Cluster Installation Manual

9.12.0v1

SECURITY MANAGEMENT SYSTEM

9600-0406

Cluster Installation Manual
(9600-0406)

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Applies to version 9.12.0 or later of the Symmetry software, until superseded by a later issue of the manual.

Contents

About this Manual

This manual explains the following:

- The purpose, operating concepts and benefits of clusters.
- How to install clusters for use with the Symmetry software using Microsoft® Windows® Clustering or the NEC® ExpressCluster software.

This manual is intended to be used by technical staff who need to install a cluster. Such staff should have experience with installing, configuring and maintaining clusters and network applications.

Chapter 1: Introduction

About Clustering

Clustering is generically known as "high-availability", "data protection" or "replication" software. The software is installed and configured on connected servers, which are also installed with the application software. Should the currently running server stop functioning, a "failover" process causes another server to assume control to provide continuous service.

Microsoft Clustering

A Microsoft cluster implementation can use a server-attached storage device (such as a Fiber Channel disk array as illustrated in *Figure 1*) or a network-attached storage device (such as Windows iSCSI Server as illustrated in *Figure 2*).

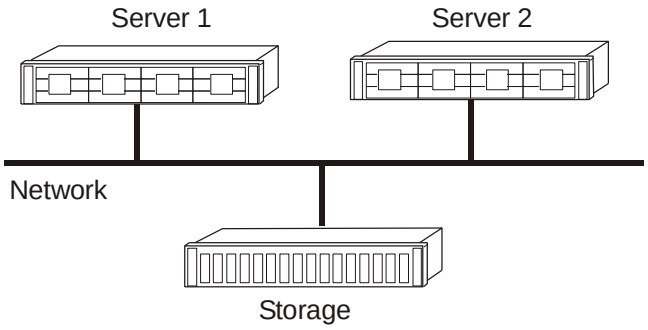


Figure 1: Microsoft Clustering Configuration Using Server-Attached Storage

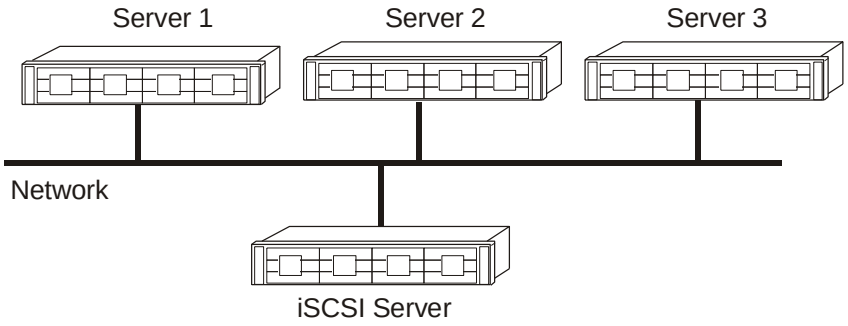


Figure 2: Microsoft Clustering Configuration Using Network-Attached Storage

A Microsoft cluster can be used to run one of the following:

- A Symmetry Enterprise Edition server. Optionally, the Symmetry XML Open Integration Module can form part of the clustered environment. The Symmetry database can be local to the clustered Symmetry server, or a separate database server can be used (recommended to be clustered).
- A Symmetry Network Video Recorder (NVR).

In Microsoft Windows clustering terminology, the server that is currently serving the clients is known as the "active node". The other's are known as "passive nodes". Passive nodes continually monitor the active node in the event that one of them needs to assume responsibility and become the active node.

NEC Clustering

The NEC cluster implementation uses two separate storage devices that are local to each server, as illustrated in *Figure 3*.

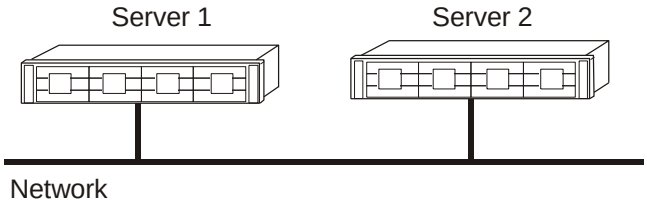


Figure 3: NEC Clustering Configuration

NEC clustering can be used to cluster one of the following:

- A Symmetry Enterprise Edition server. The Symmetry database can be local to the clustered Symmetry server, or a separate database server can be used (recommended to be clustered).
- A Symmetry Network Video Recorder (NVR).

In NEC clustering terminology, the server that is currently serving the clients is known as the "primary server" or "primary node". The other is known as the "secondary server" or "secondary node". When configured to do so, the secondary server continually monitors the primary server in the event that it needs to assume responsibility and become the active server.

System Requirements

Requirements for a Symmetry Server when using Microsoft Clustering

Hardware

Two or more servers set up on a domain are required with the same minimum hardware requirements as a Symmetry Enterprise server, as specified in the Symmetry Software Installation Manual.

Ensure that all servers are cluster certified and support clustering under the selected operating system.

Ensure that shared storage (such as a Fiber Channel disk array, or iSCSI Server) are cluster certified for use with Microsoft Clustering.

If you are using iSCSI for shared storage, it is recommended to use a dedicated network card for the connection between each cluster node and the iSCSI storage server.

The network used for iSCSI should be of a suitable speed to handle the potential size of the Symmetry system, and the peak number of transactions on a site.

Refer to *Symmetry Performance Tuning and Maintenance* in the *Symmetry Software Installation Manual* for further details on tuning a Symmetry system or network.

The Cluster Verification tests executed by the Failover Cluster Manager should have completed and all tests passed successfully prior to creating the cluster.

Each node must be a dedicated machine; it must not be used to operate the Symmetry client software.

Each node requires two or more network adapters: one for the public local/wide-area network connection, one for the private crossover network between the two machines, and one or more separate adapters for iSCSI (if used).

A number of separate drives configured on the shared storage device is required; the minimum number is dependent on whether SQL is local to the cluster or on a remote network location. Ensure the cluster drive configuration complies with Microsoft's cluster storage configuration recommendations.

Software

Each server requires:

- Any version/edition of Windows and SQL Server supported by a Symmetry Enterprise Edition server, as documented in the *Symmetry Software Installation Manual*.
- Enterprise Edition of the Symmetry server software, installed using a cluster-aware Enterprise License (optionally, with the XML Open Integration Module) or the Symmetry NVR software, as appropriate.

  Note: It is possible to use a cluster-aware Symmetry license to install a non-clustered version of Symmetry. However, Symmetry will be installed without any cluster-specific functionality, and will require advanced reconfiguration if clustering is required at a later date. The advanced reconfiguration required is not described in this manual.
- NTFS file system.
- An Active Directory (domain-based) network (Microsoft clustering requires each node to be joined to a domain prior to creating the cluster).
- A folder is required for Symmetry Messaging (e.g. named "Symmetry Messaging"). This must not be on the same drive as the Symmetry installation folder or on the shared drive. The folder must be accessible by all nodes in the cluster and must be part of the same resource group as the Symmetry services. During configuration, you will need to add it as a dependency of the Symmetry Messaging service (page 10).

Requirements for a Symmetry Server when using NEC Clustering

Hardware

Two servers set up on a domain are required with the same minimum hardware requirements as a Symmetry Enterprise server, as specified in the *Symmetry Software Installation Manual*.

Each server in the cluster:

- Must have the NEC Express Cluster software installed, and must have the required licenses for Mirrored Disk Replication, as described in the NEC documentation.

- Must have the same minimum hardware requirements as a Symmetry Enterprise server, as specified in the *Symmetry Software Installation Manual*.

- Must be dedicated and not used to operate the Symmetry client software. **Note:** Please contact your Technical Support Representative if a clustered Symmetry "Comms client" is required.

- Require two network adapters: one for the public local/wide-area network connection and the other for the private crossover network between the two machines.

- Must have the NEC services running under local system, and not be changed to run under a Windows or domain account.

- Must have at least two separate physical disks, one for the operating system, and one for the following:
  - A **Q drive partition** (quorum drive) used for the cluster configuration data. The partition should be unformatted (RAW) and have at least 1024MB of available space.
  - A **data drive partition** (e.g. F:\) used for SQL\Symmetry data\Message Queuing. This is the **NEC mirrored disk**. The partition can be on the same physical disk as the Q drive.

  Symmetry must not be installed on the same physical disk as used by the Q drive and data drive partitions.

Mirrored disk communication defaults to synchronous replication, which can cause performance issues with Symmetry if there is a slow or degraded network link between the clustered nodes. Asynchronous replication can be used if this is the case, although loss of transactions or Symmetry data can occur on failover.

If asynchronous replication is configured, a local disk attached to each node in the cluster is required for the History Files Store Folder.

For further information about how to plan a clustered system to achieve best performance, please refer to the *Symmetry Performance Tuning and Maintenance* appendix in the *Symmetry Software Installation Manual*.

Software

Each server requires:

- NEC EXPRESSCLUSTER X R4.3 or R5.2 WAN Edition.
- Any version/edition of Windows and SQL Server supported by a Symmetry Enterprise Edition server, as documented in the *Symmetry Software Installation Manual*.
- Internet Explorer, Edge or Google Chrome.
- Enterprise Edition of the Symmetry server software, installed using a cluster aware Enterprise License or the Symmetry NVR software, as appropriate.

  Note: It is possible to use a cluster-aware Symmetry license to install a non-clustered version of Symmetry. However, Symmetry will be installed without any cluster-specific functionality, and will require advanced reconfiguration if clustering is required at a later date. The advanced reconfiguration required is not described in this manual.
- An Active Directory (domain-based) network. Installation with or without dynamic DNS is supported.

A folder is required for Symmetry Messaging (e.g. named "Symmetry Messaging"), which can be located on the same mirrored disk used for other Symmetry program data or on another mirrored disk. During configuration, you need to add the disk as a dependency of the Symmetry Messaging service (page 29).

Chapter 2: Symmetry Server and XML Installation on a Microsoft Cluster

This chapter describes how to install the Symmetry server software and optionally also the Symmetry XML Open Integration Module on a Microsoft cluster.

Note: This chapter does not describe the initial installation of a cluster. It is assumed that an administrator has already carried out this work and is available during the following procedures.

Before you begin:

- Read *Requirements for a Symmetry Server when using Microsoft Clustering* on page 2.
- Make sure both nodes are joined to an Active Directory domain.
- Make sure the Microsoft cluster software is installed and licensed.
- Make sure the following ports are opened on the active and passive nodes:
  a) UDP port 3343 – for Microsoft Cluster Services.
  b) TCP port 4222 – for Symmetry messaging.

Symmetry Server Cluster Installation Procedure

Note: This procedure assumes that the active node is the same machine throughout. If you install the software at different times, you should ensure that the active node is the same machine at both times. If you do not do this, uninstalling at a later time can be more difficult.

Step 1 – Enable Microsoft Clustering and Required Roles and Features

Carry out the following at **both** nodes:

1.1 Open **Server Manager** and add the **Message Queuing** and **Failover Clustering** features.

1.2 In **Computer Management, Services** ensure that the **Message Queuing** service is set to **Manual** start.

1.3 Create the cluster.

Step 2 – Install SQL Server

SQL Server can be on the same machine as the Symmetry server, or can be on a separate database server (recommended to be clustered).

Install SQL Server as documented in the *Software Installation Manual*, but please note the following.

On the active node:

- Select **New SQL Server Failover Installation** on the SQL Server install screen.
- Specify the cluster network name on the Instance Configuration screen, and select **Default Instance** (or **Named instance** if using named instances).
- On the Cluster Network Configuration screen, specify the desired public SQL IP address.
- Specify the SQL Server service accounts on the Server Configuration screen.
- Ensure the Data Directories in the Database Engine Configuration screen are located on the shared drive. This must be a separate drive (not just a separate partition) from the quorum.
- Make sure that the Firewall settings for SQL Server on the active node are as documented in the *Symmetry Software Installation Manual*.

On the passive node:

- Select **Add node to a SQL Server failover cluster** on the SQL Server install screen.
- Verify the correct SQL cluster network name on the Cluster Node Configuration screen.
- Make sure that the user accounts specified on the Service Accounts screen are the same as were specified during the installation on the active node.
- Make sure that the Firewall settings for SQL Server on the passive node are as documented in the *Symmetry Software Installation Manual*.

Step 3 – Configure the Message Queuing Resource

At the active node:

3.1 Open **Failover Cluster Management** from the Windows **Start** menu.

3.2 Right-click **Roles** and choose **Configure Role**.

3.3 Select **Message Queuing**.

3.4 Specify a **Client Access Point**. This name will need to be entered during the installation of the Symmetry software (Step 4).

3.5 Specify an IP Address.

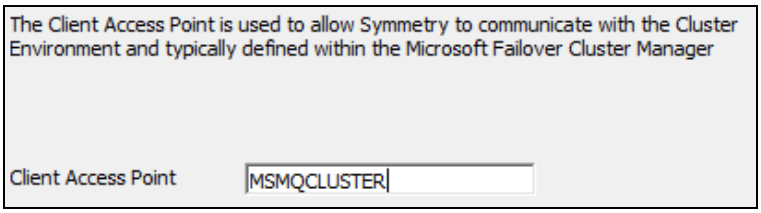
3.6 Select an available storage volume.

Step 4 – Install the Symmetry Server Software on the Active Node

Carry out the following to install the Symmetry software:

4.1 Install the Symmetry software on the active node, as described in the *Symmetry Software Installation Manual*, but note the following:

a) When prompted for the **Client Access Point**, enter the **Network Name** specified in step 3.4:



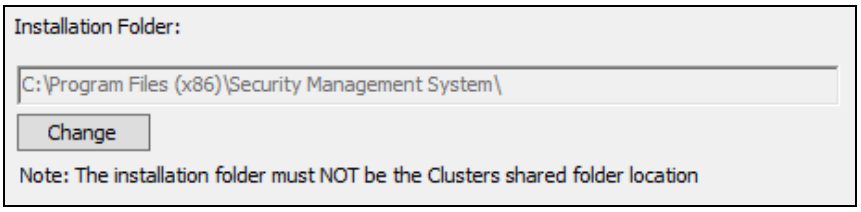
b) When you see **Specify a SQL Server**, specify one of the following:

- If SQL Server is local to the cluster and a default instance is used: **<SQL Resource network name>**
- If SQL Server is local to the cluster and a named instance is used: **<SQL Resource network name>\<Instance Name>**
- If the SQL Server database is remote, and a default instance is used: **<Server name>** (or **<SQL Resource Network Name>** if the remote database is clustered
- If the SQL Server database is remote, and a named instance is used: <**Server name>\<Instance Name>** (or **<SQL Resource Network Name>\<Instance Name>** if the remote database is clustered

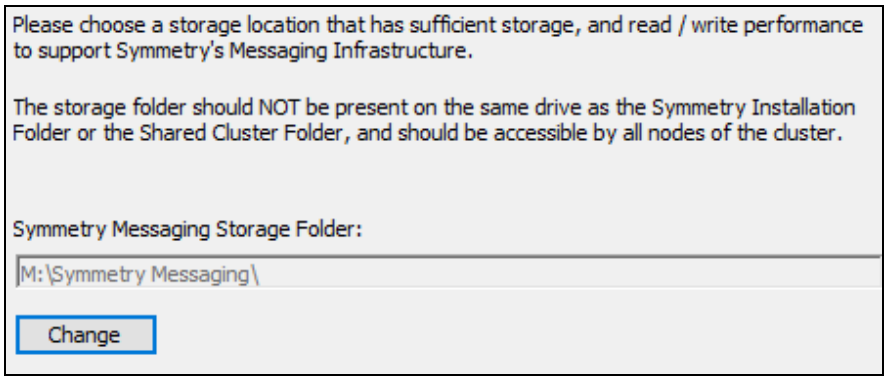
c) When prompted for the **Database Backup** folder, if the share is local to the cluster enter \\<Cluster Name>\SymmetryBackup, so that the backup path points to an available local shared drive, or specify a remote share.

d) Choose **Custom** installation.

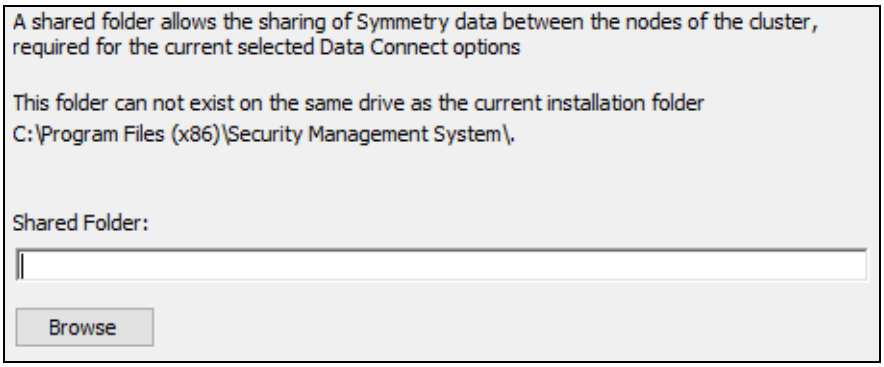
e) When prompted for the **Installation Folder**, do not choose a folder on the shared drive:



f) When prompted for the **Symmetry Messaging Infrastructure** folder, specify the folder to use for Symmetry Messaging (see page 3 for details of the folder requirements):



g) When prompted for the **Shared Folder**, make sure that you select a folder on the shared drive (the folder must not be on the quorum drive):



h) Use a named account for the Symmetry services.

Step 5 – Install the Symmetry Server Software on the Passive Node(s)

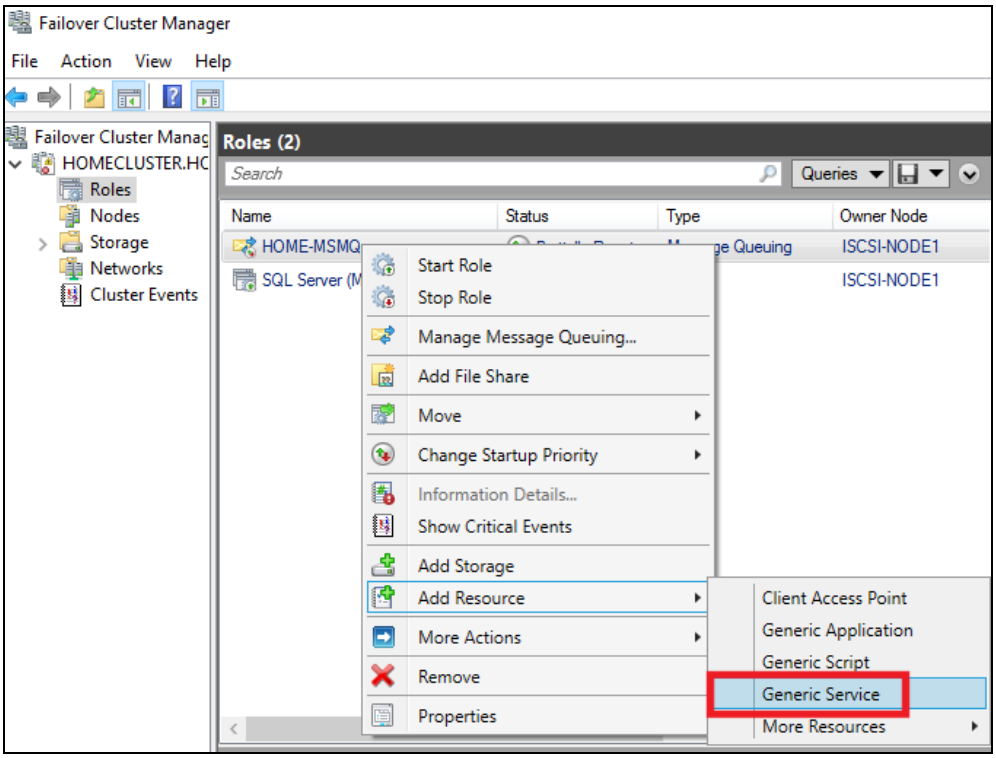
Install the Symmetry software on the passive node(s).

Specify the same password for the services account as previously used for the installation at the active node.

Step 6 – Set Up the Symmetry Services Resource

At the active node:

6.1 In Failover Cluster Management under **Roles**, right-click the network name created in step 3.4, and choose **Add a resource, Generic Service**, as shown next:



6.2 In the New Resource wizard, select **Symmetry Support Service**, click **Next**, **Next** and then **Finish**.

6.3 Right-click the Symmetry Support Service resource and select **Properties**.

6.4 In the Dependencies tab, add the Message Queuing Resource created in Step 3.

6.5 In the Registry Replication tab, add the following registry key:

software\Wow6432Node\Group4

6.6 Under the General tab, select **Use Network Name for computer name**.

6.7 In the Advanced Policies tab, ensure that both nodes are selected as Possible Owners.

Step 7 – Add Additional Generic Symmetry Resources

At the active node, using the previous step as a guide, create the following resources:

Name : Symmetry Transaction Service, of type Generic Service
Possible owners: Both nodes
Resource dependencies: Symmetry Support Service
(select **Use Network Name for computer name**)
Registry replication: None

Name : Symmetry Client Service, of type Generic Service
Possible owners: Both nodes
Resource dependencies: Symmetry Support Service
(select **Use Network Name for computer name**)
Registry replication: None

Name : Symmetry Integration Server, of type Generic Service
Possible owners: Both nodes
Resource dependencies: Symmetry Support Service
(select **Use Network Name for computer name**)
Registry replication: None

Name : Symmetry State Service, of type Generic Service
Possible owners: Both nodes
Resource dependencies: Symmetry Support Service
(select **Use Network Name for computer name**)
Registry replication: None

Name : Symmetry Transaction Parser Service, of type Generic Service
Possible owners: Both nodes
Resource dependencies: Symmetry Support Service
Service name: SymmetryTransactionparser
(select **Use Network Name for computer name**)
Registry replication: None

Name : Symmetry HTTPServer, of type Generic Service
Possible owners: Both nodes
Resource dependencies: Symmetry Support Service
(select **Use Network Name for computer name**)
Registry replication: None

Name : Symmetry Messaging, of type Generic Service
Possible owners: Both nodes
Resource dependencies: MSMQ, and the disk that contains the Symmetry Messaging folder
(select **Use Network Name for computer name**)
Registry replication: None

Name : Symmetry Activity Management, of type Generic Service
Possible owners: Both nodes
Resource dependencies: Symmetry Messaging
(select **Use Network Name for computer name**)
Registry replication: None

Step 8 – Bring the Application Online

Bring the application online: right-click the role and select **Bring Online**.

All resources should show as being online.

Step 9 – Test Fail-Over

Test fail-over as follows:

9.1 Shut down the current active node. Using Cluster Administrator on the new active node, ensure that the Symmetry resources are online.

9.2 Restart the original active node. Once started, reboot the new active node. This will cause the original to be active again. Use Cluster Administrator to verify this.

Step 10 – Connect a Symmetry Client

At a separate machine:

10.1 Log on with an account that is present in the domain ACS Admin group.

10.2 Run the Symmetry client installation software.

10.3 When prompted, enter the serial number of an Enterprise client license.

10.4 In the Database Server screen, specify the **Database Server** to be one of the following, depending on the location of the Symmetry SQL Server database:

a) If SQL Server is installed on the same cluster as Symmetry, enter the SQL Network Name(\<InstanceName>).

b) If SQL Server is not installed on the same cluster as Symmetry, specify the remote SQL server and instance name (SQLServerName\<InstanceName>).

Symmetry XML Cluster Installation Procedure

Once the clustering of the Symmetry server is complete, follow the steps given next ONLY if you are installing the XML Open Integration Module on the Symmetry server (i.e. you are not installing the XML Open Integration Module on a separate web server).

Note: The default architecture is to use a separate web server on each machine. At failover, the web server on the new active machine becomes the current web server. If required, a clustered web server implementation can be used, the configuration of which is outside the scope of this manual.

Step 1 – Install the Symmetry XML Open Integration Module

Carry out the following:

1.1 Install the XML Open Integration Module on the active node, as described in the *XML Open Integration Module Installation and User Guide*. When prompted for the account to use for the XML Open Integration services, specify the same account details used for the Symmetry services on the Symmetry server.

1.2 When the installation procedure is finished, read the instructions, and click **Finish**.

1.3 Install the XML Open Integration Module on each passive node (again using the same services account), and click **Finish**.

Step 2 – Update Web.config

The Web.config file (default location c:\inetpub\wwwroot\smsXMLWebService) needs to contain the same information on both nodes, otherwise failover may not occur. If the file is edited on the active node, copy the file to the same location on the passive node.

Web.config will need to be edited to implement SSL if encrypted (https) communications are required for the XML Open Integration Module, as described in the *XML Open Integration Module Installation and User Guide*.

Step 3 – Referencing the smsXMLWebService Web Service

When referencing the smsXMLWebService Web service (see the *XML Open Integration Module Installation and User Guide*), use the clustered network name for the server name; that is:

http(s)://<Clustered Network Name>/smsXMLWebService/smsXMLWebService.svc

This is to ensure that communications are with the shared cluster Virtual Network Name, instead of with the local machine name.

Additional Information

Multimax.ini

All new symmetry multimax.ini file entries should be added to the registry on both the primary and secondary servers. The location for multimax.ini file entries is:

HKEY_LOCAL_MACHINE>SOFTWARE>Wow6432Node>Group4>Multimax>***<SectionName>***

For example:

HKEY_LOCAL_MACHINE>SOFTWARE>Wow6432Node>Group4>Multimax>Multimax
HKEY_LOCAL_MACHINE>SOFTWARE>Wow6432Node>Group4>Multimax>Comms

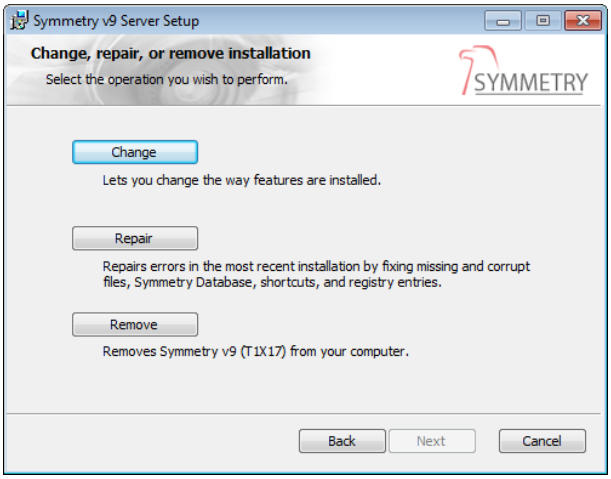
Select **New, String Value** and name it whatever the multimax,ini setting is. Right-click the setting, select **Modify** and enter the required value for the setting. Once saved, right-click, select **Modify** and set the value to the data required.

Accessing Message Queues

On a Microsoft cluster, you can access the clustered message queues by navigating to the Message Queuing role, right-clicking and selecting **Manage Message Queueing**.

Changing or Repairing Symmetry

As described in the *Symmetry Software Installation Manual*, you can change various Symmetry installation settings, or repair a damaged installation, by re-running the Symmetry installation software and choosing **Change** or **Repair** as applicable:



For a clustered system, note the following:

- Before using **Change** or **Repair**, stop the Symmetry Service resources.
- You need to use **Change** only on the active node.
- You may want to run **Repair** on the active node, passive node or both. A repair only needs to be run on the passive node if there is a problem with the Symmetry install files or services.

Chapter 3: Symmetry NVR Installation on a Microsoft Cluster

This chapter describes how to install a Symmetry NVR on a Microsoft cluster.

Note: This chapter does not describe the initial installation of a cluster. It is assumed that an administrator has already carried out this work and is available during the following procedures.

Note: This procedure assumes that the active node is the same machine throughout. If you install the software at different times, you should ensure that the active node is the same machine at both times. If you do not do this, uninstalling at a later time can be more difficult.

Installation Procedure

Step 1 – Enable Microsoft Clustering

Carry out the following at both nodes:

1.1 Open **Server Manager, Features** and enable the **Failover Clustering** feature.

1.2 Create the cluster.

Step 2 – Install the Symmetry NVR Software

Carry out the following to install the Symmetry NVR software:

4.1 Install the Symmetry NVR on the active node, as described in the *Symmetry Software Installation Manual*. The NVR program files should be installed in a folder on the node's local drive. When prompted for the **Configuration Folder Location**, make sure that you select a folder on the shared drive (the folder must not be on the quorum drive). When you are prompted for the services account, specify a domain account (a local system account must not be used on a cluster).

4.2 Install the Symmetry NVR on the passive node. During the installation procedure, you will be prompted for the credentials of a user set up in the NVR's web interface (please refer to the *Symmetry Software Installation Manual* for further information).

Step 3 – Set Up the Symmetry Services Resources

3.1 Using the Computer Management in Windows, stop all Symmetry NVR services. Stopping the Symmetry NVR Service Bus service stops all other NVR services.

3.2 Launch Failover Cluster Management.

3.3 Right-click **Roles**, followed by **Create Empty Service or Application**.

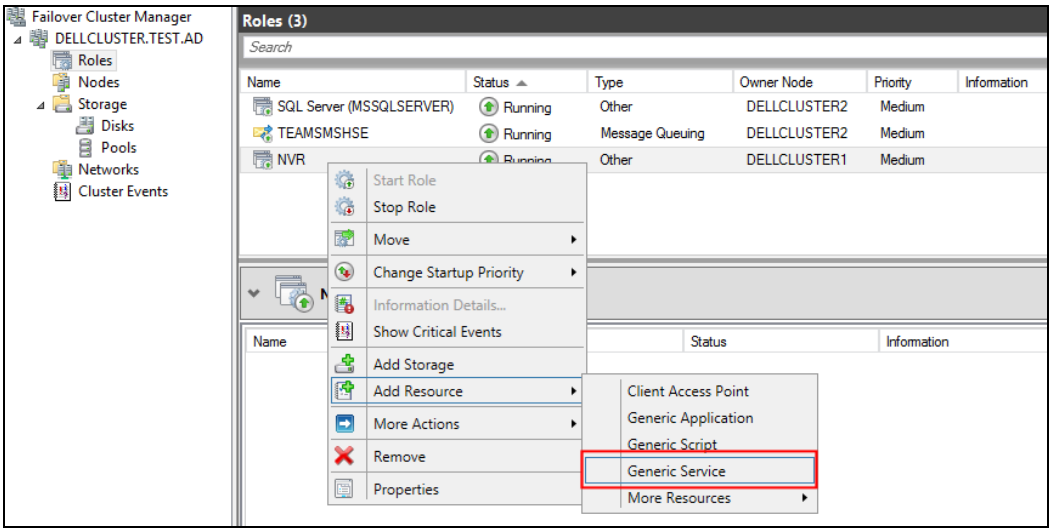
3.4 Right-click the new roles item and select **Properties**.

3.5 Set both cluster nodes to be preferred owners.

3.6 Set **Name** to "NVR", and click **OK**.

3.7 Right-click **NVR** under **Roles**, select **Add storage**, then choose to add it to the drive used for the NVR configuration files, as specified during the installation of the NVR.

3.8 Right-click **NVR** under **Roles**, select **Add a resource, Generic Service**, as shown next:



3.9 In the New Resource wizard, select **Symmetry NVR Device Manager**, click **Next**, **Next** and then **Finish**.

3.10 Repeat step 3.8 and 3.9 to add the following additional NVR resources:

Symmetry NVR Event Listener
Symmetry NVR Event Reporter
Symmetry NVR External Interface
Symmetry NVR Presentation Manager
Symmetry NVR Recording Manager
Symmetry NVR Recording Scheduler
Symmetry NVR Service Bus
Symmetry NVR Storage Manager

3.11 For each Symmetry resource, right-click, select **Properties** and in the Dependencies tab, set the following dependencies.

Symmetry Service	**Dependencies**
Symmetry NVR Service Bus	Drive used for the NVR configuration files
Symmetry NVR Device Manager	Symmetry NVR Service Bus
Symmetry NVR Event Listener	Symmetry NVR Service Bus
Symmetry NVR Event Reporter	Symmetry NVR Service Bus
Symmetry NVR Presentation Manager	Symmetry NVR Service Bus
Symmetry NVR Recording Manager	Symmetry NVR Service Bus
Symmetry NVR Recording Scheduler	Symmetry NVR Service Bus
Symmetry NVR Storage Manager	Symmetry NVR Service Bus
Symmetry NVR External Interface	Drive used for the NVR configuration files Symmetry NVR Service Bus Symmetry NVR Event Reporter Symmetry NVR Storage Manager Symmetry NVR Recording Manager Symmetry NVR Recording Scheduler Symmetry NVR Presentation Manager Symmetry NVR Device Manager

Step 4 – Add an IP Address to the NVR Service

The following specifies the IP address for the NVR application. The IP must be static, unique and cannot be the same as the IP address of the active node, passive node or cluster.

The IP address must be specified in the "Install/Video & Audio/Digital Video-NVR" screen when defining the NVR at a Symmetry client. The IP address must also be used when connecting to the NVR's web interface from a browser.

4.1 Right-click **NVR** under **Roles**, select **Add a resource, More resources, Add IP address**. This adds an IP address resource.

4.2 Right-click the **IP address** resource and select **Properties**.

4.3 Specify a name (e.g. "NVR Shared IP Address"), select a valid **Network**, enter the static IP address and click **OK**.

Step 5 – Bring the NVR Application Online

Bring the application online: right-click the role and select **Start Role**. All resources should show as being online.

Step 6 – Test Fail-Over

Test fail-over as follows:

6.1 Shut down the current active node. Using Cluster Administrator on the new active node, ensure that the Symmetry resources are online.

6.2 Restart the original active node. Once started, reboot the new active node. This will cause the original to be active again. Use Cluster Administrator to verify this.

Chapter 4: Symmetry Server Installation on an NEC Cluster (Domain)

This chapter describes how to set up the Symmetry server software on a pair of NEC cluster servers within a domain-based network. The SQL Server database used by Symmetry can either be installed on the same cluster as Symmetry, or on a remote machine (or cluster).

Note: If you experience a problem during the installation, please refer to *Troubleshooting* on page 37.

Before you begin:

- Read *Requirements for a Symmetry Server when using NEC Clustering* on page 3.
- Make sure both servers are joined to an Active Directory domain.
- Make sure the NEC cluster software is installed and licensed.
- Make sure the following ports are opened on the primary and secondary servers:
  a) TCP port 445 – for Symmetry remote registry access during install, and Symmetry registry key synchronization.
  b) TCP port 4222 – for Symmetry messaging.

  Other ports need to be opened for NEC clustering; typically these are the following, but please refer to the NEC cluster documentation:

  TCP:

  29001 to 29005

  29007

  29008 (Information Base Port Number)

  29009 (API HTTP Port Number)

  29010 (API Server Internal Port Number)

  UDP:

  29003

  29007

  29106

Installation Procedure

Step 1 – Generating and Configuring the Cluster

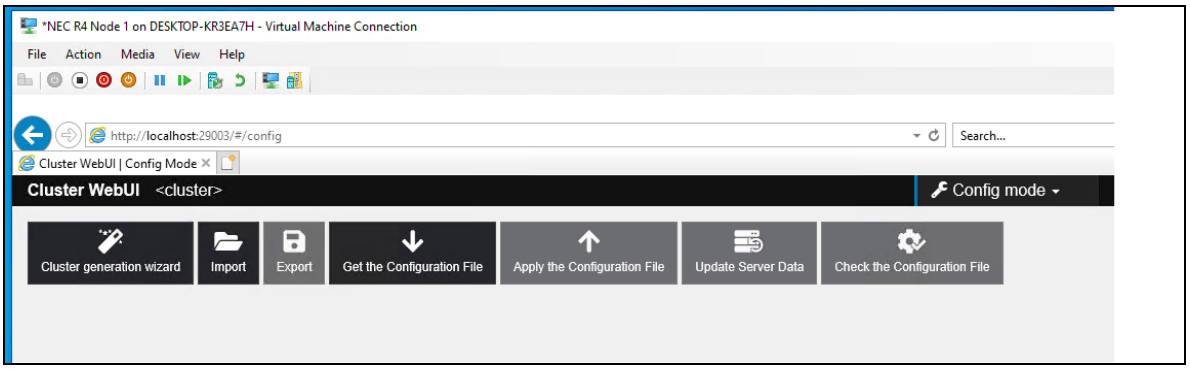
Note: This section explains how to generate and configure a cluster before you begin to cluster Symmetry. Skip this step and continue from Step 2 on page 22 if the cluster is already configured.

Note: For further information about NEC clustering, please refer to the NEC cluster documentation.

At the primary server:

1. Navigate to **http://<PimaryServerIPAddress>:29003**.

2. Put the cluster in **Config Mode**, then start the **Cluster Generation Wizard**.

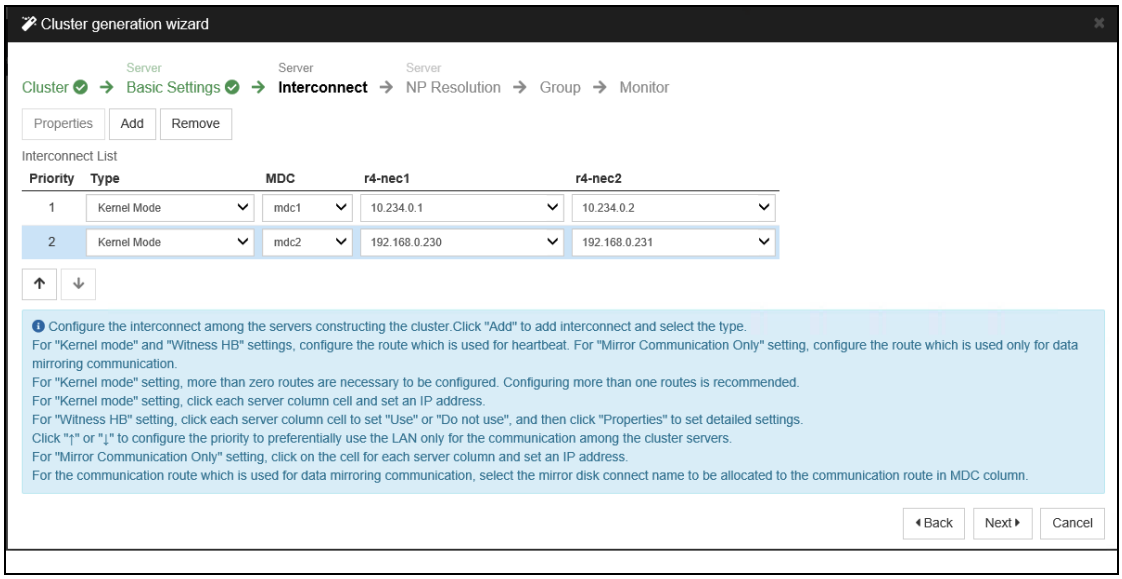


3. Give the cluster a name and specify the **Management IP address**. Click **Next**.

4. In the Basic Settings (Server Definition) screen, click **Add** and specify the computer name of the secondary server. Click **OK**, then **Next**.

5. In the Interconnect screen:

   a) Make sure the internal crossover network is in the **Priority 1** row, and the external LAN network is in the **Priority 2** row (if necessary, use the **Up**/**Down** button).



b) Choose the following in the **MDC** column:

i) **mdc1** – for the internal crossover network.

ii) **mdc2** – for the external LAN network.

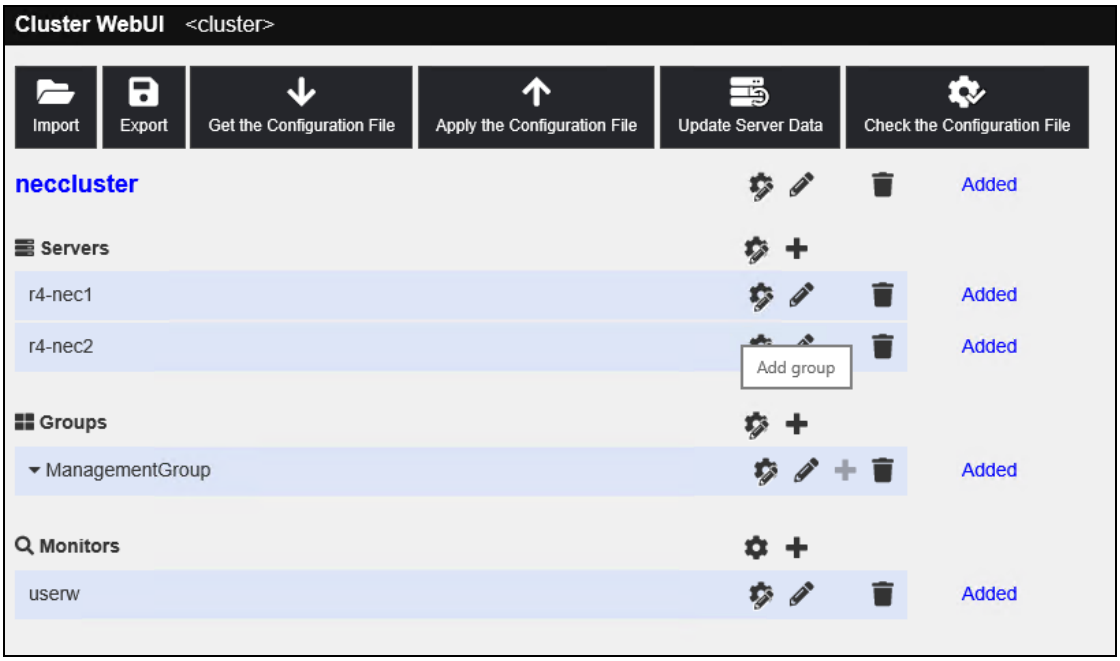
This enables mirroring to occur primarily over the private network between each server. If it is not possible to mirror over the private network, the external LAN is used.

c) Click **Next**.

6. In the NP Resolution screen, click **Add**, choose **Ping** for the **Type**, and in **Ping Target**, select an external IP address that is accessible to both servers (and is a device that is always switched on, such as a router on the network). Click **Next** and accept the defaults until the finish. Click **Next** twice, and accept the defaults until the finish.

7. Using Cluster Manager, add a failover group as follows:

a) Make sure Config mode is selected (as shown in the menu near the top-right corner of the window), then click **+** adjacent to **Groups**:



b) From the **Type** menu, select **failover**. In **Name**, specify a name such as **sms_failover**.

c) Keep clicking **Next** until you see the Group Resource screen, then:

i) Click **Add**.

ii) From the **Type** menu, select **floating ip resource**. Specify a name for the resource.

iii) Click **Next** until you see the Recovery Operation screen. From the **Final Action** menu, in **Recovery Operation at Deactivity Failure Detection**, select **Stop the cluster service and reboot the OS**. Click **Next**.

iv) In the Details screen, specify the floating IP address. Click **Finish**. You return to the Group Resources screen.

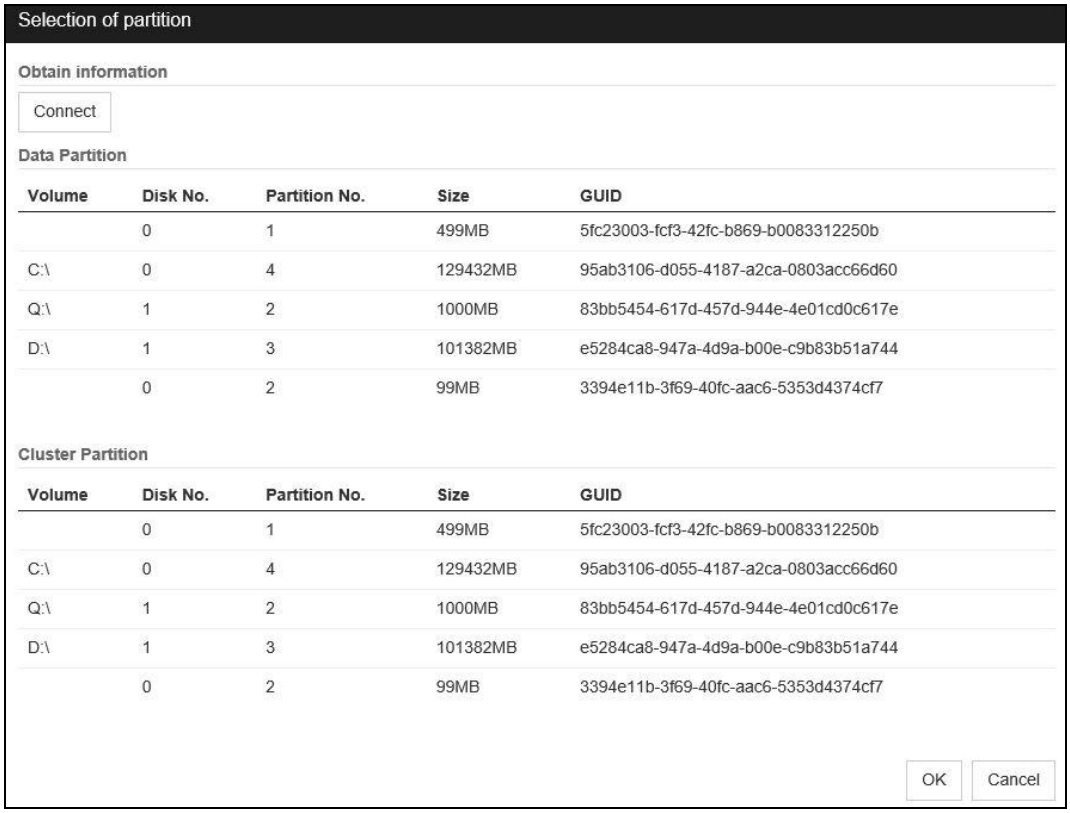
e) Add a mirrored disk resource as follows (this is to specify the mirrored disks to use for SQL and the cluster partition):

i) In the Group Resources screen, click **Add**.

ii) From the **Type** menu, select **mirrored disk resource**. Specify a name for the resource.

iii) Click **Next** twice until you see the Recovery Operation page. From the **Final Action** menu, in **Recovery Operation at Deactivity Failure Detection**, select **Stop the cluster service and reboot the OS**. Click **Next**.

iv) In the Details screen, click **Add** with the primary server selected. Click **Connect**, then in **Data Partition**, select the partition you want to use for the mirrored disk (e.g. F:). In **Cluster Partition**, select the partition you want to use for the cluster configuration data (e.g. Q). Click **OK**.



v) Back in the Details screen, click **Add** again with the secondary server selected, Click **Connect**, then in **Data Partition**, select the partition you want to use for the mirrored disk (e.g. F:). In **Cluster Partition**, select the partition you want to use for the cluster configuration data (e.g. Q). Click **OK**.

vi) Click **Finish**. You return to the Group Resources screen.

f) Add a virtual computer name resource as follows:

i) In the Group Resources screen, click **Add**.

ii) From the **Type** menu, select **virtual computer name resource**. Specify a name for the resource.

iii) Click **Next** twice until you see the Recovery Operation page. From the **Final Action** menu, in **Recovery Operation at Deactivity Failure Detection**, select **Stop the cluster service and reboot the OS**. Click **Next**.

iv) In the Details screen, specify the virtual computer name, choose the **Target FIP Resource Name** as the floating IP resource created earlier.

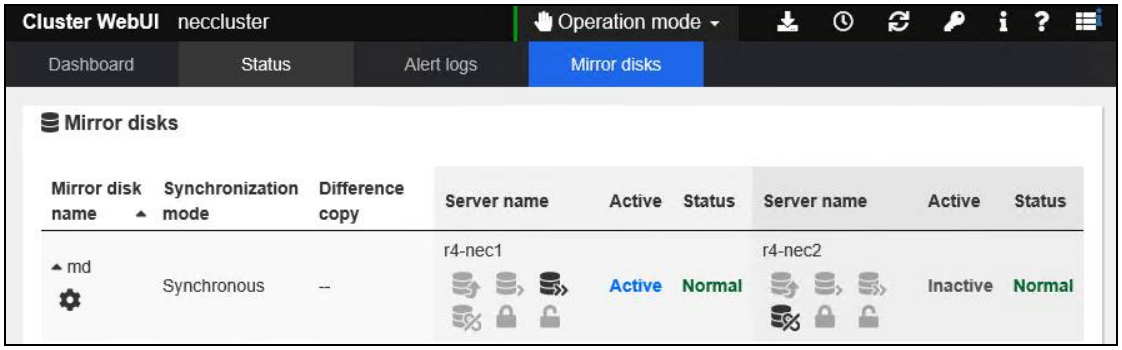
8. In Cluster Manager, Apply All Changes, and change from Config Mode to Operation Mode.

9. In the **Service Status** screen, select **Restart Manager**.

10. In the **Service Status** screen, select **Start Cluster** if the cluster has not already started (you may need to wait for this option to be made available).

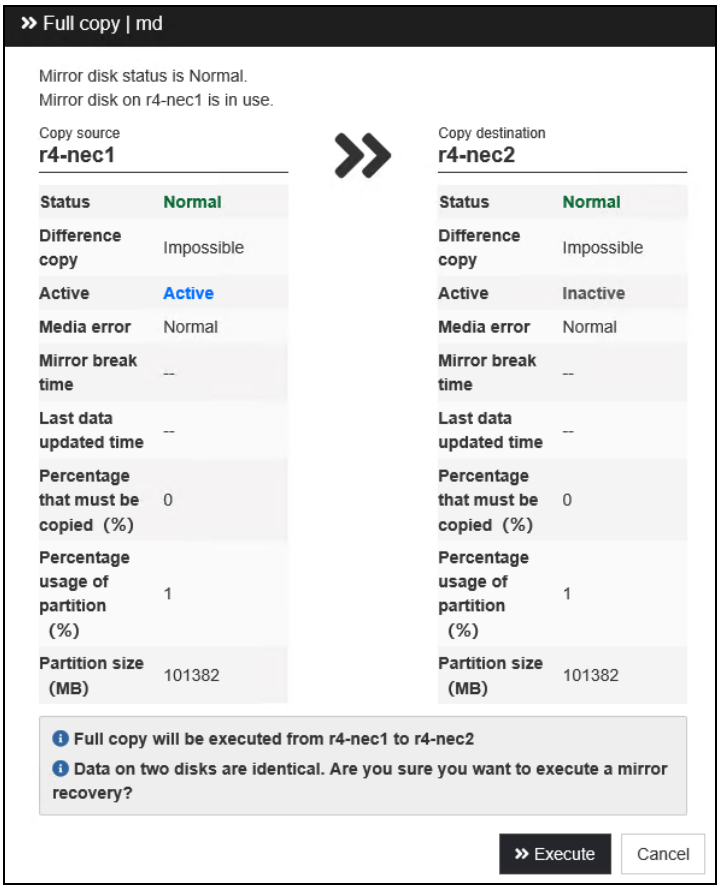
11. Wait for the Status screen to report the cluster is online.

12. The disks automatically start replicating and you should see the status displayed as "Normal" in the **Mirror Disks** screen:



If the status is not "Normal":

a) Click the **Full Copy** button. You should see the following:



b) Click **Execute**.

c) Wait for the status to return as "Normal".

13. Exit Cluster Manager.

Step 2 – Configure Dynamic DNS (Optional)

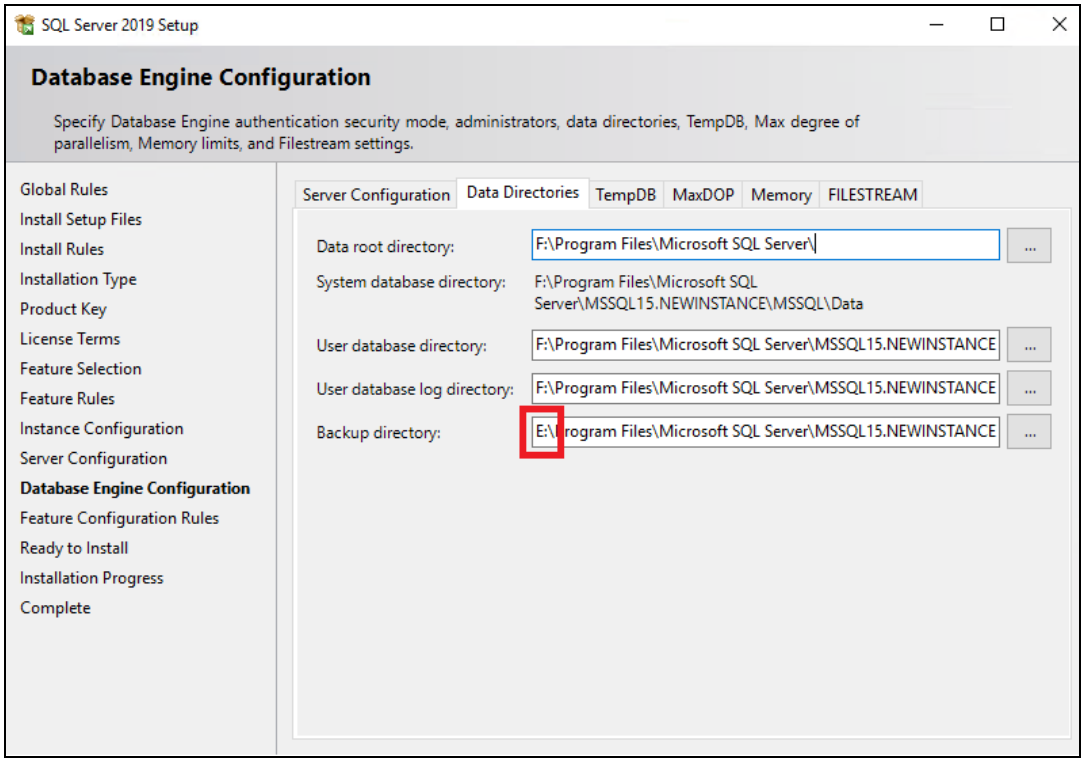
If dynamic DNS is required, follow the information provided from page 32. Dynamic DNS is commonly required if cluster nodes exist in different subnets.

Step 3 – Install SQL Server

Note: Skip this step and continue from Step 5 on page 25 if you are going to use a remote SQL database for Symmetry (that is, if SQL Server is not required on the same cluster as Symmetry).

1. Install SQL Server on the primary server, noting the following:
   a) In the Services Accounts screen, specify a domain user account.
   b) In the Database Engine Configuration screen, ensure that **Data root directory** is on the mirrored disk (e.g. F:\):

      It is recommended that you set the 'Backup directory' path to a location other than the mirrored disk.



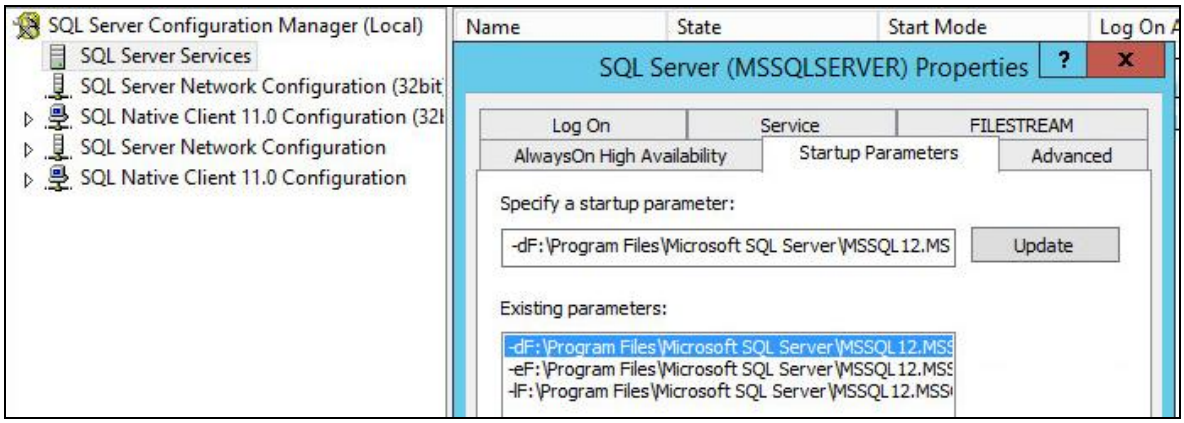
   c) Once installation is complete, stop the SQL Server service and set it to **Manual start**.

2. Install SQL on the secondary server, noting the following:
   a) Use the same domain account specified during installation on the primary server.
   b) If a named instance was used on the primary server, a named instance (with the same name) needs to be on the secondary server.
   c) In the Database Engine Configuration screen, keep the data directories on the default (C:\) drive, as if you were installing on a non-clustered system.
   d) Once installation is complete, change the SQL Server service to **Manual Start**.

3. Open SQL Server Configuration Manager on the secondary server.

4. Select **SQL Server Services**, right-click **SQL Server (<Instance Name>)** and select **Properties**.

5. Select the Startup Parameters tab:



6. For each parameter listed in **Existing parameters**, select the parameter, update the location (drive letter) to be on the mirrored drive (e.g. F:\\), then click **Update**.

7. Click **Apply**.

8. Stop the SQL Server service on the secondary server.

Step 4 – Configure a SQL Alias (Optional)

If a SQL alias is required (commonly used when using Dynamic DNS), follow the information provided from page 33.

Step 5 – Cluster SQL Server

Note: Skip this step and continue from Step 5 on page 25 if you are going to use a remote SQL database for Symmetry (that is, if SQL Server is not required on the same cluster as Symmetry).

At the primary server:

1. Via the Cluster Manager, put the cluster into Config Mode, and press the "**+**" next to the failover group to add a new resource.

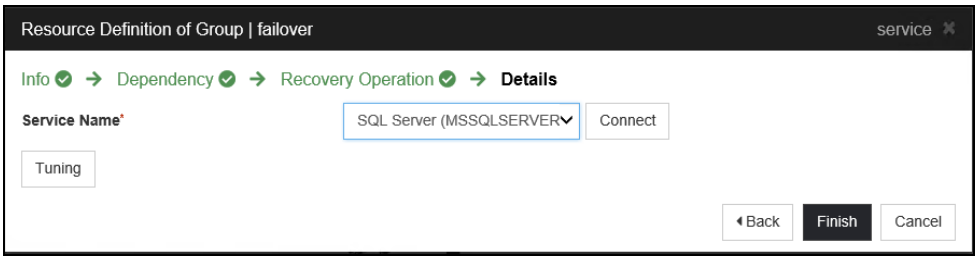
2. Select a service resource, and give it a name (e.g. **SQL Server**) and click **Next**.

3. In the Dependency screen, make sure that **Follow the default Dependency** is checked and click **Next**.

4. In the Recovery Operation screen, specify a **Final Action** under **Recovery Operation at Deactivity Failure Detection** of **Stop the cluster service and reboot the OS**.

5. In the Details screen, click **Connect** adjacent to the **Service Name** combo box.

6. Scroll down and select **SQL Server (MSSQLSERVER)** if a default instance is used, or **SQL Server (MSSQLSERVER\<InstanceName>)** if an SQL instance is present:



7. Click **Finish**.

8. Select **Apply the Configuration File**.

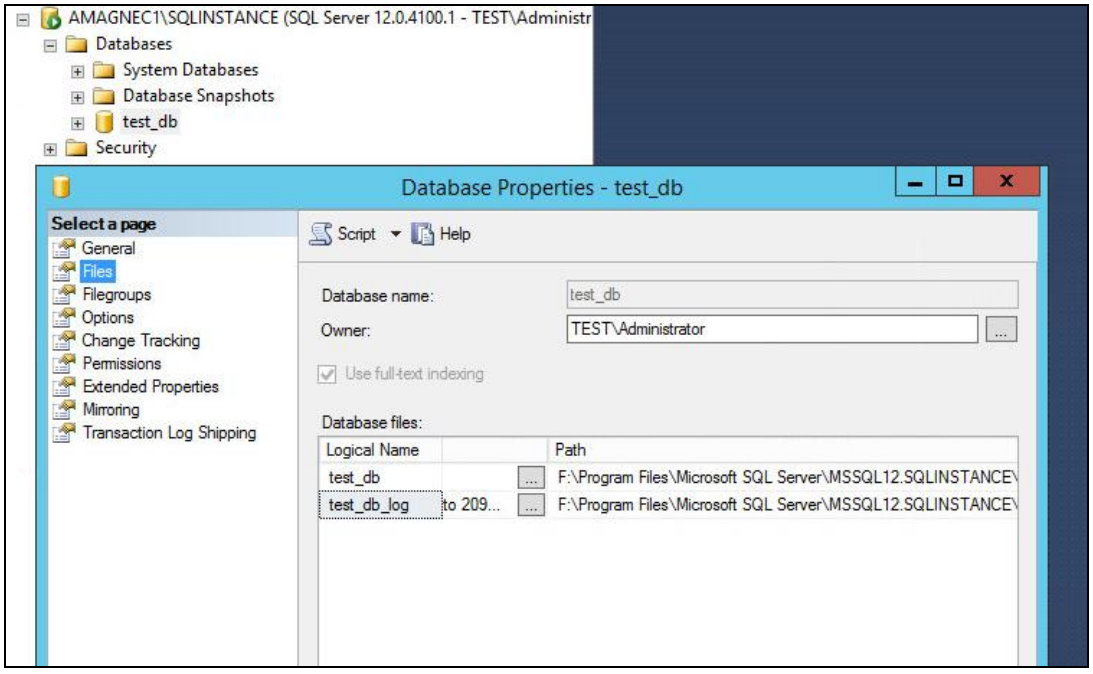
9. Put the cluster back into Operation Mode and start the cluster on the primary server. Check that the SQL Server service starts.

10. To test that SQL Server is clustered and functional:

    a) Open SQL Management Studio on the primary server.

    b) Create a test database (right-click **Databases**, select **New Database**, enter a database name, then click **OK**).

    c) Right-click the test database select **Properties** and make sure that the database files are present on the shared drive:



    d) Fail the cluster over to the secondary server, open SQL Management Studio on the secondary server and make sure that the test database is present.

    e) Delete the database on the secondary server.

    f) Fail back to the primary server.

Step 6 – Install Symmetry on the Primary Server

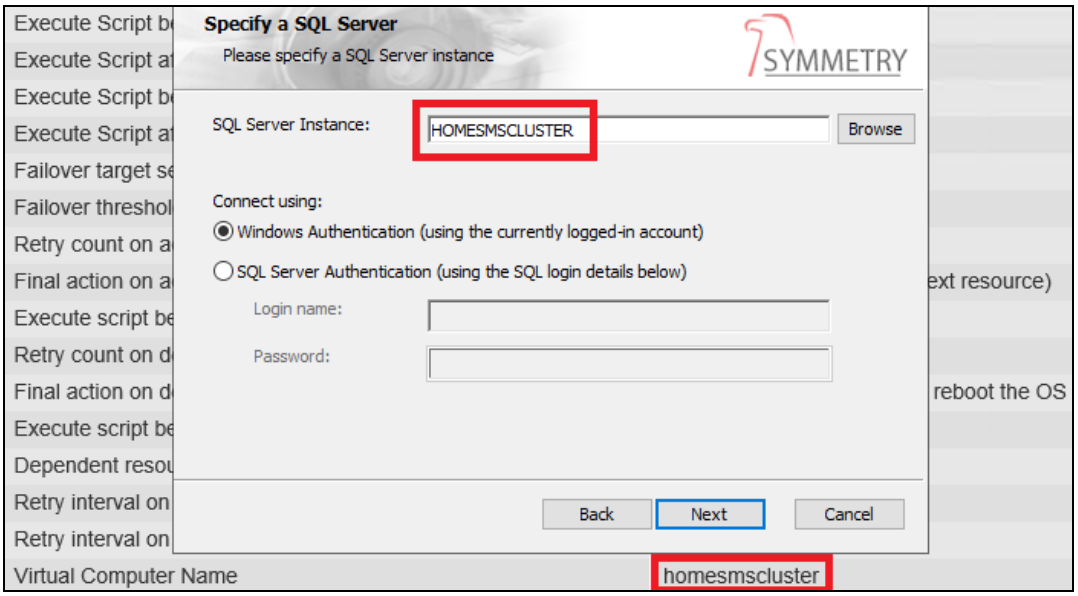
Note: For further information, please refer to the *Symmetry Software Installation Manual*.

1. Start Symmetry installation on the primary server using an account that has SQL admin permissions.

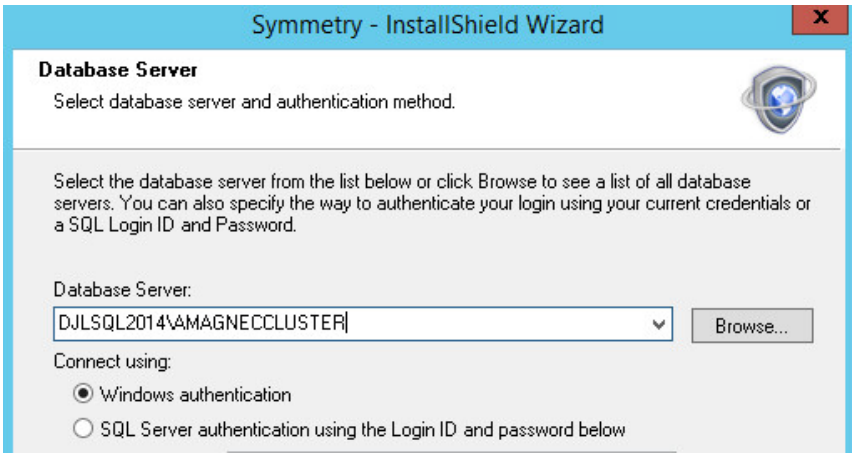
2. When prompted, enter a serial number for a Symmetry Cluster Aware Enterprise license.

3. When you see **Specify a SQL Server**, specify one of the following, depending on the location of the Symmetry SQL Server database:

   a) If SQL Server is installed on the same cluster as Symmetry, enter the Virtual Computer Name:



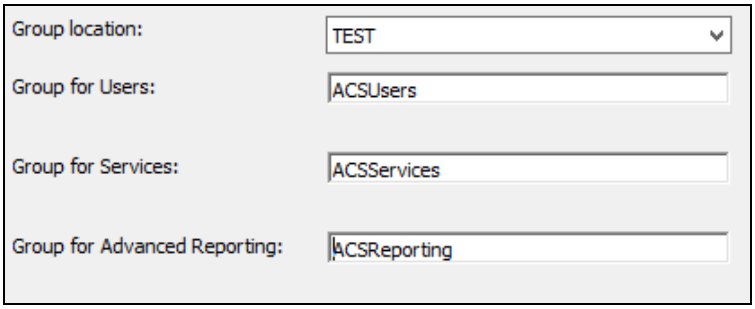
   b) If SQL Server is not installed on the same cluster as Symmetry, specify the remote SQL server and instance name (SQLSERVERNAME\<INSTANCENAME>):



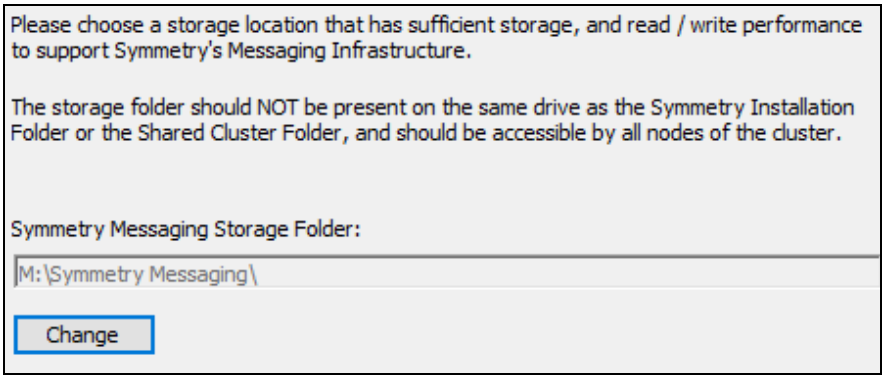
4. In the Installation Type screen, select **Custom**.

5. In the Symmetry Service Account screen, specify a domain account that will be used to authenticate the starting of the Symmetry services. (This account needs to me a member of "Group used for ACS Services", as specified on the next screen.)

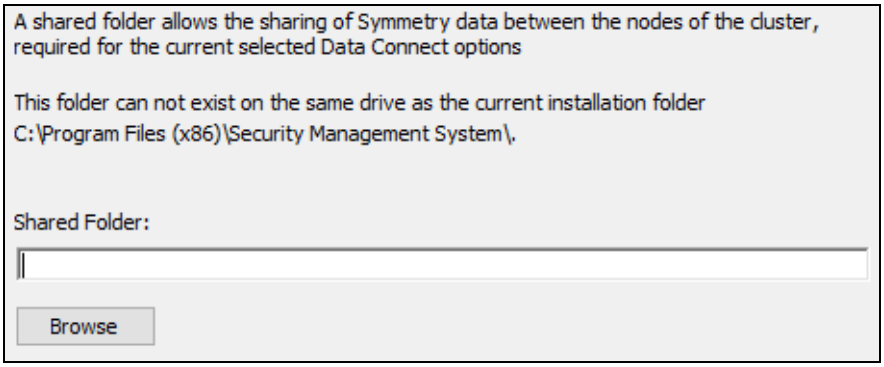
6. In the Group Account Configuration screen, specify the pre-configured domain groups:



7. If prompted for the **Symmetry Messaging Infrastructure** folder, specify the folder to use for Symmetry Messaging (see page 4 for details of the folder requirements):



8. If prompted for the **Shared Folder**, specify a folder on the mirrored disk:



9. Continue through the installation process to completion.

10. The installation of Symmetry on the primary server automatically adds the required Symmetry registry keys on the secondary server. Open the registry on the secondary server, and you should see HKLM\SOFTWARE\Wow6432Node\Group4.

    DO NOT FAIL OVER THE CLUSTER.

11. Make sure that the firewall settings for SQL Server on the primary server are as documented in the *Symmetry Software Installation Manual*.

Step 7 – Install Symmetry on the Secondary Server

1. Start Symmetry installation on the secondary server.

   Symmetry detects that the server is the secondary server, and does not prompt you for a license serial number or Data Folder. You will also not see the screen to activate the license,

2. Complete Symmetry installation on the secondary server.

3. Make sure that the firewall settings for SQL Server on the secondary server are as documented in the *Symmetry Software Installation Manual*.

Step 8 – Set all Services to Manual Start

1. At the primary server, ensure all Symmetry and Message Queuing services are set to **Manual** start, but leave Message Queuing started.

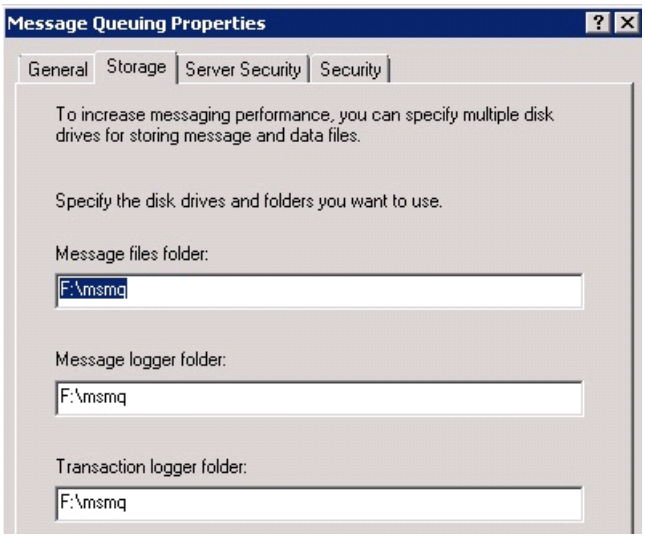
2. At the secondary server, ensure all Symmetry and Message Queuing services are set to **Manual** start. Ensure that Message Queuing is stopped on the secondary server.

3. If SQL Server is local to the Symmetry cluster, check again that the SQL Server service is set to **Manual** start on both the primary and secondary servers.

Step 9 – Move Message Queuing Databases to the Shared Drive

1. At the primary server, open Computer Management, navigate to **Message Queuing** (in Services and Applications), right-click and select **Properties**.

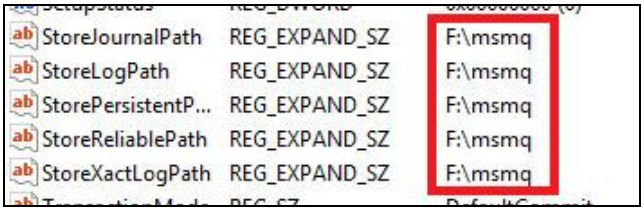
2. Select **Storage**, and change all storage folders to a directory on the shared drive. Make sure that message queuing creates the folder; do not create then choose an existing folder, since Message Queuing sets the correct permissions required on the folder. The console should prompt to restart Message Queuing for changes to take effect.



3. Stop the Message Queuing service on the primary server.

4. On the secondary server, open the Registry Editor and navigate to HKLM>SOFTWARE>Microsoft>MSMQ>Parameters.

5. Update the Store... paths to that of the message queuing folder on the shared drive:



Note: When specifying the Message Queuing path, use x:\foldername and NOT x:\foldername\

Step 10 – Build the Message Queuing Cluster Resource

At the primary server:

1. Put the cluster into Config Mode.
2. Via the Cluster Manager, put the cluster into Config Mode, and press the "**+**" next to the failover group to add a new resource.
3. In the **Type** menu, select **service resource**.
4. In **Name**, specify a name (e.g. **MSMQ**).
5. In the Dependency (Dependent Resources) screen, select **Follow default dependency**.
6. In the Recovery Operation screen, specify a **Final Action** under **Recovery Operation at Deactivation Failure** of **Stop the cluster service and reboot the OS**.
7. In the Details screen, click **Connect** and select **Message Queuing**.
8. Click **Finish**.

Step 11 – Build the Symmetry Services Cluster Resources

At the primary server, carry out the following steps for each service listed in Table 1:

1. Via the Cluster Manager, put the cluster into Config Mode, and press the "**+**" next to the failover group to add a new resource.
2. In the **Type** menu, select **Service resource**.
3. In **Name**, specify the **Service Name** shown in Table 1.
4. In the Dependency (Dependent Resources) screen, uncheck **Follow default dependency**.
5. Add the dependencies shown in the table.
6. In the Recovery Operation screen, specify a **Final Action** under **Recovery Operation at Deactivation Failure** of **Stop the cluster service and reboot the OS**.
7. In the Details screen, click **Connect** and select the **Service Name** shown in the Table 1.

Table 1: Resources for Symmetry Services

Service Name	Dependencies
Symmetry Support Service	Mirrored Disk (MD) Message Queuing (MSMQ) SQL Server *(only if SQL Server is on Symmetry cluster)* Virtual Computer Name (VCOM)
Symmetry Transaction Service	Mirrored Disk (MD) Message Queuing (MSMQ) Symmetry Support Service SQL Server *(only if SQL Server is on Symmetry cluster)* Virtual Computer Name (VCOM)
Symmetry Client Service	Mirrored Disk (MD) Message Queuing (MSMQ) Symmetry Support Service SQL Server *(only if SQL Server is on Symmetry cluster)* Virtual Computer Name (VCOM)
Symmetry Integration Server	Mirrored Disk (MD) Message Queuing (MSMQ) Symmetry Support Service SQL Server *(only if SQL Server is on Symmetry cluster)* Virtual Computer Name (VCOM)
Symmetry State Service	Mirrored Disk (MD) Message Queuing (MSMQ) Symmetry Support Service SQL Server *(only if SQL Server is on Symmetry cluster)* Virtual Computer Name (VCOM)
Symmetry Transaction Parser Service	Mirrored Disk (MD) Message Queuing (MSMQ) Symmetry Support Service SQL Server *(only if SQL Server is on Symmetry cluster)* Virtual Computer Name (VCOM)
Symmetry HTTPServer	Mirrored Disk (MD) Message Queuing (MSMQ) Symmetry Support Service SQL Server *(only if SQL Server is on Symmetry cluster)* Virtual Computer Name (VCOM)
Symmetry Messaging	Mirrored Disk (MD), or the disk that contains the Symmetry Messaging folder Message Queuing (MSMQ) SQL Server *(only if SQL Server is on Symmetry cluster)* Virtual Computer Name (VCOM)
Symmetry Activity Management	Mirrored Disk (MD) Message Queuing (MSMQ) SQL Server *(only if SQL Server is on Symmetry cluster)* Virtual Computer Name (VCOM) Symmetry Messaging

Optional Step:
When a resource is created by the user a service monitor is automatically created (under CLUSTERNAME>Monitors) named servicew# where # is a sequential number. If you would like to rename the monitors so they correspond with the Symmetry Service names, you can do so in Config Mode>CLUSTERNAME>Monitors by right-clicking **servicew#** and select **Rename Monitor Resource**.

Step 12 – Build the NIC Monitoring Cluster Resource (Optional)

This step configures monitoring of the network link between both nodes in the cluster. This is not recommended for use over a WAN, where network performance may cause unnecessary failovers

At the primary server:

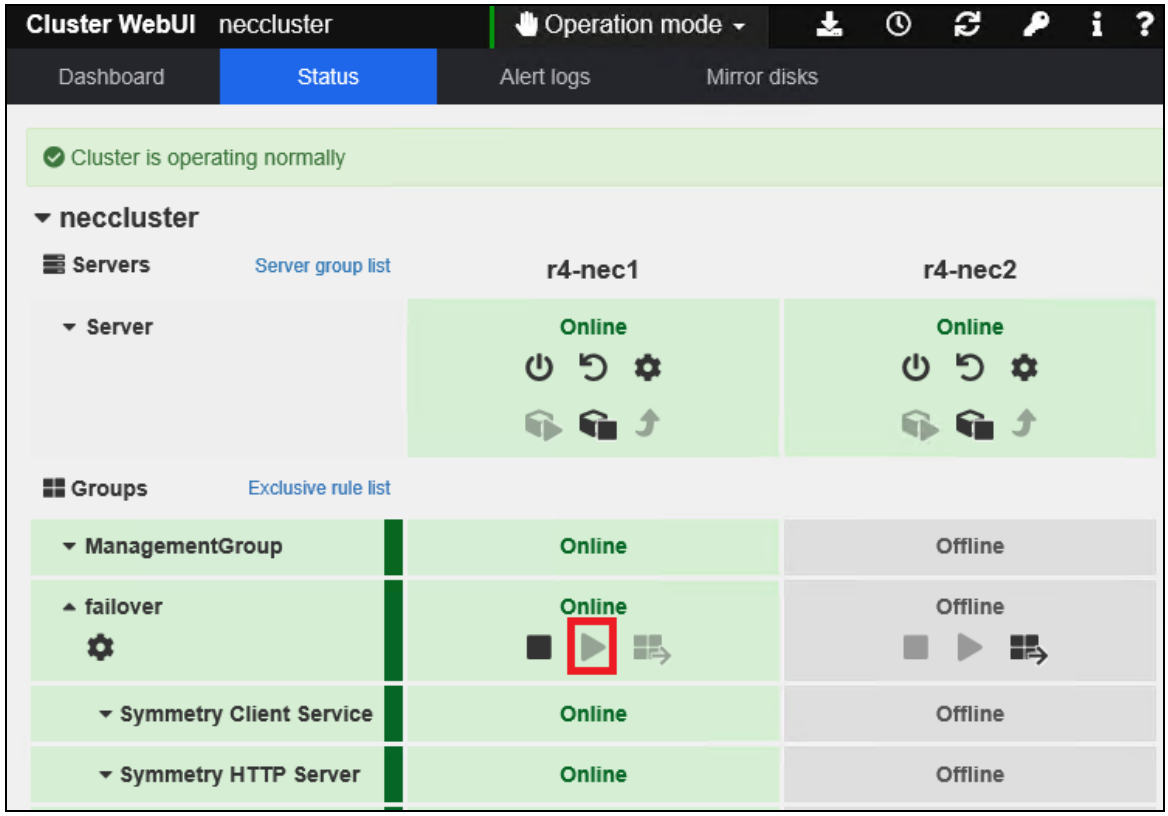
1. While in Config Mode, press the "**+**" next to **Monitors** to add a new Monitor resource.
2. In the **Type** menu, select **NIC Link Up/Down monitor**.
3. Accept the defaults on the next page.
4. In the **Monitor(Special)** section:
   a) Add the primary server.
   b) Specify the public IP address of the primary server.
   c) Add the secondary server.
   d) Specify the public IP address of the secondary server.
5. In the Recovery Action page, click **Browse** and select **All Groups**.
6. Click **Finish**.

Step 13 – Start the Cluster

At the primary server:

1. Using Cluster Manager, select **Apply the Configuration File**.
2. Follow the prompts.
3. Put the cluster into Operation Mode.

4. If required, start the failover group by pressing the Start button as shown below, and confirm that the cluster has started successfully (also as shown below).



Step 14 – Connect a Symmetry Client

At a separate machine:

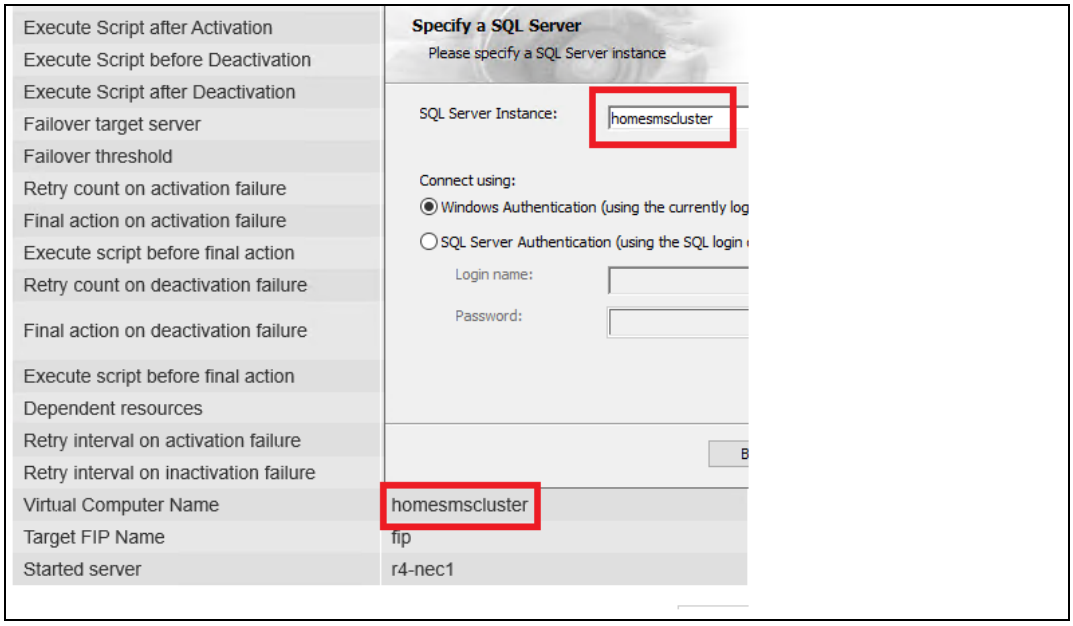
1. Log on with an account that is present in the domain ACS Admin group.

2. Run the Symmetry client installation software.

3. When prompted, enter the serial number of an Enterprise client license.

4. When you see **Specify a SQL Server**, specify one of the following, depending on the location of the Symmetry SQL Server database:

   a) If SQL Server is installed on the same cluster as Symmetry, enter the Virtual Computer Name (or Virtual Computer Name\Instance Name), as shown next.



b) If SQL Server is not installed on the same cluster as Symmetry, specify the remote SQL server and instance name (SQLSERVERNAME\<INSTANCENAME>).

Additional Information

Multimax.ini

All new symmetry multimax.ini file entries should be added to the registry on both the primary and secondary servers. The location for multimax.ini file entries is:

HKEY_LOCAL_MACHINE>SOFTWARE>Wow6432Node>Group4>Multimax>***<SectionName>***

For example:

HKEY_LOCAL_MACHINE>SOFTWARE>Wow6432Node>Group4>Multimax>Multimax
HKEY_LOCAL_MACHINE>SOFTWARE>Wow6432Node>Group4>Multimax>Comms

Select **New, String Value** and name it whatever the multimax,ini setting is. Right-click the setting, select **Modify** and enter the required value for the setting. Once saved, right-click, select **Modify** and set the value to the data required.

Configuring Dynamic DNS

You can configure dynamic DNS (if necessary – see page 22) as follows.

Step 1 – Clear the DNS Settings

This method assumes that the vcom resource is configured to register with DNS:

1. In Cluster Manager, change to Config Mode.

2. Open the properties of the VCOM resource.

3. In the Details tab, make a note of the Virtual Computer Name (this will be used for the ddns resource).

4. Click **Tuning**.

5. In the VCOM Resource Tuning Properties screen, click **Initialize**, then **OK** (this will clear the DNS settings from the vcom resource).

6. Click **OK** to close the vcom Resource Properties screen.

Step 2 – Add the ddns Resource

1. Via the Cluster Manager, put the cluster into Config Mode, and press the "**+**" next to the failover group to add a new resource.

2. In the **Type** menu, select **dynamic dns resource**, then **Next**.

3. Use the default dependency, and click **Next**.

4. Under **Recovery Operation at Deactivity Failure Detection**, select **Stop the cluster service and reboot OS**, and click **Next**.

5. Use the following settings:
   - **Virtual Host Name**: Enter the FQDN version of the vcom resource. For example, if the vcom is “CLUSTERSERVER” and the domain is “amag.local”, the FQDN version is “clusterserver.amag.local”.
   - **IP Address**: Set to 0.0.0.0.
   - **DDNS Server**: Set to the IP Address of the DNS server.
   - **Execute Dynamic Update Periodically**: Add a checkmark.
   - **Delete the Registered IP Address**: Add a checkmark.
   - **Port No**, **Cache TTL**, **Update Interval** and **Kerberos Authentication**: Leave at their default settings.
   - For the primary cluster server: Add a checkmark against **Set up Individually**, and set **IP Address** to the IP address of the public network-interface card on the primary cluster server.
   - For the secondary cluster server: Add a checkmark against **Set up Individually**, and set **IP Address** to the IP address of the public network-interface card on the secondary cluster server.

6. Click **Finish**.

7. Save the configuration to the cluster by selecting **Apply the Configuration File**.

8. Change from Config Mode to Operation Mode.

9. Start the DDNS resource.

Configuring a SQL Alias

You can configure a SQL alias (if necessary – see page 23) as follows:

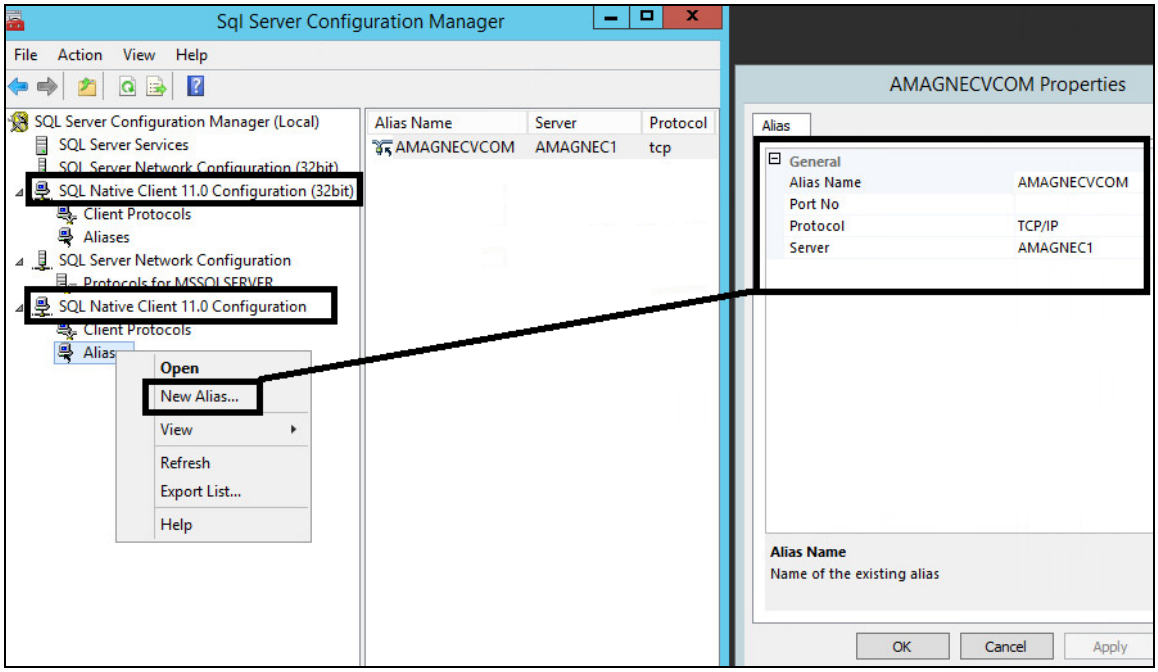
1. On the primary server:
   a) Open SQL Server Configuration Manager.

b) Under **SQL Native Client 11.0 Configuration (32Bit)**, right-click **Aliases** and select **New Alias**.

c) In **Alias Name**, specify the Cluster Virtual Computer Name (VCOM).

d) In **Server**, specify the local server name.

e) Under **SQL Native Client 11.0 Configuration**, right-click **Aliases** and select **New Alias**:



f) In **Alias Name**, specify the Cluster Virtual Computer Name (VCOM).

g) In **Server**, specify the local server name.

h) Save changes.

2. Repeat step 1 on the secondary server.

3. Restart the SQL Server service on the primary server.

Configuring Asynchronous Replication

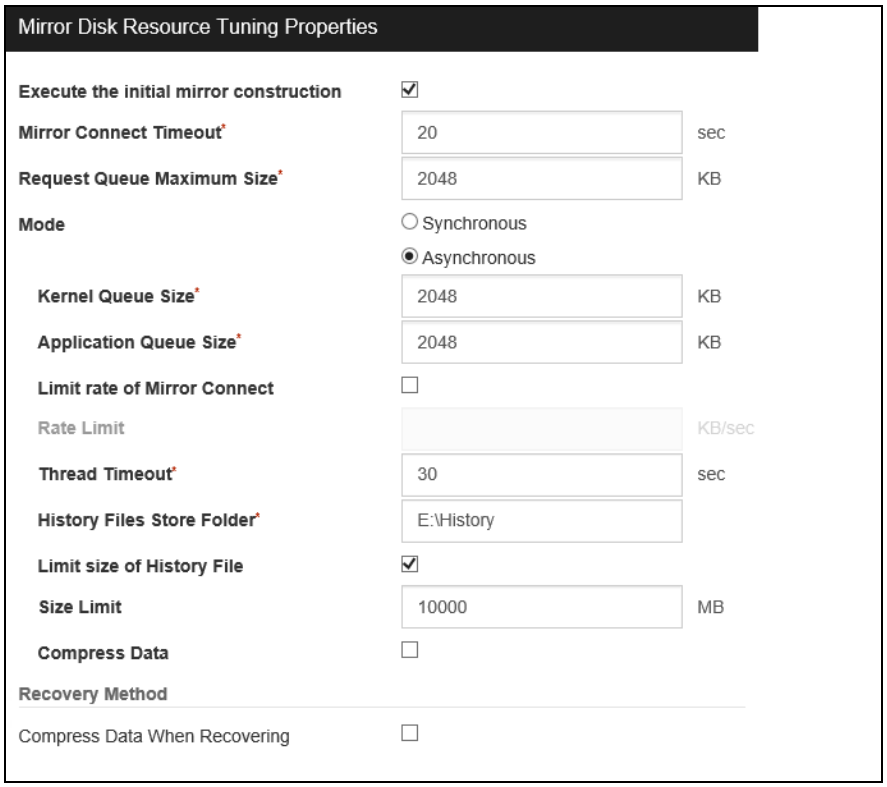
By default, an NEC cluster is configured with synchronous replication for the mirrored disk, which is recommended when data resiliency is important and there is a good network connection between both servers in the cluster, since when the cluster fails over, the most up-to-date information will be present on the mirrored disk.

If a WAN is used, and/or a lower-speed network connection, synchronous replication may cause the system to slow down significantly. In this case, asynchronous replication may be preferred, but transactions can be lost on failover.

Asynchronous Replication is an advanced configuration setting and should be used only after consultation with an AMAG Technical representative.

To configure the cluster for asynchronous replication:

1. Put the Cluster in Config Mode.
2. Open the properties of the Mirrored Disk Resource.
3. Under **Details**, select **Tuning**.
4. Select **Asynchronous**.
5. Specify a path to a local disk on each node to host cached data that both servers can access (this must not be present on the mirrored disk of the cluster). The path must exist on both nodes (such as e:\HistoryStore\) and be separate from the mirrored disk.
6. Optionally, add a **Size Limit** value, so that the cached data does not exceed the specified size.
7. Save the Mirrored Disk configuration, and select **Apply the Configuration File**.
8. Start the Mirrored Disk Resource, and the other resources in the failover group.



DNS Host Records and Scavenging

Some DNS zones are set to remove old DNS records that have not been used for a user-configurable length of time. To ensure DNS records relating to the NEC Cluster are not deleted, it may be necessary to uncheck the **Delete this record when it becomes stale** checkbox in the properties of the host records on the DNS server.

Updating the DNS Host Record in the Event that the Active Node Powers Off

If you are using dynamic DNS and the active node powers off without a failover using Cluster Manager, then when the passive node attempts to start, the DNS host record for the active side will still be configured with the public IP address of the active node. In this case, it is necessary to manually update the virtual computer name host record in the DNS server with the public IP address of the passive node, and then manually start the failover group.

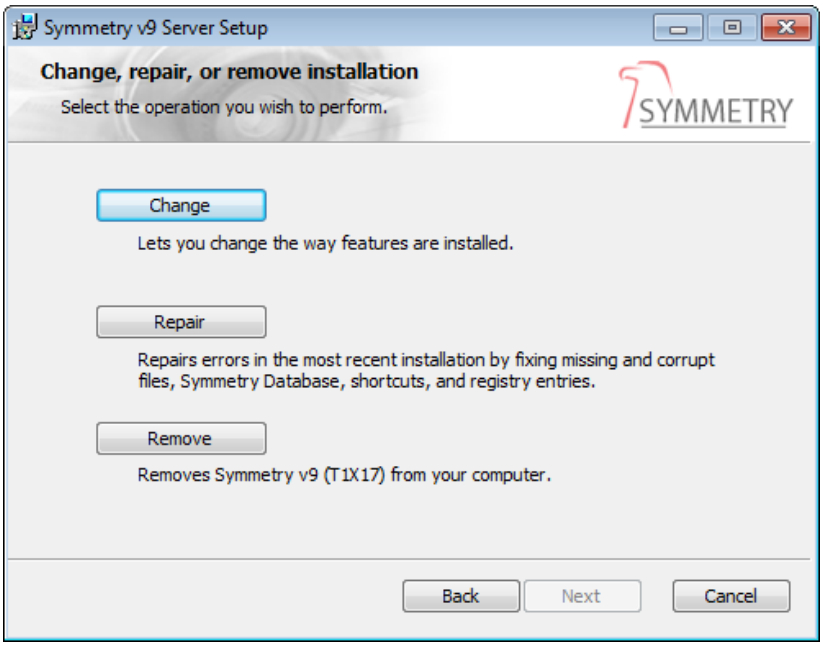
Stopping Services and Service Monitoring

If you need to stop a Symmetry service on the active node of an NEC cluster, open the NEC cluster web page, and select the **Stop** button on the resource.

If you need to disable monitoring of a service, open the NEC cluster web page, and under **Monitors**, select the **Suspend** button for the required monitor. Doing so stops any action following a failure of the service, so please make sure you resume monitoring once you have finished.

Changing or Repairing Symmetry

As described in the *Symmetry Software Installation Manual*, you can change various Symmetry installation settings, or repair a damaged installation, by re-running the Symmetry installation software and choosing **Change** or **Repair** as applicable:



For a clustered system, note the following:

- Before using **Change** or **Repair**, stop the Symmetry Service resources.
- You need to use **Change** only on the active node.

You may want to run **Repair** on the active node, passive node or both. A repair only needs to be run on the passive node if there is a problem with the Symmetry install files or services.

Symmetry Backups

It is recommended the mirrored disk (replicated drive) is not used to host Symmetry backups. Instead, a remote location or a separate drive local to the cluster should be used. This is to counteract any unnecessary drive writes and data replication over the network.

Troubleshooting

Status of devices in Symmetry not shown in Command Center after failover

If you are using dynamic DNS, it may be necessary to close and re-open the Symmetry client application after failover.

This is because local outgoing message queues are cached, so after failover may still be configured to communicate with the previous primary server. Completely exiting out of Symmetry clients (logging off and closing the log on screen) rectifies this.

"Login failed" message

If you are installing Symmetry on the primary server of an NEC cluster, and after selecting a local SQL Server, you see "Login failed. The login is from an untrusted Windows domain", ensure you have set up a SQL alias on both the primary and secondary servers.

"An error occurred accessing the Message Queues"

If you see a message in the event log stating "An error occurred accessing the Message Queues - There are insufficient resources to perform this operation", check that the path to the message queuing folder is:

- A folder with no sub folders in.
- In the format X:\foldername, and NOT X:\foldername\

"The message file 'X:\foldername\\l00001.mq could not be created"

If you see a message in the event log stating "The message file 'X:\foldername\\l00001.mq could not be created. There is insufficient disk space or memory", check that there are not two '\' characters after the folder name. If there are, message queuing will not create the files necessary for the Symmetry message queues to work.

Inability to browse to a clustered SQL Server during installation of Symmetry

When connecting a Symmetry server or client to an SQL Server installed on a cluster, it may not be possible to browse to the SQL network name. This is due to SQL being installed on a machine with two network adapters (required for clustering).

If you are unable to browse to a clustered SQL server, you should be able to type the network name and continue with the install.

"Unable to verify "servername" is a Symmetry server"

If you see this error when installing a Symmetry client, make sure that the user account you are using is in the correct domain ACS Admin group.

Chapter 5: Symmetry NVR Installation on an NEC Cluster

This chapter describes how to set up a Symmetry NVR on a pair of NEC cluster nodes within a domain-based network.

Note: This procedure does not describe the initial installation of a cluster. It is assumed that a Network Administrator has already carried out this work and is available during the installation of the Symmetry software on the cluster. A failover group must have been configured, with an "MD - Mirror Disk resource" and "FIP - Floating IP address resource".

Please refer to the NEC cluster installation manuals for a more detailed explanation of NEC clustering and its options.

Installation Procedure

Step 1 – Install Symmetry NVR Software

Carry out the following:

1.1 Install the Symmetry NVR on the primary server, as described in the *Symmetry Software Installation Manual*. The NVR program files should be installed in a folder on the server's local drive. When prompted for the **Configuration Folder Location**, make sure that you select a folder on the data (replicated) drive.

1.2 Install the Symmetry NVR on the secondary server. Make sure you use the same account (username and password) for the Symmetry services on both servers.

1.3 Make sure that the NVR services are stopped on the primary and secondary servers.

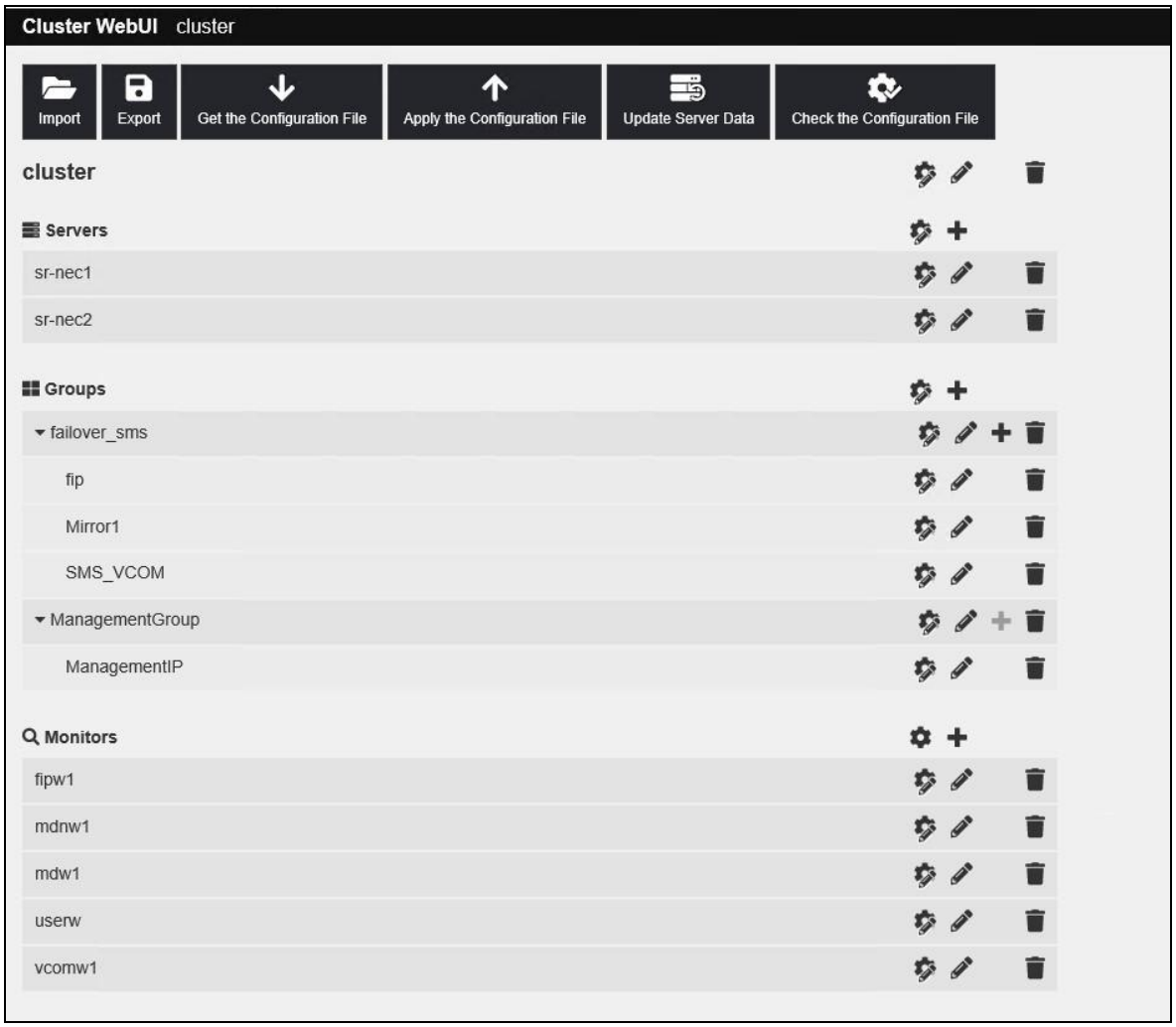
Step 2 – Add the NVR Service Resources

Using the NEC Cluster Manager (web interface):

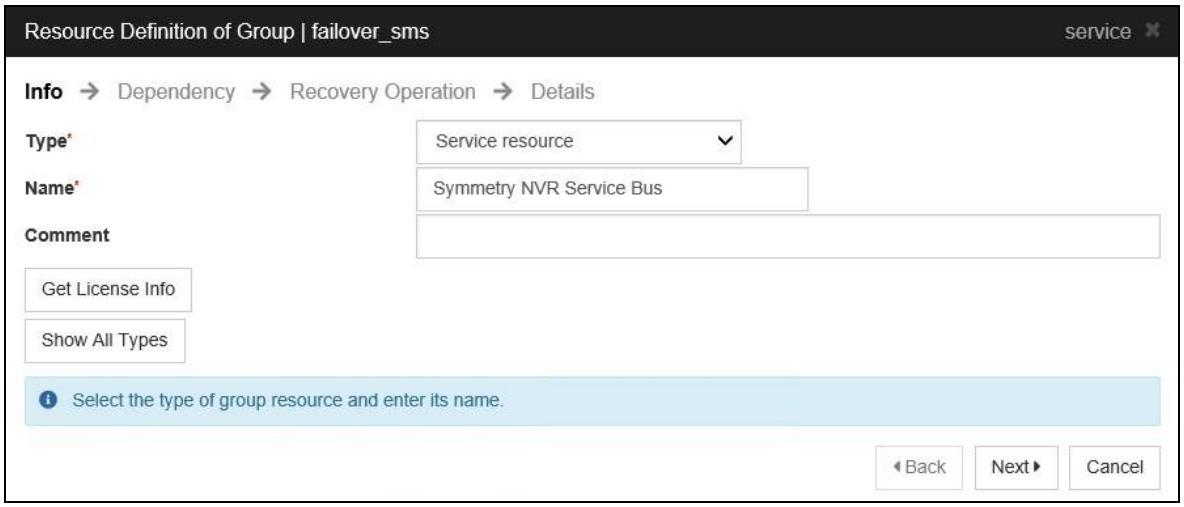
2.1 Launch the NEC Cluster Manager (web interface) on the primary server.

2.2 Select **Config Mode**.

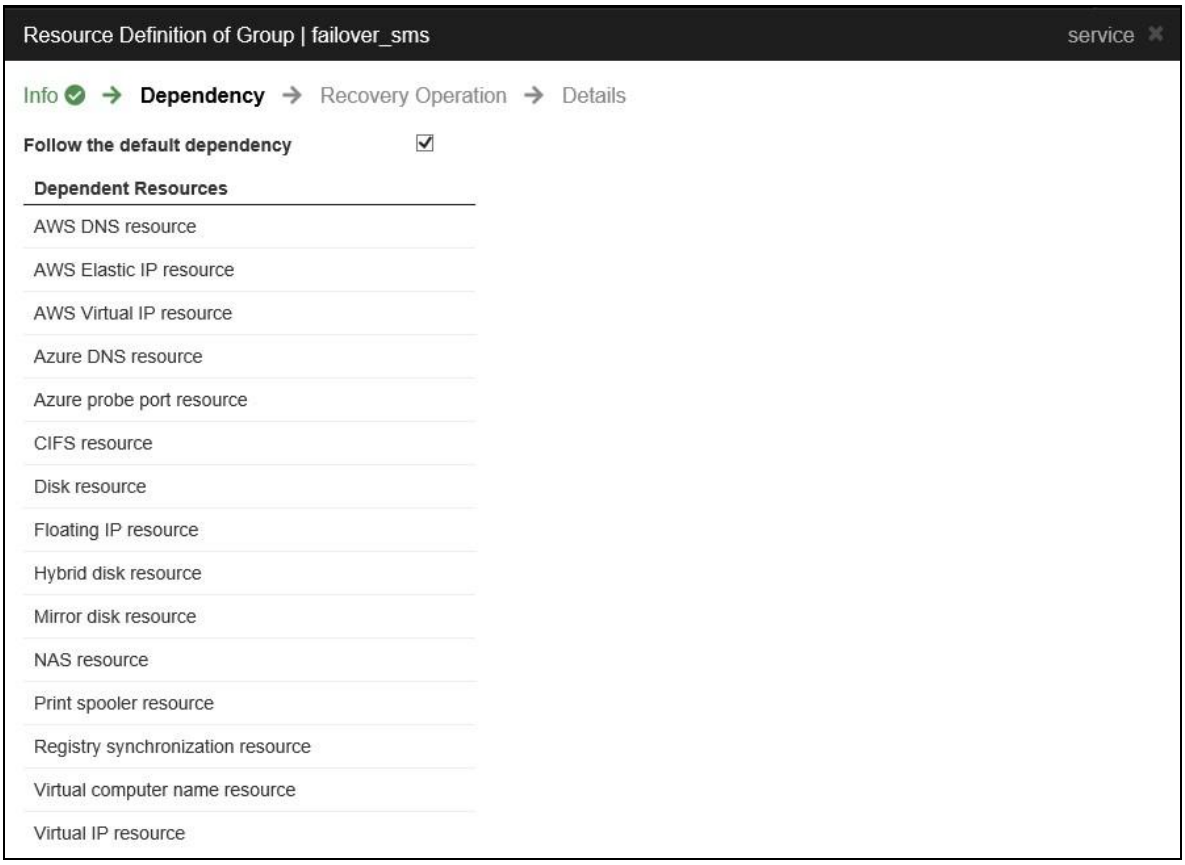
2.3 Click the "**+**" associated with the failover group:



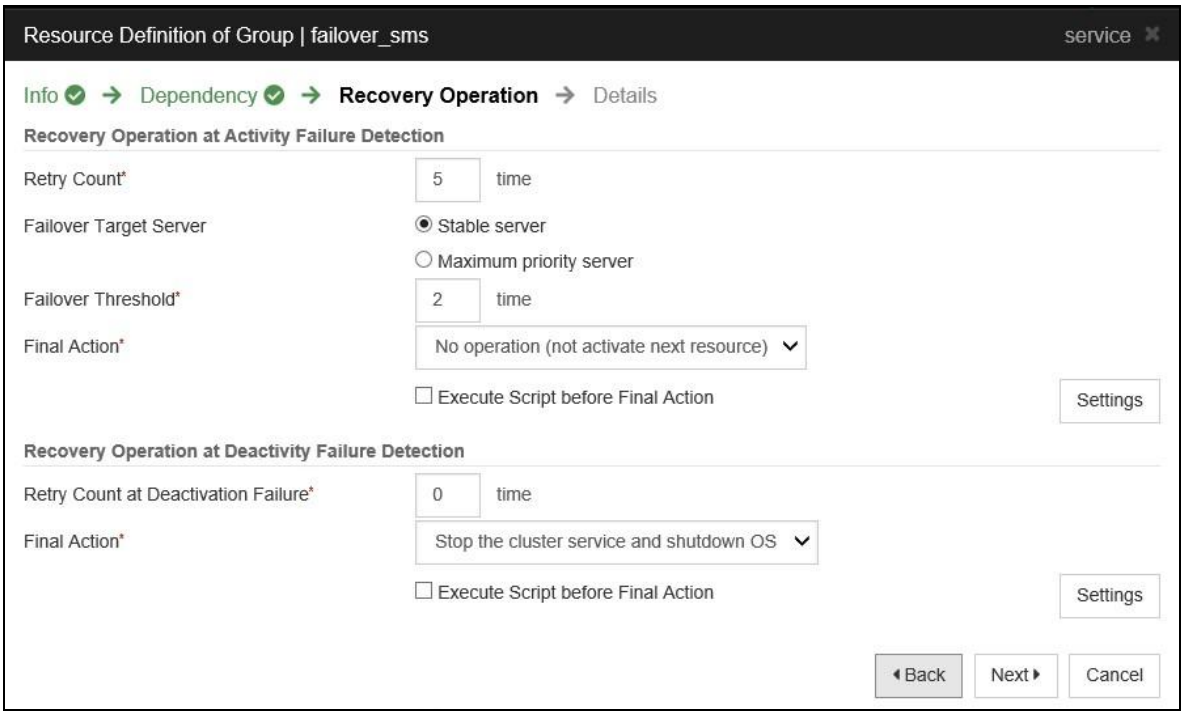
2.4 Add a **service resource**, and enter a name of "Symmetry NVR Service Bus":



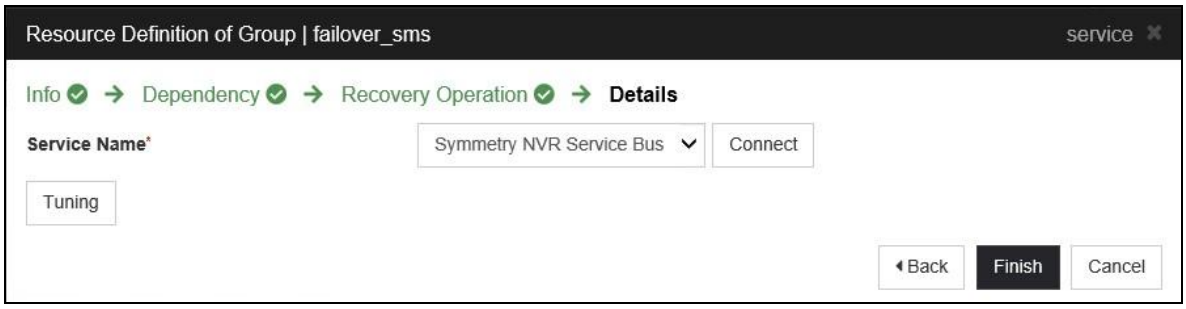
2.5 Click **Next** to display the Dependency page:



2.6 Click **Next**. In the Recovery Operation page, specify a **Retry Count** of 5 and a **Failover Threshold** of 2:



2.7 Click **Next**. In the Details page, click **Connect** to load the list of services, choose **Symmetry NVR Service Bus** from the **Service Name** menu, then click **Finish**:



2.8 Repeat steps 2.3 to 2.7 to add the following resources (replacing "Symmetry NVR Service Bus" above for the name below):

Symmetry NVR Device Manager
Symmetry NVR Event Listener
Symmetry NVR Event Reporter
Symmetry NVR External Interface
Symmetry NVR Presentation Manager
Symmetry NVR Recording Manager
Symmetry NVR Recording Scheduler
Symmetry NVR Storage Manager

Step 3 – Applying Service Resource Dependencies

Carry out the following:

3.1 With Cluster Manager in Config Mode, select the failover group. The resources, including the ones you added, are listed below the group title:

3.2 For each Symmetry resource:

a) Select the properties icon against the resource.

b) In the Dependency tab, uncheck **Follow the default dependency**.

c) Add the dependencies shown in the following table, then click **OK**.

Symmetry Resource	**Dependencies**
Symmetry NVR Service Bus	fip - Floating IP MD - Mirror disk
Symmetry NVR Device Manager	Symmetry NVR Service Bus
Symmetry NVR Event Reporter	Symmetry NVR Service Bus
Symmetry NVR Storage Manager	Symmetry NVR Service Bus Symmetry NVR Event Reporter Symmetry NVR Device Manager
Symmetry NVR Event Listener	Symmetry NVR Service Bus Symmetry NVR Event Reporter Symmetry NVR Device Manager Symmetry NVR Storage Manager
Symmetry NVR Presentation Manager	Symmetry NVR Service Bus Symmetry NVR Storage Manager
Symmetry NVR Recording Manager	Symmetry NVR Service Bus Symmetry NVR Presentation Manager
Symmetry NVR Recording Scheduler	Symmetry NVR Service Bus Symmetry NVR Recording Manager
Symmetry NVR External Interface	Symmetry NVR Service Bus Symmetry NVR Device Manager Symmetry NVR Event Listener Symmetry NVR Event Reporter Symmetry NVR Presentation Manager Symmetry NVR Recording Manager Symmetry NVR Recording Scheduler Symmetry NVR Storage Manager

You need to repeat step 3.2 until all the dependencies shown in the above table have been applied.

3.3 View the Entire Dependency tab to check that the dependencies are correct.

Step 4 – Starting the Cluster

Start the cluster as follows:

4.1 At the top of the page click **Apply the Configuration File**.

4.2 Click **OK**:

4.3 Put the cluster back into Operating Mode, and select **Status**.

4.4 Click the **Start cluster** button at the top of the page.

The cluster should start and the application should now be running under control of the cluster.