with your Vocera server.
- **Appendixes** on page 175 provide additional information about installing and configuring Vocera.

After you install Vocera successfully, you need to configure and administer the system. For Vocera configuration and administration instructions, refer to the following Vocera guides:

- *Vocera Administration Guide*
- *Vocera Badge Configuration Guide*
- *Vocera Telephony Configuration Guide*
- *Vocera Smartphone Configuration Guide*







## System Requirements

This chapter describes the requirements of the Vocera Voice Communication solution.

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### Server Requirements

For server configuration guidelines, whether you are installing on physical machines or on VMware virtual machines, see the [Vocera Voice Server Sizing Matrix](http://www.vocera.com/products/documents/VoceraServerSizingGuidelines.pdf)<sup>1</sup>.

#### *Vocera Server Requirements*

Use a dedicated computer to run the Vocera Server—it should not run any other applications. If the computer has previously run other applications, you should re-install the operating system and its appropriate service packs to ensure you install the Vocera software into a clean environment.

#### *Vocera SIP Telephony Gateway Requirements*

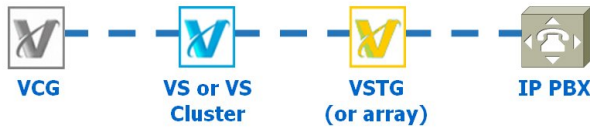
Install the Vocera SIP Telephony Gateway on a dedicated computer. The Vocera SIP Telephony Gateway uses software that might cause conflicts, and it performs resource-intensive tasks that might affect performance of other applications.

The following figure shows a typical Vocera system consisting of Vocera Client Gateway, Vocera Server, and Vocera SIP Telephony Gateway (or Vocera Telephony Server) installed on separate computers. Optionally, Vocera Report Server can also be installed on a separate computer.

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<sup>1</sup> <http://www.vocera.com/products/documents/VoceraServerSizingGuidelines.pdf>

**Figure 1. Vocera software installed on separate computers**



If your PBX is not SIP-enabled or does not handle all SIP features such as RFC 2833 DTMF relay, you can use a VoIP media gateway (such as Dialogic Media Gateway) to connect to the PBX, as shown in the following figure.

**Figure 2. VSTG connecting to PBX through Dialogic Media Gateway**



The Vocera SIP Telephony Gateway must be installed with the same version as the Vocera Server and the Vocera Telephony Server. The Vocera SIP Telephony Gateway cannot communicate with earlier versions of Vocera Server and Vocera Telephony Server.

If the computer on which you are installing Vocera SIP Telephony Gateway has previously run other applications, re-install the operating system and apply appropriate service packs to ensure you install the Vocera SIP Telephony Gateway into a clean environment.

### Cisco Unified Communications Manager Support

Vocera has tested Vocera SIP Telephony Gateway with the following versions of Cisco Unified Communications Manager:

- Cisco Unified Communications Manager version 6.0
- Cisco Unified Communications Manager Express (CME) version 7.1

## Dialogic Media Gateway Support

Vocera has tested Vocera SIP Telephony Gateway with the following Dialogic Media Gateways:

**Table 1. Digital Dialog Media Gateway models**

SKU	Digital Gateway Description	Ports
235-02030	Dialogic DMG2030DTIQ – single T1/E1	30

**Table 2. Analog Dialog Media Gateway models**

SKU	Analog Gateway Description	Ports
235-01004	Dialogic DMG1004LSW – 4 port analog	4
235-01008	Dialogic DMG1008LSW – 8 port analog	8

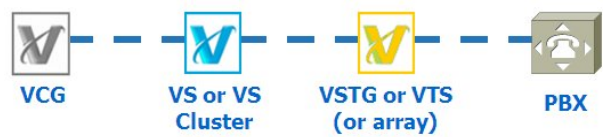
## Vocera Client Gateway Requirements

Install the Vocera Client Gateway on a dedicated computer. The Vocera Client Gateway uses software that might cause conflicts, and it performs resource-intensive tasks that might affect performance of other applications.

Motorola Mobility Services Platform (MSP), which is used to configure and update smartphones, can either be installed on the Vocera Client Gateway computer or in a VMware virtualized environment. For information about installing MSP, see the *Vocera Smartphone Configuration Guide*.

The following figure shows a typical Vocera system consisting of Vocera Client Gateway, Vocera Server, and Vocera SIP Telephony Gateway (or Vocera Telephony Server) installed on separate computers. Optionally, Vocera Report Server can also be installed on a separate computer.

**Figure 3. Vocera software installed on separate computers**



The Vocera Client Gateway must be installed with the same version as the Vocera Server and the Vocera Telephony Server. The Vocera Client Gateway cannot communicate with earlier versions of Vocera Server and Vocera Telephony Server.

If the computer on which you are installing Vocera Client Gateway has previously run other applications, re-install the operating system and apply appropriate service packs to ensure you install the Vocera Client Gateway into a clean environment.

## Vocera Report Server Requirements

**Important:** Note the following limitations when you install Vocera Report Server:

- Do not install more than one copy of the Vocera Report Server on your network.
- Do not install Vocera Report Server on a machine with dual network interface controllers (NICs). Only one NIC is supported.

The Vocera Report Server generates reports from logs and user data acquired from the Vocera Server. The Vocera Report Server cannot communicate with earlier versions of the Vocera Server.

Install the Vocera Report Server on a dedicated computer—it should not run any other applications. The Vocera Report Server uses software that might cause conflicts, and it performs resource-intensive tasks that might affect performance of other applications.

If the computer has previously run other applications, re-install the operating system and apply appropriate service packs to ensure you install the Vocera Report Server into a clean environment.

## Vocera Telephony Server Requirements

The Vocera Telephony Solution Software option has the following requirements:

**Table 3. Telephony Server requirements**

Component	Requirement
Operating System Processor Speed Hard Disk Capacity Internal Memory	See the <a href="http://www.vocera.com/products/documents/VoceraServerSizingGuidelines.pdf">Vocera Voice Server Sizing Matrix</a> <sup>2</sup> .
File System Type	NTFS is required for Dialogic system software. FAT32 or FAT file system types are not supported.

<sup>2</sup> <http://www.vocera.com/products/documents/VoceraServerSizingGuidelines.pdf>

Component	Requirement
Slots	One full-length and full-height PCI, PCI-X, or PCI Express slot for each Dialogic board. See <a href="#">Hardware for the Analog Integration</a> on page 95 and <a href="#">Hardware for the Digital Integration</a> on page 98 for complete information.
Boards	<p>One of the following boards for an analog integration:</p> <ul style="list-style-type: none"> <li>• Intel® Dialogic® D/120JCT-LSU board.</li> <li>• Intel® Dialogic® D/41JCT-LS board.</li> <li>• Intel® Dialogic® D/120JCT-LSU-EU2 board.</li> <li>• Intel® Dialogic® D/41JCT-LS-EURO board.</li> <li>• Intel® Dialogic® D/41JCTLSEW board</li> <li>• Intel® Dialogic® D/120JCTLSEW</li> </ul> <p>One of the following boards for a digital integration:</p> <ul style="list-style-type: none"> <li>• Intel® Dialogic® D/240JCT-T1 board.</li> <li>• Intel® Dialogic® D/480JCT-2T1 board</li> <li>• Intel® Dialogic® D/480JCT-1T1 board.</li> <li>• Intel® Dialogic® D/600JCT-1E1 board.</li> <li>• Intel® Dialogic® D/240JCTT1EW</li> <li>• Intel® Dialogic® D/480JCT1T1EW</li> <li>• Intel® Dialogic® D/480JCT2T1EW</li> </ul> <p>The boards and the Telephony server computer must be compatible with each other. See the following sections for detailed information:</p> <ul style="list-style-type: none"> <li>• <a href="#">Analog Telephony Boards</a> on page 96</li> <li>• <a href="#">Digital Telephony Boards</a> on page 98</li> </ul>
Cables	<p>Phone lines and cabling to connect the PBX and the Telephony server. See the following sections for detailed information:</p> <ul style="list-style-type: none"> <li>• <a href="#">Analog Telephony Cables</a> on page 96</li> <li>• <a href="#">Digital Telephony Cables</a> on page 99</li> </ul>
PBX-specific station cards	These cards are required only if the PBX does not have an adequate number of station ports already available. See <a href="#">Procuring Equipment</a> on page 101.

Before you install Vocera software, make sure the server computer itself is configured properly. See [Preparing the Vocera Server](#) on page 63.

## Infrastructure Requirements

Your wired and wireless infrastructure may require minor configuration to accommodate the Vocera Communications System. See the *Vocera Infrastructure Planning Guide* for complete information.

## Configuration Hardware Requirements

The *configuration hardware* is the computer and other equipment that configures Vocera devices. The configuration computer is the computer on which you run the Vocera Badge Configuration Utility (BCU), so it is referred to as the BCU computer.

Vocera requires the following configuration hardware for badges and phones:

**Table 4. Configuration hardware requirements**

Component	Requirement
Configuration Computer	See the <a href="#">Vocera Voice Server Sizing Matrix<sup>3</sup></a> .
Access Point	An isolated access point that is not connected to the installation site's network.
Cable	An Ethernet crossover cable to connect the configuration computer and the access point.

## Browser Requirements

To access Vocera Voice Web applications (Administration Console, User Console, Report Console, and Staff Assignment), your computer must have the following required software:

**Table 5. Web application software requirements**

Applications	Client-side component	Requirement
All applications	Browser	Internet Explorer version 7, 8, or 9. Internet Explorer versions 10 and 11 are supported in compatibility mode.
Administration Console Report Console	Java Runtime Environment (JRE)	JRE 6.0 (1.6) from <a href="http://www.java.com">www.java.com</a>

<sup>3</sup> <http://www.vocera.com/products/documents/VoceraServerSizingGuidelines.pdf>

**Important:** Do not install another JRE on the Vocera Server or Vocera Report Server machines. The required version of Java is installed with those servers.

## *Browser Security Requirements*

Configure the following Internet Explorer security settings:

- **Configure the Internet Explorer security level to Medium-low or lower** – Otherwise, Internet Explorer prevents the scripts used by the consoles from executing completely. You can configure security settings through **Tools > Internet Options > Security** in Internet Explorer. See your Internet Explorer documentation for complete information.
- **Disable the pop-up blocker** – Vocera consoles display information in pop-up windows, so disable pop-up blocking in Internet Explorer (that is, configure the browser to allow pop-up windows). Choose **Tools > Internet Options > Privacy**, and then uncheck the **Turn On Pop-Up Blocker** box.

If you are using a third-party tool to block pop-ups, refer to the tool's documentation.

- **Remove scroll bars from pop-up windows** – Pop-up windows may display scroll bars. To remove the scroll bars, choose **Tools > Internet Options > Security**, and select the **Local Intranet** zone. Click **Custom Level** to display the Security Settings dialog box. Enable **Allow script-initiated windows without size or position constraints**.
- **If necessary, add the Vocera Server and Vocera Report Server IP addresses to the list of Trusted Sites** – The security policy in certain situations may prevent you from setting the Internet Explorer security level for the local intranet below Medium. If Internet Explorer continues to display pop-up windows with scroll bars, follow these steps to configure a trusted site for the Vocera Server:

### ***To add the Vocera Server and Vocera Report Server to the list of trusted sites:***

1. In Internet Explorer, choose **Tools > Internet Options**. The Internet Options dialog box appears.
2. Click the **Security** tab.
3. Click **Trusted Sites**.
4. In the **Security Level for this Zone** box, set the security level to Medium-low, and click **Apply**.
5. Click the **Sites** button. The Trusted Sites dialog box appears.

6. Type the IP address of the Vocera Server, and click **Add**.
7. Type the IP address of the Vocera Report Server, and click **Add**.
8. Click **Close** to close the Trusted Sites dialog box.
9. Click **OK** to close the Internet Options dialog box.

A system administrator can manage the Internet Explorer Trusted Sites for an entire organization using Group Policy Objects (GPOs). See the following Microsoft article for more information:

- [How to Configure Internet Explorer Security Zone Sites Using Group Policies](#)<sup>4</sup>
- **Do not access a Vocera Voice Web application from the server on which it is running** – By default, Windows Server 2003 and Windows Server 2008 ship with Internet Explorer Enhanced Security Configuration enabled, which may display frequent security prompts when you access a Web application from the server on which it is running. Rather than disable Internet Explorer Enhanced Security Configuration on the server, we recommend that you access Vocera Voice Web applications from your desktop or laptop computer.
- **If your Vocera Server or Vocera Report Server has enabled SSL, configure Internet Explorer to NOT save encrypted pages to disk** – If you enable SSL on the Vocera Server or Vocera Report Server, you may need to update the browser security settings for Internet Explorer to make sure the browser does not save encrypted pages to disk. Otherwise, certain pages of the Administration Console, such as the Permission Browser, will not work properly.

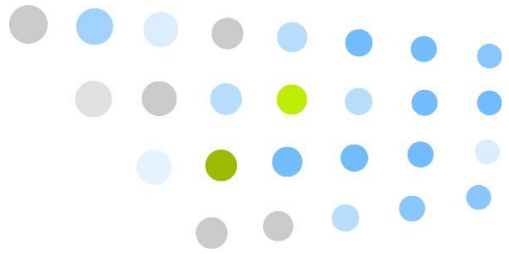
***To update Internet Explorer security settings for SSL access:***

1. In Internet Explorer, choose **Tools > Internet Options > Advanced**.
2. Make sure the **Do not save encrypted pages to disk** option is checked.
3. Click **OK**.

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<sup>4</sup> <http://blogs.msdn.com/b/askie/archive/2012/06/05/how-to-configure-internet-explorer-security-zone-sites-using-group-policies.aspx>



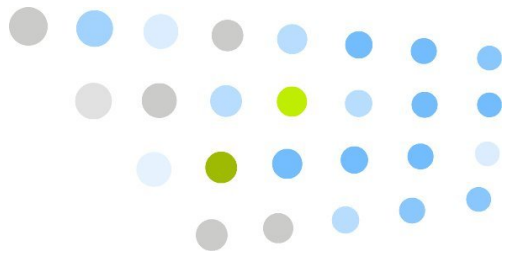


## Upgrading Your Vocera 4.2 or Vocera 4.3 System

The following topics explain how to upgrade your Vocera 4.2 or Vocera 4.3 system to version 4.4:

- **Vocera Cluster Upgrade Checklist** on page 27  
Provides a high-level checklist for upgrading from your current Vocera Server cluster to a Vocera 4.4 cluster.
- **Performing an Upgrade** on page 29  
Describes detailed instructions on how to upgrade all Vocera Voice components to version 4.4.
- **Updating Smartphones** on page 49  
Describes how to update the firmware on Vocera smartphones after you have upgraded your Vocera system.





## Vocera Cluster Upgrade Checklist

This chapter provides a high-level checklist for upgrading from your current Vocera Server cluster to a Vocera 4.4 cluster. For more details on the upgrade steps in this checklist, see [Upgrading a Vocera Server Cluster to Version 4.4](#) on page 32.

If you are upgrading with new machines, see [Upgrading with New Machines](#) on page 35.

<input type="checkbox"/>	1. Make sure your hardware and operating system are capable of supporting Vocera 4.4. See the <a href="#">Vocera Voice Server Sizing Matrix</a> <sup>1</sup> .
<input type="checkbox"/>	2. Confirm that the Vocera Server is set up properly. See <a href="#">Preparing the Vocera Server</a> on page 63.
<input type="checkbox"/>	3. Back up your Vocera Server data. See <a href="#">Backing up Vocera Data</a> on page 29.
<input type="checkbox"/>	4. If your current Vocera installation has customized properties files, back up the files to a flash drive or to a temporary location on a network drive. After you install Vocera 4.4, you will need to merge the changes into the corresponding file on your upgraded servers. See <a href="#">Upgrading Properties Files</a> on page 39.
<input type="checkbox"/>	5. If Vocera Report Server is running, shut it down.
<input type="checkbox"/>	6. Make sure Vocera badges are configured with the correct comma-separated list of IP addresses in the <b>Vocera Server IP Address</b> property. If necessary, use the Badge Properties Editor to update the <b>badge.properties</b> file on every cluster node. For details, see the <i>Vocera Badge Configuration Guide</i> .
<input type="checkbox"/>	7. Shut down the standby Vocera Server to make it inactive. If there are multiple standby Vocera Servers, shut down ALL of them.

<sup>1</sup> <http://www.vocera.com/products/documents/VoceraServerSizingGuidelines.pdf>



<input type="checkbox"/>	<p>8. Upgrade the Vocera Server on one of the inactive nodes.</p> <p><b>Note:</b> If your current Vocera installation had a modified <b>Properties.txt</b> file, merge the changes into the corresponding file on your new server.</p>
<input type="checkbox"/>	<p>9. Shut down the Vocera Client Gateway, Vocera SIP Telephony Gateway, and Vocera Telephony Server, as appropriate.</p>
<input type="checkbox"/>	<p>10. Shut down the <b>active</b> node of the Vocera Server cluster.</p> <p>Make sure a Vocera Server node that has been updated to version 4.4 is now active.</p>
<input type="checkbox"/>	<p>11. Upgrade Vocera SIP Telephony Gateway, Vocera Telephony Server, and Vocera Client Gateway to version 4.4, as appropriate.</p> <ul style="list-style-type: none"><li>• <a href="#">Upgrading Vocera SIP Telephony Gateway</a> on page 40</li><li>• <a href="#">Upgrading Vocera Telephony Server</a> on page 41</li><li>• <a href="#">Upgrading Vocera Client Gateway</a> on page 42</li></ul> <p><b>Note:</b> If you upgrade Vocera Gateway Client, be sure to update the Windows environment variable on each VCG. For more information, see <a href="#">Updating Site Awareness for the Vocera Client Gateway</a> on page 149.</p>
<input type="checkbox"/>	<p>12. Update other standby nodes to version 4.4.</p> <p><b>Note:</b> If your current Vocera installation had a modified <b>Properties.txt</b> file, merge the changes into the corresponding file on your new server.</p>
<input type="checkbox"/>	<p>13. Update Vocera smartphones to the latest firmware. See <a href="#">Updating Smartphones</a> on page 49.</p> <p><b>Important:</b> Smartphones running firmware earlier than version 2.3 are incompatible with Vocera Server 4.4. Make sure you update smartphones immediately after upgrading the server. Otherwise, smartphone users will have a lengthy outage.</p>
<input type="checkbox"/>	<p>14. Upgrade Vocera Report Server as appropriate. See <a href="#">Upgrading the Vocera Report Server</a> on page 43.</p>
<input type="checkbox"/>	<p>15. Upgrade Vocera Administration Interface (VAI) applications as appropriate. See <a href="#">Upgrading Vocera Administration Interface (VAI) Applications</a> on page 44.</p>
<input type="checkbox"/>	<p>16. Perform the post-installation tasks to completely migrate your data to Vocera 4.4:</p> <ul style="list-style-type: none"><li>• See <a href="#">Required Post-Upgrade Tasks</a> on page 45.</li><li>• See <a href="#">Suggested Post-Upgrade Tasks</a> on page 48.</li></ul>



## Performing an Upgrade

This chapter describes how to upgrade Vocera Voice servers to Version 4.4.

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### Upgrade Paths

This manual describes how to upgrade to Vocera 4.4 from Vocera 4.2 or Vocera 4.3. For a complete list of upgrade paths supported for Vocera 4.4, see the [Vocera 4.4 Release Notes](#)<sup>1</sup>.

---

### Before You Upgrade

When you upgrade to Vocera 4.4, all of your data and settings are converted to the new 4.4 format and your badge firmware is automatically upgraded. However, Vocera smartphone firmware is NOT automatically upgraded; you must update the smartphones after the Vocera Server has been upgraded. See [Updating Smartphones](#) on page 49.

Before you begin, make sure your machines and operating system are capable of supporting Vocera 4.4. See the [Vocera Voice Server Sizing Matrix](#)<sup>2</sup>.

Refer to [Preparing the Vocera Server](#) on page 63 to confirm that the server computer is set up properly.

---

### Backing up Vocera Data

Use the Vocera backup utility to backup existing data. After an upgrade, the Vocera server restores backed up data the first time you launch it.

#### **To back up Vocera data:**

1. Launch the Administration Console on your Vocera Server 4.2 or 4.3 system.

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<sup>1</sup> <http://www.vocera.com/ts/updates/4.4/ReleaseNotes.html>

<sup>2</sup> <http://www.vocera.com/products/documents/VoceraServerSizingGuidelines.pdf>

2. Click the Maintenance button in the navigation bar to display the set of Maintenance tabs. By default, the Server page is already selected.

3. Click the **Backup** button.

Vocera backs up your configuration data to a file in the `\vocera\backup` directory of the server computer and displays a dialog box to show you the progress. When the backup is finished, Vocera displays the progress as 100%.

4. Click **OK** to close the dialog box and return to the Administration Console.

5. If your Vocera 4.2 or Vocera 4.3 installation has a modified `\vocera\server\properties.txt` file, back up the file to a flash drive or to a temporary location on a network drive.

After you install Vocera 4.4, you will need to merge the changes into the corresponding file on your upgraded Vocera Server.

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## Upgrading Vocera Server

### *Upgrading a Standalone Vocera Server to Version 4.4*

This section shows you how to upgrade from a standalone Vocera Server 4.2 or 4.3 system to a standalone Vocera Server 4.4 system. It shows you how to migrate your data and any custom configuration files so you can go live with minimal down-time.

If you have a standalone Vocera Server running Staff Assignment, Vocera recommends setting up a Vocera Server cluster *before* upgrading to Version 4.4. If you want to upgrade from a standalone server to a cluster, you need additional machines. See [Upgrading with New Machines](#) on page 35 for instructions on how to install the initial active node for a 4.4 cluster on new machines. For more information about setting up a cluster, see [Setting Up a Vocera Cluster](#) on page 127.

**Important:** This upgrade affects Vocera badges in the following ways:

- Users will experience a short outage (several minutes) while their badges connect to the upgraded 4.4 server for the first time and download new firmware. Due to changes made to the signaling between badges and the server, the badges cannot download the new firmware in the background. Plan for downtime accordingly.

- During the upgrade process, the server restores data from a backup file. Consequently, when badges connect to the upgraded 4.4 server for the first time, users will be logged out automatically. Warn your Vocera users that after the firmware upgrade completes on their badge they will need to log in again.

**To upgrade a standalone Vocera Server from version 4.2 or 4.3 to version 4.4:**

1. If Vocera Report Server is running, shut it down:
  - a. On the Vocera Report Server computer, choose **Start > All Programs > Administrative Tools > Services**. The Services window appears.
  - b. Stop the Tomcat service.
  - c. Close the Services window.
2. Use the backup utility in your current Vocera installation to back up your data.  
See [Backing up Vocera Data](#) on page 29.
3. Uninstall the Vocera Server 4.2 or 4.3 software. See [Removing a Vocera Voice Server](#) on page 119.
4. Install the 4.4 Vocera Server software.  
See [Running the Vocera Installation Program](#) on page 107.  
If you obtained a new license key from Vocera, make sure you enter the new Vocera license key when you install.  
At the end of the installation program, *do not* reboot.
5. If your Vocera 4.2 or Vocera 4.3 installation had a modified **Properties.txt** file, merge the changes into the corresponding file on your new server. See [Upgrading Properties Files](#) on page 39.
6. Reboot the server you are upgrading.
7. After you reboot, the Vocera Server automatically restores your Vocera 4.2 or Vocera 4.3 database.  
When the restore completes, the badges will connect to the server and be able to communicate.
8. Perform the post-installation tasks to completely migrate your data from Vocera 4.2 or Vocera 4.3 to Vocera 4.4:
  - See [Required Post-Upgrade Tasks](#) on page 45.
  - See [Suggested Post-Upgrade Tasks](#) on page 48.
9. Install or upgrade Vocera components on any other machines:

Badge Configuration Utilities	See the <i>Vocera Badge Configuration Guide</i> .
Vocera SIP Telephony Gateway	See <a href="#">Upgrading Vocera SIP Telephony Gateway</a> on page 40.
Vocera Telephony Server	See <a href="#">Upgrading Vocera Telephony Server</a> on page 41.
Vocera Client Gateway	See <a href="#">Upgrading Vocera Client Gateway</a> on page 42.
Vocera Report Server	See <a href="#">Upgrading the Vocera Report Server</a> on page 43.

## Upgrading a Vocera Server Cluster to Version 4.4

This section shows you how to upgrade from a Vocera 4.2 or Vocera 4.3 cluster to a Vocera 4.4 cluster. It shows you how to migrate your data and any custom configuration files so you can go live with minimal downtime.

Plan for downtime as follows:

- Badge-to-badge calls

Users will experience a short outage (several minutes) while their badges connect to the upgraded 4.4 server for the first time and download new firmware. Due to changes made to the signaling between badges and the server, the badges cannot download the new firmware in the background.

- Badge-to-phone calls

Users will experience a longer outage while you upgrade the Vocera SIP Telephony Gateway or Vocera Telephony Server.

- Learned names, learned commands, and pending deletes

There is a brief period during the upgrade when learned names, learned commands, and pending deletions of Vocera entities may not be synchronized with the standby Vocera 4.2 or Vocera 4.3 server. To avoid any problems, advise users not to record any learned names or learned commands and not to delete any entities during the entire upgrade.

**Important:** If you are concerned about possibly losing some learned names, learned commands, or pending deletes during the upgrade, you can shut down ALL Vocera Servers during the entire upgrade process. If you decide to do this, make sure you notify users of the planned outage.



When you perform this upgrade, the first machine you configure becomes the initial active node in the 4.4 cluster. You upgrade an inactive cluster node to 4.4 (leaving Vocera running on the active node), move the badges over to this new 4.4 server, and then upgrade the remaining cluster node(s).

**To upgrade a Vocera Server 4.2 or 4.3 cluster to Version 4.4:**

1. If Vocera Report Server is running, shut it down:
  - a. On the Vocera Report Server computer, choose **Start > All Programs > Administrative Tools > Services**. The Services window appears.
  - b. Stop the Tomcat service.
  - c. Close the Services window.
2. Make sure Vocera badges are configured with the correct comma-separated list of IP addresses in the **Vocera Server IP Address** property. If necessary, use the Badge Properties Editor to update the **badge.properties** file on every cluster node. For details, see the *Vocera Badge Configuration Guide*.
3. Shut down the standby Vocera Server to make it inactive. If there are multiple standby Vocera Servers, shut down ALL of them. This action does not affect the active Vocera Server.

In the Vocera Control Panel, choose **Run > Exit**, or hold down the Alt key and press X.

4. Upgrade the Vocera Server on the inactive node as follows:
  - a. Uninstall the Vocera 4.2 or Vocera 4.3 software on the inactive node.  
See [Removing a Vocera Voice Server](#) on page 119.
  - b. Install the 4.4 Vocera Server software.  
  
If you obtained a new license key from Vocera, make sure you enter the new Vocera license key when you install.  
  
At the end of the installation program, *do not* reboot.
  - c. If your Vocera 4.2 or Vocera 4.3 installation had a modified **Properties.txt** file, merge the changes into the corresponding file on your new server. See [Upgrading Properties Files](#) on page 39.
  - d. Reboot the server you are upgrading.

**Important:** After the Vocera Server starts, it initially comes up as an **active** node, and then within a minute it rejoins the cluster and performs a remote restore. DO NOT proceed to the next step until after the remote restore finishes. With a large database, a remote restore can take several minutes. After the remote restore finishes, the server comes online as a **standby** node.

5. Shut down the Vocera Client Gateway, Vocera SIP Telephony Gateway, and Vocera Telephony Server, as appropriate.

- **To shut down Vocera Client Gateway:**

1. Choose **Start > Settings > Control Panel > Administrative Tools > Services**. The Services dialog box appears.
2. Right-click the **VCG Launcher** service, and select **Stop**.

- **To shut down Vocera SIP Telephony Gateway:** Double-click the VSTG Service Stop shortcut icon on the Windows desktop.

- **To shut down Vocera Telephony Server:** In the Telephony Control Panel, choose **Run > Exit**, or hold down the Alt key and press X.

**Note:** During the time you are shutting down these other Vocera servers, learned names and learned commands may not be synchronized from the active Vocera 4.2 or Vocera 4.3 server to the standby 4.4 server.

6. In the Vocera Control Panel on the **active** node of the cluster, choose **Run > Exit**. In the confirmation dialog box, click **OK**.

Make sure the Vocera Server node that has been updated to version 4.4 is now active.

**Note:** When the updated server becomes the active node, there is a **service interruption** as badges connect to the server and are updated. The badge update completes in approximately 5 minutes.

7. Upgrade the Vocera SIP Telephony Gateway, Vocera Telephony Server, and Vocera Client Gateway to version 4.4, as appropriate.

Vocera SIP Telephony Gateway	See <a href="#">Upgrading Vocera SIP Telephony Gateway</a> on page 40.
Vocera Telephony Server	See <a href="#">Upgrading Vocera Telephony Server</a> on page 41.
Vocera Client Gateway	See <a href="#">Upgrading Vocera Client Gateway</a> on page 42.

8. Update other standby node(s) to version 4.4:

- a. Uninstall the Vocera 4.2 or Vocera 4.3 software on the inactive node.

See [Removing a Vocera Voice Server](#) on page 119.

- b. Install the 4.4 Vocera Server software.

If you obtained a new license key from Vocera, make sure you enter the new Vocera license key when you install.

At the end of the installation program, *do not* reboot.

- c. If your Vocera 4.2 or Vocera 4.3 installation had a modified **Properties.txt** file, merge the changes into the corresponding file on your new server. See [Upgrading Properties Files](#) on page 39.
- d. Reboot the server you are upgrading.

**Important:** After the Vocera Server starts, it initially comes up as an **active** node, and then within a minute it rejoins the cluster and performs a remote restore. With a large database, a remote restore can take several minutes. After the remote restore completes, the server comes online as a **standby** node.

- e. If you have NOT installed Staff Assignment before, open the **\vocera\data\applications\staffassignment\app.config** file, and update the **serverIP** property to include the comma-separated list of IP addresses for the Vocera Server cluster. For details, see the *Vocera Staff Assignment Guide*. If you do not intend to use Staff Assignment, you can skip this step.

9. Upgrade Vocera Report Server as appropriate. See [Upgrading the Vocera Report Server](#) on page 43.

10. Perform the post-installation tasks to completely migrate your data from Vocera 4.2 or Vocera 4.3 to Vocera 4.4:

- See [Required Post-Upgrade Tasks](#) on page 45.
- See [Suggested Post-Upgrade Tasks](#) on page 48.

## *Upgrading with New Machines*

If you have an existing Vocera 4.2 or Vocera 4.3 system—standalone or cluster—and you want to install 4.4 on new machines, this section shows you how to upgrade, migrating your data and settings, with minimal down-time. If you are setting up a cluster as you upgrade, the first machine that you configure becomes the initial active node.

If your Vocera system has Vocera Messaging Interface (VMI) applications that connect to it, you need to coordinate with the integration developer to schedule updates to those applications before Vocera badge users can begin using the new system. VMI applications integrate the Vocera system with external systems (such as a nurse call system).

**Important:** This upgrade affects Vocera badges in the following ways:

- Users will experience a short outage (several minutes) while their badges connect to the upgraded 4.4 server for the first time and download new firmware. Due to changes made to the signaling between badges and the server, the badges cannot download the new firmware in the background. Plan for downtime accordingly.
- During the upgrade process, the server restores data from a backup file. Consequently, when badges connect to the upgraded 4.4 server for the first time, users will be logged out automatically. Warn your Vocera users that after the firmware upgrade completes on their badge they will need to log in again.

***To upgrade to Version 4.4 using new machines:***

1. Use the backup utility in your current Vocera installation to backup your data.

See [Backing up Vocera Data](#) on page 29.

2. Copy the following files to a flash drive or to a temporary location on a network drive that is accessible from your new Vocera Server machine:

- **`\vocera\backup\MostRecentBackup.zip`**

If you are upgrading a Vocera cluster, this file is on any of the nodes.

- **`\vocera\config\badge.properties`**

If you are upgrading a Vocera cluster, this file is on the active node.

- **`\vocera\server\Properties.txt`**

If you are upgrading a Vocera cluster, this file is on the active node.

3. Copy your license key from the **VOCERA\_LICENSE** environment variable to a flash drive or a temporary location on a network drive that is accessible from your new Vocera Server machine.

Navigate to the Advanced tab of the Windows System control panel on your Vocera 4.2 or Vocera 4.3 server, edit the environment variable, copy its value to the clipboard, and save the value in a text file.

4. Set up your new 4.4 server as follows:

- a. Install the 4.4 Vocera Server software. When prompted for the license key, copy and paste it from the temporary file you created.

At the end of the installation program, *do not* reboot.

- b. If your Vocera 4.2 or Vocera 4.3 installation had a modified **Properties.txt** file, merge the changes into the corresponding file on your new server. See [Upgrading Properties Files](#) on page 39.
- c. Copy **badge.properties** from your flash drive or network drive to the new **\vocera\config\** directory.
- d. If you are going to create a cluster, use the Badge Properties Editor to edit the **Vocera Server IP Address** field in the **\vocera\config\badge.properties** file on this new machine:
  - Specify the IP address of every cluster node in a comma-separated list, without spaces.
  - Specify the IP address of the current Vocera Server as the first node in the list.

Make sure you update the **Vocera Server IP Address** field for all types of badges. See “Using the Badge Properties Editor” in the *Vocera Badge Configuration Guide*.

- e. Copy *MostRecentBackup.zip* from your flash drive or network drive to the new **\vocera\backup\** directory.
- f. Reboot the server you are upgrading.

After you reboot, the Vocera Server automatically restores your Vocera 4.2 or Vocera 4.3 database.

- g. Perform the post-installation tasks to completely migrate your data from Vocera 4.2 or Vocera 4.3 to Vocera 4.4:
  - See [Required Post-Upgrade Tasks](#) on page 45.
  - See [Suggested Post-Upgrade Tasks](#) on page 48.

5. Install or upgrade Vocera components on any other machines:

Badge Configuration Utilities	See the <i>Vocera Badge Configuration Guide</i> .
Vocera SIP Telephony Gateway	See <a href="#">Upgrading Vocera SIP Telephony Gateway</a> on page 40.
Vocera Telephony Server	See <a href="#">Upgrading Vocera Telephony Server</a> on page 41.

Vocera Client Gateway	See <a href="#">Upgrading Vocera Client Gateway</a> on page 42.
Vocera Report Server	See <a href="#">Upgrading the Vocera Report Server</a> on page 43

6. If Vocera Messaging Interface (VMI) client applications connect to your Vocera system, update them all. The VMI applications must be modified to connect to the new Vocera Server IP address(es).

Before moving badges over to the new Vocera system, ensure that VMI applications are able to connect to the Vocera Server and send messages.

7. Move the badges from your current production server to the 4.4 server that you just upgraded as follows:

- a. Use the Badge Properties Editor to edit the **Vocera Server IP Address** field in the `\vocera\config\badge.properties` file that resides on your production Vocera 4.2 or Vocera 4.3 system.

Enter the IP address of the 4.4 server that you just upgraded. If you are creating a cluster, this becomes your initial active node. Make sure you update the **Vocera Server IP Address** field for all types of badges. See “Using the Badge Properties Editor” in the *Vocera Badge Configuration Guide*.

- b. Restart your production Vocera 4.2 or Vocera 4.3 server, as described in [Stopping and Restarting the Server](#) on page 112.

When the Vocera 4.2 or Vocera 4.3 server restarts, it downloads the edited **badge.properties** file to your existing badges, and then they automatically connect to the 4.4 system. The 4.4 server is now your production system.

- c. Leave your existing Vocera 4.2 or Vocera 4.3 server running, even though the currently active badges are not connected to it.

When users boot badges that haven't been used recently, they will connect to the Vocera Server at that IP address, download the new **badge.properties** file, and then connect to the current 4.4 server.

8. If you are migrating to a cluster, use the cluster setup documentation to configure the remaining nodes.

See [Setting Up a Cluster](#) on page 130.

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## Upgrading Properties Files

The following files define properties for Vocera Server, Vocera SIP Telephony Gateway, and Vocera Telephony Server, respectively.

Vocera Server	<code>\vocera\server\properties.txt</code>
Vocera SIP Telephony Gateway Vocera Client Gateway	<code>\vocera\telephony\vgw\vgwproperties.txt</code>
Vocera Telephony Server	<code>\vocera\dialogic\telproperties.txt</code>

These files provide default values that are appropriate for most installations.

If you have edited one or both of these files to specify specialized behavior, this topic tells you how to preserve these changes when you migrate to Vocera 4.4. If you have not changed the default values in these files, you do not need to perform this task.

### ***To upgrade the property files:***

1. Find your customized Vocera 4.2 or Vocera 4.3 property files.

You copied these files to a flash drive or to a temporary location on a network drive before installing Vocera 4.4.

2. Find the new property files in the locations specified above.
3. Merge the changed data from the backup files into the new files.

Several text editors—especially programs designed for editing source code—provide a merge feature. You can also copy and paste the data by hand.

4. To load the updated **properties.txt** file, restart the Vocera Server(s).

If you have a Vocera Server cluster, restart the standby node(s) first. The standby node(s) automatically perform a remote restore. After remote restore is completed on the standby node(s), force a failover on the active node by choosing **Cluster > Failover** in the Vocera Control Panel.

5. To load the updated **vgwproperties.txt** or **telproperties.txt** file, restart the telephony server(s) or Vocera Client Gateway server(s).

If you have multiple telephony servers or Vocera Client Gateway servers, restart one server at a time. Wait until the server has started before restarting the next server in the array until all servers have been restarted.

---

## Upgrading Vocera Staff Assignment

Staff Assignment is automatically installed with Vocera Server 4.4. After you upgrade the Vocera Server to Version 4.4 and then restart the computer, the Vocera Server performs a remote restore (if you have a Vocera cluster) or restores data from a backup file (if you have a standalone Vocera Server). The Staff Assignment application data and certificate file are also restored.

**Important:** If you have a standalone Vocera Server running Staff Assignment, Vocera recommends setting up a Vocera Server cluster *before* upgrading to Version 4.4. Otherwise, badges will be logged out automatically when they connect to the 4.4 server for the first time. Also, if bed/room groups and role-based groups have been configured to remove users on logout, all staff assignments for the current shift will be cleared during the Vocera Server upgrade.

### *Staff Assignment Standard and Premier*

Staff Assignment has two versions, Standard and Premier.

- **Staff Assignment Standard** allows you to use basic staff assignment features. There is no charge for Staff Assignment Standard; it is included with Vocera Server.
- **Staff Assignment Premier** provides several additional communication, user interface, and session management features, and requires client application licenses on the Vocera Server. To obtain additional licenses, contact Vocera. If the Vocera Server does not have client application licenses available for Staff Assignment Premier, users will log in with Staff Assignment Standard functionality.

For instructions on how to update your Vocera Server license, see [Updating the Vocera Server License](#) on page 141.

---

## Upgrading Vocera SIP Telephony Gateway

This section describes how to upgrade Vocera SIP Telephony Gateway. If you have an array of Vocera SIP Telephony Gateway servers, perform these upgrade steps on each server.

### ***To upgrade the Vocera SIP Telephony Gateway:***

1. If your Vocera 4.2 or Vocera 4.3 installation has a customized Vocera SIP Telephony Gateway properties file (**\\vocera\\telephony\\vgw\\vgwproperties.txt**), back up the file to a flash drive or to a temporary location on a network drive.



After you install Vocera 4.4, you will need to merge the changes into the corresponding file on your upgraded Vocera SIP Telephony Gateway.

2. Uninstall the existing Vocera SIP Telephony Gateway.

See [Removing a Vocera Voice Server](#) on page 119.

3. Install the new Vocera SIP Telephony Gateway.

See [Running the Vocera Installation Program](#) on page 107.

4. If you have a customized Vocera SIP Telephony Gateway properties file (**\vocera\telephony\vgw\vgwproperties.txt**) from a previous deployment, merge the changes into your current **vgwproperties.txt** file.

See [Upgrading Properties Files](#) on page 39.

---

## Upgrading Vocera Telephony Server

This section describes how to upgrade Vocera Telephony Server. If you have an array of Vocera Telephony Server servers, perform these upgrade steps on each server.

### *To upgrade the Vocera Telephony Server:*

1. If your Vocera 4.2 or Vocera 4.3 installation has a customized **\vocera\dialogic\telproperties.txt** file, back up the file to a flash drive or to a temporary location on a network drive.

After you install Vocera 4.4, you will need to merge the changes into the corresponding file on your upgraded Vocera Telephony Server.

2. Uninstall the existing Vocera Telephony Server.

See [Removing a Vocera Voice Server](#) on page 119.

3. After you reboot the computer, the Found New Hardware wizard will appear. Click **Cancel** to close this dialog box. You will select Dialogic drivers when you install Vocera Telephony Server 4.4.

4. If necessary, upgrade your tone set file.

See [Upgrading a Tone Set File](#) on page 42.

5. Install the new Vocera Telephony Server.

See [Running the Telephony Installation Program](#) on page 159.

6. If you have a customized Vocera Telephony Server properties file (**\vocera\dialogic\telproperties.txt**) from a previous deployment, merge the changes into your current **telproperties.txt** file. See [Upgrading Properties Files](#) on page 39.

## Upgrading a Tone Set File

As described in [Creating a Tone Set File](#) on page 169, your PBX may require a tone set (.tsf) file to notify the Dialogic board that a far-end disconnect occurs.

### **To upgrade an existing tone set file:**

1. Rename the existing tone set file.  
Rename the file from `\vocera\dialogic\pbx.tsf` to `\vocera\dialogic\pbx_old.tsf`.
2. Use the **PBXpert** utility to create a new tone set file.  
See [Creating a Tone Set File](#) on page 169.

---

## Upgrading Vocera Client Gateway

If you are currently using Vocera 4.2 or Vocera 4.3, you can upgrade to Vocera 4.4 with minimal effort. With Vocera 4.4, you can take advantage of high availability features by installing multiple Vocera Client Gateway servers. See [Installing Multiple Vocera Client Gateway Servers](#) on page 88.

### **To upgrade the Vocera Client Gateway:**

1. If your Vocera 4.2 or Vocera 4.3 installation has a customized Vocera Client Gateway properties file (`\vocera\telephony\vgw\vgwproperties.txt`), back up the file to a flash drive or to a temporary location on a network drive.

After you install Vocera 4.4, you will need to merge the changes into the corresponding file on your upgraded Vocera Client Gateway.

2. Uninstall the existing Vocera Client Gateway.  
See [Removing a Vocera Voice Server](#) on page 119.
3. Install the new Vocera Client Gateway.  
See [Running the Vocera Installation Program](#) on page 107.

**Note:** If you upgrade Vocera Gateway Client, be sure to update the Windows environment variable on each VCG. For more information, see [Updating Site Awareness for the Vocera Client Gateway](#) on page 149.

4. If you have a customized Vocera Client Gateway properties file (`\vocera\telephony\vgw\vgwproperties.txt`) from a previous deployment, merge the changes into your current `vgwproperties.txt` file. See [Upgrading Properties Files](#) on page 39.

5. After you upgrade to Vocera 4.4, update your smartphones to the latest firmware. See [Updating Smartphones](#) on page 49.

---

## Archiving and Purging Report Server Data

Before upgrading Report Server, it might be a good time to perform some basic maintenance. If your Report Server has a large amount of data that is several months old and is no longer needed to generate reports, you should consider archiving the older data up to a certain date. After the archive is saved, you can purge the old data, and then perform a backup.

Performing this maintenance will have the following beneficial results:

- The number of records in the database will be reduced.
- The disk space required for scheduled backups will be reduced.
- The Report Server will use less processing power and RAM to generate reports, and it will generate them faster.
- The time needed to back up and restore Report Server data will be reduced.

For more information on how to archive and purge data, see the *Vocera Report Server Guide*.

---

## Upgrading the Vocera Report Server

This section describes how to upgrade Vocera Report Server from a previous release.

### ***To upgrade to Vocera Report Server 4.4:***

1. Upgrade to Vocera Server version 4.4.  
For upgrade instructions, see [Upgrading Vocera Server](#) on page 30.
2. Prepare the Vocera Server.  
See [Preparing the Vocera Server](#) on page 91.
3. Perform basic maintenance of your Report Server to purge old data and reduce the size of the data set.  
See [Archiving and Purging Report Server Data](#) on page 43.
4. Make sure your report data is backed up. Normally, a backup is scheduled to occur every night. Check the `\vocera\reports\backup` folder to see that the backup file exists.
5. If you have custom reports, create a back up of the following folder:

**`\vocera\reports\Reports\custom`**

6. Remove Vocera Report Server 4.2 or 4.3.

See [Removing a Vocera Voice Server](#) on page 119.

**Important:** Do not delete any of the remaining directories or files from your Vocera Report Server installation. They will be used to restore your data when upgrading.

7. Install Vocera Report Server 4.4.

See [Running the Vocera Installation Program](#) on page 107.

8. Restore your report data:

- a. Log into the Vocera Report Console using the default **admin** password.

**Note:** After you restore your report data, your custom password (if any) is restored.

- b. Click **Maintenance** in the navigation bar.

- c. Click **Legacy Restore**.

The **Select Restore Files** dialog box opens.

- d. Click to highlight the backup file you want to restore and click **Restore**.

- e. The confirmation dialog box opens. Click **OK** to restore data.

When you click **OK**, the process begins, and a dialog box displays status messages.

- f. When the process is complete, click **OK** to close the dialog box.

9. If you have custom reports, follow these steps to restore them:

- a. Copy the contents of the backup you made of the **vocera\reports\Reports\custom** folder.

- b. Paste the files into the **vocera\reports\Reports\custom** folder.

- c. Choose **Start > Settings > Control Panel > Administrative Tools > Services**. The Services window appears.

- d. Stop the Tomcat7 service and then start it again.

- e. Close the Services window.

---

## Upgrading Vocera Administration Interface (VAI) Applications

If you have deployed VAI applications, copy the **server.jar** from the **%vocera\_drive%\vocera\server\lib** directory on the Vocera Server into your application's **\lib** folder.

The Vocera 4.4 **server.jar** file is compiled using Java 6.0 (1.6). However, most VAI applications built with version 5.0 compilers should run fine in JRE 6. Generally, you should not need to rebuild your application unless it uses methods that have changed in the latest version of **server.jar** or is in some way incompatible with JRE 6.

**Important:** VAI applications that connect to Vocera Server 4.4 must use Java Runtime Environment (JRE) 6.0 (1.6).

---

## Required Post-Upgrade Tasks

Changes in behavior between Vocera 4.2 or Vocera 4.3 and Vocera 4.4 may require you to modify your configuration after you install. This section summarizes the changed behavior in Vocera 4.4 that you may need to accommodate.

### *Changes in Behavior Between 4.3 and 4.4*

The following changes in behavior occurred between Vocera 4.3 and Vocera 4.4:

- **Qos Manager Installs with Vocera Server, Vocera SIP Telephony Gateway and Vocera Client Gateway** – The Vocera QoS Manager, which prioritizes voice packets over the network, is now installed with the Vocera Server, Vocera SIP Telephony Gateway, and Vocera Client Gateway.
- **Recorded Genie prompts** – Users may notice a change in the Genie's voice. All English Genie prompts, both male and female, have been re-recorded using different voiceover talents. Several new prompts have been added.
- **Faster call announcements** – Call announcements are much shorter, saving users valuable time. It may take a few calls for users to adjust to the shorter call announcement. The response to the prompt (Yes or No, using a voice response or buttons) has not changed.
- **Recorded name reminder** – If users have not recorded their name, the Genie reminds them to record one at the next login.  
  
If you'd rather not remind users to record their names, you can disable the system preference for this feature.
- **Active Directory authentication** – If Active Directory authentication is enabled in the Administration Console, users must log into the Administration Console, User Console, and Staff Assignment using their Active Directory credentials.

If you enable Active Directory authentication, make sure you notify users of the change. Otherwise, they may try to log in using their Vocera user ID and password.

When Active Directory authentication is enabled for the Vocera Server, the **Password** field for users in the Administration Console and User Console is required only for Vocera Connect users. Otherwise, it is not used.

- **Change if “Announce Caller's Name After Tone” is NOT selected** – There is a change in behavior when the “Announce Caller's Name after Tone” default setting is NOT selected. With Vocera 4.3, the recipient of a call heard only a chime to announce the call. With Vocera 4.4, the recipient of a call now hears a chime plus “Accept call?”
- **Changes to the Badge Properties Editor** – To simplify the Badge Properties Editor user interface and make it easier to configure badges for today's wireless networks, several badge properties have been removed. The removed properties are still supported and their default values have not changed. For details, see the *Vocera Badge Configuration Guide*.
- **Vocera Report Server Diagnostic reports removed** – The Diagnostic reports, which were deprecated in Vocera Report Server 4.3 and replaced by the Speech Reports, have been removed from the product. Make sure these reports are not used in any of your scheduled report packages.
- **Smaller Vocera Server backup files** – Due to optimization of entity prompts, Vocera Server backup files may be noticeably smaller after you upgrade to Version 4.4.
- **JRE update** – Vocera web clients (Administration Console, User Console, and Staff Assignment) and VAI applications all require JRE 6.0 (1.6) or later.

### *Changes in Behavior Between Vocera 4.2 and 4.3*

The following changes in behavior occurred between Vocera 4.2 and Vocera 4.3:

- **Changes made to the signaling between badges and the server** – Users will experience a short outage (several minutes) while their badges connect to the upgraded 4.4 server for the first time and download new firmware. Due to changes made to the signaling between badges and the server, the badges cannot download the new firmware in the background. Plan for downtime accordingly. Subsequent badge firmware updates that don't involve a signaling change should occur in the background.

- **Frequently Called Departments** – The Vocera Server accumulates call history data, calculating the frequency of calls made from one department to another. The data is used at recognition time to apply probabilities to user names in the speech recognition grammar files, resulting in overall improvements in speech recognition.

The Frequently Called Departments feature replaces the Inner Circle mechanism that was available in Vocera 4.1 and earlier releases.

For information on how to administer Frequently Called Departments after you have upgraded to Version 4.4, see [Best Practices for Frequently Called Departments](#) in the *Vocera Administration Guide*.

- **Change to behavior of sWAVFiles parameter of the VMI Message method** – Previously, you could specify multiple WAV files in the `sWAVFiles` parameter to use as responses to a VMI message. This parameter has been modified. It now takes only one WAV file as a custom alert tone. The WAV file must be located in the `\vocera\config\custom\prompts` folder on the Vocera Server so that it gets loaded on the badges. Only the first WAV file specified is used; other comma-separated WAV files are ignored. For details, see the *Vocera Messaging Interface Guide*.
- **New location of custom audio prompts** – Here is the location on the Vocera Server computer for custom audio prompts used by VMI messages:

**`\vocera\config\custom\prompts`**

To use custom audio prompts, place the WAV files in the above folder on the Vocera Server and then stop and start the server to force devices to download the custom prompts.

- **By default, the "Skip" response to VMI messages that are played aloud has been disabled** – By default, when users play VMI messages aloud they must either Accept or Reject the message (or say another valid response); they cannot respond by saying "Skip," which skips the message. However, you can enable the "Skip" response by adding a property to the `properties.txt` file on the Vocera Server. For details, see the *Vocera Messaging Interface Guide*.
- **Change to Report Server filtering by department** – Previously, if you filtered Report Server reports by department, any calls or VMI messages made directly to a department were listed under "Department: Not Assigned" in reports. Now such records are listed under their own department along with other groups in that department. This change affects the following VRS reports:

- Group Entry Summary
- Incoming Calls to Groups - Summary
- Incoming Calls to Groups - Detail
- Broadcasts
- VMI Message Activity

For details, see the *Vocera Report Server Guide*.

---

## Suggested Post-Upgrade Tasks

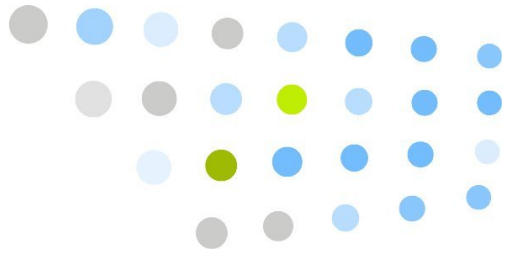
After you install the software, consider taking advantage of some of the more powerful new 4.4 features by performing the tasks in the following list. This section is not all-inclusive—see the Release Notes for a complete list of new features in version 4.4, or see [What's New](#) on page 9 for a list of changes related to installing and configuring Vocera.

Vocera recommends performing the following post-installation tasks after you upgrade to Vocera 4.4:

- If your organization uses Vocera Messaging Platform, which provides enterprise messaging and alerting capabilities, consider integrating it with your Vocera Server. For details, see the *Vocera Administration Guide*.
- Optionally, check the **Permission Only (not callable)** property for administrative groups that you do not want to receive group calls.
- Optionally, run the Data Check utility in the Administration Console to check department groups for potential problems (such as nested departments or departments that are unusually large or small).
- After you upgrade to Vocera Report Server 4.4, check the Task Scheduler settings for the backup, dataload, and sweep tasks to make sure they are correct. You may also want to schedule archive and purge tasks.

For more information about the Task Scheduler, see the *Vocera Report Server Guide*.





## Updating Smartphones

The following topics describe how to update Vocera smartphones with the latest firmware after upgrading your Vocera system to Version 4.4.

---

### Opening Ports on the Vocera Server

Smartphones require access to ports 80 or 443 (if using SSL) on the Vocera Server for contacts and text messaging functionality. Before updating smartphones, make sure all necessary ports are open for communication with the server. For a complete list of ports that must be opened, see [Opening Ports for Communication](#) on page 182.

---

### Updating Vocera Smartphones Using Tethered Configuration

**Note:** These steps assume you already have set up a configuration computer and have previously configured smartphones by tethering them to the configuration computer. For details, see the *Vocera Smartphone Configuration Guide*

#### **Task 1: Update the Vocera Client Gateway and Configuration Computers**

1. Upgrade your Vocera Client Gateway computer(s) to Version 4.4.  
See [Upgrading Vocera Client Gateway](#) on page 42.
2. On the Vocera Client Gateway computer, copy the `%vocera_drive%\vocera\config\smartphone` folder and its subfolders to the working folder for smartphone CAB files on the configuration computer (for example, `c:\vocera\config\smartphone`).

#### **Task 2: Create a New Provisioning CAB File**

1. Install Motorola EWP Provisioning Tool 1.15 (or later) on the configuration computer.

See [Installing the Motorola EWP Provisioning Tool](#) in the *Vocera Smartphone Configuration Guide*.

2. Use the Motorola EWP Provisioning Tool to create a provisioning CAB file for the phone with network, Vocera Server, Vocera Client Gateway, and time zone settings. Save the **SSID.CAB** file to the working folder for smartphone CAB files (for example, **c:\vocera\config\smartphone**).

See [Using the Motorola EWP Provisioning Tool](#) in the *Vocera Smartphone Configuration Guide*.

### **Task 3: Install CAB Files on a Smartphone**

1. Turn on the phone by pressing and holding the Power/End key for one to two seconds.
2. To check the version of Vocera software on the smartphone, follow these steps:

- Press **Start > All Programs > Vocera Smartphone Information > About**.

If the Vocera Smartphone version is **less than 2.4.2.0125**, continue with these steps to update the phone. Otherwise, stop here.



3. Copy the **%vocera\_drive%\vocera\config\smartphone** folder on the Vocera Client Gateway computer to the working folder for smartphone CAB files on the configuration computer.
4. Open the working folder for smartphone CAB files, and copy the following files to the Clipboard:

- **ewpsecuritypolicyoff.cab**
- **installer\_SW\_REL\_number.CAB**
- **JBlendWM\_Vocera.CAB**
- **SSID.CAB**
- **VoceraAppsSettings.CAB**
- **VoceraAppsInstaller.CAB**

5. Using a USB cable, plug the phone into your configuration computer.
6. Use Windows Mobile Device Center, ActiveSync, or Windows Explorer to paste files to the **\Temp** folder on the phone.

**Note:** If ActiveSync prompts that it may need to convert files when synchronizing between your computer and the phone, click **OK**.

7. On the phone, press **Start > All Programs > File Manager**.

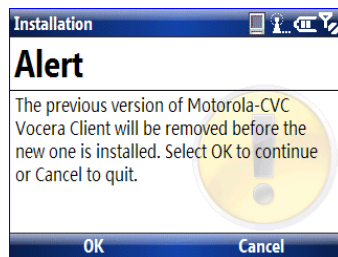
8. Navigate to the **\Temp** folder, and open the folder.
9. Use the navigation key  to scroll to a file and then press the center key  to install it.

You must install the CAB files in the following order:

- **ewpsecuritypolicyoff.cab**
- **installer\_SW\_REL\_number.CAB**
- **JBlendWM\_Vocera.CAB**
- **SSID.CAB**
- **VoceraAppsSettings.CAB**
- **VoceraAppsInstaller.CAB**

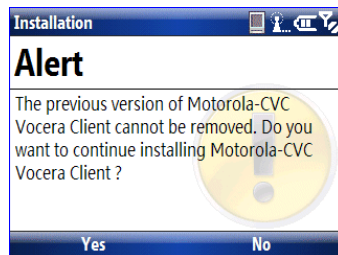
**Note:** If there are multiple files with the name **installer\_SW\_REL\_number.CAB** in that folder, select the one with the highest version number.

10. Respond to prompts as appropriate for each file.
  - **installer\_SW\_REL\_number.CAB**—When you run this file, the following alert dialog box appears:



Press **OK** (the left soft key) to continue.

Another alert dialog box appears:



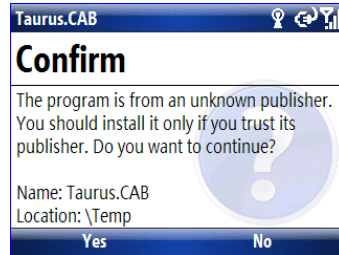
Press **Yes** (the left soft key) to continue.

When you are prompted to reboot, press **Cancel**.

- **JBlendWM\_Vocera.CAB**—When you are prompted to reboot, press **OK** only if you are enabling SSL on the phone. Otherwise, press **Cancel**.

**Note:** If you are enabling SSL on the phone, you must reboot the phone after installing the **JBlendWM\_Vocera.CAB** file. Otherwise, you will encounter a Java exception when you install subsequent CAB files.

- **SSID.CAB**—When you run this file, a confirmation dialog box appears:



Press **Yes** (the left soft key) to continue.

When the file is finished being installed, press **Done**.

- *All Other CAB Files*—When the file is finished being installed, press **Done**.

11. Reboot the phone to load the updated settings.

12. Verify that the smartphone has been configured correctly.

See [Verifying Smartphone Configuration](#) in the *Vocera Smartphone Configuration Guide*.

#### **Task 4: Install Vocera Server SSL Certificates on a Smartphone**

**Note:** If SSL is not enabled on your Vocera system, skip this setup task.

1. On the configuration computer, create a folder to store the SSL certificates. For example, the folder could be **%vocera\_drive%\vocera\config\smartphone\certs**.
2. Copy the SSL certificate from each Vocera Server to the SSL certificates folder on your configuration computer.

On the Vocera Server, the certificate is found in the following folder:

**%vocera\_drive%\apache\Apache2\conf\ssl**

**Important:** Make sure you copy the certificate with a **.cer** filename extension. The smartphone does not support certificates with a **.crt** filename extension.

3. Connect the smartphone to the configuration computer using a USB cable.

4. Use Windows Mobile Device Center, ActiveSync, or Windows Explorer to paste the certificate(s) to the **\My Documents\certs\_to\_install\** folder on the phone.

Use ActiveSync and Windows Explorer

5. On the smartphone, open File Manager and navigate to the **\My Documents\certs\_to\_install\** folder.
6. Run each certificate file. The certificates are automatically added to the phone's certificate store.
7. For security reasons, delete the certificate file(s) in the **\My Documents\certs\_to\_install\** folder. This prevents the file(s) from being copied to other devices.
8. Reboot the phone to load the certificates.

---

## Updating Vocera Smartphones Using MSP

This section describes how to update Vocera smartphones with new firmware installed by Vocera 4.4 if you use Motorola Mobility Services Platform (MSP) to stage and provision software on the phones.

By default, Vocera smartphones check in with the Relay Server every 15 minutes for updates, so it may take longer to provision updates to smartphones than badges.

### ***Task 1: Make Sure the MSP License Has Provisioning Seats for All Smartphones***

- Each time your organization purchases additional smartphones from Vocera, you must update your MSP license key to ensure that you have Provisioning seats for all smartphones. See [Updating Your MSP License Key](#) in the *Vocera Smartphone Configuration Guide*.

### ***Task 2: Update the Vocera Client Gateway and MSP Computers***

1. Upgrade your Vocera Client Gateway computer(s) to Version 4.4.  
See [Upgrading Vocera Client Gateway](#) on page 42.
2. If Vocera Client Gateway and MSP Server are running on different machines (whether physical or virtual), copy the **%vocera\_drive%\VoceraMSP** folder on the Vocera Client Gateway computer, and paste it to the root of the drive where MSP is installed on the MSP computer.

### ***Task 3: Upload the Network Settings DefDoc File to the MSP Server***

1. Launch the Internet Explorer browser, and enter the following address:

`http://msp_server/MSP.Web`

where *msp\_server* is either the numeric IP address or the DNS name of the MSP Server.

2. On the Login page, enter the **Username** and **Password**, and then click **Sign In**.

**Note:** The default username/password is admin/admin.

3. Click the **Admin** tab.
4. Click **DefDocs**.
5. Click **Upload**.
6. Click **Browse** to select the following file:

**%msp\_drive%\VoceraMSP\setup\xml\  
Network.WLAN.EWP.setting.xml**

**Note:** Do not select the file from a network drive.

7. Click **Upload**.
8. If you are prompted whether to overwrite an existing file, click **Yes**.

#### ***Task 4: Upload the Vocera Root Certificate Install Package Template***

**Note:** If you do not plan to enable SSL on your Vocera system, skip this setup task.

1. In the MSP Console, click the **Builder** tab.
2. Click **Upload Template**.
3. In the **File Template File** field, click **Browse** and select the following file:

**%msp\_drive%\VoceraMSP\setup\xml\  
Vocera\_Cert.xml**

**Note:** Do not select the file from a network drive.

4. Click **Upload**.
5. The Related Tasks list appears. Select one of the options.

#### ***Task 5: Upload New Packages to the MSP Server***

1. Run the following batch file on the MSP computer:

**%msp\_drive%\VoceraMSP\setup\vocera\upload\_packages.bat**

**Note:** This is a simple batch file that provides no error checking. You must enter valid values when you use it. Also, this batch file requires that MSP Server is installed in the default location (%system\_drive%\Program Files\Motorola MSP).

2. A Command Prompt window opens, and the batch file prompts for the first VCG IP address.

Type the IP address of the first VCG server in dotted-decimal notation (for example, 192.168.15.10), and then press Enter.

3. The batch file prompts for the second VCG IP address. Type the IP address of the second VCG server, and then press Enter. If you do not have a second VCG server, press Enter without typing anything.

Respond to other VCG IP address prompts as appropriate.

4. When you finish entering VCG IP addresses, the batch file prompts for the first VS IP address.

Type the IP address of the first Vocera Server, and then press Enter.

5. The batch file prompts for the second VS IP address.

Type the IP address of the second Vocera Server, and then press Enter. If you do not have a second Vocera Server, press Enter without typing anything.

Respond to other VS IP address prompts as appropriate.

6. When you finish entering VS IP addresses, the batch file prompts whether to enable SSL.

**Important:** You should only enable SSL on Vocera smartphones after SSL has already been enabled on all Vocera Servers.

To enable SSL, type **Yes** and then press Enter. If you do not want to enable SSL, type **No** and then press Enter.

7. Press any key.

8. The script prompts that one file has been moved and several have been copied.

Press any key to close the Command Prompt window.

**Task 6: Deactivate Provisioning Policies that Use the Vocera Bundle**

1. In the MSP Console, click **Provisioning > Policy Management** to display a list of provisioning policies.

2. To deactivate a provisioning policy, click the **Deactivate** link in the **Modify Status** column.

### **Task 7: Update Vocera Packages**

1. In the MSP Console, click the **Library > Packages**.

**Note:** You may need to wait a couple minutes for newer Vocera packages to be loaded. If you do not see the latest packages, click the **Refresh Data** icon.

2. Click the **VoceraClientGatewayIPAddress** package (any version). The Package Details page appears.
3. In the **Related Tasks** list, click **Manage**. The Package Management page appears.
4. In the **Change To** drop-down list, select the version you want to use.

**Note:** The version should list the Vocera Client Gateway and Vocera Server IP addresses for your Vocera system.

5. For each Bundle that you want to use the selected version of the Package, check the box next to the Bundle name.
6. Click **Apply**.
7. Click **Library > Packages** again to display the Packages page.
8. Click the **VoceraCab** package (any version). The Package Details page appears.
9. In the **Related Tasks** list, click **Manage**. The Package Management page appears.
10. In the **Change To** drop-down list, select version **2.4.2.0125** (or later).
11. For each Bundle that you want to use the selected version of the Package, check the box next to the Bundle name.
12. Click **Apply**.
13. If you are upgrading from Vocera 4.2, click **Library > Packages** again to display the Packages page.
14. Click the **VoceraApps** package (any version). The Package Details page appears.
15. In the **Related Tasks** list, click **Manage**. The Package Management page appears.
16. In the **Change To** drop-down list, select version **4.3.0.2761** (or later).
17. For each Bundle that you want to use the selected version of the Package, check the box next to the Bundle name.



18. Click **Apply**.

### **Task 8: Create a Vocera Server SSL Certificates Package**

**Note:** If SSL is not enabled on your Vocera system, skip this setup task.

1. Create a folder to store the SSL certificates on your configuration computer. For example, the folder could be **%vocera\_drive%\vocera\config\smartphone\certs**.

2. Copy the SSL certificate from each Vocera Server to the SSL certificates folder on your configuration computer.

On the Vocera Server, the certificate is found in the following folder:

**%vocera\_drive%\apache\Apache2\conf\ssl**

**Important:** Make sure you copy the certificate with a **.cer** filename extension. The smartphone does not support certificates with a **.crt** filename extension.

3. In the MSP Console, click the **Builder** tab.

4. Click **Create Package**. The Create Package wizard appears.

5. In the **Name** field, enter **VoceraServerSSLCertificates**.

6. In the **Version** field, enter a version for the package. Best practice is to enter the IP address for one or more of the Vocera Server computers followed by the date the certificate was created, for example, **10.37.43.101\_02-01-11**.

7. Click **Next**.

The General Package Info screen appears.

8. On the General Package Info screen, use the default settings. Click **Next**.

9. Click **Next**.

The Package Files screen appears.

10. In the **File Template Type** field, select Vocera Root Certificate Install. The **File To Add** field appears.

11. In the **File To Add** field, click **Browse** to select the Vocera Server certificate file, and then click **Add**.

If you have multiple Vocera Servers, add other certificate files to the package in the same way.

12. After all certificates for your Vocera Servers have been added, click **Next**.

The Command Definition screen appears.

13. On the Command Definition screen, use the default settings. Click **Next**.

The Review screen appears.

14. Review the package settings, and then click **Create Package**.

15. The Related Tasks list appears. Click **Upload to MSP** to upload the package you created to the MSP Server.

#### **Task 9: Update the Vocera Bundle**

1. In the MSP Console, click the **Library** tab.

2. Click **Bundles**.

3. Click the Bundle you want to modify. The Bundle Detail page appears.

4. Click **Edit**. The Bundle Create wizard appears.

5. Click **Next** to go to the Deployment Steps screen.

6. Use the **Add Step** button to add the following bundle steps (if they are not already included in the bundle):

**Table 6. New Vocera smartphone bundle steps**

<b>Bundle Step Type</b>	<b>Package Type</b>	<b>Package Name</b>	<b>Reboot Type</b>	<b>Force Install</b>	<b>Description</b>
Install Package	User-Defined	<b>abup30 - dwp_7.02.79</b>	N/A	False	Updates the MSP Agent on devices.
Install Package	User-Defined	<b>VoceraJBlendJVM</b>	N/A	False	Updates the JBlend JVM on the device.
Install Package	User-Defined	<b>VoceraApps</b>	N/A	False	Installs Vocera Apps, which provides contacts and text messaging functionality.
Install Package	User-Defined	<b>VoceraServer-SSLCertificates</b>	N/A	False	Installs root Vocera Server SSL certificates to the certificate store of phones.  <b>Important:</b> This package should only be installed if SSL is enabled on all Vocera Servers. Otherwise, it should not be included in the bundle.

7. Use the **Move Up** and **Move Down** buttons to reorder the bundle steps in this exact order:
  - Install Package - abup30
  - Install Package - DateAndTime
  - Install Package - GetAdapters
  - Install Package - Clock.DateAndTime - *TimeZone*
  - Install Package - enable30
  - Install Package - VoceraJBlendJVM
  - Install Package - VoceraClientGatewayIPAddress
  - Install Package - VoceraServerSSLCertificates (*if SSL is enabled*)
  - Install Package - VoceraCAB
  - Install Package - VoceraApps
  - *[One or more of the predefined VoceraRadio packages]*
  - Install Package - Network.WLAN. EWP.Site.SSID
  - Install Package - *RelayServer*
  - Reboot - Warm with RegMerge
8. Click **Finish**.

#### **Task 10: Stage a Test Phone**

- Master Clear a test phone and stage the updated Vocera bundle on it to make sure staging is working properly. See the following topics for instructions:
  - [Master Clearing a Smartphone](#) in the *Vocera Smartphone Configuration Guide*
  - [How to Use Staging](#) in the *Vocera Smartphone Configuration Guide*
  - [Verifying Smartphone Configuration](#) in the *Vocera Smartphone Configuration Guide*.

#### **Task 11: Test Provisioning the Vocera Bundle to a Single Phone**

1. In the MSP Console, click **Provisioning > Policy Management**, and then click the name of the policy in the **Name** column.
2. In the **Related Tasks** list, click **Edit**.
3. Click **Next** to display the Applicability Rule page of the Policy Create wizard.
4. In the **Rule Type** field, make sure **Custom Rule** is selected. In the **Custom Rules** box, click **Modify**.

5. Use the Custom Rule Builder window to construct a custom rule that applies to a single phone. For example, the following rule applies to a Vocera smartphone with the uuid "0050bf4339bf010801e000156f7e4e50".

```
[identity.deviceModel] = 'Moto EWP'  
AND  
[identity.uuid] = '0050bf4339bf010801e000156f7e4e50'
```

**Note:** You can find uuid values for smartphones on the Device Status page in the MSP Console. Click **Status > Device Status** to see the list of devices that have accessed the MSP Server.

6. Click **Finish** to save the rule and close the Custom Rule Builder window.
7. Click **Next** three times to go to the end of the Policy Create wizard, and then click **Finish**.
8. In the **Related Tasks** list, select **Activate**. The policy is activated, and the phone should be updated shortly.

**Note:** You can force the phone to check in with the Relay Server. On the phone, press **Start > All Programs > MSP Agent**, and then select **Force Check-In**.

9. After the phone finishes updating, verify that it has been configured correctly.

See [Verifying Smartphone Configuration](#) in the *Vocera Smartphone Configuration Guide*.

10. If the phone has been updated successfully, remove the custom rule that you added earlier so that the provisioning policies apply to all Vocera smartphones. Otherwise, fix the provisioning bundle and run the test again.

#### **Task 12: Reactivate Provisioning Policies that Use the Vocera Bundle**

1. In the MSP Console, click **Provisioning > Policy Management** to display a list of provisioning policies.
2. To activate a provisioning policy, click the **Activate** link in the **Modify Status** column.
3. After the provisioning policy is reactivated, new and updated packages should be provisioned to smartphones.

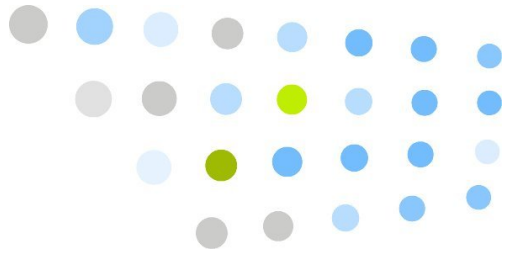


## Preparing the Server for a New Installation

The following topics explain how to prepare a machine before installing Vocera Voice software:

- **Preparing the Vocera Server** on page 63  
Describes how to prepare a machine for Vocera Server installation.
- **Preparing the Vocera SIP Telephony Gateway** on page 69  
Describes how to prepare a machine for Vocera SIP Telephony Gateway installation.
- **Preparing the Vocera Client Gateway** on page 83  
Describes how to prepare a machine for Vocera Client Gateway installation.
- **Preparing the Vocera Report Server** on page 91  
Describes how to prepare a machine for Vocera Report Server installation.
- **Preparing the Vocera Telephony Server** on page 93  
Describes how to prepare a machine for Vocera Telephony Server installation.





## Preparing the Vocera Server

Before you install Vocera software, make sure the server computer itself is configured properly:

- Make sure the Windows Installer service is enabled. See [Enabling Windows Installer](#) on page 63.
- Optionally disable Internet Information Server (IIS), the default web server for Windows Server. See [Disabling IIS](#) on page 64.
- Disable Visual Notifications in the Dr. Watson error handler. See [Setting Up Dr. Watson](#) on page 64.
- Make sure the built-in Windows DHCP server is not running on the Vocera Server machine. See [Removing the Windows DHCP Server](#) on page 65.
- Make sure the Windows Update software does not apply updates automatically. See [Configuring Windows Update](#) on page 65.
- Configure Windows processor scheduling and memory usage for the best performance of programs. See [Configuring Performance Options](#) on page 66.
- Synchronize the clocks of each server in a Vocera cluster. See [Synchronizing Cluster Server Clocks](#) on page 67.

---

### Enabling Windows Installer

The Microsoft Windows Installer is a service of the Windows operating system that simplifies application installation. By default, Microsoft installs and enables this service as part of the operating system installation.

The Vocera installation program requires the Windows Installer service. If you have disabled this service for some reason, the Vocera installation will display a dialog box notifying you of this requirement and then exit.

***To make sure the Windows Installer is enabled:***

1. From the Windows **Start** menu, select **Settings > Control Panel > Administrative Tools > Services**.

The Services dialog box appears, displaying the list of installed Windows services.

2. Double-click the **Windows Installer** service.

The Windows Installer Properties dialog box appears. By default, the General pane is visible.

3. Make sure the value of the **Startup Type** field is set to **Manual**, and set it if necessary.
4. Click **OK**.

The Windows Installer Properties dialog box closes, saving your changes.

---

## Disabling IIS

By default, Windows Server installs and enables the Internet Information Server (IIS). Because IIS interferes with a service that Vocera requires, the Vocera installation program displays a dialog box to notify you if it detects that IIS is enabled. If you continue with the installation, the Vocera installer will disable IIS and its dependent services.

If you prefer, you may optionally disable IIS manually before installing Vocera. Because you must also disable any dependent services, best practice is to let the Vocera installation program disable IIS. See your Microsoft documentation for information about disabling IIS.

---

## Setting Up Dr. Watson

If a fatal error causes one of the processes used by Vocera to fail, Vocera attempts to restart the process and bring the Vocera or Telephony server back online automatically. In some situations, however, the Windows Dr. Watson utility can prevent Vocera from restarting a process.

Windows Server 2003 typically uses Dr. Watson as a fatal error handler. If the **Visual Notification** option in Dr. Watson is turned on (the default), this utility displays a Program Error dialog box when a fatal error occurs.

Windows does not completely abandon a failed process until you close the Program Error dialog box. Consequently, the Program Error dialog box can prevent Vocera from restarting a Nuance process on the Vocera server computer or a Dialogic process on the Telephony server computer.



For example, if the Nuance recclient process binds to a listening port and then fails for some reason, Dr. Watson displays the Program Error dialog box. If the dialog box is still open when Vocera attempts to restart recclient, the port is still busy, and the restart fails.

To prevent this situation from occurring, turn off the **Visual Notification** option in Dr. Watson.

***To turn off Visual Notification:***

1. Choose **Start > Run** from the Windows task bar on the Vocera server computer.

The Run dialog box appears.

2. Enter **drwtsn32** and click **OK**.

The Dr. Watson for Windows dialog box appears.

3. Uncheck **Visual Notification**, then click **OK**.

Dr. Watson closes, and **Visual Notification** is turned off.

4. If the Telephony server is installed on a different computer, repeat this process for the Telephony server.

---

## Removing the Windows DHCP Server

Do not run the built-in Windows DHCP server on the Vocera Server machine. Although the DHCP server does not typically require significant system resources, running it on the Vocera Server computer causes significant problems in a clustered environment, including the following:

- Devices may inadvertently receive duplicate IP addresses.
- Badges may not receive an IP address and get stuck displaying "Requesting IP Address".
- Badges may get invalid and unusable IP address information.

If the Windows DHCP server is running on the Vocera Server computer, use the Windows Control Panel to remove it.

---

## Configuring Windows Update

Many server computers use the Windows Update software to keep their operating systems, software, and hardware up to date. If Windows Update is set to apply updates automatically, it may reboot your server as part of the update process. This forced system reboot may result in a Java exception, because Windows Update did not shut down all the server processes properly.

If your server computer uses the Windows Update software to keep its components up to date, make sure it does not apply these updates automatically. You can configure Windows Update to download any updates automatically, but apply the updates yourself after you shut down Vocera and its related services properly.

---

## Configuring Performance Options

Nuance Speech Recognition, Verifier, and Vocalizer software work best when the server is set to give the best performance to Programs rather than Background Services.

In Programs mode, Windows provides more frequent but smaller time slices during thread switching. In Background Services mode, Windows provides longer and less frequent time slices. If you run Windows with Background Services mode, Vocera badges may experience choppy audio.

### *To set Windows performance options for the Vocera Server:*

1. Choose **Start > Settings > Control Panel > System**. The System Properties dialog box appears.
2. Click the **Advanced** tab.
3. In the Performance box, click **Settings**. The Performance Options dialog box appears.
4. Click the **Advanced** tab.
5. In the Processor Scheduling box, click **Programs**. This gives more processor resources to the Vocera Server instead of background services.
6. In the Memory Usage box, click **Programs**. This allocates more system memory to the Vocera Server instead of the system cache.
7. Click **OK**.
8. A dialog box informs you that the changes will not take effect until you restart the computer. Click **OK** to close the dialog box.
9. In the Performance Options dialog box, click **OK**.
10. In the System Properties dialog box, click **OK**.
11. Restart the computer.

---

## Synchronizing Cluster Server Clocks

If you are planning to deploy a Vocera cluster, best practice is to synchronize the clocks on each server in the cluster. You are not required to synchronize the clocks to support cluster failover; however, if the clocks are set to different times, troubleshooting with system log files and analyzing Vocera Report Server log files becomes difficult after a failover.

If the servers physically reside in different time zones, you should set them all to a single time zone at the operating system level, then use Vocera to specify the actual time zone for each site. Standardizing the time zones in this manner allows the log files to be time stamped uniformly for failover purposes and also enables the Vocera Genie to say the actual correct time in voice prompts that users hear.

### ***To synchronize cluster server clocks:***

1. At the operating system level, set each server in the cluster to the same time zone.

See your operating system documentation for additional information.

2. Synchronize the clocks in every server in the cluster. For example, you can make sure the clocks are synchronized in one of the following ways:
  - Set the clock of each server in the cluster to sync to the same internet time source.
  - Use the Windows Time service to make sure that each server in the cluster uses a common time.

See your operating system documentation for additional information.

3. After Vocera is installed, use the Sites screen to specify the time zone of every site. See [Adding or Editing a Site](#) in the *Vocera Administration Guide* for complete information.





## Preparing the Vocera SIP Telephony Gateway

This chapter describes the Vocera SIP Telephony Gateway architecture, lists system requirements, and describes tasks and procedures to perform before you install Vocera SIP Telephony Gateway.

---

### About Vocera SIP Telephony Gateway

This section describes the architecture, signaling, features, and benefits of Vocera SIP Telephony Gateway.

#### *Vocera Telephony Software Benefits*

The Vocera SIP Telephony Gateway and Vocera Telephony Server software provides seamless calling between Vocera badges and telephones, expanding the reach of the Vocera system to people outside the wireless network. Both Vocera SIP Telephony Gateway and Vocera Telephony Server support installation of multiple telephony servers for N + 1 redundancy, scalability, and load balancing. When you integrate the Vocera server with the corporate telephone system:

- Telephone callers outside the Vocera system can place calls to users' badges.

The Vocera Genie answers calls and prompts the callers to speak the name of the person or group they want to reach. If no one answers, the caller can leave a message or try someone else.

- Users can call telephones from their badges.

Voice commands let users call internal extensions, local phone numbers, and long-distance numbers. You control which groups of users have permissions to make each type of call in the Administration Console.

- Users can forward incoming badge calls to an extension, an outside telephone number, or a voicemail box.

Callers can reach badge users who are at home, traveling, or telecommuting. Voice commands let users specify where and when to forward calls. See the *Vocera Badge User Guide* for a description of voice commands for forwarding.

- Unanswered calls to a group can be forwarded to a telephone.

The system administrator or a group manager can configure groups to make Vocera forward their calls to special numbers, such as the switchboard operator or the telephone number of an individual group member. For example, if all members of the “Tech Support” group are busy or off-network, Vocera can forward a call to the cell phone or contact number of the group member who is “on call.”

- Users can place phone calls through their badges by speaking the names of people or places, instead of their phone numbers.

The address book lets you define the names and contact phone numbers for people and places who are not in the Vocera system. These names are then available to all users on the system. For example, outside assistance is immediately available to a badge user who says, “Call Poison Control”. Individual users can also set up personal outside buddies, and place phone calls to them by name.

- Users can transfer calls from their badges to telephone extensions.

Users who receive calls on their badges can optionally transfer them to telephone extensions with a simple voice command. For example, if more privacy is required, users can transfer a call to a telephone extension in a more private location.

- Users can send and receive pages.

Users can send pages to other badge users. Users with the proper permissions can use voice commands to control whether they want to receive pages at any time.

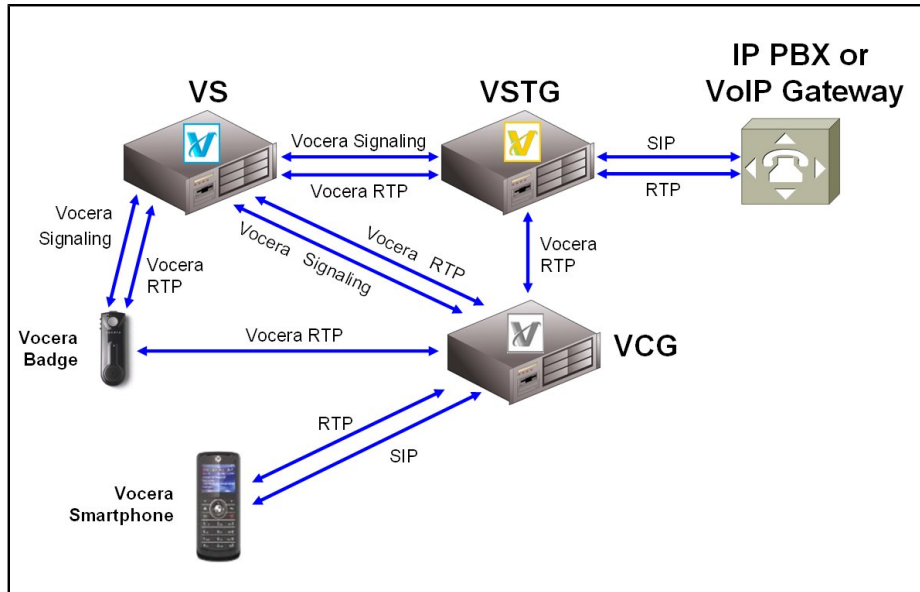
Vocera SIP Telephony Gateway provides the following *additional* benefits:

- Reduced call latency
- Software-only solution (no Dialogic card required)
- Less cabling, not required to be near PBX
- Support for deployment in a VMware virtualized environment
- Vocera Access Anywhere (phone access to the Vocera Genie) for all users

## Vocera SIP Telephony Gateway Architecture

Vocera SIP Telephony Gateway is a SIP telephony gateway between the Vocera Server and an IP PBX or a VoIP gateway.

**Figure 4. Vocera SIP Telephony Gateway architecture**



### Session Initiation Protocol Support

Vocera SIP Telephony Gateway is based on Internet Engineering Task Force (IETF) standards for Session Initiation Protocol (SIP) 2.0 and Real Time Transport Protocol (RTP). Vocera SIP Telephony Gateway communicates via a SIP trunk with a SIP-enabled PBX or a SIP Gateway. The Vocera SIP Telephony Gateway provides basic SIP telephony functionality, including placing and receiving calls, OPTIONS keep-alive messages, and obtaining ANI and DNIS information. The Vocera SIP Telephony Gateway should interoperate with SIP-enabled PBXs and SIP Gateways as long as they follow SIP 2.0 and RTP standards.

For audio transport, Vocera SIP Telephony Gateway uses Real-time Transport Protocol (RTP), an Internet protocol standard for delivering multimedia data over unicast or multicast network services (see [RFC 3550](http://tools.ietf.org/html/rfc3550)<sup>1</sup> and [RFC 3551](http://tools.ietf.org/html/rfc3551)<sup>2</sup>).

<sup>1</sup> <http://tools.ietf.org/html/rfc3550>

<sup>2</sup> <http://tools.ietf.org/html/rfc3551>

Vocera Server uses Vocera's proprietary signaling and transport protocols for all communication between the server and Vocera badges. Consequently, Vocera SIP Telephony Gateway converts from SIP/RTP protocols to Vocera's protocols, and vice versa, to enable communication between the Vocera Server and the IP PBX.

## *Outgoing Calls*

When the Vocera Server receives an outgoing call request, it passes the dialing sequence to the Vocera SIP Telephony Gateway, which performs the call setup, connects to the PBX or other telephone system and dials the outgoing call.

Once a call is established, badges participating in the call communicate directly with the Vocera SIP Telephony Gateway without going through the Vocera Server.

## *Incoming Calls*

The Vocera SIP Telephony Gateway answers incoming calls and routes the calls to the Vocera Server. On the Vocera Server, the Genie prompts the caller for the name of a user or group. The Vocera Server then attempts to route the call to the appropriate badge:

- If the badge user is available, the badge communicates with the telephone through the Vocera SIP Telephony Gateway, without going through the Vocera Server.
- If the badge user is not available, the Vocera Server checks the forwarding option for the user or group and processes the call accordingly.

If a call cannot be forwarded, the Genie invites the caller to leave a message.

## *Using the SIP Testing Tool*

Before installing Vocera SIP Telephony Gateway, Vocera recommends testing the SIP connection to your PBX using a SIP Testing Tool that it provides. The SIP Testing Tool allows you to test the following SIP functionality:

- Place a SIP test call to the PBX.
- Receive a SIP call from the PBX (requires a SIP handset or soft phone).
- Test whether OPTIONS keep-alive is working.

For more information about the SIP Testing Tool, see **KB1086** in the Vocera Technical Support Knowledge Base.

You can download the SIP Testing Tool from the following location:



[http://www.vocera.com/ts/VSTG\\_siptest/siptest.zip](http://www.vocera.com/ts/VSTG_siptest/siptest.zip)

**Important:** Make sure the Vocera SIP Telephony Gateway is not running on the computer on which you run the SIP Testing Tool.

---

## Vocera SIP Telephony Gateway License Requirements

To use Vocera SIP Telephony Gateway as the telephony server for your Vocera system, you must meet the following license requirements:

- Obtain a SIP telephony license from Vocera.
- Update each Vocera Server with the new Vocera license. See [Updating the Vocera Server License](#) on page 141.

**Important:** If you do not meet these license requirements, the Vocera SIP Telephony Gateway will not start, and the Vocera Server will be unable to connect with the Vocera SIP Telephony Gateway.

---

## Telephony Deployment Scenarios

With the high availability features provided for Vocera SIP Telephony Gateway and Vocera Telephony Server, there are several telephony deployment scenarios to choose from based on whether your enterprise fully takes advantage of these features, and also based on the following factors:

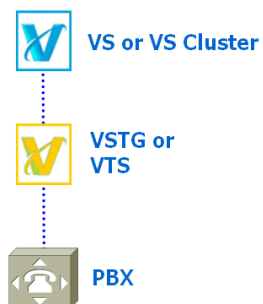
- number of Vocera sites
- number of PBXs at those sites
- mission criticality of the Vocera system
- capital budget limits

**Important:** Although you can deploy a telephony server array to take advantage of high availability features, a combined Vocera SIP Telephony Gateway and Vocera Telephony Server telephony array is NOT supported. You must use either Vocera SIP Telephony Gateway or Vocera Telephony Server servers in the array, not a combination of the two. Only Vocera SIP Telephony Gateway provides PBX failover support.

### *Single Site Scenarios*

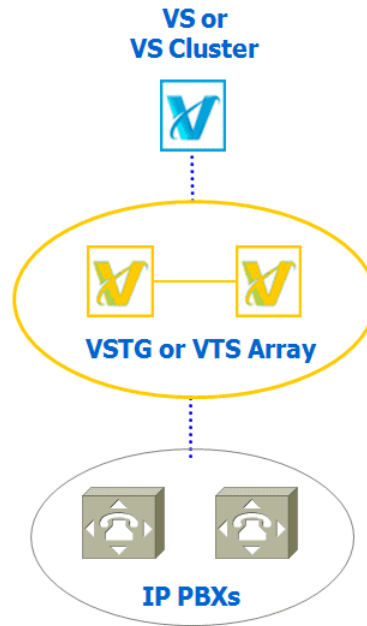
The simplest single site deployment scenario has one Vocera Server connected to one telephony server using one PBX. This scenario does not take advantage of any high availability features, such as redundancy, scalability, and load balancing.

**Figure 5. Single Site Scenario with 1 Telephony Server**



Summary	
Sites:	1
Telephony Sharing:	No
PBX Failover:	No
High Availability:	No

To add high availability to a single site Vocera system, an array of telephony servers can be installed, and two SIP trunks can be used to provide failover support. This scenario provides redundancy, scalability, and load balancing. The Vocera Server handles outbound load balancing by automatically allocating calls to the least busy telephony server. The PBX handles inbound load balancing.

**Figure 6. Single Site Scenario with a Telephony Server Array**

Summary	
Sites:	1
Telephony Sharing:	No
PBX Failover:	Yes
High Availability:	Yes

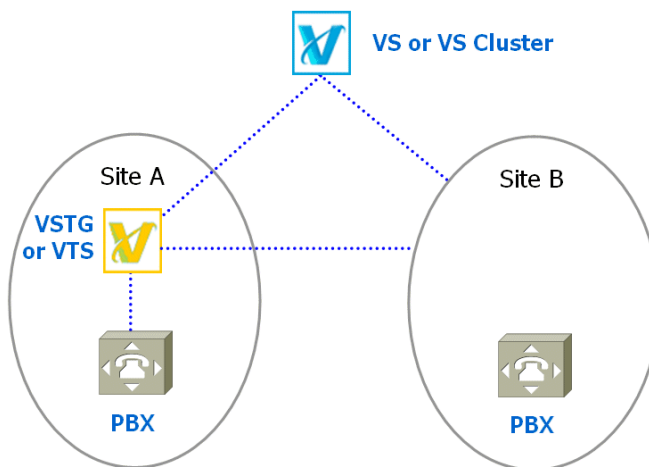
### Multiple Site Scenarios

With multiple sites, the complexity of telephony deployment scenarios increases due to the following factors:

- Option of installing redundant telephony servers at each site for high availability
- Option of sharing telephony servers between sites
- Potentially multiple PBXs

The following scenario shares telephony servers between sites. In this example, the telephony server uses the PBX at site A. The telephony server is shared with site B, which may or may not have its own PBX. Because a single telephony server instead of an array of telephony servers is installed at site A, high availability features are not supported.

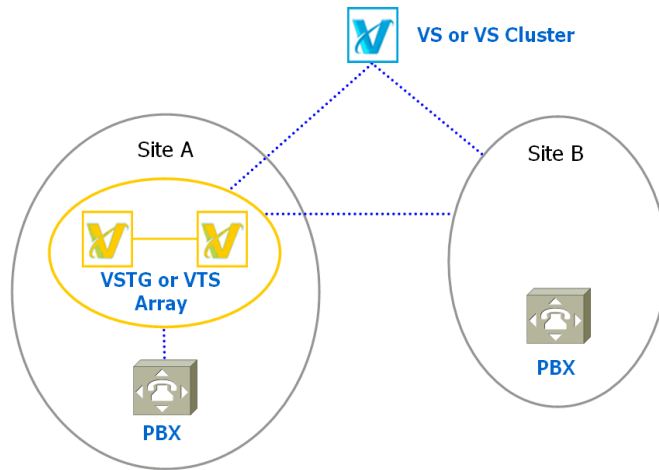
**Figure 7. Multiple Site Scenario Using a Shared Telephony Server and 1 PBX Per Site**



Summary	
Sites:	Multiple
Telephony Sharing:	Yes
PBX Failover:	No
High Availability:	No

The following scenario is a variation of the previous one. An array of telephony servers has been added, which provides redundancy, scalability, and load balancing.

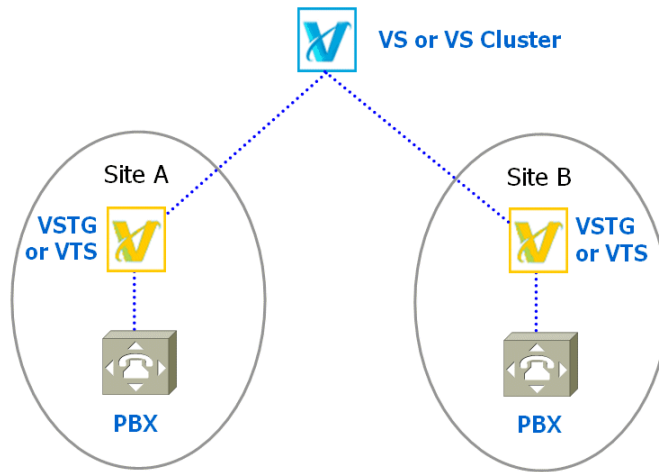
**Figure 8. Multiple Site Scenario Using a Shared Telephony Server Array and 1 PBX Per Site**



Summary	
Sites:	Multiple
Telephony Sharing:	Yes
PBX Failover:	No
High Availability:	Yes

The following scenario has a telephony server and PBX at each site. Using independent telephony servers instead of sharing a telephony server between sites may be needed for performance and scalability. Because a single telephony server is installed at each site instead of an array of telephony servers, high availability features are not supported.

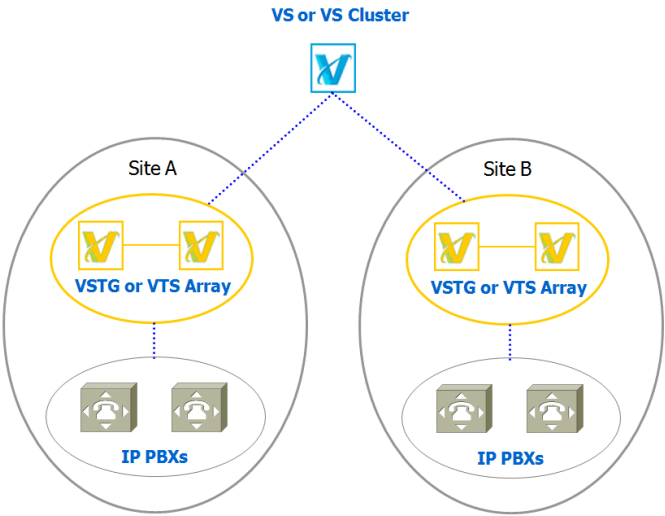
**Figure 9. Multiple Site Scenario Using a Telephony Server and PBX at Each Site**



Summary	
Sites:	Multiple
Telephony Sharing:	No
PBX Failover:	No
High Availability:	No

The following multiple site scenario represents the best practice for high availability support. It has an array of telephony servers and redundant PBXs at each site.

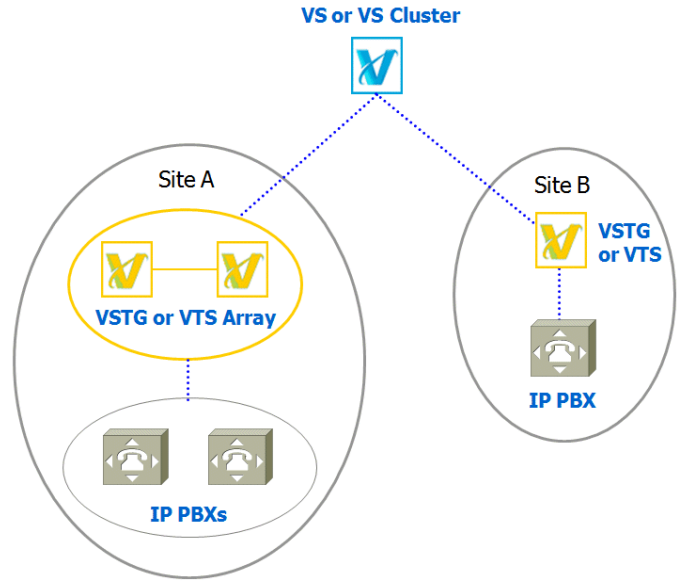
Figure 10. Multiple Site Scenario Using 2 Telephony Servers and 2 PBXs at Each Site



Summary	
Sites:	Multiple
Telephony Sharing:	No
PBX Failover:	Yes
High Availability:	Yes

This next scenario is an option for multiple sites where one site uses Vocera as a mission critical application, and the other site does not (perhaps because it is a small test deployment). In this example, an array of telephony servers and two PBXs are installed at site A but not at site B. Therefore, only site A has high availability features.

**Figure 11. Multiple Site Scenario with a Mission Critical Vocera System at One Site, and a Test System at Another**



Summary	
Sites:	Multiple
Telephony Sharing:	No
PBX Failover:	Yes at Site A, No at Site B
High Availability:	Yes at Site A, No at Site B

## Telephony High Availability

You can install multiple Vocera SIP Telephony Gateway servers or Vocera Telephony Servers—also called a telephony server array—at each site. By installing an array of telephony servers at a site, you can take advantage of the following high availability features:

- **Redundancy** – If one of the telephony servers stops responding, the Vocera Server automatically redirects outbound calls to another available telephony server for uninterrupted service.
- **Scalability** – You can purchase and install as many telephony servers as you need to increase telephony capacity.



- **Load balancing** – For outbound calls, the Vocera Server automatically allocates calls to the least busy telephony server. The PBX equipment handles inbound load balancing.

**Important:** The Administration Console allows you to specify only one telephony configuration per site. If you deploy multiple telephony servers at one site, all of them must use the same configuration. Each telephony server installed at a site must use the same signaling protocol and have the same capacity. You can use telephony boards with different form factors (for example, PCI vs. PCI-X). **A combined Vocera SIP Telephony Gateway and Vocera Telephony Server telephony array is NOT supported. You must use either Vocera SIP Telephony Gateway or Vocera Telephony Server servers in the array, not a combination of the two.**

Generally, all telephony servers at a site will use the same PBX. However, they could use different PBXs as long as all PBXs have the same configuration for the trunks to the telephony servers and the same capabilities for off-PBX dialing (for example, tie lines).

Telephony servers in an array do not communicate with each other. Instead, the telephony servers respond to requests from the Vocera Server. All communication with telephony servers is handled by the Vocera Server.

## *Vocera SIP Telephony Gateway and PBX Failover Support*

For PBX failover support, you can configure Vocera SIP Telephony Gateway to use multiple call signaling addresses. On the **Telephony > Basic Info** page of the Administration Console, select the **Call Signaling Address** field and enter a comma-separated list of call signaling addresses for two or more IP PBXs or VoIP gateways. At startup, Vocera SIP Telephony Gateway tries each PBX or gateway in the order specified and uses the first one that responds. If that PBX or gateway goes down, Vocera SIP Telephony Gateway switches to another one.

The VSTG uses the response to a SIP OPTIONS message to determine if the PBX or gateway is currently available. See [Detecting the Connection to the IP PBX](#) in the *Vocera Telephony Configuration Guide*.

In some situations, using TCP as the signaling transport protocol reduces the length of time required for the VSTG to recognize that the current PBX is down and move to the next PBX in the list. see [Using UDP, TCP, or TLS Transport to the IP PBX](#) in the *Vocera Telephony Configuration Guide*.

You can override the call signaling address for a particular Vocera SIP Telephony Gateway and have it connect to a different PBX than the one used by other Vocera SIP Telephony Gateway servers in the array. For more information, see [Overriding the Call Signaling Address to Connect to a Different IP-PBX](#) in the *Vocera Telephony Configuration Guide*.

---

## Checklist for Preparing the Vocera SIP Telephony Gateway

Before you install Vocera SIP Telephony Gateway software, make sure the server computer itself is configured properly:

<input type="checkbox"/>	<p>1. Log in to the Vocera SIP Telephony Gateway computer using an account with administrator privileges. This account should also use the default system locale, which was specified when Windows was installed on the computer.</p> <p>To view and change an account's locale settings, choose <b>Start &gt; Settings &gt; Control Panel &gt; Regional Options</b>. For more information about locales, refer to your Windows documentation.</p>
<input type="checkbox"/>	<p>2. Make sure the Windows Installer service is enabled. See <a href="#">Enabling Windows Installer</a> on page 63.</p>
<input type="checkbox"/>	<p>3. Make sure the Windows Update software does not apply updates automatically. See <a href="#">Configuring Windows Update</a> on page 65.</p>



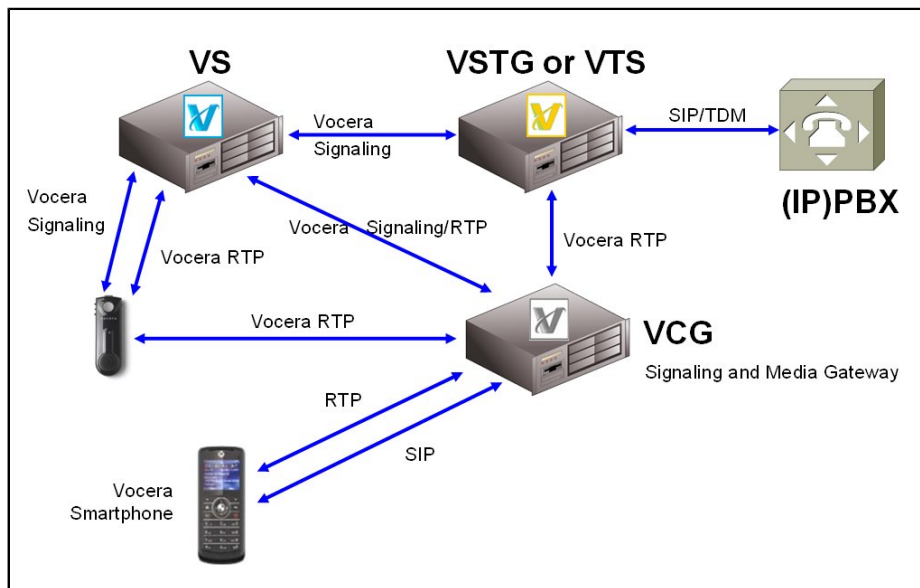
## Preparing the Vocera Client Gateway

This chapter describes the Vocera Client Gateway architecture, lists system requirements, and describes tasks and procedures to perform before you install Vocera Client Gateway.

### Vocera Client Gateway Architecture

Vocera Client Gateway supports Vocera smartphones, providing a signaling and multimedia gateway from the phones to the Vocera Server for all calls. Vocera Client Gateway also provides a tunnel for application data between the Vocera smartphone and the Vocera Server. All communication between the Vocera Server and the Vocera smartphone is done through the Vocera Client Gateway.

**Figure 12. Vocera Client Gateway architecture**



---

## Location Service

How does the Vocera system locate Vocera smartphones on the network? Vocera Client Gateway maintains a registry of Vocera smartphones, mapping their MAC addresses to call signaling addresses. A call signaling address is an IP address and port on which a device listens for SIP messages. The Vocera smartphone registers itself with the gateway when it boots up or changes its IP address due to subnet roaming. It also periodically registers with the gateway as a keep alive mechanism.

If you install multiple VCG servers (see [Installing Multiple Vocera Client Gateway Servers](#) on page 88), you can configure Vocera smartphones to support registration with multiple servers. Whenever the smartphone needs to register with a VCG (such as at boot-up or when the connection with the previously associated VCG fails), it randomly selects one of the VCG IP addresses from the complete list it has been configured with. If registration at that VCG fails, the smartphone randomly selects one of the remaining VCG IP addresses from the list. The smartphone attempts to connect to all of the VCGs in random fashion until it achieves a successful connection. If a successful connection is not achieved after trying the entire list of VCG servers, the smartphone will wait 10 seconds before beginning the registration process again.

---

## Vocera Client Gateway Deployment Scenarios

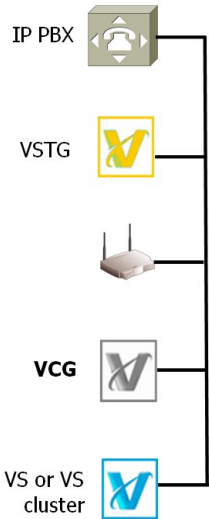
With the high availability features provided for Vocera Client Gateway, there are several deployment scenarios to choose from based on whether your enterprise fully takes advantage of these features, and also based on the following factors:

- number of Vocera sites
- capital budget limits

### *Single Site Scenarios*

The simplest single site deployment scenario has one Vocera Server connected to one VCG. This scenario does not take advantage of any high availability features, such as redundancy and scalability.

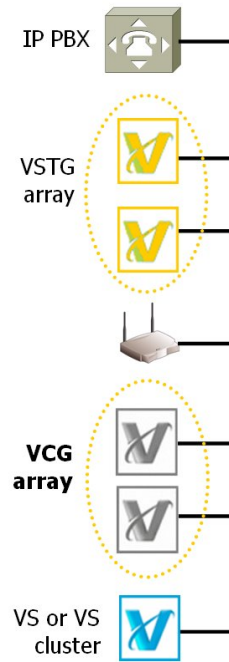
Figure 13. Single Site Scenario with 1 VCG



Summary	
Sites:	1
High Availability:	No

To add VCG high availability to a single site Vocera system, an array of VCG servers can be installed. This scenario provides redundancy and scalability.

**Figure 14. Single Site Scenario with a VCG Array**



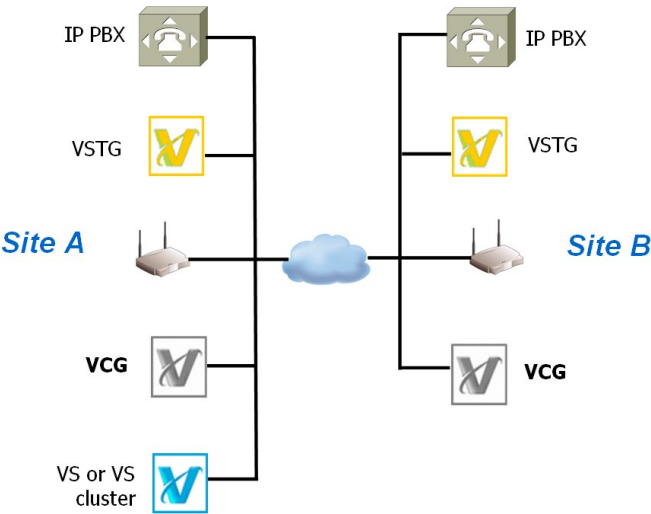
Summary	
Sites:	1
High Availability:	Yes

## Multiple Site Scenarios

If your Vocera system has multiple sites, you can install a VCG at each site, or install multiple VCGs at each site for redundancy. As long as you have multiple VCGs deployed, you can take advantage of high availability features.

The following multiple site scenario shows only one VCG installed at each site. This scenario lacks VCG redundancy unless smartphones are configured to connect to the VCGs at both sites.

Figure 15. Multiple Site Scenario Using 1 VCG at Each Site

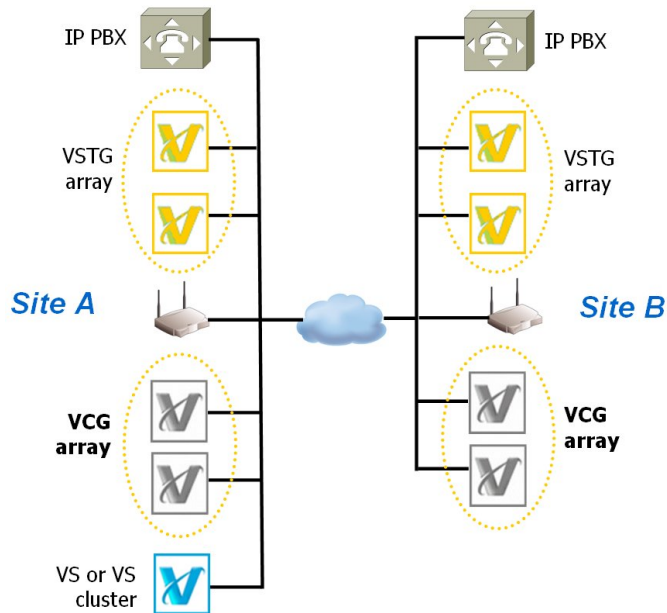


Summary	
Sites:	Multiple
High Availability:	No, unless smartphones are configured to connect to both VCGs across the WAN

The following multiple site scenario represents the best practice for high availability support. It has arrays of VCG servers installed at each site.

**Important:** If you want to restrict Vocera smartphones to use only the VCGs installed at a particular site and thereby reduce smartphone traffic across the WAN, you will need to configure phones manually rather than use Motorola Mobility Services Platform (MSP) to configure them over the air. For more information about configuring Vocera smartphones, see the separate *Vocera Smartphone Configuration Guide*.

**Figure 16. Multiple Site Scenario Using VCG Server Arrays**



Summary	
Sites:	Multiple
High Availability:	Yes

## Installing Multiple Vocera Client Gateway Servers

You can install up to 4 Vocera Client Gateway servers for your Vocera system. By installing an array of Vocera Client Gateway servers, you can take advantage of the following high availability features:

- **Redundancy** – If one of the VCG servers stops responding, Vocera smartphones automatically connect with another available VCG server for uninterrupted service.
- **Scalability** – You can install multiple VCG servers to increase smartphone calling capacity.

For more information about Vocera Client Gateway deployment scenarios, see [Vocera Client Gateway Deployment Scenarios](#) on page 84.



**Important:** Vocera recommends using the same configuration settings (specified in the **vgwproperties.txt** file) on each Vocera Client Gateway server in the array. This results in consistent settings for ports, logging, jitter buffer, and jitter tolerance. For more information about Vocera Client Gateway configuration, see the *Vocera Telephony Configuration Guide*.

---

## Checklist for Preparing the Vocera Client Gateway

Before you install Vocera Client Gateway software, make sure the server computer itself is configured properly:

<input type="checkbox"/>	<p>1. Log in to the Vocera Client Gateway computer using an account with administrator privileges. This account should also use the default system locale, which was specified when Windows was installed on the computer.</p> <p>To view and change an account's locale settings, choose <b>Start &gt; Settings &gt; Control Panel &gt; Regional Options</b>. For more information about locales, refer to your Windows documentation.</p>
<input type="checkbox"/>	<p>2. Make sure the Windows Installer service is enabled. See <a href="#">Enabling Windows Installer</a> on page 63.</p>
<input type="checkbox"/>	<p>3. Make sure the Windows Update software does not apply updates automatically. See <a href="#">Configuring Windows Update</a> on page 65.</p>





## Preparing the Vocera Report Server

This chapter describes system requirements and tasks to complete before you install the Vocera Report Server.

**Important:** If you are upgrading from an earlier version of the Vocera Report Server, see [Upgrading the Vocera Report Server](#) on page 43 before you install the latest Vocera software.

---

### Preparing the Vocera Server

Before you begin installing the Vocera Report Server software, perform the following task on the Vocera server (not the Vocera Report Server):

***To prepare the Vocera server:***

1. Upgrade the Vocera Server to version 4.2.

For upgrade instructions, see [Performing an Upgrade](#) on page 29.

2. Start the Vocera Server Administration Console and log in.

3. Click **System**.

4. On the **License Info** tab, enter the IP address of the Vocera Report Server in the **Report Server IP Address** field.

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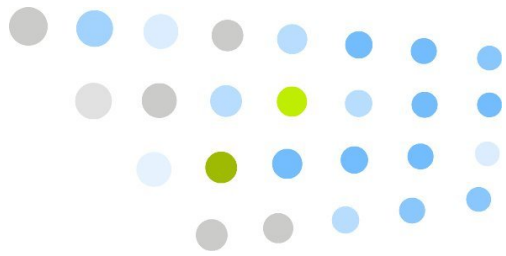
## Preparing the Report Server

Before you install Vocera Report Server software, make sure the server computer itself is configured properly:

- Log in to the Vocera Report Server computer using an account with administrator privileges. This account should also use the default system locale, which was specified when Windows was installed on the computer. Otherwise, reports may not be formatted as designed.

To view and change an account's locale settings, choose **Start > Settings > Control Panel > Regional Options**. For more information about locales, refer to your Windows documentation.

- Make sure the Windows Installer service is enabled. See [Enabling Windows Installer](#) on page 63.
- Optionally disable Internet Information Server (IIS), the default web server for Windows Server 2003. See [Disabling IIS](#) on page 64.
- Make sure the Windows Update software does not apply updates automatically. See [Configuring Windows Update](#) on page 65.



## Preparing the Vocera Telephony Server

The following topics present concepts to understand and tasks to perform before you install and configure Vocera Telephony hardware and software.

- **About Vocera Telephony** on page 93 describes the major components, features, and benefits of a Vocera telephony integration.
- **Vocera Telephony Server Deployment Scenarios** on page 95 describes several different scenarios for deploying Vocera Telephony Server at one site or multiple sites, taking into account telephony sharing, redundancy, scalability, and load balancing.
- **Hardware for the Analog Integration** on page 95 describes the boards and cables required for an analog telephony integration.
- **Hardware for the Digital Integration** on page 98 describes the boards and cables required for a digital telephony integration.
- **Advance Preparation for Telephony** on page 100 outlines tasks to perform for a smooth telephony integration.

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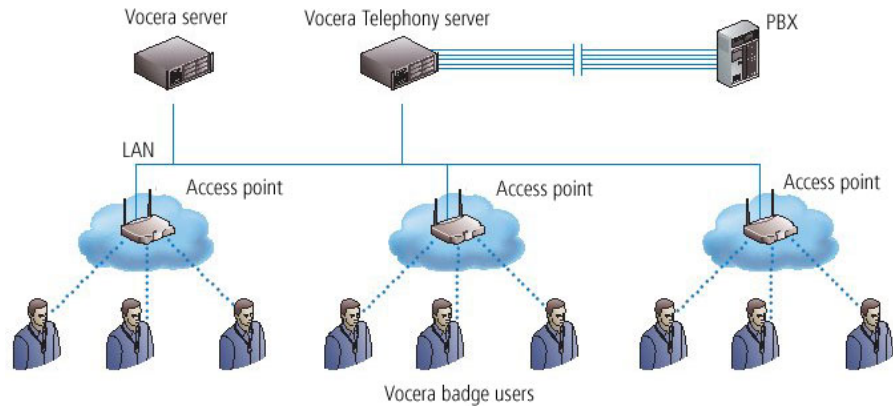
### About Vocera Telephony

The Vocera telephony integration includes the following major components:

- The Vocera Telephony Server, the software supporting the telephony integration.
- One or more Intel® Dialogic® Boards, the hardware supporting the telephony integration. You install these boards in the computer running the Vocera Telephony Server. The drivers for these boards are installed when you install the Vocera Telephony Server.
- The company PBX (or switch, or other telephone system). The PBX provides a group of lines that connect to the public telephone network. You connect the Dialogic boards to the PBX through specially-prepared cables that patch to analog or digital station ports on the PBX.

The following figure shows the Vocera Telephony Server and the Vocera Server installed on different computers. Because you must physically connect the Dialogic boards in the Vocera Telephony Server computer to the PBX, it is often most convenient to place the Vocera Telephony Server computer in the PBX room and to place the Vocera Server computer in a network closet or a similar location for an analog integration.

**Figure 17. Vocera Server and Vocera Telephony Server installed on separate computers**



## Vocera Telephony Server Benefits

See [Vocera Telephony Software Benefits](#) on page 69 for a list of Vocera SIP Telephony Gateway and Vocera Telephony Server benefits.

## Outgoing Calls

When the Vocera server receives an outgoing call request, it passes the dialing sequence to the Telephony server, which performs the call setup. The Dialogic card connects to the PBX or other telephone system and dials the outgoing call.

Once a call is established, badges participating in the call communicate directly with the Telephony server without going through the Vocera server.

## Incoming Calls

The Dialogic cards answer incoming calls under the control of the Vocera Telephony Server, which routes the calls to the Vocera Server. On the Vocera Server, the Genie prompts the caller for the name of a user or group. The Vocera Server then attempts to route the call to the appropriate badge:

- If the badge user is available, the badge communicates with the telephone through the Vocera Telephony Server, without going through the Vocera Server.
- If the badge user is not available, the Vocera Server checks the forwarding option for the user or group and processes the call accordingly.

If a call cannot be forwarded, the Genie invites the caller to leave a message.

### *Vocera Telephony Server Startup*

The first time you start the Vocera Telephony Server, it connects to the Vocera Server and downloads configuration information. The Vocera Telephony Server uses this information to initialize and start the Dialogic software, which takes several minutes. It then creates the **\vocera\dialogic\configuration.txt** file to cache this information.

The Vocera Telephony Server can lose its connection to the Vocera Server for a number of reasons. For example, when a failover occurs, the Vocera Server restarts and the Vocera Telephony Server connects to a new Vocera Server. The Vocera Telephony Server will also lose its connection during a Vocera Server backup, restore, or other planned outage that causes it to stop and restart.

When the Vocera Telephony Server loses its connection to the Vocera Server, it resets its channels and attempts to connect to the same Vocera Server or another one in its cluster list. After establishing a connection to a Vocera Server, the Vocera Telephony Server downloads configuration information from it and compares it to the information in **configuration.txt**.

If the configuration has not changed, the Vocera Telephony Server is ready and can begin processing calls with the Vocera Server immediately. If the configuration has changed, the Vocera Telephony Server must reinitialize the Dialogic software and restart it, as it does during the initial configuration.

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## **Vocera Telephony Server Deployment Scenarios**

Vocera Telephony Server supports the same deployment scenarios as Vocera SIP Telephony Gateway. For more information, see [Telephony Deployment Scenarios](#) on page 73.

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## **Hardware for the Analog Integration**

The hardware you need to integrate Vocera with your PBX differs according to whether you perform an analog or a digital integration. This section describes the hardware you need to perform an analog integration.

## *Analog Telephony Boards*

You can use *only* the following telephony boards to perform an analog integration of your PBX and Vocera:

- **Intel® Dialogic® D/120JCT-LSU** 12-port board.
- **Intel® Dialogic® D/41JCT-LS** 4-port board.
- **Intel® Dialogic® D/120JCT-LSU-EU2** 12-port analog Euro board.
- **Intel® Dialogic® D/41JCT-LS-EURO** 4-port analog Euro board.
- **Intel® Dialogic® D/41JCTLSEW** 4-port analog PCI Express board.
- **Intel® Dialogic® D/120JCTLSEW** 12-port analog PCI Express board.

The telephony board and the Telephony server computer must be compatible:

- Most new boards have a universal dual-keyed connector that fits into slots in new servers. Older boards may have a single-keyed connector that is not compatible with new slots, because the key is at the wrong end of the board.
- All boards are 12.3 inches long (without the edge retainer), 3.87 inches high (without the edge connector), and .79 inches wide (single-slot width). They require full-length and full-height PCI, PCI-X, or PCI Express slots. They are not compatible with smaller form factors.

## *Analog Telephony Cables*

This section describes the cables required to use all 12 ports of an Intel Dialogic D/120JCT-LSU analog telephony board. A four-port board requires proportionally fewer cables.

Each Dialogic card provides six RJ11 jacks with RJ14 pin-outs. Because each jack provides two station lines, each Dialogic card can support a total of 12 station lines.

To connect the Dialogic card to the PBX, you need to do either of the following:

- Procure line splitters and telephone cables.

Procure six line splitters and 12 telephone cables for each Dialogic card (fewer if you are not using every line on the card)

- Manually prepare CAT 5 cables with crimped ends.

Procure three CAT 5 cables and 18 RJ11 plugs for each Dialogic card (fewer if you are not using every line on the card)

If you use line splitters, they need to do the following:

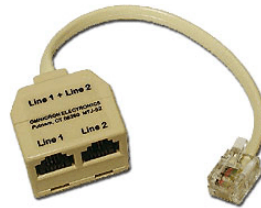
- Split a two-line RJ11 jack (with an RJ14 pin-out) into two separate one-line RJ11 jacks (with RJ11 pin-outs).



- Provide a short “pig-tail” so multiple splitters can fit next to each other in the Dialogic card.

For example, you can use the Omnicron Electronics MTJ-S2 splitter, or any comparable RJ11 line one/line two splitter, as shown in the following illustration:

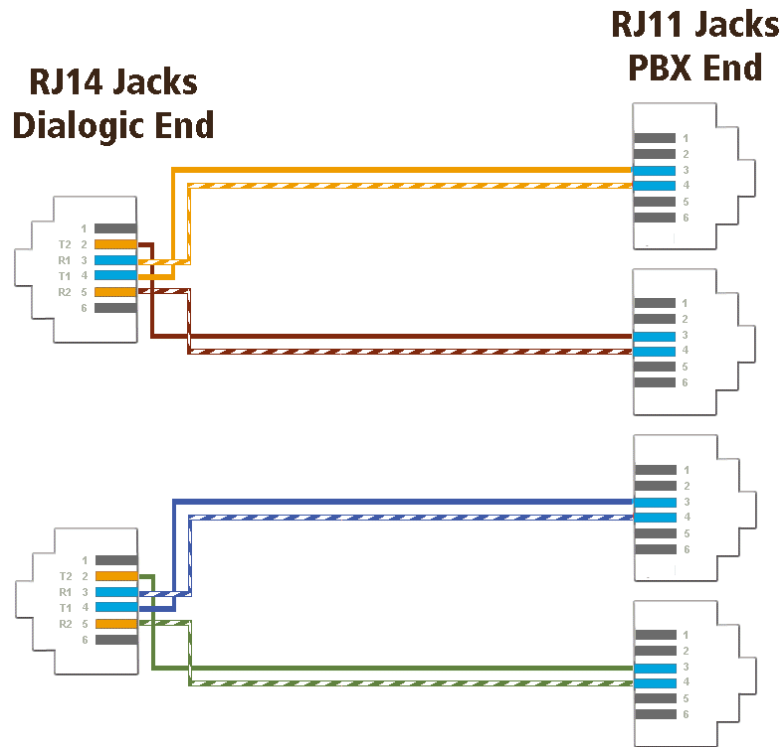
**Figure 18. Omnicron Electronics MTJ-S2 splitter**



If you manually prepare the cables, you can find the exact RJ14 pin-out configuration in the Dialogic documentation that comes with the card. You need to provide two plugs on the Dialogic end of the CAT 5 cable, and four plugs on the PBX end of the cable.

The following illustration summarizes the pin configuration of the jacks. You need to use the **inner** pair of wires in each jack for the first line and the **outer** pair of wires in each jack for the second line.

**Figure 19. Analog pin configuration of RJ14/RJ11 jacks**



On the PBX side, you may connect your cables directly to the analog station card or to an RJ11 patch panel that is connected to the analog station card.

## Hardware for the Digital Integration

The hardware you need to integrate Vocera with your PBX differs according to whether you perform an analog or a digital integration. This section describes the hardware you need to perform a digital integration.

### Digital Telephony Boards

You can use *only* the following telephony boards to perform a digital integration of your PBX and Vocera:

- **Intel® Dialogic® D/240JCT-T1** board
- **Intel® Dialogic® D/480JCT-2T1** board.
- **Intel® Dialogic® D/480JCT-1T1** board.
- **Intel® Dialogic® D/600JCT-1E1** board.

- **Intel® Dialogic® D/240JCTT1EW** PCI Express board.
- **Intel® Dialogic® D/480JCT1T1EW** PCI Express board.
- **Intel® Dialogic® D/480JCT2T1EW** PCI Express board.

Use the following table to determine which telephony board to procure for your system:

**Table 7. Selecting a telephony board**

If your PBX protocol is:	And you want up to this many DS0 channels:	Procure one of these telephony boards:
Wink Start	24	D/240JCT-T1 D/240JCTT1EW D/480JCT1T1EW
Wink Start	48	D/480JCT-2T1 D/480JCT2T1EW
ISDN-PRI	23	D/480JCT-1T1 D/480JCT1T1EW D/480JCT2T1EW
ISDN-PRI	30	D/600JCT-1E1

The telephony board and the Telephony server computer must be compatible:

- Most new boards have a universal dual-keyed connector that fits into slots in new servers. Older boards may have a single-keyed connector that is not compatible with new slots, because the key is at the wrong end of the board.
- All boards are 12.3 inches long (without the edge retainer), 3.87 inches high (without the edge connector), and .79 inches wide (single-slot width). They require full-length and full-height PCI, PCI-X, or PCI Express slots. They are not compatible with smaller form factors.

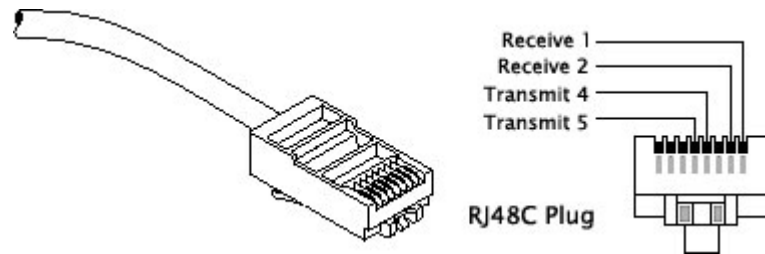
*Digital Telephony Cables*

Connect the T1 board in the PBX to the Dialogic card in the Telephony server. The cable must have an RJ48C plug on the Dialogic end. Looking into the connector, the pin configuration of the RJ48C plug is as follows:

- Pins 1 and 2: Receive from PBX

- Pins 4 and 5: Transmit to PBX
- Other pins: Unused

**Figure 20. RJ48C plug**



At the PBX end, the type of connector and cabling requirements for individual switches may vary. Work with the IT manager responsible for the telephone system to procure the specific type of cable the PBX requires.

---

## Advance Preparation for Telephony

Preparation is the key to a successful telephony integration. Complete the tasks described in this section before beginning the integration.

**Note:** You typically need to work with the IT or PBX administrator responsible for the installation site.

### *Investigating the Installation Site*

Because the Telephony server needs to be in proximity to the PBX for an analog integration, you need to understand the physical layout of the installation site before you begin. Complete the following tasks to understand the installation site requirements for an analog integration:

1. Find out if the computer hosting the Vocera server will be located in proximity to the PBX.

The IT administrator may want to place the Vocera server computer in a network closet or another location that is not physically close to the PBX. In this situation, you need to host the Telephony server on a separate computer, because the Dialogic cards must physically connect to the PBX. Ideally, an RJ11 patch panel should be set up next to the computer.

2. Make sure a network drop is available in the PBX room, because the Telephony server computer requires an IP connection to the LAN.

## Procuring Equipment

Complete the following tasks to make sure you have the equipment necessary for the integration:

1. Procure a computer for the Telephony server. See [Investigating the Installation Site](#) on page 100.
2. Consult with the IT administrator to make sure that the desired number and type (either analog or digital) of station ports are available on the PBX.  
If the ports are not available, you will probably need to procure a new PBX-specific card and install it in the PBX.
3. Procure the required number of Dialogic boards, described in [Analog Telephony Boards](#) on page 96 and [Digital Telephony Boards](#) on page 98.  
If possible, try to have a back-up board available. Telephony boards are complex, and they are sometimes defective. In some situations, only certain ports may be bad.
4. Prepare or procure the cables and adapters that you need to connect the Dialogic cards and the PBX. See [Analog Telephony Cables](#) on page 96 and [Digital Telephony Cables](#) on page 99.

## Configuring the PBX

Before installing any hardware or software, you need to configure the PBX to support the Vocera system. If you are performing an analog integration, you should also test the PBX configuration. Testing the PBX configuration before integrating Vocera helps to isolate problems that may arise later.

The configuration tasks differ according to whether you are performing an analog or a digital integration. After completing the tasks in this section, you can continue with the next step in the telephony integration, as described in [Hardware for the Analog Integration](#) on page 95.

### **To configure the PBX for an analog integration:**

In analog telephony, a hunt group is a cluster of lines that have individual extensions. The hunt group number is a separate extension you assign to the cluster. People can then call the hunt group number and have their call routed to an individual extension.

1. Work with the IT or PBX administrator to configure the PBX to provide a hunt group with an extension for each line in your telephony license. Callers can dial the hunt group number to connect to any user with a Vocera badge.

Configure the hunt group to use the “first available line” search method. The hunt group should roll over from one line to another in a sequential fashion when lines are busy, always starting with the first line in the group. Record the list of extensions in the group for customer reference and troubleshooting.

2. Set up a DID (Direct Inward Dialing) number for the first extension in the hunt group.
3. Configure each extension in the hunt group to **drop loop current** to notify the Telephony server when a disconnect at the remote end occurs.

**Important:** Unless you configure each extension to drop loop current upon remote hang-up, the Dialogic card will not know that the party on the far end has ended the call, and erratic behavior will result. The method of configuring loop current drop is PBX vendor-specific. If the PBX at the installation site does not support loop current drop, see [Creating a Tone Set File](#) on page 169.

4. Prior to connecting to the Dialogic card, use a telephone to test each station port in the PBX. Check both incoming and outgoing calls, and make sure the hunt group works properly.

***To configure the PBX for a digital integration:***

You must configure the software for your PBX to allow its T1 card to communicate with the Telephony server. The lines within the T1 trunk used by Vocera do not have individual extensions, as they do in an analog integration. In a digital integration, you assign an access code to the trunk itself, and the PBX uses that code to access the first available channel in the trunk. Depending on the switch, this configuration may be called a trunk steering code, a coordinated dialing plan, a uniform dialing plan, or a phantom extension.

The specific steps necessary for configuring your PBX vary with the type of switch in use at your site. This section provides an overview of the PBX configuration necessary for a digital integration.

1. Work with the PBX administrator to install a T1 card in the PBX and to configure it with the switch software.
2. Work with the PBX administrator to assign a Vocera access code to the trunk, and to associate a DID (Direct Inward Dialing number for the Vocera trunk.
3. Configure the T1 card in the PBX so it provides the master clock for the Dialogic board.

A 1.544 Mhz clock synchronizes the PBX and the Dialogic card. The T1 card in the PBX must be the master clock source.

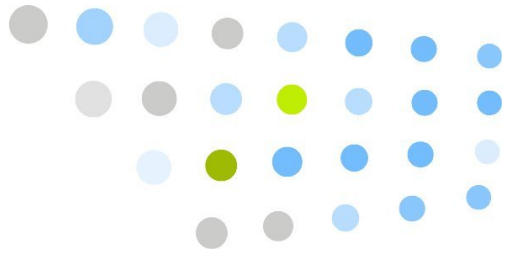
4. Provide a Direct Inward Dialing (DID) number to allow individuals to call into the Vocera system. This DID number provides functionality that is similar to an analog hunt group.

**Important:** If your system has Vocera Access Anywhere licenses and you are using ISDN signaling protocol with a digital PBX, provide **two** DID numbers to call into the Vocera system. The additional number will be used for direct access to the Vocera Genie for users who are assigned the Vocera Access Anywhere license.

Unless you have T1 digital test equipment, you cannot test the PBX setup until you install the Dialogic board and connect it to the T1 board in the PBX. See [To connect the cables for a digital integration](#) on page 164.







## Installing Vocera Voice Software

The following topics explain how to install the Vocera Voice software:

- **Running the Vocera Installation Program** on page 107  
Describes how to install Vocera Voice software using the Vocera installation program.
- **Using the Vocera Control Panel** on page 109  
Describes using the Vocera Control Panel to control Vocera and to display of system messages.
- **Installing the Vocera QoS Manager Service** on page 117  
Describes how to install the Vocera QoS Manager service to prioritize Vocera voice packets on the network.
- **Removing a Vocera Voice Server** on page 119  
Describes how to uninstall Vocera Voice software.





## Running the Vocera Installation Program

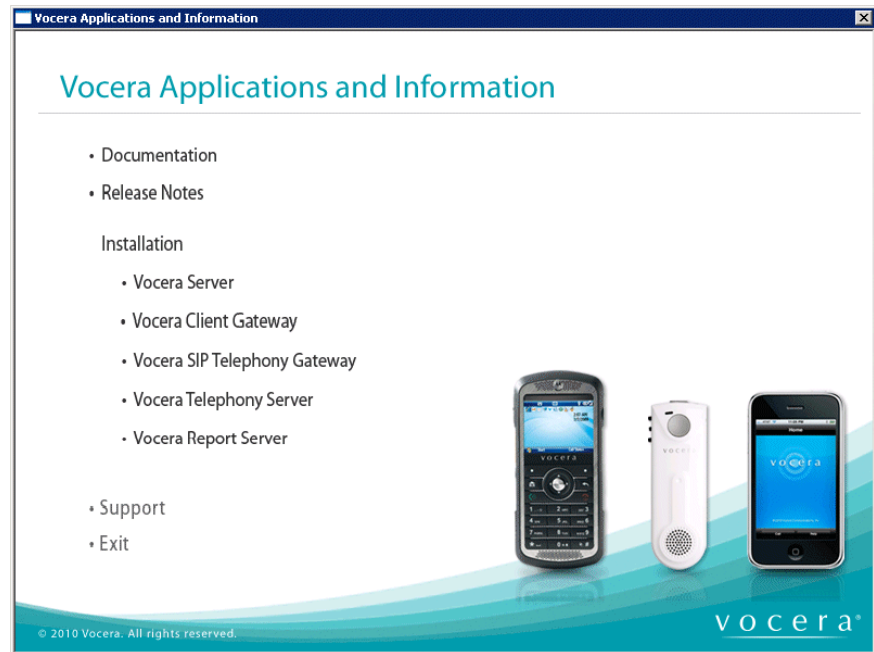
This chapter describes how to install Vocera Voice software.

### ***To install the Vocera Voice software:***

1. Log in to the computer with administrator privileges.
  2. **Electronic Software Distribution:** Navigate to the folder where you extracted the contents of the Vocera ISO file, and run the **vocera.hta** file. For details on downloading the software, see [Electronic Software Distribution](#) on page 14.
- DVD Media:** Insert the Vocera Software DVD in the drive. The main installation screen appears automatically. If this screen does not appear, run the **vocera.hta** at the root of DVD.

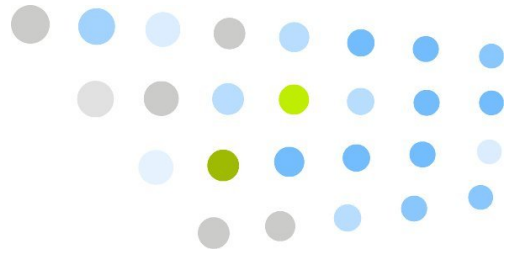


**Figure 21. Vocera main installation screen**



3. Click the Vocera Voice product to install.
4. On the Welcome screen, click **I Agree** to continue with the installation program.  
The Available Features screen appears.
5. Check the features that you want to install and click **Next**.
6. Continue following the prompts in the installation program.  
Use the **Help** button on any screen for further information.  
Click **Install** on the final installer screen to install the software.
7. If you install Vocera Server or Vocera Report Server and Internet Information Services (IIS) is enabled, the installer prompts you to disable its services.  
Choose **Yes** to disable IIS and continue installing.
8. When you are finished, select **Yes, I want to restart my computer now**, and click **Finish**.

**Note:** If you install Vocera Gateway Client, be sure to update the Windows environment variable on each VCG. For more information, see [Updating Site Awareness for the Vocera Client Gateway](#) on page 149.



## Using the Vocera Control Panel

This chapter describes how to use the Vocera system tray icon to display the Vocera Control Panel, which lets you control the server.

---

### About the Vocera System Tray Icon

When the Vocera Server, Vocera Telephony Server, Vocera SIP Telephony Gateway, or Vocera Client Gateway server starts running, the Vocera system tray icon appears in the server notification area at the right of the taskbar.

**Figure 22. System tray**




You can use the Vocera system tray icon to start the Vocera Control Panel for your user session. The Vocera Control Panel displays status messages and lets you control the server.

**Note:** Windows 2008 R2 systems may require additional configuration to add the Vocera Control Panel system tray options to the notification area. For details about these configuration requirements, see [Change how icons appear in the notification area](#)<sup>1</sup>.



The Vocera system tray icon is either blue or gray depending on the status of the server:

**Table 8. Vocera system tray icons**


Icon	Description
	The server is running. You can use the Vocera system tray icon to start the Vocera Control Panel.

---

<sup>1</sup> <http://windows.microsoft.com/en-us/windows7/change-how-icons-appear-in-the-notification-area>

Icon	Description
	The server is not running. You can use the Vocera system tray icon to start the server.
	The server is processing a stop or start request.


### ***To display the Vocera Control Panel:***

- Right-click the Vocera system tray icon , and select the following command appropriate for your server:
  - Vocera Server = **Vocera Control Panel**
  - Vocera Telephony Server = **VTS Control Panel**
  - Vocera SIP Telephony Gateway = **VSTG Control Panel**
  - Vocera Client Gateway = **VCG Control Panel**

The Control Panel window appears on the desktop.

**Note:** On the Vocera Server, a Command Prompt window called **Vocera Launcher Console** also appears. It displays status messages as Vocera processes are started and stopped.

### ***To start up the server:***

- Right-click the gray Vocera system tray icon , and select the following command appropriate for your server:
  - Vocera Server = **Start Vocera**
  - Vocera Telephony Server = **Start VTS**
  - Vocera SIP Telephony Gateway = **Start VSTG**
  - Vocera Client Gateway = **Start VCG**

The Control Panel window appears on the desktop.

---

## **Displaying Vocera Control Panel Help**

The Vocera Control Panel has online help that displays in your browser.

### ***To display Vocera Control Panel help:***

- Choose **Help > Contents**.

The help opens in your browser.

---

## Vocera Control Panel Menus

The Vocera Control Panel has the following menus:

**Table 9. Control Panel menus**

Menu	Command	Description	Servers
Run	Start	Starts the server.	VS, VTS, VSTG, VCG
	Stop	Temporarily suspends the server.	
	Shutdown	Shuts down the server.	
Display	Normal	Displays only the most significant system events. This is the default.	VS only
	Detailed	Displays all events.	
	Off	Displays no events.	
Cluster	Start Standalone	Temporarily removes a Vocera Server from a cluster and restarts it as a standalone system.	VS only
	Failover	Fails over to the standby Vocera Server, or restarts the server if it's currently in standby.	
Server	IP Address(es)	Specifies the Vocera Server IP address(es) used by the server.	VTS, VSTG, VCG
Help	Contents	Displays online help.	VS, VTS, VSTG, VCG
	About	Displays version information.	

---

## Determining the Status of the Server

The Vocera Control Panel provides a status indicator below the menu bar at the top of the screen. The indicator displays one of the following states to tell you whether the server is available for use:

**Table 10. Control Panel status**

Status	Description
● Active	The server is running and available for use. A standalone Vocera Server is always active unless you have stopped it. A Vocera Server that is part of a cluster is active when it is the primary machine, unless you have stopped it.
● Standby	The server is running but is not available for use. A Vocera Server that is part of a cluster is in the standby state when it is one of the secondary machines.

## Stopping and Restarting the Server

In certain situations, you may need to stop and restart the server. For example, if you want to update the properties in all your badges at the same time, you must stop the Vocera Server and then restart it.


You may want to restart the server when only a few people are using the system. When the server is stopped, clients are unable to connect and communication is temporarily suspended:

- When the Vocera Server is stopped, users cannot communicate with their badges.
- When the Vocera Telephony Server or Vocera SIP Telephony Gateway is stopped, users cannot place or receive phone calls.
- When the Vocera Client Gateway is stopped, users cannot communicate with the Vocera Connect app or with Vocera Smartphones.


The server stops and starts fairly quickly, so if few people are using the system, there will be very little interruption.

**Note:** You can also use the Server page of the **Maintenance** screen in the Administration Console to stop and start the Vocera Server.

### **To stop and restart the server:**

1. In the Vocera Control Panel, choose **Run > Stop**, or click .

The Control Panel displays messages indicating that the server has stopped.

2. Choose **Run > Start**, or click .

The Control Panel displays messages indicating that the server has started.



---

## Controlling the Display of Events

On the Vocera Server, the Vocera Control Panel displays a continuously scrolling list of system events, letting you view the system status at a glance. You determine the level of detail that the Control Panel displays through settings that you make in the menus. You can specify any of the following settings on the **Display** menu of the Vocera Control Panel:

- **Normal** displays only the most significant system events in the Control Panel. This is the default.
- **Detailed** displays all events in the Control Panel.
- **Off** displays no events in the Control Panel.

Vocera records all system events in the system log files, regardless of the setting you make for the display of events.

---

## Using the Cluster Menu

On a Vocera Server that is part of a cluster, the Vocera Control Panel has a **Cluster** menu that lets you control the cluster. For example, you may want to force a failover when you add a new machine to a cluster, or you may want to start one of the machines as a standalone Vocera Server.

The **Cluster** menu provides the following commands:

**Table 11. Cluster menu commands**

Command	Description
<b>Start Standalone</b>	<p>Temporarily removes a Vocera Server from a cluster and restarts it as a standalone system. This command <i>does not</i> break up a cluster or cause a failover to occur; instead, it allows you to disconnect a server from a cluster temporarily for maintenance.</p> <p>The exact behavior of this command depends upon the state of the server at the time that you stopped it:</p> <ul style="list-style-type: none"> <li>• If the Vocera Server was <i>active</i> and badges were connected to it, the badges reconnect when you start the node as a standalone system.</li> <li>• If the Vocera Server was in <i>standby</i> mode, it restarts as an active standalone server, and it does not interfere with the active node of the cluster in any way.</li> </ul> <p>The <b>Start Standalone</b> command is available only when the Vocera Server is stopped. See <a href="#">Stopping and Restarting the Server</a> on page 112 for more information about stopping the server.</p> <p>The Cluster Setup page on the System screen in the Administration Console does not get updated when you execute the <b>Start Standalone</b> command. That is, the <b>Enable Cluster</b> checkbox remains selected, all the servers remain in the list, and the status of the servers in the list does not change.</p> <p>When you restart a standalone server, it goes into discovery mode and comes online as a cluster node in the same state—active or standby—it was in prior to becoming a standalone server.</p> <p>You can restart a standalone server with either the <b>Failover</b> command in its Vocera Control Panel or the <b>Force Restart</b> button on the Cluster Setup page of its Administration Console. See <a href="#">Starting a Standalone Server</a> on page 138.</p>

Command	Description
<b>Failover</b>	<p>Does one of the following, depending on the status of the Vocera Server:</p> <ul style="list-style-type: none"><li>• If the server was <i>active</i>, this command causes control of the cluster to fail over to one of the standby machines.</li><li>• If the server was in <i>standby</i> mode, this command restarts the server, but does not cause control of the cluster to fail over.</li><li>• If the server was running as a standalone server, this command restarts the server as a cluster node in the same state—active or standby—it was in prior to becoming a standalone server.</li></ul>

If failover occurs in a clustered environment, the control panel opens to the the active server instance.

See [Controlling a Cluster](#) on page 136 for complete information about clusters.

---

## Changing the Vocera Server IP Address

The Vocera Telephony Server, Vocera SIP Telephony Gateway, and Vocera Client Gateway need to know the IP address(es) of the Vocera Server. You enter this IP address(es) when you install the software. However, you can use the Vocera Control panel to change the address.

### ***To change the Vocera Server IP address used by the server:***

1. In the Vocera Control Panel, choose **Server > IP Address(es)**.

The IP Address dialog box appears.

2. Use the **Server IP Address** field to provide the address of the Vocera Server.

Enter the numeric IP address using dot notation. For example:

**192.168.15.10**

For a Vocera Server cluster, enter a comma-separated list of IP addresses. For example:

**192.168.15.10,192.168.15.11,192.168.15.12**

3. Click **OK**.

The dialog box closes, and the server begins using the new Vocera Server IP address immediately.

---

## Shutting Down the Server

When you shut down the server, you stop the Vocera server and all its related services. In the case of the Vocera Server, this includes MySQL, Tomcat, Apache Web Server, and Nuance.

### ***To shut down the server:***

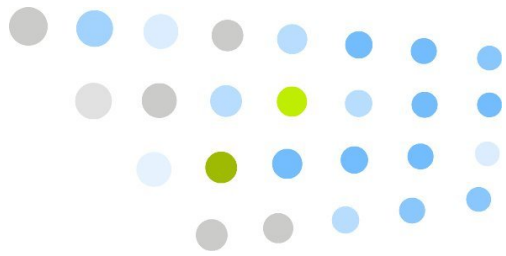
1. In the Vocera Control Panel, choose **Run > Shutdown**.

A confirmation dialog box appears.

2. Click **OK**.

The dialog box closes, and the Control Panel also closes.

If you shut down the Vocera Server, the launcher Command Prompt window displays messages indicating that Vocera and its related services are stopping. When all Vocera services have stopped, the Command Prompt window closes.



## Installing the Vocera QoS Manager Service

The Vocera QoS Manager service is automatically installed with the Vocera Server, Vocera SIP Telephony Gateway, and Vocera Client Gateway. However, the service requires some configuration after installation to make sure it is started. The Vocera QoS Manager service configures the QoS Packet Scheduler network service with QoS parameters required by Vocera, thereby prioritizing the treatment of Vocera voice packets originating from the server.

When the Vocera QoS Manager service is running, each Vocera voice packet originating from the server is tagged with DSCP Expedited Forwarding (EF). On the network side, switches and routers must be configured to honor DSCP markings. See [WAN QoS](#) in the *Vocera Infrastructure Planning Guide*.

**Important:** To take full advantage of the benefits of Vocera QoS Manager, the QoS Packet Scheduler network service must be installed and enabled on a network connection. The Vocera installer does not install QoS Packet Scheduler for you. You must do that separately. During installation of QoS Packet Scheduler, you will lose your network connection for a moment, and after installation of the QoS Packet Scheduler you will need to restart the computer to make sure all Vocera services are restarted. In a clustered environment, perform these steps on a standby node first.

### ***To install the Vocera QoS Manager service :***

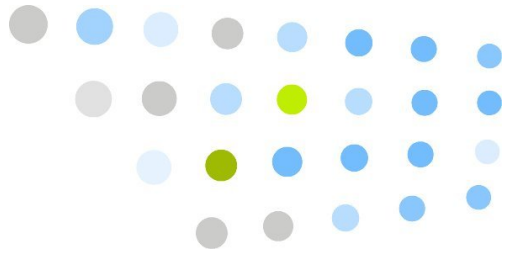
1. Install the Vocera Server, Vocera SIP Telephony Gateway, and Vocera Client Gateway as needed. The Vocera QoS Manager service is installed automatically with these products.
2. Install the QoS Packet Scheduler network service on a network connection. Perform these steps on one computer only, either the Vocera Server, Vocera SIP Telephony Gateway, or Vocera Client Gateway. In a clustered Vocera Server environment, perform the installation on a standby node.
  - a. Log in to the Vocera Server computer with administrator privileges.



- b. Choose **Start > Control Panel > Network Connections**.
- c. Right-click a connection, and choose **Properties**.
- d. Click **Install**, click **Service**, and then click **Add**.
- e. Click **QoS Packet Scheduler**, and then click **OK**.

**Note:** When you install QoS Packet Scheduler on any network connection, it is installed on every local network connection.

3. Restart the computer.
4. Start the Vocera QoS Manager service, and make sure the startup type of the service is Automatic. Perform these steps on each Vocera Server, Vocera SIP Telephony Gateway, and Vocera Client Gateway.
  - a. Choose **Start > Control Panel > Administrative Tools > Services**.  
The Services dialog box appears, displaying the list of installed Windows services.
  - b. Right-click the **Vocera QoS Manager** service and select **Properties**.  
The Vocera QoS Manager Properties dialog box appears.
  - c. In the **Startup type** field, select Automatic.
  - d. Click **Start** to start the service.
  - e. Click **OK** to save the settings and close the Vocera QoS Manager Properties dialog box.



## Removing a Vocera Voice Server

When you uninstall a Vocera Voice server, the installation program removes most of the files in the **\vocera** directory and other directories. The installation program or the Vocera Voice server uses the remaining files when you upgrade.

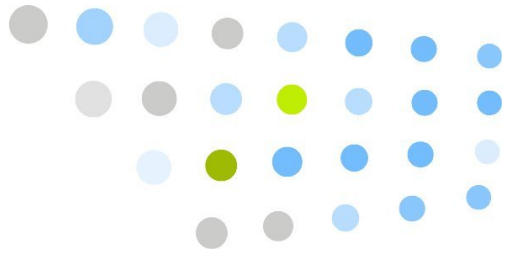
**Important:** Do not remove any remaining Vocera files or directories after you uninstall.

### ***To remove the Vocera Voice server:***

1. Log into the computer with administrator privileges.
2. If you are removing the Vocera Server, back up your data.  
See [Backing up Vocera Data](#) on page 29.
3. If the Vocera Voice server is running, shut it down.  
See [Shutting Down the Server](#) on page 116.
4. For **Windows 2008 R2**, follow these steps:
  - a. Choose **Start > Control Panel > Programs and Features**.
  - b. Select the Vocera Voice software to remove, and then click **Uninstall/Change**.
  - c. A dialog box asks you to confirm the uninstall. Click **Yes**.
5. For **Windows 2003**, follow these steps:
  - a. Choose **Start > Settings > Control Panel > Add or Remove Programs**.
  - b. Select the Vocera Voice software to remove, and then click **Change/Remove**.
  - c. A dialog box asks you to confirm the uninstall. Click **Yes**.
6. When you are finished, select **Yes, I want to restart my computer now**, and click **Finish**.







## Additional Vocera Server Setup

The following topics describe additional Vocera Server setup tasks:

- [Setting Up a Staging Server](#) on page 123  
Describes how to set up a staging server for the Vocera Server to test before installing onto a production server.
- [Setting Up a Vocera Cluster](#) on page 127  
Explains how to set up a cluster to support Vocera in the event of hardware or software failure.
- [Updating the Vocera Server License](#) on page 141  
Describes how to update your Vocera license key.
- [Setting Up Users and Groups](#) on page 143  
Describes how to set up users and groups in the Vocera database after you install the Vocera Server.





## Setting Up a Staging Server

This chapter describes how to set up a Vocera staging server.

---

### About Staging Servers

For mission critical deployments of the Vocera Server, Vocera recommends setting up a staging server to test software and database changes to validate whether they work in your environment before updating your production server. If you purchase a Vocera Enterprise License, Vocera includes an additional 6-seat Enterprise License that can be used to test the server.

A Vocera staging server is excellent for:

- Testing a software upgrade or update
- Learning how to use new features
- Developing a training plan for new features
- Testing badge property network changes
- Testing major database changes to your system
- Testing call flows and forwarding conditions
- Estimating the downtime needed to perform the upgrade on your production system

A Vocera staging server is NOT appropriate for:

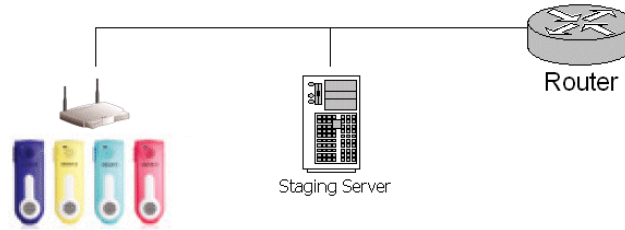
- Infrastructure testing
- Stress testing
- Testing telephony integration
- Testing roaming (unless the staging server connects to the same VLAN as the production server)
- Testing cluster failover
- Moving data back and forth between the staging and production server

## Staging Server Network Architecture

When you set up your staging server, choose from the following network architectures:

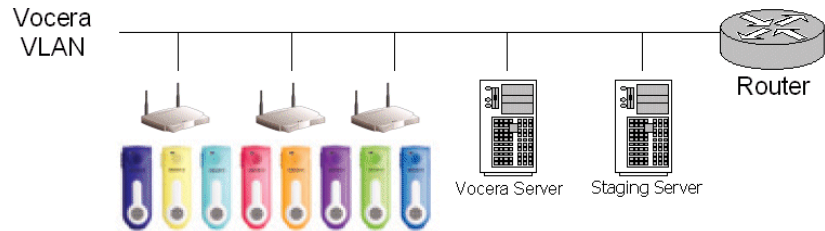
- **Connect to a Standalone AP** – The staging server is connected to its own wireless access point with its own SSID.

**Figure 23. Staging Server with Standalone AP**

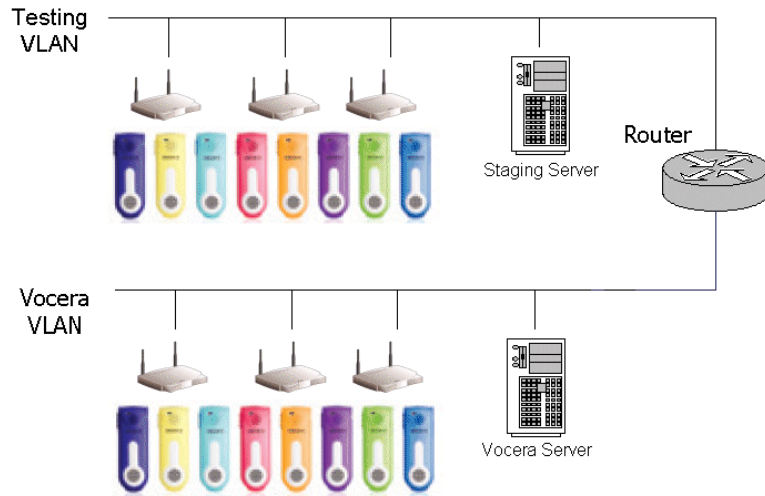


- **Connect to the Production VLAN** – The staging server is connected to the production VLAN using either the same SSID as the production VLAN or a new SSID.

**Figure 24. Staging Server connected to Production VLAN**



- **Connect to a Testing VLAN** – The staging server is connected to a testing VLAN using either the same SSID as the production VLAN or a new SSID.

**Figure 25. Staging Server connected to Testing VLAN**

## Configuring Badges to Connect to the Staging Server

To test the Vocera staging server, you should configure several badges to connect to it. Try to make badge-to-badge calls and test other Vocera functionality.

This section provides a quick summary on how to configure badges to connect to the Vocera staging server. For complete instructions, see the *Vocera Badge Configuration Guide*.

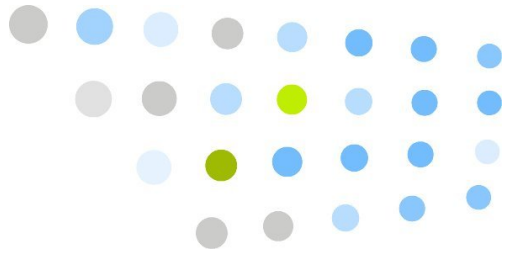
### ***To configure badges to connect to the Vocera staging server:***

1. On the configuration computer, back up the **badge.properties** file located in the **\vocera\config** directory. Name the backup copy **badge.properties.production**. This file contains badge properties used for your Vocera production server.
2. Use the Badge Properties Editor on the configuration computer to set the **Vocera Server IP Address** property to the IP address of the Vocera staging server.
3. Copy the **badge.properties** file from the configuration computer to the Vocera staging server.
4. Restore factory settings on the badges you want to use to test the Vocera staging server.
5. Put fully charged batteries in two badges.

6. Start the Badge Configuration Utility on the Vocera configuration computer.
7. Make sure the badges connect to the Vocera staging server.
8. If the badges are unable to connect to the Vocera staging server or make and receive calls, repeat steps 2 through 6 to make any needed changes to badge properties.
9. On the configuration computer, restore the badge properties for your Vocera production server. Rename the **badge.properties** file located in the **\vocera\config** directory to **badge.properties.staging**. Then rename the **badge.properties.production** file to **badge.properties**.

After you have validated that the Vocera staging server works properly, you can follow the instructions to install or upgrade the Vocera production server.

When the Vocera production server is ready, you can change the **Vocera Server IP Address** property of the test badges to the IP address of the Vocera production server. If the production server is a cluster, enter the IP address of each machine in the cluster, separated by commas, with no spaces.



## Setting Up a Vocera Cluster

This chapter describes how to set up and control a Vocera cluster.

---

### About Vocera Clusters

Some environments require redundancy to support critical applications in the event of hardware or software failure. In such environments, a critical application is installed on two or more computers. The computer controlling the application is called the *active* node, and the other computers are called the *standby* nodes. This redundant combination of active and standby nodes is called a *cluster*.

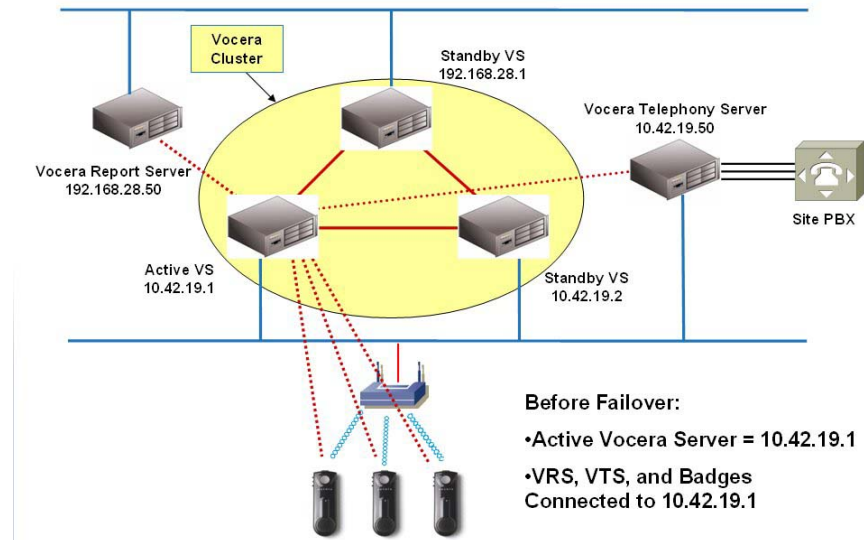
Vocera clustering provides high availability when any of the following events occur:

- The computer hardware fails.
- The Vocera Server fails.
- The Nuance service fails.
- The MySQL service fails.

The cluster's active node controls the Vocera system, but a standby node can take over control of the application if the active node fails. The situation where a standby node takes control from the active node is called a *failover*.

The following figure shows the way that the Vocera Telephony Server, the Vocera Report Server, and badges connect to a Vocera cluster:

**Figure 26. Vocera Cluster before failover**

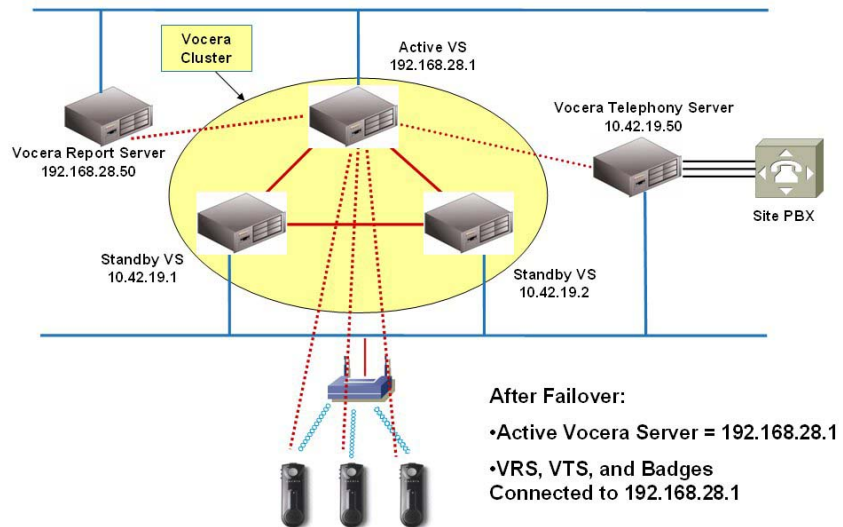


As shown in the above illustration, the badges, the Vocera Telephony Server, and the Vocera Report Server are all associated with **10.42.19.1**, the IP address of the *active* Vocera Server. Similarly, any Administration Console or User Console sessions would also point to the IP address of the active Vocera Server.

Vocera supports a maximum of four cluster nodes (one active node and three standby nodes). Each cluster node maintains its own copy of the Vocera database, the Vocera Report Server log files, and the **badge.properties** file. The cluster synchronizes these files continually.

If a failover occurs, one of the standby nodes becomes active and takes control of the cluster. At that time, the badges, the Vocera Telephony Server, and the Vocera Report Server automatically associate with the IP address of the newly active node, as shown in the following illustration:



**Figure 27. Vocera Cluster after failover**

As shown in the above illustration, Vocera Server nodes, the Vocera Telephony Server, and the Vocera Report Server can reside on different subnets. In a Vocera cluster, the Vocera Server and all its related services are always running on any standby nodes so failover can occur quickly. If the active node fails, a standby node becomes active and takes control of the cluster almost immediately. See "Sequence of Failover Events" in the *Vocera Administration Guide* for complete information about failovers.

You can use the Administration Console or the Vocera Control Panel to determine which node of a cluster is active:

- The Vocera Control Panel displays a status message to indicate whether its server is in active or standby mode.

See [Determining the Status of the Server](#) on page 111 for complete information.

- The **Address** field of your web browser displays the IP address of the active Vocera Server when you open the Administration Console with the Client Redirect Utility.

See [Using the Client Redirect Utility](#) on page 135 for complete information.

Because each node maintains an independent copy of the database, the Vocera cluster architecture allows disaster survival, as described in "Geographically Distributed Clusters" in the *Vocera Administration Guide*. The use of multiple nodes will also allow rolling upgrades with minimal down-time in the future.

---

## Setting Up a Cluster

The following procedure summarizes the steps in an initial Vocera Server cluster configuration.

### ***To set up a Vocera cluster:***

1. Install all the software and hardware as follows:
  - a. Perform the pre-installation tasks described in [Preparing the Vocera Server](#) on page 63.
  - b. Install the Vocera Server on every computer that will be a member of the cluster.

If necessary, you can also add and remove servers any time after the setup is complete.
  - c. If you are using the telephony integration option, install the Vocera SIP Telephony Gateway or Vocera Telephony Server software.

For Vocera Telephony Server, you must also install the telephony board, and connect the board to the PBX.
  - d. If you are planning to use the Vocera Report Server, install it also.
2. On the computer(s) that will be the standby node(s), use the Vocera Control Panel to stop the Vocera Server.

**Important:** Keep the Vocera Server on the standby nodes stopped while you configure the active node. This ensures that when you start the standby nodes they will perform a remote restore from the active node because it has been running longer. Otherwise, you may unintentionally cause the active node to perform a remote restore from one of the standby nodes.

3. Prepare the Vocera Server that you want to use as the initial active node as follows:
  - a. On the Vocera Server that you want to use as the initial active node, fully configure the database or restore an existing database.

See the *Vocera Administration Guide* for information about setting up users and groups and restoring data a backup file.

- b. If you did not restore from a backup file, back up the database on the initial active node.

Although this step is not required, best practice is to do a complete backup to preserve your work in case you need to rollback to it.
  - c. On your configuration computer, create a **badge.properties** file that includes the IP address of every machine in your cluster in a comma-separated list.

See "Creating a Property File to Download" in the *Vocera Badge Configuration Guide*.
  - d. Copy the new **badge.properties** file to the **\vocera\config\** directory of the initial active node.

The standby nodes copy this file when they come online as cluster members. See [Data Synchronization](#) in the *Vocera Administration Guide*.
  - e. If you have a customized **Properties.txt** file, make sure you copy it to the **\vocera\server\** directory on every Vocera Server.
  - f. Restart the Vocera Server on the machine you want to use as the initial active node so it loads your new **Properties.txt** file and **badge.properties** file.
4. Set up clustering on the server that you want to use as the initial active node.
    - a. Log in to the Administration Console of the Vocera Server you want to use as the initial active node.
    - b. Click **System** in the navigation bar.
    - c. Click the **Cluster** tab to display the Cluster Setup page.

The IP address of the current server appears in the server list. The **Status** column displays "Unsaved".
    - d. Check **Enable Cluster**.

The buttons for setting up and maintaining the cluster appear to the right of the server list.
    - e. Click **Add Server**.

The Add/Edit Cluster Server dialog box appears. Use this dialog box to add servers to a cluster.
    - f. Enter the IP address of a standby server and a brief description, and then do either of the following:

- If you do not need to add other nodes to the cluster, click **Add** to save changes, close the Add/Edit Cluster Server dialog box, and display the Cluster Setup page.
- If you need to add any other nodes to the cluster, click **Add & Continue** to save the information and leave the Add/Edit Cluster Server dialog box open, then add another node.

When you are finished, the server list displays the IP address of each server you added along with any descriptions you entered. The **Status** column for each new server displays “Unsaved”.

g. Click **Save Changes**.

Vocera saves the information and displays the first tab of the System screen, License Info.

h. Click the **Cluster** tab to display the Cluster Setup page and check your work. The server list should display the following:

- The **Status** column for the current server displays “Active”.
- The **Status** column for each additional server displays “Unknown”.

The cluster discovers the status of these unknown servers after you configure them for clustering and restart them.

i. Click the **Log Out** button at the top of the page.

The system logs you out and displays the Log In page of the Administration Console.

5. On the standby node(s), use the Vocera Control Panel to start the Vocera Server.

6. Set up clustering on every other server that will be in the cluster. These additional servers will become standby nodes in the cluster.

- a. Log in to the Administration Console of a server you want to use as a standby node.
- b. Click **System** in the navigation bar.
- c. Click the **Cluster** tab to display the Cluster Setup page.

The IP address of the current server appears in the server list. The **Status** column displays “Unsaved”.

d. Check **Enable Cluster**.

The buttons for setting up and maintaining the cluster appear to the right of the server list.

e. Click **Add Server**.

The Add/Edit Cluster Server dialog box appears. Use this dialog box to identify the server you are using as the initial *active* server.

f. Enter the IP address of the active server and a brief description, and then click the **Add** button to save changes, close the Add/Edit Cluster Server dialog box, and display the Cluster Setup page.

**Note:** You do not have to add the IP address of any other cluster servers to the list. When you restart the server you are configuring, it will download this information from the active server.

g. Click **Save Changes**.

Vocera saves the information and displays the first tab of the System screen, License Info.

h. Click the **Cluster** tab to display the Cluster Setup page. The server list should display the following:

- The **Status** column for the current server displays “Active”.
- The **Status** column for the server you want to use as the initial active server displays “Unknown”.

i. Click **Force Restart**.

A dialog box asks you to confirm restarting the server.

**Note:** If you do not click **Force Restart**, within a minute the cluster's self-healing mechanism will cause the server to automatically enter discovery mode, perform a remote restore from the active server, and then come online as a standby node.

j. Click **OK**.

Vocera logs you out of current server's Administration Console, and the current server restarts as a standby node in the cluster. If you copied a customized **Properties.txt** file to each standby, the Vocera Server loads it when it restarts.

**Note:** You cannot log in to the Administration Console of a server after it becomes a standby node. If you attempt to log in to a standby node's Administration Console, the cluster redirects you to the Administration Console of the active node.

7. If your organization uses Staff Assignment, update the cluster list in the Staff Assignment configuration file (**app.config**) on each standby node:

- a. On each standby node, open the following file in a text editor:

**`\\vocera\data\applications\staffassignment\app.config`**

- b. Edit the **serverIP** property to include the comma-separated list of IP addresses for the Vocera Server cluster. Enter numeric IP addresses using dotted-decimal notation. Do not enter domain names.
- c. Save your changes.

**Note:** You do not need to update the cluster list in the Staff Assignment configuration file on the active node. The **serverIP** property is updated automatically on the active node when someone logs into Staff Assignment.

8. If you use the telephony integration option, open the Vocera SIP Telephony Gateway or Vocera Telephony Server control panel and set the **Server IP Address** field to the IP address of the *active* Vocera Server.

After you save this setting, the Vocera Server populates the **Server IP Address** field with a comma-separated list of all cluster IP addresses. The Vocera Server maintains this list if cluster nodes are added or removed.

**Note:** You can optionally enter a comma-separated list of all cluster IP addresses manually in the **Server IP Address** field.

9. If you use a Vocera Report Server, open the Report Console and enter a comma-separated list of all cluster IP addresses in the **Vocera Server IP Address** field.

Because the Vocera Report Server does not communicate continually with the Vocera Server as the Vocera telephony server does, you must enter every cluster IP address. The Vocera Report Server does not maintain this list of addresses.

10. Install the Client Redirect Utility on every computer that needs to access the Administration Console or the User Console.

See [Using the Client Redirect Utility](#) on page 135.

11. Check your work.

Log in to the Administration Console of the active Vocera Server. Make sure each server shows up in the list on the Cluster Setup page with the proper status of “active” or “standby”.

Fail over cluster control several times, until you confirm that the cluster behaves as you expect. See [Forcing a Failover](#) on page 136.

---

## Using the Client Redirect Utility

The Administration Console and the User Console are client-side applications that run in a web browser. These client applications access the Vocera Server by using a URL that includes the server's IP address. If you have a clustered Vocera Server, you should use the Client Redirect Utility to make sure you can always access the Administration Console and the User Console.

### *About the Client Redirect Utility*

The Client Redirect Utility is a Java application that keeps track of all the IP addresses in a cluster. The installer extracts all the Client Redirect Utility files to the **\vocera\client** directory at the root of your system drive.

As part of the installation, the program creates a **serverlist.txt** file containing the initial list of cluster IP addresses. When you run the Client Redirect Utility, it uses **serverlist.txt** to find the URL of the active cluster node automatically. In addition, the Client Redirect Utility automatically updates the list of nodes in **serverlist.txt**, if necessary.

The Client Redirect Utility installer creates shortcuts for both the Administration Console and the User Console on your desktop. After installing the Client Redirect Utility, use these shortcuts to access either of the consoles.

### *Installing the Client Redirect Utility*

You should install the Client Redirect Utility on every computer that needs to work with the Administration Console or the User Console.

#### ***To download and install the Client Redirect Utility:***

1. Open the home page of any Vocera Server in the cluster by navigating to `http://vocera_ip_address` (or `https://vocera_ip_address`, if you are using SSL), where `vocera_ip_address` is the IP address of the Vocera Server.

2. Click **Download Client Redirect Utility**.

The **Download Client Redirect Utility** dialog box opens, prompting you to download the client.

3. Click the **Download** button.

A Windows dialog box called File Download - Security Warning asks whether you want to run or save the file Redirect.exe.

**Important:** If the File Download - Security Warning dialog box does not appear, your Internet Explorer security settings are preventing it from launching. Close the Download Client Redirect Utility dialog box and do either of the following:

- Hold down the **Ctrl** key when you click the **Download** button.
- Add the home page of the Vocera Server to your list of trusted Internet Explorer sites.
- Set your Internet Explorer security configuration to medium-low.

See your Internet Explorer documentation for complete information.

4. Click **Run**.

When the installer finishes extracting all files, it displays a dialog box indicating that the install was successful.

5. Click **OK** to close the confirmation dialog box.

### *Running the Client Redirect Utility*

The Client Redirect Utility installer creates two shortcuts on your desktop: one for the cluster's Administration Console, and one for its User Console.

**To run the Client Redirect Utility:**

1. Do either of the following:

- Double-click the shortcut for the Administration Console.
- Double-click the shortcut for the User Console.

The login screen of the appropriate console appears.

2. Log in to the console and work with it as usual.

---

## **Controlling a Cluster**

In most situations, the active node of a cluster runs continually while the standby nodes wait in case a failure occurs. In some situations, however, you may want to intervene manually and take control of one or more servers.

### *Forcing a Failover*

A *failover* occurs when the active node passes control of a cluster to one of the other nodes. Failure of either the Vocera Server on the active node or its hardware results in a failover.



In some situations, however, you may want to *force* a failover to occur. For example, you may want to initiate a failover so you can perform planned maintenance on the active node, or to test your cluster set up.

Use the Vocera Control Panel or the Administration Console of the active node to force a failover. See [Using the Vocera Control Panel](#) on page 109 for additional information.

***To initiate a failover through the Vocera Control Panel:***

1. Display the Vocera Control Panel on the *active* node of the cluster.
2. Choose **Failover** from the **Cluster** menu of the Vocera Control Panel.

A dialog box asks you to confirm the failover.

3. Click **OK**.

Control of the cluster fails over and a new node becomes active and takes control of the cluster almost immediately.

***To initiate a failover through the Administration Console:***

1. Display the Administration Console on the *active* node of the cluster.
2. Display the Cluster page of the Server screen.
3. Click **Force Restart**.

A dialog box asks you to confirm the restart.

4. Click **OK**.

Control of the cluster fails over and a new node becomes active and takes control of the cluster almost immediately.

## *Restarting a Standby Node*

You can restart a standby node at any time without affecting the cluster. You must use the Vocera Control Panel to restart a standby node, because the Administration Console for a cluster provides access to the active node only.

**Note:** You can use the Administration Console to restart a server when you add it to a cluster. After adding the machine to the cluster, you must use the Vocera Control Panel to restart it. See [Setting Up a Cluster](#) on page 130.

***To restart a standby node:***

1. Display the Vocera Control Panel on the node that you want to restart.
2. Choose **Failover** from the **Cluster** menu of the Vocera Control Panel.

A dialog box asks you to confirm the failover.

3. Click **OK**.

The node restarts without affecting the cluster.

## Starting a Standalone Server

You may want to disconnect a server from a cluster temporarily without permanently breaking up the cluster. For example, you may want to access the Administration Console of a standby server that you do not have access to when it is part of a cluster, or perform some system maintenance.

Starting a cluster node as a standalone server temporarily removes it from the cluster and allows it to run as an independent Vocera Server. When running standalone, a Vocera Server is no longer part of a cluster and no longer communicates with it.

You can start either the active node or a standby node as a standalone Vocera server.

### **To start a clustered node as a standalone server:**

1. Display the Vocera Control Panel on the node that you want to start as a standalone server.
2. Choose **Stop** from the **Run** menu of the Vocera Control Panel.

The status indicator disappears and the Vocera Control Panel displays the message "Exiting server process".

**Important:** If you execute the **Stop** command on the active node, it *does not* cause a failover, but it *does* cause an interruption in badge service until you start the Vocera Server as a standalone server.

3. Choose **Start Standalone** from the **Cluster** menu of the Vocera Control Panel.

The server disconnects from the cluster and starts as a standalone system. When the server finishes starting, the status indicator displays the **Active** status and a green icon.

The exact result of the **Start Standalone** command depends upon the state of the server at the time that you stopped it:

- If the Vocera Server was *active* and badges were connected to it, the badges reconnect when you start the node as a standalone system.
- If the Vocera Server was in *standby* mode, it restarts as an active standalone server, and it does not interfere with the active node of the cluster in any way.

***To rejoin a standalone server to a cluster:***

When you are finished working with the standalone server, you can restart it to join it to the cluster again.

1. Do either of the following:

- On the Cluster Setup page of the Administration Console, click **Force Restart**.
- In the Vocera Control Panel, choose **Failover** from the **Cluster** menu.

A confirmation dialog box appears.

2. Click **OK**.

The standalone server restarts as a cluster node in the same state—active or standby—it was in prior to becoming a standalone server.

---

## **Breaking Up a Cluster**

You can remove a standby server from a cluster at any time. You cannot remove the active server unless you first fail over control to another node.

When you remove a standby server from a cluster, it becomes active as a standalone server.

See the *Vocera Administration Guide* or the Administration Console online help for complete information.





## Updating the Vocera Server License

When you install the Vocera Server, the installation program requires that you enter your Vocera license key. You can change the value of the VOCERA\_LICENSE environment variable to update your license key. You may want to keep a copy of the old license key in case it needs to be re-installed at a later date.

If you are updating the license key for a Vocera Server cluster, see separate steps below. Every Vocera Server in a cluster should use the same license key.

### ***To update your Vocera license key:***

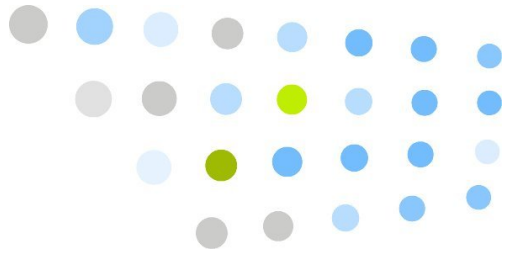
1. Log in to the Vocera Server computer with administrator privileges.
2. Choose **Start > Control Panel > System**.  
The System Properties dialog box opens.
3. Click the **Advanced** tab.
4. Click **Environment Variables**.  
The Environment Variables dialog box opens.
5. In the System Variables box, select the VOCERA\_LICENSE variable, and then click **Edit**.  
The Edit System Variable dialog box opens.
6. In the **Variable Value** field, enter your Vocera license key, and click **OK** to close the Edit System Variable dialog box.
7. Click **OK** to close the Environment Variables dialog box, and click **OK** again to close the System Properties dialog box.
8. Reboot the Vocera Server computer.

**Note:** To verify your Vocera license information, log in to the Administration Console, click **System** in the navigation bar, and select the **License Info** tab.



***To update the Vocera license key on a Vocera cluster:***

1. On all standby nodes, follow the steps described above to update the license key.
2. After the standby nodes have rebooted AND completed a remote restore, force a failover to a standby node to make it become active.
3. On the remaining standby (formerly active) node, update the license key following the steps above.



## Setting Up Users and Groups

After you install Vocera software and configure badges, you must set up profiles for users, groups, and (optionally) sites in the Vocera database.

Use the following checklist to complete the configuration of your Vocera Voice system:

<input type="checkbox"/>	<p>1. Collect site data.</p> <p>Each site that you define contains its own users, groups, locations, and address book entries.</p> <p>You can set up all your users and groups in the Global site, then transfer them to individual sites later when you define them. It may be more convenient, however, to define your sites in advance and assign users and groups to their appropriate home sites.</p>
<input type="checkbox"/>	<p>2. Collect the user name data.</p> <p>Collect official names, spoken names, nicknames, phone numbers, and other information that you need to populate the database.</p>
<input type="checkbox"/>	<p>3. Collect the group data.</p> <p>Create two separate lists for groups: a list of group names and a list of the members of each group.</p>
<input type="checkbox"/>	<p>4. Enter the user, group, and group member data into the following spreadsheet templates, then save them in CSV format:</p> <ul style="list-style-type: none"><li>• <b>users-template.xls</b></li><li>• <b>groups-template.xls</b></li><li>• <b>members-template.xls</b></li></ul> <p>For more information, see the <i>Vocera Data-Loading Reference</i>.</p>
<input type="checkbox"/>	<p>5. Use the Vocera Administration Console to load the data from the spreadsheets into Vocera.</p>

---

## Completing the Configuration

After you set up users and groups, use a Vocera badge to record name prompts for groups and locations. Perform other system configuration tasks in the Vocera Administration Console. This section provides an overview of the configuration tasks. For more information, see the *Vocera Administration Guide*.

### **To complete Vocera Server configuration:**

1. Log in to the Administration Console.

The default user ID/password is Administrator/admin.

2. Configure the default permissions that all users will have:

- If you are supporting multiple sites, assign permissions to the **Everyone Everywhere** group.
- If you are not supporting multiple sites, assign permissions to the **Everyone** group for the Global site.

3. Assign permissions to the groups you have created.

Users accumulate permissions from every group they belong to. If necessary, you can also use membership in groups to *revoke* specific permissions.

4. Specify global settings for the Vocera system.

5. Define location names and neighbors in either of the following ways:

- Specify the names directly in the Administration Console.
- Enter the names in a spreadsheet, then import Vocera data in a CSV file.

The location names you choose should be meaningful to users who use the “Locate” command on the badge.

6. Use a badge and voice commands to assign location names to the access point your badge is currently associated with while you roam.

7. Configure SMTP settings for incoming and outgoing email.

8. Schedule automatic system backups to occur at designated times and days, and a maximum number of backup files to maintain.

9. Record names for sites, groups, and locations:

- a. Click the **Users** button on the navigation bar.

The Add, Edit, and Delete Users page appears and displays a list of users.

- b. Press the **Call** button on a badge. When the Genie greets you and asks you to say your first and last name, log in as any user.



c. In the Administration Console, click **Sites** in the navigation bar.

The Sites page displays a list of sites.

d. Using the list of sites as a reference, record a name prompt for each site with the badge.

e. In the Administration Console, click **Groups** in the navigation bar.

The Groups page displays a list of groups.

f. Using the list of groups as a reference, record a name prompt for each group with the badge.

For example, press the **Call** button on the badge and say "Record name for *Technical Support*."

g. In the Administration Console, click **Locations** in the navigation bar.

The Locations page displays a list of locations.

h. Using the list of locations as a reference, record a name prompt for each location with the badge.

For example, press the **Call** button on the badge and say "Record name for *Front Lobby*."

---

## Testing the Configuration

After you complete the system configuration, use the badge to test the configuration.

### ***To test the configuration:***

1. Log in to the Administration Console.

The default user ID/password is Administrator/admin.

2. Click the **Users** button on the navigation bar.

The Add, Edit, and Delete Users page appears and displays a list of users.

3. Press the **Call** button on a badge. When the Genie greets you and asks you to say your first and last name, log in as any user.

4. Perform the following tasks for each user to check the system's name recognition:

- Issue a command from the badge that names that user.

For example, say "Call John Smith."

- Issue a command from the badge for each alternative spoken names.

For example, say "Play Messages from Johnny Smith".

- Issue a command from the badge that names the user and the department.

For example, say “Call Lin in Tech Support”.

- Test the identifying phrase, if you have defined one.

For example, say “Call John Smith on the third floor”.

Make a list of the names that the system fails to recognize, or confuses with some other name.

5. Click the **Groups** button on the navigation bar to see the list of groups.

The Add, Edit, and Delete Groups page appears and displays a list of groups.

6. Use the badge to check the system’s name recognition for each group, as follows:

- Test the group name
- Test the group member name-singular
- Test the group member name-plural
- Test the alternative group name

Make a list of the names that the system fails to recognize, or confuses with some other name.

7. If the system failed to identify any user or group names, use the Administration Console to make sure the name is spelled correctly.

- If the name is not a common English name or seems difficult to pronounce, try adding a phonetic spelling as a variant. For example, you might spell Bauer as “Bower”. The variant should be added as an alternate spoken name.
- If the name is consistently interpreted as another name in the database, it may be that the two names are too close for the recognition engine to differentiate between them reliably.

To see if this is the problem, temporarily alter the second name through the Users page of the Administration Console so it does not conflict, and then try the problem name again. If the problem name is now recognized consistently, the names were too close for the speech recognition engine. Otherwise, the system is just having difficulty with your pronunciation of the name.

- If the names are too close, differentiate them by requiring that one of the users be called by the first name and department, first name and last initial, by a nickname, or an identifying phrase. Communicate any such changes to all users.
  - If the system is having trouble with the pronunciation, and supplying a phonetic spelling as an alternate spoken name does not help, it may mean that a custom dictionary entry is required. Contact Vocera Technical Support (support@vocera.com).
8. If necessary, use the badge to check the system's name recognition for each site. For example, say "Connect to Santa Cruz", then say "Call Maya Shui".

***To send messages to users and groups:***

1. Log in to the Administration Console.  
The default user ID/password is Administrator/admin.
2. Click the **Users** button on the navigation bar.  
The Add, Edit, and Delete Users page appears and displays a list of users.
3. Press the **Call** button on a badge. When the Genie greets you and asks you to say your first and last name, log in as any user.
4. Use the badge to send a message to individual users.  
For example, say "Send a message to Randy Cochran".
5. Log in as the message recipient and make sure the message was recorded properly.  
For example, log in as the recipient and say, "Play messages".
6. Use the badge to send a message to a group.  
For example, say "Send a message to Tech Support".
7. Log in as a group member and make sure the message was recorded properly.  
For example, log in as a group member and say, "Play messages".





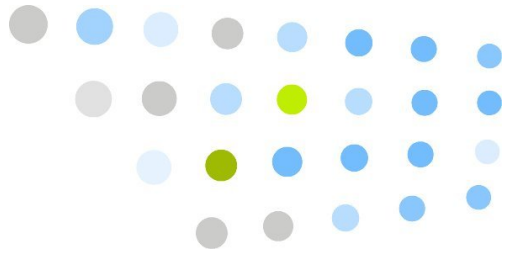
## Updating Site Awareness for the Vocera Client Gateway

When the Vocera Client Gateway (VCG) is installed, the installer creates the VOCERA\_SITE Windows environment variable. By default, this variable is set to global. In order for client devices to connect to the designated VCG, you must change the default from global to the specific site name for each VCG.

### ***To update the Windows environment variable for VCG site awareness:***

1. Log in to the Vocera Client Gateway computer with administrator privileges.
2. Choose **Start > Control Panel > System**.  
The System Properties dialog box opens.
3. Click the **Advanced** tab.
4. Click **Environment Variables**.  
The Environment Variables dialog box opens.
5. In the System Variables box, select the VOCERA\_SITE variable, and then click **Edit**.  
The Edit System Variable dialog box opens.
6. In the **Variable Value** field, enter your Vocera site name, and click **OK** to close the Edit System Variable dialog box.
7. Click **OK** to close the Environment Variables dialog box, and click **OK** again to close the System Properties dialog box.
8. Reboot the Vocera Client Gateway server.





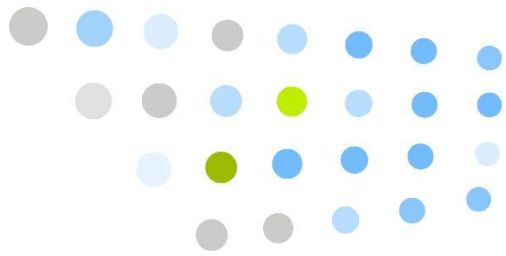
## Installing Vocera Telephony Server

The following topics describe how to configure Vocera telephony and integrate it with your Vocera server:

- **Vocera Telephony Server Installation Checklist** on page 153  
Provides an installation checklist for Vocera Telephony Server.
- **Installing the Dialogic Boards** on page 155  
Explains how to install boards and cables in the Telephony server computer.
- **Installing the Telephony Software** on page 159  
Explains how to install or upgrade the Vocera Telephony Server software.
- **Connecting the PBX to the Dialogic Board** on page 163  
Explains how to connect the PBX to the Dialogic telephony board on the telephony server.
- **Testing the Telephony Server Installation** on page 165  
Explains how to test the Vocera Telephony Server installation to make sure that the basic integration was successful.
- **Troubleshooting Telephony** on page 169  
Describes problems that can arise in a telephony integration and shows you how to troubleshoot them.







## Vocera Telephony Server Installation Checklist

Following is a summary of the steps for telephony integration:

<input type="checkbox"/>	1. Complete the advance preparation checklists. Procure boards, connectors, and cables; then configure the PBX. You cannot continue with the integration until you have completed these tasks. See <a href="#">Advance Preparation for Telephony</a> on page 100.
<input type="checkbox"/>	2. Install the Vocera server. See <a href="#">Running the Vocera Installation Program</a> on page 107.
<input type="checkbox"/>	3. Install the Dialogic boards. See <a href="#">Installing the Dialogic Boards</a> on page 155.
<input type="checkbox"/>	4. Install the Vocera Telephony Solution Software. See <a href="#">Installing the Telephony Software</a> on page 159.
<input type="checkbox"/>	5. Connect the PBX to the Dialogic boards. See <a href="#">Connecting the PBX to the Dialogic Board</a> on page 163.
<input type="checkbox"/>	6. Use the Administration Console to configure the Vocera server to support the telephony integration. See the <i>Vocera Telephony Configuration Guide</i> .
<input type="checkbox"/>	7. Test the installation. See <a href="#">Testing the Telephony Server Installation</a> on page 165.





## Installing the Dialogic Boards

This chapter describes how to install and configure the Dialogic boards.

**Important:** Before you begin installing the hardware, make sure you are following the overall telephony integration procedure described in [Preparing the Vocera Telephony Server](#) on page 93.

The manufacturer's installation instructions for the Dialogic boards contain steps that are not applicable to the Vocera telephony integration, such as autoconfiguration for IRQ and memory addresses and determining precedence in mixed PCI/ISA systems. Ignore those instructions and use the following procedure to install the boards for use with the Vocera Telephony server.

### ***To install the Dialogic Boards:***

1. Read the compliance and warranty statements included with the Dialogic boards.
2. Follow the manufacturer's precautions, which are described in the section called "Protect the Boards from Damage" in the manufacturer's installation instructions.

These instructions require you to wear a grounded wrist strap and work at a static-guarded workstation to protect the board from damage during installation. Failure to follow the instructions may void the warranty on the board.

3. Turn off all power to the computer and unplug the power cord.
4. Open the computer's cover.
5. Remove the cover plate on each PCI expansion slot you are going to use.

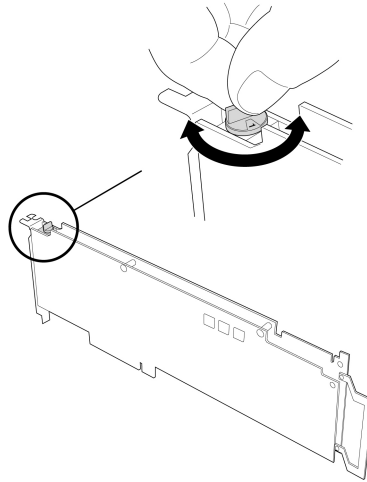
You may need to remove a screw or plastic retention bracket before you can remove the cover plate. See the documentation included with your computer for instructions.

6. Use the SW100 rotary switch on the first board to set its board ID to **1**.



The default switch setting is 0. For the Vocera telephony integration, you must set the switch on the first board to 1.

**Figure 28. SW100 rotary switch**

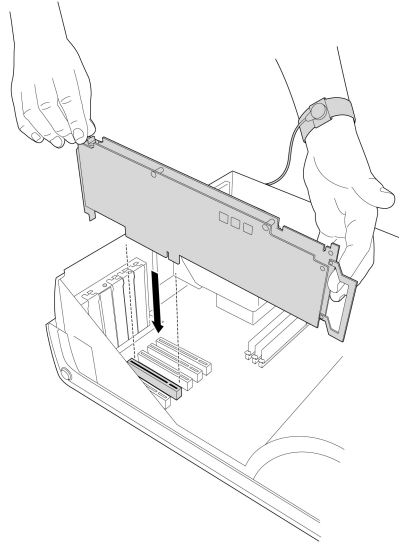


7. If you need additional boards for analog telephony, set the switch on the second board to 2, set the switch on the third board to 3, and so forth.

Use a permanent marker to write the switch setting on the rear bracket of each board so it is easier to connect the telephone lines correctly.

8. Insert the connector on the board into the PCI bus slot and press down gently until the board is seated.

**Figure 29. Inserting the Dialogic board**



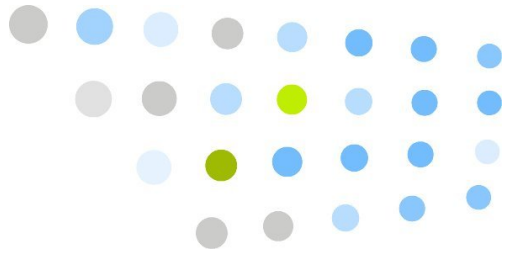
Repeat this step for all additional boards.

9. Replace the screws or retention brackets you removed previously.
10. Close the computer cover.

You are now ready to install the telephony software.

**Important:** If you install the boards at a remote location and then transport the computer to the site, re-seat the boards after the computer arrives. Because the Dialogic boards are larger than most PCI boards, they are easily unseated during transport.





## Installing the Telephony Software

Complete the following tasks before you run the Telephony installation program:

- Make sure that the Telephony server computer meets the minimum hardware and software requirements listed in [Vocera Telephony Server Requirements](#) on page 20.
- Make sure the server computer itself is configured properly. See [Preparing the Vocera Telephony Server](#) on page 93.
- Complete the tasks outlined in [Advance Preparation for Telephony](#) on page 100.
- If you are setting up separate Telephony servers for multiple sites, use the Administration Console to configure the sites before installing the Telephony servers. See the sections “Telephony in a Multi-Site Environment” in the *Vocera Telephony Configuration Guide*.
- When you are installing Vocera Telephony Server for a site, you can take advantage of high availability features by installing an array of telephony servers. Multiple telephony servers installed at a site provide redundancy, scalability, and load balancing. For more information, see [Telephony High Availability](#) on page 80.

**Important:** If you are installing an array of telephony servers at each site to take advantage of high availability features, make sure your telephony licenses provide enough lines for the total system. You may need to purchase additional telephony licenses.

---

### Running the Telephony Installation Program

The Vocera installation program for Vocera Telephony Server is similar to other installers, but it has additional dialog boxes for Dialogic hardware and drivers.

**To install Vocera Telephony Server:**

1. Log in to the Vocera Telephony Server computer with administrator privileges.
2. **Electronic Software Distribution:** Navigate to the folder where you extracted the contents of the Vocera ISO file, and run the **vocera.hta** file. For details on downloading the software, see [Electronic Software Distribution](#) on page 14.

**DVD Media:** Insert the Vocera Software DVD in the drive. The main installation screen appears automatically. If this screen does not appear, run the **vocera.hta** at the root of DVD.

3. Click **Vocera Telephony Server**.
4. On the Welcome screen, click **Next**.
5. Continue following the prompts in the installation program.  
Use the **Help** button on any screen for further information.  
Click **Install** on the final installer screen to install the software.
6. During installation, the Found New Hardware wizard appears.

**Figure 30. Found New Hardware Wizard**



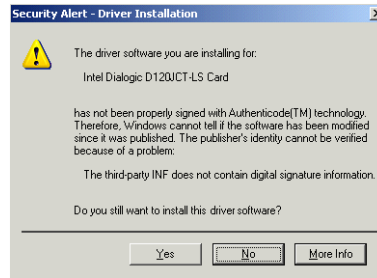
Select **No, not this time** to NOT connect to Windows Update to search for software, and then click **Next**.

7. Select **Install from a list or specific location**, and then click **Next**.
8. Select **Search for the best driver in these locations**, check the box **Include this location in the search**, and then click **Browse** to navigate to the **[Install\_Drive]\dialogic\driver** directory where the Dialogic drivers are installed. Then click **Next**.



9. The Security Alert - Driver Installation dialog box may appear.

**Figure 31. Security Alert - Driver Installation dialog**



Click **Yes** to allow the installation program to install the driver for your telephony board.

10. Click **Finish** to close the Found New Hardware wizard.

11. When the installation is complete, restart the computer.

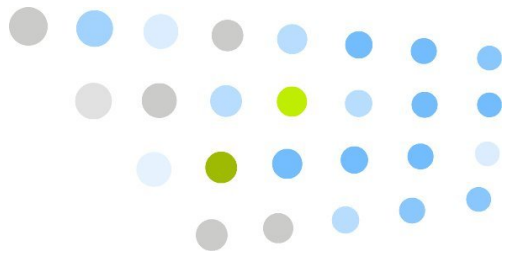
The Vocera Telephony Server launches and displays the Telephony Server Control Panel.

**Important:** At this point, the Dialogic service is not properly activated. The Telephony Server Control Panel status indicator below the menu bar flashes "Initializing Dialogic," and the console displays the message "DIALOGIC HARDWARE CONFIGURATION ERROR. "

12. **Restart the computer again.** This is necessary to ensure that the Dialogic service starts properly.

You are now ready to connect the telephone lines to the Dialogic boards. See [Connecting the PBX to the Dialogic Board](#) on page 163.





## Connecting the PBX to the Dialogic Board

The procedures in this section refer to each Dialogic board by its hardware switch setting (see [Installing the Dialogic Boards](#) on page 155). For example, the first Dialogic board is the board that has its rotary switch set to 1.

The cabling procedures differ slightly for an analog integration and a digital integration.

### ***To connect cables for an analog integration:***

1. Use the cables you prepared as described in [Analog Telephony Cables](#) on page 96 in either of the following ways:

- Insert the telephone cables into the line splitters, and insert the line splitters into the appropriate jacks on the first Dialogic board.
- Insert the RJ11 plugs that you crimped on to the CAT 5 cable into the appropriate jacks on the Dialogic card.

The board bracket displays the numbers 1 and 6 next to the jacks at either end of the bracket, indicating the first and last jacks on the board. Connect the cables to the Dialogic board starting with jack 1.

Fill the jacks in each board consecutively. Make sure board 1 is completely filled before you cable board 2, and so on. You do not need to fill all the jacks in the final board.

2. Connect the other ends of the cables to the appropriate ports of the analog cards in the PBX. If you use a patch panel (recommended), connect the cables to the patch panel, and then run patch cords from the panel to the PBX.

Connect the plug corresponding to the first Dialogic port (the inner pair of the first RJ-14 jack on the Dialogic card) to the PBX port representing the first extension in the hunt group. Connect the plug corresponding to the second Dialogic port (the outer pair of the first RJ-14 jack) to the PBX port representing the second extension, and so on.



***To connect the cables for a digital integration:***

1. Connect one end of the cable to the PBX T1 board and the other end to the RJ48C jack on the Dialogic board. See [Digital Telephony Cables](#) on page 99.
2. Examine the LEDs on the plate in the back of the Dialogic board. A green status LED lights up to indicate a successful connection. Yellow or red LEDs light up to indicate a problem. Consult your board documentation for more information.

For information on how to test the installation to isolate and resolve problems, see [Testing the Telephony Server Installation](#) on page 165.



## Testing the Telephony Server Installation

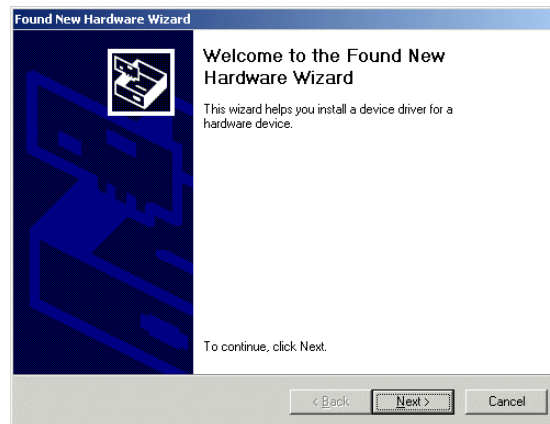
This chapter describes how to test the telephony server once the hardware and software are installed and configured.

### ***To complete Vocera Telephony Server installation:***

1. Turn on the Telephony server computer.

If the Found New Hardware wizard appears, use it to navigate to the **\dialogic\driver** directory where the drivers are stored.

**Figure 32. Found New Hardware Wizard**



2. Use the Telephony screen in the Administration Console to configure the Vocera server to support telephony.

See the *Vocera Telephony Configuration Guide*.

3. *For digital telephony integration only*, perform the following tests to ensure that the basic integration is working properly:

- a. Examine the LEDs on the plate in the back of the Dialogic board. If the red LED on the Dialog board is on, this indicates a problem with the clock signal. Use a T1/E1 loopback adapter to isolate and fix the problem.

See **PBX Loopback Testing** on page 166.

- b. Test the crossover connection from the telephony server to the PBX.

See **Crossover Testing** on page 168.

- c. If the red LED on the Dialog board is still on, try the following:

- Verify that the PBX T1 card is started. This requires assistance from the PBX technician.
- Verify that the Dialogic board is functioning properly. Use the Dialogic Configuration Manager (DCM) to start the Dialogic service. On the telephony server machine, choose **Start > Programs > Vocera > Telephony Server > Dialogic Configuration Manager - DCM**.

The board's LED should be green after the board is enabled and started.

4. Test each port by placing calls from a phone to each of the extensions in the hunt group (analog integration) or DID number for the Vocera trunk (digital integration).
5. Use a badge to place the following types of calls:
  - Calls to internal extensions
  - Calls to external numbers

See the *Vocera Badge User Guide* for descriptions of the badge commands that let users place calls and control forwarding.

6. Use a badge to send a numeric page to someone with a pager.

Congratulations! The Vocera telephony integration is now complete.

---

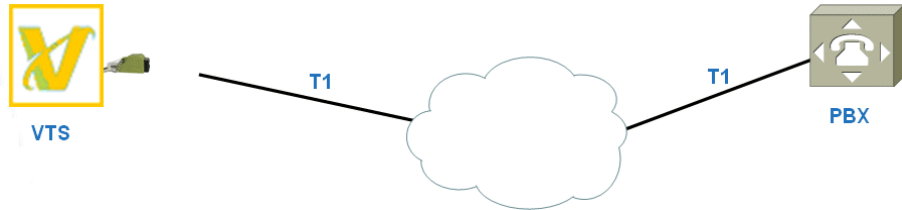
## PBX Loopback Testing

In a digital telephony integration, if the LED light on the plate in the back of the Dialogic board is red, there is no clock signal on the line. This could indicate a problem with one of the following components:

- PBX configuration
- Dialogic board
- T1/E1 cable

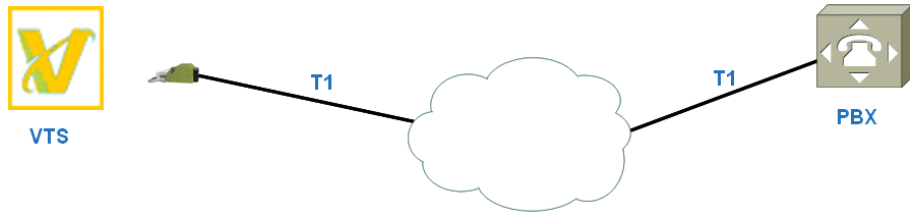
A loopback adapter plug is a small, inexpensive device for testing the transmitter and receiver pairs of T1/E1 circuits by creating a feedback loop. You can use the loopback adapter plug to isolate equipment to identify the source of a problem. For example, if you plug the loopback adapter into the Dialogic board and the Dialogic LED light is green, then the clock signal from the Dialogic board is okay.

**Figure 33. Isolating the Dialogic board**



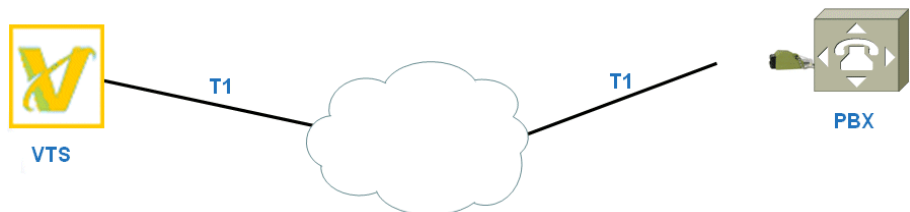
You can use the loopback adapter to isolate the cable that leads to the PBX. If you see a clock signal on the PBX, then the cable is okay.

**Figure 34. Isolating the cable**



Finally, you can use the loopback adapter to isolate the PBX. If you see a clock signal on the PBX, then the PBX configuration is okay.

**Figure 35. Isolating the PBX**

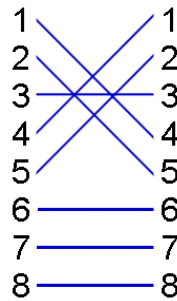


**Note:** T1 loopback tests may be successful even when the transmit and receive pairs are not correctly matched up between the telephony server and the PBX. Consequently, the telephony server and the PBX may not be in sync with each other. In your crossover cabling from the telephony server to the PBX, it's important to make sure the transmit and receive pairs are mapped correctly. See [Crossover Testing](#) on page 168.

## Crossover Testing

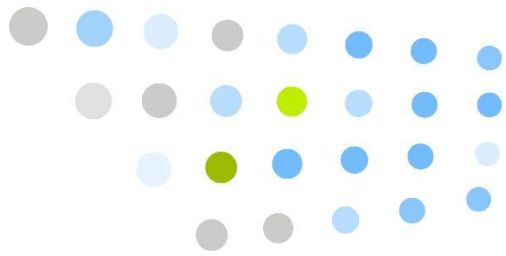
If your connection between your telephony server and PBX requires a crossover cable, you must use a T1/E1 crossover cable. An Ethernet crossover cable will not work. The crossover cable maps output signals from the Dialogic board to input signals from the PBX, and vice versa. In other words, the telephony pairs 1 and 2 (receive) need to be rolled with 4 and 5 (transmit), as shown in the following figure.

**Figure 36. T1/E1 crossover cable pinouts**



A crossover adapter plug can be used to convert standard T1/E1 cable into a crossover cable.





## Troubleshooting Telephony

This chapter describes how to solve problems that can occur during the telephony integration.

---

### Creating a Tone Set File

In an analog telephony integration, the PBX must generate a loop current drop to notify the Dialogic board when a far-end disconnect occurs. Otherwise, the board does not know when to hang up, and the display screen of the badge continues to blink **Phone** after the telephone disconnects.

If you cannot configure your PBX to generate a loop current drop, use the PBXpert/32 utility to learn the tone definitions your PBX uses for call signaling. In most cases, the PBX generates a fast busy, a modified fast busy, or a dial tone to signal a far-end disconnect. PBXpert/32 saves the tone definitions in a file that the Telephony server can use to detect far-end disconnects.

#### ***To create a tone set file:***

1. Make sure the Dialogic board and the Vocera Telephony server are fully installed and cabled to the PBX.
2. Make sure the Dialogic board is initialized in either of the following ways:
  - If the Telephony server is running, the board is already initialized. Stop the Telephony server so it does not interfere with PBXpert. See [Stopping and Restarting the Server](#) on page 112.
  - If the Telephony server is not running, choose **Programs > Vocera > Telephony > Dialogic Configuration Manager** from the **Start** menu. The Dialogic Configuration Manager appears.  
Click the green **Start Service** button to start the Dialogic system service, then close the Dialogic Configuration Manager.
3. From the **Start** menu, choose **Programs > Vocera > Telephony > PBXpert**.

The PBXpert wizard appears.

4. Click **Next**.

The PBX Information screen appears.

5. Complete the PBX Information screen as follows, then click **Next**.

**Table 12. PBX Information fields**

Field	Description
Manufacturer	Enter the name of the PBX manufacturer.
Model	Enter the model of the PBX.
File Name	<p>Click <b>Browse</b> and navigate to the <b>\vocera\dialogic</b> folder, then enter the file name <b>pbx.tsf</b>.</p> <p>By default, PBXpert uses a combination of the manufacturer and model as a file name. You must change the default value to <b>pbx.tsf</b>, which is the file name the Telephony server uses.</p> <p>You must save this file in the <b>\vocera\dialogic</b> directory so the Telephony server can find it.</p>

The TAPI information screen appears.

6. Select **none** in the list on the TAPI Information screen (the default), then click **Next**.

The Select a Board screen appears.

7. Make sure that the **Board #** field displays the following, then click **Next**.

**#:1, Type: SPAN, Channels:4**

The Select the Calling Resource screen appears.

8. Complete the Select the Calling Resource screen as follows, then click **Next**.

**Table 13. Select the Calling Resource fields**

Field	Description
Select the Channel	Enter <b>1</b> .
Phone Number	Enter the phone number that the PBX assigns to the first Dialogic port. This is <b>Line A</b> .

The Select the Called Resource screen appears.

9. Complete the Select the Called Resource screen as follows, then click **Next**.

**Table 14. Select the Called Resource fields**

Field	Description
Select the Channel	Enter <b>2</b> .
Phone Number	Enter the phone number that the PBX assigns to the second Dialogic port. This is <b>Line B</b> .

The Settings Confirmation screen appears.

10. Review the information summary, make sure the **Run Wizard Auto-Test** check box is checked, then click **Next**.

The Learning Tones screen appears, and PBXpert starts running the Auto Line Test.

11. After the six tests (3 for each line) complete successfully, click **OK** to close the Auto Line Test dialog box, then click **Next** in the wizard.

PBXpert begins learning the tone definitions your PBX uses for five signaling tones: dial tone, ringback, busy, reorder, and disconnect.

12. Make sure PBXpert displays a green dot next to each tone in the Tone column to indicate that it successfully learned the tones, then click **Keep Data**.

The Verifying the Learn dialog box appears.

13. Click **Next** to verify the learned tones.

PBXpert displays a dialog box and begins verifying the tones.

14. After the verification completes, click **OK** to close the dialog box.

The Summary of Results screen appears.

15. Click **Finish** to close the wizard.

The tone summary sheet displays definitions for all of the tones.

16. Close the PBXpert window.

17. Run the Telephony server.

The Telephony server loads the **pbx.tsf** file automatically.

18. Test a badge-to-telephone call and make sure the Dialogic board hangs up properly after a far-end disconnect:

- If the board hangs up properly, the screen of the badge displays the user name.

- If the board does not hang up, the screen of the badge continues to display **Phone** after the far-end disconnect.

---

## Enabling ISDN Debugging Features

You can enable ISDN debugging features from the Basic Information page of the Telephony screen in the Administration Console. In general, though, you should not enable ISDN debugging features unless instructed to do so by Vocera support engineers. For example, you can enable D-channel tracing for a specified number of calls. The trace data can help Vocera support engineers troubleshoot telephony problems.

---

## Minimizing Glare

A *glare* condition occurs when the Vocera Telephony Server tries to access a trunk for an outgoing call and the PBX simultaneously attempts to access the same trunk for an incoming call. Glare potentially affects any digital PBX integration and causes the Vocera Telephony Server to restart if it occurs.

To minimize the likelihood of a glare condition occurring, set the trunk selection order of the trunk group configuration in the PBX to reverse order.

---

## Updating the Dialogic Driver

During installation or upgrade of the Vocera Telephony Server, you may encounter the Found New Hardware wizard, which appears when the server has not yet registered the driver associated with the Dialogic board. If you believe the Dialogic driver is not properly installed, you can always update the driver later.

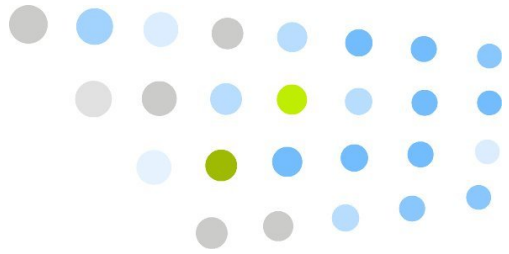
### ***To update the Dialogic driver:***

1. Choose **Start > Control Panel > System**. The System Properties dialog box appears.
2. Click the **Hardware** tab.
3. Click **Device Manager**. The Device Manager window appears.
4. Right-click the Intel Dialogic Card, and choose **Update Driver** from the popup menu. The Hardware Update Wizard appears.
5. Do not use Windows Update to search for new software. Click **No, not this time** and then click **Next**.
6. Select **Install from a list or specific location**, and then click **Next**.

7. Select **Search for the best driver in these locations**, check the box **Include this location in the search**, and then click **Browse** to navigate to the **[Install\_Drive]\dialogic\driver** directory where the latest Dialogic drivers are installed. Then click **Next**.
8. The Hardware Update Wizard will locate the matching Dialogic driver. Click **Yes** to confirm that you want to update the driver.
9. Click **Finish** to close the Hardware Update Wizard.

Although the Hardware Update Wizard does not advise you to reboot, it is advisable to reboot the computer.





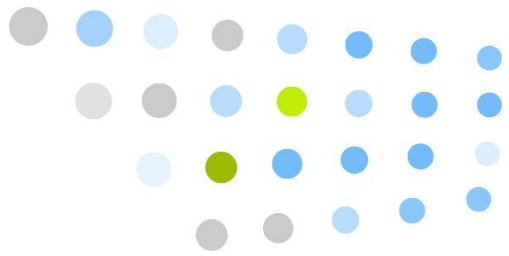
## Appendixes

The following topics provide additional information about installing and configuring a Vocera Voice system:

- **IP Port Usage** on page 177  
Lists ports used by the Vocera Voice system for IP communication.
- **Changing the IP Address of the Vocera Server** on page 185  
Describes how to update the IP address used by the Vocera Server.
- **Working with Locales** on page 187  
Describes how to use locales. A locale determines the language of installation, administration console, tools, online documentation, and other components of the product. It also determines country-specific hardware settings, such as radio channel selections.







## IP Port Usage

The following tables indicates the ports used by Vocera system components for IP communication:

**Table 15. Vocera Server IP port usage**

Description	Protocol	Port No
Badge ↔ Server Signaling	UDP	5002
Telephony Server Signaling -> Vocera Server Signaling	TCP	5001
Vocera Client Gateway -> Vocera Server Signaling	TCP	5006
Badge ↔ Updater Signaling	UDP	5400
Badge -> Vocera Server Audio	UDP/TCP	5100 - 5199
Telephony Server -> Vocera Server Audio	UDP	5100 - 5149
Vocera Client Gateway -> Vocera Server Audio	UDP	5100 - 5355
Browser ↔ Apache Signaling	TCP	80 and 443 (for SSL)
Apache Tomcat Connector	TCP	8009
Tomcat HTTP Connector	TCP	8080
Tomcat ↔ Eclipse Signaling	TCP	8090
MySQL Signaling	TCP	3306
Vocera Server ↔ VMI Clients	TCP	5005
Vocera Server ↔ VMI Clients (TLS)	TCP	5007



Description	Protocol	Port No
Vocera Server ↔ VAI Clients	TCP	5251
Vocera Server ↔ Vocera Report Server Signaling	TCP	5251
Vocera Server Cluster Signaling	TCP	5251
Vocera Server Dictation Audio	UDP	8200
Badge ↔ Vconfig (Vch) Signaling during Discovery	UDP	5555 and 5556
Badge ↔ Vconfig (Vch) Signaling during Connection	TCP	5555 and 5556
Nuance Watcher Telnet Client	TCP	7023
Nuance Watcher HTTP Client	TCP	7080
Nuance Resource Manager	UDP	7777
Nuance Watcher	UDP	7890
Nuance License Manager	TCP	8470
Administration Console ↔ Vocera Server	TCP	9091
Nuance Recclient	TCP	9200
Nuance Compilation Server	TCP	10101
Nuance Dictionary	TCP	22552
Nuance TTS	TCP	32323
Vocera Server ↔ CUCM JTAPI Signaling	TCP	2748

**Table 16. Vocera Telephony Server IP port usage**

Description	Protocol	Port No
Vocera Server -> Telephony Server Signaling	TCP	any free port
Badge -> Telephony Server Audio Vocera Server -> Telephony Server Audio Vocera Client Gateway -> Telephony Server Audio	UDP	5300 - 5399 <sup>a</sup>

<sup>a</sup> The number of ports used is based on the number of lines configured.

**Table 17. Vocera SIP Telephony Gateway IP port usage**

Description	Protocol	Port No
IP PBX ↔ Vocera SIP Telephony Gateway Signaling	UDP	5060
Vocera Server -> Vocera SIP Telephony Gateway Audio	UDP	5300 - 5555 <sup>a</sup>
IP PBX -> Vocera SIP Telephony Gateway Audio (RTP/RTCP)	UDP	8700 - 9467 <sup>b</sup>
Vocera Server -> Vocera SIP Telephony Gateway Signaling	TCP	any free port

<sup>a</sup> The number of ports used is based on the number of lines configured. The maximum number of lines is 256 with one Vocera RTP port for each. The base port for this range is configurable.

<sup>b</sup> The number of ports used is based on the number of lines configured. The maximum number of lines is 256 with 2 ports (RTP and RTCP) for each, or 512 total. The server multiplies 512 by 1.5 to reserve additional ports in case some ports are already in use, resulting in 768 ports. The base port for this range is configurable.



**Table 18. Vocera Client Gateway IP port usage**

Description	Protocol	Port No
Smartphone ↔ Vocera Client Gateway Signaling	UDP	5060, 5888-5889
Badge -> Vocera Client Gateway Audio Vocera Server -> Vocera Client Gateway Audio Vocera Telephony Server -> Vocera Client Gateway Audio Vocera SIP Telephony Gateway -> Vocera Client Gateway Audio	UDP	6300 - 6555 <sup>a</sup>
Smartphone -> Vocera Client Gateway Audio (RTP/RTCP)	UDP	7700 - 8467 <sup>a</sup>
Vocera Server -> Vocera Client Gateway Signaling	TCP	any free port

<sup>a</sup> The number of ports used is based on the number of lines configured.

**Table 19. MSP Server IP port usage**

Description	Protocol	Port No
MSP Console (Browser) ↔ IIS Web Server	TCP	80 and 443 (for SSL)
FTP Server ↔ Smartphone	TCP	20 and 21
<b>Note:</b> Different ports are required based on the FTP mode used (Active vs. Passive). See below.	UDP	> 1023

**Ports used when the FTP Server is in Passive Mode:**

- FTP Server's port 21 from anywhere  
(Client initiates connection)
- FTP Server's port 21 to ports > 1023  
(Server responds to client's control port)
- FTP Server's ports > 1023 from anywhere  
(Client initiates data connection to random port specified by server)
- FTP Server's ports > 1023 to remote ports > 1023  
(Server sends acknowledgments and data to client's data port)

### Ports used when the FTP Server is in Active Mode:

- FTP Server's port 21 from anywhere  
(Client initiates connection)
- FTP Server's port 21 to ports > 1023  
(Server responds to client's control port)
- FTP Server's port 20 to ports > 1023  
(Server initiates data connection to client's data port)
- FTP Server's port 20 from ports > 1023  
(Client sends acknowledgements to server's data port)

**Table 20. Vocera Report Server IP port usage**

Description	Protocol	Port No
Vocera Server ↔ Vocera Report Server Signaling	TCP	5251
Report Console (Browser) ↔ Apache Tomcat	TCP	8080
Report Console ↔ Report server	TCP	9090
Report results	TCP	80
MySQL port	TCP	3306
Eclipse port	TCP	8090

**Table 21. Badge IP port usage**

Description	Protocol	Port No
Badge ↔ Server Signaling	UDP	5002
Vocera Server -> Badge Audio Telephony Server -> Badge Audio Vocera SIP Telephony Gateway -> Badge Audio Badge -> Badge Audio	UDP	5200
Badge ↔ Updater Signaling	UDP	5400
Badge ↔ Vconfig (Vch) Signaling during Discovery	UDP	5555 and 5556
Badge ↔ Vconfig (Vch) Signaling during Connection	TCP	5555 and 5556

**Table 22. Smartphone IP port usage**

Description	Protocol	Port No
Smartphone ↔ Vocera Client Gateway Signaling	UDP	5060, 5888-5889
Vocera Client Gateway -> Smartphone Audio (RTP)	UDP	50000 - 50255
FTP Server ↔ Smartphone	UDP	> 1023

**Table 23. Vocera Connect IP port usage**

Description	Protocol	Port No
Vocera Connect Contacts	TCP	80 or 443 (for SSL)
iPhone and Android Smartphone ↔ Vocera Client Gateway Signaling	UDP	5060, 5888-5889
iPhone Audio	UDP	7700-8467
Android Audio	UDP	7700-8467 32768-65536

## Opening Ports for Communication

If a firewall separates Vocera servers from the wireless network, make sure the following ports are open for communication:

**Table 24. WLAN Ports Used by Vocera Clients**

Client	Direction	Server / Client	Type	Protocol	Ports
Badge	Inbound/ Outbound	VS	Signaling	UDP	5002
Badge	Inbound	VS	Audio	UDP / TCP	5100-5199 <sup>a</sup>
Badge	Inbound/ Outbound	Badge/VS/VTs	Audio	UDP	5200
Badge	Inbound	VTs	Audio	UDP	5300-5399
Badge	Inbound/ Outbound	Updater	Signaling	UDP	5400

Client	Direction	Server / Client	Type	Protocol	Ports
Badge	Inbound/ Outbound	VS	Discovery	UDP	5555 & 5556
Badge	Inbound/ Outbound	VS	Connection	TCP	5555 & 5556 <sup>b</sup>
Badge	Inbound	VCG	Audio	UDP	6300-6555 <sup>c</sup>
Smartphone	Inbound/ Outbound	VCG	Signaling	UDP	5060
Smartphone	Outbound	VCG	Audio	UDP	50000-50255
Smartphone	Inbound/ Outbound	FTP Server	MSP / FTP	TCP	20 & 21
Smartphone	Inbound/ Outbound	FTP Server	MSP / FTP	UDP	> 1023
Smartphone, Vocera Connect for Android and iPhone	Inbound	VCG	Audio	UDP	7700-8467
Smartphone, Vocera Connect for Android and iPhone	Inbound	VS	Signaling	TCP	80 or 443 (for SSL)
Vocera Connect for Android and iPhone	Inbound/ Outbound	VCG	Signaling	UDP	5060, 5888-5889
Vocera Connect for Android	Inbound/ Outbound	Vocera Devices	Audio	UDP	32768-65536
VMI Clients	Inbound/ Outbound	VS	Connection	TCP	5005
VAI Clients (includes Staff Assignment)	Inbound/ Outbound	VS	Connection	TCP	5251
Vocera Devices (Dictation client)	Inbound	VS	Audio	UDP	8200

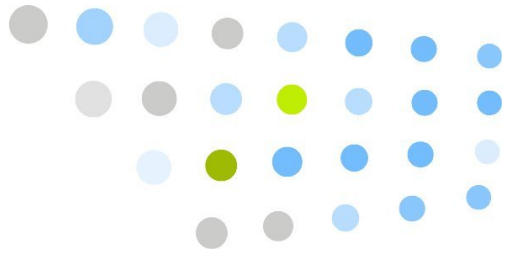
Client	Direction	Server / Client	Type	Protocol	Ports
VS (Vocera Connect for Cisco)	Outbound	Cisco UCM	Signaling	TCP	2748

<sup>a</sup> This TCP range must be opened if TCP-to-Genie is enabled on the Vocera Server.

<sup>b</sup> Make sure you allow packets from TCP port 5556 to be received on any available port on the Vocera Server.

<sup>c</sup> The base port for this range is configurable.





## Changing the IP Address of the Vocera Server

This appendix explains how to change the IP address of the Vocera Server.

---

### Introducing the Change Server IP Address Utility

After you install the Vocera software, you may decide to change the IP address of the Vocera Server. Vocera provides a simple utility called Change Server IP Address that updates the Vocera Server IP address in all the locations used by the Vocera software. The Change Server IP Address utility is located in the **\vocera\tools** directory on the Vocera Server, but you can also run it from the Windows **Start** menu.

---

### Supported Vocera Environments

The Change Server IP Address utility works in the following environments:

- A stand-alone Vocera Server (that is, a Vocera Server that does not also have a Vocera Telephony Server on it, or a Vocera Server that is not part of a cluster)
- A server where both Vocera Server and Vocera Telephony Server are installed
- A Vocera Server that is part of a cluster

A stand-alone Vocera Telephony Server needs to know the IP address of the Vocera Server. If you've already installed Vocera Telephony Server and need to change the Vocera Server IP address it is pointing to, use the VTS Control Panel. See [Changing the Vocera Server IP Address](#) on page 115.

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### Using the Change Server IP Address Utility

*To update the IP address used by the Vocera server software:*

1. Log in to the Vocera server computer with administrator privileges.
2. Shut down the Vocera Server. In the Vocera Control Panel, choose **Run > Exit**. Click **OK** to confirm.

3. From the Windows **Start** menu, select **Settings > Control Panel > Administrative Tools > Services**. The Services window appears, displaying the list of installed Windows services.

Confirm that all Vocera services have shut down. This includes Vocera Launcher, MySQL, Apache2, Tomcat, and the Nuance Watcher Daemon. If any one of these services is running, right-click it and choose **Stop**.

4. Choose **Start > Programs > Vocera > Change Server IP Address**.
5. Specify the old IP address used by the Vocera Server and the new IP address.

By default, the old IP address is the value of the `VOCERA_LOCAL_HOST_ADDRESS` environment variable and the new IP address is the current NIC address of the server.

6. Click **Change IP**.

The utility proceeds to update the server.

7. Select **Yes, I want to restart my computer now**, and then click **Finish**.

After the server restarts, the Vocera server launches and displays the Vocera Control Panel.

**Note:** All changes made by the Change Server IP Address utility are saved to a log file named **IPAddressChange.log** in the **InstallLogs-Vocera** directory.



## Working with Locales

A Vocera *locale* designates a specific language in combination with a particular cultural, political, or geographic region. For example, US English and UK English designate locales. You specify a locale in the Country field when you install Vocera. The installation program copies the required files to the server computer and configures appropriate settings.

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### Updating the Locale

The Vocera locale determines which language packs are installed with the system. Therefore, to update the locale, you must uninstall the Vocera Server and reinstall it. When you install the software, specify the locale in the **Country** field.

If you decide to update the locale on the Vocera Server, you must also uninstall and reinstall the Badge Configuration Utilities software installed on a separate computer.

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### Genie Personas

The Vocera system locale determines which Genie personas are available in the Administration Console and the User Console. For example, when Vocera is configured for the United States (US) locale, the Genie personas Dan and Jennifer are available. When Vocera is configured for the United Kingdom (GB) locale, the Genie personas George and Emma are available. The Genies for each locale use the appropriate language and accent for prompts and responses.

You can choose a Genie persona (and specify whether users can override this choice) from the Genie Settings page of the Defaults screen in the Administration Console. Users can choose a Genie persona from the Genie Settings page of the Announcements screen in the User Console (if granted access by an administrator).

## Language Packs

Vocera uses language packs for speech recognition and Text-to-Speech actions. They are installed and used based on the locale specified when Vocera is installed. The following table lists supported locales and corresponding language packs.

**Table 25. Vocera supported locales and language packs**

Locale	Speech Recognition	Text-to-Speech	Genies
United States (US)	English US	English US	Dan, Jennifer
Singapore (SG)	English SG	English US	Dan, Jennifer
United Kingdom (UK)	English UK	English UK	George, Emma
Australia (AU)	English AUS/NZ	English UK	George, Emma
New Zealand (NZ)	English AUS/NZ	English UK	George, Emma

The binary representation of a learned name or learned command in Vocera database tables depends on the language pack (and therefore the acoustic model) in use when the name or command is learned. When the Vocera system learns a name or keyword, it notes which language pack is in use. Vocera keeps a separate set of learned names and keywords for each language pack.

## Grammars

Each locale has an associated grammar directory (under **\vocera\server\grammars**) that stores the system grammars (mainmenu, phonenumbers, etc.) for that locale. Different locales can share the same language pack but have different grammars. The AU and NZ locales are an example. For this reason, the grammar directories have locale names rather than package names. Directories for all supported grammars are created on the server computer when you install Vocera.

## Dialing Plan

In a Vocera installation that includes the telephony integration, the locale determines the dialing plan, which specifies how phone numbers are formatted and interpreted.

For example, the dialing plan for the United States (US) locale assumes that phone numbers longer than 10 digits contain complete information. Given an 11-digit number, Vocera would dial it as-is, without adding access codes or area codes.

That same number would be handled differently by a Vocera system configured for the United Kingdom (GB) locale. The corresponding dialing plan supports home and business phone numbers up to 11 digits in length, so Vocera would add access codes or area codes, as appropriate, before dialing.

## Wireless Channels

The Vocera system locale determines which wireless channels are supported on Vocera badges.

**Table 26. Locales and supported 802.11b/g channels**

Locale	Supported 802.11b/g Channels
United States (US)	1 to 11
Canada (CA)	
United Kingdom (UK)	1 to 13
Australia (AU)	
New Zealand (NZ)	
Singapore (SG)	
France (FR)	

By default, B3000 and B2000 badges scan only channels 1, 6, and 11 unless the **Channels To Scan** property is set. Setting this property allows B3000 and B2000 badges to scan up to four arbitrary channels. For more information on how to configure badges, see the *Vocera Badge Configuration Guide*.

