Upgrading Multiservice Switch 15000 in Succession Networks (PT-AAL1/UA-AAL1)

ATTENTION
Direct upgrade from SN05 to SN07 is not supported for Multiservice Switch 15000 nodes. Upgrade to SN06.2 first and then upgrade from SN06.2 to SN07. Refer to your SN06.2 Helmsman collection for the upgrade to SN06.2 and use this document to complete the upgrade to SN07.

The following topics are discussed in this section:

Who should read this document and why

This document is intended for the following users:

- You are upgrading Nortel Networks Multiservice Switch 15000 nodes from PCR 5.1 to PCR 6.1 within the context of a Packet Trunking - AAL1 (PT-AAL1) solution upgrade from SN06 to SN07.
- You are upgrading Nortel Networks Multiservice Switch 15000 nodes from PCR 5.1 to PCR 6.1 within the context of a Universal Access - AAL1 (UA-AAL1) solution upgrade from SN06 or SN06.2 to SN07.
- You are upgrading Nortel Networks Multiservice Switch 15000 nodes from one PCR 6.1 software version to another PCR 6.1 software version within the context of a PT-AAL1 or UA-AAL1

solution upgrade from one SN07 software version to another SN07 software version.

Note 1: The upgrade of other components within the solutions is not within the scope of this document. For more information about the solution level upgrades, see NN10320-100 *ATM Solutions Basics* and NN10300-100 *IP Solutions Basics*.

Note 2: The examples shown in this document represent an SN06 to SN07 upgrade. Additional notes are given when necessary for SN06.2 to SN07, or SN07 to SN07 upgrades.

Note 3: Multi-service configurations are not supported.

What you need to know

Before you begin upgrading the nodes, you must clearly understand the impact of upgrading Nortel Networks Multiservice Switch 15000 nodes within the Succession portfolio architecture. In addition, you must have reviewed the solution level upgrade strategies defined in NN10320-100 *ATM Solutions Basics* and NN10300-100 *IP Solutions Basics*.

To perform the procedures discussed in this document, you must have an extensive knowledge of Unix, Nortel Networks Preside Multiservice Data Manager server, and Multiservice Switch software configuration.

How this document is organized

This document presents a detailed flow chart of the specific tasks required to upgrade Nortel Networks Multiservice Switch 15000 nodes within the PT-AAL1 and UA-AAL1 solutions from Nortel Networks Preside Multiservice Data Manager (MDM) Command Console and/ or from Preside MDM Succession ATM Software Migration tool (SASM).

It also contains a detailed description of what happens on the node during a hitless software migration. Finally, it contains troubleshooting information and procedures to abort the upgrade if required.

NN10070-461 *Upgrading Nortel Networks Multiservice Switch 15000 in Succession Networks PT-AAL1/UA-AAL1* has three parts that reflect the basic phases of the upgrade:

- Preparation: the phase during which information is gathered and software is downloaded.
- Migration: the phase during which pre-HSM checks are made, the migration occurs, post-HSM checks are made,
- New feature activation, troubleshooting and rollback: the phase during which new mandatory features are activated, problems are fixed, and the migration is rolled back if required.

The preparation phase contains procedures that are common to any Command Console HSM. These procedures are performed prior to the migration. This part contains the following sections:

- Information collection on page 13
- Downloading and backing up Multiservice Switch software on page 19

The migration phase is divided into two parts to reflect the two migration options available:

- HSM from the Multiservice Switch 15000 node using Preside MDM Command Console.
- HSM using Preside MDM Succession ATM Software Migration (SASM) tool

HSM using the Command Console

This part contains the following chapters:

- HSM (Command Console) pre-work on page 49
- HSM (Command Console) activation on page 67

HSM using Preside MDM Succession ATM Software Migration tool

This is described in the section:

- HSM (Preside MDM SASM tool) activation on page 97

The new feature activation, troubleshooting and rollback phase contains procedures that are common to any Nortel Networks Multiservice Switch 15000 node HSM. These procedures are used following an HSM performed using Nortel Networks Preside Multiservice Data Manager Command Console or the SASM tool. This part contains the following sections:

- Feature activation on page 113
- Rollback on page 121
- Troubleshooting a software upgrade on page 125

What's new in this document

The terms Passport 15000 and Packet Voice Gateway (PVG) have been rebranded in conjunction with the new Nortel Networks' brand simplified naming format.

The Passport 15000 is now referred to as the Nortel Networks Multiservice Switch 15000. The Packet Voice Gateway (PVG) is now referred to as Nortel Networks Multiservice Switch 15000.

The Multiservice Switch 15000 and Media Gateway 15000 network elements continue to share common hardware and software aspects. Hybrid systems can combine these network elements' capabilities, despite the fact that no specific brand exists for such hybrids.

For more information on the product rebranding, refer to the NN10600-000 *Nortel Networks Multiservice Switch 7400/15000/20000 What's New in PCR6.1*.

The following changes were made to this document:

- The section Prerequisites to performing a software upgrade on page 7 was updated to include the SN06 to SN07 and SN07 to SN07 upgrade path.
- The section HSM (Command Console) activation on page 67 was updated to include information about an SN06 or SN07 to SN07 migration where Pbg components have been configured and to include cautionary advice on using the *continue -force* command if a pause occurs (due to a fault) during the migration.
- The section Upgrade the fabric on page 83 was updated to include information on how to perform an upgrade.
- The section Performing HSM using Preside MDM SASM on page 100 was updated to include information about authentication, applying a transparent patch using SASM, and SASM command response format, additional steps and information about continuing if the software migration pauses.
- The section Feature activation on page 113 was modified. The procedures: Enabling the recurring fan failure alarm on page 115, Setting the Succession release name identification on page 116, Setting Succession release name for Multiservice Switch 15000 on page 118 and Setting the log spooler daysToRetainFiles attribute on page 120 were added.

- The chapter on Troubleshooting a software upgrade on page 125 was updated to include information on error conditions during an HSM, error conditions during an HSM using the Preside SASM tool, problems with loading software and patches and problems with fabric card versions during an HSM.

Software migration

An upgrade to a Nortel Networks Multiservice Switch 15000 node is also known as a hitless software migration. During an upgrade of the Packet Trunking - AAL1 (PT-AAL1) and Universal Access AAL1 (UA-AAL1) solutions' components, the nodes must be upgraded so that you have access to new, enhanced, or corrected software applications.

An operator can choose to perform a software migration from either the Nortel Networks Preside Multiservice Data Manager (MDM) Command Console or the Preside MDM Succession ATM Software Migration (SASM) tool.

This section describes the overall hitless software migration process. For overview information on performing a hitless software migration from the Preside MDM Command Console, see What happens to the node during a hitless software migration on page 41. For overview information on performing a hitless software migration from the SASM, see Performing HSM using Preside MDM SASM on page 100.

Upgrade software to add new functionality to Nortel Networks Multiservice Switch 15000 nodes by activating a new version of software.

Prerequisites to performing a software upgrade

CAUTION
Calls in the process of being set up are dropped
This strategy removes inactive control and function processors from service. As a result, redundancy in the event of failure of the active shelf components is not available and some calls in the process of being set up (known as transient calls) are dropped. Stable calls are unaffected by the migration.

CAUTION
Loss of stable SVC connections may occur
When you perform the hitless software migration, a loss of SVC connections may occur. Although stable SVC calls should remain active in a redundant processor configuration, exercise caution when performing this upgrade.

- Nortel Networks Preside Multiservice Data Manager (MDM) software is backwards compatible and can manage the current and previous releases of Nortel Networks Multiservice Switch hardware. However, Preside MDM software is not necessarily forward compatible. As a result, you should upgrade Preside MDM servers before upgrading the nodes they manage. To upgrade Preside MDM servers, see NN10185-461 *Upgrading Preside MDM in Succession Networks*.
- If you have DS-1 IMA interfaces using the Edgelink MUX, ensure that you use the Edgelink MUX software (R3.3) during the SN07 upgrade. Contact Telco Systems to get the Edgelink MUX software and upgrade procedures: http://www.telco.com/products/Transport/M13Multiplexers/EdgeLink100/
- While the CS2000 Core Manager is being upgraded, a short interruption of OAM&P management occurs if the SDM is in the OAM flow to the OSS. To upgrade the CS2000 Core Manager, see NN10060-461, *CS2e Upgrades*.
- Make sure you have MAP-level access to the CS2000 and the SASM 21 if you have *Pbg* Components configured.
- Ensure that all configuration changes from the Global Bulletin System (GBS) and the Method of Procedure (MOP) are reflected on the node before performing the upgrade.
- Before performing the upgrade, ensure that all journal files are either used or purged by issuing the `display ProvisioningSystem restorePossible` command. If the response is “yes,” see the table Impact of an error condition on a HSM on page 126.
- You need to determine the order in which you will upgrade the nodes in your network. For in-band OAM topologies, you must upgrade all Nortel Networks Multiservice Switch 15000 nodes in the network in the following sequence:
  - upgrade all the remote nodes first
  - upgrade the Multiservice Switch 15000 Gateway node that is not preferred. For more information about preferred and non-preferred gateways, see NN10028-111 *Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Product and Technology Basics*

PT-AAL1/UA-AAL1/UA-IP and Appendix B - In-band OAM quick reference on page 143.

— upgrade the preferred Multiservice Switch 15000 Gateway node last. For more information about preferred and non-preferred gateways, see NN10028-111 *Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Product and Technology Basics PT-AAL1/UA-AAL1/UA-IP*

- You need an extensive knowledge of Unix, Multiservice Switch software, and Succession portfolio architecture.
- You need a valid node user ID configured for local access, and access to ftp, fmip, telnet and the Nortel Networks Preside Multiservice Data Manager (MDM) server.
- You need a:
  - — user ID for Web support (see Download release notes on page 15)
  - — user ID for root access to the Preside MDM tools.
  - — Preside MDM user ID for software download.
  - — user ID for general access to Preside MDM.
  - — Multiservice Switch 15000 node user ID with a minimum command scope of *device* and a command impact of *configuration*. To determine your command scope and impact, type **me**. Information about your user ID is displayed.
- We recommend that you perform the tasks involving commands issued from the command line using the Preside MDM Command Console tool rather than a Telnet session. For more information on using the Command Console, see 241-6001-804 *Preside MDM Workstation Utilities User Guide*.
- Ensure that all components supporting the service intended to be hitless are enabled. A check of all components should be performed prior to activating the migration provisioning to minimize any impacts to associated services.
- The nodes must be connected to the Preside MDM servers. The nodes must also be in service and capable of supporting traffic and network management functions. In addition, the nodes must not have any major or critical alarms raised on them.

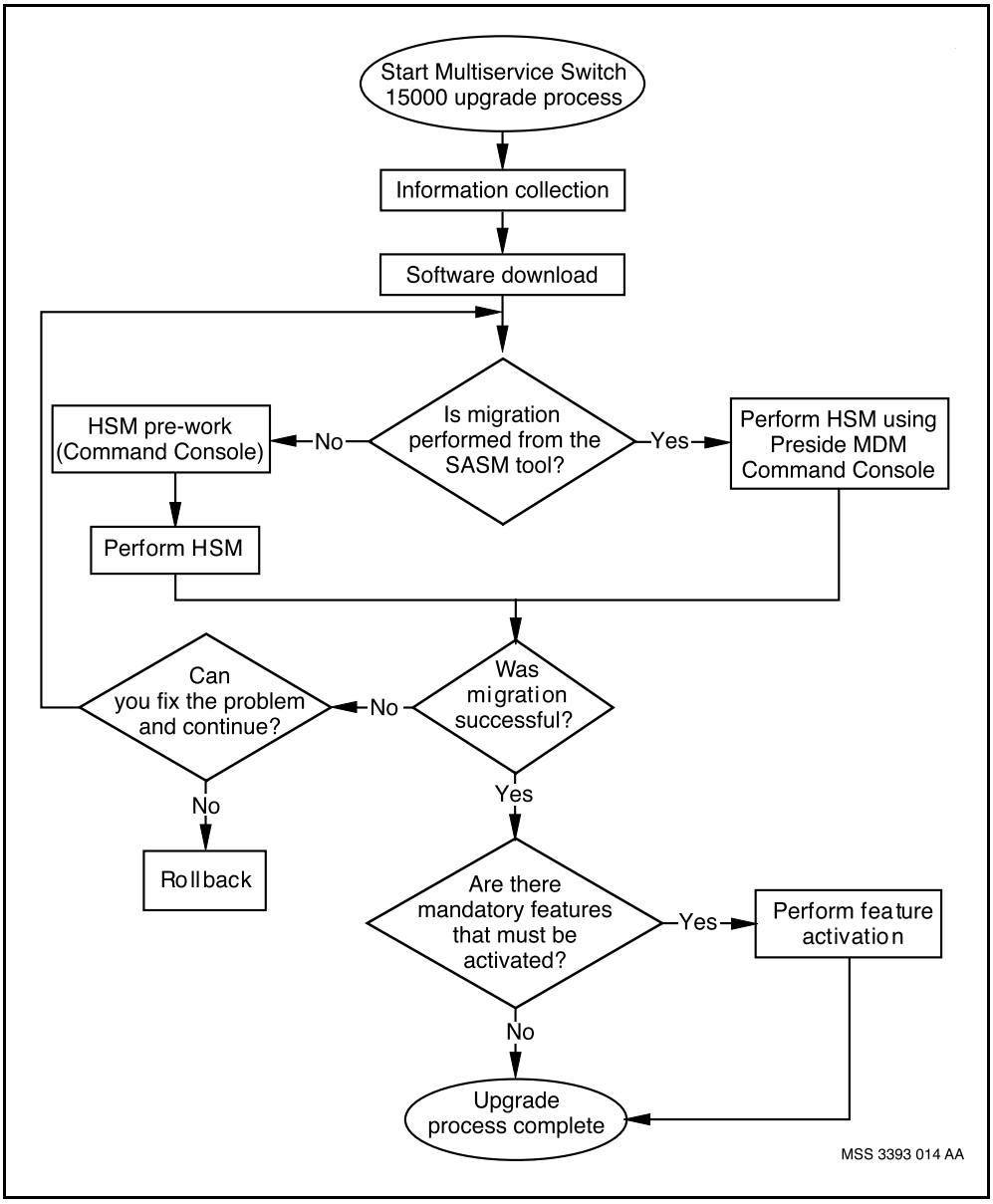
- Review the *Nortel Networks Multiservice Switch Release Notes PCR6.1* to determine the following:
  - how the data model has changed for this release and how you must adjust your configuration to compensate for these changes
  - which features and services are required by this release and by each of the processor cards, and which software files and applications you need to download to support these features and services
  - if the software you are installing is compatible with the other software already on the node
- Ensure that you have an alternate way to access the node in case you lose IP connectivity during the migration.

  For example, you can connect an operator terminal as described in the section “Connecting an operator terminal” in the NN10600-130 *Nortel Networks Multiservice Switch 15000/20000 Hardware Installation, Maintenance, and Upgrade*. You could also use a modem or some other mode of out-of-band connectivity that should have been in place during the initial installation of the node.
- You must complete the tasks described in the section “Multiservice Switch 15000 software upgrade task flow” (page 11) before installing additional hardware and configuring additional capabilities.
- Because of the amount of time required to remove old software releases, you may want to do this several days before beginning the upgrade. In particular, running the **tidy Software** command can take several hours to complete. As a result, you may want to run it overnight.

Multiservice Switch 15000 software upgrade task flow

The figure Multiservice Switch 15000 software upgrade task flow on page 11 shows you the sequence of procedures you need to perform to upgrade software. To link to any procedure, go to the list that follows the task flow chart.

Multiservice Switch 15000 software upgrade task flow



Work flow navigation

- Information collection on page 13
- Downloading and backing up Multiservice Switch software on page 19
- HSM (Command Console) pre-work on page 49 for migrations performed from the Command Console
- HSM (Command Console) activation on page 67, or HSM (Preside MDM SASM tool) activation on page 97
- Feature activation on page 113
- Rollback on page 121

Information collection

Collect information to identify and avoid any compatibility issues that could prevent a software migration from completing successfully.

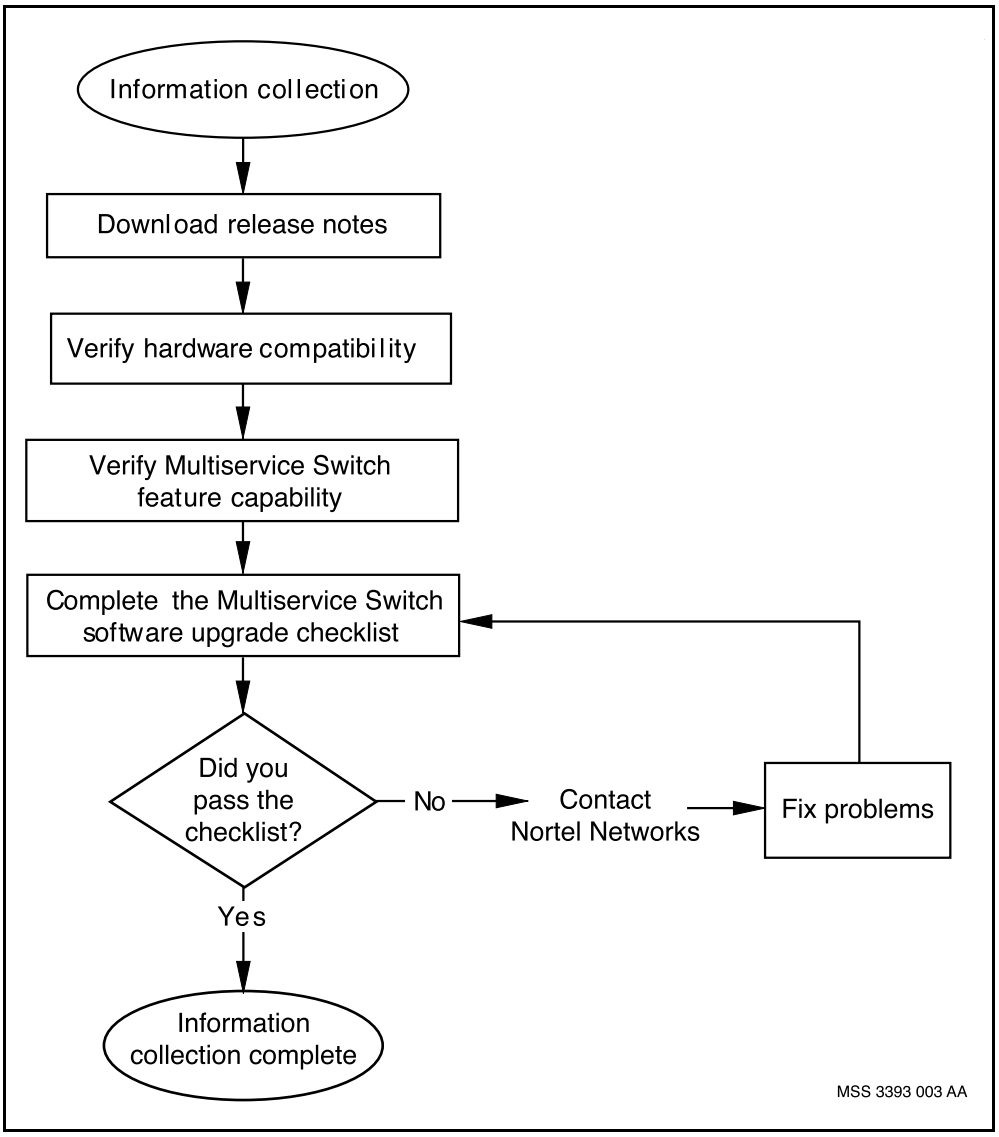
Prerequisites to information collection

- You have determined the order in which you will upgrade the Nortel Networks Multiservice Switch nodes in your network.
- You have determined that the Nortel Networks Preside Multiservice Data Manager servers have already been upgraded.
- You have confirmed which release of software is active on the node.
- You have determined an upgrade path to identify which release you are migrating to.
- The node is operating without known errors or failures.

Information collection task flow

The task flow shows you the sequence of procedures you perform to collect information about the upgrade. To link to any procedure, go to Work flow navigation on page 15.

Information collection task flow



Work flow navigation

- Download release notes on page 15
- Verify hardware compatibility on page 16
- Verify node feature compatibility.
- Complete the software upgrade checklist on page 17

Download release notes

Download the release notes for Nortel Networks Multiservice Switch in Succession PT/UA-AAL1 solutions to collect specific information affecting hardware and services for each of Multiservice Switch equipment software release (PCRs) and Multiservice Switch for Succession software releases involved in the migration.

From your browser

1. Go to the Nortel Networks public website.

   http://*www.nortelnetworks.com/*
2. In the section titled Support, click *Technical Documentation*.
3. Click *Passport* from the list of products.
4. Click the *Documentation* link under Passport 15000 for Succession PT/UA-AAL1.
5. A security screen appears requesting your user ID and password.
6. Enter your user ID and password.
7. Select and download all the documentation you require.

Verify hardware compatibility

Verify hardware compatibility to confirm that your hardware configuration will support all the software versions that will be used in the migration.

1. Note the product engineering codes (PECs) of all the processor cards used in your node.

   d shelf card/* prc

2. Review the hardware compatibility section in the *Nortel Networks Multiservice Switch Release Notes* for each release in your migration path to determine if there are any other hardware considerations.

3. Compare your hardware configuration to the minimum supported hardware information in the *Nortel Networks Multiservice Switch Release Notes* for each release in the migration path.

Verify node feature compatibility

Verify the node's compatibility with the new software to confirm that your configuration of services and features will not be negatively affected by the software migration.

1. Create a list of all the applications loaded on the node.

   d -p sw lpt/* fl, log

2. Refer to the *Nortel Networks Multiservice Switch Release Notes* for each PCR in your migration path to confirm there are no known compatibility issues.

3. If you have any doubt about the compatibility between your existing features and your migration path, contact your Nortel Networks Service Representative before beginning the migration.

Complete the software upgrade checklist

Complete this software upgrade checklist to confirm that all potential complications have been considered and eliminated. Use the information gathered while performing the Work flow navigation on page 15.

Multiservice Switch software upgrade checklist

Task	Yes	No	Date and Comments
A migration order has been established for all the Multiservice Switch nodes in the network.			
Migration plan has been created including acceptance criteria and fall back strategy (backup and restore).			
Migration plan has been reviewed and verified by migration prime as well as operational and engineering resources.			
Migration operator has complete knowledge of Multiservice Switch applications, features and software.			
Migration operator has complete knowledge of all software versions in the migration.			
The *Nortel Networks Multiservice Switch Release Notes* for all releases in the migration path have been reviewed for potential impacts to the migration plan.			
Network health has been analyzed to verify that no known problems exist.			
Network management platform meets minimum hardware requirements.			
Network management software is compatible with each release in the migration plan.			
Network statistical data is collected. (Install NetRx if required. See http://*www.nortelnetworks.com*)			

Task	Yes	No	Date and Comments
Multiservice Switch hardware is compatible with all releases in the migration plan.			
Multiservice Switch software is compatible with all releases in the migration plan.			
All provisioning files have been saved (backed up).			
Network configuration changes have been prohibited.			
The software version you are migrating to has been downloaded and installed on the Preside MDM server acting as an SDS.			
The software version patches to be applied have been downloaded and installed on the Preside MDM server acting as an SDS.			
All configuration changes from the Global Bulletin System (GBS) and the Method of Procedure (MOP) are reflected on the node before performing the upgrade.			
The file system is organized and the migration operator knows which software versions are applicable to the migration plan.			
For networks using in-band OAM, is this node a gateway node or a remote node?			
The software version currently running on the node is:			
The current patches running on the node are:			
The intended software after the migration is:			
The software patches you are applying during the upgrade are:			
The PCRs between the intended software release and the current PCR operating on the node are:			

Downloading and backing up Multiservice Switch software

Before you can begin your upgrade, ensure that the correct version of Nortel Networks Multiservice Switch software and the correct patches have been downloaded to the Nortel Networks Preside Multiservice Data Manager server acting as the software distribution site (SDS). After verifying that you have the correct software and patches, you can download them to the nodes.

Prerequisites to software download and backup

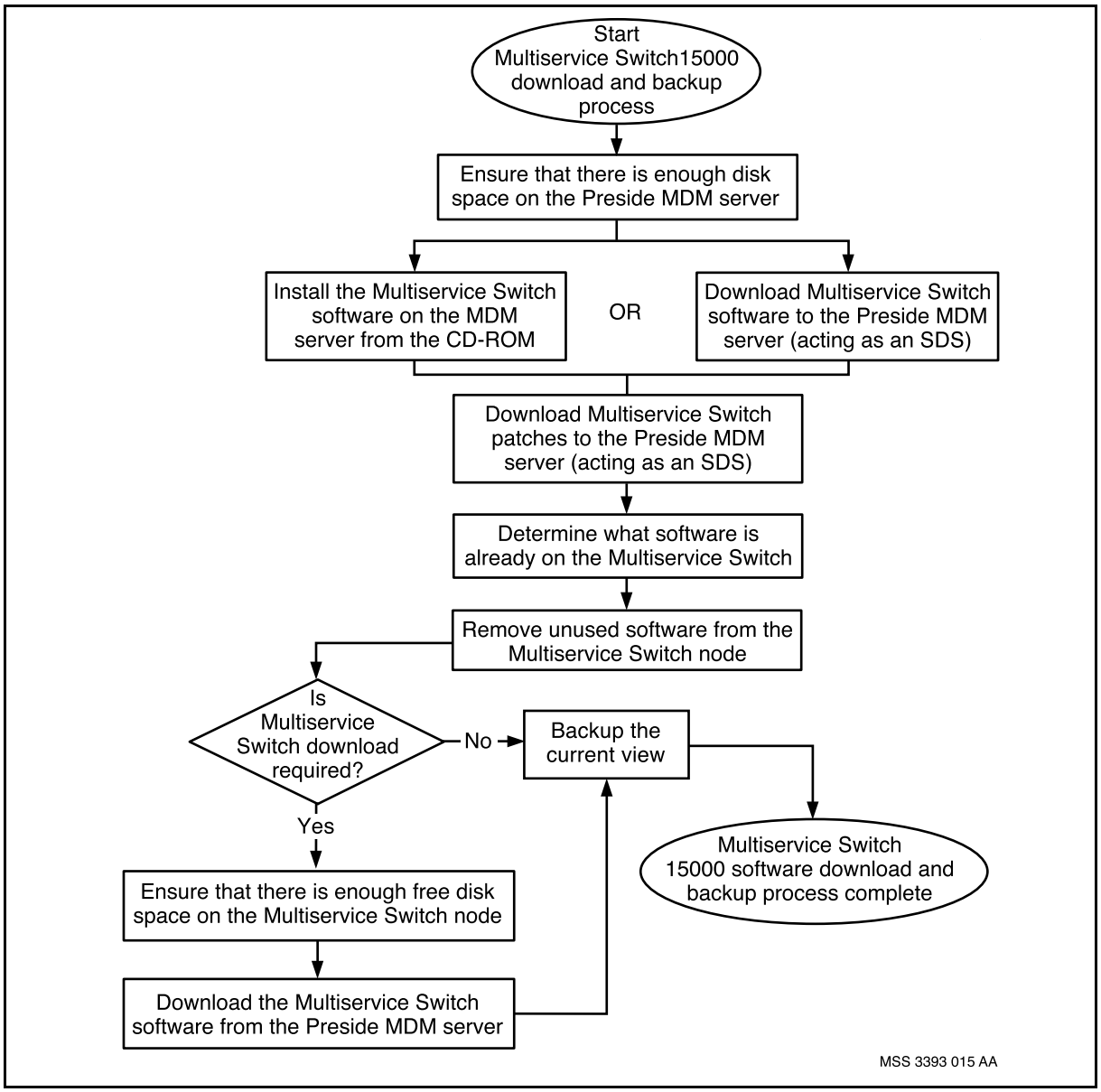
- Within the PT-AAL1 and UA-AAL1 solutions, one of the Nortel Networks Preside Multiservice Data Manager (MDM) servers has been configured as a software distribution site (SDS). The server acting as the SDS manages, stores, and provides access to Nortel Networks Multiservice Switch software and patches. To upgrade your Multiservice Switch nodes, you must download the required software from this server to the nodes.
- The download of the software and patches onto the server acting as the SDS and the download of the software and patches from this server to the nodes can be done at any time prior to the hitless software migration. Unless there are specific operational requirements, perform these tasks before the upgrade period begins.
- The application version list must contain the following applications: base, networking, atmNetworking, and ip. If your nodes have been configured with in-band OAM, you will also have the wanDte application. The application version list must not contain any additional applications.

Software download and backup provisioning views task flow

This task flow shows you the sequence of procedures you need to perform to configure the Nortel Networks Preside Multiservice Data Manager (MDM) as an SDS, download the Nortel Networks Multiservice Switch software and patches to the server, and finally to download the software and patches to the nodes.

Note: These procedures are located in two documents. Four are in this document, and the remaining procedures are in NN10600-270 *Nortel Networks Multiservice Switch 7400/15000/20000 Software Installation*. To complete this task, perform the procedures in the listed sequence.

Software download and backup task flow



Work flow navigation

- Ensuring that there is enough disk space on the server on page 23
- Download the software to the server from the Nortel Networks website on page 24 or
- Download software patches to the server from the website on page 26
- Install the software on the server from a CD-ROM on page 28
- “Determining what software is already on the node” in NN10600-270 *Nortel Networks Multiservice Switch 7400/15000/20000 Software Installation*
- “Removing unused software from the node” in NN10600-270 *Nortel Networks Multiservice Switch 7400/15000/20000 Software Installation*
- Ensuring that there is enough free space on the node on page 30
- Download the software from the server on page 32
- Back up the current view on page 36

Ensuring that there is enough disk space on the server

Before downloading the required software and patches to the Nortel Networks Preside Multiservice Data Manager (MDM) acting as the SDS, verify that the server has sufficient disk space to hold the software release.

Prerequisites

- Nortel Networks Multiservice Switch 15000 software requires approximately 300 Mbytes of space. See the *Nortel Networks Multiservice Switch Release Notes for PCR6.1* to verify the disk space required for this release.

From the Preside MDM acting as the SDS

1 Log in.

2 Determine how much disk space is available on the partition containing the Multiservice Switch software:

df -k /localdisk/pp15ksw/software

Note: This directory path assumes that the user ID configured to access the software on the SDS has a home directory of /localdisk/pp15ksw. If the user ID has a different home directory, adjust the directory accordingly.

The system indicates (in kilobytes) how much disk space is available in the disk partition.

3 Verify that the space available is more than 300 Mbytes.

4 If there is not 300 Mbytes of space, remove files from the server, as required. You can safely remove software from the SDS after all subtending nodes are upgraded to a new release.

Software is located among multiple directories (base, atm, ip). Each release subdirectory must be located and removed. The directory structure on the SDS includes the following directories:

- a user-defined home directory which is the default login directory. The home directory must have a subdirectory called software.
- application directories, which contain the software application version directories.
- software application version directories, which contain all the control files and object files for a particular version of an application.

Download the software to the server from the Nortel Networks website

After verifying that the Nortel Networks Preside Multiservice Data Manager (MDM) server acting as the SDS has sufficient disk space, you can begin to download the Nortel Networks Multiservice Switch software from the website. When you download the software from this website, a copy of the software is placed in the directory you specify.

Prerequisites

- You need a Nortel Networks Web access account with a user name and password. Contact your Nortel Networks customer representative for more information on accessing the site.
- Refer to the software downloads area of the website (*www.nortelnetworks.com*) to determine the software load that you must install.
- The software you need to download may be composed of more than one file. Ensure that you download all software files that belong to the release you require.
- After downloading the required software release from the website, you need to download the associated patches.
- Verify which Multiservice Switch software and patches are available on the Preside MDM server.
- Ensure that there is enough disk space on the server.

From the Preside MDM server acting as the SDS

1 Login.

2 On the web, go to *www.nortelnetworks.com*.

3 In the Support section of the window, click *Software Downloads*.

The Software Downloads window opens.

4 Click *Log In*.

5 When prompted, enter your user name and password.

6 In the Product Family section of the Software Downloads window, click *Passport*.

The Passport Product Family window opens.

7 Under the Passport 15000 for Succession PT/UA-AAL1 section, click *Software*.

The software versions you can download are listed.

8 Click the version of the release software you want to download.

Note: The software you want to download may be composed of more than one file. Ensure that you download all software files that belong to the release you require.

The Software Downloads: Software Detail Information window opens.

9 Click the load name listed beside the File Download heading.

A Save As dialog opens.

10 Specify a folder in the home directory of the Preside MDM user to indicate where you want the patch placed. This is typically:

/localdisk/pp15ksw/

11 Click **Save**.

12 On the server, change directories to the directory containing the software (This is the same directory you specified in step 10.):

cd /localdisk/pp15ksw/

13 Uncompress the software file:

uncompress <load_name>.tar.Z

14 Untar the software file:

tar -xvf <load_name>.tar

15 Repeat step 9 through step 15 for every software file you want to download.

16 Remove the tar file: **rm -r <swload_name>.tar**

Variable values

Variable	Value
<load_name>	The name of the software load file that you want to download.

Download software patches to the server from the website

In addition to the main software release, you may need to download patches from the Nortel Networks website to the Preside Multiservice Data Manager (MDM) server, which is acting as the SDS. When you download the patches from this website, a copy of the patches is placed in the specified directory.

Prerequisites

- You need an account with a user name and password. Contact your Nortel Networks customer representative for more information on accessing the website.
- Refer to the software downloads area of the website (*www.nortelnetworks.com*) to determine the software patches that you must install on the node. If there are no patches listed for this release, it means that there are no patches currently required for this release.
- Verify which Nortel Networks Multiservice Switch software and patches are available on the Preside MDM server.
- Ensure that there is enough disk space on the server.
- Regular software has been downloaded.

From the Preside MDM server acting as the SDS

1 Login.

2 On the web, go to *www.nortelnetworks.com*.

3 In the Support section of the window, click *Software Downloads*.

The Software Downloads window opens.

4 Click *Log In*.

5 When prompted, enter your user name and password.

6 In the Product Family section of the Software Downloads window, click *Passport*.

The Passport Product Family window opens.

7 Under the Passport 15000 for Succession PT/UA-AAL1 section, click *Software*.

The software patches you can download are listed.

8 Click the patch that you want to download.

The Software Downloads: Software Detail Information window opens.

Note: If there are no patches listed for this release, it means that there are no patches currently required for this release. You can move on to the next task in the upgrade process.

9 Click the patch name listed beside the File Download heading.

A Save As dialog is displayed.

10 Specify a folder in the home directory of the Preside MDM user to indicate where you want the patch placed. This is typically:

/localdisk/pp15ksw/

11 Click *Save*.

12 On the server, change directories to the directory containing the patch (This is the same directory you specified in step 10.):

cd /localdisk/pp15ksw/

13 Uncompress the patch file:

uncompress <patch_name>.tar.Z

14 Untar the patch:

tar -xvf <patch_name>.tar

15 Repeat step 8 through step 15 for every patch you need.

16 Remove the tar file.

Variable values

Variable	Value
<patch_name>	The name of the patch that you want to download.

Install the software on the server from a CD-ROM

An alternative to downloading the software from the server acting as the SDS, is to install the software from Nortel Networks Multiservice Switch CD-ROM using the installation program.

Prerequisites

- You need a copy of Nortel Networks Multiservice Switch PCR6.1 software CD. Contact your Nortel Networks customer representative for information on how to order a CD.
- You need the IP address of the Nortel Networks Preside Multiservice Data Manager (MDM) server acting as the SDS.
- After installing the required software release from the CD-ROM, you need to download the required patches. For more information, see Download software patches to the server from the website on page 26.

From the Preside MDM server that is the acting SDS

1 Log in to the server.

2 Insert the software CD in the server's CD-ROM drive.

3 Create a directory for mounting the CD:

cd /

mkdir /cdrom

Note: If the mountable CDs have been used for other applications, you may not have to create this directory.

4 Start the installation program:

/cdrom/cdrom0/install

5 Follow the installation program's prompts.

6 When the installation program prompts you for a product, select Passport 15000.

7 When the installation program prompts you, select Install software.

8 When the installation program prompts you for a directory in which to place the software, type the following:

/localdisk/pp15ksw/

The installation program indicates when the installation is complete. At this time, the software has been installed in the directory you defined when prompted by the installation program.

9 Once the software has been successfully installed, log back into the Preside MDM server.

10 Eject the CD from the CD-ROM drive:

eject cdrom

Ensuring that there is enough free space on the node

Before downloading Nortel Networks Multiservice Switch software and patches from the server, ensure that the node has sufficient disk space to download the software applications.

Prerequisites

- Ensure that there is sufficient space to download the software files for the following applications: base, networking, atmNetworking, ip, (and wanDte and fabric if necessary). The amount of space required for the (up to) six applications is approximately 250 Mbyte.
- If your nodes have been configured with in-band OAM, you will also need to download the wanDte application. Allocate additional space for this application.
- If you need to upgrade the fabric card firmware with this release, you will also need to download the fabric application. Allocate additional space for this application.
- If you need to download patches, allocate additional space for the patches.
- See the *Nortel Networks Multiservice Switch Release Notes PCR6.1* and the software downloads area of Nortel Networks website (*www.nortelnetworks.com*) to determine the software load and patches that you must install, and the amount of disk space required. See the section on determining which software is already on the node in NN10600-270 *Nortel Networks Multiservice Switch 7400/15000/20000 Software Installation*.

From the node

1 Log in to the node using the appropriate permissions.

2 Determine the space currently available on the file system:

display FileSystem freeSpace

The number of bytes available on the system is displayed.

3 Verify that the space available is more than 250 Mybte.

Note 1: If your nodes have been configured with in-band OAM, you need to allocate additional space for the wanDte application.

Note 2: If you need to install patches, you need to allocate additional space for the patches.

4 If the file system does not have enough available space, remove any unused software and provisioning files. See the section on

removing unused software in NN10600-270 *Nortel Networks Multiservice Switch 7400/15000/20000 Software Installation*.

Note: Removing unused software will usually free up sufficient disk space. However, it is possible that a significant amount of disk space is being used by spooling files if they are not being removed often enough by the Management Data Provider (MDP). If this is the case, use MDP to retrieve and delete spooling files. See 241-6001-309 *Preside MDM Management Data Provider User Guide*.

Download the software from the server

Before beginning the hitless software migration, you need to download the software from the Nortel Networks Preside Multiservice Data Manager (MDM) server acting as the SDS, to the nodes.

Prerequisites

- Download the software to the server from the Nortel Networks website on page 24 or install the software from a CD-ROM.
- Download software patches to the server from the website on page 26.
- Perform the procedure “Ensuring that there is enough free space on the file system” in NN10600-270 *Nortel Networks Multiservice Switch 7400/15000/20000 Software Installation*.
- You need to download the software files for the following applications: base, networking, atmnetworking, and ip. If your nodes have been configured with in-band OAM, you will also need to download the wanDte application.
- If you need to upgrade the fabric card firmware with this release, you will also need to download the fabric application. For more information, see Upgrade the fabric on page 83.
- Refer to the software downloads area of Nortel Networks website (*www.nortelnetworks.com*) to determine the software load and patches that you must install on the node. If there are no patches listed for this release, it means that there are no patches currently required for this release.
- You need the IP address of the Preside MDM server acting as the SDS.
- You need the user ID that has read access to the node and the associated password for that user ID. This is the user ID for the folder specified in step 10 of Download software patches to the server from the website on page 26.
- If you are using the CLI to perform this upgrade, we recommend that you use the Preside MDM Command Console tool. For more information on opening the Command Console, see 241-6001-804 *Preside MDM Workstation Utilities User Guide*.
- Support for multiservices is not available.

From the node

1 Login to the node using the appropriate permissions.

Note: You need a user ID with a minimum command scope of *device* and a command impact of *configuration*.

2 Verify that the downloader is inactive:

display Software Download status

The value of the *status* attribute must be inactive.

3 Set the processor target type for the application versions:

set Software Download processorTargets PPC i960

4 Create the list of software applications that you need to download:

set Software Download avListToDownload ! <application_versions>

You must download the software files for the following applications:

- base_CF01xxx
- networking_CF01xxx
- atmNetworking_CF01xxx
- ip_CF01xxx
- wanDte_CF01xxx (if your nodes have been configured with in-band OAM)
- fabric_CF01xxx
- patch_CF01xxx

Note: You can not download patch_CF01xxx if you have a release earlier than PCR 6.1. Download patch_CF01xxx after upgrading to SN07. Refer to the Attention note in step 8 in procedure Perform HSM using Command Console on page 69.

Nortel Networks Multiservice Switch system downloads any patches associated with the application versions you specify.

5 Verify that the software applications that you want to download are in the list of software that will be downloaded:

display Software Download avListToDownload

6 Start downloading the software:

start -host(<ipAddress>) -user(<userId>) -password(<password>) Software Download

The download process begins.

7 Monitor the progress of the download:

display Software Download

When the *status* attribute is *inactive* and the *filesToTransfer* attribute is *0*, the download is complete.

8 Verify that the software listed in step 4 was downloaded:

list Software ApplicationVersion/*

9 Verify that the patches listed in the software downloads area of the Nortel Networks website (*www.nortelnetworks.com*) were downloaded:

list Software ApplicationVersion/* Patch/*

Variable values

Variable	Value
<application_version>	A space-separated, case sensitive list of application versions. Download the new version of the base, networking, atmNetworking and IP applications. If your node has been configured with in-band OAM, you also need to download the wanDte application. If you need to upgrade the fabric card firmware with this release, download the fabric application. For more information, see Upgrade the fabric on page 83.
i960	An attribute indicating that the i960 processor type is being used. This attribute is always required.
<ipAddress>	The IP address of the Preside MDM server acting as the SDS.
<password>	The password for the <userid> of the Preside MDM server acting as the SDS.
PPC	An attribute indicating that the PowerPC processor type is being used. This attribute is always required.

Variable values

Variable	Value
<userid>	The <userid> for a Preside MDM account that contains the Multiservice Switch software to be downloaded The value is usually pp15ksw.

Back up the current view

Save a view from a node using the Preside MDM Backup and Restore tool. This tool copies service data and application version information from the node to a reliable data storage site. This view can be used to restore provisioning on a node in case of file corruption.

Prerequisites

- The view to be saved must be either a committed or portable view.
- You must have write permissions on the node, with a minimum impact of service, a minimum scope of device, and a minimum access of ftp and fmip.
- The backup site can be the Preside MDM server or another node. It can also be a Software Distribution Site (SDS) configured to store backed-up node service data.
- Verify that the backup site has enough space to accommodate the backup. For more information, see NN10600-272 *Nortel Networks Multiservice Switch 7400/15000/20000 Upgrading Software*.
- The Preside MDM Backup and Restore tool uses the */tmp* directory to perform some of its file processing (for example, archive, compress, and uncompress). Your local disk needs to have twice the amount of space as the actual size of the files you are transferring for back up. You need to clean up the local disk if errors are raised (for example, *"No space left on device")*. In this case, you can mount the */tmp* directory from a lower-usage disk on a selected file server.
- The Preside MDM Backup and Restore tool backs up only the node's configuration data. It does not back up the software.
- The Backup server, the Restore server, the Backup Provider, and the Restore Provider must all be running on the Preside MDM server for the Preside MDM Backup and Restore tool to function properly. Using the Preside MDM Server Administration tool, verify that these four servers are running. If they are not, or if you need more information, see 241-6001-807 *Preside MDM Network Backup and Restore*.
- Using the **display -o prov** command, ensure that the committed view, the current view, the edit view, and the last used view are identical. If these views are not the same, see NN10600-270 *Nortel Networks Multiservice Switch 7400/15000/20000 Software Installation* for information on making them the same.
- The Preside MDM server has been configured to regularly back up the provisioning files from the nodes. By creating a backup of the

committed file before beginning the upgrade, you ensure that you have the most current committed file you can have before beginning the migration.

- If a view is not saved prior to an upgrade attempt and you have to revert to a previous software load, then you must re-configure the old software release manually.
- If you need to revert to a saved view of an older software version, when the node restarts, it restarts in the operational state it was in when you saved that view.

From the node

1 Login with the appropriate permissions.

2 Display on-switch provisioning to determine which files you need to back up:

display -o prov

The *commitedFileName* is the view you need to save. The *committedFileName* and the *currentViewFileName* should be the same.

Sample output

```
1> d prov
Prov
adminState = unlocked
operationalState = enabled
usageState       = idle
provisioningActivity = none
activityProgress     = n/a
standbyCpActivity    = none
standbyCpActivityProgress = n/a
committedFileName         = BASE_ENG01_7_0_9.full.005
currentViewFileName       = BASE_ENG01_7_0_9.full.005
lastUsedFileName          = BASE_ENG01_7_0_9.full.005
provisioningSession       =
provisioningUser          = none
checkRequired             = no
confirmRequired           = no
editViewName              = BASE_ENG01_7_0_9.full.005
editViewAddedComponents   = 0
editViewDeletedComponents = 0
editViewChangedComponents = 0
```

3 Login to a Preside MDM server as a root user ID.

4 Open a Preside MDM window:

/opt/MagellanNMS/bin/nmstool &

The copyright dialog and the Preside MDM window open.

5 Click **OK** to close the copyright dialog.

6 From the window, select Configuration > Passport > Administration > Passport/ Backup/Restore.

The Backup and Restore window opens.

7 From the File menu, click **Open**.

The Open File dialog opens.

8 Select *device.conf* using the Look in drop-down list box and clicking on the file in the display panel. You can also enter the path and the *device.conf* file name in the File name text box.

9 Click **Open** to list the selected group information file.

The list of groups defined for the server appears.

10 Double-click the group to which the target node belongs.

11 Select the node that you want to back up.

The selected devices have a check mark in the *Bck* column. All other devices have no entry in the Bck column.

12 Uncheck devices that do not need to be backed up.

13 In the WR Community area, enter your user ID and password.

14 In the Backup Mode Selection area, click **sel**.

15 Select the view name to back up. This should be the current view on the node and should be noted in your pre-migration check list.

16 Click **Backup**.

When the back up completes successfully, a message is displayed in the Message area. If the back up is unsuccessful, an error dialog is displayed that specifies the device and the reason for the failure.

17 When the back up is finished, click **Exit** to close the window.

HSM overview

This section describes Nortel Networks Multiservice Switch hitless software migration, along with its associated processes. While an HSM must be preceded by pre-migration checks and followed by post-migration checks, these are not described in this overview. For information on pre-migration checks, see HSM (Command Console) pre-work on page 49. For information on post-migration checks, see Verify the success of HSM on page 90.

What happens to the node during a hitless software migration

Nortel Networks supports hitless software upgrades on Nortel Networks Multiservice Switch 15000 nodes used in Succession Packet Trunking - AAL1 and Succession Universal Access - AAL1 solutions. During a hitless software migration, the node logically splits into two shelves: the service shelf and the migration shelf. The service shelf contains the active FPs and is controlled by the active CP. The migration shelf contains the standby FPs and is controlled by the standby CP. The standby cards that are being loaded with the new version of software are referred to as the migrating cards.

During the migration, the active CP and FPs continue to operate using the old version of software while a new version of software is being loaded and provisioned on the migrating CP and FPs. The active cards remain active until the migrating cards have finished migrating to the new software and are ready to take over.

On shelves with Port Bridging (Pbg components), migration must be activated with the *-pause* option, so that when the migration shelf is ready, the migration will pause. When the operator issues the *continue prov* command, the active CP and FPs shut down and the migration shelf becomes the new active shelf.

Without the pause, when the migration shelf is ready, the migration shelf will become the active shelf without operator intervention. This is called migration switchover. The CP and FPs in the former service shelf then reset and are loaded with the new version of software.

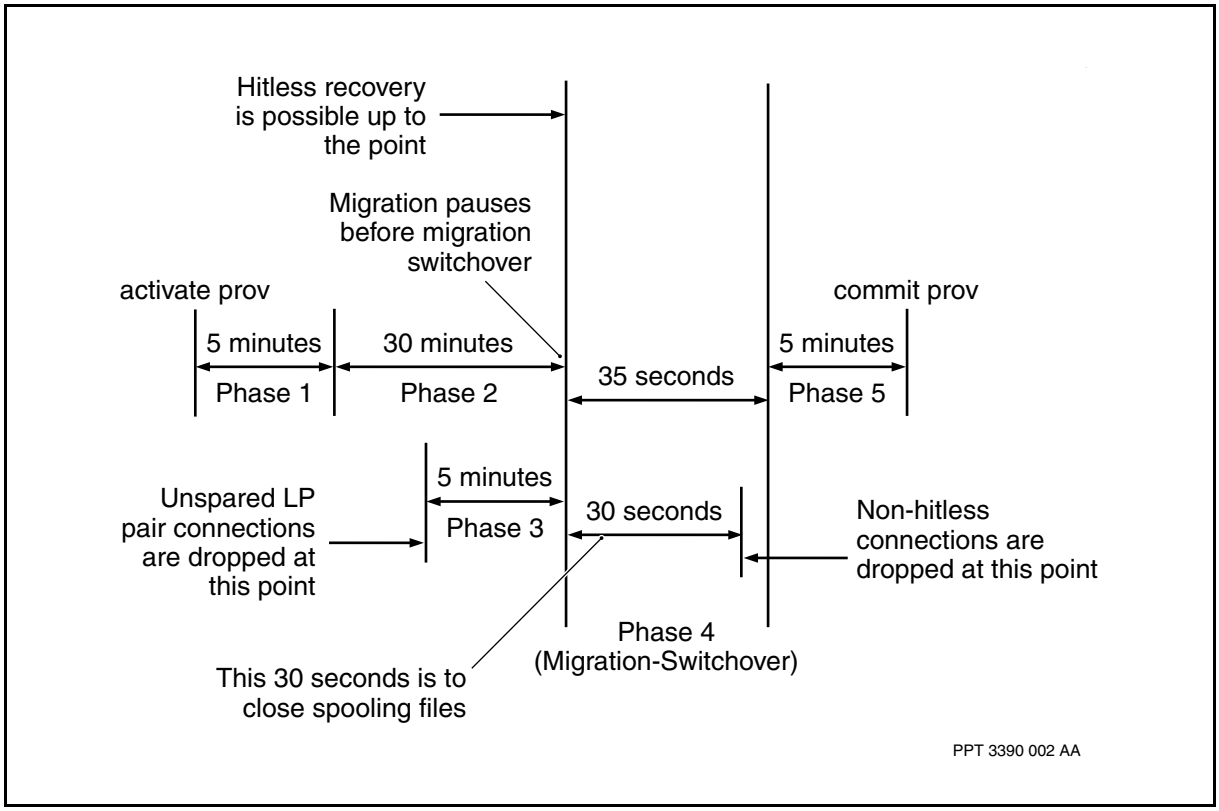
Note: If a problem is detected by the system, the process pauses automatically allowing the operator to stop migration or fix the problem and continue.

The five phases of a hitless software migration are as follows:

- Phase 1 — Preparation of the CP on page 43
- Phase 2 — CP migration on page 43
- Phase 3 — FP migration on page 44
- Phase 4 — Migration switchover on page 45
- Phase 5 — Post-migration on page 47

Refer to the figure Multiservice Switch hitless software migration phases on page 42 for more information about the phases.

Multiservice Switch hitless software migration phases



Phase 1 — Preparation of the CP

As the hitless software migration begins, the following occurs:

1. The edit view is saved in a temporary file.
2. Hitless CP switchover is disabled.
3. The card availability status of the standby CP is set to migrating. The standby CP resets to load new software.
4. The system responds to the *activate prov* command indicating that a software migration activation is to be performed.
5. Certain operator commands are automatically disabled.
6. The *Prov Migration* component is created and a SET warning alarm is issued against this component indicating that a software migration is being performed.

   Note: The disabled operator commands remain disabled by the system until after the migration switchover or hitless recovery.

Phase 2 — CP migration

After the system raises the SET warning alarm to complete phase 1, the following occurs:

1. The migrating CP is reset to load new software and start up in migration mode.

   The operator can activate migration with the *-pause* option to halt migration before a migration switchover occurs. If activated, migration pauses regardless of any fault conditions to allow the operator to verify control channel recovery to the Communication Server 2000 and any Multiservice Gateways.
2. The LED of the migrating CP eventually changes to fast, pulsing green.
3. The new provisioning view migrates to the migrating CP.
4. Committed formats of the migrated view are saved on the migrating CP.
5. The active CP splits the physical shelf into two logical shelves: the service shelf and the migration shelf. The active CP also prepares for the FP migrations according to the following criteria:

a For FPs in a one-for-one sparing model, one FP remains under the control of the active CP in the service shelf while the second FP goes under the control of the migrating CP. The second FP's card availability is set to migrating and is reset to load new software. At this point, equipment protection is disabled.

b For FPs that fit neither of the previous criteria, the FPs remain under the control of the active CP in the service shelf. These FPs are reloaded with new software after the migration switchover occurs.

6 Provisioning data is delivered within the migrating CP.

7 Applications that run on the CP, such as ATM routing, are initialized.

Note: Disk synchronization occurs in the background during this phase. This phase is not complete until disk synchronization is complete.

Phase 3 — FP migration

After the system initializes, the CP applications to complete phase 2, the following occurs:

1 The migrating FPs load new software and start up in migration mode.

2 The LEDs on the migrating FPs eventually change to fast, pulsing green or to solid green.

3 Provisioning data is delivered on the migrating FPs.

4 On 16pOC3SmIrATM FP cards with Pbg components, the software on the migration active card enables the SONET ports and the inter-card sharing bus on unprotected SONET interface pairs to allow the active card to resume carrying traffic for unprotected lines connected to the inactive card.

5 The migrating FPs are loaded with dynamic data for switched services, such as ATM SVCs.

Note 1: There are two conditions that initiate an automatic pause when the *-pause* option is activated. The first condition exists when port bridging is configured on 16pOC3SmIrATM FP cards in the node, and migration switchover is about to begin. This allows the operator to confirm that the Communication Server 2000, MG4000s, and MG9000s have recovered their control channels prior to a

migration switchover. A *continue prov* command issued by the operator allows the migration switchover to continue.

The second automatic pause condition exists when a fault scenario occurs on the migration shelf such that an application cannot achieve its expected switchover behavior. The software migration pauses before the migration switchover. The *Prov Migration* component is operationally disabled and an appropriate alarm is raised against it. The operator must either issue a *continue prov* command to continue with the migration switchover, or *stop prov* to stop the software migration.

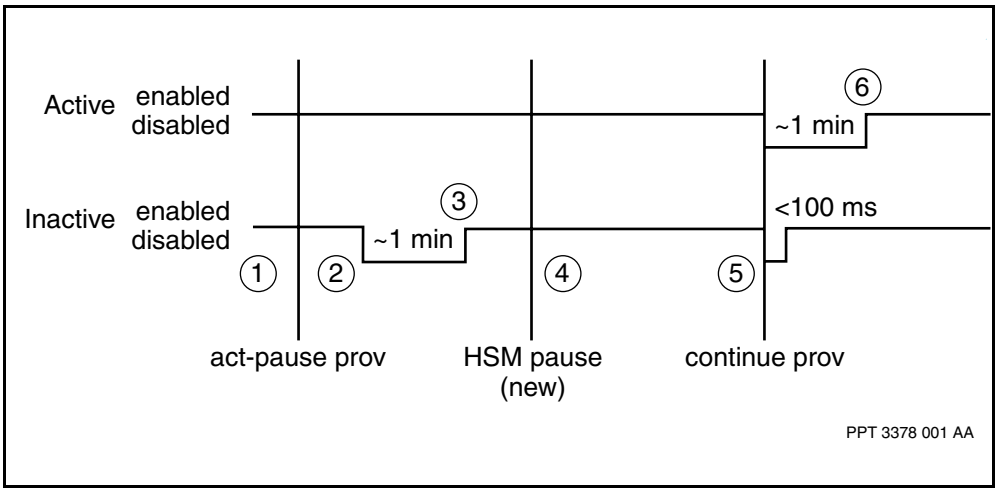
Note 2: After a *continue -force prov* command is issued, the system does not pause again. If you are in an SN07 to SN07 migration, and the system has paused prior to migration switchover, the expected pause at migration switchover does not occur.

Phase 4 — Migration switchover

After the system notifies the active CP that phase 3 is complete, the following occurs:

1 If the provisioning command was activated with the *-pause* option, (in the figure, Migration switchover of Pbg SONET interfaces on page 46, this is the circled point 1) migration pauses to allow Communication Server and Multiservice Gateways to recover control channels using the inactive (or migration active) card. In the figure, “Migration switchover of Pbg SONET interfaces” (page 46), the paused migration is indicated at the circled point 4.

Migration switchover of Pbg SONET interfaces



Note: In the figure, Migration switchover of Pbg SONET interfaces on page 46 circled points 2 and 3 indicate FP migration activity described in the previous section.

2 After the operator confirms that channel recovery is complete, the operator issues the *continue prov* command to stop the service on the active card and start the service on the migration active shelf. In the figure, Migration switchover of Pbg SONET interfaces on page 46 this is indicated at circled point 5.

3 In all other migration scenarios, migration switchover begins when the CPs close all spooled files. For example, alarms and security logs.

4 All processors in the service and migration shelves are notified to switchover.

5 Processors within the service shelf reset to load new software.

6 The CP and FPs in the migration shelf become the service shelf. FPs providing switched services, such as ATM SVCs, re-establish signalling and routing functions. The CP and FPs with the new software start providing service.

7 Any sparing panels are switched over.

8 Final port initialization is completed.

9 The shelf becomes one when all CPs and FPs are running the new software. The shelf is no longer logically split into two parts.

Phase 5 — Post-migration

After all the CPs and FPs are running the new software and phase phase 4 is complete, all alarms are cleared and the following occurs:

1 The restarting CP and FPs load new firmware, new software, and their provisioning data is activated.

2 FP applications initialize with provisioning data and re-establish permanent connections at maximum call setup rate. Dynamic service data is loaded from the active FPs.

3 Network management connectivity is re-established.

4 Equipment protection and inter-card APS are re-established.

5 The operator commands which are disabled during the software migration are now available.

6 The operator must complete provisioning by confirming the provisioning changes. This phase is completed after the operator commits the new provisioning view.

HSM (Command Console) pre-work

Complete the HSM pre-work before you proceed with a software upgrade.

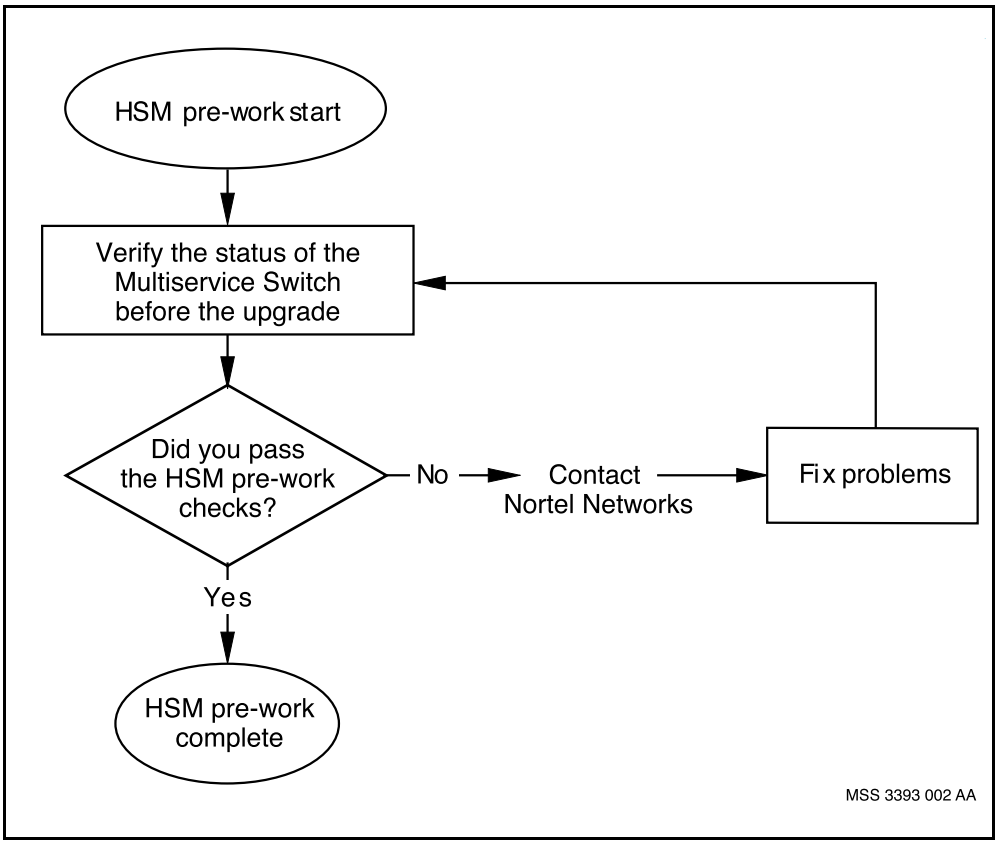
Prerequisites

- Complete Downloading and backing up Multiservice Switch software on page 19.

HSM pre-work task flow

The task flow shows the sequence of procedures you need to perform prior to performing the HSM.

HSM pre-work task flow



Work flow navigation

- Verify the status of the node before the upgrade on page 50

Verify the status of the node before the upgrade

Verify the status of the Nortel Networks Multiservice Switch node before upgrading to ensure that the node does not have any alarms raised on it and that it has been configured correctly. In addition, by recording the current status, you can compare it to the status following the upgrade to verify that the upgrade proceeded correctly.

Prerequisites

- If your network has a lot of live connections, displaying the status of the logical processors, SONET ports, and ATM interfaces will result in large amounts of output.
- Save the information gathered in the following procedure to verify the success of the upgrade. To save the information to a file if you are using Nortel Networks Preside Multiservice Data Manager Command Console, select *Log to File* from the File menu and set the options in the Log to File dialog as required. If you are not using Command Console, use the standard UNIX logging functionality.
- If any of the components displayed in the following procedure are not enabled or have alarms, investigate the cause and correct the problem before proceeding with the hitless software migration. The node that you are upgrading and all of the nodes connected to it must be free of alarms.

1 Verify that the disk and file systems are synchronized:

display FileSystem syncStatus

2 Verify that the syncProgress between the disk and the file system is 100%:

display FileSystem syncProgress

3 Verify the status of the fabrics before migration:

display shelf fabriccard/* osistate

For both fabrics, the osiAdmin column should contain only unlck values. The osiAvail column should be empty. Both fabrics must be enabled and free of alarms.

The following shows sample output when you verify the status of the fabrics before migration:

```
5> display shelf fabriccard/* osistate
Shelf Fabriccard/*


-------------------------------------------------------------------------------------------
|Card |osiAdmin|osiOper|osiUsage|osiAvail|osiProc |osiCntrl |osiAlarm |osiStby   |osiUnkn
-------------------------------------------------------------------------------------------
|x    |unlck   |ena    |activ   |        |        |         |         |nset      |false
|y    |unlck   |ena    |activ   |        |        |         |         |nset      |false
|
```

4 Verify that all logical processors on the system are enabled, unlocked, and free of alarms: **display Lp/* osistate**

The osiAdmin column should contain only unlck values. The osiAvail column should be empty. All of the logical processors must be enabled and free of alarms.

The following sample shows output for this command:

```
3> display Lp/* osistate
Lp/*


-------------------------------------------------------------------------------------------
|Card |osiAdmin|osiOper|osiUsage|osiAvail|osiProc |osiCntrl |osiAlarm |osiStby   |osiUnknw
-------------------------------------------------------------------------------------------
|0    |unlck   |ena    |activ   |        |        |         |         |serv      |false
|1    |unlck   |ena    |activ   |        |        |         |         |serv      |false
|2    |unlck   |ena    |activ   |        |        |         |         |serv      |false
|3    |unlck   |ena    |activ   |        |        |         |         |serv      |false
|8    |unlck   |ena    |activ   |        |        |         |         |serv      |false
|9    |unlck   |ena    |activ   |        |        |         |         |serv      |false
```

5 Verify that all the SONET ports configured on the system are enabled, unlocked, and free of alarms:

display Lp/* Sonet/* osistate

The osiAdmin column should contain only unlck values. The osiAvail column should be empty. All of the SONET ports must be enabled and free of alarms.

The following shows sample output for this command:

```
5> display Lp/* Sonet/* osistate
Lp/* Sonet/*


-------------------------------------------------------------------------------
|Lp  |Sonet|osiAdmin|osiOper|osiUsage|osiAvail|osiProc|osiCntr|osiAlarm|osiStby|osiUnkn
-------------------------------------------------------------------------------
|2   | 1   |unlck   |ena    |busy    |        |       |       |nSet    |false
|2   | 2   |unlck   |ena    |busy    |        |       |       |nSet    |false
|3   | 1   |unlck   |ena    |busy    |        |       |       |nSet    |false
|3   | 2   |unlck   |ena    |busy    |        |       |       |nSet    |false
|8   | 0   |unlck   |ena    |busy    |        |       |       |nSet    |false
|8   | 1   |unlck   |ena    |busy    |        |       |       |nSet    |false
|8   | 2   |unlck   |ena    |busy    |        |       |       |nSet    |false
|8   | 13  |unlck   |ena    |busy    |        |       |       |nSet    |false
|9   | 0   |unlck   |ena    |busy    |        |       |       |nSet    |false
|9   | 1   |unlck   |ena    |busy    |        |       |       |nSet    |false
|9   | 3   |unlck   |ena    |busy    |        |       |       |nSet    |false
|9   | 13  |unlck   |ena    |busy    |        |       |       |nSet    |false
```

6 Verify that all ATM interfaces configured on the system are enabled, unlocked, and free of alarms:

display AtmIf/* osistate

The osiAdmin column should contain only unlck values. The osiAvail column should be empty. All of the ATM interfaces must be enabled and free of alarms.

The following shows sample output for this command:

```
6> display AtmIf/* osistate
AtmIf/*


-------------------------------------------------------------------------------
|AtmIf |osiAdmin|osiOper|osiUsage|osiAvail|osiProc|osiCntrl|osiAlarm|osiStby|osiUnknw
-------------------------------------------------------------------------------
|201  |unlck  |ena   |busy   |       |       |       |       |nSet   |false
|202  |unlck  |ena   |busy   |       |       |       |       |nSet   |false
|800  |unlck  |ena   |busy   |       |       |       |       |nSet   |false
|801  |unlck  |ena   |busy   |       |       |       |       |nSet   |false
|802  |unlck  |ena   |busy   |       |       |       |       |nSet   |false
|803  |unlck  |ena   |busy   |       |       |       |       |nSet   |false
|813  |unlck  |ena   |busy   |       |       |       |       |nSet   |false
|900  |unlck  |ena   |busy   |       |       |       |       |nSet   |false
```

7 Verify that all *UNI* signalling components are enabled and unlocked:

display atmif/* uni sig/(operatingMode = normal) osistate

The osiAdmin column should contain only *unlck* values. All of the UNI Signalling components must be enabled.

The following shows sample output for this command:

```
4> display atmif/* uni sig/(operatingMode = normal) osistate

AtmIf/* Uni Sig
-------------------------------------------------------------
|AtmIf|osiAd|osiO|osiUs|Response
|     | min |per | age |
-------------------------------------------------------------
|    60|unlck|ena |activ|
|    61|unlck|ena |activ|
|    62|unlck|ena |activ|
|    63|unlck|ena |activ|
|   200|unlck|ena |activ|
|   201|unlck|ena |activ|
|   202|unlck|ena |activ|
|   203|unlck|ena |activ|
|   204|unlck|ena |activ|
|   205|unlck|ena |activ|
|   206|unlck|ena |activ|
|   207|unlck|ena |activ|
|   208|unlck|ena |activ|
|   300|unlck|ena |activ|
```

8 Verify that all *PNNI* signalling components are enabled and unlocked:

display AtmIf/* Pnni Sig osistate

The osiAdmin column should contain only *unlck* values. All of the PNNI Signalling components must be enabled.

The following shows sample output for this command:

```
10> display AtmIf/* Pnni Sig osistate

AtmIf/* Pnni Sig

-------------------------------------------------------------------------------
 AtmIf |osiAdmin|osiOper|osiUsage |Response

-------------------------------------------------------------------------------
   201 |unlck   |ena     |activ    |
   202 |unlck   |ena     |activ    |
```

9 Verify that the *ILMI* channel osistate for the AtmInterface is enabled and unlocked:

display atmif/* uni ilmi/(operatingMode = addressRegEnabled) osistate

The osiAdmin column should contain only *unlck* values. All of the ILMI components must be enabled.

Note: If ILMI is not configured, disabled is a valid osiState.

The following shows sample output for this command:

```
10> display atmif/* uni ilmi/(operatingMode = addressRegEnabled)
osistate

AtmIf/* Uni Ilmi

-------------------------------------------------------------------------------
 AtmIf|osiAd|osiO|osiUs|Response
      | min |per | age |
-------------------------------------------------------------------------------
    45|unlck|ena |idle |
    48|unlck|ena |idle |
    49|unlck|ena |idle |
    55|unlck|ena |idle |
    59|unlck|ena |activ|
    63|unlck|ena |activ|
   100|unlck|ena |activ|
   101|unlck|ena |activ|
   212|unlck|dis |idle |
```

10 Ensure that there is no provisioning activity occurring on the control processors by verifying that the provisioningActivity value is none:

display prov provisioningActivity

11 Ensure that there is no provisioning activity occurring on the control processors by verifying that the standbyCpActivity value is none:

display prov standbyCpActivity

12 Ensure that there is no provisioning activity occurring on the control processors by verifying that the standbyCpActivityProgress value is n/a:

display prov standbyCpActivityProgress

13 Ensure that there is no provisioning activity occurring on the control processors by verifying that there is either no value for t*he provisioningSession* or, that the value is the same as the value for the Preside MDM session:

display prov provisioningSession

Note: To find the value of the Preside MDM session, issue the **me** command. An empty value or a value the same as your session is the expected response.

14 Ensure that there is no provisioning activity occurring on the control processors by verifying that the *editViewAddedComponents* value is 0:

display prov editViewAddedComponents

15 Ensure that there is no provisioning activity occurring on the control processors by verifying that the editViewDeletedComponents value is 0:

display prov editViewDeletedComponents

16 Ensure that there is no provisioning activity occurring on the control processors by verifying that the *editViewChangedComponents* value is 0:

display prov editViewChangedComponents

17 Verify that there are no shelf hardware failures:

display sh hardware

```
d sh hardware

Shelf
   hardwareFailures =
ok   2004-09-09 20:03:32.53

2> h sh hard
Shelf
   Attribute     hardwareFailures (hwFailures)
       Access     Read:  passive     Write: not allowed
       Criticality      none
       Type   SET OF Enumeration
       Values
 card,powerConverter,coolingUnit,terminatorCard,fan,

 powerSupply,fabricCard,macAddressCard,alarmBitsCard
       Default
```

18

CAUTION

Possibility of a non-hitless software migration

Any card that does not have equipment protection enabled will undergo a regular software upgrade during the migration and experience an outage. If there is a card that has equipment protection configured on it, but has a value of *nset* displayed in the *osiStby* column, that protection pair will also undergo a service outage. Investigate why that value is being displayed and correct the problem before proceeding with a hitless software migration.

Verify that the equipment protection has been configured properly and all spared cards are ready to take over:

display Shelf Card/* SparedServices

The cards that are currently providing service should have a Standby Status value of *serv*. All standby function processors should have a value of *hot* indicating *hot*. The osiAvail should be empty. All of the shelf card spared services should be enabled and free of alarms.

For cards configured with *Pbg* components, the values for osiAdmin and osiAvail should be enabled and empty respectively, for both FPs in the 1+1 pair.

If hitless ATM routing is activated, the standby control processor must have a value of *hot* indicating *hot standby*. If hitless ATM routing is not activated, the standby control processor must have a value of *cold* indicating *cold standby*.

The osiAdmin column should contain only *unlck* values. The osiAvail column should be empty.

The following shows sample output when you verify that the equipment protection is configured properly, and all spared cards are ready to take over:

```
4> display Shelf Card/* SpServ

Shelf Card/* SpServ
-------------------------------------------------------------------
Card|osiAd|osiO|osiUs|osiAvai|osiProc|osiCntr|osiAlar|osiS|osi
    | min |per | age |   l   |       |   l   |   m   |tby | kr
-------------------------------------------------------------------
   0|unlck|ena |activ|       |       |       |       |serv|fal
   1|unlck|ena |activ|       |       |       |       |hot |fal
   8|unlck|ena |activ|       |       |       |       |serv|fal
   9|unlck|ena |activ|       |       |       |       |hot |fal
  10|unlck|ena |activ|       |       |       |       |serv|fal
  11|unlck|ena |activ|       |       |       |       |hot |fal
  14|unlck|ena |activ|       |       |       |       |hot |fal
  15|unlck|ena |activ|       |       |       |       |serv|fal
```

19 Display the *Laps* components to identify any Laps components that have any faults or a manual override associated with them.

Note: Use the -noTabular option to view the following hidden attributes: *osiUnknw, osiStby, osiAlarm, osiCntrl, osiProc, osiAvail, mmAlarm, pfAlarm* and *timeUntilRestore*.

display Laps/*

The *Laps* component should be unlocked, enabled, working, and protected.

The following shows a sample output for this command:

```
7> display Laps/*
-------------------------------------------------------------------------------
 Laps |osiAd|osiO|osiUs|neRxLi|neReq |neReqC|feReq |feReqC|sdOnLin|switchover
      | min |per | age |  ne  |      | han  |      | han  |  es   |
-------------------------------------------------------------------------------
  200|unlck|ena |busy |protec|doNotR|workin|noRequ|protec|       |
  201|unlck|ena |busy |protec|doNotR|workin|noRequ|protec|       |
  202|unlck|ena |busy |protec|doNotR|workin|noRequ|protec|       |
  203|unlck|ena |busy |protec|doNotR|workin|noRequ|protec|       |
  600|unlck|ena |busy |workin|noRequ|protec|noRequ|protec|       |
  601|unlck|ena |busy |workin|lockou|protec|noRequ|protec|       |
  602|unlck|ena |busy |protec|manual|workin|doNotR|workin|       |
ok            2004-05-27 11:32:05.76
```

20 If *neReq* has a value of manual, you have a manual override. For each *Laps* component listed in the output, remove the manual overrides related to the automatic selection of the active line of a link protected by line automatic protection switching (LAPS):

clear Laps/<laps_inst>

Issuing this command clears the effects of the **protectionLockout Laps** and the **switch Laps** commands and ensures that all higher priority commands are nulled before the migration.

21 Verify that the *lop, ais, rfi, slm, txAis, and txRdi* attributes of the *Laps Sts* components have a value of off:

display Laps/* Sts/0

The osiAdmin column should contain only *unlck* values. All of the attributes from *lop* to *txRdi* should have a value of off.

The following shows sample output for this command:

```
17> display Laps/* Sts/0
Laps/* Sts/0
  Use -noTabular to see the many hidden attributes.
-------------------------------------------------------------------------------------------
---
Laps  |osiAdmin|osiOper|osiUsage|snmpOperstate|lop |ais |rfi |slm |txAis|txRdi |pefs
|pcv
-------------------------------------------------------------------------------------------
--
|201  |unlck   |ena    |busy    |up           |off |off |off |off |off  |off   |4374  |
|202  |unlck   |ena    |busy    |up           |off |off |off |off |off  |off   |4374  |
|801  |unlck   |ena    |busy    |up           |off |off |off |off |off  |off   |3597  |
|802  |unlck   |ena    |busy    |up           |off |off |off |off |off  |off   |3605  |
|803  |unlck   |ena    |busy    |up           |off |off |off |off |off  |off   |4359  |
```

22 Verify that the *Laps* components are enabled, unlocked, and free of alarms:

display Laps/* osistate

The osiAdmin column should contain only *unlck* values. The osiAvail column should be empty. All of the Laps components must be enabled and free of alarms.

The following shows sample output for this command:

```
> display Laps/* osistate

Laps/*
-------------------------------------------------------------------------
|Laps |osiAd|osiO|osiUs|osiAvai|osiProc|osiCntr|osiAlar|osiS|osiUn
|     | min |per | age |   l   |       |   l   |   m   |tby | knw
-------------------------------------------------------------------------
|  800|unlck|ena |busy |       |       |       |       |nSet|false
|  802|unlck|ena |busy |       |       |       |       |nSet|false
|  803|unlck|ena |busy |       |       |       |       |nSet|false
```

23 If *Pbg* components have been configured, verify that the *sts/0* component is enabled, unlocked, and free of alarms:

display pbg/* sts/0 osiState

The osiAdmin column should contain only *unlck* values. The osiAvail column should be empty. All of the *Pbg* components must be enabled and free of alarms.

The following shows sample output for this command:

```
1> display pbg/* sts/0 osistate
Pbg/* Sts/0
-------------------------------------------------------------------
| Pbg |osiAd|osiO|osiUs|osiAvai|osiProc|osiCntr|osiAlar|osiS|osiUn
|     | min |per | age |   l   |       |   l   |   m   |tby | knw
-------------------------------------------------------------------
|  800|unlck|ena |busy |       |       |       |       |nSet|false
|  801|unlck|ena |busy |       |       |       |       |nSet|false
```

24 If *Pbg* components have been configured, verify that the *Pbg* components are enabled, unlocked, and free of alarms:

display pbg/* osiState

The osiAdmin column should contain only *unlck* values. The osiAvail column should be empty. All of the *Pbg* components must be enabled and free of alarms.

The following shows sample output for this command:

```
2> display pbg/* osistate
Pbg/*
-----------------------------------------------------------------
| Pbg |osiAd|osiO|osiUs|osiAvai|osiProc|osiCntr|osiAlar|osiS|osiUn
|     | min |per | age |   l   |       |   l   |   m   |tby | knw
-----------------------------------------------------------------
|  800|unlck|ena |busy |       |       |       |       |nSet|false
|  801|unlck|ena |busy |       |       |       |       |nSet|false
```

25 If *Pbg* SONET components have been configured, verify that the components are enabled, unlocked, and free of alarms:

display lp/* bso/* osiState

The osiAdmin column should contain only *unlck* values. The osiAvail column should be empty. All of the *BridgedSonet* components must be enabled and free of alarms.

The following shows sample output for this command:

```
6> display lp/* bso/* osistate
Lp/* Bso/*
-----------------------------------------------------------------
|Lp|Bso|osiAd|osiO|osiUs|osiAvai|osiProc|osiCntr|osiAlar|osiS|osiUn
|  |   | min |per | age |   l   |       |   l   |   m   |tby | knw
-----------------------------------------------------------------
| 8|  1|unlck|ena |busy |       |       |       |       |nSet|false
| 9|  0|unlck|ena |busy |       |       |       |       |nSet|false
```

26 If *DS3* components have been configured, verify that the components are enabled, unlocked, and free of alarms:

d lp/* ds3/* osistate

The osiAdmin column should contain only *unlck* values. The osiAvail column should be empty. All of the *DS3* components must be enabled and free of alarms.

The following shows sample output for this command:

```
43> d lp/* ds3/* osiState
Lp/* DS3/*
-------------------------------------------------------------------------------
|Lp|DS3|osiAdmin|osiOper|osiUsage|osiAvail|osiProc|osiCntr|osiAlarm|osiStby|osiUnknw
-------------------------------------------------------------------------------
|10|  0|unlck   |ena    |busy    |        |       |       |        |nSet   |false
```

27 If *DS1* components have been configured, verify that the components are enabled, unlocked, and free of alarms:

d lp/* ds3/* ds1/* osistate

The osiAdmin column should contain only *unlck* values. The osiAvail column should be empty. All of the *DS1* components must be enabled and free of alarms.

The following shows sample output for this command:

```
44> d lp/* ds3/* dsl/* osiState
Lp/* DS3/* DS1/*
-------------------------------------------------------------------------------------
|Lp|DS3|DS1|osiAdmin|osiOper|osiUsage|osiAvail|osiProc|osiCntr|osiAlarm|osiStby|osiUnkn
-------------------------------------------------------------------------------------
|10|  0|  1| unlck   |ena    |busy    |        |       |       |        |nSet   |false
|10|  0|  2| unlck   |ena    |busy    |        |       |       |        |nSet   |false
|10|  0|  3| unlck   |ena    |busy    |        |       |       |        |nSet   |false
|10|  0|  4| unlck   |ena    |busy    |        |       |       |        |nSet   |false
|10|  0|  5| unlck   |ena    |busy    |        |       |       |        |nSet   |false
|10|  0|  6| unlck   |ena    |busy    |        |       |       |        |nSet   |false
|10|  0|  7| unlck   |ena    |busy    |        |       |       |        |nSet   |false
|10|  0|  8| unlck   |ena    |busy    |        |       |       |        |nSset  |false
```

28 If *DS3 DS1 Chan* components have been configured, verify that the components are enabled, unlocked, and free of alarms:

d lp/* ds3/* ds1/* chan/* osistate

The osiAdmin column should contain only *unlck* values. The osiAvail column should be empty. All of the *DS3 DS1 Chan* components must be enabled and free of alarms.

The following shows sample output for this command:

```
13> d lp/* ds3/* ds1/* chan/* osistate

Lp/* DS3/* DS1/* Chan/*
-------------------------------------------------------------------------------
|Lp|DS3|DS1|Chan|osiAd|osiO|osiUs|osiAvai|osiProc|osiCntr|osiAlar|osiS|osiUn
|  |   |   |    | min |per | age |   l   |       |   l   |   m   |tby | knw
-------------------------------------------------------------------------------
|14|  0|  1|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  2|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  3|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  4|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  5|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  6|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  7|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  8|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  9|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1| 17|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1| 18|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1| 19|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1| 20|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1| 21|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1| 22|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1| 23|   0|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1| 24|   0|unlck|ena |busy |       |       |       |       |nSet|false
ok              2004-05-27 11:38:17.78
```

29 If *DS3 IMA* components have been configured, verify that the components are enabled, unlocked, and free of alarms:

d lp/* ds3/* ima/* osistate

The osiAdmin column should contain only *unlck* values. The osiAvail column should be empty. All of the *DS3 IMA* components must be enabled and free of alarms.

The following shows sample output for this command:

```
14> d lp/* ds3/* ima/* osistate
Lp/* DS3/* Ima/*
-------------------------------------------------------------------------------
|Lp|DS3|Ima|osiAdmin|osiOper|osiUsage|osiAvail|osiProc|osiCntr|osiAlarm|osiStby|osiUnknw
-------------------------------------------------------------------------------
|10|  0|  0|unlck   |ena    |busy    |        |       |       |        |nSet   |false
|4|   1|  0|unlck   |ena    |busy    |        |       |       |        |nSet   |false
```

30 If *DS3 IMA LINK* components have been configured, verify that the components are enabled, unlocked, and free of alarms:

d lp/* ds3/* ima/* lk/* osistate

The osiAdmin column should contain only *unlck* values. The osiAvail column should be empty. All of the *DS3 IMA LINK* components must be enabled and free of alarms.

The following shows sample output for this command:

```
Lp/* DS3/* Ima/* Lk/*
-------------------------------------------------------------------------------
|Lp|DS3|Ima|Lk|osiAd|osiO|osiUs|osiAvai|osiProc|osiCntr|osiAlar|osiS|osiUn
|  |   |   |  | min |per | age |   l   |       |   l   |   m   |tby | knw
-------------------------------------------------------------------------------
|14|  0|  0| 1|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  0| 2|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  0| 3|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  0| 4|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  0| 5|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  0| 6|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  0| 7|unlck|ena |busy |       |       |       |       |nSet|false
|14|  0|  0| 8|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1|  2| 1|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1|  2| 2|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1|  2| 3|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1|  2| 4|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1|  2| 5|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1|  2| 6|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1|  2| 7|unlck|ena |busy |       |       |       |       |nSet|false
|14|  1|  2| 8|unlck|ena |busy |       |       |       |       |nSet|false
ok              2004-05-27 11:39:30.16
```

31 If the node being migrated relies on OAM Ethernet connectivity, verify that the value is available:

display Lp/0 Oamenet/0 activeStatus

Note: If the node is using in-band OAM, you need to have an Ethernet connection to the gateway node. You may have an Ethernet connection to the remote node for emergency access.

32 If the node being migrated relies on OAM Ethernet connectivity, verify that the value is available:

display Lp/0 Oamenet/0 standbyStatus

33 Optionally, display, ping, and record information about the IP accessibility of the node to verify the reachability of the node after the migration.

list ac ipaccess/*

The following shows sample output for this command:

```
8> list ac ipaccess/*
Ac IpAccess/58.183.182.10
Ac IpAccess/58.138.191.21
```

34 If you have configured in-band OAM, verify that the *Atmmpe* components are unlocked, enabled, and active:

display Atmmpe/* osiState

The following shows sample output for this command:

```
25> display atmmpe/* osiState

AtmMpe/*
-----------------------------------------------------------------
|AtmMpe|osiAd|osiO|osiUs|Response
|      | min |per | age |
-----------------------------------------------------------------
|     0|unlck|ena |activ|
ok             2004-05-27 11:39:30.16
```

35 If you have configured in-band OAM, verify that the *Ac* components are unlocked, enabled, and active:

display Atmmpe/* Ac/* osiState

The following shows sample output for this command:

```
24> display atmmpe/* ac/* osiState

AtmMpe/* Ac/*
-----------------------------------------------------------------
|AtmMpe|Ac  |osiAd|osiO|osiUs|Response
|      |    | min |per | age |
-----------------------------------------------------------------
|     0|   1|unlck|ena |activ|
```

36 If you have configured in-band OAM, verify and record information about the accessibility of the chosen Preside MDM server from the node. In conjunction with step 37 ensure that both Preside MDM servers are connected by way of different gateway nodes and that hop 1 in the output for this step is different from the output for step 37:

ping -trace -ip(<MDM1 IP>) Vr/0 Ip Icmp

Take the Preside MDM server addresses in step 33 and verify that there are diverse routes to each one, and that you are able to reach it.

For a description of “chosen” and “alternate” Preside MDM servers, see step 33.

The following shows sample output for this command:

```
8> ping -trace -ip(47.135.211.28) Vr/0 Ip Icmp
Vr/0 Ip Icmp
   IP Trace Route for 47.135.211.28:
   Path taken:
     Hop 1:   58.142.129.1    (time = 1ms)
     Hop 2:   58.142.204.145  (time = 2ms)
     Hop 3:   58.142.204.141  (time = 17ms)
     Hop 4:   58.142.205.201  (time = 1ms)
     Hop 5:   58.142.205.1    (time = 1ms)
     Hop 6:   58.255.4.145    (time = 27ms)
     Hop 7:   58.130.255.105  (time = 27ms)
     Hop 8:   58.131.49.10    (time = 27ms)
     Hop 9:   58.129.255.210  (time = 88ms)
     Hop 10:  58.129.255.58   (time = 30ms)
     Hop 11:  58.135.211.28   (time = 25ms)
```

37 If you have configured in-band OAM, verify and record information about the accessibility of the alternate server from the node. In conjunction with step 36 ensure that both Preside MDM servers are connected by way of different gateway nodes:

ping -trace -ip(<MDM2 IP>) Vr/0 Ip Icmp

Take the Preside MDM server addresses in step 33 and verify that there are diverse routes to each one, and that you are able to reach it.

The following shows sample output for this command:

```
8> ping -trace -ip(47.135.211.40) Vr/0 Ip Icmp
Vr/0 Ip Icmp
   IP Trace Route for 47.135.211.40:
   Path taken:
     Hop 1:   58.142.129.1    (time = 0ms)
     Hop 2:   58.142.204.145  (time = 3ms)
     Hop 3:   58.142.204.141  (time = 16ms)
     Hop 4:   58.142.205.201  (time = 1ms)
     Hop 5:   58.142.205.1    (time = 0ms)
     Hop 6:   58.255.4.145    (time = 26ms)
     Hop 7:   58.130.255.105  (time = 27ms)
     Hop 8:   58.131.49.10    (time = 26ms)
     Hop 9:   58.129.255.210  (time = 83ms)
     Hop 10:  58.129.255.58   (time = 28ms)
     Hop 11:  58.135.211.40   (time = 48ms)
```

Variable values

Variable	Value
<laps_inst>	The instance value of the *Laps* component whose manual overrides you want to remove. This instance value is an integer between 0 and 15999.

HSM (Command Console) activation

Perform the HSM by setting the application version list, setting the patchlist, if required, and activating the provisioning changes. When the activation completes, the node will be running the new software.

Prerequisites

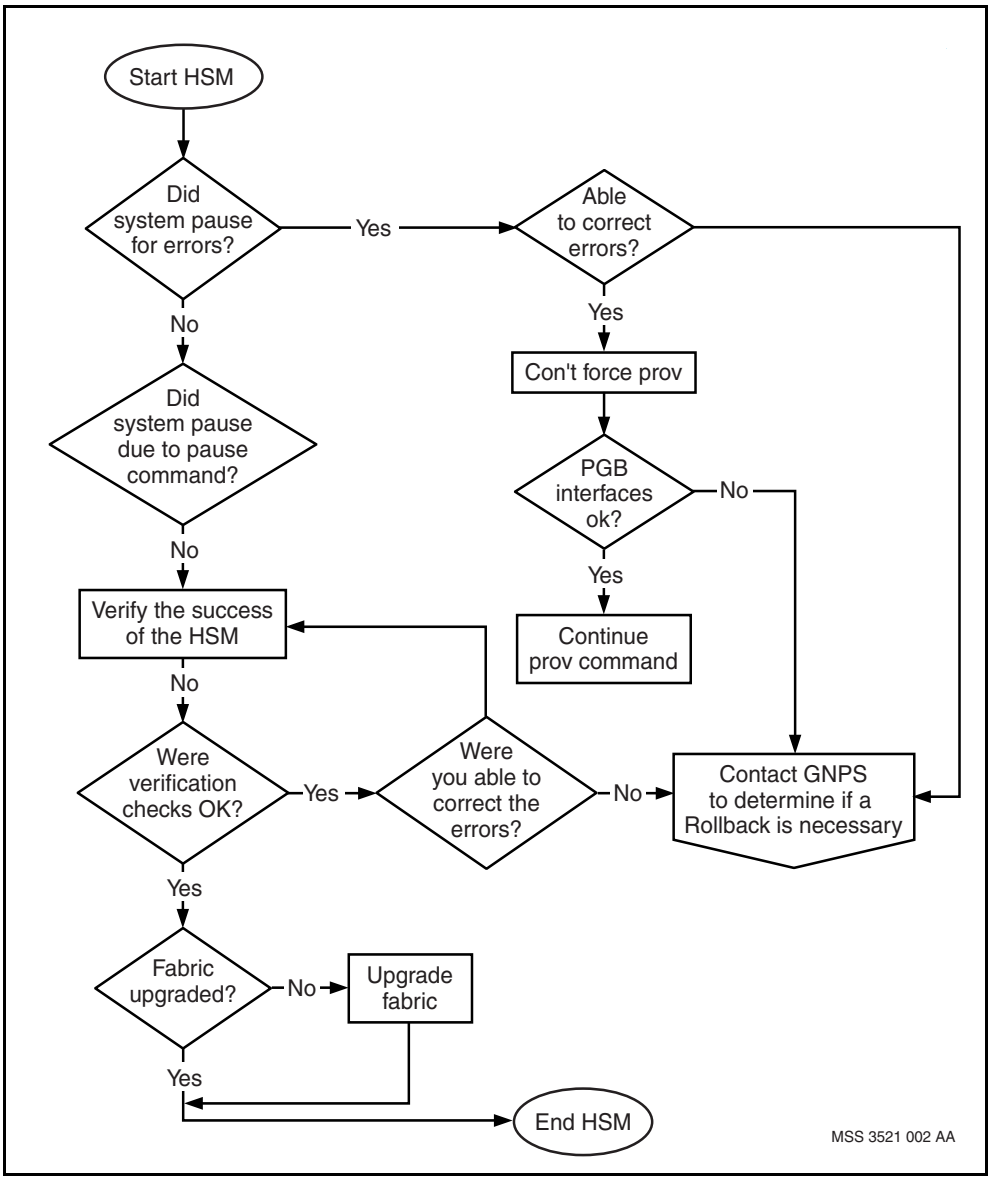
- Complete the HSM pre-work. See HSM (Command Console) pre-work on page 49 for more information.
- For in-band OAM configurations, upgrade all Nortel Networks Multiservice Switch 15000 nodes in the network in the following sequence:
- upgrade all the remote nodes first
- upgrade the non-preferred Gateway node next
- upgrade the preferred Gateway node last

Note: For a quick reference to key relationships needed to understand in-band OAM migration, see Appendix B - In-band OAM quick reference on page 143. For a description of in-band OAM, see NN10028-111 *Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Product and Technology Basics PT-AAL1/UA-AAL1/UA-IP*.

HSM task flow

The task flow shows the sequence of procedures you must perform to execute the HSM.

HSM task flow



Work flow navigation

- HSM (Command Console) pre-work on page 49
- Perform HSM using Command Console on page 69
- Upgrade the fabric on page 83
- Verify the success of HSM on page 90
- Stop the HSM using Command Console on page 94

Perform HSM using Command Console

Upgrade a Nortel Networks Multiservice Switch 15000 node by setting the application version list, setting the patchlist, if required, and activating the provisioning changes. When the activation completes, the node will be running with the new software.

Prerequisites to performing the hitless software migration

CAUTION
Calls in process of being setup are dropped
This strategy removes inactive control and function processors from service. As a result, redundancy in the event of failure of the active shelf components is not available and some calls in the process of being set up (known as transient calls) are dropped. Stable calls are unaffected by the migration.

Undertake the procedures required by this strategy during low-traffic periods.

- Perform HSM Pre-work.
- Do not load the software application for the fabric. Refer to Upgrade the fabric on page 83 for more information about upgrading the fabric firmware.
- Do not modify the “sw avl, pa” lists using the command **load -f (<view name>) prov**. When performing HSM using the Command Console, enter the new “sw avl, pa” lists manually. Use of the **load** command could result in a disruptive software migration.
- Perform this upgrade using Nortel Networks Preside Multiservice Data Manager (MDM) Command Console tool server rather than through a Telnet session. Using the Command Console ensures that you remain connected to the node and monitor the CP switchover. For more information on opening the Command Console, see 241-6001-804 *Preside MDM Workstation Utilities User Guide*.
- The node must contain two control processors (CP). One CP must be active and the other CP must be in standby mode.
- Hitless software migration only applies to FPs in a one-for-one equipment sparing configuration. The active FPs must be provisioned for one-for-one equipment sparing. During the software migration, equipment protection is unavailable for those cards whose standby card is part of the migration shelf.

- To prevent outages during the hitless software migration, ensure that the links between the CS2000 and the node are configured in two groups that have been distributed between the shelves to create redundancy.

  Note: This does not apply if the CS2000 is configured for Port Bridging.

- While you perform software migration tasks, the system may interrupt the process to display warnings or notifications. Some of these notifications may require you to confirm your intent before continuing. Respond as required by the online instructions.
- You must have an extensive knowledge of Unix, Multiservice Switch software, and the Succession portfolio architecture.
- You need to add the following applications to the application version list: base, networking, atmNetworking, and ip. If your nodes have been configured with in-band OAM, you will also need to add the wanDte application. The application version list must not contain any additional applications.
- Refer to the software downloads area of Nortel Networks Web site (*www.nortelnetworks.com*) to determine the software patches that you need to add to the patchlist. If there are no patches listed for this release, it means that there are no patches currently required for this release.

From the node

1 Login with the appropriate permissions.

2 Enter provisioning mode so that you can issue the appropriate commands:

start prov

Sample output

```
7> start prov
Prov
The edit view differs from the current view.
Added 2 provisioning component(s) to the edit view.
```

Note: If the system indicates that the edit view and the current view are the same, proceed to step 4.

3 Copy the current view into the edit view to ensure that they are identical: **copy prov**

Note: If you were referenced to this step as a method to abort the migration before activation, no outage will occur as you have not yet started the hitless software migration.

4 Display the current software application version list:

display -c Software avList

Sample output

```
7> display -c Sw Avl
Sw avList = base_CE01S1B,
    networking_CE01S1B,   atmNetworking_CE01S1B,
     ip_CE01S1B
```

5 Replace all of the old application versions in the application version list with the new application versions:

set Software avList ! <new_applications>

The software applications you need to load are base, ip, networking, and atmNetworking. If your nodes have been configured with in-band OAM, you will also need to load the wanDte application. Do not add any other applications to the application version list.

Note: Do not set the software applications for the fabric. Refer to Upgrade the fabric on page 83 for more information about upgrading the fabric firmware.

Sample output

```
PROV 26> set Sw Avl !
base_CF01S1A ip_CF01S1A networking_CF01S1A
atmNetworking_CF01S1A
Sw
ok 2001-08-09 18:05:09.94
```

Note: You may need to set a different list of software application versions.

6 Check that the new applications are in the application version list and that, other than the load name, the applications are the same as those listed in step 4:

display Software avList

Sample output

```
PROV 2> display Software AvList
Sw
 avList = base_CF01S1A,      ip_CF01S1A,
      networking_CF01S1A,       atmNetworking_CF01S1A,
```

7 Display software patchlist:

display software patchlist

8 If there are patches on the load you need to remove, remove those patches (otherwise you will not be able to download the new patches). See *Nortel Networks Multiservice Switch Release Notes PCR 6.1* to determine the software patches required, and apply the patches needed for SN07:

set Software patchlist ! <patches>

Note: This step applies only to non disruptive patches. You may need to set a different list of patches.

Attention: If you are migrating directly from a pre-SN07 release to SN07 FVS with patches, you must apply a patch to your current release before downloading the SN07 FVS software.

Switches must be running baseFT420A_XXXX.

Once this patch is applied, download the SN07FVS software, including patch_CF01xxx. Then migrate to SN07FVS with the patches described in this procedure.

Contact Nortel Networks Global Network Product Support to obtain the appropriate baseFT420A_XXXX migration patch. The patch readme file contains download and activation instructions.

9 Verify the patches that are going to be applied:

display software patchlist

Note: If you are migrating directly from a pre-SN07 release to SN07 FVS with patches, see the Attention note in step 8.

Sample output

```
PROV 2> d  Sw patchlist
Sw
patchlist = atmNetworkingFT032A, baseFT173A, baseFT
 baseFT173A, baseFT172A,
```

10

CAUTION
Potential interruption of calls in progress
The software upgrade for the Multiservice Switch 15000 shelf is hitless if the new provisioning view contains only the new AVL and optionally, a new patch list. If the system indicates that more than one provisioning change has occurred, the node will go through a normal software migration that is not hitless and all calls on the node will be interrupted.

If more than one provisioning change has occurred, repeat step 3 and then perform the procedure Verify the status of the node before the upgrade on page 50.

Verify that the *editViewChangedComponents* attribute indicates that you have made only one provisioning change:

display -o prov

Sample output

```
36> display -o pr
Prov
   adminState = unlocked
   operationalState = enabled
   usageState       = busy
   provisioningActivity = none
   activityProgress     = n/a
   standbyCpActivity    = none
   standbyCpActivityProgress = n/a
   committedFileName         = CE01S1B_Complete.full.004
   currentViewFileName       = CE01S1B_Complete.full.004
   lastUsedFileName          = CE01S1B_Complete.full.004
   provisioningSession       = Nmis Fmip Session/2
   provisioningUser          = dominicr
   checkRequired             = yes
   confirmRequired           = no
   editViewName              = none
   editViewAddedComponents   = 0
   editViewDeletedComponents = 0
   editViewChangedComponents = 1
   currentJournal            = 0
   journalDisabledReason     = not disabled
   restorePossible           = no
ok             2004-05-27 11:57:37.75
```

11

CAUTION
Proceeding with a non-hitless software migration
The node will go through a normal software migration that is not hitless and all calls on the node are interrupted if the system returns the following message: *All applications will experience service outage.*

If this happens, fix the problem and repeat this step. If you cannot fix the problem, stop the migration.

Perform a semantic check:

check prov

The node can continue with a hitless software migration if the system returns the following message:

```
Some applications may experience service
outage.
```

Sample output

```
PROV 2> check prov
Lp/0
   Warning:
      Reason:  Lp 0 (card 0) will be reset when this view is activated.
Lp/8
   Warning:
      Reason:  Lp 8 (card 8) will be reset when this view is activated.
Lp/10
   Warning:
      Reason:  Lp 10 (card 10) will be reset when this view is activated
Prov
   Warning:
    Activation will disrupt service for the following component(s):
         Lp/0,
         Lp/8,
         Lp/10
   Warning:
    Activation will result in a software migration system reload. Some
   applications may experience service outage.
```

12 Save the edit view with portable formats:

save -f(<filename>) -portable prov

13 Apply the changes:

activate -pause prov

If you are performing an SN06 to SN07 or SN07 to SN07 migration, always use the **activate -pause prov** command. The software migration activation pauses before migration switchover occurs and displays the message shown in the sample output.

Note: The system can pause for one of two reasons: the system has found a fault, or an operator issued a pause command. If the system pauses because the operator has used the **-pause** command, the operator can issue the **continue -prov** command to continue the HSM.

Sample output with the pause option

```
PROV 151> activate -pause prov

--- Response 149 continued ...
The software migration is paused, pause reason:
Details:
On Card 1: Pausable Alarm recvd;
ACTIVATE -PAUSE PROV operator command.

To resume, type Continue Prov. To stop, type Stop Prov.
```

14

CAUTION
Before issuing a continue prov command, perform the following:
Before issuing a **continue pro**v command, perform steps 14 to step 17. Steps 14 to step 17 must always be done in a paused state.

In a migration where the *Pbg* components have been configured, verify that all CCMT logs are cleared from the MAP. (Determine that the CS2000 Core Manager CCMT links and the SAM21 SC H.248 and OAM channels that went out of service when migration started, are re-established).

See “Tools and utilities” for the “Preside CS2000 Core Manager” and “Preside Media Gateway 9000 Manager” in the *Succession Fault Management* document for Wireline Universal Packet Access (UA-AAL1) and for Packet Trunking (PT-AAL1).

15 Verify that the *Laps* components are enabled, unlocked, and free of alarms:

display Laps/* osistate

The osiAdmin column should contain only *unlck* values. The osiAvail column should be empty. All of the *Laps* components must be enabled and free of alarms.

Sample output

```
      15> display laps/* osistate

Laps/*
-------------------------------------------------------------------
|Laps |osiAd|osiO|osiUs|osiAvai|osiProc|osiCntr|osiAlar|osiS|osiUn
|     | min |per | age |   l   |       |   l   |   m   |tby | knw
-------------------------------------------------------------------
|   60|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|   61|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|   62|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|   63|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|  201|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|  202|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|  203|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|  204|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|  205|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|  206|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|  211|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|  212|unlck|ena |busy |degrad |       |       |minor  |nSet|false
|  213|unlck|ena |busy |degrad |       |       |minor  |nSet|false
```

16 In a migration where the *Pbg* components have been configured, verify that the *sts/0* component is enabled, unlocked, and free of alarms:

display pbg/* sts/0 osiState

17 In a migration where the *Pbg* components have been configured, verify that the *Pbg* components are enabled, unlocked, and free of alarms:

display pbg/* osiState

18

CAUTION
Unexpected messages about the logical processors
If the system gives you unexpected messages about the logical processors during the migration, abort the migration. For more information see Stop the HSM using Command Console on page 94.

CAUTION
Exercise caution when using the continue -force prov command
Contact Nortel Networks Global Networks Technical Support (GNTS) for advice or assistance before issuing a **continue -force prov** command during a software migration pause.

Always issue a **continue prov** command:

continue prov

The migration is now taking place. The time required to complete the migration depends on the number of calls and components that have been provisioned on the node. Generally, migrations take between fifteen minutes and three and a half hours.

Note 1: After you enter **activate prov**, after the CP switchover during the hitless software migration, connectivity between the node and Preside MDM server is temporarily lost. The active alarms for the node clear and the node appears grey in the Network Viewer until the connection is re-established. The connection between the node and the server re-establishes itself automatically within a minute. Messages, such as the following, may be observed on the

Command Console and the system log display during this time:

(Command Console): `CC_ERROR 1019 Passport Register Command error: APPLICATION_ERROR 1122 FMIP connection locked or down, command terminated`

(System log display): `CO: APPLICATION_ERROR 1112 Fdtr lost connection to DESIGN_2 W MSG 00000001 NMS ft1400-2 (25335) 15-13:37:02CO: APPLICATION_ERROR 1111 Fdtr cannot connect to DESIGN_2 because the connection was lost`

Note 2: If there are any logical processors that cannot participate in the hitless software migration because of provisioning reasons (for example, they are unspared or in a 1 for N configuration) or because of operational reasons (for example, a standby card is unavailable), the system identifies these logical processors.

Note 3: If the list of logical processors changes during the software migration, the system generates a *Migration Visible Alarm*, which pauses the software migration. You have three options at this point, abort (**stop prov**), fix the problem and continue (**continue -force prov**), or ignore the problem and continue (**continue -force prov**).

19 To monitor the progress of the migration, enter the following command:

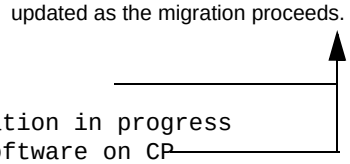
display -o prov

The results of this command are constantly updated in operational mode. Even when the node is reconnecting, you can use this command to monitor the upgrade.

You can continue to issue this command up until you lose connectivity to the node. When the active control processor begins to load the software, connectivity is lost. After you lose connectivity, you will need to log back in (see step 20). If you are using Preside MDM Command Console, the connection to the node is automatically re-established, but you will need to get back into provisioning mode. For more information, see step 2.

Sample output

```
52> display -o prov
Prov
   adminState = unlocked
   operationalState = enabled
   usageState       = busy
   provisioningActivity = activation
   activityProgress     = software migration in progress
   standbyCpActivity    = loading new software on CP
   standbyCpActivityProgress = 10%
   committedFileName         = CF01S1A_with_base_Mar22_04.full.006
   currentViewFileName       = CF01S1A_with_base_Mar22_04.full.006
   lastUsedFileName          = CF01S1A_with_base_Mar22_04.full.006
   provisioningSession       =
   provisioningUser          = none
   checkRequired             = no
   confirmRequired           = no
   editViewName              = CF01S1A_base_Mar22_04.full.006
   editViewAddedComponents   = 0
   editViewDeletedComponents = 0
   editViewChangedComponents = 0
   currentJournal            = 0
   journalDisabledReason     = not disabled
   restorePossible           = no
```



20 If using Telnet, when prompted, login to the node with the appropriate permissions.

21 Within 20 minutes of activating the new software and completing the software migration, confirm the changes to avoid a non-hitless rollback to the previously committed configuration:

confirm prov

Sample output

```
 3> confirm prov
Prov
   Activation confirmed. Rollback will not occur.
```

22 Enter provisioning mode: **start prov**

Sample output

```
 4> st pr
Prov
The edit view is identical to the current view.
The current view needs to be semantically checked.
Issue:
     Copy Prov
     Check Prov
to correct. It may also be advisable to re-save or
re-commit.
```

23 Check that the edit view is the same as the current view:

copy prov

The message should confirm that both views are the same.

24 Perform a semantic check on the changes:

check prov

You may see warnings during the semantic check, but they will not disrupt service.

Note: If the semantic check fails, troubleshoot the problem using and NN10198-912 *Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP*.

25 If the semantic check passes, save the view:

save prov

26 If the semantic check passes, commit the final version of the view:

commit prov

Sample output

```
 9> commit prov
Prov
   Saving the current view into
CF0151A_base_Mar22_04.full.006 (with commit,portable
formats) ...
Prov
   The committed file is CF0151A_base_Mar22_04.full.006.
```

A committed file is required in case of a node reset, at which time the committed view will be reloaded.

27 Verify that the edit view and the current view are the same:

display -o prov

Sample output

```
6> display  -o pr
Prov
   adminState = unlocked
   operationalState = enabled
   usageState       = idle
   provisioningActivity = none
   activityProgress     = n/a
   standbyCpActivity    = none
   standbyCpActivityProgress = n/a
   committedFileName         = CE01S3H_April_12.full.002
   currentViewFileName       = CE01S3H_April_12.full.002
   lastUsedFileName          = CE01S3H_April_12.full.002
   provisioningSession       =
   provisioningUser          =
   checkRequired             = no
   confirmRequired           = no
   editViewName              = CE01S3H_April_12.full.002
   editViewAddedComponents   = 0
   editViewDeletedComponents = 0
   editViewChangedComponents = 0
   currentJournal            = 0
   journalDisabledReason     = not disabled
   restorePossible           = no
ok             2004-04-27 16:12:12.8
```

28 Exit provisioning mode once the migration is complete:

end prov

Variable values

Variable	Value
<filename>	The name of the file that contains the committed or portable provisioning data. The variable must be between 1 and 31 characters in length. Use a consistent naming convention.
<new_applications>	A space-separated, case-sensitive list of application versions. The release is indicated by the version number after the underscore.

Variable values

Variable	Value
	The applications required for Succession VoA are base, networking, atmNetworking, and ip. If the nodes have been configured with in-band OAM, the wanDte application must also be present. The application version list must not contain any additional applications
<patches>	A space-separated, case-sensitive list of patches. The patches you need to add to the patch list are listed at the software downloads area of the Nortel Networks Web site (*www.nortelnetworks.com*)

Upgrade the fabric

You can upgrade the fabric firmware installed on Nortel Networks Multiservice Switch 15000 fabric cards to take advantage of enhancements and new functionality contained in later firmware releases. All software running on Multiservice Switch 15000 nodes is compatible with any firmware running on the fabric cards.

Prerequisites

- You do not need to upgrade the fabric card firmware every time you upgrade the control and function processor software. An alarm is raised by the system whenever a newer version of the fabric card firmware is available. To see if you need to upgrade the transport fabric firmware, see *Nortel Networks Multiservice Switch Release Notes PCR6.1*.
- The new fabric card firmware must be downloaded from the Nortel Networks Preside Multiservice Data Manager (MDM) server acting as the software distribution site (SDS). For more information on how to download from the SDS, see NN10600-272 *Nortel Networks Multiservice Switch 7400/15000/20000 Upgrading Software*.
- You can install new fabric card firmware at any time during normal node operation. Installing the new fabric firmware during off-peak hours will limit loss of data on the fabric switchover.
- Nortel Networks Multiservice Switch 15000 nodes must contain two fabric cards. A single fabric card shelf cannot be upgraded hitlessly.
- The fabric card that is receiving the new firmware version must be locked and must not be running any traffic or tests. The fabric card that is not receiving the new firmware version must be unlocked and enabled.

From the node

1 Display the attributes of the fabric card banks:

display Shelf FabricCard/<n> banks

Sample output

```
 1> d sh fa/x banks
 Shelf FabricCard/x
    fixedBankVersion = 8.2
    writableBankVersion = 9.3
    recommendedVersionToInstall = CF01S1A
    activeBank                  = writable
    bankOnShelfRestart          = writable
    downloadProgressPercent     = 100 %
    writableBankStatus          = loaded
 ok             2004-02-23 16:57:25.02
```

2 Verify that the required fabric firmware version has been downloaded to the node:

list Sw Av/Fabric_<version>

Sample output

```
2> l sw AV/fabric_CF01S1A
Sw Av/FABRIC_CF01S1A
  Component has no operational subcomponents of the requested type.
ok              2004-02-23 23:13:25.85
```

If the correct fabric firmware has not been downloaded to the node, see Download the software to the server from the Nortel Networks website on page 24.

3 Verify both fabrics are enabled and unlocked:

display Shelf FabricCard/*

Sample output

```
3> d sh fa/* state
Shelf FabricCard/*
-------------------------------------------------------------------------
|FabricCard|osiAd|osiO|osiUs|osiAvai|osiProc|osiCntr|osiAlar|osiS|osiUn
|          | min |per | age |   l   |       |   l   |   m   |tby | knw
-------------------------------------------------------------------------
|x         |unlck|ena |activ|       |       |       |       |nSet|false
|y         |unlck|ena |activ|       |       |       |       |nSet|false
ok              2004-02-23 23:26:38.95
```

4 Verify that the appropriate card ports on both fabrics are in service:

display Shelf FabricCard/* CardPort/*

All card ports without a *dependenciesInEffect* of *CardNotInstalled* must be unlocked and enabled.

Sample output

```
4> d sh fa/* ca/*
Shelf FabricCard/* CardPort/*
Use -noTabular to see the many hidden attributes.
-------------------------------------------------------------------------
|FabricCard|CardPort|osiAd|osiO|osiUs|failures|dependencies|selfTestEr
|          |        | min |per | age |InEffect|  InEffect  | rorCode
-------------------------------------------------------------------------
|x         |       0|unlck|ena |activ|        |            |         0
|x         |       1|unlck|ena |activ|        |            |         0
|x         |       2|unlck|ena |activ|        |            |         0
|x         |       3|unlck|ena |activ|        |            |         0
|x         |       4|unlck|dis |idle |        |cardNo      |         0
|x         |       5|unlck|dis |idle |        |cardNo      |         0
|x         |       6|unlck|ena |activ|        |            |         0
|x         |       7|unlck|ena |activ|        |            |         0
|x         |       8|unlck|dis |idle |        |cardNo      |         0
|x         |       9|unlck|dis |idle |        |cardNo      |         0
|x         |      10|unlck|dis |idle |        |cardNo      |         0
|x         |      11|unlck|dis |idle |        |cardNo      |         0
|x         |      12|unlck|dis |idle |        |cardNo      |         0
|x         |      13|unlck|dis |idle |        |cardNo      |         0
|x         |      14|unlck|dis |idle |        |cardNo      |         0
|x         |      15|unlck|dis |idle |        |cardNo      |         0
|y         |       0|unlck|ena |activ|        |            |         0
|y         |       1|unlck|ena |activ|        |            |         0
|y         |       2|unlck|ena |activ|        |            |         0
|y         |       3|unlck|ena |activ|        |            |         0
|y         |       4|unlck|dis |idle |        |cardNo      |         0
|y         |       5|unlck|dis |idle |        |cardNo      |         0
|y         |       6|unlck|ena |activ|        |            |         0
|y         |       7|unlck|ena |activ|        |            |         0
|y         |       8|unlck|dis |idle |        |cardNo      |         0
|y         |       9|unlck|dis |idle |        |cardNo      |         0
|y         |      10|unlck|dis |idle |        |cardNo      |         0
|y         |      11|unlck|dis |idle |        |cardNo      |         0
|y         |      12|unlck|dis |idle |        |cardNo      |         0
|y         |      13|unlck|dis |idle |        |cardNo      |         0
|y         |      14|unlck|dis |idle |        |cardNo      |         0
|y         |      15|unlck|dis |idle |        |cardNo      |         0
ok            2004-02-23 23:14:57.86
```

5 Verify that the fabric ports on the cards are unlocked and enabled:

display Shelf Card/* fabricPort/* state

Sample output

```
5> d sh ca/* fabric/* state
Shelf Card/* FabricPort/*
-------------------------------------------------------------------------
|Card|FabricPort|osiAd|osiO|osiUs|osiAvai|osiProc|osiCntr|osiAlar|osiS|osiUn
|    |          | min |per | age |   l   |       |   l   |   m   |tby | knw
-------------------------------------------------------------------------
|   0|x         |unlck|ena |activ|       |       |       |       |nSet|false
|   0|y         |unlck|ena |activ|       |       |       |       |nSet|false
|   1|x         |unlck|ena |activ|       |       |       |       |nSet|false
|   1|y         |unlck|ena |activ|       |       |       |       |nSet|false
|   2|x         |unlck|ena |activ|       |       |       |       |nSet|false
|   2|y         |unlck|ena |activ|       |       |       |       |nSet|false
|   3|x         |unlck|ena |activ|       |       |       |       |nSet|false
|   3|y         |unlck|ena |activ|       |       |       |       |nSet|false
|   6|x         |unlck|ena |activ|       |       |       |       |nSet|false
|   6|y         |unlck|ena |activ|       |       |       |       |nSet|false
|   7|x         |unlck|ena |activ|       |       |       |       |nSet|false
|   7|y         |unlck|ena |activ|       |       |       |       |nSet|false
ok            2004-02-23 23:32:58.28
```

6 Lock the fabric card to be upgraded:

lock Shelf FabricCard/<n>

Sample output

```
6> lock sh fa/x
Shelf FabricCard/x; 2002-08-12 16:37:34.50
SET critical operator operationalCondition 00001000
ADMIN: locked        OPER: enabled       USAGE: idle
AVAIL:               PROC:               CNTRL:
ALARM:               STBY: notSet        UNKNW: false
Id: 01000057  Rel:
Com: Fabric Card is locked
Int: 1/0/2/29063; bcsBus.cc; 677; ""
Shelf FabricCard/x
ok             2002-08-12 16:37:34.50


Shelf FabricCard/x; 2002-08-12 16:37:34.50
SET critical equipment processorProblem 00001001
ADMIN: locked        OPER: disabled      USAGE: idle
AVAIL: dependency    PROC:               CNTRL:
ALARM:               STBY: notSet        UNKNW: false
Id: 01000058  Rel:
Com: Fabric Card is disabled
Int: 1/0/2/29063; bcsBus.cc; 752; ""
```

7 Install the new firmware on the locked fabric card:

install -file(<version>) Shelf FabricCard/<n>

Wait a few minutes for the firmware to install and for the system to notify the operator of any errors or success.

Sample output

```
7> install -file(CF01S1A) shelf fabriccard/x
Shelf FabricCard/x
      The command has been issued to the fabric card.

7> install -file(CF01S1A) shelf fabriccard/x ... continued ...
Shelf FabricCard/x
The command completed successfully.
ok            2004-02-24 13:09:57.99
```

8 Display the attributes of the fabric card banks to verify that the upgrade was a success. If the *activeBank* is set to “fixed”, the fabric card was not able to use the new firmware load and reverted back to the fixed bank. If this happens, contact GNTS.

display Shelf FabricCard/<n> banks

Sample output

```
8> d sh fa/x banks
Shelf FabricCard/x
fixedBankVersion = 8.2
writableBankVersion = 9.4
recommendedVersionToInstall = Fabric software version is up to date.
activeBank                  = writable
bankOnShelfRestart          = writable
downloadProgressPercent     = 100 %
writableBankStatus          = loaded
ok                    2004-02-24 13:10:01.43
```

9 Verify that the fabric card operates correctly by running a manual test with the new firmware before you unlock and send live traffic over the card.

start Shelf FabricCard/<n> test

Sample output

```
9> start shelf fabriccard/x test
Shelf FabricCard/x Test
   Test started.

9> start shelf fabriccard/x test ... continued ...
Shelf FabricCard/x Test
   Test stopped.
ok             2004-02-24 13:12:19.40
```

The test results show whether the fabric card is operating correctly. You can view the results of a test while the fabric test is still in progress or after it has completed.

display Shelf FabricCard/<n> Test results

If the entry in the *fabricSelfTestResults* attribute shows *OK*, the fabric card test has passed.

Note: If there are any problems with the upgraded fabric card, see NN10600-520 *Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting* to interpret the test results.

10

CAUTION
Fabric card not returning to service
If the writable bank is set as the committed bank and it becomes corrupt, the fabric card might not come up. If the writable bank is corrupt, it must be replaced. Contact GNTS.

Unlock the fabric card to return it to service:

unlock Shelf FabricCard/<n>

Note: The fabric unlock command may time-out because the response is not returned until the fabric has finished running the diagnostics. This is normal.

11 Repeat step 3 through step 10 for the other fabric card.

12 If the test result is not *OK*, or if the writable bank appears not to be working correctly after being unlocked, lock the fabric and revert back to the fixed bank. To switch the fabric x from the writable bank to the fixed bank, enter the following commands:

Note: By setting *activeBank* to *fixed*, *bankOnShelfRestart* is also set to *fixed*.

lock Shelf FabricCard/<x>
set sh fab/<x> activeBank fixed
unlock sh fabric Card/<x>

Contact Nortel Networks Global Networks Technical Support (GNTS) to inform them about the fabric card upgrade failure.

Variable values

Variable	Value
<n>	The instance value of the fabric card, X or Y.
<version>	The firmware that is referred to by the recommendedVersionToInstall in step 7.

Verify the success of HSM

After completing the upgrade, verify that HSM executed correctly and that the connections are functioning as they were prior to the upgrade.

Should your checks fail, decide whether or not you should continue. If you are uncertain, contact GNTS for help deciding.

Prerequisites

- If your network has a lot of live connections, displaying the status of the logical processors, SONET ports, and ATM interfaces will result in large amounts of output.
- Verify the status of the node before the upgrade on page 50
- Perform HSM using Command Console on page 69

From the node

1 Login with the appropriate permissions.

2 Compare the status of the logical processors with the status recorded in step 4 of the procedure Verify the status of the node before the upgrade on page 50:

display Lp/* osistate

3 Compare the status of the SONET ports with the status recorded in step 5 of the procedure Verify the status of the node before the upgrade on page 50:

display Lp/* sonet/* osistate

4 Compare the status of the ATM interfaces with the status recorded in step 6 of the procedure Verify the status of the node before the upgrade on page 50:

display Atmlf/* osistate

5 Compare the status of the *UNI* signalling components with the status recorded in step 7 of the procedure Verify the status of the node before the upgrade on page 50:

display atmif/* uni sig/(operatingMode = normal) osistate

6 Compare the status of the *PNNI* signalling components with the status recorded in step 8 of the procedure Verify the status of the node before the upgrade on page 50:

display Atmlf/* Pnni Sig osistate

7 Compare the status of the *ILMI* signalling components with the status recorded in step 9 of the procedure Verify the status of the node before the upgrade on page 50:

display atmif/* uni ilmi/(operatingMode = addressRegEnabled) osistate

8 Compare the status of equipment protection with the information you gathered in step 18 of the procedure Verify the status of the node before the upgrade on page 50:

display Shelf Card/* SparedServices

9 Compare the status of the *Laps* components with the status recorded in step 22 of the procedure Verify the status of the node before the upgrade on page 50:

display Laps/* osistate

10 If configured, compare the status of the *Pbg* signalling components with the status recorded in step 23 of the procedure Verify the status of the node before the upgrade on page 50:

display pbg/* sts/0 osiState

11 If configured, compare the status of the *Pbg* components with the status recorded in step 24 of the procedure Verify the status of the node before the upgrade on page 50:

display pbg/* osiState

12 Compare the status of the *BSo* components with the status recorded in step 25 of the procedure Verify the status of the node before the upgrade on page 50:

display lp/* BSo/* osiState

13 If configured, compare the status of *DS3* components with the information you gathered in step 26 of the procedure Verify the status of the node before the upgrade.:

display lp/* ds3/* osiState

14 If configured, compare the status of *DS1* components with the information you gathered in step 27 of the procedureVerify the status of the node before the upgrade on page 50:

display lp/* ds3/* ds1/* osiState

15 If configured, compare the status of *DS3 DS1* channel components with the information you gathered in step 28 of the procedure Verify the status of the node before the upgrade on page 50:

display lp/* ds3/* ds1/* chan/* osiState

16 If configured, compare the status of *DS3 IMA* components with the information you gathered in step 29 of the procedure Verify the status of the node before the upgrade on page 50:

display lp/* ds3/* ima/* osistate

17 If configured, compare the status of *DS3 IMA LINK* components with the information you gathered in step 30 of the procedure Verify the status of the node before the upgrade on page 50:

display lp/* ds3/* ima/* lk/* osiState

18 Compare the status of the Ethernet connection with the information you gathered in step 31 of the procedure Verify the status of the node before the upgrade on page 50:

display Lp/0 Oamenet/0 activeStatus

19 Compare the status of the Ethernet connection with the information you gathered in step 32 of the procedure Verify the status of the node before the upgrade on page 50:

display Lp/0 Oamenet/0 standbyStatus

20 Compare the status of IP access with the information you gathered in step 33 of the procedure Verify the status of the node before the upgrade on page 50:

display ac ipaccess/*

21 If you have configured in-band OAM, ensure that the Preside MDM servers can display OAM data received by way of both the preferred and non preferred Gateway nodes.

22 If you have configured in-band OAM, compare the status of the *Atmmpe* components with the information you gathered in step 34 of the procedure Verify the status of the node before the upgrade on page 50:

display Atmmpe/* osiState

23 If you have configured in-band OAM, compare the status of the *Ac* components with the information you gathered in step 35 of the procedure Verify the status of the node before the upgrade on page 50:

display Atmmpe/* Ac/* osiState

24 If you have configured in-band OAM, compare the accessibility of the chosen Preside MDM server from the node with the information you gathered in step 36 of the procedure Verify the status of the node before the upgrade on page 50. In conjunction with this step, ensure that both Preside MDM servers are connected by way of different Gateway nodes.

ping -trace -ip(<MDM1 IP>) Vr/0 Ip Icmp

25 If you have configured in-band OAM, compare the accessibility of the alternate Preside MDM server from the node with the information you gathered in step 37 of the procedureVerify the status of the node before the upgrade on page 50. In conjunction with step ensure that both Preside MDM servers are connected by way of different Gateway nodes.

ping -trace -ip(<MDM2 IP>) Vr/0 Ip Icmp

26 In multi-shelf configurations, compare the information you gathered in the procedure Verify the status of the node before the upgrade on page 50. It is recommended that you repeat the steps in this procedure on adjacent nodes in addition to the upgraded node. This verification procedure ensures that the far end links of the migrating node are operating correctly, and can handle a switchover.

Stop the HSM using Command Console

During an upgrade of the nodes, you may encounter problems that require you to abort the upgrade. Generally, you want to abort a hitless software migration if service windows close, failures occur on other nodes, or a MigrationVisibleAlarm is raised, indicating unknown impact or a known service affecting impact. If a MigrationVisibleAlarm is raised, the system pauses the migration. If you expected the alarm and want to continue with the migration, issue the **continue prov** command.

In order to abort a hitless software migration, you must issue the **stop prov** command. To do so without causing a service outage, you must issue this command during the migration-switchover phase. This phase is a short period of time during which the logical or migrating shelf (which held the former standby control processors and standby function processors, but which are now being loaded with the new software) takes control and becomes the service shelf. By issuing the command during this phase, or if the system pauses, you can roll back to the view before the software application version list has changed with no system impact.

Note: If the system pauses you must issue either the **continue prov** command or the **stop prov** command.

Prerequisites

CAUTION
Service outage
If you issue the **stop prov** command after the migration-switchover phase, it will cause a service outage.

From the node

1 Stop the migration:

stop prov

2 Exit provisioning mode.

end prov

3 To resume a hitless software migration after issuing the **stop prov** command, wait until both control processors' LEDs are green, with one flashing and one solid, and return to step 2 in HSM (Command Console) activation on page 67.

```
PROV 56> stop prov
Prov
ok             2001-08-10 15:29:10.78
PROV 57>
    Fs; 2001-08-10 15:29:10.81
SET minor equipment processorProblem 70081019
    ADMIN: unlocked      OPER: enabled       USAGE: active
    AVAIL:               PROC:               CNTRL:
    ALARM:               STBY: notSet        UNKNW: false
    Id: 02BA      Rel: Lp/0
    Com: File system lost disk synchronization.
    Int: 0/0/0/0; sfsFileSys.cc; 1195; ""
PROV 57>
    Fs Disk/1; 2001-08-10 15:29:10.82
CLR cleared processing underlyingResourceUnavail            00000000
    ADMIN: unlocked      OPER: disabled      USAGE: idle
    AVAIL:               PROC:               CNTRL:
    ALARM:               STBY: notSet        UNKNW: false
    Id: 02BB      Rel: Lp/0
    Com: Cleared all alarms against standby DISK
    Int: 0/0/0/0; sfsFileSys.cc; 1238; ""
PROV 57>
--- Response 43 continued ...
   The software upgrade failed due to a failure in upgrading the
standby CP.
   Failure reason: Standby Cp crashed. Software migration aborted.
command failed 2001-08-10 15:29:10.83
PROV 57>
    Prov Migration; 2001-08-10 15:29:10.98
CLR cleared operator operationalCondition                   70000033
    ADMIN: unlocked      OPER: enabled       USAGE: active
    AVAIL:               PROC:               CNTRL:
    ALARM:               STBY: notSet        UNKNW: false
    Id: 02BC      Rel: Lp/0
    Com: Prov Migration component deleted.
    Int: 0/0/2/6973; casAlarm.cc; 1132; S_PCR2.2.1.2
```

HSM (Preside MDM SASM tool) activation

Perform the HSM by setting the application version list, setting the patchlist, and activating the provisioning changes. When the activation completes, the node will be running the new software.

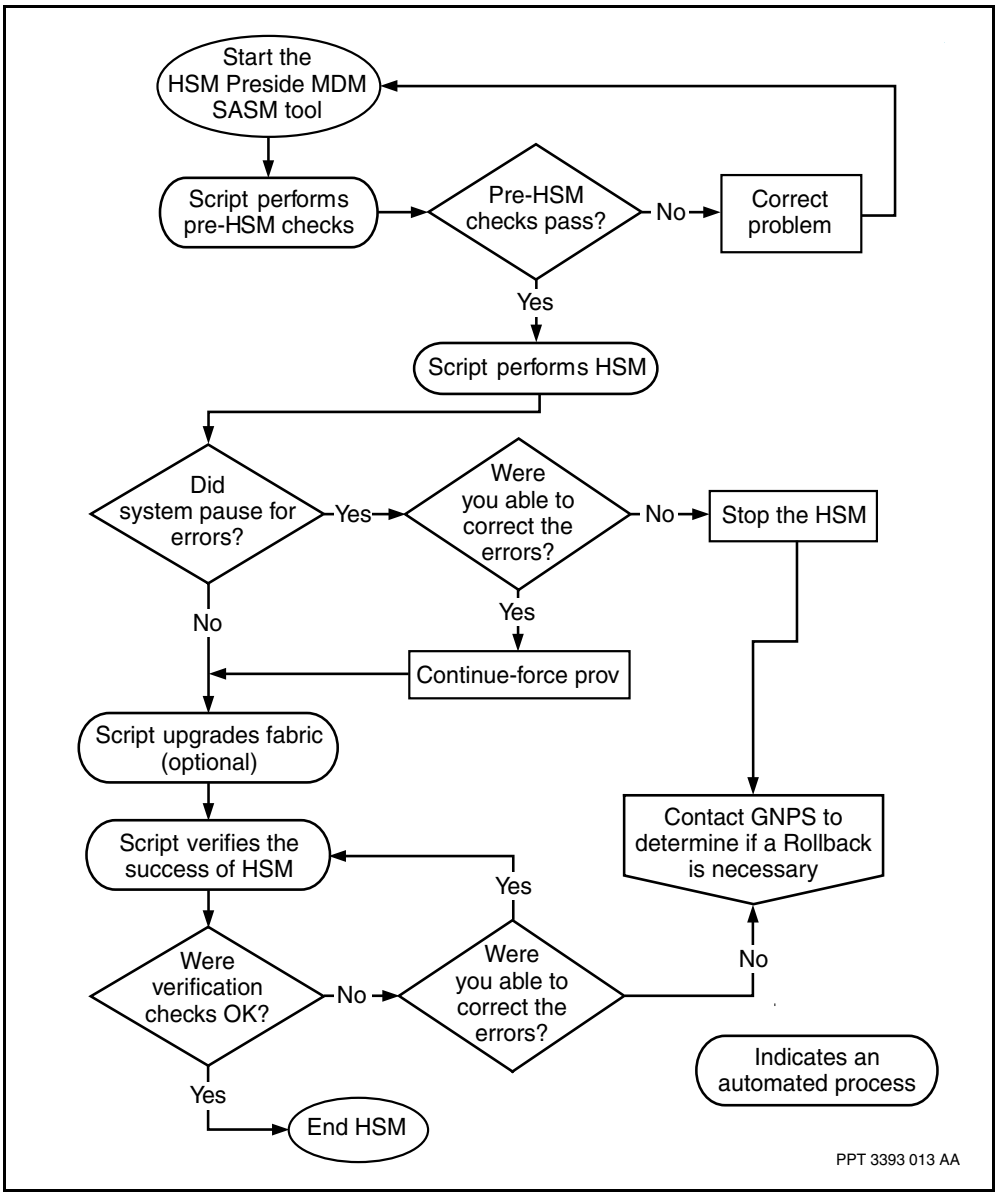
Prerequisites

- For in-band OAM topologies, upgrade all Nortel Networks Multiservice Switch 15000 nodes in the network in the following sequence:
  - — upgrade all the remote nodes first
  - — upgrade the non-preferred Gateway node next
  - — upgrade the preferred Gateway node last

HSM task flow

The task flow shows you the sequence of procedures you need to perform to execute the HSM.

HSM task flow



Work flow navigation

The following initial portion of the HSM is manually controlled by the operator:

- Manual verification checks on page 100

The following aspects of the HSM are automated by the Succession ATM Upgrade script:

- Start Succession ATM Software Migration tool on page 101
- Pre-HSM verification checks on page 106
- HSM activation on page 107
- Post-HSM verification and Fabric upgrade on page 109
- HSM script completion and final steps on page 110

The final portion of the HSM is manually controlled by the operator:

- Stop the HSM using Preside MDM SASM tool on page 112

Performing HSM using Preside MDM SASM

Perform HSM using a Nortel Networks Preside Multiservice Data Manager (MDM) GUI tool called Succession ATM Software Migration (SASM), to upgrade the Nortel Networks Multiservice Switch node.

Prerequisites

- Have the correct software load and patches downloaded to the Preside MDM server.
- If you have configured in-band OAM, you need to perform some pre-HSM verification checks manually.

Manual verification checks

1 Verify that the *Atmmpe* components are unlocked, enabled, and active. Use step 34 through step 37 in Verify the status of the node before the upgrade on page 50.

2 Verify that the *hardwareFailures* attribute for the shelf component does not have a failure. See step 17 in Verify the status of the node before the upgrade on page 50.

Start Succession ATM Software Migration tool

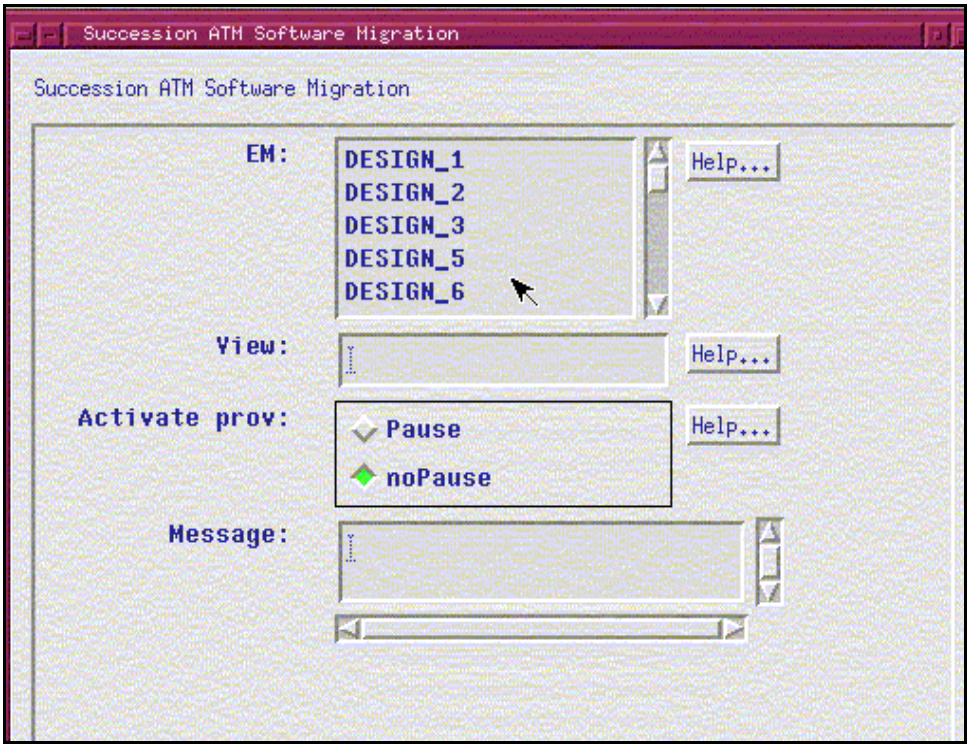
From the Preside MDM window

1 Choose Configuration > Passport > Administration > Succession ATM Software Migration.

Alternatively, from the Preside MDM Command Console, type:

$ /opt/MagellanNMS/bin/succession_atmsw_migr

The Succession ATM Software Migration window opens.



2 In the EM field, select the name of the node you want to upgrade.

3 In the View field, enter the new target view name.

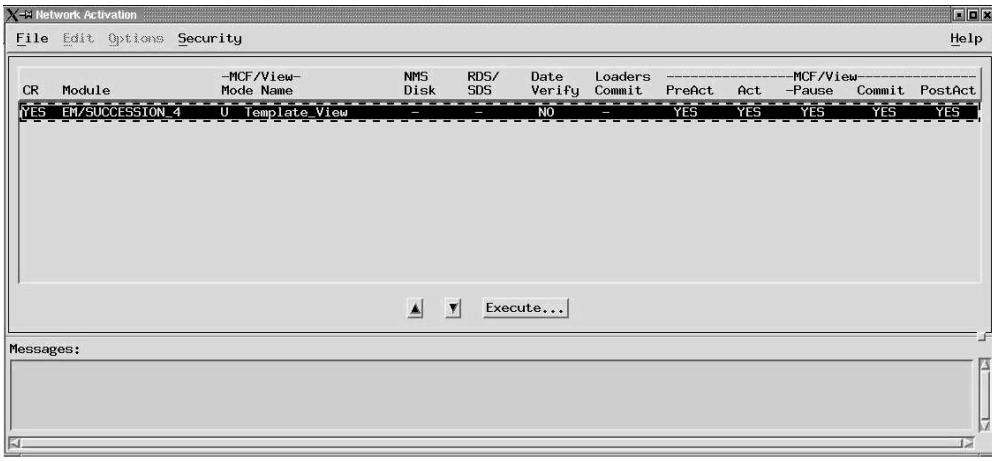
Use a consistent naming convention as this name is used when saving the current view and to create the view that will be activated for the software migration.

4 Select **Pause** or **No Pause**.

5 Click **OK**.

The Component Information Viewer opens.

The Network Activation window opens.



The Network Activation tool launches automatically in Hitless Software Migration mode with the Succession network activation file already loaded. The Succession network activation file contains one network activation record defined specifically for Succession software migration activation. The record is already selected.

6 From the Preside MDM window, choose Fault > Alarm Display: Log.

The Alarm Display window opens.

7 Ensure the appropriate filters are turned on, including the filter for the target node, and that Format is set to full, then click **Filter**. For more information on how to filter alarms, see “Filtering alarms” in 241-6001-011 *Preside MDM Fault Management User Guide*.

8 From the Preside MDM window, choose Fault > Alarm Display: Active.

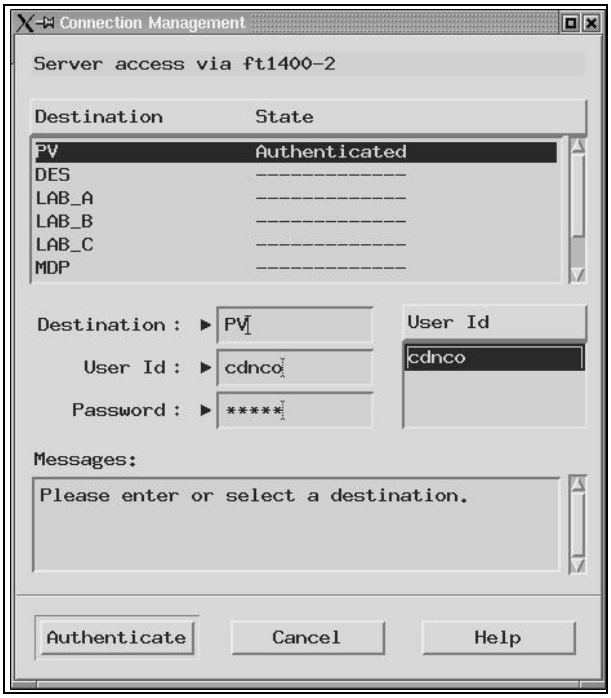
The Alarm Display window opens.

9 Ensure the appropriate filters are turned on, including the filter for the target node, and that Format is set to full, then click **Filter**. For more information on how to filter alarms, see “Filtering alarms” in 241-6001-011 *Preside MDM Fault Management User Guide*.

Note: You should monitor any alarms against the *prov* component (specifically 7000 0033, 7000 0034, and 7000 0035) and the *prov migration* component. You should also monitor 7012 0204 against the *Lp* component. This alarm indicates that the LP cannot achieve its expected migration switchover behaviour.

10 From the Network Activation tool, select **Group Authenticate** from the Security menu.

The Connection Management Dialog opens.



11 Enter or select the node's group name, and enter a valid user ID and password for the group. (Your user ID must have a minimum impact of System Admin and minimum scope of network.)

12 Click **Authenticate**.

Authentication takes place. If authentication is successful, the dialog closes.

> ***Note:*** If your user ID does not have sufficient permissions to perform the upgrade, you must exit and restart the SASM tool using an ID that has a minimum impact of System Admin and minimum scope of network.

After you authenticate with the group that contains the node to be migrated, you can use the Component Information Viewer to display the attributes of the provisioned components and later after the migration starts, monitor the progress of the migration. See 241-6001-011 *Preside MDM Fault Management User Guide*.

13 In the Network Activation tool window, click **Execute**.

A confirmation dialog opens.

14 Click **OK** to proceed with the activation.

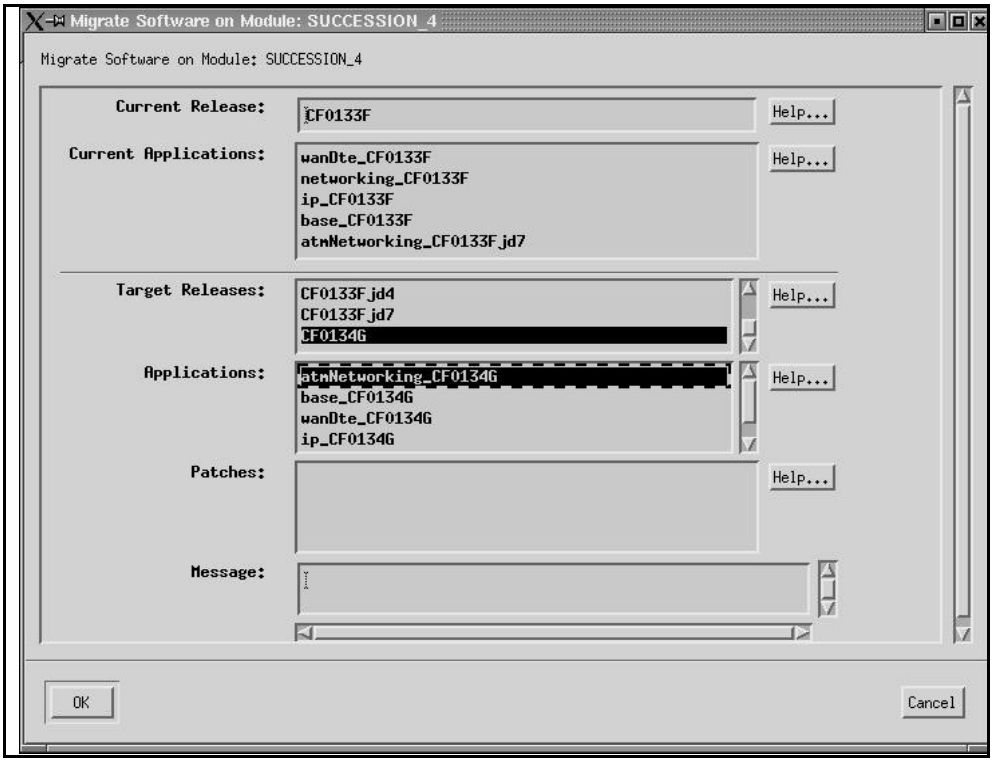
On the Network Activation tool, the **Execute** button changes turn to grey and can no longer be selected.

The activation begins. Information about the activation is written into the log file: `/opt/MagellanNMS/data/log/nat/nat_<nodename>_<timestamp>.log`.

As each process is performed, the corresponding field in the record turns from blue to green. If the action completes successfully, the field turns from green to blue and the next field turns green. If an action fails, the entire record turns red or yellow according to the severity of the error. While execution is underway, **Execute** is replaced by a **Stop** button that can be used to halt execution.

A window opens displaying the results of the pre-check and post-check commands. If a fault is found, the operator can stop the script (for example, if there is a fault on a component and the the operator wants to fix it), fix the problem and repeat the process until all problems are corrected.

The Migrate Software on Module window opens.



15 In the Migrate Software on window, select the target release.

16 In the Migrate Software on window, select the software version that is the destination software version. Verify that the application version selected matches the application version in the target release.

17 Select the required patches from the patch list.

Note 1: You cannot apply transparent (FT) patches using the SASM tool.

Note 2: This step is only valid if you are migrating from SN07 to SN07 and the patch AV has been downloaded to the Multiservice Switch 15000 node. When migrating from a pre-SN07 release (SN06, SN06.2) to SN07, patches cannot be specified. Refer to step 8 in procedure Perform HSM using Command Console on page 69 for more details on how to apply patches in SN07.

18 If you would like to proceed with the migration, click **OK**.

19 The script progresses to the pre-activation stage and executes pre-HSM verification checks.

Note: You should monitor the *prov* component using the Component Information Viewer. While the activation is in progress, you should monitor for alarms from the node using the Preside MDM alarm display. The migration should be stopped if unexpected warnings or alarms appear.

Pre-HSM verification checks

1 Monitor the pre-HSM verification.

While the record is executing the pre-HSM portion of the script, information is displayed and you may be prompted to continue with the software migration or to abort the software migration.

Note: The Command Console CLI response format is different from the SASM tool GUI command response format because the SASM format is optimized for automated processing. The information presented is the same.

Error messages occur for the following reasons:

- if another operator is also provisioning
- if there are warnings or errors from the check prov
- if the message “All applications will experience service outage” appears during the check prov
- if the disks or file systems are not synchronized
- if a Logical processor, Sonet port, DS3 port, DS1 port under a DS3 port, channel under a DS1 port, IMA component under a DS3 port, IMA link, or an ATM interface on the system is not enabled, unlocked, free of alarms, and the osiAvail is not empty
- if *UNI signalling*, *PNNI signalling*, or *UNI ILMI* component on the system is not enabled
- if a CP is performing a provisioning activity
- if a CP does not have an Ethernet connection available
- if equipment protection is not configured properly or spared services are not ready
- if a Laps component has alarms

For information on how to handle these error messages, see Impact of an error condition on a HSM using the SASM tool on page 130.

HSM activation

1 At the completion of the pre-activation portion of the script, you are asked if you want to continue with the software migration. If you would like to proceed, press **Enter**.

The migration takes place. The number of calls and components that have been provisioned on the node determine how long the activation takes.

Monitor the status of the node and the status of the migration. To monitor the progress of the migration, use the Component Information Viewer to display the attributes of the provisioning component. You can continue to do this until you lose connectivity to the node, which is when the originally active CP begins to load the new software. The Preside MDM server automatically reconnects to the node when possible.

While the activation is in progress, monitor the alarms from the node using the Preside MDM Alarm Display. If unexpected warnings or alarms appear, stop the migration. Refer to What happens to the node during a hitless software migration on page 41 for more information.

2 If the software migration pauses, you are prompted to either stop the migration or continue the migration.

The software migration will pause because the **-pause** option has been chosen or, there is something wrong with the application during the software migration (Phases 1 to 3).

a If the software migration paused because of *Pbg* components have been provisioned, perform steps 15 to 17 from the procedure Perform HSM using Command Console on page 69. If the CS2000 and SAM21 connections have returned to service, click **Continue**.

b Review the Migration Visible Alarms to determine whether or not you should continue the migration. Click the appropriate button to continue or stop.

CAUTION
Contact GNTS before continuing during a migration pause
Contact Nortel Networks Global Networks Technical Support (GNTS) for advice or assistance before continuing if the software migration pauses due to a Migration Visible Alarm.

Note: If you have used the **-pause** option and the system has paused prior to the switchover, and you have pressed the **continue** button to continue HSM, the HSM will not pause again to allow you to make the checks outlined above (unless the system finds a fault).

Post-HSM verification and Fabric upgrade

After the HSM activation phase and commit phase are complete, the Network Activation tool starts the post-HSM verification portion script. After the record has executed the post-HSM verification, a fabric card firmware upgrade is performed on each fabric card if required.

Information on the result of the fabric card firmware upgrade and fabric card test is written to the log file. If the first fabric card firmware upgrade does not complete successfully, the second fabric card firmware upgrade is not attempted.

HSM script completion and final steps

When all actions in the record have completed successfully, the entire record turns blue.

1 Double-click on the executed record in the record list to display and review the logged information. Alternatively you can choose Show Status from the record list pop-up menu.

2 Select **Exit** from the File menu to close the Network Activation Tool.

3 Select **Exit** from the File menu to close the Component Information Viewer tool.

4 If you have configured in-band OAM, use step 21 to step 25 inclusive in Verify the success of HSM on page 90 to compare the status of the *Atmmpe* components with the information you gathered in steps 21 to 23 of the procedure Verify the success of HSM on page 90.

5 If **display -o prov** shows a different version number for the `editViewName` from the `committedFileName`, execute the following comments through the `commandConsole`:.

```
PROV 3> st pr
Prov
ok              2004-06-01 10:36:06.01

PROV 4> load -file(<committedFileName>) pr
Prov
   Loaded or applied file <committedFileName>.
ok              2004-06-04 10:20:47.36

PROV 5> end pr
Prov
ok              2004-06-01 10:36:09.45
```

The following output shows an example of misaligned `editViewName` and `committedFileName`.

```
Prov
   adminState = unlocked
   operationalState = enabled
   usageState       = idle
   provisioningActivity = none
   activityProgress     = n/a
   standbyCpActivity    = none
   standbyCpActivityProgress = n/a
   committedFileName         = CF0124F_April_27.full.001
   currentViewFileName       = CF0124F_April_27.full.001
   lastUsedFileName          = CF0124F_April_27.full.001
   provisioningSession       =
   provisioningUser          =
   checkRequired             = no
   confirmRequired           = no
   editViewName              = CF0124F_April_27.full.001
   editViewAddedComponents   = 0
   editViewDeletedComponents = 0
   editViewChangedComponents = 0
   currentJournal            = 0
   journalDisabledReason     = not disabled
   restorePossible           = no
```

Stop the HSM using Preside MDM SASM tool

At any decision point during the software migration before the activation phase has begun, the operator can select **Abort** or **Cancel** and the migration stops. The Network Activation and Preside Multiservice Data Manager (MDM) Component Information Viewer windows can be closed by selecting **File** and then **Exit**.

During the pre-script phase, you can stop the process by entering **<Ctrl> -C** in the pre-script window.

After the software activation has started and before the migration switchover phase starts, it is possible to abort the software migration hitlessly by clicking the STOP button in the Network Activation tool's main window. The Network Activation tool sends a **stop prov** command to the node and all the tool's processes stop. The success of the stop depends on timing. If the node enters the migration switchover phase before processing the **stop prov** command then it is too late to stop the hitless software migration.

If the system detects a problem during the software migration (phases 1-3), then the hitless software migration automatically pauses before migration switchover occurs. This pause allows you to review the migration visible alarms before continuing or stopping the migration.

To stop the process after the Migration switchover phase has started, click the **Stop** button in the Network Activation Tool main window. Further processing stops on the HSM SASM tool (but not on the node). To back out after the migration switchover, follow the steps in SN06 Rollback on page 123.

CAUTION
Non-hitless process
Stopping the process after the HSM switchover is not a hitless process.

Feature activation

The following features should be activated:

- Enabling the recurring fan alarm
- Setting the Succession release name identification
- Setting the log spooler daysToRetainFiles attribute

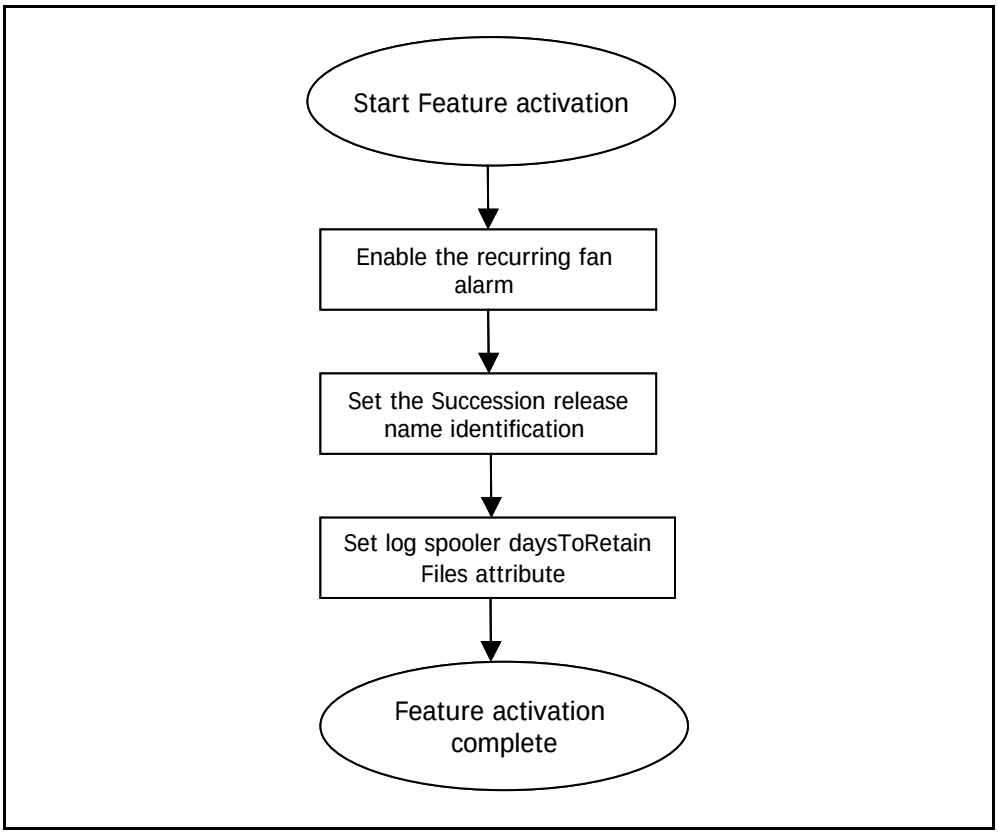
Prerequisites

- Complete the HSM. See HSM (Command Console) activation on page 67 and HSM (Preside MDM SASM tool) activation on page 97 for more information.

Feature activation task flow

The task flow shows you the sequence of procedures you need to perform to activate new features.

Feature activation work flow



Work flow navigation

- Enabling the recurring fan failure alarm on page 115
- Setting the Succession release name identification on page 116
- Setting the log spooler daysToRetainFiles attribute on page 120

Enabling the recurring fan failure alarm

In a Succession solution, Nortel Networks recommends configuring the recurring fan failure alarm on Nortel Networks Multiservice Switch 15000 nodes. If a fan fails, the alarm 7012 0051 is always raised. If the recurring alarm is configured, the alarm is repeated periodically (every 8 hours with the same severity, and on the fourth occurrence the fan severity is increased to critical) until the problem is cleared. This raises the operators' attention to the problem and ensures action is taken before an outage occurs.

Prerequisites

- SN07 software must be running on the node.

From the node

1 Login with the appropriate permissions.

2 Enter provisioning mode: **start prov**

3 Configure the recurring fan alarm feature:

set shelf repeatFanAlarm ON

4 Perform a semantic check on the changes:

check prov

Note: If the semantic check fails, troubleshoot the problem using the chapter Troubleshooting a software upgrade on page 125.

5 If the semantic check passes, activate the view:

activate prov

6 If the semantic check passes, confirm the final version of the view:

confirm prov

7 If the semantic check passes, save the view:

save prov

8 If the semantic check passes, commit the final version of the view:

commit prov

Setting the Succession release name identification

The *commentText* field of the Multiservice Switch 15000 shelf component contains record release and load information that appears in the following order:

- Succession release
- patchlevel of Nortel Networks Preside Multiservice Data Manager (MDM) software used to commission the node
- version of Installation Methods used to commission the node
- version of the Engineering Specification Book used to commission the node

To help identify which Succession release the MDM and Multiservice Switch 15000 are running, you can use the MDM 15.1 toolset to modify the Succession release name in the *commentText* field of the Multiservice Switch 15000 shelf component for Multiservice Switch 15000/Media Gateway 15000 in a VoIP network. See NN10419-461 *Upgrading Nortel Networks Multiservice Switch 15000 and Media Gateway 15000/20000 in Succession IP Solutions* for more information.

For Multiservice Switch 15000 in Core ATM networks, migration is done through the Succession ATM Software Migration (SASM) tool. When the SASM tool migrates the Multiservice Switch 15000 in Core ATM network, a customized version of the NAT tool is displayed to the operator running the SASM tool. This version of NAT has Succession pre and post scripts to validate the node state before and after the migration. When the post-activation script is finished, the tool prompts the operator to enter the Succession release name.

An alternate way to set the Succession release name on Multiservice Switch 15000 is by using the **Set Shelf Commenttext** command.

Perform either the:

- Setting Succession release name using the Set Shelf CommentText command on page 117 or
- Setting release Succession release name for Multiservice Switch 15000 on page 118

Setting Succession release name using Set Shelf CommentText command

Setting Succession release name using the Set Shelf CommentText command

From the node

1 Login with the appropriate permissions.

2 Display the comment text field:

display Shelf CommentText

The following shows sample output for this command:

```
7> display Shelf CommentText

SN06, MDM 142-09, IM9095 1.01, IM1662 1.35, IM1661 1.04, Spec 2.0
```

3 If the first entry, the release name, is not the release you have running on the node, update this entry by setting the current text to contain the string “SN07” and leave the remainder of the text unchanged. For example:

set Shelf CommentText "SN07, MDM 142-09, IM9095 1.01, IM1662 1.35, IM1661 1.04, Spec 2.0"

Setting Succession release name for Multiservice Switch 15000

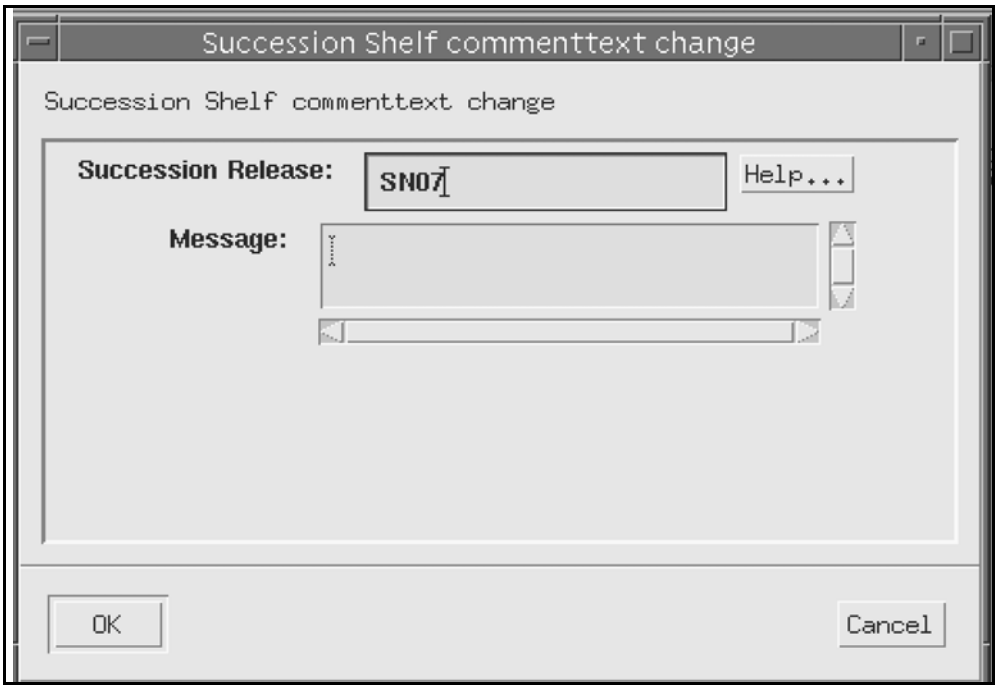
Prerequisites

- The Multiservice Switch 15000 hitless software migration must have been performed using the Preside SASM tool.

Setting release Succession release name for Multiservice Switch 15000

From the Preside MDM server

1 The SASM tool post-activation script prompts you for the new Succession release name to be displayed in the Multiservice Switch 15000 Shelf CommentText. Use the format: SNxx.y.



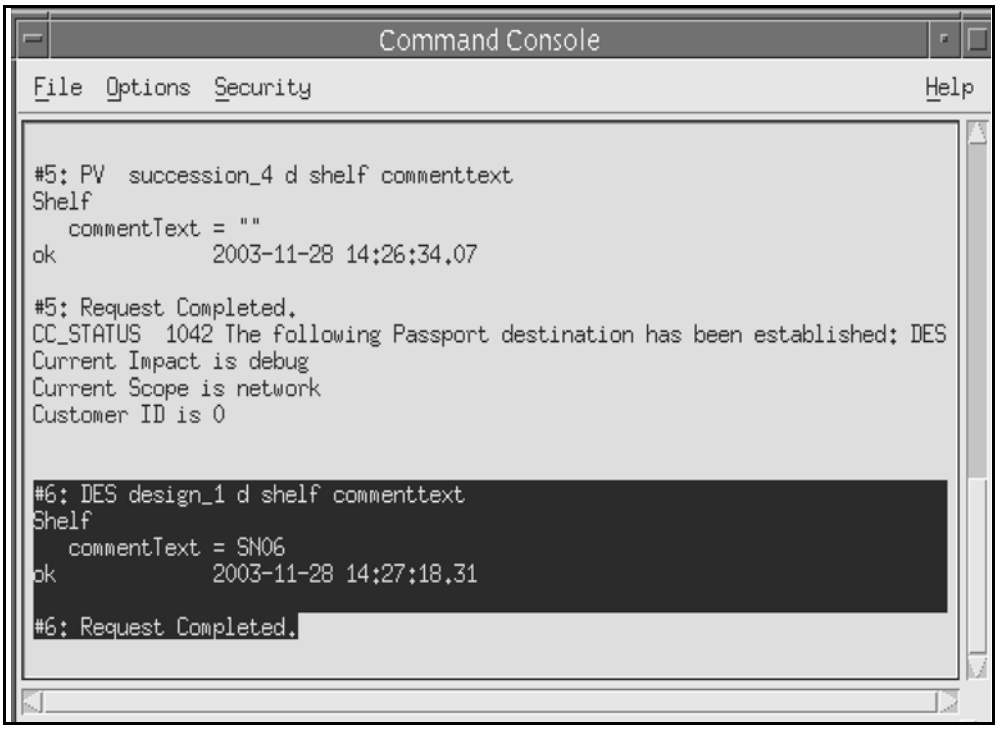
If you click **Cancel**, the update is cancelled before execution and the Multiservice Switch 15000 Shelf *CommentText* remains unchanged.

2 Click **OK**.

A NAT record is created and the NAT window is displayed for a second time since the start of SASM.

This time it activates the service data (the only change is the S*helf CommentText*) with no pre- and post checks.

The *Shelf CommentTex*t attribute on the target node is updated with the Succession release name being displayed before the rest of the information in the *Shelf CommentText* field.


Command Console
File Options Security Help
#5: PV succession_4 d shelf commenttext
Shelf
commentText = ""
ok 2003-11-28 14:26:34.07
#5: Request Completed.
CC_STATUS 1042 The following Passport destination has been established: DES
Current Impact is debug
Current Scope is network
Customer ID is 0
#6: DES design_1 d shelf commenttext
Shelf
commentText = SN06
ok 2003-11-28 14:27:18.31
#6: Request Completed.

Setting the log spooler daysToRetainFiles attribute

When migrating from SN06, the following change is required to maintain the Succession recommended handling of spooled log files.

Prerequisites

- SN07 software must be running on the node.

From the node

1. Login with the appropriate permissions.
2. Enter provisioning mode:

   start prov
3. Configure the log spooler attribute:

   set Collector/log Spooler daysToRetainFiles 30
4. Perform a semantic check on the changes:

   check prov

   Note: If the semantic check fails, troubleshoot the problem using the chapter Troubleshooting a software upgrade on page 125.
5. If the semantic check passes, activate the view:

   activate prov
6. If the semantic check passes, confirm the final version of the view:

   confirm prov
7. If the semantic check passes, save the view:

   save prov
8. If the semantic check passes, commit the final version of the view:

   commit prov

Rollback

If you need to back out of an upgrade and the software has already been activated, you can revert the software on the node to a provisioning view that was saved while running a previous version of the software.

Prerequisites

CAUTION
Reverting to an earlier software version is not hitless
After the originally-active CP and FPs have been reset, reverting back to the old configuration view is not hitless. At this point, any downgrade to the old configuration view results in a loss of call processing. While loading the old software and configuration view, the following events occur: call processing is initially maintained while the previous software load is loaded into one of the control processors. The function processors then go out of service, resulting in a loss of calls.

CAUTION
Loss of provisioning changes
If you revert the node to an earlier version of the software, provisioning changes made to the upgraded version are lost.

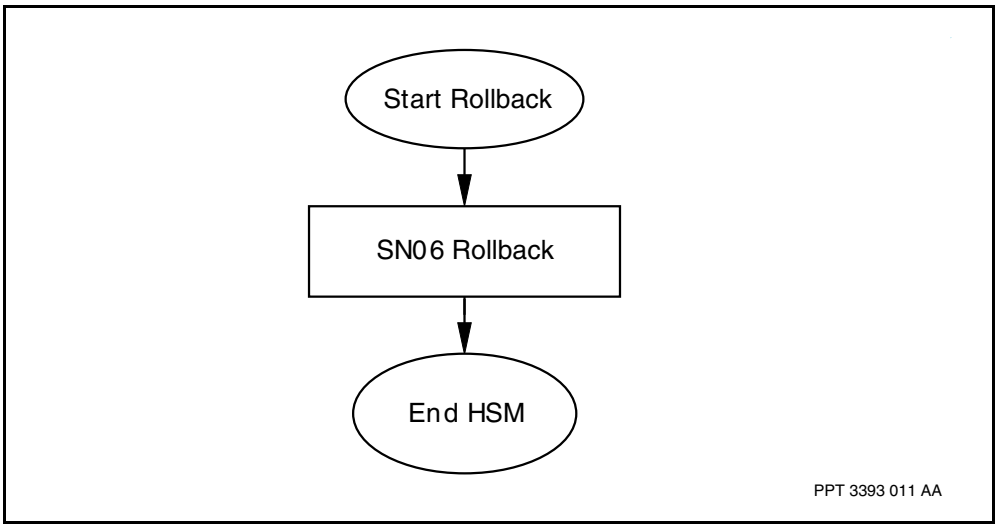
- You must ensure the FPs and CPs on the shelf are compatible with the level of software to which you are reverting. To verify the minimum software requirements of the FPs, see NN10600-551 *Nortel Networks Multiservice Switch 7400/15000/20000 FP Configuration Reference*. To verify the software requirements of the CPs, see NN10600-120 *Nortel Networks Multiservice Switch 15000/20000 Hardware Description*.
- If you need to revert to a saved view of an older Nortel Networks Multiservice Switch software version, when the Multiservice Switch 15000 node restarts, it restarts in the operational state it was in when you saved the current view.

- The Backup server, the Restore sever, the PP Backup provider, the PP Restore provider, the FMDR server, and the GMDR server must all be running on the Nortel Networks Preside Multiservice Data Manager (MDM) server for the Preside MDM Backup and Restore tool to function properly. See 241-6001-807 *Preside MDM Network Backup and Restore* for information on how to check these servers.
- Nortel Networks recommend that you perform this upgrade using the Preside MDM Command Console. For more information on opening the Command Console, see 241-6001-804 *Preside MDM Workstation Utilities User Guide*.

Rollback task flow

The task flow shows you the procedure you need to perform to rollback to the last committed view saved prior to HSM.

Rollback task flow chart



SN06 Rollback

Rollback to the last committed view saved prior to the HSM.

Prerequisites

- Contact Nortel Networks GNTS before initiating a rollback to verify that a rollback is necessary.

From the node

1 Login with the appropriate permissions.

2

CAUTION
Possible loss of calls
After activating the previously saved view, the following events occur: call processing is initially maintained while the previous software load is loaded into one of the control processors. The function processors then go out of service, resulting in a loss of calls.

Activate the previously saved view:

activate -force -file(<committedViewName>) prov

Network connectivity is lost and the node starts reloading the old software.

3 When the Preside MDM server reconnects to the node, confirm the provisioning changes: **confirm prov**

4 Commit the provisioning changes: **commit prov**

5 Exit provisioning mode once the commit is complete:

end prov

Variable values

Variable	Value
<committedViewName>	The name of the previously saved committed view.

Troubleshooting a software upgrade

Refer to one of the following sections for information on:

Error conditions during an HSM

The table Impact of an error condition on a HSM on page 126 describes the error conditions that can occur in each phase of a software migration, how the system responds to the error conditions, and the steps you must take to correct the error condition.

Note: If you are performing the migration using the native CLI, alarms appear directly in the console window. If you are using the Command Console, open Nortel Networks Preside Multiservice Data Manager (MDM) Alarm Display in log mode to monitor the alarms.

Impact of an error condition on a HSM

Phase	Error condition	Result and action
1) Active CP pre-work	Criteria for activate prov is not met.	Command failed
	Cannot save temp file.	Command failed. Check disk usage and tidy disk if necessary.
	Active CP crashes (service shelf).	CP switchover. Take action based on responses or alarms received as a result of the failed activity.
	"Yes" in response to the *display ProvisioningSystemrestore Possible* command.	The journal files have not been purged. Purge the files by issuing the *commit force prov* command. Then re-issue the *display ProvisioningSystemrestorePossible* disk to verify the files have been purged. To restore these journal files, see the Restore Prov command section in NN10600-050 *Nortel Networks Multiservice Switch 7400/15000/20000 Command Reference*
Note: For more information on Multiservice Switch alarms, see NN10600-500 *Nortel Networks Multiservice Switch 6400/7400/15000/20000 Alarms Reference*		

Impact of an error condition on a HSM

Phase	Error condition	Result and action
2) CP migration	Cannot load new software.	Command failed. Take action based on responses or alarms received as a result of the failed activity.
	Cannot build migration provisioning view.	Command failed. Take action based on responses or alarms received as a result of the failed activity.
	Cannot save commit formats.	Command failed. Take action based on responses or alarms received as a result of the failed activity.
	Cannot deliver shelf management data.	Command failed. Take action based on responses or alarms received as a result of the failed activity.
3) FP migration	Cannot load new software.	FP failed. Take action based on responses or alarms received as a result of the failed activity.
	An application does not acknowledge the provisioning data entry.	Application failed. Take action based on responses or alarms received as a result of the failed activity.
	An application negatively acknowledges the provisioning data delivery.	Application failed. Take action based on responses or alarms received as a result of the failed activity.
	An application cannot achieve synchronization of dynamic data.	Application failed. Take action based on responses or alarms received as a result of the failed activity.
4) Migration	Active CP crashes (service shelf).	Continue with software migration.
Note: For more information on Multiservice Switch alarms, see NN10600-500 *Nortel Networks Multiservice Switch 6400/7400/15000/20000 Alarms Reference*		

Impact of an error condition on a HSM

Phase	Error condition	Result and action
5) Post-migration switchover	Former migrating CP cannot become active.	Service shelf outage. The system rolls back to the committed provisioning view. No operator action.
	Former migrating FP cannot become active.	FP outage. The new provisioning view is maintained. Respond to alarms generated by the system.
	Operator does not or cannot confirm provisioning changes.	Service shelf outage. The system rolls back to the committed provisioning view. No operator action.
	The newly active CP crashes (with or without standby CP available).	Service shelf outage. The system rolls back to the committed provisioning view. No operator action.
	FP crashes.	Normal recovery procedure. The FP resets, reloads software, reloads provisioning data and restarts applications. The new provisioning view is maintained.
	Former service shelf FPs/CP cannot reload with new software.	Equipment sparing is not restored. The new provisioning view is maintained. Respond to alarms generated by the system.
	Disk synchronization failed or unexpectedly lost.	Respond to alarms generated by the system. The *commit prov* command is not accepted until disk synchronization is achieved or the standby CP is removed from service.
Note: For more information on Multiservice Switch alarms, see NN10600-500 *Nortel Networks Multiservice Switch 6400/7400/15000/20000 Alarms Reference*		

Impact of an error condition on a HSM

Phase	Error condition	Result and action
Any phase	Any FP crash (service shelf).	The system performs the appropriate recovery procedure, depending on the type of sparing that is available for an FP crash, either processor sparing or a card restart. The software migration activation continues.
1-3	Disk synchronization failed or unexpectedly lost.	An hardware disk failure has occurred, or the CP disks are not the same size and the total data on the disk exceeds the size of the smallest disk. It is normal to lose disk synchronization when the standby CP is reset to reload new software. Disk synchronization must be regained before the migration switchover can occur. Take action based on responses or alarms received as a result of the failed activity.
2-3	Active CP crashes (service shelf).	If both the following conditions are true, then this error triggers migration switchover: - disks are synchronized - Lp/0 is ready for migration switchover FPs that have not completed their FP migration phase are reset. FPs that have completed their FP migration phase switchover to the new software. If either of the conditions are not true, then the system rolls back to the committed provision view. A service shelf outage occurs.
Note: For more information on Multiservice Switch alarms, see NN10600-500 *Nortel Networks Multiservice Switch 6400/7400/15000/20000 Alarms Reference*		

Error conditions during an HSM using the Preside MDM SASM tool

The table Impact of an error condition on a HSM using the SASM tool on page 130 describes the error conditions that can occur in each phase of a software migration performed using Nortel Networks Preside Multiservice Data Manager (MDM) SASM tool, how the system responds to the error conditions, and the steps you must take to correct the error condition.

Impact of an error condition on a HSM using the SASM tool

Phase	Error condition	Result and action
Prior to starting the Pre-HSM Verification checks	Cannot start the tool.	Check the /opt/MagellanNMS/cfg/.SuccessionEnabled is setup properly.
	Cannot select node, cannot connect to the nodes.	Check *NN10198-912 Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP*
	Cannot select loads or patches.	Verify that the loads are downloaded to the node.
Pre-HSM Verification checks	Pre-check fails with: “Operation failed: CC_ERROR 1019 Passport Register Command error: APPLICATION_ERROR 1111 Fdtr cannot connect to SUCCESSION_3 because it can’t be pinged ... Done recording IP accessibility.”	Preside MDM server has lost connectivity to the node, see the NN10198-912 *Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP*
Note: For more information on Nortel Networks Multiservice Switch alarms, see NN10600-500 *Nortel Networks Multiservice Switch 6400/7400/15000/20000 Alarms Reference*.		

Impact of an error condition on a HSM using the SASM tool

Phase	Error condition	Result and action
Pre-HSM verification checks continued	Another operator is provisioning at the time of HSM.	Contact the other operator and request that they finish the session. Restart HSM. Alternatively, log on to the node and issue a *start -prov* to terminate the other provisioning session. Exit provisioning and restart HSM.
	Current view saved as <viewname.xxx> Do you want to commit to the current view?	Prompts the operator when the current view and the committed view are not the same. When the operator answers yes, the view is committed.
	View <viewname.xxx> is the committed view. It may not have been backed up. Do you want to continue without backing it up or abort the migration?	Prompts the operator after the current view has been committed. When the operator answers to continue, the operator may not be able to rollback if the committed view has not have been backed up.
	Operation has completed but errors were found.	You may not have sufficient privileges to execute all the commands in the script. Restart the HSM with the correct scope and impact.

Note: For more information on Nortel Networks Multiservice Switch alarms, see NN10600-500 *Nortel Networks Multiservice Switch 6400/7400/15000/20000 Alarms Reference*.

Problems with a hitless software migration (HSM)

Problems with an HSM may be caused by one of the following

- the new software does not load
- the migration provisioning view does not build
- the commit formats did not save
- an application does not acknowledge the provisioning data entry, negatively acknowledges the data delivery, or cannot achieve the synchronization of dynamic data
- the disk synchronization fails
- a *confirm prov* command is not issued within 20 minutes of activating the new software
- the PBG components are locked or disabled

Problem indicators

Migration alarms are displayed on the OSS and the node. For example:

- 7000 0033-0035 - Prov Migration alarms used to indicate migration pause and applications not ready for switchover
- 7006 0005 - FP failure to FTP firmware from CP during migration
- 7012 0204 - Lp software does not support HSM - services on that Lp will be interrupted during the software migration
- 7054 0101 - Electrical FP sparing panel, as configured does not support HSM

Corrective action

The following table shows the sequence of tasks you need to perform to isolate and correct various problems during an HSM. This table references procedures contained in this document or located in other Nortel Networks Multiservice Switch, Preside Multiservice Data Manager, or Succession documents.

Corrective action for problems during a HSM

	Task	Use the section ...	in
1.	On the Preside MDM server, open the Command Console tool and connect to the network.	“Connecting to the network”	241-6001-804 *Preside MDM Workstation Utilities User Guide*
2.	On the Preside MDM server, log the command output to a file.	“Logging command output to a file”	241-6001-804 *Preside MDM Workstation Utilities User Guide*
3.	On the Preside MDM server, open the Network Viewer tool, the Alarm Display tool and the Alarm Help.	“Starting the Network Viewer” “Viewing alarms in the Active mode” “Starting Alarm Help”	241-6001-011 *Preside MDM Fault Management User Guide*
4.	If the hitless software migration fails, ensure that there is enough free space on the file system.	“Ensuring that there is enough free space on the file system”	NN10600-270 *Nortel Networks Multiservice Switch 7400/15000/20000 Software Installation*
5.	Verify that the committed provisioning view is complete after the migration.	“Correcting provisioning view problems”	NN10198-912 *Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP*
6.	If the provisioning view has changed, reactivate the provisioning view.	Performing HSM using Preside MDM SASM on page 100	This document.
7.	Correct other problems as directed by the alarm remedial text or as indicated by the documentation.	This chapter.	This document.

Corrective action for problems during a HSM

	Task	Use the section ...	in
8.	Before performing hitless software migration, the *Pbg* components must be unlocked and enabled. If the *Pbg* osi state is not enabled, check the bso, sts and lp components.	"Verifying the status of the link layer" Verify the status of the node before the upgrade on page 50	NN10198-912 *Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP* This document.

Active equipment crashes during an HSM

Active equipment crashing during a hitless software migration (HSM) may be caused by one of the following:

- locked equipment
- a control processor (CP) switchover

Problem indicators

Alarms are displaying on the Nortel Networks Multiservice Switch node while new software is being loaded on the active shelf, the active control processor (CP), or the active function processor (FP).

Corrective action

The following table shows the sequence of tasks you need to perform to isolate and correct active equipment crashes during an HSM. This table refers to procedures contained in this document or located in other Nortel Networks Multiservice Switch, Preside Multiservice Data Manager, or Succession documents.

Corrective action for active equipment crashes during a HSM

	Task	Use the section ...	in
1.	On the Preside MDM server, open the Command Console tool and connect to the network.	“Connecting to the network”	241-6001-804 *Preside MDM Workstation Utilities User Guide*
2.	On the Preside MDM“server, log the command output to a file.	“Logging command output to a file”	241-6001-804 *Preside MDM Workstation Utilities User Guide*
3.	On the Preside MDM server, open the Network Viewer tool, the Alarm Display tool and the Alarm Help.	“Starting the Network Viewer” “Viewing alarms in the Active mode” “Starting Alarm Help”	241-6001-011 *Preside MDM Fault Management User Guide*
4.	If any of the equipment is locked, unlock it.	“Unlock command”	NN10600-050 *Nortel Networks Multiservice Switch 7400/15000/20000 Command Reference*

Corrective action for active equipment crashes during a HSM

	Task	Use the section ...	in
5.	Collect data about the crash.	"Isolating the problem that causes a crash."	NN10198-912 *Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP*
6.	Determine why the newly active CP or FP failed.	This chapter.	This document.
7.	Correct the problem as directed by the Impact and Result column of the table Impact of an error condition on a HSM using the SASM tool on page 130.	Impact of an error condition on a HSM using the SASM tool on page 130	This document.
8.	Abort the hitless software migration if the problems identified in task 4 cannot be resolved.	SN06 Rollback on page 123	This document.
9.	Contact Nortel Networks GNTS and provide them with the information collected in task 2.		

Problems with loading software and patches

Problems with loading software and patches may be caused by one of the following:

- an incorrect version of software is being loaded
- the patches being loaded are not up-to-date
- the software and card types are incompatible

Problem indicators

- errors occur when the **check prov** command is issued
- issuing the **display Software avList** and **display Software patchList** commands indicate that the software or patches did not load

Corrective action

The following table shows the sequence of tasks you need to perform to isolate and correct problems associated with loading software and patches. This table refers to procedures contained in this document or located in other Nortel Networks Multiservice Switch, Preside Multiservice Data Manager, or Succession documents

Corrective action for problems loading software and patches

	Task	Use the section ...	in
1.	On the Preside MDM server, open the Command Console tool and connect to the network.	"Connecting to the network"	241-6001-804 *Preside MDM Workstation Utilities User Guide*
2.	On the Preside MDM server, log the command output to a file.	"Logging a command output to a file"	241-6001-804 *Preside MDM Workstation Utilities User Guide*
3.	Isolate the problem with the software or the patch.	"Isolating check prov problems"	NN10198-912 *Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP*

Corrective action for problems loading software and patches

	Task	Use the section ...	in
4.	Using the appropriate Nortel Networks Multiservice Switch Release Notes, identify the version of software that should be running on the node.	Download release notes on page 15	This document.
5.	If the problem is an incorrect application version, or that an application has not been loaded, upgrade the application.	Download the software to the server from the Nortel Networks website on page 24 Download the software from the server on page 32 HSM (Command Console) activation on page 67	This document.
6.	If the problem is that the card type and the software features are incompatible, reinstall the software.	Verify hardware compatibility on page 16 Verify node feature compatibility on page 16	This document.

Problems with a fabric card version during a HSM

Problems with a fabric card version during an HSM may be caused by one of the following:

- the wrong firmware version was installed
- multiple versions of the firmware are in use
- the writable bank is corrupt

Probable indicators

7002 0002 upgrade fabric version alarm is displaying on the OSS.

Corrective action

The following table shows the sequence of tasks you need to perform to isolate and correct problems during loading software and patches.

Corrective action for problems loading software and patches

	Task	Use the section ...	in
1.	On the Preside MDM server, open the Command Console tool and connect to the network.	"Connecting to the network"	241-6001-804 *Preside MDM Workstation Utilities User Guide*
2.	On the Preside MDM server, log the command output to a file.	"Logging command output to a file"	241-6001-804 *Preside MDM Workstation Utilities User Guide*
3.	Using the appropriate Nortel Networks Multiservice Switch Release Notes, identify the version of software that should be running on the node.	Download release notes on page 15	This document.
4.	Verify that the correct version of fabric firmware is being used.	"Identifying the firmware that is installed on the fabric"	NN10198-912 *Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP*

Corrective action for problems loading software and patches

	Task	Use the section ...	in
6.	If the fabric card firmware is not up-to-date, upgrade it.	"Fabric replacement may need a fabric firmware upgrade"	NN10600-120 *Nortel Networks Multiservice Switch 15000/20000 Hardware Description*
		Upgrade the fabric on page 83 or "Fabric firmware upgrade"	This document or the NN10600-272 *Nortel Networks Multiservice Switch 7400/15000/20000 Upgrading Software*

Appendix A - Alarms seen during an upgrade

Alarms are expected during a migration. The following alarms may be seen and depending on your configuration, and the phase of migration, may be expected and considered normal behavior.

Note: This is not a comprehensive list of alarms that you may see. Monitor all alarms carefully and use your judgement to determine what alarms, if any, need operator intervention.

For more information on these and other alarms, see NN10600-500 *Nortel Networks Multiservice Switch 6400/7400/15000/20000 Alarms Reference* and 241-6001-501 *Preside MDM Alarms Reference Guide*.

Alarms seen during an upgrade

Phase	Alarm message	Comment
0999 0001	Loss of connectivity.	Normal behavior after active CP resets.
7000 0007	Activation complete. Enter 'confirm prov' to confirm the activation or the rollback will occur in 20 minutes.	Normal behavior.
7000 0033	Prov migration component created.	Normal behavior.
7000 0034	MSG indeterminate equipment equipmentFailure 70120101	Normal behavior. There is one alarm per card in the Service shelf.
7011 5251	The far end has raised an Alarm Indication Signal.	Critical behavior. The line on the migration shelf card went out of service and the far end could not switch to the line of the service card and is now receiving P-AIS. The outage recovers on migration switchover.

Alarms seen during an upgrade

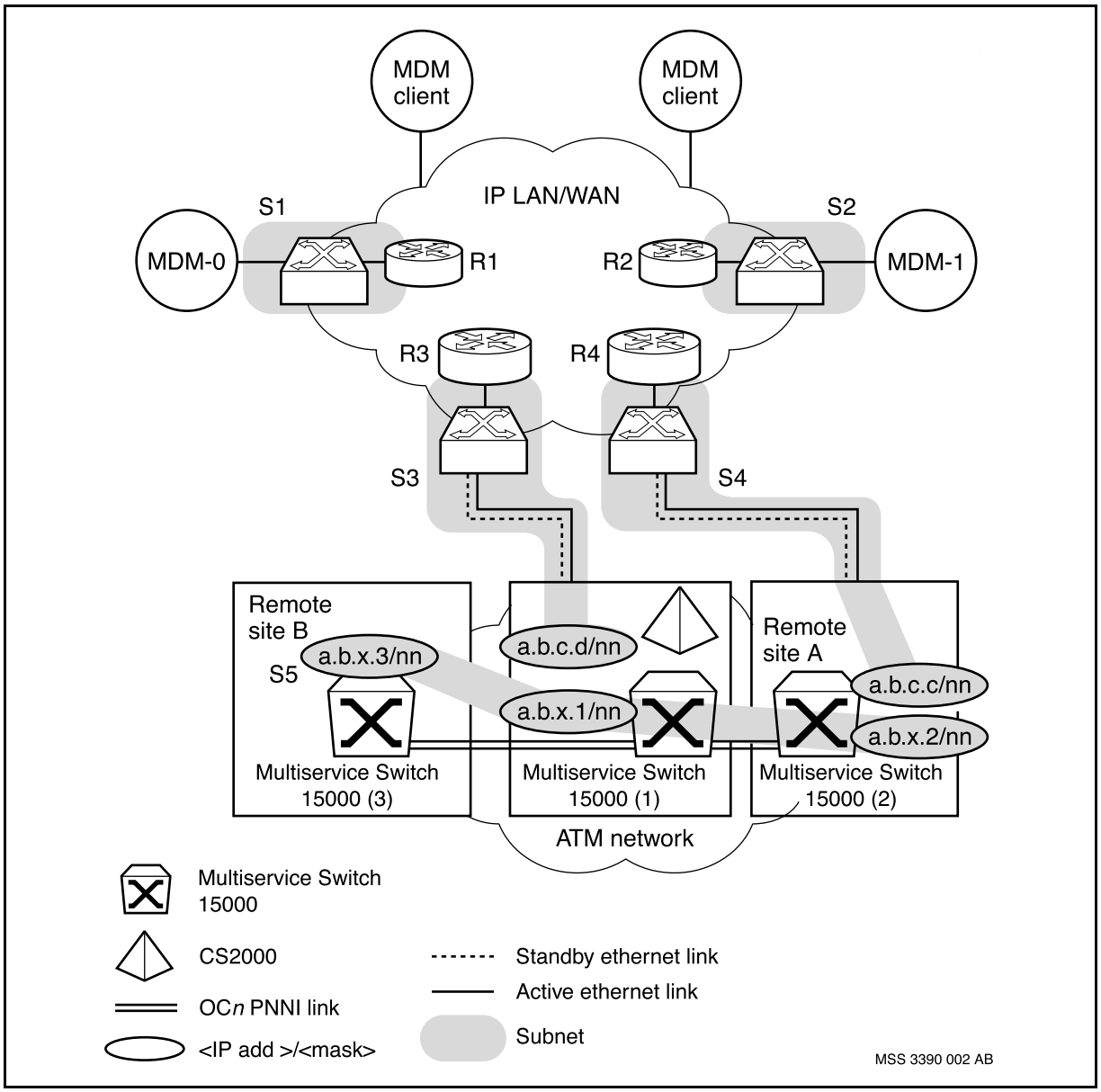
Phase	Alarm message	Comment
7011 5274	The APS request signalFail has been detected.	Normal behavior. As the first set of cards restart and enter the migration shelf, the associated Sonet lines go out of service (LOS>L-AIS). In response, the far end signals “signalFail” in the Kbytes of the line to the Service cards.
7012 0100	Card is disabled.	Normal behavior. Occurs with new loads.
7012 0200	LP is disabled.	Normal behavior. LP disabled, card disabled alarms: these cards are joining the migration active CPs with the card alarm that follows.
0999 0012	ARTG SPSERV:Proxy alarm generated as a result of State Walk	This alarm appears after upgrade to SN06 before the Hitless ATM routing for CP equipment protection feature has been activated. This alarm is cleared when this feature is enabled.

Appendix B - In-band OAM quick reference

Key relationships

The figure Sample in-band connectivity topology on page 143, illustrates a typical in-band OAM configuration. A brief description of the items in this diagram and their relationship to each other are provided below.

Sample in-band connectivity topology



MDM-0 and MDM-1

These Nortel Networks Preside Multiservice Data Manager (MDM) servers are used to manage the Nortel Networks Multiservice Switch network.

The chosen server is the Preside MDM server that the operator uses as a launching point for Preside MDM applications, such as Succession ATM Software Migration (SASM) or Command Console.

The alternate server is the other Preside MDM server that could have been used to perform the same set of tasks, except that it was not chosen.

Multiservice Switch -1

This Multiservice Switch 15000 node is in the Succession Office and is a Gateway node using out-of-band connectivity.

From the perspective of Preside MDM-0, S3 represents subnet to the preferred Multiservice Switch 15000 node.

Multiservice Switch-2

This Multiservice Switch 15000 node is in a remote office and is a Gateway node using out-of-band connectivity.

From the perspective of Preside MDM-0, S4 represents the subnet to the alternate Multiservice Switch 15000 node.

Multiservice Switch-2 and Multiservice Switch-3

These Multiservice Switch 15000 nodes are Remote nodes using in-band connectivity with Multiservice Switch-1.

S5 represents the in-band OAM subnet. Multiservice Switch-1 has a direct ATMMPE ATM (PVC) connection to every other Multiservice Switch 15000 node.