MIGRATING EXCHANGE SERVER 2003 TO HIGHLY AVAILABLE EXCHANGE SERVER 2010 ON DELL POWEREDGE R510 SERVERS WITH HIGH CAPACITY NEAR LINE SAS DRIVES

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Table of contents

Introduction

Migration overview

This Guide shows the best practices and benefits of migrating from
two legacy clustered Exchange Server 2003 servers and external
storage onto a highly available Microsoft® Exchange Server 2010
solution running on Dell™ PowerEdge™ R510 servers with internal
1TB Near Line SAS-based storage.

The migration scenario models a mid-sized enterprise supporting
3,000 Exchange users that is seeking to lower operational costs,
improve fault tolerance and availability, expand user mailbox
capacity (60 MB to 600 MB), and enhance mail server functionality.

Dell PowerEdge R510 rack servers provide high capacity, high
value, and the ability to deliver the performance needed by the
high volume mailboxes in our test scenario.

We took full advantage of the enhanced capacity of Dell's 1TB Near
Line SAS drives for our mailbox databases. Our tests showed that
Microsoft Exchange 2010 could support up to 3,000 mailboxes on
these low-cost, high-capacity drives and does not require an
external storage array. The Near Line drives also supported the
increase in mailbox size that the users in this test scenario
required.

Goals of the migration

The hardware upgrade, OS upgrade, virtualization, Microsoft
Exchange migration, and best practices implemented are designed
to provide higher availability, improved fault tolerance, enhanced
regulatory compliance, better IT productivity, and improved end-
user productivity.

Higher availability
Organizations and users depend upon stabile e-mail access.
Component failure, power failures, and natural disasters can affect
email system availability or level of service. Highly available email
systems have minimal downtime, provide acceptable performance,
and aid user productivity. In addition, they can recover quickly
from hardware or network failures

Microsoft Exchange Server 2010 provides high availability through
Database Availability Groups (DAG), which essentially provide
continuous background replication. For the usage scenario in this
report, we setup a DAG on the Exchange 2010 servers to replace

4

the Clustered Mailbox Servers in the legacy Exchange 2003
solution. This change allowed us to put one-half of the 3,000
mailboxes on each server along with a passive copy of the other
server's mailboxes. With the clustered mailbox solution on the
Exchange 2003 servers, we put the active copy of all 3,000
mailboxes on one server, leaving the other server to host a passive
copy. The Exchange 2010 DAG configuration allows you to use the
capabilities of both servers and still maintain high availability and
redundancy.

Improved fault tolerance

Fault tolerance is the ability of a solution to continue operating
after any part of the solution fails. Fault tolerance requires a high
degree of redundancy. If any single component fails, the redundant
component takes its place with no appreciable downtime. The
clustered Microsoft Exchange 2003 solution would be able to
provide fault tolerance in case of many server problems because a
second server maintains access to the database and could be
activated in response to problems on the active server. However,
the solution lacks redundancy for the storage array. The Dell
PowerEdge R510 and Microsoft Exchange 2010 solution improves
fault tolerance as it has redundancies for all hardware components,
not just the servers and disks.

Improved regulatory compliance

Exchange Server 2010 includes integrated e-mail retention and
discovery features aimed at meeting regulatory requirements
related to preventing information leaks and preserving business
emails. Centrally managed emails and information control
capabilities such as multi-mailbox search and immediate hold give
IT the ability to store and query email across the organization more
effectively.

Improved IT productivity

Exchange Server 2010 includes features designed to reduce the
cost of managing e-mail infrastructure. New role-based
permissions functionality enables administrators to delegate
permissions to other administrators and users based on the
Exchange tasks each needs to perform and to define what users
can configure on their mailboxes. The Web-based Exchange Control
Panel (ECP) provides self-service options for tasks that might
otherwise require a help desk call and the role-based access
control model ensures users can only access the functions to which
they have access.

Improved end-user satisfaction and productivity.
Additional features address end-user productivity problems and disaster recovery. Features such as the ignore conversation option and conversation view options give users more control over mailbox content and organization. If the organization adds mobile and Web access capability, users can access all their centrally managed emails from PC, mobile, and web access devices using a consistent interface on Outlook on the PC, Outlook Mobile, and Outlook Web access. For the scenario we model, we anticipate some front-end productivity costs as users learn the new features, but significant long-term end-user productivity and satisfaction gains as they use and benefit from the features.

Lower costs by using internal higher capacity, lower performance, lower cost disks
Our tests showed that Exchange Server 2010 could support the 3,000 mailboxes in this workload on low-cost, high-capacity 1TB 7,200 RPM Near Line SAS drives installed on the server and did not require an external storage array. These high capacity drives also allowed the increase in mailbox size from 60GB to 600GB that the users in this test scenario required.

Features and benefits of Exchange Server 2010

Exchange Server 2010 introduces a wide variety of new features and enhances many others that are present in Exchange Server 2007. While there are far too many features to discuss all in this Guide, the following list highlights some of the more significant improvements:

- **Database Availability Groups.** Exchange Server 2010 brings with it a new method for database redundancy and high availability. Exchange Server 2010 uses DAGs to keep Exchange mailboxes running in the face of hardware or network failures.

- **Convenient mailbox migration.** A big change from Exchange Server 2007 to Exchange Server 2010 is the greater responsibility of the Client Access Services (CAS) role. Putting all mailbox database requests on the CAS role allows the movement of mailboxes without interfering with user connectivity.

- **Reduced overall IOPs.** Exchange Server 2007 reduced overall input/output operations per second (IOPs) by 50

to 70 percent. Exchange Server 2010 represents a similarly dramatic drop in IOPs. For more information, see http://technet.microsoft.com/en-us/library/bb125040(EXCHG.140).aspx. This reduces load on the storage and allows for the use of less costly storage alternatives.

- **Greater unified messaging functionality.** Exchange Server 2010 offers new unified messaging features such as Voice Mail Preview and Protected Voicemail.

Exchange Server 2010 offers distinct benefits that both administrators and users will encounter after an upgrade. The following list highlights some of the more significant improvements:

- **Greater deployment flexibility.** In previous versions of Exchange, implementations such as clustering required separation of Exchange roles and installation of a specific clustered mailbox role. Exchange Server 2010 changes that with Database Availability Groups. DAGs allow clustering and disaster recovery to be added to an existing Exchange Server 2010 setup without any special clustering preparation. DAGs also allow for clustering in multi-role installations because DAGs use mailbox-level failover while previous versions of Exchange use Exchange-level failover.

- **More accessible high availability capabilities.** DAGs also create a more accessible high availability environment. Instead of having to plan a cluster and master other clustering tools, Exchange Server 2010 has directly integrated Microsoft's clustering technology (clustering is installed upon the creation of a DAG).

- **Greater mailbox mobility.** As previously mentioned, putting more responsibility on the CAS role allows for greater mailbox mobility. This allows mailboxes to be moved between servers while a user is still accessing it.

- **Shadow copies of e-mail messages.** Shadow copies of e-mails are copies of e-mails that are created as an e-mail moves throughout an organization. Exchange Server 2010 uses these shadow copies to keep messages from being lost due to disk or server failure.

- **I/O optimization.** Exchange Server 2010 uses several different techniques to help reduce the load on storage.

The reduced amount of I/O allows for use of cheaper disks, which saves costs for Exchange administrators. Exchange Server 2010 also optimizes disk I/O to no longer arrive in bursts, which allows more utilization of lower-end SATA disk drives.

- **Greater messaging consolidation.** Exchange 2010 adds many features to unified messaging. New capabilities like receiving voicemail in your inbox allow Exchange to act as a one-stop location for all messaging. The new voicemail text preview feature allows users to identify voicemails at work having to listen to the actual message

Features and benefits of Windows Server 2008 Enterprise with Hyper-V

Windows Server 2008 Enterprise also introduces many new features. The following list mentions a few of the more significant features that may benefit system administrators:

- **Server core.** Windows Server 2008 Enterprise Edition allows administrators to install only the functions necessary for a server's role. For example, the server core installation does not include a GUI or the Explorer shell. The reduced number of components should improve efficiency, reduce maintenance costs, and improve security by reducing the vectors available to viruses.

- **Windows PowerShell™.** This new command-line shell includes over 130 utilities and an admin-focused scripting language to make system administration easier.

- **Self-healing NTFS file system.** If the Windows file system detects an error, it spawns a worker thread that attempts to fix the problem. If the problem is recoverable, the system resolves the issue without the need for administrator intervention or a system restart.

- **Network Access Protection (NAP).** NAP allows administrators to define health and security policies for the network and to block non-compliant computers from the network.

- **Windows Deployment Services (WDS).** This replacement for Remote Installation Services (RIS) helps improve the deployment of image-based Windows operating systems. Notably, WDS allows network-based installation of

Windows Vista® and Windows Server 2008 Enterprise on computers with no operating system currently installed.

- **BitLocker™ data encryption.** Windows Server 2008 Enterprise adds support for Microsoft's BitLocker, which lets administrators easily and transparently encrypt whole volumes, even across multiple drives.

- **Built-in virtualization.** Windows Server 2008 Enterprise includes a hypervisor, Hyper-V, which provides native virtualization. Hyper-V allows virtual devices to access the VMBus directly, via Enlightened I/O. This technology can greatly improve efficiency, but does require that the guest OS support Enlightened I/O.

We use Windows Server 2008 with Hyper-V to install two VMs on each server, one for the database role and one for the hub role. This configuration benefits the migration by easing backup and recovery and by better utilizing resources.

Disaster recovery. With the pre-migration configuration, the operating system and log files would be located on the servers, one passive and the other active, and the databases would be located on the single storage array. The passive server would be available in case of any failure on the primary server. Failures on the storage array not covered by RAID 10 recovery mechanisms would be less easily recoverable and would possibly require replacement hardware or restoring databases from archives. These disaster recovery scenarios require significant IT time and entail user downtime.

In the post-migration scenario, the organization would set up individual mailserver and client access services/hub transport (CAS/HUB) virtual machines on each server. This configuration would provide redundancies for all components – servers and storage, databases, OS, and the CAB/HUB, and would enable quick recovery from failures of any of those components with less user downtime and lower IT costs.

Better resource utilization. The organization would also more fully utilize the servers – in the pre-migration scenario, the organization would gain little day-to-day value from its investment in the second, passive server; in the post-migration scenario, however, both servers would be running the Exchange workload and the organization would get ongoing value from the processing power and storage capacity of both servers.

Pre-migration considerations

This section reviews some of the topics you should consider prior to migrating to Exchange Server 2010.

Upgrade paths

The upgrade paths to Exchange Server 2010 that Microsoft supports include Exchange Server 2003 SP2 and Exchange Server 2007 SP2. Side-by-side migrations or transitions are the only upgrade options. Transition is moving all roles, databases, and settings from one Exchange Server to a new Exchange Server 2010 server. Migration can mean (1) moving a database into an existing configuration without bringing its own configuration with it, or (2) moving data from another program into Exchange. For this Guide, we used the side-by-side migration method.

Component considerations

In this Guide, we limit our discussion to migrating the Mailbox, Client Access Services, and Hub Transport roles as well as migrating all user mailboxes. Depending on the installation, you may also need to migrate your SSL certificates. In addition, you may decide to upgrade your domain controllers to a Windows Server 2008 R2 domain. For more information, see the following Technet article: http://technet.microsoft.com/en-us/library/cc725611(WS.10).aspx.

Installing and setting up Windows Server 2008 Enterprise and Exchange Server 2010 in this environment

In this section, we focus on installing and setting up the Windows Server 2008 R2 Enterprise Edition hypervisor (Hyper-V) on the Dell PowerEdge R510 servers and as well as Windows Server 2008 R2 and Exchange Server 2010 release candidate (RC) on the virtual machines.

We begin by defining our actual environment. Next, we present an overview of the steps we took to configure the internal and external drives and to install and configure both Windows Server 2008 R2 Enterprise Edition and Exchange Server 2010 RC. The steps apply to both x86 (32-bit) and x64 (64-bit) setups.

Defining our environment

We used a Windows domain containing four virtual machines, two virtual machines each on two Windows Server 2008 R2 servers running the Hyper-V role, an Active Directory® server, and a legacy HP ProLiant DL385 physical server.

We used only one of the two HP servers in the legacy solution in our testing for this Guide because the active server and the passive server in the clustered solution would be configured identically.

To be specific, our example Exchange Server 2010 servers were four Windows Server 2008 R2 Enterprise Edition virtual machines spread across two Dell PowerEdge R510s running Windows Server 2008 R2 Enterprise Edition with the Hyper-V role installed. Our Active Directory server was a Dell™ PowerEdge™ 2950 running Windows Server 2003 R2 Enterprise Edition R2 SP2. We connected all servers via a gigabit Ethernet switch. Our legacy server connected to an HP StorageWorks MSA1000 storage array via Fibre Channel. Figure 1 presents the Exchange Server 2010 setup we used for this Guide.

Migrating Exchange Server 2003 to highly available Exchange Server 2010 on Dell PowerEdge R510 servers with capacity Near Line SAS drives
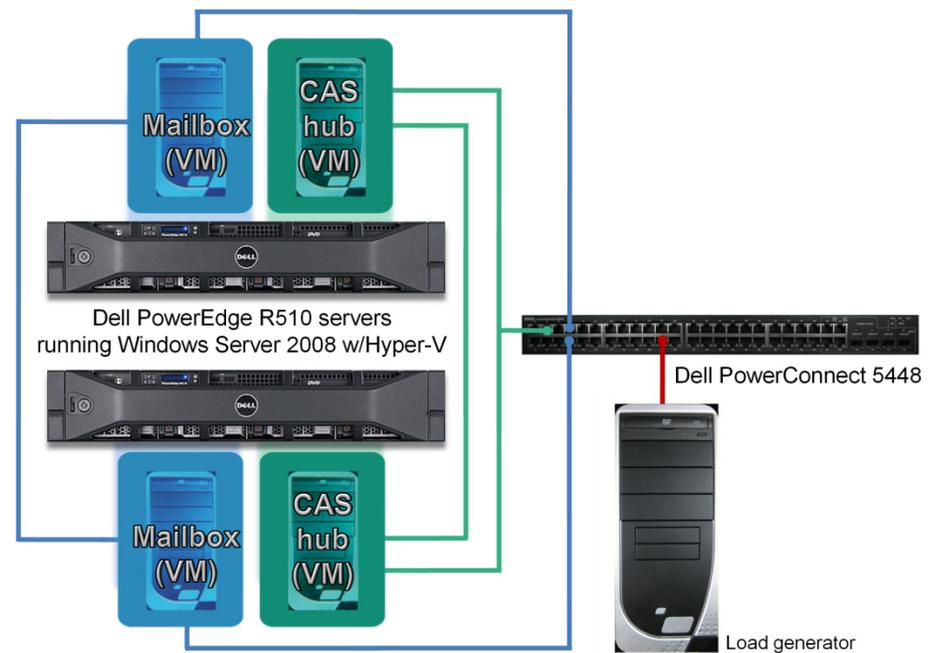
Figure 1. The Exchange Server 2010 setup we used in our hands-on testing and research for the Exchange Server 2010 deployment in this Guide.

Figures 2 and 3 present the hardware and software we used to simulate an Active Directory domain and associated Exchange Server 2003 and Exchange Server 2010 servers.

Migrating Exchange Server 2003 to highly available Exchange Server 2010 on Dell PowerEdge R510 servers with capacity Near Line SAS drives

Server	Processor	Memory	Disk
Dell PowerEdge 2950 (Active Directory Server	2 x Quad Core E5440 Intel Xeon	32 GB	2 x SAS, 15K RPM, 73 GB
HP DL385 (Legacy Exchange Server)	2 x Opteron 254	4 GB	4 x SCSI, 15K RPM, 72 GB
Dell PowerEdge R510 (Migration Server)	2 x Quad Core E5540 Intel Xeon	12 GB	2 x SAS, 15K RPM, 300 GB 6 x Near-line SAS, 7,200 RPM 1 TB

Figure 2. Servers we used in our hands-on testing and research for this Guide.

Server	Server operating system	Exchange server version
Dell 1950 (Active Directory Server)	Windows Server 2003 R2 SP2 x86 Enterprise Edition	N/A
Dell 6650 (Legacy Exchange Server)	Windows Server 2003 R2 SP2 x86 Enterprise Edition	Exchange Server 2003 Enterprise Edition SP2 x86
Dell R900 (Migration Exchange Server)	Windows Server 2008 x86 Enterprise Edition R2	Exchange Server 2010 Enterprise Edition RC

Figure 3. Software we used in our hands-on testing and research for this Guide.

We used the following storage and networking devices:

HP StorageWorks MSA1000—14 x SCSI, 10k rpm, 146GB
Gigabit switch—48 port gigabit

BEST PRACTICE: Use the latest tested and validated software, firmware, and driver versions for NICs, storage arrays, and other components.

13

Preparing the domain controller

Overview

In this section, we discuss the alterations we made to our domain controller to allow for migration to Exchange Server 2010. Default domain functional levels that work for an Exchange Server 2003 installation may not work for Exchange Server 2010. Exchange Server 2010 requires a domain and forest functional level of Windows Server 2003 in order to install. For detailed instructions on how we prepared the domain controller, see Appendix A.

1. Browse to Administrative Tools, and open Active Directory Domains and Trust. Right-click your domain, and raise the domain functional level to Windows Server 2003.
2. Right-click Active Directory Domains and Trusts, and raise the forest functional level to Windows Server 2003.

Preparing the Dell PowerEdge R510 servers

To create a highly available Exchange Server 2010 environment, we chose to use virtual machines located on two Dell PowerEdge R510 servers. Hyper-V requires some form of Windows Server 2008 R2 to be running in the parent partition—either the full installation or the core installation. For simplicity and ease of installation, we chose to install the full version of Windows Server 2008 R2.

The Dell PowerEdge R510 servers also required the setup and configuration of base virtual machines. Appendix B provides complete, detailed installation instructions.

NOTE: Plan on at least 25 minutes for installing Windows Server 2008 R2 Enterprise Edition on the Dell PowerEdge R510 server. The time to install updates—two in our setup—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 booting loading bar.
2. For Hyper-V, you must install Standard, Datacenter, or Enterprise Edition. We chose

Enterprise Edition. 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.

NOTE: Plan on at least 7 minutes for installing the Hyper-V role on your Dell PowerEdge server.

5. Click Start→Server Manager. Click Roles, and choose Add Roles.

6. Click Hyper-V. (See Figure 4.) Configure your networking as you desire, and proceed to install the Hyper-V role.

7. The installation requires two reboots upon completion, after which the Hyper-V role finishes installing.
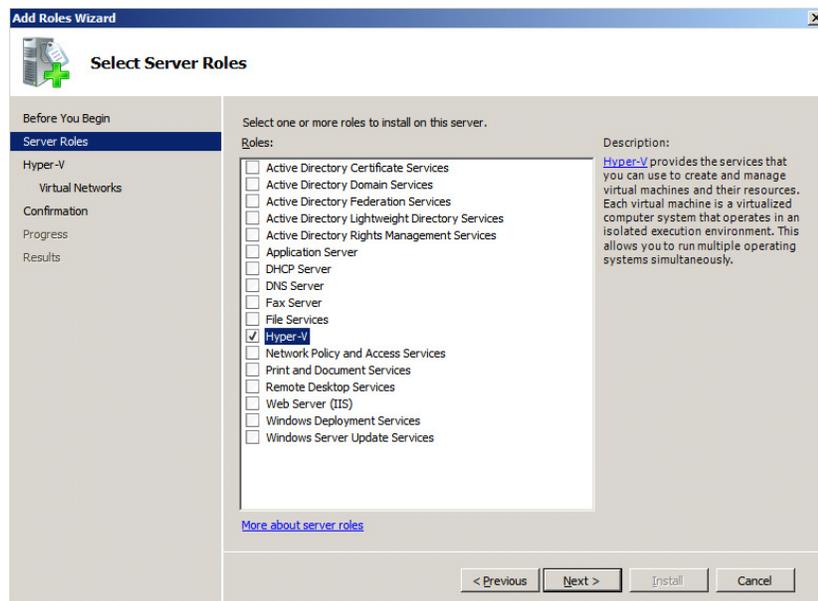
Figure 4. Installing the Hyper-V role in Windows Server 2008 R2.

NOTE: Plan on at least 5 minutes for adding database LUNs to the server.

8. Click Start→Server Manager. Expand Storage, and click Disk Management.

9. Set up New Simple Volumes using the available
   on-board storage. Make sure to create two LUNs,
   one for the database and one for the database
   copy that will be used by the Database
   Availability Group.

Setting up and configuring base virtual machines

Virtual machines allow for both high availability and the
performance boost of separated roles without incurring the
costs of extra hardware. Appendix B provides complete,
detailed installation instructions.

NOTE: Plan on at least 30 minutes for setting up and
configuring your base virtual machines.

1. Click Start→click Hyper-V Manager. Click Actions,
   and create a new virtual machine.
2. Name your Virtual Machine CASHUB1 for the first
   Dell PowerEdge R510 and CASHUB2 for the
   second.
3. Specify a reasonable amount of memory and two
   virtual NICs. Specify that you will attach a virtual
   hard drive later, and finish the virtual machine
   creation.
4. Follow that same creation process for the
   Mailserver1 virtual machine on the first Dell
   PowerEdge R510 and the Mailserver2 virtual
   machine on the second Dell PowerEdge R510.
5. Right-click each of the virtual machines, and click
   Settings. Add an IDE fixed-size virtual hard drive
   (VHD). Use this VHD as your operating system
   drive.
6. Right-click each of the Mailserver virtual
   machines, and click Settings. Add two SCSI
   drives by selecting the LUNs you set up earlier.

NOTE: Plan on at least 2 hours for installing Windows
Server 2008 R2 Enterprise Edition on all four of the virtual
machines. The time to install updates—two in our setup—
will increase over time as Microsoft releases OS updates for
Windows Server 2008 R2.

7. 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

16

so. During the boot, a message that Windows is loading files appears, followed by a Windows booting loading bar.

8. For Hyper-V, you must install Standard, Datacenter, or Enterprise Edition. We chose Enterprise Edition. Accept the license terms, proceed with the installation, and enter the information the installation software requires.

9. Set your password; enter configuration information, including the public IP address and domain information; and reboot the system.

10. Download and install updates.

11. Repeat this process on the remaining three VMs.

Migrating the Client Access Services and Hub Transport roles

A major change from Exchange Server 2003 (and Exchange Server 2007) to Exchange Server 2010 is the change in client request destination. The Mailbox role received all MAPI requests in Exchange Server 2003 and 2007, where the client access services role performs that task in Exchange Server 2010. Thus, best practices dictate that the best order of migration is CAS, then Hub Transport, then Mailbox role.

Network Load Balancing (NLB)

The best way to avoid overloading one CAS/HUB virtual machine is to use some sort of load balancing mechanism. In this case, we used Windows Network Load Balancing, although hardware load balancers may also be used. Network Load Balancing routes traffic depending on the current network traffic going to each CAS/HUB virtual machine (See Figure 5). Appendix C provides complete, detailed installation instructions.

Migrating Exchange Server 2003 to highly available Exchange Server 2010
on Dell PowerEdge R510 servers with capacity Near Line SAS drives
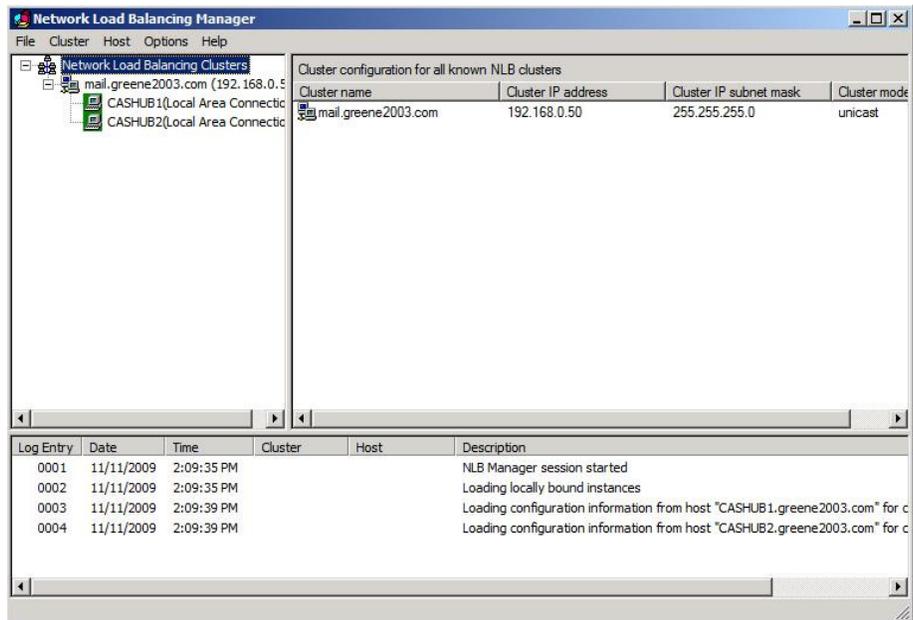
Figure 5. A completed NLB setup with both CAS/HUB virtual machines configured.

→ **NOTE:** The Hub Transport role takes care of its own load balancing. Thus, we only use NLB for load balancing the CAS role. Plan on at least 5 minutes for setting up Network Load Balancing.

1. Log onto your domain controller, and run dnsmgmt.msc. Right-click your domain, and create a new host (A or AAAA). Give this host the name of `mail.yourdomainname` and an IP that you wish to use as your NLB consolidated IP.
2. On your first CAS/HUB virtual machine, click Start→Server Manager.
3. Click Features, and select Add Feature. Install the Network Load Balancing Feature.
4. After NLB has installed, repeat the process on your other CAS/HUB VM.
5. Click Start→Administrative Tools→Network Load Balancing. Right-click Network Load Balancing Cluster, and make a new Cluster. Be sure to select your outside network-facing NIC as your NLB NIC and to use your NLB consolidated IP that you set earlier as your NLB IP.
6. Right-click your newly formed cluster, and select Add Host to Cluster. Add your second CAS/HUB virtual machine to your NLB cluster.

18

NOTE: NLB uses MAC addresses as a basis for its communication. You must enable MAC spoofing or NLB will not function properly (See Figure 6).

7. Turn off both of your CAS/HUB virtual machines, and open their settings. Click your client-facing NIC and enable MAC spoofing.
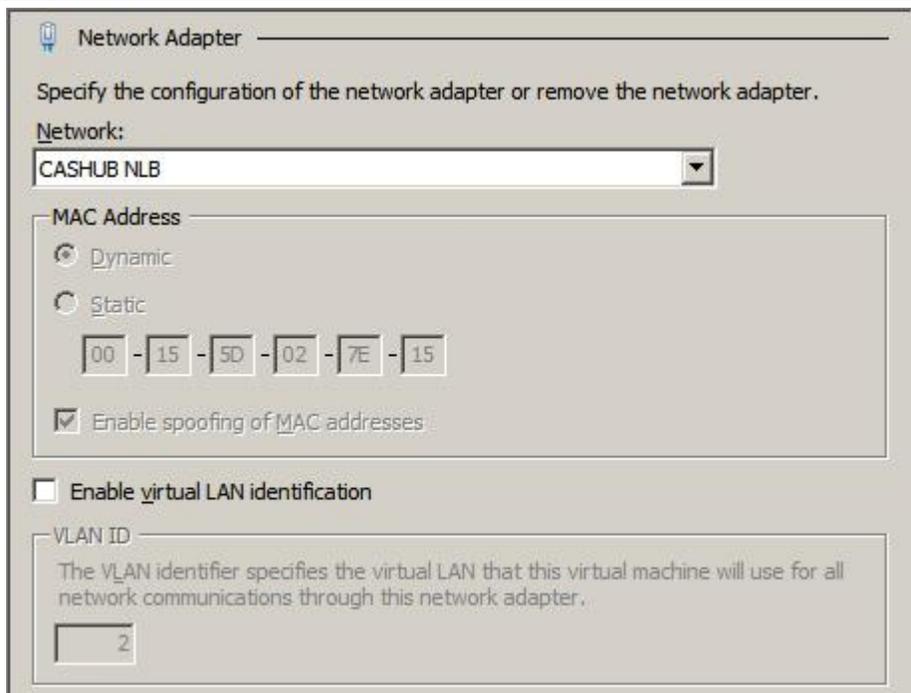
Figure 6. Mac spoofing must be enabled for NLB to work.

Client Access Services/Hub Transport prerequisites

There are a few prerequisites required to install the client access services and hub transport roles. These prerequisites are .NET 3.5 and IIS. The CAS role also suggests that you set the Net.tcp port sharing to automatic. Appendix C provides complete, detailed installation instructions.

NOTE: Plan on at least 5 minutes for setting up Client Access Services/Hub Transport prerequisites.

1. Click Start, and click Server Manager. Click Features, and choose Add Features.
2. Choose .NET 3.5.1 Features, and install them.

3. Once that finishes, click Roles, and choose Add Roles.
4. Click Web Server (IIS). Add IIS 6 Metabase Compatibility, IIS 6 Management Console, Basic Authentication, Windows Authentication, Digest Authentication, and Dynamic content Compression checkboxes; and proceed to install the Web Server (IIS) role. (1 minute)
5. Open Services, and set the Net.tcp port sharing to automatic.
6. Install the Active Directory Domain Services remote management tools by opening a command prompt and running the following command: `ServerManagerCmd -i RSAT-ADDS`

Migrating the Client Access Services role

There are two important steps in migrating the CAS role from Exchange Server 2003 to Exchange Server 2010. First, you must update domain permissions. Second, you must set up the Exchange Server 2010 CAS role. For this Guide, we set up the CAS role in our own configuration. For complete details of the migration of the CAS role, see Appendix C.

NOTE: Plan on at least 30 minutes for setting up the Exchange Server 2010 Client Access Services role.

1. Download Exchange Server 2010 from the following location: http://www.microsoft.com/downloads/details.aspx?FamilyID=05741f65-2a7b-4070-879f-d74208d6171d&displaylang=en.
2. Extract the installation files, and browse to that directory in a command prompt. Run the following two commands via the command line to update domain permissions: `Setup /PrepareAD` and `Setup /PrepareDomain`
3. Kick off your Exchange Server 2010 installation, and choose only the CAS role. See Appendix C for specific settings to use.
4. Run the following command after setup finishes to move RPC over HTTP capabilities from Exchange Server 2003 to Exchange Server 2010: `ServerManagerCmd.exe -I RPC-over-HTTP-proxy`

5. Open the Exchange Management Console, and click Server Configuration→Client Access. Configure our External Client Access domain as your combined NLB host name (`mail.yourdomain`). Be sure to add both CAS/HUB virtual machines (See Figure 7).
6. On that same screen, right-click both of your CAS/HUB servers, and choose Enable Outlook Anywhere. Again, type your NLB host name (`mail.yourdomain`) in the available space.
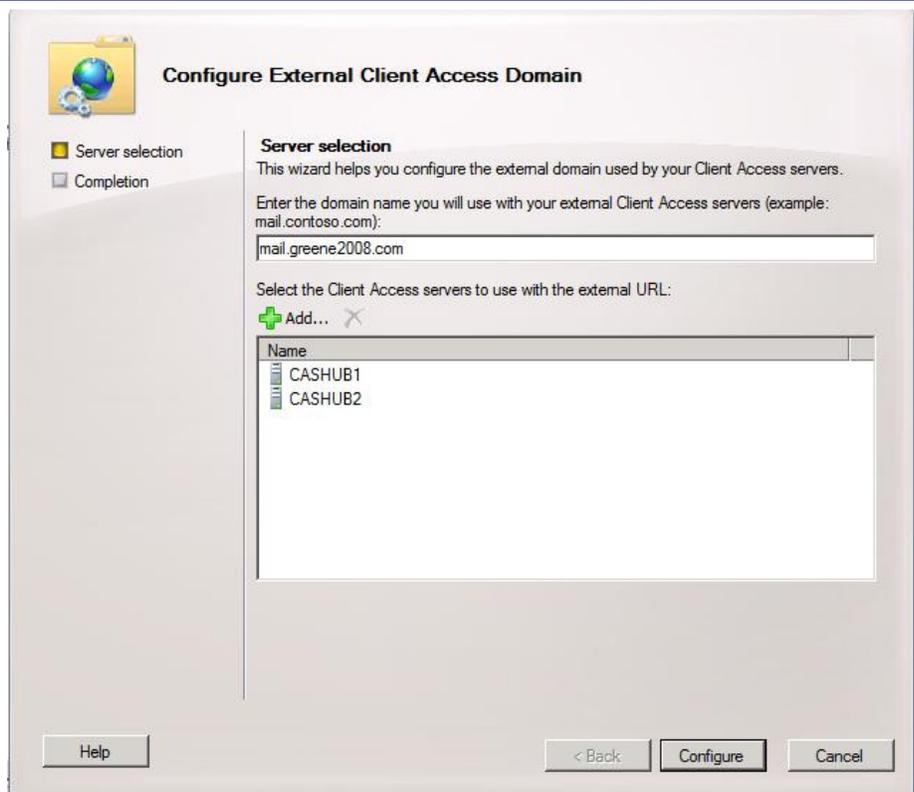
Figure 7. Configuring the External Client Access Domain.

Migrating the Hub Transport role

Hub Transport migration is similar to migrating the CAS role. However, since the AD is already prepped from the setup of the CAS role, we can skip those steps. For complete details of the migration of the CAS role, see Appendix C.

NOTE: Plan on at least 20 minutes for setting up the Exchange Server 2010 Hub Transport role.

1. Kick off your Exchange Server 2010 installation, and choose only the Hub Transport role. See Appendix C for specific settings to use.
2. Open the Exchange Management Console, click Organization Configuration, and click Hub Transport. Click Send Connectors, and create a new SMTP send connector.

Configuring a Client Access Services array

Redundancy and consistent mailbox access is important in an Exchange environment. Thus, creating a Client Access Services array provides a level of redundancy that can switch traffic between CAS servers in the event of hardware or software failure. The CAS array also uses the rpcclientaccessserver variable to route Messaging Application Programming Interface (MAPI) traffic through the NLB IP address. For complete details of the configuration of a CAS array, see Appendix C.

NOTE: Plan on at least 2 minutes for setting up a Client Access Services array.

1. Open the Exchange Management Shell, and type the following commands to create your CAS array:

```
new-clientaccessarray –name CASarray –
fqdn mail.yourdomain
get-mailboxdatabase | set-mailboxdatabase
-rpcclientaccessserver
mail.mailserver.com
get-mailboxdatabase | select
name,rpcclientaccessserver | fl
```

Migrating the Exchange Server 2010 Mailbox role

The Mailbox role requires the same prerequisites as the CAS and Hub Transport roles. Be sure to install .Net 3.5, IIS, and Active Directory Domain Services remote management tools before attempting to install the Mailbox role. For complete details of the configuration of the Mailbox role, see Appendix D.

NOTE: Plan on at least 25 minutes for setting up the Exchange Server 2010 Mailbox role.

1. Install the Active Directory Domain Services remote management tools by opening a

22

command prompt and running the following command: `ServerManagerCmd -i RSAT-ADDS`

2. Kick off your Exchange Server 2010 installation, and choose only the Mailbox role. See the Appendix for specific installation settings.
3. Open the Exchange Management Console, click Organization Configuration, and click Database Management. Move your database from its default location to the storage LUNs.
4. Move your Logs to the other storage LUN.
5. Move from Database Management to Mailbox, and click the Offline Address Book tab. Move the Default Offline Address Book from your Exchange Server 2003 server to your first mailbox virtual machine.
6. Click the Distribution tab, and enable Web-based distribution of the Offline Address Book (OAB).

Database Availability Group (DAG) overview

One new and important feature of Exchange Server 2010 is the creation of Database Availability Groups. Database Availability Groups are the newest high availability option for Exchange. The DAG removes the need for Exchange Virtual Servers and Clustered Mailbox Servers. The DAG essentially allows for continuous background replication.

The DAG uses database copies placed on each Mailbox server. Therefore, you would join the DAG, and then create a copy of Mailserver1's database on Mailserver2, and vice versa. The DAG then uses two network connections, a public connection and a private connection. (See Figure 8.) The public connection acts the same as any public connection and receives requests from CAS servers. The private connection acts as a heartbeat to keep the databases consistent. During the creation of this Guide, our DAG failovers took approximately 40 seconds.
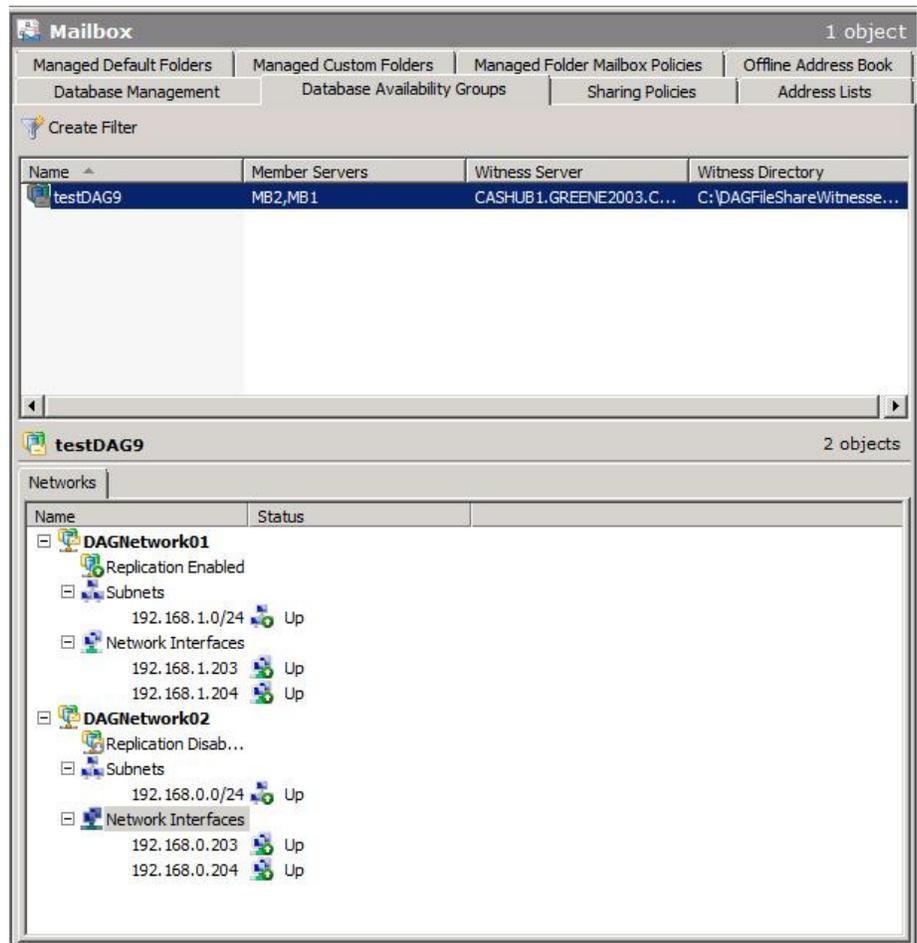
Figure 8. A completed DAG with functional private and public networks.

Configuring a Database Availability Group

Users can create a DAG via the Exchange Management Console or Exchange Management Shell. We chose to create the DAG in the console but to configure it in the shell. For complete details of the configuration of a DAG, see Appendix D.

NOTE: The total time required to create a DAG relies heavily on the size of the database.

1. Open the Exchange Management Console, and click Organization Configuration→Database Management. Click the Database Availability Group tab, and create a new DAG.
2. Use the Exchange Management Shell to add a static IP to your DAG, and add both Mailbox VMs into the DAG. Be sure to have replication enabled

24

on your internal Mailbox network and replication disabled on your client-facing network.
3. Create database copies of each Mailbox VM's database, and place them on the other Mailbox VM.

Migrating to Exchange Server 2010

Due to the nature of the migration process from Exchange Server 2003 to Exchange Server 2010, most migration occurred during the installation step. However, this section details the steps to take after installation is completed.

In this section, we provide details about the migration of user mailboxes from Exchange Server 2003 to Exchange Server 2010. We provide an overview of the process involved in migrating your mailboxes from Exchange Server 2003 to Exchange Server 2010 on the Dell PowerEdge R510s.

Migrating mailboxes to the new server

The final step in this migration is to spread the user mailboxes between the two Mailbox VMs. For complete details of the mailbox migration, see Appendix E.

NOTE: The total time required to migrate mailboxes relies heavily on the size of the database.

1. Open the Exchange Management Console, and click Recipient Configuration→Mailbox.
2. Create a New Local Move Request. Use this move request to move half of the user mailboxes to the first Mailbox VM.
3. Create another Local Move Request to move the remaining user mailboxes to the second Mailbox VM.

Summing up

This Guide showed the best practices and benefits of migrating from two legacy servers with external storage onto a highly available Microsoft Exchange Server 2010 solution running on Dell PowerEdge R510 servers with internal 1TB Near Line SAS-based storage.

The hardware upgrade, OS upgrade, virtualization, Microsoft Exchange migration, and best practices implemented are designed to provide higher availability, improved fault tolerance, better regulatory compliance, enhanced IT productivity, and superior end-user productivity.

As this Guide has explained, the migration process is relatively straightforward. After the pre-migration/planning phase is complete, you can perform a basic installation and migrate from Exchange Server 2003 to Exchange Server 2010 in about a day. The duration is, of course, largely dependent on the size of your mail databases.

Appendix A. Preparing the domain controller

Migrating from Exchange Server 2003 to Exchange Server 2010 is not possible with default Exchange Server 2003 permissions. Use the following steps to prepare your domain permissions for Exchange Server 2010.

Raising the domain and forest functional levels

Before setting up the new server, you must set the existing domain controller to run in Exchange 2003 native mode.

1. Click Start→Administrative Tools→Active Directory Domains and Trust.
2. In the console tree, right-click Active Directory Domains and Trusts, and select Raise Forest Functional Level.
3. Under Select an available forest functional level, click Windows Server 2003, and click Raise.
4. In the console tree, right-click the domain for which you want to raise functionality, and select Raise Domain Functional Level.
5. Under Select an available domain functional level, click Windows Server 2003, and click Raise to raise the Domain Functional level to Windows Server 2003.

Appendix B. Preparing the Dell PowerEdge R510 servers

To set up Exchange Server 2010, you must deploy your Hyper-V environment. Use the following steps to set up the server and create virtual machines.

Installing Windows Server 2008 R2 as the host operating system

Here, you will install Microsoft Windows Server 2008 Enterprise Edition R2 by following these steps.

1. Insert the installation DVD for Windows Server 2008 R2 into the DVD drive.
2. Choose the language, time and currency, and keyboard input. Click Next.
3. Click Install Now.
4. Choose Windows Server Enterprise (Full Installation). Click Next.
5. Accept the license terms, and click Next.
6. Click Custom.
7. Click the Disk, and click Drive options (advanced).
8. Click New, Apply, Format, and click Next.
9. After the installation completes, click OK to set the Administrator password.
10. Enter the administrator password twice, and click OK.
11. Click Start, type `change power-saving settings` and press Enter.
12. Click Change plan settings.
13. Change the Turn off the display drop-down menu to Never.
14. Click Save changes, and close the Power Options, Screen Saver Settings, and Personalization windows.

Adding the Hyper-V role to Windows Server 2008

Here, you will install the Hyper-V role to Windows to allow you to add the necessary VMs.

> **NOTE:** Make sure you have installed all the latest critical and recommended updates for Windows Server 2008 from Windows Update.

1. Click Server Manager→Roles→Add Roles.
2. Check the box beside the Hyper-V role, and click Next.
3. Click Next.

28

4. Check the box beside the Ethernet card you wish to use, and click Next.
5. Click Install. Installation begins.
6. When installation finishes, click Close.
7. When the system prompts you to restart, click Yes.
8. Once the system finishes rebooting (this might happen twice), log in. The Resume Configuration Wizard should start automatically.
9. Once the Resume Configuration Wizard completes, the installation results should appear with a message that the installation succeeded.
10. Click Close.
11. Restart the server.

Adding logical unit numbers (LUNs)

The Mailserver virtual machines require two LUNS each: one for their current database and one for a DAG-based database copy of the other Mailserver's database.

1. Click Server Manager→Storage→Disk Management.
2. When the wizard prompts you to initialize new disks, click OK. Note: If you must select a partition table, select MBR.
3. Right-click the first unallocated disk partition, and select New Simple Volume…
4. Click Next.
5. Use the entire LUN storage space (this should be the default), and click Next.
6. Select the drive letter to assign to the new partition, and click Next.
7. Label the volumes appropriately (e.g., DB1 and DBBackup), make sure Perform a quick format is checked, and click Next.
8. Click Finish.

Creating the virtual machines

Here, you will set up four virtual machines, so complete the following steps four times.

1. Click Start→Administrative Tools→Hyper-V Manager.
2. From the Actions menu, select New→Virtual Machine...
3. Click Next.

4. Enter a name for the virtual machine, and browse to the location where you want to store the VM files. (The New Virtual Machine Wizard will automatically create a subfolder with the name of the VM.)
5. Click Next.
6. Specify the amount of memory to allocate to the virtual machine, and click Next.
7. Select the network connection for the virtual machine to use, and click Next.
8. Select Attach a virtual hard disk later, and click Next.
9. Click Finish.

Modifying the virtual machines (creating the virtual HDD)

1. Click Start→Administrative Tools→Hyper-V Manager.
2. Right-click the virtual machine on which you want to install Windows, and click Settings…
3. From the menu on the left, select IDE Controller 0, and click Add to add a new hard drive to the IDE Controller.
4. Click New to create a new virtual hard disk file.
5. Click Next.
6. Select Fixed size, and click Next.
7. Specify the name and location of the virtual hard disk file.
8. Specify the size of the new blank virtual hard disk (in GB).
9. Click Finish. The server begins creating the new virtual hard disk.
10. Once it finishes creating the new virtual hard disk, click OK.

Modifying the virtual machines (adding an additional hard disk)

1. Click Start→Administrative Tools→Hyper-V Manager.
2. Right-click the virtual machine on which you want to install Windows, and click Settings…
3. From the menu on the left, select Add Hardware.
4. Choose the SCSI Controller device, and click Add.
5. Click Add to add a new hard drive to the virtual SCSI Controller.

6. Select Physical hard disk, browse to the hard disk
   you would like to add to your mailserver virtual
   machine, and click OK.

Installing Windows on the VM

Here, you will install Windows Server 2008 R2Enterprise Edition on
all four virtual machines.

1. Click Start→Administrative Tools→Hyper-V
   Manager.
2. Right-click the virtual machine on which you want
   to install Windows, and click Connect…
3. From the menu, select Media→DVD Drive→Insert
   Disk…
4. Select the ISO image file for the version of
   Windows you are installing, and click Open.
5. To start the virtual machine, select Start from the
   Action menu.
6. Click the screen, and begin installing Windows as
   you normally would.
7. Once installation is complete, select
   Action→Ctrl+Alt+Delete.
8. Enter your password, and press Enter.
9. At the prompt to restart, click Yes.
10. Once the system has restarted, log in, and verify
    that all configured devices (mouse, keyboard,
    video, network, etc.) are working.

Appendix C. Migrating the Client Access Services and Hub Transport roles

Here, you will set up the virtual machines that will act as both Client Access Services and Hub Transport roles. You need to install a number of pre-requisites before you can begin installing Exchange roles.

Configuring Network Load Balancing

You will configure Windows to automatically load balance all traffic directed to your mail server. Network load balancing will direct traffic to whichever CAS/HUB virtual machine is least burdened.

1. Run dnsmgmt.msc on your domain controller.
2. Expand Forward Lookup Zones.
3. Right-click your domain name, and click New host (A or AAAA).
4. Fill in the host name field with the name of `mail.x` where x is your domain name (e.g., mail.mailserver.com).
5. Fill in the IP address field with the IP address that you are planning to use as your consolidated IP for Windows Network Load Balancing (NLB).
6. Click Add Host.
7. Return to your first CAS/HUB virtual machine.
8. Click Start→Administrative Tools→Server Manager.
9. Click Features in the left panel, and click Add Features.
10. Select the Network Load Balancing check box, and click Install.
11. When the Install has finished, click Finish.
12. Click Start→Administrative Tools→Network Load Balancing Manager.
13. Right-click Network Load Balancing Cluster, and select New Cluster.
14. Enter the hostname of the CAS/HUB virtual machine you are on in the Host field, and click Connect.
15. Select the NIC you wish to use as your client-facing NIC, and click Next.
16. Leave defaults, and click Next.
17. Click Add, and enter the IP address and subnet mask that you have bound to mail.x as your Host IP address.
18. Once you have selected your IP, click OK to close the Add IP address window.
19. Click Next.

20. At the New Cluster:Cluster Parameters screen, fill in the Full Internet Name field with `mail.x` DNS name, and click Next.
21. At the New Cluster:Port Rules screen, add all ports that you wish to use NLB with, and click Finish.
22. Once you have completed Step 18, NLB will give you an error. Ignore this for now.
23. Right-click your new NLB name, and select Add Host To Cluster.
24. Enter the hostname of your other CAS/HUB server in the Host field, and click Connect.
25. Select the NIC you wish to use as your client-facing NIC, and click Next.
26. Leave defaults, and click Next.
27. Click Finish.
28. Both CAS/HUB servers should now be in your NLB cluster, but they will both have errors due to issues with MAC addresses and virtual machines.
29. Shut down both CAS/HUB virtual machines.
30. Click Start→Administrative Tools→Hyper-V Manager.
31. Right-click your CAS/HUB virtual machine, and select Settings…
32. Click your client-facing network adapter.
33. Click the Enable spoofing of MAC addresses checkbox.
34. Repeat steps 29 through 31 on your other CAS/HUB virtual machine.
35. Turn both CAS/HUB virtual machines on.
36. Click Start→Administrative Tools→Network Load Balancing Manager.
37. Right-click your cluster, and select Cluster Properties.
38. Click OK without making any changes. This will force NLB to start again; this time, the errors should disappear.

Installing .NET Framework 3.5.1 features

This is required to install Exchange Server 2010.

1. Click Start→Administrative Tools→Active Directory Domains and Trust.
2. Select Start→Administrative Tools→Server Manager.
3. Click Features.
4. Click Add Features.
5. Select .NET Framework 3.5.1 Features, and click Install.
6. When the installation has finished, click OK.

Installing Internet Information Services

This is required to install 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), and click Next.
4. At the Introduction to Web Server (IIS) screen, click Next.
5. 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.
6. At the Confirm Installation Selections screen, click Install.
7. At the Installation Results screen, click Close.

Migrating the Client Access Services role

Here, you will install and configure the first set of VMs to run Client Access Services, including Outlook Web Access, Outlook Anywhere, and ActiveSync.

NOTE: If you use SSL, you will also need to move your certificates to the Exchange Server 2010 server.

1. Select Start→Administrative Tools→Server Manager.
2. Click Start, type `services` and press Enter.
3. Right-click the Net.Tcp Port Sharing service, and click Properties.
4. Change the Net.Tcp Port Sharing startup type to Automatic, and click OK.
5. Open a command prompt, and run `ServerManagerCmd -i RSAT-ADDS`
6. Restart the VM.
7. Download the Exchange Server 2010 from the following location: http://www.microsoft.com/downloads/details.asp x?FamilyID=05741f65-2a7b-4070-879f-d74208d6171d&displaylang=en.
8. Double-click Exchange2010-RC1-x64.exe.
9. Select a folder to extract the installation files to, and click OK.
10. Open a command line at the location the files were extracted to.

34

NOTE: The two Run commands that follow only need to be run once per domain that is being configured. In the subsequent VM install, proceed directly to running the Exchange Server 2010 setup.EXE.

11. Run `Setup /PrepareAD`
12. Run `Setup /PrepareDomain`
13. Run `Setup.EXE`
14. The installer should consider Steps 1 and 2 complete, and gray them out.
15. Click the link to Step 3: Choose Exchange Language Option.
16. Click Install only languages from the DVD.
17. Click the link to Step 4: Install Microsoft Exchange Server 2007 SP1.
18. Click Next to proceed past the introduction screen.
19. Accept the license agreement, and click Next.
20. Select No for error reporting, and click Next.
21. Select Custom Exchange Server Installation, and click Next.
22. Select Client Access Services (Exchange will automatically select Exchange Management Tools as well).
23. Leave the organization name at default (First Organization), and click Next.
24. At the question about client computers running Outlook 2003 and earlier, select Yes, and click Next.
25. On the Configure Client Access server external domain screen, check the box for The Client Access server role will be Internet-facing, and enter the domain of your server.
26. At the Customer Experience Improvement Program screen, select I don't wish to join the program at this time, and click Next.
27. If a warning about a lack of SMTP appears after the check finishes, ignore it.
28. Click Install to start the installation process.
29. Once installation is complete, click Finish. Exchange should automatically open the Exchange Management Console.
30. Open a command prompt, and run `ServerManagerCmd.exe -I RPC-over-HTTP-proxy`
31. If Exchange does not automatically open the Exchange Management Console, select Start→All Programs→Microsoft Exchange Server 2010→Exchange Management Console.
32. In the left pane, expand Server Configuration, and select Client Access.

33. Right-click and select Configure External Client Access Domain…

34. On the Server selection screen, type `mail.mailserver.com`

35. Click Add…

36. Select both CASHUB servers, and click OK.

37. Click Configure.

38. Once the settings have been configured, click Finish.

39. In the center pane of Client Access, right-click the first CASHUB server.

40. Select Enable Outlook Anywhere.

41. On the Enable Outlook Anywhere screen, enter `mail.mailserver.com`

42. Select basic authentication.

43. Ensure that the Allow secure channel (SSL) offloading is unchecked.

44. Click Enable.

45. Click Finish.

Migrating the Hub Transport role

Here, you will install and configure the Hub Transport role, which is responsible for routing all mail messages to and from your mailboxes.

1. Run Setup.EXE.

2. The installer should consider Steps 1 and 2 complete, and gray them out.

3. Click the link to Step 3: Choose Exchange Language Option.

4. Click Install only languages from the DVD.

5. Click the link to Step 4: Install Microsoft Exchange Server 2007 SP1.

6. Click Next to go past the Maintenance Mode screen.

7. Select Hub Transport Role.

8. Click Install to start the installation process.

9. Once installation is complete, click Finish. Exchange should automatically open the Exchange Management Console.

10. If Exchange does not automatically open the Exchange Management Console, select Start→All Programs→Microsoft Exchange Server 2010→Exchange Management Console.

11. In the left pane, expand Organization Configuration, and select Hub Transport.

12. In the action pane on the far right, select New Send Connector.

13. Name the send connector `SMTP` select the intended use as Internet, and click Next.

14. In the Address space window, click Add.

15. In the SMTP Address Space window, type * as the address, ensure that the installer has checked Include all subdomains, and click OK.
16. Click Next.
17. Accept defaults for the next two pages by clicking Next.
18. At the New Connector page, click New to create the connector.
19. Click Finish to close the New SMTP Send Connector wizard.
20. Close the Exchange Management Console, and reboot the server.

Configuring a Client Access Services array

Here, you will configure a Client Access Services array. This will ensure that, during a database failover or move, client access is uninterrupted.

1. Run Setup.EXE.
2. On one of your CAS/HUB virtual machines, click Start→All Programs→Microsoft Exchange Server 2010→Exchange Management Shell.
3. Type `new-clientaccessarray –name CASarray –fqdn mail.mailserver.com` and press Enter.
4. If the application prompts you for a site, enter your Active Directory site name, and press Enter. You can find the Active Directory site name under Active Directory Sites and Services on the domain controller.
5. Type `get-mailboxdatabase | set-mailboxdatabase -rpcclientaccessserver mail.mailserver.com` and press Enter.
6. Type `get-mailboxdatabase | select name,rpcclientaccessserver | fl` and press Enter to verify that Exchange accurately assigned your rpcclientaccessservers.

Appendix D. Migrating the Mailbox role

Here, you will set up the virtual machines that will act as the Mailbox Server role. You need to install a number of pre-requisites before you can begin installing this Exchange role.

Installing .NET Framework 3.5.1 features

This is required to install Exchange Server 2010.

1. Click Start→ Administrative Tools→Active Directory Domains and Trust.
2. Select Start→Administrative Tools→Server Manager.
3. Click Features.
4. Click Add Features.
5. Select .NET Framework 3.5.1 Features, and click Install.
6. When the installation has finished, click OK.

Installing Internet Information Services

This is required to install Exchange Server 2010.

1. Click Start→ Administrative Tools→Active Directory Domains and Trust.
2. Select Start→Administrative Tools→Server Manager.
3. Click Add Roles.
4. At the Select Server Roles screen, click Web Server (IIS), and click Next.
5. At the Introduction to Web Server (IIS) screen, click Next.
6. 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.
7. At the Confirm Installation Selections screen, click Install.
8. At the Installation Results screen, click Close.

Installing the Mailbox role

Here, you will install the last set of VMs to run the mailbox server roles.

1. Click Start, type `services` and press Enter.
2. Right-click the Net.Tcp Port Sharing service, and click Properties.

3. Change the Net.Tcp Port Sharing startup type to Automatic, and click OK.
4. Run `ServerManagerCmd -i RSAT-ADDS` from the command line on each VM.
5. Restart the VM.
6. Once the VM has restarted, double-click Exchange2010-RC1-x64.exe.
7. Select a folder to extract the installation files to, and click OK.
8. Run Setup.EXE.
9. The installer should consider Steps 1 and 2 complete, and gray them out.
10. Click the link to Step 3: Choose Exchange Language Option.
11. Click Install only languages from the DVD.
12. Click the link to Step 4: Install Microsoft Exchange Server 2007 SP1.
13. Click Next to go past the introduction screen.
14. Accept the license agreement, and click Next.
15. Select No for error reporting, and click Next.
16. Select Custom Exchange Server Installation, and click Next.
17. Select Mailbox Role (Exchange will automatically select Exchange Management Tools as well).
18. At the Customer Experience Improvement Program screen, select I don't wish to join the program at this time, and click Next.
19. If a warning about a lack of SMTP appears after the check finishes, ignore it.
20. Click Install to start the installation process.
21. Once installation is complete, click Finish. Exchange should automatically open the Exchange Management Console.

Migrating the Exchange Server 2010 Mailbox role

Here, you will set up your mailbox server. Many of these settings may differ based on your organization's specific policies and procedures.

1. If Exchange does not automatically open the Exchange Management Console, select Start→All Programs→Microsoft Exchange Server 2010→Exchange Management Console.
2. In the left pane, expand Organization Configuration and Mailbox so the Database Management tab is visible.
3. Right-click Mailbox Database, and select Properties.
4. Select the Maintenance tab.
5. Check the Enable circular logging box.
6. Click OK.

7. Click OK to any warnings about circular logging being applied after the database is remounted.
8. Click Move Database on the far right panel.
9. Change the Database file and Log folder path locations to E:\Database\(filename) and D:\Maillogs respectively, and click Move.
10. Click Yes if the application prompts you to dismount.
11. Click Finish.
12. Right-click Public Folder Database, and select Properties.
13. Check the Enable circular logging box.
14. Click OK.
15. Click OK to any warnings about circular logging being applied after the database is remounted.
16. Click Move Database on the far right panel.
17. Change the Database file and Log folder path locations to E:\Database\(filename) and D:\Publiclogs respectively, and click Move.
18. Click Yes if the application prompts you to dismount.
19. Click Finish.

Configuring the Offline Address Book and enabling Web distribution

Here, you will set up the Offline Address Book. You are also enabling Web distribution from both mailbox VMs.

1. Click Start→All Programs→Microsoft Exchange Server 2010→Exchange Management Console.
2. In the left pane, expand Organization Configuration, and select Mailbox.
3. In the center pane, click the Offline Address Book tab.
4. Right-click the Default Offline Address List, and click Move…
5. On the Move Offline Address Book screen, click Browse…
6. Select the first mailbox server, and click OK.
7. Click Move.
8. Once the move is complete, click Finish.
9. Right-click Default Offline Address List, and click Properties.
10. Click the Distribution Tab.
11. Click Enable Web-based distribution.
12. Click Add…
13. Select both OAB sites, and click OK.
14. Click Apply, and click OK.

Configuring a Database Availability Group (DAG)

Here, you will set up a Database Availability Group. This will allow Exchange to manage databases between your mailbox servers and provide database-centric failover.

1. Click Start→All Programs→Microsoft Exchange Server 2010→Exchange Management Console.
2. In the left pane, expand Organization Configuration, and select Mailbox.
3. Click the Database Availability Group tab.
4. Right-click and click New Database Availability Group.
5. Enter a name in the Database availability group name field (i.e., `testDAG`), and click Next. Exchange will automatically select one of the CAS/HUB virtual machines as a witness server.
6. Click Finish once the setup has completed.
7. Click Start→All Programs→Microsoft Exchange Server 2010→Exchange Management Shell.
8. After the shell has logged into your server, type `Set-DatabaseAvailabilityGroup -Identity testDAG -DatabaseAvailabilityGroupIpAddress 192.168.27.6`
9. Type `Add-DatabaseAvailabilityGroupServer -Identity testDAG -MailboxServer mailboxserver1` and press Enter.
10. Type `Add-DatabaseAvailabilityGroupServer -Identity testDAG -MailboxServer mailboxserver2` and press Enter.
11. The DAG should automatically add your existing NICs to the DAG. Browse back to the Exchange Management Console, and right-click the network that hosts your client-facing NICs.
12. Select Properties.
13. Uncheck the Replication Enabled checkbox, and click OK.
14. Right-click your Mailbox Database on mailboxserver1, and select Add Mailbox Database Copy.
15. Click Browse.
16. Select mailboxserver2 if you are on mailboxserver1 or mailboxserver1 if you are on mailboxserver2, and click OK.
17. Click Add. (Note: You must disable circular logging to create a mailbox database copy. You

can re-enable circular logging after creating the copy.)

18. After the copy completes, click Finish.

19. Repeat steps 13 through 17 on mailboxserver2.

Appendix E. Migrating user mailboxes

Here, you will need to migrate user mailboxes off of the Exchange Server 2003 server and onto your Exchange server 2010 virtual machines.

Migrating mailboxes to the new server

The final step is moving all your mailboxes to your new server.

> **NOTE:** Depending on the size of your organization, you may find it easier to manage the mailbox moves using the Move-Mailbox cmdlet in the Exchange Management Shell.

1. Click Start→All Programs→Microsoft Exchange Server 2010→Exchange Management Console.

2. Expand Recipient Configuration, and select Mailbox.

3. Select the mailboxes you wish to move to the first server.

4. On the lower right panel, click New Local Move Request.

5. On the Introduction screen, click Browse…

6. Select the first mailbox server, and click OK.

7. Click Next.

8. On the Move Options Screen, keep defaults, and click Next.

9. Click New to create the move requests.

10. After the move requests are created, the servers will start transferring the mailboxes you selected. You can check the status of the moves in Move Requests, under Recipient Configuration.

11. Repeat steps 2 through 9 to move the remaining mailboxes to the second mailbox server.

About Principled Technologies

We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help you assess how it will fare against its competition, its performance, whether it's ready to go to market, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.

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