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JetStor NAS 1600S

Configuration Guide

Revision 1.1

Table of Contents

Preface 4
Chapter 1 Introduction 6
1.1 Key Features 6
1.2 Technical Specifications 7
Chapter 2 Getting Started With JetStor NAS 1600S 9
2.1 Prepare to Setup NAS 9
2.2 Login NAS Management Webpage by Using Web Browser 9
2.3 Setup and Installation 11
2.3.1 Quick Setup 11
2.3.2 Manually Initializing the NAS Step by Step 13
2.4 Connecting to the NAS Share Folder via Network 15
Chapter 3 System Management 17
3.1 Basic Layout of NAS Management GUI 17
3.2 Top Shortcut Bar 18
3.3 System Monitoring 20
3.3.1 System Information 21
3.3.2 Resource Monitor 22
3.3.3 System Log 23
3.4 System Manager 24
3.4.1 General 24
3.4.2 Network 26
3.4.3 UPS 34
3.4.4 Event 35
3.4.5 Power 38
3.4.6 Upgrade 39
3.4.7 Tools 40
3.4.8 Schedule Manager 41
3.5 Storage Manager 43
3.5.1 RAID / Array Manager 43
3.5.2 Volume Group Manager 47
3.5.3 iSCSI Manager 54
3.5.4 FC Manager 58
3.5.5 Share Manager 61
3.6 Service Manger 71
3.6.1 Samba service 71
3.6.2 NFS service 73
3.6.3 AFP service 74

3.6.4 FTP service 75
3.6.5 WebDAV service 76
3.6.6 TFTP service 77
3.6.7 Rsync service 77
3.6.8 Bonjour service 78
3.6.9 SNMP service 79
3.6.10 DHCP service 80
3.6.11 SSH service 81
3.6.12 Telnet service 81
3.6.13 File Manager 82
3.7 Account Manager 83
3.7.1 Account 83
3.7.2 Group 89
3.7.3 Directory Service 92
3.8 Backup Manager 95
3.8.1 Data Backup 95
3.8.2 Data Copy 102
3.8.3 Replication Backup 106
3.8.4 Snapshot Backup 111
3.8.5 Volume Clone 116
3.8.6 Rsync Backup 118
3.8.7 System Configuration 120
3.8.8 Amazon S3 121
3.9 Attached Device Manager 124
3.9.1 Physical Device 124
3.9.2 ISO Mount 125
3.9.3 iSCSI Initiator 126
3.10 Plug-in Manager 128
3.10.1 NAS HA 131
3.11 File Manager 140
3.12 General Limitation List 144

Preface

About this manual

This manual provides information regarding the configuration of the **JetStor NAS 1600S System**. This document also describes the use of the storage management software. Information contained in the manual has been reviewed for accuracy, but not for product warranty because of the various environment/OS/settings. Information and specifications will be changed without further notice. Some pictures and screenshots might be different with the actual machine.

This manual uses section numbering for every topic being discussed for easy and convenient way of finding information in accordance with the user's needs. The following icons are being used for some details and information to be considered in going through this manual:

NOTES:
These are notes that contain useful information and tips that the user must pay attention to in going through the subsystem operation.

IMPORTANT!
This is important information that the user must remember.

WARNING!
These are warnings that the user must follow to avoid unnecessary errors and bodily injury during hardware and software operation of the subsystem.

CAUTION:
These are cautions that user must be aware of to prevent damage to the equipment and its components.

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Changes

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Chapter 1 Introduction

1.1 Key Features

- Integrates NAS, DAS, SAN and iSCSI into one chassis
- Smart-functioned LCD panel for environmental status display and setting
- Supports advanced storage management features such as thin provisioning, snapshot, remote replication and HA
- Remotely manage, upload, and download through the mobile devices, such as smart phones or tablets
- Support Fiber target for Fiber storage environment (Optional)
- Support iSCSI target for IP storage environment
- Supports hot spare and automatic hot rebuild.
- Allows online capacity expansion within the enclosure
- 64 bit Linux-based embedded system
- Centralization of Data and Storage Management
- Latest volume snapshot technology
- Apply volume replication to enhance data protection
- Data Backup via backup plan and scheduling
- Enhance system configuration backup
- Local and external account management, support large account import
- Share management and permission (support ACL setting)
- Support Internet Gateway function
- Online expansion file system
- Support E-mail notification and system log information
- Volume Clone (EXT3 / EXT4 / XFS / NTFS / VMFS)

1.2 Technical Specifications

Model: JetStor NAS 1600S
Storage Management
Volume Management (Support XFS, ext3 & ext4 file system)
Disk usage statistics
Hot spare capability
iSCSI Target Manager: Support LUN Mapping / Initiator filter/ Thin provision
FC Target Manager: Support LUN Mapping / Thin provision
General
File Server Independent
Multiple language support
Support UPS management
Support LV encryption
System Management
Automatic IP address configuration
Self-contained unit - no extras needed
Management through Web browser
Flash upgradeable unit
SNMP management and notification
Fail-free online firmware upgrade
Unicode support
Multi-node Management GUI
NAS Configuration Backup
Central Management
Networking
Supports NIC / Trunking / load balance / fail over / 802.3ad
DHCP Server / DHCP Client
WINS Server
Internet gateway
Protocols
TCP/IP, SMB/CIFS, NFS, SNMP, FTP/SFTP/FXP, HTTP, HTTPS, Telnet, SSH, AFP ,(Novell by TCP/IP), WebDAV
Client Operating Systems Support

Microsoft® Windows® 98/ ME/ NT/ 2000 / XP / 2003 / Vista /2008 / Win7/ Windows 2012/ Win 8
Unix / Linux
Mac OS
Authentication
Local User Account/Group
Microsoft NT Domain Controller (PDC)
Microsoft Active Directory Authentication (ADS)
Network Information Service (NIS)
Support OpenLDAP Service
Support batch creating users/Group
User quota management
Share level security
File level security
User ID security for NFS
Recycle bin (Samba)
Audit file access (Samba)
Write once read many (WORM)
Block Storage
iSCSI Target Support
Fiber Target Support (optional)
Windows server 2012 Thin-provisioning support
Virtualization
VMware / Citrix / Hyper-V
Data Backup / Restore
Volume Clone (EXT3 / EXT4 / XFS / NTFS / VMFS/ Others)
Symantec BackupExec Agent (by additional installation)
Scheduling Multi-Snapshot (Support snapshot of iSCSI & FC)
Replication (Remote RealTime Data mirror)
NAS High-Availability (optional)
Scheduling Rsync Replication
Support NetVaultR backup Client (by additional installation)
Support CA ARCserve (by additional installation)
Support CDP Server (by additional installation)
Support Apple Time machine

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Chapter 2 Getting Started With JetStor NAS 1600S

2.1 Prepare to Setup NAS

1. Before power on, make sure all power cables are plugged.
2. Check that LAN cable is connected to LAN_0 port of NAS and is linked.
3. To initialize the system, at least one hard drive is needed and inserted in the drive slot.

NOTE: Compatible List of Hard Drive Models

JetStor NAS 1600S supports major hard drive brands of 3.5-inch SAS / SATA hard drive. Please check AC&NC website: **http://www.acnc.com** for the latest hard disk drives compatibility list for the NAS.

Important Reminder: AC&NC will not be responsible for any data loss due to incorrect installation or use of hard drive and caused damage to the product under abnormal operation.

Warning: When hard drives that have never been used in the NAS are installed, the hard drives will be formatted automatically when Array is created, and existing data on the hard drives will be cleared.

2.2 Login NAS Management Webpage by Using Web Browser

After power on, please wait for about one minute to boot the system, then the NAS can be managed via web browser at any Windows, Linux, or Mac OS client.

1. Open web browser, input **http://<NAS-IP>** in URL bar.

   For example: http://172.16.0.1

NOTE:

A. The NAS default IP address is **172.16.0.1.**

B. If NAS is set as a DHCP client or you are not sure what IP is used by the NAS, please check the front panel LCD to know the current IP address.

C. Make sure the NAS and the client PC (that you will use to manage the NAS) are on the same subnet.

D. The recommend browsers for management are Google Chrome and Firefox.

2. When the login page (Figure 2.2.1) is shown, input user name "**admin**" and password (default) "**00000000**". To select the operating language of the management page, select your preferred language on the drop-down list box on the right side.

NOTE: The default admin password might be different in some NAS. Please ask your NAS vendor if you have problems with login.

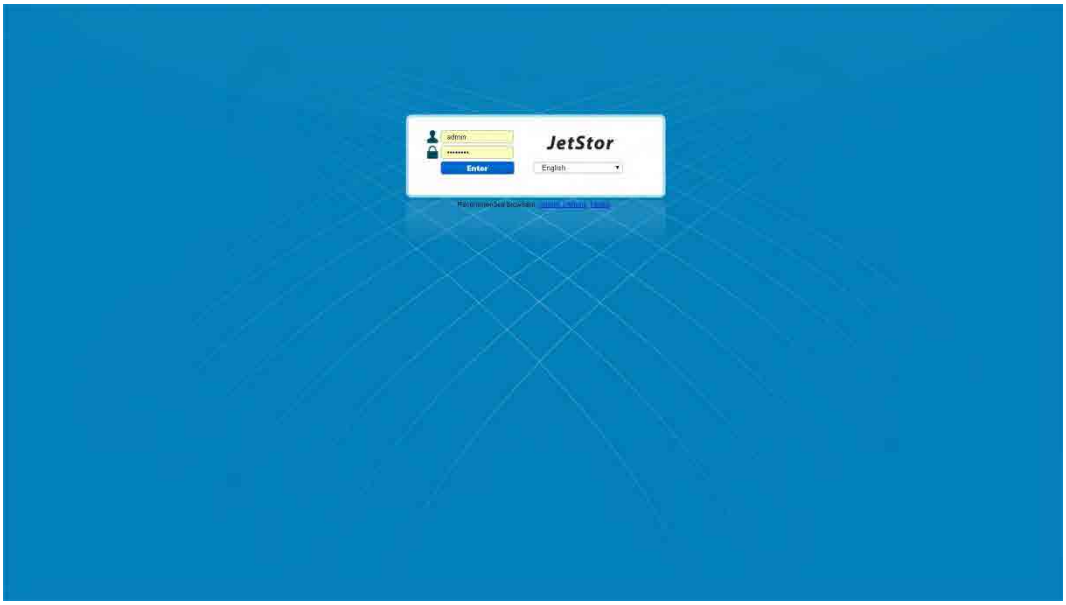


Figure 2.2-1 Login page

3. After login, you will see the main NAS management GUI (Figure 2.3.2-1). You can now start to manage or setup the system.
4. By default, SSL login is enabled in NAS and allows users to configure and manage the NAS via encrypted transmission. To use this function, you can open the browser then input **https://<NAS-IP>** in URL bar.

For example: https://172.16.0.1

NOTE: If the NAS is behind NAT router or firewall and will use SSL login and remote access from the Internet, open NAT or firewall port 443 to direct to the LAN IP of NAS.

2.3 Setup and Installation

All NAS services and functions are disabled without first initializing the NAS. There are two ways to initialize the NAS, by using Quick Initialization feature or manually step by step.

2.3.1 Quick Setup

After login as "admin" and NAS has not been initialized yet, GUI will pop up a message to ask you to use Quick Initialization feature (Figure 2.3.1-1) to setup the system. The Quick Initialization feature helps you to initialize the NAS in just one page setup. To setup using "NAS Quick Initialization", click “Yes”. Then you can start to quickly setup the NAS by providing some information and setting some options, as shown in Figure 2.3.1-2.

If you do not want to use Quick Initialization feature, click "**No**" in Figure 2.3.1-1. Please note that many functions will be disabled without first initializing the NAS. The Options of Quick Initialization page list next page.

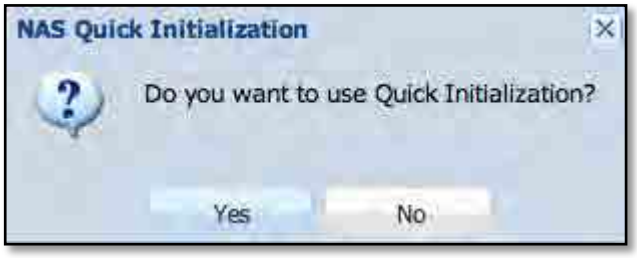


Figure 2.3.1-1 The confirmation message to use Quick Initialization

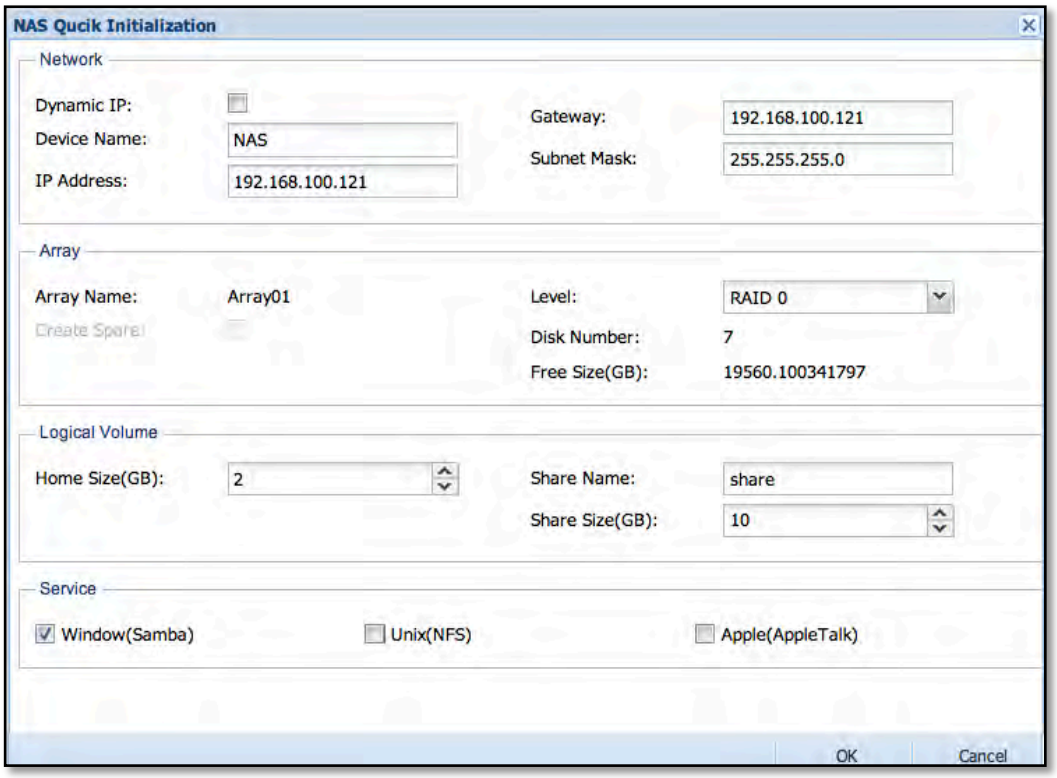


Figure 2.3.1-2 NAS Quick Initialization page

Network

Please modify the options here to match your network environment.

Dynamic IP	When enabled, this set the NAS as DHCP client (not suggested)
Host Name	Set a unique host name for NAS to be used in network environment.
IP address	Set a static IP for LAN_0. (Usually for client connection)
Gateway	Set gateway IP for LAN_0.
Subnet Mask	Set the Subnet Mask for LAN_0.

Array

The NAS must have at least one Array in order to initialize the system.

Array Name	It is fixed to "Array01" for the first Array.
Create Spare	Enable this option to reserve a hard drive as a spare disk for Array.
Level	Select the RAID Level. Quick Initialization only supports RAID levels 0,1,5 and 6.
Disk Number	The total number of hard drives detected by the system.
Free Size	The estimated size of the Array after it is created.

NOTE: All disks will be the member of Array01. If you plan to create the Array manually, please exit (Cancel) the Quick Initialization and read the Chapter 2.3.2.

Logical Volume

Create a network share folder with specified size for users.

Home Size(GB)	The default reserved space for user's home folder
Share Name	The share folder name that will be accessible to users in the network
Share Size(GB)	The volume size of the share folder

Service

Decide which services need to be enabled after setup, and allow users to connect and access the network share folder(s).

Window(Samba)	Select this service to enable access for Window users.
Unix(NFS)	Select this service to enable access for Unix users.
Apple(AFP)	Select this service to enable access for MAC users.

After filling up all options, click "**OK**" to execute the setup. This only takes about one minute. After setup is completed, you need to re-login the GUI and customize the detailed configuration. Meanwhile, user can access the share folder via network now.

2.3.2 Manually Initializing the NAS Step by Step

If you would like to create the Array manually, please click "**No**" in Quick Initialization page (Figure 2.3.1-1). After that, you will see the main NAS information page as shown in Figure 2.3.2-1. Then select "**Storage Manager**" and "**RAID**" (refer to Section 3.5.1), and click "**Add**" to create a customized Array. After Array is created, follow the GUI wizard that will take you to setup NAS by creating Volume Group, Logical Volume, Share or iSCSI step by step.

Figure 2.3.2-1 NAS main information page

NOTE: For more information about creating Array, please see Section 3.5.1.

2.4 Connecting to the NAS Share Folder via Network

After NAS is initialized, users can access the share folder from a client PC. Here are the steps to access NAS share folder from clients with different platforms.

Windows Users (SMB/CIFS)

Steps to connect to a NAS share folder:

1. Two options to connect to NAS shared folder:
   a) Open Network Neighborhood and search Workgroup. If you can't find NAS, search the entire network, double-click the mouse on your workgroup, search for the NAS hostname, and double-click the mouse to connect the NAS.
   b) Use the Run function in Windows OS, and enter \\NAS-hostname or \\NAS-IP to connect to NAS. For example: **\\NAS** or **\\172.16.0.1**

2. Enter a valid user name and password:
   User name: admin
   Password: 00000000

3. Select the share folder which you want to connect to.
4. You can start to use the NAS share folder, and you can also map the share folder as network drive.

Mac OS Users (SMB or AFP)

NOTE: If AFP is used, make sure AFP is enabled in Service Manager and in Share Protocol.

Steps to connect to a NAS share folder:

1. Click 'Go' > 'Connect to Server'
2. Use the following methods to mount the NAS share folder:
   Using SMB, input: smb://NAS-IP or smb://NAS-hostname
   Using AFP, input: afp://NAS-IP
   For example: smb://172.16.0.1 or afp://172.16.0.1
3. Click 'Connect'

4. Enter a valid NAS user name and password (with permission to the share folder),

   User name: admin

   Password: 00000000

5. Click 'Connect'
6. Select the NAS share folder you want to be mounted on Mac, and click 'OK'.

Linux Users (NFS)

Steps to connect to a NAS share folder:

Execute the following command in client Linux console:

mount –t nfs <NAS IP>:/<Path-To-NFS-Share-Folder> <Directory to Mount>

Example:

NAS IP address: 172.16.0.1

Path to NFS Share Folder: /vol/LV_2/nfsshare

Directory to Mount: /mnt/share1

Use the following sample command on the Linux client computer:

mount –t nfs 172.16.0.1:/vol/LV_2/nfsshare /mnt/share1

To check the NAS NFS export list (path to NFS share folders), execute from console of Linux NFS client computer:

showmount –e <NAS-IP>

Example:

showmount –e 172.16.0.1

NOTE: On the Linux NFS client computer, you must be logged on with the root privileges to be able to mount successfully.
After mounting network share folder of NAS, you access the data on the mounted directory.

Chapter 3 System Management

3.1 Basic Layout of NAS Management GUI

There are 3 parts of the basic layout of NAS GUI, see Figure 3.1-1.

Part 1. **Top Menu**:

Shortcut Bar contains shortcut buttons of commonly used functions for quick access. Shortcut icon for System Log, File Manager, Buzzer, all APP list and Logout.

Part 2. **Left Tree**:

App Search: To find out a particular application or function, type the text to search for.

App List: All NAS functions are listed as tree view. You can click or click to expand tree view of all function tree.

Multi Node List: As shown in Figure 3.1-2, this lists all detected NAS that are in the same subnet. QLaunch can be downloaded here. QLaunch is a tool to scan and discover all NAS systems in the network.

Part 3. **Right Content**: This shows the NAS status and settings and configuration options.

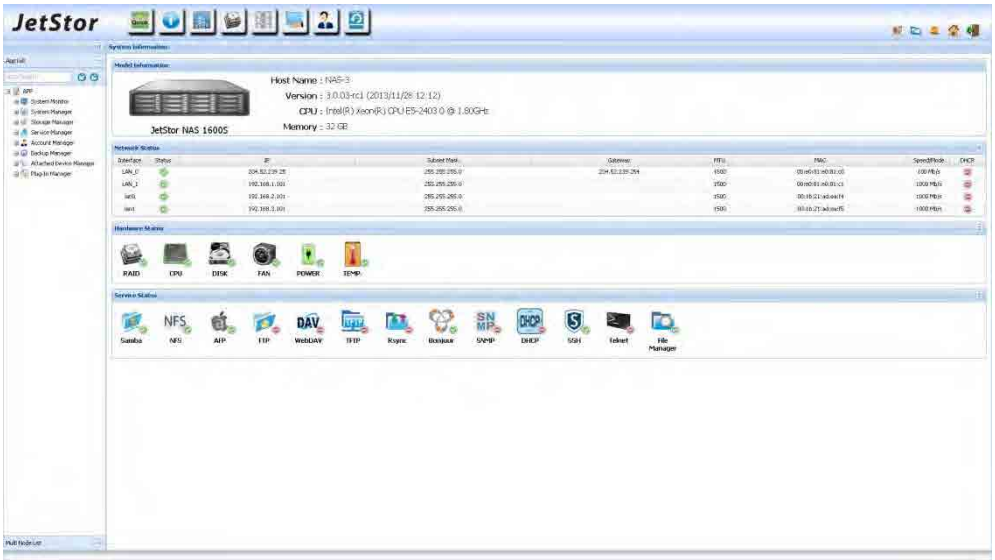


Figure 3.1-1 Basic NAS GUI Layout

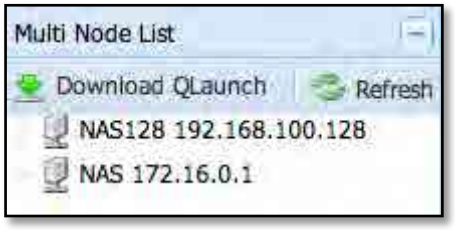


Figure 3.1-2 Multi Node List

You can click "<<" between the tree view and content view (on the upper side) to hide the left tree and change the content view into full mode for better viewing, in some case like viewing in tablet device. (Figure 3.1-3). Click ">>" to change back to normal view.

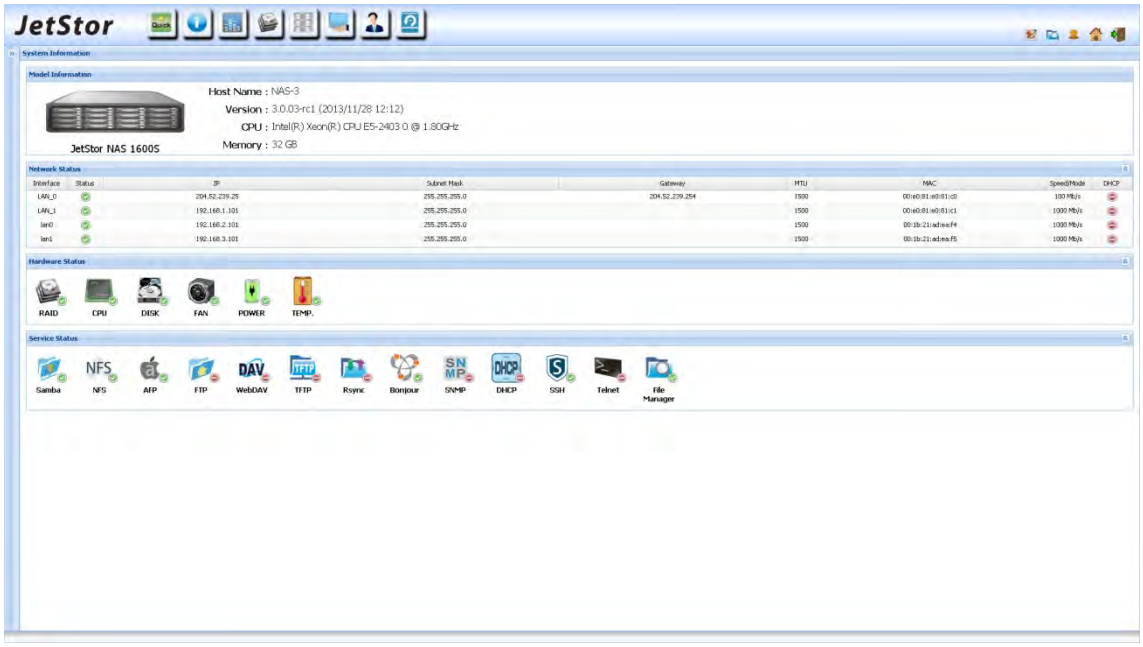


Figure 3.1-3 Hide the tree view list

3.2 Top Shortcut Bar

Figure 3.2-1 Shortcut Bar

Administrators can place frequently used functions in the shortcut bar for quick access.

Default functions in top Shortcut Bar

Icon	Function	Description
	Quick Wizard	**Wizard that can be used to setup NAS functions quickly**
	Information	**For viewing the NAS information and status**
	Resource Monitor	**For checking the usage of system resources**
	Array Manager	**For creating / editing Array**
	Volume Manager	**For creating / editing Volume**
	Share Manager	**For create / editing Share folder**
	Account Manager	**For creating / editing Account**
	Backup Manager	**For creating / editing Backup Plan**

Modifying Shortcut Functions in the Shortcut Bar

To Add:

Select the function on the left tree (App List), drag and drop the icon to the top Shortcut Bar. The selected function will be automatically added in the Shortcut Bar. Please note that the maximum number of shortcut icons that can be placed on the Shortcut Bar is 9.

To Remove:

On the Shortcut Bar, press and hold your mouse button on the function icon and drag the mouse cursor anywhere to the right. The selected function will be automatically removed from the Shortcut Bar. Please note that "Quick Wizard" cannot be removed.

There are some small shortcut icons on the top right side of the GUI. There icons are system default and cannot be modified.

Icon	Function	Description

	System Log	For viewing system logs (see Section 3.3.3)
	File Manager	This icon enables “admin” user to redirect to the File Manager web page (see Section 3.11)
	Buzzer	This is used to enable/disable alarm beeper when hardware event occur.
	Home	Show all App List to easily find all functions. (Figure 3.2-2)
	Logout	Exit the management GUI

NOTE: If you do not logout by clicking the Logout icon, you will not be allowed login again on another web browser until the GUI has timed out.

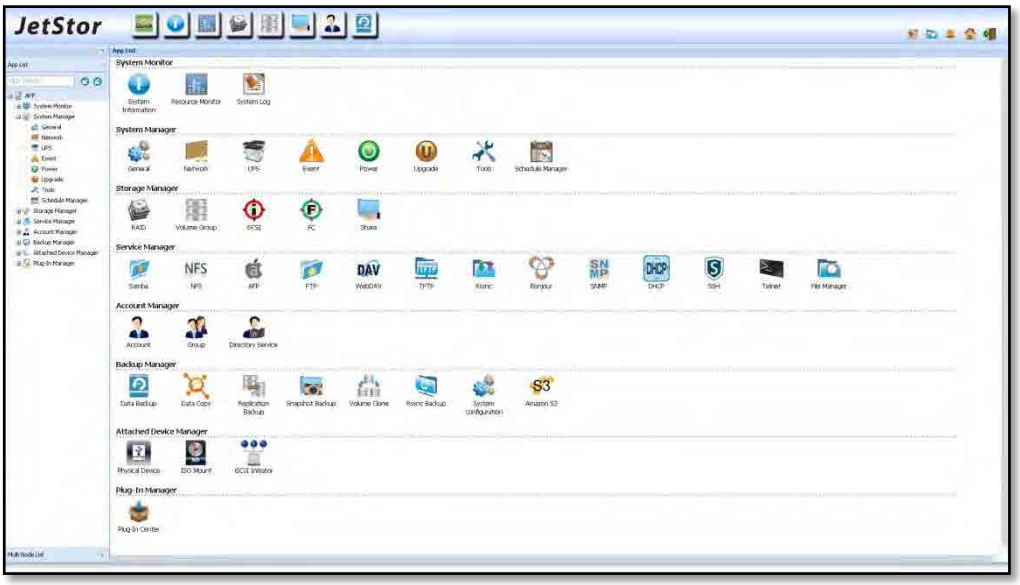


Figure 3.2-2 Home button lists all function

3.3 System Monitoring

System monitoring provides administrators with information regarding NAS system resources. Admin can also check the system event log, allowing the administrator to be updated with the latest state of the system, and this information can be a basis for adjusting system configurations.

3.3.1 System Information

The System Information provides administrators with information regarding NAS model, network status, hardware status, and service status, as shown in Figure 3.3.1-1.

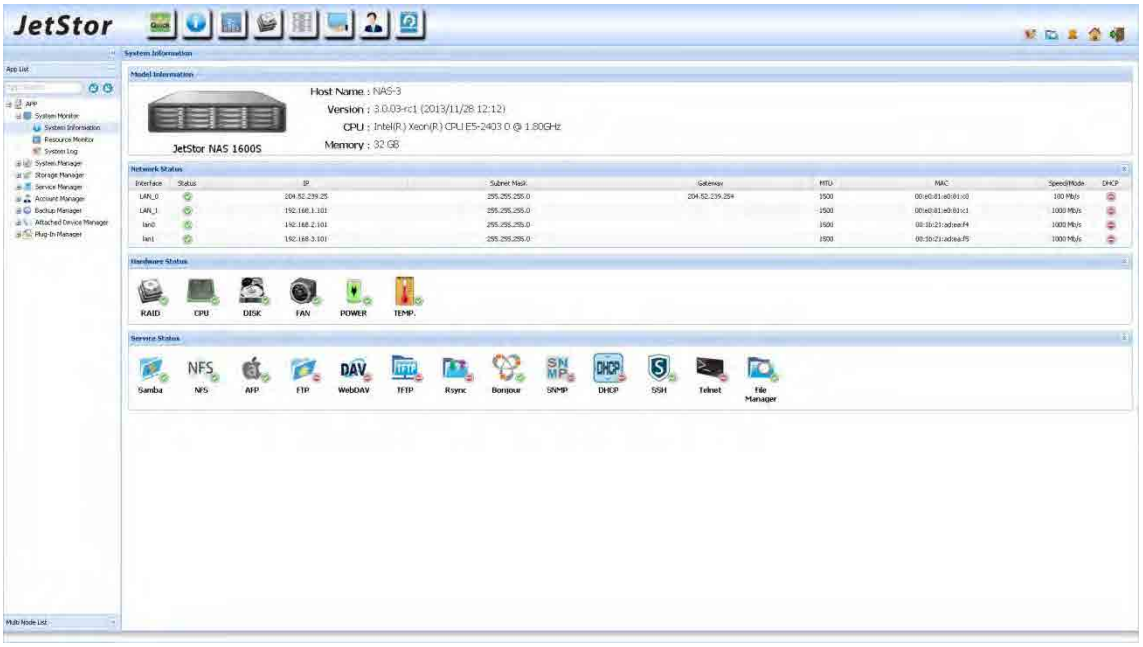


Figure 3.3.1-1 System Information

3.3.2 Resource Monitor

As shown in Figure 3.3.2-1, the Resource Monitor provides graphical information of usage of system resources, such as CPU, memory, and LAN ports. The statistics or usage of various resources are displayed, and updated (refreshed) periodically.

Statistics of System Resources:

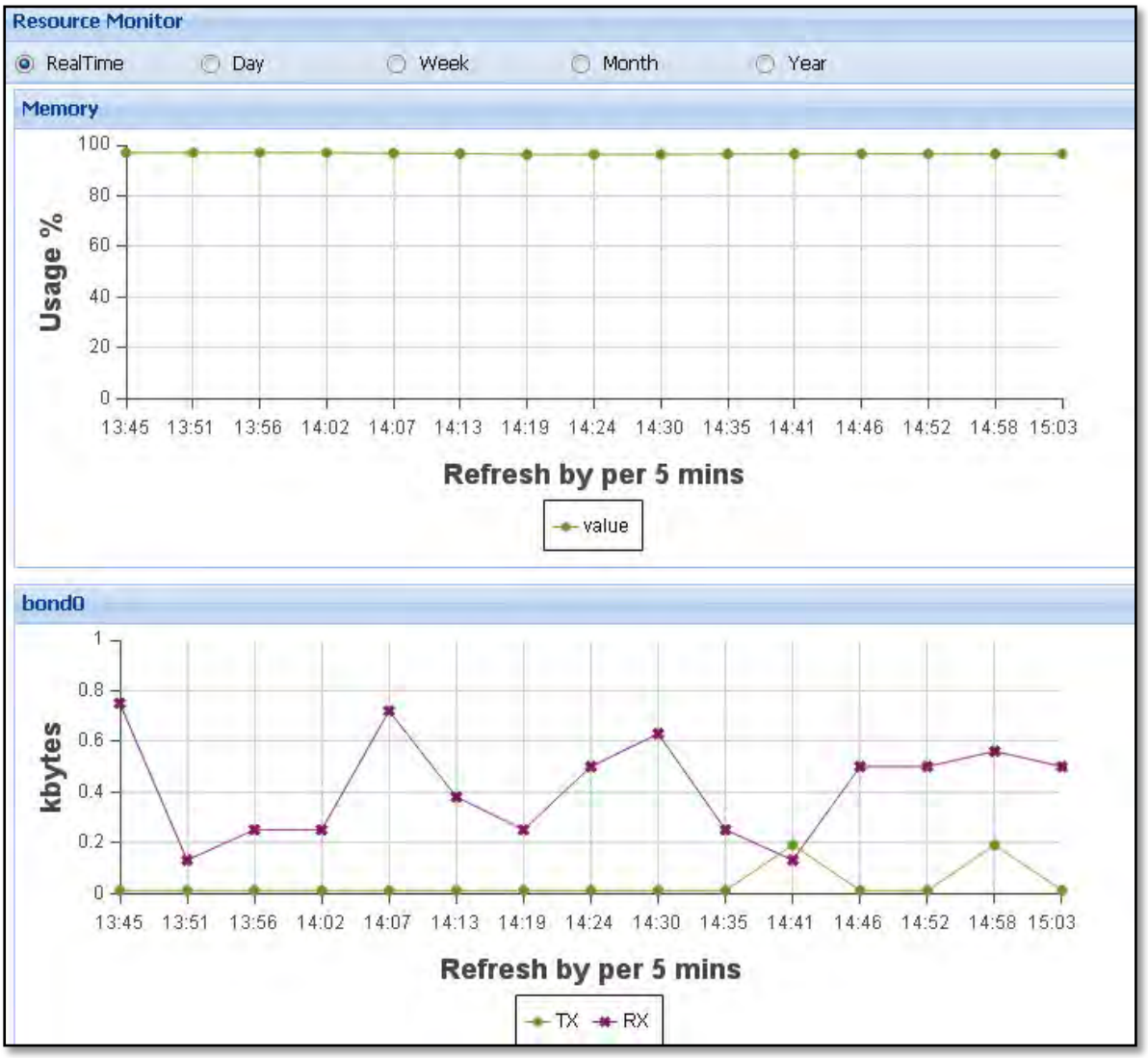


Figure 3.3.2-1 Resource Monitor

The chart can be shown by RealTime, Day, Week, Month or Year view. (See Figure 3.3.2-1)

3.3.3 System Log

Administrators can view the records of system events in the System Log. Refer to Figure 3.3.3-1. All logs can be filtered by Date, Type and Level.

Type : Event type can be filtered, such as All, System, Storage, Service, Account, Backup, Schedule, and PlugIn.

Level: Level can be filtered such as all, ERROR, WARNING, and INFO.

Download Log: Administrators can save the NAS logs to a local computer. Click "Download log" and the NAS system will save the system log to the computer where NAS webpage was opened. The NAS system log is useful in analyzing NAS systems problems. Administrators can download the system log first and then analyze the logs. The saved log default filename is "NASlog.tgz".
This function is very useful for system trouble shooting.

Clear All Log: Administrator can clear all logs with this button, but it is not recommended.

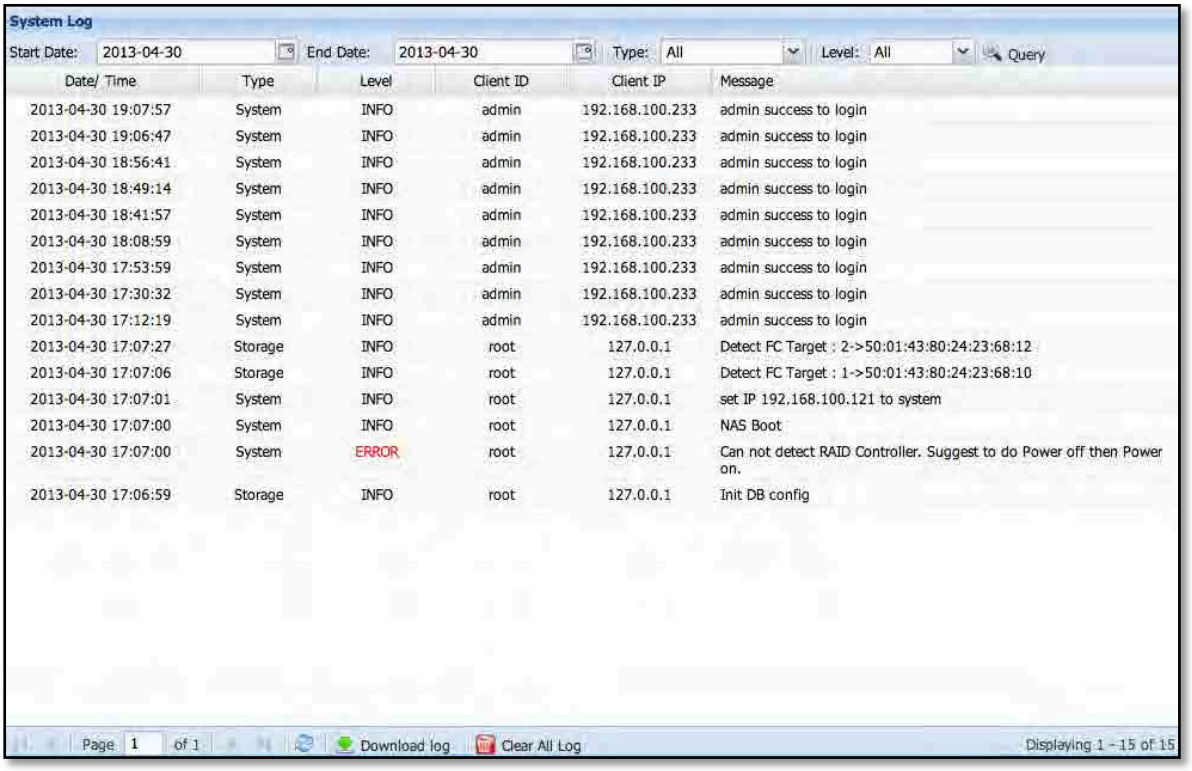


Figure 3.3.3-1 System Log

3.4 System Manager

The System Manager enables NAS administrators to configure system setup such as Date/Time settings, Network settings, UPS settings, Event settings, Power settings, and Schedule Manager, and upgrade the NAS firmware version.

3.4.1 General

In General setting, admin can set or modify the "GUI" and "Date/Time" settings and other related options.

Host Name: Admin can set the NAS Host Name, which can be up to 16 characters and can only contain letters, numbers, hyphen (-) and underscore (_). A space or a period (.) cannot be used. Host name containing numbers only is also not allowed; it must contain at least one non-numeric character. See Figure 3.4.1-1.

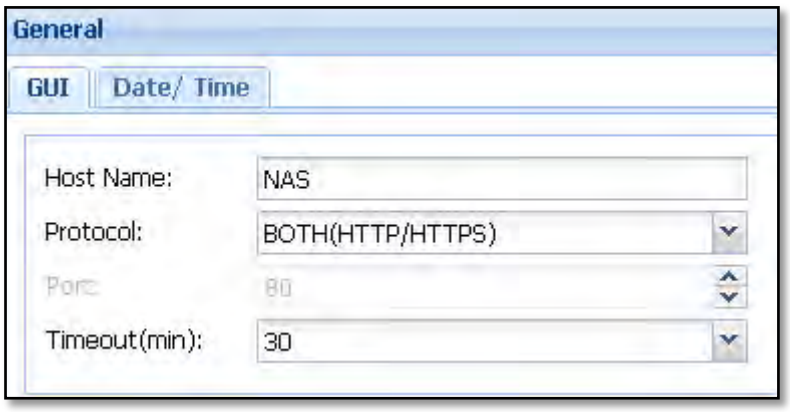


Figure 3.4.1-1 General Setting

Protocol: Default web GUI protocol is set to "Both (HTTP/HTTPS)". There are three possible options: "HTTP", "HTTPS", and "Both (HTTP/HTTPS)".

Port: Default port is set to 80. If changed to another port number, option range is from 1 to 65536.

Timeout (min): Default is 5 minutes, which means admin will be automatically logged out from GUI if there is no activity (idle) in the GUI for 5 minutes. There are four options: 5, 15, 30, and Never. "Never" means no GUI timeout.

NOTE: Don't forget to logout GUI if Timeout is set to "Never", else you cannot login the GUI again from other web browser or PC.

Date / Time

Set up the NAS time and time zone here. See Figures 3.4.1-2 and 3.4.1-3.

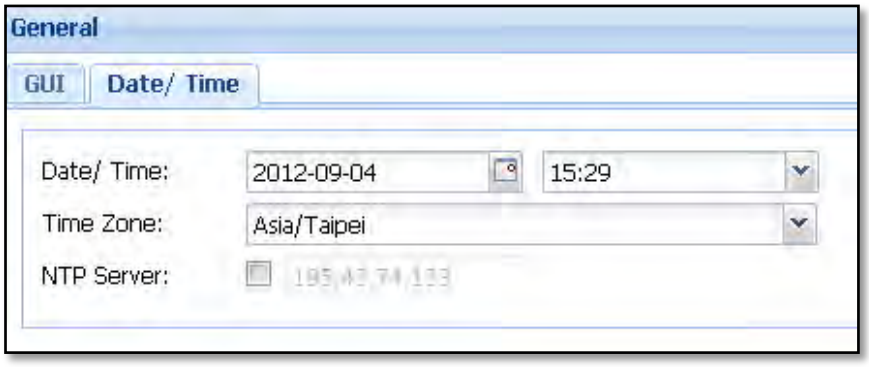


Figure 3.4.1-2 General Date/Time setting

To change the date, click the calendar icon and select the preferred date.

To change the time, click arrow-down button in Time option, and select the preferred time.

To set the time zone, click the arrow-down button in Time Zone option, and select the preferred time zone.

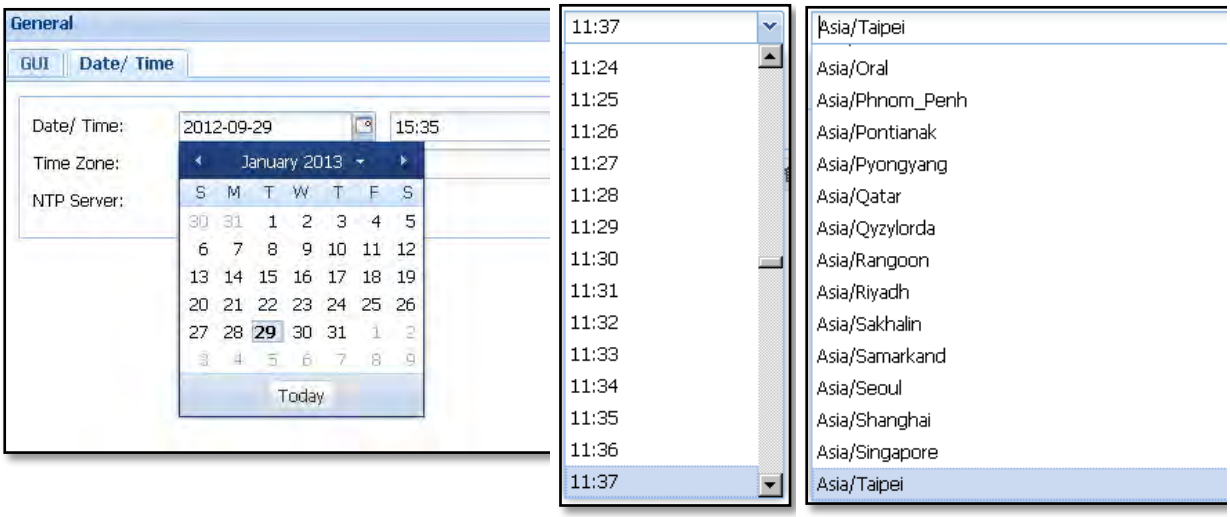


Figure 3.4.1-3 General Date/Time Setting

NTP Server: To enable the NAS to synchronize time from an NTP server, select the NTP Server box (check mark will appear) and then enter the NTP server's IP address or fully qualified domain name. See Figure 3.4.1-2. (After NTP Server setting is done, system will sync time from NTP server every 24 hours.)

Sync Local Time to NAS: If you want to synchronize the NAS system time from local time of PC (which you used to login the NAS management GUI), click the "Sync local time to NAS" button.

Apply: After modifying settings, click "Apply" to save changes.

3.4.2 Network

Network management provides options to configure settings such as Adapter, DNS, IPv6, Security, and Routing Table.

Adapter:

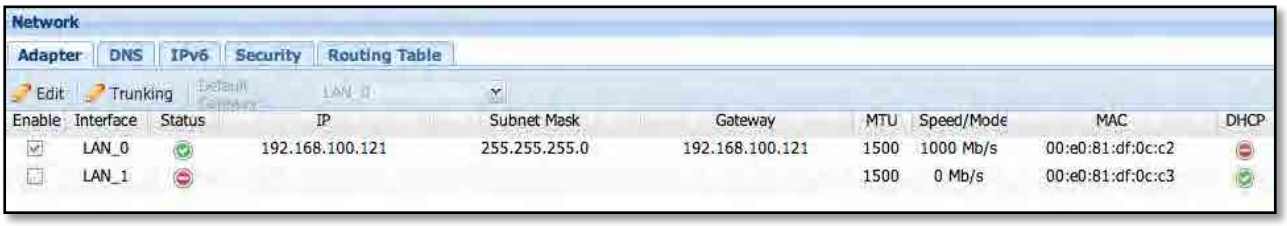


Figure 3.4.2-1 Network Setting

Changing Adapter settings:

Edit:

Select interface on the list (Figure 3.4.2-1), for example 'LAN_0' and then click the 'Edit' button. The following screen will be shown (Figure 3.4.2-2).

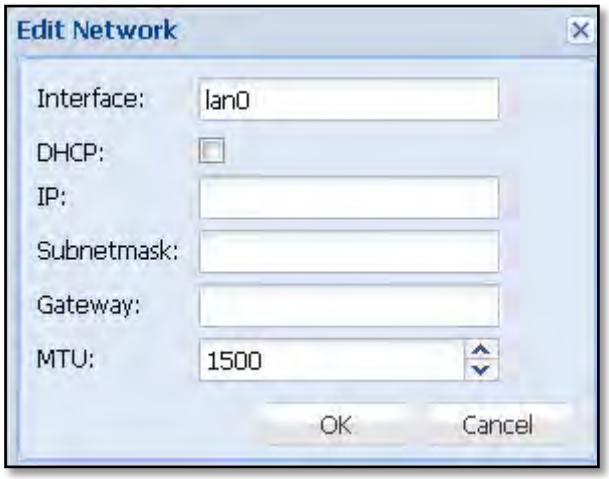


Figure 3.4.2-2 Edit Network Setting

Interface: The LAN Port name. (This name is fixed and can't be modified.)

DHCP: Click the DHCP box to enable DHCP client option (default is disabled). NAS will get a DHCP assigned IP address from a DHCP server, if DHCP server is available.

IP: To use static IP address (DHCP option is not checked), enter the preferred IP address, for example 192.168.1.1. In 'Subnetmask', enter a valid subnet mask, such as 255.255.255.0. In 'Gateway', enter a valid gateway IP address, for example 192.168.1.254.

(Default IP Address / Subnetmask / Gateway are: 172.16.0.1 / 255.255.255.0 / 172.16.0.1)

MTU: Set the Maximum Transmission Unit size of the network packets, in bytes. (Default is 1500)

Trunking:

Trunking enables multiple network interfaces to be combined to form a single channel.

To setup Trunking, click 'Trunking' button, and the following screen will be shown.

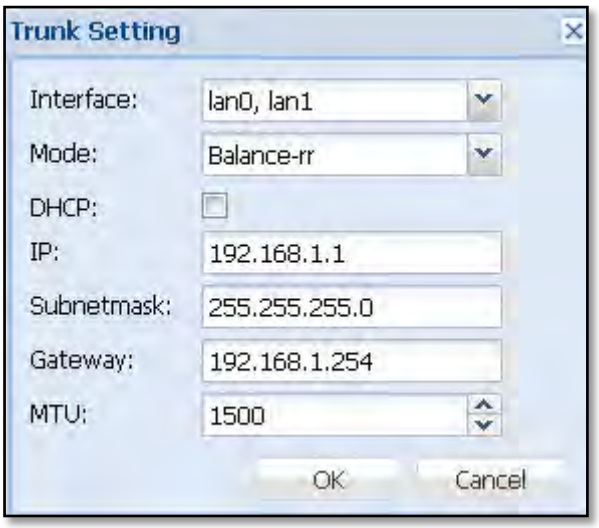


Figure 3.4.2-3 Edit Trunk Setting

Interface: Click the arrow-down button on the right, and then select which LAN ports will be included in Trunking mode. (This is multiple-choice.) After Trunk Setting setup is done, click "**OK**".

Mode: Please refer to the following list for options and description of each option.

Mode	Description	Switch Required
Balance-rr (Round-Robin)	Round-Robin mode is good for general purpose load balancing between two Ethernet interfaces. This mode transmits packets in sequential order from the first available slave through the last. Balance-rr provides load balancing and fault tolerance.	Supports static trunking. Make sure static trunking is enabled on the switch.
Active Backup	Active Backup uses only one Ethernet interface. It switches to the second Ethernet interface if the first Ethernet interface does not work properly. Only one interface in the bond is active. The bond's MAC address is only visible externally on one port (network adapter) to avoid confusing the switch. Active Backup mode provides fault tolerance.	General switches

Balance XOR	Balance XOR balances traffic by splitting up outgoing packets between the Ethernet interfaces, using the same one for each specific destination when possible. It transmits based on the selected transmit hash policy. The default policy is a simple slave count operating on Layer 2 where the source MAC address is coupled with destination MAC address. Alternate transmit policies may be selected via the xmit_hash_policy option. Balance XOR mode provides load balancing and fault tolerance.	Supports static trunking. Make sure static trunking is enabled on the switch.
Broadcast	Broadcast sends traffic on both network interfaces. This mode provides fault tolerance.	Supports static trunking. Make sure static trunking is enabled on the switch.
IEEE 802.3ad (Dynamic Link Aggregation)	Dynamic Link Aggregation uses a complex algorithm to aggregate adapters by speed and duplex settings. It utilizes all slaves in the active aggregator according to the 802.3ad specification. Dynamic Link Aggregation mode provides load balancing and fault tolerance but requires a switch that supports IEEE 802.3ad with LACP mode properly configured.	Supports 802.3ad LACP
Balance-tlb (Adaptive Transmit Load Balancing)	Balance-tlb uses channel bonding that does not require any special switch. The outgoing traffic is distributed according to the current load on each Ethernet interface (computed relative to the speed). Incoming traffic is received by the current Ethernet interface. If the receiving Ethernet interface fails, the other slave takes over the MAC address of the failed receiving slave. Balance-tlb mode provides load balancing and fault tolerance.	General switches
Balance-alb (Adaptive Load Balancing)	Balance-alb is similar to balance-tlb but also attempts to redistribute incoming (receive load balancing) for IPV4 traffic. This setup does not require any special switch support or configuration. The receive load balancing is achieved by ARP negotiation sent by the local	General switches

	system on their way out and overwrites the source hardware address with the unique hardware address of one of the Ethernet interfaces in the bond such that different peers use different hardware address for the server. This mode provides load balancing and fault tolerance.	

Default Gateway:

Figure 3.4.2-4 Set Default Gateway to a Network Interface

In the Adapter list in Figure 3.4.2-1, to set Default Gateway, click the arrow-down button on the right (Figure3.4.2-4), and select the interface that will be assigned as default gateway. The NAS system supports only single default gateway interface. The default setting is LAN_0.

DNS:

As shown in Figure 3.4.2-5, NAS system supports up to two DNS server IP address.

To setup DNS server, enter the DNS server IP address in 'DNS Server 1'. If another DNS server will be setup, enter the other DNS server IP address in 'DNS Server 2'.

Apply: After modifying settings, click "Apply" to save changes.

Figure 3.4.2-5 Edit DNS Setting

Hosts Table:

Click “Hosts Table” (see Figure 3.4.2-5) to edit the Hosts Table. The Hosts Table contains mapping of IP addresses to hostnames. (See Figure 3.4.2-6.)

Figure 3.4.2-6 Edit Hosts Table

The Hosts Table can be modified to add IP address and hostname mapping. After editing Hosts Table, click ‘OK’.

LmHosts Table:

Click “LmHost Table” (see Figure 3.4.2-5) to edit the LmHosts Table. The LmHosts Table is a mapping of IP addresses to Samba NetBIOS names. It is similar to the Hosts Table, except that the hostname component must correspond to the NetBIOS naming format. (This is optional.)
The LmHosts Table can be modified and add IP address and NetBIOS hostname mapping. After editing LmHost Table, click ‘OK’. (See Figure 3.4.2-7.)

OK: After modifying settings, click “OK” to save changes.
Cancel: Click this to undo any changes.

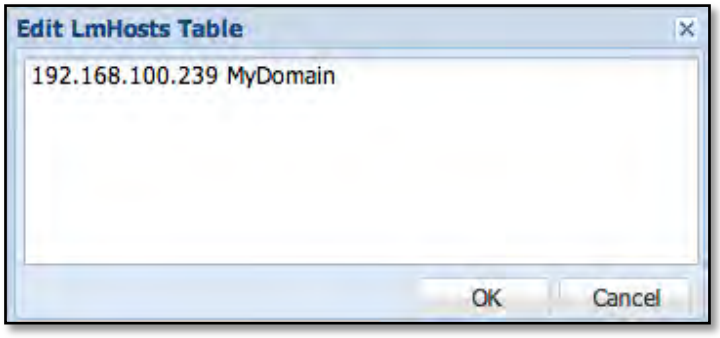


Figure 3.4.2-7 Edit LmHosts Table

IPv6:

By default, IPv6 is set to Disabled, as shown in Figure 3.4.2-8. IPv6 can be enabled by selecting “Enabled”. The default IPv6 IP will be displayed in the list after being enabled, as shown in Figure 3.4.2-9.

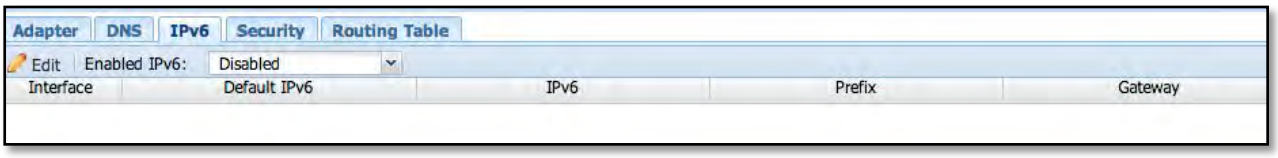


Figure 3.4.2-8 IPv6 Disabled by default

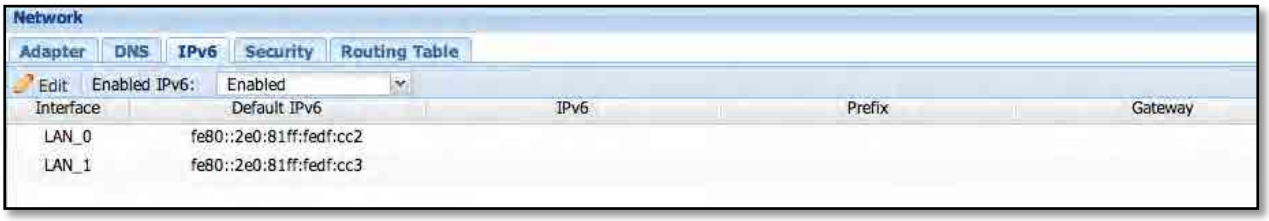


Figure 3.4.2-9 IPv6 Table after Set to Enabled

Edit:

Select an interface on the list, for example LAN_0, and then click the ‘Edit’ button. A screen like below will be displayed, and the IPv6 settings can be configured.

Figure 3.4.2-10 Edit IPv6 Setting

Interface: The LAN Port name. (This name is fixed and cannot be modified.)

IPv6: Enter the IPv6 address which is usually a 128-bit address, divided into eight groups separated by colon “:”, and each address is a hexadecimal digit representing 4-bits.

For example: 2001:0db8:85a3:08d3:1319:8a2e:0370:7344

Other IPv6 formats that can be used are shortened format such as omitting leading zeros or using double colon.

Prefix: Select the prefix.

Gateway: Input IPv6 Default Gateway.

Security:

The Security setting determines which client IP address or range of IP addresses are allowed or rejected access to the NAS resources.

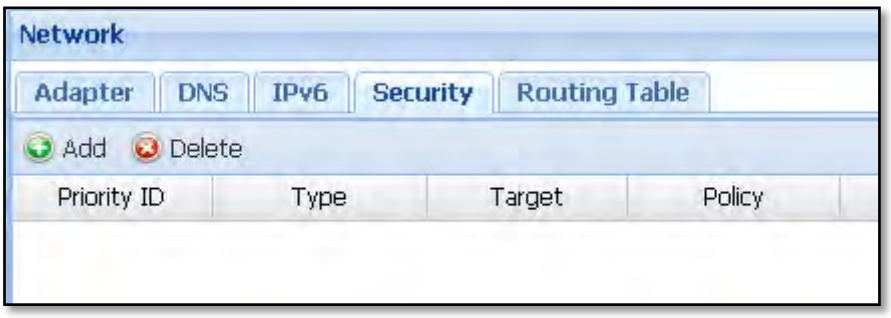


Figure 3.4.2-11 Security Table

Add: Click 'Add' to add a security setting. The screen below will be displayed.

Figure 3.4.2-12 Add Security Table

Type: There are 2 options: Single (for single IP address) or Range (for a range of IP addresses)

Priority ID: This setting allows the NAS system to make a judgment according to the level of Priority ID, with 1 as the highest priority. For example: If an IP address 192.168.1.10 is included in the Range type (192.168.1.1 – 192.168.1.20) and the Priority ID is set to 1 and Policy is ACCEPT (allow access), and the same IP address 192.168.1.10 is set as Single type with Priority ID 2 and Policy is DROP, the higher priority ID 1 will be the effective one, hence the IP address 192.168.1.10 will be allowed access.

Policy: There are 2 options: ACCEPT (allow the IP or range of IP) or DROP (reject the IP or range of IP)

IP: When the Type option is set as Single, enter a single IP address.
When the Type option is set as Range, enter the starting IP address and ending IP address for the range of IP addresses.

Routing Table:

Routing Table allows you to setup static routes to specific hosts or networks.

Figure 3.4.2-13 Routing Table

Add: Click 'Add'. The Add Route window will appear.

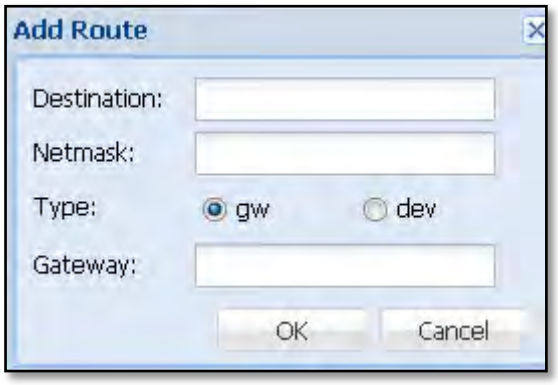


Figure 3.4.2-14 Edit Routing Table

Destination: Please enter the IP address or network range. For example: 192.168.0.1 or 192.168.0.

Netmask: Input a netmask, for example: 255.255.255.0

Type: If "gw" is selected, NAS will use the Gateway for routing packets. If "dev" is selected, NAS will use a LAN interface for routing packets.

Gateway: If "gw" is selected, please enter the gateway IP address. If "dev" is selected, please select a LAN interface.

OK: After modifying settings, click "OK" to save changes.

Cancel: To undo any changes, click "Cancel".

3.4.3 UPS

The NAS system supports UPS (uninterruptible power supply) equipment. (see Figure 3.4.2-5)

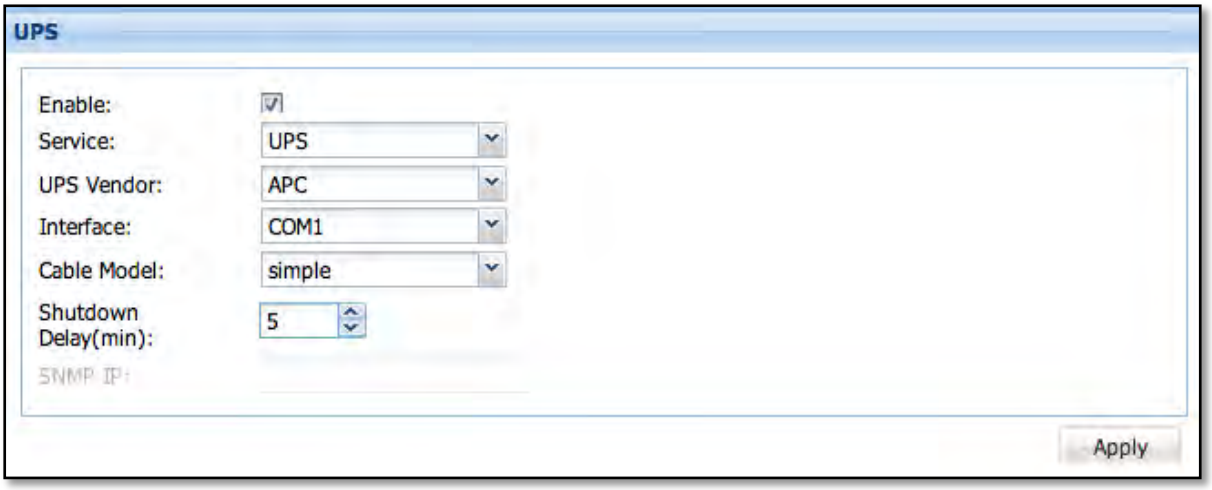


Figure 3.4.3-1 UPS Configuration

Enable: Select (check) this to enable support for UPS.
Service: UPS
UPS Vendor: (For example: APC)
Interface: There are three options for interface connection: COM1, USB, and SNMP.
Cable model: Please select the terminal type.

Interface	Cable model
COM1	simple/smart/ether
USB	usb
SNMP	ether

Shutdown Delay (min): Use this to set the delay time in minutes. After a power failure, UPS will shutdown the NAS when the Shutdown Delay time has expired.

SNMP IP: The IP address of APC UPS. This is enabled only when Cable model is set to SNMP.

Apply: After modifying settings, click “Apply” to save changes.

3.4.4 Event

Email setting:

Enable Email notification for sending message when a system failure event occurs.

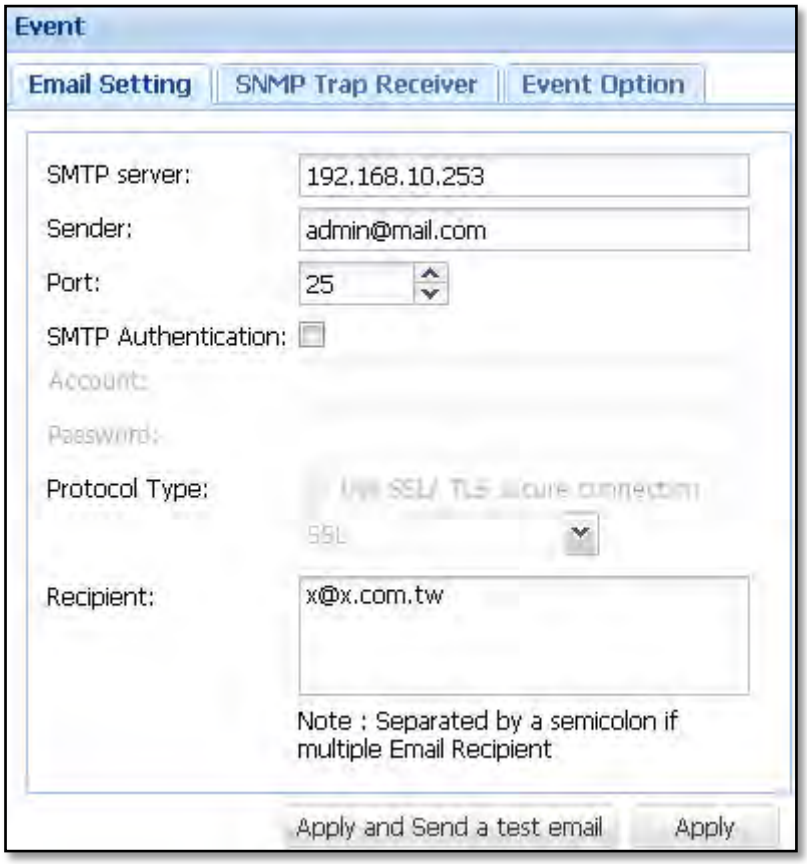


Figure 3.4.4-1 Event Setting

SMTP server: Input the SMTP server's IP address.

Sender: Input the sender's email address.

Port: Enter the port number used by SMTP server. Default port is 25.

SMTP Authentication: If the SMTP server requires authentication using username and password, please select (enable) it.

Account: Enter a valid SMTP account name.

Password: Enter the password of SMTP account name.

Protocol Type: If SMTP server supports SSL/TLS secure connection, please select (enable) it.

Recipient: Please enter the email address of the first email recipient. If there is more than one recipient, please separate them with a semicolon. For example: admin@nas.com; tony@nas.com

Apply and Send a test mail: Use this to save changes, and at the same time send a test email to the recipient(s).

Apply: Click to save changes.

SNMP Trap Receiver :

This setting provides SNMP trap notification by sending message when system failure event occurs.

Figure 3.4.4-2 SNMP Trap Setting

Trap Receiver IP: Input here the IP address of SNMP Trap Receiver, i.e. computer running SNMP application that will receive the event messages.

Apply and Send a test snmp trap: Use this to save changes, and at the same time send a test snmp trap to the Trap Receiver.

Apply: Click 'Apply' to save changes.

Event Option: This setting allows you to select which system failure events will be included when messages or event notifications are sent.

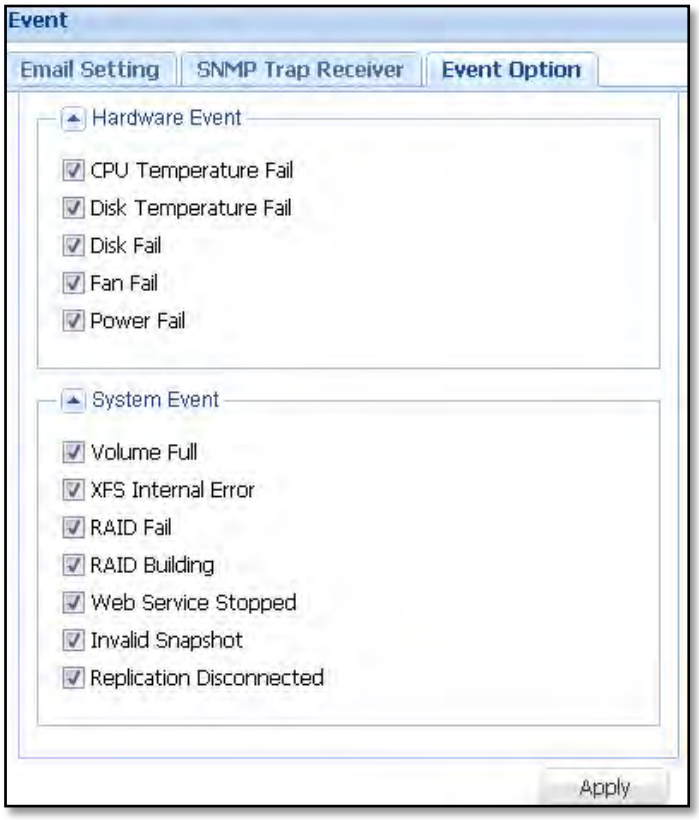


Figure 3.4.4-3 Event Options

Apply: Use 'Apply' button to save changes.

NOTE: The events selected in the Event Option will apply to both Email notification and SNMP Trap notification.

3.4.5 Power

Power provides option to Reboot or Shutdown the NAS system, or to reset the NAS system to factory default by deleting configuration and/or data.

Figure 3.4.5-1 Power Setting

NAS Reboot: Select 'Reboot Confirm' and click 'Reboot' button to reboot the NAS system.

NAS Shutdown: Select 'Shutdown Confirm' and click 'Shutdown' button to shutdown system.

NAS to Factory Default: To reset the NAS system to factory default settings, enter the text "ResetToDefault" in the 'Confirm Text:' box, and then click 'Reset to Factory Default' button.

Description of Options in Resetting to Factory Default:

Delete All: Delete all data, NAS config, and Array.

Keep Raid, Delete Data and Config: Delete NAS configuration and data, but the Array will be retained.

Keep Raid and Data, Delete Config: Delete NAS configuration, but the Array and data will be retained. Only the NAS system settings will be cleared and reverted to the default value. Array information and data will be retained.

The "Reboot" can also be defined with scheduled job in Schedule manager. (See Chap 3.4.8)

3.4.6 Upgrade

This page allows updating the NAS firmware version.

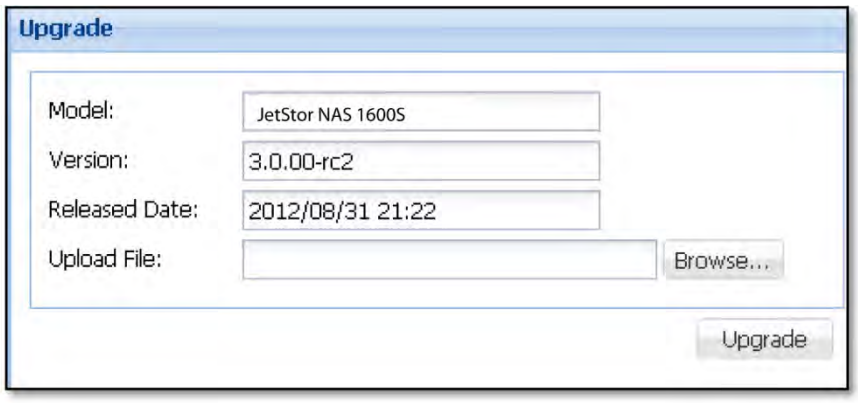


Figure 3.4.6-1 Upgrade

Click the '**Browse**...' button and select the firmware file, and then click '**Upgrade'**. The firmware file will be automatically uploaded and updated to the NAS system, after which the NAS system will reboot.

NOTE:

A. When NAS is updating, do not power off the NAS to avoid system update failure.

B. When NAS is updating, make sure that the client computers accessing the NAS data (such as share folders) have been disconnected to avoid damaging the data, because during firmware upgrade the NAS system will be rebooted automatically.

C. After upgrade and before re-login GUI, it is better to clear the web browser cache.

3.4.7 Tools

Tools provide the administrator with some useful functions. Select the function and then click 'Query'.

Tools options	Description
Connections	Shows current Samba (Windows Client), NFS, AFP (Mac Client), SSH, Telnet, and FTP client connections list.
ps	Shows the list of NAS system processes that are currently running.
df	Shows the usage information, such as used capacity or free space, of mounted volumes or partitions in the NAS system.
top	Shows the NAS system CPU and memory usage and program status.
ping	Can be used to test network connectivity. Enter the IP address to test network connection.
dmesg	Shows the kernel messages of NAS system boot-up process.
iostat	Shows the current disk device loading information or statistics.
netstat	Shows various information about the NAS system network connection.
syslog	Shows the latest system message log generated by kernel.

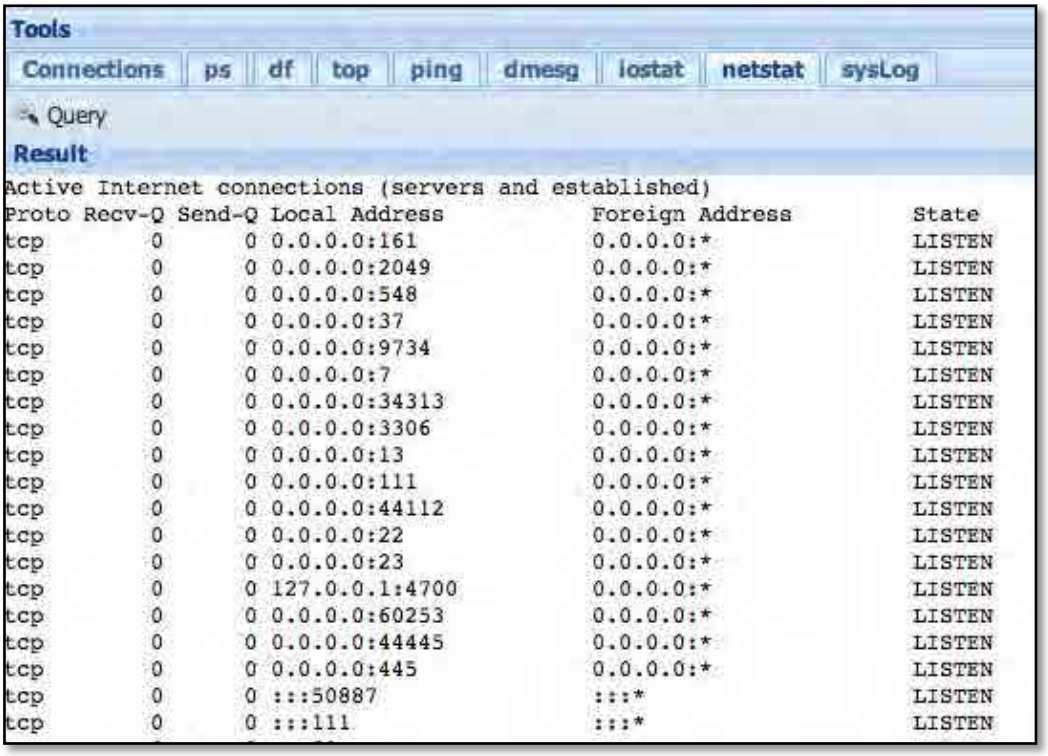


Figure 3.4.7-1 Tools

3.4.8 Schedule Manager

This function allows administrators to control scheduled tasks in the NAS. There are 5 Types of functions that can be set with schedule: Data Backup, Data Copy, Snapshot, Rsync and Power (Restart/ON/OFF).

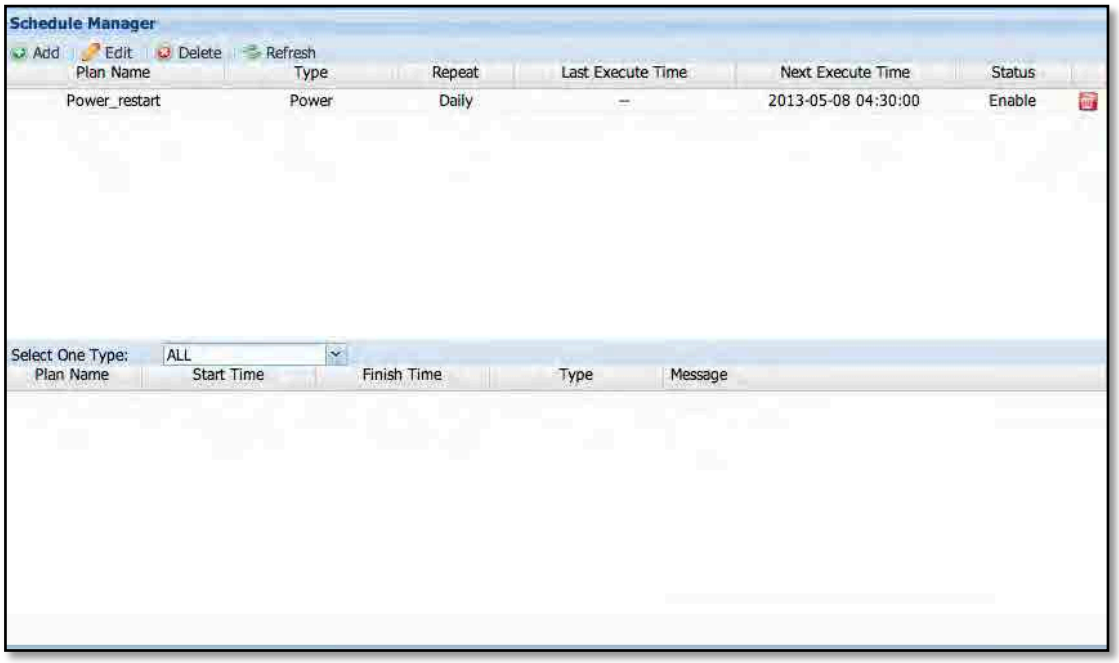


Figure 3.4.8-1 Schedule Manager

Add Schedule: Click '**Add**' button. The setup screen below will appear.

Figure 3.4.8-2 New Schedule Task

Type: This field has five options: Data Backup, Data Copy, Snapshot, Rsync and Power.

Plan Name: Select the name of the backup plan (available only in Data Backup, Data Copy, Snapshot, and Rsync).

Action: Select the type of action for the schedule, such as Power Restart, Power ON, or Power OFF (available only in Power).

Start Date: Select the date when to start backup. Please select current date or a future date.

Start Time: Select the time when to start backup. This field is a 24-hour clock.

Repeat:

Option	Description
Disabled	Disables the backup schedule. When you need to temporarily turn off this schedule, you can use this option to pause the backup schedule.
Once	This option will perform a one-time backup based on the set date and time. This option will change to Stop when this scheduled backup has run once.
Hourly	The hourly schedule will be based on the start date and time. Every hour, the scheduled backup will be executed.
Daily	The daily schedule will be based on the start date and time. The scheduled backup will be performed daily.
Weekly	The weekly schedule will be based on the start date and time. The scheduled backup will be executed weekly.
Every 2 weeks	Every two weeks schedule will be based on the start date and time. Scheduled backup will be performed once every two weeks.
Monthly	The monthly schedule will be based on the start date and time. Once a month, the scheduled backup will be performed.
Yearly	The annual schedule will be based on the start date and time. Every year, the scheduled backup will be executed.

NOTE:

A. The same backup plan name cannot be selected to have different schedule settings.

B. When setting backup schedule, the past date and time cannot be selected.

C. Setting scheduled tasks with time too close to each other is not recommended.

Edit schedule: Select a schedule and click '**Edit**' to modify schedule, such as the Start Date, Start Time, and Repeat settings.

Delete a schedule: Click at the right column of the plan to be deleted.

3.5 Storage Manager

This page allows administrators to do Array (RAID) configuration and disk allocation, and management of Volume Groups and Logical Volumes, iSCSI and FC volumes, and Share folders.

3.5.1 RAID / Array Manager

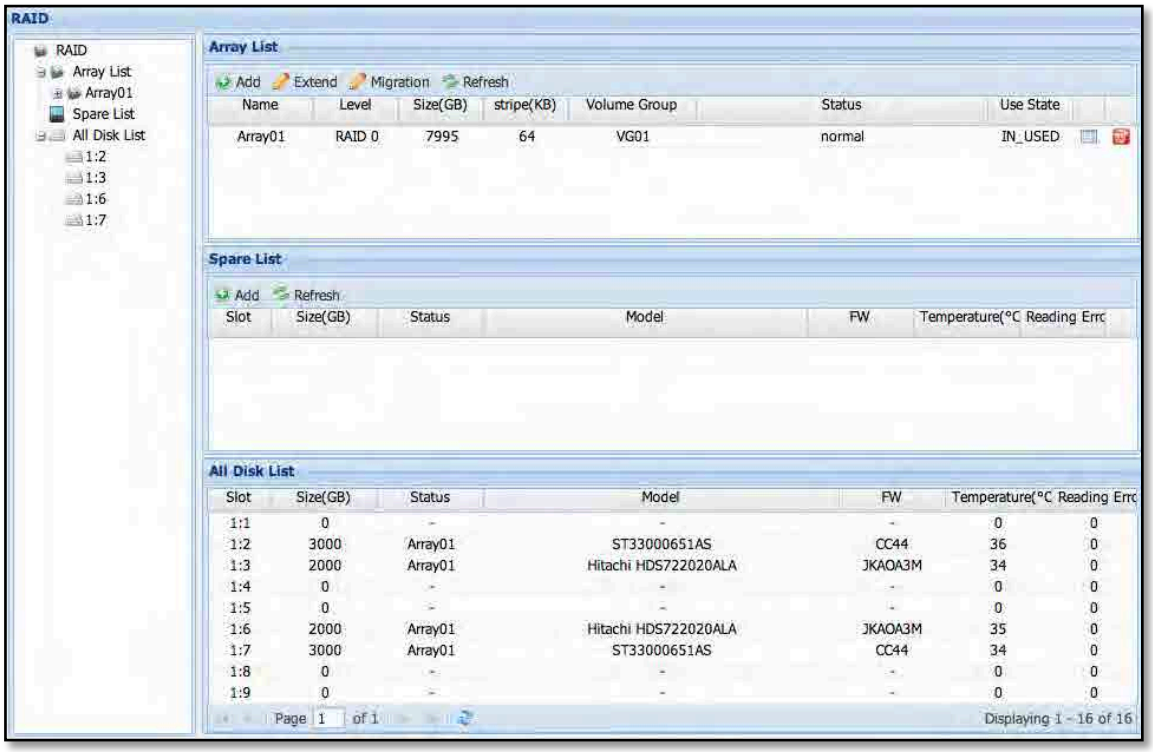


Figure 3.5.1-1 Array Manager

Functions on Array Manager (left pane):

Array List:

A. Displays the list of existing Arrays, and the member hard disks in each Array

B. After selecting the Array List option, on the right pane you can select an Array and do Add/Extend/Delete Array operation.

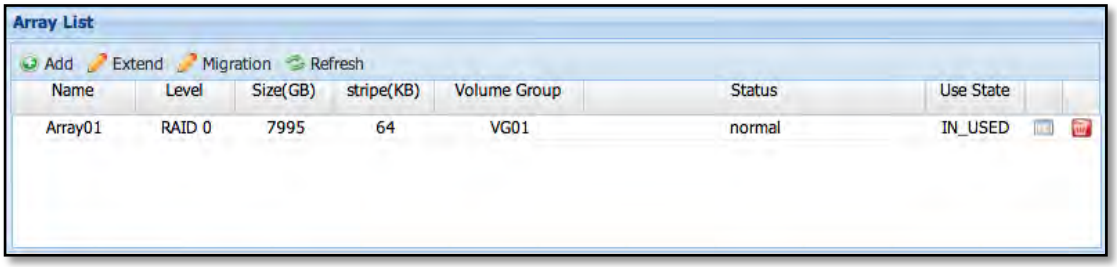


Figure 3.5.1-2 Array List

Add: Press '**Add**' button. The Add Array window will appear.

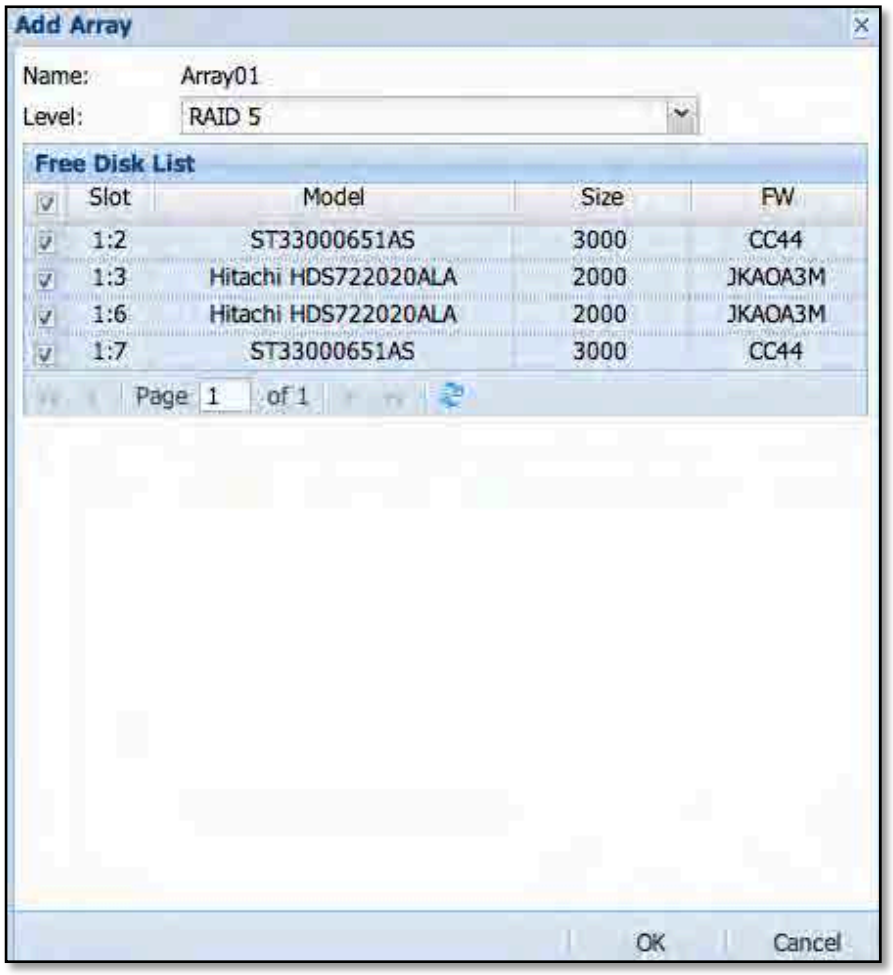


Figure 3.5.1-3 Add Array

Name: Displays the Array name. System will automatically generate an Array name and can't be modified.

Level: Select the RAID Level for the Array. The NAS supports RAID levels 0, 1, 3, 5, 6, 10, 50 and 60 (by selected model). The detailed information of each RAID level is described in the succeeding page.

Free Disk List: This is the list of unused hard disks. Administrator can select which hard disk to include in the Array.

Slot: Shows the Chassis ID: hard disk slot number

For example: 1:9 is the first chassis (usually the NAS chassis itself) and 9th slot hard disk

Model: The hard disk model

Size: The hard disk capacity; unit is gigabytes (GB).

FW: The hard disk firmware version.

Extend Array: Select the Array name then click 'Extend' button, and then choose an unused hard disk that will be used for Array expansion.

NOTE:

a. If an Array is already in use (has been assigned to a volume group), this Array cannot be deleted.

b. If initialization of new Array is completed, but new Array does not appear in the list, click ' Refresh ' or ' ' to update the Array List.

Delete Array: On the left pane, select 'Array List' under 'Array Manager' (RAID), then on the Array List on right pane click the delete icon on the right side of the Array to be deleted.

Before deleting an Array, please make sure that the selected Array is not in use, such as Array is included in a volume group. If Array is included in a VG, delete first the VG. After VG is deleted, then the Array can be deleted.

If a VG contains existing logical volume(s) and share folder(s), delete first the share folder(s) and logical volume(s), and then delete the VG and the Array.

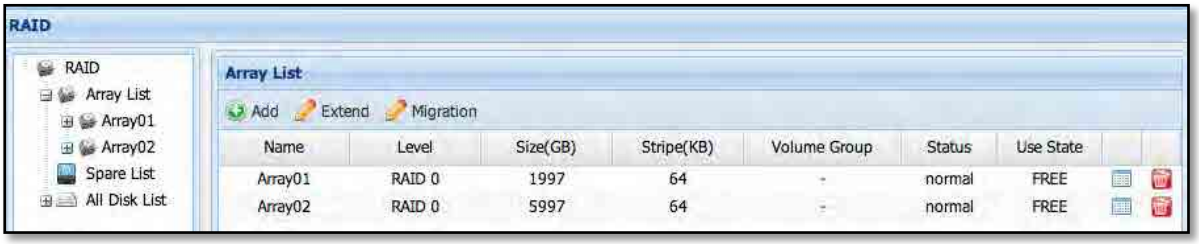


Figure 3.5.1-4 Array Manager (RAID)

After clicking the delete icon, a confirmation window will appear to confirm deletion of selected Array. Select the 'Confirm:' box and click the 'Yes' button to confirm the deletion of Array. System will delete the selected Array.

Figure 3.5.1-5 Confirm Message to Delete an Array

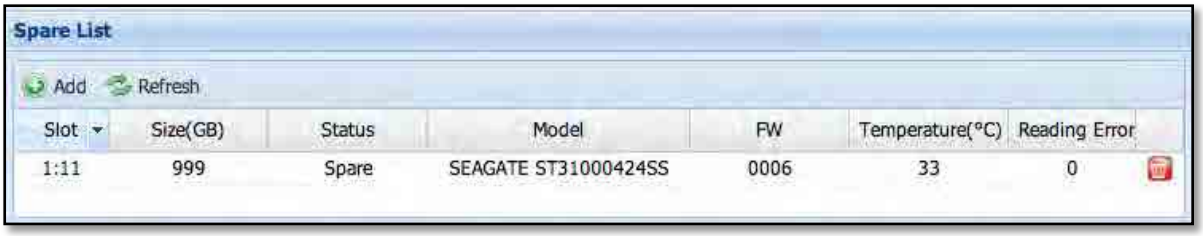


Figure 3.5.1-6 Spare List

Spare List: On the right pane, the Spare List (Figure 3.5.1-6) will show the list of Hot Spare hard disks. You can add an unused hard disk as Hot Spare.

Add Spare: Click 'Add', select a hard disk, and click 'OK' button. In Confirm window, select the 'Confirm:' box and click 'Yes'. The hard disk will be set as Hot Spare.

Delete Spare: To delete a Hot Spare hard disk and make it as unused hard disk, click the delete icon on the right of the Hot Spare hard disk.

After that, the confirmation window will appear (Figure 3.5.1-7) . To confirm deletion of Hot Spare hard disk, check the 'Confirm:' box and click the 'Yes' button. The selected Hot Spare hard disk will become unused hard disk.

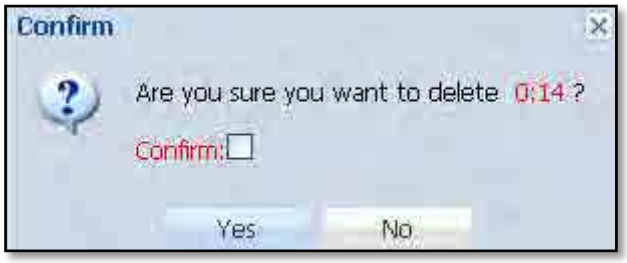


Figure 3.5.1-7 Confirm Message to Delete a Spare Disk

All Disk List: After selecting this option, a list of all hard disks and hard disk status will be shown on the right pane.

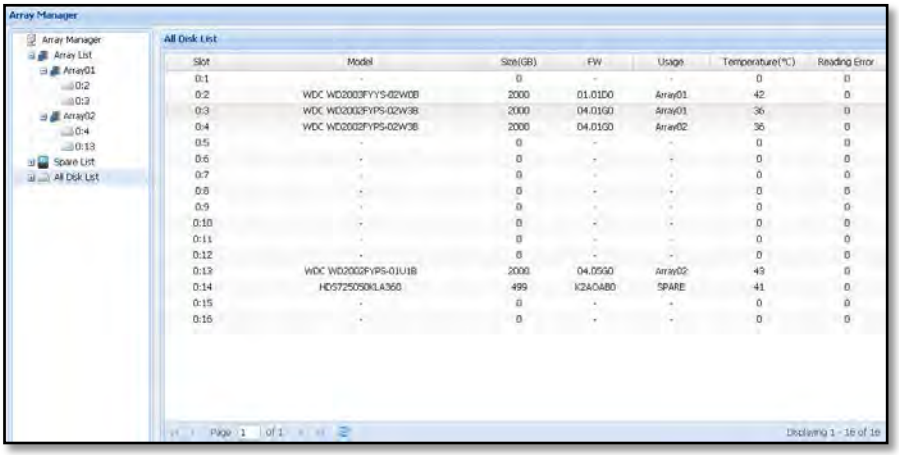


Figure 3.5.1-8 All Disk List

3.5.2 Volume Group Manager

Volume Group (VG) is a storage pool for creating logical volumes. You need to create at least one VG (first VG is VG01) by adding an Array (for example Array01) to initialize the NAS system and enable NAS functions.

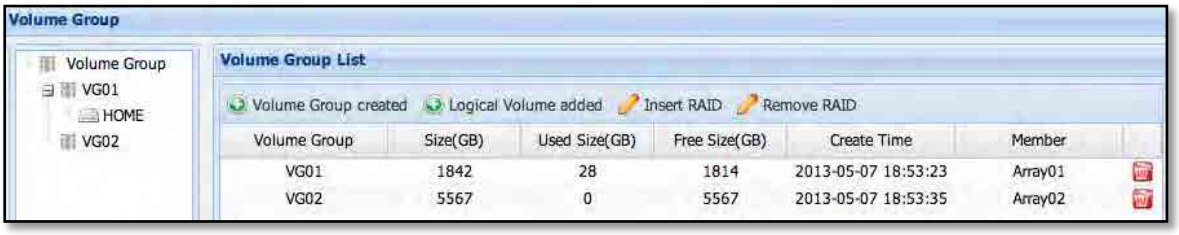


Figure 3.5.2-1 Volume Group Manager

Add: To add a Volume Group, click 'Add' button, and then select the Array name to be included in the VG and click 'OK' button. The NAS system will automatically create the new Volume Group.

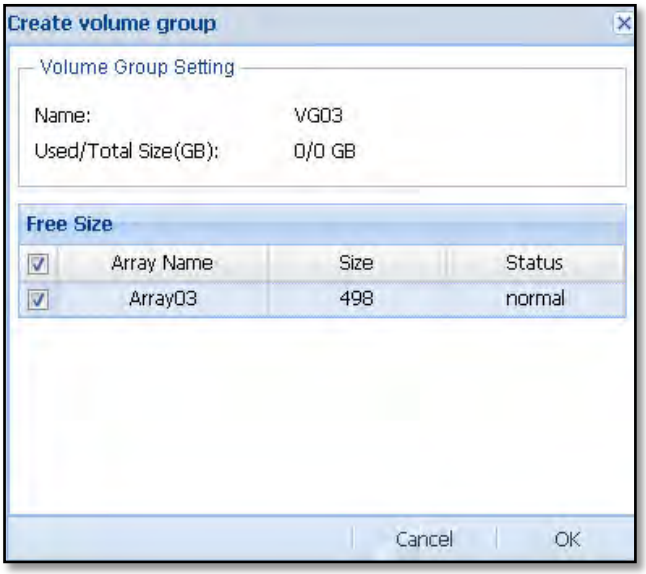


Figure 3.5.2-2 Create a new Volume Group

Insert Array: To expand the size of a Volume Group, select the Volume Group name and click 'Insert RAID' button. Select the Array name that will be joined to the VG, and then click 'OK'. In Confirm window, select the 'Confirm:' option and click 'Yes'. The NAS system will automatically expand the size of the selected VG using the added Array.

Remove Array: To remove an Array from a Volume Group, select the Volume Group name and click 'Remove RAID', and then click 'OK' button. In Confirm window, select the 'Confirm:' option and click 'Yes'. The NAS system will automatically remove the selected Array from the VG, and the VG size will be reduced accordingly.

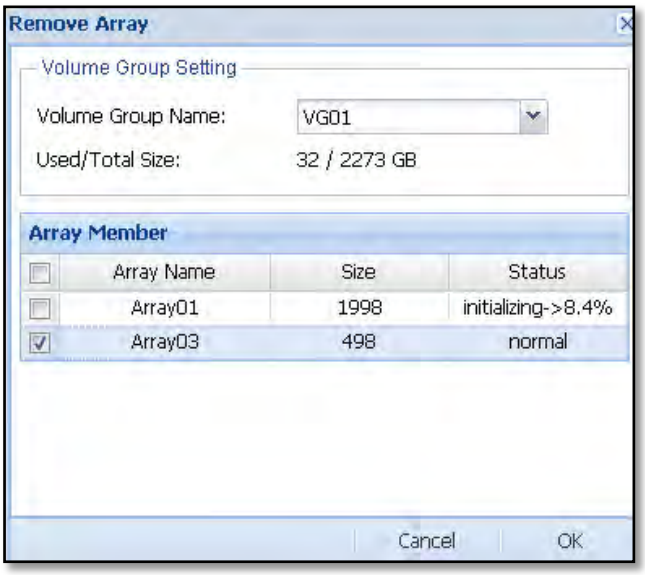


Figure 3.5.2-3 Remove Array

Add: To create a Logical Volume (LV) from a Volume Group

a. Select first the Volume Group name (VGXX) where a Logical Volume will be created, and then click the 'Add' button under Logical Volume List.

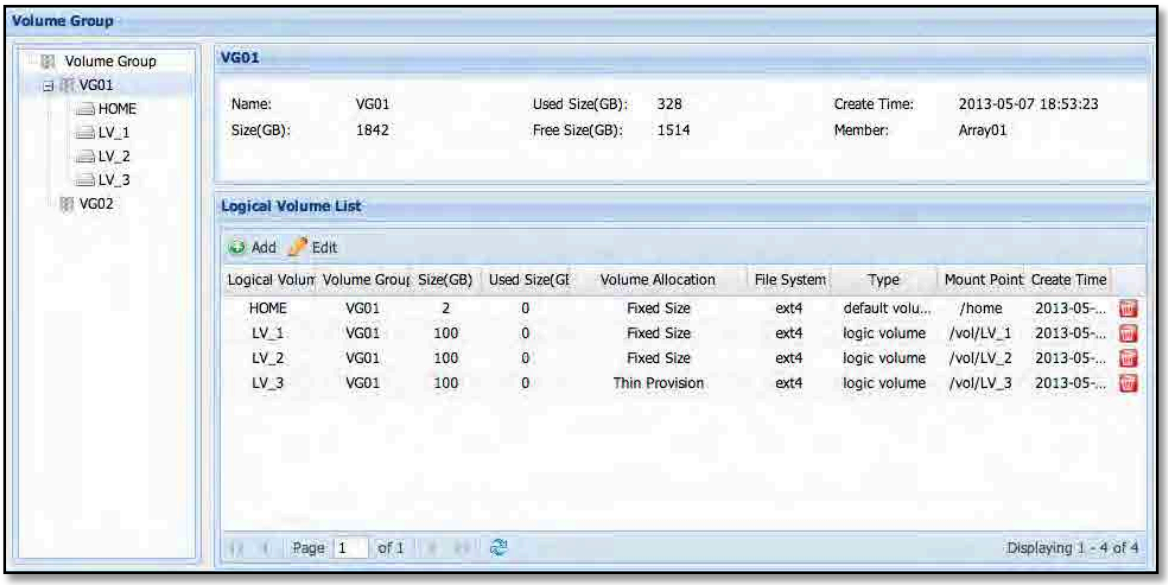


Figure 3.5.2-4 Volume Group Status

b. The ‘Add Logical Volume’ window will appear. Enter the logical volume name, change the Volume Group Name where the LV will be created if necessary, select the file system format for the LV, and set the LV size. Click ‘OK’ when done.

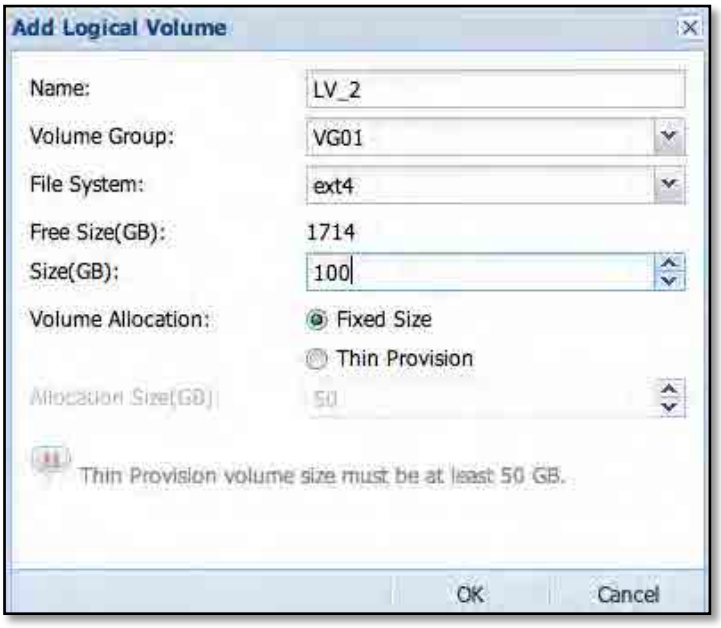


Figure 3.5.2-5 Creating a Fixed Size Logical Volume

Name: The NAS system will automatically generate a default LV name ‘LV_x’ where x is a number in series starting from 1, such as LV_1. The LV name can also be modified if needed.

Volume Group Name: Click the arrow-down button on the right, and a drop-down menu will appear where a volume group name can be selected.

Free Size(GB): This displays the selected volume group’s unused capacity.

File System: Select the file system format for the LV, default is **ext4**. Format options are described below.

Format	Description
ext3	This file format is suitable for small I/O, average single-file size of about 4KB-50MB.
ext4	This file format is suitable for big I/O, average single-file size of about 4KB-128MB
xfs	This file format is suitable for big I/O, average single-file size of about 128MB-1GB or above

NOTE: The LV Name only allows up to 32 characters, and can only contain letters, numbers, hyphen (-) and underscore (_).

Size(GB): The size of Logical Volume to be created must be based on the “Free Size (GB)” field, size must be less than the Volume Group available capacity.

Volume Allocation options:

Fixed Size: Create a logical volume with fixed physical size.

Thin Provision: Create a Thin Provisioning pool with Size, and create a Thin Provisioning volume with Allocation Size (option below).

Allocation Size(GB): This field is enabled only when creating LV with Thin Provision. The minimum size of a Thin Provisioning volume is 50GB, and the maximum size is 32TB or 4 times of physical volume size.

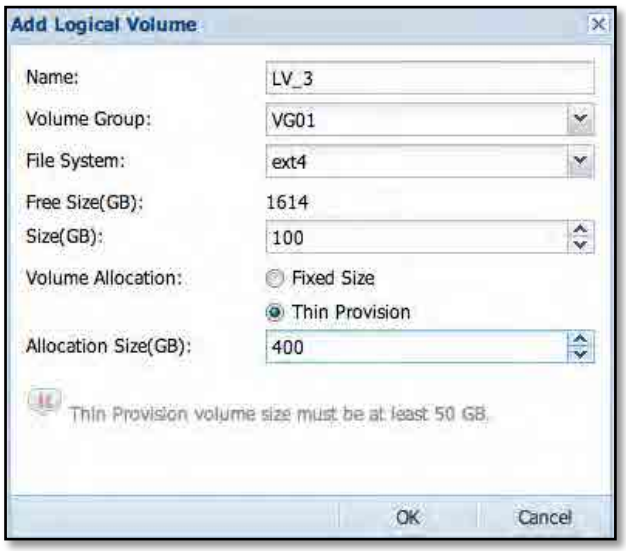


Figure 3.5.2-6 Create a Thin Provisioning Logical Volume

Expanding Logical Volume Capacity:

Select a Logical Volume that need to be expanded in the Logical Volumes List (See Figure 3.5.2-4) and click '**Edit**', change the "Logical Volume Size (GB)" to the preferred size, and then click 'Apply'. In Confirm window, select the "**Confirm**:" option and click '**Yes**'. The Logical Volume size will be expanded automatically.

If the volume set as a Thin Provision Volume, you can also modify the field "Thin Provision Size" here (See Figure 3.5.2-7).

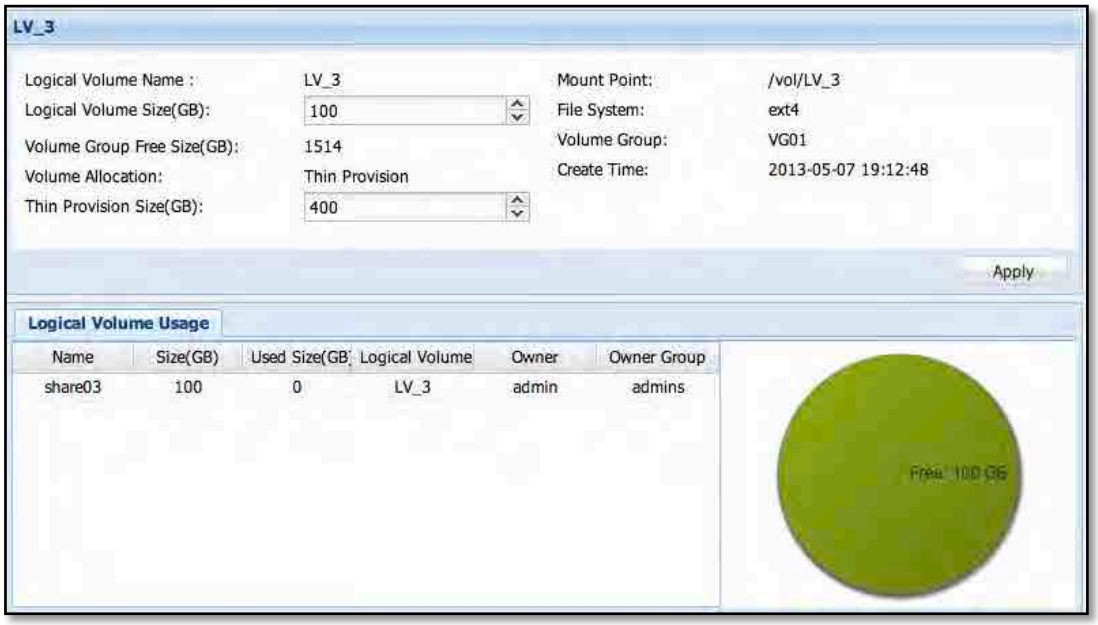


Figure 3.5.2-7 Logical Volume Information

NOTE:

1. The logical volume size can only be expanded, but cannot be reduced.
2. It might take time to expand a volume with file system.

Volume Encryption:

In each logical volume information, if share folders have not been created yet in the logical volume, as shown in Figure 3.5.2-8, the volume can be encrypted by clicking "**Encrypt**" and then typing the password. After an encrypted volume is created, system will download the key file automatically. Please keep the key file safely. The volume data will become invalid without key file.

Figure 3.5.2-8 Creating an Encrypted Logical Volume

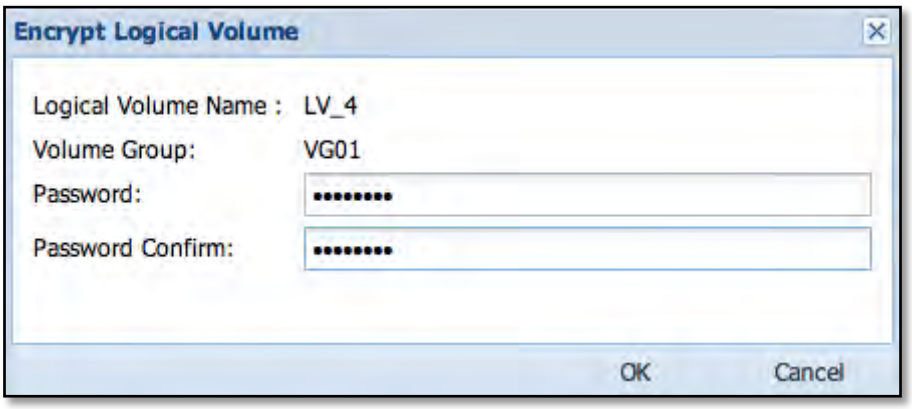


Figure 3.5.2-9 Set Password for the Encrypted Logical Volume

The volume will not be mounted automatically after encryption. You can mount the encrypted volume manually by clicking "**Mount**" (Figure 3.5.2-10) and input the password. Then the encrypted volume will be mounted and ready to use (Figure 3.5.2-11).

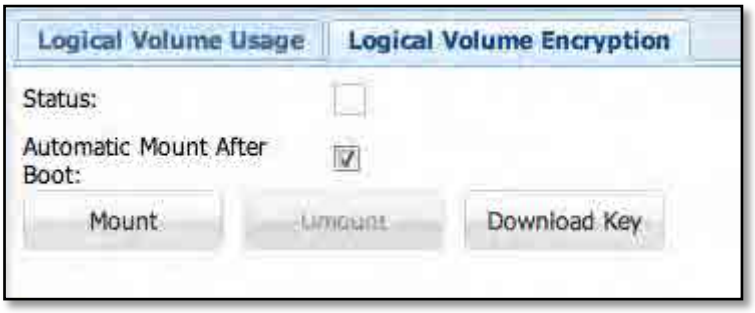


Figure 3.5.2-10 Encrypted Logical Volume in Un-mounted State

Automatic Mount After Boot:

Default is enabled. The volume will be automatically mounted after boot without typing the password. If disabled, you have to manually mount the volume and type password after every boot.

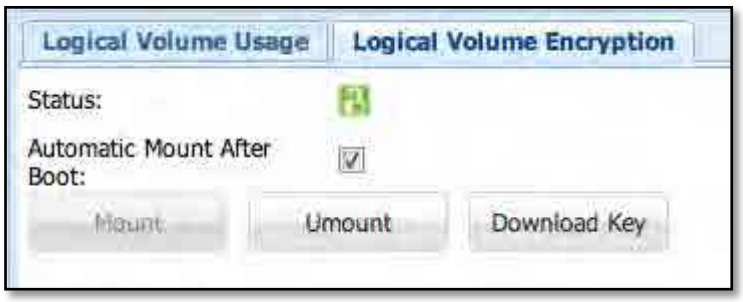


Figure 3.5.2-11 Encrypted Logical Volume in Mounted State

3.5.3 iSCSI Manager

The iSCSI Manager allows administrator of the NAS system to setup logical volumes as iSCSI Target Volumes. A logical volume that is not yet formatted or has no existing share folder in it can be setup as an iSCSI volume device.

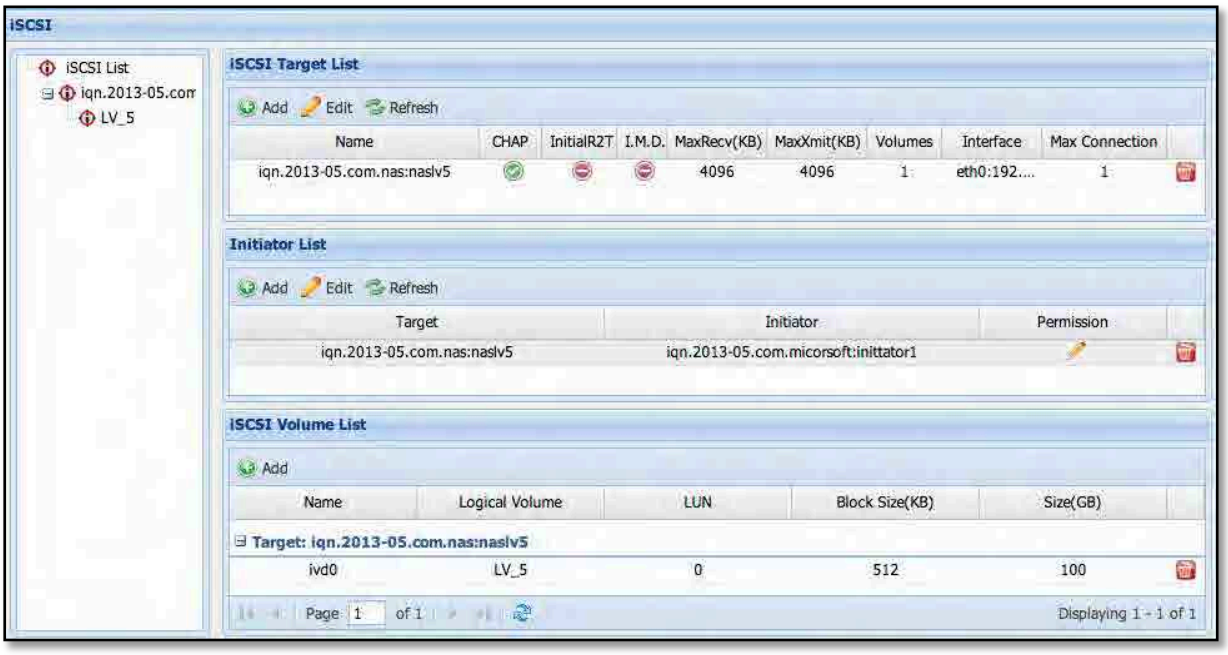


Figure 3.5.3-1 The iSCSI Manager

Add iSCSI Target: To add an iSCSI target, click 'Add' icon in the iSCSI Target List shown in Figure 3.5.3-1. The iSCSI Target setup will appear (Figure 3.5.3-2).

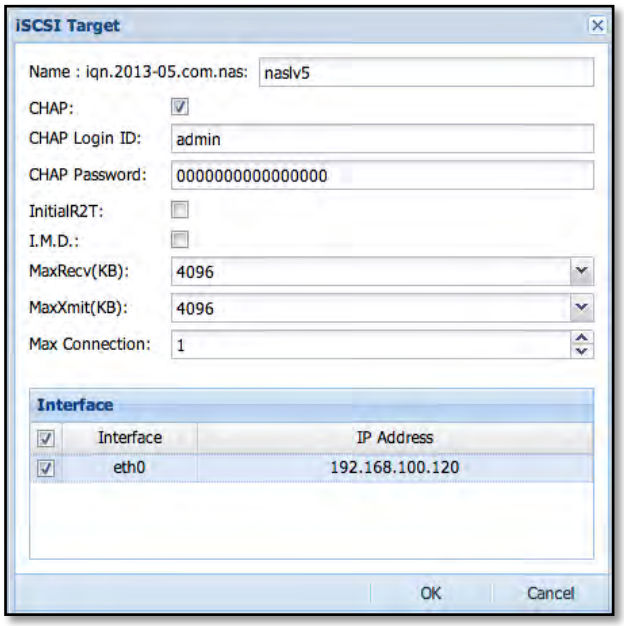


Figure 3.5.3-2 Create iSCSI Target

Name: Input iSCSI Target name

CHAP: If CHAP authentication is needed, select the 'CHAP:' option to enable it, and then input the CHAP Login ID and CHAP Password.

InitialR2T: Initial Ready to Transfer. Default is disabled. If needed to enable this option, please select it.

I.M.D.: Immediate Data. Default is disabled. If needed to enable this option, please select it.

MaxRecv(KB): Maximum data per PDU (Protocol Data Unit) to receive. Default value is 4096 KB. If needed to change the value, please modify it.

MaxXmit(KB): Maximum data per PDU (Protocol Data Unit) to transmit. Default value is 4096 KB. If needed to change the value, please modify it.

Max Connection: Default value is 1. If needed to increase the maximum number of initiator connections, please modify the value.

For example: If four initiator connections are allowed on the iSCSI target, set the 'Max Connection' value to 4.

Interface: Specify the network port dedicated for iSCSI connection. iSCSI initiators can only connect to the iSCSI target via this port.

NOTE:

The Name only allows up to 32 characters, and can only contain letters, numbers, hyphen (-) and underscore (_).

Delete iSCSI Target: To delete an iSCSI Target, select the 'Remove' icon on the right side of the iSCSI target name to be deleted. The Confirmation window will appear. Select the "Confirm:" option and click 'Yes'. The iSCSI Target will be deleted.

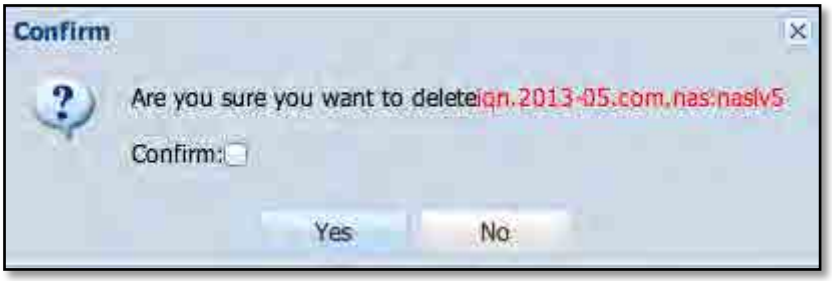


Figure 3.5.3-3 Confirm Message to Delete iSCSI Target

Add iSCSI Target Volume: Click 'Add' icon on the iSCSI Volume List. The Add iSCSI Volume window will appear.

Select a Target name, and choose the logical volume to be used as iSCSI volume, set the Size(GB), and select the Block Size(KB). After completing the setup, click 'OK'. The new iSCSI Target Volume will be created.

Figure 3.5.3-4 Assign a Volume to the iSCSI Target

Block Size: The default setting is 512. There are four options: 512, 1024, 2048, and 4096

NOTE: The Thin Provision volume does not support Windows full format; user can only use the quick format.

Delete iSCSI Target Volume: Click the 'Remove iSCSI Logic Volume' icon on the right of the iSCSI target volume to be deleted. The confirmation window will appear. Check the "Confirm:" option and click 'Yes'. The iSCSI Target Volume will be deleted.

Add Initiator: Click the 'Add' icon under the Initiator List. The Add Initiator window will appear. Select a Target name, enter the Initiator iqn name, and set the Permission. Click 'OK' when done.

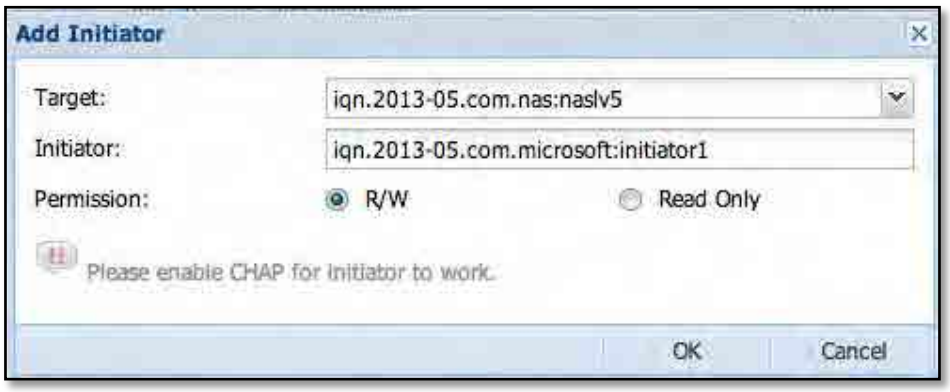


Figure 3.5.3-5 Add Initiator

NOTE: The Initiator Name only allows up to 64 characters, and can only contain letters, numbers, hyphen (-) and underscore (_).

Figure 3.5.3-6 Initiator List

Edit Initiator: To edit the Initiator permission, select from the Initiator List the Initiator name and click “Edit”, or double click the Initiator name or its Permission. The following screen will appear. Only the Permission setting can be modified.

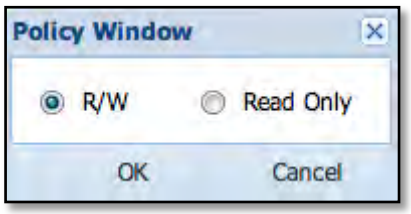


Figure 3.5.3-7 Edit Initiator Permission

Permission: Default is read/write. There are two options available: “R/W” (read/write) and “Read Only".

After modification is completed, click ‘OK’ button to apply the setting. If you want to undo changes, click the ‘Cancel’ button.

Remove Initiator: In the Initiator List, click the ‘Remove’ icon on the right side of the Initiator name. The Confirm window will appear. Select the “Confirm:” option and click ‘Yes’. The Initiator name will be deleted.

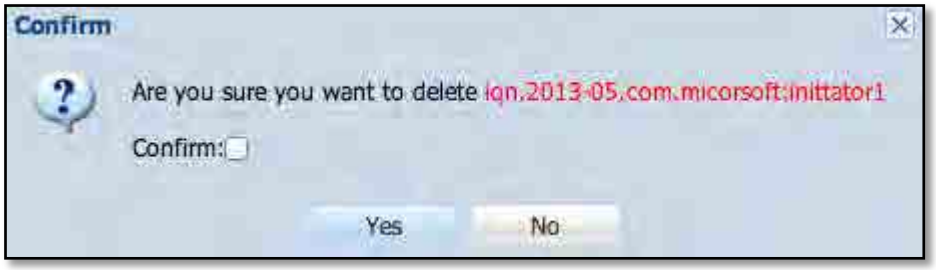


Figure 3.5.3-8 Confirm Message to Delete an Initiator

3.5.4 FC Manager

The FC Manager allows administrator of the NAS system to setup logical volumes as Target Volumes for use in Fibre SAN environment, allowing administrators to directly integrate with existing Fibre SAN environment and enable direct access to the NAS data.

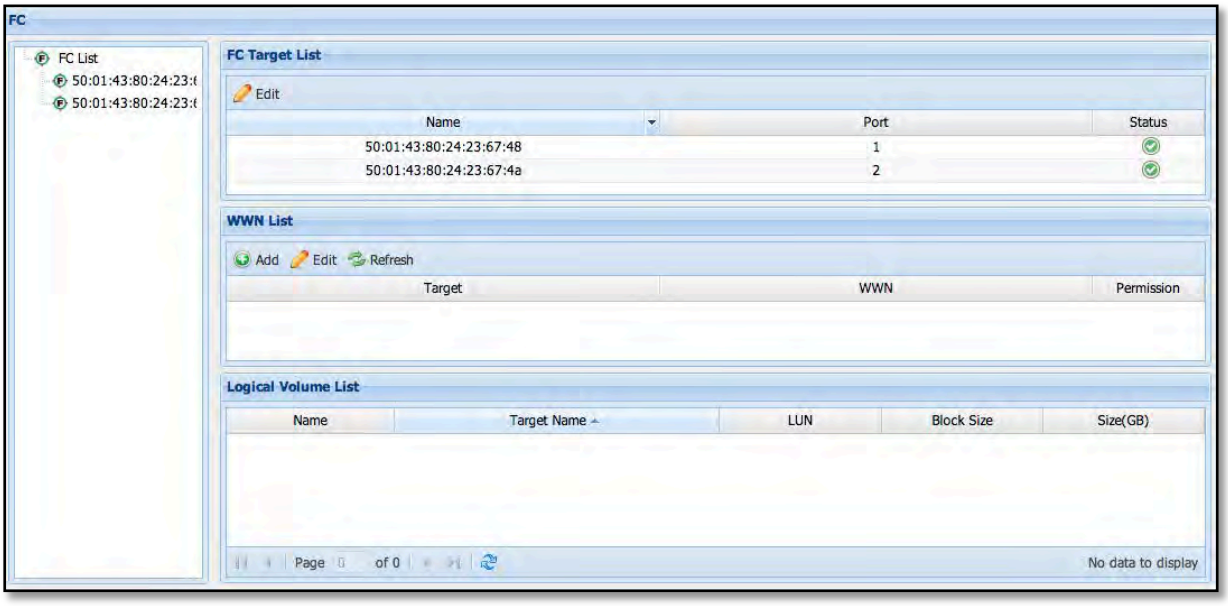


Figure 3.5.4-1 FC List

Enable or Disable FC Target Port:

Default setting of FC Target Port is Active. If needed to disable an FC Target Port, select the FC Target Name from the FC Target List and click 'Edit'. The Edit FC Target window will appear. Select the Stop option and click 'OK'. The selected FC Target Port will be disabled.

Figure 3.5.4-2 Active FC Target

Add FC Volume:

Click '**Add**' in the Logic Volume List. The Add FC Volume window will appear (Figure 3.5.4-3). Select the corresponding FC Target WWN, select a logical volume and choose the Block Size. When done, click 'OK'. The settings will be immediately applied. When setup is complete, the FC Volume can be accessed via the FC Target Port, which can be connected directly to a server's FC HBA or to an FC SAN Switch.

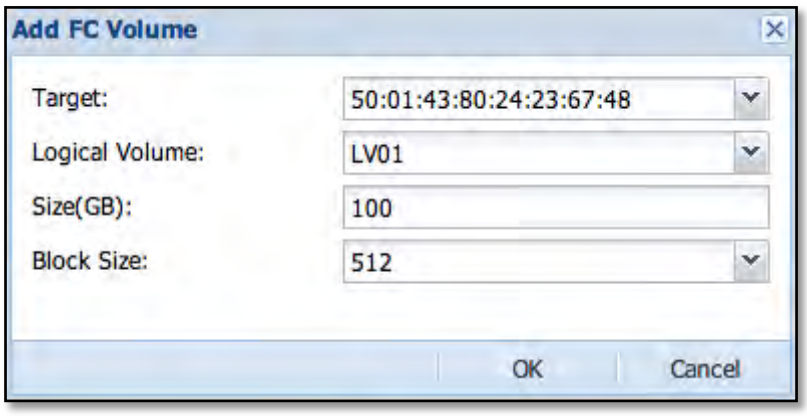


Figure 3.5.4-3 Add FC Volume

Block Size:

The default setting is 512. There are four options: 512, 1024, 2048, and 4096

NOTE: The Thin Provisioning volume does not support Windows full format; user can only use the quick format.

Add FC WWN Initiator:

This function allows admin to assign WWN initiator and permission. Click 'Add' in the WWN List. The Add WWN window will appear. Input the WWN initiator in the field.

Permission:

Default is read/write. There are two options available: "R/W" (read/write) and "Read Only".

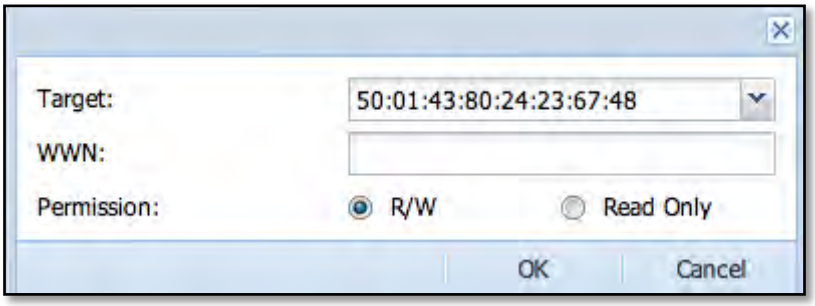


Figure 3.5.4-4 Add FC WWN Initiator

When done, click '**OK**' button to apply the setting. To undo changes, click the '**Cancel**' button.

Remove WWN Initiator:

In the WWN List, click the 'Remove' icon on the right side of the WWN initiator name. The Confirm window will appear. Select the "Confirm:" option and click 'Yes'. The WWN initiator name will be deleted.

Remove FC Target Volume:

Click the FC Target and find the volume in the Logical Volume List. Click the remove icon on the right side of the Logical Volume List (Figure 3.5.4-5). The confirmation window will appear. Check the "**Confirm**" option and click '**Yes'**. The FC Volume will be removed from the target.

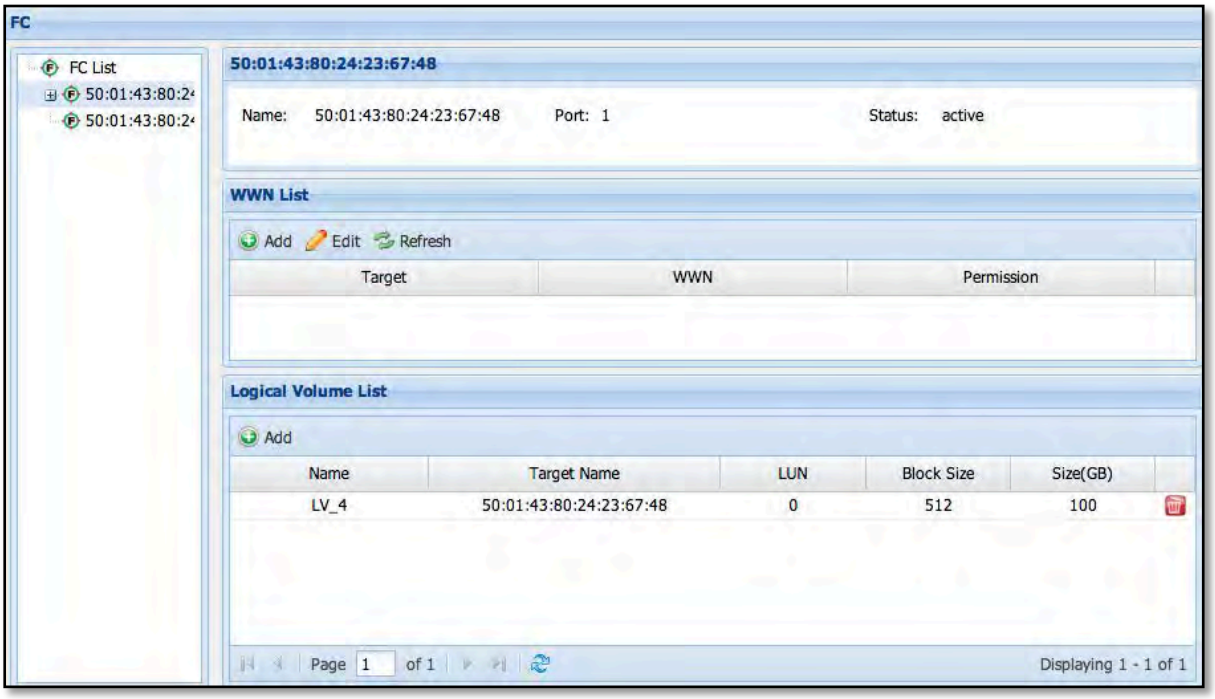


Figure 3.5.4-5 FC Target Volume Information

3.5.5 Share Manager

Share Manager allows admin to manage share folders that can be accessed by users via Samba (SMB/CIFS), NFS, AFP, FTP, WebDAV, and Rsync.

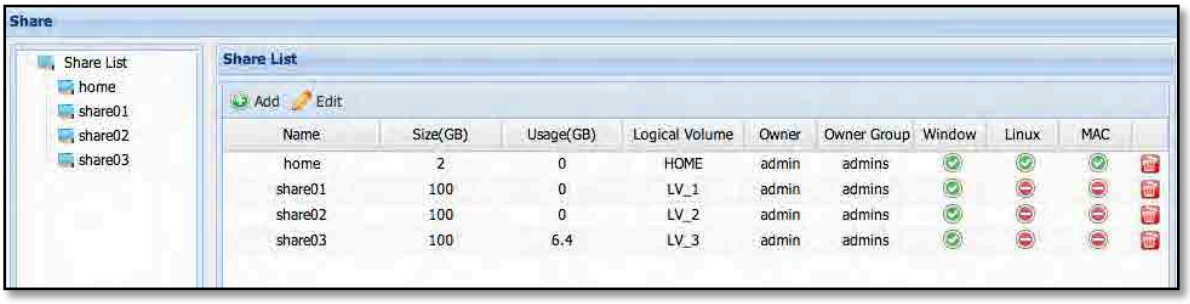


Figure 3.5.5-1 Share List

Add Share: In the Share List, click 'Add'. The Add Share window will appear. Follow the setup instructions step by step. After setup in one page, click 'Next' to go to next setup page until completed and share folder is created.

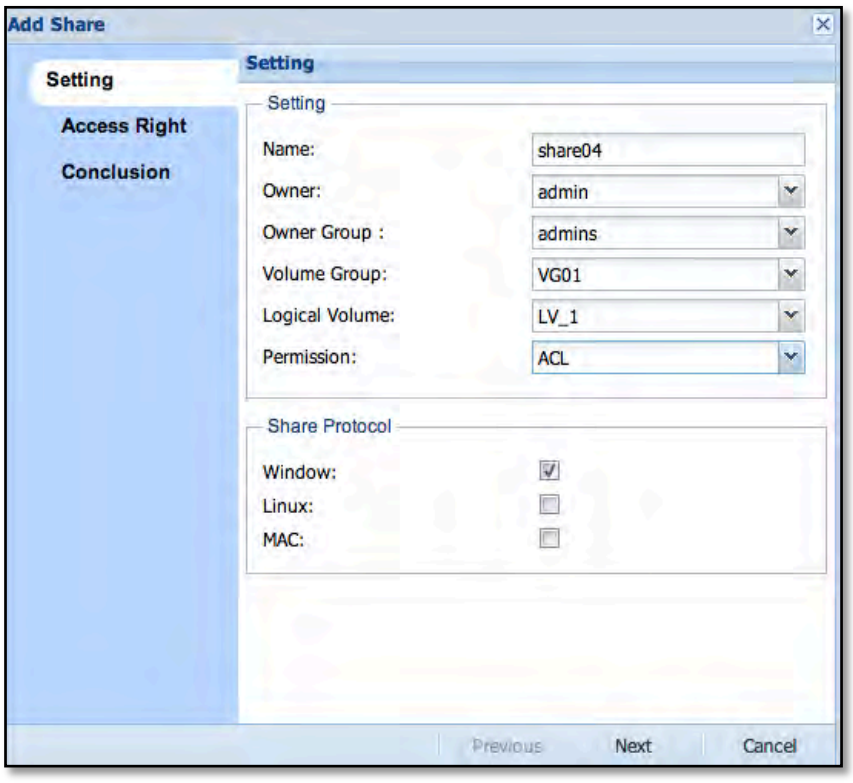


Figure 3.5.5-2 Create a New Share

Name: Enter name of the share folder. The Name can be up to 32 characters, and can only contain letters, numbers, hyphen (-) or underscore (_).

Owner: Default share folder owner is admin. If needed to change the owner, select other user account.

Volume Group: Select the volume group where the share folder will be created.

Logical Volume: Select the logical volume where the share folder will be created, or create a new logical volume by selecting “Create New”.

New Share Size (GB): This option appears only when “Create New” is selected in Logical Volume. Enter the size for the new volume to be created.

Volume Group Free size (GB): This option appears only when “Create New” is selected in Logical Volume. This is the available capacity of the selected Volume Group. This information is for reference only and cannot be modified.

Permission: Default is ACL. There are three options available: ACL, No ACL, and Public.

Share Protocol: Default option selected is Windows. There are three options available: Windows (Samba), Linux (NFS), and MAC (AFP).

When setup is completed, click **‘Next’** to go to the Access Right configuration page. See Figure 3.5.5-3.

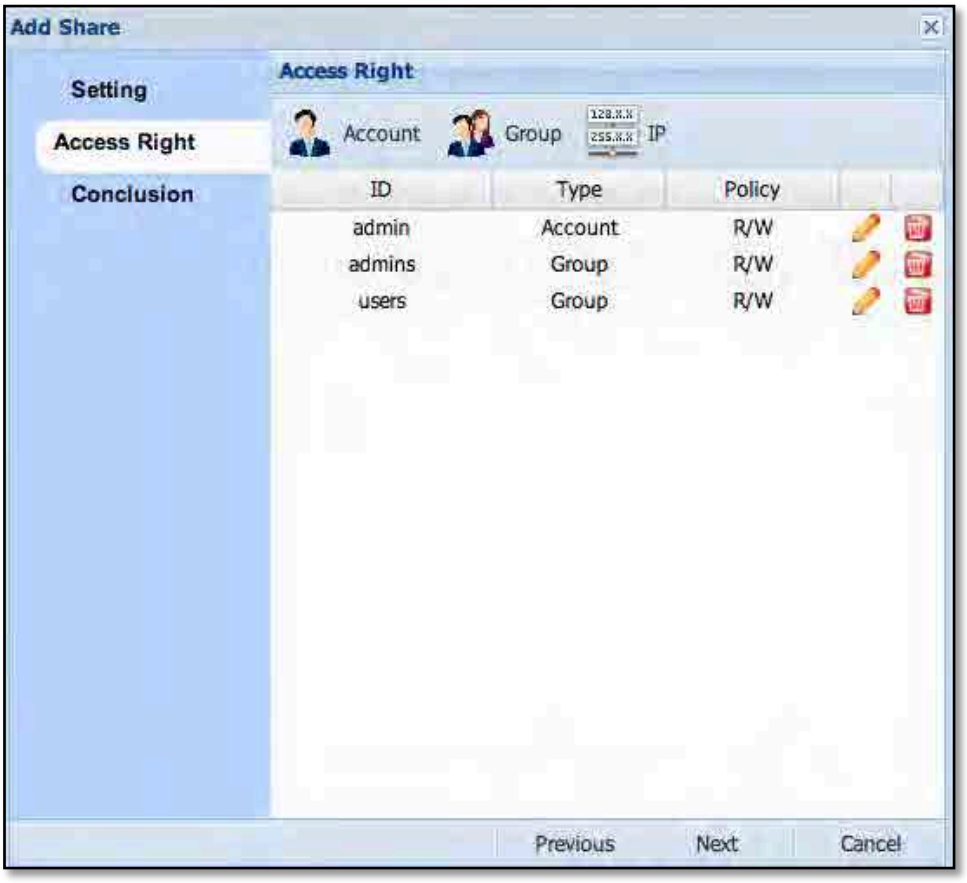


Figure 3.5.5-3 Set Access Right for the New Share

Add Account Permission:

In Access Right page, click **'Account'** button. The Account List window (Figure 3.5.5-5) will appear. Select the name of the account that will be assigned access permission to the share folder and click **'OK'.** The account name will appear in Access Right list with read/write (R/W) permission (Figure 3.5.5-3). If the access permission of the account needs to be modified, click the **'Edit'** button (pencil icon) on the right side of **'Policy'** column. The option to modify access permission will be shown (Figure 3.5.5-5). There are 2 options: **"R/W"** (read/write) and **"Read Only"**. Set the preferred access mode and click **'OK'** when done.

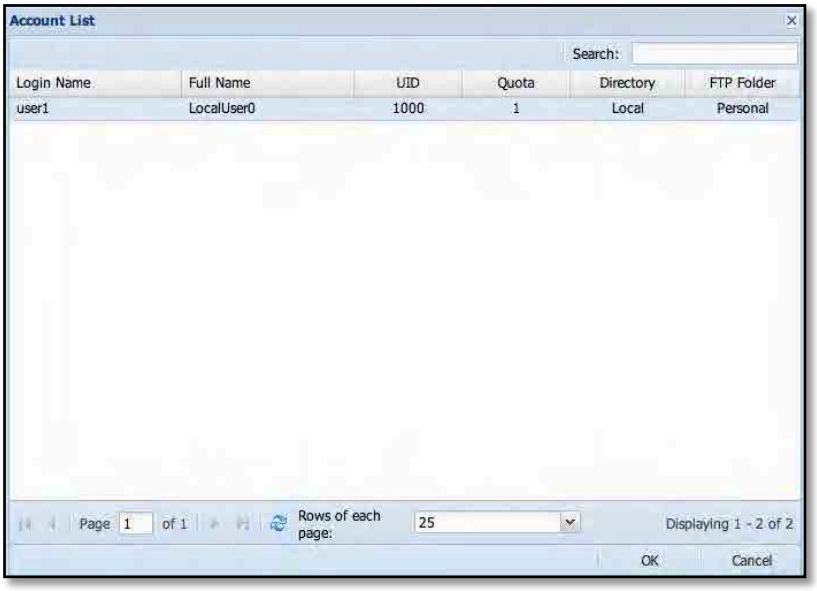


Figure 3.5.5-4 Select Accounts for Setting Share Permission

Figure 3.5.5-5 Modify Account Policy in the Share

Add Group Permission:

By default, all accounts in the 'users' group are allowed access to the share folders. If you need to assign permission to another group, click '**Group**' button. The Group List window (Figure 3.5.5-6) will appear. Select the name of the Group that will be assigned permission to the share folder and click '**OK**'. The group name will appear in the Access Right list with read/write (R/W) permission. If the access permission of the group needs to be modified, click the '**Edit**' button (pencil icon) on the right side of 'Policy' column. The option to modify access permission will be shown (Figure 3.5.5-7). There are 2 options: "**R/W**" (read/write) and "**Read Only**". Set the preferred access mode and click **'OK**' when done.

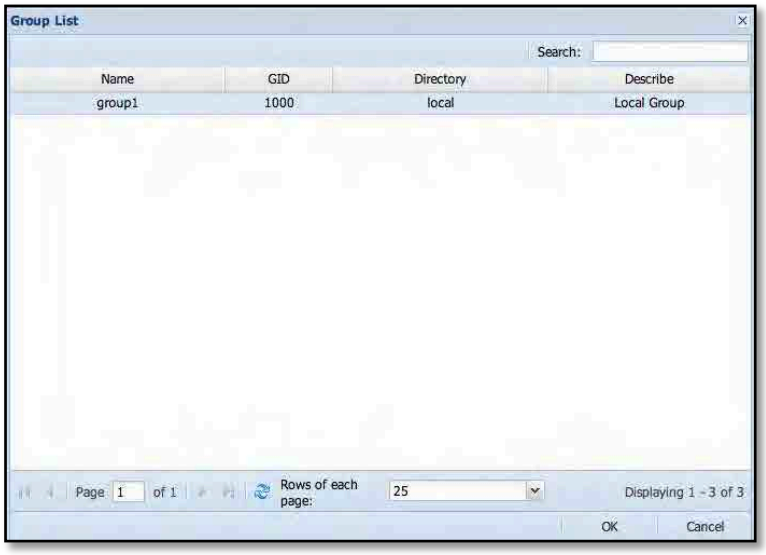


Figure 3.5.5-6 Select Groups for Setting Share Permission

Figure 3.5.5-7 Modify Group Policy in the Share

Add IP Permission:

By default, all client IP addresses are allowed access to the share folders. If you need to assign specific client IP, click the '**IP**' button. The Client IP window will appear (Figure 3.5.5-8). Enter the client IP address that will be allowed access to the share folder. Set the Permission, whether "**R/W**" (read/write) or "**Read Only (NFS Only)**". Click '**OK**' when done. The IP address will appear in the Access Right list (Figure 3.5.5-9). If the access permission of the IP address needs to be modified, click the '**Edit**' button (pencil icon) on the right side of '**Policy**' column. The option to modify access permission will be shown (Figure 3.5.5-8). Set the preferred access mode and click '**OK**' when done.

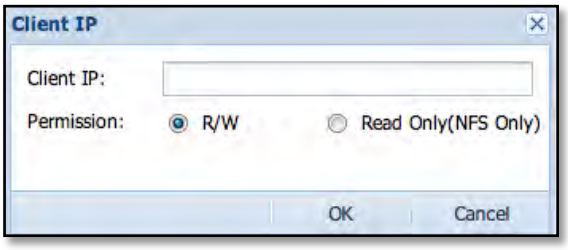


Figure 3.5.5-8 Add Client IP in the Access Right List

Figure 3.5.5-9 Client IP in Access Right List

When Access Right configuration is completed, click 'Next' for confirming the settings. Verify the share folder configuration in the Conclusion page (Figure 3.5.5-10) and make sure all settings correct. Click **'OK'** to save all settings.

Figure 3.5.5-10 Conclusion Page Before Creating Share

Edit Share Folder:

Please select the share folder name to be edited from the Share List (Figure 3.5.5-11), and then click 'Edit' icon, the Share Information now can be modified (Figure 3.5.5-12)

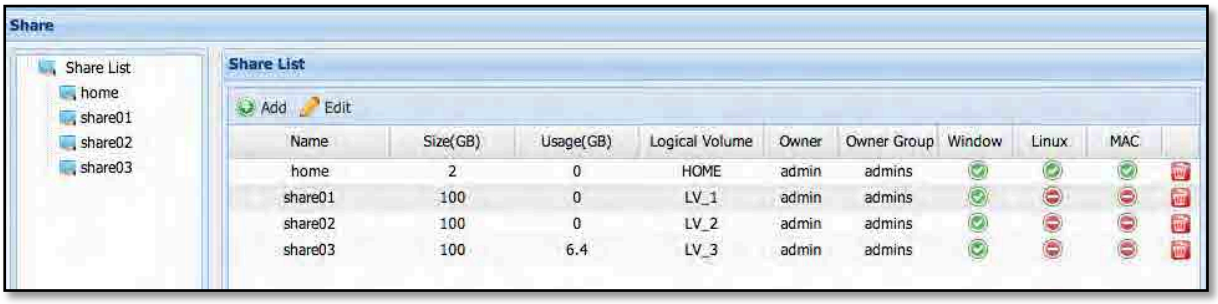


Figure 3.5.5-11 Share List

Name : The share name is fixed and cannot be edited.
Logical Volume: Shows the Logical Volume name where the share was created from.
Size: The capacity of Logical Volume.
Owner: The share owner, and who always has write permission.
Owner Group: The default group owner of share, and who always has write permission.
Permission: You can set the share access control with or without ACL. If "NoACL" is selected, you can specify the share directory mode as commonly used in Linux systems, like "755", or choose "Public" to allow users access to this share (which also means NoACL mode as "777").

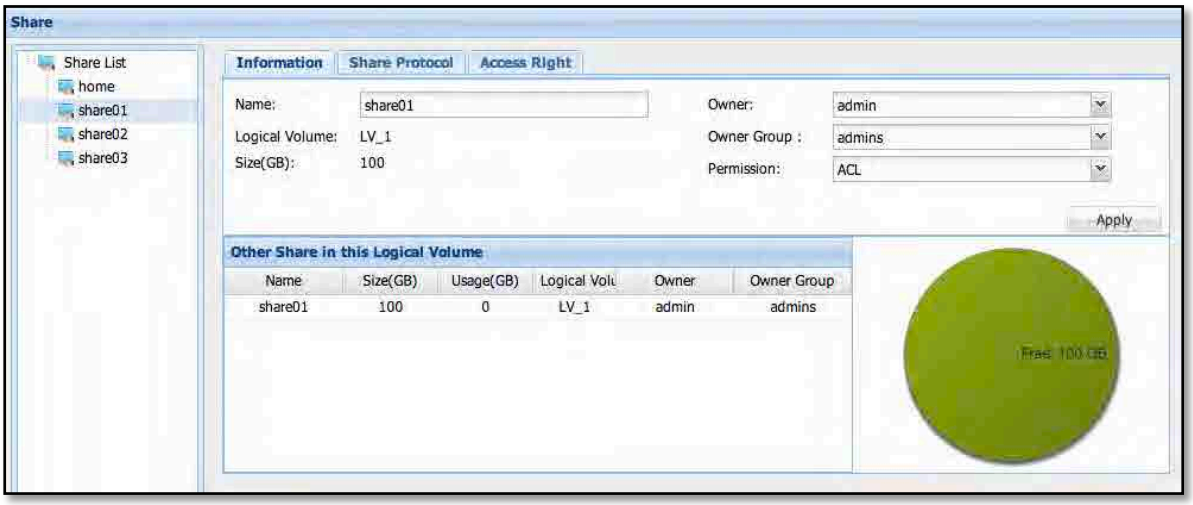


Figure 3.5.5-12 Share Information

Share Protocol:

As shown in Figure 3.5.5-13, there are 4 Share Protocol options that can be enabled: CIFS (Samba), NFS, Apple Talk (AFP) and Rsync.

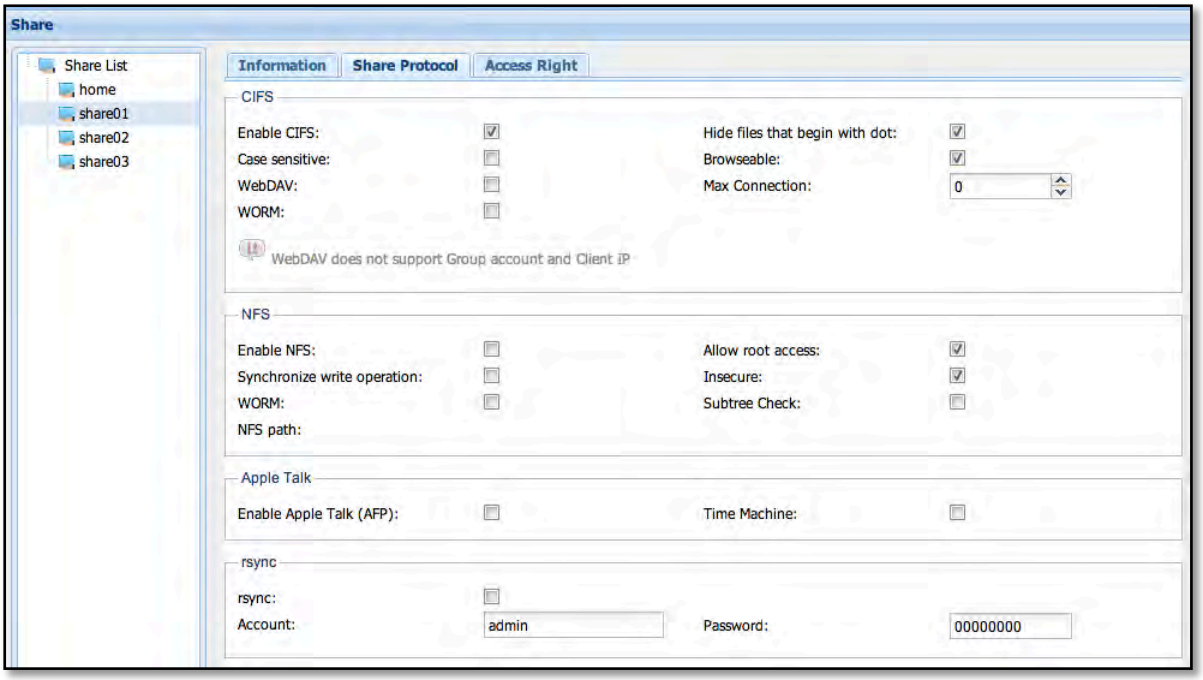


Figure 3.5.5-13 Share Protocol

CIFS

Enable CIFS: Enable and export share for CIFS (Windows) clients.

Case sensitive: Controls whether filenames are case sensitive or not.

WebDAV: When enabled, WebDAV clients are allowed access to the share.

WORM: Write Once Read Many. When this is enabled, all users with permission can only create files but cannot modify or delete it. Only the share owner can delete or modify newly created files.

Hide files that begin with dot: Hide the files that name begin with dot.

Browseable: This option controls whether the share folder will be visible and can be browsed when client PC connects to the NAS. Default setting is enabled. When disabled, and client PC connect to the NAS via CIFS, the share folder will not be visible.

MaxConnection: Set the maximum number of client connection. "0" means no limit.

NFS

Enable NFS: Enable and export share for NFS clients

Allow root access: When this option is enabled, root access to share is allowed.

Synchronize write operation: This option is used to set share IO with synchronous write.

WORM: Write Once Read Many. When this is enabled, all users with permission can only create files but cannot modify or delete it. Only the share owner can delete or modify newly created files.

Insecure: Allows request from IP port larger than 1024.

Subtree Check: Do subtree checking while share is being accessed. Default is Disabled (no subtree checking).

Apple Talk

Enable Apple Talk(AFP): Enable and export share for Apple MAC clients

Time Machine: Enable and export share that can be discovered by "Time Machine" backup application in MAC.

Rsync

Account: Set the user name that will be used for share login via Rsync.

Password: Set the password that will be used for share login via Rsync.

Edit Access Right:

You can modify share permission in the "Access Right" tab by clicking Account/Group/IP in the list (Figure 3.5.5-14), or clicking "Account/Group/IP" at the top to assign new permission. If you want to remove the account/group/IP assigned in the share, just click at the right-most column of the ID to be removed.

Figure 3.5.5-14 Share Access Right

Delete Share Folders:

In the Share List, click the delete icon (Figure 3.5.5-15) on the right of the Share Folder name to be deleted. The Confirmation window (Figure 3.5.5-16) will be displayed. Select the “Confirm:” option and click ‘Yes’ to continue deleting the selected share folder.

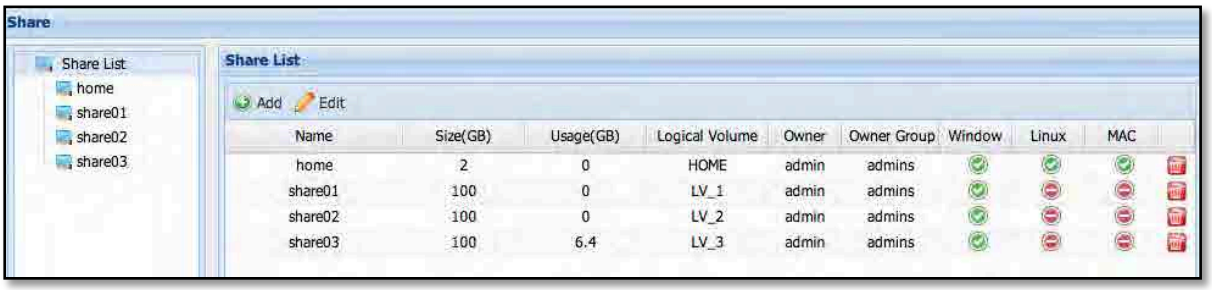


Figure 3.5.5-15 Share list

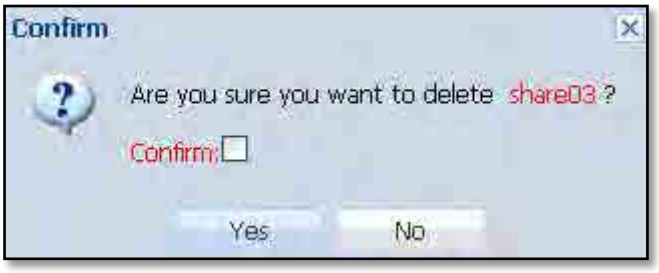


Figure 3.5.5-16 Confirm Message to Delete Share

3.6 Service Manger

3.6.1 Samba service

Samba provides SMB/CIFS file and printer sharing. This service needs to be enabled so that MS Windows systems can access NAS share folders or printer.

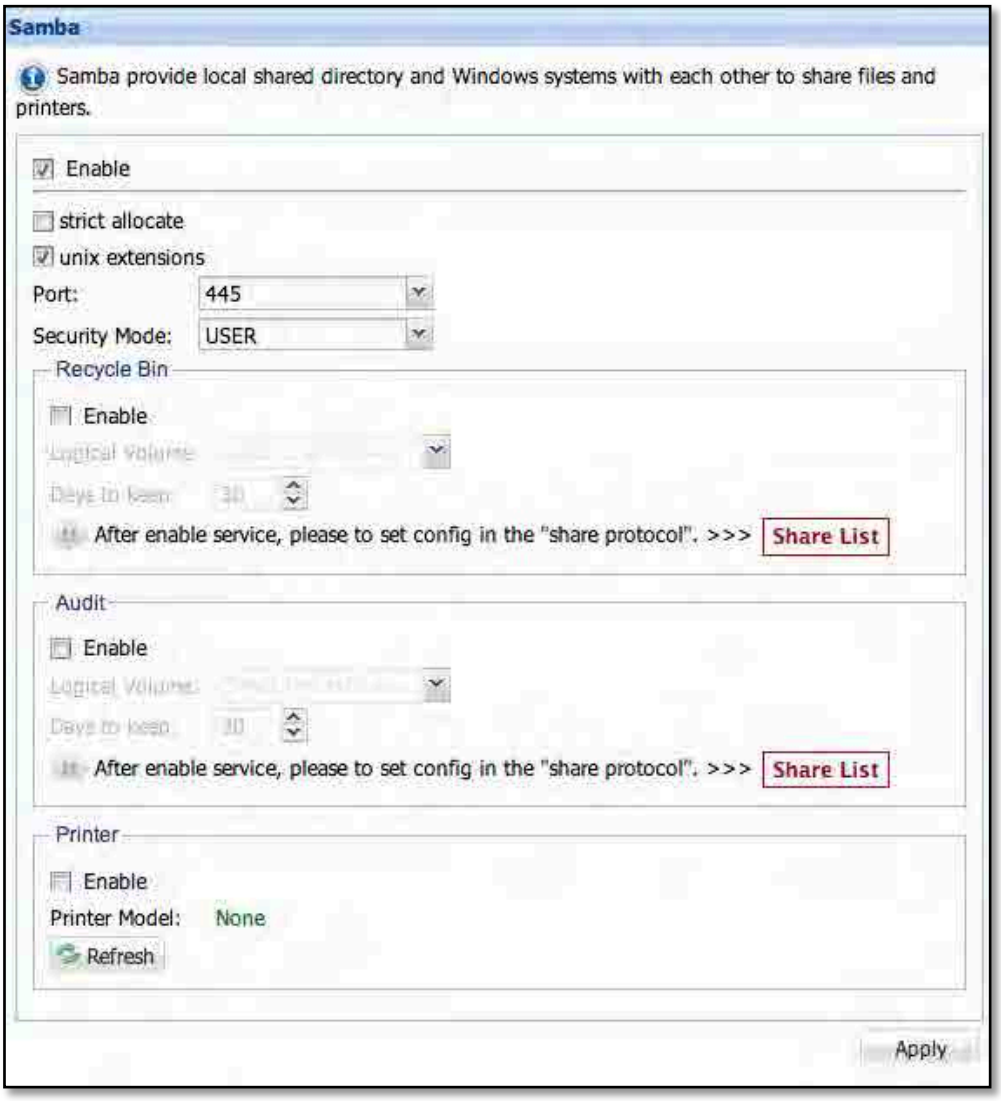


Figure 3.6.1-1 Samba Options

Enable: To start Samba service, select the 'Enable' option. To stop this service, unselect this option. Modify other options if necessary. Click 'Apply' when done,

Strict allocate: This option controls the handling of logical volume space allocation. When disabled (default setting is disabled or un-checked), the system does not sparse logical volume block allocation when a file is extended. To enable this option, select it and click 'Apply'.

Unix extensions: Default is enabled. To disable this option, deselect (uncheck) it and click 'Apply'.

Port: Default is 445. There are 3 options: 445, 139, and '445,139'

Security Mode: Default is set to USER. There are two options available for setup: USER, SHARE

Recycle Bin: This option allows deleted files from the NAS share folder to be retained in the Recycle Bin share folder.

To enable Recycle Bin, select the 'Enable' option, and then select the logical volume that will be used to store the Recycle Bin data. Setup the 'Days to keep:' option for the number of days you want to keep the deleted files in the Recycle Bin. Click 'Apply' when setup is done. The Recycle Bin function will be enabled.

Audit: This option provides record of all user access to share folder data. Some examples of information are add/delete/modify record.

To enable Audit, select the 'Enable' option, and then select the logical volume that will be used to store the Audit information. Setup the 'days to keep:' option for the number of days to retain Audit information. Click 'Apply' when setup is done. The Audit function will be enabled.

Printer: Enable this option to connect and detect a USB printer and share it to clients.

NOTE: For detailed options, please edit Share Protocol in Share manager.

3.6.2 NFS service

NFS provides Network File System file sharing. This service must be enabled so that UNIX and Linux systems will be able to access (mount) the NAS share folders.

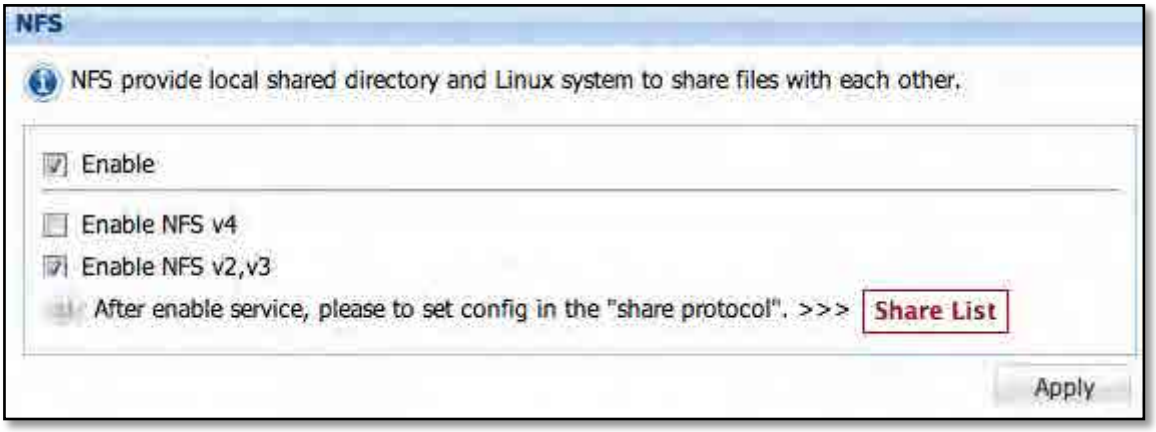


Figure 3.6.2-1 NFS Options

Enable: To start NFS service, select the 'Enable' option, or unselect this option to stop service, Choose the NFS version option if needed. Click 'Apply' when done.

Enable NFSv4: Default is disabled. To enable support for NFS version 4, select this option.

Enable NFS v2, v3: Default is enabled, which means NFS version 2 and version 3 are supported. To disable this option, deselect it (check mark will disappear).

NOTE: The detailed options please edit Share Protocol in Share manager.

3.6.3 AFP service

AFP provides file services for Mac OS X and original Mac OS. This service need to be enabled so that Mac OS users will be able to access the NAS share folders vi AFP.

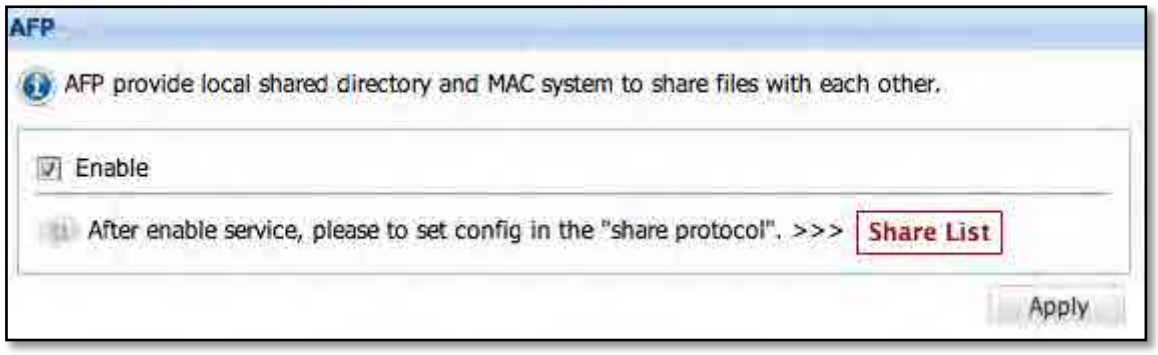


Figure 3.6.3-1 AFP Options

Enable: To start AFP service, select the 'Enable' option and the click 'Apply'. To stop this service, unselect option and click 'Apply'.

NOTE: The detailed options please edit Share Protocol in Share manager.

3.6.4 FTP service

FTP is a standard network protocol used to transfer files to/from NASfrom/ to another host over a TCP-based network After this service is enabled, NAS accounts can be used to login NAS and access share folders via FTP.

Enable: To start FTP service, select the 'Enable' option. If necessary, modify the Port and Max Connections options. Click 'Apply' when done. To stop this service, unselect this option and click 'Apply'.

Port: Default port used by FTP is 21. If modified, select from range 1024 to 65534.

Max connections: Default maximum number of FTP connections is 10. If modified, number can be changed up to 1000.

Type: Select option: FTP (general support only), FTP over explicit TLS/SSL, or Both

SFTP: Select to enable SFTP (Secure FTP), please note that SSH service will also enabled when SFTP selected.

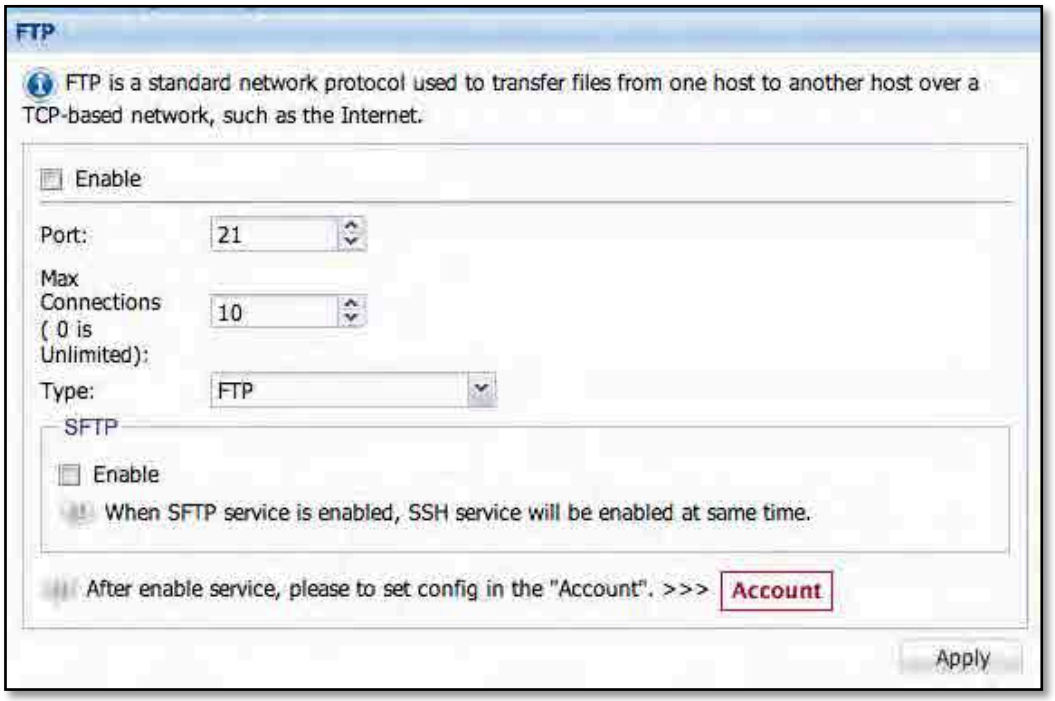


Figure 3.6.4-1 FTP Options

3.6.5 WebDAV service

WebDAV protocol makes the Web a readable and writable medium. It provides a framework for users to create, change and move documents on a server; typically a web server or web share.

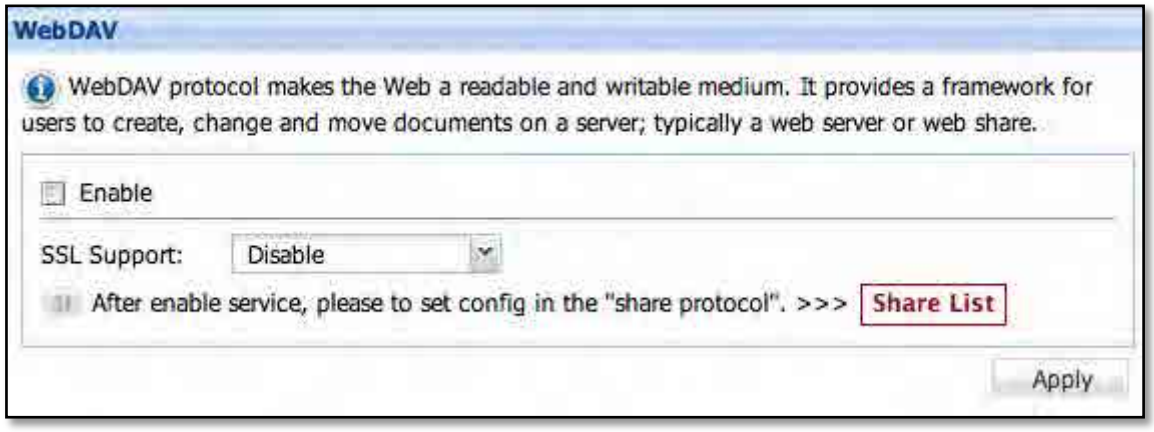


Figure 3.6.5-1 WebDAV Options

Enable : Select and click 'Apply' to start WebDAV service. To stop service, unselect this option and click "Apply'.

SSL Support : Disable or enable HTTPS support.

3.6.6 TFTP service

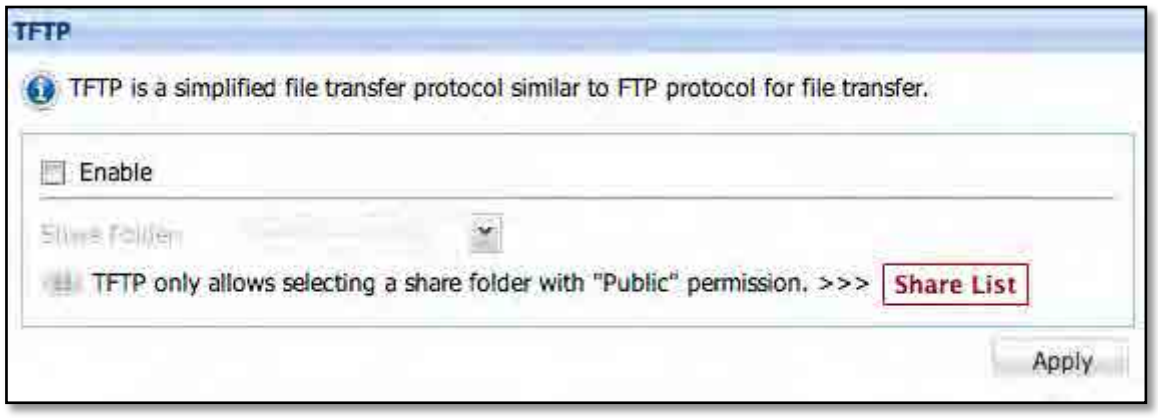


Figure 3.6.6-1 TFTP Options

Enable: To start TFTP service, select the 'Enable' option and then choose a share folder (must be a share folder set as "Public"). Click 'Apply' when done. To stop service, unselect this option and click 'Apply'.

3.6.7 Rsync service

Rsync is a file transfer program which provides copying and updating files to/from NAS share folder from/to a remote Rsync host, such as another NAS.

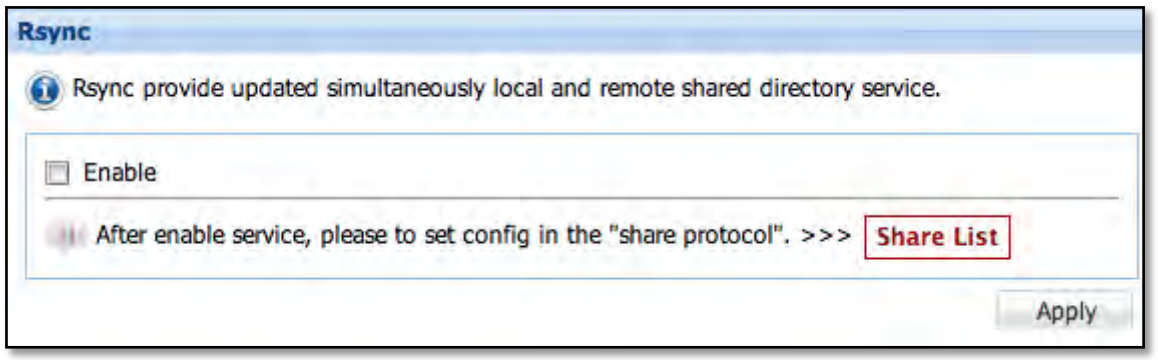


Figure 3.6.7-1 Rsync Options

Enable: To start Rsync service, select the 'Enable' option and click 'Apply. To stop service, unselect this option and click 'Apply'.

3.6.8 Bonjour service

Bonjour provides a general method to discover services in the LAN. It is designed to help devices and applications discover each other on the same network.

Figure 3.6.8-1 Bonjour Options

Enable: To start Bonjour service, select the 'Enable' option and click 'Apply'. To stop service, unselect this option and click 'Apply'.

3.6.9 SNMP service

SNMP is used mostly in network management systems to monitor network-attached devices for conditions that warrant administrative attention.

Start SNMP Service: To enable SNMP service, select the 'Enable' option. Choose the SNMP version if necessary. By default, SNMP version 1 and 2 is enabled. Click 'Apply' when done.

Enable SNMP v3: To enable support for SNMP version 3, select the 'Enable snmp v3' option, then setup Auth Protocol, Auth Password, Priv Protocol, and Priv Password. Click 'Apply' when done.

Figure 3.6.9-1 SNMP Options

3.6.10 DHCP service

DHCP service enables the NAS to function as DHCP server and provides automatically assigned IP address to other computers in the internal network or LAN.

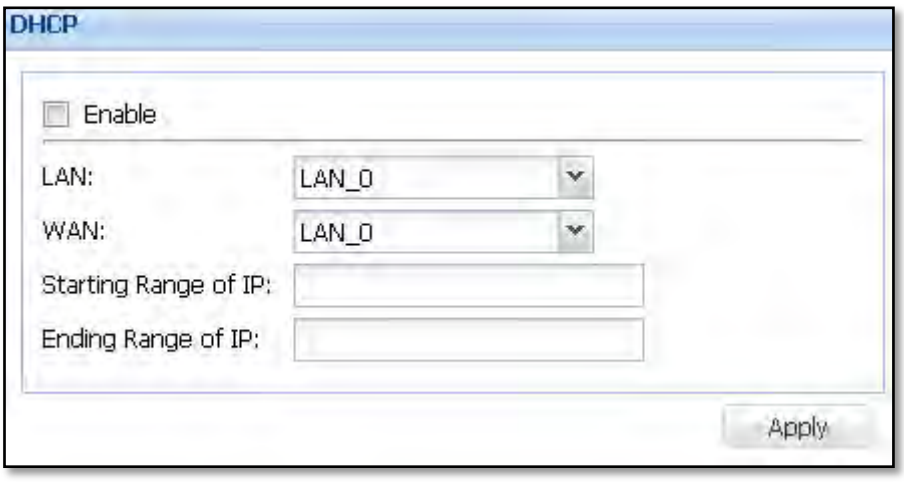


Figure 3.6.10-1 DHCP Options

Enable: To start DHCP service, select the 'Enable' option. Modify the other settings as necessary. Click 'Apply' when done. The DHCP service will be started and the NAS system will act as DHCP server, providing dynamic IP addresses to client PCs. To stop service, unselect this option and click 'Apply'.

LAN: Select the LAN interface that is connected to private/internal network, the same network segment as the client PCs.

WAN: Select the LAN interface that is connected to public/external network, the same network segment that has internet/WAN connection.

Start Range of IP: Enter the starting IP address of the range of addresses (dynamic IP) for the private/internal network.

Ending Range of IP: Enter the ending IP address of the range of addresses (dynamic IP) for the internal network.

3.6.11 SSH service

SSH (Secure Shell) is a network protocol that allows data to be exchanged using an encrypted and secure channel between the NAS and a remote host.

Figure 3.6.11-1 SSH Options

Enable: To start SSH service, select the 'Enable' option and click 'Apply'. To stop service, unselect this option and click 'Apply'.

3.6.12 Telnet service

Telnet is a network protocol used on the Internet or local area networks to provide a bidirectional interactive text-oriented communication facility using a virtual terminal connection.

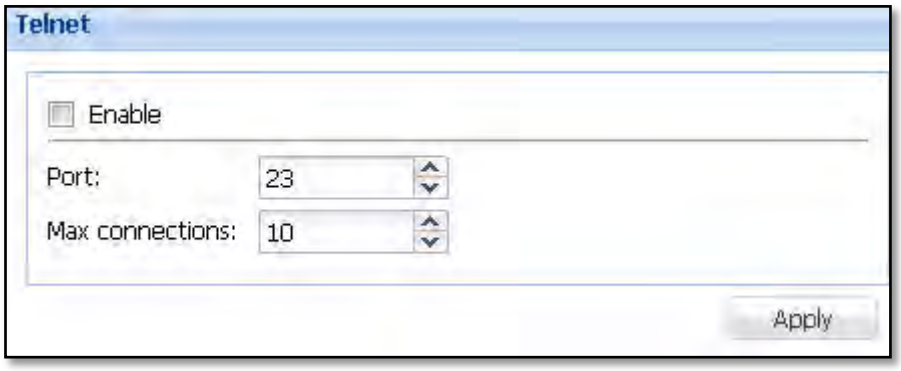


Figure 3.6.12-1 Telnet Options

Enable: To start Telnet service, select the 'Enable' option. If necessary, modify the Port and Max Connections options. Click 'Apply' when done. To stop service, unselect this option and click 'Apply'.

Port: Default port used by Telnet is 23. If modified, select from range 1024 to 65534.

Max connections: Default maximum number of Telnet connections is 10. If modified, number can be up to 1000.

3.6.13 File Manager

File Manager provide NAS user accounts access to NAS share folders and files via web GUI.

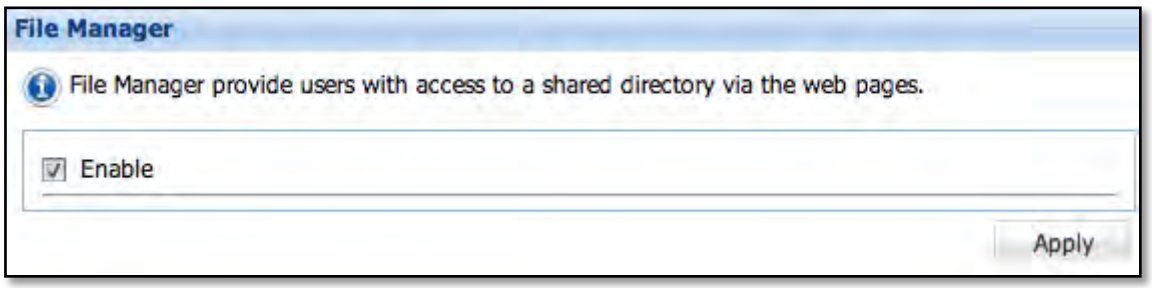


Figure 3.6.13-1 File Manager Options

Enable: To start File Manager service, select the 'Enable' option and click 'Apply'. To stop service, unselect this option and click 'Apply'.

More information about File Manager please see Chapter 3.11.

3.7 Account Manager

3.7.1 Account

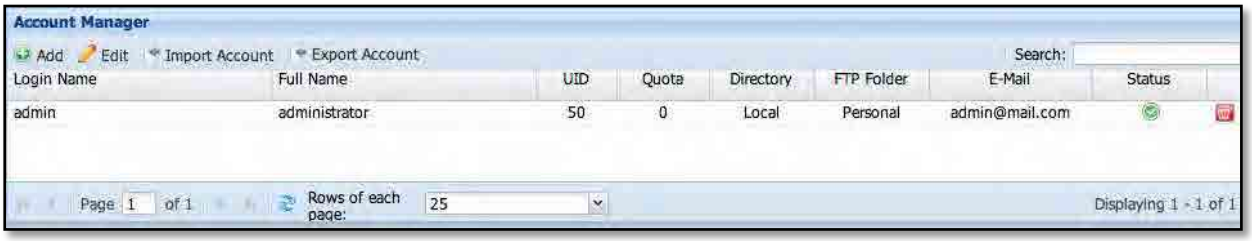


Figure 3.7.1-1 Account List

Add Account: To add a new account, click 'Add' button in Account Manager. The 'Add new account' window will appear. Follow the 'Add new account' setup wizard (Figure 3.7.1-2) .

Account Setting: Enter the account information such as Login Name, Full Name, Password, and other necessary settings. When done, click 'Next' to go the next setup page 'Assign Share'.

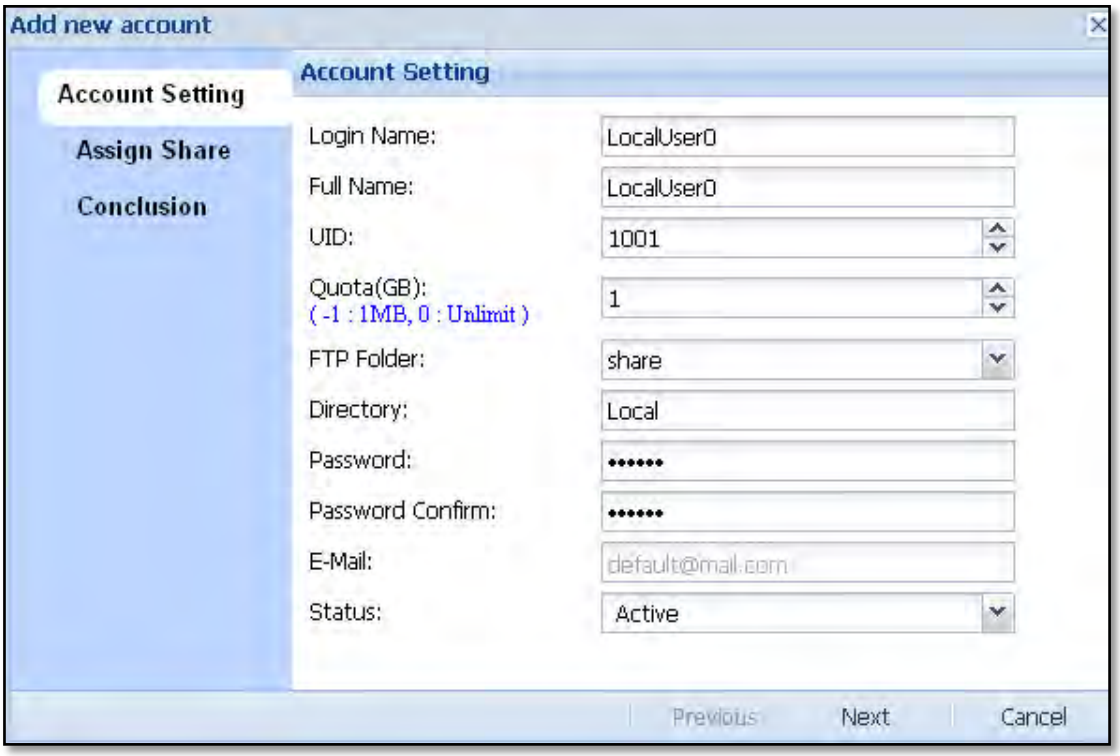


Figure 3.7.1-2 Add New Account Setting

Login Name: Please enter the account name. Account name allows up to 32 characters and can only contain letters, numbers, hyphen (-), and underscore (_). A space or period (.) is not allowed.

Fully Name: Enter a full name or a descriptive name for the account.

Quota (GB): Set the quota/limitation for the account's personal (home) folder. To disable (turn off) the quota for the account's personal folder, set the value to "-1". To set the quota to no limit, set the value to "0".

FTP Folder: Select the default FTP folder for the account. This option will direct the user account to the selected share folder, when user account login via FTP. Options include all existing share folders, Personal, and All.

Directory: This information is set by the system automatically. When an account is created in the NAS system, this field will show 'Local'.

Password: Enter password for the account. Password can contain at least 6 characters, can be up to 32 characters, and can only contain letters, numbers and special characters _ - ~! @ # $% ^ & *. The following characters cannot be used [] {} ().

Password Confirm: Enter the same password again.

E-mail: Enter e-mail address for this account.

Status: Default is 'Active' or enabled. If administrator wants to disable this account, set this to 'Inactive'.

Assign Share: Select the share folders that this account can access, and click 'Next' to go to the next page "Conclusion".

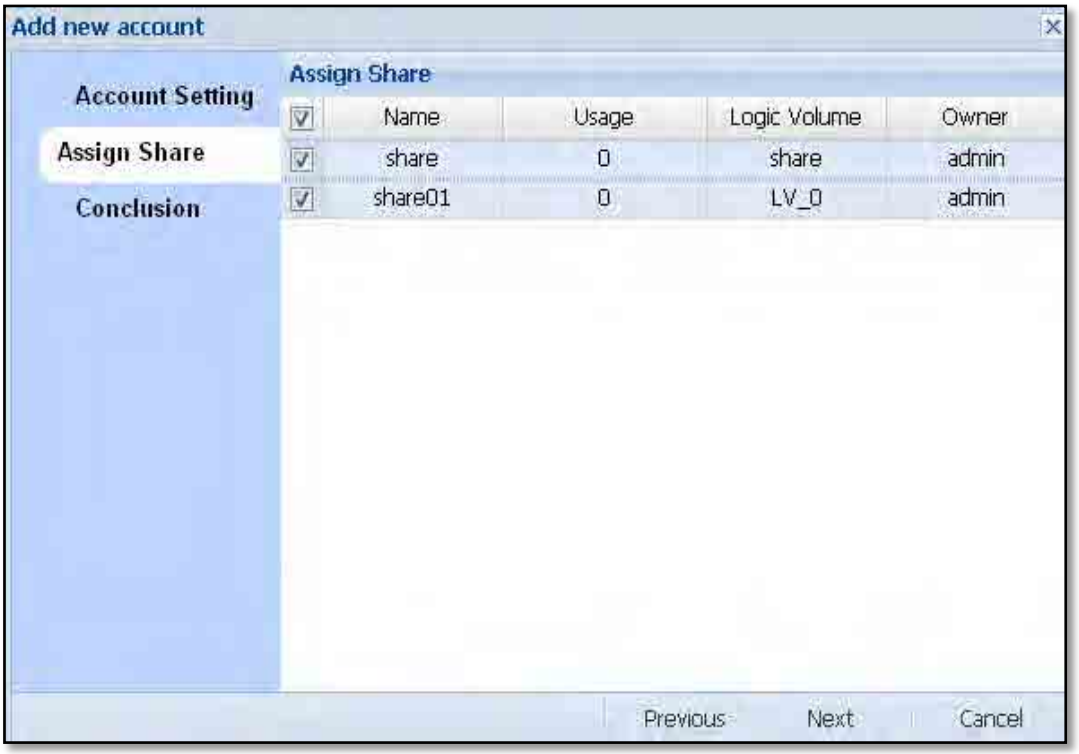


Figure 3.7.1-3 Add New Account, Assign Share Setting

Conclusion: Verify that the account settings are correct. Click 'OK' when done. The new account will be created.

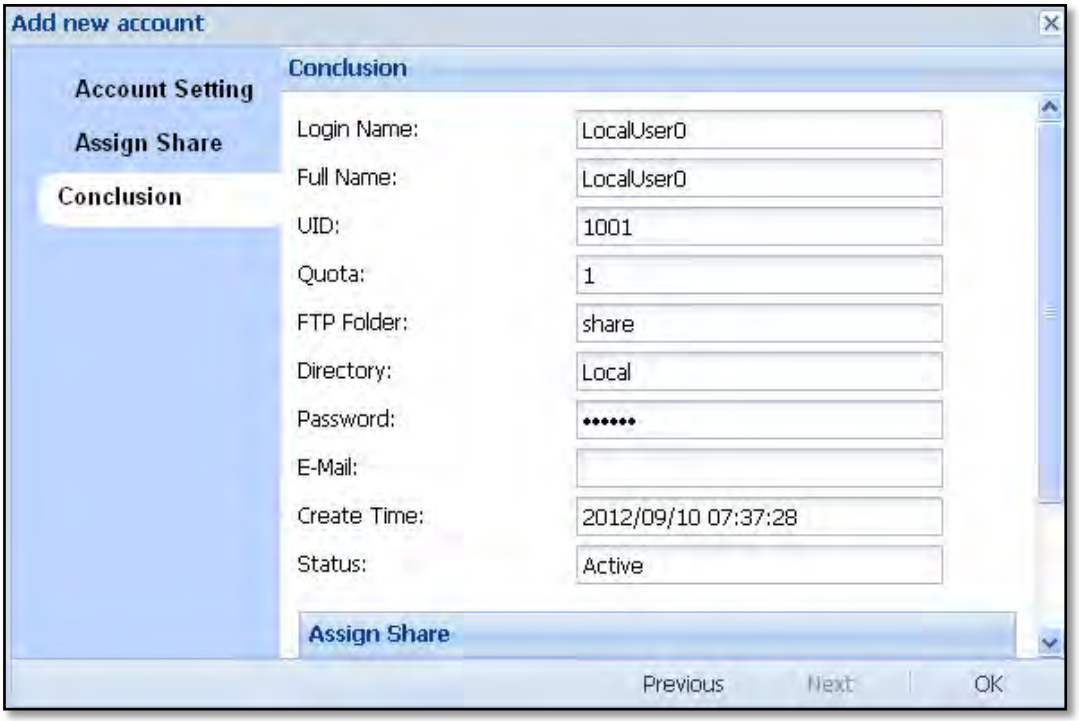


Figure 3.7.1-4 Confirm Information to Create a New Account

Edit: To edit an account, select the account name in the Account Manager's list, and click 'Edit'. The Account Setting page will appear. Modify the settings if necessary. Click 'Next'.

Figure 3.7.1-5 Edit Account

The step to modify account is just like the step to create account, but some options like Login Name, Full Name and UID are disabled and cannot be modified.

Conclusion: Verify that the account settings are correct. Click 'OK' when done. The system will update the new settings for the account.

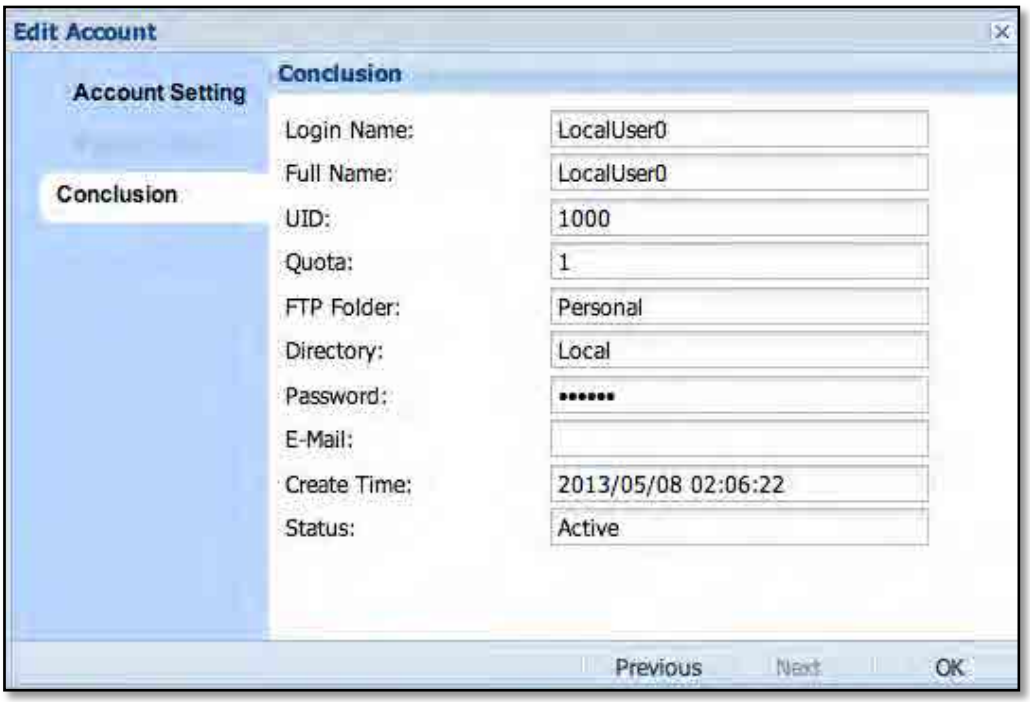


Figure 3.7.1-6 Confirm Information to Edit Account

Delete Account: Click the delete icon on the right of the account name to be deleted (Figure 3.7.1-7). The confirmation window will be displayed. Select the "Confirm:" option and click 'Yes' (Figure 3.7.1-8). The account name will be deleted.

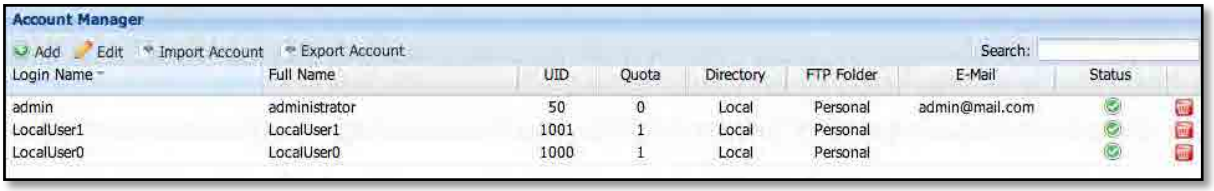


Figure 3.7.1-7 Account Manager, Account List

Figure 3.7.1-8 Confirm Information to Delete Account

Import Account: In Account Manager (figure 3.7.1-7), click the 'Import Account' button. The Import Account window will appear. Click the 'select file' icon , and select the file (extension must be CSV) containing the account list that will be imported to the NAS system. Click 'OK' when done. The accounts will be automatically added to the Account list.

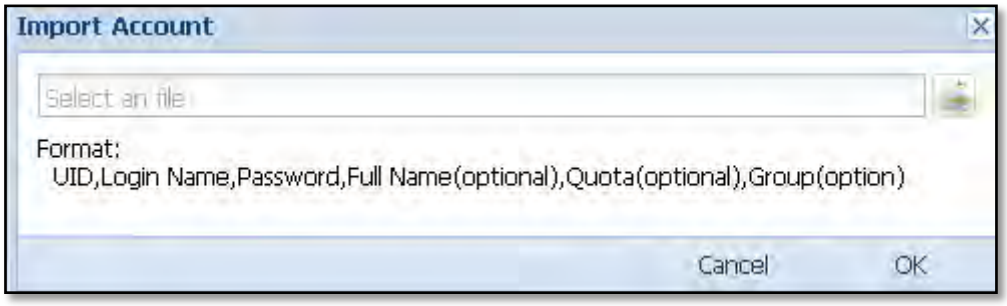


Figure 3.7.1-9 Import Account

Format of each Account Entry:

UID,Login Name,Password,Full Name,Quota,Group Name

NOTE: Each field in an account entry must be separated by comma, and there should be no space between commas. In the CSV file, each account entry must be in one line.

For example:

1001,Tony,1qazxsw2,Tony Lee,10,Sales
1002,Scott,qwerty123,PM Scott,10,PM

Export Account: Click the 'Export Account' button. Save the account file (default file name is "nasaccount.csv) to your client computer. The account file can be used later for account recovery/import.

3.7.2 Group

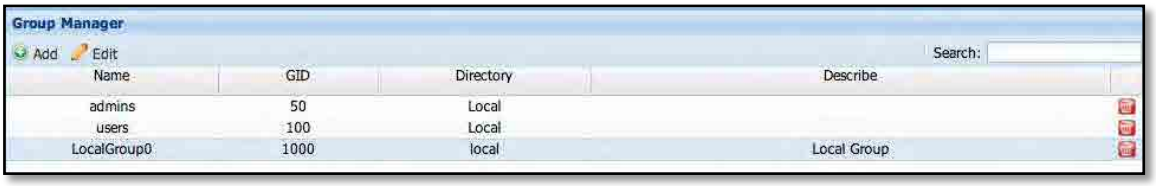


Figure 3.7.2-1 Group Manager, Group list

Add New Group: Click 'Add' button. The Add Group window will appear. Setup the Group Setting.

Name: Enter the name for the local group. The group name allows up to 32 characters and can only contain letters, numbers, hyphen (-), and underscore (_). A space or period (.) is not allowed.

GID: System default value starts with 1000. If needed to assign other GID (group ID), select the preferred GID using the arrow-down or arrow-up button. Duplicate GID is not allowed.

Describe: Enter a description for the new local group.

Add Account to Group: Select the account name that you want to join to the group by using the mouse and dragging the account name from Account List into the Group Member pane. When done, click 'Next' to go to Conclusion page.

Remove Account from Group: In Group Member list, select account name you want to remove the group, and use the mouse to drag the account from the Group Member pane to the Account List pane on the left side. When done, click 'Next' to go to Conclusion page.

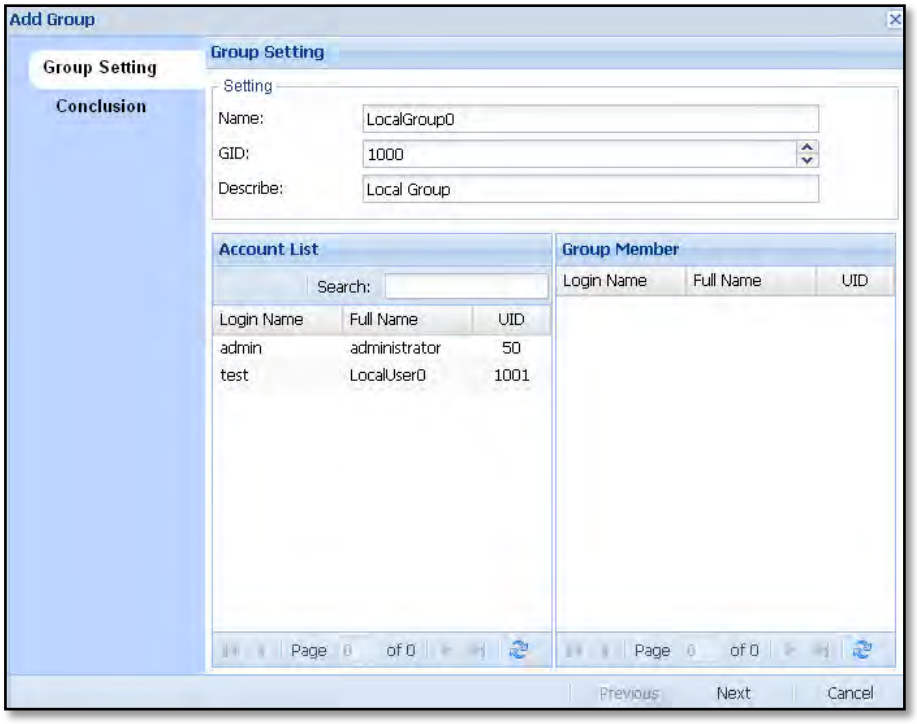


Figure 3.7.2-2 Add New Group

Conclusion: Verify settings for the new group if correct. Click 'OK' when done. The new group will be created.

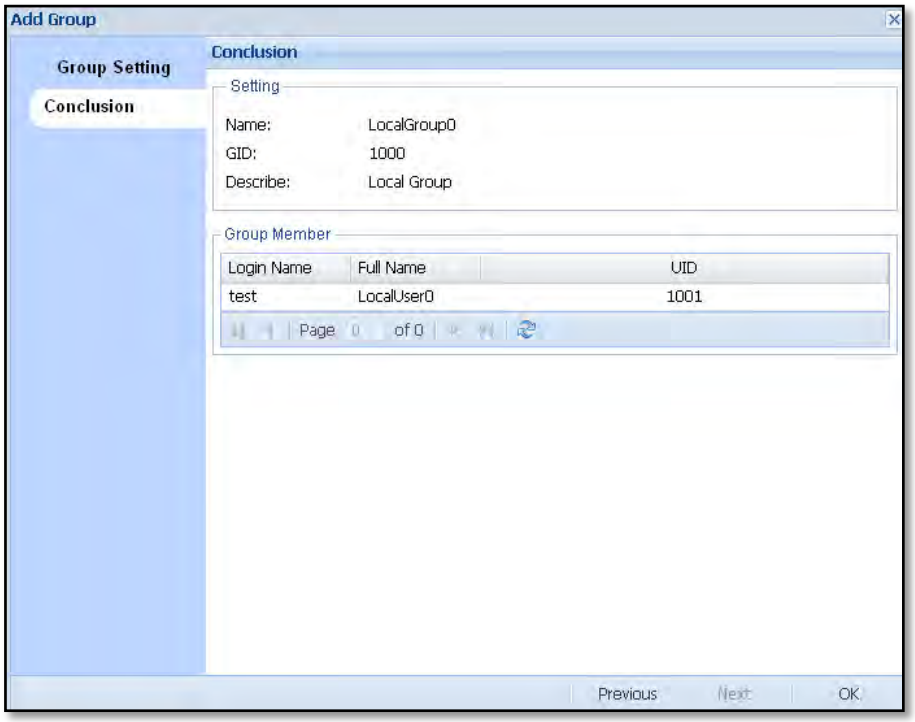


Figure 3.7.2-3 Confirm Message to Create Group

Edit Group: In the Group Manager list (Figure 3.7.2-1), click the group name to be edited and then click 'Edit' button. The following window will appear.

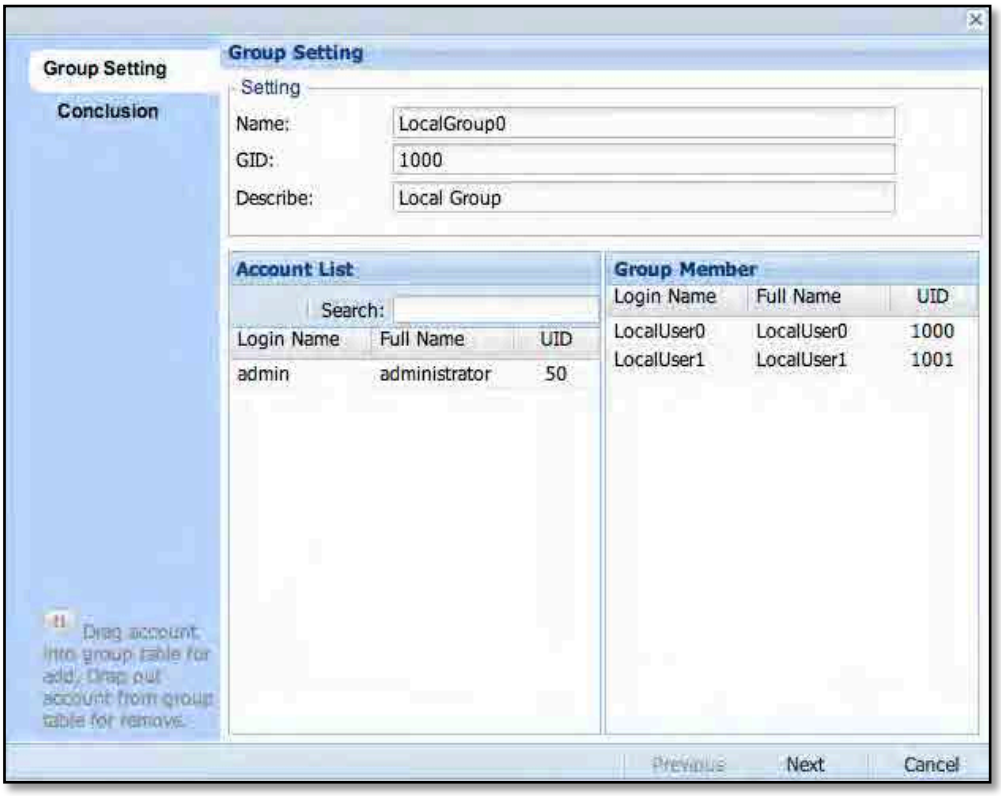


Figure 3.7.2-4 Edit Group

The step to modify group is just like the step to create group, but some options like Name and GID are disabled and cannot be modified.

Delete Group: Click the delete icon on the right side of the group name to be deleted (Figure 3.7.2-1). The confirmation window will be displayed (Figure 3.7.2-5). Select the "Confirm:" option and click 'Yes' button. The group will be deleted.

Figure 3.7.2-5 Confirm Message to delete Group

3.7.3 Directory Service

Enable ADS Authentication:

To start the Windows directory service ADS, select this option. Configure the ADS settings. When done, click 'Apply' button. The NAS system will be joined to the Windows domain, and ADS accounts and groups will be shown in the Account and Group list in the NAS system. Administrator can then assign share folder permission to these ADS accounts and groups.

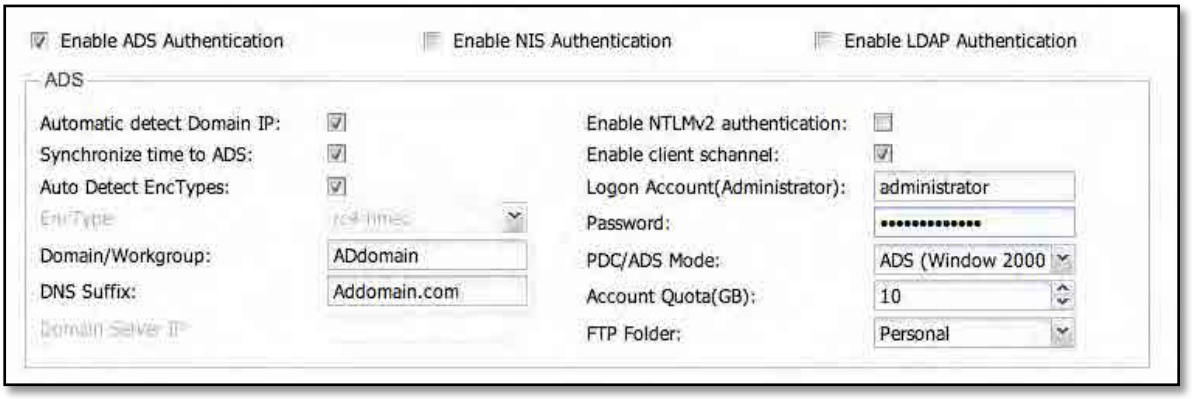


Figure 3.7.3-1 Enable ADS Authentication

Automatic detect Domain IP:

Default is enabled. To use this option, DNS must be set first in "System Manager" ➔ "Network" ➔ "DNS". If system does not automatically detect the domain server IP, this option can be disabled, and then the domain server IP address can be manually entered in the "Domain Server IP" box.

Synchronize time to ADS:

Default is enabled. NAS system will synchronize time from ADS domain server. If administrator wants to synchronize time from NTP Server, this option must be disabled and NTP Server must be setup in "System Manager" ➔ "General" ➔ "Date/Time".

NOTE: When NAS system is set to synchronize time from NTP Server, the ADS domain server must also synchronize time from the same NTP Server to avoid desynchronized time between ADS server and NAS system, which can result in failure to join the NAS to ADS domain.

Auto Detect Enctypes:

Default is enabled which means the NAS will automatically detect the encryption type. If ADS Server is using a special password encryption mode, please disable this option and select the appropriate encryption mode from "EncType" field. Click first the arrow-down button on the right to see the various encryption mode options.

Enctype: After "Automatic Detect Enctypes" is disabled, this function will be enabled.

Domain/Workgroup: Enter the domain name, for example: MYDOMAIN, or enter the workgroup name.

DNS Suffix: Enter the fully qualified domain name. For example: MYDOMAIN.COM

Doman Server IP: The "Automatic detect Domain IP" option must be disabled, and then the domain server's IP address can be manually entered here.

Enable NTLMv2 authentication: Default is disabled. To enable NTLMv2 authentication, select this option.

Enable client schannel: Default is enabled.

Logon Account (Administrator): Enter the domain administrator's account name.

Password: Enter the password for the domain administrator's account name.

PDC/ADS Mode: Select the domain server mode, ADS or PDC. ADS include Windows 2000, 2003, and 2008 Server, and PDC includes Windows NT Server.

Account Quota (GB): Set the quota/limitation for the domain account's personal (home) folder. To disable (turn off) the quota for the domain account's personal folder, set the value to "-1". To set the quota to no limit, set the value to "0".

FTP Folder: Select the default FTP folder for the domain account. This option will direct the domain account to the selected FTP share folder, when user account login via FTP.

Enable NIS Authentication:

To start the NIS directory service, select this option and set the following information below. Click 'Apply' when done. The NIS domain accounts and groups will be added in Account and Group list, and then administrator can set share folder access permissions to the accounts or groups.

NIS Domain: Enter the NIS domain name

NIS Server: Enter NIS Server IP address.

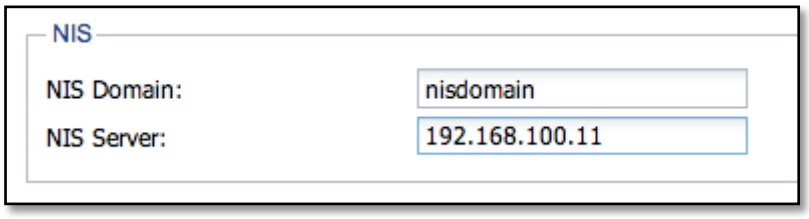


Figure 3.7.3-2 Enable NIS Authentication

Enable LDAP Authentication:

To start the LDAP directory service, select this option and set following information below. When done, click **'Apply'**. The LDAP accounts and groups will be added to the Account and Group list, and then administrator can set share folder access permissions to the accounts or groups.

LDAP server DC suffix: Enter the LDAP DC suffix. For example: dc=ldapserver,dc=com

LDAP server IP: Enter the LDAP Server IP address.

LDAP admin DN: Enter the LDAP administrator DN. For example: cn=admin,dc=ldapserver,dc=com

LDAP admin password: Enter the LDAP administrator password.

NOTE: If administrator wants to use LDAP accounts and groups to be assigned Samba share folder access, administrator must start first in the LDAP server the Samba account schema and then start the LDAP directory services in NAS. If Samba account schema is not activated in LDAP server, the NAS system can only use LDAP server's accounts and groups to be assigned share folder access via FTP.

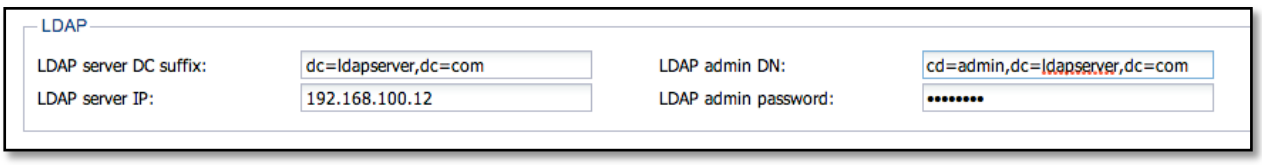


Figure 3.7.3-3 Enable LDAP Authentication

3.8 Backup Manager

3.8.1 Data Backup

The Data Backup pack all selected files into a single backup file, and it supports full, incremental and differential backup of specified share folder containing data, and also supports scheduled backups. Supported backup destinations are: Local Share folder in NAS, External Devices such as USB external disk, Samba (SMB/CIFS) remote share folder, and NFS remote share folder.

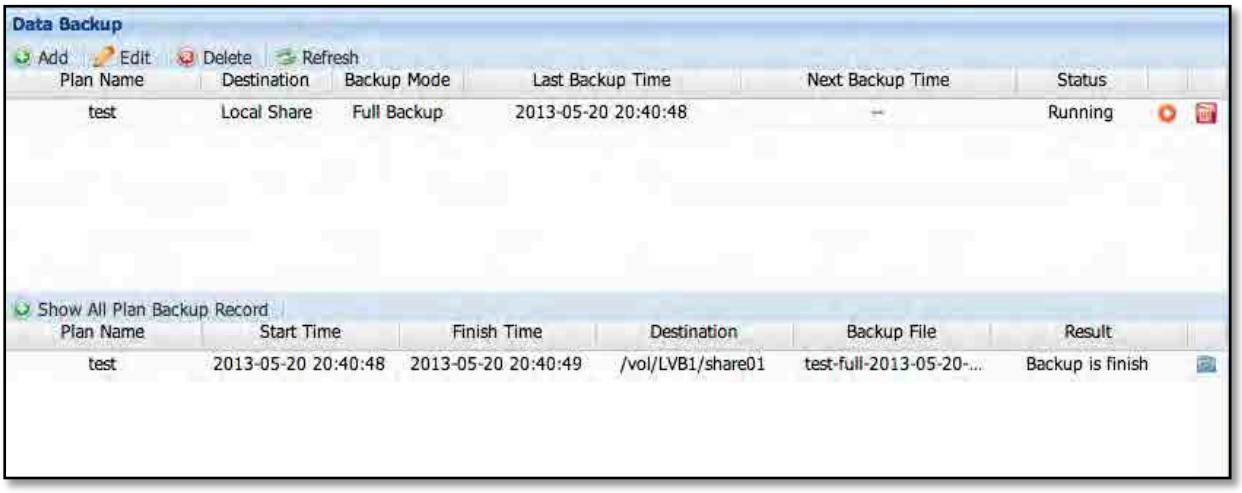


Figure 3.8.1-1 Data Backup Plan List

Add Backup Plan: Click the '**Add**' icon. The Add Backup window will be displayed.

Step 1: Configure the basic settings, such as plan name, destination, and mode.

Plan Name: Enter the name of the backup plan. The plan name allows up to 32 characters, and can only contain letters, numbers, hyphen (-), and underscore (_). Space and period (.) is not allowed. Duplicate backup plan name is also not allowed.

Destination Description:

Destination	Setting	Description
Local Share (Figure 3.8.1-2)	Share folder	NAS Local share folder
External Devices (Figure 3.8.1-3)	Ext_Device	USB / eSATA Disk
	Format	EXT3/NTFS/Not format
Samba (Figure 3.8.1-4)	IP	Remote Samba/CIFS share folder IP address
	Account	Login account
	Password	Login password
	path	Remote Samba/CIFS share folder name
NFS (Figure 3.8.1-5)	IP	Remote NFS computer IP address
	Path	Remote NFS share folder name

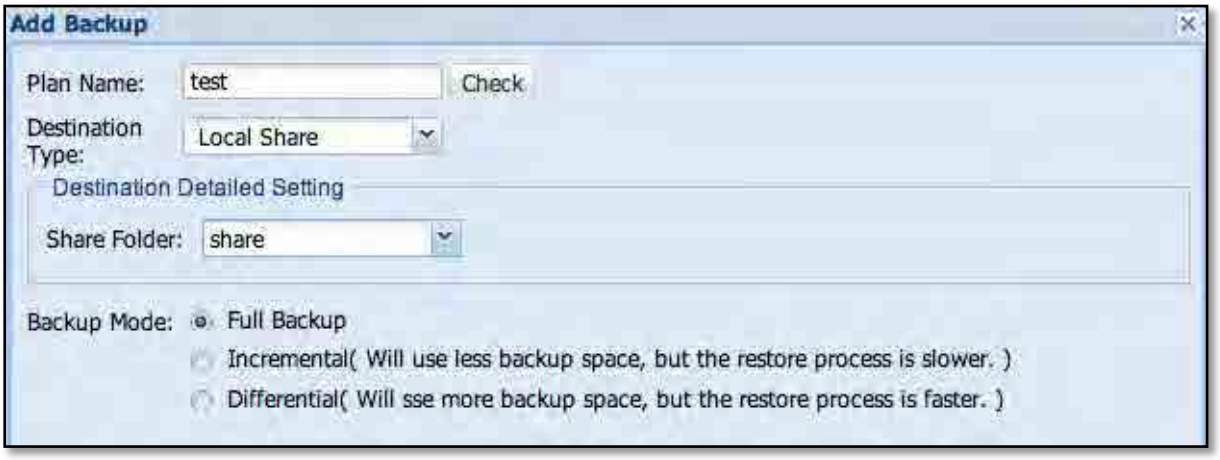


Figure 3.8.1-2 Add a Plan to Backup to a Local Share

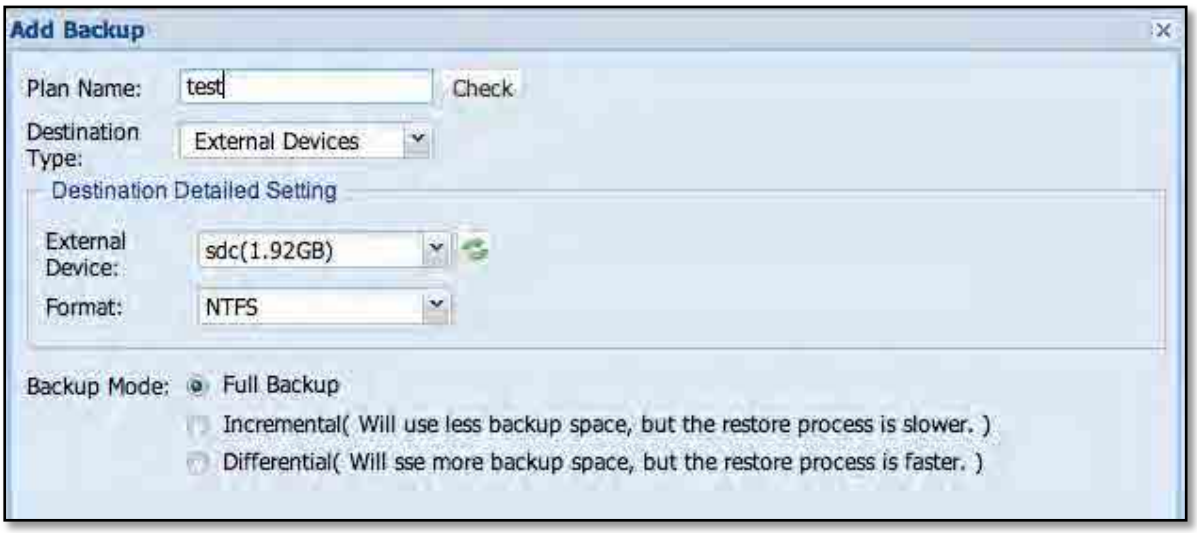


Figure 3.8.1-3 Add a Plan to Backup to Local External Device

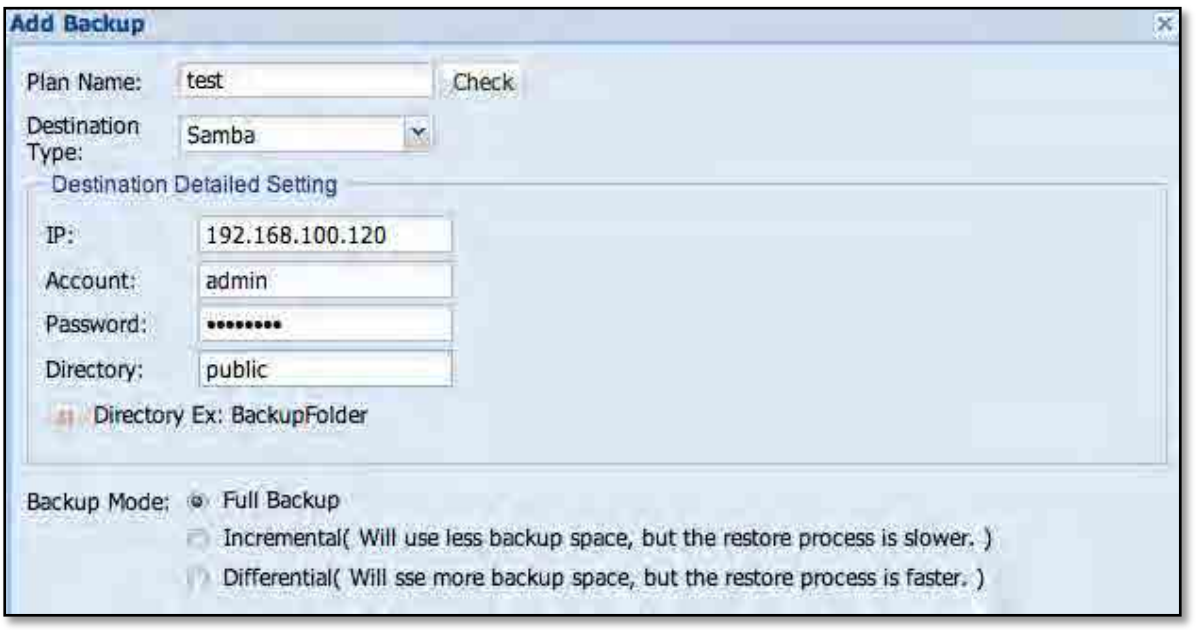


Figure 3.8.1-4 Add a Plan to Backup to Remote Samba (CIFS) Share

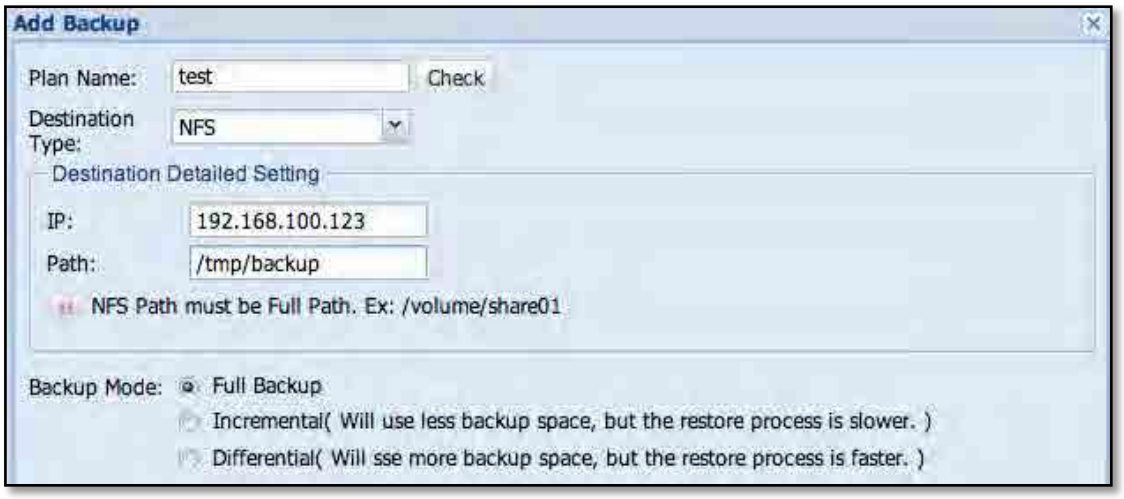


Figure 3.8.1-5 Add a Plan to Backup to Remote NFS Share

Backup Mode: Default mode is a Full Backup. There are three options: Full Backup, Incremental, and Differential

After setup is completed, click '**Next**' to choose the share folder to be backed up.

Step 2: From the Source File, select the file(s) or share folder(s) to be backed up. Then click the Add icon . The selected file(s) or share folder(s) will be added to the Backup File list. Click 'Next' to go to the Backup Plan Summary page for confirmation.

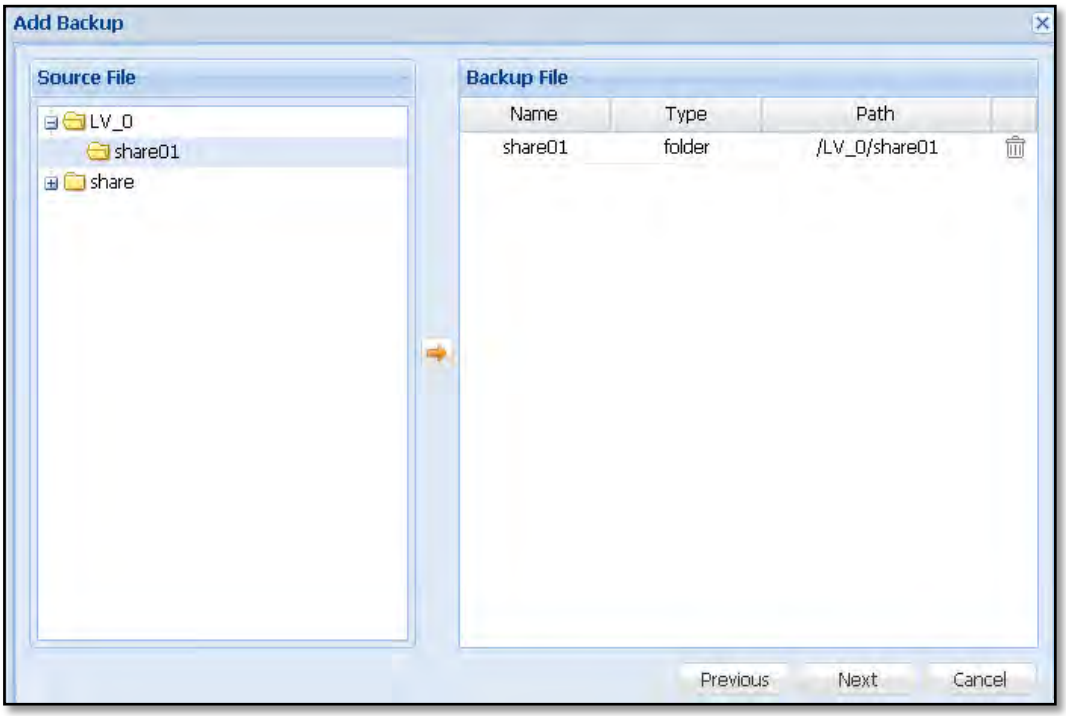


Figure 3.8.1-6 Step 2: Select Share Folder or File to Add to the Backup File List

Step 3: In Backup Plan Summary page, check the backup plan setup if correct or need to be modified. Click 'OK' when done. The new backup plan will be created.

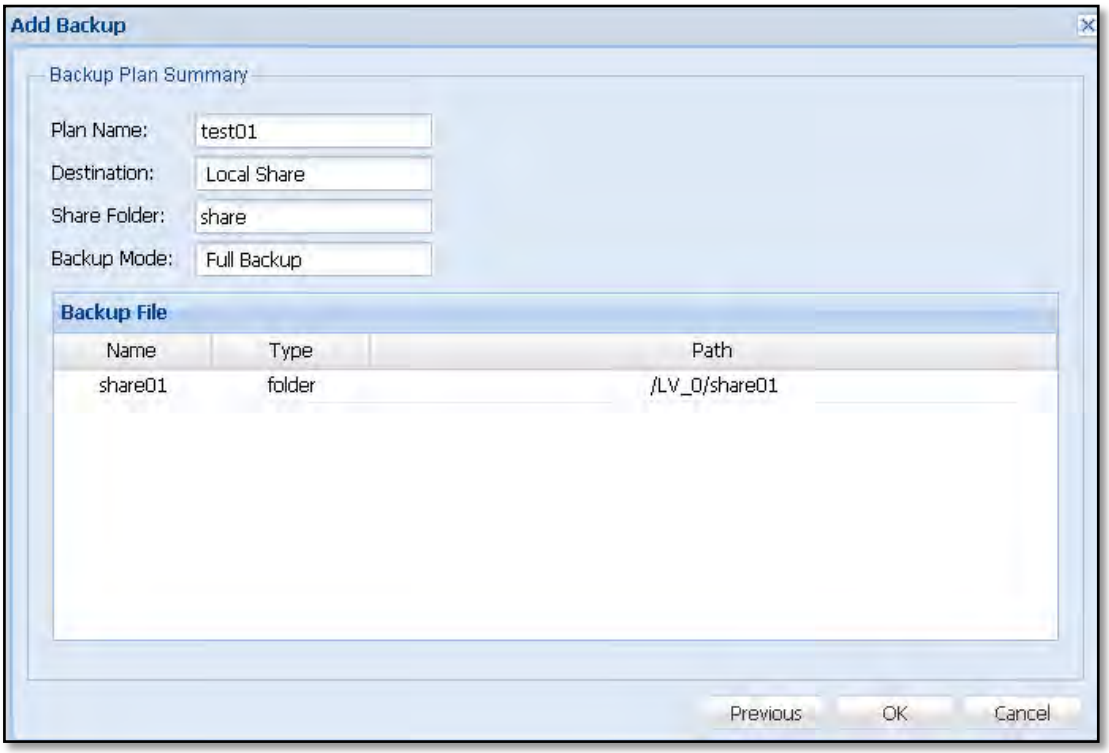


Figure 3.8.1-7 Step 3: Confirm to Add New Backup Plan

Restore:

Select the backup plan name or click '**Show All Plan Backup Record**', and previous backup records will be shown (Figure 3.8.1-8). To restore a previous backup record, click the restore icon on the right side. A confirmation screen will appear. Make sure the destination folder has enough space. Click 'Yes' to confirm. The Restore Backup page (Figure 3.8.1-9) will appear. Select the folders or files you want to be restored and click the Add icon. The selected files or folders will appear on the Restore File list. Finally select the destination share folder in '**Destination**'. Click '**Restore**' when done. The backup data will be restored to the specified destination share folder.

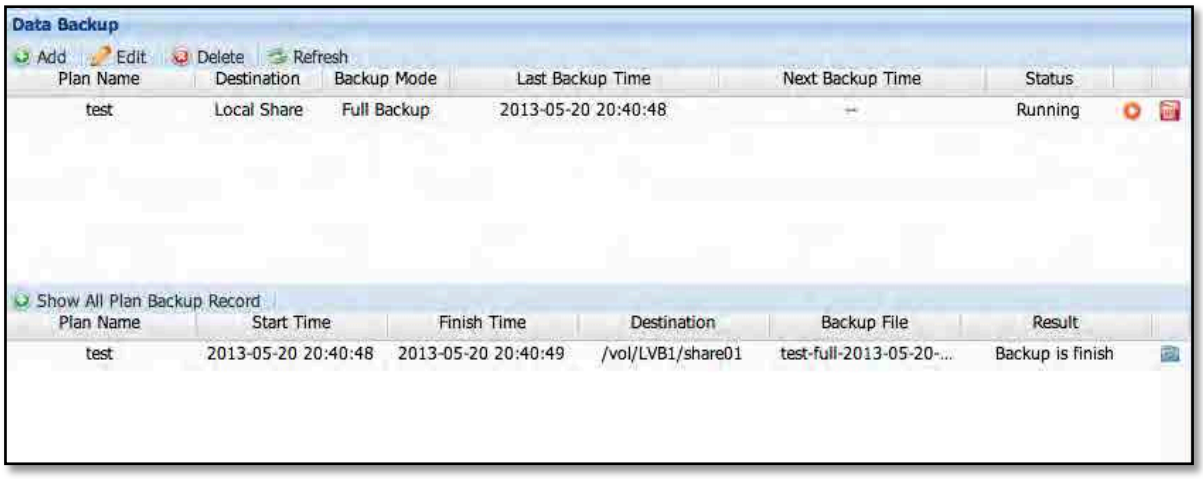


Figure 3.8.1-8 Data Backup Plan List and Record List

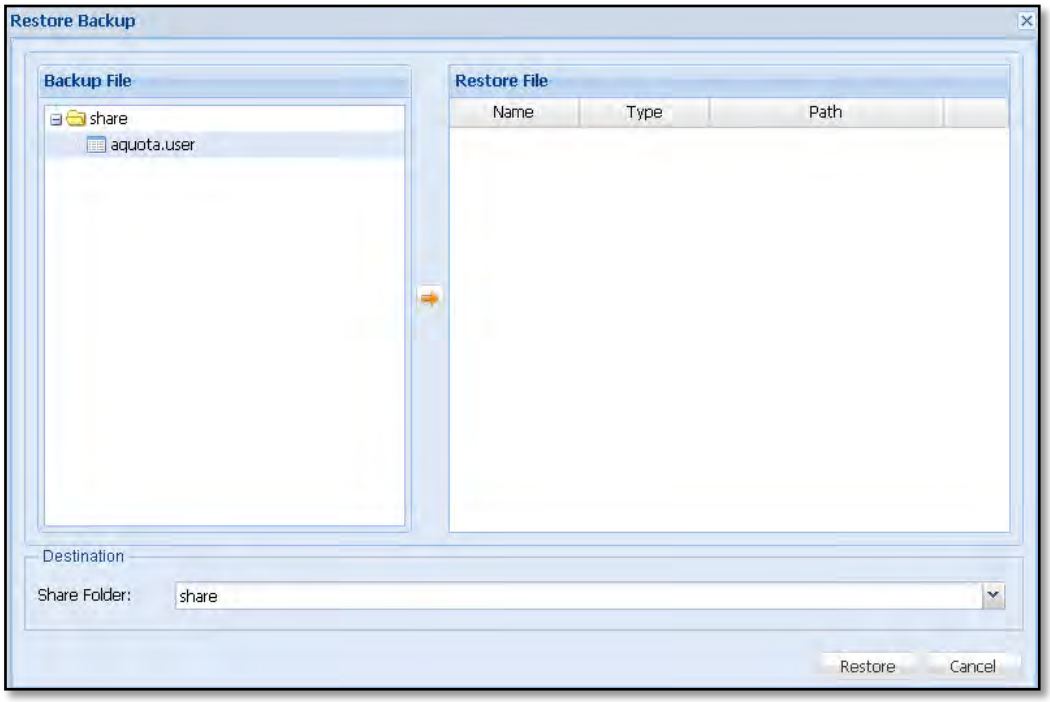


Figure 3.8.1-9 Select the Share Folders and/or Files to be Restored

Edit: Select the backup plan name you want to be modified and click 'Edit'. Click 'Next' to modify the backup plan.

Edit Backup Source File: Under 'Source File' list, select the file or share folder you want to be added for backup and click the Add icon . The selected file or folder will appear on the 'Backup File' list on the right. To delete a file or folder from Backup File list,

click the delete icon on the right of the file or folder. When done, click 'Next' to go to Back Plan Summary page.

Back Plan Summary: Check the backup plan setup if correct or still need to be modified. Click 'OK' when done. The backup plan settings will be updated.

Delete Backup Plan: Click the delete icon on the right side of the backup plan name to be deleted (Figure 3.8.1-1). The Confirm window will appear. Click 'Yes' to confirm deletion of the selected backup plan.

The backup plan can also be defined with scheduled job in Schedule manager. (See Chap 3.4.8)

3.8.2 Data Copy

Data Copy is similar to Data Backup but doing only 1:1 copy to another destination. It creates a full and exact copy of the selected data. The Share Copy backup function supports full copy backup of selected shared folder to backup destination device. It also supports scheduled backup for automatic backup. Supported backup destinations are: Local Share folder in NAS, External Devices such as USB external disk, Samba (SMB/CIFS) remote share folder, and NFS remote share folder.

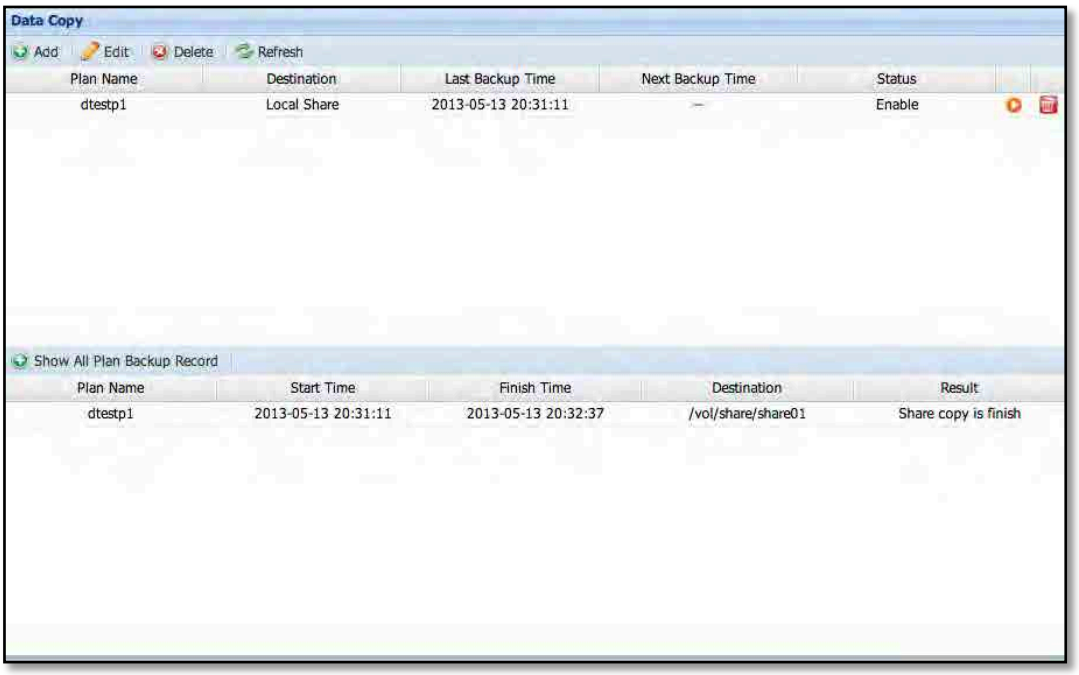


Figure 3.8.2-1 Data Copy Plan and Record List

The backup plan can also be defined with scheduled job in Schedule manager. (See Chap 3.4.8)

Add Share Copy Backup: Click the 'Add' icon. The Add Backup window will appear.

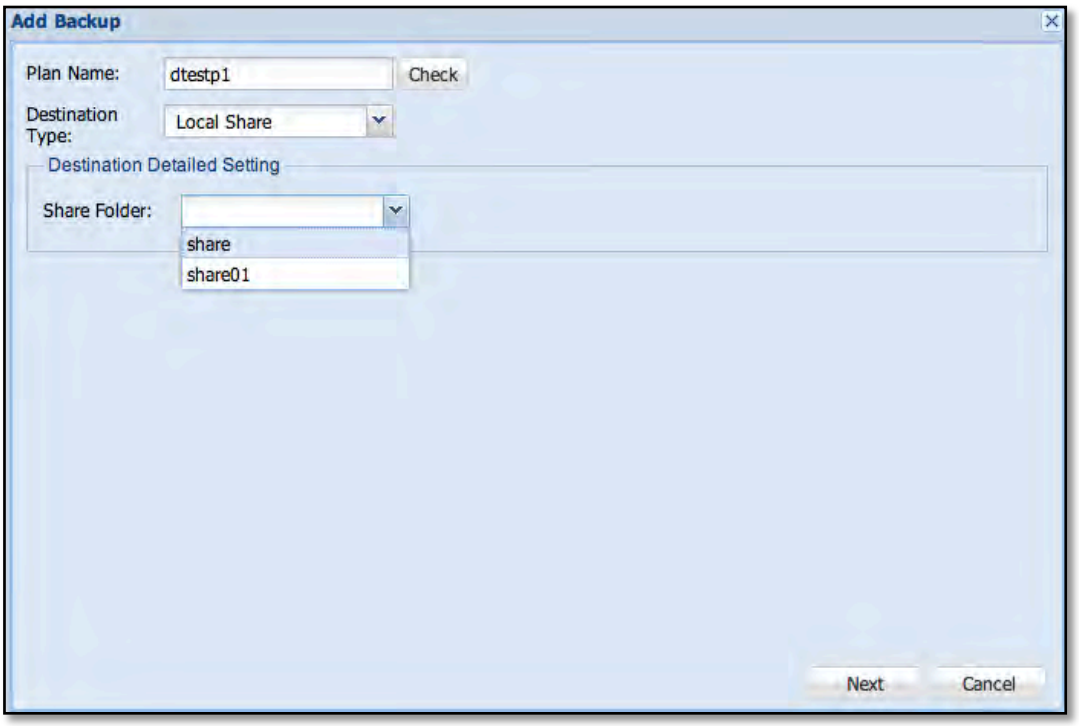


Figure 3.8.2-2 Step 1: Add a New Data Copy Plan

Step 1: Configure the basic backup plan settings, such as plan name and destination. Click 'Next' when done.

Plan Name: Enter the name of the backup plan. Plan name allows up to 32 characters, and can only contain letters, numbers, hyphen (-), and underscore (_). Space or period (.) is not allowed. Duplicate backup plan name is also not allowed.

Destination	Setting	Description
Local Share	Share Folder	NAS Local share folder
External Devices	Ext_Device	USB Disk
	Format	EXT3/NTFS /Not format. If set as EXT3 or NTFS, in the first backup, system will format the external device as EXT3 or NTFS. If set as “Not format”, system will automatically recognize the external device's file system format after auto-mount.
Samba	IP	Remote Samba/CIFS share folder IP address
	Account	Login account
	Password	Login password
	Path	Remote Samba/CIFS share folder name
NFS	IP	Remote NFS share folder IP address
	Path	Remote NFS share folder name

Step 2: Select the share folder or file to be backed up from Source File, and click the Add button . The selected share folder or file will appear on the Backup File list in the right. Click ‘Next’ to go to Backup Plan Summary confirmation page.

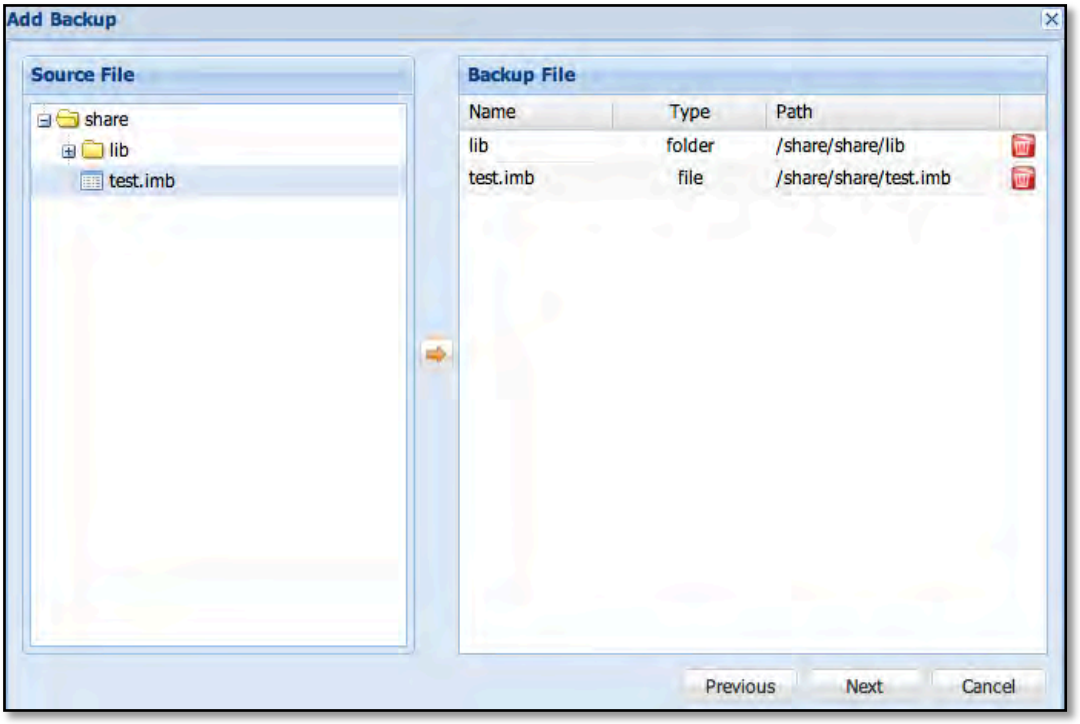


Figure 3.8.2-3 Step 2: Select Share Folder or File to Add to Backup File List

Step 3: In Backup Plan Summary page, check the backup plan setup if correct or need to be modified. Click 'OK' when done. The new backup plan will be created.

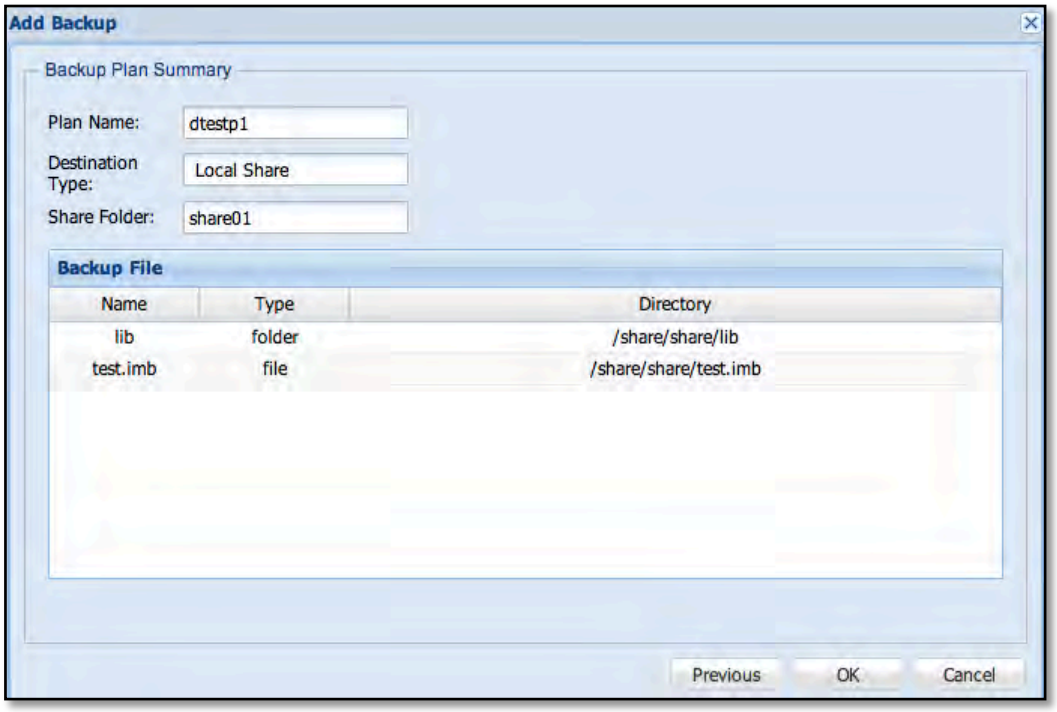


Figure 3.8.2-4 Step 3: Confirm to Add the New Backup Plan

Edit: Select the backup plan that you want to edit, and then click 'Edit' icon. Click 'Next' to modify the backup plan.

Edit Backup Source File: Under 'Source File' list, select the file or share folder you want to be added for backup and click the Add icon . The selected file or folder will appear on the 'Backup File' list on the right. To delete a file or folder from Backup File list, click the delete icon on the right of the file or folder. When done, click 'Next' to go to Back Plan Summary page.

Back Plan Summary: Check the backup plan setup if correct or still need to be modified. Click 'OK' when done. The backup plan settings will be updated.

Delete Back Plan: Click the delete icon on the right side of the backup plan name to be deleted (Figure 3.8.2-1). The Confirm window will appear. Click 'Yes' to delete the selected plan.

The backup plan can also be defined with scheduled job in Schedule manager. (See Chap 3.4.8)

3.8.3 Replication Backup

Replication Backup supports block-level replication of data from one logical volume of a NAS system to another logical volume of another NAS system. The two logical volumes, which are setup with Replication Backup, will be similar to a mirrored logical volume or Raid Level 1, and this enhances the logical volume data protection. When data is written on the source NAS logical volume, the data in the destination NAS logical volume is automatically synchronized. If the source NAS fails, administrator can manually switch and connect directly to the second NAS for continued data access.

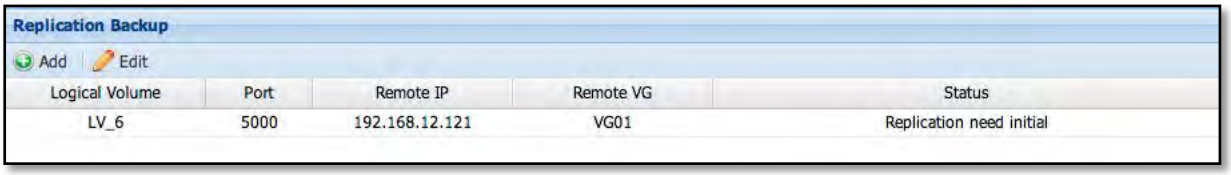


Figure 3.8.3-1 Replication Backup List

Add Replication Backup: Click 'Add'. The Add Replication window will be displayed. Set the options below and click 'OK' when done.

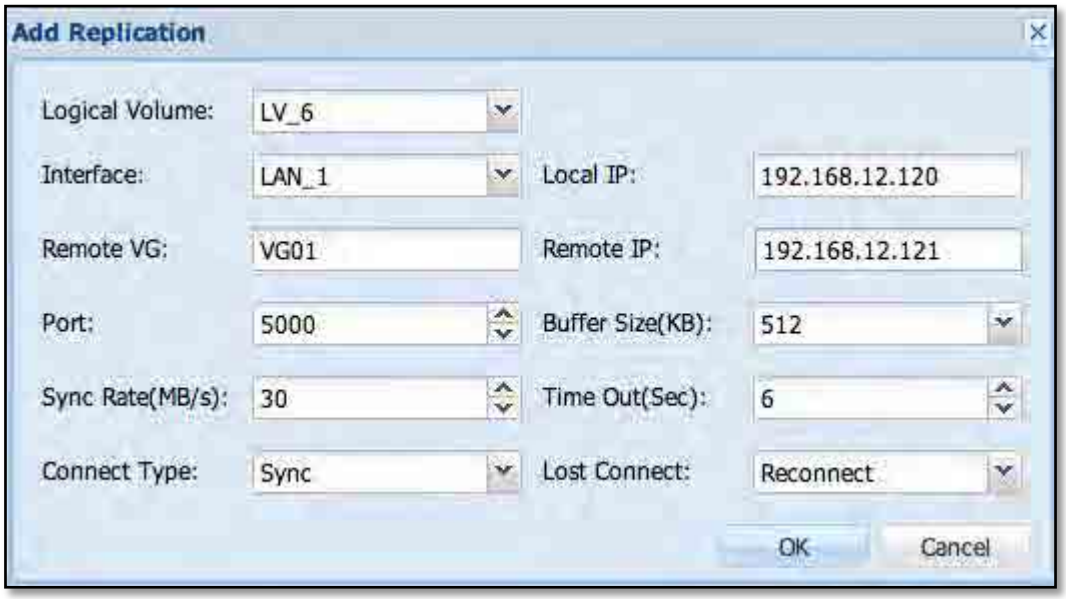


Figure 3.8.3-2 Add New Replication Backup

Logic Volume: Select which Volume will be replicated
Interface: Select which NAS Ethernet port will be used for Replication connection
Local IP: Displays the local (source) NAS IP address that will be used for Replication.

Remote VG: Enter the VG name on the remote (destination) NAS where the replicated logical volume will be created

Remote IP: Manually enter the remote (destination) NAS IP address that will be used for Replication.

Port: Select a TCP port to bind locally and will be used to connect to the remote NAS.

Buffer Size (KB): It is the size of the TCP socket send buffer. You can specify smaller or larger values. Larger values are appropriate for reasonable write throughput with asynchronous protocol over high latency networks. Default is 512K and maximum is 2048K.

SyncRate (MB/s): This sets the limit of the bandwidth that will be used by the synchronization process. Default is 30MB/sec. Minimum value is 10MB/sec and maximum value is 1000 MB/sec – for high latency network environment (e.g. bonding on Gigabit Ethernet).

Time Out (Sec): It is the value to wait for connection timeout if the remote NAS has failed. If the remote NAS fails to send the response packet within the specified timeout time, the remote NAS will be considered dead and the TCP/IP connection is abandoned. The default is 6 sec. Minimum is 1 sec and maximum is 60 sec

Connection Type: There are two types of Replication Backup Connection:

Sync (Synchronous) - The system will acknowledge the transaction as completed after the data is written to the logical volume of destination NAS. It is recommended to use this mode. In most cases, this connection type preserves transaction semantics. Write IO is reported as completed if it has reached the remote logical volume.

Async (Asynchronous - for high latency network) - The system will acknowledge the transaction as completed after the data is written to system buffer. It provides faster transmission and is suitable for busy network. Write IO is reported as completed if it has reached the local TCP send buffer.

Lost Connect: When connection is lost, the Replication Backup can either go to stand-alone mode or will try to reconnect.

Reconnect: The Replication Backup will attempt to reconnect. (Default)

Stand-alone: The Replication Backup will not attempt to reconnect and will be in stand-alone state. All IO requests are only passed locally and no replication.

NOTE: Before Replication Backup is successfully created, a 4GB logical volume will be created on each NAS. This will serve as the metadata device for the replicated volume. This volume is not mounted and will not be seen on the NAS GUI. Please be sure to have an extra 4GB available VG space on both source and destination NAS.

Initialize or Edit Replication: Select the Logical Volume name in Replication Backup list, and then click 'Edit'. The Edit Replication window will appear.

Figure 3.8.3-3 Modify Replication Backup

Initial Replication: Click "Initial Replication" to initialize the Replication Backup for the selected Logical Volume.

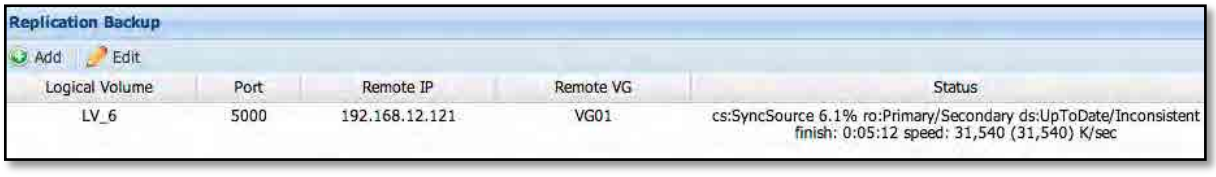


Figure 3.8.3-4 Replication Backup Status

NOTE: After setup of Replication Backup on a logical volume in source NAS, a similar logical volume will be automatically created on the destination NAS under the specified VG. At this point, the Replication Backup is not yet initialized and no synchronization. Replication Backup still needs to be initialized first. After selecting “Initial Replication” button, the source NAS will then connect to the destination NAS and starts to synchronize. Synchronization typically takes quite a while especially on larger logical volume. After initialization, the source NAS should be in "Primary" state and the destination NAS should be in "Secondary" state. If this is the state, you have now a working Replication Backup. Initializing the Replication is done in the source NAS.

Set Primary: To set the replicated logical volume in destination (Secondary) NAS to be Primary, both NAS must be set first to Secondary state. This can be done by setting the Primary NAS to be Secondary. After both NAS becomes Secondary/Secondary, go to the NAS GUI of the destination NAS. Edit the replicated logical volume and use the "Set Primary" button.

Set Secondary: To set a Primary (source) logical volume to be Secondary (destination), use the "Set Secondary" button on the Primary NAS.

Force Sync: To manually force the synchronization, click the "Force Sync" button. The data on the primary NAS will be forcefully synchronized to the secondary NAS.

Reconnect: To reconnect a broken Replication Backup connection, click the "Reconnect" button. At some point in time, if Replication Backup fails to establish connection to the other NAS, you may try to re-establish connection thru this button. This button will be enabled only if one of the NAS losses connection.

Abort Replication: To abort or drop the replication, click the "Abort Replication" button. After aborting replication, the data on the destination logical volume (Secondary NAS) can be retrieved by accessing the share folder under that destination logical volume, and the share folder name is exactly the same as the share folder on the source logical volume (Primary NAS).

NOTE: iSCSI, FC, Snapshot and Thin Provisioning volumes do not support Replication.

Extending Logical Volume Size under Replication Backup

The following are the steps:

1. Abort the Replication Backup by selecting "**Abort Replication**" button.
2. Delete the replicated logical volume on the destination (Secondary) NAS.
3. Extend the size of the source logical volume in primary NAS. Please note that there should be enough space on the VG of the destination NAS to accommodate the extended logical volume space. For example, if the size of source logical volume is now 3TB, the VG ("Remote VG") on the destination NAS must also have free 3TB space for creating the replicated logical volume (Note that after aborting replication, the same logical volume name can be deleted on the destination NAS to free up VG space).
4. Create a new Replication Backup using the extended logical volume on primary NAS.

NOTE:

Extending the size of a Logical Volume under Replication Backup is not allowed. However, there is a work around to extend the LV size. Note that the extended LV size must not exceed 16TB.

3.8.4 Snapshot Backup

Snapshot Backup creates a backup “copy” of a logical volume in specific moment in time. This feature is Block Level. Snapshot Backup also supports backup of iSCSI Target Volume and FC Target Volume, including scheduled backup.

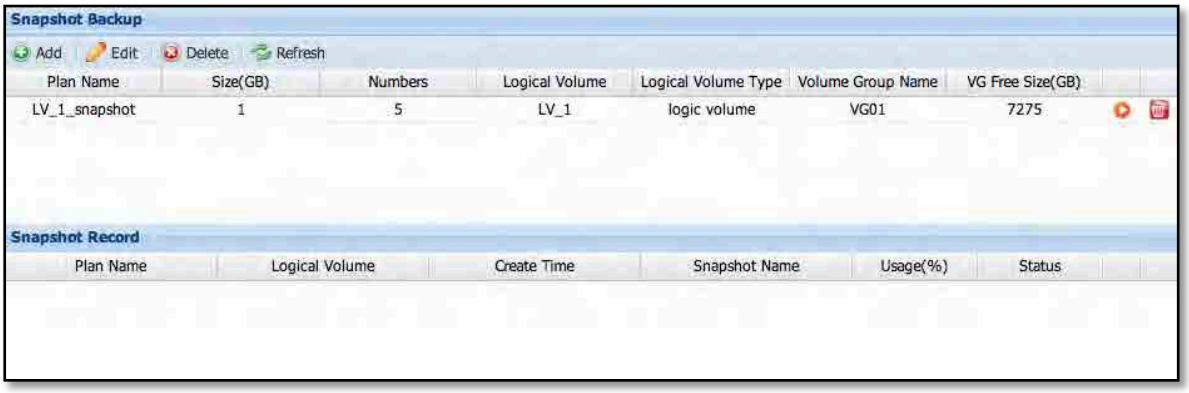


Figure 3.8.4-1 Snapshot Backup List

Add Snapshot: Click the ‘Add’ icon. The Add Snapshot window will appear. Enter the necessary information. Click ‘OK’ when done.

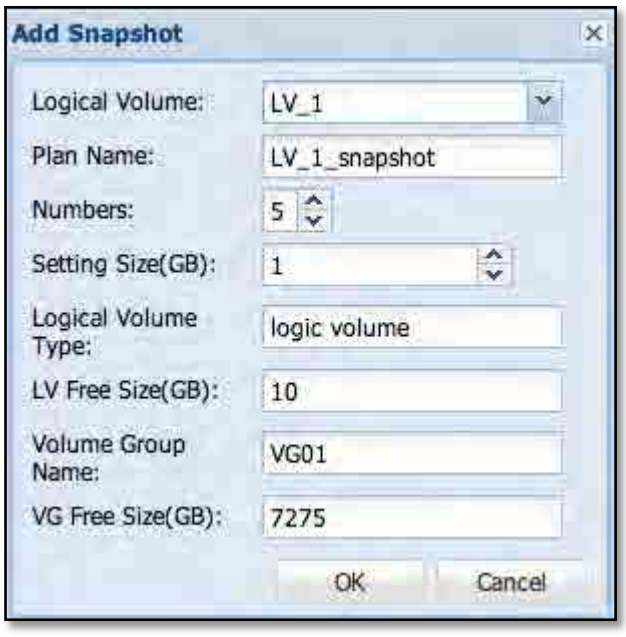


Figure 3.8.4-2 Create a New Snapshot Backup Plan

Logic Volume: Select the logical volume name that will be used to create Snapshot Backup.

Plan Name: Enter the name of the Snapshot Backup plan. The plan name can be up to 32 characters, and can contain only letters, numbers, hyphen (-), or underscore (_). Space or period (.) is not allowed. Duplicate plan name is also not allowed.

Numbers: This is the maximum number of snapshots. Default is 5. If the maximum number of snapshots is reached, for example there are now 5 snapshot backup, the next/newest snapshot will automatically overwrite the first/oldest snapshot.

Setting Size (GB): This is the capacity that will be used in each snapshot backup. If the amount of data in the logical volume exceeds the capacity that will be used for the snapshot, the snapshot backup will fail and can't be used. In order to avoid such case, it is advisable to set the snapshot capacity (Setting Size) the same as logical volume size.

Logic Volume Type: The system will automatically detect the type of logical volume, such as Default Volume, Logical Volume, Replication Volume, iSCSI Volume, or FC Volume (5 types). This information is for reference only and cannot be changed.

LV Free Size (GB): This is capacity of the selected logical volume. This information is for reference only and cannot be changed.

Volume Group Name: This is the volume group name where the selected logical volume was created. This information is for reference only and cannot be modified.

VG Free Size (GB): This is the free space of the volume group name where the selected logical volume exists. This information is for reference only and cannot be modified.

NOTE: If a logical volume is already used for Snapshot Backup, the logical volume can no longer be used to create another snapshot backup plan. Only one snapshot backup plan is allowed to be created in a logical volume.

Edit Snapshot: Select the Snapshot Backup plan name you want to edit and click the 'Edit' icon. The Edit Snapshot window will appear. Only the "Numbers" and "Setting Size (GB)" can be modified. Click 'OK' when done. The changes will be updated to the snapshot backup plan.

Delete Snapshot Backup Plan: Click the delete icon on the right of the snapshot backup plan name to be deleted. The Confirm window will appear. Select the 'Yes' button to confirm deletion.

Delete Snapshot Backup Record: Click the delete icon on the right of the snapshot backup record to be deleted. The Confirm window will appear. Select the 'Yes' button to confirm deletion.

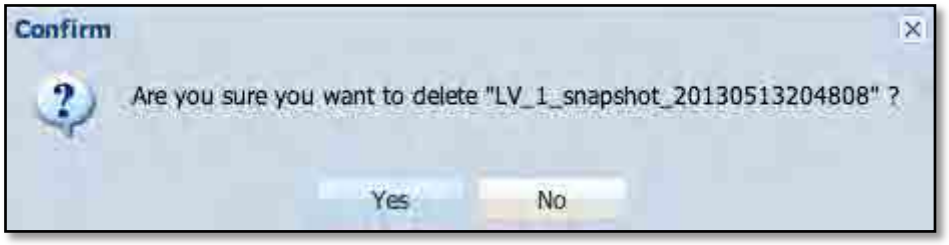


Figure 3.8.4-3 Confirm Message to Remove a Snapshot Backup Record

Restore Snapshot: Select the Plan Name that has the snapshot backup to be restored. The previous snapshot backups will appear in the Snapshot Record list. Click the 'Restore' icon on the right of the snapshot backup to be restored (Figure 3.8.4-4). The Snapshot Restore window will appear (Figure 3.8.4-5).

NOTE: Only snapshot backups of logical volumes can be restored. Snapshot backups of iSCSI volumes or FC volumes cannot be restored. However, there is a work around in order to access the data from snapshot backup, and that is to create an iSCSI or FC target volume using the snapshot backup volume (of the iSCSI volume or FC volume), and then connect the client computer to the iSCSI or FC target volume.

2 Options for Restore:

Select **"Select File Restore"** to restore specific files or folders only and click 'OK'. The Confirm window will appear (Figure 3.8.4-7). Click 'Yes'. The Restore Snapshot window will appear (Figure 3.8.4-8). Select the folder or file you want to be restored, choose the Destination folder and click 'Restore'. Data will be restored to the Destination folder.

Select **"Full Volume Restore"** and click 'OK'. The Confirm window will appear (Figure 3.8.4-6). Click 'Yes' to restore full volume data.

Figure 3.8.4-4 Snapshot Record List

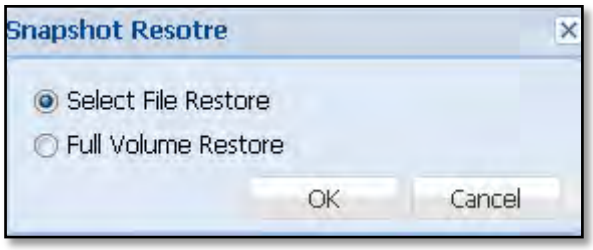


Figure 3.8.4-5 Snapshot Restore Option

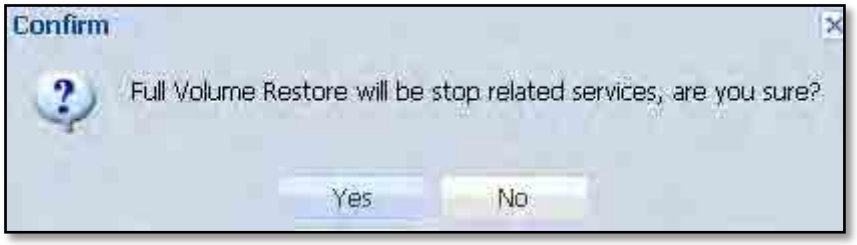


Figure 3.8.4-6 Confirm Message of Full Volume Restore Snapshot

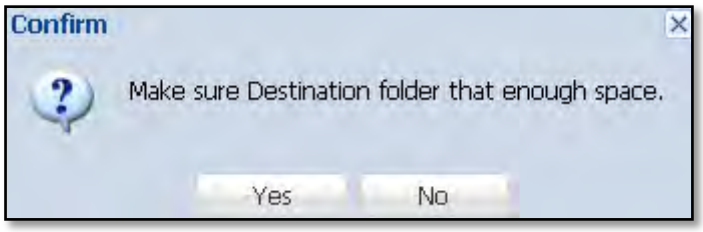


Figure 3.8.4-7 Confirm Message to Restore Snapshot

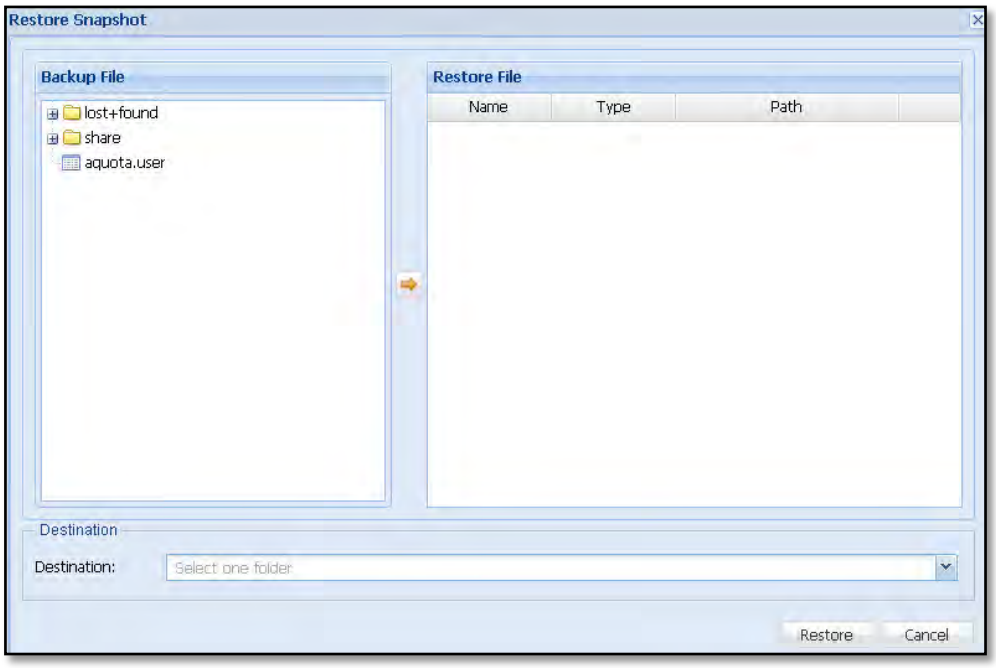


Figure 3.8.4-8 Select Share Folder or File to Restore

The Snapshot backup plan can also be defined with scheduled job in Schedule manager. (See Chap 3.4.8)

3.8.5 Volume Clone

Volume Clone can create fast replicate copy of one volume locally. One copy and up to three copies can be created.

Clone Status: Status of clone job. If it shows Ready, a new clone can be created.

Step 1: Select Clone Source: Select the original volume which can be general data volume, iSCSI or FC volumes. (Figure 3.8.5-1)

Step 2: Select Clone Destination: Select volume group to create the new volume clone copy, define the name of new volume clone. If you want to clone more than one copy, Click "**Add**" Figure 3.8.5-2). The maximum number of clones is 3.

After configure, click "**Start**". The system will start cloning the volume after confirming the Clone Summary (Figure 3.8.5-3).

While cloning, you can see the volume clone status (Figure 3.8.5-4).

NOTE: Snapshot and Thin Provisioning volumes do not support cloning.

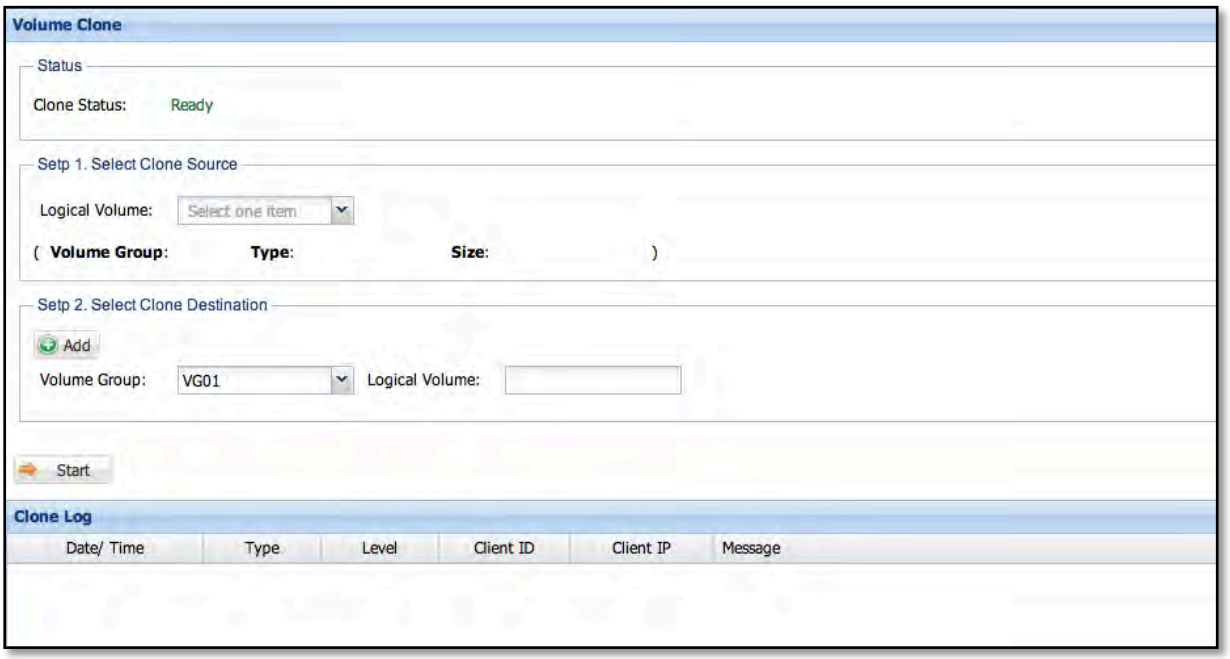


Figure 3.8.5-1 Clone Manager

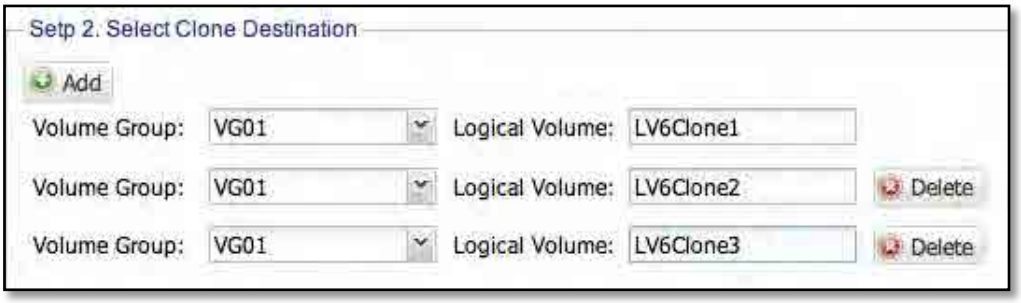


Figure 3.8.5-2 Clone More Than One Copy

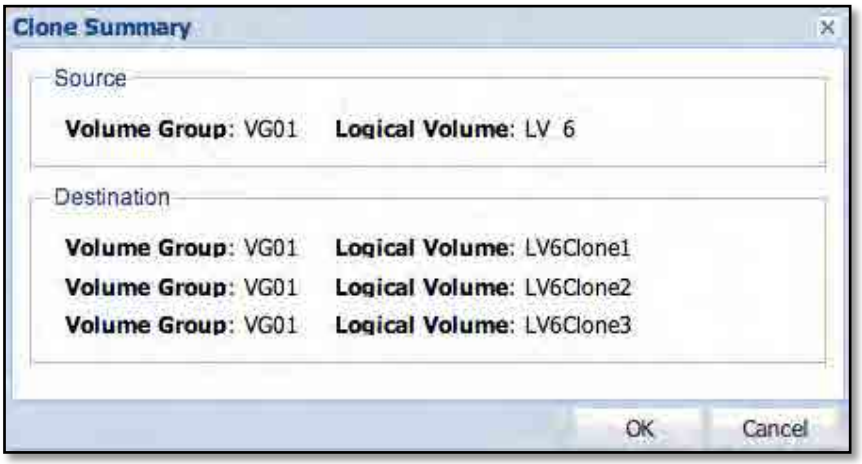


Figure 3.8.5-3 Confirm Message to Clone Volume

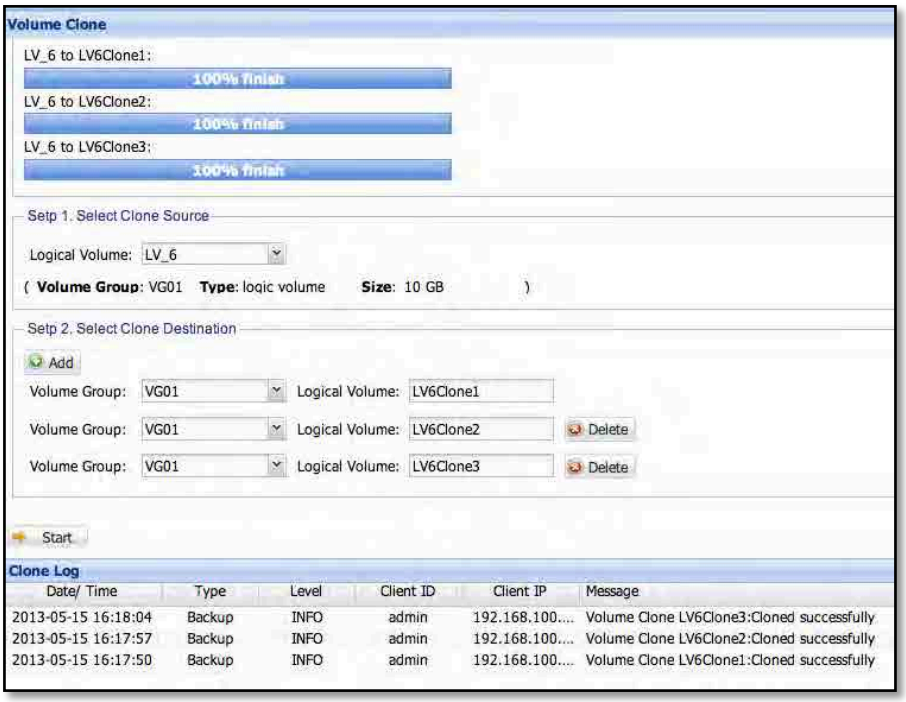


Figure 3.8.5-4 The Status after Clone Volume

3.8.6 Rsync Backup

Rsync is one of the popular remote backup solutions. Admin can use Rsync to upload whole local share to remote share or download files from remote share. You can create an Rsync backup plan by clicking "Add" button.

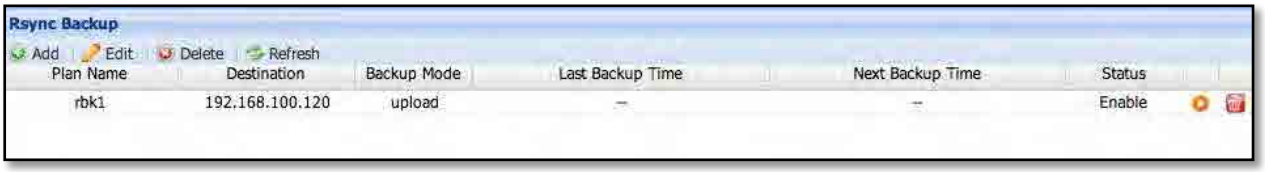


Figure 3.8.6-1 Rsync Backup

To add a new Rsync backup plan, the following need to be defined:
Plan Name: The name of Rsync plan. The name must be unique.

Local Share Folder
Share Folder: Select local share to do upload or download

Remote Share Folder
IP: the remote Rsync server IP
Account: the remote login name
Password: the login password
Path: The name or path of remote share
Mode: Specify to upload or download
Parameter: You can also define your own Rsync parameter here. Click ". . ." button to setup additional options.

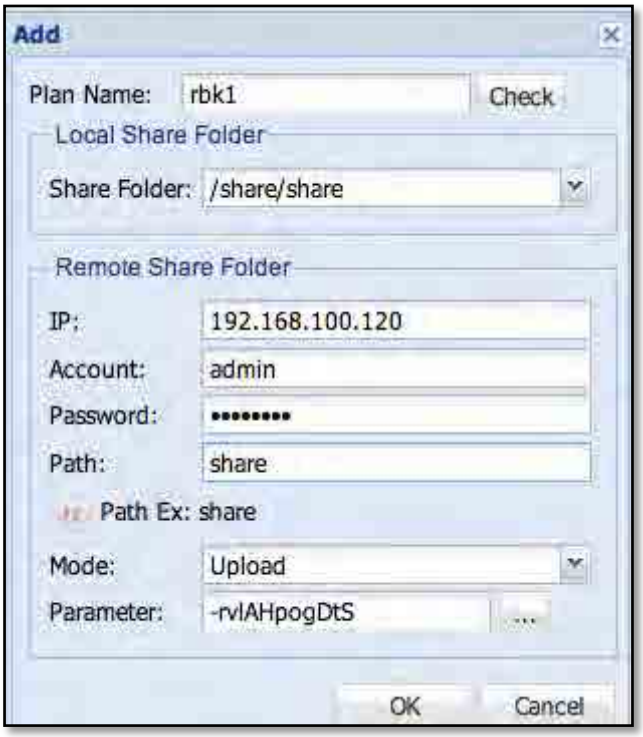


Figure 3.8.6-2 Options to Create Rsync Backup Plan

After Rsync backup plan is created, you will see the new plan in the list. If need to modify Rsync options, just select the plan and click 'Edit'.
To immediately do Rsync backup, click icon in the right column.

The Rsync backup plan can also be defined with scheduled job in Schedule manager. (See Chap 3.4.8)

3.8.7 System Configuration

System Configuration Backup can backup whole system configuration including Array, volumes, shares and accounts. You can import the backup configuration file to reconstruct the NAS configuration as before.

Configuration Backup: Click "Backup" button to backup the latest system configuration and create a backup configuration file, for example nas-config.tgz.
Configuration Restore: Click "Select File" to select a backup configuration file to restore.

Before restore, the system must be started with factory default settings and without Array or volume.

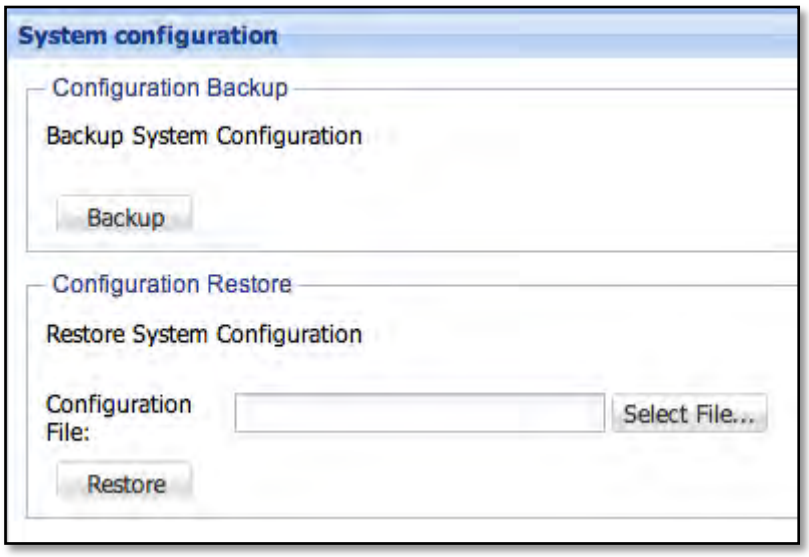


Figure 3.8.7-1 System Configuration Backup and Restore

3.8.8 Amazon S3

Amazon S3 (Simple Storage Service) is provided by the Amazon Pay online storage services. NAS users through support for Amazon S3 to backup your important data to Amazon S3, or download the data from Amazon S3 and to the NAS. Addition, users can also function with built-in scheduler to set automatic backup task

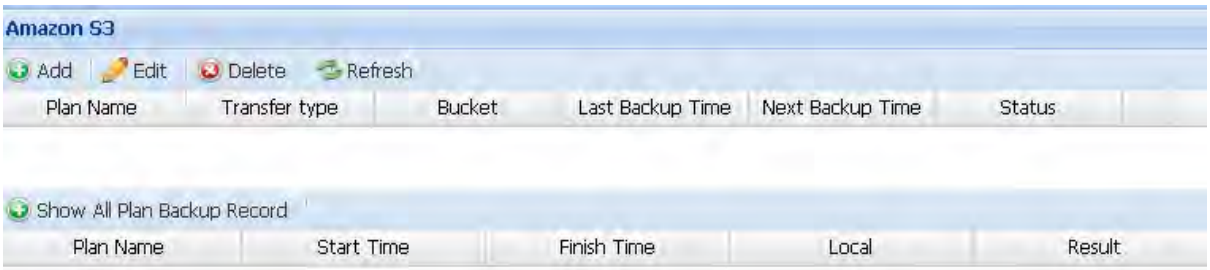


Figure 3.8.8-1 Amazon S3

Add Amazon S3 backup plan : To add a new Amazon S3 backup plan, the following need to be defined.

Figure 3.8.8-2 Add Amazon S3

Plan name: Amazon S3 project name, the name must be unique.
Transfer type: upload or Download Select local shared upload or download
Local Folder: Select the files needed to synchronize local folder

Amazon S3 information:

Access key: enter the access key

Secret key: Enter the passkey

Bucket: When you have entered the correct information, you will be imported into your account. Or create a new "Create New" and enter the bucket name, for example: backup. Be created in any folder under the root directory is your buckets. Your bucket name must be unique, meaning that all other users of the S3 bucket differently. All files and folders will be stored in buckets in.

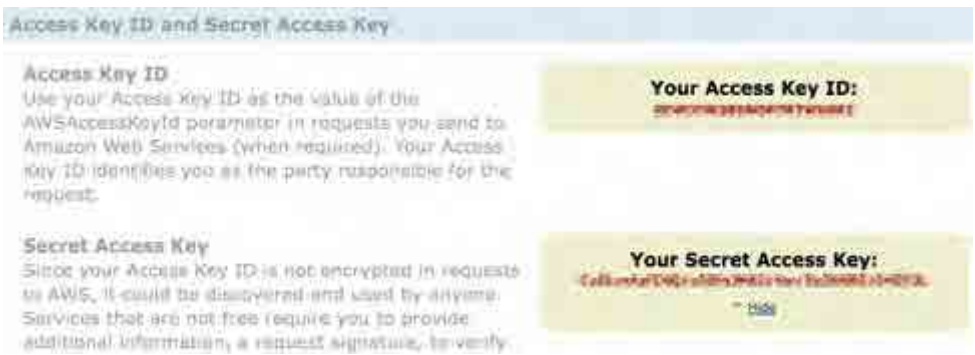
Get Amazon S3 account

Step 1: Registration Amazon Web Services account

Before using this service, you need to first obtain a personal Amazon S3 account (http://aws.amazon.com/s3/). For details about the fees, see the Amazon web services website.

Step 2: Get your Access Key ID and Secret Access Key

When you have completed the account application process, you will receive part of your Access Key ID and Secret Access Key. Please keep this ID and key.



If you accidentally lost your Access Key ID and Secret Access Key, please click on "Your Account" and select "Security Credentials" to regain.

You can use the "Your Account" option at any time to review your account status, payment information, and change your personal information.

3.9 Attached Device Manager

3.9.1 Physical Device

When USB or eSATA storage device is attached to the NAS, the NAS detects it as Physical Device (Figure 3.9.1-1). This device can be mounted and exported as a Samba share folder (Figure 3.9.1-4). The detected device is also available as backup destination.

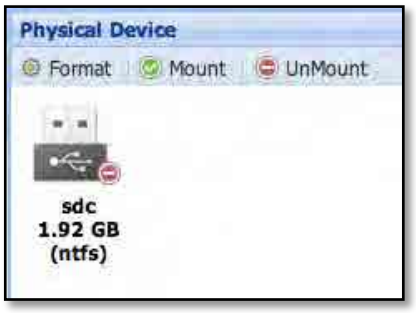


Figure 3.9.1-1 Physical Device Manager

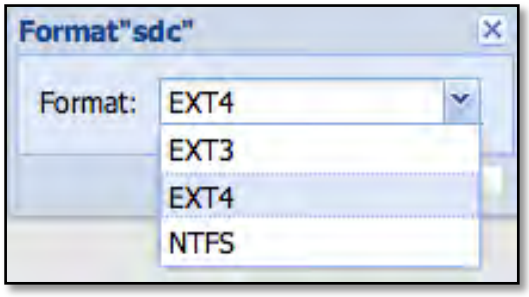


Figure 3.9.1-2 Format Attached Device

Format: The device can be formatted with NTFS, EXT3 or EXT4 file system.
Mount: If system recognized the file system in the attached device, it can be mounted as Samba share folder.
Umount: Un-mount the device. The device will no longer be defined in Samba service.

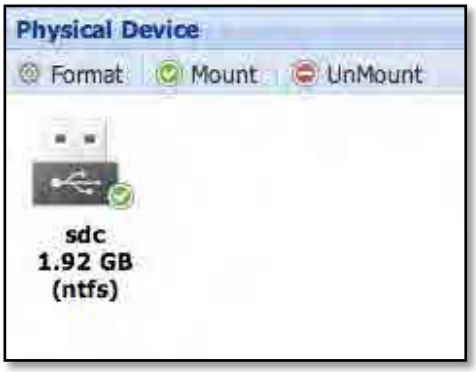


Figure 3.9.1-3 Mount and Share Attached Device

Figure 3.9.1-4 If Mounted, Attached Device can be Accessed from Windows Clients

NOTE: Please make sure the device is un-mounted before it is detached from NAS unit.

3.9.2 ISO Mount

You can pick an ISO file in NAS then mount and export it as a Samba share (Figure 3.9.2-4).

Add: Click to select a ISO File in the list. (See Figure 3.9.2-2)
Delete: Remove the ISO File from list.
Mount: Mount the ISO File and share it to a Samba share list (See Figure 3.9.2-3)
Umount: Umount the ISO File and remove from Samba share list

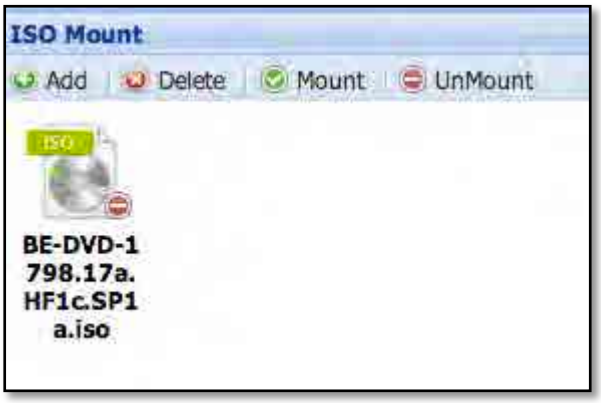


Figure 3.9.2-1 ISO Mount

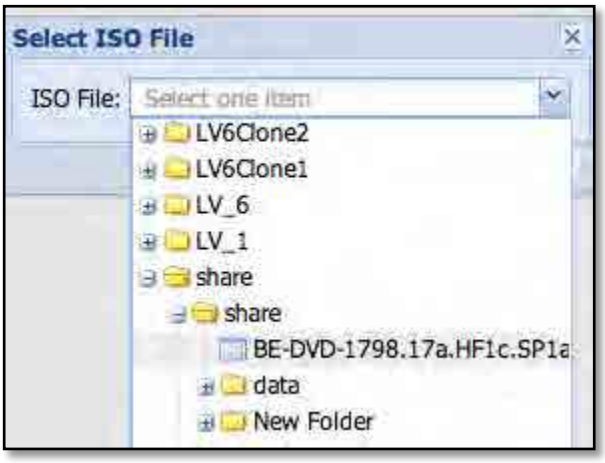


Figure 3.9.2-2 Select ISO file

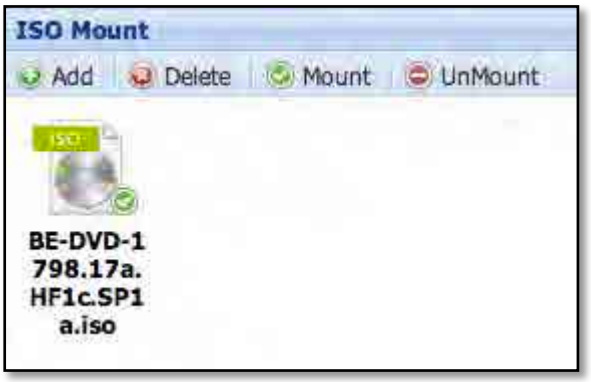


Figure 3.9.2-3 Mount and Share ISO File

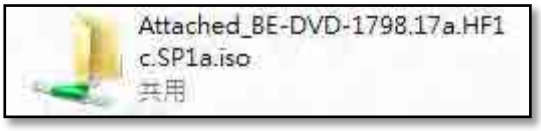


Figure 3.9.2-4 ISO Share in Samba

3.9.3 iSCSI Initiator

iSCSI Initiator allows admin to connect to iSCSI target, mount iSCSI volume, format and export it as a Samba share (Figure 3.9.3-5)

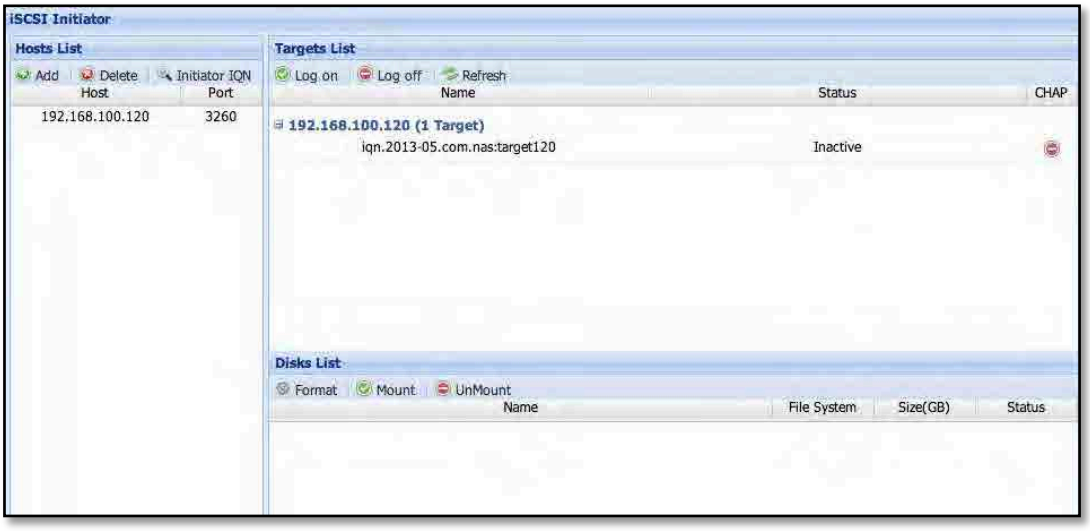


Figure 3.9.3-1 iSCSI Initiator

Host List: (See Figure 3.9.3-1)
List All known iSCSI host list
Button in Host list
Add: Assign a new iSCSI host in list.
Delete : Remove a host from list
Initiator IQN: Some iSCSI targets require IQN to logon. Enter the IQN for the iSCSI host

After adding host, the target(s) will be displayed in the Targets List on the right.

Target List (See Figure 3.9.3-1)
List all targets from Hosts List.
Logon : Logon to Target and get all iSCSI disks list. (See Figure 3.9.3-2)
Logoff : Logoff from Target and release all iSCSI disks.
Refresh: Refresh the target list.

Figure 3.9.3-2 Log on iSCSI Target

After logon target successfully, all iSCSI Disks will be shown in the Disks List. (Figure 3.9.3-3)

Format: Format the iSCSI disk with EXT3, EXT4 or NTFS. (See Figure 3.9.3-4)
Mount: Mount the iSCSI disk and show in Samba share list. (See Figure 3.9.3-5)
Umount: Umount iSCSI disk and remove from Samba share list.

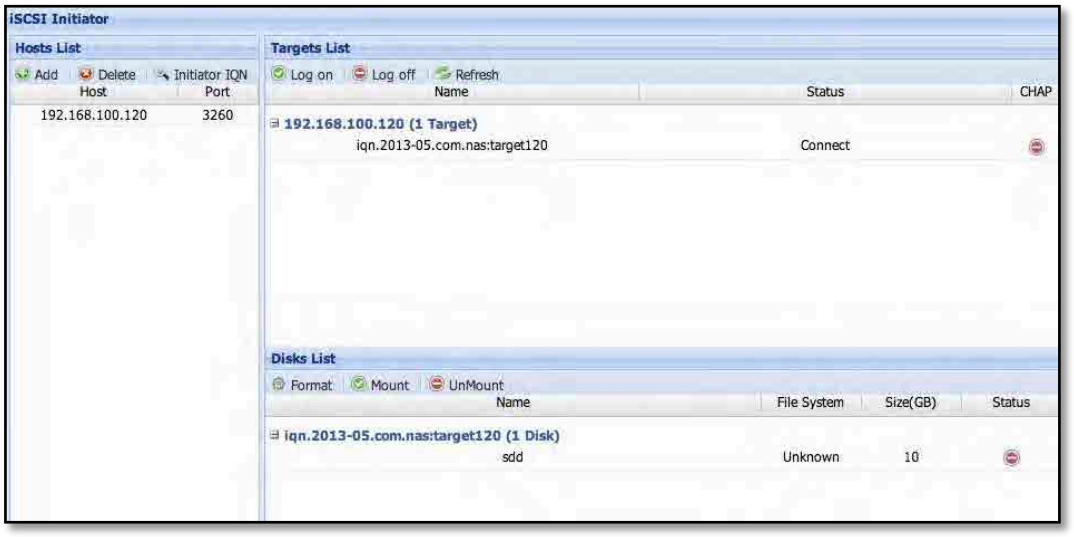


Figure 3.9.3-3 Disks List from iSCSI Target

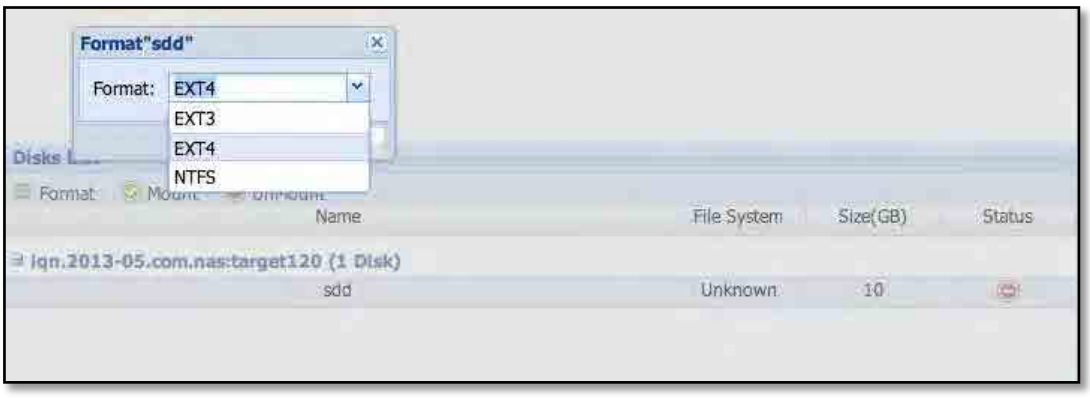


Figure 3.9.3-4 Format the iSCSI Disk

Figure 3.9.3-5 iSCSI Disk Share in Samba

3.10 Plug-in Manager

The Plug-in Manager is for installing other software like backup agent, HA services, etc.

Current Plug-in modules are CA ARCserve Backup Agent, NetVault Backup Agent, Symantec Backup Exec Agent, CDP Agent and HA.

How To install

Please ask your vendor to get the latest plug-in modules.

Go to Plug-in Center and click "**Add Plug-in Application**" button at the upper right side (Figure 3.10.1).

Choose what plug-in (Figure 3.10.2) to install then select plug-in file (Figure 3.10.3) to upload and install.

While installing, the status will be shown as Figure 3.10.4, After install successful the new service will show up in Plug-in center (Figure 3.10.5).

Figure 3.10-1 Plug-in Manager

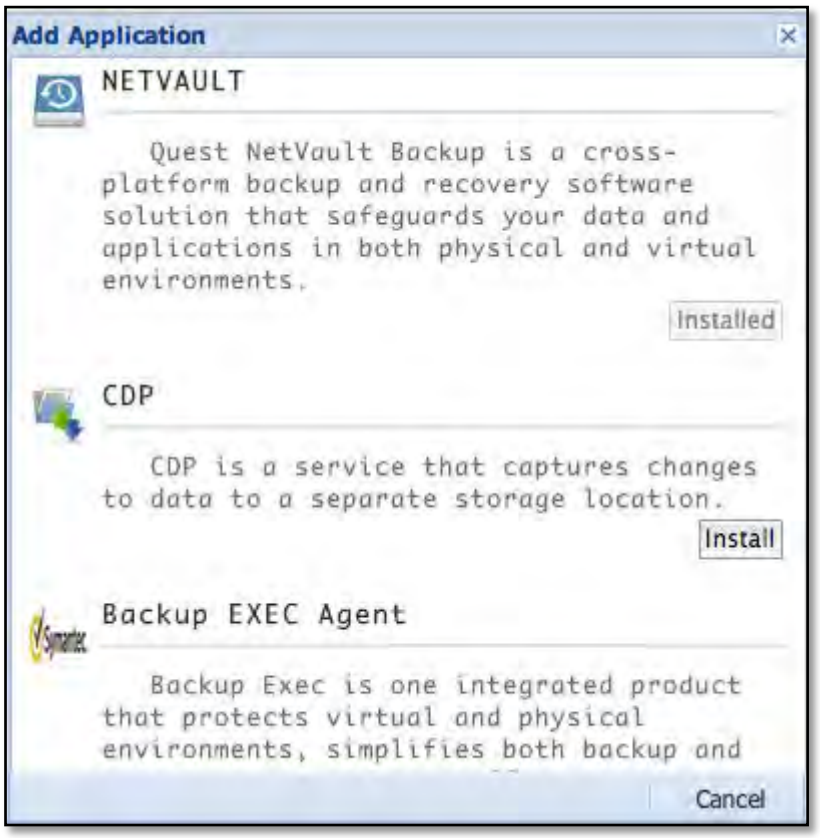


Figure 3.10-2 Choose and Add Plug-in Application

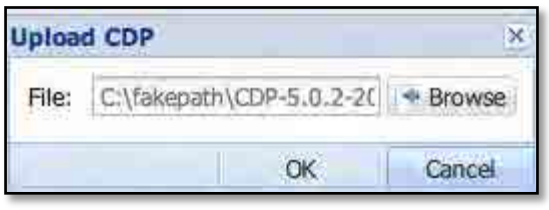


Figure 3.10-3 Select Plug-in File to Install

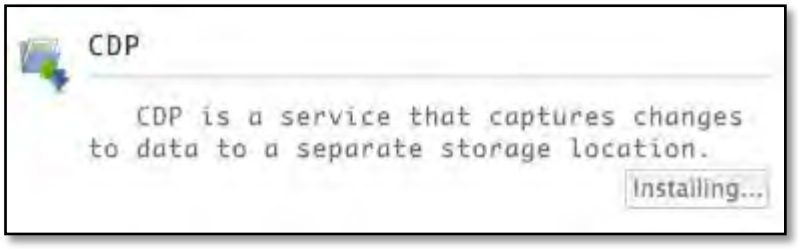


Figure 3.10-4 Status of Installing a Plug-in Application

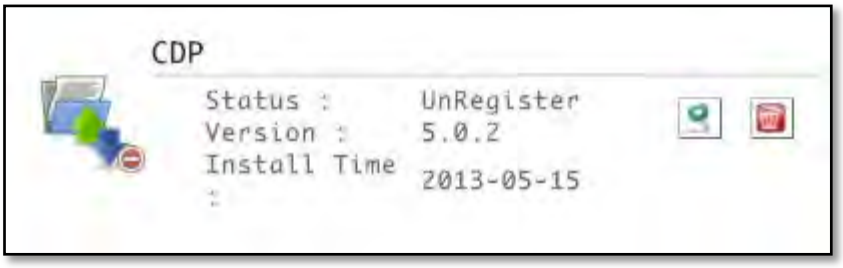


Figure 3.10-5 Plug-in Service Status after Install

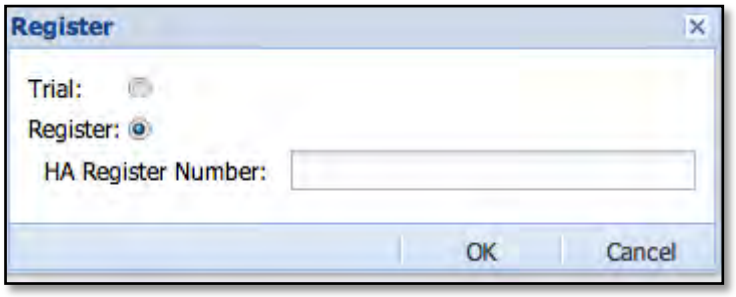


Figure 3.10-6 Register or use Trial Version (Trial Period)

After Backup Agents is installed, it needs a related backup server to connect to. Please contact the vendor of backup server for more information.

Register:

Some modules like CDP and HA needs to be registered (Figure 3.10.6). Please contact the NAS vendor to get detailed information. You can test the functions as a "Trial" version, and allows you to test within 30 days trial period.

NOTE: Installing un-official Plug-in modules is not allowed.

3.10.1 NAS HA

What's NAS HA?

The NAS HA can provide 2~3 NAS High-Availability service。

NAS HA Architecture

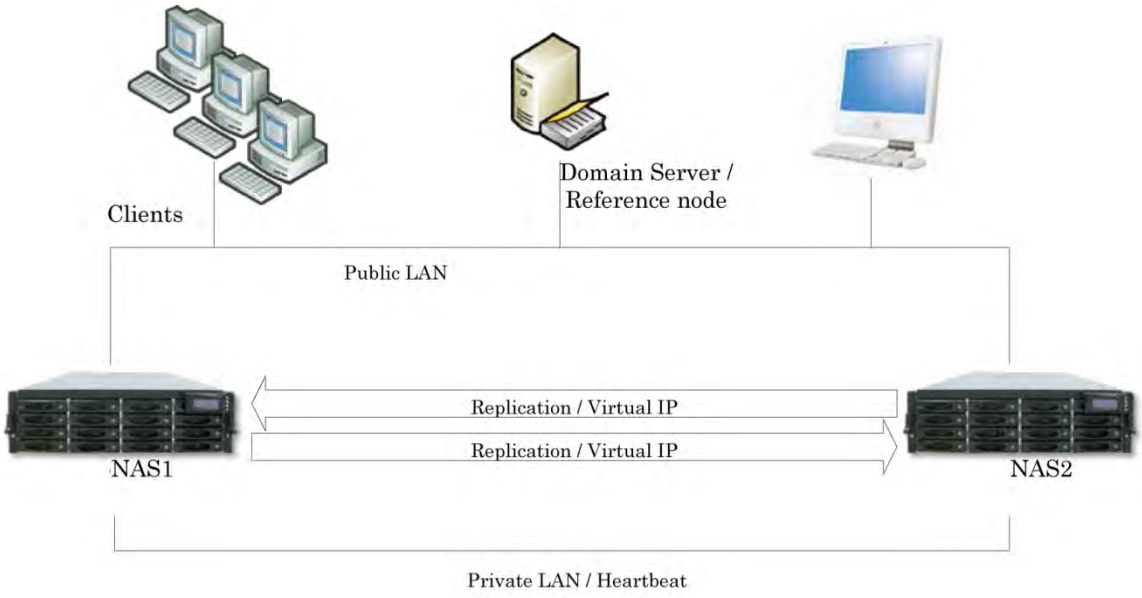


Figure 3.10.1-1 two nodes HA

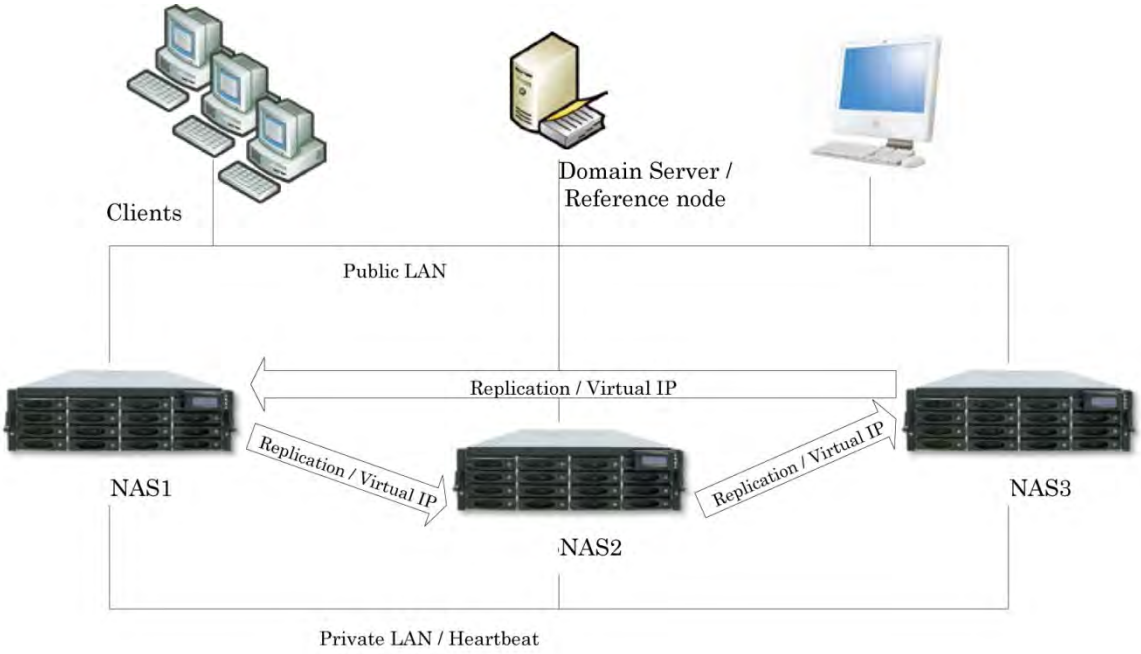


Figure 3.10.1-2 three nodes HA

NAS HA Setup Steps

Configure Logical Volumes → Configure Hostname → Configure Networking → Install NAS HA plugin → Setup HA → Start HA service

Configure Logical Volumes

Each node requires least one Logical Volume to run HA.

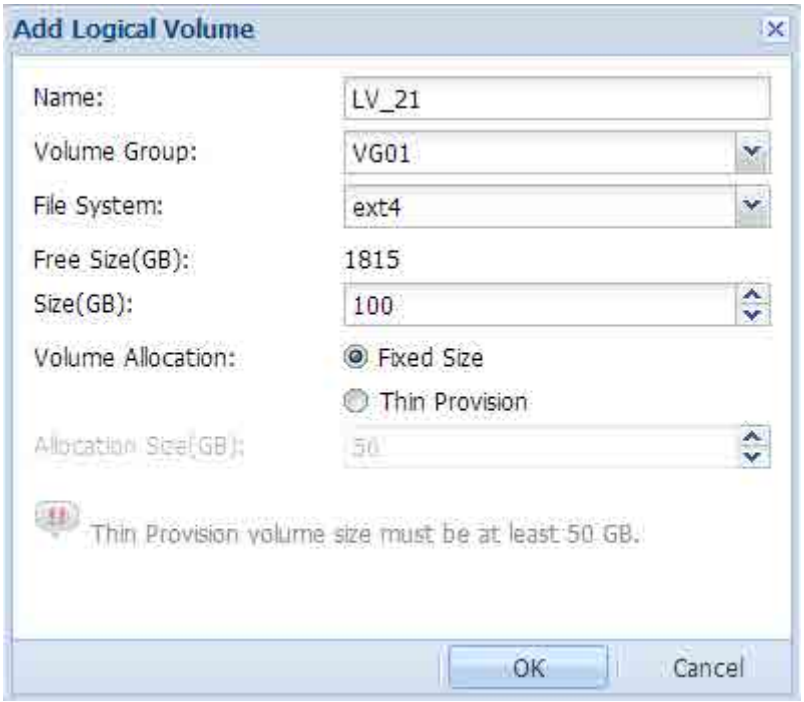


Figure 3.10.1-3 Configure Logical Volumes

NOTE: The Logical Volume name/Shared Folder name can't be the same between nodes!

Please reference ***Ch. 3.5 Storage Manager*** for more information to configure LV & share folder.

Configure NAS Hostname

To use the NAS HA service, you must name each node, each node's host name must be different.

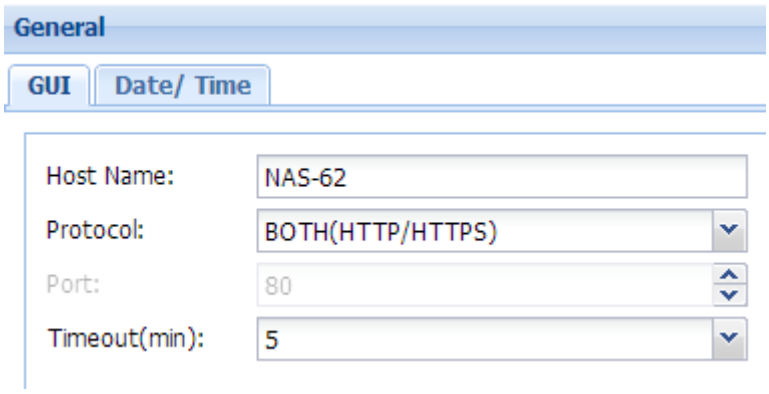


Figure 3.10.1-4 Configure Host Name

Please see ***Ch. 3.4.1 General*** for more information.

Configure Networking

NAS HA service needs 2 LAN interface:

Public LAN - for client's access

Private LAN – for data replication / heartbeat

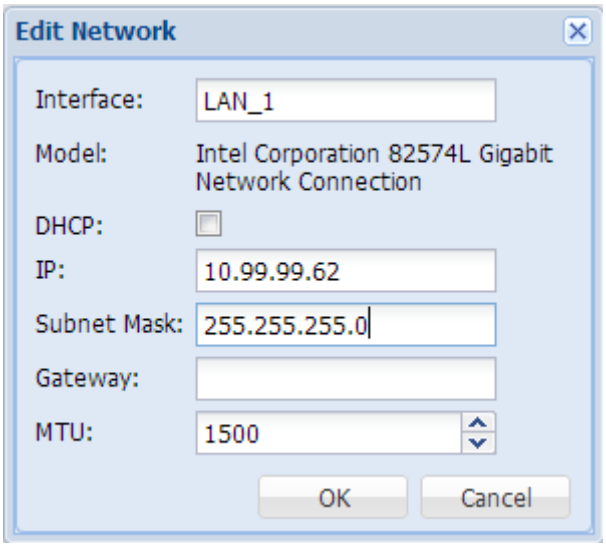


Figure 3.10.1-5 Configure Network

Please see ***Ch. 3.4.2 Network*** for more information to configure IP address.

Install NAS HA plugin

When using NAS redundant service, you need to install NAS HA kit.

Instructions:

1. Please expand Plug-In Manager, and click into “Plug-In Center” page.

Figure 3.10.1-6 Install HA Plugin-1

2. Click the "Add Plug-In Application" to start the installation wizard.

Figure 3.10.1-7 Install HA Plugin-2

3. Click the “Install” button of HA item.

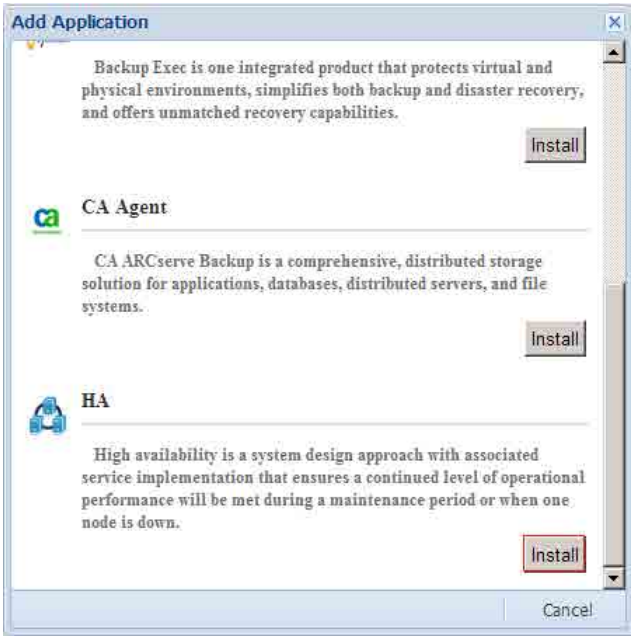


Figure 3.10.1-8 Install HA Plugin-3

4. Click the “Browse” button to select the plugin file.

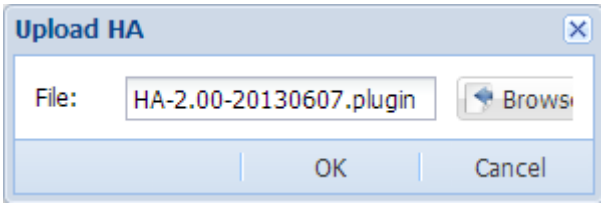


Figure 3.10.1-9 Install HA Plugin-4

5. Installation is complete, click “Yes”

Figure 3.10.1-10 Install HA Plugin-5

6. You can select trial or provide the license key file.

Figure 3.10.1-11 Install HA Plugin-6

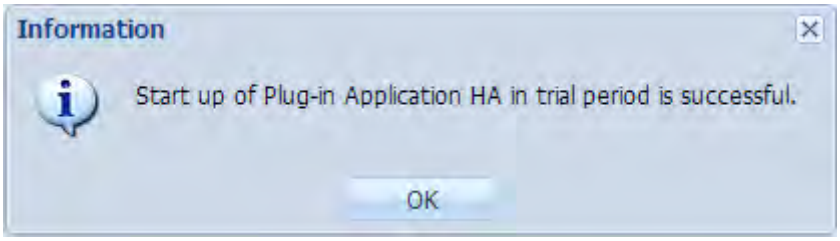


Figure 3.10.1-12 Install HA Plugin-7

Setup NAS HA

1. Please expand Plug-In Manager, and click into “HA” page.

Figure 3.10.1-13 Setup HA-1

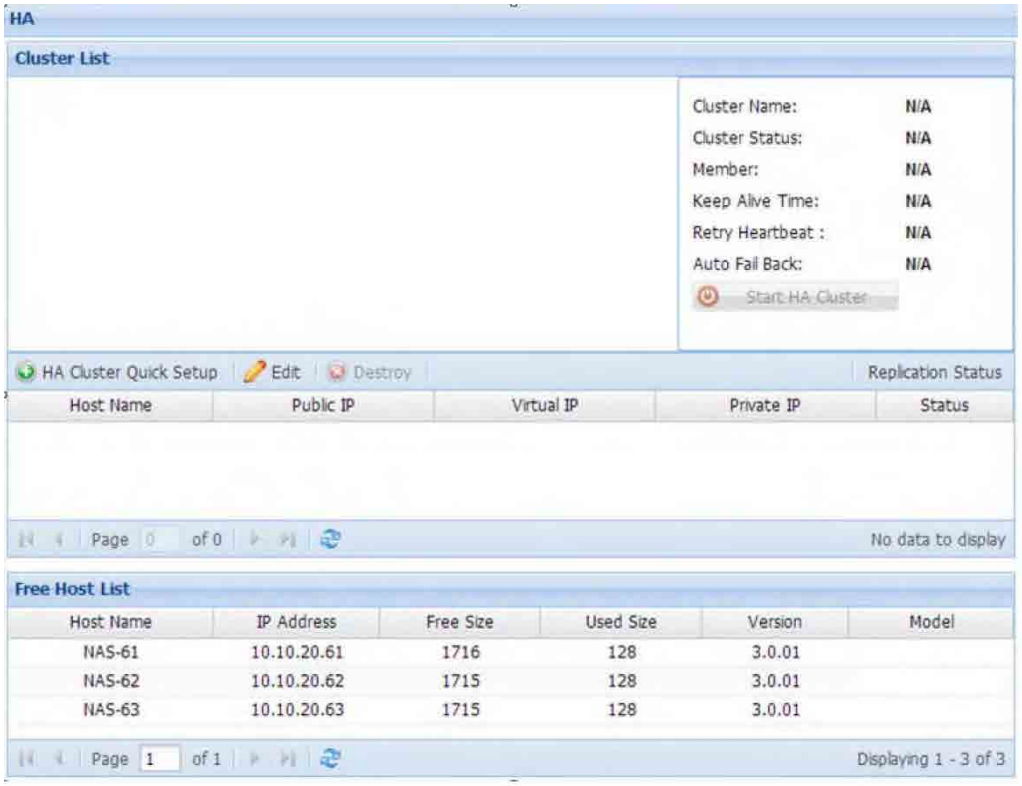


Figure 3.10.1-14 Setup HA-2

2. Click “HA Cluster Quick Setup”

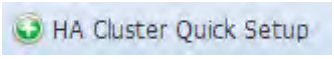


Figure 3.10.1-15 Setup HA-3

3. Select hosts, Next

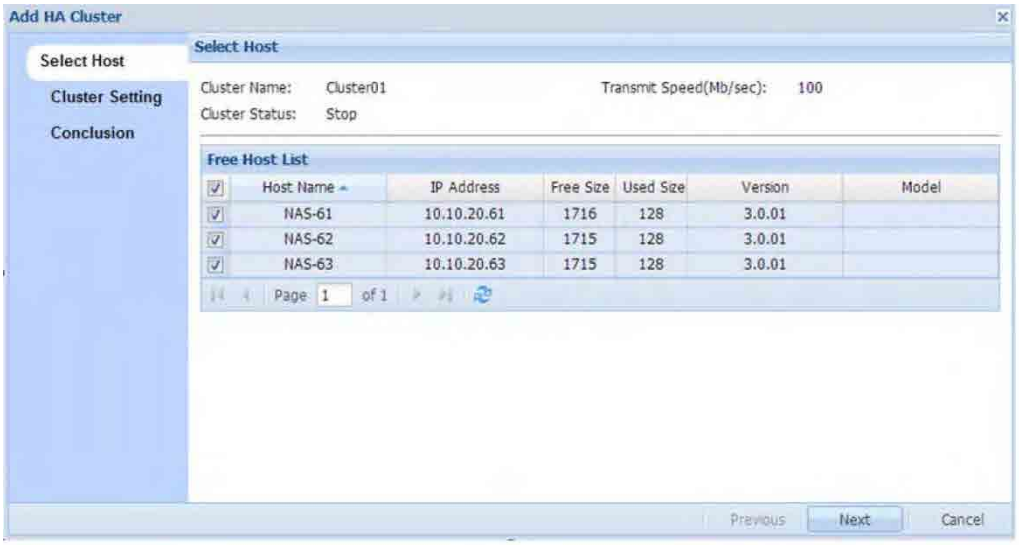


Figure 3.10.1-16 Setup HA-4

4. Cluster Setting:

Reference Node: other hosts or device on the network used to verify that the network access.

Virtual IP: Cluster IP address for client access

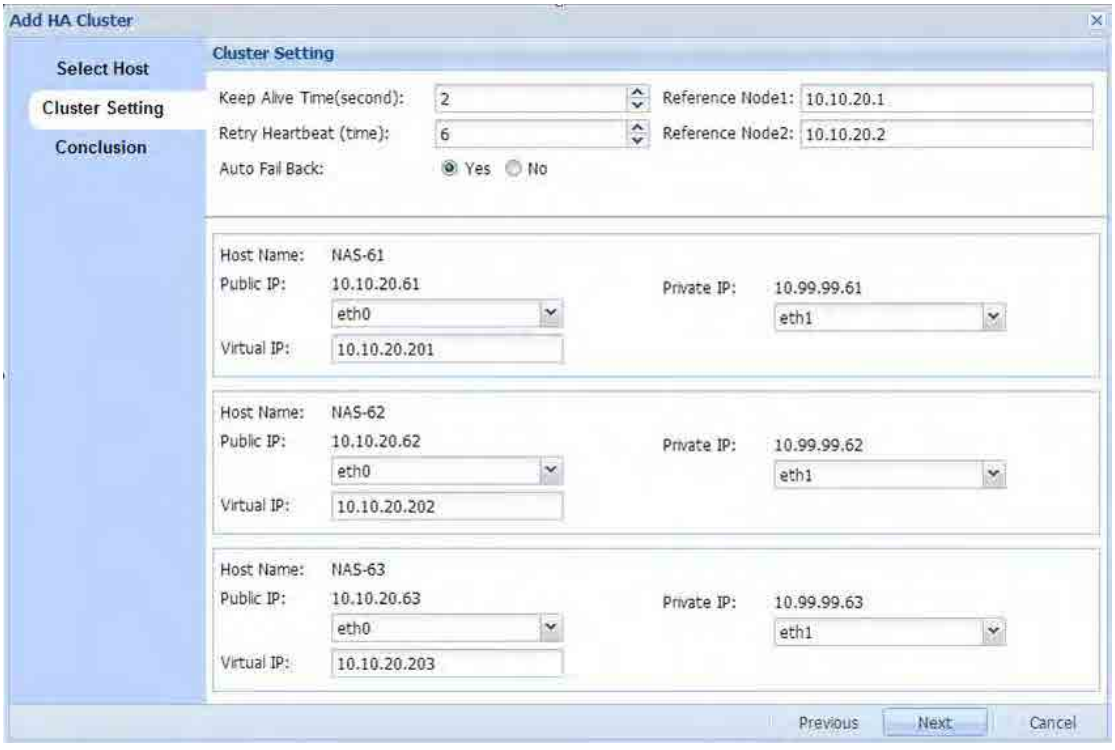


Figure 3.10.1-17 Setup HA-5

5. Summary, OK

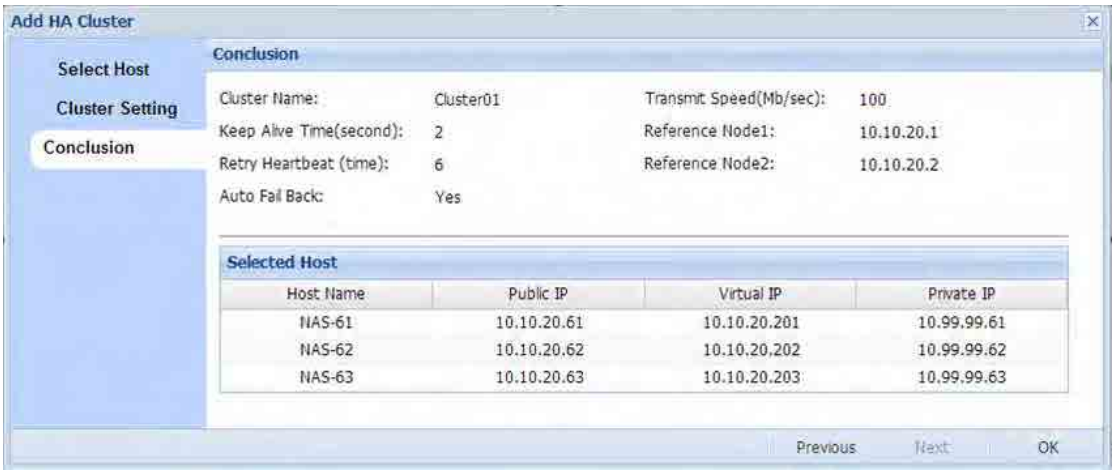


Figure 3.10.1-18 Setup HA-6

6. Confirm setting and auto start HA service.

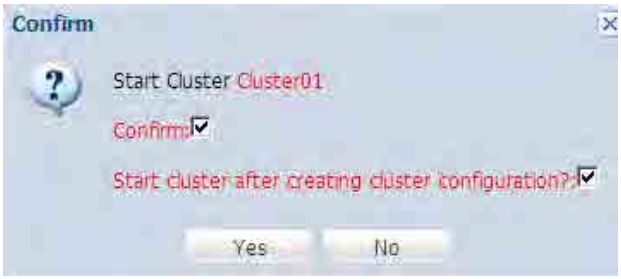


Figure 3.10.1-19 Setup HA-7

7. Please wait writing down setting.

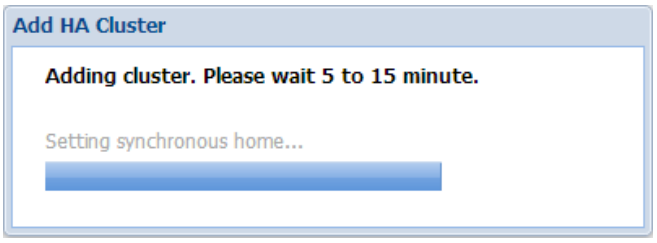


Figure 3.10.1-20 Setup HA-8

8. Logical Volumes synchronization in progress.

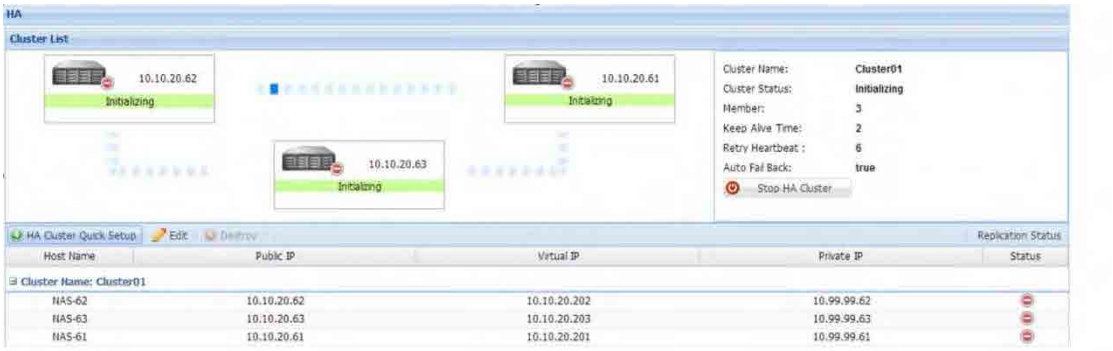


Figure 3.10.1-21 Setup HA-9

9. Synchronization is complete, HA service is working properly.

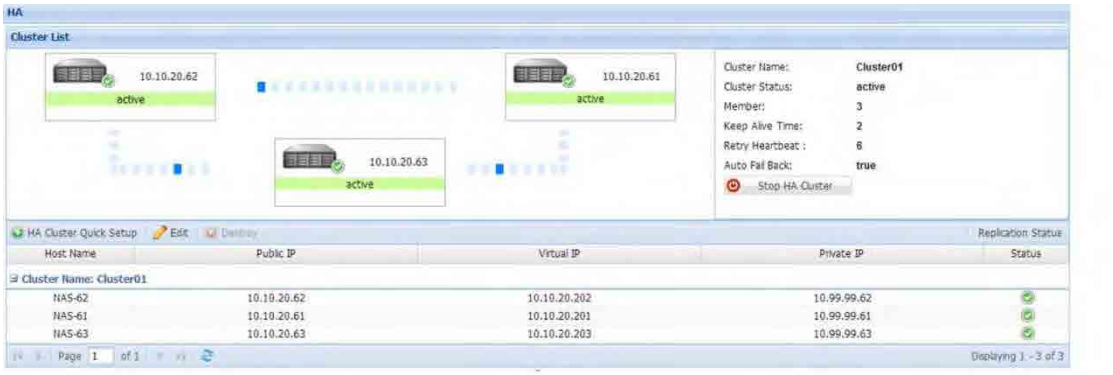


Figure 3.10.1-22 Setup HA-10

3.11 File Manager

File Manager is a web-based tool used to manage files and folders under a share. The service is enabled by default. It can be disabled in Service Manager. If File Manager service is enabled, all NAS users can logon NAS GUI via web browser and use File Manager for quick maintenance of files (Figure 3.11-1). By default, if admin login NAS GUI, he will be shown with the NAS management GUI. If admin wants to switch to File Manager, click the small File Manager icon on the upper right side, on the right side of "**System Log**" icon (Chap 3.2).

In the File Manager, all functions are listed in right top menu. File Manager allows NAS users to do file editing like upload(Figure 3.11-8), download, delete(Figure 3.11-3), rename(Figure 3.11-4), copy (Figure 3.11-6) or move(Figure 3.11-7). Just need to make sure the NAS user have read and write permission.

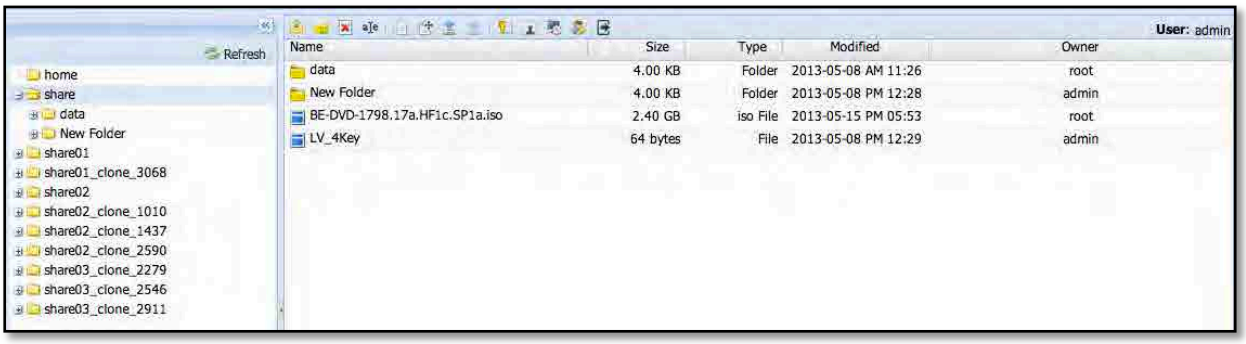


Figure 3.11-1 File Manager

Figure 3.11-2 Create a New Folder

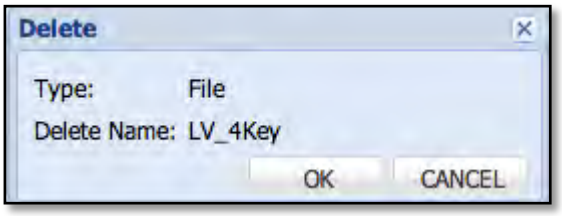


Figure 3.11-3 Delete a File

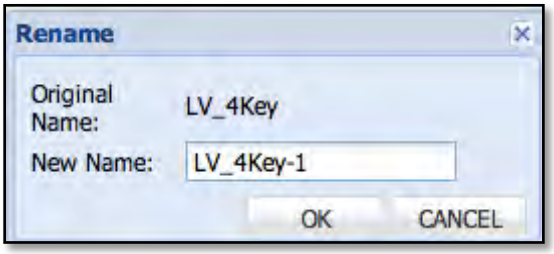


Figure 3.11-4 Rename a File

Figure 3.11-5 Change File Owner

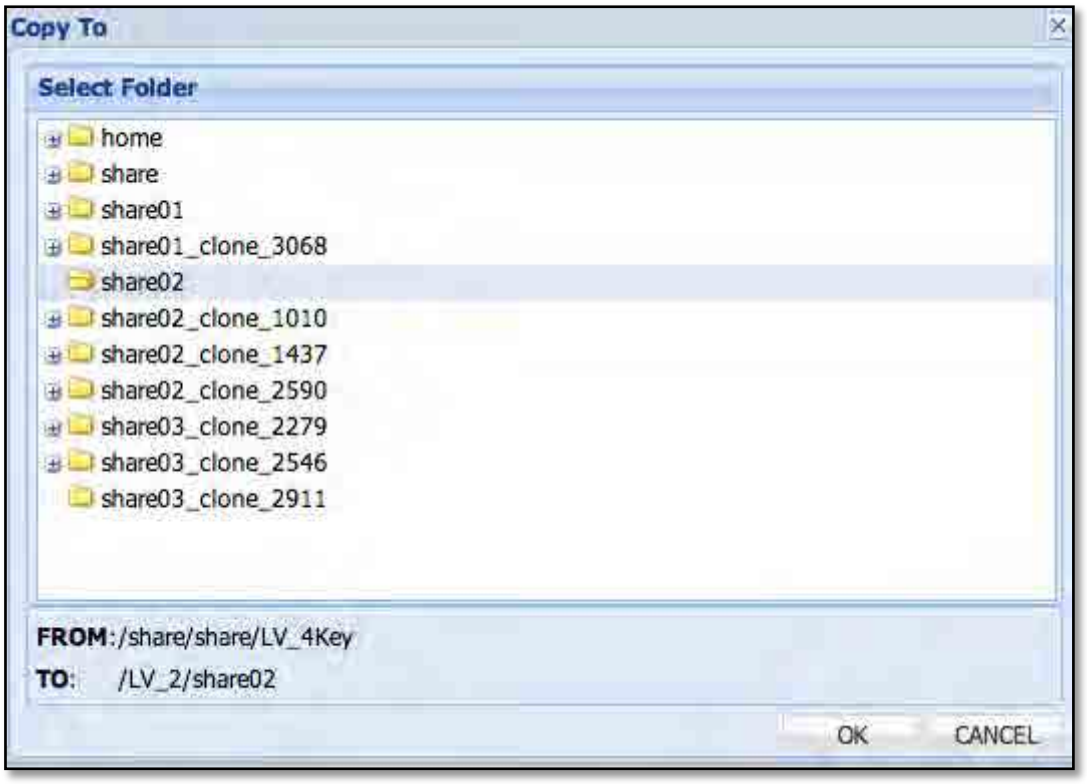


Figure 3.11-6 Copy a File to Selected Destination Folder

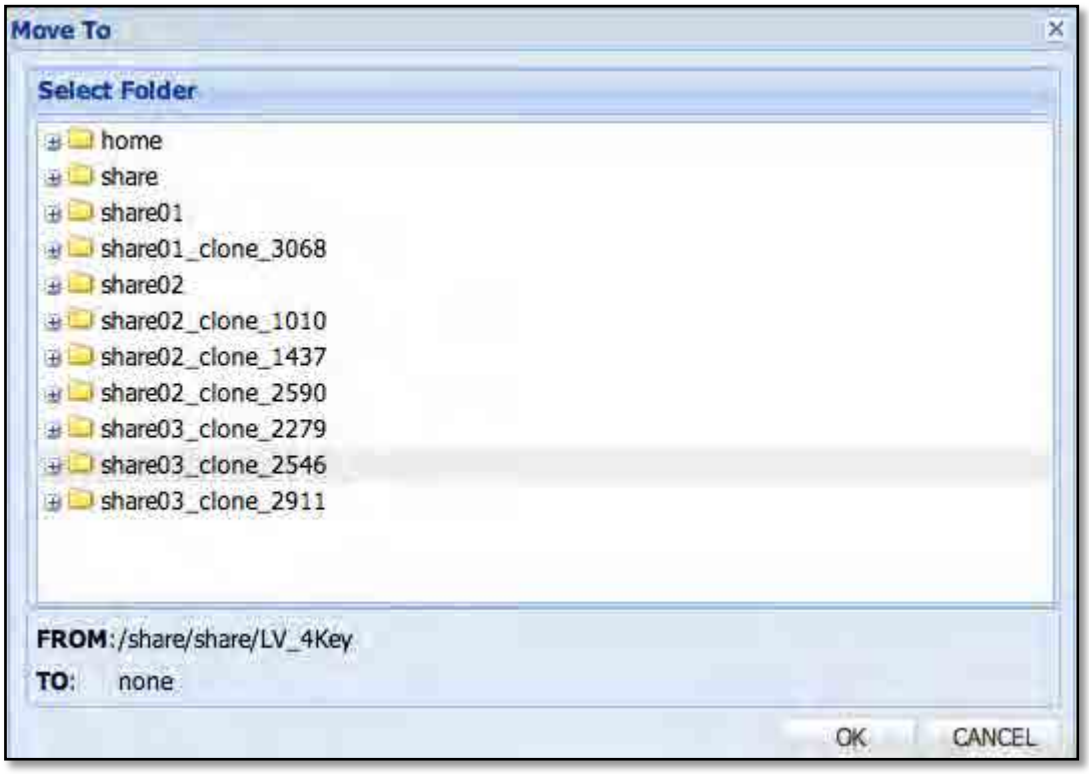


Figure 3.11-7 Move a File to Select Destination Folder

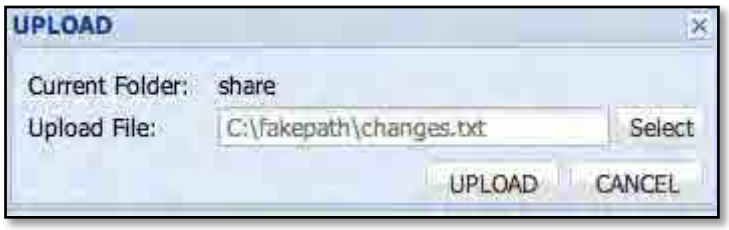


Figure 3.11-8 Upload a File

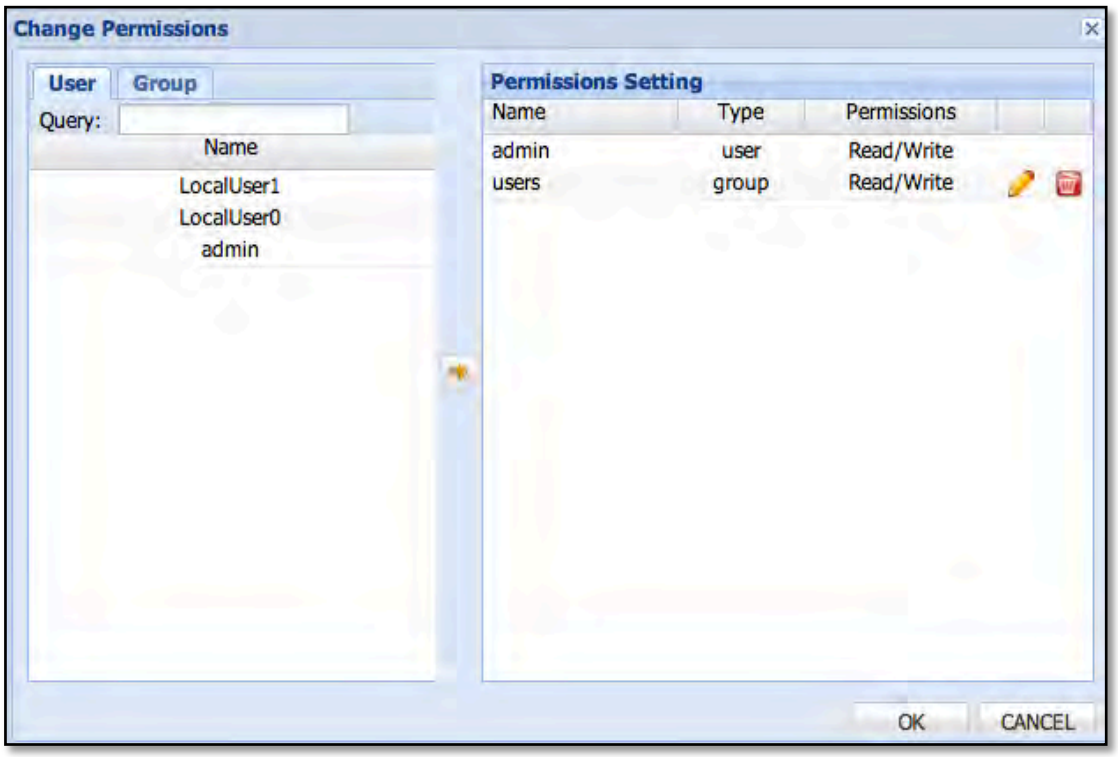


Figure 3.11-9 Change File or Folder Permission

If the NAS user account currently logged on in File Manager is the share owner, he can change file or folder permission (See Figure 3.11-9) under the share.

Figure 3.11-10 Change User Password

If NAS users want to change their password, they can logon to File Manager to change their password. This function is only for local NAS user accounts (Figure 3.11-10).

3.12 General Limitation List

Some basic limitations are listed below.

GUI

Admin login	Single Admin login
Shortcut bar icon	Max :9

System Manager

NIC ports	Max: 8
Trunk device	Max: 4
Event Email Receiver	Max: 8

Storage Manager

Array Number	Max: 64
Volume Group Number	Max: 64
Logical Volume Number	Max: 512
Logical Volume Size	Max: 16 TB for ext3 1000 TB for others
Logical Volume with Thin Provision Size	Min: 50GB Max: 32 TB or Logical Volume Size x 4

iSCSI Target

Target Number	Max: 64
Connections	Max: 32
Volumes per Target	Max: 256
Initiators ACL per target	Max: 32

FC Target

Target Number	Max: 8
Volumes per Target	Max: 256
WWN ACL per target	Max: 32

Share

Number	Max: 512
ACL per share	Max: 64

Account

Number	Max: 20000

Group

Number	Max: 20000
Member in group	Max: 200

Backup

Plan Number	Max: 128
Snapshots per volume	Max: 8
Snapshot Total Number	Max: 256

File Manager

Max node number in Tree	10000
Max node number in List	10000
Upload single file size	Max:5GB