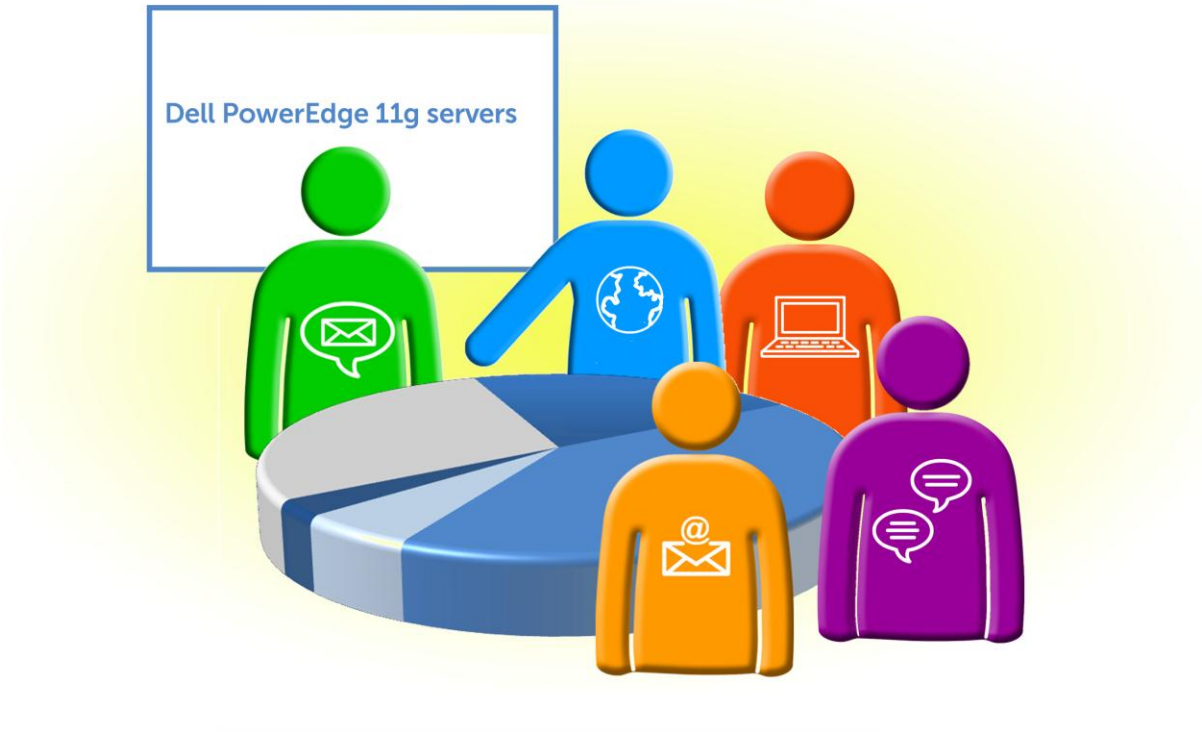


USING DELL POWEREDGE 11G SERVERS TO ENABLE MICROSOFT COLLABORATION TOOLS IN A MEDIUM-SIZED BUSINESS ENVIRONMENT



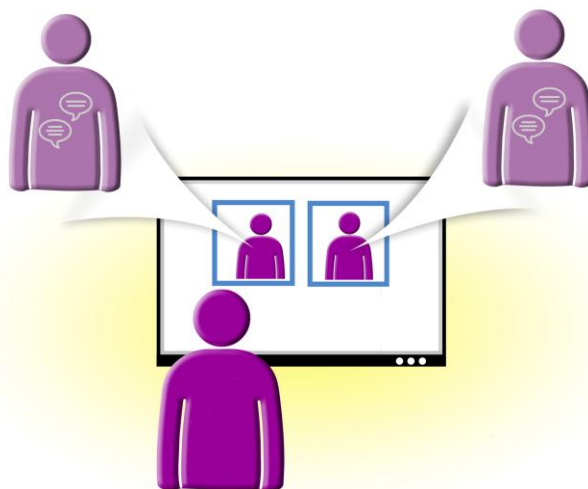
A collaboration deployment guide commissioned by Dell Inc.

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Introduction

In today's work environment, success increasingly relies on users being able to communicate from anywhere in a cost-effective and secure manner. In response, organizations seek integrated productivity tools that enable real-time collaboration. Microsoft® Lync™ Server 2010 joins Microsoft Exchange Server and Microsoft SharePoint® Server to provide a complete suite of collaboration tools. These tools, coupled with Dell™ PowerEdge™ servers, offer a powerful solution for companies' collaboration needs.

As this Principled Technologies (PT) study shows, the latest Microsoft collaboration tools are easy to install, implement, and integrate into your existing infrastructure, and doing so will give your organization a wide array of productivity options. Dell™ PowerEdge™ 64-bit servers running Microsoft Windows Server® 2008 R2 SP1 let you take advantage of the performance and power of 64-bit computing while Microsoft virtualization technologies let you consolidate several servers onto one.

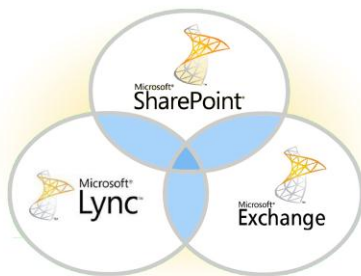
This Guide shows the process for implementing Microsoft collaboration tools in a medium-sized company, one with fewer than 1,000 employees. We not only introduce Microsoft Lync Server 2010 and the Dell servers that help make collaboration easier, we also perform an actual hands-on implementation of Microsoft Lync Server 2010 and Microsoft SharePoint Server 2010. (Our implementation assumes an Active Directory® (AD) infrastructure, as well as a Microsoft SQL Server® 2008 R2 and Microsoft Exchange Server 2010 already in place.)

NOTE

Those with more complex configurations, special requirements, or the desire to avoid performing the implementation themselves may wish to investigate the consulting services Dell and Microsoft offer.

Dell and Microsoft simplify collaboration

Dell and Microsoft combine server, software and client technologies to make collaboration—both internal and external—simple and successful for your organization. Lync Server 2010, the latest collaboration tool from Microsoft, consolidates your collaboration needs into one system with a single management point. SharePoint Server 2010 allows users to set up collaboration sites in order to share information with others, manage documents from start to finish, and publish a wide variety of reports. In this section, we detail the characteristics of the 64-bit Dell PowerEdge R710 as well as the features and capabilities of Lync Server 2010 and SharePoint Server 2010.



If you use Exchange Server 2010 to manage your email, you have all the tools you need to take full advantage of collaboration possibilities. Exchange Server 2010 easily integrates with SharePoint Server 2010 and Lync Server 2010 to provide functionalities such as presence awareness and instant messaging. You can launch IM or a meeting from the contact information or initiate a Web conference from a simple IM session. You can play voice mails from your email, and send and receive faxes from your computer. Collaboration and sharing information becomes easy and seamless. Exchange Server 2010 to manage your email, SharePoint Server 2010 to manage your intranet and collaboration sites, and Lync Server 2010 to integrate all your communication—this is your toolkit for success.

The Dell PowerEdge R710—64-bit power



The Dell PowerEdge R710 server maximizes the advantages of 64-bit computing

The Dell PowerEdge R710 is a high-performance server that can readily support significant consolidation. The Dell PowerEdge R710 offers many new features for maximizing performance on virtualized applications and for minimizing operational expenses, including the following:

64-bit computing with large RAM capacities

The Dell PowerEdge R710 allows for up to 192 GB of RAM via its 18 DIMM slots, which accept any of the following sizes of DDR3 RAM: 1GB, 2GB, 4GB, 8GB, or 16GB. These amounts of memory, along with the 64-bit Windows Server software platform, let you virtualize multiple servers in a single machine.

Power

Enhancements to the Dell PowerEdge R710 let it use less energy than many older servers do. When you consolidate multiple legacy servers onto a Dell PowerEdge R710, the potential power savings are dramatic.

Processors

The Dell PowerEdge R710 uses the Intel® Xeon® processor 5500 series. These processors automatically adjust their speed and energy usage to meet the requirements of your applications, improving performance and saving power. Combined with support for ever-increasing amounts of

memory, the Intel Xeon processor 5500 series makes the Dell PowerEdge R710 an excellent virtualization platform.

Management

The Dell PowerEdge R710, like all late-model Dell servers, comes with the Dell Lifecycle Controller. This tool simplifies management by providing a single interface for management functions and by storing critical information in the system itself. There are no CDs or USB keys to keep track of for drivers or firmware. In addition, you can use the Dell Lifecycle Controller in conjunction with Microsoft System Center Configuration Manager 2007 to streamline remote operating system deployments. For more information on the Dell Lifecycle Controller, visit <http://www.delltechcenter.com/page/Lifecycle+Controller>.

Microsoft Lync Server 2010 and client software

Microsoft Lync Server 2010, the latest in collaborative communication software, brings voice, video, application sharing, instant messaging (IM), and Web conferencing together into a single unified platform. Its key features include the following:

Integration with Microsoft Outlook® 2010

Integration with Outlook 2010 lets Lync Server 2010 users initiate meetings and conferences in a single click. Users can also convert an IM session to anything from a group chat to a Web conference with audio and video, again with only one click.

Presence integration

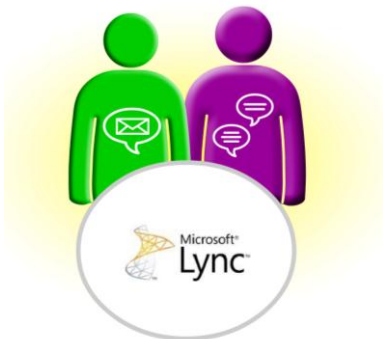
The presence information set in the Lync Server 2010 client and sign-on automatically integrates into Outlook 2010 and SharePoint 2010, enabling and enhancing these tools to make them more collaborative.

Exchange Unified Messaging (UM) integration

Users receive visual notification of voice mail messages and can play them directly from an Outlook message.

Planning Tool and Topology Builder

The Lync Server 2010 Planning Tool is a very robust application that collects information about your deployment and draws a map of your complete topology and infrastructure, which is necessary for a successful deployment. The Planning Tool exports an XML file that is importable by the Topology Builder, which you use to display and adjust your planned topology. The Topology Builder also validates topologies, and when you are ready to begin deployment, you use it to author a topology for your Lync Server 2010 deployment.



Instant messaging (IM)

The Standard Edition of Lync Server 2010 includes instant messaging and conferencing. These features are also configurable to connect with public IM networks such as AOL® AIM® and Yahoo!® Messenger.

Support for remote users

Through the implementation of Edge Servers and/or Branch Office Extenders, users can connect remotely through the Internet. Depending on the infrastructure, communications, and options selected, Lync Server 2010 can support voice as well.

Availability of a Web client

The Web client extends the conferencing features to participants who do not have the desktop Lync Server 2010 client software installed.

Microsoft Lync Server 2010—choose the edition that suits your organization

The Standard Edition of Lync Server 2010 comes with IM, presence, conferencing, and the option of enabling enterprise voice. It supports these applications and up to 5,000 users on a single server. The Enterprise Edition, for larger deployments, lets you separate the individual components for better performance and scalability. This configuration utilizes Front-End Server pools, multiple Edge Servers, and possibly multiple A/V servers. Each Front-End Server supports up to 10,000 users and each pool supports up to 80,000 users.

Clients for Microsoft Lync Server 2010

- Lync Server 2010 with presence, contact management, IM, conferencing, and telephony is the standard installed client.
- Lync 2010 Attendee is a conferencing client that allows users to participate in Lync meetings without having to fully install Lync. The user can download and install Lync 2010 Attendee as needed.
- The Lync 2010 Web client lets users attend meetings when they have no Lync client installed.

Microsoft SharePoint Server 2010

Microsoft SharePoint Server 2010 is the latest version of this very popular and flexible software. It allows users to create collaborative Web sites, and to create and manage their own workspaces. Some of its key features include the following:

Sites

Sites include dashboards, portals, and collaboration workspaces that are accessible through the Internet, extranet, or intranet depending on your infrastructure and requirements.

Communities

SharePoint 2010 Communities exemplifies collaboration by letting people work together and share ideas and information from a single platform.



Content

If you are concerned about compliancy or document retention in general, SharePoint 2010 Content makes managing these features a little easier. You can create document sets and apply and enforce retention schedules. Its close connection with Microsoft Office, which most users are familiar with, makes it easy to learn and use.

Search

SharePoint 2010 Search provides multiple features to help you find people and information efficiently. It provides an interactive experience that lets you use visual cues to identify more quickly the people and information you are seeking.

Insights

SharePoint 2010 Insights gives users an improved ability to access databases, reports, and business applications in order to make better, more informed decisions in their jobs.

Composites

SharePoint 2010 Composites takes advantage of SharePoint 2010's robust architecture, offering the tools and components that let users create do-it-yourself solutions. Rapid deployment and responses to ever-changing business needs are vital in industry today, and SharePoint 2010 Composites gives you the building blocks to respond quickly to changing needs.

Windows® Phone 7

SharePoint also has tight integration for Windows Phone 7 devices through the built-in Office Hub using Office Mobile. Office Hub gives you direct integration with your SharePoint server sites with Microsoft SharePoint Workspace Mobile. No configuration is required on the SharePoint server; you just point the application to the address of the server. SharePoint Workspace Mobile then lets you access and sync collaborative documents, projects, and schedules. Office Hub also includes other features such as Word Mobile, Excel Mobile, OneNote Mobile, and PowerPoint Mobile.

Microsoft Exchange Server 2010



Microsoft Exchange Server 2010 equips you with a robust communications platform that lets you reap the full benefits of Microsoft Lync Server 2010 and Microsoft SharePoint Server 2010. With Microsoft Exchange Server 2010, you can also give your users anywhere access, increasing their mobility. Some other key features of Exchange Server 2010 include the following:

Unified Mailbox Resilience

This new mailbox model gives businesses the ability to provide high availability, better disaster recovery, and more robust backup capabilities for the mailbox.

Archiving

Exchange Server 2010 includes newly integrated archiving, discovery, and retention functionalities.

Outlook Web Application

This application gives users an additional way to access email across different platforms, allowing them access to email, voice mail, instant messaging, and text messages all from within an Internet browser.

Information protection

Exchange Server 2010 includes tools to monitor sensitive content and control distribution. Automated alerts, redirects, and encryption of messages are included.

Management tools

IT administrators can delegate permissions to end users for some functionality such as editing personal information and managing distribution lists. This can help your business reduce costs for managing email.

Windows Phone 7

Mobile users of Windows Phone 7 devices such as the Dell Venue Pro have extra potential for collaboration. Exchange Server's Exchange ActiveSync synchronization protocol is a mobile data synchronization feature enabled by default when you install the Client Access server role on the server. This technology lets mobile users synchronize their Exchange 2010 mailbox including email, tasks, calendar, and contacts. Other features include support for setting auto-replies, enhanced Exchange searches, access to meeting attendee information, and the ability to apply IT policies like PIN requirements and remote management to lock and wipe devices.

We show you how: Planning the deployment

This section reviews some of the topics and tools you should consider prior to deploying Microsoft Lync Server 2010. In this study, we are planning for an 800-user company whose existing infrastructure includes Microsoft Active Directory and Microsoft Exchange Server 2010. We look at deploying Lync Server 2010 to include access for remote users through the Edge Servers and monitoring for Web meetings and conferencing through the Monitoring Server. We also look at deploying Microsoft SharePoint 2010. We use Dell PowerEdge R710 servers and Microsoft Hyper-V™ for virtualizing the installation. To run the Lync Server 2010 clients, we selected a Dell Latitude™ E6510 notebook system and a Dell OptiPlex™ 755 desktop system running Windows® 7 Ultimate. For more detail about our test bed, please see [Appendix A](#).

Microsoft Lync Server 2010 Planning Tool

Although not required for installation, the Lync Server 2010 Planning Tool (see Figure 1) is a robust planning wizard that guides you through a

questionnaire producing the topology (see Figure 2) and the hardware configurations (see Figure 3) you will need for actual deployment. It guides you through such questions as the number of users, percentage of external users, and amount of Web and voice traffic you anticipate. Download the Lync Server 2010 Planning Tool and access more information about it at <http://www.microsoft.com/downloads/en/details.aspx?FamilyID=bcd64040-40c4-4714-9e68-c649785cc43a>.

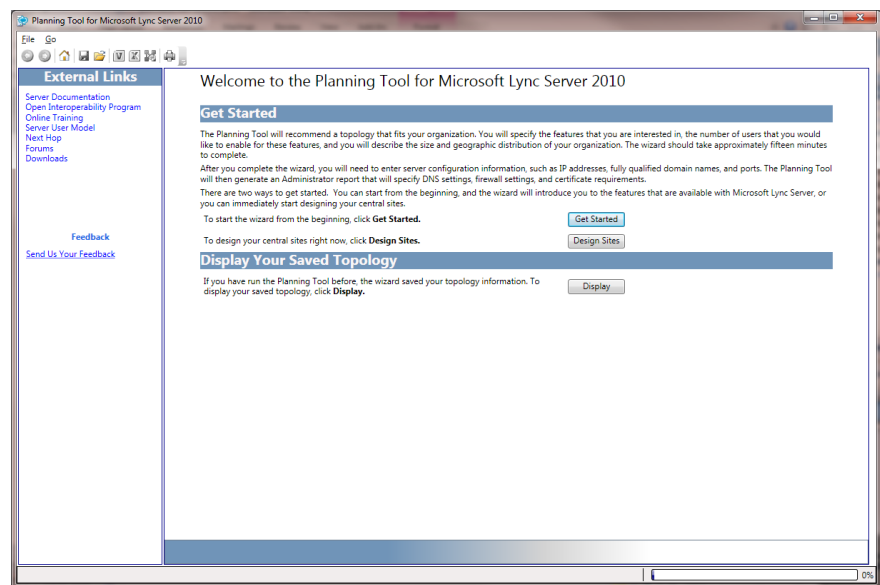


Figure 1. Microsoft Lync Server 2010 Planning Tool welcome screen.

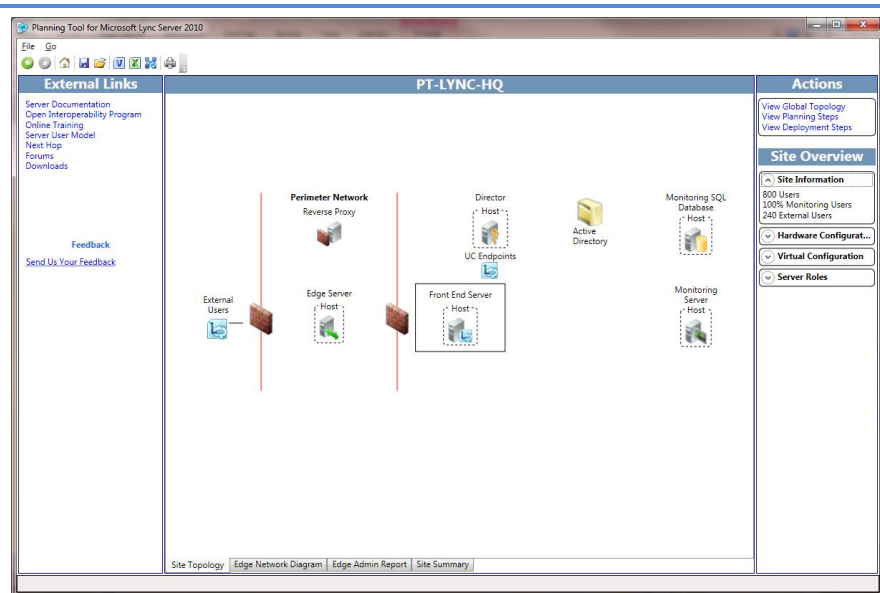


Figure 2. Microsoft Lync Server 2010 Planning Tool topology questionnaire.

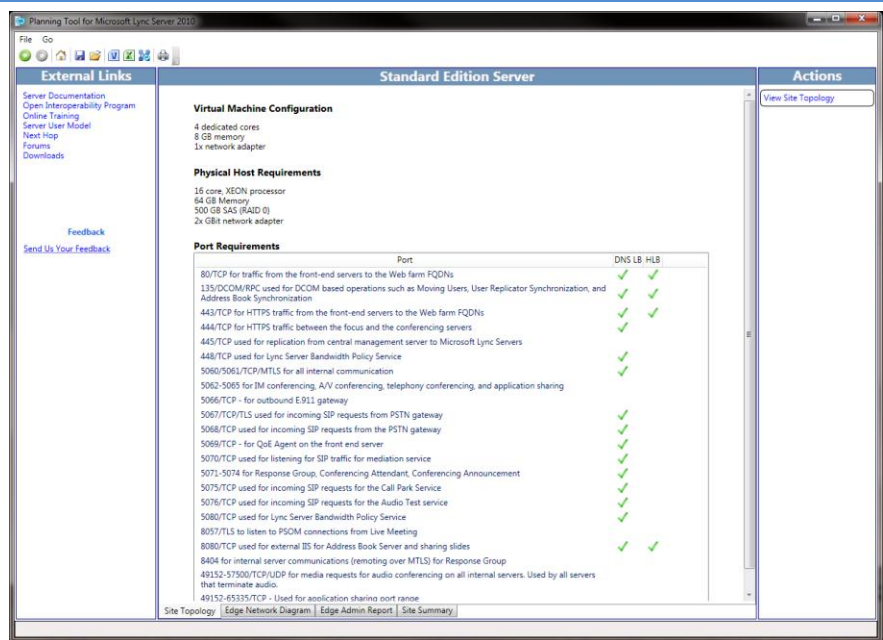


Figure 3. Microsoft Lync Server 2010 Planning Tool hardware requirements.

Microsoft Lync Server 2010 Topology Builder

Using Topology Builder is a mandatory part of the installation process. You can accelerate this step by taking the information you entered into the Planning Tool, exporting it, and importing it into the Topology Builder. You must know all your fully qualified domain names (FQDN) for your server infrastructure before proceeding with this tool. More detail about the Topology Builder application is located in the Front-End Server installation section and in [Appendix G](#).

Prerequisite considerations

Depending on the options you select for installation and your current infrastructure, prerequisites vary. The most common prerequisite for each component and Front-End Server is Internet Information Services (IIS) with specific options selected. The Microsoft Lync Server 2010 installation requires that you have a Certificate Authorization server accessible to create certificates for the Front-End, Edge, and Director Servers used in this particular topology. You must also install Microsoft Message Queuing (MSMQ) and Microsoft Silverlight® for Lync Server 2010 to work properly.

Virtualization considerations

Virtualization is an option presented as part of the Lync Server 2010 Planning Tool. When deploying with a virtualized environment, note that you get roughly 50 percent of the resource capacity of the Lync Server 2010

servers used in the deployment. In our study, we used virtualization to deploy our server components.

We show you how: Installing the operating system

Installing Windows Server 2008 R2 SP1

This section provides an overview of the Windows Server 2008 R2 SP1 installation process on the Dell PowerEdge R710. ([Appendix B](#) provides complete, detailed installation instructions.)

NOTE

Allow around 30 minutes to complete the installation of Windows Server 2008 R2 Enterprise Edition with SP1 on the Dell PowerEdge R710 server. The time to install updates will increase over time as Microsoft releases OS updates for Windows Server 2008 R2.

1. Insert the Microsoft Windows Server 2008 R2 Enterprise Edition DVD into the DVD drive, and reboot the system. If a message appears telling you to press any key to boot from CD or DVD, do so. During the boot, a message that Windows is loading files appears, followed by a Windows loading bar.
2. To use Hyper-V with Lync Server 2010, you must install either the Standard or Enterprise Edition of Windows Server 2008 R2. Best practice recommends Enterprise Edition, which we selected for our installation. Accept the license terms, proceed with the installation, and enter the information the installation software requires.
3. Set your password; enter configuration information, including the public IP address and domain information; and reboot the system.
4. Download and install updates, including Microsoft Windows Server 2008 R2 SP1. (Download times will vary based on the number and size of updates.)

Installing the Hyper-V role

Enabling Hyper-V on your Microsoft Windows Server 2008 R2 SP1 installation is very straightforward, requiring just a few short steps. We provide detailed instructions in [Appendix C](#).

1. Click Start, and click Server Manager. Click Roles, and choose Add Roles.
2. Click Hyper-V (see Figure 4). Configure your networking as you desire, and proceed to install the Hyper-V role. The installation requires one or more reboots upon completion, after which the Hyper-V role finishes installing.

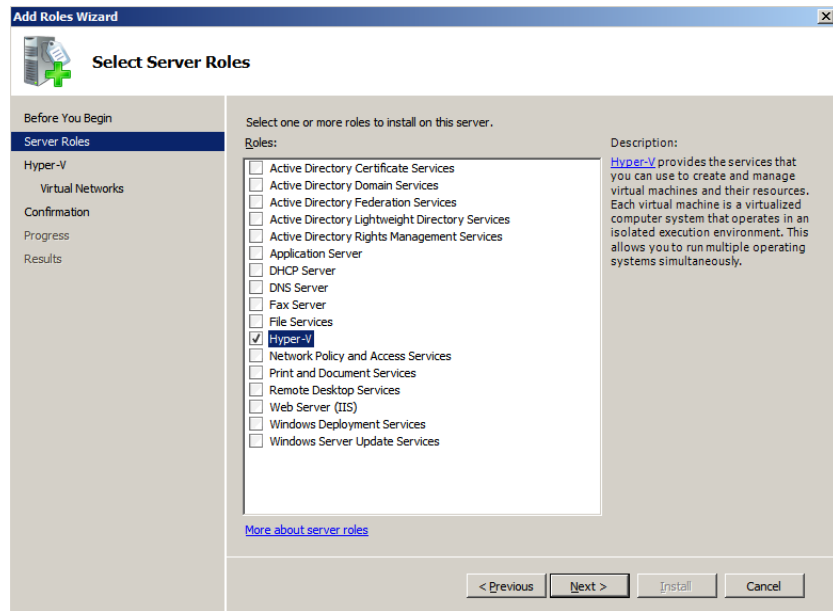


Figure 4. Installing the Hyper-V role in Windows Server 2008 R2 SP1.

Creating the virtual machine for Lync Server 2010 components

Microsoft recommends deploying the VMs required for Lync Server 2010 deployment using System Center Virtual Machine Manager (SCVMM). We chose not to use SCVMM and built the VMs manually to virtualize the Front-End, Director, Edge, and Monitoring Servers on our new Hyper-V platform. Here, we provide an overview of the steps required to create your VMs using Hyper-V Manager. For detailed steps on this process, see [Appendix D](#). For detailed instructions on installing and using SCVMM, please see our paper at <http://principledtechnologies.com/clients/reports/Dell/Hyper-V-Migration-Guide.pdf>.

1. Click Start → Administrative Tools, and click Hyper-V Manager.
2. Create a new VM, assigning just one virtual processor, with 2 GB of RAM, and create a 100GB VHD to install the operating system on.
3. Insert the Windows Server 2008 R2 installation media, and attach the physical media to the VM.
4. Start the VM and install Windows Server 2008 R2, which requires several reboots of the VM.
5. Download and install updates including Microsoft Windows Server 2008 R2 SP1.
6. Repeat steps 1 through 5 to create VMs for the Director, Edge, and Monitor servers needed for Lync Server 2010 deployment.

Installing AD tools on the Front-End Server

For both the Enterprise and Standard Editions of Lync Server 2010, you will need to install the AD tools as a feature in the Windows Server 2008 R2 SP1 operating system on the VM designated as the Front-End Server. This is part of the Remote Administration feature installed from Server Manager. Please see [Appendix F](#) for detailed instructions.

Installing the Internet Information Services (IIS) role

IIS is an integral requirement needed for the Web conferencing and meetings functionality of Lync Server 2010. IIS is a role added from Server Manager but needs customization to provide functionality for Lync Server 2010. Detailed instructions with the correct options are located in [Appendix E](#).

Other prerequisites

The prerequisites for Lync Server 2010 differ greatly depending on the functionality you wish to implement. All installations require you to install Microsoft Silverlight on the servers running Lync Server 2010 and MSMQ on the server running Lync Server 2010 and the Edge Server. For instructions on downloading and installing Microsoft Silverlight and installing MSMQ, see [Appendix F](#).

We show you how: Installing Microsoft SharePoint Server 2010

Microsoft SharePoint Server 2010 installation overview

In addition to installing Microsoft Lync Server 2010, we chose to install the Microsoft SharePoint Server 2010 on a standalone system to further demonstrate the collaboration tools Microsoft provides. We assume Microsoft SQL Server 2008 R2 is already installed as part of the infrastructure. When we installed SharePoint Server 2010, we followed the server farm installation procedure. We followed the steps below to install the software.

Installing Microsoft SharePoint Server 2010

1. For complete details on the installation of SharePoint Server 2010, see [Appendix E](#).
2. Insert the installation DVD, and capture the DVD drive in the VM session. Launch setup.exe, and click Install software prerequisites (see Figure 5).



Figure 5. The main installation menu for SharePoint Server 2010.

3. When the prerequisites finish installing, click Install SharePoint Server on the main SharePoint installation menu.
4. Choose the Complete server type, and click Install (see Figure 6).

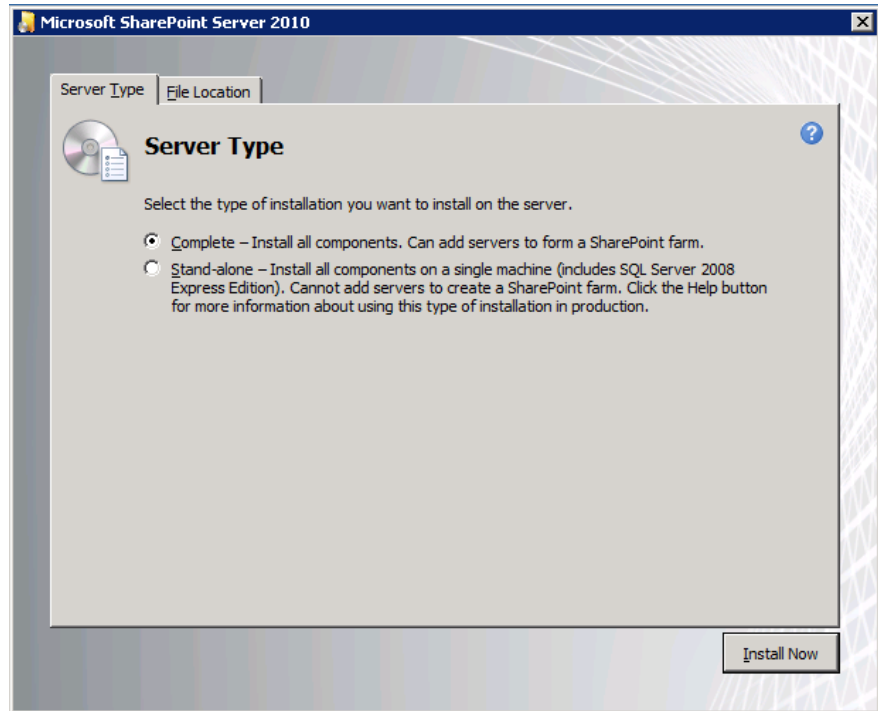


Figure 6. Selecting the server type.

5. When the installation finishes, check the box for Run the SharePoint Products Configuration Wizard now, and click Close.
6. Create a new server farm and enter the name of your existing database server and database name (see Figure 7).

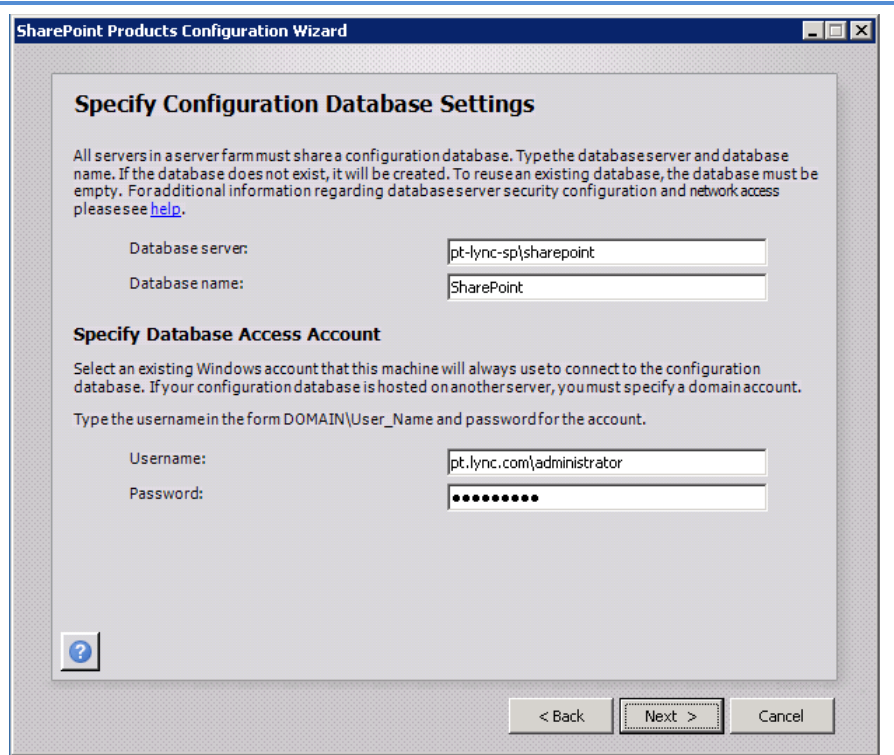


Figure 7. Specify Configuration Database Settings screen.

7. Specify a username and password to connect to your database server, and click Next.
8. Leave the default settings on the Configure SharePoint Central Administration Web Application screen, and click Next.
9. When the wizard has completed the configuration, choose Run the farm configuration wizard on the Central Administration site.
10. Choose the services you wish to include in your server farm, and click Next.
11. Enter the specifications for the new site, and finish the installation.

We show you how: Installing Microsoft Lync Server 2010

Microsoft Lync Server 2010 installation overview

For this Guide, we chose to use the Microsoft Lync Server 2010 Planning Tool and to virtualize the server components. We initiated the steps below to install the Front-End Server, Director Server, Edge Server, and Monitoring Server.

Installing Microsoft Lync Server 2010 on the Front-End Server

After you install all prerequisites for Lync Server 2010 on the VM, you may proceed with the installation of the Front-End Server. For this 800-user deployment, we used the Lync Server 2010 Standard Edition configuration. For complete details of the installation of the Front-End Server, see [Appendix G](#).

1. Insert the installation DVD, and capture the DVD drive in the VM session. Launch the setup.exe, and click install. The Deployment Wizard appears (see Figure 8).
2. Click Prepare Active Directory to start the installation process. After the Active Directory preparation has completed, click Prepare first Standard Edition server and allow it to complete.

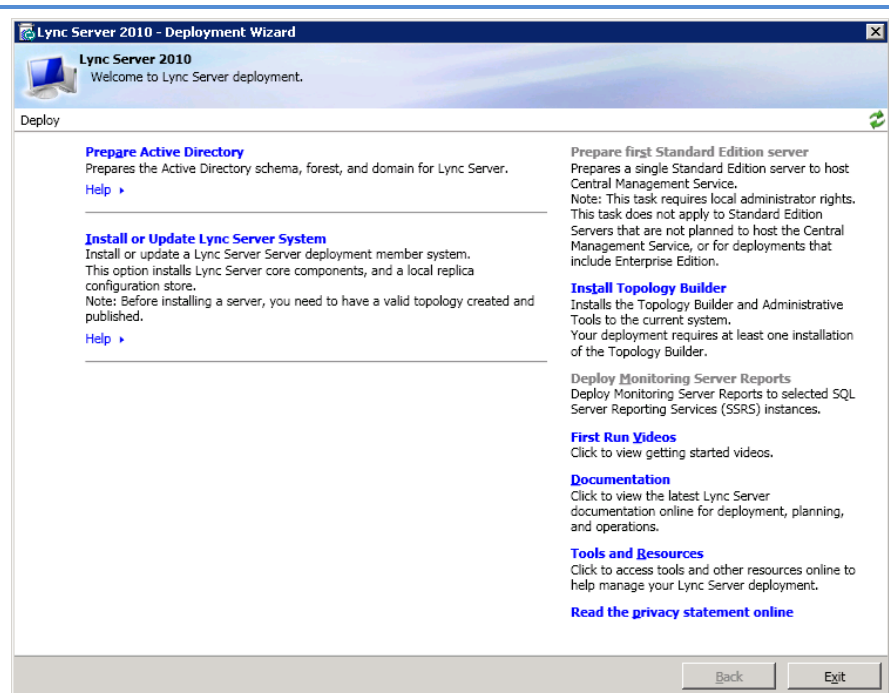


Figure 8. Microsoft Lync Server 2010 Deployment Wizard screen.

3. Click Install Topology Builder, and launch that tool separately before proceeding with the Deployment Wizard.
4. Choose Open Topology from a local file, and either open the .tbxml file exported from the Planning Tool or select New Topology to create the topology from scratch (see Figure 9).

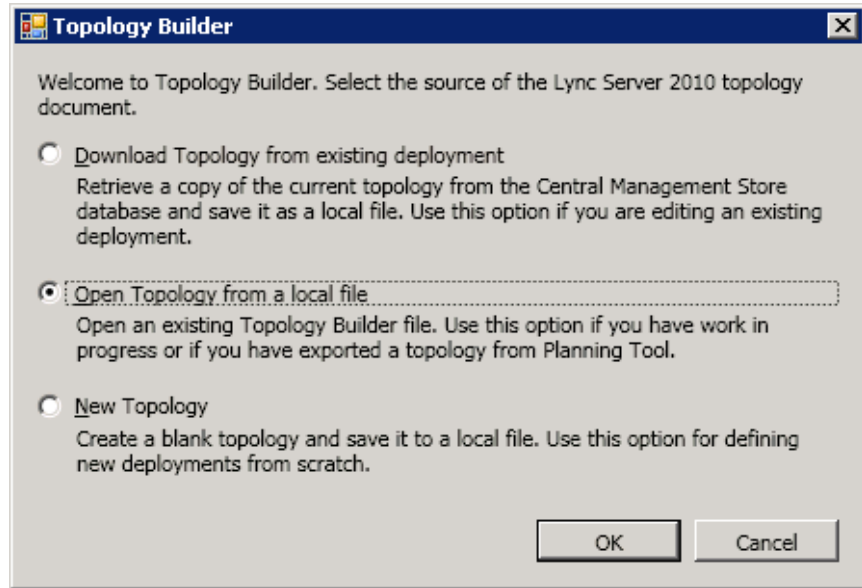


Figure 9. Topology Builder selection screen.

5. Expand SQL store, SEL Server DQDN, and Monitoring Server and review the information. Make any corrections before clicking Publish Topology (see Figure 10).

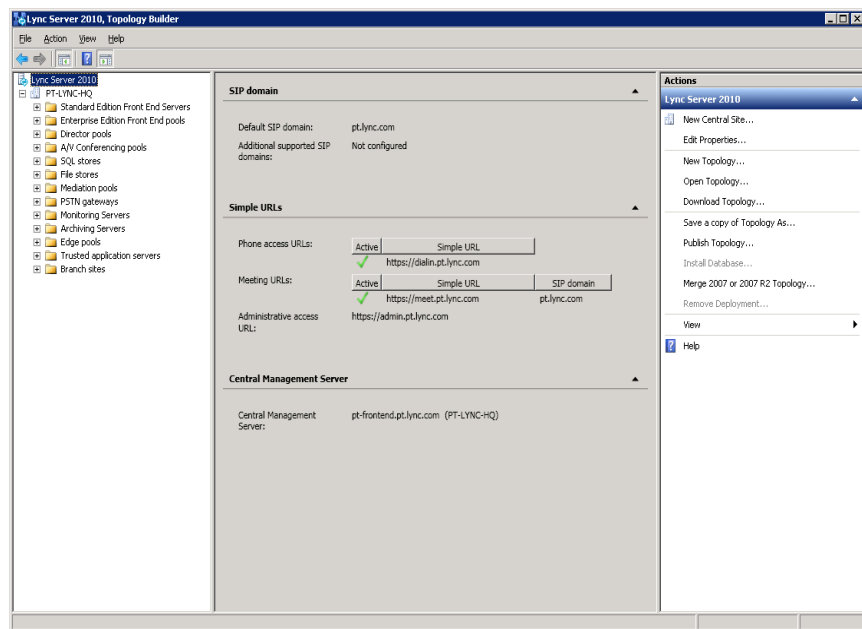


Figure 10. Microsoft Lync Server 2010 Topology Builder screen.

6. Once you have completed building and publishing the topology, return to the Deployment Wizard, and select Install or Update Lync Server System. Next, continue following steps 1 through 4 of the wizard and check to make sure services start (see Figure 11).

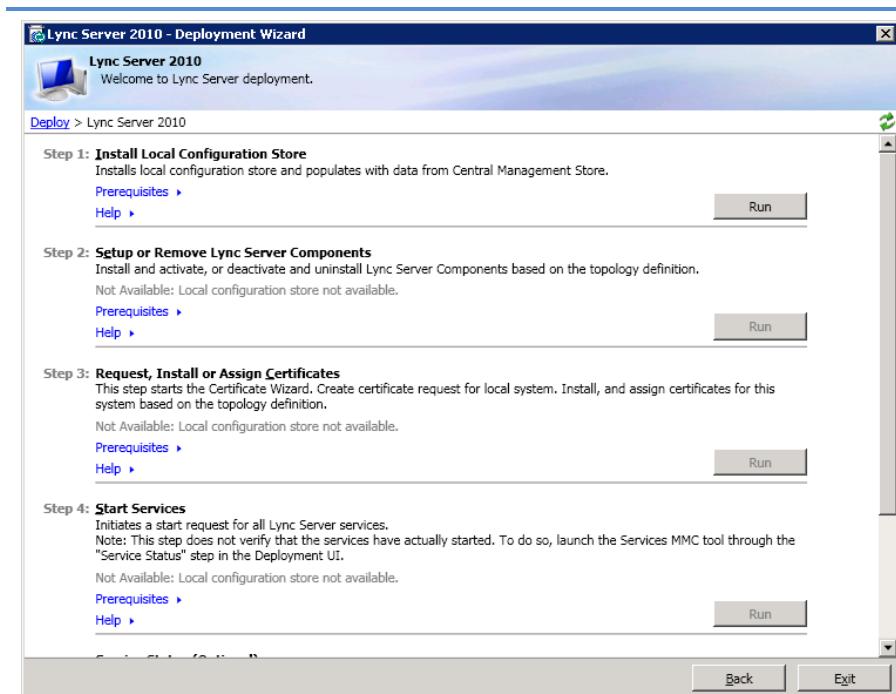


Figure 11. Install or Update Lync Server 2010 System wizard screen.

Installing Microsoft Lync Server 2010 on the Director Server

After you install Microsoft Lync Server 2010 Standard Edition on the Front-End Server's VM, proceed to install the Director Server on the designated VM. For complete Director Server installation details, see [Appendix H](#).

1. Insert the installation DVD, and capture the DVD drive in the VM session. Launch setup.exe, and click Install.
2. In the Deployment Wizard (see Figure 8), select Install or Update Lync Server System, follow steps 1 through 4 of the wizard, and check to make sure services start (see Figure 11).

Installing Microsoft Lync Server 2010 on the Edge Server

Connect to the VM designated for the Edge Server. For complete details on the installation of the Edge Server, please see [Appendix I](#). Because the Edge Server will reside on the other side of a firewall from your Front-End Server, you must export the topology of your Lync Server 2010 environment into the Edge Server. We will use the Lync Server Management Shell, which is a

command-line interface (CLI) management tool for Microsoft Lync Server 2010, to accomplish this task.

NOTE

The Edge Server requires separate network connections and must be able to connect through your firewall. Please contact your local network engineer for assistance and reference the following Microsoft TechNet article for more detail: <http://technet.microsoft.com/en-us/library/gg412847.aspx>.

1. Insert the installation DVD, and capture the DVD drive in the VM session. Launch setup.exe, and click Install.
2. In the Deployment Wizard (see Figure 8), select Install or Update Lync Server System, and click Run on Step 1. Select the topology file exported via the CLI and import it to complete the step. Follow steps 2 through 4 of the wizard to complete the install and check to make sure services start (see Figure 11).

NOTE

The Edge Server requires certificates that may need to be public depending on your setup preference. Please contact your local network engineer for assistance and refer to the following Microsoft TechNet Web site for more detail: <http://technet.microsoft.com/en-us/library/gg412750.aspx>. The certificates must be applied before starting services.

Installing Microsoft Lync Server 2010 on the Monitoring Server

The Monitoring Server requires installation of MSMQ and IIS. Please verify that these prerequisites are on the selected VM. For complete details on the installation of the Monitoring Server, please see [Appendix J](#).

1. Insert the installation DVD, and capture the DVD drive in the VM session. Launch setup.exe, and click Install.
2. In the Deployment Wizard (see Figure 8), select Install or Update Lync Server System. For the Monitoring Server, you need to run only steps 1, 2, and 4 of the wizard. Check to make sure services start, and exit the installation wizard (see Figure 11).

Deploying Monitoring Server reports

Deploying the monitoring reports is a very simple procedure done on the Monitoring Server. For detailed installation instructions, see [Appendix J](#).

1. Launch the Lync Server Deployment Wizard from the Start menu, and click Deploy Monitoring Server Reports.
2. Select the appropriate SQL report server with corresponding login credentials, and complete the installation.

Configuring Monitoring Server reports for viewing

The Monitoring Server reports are configured through the Lync Server Control Panel, which is launched from the Start menu on the front-end server.

1. Select Monitoring and Archiving, where you can select Quality of Experience Data and apply desired settings. Please see [Appendix J](#) for detailed instructions.

Summing up

As this Guide has explained, the process of installing and deploying Microsoft Lync Server 2010 and Microsoft SharePoint Server 2010 to a virtual environment running on a Dell PowerEdge R710 server running Windows Server 2008 R2 SP1 with Hyper-V is relatively straightforward; you can perform a basic implementation up and running in a few hours. We recommend that you first invest ample time in the planning phase to help avoid problems and ensure a smooth installation to enhance your existing infrastructure.

The Dell PowerEdge R710 combined with the Microsoft collaboration tools make a complete collaboration package that will benefit any organization by significantly expanding their options for peer communications.

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Appendix A. Defining the test environment

Our test bed starting point consisted of an Active Directory domain controller, a backup domain controller, an Exchange Server 2010 email server, and a SharePoint Server 2010 server. For testing purposes, we virtualized the Active Directory and Exchange servers on a Dell PowerEdge R910 and ran SharePoint Server 2010 on a Dell PowerEdge R710. We deployed Microsoft Lync Server 2010 on a Dell PowerEdge R710 server running Windows Server 2008 R2 Enterprise Edition SP1 with the Hyper-V role enabled. Figure 12 illustrates the topology of our setup.

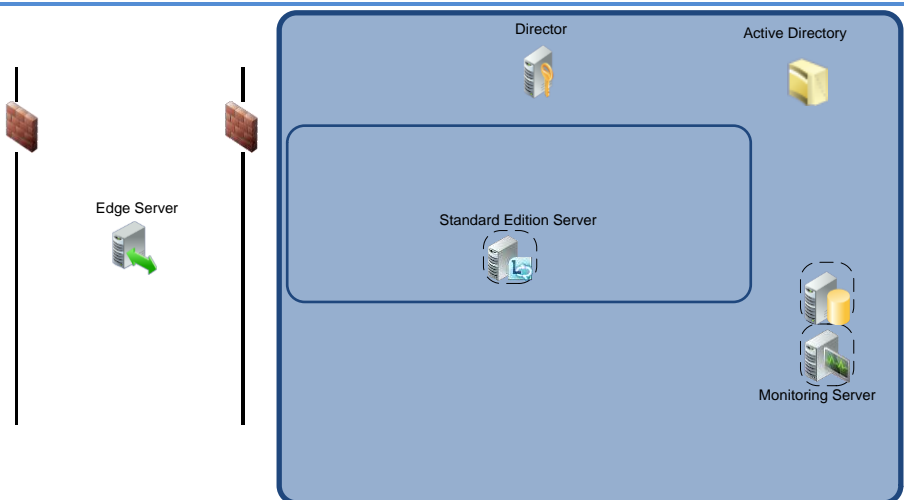


Figure 12. The site topology of the test bed, taken from Microsoft Lync Server 2010 Planning Tool.

Figures 13 and 14 present the hardware and software we used in our test environment.

Server	Processor	OS	Memory	Disk
Dell PowerEdge R710	2 x Intel Xeon processor X5570 ¹ 2.93 GHz	Windows Server 2008 R2 Enterprise SP1 w/Hyper-V	48 GB	8 SAS, 15K, 146 GB
Dell PowerEdge R910	4 x Intel Xeon processor X7560 2.27 GHz	Windows Server 2008 R2 Enterprise SP1 w/Hyper-V	256 GB	16 SAS, 15K, 146 GB

Figure 13. Servers we used in our hands-on testing and research for this Guide.

Client	Processor and memory	OS	Applications
Dell Latitude E6510	Intel Core 2 Duo processor 2.33 GHz, 4GB RAM	Windows 7 Ultimate 64-bit	Office 2010, Lync Server 2010
Dell OptiPlex 755	Intel Core i5 M560 processor 2.67 GHz, 2GB RAM	Windows 7 Ultimate 32-bit	Office 2010, Lync Server 2010

Figure 14. Clients and software we used in our hands-on testing and research for this Guide.

¹ The Intel Xeon processor X5570 no longer comes standard with the Dell PowerEdge R710 server, due to the launch of the new Intel Xeon processor 5600 series.

Appendix B. Installing the Windows Server 2008 R2 SP1 host

Allow 25 minutes to complete the installation of Windows Server 2008 R2 SP1 on the Dell PowerEdge R710.

1. Insert the Microsoft Windows Server 2008 R2 DVD into an external DVD drive, connect the DVD drive to the system, and reboot the system.
2. During the boot, press F2 to enter setup.
3. In setup, scroll down to CPU Information, and press Enter.
4. Enable Virtualization Technology if necessary.
5. After you have checked the BIOS settings, press Escape to continue the boot.
6. During the boot, a Windows is loading files message appears, followed by a Windows booting loading bar.
7. At the Install Windows Server 2008 screen, accept the defaults of English language, English time and currency format, and US keyboard or input method by clicking Next.
8. Click Install now.
9. At the Select the edition of Windows that you purchased screen, click the appropriate edition, and click Next.
10. At the Please read the license terms screen, check the I accept the license terms checkbox, and click Next.
11. At the Which type of installation do you want? screen, for Type of install, click Custom (Advanced).
12. At the Where do you want to install Windows? screen, click Drive options (Advanced).
13. Delete any existing partitions, recreate a partition, and format it. Highlight the partition, and click Next to start the installation.
14. When the system indicates that you must change the user's password before you log on the first time, click OK.
15. Enter a strong password in both the New password and Confirm password fields, and click the arrow.
16. At the Your password has been changed prompt, click OK. Windows then prepares the desktop.
17. Set the time zone.
18. Set the IP address, subnet mask, and domain information as per the steps in the next section.
19. Install Windows updates if applicable, including Windows Server 2008 R2 SP1. (Download times will vary based on number and size of updates.)
20. Reboot the server after any updates install.

After rebooting, set the static IP addresses and subnet mask using the following process:

1. Click Start.
2. Right-click Network, and select Properties.
3. In the Network Sharing Center, click Manage network adapters.
4. Right-click the Local Area Connection, and select Properties.
5. In the Local Area Connection Properties dialog, highlight Internet Protocol Version 4 (TCP/IPv4), and click Properties.
6. Click the radio button next to Use the following IP address.
7. Enter the IP address you want the server to have, enter the Subnet mask, and enter the Preferred DNS server. Click OK.
8. Close the Network Connections window.
9. From the Start menu, right-click Computer, select Properties, and select Change settings.
10. Select the Computer Name tab.
11. Click Change.
12. Enter the server name.
13. Click the Member of Domain radio button.
14. Enter the domain name.
15. When the system prompts you to do so, enter the user name and password.
16. When the Computer Name/Domain Changes window appears, click OK to close it.
17. Click OK to go past the warning to restart.
18. Click Restart Now to reboot the server.

Appendix C. Enabling the Hyper-V role

Allow around 10 minutes for enabling the Hyper-V role in Windows Server 2008 R2 SP1.

1. Click Start.
2. Expand Administrative Tools, and click Server Manager.
3. Right-click Roles, and select Add Roles.
4. On the Before You Begin page, click Next.
5. On the Select Server Roles page, select Hyper-V, and click Next.
6. On the Hyper-V page, click Next.
7. On the Create Virtual Networks page, select the appropriate Local Area Connection, and click Next. (In our Dell PowerEdge R710, we had four NICs in the system. We used the first as a NIC specifically assigned to the SCVMM VM, and one NIC per VM after the P2V process.)
8. On the Confirm Installation Selections page, click Install.
9. On the Installation results screen, click Close.
10. When Windows prompts you to reboot the server, click Yes. The server will reboot twice.
11. When you see the Installation Results page, click Close.

Appendix D. Creating a virtual machine

Follow the steps below to create a VM on the server that will host the Lync Server 2010 components.

1. Click Start.
2. Expand Administrative Tools, and click Hyper-V Manager.
3. From the Action menu, select New → Virtual Hard Disk.
4. Choose Fixed Size, assign 100GB for size, and place the VHD in the appropriate folder on the server.
5. From the Action menu, select New → Virtual Machine.
6. On the Before You Begin page, click Next.
7. On the Specify Name and Location page, enter the name for your new VM, and click Next.
8. On the Assign Memory page, enter 8,000 MB of RAM.
9. On the Configure Networking, choose the network assigned to internal traffic, and click Next.
10. Choose to add a virtual hard disk later.
11. On the Installation Options page, accept the default of Install an operating system later, and click Next.
12. On the Completing the New Virtual Machine Wizard page, click Finish.
13. Right-click the VM, and choose Settings.
14. Click Processors, and choose 2 virtual processors.
15. Click the virtual IDE controller 0.
16. Click Add, and click Hard Drive.
17. Browse to the VHD you created in Step 4, and choose that VHD for the guest OS VHD.
18. Click Apply.

Complete the following steps below to install the guest operating system:

1. Insert the installation DVD for Windows Server 2008 R2 into the physical DVD drive.
2. In Hyper-V Manager, right-click the VM, and choose Connect.
3. On the media menu, choose DVD Drive → Capture D:
4. On the Action menu, choose Start.
5. Double-click the VM to connect to the console.
6. During the boot of the VM, a Windows is loading files message appears, followed by a Windows booting loading bar.
7. At the Install Windows Server 2008 R2 screen, accept the defaults of English language, English time and currency format, and US keyboard or input method by clicking Next.
8. Click Install now.
9. At the Select the edition of Windows that you purchased screen, click the appropriate edition, and click Next.

10. At the Please read the license terms screen, check the I accept the license terms checkbox, and click Next.
11. At the Which type of installation do you want? screen, for Type of install, click Custom (Advanced).
12. In the Where do you want to install Windows? screen, click Drive options (Advanced).
13. Delete any existing partitions, recreate a partition, and format it. Highlight the partition, and click Next to start the installation.
14. When the system indicates that you must change the user's password before you log on the first time, click OK.
15. Enter a strong password in both the New password and Confirm password fields, and click the arrow.
16. At the Your password has been changed prompt, click OK. Windows then prepares the desktop.
17. Set the time zone.
18. Set the IP address, subnet mask, and domain information as per the steps in the above section.
19. Install Windows updates if applicable, including Windows Server 2008 R2 SP1. (Download times will vary based on number and size of updates.)
20. Reboot the VM after any updates install.

Appendix E. Installing SharePoint Server 2010

1. Insert the installation DVD, and capture the DVD drive in the VM session. Launch setup.exe, and click Install software prerequisites.
2. Review the list of software, and click Next.
3. Accept the EULA, and click Next.
4. When the prerequisites finish installing, click Finish.
5. On the main SharePoint installation menu, click Install SharePoint Server.
6. Enter your product license key, and click Continue.
7. Accept the EULA, and click Continue.
8. Choose the Complete server type, and click Install.
9. When the installation finishes, check the box for Run the SharePoint Products Configuration Wizard now, and click Close.
10. On the Welcome to SharePoint Products screen, click Next.
11. On the pop-up warning about services that will need to be restarted during the configuration, click Yes.
12. Choose Create a new server farm, and click Next.
13. Enter the name of your existing database server and database name.
14. Specify a username and password to connect to your database server, and click Next.
15. Enter a passphrase into the Passphrase and Confirm Passphrase fields, and click Next.
16. Leave the default settings on the Configure SharePoint Central Administration Web Application screen, and click Next.
17. Verify your settings, and click Next.
18. When the wizard has completed the configuration, click Finish.
19. Choose Run the farm configuration wizard on the Central Administration site.
20. Choose the services you wish to include in your server farm, and click Next.
21. Enter the specifications for the new site, and click OK.
22. Click Finish.

Appendix F. Installing prerequisites for the Lync Server 2010 software installation

Installing Active Directory tools feature

1. Click Start→Administrative Tools→Server Manger.
2. Click Features, and click Add Feature.
3. Expand Remote Server Administration Tools, expand Role Administration Tools, and check AD, DS, and AD LDS Tools.
4. Accept the default for installing .NET Framework 3.5.1 Features.
5. Click Next, and click Install.
6. Click Close, and restart the server.
7. After restart, on the Feature Install screen, click Close.

Installing IIS

1. In Server Manager, click Roles, and click Add Role.
2. Check Web Server (IIS), and click Next.
3. Click Next.
4. Check the following options to be installed:
 - Static Content
 - Default Document
 - HTTP Errors
 - ASP.NET
 - .NET Extensibility
 - Internet Server API (ISAPI) Extensions
 - ISAPI Filters
 - HTTP Logging
 - Logging Tools
 - Tracing
 - Windows Authentication
 - Client Certificate Mapping Authentication
 - Request Filtering
 - Static Content Compression
 - IIS Management Console
 - IIS Management Scripts and Tools
5. Click Next, and click Install.
6. When the installation is complete, click Close.

Installing Microsoft SilverLight

1. Download Microsoft SilverLight software from <http://www.microsoft.com/silverlight/>.
2. Launch setup.exe, and click Install Now.
3. On the Enable Microsoft Update screen, click Next .
4. When the installation is complete, click Close.

Installing Microsoft Message Queuing (MSMQ)

1. Click Start→Administrative Tools, and select Server Manager.
2. Click Features, and select Add Features.
3. Expand Message Queuing, and expand Message Queuing Services.
4. Select the Directory Services Integration and HTTP Support options.
5. Accept the pop-up prompts to install required services for these options.
6. Click Next, and click Install.
7. When the installation is complete, close Server Manager.

Appendix G. Installing Microsoft Lync Server 2010 on the Front-End Server

1. Insert the installation DVD, and capture it in the VM session.
2. Run setup.exe to launch installation.
3. If a prompt appears to install the Microsoft Visual C++ 2008 Redistributable –x64 9.0.30729.4148 Package if needed, click Yes.
4. Keep the default location, and click Install.
5. Accept the License agreement, and click OK.
6. Click Prepare Active Directory. (This prepares AD for Lync Server deployment.)
7. On the Prepare Schema screen, click Run.
8. On the Run once per deployment screen, click Next.
9. At the Executing Commands screen, click Finish.
10. At the Prepare Current Forest screen, click Run, and click Next.
11. In Universal Group Location, select Domain FQDN, enter domain information (e.g., pt.lync.com), and click Next.
12. At the Executing Commands screen, click Finish.
13. At the Prepare Current Domain screen, click Run, and click Next.
14. At the Executing Commands screen, click Finish.
15. Click Start→Administrative Tools→Active Directory Users and Computers.
16. Expand forest, and select Users.
17. Right-click CSAdministrator, and select Properties.
18. Select the Members tab, and add a user from domain that needs rights to make changes on the Lync Server (i.e., administrator).
19. Click OK, and close the window.
20. On the Prepare Active Directory Screen, click BACK.
21. Click Prepare first Standard Edition server, and click Next to start installation.
22. Click Finish.
23. Click Install Topology Builder, and click Next.
24. Click Start→All Programs→Microsoft Lync Server 2010, and launch Lync Server Topology Builder.
25. Select Open Topology from a local file, and click OK.
26. Navigate to location of tbxml file, and click OK.
27. Expand SQL stores, right-click SQL Server\SQL Instance, and select Edit Properties.
28. Enter SQL Server FQDN and name of SQL Instance (i.e., pt-lync-sp.pt.lync.com, PTLYNCSQL), and click OK.
29. Expand Monitoring Servers, right-click Monitoring Server, and select Edit Properties.
30. Enter the fully qualified domain name (FQDN) (e.g., pt-lync-mon.pt.lync.com) for Monitoring Server, and click OK.
31. Right-click Lync Server 2010, and select Edit Properties.

32. Enter the URL for administrative access (i.e., <https://admin.pt.lync.com>), and click OK.
33. Right-click Lync Server 2010, and select Publish Topology.
34. On the Publish the Topology screen, click Next.
35. On the Create Database screen, click Next.
36. On the Select Central Management Server screen, click Next.
37. When publishing is complete, click Finish, and close the Lync Server Topology Builder application.
38. Back in the Deployment wizard, click Install or Update Lync Server System to launch the Lync Server deployment wizard.
39. On Step 1 – Install Local Configuration Store, click Run.
40. On the Configure Local Replica of Central Management Store screen, keep defaults, and click Next.
41. When installation is complete, click Finish.
42. On Step 2 – Setup or Remove Lync Server Components, click Run, and click Next.
43. If a prompt to restart the server before continuing the installation appears, click Finish, click OK, and reboot the system. If not, click Finish and continue to Step 49 below.
44. After the server is rebooted, re-launch the deployment wizard (d:\setup\amd64\setup.exe), and click Install or Update Lync Server System to launch the Lync Server deployment wizard.
45. On Step 2 – Setup or Remove Lync Server Components, click Run, and click Next.
46. After the components have finished installing, click Finish.
47. On Step 3 – Request, Install or Assign Certificates, click Run.
48. Keep defaults, click Request, and click Next.
49. On the Delayed or Immediate Request screen, accept the default, and click Next.
50. Enter certificate server information (pt-lync-ad1.pt.lync.com/pt-lync-ad1-CA), and click Next.
51. Enter login credentials, and click Next.
52. On the Specify Alternate Certificate Template screen, accept defaults, and click Next.
53. Enter a name for your certificate. (e.g., Standard Edition Server Default Cert), and click Next.
54. On the Organization Information screen, enter organizational information, and click Next.
55. On the Geographical Information screen, enter Geographical information, and click Next.
56. On the Subject Name/Subject Alternate Names screen, accept defaults, and click Next.
57. Select the SIP domain, and click Next on the SIP Domain setting on Subject Alternate Names (SANs) screen.
58. On the Configure Additional Subject Alternate Names screen, click Next.

59. On the Certificate Request Summary screen, click Next.
60. When request for certificates has completed, click Next, and click Finish.
61. If the certificate is not automatically assigned, you may have to manually install certificates and click Assign to complete the configuration of assigning certificates.
62. After assigning certificates is complete, click Finish, and click Close.
63. On Step 4 – Start Services, click Run, and click Next.
64. After the services start, click Finish.
65. Check to see if all Services started.
66. On Step 5 – Check for Updates, click Run.

Appendix H. Installing Microsoft Lync Server 2010 on the Director Server

1. Install prerequisite .NET 3.5.1 Framework in Features.
2. Install prerequisite IIS (see [Appendix F](#) for instructions).
3. Insert the installation DVD, and capture it in the VM session.
4. Run setup.exe to launch installation.
5. If a prompt appears to install the Microsoft Visual C++ 2008 Redistributable –x64 9.0.30729.4148 Package if needed, click Yes.
6. Keep default location, and click Install.
7. Accept License agreement, and click OK.
8. Click Install or Update Lync Server System to launch the Lync Server deployment wizard.
9. On Step 1 – Install Local Configuration Store, click Run.
10. On Configure Local Replica or Central Management Store screen, keep defaults, and click Next.
11. When installation is complete, click Finish.
12. On Step 2 – Setup or Remove Lync Server Components, click Run, and click Next.
13. After components have finished installing, click Finish.
14. On Step 3 – Request, Install or Assign Certificates, click Run.
15. On Certificate Wizard screen, click Request, and click Next.
16. On Delayed or Immediate Request screen, accept the default, and click Next.
17. Enter certificate server information (i.e., `pt-lync-ad1.pt.lync.com/pt-lync-ad1-CA`) or select from list, and click Next.
18. If you are not signed in with the appropriate permissions, enter login credentials, and click Next.
19. On the Specify Alternate Certificate Template screen, accept defaults, and click Next.
20. Enter a name for your certificate. (e.g., Standard Edition Server Default Cert), and click Next.
21. On the Organization Information screen, enter organizational information, and click Next.
22. On the Geographical Information screen, enter geographical information, and click Next.
23. On the on Subject Name/Subject Alternate Names screen, accept defaults, and click Next.
24. On the SIP Domain setting on Subject Alternate Names (SANs) screen, select the SIP domain, and click Next.
25. On the Configure Additional Subject Alternate Names screen, click Next.
26. On the Certificate Request Summary screen, click Next.
27. When request for certificates has completed, click Next, and click Finish.

28. On the Certificate Assignment screen, click Next.
29. On the Certificate Assignment Summary screen, click Next.
30. Once assignment has completed, click Finish, and click Close.
31. On Step 4 – Start Services, click Run, and click Next.
32. After starting services is complete, click Finish.
33. Check to see if all Services started.
34. Click Exit to close the installation wizard.

Appendix I. Installing Microsoft Lync Server 2010 on the Edge Server

1. Install prerequisite .NET 3.5.1 Framework in Features.
2. Configure Network Interfaces (see TechNet <http://technet.microsoft.com/en-us/library/gg412847.aspx> for details).
3. Export Topology from the Front-End server so it can be imported into the Edge Server:
 - a. Click Start→All Programs→Microsoft Lync Server 2010, and click Lync Server Management Shell.
 - b. Enter the following command: `Export-CsConfiguration -FileName <ConfigurationFilePath.zip>`
 - c. You may now copy the file to USB or network media that is accessible by the Edge Server.
4. Insert the installation DVD, and capture it in the VM session.
5. Run setup.exe to launch installation.
6. If a prompt appears to install the Microsoft Visual C++ 2008 Redistributable –x64 9.0.30729.4148 Package if needed, click Yes.
7. Keep the default location, and click Install.
8. Accept the License agreement, and click OK.
9. Click Install or Update Lync Server System to launch the Lync Server deployment wizard.
10. On Step 1 – Install Local Configuration Store, click Run.
11. On the Configure Local Replica or Central Management Store screen, select Import from file (Recommended for Edge Servers).
12. Browse to location of topology export file from Step 3, click Open, and click Next.
13. When the installation is complete, click Finish.
14. On Step 2 – Setup or Remove Lync Server Components, click Run, and click Next.
15. After the components have finished installing, click Finish.
16. Set Up Edge Server Certificates – There are many different options for setting up the correct certificates based on your topology and requirements. Please see the Microsoft TechNet Web site (<http://technet.microsoft.com/en-us/library/gg412750.aspx>) for an in depth procedure for implementing the certificates. Note – These need to be applied before the services are started.
17. On Step 4 – Start Services, click Run, and click Next.
18. After services are started, click Finish.
19. Check to see if all Services started.
20. Click Exit to close the installation wizard.

Appendix J. Installing and configuring Microsoft Lync Server 2010 on the Monitoring Server

Installing Microsoft Lync Server 2010 on the Monitoring Server

1. Install prerequisite .NET 3.5.1 Framework in Features.
2. Install prerequisite IIS (See [Appendix F](#) for instructions).
3. Install and configure prerequisite Message Queuing (MSMQ) (See [Appendix F](#) for instructions).
4. Insert the installation DVD, and capture it in the VM session.
5. Run setup.exe to launch installation.
6. If prompted to install the Microsoft Visual C++ 2008 Redistributable –x64 9.0.30729.4148 Package if needed, click Yes.
7. Keep default location, and click Install.
8. Accept the License agreement, and click OK.
9. Click Install or Update Lync Server System to launch the Lync Server deployment wizard.
10. On Step 1 – Install Local Configuration Store, click Run.
11. On Configure Local Replica or Central Management Store screen, keep defaults, and click Next.
12. When installation is complete, click Finish.
13. On Step 2 – Setup or Remove Lync Server Components, click Run, and click Next.
14. After the components have finished installing, click Finish.
15. On Step 4 – Start Services, click Run, and click Next.
16. After services are started, click Finish.
17. Check to see if all Services started.
18. Click Exit to close the installation wizard.

Deploying Monitoring Server Reports to the SQL report server

1. Click Start→All Programs→Microsoft Lync Server 2010, and select Lync Server Deployment Wizard.
2. Click Deploy Monitoring Server Reports.
3. On the Specify Monitoring Server screen, select the appropriate monitoring server from the drop-down list and verify the SQL report server information, and click Next.
4. On the Specify Credentials screen, enter the appropriate user name and password and click Next.
5. (Optional) On the Specify Read-Only Group screen, enter domain group for read-only access (e.g., PT\Domain Users).
6. When installation completes, click Finish.

Configuring Monitoring Server Reports for viewing

1. On the front-end server, click Start→All Programs→Microsoft Lync Server 2010, and select Lync Server Control Panel.
2. Click Monitoring and Archiving.
3. Click Quality of Experience Data, and enable.
4. Configure the QoE settings that you need, and click OK.

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