Preparing for Windows 2003 Cluster Services

Before You Begin

To complete this lab, you will need the following information:

Domain Controller:

- Node NetBIOS name: HOL169-DC
- IP address (public): 192.168.100.1
- Domain: HOL169.local
- Domain Admin Account: CLUSTERGUY
- Password: Password1!

First node in Cluster:

- Node NetBIOS name: HOL169-NODE1
- Cluster_public IP address: 192.168.100.11
- Cluster_private IP address: 10.0.0.1
- Domain Login Account: HOL169USER
- Domain Login Password: P@sswOrd
- ISCSI Drives:
  - Quorum Drive: Disk Q:
  - File Share Drive: Disk R:
  - Printer Drive: Disk S:

Second node in Cluster:

- Node NetBIOS name: HOL169-NODE2
- Cluster_public IP address: 192.168.100.12
- Cluster_private IP address: 10.0.0.2
- Domain Login Account: HOL169USER
- Domain Login Password: P@sswOrd
- ISCSI Drives:
  - Quorum Drive: Disk Q:
  - File Share Drive: Disk R:
  - Printer Drive: Disk S:

Cluster

- Cluster Name: HOL169CLUSTER
- Cluster IP Address: 192.168.100.13
- Cluster Service Account: CLUSTERSVC
- Password: P@sswOrd
- File Server Name: HOL169FILE
- File Server IP Address: 192.168.100.14
- Print Server Name: HOL169PRINT
- Print Server IP Address: 192.168.100.15

Lab 1: Installing Windows 2003 Cluster Service (Join)

Objectives

After completing this lab, the student will be able to:

- Install Cluster Service.
- Verify Cluster service installation.

Exercise

In this exercise, the first node of the Cluster has already been configured. This exercise will show how the installation of Cluster Services has been improved by doing the installation from within Cluster Administrator. In Windows 2003 Enterprise Edition, the Cluster Service is installed, but not yet configured.

In this exercise, we will log onto the first node running the Cluster Service and configure the Cluster Service on the second node and allow it to join.

Tasks	Detailed Steps
• Switch to HOL169-NODE1 logging in as the HOL169USER account and start Cluster Administrator	**a.** Choose the **Start** menu **b.** Select the **Administrative Tools** **c.** Select Cluster Administrator **d.** In the **Open Connection to Cluster** box, type HOL169CLUSTER in the **Cluster or server name box**.
• Add the second node to the Cluster	**e.** Choose the **File** menu **f.** Select **New** **g.** Select **Node** **h.** In the **Welcome to the Add Nodes Wizard**, select Next **i.** In the **Computer Name box**, type HOL169-NODE2 **j.** Click the **Add** button so that is added **k.** Select Next **l.** At this point, it will go through and validate the configuration and connectivity. **m.** Once it completes, you can expand the individual testing points to see what it was doing. **n.** If you click on the **View Log** button, you can see that Cluster Services now create a setup log called CLCFGSRV.LOG and is located in the C:\WINDOWS\SYSTEM32\LOGFILES\CLUSTER folder on the node that was just added. **o.** If you click on the **Details** button while highlighting the checking points, you will get a little more detail and that it completed or not. **p.** Clicking the **Re-analyze** button will run through the tests again. **q.** Click the Next Button. **r.** You will be prompted for the password of the Cluster

	Service account that is currently being used on the first node. Type the password “P@sswOrd” and choose Next. **s.** The Next screen shows you information about the Cluster as it is configured (i.e. Name, IP Address, etc). **t.** Choosing the **View Log** button here will also bring up the CLCFGSRV.LOG file. **u.** Choose the Next button. **v.** This screen will run through another quick analyzing of the Cluster and also configure the Cluster Services on the second node. This will also start the Cluster Service on the second node. **w.** Choose the NEXT button. **a.** Choose the Finish Button and you are done.

Lab 2: Creating a group for File Shares (home folders)

Objectives

After completing this lab, the student will be able to:

- Create an IP Address resource
- Create a Network Name resource
- Create a File Share resource with Cluster Administrator
- Using CLUSTER.EXE to create shares

Exercise

In this exercise, we will show the benefits of creating file shares on a Cluster and how the administration of the shares can be kept to a minimum.

When the Cluster Service first installs, it will create separate groups for each of the disks. The first group already has the disk (Disk R: in it, with the folders of:

R:\home
R:\home\user1
R:\home\user2
R:\home\user3

All groups in a Cluster should be considered as an individual machine on the network. Every machine on the network has a disk, a name, an IP Address, and a role. Our role for this exercise is a File Server

Tasks	Detailed Steps
• Create an IP Address resource	(a) Choose the **File** menu (b) Select **New** and **Resource** (c) In the **Name** box, type Home Folders IP Address. This is what will display in Cluster Administrator as a resource. (d) In the **Description** box, you can add a description if you like. (e) In the **Resource Type** box, select IP Address. This designates that this will be an IP Address. (f) In the **Group** box, select **File Shares** since this will be the group we want the resource to exist. (g) Click Next button (h) This next screen will show the Possible Owners that can own the group. Leave both nodes as Possible Owners and choose the Next button. (i) The next screen is the Resource Dependencies box. This is where you would want to add a dependency that might be required in order for this resource to come online. For an IP Address resource, we do not need any dependency, so choose the Next button. (j) In the **IP Address** box, input the IP Address we will be using of 192.168.100.14. (k) Hit the TAB key on the keyboard and the subnet mask will be filled in for you. (l) For the **Network to Use**, select the Cluster_public network

	(m) Make sure to select **Enable NetBIOS for this address** so that the network name can be bound to the IP Address. (n) Click Finish button (o) Right mouse click on the newly created resource and bring it online.
• Create a Network Name Resource	(p) Choose the **File** menu (q) Select **New** and **Resource** (r) In the **Name** box, type Home Folders Network Name. This is what will display in Cluster Administrator as a resource. (s) In the **Description** box, you can add a description if you like. (t) In the **Resource Type** box, select Network Name. This designates that this will be an Network Name. (u) In the **Group** box, select File Shares since this will be the group we want the resource to exist. (v) Click Next button (w) This next screen will show the Possible Owners that can own the group. Leave both nodes as Possible Owners and choose the Next button. (x) The next screen is the Resource Dependencies box. This is where you would want to add a dependency that might be required in order for this resource to come online. For a Network Name, we are dependent on an IP Address, so move the IP Address to the right box and choose the Next button. (y) In the **Name** box, this is the actual name of the "server" the users will connect to. In this box, type in HOL169FILE. (z) If you want to ensure that the network name successfully registers with DNS, select the **DNS Registration must succeed** box. DNS must successfully registee the name; otherwise, the resource will fail to come online. If you are using a DNS Server that does not accept dynamic registrations, then you would leave this as not selected. (aa) If you want to enable Kerberos authentication against the network name, select the **Enable Kerberos Authentication** box. (bb) Click the Finish button. (cc) Right mouse click on the newly created resource and bring it online.
• Create the file share resource	(a) Choose the **File** menu (b) Select **New** and **Resource** (c) In the **Name** box, type Home Folders Share. This is what will display in Cluster Administrator as a resource. (d) In the **Description** box, you can add a description if you like. (e) In the **Resource Type** box, select File Share. This designates that this will be a File Share. (f) In the **Group** box, select File Shares since this will be the group we want the resource to exist. (g) Click Next button (h) This next screen will show the Possible Owners that can own

	the group. Leave both nodes as Possible Owners and choose the Next button. (i) The next screen is the Resource Dependencies box. This is where you would want to add a dependency that might be required in order for this resource to come online. For a File Share, we are dependent on a disk and a network name, so move them to the right box and choose the Next button. (j) In the **Share Name** box, this is the actual name of the "share" the users will connect to. In this box, type in HOME. (k) In the **Path** box, you must give the exact path to where the share resides. There is no browse button, so you must type it in exactly. Otherwise it will error out. In this both, type in R:\HOME. (l) In the **Comment** box, you can add a comment that will display as part of browsing the share. (m) In the **User Limit** box, this is where you set the number of users that are allowed to connect. For now, leave it on the maximum selection (n) The **Permissions** box is where you set the File Share permissions. Since this is going to be a file share for home folders, set this at Everyone – Full Control. More on this on the next step. (o) On the Advanced Button, here is where the administration gets easier. If you select **Share subdirectories**, what this does is take the immediate subfolder under R:\HOME and shares it out automatically for you. This can come in handy when users leave or join the company. Simply create the folder under R:\HOME and it will automatically share it out for you. Remove the folder and the share will disappear. You can also select the **Hide Subdirectory shares** option which will tag the share with a $ sign which makes the share hidden. For now, leave this unselected. **NOTE**: When setting this up, you must rely on NTFS Permissions on the drive and folders. We must have full control at the share level and then have the NTFS permissions come in to keep unauthorized users from connecting. (p) Click the Finish button. (q) Right Mouse click on the newly create resource and bring it online.
• Browse the share	**x.** Choose the Start Menu and select Run and type in \\HOL169FILE and press <ENTER>. You will see the shares all listed out. **y.** Choose the Start Menu and Run and type in R:\HOME to bring up Explorer. In this folder, create a new folder called USER4. **z.** Go back to the \\HOL169FILE and refresh the screen and you will see the new USER4 share dynamically created.
• CLUSTER.EXE commands that can be used to script creating shares	On HOL169-NODE1, go to Disk R: and create the following folders: • R:\DEPT

	• R:\DEPT\ACCOUNTING • R:\IT Run a command promt and type the following commands: cluster. **res** "Dept Shares" /create /group:"File Shares" /type:"File Share" cluster . **res** "Dept Shares" /priv path="R:\Dept " cluster . **res** "Dept Shares" /priv Sharename=DEPT cluster . **res** "Dept Shares" /priv Remark="This is Dept Shares" cluster . **res** "Dept Shares" /prop Description="This is Dept Shares" cluster . **res** "Dept Shares" /priv security=everyone,set,F cluster . **res** "Dept Shares" /priv ShareSubDirs=1 cluster . **res** "Dept Shares" /AddDep:"Disk R:" cluster . **res** "Dept Shares" /AddDep:"Home Shares Network Name" cluster . **res** "Dept Shares" /Online You will now see that the share has been created. If you bring up the properties of the Dept Share resource, you will see all of the above settings. If you run a command prompt anf type \\HOL169FILE, you will now see the Dept Share as well as the Accounting and IT Shares.

Lab 3: Creating a group for Print Shares

Objectives

After completing this lab, the student will be able to:

- Create an IP Address resource
- Create a Network Name resource
- Create a Print Spooler resource with Cluster Administrator

Exercise

In this exercise, we will show the benefits of creating Printer shares on a Cluster and how the administration of the printer shares and printer driver updates can be kept to a minimum.

When the Cluster Service first installs, it will create separate groups for each of the disks. The first group already has the disk (Disk S: in it, with the folder of S:\SPOOL.

All groups in a Cluster should be considered as an individual machine on the network. Every machine on the network has a disk, a name, an IP Address, and a role. Our role for this exercise is a File Server

• Create an IP Address resource	**aa.** Choose the **File** menu **bb.** Select **New** and **Resource** **cc.** In the **Name** box, type Print IP Address. This is what will display in Cluster Administrator as a resource. **dd.** In the **Description** box, you can add a description if you like. **ee.** In the **Resource Type** box, select IP Address. This designates that this will be an IP Address. **ff.** In the **Group** box, select Printers since this will be the group we want the resource to exist. **gg.** Click Next button **hh.** This next screen will show the Possible Owners that can own the group. Leave both nodes as Possible Owners and choose the Next button. **ii.** The next screen is the Resource Dependencies box. This is where you would want to add a dependency that might be required in order for this resource to come online. For an IP Address resource, we do not need any dependency, so choose the Next button. **jj.** In the **IP Address** box, input the IP Address we will be using of 192.168.100.15. **kk.** Hit the TAB key on the keyboard and the subnet mask will be filled in for you. **ll.** For the **Network to Use**, select the Cluster_public network **mm.** Make sure to select **Enable NetBIOS for this address** so that the network name can be bound to the IP Address. **nn.** Click Finish button **oo.** Right mouse click on the newly created resource and bring it online.

• Create a Network Name Resource	Choose the **File** menu Select **New** and **Resource** In the **Name** box, type Print Network Name. This is what will display in Cluster Administrator as a resource. In the **Description** box, you can add a description if you like. In the **Resource Type** box, select Network Name. This designates that this will be a Network Name. In the **Group** box, select Printers since this will be the group we want the resource to exist. Click Next button This next screen will show the Possible Owners that can own the group. Leave both nodes as Possible Owners and choose the Next button. The next screen is the Resource Dependencies box. This is where you would want to add a dependency that might be required in order for this resource to come online. For a Network Name, we are dependent on an IP Address, so move the IP Address to the right box and choose the Next button. In the **Name** box, this is the actual name of the "server" the users will connect to. In this box, type in HOL169PRINT. If you want to ensure that the network name successfully registers with DNS, select the **DNS Registration must succeed box**. DNS must successfully register the name; otherwise, the resource will fail to come online. If you are using a DNS Server that does not accept dynamic registrations, then you would leave this as not selected. If you want to enable Kerberos authentication against the network name, select the **Enable Kerberos Authentication** box. Click the Finish button. Right mouse click on the newly created resource and bring it online.
• Create a Print Spooler resource	Choose the **File** Menu Select **New** and **Resource** In the **Name** Box, type Print Spooler. This is what will display in Cluster Administrator. In the **Description** box, you can add a description if you like In the **Resource Type** box, select Print Spooler. This designates that this will be a Print Spooler. In the **Group** box, select Printers since this will be the group we want the resource to exist. Click Next button This next screen will show the Possible Owners that can own the group. Leave both nodes as Possible Owners and choose the Next button. The next screen is the Resource Dependencies box. This is where you would want to add a dependency that might be required in order for this resource to come online. For a Spooler, we will need the disk and network name. In the next screen, it will show you the location of S:\SPOOL which is where the print jobs will be spooled when clients print. Click the Finish button Right mouse click on the newly created resource and bring it online.

• Create Printers - This is where some of the burden of printer installs on a Cluster Server in previous versions has been eased. In Windows NT 4.0 Cluster, you had to install (and update) each printer 3 times. In Windows 2000 Cluster, it was two times. Now, with Windows 2003 Cluster, you will only need to do this once. The reason for this is that all printer information is kept within the Cluster registry and the printer driver files are also kept on the same shared drive as the Spool directory. When a printer is installed, it's files are placed on this shared drive. When there is a failover, these new printers (or print driver updates) are copied down locally to the node.	From the Start menu, type \\HOL169PRINT. Double mouse click on **Printers and Faxes**. Double mouse click on **Add Printer** to bring up the Add Printer Wizard. Click the Next button Select **Create a new port** and **Standard TCP/IP Port** and Next to bring you into the Add Port Wizard. Click the Next button. Type in the IP Address of 192.168.100.25 and Next. Select **Generic Network Card** and Next. Select Finish button Now we are prompted to install a printer. Go ahead and select the **Agfa** as the Manufacturer and **AGFA-AccuSet v52.3** Printer and Next button. Leave the Printer name as the default selected and choose Next button Select **Share name** and leave as Agfa-Acc and Next button The **Location** and **Comment** boxes are for information displayed when browsing the printer. You can put something in if like and choose Next button. Select **No** for a test page as the printer truly does not exist in our lab; choose Next button. Click the Finish button. From the Start menu, type \\HOL169PRINT and you will now see the printer. By going to Drive S: in Explorer, you will now see a folder called S:\PrinterDrivers that has the subfolders of \W32X86\DRIVERS\3. This is where the printer drivers are actually copied during the installation. Looking locally on Drive C:, you will now see the folder C:\WINDOWS\SYSTEM32\SPOOL\DRIVERS\<*guid*>\DRIVERS\\W32X86\3 which is the location that we copy the printer drivers to so that the clients can gain access to the files. If you go to the node that does not currently hold the Print Spooler resource, you will see that the local directory does not contain the print driver files. In Cluster Administrator, right mouse click on the Printers Group and select Move Group to move the group to the other node. Now check this same local directory and you will see the drivers are now there. This is because there is a flag that is marked for any printers newly added or updated. When the node brings the Spooler resource online, it checks for this flag and copies down the appropriate files to the local machine if it does not have them.

Lab 4: Creating Failback Policies

Objectives

After completing this lab, the student will be able to:

- Set up an Active/Active Cluster
- Create Failback Policies
- Explain the difference between a “possible” and a “preferred” owner of a group

Exercise

In this exercise, we will show how to set up Failback policies so that each node in the Cluster has a group “assigned” to it. This is beneficial in the case of a File and Print Cluster (or Cluster with two print spoolers). The reason for this is so that you will not give the burden of running everything off of on node.

Microsoft **Cluster** Server (MSCS) has the ability to define a specific node in the **cluster** as the **preferred** node that is to own a particular group. If for any reason this node fails or goes offline, you can set the **Cluster** service to automatically move these groups back to the node that you want to. This is useful in statically load-balancing the nodes in your **cluster**. This is referred to as Failover and Failback policies.

The first thing to differentiate is between what a “possible” owner and a “preferred” owner is. **Possible** Owner defines whether a resource is ever able to failover to a specific node. Use extreme caution in defining **Possible** Owners because defining a **possible owner** for a single resource will effect the failover for the entire group. This is defined under the properties of the individuals resources.

If you bring up the properties of a group, you will see a Preferred Owners box. As a default, this is left blank.

When you configure a group to automatically failback to the **preferred** node, you specify whether you want the group to failback as soon as the **preferred** node is available or to failback only during specific hours that you define. This option is useful if you want the failback to occur after peak business hours, or if you want to make sure the **preferred** node is able to support the group when it does come back online.

The "**Preferred Owner**" of a group must be specified for failback to occur. The **preferred owner** is the node that one configures to (under normal operating circumstances) to host the group. Furthermore, on a resource level, the resource must be configured to have both nodes as "Possible Owners" for the resource to failover.

Tasks	Detailed Steps
• Define Preferred Owners	**a.** In Cluster Administrator, right mouse click on the File Shares group and choose **Properties**. **b.** On the **General** tab, select the **Modify** button. **c.** Add HOL169-NODE1 only as the Preferred Owner **d.** On the **Failback** tab, select **Allow Failback** and **Immediately**. **e.** OK this setting.

	f. In Cluster Administrator, right mouse click on the Printers Group and choose **Properties**. **g.** On the **General** tab, select the **Modify** button. **h.** Add HOL169-NODE2 only as the Preferred Owner. **i.** On the **Failback** tab, set **Allow Failback** and **Immediately**. **j.** OK this setting.
• Test Preferred Owner settings	**k.** Switch to HOL169-NODE1 and open Cluster Administrator. **l.** In the left column, right mouse click on HOL169-NODE2 and choose **Stop Cluster Service**. **m.** All groups would now be owned by HOL169-NODE1. **n.** Once the Cluster Service has stopped on HOL169-NODE2 (designated by the red 'x'), right mouse click it again and select **Start Cluster Service**. **o.** Notice that when HOL169-NODE2 starts up, the Printers Group is immediately moved over and now resides on that node. **p.** Switch to HOL169-NODE2 and open Cluster Administrator. **q.** In the left column, right mouse click on HOL169-NODE1 and choose **Stop Cluster Service**. **r.** All groups would now be owned by HOL169-NODE2. **s.** Once the Cluster Service has stopped on HOL169-NODE1 (designated by the red 'x'), right mouse click it again and select **Start Cluster Service**. **t.** Notice that when HOL169-NODE1 starts up, the File Shares Group is immediately moved over and now resides on that node. NOTE: This setting only takes effect when the Cluster Service starts on the particular node. If you were to manually move the File shares Group to HOL169-NODE2, it will stay there and will not automatically moved back to HOL169-NODE1. This is because Failback policies **ONLY** come into play when the Cluster Service on the particular node starts.