

# Getting Started Guide for Netvisor® ONE Version 5.0.0

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## Introduction

Follow the steps in this document to upgrade Netvisor based on OpenSolaris to Netvisor 5.0.0 for Linux. You can upgrade following version of Netvisor to Netvisor 5.0.0:

- Netvisor 2.6.1-HF14-12327(GA)

## Supported Platforms

Netvisor supports an upgrade path from OpenSolaris to Netvisor 5.0.0 on the following platforms:

- NSU
- NRU01
- NRU02

## Upgrade Checklist

Upgrading to Netvisor 5.0.0 uses following steps:

- Establishing a serial console connection to the switch
- Performing disk checks and free disk space checks
- Copying the upgrade package to the switch
- Starting the upgrade process

## Upgrading to Netvisor 5.0.0

### Connecting to the Serial Console

During the upgrade of Netvisor to 5.0.0, the switch performs two reboots. To monitor the upgrade as well as to ensure the connectivity to the switch in case upgrade process fails, establish a serial console connection to the switch before starting the upgrade.

### Disk Checks and Free Disk Space

The upgrade process installs Netvisor 5.0.0 onto the second hard disk available in switches and preserves the existing Netvisor installation on the first hard disk.

Prior to beginning the upgrade process, please verify that a second hard disk exists on the switch. You can use the command, `storage-device-show`, to verify a second disk on the switch.

```
CLI (network-admin@Leaf1)>hidden storage-device-show
```

name	label	disk	type	capacity	in-use	data-set
disk0		c7t0d0	disk	238G	yes	rpool
disk1		c7t1d0	disk	238G	no	

Upgrading to Netvisor 5.0.0 requires a minimum of 10GB available disk space. Please use the `storage-pool-show` command to verify available disk space.

```
CLI (network-admin@Leaf1)>storage-pool-show
name  raid-type used avail status state
-----
rpool no-raid  200G 34.5G ok      ONLINE
```

## Identifying the Upgrade Package

In previous releases, several upgrade packages allowed you to select the appropriate software for your switch. For Version 5.0.0, a single package, **nvOS-s21-leo-5.0.0-5000014540-leo.pkg**, allows you to upgrade to Version 5.0.0.

## Copying the Upgrade Package to the Switch

- Enable Secure File Transfer Protocol (SFTP) on the switch:

```
CLI (network-admin@Leaf1)>admin-sftp-modify enable
sftp password:
confirm sftp password:
CLI (network-admin@Leaf1)>
```

- Upload the software package to the switch:

```
root@server-os-9:~/s21# sftp sftp@nru02-01
The authenticity of host 'nru02-01 (10.14.16.27)' can't be established.
RSA key fingerprint is SHA256:SI8VQZgJCpbbrF4sRcby36Fx7rz3Hh5EJl1PPyScLZU.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'nru02-01, 10.14.16.27' (RSA) to the list of known hosts.
* Welcome to Pluribus Networks Inc. Netvisor(R). This is a monitored system.      *
*                                     ACCESS RESTRICTED TO AUTHORIZED USERS ONLY *
* By using the Netvisor(R) CLI, you agree to the terms of the Pluribus Networks *
* End User License Agreement (EULA). The EULA can be accessed via              *
* http://www.pluribusnetworks.com/eula or by using the command "eula-show"     *
Password:
Connected to nru02-01.
sftp> cd import
sftp> put nvOS-s21-leo-5.0.0-5000014540-leo.pkg
Uploading nvOS-s21-leo-5.0.0-5000014540-leo.pkg to /import/
nvOS-s21-leo-5.0.0-5000014540-leo.pkg
nvOS-s21-leo-5.0.0-5000014540-leo.pkg          100% 1870MB   7.5MB/s   04:00
```

## Starting the Upgrade Process

Start the upgrade to Netvisor 5.0.0 using the `software-upgrade` command. Netvisor does not support fabric upgrade for Netvisor 5.0.0. Each switch in fabric must be upgraded individually.

```
CLI (network-admin@Leaf1)>software-upgrade package import/
nvOS-s21-leo-5.0.0-5000014540-leo.pkg
```

Scheduled background update. Use `software-upgrade-status-show` to check. Switch will reboot itself. DO NOT reboot manually.

Monitor the upgrade process using the `software-upgrade-status-show` command:

```
CLI (network-admin@Leaf1)>software-upgrade-status-show show-interval5  
log
```

```
-----  
[Jan13.09:00:05] Starting software upgrade ...  
[Jan13.09:00:06] Checking available disk space  
[Jan13.09:00:06] Unpacking local package bundle...  
[Jan13.09:00:06] Extracting initial bundle.
```

```
.  
.log
```

```
-----  
[Jan13.09:00:05] Starting software upgrade ...  
[Jan13.09:00:06] Checking available disk space  
[Jan13.09:00:06] Unpacking local package bundle...  
[Jan13.09:00:06] Extracting initial bundle.  
[Jan13.09:01:42] Decrypting signed bundle.  
[Jan13.09:01:49] Extracting signed bundle.  
[Jan13.09:03:26] Extracting packages.  
[Jan13.09:05:31] Fetching repository metadata.  
[Jan13.09:05:32] Checking and upgrading pkg in current boot image  
[Jan13.09:05:34] Computing package update requirements.  
[Jan13.09:05:37] Upgrading software upgrade framework  
[Jan13.09:05:42] Fetching repository metadata.  
[Jan13.09:05:42] Checking and upgrading pkg in current boot image  
[Jan13.09:05:44] Computing package update requirements.  
[Jan13.09:05:47] Upgrading platform software  
[Jan13.09:06:10] Upgrading platform software  
[Jan13.09:06:10] Software upgrade completed. Rebooting.
```

Monitor the progress of reboots by connecting to serial console of the switch.

After the switch reboots twice and you see following message in serial console of the switch, you can SSH to switch as the **network-admin**:

```
nvOS system info:
  serial number: 1902ST9100059
  hostid: 0900089d
  device id:
[ OK ] Started Netvisor Operating System.
      Starting nvOSd Monitor...
[ OK ] Started nvOSd Monitor.
[ OK ] Reached target Multi-User System.
[ OK ] Reached target Graphical Interface.
[ OK ] Started Stop ureadahead data collection 45s after completed startup.
      Starting Update UTMP about System Runlevel Changes...
[ OK ] Started Update UTMP about System Runlevel Changes.

* Welcome to Pluribus Networks Inc. Netvisor(R). This is a monitored system. *
*           ACCESS RESTRICTED TO AUTHORIZED USERS ONLY *
* By using the Netvisor(R) CLI, you agree to the terms of the Pluribus Networks *
* End User License Agreement (EULA). The EULA can be accessed via *
* http://www.pluribusnetworks.com/eula or by using the command "eula-show" *
nru02-01 login: network-admin
Password:
Netvisor OS Command Line Interface 5.0
Connected to Switch nru02-01; nvOS Identifier:0x9000879; Ver: 5.0.0-5000014540
CLI (network-admin@nru02-01) > software-show
version:           5.0.0-5000014540
```

## Upgrading Netvisor over the Fabric and Multiple Nodes

Netvisor 5.0.0 adds the capability to upgrade the entire fabric from one node in the fabric using the fabric upgrade feature.

Netvisor supports the options, `auto-finish` and `manual-reboot` for the command `fabric-upgrade-start` when upgrading from Netvisor 2.6.1 to Netvisor 5.0.0.

### Fabric Upgrade using the Option, `auto-finish`

Pluribus Networks recommends using the `fabric-upgrade-start` command with the `auto-finish` parameter when you want to upgrade and reboot all switches in fabric at the same time.

After copying the upgrade package to switch, you can start the upgrade using `fabric-upgrade-start` with the `auto-finish` parameter. This upgrades all switches in fabric at the same time and then reboots all switches at the same time.

```

CLI (network-admin@Leaf1)>fabric-upgrade-start packages
import/nvOS-s21-leo-5.0.0-5000014540-leo.pkg auto-finish
Warning: This will start software upgrade on your entire fabric.
Please confirm y/n (Default: n):y
Scheduled background update.
Use:
* fabric-upgrade-status-show to check progress
Entire fabric will auto-reboot. DO NOT use switch-reboot
CLI (network-admin@nru02-01) > fabric-upgrade-status-show show-interval 5

```

log	switch	state	cluster
(0:06:01)Upgrading platform software	nru02-01*	Running	none
(0:06:06)Upgrading platform software	nru02-01*	Running	none

fabric-upgrade-status-show: Switch waiting to reboot

CLI (network-admin@nru02-01) > Connection to nru02-01 closed.

## Upgrading the Fabric Upgrade Using the Option, manual-reboot

Pluribus Networks recommends using the `fabric-upgrade-start` command with the option `manual-reboot` parameter when you want to upgrade all switches in fabric at same time, but manually reboot each node in fabric separately by issuing the `switch-reboot` command.

```

CLI (network-admin@nru02-01) fabric-upgrade-start packages
import/nvOS-s21-leo-5.0.0-5000014540-leo.pkg manual-reboot auto-finish

```

```

Warning: This will start software upgrade on your entire fabric.
Please confirm y/n (Default: n):y
Scheduled background update.
Use:

```

```

* fabric-upgrade-status-show to check progress
Entire fabric will auto-reboot. DO NOT use switch-reboot

```

```

CLI (network-admin@nru02-01) >
log          switch          state    cluster
-----
(0:05:48)Upgrading platform software nru02-01* Running none
log          switch          state    cluster
-----

```

```

(0:05:53)Upgrading platform software nru02-01* Running none
fabric-upgrade-status-show: Switch waiting to reboot

```

```

CLI (network-admin@nru02-01) >
CLI (network-admin@nru02-01) > switch-reboot
This will reboot the switch Operating System.
Please enter your username and password to confirm.
  Username (network-admin):
  Password:
Rebooting now! You will be automatically logged off

```

## Upgrading Software on Multiple Cluster Nodes

To minimize traffic loss or to avoid marshalling errors in some cases of CLI configuration incompatibility between 2.6.1 to 5.0, use the following steps to upgrade the software across multiple nodes of the fabric:

For a leaf-cluster pair:

1. For leaf-A, bring down the ports in the sequence a) host facing ports, b) spine facing ports, and c) cluster link.
2. Software upgrade leaf-A and bring up the ports in the sequence a) spine facing ports and then b) host facing ports.
3. For leaf-B bring down the ports in the sequence a) host facing ports and then b) spine facing ports.
4. Software upgrade leaf-B and bring up the ports in the sequence a) cluster link b) spine facing ports and c) host facing ports.
5. Software upgrade for multiple leaf-clusters can be started in parallel to reduce the overall S2L fabric upgrade maintenance window. For a spine-cluster pair, host facing ports do not apply.

## Reverting to older versions of Netvisor

After the upgrade, the switch is configured to boot automatically into Netvisor 5.0.0. If you want to revert the switch into OpenSolaris based Netvisor versions, you can either use `switch-boot-solaris` CLI command or by selecting appropriate boot environment in GRUB menu while switch is booting up.

### Using the `switch-boot-solaris` Command

Netvisor 5.0.0 adds capability to rollback the switch to Netvisor 2.6.1 from Netvisor 5.0.0 using executing a CLI command while the switch is running Netvisor 5.0.0.

You can use the `switch-boot-solaris` CLI command to rollback the switch to Netvisor 2.6.1. After booting switch in Netvisor 2.6.1 using `switch-boot-solaris` command, subsequent reboots of the switch automatically boot the switch in Netvisor 2.6.1.

```
CLI (network-admin@nru2-01)>switch-boot-solaris
```

```
Warning: This will reboot the switch to Solaris.
```

```
Please confirm y/n: (Default:n) y
```

```
Booting Solaris...
```

```
CLI (network-admin@nru2-01)>
```

### Using the RESTful API for the `switch-boot-solaris` Command

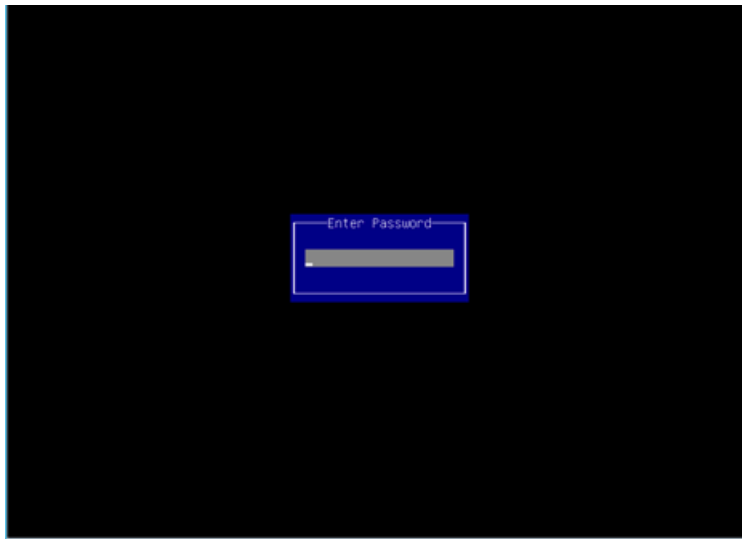
Netvisor 5.0.0- release adds the capability to rollback the switch to Netvisor 2.6.1 from Netvisor 5.0.0 using a RESTful API call.

```
manoj-sc-mac:~ manoj$ curl -s -u network-admin:test123 -X POST
http://nru02-01/vRest/switch-boot/solaris
{"result":{"status":"Success","result":[{"api.switch-name":"local","scope":"local","status":"Success","code":0,"message":"Booting Solaris..."}]}}manoj-sc-mac:~ manoj$
```

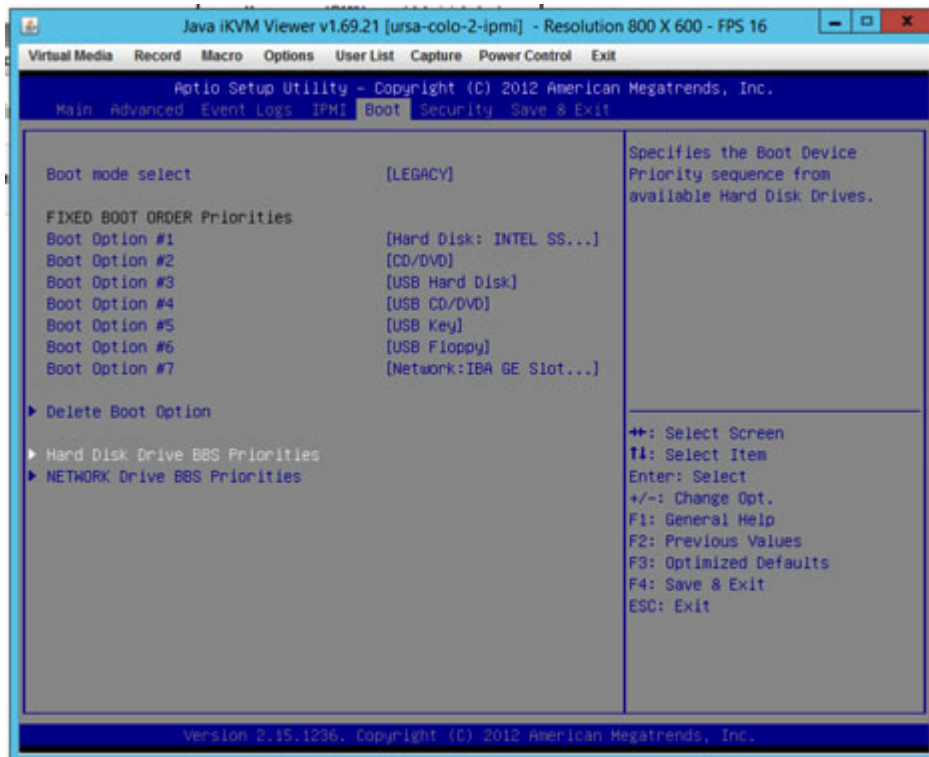
## Note

If the command, `switch-boot-solaris`, reboots the switch back to Linux instead of booting to Solaris, which may occur on some NRU01s without the correct boot device selection in BIO, verify if the active boot device is set properly in BIOS.

- Reboot the switch again and while the switch is booting, on the serial console or IPMI Java Console session, keep pressing DEL key on your keyboard to enter into BIOS.
- If the device prompts you for a BIOS password please, contact Pluribus Networks Support for assistance with the password.

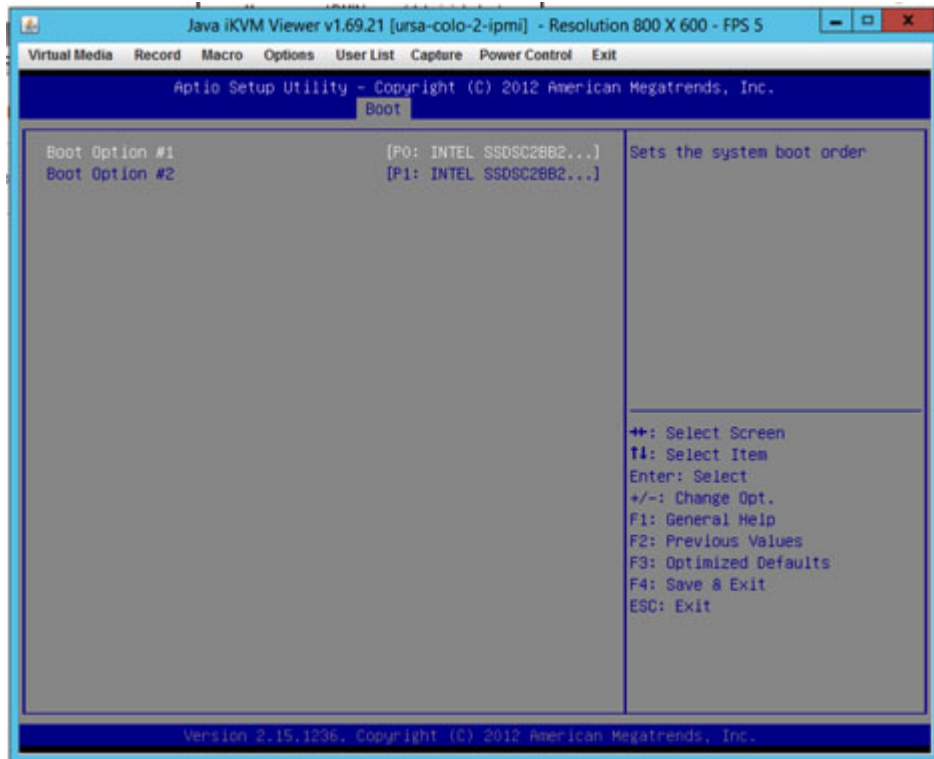


- After entering the password, select the BIOS settings -> **Boot** -> **'Hard Disk Drive BBS Priorities**.

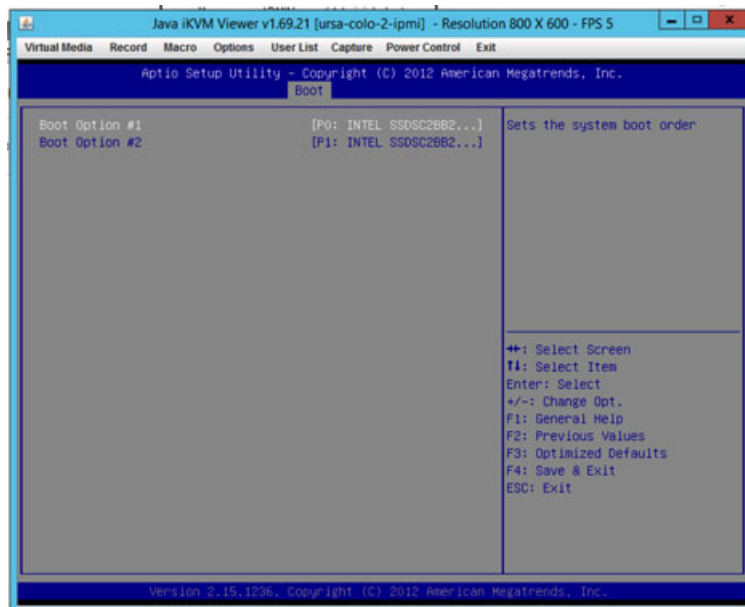


- The Boot option#1 should be set to P0 and Boot Option#2 should be set to P1.

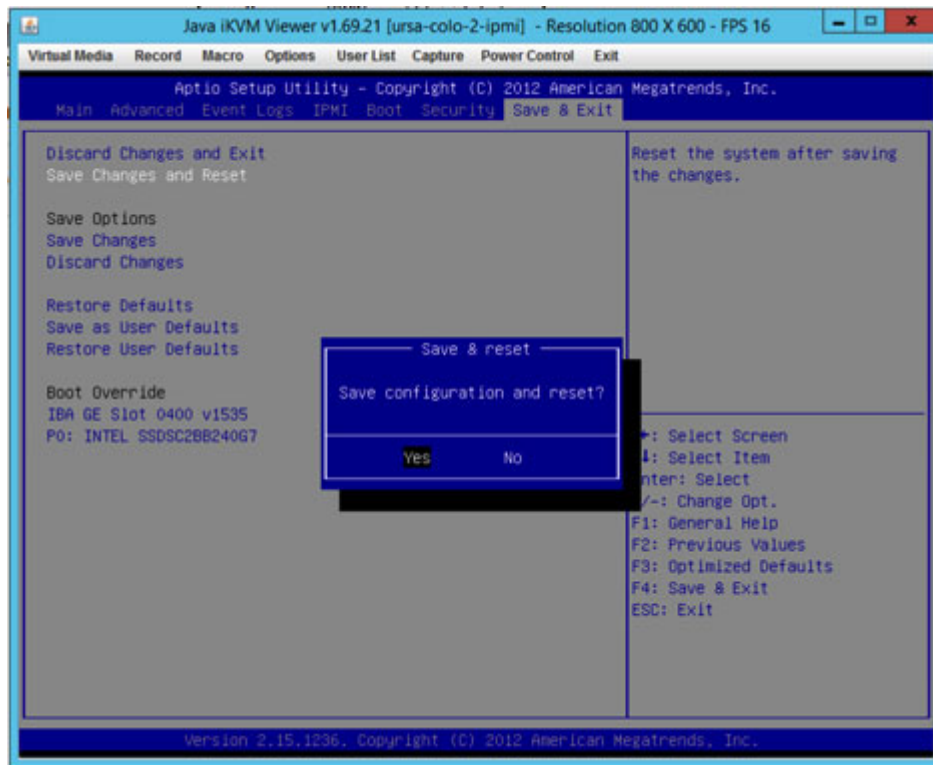




- If the boot options are different, set the Hard-disk boot option to P0.



- After changing the boot disk selection, press ESC and select the "Save&Exit" tab in BIOS and select "Save Changes and Reset". Select Yes from the prompt.



- The switch reboots into Solaris.

## Activating 5.0.0 as the Default Boot from Solaris

After rolling back switch to Netvisor 2.6.1 from 5.0.0, if you need to activate 5.0.0 as default boot choice, you can use following commands from shell in Netvisor 2.6.1:

```
root@nru02-01:/root# sh /opt/nvOS/bin/activate_onvl.sh
Activated. Please issue a reboot command to boot ONVL.
root@nru02-01:/root# cli
Netvisor OS Command Line Interface 2.6
Connected to Switch nru02-01; nvOS Identifier:0x9000472; Ver: 2.6.2060112325
sCLI (network-admin@nru02-01) > switch-reboot
This will reboot the switch Operating System.
Please enter your username and password to confirm.
Username (network-admin):
Password:
Rebooting now! You will be automatically logged off
CLI (network-admin@nru02-01) > svc.startd: The system is coming down. Please wait.
svc.startd: 97 system services are now being stopped.
```

## Rollback by selecting GRUB menu

After the upgrade, you can configure the switch to boot automatically into Netvisor 5.0.0. If you want to revert the switch into OpenSolaris-based Netvisor versions, you can reboot the switch and manually select the appropriate boot environment from the serial console when you see the boot menu. The switch now automatically boots into Netvisor 5.0.0.

```

GNU GRUB version 0.97 (619K lower / 2062776K upper memory)
*****
Netvisor - ONVL
* Pluribus Networks, Inc. Netvisor(R) Monitor nvOS(R) 2.6.1-12225 *
* Pluribus Networks, Inc. Netvisor(R) Console nvOS(R) 2.6.1-12225 *
* Pluribus Networks, Inc. Netvisor(R) Monitor nvOS(R) 2.6.1-12225 *
* Pluribus Networks, Inc. Netvisor(R) Console nvOS(R) 2.6.1-12225 *
* Pluribus Networks, Inc. Netvisor(R) Monitor nvOS(R) 2.3.2-8732 *
* Pluribus Networks, Inc. Netvisor(R) Console nvOS(R) 2.3.2-8732 *
* Pluribus Networks, Inc. Netvisor(R) Backup nvOS(R) 2.3.2-8732 *
*
*
*
*****
Use the * and * keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the
commands before booting, or 'c' for a command-line.

The highlighted entry will be booted automatically in 1 seconds.
  
```

## Managing Netvisor 2.6.1-HFx and Netvisor 5.0.0 Device Testing

If you use the same switches in a lab for testing both Netvisor 2.6.1-HFx and Netvisor 5.0.0 releases, the software upgrade agent version on the switch becomes incompatible with the software upgrade version.

For example, when you upgrade a switch from Version 2.6.1-HF12 to Version 5.0.0, the software upgrade agent in the current nvOS boot environment upgrades to upgrade agent from Version 5.0.0. After testing 5.0.0, you want to rollback to nvOS, software upgrade agent version number in nvOS becomes Version 5.0.0

If you want to upgrade current nvOS BE to 2.6.1-HF14 or later, you may encounter errors. During the software upgrade to 2.6.1-HF14 or later, Netvisor ONE Version 5.0.0 and the upgrade agent may not correctly upgrade the software to 2.6.1-HF14.

To avoid these unique scenarios in lab testing, Pluribus recommends using the following procedure to ensure the software upgrade agent version correlates with the Netvisor version in the current nvOS boot environment:

- Remove `/etc/production_disk` file from switch.
- Create a new BE from current Version 2.6.1-HF BE.
- Boot into new BE.
- Perform the 5.0.0 upgrade from this new BE.
- When you return to nvOS, use `switch-boot-solaris` command
- After switches boot in nvOS, use the `bootenv-activate-and-reboot` command to boot into the original BE with the matching software upgrade agent version.

## Recommended Upgrade Procedure

To upgrade switches in your testing lab, use the following recommended procedure.

6. Verify Netvisor and software upgrade agent version number correlate as the same version:

```
>root@nru02-01:/root# pkg info pn-upgrade-agent | grep Branch
Branch: 2060112327
```

```
>root@nru02-01:/root# pkg info pn-nvos | grep Branch
Branch: 2060112327
```

7. If the Netvisor and software upgrade agent version numbers display as the same version, remove the `/etc/production_disk` file. Then create a new boot environment, boot into new boot environment, and perform the upgrade to Netvisor Version 5.0.0:

```
root@nru02-01:/root# rm -rf /etc/production_disk
root@nru02-01:/root# cli
Netvisor OS Command Line Interface 2.6
Connected to Switch nru02-01; nvOS Identifier:0x900089d; Ver: 2.6.2060112327
CLI (network-admin@nru02-01) > bootenv-show
name          version      current  reboot  space  created
-----
netvisor-14  2.6.1-12059 no        no      12.1M  01-26,17:41:57
netvisor-15  2.6.1-12225 no        no      2.08G  01-26,18:12:01
netvisor-16  2.6.1-12225 no        no      12.8M  01-26,18:18:21
netvisor-17  2.6.1-12327 yes       yes     10.8G  12:37:36
```

```
CLI (network-admin@nru02-01) > exit
root@nru02-01:/root# beadm create netvisor-18
Created successfully
```

```
root@nru02-01:/root#grub-gen.ksh
root@nru02-01:/root#cli
boCLI (network-admin@nru02-01) > bootenv-activate-and-reboot name netvisor-18
Booting netvisor-18...
CLI (network-admin@nru02-01) >
```

```
CLI (network-admin@nru02-01) > bootenv-show
name          version      current  reboot  space  created
-----
netvisor-14  2.6.1-12059 no        no      12.1M  01-26,17:41:57
netvisor-15  2.6.1-12225 no        no      2.08G  01-26,18:12:01
netvisor-16  2.6.1-12225 no        no      12.8M  01-26,18:18:21
netvisor-17  2.6.1-12326 no        no      13.7M  12:37:36
netvisor-18  2.6.1-12327 yes       yes     10.8G  13:53:07
CLI (network-admin@nru02-01) >
```

You can now upgrade the switch to Netvisor Version 5.0.0.

When switch has Netvisor 5.0.0 loaded and you want to rollback to nvOS 2.6.1, use the `switch-boot-solaris` command to rollback to nvOS.

After switch boots into Solaris, the switch boots with the boot environment where you performed the previous upgrade to Netvisor Version 5.0.0.

In this boot environment, Netvisor identifies the software upgrade agent version as Netvisor 5.0.0.

```

user-sc-mac:~ user$ ssh pluribus@nru02-01
* Welcome to Pluribus Networks Inc. Netvisor(R). This is a monitored system.      *
*           ACCESS RESTRICTED TO AUTHORIZED USERS ONLY                          *
* By using the Netvisor(R) CLI,you agree to the terms of the Pluribus Networks  *
* End User License Agreement (EULA). The EULA can be accessed via                *
* http://www.pluribusnetworks.com/eula or by using the command "eula-show"      *
pluribus@nru02-01's password:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

pluribus@nru02-01:~$ su -
Password:
root@nru02-01:~# cli
Netvisor OS Command Line Interface 5.0
Connected to Switch nru02-01; nvOS Identifier:0x900089d; Ver: 5.0.0-5000014540
aCLI (network-admin@nru02-01) > fabric-node-show

name      fab-name mgmt-ip          in-band-ip      in-band-vlan-type  version          state
-----
nru02-01  nru02-01 10.14.8.64/23    178.192.212.7/24 public            5.0.0-5000014540 online

firmware-upgrade device-state
-----
not-required      ok

CLI (network-admin@nru02-01) > switch-boot-solaris
Warning : This will reboot the switch to Solaris.
Please confirm y/n (Default: n):y
Booting Solaris...
CLI (network-admin@nru02-01) > Connection to nru02-01 closed by remote host.
Connection to nru02-01 closed.
user-sc-mac:~ user$
  
```

To restore the software upgrade agent to the correct version, boot into the original nvOS 2.6.1-HFx BE, and delete the BE where Netvisor 5.0.0 upgrade started:

```

root@nru02-01:/root# cli
* Welcome to Pluribus Networks Inc. Netvisor(R). This is a monitored system.      *
*           ACCESS RESTRICTED TO AUTHORIZED USERS ONLY                          *
* By using the Netvisor(R) CLI,you agree to the terms of the Pluribus Networks  *
* End User License Agreement (EULA). The EULA can be accessed via                *
* http://www.pluribusnetworks.com/eula or by using the command "eula-show"      *
Netvisor OS Command Line Interface 2.6
Connected to Switch nru02-01; nvOS Identifier:0x900089d; Ver: 2.6.2060112327
boCLI (network-admin@nru02-01) > bootenv-show
name      version      current reboot space created
-----
netvisor-14 2.6.1-12059 no         no      12.1M 01-26,17:41:57
netvisor-15 2.6.1-12225 no         no      2.08G 01-26,18:12:01
netvisor-16 2.6.1-12225 no         no      12.8M 01-26,18:18:21
netvisor-17 2.6.1-12326 no         no      13.7M 12:37:36
netvisor-18 2.6.1-12327 yes        yes     12.7G 13:53:07
CLI (network-admin@nru02-01) > bootenv-activate-and-reboot name netvisor-17
Booting netvisor-17...
CLI (network-admin@nru02-01) >
  
```

By using this method, you maintain one BE with the same Netvisor and software upgrade agent versions on the switch.

After the switch boots up, delete the BE with the mismatched Netvisor and software upgrade agent versions using the following sequence of commands:

```
CLI (network-admin@Leaf1)>bootenv-delete name netvisor-18
```

```
Warning : This will permanently delete this BE.
```

```
Please confirm y/n (Default: n):y
```

```
CLI (network-admin@Leaf1)>
```

If you opt to upgrade to Netvisor Version 5.0.0 again, you can create a new boot environment and boot into it. Then upgrade to Netvisor Version 5.0.0.

Or if you opt to upgrade to Netvisor 2.6.1-HFx, you can upgrade to Netvisor 2.6.1-HFx from current boot environment.