



# Upgrading Multiservice Switch 15000 in Carrier Voice over IP Networks (PT-AAL1/UA-AAL1)

The following topics are discussed in this section:

- [Who should read this document and why on page 1](#)
- [What you need to know on page 2](#)
- [How this document is organized on page 2](#)
- [What's new in this document on page 3](#)

## Who should read this document and why

This document is intended for users who are upgrading:

- Nortel Multiservice Switch 15000 nodes from PCR 6.1 to SPCR 6.1 within the context of a Packet Trunking - AAL1 (PT-AAL1) solution upgrade from SN07 to SN08.
- Nortel Multiservice Switch 15000 nodes from PCR 5.1 to SPCR 6.1 within the context of a Universal Access - AAL1 (UA-AAL1) solution upgrade from SN06.2 to SN08.
- Nortel Multiservice Switch 15000 nodes from SPCR 6.1 to SPCR 6.1 within the context of a Universal Access - AAL1 (UA-AAL1) solution upgrade from one SN08 software version to another SN08 software version.

**Note:** The examples shown in this document represent an SN07 to SN08 upgrade.

## What you need to know

Before you begin upgrading the nodes, you must clearly understand the impact of upgrading Nortel Multiservice Switch 15000 nodes within the Carrier Voice over IP portfolio architecture. In addition, you must have reviewed the solution level upgrade strategies defined

- NN10441-100 *PT-AAL2 Solution-level Basics*
- NN10442-100 *Packet Trunking/Packet Transit - IP Solution-level Basics (PT-IP)*
- NN10443-100 *UA-AAL1 Solution-level Basics*
- NN10446-100 *Universal Access - IP Solution-level Basics (UA-IP)*

To perform the procedures discussed in this document, you must have an extensive knowledge of Unix, Nortel MDM, and Multiservice Switch (MSS) software configuration.

## How this document is organized

This document presents a detailed flow chart of the specific tasks required to upgrade Nortel Multiservice Switch 15000 nodes within the PT-AAL1 and UA-AAL1 solutions from Nortel MDM Command Console and/ or from 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 Multiservice Switch 15000 in Carrier Voice over IP 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 11](#)
- [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 MDM Command Console.
- HSM using MDM Succession ATM Software Migration (SASM) tool

The HSM using the Command Console is the phase during which pre-HSM checks occur, and software is downloaded. This phase is described in the sections:

- [HSM \(Command Console\) pre-work on page 49](#)
- [HSM \(Command Console\) activation on page 69](#)

An alternate way to perform an HSM is to use SASM tool. It is described in section:

- [HSM \(MDM SASM tool\) activation on page 99](#)

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

- [Feature activation on page 113](#)
- [Rollback on page 119](#)
- [Troubleshooting a software upgrade on page 123](#)

## What's new in this document

The following changes were made to this document:

- The section [HSM overview on page 41](#) was updated to include information about an SN07 to SN08 migration.
- The section [HSM \(Command Console\) pre-work on page 49](#) has been updated to include [Pre-work for HSM with AAL1 support of MG9000 Internode ESA on page 66](#).
- The section [Performing HSM using MDM SASM on page 102](#) was updated to include information about authentication, and SASM command response format, additional steps and information about continuing when the software migration pauses.

- The section [Feature activation on page 113](#) was modified to include SN08 feature activation procedures.
- The chapter on [Troubleshooting a software upgrade on page 123](#) was updated to include information on error conditions during an HSM.

### **Branding changes**

- The term Succession has been rebranded to Carrier Voice over IP (CVoIP)
- The term Preside Multiservice Data Manager (Preside MDM) has been rebranded to Multiservice Data Manager (MDM) in conjunction with the new Nortel brand simplified naming format.
- The term Passport 8600 (PP8600) has been rebranded to Ethernet Routing Switch 8600 (ERS 8600).

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

## Software migration

An upgrade to a Nortel 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 MDM Command Console or the 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 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 MDM SASM on page 102](#).

Upgrade software to add new functionality to Nortel 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 MDM software is backwards compatible and can manage the current and previous releases of Nortel Multiservice Switch hardware. However, MDM software is not necessarily forward compatible. As a result, you should upgrade MDM servers before upgrading the nodes they manage. To upgrade MDM servers, see NN10185-461 *Upgrading Nortel Multiservice Data Manager in Carrier Voice over IP Networks*.
- If you have DS-1 IMA interfaces using the Edgelink100 MUX, ensure that you use the Edgelink100 MUX software (R3.3) during the SN08 upgrade. Contact Telco Systems to get the Edgelink100 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 Manager and the SAM 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 an HSM” in NN10070-461 *Upgrading Nortel Multiservice Switch 15000 in Carrier Voice over IP Networks PT-AAL1/UA-AAL1*.
- The Multiservice Switch 15000 nodes in your network must be upgraded one at a time to ensure that no service interruption occurs. For in-band OAM topologies, you must upgrade the nodes 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 Multiservice Switch 15000, Media Gateway 15000 and Multiservice Data Manager in Carrier Voice over IP Networks Product and*

*Technology Basics PT-AAL1/UA-AAL1/UA-IP* and [In-band OAM quick reference on page 141](#).

- upgrade the preferred Multiservice Switch 15000 Gateway node last. For more information about preferred and non-preferred gateways, see NN10028-111 *Nortel Multiservice Switch 15000, Media Gateway 15000 and Multiservice Data Manager in Carrier Voice over IP Networks Product and Technology Basics PT-AAL1/UA-AAL1/UA-IP*.
- You need an extensive knowledge of Unix, Multiservice Switch software, and Carrier Voice over IP portfolio architecture.
- You need a valid node user ID configured for local access as well as, access to ftp, fmip, telnet and the Nortel MDM server.
- You need a:
  - user ID for Web support (see [Download release notes on page 13](#))
  - user ID for root access to the MDM tools.
  - MDM user ID for software download.
  - user ID for general access to 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.
- Nortel recommends that you perform the tasks involving commands issued from the command line using the MDM Command Console tool rather than a Telnet session. For more information on using the Command Console, see 241-6001-804 *Nortel Multiservice Data Manager Workstation Utilities*.
- 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 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.

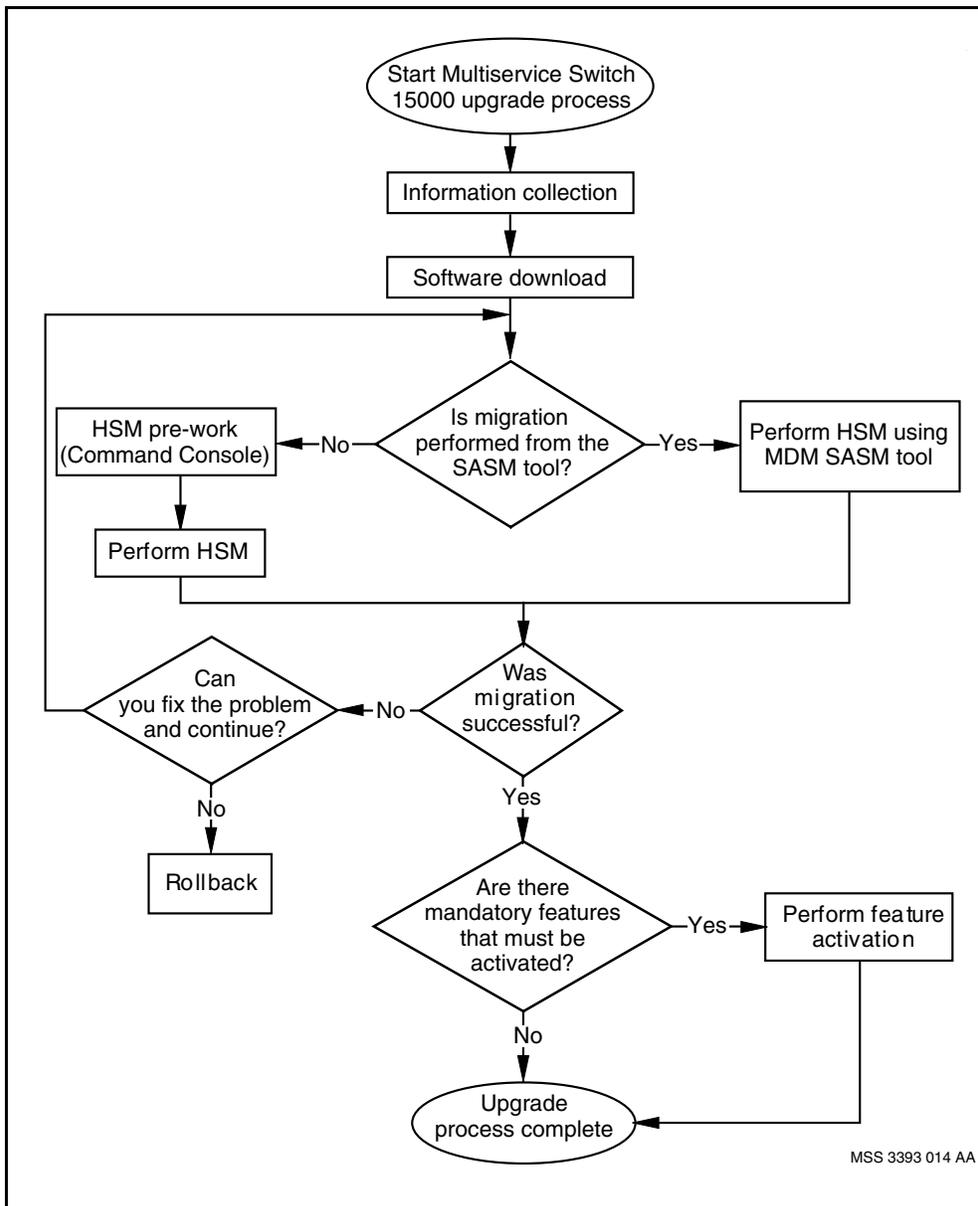
- Review the *Nortel Multiservice Switch Release Notes* to determine the following:
  - how the data model has changed for this release and how you must adjust your configuration to compensate for these changes
  - which features and services are required by this release and by each of the processor 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 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 9) 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 9](#) shows you the sequence of tasks 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 11](#)
- [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 69](#) or [HSM \(MDM SASM tool\) activation on page 99](#)
- [Feature activation on page 113](#)
- “Rollback” in NN10070-461 *Upgrading Nortel Multiservice Switch 15000 in Carrier Voice over IP Networks PT-AAL1/UA-AAL1*

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## Information collection

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

### Prerequisites to information collection

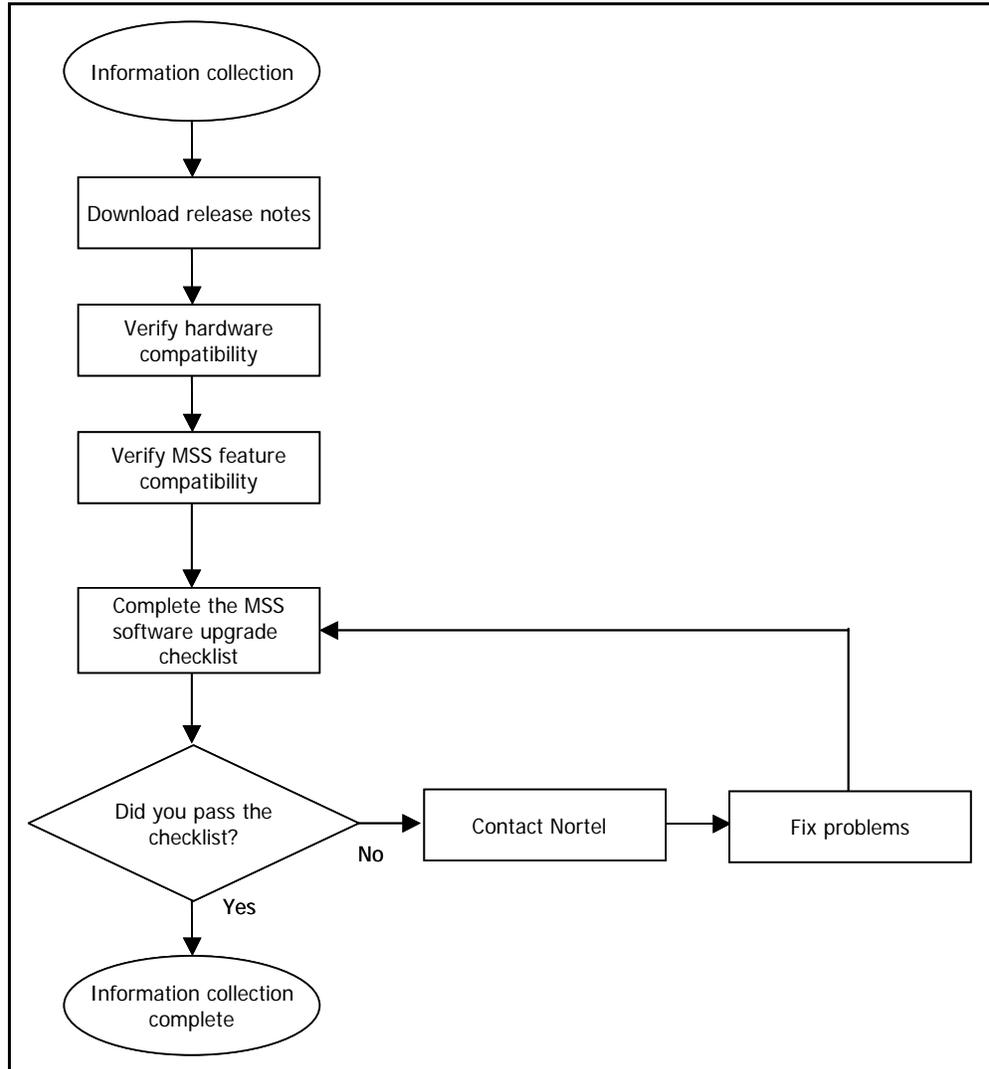
Ensure you have:

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

## Information collection task flow

The task flow shows you the sequence of tasks you perform to collect information about the upgrade. To link to any procedure, go to [Work flow navigation on page 13](#).

### Information collection task flow



## Work flow navigation

- [Download release notes on page 13](#)
- [Verify hardware compatibility on page 14](#)
- [Verify node feature compatibility.](#)
- [Complete the software upgrade checklist on page 15](#)

## Download release notes

Download the release notes for Nortel Multiservice Switch in Carrier Voice over IP 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 Carrier Voice over IP software releases involved in the migration.

### ***From your browser***

- 1 Go to the Nortel public website.  
<http://www.nortel.com/>
- 2 In the section titled Support & Training, 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 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 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 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 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 13](#).

### 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 <i>Nortel Multiservice Switch Release Notes</i> 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 <a href="http://www.nortel.com">http://www.nortel.com</a> )			

**Multiservice Switch software upgrade checklist**

<b>Task</b>	<b>Yes</b>	<b>No</b>	<b>Date and Comments</b>
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 MDM server acting as an SDS.			
The software version patches to be applied have been downloaded and installed on the 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 synchronized 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?			
Enter "display software avlist" to find the software version. The software version currently running on the node is:			
Enter "display software patches" to find the current patches. The current patches running on the node are:			
The intended software after the migration is:			

**Multiservice Switch software upgrade checklist**

<b>Task</b>	<b>Yes</b>	<b>No</b>	<b>Date and Comments</b>
The software patches you are applying during the upgrade are:			
The PCR's between the intended software release and the current PCR operating on the node are:			



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## Downloading and backing up Multiservice Switch software

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Before you can begin your upgrade, ensure that the correct version of Nortel Multiservice Switch software and the correct patches have been downloaded to the Nortel MDM 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

Ensure that:

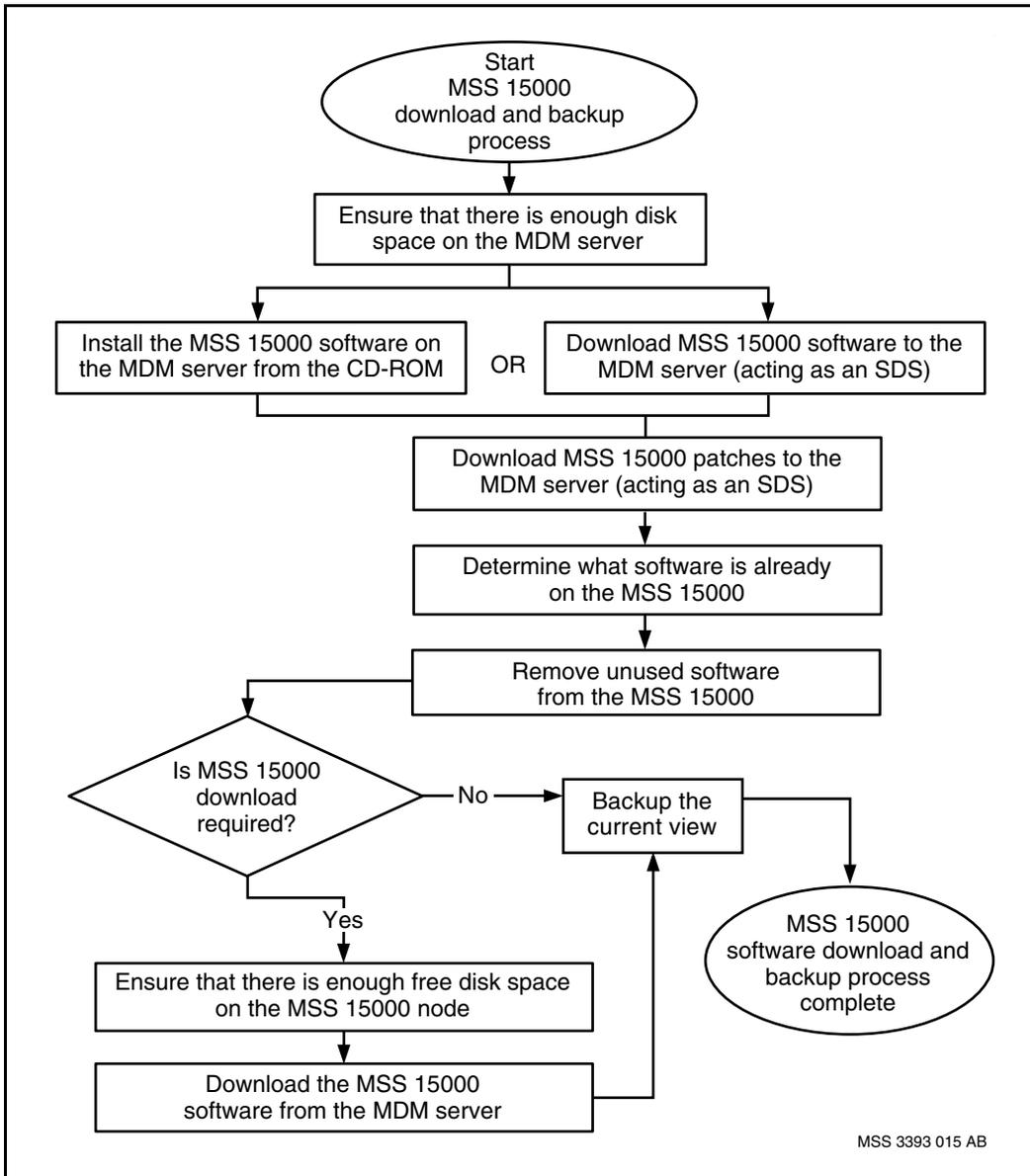
- within the PT-AAL1 and UA-AAL1 solutions, one of the Nortel MDM servers has been configured as a software distribution site (SDS). The server acting as the SDS manages, stores, and provides access to Nortel Multiservice Switch software and patches. To upgrade your Multiservice Switch nodes, you must 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 or support for MG9000 Internode ESA, you will also have the wanDte application. If patches have been applied, you will also have the patch application provided you are starting at SN07. The application version list must not contain any additional applications.

**Note:** There is a prerequisite patch for migration from SN06.2 to SN08. Patch baseFT420A\_CE01S3H must be applied in SN06.2 before upgrading to SN08 to allow patch activation in SN08. Patch baseFT420A\_CE01S3H is available on [www.nortel.com](http://www.nortel.com) under Support & Training / Software Downloads / Product Family: select Passport / Product: select Multiservice Switch 15000 for Succession PT/UA-AAL1.

## Software download and backup provisioning views task flow

This task flow shows you the sequence of tasks you need to perform to configure the Nortel MDM as an SDS, download the Nortel 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 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 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 29](#)
- “Determining what software is already on the node” in *NN10600-270 Nortel Multiservice Switch 7400/15000/20000 Software Installation*
- “Removing unused software from the node” in *NN10600-270 Nortel Multiservice Switch 7400/15000/20000 Software Installation*
- [Ensuring that there is enough free space on the node on page 31](#)
- [Download the software from the server on page 33](#)
- [Back up the current view on page 37](#)

## Ensuring that there is enough disk space on the server

Before downloading the required software and patches to the Nortel MDM acting as the SDS, verify that the server has sufficient disk space to hold the software release.

**Note:** Keep the patch AV on the SDS. Nortel recommends that at least one SDS be available with the current software on the MSS.

### Prerequisites

Ensure that the:

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

### *From the 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 log in 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 website

After verifying that the Nortel MDM server acting as the SDS has sufficient disk space, you can begin to download the Nortel 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 Web access account with a user name and password. Contact your Nortel customer representative for more information on accessing the site.
- Refer to the software downloads area of the website ([www.nortel.com](http://www.nortel.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 MDM server.
- Ensure that there is enough disk space on the server.

### ***From the MDM server acting as the SDS***

- 1 Log in.
- 2 On the web, go to [www.nortel.com](http://www.nortel.com).
- 3 From Support & Training, select *Software Downloads*.
- 4 Under the Product Families link, select the family *Passport*.
- 5 Under the Passport 15000 for Succession PT/UA-AAL1 (Now known as: Multiservice Switch 15000 for Succession PT/UA-AAL1 section), select *Software*.  
The Software Downloads window opens.
- 6 Select the version of the release software you want to download.  
A Log In window opens.

- a When prompted to log in, enter your user name and password for the web access log in.  
**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.
- 7 Click the load name listed beside the File Download heading.  
A Save As dialog opens.
- 8 Specify a folder in the home directory of the MDM user to indicate where you want the patch placed. This is typically:  
**/localdisk/pp15ksw/software**
- 9 Click **Save**.
- 10 On the server, change directories to the directory containing the software (This is the same directory you specified in step 8.):  
**cd /localdisk/pp15ksw/software**
- 11 Uncompress the software file:  
**uncompress <load\_name>.tar.Z**
- 12 Untar the software file:  
**tar -xvf <load\_name>.tar**
- 13 Repeat step 7 through step 13 for every software file you want to download.
- 14 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 website to the 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.

As of SN07, all MSS patches are delivered as a single application version (Av), the Patch Av. The Patch Av includes all the patches associated with a given software version. Reset and TAP patches are delivered with the Patch Av. If you have enabled Patch auto-application, MSS TAP patches will be automatically applied, however, reset patches are not eligible for auto-application and must be manually applied. The Patch Av must not be confused with a patched Av, however, a Patch Av can include any patches that have been built specifically for a patched Av based on the release.

The Patch Av ensures that your switches have access to the complete set of TAP and Reset patches at a given level. The Patch Av does not need to be provisioned in the Sw avList to view the patches contained within it, however, it must be provisioned in the Sw avl to be added to the Sw patchList. If you choose to display the patches for the patch Av, all the patches for all the Avs (base, atmNetworking, ip, and so forth) are displayed. If you choose to display the patches for the base Av, all the patches on the CP disk for that SW level will be displayed.

The Patch Av tracks the patches for each software level. The AD file contains a list of Patch Version files for that software level. Each Patch Version (PV) file reflects the status of patches when the PV file is created and displays which patches are calculated and applied. The status of the patches on the switch is tracked in version files within the Patch Av. Refer to NN10600-272 *Nortel Multiservice Switch 7400/15000/20000 Upgrading Software* for more information about patching.

### Prerequisites

- You need an account with a user name and password. Contact your Nortel customer representative for more information on accessing the website.
- Refer to the software downloads area of the website ([www.nortel.com](http://www.nortel.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 Multiservice Switch software and patches are available on the MDM server.

- Ensure that there is enough disk space on the server.
- Regular software has been downloaded.

**From the MDM server acting as the SDS**

- 1 Log in.
- 2 On the web, go to *www.nortel.com*.
- 3 From Support & Training, select *Software Downloads*.
- 4 Under the Product Families link, select the family *Passport*.
- 5 Under the Passport 15000 for Succession PT/UA-AAL1 (Now known as: Multiservice Switch 15000 for Succession PT/UA-AAL1) section, select *Software*.  
The Software Downloads window opens.
- 6 Click the patch that you want to download.  
The Software Downloads: Software Detail Information window opens.
  - a When prompted to *Login* enter your user name and password for the web access log in.  
**Note:** If there are no patches listed for this release, there are no patches currently required for this release. You can move on to the next task in the upgrade process.
- 7 Select the patch name listed beside the File Download heading.  
A Save As dialog is displayed.
- 8 Specify a folder in the home directory of the MDM user to indicate where you want the patch placed. This is typically:  
**/localdisk/pp15ksw/software**
- 9 Click *Save*.
- 10 On the server, change directories to the directory containing the patch (This is the same directory you specified in step 8.):  
**cd /localdisk/pp15ksw/software**
- 11 Uncompress the patch file:  
**uncompress <patch\_name>.tar.Z**
- 12 Untar the patch:  
**tar -xvf <patch\_name>.tar**
- 13 Repeat step 6 through step 13 for every patch you need.
- 14 Remove the tar file.

**Variable values**

<b>Variable</b>	<b>Value</b>
<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 Multiservice Switch CD-ROM using the installation program.

### Prerequisites

- You need a copy of Nortel Multiservice Switch SPCR6.1 software CD. Contact your Nortel customer representative for information on how to order a CD.
- You need the IP address of the Nortel 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 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 Multiservice Switch 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 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 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 and ip. If your nodes have been configured with in-band OAM or support for MG9000 Internode ESA, you will also have the wanDte application. If patches have been applied, you will also have the patch application. The application version list must not contain any additional applications. The amount of space required for the (up to) six applications is approximately 250 Mbyte.
- 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 Multiservice Switch Release Notes* and the software downloads area of Nortel website ([www.nortel.com](http://www.nortel.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 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 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 *Nortel Multiservice Data Manager Management Data Provider*.

## Download the software from the server

Before beginning the hitless software migration, you need to download the software from the Nortel MDM server acting as the SDS, to the nodes.

### Prerequisites

- [Download the software to the server from the Nortel 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 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 or support for MG9000 Internode ESA, you will also have the wanDte application. If patches have been applied, you will also have the patch application. The application version list must not contain any additional applications.
- 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 firmware on page 84](#).
- Refer to the software downloads area of Nortel ([www.nortel.com](http://www.nortel.com)) website 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. VoA patches are located on [www.nortel.com](http://www.nortel.com) under Support & Training/Software Downloads/Product Family: select Passport/select product: Multiservice Switch 15000 for Succession PT/UA-AAL1.
- You need the IP address of the 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 8 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 MDM Command Console tool. For more information on opening the Command Console, see 241-6001-804 *Nortel Multiservice Data Manager Workstation Utilities*.
- Support for multiservices is not available.

**From the node**

- 1 Log in 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\_CF01S1E
- patch\_CF01S1E

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

**Sample output**

```
> set Software Download avListToDownload ! base_CF01S1E
networking_CF01S1E ip_CF01S1E wanDte_CF01S1E atmNetworking_CF01S1E
Sw Dld
ok 2005-01-07 14:46:46.14
```

- 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 website (*www.nortel.com*) were downloaded:  
**list Software ApplicationVersion/patch\_CF01Sxxx Patch/\***

### Variable values

Variable	Value
<application_version>	<p>A space-separated, case sensitive list of application versions.</p> <p>Download the new version of the base, networking, atmNetworking and ip. If your nodes have been configured with in-band OAM or support for MG9000 Internode ESA, you will also have the wanDte application. If patches have to be applied, you will also have the patch application. The application version list must not contain any additional applications.</p> <p>If you need to upgrade the fabric card firmware with this release, download the fabric application. For more information, see <a href="#">Upgrade the fabric firmware on page 84</a>.</p>
i960	An attribute indicating that the i960 processor type is being used. This attribute is always required.
<ipAddress>	The IP address of the MDM server acting as the SDS.
<password>	The password for the <userid> of the MDM server acting as the SDS.

**Variable values**

<b>Variable</b>	<b>Value</b>
PPC	An attribute indicating that the PowerPC processor type is being used. This attribute is always required.
<userid>	The <userid> for a 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 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 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 Multiservice Switch 7400/15000/20000 Upgrading Software*.
- The 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 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 MDM server for the MDMBackup and Restore tool to function properly. Using the 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 *Nortel Multiservice Data Manager 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 Multiservice Switch 7400/15000/20000 Software Installation* for information on making them the same.
- The 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.



### CAUTION

This procedure backs up all views currently stored on each node and should be done during a maintenance window.

### From the node

- 1 Log in with the appropriate permissions.
- 2 Display on-switch provisioning to determine which files you need to back up:

#### **display -o prov**

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

### Sample output

```
l> 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 Log in to an MDM server using a root user ID.
- 4 Open an MDM window:  
**/opt/MagellanNMS/bin/nmstool &**  
The copyright dialog and the MDM window open.
- 5 Click **OK** to close the copyright dialog.
- 6 From the MDM window, select Configuration > MSS > Administration > MSS Service Data Backup/Restore.  
The MSS Service Data Backup/Restore window opens.
- 7 Click **Add ....**
- 8 Select the device(s) to be backed up by selecting the groups and/or nodes located in the Device Groups panel.
- 9 From the popup menu, select the value full to ensure that the default for the backup is to do a full backup and not an incremental one.
- 10 Enter the appropriate user ID and password to authenticate for the selected device(s).
- 11 Click **OK**.  
The added devices now appear in the **Device List** of the main MSS Backup and Restore window.
- 12 Click **Backup** to start the backup procedure for all the devices listed in the Device List of the main MSS Backup and Restore window.  
This will proceed to backup all the views currently stored on each node, and should be done during a maintenance window.
- 13 Alternatively, specific views can be backed up as follows. For each device in the Device List:
  - change the parameter under the Mode column from full to selective.
  - select the specific view to backup from the Configuration column.
  - click **Backup** to start the backup of the selected view for each node in the Device List.



---

## HSM overview

---

This section describes Nortel 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 92](#).

### What happens to the node during a hitless software migration

Nortel supports hitless software upgrades on Nortel Multiservice Switch 15000 nodes used in Carrier Voice over IP Packet Trunking - AAL1 and Carrier Voice over IP 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.

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.

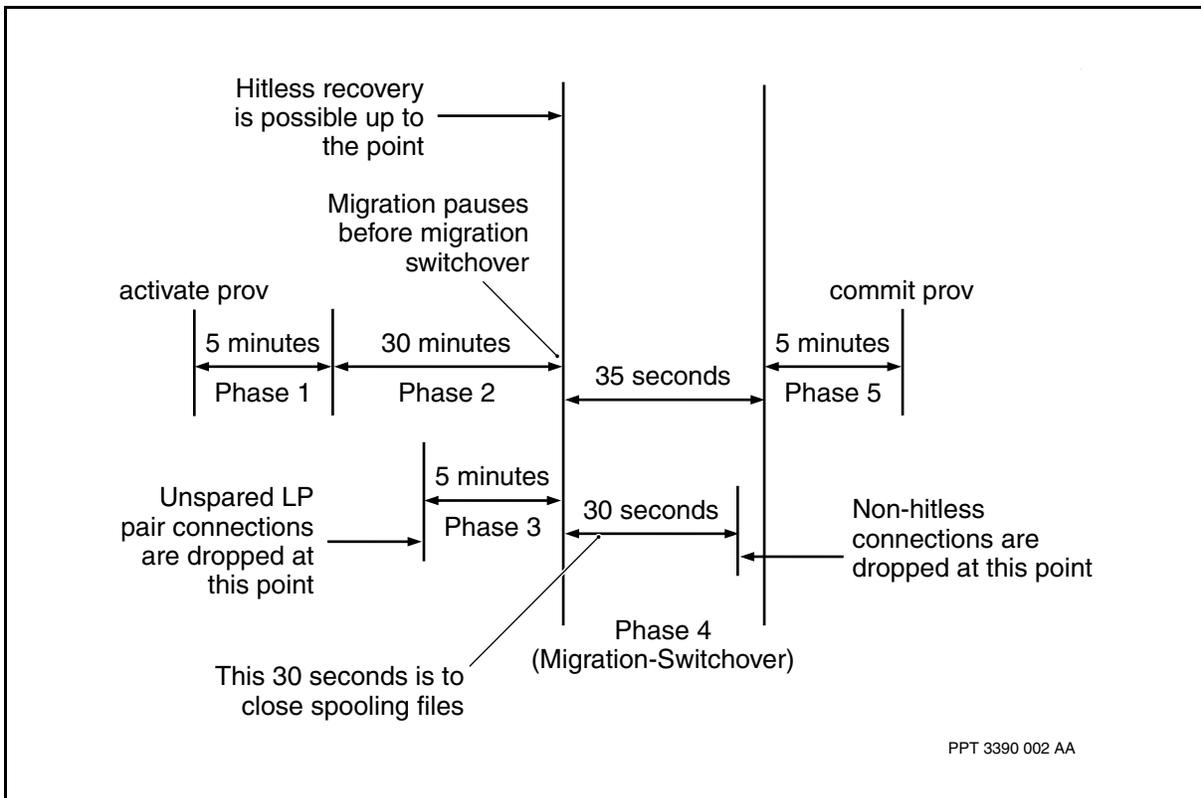
**Note:** If a problem is detected by the system, the process pauses automatically allowing the operator to stop migration or fix the problem and continue.

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 16pOC3SmlrATM 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 16pOC3SmlrATM 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.

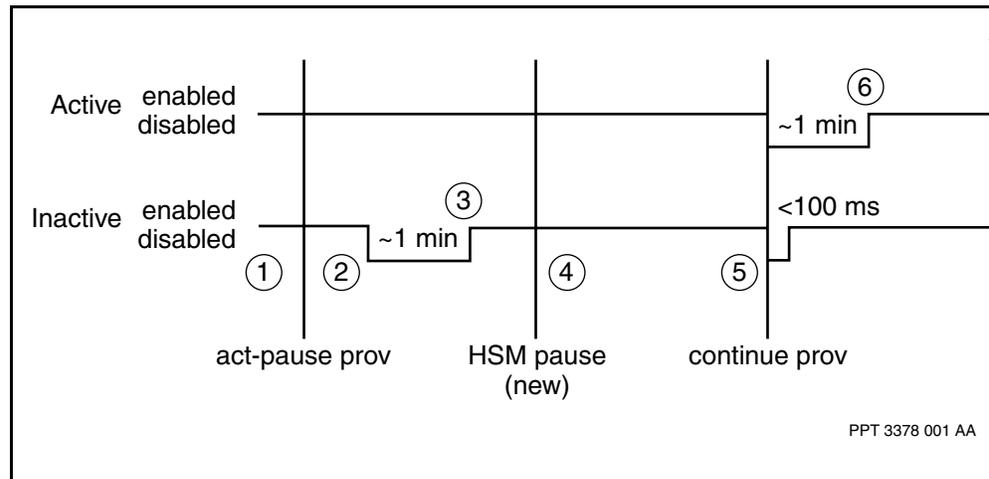
**Note 2:** After a *continue -force prov* command is issued, the system does not pause again.

#### 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 All 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 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. If Internode ESA is configured for your network, you must also complete the procedure [Pre-work for HSM with AAL1 support of MG9000 Internode ESA on page 66](#).

### Prerequisites

Before doing an HSM, ensure that the auto-patch script (ppautopatch) is not running and that it does not run during the HSM. Issue the following commands on both MDM servers where a ppautopatch script could be configured to run for the node being upgraded:

- 1 **touch /opt/MagellanNMS/cfg/private/noppautopatchrun**
- 2 **ps -ef | grep ppautopatch**

If the second command returns only one response, such as the following, proceed with the HSM:

```
ps -ef | grep ppautopatch  
  
root 6453 29431 0 09:10:53 pts/11 0:00 grep  
ppautopatch
```

If the second command returns one or more additional responses, such as the following, then the script ppautopatch is running.

```
ps -ef | grep ppautopatch  
  
root 2112 282 0 Dec 03 ? 13:50 ppautopatch -download  
-host 47.1.2.3 -huser pp15ksw pp15ksw -apply -nodes  
OFFICE1 -nuser config config -max_duration 1 h  
  
root 6453 29431 0 09:10:53 pts/11 0:00 grep  
ppautopatch
```

**Note 1:** The script does not typically take a long time to run so, in general, Nortel recommends waiting until all ppautopatch scripts are finished before starting the HSM.

**Note 2:** On an MDM that manages nodes in more than one Carrier Voice over IP office, a running script may not necessarily include the node to be upgraded (refer to the -nodes parameter value for the

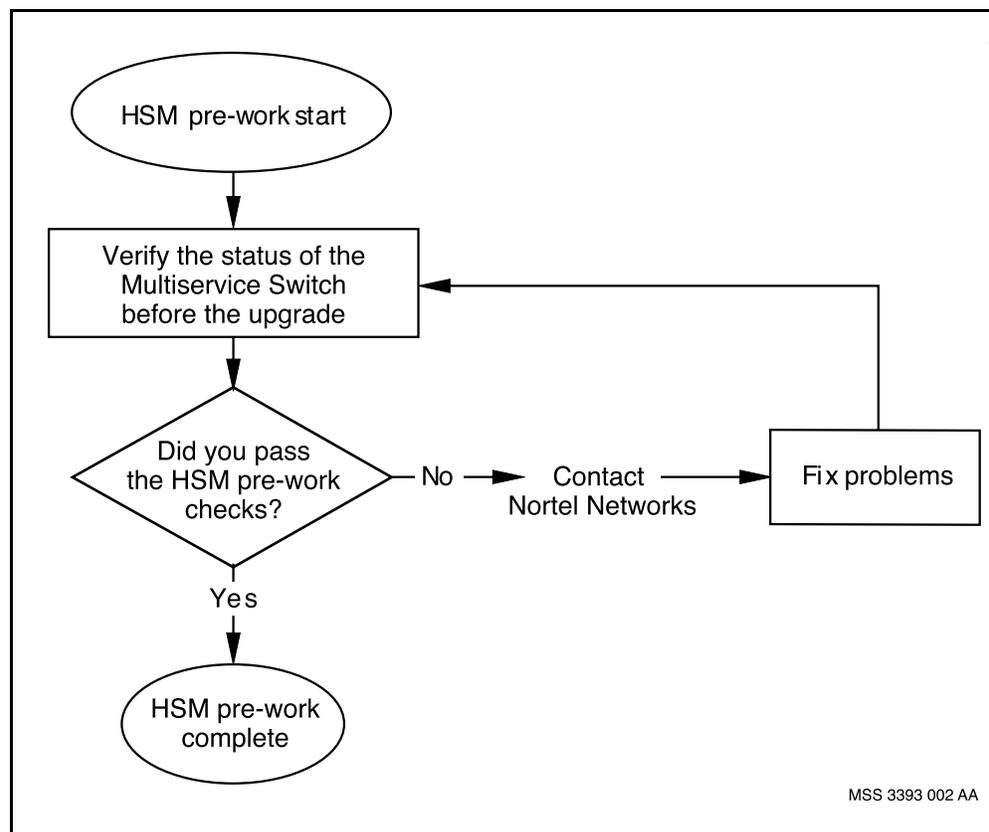
ppautopatch script). If you are sure that none of the running scripts pertain to the node being upgraded, proceed with the HSM.

**Note 3:** The noppautopatchrun file should be deleted on both MDM servers after the HSM is completed. If performing HSM on a series of nodes from the same MDM, do not remove the file until after all the HSM's have been performed.

## HSM pre-work task flow

The task flow shows the sequence of tasks 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 51](#)
- [Pre-work for HSM with AAL1 support of MG9000 Internode ESA on page 66](#)

## Verify the status of the node before the upgrade

Verify the status of the Nortel 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 the MDM 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 Ensure that there is no provisioning activity occurring on the control processors by verifying that the provisioningActivity value is none:  
**display prov provisioningActivity**
- 4 Ensure that there is no provisioning activity occurring on the control processors by verifying that the standbyCpActivity value is none:  
**display prov standbyCpActivity**

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

**display prov standbyCpActivityProgress**

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

**display prov provisioningSession**

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

- 7 Ensure that there is no provisioning activity occurring on the control processors by verifying that the `editViewAddedComponents` value is 0:

**display prov editViewAddedComponents**

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

**display prov editViewDeletedComponents**

- 9 Ensure that there is no provisioning activity occurring on the control processors by verifying that the `editViewChangedComponents` value is 0:

**display prov editViewChangedComponents**

- 10 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|osiUnkr
-----
|x|unlck|ena|activ||| | |nset|false
|y|unlck|ena|activ||| | |nset|false
|
```

- 11** 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	osiUnkw
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

## 12



### 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 standby*. 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 *osiOper* 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
```

Card	osiAd min	osiO per	osiUs age	osiAvai l	osiProc	osiCntr l	osiAlar m	osiS tby	osi 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

**13** Verify that there are no shelf hardware failures:

**display sh hardware**

```
d sh hardware
```

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

**14** 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

```

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

**display Atmlf/\* 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

- 16** 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 min	osiO per	osiUs age	Response
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	

- 17** 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 |

```

- 18** 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 |

```

- 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 and enabled.

The following shows a sample output for this command:

```
7> display Laps/*
```

Laps	osiAd min	osiO per	osiUs age	neRxLi ne	neReq	neReqC han	feReq	feReqC han	sdOnLin es	switchover
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	<b>lockou</b>	protec	noRequ	protec		
602	unlck	ena	busy	protec	<b>manual</b>	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*, *rfl*, *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 | 1 |   | 1 | 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 | 1 |   | 1 | 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 | 1 | | | 1 | 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/* ds1/* 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 | 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 or internode ESA, 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 or internode ESA, 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 MDM server from the node. In conjunction with step [37](#) ensure that both 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 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 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 MDM servers are connected by way of different gateway nodes:

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

Take the 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 <i>Laps</i> component whose manual overrides you want to remove. This instance value is an integer between 0 and 15999.

### Pre-work for HSM with AAL1 support of MG9000 Internode ESA

If the MSS15000 is configured to support MG9000 InterNode ESA, you must also check the state of the following additional components:

- 1 Verify that all *VirtualRouter* components are unlocked, enabled and active:

#### **display Vr/\* osistate**

The following shows sample output for this command:

```

> display Vr/* osistate

Vr/*
-----
|          Vr          | osiAd | osiO | osiUs | Response |
|                    |  min |  per |  age  |          |
-----
| 0                  | unlck | ena  | activ |          |
| ESA                 | unlck | ena  | activ |          |

```

- 2 Verify that all *ProtocolPorts* components are unlocked, enabled and active:

**display Vr/\* Pp/\* osistate**

The following shows sample output for this command:

```
> display Vr/* Pp/* osistate

Vr/* Pp/*
+-----+-----+-----+-----+-----+
|          Vr          |          Pp          | osiAd | osiO | osiUs |
|          |          |   min |   per |   age |
+-----+-----+-----+-----+-----+
| 0          | ATMMPE              | unlck | ena  | activ |
| 0          | OAMENET0           | unlck | ena  | activ |
| ESA       | 9K_1_ESA           | unlck | ena  | activ |
| ESA       | 9K_2_ESA           | unlck | ena  | activ |
| ESA       | 9K_3_ESA           | unlck | ena  | activ |
| ESA       | 9K_4_ESA           | unlck | ena  | activ |
| ESA       | PP_D6_1000_ESA     | unlck | ena  | activ |
| ESA       | PP_D6_1001_ESA     | unlck | ena  | activ |
| ESA       | PP_D7_800_ESA      | unlck | ena  | activ |
```

- 3 Verify that all *Ip* components are unlocked, enabled and active:

**display Vr/\* Ip osistate**

The following shows sample output for this command:

```
> display Vr/* Ip osistate

Vr/* Ip
-----
|          Vr          | osiAd | osiO | osiUs | Response |
|          |   min |   per |   age |          |
-----
| 0          | unlck | ena  | activ |          |
| ESA       | unlck | ena  | activ |          |
```

- 4 Verify that the static routes are up.

The *osiOper* (operational state) of all static routes are *ena* (enabled).

**display Vr/\* Ip static routeEntry/\* operationalState**

The following shows sample output for this command:

```

> display Vr/* Ip static routeEntry/* operationalState
Vr/* Ip Static Route/*,*,*
-----
|      Vr      |      addr      |      mask      | tos |osiO
|              |                |                |     |per
|-----|-----|-----|-----|-----|
| ESA          | 10.0.16.0      | 255.255.240.0  | 0   |ena
| ESA          | 10.0.32.0      | 255.255.240.0  | 0   |ena

```

- 5 Verify that all *NextHop* components under static routes have an operational status of enabled:

**display Vr/ESA Ip static route/\*Nh/\* operationalState**

The following shows sample output for this command:

```

>
Vr/ESA Ip Static Route/*,*,* Nh/*
-----
|      addr      |      mask      |      tos      |      Nh      |      osiO
|                |                |                |              |      per
|-----|-----|-----|-----|-----|
| 10.0.16.0      | 255.255.240.0  | 0              | 10.48.0.2    |      ena
| 10.0.32.0      | 255.255.240.0  | 0              | 10.48.0.10   |      ena

```

---

## 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

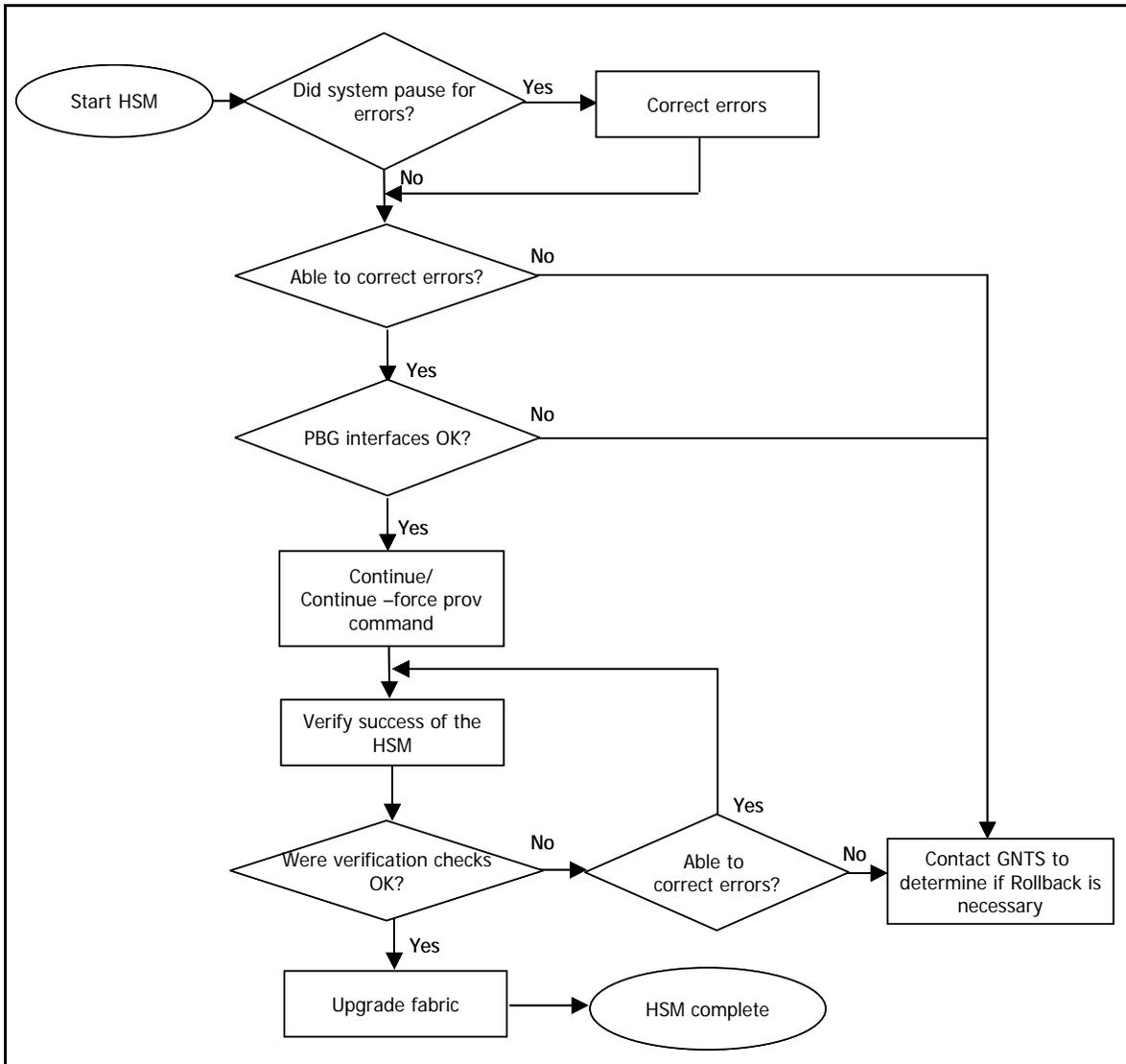
- Complete the HSM pre-work. See [HSM \(Command Console\) pre-work on page 49](#) for more information.
- For in-band OAM configurations, upgrade all Nortel Multiservice Switch 15000 nodes in the network in the following sequence:
- Upgrade all the remote nodes first.
- Upgrade the non-preferred Gateway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

**Note:** For a quick reference to key relationships needed to understand in-band OAM migration, see [In-band OAM quick reference on page 141](#). For a description of in-band OAM, see NN10028-111 *Nortel Multiservice Switch 15000, Media Gateway 15000 and Multiservice Data Manager in Carrier Voice over IP 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 71](#)
- [Upgrade the fabric firmware on page 84](#)
- [Verify the success of HSM on page 92](#)
- [Stop the HSM using Command Console on page 96](#)

## Perform HSM using Command Console

Upgrade a Nortel 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 firmware on page 84](#) 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 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 *Nortel Multiservice Data Manager Workstation Utilities*.
- 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 Manager 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 Manager 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 Carrier Voice over IP 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 Web site ([www.nortel.com](http://www.nortel.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 Log in 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_CF01S1E, patch_CF01S1E
           networking_CF01S1E, atmNetworking_CF01S1E,
           ip_CF01S1E
```

- 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 firmware on page 84](#) for more information about upgrading the fabric firmware.

### Sample output

```
PROV 26> set Sw Avl !
base_CF01S1E, ip_CF01S1E, networking_CF01S1E
atmNetworking_CF01S1E, patch_CF01S1E
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_CF01S1E,      ip_CF01S1E,
         networking_CF01S1E,  atmNetworking_CF01S1E,
         patch_CF01S1E
```

- 7 Display software patchlist:  
**display software patchlist**
- 8 If there are patches on the load you need to remove, remove those patches. See *Nortel Multiservice Switch Release Notes* to determine the software patches required, and apply the patches needed for SN08:

**set Software patchlist ! <patches>**

- 9 Verify the patches that are going to be applied:

**display software patchlist**

### 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 51](#).

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.
```

**Note:** 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.

**12** Save the edit view with portable formats:

**save -f(<filename>) -portable prov**

**13** Apply the changes:

**activate -pause prov**

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. In case of a fault, refer to the NN10198-912 *Nortel Multiservice Switch 15000, Media Gateway 15000 and Multiservice Data Manager in Carrier Voice over IP Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP*. If the system pauses because the operator has used the **-pause** command, the operator can issue **continue -prov** command to continue the HSM. In the example below, the system has paused due to a fault.

### 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.
```

**Note:** 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**).

## 14

**CAUTION**

**Before issuing a continue prov command, perform the following:**

Before issuing a **continue prov** command, perform steps [14](#) to [17](#). Steps [14](#) to [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 “CS2000 Core Manager” and “Media Gateway 9000 Manager” in the *Carrier Voice over IP 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 contain *degrad*. 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|   |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 96](#).



**CAUTION**

**Exercise caution when using the continue -force prov command**

Contact Nortel 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:** After the CP switchover during the hitless software migration, connectivity between the node and 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 MSS 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
```

- 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 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

```

These three attributes describe the progress of the migration. They will be updated as the migration proceeds.

- 20 If using Telnet, when prompted, log in 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 "Troubleshooting a software upgrade" in NN10070-461 *Upgrading Nortel Multiservice Switch 15000 in Carrier Voice over IP Networks PT-AAL1/UA-AAL1*.

- 25** If the semantic check passes, save, activate, confirm and commit the view:

#### **save prov**

#### **activate prov**

#### **confirm prov**

#### **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.

- 26** Exit provisioning mode once the migration is complete:

#### **end prov**

**Variable values**

<b>Variable</b>	<b>Value</b>
<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>	<p>A space-separated, case-sensitive list of application versions. The release is indicated by the version number after the underscore.</p> <p>The applications required for Carrier Voice over IP 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</p>
<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 Web site ( <a href="http://www.nortel.com">www.nortel.com</a> )

## Upgrade the fabric firmware

You can upgrade the fabric firmware installed on Nortel 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 Multiservice Switch Release Notes*.
- The new fabric card firmware must be downloaded from the Nortel MDM server acting as the software distribution site (SDS). For more information on how to download from the SDS, see NN10600-272 *Nortel 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 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**

The following shows sample output for this command in a SN06 to SN08 upgrade:

**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
```

The following shows sample output for this command in a SN07 to SN08 upgrade. If the output is:

```
"recommendedVersionToInstall = Fabric software
version is up to date".
```

a fabric upgrade is not required.

- 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 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 | 1    |    | 1    | 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 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 Global Networks Technical Support (GNTS) to inform them about the fabric card upgrade failure.

**Variable values**

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

## 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 51](#)
- [Perform HSM using Command Console on page 71](#)

#### *From the node*

- 1 Log in with the appropriate permissions.
- 2 Compare the status of the logical processors with the status recorded in step [11](#) of the procedure [Verify the status of the node before the upgrade on page 51](#):  
**display Lp/\* osistate**
- 3 Compare the status of equipment protection with the information you gathered in step [12](#) of the procedure [Verify the status of the node before the upgrade on page 51](#):  
**display Shelf Card/\* SparedServices**
- 4 Compare the status of the shelf hardware with the information you gathered in step [13](#) of the procedure [Verify the status of the node before the upgrade on page 51](#).  
**display sh hardware**
- 5 Compare the status of the SONET ports with the status recorded in step [14](#) of the procedure [Verify the status of the node before the upgrade on page 51](#):  
**display Lp/\* sonet/\* osistate**
- 6 Compare the status of the ATM interfaces with the status recorded in step [15](#) of the procedure [Verify the status of the node before the upgrade on page 51](#):  
**display Atmlf/\* osistate**

- 7 Compare the status of the *UNI* signalling components with the status recorded in step [16](#) of the procedure [Verify the status of the node before the upgrade on page 51](#):  
**display atmif/\* uni sig/(operatingMode = normal) osistate**
- 8 Compare the status of the *PNNI* signalling components with the status recorded in step [17](#) of the procedure [Verify the status of the node before the upgrade on page 51](#):  
**display AtmIf/\* Pnni Sig osistate**
- 9 Compare the status of the *ILMI* signalling components with the status recorded in step [18](#) of the procedure [Verify the status of the node before the upgrade on page 51](#):  
**display atmif/\* uni ilmi/(operatingMode = addressRegEnabled) osistate**
- 10 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 51](#):  
**display Laps/\* osistate**
- 11 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 51](#):  
**display pbg/\* sts/0 osiState**
- 12 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 51](#):  
**display pbg/\* osiState**
- 13 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 51](#):  
**display Ip/\* BSo/\* osiState**
- 14 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 Ip/\* ds3/\* osiState**
- 15 If configured, compare the status of *DS1* components with the information you gathered in step [27](#) of the procedure [Verify the status of the node before the upgrade on page 51](#):  
**display Ip/\* ds3/\* ds1/\* osiState**

- 16 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 51](#):
- display lp/\* ds3/\* ds1/\* chan/\* osiState**
- 17 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 51](#):
- display lp/\* ds3/\* ima/\* osistate**
- 18 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 51](#):
- display lp/\* ds3/\* ima/\* lk/\* osiState**
- 19 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 51](#):
- display Lp/0 Oamenet/0 activeStatus**
- 20 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 51](#):
- display Lp/0 Oamenet/0 standbyStatus**
- 21 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 51](#):
- display ac ipaccess/\***
- 22 If you have configured in-band OAM, ensure that the MDM servers can display OAM data received by way of both the preferred and non preferred Gateway nodes.
- 23 If you have configured in-band OAM or internode ESA, 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 51](#):
- display Atmmpe/\* osiState**
- 24 If you have configured in-band OAM or internode ESA, 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 51](#):
- display Atmmpe/\* Ac/\* osiState**

- 25** If you have configured in-band OAM, compare the accessibility of the chosen 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 51](#). In conjunction with this step, ensure that both MDM servers are connected by way of different Gateway nodes.

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

- 26** If you have configured in-band OAM, compare the accessibility of the alternate MDM server from the node with the information you gathered in step [37](#) of the procedure [Verify the status of the node before the upgrade on page 51](#). In conjunction with step ensure that both MDM servers are connected by way of different Gateway nodes.

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

- 27** In multi-shelf configurations, compare the information you gathered in the procedure [Verify the status of the node before the upgrade on page 51](#). 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.

- 28** If you have inhibited the ppautopatch file from running, remove the noppautopatchrun file on all MDM servers configured for auto-patching on the MSS/MG15000 node.

From the MDM:

- a** Log in as root.
- b** Remove the file as follows:

```
rm
/opt/MagellanNMS/cfg/private/noppautopatchru
n
```

## 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 69](#).

```
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 (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.

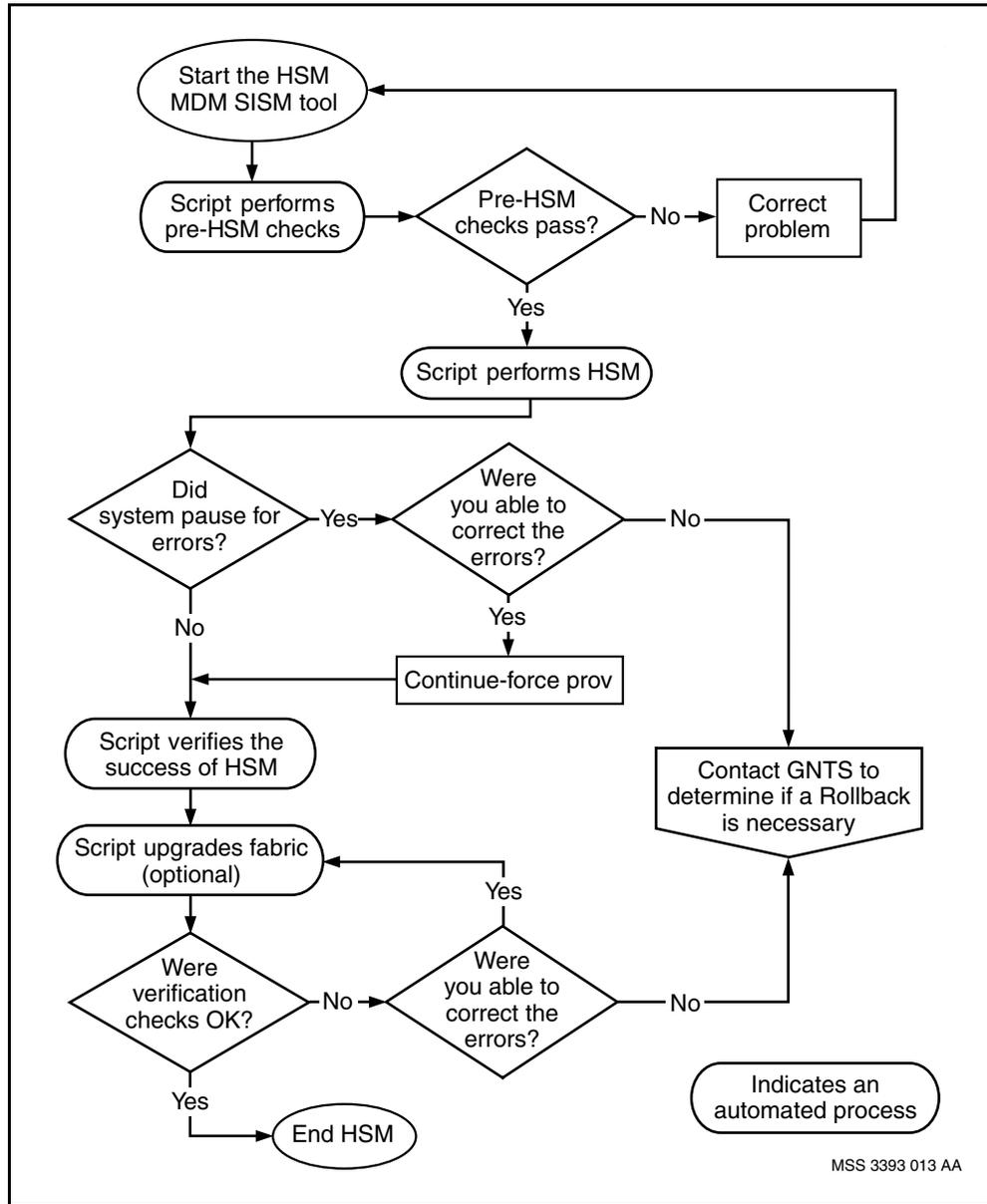
### Prerequisites

- Refer to the Prerequisites described in [HSM \(Command Console\) pre-work on page 49](#).
- For in-band OAM topologies, upgrade all Nortel 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 tasks you need to perform to execute the HSM.

**HSM task flow**



## Work flow navigation

The following aspects of the HSM are automated by the Carrier Voice over IP ATM Upgrade script:

- [Start HSM using SASM tool on page 102](#)
- [Pre-HSM verification checks on page 107](#)
- [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 MDM SASM tool on page 112](#)

## Performing HSM using MDM SASM

Perform HSM using the Nortel MDM GUI tool SASM to upgrade the Multiservice Switch node.

### Prerequisites

- If MG9000 Internode ESA is provisioned on the MSS15000, perform the manual pre-check procedure, [Pre-work for HSM with AAL1 support of MG9000 Internode ESA on page 66](#) before you launch the SASM tool.
- Have the correct software load and patches downloaded to the MDM server.

### Start HSM using SASM tool

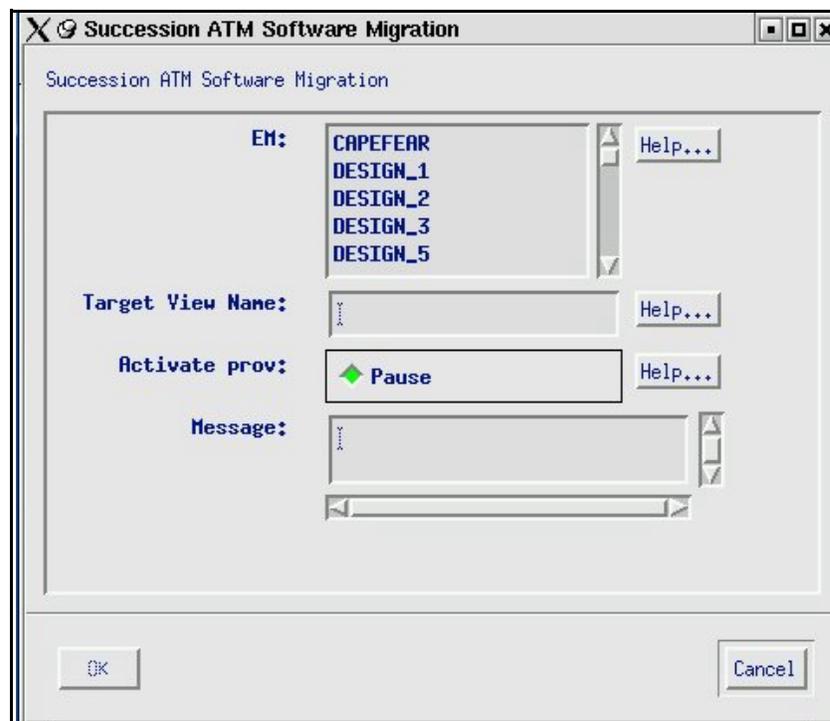
#### *From the MDM window*

- 1 Choose Configuration > MSS > Administration > Succession ATM Software Migration.

Alternatively, from the MDM Command Console, type:

**\$ /opt/MagellanNMS/bin/succession\_atmsw\_migr**

The Succession ATM Software Migration window opens.



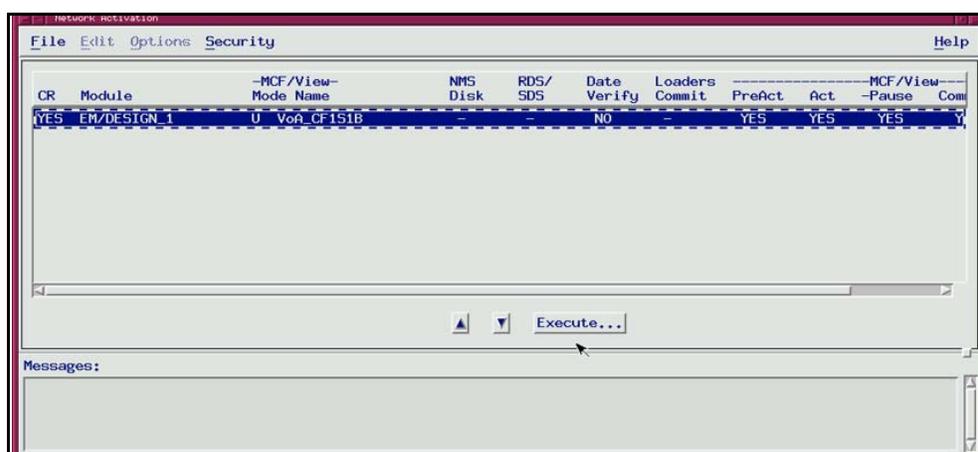
- 2 In the EM field, select the name of the node you want to upgrade.
- 3 In the View field, enter the new target view name without the view type or version in the name (for example, CF01S1B\_April\_24).

The target view name must be 20 characters or less and be composed of numbers, letters and underscore. Use a consistent naming convention because this name is used when saving the current view and to create the view that will be activated for the software migration.

- 4 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 network activation file already loaded. The network activation file contains one network activation record defined specifically for Carrier Voice over IP software migration activation. The record must be selected before you click **Execute**.

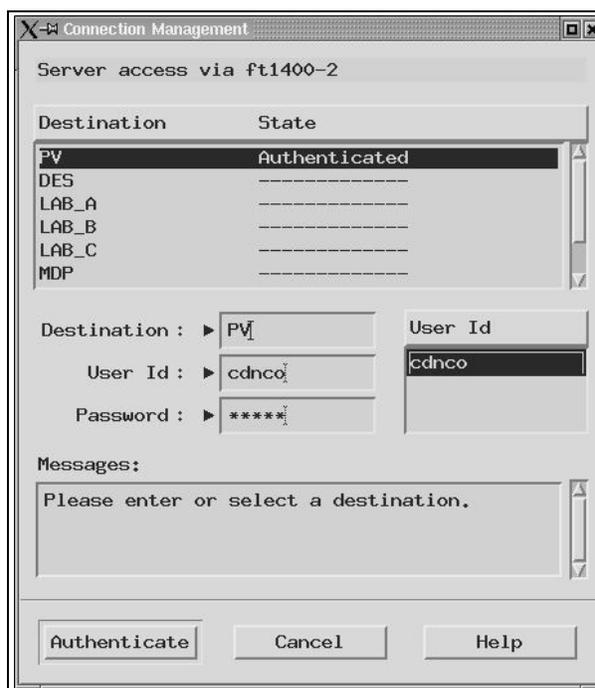
- 5 From the MDM window, choose Fault > Alarm Display: Log.  
The Alarm Display window opens.
- 6 Ensure the appropriate filters are turned on, including the filter for the target node, and that Format is set to full. Set filter to on. For more information on how to filter alarms, see “Filtering alarms” in 241-6001-011 *Nortel Multiservice Data Manager Fault Management Tools*.
- 7 From the MDM window, choose Fault > Alarm Display: Active.  
The Alarm Display window opens.

- 8 Ensure the appropriate filters are turned on, including the filter for the target node, and that Format is set to full. Set filter to on. For more information on how to filter alarms, see “Filtering alarms” in 241-6001-011 *Nortel Multiservice Data Manager Fault Management Tools*.

**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.

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

The Connection Management Dialog opens.



- 10 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.)
- 11 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 *Nortel Multiservice Data Manager Fault Management Tools*.

- 12 In the Network Activation tool window, click **Execute**.

A confirmation dialog opens.

- 13 Click **OK** to proceed with the activation.

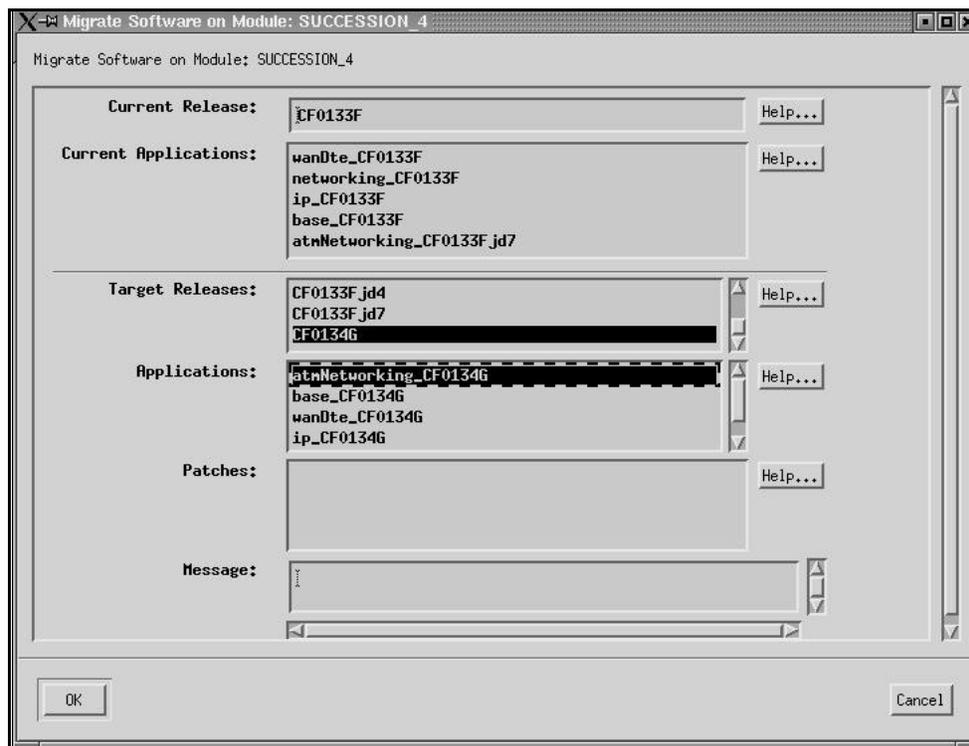
On the Network Activation tool, the **Execute** button changes to grey and can no longer be selected.

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 operator wants to fix it), fix the problem and repeat the process until all problems are corrected.

The Migrate Software on Module window opens.



- 14 In the Migrate Software on Module window, select the target release.
- 15 In the Migrate Software on Module window, select the software version that is the destination software version. Verify that the application version selected matches the application version in the Current Applications field.
- 16 Select the required patches from the patch list.

**Note:** 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 71](#) for more details on how to apply patches in SN08.
- 17 If you would like to proceed with the migration, click **OK**.
- 18 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 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 can occur for various reasons, for example: if another operator is also provisioning or if there are warnings or errors from the check prov and so forth.

For information on how to handle these error messages, see “Impact of an error condition on a HSM using the SASM tool” in NN10070-461 *Upgrading Nortel Multiservice Switch 15000 in Carrier Voice over IP Networks PT-AAL1/UA-AAL1*.

## 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 MDM server automatically reconnects to the node when possible.

While the activation is in progress, monitor the alarms from the node using the 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** When 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 is mandatory or, there is something wrong with the application during the software migration (Phases 1 to 3).

- a** When the software migration has paused and *Pbg* components have been provisioned, perform steps [15](#) to [17](#) from the procedure [Perform HSM using Command Console on page 71](#). 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 Global Networks Technical Support (GNTS) for advice or assistance before continuing if the software migration pauses due to a Migration Visible Alarm.

**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 [22](#) to step [26](#) inclusive in [Verify the success of HSM on page 92](#) to compare the status of the *Atmmpc* components with the information you gathered in steps [22](#) to [24](#) of the procedure [Verify the success of HSM on page 92](#).
- 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 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 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).

Close the SASM tool after stopping an HSM.

- Select **Exit** from the File menu to close the NAT.
- Select **Exit** from the File menu to close the Component Information Viewer window.

To back out after the migration switchover, follow the steps in "Rollback" in NN10070-461 *Upgrading Nortel Multiservice Switch 15000 in Carrier Voice over IP Networks PT-AAL1/UA-AAL1*.



### CAUTION

#### Non-hitless process

Stopping the process after the HSM switchover is not a hitless process.

## Feature activation

The following optional features can be activated:

- Recurring fan alarm enhancement if you are upgrading from SN06 to SN08. If your current release is SN07 or SN08, this feature should already be enabled.
- setting the Solution release name identification

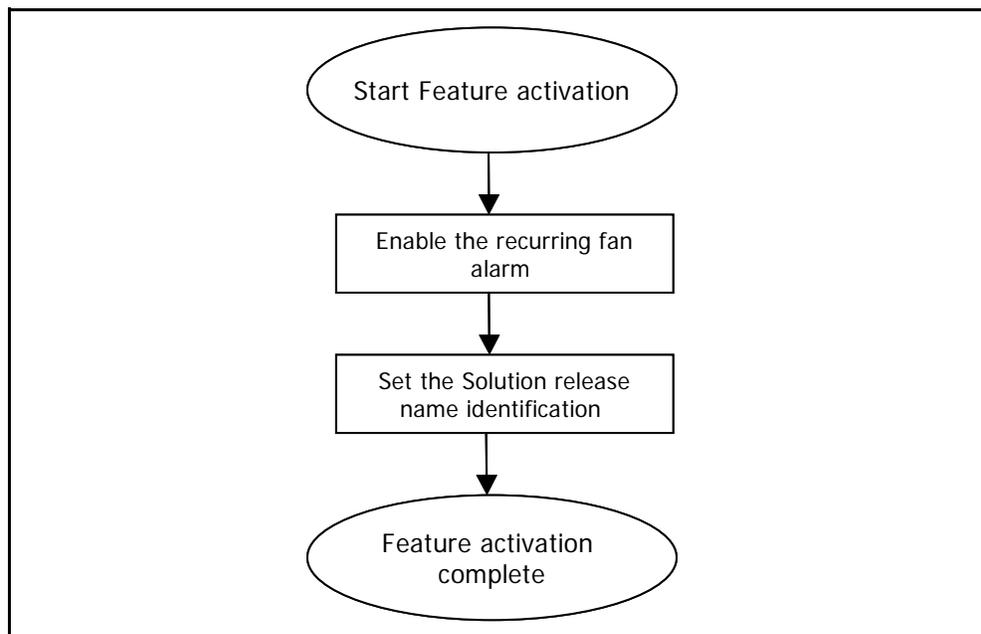
### Prerequisites

- Complete the HSM. See [HSM \(Command Console\) activation on page 69](#) and [HSM \(MDM SASM tool\) activation on page 99](#) for more information.

### Feature activation task flow

The task flow shows you the sequence of tasks you must perform to activate new features.

#### Feature activation work flow



### Work flow navigation

- [Enabling the recurring fan failure alarm enhancement on page 114](#)
- [Setting the Solution release name identification on page 115](#)

## Enabling the recurring fan failure alarm enhancement

In a Carrier Voice over IP solution, Nortel recommends configuring the recurring fan failure alarm on Nortel 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

- SN08 software must be running on the node.

#### *From the node*

- 1 Log in 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 section "Troubleshooting a software upgrade" in NN10070-461 *Upgrading Nortel Multiservice Switch 15000 in Carrier Voice over IP Networks PT-AAL1/UA-AAL1*.
- 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 Solution release name identification

The *commentText* field of the MSS15000 shelf component contains record release and load information that appears in the following order:

- Solution release
- patchlevel of Nortel 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 Solution (Carrier Voice over IP) release the MDM and MSS15000 are running, you can use the MDM toolset to modify the Solution release name in the *commentText* field of the Multiservice Switch 15000 shelf component for MSS 15000/MG 15000 in a VoIP network. See NN10419-461 *Upgrading Nortel Multiservice Switch 15000 and Media Gateway 15000/20000 in Carrier Voice over IP Networks* for more information.

For MSS15000 in Core ATM networks, migration is done through the SASM tool. When the SASM tool migrates the MSS15000 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 Carrier Voice over IP 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 Solution release name.

An alternate way to set the Solution release name on MSS15000 is by using the **Set Shelf Commenttext** command.

Perform either the:

- [Setting Solution release name using the Set Shelf CommentText command on page 116](#) or
- [Setting Solution release name for MSS15000 on page 117](#)

## Setting Solution release name using Set Shelf CommentText command

### Setting Solution release name using the Set Shelf CommentText command

#### *From the node*

- 1 Log in 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  
  
SN07, MDM 151-09, 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 "SN08" and leave the remainder of the text unchanged. For example:

```
"set Shelf CommentText SN08, MDM 151-09, IM9095 1.01,  
IM1662 1.35, IM1661 1.04, Spec 2.0"
```

## Setting Solution release name for MSS15000 using SASM

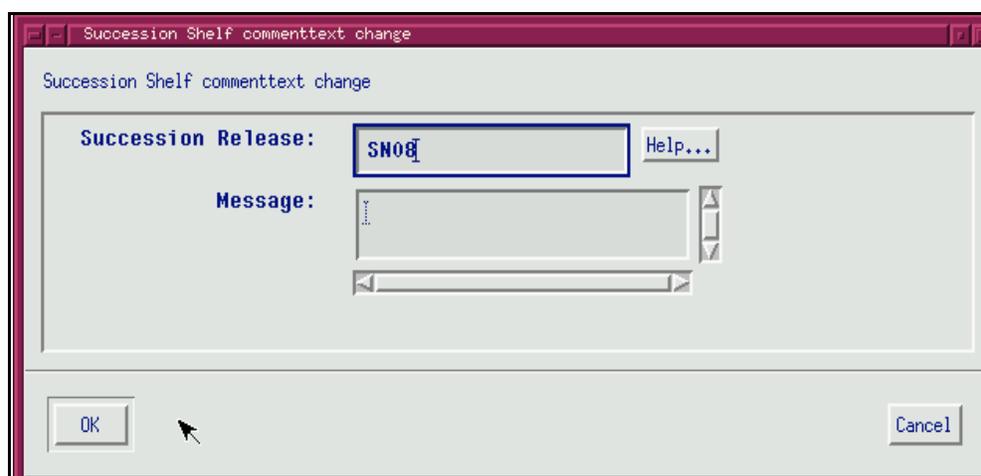
### Prerequisites

- The MSS15000 hitless software migration must have been performed using the MDM SASM tool.

### Setting Solution release name for MSS15000

#### From the MDM server

- 1 The SASM tool post-activation script prompts you for the new Carrier Voice over IP release name to display in the MSS15000 Shelf CommentText. Use the format: SNxx.y.



If you click **Cancel**, the update is cancelled before execution and the MSS15000 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 *Shelf CommentText*) with no pre- and post checks.

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



## 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.

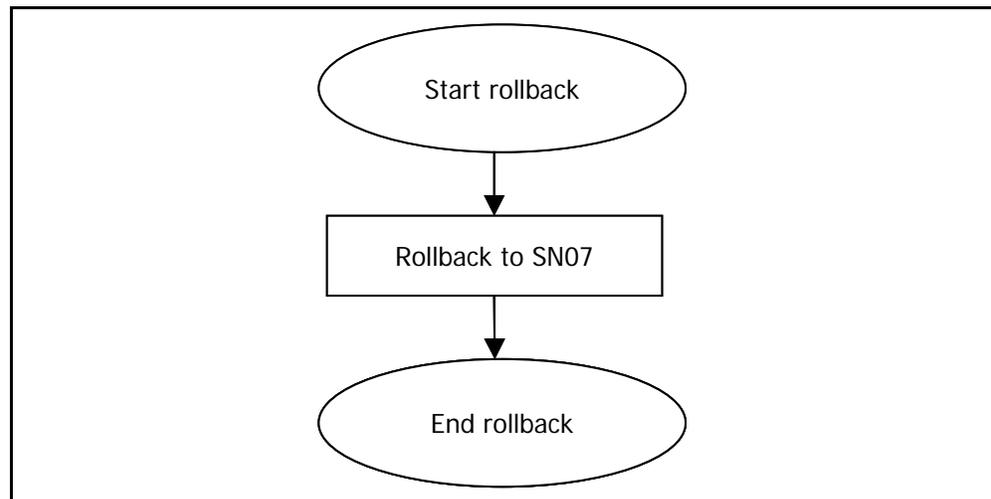
- You must ensure the FPs and CPs on the shelf are compatible with the level of software to which you are reverting. To verify the minimum software requirements of the FPs, see NN10600-551 *Nortel Multiservice Switch 7400/15000/20000 FP Configuration Reference*. To verify the software requirements of the CPs, see NN10600-120 *Nortel Multiservice Switch 15000/20000 Hardware Description*.
- If you need to revert to a saved view of an older Nortel 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 server, the MSS Backup provider, the MSS Restore provider, the FMDR server, and the GMDR server must all be running on the Multiservice Data Manager (MDM) server for the MDM Backup and Restore tool to function properly. See 241-6001-807 *Nortel Multiservice Data Manager Network Backup and Restore* for information on how to check these servers.
- Nortel recommends that you perform this rollback using the MDM Command Console. For more information on opening the Command Console, see 241-6001-804 *Nortel Multiservice Data Manager Workstation Utilities*.

## Rollback task flow

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

### Rollback task flow chart



## Rollback to SN07

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

### Prerequisites

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

### *From the node*

- 1 Log in 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 MDM server reconnects to the node, confirm the provisioning changes: **confirm prov**
- 4 Commit the provisioning changes: **commit prov**

### Variable values

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



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## Troubleshooting a software upgrade

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Refer to one of the following sections for information on:

- [Error conditions during an HSM on page 124](#)
- [Error conditions during an HSM using the MDM SASM tool on page 128](#)
- [Problems with a hitless software migration \(HSM\) on page 130](#)
- [Active equipment crashes during an HSM on page 133](#)
- [Problems with loading software and patches on page 135](#)
- [Problems with a fabric card version during a HSM on page 137](#)

## Error conditions during an HSM

The table [Impact of an error condition on a HSM on page 124](#) 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 the 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 <i>display ProvisioningSystemrestore Possible</i> command.	The journal files have not been purged. Purge the files by issuing the <i>commit force prov</i> command. Then re-issue the <i>display ProvisioningSystemrestore Possible</i> disk to verify the files have been purged. To restore these journal files, see the Restore Prov command section in NN10600-050 <i>Nortel Multiservice Switch 7400/15000/20000 Command Reference</i>
<p>Note: For more information on Multiservice Switch alarms, see NN10600-500 <i>Nortel Multiservice Switch 6400/7400/15000/20000 Alarms Reference</i></p>		

**Impact of an error condition on a HSM**

<b>Phase</b>	<b>Error condition</b>	<b>Result and action</b>
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.
<b>Note:</b> For more information on Multiservice Switch alarms, see NN10600-500 <i>Nortel Multiservice Switch 6400/7400/15000/20000 Alarms Reference</i>		

**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 <i>commit prov</i> command is not accepted until disk synchronization is achieved or the standby CP is removed from service.
<p>Note: For more information on Multiservice Switch alarms, see NN10600-500 <i>Nortel Multiservice Switch 6400/7400/15000/20000 Alarms Reference</i></p>		

**Impact of an error condition on a HSM**

<b>Phase</b>	<b>Error condition</b>	<b>Result and action</b>
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).	<p>If both the following conditions are true, then this error triggers migration switchover:</p> <ul style="list-style-type: none"> <li>- disks are synchronized</li> <li>- Lp/0 is ready for migration switchover</li> </ul> <p>FPs that have not completed their FP migration phase are reset. FPs that have completed their FP migration phase switchover to the new software.</p> <p>If either of the conditions are not true, then the system rolls back to the committed provision view. A service shelf outage occurs.</p>
<p>Note: For more information on Multiservice Switch alarms, see NN10600-500 <i>Nortel Multiservice Switch 6400/7400/15000/20000 Alarms Reference</i></p>		

## Error conditions during an HSM using the MDM SASM tool

The table [Impact of an error condition on a HSM using the SASM tool on page 128](#) describes the error conditions that can occur in each phase of a software migration performed using the 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/.Succession Enabled is setup properly.
	Cannot select node, cannot connect to the nodes.	Check <i>NN10198-912 Nortel Multiservice Switch 15000, Media Gateway 15000 and Multiservice Data Manager in Carrier Voice over IP Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP</i>
	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 MSS Register Command error: APPLICATION_ERROR 1111 Fdtr cannot connect to SUCCESION_3 because it can't be pinged ... Done recording IP accessibility."	MDM server has lost connectivity to the node, see the <i>NN10198-912 Nortel Multiservice Switch 15000, Media Gateway 15000 and Multiservice Data Manager in Carrier Voice over IP Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP</i>
Note: For more information on Nortel Multiservice Switch alarms, see <i>NN10600-500 Nortel Multiservice Switch 6400/7400/15000/20000 Alarms Reference</i> .		

**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 <i>start -prov</i> 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.
<p>Note: For more information on Nortel Multiservice Switch alarms, see NN10600-500 <i>Nortel Multiservice Switch 6400/7400/15000/20000 Alarms Reference</i>.</p>		

## 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 Multiservice Switch or MDM documents.

**Corrective action for problems during a HSM**

<b>Task</b>	<b>Use the section ...</b>	<b>in</b>
1. On the MDM server, open the Command Console tool and connect to the network.	“Connecting to the network”	241-6001-804 <i>Nortel Multiservice Data Manager Workstation Utilities</i>
2. On the MDM server, log the command output to a file.	“Logging command output to a file”	241-6001-804 <i>Nortel Multiservice Data Manager Workstation Utilities</i>
3. On the 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 <i>Nortel Multiservice Data Manager Fault Management Tools</i>
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 <i>Nortel Multiservice Switch 7400/15000/20000 Software Installation</i>
5. Verify that the committed provisioning view is complete after the migration.	“Correcting provisioning view problems”	NN10198-912 <i>Nortel Multiservice Switch 15000, Media Gateway 15000 and Multiservice Data Manager in Carrier Voice over IP Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP</i>
6. If the provisioning view has changed, reactivate the provisioning view.	<a href="#">Performing HSM using MDM SASM on page 102</a>	This document.

**Corrective action for problems during a HSM**

	<b>Task</b>	<b>Use the section ...</b>	<b>in</b>
7.	Correct other problems as directed by the alarm remedial text or as indicated by the documentation.	This chapter and <a href="#">Alarms seen during an upgrade</a>	
8.	Before performing hitless software migration, the <i>Pbg</i> components must be unlocked and enabled. If the <i>Pbg</i> osi state is not enabled, check the bso, sts and lp components.	“Verifying the status of the link layer”  <a href="#">Verify the status of the node before the upgrade on page 51</a>	NN10198-912 <i>Nortel Multiservice Switch 15000, Media Gateway 15000 and Multiservice Data Manager in Carrier Voice over IP Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP</i>  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 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 Multiservice Switch or MDM documents.

#### Corrective action for active equipment crashes during a HSM

Task	Use the section ...	in
1. On the MDM server, open the Command Console tool and connect to the network.	"Connecting to the network"	241-6001-804 <i>Nortel Multiservice Data Manager Workstation Utilities</i>
2. On the MDM server, log the command output to a file.	"Logging command output to a file"	241-6001-804 <i>Nortel Multiservice Data Manager Workstation Utilities</i>
3. On the 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 <i>Nortel Multiservice Data Manager Fault Management Tools</i>
4. If any of the equipment is locked, unlock it.	"Unlock command"	NN10600-050 <i>Nortel Multiservice Switch 7400/15000/20000 Command Reference</i>

**Corrective action for active equipment crashes during a HSM**

<b>Task</b>	<b>Use the section ...</b>	<b>in</b>
5. Collect data about the crash.	“Isolating the problem that causes a crash.”	NN10198-912 <i>Nortel Multiservice Switch 15000, Media Gateway 15000 and Multiservice Data Manager in Carrier Voice over IP Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP</i>
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 <a href="#">Impact of an error condition on a HSM using the SASM tool on page 128</a> .	<a href="#">Impact of an error condition on a HSM using the SASM tool on page 128</a>	This document.
8. Abort the hitless software migration if the problems identified in task 4 cannot be resolved.	<a href="#">Rollback to SN07 on page 121</a>	This document.
9. Contact Nortel 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 Multiservice Switch or MDM documents.

### Corrective action for problems loading software and patches

Task	Use the section ...	in
1. On the MDM server, open the Command Console tool and connect to the network.	“Connecting to the network”	241-6001-804 <i>Nortel Multiservice Data Manager Workstation Utilities</i>
2. On the MDM server, log the command output to a file.	“Logging a command output to a file”	241-6001-804 <i>Nortel Multiservice Data Manager Workstation Utilities</i>
3. Isolate the problem with the software or the patch.	“Isolating check prov problems”	NN10198-912 <i>Nortel Multiservice Switch 15000, Media Gateway 15000 and Multiservice Data Manager in Carrier Voice over IP Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP</i>

**Corrective action for problems loading software and patches**

	<b>Task</b>	<b>Use the section ...</b>	<b>in</b>
4.	Using the appropriate Nortel Multiservice Switch Release Notes, identify the version of software that should be running on the node.	<a href="#">Download release notes on page 13</a>	This document.
5.	If the problem is an incorrect application version, or that an application has not been loaded, upgrade the application.	<a href="#">Download the software to the server from the Nortel website on page 24</a>  <a href="#">Download the software from the server on page 33</a>  <a href="#">HSM (Command Console) activation on page 69</a>	This document.
6.	If the problem is that the card type and the software features are incompatible, reinstall the software.	<a href="#">Verify hardware compatibility on page 14</a>  <a href="#">Verify node feature compatibility on page 14</a>	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

### Problem 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 MDM server, open the Command Console tool and connect to the network.	“Connecting to the network”	241-6001-804 <i>Nortel Multiservice Data Manager Workstation Utilities</i>
2. On the MDM server, log the command output to a file.	“Logging command output to a file”	241-6001-804 <i>Nortel Multiservice Data Manager Workstation Utilities</i>
3. Using the appropriate Nortel Multiservice Switch Release Notes, identify the version of software that should be running on the node.	<a href="#">Download release notes on page 13</a>	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 <i>Nortel Multiservice Switch 15000, Media Gateway 15000 and Multiservice Data Manager in Carrier Voice over IP Networks Fault Management Troubleshooting PT-AAL1/UA-AAL1/UA-IP</i>

**Corrective action for problems loading software and patches**

<b>Task</b>	<b>Use the section ...</b>	<b>in</b>
6. If the fabric card firmware is not up-to-date, upgrade it.	“Fabric replacement may need a fabric firmware upgrade”  <a href="#">Upgrade the fabric firmware on page 84</a> or “Fabric firmware upgrade”	NN10600-120 <i>Nortel Multiservice Switch 15000/20000 Hardware Description</i>  This document or the NN10600-272 <i>Nortel Multiservice Switch 7400/15000/20000 Upgrading Software</i>

## Alarms seen during an upgrade

Alarms are expected during a migration. The table, [Alarms seen during an upgrade on page 139](#), lists alarms that 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 about alarms, see 241-6001-501 *Nortel Multiservice Data Manager Alarms Reference*.

### 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**

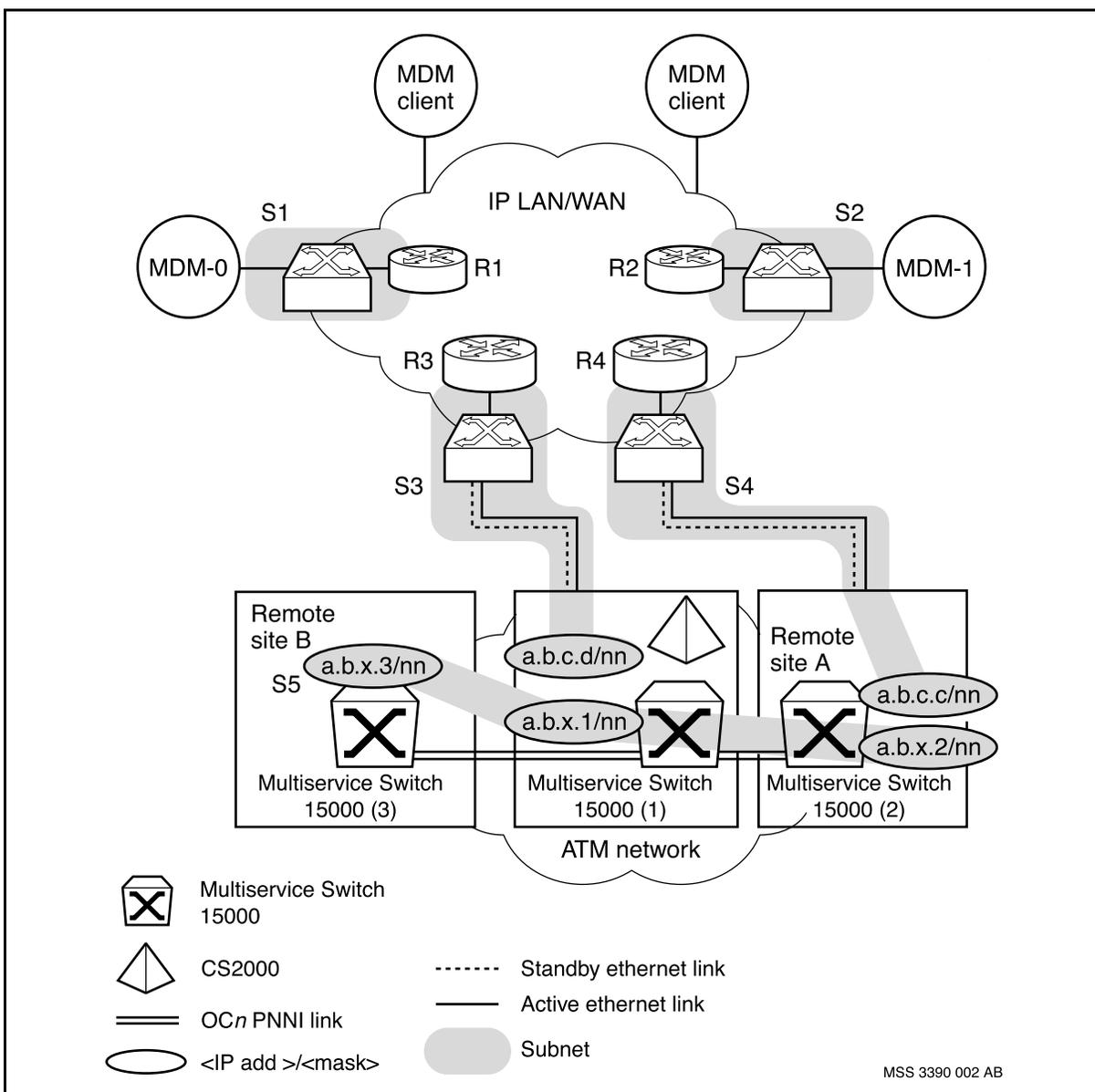
Phase	Alarm message	Comment
7011 5274	The APS request signalFail has been detected.	Normal behavior. As the first set of cards restart and enter the migration shelf, the associated Sonet lines go out of service (LOS>L-AIS). In response, the far end signals "signalFail" in the Kbytes of the line to the 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 SN08 before the Hitless ATM routing for CP equipment protection feature has been activated. This alarm is cleared when this feature is enabled.

## In-band OAM quick reference

### Key relationships

The figure [Sample in-band connectivity topology on page 141](#), 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 Multiservice Data Manager servers are used to manage the Nortel Multiservice Switch network.

The chosen server is the MDM server that the operator uses as a launching point for MDM applications, such as SASM or Command Console.

The alternate server is the other 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 Office and is a Gateway node using out-of-band connectivity.

From the perspective of 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 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.