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Application Note – AN1302

Automatic Shutdown NAS in PowerPanel

Content

Introduction

If you want to properly shut down both the computer and the NAS that are being supplied power by a UPS, this manual will guide through the necessary steps. This will allow the NAS to shut down via the SSH service and the computer to shut down gracefully.

If you are only connecting a NAS to the UPS, you do not need this manual. Simply connect USB cable from the UPS to the NAS and refer to user's manual for the NAS about power management instructions.

Set-up

1. Enable the SSH service on the NAS to allow remote SSH login.

    QNAP NAS Example:

    Log in to the QTS web service and enable **Allow SSH connection** from *Control Panel > Network Services > Telnet/SSH.*

    Synology NAS Example:

    Log in of the DSM web service and check **Enable SSH Service** from *Control Panel > Terminal.*

    (Refers to your NAS user's manual for more details about SSH service.)

2. Make sure that the PowerPanel Software has been installed on your computer:

    PowerPanel Person Edition is used on Windows.

    PowerPanel for Mac is used on Mac OS X.

    PowerPanel for Linux is used on Linux.

3. Plug in your NAS and computer to the UPS outlets labeled **BATTERY/SURGE** or **CRITICAL LOAD**.

4. Connect the USB or serial cable between the UPS and the computer to allow PowerPanel to communicate with the UPS.

5. Ensure that there is an active network connection between your computer and NAS.

Configuration on Windows

Download SSH client tool

In order to remote control the NAS equipment via SSH service automatically, use **plink.exe** as the SSH client tool. Visit http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html, click the download for **plink.exe** from the list and save it to your desired directory.

Edit External Command of PowerPanel Personal Edition

1. Go to PowerPanel Personal Edition installation directory, such as *C:\Program Files(x86)\CyberPower PowerPanel Personal Edition* is the default directory.

2. Ensure that you are on an administrative permission.

3. Edit **default.cmd** as shown below to allow the NAS to shutdown. Note that on older versions of Windows systems such as *Win98 or ME*, the filename may be **default.bat**.

```
echo n | C:\plink.exe  – ssh –pw AdminPassword AdminAccount@IpAddress poweroff
```

AdminAccount and *AdminPassword* indicate the administrator account and password for NAS.

IpAddress is IP address or domain name of NAS.

When a power event occurs, the external command execution will be initiated prior to the computer shutdown. Refer to the **Suggestions** chapter for more details.

Configure Proper Delay Time to Turn Off UPS

When a shutdown procedure is initiated, UPS will delay the shutdown of its own outlets. This delay must be long enough to allow for the computer shutdown of both the NAS and the computer. The default setting is 120 seconds (2 minutes). This setting will need to be changed (as shown below) if your NAS and computer take longer than 2 minutes to shut down.

1. Open **Notepad** application from *Start > All Programs > Accessories*.
2. Copy and paste the following properties into **Notepad**.

```
<shutdown>
     <hibernate>
          <off>
               <delay>600</delay>
          </off>
     </hibernate>
     <shutdown>
          <off>
               <delay>600</delay>
          </off>
     </shutdown>
</shutdown>
```

3. Change the delay time (in seconds) to the needed time for your system to shutdown.
4. Click *File > Save As…* to popup *Save As* Window.
5. Change location to the PowerPanel installation directory from *Save in* Drop-down list.
6. Enter **shutdown.xml** at *File name* filed and change *Save as type* to **All Files (*.*)**.
7. Click **Save**.
8. Restart the **PowerPanel Personal Edition** service from your services panel or reboot the computer to apply the change.

Configuration on Mac OS X

Generate an SSH Key

In order to control the NAS from a remote SSH session, you must set up the SSH client with a SSH key which will allow the PowerPanel software to execute the shell script on the NAS and shut it down.

This SSH key is generated on a root account for PowerPanel daemon to execute a shell script. Generate a private and a public key by following the steps below:

1. Use root account in Mac OS X
   a. Choose System **Preferences…** item from the Apple menu.
   b. Choose **Users & Groups** from the **View** menu

   c. Click the **lock** icon and authenticate as an administrator account.

   d. Click Login Options.

   e. Click the **Join...** button at the lower-right corner.

   f. Click the **Open Directory Utility...** button.

   g. Click the **lock** icon in the Directory Utility window.

   h. Enter an administrator account and password, and then click **OK**.

   i. Choose **Enable Root User** from the **Edit** menu.

   j. Enter the new root password in both the Password and Verify fields, and then click **OK**.

  (Visit http://support.apple.com/kb/ht1528 for more details in other MAC OS X version.)

2. Launch the **Terminal** from the **Applications** > **Utilities.**

3. Setup SSH client to remote control NAS without assigning password.

   a. Switch to the root account.

```
su root
```

    This requires the root password to complete the authentication.

```
Password:
```

   b. Generate a new RSA key pair.

```
ssh-keygen –t rsa
```

    A prompt will ask you to provide a location to save the keys and a passphrase. The prompt message is shown below:

    (Press **Enter** if you want to change nothing.)

```
Generating public/private rsa key pair.
Enter file in which to save the key (/var/root/.ssh/id_rsa):
```

    And then the ssh-keygen command will also ask you to provide the passpharase. Press **ENTER** to accept the default (no passphrase).

```
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
```

    After you confirm the passphrase, a key pair will be generated.

```
Your identification has been saved in /var/root/.ssh/id_rsa.
Your public key has been saved in /var/root/.ssh/id_rsa.pub.
The key fingerprint is:
b1:99:1e:25:a5:f9:c9:86:15:5e:5a:4b:53:4f:a8:c9 root@mac-name.local
The key's randomart image is:
+--[ RSA 2048]----+
|                 |
|     .           |
|      E .        |
|   .   .o        |
|  o . .S .       |
| + + o . +       |
|. + o = o +      |
```

```
| o...o * o          |
|.  oo.o .           |
+----------------------+
```

c. Copy Mac's public key file (id_rsa.pub) to SSH server of NAS for new *mac_keys*.

```
scp ~/.ssh/id_rsa.pub AdminAccount@IpAddress:~/.ssh/mac_keys
```

AdminAccount is the administrator account of NAS. *IpAddress* is the IP address or domain name of NAS.

This command requires entering **yes** and the NAS administrator's *password* to continue connection. The message shows as below example:

```
The authenticity of host '192.168.20.10 (192.168.20.10)' can't be established.
RSA key fingerprint is b1:99:1e:25:a5:f9:c9:86:15:5e:5a:4b:53:4f:a8:c9.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.20.10' (RSA) to the list of known hosts.
root@192.168.20.10's password:
```

d. Login to NAS via SSH client command

```
ssh AdminAccount@IpAddress
```

AdminAccount is the administrator account of NAS. *IpAddress* is the IP address or domain name of NAS.

e. Append Mac's public key (mac_keys) to NAS's authorized_keys.

```
cat ~/.ssh/mac_keys >> ~/.ssh/authorized_keys
```

f. Change the access permission of the public key.

```
chmod 600 ~/.ssh/authorized_keys
```

g. Logout NAS.

```
Exit
```

4. Refer to the step 1 to disable root account in Mac OS X If you want to keep disabled.

Edit External Command of PowerPanel for Mac

Edit the script of PowerPanel application allowing to shutdown NAS from the below steps.

1. Open **PowerPanel** application from Applications.
2. Make sure that you have installed the Daemon from the **Configure** toolbar > **Daemon** tab.
3. Click the **lock** icon and authenticate as an administrator account.
4. Click the **Edit script** button from the **Configure** toolbar > **Shutdown** tab.
5. Append the below command to allow to shutdown NAS.

```
ssh AdminAccount@IpAddress poweroff
```

AdminAccount is the administrator account of NAS. *IpAddress* is the IP address or domain name of NAS.

6. Click **OK** to save script.

When a power event occurs, the external command execution will be initiated prior to the computer being shut down. Refer to the **Suggestions** chapter for more details.

Configure Shutdown Options of Energy Saver

Use the following steps to configure shutdown options for power events in the **Energy Saver** panel.

1. Choose System **Preferences....** from the Apple menu.
2. Choose **Energy Saver** from the **View** menu.
3. Click the **lock** icon and authenticate as an administrator account.
4. Click **UPS** tab view.
5. Click the **Shutdown Options...** button.
6. Select the target shutdown option and change the time or percentage. (E. G. Enable the *Shut down the computer after using the UPS battery for:* option and set the proper time.)
7. Click **Done** button to complete.

Configure Proper Delay Time to Turn Off UPS

When a shutdown procedure is initiated, the UPS will delay the shutdown of its own outlets. This delay must be long enough to allow for the computer shutdown of both the NAS and the computer. The default setting is 180 seconds (3 minutes). This setting will need to be changed if your NAS and computer take longer than 3 minutes to shut down.

1. Open **PowerPanel** application.
2. Make sure that you have installed Daemon from the **Configure** toolbar > **Daemon** tab.
3. Click the **lock** icon and authenticate as an administrator account.
4. Make sure that the *Turn off UPS when computer shuts down* option is checked.
5. Assign a proper delay time from the *Delay to turn off UPS when computer shuts down* Drop-down list.

Configuration on Linux

Generate an SSH Key

In order to control the NAS from a remote SSH session, you must set up the SSH client with an SSH key which will allow the PowerPanel software to execute the shell script on the NAS and shut it down.

This SSH key is generated on an root user account. Generate a private and a public key by following the steps below:

1. Switch to root account.

```
su root
```

A prompt ask you to provide the root password to complete the authentication.

```
Password:
```

2. Generate a new RSA key pair.

```
ssh-keygen –t rsa
```

This command will ask you to provide a location to save the keys and a passphrase. (Press **Enter** if you change nothing.)

The prompt message shows as below example:

```
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
```

And then ssh-keygen command also asks you to provide a passphrase. Press **ENTER** to accept the default (no passphrase).

```
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
```

After you confirm the passphrase, the key pair will be generated.

```
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
```

3. Copy public key to SSH server of NAS.

```
ssh-copy-id –i /root/.ssh/id_ras.pub AdminAccount@IpAddress
```

AdminAccount is the administrator account of NAS. **IpAddress** is the IP address of NAS. This command requires entering **yes** and the NAS administrator *password* to continue connection.

The message shows as below example:

```
The authenticity of host '192.168.20.10 (192.168.20.10)' can't be established.
RSA key fingerprint is b1:99:1e:25:a5:f9:c9:86:15:5e:5a:4b:53:4f:a8:c9.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.20.10' (RSA) to the list of known hosts.
root@192.168.20.10's password:
```

Edit External Command of PowerPanel for Linux

Use **vi** command to edit **/etc/pwrstatd-powerfail.sh** and **/etc/pwrstatd-lowbatt.sh**. Append below shell command to allow the shutdown of the NAS.

```
ssh AdminAccount@IpAddress poweroff
```

AdminAccount is the administrator account of NAS. **IpAddress** is the IP address or domain name of NAS.

When a power event occurs, the external command execution will be initiated prior to the computer being shut down. Refer to the **Suggestions** chapter for more details.

Configure Proper Delay Time to Turn Off UPS

When a shutdown procedure is initiated, the UPS will delay the shutdown of its own outlets. This delay must be long enough to allow for the computer shutdown of both the NAS and the computer. The default setting is 600 seconds (10 minutes). This setting will need to be changed if your NAS and computer take longer than 10 minutes to shut down.

1. Stop daemon of PowerPanel.

```
/etc/init.d/pwrstatd stop
```

2. Use **vi** to open **/etc/pwrstatd.conf.**
3. Search for **shutdown-sustain = 600** and modify it for the necessary time (in seconds) your NAS and computer to shut down.
4. Save the file and quit **vi**.
5. Start the PowerPanel daemon.

```
/etc/init.d/pwrstatd start
```

Suggestion

1. A NAS remote login requires *admin* or *root* account. Note: The *Synology* NAS equipment requires root password whose default password is same as administrator password.
2. Because your IP address which is dynamically obtained may change, you must use the domain name to replace with the IP address. The NAS shutdown may not work due to the IP address changed. Recommends using DDNS service to resolve the dynamic IP address issue. Refer to NAS user's manual for advanced details about DDNS service.
3. PowerPanel software had tested on *Synology* and *QNAP* NAS.