TECHNICAL BULLETIN

Network Attached Storage System Recovery Procedure

This document describes how to recover your Network Attached Storage (NAS) system if it has failed due to a problem with the internal USB flash drive. It contains the following sections:

- Products Affected
- Problem Description
- NAS Recovery Using an External USB Drive
- Formatting the External USB Flash Drive
- Downloading the Recovery Bootloader and Firmware Update Files
- Rebooting the NAS Using the External USB Flash Drive
- Upgrading the NAS Firmware
- Backing Up the NAS Configuration

Products Affected

- NSS4000 4-Bay Gigabit Network Storage System Chassis
- NSS4100 4-Bay Gigabit Network Storage System Chassis with 1.0 TB RAID
- NSS6000 4-Bay Advanced Gigabit Network Storage System Chassis
- NSS6100 4-Bay Advanced Gigabit Network Storage System Chassis with 1.0 TB RAID

Problem Description

The Network Storage Server (NSS) can lock up unexpectedly during startup (for example, after a power outage, power cycle, or a reboot required after a firmware upgrade). The System LED (light) flashes red or displays steady red if the internal USB flash drive failed to boot in USB 2.0 mode.

NOTE: All data existing on the hard drives is secure.

NAS Recovery Using an External USB Flash Drive

You will need an external USB 2.0 flash drive to start your NAS. A USB 2.0 flash drive that is 256MB to 1 GB in size with formatted bootable and FAT16 is required. (Linksys recommends the Kingston Data Traveler 512 MB USB 2.0 flash drive.)

You will leave this external USB flash drive permanently inserted into the unit and it will be used every time you start the unit.

If you are not sure that the external USB flash drive is formatted for FAT16, perform the steps in the following section, "**Formatting the External USB Flash Drive.**" If your flash drive is already formatted, go to the "**Download the Recovery Bootable and Firmware Update Files**" section.

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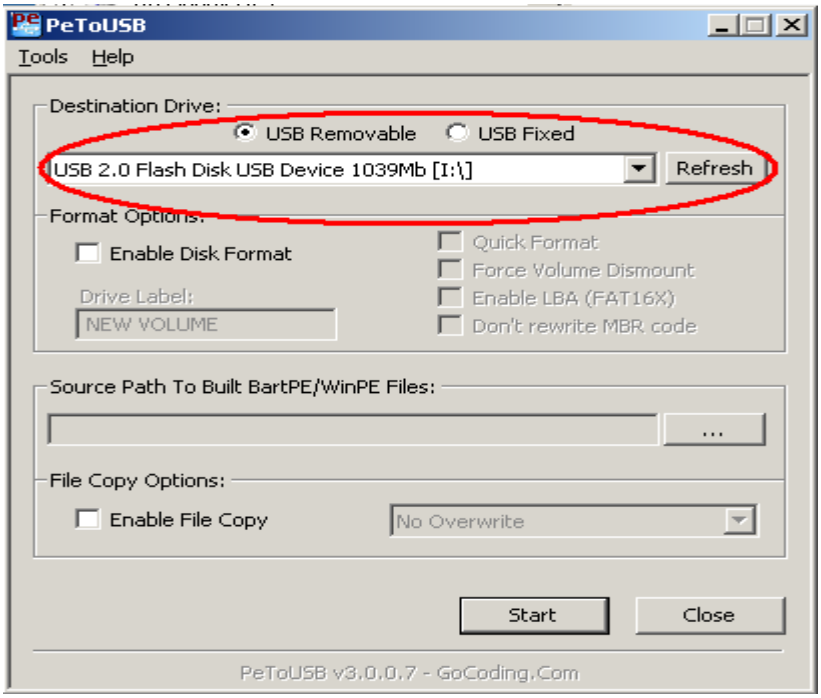
Formatting the External USB Flash Drive

1. Download the **PeToUSB** program (version 3.0.0.7) to format the USB flash drive. This application is a freeware program and can be downloaded from the following URL:

   http://gocoding.com/page.php?al=petousb

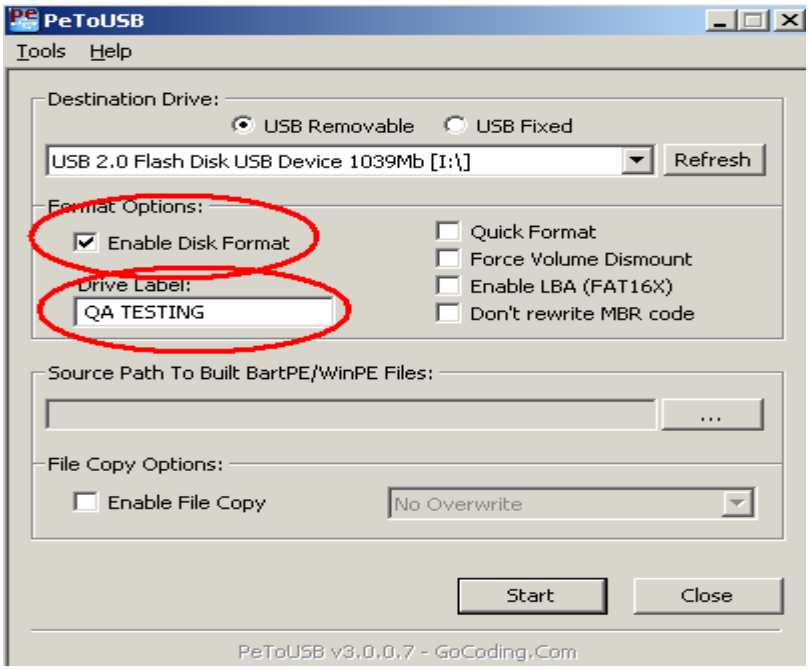
2. On your local PC, create the directory **c:\PeToUSB**.
3. Open the **PeToUSB V3.0.0.7** zip file and extract the files to the **c:\PeToUSB** directory you created. The following files should appear:
   - PeToUSB.exe
   - ReadMe.txt
   - petousb_changes.txt
4. Insert the USB flash drive into the USB port on the local PC.
5. Using Microsoft Windows Explorer, browse to c:\PeToUSB.
6. Double-click **PeToUSB.exe** to run the program. If the USB flash drive is inserted in the PC, the program automatically finds the device. Click **Refresh** if you do not see the drive at first.

   If you have more than one USB drive inserted in your PC, make sure that the correct one is selected.



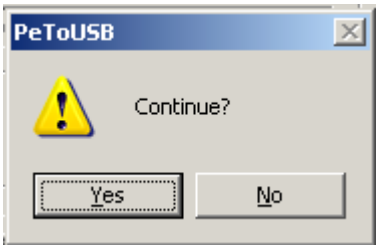
7. Make sure **USB Removable** is selected.

8. Check the **Enable Disk Format** box and enter a volume name in the **Drive Label** field.

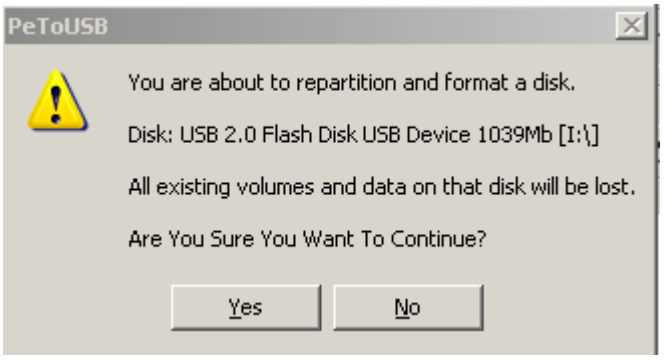


9. Click **Start** to format the drive.

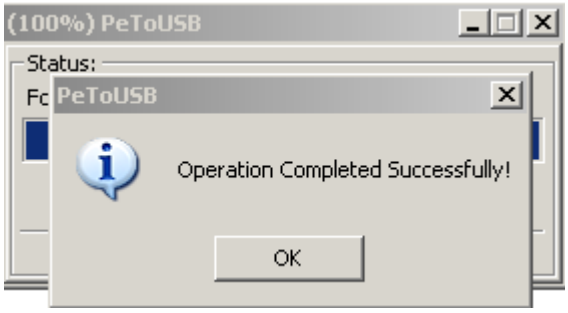
10. Click **Yes** to continue.



11. At the warning message, click **Yes** to continue.



12. Click **OK** to complete the USB formatting procedure.



Downloading the Recovery Bootloader and Firmware Update Files

1. Go to the following URL to review the latest updates for this issue:

   http://www.linksys.com/nssupdate

2. Log in to the Linksys Technical Support website to download the recovery bootloader and latest fix of firmware files. Go to the following URL:

   http://www.linksys.com/downloads

3. Do one of the following:
   - Enter the model number of your NAS (for example, **NSS4000**) and click **Go**.
   - In the **Select Product Category** section, under **Special Products**, click the arrow and scroll to choose **Network Storage**. Under the picture of the NAS, click the arrow and scroll to choose the model number of your device.
4. In the Device Version Number section, click the down arrow and select the version number of your device.
5. Download the files for your specific NAS model.

   For the NSS4000 system:

   a. Download the recovery bootable file **pmon-PM74101-B024-recovery.elf** and save it to the USB flash drive as **vmlinux** (do **not** use any file extension).

   b. Download firmware version V1.11-4 or later to your local PC drive. The firmware filename will be in the format *NSS4000_fwupgrade_xxx-x.tar.gz* or *pmxxxxx_x.xx-x_fwupgrade.tar.gz*. (For example, the files for firmware version V1.11-4 are named NSS4000_fwupgrade_0111-4.tar.gz.)

   For the NSS6000 system:

   a. Download the recovery bootable file **pmon-PM74100-B024-recovery.elf** and save it to the USB flash drive as **vmlinux** (do **not** use any file extension).

   b. Download firmware version V1.11-4 or later to your local PC drive. The firmware filename will be in the format *NSS6000_fwupgrade_xxx-x.tar.gz* or *pmxxxxx_x.xx-x_fwupgrade.tar.gz*. (For example, the files for firmware version V1.11-4 are named NSS6000_fwupgrade_0111-4.tar.gz.)

NOTE: You must save the recovery bootable file with the name **vmlinux** (without any file extension) because the NAS searches for that filename when booting from the USB drive.

Rebooting the NAS Using the External USB Flash Drive

1. Power off the system.
2. Remove any USB memory devices connected to the system. The uninterruptible power supply (UPS) can remain connected.
3. Insert the external USB flash drive that contains a **vmlinux** file into the AUX-2 port on the back of the failed system. We recommend you use the AUX-2 port for rebooting the NAS so that the USB port on the front panel can be used for saving your configuration.

NOTE: The recovery **vmlinux** files for NSS4000 and NSS6000 are different; make sure you have the correct file installed on the USB flash drive.

4. Power on the system. After 3-5 minutes, the power LED flashes green, indicating that the system has booted from the external recovery USB flash drive. **As soon as the power LED flashes green, remove the external USB flash drive.**

NOTE: If you do not remove the external USB flash drive *within 10 seconds after the power LED flashes green*, the system fails to boot. Return to Step 1.

5. Let the system boot fully (indicated by the power LED displaying steady green and the System LED turned off). This takes an additional 3 to 4 minutes.
6. Insert the recovery USB 2.0 flash drive into the AUX-2 port again.

IMPORTANT: **Leave the external USB flash drive permanently inserted in the unit.**

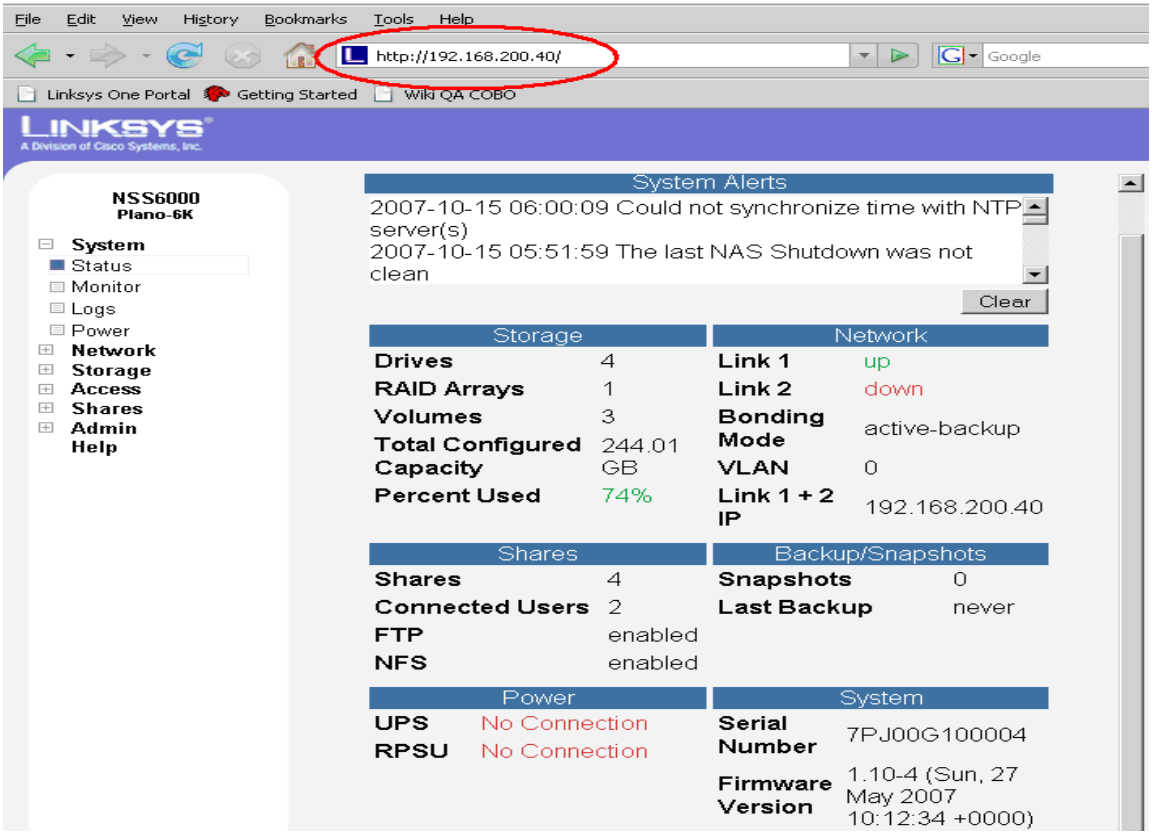
Upgrading the NAS Firmware

Before performing the firmware upgrade, make sure the recovery USB flash drive is inserted into either the USB port on the front panel or AUX-2 port on the back of the NAS.

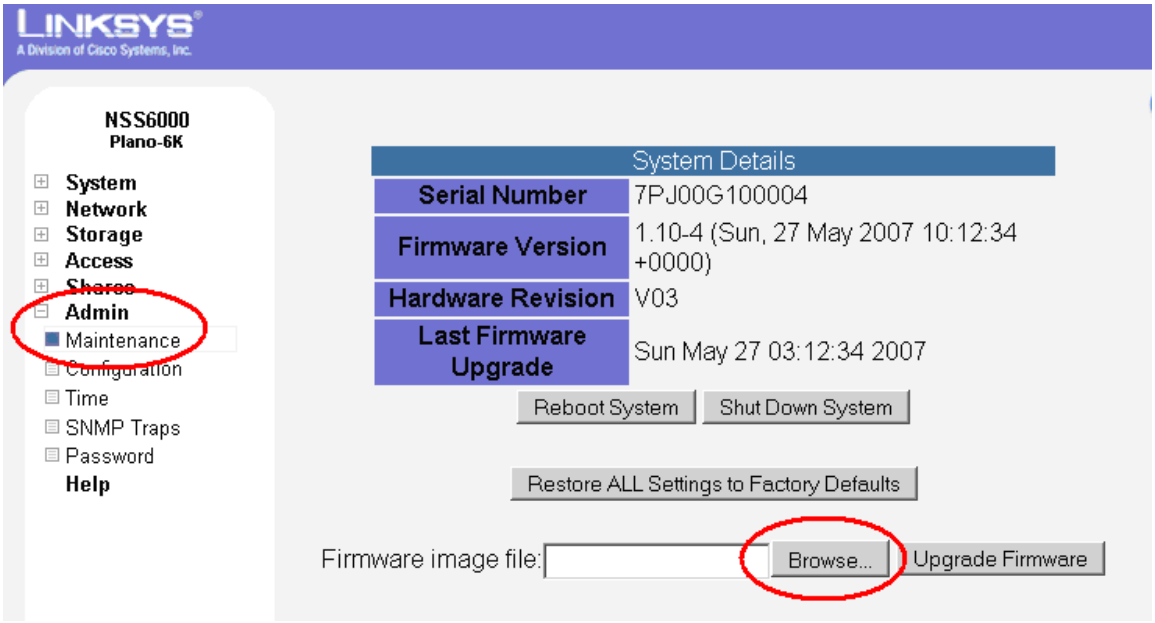
IMPORTANT: If the recovery USB flash drive is not inserted into either the USB or AUX-2 port, the system will fail to automatically boot after you perform Step 5.

The firmware upgrade takes about 13 minutes. To upgrade the firmware:

1. Using a web browser, access the system's administrative graphical user interface (GUI) by entering the IP address of the NAS in the browser's address field.

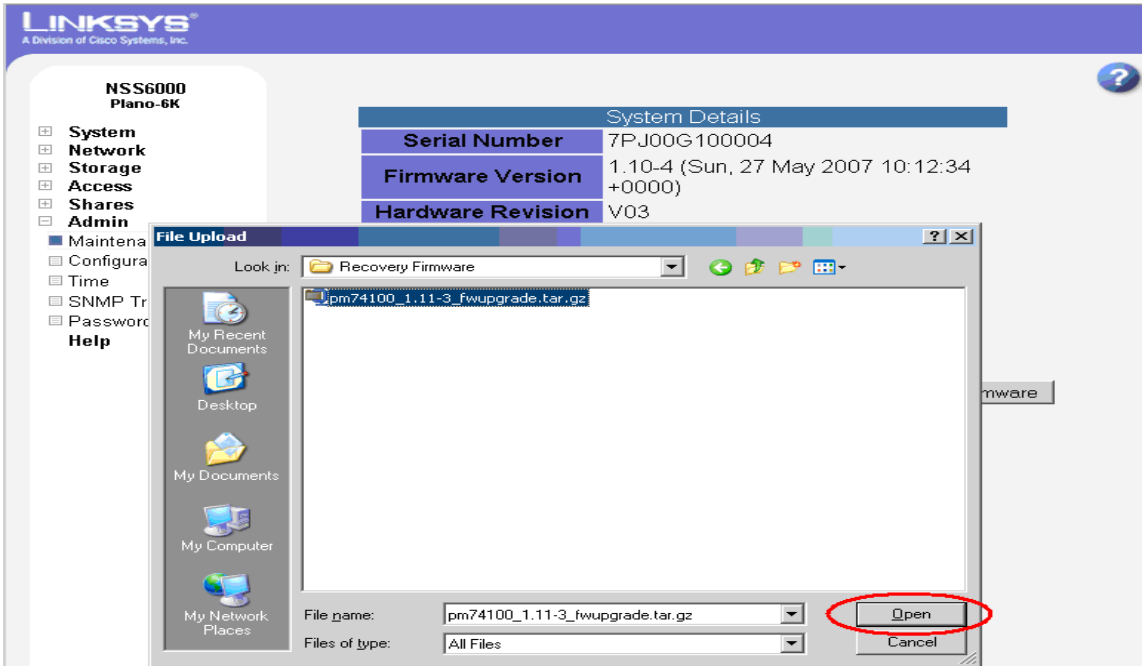


2. Click **Admin** > **Maintenance**.



3. Click the **Browse** button next to the **Firmware Image File** field to select the firmware file from the local directory: (Use firmware version 1.11-4 or higher.)

4. Click **Open**. The firmware file name appears in the **Firmware Image File** field.



5. Click **Upgrade Firmware** to start the upgrade. After one to two minutes, the upgrade log messages appear as follows:

```
Upon successful programming the NAS will be rebooted
Stopping services:
+_dagent
+_crond
+_winbind
+_samba
+_upnpd
+_ypbind
+_httpds
+_vsftpd
+_nfs
+_ups
+_dropbear
+_portmap
+_ntpd
+_aggregation
All requested services are stopped.
Current approximate RAM usage: [19868]kB
Start: Receiving data from /tmp/fwpipe...
Received all data from /tmp/fwpipe, checking its validity...
New firmware version is [071]
Old firmware version is [054]
Received valid data, starting programming process...
Dumping rw partition upgrade into [/linuxrwfs/update.d/confupdate]...
Extracting [confupdate.tar.gz]...
Removing /linuxrwfs/update.d/confupdate...
Creating [/linuxrwfs/update.d/confupdate] dump point...
Dumping [confupdate.tar.gz] content into [/linuxrwfs/update.d/confupdate]...
confupdate.tar.gz successfully programmed.
Erasing rootfs from [/dev/scsibd4]...
Extracting and programming rootfs...
Block size is [131072], programming [/dev/scsibd4]...
rootfs successfully programmed.
Extracting and programming kernel...
Block size is [131072], skipping [1999] blocks...
vmlinux successfully programmed.
Transfering current settings to upgraded partition...
Setting up bootline...
Setting bootstate to B0...
Firmware update succeeded. The system will reboot now.
```

Note to Customers Using the NAS with a Linksys One Services Router

After the firmware upgrades and the system reboots, Linksys recommends that you perform the NAS firmware upgrade procedure a second time by repeating Step 1 through Step 5 in the "**Upgrading the NAS Firmware**" section.

The services router (SVR) requires that the NAS use the latest firmware that is compatible with the SVR system firmware. If you are running an older release of the SVR system firmware, you may see the GUI from the NAS maintenance window display inactive or grayed-out buttons. These buttons will become active as the SVR and NAS complete the upgrade process to compatible firmware. If you have difficulty during the recovery process with the SVR or have other questions, contact Linksys Customer Support.

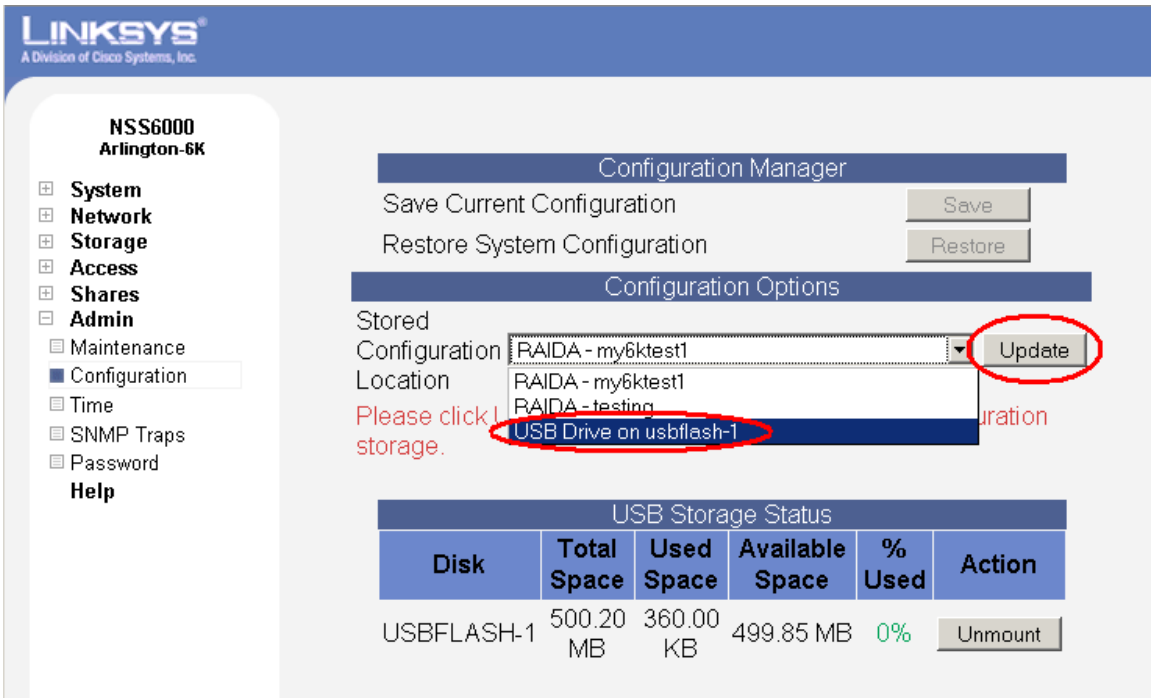
Backing up the NAS Configuration

You must back up the current configuration on the NAS so that you can restore it in the future.

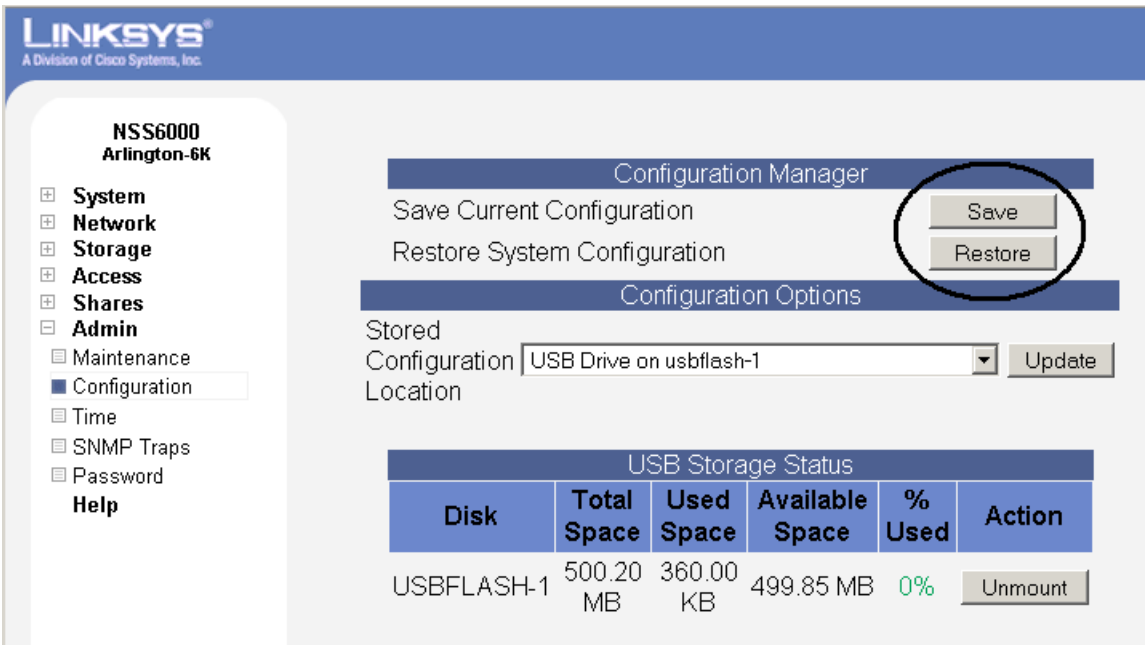
NOTE: The configuration data can be saved on the recovery USB flash drive; however, we recommend that you use a different USB flash drive and store it in a safe place.

Perform the following steps to back up the NAS configuration:

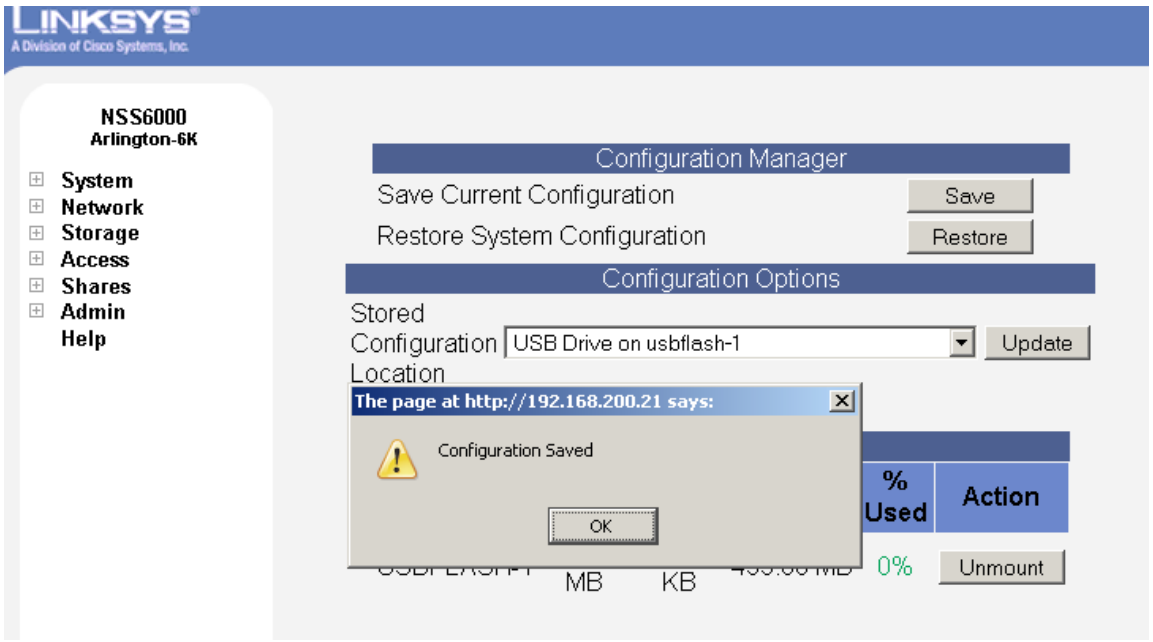
1. Using a web browser, access the system's administrative graphical user interface (GUI) by entering the IP address of the NAS in the browser's address field.
2. Click **Admin** > **Configuration**.
3. In the **Stored Configuration Location** field, click the down arrow and choose the USB drive as the new location. (See note above regarding using the recovery USB flash drive.)
4. Click **Update**.



5. After you update the location, the **Save** and **Restore** buttons are enabled. Click **Save** to save the current configuration to the external USB drive.



6. The configuration is saved onto the USB drive. Click **OK** to continue.



The backup process is complete.

To avoid similar problems, Linksys recommends that you connect the NAS to an uninterruptible power supply (UPS).