



Unofficial
Tips & How-to Guide
for the QNAP TS/SS
ARM & Intel Series NAS





Table of Contents

Table of Figures

Revision History

Version	Name	Forum ID	Contribution	Notes
1.0	Don Muller	Don	Author	Initial Release
	Ken Fribert	fribse	Reviewer/contributor	
		silas	Reviewer/contributor	
	Christian	Christian	Reviewer/contributor	
		Eraser-EMC2-	Contributor	
		algerian_goat	Contributor	
				Released 12/28/08
1.1	Don Muller	Don		Added NRB
				Minor adjustments, corrections, & updates
				Added NAP
				Added new models
		Thorejoha	Contributor	Speed test
		sjarkie	Contributor	crontab editing
				Not released
1.2	Don Muller	Don	Author	Major formatting changes.
				Added raid definitions and other minor additions.

Introduction

This guide was developed for users of the QNAP TS/SS ARM & Intel series of NAS units to gain a better understanding of how the units function, how they can modify their units to improve the built in functionality or to add additional functionality. The QNAP NAS units are based on an imbedded Linux and hopefully this guide can be used by people new to QNAP NAS devices and/or Linux and also by experienced users. It is not intended to be a guide on installing or troubleshooting the add-on programs but rather geared more toward the core functionality.

Conventions

The following are the conventions used in this document.

- References to the /share/volumes/ in this document will be referenced as /share/xxx_DATA. You will need to replace xxx with the proper value depending on where your data is stored. The same also applies to reference of xxx_ROOT.
- Items in red mean you need to supply your own path or file name information.
- Items in blue are hyperlinks.
- Items in a grey box are Linux commands.
- Items in a blue box are configuration file entries.
- Items in a green box are just tables.

Prerequisites

Some Linux knowledge is required, although it's quite basic knowledge needed.

Problems & Additions

Please report any problems to me, user id Don, via a Private Message (PM) through the forums.

If there are additional items you would to see in future versions of this document please let me know. I will evaluate it to determine if it should be included. It would be most helpful if you could, when submitting a suggestion, include the write-up. Please submit write-ups via a private message so the forum thread does not get filled with postings.

Disclaimer

Every effort is made to ensure that the information contained in this document is accurate and that all processes, instructions, and scripts have been tested. I make no guarantee that everything will work as described or that following the instructions in this guide will not cause the loss of data or the ability to access your system. I highly recommend that you, if possible, test any modifications on a test system first. You should also have a backup of your data and settings before you make changes to a production system. You have been warned.

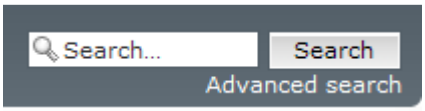
Forums

QNAP provides an excellent community forum for their products where you can learn more about the systems and get questions answered and problems solved by fellow forum members and the QNAP staff. It is a great source of knowledge on their products, OS, and additional software.

The forums have great member participation. You can learn a lot from the postings of the other members. Many times other members have had the same issues or questions as you and will provide assistance.

One of the great but underutilized features of the forum is the ability to perform keyword searches. It allows you to search for answers to a problem or question. **Chances are good that you will find your answers via the search facility and will not have to post a message. I highly recommend that you use the search feature to look for answers before you post your question or problem.**

The search link can be found in the upper right hand corner of the forum pages.



The forums are located at forum.qnap.com and you have to register before you will be allowed to post a message.

WIKI

QNAP maintains a WIKI where you can find detailed information and how-to's on QNAP devices and software as well as 3rd party applications. The WIKI is located here http://wiki.qnap.com/wiki/Main_Page. Please check the WIKI for information on what you are trying to install. You should also consider contributing to the WIKI so others can benefit from your experience

Built-in Features/Software

This section will provide information on the built-in Linux operating system. It will also describe some of the built in features and describe how to modify some of these features so you can enhance the usefulness of your NAS device.

Built in Shares

The QNAP NAS software provides some predefined folders. Each of these folders is also a network share. The share names and their usage are described below.

- Network Recycle Bin – when a file is deleted from your NAS it is not actually deleted but moved to the Network Recycle. This way you can recover a deleted file or prior version of a file if you need to. At present there is no size limitation on the recycle bin so you should periodically remove files from it via the network share or the admin web interface. Failure to monitor the recycle bin could cause the disk to become full. There is a separate recycle bin for each volume on the NAS. The Network Recycle Bin has to be enabled in the web admin interface.
- Public – This folder is intended to be used as a public share where you can share files amongst all of your users.
- Qdownload – is used as the default download location for the Download Station.
- Qmultimedia – is used as the default location for the Multimedia Station.
- Qrecordings - is the default location where recordings made by the Surveillance Station are stored.
- Qusb – is used as the location for the USB auto copy function.
- Qweb – is used as the location for your custom web pages for the web server.

Customizing Startup

There are certain files and settings that get reset back to factory defaults at every reboot. In order to set those back to what you want you need to modify the autorun.sh script. This file is executed every time the device is booted. It is located on a volume that is not normally mounted. This means that anytime you wanted to edit the file you would have to mount the volume, edit the file, and then unmount the volume. A better way is to make the autorun.sh file a link to your actual autorun file. This way you only have to edit the autorun.sh file on the unmounted volume once. To change the autorun file you would just have to edit your autorun file. Here are the steps to change the default autorun.sh file to a link.

On the ARM series NAS use the following:

```
mount /dev/mtdblock5 -t ext2 /tmp/config
cd /tmp/config
rm autorun.sh (see note 1)
ln -sf /path to your file/autorun.sh autorun.sh
cd /
umount /dev/mtdblock5
```

On the Intel series NAS use the following:

```
mount /dev/sdx6 /tmp/config
cd /tmp/config
rm autorun.sh (see note 1)
ln –sf /path to your file/autorun.sh autorun.sh
cd /
umount /dev/sdx6
```

If for some reason, like maybe during a firmware update, the link was replaced with the default file you would just have to restore the link. Your autorun file would still be intact.

Notes

1. Check to see if the existing autorun.sh file has any entries in it before you delete it. If it does copy them to you new autorun.sh file before deleting the one in /tmp/config.
2. Make sure you unmount the device before the NAS is rebooted.
3. Make sure the autorun.sh files are marked as executable (chmod +x autorun.sh).
4. Any files or executables that you reference in the autorun.sh file, or any files or executables that are referenced by your scripts or other scripts, must use the full path name. During the execution of autorun.sh the system will not perform a search to find other executables or files; you must specify the full paths in everything that you reference.

How to Add Scheduled Tasks

The NAS servers include the cron scheduler. cron is a time-based scheduling service in Linux & UNIX computer operating systems. cron is driven by a crontab, a configuration file that specifies shell commands to run periodically on a given schedule. The crontab file can be edited via the vi editor, using WinSCP to edit on your computer, or via a web interface developed by one of the forum members.

The crontab file consists of six fields. The format of the fields is defined below.

Fields

```
+          minute (0 - 59)
|          +          hour (0 - 23)
|          |          +          day of month (1 - 31)
|          |          |          +          month (1 - 12)
|          |          |          |          +          day of week (0 - 7) (Sunday=0 or 7)
|          |          |          |          |
*          *          *          *          *                    command to be executed
```

Each of the patterns from the first five fields may be either * (an asterisk), which matches all legal values, or a list of elements separated by commas. The sixth field and subsequent fields (i.e., the rest of the line) specify the command to be run.

For "day of the week" (field 5), both 0 and 7 are considered Sunday.

A job is executed when the time/date specification fields all match the current time and date. There is one exception: if both "day of month" and "day of week" are restricted (not "*"), then either the "day of month" field (3) or the "day of week" field (5) must match the current day (even though the other of the two fields need not match the current day).

To view what is scheduled type:

```
crontab – l
```

To restart the scheduler type:

```
/etc/init.d/crond restart
```

Editing crontab via the Web Interface

One of the forum members, sjarkie, has developed a web interface for editing the crontab file. In order to use this interface you must download the web files and have the web server and telnet service running on your NAS server. For complete requirements and installation instructions please visit this forum thread - [HOWTO] Crontab web interface. This is by far an easier method of editing the crontab file instead of manually editing it.

Editing crontab Manually

In order to edit the crontab file manually you have to use an editor on the NAS server such as vi or edit the file on your PC using WinSCP to open the file.

The crontab file is located at:

```
/etc/config/crontab which is linked to /mnt/HDA_ROOT/.config/crontab
```

Edit the file and save it.

How to Enable DFS Support

The NAS devices can support MS DFS (Distributed File System). In order to enable DFS support you have to manually edit the smb.conf file. The smb.conf file is located at:

```
/etc/config/smb.conf
```

To activate DFS add a line in the global section [global]:

```
host msdfs = yes
```

and activate a share like this:

```
[dfs]
comment = DFS
path = /share/xxx_DATA/DFS
msdfs root = yes
```

To create a dfs link use:

```
ln -s msdfs:\\myserver\\datashare /share/xxx_DATA/DFS/mydata
```

How HDDs are Referenced

All hard drive user volumes in the NAS file system are actually mount points under the /share/ directory. A separate directory is used for each volume. There are different names used depending if you are using raid volumes or single drive volumes.

The directory names used for raid volumes are:

MD0_DATA	for the first raid volume
MD1_DATA	for the second raid volume
MD2_DATA	for the third raid volume
MD3_DATA	for the fourth raid volume

Figure 1 - Raid Volume Names

The directory names used for the single volume drives are:

HDA_DATA	for the single volume drive in slot 1
HDB_DATA	for the single volume drive in slot 2
HDC_DATA	for the single volume drive in slot 3
HDD_DATA	for the single volume drive in slot 4
HDE_DATA	for the single volume drive in slot 5
HDF_DATA	for the single volume drive in slot 6
HDG_DATA	for the single volume drive in slot 7

HDH_DATA	for the single volume drive in slot 8

Figure 2 - Single Volume Names

The directory names for external volumes are:

eSATADisk1	for the first eSATA disk plugged in
eSATADisk1	for the second eSATA disk plugged in
USBDisk1	for the first USB disk plugged in
USBDisk2	for the second USB disk plugged in
USBDisk3	for the third USB disk plugged in
USBDisk4	for the forth USB disk plugged in
USBDisk5	for the fifth USB disk plugged in

Figure 3 - External Volume Names

The following chart illustrates what names are possible on each NAS device. Pro and non-Pro devices are the same.

	1 drive	2 drives	4 drives	5 drives	6 drives	8 drives
MD0_DATA		X	X	X	X	X
MD1_DATA			X	X	X	X
MD2_DATA					X	X
MD3_DATA						X
HDA_DATA	X	X	X	X	X	X
HDB_DATA		X	X	X	X	X
HDC_DATA			X	X	X	X
HDD_DATA			X	X	X	X
HDE_DATA				X	X	X
HDF_DATA					X	X
HDG_DATA						X
HDH_DATA						X

Figure 4 – Possible Volume Names

How to Modify the Profile

When you login to the NAS from a telnet or SSH session there is a profile that is loaded that contains the paths, environment variables, aliases, etc that are used to set up your session environment. When Bash starts, it executes the commands in a variety of different scripts. When Bash is invoked as an interactive login shell, it first reads and executes commands from the file /etc/profile, if that file exists. After reading that file, it looks for /root/.bash_profile, /root/.bash_login, and /root/.profile, in that order, and reads and executes commands in those files. I recommend that you add your commands to the /root/.profile file. To modify your environment all you need to do add your statements to the end of the profile file. Unfortunately any changes you make to the profile are lost when the system is rebooted. In order to set up your login environment each time you should put your profile modifications in your autorun file.

Two ways you could modify the profile file is using an echo command or a cat command.

Sample echo command:

```
echo "export PAGER=/opt/bin/less " >> /root/.profile
```

Sample cat command:

```
cat /…/yourprofileconfig >> /root/.profile
```

When you chroot to a different folder a different profile gets loaded. The profile file that gets used when you execute the chroot command is located in /root/.bashrc within the chrooted folder. You would make the same changes to this file using the same methods to modify your session environment when you chroot to a different folder.

Memory Usage

There are many concerns about memory usage on the forum threads. The concerns are that the free memory is very low. This is normal on Linux systems and is nothing to worry about. The OS is caching information in memory and will free up memory as it is needed. It is better to have information or programs cached in memory then it is to read it from disk. Linux is very good at memory management and a low amount of free memory is normal on the NAS systems.

On newer versions of the firmware the amount of cache memory is not included in the used memory size. Therefore the free memory size reflects the amount of free memory plus the amount of cache memory.

Modifying SSH

SSH is used to establish a secure connection between your NAS and another device, like your PC. The default SSH configuration will allow SSH connections from any device without an SSH key. To make SSH more secure and to limit who can establish a connection you should do two things. First add a public SSH key to the authorized_keys file. You will need a utility like PuTTYgen to generate your keys. You should generate dsa keys as they are more secure than rsa keys. Second, modify the sshd_conf file to limit access to SSH2 connections and to users that have the correct public SSH key. After you make these changes sshd will have to be restarted. You should make these changes and restart the sshd daemon from your autorun.sh file since all changes are lost at reboot.

The sshd configuration file is located at /etc/ssh/sshd_config. For a complete definition of all configuration options please refer to the sshd_config manual located at www.openbsd.org. The following changes to the sshd configuration file are needed to tell sshd to only accept public/private key authentication.

```
Protocol 2
RSAAuthentication no
PubkeyAuthentication yes
PasswordAuthentication no
PermitEmptyPasswords no
```

Once sshd is set up to accept only key authentication you also need to set up your SSH client to use key authentication. Please refer to your SSH client's help file for instructions on how to do this.

The following are sample commands that you can add to your autorun.sh script file.

```
#       Setup the files needed for SSHD
rm /root/.ssh/authorized_keys
cp /share/xxx_DATA/your_path/authorized_keys /root/.ssh/authorized_keys
chmod 644 /root/.ssh/authorized_keys
ln -sf /share/xxx_DATA/your_path /sshd_config /etc/ssh/sshd_config
/etc/init.d/login.sh restart
```

Warning: When making changes to SSH it is a good idea to enable the telnet service since this will leave you a way to logon to the system if you mess up SSH and can't get in that way. Once you have SSH working you can disable telnet if you desire.

Resetting the NAS

There are times that you might need to reset your NAS if for some reason you have lost access to it. There are two methods for resetting your NAS each with different results.

Resetting via the reset button

When you press the reset button on NAS, a beep sound will be heard. The following settings are reset to default:

- System admin password: admin
- Network Settings/ TCP/IP Configuration: Obtain IP address settings automatically via DHCP
- Network Settings/ TCP/IP Configuration: Disable Jumbo Frame
- Network Setting/ System Port Management: 8080 (system service port)
- System Tools/ IP Filter: Allow all connections

Resetting via the WEB admin

The Reset function on "System Tools> Backup/ Restore/ Reset Settings" is designed to reset all settings of NAS to default. **When you press [Reset] on this page, all drive data, user accounts, network shares, and system settings are cleared and restored to default.** Please make sure you have backed up all the important data and system settings before resetting the NAS via this method.

Runone

There is the ability to have a script run one time at boot. To have a script run once at boot time you must put it in the /etc/config/runone/ directory and it must have an extension of '.sh'. Once the script is run it will be deleted from the directory. You can put multiple scripts in the directory to run. If the /etc/config/runone directory does not exist you must create it.

Warning – I have discovered that if you exit the script via an 'exit' statement then the script will not be deleted and script processing will stop and no other scripts in the directory will be run. I have reported this to QNAP and am awaiting a response.

Setting up Aliases

The alias command allows you to define shortcuts and synonyms for commonly used shell commands. The basic usage is:

```
alias newcommand='yourcommand -arguments'
```

Starting alias without any options lists the current aliases:

```
alias
```

You can also make aliases for existing commands. To remove aliases you would use the unalias command.

```
unalias aliasname
```

Alias commands get added to your profile. Unfortunately any changes you make to the profile are lost when the system is rebooted so you should put any profile changes in your autorun script. Some examples of alias commands are:

```
alias dir='/bin/ls -laFh | less'
alias dmesg='dmesg | less'
alias lsop='lsof -i'
```

Updating Firmware via telnet or SSH

There may be times when the normal methods of firmware update via web admin interface or Qfinder fails. In these cases you can still perform a firmware upgrade via a terminal session. To accomplish this follow these steps:

1. Download to a shared folder in the NAS (e.g. Public).
2. Move the file to the update folder.

   ```
   mv /share/Public/Firmware_Image_File.img /mnt/xxx_ROOT/update
   ```

   Note – Firmware_Image_File.img is the name of the image file and not the word Firmware_Image_File.img.

3. Link to the update folder.
   ```
   ln –sf /mnt/xxx_ROOT/update /mnt/update
   ```
4. Issue the update command.
   ```
   /etc/init.d/update.sh /mnt/xxx_ROOT/update/Firmware_Image_File.img
   ```
5. Once the update has successfully completed you then need to reboot the system.

You have just completed a manual update of the firmware.

Optional Software

The following is a description of some of the optional utilities/applications that can be installed on your QNAP NAS. It is by no means complete and just lists some of the more popular programs.

There are two easy methods of installing most of these utilities by using either IPKG or QPKG. IPKG is a non-QNAP specific method, which sometimes requires some tinkering, where QPKG is a QNAP specific and very automatic way of installing utilities.

Note: the information about the software and what software packages are available are correct as of the release of this document. For complete up-to-date information please visit the QNAP forum.

AjaxXplorer

Description: AjaXplorer is a file explorer for remotely managing files on a web server or operation as a simple file-sharing system. Its rich layout and actions make it easily accessible to virtually any end-user. The AJAX based interface, providing streamlined and intuitive functionalities, similar to that of a standard file-system explorer on any operating system.

Installed via: QPKG

Available: All

Asterisk

Description: Asterisk® is the world's leading open source telephony engine and tool kit. Offering flexibility unheard of in the world of proprietary communications, Asterisk empowers developers and integrators to create advanced communication solutions...for free.

Asterisk® is released as open source under the GNU General Public License (GPL), and it is available for download free of charge. Asterisk® is the most popular open source software available, with the Asterisk Community being the top influencer in VoIP.

Asterisk® is a QPKG but not yet available via download from the QPKG interface. It must be downloaded from the forum from here.

Installed via: QPKG

Available: All

crontab

Description: crontab is a PHP script that allows you to add, edit, & delete cron jobs. It is a web based program that makes maintaining your cron jobs very easy. For install instructions and to download please see this post. It was developed by forum member sjarkie.

Installed via: Manually

Available: All

ddclient

Description: ddclient is a Perl client used to update dynamic DNS entries for accounts on Dynamic DNS Network Services' free DNS service. ddclient is a small but full featured client requiring only Perl and no additional modules. Supported features include: operating as a daemon, manual and automatic updates, static and dynamic updates, optimized updates for multiple addresses, MX, wildcards, abuse avoidance, retrying failed updates, and sending update status to syslog and through e-mail.

Installed via: IPKG

Available: All

findutils

Description: findutils replaces the find utility with one that is more powerful and adds additional file utilities to the system. It replaces 'find' and adds the 'locate', 'updatedb', and 'xargs' utilities.

- `find' searches for files in a directory hierarchy and prints information about the files it found.
- 'locate' searches special file name databases for file names that match patterns. The system administrator runs the `updatedb' program to create the databases.
- `updatedb' creates and updates the database of file names used by `locate'. `updatedb' generates a list of files similar to the output of `find' and then uses utilities for optimizing the database for performance. `updatedb' is often run periodically as a `cron' job and configured with environment variables or command options.
- `xargs', pronounced EX-args, means "combine arguments." `xargs' builds and executes command lines by gathering together arguments it reads on the standard input. Most often, these arguments are lists of file names generated by `find'.

Installed via: IPKG

Available: All

Icecast

Description: Icecast is a streaming media server which currently supports Ogg Vorbis and MP3 audio streams. It can be used to create an Internet radio station or a privately running jukebox and many things in between.

Icecast is a QPKG but not yet available via download from the QPKG interface. It must be downloaded from the forum from here.

Installed via: QPKG

Available: All

Joomla!

Description: Joomla! is a free, open source content management system for publishing content on the World Wide Web and intranets. The system includes features such as page caching to improve performance, RSS feeds, printable versions of pages, news flashes, blogs, polls, website searching, and language internationalization.

Installed via: QPKG

Available: All

JRE 6

Description: JRE 6 installs the java runtime environment that will allow you to run certain java based application on your x86 based NAS.

JRE 6 is a QPKG but not yet available via download from the QPKG interface. It must be downloaded from the forum from here.

Installed via: QPKG

Available: Intel NAS models only

Less

Description: less is a terminal pager program on UNIX, Windows and UNIX-like systems used to view (but not change) the contents of a text file one screen at a time. It is similar to more, but has the extended capability of allowing both forward and backward navigation through the file. Unlike most UNIX text editors/viewers, less does not need to read the entire file before starting, resulting in faster load times with large files.

Installed via: IPKG

Available: All

LSOF

Description: lsof is a command meaning "list open files", which is used in many UNIX-like systems to report a list of all open files and the processes that opened them. In UNIX/Linux everything is a file: pipes are files, IP sockets are files, UNIX sockets are files, directories are files, devices are files, inodes are files...

Installed via: IPKG

Available: All

Midnight Commander (mc)

Description: Midnight Commander is a console application with a text user interface. The main interface consists of two panels which display the file system. It is used in a similar way to many other programs run in the Unix shell. Arrow keys control file selection, the insert key is used to select files and the Function Keys perform operations such as renaming, editing and copying files. Later versions of the Midnight Commander additionally have mouse support for easier operation.

Installed via: IPKG

Available: All

MLDonkey

Description: MLDonkey is a door to the 'donkey' world, a multi-network, multi-platform open source P2P application used to exchange big files on the Internet and present most features of the basic Windows donkey client and additionally supports overnet, fasttrack, bittorrent and gnutella protocols (and more)! The core works best with sancho – the premier graphical user interface for MLDonkey and you can download it here.

Installed via: QPKG

Available: All

NZBGet

Description: NZBGet is a binary newsgrabber, which downloads files from usenet based on information given in nzb-files. NZBGet supports automatic par-check and repair. Because it's entirely written in C++ it has an extremely low CPU footprint and memory usage (except for par-check/-repair). NZB file auto-download monitoring is also part of the native features.

rTorrent++ is a QPKG but not yet available via download from the QPKG interface. It must be downloaded from the forum from here. It is still considered beta.

Installed via: QPKG

Available: All

Optware/IPKG

Description: IPKG, or the Itsy Package Management System, is a lightweight package management system designed for embedded devices. It is used in the Unslung operating system for the Linksys NSLU2, in OpenWRT, OpenMoko, Gumstix, iPAQ and now on QNAP NAS too.

Installed via: QPKG

Available: All

Perl

Description: Perl, sometimes referred to as Practical Extraction and Reporting Language, is an interpreted programming language with a huge number of uses, libraries, and resources. Perl is a programming language which can be used for a large variety of tasks. A typical simple use of Perl would be for extracting information from a text file and printing out a report or for converting a text file into another form. But Perl provides a large number of tools for quite complicated problems, including systems programming. Programs written in Perl are called Perl scripts, whereas the term the perl program refers to the system program named perl for executing Perl scripts. Perl is an object-based, interpreted language. As a result, it is easier to write, easier to maintain, and easier to extend then other languages such as C or C++.

Installed via: IPKG

Available: All

phpMyAdmin

Description: phpMyAdmin is an open source tool written in PHP intended to handle the administration of MySQL over the Internet. Currently it can create and drop databases, create/drop/alter tables, delete/edit/add fields, execute any SQL statement, and manage keys on fields.

Installed via: QPKG

Available: All

PhpXmail

Description: PhpXmail is a web based management software for the XMail mail server written in php. Its main usage is as a GUI (Graphic User Interface) to the XMail administration extensions. It allows the administrator of the mail server to perform configuration management and monitoring tasks for the mail server. It allows the postmaster for each domain the XMail server is configured to perform management functions. It allows the users who have a mail account to manage their account settings.

Installed via: Manually

Available: All

Plugmedia

Description: Plugmedia is an enhancement of the built in multimedia station. It does not replace the multimedia station but is a new QPKG that can be installed. It has many more features. It was developed by forum member comicway.

Q-Ext is a QPKG but not yet available via download from the QPKG interface. It must be downloaded from the forum from here. Instructions for installing Plugmedia can be found here.

Installed via: QPKG

Available: All

Python

Description: Python is a dynamic object-oriented programming language that can be used for many kinds of software development. It offers strong support for integration with other languages and tools, comes with extensive standard libraries, and can be learned in a few days. Many Python programmers report substantial productivity gains and feel the language encourages the development of higher quality, more maintainable code.

Installed via: QPKG

Available: All

Q-Ext

Description: Q-Ext stands for Quick-Extension and is targeted to support scripts for administration functions. It eases the integration of scripts that need to be launched either at boot or via crontab. Q-Ext is aimed to support, thanks to scripts, server reconfiguration after firmware upgrade, configuration reloading at boot and any

functions that are not yet part of the QNAP server administration interface. It was developed by forum member adnovea.

Q-Ext is a QPKG but not yet available via download from the QPKG interface. It must be downloaded from the forum from here. Go to this forum post for an installation how-to.

Installed via: QPKG

Available: All

Q-Sims

Description: Quick-Sims is intended to provide a Mevaterses (meta-universes or virtual worlds like in Second life or MMORPG) Starter Kit for QNAP SOHO servers.

Q-Sims LITE Edition will help you to setup your own Sims (made of one or more regions) and to connect it to a larger metavers (virtual world) using a Free Public grid such as OSGrid which already gathers more than 2,500 regions with 4,000 active users and about 25,000 accounts!

You may wonder what to do with a metavers! - see the wikies for a detailed description.

They are already widely used in MMORPG and Social Networking but there are numerous applications not to mention the new ones that you will invent unleashing your creativity.

Q-Ext is a QPKG but not yet available via download from the QPKG interface. It must be downloaded from the forum from here.

Installed via: QPKG

Available: Intel NAS models only

rTorrent++

Description: LibTorrent is a BitTorrent library written in C++ for *nix, with a focus on high performance and good code. The library differentiates itself from other implementations by transferring directly from file pages to the network stack. On high-bandwidth connections it is able to seed at 3 times the speed of the official client.

rTorrent++ is a QPKG but not yet available via download from the QPKG interface. It must be downloaded from the forum from here. It is still considered beta.

Installed via: QPKG

Available: All

SlimServer (SSOTS with Squeeze Center 7!)

Description: Squeeze Center is the server software from Slim Devices that manages common digital audio formats (.mp3, .flac, .ogg, etc.) and streams them to its players. Slim Server On Turbo Station (SSOTS) developed by flipflip is an add-on to the Turbo Station's firmware which provides the environment to run SqueezeCenter on it.

Installed via: QPKG

Available: All

SABnzbd+

Description: SABnzbd+ is a multi-platform binary newsgroup downloader written in Python language. The program works in the background and simplifies the downloading, verifying and extracting of files from Usenet. SABnzbd+ does not search for files, instead NZB files (similar to .torrent files, but for Usenet) are fed to SABnzbd+ from sites like newzbin.com, binsearch.info and tvnzb.com (Requires prior installation of Python)

Installed via: QPKG

Available: All

Tomcat

Description: Apache Tomcat, or simply Tomcat, is a servlet container developed by the Apache Software Foundation (ASF). Tomcat implements the Java Servlet and the JavaServer Pages (JSP) specifications from Sun Microsystems, and provides a "pure Java" HTTP web server environment for Java code to run.

Tomcat should not be confused with the Apache web server, which is a C implementation of an HTTP web server; these two web servers are not bundled together.

There are many web apps in larger scale that have adopted the Java technology and now you are able to run it on your QNAP NAS too.

Note: JRE 6 is required to be installed prior to installation of Tomcat!

Installed via: QPKG

Available: Intel NAS models only

UnrealIRCd

Description: UnrealIRCd is an Open Source IRC[1] Server. UnrealIRCd is one of the most popular and full-featured ircds and is used on the largest number of IRC servers.

Installed via: QPKG

Available: ARM NAS models only

Unzip

Description: 'unzip' will list, test, or extract files from a ZIP archive, commonly found on Windows systems.

Installed via: IPKG

Available: All

Wakelan

Description: WakeLan is a free open source utility that sends a properly formatted UDP packet across the LAN which will cause a wake-on-lan enabled computer to power on.

Installed via: IPKG

Available: All

WordPress

Description: WordPress is a free, open-source personal publishing system that allows you to easily create a complex blog, or web log, on your site. Written in PHP and supported by a MySQL database, WordPress offers intuitive administrative tools and sophisticated design features that make it easy to develop and integrate a personal or professional blog on your site.

Installed via: QPKG

Available: All

XDove

Description: XDove named after XMail & Dovecot the 2 open source offerings that are combined to provide a complete set of Email server functionalities which is one-click installable on your QNAP NAS. XDove not only provides SMTP, POP3, and IMAP services, it also comes with a variety of features like multiple virtual domains and accounts, AJAX

[1] Internet Relay Chat

webmail with extended functionalities including personal folders, address book, calendar and real-time chat among users under the same mail domain. Besides the mail services XDove offers scheduled backup and restore of your mailboxes from multiple domains which gives you an extra protection on the top of your RAID data redundancy.

Installed via: QPKG

Available: All

XMail

Description: XMail is an Internet and intranet mail server featuring an ESMTP server, POP3 server, finger server, TLS support for SMTP and POP3 (both server and client side), multiple domains, no need for users to have a real system account, SMTP relay checking, DNS based maps check, custom (IP based and address based) spam protection, SMTP authentication (PLAIN LOGIN CRAM-MD5 POP3-before-SMTP and custom), a POP3 account synchronizer with external POP3 accounts, account aliases, domain aliases, custom mail processing, direct mail files delivery, custom mail filters, mailing lists, remote administration, custom mail exchangers, logging, and multi-platform code.

Installed via: IPKG

Available: All

XMail Queue Manager (XQM)

Description: XMail Queue Manager gives you full control over the multi level nested mail queue of XMail Server. You can track messages in their different states (sending, resending and frozen). Statistics tell you about the number of spooled messages. You can start and stop XMail Server directly from this application.

Installed via: Manually

Available: All

Installing a Compiler

ARM Based NAS Cross Compiler

The cross compiler will allow you to compile applications for your NAS that you have downloaded from the web or written yourself. I would not recommend using on a production machine.

Here are the instructions for installing the cross compiler

1. Logon to console of your NAS by PuTTY (SSH)
2. If you **DON'T** have raid do this:

```
cd /share/HDA_DATA
```

3. If you **DO** have raid, do this:

```
cd /share/MD0_DATA
```

4. Download qnap_arm_native_compiler-0.16-8.

```
wget http://qnas.pl/tools/arm/qnap_arm_native_compiler-0.16-8.tar.gz
```

5. Unpack archive.

```
tar zxvf qnap_arm_native_compiler-0.16-8.tar.gz
rm qnap_arm_native_compiler-0.16-8.tar.gz
```

Congratulations, you have just installed the cross compiler.

Now you need to know few things before you start using it. Before chroot'ing to the environment where the compiler tools are you will need to start it (mount directories). There is a start script and simple how-to.

Here are the instructions for starting the compiler environment.

1. Logon to console of your QNAP via PuTTY (SSH)
2. If you **DON'T** have raid do this:

```
/share/HDA_DATA/native/native.sh start
chroot /share/HDA_DATA/native
```

3. If you **DO** have raid, do this:

```
/share/MD0_DATA/native/native.sh start
chroot /share/MD0_DATA/native
```

Note: If you want to remove native tools, remember to umount directories because you if do not you will lost all of your data.

Here are the instructions for removing the cross compiler:

1. Logon to console of your NAS by PuTTY (SSH)
2. If you **DON'T** have raid do this:

```
/share/HDA_DATA/native/native.sh stop
rm /share/HDA_DATA/native
```

3. If you **DO** have raid, do this:

```
/share/MD0_DATA/native/native.sh stop
rm /share/MD0_DATA/native
```

Once you get your application working it would be nice to share it with the rest of the QNAP community. You could even contact QNAP about how to make a QPKG out of it.

This information is also posted on the forum here.

Intel Based NAS Compiler

The compiler will allow you to compile applications for your NAS that you have downloaded from the web or written yourself. I would not recommend using on a production machine.

Here are the instructions for installing the compiler

1. Logon to console of your NAS via PuTTY (SSH)
2. If you **DON'T** have raid do this:

```
cd /share/HDA_DATA
```

3. If you **DO** have raid, do this:

```
cd /share/MD0_DATA
```

4. Download qnap_debian-4.0_r3-etch-i386

```
wget http://qnas.pl/tools/i386/qnap_debian-4.0_r3-etch-i386.tar.gz
```

5. Unpack archive

```
tar zxvf qnap_debian-4.0_r3-etch-i386.tar.gz
rm qnap_debian-4.0_r3-etch-i386.tar.gz
```

Congratulations, you have just installed the compiler.

Now you need to know few things before you start using it. Before chroot'ing to the environment where the compiler tools are you will need to start it (mount directories). There is a start script and simple how-to.

Here are the instructions for starting the compiler environment.

1. Logon to console of your NAS via PuTTY (SSH)
2. If you **DON'T** have raid do this:

```
# /share/HDA_DATA/debian/debian.sh start
# chroot /share/HDA_DATA/debian
```

3. If you **DO** have raid do this:

```
/share/MD0_DATA/debian/debian.sh start
chroot /share/MD0_DATA/debian
```

Note: If you want to remove native tools, remember to umount directories because you if do not you will lost all of your data.

Here are the instructions for removing the cross compiler:

1. Logon to console of your NAS via PuTTY (SSH)
2. If you **DON'T** have raid do this:

```
/share/HDA_DATA/debian/debian.sh stop
rm /share/HDA_DATA/debian
```

3. If you **DO** have raid, do this:

```
/share/MD0_DATA/native/debian.sh stop
rm /share/MD0_DATA/debian
```

Once you get your application working it would be nice to share it with the rest of the QNAP community. You could even contact QNAP about how to make a QPKG out of it.

This information is also posted on the forum here.

Additionally apt-get (a package management system) has been implemented on the Intel based NAS devices.

For example:

```
apt-get install rtorrent
apt-get install php
```

Recommended Utilities

The following are some utilities that will make your life easier and that you might find useful.

EditPad

EditPad is a useful and powerful utility for editing your Linux/UNIX files on a Windows system. EditPad is much more suitable for editing files on a Linux system than notepad, as Notepad will add characters to the end of every line, and sometimes Linux can't understand the config files after this. Some of its features include converting/saving files in the proper format (Windows, UNIX/Linux, and MAC) and syntax highlighting. There are two different versions of EditPad, a Lite version and a Pro version. The Lite version is free.

EditPad Lite is a general-purpose text editor, designed to be small and compact, yet offer all the functionality you expect from a basic text editor. EditPad Lite works with Windows NT4, 98, 2000, ME, XP and Vista. EditPad Lite can be found here.

EditPad Pro is a powerful and versatile text editor or word processor, designed to make text editing as convenient as possible. Write and edit all your plain text files such as source code, scripts, web sites, logs, letters, memos, reports, articles, etc. EditPad Pro can be found here.

Pageant

Pageant is an SSH authentication agent that is included with PuTTY. It holds your private keys in memory, already decoded, so that you can use them often without needing to type a passphrase each time. You supply the passphrase for each key once when the program starts.

PuTTY

PuTTY is a free implementation of Telnet and SSH for Win32 and UNIX platforms, along with an xterm terminal emulator. PuTTY is open source software that is available with source code and is developed and supported by a group of volunteers. PuTTY is available here. PuTTY also includes PuTTYgen and Pageant. PuTTYgen is a program for creating keys. Pageant is an SSH authentication agent.

PuTTYgen

PuTTYgen is a key generator. It generates pairs of public and private keys to be used with PuTTY, PSCP, and Plink, as well as the PuTTY authentication agent, Pageant. PuTTYgen can generate RSA or DSA keys.

QlogR

QlogR is a NAS monitoring utility. It was written by fellow QNAP user silas. Some of the features of QlogR are:

- CPU usage and Memory
- System and HDD temperatures

- System Up Time
- Monitor HDD and RAID Information
- Full Smart Information
- Watch Events and Connections Logs
- Sound events
- Balloon hints notifications
- Work in background
- Copy interested items to clipboard by Ctrl+C

For a full description of QlogR and also for download instructions please visit this forum message. Please note that not all features are supported by all models.

sancho

sancho is a GUI that connects to a p2p core application. Power users that use p2p applications usually choose one that has core/GUI separation. sancho provides an easy to use, powerful, and configurable GUI, currently supporting the GUI protocol of the popular MLDonkey core. sancho can be found here.

WinSCP

WinSCP is an open source free SFTP client and FTP client for Windows. Legacy SCP protocol is also supported. Its main function is safe copying of files between a local and a remote computer. WinSCP can be found here.

Tips

The following information provides some troubleshooting and setup tips.

autorun.sh Does Not Work

Sometimes a script or command that works from a terminal session will not work when included in the autorun.sh file. This is because when the autorun.sh is executed during system startup there are a limited number of directories specified in the PATH statement so applications or scripts that would be found from a terminal session might not be found during the execution of your autorun.sh script. You therefore must specify the full path name to reference any files (commands, scripts, files, etc) you are adding. For example:

```
/share/path-to-your-script/your-script.sh
```

Additionally any scripts or commands that you reference in your script must also use the full path name.

To help diagnose problems with your autorun.sh file you might also try to redirect the output of your commands to a log file so you can see what messages are being generated. To capture the stdout and stderr add the following onto your command:

```
yourcommand  arguments 1>>yourlogfile 2>>yourlogfile
```

You can now review the messages in yourlogfile to see why your command is not running from autorun.sh.

Sometimes there are certain tasks that you cannot get started from autorun.sh. For these tasks I use daemon_mgr to start the task. Please see the daemon_mgr section on how to use it.

Creating Multiple Websites on Your NAS

There are several apache servers already running on your NAS. These have different special purposes like NAS admin. To have your NAS serve multiple domains, there is no need to add additional apache servers; you can serve them all from one Apache server. All the magic lies inside apache, by using VirtualHosts.

First you need to create a folder structure on the NAS that the apache server can utilize. We already have Qweb, so let's just extend the use of it by moving all our websites to subfolders.

Original structure:

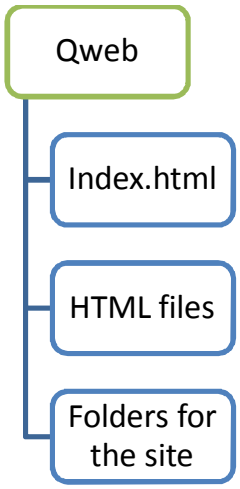


Figure 5 - Single WEB Site Directory Structure

Changes to:

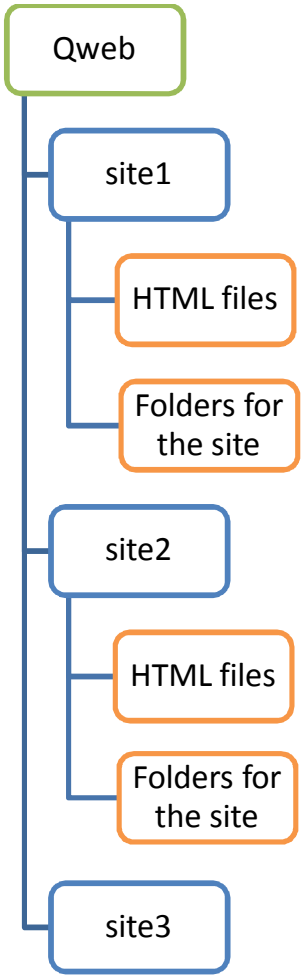


Figure 6 - Multiple WEB Sites Directory Structure

To minimize the damage to the apache.conf file if it is reset by a firmware update you should create your own config file. As we no longer want to use the root of Qweb to hold web server pages, we can place the additional configuration there.

```
Qweb/customapache.conf
```

Then in the config file of the apache server (/etc/config/apache/apache.conf) add the following at the bottom of the apache.conf file. If this file gets overwritten all you need to do is add this line back to include your configuration file again.

```
include /share/Qweb/customapache.conf
```

An example of a config file could look like this:

```
ServerAdmin webmaster@site1.com
ServerName www.site1.com
DocumentRoot "/share/Qweb/site1”
<Directory />
                Order Deny,Allow
                Deny from all
</Directory>
<Directory "/share/Qweb/site1">
                Options FollowSymLinks MultiViews
                AllowOverride None
                Order allow,deny
                Allow from all
</Directory>
ServerSignature Off
ServerTokens Prod
NameVirtualHost *:80
<VirtualHost *:80>
        ServerName www.site1.com
        ServerAlias site1.com www.site1.org site1.org
        DocumentRoot "/share/Qweb/site1"
        <Directory "/share/Qweb/site1">
                Options FollowSymLinks MultiViews
                AllowOverride All
                Order allow,deny
                Allow from all
        </Directory>
        ErrorLog /share/Qweb/logs/site1_error
        CustomLog /share/Qweb/logs/site1_access combined
</VirtualHost>
```

First of all we define where to send mail for users that experience errors, we also set a deny for root which is lacking in the standard config.

Furthermore we limit the info we want to give away and then we tell apache that we want to create virtualhosts based on their name on port 80, which is the standard web port.

Finally we define a virtual server based on its name. There is the servername, which is what apache is to react on and then there are aliases created for other sites, or TopLevelDomains, that you want to direct to the same site. There is also a seperate logfile for each website. If you don't want to look at the logfiles, the errorlog and customlog lines can be omitted. Then the apache will use its standard log file for every transaction.

To create another site, we simply add a new <VirtualHost> ... </VirtualHost> set, that points to another directory. This way you can have some domains point to the same site, and others to separate sites.

If you wish to harden the apache a bit more, you should find the Rewrite module, which can be found on the qnap forums, and then add the following lines to the customization config. The apache daemon replies to some very unusual request methods, and there is no need for that, so we just want to redirect them to nothing.

```
LoadModule rewrite_module libexec/mod_rewrite.so
    RewriteEngine On
    RewriteCond %{REQUEST_METHOD} ^TRACE [OR]
    RewriteCond %{REQUEST_METHOD} ^PROPFIND [OR]
    RewriteCond %{REQUEST_METHOD} ^PROPPATCH [OR]
    RewriteCond %{REQUEST_METHOD} ^MKCOL [OR]
    RewriteCond %{REQUEST_METHOD} ^COPY [OR]
    RewriteCond %{REQUEST_METHOD} ^MOVE [OR]
    RewriteCond %{REQUEST_METHOD} ^LOCK [OR]
    RewriteCond %{REQUEST_METHOD} ^UNLOCK [OR]
    RewriteCond %{REQUEST_METHOD} ^LINK [OR]
    RewriteCond %{REQUEST_METHOD} ^UNLINK
    RewriteRule .* - [F]
```

Firmware Update Fails

Here are some things to check if you are attempting to update the firmware and it fails.

1. You might be using the wrong file. Make sure you are updating with an .img file and not a .zip or some other file type.
2. The downloaded image file might be corrupt. Try re-downloading the file and attempt the update again.

3. Your hard drive might be at or near capacity. The update process requires a certain amount of free space on the disk. If there is insufficient space then the update will fail. Free up some space and try again.
4. Sometimes an update will fail if you are using TwonkyMedia Server because it can fill up the root partition of the disk. To solve this problem please refer to this posting - TwonkyMedia Log, DB, and Cache Relocation - on the QNAP WIKI forum.

General Troubleshooting Tips

When something doesn't work right we always think something major is wrong, but may times it is something simple. Here are some general troubleshooting techniques that you can try. Some of these tips are also in other sections of this guide.

1. Use the forum search feature or check the WIKI. It's possible that others have had the same problem/issue/question and a solution might already be posted.
2. Make sure your subnet mask is correct and that all devices on the subnet are using the same mask. Under most installations it will be 255.255.255.0.
3. Make sure your DNS address is correct. You should usually set it to the same DNS address that you use on a computer that is connected to the same subnet.
4. Make sure your gateway address is correct. You should usually set it to the same gateway address that you use on a computer that is connected to the same subnet.
5. If you are using a static IP address make sure you do not have an IP address conflict.
6. In order to achieve gigabit connections you should be using cat 5e or cat 6 cabling.
7. For gigabit connections check the status page to ensure you are connecting at 1000mbs.
8. You can test your internet and intranet connectivity by opening a terminal session on the NAS and pinging an internet and intranet address by name. This will verify that your IP address, subnet mask, gateway address, and DNS address are correct.
9. Reboot the NAS. Sometimes all that is needed to solve a problem is a reboot.
10. Check the System Log for messages.
11. If you are experiencing slow network performance or network drop outs try changing your connection speed from a fixed value to auto or from auto to a fixed value on the NAS and switch if you can. I have seen switches work better with one setting over the other. Also try replacing the Ethernet cable. Try a different port on your switch.
12. Try connecting the NAS directly to your PC. There could be compatibility problems between your switch and the NAS.
13. If you are experiencing slow response it could be because one task is hogging the CPU. To see what the CPU usage by task open a terminal session on the NAS and type 'top'.
14. If you have enabled jumbo frames disable it on the devices you are trying to connect from/to and on the NAS.
15. To be able to resolve your intranet (local) names you might have to add them to your hosts file. The host file is located at /etc/hosts. This is true for your PC and your NAS.

16. If you are trying to access a web page on your NAS, other than the admin GUI, and cannot make a connection ensure you have enabled the web server.
17. To access services from the internet like FTP and bittorrent make sure you have forwarded the proper ports in your router.
18. Just upgraded the firmware and the screens are not right? Try clearing your browser's cache. This normally fixes the issue. Sometimes you will also have to delete your cookies.
19. Trying to use jumbo frames? Make sure all of the devices, including your switch/router, support jumbo frames. Turn off jumbo frames and see if it works.

How to Change a Shared Folder Name and not Lose Data

The easy way is to create a new share on the NAS and then move the data from the old share to the new share.

Open up a shell (ssh or telnet) and do the following:

```
cd /share/OLD_SHARE
mv * /share/NEW_SHARE
```

This way we've moved all the data to the new share. If both shares are on the same volume then it's quite fast operation. If the shares are on different volumes then the move command might take awhile depending on how much data there is to move. The last bit of the operation is to remove the OLD_SHARE via the web interface.

How to Create Your Shares

Doing the actual work of setting up shares on the NAS is easy. It's how you want to set them up that you should spend some time to think about. There are two ways to set up your shares for you users.

The first method is with individual shares for each user (see Figure 7). With this method you create separate shares and folders for each user. If you also wanted to have a common shared folder you would create a share for that also. For each share that you wanted to access from your computer you would have to map a drive to each share. Secure each folder by setting who can have access to the share via the admin pages.

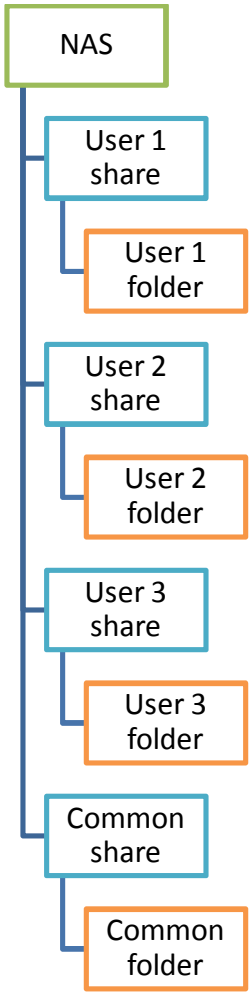


Figure 7 - Individual Shares and Folders

The second method is to create a single share with separate folders for each user (see Figure 8). With this method you create a single share and then create the individual user folders below the shared folder. Since everyone would need to have access to the share you would secure the individual folders by setting the owner and group that has access by using the chown and chgrp Linux commands from a telnet or SSH session.

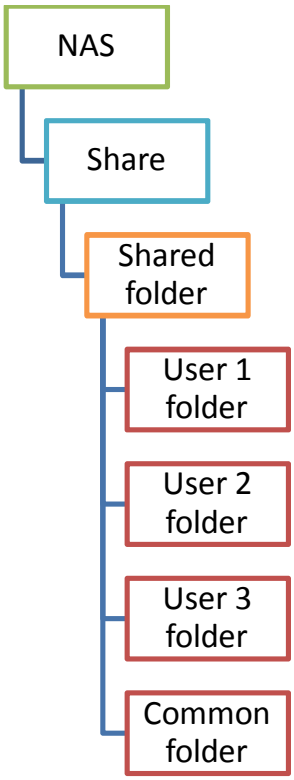


Figure 8 - Single Share / Multiple Folders

How to Increase Raid Rebuild/Expansion Speed

Enable BITMAP

Bitmaps optimize the rebuild time after a crash, or after removing and re-adding a device. They do not improve normal read/write performance, and may well cause a small degradation in performance.

When an array has a bitmap, a device can be removed and re-added and only blocks changed since the removal (as recorded in the bitmap) will be resynced.

The bitmap is enabled / disabled in the Device Configuration/RAID Management Tool section of the admin interface.

Minimum Guaranteed Speed

The rebuild / rsync speed on a raid array is very slow, usually taking days to finish a raid 5 rebuild. The settings that QNAP has used for the rebuild speed highly favors system responsiveness. You can change these settings so that the rebuild will take less time. How much less time is up to you. You will have to decide which is more important – a much faster rebuild or system response time and adjust your settings accordingly. You will have to play with the settings to find one that you are happy with. It will place a much higher load on the system so you should use it with care.

To see your Linux kernel speed limits imposed on the RAID reconstruction issue the following commands at a terminal session:

```
cat /proc/sys/dev/raid/speed_limit_max
200000
cat /proc/sys/dev/raid/speed_limit_min
1000
```

In the system logs you can see something similar to the following listed:

> md: minimum _guaranteed_ reconstruction speed: 1000 KB/sec/disc.
> md: using maximum available idle IO bandwidth (but not more than 200000 KB/sec) for reconstruction.

This means that the minimum guaranteed speed of the rebuild of the array is approx 1MB/s. The actual speed will be higher and will depend on the system load and what other processes are running at that time.

If you want to increase this minimum speed you need to enter a higher value in speed_limit_min. For example to set this to approx 50 megabytes per second as the minimum use:

```
echo 50000 >/proc/sys/dev/raid/speed_limit_min
```

Results are instantaneous and you can use the following to view the results:

```
cat /proc/mdstat
```

You can also use the web admin interface to monitor the CPU usage. I recommend that you slowly increase this number until you get results you are comfortable with. Once you have found a number that works for you, you will have to add the command to modify the speed_limit_min value to your autorun.sh file so it will always be in effect.

How to Mount an ISO Image

If you have ISO image files that you would like to share you can do it through your NAS. All you have to do is mount the image and share it. For example to mount an ISO image with a file name of widgets.iso located in the Qdownload directory and share it as widgets use the following command:

```
mount -t iso9660 -o loop /share/Qdownload/widgets.iso /share/widgets
```

If you want your ISO images to always be shared you will have to add the mount commands to your autorun.sh file.

How to Mount a Windows File Share

It is possible to access a Windows file share on your NAS using the Linux mount command. This can also be used to mount a smb share on another Linux server (hint – from one QNAP NAS to another QNAP NAS)

1. Create the following link:

```
ln -sf /usr/bin/mount.cifs /sbin/mount.cifs
```

2. Make sure you have file sharing enabled on your Windows machine and create the share(s) if you have not already done so.
3. On the NAS create the directory where you want to make the mount:

```
mkdir -p /mnt/winfileshare
```

4. Then use the mount command to mount the actual share:

```
mount -t cifs //winpcname/winsharename -o username=winuser,password=winpassword
/mnt/winfileshare
```

Note- Enter the previous command on one line. Repeat steps 2 – 4 for each share you wish to access.

Internal Security Suggestions

There are measures you can take to protect your data internally.

1. User id and passwords – Make sure that the user ids and password that you use on your NAS are as complex as possible. Try to use a combination of upper and lower case characters along with numbers and special characters. Since you cannot change the admin id make sure the password is something that will not be easily guessed.

2. User groups – User groups can be used to provide or deny access to network shares. When supporting more than a few people using groups to manage access makes it easier to administer.

3. Share Security – When creating your shares make sure you only grant access to the people or groups that need access.

4. Wireless routers and/or Access Points– Although wireless routers do not pose an internet threat they do present a local threat. Anyone within range of your wireless router could try to hack your network. Make sure that you use the strongest encryption that is available on your clients. WPA2 is better than WPA which is better than WEP. Make sure you network key is as long as possible and use a combination of numbers, lower case, and upper case characters. Change the default SSID since everyone knows what the default ones are for all of the different manufactures. If possible disable SSID broadcast. If your wireless router and/or access point support MAC filtering turn it on and add the MAC addresses of only the devices you want to have access.

Remember the rule of thumb should be to only give people the minimum access that they need to get their job done.

Internet Security Suggestions

If you are going to open your NAS to the internet it is vitally important that you protect your device and data from prying eyes (hackers). It is important that you implement as many security procedures as you can to protect yourself. The more you implement the more secure you will be. The following are some ideas for securing your NAS when opened to the internet:

1. Port Forwarding - When opening ports on your internet firewall you should only open the ports that you absolutely need. When someone from the internet is attacking your router they most likely will be searching for the known ports, like 21 (FTP), 22 (SSH), and 23 (Telnet) in order to gain access to your system. If only a select number of people will have access to your NAS from the internet then it is suggested that you do not use the standard ports on your router. You should use a non standard port and have the router forward the traffic on this port to the standard port on your NAS. For example you can use port 12345 as your ftp port externally and have the router redirect that port to port 21 on your NAS. This way only someone that knows exactly what port to use externally will have FTP access. You can still access the NAS on port 21 from your internal network. This can be done for any port. Most hackers will attempt access via the well known standard ports and will not spend the time searching all 65,535 ports to see which ones are active. It is too time consuming and might trigger ISP monitors that someone is trying to attack someone on their network.

2. DMZ – Don't put your NAS into the DMZ zone of your router. This will open all ports to your NAS. Only use this if you really need to, really understand the implications, and really know what you are doing.

3. IP Filters - Use IP filters to either allow or block individual IP addresses or entire subnets. IP filtering is available from the Admin web interface on the System Tools → IP Filter page. You can enable an allow or deny filter list. You cannot use both at the same time.

4. Telnet – Do not allow telnet access from the internet as there is no way to secure it.

5. SSH - As outlined above use SSH with shared keys. This way only someone that has the proper key will be able to attach to your NAS.

6. FTP – Do not use standard FTP if there is data you wish to protect. Only allow ftp connections with SSL/TLS (Explicit). This is settable in the FTP server admin page. This option requires a shared key. For even more secure FTP you could implement a SFTP daemon. Don't enable anonymous access unless you want the world to have access to your FTP site in which case you have to use standard FTP. Just make sure that you have proper security implemented on your shares and folders so only the data you want to be accessible is accessible.

7. VPN – If only a few select people are going to have access to your NAS you should consider using VPN to access your NAS. VPN is available on many brands of routers or you could install openvpn on your NAS. Not only does VPN allow access via a dedicated tunnel so only the VPN ports need to be opened on the router, it also provides data encryption so no one can sniff your data traffic and understand it.

8. Network Access Protection - Some newer versions of the firmware include the ability to block failed access attempts via a feature called 'Network Access Protection'. If your firmware supports this it can be found in the admin web interface under System Tools/ IP Filter. What this allows you to do is to block an IP address after x number of failed connection attempts in x number of minutes for x length of time. You can enable this feature for a number of different protocols. See the figure below for an example.

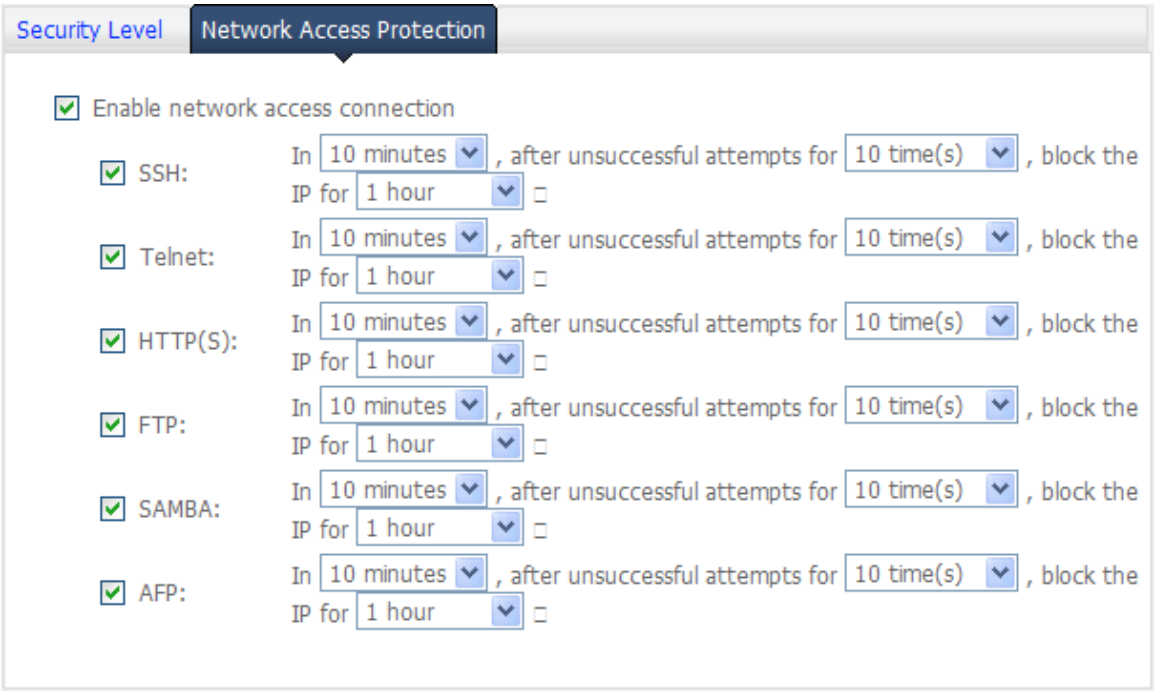


Figure 9 – Network Access Protection Example

Limiting User Access to FTP

You can control who can log into your FTP server very simply. The FTP process uses a file named ftpusers to see who can have access. This file contains a list of users that are denied access to FTP. If the user's ID is found in this file, FTP access is denied. All you need to do is create this file somewhere in your /share folders. Put one user ID per line. Add the following commands to your autorun.sh file so they get executed at boot time.

```
cp /share/xxx_DATA/your folder/ftpusers /etc/ftpusers
/etc/init.d/proftpd.sh reconfig
```

Missing Info on the Admin Web Pages after Firmware Update

Sometimes after a firmware update you will not see the new options or you might have missing data on the admin web pages. To correct these issues clear the cache on your web browser. As a general practice this should be done after every firmware upgrade. Sometimes you will also have to delete your cookies.

Multi-share Backup

There is no easy built in way to backup multiple shares at the same time to another TS NAS via remote replication. The secret is to create a new share & folder that will act as the mount point for the folders you wish to backup. In the new folder create a directory for each share that you want to backup. Using the mount command you mount the shared folder in the directory you created for it. For example:

1. Create a share called BackupShares along with a folder called BackupShares.
2. Make sure that only the admin id has access to the BackupShares share. You can even hide the share if you wish.
3. Create a subdirectory in BackupShares called Qweb_Backup.
4. Mount the Qweb folder in the Qweb_Backup directory using the following command:

```
mount -o bind /share/xxx_DATA/Qweb /share/xxx_DATA/BackupShares/Qweb_Backup
```

Repeat steps 3 & 4 for as many shares you want to replicate. Then all you need to do is create one replication job for BackupShares and all of the folders that you mounted will get backed up. The mount command does not survive a reboot so you will need to add the mount commands to your autorun.sh script file.

Network Recycle Bin

The QNAP NAS servers have a feature called Network Recycle Bin (NRB). It functions the same way that the recycle bin works on Windows systems. Any file deleted on the NAS via SMB or NFS is moved to the NRB. Each volume on the NAS has its own NRB. The NRB is a great feature unfortunately QNAP does not provide a way to manage the NRB. I have written a script that will allow you to manage the files in the NRB. This script will allow you delete files by file name mask and/or by the number of days since a file has been modified. For a full description of the script and to obtain a copy of it please visit this forum post.

Printing a File

It is possible to print a file on your NAS device from a terminal session. In order to print you must have a USB printer attached to the NAS. The command to print is as follows:

```
lpr –P <printer name> <file to be printed>
```

The printer name is composed of your NAS name and PR1, PR2, or PR3 depending on which USB port the printer is plugged into. For example the following will print the hosts file on the printer connected to USB port 1 on server named PRODNAS.

```
lpr –P PRODNASPR1 /etc/hosts
```

To see a list of connected USB printers enter the following command:

```
lpc status all
```

Restoring the QNAP Shares

If you have your NAS set up with one drive (HDA_DATA), sometimes when you add the second drive also as a single volume (HDB_DATA) the default QNAP shares get moved to the second drive. In order to restore the shares to HDA_DATA you have to edit the smb configuration file smb.conf. In the file you will find a section for each share (Qmultimedia, Public, Qdownload, etc). Each section will contain the share name surrounded by [ ] such as [Public]. In each section you will find an entry called path that contains the location of the share. It will look like this:

```
path = /share/HDB_DATA/Public
```

You have to change it to this:

```
path = /share/HDA_DATA/Public
```

You will have to do this for each share that has been moved. Save the file when you have finished editing it. After saving the file execute the following command at a terminal session to restart smb:

```
/etc/init.d/smb.sh restart
```

After you do this all the default shares should be pointing back to where they should be.

Newer versions of the firmware have an option to restore the default shares.

Testing Network Speed

Here are two methods for you to test your network speed. The first method will test your internet speed and the second method will test your LAN speed.

Internet Speed

To test your internet speed go to the SPEEDTEST web site at http://speedtest.net/. Select you region and then select a location near you to begin the test. You can also select other locations in other regions to test the speed to those sites. When the test is completed it will show you your internet upload and download speeds.

LAN speed

To test your LAN speed you need to go to the SPEEDTEST web site and download a web application that will be installed on your NAS server. In order for this to work you must also have the web server enabled on your NAS server. To install this application perform the following steps:

1. Go to the SPEEDTEST Mini site located at http://speedtest.net/mini.php.
2. Click the Download Now button to download the zip file.

3. Create a directory in Qweb named 'mini'.

4. Unzip the file to this directory. Make sure the files get unzip to the proper subdirectories.

To begin the tests go to 'http://your NAS IP or name/mini/index-php.html'. You can also rename index-php.html to index.html so all you need to enter is 'http://your NAS IP or name/mini/'. Once the page is displayed click on 'Begin Test' to start you tests. When the test is completed it will show you your LAN upload and download speeds. If you have multiple NAS servers you can install this on all of them to test the speeds of your different NAS servers.

Unable to Communicate to Internet

Many times when you are unable to communicate to the internet from your NAS or sometimes unable to communicate from the internet to your NAS it is because of improper network settings. Make sure that the subnet mask, gateway, and DNS addresses in the TCP/IP settings section are set properly. They should be set to the same values as the other devices on the same subnet; which will usually be your computer. Improperly configured TCP/IP settings will cause things like time synchronization and QPKG to fail. An easy way to test your settings would be to open a terminal session via telnet or SSH. Then issue a ping command to an internet site via the site's name. If you do not get an IP address returned then your DNS and/or gateway address is incorrect.

Using daemon_mgr

daemon_mgr is a daemon that monitors other daemons. If it sees that a daemon has stopped running it will restart it. If you have ever seen a 'Re-launch process' message in your event log it was daemon_mgr that restarted the process and generated the event log message. You can use daemon_mgr to start and monitor anything that you want running all of the time. The format of the daemon_mgr command is:

```
[usage]: daemon_mgr [name] [action] [daemon]
    [name]:      name of daemon
    [action]:    "start" or "stop" or "nolog"
    [daemon]:    the execute file of daemon
```

The execute file of the daemon should be enclosed in quotes (""). For example to have daemon_mgr start and monitor ddclient I use the following command (entered on one line):

```
/sbin/daemon_mgr ddclient start "/share/MD0_DATA/apps/ddclient -file
/etc/config/ddclient/ddclient.conf 2> /dev/nul 1> /dev/nul"
```

The file /etc/daemon_mgr.conf contains a list of processes that the daemon_mgr is watching. To view this file execute the following command:

```
cat /etc/daemon_mgr.conf
```

A partial listing of daemon_mgr.conf is:

```
DAEMON0 = bcclient, start, /sbin/bcclient
DAEMON1 = hotswap, start, /sbin/hotswap &
DAEMON2 = qwatchdogd, start, /sbin/qwatchdogd -t 5 &
DAEMON3 = upsd, start, /usr/sbin/upsd -u admin
DAEMON4 = qsmartd, start, /sbin/qsmartd –d
```

vi Commands

vi is a Visual Editor (hence the name -- vi for VIsual). What is a visual editor (as opposed to a non-visual one)? Visual editors are ones that let you see multiple lines of the document that you are editing as you edit it. This seems pretty common in most editors today, so the idea of a non-visual editor is a little strange. For those people unfamiliar with the vi editor commands here is a link to a *vi* command cheat sheet. Please note that not all of the vi commands might be implemented on the QNAP devices.

Supported Volume Types

The following sections describe what type of raid and non raid volumes that the QNAP devices support. Raid is great for maintain the system uptime in the case of a single (Raid 1 or 5) or double (Raid 6) drive failure. Keep in mind that raid is not a substitute for backups. To ensure that your important data is truly safe you should backup your data to an external drive or another NAS unit.

Note: Not all devices support all types.

Raid 0

"**Striped set without parity**" or "**Striping**". Raid 0 provides improved performance and additional storage but no redundancy or fault tolerance. Because there is no redundancy, this level is not actually a *Redundant* Array of Inexpensive Disks, i.e. not true RAID. However, because of the similarities to RAID, simple strip sets are normally referred to as RAID 0. Any disk failure destroys the array, which has greater consequences with more disks in the array (at a minimum, catastrophic data loss is twice as severe compared to single drives without RAID). A single disk failure destroys the entire array because when data is written to a RAID 0 drive, the data is broken into fragments. The number of fragments is dictated by the number of disks in the array. The fragments are written to their respective disks simultaneously on the same sector. This allows smaller sections of the entire chunk of data to be read off the drive in parallel, increasing bandwidth. RAID 0 does not implement error checking so any error is unrecoverable. More disks in the array means higher bandwidth, but greater risk of data loss.

Minimum # of disks: **2**

Space Efficiency: **2**

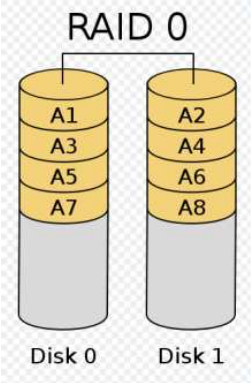


Figure 10 - Raid 0 Layout

Raid 1

Mirrored set without parity' or '**Mirroring'**. Provides fault tolerance from disk errors and failure of all but one of the drives. Increased read performance occurs when using a multi-threaded

operating system that supports split seeks, as well as a very small performance reduction when writing. Array continues to operate so long as at least one drive is functioning.

Number # of disks: **2**

Space Efficiency: **1**

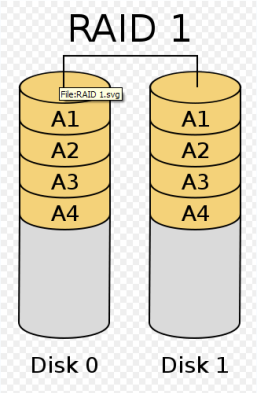


Figure 11 - Raid 1 Layout

Raid 5

Striped set with distributed parity or **interleave parity**. Distributed parity requires all drives but one to be present to operate; drive failure requires replacement, but the array is not destroyed by a single drive failure. Upon drive failure, any subsequent reads can be calculated from the distributed parity such that the drive failure is masked from the end user. The array will have data loss in the event of a second drive failure and is vulnerable until the data that was on the failed drive is rebuilt onto a replacement drive. A single drive failure in the set will result in reduced performance of the entire set until the failed drive has been replaced and rebuilt.

Minimum # of disks: **3**

Space Efficiency: **N – 1**

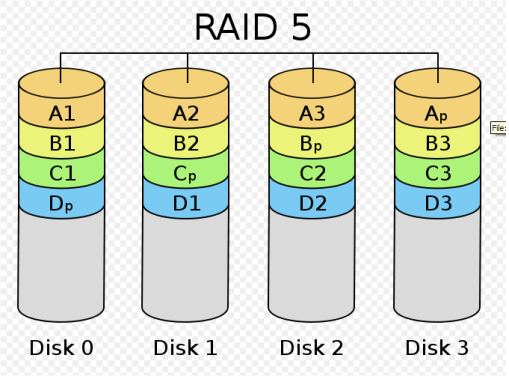


Figure 12 - Raid 5 Layout

Raid 6

Striped set with dual distributed parity. Provides fault tolerance from two drive failures; array continues to operate with up to two failed drives. This makes larger RAID groups more practical, especially for high availability systems. This becomes increasingly important because large-capacity drives lengthen the time needed to recover from the failure of a single drive. Single parity RAID levels are vulnerable to data loss until the failed drive is rebuilt: the larger the drive, the longer the rebuild will take. Dual parity gives time to rebuild the array without the data being at risk if a (single) additional drive fails before the rebuild is complete.

Minimum # of disks: **4**

Space Efficiency: **N - 2**

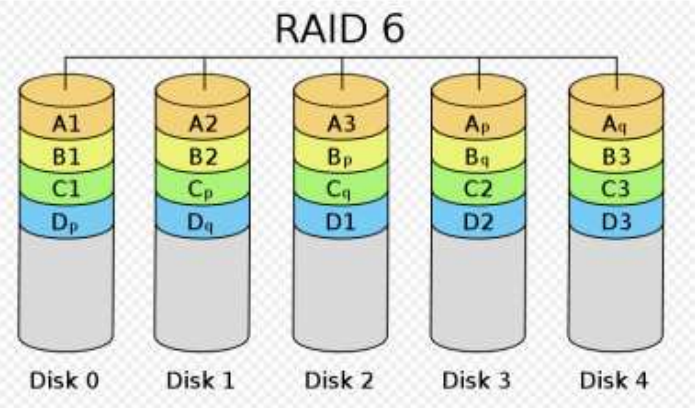


Figure 13 - Raid 6 Layout

Single Disk Volume

A single disk volume is a volume contained on just one disk. There is no redundancy so if the disk fails then all data on the disk will be lost.

Number of disks: **1**

Space Efficiency: **1**

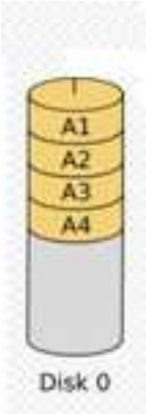


Figure 14 - Single Disk Layout

Linear Disk

Linear disk is also referred to as JBOD (Just a Bunch of Disks).You can combine two or more disks into one larger disk. During file saving, the file will be saved on physical disks sequentially but does not have a disk failure file protection function. The overall capacity of linear disk is the sum of all disks. Linear disk is generally used for storing large data and is not appropriate to use for file protection of sensitive data.

Minimum # of disks: **2**

Space Efficiency: **N**

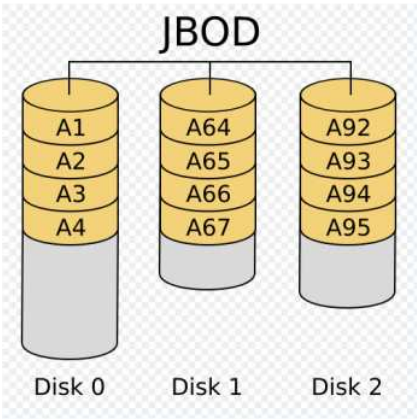


Figure 15 – Linear Disk Layout

Process List

The following is a partial list of some of the common processes that are or could be running on your NAS. This list is provided as a reference in case you see messages in the log pertaining to one of these processes you will know what it does.

apache	WEB server
apcupsd	APC UPS service
bcclient	Download station
btd	Bit Torrent daemon
crond	Task scheduler
daemon_mgr	A process that monitors other processes and restarts them if they stop
gpiod	gpiod & picd together monitors and handles your beeper, status LED, fan and all the buttons on the NAS
hotswap	Raid hot swap disk service
ImRd	Service that creates the thumbnail pictures for the multimedia station
mt	daapd
iscsid	iscsi daemon
mysqld	mysql daemon
nmdb	NETBIOS Name Service & NETBIOS Datagram Service
ntpdated	Network Time Protocol service
nvrd	Network Video Recorder daemon
picd	gpiod & picd together monitors and handles your beeper, status LED, fan and all the buttons on the NAS
proftpd	FTP service
qLogEngined	Log service
qsmartd	S.M.A.R.T. disk service
rsync	Remote replication
sh	shell
smdb	NETBIOS Session Service & Microsoft Directory Services
sshd	SSH service
stunnel	Secure tunnel for HTTPS access
thttpd	WEB service for system management
utelnetd	Telnet service

Useful Links

The following are some links that you might find useful.

About.com:Linux

Home page: linux.about.com

apache

Home page: www.apache.org
Documentation: www.apache.org

Compiler - ARM Based Installation

Forum: forum.qnap.com

Compiler - Intel Based Installation

Forum: forum.qnap.com

Dovecot

Home page: www.dovecot.org
Wiki: wiki.dovecot.org

EditPad

Home page: www.just-great-software.com
EditPadPro: www.editpadpro.com
EditPadLite: www.editpadpro.com

proftpd

Home page: www.proftpd.org
Configuration list: www.proftpd.org

PuTTY

Home page: www.chiark.greenend.org.uk
Documentation: www.chiark.greenend.org.uk
Download: www.chiark.greenend.org.uk

QlogR

Forum: forum.qnap.com

QNAP

Crontab web interface forum.qnap.com
Forum: forum.qnap.com
FTP site: ftp.qnap.com

ID: csdread
PW: csdread
Firmware Subscribe URL: forum.qnap.com
Firmware Unsubscribe URL: forum.qnap.com
Firmware Preferences URL: forum.qnap.com
Hardware Comparison Chart: www.qnap.com
HDD Compatibility list: www.qnap.com
Home page: www.qnap.com
Increase raid rebuild speed: forum.qnap.com
NRB script: forum.qnap.com
Support form: www.qnap.com
UPS Compatibility list: www.qnap.com
Wiki Home page: wiki.qnap.com

sancho

Home page: sancho-gui.sourceforge.net
Downloads: sancho-gui.sourceforge.net

SlimDevices

Downloads: www.slimdevices.com/su_downloads.html
Forums: forums.slimdevices.com/
Home Page: www.slimdevices.com/
Wiki: wiki.slimdevices.com/index.php/Main_Page

SPEEDTEST.NET

Internet test: speedtest.net
LAN test: speedtest.net/mini

SSHD Manuals

SSH daemon: www.openbsd.org
daemon configuration: www.openbsd.org

Twonkymedia

Log, DB, and Cache Relocation WIKI page: wiki.qnap.com

vi cheatsheet

Manual: www.sm.luth.se

WinSCP

Home page: www.winscp.net
Download: www.winscp.net

XMail

Home Page: www.xmailserver.org
Manual: www.xmailserver.org
Forums: xmailforum.homelinux.net

XMail Queue Manager

Home Page: xmail.marketmix.com