Thecus®
Subsidiary of Innoconn

OS7 User's Manual

N2350/N4350/
N2810 Series/ N4810 Series/N5810 Series/
N4910U/N4910U PRO/N4820U
N12850 Series/N16850 Series/
N8910/N12910/N12910SAS/N16910SAS

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About This Manual

All information in this manual has been carefully verified to ensure its correctness. In case of an error, please provide us with your feedback. Thecus Technology Corporation reserves the right to modify the contents of this manual without notice.

Product name: Thecus OS7.0 used models
Manual Version: 1.4
Release Date: 2017/03

Limited Warranty

Thecus Technology Corporation guarantees all components of Thecus NAS products are thoroughly tested before they leave the factory and should function normally under general usage. In case of any system malfunctions, Thecus Technology Corporation and its local representatives and dealers are responsible for repair without cost to the customer if the product fails within the warranty period and under normal usage. Thecus Technology Corporation is not responsible for any damage or loss of data deemed to be caused by its products. It is highly recommended that users conduct necessary back-up practices.

Check the functions that are available on your particular Thecus NAS model at:
http://www.Thecus.com

Safety Warnings

For your safety, please read and follow the following safety warnings:

- Read this manual thoroughly before attempting to set up your Thecus IP storage.

- Your Thecus IP storage is a complicated electronic device. DO NOT attempt to repair it under any circumstances. In the case of malfunction, turn off the power immediately and have it repaired at a qualified service center. Contact your vendor for details.

- DO NOT allow anything to rest on the power cord and DO NOT place the power cord in an area where it can be stepped on. Carefully place connecting cables to avoid stepping or tripping on them.

- Your Thecus IP storage can operate normally under temperatures between 5°C and 40°C, with relative humidity of 20% – 85%. Using Thecus IP storage under extreme environmental conditions could damage the unit.

- Ensure that the Thecus IP storage is provided with the correct supply voltage. Plugging the Thecus IP storage to an incorrect power source could damage the unit.

- Do NOT expose Thecus IP storage to dampness, dust, or corrosive liquids.

- Do NOT place Thecus IP storage on any uneven surfaces.

- DO NOT place Thecus IP storage in direct sunlight or expose it to other heat sources.

- DO NOT use chemicals or aerosols to clean Thecus IP storage. Unplug the power cord and all connected cables before cleaning.

- DO NOT place any objects on the Thecus IP storage or obstruct its ventilation slots to avoid overheating the unit.

- Keep packaging out of the reach of children.

- If disposing of the device, please follow your local regulations for the safe disposal of electronic products to protect the environment.

- Risk of explosion if battery is replaced by an incorrect type.

- Dispose of used batteries according to the instructions

Table of Contents

Chapter 1: Introduction

Overview

Thank you for choosing the Thecus IP Storage Server. The Thecus IP storage is an easy-to-use storage server that allows a dedicated approach to storing and distributing data on a network. Data reliability is ensured with RAID features that provide data security and recovery—over multiple Terabyte of storage are available using RAID 5 and RAID 6. Gigabit Ethernet ports enhance network efficiency, allowing Thecus IP storage to take over file management functions, increase application and data sharing and provide faster data response. The Thecus IP storage offers data mobility with a disk roaming feature that lets you swap working hard drives for use in other Thecus IP storage, securing the continuity of data in the event of hardware failure. The Thecus IP storage allows data consolidation and sharing between Windows (SMB/CIFS), UNIX/Linux, and Apple OS X environments. The Thecus IP storage's user-friendly GUI supports multiple Languages.

Product Highlights

File Server

First and foremost, the Thecus IP storage allows you to store and share files over an IP network. With a Network Attached Storage (NAS) device, you can centralize your files and share them easily over your network. With the easy-to-use web-based interface, users on your network can access these files in a snap.

FTP Server

With the built-in FTP Server, friends, clients, and customers can upload and download files to your Thecus IP storage over the Internet with their favorite FTP programs. You can create user accounts so that only authorized users have access.

iTunes Server

With the built-in iTunes server capability, the Thecus IP storage enables digital music to be shared and played anywhere on the network!

Printer Server

With the Thecus IP storage's Printer Server, you can easily share an IPP printer with other PCs connected to your network.

Multiple RAID

Thecus IP storage supports multiple RAID volumes on one system. So, you can create RAID 0 for your non-critical data, and create RAID 1,5,6,50 or 60 (depend on model) for mission-critical data. Create the RAID levels depending on your needs.

iSCSI Capability

Thecus IP storage is not only a file server, but it also supports iSCSI initiators. Your server can access Thecus IP storage as a direct-attached-storage over the LAN or Internet. There is no easier way to expand the capacity of your current application servers. All the storage needs can be centrally managed and deployed. This brings ultimate flexibility to users.

Superior Power Management

Thecus IP storage supports schedule power on/off. With this feature, administrator can set at what time to turn on or off the system. This feature is a big plus for people who want to conserve energy. Wake-On-LAN enables administrator to remotely turn on the system without even leaving their own seat.

Package Contents

N2810 Series/N2820 Series/N2350 Series/N4350 Series/N4810 Series
The Thecus IP storage should contain the following common items:

- System Unit x1
- QIG (Quick Installation Guide) x1
- CD-Title (OS7 Universal CD)
- Ethernet Cable x1
- Accessory box x1
- HDD Compatibility list Card x1
- Multiple Languages Warranty Card x1
- Power adaptor cable tie x1
- Power adaptor x1
- Power cord x1

N5810/N5810PRO Series/N12850 Series/N16850 Series/N8910/N12910/N12910SAS/ N16910SAS/N4910U/N4820U
The Thecus IP storage should contain the following common items:

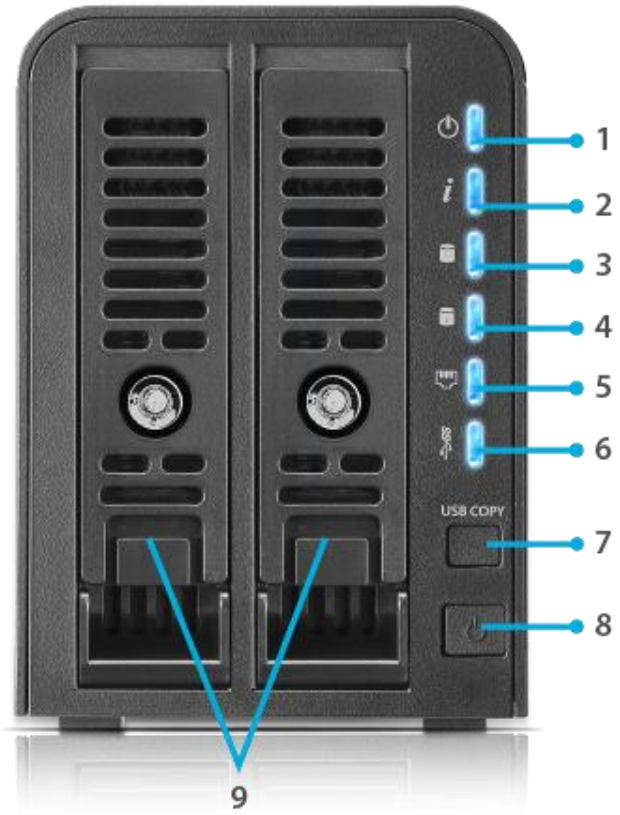
- System Unit x1
- QIG (Quick Installation Guide) x1
- CD-Title (OS7 Universal CD)
- Ethernet Cable x1
- Accessory bag x1
- HDD Compatibility list Card x1
- Multiple Languages Warranty Card x1
- Power cord x1

Please check to see if your package is complete. If you find that some items are missing, contact your dealer.

N2350

Front Panel

The Thecus N2350 front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	**Description**
1. Power LED	Solid blue: System ready Blinking blue: Power on process Solid Orange: System with error occurred
2. System status LED	Blinking blue: Diagnostic mode kick-in Solid blue: Diagnostic completed Solid Orange: System with error occurred
3. HDD1 LED	Blinking blue: HDD activity Orange: HDD failure
4. HDD2 LED	Blinking blue: HDD activity Orange: HDD failure
5. LAN LED	Solid blue: LAN Cable link Blinking : Network activity
6. USB LED	Solid blue: Installed Blinking blue: USB copy activity Solid Orange: USB copy failure
7. USB Copy Button	Copies USB storage contents to N2350.
8. Power Button	Power the N2350 on/off.
9. HDD Trays	Two HDD Trays for two 2.5"/3.5" SATA HDDs with Hot-swappable supports.

Rear Panel

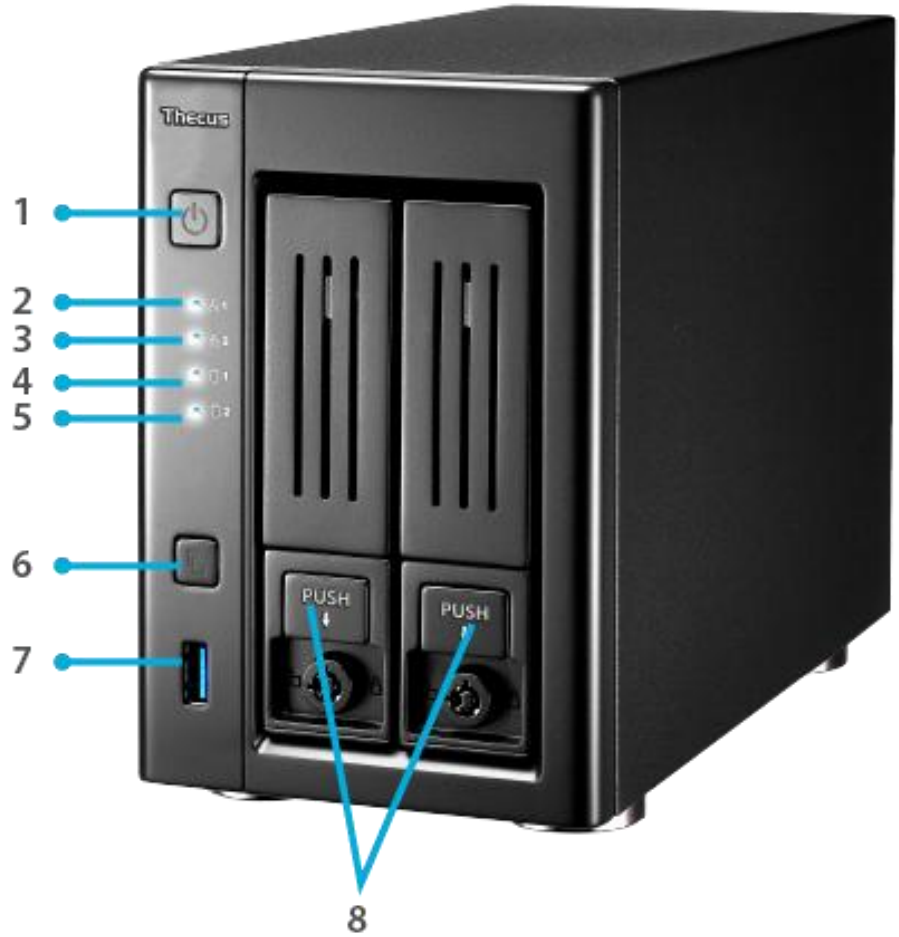
The N2350 rear panel features ports and connectors.

Back Panel	
Item	**Description**
1. USB 3.0 Port	USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers.
2. USB 3.0 Port	USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers.
2. LAN Port	LAN port for connecting to an Ethernet network through a switch or a router.
4. Reset Button	Resets the N2350. Pressing and holding the Reset button on the back for 1 seconds will reset your network setting and password, and turn off Jumbo Frame Support.
5. Power Connector	Connect the included power cords to this connector.
6. System Fan	System fan that exhausts heat from the unit.

N2810

Front Panel

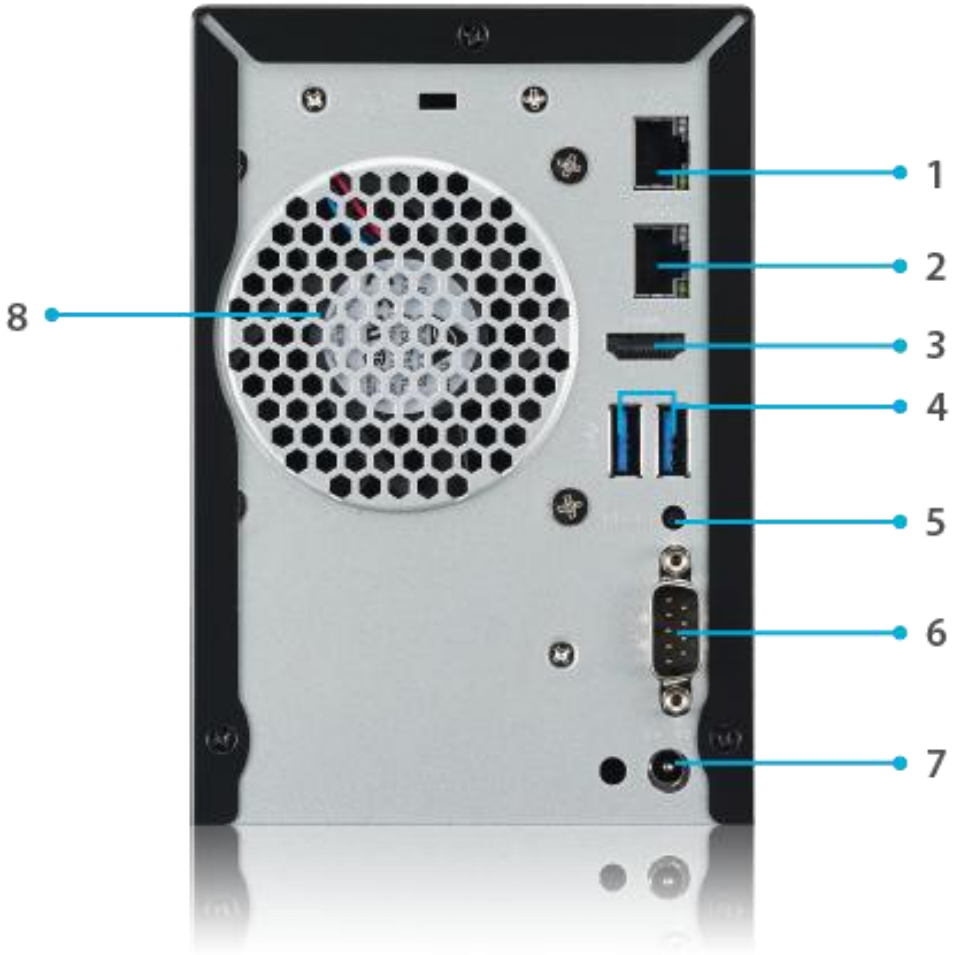
The Thecus N2810 front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	**Description**
1. Power Button	• Power on/off N2810.
2. LAN1 LED	• **Solid white:** LAN1 Cable link • **Blinking :** Network activity
3. LAN2 LED	• **Solid white:** LAN2 Cable link • **Blinking :** Network activity
4. HDD1 led	• **Blinking white:** HDD activity
5. HDD2 led	• **Blinking white:** HDD activity
6. USB Copy Button	• Copies USB storage contents to N2810.
7. USB Port	• USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers.
8. HDD Trays	• Two 2.5"/3.5" SATA HDD trays • Locks are provided for added security

Rear Panel

The N2810 rear panel features ports and connectors.

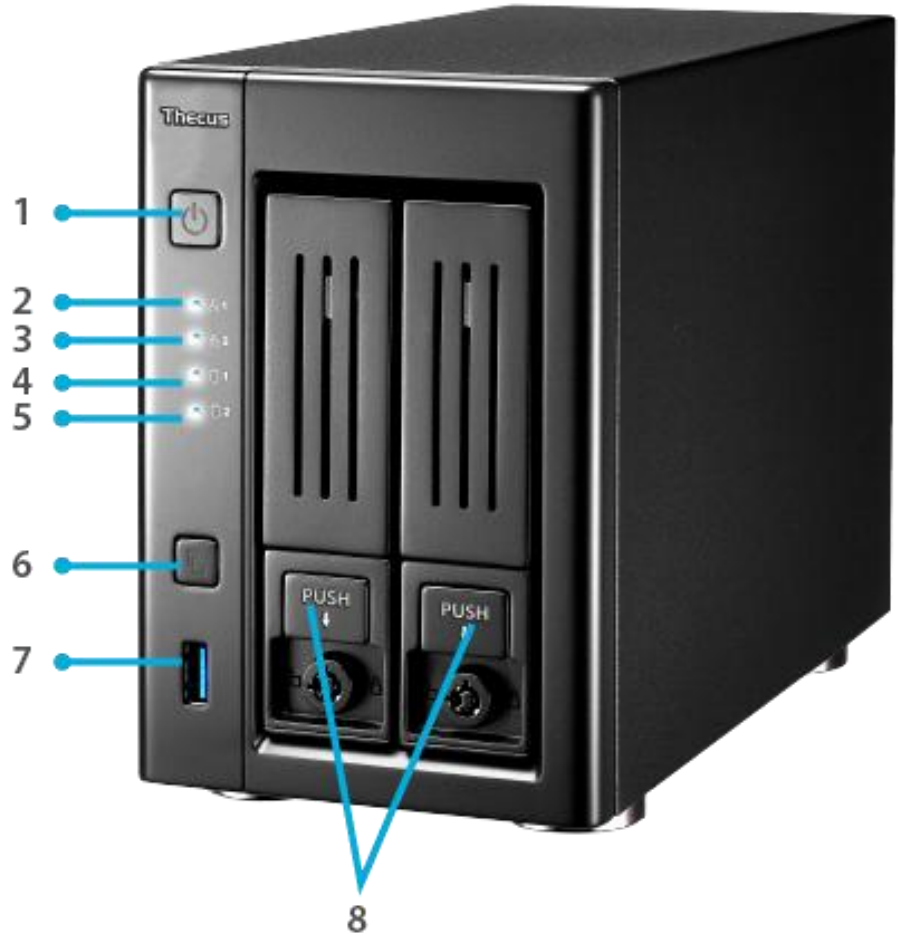


Back Panel	
Item	**Description**
1. LAN2 Port	• LAN2 port for connecting to an Ethernet network through a switch or router
2. LAN1 Port	• WAN/LAN1 port for connecting to an Ethernet network through a switch or router
3. HDMI Port	• For Video/Audio out
4. USB Port	• USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers.
5. Reset Button	• Reboot system.
6. Serial Port	• This port has used for debug purpose
7. Power Connector	• Connect the included power adaptor to this connector.
8. System Fan	• System fan that exhausts heat from the unit.

N2810 PRO

Front Panel

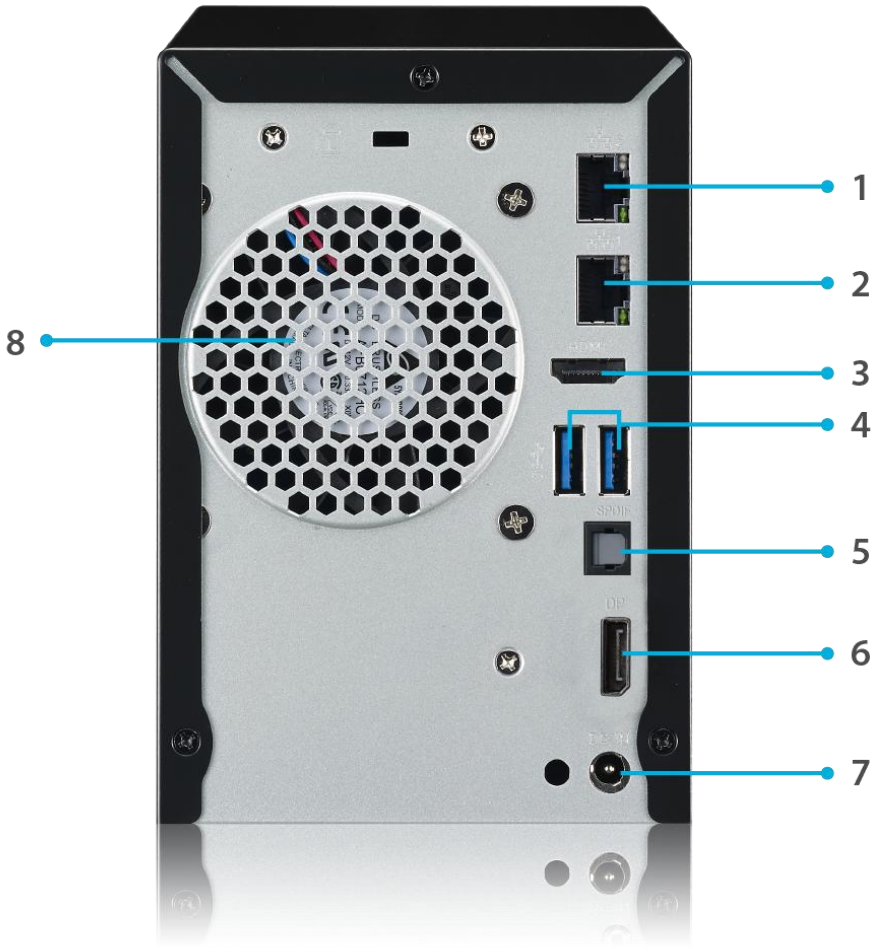
The Thecus N2810PRO front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	**Description**
1. Power Button	• Power on/off N2810PRO.
2. LAN1 LED	• **Solid white:** LAN1 Cable link • **Blinking :** Network activity
3. LAN2 LED	• **Solid white:** LAN2 Cable link • **Blinking :** Network activity
4. HDD1 led	• **Blinking white:** HDD activity
5. HDD2 led	• **Blinking white:** HDD activity
6. USB Copy Button	• Copies USB storage contents to N2810PRO.
7. USB Port	• USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers.
8. HDD Trays	• Two 2.5"/3.5" SATA HDD trays • Locks are provided for added security

Rear Panel

The N2810PRO rear panel features ports and connectors.

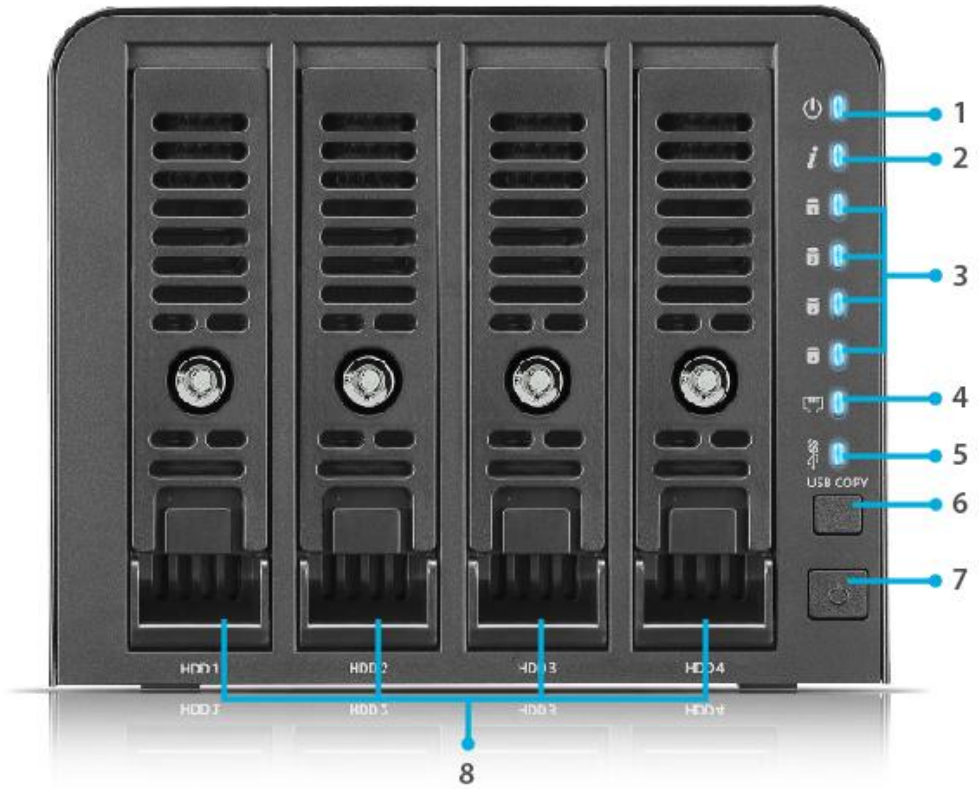


Back Panel	
Item	**Description**
1. LAN2 Port	• LAN2 port for connecting to an Ethernet network through a switch or router
2. LAN1 Port	• WAN/LAN1 port for connecting to an Ethernet network through a switch or router
3. HDMI Port	• For Video/Audio out
4. USB Port	• USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers.
5. SPDIF	• For Audio out
6. LocalDisplay Port	• For Video/Audio out
7. Power Connector	• Connect the included power adaptor to this connector.
8. System Fan	• System fan that exhausts heat from the unit.

N4350 Series

Front Panel

The Thecus N4350 Series front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	**Description**
1. Power LED	Solid blue: System ready Blinking blue: Power on process Solid Orange: System with error occurred
2. System status LED	Blinking blue: Diagnostic mode kick-in Solid blue: Diagnostic completed Solid Orange: System with error occurred
3. HDD1-4 LED	Blinking blue: HDD activity Orange: HDD failure
4. LAN LED	Solid blue: LAN Cable link Blinking : Network activity
5. USB LED	Solid blue: Installed Blinking blue: USB copy activity Solid Orange: USB copy failure
6. USB Copy Button	Copies USB storage contents to N4350.
7. Power Button	Power the N4350 on/off.
8. HDD Trays	Two HDD Trays for two 2.5"/3.5" SATA HDDs with Hot-swappable supports.

Rear Panel

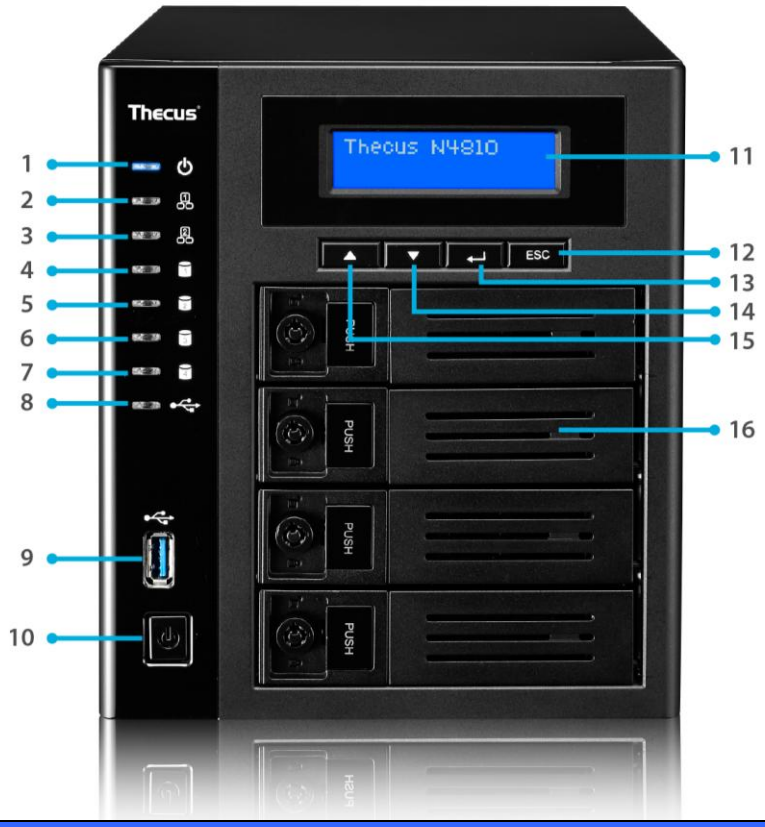
The N4350 Series rear panel features ports and connectors.

Back Panel	
Item	**Description**
1. USB 3.0 Port	USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers.
2. USB 3.0 Port	USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers.
3. LAN Port	LAN port for connecting to an Ethernet network through a switch or a router.
4. Reset Button	Resets the N4350. Pressing and holding the Reset button on the back for 1 seconds will reset your network setting and password, and turn off Jumbo Frame Support.
5. Power Connector	Connect the included power cords to this connector.
6. System Fan	System fan that exhausts heat from the unit.

N4810 Series

Front Panel

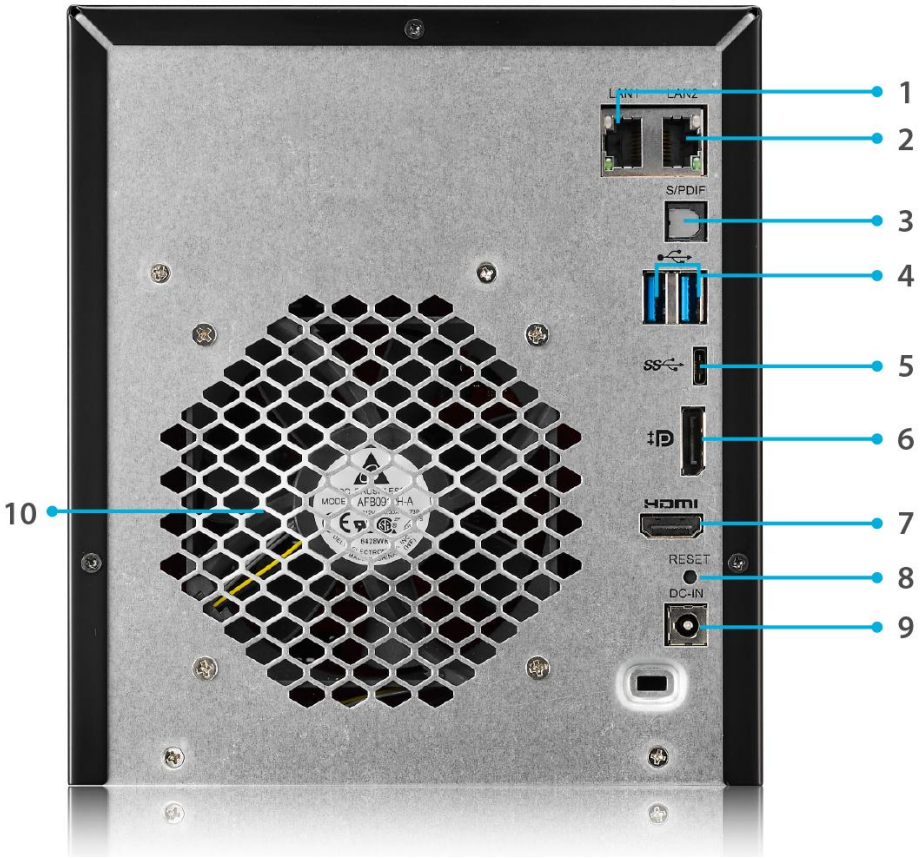
The Thecus N4810 Series front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	**Description**
1. Power LED	• **Blue:** System is power on.
2. LAN1 LED	• **Solid Yellow:** LAN1 Cable link • **Blinking :** Network activity
3. LAN2 LED	• **Solid Yellow:** LAN2 Cable link • **Blinking :** Network activity
4. HDD1 led	• **Blinking Yellow:** HDD activity
5. HDD2 led	• **Blinking Yellow:** HDD activity
6. HDD3 led	• **Blinking Yellow:** HDD activity
7. HDD4 led	• **Blinking Yellow:** HDD activity
8. USB Copy LED	• **Blue:** Files are being copied from a USB storage device • **Red:** USB copy error
9. USB Port	• USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers.
10. Power Button	• Power on/off N4810 Series
11. LCD Display	• Displays current system status and warning messages.
12. Up Button ▲	• Push to scroll up when using the LCD display.
13. Down Button ▼	• Push to enter the USB copy operation screen.
14. Enter Button	• Push to enter LCD administrator password to access basic system setting.
15. Escape Button **ESC**	• Push to leave the current LCD menu.
16. HDD Trays	• Four 2.5"/3.5" SATA HDD trays • Locks are provided for added security

Rear Panel

The N4810 Series rear panel features ports and connectors.

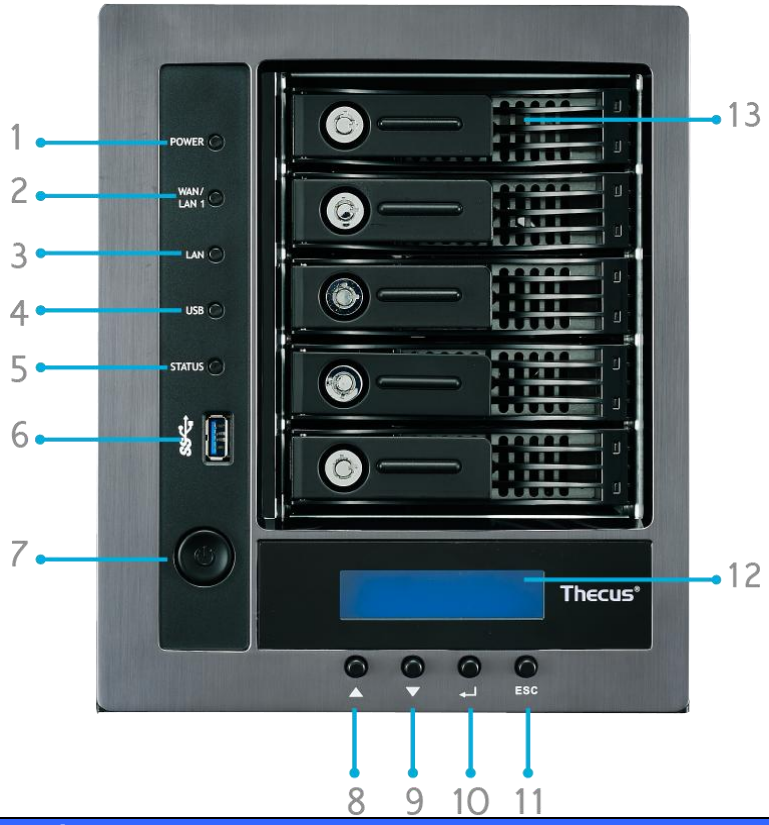


Back Panel	
Item	**Description**
1. LAN1 Port	• WAN/LAN1 port for connecting to an Ethernet network through a switch or router
2. LAN2 Port	• LAN2 port for connecting to an Ethernet network through a switch or router
3. SPDIF	• For Audio out
4. USB Port	• USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers.
5. USB Port (Type-C)	• USB 3.0 (Type-C) port for compatible USB devices, such as digital cameras, USB disks, and USB printers.
6. Display Port	• For Video/Audio out
7. HDMI Port	• For Video/Audio out
8. Reset Button	• Resets the N4810 series. • Pressing and holding the Reset button on the back for 5 seconds will reset your network setting and password, and turn off Jumbo Frame Support.
9. Power Connector	• Connect the included power adaptor to this connector.
10. System Fan	• System fan that exhausts heat from the unit.

N5810/N5810PRO Series

Front Panel

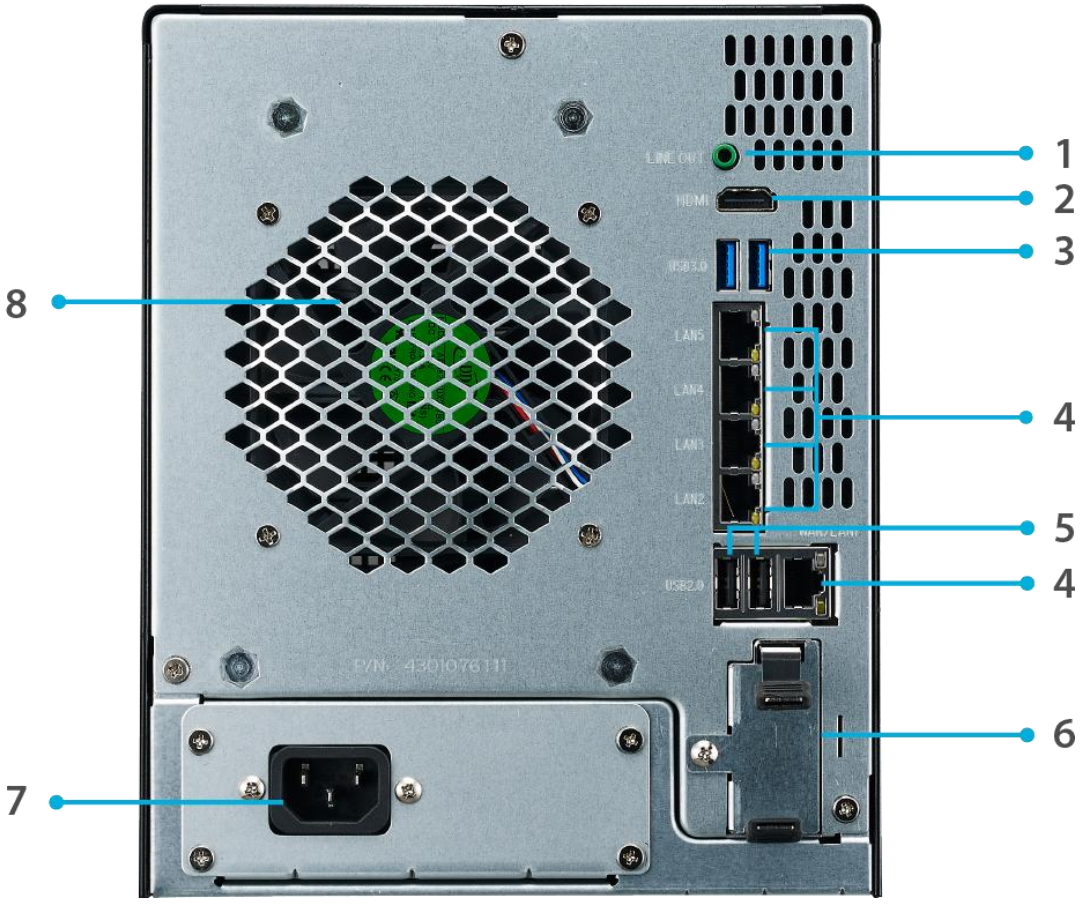
The Thecus N5810/N5810PRO Series front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	**Description**
1. Power LED	• **White:** System is power on.
2.WAN/LAN1 LED	• **White:** Network activity
3.LAN2 LED	• **White:** Network activity
4.USB Copy LED	• **White:** Files are being copied from a USB storage device • **Red:** USB copy error
5. System LED	• **White:** System is being upgraded or ;is starting up; data currently inaccessible • **RED:** System error
6.USB Port	• USB 3.0 port for compatible USB devices, such as USB disks.
7.Power Button	• Power on/off N5810/N5810PRO Series and Power LED.
8.Up Button ▲	• Push to scroll up when using the LCD display.
9.Down Button ▼	• Push to enter the USB copy operation screen.
10.Enter Button	• Push to enter LCD administrator password to access basic system setting.
11.Escape Button **ESC**	• Push to leave the current LCD menu.
12.LCD Display	• Displays current system status and warning messages.
13.HDD Trays	• Five 3.5" SATA HDD trays. • Locks are provided for added security.

Rear Panel

The N5810/N5810PRO Series rear panel features ports and connectors.

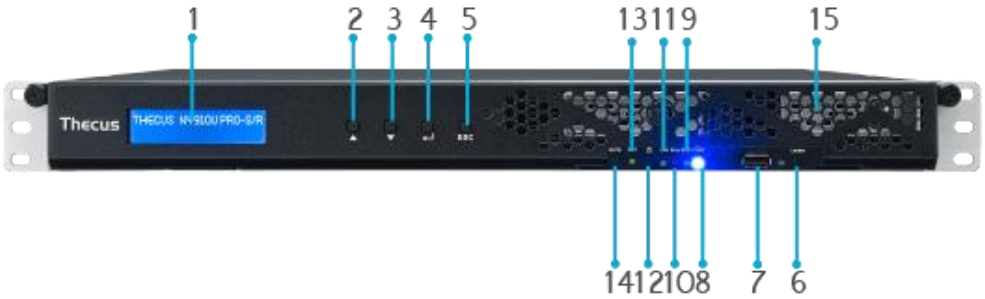


Back Panel	
Item	**Description**
1. Line out	• For Audio out
2.HDMI Port	• For Video/Audio out
3.USB Port	• USB 3.0 port for compatible USB devices, such as USB disks, and USB printers
4. WAN/LAN1/ LAN2/LAN3/LAN4/LAN 5 Port	• WAN/LAN1/LAN2/LAN3/LAN4/LAN5 port for connecting to an Ethernet network through a switch or router
5.USB Port	• USB 2.0 port for compatible USB devices.
6.UPS Battery slot (N5810PRO)	• For UPS Battery
7.Power Connector	• Connect the included power cords to these connectors
8.System Fan	• System fan that exhausts heat from the unit.

N4910U/N4910U PRO/N4820U:

Front Panel

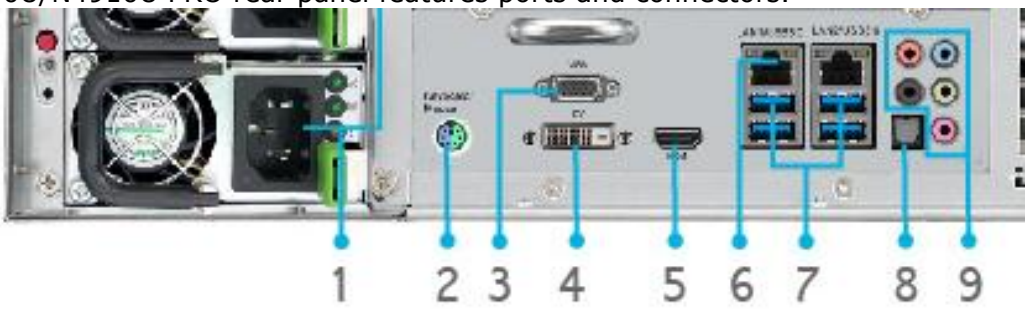
The Thecus N4910U/N4910U PRO/N4820U front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	**Description**
1. LCD	• Displays current system status and messages • LCD screen saver will be enabled after screen is idle for more than 3 minutes • LCD screen will be turn off after idle for more than 6 minutes
2. Up Button ▲	• Push to scroll up when using the OLED display
3. Down Button ▼	• Push to enter USB copy operation screen
4. Enter Button ↵	• Push to enter OLED operate password for basic system setting
5. Escape Button **ESC**	• Push to leave the current OLED menu
6. Locator button / LED	• Press the button, the back led will light up to identify the system position of the rack
7. USB Port	• USB 2.0 port for compatible USB devices, such as USB disks and USB printers
8. Power LED	• **Solid green:** System is power on.
9. BUSY	• Blinking orange: system startup or system maintenance; data currently inaccessible
10. System error LED	• Solid RED: System error.
11. LAN	• Blinking green: network activity • Solid green: network link
12. Power Button	• Power on/off N12850
13. RST	• Reboot system.
14. Mute button	• Mute the system fan alarm.

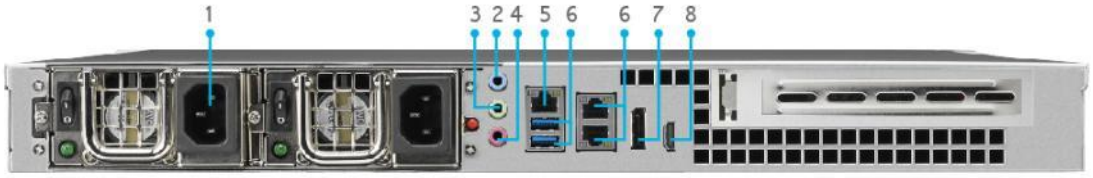
Rear Panel

N4910U/N4910U PRO rear panel features ports and connectors.



Back Panel	
Item	**Description**
1. Power Connector	• Connect the included power cords to these connectors
2. PS/2 connector	• The color-coded PS/2 connection ports (purple for keyboard and green for mouse)
3. VGA Port	• For Video out
4. DVI Port	• For Video out
5. HDMI Port	• For Video/Audio out
6. LAN1\LAN2\ Port	• LAN1\LAN2port for connecting to an Ethernet network through a switch or router
7. USB Port	• USB 3.0 port for compatible USB devices.
8. SPDIF Port	• For Audio out
9. Audio(5+1)	• For Audio out/in

N4820U rear panel features ports and connectors.

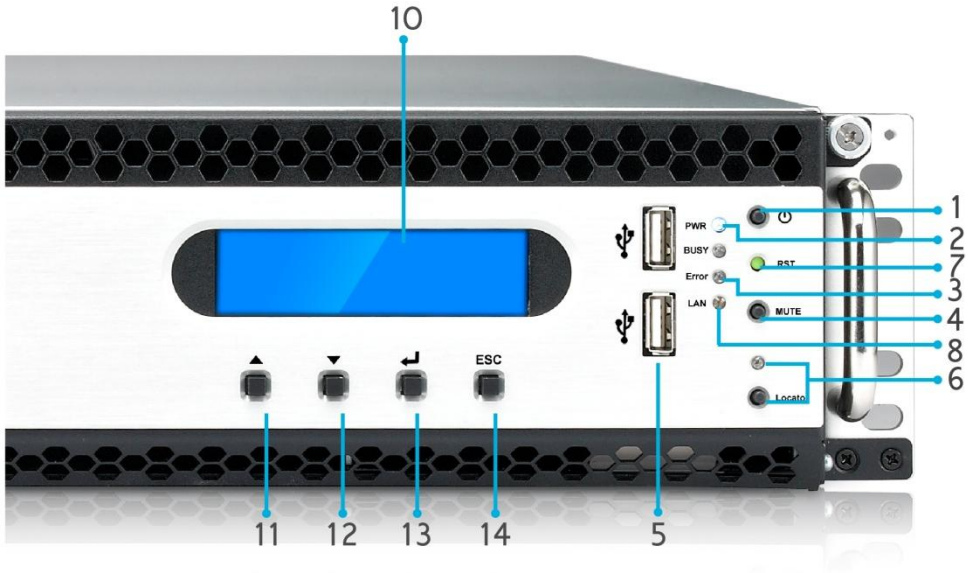


Back Panel	
Item	**Description**
1. Power Connector	• Connect the included power cords to these connectors
2. Line in	• For Audio in
3. Line out	• For Audio out
4. Mic input	• Microphone input
5. LAN1\LAN2\ LAN3 Port	• LAN1\LAN2\ LAN3 port for connecting to an Ethernet network through a switch or router
6. USB Port	• USB 3.0 port for compatible USB devices.
7. Display Port	• For Video/Audio out
8. HDMI Port	• For Video/Audio out

N12850:

Front Panel

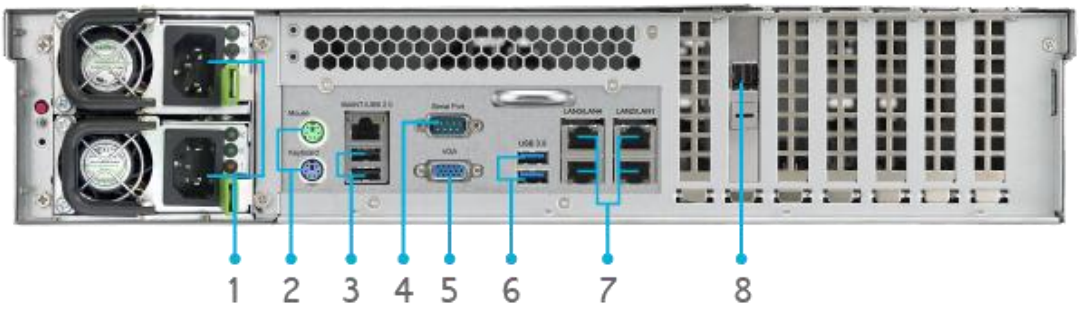
The Thecus N12850 front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	**Description**
1.Power Button	• Power on/off N12850
2.Power LED	• **Solid green:** System is power on.
3.System error LED	• Solid RED: System error.
4.Mute button	• Mute the system fan alarm.
5.USB Port	• USB 2.0 port for compatible USB devices, such as USB disks and USB printers
6. Locator button / LED	• Press the button, the back led will light up to identify the system position of the rack
7. RST	• Reboot system.
8. LAN	• Blinking green: network activity • Solid green: network link
9. BUSY	• Blinking orange: system startup or system maintenance; data currently inaccessible
10.LCD	• Displays current system status and messages • LCD screen saver will be enabled after screen is idle for more than 3 minutes • LCD screen will be turn off after idle for more than 6 minutes
11.Up Button ▲	• Push to scroll up when using the OLED display
12.Down Button ▼	• Push to enter USB copy operation screen
13.Enter Button ↵	• Push to enter OLED operate password for basic system setting
14.Escape Button **ESC**	• Push to leave the current OLED menu

Rear Panel

N12850 rear panel features ports and connectors.

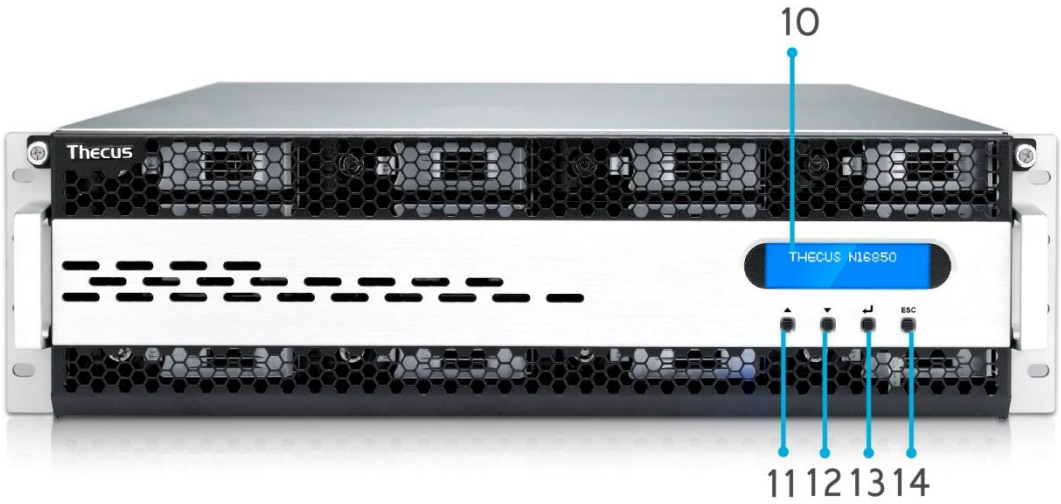


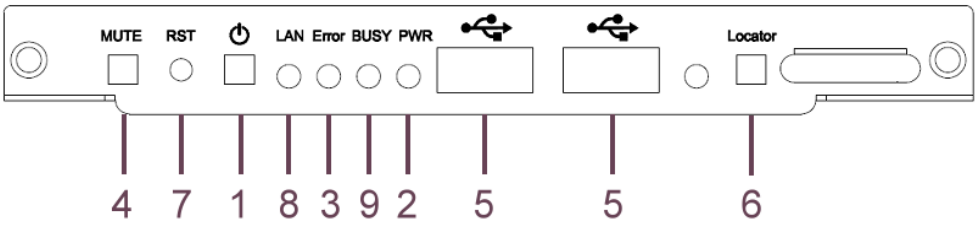
Back Panel	
Item	**Description**
1.Power Connector	• Connect the included power cords to these connectors
2. PS/2 connector	• The color-coded PS/2 connection ports (purple for keyboard and green for mouse)
3.USB Port	• USB 2.0 port for compatible USB devices, such as USB disks, and USB printers
4.Serial Port	• This port is for external UPS device
5.VGA Port	• For Video out
6.USB Port	• USB 3.0 port for compatible USB devices.
7. LAN1\LAN2\ LAN3\ LAN4 Port	• LAN1\LAN2\ LAN3\ LAN4 port for connecting to an Ethernet network through a switch or router
8. SFF-8644 SAS Wide Port	• Support Capacity expansion via Thecus JBOD device

N16850:

Front Panel

The Thecus N16850 front panel has the device's controls, indicators, and hard disk trays:

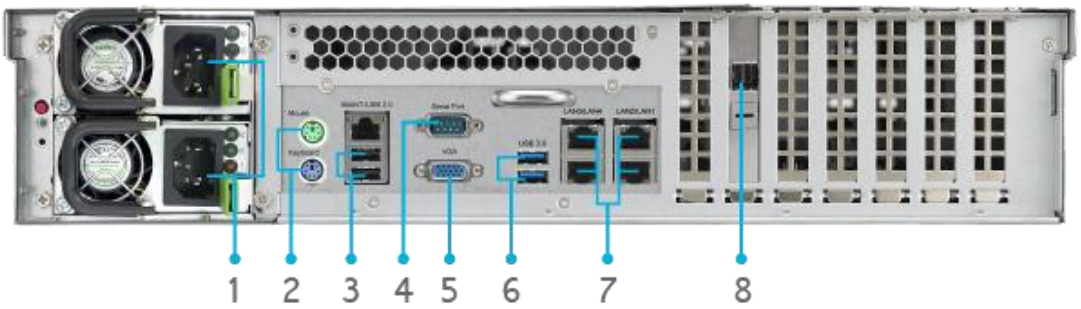




Front Panel	
Item	**Description**
1.Power Button	• Power on/off N16850
2.Power LED	• **Solid green:** System is power on.
3.System error LED	• Solid RED: System error.
4.Mute button	• Mute the system fan alarm.
5.USB Port	• USB 2.0 port for compatible USB devices, such as USB disks and USB printers
6. Locator button / LED	• Press the button, the back led will light up to identify the rack position of the system
7. RST	• Reboot system.
8. LAN	• Blinking green: network activity • Solid green: network link
9. BUSY	• Blinking orange: system startup or system maintenance; data currently inaccessible
10.LCD	• Displays current system status and messages • LCD screen saver will be enabled after screen is idle for more than 3 minutes • LCD screen will be turn off after idle for more than 6 minutes
11.Up Button ▲	• Push to scroll up when using the OLED display
12.Down Button ▼	• Push to enter USB copy operation screen
13.Enter Button ↵	• Push to enter OLED operate password for basic system setting
14.Escape Button **ESC**	• Push to leave the current OLED menu

Rear Panel

N16850 rear panel features ports and connectors.

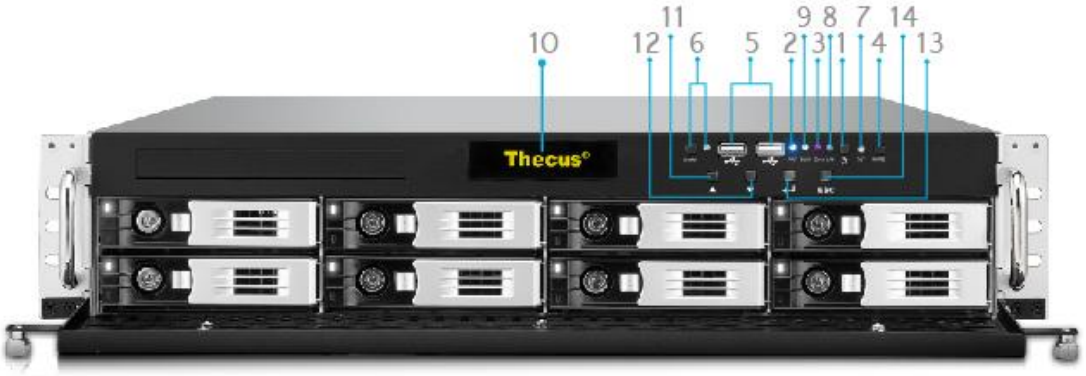


Back Panel	
Item	**Description**
1.Power Connector	• Connect the included power cords to these connectors
2. PS/2 connector	• The color-coded PS/2 connection ports (purple for keyboard and green for mouse)
3.USB Port	• USB 2.0 port for compatible USB devices, such as USB disks, and USB printers
4.Serial Port	• This port is for external UPS device
5.VGA Port	• For Video out
6.USB Port	• USB 3.0 port for compatible USB devices.
7. LAN1\LAN2\ LAN3\ LAN4 Port	• LAN1\LAN2\ LAN3\ LAN4 port for connecting to an Ethernet network through a switch or router
8. SFF-8644 SAS Wide Port	• Support Capacity expansion via Thecus JBOD device

N8910:

Front Panel

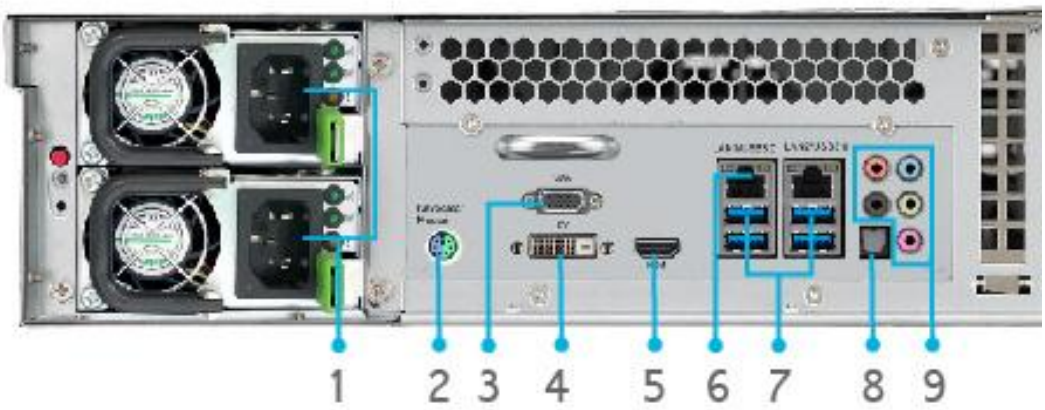
The Thecus N8910 front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	**Description**
1.Power Button	• Power on/off N8910
2.Power LED	• **Solid green:** System is power on.
3.System error LED	• Solid RED: System error.
4.Mute button	• Mute the system fan alarm.
5.USB Port	• USB 2.0 port for compatible USB devices, such as USB disks and USB printers
6. Locator button / LED	• Press the button, the back led will light up to identify the system position of the rack
7. RST	• Reboot system.
8. LAN	• Blinking green: network activity • Solid green: network link
9. BUSY	• Blinking orange: system startup or system maintenance; data currently inaccessible
10.OLED	• Displays current system status and messages • OLED screen saver will be enabled after screen is idle for more than 3 minutes • OLED screen will be turn off after idle for more than 6 minutes
11.Up Button ▲	• Push to scroll up when using the OLED display
12.Down Button ▼	• Push to enter USB copy operation screen
13.Enter Button ↵	• Push to enter OLED operate password for basic system setting
14.Escape Button **ESC**	• Push to leave the current OLED menu

Rear Panel

N8910 rear panel features ports and connectors.

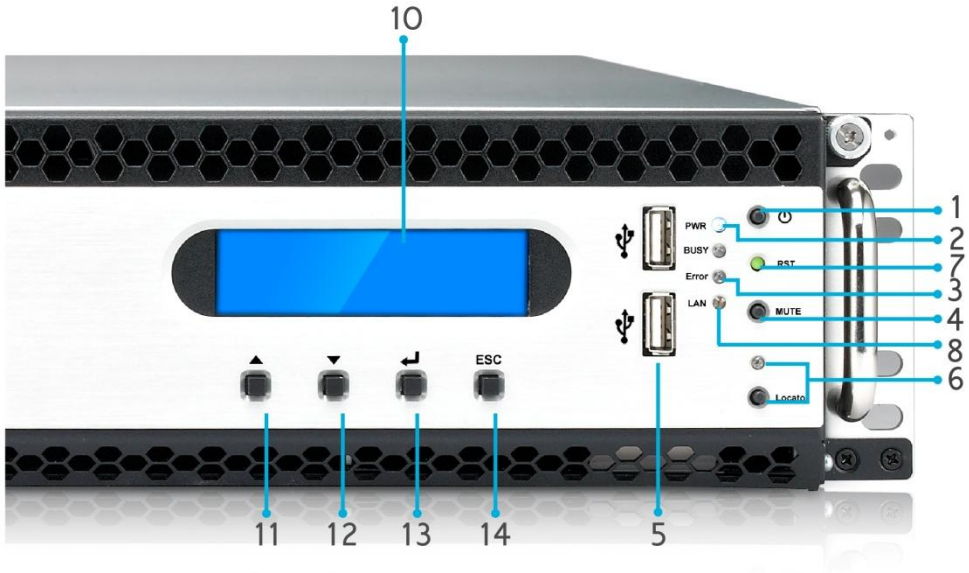


Back Panel	
Item	**Description**
9. Power Connector	• Connect the included power cords to these connectors
10. PS/2 connector	• The color-coded PS/2 connection ports (purple for keyboard and green for mouse)
11. VGA Port	• For Video out
12. DVI Port	• For Video out
13. HDMI Port	• For Video/Audio out
14. LAN1\LAN2\ Port	• LAN1\LAN2port for connecting to an Ethernet network through a switch or router
15. USB Port	• USB 3.0 port for compatible USB devices.
16. SPDIF Port	• For Audio out
17. Audio(5+1)	• For Audio out/in

N12910/N12910SAS:

Front Panel

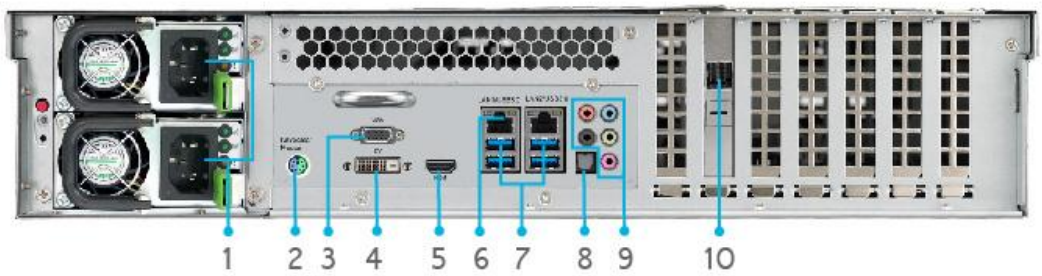
The Thecus N12910/N12910SAS front panel has the device's controls, indicators, and hard disk trays:



Front Panel	
Item	**Description**
1.Power Button	• Power on/off N12910/N12910SAS
2.Power LED	• **Solid green:** System is power on.
3.System error LED	• Solid RED: System error.
4.Mute button	• Mute the system fan alarm.
5.USB Port	• USB 2.0 port for compatible USB devices, such as USB disks and USB printers
6. Locator button / LED	• Press the button, the back led will light up to identify the system position of the rack
7. RST	• Reboot system.
8. LAN	• Blinking green: network activity • Solid green: network link
9. BUSY	• Blinking orange: system startup or system maintenance; data currently inaccessible
10.LCD	• Displays current system status and messages • LCD screen saver will be enabled after screen is idle for more than 3 minutes • LCD screen will be turn off after idle for more than 6 minutes
11.Up Button ▲	• Push to scroll up when using the OLED display
12.Down Button ▼	• Push to enter USB copy operation screen
13.Enter Button ↵	• Push to enter OLED operate password for basic system setting
14.Escape Button **ESC**	• Push to leave the current OLED menu

Rear Panel

N12910/N12910SAS rear panel features ports and connectors.

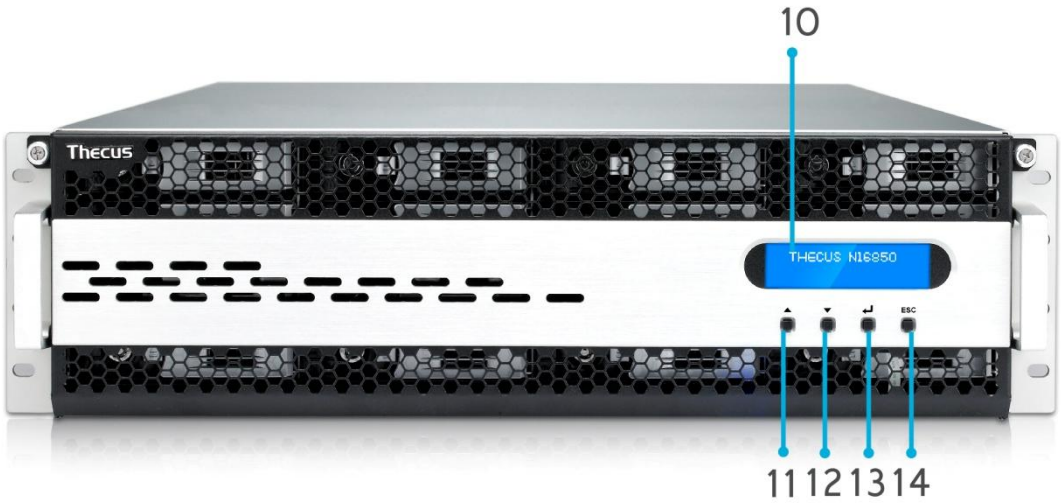


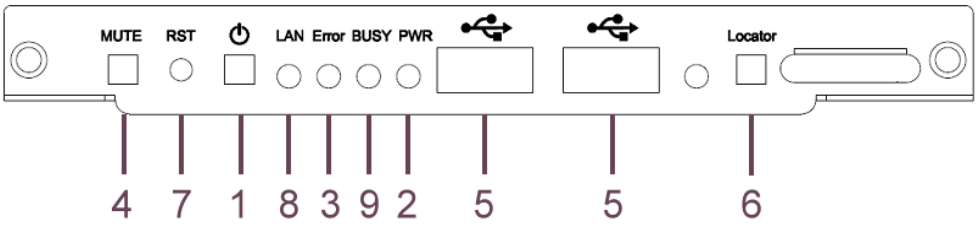
Back Panel	
Item	**Description**
18. Power Connector	• Connect the included power cords to these connectors
19. PS/2 connector	• The color-coded PS/2 connection ports (purple for keyboard and green for mouse)
20. VGA Port	• For Video out
21. DVI Port	• For Video out
22. HDMI Port	• For Video/Audio out
23. LAN1\LAN2\ Port	• LAN1\LAN2port for connecting to an Ethernet network through a switch or router
24. USB Port	• USB 3.0 port for compatible USB devices.
25. SPDIF Port	• For Audio out
26. Audio(5+1)	• For Audio out/in
27. SFF-8644 SAS Wide Port(N12910 SAS only)	• Support Capacity expansion via Thecus JBOD device

N16910SAS:

Front Panel

The Thecus N16910SAS front panel has the device's controls, indicators, and hard disk trays:





Front Panel	
Item	**Description**
1.Power Button	• Power on/off N16910SAS
2.Power LED	• **Solid green:** System is power on.
3.System error LED	• Solid RED: System error.
4.Mute button	• Mute the system fan alarm.
5.USB Port	• USB 2.0 port for compatible USB devices, such as USB disks and USB printers
6. Locator button / LED	• Press the button, the back led will light up to identify the rack position of the system
7. RST	• Reboot system.
8. LAN	• Blinking green: network activity • Solid green: network link
9. BUSY	• Blinking orange: system startup or system maintenance; data currently inaccessible
10.LCD	• Displays current system status and messages • LCD screen saver will be enabled after screen is idle for more than 3 minutes • LCD screen will be turn off after idle for more than 6 minutes
11.Up Button ▲	• Push to scroll up when using the OLED display
12.Down Button ▼	• Push to enter USB copy operation screen
13.Enter Button ↵	• Push to enter OLED operate password for basic system setting
14.Escape Button **ESC**	• Push to leave the current OLED menu

Rear Panel

N16910SAS rear panel features ports and connectors.

Back Panel		
	Item	**Description**
1.	Power Connector	• Connect the included power cords to these connectors
2.	PS/2 connector	• The color-coded PS/2 connection ports (purple for keyboard and green for mouse)
3.	VGA Port	• For Video out
4.	DVI Port	• For Video out
5.	HDMI Port	• For Video/Audio out
6.	LAN1\LAN2\ Port	• LAN1\LAN2port for connecting to an Ethernet network through a switch or router
7.	USB Port	• USB 3.0 port for compatible USB devices.
8.	SPDIF Port	• For Audio out
9.	Audio(5+1)	• For Audio out/in
10.	SFF-8644 SAS Wide Port	• Support Capacity expansion via Thecus JBOD device

Chapter 2: Hardware Installation

Overview

Your Thecus IP storage is designed for easy installation. To help you get started, the following chapter will help you quickly get your Thecus IP storage up and running. Please read it carefully to prevent damaging your unit during installation.

Before You Begin

Before you begin, be sure to take the following precautions:

1. Read and understand the ***Safety Warnings*** outlined in the beginning of the manual.

2. If possible, wear an anti-static wrist strap during installation to prevent static discharge from damaging the sensitive electronic components on the Thecus IP storage.

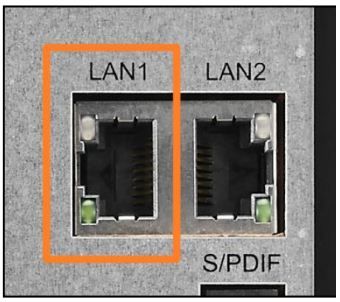
3. Be careful not to use magnetized screwdrivers around the Thecus IP storage's electronic components.

Cable Connections

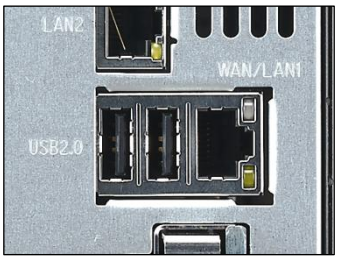
To connect the Thecus IP storage product to your network, follow the steps below:

1. Connect an Ethernet cable from your network to the WAN/LAN1 port on the back panel of the Thecus IP storage.

▲ *N2810 Series/ N4810 Series WAN/LAN1 port*



▲ *N4810 Series WAN/LAN1 port*



▲ *N5810/N5810PRO Series WAN/LAN1 port*

▲ *N4910/N8910/N12910/N12910 SAS/N16910 SAS WAN/LAN1 port*

▲ *N2350/N4350 WAN/LAN1 port*

2. Connect the provided power adaptor and power cord into the power socket on the back panel. Plug the other end of the cord into a surge protector socket.

▲ *N2810 Series /N4810 Series power socket*

▲ *N5810/N5810PRO Series power socket*

▲*N8910/N4910U/N12910N12910SAS//N16910SAS power socket*

▲*N4810 Series power socket*

▲*N2350 Series power socket*

▲*N4350 Series power socket*

3. Press the power button on the Front Panel to boot up the Thecus IP storage.

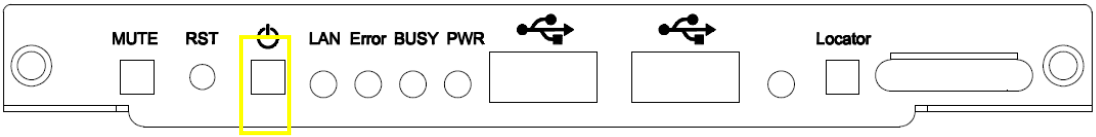
▲ *N2810 Series power button*

▲ *N5810/N5810PRO Series power button*

▲*N4810 Series power button*

▲*N2350 Series power button*

▲*N4350 Series power button*



▲ *N12850/N16850/N4910U/N8910/N12910/N12910SAS/N16910SAS power button*

Chapter 3: First Time Setup

Overview

Once the hardware is installed, physically connected to your network, and powered on, you can configure the Thecus IP storage so that it is accessible to your network users. There are two ways to set up your Thecus IP storage: using the **Thecus Setup Wizard** or the **LCD display (Depend on models)**. Follow the steps below for initial software setup.

Thecus Setup Wizard

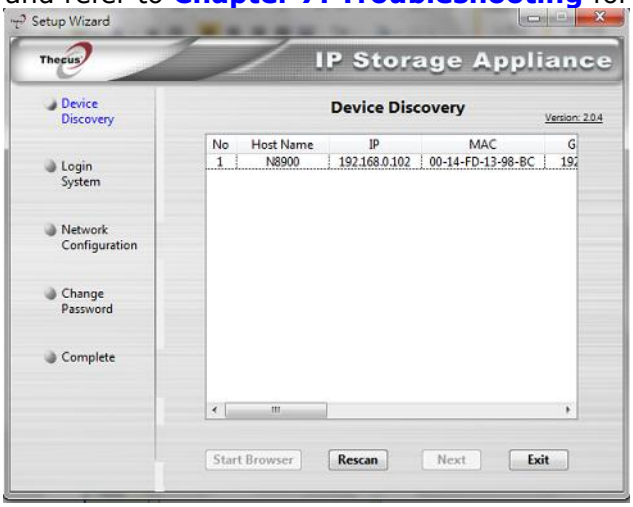
The handy Thecus Setup Wizard makes configuring Thecus IP storage a snap. To configure the Thecus IP storage using the Setup Wizard, perform the following steps:

1. Insert the installation CD into your CD-ROM drive (the host PC must be connected to the network).

2. The Setup Wizard should launch automatically. If not, please browse your CD-ROM drive and double click on **Setup.exe.**

NOTE For MAC OS X users, double click on Thecus Setup Wizard .dmg file.

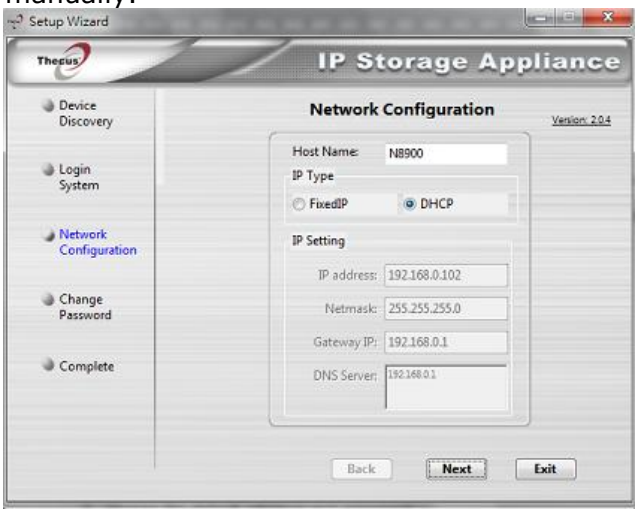
3. The Setup Wizard will start and automatically detect all Thecus storage devices on your network. If none are found, please check your connection and refer to **Chapter 7: Troubleshooting** for assistance.



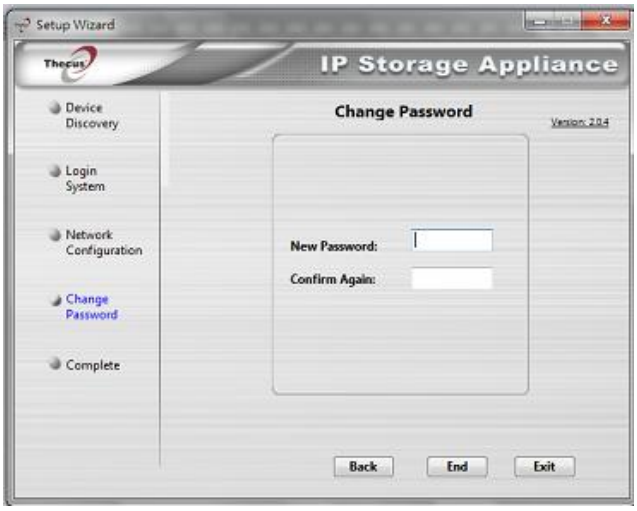
4. Select the Thecus IP storage that you like to configure.

5. Login with the administrator account and password. The default account and password are both "`admin`".

6. Name your Thecus IP storage and configure the network IP address. If your switch or router is configured as a DHCP Server, configuring the Thecus IP storage to automatically obtain an IP address is recommended. You may also use a static IP address and enter the DNS Server address manually.



7. Change the default administrator password.



8. Finished! Access the Thecus IP storage Web Administrator Interface by pressing the ***Start Browser*** button. You can also configure another

Thecus IP storage at this point by clicking the ***Setup Other Device*** button. Press ***Exit*** to exit the wizard.

NOTE

The Thecus Setup Wizard is designed for installation on systems running Windows XP/2000/vista/7/8/10 or Mac OSX or later. Users with other operating systems will need to install the Thecus Setup Wizard on a host machine with one of these operating systems before using the unit.

Typical Setup Procedure

From the Web Administration Interface, you can begin to setup your Thecus IP storage for use on your network. Setting up the Thecus IP storage typically follows the five steps outlined below.

Step 1: Network Setup

From the Web Administration Interface, you can configure the network settings of the Thecus IP storage for your network. You can access the **Network** menu from the control panel.

Step 2: RAID Creation

Next, administrators can configure their preferred RAID setting and build their RAID volume. You can access RAID settings from the control panel of the Web Administration Interface by navigating to **Storage Management > Disk and RAID.**

Step 3: Create Local Users or Setup Authentication

Once the RAID is ready, you can begin to create local users for Thecus IP storage, or choose to setup authentication protocols such as Active Directory (AD).

Step 4: Create Folders and Set Up ACLs

Once users are introduced into your network, you can begin to create various folders on the Thecus IP storage and control user access to each using Folder Access Control Lists.

Step 5: Start Services

Finally, you can start to setup the different services of Thecus IP storage for the users on your network.

Chapter 4: System Administration

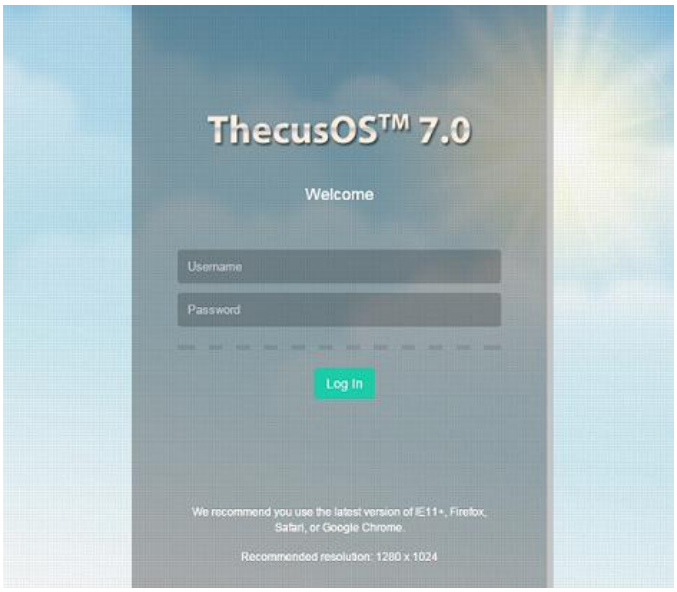
Overview

The Thecus IP storage provides an easily accessible **Web Administration Interface**. With it, you can configure and monitor the Thecus IP storage anywhere on the network.

Web Administration Interface

Make sure your network is connected to the Internet. To access Thecus IP storage **Web Administration Interface**:

1. Type the Thecus IP storage IP address into your browser. (Default IP address is `http://192.168.1.100`)



NOTE

Your computer's network IP address must be on the same subnet as the Thecus IP storage. If the Thecus IP storage has default IP address of 192.168.1.100, your managing PC IP address must be 192.168.1.x, where x is a number between 1 and 254, but not *100*.

2. Login to the system using the administrator user name and password. The factory defaults are:

   User Name: `admin`
   Password: `admin`

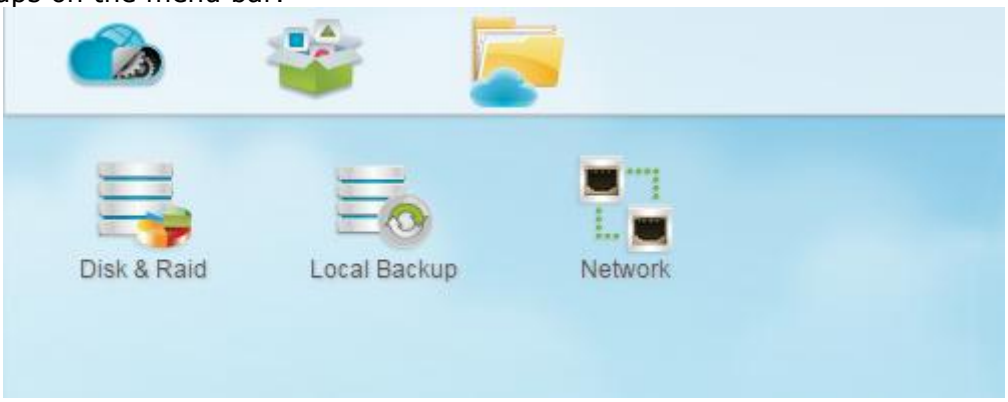
※ If you changed your password in the setup wizard, use the new password.

Once you are logged in as an administrator, the disclaimer page will appear as below. Please click the check box if you do not want to have this page displayed during the next login.

Following the disclaimer page, you will see the **Web Administration Interface**. From here, you can configure and monitor virtually every aspect of the Thecus IP storage from anywhere on the network.

Menu Tree

The **Menu Tree** is where you will find all of the information screens and system settings of Thecus IP storage. The various settings are placed in the following groups on the menu bar.

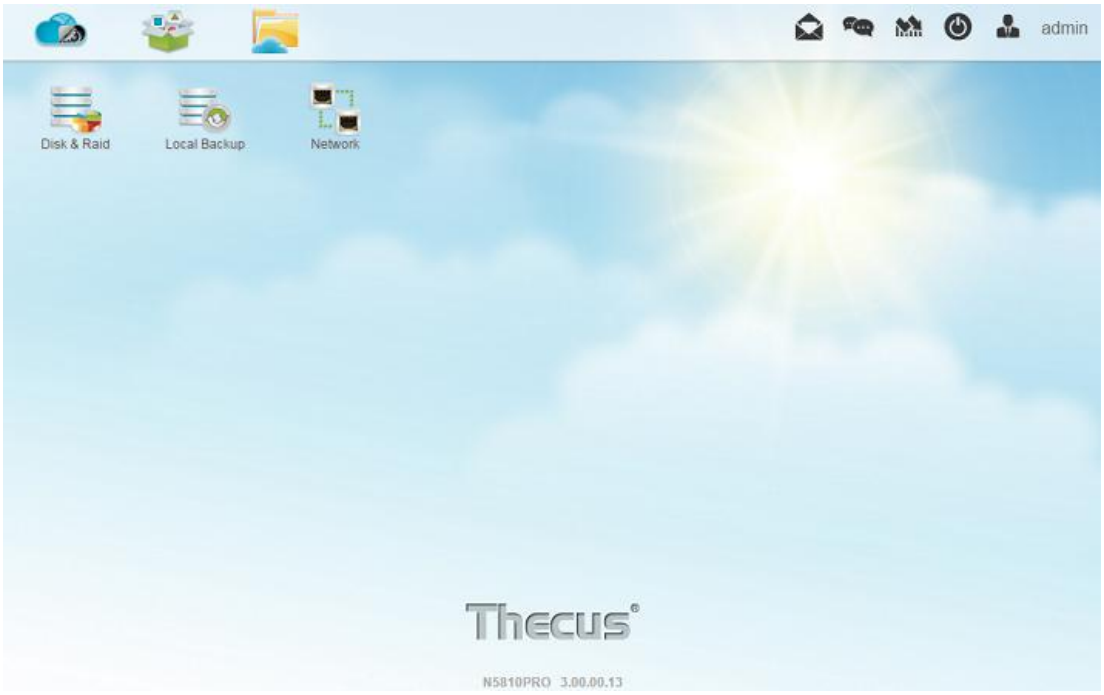


Menu Bar	
Item	**Description**
Control Panel	The Entry of system and function setting
App Center	The entry of App Center
File Center	The entry of File Center

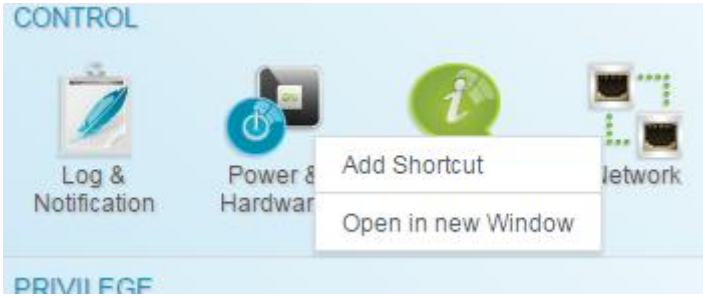
Moving your cursor over any of these items and click, it will display the associated screen for each topic.

Add/Remove Shortcut

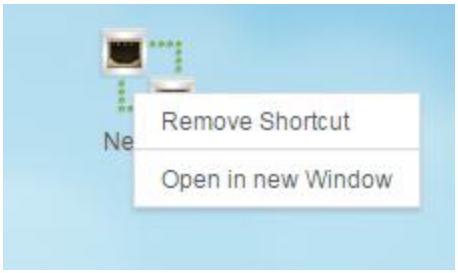
The user interface allows the user to designate often used items and have them display on the main screen area by add Shortcut. The figure below displays system favorite functions.



Administrators can add or remove Shortcut by right clicking the mouse and selecting "Add Shortcut" icon in each function screen. See the figure below with the red circled icon.

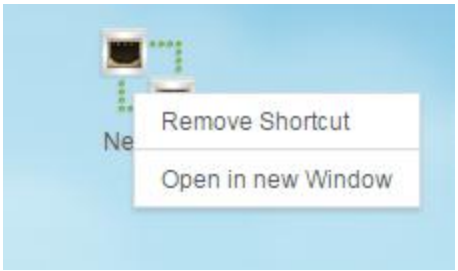


To remove "Shortcut" from main screen, right click the mouse button and select "Remove Shortcut".



Open in New Window

To open associated function on the front of screen, right click mouse and select "Open in new window".



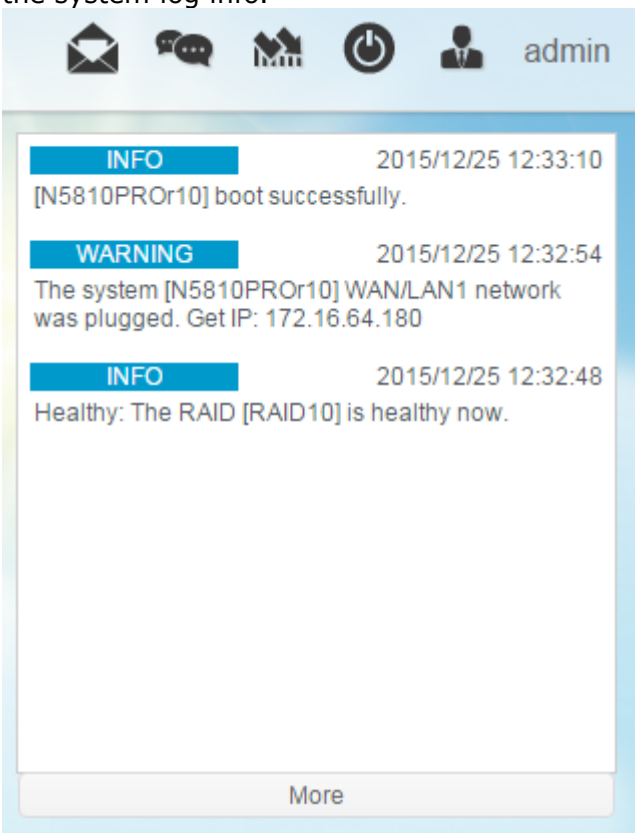
In the following sections, you will find detailed explanations of each function, and how to configure your Thecus IP storage.

Feedback for OS7.0

On the top right hand corner of menu bar, click on and it will open the mail sending screen, please provide your feedback.

Quick System Log Info

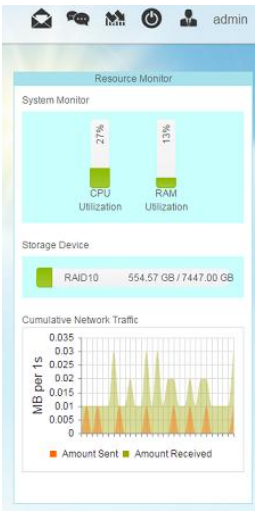
On the top right hand corner of the menu bar, click on and it will display the system log info.



Quick System Resource Monitor

On the top right hand corner of the menu bar, click on and it will display the

system resource monitor info
such as CPU, memory and storage usage. .



System shut down and reboot

On the top right hand corner of the menu bar, click on , this is a shortcut to shut down or reboot the system.

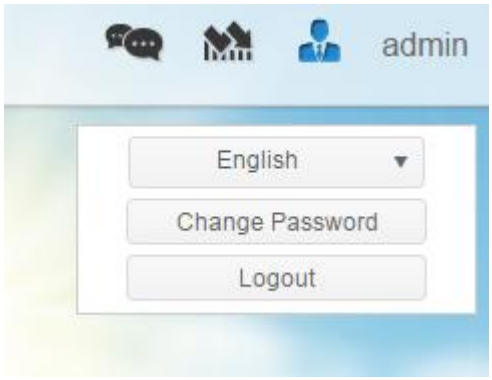
Language Selection

The Thecus IP storage supports multiple Languages, including:

- English
- Japanese
- Traditional Chinese
- Simplified Chinese
- French
- German
- Italian
- Korean
- Spanish
- Russian
- Polish
- Portuguese

On the top right hand corner of menu bar, select desired language from drop down list. This user interface will switch to the selected language for Thecus IP storage.

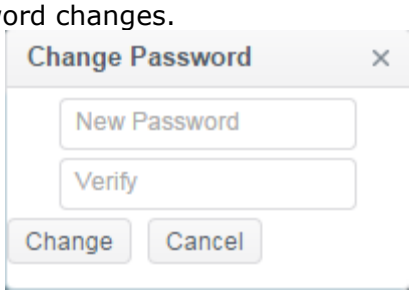
Logout



Click on logout to quit Web Administration Interface.

Change Password

On the top right hand corner of menu bar, select **Password** item and the **Change Password** screen will appear. Enter a new password in the **New Password** box and confirm your new password in the **Verify** box. Click on ***Change*** to confirm password changes.



Control Panel

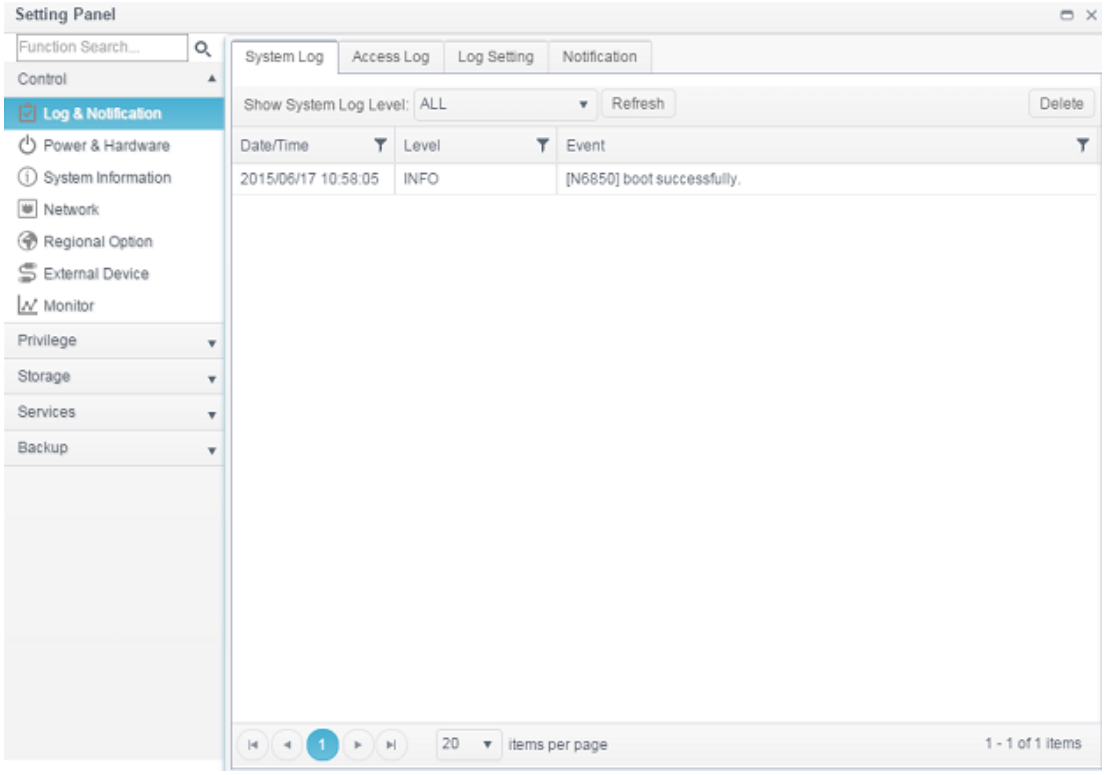
The control panel has 5 main categories: CONTROL, PRIVILLEGE, STORAGE, SERVICES and BACKUP. Please see below for explanation.

CONTROL

Log and Notification

System Log

From the **Log & Notification** menu, choose the **System Log** option and the **System Log** screen will appear. This screen will show a history of system usage and important events such as disk status, network information, and system booting.

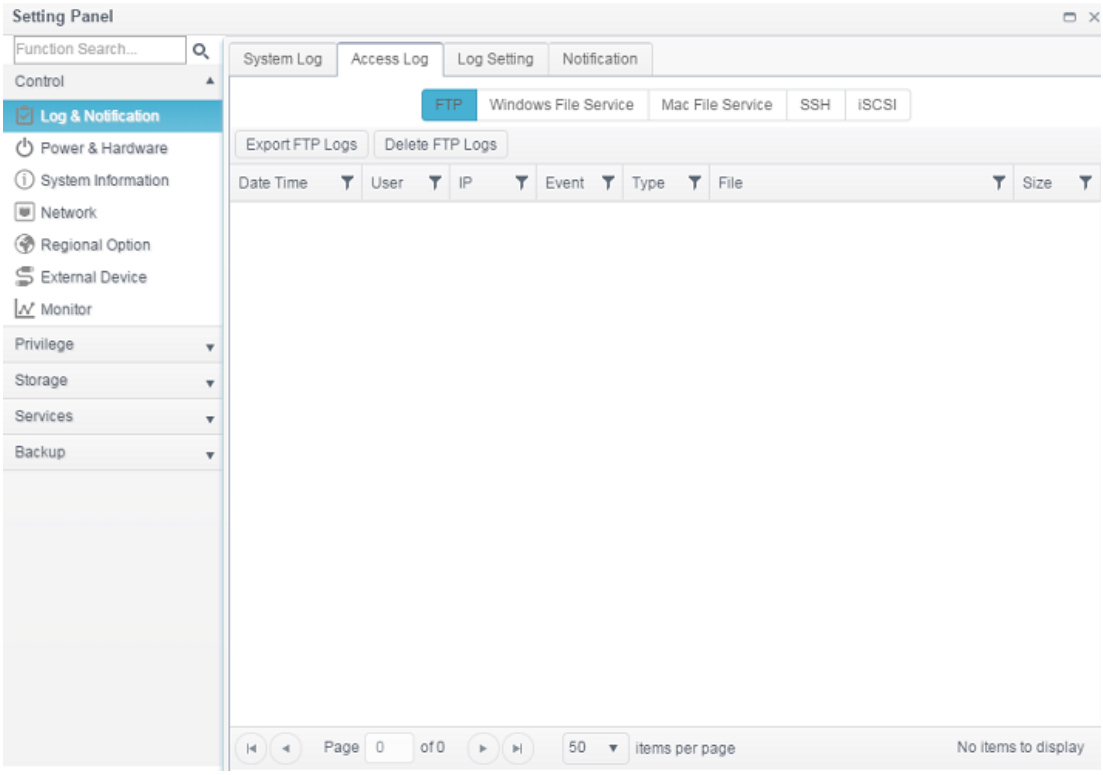


Logs	
Item	**Description**
Log Level	ALL: Provides all log information including system, warning, and error messages. WARN: Shows only warning messages. ERROR: Shows only error messages.
Delete	Clear all log files.
Items per page □	Specify the desired number of lines to display per page.
Filters	Input desired value to filter unwanted items

|<< < > >>|	Use the forward (**> >>|**) and backward (**|<< <**) buttons to browse through the log pages.
Refresh	Reload logs

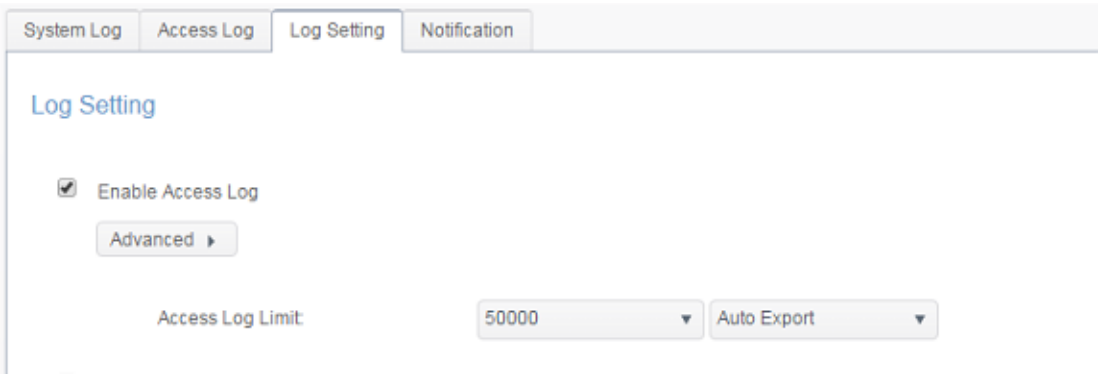
Access Log

The **Access Log Support** section allows administrators to choose associated protocol and view user activity information.



Log Setting

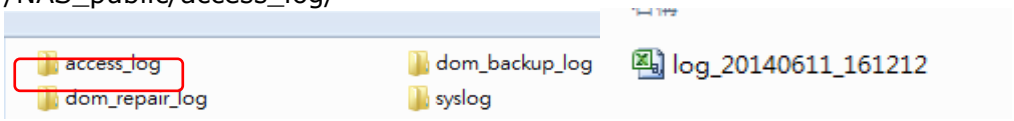
To have user access details for associated system, **Access Log Support** must be enabled and confirmed with "Apply" button, at the time all supported services will restart. To view Access Log details, please go to **Access Log** section.



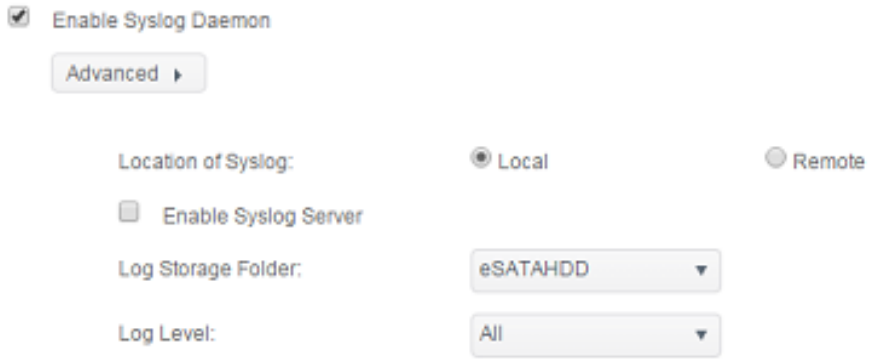
To export details from the User Access Log as a single file from target folder, administrators must first select the desired number of records from the dropdown

list and also select the "Auto export" option. Please choose the number of logs to export and click **Apply** to activate these settings.

Once (for example) 10,000 records have been reached, the log file will appear in /NAS_public/access_log/



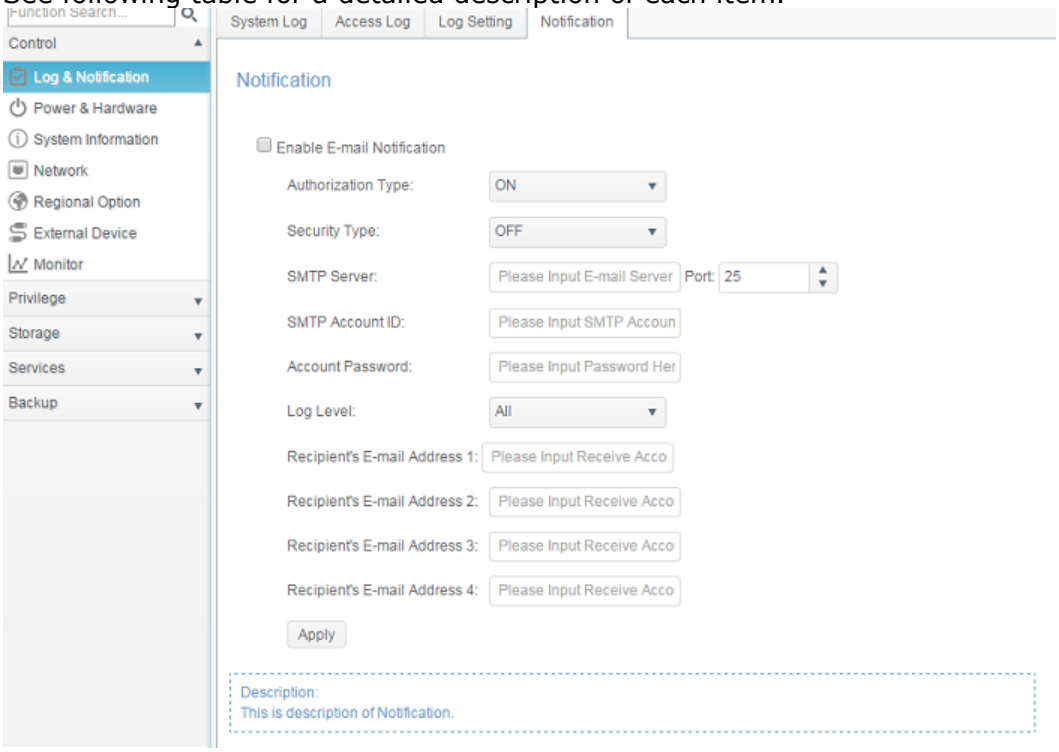
Syslog service can generate system logs to be stored locally or remotely. Information can be obtained in two ways: locally and remotely.



Log Setting	
Item	**Description**
Enable Access Log	Enable or disable the Access Log service.
Access log limit	This can be selected from a dropdown list to export the log(s) as a single file. Please also choose "Auto Export" or "Auto Delete" once the log item exceeded the defined number.
Enable Syslog Daemon	Enable or disable Syslog service.
Location of Syslog	Choose Local, all system logs will be stored in an associated syslog folder filled in from next filed. And the syslog folder will have file "messages" to store all system logs. If Remotely has been selected, a syslog server is needed and an IP address is required to fill in from next filed.
Enable Syslog Server	Checked to enable associated system can play a role as syslog server while syslog location has select "Local"
Log Server IP (Remote)	Input the remote syslog server IP address once syslog store in remote server has selected
Log storage folder (Local)	Select from a drop down share list, all of the system logs will be stored on it. This syslog folder is applied to "syslog server" or "syslog client" with "local" selected.
Log Level	The user can choose from 3 different levels. "All", "Warning/Error" or "Error".
Apply	Click Apply to save changes.
Description	The user access list will record different activities for supported protocols. 1. AFP: User login and logout. 2. FTP: User file deletion, uploads/downloads, folder creation, object renaming, and login and logout. 3. iSCSI: User login and logout. 4. Samba: User file deletion, folder creation, folder opening, and object reading, renaming, and writing. 5. SSH: User login and logout. 6. VPN: User login and logout

Notification

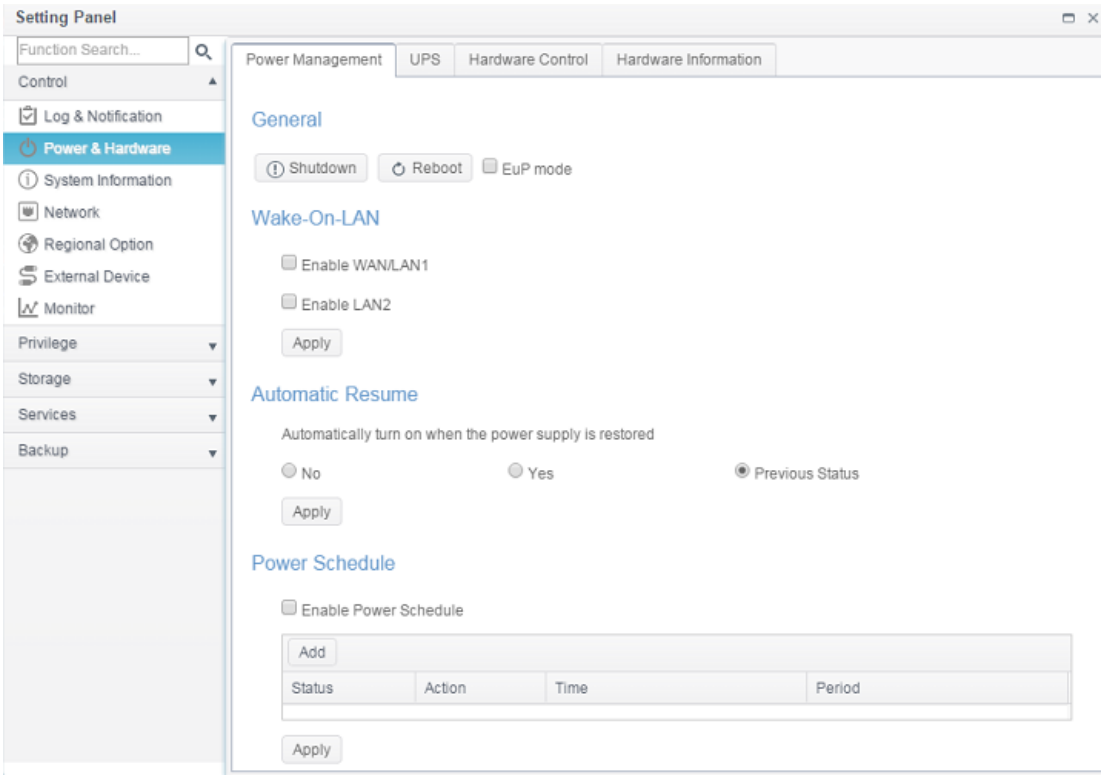
From log and notification, choose the ***Notification*** item, and the **Notification Configuration** screen will appear. This screen lets you have Thecus IP storage notify you in case of any system malfunction. Press ***Apply*** to confirm all settings. See following table for a detailed description of each item.



Notification Configuration	
Item	**Description**
Email Notification	Enable or disable email notifications of system problems.
Authentication Type	Select the SMTP Server account authentication type from drop down list.
Security Type	Select the security type while mail has sent out
SMTP Server	Specifies the hostname/IP address of the SMTP server.
Port	Specifies the port to send outgoing notification emails.
SMTP Account ID	Set the SMTP Server Email account ID.
Account Password	Enter a new password.
Log Level	Select the log level to send the e-mail out.
Sender's E-mail Address	Set senders email address to send email notifications.
HELO/EHLO Domain Name	Specified valid HELO/EHLO domain name
Receiver's E-mail Address (1,2,3,4)	Add one or more recipient's email addresses to receive email notifications.

NOTE Consult with your mail server administrator for email server information.

Power & Hardware

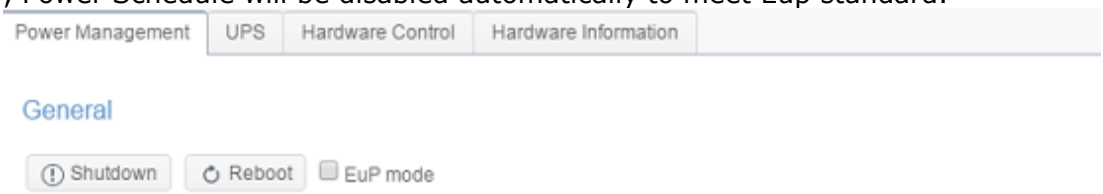


Power Management

General

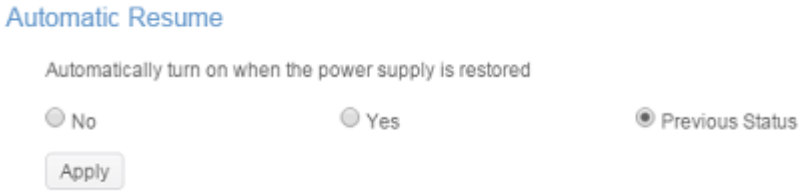
Press ***Reboot*** to restart the system or ***Shutdown*** to turn the system off.

The option of **Eup mode** could help to lower system power consumption. However, once it has enabled the Wake-On-Lan
, Power Schedule will be disabled automatically to meet Eup standard.



Automatic Resume

Thecus IP storage allows users to setup in 3 different modes while power cut resume.



Automatic Resume	
Item	**Description**
No	Choose **No** to keep system off after power cut resume

Yes	Choose **Yes** to have system on after power cut resume
Previous Status	Keep former state of system while power cut resume
Apply	Click ***Apply*** to save changes.

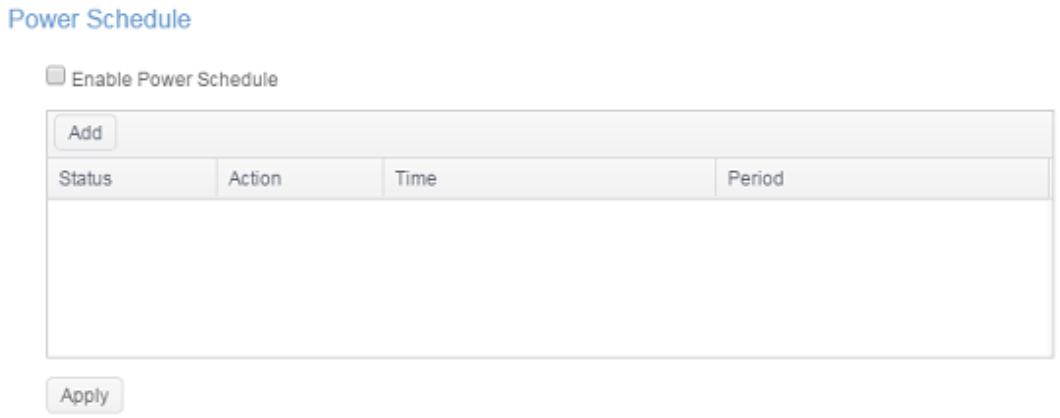
Power Schedule

Using the Thecus IP storage Power Management, you can save energy and money by scheduling the Thecus IP storage to turn itself on and off during certain times of the day.

To designate a schedule for the Thecus IP storage to turn on and off, first enable the feature by checking the **Enable Power Schedule** checkbox.

Then, click **Add** to add desired time for system power on or off.

Finally, click ***Apply*** to save your changes.



Example - Monday: On: 8:00; Off: 16:00
System will turn on at 8:00 AM on Monday, and off at 16:00 on Monday. System will turn on for the rest of the week.

If you choose an on time, but do not assign an off time, the system will turn on and remain on until a scheduled off time is reached, or if the unit is shutdown manually.

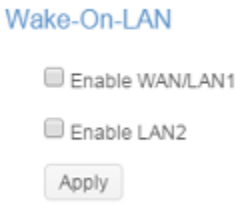
Example - Monday: On: 8:00
System will turn on at 8:00 AM on Monday, and will not shut down unless powered down manually.

You may also choose two on times or two off times on a particular day, and the system will act accordingly.

Example - Monday: Off: 8:00; Off: 16:00
System will turn off at 8:00 AM on Monday. System will turn off at 16:00 PM on Monday, if it was on. If the system was already off at 16:00 PM on Monday, system will stay off.

Wake-On-LAN

The Thecus IP storage has the ability to be awoken from sleep mode via WAN/LAN1 or LAN2 port.

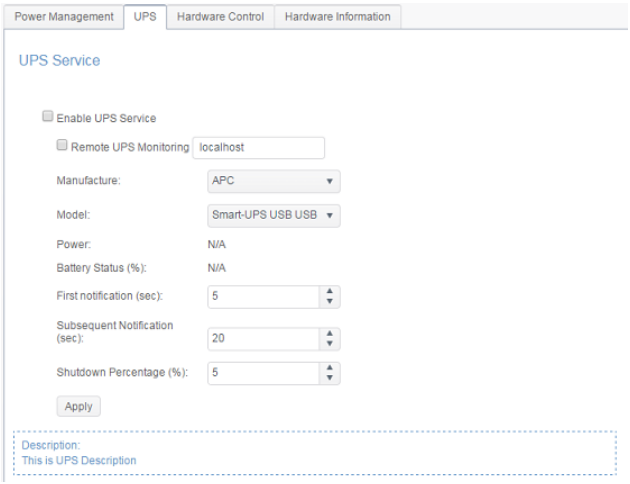


Click on associated NIC interface to **Enable** or **Disable Wake-On-LAN**.

Wake-up On LAN Configuration	
Item	**Description**
WAN/LAN1	**Enable** or **Disable** WOL service from WAN/LAN1
LAN2	**Enable** or **Disable** WOL service from LAN2
Apply	Click ***Apply*** to save changes.

UPS

Thecus IP storage supports ***Uninterrupted Power Source*** through USB interface. Make the changes of **UPS Setting** and press ***Apply*** to confirm changes.

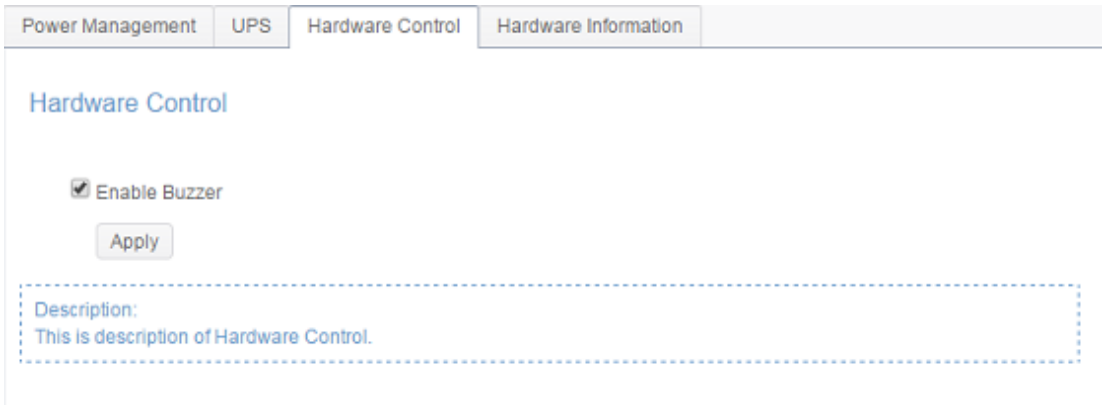


See the following table for a detailed description of each item.

UPS Setting	
Item	**Description**
UPS Service	Enable or disable UPS monitoring.
Remote UPS Monitoring	Checked to enable remote UPS monitoring. And input the IP address of the NAS that the UPS device is connected to via USB.
Manufacturer	Choose the UPS manufacturer from the dropdowns.
Model	Choose the UPS model number from the dropdowns.
Battery Status	Current status of the UPS battery
Power	Current status of the power being supplied to the UPS
First notification (sec)	Delay between power failure and first notification in seconds.
Subsequent notifications (sec)	Delay between subsequent notifications in seconds.
Shutdown percentage (%)	Amount of UPS battery remaining before system should auto-shutdown.
Apply	Press ***Apply*** to save your changes.

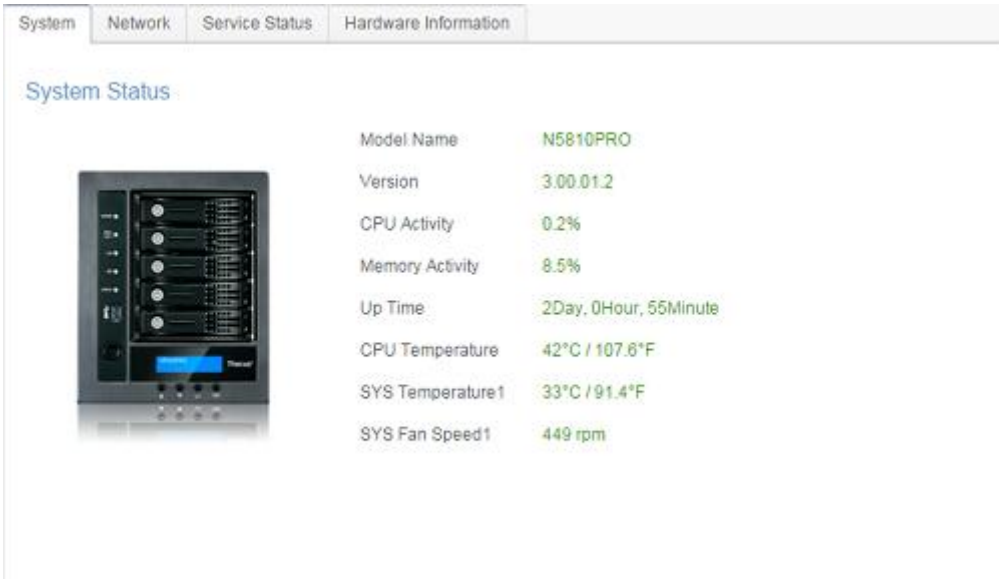
Hardware Control

The system buzzer can be **Enabled/Disabled** by clicking the check box. Check to enable system buzzer when any error occurs or disable to mute the system.



System Status

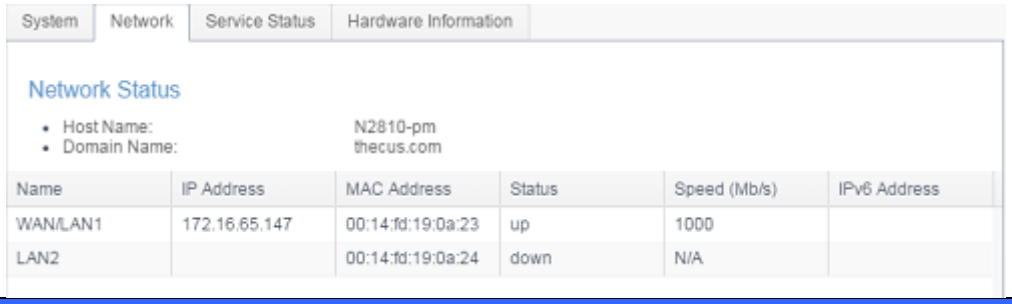
This screen provides basic system status information.



System Status	
Item	**Description**
Model	Model name
Version	Current FW version
CPU Activity	Displays current CPU workload of the Thecus IP storage.
Memory Activity	Display current memory workload of the Thecus IP storage
CPU Temperature	Displays current CPU Temperature.
System Temperature/1	Displays current System temperature from 2 positions
System Fan Speed	Displays the current status of the system fan.
Up Time	Shows how long the system has been up and running.

Network Status

This screen provides basic system network status and information.

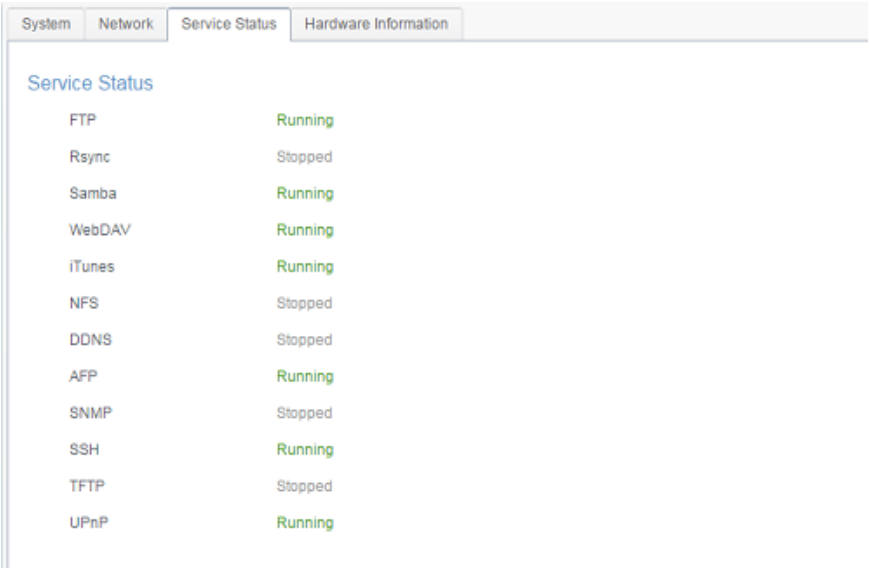


Network Information (Global parameter)	
Item	**Description**
Host name	Host name that identifies the Thecus IP storage on the network.
Domain name	Specifies the domain name of Thecus IP storage.
Link speed	Display associated NIC port link speed.
Link status	Display associated NIC port link status.
MAC address	MAC address of the network interface.
IPv4 IP address	IP address of associate NIC interface in IPv4.

IPv6 IP address	IP address of associate NIC interface in IPv6.

Service Status

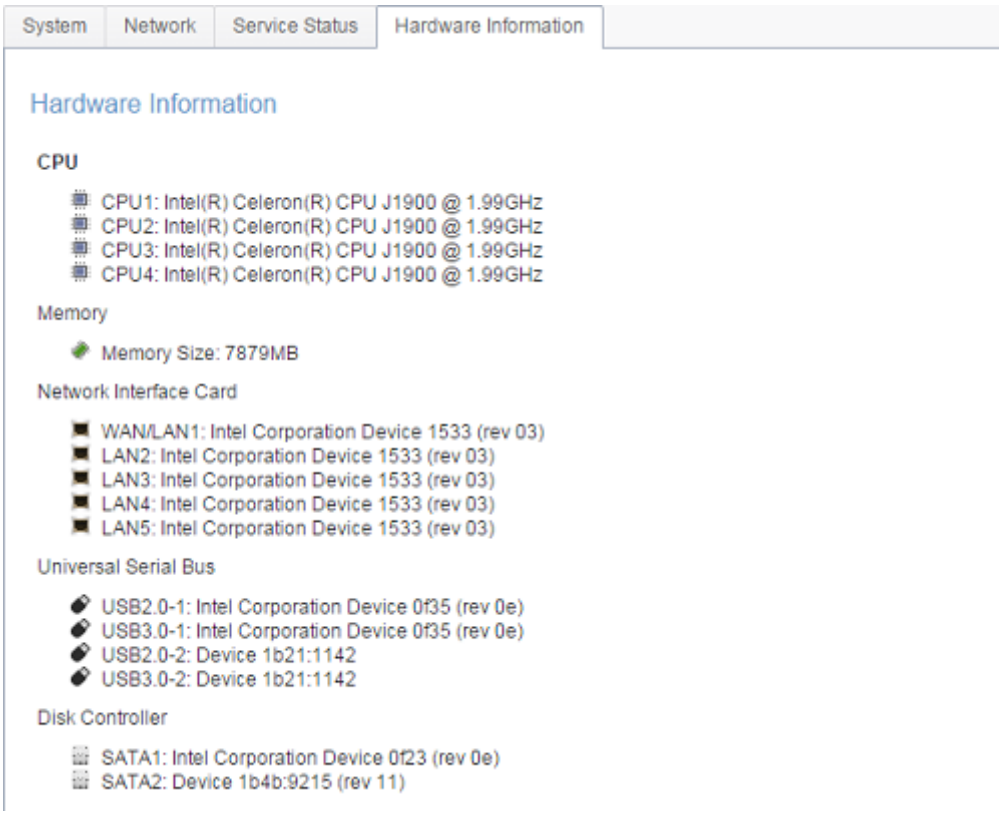
This screen provides basic service status information.



Service Status	
Item	**Description**
AFP Status	The status of the Apple Filing Protocol server.
NFS Status	The status of the Network File Service Server.
SMB/CIFS Status	The status of the SMB/CIFS server.
FTP Status	The status of the FTP server.
TFTP Status	The status of the TFTP server.
Rsync Status	The status of the Rsync server.
UPnP Status	The status of the UPnP service.
SNMP	The status of the SNMP service.

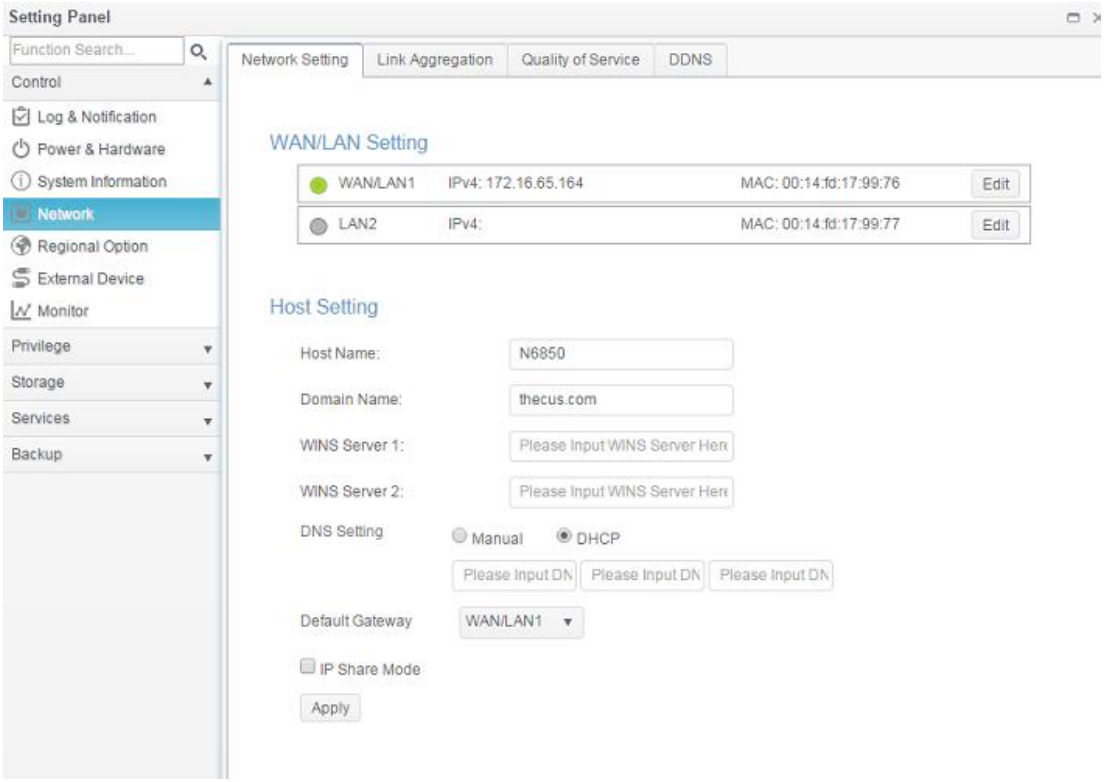
Hardware Information

Click on **Hardware Information,** this will display the related HW details for the associated model. Below is an example of the information for a Thecus N5810.



Network

From the **Control** menu, choose ***Network***, and the **Networking Configuration** screen will appear. This screen displays the network parameters of the global setting and available network connection. You may change any of these items and press ***Apply*** to confirm your settings. See a description of each item in the following table:



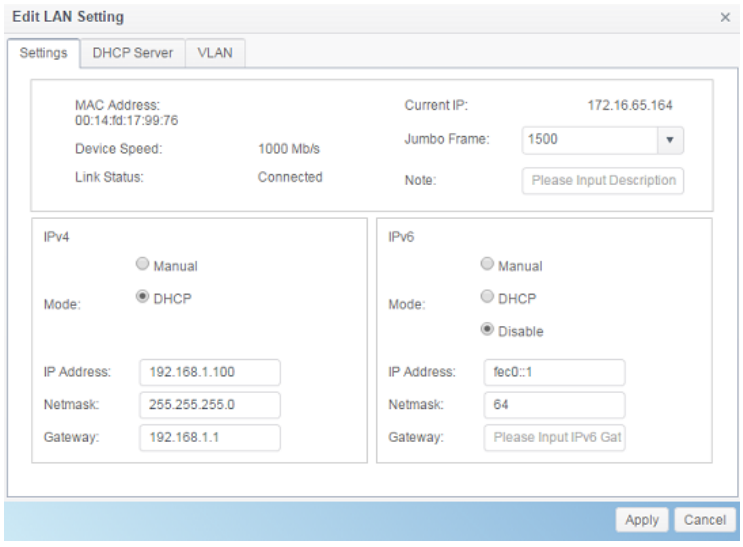
Network Setting

WAN/LAN Setting:

The available system network ports are coming from embedded system ports. Therefore, the screen shown above is an example of a Thecus N5810 with 2 on board GbE NIC.

To modify port setting, please click on **Edit** with the associated network port. The setting screen will appear, it can be configured for basic setting, DHCP server and VLAN.

Basic Setting:



Basic Setting	
MAC address	MAC address of the network interface.
IP	IP address of associate NIC interface.
Device speed	Display associated NIC port link speed.
Link status	Display associated NIC port link status.
Jumbo Frame	Input Jumbo Frame rate from drop down list, default is 1500
Note	Input the description of associated network port if any
IPv4/IPv6	Setting IP address from manual input or DHCP server .
Mode	It can choose a static IP by manually input or Dynamic IP from DHCP server.
IP address	Input IP address if manually input has selected or displayed by granted from DHCP server
Netmask	Input netmask if manually input has selected or displayed by granted from DHCP server
Gateway	Input gateway if manually input has selected or displayed by granted from DHCP server

NOTE

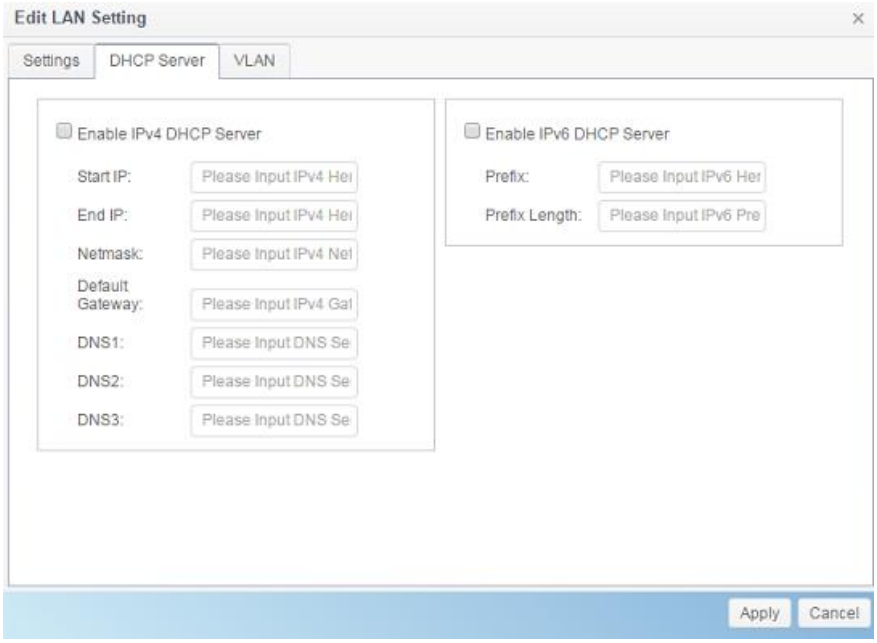
- Only use Jumbo Frame settings when operating in a Gigabit environment where all other clients have Jumbo Frame Setting enabled.
- Proper DNS setting is vital to networks services, such as SMTP and NTP.

WARNING

Most faster Ethernet (10/100) Switches/Routers do not support Jumbo Frame and will not be able to connect to your Thecus NAS after Jumbo Frame is turned on.

DHCP Server:

The network port of Thecus IP storage can be acted as DHCP server if associated NIC has been set-up to a static IP. Please fill in the fields to complete setting.

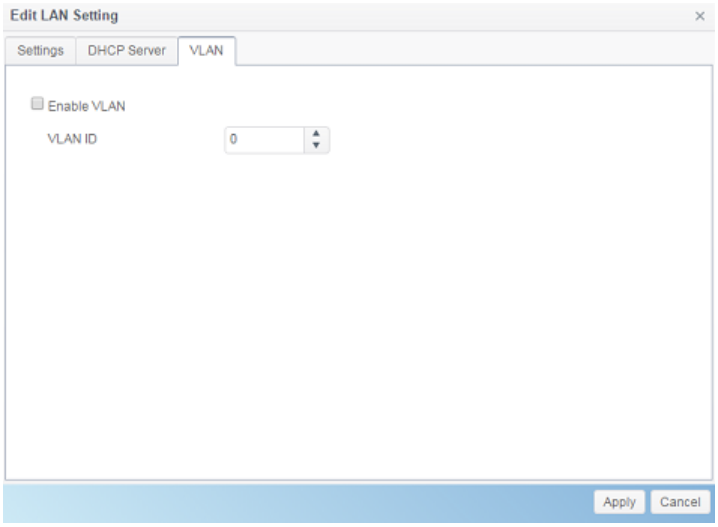


DHCP Configuration	
Item	**Description**
Enable IPv4/IPv6 DHCP Server	Enable or disable the IPv4/IPv6 DHCP Server to automatically assign IP address to PCs connected to associate NIC interface.
Start IP (IPv4)	Specifies the lower IP address of the DHCP range.
End IP in (IPv4)	Specifies the highest IP address of the DHCP range.

Netmask(IPv4)	Specifies netmask for the DHCP server service.
Default Gateway (IPv4)	Specifies gateway for the DHCP server service.
DNS Server 1,2,3 (IPv4)	Displayed the DNS server IP address.
Prefix (IPv6)	Specifies prefix
Prefix Length (IPv6)	Specifies prefix length

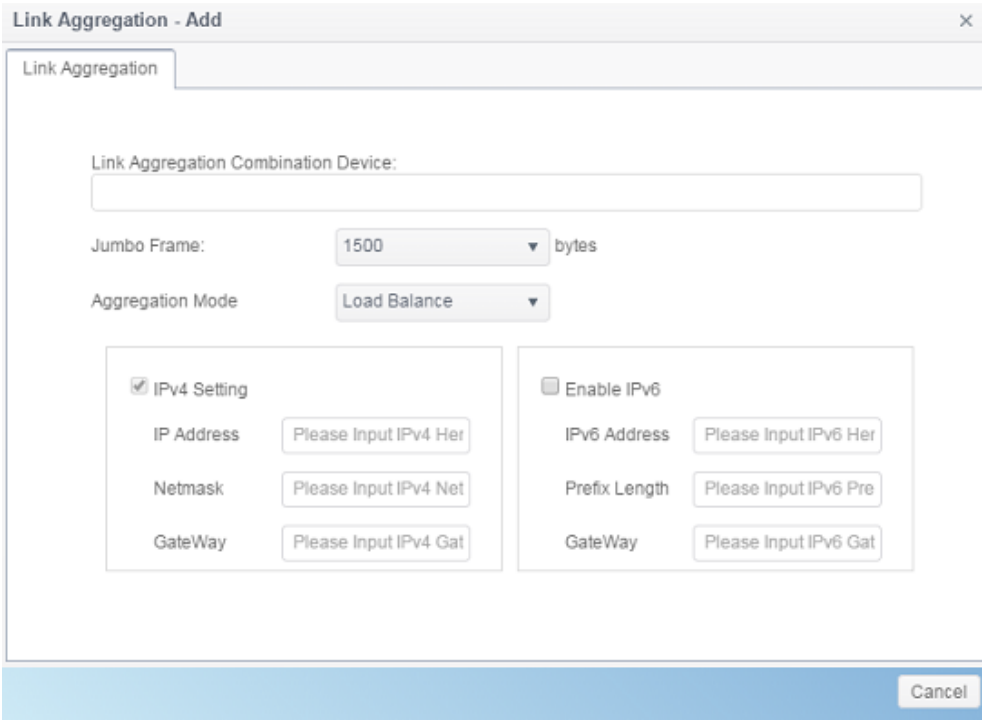
WARNING The IP address of associated NIC should not be in the range of the Start IP address and End IP address (IPv4).

VLAN:
Each NIC is capable of VLAN support. To enable VLAN, simply click the check box and input the VLAN ID (VLAN ID can be any digital number). The system with the same VLAN ID will become a Virtual LAN group to allow more specific communication among members.

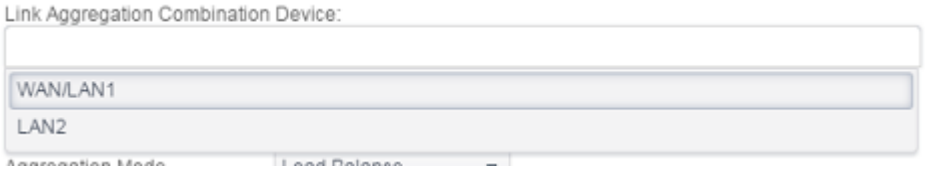


Link Aggregation (N2350/N4350 not supported)

The Thecus IP storage supports link aggregation from on board network port. Simply click on **Add** from Link Aggregation page and the screen will appear as below.

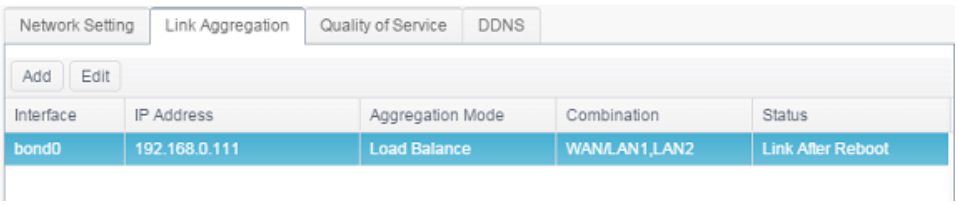


Click on field of "Link Aggregation Combination Device" to select member for Link Aggregation. Also fill in all other required information to complete the setting.

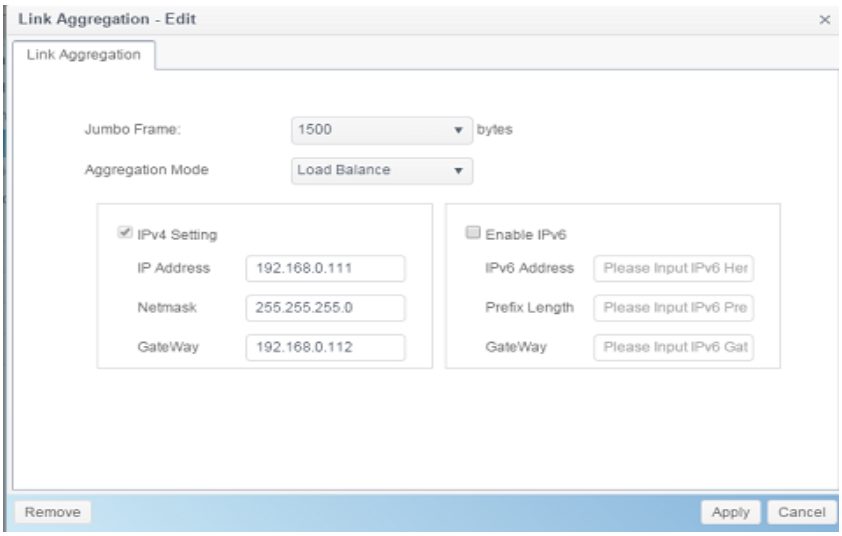


Link Aggregation Configuration	
Jumbo Frame Support	Enable or disable Jumbo Frame Support of the associated interface on your Thecus IP storage.
Aggregation Mode	Select from drop down list for desired mode.
IPv4/IPv6	Click to enable IPv4/IPv6 for TCP/IP. The default is IPv4 enabled.
Mode	It has to be a static IP with the link aggregation being used.
IP	IP address of link aggregation.
Netmask/Prefix Length	Input netmask for IPv4 and Prefix length for IPv6.
Gateway	Gateway for associated link aggregation

Click **Apply** to confirm the setting. The newly created Link Aggregation will appear on associated device list

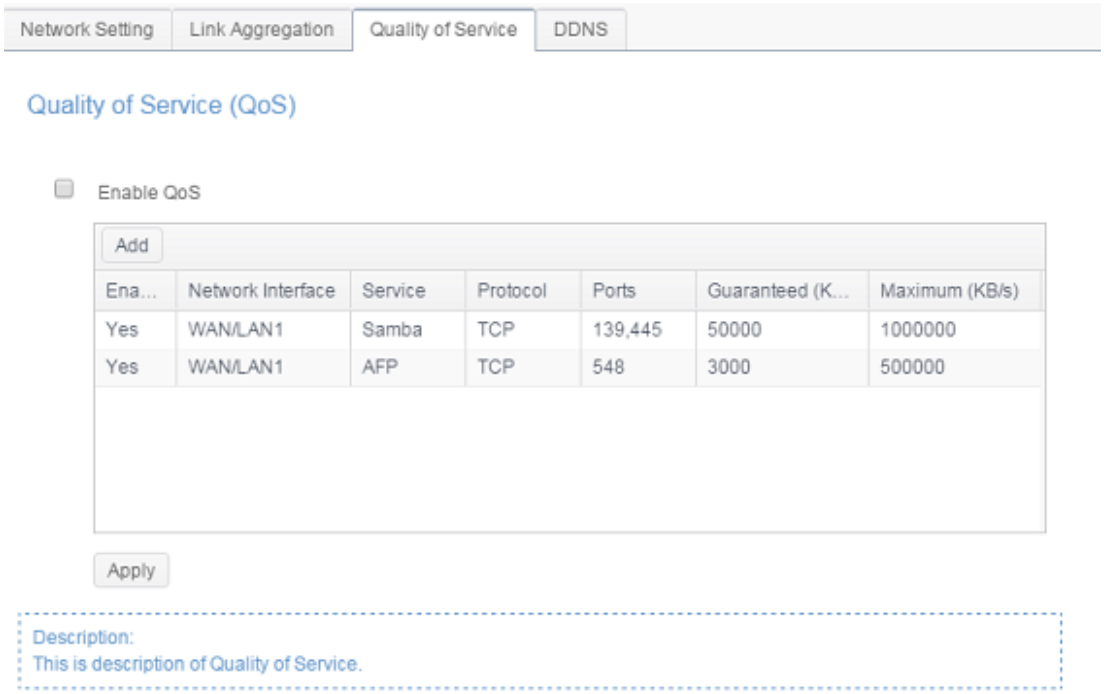


To modify or delete Link Aggregation device, select desired device from device list then click “Edit”. The associated screen will appear as below. Carry on for necessary modification to modify or click on **Remove** button from left hand bottom corner to remove from device list.



Quality of Service

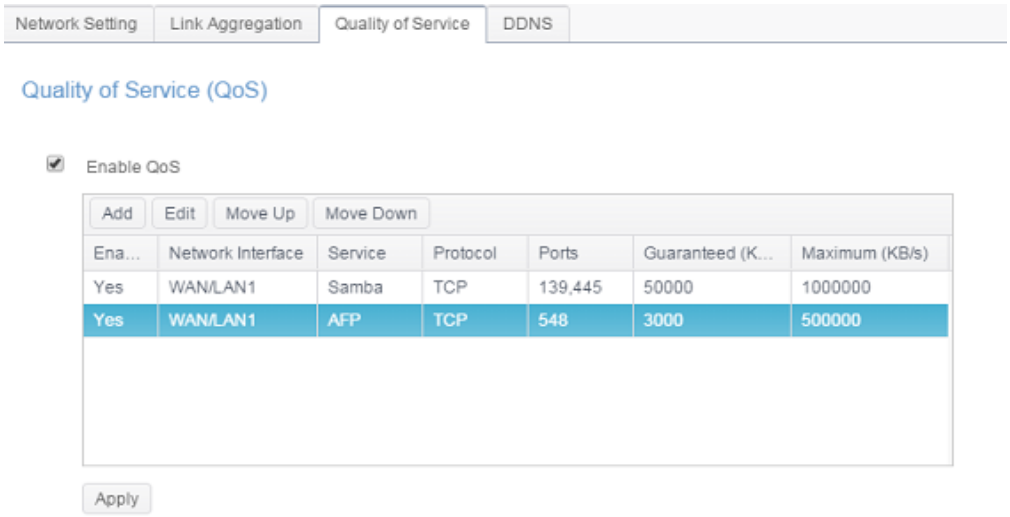
Thecus IP storage is capable for QoS (Quality of Service) by supported services. The bandwidth will give by the order from QoS list once the overall bandwidth required is larger than the physical number.



To setup QoS, simply Enable QoS and then click ‘Add” on QoS screen. The screen will appear as below.

Quality of Service Configuration	
Enable the Rule	Checked the box to enable defined rule.
Network Interface	Select network interface from drop down list.
Service List	Select desired service to have QoS served
User Defined	Other than pre-defined service list, user defined service is allowed.
Service Name	Input user defined service name
Protocol and Ports	Input user defined protocol from drop down list and associated ports will be used
Protocol	List associated protocol of selected service.
Ports	List associated port number of selected service.
Guaranteed (KB/s)	Input MUST of throughput for associated service.
Maximum (KB/s)	Input maximum of throughput for associated service

To modify, delete or change priority of created QoS service, select desired service from service list then click required activities. Carry on for necessary modification to modify by click "Edit" or click on "Move Up" or "Move Down" to change priority. The Delete the rule button can be found on left hand bottom corner after go into "Edit" screen.



DDNS

DDNS Support:

To set up a server on the Internet and enable the users to connect to it easily, a fixed and easy-to remember host name is often required. However, if the ISP provides only dynamic IP address, the IP address of the server will change from time to time and is difficult to recall. You can enable the DDNS service to solve the problem.

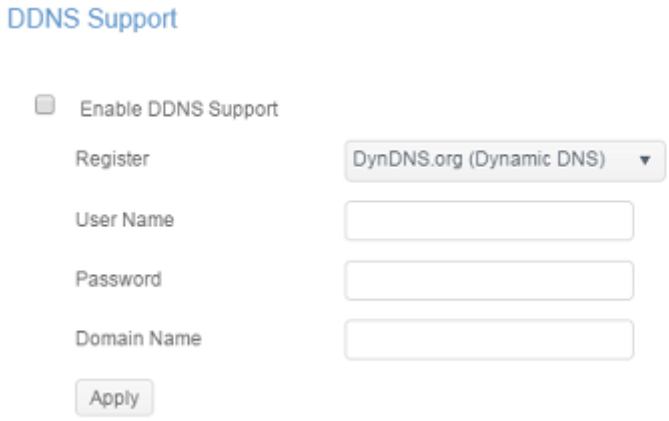
After enabling the DDNS service of the NAS, whenever the NAS restarts or the IP address is changed, the NAS will notify the DDNS provider immediately to record the new IP address. When the user tries to connect to the NAS by the host name, the DDNS will transfer the recorded IP address to the user.

The NAS supports the DDNS providers:

DyDNS.org(Dynamic DNS),DyDNS.org(Custom DNS),DyDNS.org(Static DNS), www.zoneedit.com,www.no-ip.com.

A description for each item as following:

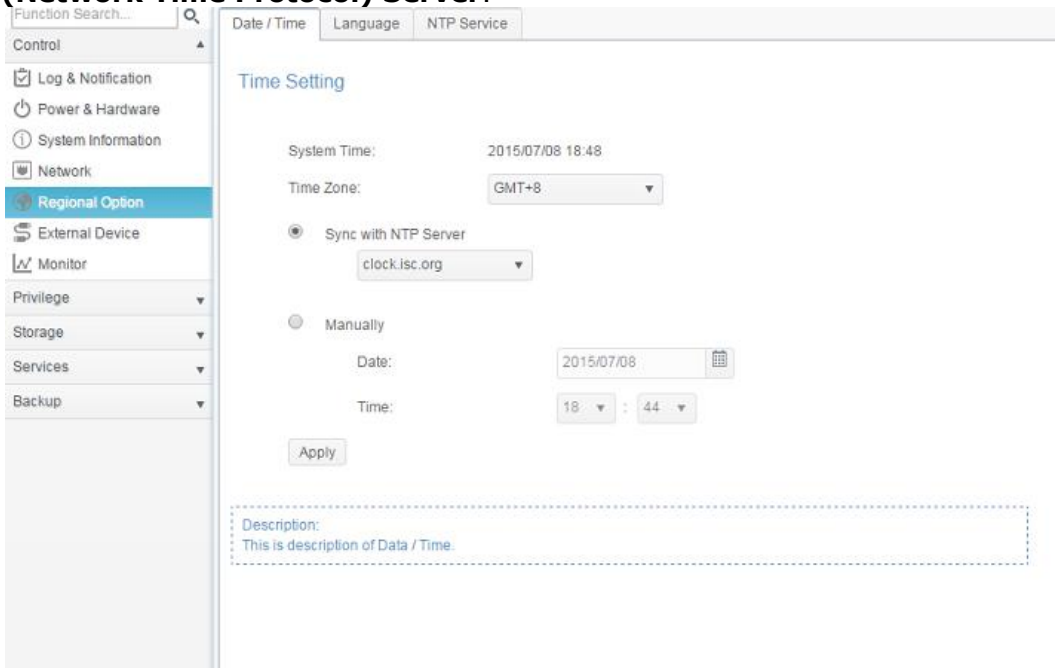
DDNS	
Item	**Description**
DDNS Service	Enable or disable DDNS service.
Register	Choose the service provider from the drop down list
User name	Input user name with DDNS registry.
Password	Input password with DDNS registry.
Domain name	Input domain name with DDNS registry.
Apply	Click "Apply" to confirm the changes.



Regional Option

Date/Time

From the **Regional Option** menu, choose the **Date/Time** item and the **Time Settings** screen appears. Set the desired **Date**, **Time**, and **Time Zone**. You can also elect to synchronize the system time on Thecus IP storage with an **NTP (Network Time Protocol) Server**.



See the following table for a detailed description of each item:

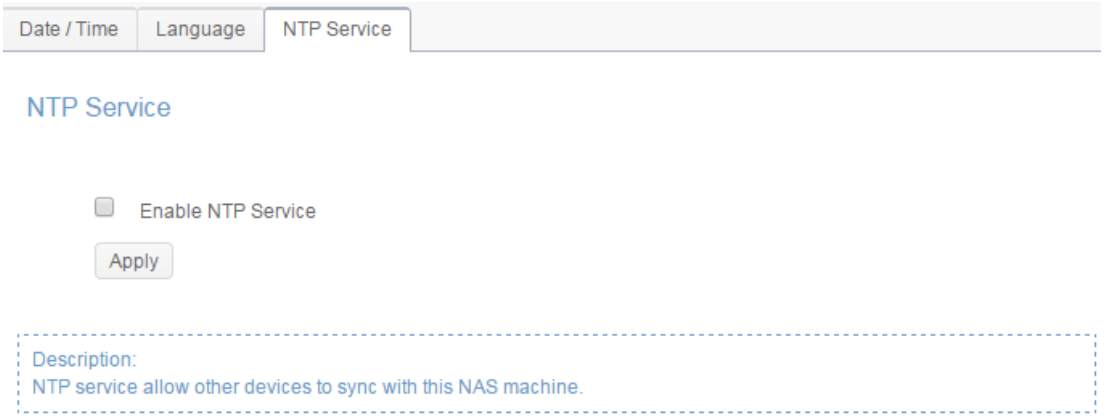
Time	
Item	**Description**
System Time	The current system date and time
Time Zone	Sets the system time zone.

Sync with NTP Server	Select NTP server from drop down list to sync up system time
Date	Sets the system date manually.
Time	Sets the system time manually.
Apply	Click Apply to save changes.

WARNING If an NTP server is selected, please make sure your Thecus IP storage has been setup to access the NTP server.

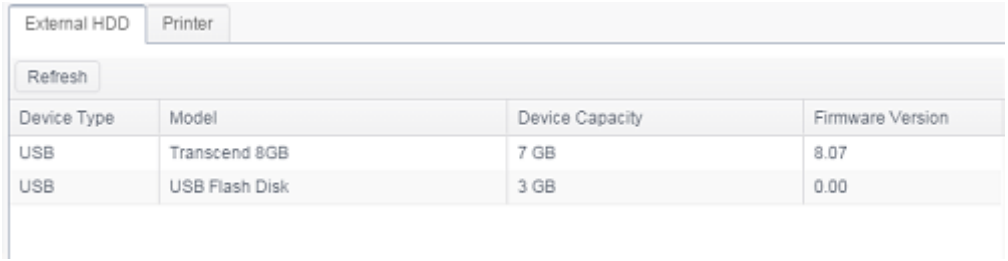
NTP Service

The Thecus IP storage can also provide NTP service. You can also elect to synchronize the system time on Thecus IP storage with an **NTP (Network Time Protocol) Server**. To do this, simply click on NTP service button to enable it.



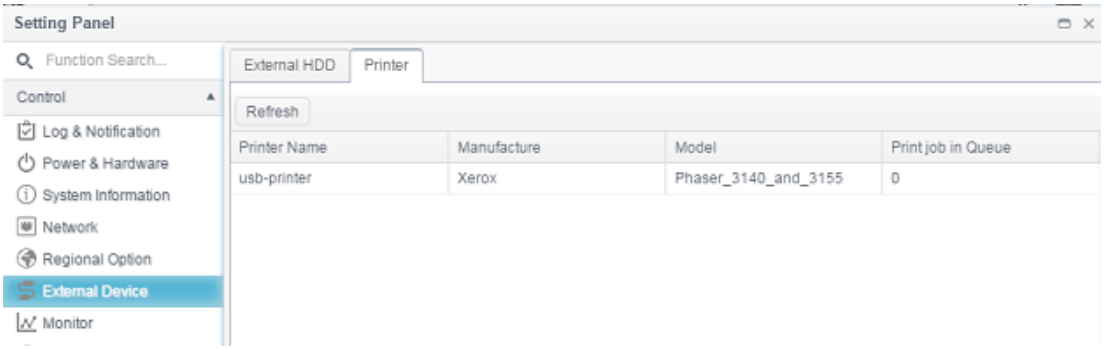
External HDD

From the **External Devices** menu, choose the ***External HDD***, and the **External HDD** screen will appear. This screen provides the information about the external HDDs have connected to this system.



Printer

From the **External Devices** menu, choose the ***Printer*** item, and the **Printer Information** screen will appear. This screen provides the following information about the USB printer connected to the USB port.



Printer Information	
Item	**Description**
Printer Name	The default is usb-printer. It can be changed by select printer then click on **Edit** to modify it.
Manufacturer	Displays the name of the USB printer manufacturer.
Model	Displays the model of the USB printer.
Printer job in Queue	Displays the print job in queue of the USB printer.

You can configure Thecus IP storage to act as a printer server. That way, all PCs connected to the network can utilize the same printer.

NOTE

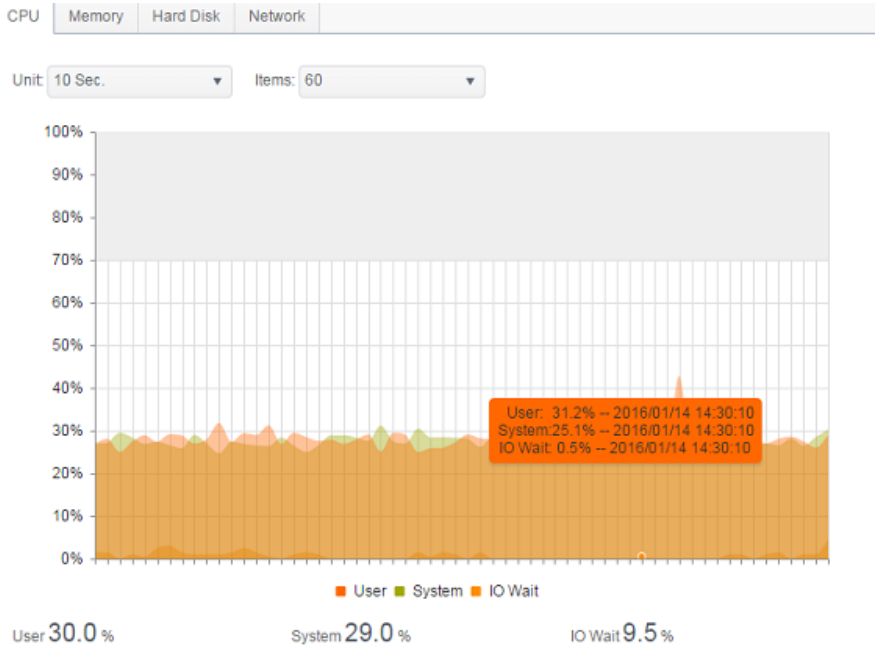
- For example to setup attached USB printer on your Windows 7 environment. Please use http://<NAS IP address>:631/printers/printer name The default printer name is usb-printer or use the one has been

Monitor

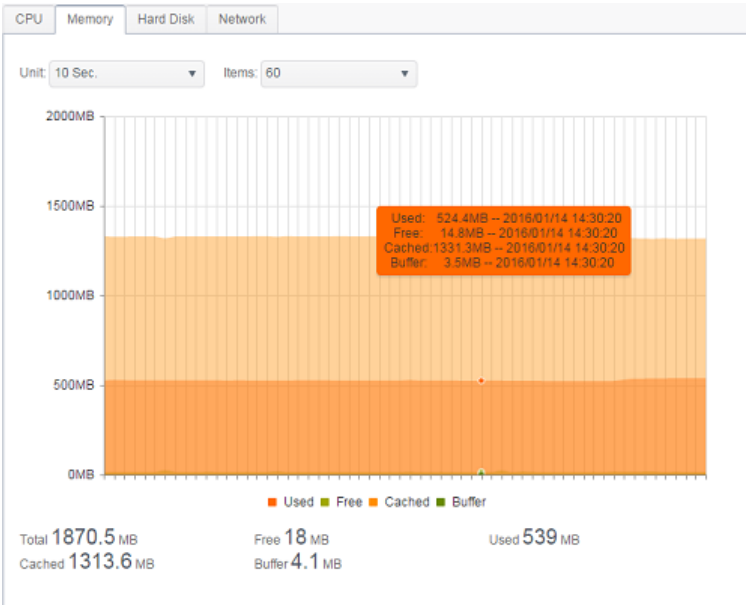
The system monitor is capable to monitor system status including CPU, memory, hard disk and network.

To monitor system status, simply click on tab of associated item and the screen will appear accordingly.

CPU

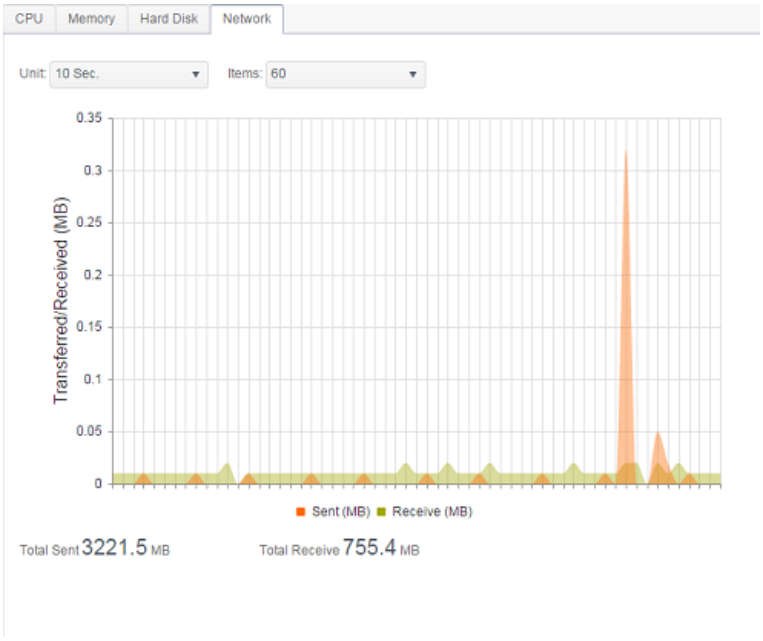


Memory



Hard Disk

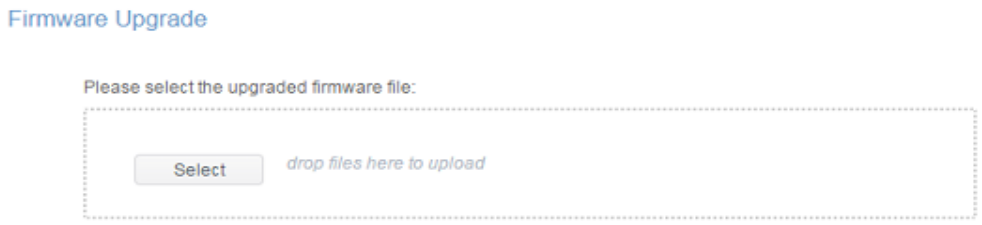
Network



Firmware Setting

Firmware Setting

From the menu, choose the ***Firmware Setting*** item and the **Firmware Setting** screen appears.



Follow the steps below to upgrade your firmware:

1. Click the ***Select*** button to find the firmware file.
2. System will check correctness of selected file and carry on for upgrade process .
3. The buzzer will beep and the Busy LED will blink until the upgrade is complete.

NOTE

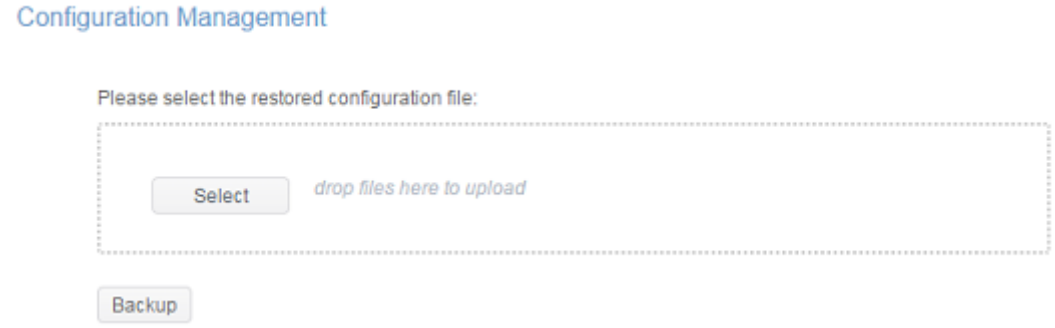
- Check Thecus website for the latest firmware release and release notes.
- Downgrading firmware is not permitted.

WARNING

Do not turns off the system during the firmware upgrade process.
This will lead to a catastrophic result that may render the system inoperable.

Configuration Management

The **System Configuration Management** is to let you to download or upload stored system configurations.



See the following table for a detailed description of each item.

System Configuration Management	
Item	**Description**
Backup	Save and export the current system configuration.
Select	Import a saved configuration file to overwrite the current system configuration.

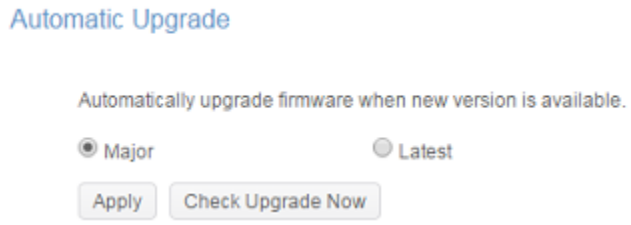
NOTE

Backing up your system configuration is a great way to ensure that you can revert to a working configuration when you are experimenting with new system settings.
The system configuration you have backed up can only be restored in the same firmware version. The backup details exclude user/group accounts.

Automatic Upgrade

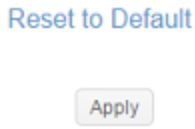
The system is defaulted to enable **Major** upgrade mode for any MUST update. It also provides the option for **Latest** upgrade mode, which has **Major** upgrade included but also most updated fixes and latest functions.

Click on **Check Upgrade Now** can let you find out the latest FW version.



Reset to Default

In any case the system needs to set back to factory default, click on ***Apply*** on **Reset to Default** section to reset Thecus IP storage to factory default settings.



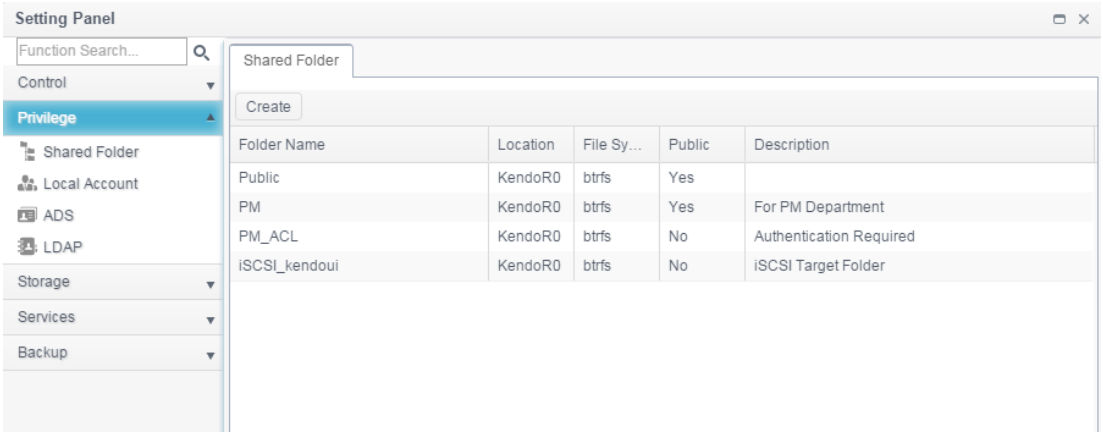
WARNING

Resetting to factory defaults will not erase the data stored in the hard disks, but WILL revert all the settings to the factory default values.

PRIVILEGE

Share Folder

From the **PRIVILEGE** menu, choose ***Share Folder***, and the **Shared Folder** screen will appear. This screen allows you to create and configure folders on the Thecus IP storage volume.

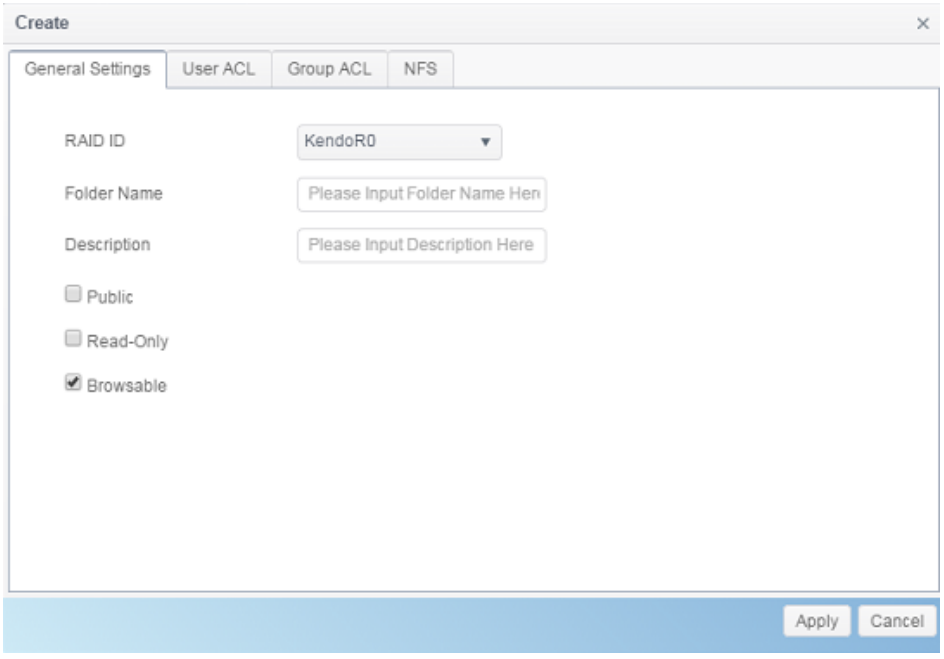


Adding Folders

On the **Shared Folder** screen, click on the ***Create*** button and the **Create Folder** screen appears. There are four sub-items related folder creation setting. Please fill in necessary information then press ***Apply*** to complete folder creation.

General Settings:

Please input required information to complete general setting of folder creation.



Add Folder	
Item	**Description**
RAID ID	RAID volume where the new folder will reside.
Folder Name	Enter the name of the folder.
Description	Provide a description the folder.
Browseable	Enable or disable users from browsing the folder contents. If **Yes** is selected, then the share folder will be browseable.
Public	Admit or deny public access to this folder. If **Yes** is selected, then users do not need to have access permission to write to this folder. When accessing a public folder via FTP, the behavior is similar to anonymous FTP. Anonymous users can upload/download a file to the folder, but they cannot delete a file from the folder.
Read Only	Define only allowed to read from associate but not write into.

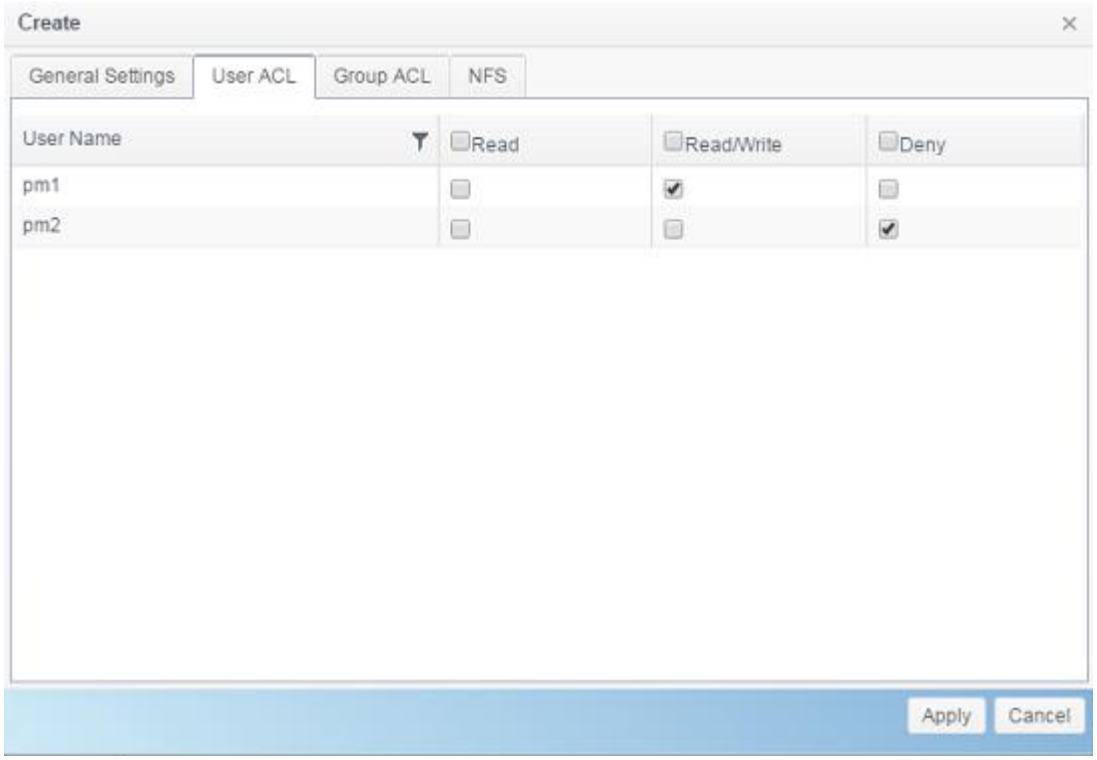
Apply	Press ***Apply*** to create the folder.

NOTE

Folder names are limited to 60 characters. Systems running Windows 98 or earlier may not support file names longer than 15 characters.

User ACL:

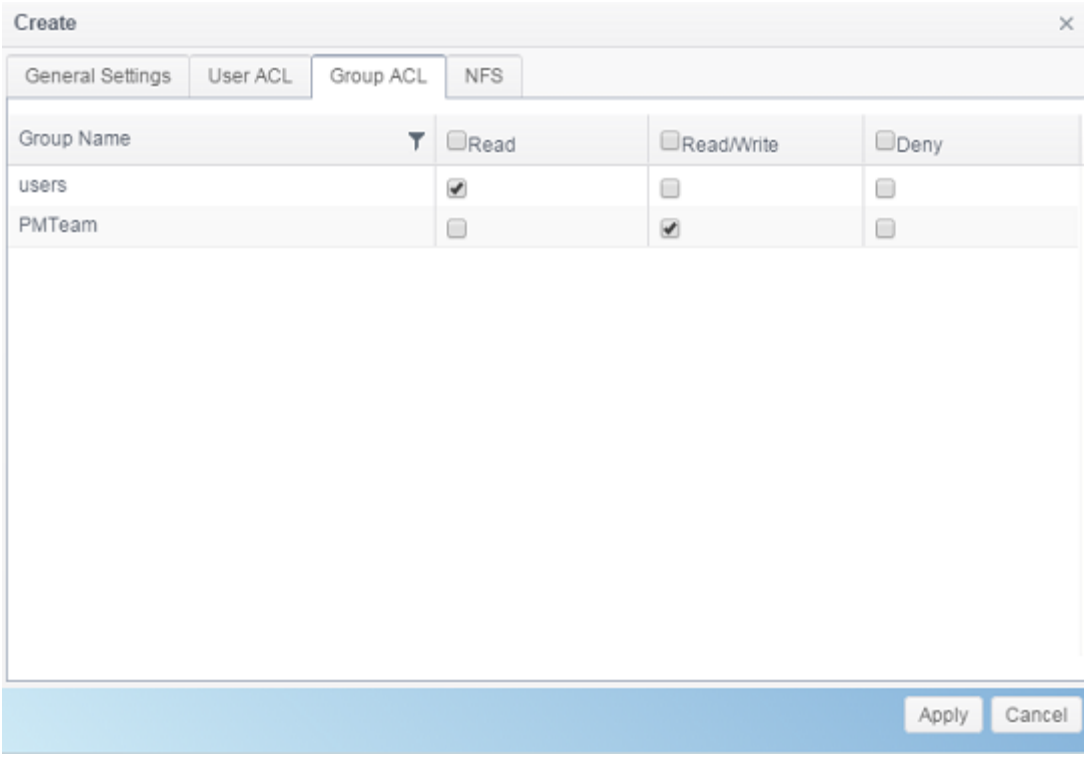
On the Folder Create screen, press the ***User ACL*** button, and the **User ACL setting** screen will appear. This screen allows you to configure access to the specific folder for users. From the left hand column user lists then choose ***Deny***, ***Read Only***, or ***Writable*** to configure their access level. Press the ***Apply*** button to confirm your settings.



User ACL setting	
Item	**Description**
Deny	Denies access to users who are displayed in this column.
Read Only	Provides Read Only access to users who are displayed in this column.
Writable	Provides Write access to users who are displayed in this column.

Group ACL:

On the Folder Create screen, press the ***Group ACL*** button, and the **Group ACL setting** screen appears. This screen allows you to configure access to the specific folder for groups. From the left hand column group lists then choose ***Deny***, ***Read Only***, or ***Writable*** to configure their access level. Press the ***Apply*** button to confirm your settings.



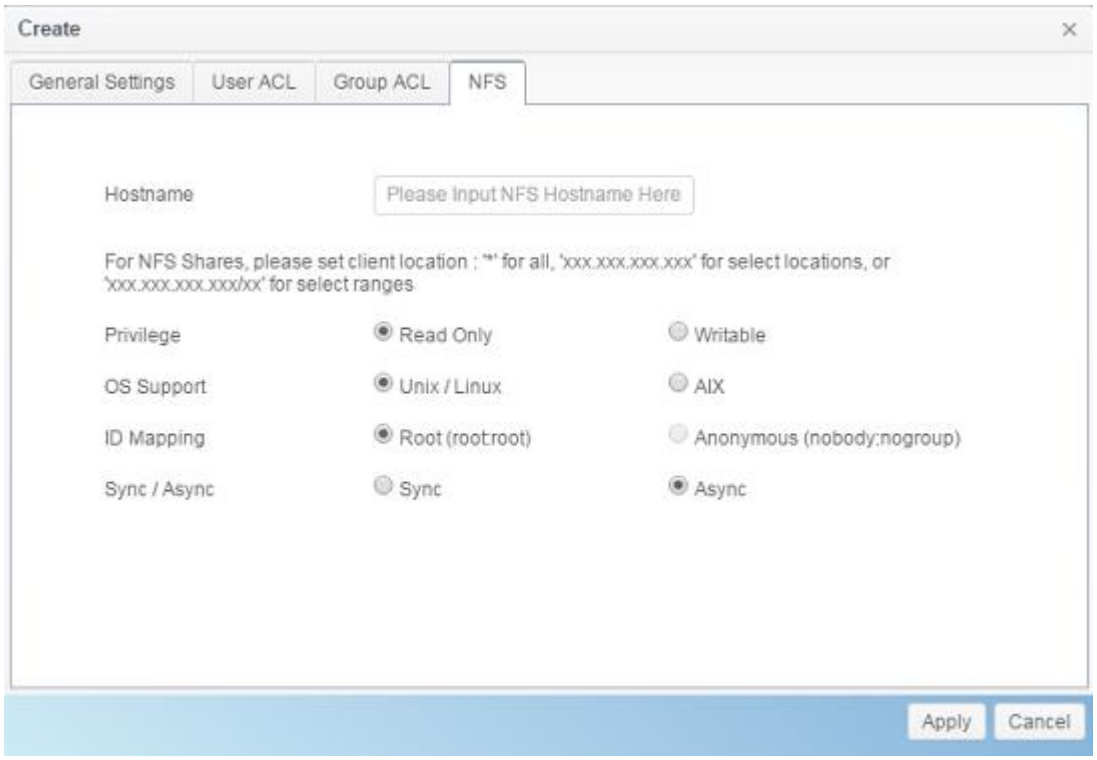
Group ACL setting	
Item	**Description**
Deny	Denies access to groups who are displayed in this column.
Read Only	Provides Read Only access to groups who are displayed in this column.
Writable	Provides Write access to groups who are displayed in this column.

NOTE

If one user has belonged to more than one group with different privilege, then the priority of the privilege will be as followed:
Deny > Read Only > Writable

NFS:

To allow NFS access to the share folder, enable the **NFS Service**, and then set up hosts with access rights as well as related options.



NFS Share	
Item	**Description**
Hostname	Enter the name or IP address of the host
Privilege	Host has either read only or writeable access to the folder.
OS Support	There are two selections available: • Unix / Linux System • AIX (Allow source port > 1024) Choose the one which best fits your needs.
ID Mapping	There are three selections available: • Guest system root account will have full access to this share (root:root). • Guest system root account will be mapped to anonymous user (nobody:nogroup) on NAS. • All user on guest system will be mapped to anonymous user (nobody:nogroup) on NAS. Choose the one which best fits your needs.
Sync / Async	Choose to determine the data "Sync" at once or "Async" in arranged batch.
Apply	Click to save your changes.

Modify/Remove Folders

On the existed **Folder** list, click on desired **Folder** then the associated menu items will appear.

NOTE

The Snapshot item will appear only if:

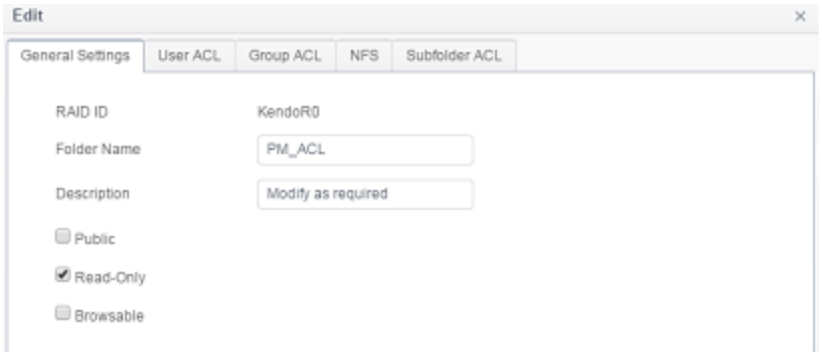
3. The system RAID volume is selected btrfs file system.
4. The folder is user created not system default.

Edit & ACL:

Click on the **Edit & ACL** buttons, there are five sub-items related folder modification that can be choose if the associated folder has ACL defined. Or ACL related tabs won't appear and it is known as public folder.

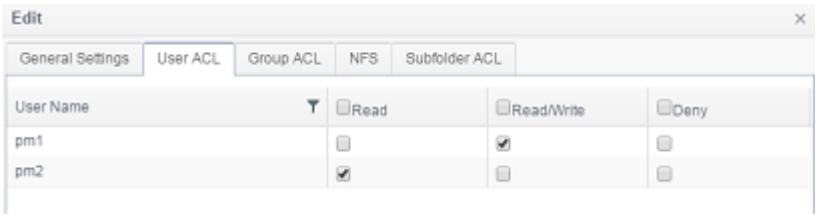
General Settings:

The only item can't be changed is folder belonging with associated RAID volume. With others, make any changes if required.



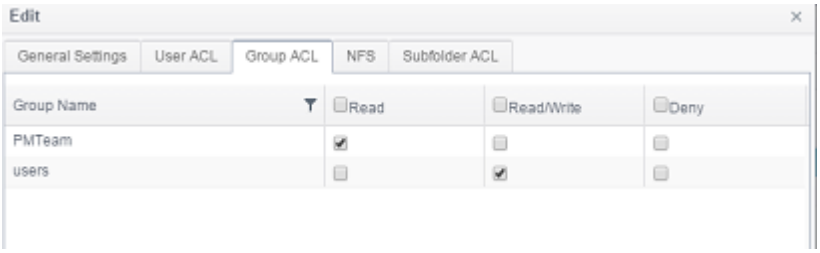
User ACL (ACL folder only):

It is allowed to change access user list of associated folder.



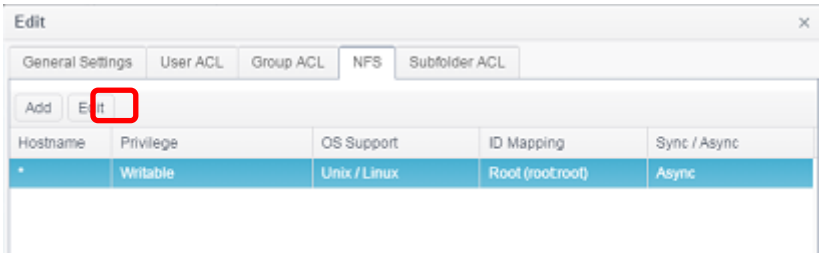
Group ACL (ACL folder only):

It is allowed to change access group list of associated folder.



NFS:

It is allowed to change the existing NFS access setting or create a new one. To modify existing setting, click on from list then press Edit tab,

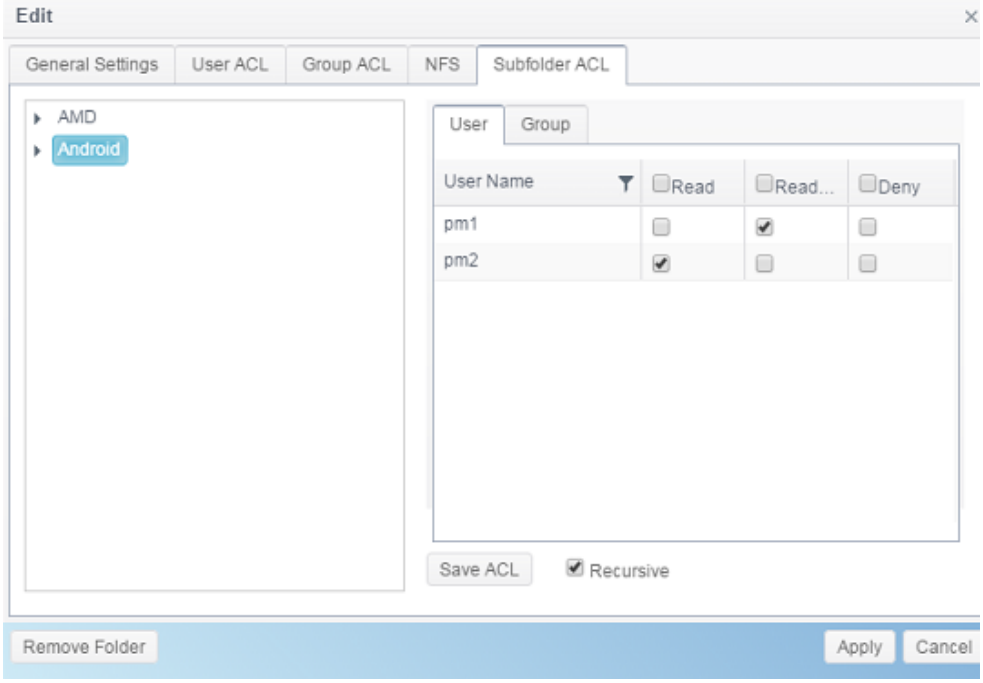


Or click on Add tab to create new access setting.

Subfolder ACL:

Other than folder level access control support, Thecus IP storage is capable for sub-folder ACL. To setup sub-folders ACL, click on **Subfolder ACL** tab and screen shows as below.

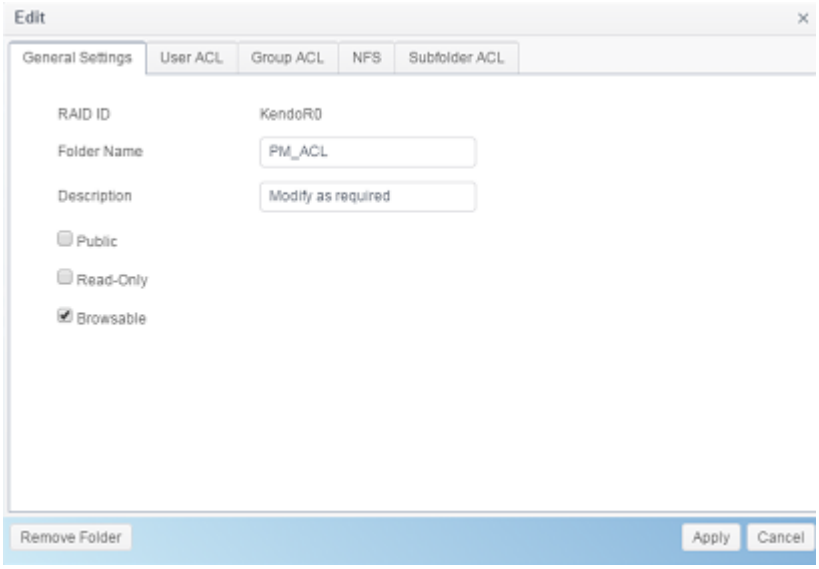
The left hand pane is the subfolders list for the associated parent folder. Click on desired subfolder and the right hand pane will appear and have system's user and group. Make necessary changes for user or group access right of associated subfolder. Please do remember to click on **Save ACL** tab once setting completed.



NOTE The ACL can only be set for share and sub-folders level, not for files.

Remove Folder:

Click on Remove Folder tab and associated folder will be deleted from system.

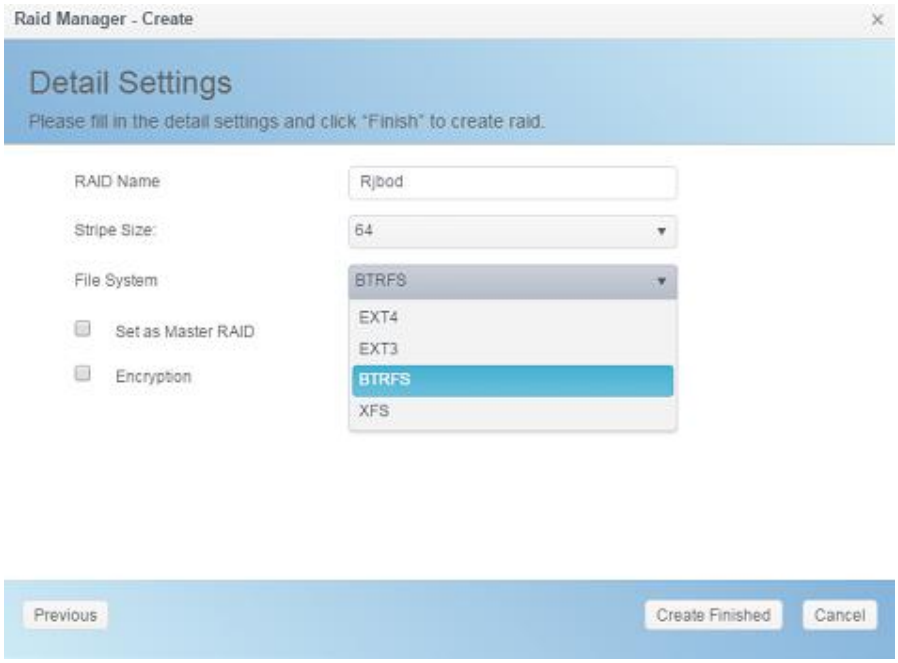


WARNING All the data stored in the folder will be deleted once the folder is deleted. The data will not be recoverable.

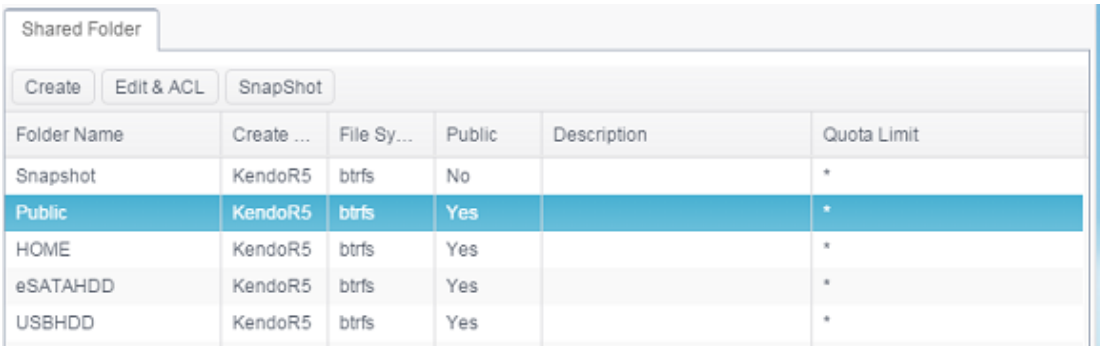
Snapshot (N2350/N4350 not supported)

Snapshot (Btrfs file system only):

SMB and enterprise Thecus IP storage systems are now capable of saving 16 snapshot versions of files and folders. For Snapshot to function, a "BTRFS" file system is required.



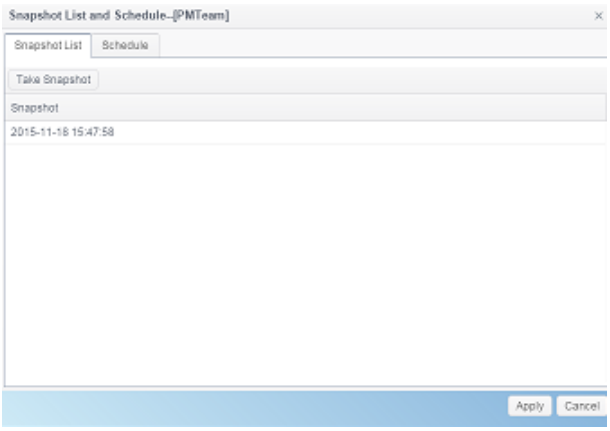
Any folder using a "BTRFS" file system is capable of being included in the Snapshot function. In the "Share Folder" submenu, the Snapshot button is available in the tool bar.



Taking a Snapshot

Click on the **Snapshot** button. The management screen will then appear as below for the associated folder.

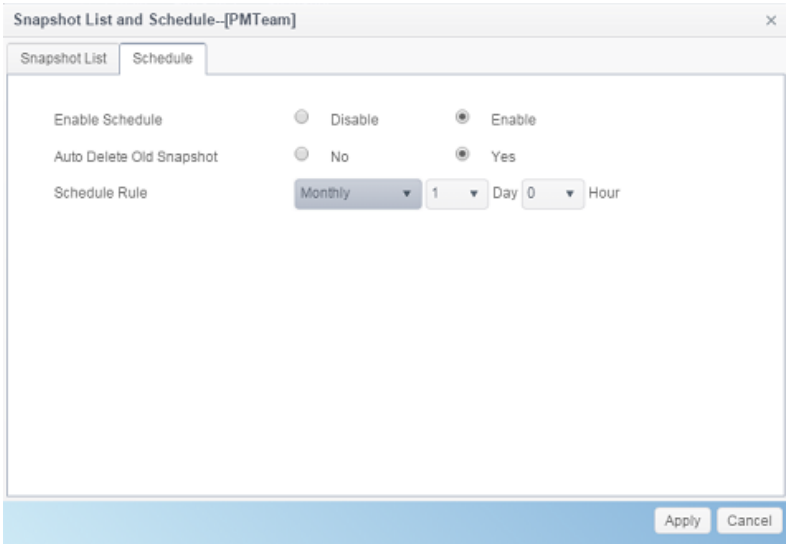
To manually take a Snapshot, simply click **Take Snapshot** and the Snapshot history will be listed. It can store up to 16 versions.



To locate where the Snapshot files or folders are stored, please browse to \\System_IP\snapshot. Please note that you will need to have the relevant folder permissions enabled for your account.

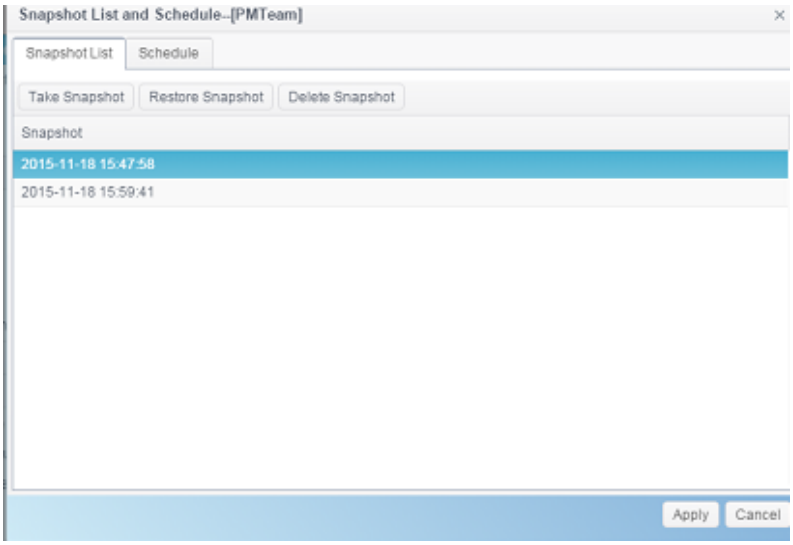
Besides manual Snapshots, this feature also allows for scheduled backups. Click on **Schedule** and the setup screen will appear. Check "Enable Snapshot Schedule" and select the desired Snapshot interval. Options include Daily, Weekly, or Monthly.

Since files and folders are limited to 16 Snapshots versions, the "Auto Delete Old Snapshot" option allows for the removal of the oldest version automatically once the limit is reached.



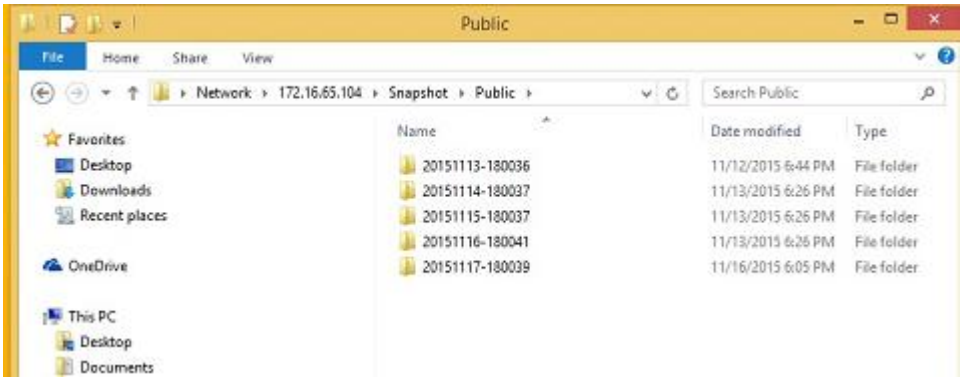
Snapshot Restore

To restore a Snapshot, simply select the desired version from list and click "Restore Snapshot". Once the restore confirmation has been made, the selected Snapshot will overwrite the current associated file or folder.



The other way to restore a recorded Snapshot version is manually by browsing to the "Snapshot" folder via SAMBA (\\System_IP\snapshot). All Snapshot versions are stored here, and you can copy or paste to restore a version manually.

For example, the NAS system at 172.16.65.104 has a folder named "Public" with a Snapshot version backed up. If the user were to browse to \\172.16.65.104\Snapshot, the following details would be visible:

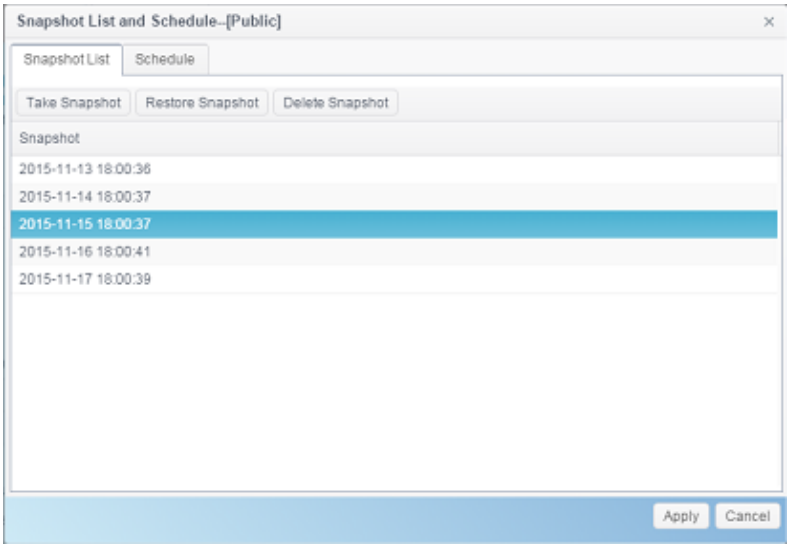


NOTE To access the Snapshot folder, a user requires the relevant authentication rights.

NOTE If the Snapshot folder is used for iSCSI purposes, it can only be restored from the WebUI (i.e. through the Snapshot feature) and cannot be done manually.

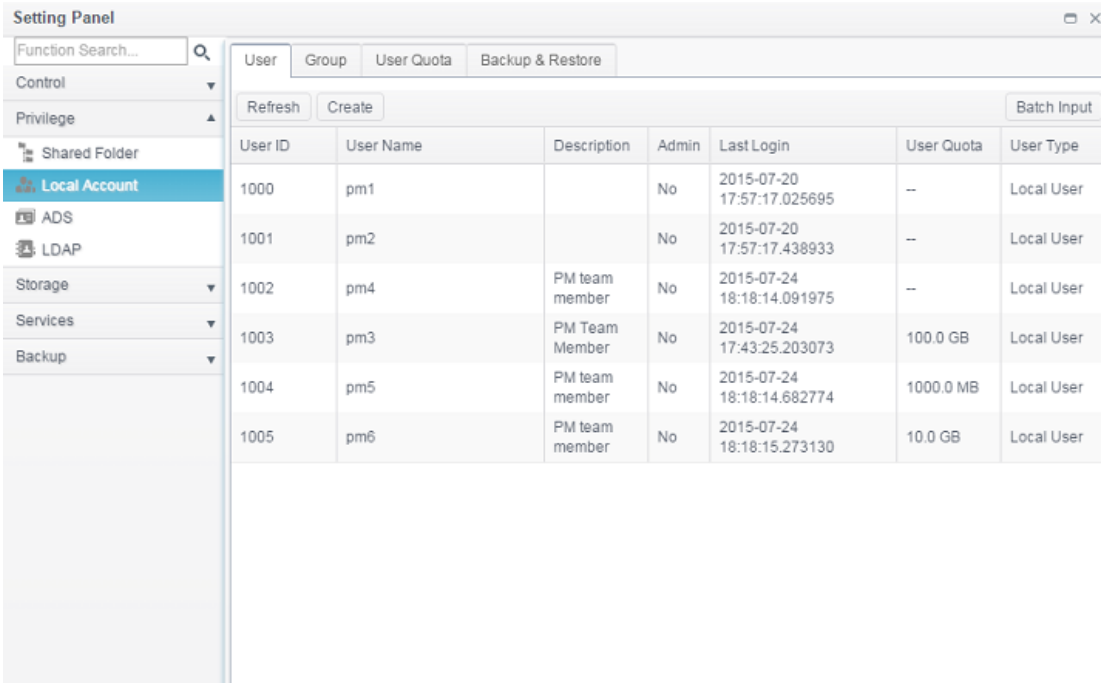
Snapshot Removal

To remove a Snapshot, simply select the desired version from list and click "Delete Snapshot".



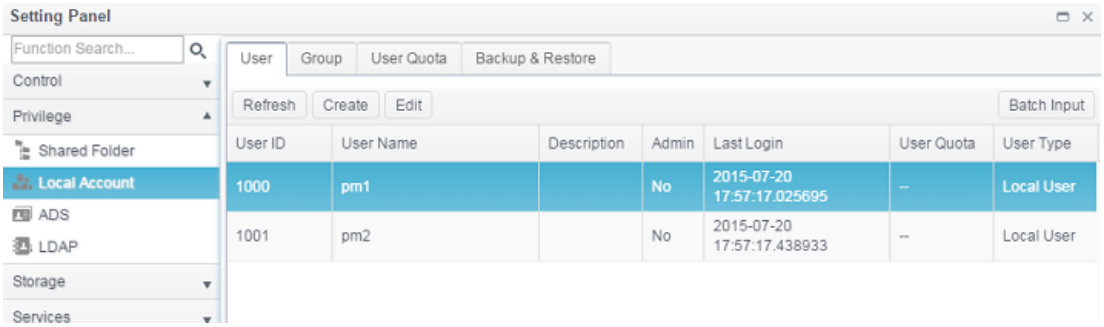
Local Account

The Thecus IP storage has built-in user database that allows administrators to manage user access using different group policies. From the **Privilege** menu of ***Local Account*** , you can create, modify, and delete users, and assign them to groups that you designate.



User

From the **Local Account** menu, choose the **User** item, and the **Local User Configuration** screen appears. This screen allows you to **Add**, **Edit**, **Remove** and **Batch Input** local users.

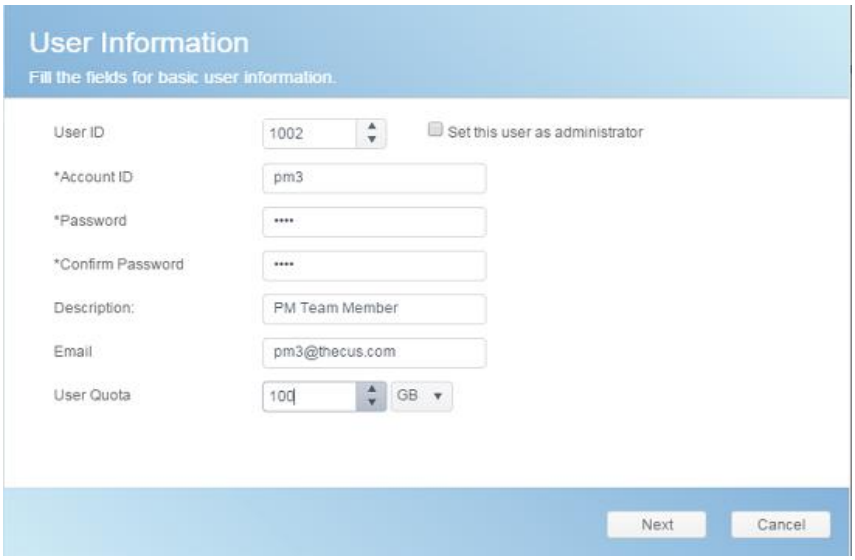


Local User Configuration	
Item	**Description**
Refresh	Press ***Refresh*** to reload user list
Create	Press the ***Create*** button to add a user to the list of local users.
Edit	Press the ***Edit*** button to modify a local user.
Batch Input	Press the ***Batch Input*** button and associated screen appear to allow using batch input of local users.

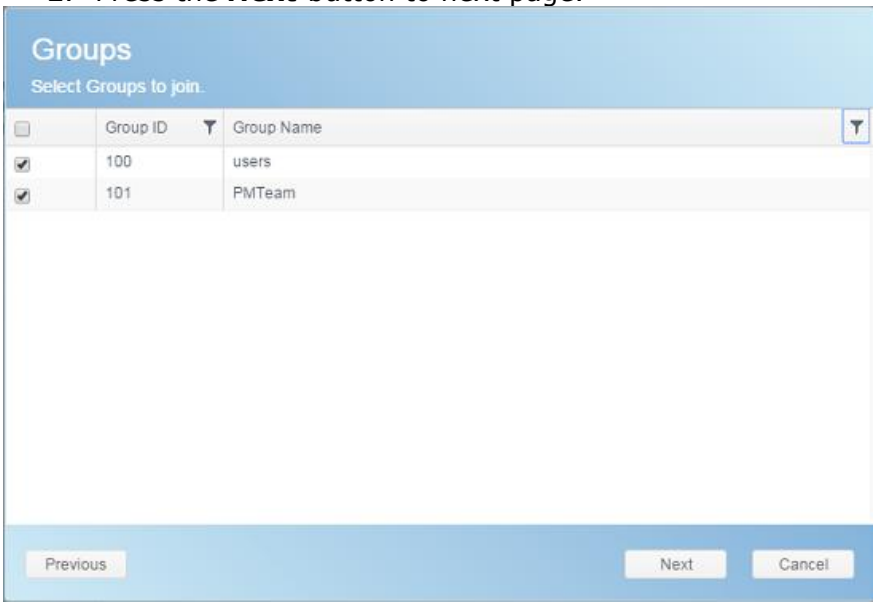
Create User:

On the **User** screen, press the ***Create*** button and the **Create User** screen appears. Follow the wizard and system will lead you to complete the setting.

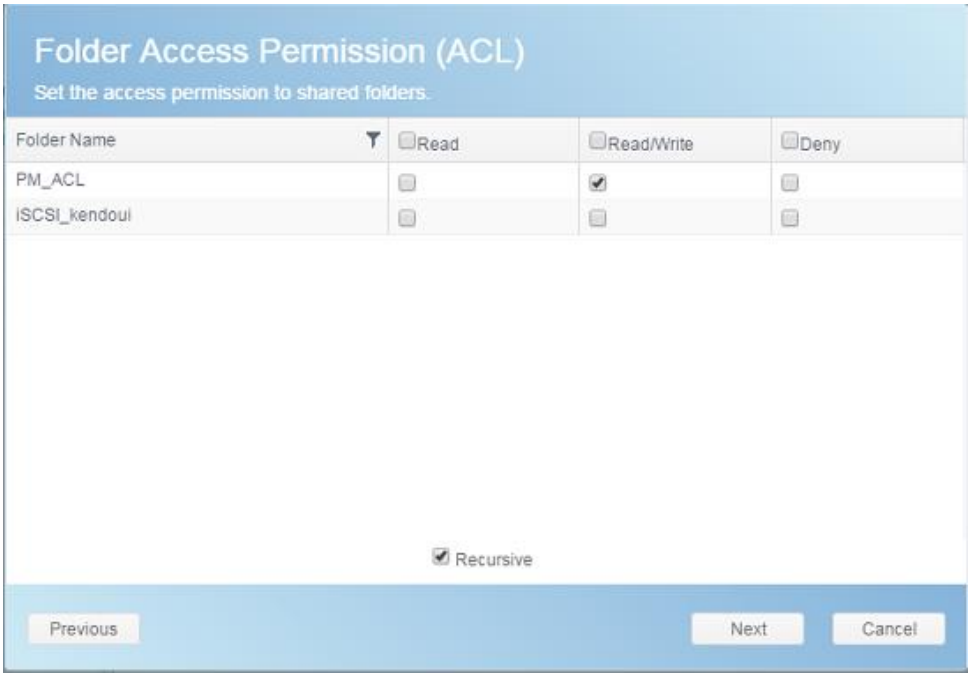
1. Enter a **User ID** number or leave it to use the system default value.
2. Tick on check box if this can be acted as administrator.
3. On the **Account ID** field, enter a name for the **User**.
4. Enter a **User ID** number or leave blank to use the system default value.
5. Enter a password in the **Password** box and re-enter the password in the **Confirm** box.
6. Input the user description
7. Input user's mail address
8. Input user quota or leave it as default for no limitation.
9. Press the ***Next*** button to next page.



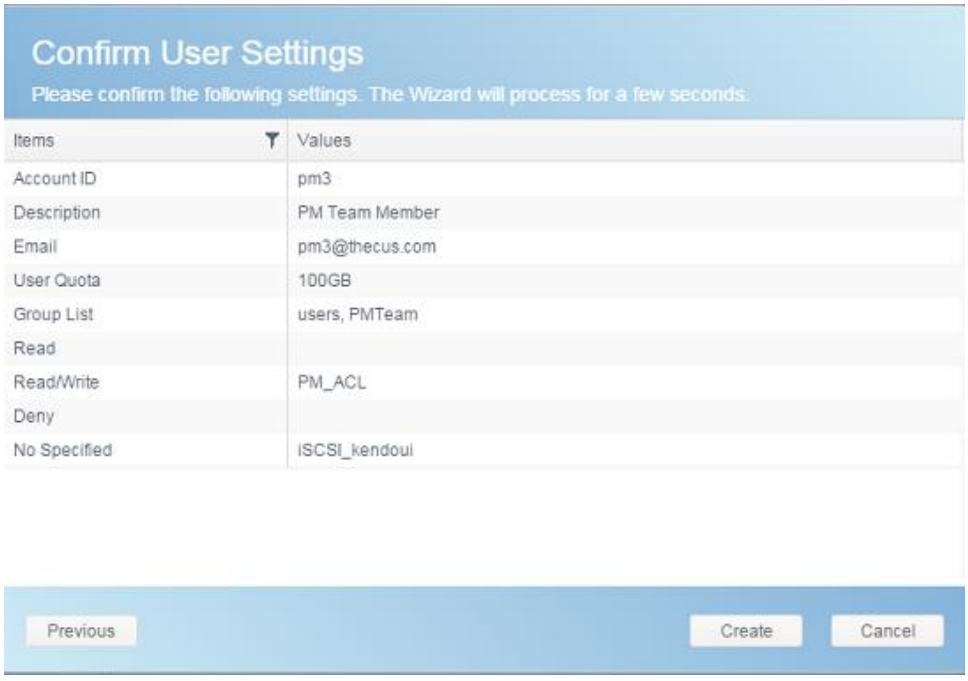
1. Select which group the user will belong to. **Group Members** is a list of groups this user belongs to.
2. Press the ***Next*** button to next page.



1. Set the access right for ACL folders.
2. Checked “Recursive” box if it will apply to all subfolders
3. Press the ***Next*** button go to next page.



1. The page has listed user’s information for double check.
2. Press the ***Create*** button and the user is created.

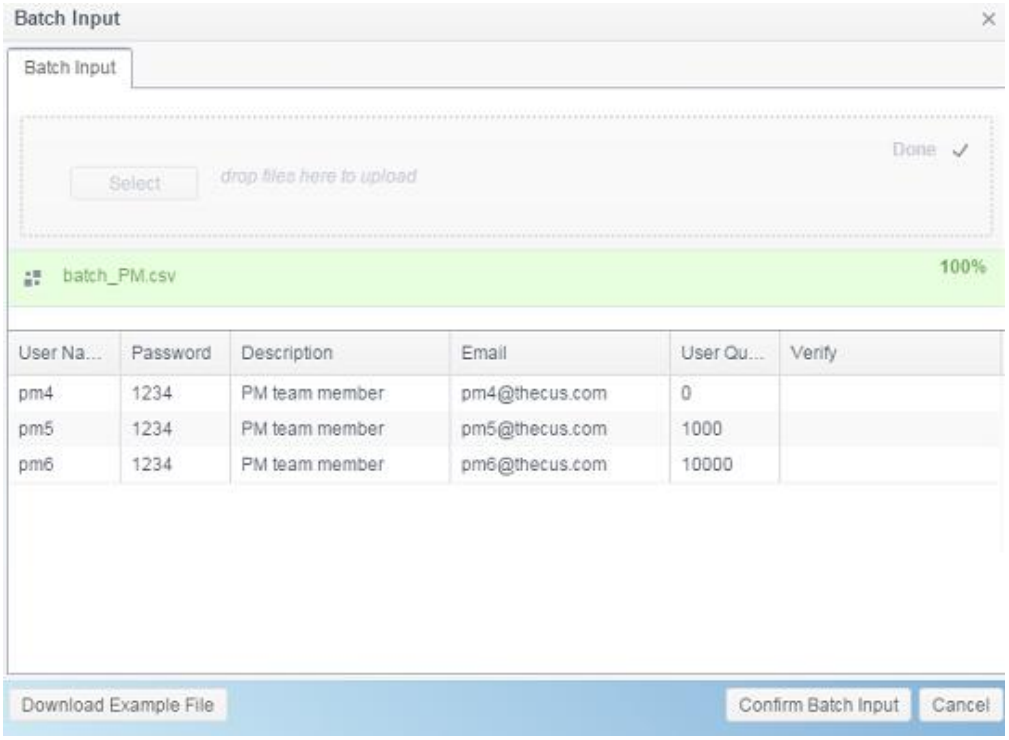


Batch Input:

The Thecus IP storage can also add users and groups in batch mode. This enables you to conveniently add numerous users and groups automatically by importing a simple Microsoft Excel (*.csv) file.

From the **User** menu, click ***Batch Input*** and the **Batch User Input Creation** dialogue will appear. To import your list of users and groups, follow these steps:

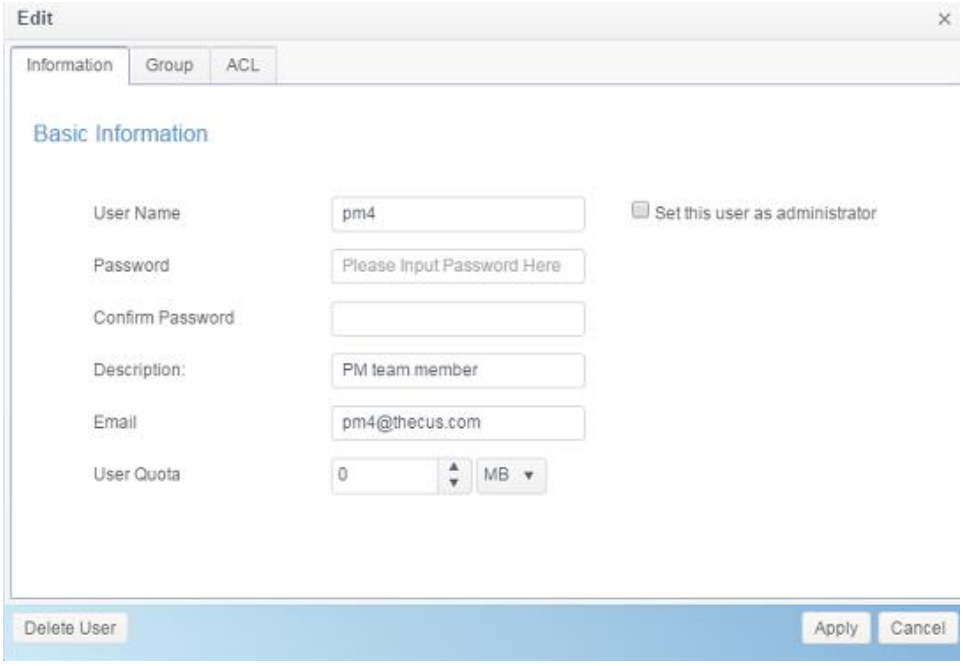
1. Click on the ***Select*** button to locate your Excel (.csv) file.
2. Click ***Confirm Batch Input*** to confirm import.
3. Or on the left bottom corner can download sample file to manipulate.



NOTE All users are automatically assigned to the 'users' group.

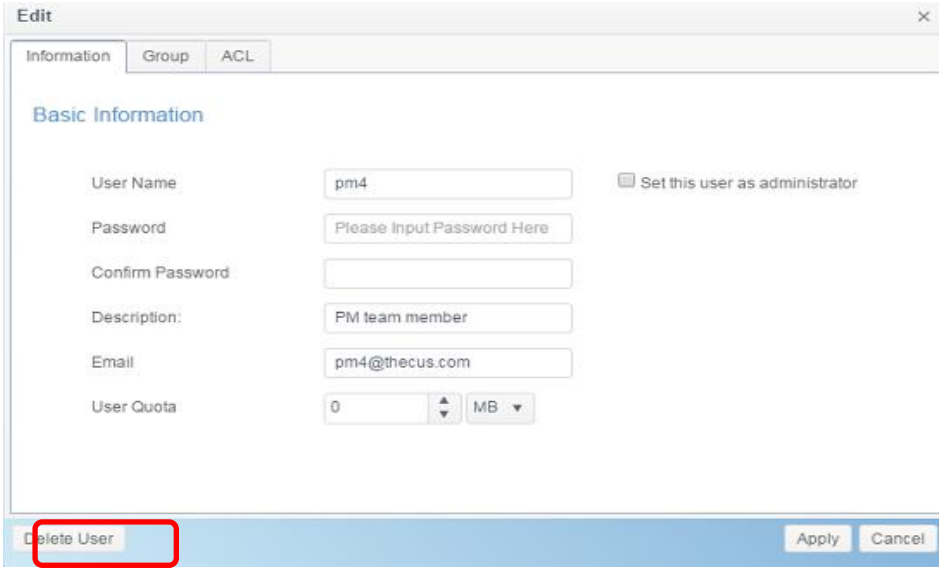
Edit User:

1. Select an existing user from the list.
2. Click on the ***Edit*** button, and the **User Setting** screen appears.
3. Making the changes if need.



Delete User:

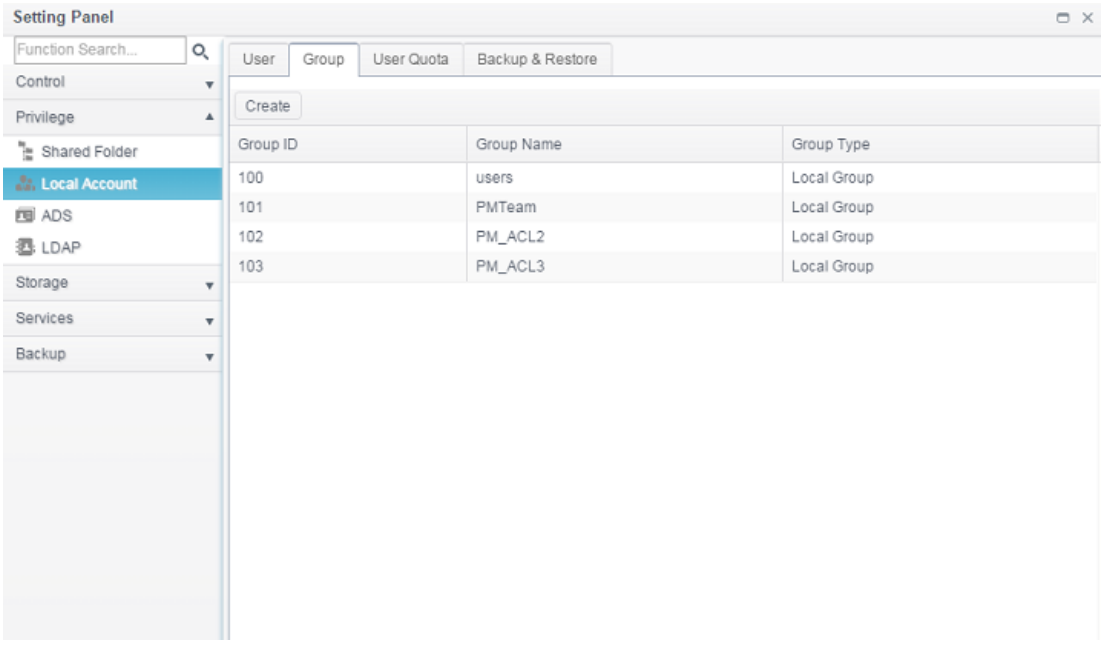
1. Select an existing user from the list.
2. Click on the ***Delete User*** button, and the **User** will remove from system.



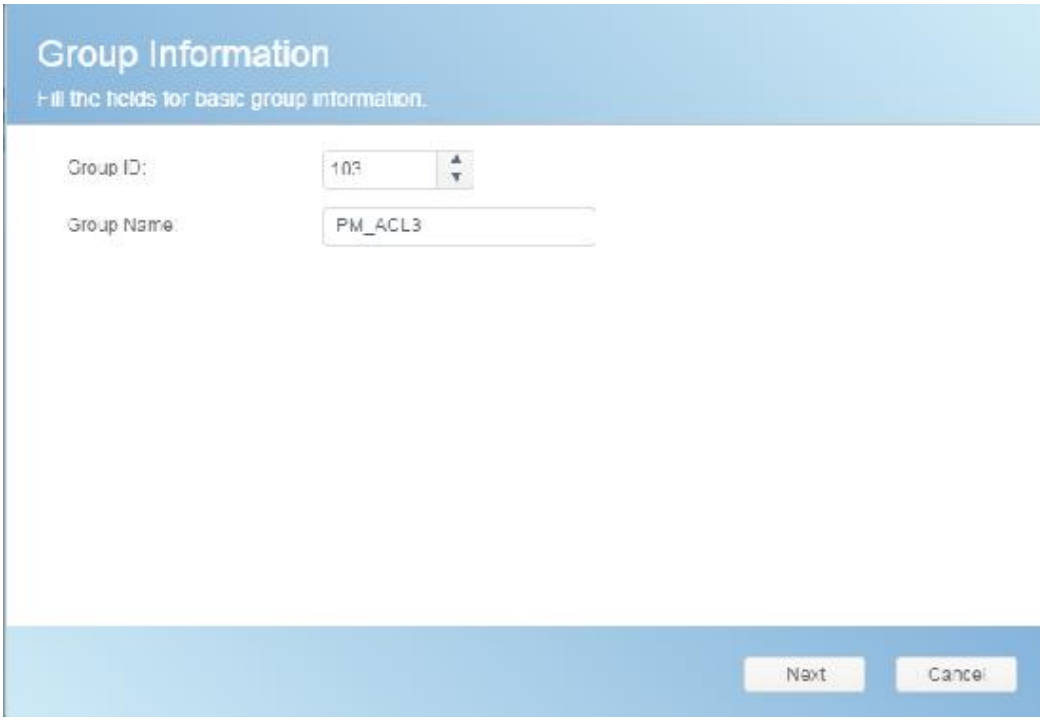
Group

Create Group:

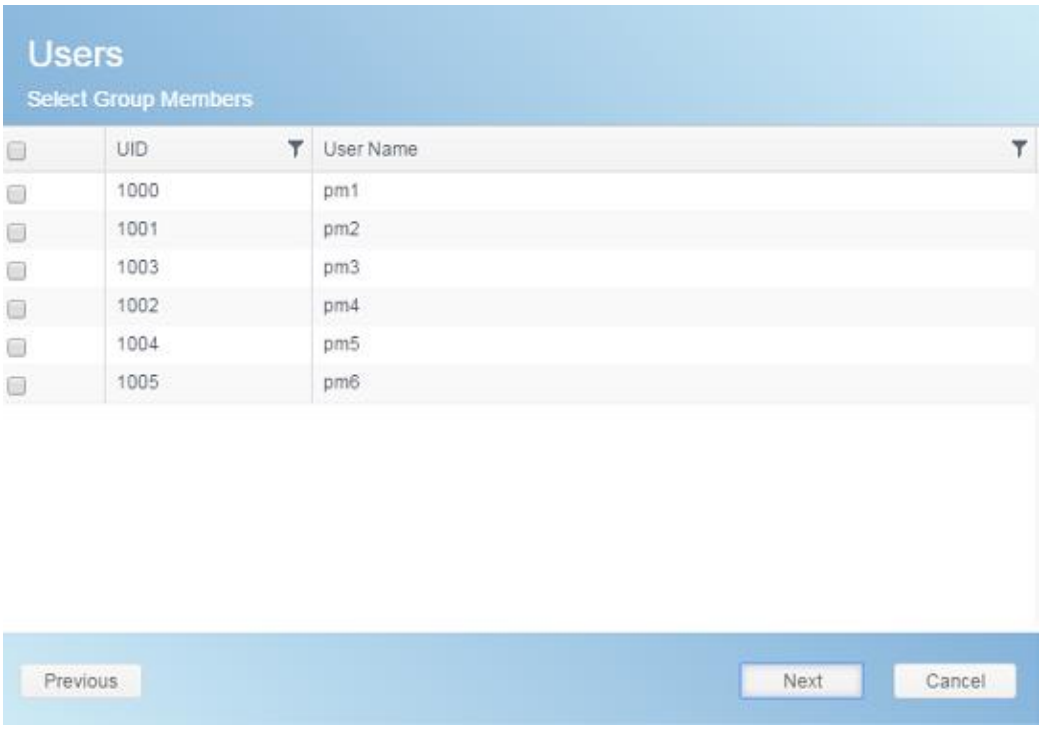
On the **Group** screen, press the ***Create*** button and the **Create Group** screen appears. Follow the wizard and system will lead you to complete the setting.



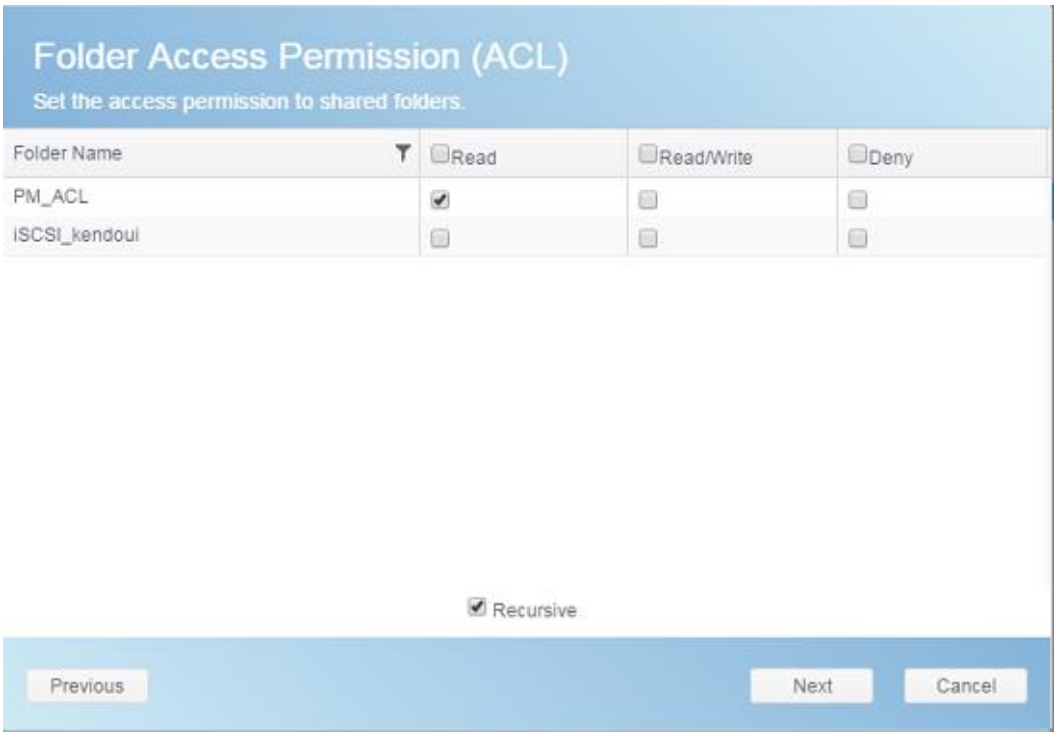
1. Enter a **Group ID** number or leave it to use the system default value.
2. On the **Group Name** field, enter a name for the **Group**.
3. Press the ***Next*** button to next page.



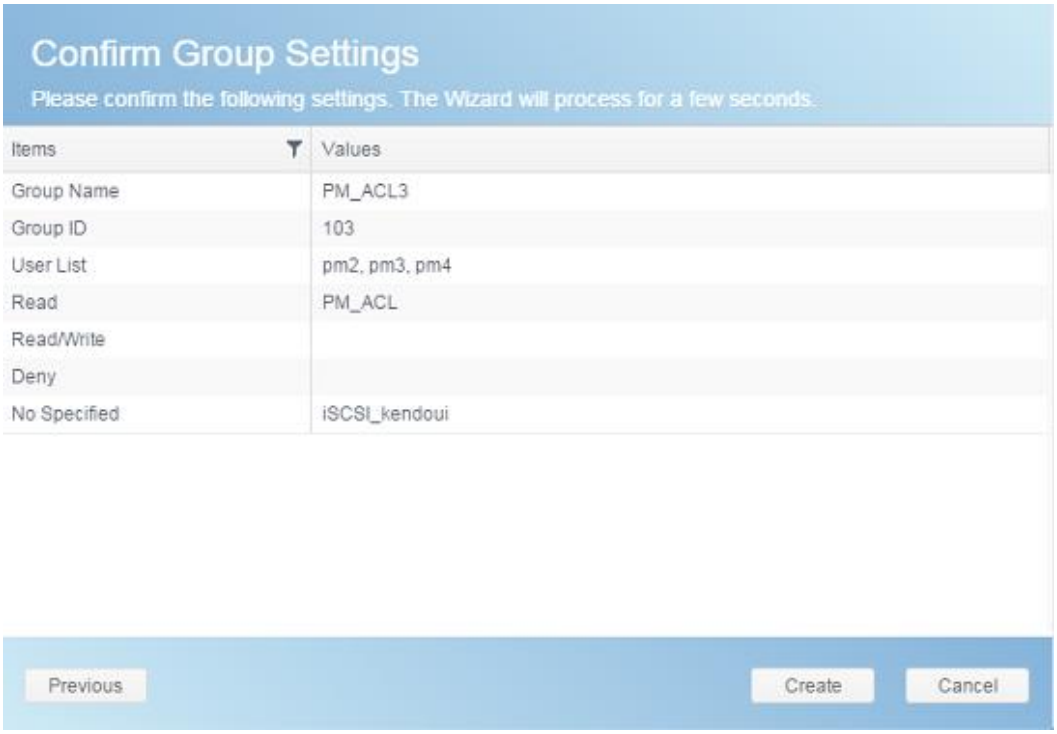
1. Select group members from user list.
2. Press the ***Next*** button to next page.



1. Set the access right for ACL folders.
2. Checked "Recursive" box if it will apply to all subfolders
3. Press the ***Next*** button to go to next page.

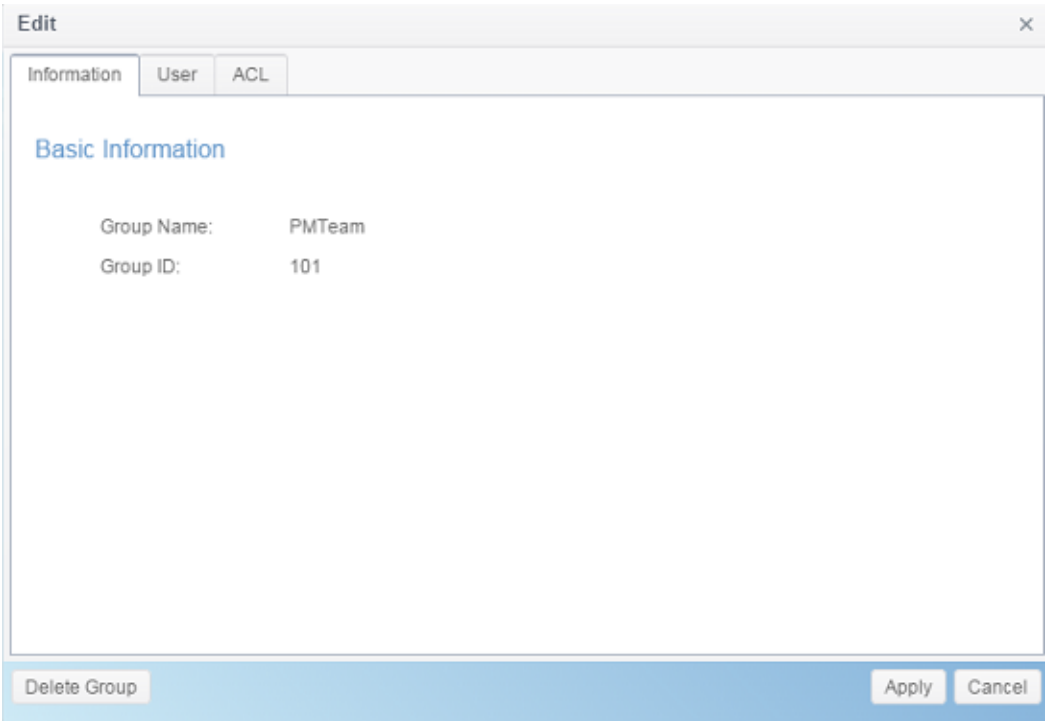


1. The page has listed group's information for double check.
2. Press the ***Create*** button and the group is created.



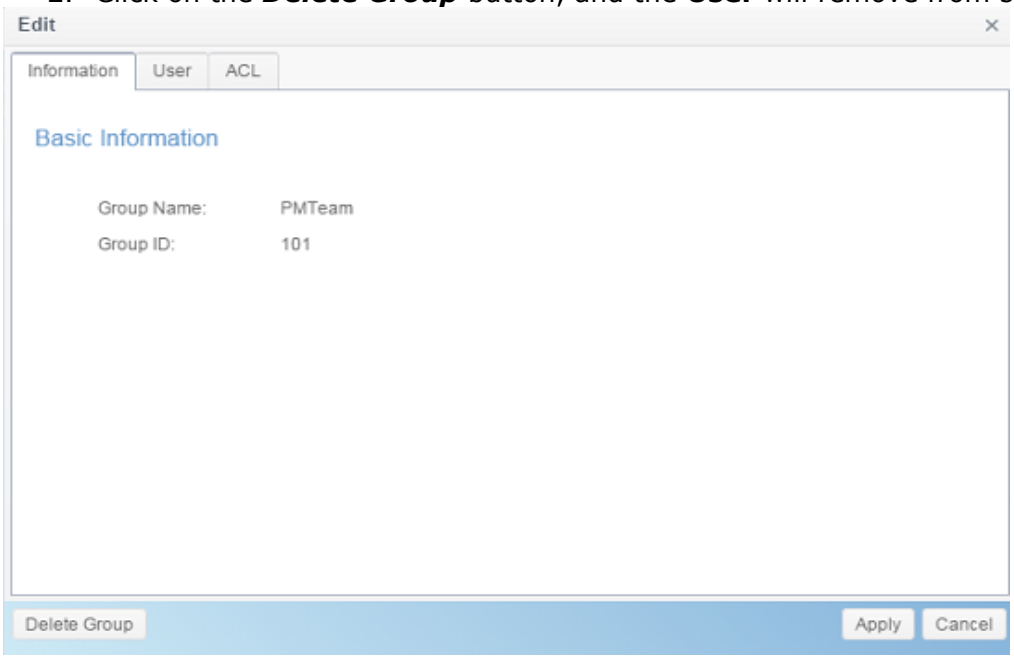
Edit Group:

1. Select an existing group from the list.
2. Click on the ***Edit*** button, and the **Group Setting** screen appears.
3. Making the changes if need.



Delete Group:

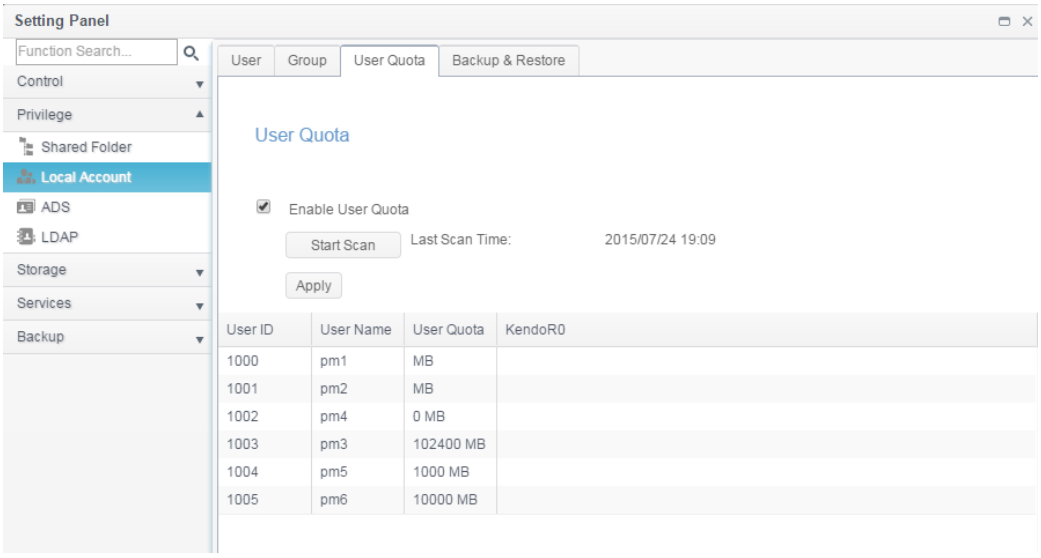
1. Select an existing user from the list.
2. Click on the ***Delete Group*** button, and the **User** will remove from system.



User Quota (Btrfs not support)

The Thecus IP storage support local or AD users with storage quota limitations in each RAID volume of the system. To enable this function, simply click "Enable", then apply.

It can click on Start Scan button to have most update of quota usage for every user and associated RAID volumes.

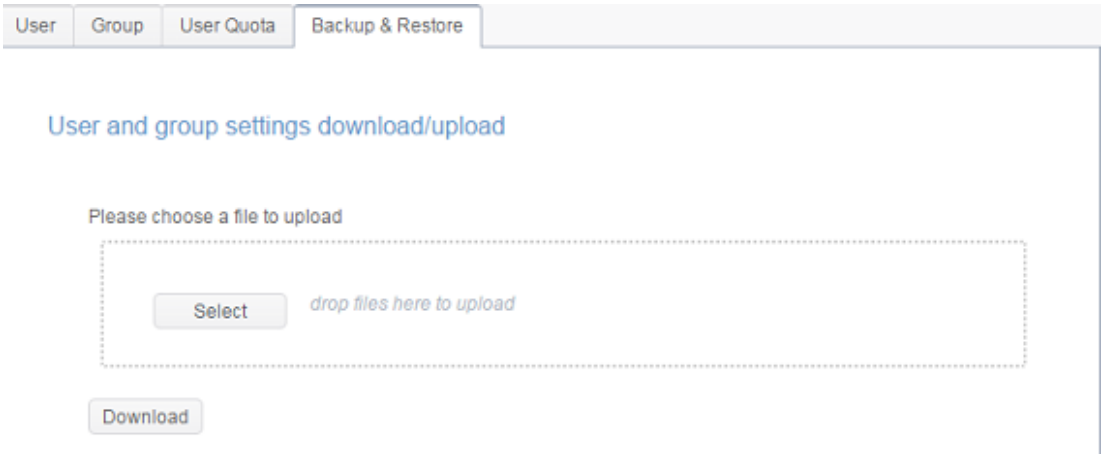


Backup & Restore

User and group settings download/upload:

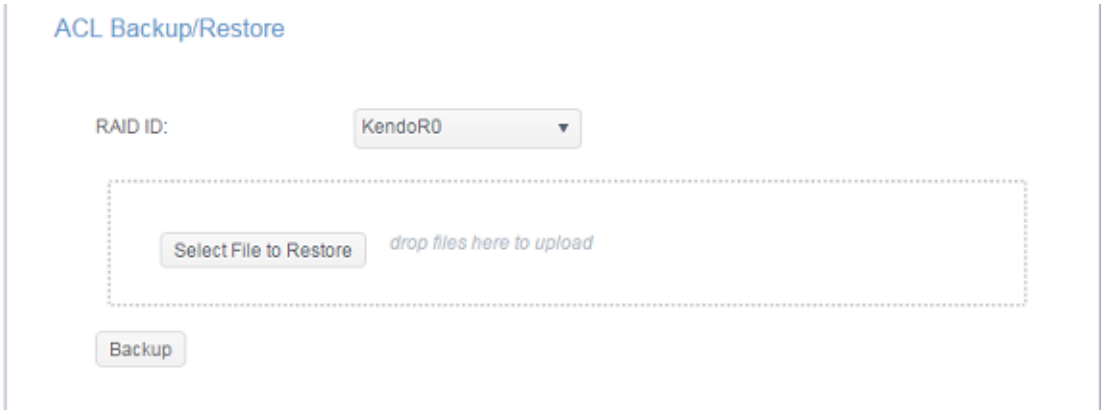
The user and group backup feature allow system users and groups to be backed up to another location and be restored if needed.

Please note, when restoring previous backup users and groups, the current users and groups list will be replaced from this restore file's contents.



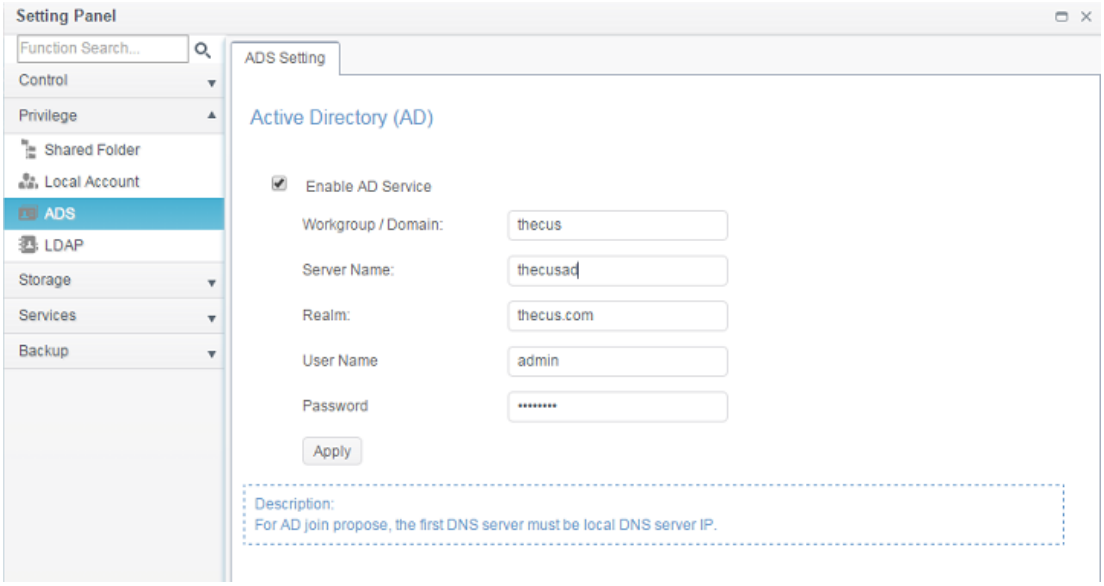
ACL backup/restore

The ACL backup and restore feature enables the system ACL (Access Control List) to be backed up on the RAID volume based to other location and restored if needed.



ADS

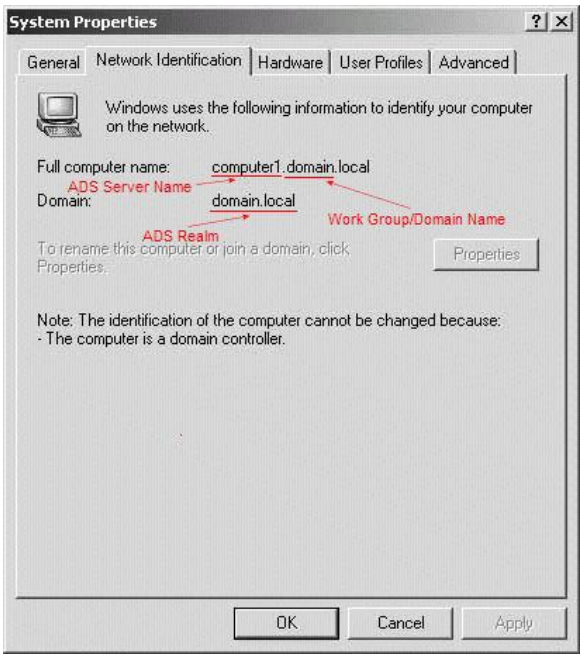
If you have a Windows Active Directory Server (ADS) to handle the domain security in your network, you can simply enable the ADS support feature; the Thecus IP storage will connect with the ADS server and get all the information of the domain users and groups automatically. From the **Privilege** menu, choose ***ADS*** item and the **ADS Setting** screen appears. You can change any of these items and press ***Apply*** to confirm your settings.



A description of each item follows:

ADS/NT Support	
Item	**Description**
Work Group / Domain Name	Specifies the SMB/CIFS Work Group / ADS Domain Name (e.g. MYGROUP).
ADS Support	Select Disable to disable authentication through Windows Active Directory Server.
ADS Server Name	Specifies the ADS server name (e.g. adservername).
ADS Realm	Specifies the ADS realm (e.g. example.com).
Administrator ID	Enter the administrators ID of Windows Active Directory, which is required for Thecus IP storage to join domain.
Administrator Password	Enter the ADS Administrator password.
Apply	To save your settings.

To join an AD domain, you can refer to the figure here and use the example below to configure the Thecus IP storage for associated filed input:



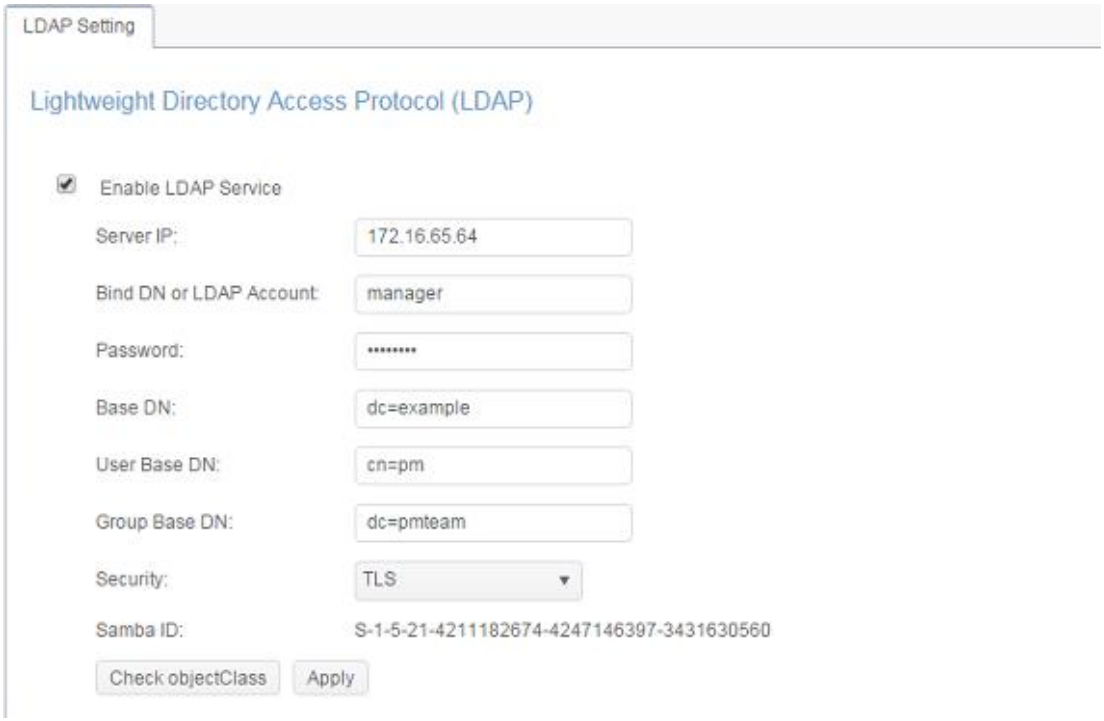
AD Domain Example	
Item	**Information**
Work Group / Domain Name	domain
ADS Support	Enable
ADS Server Name	Computer1
ADS Realm	Domain.local
Administrator ID	Administrator
Administrator Password	**********

NOTE

- The DNS server specified in the WAN/LAN1 configuration page should be able to correctly resolve the ADS server name.
- The time zone setting between Thecus IP storage and ADS should be identical.
- The system time difference between Thecus IP storage and ADS should be less than five minutes.
- The Administrator Password field is for the password of ADS (Active Directory Server) not Thecus IP storage.

LDAP

The LDAP is the other way to authenticate login users who has joined LDAP server, fill in the LDAP server information and get LDAP authentication started. Please make sure that the LDAP server has a Samba sam **and** a POSIX ObjectClass account.



LDAP Support	
Item	**Description**
LDAP Service	**Enable** or **Disable** LDAP service.
LDAP Server IP	Input LDAP server IP address.
Base Domain	Input base domain information ex. dc=tuned, dc=com, dc=tw
Manager	Input manager's name.

Password	Input manager's password
Apply	Click ***Apply*** to save your changes.
Check ObjectClass	Click this checkbox to ensure LDAP server has a Samba sam and a POSIX account or it may not work properly for LDAP client authentication.

Storage

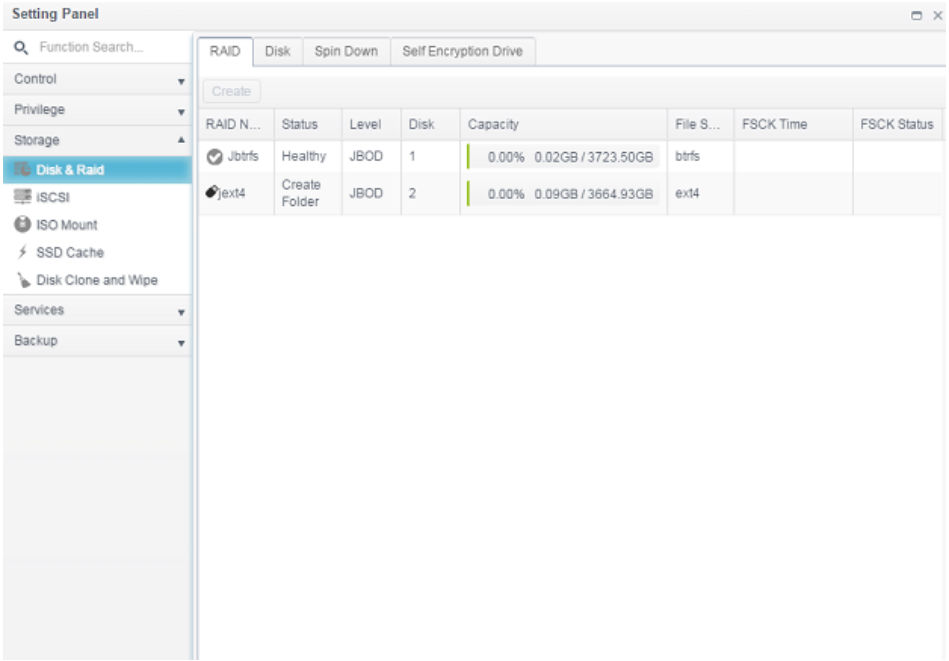
Disk & RAID

& RAID and the associated storage information will display. Also the related setting can be operated from here.

RAID

From the **Disk& RAID** menu, choose the ***RAID*** item and the **RAID Management** screen appears.

This screen lists the RAID volumes currently residing in the Thecus IP storage. From this screen, you can get information about the status of your RAID volumes, as well as the capacities allocated for data.



Create a RAID

On the **RAID Information** screen, press the ***Create*** button to go to the **RAID Volume Creation** screen. In addition to RAID disk information and status, this screen lets you make RAID configuration settings.

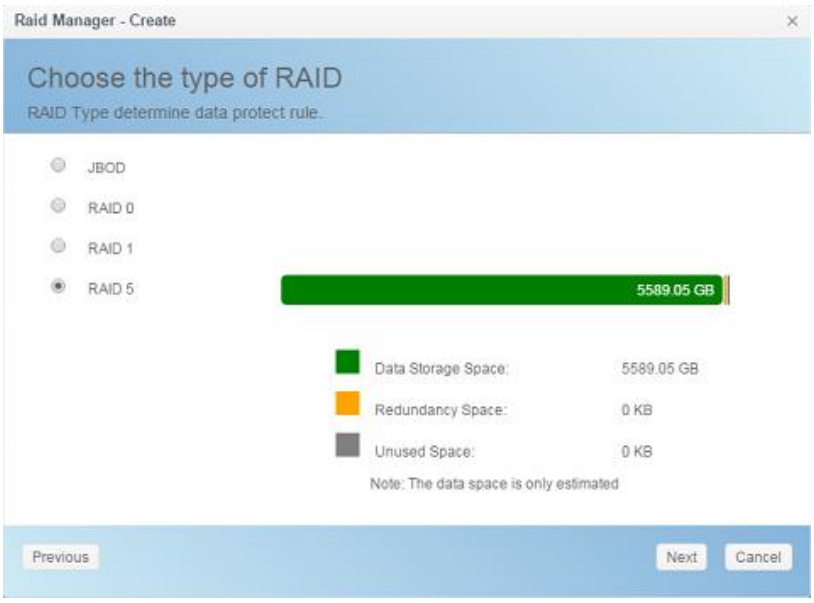
Using **Create RAID**, you can select stripe size, choose which disks are RAID disks or the Spare Disk. .

RAID Configurations	
Item	**Description**
Disk .	Number assigned to the installed hard disks.
Capacity (MB)	Capacity of the installed hard disks.
Model	Model number of the installed hard disks.
Status	Status of the installed hard disks.
Used	If this is checked, current hard disk is aalready part of a RAID volume.
Spare	If this is checked, current hard disk is designated as a spare for a RAID volume.
Master RAID	Check a box to designate this as the Master RAID volume. See the **NOTE** below for more information.
Stripe Size	This sets the stripe size to maximize performance of sequential files in a storage volume. Keep the 64K setting unless you require a special file storage layout in the storage volume. A larger stripe size is better for large files.
Data Percentage	The percentage of the RAID volume that will be used to store data.
Create	Press this button to configure a file system and create the RAID storage volume.

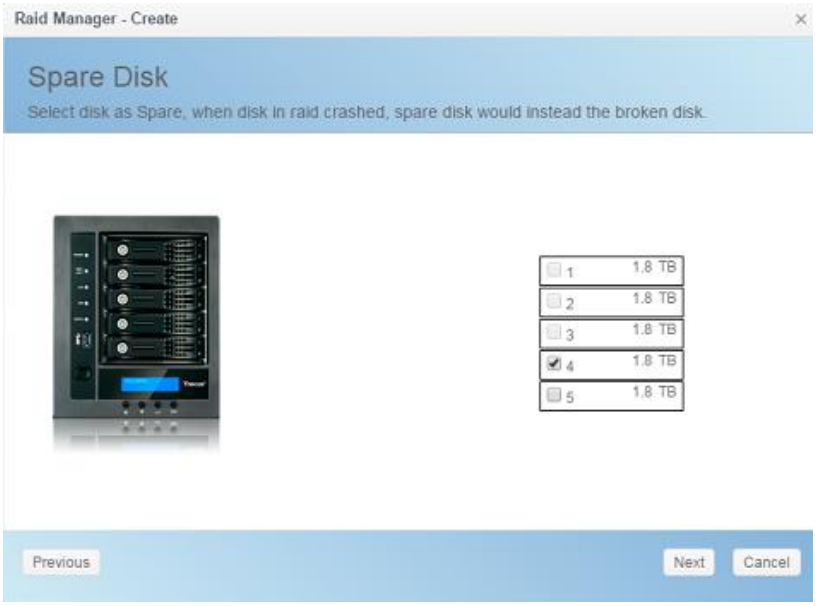
To create a RAID volume, follow the steps below:

1. On the **Select Disk** screen, select available disks for the RAID volume member(s).

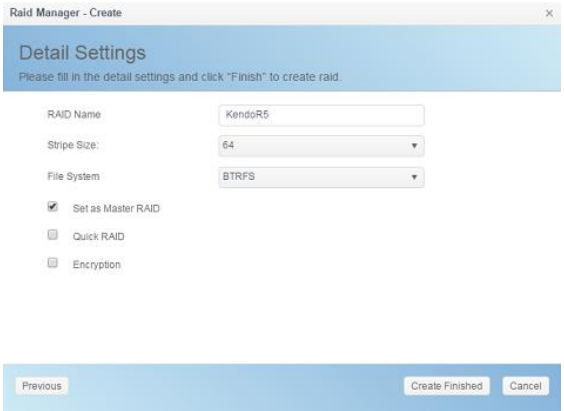
2. Set the RAID storage space as **JBOD**, **RAID 0**, **RAID 1**, **RAID 5**, **RAID 6, RAID 10, RAID 50 and RAID 60** (depends on how many disks has installed into system)— see **Appendix B: RAID Basics** for a detailed description of each.



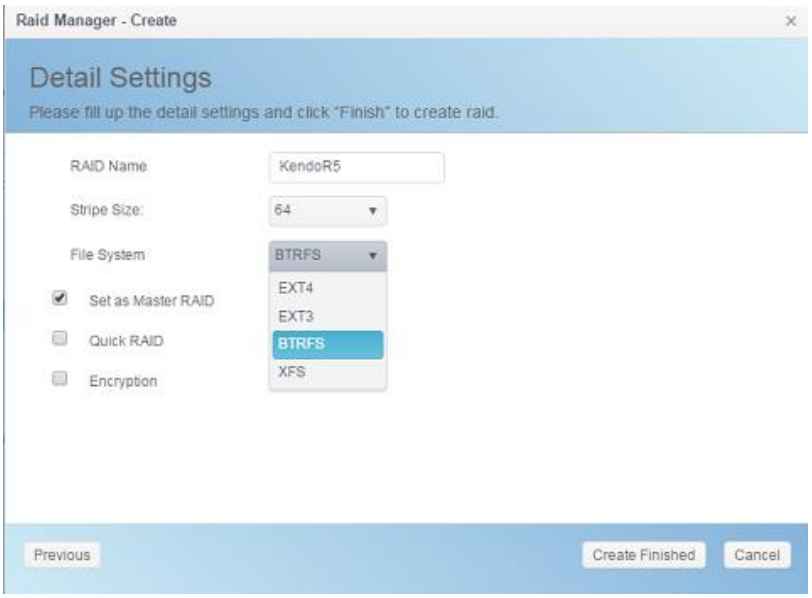
3. Choose spare disk for associated RAID volume if applicable.



4. Specify a RAID Name.



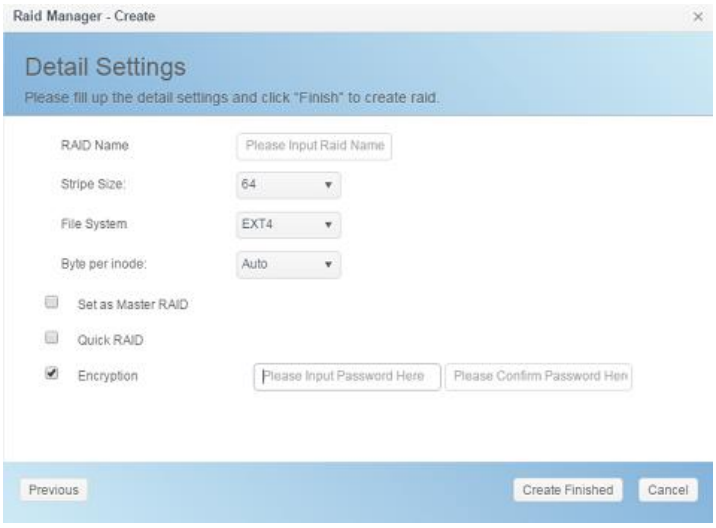
5. If this RAID volume is meant to be the Master RAID volume, tick the **Master RAID** checkbox.



NOTE

In a multiple RAID configuration, one RAID volume must be designated as the Master RAID volume. The Master RAID volume will store all installed modules. If the Master RAID is changed to another location (i.e. assigning volume 2 to be the Master RAID volume after volume 1 had been previously assigned), then all modules must be reinstalled. In addition, all system folders that were contained on the Master RAID volume will be invisible. Reassigning this volume to be the Master RAID will make these folders visible again.

6. Selected whether the RAID volume will be encrypted or not.
The RAID volume can protect data by using RAID Volume Encryption function to prevent the risk of data exposure. To activate this function, the **Encryption** option needs to be enabled while the RAID is created and followed by a password input for identification. Also, an external writable USB disk plugged into any USB port on the system is required to save the password you have entered while the RAID volume is being created. See the screenshot below for details.



After the RAID volume has been created, you may remove the USB disk until the next time the system boots. The RAID volume cannot be mounted if the USB disk with the encryption key isn't found in any system USB port when the volume is accessed. To activate the encrypted volume, plug the USB disk containing the encryption key and into any system USB port.

We strongly recommended copying the RAID volume encryption key to a safe place. You can find the encryption key file from the USB disk in the following format:

(RAID volume created date)_xxxxxx.key

WARNING

Please keep your USB disk in a safe place and also backup the encrypted key.
There is no way to rescue data back if the key is lost.

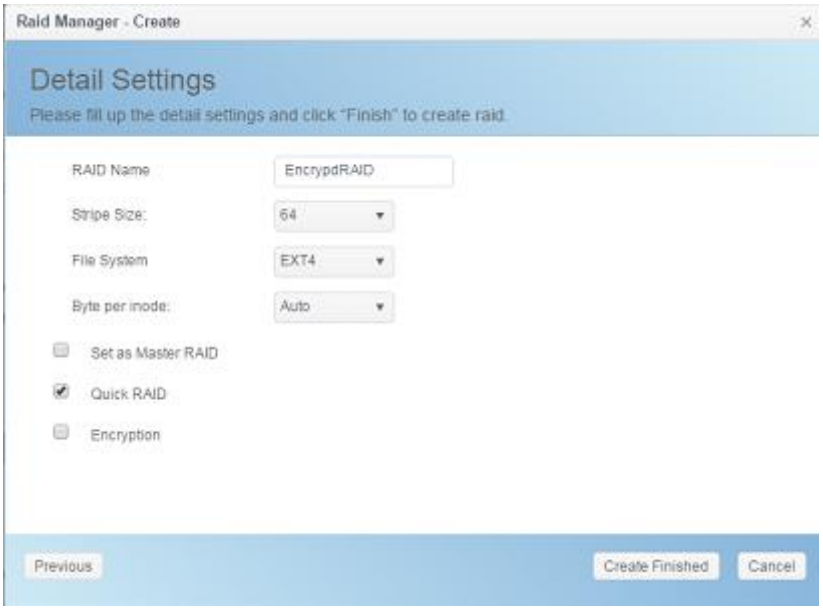
NOTE

With RAID volume encryption enabled, the system performance will go down.

RAID volumes with encryption enabled will be displayed with a key lock symbol next to volume ID name.

RAID N...	Status	Level	Disk	Capacity	File S...	FSCK T...	FSCK Status
KendoR5	Create Folder	RAID5	1, 3, 2(4)	0.02% 0.74GB / 3721.00	btrfs		
EncryptRAI	Format Data	JBOD	5		ext4		

7. Quick RAID — Enabling the quick RAID setting is going to enhance RAID creation time.



NOTE

We recommend using the "Quick RAID" setting only if the hard disks are brand new or if no existing partitions are contained.

8. Specify a stripe size — 64K is the default setting.
9. Specify size for "Bytes per inode" if ext3/ext4 has selected. The default value is Auto and it has no need to change for general use.

10. Select the file system you would like to have for this RAID volume. The selection is available from ext3, XFS, ext4 and btrfs(N2350/N4350 not supported).

NOTE

Single volume size supported:
ext3 → 8TB
XFS → 48TB
ext4 → 36TB
btrfs → 16EB

11. Press ***Create Finished*** to build the RAID storage volume.

NOTE

Building a RAID volume may be time consuming, depending on the size of hard drives and RAID mode. In general, if the RAID volume building process is up to "RAID Building", then the data volume is accessible.

WARNING

Creating RAID destroys all data in the current RAID volume. The data will be unrecoverable.

RAID Level
You can set the storage volume as **JBOD**, **RAID 0**, **RAID 1**, **RAID 5, RAID 6, RAID 10, RAID 50 and RAID 60 (Depend on Model and how many disks has been installed)**.

Level / Model	JBOD	RAID 0	RAID 1	RAID 5	RAID 6	RAID 10	RAID 50	RAID 60
N2350 series	•	•	•					
N2810 series	•	•	•					
N4810 series	•	•	•	•	•	•		
N4350 series	•	•	•	•	•	•		
N5810 series	•	•	•	•	•	•		
N12850 series	•	•	•	•	•	•	•	•
N12910/N12910SAS	•	•	•	•	•	•	•	•
N16850 series	•	•	•	•	•	•	•	•
N16910SAS	•	•	•	•	•	•	•	•
N8910 series	•	•	•	•	•	•	•	•

RAID configuration is usually required only when you first set up the device. A brief description of each RAID setting follows:

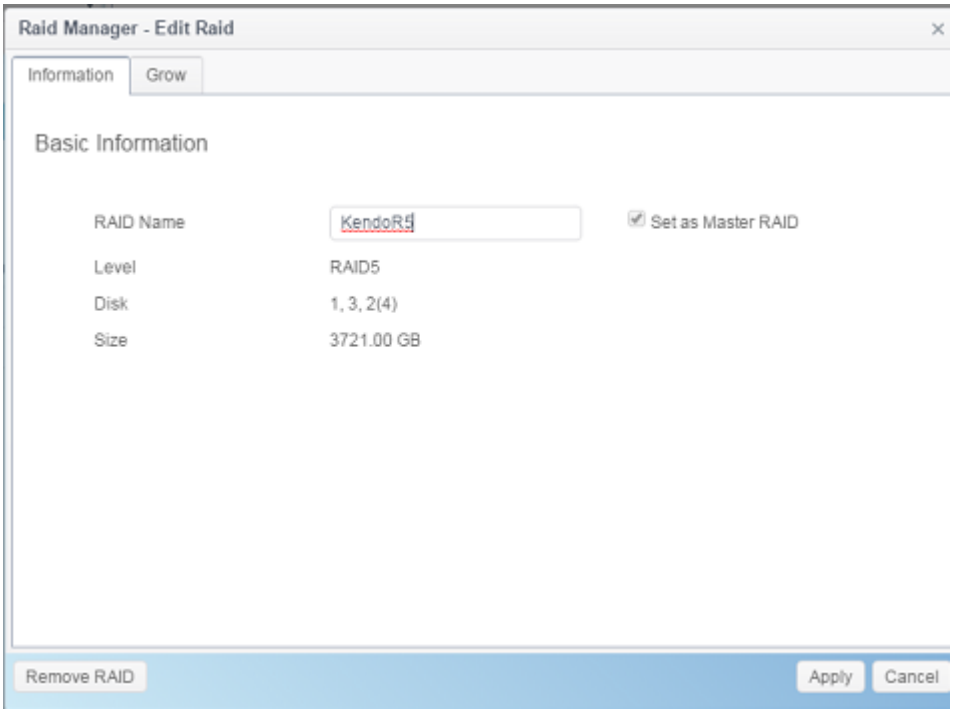
RAID Levels	
Level	**Description**
JBOD	The storage volume is a single HDD with no RAID support. JBOD requires a minimum of 1 disk.
RAID 0	Provides data striping but no redundancy. Improves

	performance but not data safety. RAID 0 requires a minimum of 2 disks.
RAID 1	Offers disk mirroring. Provides twice the read rate of single disks, but same write rate. RAID 1 requires a minimum of 2 disks.
RAID 5	Data striping and stripe error correction information provided. RAID 5 requires a minimum of 3 disks. RAID 5 can sustain one failed disk.
RAID 6	Two independent parity computations must be used in order to provide protection against double disk failure. Two different algorithms are employed to achieve this purpose. RAID 6 requires a minimum of 4 disks. RAID 6 can sustain two failed disks.
RAID 10	RAID 10 has high reliability and high performance. RAID 10 is implemented as a striped array whose segments are RAID 1 arrays. It has the fault tolerance of RAID 1 and the performance of RAID 0. RAID 10 requires 4 disks. RAID 10 can sustain two failed disks.
RAID 50	RAID 50 combines the straight block-level striping of RAID 0 with the distributed parity of RAID 5. This is a RAID 0 array striped across RAID 5 elements. It requires at least 6 drives.
RAID 60	RAID 60 combines the straight block-level striping of RAID 0 with the distributed double parity of RAID 6. That is, a RAID 0 array striped across RAID 6 elements. It requires at least 8 disks.

WARNING If the administrator improperly removes a hard disk that should not be removed when RAID status is degraded, all data will be lost.

Edit RAID

1. Select an existing RAID volume from the list.
2. Click on the ***Edit*** button, and the **RAID volume setting** screen appears.
3. Making the changes such as RAID name or role of master RAID if needed.



Remove RAID

1. Select an existing RAID volume from the list.
2. Click on the ***Remove RAID*** button from left bottom corner, A confirmation screen will appear.
3. Confirm with click "OK" to complete the "**Remove RAID**" operation.

Click to remove the RAID volume. All user data and iSCSI created in the selected RAID volume will be deleted.

WARNING Remove RAID destroys all data in the selected RAID volume. The data will be unrecoverable.

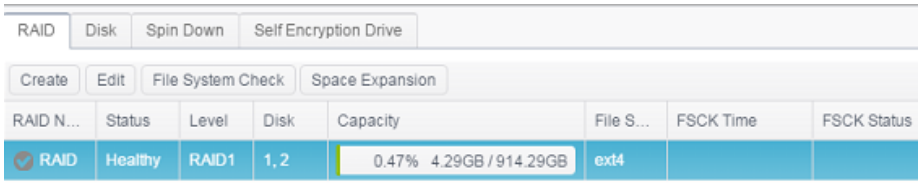
Expanding a RAID
To expand a RAID 1, RAID 5, or RAID 6 volume, follow the steps below:

1. Replace one of the hard drives in the RAID volume and allow it to automatically rebuild.

2. Once rebuilt, you can continue to replace any remaining disks in the RAID array.

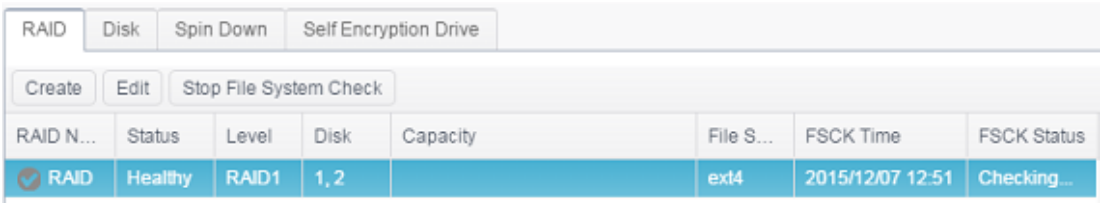
3. When you are done replacing hard drives, click on RAID volume that is going to expand capacity. System will have additional tab **"Space Expansion"** appear if associated RAID volume is capable for expansion.

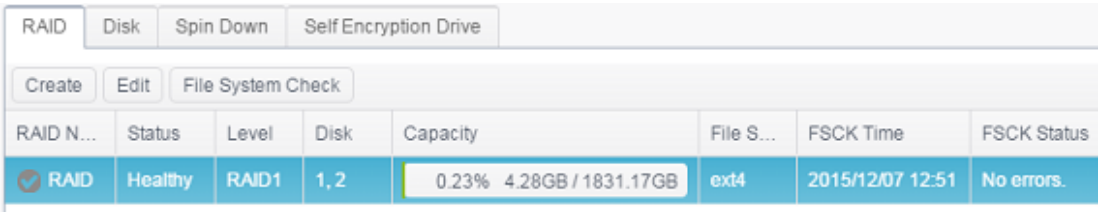
4. On the **RAID Configuration** screen, click **Space Expansion**.



File System Check
The File System Check allows you to perform a check on the integrity of your disks' file system.

To perform File System Check, select RAID volume from RAID Volume list and the tab **File System Check** will appear. Click on **File System Check** button to start the task. From the screen, it will display FSCK check time and checking status.



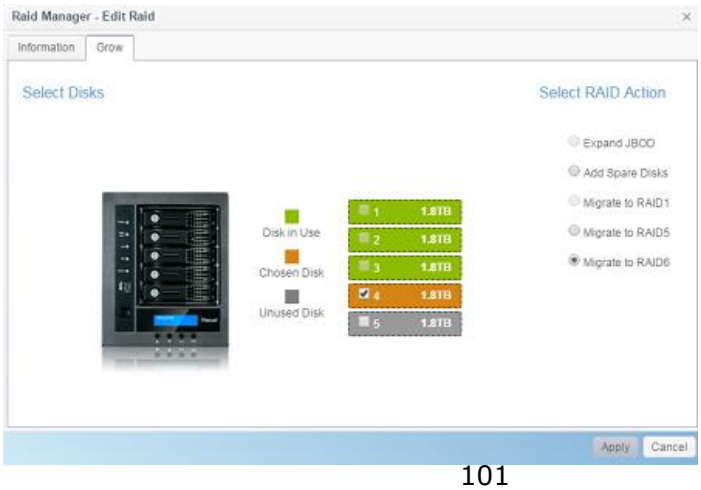


Migrating a RAID

Once a RAID volume has been created, you may want to move it to other physical drives or change the RAID array all together. To migrate a RAID 1, RAID 5 or RAID 6 volume, follow the steps below:

1. Select RAID volume which is going to execute **RAID Migration.**
2. Press **Edit** to bring up management screen.
3. Choose **Grow** to have all installed disks listed included used and unused.

4. Select from unused disk then click **OK**, the system will bring up available options to choose from.



5. Confirm the setting, then system will begin migrate the RAID volume.

NOTE

- Migrating a RAID volume could take several hours to complete
- The RAID migration feature is available only when it is configurable.

Here is a list of limitation with RAID level migration function:

1. During RAID level migration, it is not permitted to reboot or shutdown system.
2. For RAID migration from **R1 to R5 or R1 to R6**, all services will restart and "iSCSI" volume will be in read only mode but read/write of the "user data" will be possible during the operation.

NOTE

The migration scheme below is based on Thecus IP Storage product's maximum possible combination. For other model which supports less HDD, please refer to the web UI while RAID migration operates.

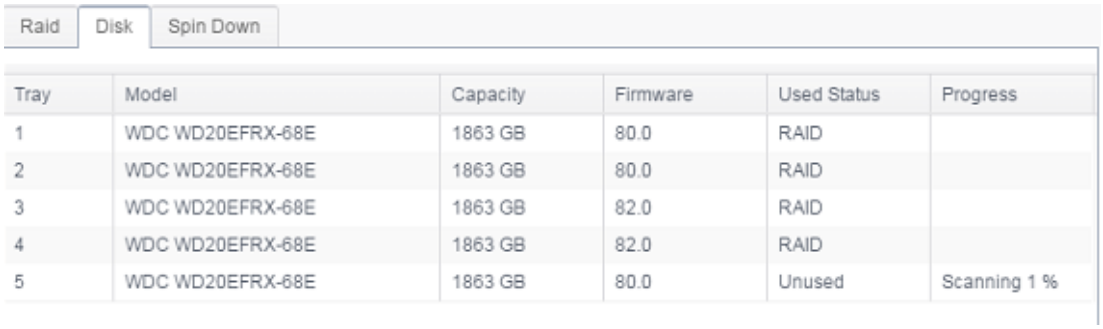
Below is a table listing of possible RAID migration schemes:

To From	RAID 0	RAID 5	RAID 6
RAID 1		[RAID 1] HDDx2 to [RAID 5] HDDx3 [RAID 1] HDDx2 to [RAID 5] HDDx4 [RAID 1] HDDx2 to [RAID 5] HDDx5 [RAID 1] HDDx2 to [RAID 5] HDDx6 [RAID 1] HDDx2 to [RAID 5] HDDx7 [RAID 1] HDDx2 to [RAID 5] HDDx8 ……..HDDx16 [RAID 1] HDDx3 to [RAID 5] HDDx4 [RAID 1] HDDx3 to [RAID 5] HDDx5 [RAID 1] HDDx3 to [RAID 5] HDDx6 [RAID 1] HDDx3 to [RAID 5] HDDx7 [RAID 1] HDDx3 to [RAID 5] HDDx8 ……..HDDx16 [RAID 1] HDDx4 to [RAID 5] HDDx5 [RAID 1] HDDx4 to [RAID 5] HDDx6 [RAID 1] HDDx4 to [RAID 5] HDDx7 [RAID 1] HDDx4 to [RAID 5] HDDx8 ……..HDDx16 [RAID 1] HDDx5 to [RAID 5] HDDx6 [RAID 1] HDDx5 to [RAID 5] HDDx7 [RAID 1] HDDx5 to [RAID 5] HDDx8 ……..HDDx16 [RAID 1] HDDx6 to [RAID 5] HDDx7 [RAID 1] HDDx6 to [RAID 5] HDDx8 ……..HDDx16 [RAID 1] HDDx7 to [RAID 5] HDDx8 ……..HDDx16	[RAID 1] HDDx2 to [RAID 6] HDDx4 [RAID 1] HDDx2 to [RAID 6] HDDx5 [RAID 1] HDDx2 to [RAID 6] HDDx6 [RAID 1] HDDx2 to [RAID 6] HDDx7 [RAID 1] HDDx2 to [RAID 6] HDDx8 ……..HDDx16 [RAID 1] HDDx3 to [RAID 6] HDDx4 [RAID 1] HDDx3 to [RAID 6] HDDx5 [RAID 1] HDDx3 to [RAID 6] HDDx6 [RAID 1] HDDx3 to [RAID 6] HDDx7 [RAID 1] HDDx3 to [RAID 6] HDDx8 ……..HDDx16 [RAID 1] HDDx4 to [RAID 6] HDDx5 [RAID 1] HDDx4 to [RAID 6] HDDx6 [RAID 1] HDDx4 to [RAID 6] HDDx7 [RAID 1] HDDx4 to [RAID 6] HDDx8 ……..HDDx16 [RAID 1] HDDx5 to [RAID 6] HDDx6 [RAID 1] HDDx5 to [RAID 6] HDDx7 [RAID 1] HDDx5 to [RAID 6] HDDx8 ……..HDDx16 [RAID 1] HDDx6 to [RAID 6] HDDx7 [RAID 1] HDDx6 to [RAID 6] HDDx8 ……..HDDx16 [RAID 1] HDDx7 to [RAID 6] HDDx8 ……..HDDx16

RAID 5	X	[RAID 5] HDDx3 to [RAID 5] HDDx4 [RAID 5] HDDx3 to [RAID 5] HDDx5 [RAID 5] HDDx3 to [RAID 5] HDDx6 [RAID 5] HDDx3 to [RAID 5] HDDx7 [RAID 5] HDDx3 to [RAID 5] HDDx8 ……..HDDx16 [RAID 5] HDDx4 to [RAID 5] HDDx5 [RAID 5] HDDx4 to [RAID 5] HDDx6 [RAID 5] HDDx4 to [RAID 5] HDDx7 [RAID 5] HDDx4 to [RAID 5] HDDx8 ……..HDDx16 [RAID 5] HDDx5 to [RAID 5] HDDx6 [RAID 5] HDDx5 to [RAID 5] HDDx7 [RAID 5] HDDx5 to [RAID 5] HDDx8 ……..HDDx16 [RAID 5] HDDx6 to [RAID 5] HDDx7 [RAID 5] HDDx6 to [RAID 5] HDDx8 ……..HDDx16 [RAID 6] HDDx7 to [RAID 5] HDDx8 ……..HDDx16	[RAID 5] HDDx3 to [RAID 6] HDDx4 [RAID 5] HDDx3 to [RAID 6] HDDx5 [RAID 5] HDDx3 to [RAID 6] HDDx6 [RAID 5] HDDx3 to [RAID 6] HDDx7 [RAID 5] HDDx3 to [RAID 6] HDDx8 ……..HDDx16 [RAID 5] HDDx4 to [RAID 6] HDDx5 [RAID 5] HDDx4 to [RAID 6] HDDx6 [RAID 5] HDDx4 to [RAID 6] HDDx7 [RAID 5] HDDx4 to [RAID 6] HDDx8 ……..HDDx16 [RAID 5] HDDx5 to [RAID 6] HDDx6 [RAID 5] HDDx5 to [RAID 6] HDDx7 [RAID 5] HDDx5 to [RAID 6] HDDx8 ……..HDDx16 [RAID 5] HDDx6 to [RAID 6] HDDx7 [RAID 5] HDDx6 to [RAID 6] HDDx8 ……..HDDx16 [RAID 5] HDDx7 to [RAID 6] HDDx8 ……..HDDx16
RAID 6	X	X	[RAID 6] HDDx4 to [RAID 6] HDDx5 [RAID 6] HDDx4 to [RAID 6] HDDx6 [RAID 6] HDDx4 to [RAID 6] HDDx7 [RAID 6] HDDx4 to [RAID 6] HDDx8 ……..HDDx16 [RAID 6] HDDx5 to [RAID 6] HDDx6 [RAID 6] HDDx5 to [RAID 6] HDDx7 [RAID 6] HDDx5 to [RAID 6] HDDx8 ……..HDDx16 [RAID 6] HDDx6 to [RAID 6] HDDx7 [RAID 6] HDDx6 to [RAID 6] HDDx8 ……..HDDx16 [RAID 6] HDDx7 to [RAID 6] HDDx8 ……..HDDx16

Disk

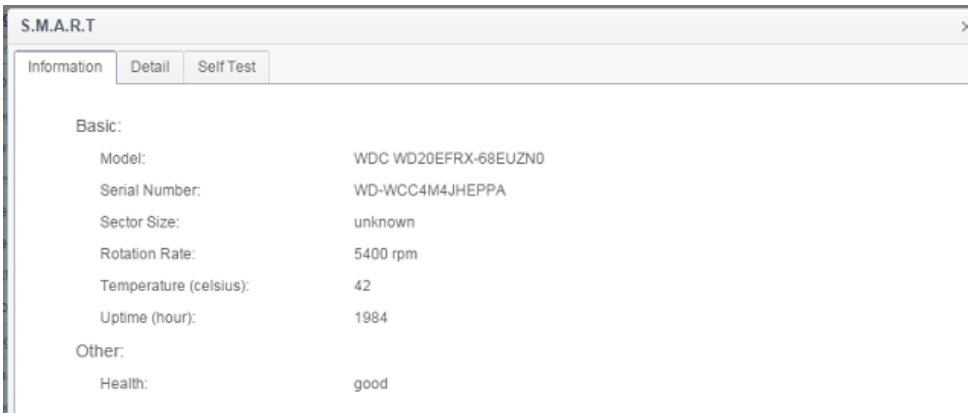
Disk & RAID talked hard disks basic information, used status and progress while perform bad block scan.



S.M.A.R.T :

1. Select a disk from the list.
2. Click on ***S.M.A.R.T.*** tab to perform.

Once clicking on S.M.A.R.T., system will display the basic hard disk information and status. Based on S.M.A.R.T. status, system will give the healthy condition for reference. Please see below for details.

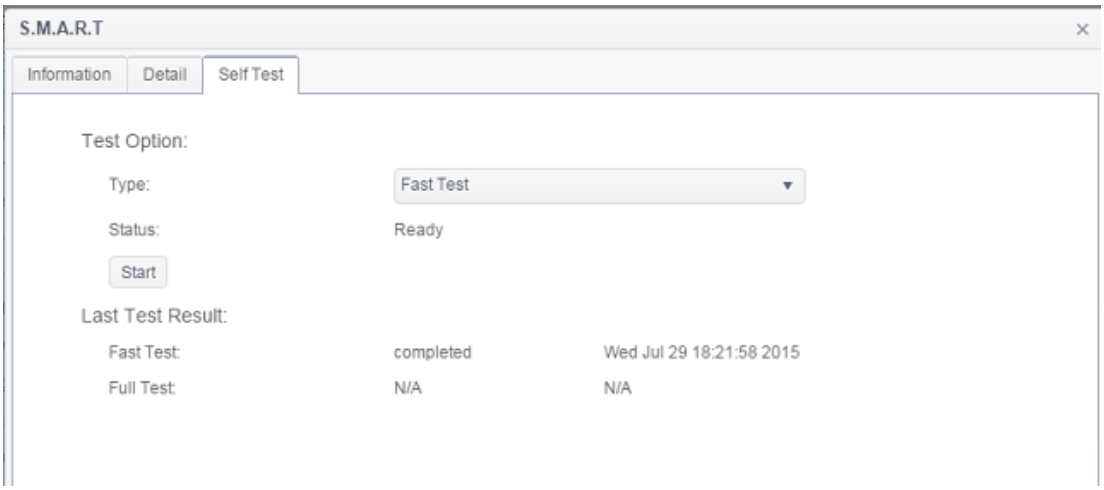


S.M.A.R.T. Information	
Item	**Description**
Model	Model name of the installed hard disk.
Serial Number	Serial number of the installed hard disk
Sector Size	Sector size of the installed hard disk
Rotation Rate	Rotation speed of the installed hard disk
Temperature (Celsius)	The current temperature of the installed disk in degree Celsius
Uptime(Hour)	Count of hours in power-on state. The raw value of this attribute shows total count of hours (or minutes, or seconds, depending on manufacturer) in power-on state.

For more technical S.M.A.R.T. information, please click on **Detail**.

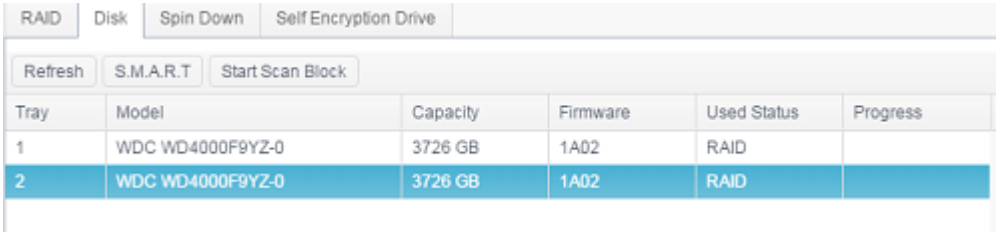
You may also like to perform a disk SMART test, simply click "Self Test" to start the SMART test. The result is only for reference and the system will not take any action from its results.

There are "Fast Test" or 'Full test" can be choose from.



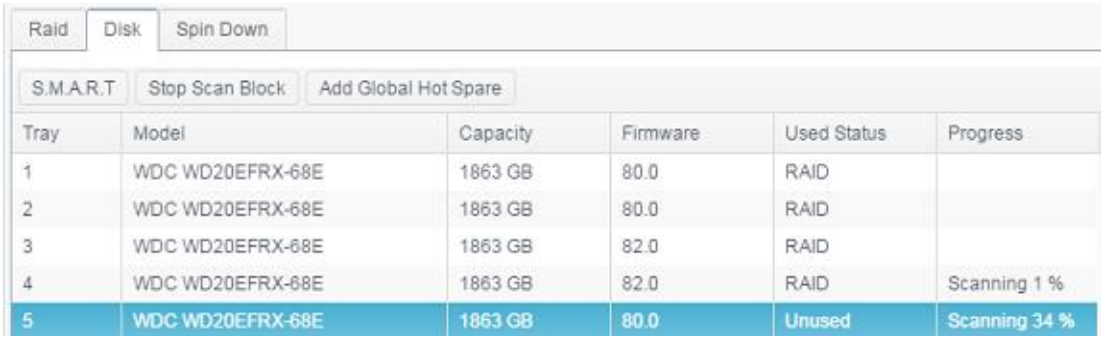
Bad Block Scan:

1. Select a disk from the list.
2. Click on **Start Scan Block button** to perform.
3. Click again to stop bad block scanning.



Global Hot Spare:

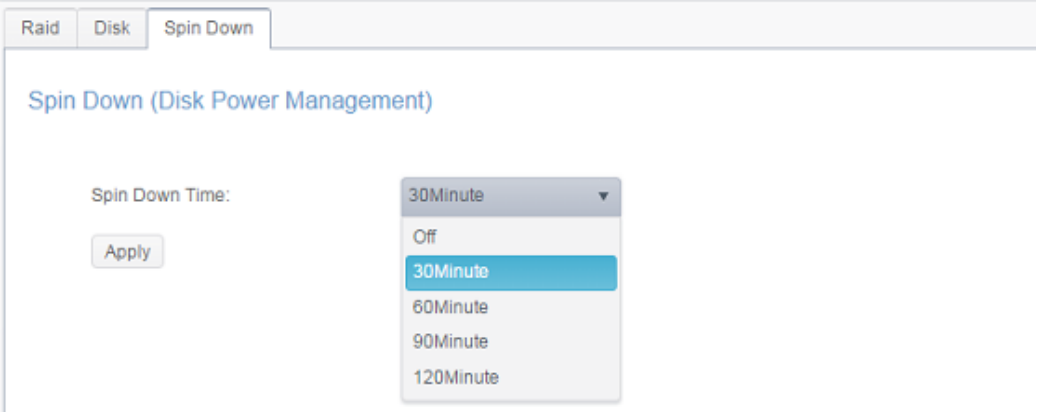
Click on installed hard disk but at unused status and the "Global Hot Spare" tab will appear. Check on the button to have associated hard disk as spare disk.



Spin Down

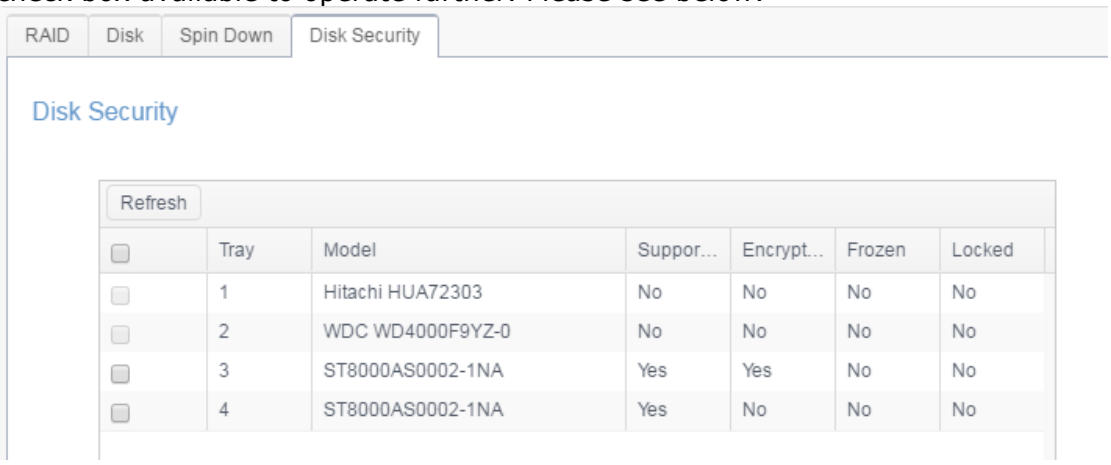
For disks installed into system, there is default 30 minutes to spin down if no disk activities have been detected. However, the spin down duration can be either

turned off or extended. Select from drop down option to make choice.

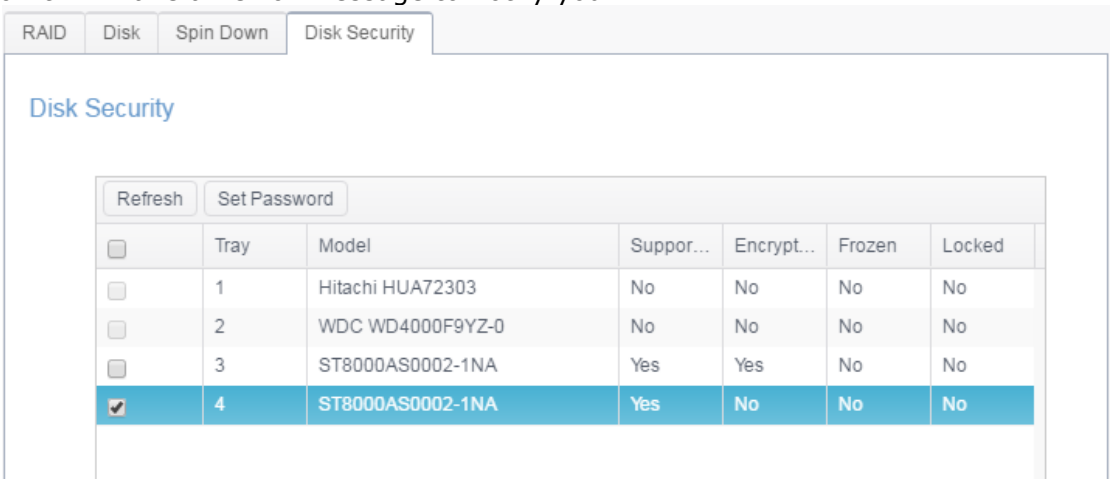


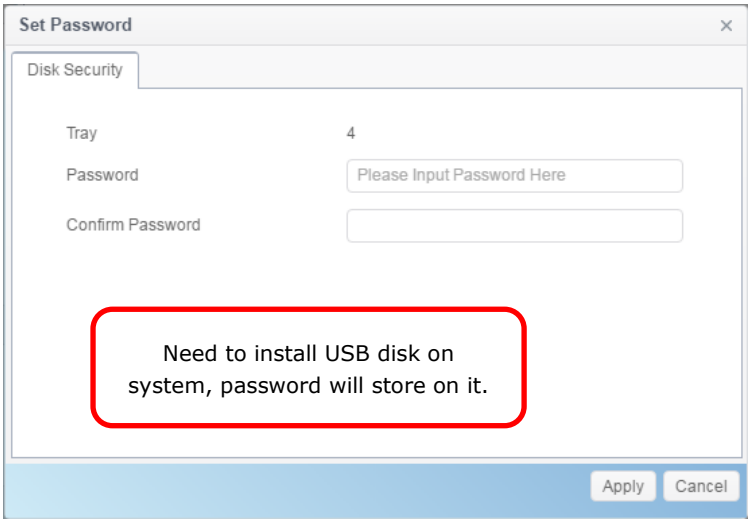
Disk Security

Thecus IP storage support Disk Security which could perform disk lock capability of disk itself. Click on "Disk Security" from category Disk & RAID and the installed disks list will appear. The disk drive which is capable for disk-security will have check box available to operate further. Please see below:



To setup available disk-security drive, please click on check box then "Set Password" tab will appear. Click on "Set Password" to have associated disk with Disk-Security enabled, please do install USB disk and the password will store on it or it will have an error message to notify you.

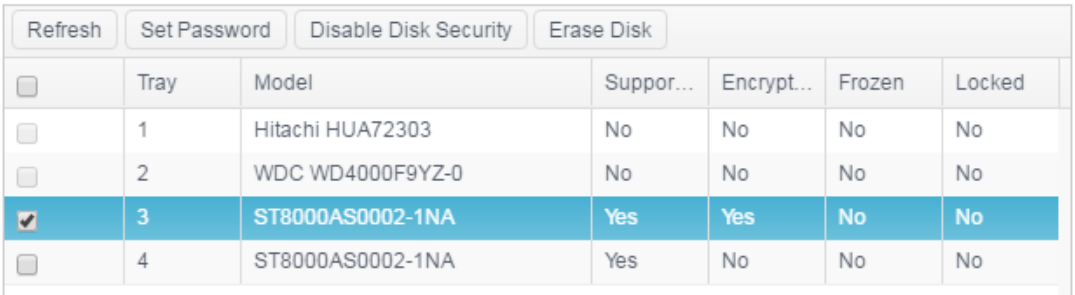




NOTE

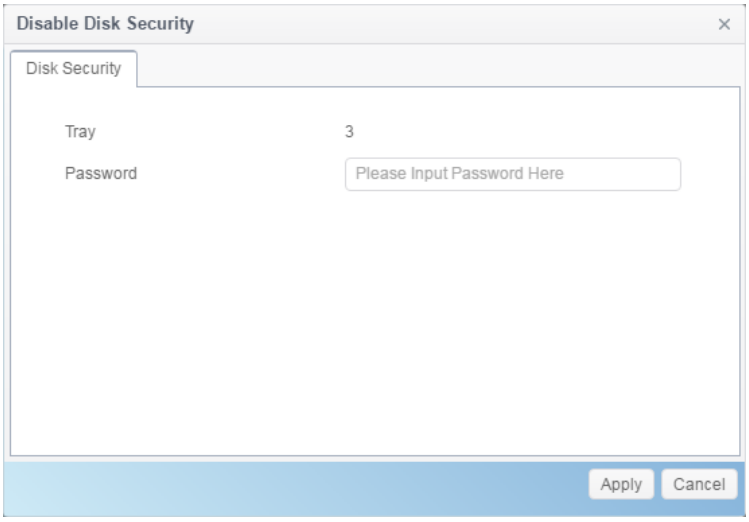
- The disk to enable Disk-Security setting is only available while disk is unused
- The USB disk which has contained password need to plug-in on system once associated disk with Disk-Security enabled is part of RAID member during system power on.
- Without enable Disk-Security on installed disk, it is just like normal disk

To change the state of enabled Disk-Security disk, click on associated disk (MUST in unused) and the available function tab will appear.



	Tray	Model	Suppor...	Encrypt...	Frozen	Locked
☐	1	Hitachi HUA72303	No	No	No	No
☐	2	WDC WD4000F9YZ-0	No	No	No	No
☑	3	ST8000AS0002-1NA	Yes	Yes	No	No
☐	4	ST8000AS0002-1NA	Yes	No	No	No

Other than Set Password as mentioned above, the Disk Security can be disabled by clicking on 'Disable Disk Security" and the disk can be erased by clicking on "Erase Disk" if correct password has been inputted.



iSCSI

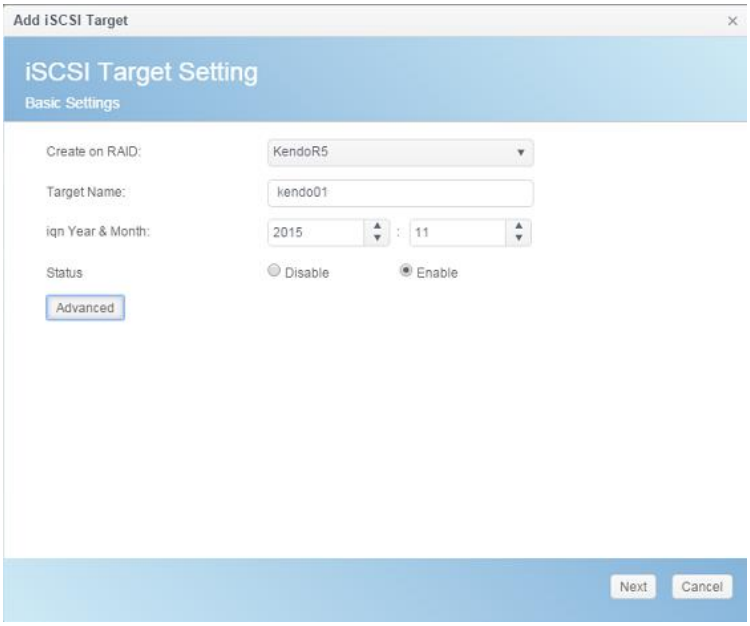
You may specify the space allocated for iSCSI. See the table below to view the allowed iSCSI target number per system:

Model	N2350 series N2810 series N4350 series	N4820U series N4810 series N5810 N5810PRO N12850L N12850RU N12910 N8910	N12850 N12910sas N16850 N16910sas
Allowed iSCSI volume	25	50	200

iSCSI List

Add iSCSI Target

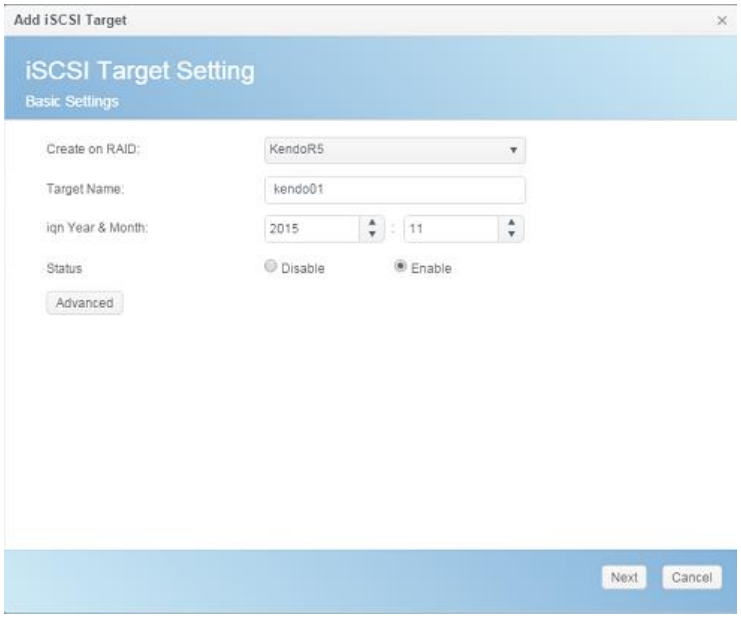
To add iSCSI target volume, click **Add** from **iSCSI List** and associated screen will appear.



To allocate space for an iSCSI target on the current RAID volume, follow the steps below:

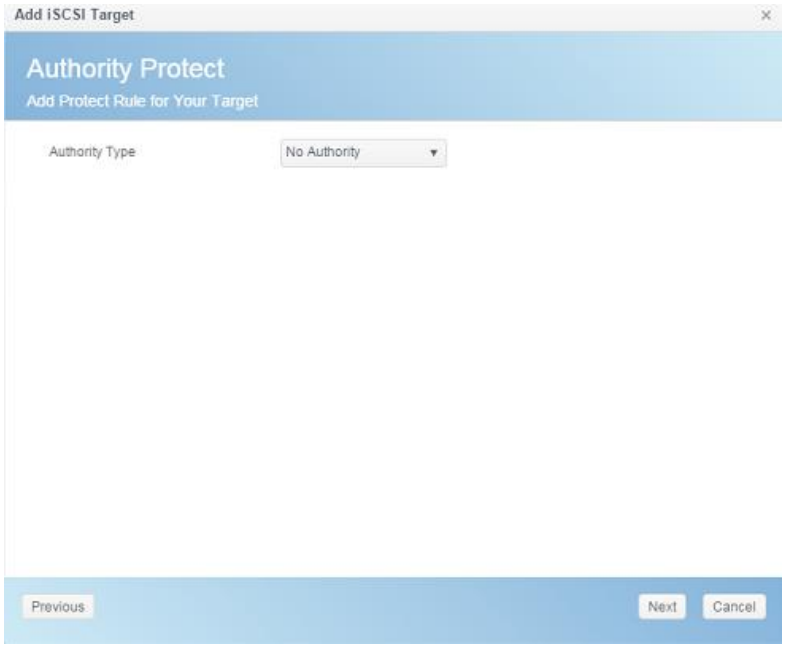
1. Select desired RAID volume from its drop down list to have iSCSI target created.
2. Enter a **Target Name**. This will be used by the **Stackable NAS** function to identify this export share.
3. Choose the current year from the **Year** dropdown.
4. Choose the current month from the **Month** dropdown.
5. Enable the **iSCSI Target Volume** by selecting ***Enable***.

NOTE Be sure the iSCSI target volume has been enabled or it will not list out while using Initiator to get associated iSCSI target volumes.



Click Next

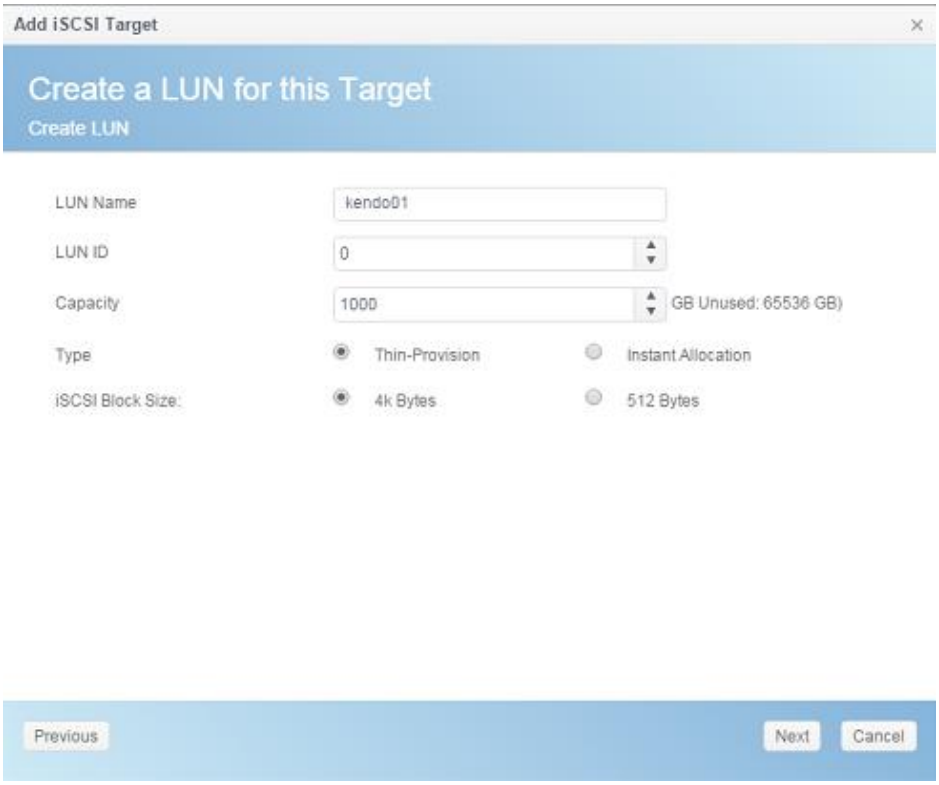
6. Choose **Authority Type** to enable ***CHAP*** authentication or ***None***.
7. If you've enabled CHAP authentication, enter a **username** and a **password**. Confirm your chosen password be reentering it in the **Password Confirm** box.



Click Next

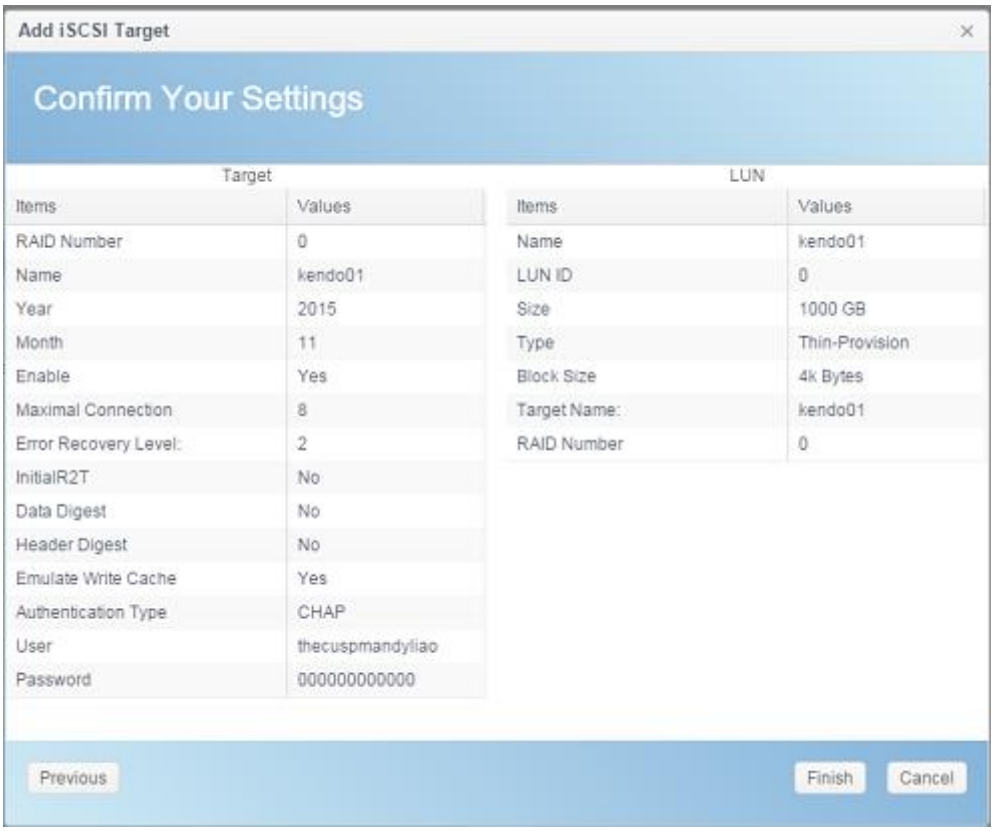
8. Enter a **LUN Name**.
9. When iSCSI target volume has been created, the LUN ID is configurable from 0 to 254 with a default of the next available number in ascending numerical order. The LUN ID is unique and cannot be duplicated.
10. Designate the capacity for associate **LUN**.
11. Choose **Thin-Provision** or **Instant Allocation**
12. Choose **[4K] block size** to have iSCSI target volume over 2TB barrier or **[512 Bytes] block size** in some application needed.

NOTE The iSCSI target volume creation will associate at least one LUN together. It can be assigned either "Thin-Provisioning" or "Instant Allocation".



Click Next

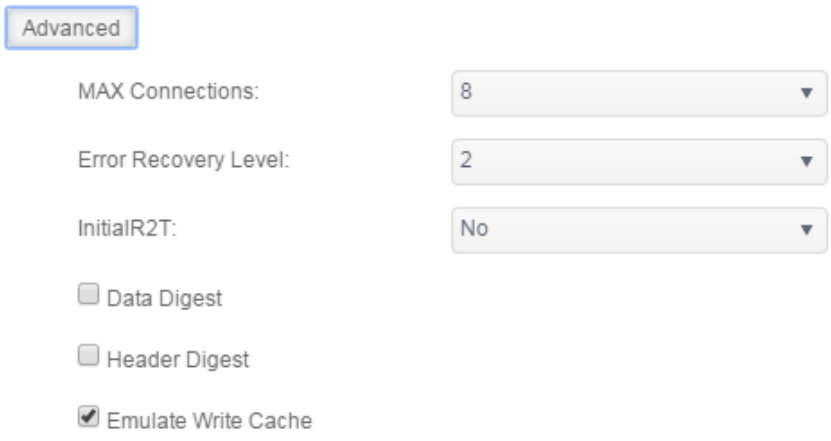
13. It will display the setting for associated iSCSI target creation. Click ***Finish*** to create the iSCSI volume.



Create iSCSI Volume	
Item	**Description**
iSCSI Target Volume	Enable or Disable the iSCSI Target Volume.
Target Name	Name of the iSCSI Target. This name will be used by the **Stackable NAS** function to identify this export share.
iqn_Year	Select the current year from the dropdown.
Iqn_Month	Select the current month from the dropdown.
Authentication	You may choose CHAP authentication or choose None.
Username	Enter a username.
Password	Enter a password.
Password Confirm	Reenter the chosen password
Mutual CHAP	With this level of security, the target and the initiator authenticate each other.
Username	Enter a username.
Password	Enter a password.
Password Confirm	Reenter the chosen password
RAID ID	ID of current RAID volume.
LUN Allocation	Two modes can be choose from: Thin-provision : iSCSI thin-provisioning shares the available physical capacity to multiple iSCSI target volumes. It allows virtual capacity to be assigned to targets prior to adding physical space when it has run out. Instant Allocation: Allocate available physical capacity to iSCSI target volumes.
LUN Name	Name of the LUN.
Unused	Unused space on current RAID volume.
Allocation	Percentage and amount of space allocated to iSCSI volume.
LUN ID	Specific Logic unit ID number.
iSCSI Block size	The iSCSI block size can be set under system advance option, default is 512 Bytes. [4K] block size while more than 2TB capacity will be configured in Windows XP. [512 Bytes] block size for application like VMware etc.

Advance Option

There are available options for the user to operate Thecus IP storage associated with iSCSI setting. The details are listed in the following screenshot. If the options are modified, the system will need to reboot for the changes to take place.



Max Connections
The maximum number of iSCSI connections.

Error Recovery Level
The Error Recovery Level (ERL) is negotiated during a leading iSCSI connection login in traditional iSCSI (RFC 3720) and iSER (RFC 5046).

ERL=0: Session Recovery
ERL=0 (Session Recovery) is triggered when failures within a command, within a connection, and/or within TCP occur. This causes all of the previous connections from the failed session to be restarted on a new session by sending a iSCSI Login Request with a zero TSIHRestart all iSCSI connections on any failure.

ERL=1: Digest Failure Recovery
ERL=1, only applies to traditional iSCSI. For iSCSI/SCTP (which has its own CRC32C) and both types of iSER (so far), handling header and data checksum recovery can be disabled.

ERL=2: Connection Recovery
ERL=2, allows for both single and multiple communication path sessions within a iSCSI Nexus (and hence the SCSI Nexus) to actively perform realligence/retry on iSCSI ITTs from failed iSCSI connections. ERL=2 allows iSCSI fabrics to take advantage of recovery in all regards of transport level fabric failures, and in a completely OS independent fashion (i.e. below the host OS storage stack).

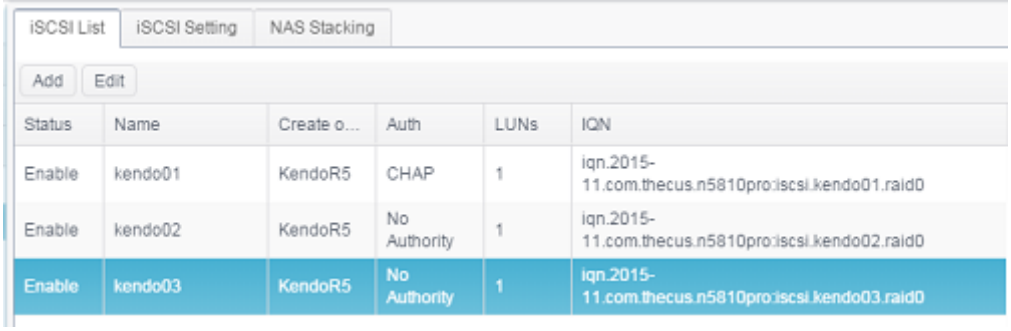
initialR2T
InitialR2T is a setting that only really matters over high-latency WAN connections and perhaps in some exotic situations with synchronous writes to very, very fast storage.

iSCSI CRC/Checksum
To enable this option, the initiator can connect with "Data digest" and "Header digest".

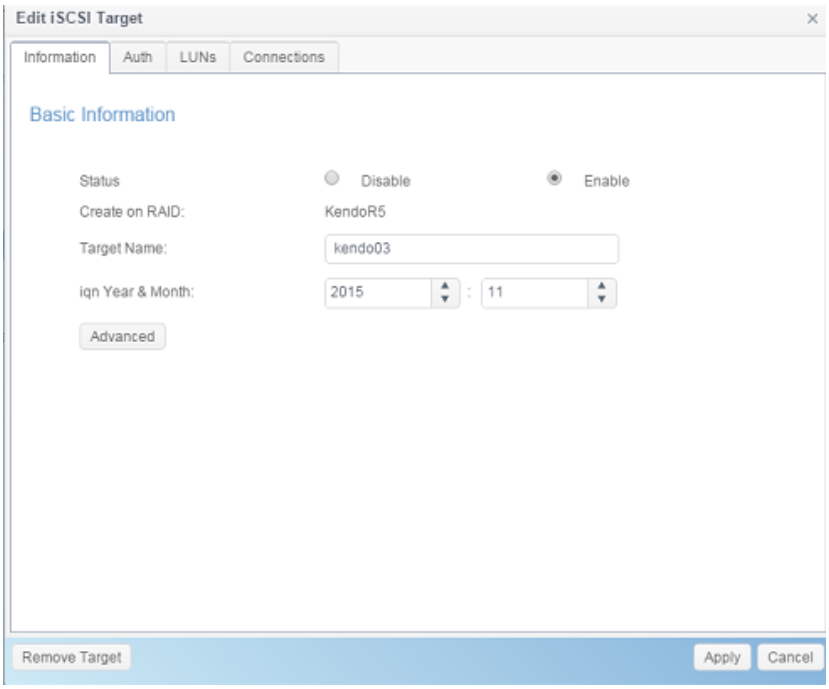
Emulate Write Cache
To enable this option, the performance will increase. .

Modify/Remove iSCSI Target
To modify or remove iSCSI target on the current RAID volume, follow the steps below:

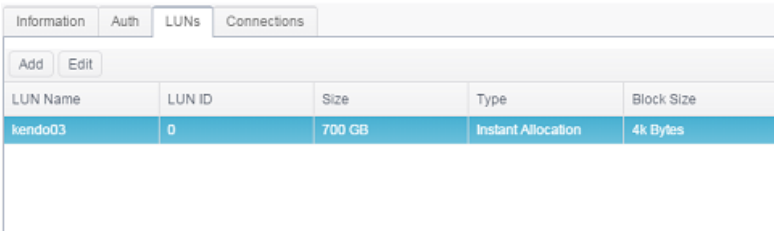
1. Under the **iSCSI List**, click on desired iSCSI volume you like to modify or remove.

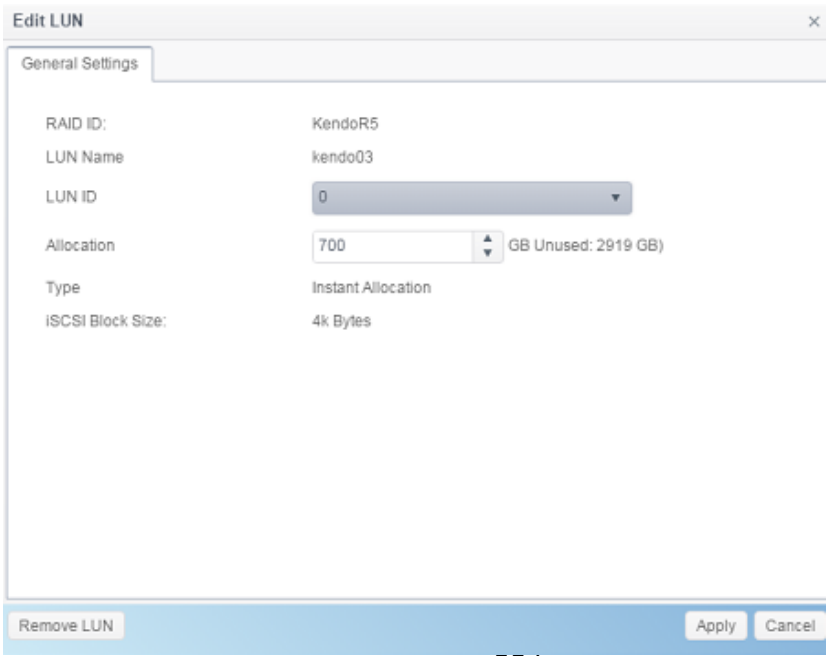


2. Click on **Edit** and associated screen will appear.
3. Click on **Remove Target** to remove it or make necessary change then press **Apply** to confirm.

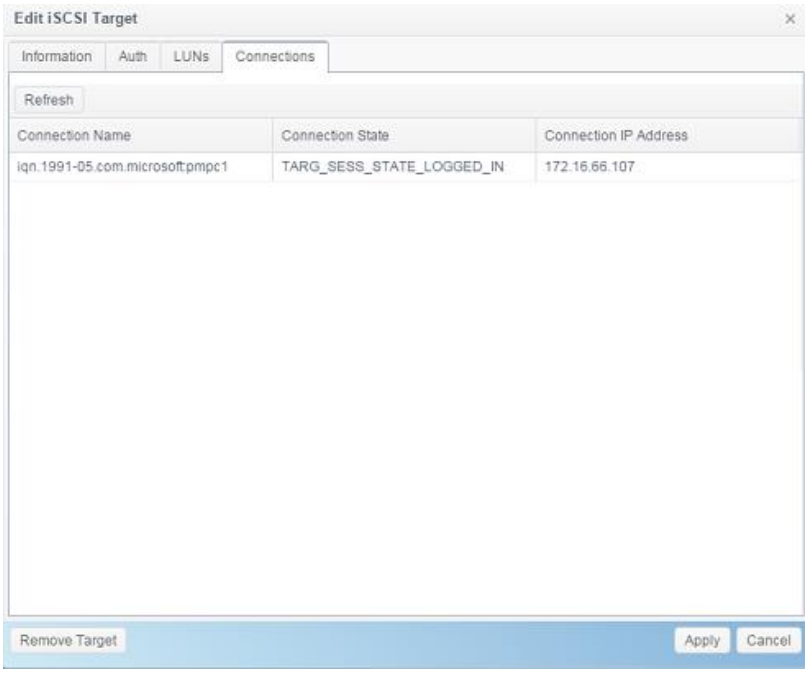


4. The associated LUN ID can be changed and also expand LUN capacity from LUNs tab.



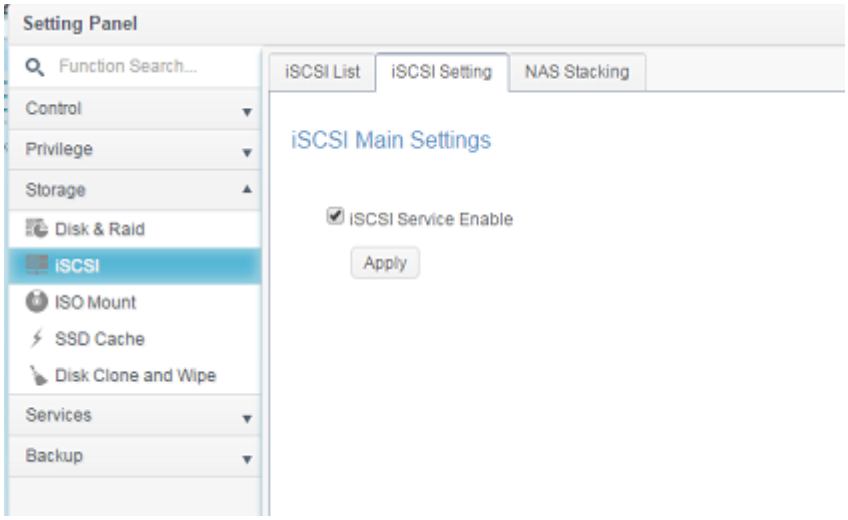


5. To check the connection for associated LUN, click on **Connections**.



iSCSI Setting

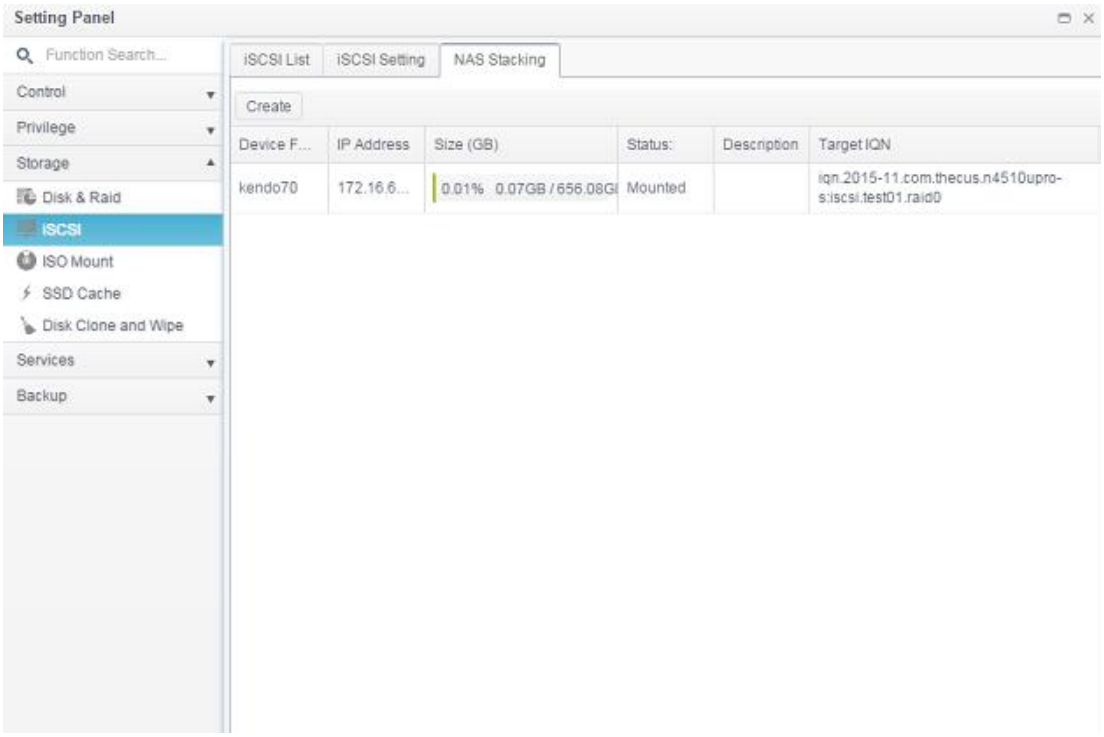
The iSCSI service can be enabled/disabled globally. If iSCSI service has been turned off then each individual iSCSI volume will be inaccessible.



NAS Stacking

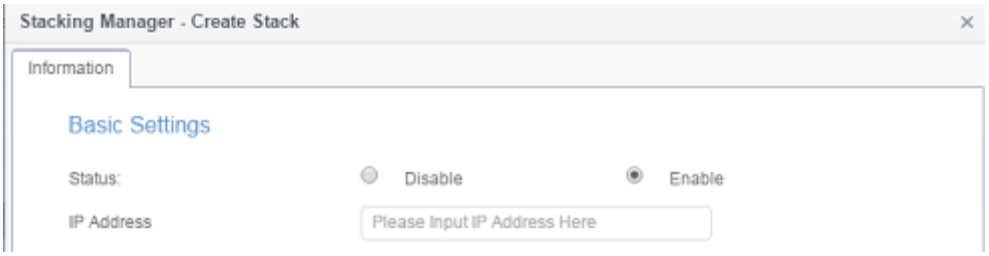
The Thecus IP storage's capacity can be expanded even further using the stackable function. With it, users can expand the capacity of their network storage systems up to 5 other stack target volumes which are located in different systems. These can be stacked through single network access like SMB or AFP acting as a share folder type.

From the main menu, the **NAS Stacking** feature is located in **iSCSI** under "**Storage**". Please refer the figure below for reference.

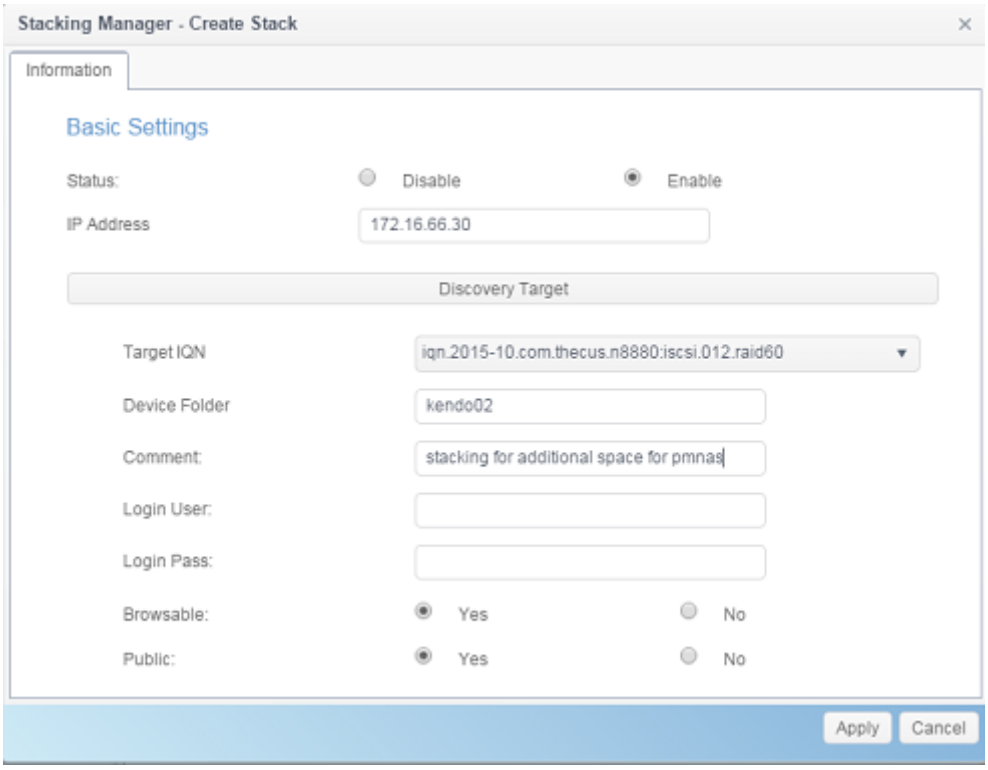


A. *Add a Stack Target Volume*
From the figure above, click ***Create*** to access the stackable target device configuration page. Please refer to the figure below:

With the added stack target you can "Enable" or "Disable" the stack target now or later depending on usage required.



Next, input the target IP address of the stackable device and click the ***Discovery Target*** button. The system will list available target volumes from the inputted IP address.

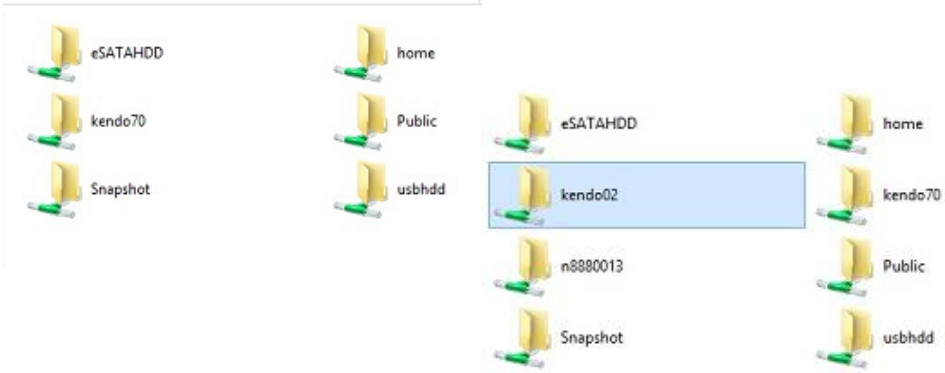


Select Target IQN from drop list whic will be the stacking device after connected.

The **Device Folder** will become the network share name and will be displayed through network access such as SMB. You may input **Comment** to tell the subject of this stack folder if needed.

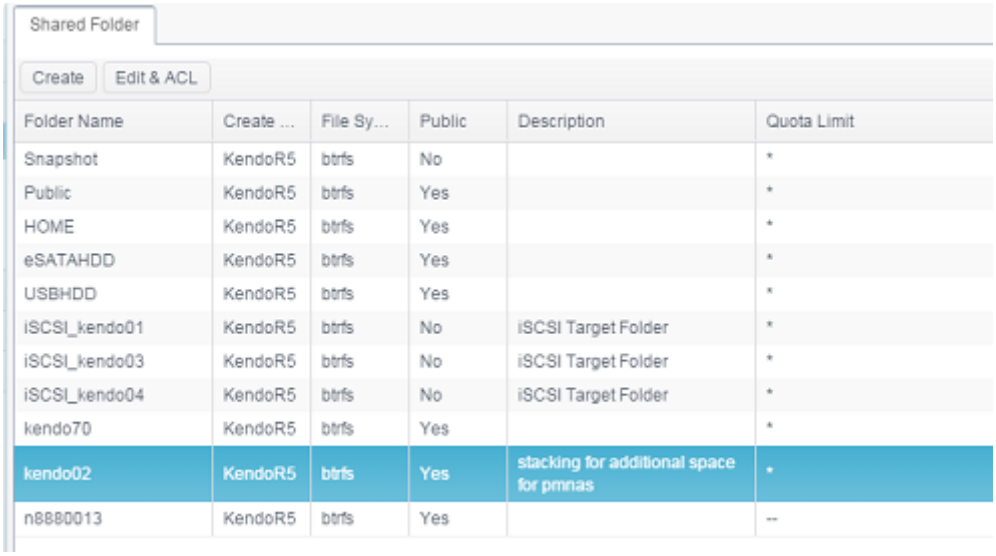
For this associated stacking device, you may need to input a valid user name and password to validate your access rights. If there is no user name and password needed to access target volume, then leave it blank.

From the figure above, the **Device Folder** is "kendo02". The figures below show the result before and after via Microsoft Network Access when settings have been completed.



The **Browseable** setting is the same method used for setting a system share folder. It designates whether or not this folder will be visible through web disk. You may refer to the figure below for reference when **Yes** and **No** are selected.

The **Public** setting will be set the same way as the setting for the system share folder associated with the ACL permission is. The sample above of Device Folder "Kendo02" can be found from share folder list.

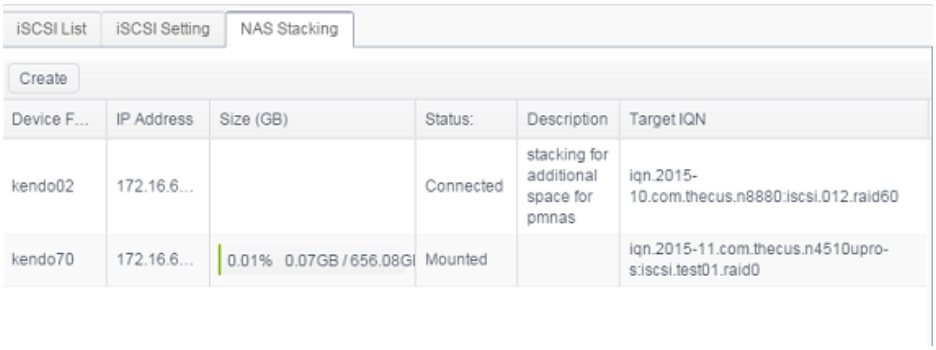


Click ***Apply*** to save your changes.

B. Activate a Stack Target

After your settings have been applied, the system will bring you back to the **NAS Stacking List** window as shown below. There is one stack target device that has been attached into this stack master.

With this newly attached stack target device, you will see the information displayed .



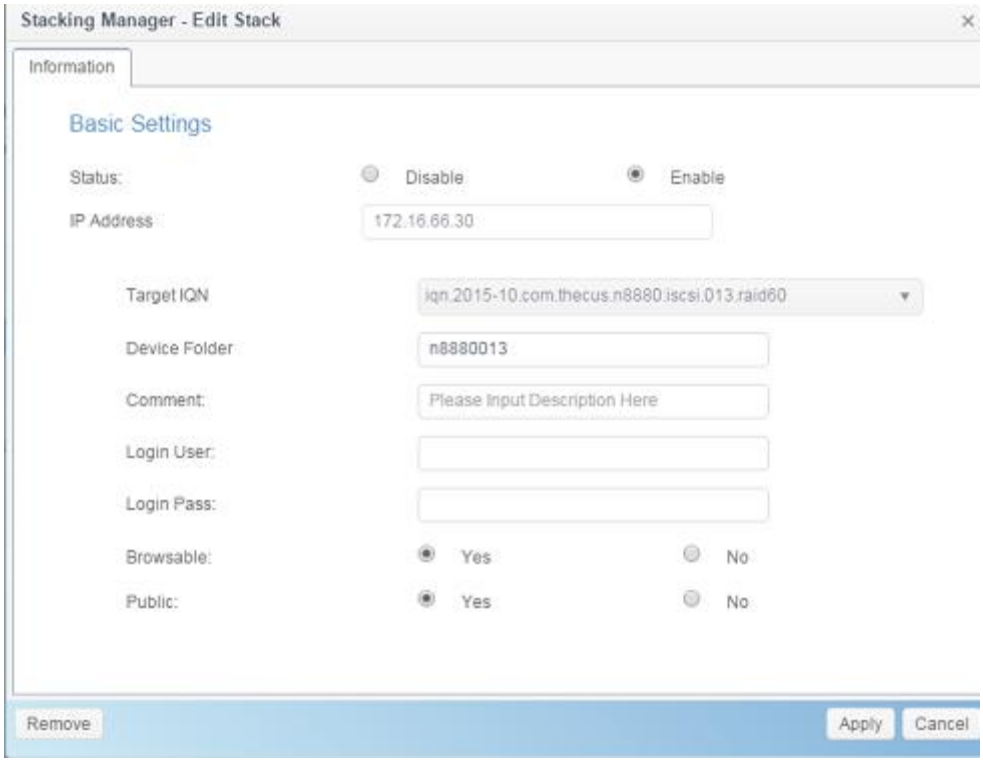
In general, clicking on associated stack target, if the attached stack target device has been used by another Thecus NAS as stack target volume, then the status **Mounted** will be displayed and system will recognize it straight away and display its capacity. Otherwise, the **Connected** will be displayed in **Status**. Now click on associated stack target and you will see the **File System Format** tab appear.

Click on it to proceed with formatting.

After the format is completed, the stack target volume will be created successfully. You will see the volume's capacity and status in the **NAS Stacking List** screen.

C. *Edit a Stack Target*

To make any changes to a stack target, select the corresponding stack target then click ***Edit***, and the system will bring up the following dialogue window:

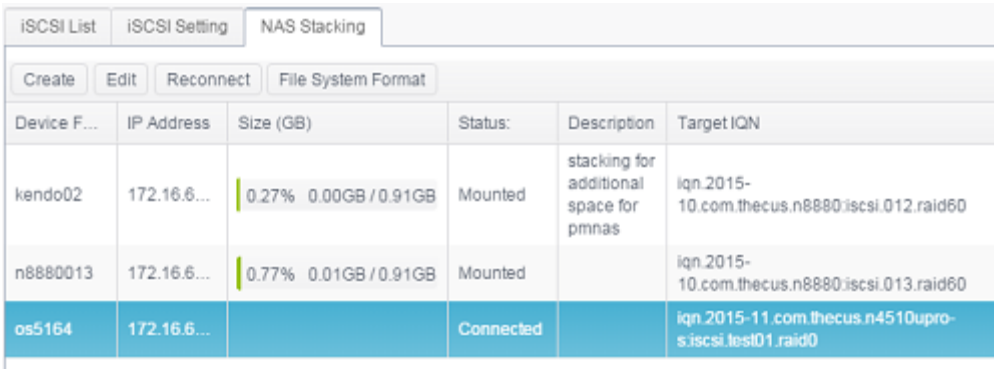


After your changes have been made, click ***Apply*** to confirm any modifications. Once changes are applied, the associated information will be updated on the **Stack Target List** window.

D. *Stack Target ACL*

Go to the **System Folder** section with associated **Device Folder** created by NAS stacking. The **ACL** settings will be exactly the same as the system folder that you may have setup previously.

E. *Reconnect a Stack Target*
This is used to enable stack target devices that may have been disconnected due to a power outage or a disconnected network. When this happens, the **Reconnect** button will become available. To attempt to reconnect the stack target, click ***Reconnect***.



ISO Mount

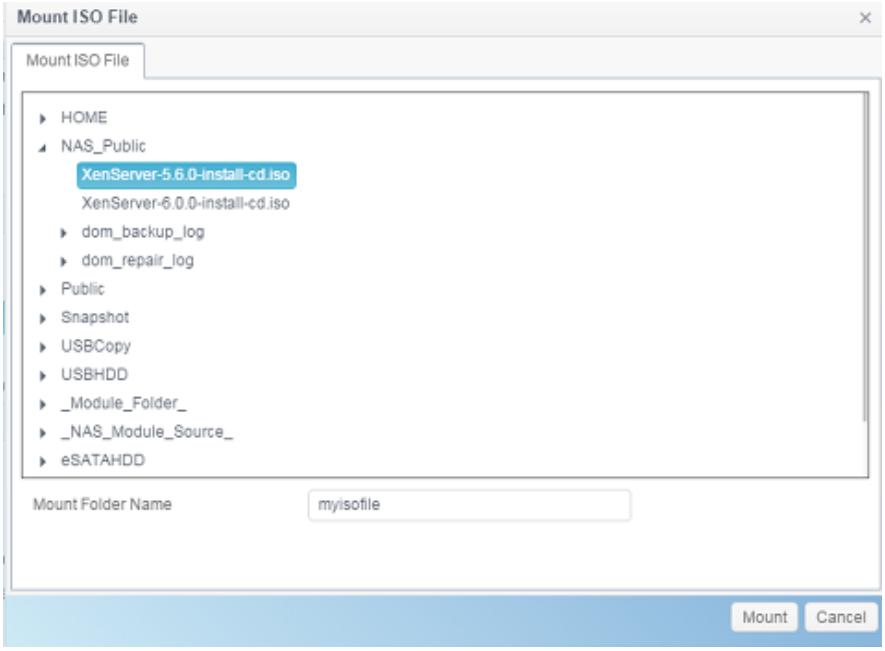
The ISO Mount feature is a very useful tool from the Thecus product line. With it, users can mount an ISO file and have the export name display all the details from the mounted ISO file.

From the Control Panel, the ISO Mount feature is located under "Storage".

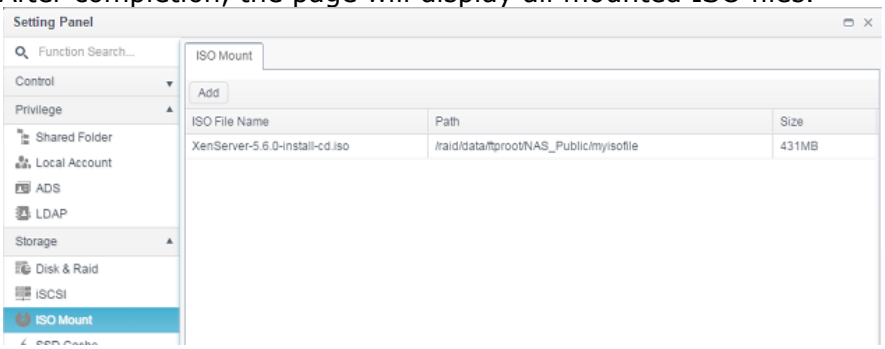
Select the **ISO Image** function and the ISO Image Mounting window will appear as shown below.

A. *Add an ISO file*
Click on the **Add** button and the available system share will appear.

To mount the new ISO file, select one ISO file from the associated share list and input the desired mounting name into the "Mount Folder Name" field. Click **Mount** to confirm the completion of the mounting.



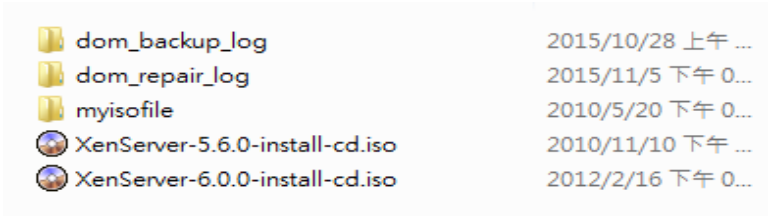
After completion, the page will display all mounted ISO files.



To unmount the image file, select the mounted ISO file from list then click **Unmount** to eliminate a mounted ISO file.

B. *Using ISO*

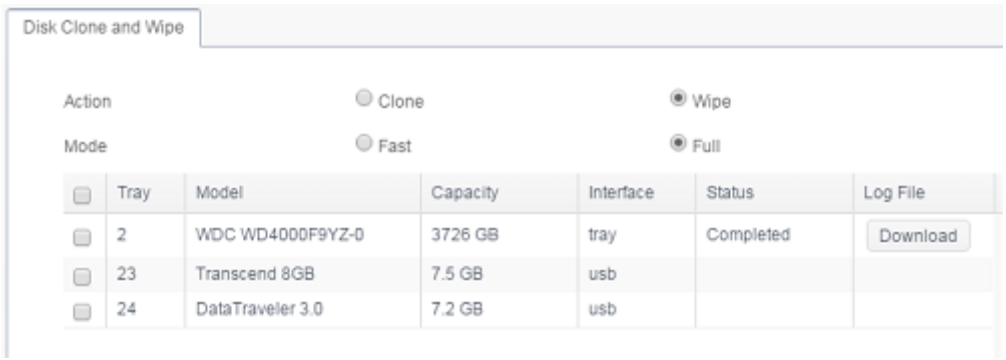
The mounted ISO image file will have a folder created from input "Mount Folder Name" and be located in the share folder same as selected ISO file. Please refer the screen shot below and folder "myisofile" can be found.



Disk Clone & Wipe

From the Control Panel, the Disk Clone and Wipe feature is located under "Storage".

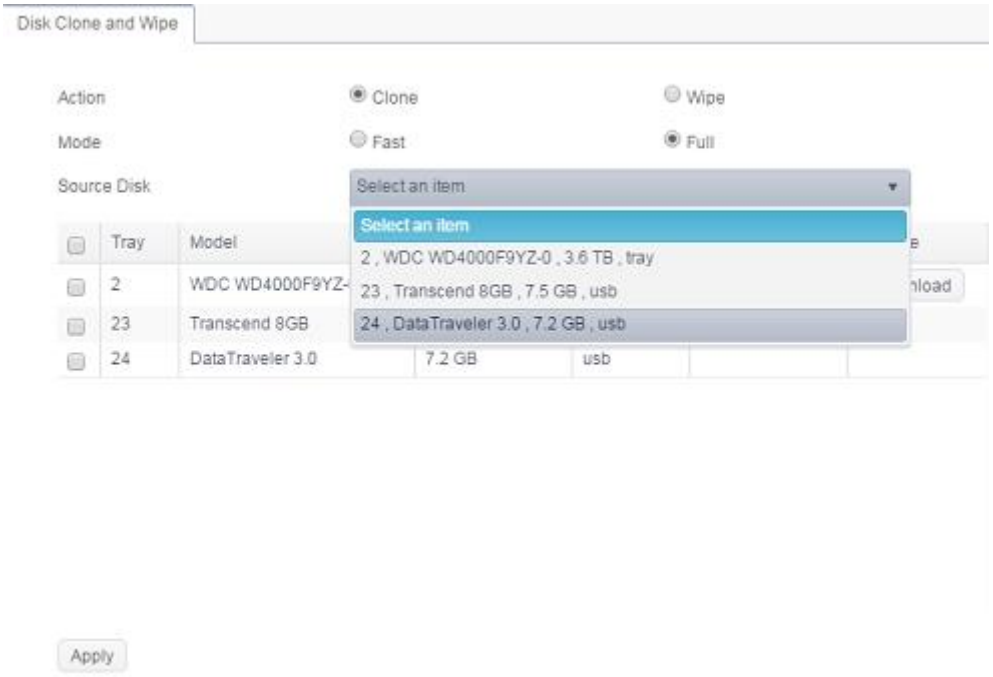
Select the **Disk Clone and Wipe** function and the unused internal and installed USB disks will list as shown below.

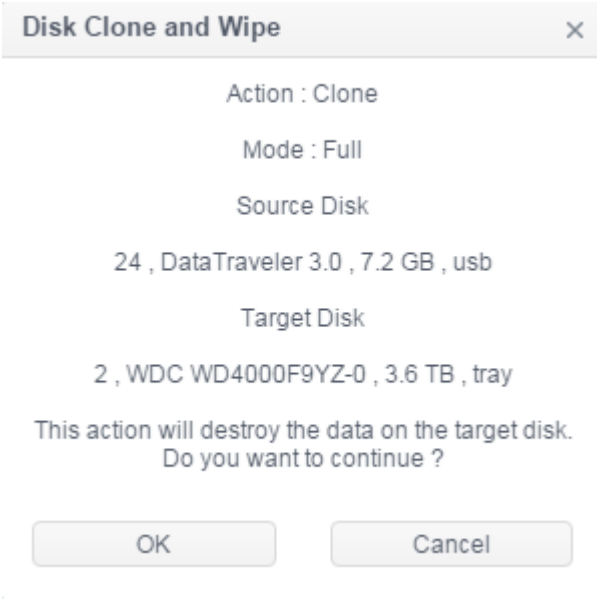


Disk Clone:

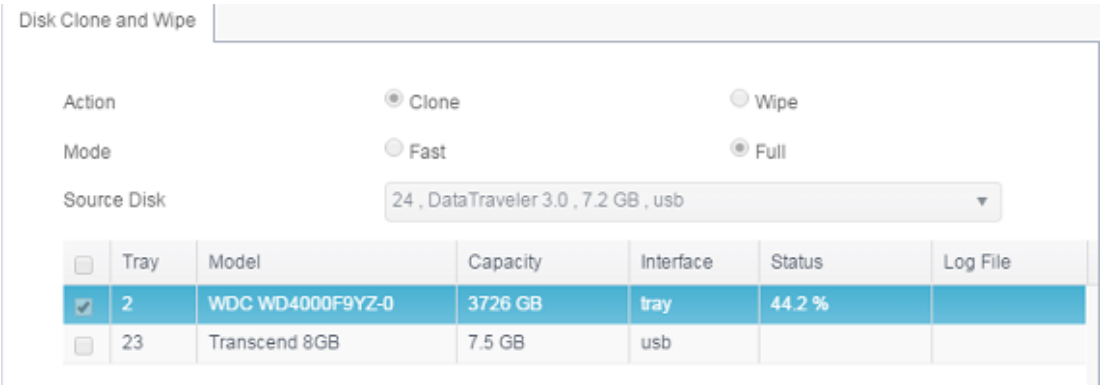
Unused Disks and plugin USB disks that have been installed on this storage device can utilize the disk clone function. If disks have already been configured in a RAID volume or as a spare disk, they cannot perform disk clone.
To start disk clone, select the source disk from the Source Disk drop down menu and target a disk from the dialog box as seen below. Carry on to press "Apply," then the task will start after confirmation. It may take a few hours depending on the size of the disk.

Please be sure the source disk is equal to or smaller than the target disk.





The task will list and status as shown below.

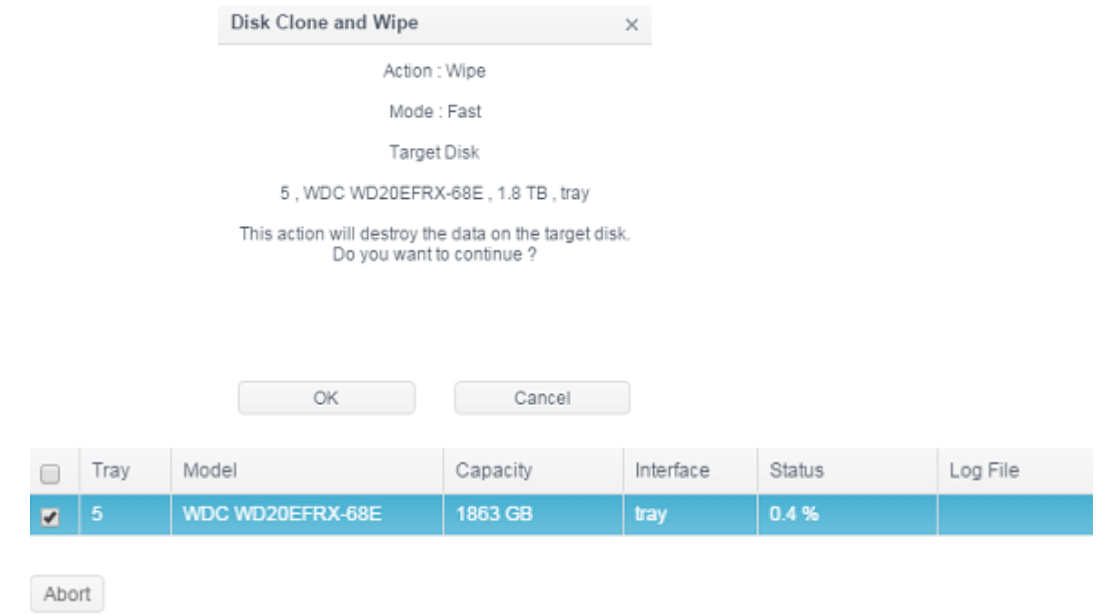


Disk Wipe:

Disk Wipe is able to erase data from selected disks. Again, disks that have already been configured in a RAID volume or as a spare disk cannot perform this function.

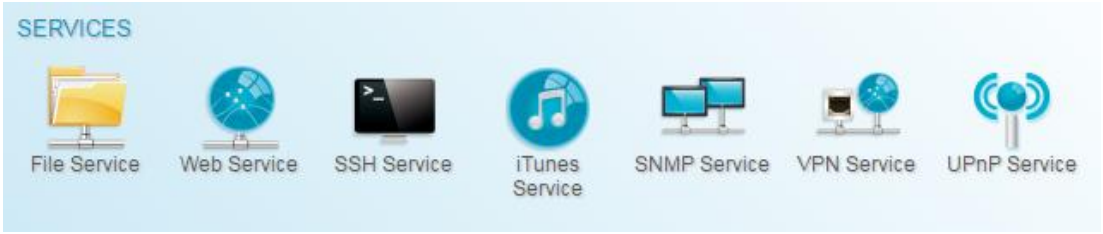
To start disk wipe, select the disk from the list and carry on to press “Apply,” then the task will start after confirmation. It may take a few hours depending on the size of the disk.

The task will list and status as shown below.



Disk Clone and Wipe	
Item	**Description**
Action	Click to choose to perform Disk Clone or Disk Wipe
Mode	2 options can be chosen: Fast: suitable for single disk to many tasks but less information to be displayed Full: suitable for single to single disk operation and will have a complete log recorded during operation
Source Disk	Listed available disks can used as the source disk while performing disk clone
Target Disk	Listed available disks can be used for disk clone or disk wipe
Apply	To save your settings.

Services

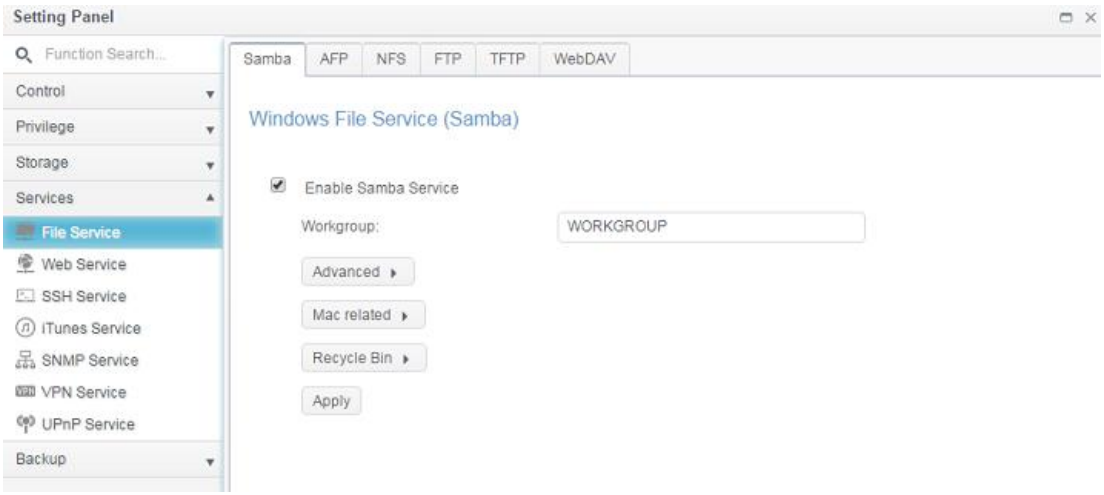


Use the Services menu to make network service support settings.

File Service

Samba

There are options allow Admin to Enable/Disable to operate Thecus IP storage associated with Samba / CIFS protocol.

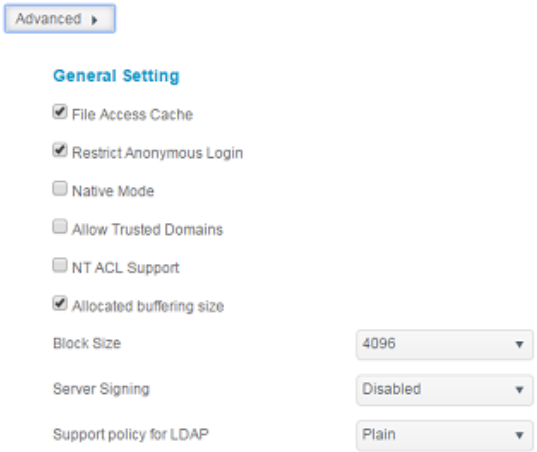


Samba Service
Used for letting the operating system of UNIX series and SMB/CIFS of Microsoft Windows operating system (Server Message Block / Common Internet File System).Do the link in network protocol. Enable or Disable SMB/CIFS protocol for Windows, Apple, Unix drive mapping.

NOTE

- In some environments, due to security concerns, you may wish to disable SMB/CIFS as a precaution against computer viruses.

For more options related to the Samba option, please click **Advanced** for details.



File Access Cache
File Access Cache is default **Enable**. This option will help to increase the performance while single client access the share folder in writing under SMB/CIFS protocol.

Restrict Anonymous Login
To enable this option, no matter there is share folder has been created in public access. The user account and password is needed from system to access under SMB/CIFS protocol. On the other hand, no more anonymous login is allowed.

Native Mode

The Thecus IP storage is supported Samba mode options. In the ADS environment with "Native" mode selected then Thecus IP storage is capable to become local master position.

Allowed Trusted Domain
This is useful if you only want your Samba server to serve resources to users in the domain it is a member of. As an example, suppose that there are two domains DOMA and DOMB. DOMB is trusted by DOMA, which contains the Samba server. Under normal circumstances, a user with an account in DOMB can then access the resources of a UNIX account with the same account name on the Samba server even if they do not have an account in DOMA. This can make implementing a security boundary difficult.

NT ACL Support
This setting controls whether Samba will attempt to map UNIX permissions into Windows NT access control lists.

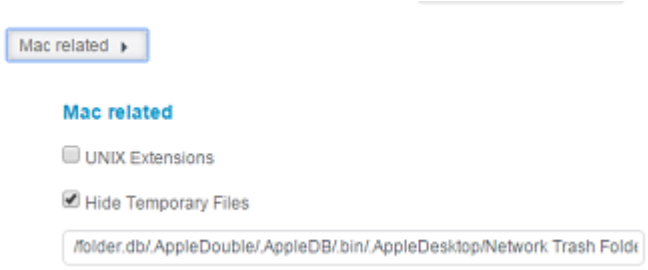
Allowed Buffering Size (Block Size)
This function controls the behavior of Samba when reporting available disk space. This function was added to allow advanced administrators to increase block size to increase write performance without re-compiling the code.

Disabled= 4k Enabled=256k

Server Signing
This is setting while Samba server has been used in US of FDCC. If the system has used only in Windows environment choose "Mandatory" otherwise "Auto".

is Support policy for LDAP
The client LDAP sasl wrapping defines whether ldap traffic will be signed or signed and encrypted (sealed). Possible values are *plain*, *sign* and *seal*.

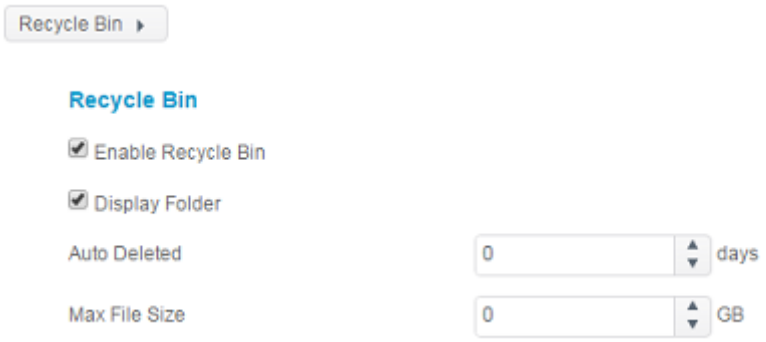
For Mac related option, please click on "Mac Related" for details.



UNIX Extension
The default is enabled for Samba usage,if there is a situation with using Mac OSX with smb connection, it may have permission issue. When it happens, please setup "UNIX Extension" disable to get issue solved.

Hide Temporary File
This is a list of files or directories that are not visible but are accessible

For Samba Recycled Bin related setting, please see below.



The Thecus IP storage is supported recycle bin via SMB/CIFS protocol.

Simply enable the "Recycle Bin" function and "Recycle Folder Display" then all of deleted files/folders will reside in the "_NAS_Recycle_(Associated RDID Volume)" share folder.

For example, the system has created 2 RAID volumes with ID "RAIDpm" and 'RAID". Then it will have 2 recycle bin folder appear as "_NAS_Recycle_RAID" and "_NAS_Recycle_RAIDpm".

There are 2 more setting could help to manage the recycle bin for deleted folders/files.

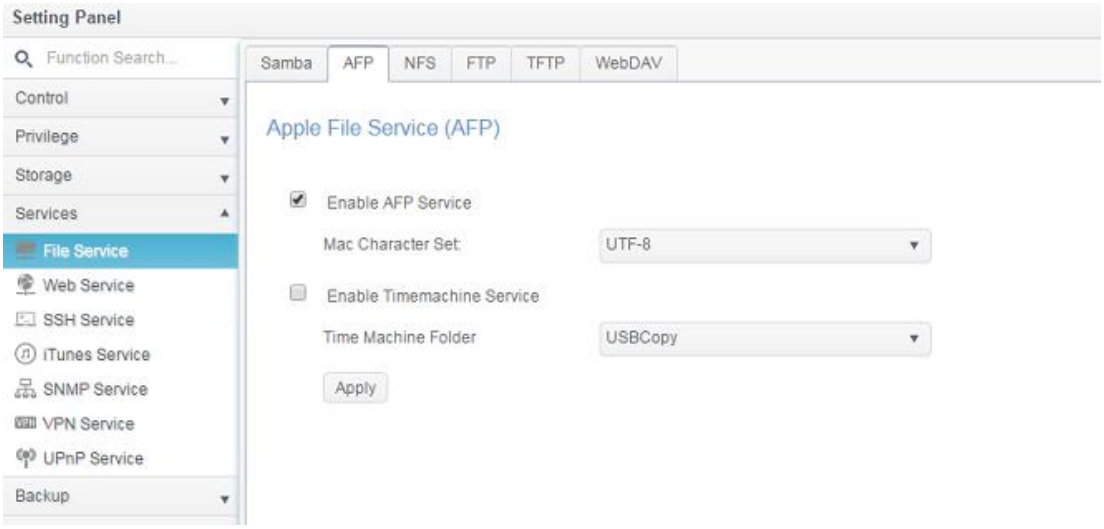
1. Setup the "Day" to remove deleted folders/files which has resided in recycle bin permanently. Left default value "0" if desired to clean up recycle bin manually.
2. Setup the "Size" for recycle bin to allow deleted folders/files can store. Left default value "0" with no limitation.

NOTE

- The deleted files/folders which have resided in recycle bin will keep its permission. On the other hand, only the admin and owner can view/read/write these folders/files.
- If deleted single file size is large than 2GB then it won't reside in the recycle bin but erase permanently.

AFP

From the **File Services** menu, choose the ***AFP*** item, and the **AFP Support** screen appears. This screen displays the configuration items for the Apple Filing Protocol. You can change any of these items and press ***Apply*** to confirm your settings.

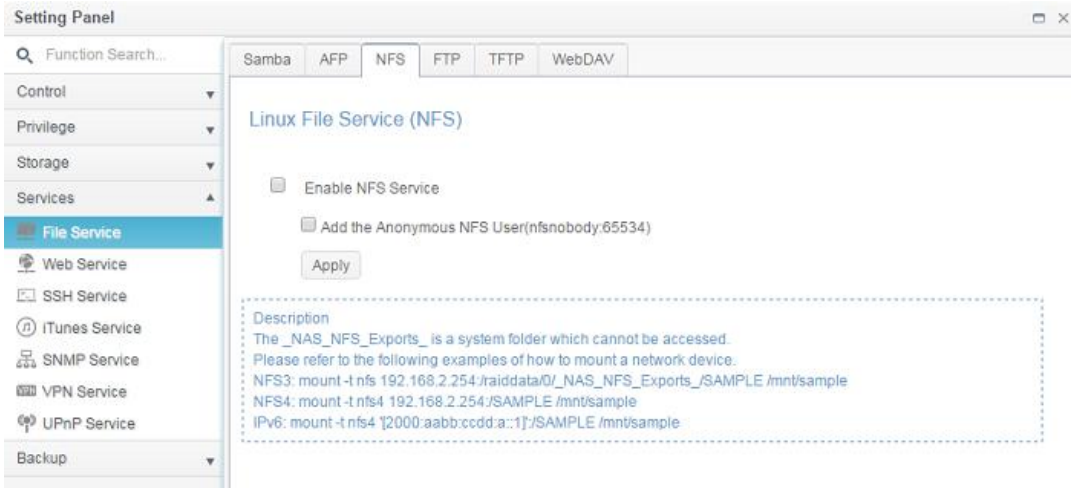


A description of each item follows:

Apple Network Configuration	
Item	**Description**
AFP Server	Enable or disable Apple File Service to use the Thecus IP storage with MAC OS-based systems.
MAC CHARSET	Specifies the code page from the drop down list.
Zone	Specifies Zone for Applet Talk service. If your AppleTalk network uses extended networks and is assigned with multiple zones, assign a zone name to the Thecus IP storage. If you do not want to assign a network zone, enter an asterisk (*) to use the default setting.
Time Machine	Click the enable checked box if you would like your MAC system to use the Thecus IP storage as MAC time machine backup.
Time Machine backup folder	Select from the drop down list to designate the folder for time machine backup destination.

NFS

From the **File Service** menu, choose the ***NFS*** item, and the **NFS Support** screen appears. The Thecus IP storage can act as an NFS server, enabling users to download and upload files with their favorite NFS clients. Press ***Apply*** to confirm your settings.

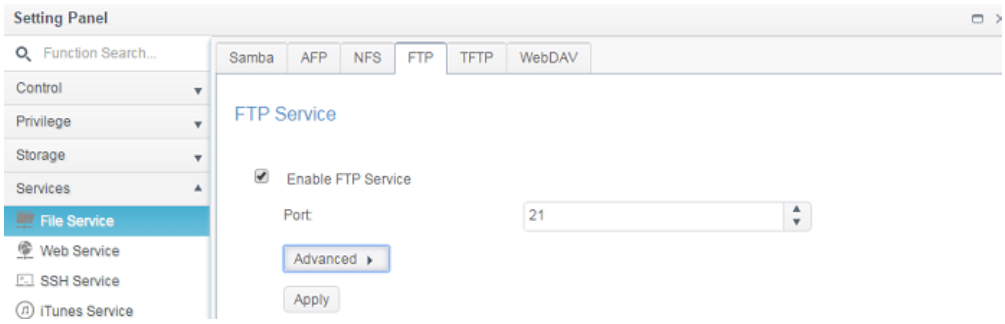


A description of each item follows:

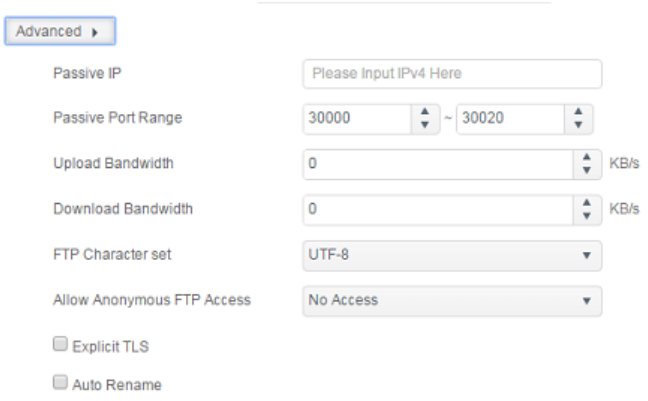
NFS Server Setting	
Item	**Description**
NFS	**Enable** or **Disable** NFS support.
NFS Threads	Choose the number of NFS threads.
Advanced	Checked to add the Anonymous NFS User.
Apply	Click ***Apply*** to save your changes.

FTP

The Thecus IP storage can act as an FTP server, enabling users to download and upload files with their favorite FTP programs. From the **File Service** menu, choose the ***FTP*** item, and the **FTP** screen appears. You can change any of these items and press ***Apply*** to confirm your settings.



Click on "Advanced" button to have more setting details.



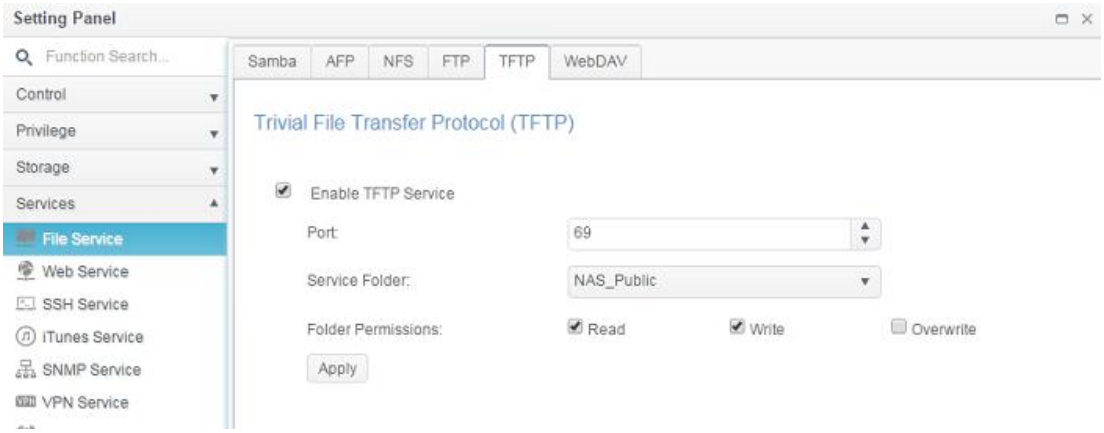
A description of each item follows:

FTP	
Item	**Description**
FTP	Enables FTP Service on the Thecus IP storage.
Port	Specifies the port number of an incoming connection on a non-standard port.
Passive IP	Input the public IP address of the router when the Thecus secure FTP server has been enabled. This can help to respond to the ftp client with proper communication information.
Passive Port Range (30000-32000)	Limited port range for the FTP server to use.
FTP ENCODE	If your FTP client or operating system does not support Unicode (e.g. Windows® 95/98/ME or MAC OS9/8), select the same encoding as your OS here in order to properly view the files and directories on the server. Available options are BIG5, HZ, GB2312, GB18030, ISO, EUC-JP, SHIFT-JIS and UTF-8.
Allow Anonymous FTP	**Upload/Download:** Allow anonymous FTP users to upload or

Access	download files to/from public folders. **Download:** Allow anonymous FTP users to download files from public folders. **No access:** Block anonymous FTP user access.
Upload Bandwidth	You may set the maximum bandwidth allocated for file uploads. Selections include **Unlimited, 1 ~ 32 MB/s.**
Download Bandwidth	You may set the maximum bandwidth allocated for file downloads. Selections include **Unlimited, 1 ~ 32 MB/s.**
Explicit TLS	Enable or disable Security TLS, be sure the client FTP software has also security TLS setting enabled.
Auto Rename	If checked, the system will automatically rename files that are uploaded with a duplicate file name. The renaming scheme is `[filename].#`, where # represents an integer.

TFTP

Thecus IP storage can act as a TFTP server, enabling users to download and upload files with their favorite TFTP programs. From the **File Service** menu, choose the ***TFTP*** item, and the **TFTP** screen appears. You can change any of these items and press ***Apply*** to confirm your settings.

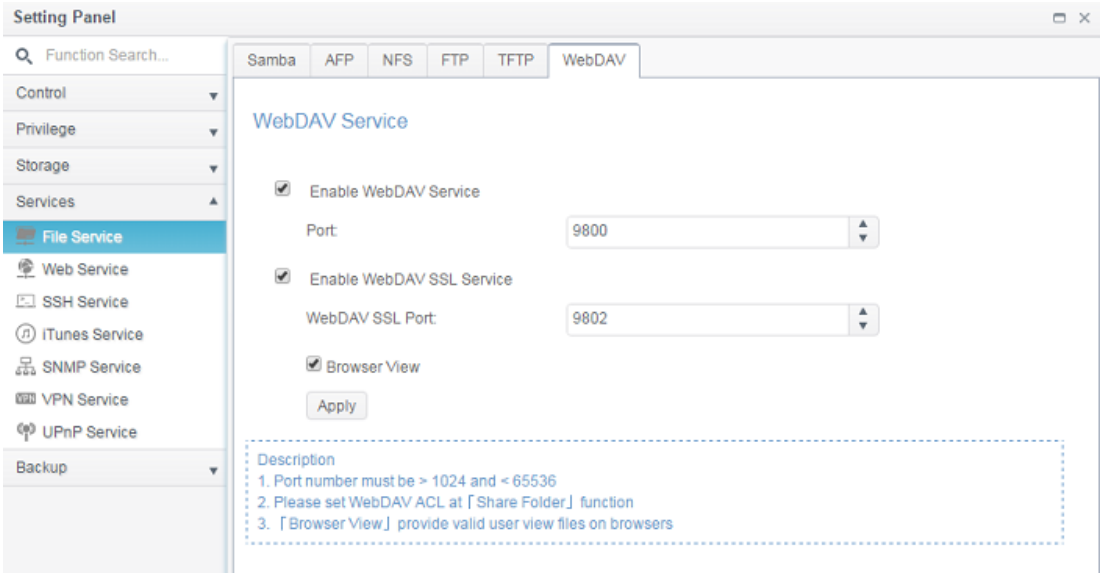


A description of each item follows:

TFTP	
Item	**Description**
TFTP	Enables TFTP Service on the Thecus IP storage.
IP	Checked WAN/LAN1 or LAN2 to enable port use
Port	Specifies the port number of an incoming connection on a non-standard port.
Share Folder	Select the file stored folder, it cannot be empty.
Folder Permission	Select the folder permission

WebDAV

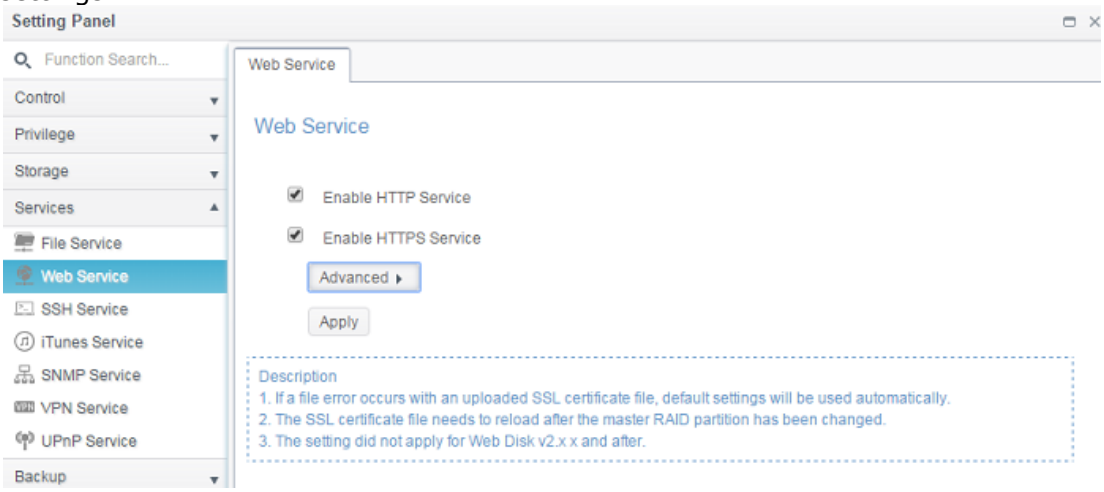
The WebDAV is an extended protocol of http(s) which allows remote access to your NAS system.
To begin using WebDAV and WebDAV SSL, simply click enable and provide the port number. The default port number is 9800, under normal circumstances this will not need to be changed.



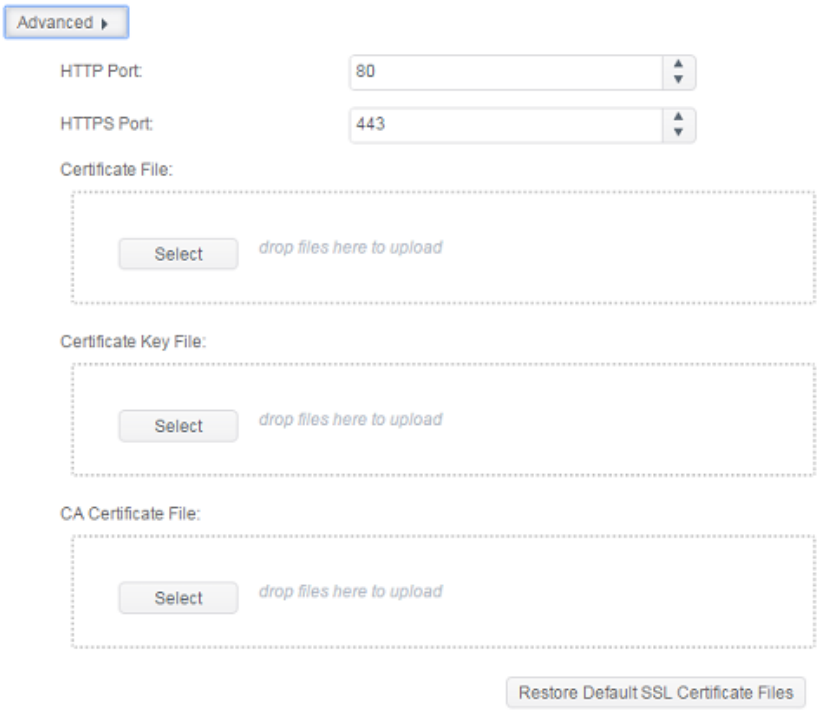
WebDAV Configuration	
Item	**Description**
WebDAV Service	Press the ***Enable*** button to activate WebDAV service and specify the port number if it needs to change from the default value. P.S. Port number is limited to greater than 1024 and less than 65536
WebDAV SSL Service	Press the ***Enable*** button to activate WebDAV SSL service and specify the port number if it needs to be changed from the default value. P.S. The ort number is limited to greater than 1024 and less than 65536
Browser View	Press the Enable button and viewing the share folder list through the browser will be allowed
Apply	Click “Apply” to confirm the changes.

Web Service

From the **Services** menu, choose the **Web Service** item, and the **Web Service** screen appears. This screen displays the service support parameters of the system. You can change any of these items and press ***Apply*** to confirm your settings.



Click on the **Advanced** button to have more setting details.



A description of each item follows:

Web Service	
Item	**Description**
HTTP (WebDisk) Support	Enable or disable WebDisk support. Enter the port number if this option is enabled. The port number is default 80.
HTTPs (Secure WebDisk) Support	Enable or disable secure WebDisk support. Enter the port if this option is enabled.
Certificate Type	Select "User" if there is available Certification ID ex. Apply from VeriSign. Or using system default by select "System".
Certificate File	Upload Certificate File if choose Certificate type "User".
Certificate Key File	Upload Certificate Key File if choose Certificate type "User".

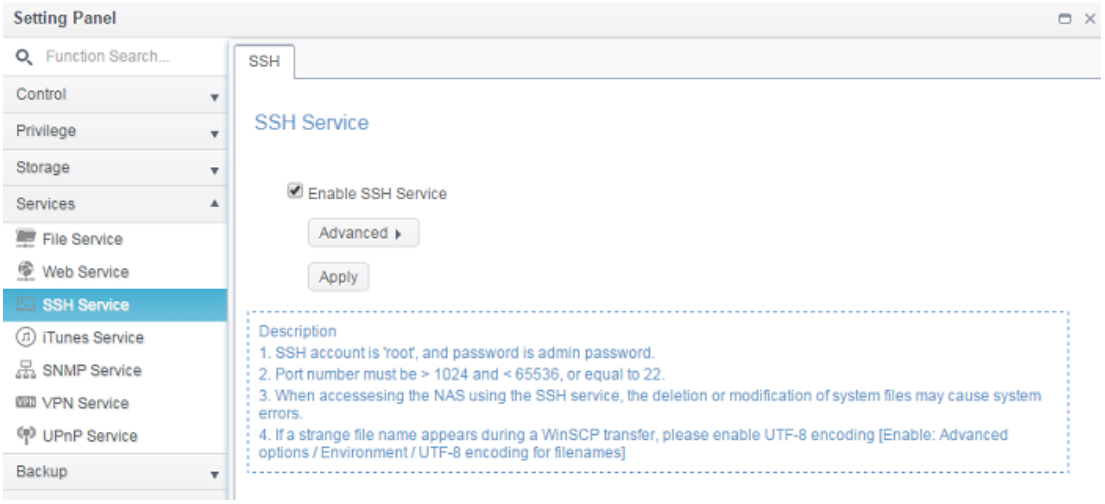
CA Certificate File	Upload CA Certificate File if choose Certificate type "User".
Restore All SSL Certificate Files	Click to set back to default certification details.
Apply	Click "Apply" to confirm the changes.

NOTE

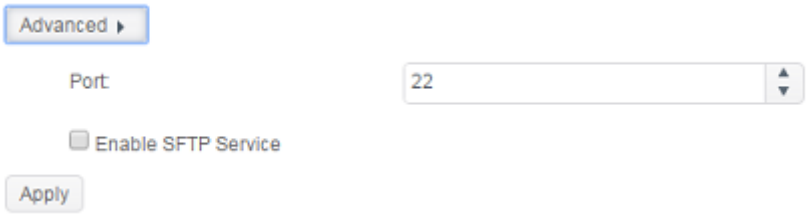
- Disable HTTP support and Enable Secure HTTP support to guarantee secure access.

SSH Service

The device is now SSH protocol supported. It allows user to use SSH and have console to manipulate as needed. The SSH default login user name is "root" with full privilege and password is admin's password. The default admin password is "admin" so once the admin password has changed then SSH login need to change the password too.



Click on **Advanced** button to have more setting details.



A description for each item as following:

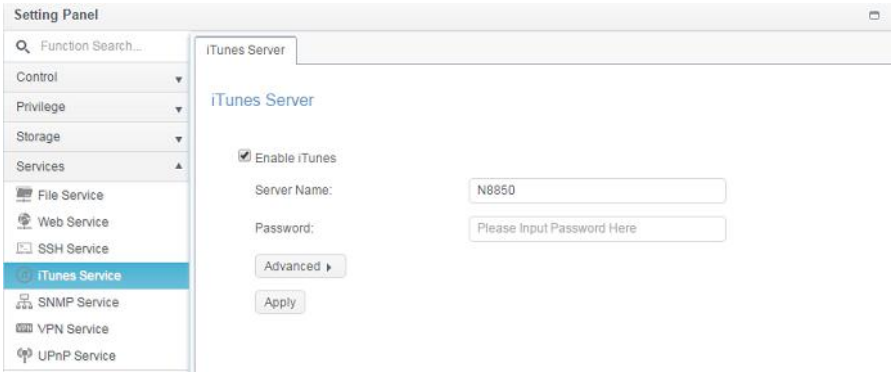
SSH	
Item	**Description**
SSH Service	Enable or disable SSH service.
Port	The port number is default 22.
SFTP	Enable or disable SFTP protocol under SSH service.
Apply	Click "Apply" to confirm the changes.

iTunes Service

With the built-in iTunes server capability, Thecus IP storage enables digital music to be shared and played anywhere on the network!

From the **Services** menu, choose the ***iTunes Service*** item, and the **iTunes Server Configuration** screen appears. You may enable or disable the iTunes

Service from here. Once enabled, enter the proper information for each field and press ***Apply*** to save your changes.



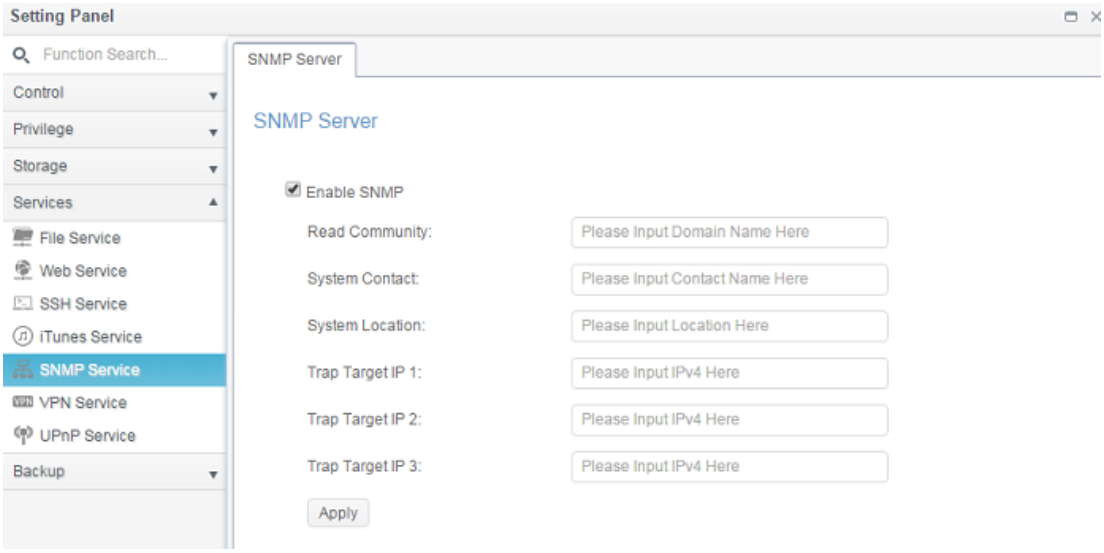
Click on "Advanced" button to have more setting details.

See the following table for a detailed description of each field:

iTunes Configuration	
Item	**Description**
iTunes Service	Enable or disable the iTunes Service.
iTunes Server Name	Name used to identify Thecus IP storage to iTunes clients.
Password	Enter a password to control access to your iTunes music.
Rescan Interval	Rescan interval in seconds.
Tag Character Set	Specify tag encoding for MP3 files stored in Thecus IP storage. All ID3 tags will be sent out in UTF-8 format.
Music Folder	Select from drop down list for music location of associated iTunes server on the network

SNMP Service

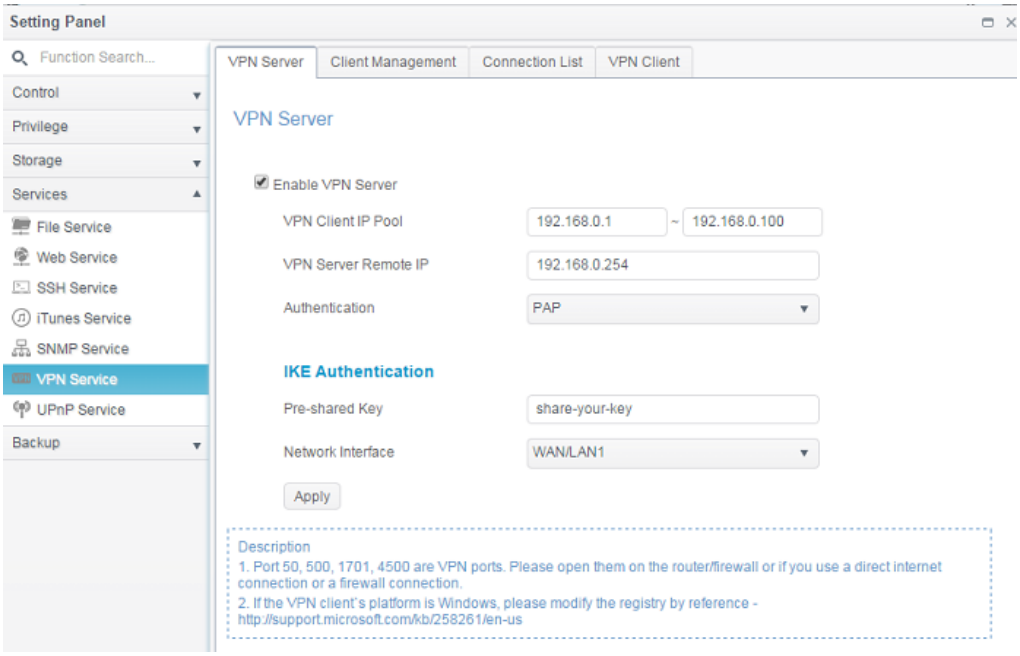
From the **Services** menu, choose the **SNMP** item and the **SNMP Support** screen appears. You could enable the SNMP function and fill in the related information in each field. With the SNMP management software, you can get other system's basic information.



VPN Service

VPN Server

This storage device provides VPN server service and this allows remote access to this device via a secure connection. Settings can be found in the "VPN Service" tab as seen below



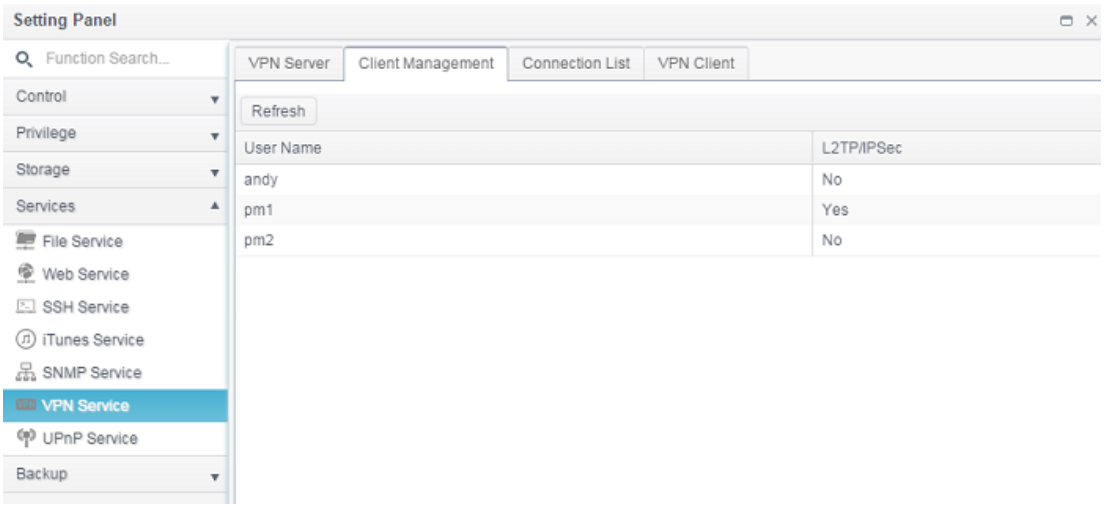
To setup your VPN server you must first choose the NIC interface from the drop down menu and complete the rest of the necessary information.

Below is a description of each item:

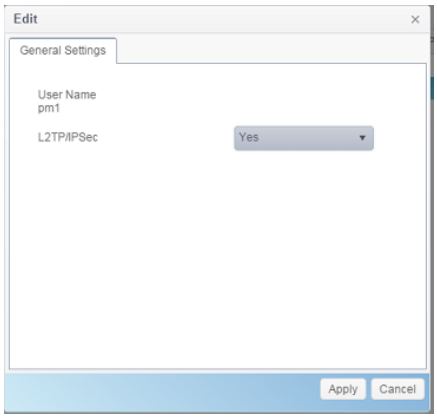
VPN Server	
Item	**Description**
Enable VPN Server	Check to enable VPN server service
VPN Client IP Pool	Input the IP range for client IP.
VPN Server remote IP	Input the IP for the VPN server for VPN client connection
Authentication	The default is PAP, can't change.
IKE Authentication	Internet Key Exchange for authentication while connection is made.
Pre-shared key	Input the key for connection authentication in between VPN client and server.
Network Interface	Select the NIC interface to use for VPN server
Apply	Click "Apply" to confirm the changes.

Client Management

For the VPN client access control, simply click on "Client Management" tab. It will list all the users on this system and default "**not allowed**" for VPN connection.



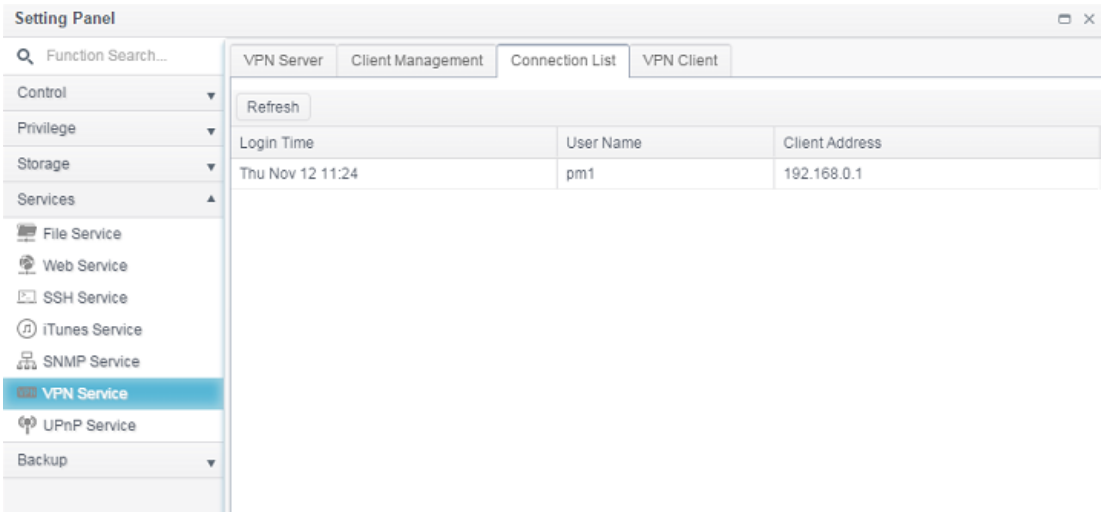
Click on associated user and **Edit** button to change the accessibility.



Connection List

To get the on-line connection list, click on the "Connection List" tab. It will display connected users with associated connection information.

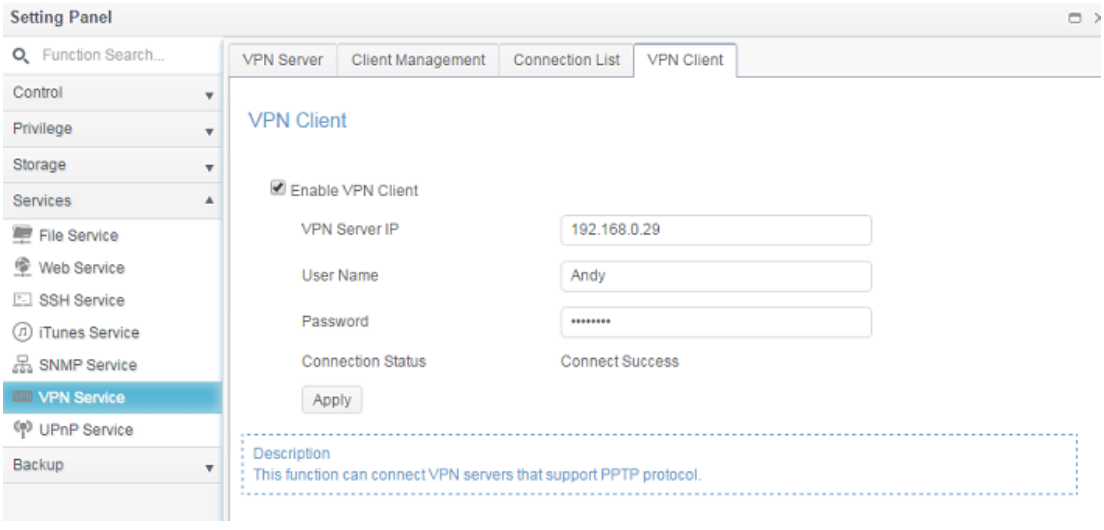
NOTE The VPN server only supports L2TP/IPSec connection.



NOTE The VPN server only supports L2TP/IPSec connection.

VPN Client

To have this storage device join a Virtual Private Network, simply provide a VPN server IP address and a valid login user name and password. Once the input information has been confirmed, the connection will be made. This storage device will be capable of playing a role as a local device to communicate with other systems.

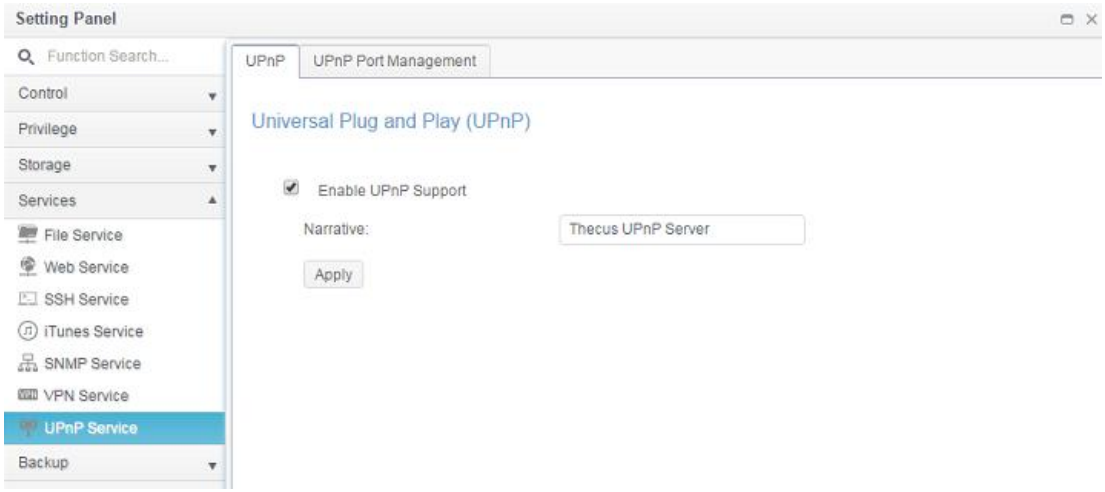


NOTE

- Please notice that the connection to the VPN server only supports PPTP.

UPnP

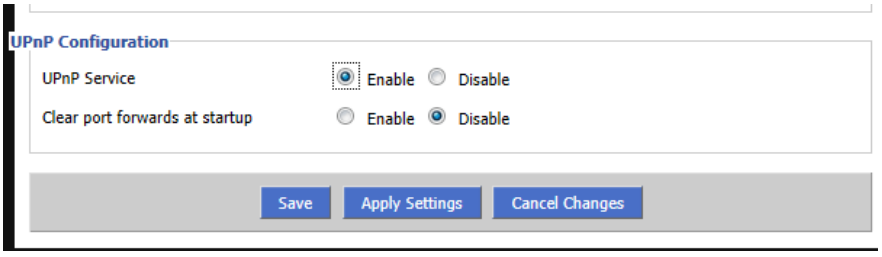
This device supports UPnP Media server, which allows users to play media files with UPnP client (ex. DMA devices). Enable or disable Universal Plug and Play protocol. UPnP helps to find the IP address of Thecus IP storage.



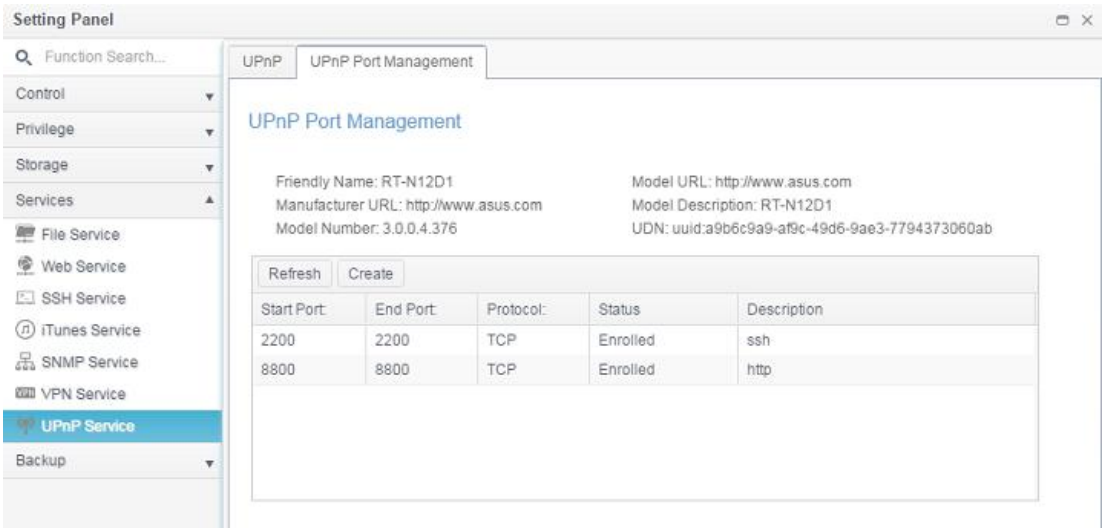
UPnP Port Management

One of the most convenient ways to allow users to access required services such as FTP, SSH, web disk and http etc. from Internet environment is setting UPnP port management.

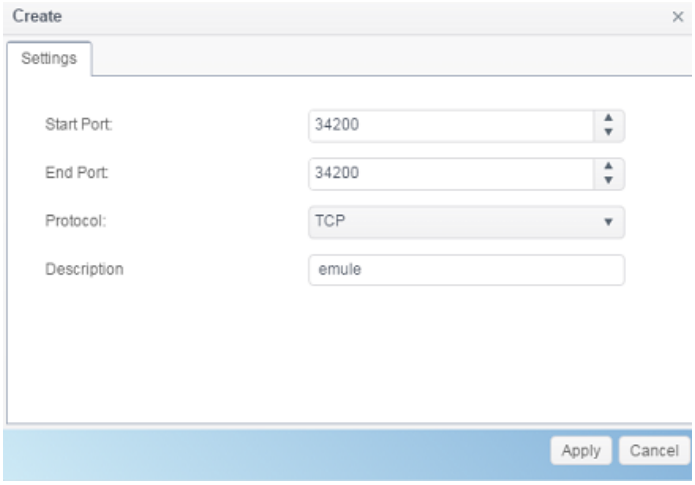
To set up this UPnP port forwarding feature, please be sure that the router has "UPnP Service" Enabled. The following is an example from one of the router manufacture with UPnP Configuration page.



After the router has enabled "UPnP Service" then you will have information come from associated router to UPnP port management as shown in the screen shot below.



Click "Create" to add more port mapping from Internet to access desired services or press "Refresh" to get most updated list.

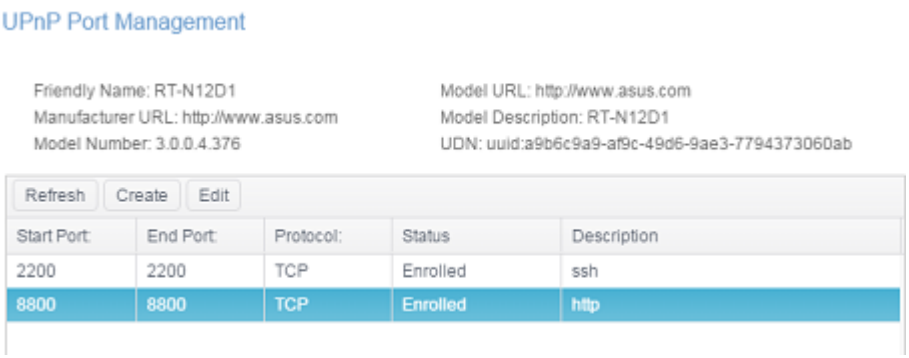


A description for each item as follows:

UPnP Port Management	
Item	**Description**
Start port	Specific port number starts with.
End port	Specific port number ended
Protocol	Choose the protocol for port forwarding needed.
Description	Specific the port services if applicable.
Apply	Click "Apply" to confirm the changes.
Cancel	Click "Cancel" to abort the changes

WARNING **Some of the routers do not allow the input of port number below 1024. So it may have resulted "setting fails".**

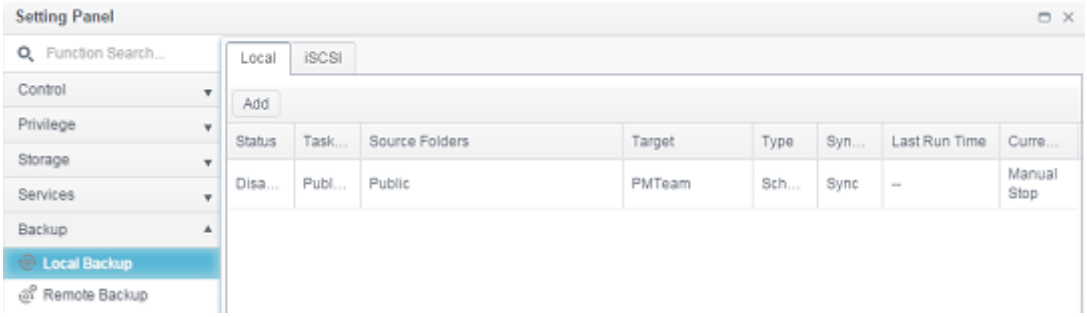
To modify or remove listed role, click on associated item then press **Edit** to carry on necessary action.



Backup

Local Backup

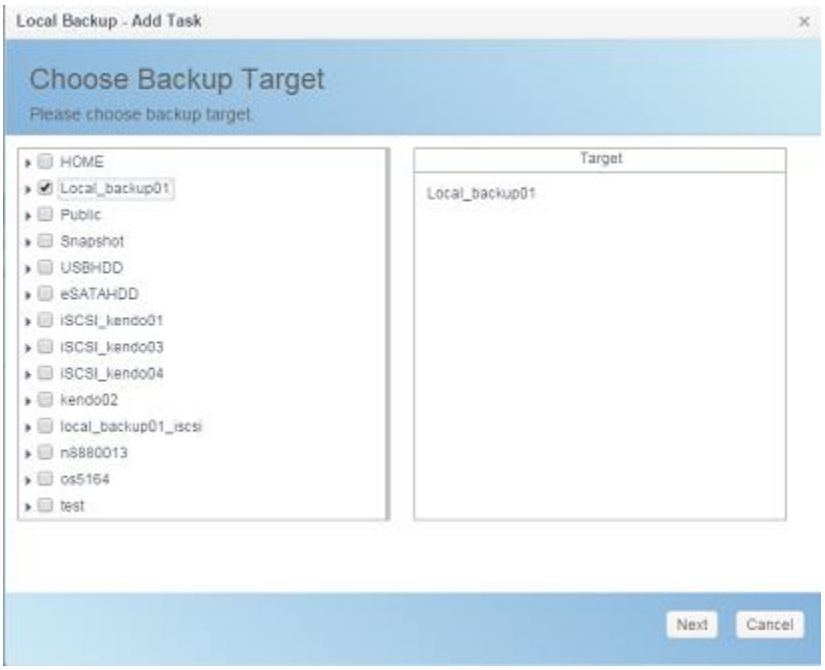
(Remote Backup/details in next section) (Local Backup)



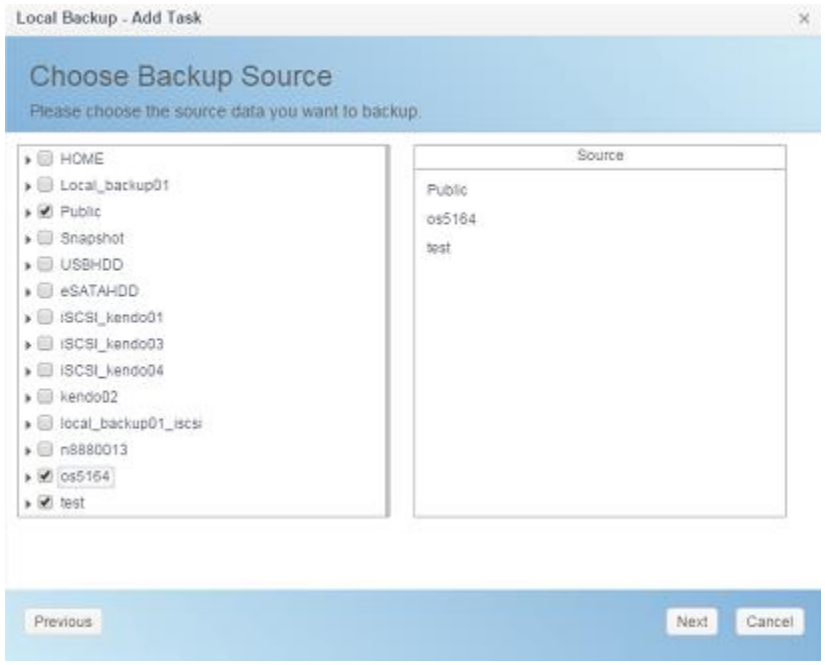
Local File/Folder Backup

Add Task:
From "Local" tab click on **Add** button and the setting screen will appear as below. Follow the steps to complete the setting.

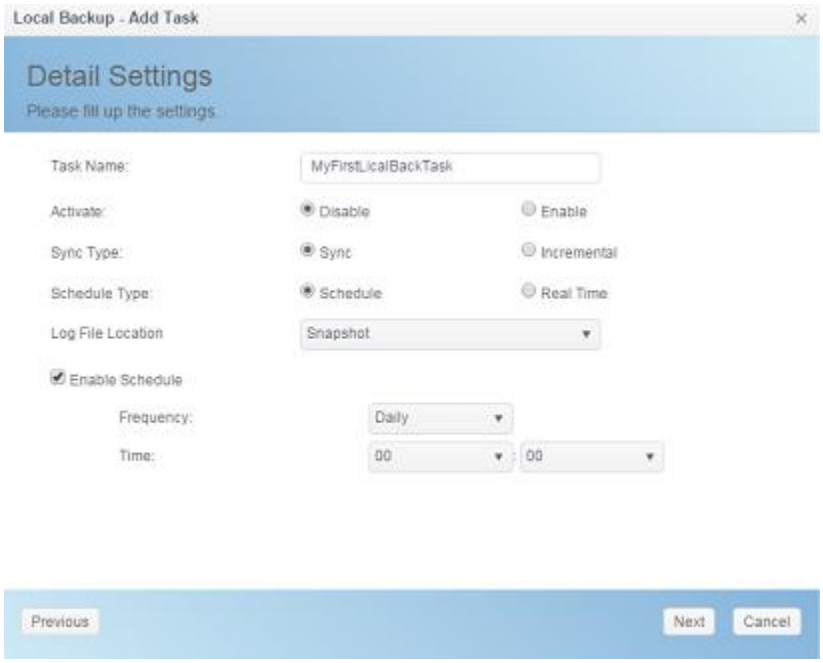
1. Choose backup target folder, this is the destination where the files/folders backup to.



2. Choose source folder to backup. The multiple folders selection is allowed.

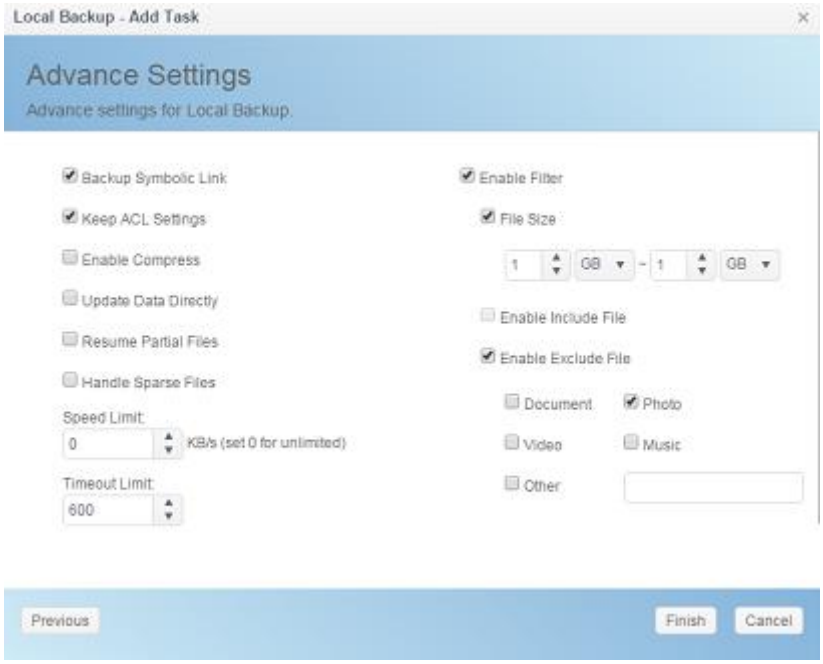


3. Input task name and related options.



Add Rsync Backup Task	
Item	**Description**
Task Name	This is how this task will appear in the task list.
Activate	Enable to activate task or disable to execute later.
Sync Type	Sync mode: Makes your source match your target completely; deleting and adding files on your target as they are deleted and added on your source. Incremental Mode : Makes your source match your target and keep all old files; adding files on your target as they are added on your source, but NOT deleting files on your target as they are deleted on your source.
Schedule Type	Real time: It will backup folders/files from source to target on the fly. On the other hand, any changes from the source will back up to the target right away. Schedule: The task will start only according to the schedule.
Log Location	Choose the folder to save the log details while the task is executed.
Enable Schedule	If backup is set as "Schedule", please input the related period and time.

4. More advanced settings

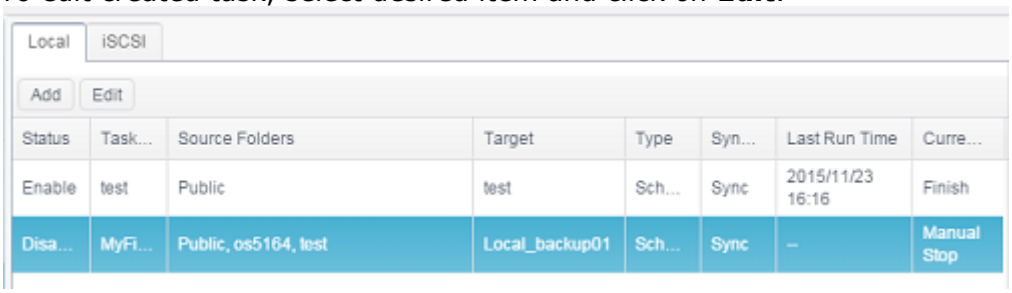


5. Click Finish to complete task added.

Add Rsync Backup Task	
Item	**Description**
Backup Symbolic Link	
Keep ACL Setting	It will backup not just data itself but also ACL configuration with associated folders/files.
Enable Compress	With this option, compress the file data as it is sent to the destination machine, which reduces the amount of data being transmitted – something that is useful over a slow connection.
Update Data Directly	It could by pass temp file creation wile copy file from source to destination. It will more efficiency but risky if any interrupt during operation.
Resume Partial File	Enable this could keep the partial file which should make a subsequent transfer of the rest of the file much faster
Handle Sparse File	Try to handle sparse file efficiently so they take up less space on the destination.
Speed Limit	Input the bandwidth control for data backup operation.
Timeout Limit	Setup the timeout when trying to build up a connection in between the source and the target system.
Enable Filter	The filter can be set to be executed only in certain circumstances. If none of them has been selected, it will do the backup from the source to the destination in full. File size: From xx ~ xxx If xx=1 and xxx blank then only file size > xx will execute real time backup. If xx=1 and xxx=2 then only size in between xx and xxx will execute real time backup. If xx blank and xxx=2 then only file size < xxx will execute real time backup. Include File Type: Only the associated file format will do the real time backup.

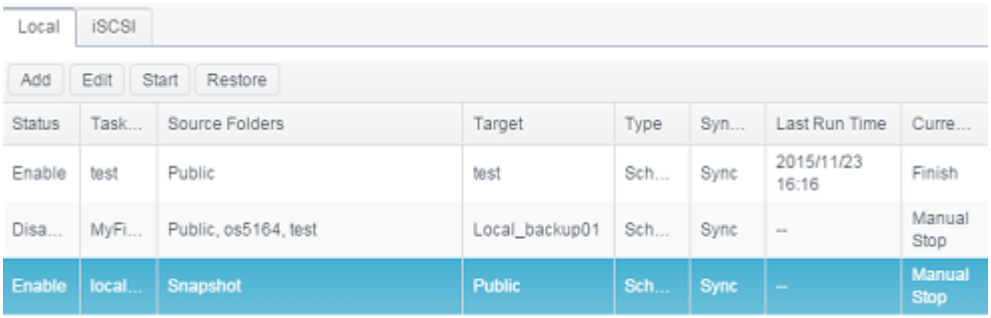
	Exclude File Type: The excluded file format won't be included in the real time backup. **For document file format:** doc, xls, pdf, docx, xlsx, txt, ppt, pptx, html, htm **For picture file format:** jpg, bmp, tif, png, pbm, tga, xar, xbm **For video file format:** avi, mpg, mp4, mkv, fli, flv, rm, ram **For music file format**: mp3, wav, wma, acc, dss, msv, dvf, m4p, 3gp, amr, awb User defined can be input in other box.

Edit Task:
To edit created task, select desired item and click on **Edit**.

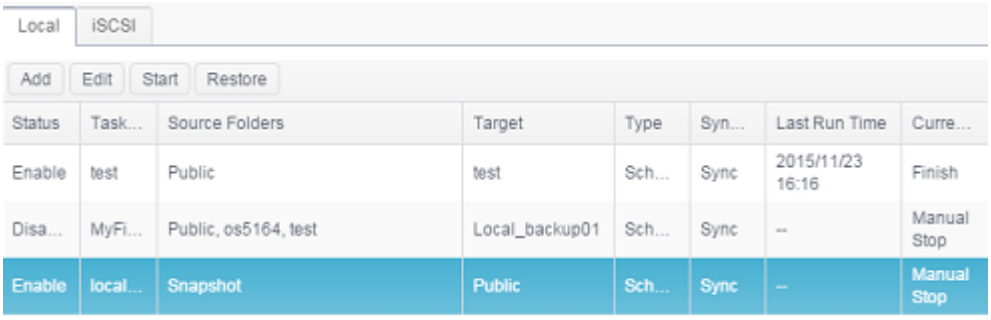


Then you can follow the task creation wizard to do the necessary modification.

Start Task:
If the task has status Enabled, it can be selected and click on Start button to execute right away.



Restore Task:
To restore a backup from the backup task, simply select a task from the task list then click "Restore" from the function bar. The restore task will start to have the associated files/folders from the target folder restored to the source.

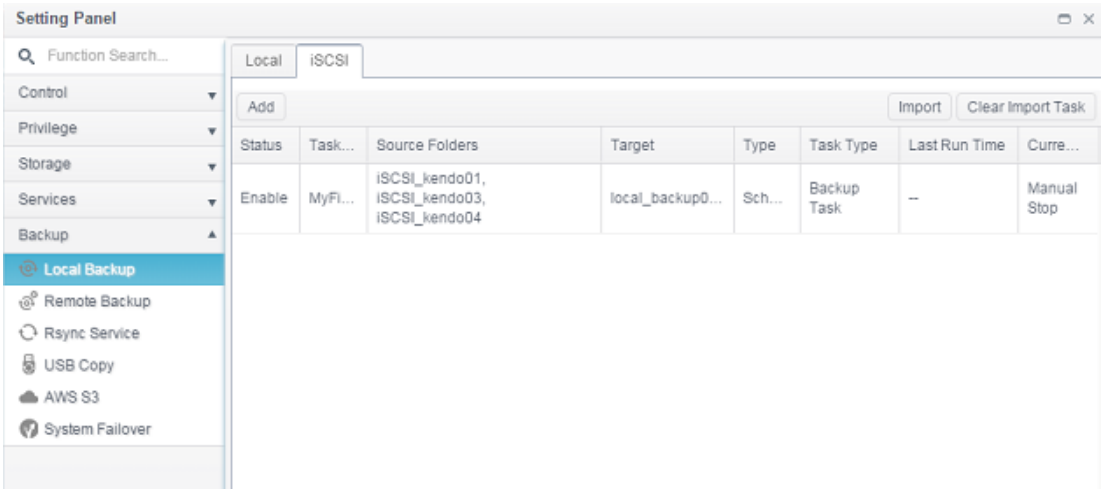


NOTE

- To restore task with backup type set as "Real time", first you need to stop the task then you can proceed with the restore operation.

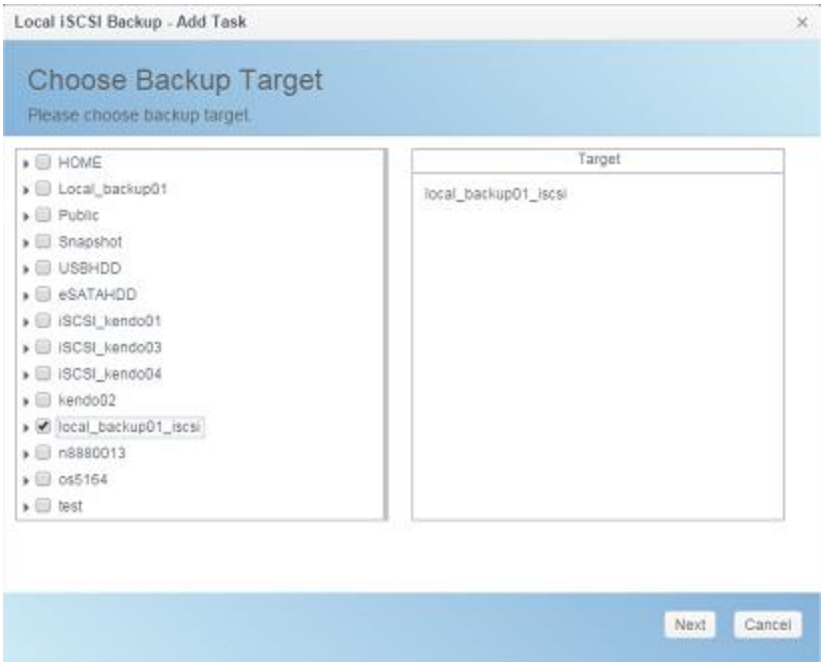
iSCSI Backup

From "iSCSI" tab click on "Add" button and the setting screen appear as below. Follow the steps to complete the setting.

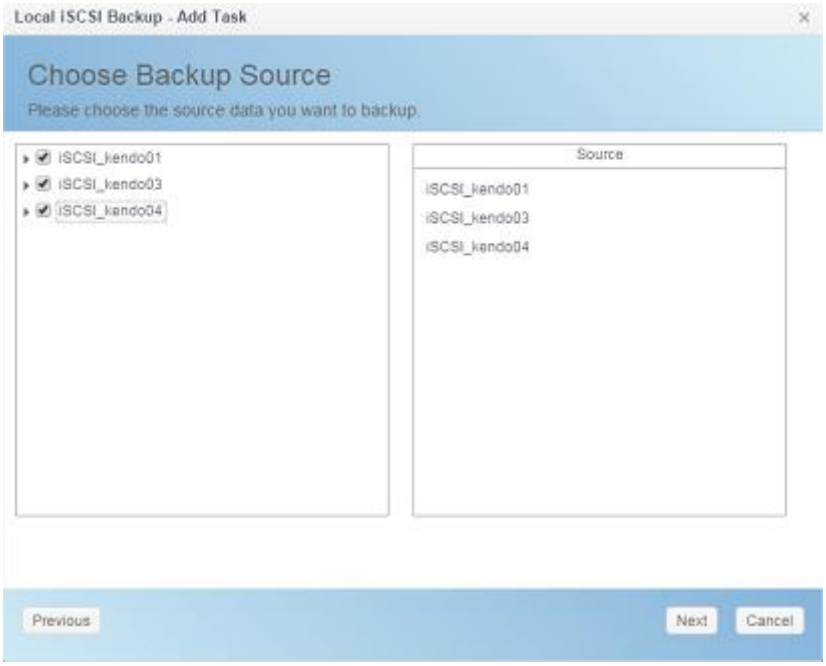


Add Task:

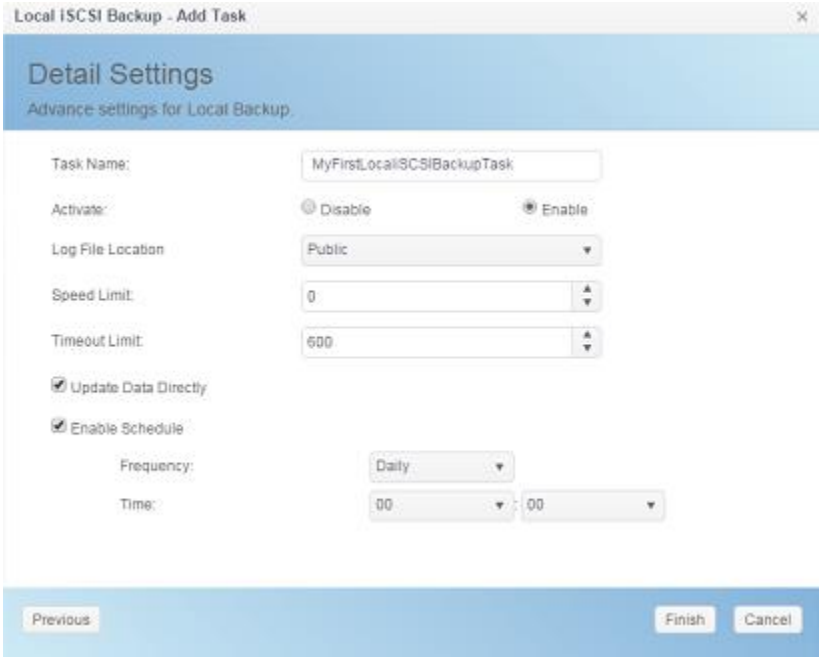
1. Choose backup target folder, this is the destination where the iSCSI volume will backup to.



2. System will list available iSCSI volume, choose source iSCSI volume to backup. The multiple iSCSI volume selection is allowed.



3. **Input** task name and related options.



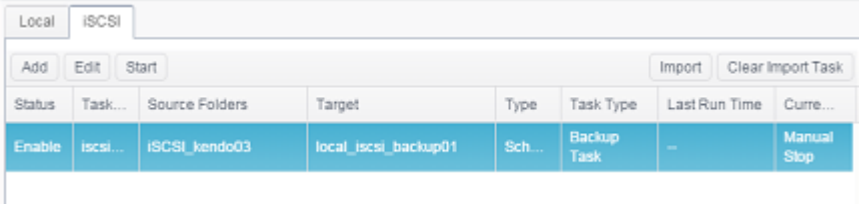
Add Rsync Backup Task	
Item	**Description**
Task Name	This is how this task will appear in the task list.
Activate	Enable to activate task or disable to execute later.
Log Location	Choose the folder to save the log details while the task is executed.
Speed Limit	Input the bandwidth control for data backup operation.
Timeout Limit	Setup the timeout when trying to build up a connection in between the source and the target system.
Update Data Directly	It could by pass temp file creation wile copy file from source to destination. It will more efficiency but risky if any interrupt during operation.
Enable Schedule	If backup is set as "Schedule", please input the related period and time.

4. Click **Finish** to complete task added.

Edit Task:
To edit created task, select desired item and click on **Edit**.

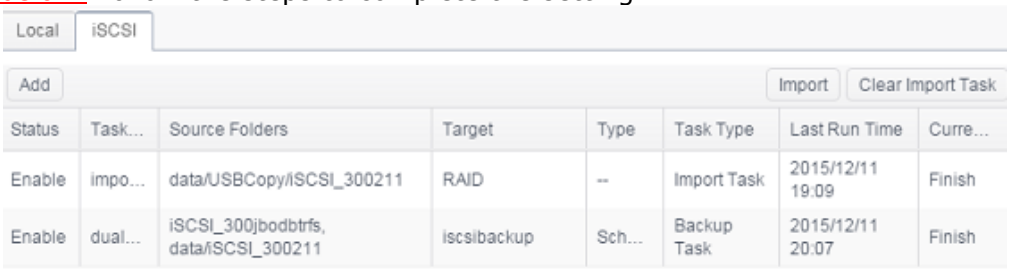
Then you can follow the task creation wizard to do the necessary modification.

Start Task:
If the task has status Enabled, it can be selected and click on Start button to execute right away.

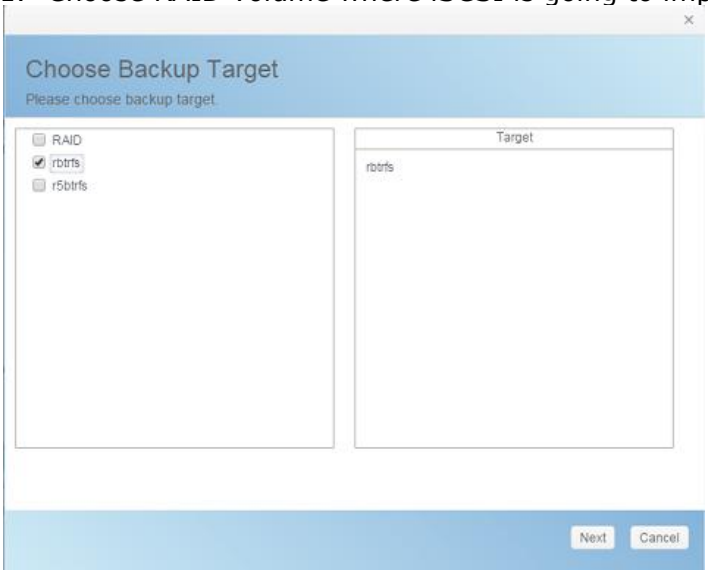


Import:

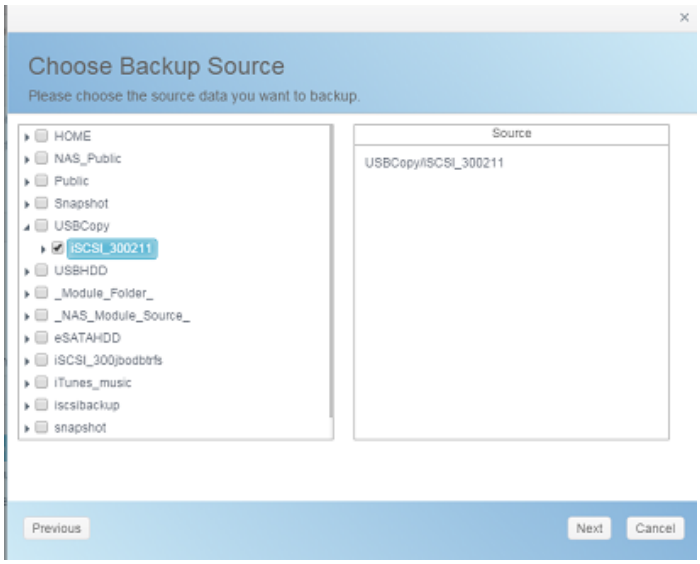
It can be imported from backup of iSCSI and become to physical iSCSI volume. Click on "Import" tab on right hand portion of task bar and screen appear as below. Follow the steps to complete the setting.



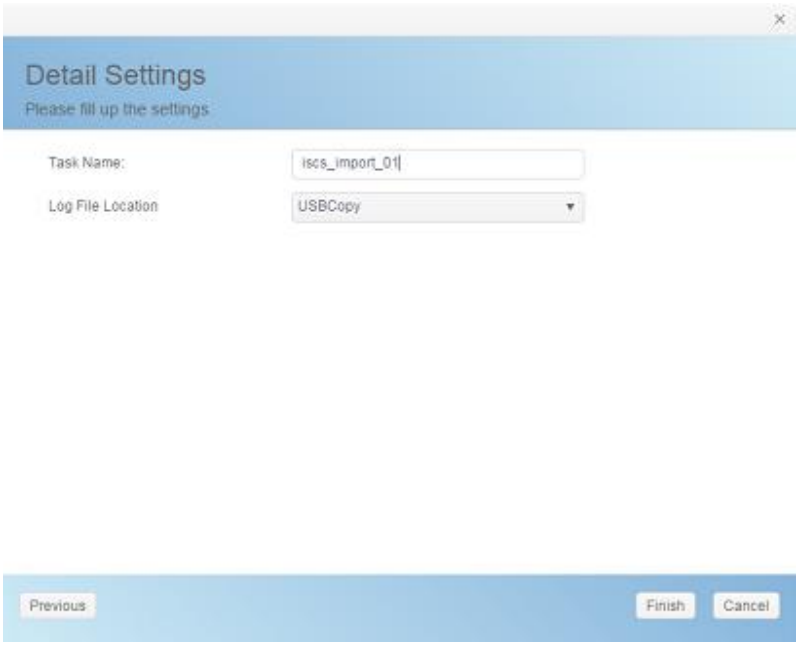
1. Choose RAID volume where iSCSI is going to import.



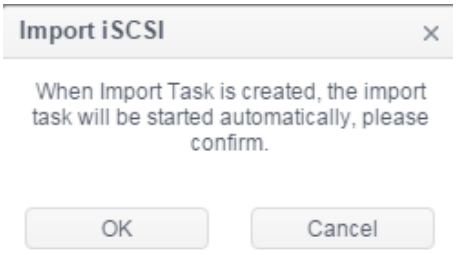
2. Choose the iSCSI backup folder and locate the file where the iSCSI volume has backuped previously. System will denote the triangle symbol for the valid file which can be imported.



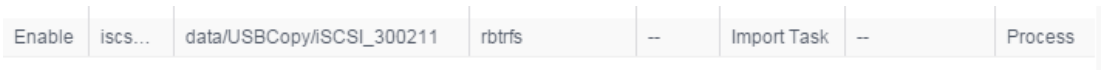
3. Input task name for this iSCSI import job and select where the task log will be recorded.



4. Clicking on "Finish" to complete the iSCSI import task and confirm OK to start the iSCSI import job.



5. Now the local backup task list has the iSCSI import job listed and under process.



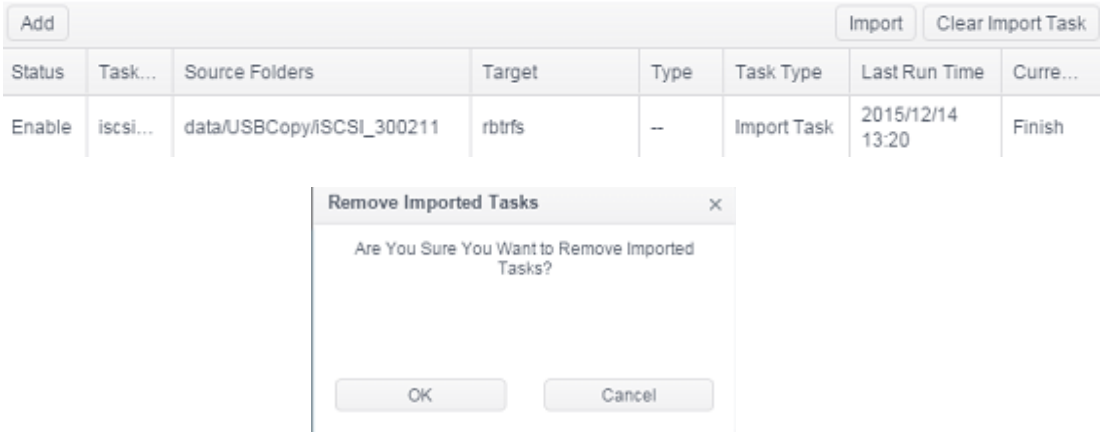
6. The status will change to "Finish" once the task has completed.
iSCSI volume 30021 can be found on iSCSI list under RAID volume btrfs.

NOTE

- To import iSCSI volume from backup folder → file, system will check whether the physical iSCSI volume existed or not. If the iSCSI volume is existed, then warning message "The target name already

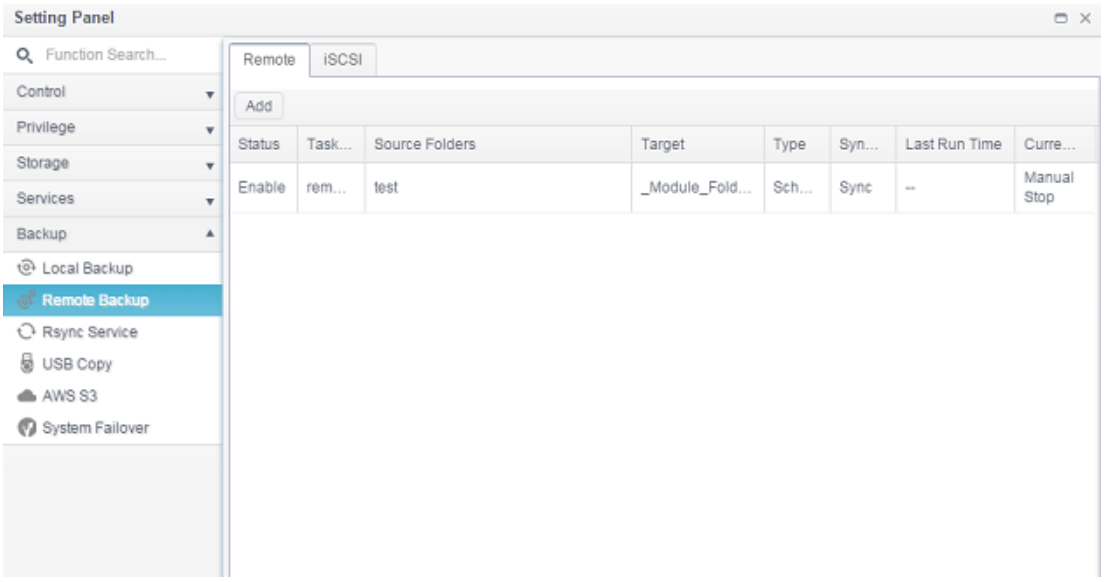
Clear Import Task:

Click on "Clear Import Task" tab on right hand portion of task bar, following with confirmation "OK" to remove all import tasks.



Remote Backup

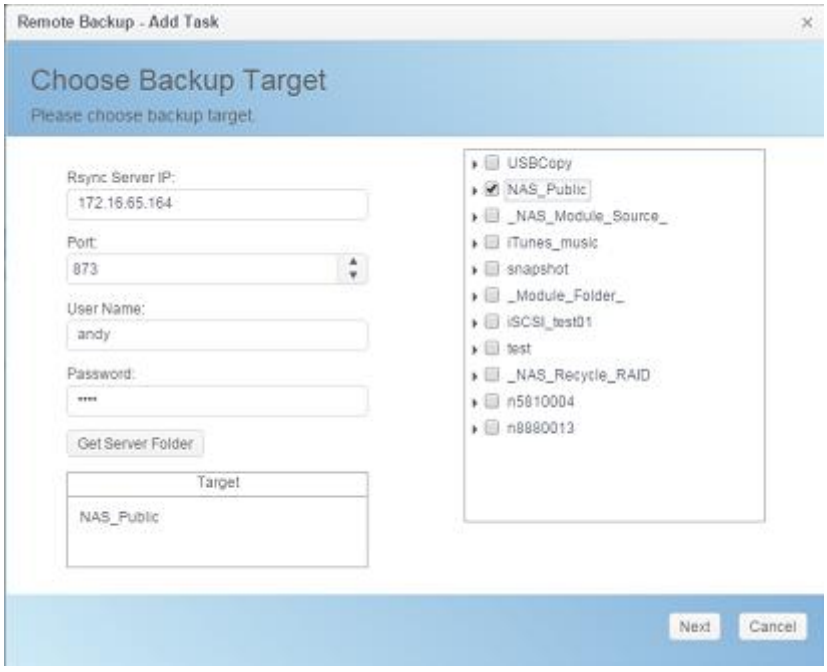
When it comes to backing up your data, it's very important to have flexibility. Remote Backup provides you with many options, including custom/full backup for shares and iSCSI volume backup.



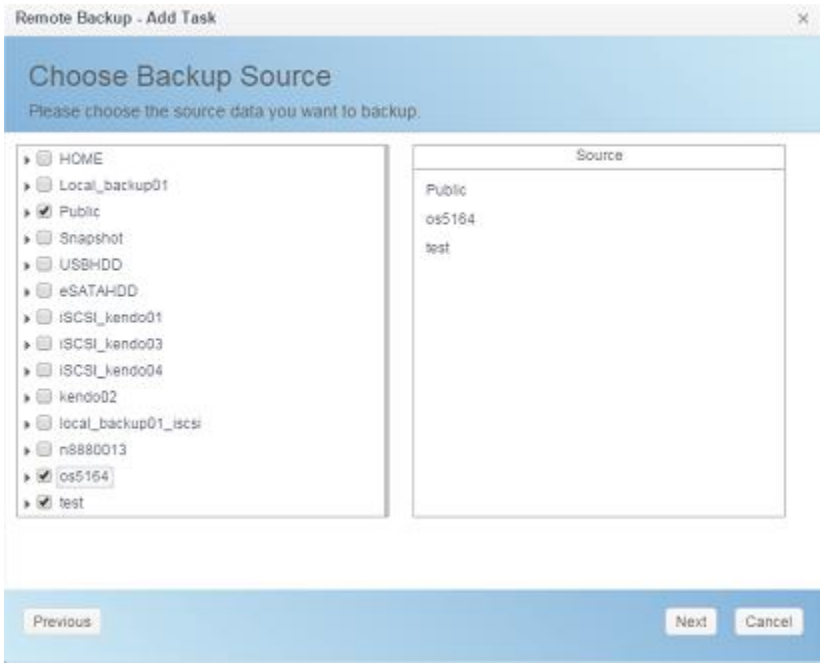
Remote File/Folder Backup

Add Task:
From "Remote" tab click on "Add" button and the setting screen will appear as below. Follow the steps to complete the setting.

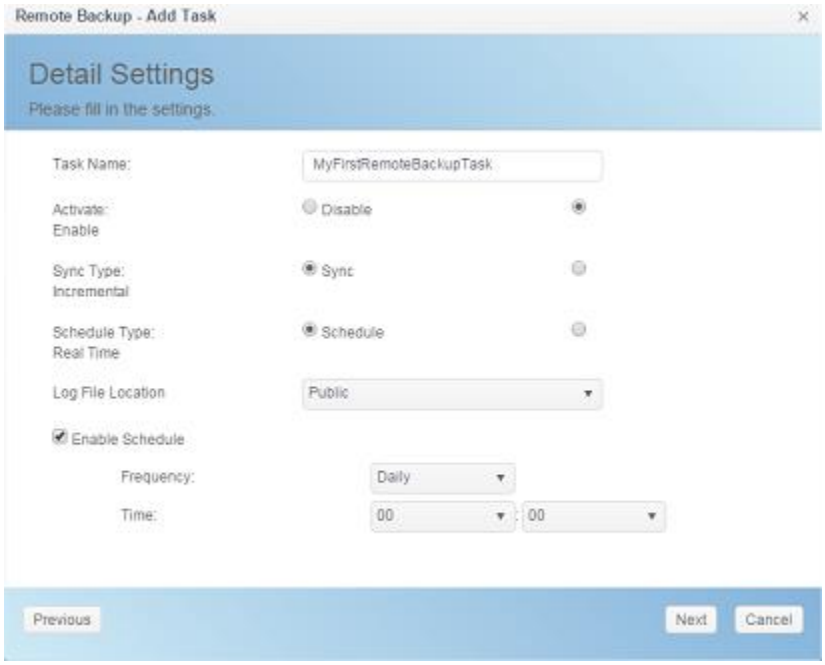
1. Fill in the remote target IP (Destination) and port (need to be changed only if this port is already in use). If encryption is required then enable it. Please make sure the associated target server also has encryption enabled. And click on "Get Server Folder" to get remote target server folder list to choose destination.



2. Choose source folder to backup. The multiple folders selection is allowed.



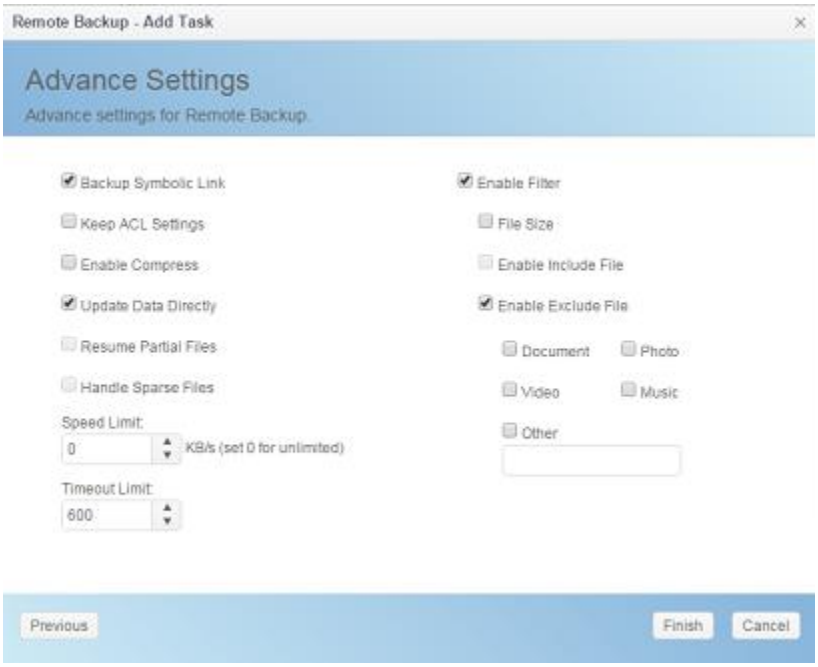
3. Input task name and related options.



Add Rsync Backup Task	
Item	**Description**
Task Name	This is how this task will appear in the task list.
Activate	Enable to activate task or disable to execute later.
Sync Type	Sync mode: Makes your source match your target completely; deleting and adding files on your target as they are deleted and added on your source. Incremental Mode : Makes your source match your target and keep all old files; adding files on your target as they are added on

	your source, but NOT deleting files on your target as they are deleted on your source.
Schedule Type	Real time: It will backup folders/files from source to target on the fly. On the other hand, any changes from the source will back up to the target right away. Schedule: The task will start only according to the schedule.
Log Location	Choose the folder to save the log details while the task is executed.
Enable Schedule	If backup is set as "Schedule", please input the related period and time.

4. More advanced settings.

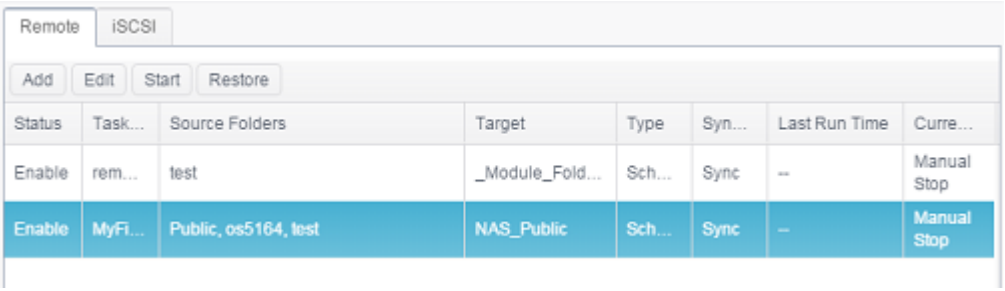


Add Rsync Backup Task	
Item	**Description**
Backup Symbolic Link	
Keep ACL Setting	It will backup not just data itself but also ACL configuration with associated folders/files.
Enable Compress	With this option, compress the file data as it is sent to the destination machine, which reduces the amount of data being transmitted – something that is useful over a slow connection.
Update Data Directly	It could by pass temp file creation wile copy file from source to destination. It will more efficiency but risky if any interrupt during operation.
Resume Partial File	Enable this could keep the partial file which should make a subsequent transfer of the rest of the file much faster
Handle Sparse File	Try to handle sparse file efficiently so they take up less

	space on the destination.
Speed Limit	Input the bandwidth control for data backup operation.
Timeout Limit	Setup the timeout when trying to build up a connection in between the source and the target system.
Enable Filter	The filter can be set to be executed only in certain circumstances. If none of them has been selected, it will do the backup from the source to the destination in full. File size: From xx ~ xxx If xx=1 and xxx blank then only file size > xx will execute real time backup. If xx=1 and xxx=2 then only size in between xx and xxx will execute real time backup. If xx blank and xxx=2 then only file size < xxx will execute real time backup. Include File Type: Only the associated file format will do the real time backup. Exclude File Type: The excluded file format won't be included in the real time backup. **For document file format:** doc, xls, pdf, docx, xlsx, txt, ppt, pptx, html, htm **For picture file format:** jpg, bmp, tif, png, pbm, tga, xar, xbm **For video file format:** avi, mpg, mp4, mkv, fli, flv, rm, ram **For music file format**: mp3, wav, wma, acc, dss, msv, dvf, m4p, 3gp, amr, awb User defined can be input in other box.

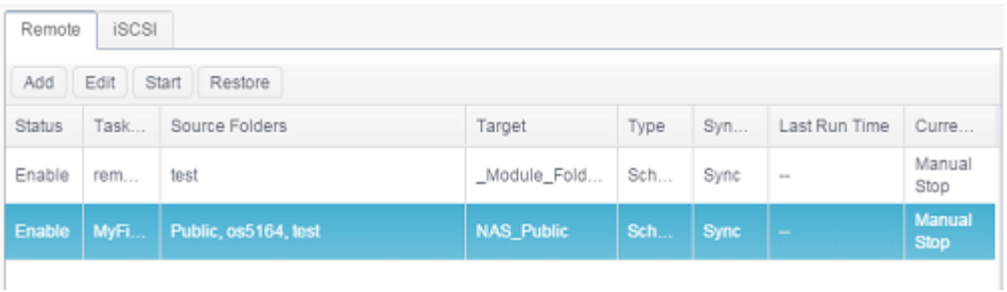
5. Click Finish to complete task added

Edit Task:
To edit created task, select desired item and click on Edit.

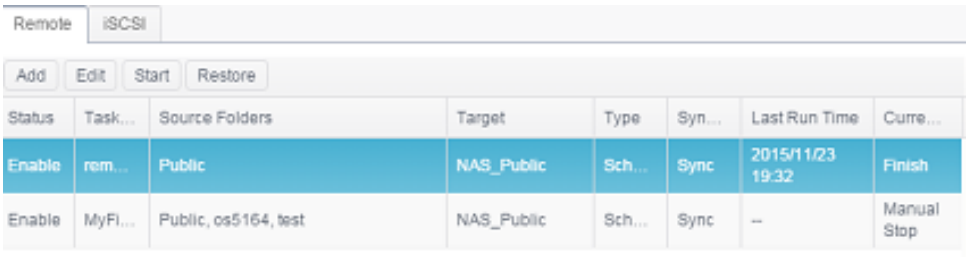


Then you can follow the task creation wizard to do the necessary modification.

Start Task:
If the task has status Enable, it can be selected and click on **Start** button to execute right away.



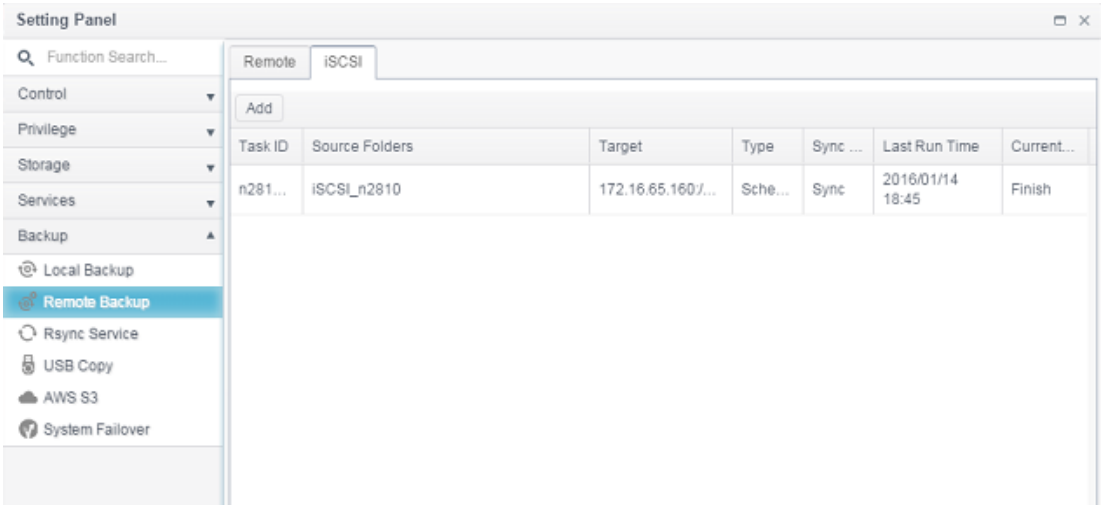
Restore Task:



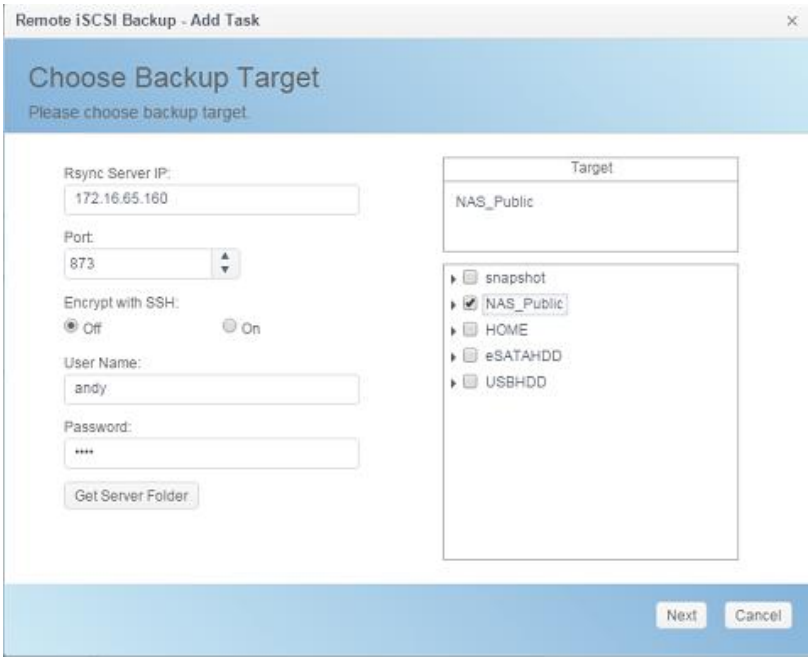
Remote iSCSI Backup

Add Task:

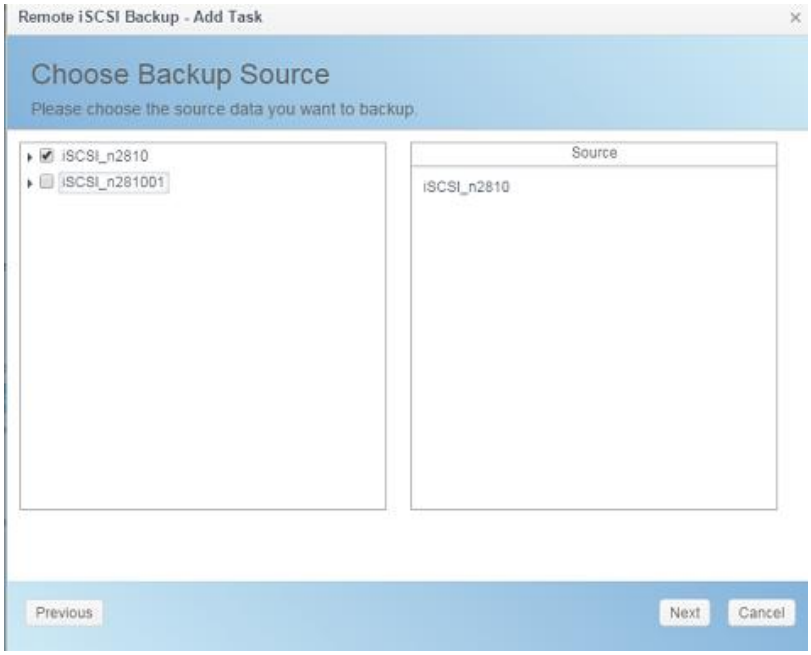
From "iSCSI" tab click on **Add** button and the setting screen will appear as below. Follow the steps to complete the setting.



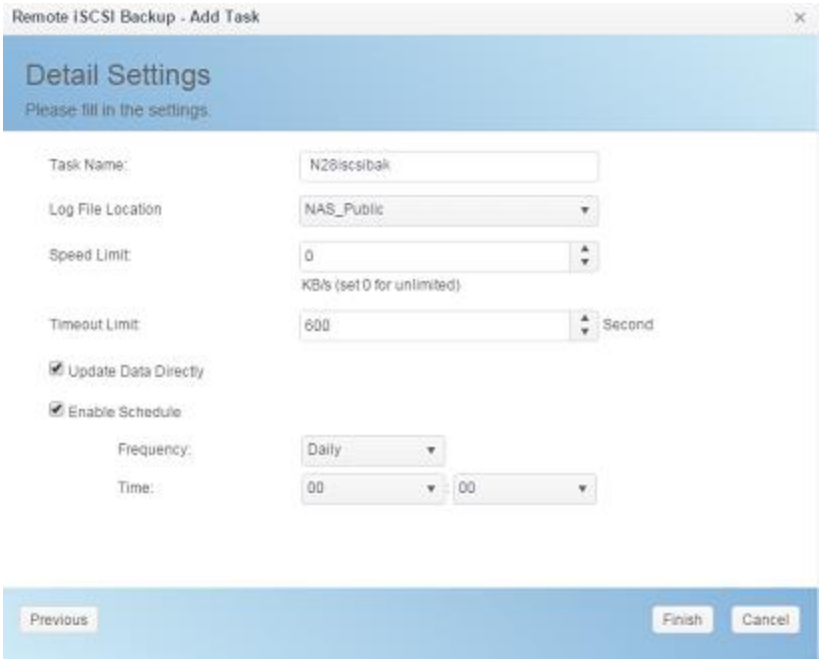
1. Fill in the remote target IP (Destination) and port (need to be changed only if this port is already in use). If encryption is required then enable it. Please make sure the associated target server also has encryption enabled. And click on "Get Server Folder" to get remote target server folder list to choose destination.



2. System will list available iSCSI volume, choose source iSCSI volume to backup. The multiple iSCSI volume selection is allowed.



3. Input task name and related options.

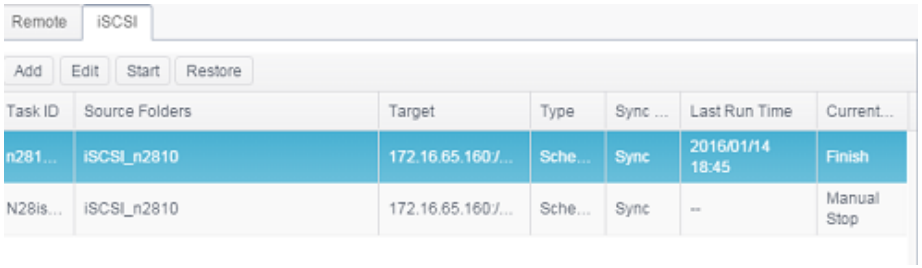


Add Rsync Backup Task	
Item	**Description**
Task Name	This is how this task will appear in the task list.
Log Location	Choose the folder to save the log details while the task is executed.
Speed Limit	Input the bandwidth control for data backup operation.
Timeout Limit	Setup the timeout when trying to build up a connection in between the source and the target system.
Update Data Directly	It could by pass temp file creation wile copy file from source to destination. It will more efficiency but risky if

	any interrupt during operation.
Enable Schedule	If backup is set as "Schedule", please input the related period and time.

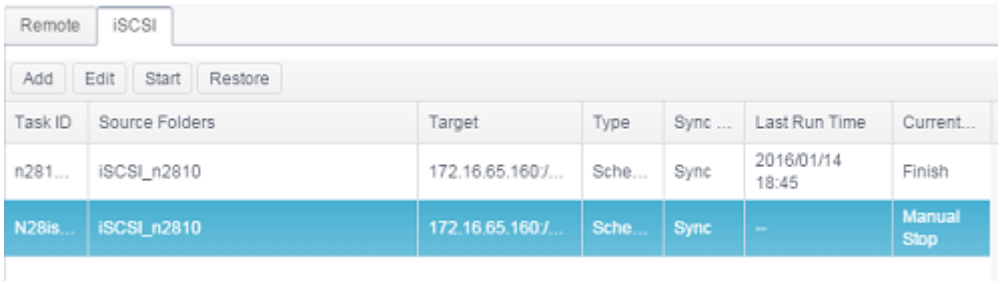
4. Click Finish to complete task added.

Edit Task:
To edit created task, select desired item and click on Edit.

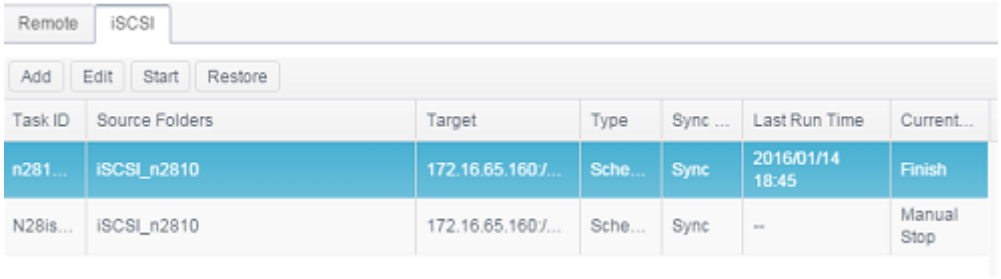


Then you can follow the task creation wizard to do the necessary modification.

Start Task:
The task can be started right away by selecting the associated task and clicking on **Start** button to execute.

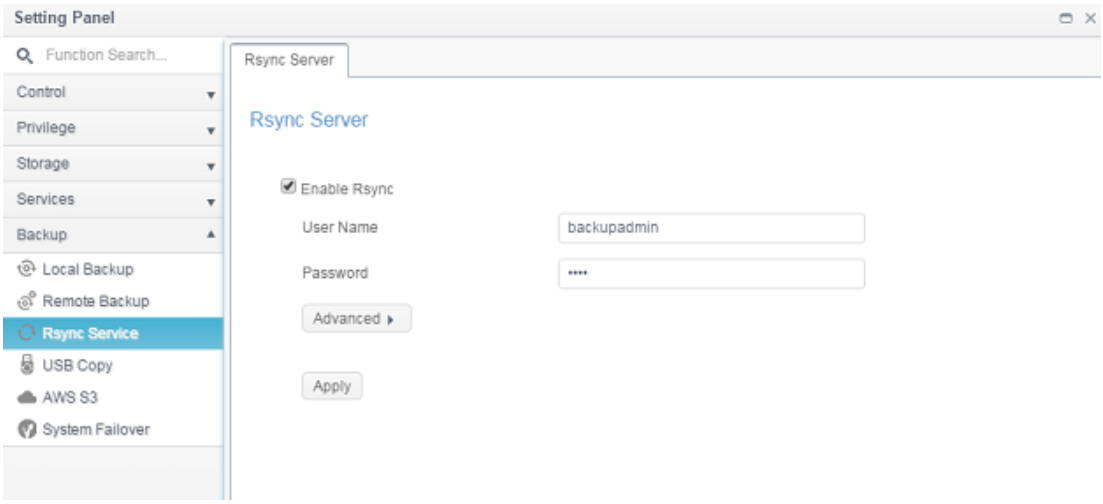


Restore Task:
iSCSI volumeserver



Rsync Service

Rsync Service is used for rsync remote backup astarget role. So while setup rsync remote backup the associated rsync service from target side is required. To enable Thecus NAS as rsync target role, click on Rsync Service under Backup category and the setting screen will appear as below.



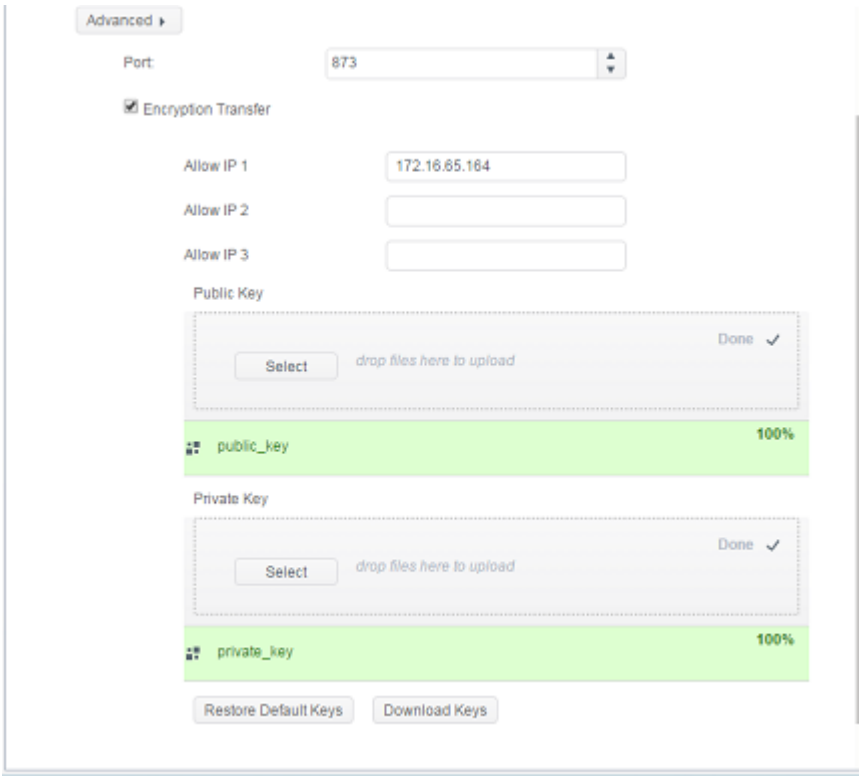
1. Enable **Rsync Service**
2. Add a **username** and **password** (they can be different than your NAS's username and password)
3. Select **Apply**

NOTE

- You will need this user name and password while the data is going to remotely backup to this Rsync target server.

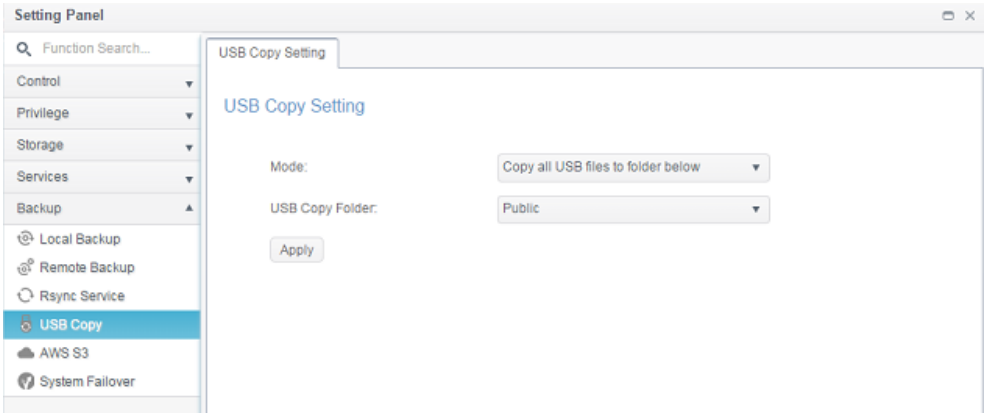
Now Rsync is turned on your NAS, which means it can be used as a target for Rsync backup, in other words, only the backup NAS needs to be activated in this way.

Click on **Advanced** to change network port or enable encryption transfer. If encryption transfer has been enabled, it needs to input both public and private keys. Or click on **Download keys** button to use system default.

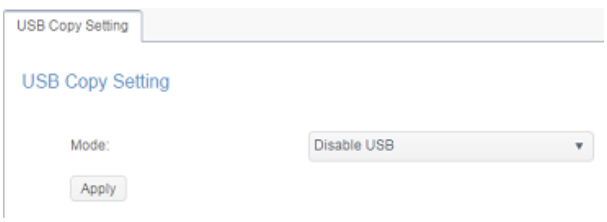


USB Copy

The USB Copy function using the USB copy button or front panel LCM/OLED of system used to only offer one-way transfers (i.e. only from the USB drive to the designated NAS folder). Now numerous options are available, such as: Disabled, bi-directional, and scheduled.

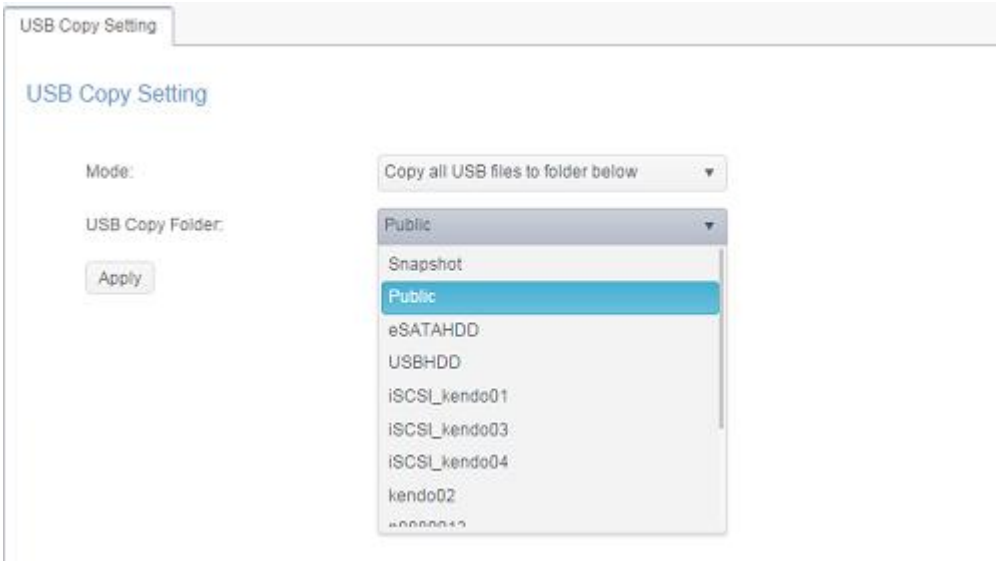


Disable USB Copy:
Simply select **Disable** from USB Copy Mode and the USB Copy button or LCM/OLED USB Copy item will become inactive.

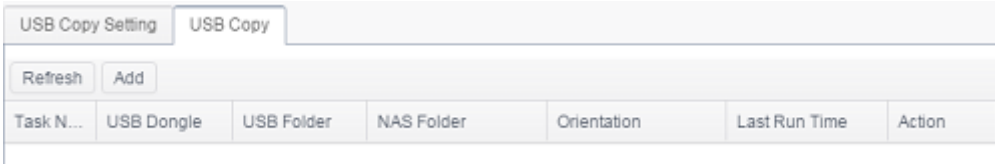


Copy all USB files to folder below:

If you select “Copy all USB files to folder below”, then please choose the target path from the drop-down list. All files and folders on the USB device will be copied over to the NAS.

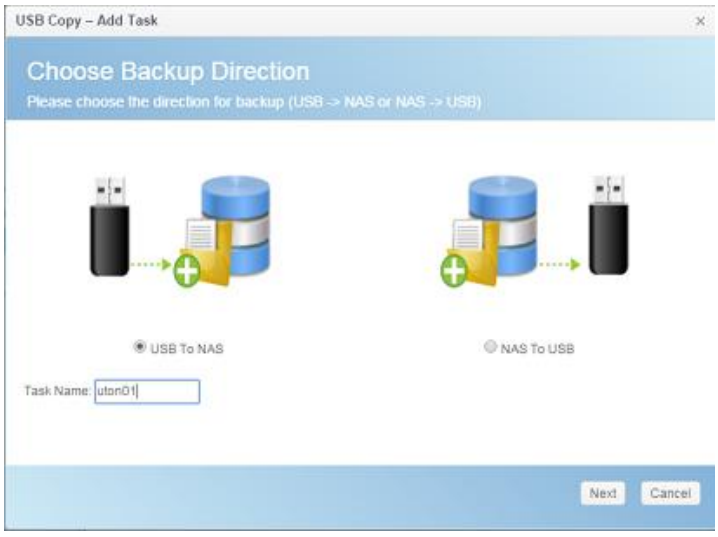


User defined:
By applying the USB Copy service in user defined mode, the additional USB Copy tab will appear, click on USB Copy to add new task.

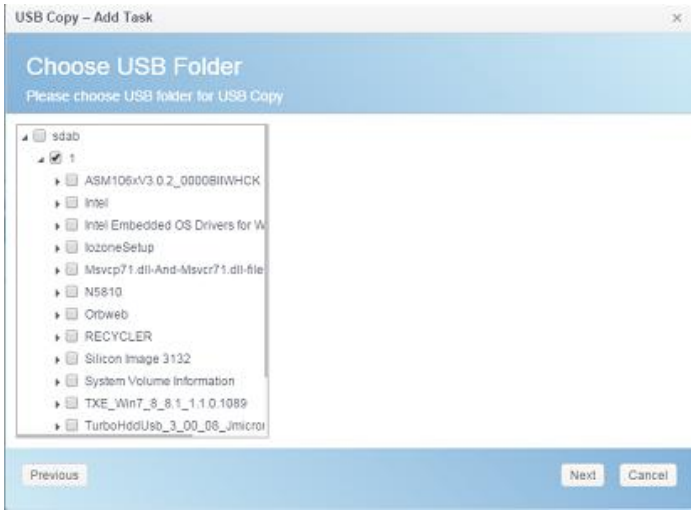


There are 2 options available: “USB to NAS” and “NAS to USB”, following the steps below to complete the setting.

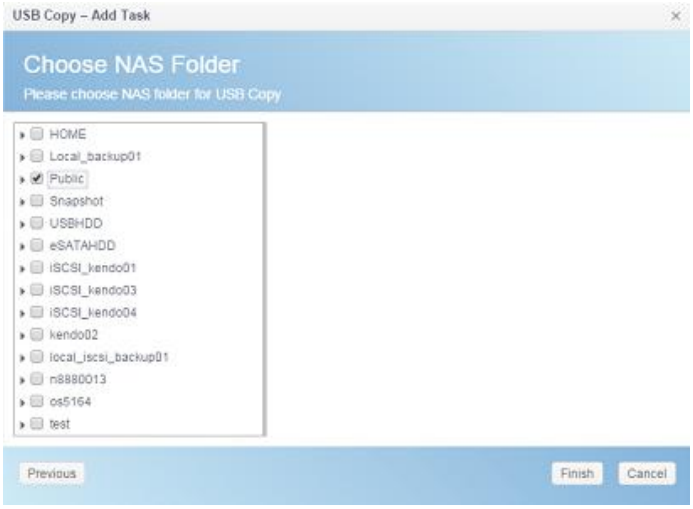
1. Choose direction and input task name then click **next**.



2. Choose USB device which has been installed on the system then select folder(s) to copy.

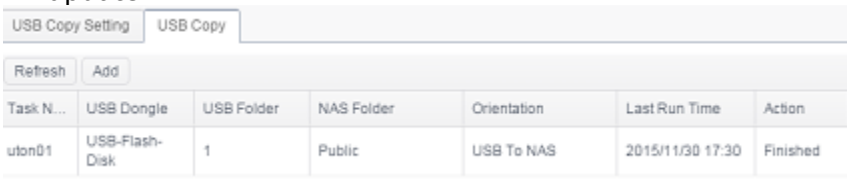


3. Choose the destination on NAS folder.



4. Click on **Finish** to complete add USB copy task. The USB Copy page will have a new task listed.

5. Now you can operate by using USB copy button or LCM to execute USB copy task. Once the task has been completed, the Last Run Time and Action will update.



AWS S3

Please refer to the link
http://www.thecus.com/sp_download_page.php?TYPE_ID=1&PROD_ID=113

System Failover

Please refer to the link
http://www.thecus.com/sp_download_page.php?TYPE_ID=1&PROD_ID=113

Chapter 5: General User Login

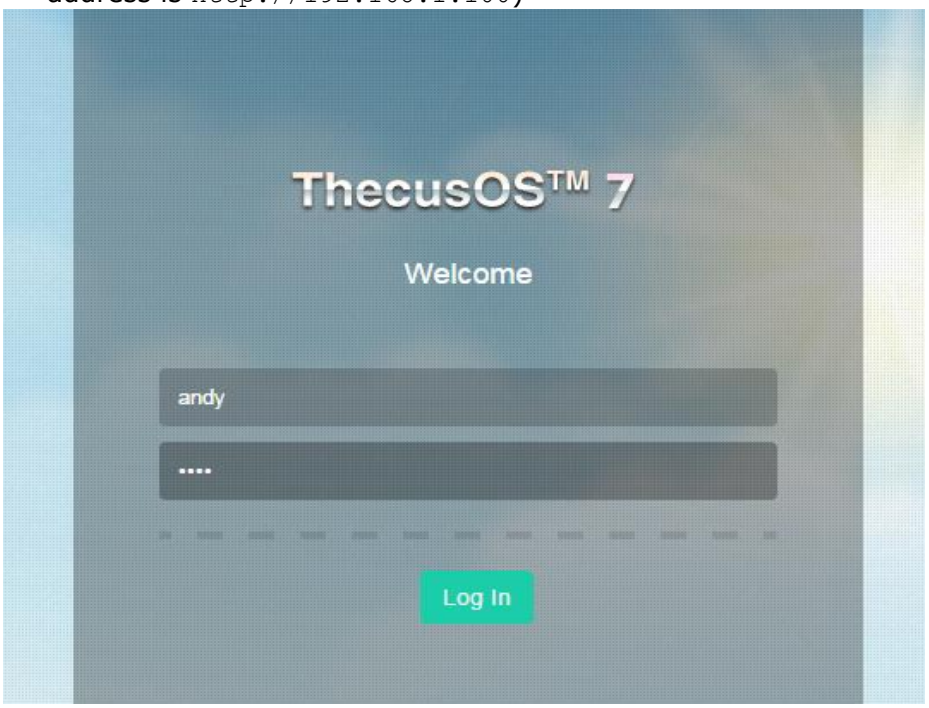
Overview

The Thecus IP storage provides an easily accessible connection for **General User** via web interface. With it, you can manage your own files and photos on Thecus IP storage anywhere on the network.

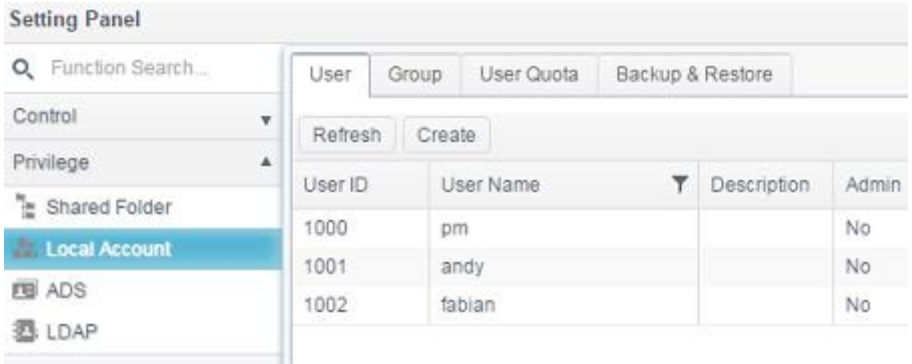
General User Login Interface

Make sure your network is connected to the Internet and the system administrator has local user account created. To login Thecus IP storage as **General User**:

1. Type the Thecus IP storage IP address into your browser. (Default IP address is `http://192.168.1.100`)



2. Login to the system using the valid system user name and password which is created by administrator. The example for user andy and password 0000:



User Name: andy
Password: 0000

You will see the **General User Interface** as below. From here, you can manage your own files/photos, change password, select display language and monitor virtually every aspect of the Thecus IP storage from anywhere on the network.

Menu Tree

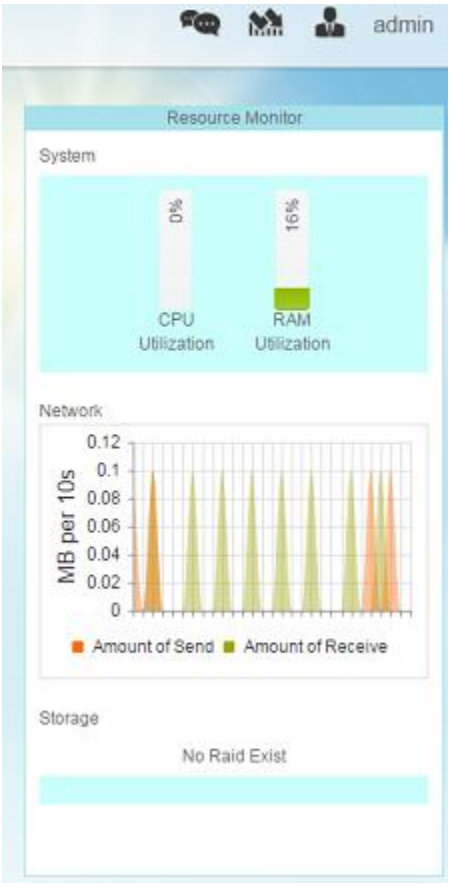
The **Menu Tree** is where you will find the entry for each topic which General User can operate in the Thecus IP storage.

Menu Bar	
Item	**Description**
App Center	The entry of App Center
File Center	The entry of File Center
Photo Center	The entry of Photo Center

Moving your cursor over any of these items and click, it will display associated screen for each topic.

Quick System Resource Monitor

On the top right hand corner of menu bar, click on  and it will display the system resource monitor info such as CPU, memory and storage usage. .


admin
Resource Monitor
System
0%
16%
CPU
Utilization
RAM
Utilization
Network
0.12
0.1
0.08
0.06
0.04
0.02
0
MB per 10s
Amount of Send
Amount of Receive
Storage
No Raid Exist

Language Selection

The Thecus IP storage supports multiple Languages, including:

- English
- Japanese
- Traditional Chinese
- Simplified Chinese
- French
- German
- Italian
- Korean
- Spanish
- Russian
- Polish
- Portuguese

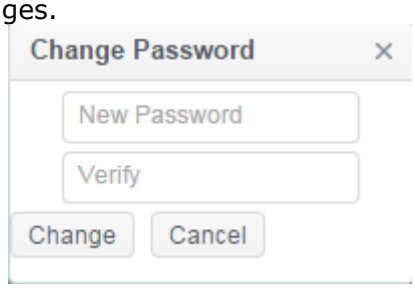
On the top right hand corner of menu bar, select desired language from drop down list. This user interface will switch to the selected language for Thecus IP storage.

Logout

Click on logout to quit **General User Web Interface.**

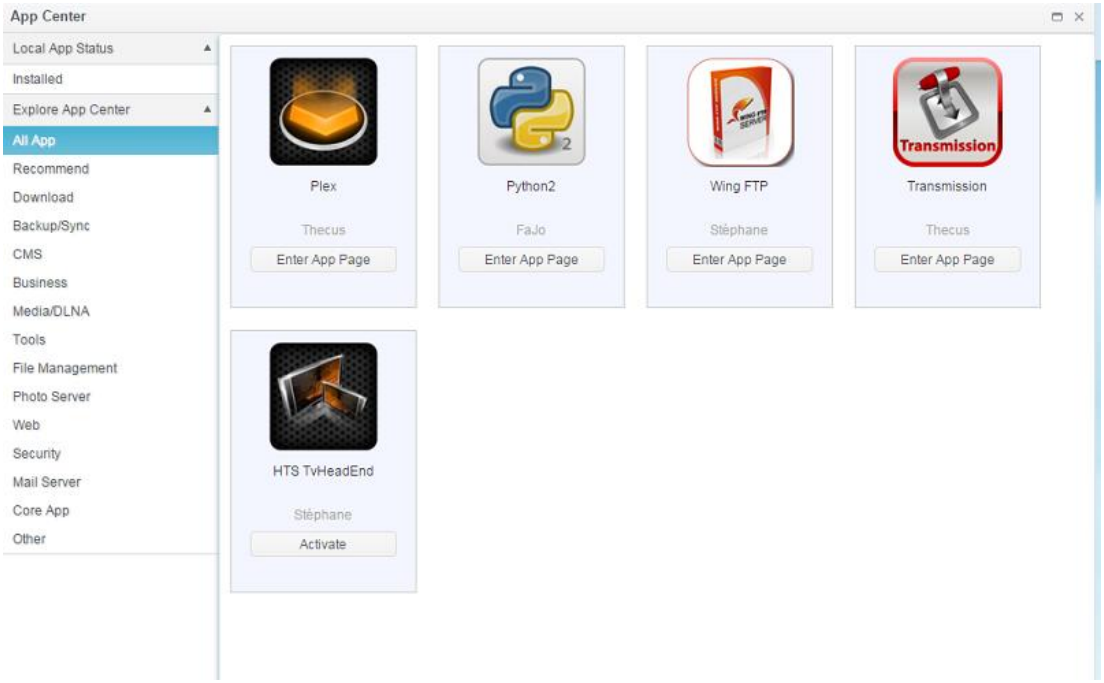
Change Password

On the top right hand corner of menu bar, select **Password** item and the **Change Password** screen appears. Enter a new password in the **New Password** box and confirm your new password in the **Verify** box. Press ***Change*** to confirm password changes.

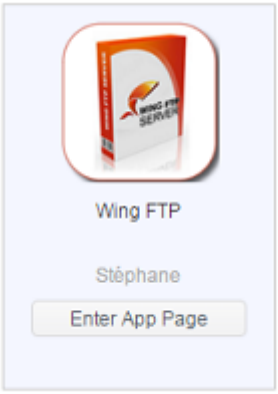


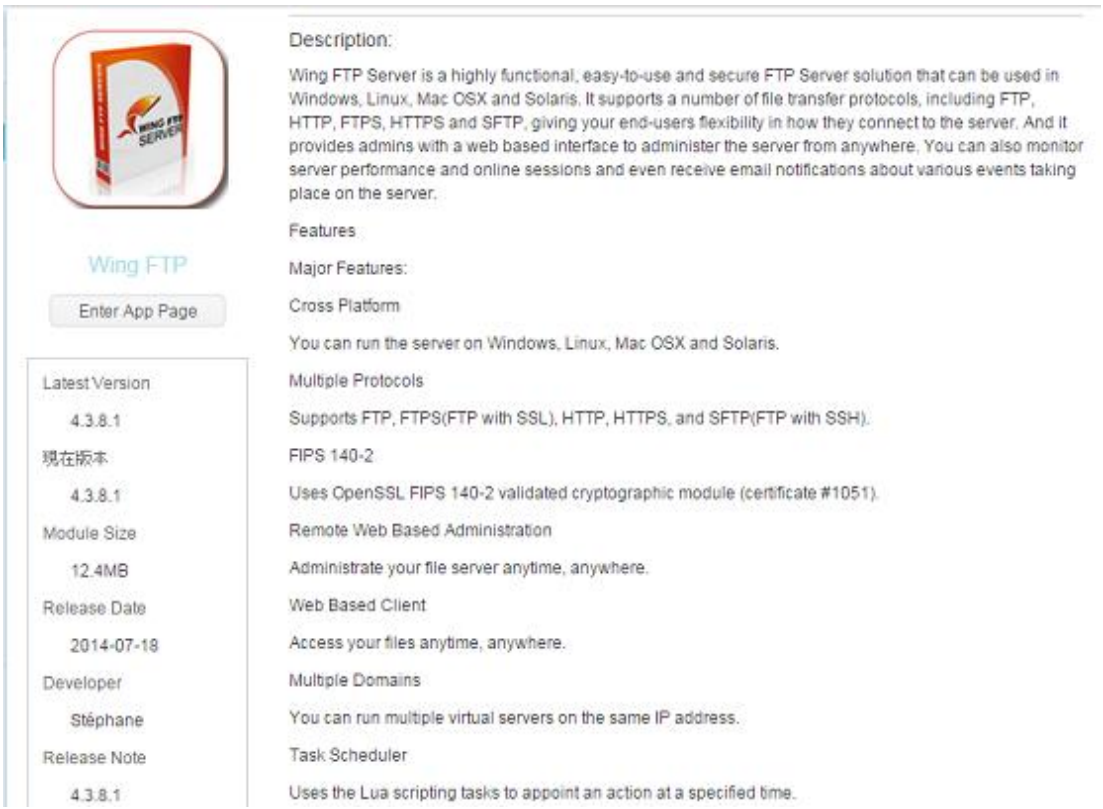
App Center

The **App Center** is where to store additional application which has provided by either 3rd party users or Thecus. Click on App Center icon and a screen will appear as below. It will list "installed Apps" which has installed by administrator.



To view the details of associated App, click on icon of App to open the window. To execute associated App, click on 'Enter App Page".



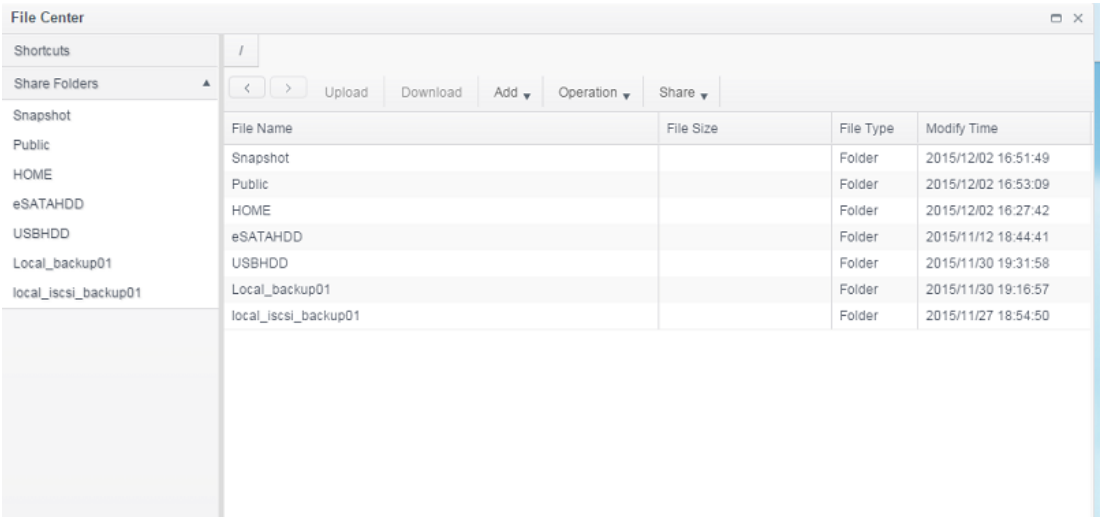


File Center

The **File Center** allowed General NAS user to mange public, permitted and own files through web interface. Click on File Center icon and the system will display public system folder, associated ACL allowed folders and login user's **Home** folder.

The left pane has listed all available folders list for associated login user. The right pane will list details files/folders to against selected folder.

To manage files/folders using the function tabs or click on right button of mouse to bring out contact menu.

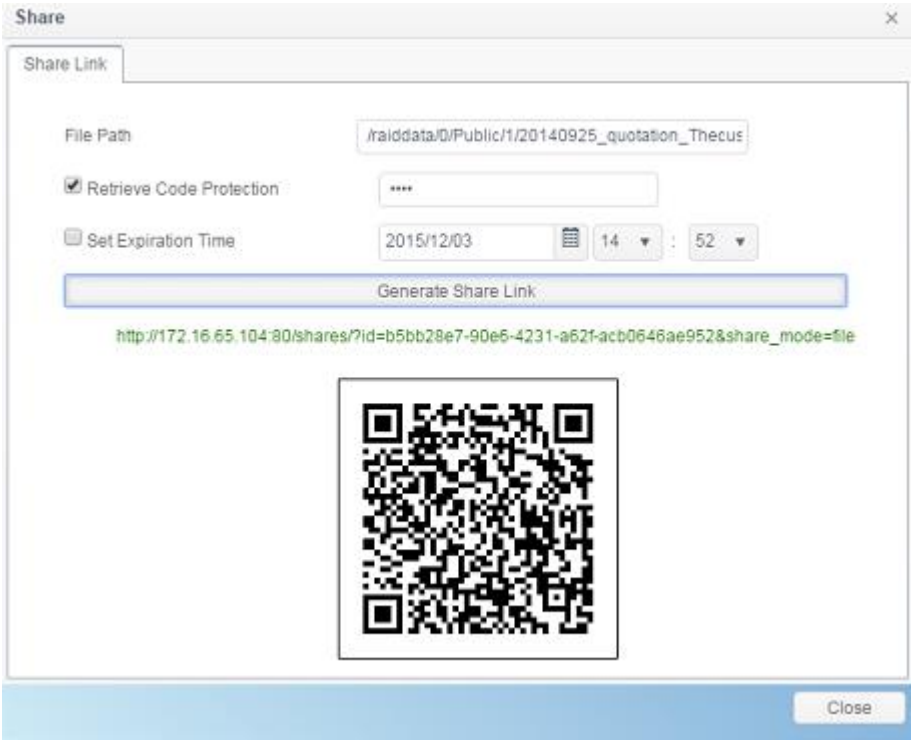


A description for functions on File Center as following:

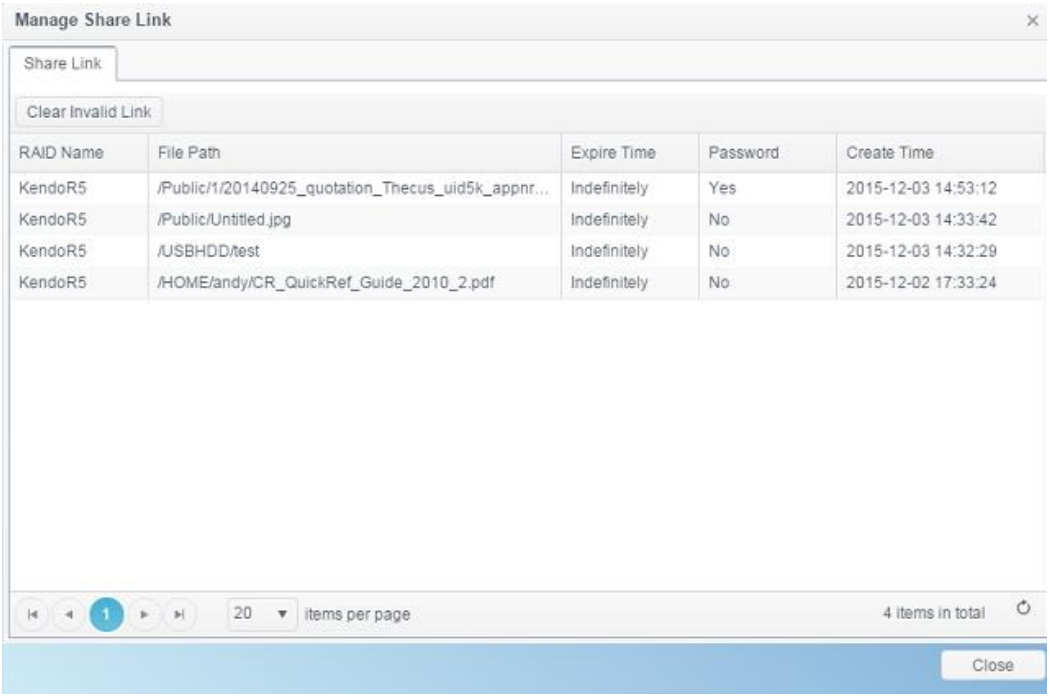
UPnP Port Management	
Item	**Description**
Upload	Upload the file(s) to associated NAS folder
Download	Download file(s) from NAS associated NAS folder to local system
Add	Allowed you to create folder
Operation	
Cut	Cut selected folder/file
Copy	Copy selected folder(s)/file(s), hold on shift key and next file/folder to have multiple selection
Paste	Paste Cut/Copy file(s)/folder(s)
Delete	Delete selected folder/file
Rename	Rename selected folder/file
Add to shortcut	Add selected file/folder to short list
Detail	Display selected file/folder details
Share	
Share file	Can generate share link/QR Code and shared on the network
Manage share link	To manage share link list

For above function list, sharing file is very useful tool that could have particular file shared instantly via URL or QR Code. And it could also protect by password if there is security concern.

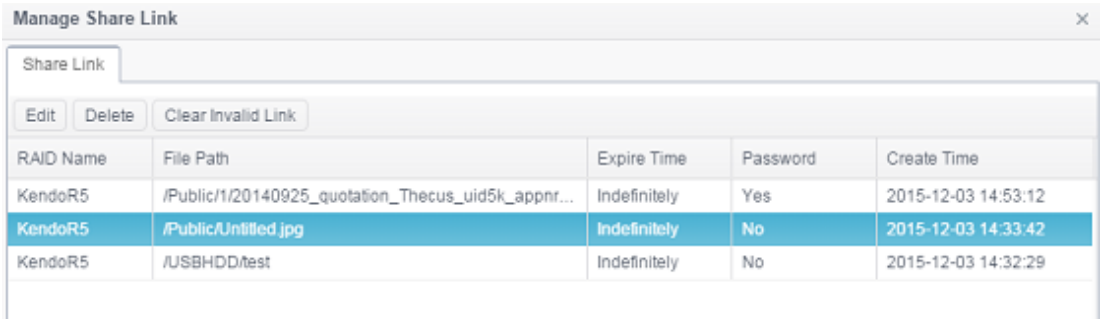
To share the file, simply select desired file from file list then click on "Share" to have drop down menu appear. Click on "Share File" and setting screen will appear as below. Input the password to have shared file protected if needed. The shared file can also setup duration for haring period. Carry on to click on "Generate Share Link", system will generate URL and QR Code automatically. You could provide either one to whom have this file shared.



For all of share link been generated, it can be managed from “Manage Share Link”. Click on “Share” to bring out drop down menu list then select “Manage Share Link”. The all existed share link will be listed.



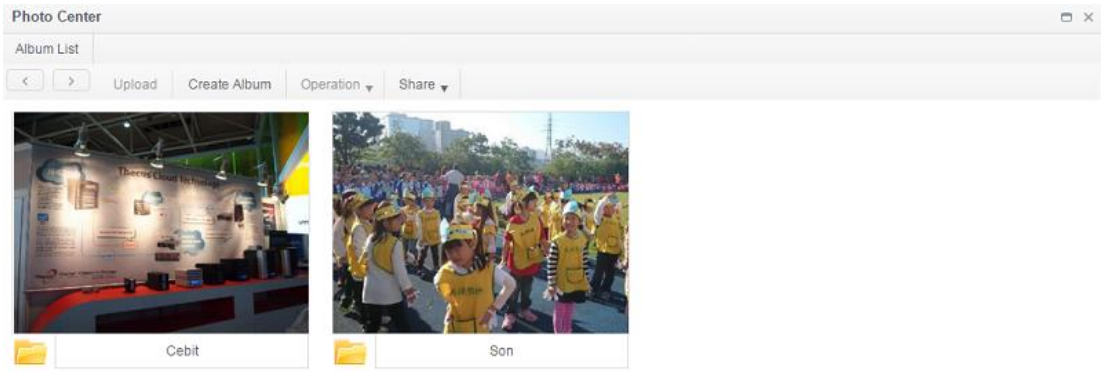
Click on “Clear Invalid Link”, system will check listed share link for file path correctness. If found the file is no longer existed, the share link will be deleted. To manage single share link, click on desired one from share link list. The additional function tab will appear to allow you “Edit” or “Delete” associated share link.



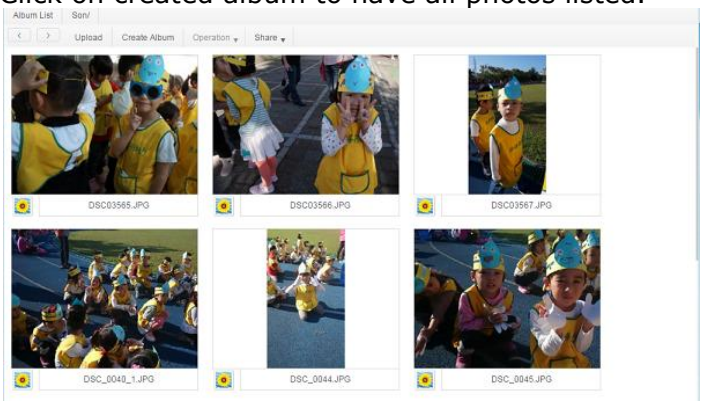
To remove associated share link, simply click on “Delete”. To add/remove password or make expire time, click on “Edit” to make the modification.

Photo Center

The **Photo Center** allowed General NAS user to manger album and photos through web interface. Click on **Photo Center** icon and system will display album list and operation tabs to manage album and photos. .



Click on created album to have all photos listed.



A description for functions on Photo Center as following:

UPnP Port Management	
Item	**Description**
Upload	Upload the file(s) to associated NAS folder
Create Album	
Add	Allowed you to create folder
Operation	
Delete	Delete selected photo
Rename	Rename selected photo
Detail	Display selected photo details
Set as Cover	Set selected photo as album cover
Share	
Share album	Can generate share link/QR Code and shared associated album on the network
Share photo	Can generate share link/QR Code and shared associated photo on the network
Manage share link	To manage share link list

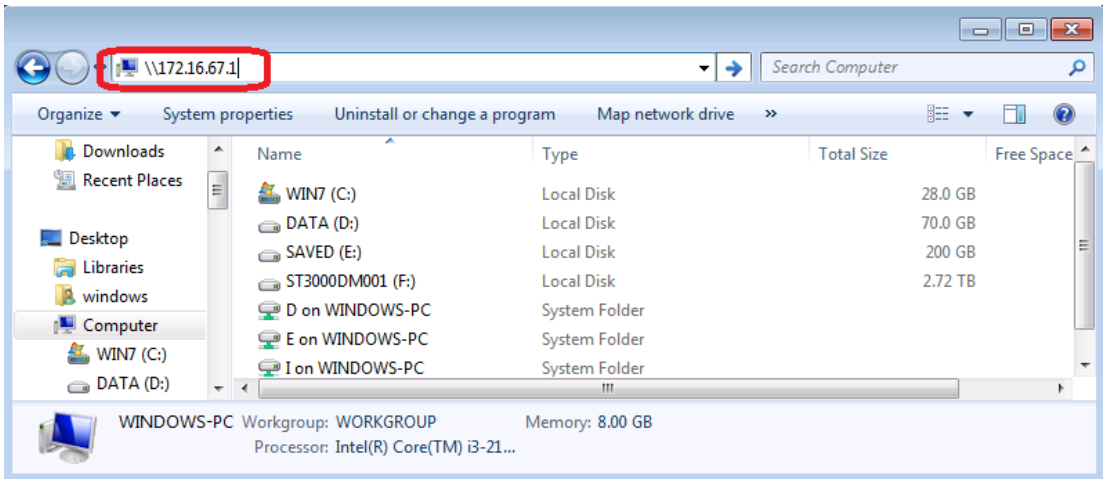
Just like sharing tool from File Center, Photo Center is also capable of this. The album and photo can be shared on the network with or without password protection and also setup sharing time.

Exactly same way as File Center to manage share link, system could validate all of created share link and allowed to add/remove password protection or sharing duration.

Chapter 6: Tips and Tricks

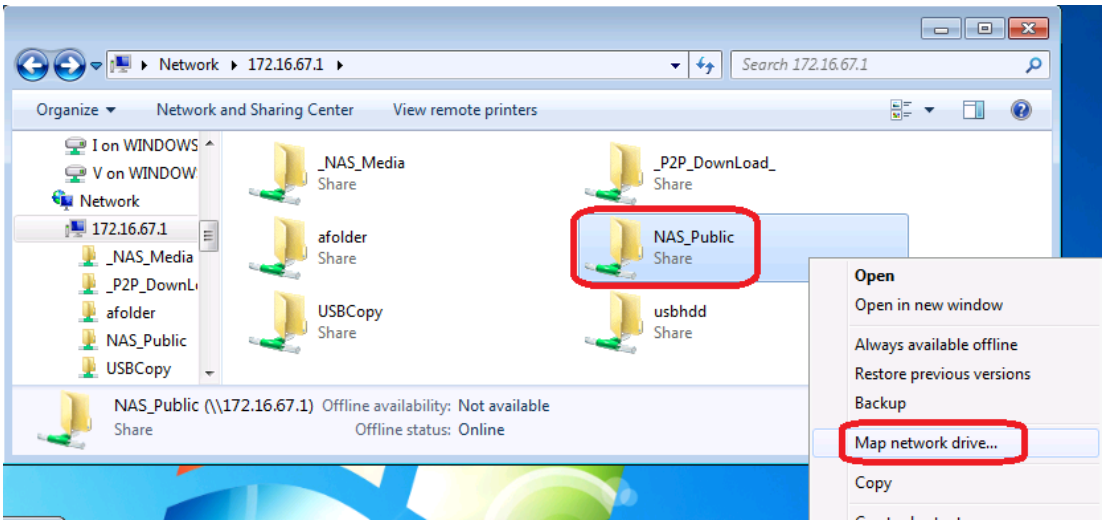
Access your NAS from Windows

The quick way to access your Thecus IP storage from Windows is if the NAS IP is at 172.16.67.1, to access the NAS share folder, input \\172.16.67.1 from file explore.



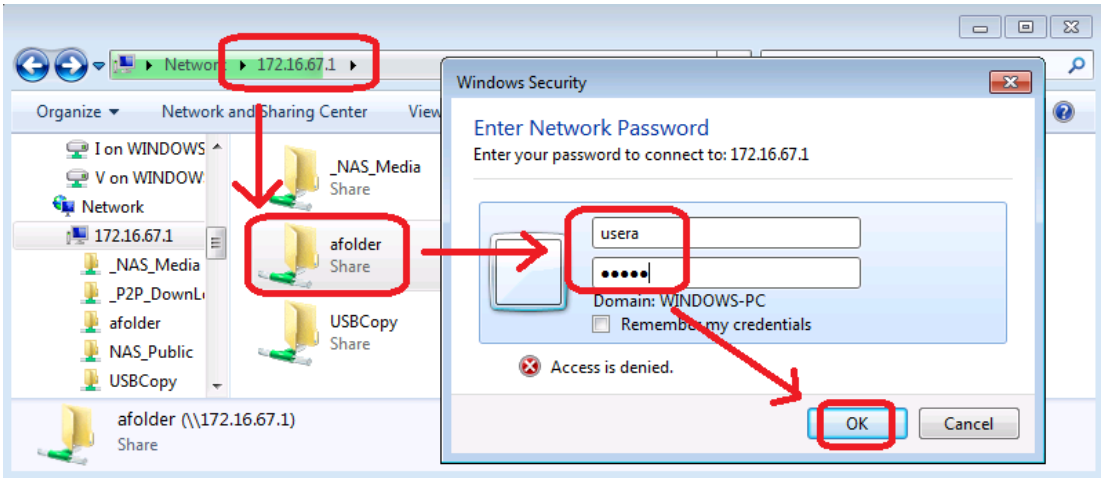
Share folder accessibility with associated login user account

If it is an open permission share folder (PUBLIC =YES), just click the right mouse key to map network driver.



If it is nonpublic ACL share folder (PUBLIC =NO), you will need to key-in the user account & password which has been created on Thecus IP storage user database and permission granted.

Warning: Windows will auto save the connection account & password automatically. If you want to test multiple accounts & ACL, please doing test from FTP.



For more information and resources, see How to remove Windows saved network password.

USB Storage Expansion

The Thecus IP storage supports external USB hard disks through its USB ports. Once a USB hard disk is successfully mounted, the entire volume will be linked automatically to the default USB HDD folder. The Thecus IP storage supports USB external storage devices. All file names on the USB disk volume are case sensitive.

Before attaching a USB disk drive to Thecus IP storage, you have to partition and format it on a desktop computer or a notebook first. The attached device will be located at `\\192.168.1.100\usbhdd\sd(x)1` where `192.168.1.100` means the IP address of Thecus IP storage and `sd(x)1` stands for the first partition on the USB disk drive.

Remote Administration

You can set up your Thecus IP storage for remote administration. With remote administration, you can access your Thecus IP storage over the Internet, even if your Thecus IP storage is behind a router. This is especially useful if you are traveling and suddenly need a file from your Thecus IP storage.

Setting up remote administration is a three-part process, and will require the following equipment:

- Thecus IP storage device
- Cable / DSL Router with Dynamic DNS support
- Home PC
- Internet Connection

NOTE

Router setup will differ slightly depending on router used. For this example, we will use the Asus WL500g because it has support for Dynamic DNS. Contact your router hardware vendor for setup help.

Part I - Setup a DynDNS Account

1. Go to `http://www.dyndns.org` from your home PC.
2. Click on the ***Sign Up Now*** link.
3. Check the Check boxes, select a user name (i.e.: N5810), enter your email address (i.e.: xxx@example.com), check ***Enable Wildcard***, and create a password (i.e.: xxxx).
4. Wait for an email from www.dyndns.org.
5. Open the email and click on the link to activate your account

Part II - Enable DDNS on the Router

1. Go to the router setup screen and select ***IP Config*** > ***Miscellaneous DDNS Setting*** from your Home PC.
2. Click on ***Yes*** for **Enable the DDNS Client?**
3. Select **`www.dyndns.org`**.
4. Go to router setup screen, and enter the following information:
    a. User Name or E-mail Address: **xxx@example.com**
    b. Password or DDNS Key: **xxxx**
    c. Host Name: **`www.N5810.dyndns.org`**
    d. Enable wildcard? Select ***Yes***
    e. Update Manually: Click ***Update***

Part III - Setting up Virtual Servers (HTTPS)

1. Navigate to ***NAT Setting*** > ***Virtual Server***.
2. For **Enable Virtual Server?**, select ***Yes***
3. Setup the HTTPS Server
    a. **Well-Known Applications**: Select **User Defined**
    b. **Local IP**: Enter **`192.168.1.100`**
    c. **Port Range**: **`443`** (the default HTTPS port setting on the Thecus IP storage)
    d. **Protocol**: select **TCP**
    e. Click ***Add***.
    f. Click ***Apply***.
4. Test the HTTPS connection from another computer on the Internet
    a. From a remote computer, open your browser and enter **`https://www.N5810.dyndns.org`**
    b. You should see the login page of Thecus IP storage.

Firewall Software Configuration

If you are using a software firewall (i.e. Norton Internet Security) and are having trouble connecting to Thecus IP storage, you can try the following steps:

1. Double click the **NIS** icon on system tray, and then configure the **Personal Firewall**.

2. On the **Programs** page, find the **SetupWizard.exe** and change its permission to "Permit All". If it's not in the program list, use the **Add** or **Program Scan** buttons to find it.

3. On the **Networking** page, manually add Thecus IP storage IP address (i.e. `192.168.1.100`) to the **Trusted** list.

Replacing Damaged Hard Drives

If you are using RAID 1 you can easily replace a damaged hard drive in the Thecus IP storage while keeping your data secure with the system's automatic data recovery.

Hard Drive Damage

When a hard drive is damaged and data in the RAID volume is corrupted, the system will beep to notify the status.

Replacing a Hard Drive

To replace a hard disk drive in the Thecus IP storage:

1. Remove the tray with the damaged hard disk.
2. Unscrew the damaged hard disk and remove it from the tray.
3. Slide a new hard disk into the tray and fasten the screws.
4. Insert the hard disk tray back into the Thecus IP storage until it snaps into place. You can also lock it with a key if desired.
5. The LED will blink green when the HDD is accessed.

RAID Auto-Rebuild

When using RAID 1 on the Thecus IP storage, you can use the auto-rebuild function when an error is detected.

1. When a hard disk fails the system beeps and/or an email notification is sent to the specified receivers.
2. Follow the steps mentioned above to replace the failed hard disk.
3. The system automatically recognizes the new hard disk and starts the auto-rebuild sequence to resume its status before the hard disk crash.

Chapter 7: Troubleshooting

Forgot My Network IP Address

If you forget your network IP address and have no physical access to the system, you can find out the IP address by using the setup wizard to retrieve the IP of your Thecus IP storage.

1. Start the Setup Wizard, and it will automatically detect all Thecus IP storage products on your network.

2. You should be able to find the IP address of the Thecus IP storage which you have forgotten in the **Device Discovery** screen.

Can't Map a Network Drive in Windows XP

You may have problems mapping a network drive under the following conditions:

1. The network folder is currently mapped using a different user name and password. To connect using a different user name and password, first disconnect any existing mappings to this network share.

2. The mapped network drive could not be created because the following error has occurred: **Multiple connections to a server or shared resource by the same user, using more than one user name, are not allowed.** Disconnect all previous connections to the server or shared resource and try again.

To check out existing network connections, type `net use` under the DOS prompt. You may refer the URL below for more network mapping information.

http://thecus.kayako.com/default_import/Knowledgebase/Article/View/541/0/three-ways-to-remove-windows7-saved-network-password

http://thecus.kayako.com/default_import/Knowledgebase/Article/View/113/0/what-is-unc-path

Restoring Factory Defaults

From the **Firmware Setting** menu, choose the ***Reset to Default*** item and **the Reset to Factory Default** screen appears. Press ***Apply*** to reset Thecus IP storage factory default settings.

WARNING Resetting to factory defaults will not erase the data stored in the hard disks, but WILL revert all the settings to the factory default values.

Problems with Time and Date Settings

The administrator is able to select an NTP Server to keep Thecus IP storage time synchronized. However, if Thecus IP storage cannot access the Internet, you may encounter a problem when setting the Time and Time Zone. If this happens:

1. Login to the Web Administration Interface.
2. Navigate to **Regional Option>NTP Service**.
3. Under **NTP Service**, untick to disable.
4. Set the **Date**, **Time**, and **Time Zone** manually from **Date/Time**.
5. Click ***Apply***.

In addition, if the Thecus IP storage is able to access the Internet and you want to keep the NTP Server clock.isc.org by default, please make sure the DNS Server is correctly entered, thereby allowing the NTP Server name to correctly resolve. (See ***Network*** > ***Host Setting*** > ***DNS Setting***)

Appendix A: Customer Support

If your Thecus IP storage is not working properly, we encourage you to check out **Chapter 7: Troubleshooting**, located in this manual. You can also try to ensure that you are using the latest firmware version for your Thecus IP storage. Thecus is committed to providing free firmware upgrades to our customers. Our newest firmware is available on our Download Center:

http://www.thecus.com/sp_download.php

If you are still experiencing problems with your Thecus IP storage, or require a Return Merchandise Authorization (RMA), feel free to contact technical support via our Technical Support Website:

http://www.thecus.com/sp_tech.php

For Sales Information you can e-mail us at:

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Thank you for choosing Thecus!

Appendix B: RAID Basics

Overview

A Redundant Array of Independent Disks (RAID) is an array of several hard disks that provide data security and high performance. A RAID system accesses several hard disks simultaneously, which improves I/O performance over a single hard disk. Data security is enhanced by a RAID, since data loss due to a hard disk failure is minimized by regenerating redundant data from the other RAID hard disks.

Benefits

RAID improves I/O performance, and increases data security through fault tolerance and redundant data storage.

Improved Performance

RAID provides access to several hard disk drives simultaneously, which greatly increases I/O performance.

Data Security

Hard disk drive failure unfortunately is a common occurrence. A RAID helps prevent against the loss of data due to hard disk failure. A RAID offers additional hard disk drives that can avert data loss from a hard disk drive failure. If a hard drive fails, the RAID volume can regenerate data from the data and parity stored on its other hard disk drives.

RAID Levels

The Thecus IP storage supports standard RAID levels 0, 1, 5, 6, 10, 50, 60 and JBOD. You choose a RAID level when you create a system volume. The factors for selecting a RAID level are:

- Your requirements for performance
- Your need for data security
- Number of hard disk drives in the system, capacity of hard disk drives in the system

The following is a description of each RAID level:

RAID 0

RAID 0 is best suited for applications that need high bandwidth but do not require a high level of data security. The RAID 0 level provides the best performance of all the RAID levels, but it does not provide data redundancy.

RAID 0 uses disk striping and breaking up data into blocks to write across all hard drives in the volume. The system can then use multiple hard drives for faster read and write. The stripe size parameter that was set when the RAID was created determines the size of each block. No parity calculations complicate the write operation.

RAID 1

RAID 1 mirrors all data from one hard disk drive to a second one hard disk drive, thus providing complete data redundancy. However, the cost of data storage capacity is doubled.

This is excellent for complete data security.

RAID 5

RAID 5 offers data security and it is best suited for networks that perform many small I/O transactions at the same time, as well as applications that require data security such as office automation and online customer service. Use it also for applications with high read requests but low write requests.

RAID 5 includes disk striping at the byte level and parity information is written to several hard disk drives. If a hard disk fails the system uses parity stored on each of the other hard disks to recreate all missing information.

RAID 6

RAID 6 is essentially an extension of RAID level 5 which allows for additional fault tolerance by using a second independent distributed parity scheme (dual parity) Data is striped on a block level across a set of drives, just like in RAID 5, and a second set of parity is calculated and written across all the drives; RAID 6 provides for an extremely high data fault tolerance and can sustain two simultaneous drive failures.

This is a perfect solution for mission critical applications.

RAID 10

RAID 10 is implemented as a striped array whose segments are RAID 1 arrays.
RAID 10 has the same fault tolerance as RAID level 1.
RAID 10 has the same overhead for fault-tolerance as mirroring alone. High I/O rates are achieved by striping RAID 1 segments.
Under certain circumstances, RAID 10 array can sustain up to 2 simultaneous drive failures

Excellent solution for applications that would have otherwise gone with RAID 1 but need an additional performance boost.

RAID 50

A RAID 50 combines the straight block-level striping of RAID 0 with the distributed parity of RAID 5. This is a RAID 0 array striped across RAID 5 elements. It requires at least 6 drives.

RAID 60

A RAID 60 combines the straight block-level striping of RAID 0 with the distributed double parity of RAID 6. That is, a RAID 0 array striped across RAID 6 elements. It requires at least 8 disks.

JBOD

Although a concatenation of disks (also called JBOD, or "Just a Bunch of Disks") is not one of the numbered RAID levels, it is a popular method for combining multiple physical disk drives into a single virtual one. As the name implies, disks are merely concatenated together, end to beginning, so they appear to be a single large disk.

As the data on JBOD is not protected, one drive failure could result total data loss.

Stripe Size

The length of the data segments being written across multiple hard disks. Data is written in stripes across the multiple hard disks of a RAID. Since multiple disks are accessed at the same time, disk striping enhances performance. The stripes can vary in size.

Disk Usage

When all disks are of the same size, and used in RAID, Thecus IP storage disk usage percentage is listed below:

RAID Level	Percentage Used
RAID 0	100%
RAID 1	1/n x 100%
RAID 5	(n-1)/n x 100%
RAID 6	(n-2)/n x 100%
RAID 10	50%
RAID 50	(n-1)/n x 100%
RAID 60	(n-2)/n x 100%
JBOD	100%

n : HDD number

Appendix C: Active Directory Basics

Overview

With Windows 2000, Microsoft introduced Active Directory (ADS), which is a large database/information store. Prior to Active Directory the Windows OS could not store additional information in its domain database. Active Directory also solved the problem of locating resources; which previously relied on Network Neighborhood, and was slow. Managing users and groups were among other issues Active Directory solved.

What is Active Directory?

Active Directory was built as a scalable, extensible directory service that was designed to meet corporate needs. A repository for storing user information, accounts, passwords, printers, computers, network information and other data, Microsoft calls Active Directory a "namespace" where names can be resolved.

ADS Benefits

ADS lets Thecus IP storage integrate itself with the existing ADS in an office environment. This means the Thecus IP storage is able to recognize your office users and passwords on the ADS server. Other major benefits ADS support provides include:

1. Easy integration of Thecus IP storage into the existing office IT infrastructure

   The Thecus IP storage acts as a member of the ADS. This feature significantly lowers the overhead of the system administrator. For example, corporate security policies and user privileges on an ADS server can be enforced automatically on Thecus IP storage.

2. Centralized user/password database

   The Thecus IP storage does not maintain its own copy of the user/password database. This avoids data inconsistency between Thecus IP storage and other servers. For example, without ADS support, an administrator might need to remove a specific user privilege on Thecus IP storage and each individual server. With ADS support, the change on an ADS server is known to all of its ADS members.

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