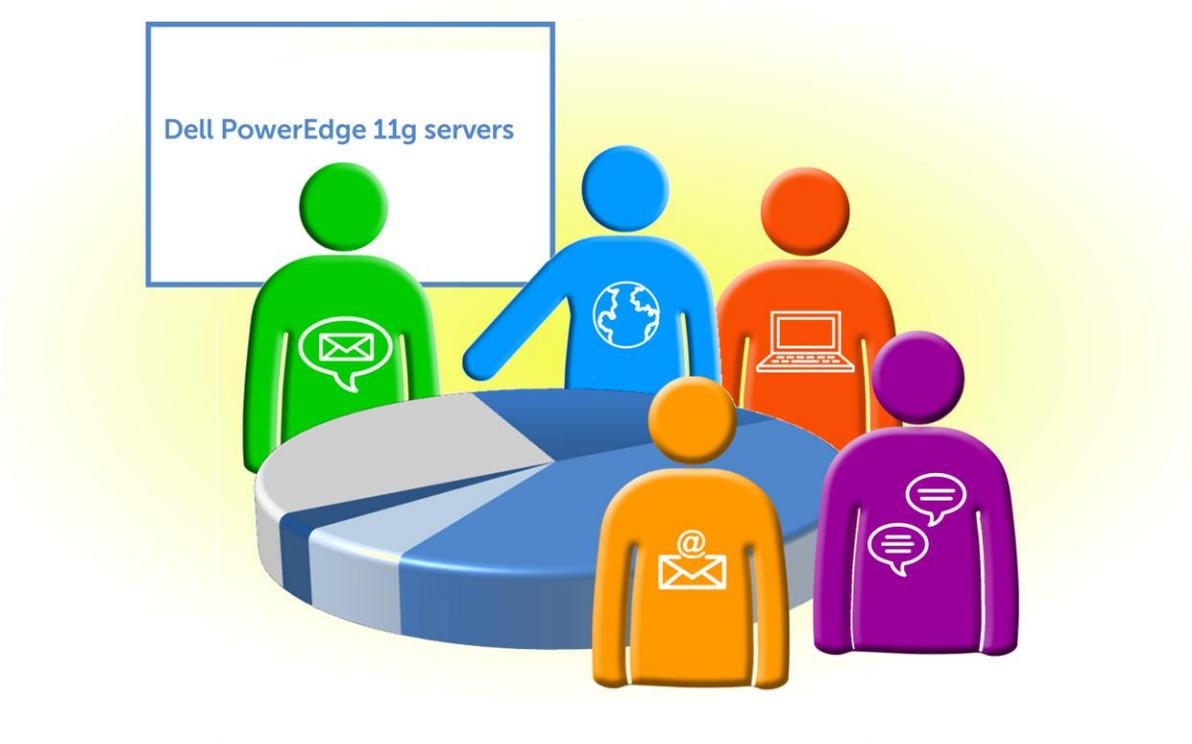


USING DELL POWEREDGE 11G SERVERS TO ENABLE MICROSOFT COLLABORATION TOOLS IN A SMALL BUSINESS ENVIRONMENT

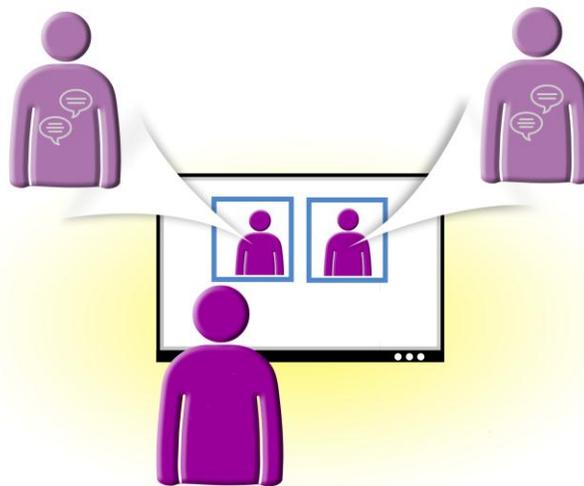


A collaboration deployment guide commissioned by Dell Inc.

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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 Enterprise Edition with 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.

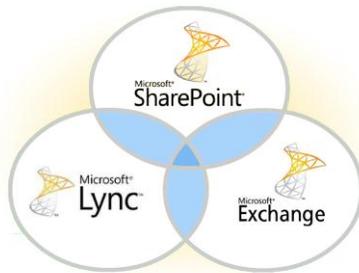
This Guide shows the process for implementing Microsoft collaboration tools in a small company, one with fewer than 250 employees. We not only introduce Microsoft Lync Server 2010 and the Dell servers that help make collaboration easier, we also perform an actual hands-on implementation of Microsoft Lync Server 2010, Microsoft SharePoint Server 2010, and Microsoft Exchange Server 2010. (Our implementation assumes an Active Directory® (AD) infrastructure is 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, SharePoint Server 2010, and Exchange Server 2010.



Using Exchange Server 2010 to manage your email gives you 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

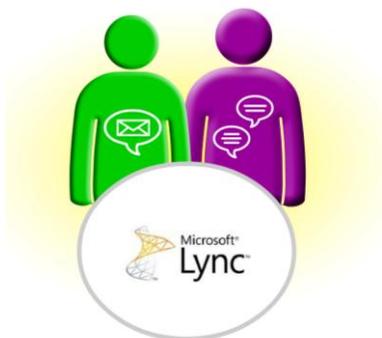
The presence information set in the Lync Server 2010 client and sign-on automatically integrates into Outlook 2010 and SharePoint 2010, enabling and enhancing these tools to make them more collaborative.

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. 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 can 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

In this section, we review some of the topics and tools you should consider prior to deploying Microsoft Lync Server 2010. In this study, we plan for a 200-user company whose existing infrastructure includes Microsoft Active Directory. We look at deploying Lync Server 2010 to include access for audio/visual conferencing and Web conferencing. We also look at deploying Microsoft SharePoint Server 2010 and Microsoft Exchange Server 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 Edition. For more detail about our test bed, please see [Appendix A](#).

Microsoft Lync Server 2010 Planning Tool

Although we do not use this tool for this guide and it is not required for the Standard Edition installation, the Lync Server 2010 Planning Tool (see Figure 1) is a robust planning wizard that is useful in larger deployments; you might keep it in mind as your business grows. The tool 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>.

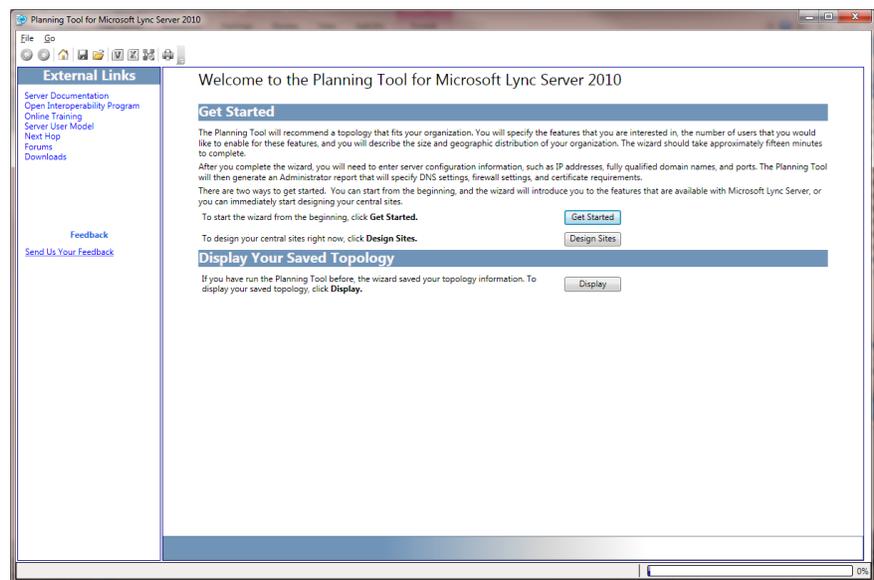


Figure 1. Microsoft Lync Server 2010 Planning Tool welcome screen.

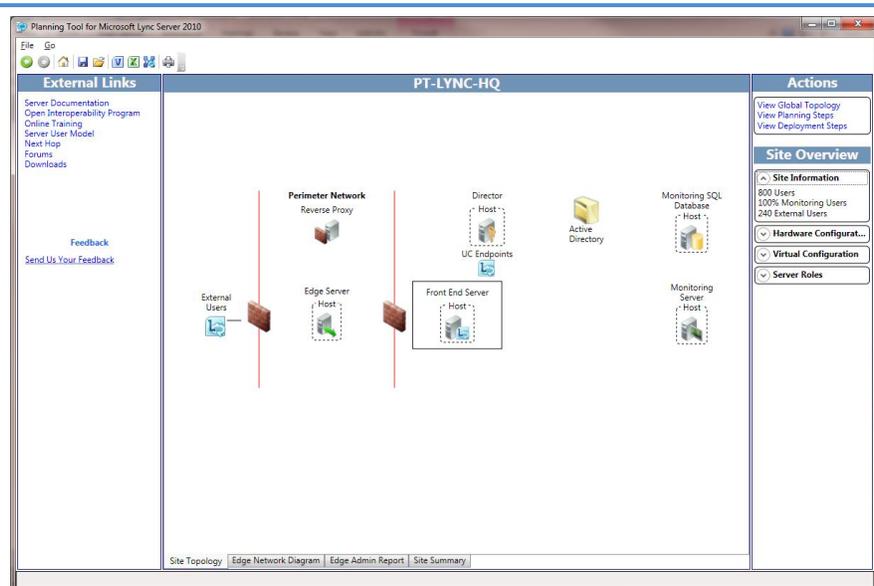


Figure 2. Microsoft Lync Server 2010 Planning Tool topology questionnaire.

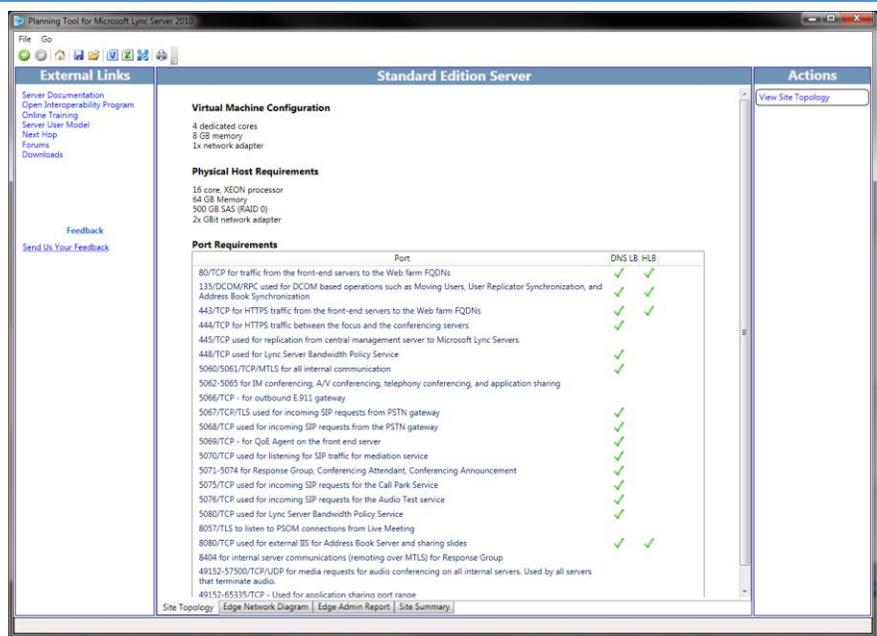


Figure 3. Microsoft Lync Server 2010 Planning Tool hardware requirements.

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 H](#).

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.

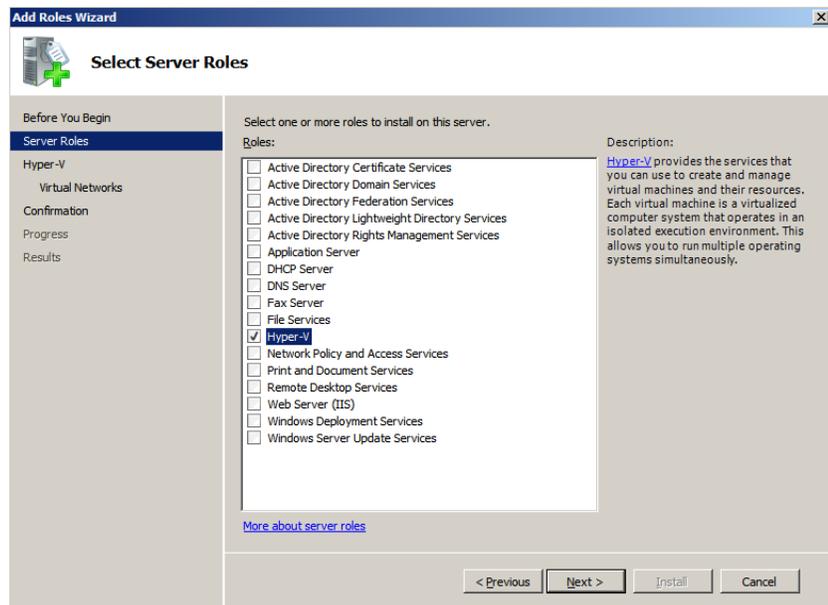


Figure 4. Installing the Hyper-V role in Windows Server 2008 R2 SP1.

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 G](#) 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 G](#).

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 G](#).

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

For complete details on the installation of SharePoint Server 2010, see [Appendix E](#).

1. 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.

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



Figure 6. Selecting the server type.

4. When the installation finishes, check the box for Run the SharePoint Products Configuration Wizard now, and click Close.
5. When the configuration completes successfully, click Finish.

We show you how: Installing Microsoft Exchange Server 2010

Microsoft Exchange Server 2010 installation overview

Because we are working with a small business environment for this Guide, we performed a basic installation of Exchange Server 2010. We followed the steps below to install the software.

Installing Microsoft Exchange Server 2010

For complete details on the installation of Exchange Server 2010, see [Appendix F](#).

1. Insert the Exchange 2010 installation DVD, and capture the DVD drive in the VM session. When the Autoplay window appears, click Run Setup.EXE (see Figure 7).



Figure 7. The main installation menu for Exchange Server 2010.

2. The installer should consider steps 1 and 2 to be complete (they appear grayed out). Click the link to Step 3: Choose

Exchange Language Option and install only languages from the DVD.

3. Click the link to Step 4: Install Microsoft Exchange Server 2010.
4. On the introduction screen, click Next and accept the license agreement.
5. Select Custom Exchange Server Installation, and click Next (see Figure 8).

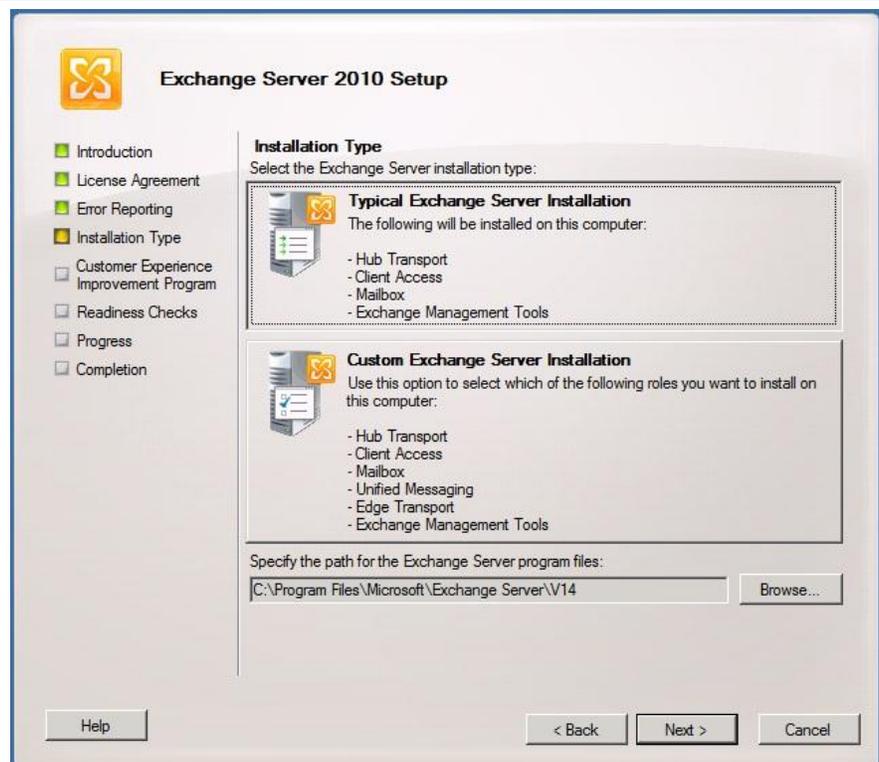


Figure 8. Exchange Server 2010 Installation type selection screen.

6. Select Mailbox Role, Client Access Role, and Hub Transport Role (Exchange will automatically select Management Tools as well). Click Next.
7. Leave the organization name at default (First Organization), and click Next.
8. To enable compatibility with previous Outlook 2003 clients, at the question about client computers running Outlook 2003 or Entourage, select Yes, and click Next.
9. Click Next to accept defaults for Configure Client Access server external domain, and chose the option for Customer Experience Improvement Program.
10. The installation will now perform a Readiness check. (If a warning about a lack of SMTP appears after the check

finishes, ignore it.) To start the installation process, click Install (see Figure 9).

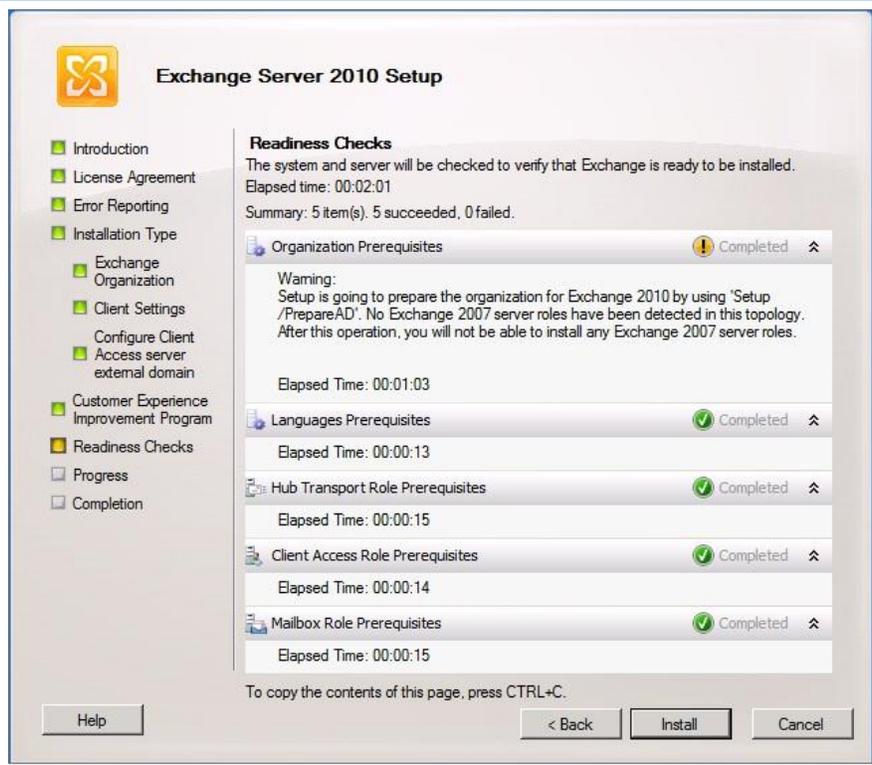


Figure 9. Readiness Checks status and install screen.

11. Once the installation has completed, click Finish. Exchange should automatically open the Exchange Management Console (see Figure 10).

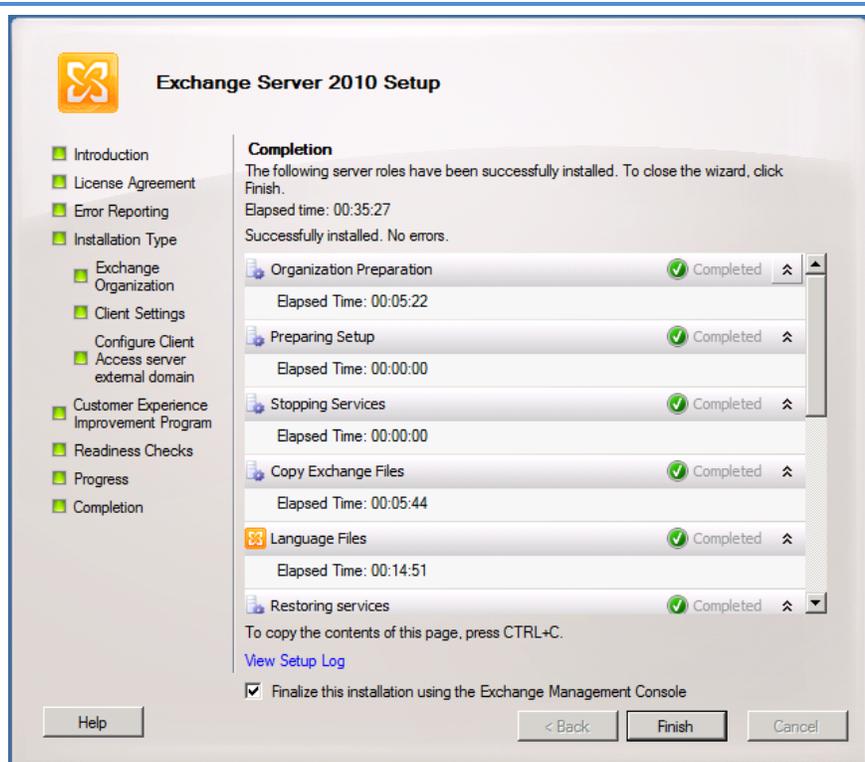


Figure 10. Installation complete screen.

NOTE

In order to receive external email, you will need to contact your Internet Service Provider (ISP) in order to register your MX record associated with your email server's external IP address. You will also need to establish routes in your Firewall to direct all SMTP traffic to your Exchange Server 2010 IP address.

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 Standard Edition, which includes all the parts needed for the complete installation on one server. We initiated the steps below to install the Standard Edition server.

Installing Microsoft Lync Server 2010 Standard Edition

After you install all its prerequisites on the VM, you may proceed with the installation of Lync Server 2010 Standard Edition. For this 200-user deployment, we used the Lync Server 2010 Standard Edition configuration. For complete details of the installation, see [Appendix H](#).

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 11).
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.

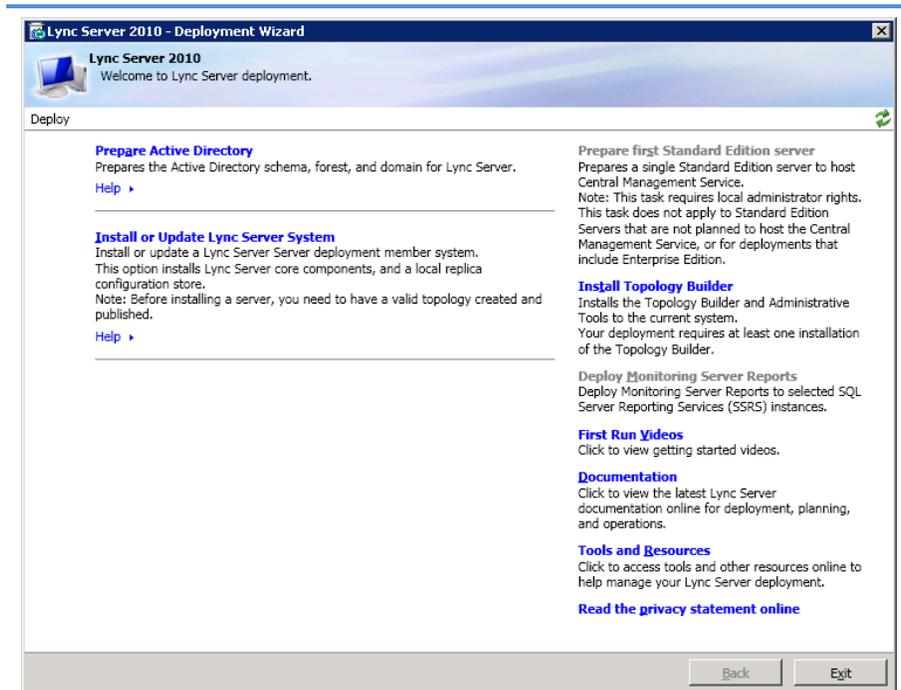


Figure 11. Microsoft Lync Server 2010 Deployment Wizard screen.

3. Click Install Topology Builder, and launch that tool separately before proceeding with the Deployment Wizard.
4. Choose select New Topology to create the topology from scratch (see Figure 12).

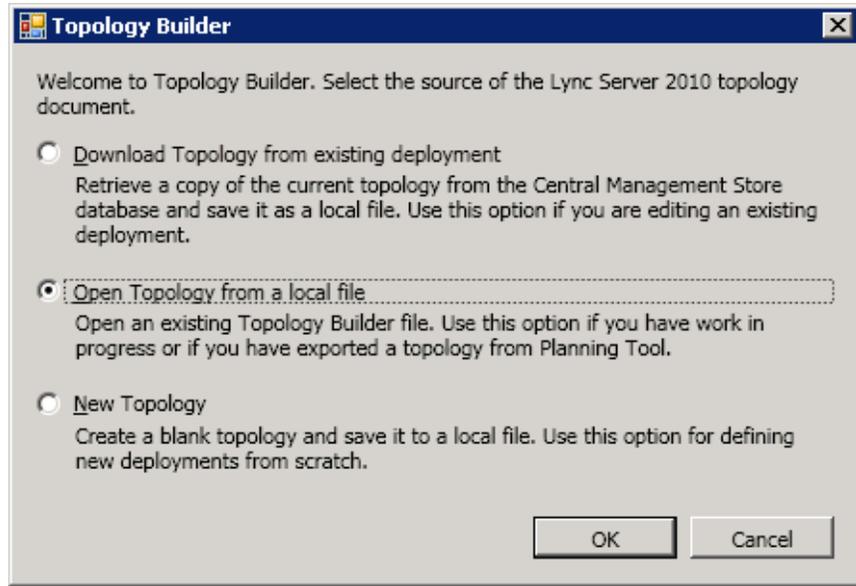


Figure 12. Topology Builder selection screen.

5. Expand SQL store, SEL Server DQDN, and Monitoring Server, and review the information. Make any corrections before clicking Publish Topology (see Figure 13).

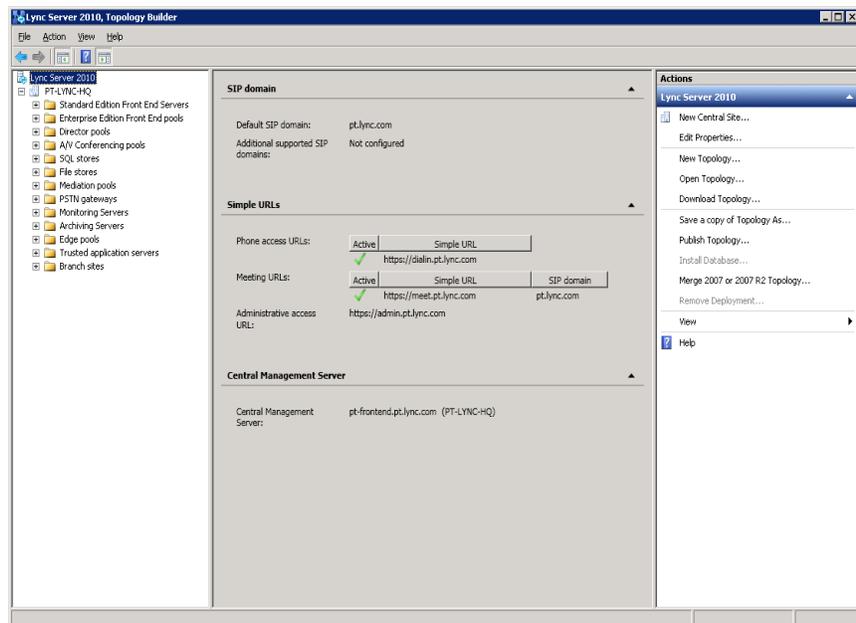


Figure 13. Microsoft Lync Server 2010 Topology Builder screen.

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 14).

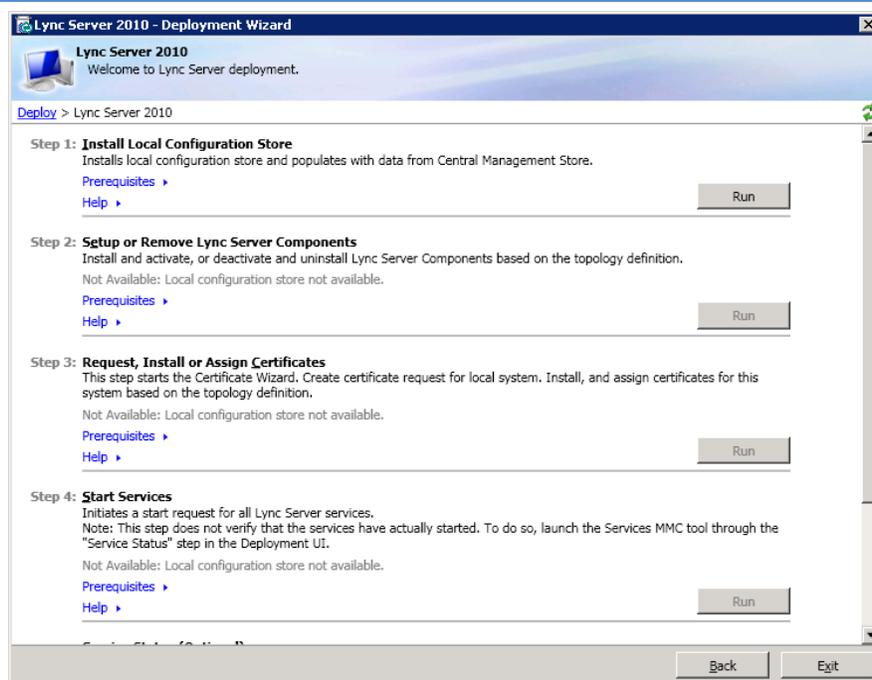


Figure 14. Install or Update Lync Server 2010 System wizard screen.

Summing up

As this Guide has explained, the process of installing and deploying Microsoft Lync Server 2010, Microsoft Exchange Server 2010, and Microsoft SharePoint Server 2010 to a virtual environment running on a Dell PowerEdge R710 server running Windows Server 2008 R2 with Hyper-V and SP1 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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Information in this document is subject to change without notice.

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 15 illustrates the topology of our setup.

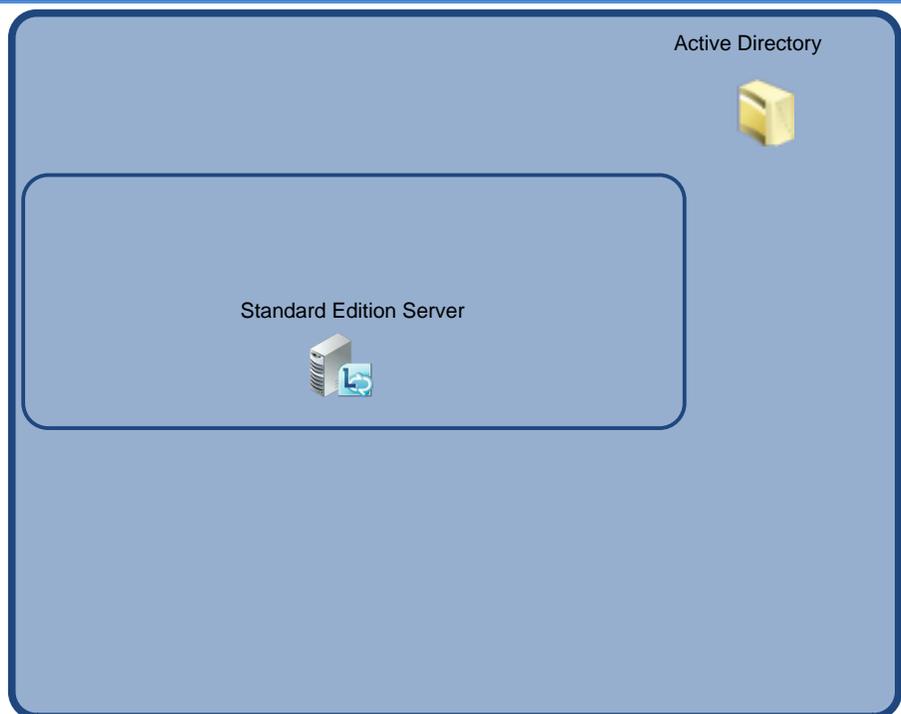


Figure 15. The site topology of the test bed, taken from Microsoft Lync Server 2010 Planning Tool.

Figures 16 and 17 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 Edition w/SP1 and Hyper-V	48 GB	8 SAS, 15K, 146 GB

Figure 16. 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 17. 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 Stand-Alone 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. When the wizard has completed the configuration, click Finish.

Appendix F. Installing Exchange Server 2010

1. Select Start→Administrative Tools→Server Manager.
2. Click Add Roles.
3. At the Select Server Roles screen, click Web Server (IIS).
4. At the Add features required for Web Server (IIS) pop-up window, click Add Required Features.
5. Click Next.
6. At the Web Server (IIS) screen, click Next.
7. At the Select Role Services screen, select the IIS 6 Metabase Compatibility, IIS 6 Management Console, Basic Authentication, Windows Authentication, Digest Authentication, and Dynamic content Compression checkboxes, and click Next.
8. At the Confirm Installation Selections screen, click Install.
9. At the Installation Results screen, click Close.
10. Select Start→Administrative Tools→Server Manager.
11. Click Features.
12. Click Add Features.
13. Select .NET Framework 3.5.1 Features.
14. Click Next.
15. Click Install.
16. At the Installation Results screen, click Close.
17. Download the Microsoft Filter Pack 1.0.
(<http://www.microsoft.com/downloads/en/details.aspx?familyid=60c92a37-719c-4077-b5c6-cac34f4227cc&displaylang=en>)
18. Run FilterPackx64.EXE.
19. Click Next.
20. Click I accept the terms in the License Agreement, and click Next.
21. Click OK once installation is complete.
22. Click Start→Administrative Tools→Services.
23. Right-click the Net.Tcp Port Sharing service, and click properties.
24. Change the Net.Tcp Port Sharing startup type to Automatic, and click OK.
25. Open command prompt and type `ServerManagerCmd -i RSAT-ADDS`, and hit Enter
26. Reboot the server.
27. Insert the Exchange Server 2010 installation DVD, and capture the DVD drive in the VM session. When the Autoplay window appears, click Run Setup.EXE.

28. The installer should consider steps 1 and 2 to be complete (they appear grayed out). Click the link to Step 3: Choose Exchange Language Option.
29. Click Install only languages from the DVD.
30. Click the link to Step 4: Install Microsoft Exchange Server 2010.
31. To go past the introduction screen, click Next.
32. Accept the license agreement, and click Next.
33. Select No for error reporting, and click Next.
34. Select Custom Exchange Server Installation, and click Next.
35. Select Mailbox Role, Client Access Role and Hub Transport Role (Exchange will automatically select Management Tools as well). Click Next.
36. Leave the organization name at default (First Organization), and click Next.
37. At the question about client computers running Outlook 2003 or Entourage, select Yes, and click Next.
38. To accept defaults for Configure Client Access server external domain, click Next.
39. At the Customer Experience Improvement Program screen, select I don't wish to join the program at this time, and click Next.
40. If a warning about a lack of SMTP appears after the check finishes, ignore it for now. We address this issue in steps 42-52 below.
41. Click Install to start the installation process.
42. Once the installation has completed, click Finish. Exchange should automatically open the Exchange Management Console.
43. If Exchange does not automatically open the Exchange Management Console, click Start → All Programs → Microsoft Exchange Server 2010 → Exchange Management Console.
44. In the left pane, expand Microsoft Exchange On-Premises, expand Organization Configuration, and select Hub Transport.
45. In the Actions pane on the far right, select New Send Connector.
46. Name the send connector *SMTP*, select the intended use as Internet, and click Next.
47. In the Address space window, click Add.
48. In the SMTP Address Space window, type * as the address, ensure that the installer has checked Include all subdomains, and click OK.
49. Click Next.
50. On the Network settings page select Use domain name system (DNS) "MX" records to route mail automatically and click Next.

51. Accept the defaults in the Source Server window and click Next.
52. At the New Connector page, click New to create the connector.
53. Click Finish to close the New SMTP Send Connector wizard.



NOTE

In order to receive external email, you will need to contact your Internet Service Provider (ISP) in order to register your MX record associated with your email server's external IP address. You will also need to establish routes in your Firewall to direct all SMTP traffic to your Exchange Server 2010 IP address.

Appendix G. 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 H. Installing Microsoft Lync Server 2010 Standard Edition

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 New Topology, and click OK.
26. Enter name of new txml file keeping the default location, and click Next.
27. Enter your primary domain and click Next.
28. Enter a name for your site and click Next.
29. Enter the site details, and click Next.
30. Check the box for opening the New Front End Pool Wizard, and click Finish.
31. Enter your FQDN information choosing Standard Edition Server, and click next.

32. Select the Conferencing, which includes audio, video and application sharing feature, and click Next.
33. Leave the defaults on the Select collocated server roles screen, and click Next.
34. Leave the defaults on the Associate server roles with this Front End pool screen, and click Next.
35. Leave the defaults on the Define the SQL store screen, and click Next.
36. Create a new folder named `share` on the C: drive, and share the folder ensuring that the administrator has read/write permissions.
37. Leave the defaults on the Define the file share screen, and click Next.
38. Leave the defaults on the Specify the Web Services URL screen, and click Finish.
39. Click Edit Properties in the top right corner of the Topology Builder.
40. Enter the URL for administrative access (i.e., <https://admin.pt.lync.com>), and click OK.
41. Right-click Lync Server 2010, and select Publish Topology.
42. On the Publish the Topology screen, click Next.
43. On the Select Central Management Server screen, click Next.
44. When publishing is complete, click Finish, and close the Lync Server Topology Builder application.
45. Back in the Deployment wizard, click Install or Update Lync Server System to launch the Lync Server deployment wizard.
46. On Step 1 – Install Local Configuration Store, click Run.
47. On the Configure Local Replica of Central Management Store screen, keep defaults, and click Next.
48. When installation is complete, click Finish.
49. On Step 2 – Setup or Remove Lync Server Components, click Run, and click Next.
50. 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.
51. 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.
52. On Step 2 – Setup or Remove Lync Server Components, click Run, and click Next.
53. After the components have finished installing, click Finish.
54. On Step 3 – Request, Install or Assign Certificates, click Run.
55. Keep defaults, click Request, and click Next.
56. On the Delayed or Immediate Request screen, accept the default, and click Next.

57. Enter certificate server information (`pt-lync-ad1.pt.lync.com/pt-lync-ad1-CA`), and click Next.
58. Enter login credentials, and click Next.
59. On the Specify Alternate Certificate Template screen, accept defaults, and click Next.
60. Enter a name for your certificate. (e.g., Standard Edition Server Default Cert), and click Next.
61. On the Organization Information screen, enter organizational information, and click Next.
62. On the Geographical Information screen, enter Geographical information, and click Next.
63. On the Subject Name/Subject Alternate Names screen, accept defaults, and click Next.
64. Select the SIP domain, and click Next on the SIP Domain setting on Subject Alternate Names (SANs) screen.
65. On the Configure Additional Subject Alternate Names screen, click Next.
66. On the Certificate Request Summary screen, click Next.
67. When request for certificates has completed, click Next, and click Finish.
68. If the certificate is not automatically assigned, you may have to manually install certificates and click Assign to complete the configuration of assigning certificates.
69. After assigning certificates is complete, click Finish, and click Close.
70. On Step 4 – Start Services, click Run, and click Next.
71. After the services start, click Finish.
72. Check to see if all Services started.

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