

December 2000

Prepared by Compaq High
Availability

Compaq Computer Corporation

Contents

Pre-migration Preparation.....3

**Migration Scenario 1:
HA/F100 with Windows
NTS/E to HA/F100 with
Windows 2000 Advanced
Server6**

**Migration Scenario 2:
HA/F200 with Windows
NTS/E to HA/F200 with
Windows 2000 Advanced
Server 14**

**Migration Scenario 3:
HA/F100 with Windows 2000
Advanced Server to HA/F200
with Windows 2000
Advanced Server 23**

**Migration Scenario 4:
HA/F100 Windows NTS/E to
HA/F200 Windows 2000
Advanced Server 28**

**Migration Scenario 5:
HA/F100 Windows NTS/E to
HA/F200 Windows NTS/E..... 39**

Summary 42

Upgrading Compaq ProLiant Clusters HA/F100 and HA/F200

Abstract: This white paper details the procedures for the following cluster migration scenarios:

1. HA/F100 Windows NTS/E to HA/F100 Windows 2000 Advanced Server
2. HA/F200 Windows NTS/E to HA/F200 Windows 2000 Advanced Server
3. HA/F100 Windows 2000 Advanced Server to HA/F200 Windows 2000 Advanced Server
4. HA/F100 Windows NTS/E to HA/F200 Windows 2000 Advanced Server
5. HA/F100 Windows NTS/E to HA/F200 Windows NTS/E

This document assumes you are familiar with basic cluster management and operation. It also assumes that you are familiar with the hardware and software configuration of the HA/F100 and HA/F200 cluster product line.

Some of the procedures in this white paper detail how to migrate clusters by loading one operating system over another. However, be aware that the new installation will clear all the data from the server's hard disks.

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Upgrading Compaq ProLiant Clusters HA/F100 and HA/F200
White Paper prepared by Compaq High Availability

First Edition
Document Number 13XT-1200A-WWEN

Pre-migration Preparation

All of the procedures outlined in this chapter preserve the data on the cluster's external storage systems. On a case-by-case basis, some of the procedures allow the cluster to be upgraded while continuing to service clients. These upgrades are called "rolling upgrades." During these rolling upgrades, however, the cluster will be operating in a degraded state since one of the servers will be unavailable to clients. Other installations will require a new installation of the operating system without giving an option to load Microsoft Windows 2000 Advanced Server over Windows NTS/E. Read each migration procedure thoroughly before starting it. As needed, some of these procedures require all nodes of the cluster to be turned off at the same time causing the cluster to be unavailable to clients during the upgrade.

IMPORTANT: Be sure to backup your data before beginning any of the migration scenarios in this paper.

Note: When migrating to an HA/F200 configuration, the firmware level on each RA4000 Controller must be updated to the same level.

Updating the Controller Firmware Version Levels

Verify the RA4000 Controller Firmware Version Levels by running the online Array Configuration Utility on Node 1 or by running the Array Configuration Utility from the Compaq SmartStart CD. Selecting the RA4000 Controller and then click on the More Information tab. The online Array Configuration Utility is installed by running the Compaq Support Paq for Windows NT or Windows 2000.

To upgrade the RA4000 Controller firmware:

- a. Create the Options ROMPaq diskettes from the Diskette Builder Utility by inserting the SmartStart CD and selecting Start and then Run. In the dialog box that displays, type X:\dskbldr\setup.exe where X is the drive letter associated with your CD-ROM drive.
- b. You can acquire the latest Options ROMPaq from the Compaq website (<http://www.compaq.com/support>).
- c. Power down Node 1 and Node 2.
- d. Insert the Options ROMPaq diskette into Node 1 and restart the node. Run Options ROMPaq and choose to update the firmware on the RA4000 Controllers.
- e. Power down the storage and Node 1 after the firmware update completes.
- f. Power on the storage, wait for the drives to spin, and then power on Node 1.

IMPORTANT: These procedures may be updated over time. For additional information on migrating to Windows 2000 Advanced Server visit the Microsoft website (<http://www.microsoft.com>) or the Compaq High Availability website (<http://www.compaq.com/highavailability>).

Cluster Migration to Windows 2000 Advanced Server

Note: These steps assume that you currently have an existing cluster in an operational state.

A cluster can be migrated to Windows 2000 Advanced Server without migrating the primary domain controller. However, if the cluster is used as a backup domain controller, the primary domain controller must be migrated first. For more detailed information on migrating domain controllers, refer to your Microsoft Windows 2000 Advanced Server documentation included with your operating system purchase.

When upgrading from an HA/F100 cluster to an HA/F200 cluster additional hardware is required. The difference between the clusters is the addition of a second redundant Fibre Channel loop. To complete the installation of this loop, the following components are required:

- A second Compaq StorageWorks RA4000 Controller per storage subsystem
- A second Fibre Channel storage hub or FC-AL switch component. Choose from the following:
 - Compaq StorageWorks Fibre Channel Storage Hub 7
 - Compaq StorageWorks Fibre Channel Storage Hub 12
 - Compaq StorageWorks FC-AL Switch 8 with or without the 3-port Expansion Module
- A second host bus adapter per server. Choose from the following:
 - Compaq StorageWorks Fibre Channel Host Adapter/P
 - Compaq StorageWorks 64-Bit/66-MHz Fibre Channel Host Adapter
- Redundancy management software:
 - Compaq SANworks Secure Path for Windows 2000 on RAID Array 4000/4100
 - Compaq Redundancy Manager (Fibre Channel) (Windows NTS/E only)
- Additional GBICs and Fibre Channel cables

In addition to the above requirements, the following software items are needed for any cluster migration:

- Compaq SmartStart and Support Software
- Server Profile Diskette (included with SmartStart)
- One of the following operating systems and the documentation received with the operating system:
 - Microsoft Windows 2000 Advanced Server
 - Microsoft Windows NT Server 4.0, Enterprise Edition
- Microsoft Service Packs

- Monitoring and Management Software (optional)
 - Compaq Insight Manager
 - Compaq Insight Manager XE
 - Compaq Intelligent Cluster Administrator

The following documentation is available for reference:

- Compaq SmartStart for Servers Setup Poster
- Microsoft clustering documentation
- Documentation for the Compaq ProLiant Cluster Servers.
- Compaq shared external storage documentation:
 - Compaq StorageWorks RAID Array 4000 User Guide
 - Compaq StorageWorks RAID Array 4100 User Guide
- Compaq host bus adapter documentation:
 - Compaq StorageWorks Fibre Channel Host Adapter Installation Guide
 - Compaq StorageWorks 64-Bit/66-MHz Fibre Channel Host Adapter Installation Guide
- Fibre Channel Storage Hub or FC-AL Switch documentation:
 - Compaq StorageWorks Fibre Channel Storage Hub 7 Installation Guide
 - Compaq StorageWorks Fibre Channel Storage Hub 12 Installation Guide
 - Compaq StorageWorks Fibre Channel FC-AL Switch 8 Installation Guide

Migration Scenario 1:

HA/F100 with Windows NTS/E to HA/F100 with Windows 2000 Advanced Server

The migration of HA/F100 with Windows NTS/E to HA/F100 with Windows 2000 Advanced Server can be performed while keeping your cluster online (a rolling upgrade) provided that the firmware levels of all RA4000 controllers are at the same level and v2.58 or later.

IMPORTANT: Back up all data before beginning the migration process.

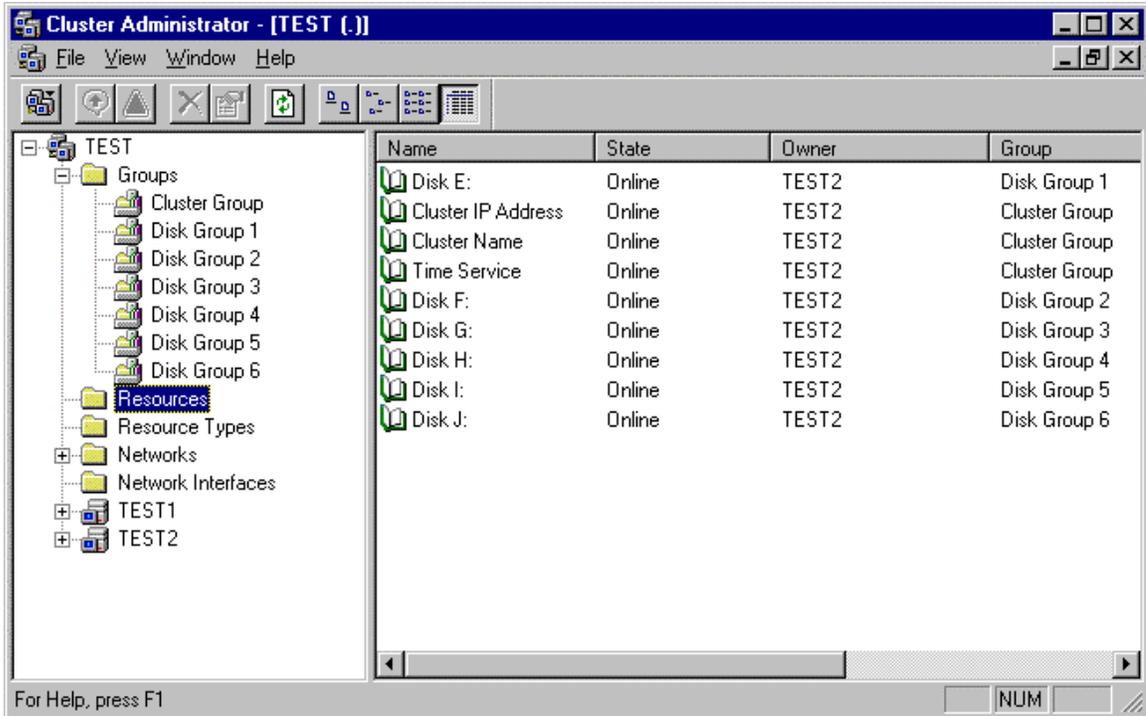
The basic steps to this rolling upgrade include:

1. Verify the Controller Firmware Levels
2. Move all cluster resources over to node 2
3. Upgrade the operating system and drivers on node 1
4. Move all cluster resources back to node 1
5. Upgrade the operating system and drivers on node 2

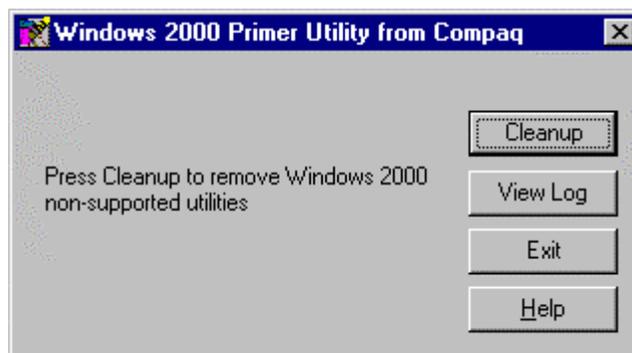
To migrate your cluster, follow these steps:

1. Migration of Node 1 Cluster
 - a. Move all of the cluster groups, including the cluster group, to Node 2 using the Cluster Administrator Utility.
 - b. Open Cluster Administrator by clicking Start, Programs, Administrative Tools, Cluster Administrator.
 - c. Referring to the following screen shot, right click on “Cluster Group” and select “Move Group”.
 - d. Repeat steps b & c until all Resource Groups listed in the Cluster Administrator display have been moved to Node 2, called TEST2 in the sample screen shot.

Note: For help on moving cluster groups, refer to the Microsoft clustering documentation that came with your operating system.



2. Upgrade the Compaq Windows 2000 Primer Utility to remove any conflicting device drivers or applications that may cause problems during the install or operation of Windows 2000 Advanced Server.
 - i. The Primer Utility only removes Compaq Utilities that are not compatible with Windows 2000.
 - ii. The Primer Utility can be downloaded from the following Compaq website: <http://www.compaq.com/partners/microsoft/>.
 - iii. Execute the Primer Utility and click on the Cleanup button to begin the process that removes Windows 2000 non-supported utilities.
 - iv. After the Primer has run, you will be asked to reboot the node to finish the cleanup process.





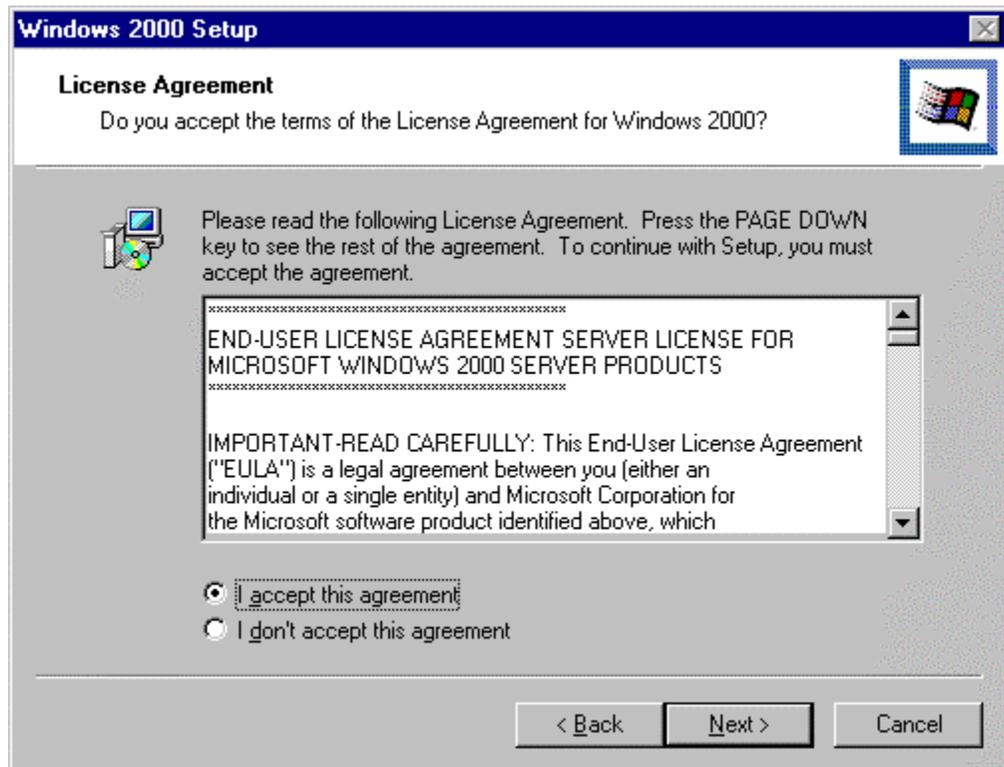
- b. Once the node has been rebooted:
 - i. Insert the Windows 2000 Advanced Server CD into the CD-ROM drive.
 - ii. If the Autorun feature for CDs has been turned off, select Start and then Run.
 - iii. At the prompt type X:\Setup.exe, where "X" is the drive letter of your CD-ROM drive.
 - iv. When asked if you want to upgrade Windows, select "Yes".



- c. Select the "Upgrade to Windows 2000" option and click "Next".



- d. Select the "I accept this agreement" option and click "Next".



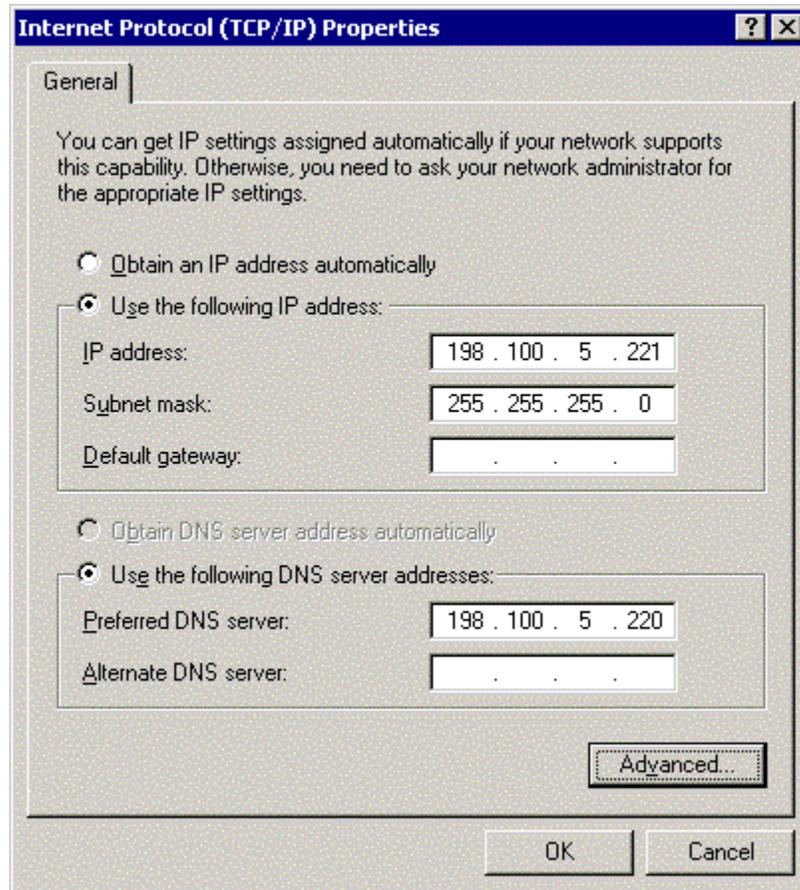
- e. During the upgrade, the Microsoft setup process will automatically restart the computer after 15 seconds or click the “Finish” button to restart manually.



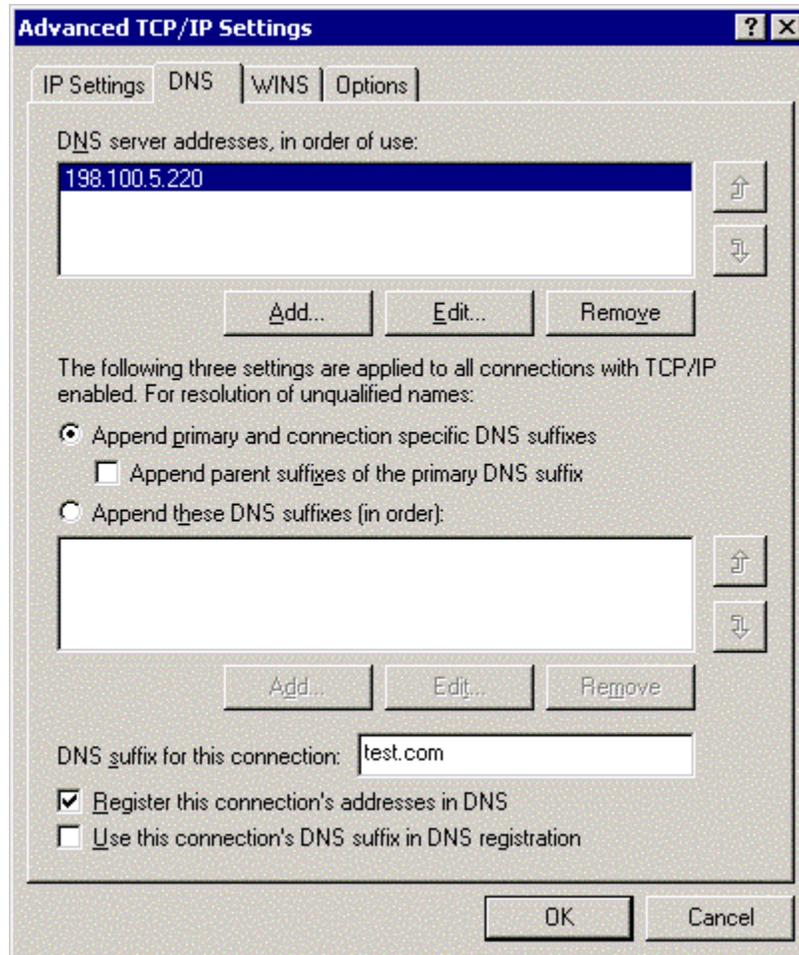
- f. Log on to the node as the administrator.

Note: After the upgrade is complete, the Cluster Service will fail to start. This is because the DNS client for Node 1 has not been set up. The problem that occurs is an authentication error with the user account used to start the Cluster Service. The error message is expected and will be resolved after the DNS client is set up.

3. If DNS is not already installed, set up the DNS client on Node 1:
 - a. Right-click “My Network Places” and click “Properties”.
 - b. Right-click on the network connection that the clients will use to connect to the domain controller and click “Properties”.
 - c. The Properties screen displays the current options available for the selected network card. Highlight “Internet Protocol (TCP/IP)”, and click “Properties”.



- d. Select "Use the following DNS server address:"
- e. In the "Preferred DNS address:" row, enter the Preferred DNS Server IP address.
- f. Click the "Advanced" button.
- g. Select the "DNS" tab.
- h. In the "DNS server address, in order of use:", enter the DNS suffix.
- i. Then click on the "OK" button.



- j. After the client setup is complete, select “Start”, “Shutdown”.
 - k. From the shutdown screen, select “Log Off Administrator”, then log back into the system as the administrator (This ensures that the domain controller has properly authenticated the machine and user ID.)
4. Install the latest Compaq drivers and server support software by running the Compaq Support Paq for Windows 2000 on Node 1:
 - a. Insert the SmartStart CD and select “Start” and then “Run”. In the displayed dialog box, type “X:\cpqsups\ntcsp\setup.exe” where “X” is the drive letter associated with your CD-ROM drive.

Note: You can also acquire the latest Compaq Support Paq from the Compaq website (<http://www.compaq.com/support>).

- b. After the installation is completed, the Compaq Support Paq window will show the drivers that were updated and the drivers that were not installed because a

current version of the driver exists on the node or because a lack of hardware on the node.

5. Install Windows 2000 Advanced Server Service Pack 1 on Node 1 and reboot the system when prompted.
6. Verify that the Cluster Service has started and that Node 1 has rejoined the cluster.
 - a. Open Cluster Administrator by clicking Start, Programs, Administrative Tools, Cluster Administrator.
 - b. As the Cluster Administrator opens, an error will display (This error is a result of the additional resources that Windows 2000 Advanced Server offers Microsoft Cluster Server. This error will not display when Node 2 is upgraded to Windows 2000 Advanced Server).
 - c. From the error screen, select “Yes To All” to open Cluster Administrator.
7. Migration of Node 2 Cluster
 - a. Upgrade Node 2 by repeating steps 1 through 6 for Node 2 and then continuing with Step 8.
8. Verify the cluster by running the Compaq Cluster Verification Utility.
 - a. Execute the startup.exe file located on the Compaq Cluster Verification Utility CD.
 - b. Select the “Run Cluster Verification Utility” option.
 - c. Select the “Compaq ProLiant Cluster HA/F100” option
 - d. Enter the first cluster computer name and click “add”.
 - e. Enter the second cluster computer name and click “add”.
 - f. Click the “Finish” button for the Compaq Cluster Verification Utility to display your Cluster configuration verification.
9. Install your applications, managing and monitoring software as needed. These may include Compaq Insight Manager, Compaq Insight Manager XE, Compaq Intelligent Cluster Administrator, and other applications needed on this cluster.

Migration Scenario 2:

HA/F200 with Windows NTS/E to HA/F200 with Windows 2000 Advanced Server:

The Migration of HA/F200 with Windows NTS/E to HA/F200 with Windows 2000 Advanced Server can be performed while keeping your cluster online (a rolling upgrade) provided that the firmware levels of all RA4000 controllers are at the same level and v2.58 or later.

IMPORTANT: Back up all data before beginning the migration process.

IMPORTANT: Prior to beginning this migration, both nodes running Windows NTS/E must have Service Pack 6a for Windows NTS/E installed.

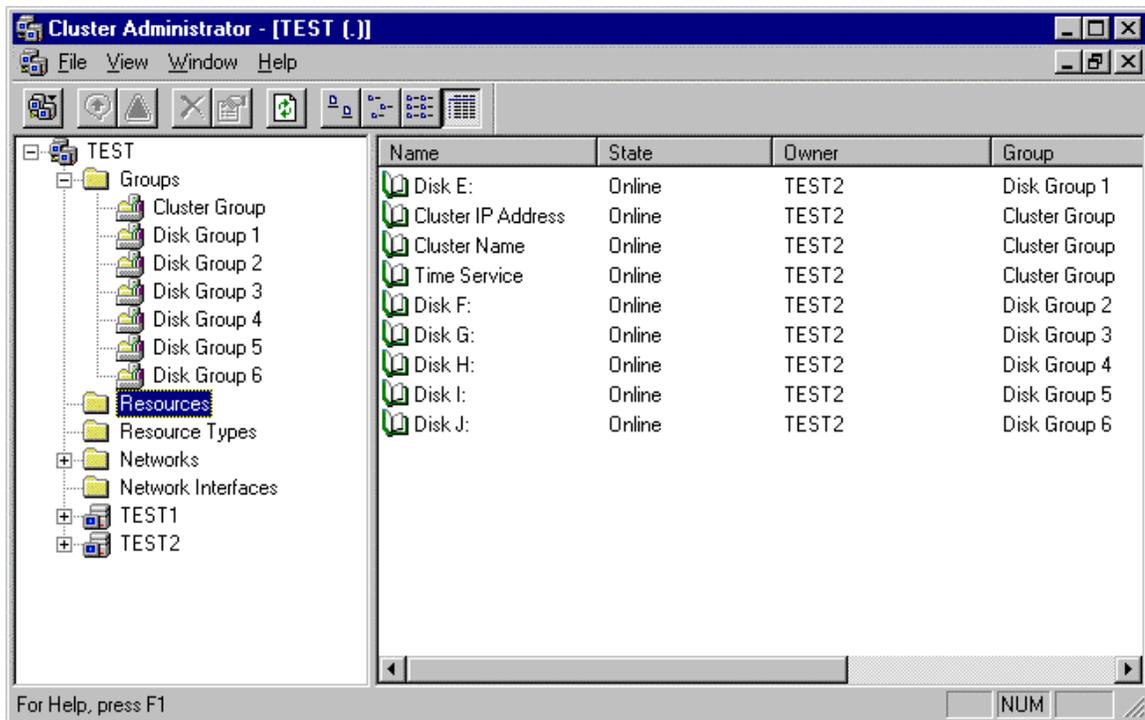
The basic steps to this rolling upgrade include:

1. Verify the Controller Firmware Levels
2. Move all cluster resources over to node 2
3. Upgrade the operating system and drivers on node 1
4. Install Secure Path on node 1
5. Move all cluster resources back to node 1
6. Upgrade the operating system and drivers on node 2
7. Install Secure Path on node 2

To migrate your cluster, follow these steps:

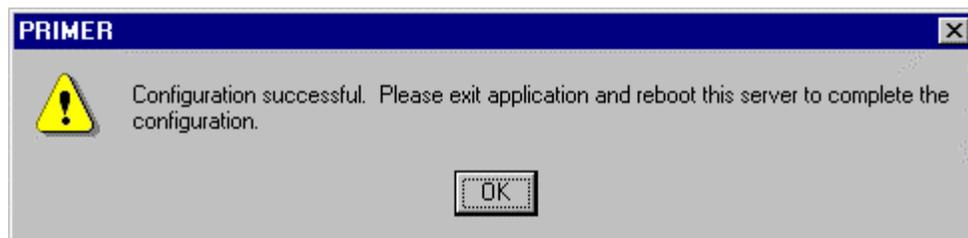
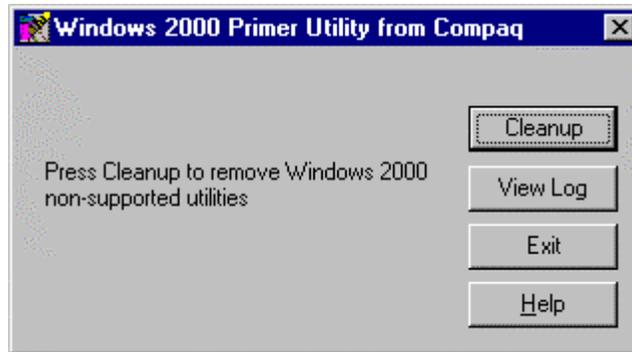
1. Migration of Node 1 Cluster
 - a. Move all of the cluster groups, including the cluster group, to Node 2 using the Cluster Administrator Utility.
 - b. Open Cluster Administrator by clicking Start, Programs, Administrative Tools, Cluster Administrator.
 - c. Referring to the screen shot below, right click on “Cluster Group” and select “Move Group”.
 - d. Repeat steps b & c until all Resource Groups listed in the Cluster Administrator display have been moved to Node 2, called TEST2 in the sample screen shot.

Note: For help on moving cluster groups, refer to the Microsoft clustering documentation that came with your operating system.



2. Upgrade Node 1 to Windows 2000 Advanced Server:

- a. Run the Compaq Windows 2000 Primer Utility to remove any conflicting device drivers or applications that may cause problems during the install or operation of Windows 2000 Advanced Server. The Primer Utility only removes Compaq Utilities that are not compatible with Windows 2000.
 - i. The Primer Utility can be downloaded from the following Compaq website: <http://www.compaq.com/partners/microsoft/>.
 - ii. Execute the Primer Utility and click on the “Cleanup” button to begin the process that removes Windows 2000 non-supported utilities.
 - iii. After the Primer has run, you will be asked to reboot the node to finish the cleanup process by clicking on “OK” button.



- b. Once the node has been rebooted:
- i. Insert the Windows 2000 Advanced Server CD into the CD-ROM drive. (If the Autorun feature for CDs has been turned off, select Start and then Run).
 - ii. At the prompt type “X:\Setup.exe”, where “X” is the drive letter of your CD-ROM drive.
 - iii. When asked if you want to upgrade Windows, select “Yes”.



- c. Select the “Upgrade to Windows 2000” option and click “Next” button.



d. Select the "I accept this agreement" option and click "Next" button.



- e. During the upgrade, the Microsoft setup process will automatically restart the computer after 15 seconds or click the “Finish” button to restart manually.

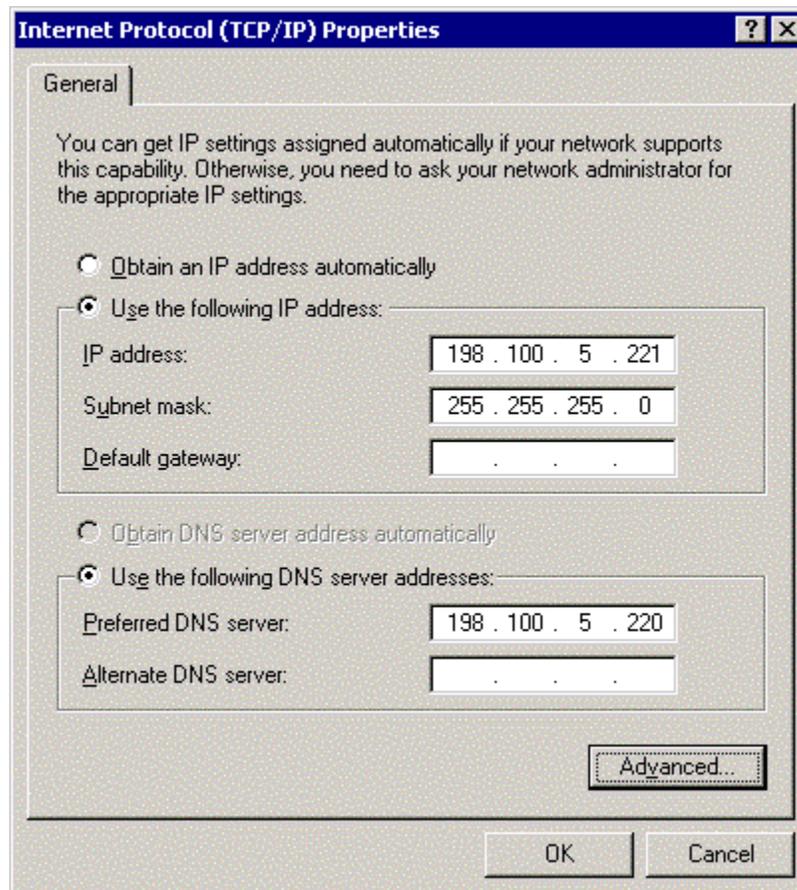


- f. Log on to the node as the administrator.

Note: After the Windows 2000 Advanced Server upgrade is complete, the Cluster Service will fail to start since the DNS client for Node 1 has not been set up. The problem that occurs is an authentication error with the user account used to start the Cluster Service. The error message is expected and will be resolved after the DNS client is set up.

3. If DNS is not already installed, set up the DNS client on Node 1:
 - a. Right-click “My Network Places” and click “Properties”.
 - b. Right-click on the network connection that the clients will use to connect to the domain controller and click “Properties”.
 - c. The Properties screen displays the current options available for the selected network card. Highlight “Internet Protocol (TCP/IP)”, and click “Properties”.
 - d. Select “Use the following DNS server address:”
 - e. In the “Preferred DNS address:” row, enter the Preferred DNS Server IP address.
 - f. Click the “Advanced” button.
 - g. Select the “DNS” tab.

- h. In the “DNS server address, in order of use:”, enter the DNS suffix.
- i. Then click on the “OK” button.

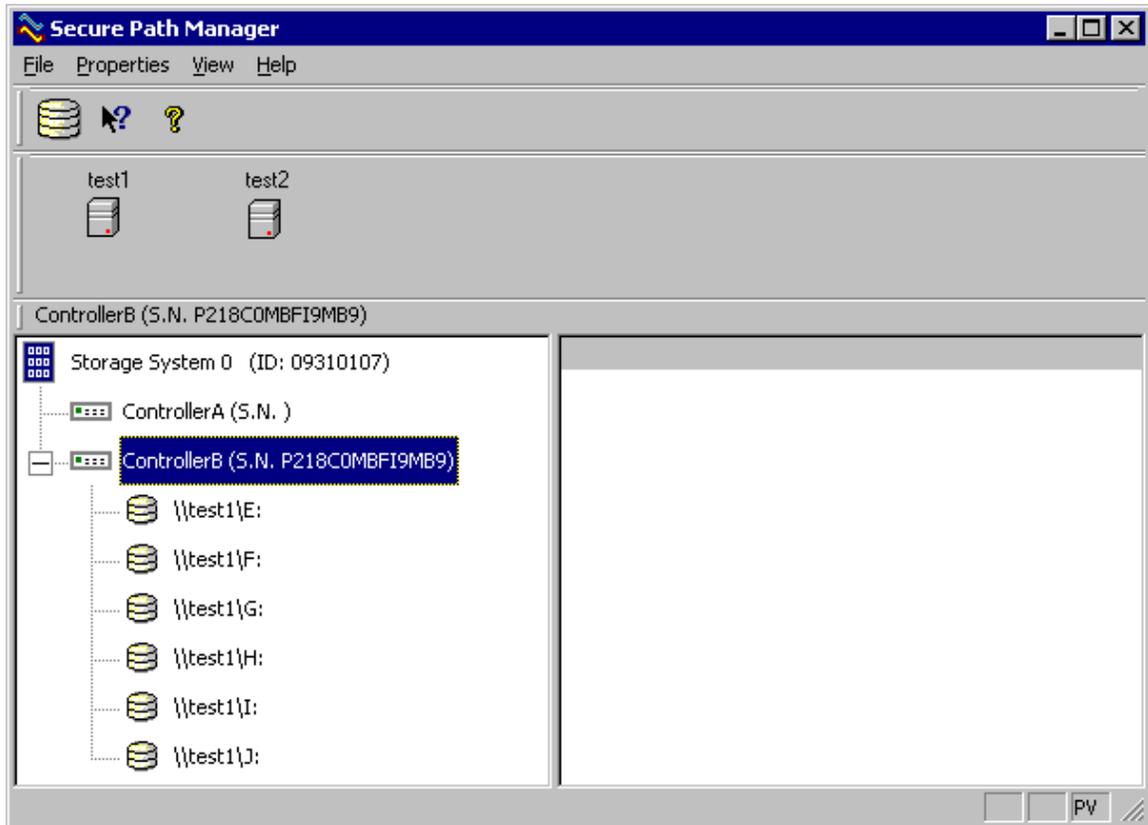


current version of the driver on the node or due to a lack of hardware on the node.

5. Install Windows 2000 Advanced Server Service Pack 1 on Node 1 and reboot when prompted.
6. Verify that the Cluster Service has started and that Node 1 has rejoined the cluster.
 - a. Open Cluster Administrator by clicking Start, Programs, Administrative Tools, Cluster Administrator.
 - b. As the Cluster Administrator opens, an error will display. (This error is a result of the additional resources that Windows 2000 Advanced Server offers Microsoft Cluster Server. This error will not display when Node 2 is upgraded to Windows 2000 Advanced Server.)
 - c. From the error screen, select “Yes” To All to open Cluster Administrator.
7. Install Secure Path on Node 1.
 - a. Insert the Secure Path CD to automatically start the Secure Path installation process. Alternatively, double click the following file on the CD: “X:\SPInstall\setup.exe” where “X” is the drive letter of your CD-ROM Drive.
 - b. During the installation, you are required to configure your clients.
 - c. Remove the Compaq SANworks Secure Path CD from the CD-ROM Drive.
 - d. Reboot the node when prompted.

Note: For more detailed information on Secure Path, refer to the Secure Path documentation.

8. Migration of Node 2 Cluster
 - a. Upgrade Node 2 by repeating steps 1 through 7 for Node 2 and then continuing with Step 9.
9. Verify the cluster by running the Compaq Cluster Verification Utility.
 - a. Execute the startup.exe file located on the Compaq Cluster Verification Utility CD.
 - b. Select the “Run Cluster Verification Utility” option.
 - c. Select the “Compaq ProLiant Cluster HA/F200” option.
 - d. Enter the first cluster computer name and click “add”
 - e. Enter the second cluster computer name and click “add”.
 - f. Click the “Finish” button for the Compaq Cluster Verification Utility to display your Cluster configuration verification.
10. Verify that Secure Path is running properly and that the redundant paths are operational by starting the Secure Path Manager Utility. See the Secure Path documentation for details on running this program.



11. Install your applications, managing and monitoring software as needed. These may include Compaq Insight Manager, Compaq Insight Manager XE, Compaq Intelligent Cluster Administrator, and other applications needed on this cluster.

Migration Scenario 3:

HA/F100 with Windows 2000 Advanced Server to HA/F200 with Windows 2000 Advanced Server

The Migration of HA/F100 with Windows 2000 Advanced Server to HA/F200 with Windows 2000 Advanced Server can be performed while keeping your cluster online (a rolling upgrade) provided that the firmware levels of all RA4000 controllers are at the same level and v2.58 or later.

IMPORTANT: Back up all data before beginning the migration process.

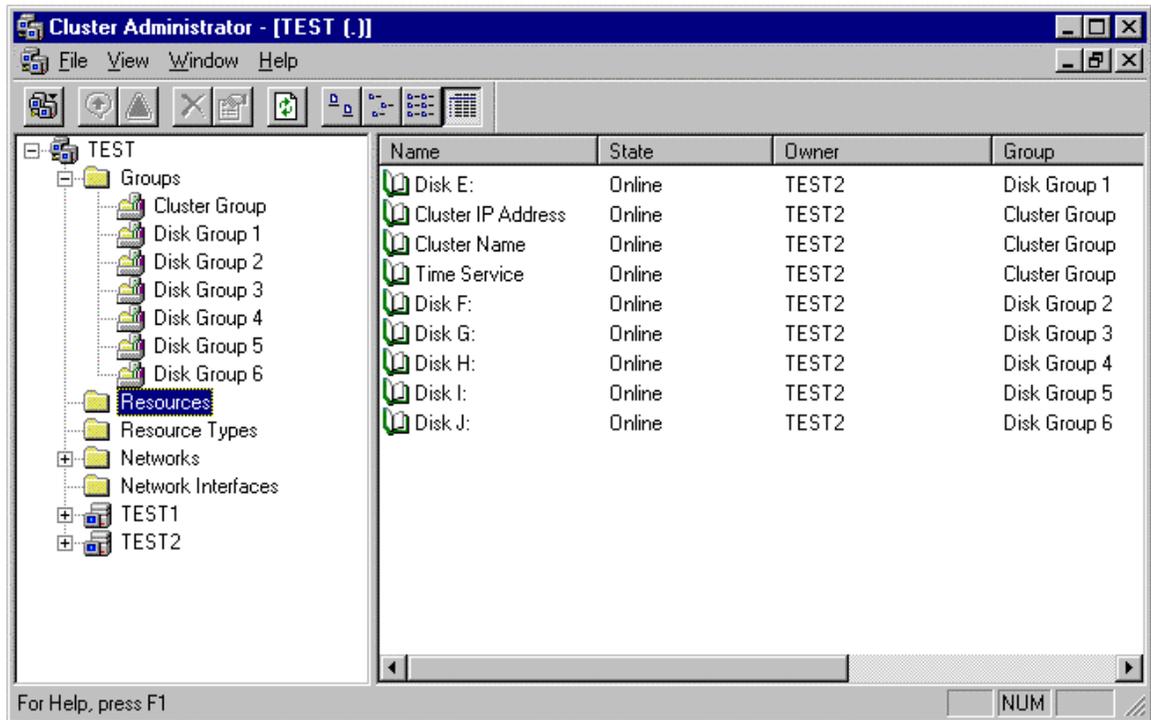
The basic steps to this rolling upgrade include:

1. Verify the Controller Firmware Levels
2. Make sure that all components are present for the second Fibre Channel loop
3. Move all cluster resources over to node 2
4. Add the redundant loop hardware
5. Upgrade the hardware on node 1
6. Install Secure Path on node 1
7. Move all cluster resources back to node 1
8. Upgrade hardware on node 2
9. Install Secure Path on Node 2

To migrate your cluster, follow these steps:

1. Migration of Node 1 Cluster
 - a. Move all of the cluster groups, including the cluster group, to Node 2 using the Cluster Administrator Utility.
 - b. Open Cluster Administrator by clicking Start, Programs, Administrative Tools, Cluster Administrator.
 - c. Referring to the screen shot below, right click on “Cluster Group” and select “Move Group”.
 - d. Repeat b & c Steps until all Resource Groups listed in the Cluster Administrator display have been moved to Node 2, called TEST2 in the sample screen shot.

Note: For help on moving cluster groups, refer to the Microsoft clustering documentation that came with your operating system.

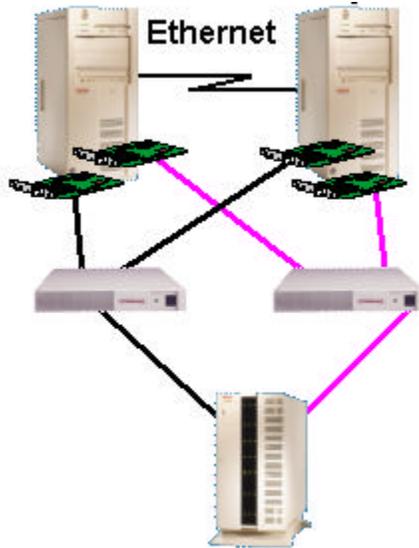


2. Install the latest Compaq drivers and server support software by running the Compaq Support Paq for Windows 2000 on Node 1:
 - a. Insert the SmartStart CD and select Start and then Run. In the dialog box that displays, type “X:\cpqsups\ntcsp\setup.exe” where “X” is the drive letter associated with your CD-ROM drive.

Note: You can also acquire the latest Compaq Support Paq from the Compaq website (<http://www.compaq.com/support>).

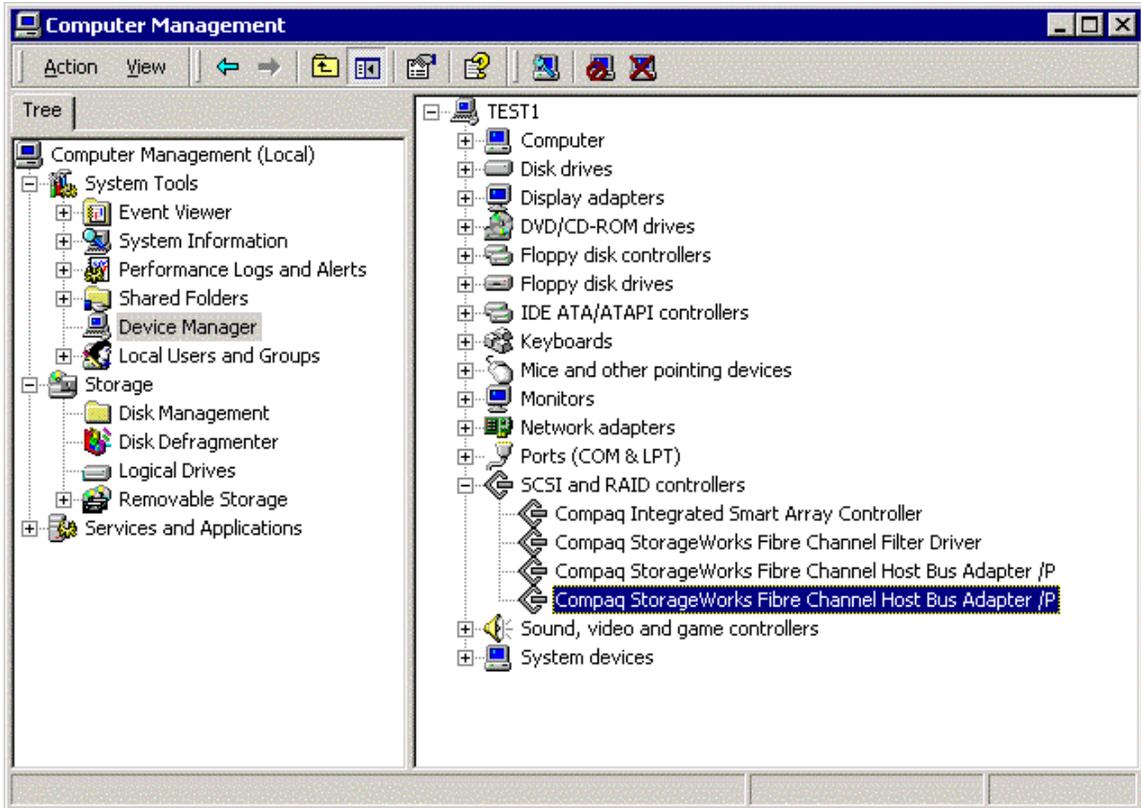
- b. After the installation is completed, the Compaq Support Paq window will show, the drivers that were updated and the drivers that were not installed due to a current version of the driver on the node or due to a lack of hardware on the node.
3. Install Windows 2000 Service Pack 1 on Node 1 and reboot when prompted.
4. Install new hardware:
 - a. Shut down Node 1 and install the second host bus adapter, additional redundant RA4000 Controller(s), the additional Fibre Channel storage hub or FC-AL switch and cables as necessary.

IMPORTANT: To ensure that your HA/F200 cluster fails over properly, attach each host bus adapter in a single server to a different Fibre Channel storage hub or FC-AL switch, and attach each RA4000 Controller in the RA4000/4100 to a different Fibre Channel storage hub or FC-AL switch.



IMPORTANT: If using the Compaq StorageWorks FC-AL Switch 8, be sure to properly set up the Port LIP Propagation Policies correctly.

- b. Power on Node 1 and run the System Configuration Utility by pressing “F10” when prompted during boot.
 - c. Verify the configuration changes to the system (a host bus adapter was added).
 - d. Save the configuration changes and reboot.
5. Add the Fibre Channel host bus adapter driver when the “Windows 2000 Found New Hardware” Wizard appears.
 - a. Click “Next” on the “Found New Hardware” Wizard window
 - b. Select the “Search for suitable driver” option and click “Next”
 - c. Follow the on screen instructions for selecting a file location and select the Fibre Channel Host bus adapter driver for the adapter you are using.
 - d. Click “Finish” to complete driver installation.



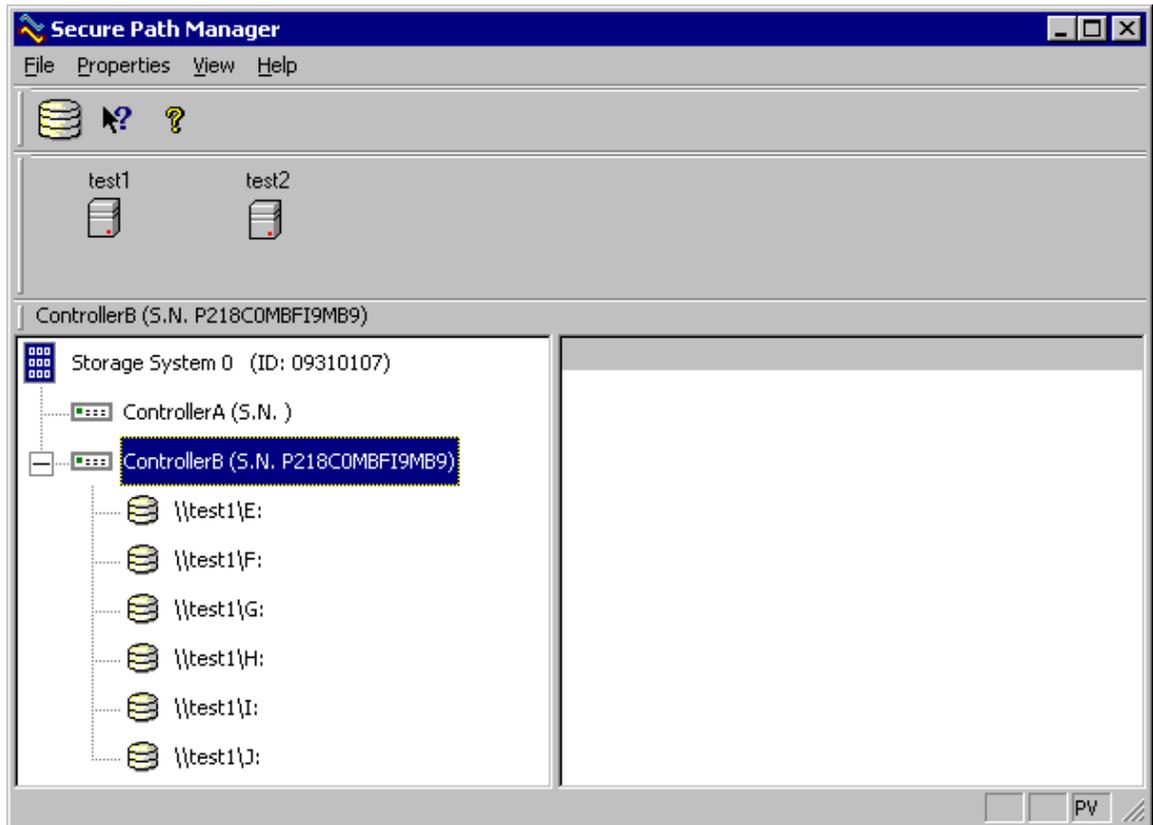
6. Install Secure Path on Node 1.
 - a. Insert the Secure Path CD to automatically start the Secure Path installation process. Alternatively, double click the following file on the CD:
"X:\SPInstall\setup.exe" where "X" is the drive letter of your CD-ROM Drive.
 - b. During the installation, you are required to configure your clients.
 - c. Remove the Compaq SANworks Secure Path CD from the CD-ROM Drive.
 - d. Reboot the node when prompted.

Note: For more detailed information on Secure Path, refer to the Secure Path documentation.

7. Migrating Node 2 Cluster.
 - a. Upgrade Node 2 by repeating steps 1 though 6 for Node 2 and then continuing with step 8.
8. Verify the cluster by running the Compaq Cluster Verification Utility.
 - a. Execute the startup.exe file located on the Compaq Cluster Verification Utility CD.
 - b. Select the "Run Cluster Verification Utility" option.
 - c. Select the "Compaq ProLiant Cluster HA/F200" option.

- d. Enter the first cluster computer name and click “add”
 - e. Enter the second cluster computer name and click “add”.
 - f. Click the “Finish” button for the Compaq Cluster Verification Utility to display your Cluster configuration verification.
9. Verify that Secure Path is running properly and that the redundant paths are operational by starting the Secure Path Manager Utility.

Note: See the Secure Path documentation for details on running this program.



10. Install your applications, managing and monitoring software as needed. These may include Compaq Insight Manager, Compaq Insight Manager XE, Compaq Intelligent Cluster Administrator, and other applications needed on this cluster.

Migration Scenario 4:

HA/F100 Windows NTS/E to HA/F200 Windows 2000 Advanced Server

The migration of HA/F100 Windows NTS/E to HA/F200 Windows 2000 Advanced Server can be performed while keeping your cluster on-line (a rolling upgrade) provided that the firmware levels of all RA4000 controllers are at the same level of v2.58 or later.

IMPORTANT: Back up all data before beginning the migration process.

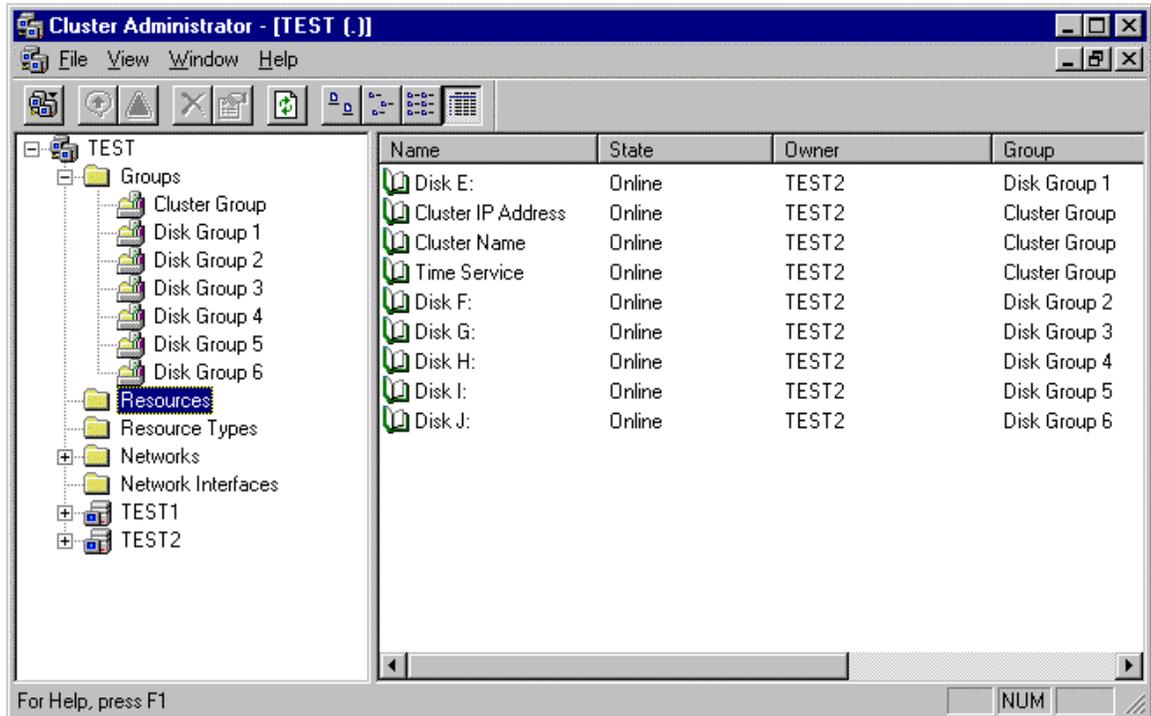
The basic steps to this rolling upgrade include:

1. Verify the Controller Firmware Levels
2. Make sure that all components are present for the second Fibre Channel loop
3. Move all cluster resources over to node 2
4. Upgrade the operating system and drivers on node 1
5. Add the redundant loop hardware
6. Upgrade the hardware on node 1
7. Install Secure Path on node 1
8. Move all cluster resources back to node 1
9. Upgrade the operating system and drivers on node 2
10. Upgrade the hardware on node 2
11. Install Secure Path on Node 2

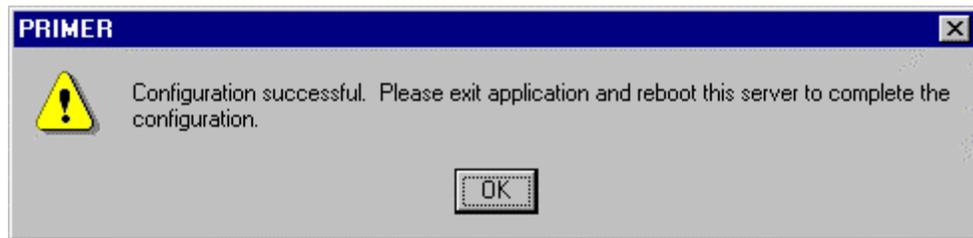
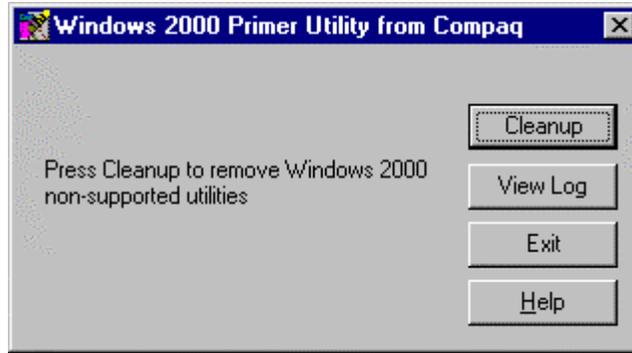
To migrate your cluster, follow these steps:

1. Migration of Node 1 in a cluster
 - a. Move all of the cluster groups, including the cluster group, to Node 2 using the Cluster Administrator Utility.
 - b. Open Cluster Administrator by clicking Start, Programs, Administrative Tools, Cluster Administrator.
 - c. Referring to the screen shot below, right click on "Cluster Group" and select "Move Group".
 - d. Repeat steps b & c until all Resource Groups listed in the Cluster Administrator display have been moved to Node 2, called TEST2 in the sample screen shot.

Note: For help on moving cluster groups, refer to the Microsoft clustering documentation that came with your operating system.



2. Upgrade Node 1 to Windows 2000 Advanced Server:
 - a. Run the Compaq Windows 2000 Primer Utility to remove any conflicting device drivers or applications that may cause problems during the install or operation of Windows 2000 Advanced Server.
 - i. The Primer Utility only removes Compaq Utilities that are not compatible with Windows 2000.
 - ii. The Primer Utility can be downloaded from the following Compaq website: <http://www.compaq.com/partners/microsoft/>.
 - iii. Execute the Primer Utility and click on the Cleanup button to begin the process that removes Windows 2000 non-supported utilities.
 - iv. After the Primer has run, you will be asked to reboot the node to finish the cleanup process.



- b. Once the node has been rebooted:
- i. Insert the Windows 2000 Advanced Server CD into the CD-ROM drive.
 - ii. If the Autorun feature for CDs has been turned off, select Start and then Run.
 - iii. At the prompt type X:\Setup.exe, where "X" is the drive letter of your CD-ROM drive.
 - iv. When asked if you want to upgrade Windows, select "Yes".



- c. Select the "Upgrade to Windows 2000" option and click "Next".



- d. Select the “I accept this agreement” option and click “Next”.



- e. During the upgrade, the Microsoft setup process will automatically restart the computer after 15 seconds or click the “Finish” button to restart manually.

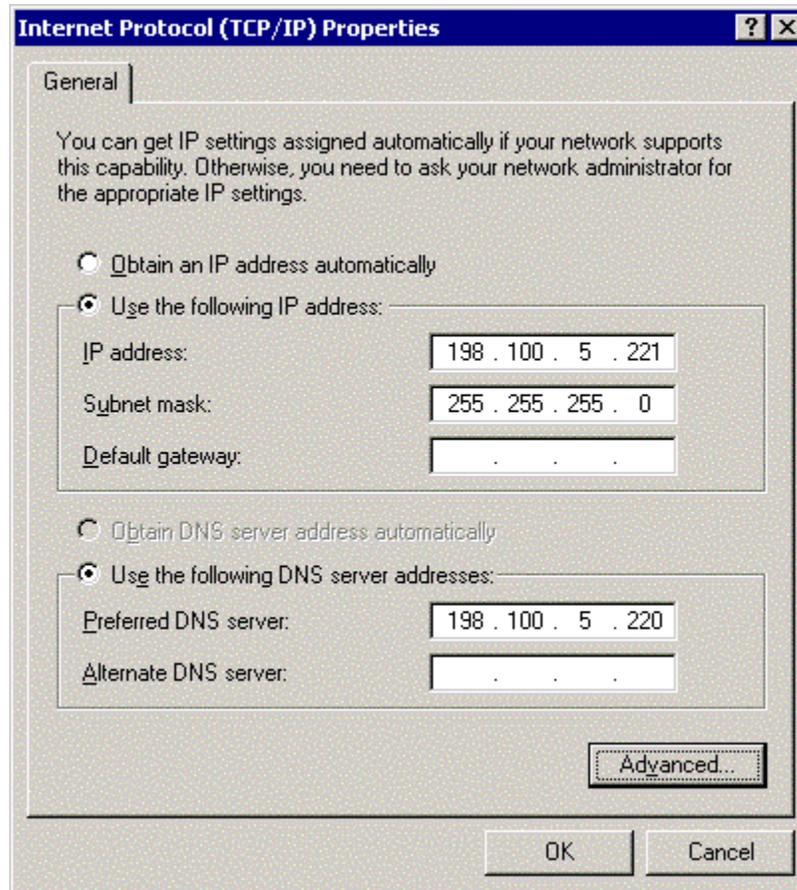


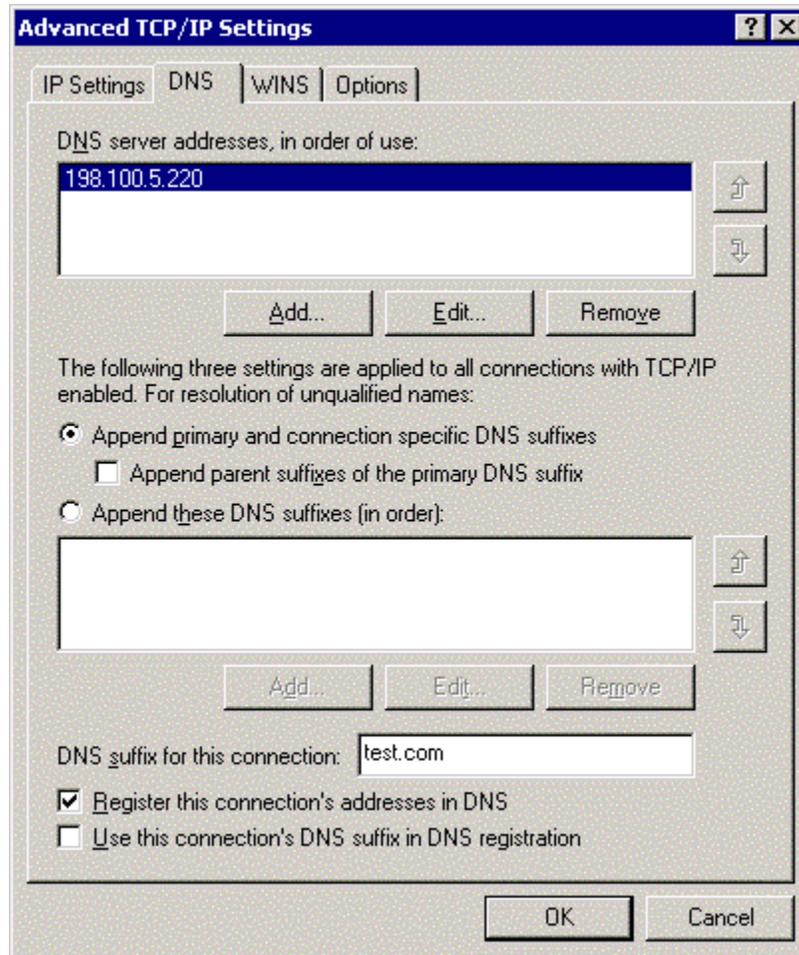
- f. Log on to the node as the administrator.

Note: After the Windows 2000 Advanced Server upgrade is complete, the Cluster Service will fail to start since the DNS client for Node 1 has not been set up. The problem that occurs is an authentication error with the user account used to start the Cluster Service. The error message is expected and will be resolved after the DNS client is set up.

3. If DNS is not already installed, set up the DNS client on Node 1:
 - a. Right-click “My Network Places” and click “Properties”.
 - b. Right-click on the network connection that the clients will use to connect to the domain controller and click “Properties”.
 - c. The Properties screen displays the current options available for the selected network card. Highlight “Internet Protocol (TCP/IP)” and click “Properties”.
 - d. Select “Use the following DNS server address:”
 - e. In the “Preferred DNS address:” row, enter the Preferred DNS Server IP address.
 - f. Click the “Advanced” button.

- g. Select the “DNS” tab.
- h. In the “DNS server address, in order of use:”, enter the DNS suffix.
- i. Then click on the “OK” button.



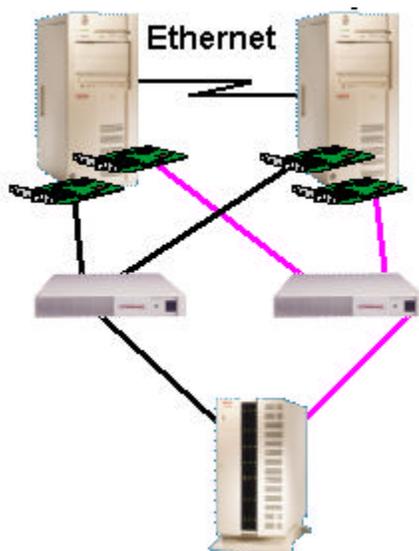


- j. After the client setup is complete, select Start and then select Shutdown.
-
4. From the shutdown screen, select Log Off Administrator, then log back into the system the Administrator (This ensures that the domain controller has properly authenticated the machine and user ID.)
 5. Install the latest Compaq drivers and server support software by running the Compaq Support Paq for Windows 2000 on Node 1:
 - a. Insert the SmartStart CD and select Start and then Run. In the dialog box that displays, type "X:\cpqsupsw\ntcsp\setup.exe" where "X" is the drive letter associated with your CD-ROM drive.

Note: You can also acquire the latest Compaq Support Paq from the Compaq website (<http://www.compaq.com/support>).

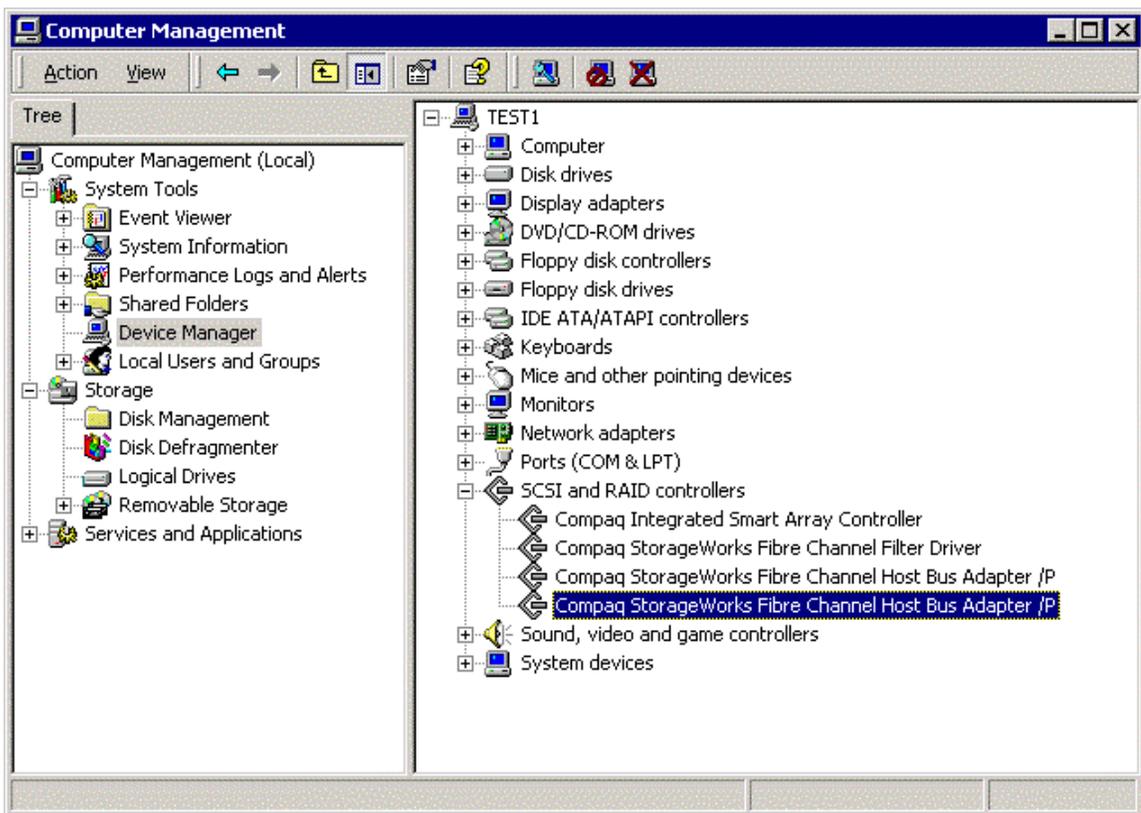
- b. After the installation is completed, the Compaq Support Paq window will show, the drivers that were updated and the drivers that were not installed due to a current version of the driver on the node or due to a lack of hardware on the node.
6. Install Windows 2000 Service Pack 1 on Node 1 and reboot when prompted.
 7. Verify that the Cluster Service has started and that Node 1 has rejoined the cluster.
 - a. Open Cluster Administrator by clicking Start, Programs, Administrative Tools, Cluster Administrator.
 - b. As the Cluster Administrator opens, an error will display. (This error is a result of the additional resources that Windows 2000 Advanced Server offers Microsoft Cluster Server. This error will not display when Node 2 is upgraded to Windows 2000 Advanced Server).
 - c. From the error screen, select Yes To All to open Cluster Administrator.
 8. Install New Hardware:
 - a. Shut down node 1 and install the second host bus adapter, additional redundant RA4000 Controllers, the additional Fibre Channel storage hub or FC-AL switch and cables as necessary.

IMPORTANT: To ensure that your HA/F200 cluster fails over properly, attach each host bus adapter in a single server to a different Fibre Channel storage hub or FC-AL switch, and attach each RA4000 Controller in the RA4000/4100 to a different Fibre Channel storage hub or FC-AL switch.



IMPORTANT: If using the Compaq StorageWorks FC-AL Switch 8, be sure to properly set up the Port LIP Propagation Policies correctly. Refer to the product documentation for the StorageWorks FC-AL Switch for this information.

- b. Turn on Node 1 and run the System Configuration Utility by pressing “**F10**” when prompted during boot.
- c. Verify the configuration changes to the system (a host bus adapter was added).
- d. Save configuration changes and reboot.

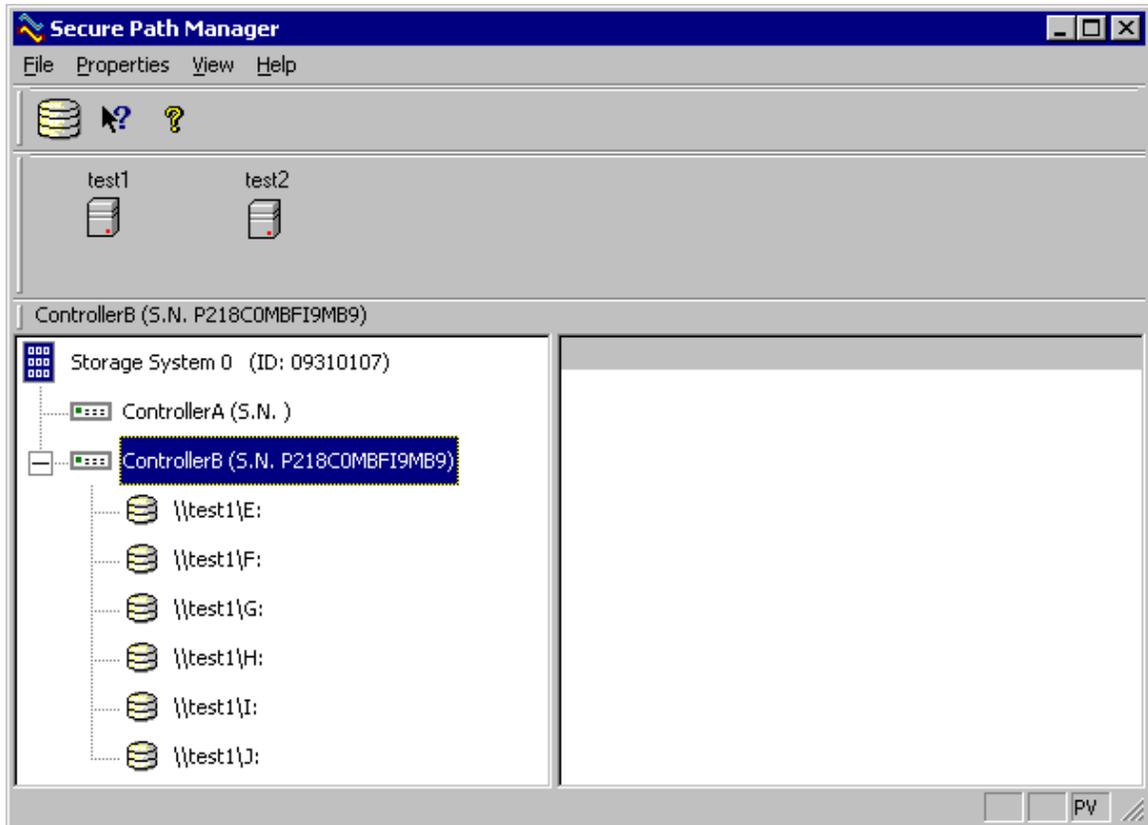


9. Add the Fibre Channel host bus adapter driver when the “Windows 2000 Found New Hardware Wizard” appears.
 - a. Click Next on the “Found New Hardware Wizard” window
 - b. Select the “Search for suitable driver” option and click “Next”
 - c. Follow the onscreen instructions for selecting a file location and select the Fibre Channel Host bus adapter driver for the adapter you are using.
 - d. Click “Finish” to complete driver installation.

10. Install Secure Path on Node 1.
 - a. Insert the Secure Path CD to automatically start the Secure Path installation process. Alternatively, double click the following file on the CD:
X:\SPInstall\setup.exe where X is the drive letter of your CD-ROM Drive.
 - b. During the installation, you are required to configure your clients.
 - c. Remove the Compaq SANworks Secure Path CD from the CD-ROM Drive.
 - d. Reboot the node when prompted.

Note: For more detailed information on Secure Path, refer to the Secure Path documentation.

11. Migrating Node 2 in a cluster.
 - a. Upgrade Node 2 by repeating steps 1 through 9 for Node 2 and then continuing with Step 11.
12. Verify the cluster by running the Compaq Cluster Verification Utility.
 - a. Execute the startup.exe file located on the Compaq Cluster Verification Utility CD.
 - b. Select the “Run Cluster Verification Utility” option.
 - c. Select the “Compaq ProLiant Cluster HA/F200” option
 - d. Enter the first cluster computer name and click “add”
 - e. Enter the second cluster computer name and click “add”.
 - f. Click the “Finish” button for the Compaq Cluster Verification Utility to display your Cluster configuration verification.
13. Verify that Secure Path is running properly and that the redundant paths are operational by starting the Secure Path Manager Utility. See the Secure Path documentation for details on running this program.



14. Install your applications, managing and monitoring software as needed. These may include Compaq Insight Manager, Compaq Insight Manager XE, Compaq Intelligent Cluster Administrator, and other applications needed on this cluster.

Migration Scenario 5:

HA/F100 Windows NTS/E to HA/F200 Windows NTS/E

The Migration of HA/F100 Windows NTS/E to HA/F200 Windows NTS/E cannot be performed as a rolling upgrade. The cluster must be shut down causing the cluster to be unavailable to clients during the migration.

IMPORTANT: Back up all data before beginning the migration process.

The basic steps to this upgrade include:

1. Upgrade the operating system drivers
2. Install Compaq Redundancy Manager
3. Adding redundant loop hardware
4. Update the RA4000 Controller firmware
5. Install the latest Microsoft Service Packs

To migrate from HA/F100 Windows NTS/E to HA/F200 Windows NTS/E, use the following steps:

1. Install the latest drivers and server support software by running the Compaq Server Support Software (SSD) for Windows NT on both nodes:
 - a. Insert the SmartStart CD and select Start and then Run.
 - b. In the dialog box that displays, type “X:\cpqsupsw\ntssd\setup.exe” where “X” is the drive letter associated with your CD-ROM drive.

Note: You can also acquire the latest Compaq Support Paq from the Compaq website (<http://www.compaq.com/support>).

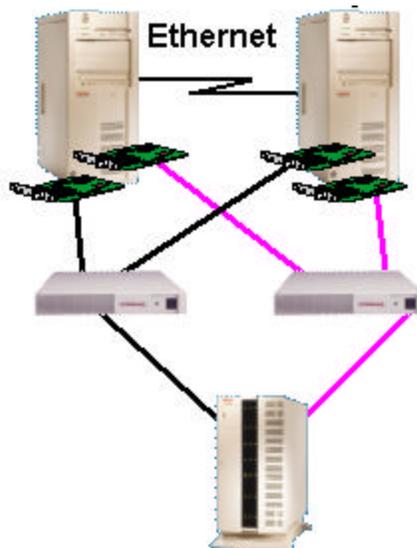
- c. After the installation is completed, the Compaq Server Support Software window will show the drivers that were updated and the drivers that were not installed due to a current version of the driver on the node or due to a lack of hardware on the node.
2. Install Windows NT Service Pack 6a on both nodes.
3. Install the Compaq Redundancy Manager on both nodes.
 - a. Place the Compaq Redundancy Manager (Fibre Channel) CD in the CD-ROM drive. It automatically loads the Install program.
 - b. Follow the instructions offered by the Redundancy Manager installation screens.

- c. Remove the Compaq Redundancy Manager (Fibre Channel) CD from the CD-ROM drive.
- d. Reboot the node when prompted to do so.

Note: For more information about Redundancy Manager, refer to the online documentation (CPQDXCFG.HLP) on the CD.

4. Install new hardware:
 - a. Shut down the nodes and install the second host bus adapters, additional redundant RA4000 Controllers, the additional Fibre Channel storage hub or FC-AL switch and cables as necessary.

IMPORTANT: To ensure that your HA/F200 cluster fails over properly, attach each host bus adapter in a single server to a different Fibre Channel storage hub or FC-AL switch, and attach each RA4000 Controller in the RA4000/4100 to a different Fibre Channel storage hub or FC-AL switch



IMPORTANT: If using the Compaq StorageWorks FC-AL Switch 8 be sure to properly set up the Port LIP Propagation Policies correctly. Refer to the product documentation for the StorageWorks FC-AL Switch for this information.

- b. Turn on Node 1 and run the System Configuration Utility by pressing “F10” when prompted during boot time.
- c. Verify the configuration changes to the system (a host bus adapter was added).

- d. Save configuration changes and reboot.
5. Power on the storage (wait for the drives to spin) and power on both nodes.
6. Verify the cluster by running the Compaq Cluster Verification Utility.
7. Verify that Compaq Redundancy Manager is running properly and that the cluster's redundant paths are operational.
8. Install your applications, managing and monitoring software as needed. These may include, Compaq Insight Manager, Compaq Insight Manager XE, Compaq Intelligent Cluster Administrator and other applications needed on this cluster.

Summary

To summarize the migration of Compaq ProLiant Clusters HA/F100 and HA/F200 the following steps are employed in this document.

- Read each migration procedure thoroughly before starting it.
- Check the firmware level on each RA4000 controller including new controllers before beginning the migration procedure.
- Upgrade the RA4000 Controller if necessary. Remember, both nodes of your cluster will have to be shut down for this procedure causing your cluster to be temporarily unavailable.
- Gather all necessary hardware and software before beginning the migration procedure.
- Gather any necessary product documentation before beginning the migration procedure.