

Documentation Notes for Integrity® XC System NonStop Clusters for SCO UnixWare Administrator's Guide

The following changes should be noted for the *Integrity XC System NonStop Clusters for SCO UnixWare System Administrator's Guide*.

Chapter 3, Upgrading to D10IPM20 NonStop Clusters Software

In this chapter, the following information is incorrect:

The following two files are always created during the upgrade and must be removed before you rebuild the kernel:

- `/etc/conf/mtune.d/kernel.n`
- `/etc/conf/mtune.d/tnc_dswap.n`

where *n* is the number of the previous release or a zero (0).

In the D10IPM20 release, these files are no longer created.

The following steps describe how to force a failover to node 1. You may need to perform this procedure if the results of the procedure called Verify that Node 1 Controls Root indicate that node 1 does not control the root directory.

To force a failover, follow these steps:

1. Run the following command to be sure that node 1 is completely up:

```
ptn -v
```

The following output is displayed if the node is up:

```
node: 1 status: UP
```

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If node 1 is not up, reboot it, or perform whatever steps are necessary to bring it up as a dependent node in the currently running cluster configuration.

2. Once node 1 is up, cycle the power on the current root node (usually node 2 if node 1 is not the root node). As node 2 goes down, the cluster automatically fails over to node 1. A message appears on node 1 indicating that the failover is complete.
3. When failover to node 1 completes, reboot node 2 to bring it back up as a dependent node.

Appendix B, Recovering from an Upgrade Failure

The following information replaces the original Appendix B:

An upgrade to version D10IPM20 of the NonStop Clusters operating system can fail for the following reasons:

- `.n` (dot number) files exist in `/etc/conf` directories
- Multiple copies of customer modifiable system files exist in the same directories as the current system files
- Kernel rebuild (`idbuild`) is not error-free

If the upgrade fails for any reason, you can normally recover by removing the D10IPM20 package, as described in *Removing the D10IPM20 Package*.

If removing the package does not work, you must perform a destructive installation as described in *Performing a Destructive Installation* on page 3.

Removing the D10IPM20 Package

The following procedure is normally all you need to recover from a failed installation of version D10IPM20 of the NonStop Clusters operating system.

1. Ensure that all data is backed up.
2. Verify that all nodes in the cluster are up and running. If they are not, bring them up.
3. Go to a command-line prompt on the root node.
4. Enter the following command:

```
pkgrm D10IPM20
```

If the preceding steps do not work, you must perform a destructive installation, as described in the following paragraph.

***Performing a
Destructive
Installation***

Use the following procedure to recover from an upgrade failure for which removing the D10IPM20 package did not work, or for any other situation that renders your cluster unbootable.

Use the following information to reinstall your system completely; that is, to perform a destructive installation:

- Installation Overview
- Required Software on page 4
- General Installation Procedures on page 4
- Installing UnixWare 2.1 on the Primary Node on page 7
- Installing NonStop Clusters on the Primary Node on page 16

Installation Overview

You must install SCO UnixWare 2.1.2 on at least one node in the cluster, making it the primary node. You can use a multi-port disk subsystem to allow the primary and secondary nodes direct access to a common disk drive for root filesystem failover. The first of these nodes installed with the complete UnixWare release is the primary node. Once you have installed UnixWare, you can install the NonStop Clusters software on that node and build the cluster kernel. Once this node is rebooted and running the new cluster kernel, it can act as an install server to the dependent nodes.

The next step is to create a boot diskette on the primary node to boot and install the remaining nodes. The boot diskette created on the primary node is used to boot, install, and configure each additional node. Once a node boots from the diskette, a menu-driven installation and configuration directs you through the remaining tasks.

Required Software

You must have the following required software components:

- The Compaq *SmartStart* CD-ROM (version 3.5 or later)
- The *UnixWare 2.1* installation CD-ROM containing the UnixWare 2.1.1 and UnixWare 2.1.2 updates
- The *NonStop Clusters for SCO UnixWare* installation CD-ROM (version D10)
- The *NonStop Clusters for SCO UnixWare* installation CD-ROM (version D10IPM10)
- The *NonStop Clusters for SCO UnixWare* installation CD-ROM (version D10IPM20)
- The *NonStop Clusters for SCO UnixWare Primary Node Boot Diskette* for installing NonStop Clusters software on the primary node in the cluster
- The *NonStop Clusters for SCO UnixWare Secondary Node Boot Diskette* for installing NonStop Clusters software on nodes other than the primary node in the cluster
- The *Compaq Host Bus Adapters for SCO UnixWare 2.1* diskette containing the Compaq drivers for the system
- The *Compaq NetFlex Controller Support for SCO UnixWare 2.1* diskette containing version 2.17 of the `ptfcnet` package

Optional hardware may require drivers that must be installed in addition to required NonStop Clusters software. If so, follow the instructions provided with each individual hardware item to install its software.

General Installation Procedures

Table 1 lists the major categories of steps required to install NonStop Clusters. For detailed information about each step, refer to the specified paragraph.

Table 1 **General Procedure for Installing NonStop Clusters**

| Step | Reference |
|---|---|
| If hardware has been added (for example, you have configured an optional disk array as the root file system), or if configuration information has been lost, boot the Compaq <i>SmartStart</i> CD-ROM on each node in the cluster to set up a small SmartStart system partition on each node's internal disk. | Follow the instructions in the Compaq SmartStart documentation. |
| On the primary node, boot from the <i>NonStop Clusters for SCO UnixWare Primary Node Boot Diskette</i> to start the installation of UnixWare 2.1.2. | See Installing UnixWare 2.1 on the Primary Node on page 7 |
| On the primary node, install HBA drivers from the <i>Compaq Host Bus Adapters for SCO UnixWare 2.1 diskette</i> . | See Installing UnixWare 2.1 on the Primary Node on page 7 |
| On the primary node, apply the UnixWare 2.1.1 update patch from the <i>UnixWare 2.1</i> installation CD-ROM. | See Update UnixWare 2.1 to 2.1.1 on page 12 |
| On the primary node, apply the 2.1.2 update patch from the <i>UnixWare 2.1</i> installation CD-ROM. | See Update UnixWare 2.1.1 to 2.1.2 on page 13 |
| On the primary node, install network adapter drivers for UnixWare 2.1.2 from the <i>Compaq NetFlex Controller Support for SCO UnixWare 2.1 diskette</i> . | See Installing NetFlex-3 Drivers on page 14 |
| Add any additional third-party packages. | See Complete the UnixWare Installation on page 14 |
| On the primary node, set tunable parameters to the UnixWare kernel. | See Reconfiguring the UnixWare Kernel on page 15 |
| Use the <i>NonStop Clusters for SCO UnixWare</i> CD-ROM to set up the primary node in the cluster. | See Installing NonStop Clusters on the Primary Node on page 16 |
| Install version D10IPM10 of the NonStop Clusters operating system. | See Installing NonStop Clusters Version D10IPM10 on page 18 |
| Make the dependent nodes for the cluster. | See Installing NonStop Clusters Version D10IPM10 on page 18 |
| Install version D10IPM20 of the NonStop Clusters operating system. | See the document titled <i>Upgrading to D10IPM20 NonStop Clusters Software</i> that came with your D10IPM20 CD-ROM. |

Getting Ready

Before beginning the recovery procedures discussed in the rest of this document, be sure that you have performed all the tasks described in the *Site Preparation and Hardware Installation* manual.

Running SmartStart

If hardware has been added to the cluster (for example, you have configured an optional disk array as the root file system), or if configuration information has been lost, set up a small SmartStart system partition containing the necessary configuration information on each node's internal disk.

Note When creating a new SmartStart system partition, be sure to set the IRQ for the ServerNet SAN card to 15.

For each mirrored RAID CPU pair, perform the following steps:

1. Insert the *Compaq SmartStart* CD-ROM into the drive of the main CPU.
2. Turn off both CPUs and the RAID box.
3. Power up the RAID box.
4. Power up the main CPU.
5. As the CPU boots, press the F10 key to run the *System Partition Utilities* and follow the instructions presented by those utilities. You need to configure the array only for the main CPU.
6. After setting up the main CPU, remove the *Compaq SmartStart* CD-ROM.
7. Power up the mirrored CPU and insert the *Compaq SmartStart* CD-ROM into the drive of the mirrored CPU.
8. Reboot the mirrored CPU so that it boots from the *Compaq SmartStart* CD-ROM.
9. As the CPU boots, press the F10 key to run the *System Partition Utilities* and follow the instructions presented by those utilities.

After setting up the mirrored RAID CPU pairs, perform the following steps for each non-RAID CPU:

1. Insert the *Compaq SmartStart* CD-ROM into the drive of the non-RAID CPU.
2. Turn off both CPUs and the RAID box.
3. Power up that CPU.
4. As the CPU boots, press the F10 key to run the *System Partition Utilities* and follow the instructions presented by those utilities.

After all CPUs have a SmartStart system partition, proceed to the next paragraph.

Installing UnixWare 2.1 on the Primary Node

After you have run the SmartStart utility, you are ready to install UnixWare 2.1 on the machine that will serve as the primary node for the cluster.

In general, follow the instructional guidelines described in the *SCO UnixWare Installation Handbook*, accepting reasonable defaults and entering local network values as they apply. While performing the following steps, refer to the paragraphs of the *SCO UnixWare Installation Handbook* that are indicated in the following subheadings.

“Inserting the Install Diskette and Booting Your Computer”

1. Insert the *UnixWare 2.1* installation CD-ROM in the drive for the primary node. Then, boot the node from the *NonStop Clusters for SCO UnixWare Primary Node Boot Diskette* instead of from the *SCO UnixWare Installation Diskette* that comes packaged with the *SCO UnixWare 2.1.2* installation CD-ROM.
2. Follow the instructions as they appear on the screen.

“Inserting Host Bus Adapter (HBA) Diskettes”

3. Replace the *NonStop Clusters for SCO UnixWare Primary Node Boot Diskette* with the *Compaq Host Bus Adapters for SCO UnixWare 2.1* and proceed.

“Entering the DCU to View/Change Device Driver Configuration”

4. *Do not* select the option to use the Device Configuration Utility (DCU) when prompted. Select the default option, Continue Installation.
5. When prompted to Select Installation Method, select Install from CD-ROM, then select Yes, continue the installation.

“Configuring Disk Partitions (Destructive Installation)”

6. You must elect to perform a destructive installation.
7. When the Destructive Installation options appear, select the Display a Screen to View/Change Current Disk Configuration option to view a partition table for disk 1 similar to the example illustrated in Table 2.

Table 2 Example of Disk 1 Partition Table with Small System Partition

| Disk 1 Partitions (2048 MB) | | | | | | | |
|-----------------------------|--------|--------|-------|-----|---|-----------|-----------|
| | Type | Status | Start | End | % | Cylinders | Size (MB) |
| 1 | System | | 0 | 4 | 1 | 5 | 39 |
| 2 | unused | | | | | | |
| 3 | unused | | | | | | |
| 4 | unused | | | | | | |

Number of cylinders: 522 Currently Used: 5

If necessary, on line 2 of the partition table, change the entries for the Type, Status, and % categories so that the resulting table looks similar to the example illustrated in Table 3.

Table 3 Example of Disk 1 Partition Table with Active UNIX System Partition

| Disk 1 Partitions (2048 MB) | | | | | | | |
|-----------------------------|-------------|--------|-------|-----|----|-----------|-----------|
| | Type | Status | Start | End | % | Cylinders | Size (MB) |
| 1 | System | | 0 | 4 | 1 | 5 | 39 |
| 2 | UNIX System | Active | 5 | 522 | 99 | 517 | 2009 |
| 3 | unused | | | | | | |
| 4 | unused | | | | | | |

Number of cylinders: 522 Currently Used: 522

“Entering System Node Name (Destructive Installation)”

8. NonStop Clusters uses the node name that you specify in the `System Node Name` field as the cluster node name.

“Choosing Install Menu Options”

9. To install optional UnixWare packages, select the `View or Change Package Selection` option from the `Install Menu` menu.

Note To ensure the proper operation of NonStop Clusters, the following UnixWare packages *must be* selected for installation:

- Base System
- OS Multiprocessor Support (using the platform support option for Intel Multiprocessor Specification architecture)
- Network Support Utilities
- Internet Utilities (TCP/IP)
- Distributed File System Utilities
- Remote Procedure Calls Utilities
- Auditing
- OA&M

Do not select any of the Novell support options for installation:

- Netware Networking
 - Netware UNIX Client
 - Netware Integration Kit
-

“View or Change Disk Configuration”

10. Select the **View or Change Disk Configuration** option from the **Install Menu** menu.
 - a. To configure the partition table for the disk array subsystem, select **Disk 2 Partitions** from the **Disk Configuration** menu. Allocate the entire disk as the active UNIX system partition so that the resulting table looks similar to the example illustrated in Table 4.

Table 4 Example of Disk 2 Partition Table

| Disk 2 Partitions (2048 MB) | | | | | | | |
|-----------------------------|-------------|--------|-------|-----|-----|-----------|-----------|
| | Type | Status | Start | End | % | Cylinders | Size (MB) |
| 1 | UNIX System | Active | 1 | 522 | 100 | 522 | 2048 |
| 2 | unused | | | | | | |
| 3 | unused | | | | | | |
| 4 | unused | | | | | | |

Number of cylinders: 522 Currently Used: 522

- b. From the **Disk Configuration** menu, select the **File Systems** option. See Table 5 as a guideline for specifying the values for the file systems.

Table 5 File Systems Table (page 1 of 2)

| Name | Type | Size | Disk |
|-------------------|-------------|---|--|
| / | vxfs | User configurable; must be 500–2047. Do <i>not</i> exceed 2047! | 2 (for RAID support and root file system failover) |
| /dev/swap | slice | Calculated by system; do not change | 1 |
| /stand | bfs | Must be 40 | 1 |
| /usr ¹ | off | User configurable; must be less than 2048 | 1 or 2 |
| /home | off or vxfs | User configurable; must be less than 2048 | 1 or 2 |
| /dev/dump | slice | Calculated by system; do not change except to accommodate the installation of more memory | 1 |
| /var ¹ | off | User configurable; must be less than 2048 | 1 or 2 |
| /home2 | off or vxfs | User configurable; must be less than 2048 | 1 or 2 |
| /tmp ¹ | off | Must be 64 | 1 |
| /dev/volprivate | slice | Must be 1 | 1 |

Table 5 File Systems Table (page 2 of 2)

| Name | Type | Size | Disk |
|----------------------------------|-------|-------------------------------------|------|
| /var/tmp ¹ (RAID) | off | – | 1 |
| /var/tmp ¹ (Non-RAID) | memfs | Must be 64 | 1 |
| ALTS TABLE | slice | Calculated by system; do not change | 1 |
| ALTS TABLE ² | slice | Calculated by system; do not change | 2 |

¹ Setting up separate file systems for /tmp, /var, or /var/tmp is not recommended. If necessary, create /tmp, /var, or /var/tmp as separate file systems on the disk array subsystem (Disk 2) and list these file systems in the /etc/tnc/fdevtab file. See the fdevtab(4) reference manual page for more information. Space not used for / (root), /var, /tmp, or /var/tmp file systems can be used for user file systems, such as /home or /home2. Caution should be exercised when creating user file systems on the primary node's internal disk drive (Disk 1), because these file systems will not be accessible during a primary node failover event.

² The second ALTS TABLE file system in a cluster corresponds to the disk array subsystem.

As you enter sizes in the File Systems Table, note that the amount in the Total Currently Used field is less than or equal to the amount in the Total Available field.

- c. From the Disk Configuration menu, select the Disk Operations option. Answer no to all items to shorten installation time. These checks were completed before shipping.
- d. Return to the Install Menu by selecting the Return to Previous Menu option of the Disk Configuration menu.

“Accept All Settings and Install Now”

11. From the Install Menu, select the Accept All Settings and Install Now option.

“Reinserting HBA Diskettes (if needed)”

When asked for the Host Bus Adapter diskette, use the *Compaq Host Bus Adapters for SCO UnixWare 2.1* diskette. After loading completes, remove the diskette from the drive.

“Identifying a Multiprocessor Platform”

12. When the Choose Platform Support Module screen appears, select the currently selected default setting, Intel MP Specification.

“Rebooting the System”

13. After the system reboots, a series of UNIX System Installation screens appear.

“Configuring Your Network Interface Card(s)”

- a. At the Network Interface Card Support Utility screen, select **Cancel This Utility Without Making Changes** from the **Please Select An Option** menu.

The installation of network adapter drivers for UnixWare 2.1.2 from the *Compaq NetFlex Controller Support for SCO UnixWare 2.1* diskette occurs later in this installation procedure.

“Selecting TCP/IP Network Parameters”

- b. When the **Inet Setup Values** from **System Files** options appear, enter values in the **System IP Address**, **DNS Domain Name** and **DNS IP Address** fields. After supplying all these values, press the F10 key to apply them.

“Selecting Your Mouse Type”

- c. When the **Mouse Selection** options appear, select 3 for **PS/2-Compatible Mouse**.
 - d. Specify that the mouse is a 2-button mouse.
14. Specify user passwords for **owner**, **root**, and **administrator** in the UNIX System Installation program. After you do, the system boots and the login prompt is displayed.
 15. Exit the graphical login screen, and log in as the **root** user.

You are now ready to update to UnixWare 2.1.1.

Update UnixWare 2.1 to 2.1.1

To update UnixWare 2.1 to 2.1.1, perform the following steps.

1. Insert the *UnixWare 2.1* installation CD-ROM in the drive for the primary node.
2. Obtain the device name for the CD-ROM drive in the primary node by entering the following command:

```
ls /dev/cdrom
```

This command returns *device* as an alphanumeric string of the form *cCbBtTlL*, where *C* is the controller, *B* is the bus, *T* is the target, and *L* is the logical unit.

3. Mount the CD-ROM by entering the following command:

```
mount -F cdfs -r /dev/cdrom/device /mnt
```

4. Add the package that updates UnixWare 2.1 to 2.1.1. To do so enter the following command:

```
pkgadd -d /mnt/UW211/PKGS update211
```

5. During the installation of the `update211` package, a series of UnixWare Update 2.1.1 screens appear.
 - a. When the X/Open Single UNIX Specification options appear, select 1 to specify the Do Not Enable Single UNIX Specification Conformance Now option.
 - b. When prompted, select 2 to rebuild the kernel.
 - c. When the Required Disk Resources menu appears, select 1 to Continue the Installation.
 - d. When the Select Backup Method options appear, select 3 to specify the Skip Backup option. When the Backup Warning options appear, select 2 to specify the Continue the Installation option.

Note You have 60 seconds to unmount `/mnt` after invoking shutdown in the following step. Be sure that you unmount the filesystem in the allotted time.

- e. When the Reboot screen appears, press the RETURN key to invoke the shutdown command.

- f. Unmount `/mnt` by entering the following command:

```
umount /mnt
```

You are now ready to update to UnixWare 2.1.1.

Update UnixWare 2.1.1 to 2.1.2

To update UnixWare 2.1.1 to 2.1.2, perform the following steps:

1. Be sure that the *UnixWare 2.1* installation CD-ROM is in the drive for the primary node.
2. Exit the graphical login screen and log in as the `root` user.

3. Using the same device name that you used previously for the CD-ROM drive, enter the following command to mount the CD-ROM:

```
mount -F cdfs -r /dev/cdrom/cCbBtTlL /mnt
```

4. Add the package that updates UnixWare 2.1.1 to 2.1.2 by entering the following command:

```
pkgadd -d /mnt update212
```

The UnixWare 2.1.2 package updates without requiring user input.

5. After UnixWare is successfully updated to version 2.1.2, unmount the CD-ROM by entering the command:

```
umount /mnt
```

6. Eject the CD-ROM.

You are now ready to complete the UnixWare installation.

Complete the UnixWare Installation

To finish installing UnixWare after updating from 2.1.1 to 2.1.2, complete the following steps:

- Install the Compaq NetFlex-3 network adapter drivers for UnixWare 2.1.2.
- Configure additional Transmission Control Protocol over Internet Protocol (TCP/IP) settings.
- Add any additional third-party packages.
- Reconfigure the UnixWare kernel by setting specified tunable parameters.

Installing NetFlex-3 Drivers

Perform the following steps to install the NetFlex-3 drivers:

1. Insert the *Compaq NetFlex Controller Support for SCO UnixWare 2.1* diskette in the drive.
2. Enter the following commands:

```
cd /  
pkgadd -d diskette1 ptfcnet
```

3. Configure the driver with the UnixWare Network Interface Card Support Utility by running `niccfg`.

4. On the summary screen of the Network Interface Card Support Utility, select the **Accept All Entries** option. After you confirm your selection, the `niccfg` utility returns to the command-line prompt.
5. Complete the installation as indicated in the UnixWare documentation to set network options or other site-specific information.
6. Remove the *Compaq NetFlex Controller Support for SCO UnixWare 2.1* diskette from the drive.

Adding Third-Party Packages

Add any additional third-party packages needed to support the application environment or hardware peripherals specific to your use of the NonStop Clusters operating environment.

Reconfiguring the UnixWare Kernel

To install the NonStop Clusters operating environment, you must reconfigure some of the tunable parameters in the UnixWare kernel. Before installing NonStop Clusters, perform the following steps:

1. Remove the Compaq wellness driver by entering the following command:
2. Modify the `HDATLIM`, `SDATLIM`, `SVMLIM`, and `HVMLIM` tunable parameters by entering the following commands:

```
/etc/conf/bin/idinstall -d cpqw
```

```
/etc/conf/bin/idtune -m HDATLIM 0x7fffffff  
/etc/conf/bin/idtune -m SDATLIM 0x7fffffff  
/etc/conf/bin/idtune -m SVMLIM 0x7fffffff  
/etc/conf/bin/idtune -m HVMLIM 0x7fffffff
```

3. Rebuild the kernel and restart the system by entering the following commands:

```
/etc/conf/bin/idbuild  
/etc/shutdown -i6 -g0 -y
```

You are now ready to install the NonStop Clusters operating system on the primary node.

Installing NonStop Clusters on the Primary Node

After UnixWare 2.1.2 reboots, you can install NonStop Clusters on the primary node in the cluster.

1. Exit the graphical login screen and log in as the `root` user on the primary node.

Note The tunable parameter settings for `data` and `memory` must be set to `unlimited`. To verify that these tunable parameters are set correctly, enter the following command:

```
ulimit -a
```

-
2. Insert the D10 version of the *NonStop Clusters for SCO UnixWare* installation CD-ROM in the drive, and enter the following command:

```
pkgadd -d cdrom1 -q ncu
```

3. When the NonStop Clusters installation program prompts you, specify your serial number and activation key.

For more information about serial numbers and activation keys, see the `keyadm(1M)` and `licensekeys(4)` reference manual pages.

Note After primary node installation is complete, be sure that you change directories to `/etc/config/licensekey`, and run the following command to pass the serial number and activation key (and other resource information) to the kernel:

```
keyadm -s
```

-
4. When the NonStop Clusters installation program prompts you for a node number, specify the number identifying the primary node. For the primary node, this number must be 1, and the primary node must be connected to port 0 on the ServerNet SAN switch servicing the cluster.

5. To ensure that your RAID subsystem provides root file system failover support, specify `yes` at the `Enable Backup Failover Server:` prompt.

6. Edit the `/etc/hosts` file. This file must list the node name and IP address for each node in the cluster, similar to the following example:

```
# Internet host table
127.0.0.1 localhost
168.87.155.16 nscat21
168.87.155.17 nscat22 # node 2
168.87.155.18 nscat23 # node 3
168.87.155.19 nscat24 # node 4
168.87.155.20 nscat25 # node 5
168.87.155.21 nscat26 # node 6
```

7. Edit the `/etc/default/login` file., and make sure that the `CONSOLE=` line is commented out. If it is not, comment it out before proceeding further. Failure to do so will prevent you from logging in as the `root` user on dependent nodes later in this procedure.

Note Do *not* run the `shutdown` or `idbuild` commands, and do *not* reboot at this point. Immediately begin installing the D10IPM10 version of NonStop Clusters.

Installing NonStop Clusters Version D10IPM10

To install the D10IPM10 version of the NonStop Clusters operating system, exit the graphical login screen, log in as `root`, and follow the instructions in the *Installing D10IPM10 NonStop Clusters Software* document that comes with the installation CD-ROM for the D10IPM10 release.

Begin with step 11 on page 13 of the *Installing D10IPM10 NonStop Clusters Software* document. Perform all the steps from that point, deviating from the D10IPM10 installation procedures only where indicated in the following paragraphs.

Note If the following error appears anywhere during the D10IPM10 installation, ignore it:

```
UX:init:ERROR:Command is respawning too
rapidly. Check for possible errors.

id: kp "/sbin/keepalive -t 10 -P 1 -S 2"
```

“Edit /etc/hosts and Verify RAID Information”

In step 2 on page 14 of the D10IPM10 installation instructions, perform the following substeps to verify the RAID information:

1. Run the following command:

```
cat /stand/boot
```

2. Look at the value for the `rootdisk` parameter. A typical value would be `c2b0t010`. Record the number of the controller (2 in this case: from `c2`).

3. Run the following command:

```
/etc/scsi/pdiconfig -l
```

4. Look at the value for the `(ida,1)` line. A typical line would be:

```
2:0,31,0:HBA      :(ida,1) CompaqSMART
```

5. Verify that the first number in the line matches the value you recorded in Step 2.

“Remove Certain Files Generated During Installation”

In step 4 on page 18, perform the following actions between steps 4a and 4b.

Remove the `kernel.0` file.

Perform a `diff` command on any other files and their `.0` counterpart. For example:

```
diff cfs cfs.0
```

Any changes you have made to these files (or any changes made by applications running on your system) will appear in the output of the `diff` command. Merge the changes that you want to keep into the file without the `.0` extension, and then delete the `.0` file as described in step 4b, on page 18 of the D10IPM10 installation.

“Reboot the Primary Node”

Before performing the steps described in the paragraph titled Reboot the Primary Node on page 19 of the D10IPM10 installation instructions, perform the following steps to update the keepalive files on your cluster:

1. Change directories to the keepalive configuration directory by running the following command:

```
cd /etc/spawndaemon.d
```

2. Obtain a list of the keepalive configuration files that require updating by running the following command:

```
awk -F: '/:/ {if (NF != 8) {print FILENAME}}' *
```

3. Using the `vi` editor, remove the seventh field and one of the colon separators (`:`) by it in each of the files listed in Step 2. For example, one of the files might contain the following information:

```
::root:sys:::10::snmpd_restart
```

4. After you remove the seventh field and one of the colon separators by it, the information would appear as follows:

```
::root:sys::::snmpd_restart
```

5. After you have edited all the necessary files, continue with the paragraph titled Reboot the Primary Node on page 19 of the D10IPM10 installation instructions.

“Install the Dependent Nodes”

Instead of performing the action described in the first bullet of step 4 on page 22, export the `TERM` value by running the following commands:

```
TERM=at386  
export TERM
```

“Reboot the Cluster”

Before performing any of the steps in this paragraph on page 26 of the D10IPM10 installation instructions, be sure that you make the primary node (node 1) active on your console by pressing the `Print Screen` key and selecting the primary node from the displayed list of nodes.

After completing the remainder of the steps for installing version D10IPM10 of the NonStop Clusters operating system, continue by installing version D10IPM20. Follow the instructions in the document titled *Upgrading to D10IPM20 NonStop Clusters Software*, that came with your D10IPM20 CD-ROM.