NORTEL

Method of Procedure

HLR Netra 240
Data Archive and
System Recovery MOP
NSS 17

Doc/Ver: GHNDRMOP / AA06

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Information subject to change without notice.

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Revision Information

Version	Issue Date	Description of Changes	Edited By
AA01	07/07/03	First release (draft).	Steve Nattress
AA02	21/07/03	Second release (reviewed).	Steve Nattress
AA03	25/11/03	Changes requested from field testing (preliminary).	Steve Nattress
AA04	28/01/04	Adding single disk replacement MOP. (preliminary).	Steve Nattress
AA05	24/10/04	Editorial changes.	Brent Jenkins
AA06	19/11/04	Applied updated Nortel logos.	Brent Jenkins

Document Status

Preliminary

1 About this document

This *NSS17 SSPFS (Succession Server Platform Foundation Software) MOP* gives the procedures for backing up and restoring data on the *NSS17 SSPFS, on the Sun Netra 240*. It also covers how to swap the hard disks and system configuration card to a standby server, in the case of server hardware failure and the replacement of a single hard disk following a hard disk failure.

This document has a system level focus and is limited to the NSS17 release. It does not discuss the installation and commissioning of specific nodes in the network. Please refer to the relevant documentation for installation and commissioning.

1.1 Intended Audience

This publication is intended for

- Nortel customers (network operators)
- Nortel network engineering teams
- Nortel VO teams
- Nortel global software delivery teams
- Nortel GPS teams
- Nortel network integration team

1.2 Indication of hypertext links

Hypertext links in this document are indicated in blue. If you are viewing an electronic version of this document (such as PDF online), click the blue text to jump to the associated section or page. If you are viewing a hard copy of the document, then please note that these hypertext links are underlined.

1.3 Software release applicability

This publication is applicable to the SSPFS NSS17 software release. Unless this publication is revised, it does not apply to releases other than this.

1.4 Special text conventions in this document

Commands, parameters, and responses in this document conform to the following conventions.

Input prompt >

An input prompt > indicates that the information that follows is a command. For example:
>list

Different platforms will be identified in front of the input prompt. For example:

- sdm> identifies the HLRPS (SDM) input prompt
- sspfs> identifies the SSPFS input prompt
- ftp> identifies the FTP input prompt
- # identifies the Solaris root prompt

Commands and fixed parameters

Commands and fixed parameters that are entered at a terminal are shown in bold text. For example:
sdm**> ls –la**

Variable parameters

Variable parameters that are entered at the command line are shown enclosed in angle brackets. For example:
sdm**> ftp <Netra 240 IP Address>**

Entering data

The term “enter” in procedural documentation indicates that the user should type in the indicated commands and parameters and then press the Enter key on the keyboard.

2 Overview

In NSS17 the SSPFS on Sun Netra 240 does not have a tape drive to use in the standard SSPFS backup procedure. This document contains a MOP on how to backup the SSPFS critical data using the tape drive on the SDM and how to recover this critical data following a complete outage.

A feature of the Sun Netra 240 means that a cold standby recovery procedure is possible, by swapping the hard disks and system configuration card to a second Sun Netra 240. This document contains a MOP on how to carry out this procedure, which would be used following an outage due to faulty hardware on the Sun Netra 240 that did not affect the hard disks.

The SSPFS uses disk mirroring to provide protection against a single-disk failure. This document provides a MOP for replacing a single failed disk and recreating the mirroring.

This document contains four distinct procedures.

- To back-up the SSPFS data to a tape follow the procedure detailed in section 3.1.1.
- To restore the SSPFS data from a tape follow the procedure detailed in section 3.1.2.
- To perform the Cold Standby system recovery follow the procedure detailed in section 3.2.
- To perform a single hard disk replacement follow the procedure detailed in section 3.3

2.1 Document Pre-conditions

The procedures in this MOP assume that the following preconditions have been met.

- User has root userid access on the SDM.
- User has root userid access on Netra 240.
- For the SSPFS restore data procedure, the SSPFS software and file structure must have already been set up, (using IM 24-9082).
- For the Cold Standby and Single Disk Replacement procedures, the IP address of the Netra 240 is known.
- For the Cold Standby and Single Disk Replacement procedures, the user needs access to Sun Documentation, reference: 817-2699-10. (See Note)

Note: This Sun Microsystems document may be downloaded from the following URL:
http://www.sun.com/products-n-solutions/hardware/docs/Servers/Netra_Servers/Netra_240/index.html

3 Procedures

3.1 Standard SSPFS Back-up and Restore MOP

It is recommended that the following backup procedure is carried out following any configuration changes on the SSPFS or associated application software configuration changes (e.g. SAM21 Element Manager), on the Sun Netra 240. It is recommended that a blank tape is used to back-up the data and that only one back-up set is stored on this tape.

The intention of this procedure is produce an archive on to tape that can be used to recover the essential configuration data following a hardware failure.

3.1.1 Back up Procedure

Step	Action
1.	Log onto SSPFS (Netra 240) as root user.
2.	Issue following command to become oracle user. sspfs> **su – oracle**
3.	To create Backup File issue following command sspfs**> /opt/nortel/sspfs/bks/bkfullora <DumpFileName>** Note that the file name extension of the **<DumpFileName>** should be **".dmp"** and the oracle user has permission to create files in the specified directory. For example, all users have permission to create files in directory **/var/tmp**, so specify the **<DumpFileName>** as something like **/var/tmp/ bkexpora_yyyymmddhh.dmp** will guarantee a successful file creation. Where yyyy is the year, mm is the month, dd is the day and hh is the hour at the time of the backup.
4.	The backup file has now been created. To backup this file to tape log onto the local SDM as the maint user.
5.	Use the ftp command to get the backup file from the SSPFS. Use the maint userid and password when prompted sdm> **ftp <Netra 240 IP Address>**
6.	Change the transfer type to binary mode ftp**> bin**
7.	Change the local directory to /tmp ftp> **lcd /tmp**
8.	Change to the remote directory on the SSPFS where the backup file was created. ftp> **cd /var/tmp/**
9.	Retrieve the backup file. ftp> **get <DumpFileName>**

10.	Exit out of ftp ftp> **quit**
11.	Insert a blank tape into the DDS-3 tape drive on the SDM.
12.	Write the backup file to the tape using the following command. sdm> **tar cvf /dev/rmt0 <DumpFileName>**

3.1.2 Restore Procedure

This restore procedure should be followed after an outage that required the SSPFS to be re-installed. e.g. In the unlikely event of a dual-disk failure, full recovery of the SSPFS on the Netra 240 requires a reinstall of the SSPFS and applications software as described in IM 24-9082 followed by this data restoration procedure.

Step	Action
1.	Log onto SDM as maint user.
2.	Insert backup tape into DDS-3 drive on the SDM
3.	Copy the backup file off the tape sdm> **tar xvf /dev/rmt0 `tar tf /dev/rmt0 | grep bkexpora_`**
4.	Confirm that the backup file has been extracted. sdm> cd /tmp sdm> ls bkexpora_* There should be a file named **bkexpora_yyyymmddhh.dmp** where yyyy is the year, mm is the month, dd is the day and hh is the hour at the time of the backup. This is the **<DumpFileName>.**
5.	Use the ftp command to put the backup file onto the SSPFS. Use the maint userid and password when prompted sdm> **ftp <SSPFS IP Address>**
6.	Change the transfer type to binary mode ftp**> bin**
7.	Change the local directory to /tmp ftp> **lcd /tmp**
8.	Change to the remote directory on the SSPFS where the backup file will be restored to. ftp> **cd /var/tmp/**
9.	Put the backup file onto the SSPFS. ftp> **put <DumpFileName>**
10.	Exit out of ftp ftp> **quit**
11.	Log onto SSPFS as root user.

12.	Issue following command to become oracle user. sspfs> **su – oracle**
13.	To restore the Backup File issue following command sspfs> **/opt/nortel/sspfs/bks/rsimpora <DumpFileName>**

3.2 Cold Standby MOP

This MOP covers how to swap the hard drives and the system configuration card from a faulty SSPFS Sun Netra 240 to another Sun Netra 240 server or "standby server". This will ensure that a fully functional SSPFS is available as soon as possible and allow the failed unit to be replaced.

The Netra 240 is not any involved in any part of providing the functional HLR service hence can be swapped out using a "cold standby" technique. Some OAM functionality will be lost whilst the swapout is being undertaken, specifically; reconfiguration of SAM21 components and low level SAM21 alarms

Step	Action
1.	Ensure that both servers are powered off. See page 15-16 of (reference 1) Initiate orderly power down (Table 2-1) – this shuts down Solaris cleanly and then powers down the computing platform. Note: Power is only removed totally from the unit when the power cables are disconnected or the frame circuit BIP isolates the unit - See Installation Method 12-9078 "Passport 8600 and Netra 240 Hardware Installation for HLR Solution" for BIP details
2.	The Netra 240 system configuration card (SCC) is used to store information that uniquely identifies the server to the network, e.g. MAC addresses , host IDs etc.. This allows H/W replacement without requiring associated configuration changes on other network nodes. The SCC must be moved from the faulty Netra 240 to the standby server. • Removal of the SCC is described in reference 1 pages 36-37 • Insertion of the SCC in is described in reference 1 pages 37-38 (steps 1 & 2 only)
3.	Both hard drives must be moved such that they re-locate to the same physical slot position on the standby server as they occupied on the faulty server. Follow Sun Documentation and remove both hard disks from faulty server and insert the disks, again following Sun Documentation, into the standby server. • Removal of a hard drive is described in document reference 1 pages 38-41 (steps 6-7, 9-10) o Note: since the drives are being removed whilst the unit is powered off start the procedure at step 6, ignoring step 8 – (this is indicated by hyperlink the document) • Installing a hard drive is described in document reference 1 pages 41-42 (steps 1-5) o Note: since the drives are being installed whilst the unit is powered off only steps 1-5 are required – this is indicated in the document

4.	Swap the Ethernet cables from the faulty server into the standby server

5.	Power up the standby server.
	Note: it's suggested that a laptop/PC or terminal is attached to console serial port to observe the boot up process. See document reference 1 pages 76+ for details/options on how to do this.
	
	Follow procedure for power up – document reference 1 (step 1-6, placing the key in the "Normal position".
	
	`{0} ok boot`
	`SC Alert: Host System has Reset`
	
	`Netra 240, No Keyboard`
	`Copyright 1998-2003 Sun Microsystems, Inc.  All rights reserved.`
	`OpenBoot 4.x.build_30_TEST, 2048 MB memory installed, Serial #56145441.`
	`Ethernet address 0:3:ba:58:b6:21, Host ID: 8358b621.`
	
	`Rebooting with command: boot`
	`Boot device: disk0:b  File and args:`
	`SunOS Release 5.8 Version Generic_108528-19 64-bit`
	`Copyright 1983-2001 Sun Microsystems, Inc.  All rights reserved.`
	`Hardware watchdog enabled`
	
	The standby server should then boot up as if it were the original SSPFS.

6.	Assuming this procedure was successful the user should be able launch the Element Manager GUI. o Connect to the Netra 240 using an Internet Explorer window on another machine. o Login to the Netra 240 using the Userid and Password. o Click in SAM21 Element Manager, the EM GUI will be launched. (See CS2M management tools NTP, Reference 4)

3.3 Single Disk Replacement MOP

This MOP covers how to replace a single hard disk on the SSPFS Sun Netra 240 following a disk failure.

Each Netra 240 is equipped with two hot-swap drives: "c1t0d0", and "c1t1d0".

Prerequisites

- At least one of the hard drives must be functioning.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1.</td><td>Telnet to the server by typing
> telnet < Netra 240 IP Address>
and pressing the Enter key.</td></tr>
<tr><td>2.</td><td>When prompted, enter your user ID and password.</td></tr>
<tr><td>3.</td><td>Change to the root user by typing
$ su - root
and pressing the Enter key.</td></tr>
<tr><td>4.</td><td>When prompted, enter the root password.</td></tr>
<tr><td>5.</td><td>Check the health of the system's disks by typing
metastat
and pressing the Enter key.
Note: Information about each system disk will be displayed. The normal state is "Okay". The state "Resyncing" means the mirror was broken and is being re-created. The state "Needs Maintenance" or "Maintenance" means that the disk needs to be replaced.</td></tr>
<tr><td>6.</td><td>Determine the disk that needs to be replaced on the Netra 240 by viewing the results from step 5.
<table><tr><td>If you are replacing</td><td>Do</td></tr><tr><td>c1t0d0</td><td>step 7</td></tr><tr><td>c1t1d0</td><td>step 13</td></tr></table></td></tr>
<tr><td>7.</td><td>Detach all of the sub-mirrors on the failed disk.
<pre># metadetach d5 d3
d5: submirror d3 is detached

metadetach d2 d0
d2: submirror d0 is detached

metadetach d8 d6
d8: submirror d6 is detached

metadetach d11 d9
d11: submirror d9 is detached

metadetach d100 d101
d100: submirror d101 is detached</pre></td></tr>
</table>

8.	Remove any copies of the Meta DB from the failed disk. # metadb -d c1t0d0s7
9.	Locate disk "c1t0d0". Use the documentation for the Netra 240 (reference 1) to physically replace the disk, firstly remove the faulty disk and then install the new one. Supplementary notes to Sun Documentation (reference 1). The procedures can be found in the Hard Drives chapter. Removing a Hard Drive • In step 1 of the procedure to remove a hard disk, having determined the faulty drive is still visible to the operating system enter its number (0 or 1) and then quit out of the format tool. Continue with the remaining steps. Installing a Hard Drive • In step 6 of the procedure to install a hard disk, the documentation states that both disks will appear when using the format tool. This is incorrect and both disks will only appear after they have been configured. To proceed with this step enter either number (0 or 1) depending on which drive is visible and quit out of the format tool. Continue with the remaining steps. When complete, return to this procedure, and do step 10.

10	WARNING
	The following command is extremely dangerous and if entered incorrectly could have non-recoverable error, so check the command VERY carefully before pressing enter
	
	`# prtvtoc -h /dev/rdsk/c1t1d0s2 | fmthard -s - /dev/rdsk/c1t0d0s2`
	
	`fmthard:  New volume table of contents now in place.`

11	Reattached the sub mirrors that were on the failed disk.
	
	`# metattach d5 d3`
	`d5: submirror d3 is attached`
	
	`# metattach d2 d0`
	`d2: submirror d0 is attached`
	
	`# metattach d8 d6`
	`d8: submirror d6 is attached`
	
	`# metattach d11 d9`
	`d11: submirror d9 is attached`
	
	`# metattach d100 d101`
	`d100: submirror d101 is attached`

12	Add 2 copies of the metadb back onto slice 7 of the newly replaced disk. `# metadb -a -c 2 c1t0d0s7` Go to step 16.

13	Detach all of the sub-mirrors on the failed disk.
	`# metadetach d5 d4`
	`d5: submirror d4 is detached`
	
	`# metadetach d2 d1`
	`d2: submirror d1 is detached`
	
	`# metadetach d8 d7`
	`d8: submirror d7 is detached`
	
	`# metadetach d11 d10`
	`d11: submirror d10 is detached`
	
	`# metadetach d100 d102`
	`d100: submirror d102 is detached`

14	Remove any copies of the Meta DB from the failed disk. # metadb -d c1t1d0s7
15	Locate disk "c1t1d0". Use the documentation for the Netra 240 (reference 1) to physically replace the disk, firstly remove the faulty disk and then install the new one. Supplementary notes to Sun Documentation (reference 1). The procedures can be found in the Hard Drives chapter. Removing a Hard Drive • In step 1 of the procedure to remove a hard disk, having determined the faulty drive is still visible to the operating system enter its number (0 or 1) and then quit out of the format tool. Continue with the remaining steps. Installing a Hard Drive • In step 6 of the procedure to install a hard disk, the documentation states that both disks will appear when using the format tool. This is incorrect and both disks will only appear after they have been configured. To proceed with this step enter either number (0 or 1) depending on which drive is visible and quit out of the format tool. Continue with the remaining steps. When complete, return to this procedure, and do step 16.
16	WARNING The following command is extremely dangerous and if entered incorrectly could have non-recoverable error, so check the command VERY carefully before pressing enter

```
# prtvtoc -h /dev/rdsk/c1t0d0s2 | fmthard -s - /dev/rdsk/c1t1d0s2

fmthard:  New volume table of contents now in place.
```

17 Reattached the sub mirrors that were on the failed disk.

```
# metattach d5 d4
d5: submirror d4 is attached

# metattach d2 d1
d2: submirror d1 is attached

# metattach d8 d7
d8: submirror d7 is attached

# metattach d11 d10
d11: submirror d10 is attached

# metattach d100 d102
d100: submirror d102 is attached
```

18 Add 2 copies of the metadb back onto slice 7 of the newly replaced disk.

```
# metadb -a -c 2 c1t1d0s7
```

Go to step 19.

19 You have completed this procedure.

Note: It may take several hours for the disks to re-sync. Progress may be checked using the following command.

```
# metastat | grep "Resync in progress"
    Resync in progress: 4 % done
    Resync in progress: 65 % done
    Resync in progress: 79 % done
    Resync in progress: 46 % done
    Resync in progress: 36 % done
```

4 Terms and Abbreviations

CS2M	Call Server 2000 Management
EM	Element Manager
FTP	File Transfer Protocol
GSM	Global System for Mobile Communications
GUI	Graphical User Interface
HLR	Home Location Register
IP	Internet Protocol
MOP	Method Of Procedure
SAM21	Service Application Module 21
SCC	System Configuration Card
SDM	SuperNode Data Manager
SSPFS	Succession Server Platform Foundation Software

5 References

Reference	Document Name	Title	Comments
1	817-2699-10	Netra 240 Server Service Manual	Obtained from Sun.[1]
2	24-0736	SSPFS Software Installation and Commissioning	SSPFS IM
3	24-9082	Netra 240 Software Installation and Commissioning.	
4	NN1002011.04.01	CS2M Tools NTP	
5	12-9078	Passport 8600 and Netra 240 Hardware Installation for HLR Solution	
6			

Notes:

1. http://www.sun.com/products-n-solutions/hardware/docs/Servers/Netra_Servers/Netra_240/index.html