

Deploying an Exchange 2007 SP1 CCR Cluster on a Windows Server 2008 Failover Cluster – Part 1: Prerequisites & Configuring the failover cluster nodes

How to deploy an Exchange 2007 SP1 CCR based clustered mailbox server on a Windows Server 2008 failover cluster.

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- Author: Henrik Walther
- Company: Timengo Consulting A/S
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Back in October 2006 when Exchange Server 2007 still was a beta 2 product (at least to the general public), I wrote an <u>article series</u> that walked you through how to deploy an Exchange 2007 clustered mailbox server (CMS) based on cluster continuous replication (CCR) cluster technology. Unlike a traditional Exchange cluster, a CCR cluster not only provides redundancy on the hardware level, but also provides redundancy on the storage level.

Since then clustered mailbox servers based on CCR clusters have become a very popular method for providing a cost effective high availability messaging solution that matches the service level agreement (SLA) in many of the Enterprise organizations around the world. Now that both Exchange Server 2007 Service Pack 1 (SP1) and Windows Server 2008 have been released to manufacturing (RTM), I thought it would be good timing to provide you with an article series that walks you through how to deploy an Exchange 2007 SP1 clustered mailbox server based on cluster continuous replication on Windows Server 2008, so you are prepared for those real world deployments that lie on the horizon.

Before we move on, let me first explain why it is advantageous to deploy an Exchange 2007 clustered mailbox server based on CCR cluster technology using Windows Server 2008 failover clusters instead of sticking with the well tested clustering functionality included with Windows Server 2003. First, Exchange Server 2007 SP1 can take advantage of the heavily improved failover cluster (formerly known as server cluster) component in Windows Server 2008. The Windows Server 2008 failover cluster component makes it even simpler to deploy CCR clusters and enhances the stability of the failover cluster solution as well as makes it more secure than in previous versions of Window Server. In addition, because the new failover cluster included with Windows Server 2008 supports multiple subnets, unlike Exchange 2007 RTM, Exchange 2007 SP1 includes support for geographically dispersed clusters (GeoClusters) for failover across two subnets (although the nodes must still be in the same Active Directory site). Moreover, Exchange 2007 SP1 CCR clusters support both Internet Protocol version 4 (IPv4) as well as IPv6 and DHCP assigned IP addresses (both IPv4 and IPv6 although IPv4 is not recommended unless the DHCP server is set to grant leases for an unlimited length).

Note:

Get a complete list of failover cluster improvements in Windows Server 2008.

Prerequisites

Before you can follow along with the steps provided in this article series, you must have a lab environment consisting of the following:

- 1 Windows 2003 SP1 (preferably SP2) or Windows Server 2008 Standard edition server configured as a domain controller in an Active directory forest with a domain functional level of at least 2000 Native.
- 1 Windows 2003 SP1 (preferably SP2) or Windows Server 2008 Standard edition server with the Exchange 2007 SP1 Client Access and Hub Transport server roles installed (optionally you can install these roles on the domain controller).
- 2 Windows Server 2008 Enterprise edition servers that will become the nodes in the failover cluster.

The 2 Windows Server 2008 Enterprise edition servers should be equipped with 2 network interfaces (one for the public network and one for the private heartbeat network) and at least 2 disks – 1 for the System partition, 1 for Exchange databases and optionally 1 for transaction log files (in a lab environment these could also be located together with the Exchange databases).

I used the 32-bit edition of Exchange 2007 SP1 and Windows Server 2008, which meant I could get along with allocating a lot less memory to each box (500 MB for the Domain Controller, 700 MB for the server where the Client Access and Hub Transport server roles are installed, and 700 MB for each failover cluster node) than would have been the case if I used 64-bit editions.

Although the above configuration recommendations are sufficient for a lab environment, please bear in mind that the 32-bit bit edition of Exchange 2007 is not supported in production environment and that best practice recommendations for Exchange 2007 CCR clusters in a production environment are very different from what I used here.

If you, like me, only have a limited set of test boxes it is highly recommended you deploy this lab environment using a virtualization solution. If you choose to use the 32-bit editions of Exchange 2007 and Windows Server 2008, you can use anything from Microsoft Virtual PC, Microsoft Virtual Server, VMWare workstation/server or a real enterprise virtualization platform such as VMWare ESX Server or Microsoft's new HyperVisor (HyperV) included with Windows Server 2008. Just pick your favorite! :-)

Configuring the Failover Cluster Nodes

Alright, when you have an Active Directory forest consisting of a domain controller and a member server with the Exchange 2007 Client Access and Hub Transport server roles installed we are ready to configure the two servers that will be the nodes in our failover cluster. The first thing we want to do when the servers have been turned on is to partition the disks and configure the network interfaces appropriately. To partition the disks, open the Windows 2008 Server Manager and expand Storage and then select Disk Management. Now right-click on each LUN that is offline and then select Online in the context menu as shown in **Figure 1**.



Figure 1: Bringing disks online

Right-click on one of the disks again and this time select Initialize Disk. In the Initialize Disk window, tick both disks and make sure MBR (Master Boot Record) is selected, unless you used disks larger than two Terabytes (TB) or use Itanium-based computers as nodes in the fail-cluster (both very unlikely!), and then click OK (**Figure 2**).

ou must initialize a disk before Looi	cal Disk Manager can access it	
elect disks:		
✓ Disk 1		
Disk 2		
Jse the following partition style for th	e selected disks:	
MBR (Master Boot Record)		
C GPT (GUID Partition Table)		
Note: The GPT partition style is not r Windows. It is recommended for disk tanium-based computers.	ecognized by all previous version a larger than 2TB, or disks used o	s of an
		6 D

Figure 2: Initializing disks

The disks are now both online, and we can begin to partition them. To do so click on the unallocated disk space, then select New Simple Volume in the context menu (**Figure 3**).



Figure 3: Creating the simple volumes

In the New Simple Volume wizard, click Next. Specify the size of the new volume and click Next.

9
89

Figure 4: Specifying the size of the volume

We now need to assign a drive letter to the volume. When ready click Next (Figure 5).

œ	Assign the following drive letter:	D -	
C	Mount in the following empty NTFS folder:		
	_	Browse	
C	Do not assign a drive letter or drive path		

Figure 5: Assigning a drive letter to the volume

It is time to label and format the volume. Do so and click Next (Figure 6).

Choose whether you want to form	nat this volume, and if	so, what settings yo	want to use.
C Do not format this volume			
 Format this volume with th 	e following settings:		
File system:	NTFS		
Allocation unit size:	Default	•	
Volume label:	Databases		
Perform a quick form	nat		
Enable file and folde	e compression		

Figure 6: Labeling and formatting the volume

Lastly click Finish to exit the wizard.

Perform the above steps for the second disk as well, but label it Logs (Figure 7).

Choose whether you want to for	mat this volume, and if	so, what settings you wa	ant to use.
C Do not format this volume			
Format this volume with the second	he following settings:		
File system:	NTFS		
Allocation unit size:	Default	•	
Volume label:	Logs		
Perform a quick for	mat		

Figure 7: Labeling and formatting the volume for the log files

Next step is to name the two network connections **Public** and **Private (heartbeat)** for the external and the internal network respectively as shown in **Figure 8**. The private network will be used only for the heartbeat between the two failover cluster nodes.



Figure 8: Naming the network connections

A general best practice when configuring the servers that will become nodes in a failover cluster is to change the binding order of the network interfaces. To do so click Advanced > Advanced Settings, if it is not already the case, make sure Public is listed first in the binding order list, then Private (heartbeat) and lastly Remote Access Connections as shown in Figure 9.

dvanced Settings	×
Adapters and Bindings Provider Order	
Connections are listed in the order in which they are accessed by network services.	
Connections:	
Prote (heartbeat) [Remote Access connections]	*
Bindings for Public:	2
Internet Protocol Version 4 (TCP/IPv4) Clent for Microsoft Networks	3
Internet Protocol Version 4 (TCP/IPv4) Internet Protocol Version 6 (TCP/IPv6)	
ок	Cancel

Figure 9: Binding order

When installing Windows Server 2008, Ipv6 is enabled by default, and although this Internet Protocol version is supported by Exchange 2007 SP1, we will not use it in this series. So you should untick Internet Protocol Version 6 (TCP/Ipv6) for both the Public and Private network interface as shown in **Figure 10**.

Intel(R) PRO/1	000 MT Network Conne	ction
nis connection uses	the following items:	Configure
	to anong for moreout	
 → Internet Prot ✓ Internet Prot 	ocol Version 6 (TCP/IPv ocol Version 4 (TCP/IPv opology Discovery Map opology Discovery Resp	6) 4) ber 1/O Driver bander
 → Internet Prot ✓ Internet Prot ✓	ocol Version 6 (TCP/IPv ocol Version 4 (TCP/IPv opology Discovery Map opology Discovery Resp	6) ber I/O Driver konder Properties

Figure 10: Disabling Ipv6 on the public network interface

In addition, it is recommended you disable Client for Microsoft Networks and File and Printer Sharing for Microsoft Networks on the Private network interface.

We can now begin to configure the IP settings for each network interface. Let us start with the public network interface (**Figure 11**).

ou can get IP settings assigned is capability. Otherwise, you n in the appropriate IP settings.	automatically if your network support need to ask your network administrator
C Obtain an IP address autor	matically
Use the following IP address	951
IP address:	10 . 10 . 1 . 141
Subnet mask:	255.255.255.0
Default gateway:	10 . 10 . 1 . 2
C Obtain DNS server address	s gutomatically
· Use the following DNS serv	ver addresses:
Preferred DNS server:	10 . 10 . 1 . 140
Alternate DNS server:	
	. Advanta

Figure 11: Configuring IP settings for the public network interface

Now move on and configure the IP settings for the private network interface. Notice you only should specify an IP address and a subnet mask for the private network interface as shown in **Figure 12**.

ou can get IP settings assigned vis capability. Otherwise, you n or the appropriate IP settings.	eed to ask y	lly i	r net		neti ork i	adr	rk s mini	stral	orts tor
C Obtain an IP address autor	matically								
• Use the following IP address	55:								
IP address:	192	2.4	168		1		10		
Subnet mask:	255	5.	255	. 2	255	•	0		
Default gateway:		×		÷		•		1	
C Obtain DNS server address	: automática	89.							
· Use the following DNS serv	er addresse	51							
Preferred DNS server:				÷		÷			
Alternate DNS server:		×	- 1	¥.		•		1	
							201		

Figure 12: Configuring IP settings for the private network interface

Also make sure you untick Append parent suffixes of the primary DNS suffixes and Register this connection's addresses in DNS (Figure 13).

		2
		3
	Add Edit	Remove
he following	three settings are applied to all conn	ections with TCP/IP
Append pr F Append Append Append th	esolution of unqualities names: imary and connection specific DNS suid parent suffixes of the primary DNS ese DNS suffixes (in order):	uffixes S suffix
 Append pr Append T Append th 	esolution of unqualitied names: imary and connection specific DNS s id parent suffixes of the primary DNS lese DNS suffixes (in order):	uffixes S suffix
 Append pr Append th Append th 	imary and connection specific DNS suid parent suffixes of the primary DNS see DNS suffixes (in order):	uffixes Souffix
Append pr F Append Append th Append th NS suffix for	imary and connection specific DNS suid parent suffixes of the primary DNS seese DNS suffixes (in order):	uffixes S suffix

Figure 13: Configuring DNS settings on the private network interface

Click the WINS tab and untick Enable LMHOSTS lookup and select Disable NetBIOS over TCP/IP (Figure 14).

Settings DNS WINS WINS WINS WINS addresses, in order of use:	
Add Edit	s to all connections for which
NetBIOS setting C Default: Use NetBIOS setting from the D is used or the DHCP server doe: enable NetBIOS over TCP/IP. C Enable NetBIOS over TCP/IP. Disable NetBIOS over TCP/IP.	HCP server. If static IP address s not provide NetBIOS setting,

Figure 14: Configuring WINS settings

With the network settings configured appropriately, let us move on and name each failover cluster node with meaningful names such as **CCRNODE1** and **CCRNODE2** or whatever naming scheme you want to use in your environment. When you have done so, add them as members in your Active Directory forest (**Figure 15**).

rou can change the name computer. Changes might More information	affect acce	empership iss to netv	vork resources.
Computer name:			
CCRNODE1			
Full computer name: CCRNODE1			More
Member of Domain: MSEXCHANGELA	8.ORG		
C W I			

Figure 15: Changing computer name and adding it to the domain

Finally reboot the servers for the changes to take effect.

The concludes part 1 of this 3 part article series revolving around how to deploy an Exchange 2007 SP1 CCR Cluster on a Windows Server 2008 Failover cluster. In part 2, which will be published soon here on MSExchange.org, we will form the Windows Server 2008 Failover Cluster as well as deploy the CCR based clustered mailbox server.

If you missed the next parts in this article series please read

- <u>Deploying an Exchange 2007 SP1 CCR Cluster on a Windows Server 2008 Failover</u> <u>Cluster – Part 2</u>
- Deploying an Exchange 2007 SP1 CCR Cluster on a Windows Server 2008 Failover <u>Cluster – Part 3</u>

About Henrik Walther



Henrik Walther is a Microsoft Exchange MVP, MCA: Messaging (Exchange Ranger) Apprentice, MCITP: Exchange 2007, MCTS: Windows 2008, and MCSE: M+S that

works as a Technology Architect for <u>Timengo Consulting A/S</u>, a Microsoft Gold Partner based in Denmark. You can visit his website at: <u>www.exchange-faq.dk</u> (danish).

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• Deploying an Exchange 2007 SP1 CCR Cluster on a Windows Server 2008 Failover Cluster – Part 2: Forming and Validating the Failover Cluster

Installing the Required Windows Server 2008 Role and Features

In Part 1, we configured the 2 servers that will be the nodes in the Windows Server 2008 Failover Cluster as well as added them to the domain. The next step is to install the required Windows Server 2008 role and features. A clustered Mailbox Server requires the following role and features on each failover cluster node:

- Web Server (IIS)
- PowerShell
- Fail-Over Clustering

The simplest way to install the role and features is to use the new Windows Server 2008 command-line based ServerManagerCMD.exe tool which lets you perform the installation via command prompt window or using a custom script. To install each role or feature individually, run the following commands in a command prompt window:

ServerManagerCmd -i PowerShell ServerManagerCmd -i Failover-Clustering

ServerManagerCmd -i Web-Server

ServerManagerCmd -i Web-ISAPI-Ext

ServerManagerCmd -i Web-Metabase

ServerManagerCmd -i Web-Lgcy-Mgmt-Console

ServerManagerCmd -i Web-Basic-Auth

ServerManagerCmd -i Web-Windows-Auth

If you would rather install them using one command, you can create an XML answer file with the following content:

<ServerManagerConfiguration Action="Install" xmlns="http://schemas.microsoft.com/sdm/Windows/ServerManager/Configuration/2007/1">

<Feature Id="Failover-Clustering"/> <Feature Id="PowerShell"/>

```
<Role Id="Web-Server"/>
<RoleService Id="Web-Metabase"/>
<RoleService Id="Web-Lgcy-Mgmt-Console"/>
```

<RoleService Id=" Web-ISAPI-Ext "/> <RoleService Id="Web-Basic-Auth"/> <RoleService Id="Web-Windows-Auth"/>

</ServerManagerConfiguration>

To do so open notepad paste in the above code, then save it as an XML file (or even easier download the script <u>here</u>).

With the script created, type *ServerManagerCMD –ip <name and path of xml file>* in a command prompt. The required role and features will now be installed automatically as shown in Figure 1.

Administrator: Command Prompt	x
:\Users\administrator.MSEXCHANGELAB\Desktop>servermanagercmd -ip E2K7_CMS.xml	4
<pre>tart Installation Installation] Succeeded: [Web Server (IIS)] Management Tools. Installation] Succeeded: [Web Server (IIS)] Performance. Installation] Succeeded: [Web Server (IIS)] Forformance. Installation] Succeeded: [Web Server (IIS)] Health and Diagnostics. Installation] Succeeded: [Web Server (IIS)] Health and Diagnostics. Installation] Succeeded: [Web Server (IIS)] Security. Installation] Succeeded: [Web Server (IIS)] Security. Installation] Succeeded: [Web Server (IIS)] Common MITP Features. Installation] Succeeded: [Windows Process Activation Service] Configuration AP installation] Succeeded: [Windows Process Activation Service] Process Model. Installation] Succeeded: [Windows Process Activation Service] Process Model. Installation] Succeeded: [Web Server (IIS)] IIS 6 Metabase Compatibility. Installation] Succeeded: [Web Server (IIS)] IIS 6 Metabase Compatibility. Installation] Succeeded: [Web Server (IIS)] IIS 6 Metabase Compatibility. Installation] Succeeded: [Web Server (IIS)] Batic Content. Installation] Succeeded: [Web Server (IIS)] Default Document. Installation] Succeeded: [Web Server (IIS)] Monovs Authentication. Installation] Succeeded: [Web Server (IIS)] Monovs Authentication. Installation] Succeeded: [Web Server (IIS)] Basic Authentication. Installation] Succeeded: [Web Server (IIS)] Basic Authentication. Installation] Succeeded: [Web Server (IIS)] Directory Browsing. Installation] Succeeded: [Web Server (IIS)] MITP Logging. Installation] Succeeded: [Web Server (IIS)] Mitr Errors. Installation] Succeeded: [Web Server (IIS)] Mitr Errors. Installation] Succeeded: [Web Server (IIS)] Matic Content Compression. Installation] Succeeded: [Web Server (IIS)] Mitr Errors. Installation] Succeeded: [Web Server (IIS)]</pre>	
:\Users\administrator.MSEXCHANGELAB\Desktop>_	-

Figure 1: Installing the necessary role and features using an XML file

Creating & Forming the Failover Cluster

The next step is to form the failover cluster. This can be done either via a command prompt using Cluster.exe or using the new Failover Cluster Manager. In order to give you a little introduction to the new Failover Cluster Manager in Windows Server 2008, I will use the GUI in this articles series.

Note:

If you want to use Cluster.exe, please see the respective <u>Exchange 2007 documentation</u> on TechNet.

In order to launch the Failover Cluster Manager, first click Start then Administrative Tools and then finally select Failover Cluster Management as shown in Figure 2.



Figure 2: Launching the Failover Cluster Manager

The Failover Cluster Manager will launch. Under Management click Create a Cluster as shown in Figure 3.



Figure 3: Opening the Create Cluster wizard

In the Create Cluster Wizard (Figure 4), click Next.



Figure 4: The Before You Begin page in the Create Cluster Wizard

We now need to add the name of the servers that should be acting as nodes in the cluster (Figure 5). Do so then click Next.

Select Servers Validation Warring Access Part for Advances Part for Advances Part for Selected servers CCRNODE1 mexchangelab.org CCRNODE2 mexchangelab.org Rem	ise
CCERN Fort for Enter server name Enter server name Enter server name CCRNODE1 maexchangelab.org CCRNODE2 mexchangelab.org Rem Enter Selected servers CCRNODE2 mexchangelab.org Rem	198
Autor Selected servers: CCRNODE1 msexchangelab.org 55 ortimation exting New Quiter	
extination Ren Custor	55
reating New Quiter	NPT .
anaay.	

Figure 5: Adding the servers to the failover cluster

Give the failover cluster a name and an IP address as shown in Figure 6 and click Next.

Note:

This name should not be confused with the clustered mailbox server name which Outlook clients will connect to.

Before You Begin Select Servers	Type the name	you want to use when adm	inisteing the cluster.
Validation Warning	Ouster Name	CCRCLUSTER	
Access Point for Administering the Ouster	sure the network	 acaresies could not be out on the type is selected, and then type 	an address.
Confirmation		Networks	Address
Creating New Ouster	R	10.10.1.0/24	10 . 10 . 1 . 144
agenery (

Figure 6: Specifying the name and IP address for the failover cluster

On the confirmation page, click Next.

Create Cluster W	tion		×
Before You Begin Select Servers Validation Warning Access Point for Administering the Custor Confination Orating New Cluster Surmay	You are ready to create a The wizard will create yo Cluster: Node: Node: IP Address:	a cluster ur cluster with the following settings CCRCLUSTER CCRNODE1.msexchangelab.org CCRNODE2.msexchangelab.org 10.10.1.144	X
	To continue, click Next.		
		< Previous Next >	Cancel

Figure 7: Confirmation page

The cluster wizard will now create as well as configure the failover cluster as shown in Figure 8.

Create Claster W	xard X
Before You Begin Select Servers Validation Warring Access Poet for Administering the Cluster Confirmation Centre New Ouster	Please wat while the cluster is configured.
Samay	Cancel

Figure 8: The Failover Cluster is being created and configured accordingly

When the failover cluster has been created you will be taken to a Summary page similar to the one in Figure 9, and you can now choose to view a report or simply click Finish to exit the wizard.



Figure 9: Summary page

We have now created a basic Windows Server 2008 failover cluster, but there is still some configuration to do before it is ready for our Exchange 2007 SP1 Clustered Mailbox server.

Configuring the Cluster Networks

With the failover cluster created, we must now configure the cluster networks, so that one network interface allows client connections and one is restricted specifically to heartbeat traffic between the nodes. Let's start by opening the property page for the public network interface (**Figure 10**).



Figure 10: Opening the property page for the Public network interface

Now change the name of the network interface to Public or something else that makes it easy to see that this interface is indeed connected to the Public network. Also make sure that Allow the cluster to use this network is selected and that Allow clients to connect through this network is ticked then click OK.

olic Netwo	ork Properties	
ieneral	Public Network	
Name: Public Ne	twork	2
(Allow the cluster to use this network	
	Allow clients to connect through this network	
24	Do not allow the cluster to use this network	
		_
State:	Up	
Subnets:	10.10.1.0/24	
	6	

Figure 11: Property page for the Public Network interface

Open the property page for the private network interface, and perform the same steps, but make sure Allow clients to connect through this network is unchecked. We do not want any clients to connect to the private network interface. This should strictly be used for heartbeat traffic between the nodes.

vate Ne	twork Properties	1
Seneral	Private Network	
Private	Network	1
	 Allow the cluster to use this network Allow clients to connect through this network Do not allow the cluster to use this network 	
State: Subnets	Up 192.168.1.0/24	-
	OK Cancel Apply	

Figure 12: Property page for Private network interface

Note:

With Exchange Server 2007 SP1 any network that is configured for cluster use and accepts client connections can also be used for CCR seeding, log shipping as well as reseeding. To configure this use the new Enable-ContinuousReplicationHostName cmdlet. You can also read more about how this is accomplished in the Exchange 2007 documentation on TechNet.

Configuring the File Share Majority Quorum

We must now configure the failover cluster quorum. That is, create the file share on a separate server (best practice is to use a Hub Transport server in the same AD site as the failover cluster nodes). To do so, log on to the server in your lab environment on which the Client Access and Hub Transport server roles are installed, then open a command prompt and create a new folder by typing:

MKDIR FSM_DIR_MBX

Where MBX is the name you plan to use for the clustered mailbox server. It does not really matter what you call it but in case you plan to use a Hub Transport server as file share majority

quorum for multiple CCR clusters, it is a good idea to use the name that you also dedicate to the CMS):

Now share the newly created folder using the following command:

NET SHARE FSM MBX=C:\FSM DIR MBX/GRANT:CCRCLUSTER\$,FULL

Note that only the Windows 2008 failover cluster account gets permissions to access this share. Also notice that the failover cluster machine account is hidden, meaning you must add a "\$" sign after the name.

Now configure the file system permissions with:

CACLS C:\FSM DIR MBX/G BUILTIN\Administrators:F CCRCLUSTER\$:F



Figure 13: Creating and sharing the FSM folder

With the system file share created, we must configure the quorum settings for the failover cluster, so that they point to the share we just created. To do so, open the Failover Cluster Manager on one of the nodes, then click More Actions in the Action Pane, then select Configure Cluster Quorum Settings in the context menu (Figure 14).



Figure 14: Opening Configure Cluster Quorum Settings

In the Configure Cluster Quorum Wizard (Figure 15), click Next.



Figure 15: Before You Begin page in the Configure Cluster Quorum wizard

On the Select Quorum Configuration page, select Node and File Share Majority (for clusters with special configurations) and then click Next.



Figure 16: Selecting the appropriate quorum configuration for the failover cluster

We now need to specify the path to the shared folder created on the Hub Transport server. You can do this by typing in the path directly or by browsing to the shared folder by clicking the Browse button (Figure 17). When the respective path has been entered, we can click Next.



Figure 17: Entering the share folder path that should be used by the file share witness resource

This brings us to the Confirmation page where you have one more chance to verify that you configured the cluster quorum appropriately. If everything looks super duper, click Next and then Finish on the Summary page.



Figure 18: Confirmation page in the Configure Cluster Quorum Wizard

Note:

You can also configure the quorum settings using Cluster.exe. For details see the <u>Exchange 2007</u> documentation on <u>TechNet</u>. As mentioned previously in this article, I will use the new failover cluster GUI as much as possible in order to give you an introduction to how you do this stuff using the GUI.

As you can see in **Figure 19**, we have a fully working Windows Server 2008 failover cluster waiting desperately for Exchange 2007 SP1 binaries to be installed, but before we start installing Exchange 2007 we need to validate the failover cluster configuration.



Figure 19: Status of the Failover Cluster

Validating the Failover Cluster Configuration

Since we are dealing with servers in a lab environment in this article series, it's not that important, but when you deploy Windows Server 2008 Failover clusters in a production environment you should ensure the failover cluster is properly validated using the cluster validation wizard. As mentioned this step is not super important in this lab environment, but in order for you to see what this wizard is all about, let us go through these steps as well.

In order to validate the failover cluster configuration, we need to click Validate a Configuration as shown in Figure 20.



Figure 20: Clicking Validate a Configuration

On the Before You Begin page, click Next (Figure 21).



Figure 21: Before You Begin page in the Validate a Configuration Wizard

To validate a set of servers in an existing failover cluster, you should either add the names of the servers individually or simply type in the name of the failover cluster itself. When you have done so click Next.

Validate a Config	uration Wizard Servers or a Cluste	ar	2
Before You Begin Select Servers of a Dater Setting Options Centenation Asiconny Summary	To validate a set of a To test an existing of Enter name Selected servers	ervers, add the names of all the servers atter, add the name of the cluster or one of its nodes.	Browse
		< Previous New	t> Cancel

Figure 22: Entering the name of the cluster or the cluster nodes

We now have the option of choosing between two different tests (Figure 23). It is easier, as well as recommended, to choose the Run all tests (recommended) option. When ready click Next.



Figure 23: Selecting what test we want to run

We can start the validation of the failover cluster, to begin this process click Next (Figure 24).

efore You Begin	You are ready to start validation.		
elect Servers or a	Please confirm that the following settings are correct.		
esting Options	Servers to Test		2.
	CCRNODE1.msexchangelab.org		
orfimation	CCRNODE2.msexchangelab.org		
skästing			
annary.	Tests Selected by the User	Category	
	List BIOS Information	Inventory	1.1
	List Environment Variables	Inventory	
	List Fibre Channel Host Bus Adapters	Inventory	
	List ISCSI Host Bus Adapters	Inventory	
	List Memory Information	Inventery	100
	List Operating System Information	Inventory	*

Figure 24: Confirmation page in the Validate a Configuration Wizard

The validation wizard will go through several tests; some will take longer than others (Figure 25). Depending on the hardware specs of your cluster nodes, you need to have patience while the configuration is validated as this can take quite a few minutes.



Figure 25: Running validation tests

When all tests have completed, you will be taken to the Summary page and here you can examine any detected issues.



Figure 26: Examining any issues detected while running the tests

In addition, you can view a detailed report (by clicking View Report). Note this report is saved, meaning you can choose to examine it at a later time if you wish.

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a 🏟 🎁 Falover Cluster Valdation Report		3-10-4->	Page - () Toole - *
Microsoft			1
Failover	Cluster Valida	tion Report	
Node: CCRNODE1.msexchargelab Node: CCRNODE2.msexchargelab Started 18-02-2008 10:04:49 Completed 18-03-2008 10:08:31	s.org		
Inventory	Result	Description	_
Inventory	Read	Description Easters	_
Inventory Lat 803 Information		Description Europee Europee	_
Inventory Units Lat 8003 Information Lat Environment Variables Lat Films, Channel Heat Bux Advances		Description Suttees Suttees Suttees	_
Inventory United United Statements Unit Fibre Channel Heat Bus Adapters		Overstandow Success Success Success	
Enventory Cours Lat 8005 Information Lat Resonant Variables Lat fibre Channel Hast Bus Adaptes Lat 19031 Host Bus Adaptes Lat Network Information		Description Europee Success Success Success Europee	
Enventory		Description Summe Summe Summe Summe Summe Summe	

Figure 27: Failover Cluster Validation Report

The concludes part 2 of this 3 part article series revolving around how to deploy an Exchange 2007 SP1 CCR Cluster on a Windows Server 2008 Failover cluster. In Part 3, which will be published soon, we will deploy the CCR based clustered mailbox server (CMS) as well as test whether the CMS works as expected.

In this part 3 of this 3 part article series revolving around how to deploy an Exchange 2007 SP1 CCR based cluster on Windows Server 2008, we'll continue where we left of in part 2. That is we will install both the Exchange 2007 SP1 Active as well as the Passive clustered Mailbox server (CMS). We will also look at Transport Dumpster settings and the CMS settings through the new property pages and wizards included in the Exchange 2007 SP1 Exchange Management Console.

Installing the Active Clustered Mailbox Role on CCRNODE1

Okay the moment we have all been waiting for! It's finally time to install the Exchange 2007 SP1 binaries on the first failover cluster node. Can we start an article better than that?

By now we should already have installed the Exchange 2007 SP1 prerequisites, so on CCRNODE1, we can simply insert the DVD media containing the Exchange 2007 SP1 binaries or open the local folder or network share that holds them, then launch Setup.exe. After a few

seconds you'll be taken to the Exchange 2007 SP1 Start page, splash screen, can opener, bootstrap or whatever you like to call it. Click **Install Microsoft Exchange Server 2007 SP1** (**Figure 1**). If the setup.exe file is launched from a network share all the Exchange 2007 SP1 binaries will now be copied from the source to a temporary location locally on the server (C:\Temp\ExchangeServerSetup). If you launch Setup.exe from a DVD media or a local folder, this step will be skipped meaning the Exchange 2007 SP1 setup wizard will start faster.



Figure 1: Exchange 2007 SP1 Start page

When the Exchange 2007 SP1 Setup Introduction page appears, click Next (Figure 2).

 Introduction License Agreement Error Reporting Installation Type Readmess Ohecks Progress Completion 	<section-header><section-header><text><section-header><section-header><list-item><list-item><section-header><section-header><section-header><list-item><list-item><list-item><list-item></list-item></list-item></list-item></list-item></section-header></section-header></section-header></list-item></list-item></section-header></section-header></text></section-header></section-header>
--	--

Figure 2: Exchange 2007 SP1 Setup Introduction page

Accept the License Agreement and click **Next**, then chose whether you want to enable Error Reporting or not and then click **Next** once again. On the Installation Type page, select **Custom Exchange Server Installation** and click **Next**.



Figure 3: Exchange 2007 SP1 Installation Type page

Now tick Active Clustered Mailbox Server role and click Next (Figure 4). If you're installing an Exchange 2007 SP1 CCR cluster on a server in a production environment, this is also the place where you specify where the Exchange 2007 SP1 binaries should be installed. Large enterprise organizations with plenty of LUNs available for the Exchange server often chooses to install these binaries on a partition separate from the System partition.



Figure 4: Selecting Active Clustered Mailbox Role

On the Exchange 2007 SP1 Setup Cluster Settings page, select Cluster Continuous Replication, then enter the name you want to give to the CMS (this is the name your Outlook clients will use to connect to the CMS). When ready, click **Next**.

Introduction	Cluster Settings
License Agreement Error Reporting Installation Type Selection Custer Settings Custer IP Address Configuration Client Settings Readiness Checks Progress	Select cluster type: Cluster Continuous Replication Cluster continuous replication provides automatic management of node redundancy and uses application-level data replication. Single Copy Cluster A single copy cluster provides automatic management of node redundancy and uses shared storage among all nodes. Specity installation options for this node: Clustered Malibox Server Name: MEX
Completion	Specify the path for the Oustered Malbox Server database files D\\Malbox\SG1 Browse

Figure 5: Exchange 2007 SP1 Cluster Settings

Now we need to pay extra attention as this page is new. This is where you specify what type of IP network you want to use as well as whether the IP address(es) should be assigned dynamically using DHCP. For the purpose of this article series we'll choose a single static IPv4 address as shown in **Figure 6** below. When ready, click **Next**.

Note:

As mentioned in Part 1 of this series, a combination of Exchange 2007 SP1 and Windows Server 2008 let us deploy the active and passive clustered mailbox servers on different subnets. With Exchange 2007 RTM and Windows Server 2003 we had to stretch a single subnet between locations in order to deploy the cluster nodes in geographically dispersed locations.



Figure 6: Configuring the Cluster IP Address(es)

Since this is the first Mailbox server we install in our Exchange 2007 SP1 organization, we now need to specify whether we use Outlook 2003 and earlier or Entourage clients in the organization. If we do select **Yes** if not, leave the defaults and click **Next**.

 Introduction License Agreement Error Reporting Installation Type Selection Ouster Role Selection Ouster Settings Ouster IP Address Configuration Outer Settings Readiness Onecks Progress Completion 	Client Settings Computers surving Outlook 2003 and easter or Entrurage requires a public folder database to connect to Exchange 2007. If you select that you have computers running Outlook 2003 and easter or Entourage in your organization, a public folder database will be created during setup. If you select that you do not have computers running Outlook 2003 and easter or Entourage in your organization, setup will not create a public folder database. However, you can enable Outlook 2003 and easter or Entourage in your folder database at anytime after setup completes. Do you have any client computers running Outlook 2003 and easter or Entourage in your organization? ○ Yes
---	--

Figure 7: Specify whether Outlook 2003 and earlier or Entourage clients are used in the organization

Let the readiness check complete. Hopefully you shouldn't see other issues than the ones in **Figure 8.** If the readiness check completed without series warnings or errors, click **Install** in order to begin the installation of the Active Clustered Mailbox server.

Warning!

Although this article is based on a lab environment, I must stress that the 32-bit of Exchange Server 2007 is not supported for use in a production environment, unless it is for management of servers, user mailboxes, etc.

 Introduction Loense Agreement Enor Reporting 	Readiness Checks The system and server will be checked to see whether if Elapsed time: 00:01:40 Summary: 2 tem(s): 2 succeeded, 0 failed.	Exchange is ready to be installed.
 Installation Type Server Role Selection Ouster Settings Ouster IP Address Configuration Clerit Settings Readness Direcks Progress Completion 	Malbox Role Prerequisites Warring: The 32-bit version of Exchange Server 2007 is not s	Completed 3
	Clustered Malbox Server Prerequisites Warning: The 12-bit version of Exchange Server 2007 is not a Elapsed Time: 00:00:25	Concisted A

Figure 8: Readiness Check completed without serious issues

The installation process will take several minutes. When it has completed, click **Finish** (**Figure 9**) and reboot the server for all changes to take effect.

 Introduction License Agreement Emor Reporting Installation Type 	Completion The following server roles have been successfully Final: Elapsed time: 00:16:02 Successfully installed: No errors.	installed. To close the wittent, click
Server Role	Copy Exchange Files	Ornstetad 🗴
El Outer Settings	Elapsed Time: 00.05.46	
Duster IP Address Configuration	23 Management Tools	🕑 Completed 🗴
	Bapsed Time: 00:00:37	
Clert Settings	La Malbox Role	🕑 Completed . A
Personal Checks	Bapsed Time: 00:06:24	
Completion	La Clustered Malbox Server	🙆 Completed 🗴
	Bapsed Time: 00:03:13	
	Select OH+C to copy the contents of this page.	

Figure 9: Installation completed successfully

We now have a fully working CCR clustered Exchange 2007 SP1 Mailbox server, although only with one node.

Installing the Passive Clustered Mailbox Role on E2K7Node2

In order to make our clustered mailbox server redundant, we of course need to install the passive clustered mailbox role as well. So let's log on to our second failover cluster node (CCRNODE2) and launch the Exchange 2007 SP1 Setup.exe file. We'll be taken through the Exchange 2007 SP1 setup wizard once again (you know what to select now). When you get to the Server Role Selection page, tick **Passive Clustered Mailbox Role** as shown in **Figure 10** then click **Next**.

Introduction	Server Role Selection		
License Agreement	Select the Exchange server roles you wan	t to install on this computer.	
Error Reporting	Maibox Role	Description	
I Installation Type	▲ IT Client Access Role	The Malbox Hole provides e-mail storage an advanced scheduling services for Microsoft Office Outlook users. The Malbox Server rol also includes public folders, which provide a for addition for workflow, doo mark sharpo.	
Server Role Selection	🐉 🗐 Hub Transport Role		
Readness Checks	Infied Messaging Server Role	and other forms of collaboratio	niera snamig. M
Progress Completion	Edge Transport Server Role		
	Active Clustered Mailbox Role	de	
	Sale Passive Clustered Malbox Role		
	10 E . Hanna Tarla	Disk Space Allocation	
	LS # Management roots	Disk space required:	723,0 M
		Disk space available:	6752,6 MI
	Specify the path for the Exchange Server	installation:	
	C:\Program Files\Microsoft\Exchange Ser	ver	Browse

Figure 10: Selecting the Passive Clustered Mailbox Role option

The Readiness check will run once again. This should take a few seconds since only the Mailbox role prerequisites are checked this time. When it has completed, click **Install (Figure 11)**.

 Introduction License Agreement Error Reporting 	Readiness Checks The system and server will be checked to see whe Bapsed time: 00:03:27 Summary: 1 tem(s), 1 succeeded, 0 failed.	ther Exchange is ready to be installed.
 Installation Type Server Role Selection Readiness Checks Progress Completion 	And Malbox Role Prerequisites	Completed A
	The 32-bit version of Exchange Server 2007 is Backed Time: 00:03:27	s not supported for production use.
	Select Col+C to copy the contents of this page.	• [] •••

Figure 11: Readiness Check on the second failover cluster node

When Exchange 2007 SP1 setup has finished installing and configuring the passive clustered mailbox server, click **Finish** in order to exit the Setup wizard, and then reboot the passive CMS in order for all changes to take effect.

Configuring the Transport Dumpster

In my article series that goes through how you deploy an Exchange 2007 RTM CCR cluster on Windows Server 2003, I went through how you configured the Transport Dumpster settings using the Exchange Management Shell (using the Set-TransportConfig cmdlet), since there was no way of doing so via the GUI in Exchange 2007 RTM. Now that we are playing with Exchange 2007 SP1, let me instead show you how this is accomplished using the Exchange Management Console.

Before we move on, I want to let you know that the Transport Dumpster is enabled by default and it is completely optional to customize it. By default it is configured with a maximum size of 18 MBs for storage groups and a maximum retention time of 7 days. Microsoft recommends we configure the maximum size per storage group to a size that is 1.5 times the size of the maximum messages that can be sent through the messaging system. This means that if we have a message size limit of 10MB, the maximum transport dumpster size for storage groups should be 15MB. In addition, Microsoft recommends the retention time is set to 7 days, which as mentioned is the default setting.

For further details on how to configure the transport dumpster settings, see this <u>Exchange 2007</u> <u>documentation on TechNet</u>.

The Transport Dumpster settings can be configured via the GUI by opening the Exchange Management Console, and under Organizations Settings select Hub Transport. Here you need to click on the Global Settings tab and then open the property page for Transport Settings. This will bring you to the property page shown in **Figure 12** shown below.

Transport	Settings Properties			×
General	Message Delivery			
Transp	ort Limits			
I⊽ Ma	pamum receive size (KB):		1024	0
M No	ximum send size (KB):		1024	0
17 M	aximum number of recipients	E):	5000	
Transp	ort Dumpster			
Maxim	um size per storage group ()	MB);	18	
Maxim	um retention time (days):		7	
		1 1	(Allerand)	
	ОК	Cancel	Apply	Help

Figure 12: Transport Settings

Examining CMS settings using the Exchange Management Console

It's time to examine our CMS using the Exchange Management Console. Those of you who had the pleasure of working with a CMS based on Exchange 2007 RTM knows that you had to use cmdlets to get statistics and other details for the CMS as well as stop and start the CMS and

moving it between the failover cluster nodes. Well, with Exchange 2007 SP1 we can see details for a CMS directly from within the Exchange Management Console. This is done by opening the property page of the CMS. We do so by selecting **Server Configuration** in the navigation tree and then right-clicking on the CMS in the result pane.

Exchange Management Cons	ole				
File Action View Help					
💠 🔿 🙍 🖬 📓 💷					
🔯 Microsoft Exchange	🐜 Mailbox			1 objec	ct
Crganization Configuration	Treate Filter				
Client Access	Name *	Role		Version	
Unified Messaging	MEX	Manage Cluster	ed Maibox Server	ersion 8.1 (Build 24	0.6
E Server Configuration		New Storage Gr	oup		
Client Access	0	Properties)		
En Hub Transport	4	Help		1 2 5	
E & Recipient Configuration	MBX				
10000x	Database Managen	vent WebDAV			
	Name		Database File Pat	ha an	s
	First Store	ige Group Database	D: Walbox \SG1\Fi	rst Storage Group),	×

Figure 13: Opening the property page for the CMS

Now select the **Clustered Mailbox Server tab**. As can be seen in **Figure 14**, we can see things such as the name of the cluster nodes, storage type used (which in a CCR is non-shared) as well as whether the CMS is online, and if it is which node is the current quorum owner. Moreover, this is the place we configure the auto database mount dial. You can read more about this functionality <u>here</u>.

General		System Settings
Messaging Records	Management	Oustered Mailbox Server
Details		
Redundant machines:	comode1, comode2	
Storage type:	Non Shared	
State:	Online	
Operational machines:		
Falover Availability		
Failover Availability Auto database mount dia	I: Best Availability	<u>×</u>
Failover Availability Auto database mount dia	I: Best Availability	<u>×</u>
Failover Availability Auto database mount dia	I: Best Availability	<u>*</u>
Failover Availability Auto database mount dia	I: Best Availability	<u>•</u>

Figure 14: CMS details

We also have the option of seeing statistics for log file copy and replay between storage groups on the active and passive node. This is done by opening the property page for a Storage Group and then selecting the Cluster Continuous Replication tab as shown in **Figure 15**.

General Cluster Continuous	Replication	
Seeding:	False	
Copy status:	Healthy	
Messages:	Vew	
Target node:	CCRNODE2	
Copy queue length (logs):	0	
Replay queue length (logs)	0	
Latest available log time:	18. februar 2008 13:11:02	
Last inspected log time:	18. februar 2008 13:11:02	
Last copied log time:	18. februar 2008 13:11:02	
Last replayed log time:	18. februar 2008 13:11:02	
0	C Cancel Arrow Het	

Figure 15: Log file copy and replay statistics

To Move, Stop or Start a CMS, we use the new Manage Clustered Mailbox Server wizard introduced in Exchange 2007 SP1 (**Figure 16**). This wizard can be executed from the Action pane when the CMS is selected under the Server Configuration work center node.

	Current state: Online Management Action: Move the clustered malbox server to another node Start the clustered malbox server Stop the clustered malbox server Stopping or moving the clustered malbox server will cause the malbox server to stop responding to client requests and will result in a temporary service outage.
--	---

Figure 16: Manage Clustered Mailbox Server wizard

Lastly we can also suspend, resume, update, and restore storage group copies directly from within the Exchange Management Console as shown in **Figure 17**.

Fourth Storage Group Move Storage Group Path New Malbox Database New Public Folder Database	Fourth Storage Group Move Storage Group Path New Malbox Database	Fourth Storage Group Move Storage Group Path New Malbox Database
12 Suspend Storage Group Copy	Resume Storage Group Copy Restore Storage Group Copy	1 Suspend Storage Group Copy
2 Remove	> Remove	> Renove
Properties	Properties	Properties

Figure 17: Managing Storage Group copies from the EMC

Since I already covered how you managed a CMS using the Exchange 2007 SP1 EMC in a previous article of mine, I won't go into details on how this is done in this article. Instead I recommend you take a look at that article <u>here</u> so you can play with your new CMS.

Alright this concludes this article series revolving around how to deploy an Exchange 2007 SP1 CCR based cluster on Windows Server 2008. I hope you enjoyed it!

If you would like to read the other parts in this article series please go to: