







Thecus

N8900 series/N12000 series/N16000 series N5550/N6850/N8850/N10850 N7700PRO V2/N7710 series N8800PRO V2 /N8810U series N4510U series/N7510

User's Manual

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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 N8900 / N12000 / N16000 series/N6850/N8850/N10850/N7700PRO V2/N8800PRO V2/N7710 series/N8810U series/N5550/N4510U series/N7510 Manual Version: 5.7 Release Date: March 2014

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 (AC 100V ~ 240V, 50/60 Hz, 3A). Plugging the Thecus IP storage to an incorrect power source could damage the unit.
- A Do NOT expose Thecus IP storage to dampness, dust, or corrosive liquids.
- A 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.

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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.

To learn about the Web User Interface, go to Chapter 4: Using the Thecus IP Storage > Web Administration Interface

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.

To set up the FTP Server, refer to Chapter 4: Network Service> FTP.

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!

To set up the iTunes Server, refer to Chapter 4: Application Server>iTunes Configuration.

Printer Server

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

To set up the Printer Server, refer to Chapter 4: External Devices Server>Printer Information.

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.

To configure RAID modes on the Thecus IP storage, refer to **Chapter 4: Storage Management >RAID Information**.

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.

To set up an iSCSI volume, refer to Chapter 4: Storage Management > iSCSI

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.

To schedule system on and off, refer to Chapter 4: System Management> Scheduled Power On/Off

Package Contents

N8900/N12000/N16000 Series/N8800PRO V2/N8810U series/

N4510U-R/N4510U PRO-R

The Thecus IP storage should contain the following common items:

- System Unit x1
- QIG (Quick Installation Guide) x1
- CD-Title (Acronis backup CD & Universal CD)
- Ethernet Cable x1
- Accessory bag x1
- HDD Compatibility list Card x1
- Multiple Languages Warranty Card x1
- Power cord x2

N6850/N8850/N10850/N7700PRO V2/N7710 series/N5550/N4510U-S/

N7510/N4510U PRO-S

The Thecus IP storage should contain the following common items:

- System Unit x1
- QIG (Quick Installation Guide) x1
- CD-Title (Acronis backup CD & 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.

Front Panel

N8900 series:



| Front Panel | |
|-------------------------|--|
| Item | Description |
| 1.Power Button | Power on/off N8900 |
| 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 / | • Press the button, the back led will light up to identify the system |
| LED | 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 |

N12000 series:

The Thecus N12000 series front panel has the device's controls, indicators, and hard disk trays:



| Front Panel | |
|-----------------------------|--|
| Item | Description |
| 1.Power Button | Power on/off N12000 |
| 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 / | • Press the button, the back led will light up to identify the system |
| LED | 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 |

N16000 series:

The Thecus N16000 series front panel has the device's controls, indicators, and hard disk trays:





| Front Pane | Front Panel | |
|---------------------|--|--|
| Item | Description | |
| 1.Power Button | Power on/off N16000 | |
| 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 / | Press the button, the back led will light up to identify the rack | |
| LED | 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.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 ₊J | Push to enter OLED operate password for basic system setting | |
| 14.Escape Button | Push to leave the current OLED menu | |
| ESC | | |

N6850:

The Thecus N6850's front panel has the device's controls, indicators, and hard disk trays:



| | Front Panel | | |
|-----|---------------------|--|--|
| | Item | Description | |
| 1. | Power Button | Power on/off N6850 | |
| 2. | USB Port | • USB 2.0 port for compatible USB devices, such as digital | |
| | | cameras, USB disks, and USB printers. | |
| 3. | USB Port | • USB 3.0 port for compatible USB devices, such as digital | |
| | | cameras, USB disks, and USB printers. | |
| 4. | LAN2 LED | Solid white: LAN2 Cable link | |
| | | Blinking: Network activity | |
| 5. | LAN1 LED | Solid white: LAN1 Cable link | |
| | | • Blinking : Network activity | |
| 6. | USB LED | Solid white: USB busy | |
| | | Solid Red: USB error | |
| 7. | System LED | Solid white: System is power on. | |
| 8. | OLED | Displays system status and information | |
| 9. | System Error LED | Blinking RED: System error. | |
| 10. | Down Button | Push to enter USB copy operation screen | |
| 11. | Up Button | Push to scroll up when using the OLED display | |
| 12. | Enter Button | Push to enter OLED operate password for basic system | |
| | | setting | |
| 13. | Escape Button | Push to leave the current OLED menu | |

N8850:

The Thecus N8850's front panel has the device's controls, indicators, and hard disk trays:



| Front Panel | |
|------------------------|--|
| Item | Description |
| 1. Power Button | Power on/off N8850 |
| 2. USB Port | USB 2.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers. |
| 3. USB Port | USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers. |
| 4. LAN2 LED | Solid white: LAN2 Cable link Blinking : Network activity |
| 5. LAN1 LED | Solid white: LAN1 Cable link Blinking : Network activity |
| 6. USB LED | Solid white: USB busy Solid Red: USB error |
| 7. System LED | Solid white: System is power on. |
| 8. OLED | Displays system status and information |
| 9. System Error LED | Blinking RED: System error. |
| 10. Down Button | Push to enter USB copy operation screen |
| 11. Up Button | Push to scroll up when using the OLED display |
| 12. Enter Button | Push to enter OLED operate password for basic system setting |
| 13. Escape Button | Push to leave the current OLED menu |

N10850: The Thecus N10850's front panel has the device's controls, indicators, and hard disk trays:



| Front Panel | |
|------------------|--|
| Item | Description |
| 1. Power Button | Power on/off N10850 |
| 2. USB Port | • USB 2.0 port for compatible USB devices, such as digital |
| | cameras, USB disks, and USB printers. |
| 3. USB Port | • USB 3.0 port for compatible USB devices, such as digital |
| | cameras, USB disks, and USB printers. |
| 4. LAN2 LED | Solid white: LAN2 Cable link |
| | • Blinking : Network activity |
| 5. LAN1 LED | Solid white: LAN1 Cable link |
| | • Blinking : Network activity |
| 6. USB LED | Solid white: USB busy |
| | Solid Red: USB error |
| 7. System LED | Solid white: System is power on. |
| 8. OLED | Displays system status and information |
| 9. System Error | Blinking RED: System error. |
| LED | |
| 10.Down Button | Push to enter USB copy operation screen |
| 11.Up Button | Push to scroll up when using the OLED display |
| 12.Enter Button | Push to enter OLED operate password for basic system |
| | setting |
| 13.Escape Button | Push to leave the current OLED menu |

N7700PRO V2/N7710 series: The Thecus N7700PRO V2/N7710 series front panel has the device's controls, indicators, and hard disk trays:



| Front Panel | |
|--------------------|---|
| Item | Description |
| 1.Power LED | Solid blue: System is power on. |
| 2.System LED | • Solid orange: system is being upgraded or system startup; data |
| | currently inaccessible |
| 3.WAN/LAN1 LED | Solid green: network link |
| | Blinking green: network activity |
| 4.LAN2 LED | Solid green: network link |
| | Blinking green: network activity |
| 5.USB Copy LED | • Solid blue: files are being copied from a USB storage device |
| 6.eSATA link LED | Solid blue: external eSATA device has connected |
| (N7700PROv2) | |
| 7.USB Port | USB 2.0 port for compatible USB devices, such as USB disks. |
| 8.Power Button | Power on/off N7700PRO V2/N7710 series |
| 9.Up Button ▲ | Push to scroll up when using the LCD display |
| 10.Down Button ▼ | Push to enter USB copy operation screen |
| 11.Enter Button ₊J | Push to enter LCD operate password for basic system setting |
| 12.Escape Button | Push to leave the current LCD menu |
| ESC | |
| 13.LCD Display | Displays current system status and warning messages |
| 14.HDD Trays | • Seven 3.5" SATA HDD trays |
| | Locks are provided for added security |

N8800PRO V2/N8810U series: The Thecus N8800PRO V2/N8810U series front panel has the device's controls, indicators, and hard disk trays:



| Front Panel | |
|---------------------------|---|
| Item | Description |
| 1.Power Button | Power on/off N8800PRO V2/N8810U series |
| 2.Power LED | Solid green: System is power on. |
| 3.Reboot Button | Press to system reboot |
| 4.System fan alarm LED | Solid red: system fan failure notification |
| 5. Mute button | Mute the system fan alarm. |
| 6.USB Port | USB 2.0 port for compatible USB devices, such as USB disks, USB printers |
| 7.Up Button ▲ | Push to scroll up when using the LCD display |
| 8.Down Button ▼ | Push to enter USB copy operation screen |
| 9.Enter Button ↓ | Push to enter LCD operate password for basic system setting |
| 10.Escape Button | Push to leave the current LCD menu |
| ESC | |

N5550: The Thecus N5550 front panel has the device's controls, indicators, and hard disk trays:



| Front Panel | |
|-----------------------------|--|
| Item | Description |
| 1.System LED | • Blinking orange: System is being upgraded or ; is starting up; |
| | data currently inaccessible |
| 2.WAN/LAN1 LED | Solid green: Network link |
| | • Blinking green: Network activity |
| 3.LAN2 LED | Solid green: Network link |
| | Blinking green: Network activity |
| 4.USB Copy LED | • Solid blue: Files are being copied from a USB storage device |
| 5.Syetem Warning LED | Solid RED: System error |
| 6.Reset Button | Resets system configuration to default value. |
| 7.USB Port | • USB 3.0 port for compatible USB devices, such as USB disks. |
| 8.Power Button/ Power | Power on/off N5550 and Power LED. |
| LED | Solid blue: System is power on. |
| 9.Up Button 🔺 | Push to scroll up when using the LCD display. |
| 10.Down Button ▼ | Push to enter the USB copy operation screen. |
| 11.Enter Button ↓ | Push to enter LCD administrator password to access basic |
| | system setting. |
| 12.Escape Button ESC | Push to leave the current LCD menu. |
| 13.LCD Display | • Displays current system status and warning messages. |
| 14.HDD Trays | • Five 3.5" SATA HDD trays. |
| | Locks are provided for added security. |

N4510U:

The Thecus N4510U front panel has the device's controls, indicators, and hard disk trays:



| Front Panel | |
|---------------------------------|---|
| Item | Description |
| 1. LCD Display | Displays the current system status and warning messages. |
| | Displays hostname, WAN/LAN1/LAN2 IP addresses, RAID status, |
| | and current time. |
| Up Button ▲ | Push to scroll up when using the LCD display. |
| 3. Down Button ▼ | Push to scroll down when using the LCD display. |
| لم 4.Enter Button | • Push to confirm information entered into the LCD display. |
| 5. Escape Button | Push to leave the current LCD menu. |
| ESC | |
| 6. Locator Button | Turns on the LED backlight. |
| 7. USB Port | • USB 3.0 port for compatible USB devices, such as digital cameras, |
| | USB disks, and USB printers. |
| 8. PWR LED | Solid Blue: System is powered on. |
| 9. Busy LED | • Blinking orange: system startup or system maintenance; data |
| | currently inaccessible |
| 10.Error LED | Solid Red: System alert: Redundant power or system fan failure |
| 11.LAN LED | Solid green: network link |
| | • Blinking green: network activity |
| 12. Power Button | Power the N4510U on/off. |
| 13. Reset Button | • Resets the N4510U. |
| 14. Mute Button | • Mutes the system fan alarm (Can also be managed through the UI) |
| 15.HDD Trays | • Four 3.5" SATA HDD trays. |
| | Locks are provided for added security. |

N4510U PRO:

The Thecus N4510U PRO front panel has the device's controls, indicators, and hard disk trays:



| | Front Panel | |
|-----|----------------------|--|
| | Item | Description |
| 1. | LCD Display | Displays the current system status and warning messages. Displays hostname, WAN/LAN1 IP addresses, RAID status, and current time. |
| 2. | Up Button 🔺 | Push to scroll up when using the LCD display. |
| 3. | Down Button V | Push to scroll down when using the LCD display. |
| 4. | Enter Button 🗸 | • Push to confirm information entered into the LCD display. |
| 5. | Escape Button ESC | Push to leave the current LCD menu. |
| 6. | Locator Button | Turns on the LED backlight. |
| 7. | USB Port | USB 3.0 port for compatible USB devices, such as digital cameras, USB disks, and USB printers. |
| 8. | PWR LED | Solid Blue: System is powered on. |
| 9. | Busy LED | Blinking orange: system startup or system maintenance; data currently inaccessible |
| 10. | Error LED | Solid Red: System alert: Redundant power or system fan failure |
| 11. | LAN LED | Solid green: network link Blinking green: network activity |
| 12. | Power Button | Power the N4510U PRO on/off. |
| 13. | Reset Button | • Resets the N4510U PRO. |
| 14. | Mute Button | Mutes the system fan alarm (Can also be managed through the UI) |
| 15. | HDD Trays | Four 3.5" SATA HDD trays.Locks are provided for added security. |

N7510:

The Thecus N7510 front panel has the device's controls, indicators, and hard disk trays:



| Front Panel | |
|--------------------|---|
| Item | Description |
| 1.Power LED | Solid blue: System is power on. |
| 2.System LED | • Solid orange: system is being upgraded or system startup; data |
| | currently inaccessible |
| 3.WAN/LAN1 LED | Solid green: network link |
| | • Blinking green: network activity |
| 4.LAN2 LED | Solid green: network link |
| | • Blinking green: network activity |
| 5.USB Copy LED | • Solid blue: files are being copied from a USB storage device |
| 6.eSATA link LED | Solid blue: external eSATA device has connected |
| 7.USB Port | • USB 3.0 port for compatible USB devices, such as USB disks. |
| 8.Power Button | Power on/off N7510 |
| 9.Up Button ▲ | Push to scroll up when using the LCD display |
| 10.Down Button V | Push to enter USB copy operation screen |
| 11.Enter Button ₊J | Push to enter LCD operate password for basic system setting |
| 12.Escape Button | Push to leave the current LCD menu |
| ESC | |
| 13.LCD Display | Displays current system status and warning messages |
| 14.HDD Trays | Seven 3.5" SATA HDD trays |
| | Locks are provided for added security |

Rear Panel

N8900



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2.Serial Port | This port is for external UPS device |
| 3.eSATA Port | eSATA port for high-speed storage expansion |
| 4.USB Port | • USB 2.0 port for compatible USB devices, such as USB disks, and |
| | USB printers |
| 5.USB Port | USB 3.0 port for compatible USB devices. |
| 6.WAN/LAN1 Port | • WAN/LAN1 port for connecting to an Ethernet network through a |
| | switch or router |
| 7.LAN2 Port | LAN2 port for connecting to an Ethernet network through a switch |
| | or router |
| 8.LAN3 Port | • LAN3 port for connecting to an Ethernet network through a switch |
| | or router. |

N12000:

The N12000 rear panel features ports and connectors.



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2.Serial Port | This port is for external UPS device |
| 3.eSATA Port | eSATA port for high-speed storage expansion |
| 4.USB Port | • USB 2.0 port for compatible USB devices, such as USB disks, and |
| | USB printers |

| 5.USB Port | USB 3.0 port for compatible USB devices. |
|-----------------|--|
| 6.WAN/LAN1 Port | • WAN/LAN1 port for connecting to an Ethernet network through a |
| | switch or router |
| 7.LAN2 Port | • LAN2 port for connecting to an Ethernet network through a switch |
| | or router |
| 8.LAN3 Port | LAN3 port for HA connecting. |

N12000V/N12000PRO: N12000V/N12000PRO rear panel features ports and connectors.



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2.Serial Port | This port is for external UPS device |
| 3.eSATA Port | eSATA port for high-speed storage expansion |
| 4.USB Port | USB 2.0 port for compatible USB devices, such as USB disks, and USB printers |
| 5.USB Port | USB 3.0 port for compatible USB devices. |
| 6.WAN/LAN1 Port | WAN/LAN1 port for connecting to an Ethernet network through a switch or router |
| 7.LAN2 Port | LAN2 port for connecting to an Ethernet network through a switch or router |
| 8.LAN3 Port | LAN3 port for HA connecting. |
| 9.HDMI Port | • For Video/Audio out |
| 10. Mic input | Microphone input |
| 11. Line out | • For Audio out |
| 12.Line in | • For Audio in |

N16000:

The N16000 rear panel features ports and connectors.



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2.Serial Port | This port is for external UPS device |
| 3.eSATA Port | eSATA port for high-speed storage expansion |
| 4.USB Port | • USB 2.0 port for compatible USB devices, such as USB disks, and |
| | USB printers |
| 5.USB Port | USB 3.0 port for compatible USB devices. |
| 6.WAN/LAN1 Port | • WAN/LAN1 port for connecting to an Ethernet network through a |
| | switch or router |
| 7.LAN2 Port | • LAN2 port for connecting to an Ethernet network through a switch |
| | or router |
| 8.LAN3 Port | LAN3 port for HA connecting. |

N16000V/N16000PRO: N16000V/N16000PRO rear panel features ports and connectors.



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2.Serial Port | This port is for external UPS device |
| 3.eSATA Port | eSATA port for high-speed storage expansion |
| 4.USB Port | USB 2.0 port for compatible USB devices, such as USB disks, and USB printers |
| 5.USB Port | USB 3.0 port for compatible USB devices. |
| 6.WAN/LAN1 Port | WAN/LAN1 port for connecting to an Ethernet network through a switch or router |
| 7.LAN2 Port | LAN2 port for connecting to an Ethernet network through a switch or router |
| 8.LAN3 Port | LAN3 port for HA connecting. |
| 9.HDMI Port | • For Video/Audio out |
| 10.Line in | • For Audio in |
| 11. Line out | • For Audio out |
| 12. Mic input | Microphone input |

N6850:

The N6850 rear panel features ports and connectors.



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2.Serial Port | This port is for external UPS device |
| 3.eSATA Port | eSATA port for high-speed storage expansion |
| 4.USB Port | USB 2.0 port for compatible USB devices, such as USB disks, and USB printers |
| 5.USB Port | USB 3.0 port for compatible USB devices. |
| 6.WAN/LAN1 Port | WAN/LAN1 port for connecting to an Ethernet network through a switch or router |
| 7.LAN2 Port | LAN2 port for connecting to an Ethernet network through a switch or router |
| 8.HDMI Port | • For Video/Audio out |
| 9.Line in | • For Audio in |
| 10. Line out | • For Audio out |
| 11. Mic input | Microphone input |
| 12. User GPIO | Could define each GPIO (0~7) and implement its own functionality. |

N8850:

The N8850 rear panel features ports and connectors.



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2.Serial Port | This port is for external UPS device |
| 3.eSATA Port | eSATA port for high-speed storage expansion |
| 4.USB Port | • USB 2.0 port for compatible USB devices, such as USB disks, and |
| | USB printers |
| 5.USB Port | USB 3.0 port for compatible USB devices. |
| 6.WAN/LAN1 Port | • WAN/LAN1 port for connecting to an Ethernet network through a |
| | switch or router |
| 7.LAN2 Port | • LAN2 port for connecting to an Ethernet network through a switch |
| | or router |
| 8.HDMI Port | • For Video/Audio out |
| 9.Line in | • For Audio in |
| 10. Line out | • For Audio out |
| 11. Mic input | Microphone input |
| 12. User GPIO | • Could define each GPIO (0 ~7) and implement its own |
| | functionality. |

N10850:

The N10850 rear panel features ports and connectors.



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2.Serial Port | This port is for external UPS device |
| 3.eSATA Port | eSATA port for high-speed storage expansion |
| 4.USB Port | • USB 2.0 port for compatible USB devices, such as USB disks, and |
| | USB printers |
| 5.USB Port | USB 3.0 port for compatible USB devices. |
| 6.WAN/LAN1 Port | • WAN/LAN1 port for connecting to an Ethernet network through a |
| | switch or router |
| 7.LAN2 Port | • LAN2 port for connecting to an Ethernet network through a switch |
| | or router |
| 8.HDMI Port | • For Video/Audio out |
| 9.Line in | • For Audio in |
| 10.Line out | • For Audio out |
| 11.Mic input | Microphone input |
| 12. User GPIO | • Could define each GPIO (0~7) and implement its own |
| | functionality. |

N7700PRO V2:

The N7700PRO V2 rear panel features ports and connectors.



| Back Panel | |
|-------------------|---|
| Item | Description |
| 1.LAN2 Port | • LAN2 port for connecting to a local Ethernet network through a switch or router. |
| 2.WAN/LAN1 Port | • WAN/LAN1 port for connecting to an Ethernet network through a switch or router. |
| 3.Serial Port | • This port is for an external UPS device. |
| 4.eSATA Port | eSATA port for high-speed storage expansion. |
| 5.USB Port | USB 2.0 port for compatible USB devices, such as USB disks, and USB printers. |
| 6.System Fan | System fan that exhausts heat from the unit. |
| 7.Power Connector | Connect the included power cord to this connector. |

N7710 series:

The N7710 series rear panel features ports and connectors.



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2. WAN/LAN1 Port | • WAN/LAN1 port for connecting to an Ethernet network through a |
| | switch or router |
| 3. LAN2 Port | LAN2 port for connecting to an Ethernet network through a switch |
| | or router |
| 4.USB Port | • USB 2.0 port for compatible USB devices, such as USB disks, and |
| | USB printers |
| 5.USB Port | • USB 3.0 port for compatible USB devices, such as USB disks, and |
| | USB printers |
| 6.HDMI Port | For Video/Audio out |
| 7.VGA Port | • For Video out |

N8800PRO V2:

The N8800PRO V2 rear panel features ports and connectors.



N8810U series:

The N8810U series rear panel features ports and connectors.



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2. WAN/LAN1 Port | WAN/LAN1 port for connecting to an Ethernet network through a |
| | switch or router |
| 3. LAN2 Port | • LAN2 port for connecting to an Ethernet network through a switch |
| | or router |
| 4.USB Port | • USB 2.0 port for compatible USB devices, such as USB disks, and |
| | USB printers |
| 5.USB Port | • USB 344.0 port for compatible USB devices, such as USB disks, |
| | and USB printers |
| 6.HDMI Port | • For Video/Audio out |
| 7.VGA Port | • For Video out |

N5550:

The N5550 rear panel features ports and connectors.



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2. WAN/LAN1 Port | • WAN/LAN1 port for connecting to an Ethernet network through a |
| | switch or router |
| 3. LAN2 Port | • LAN2 port for connecting to an Ethernet network through a switch |
| | or router |
| 4.USB Port | • USB 2.0 port for compatible USB devices, such as USB disks, and |
| | USB printers |
| 5.USB Port | USB 2.0 port for compatible USB devices. |
| 6.eSATA Port | eSATA port for high-speed storage expansion |
| 7.Line in | • For Audio in |
| 8. Line out | • For Audio out |
| 9. Mic input | Microphone input |
| 10.System Fan | System fan that exhausts heat from the unit. |
| 11.HDMI Port | • For Video/Audio out |
| 12.VGA Port | • For Video out |

N4510U-R:



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2. WAN/LAN1 Port | • WAN/LAN1 port for connecting to an Ethernet network through a |
| | switch or router |
| 3. LAN2 Port | LAN2 port for connecting to an Ethernet network through a switch or router |
| 4.USB Port | USB 2.0 port for compatible USB devices, such as USB disks, and USB printers |
| 5.USB Port | USB 2.0 port for compatible USB devices. |
| 6.eSATA Port | eSATA port for high-speed storage expansion |
| 7.Line in | • For Audio in |
| 8. Line out | • For Audio out |
| 9. Mic input | Microphone input |
| 10.HDMI Port | • For Video/Audio out |
| 11.VGA Port | • For Video out |
| 12. Locator LED | • Identifies each NAS within a rack mount configuration. |

N4510U-S:

The rear panel of the N4510U-S is similar to the N4510U-R, but with a single power connector:



N4510U PRO-R:

| Back P | Back Panel | | |
|-----------------|--|--|--|
| Item | Description | | |
| 1.Power Connect | • Connect the included power cords to these connectors | | |
| 2. WAN/LAN1 Pc | WAN/LAN1 port for connecting to an Ethernet network through a switch or router | | |
| 3. LAN2 Port | LAN2 port for connecting to an Ethernet network through a switch or router | | |
| | of fouler | | |
| 4.USB Port | USB 2.0 port for compatible USB devices, such as USB disks, and USB printers | | |

5.0SB Port • USB 2.0 port for compatible USB devices. 6.eSATA Port • eSATA port for high-speed storage expansion 7.Line in • For Audio in 8. Line out • For Audio out 9. Mic input • Microphone input 10.HDMI Port • For Video/Audio out 11.VGA Port • For Video out 12. Locator LED • Identifies each NAS within a rack mount configuration.

N4510U PRO-S:

The rear panel of the N4510U PRO-S is similar to the N4510U PRO-R, but with a single power connector:



N7510:

The N7510 rear panel features ports and connectors.



| Back Panel | |
|-------------------|--|
| Item | Description |
| 1.Power Connector | Connect the included power cords to these connectors |
| 2. WAN/LAN1 Port | WAN/LAN1 port for connecting to an Ethernet network through a switch or router |
| 3. LAN2 Port | LAN2 port for connecting to an Ethernet network through a switch or router |
| 4.USB Port | USB 2.0 port for compatible USB devices, such as USB disks, and USB printers |
| 5.eSATA Port | eSATA port for high-speed storage expansion |
| 6.Line in | • For Audio in |
| 7. Line out | • For Audio out |
| 8. Mic input | Microphone input |
| 9.System Fan | System fan that exhausts heat from the unit. |
| 10.HDMI Port | • For Video/Audio out |
| 11.VGA Port | • For Video out |
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.





N12000 series/N16000 series/N8900 series WAN/LAN1 port



N6850/N8850/N10850
WAN/LAN1 port



▲ N7700PRO V2/N7710 series WAN/LAN1 port





N8800PRO
 V2/N8810U series
 WAN/LAN1 port





▲ N4510U/N4510U PRO

WAN/LAN1 port

▲ N7510 WAN/LAN1 port

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



▲ N12000 series/N16000 series/N8900 series power socket



▲ N6850/N8850/N10850 power socket



N7700PRO V2 /N7710 series/N7510 power socket



 N8800PRO V2/N8810U series power socket





▲ N5550 power socket

▲ N4510U/N4510U PRO power socket

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



▲ N12000 series/N16000 series/N8900 series power button



▲ N6850/N8850/N10850 power button



▲ N5550 power button







▲ N8800PRO V2/N8810U series power button



▲ N4510U power button



▲ N4510UPRO 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**. 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.**





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.

| Thecus | | IP Stor | age Appl | ianc |
|--------------------------|--------------------|---|--------------------------|--------------|
| Device Discovery | | Device Dis | covery | Version: 2.0 |
| Login System | No Host N 1 N89 | Contraction of the second s | MAC 00-14-FD-13-98-BC | G 192 |
| Network Configuration | | | | |
| Change Password | | | | |
| Complete | | | | |
| | (m | | | • |

- 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".

| Thegus | IP Storage | Applianc |
|--------------------------|-----------------|-------------|
| Device Discovery | Login System | Version: 20 |
| Login System | Admin ID: admin | |
| Network Configuration | Password: | |
| Change Password | | |
| Complete | | |
| | | |

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.

| Device Discovery | Network Configuration | Version: 2.0 |
|--------------------------|-----------------------------|--------------|
| Login System | Host Name: N8900 IP Type | |
| | C FixedIP O DHCP | |
| Network Configuration | IP Setting | |
| | IP address: 192.168.0.102 | |
| Change Password | Netmask: 255.255.255.0 | |
| | Gateway IP: 192.168.0.1 | |
| Complete | DNS Server: 192168.0.1 | |

7. Change the default administrator password.

| Thecus | IP Storage Ap | pliance |
|--------------------------|-----------------|---------------|
| Device Discovery | Change Password | Version: 2.04 |
| Login System | | |
| Network Configuration | New Password: | |
| Change Password | Contraininguas | |
| Complete | | |

 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.



LCD Operation (N7700PRO V2/N8800PRO V2/ N7710 series/N8810U series/N5550/N4510U series/N7510)

The mentioned models above are equipped with an LCD on the front for easy status display and setup. There are four buttons on the front panel to control the LCD functions.

LCD Controls

ESC

Escape

Use the **Up** (\blacktriangle), **Down** (\triangledown), **Enter** (\downarrow) and **Escape** (**ESC**) keys to select various configuration settings and menu options for Thecus IP storage configuration.

 LCD Controls

 Icon
 Function
 Description

 ▲
 Up Button
 Select the previous configuration settings option.

 ▼
 Down Button
 USB copy confirmation display.

 ↓
 Enter
 Enter the selected menu option, sub-menu, or parameter setting.

The following table illustrates the keys on the front control panel:

There are two modes of operation for the LCD: **Display Mode** and **Management Mode**.

Escape and return to the previous menu.

Display Mode

During normal operation, the LCD will be in **Display Mode**.

| Display Mode | |
|------------------|--|
| Item | Description |
| Host Name | Current host name of the system. |
| WAN/LAN1 | Current WAN/LAN1 IP setting. |
| LAN2 | Current LAN2 IP setting. |
| Link Aggregation | Current Link Aggregation status |
| System Fan1 | Current system fan1 status. |
| System Fan2 | Current system fan2 status. |
| CPU Fan | Current CPU fan status |
| 2009/05/22 12:00 | Current system time. |
| Disk Info | Current status of disk slot has been installed |
| RAID | Current RAID status. |

The Thecus IP storage will rotate these messages every one-two seconds on the LCD display.

USB Copy

The USB Copy function enables you to copy files stored on USB devices such as USB disks and digital cameras to the Thecus IP storage by press button. To use USB copy, follow the steps below:

- 1. Plug your USB device into an available USB port on the Front end.
- 2. In **Display Mode**, press the **Down Button** (▼).
- 3. The LCD will display "USB Copy?"
- 4. Press **Enter** (↓) and the Thecus IP storage will start copying USB disks connected to the front USB port.
- 5. All of data will be copied into system folder named "USB copy".

Management Mode

During setup and configuration, the LCD will be in **Management Mode**.

To enter into Management Mode, press **Enter (**,) and an "*Enter Password"* prompt will show on the LCD.

At this time, the administrator has to enter the correct LCD password. System will check whether the correct LCD password has been entered. The default LCD password is " 0000 ". If correct password is entered, you will enter into the **Management Mode** menu.

| Management Mode | | |
|---------------------|--|--|
| Item | Description | |
| WAN/LAN1 Setting | IP address and netmask of your WAN/LAN1 ports. | |
| LAN2 Setting | IP address and netmask of your LAN2 ports. | |
| Link Agg. Setting | Select Load Balance, 802.3ad or Failover. | |
| Change Admin Passwd | Change administrator's password for LCD operation. | |
| Reset to Default | Reset system to factory defaults. | |
| Exit | Exit Management Mode and return to Display Mode. | |

NOTE

You can also change your LCD password using the Web Administration Interface by navigating to **System Management > Administrator Password**. For more on the Web Administration Interface, see **Chapter 4: System Management**.

OLED Operation(Does not apply to the N7700PRO V2/N8800PRO V2/ N7710 series/N8810U series/N5550/N4510U series/N7510)

OLED Operation

The Thecus IP storage is equipped with an OLED on the front for easy status display and setup. There are four buttons on the front panel to control the OLED functions.

OLED Controls

Use the **Up** (\blacktriangle), **Down** (\triangledown), **Enter** (\dashv) and **Escape** (**ESC**) keys to select various configuration settings and menu options for Thecus IP storage configuration.

The following table illustrates the keys on the front control panel:

| OLED | OLED Controls | | | | | |
|------|----------------------|---|--|--|--|--|
| Icon | Function Description | | | | | |
| | Up Button | Select the previous configuration settings option. | | | | |
| ▼ | Down Button | USB copy confirmation display. | | | | |
| ъ | Enter | Enter the selected menu option, sub-menu, or parameter setting. | | | | |
| ESC | Escape | Escape and return to the previous menu. | | | | |

There are two modes of operation for the OLED: **Display Mode** and **Management Mode**.

Display Mode

During normal operation, the OLED will be in **Display Mode**.

| Display Mode | |
|------------------|----------------------------------|
| Item | Description |
| Host Name | Current host name of the system. |
| WAN/LAN1 | Current WAN/LAN1 IP setting. |
| LAN2 | Current LAN2 IP setting. |
| Link Aggregation | Current Link Aggregation status |
| System Fan | Current system fan status. |
| CPU Fan | Current CPU fan status |
| 2009/05/22 12:00 | Current system time. |
| RAID | Current RAID status. |

The Thecus IP storage will rotate these messages every one-two seconds on the OLED display.

USB Copy

The USB Copy function enables you to copy files stored on USB devices such as USB disks and digital cameras to the Thecus IP storage with a press of a button. To use USB copy, follow the steps below:

- 1. Plug your USB device into an available USB port on the Front Panel.
- 2. In **Display Mode**, press the **Enter** (↓).

- 3. The LCD will display "USB Copy?"
- Press Enter (→) and the Thecus IP storage will start copying USB disks connected to the front USB port. The LCD will display the USB copy progress and results.

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.

For more on how to use the Web Administration Interface, see **Chapter 4: Web Administration Interface**.

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 menu bar.

For details on how to configure your network settings, refer to **Chapter 4: System Network** .

Step 2: RAID Creation

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

For more information on configuring RAID, see **Chapter 4: Storage > RAID Management**.

Don't know which RAID level to use? Find out more about the different RAID levels from **Appendix B: RAID Basics**.

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).

For more on managing users, go to **Chapter 4: User and Group Authentication**.

For more information on configuring Active Directory, see Chapter 4: User and Group Authentication > ADS Support.

For information about the benefits of Active Directory, see **Appendix D: Active Directory Basics**.

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.

More information on managing folders, see Chapter 4: Storage Management > Share Folder . To find out about configuring Folder Access Control Lists, see **Chapter 4: Storage Management > Share Folder > Folder Access Control List (ACL)**.

Step 5: Start Services

Finally, you can start to setup the different services of Thecus IP storage for the users on your network. You can find out more about each of these services by clicking below:

SMB/CIFS

Apple File Protocol (AFP)

Network File System (NFS)

File Transfer Protocol (FTP)

iTunes Server

Printer Server

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)





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.

| Disclaimer | |
|--|---|
| THECUS has no liability, consequential, incidental or special damages. These include, without limitation, loss of recorded data, the cost of recovery of lost data, lost profits and the cost of the installation or removal of any THECUS products, the installation of replacement THECUS products, and any inspection, testing, or redesign caused by any defect or by the repair or replacement of Products arising from a defect in any THECUS products. | ~ |
| Users can now register their Thecus NAS online. Simply go to the online registration page and enable the registration function. The registration page states what system information will be kept in the archive. Users will receive firmware upgrade and module release notice regularly. | > |
| I agree. Don`t show this message next time. | |

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.

My Favorite

The user interface with "My Favorite" shortcut allows the user to designate often used items and have them display on the main screen area. The figure below displays system favorite functions.



Administrators can add or remove favorite functions to My Favorites by right clicking the mouse on the menu tree.

Another way the administrators can add favorite functions is by clicking the "Add Favorite" icon in each function screen. See the figure below with the red circled icon.



To return to the favorite screen, simply click "Home" located at the left hand corner of the main screen.

| • • | Home > | System Info | mation > General | 🕜 Help | ♡• My favorite | 心・ Shutdown | <i>s</i> ² Logout |
|------------------------|--------|---------------|------------------|--------|----------------|--------------------|------------------------------|
| 📕 System Information 🖃 | Pro | duct Informat | ion | | | | |
| General Status | Man | ufacturer | Thecus | | | | |
| Contrast and | Deed | | NOODOV | | | | |

Menu Bar

The **Menu Bar** 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 |
| System Information | Current system status of the Thecus IP storage. |
| System Management | Various Thecus IP storage system settings and information. |
| System Network | Information and settings for network connections, as well as various services of the Thecus IP storage. |
| Storage | Information and settings for storage devices installed into the Thecus IP storage. |
| User and Group Authentication | Allows configuration of users and groups. |
| Network Service | |
| Application Server | Printer Server and iTunes Server set-up of the Thecus IP storage. |
| Module Management | System and user Module installation of the Thecus IP storage. |
| Backup | Category of Backup Features setup of the Thecus IP storage. |

Moving your cursor over any of these items will display the dropdown menu selections for each group.

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

Message Bar

You can get quick information about your system status by moving your mouse over these icons.



| | Message Bar | |
|------|--------------------|---|
| Item | Status | Description |
| | RAID Information. | Display the status of created RAID volume. Click to go to RAID information page as short cut. |
| 0 | Disks Information. | Display the status of disks installed in the system. Click to go to Disk information page as short cut. |
| 2 | FAN. | Display system FAN Status. Click to go to System Status page as short cut. |
| 4 | Network. | Green: Connection to the network is normal. Red: abnormal connection to the network |
| J | Temperature | Display system temperature, click to go to System Status page as shot cut. |

Logout



Click to logout Web Administration Interface.

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 menu bar, click **Language** and the **selection** list appears. This user interface will switch to the selected language for Thecus IP storage.



System Information

Information provides viewing on current Product info, System Status, Service Status and Logs.

The menu bar allows you to see various aspects of the Thecus IP storage. From here, you can discover the status of the Thecus IP storage, and also other details.

System Information

Once you login, you will first see the basic **system Information** screen providing **Manufacturer**, **Product No.**, **Firmware Version**, and **System Up Time** information.

| 📜 System Information 📃 | Product Informat | tion |
|------------------------|------------------|-------------------|
| General Status | Manufacturer | Thecus |
| System Log | Product No. | N12000 |
| | Firmware Version | 2.02.00.4 |
| System Monitor | Up Time | 2 hours 5 minutes |
| | | |

| System Information | | |
|--------------------|---|--|
| Item | Description | |
| Manufacturer | Displays the name of the system manufacturer. | |
| Product No. | Shows the model number of the system. | |
| Firmware version | Shows the current firmware version. | |
| Up time | Displays the total run time of the system. | |

System/Service Status (Refer Chapter 7 for FW v2.03.01 and after)

From the **System Information** menu, choose the **Status** item, **System Status** and **Service Status** screens appear. These screens provide basic system and service status information.

| Home > System Informatio | n > Status | ⑦ Help ♡• N | ly favorite 🕛 Shutdown 🞢 Logou |
|--------------------------|--|--|---|
| System Status | | Service Status | |
| CPU Activity | 0% | AFP Status | Stopped |
| CPU Fan Speed | 2721 RPM | NFS Status | Stopped |
| System Fan 1 Speed | 5578 RPM | SMB/CIFS Status | Running |
| System Fan 2 Speed | FAIL | FTP Status | Stopped |
| System Fan 3 Speed | 5769 RPM | TFTP Status | Stopped |
| System Fan 4 Speed | FAIL | Rsync Status | Stopped |
| CPU Temperature | 44 °C | UPnP Status | Stopped |
| System Temperature 1 | 47 °C | SNMP Status | Stopped |
| System Temperature 2 | 26 °C | | |
| System Temperature 3 | 24 °C | | |
| System Temperature 4 | 24 °C | | |
| Power Supply Unit | Fai | | |
| Up Time | 2 hours 4 minutes | | |
| | System Status CPU Activity CPU Fan Speed System Fan 1 Speed System Fan 2 Speed System Fan 3 Speed System Fan 4 Speed CPU Temperature System Temperature 1 System Temperature 2 System Temperature 3 System Temperature 4 Power Supply Unit | CPU Activity0%CPU Fan Speed2721 RPMSystem Fan 1 Speed5578 RPMSystem Fan 2 SpeedFAILSystem Fan 3 Speed5769 RPMSystem Fan 4 SpeedFAILCPU Temperature44 °CSystem Temperature 147 °CSystem Temperature 226 °CSystem Temperature 324 °CSystem Temperature 424 °CPower Supply UnitFail | System StatusService StatusCPU Activity0%AFP StatusCPU Fan Speed2721 RPMNFS StatusSystem Fan 1 Speed5578 RPMSMB/CIFS StatusSystem Fan 2 SpeedFAILFTP StatusSystem Fan 3 Speed5769 RPMTFTP StatusSystem Fan 4 SpeedFAILRsync StatusCPU Temperature44 °CUPnP StatusSystem Temperature 147 °CSNMP StatusSystem Temperature 226 °CSystem Temperature 3System Temperature 424 °CPower Supply UnitPower Supply UnitFailFail |

| System Status | |
|---------------|---|
| Item | Description |
| CPU Activity | Displays current CPU workload of the Thecus IP storage. |
| CPU Fan Speed | Displays current CPU fan status. |

| System Fan 1 Speed | Displays current System fan (left 1) status |
|----------------------|---|
| System Fan 2 Speed | Displays current System fan (left 2) status |
| System Fan 3 Speed | Displays current System fan (left 3) status (Depend on model) |
| System Fan 4 Speed | Displays current System fan (left 4) status (Depend on model) |
| CPU Temperature | Displays current CPU Temperature. |
| System Temperature 1 | Displays current System temperature in position 1 |
| System Temperature 2 | Displays current System temperature in position 2 |
| System Temperature 3 | Displays current System temperature in position 3 |
| System Temperature 4 | Displays current System temperature in position 4 |
| System Fan Speed | Displays the current status of the system fan. |
| Up Time | Shows how long the system has been up and running. |

| 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. |

Logs

From the **System Information** menu, choose the **System Logs** item and the **System Logs** screen appears. This screen shows a history of system usage and important events such as disk status, network information, and system booting. See the following table for a detailed description of each item:

| • | ~~ | Home > System Information > System Log ⑦ Help ♡-My favorite ①* Shutdown | 🗗 Logout |
|---------------------------------|------|---|----------|
| 🕕 System Information | - | System Log | |
| General | | | |
| 🗹 System Log | | Download All Log Files Orruncate All Log Files Number of lines per page 13 | |
| Online Registration | | Time - Details | Help |
| Joslog Management | | 2012/02/29 17:08:56 [N12000p] : Syslog service start. | |
| -y of second monitor | | 2012/02/29 17:08:20 [N12000p] : Syslog service stop. | |
| | | 2012/02/29 16:25:40 [N12000p] : TFTP service is disabled. | |
| | _ | 2012/02/29 16:25:34 [N12000p] : TFTP service start.(IP: 172.16.66.25 172.16.66.24 , Port: 69 , folder:iTune | |
| X System Management | | 2012/02/29 16:25:34 [N12000p] : TFTP service is enabled. | |
| System Network | + | 2012/02/29 16:25:02 [N12000p] : User admin logged in from 172.16.65.155 | |
| Storage | - 11 | 2012/02/29 16:20:40 [N12000p] : Syslog service start. | |
| storage | | 2012/02/29 16:07:33 [N12000p] : Syslog service start. | |
| 🚔 User and Group Authentication | | 2012/02/29 15:49:08 [N12000p] : Syslog service start. | |
| Retwork Service | | 2012/02/29 15:47:32 [N12000p] : The ACL of folder test has been modified. | |
| - | | 2012/02/29 15:46:29 [N12000p] : Syslog service start. | |
| Application Server | + | 2012/02/29 15:40:33 [N12000p] : Syslog service start. | |
| 📅 Backup | | 2012/02/29 15:35:59 [N12000p] : User admin logged in from 172.16.64.138 | |
| | | 14 4 Dec 1 - c12 A M C1 | 12 -6150 |

| Time 🔻 | Logs Information | | _ |
|---------------------|--------------------------------------|------------------------------|-------------------|
| 2009/05/25 13:44:51 | ≜ ↓ Sort Ascending | n logged in from 172.16.65 | 5.107 |
| 2009/05/25 13:41:29 | Sort Descending | m n5500-dual01 found UPS | s is unavailable. |
| 2009/05/25 13:36:24 | | m n5500-dual01 found UPS | š is unavailable. |
| 2009/05/25 13:31:24 | Columns 🕨 | 🔽 Time | s unavailable. |
| 2009/05/25 13:26:18 | 5500-dual01 : The system | Logs Information | s unavailable. |
| 2009/05/25 13:21:13 | 5500-dual01 : The syste | em n5500-dual01 found UPS | s is unavailable. |
| 2009/05/25 13:16:08 | 5500-dual01 : The syste | em n5500-dual01 found UPS | s is unavailable. |
| 2009/05/25 13:12:28 | 5500-dual01 : User adm | nin logged in from 172.16.65 | 5.107 |
| 2009/05/25 13:11:03 | 5500-dual01 : The syste | em n5500-dual01 found UPS | s is unavailable. |

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

| System Logs | | |
|-------------------------|---|--|
| Item | Description | |
| All | Provides all log information including system messages, warning | |
| | messages and error messages. | |
| INFO | Records information about system messages. | |
| WARN | Shows only warning messages. | |
| ERROR | Shows only error messages. | |
| Download All Log File | Export all logs to an external file. | |
| Truncate All Log File | Clear all log files. | |
| The number of lines per | Specify desired number of lines to display per page. | |
| page 🗌 | | |
| Sort Ascending | Shows logs by date in ascending order. | |
| Sort Descending | Shows logs by date in descending order. | |
| << < > >> | Use the forward (> >>) and backward (<< <) buttons to | |
| | browse the log pages. | |
| 2 | Re-loading logs. | |

On-line Register

From the **System Information** menu, choose the **Online Registration** item and the **System Online Registration** screen appears. The online registration service can periodically update the user when new firmware and software modules are released by Thecus. To enable this service, simply check the "Enable" check box. By enabling this service, the items in bold will be sent to Thecus via the Internet.



Other than the defined items sent upon registration, there are also two additional items: "HDD Info" and "Time Zone". These two optional items can also be sent to Thecus anonymously for analysis and statistics purposes. To send these items, simply check the desired checkboxes to help Thecus improve its products and services.

| Registration option | |
|-----------------------|--|
| Enable | |
| [Product Model Name | ution will be recorded after [Enable] checked: ,], [Current FW version], [Mac address of WAN], [Mail address of system notification], |
| [Web UI Language]. | |
| | ms we like to get it back for statistic and analysis purpose upon to your agreement. |
| Internal HDD brandin | g and FW version |
| Time Zone | |
| Apply | |
| | |
| - List of most recent | update |
| 0.0.10 | |
| 😳 Al 🔃 Firmware 🤇 | /Module |
| Publish date 🔻 | Information Delivery |
| 2009-10-23 20:22:37 | You have new firmware 3.01.00.46 |
| 2009-10-14 15:13:28 | You have new module IP Cam 1.0.62 |
| 2009-10-14 15:13:02 | You have new module IP Cam 1.0.61 |
| 2009-10-14 15:12:40 | You have new module IP Cam 1.0.6 |
| 2009-10-14 15:12:24 | You have new module IP Cam 1.0.59 |
| 2009-10-14 15:12:12 | You have new module IP Cam 1.0.58 |
| 2009-10-14 15:12:02 | You have new module IP Cam 1.0.57 |
| 2009-10-14 15:11:51 | You have new module IP Cam 1.0.56 |
| 2009-10-14 15:11:41 | You have new module IP Cam 1.0.55 |
| 2009-10-14 15:11:30 | You have new module IP Cam 1.0.54 |
| 2009-10-14 15:11:03 | You have new module IP Cam 1.0.53 |
| | |
| | |

Syslog Management

Generates system log to be stored locally or remotely, it also can be chose to act as syslog server for all other devices.

These messages are stored on your NAS in: Nsync > log> messages. Information can be obtained in two ways: locally and remotely.

Configuration with syslog server:

| Syslog Daemon: | Enable | O Disable |
|--------------------|---------------|-----------|
| Syslog service: | erver | 🔘 client |
| Target: | Local | 🔿 Remote |
| Syslog folder: | NAS_Public ¥ | |
| Log Level: | AL | |
| Remote IP Address: | 172.16.65.147 | |

Configuration with syslog client and target to store locally:

| Syslog Daemon: | Enable | O Disable |
|--------------------|--------------|-----------|
| Syslog service: | 🔘 server | elent |
| Target: | Ocal | 🔘 Remote |
| Syslog folder: | NAS_Public ~ | • |
| Log Level: | Al 💙 | |
| Remote IP Address: | 172.16.65.14 | 7 |

Configuration with syslog client and target to store remotely:

| Syslog Daemon: | Enable | O Disable |
|--------------------|---------------|-----------|
| | | |
| Syslog service: | server | elent |
| ., | - | |
| Target: | Cocal | Remote |
| i di goti | 0.000 | O Homes |
| Syslog folder: | NAS_Public 💌 | |
| Syslog folder. | TIA5_PUDIC | |
| Log Level: | AL Y | |
| | | |
| Remote IP Address: | 172.16.65.147 | |
| | | |
| Apply | | |
| Copped L | | |
| | | |

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

| Time | | |
|-------------------|--|--|
| Item | Description | |
| Syslog Daemon | Enable/Disable syslog daemon. | |
| Syslog service | If Server has been selected then associated syslog folder will be used to store all system logs from other NAS devices which has assigned this system for syslog server as well as syslog of this server unit. It can be seen from associated syslog folder with files "error", "Information" and "warning". If client has been selected then "Local" or "Remotely" can be choose. | |
| Target | 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. | |
| Syslog folder | 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". | |
| Remote IP Address | Input the syslog server IP address if choose to store syslog info remotely. | |

System Monitor

The system monitor is capable to monitor system status including CPU/memory utilization, fan/temperature status, network throughput and on-line user list in various protocols.

To monitor system status, simply click on "System Monitor" from the tree menu and the screen will appear as below.

| ٩ | 33 | Home > System Information > System Monitor | ⑦ Help ♡• My favorite Ů• Shutdown 🞢 Logout |
|--|-----|--|---|
| 📜 System Information | - | 🔚 Save Layout 🤹 Reset Layout 📄 😕 History 🛛 🚺 Lock Layout | Up Time: 0 Day 3 Hours 38 Minutes |
| General Status System Log Online Registration System Monitor | | Office Details Monitors • 30 % | O.05 MB Monitors • 0.025 MB |
| | | Graphic Details Monitors - | Graphic Details Monitors • |
| 🗙 System Management | | | ⊕ Fan (8) |
| System Network | | | D Temperature (5) |
| Storage | .*) | | |
| Subser and Group Authentication | | | |
| Network Service | + | | |
| Application Server | | | |
| 📑 Backup | | | |
| External Devices | | | |

It is divided into 4 sections. Each section can be modified to monitor specific items by using the drop down list from the "Monitors" tab, simply click on the items you would like to monitor. From each section, you can also choose to display the information graphically by selecting "Graphic" or by plain text mode by selecting "Details".

| ΝΟΤΕ | Only 2 sections can be set in graphic mode at the same time. |
|------|--|
| | |

If graphic mode is chosen, 3 minutes of information is displayed on the x-axis. A resume of the information is displayed by dragging the mouse over the graphic at a specific time. See example below:

| Operation Details Monitors • 40 % | O.05 MB O.05 MB Time: 19:09:13 eth0: 0 MB/s eth1: 0 MB/s eth2: 0 MB/s |
|--|--|
| 19:07 19:08 19:09 — CPU — Memory | 19:08 19:10 — eth0 — eth1 — eth2 |
| 100 °C 10K RPM 0 °C 0K RPM D °C 0K RPM HDD_FAN1: 5625 RPM HDD_FAN2: 0 RPM HDD_FAN3: 5769 RPM HDD_TEMP: 28 °C HDD_TEMP2: 26 °C HDD_TEMP2: 26 °C | 4 100 MB 2 50 MB 0 0 MB 19:26 - eth0 - eth1 - eth2 FTP Samba |

For the on-line users list, system monitor will display the on-line users and the share folder they have visited.

| 🔀 Graphic 🔲 Detai | is Monitors 🗸 | |
|-------------------|---------------|---------------|
| 🖃 CPU (1) | | |
| Sys | 0.75 % | |
| ∃ FTP (1) | | |
| 172.16.64.138 | andy | _NAS_Picture_ |
| 🗏 Samba (1) | | |
| 172.16.64.138 | root | test |

| System Monitor | | | |
|----------------|--|--|--|
| Item | Description | | |
| Save Layout | Saving selected monitoring items. Layout will remain the same for future visits. | | |
| Reset Layout | Set back to default monitoring settings and layout. | | |
| History | Click on this check box and system monitor will write the monitoring history to a designate path in the RAID volume. | | |
| Lock Layout | All of the monitoring items are fixed and cannot be changed. Click again to unlock it. | | |

If the History has been enabled, click on

and system monitor will

display the history with different period for selection.



System Management

The **System Management** menu gives you a wealth of settings that you can use to configure your Thecus IP storage system administration and functions. You can set up system time, system notifications, and even upgrade firmware from this menu.

Time: Setting system time

From the **time** menu, choose the **Time** item and the **Time** 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**.

| Home > System Management > Date and Time | |
|--|---|
| System Date and Time Settings | |
| Date: 11/23/2011 | |
| Time: 02:13 ¥ | |
| Time Zone: Asia/Taipei 💌 | |
| NTP Service: O Enable O Disable | |
| Sync with an O Yes | 017 |
| External NTP | |
| _ | |
| | |
| Apply | |
| | Date: 11/23/2011 Time: 02:13 Time Zone: Asia Taipei NTP Service: Enable Disable Sync with an External NTP Server: NO |

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

| Time | | | |
|------------------------|--|--|--|
| Item | Description | | |
| Date | Sets the system date. | | |
| Time | Sets the system time. | | |
| Time Zone | Sets the system time zone. | | |
| NTP Service | Select <i>Enable</i> to synchronize with the NTP server. | | |
| | Select Disable to close the NTP server synchronization. | | |
| Sync with external NTP | Select YES to allow Thecus IP storage to synchronize with an NTP | | |
| Server | server of your choice. Press Apply to change. | | |

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

Notification configuration

From the menu, choose the **Notification** item, and the **Notification Configuration** screen appears. 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.

| ٩ | ~~ | Home > System Management > Notification | s | () Help | ♡• My favorite 🕑• Shu | tdown 🞢 Logout | 2 |
|--|-----|---|-----------------------------|---------|-----------------------|----------------|---|
| 📕 System Information | + | Notification Configuration | | | | | - |
| 💥 System Management | - | Beep Notification Beep Notification | 🔘 Disable | | | | |
| Date and Time | Â | Email Notification 📀 Enable | Disable | | | | |
| Firmware Upgrade Scheduled On/Off | = | Authorization Type: | | | | | |
| Administrator Password | | SMTP Server: | F | Port: | | | |
| Config Mgmt | - | SMTP Account ID: | | | | | |
| Factory Default Reboot & Shutdown | | Account Password: | | | | | E |
| - Fie System Check | * | Log Level: 🗸 🗸 | | | | | |
| System Network | ۰ | Sender's E-mail Address: | | | | | |
| Storage | | Recipient's E-mail Address 1: | | | | | |
| Ser and Group Authentication | ۰ | Recipient's E-mail Address 2: | | | = | | |
| Network Service | | Recipient's E-mail Address 3: | | | | | |
| Application Server | .+) | Recipient's E-mail Address 4: | | | | | L |
| 👫 Backup | ۰ | E-Mail Test Apply | | | | | |
| External Devices | ٠ | • • • • • • • • • • • • • • • • • • • | III | _ | | | |

| Notification Configuration | | |
|----------------------------|---|--|
| Item | Description | |
| Beep Notification | Enable or disable the system buzzer that beeps when a problem | |
| | occurs. | |
| Email Notification | Enable or disable email notifications of system problems. | |
| Authentication Type | Select the SMTP Server account authentication type. | |
| 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 | Set senders email address to send email notifications. | |
| Address | | |
| Receiver's E-mail | Add one or more recipient's email addresses to receive email | |
| Address (1,2,3,4) | notifications. | |

NOTE

Consult with your mail server administrator for email server information.

Firmware Upgrade

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

| × | Home > System Management > Firmware Upgrade | ⑦ Help ♡+My favorite 🕛 Shutdown ⁄ Logout |
|---|---|--|
| 📜 System Information 👘 | Firmware Upgrade | |
| 🗙 System Management 🖃 | Firmware: Select a firmware file | |
| Date and Time Notifications Firmware Upgrade Scheduled On/Off | Apply | |

Follow the steps below to upgrade your firmware:

- 1. Use the **Browse** button to find the firmware file.
- 2. Press **Apply**.
- 3. The buzzer will beep and the Busy LED will blink until the upgrade is complete.





Schedule Power On/Off

Using the Thecus IP storage System 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.

From the menu, choose the **Schedule Power On/Off** item and the **Schedule Power On/Off** screen appears.

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

Then, simply choose an on and off time for each day of the week.

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

| ٩ | ~~ | Home > System | 4anagement > Sche | duled On/Off | 🕜 Help 📿 | Ny favorite 🖒 Shutdown | 🕂 Logout |
|---------------------------------|-----|---------------|-------------------|--------------|------------|------------------------|----------|
| J System Information | | Scheduled On | /Off | | | | |
| 💥 System Management | - | ✓ Enable Sche | duled On/Off | | | | |
| Date and Time Notifications | Â | | Action | Time | Action | Time | |
| Scheduled On/Off | Ξ | Sunday: | None ¥ | 00:00 ¥ | None 👻 | 00:00 ¥ | |
| Config Mgmt | | Monday: | Power Off 🗡 | 00:00 🛩 | Power On 💙 | 00:05 🛩 | |
| Reboot & Shutdown | | Tuesday: | Power Off | 14:25 💌 | Power On 💌 | 14:30 ¥ | E |
| System Network | | Wednesday: | None 👻 | 00:00 | None 👻 | 00:00 | |
| Storage | | Thursday: | None ¥ | 00:00 | None 🗡 | 00:00 | |
| 📥 User and Group Authentication | ۲ | Friday: | None 💙 | 00:00 🛩 | None 💙 | 00:00 🛩 | |
| Network Service | | Saturday: | None 💌 | 00:00 | None 💌 | 00:00 💌 | |
| Application Server | .+) | | | | | | |
| 👫 Backup | | Apply | | | | | |
| External Devices | ۲ | • | | III | | | , |

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.

Administrator Password

From the menu, choose the **Administrator Password** item and the **Change Administrator Password** screen appears. Enter a new password in the **New Password** box and confirm your new password in the **Confirm Password** box. Press **Apply** to confirm password changes.

There is also a **password** to enter the **OLED** setting that you can setup here. Enter a new password in the **New Password** box and confirm your new password in the **Confirm Password** box. Press **Apply** to confirm password changes.

| ٩ | 7 7 | Home > System Management > Administrate |
|--|------------|---|
| 📜 System Information | ۲ | Change Administrator Password |
| 💥 System Management | - | New Password: |
| Date and Time | - | Confirm Password: |
| - 2 Firmware Upgrade - 2 Scheduled On/Off | E | Apply |
| Administrator Password | | L |

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

| Change Administrator and LCD Entry Password | | |
|---|---|--|
| Item | Description | |
| New Password | Type in a new administrator password. | |
| Confirm Password | Type the new password again to confirm. | |
| Apply | Press this to save your changes. | |

Config Mgmt

From the menu, choose the **Config Mgmt** item and the **System Configuration Download/Upload** screen appears. From here, you can download or upload stored system configurations.

| ۹. | <u></u> | Home > System Management > Config Mgmt | ⑦ Help ♡• My favorite 🔱• Shutdown 🖅 Logout |
|-----------------------------|-------------|---|--|
| I System Information | <u>.</u> +) | System Configuration Download/Upload | |
| X System Management | - | | |
| Scheduled On/Off | ^ | Upload: Please choose a file to upload. | |
| Config Mgmt | | Upload Download | |
| Reboot & Shutdown | _ | | |

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

| System Configuration Download/Upload | | |
|--------------------------------------|--|--|
| Item | Description | |
| Download | Save and export the current system configuration. | |
| Upload | Import a saved configuration file to overwrite the current system configuration. | |

| ΝΟΤΕ | 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. | |

Factory Default

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



Reboot & Shutdown

From the menu, choose **Reboot & Shutdown** item, and the **Shutdown/Reboot System** screen appears. Press **Reboot** to restart the system or **Shutdown** to turn the system off.

| ٩ | ~~ | Home > System Management > Reboot & Shutdown |
|------------------------|----|--|
| 📜 System Information | | Shutdown/Reboot System |
| 💥 System Management | - | |
| Scheduled On/Off | ~ | Shutdown Reboot |
| Administrator Password | | |
| - All Config Mgmt | | |
| Factory Default | | |
| Reboot & Shutdown | | |
| 🕼 File System Check | = | |

File System Check

The File System Check allows you to perform a check on the integrity of your disks' file system. Under the menu, click *File system Check* and the **File System Check** prompt appears.



To perform a file system check, click *Apply*. Once clicked, the following prompt will appear:

| File Syste | em Check 🗙 |
|------------|---|
| 2 | The setting has been changed; carry on with press 'Yes' for confirmation. |
| | No No |

Click **Yes** to reboot the system.

| File System Check | File System Check |
|-------------------|-------------------|
| Reboot | Reboot |
| 64 | Done. |

Once the system has rebooted, you will be returned to the **File System Check** prompt. There you will see the available RAID volumes to run the file system check. Check the desired RAID volumes and click **Next** to proceed with the file system check. Click **Reboot** to reboot without running the check.

| File System Che Encrypted RAID do | | system checks! | | | |
|--------------------------------------|---------------------|----------------|-------------------|---------------|-----------------|
| RAID Level | Disks | Status | Filesystem Status | Data Capacity | Last Check Time |
| RAID | 1,2,3,4 | | Normal | 2223.9 | |
| File System Chee ncrypted RAID do | es not support file | | Ų | | |
| RAID Level | Disks | Status | Filesystem Status | Data Capacity | Last Check Time |
| | | | | | |

Reboot

Once you click **Next**, you will see the following screen:

Next

| Status: | Press Start to Begin | |
|------------------------------|----------------------|---|
| Latest 20 lines Information: | | |
| | | |
| | | |
| Result: | | |
| | | v |

Click **Start** to begin the file system check. Click **Reboot** to reboot the system. When the file system check is running, the system will show 20 lines of information until it is complete. Once complete, the results will be shown at the bottom.

| Status: | Pass 5. Checking group summary mormation |
|------------------------------|---|
| Latest 20 lines Information: | [2009/6/8 14:5:33] 4 8 8 |
| | [2009/6/8 14:5:33] Pass 5: Checking group summary information |
| | [2009/6/8 14:5:33] 5 0 16 |
| | [2009/6/8 14:5:33] 5 1 16 |
| | [2009/6/8 14:5:33] 5 2 16 |
| | [2009/6/8 14:5:33] 5 3 16 |
| | [2009/6/8 14:5:33] 5 4 16 |
| | [2009/6/8 14:5:33] 5 5 16 |
| | [2009/6/8 14:5:33] 5 6 16 |
| | [2009/6/8 14:5:33] 5 7 16 |
| | [2009/6/8 14:5:33] 5 8 16 |
| | [2009/6/8 14:5:33] 5 9 16 |
| | [2009/6/8 14:5:33] 5 10 16 |
| | [2009/6/8 14:5:33] 5 11 16 |
| | [2009/6/8 14:5:33] 5 12 16 |
| | [2009/6/8 14:5:33] 5 13 16 [2009/6/8 14:5:33] 5 14 16 |
| | [2009/6/8 14:5:33] 5 14 16 |
| | [2009/6/8 14:5:33] 5 16 16 |
| | [2009/6/8 14:5:33] /dev/vg0/svs1v: 33/262144 files (3.0% non- |
| | contiguous), 16763/262144 blocks |
| | |
| Result: | RAID [1,2,3,4,5] System Volume : Exit Code = 0 , No |
| | errors. |
| | RAID [1,2,3,4,5] Data Volume : Exit Code = 0 , No errors. |
| | |
| | |
| | |
| Start Reboot | |
| | |
| | |
| | |
| | |
| | |
| тн | e system must be reported before Thecus IP storage can fund |
| | e system must be rebooted before Thecus IP storage can fund |

Wake-Up On LAN (WOL)

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

| • | ~~ | Home > System M | anagement > W | /ake-On-LAN |
|----------------------|----|-----------------|---------------|-------------|
| 📜 System Information | ۲ | Wake-On-LAN | | |
| 🗙 System Management | - | WAN/LAN1: | 🔘 Enable | Oisable |
| Scheduled On/Off | * | LAN2: | 🔘 Enable | Oisable |
| Config Mgmt | | Apply | | |
| Reboot & Shutdown | | ~~~~ | | |
| - Wake-On-LAN | = | | | |
| SNMP | | | | |

From the menu, choose the **WOL** item, and the **Wake-up On LAN** screen appears. From here, you can **Enable** or **Disable**.

| 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. | |

SNMP Support

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

| ٩ | ~~ | Home > System Management > SNMP | | | ⑦ Help ♡• My favorite |
|------------------------|----|---------------------------------|----------|---------|-----------------------------|
| 🕕 System Information | * | - SNMP Support - | | | |
| System Management | - | SNMP Service: | 🔘 Enable | Oisable | |
| Administrator Password | ^ | Read Community: | | | (Allow 0~9, a~z, A~Z, -, _) |
| Config Mgmt | | System Contact: | | | |
| Reboot & Shutdown | | System Location: | | | |
| 🙀 File System Check | = | Trap Target IP: | | | |
| Wake-On-LAN | _ | Apply | | | |
| SNMP | - | | | | |

From the menu, choose the **SNMP** item, and the **SNMP Support** screen appears. From here, you can **Enable** or **Disable**.

UI Login Function

Adjusts UI Login Configuration settings, you can enable/disable the Web Disk, Photo Server and modules functions, according to your needs.

| UI Login Functions | | | | | | |
|--------------------|----------------------------|-----------|--|--|--|--|
| Web Disk: | Enable | 🔘 Disable | | | | |
| Photo Server: | Enable | 🔘 Disable | | | | |
| Module: | Enable | 🔘 Disable | | | | |
| Apply | | | | | | |

System Network

Use the **System Network** menu to make network configuration settings to an on board network port or additional NIC as well as DHCP and link aggregation.

Networking

From the **System Network** menu, choose **Networking**, and the **Networking Configuration** screen appears. 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:

| Home > System Net | twork > Networking | | () Help | ∕∙My favorit |
|---------------------|--------------------------------------|--------------------------|----------------|--------------|
| Host Settings | | | | |
| Host Name: | PMA | Domain Name: the | ecus.com | |
| WINS Server 1: | 172.16.66.135 | WINS Server 2: | | |
| | | | | |
| DNS Settings | | | | |
| Mode: | Manual O DHCP (Get From WA) | N/LAN1) | | |
| DNS 1: | 172.16.66.243 | | | |
| DNS 2: | 168.95.1.1 | | | |
| DNS 3: | | | | |
| | | | | |
| WAN/LAN1 LAN2 | LAN3 Additional LAN4 Additional LAN5 | Additional LAN6 Addition | onal LAN7 | |
| Status: | | Speed: 100 | 0Mb/s | |
| MAC Address: | 00:14:FD:15:59:84 | Link Status: Con | nected | |
| Jumbo Frame: | Disabled 🕶 | | | |
| IPv4 | | IPv6 | | |
| Enable: | V | Enable: | | |
| Mode: | Manual DHCP | House | Manual DHCP | |
| | | _ | | |
| IP: | 172.16.66.25 | | c0::1 | |
| Netmask: | 255.255.252.0 | Prefix Length: 64 | | |
| Gateway: | 172.16.66.135 | Gateway: | | |
| Note: | | | | |
| Noce. | | | | |
| Default Gateway: WA | N/LAN1 👻 | | | |
| Apply | | | | |
| Apply | | | | |
| 1 | | | | |

The available system network ports are coming from embedded system ports and additional system ports added through the reserved PCI-e slot with associated compatible list. Therefore, the screen shown above is an example of a Thecus N16000 with 3 on board GbE NIC and an additionally Intel PRO/1000 PT quad port NIC, for a total of 7 NIC ports.

| Network Configuration (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. | | | |
| WINS Server | To set a server name for NetBIOS computer. | | | |
| DNS Mode | Select the DNS server is coming from DHCP server or manual input. A total of 3 DNS servers can be input. If the DNS setting is chosen from DHCP server, then it will refer to WAN/LAN1 port. | | | |
| DNS Server 1,2,3 | Domain Name Service (DNS) server IP address. | | | |

| Network Co | nfiguration (NIC port) |
|-----------------------|---|
| Link speed | Display associated NIC port link speed. |
| Link status | Display associated NIC port link status. |
| MAC address | MAC address of the network interface. |
| Jumbo Frame Support | Enable or disable Jumbo Frame Support of associate interface on your Thecus IP storage. |
| IPv4/IPv6 | Click to enable IPv4/IPv6 for TCP/IP. The default is IPv4 enabled. |
| Mode | It can choose a static IP or Dynamic IP. |
| IP | IP address of associate NIC interface. |
| Netmask/Prefix Length | Input netmask for IPv4 and Prefix length for IPv6. |
| Gateway | Gateway for associate NIC. |
| Default gateway | It can be chosen from a drop down list of default gateway that's been used for the Thecus IP storage. |

| 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 |

DHCP/RADVD

From the **System Network** menu, choose **DHCP/RADVD**, and the

DHCP/RADVD Configuration screen appears. This screen displays available NIC status. If each NIC has been set-up to a static IP, then each NIC can be configured to act as DHCP/RADVD server.

| WAN/LAN1 | LAN2 | LAN3 | Additional LAN4 | Additional LAN5 | Additional LAN6 | Additional LAN7 | |
|-------------|---------|---------|-----------------|-----------------|-----------------|-----------------|--|
| Status: | | | | | | | |
| Note: | | | | | | | |
| IPv4 | | | | | IPv6 | | |
| Enable: | | Enabled | | | Enable: | Enabled | |
| Mode: | | Manual | | | Mode: | Manual | |
| IP: | | 172.16. | 66.25 | | IP: | fec0::1 | |
| Netmask: | | | | | Prefix Length: | | |
| DHCP Servic | e: | | | | RADVD Service: | | |
| Start IP: | | | | | Prefix: | | |
| End IP: | | | | | Prefix Length: | 64 | |
| Default Ga | ateway: | | | | | | |
| DNS 1: | | | | | | | |
| DNS 2: | | | | | | | |
| DNS 3: | | | | | | | |

DHCP/RADVD Server Configuration

A DHCP/RADVD server can be configured to assign IP addresses (IPv4) or Prefix (IPv6) to devices connected to the associated NIC port.

| DHCP Configuration | | | | |
|-------------------------|--|--|--|--|
| Item | Description | | | |
| DHCP/RADVD Service | Enable or disable the DHCP/RADVD service 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. | | | |
| 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).

Linking Aggregation

The Thecus IP storage supports link aggregation from either on board network port or additional NIC. Simply click on "+" as shown in the screen shot below.

| Home > System Net | twork > Linking Aggregation | 🕐 Help 🔗 | My favorite 🔥 Shutdown | n <i>s</i> ∰ Logout |
|-------------------|---------------------------------------|-------------------|------------------------|---------------------|
| WAN/LAN1 LAN2 | 2 LAN3 Additional LAN4 Additional LAN | 5 Additional LAN6 | Additional LAN7 🚇 | |
| Status: | | Speed: | 1000Mb/s | |
| Jumbo Frame: | | | | |
| IPv4 (Origin | al Setting) | IPv6(Original | Setting) | |
| Enable: | Enabled | Enable: | Enabled | |
| Mode: | Manual | Mode: | Manual | |
| IP: | 172.16.66.25 | IP: | fec0::1 | |
| Netmask: | 255.255.252.0 | Prefix Length: | 64 | |
| Gateway: | 172.16.66.135 | Gateway: | | |
| | | Note: | | |
| Default Gateway: | NAN/LAN1 ¥ | | | |
| Apply | | | | |
| | | | | |
| • | | | | |

| The associated | screen | shot will | appear | after | the | ``+″ | is | clicked. |
|----------------|--------|-----------|--------|-------|-----|------|----|----------|
|----------------|--------|-----------|--------|-------|-----|------|----|----------|

| ome > System N | etwork > Linking Aggregation | | | | ? Help | ♥• My favorite |
|-----------------|------------------------------|---|------|-------------------|--------|----------------|
| | Available Interfaces | | | Selected Interfac | 25 | |
| Name | Speed | | Name | Speed | | |
| WAN/LAN1 | 1G | | | | | |
| LAN2 | 1G | | | | | |
| LAN3 | 1G | | | | | |
| Additional LAN4 | 1G | | | | | |
| Additional LAN5 | 1G | - | | | | |
| Additional LAN6 | 1G | | | | | |
| Additional LAN7 | 1G | | | | | |
| | | | | | | |
| | 10 | | | | Link | C |

Select from available network port then move over to selected box.

| | Available Interfaces | | | Selected Interfaces |
|----------|----------------------|---|-----------------|---------------------|
| Name | Speed | | Name | Speed |
| WAN/LAN1 | 16 | | Additional LAN4 | 16 |
| LAN2 | 1G | - | Additional LAN5 | 1G |
| LAN3 | 1G | | Additional LAN6 | 1G |
| | | | Additional LAN7 | 1G |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | Link Cancel |

Click "Link" to confirm the selection. The newly created tab will appear for more settings required to complete the link aggregation configuration.

| WAN/LAN1 LAN2 U | AN3 Additional LAN4 Additional LAN5 | Additional LAN6 A | dditional LAN7 | LINK1 | - |
|------------------------|-------------------------------------|-------------------|----------------------------|-------|---|
| Status: A | Additional LAN4, Additional I 🛛 🎡 | | L L | | |
| Jumbo Frame: | Disabled 💌 | Link Type: | Load Balance | ~ | |
| IPv4 | | IPv6 | Load Balance | | |
| Enable: | V | Enable: | Failover | | |
| Mode: | Manual | Mode: | Balance-XOR Broadcast | | |
| IP: | 172.16.66.87 | IP: | 802.3ad | | |
| Netmask: | 255.255.252.0 | Prefix Length: | Balance-TLB Balance-ALB | | |
| Gateway: | 172.16.66.239 | Gateway: | outile rite | | |
| | | Note: | | | |
| | | | | | |
| Default Gateway: LINK1 | × | | | | |
| Apply | | | | | |

| Link1 Config | juration |
|--------------|--|
| Status | Specifies the network ports being used with the associated link aggregation. |
| | Click on to modify the selected network ports. |

| Jumbo Frame Support | Enable or disable Jumbo Frame Support of the associated interface on your Thecus IP storage. |
|-----------------------|---|
| Link Type | 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 |
| Default gateway | It can be chosen from the drop down list of default gateway being used for the Thecus IP storage. |

Now under the networking, a "Link1" tab will appear from the network title bar.

| 80 P | Home > System Network > Networking | ⑦ Help ♡• My favorite 🕛• Shutdown 🞢 Logout |
|------------------------------|--|--|
| 📜 System Information 🔹 | Host Settings | |
| 🗙 System Management 🕑 | Host Name: PMA | Domain Name: thecus.com |
| System Network 🖃 | WINS Server 1: | WINS Server 2: |
| Networking | | |
| DHCP/RADVD | DNS Settings | |
| - Strang Aggregation | Mode: Manual OHCP (Get From WAN) | /LAN1) |
| | DNS 1: | |
| | DNS 2: | |
| | DNS 3: | |
| | | |
| Egg Storage | WAN/LANI LANZ LAN3 Additional LAN4 Additional LAN4 | 5 Additional LAN6 Additional LAN7 LINK1 |
| Ser and Group Authentication | | |
| Network Service | Status: | Speed: 1000Mb/s |
| Application Server | MAC Address: 00:14:FD:15:59:84 | Link Status: Connected |
| 📑 Backup 💌 | Jumbo Frame: Disabled 💙 | |
| E backup | IPv4 | IPv6 |

To modify or delete LINK1, go to Link Aggregation setting page. Click on



to modify the settings or click on

LINK1 (S) to delete this link aggregation. If any

ports are still available, additional link aggregation links can be created by clicking



Additional LAN

Other than on-board LAN port, Thecus IP storage supports additional NIC to be added in its available PCI-e slot. For the details of additional NIC support list please visit Thecus website.

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

Once the additional NIC is installed into Thecus IP storage, the "Additional LANx" will appear under the "Networking" category. Click the associated NIC to setup the details. The screen shot below shows an example of an Intel PRO/1000 PT Quad port installed thru a PCI-e slot in the Thecus IP storage.

| Home > System Ne | etwork > Linking Aggregation | ⑦ Help ♡+I | My favorite 🕛 Shutdown 🎢 Logout |
|------------------|---------------------------------------|--------------------|---------------------------------|
| WAN/LAN1 LAN | N2 LAN3 Additional LAN4 Additional LA | N5 Additional LAN6 | Additional LAN7 |
| Status: | | Speed. | 1000Mb/s |
| Jumbo Frame: | | | |
| IPv4 (Origi | inal Setting) | IPv6(Original | Setting) |
| Enable: | Enabled | Enable: | Enabled |
| Mode: | Manual | Mode: | Manual |
| IP: | 172.16.66.25 | IP: | fec0::1 |
| Netmask: | 255.255.252.0 | Prefix Length: | 64 |
| Gateway: | 172.16.66.135 | Gateway: | |
| | | Note: | |
| Default Gateway: | WAN/LAN1 | | |
| Apply | | | |
| < [| 111 | | Þ |

Storage Management

The **Storage** menu displays the status of storage devices installed in the Thecus IP storage. It includes storage configuration options such as RAID and disk settings, folder configuration, iSCSI and ISO Mount.

Disks Information (Refer Chapter 7 for FW v2.03.01 and after)

From the **Storage** menu, choose the **Disk Information** item and the **Disk Information** screen appears. From here, you can see various installed SATA/SAS hard disks. A blank line indicates that a hard disk is not currently installed in that particular disk slot.

| NOTE | s | • The screen shot below is just an example from a Thecus IP Stor slots number can range from 8, 12 to 16 slots depending on the m IP storage. | | | | | | | |
|-----------------------|------------|---|-------------|--------------|-----------|--------|--------|-------|----------------|
| » | Home > Sto | orage > Disk In | formation | 🕜 Не | alp ♡+ My | favori | te 🕛 s | ihutd | own 🞢 Log |
| System Information 👘 | Disk Inf | ormation | | | | | | | |
| System Management 🔹 | Disk No. | Capacity (MB) | Model | Link | Firmw | Statu | JS | Bad | Block Scan |
| System Network | 1 | 476,940 | ST3500418AS | SATA 1.5Gb/s | CC37 | 62 | Detect | • | Click to start |
| Storage - | 2 | 476,940 | ST3500418AS | SATA 1.5Gb/s | CC38 | -02- | Detect | | Click to start |
| Disk Information | 3 | 476,940 | ST3500418AS | SATA 1.5Gb/s | CC38 | -02- | Detect | • | Click to start |
| RAID Management | 4 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| AS Stacking | 5 | 476,940 | ST3500418AS | SATA 1.5Gb/s | CC37 | - | Detect | • | Click to start |
| SO Image Mounting | 6 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| Share Folders SCSI | 7 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 5051 | 8 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| | 9 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| | 10 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| | 11 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| | 12 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| | 13 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| | 14 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| | 15 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| | 16 | N/A acity: 1907760 | N/A | N/A | N/A | N/A | | N/A | |

| Disks Informa | ion |
|---------------|-------------|
| Item | Description |
| Disk No. | Indicates disk location. |
|----------------|---|
| Capacity | Shows the SATA hard disk capacity. |
| Model | Displays the SATA hard disk model name. |
| Link | Displays the hard disk interface and link speed |
| Firmware | Shows the SATA hard disk firmware version. |
| Status | Indicates the status of the disk. |
| Bad Block scan | Yes to start scan Bad Block. |

S.M.A.R.T. Information

On the **Disk Information** screen, the status of each disk will be displayed in the **Status** column. Clicking on the **OK** or **Warning** link will display the **S.M.A.R.T Information** window for that particular disk.

You may also perform disk SMART test (doesn't apply to SAS HDD); simply click "Test" to start the SMART test. The result is only for reference and the system will not take any action from its result.

| | SMART INFO × |
|---|-----------------------------|
| ſ | Info |
| I | Tray Number: 5 |
| I | Model: WDC WD2002FYPS-0 |
| I | Power On Hours: 529 Hours |
| I | Temperature Celsius: 35 |
| I | Reallocated Sector Count: 0 |
| I | Current Pending Sector: 0 |
| | Test |
| | Test Type: () short () long |
| I | Test Result: Click to start |
| I | Test Time: |
| | Test |

| S.M.A.R.T. In | formation |
|---------------------|--|
| Item | Description |
| Tray Number | Tray the hard disk is installed in. |
| Model | Model name of the installed hard disk. |
| Power ON Hours | 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. |
| Temperature Celsius | The current temperature of the hard disk in degrees Celsius. |
| Reallocated Sector | Count of reallocated sectors. When the hard drive finds a |
| Count | read/write/verification error, it marks this sector as "reallocated" |
| | and transfers data to a special reserved area (spare area). |
| | This process is also known as remapping and "reallocated" |
| | sectors are called remaps. This is why, on a modern hard disks, |
| | you cannot see "bad blocks" while testing the surface - all bad |
| | blocks are hidden in reallocated sectors. However, the more |
| | sectors that are reallocated, the more a decrease (up to 10% or |
| | more) can be noticed in disk read/write speeds. |
| Current Pending | Current count of unstable sectors (waiting for remapping). The |
| Sector | raw value of this attribute indicates the total number of sectors |
| | waiting for remapping. Later, when some of these sectors are |
| | read successfully, the value is decreased. If errors still occur |
| | when reading sectors, the hard drive will try to restore the data, |

| | transfer it to the reserved disk area (spare area), and mark this sector as remapped. If this attribute value remains at zero, it indicates that the quality of the corresponding surface area is low. |
|-------------|---|
| Test Type | Set short or long time to test. |
| Test Result | Result of the test. |
| Test Time | Total time of the test. |
| ΝΟΤΕ | If the Reallocated Sector Count > 32 or Current Pending Sector of a hard disk drive > 0, the status of the disk will show "Warning". This warning is only used to alert the system administrator that there are bad sectors on the disk, and they should replace those disks as soon as possible. |

Bad Block Scan

On the **Disk Information** screen, you may also perform disk bad block scan, simply click "Click to start" to start the scan. The result is only for reference and the system will not take any action from its result.

| Disk No. | Capacity (MB) | Model | Link | Firmw | Stat | us | Bad | Block Scan |
|----------|---------------|-------------|--------------|-------|------|--------|-----|---------------|
| 1 | 476,940 | ST3500418AS | SATA 1.5Gb/s | CC37 | ÷02 | Detect | | Click to star |
| 2 | 476,940 | ST3500418AS | SATA 1.5Gb/s | CC38 | ÷. | Detect | | Click to star |
| 3 | 476,940 | ST3500418AS | SATA 1.5Gb/s | CC38 | 4 | Detect | | Click to sta |
| ŧ. | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 5 | 476,940 | ST3500418AS | SATA 1.5Gb/s | CC37 | ٠ | Detect | | Click to sta |
| 5 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 7 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 8 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 9 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 10 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 11 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 12 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 13 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 14 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 15 | N/A | N/A | N/A | N/A | N/A | | N/A | |
| 16 | N/A | N/A | N/A | N/A | N/A | | N/A | |

The testing result will display "Click to start" as default until the system reboots.

RAID Information

From the **Storage** menu, choose the **RAID Management** 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.

| ٩ | ~~ | Hon | 1e > Sto | rage > R | AID Manager | ment | | (?) Help | ♡• My favorite | ப்• Shutdown | \$∰ Logout |
|---------------------------------|-----|-----|--------------|----------|----------------|---------|---------------|-------------------|------------------|--------------|------------|
| 📁 System Information | | | RAID Ma | nageme | nt | | | | | | |
| 💥 System Management | .+) | | Create | i Edit | 🍪 Global Hot S | Spare | | | | | |
| System Network | ٠ | | Mas. RAII | ID | RAID | Status | Disks Used | Total Capacity | Data Capacity | | |
| Storage | - | | • | RAID | 5 | Healthy | 1,2,3,5 | | Used for HA | | |
| Share Folders | | | | | | | | | | | |
| 🍰 User and Group Authentication | .+) | | | | | | | | | | |
| Network Service | | | | | | | | | | | |
| Application Server | | | | | | | | | | | |
| 🕂 Backup | | | | | | | | | | | |
| External Devices | ۲ | | | | | | | | | | |

| RAID Informa | nation | | | | | |
|----------------|---|--|--|--|--|--|
| Item | Description | | | | | |
| Master RAID | The RAID volume currently designated as the Master RAID | | | | | |
| | volume. | | | | | |
| ID | ID of the current RAID volume. | | | | | |
| | NOTE: All RAID IDs must be unique. | | | | | |
| RAID Level | Shows the current RAID configuration. | | | | | |
| Status | Indicates status of the RAID. Can read either <i>Healthy</i> , | | | | | |
| | Degraded, or Damaged. | | | | | |
| Disks Used | Hard disks used to form the current RAID volume. | | | | | |
| Total Capacity | Total capacity of the current RAID. | | | | | |
| Data Capacity | Indicates the used capacity and total capacity used by user 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 Configu | rations |
|-----------------|--|
| Item | Description |
| Disk No. | 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 **RAID Information** screen, clicks create.

| 🗊 Disks List | Disks List | | | | | | | | |
|--|----------------|-------------------------|------------|-------------|------|-------|-----|--|--|
| The lists of system hard disk | Disk No. | Capacity (MB) | Nodel | Status | Used | Spare | | | |
| | 3 | 572,326 | WD6000BKHG | ОК | (2) | | | | |
| | 4 | 572,326 | WD60008KHG | ОК | 13 | 10 | - | | |
| | 5 | 572,326 | WD60008KHG | ОК | 83 | 23 | | | |
| | 6 | 572,326 | WD60008KHG | OK | 13 | 11 | | | |
| | | | | | | | | | |
| NAID Level Selector | • Description: | | W. | | | | • | | |
| | Description: | us listed installed har | | s and usage | | | , | | |
| KAID Property Setup KAID System Setup | Description: | us lated installed har | | s and usage | | | , - | | |
| NAID Property Setup NAID System Setup NAID Volume Courtest Conferences | Description: | us lated installed har | | s and usage | | | | | |

 On the RAID Configuration screen, set the RAID storage space as JBOD, RAID 0, RAID 1, RAID 5, RAID 6, RAID 10, RAID 50 or RAID 60 (depends on model)— see Appendix B: RAID Basics for a detailed description of each.

| Disks List | Disks List | | | | | | |
|------------------------------------|------------------|--|------------------------|---------------|--------------|-------|--|
| The lets of notern hard dak | Disk No. | Capacity (NB) | Model | Status | Used | Spare | |
| | 4 | 572,326 | WD600084046 | OK | [2] | 23 | |
| | 5 | 372,326 | W000008KHG | OK | [2] | E1 | |
| | 6 | 572,325 | W000008KHG | OK | [V] | 1 | |
| | 7 | N/A. | N/A | N/A | | | |
| RADUARS Injection | ×. | | .80.5 | | | - 21 | |
| NASS Instants Secure | Description: | | | | | | |
| NAD Netani Sebat | The disks list h | as listed installed have the selected disk(a), it | d click with its statu | s and usage | folgener: | | |
| NAD waterie Greaterie Confirmation | JOOD,RAID 0.8 | AID 1,RAID 5 | and evenesise root lev | cife) de truc | contrasting. | | |
| | | | | | | | |
| i fini | | | | | | | |
| 1 200 | | | | | | | |

NOTE

N8900/N12000/N16000 Series supports multiple RAID modes and are capable of creating up to five RAID volumes within a single NAS system.

3. Specify a RAID ID.



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



5. 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.

| RAID Volume Creation | | | | 3 |
|--|---|--|------|-----------------------|
| 💮 Déc Lif. 🕘 AAD Lavel Sénzhar | RAID ID: RAI RAID - Take e Encryption | | x | |
| 8 RAID Property Setup Setup RAD property in values studion per needed | Password: Confirm Password: | | | |
| AKD Settern Setue AKS2 Yu&ree Crustee Confirmation Real. | Description RAD D: alow 0-9, n-0, Moster RAD aptional Encryption optional and Encryption optional and exeted inside of hard de | password a imited to enable this setting to r | | there is no partition |
| | | | Pres | Nec Cancel |

Once the **Create** button has been pressed with the **Encryption** checkbox enabled, the following message pop-up will appear for confirmation.



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)_xxxxx.key
```



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

| 0 | Create | 🗌 🌍 Ed | lit 🎲 G | lobal Hot Spar | e | | | | |
|---|----------------|--------|---------------|----------------|---------|---------------|-------------------|------------------|--|
| | Master RAID | ID | RAID Level | File Syst | Status | Disks Used | Total Capacity | Data Capacity | |
| ۲ | * | raid 🔒 | 1 | ×fs | Healthy | 6 | 463.2 GB | 463 GB | |

6. Quick RAID — Enabled the quick RAID setting is going to enhance RAID creation time.

| | RAID ID: | RAID0 | |
|----|--------------|----------------|--|
| | Master RA | ID - Take effe | ct after checked box |
| | Encryption | I | |
| | Password: | | •••• |
| | Confirm Pa | ssword: | •••• |
| | V Quick Raid | | |
| | |) | |
| | | | |
| NC | DTE | | mend using the "Quick RAID" setting only if the hard disks are |
| | | | v or if no existing partitions are contained. |

- 7. Specify a stripe size 64K is the default setting.
- 8. Selected the file system you would like to have for this RAID volume. The selection is available from ext3, XFS and ext4.

| RAID Volume Creation | | | | 3 |
|---|--|---|--|--------------|
| Disk List IA2D Lavel Selection KAD Reports Setup | Stripe Size(KB): File System: Data Percentage: | 64 ¥ EXT4 ¥ EXT3 | | |
| RAID System Setup Select stripe see (f applicable) and fire system type for RAID volume created | device requests ac | cess to data more qui setup what percentag | t drives in RAID storage which is use cky, je of disk size you want to create ra | |
| 🕐 TAID Volane Ovaton Confination | | | | |
| C fool | | | | |
| | | | Prev | Next. Cancel |

NOTE

Single volume size supported: ext3 \rightarrow 8TB XFS \rightarrow 48TB ext4 \rightarrow 36TB

9. Press *Submit* to build the RAID storage volume.

| AID Volume Creation | | | |
|---|----------------------|--------------|--------------------|
| 1 Disks List | RAID Volume Creation | Confirmation | |
| 2 RAID Level Selection | Field | Value | |
| | Disks List | 4,5,6 | |
| RAID Property Setup | RAID Level | RAID 5 | |
| RAID System Setup | RAID ID | RAID0 | |
| | Master RAID | Yes | |
| | Encryption | No | |
| RAID Volume Creation | Quick Raid | No | |
| | Stripe Size(KB) | 64 KB | |
| ofirmation | File System XFS | | |
| mmation | Data Percentage | 100 % | |
| Listed RAID creating configuration fo mit confirmation | r | | |
| Final | | | |
| | | | |
| | | | |
| | | | |
| | | | Prev Submit Cancel |
| | | | |
| RAID Configuration | | | × |



10. Press "Yes" for RAID volume creation preparation. Then click "Finish" to start up with RAID volume building.



RAID Level

You can set the storage volume as **JBOD**, **RAID 0**, **RAID 1**, **RAID 5**, **RAID 6**, **RAID 10**, **RAID 50 or RAID 60 (depending on model)**.

| Level Model | JBOD | RAID 0 | RAID 1 | RAID 5 | RAID 6 | RAID 10 | RAID 50 | RAID 60 |
|----------------|------|--------|--------|--------|--------|------------|------------|------------|
| N12000 series | ٠ | • | • | • | • | ٠ | • | • |
| N16000 series | • | • | • | • | • | ٠ | • | • |
| N8900 series | ٠ | • | • | • | • | ٠ | • | • |
| N6850 | ٠ | • | • | • | • | ٠ | • | |
| N8850 | ٠ | • | • | • | • | ٠ | • | • |
| N10850 | • | • | • | • | • | ٠ | • | • |
| N7700PRO V2 | ٠ | • | • | • | • | ٠ | • | |
| N8800PRO V2 | • | • | • | • | • | ٠ | • | • |
| N7710 series | ٠ | • | • | • | • | ٠ | • | |
| N8810U | • | • | • | | • | • | • | • |
| series | • | • | • | • | • | • | • | • |
| N5550 | • | • | • | • | • | ٠ | | |
| N4510U | • | | | | | • | | |
| series | | - | - | - | | • | | |
| N7510 | ٠ | • | • | • | • | • | • | |

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 a single disk, |
| | 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. |
| | If the administrator improperty removes a hard disk that should not be |
| 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

On the **RAID Information** screen, press the *Edit* button to go to the **RAID Information** screen.

Using **Edit RAID**, you can select RAID ID and the Spare Disk.

| RAI | ID Man | agemer | nt | | | | | | |
|-----|-------------|--------|-----------------|--------|---------|---------------|-------------------|------------------|--|
| 00 | reate | 炎 Edit | 🍪 Global Hot Sp | are | | | | | |
| | Mas RAID | ID | RAID Level | File S | Status | Disks Used | Total Capacity | Data Capacity | |
| ۲ | • | RAID | 0 | xfs | Healthy | 1,2,3,4 | 2225 GB | 2223.9 GB | |
| | | | | | | | | | |

| Edit | | | | | | |
|---|-------------------|-------------------------|--------------|-------------------------|-----------------|-------------------------------------|
| Disk No. | Capacity (MB) | Model | Status | Used | Spare | |
| 1 | 572,326 | WD6000BKHG | ОК | 1 | | <u>_</u> |
| 2 | 572,326 | WD6000BKHG | ОК | $\overline{\mathbf{v}}$ | | |
| 3 | 572,326 | WD6000BKHG | ОК | \checkmark | | = |
| 4 | 572,326 | WD6000BKHG | OK | \checkmark | | = |
| 5 | N/A | N/A | N/A | | | |
| 6 | 953,870 | Hitachi HDS72 | OK | | | |
| 7 | N/A | N/A | N/A | | | |
| 8 | N/A | N/A | N/A | | | |
| RAID Level: |) JBOD | RAID 0 | 💮 RAID 1 | ⊘ RAID 5 | 🔘 RAID 6 | ◯ RAID 10 ◯ RAID 50 ◯ RAID 60 |
| RAID ID: | RAID | (Allow 0 | ~9, a~z, A~Z |) 🔽 M | aster RAID - Ta | ke effect after checked box |
| Encryption: | Passw | /ord: | | (Allow 1~16 c | haracters) | Confirm Password: |
| Stripe Size(KB): File System: Apply Remov | 64 Y | | | | | |
| RA | AID Configuration | | *** | | | X |
| | All current | active services wi | Yes | | lo | Are you sure to update setting now? |
| | | | | |] | |
| | | RAID Conf | iguration | Ų | | × |
| | | i) ¹ | RAID Infom | ation update | Successfully! | |
| | | I FI RATE | - | OK | R Rodins | |

Remove RAID

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

To remove a RAID volume, follow the steps below:

- 1. On the RAID List screen, select the RAID volume by clicking on its radio button, and click **RAID Information** to open the **RAID Configuration** screen.
- 2. On the **RAID Configuration** screen, click *Remove RAID*.
- 3. A confirmation screen will appear, you will have to click "Yes" to complete the "**Remove RAID**" operation.

| - Edit | | | | | | |
|------------------|---------------|---------------------|--------------|-------------------------|-------------------|---------------------------------------|
| Disk No. | Capacity (MB) | Model | Status | Used | Spare | |
| 1 | 572,326 | WD6000BKHG | ок | V | | <u>^</u> |
| 2 | 572,326 | WD6000BKHG | ОК | \checkmark | | |
| 3 | 572,326 | WD6000BKHG | OK | $\overline{\checkmark}$ | | = |
| 4 | 572,326 | WD6000BKHG | OK | \checkmark | | - |
| 5 | N/A | N/A | N/A | | | |
| 6 | 953,870 | Hitachi HDS72 | OK | | | |
| 7 | N/A | N/A | N/A | | | |
| 8 | N/A | N/A | N/A | | | * |
| RAID Level: | © JBOD | RAID 0 | ⊘ RAID 1 | © RAID 5 | © RAID 6 | ◯ RAID 10 ◯ RAID 50 ◯ RAID 60 |
| RAID ID: | RAID | (Alow 0 | ~9, a~z, A~Z |) V M | laster RAID - Ta | ike effect after checked box |
| Encryption: | Passv | vord: | | (Allow 1~16 c | haracters) | Confirm Password: |
| Quick Raid: | 📄 🛛 (Ena | ble this setting to | enhance RAID | creation time i | f there is no par | rtition existed inside of hard disk) |
| Stripe Size(KB): | 64 💌 | | | | | |
| File System: | XFS 💌 | | | | | |
| Apply Remove | RAID | | | | | |
| WA | ARNING | | RAID destr | roys all data | i in the selec | cted RAID volume. The data will |

Global Hot Spare

Up to 5 RAID volumes can be created per system. The global hot spare support can eliminate the redundant disk usage in each RAID volume. Simply select an unused disk from the global hot spare disk list then apply to activate.

| obal Hot Sp | are | | | | |
|-------------|---------------|---------------|--------|------------------|--|
| Disk No. | Capacity (MB) | Model | Status | Global Hot Spare | |
| 7 | 953,870 | SAMSUNG HD103 | OK | V | |
| 8 | 953,870 | SAMSUNG HD103 | OK | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Apply | | | | | |
| | | | | | |

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, log on to Web Management. Navigate to **Storage**> *RAID* to open the **RAID Configuration** screen.
- 4. On the **RAID Information** screen, click *Edit* to open the **RAID Configuration** screen.
- 5. On the RAID Configuration screen, click Expand.

| Configuration | | | |
|------------------|--------|-------------------|--|
| RAID Information | Expand | Migrate RAID | |
| Unused: | | 36.59 GB (60 %) | |
| Apply | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

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, RAID 6, RAID50 or RAID 60 volume, follow the steps below:

- 1. From the RAID Configuration screen, click **Migrate RAID**.
- 2. A list of possible RAID migration configurations will be listed. Select the desired migration scheme and click **Apply**.
- 3. The system will begin migrating the RAID volume.

| Disk No. | Capacity (MB) | Model | Status | Used | Availabl | le | | |
|------------|---------------|-------------------|--------|--------------------------------|-------------|--------------|--|--|
| 1 | 572,326 | WD6000BKHG | OK | 1 | | | | |
| 2 | 572,326 | WD6000BKHG | OK | 1 | | E | | |
| 3 | 572,326 | WD60008KHG | OK | 1 | | | | |
| 4 | 572,326 | WD6000BKHG | OK | | | | | |
| 5 | 572,326 | WD60008KHG | ОК | | 83 | + | | |
| < | | III. | | | | • | | |
| | O RAID 1 - | > RAID 5 (Online) | | O RAID 6 | -> RAID 6 | (Online) | | |
| AID Level: | 🔘 RAID 1 - | > RAID 6 (Online) | | 🗇 RAID 50 -> RAID 50 (Offline) | | | | |
| | 🔘 RAID 5 - | > RAID 5 (Online) | | C RAID 5 | 0 -> RAID 6 | 50 (Offline) | | |
| | RAID 5 - | > RAID 6 (Online) | | 💿 RAID 6 | 0 -> RAID 6 | 50 (Offline) | | |

| Alley | ou sure? |
|-------------------------|--|
| RAID Configurat | ion X r data lost caused by power failure, a full data backup is strongly recommanded. Please type in [Yes] |
| below to proceed Yes | I. OK Cancel |
| | RAID Configuration × RAID Setting Successfully! You are in on_line Migration NOW!! |
| | |

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.
- 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.

| То | | | |
|------|--------|--|----------------------------------|
| From | RAID 0 | RAID 5 | RAID 6 |
| RAID | | [RAID 1] HDDx2 to [RAID 5] HDDx3 | [RAID 1] HDDx2 to [RAID 6] HDDx4 |
| 1 | | [RAID 1] HDDx2 to [RAID 5] HDDx4 | [RAID 1] HDDx2 to [RAID 6] HDDx5 |
| | | [RAID 1] HDDx2 to [RAID 5] HDDx5 | [RAID 1] HDDx2 to [RAID 6] HDDx6 |
| | | [RAID 1] HDDx2 to [RAID 5] HDDx6 | [RAID 1] HDDx2 to [RAID 6] HDDx7 |
| | | [RAID 1] HDDx2 to [RAID 5] HDDx7 | [RAID 1] HDDx2 to [RAID 6] HDDx8 |
| | | [RAID 1] HDDx2 to [RAID 5] HDDx8 | HDDx16 |
| | | HDDx16 | [RAID 1] HDDx3 to [RAID 6] HDDx4 |
| | | [RAID 1] HDDx3 to [RAID 5] HDDx4 | [RAID 1] HDDx3 to [RAID 6] HDDx5 |
| | | [RAID 1] HDDx3 to [RAID 5] HDDx5 | [RAID 1] HDDx3 to [RAID 6] HDDx6 |
| | | [RAID 1] HDDx3 to [RAID 5] HDDx6 | [RAID 1] HDDx3 to [RAID 6] HDDx7 |
| | | [RAID 1] HDDx3 to [RAID 5] HDDx7 | [RAID 1] HDDx3 to [RAID 6] HDDx8 |
| | | [RAID 1] HDDx3 to [RAID 5] HDDx8 | HDDx16 |
| | | HDDx16 | [RAID 1] HDDx4 to [RAID 6] HDDx5 |
| | | [RAID 1] HDDx4 to [RAID 5] HDDx5 | [RAID 1] HDDx4 to [RAID 6] HDDx6 |
| | | [RAID 1] HDDx4 to [RAID 5] HDDx6 | [RAID 1] HDDx4 to [RAID 6] HDDx7 |
| | | [RAID 1] HDDx4 to [RAID 5] HDDx7 | [RAID 1] HDDx4 to [RAID 6] HDDx8 |
| | | [RAID 1] HDDx4 to [RAID 5] HDDx8 | HDDx16 |
| | | HDDx16 | |
| | | [RAID 1] HDDx5 to [RAID 5] HDDx6 | [RAID 1] HDDx5 to [RAID 6] HDDx7 |
| | | [RAID 1] HDDx5 to [RAID 5] HDDx7 | [RAID 1] HDDx5 to [RAID 6] HDDx8 |
| | | [RAID 1] HDDx5 to [RAID 5] HDDx8 | |
| | | | |
| | | [RAID 1] HDDx6 to [RAID 5] HDDx7 | [RAID 1] HDDx6 to [RAID 6] HDDx8 |
| | | [RAID 1] HDDx6 to [RAID 5] HDDx8 HDDx16 | |
| | | [RAID 1] HDDx7 to [RAID 5] HDDx8 | |
| | | HDDx16 | |
| RAID | x | [RAID 5] HDDx3 to [RAID 5] HDDx4 | [RAID 5] HDDx3 to [RAID 6] HDDx5 |
| 5 | | [RAID 5] HDDx3 to [RAID 5] HDDx5 | [RAID 5] HDDx3 to [RAID 6] HDDx6 |
| | | [RAID 5] HDDx3 to [RAID 5] HDDx6 | [RAID 5] HDDx3 to [RAID 6] HDDx7 |
| | | [RAID 5] HDDx3 to [RAID 5] HDDx7 | [RAID 5] HDDx3 to [RAID 6] HDDx8 |
| | | [RAID 5] HDDx3 to [RAID 5] HDDx8 | HDDx16 |
| | | HDDx16 | [RAID 5] HDDx4 to [RAID 6] HDDx6 |
| | | [RAID 5] HDDx4 to [RAID 5] HDDx5 | [RAID 5] HDDx4 to [RAID 6] HDDx7 |
| | | [RAID 5] HDDx4 to [RAID 5] HDDx6 | [RAID 5] HDDx4 to [RAID 6] HDDx8 |
| | | [RAID 5] HDDx4 to [RAID 5] HDDx7 | HDDx16 |
| | | [RAID 5] HDDx4 to [RAID 5] HDDx8 | [RAID 5] HDDx5 to [RAID 6] HDDx7 |
| | | HDDx16 | [RAID 5] HDDx5 to [RAID 6] HDDx8 |
| | | [RAID 5] HDDx5 to [RAID 5] HDDx6 | HDDx16 |
| | | [RAID 5] HDDx5 to [RAID 5] HDDx7 | [RAID 5] HDDx6 to [RAID 6] HDDx8 |
| | | [RAID 5] HDDx5 to [RAID 5] HDDx8 | HDDx16 |
| | | HDDx16 | |
| | | [RAID 5] HDDx6 to [RAID 5] HDDx7 | |
| | | [RAID 5] HDDx6 to [RAID 5] HDDx8 | |
| | | HDDx16 | |
| | | [RAID 6] HDDx7 to [RAID 5] HDDx8 | |
| | | HDDx16 | |

| Below is a | table | listing | of | possible | RAID | migration | schemes: |
|------------|-------|---------|----|----------|------|-----------|----------|
| | | | | | | | |

| RAID | x | x | [RAID 6] HDDx4 to [RAID 6] HDDx5 |
|------|---|---|----------------------------------|
| 6 | | | [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 |

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 stackable feature is located under "Storage". Please refer the figure below for reference.

| ۹ | ~~ | Home > Storage > NAS Stacking | g | @ H | elp 💛• My favo | orite 🕛 Sh | utdown | ⁄ Logout |
|---|-----------|-----------------------------------|---|-----------------------|----------------|-------------|--------|----------|
| System Information | ۲ | Stacking Target List | | | | | | |
| 🔇 System Management | ۲ | Local Initiator IQN: iqn.2007-08. | | | 2 | | | |
| System Network | + | O Add ⊘Edit ⊖Remove } | | | | - | | |
| Storage | - | Stacked Target Name | P | Capacity (Used/Total) | Status | Description | iqn | |
| Disk Information RAID Management NAS Stacking | | | | | | | | |
| SO Image Mounting Share Folders SECSI High-Availability | | | | | | | | |

A. Add a Stack Target Volume

From the figure above, click **Add** 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.

| Add iSCSI Targe | t (Add Stack Target) | × |
|-------------------------|--|---|
| Enable iSCSI Target: | Enable Disable | |
| Stackable Targe IP: | 172.16.65.143 | |
| iqn: | iqn.2011-11.com.thecus:RAID.iscsi0.vg0.pmdata | |
| Username: | | |
| Password: | | |
| Stacked Target Name: | (Limit : (0~9, a~z)) | |
| Description: | | |
| Browseable: | ● yes | |
| Public: | 🔿 yes 🔘 no | |
| Stackable will mo | unt the first LUN of the iSCSI target if it has more than one LUN. | |

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

Once the volume IP has been set, 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.

| Add iSCSI Target | (Add Stack Target) | × |
|-------------------------|---|---|
| Enable iSCSI Target: | Inable O Disable | |
| Stackable Target IP: | 172.16.65.143 | |
| iqn: | iqn.2011-11.com.thecus:RAID.iscsi0.vg0.pmdata | |
| Username: | | |
| Password: | | |
| Stacked Target Name: | (Limit : (0~9, a~z)) | |
| Description: | | |
| Browseable: | 🖲 yes 🔘 no | |
| Public: | 🔘 yes 💿 no | |
| Stackable will mour | nt the first LUN of the iSCSI target if it has more than one LUN. | |

The **Stacked Target name** will become the network share name and will be displayed through network access such as SMB. You may refer to the figure below to see the result. Please note the naming limitation.

| Add iSCSI Target | (Add Stack Target) | × |
|-------------------------|---|---|
| Enable iSCSI Target: | Enable O Disable Disable | |
| Stackable Target IP: | 172.16.65.143 Discovery | |
| iqn: | iqn.2011-11.com.thecus:RAID.iscsi0.vg0.pmdata | |
| Username: | | |
| Password: | | |
| Stacked Target Name: | pmmeeting (Limit : (0~9, a~z)) | |
| Description: | | |
| Browseable: | ● yes [©] no | |
| Public: | 💿 yes 💿 no | |
| Stackable will mour | nt the first LUN of the ISCSI target if it has more than one LUN. | |

From the figure above, the **Stacked Target name** is "pmmeeting". 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.

| Add iSCSI Target | (Add Stack Target) | × |
|-------------------------|---|---|
| Enable iSCSI Target: | Enable O Disable | |
| Stackable Target IP: | 172.16.65.143 | |
| iqn: | iqn.2011-11.com.thecus:RAID.iscsi0.vg0.pmdata | |
| Username: | | |
| Password: | | |
| Stacked Target Name: | pmmeeting (Limit : (0~9, a~z)) | |
| Description: | | |
| Browseable: | ® yes ⊘ no | |
| Public: | 💿 yes 🔹 💿 no | |
| Stackable will mou | nt the first LUN of the ISCSI target if it has more than one LUN. | |
| Apply | | |

The **Public** setting will be set the same way as the setting for the system share folder associated with the ACL permission is. If **Public** is set to **Yes**, all users will be able to access it, and **ACL** button will be grayed out. If **Public** is set to **No**, the ACL button will be available in the **Stack Target List** window.

| Add iSCSI Target | (Add Stack Target) | × |
|-------------------------|---|---|
| Enable iSCSI Target: | Enable O Disable Disable | |
| Stackable Target IP: | 172.16.65.143 Discovery | |
| iqn: | iqn.2011-11.com.thecus:RAID.iscsi0.vg0.pmdata | |
| Username: | | |
| Password: | | |
| Stacked Target Name: | pmmeeting (Limit:(0~9, a~z)) | |
| Description: | | |
| Browseable: | ◉ yes ⊙ no | |
| Public: | 🔿 yes 🔘 no | |
| Stackable will moun | nt the first LUN of the ISCSI target if it has more than one LUN. | |

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 **Stack Target List** window as shown below. There is one stack target device that has been attached into this stack master.

| Stack Target List Add Export share name IP Capacity (Used/Total) Status Description | Stacked Target Name | P | Capacity (Used/Total) | Status | Des | scription in | Įn |
|---|------------------------|--------------|-----------------------|------------------------|--------------------------------|--------------|-------------|
| Add Bernove Format Status Description Ign Export share name IP Capacity (Used/Total) Status Description Ign | 🛄 stack1 | 172.16.66.24 | N/A | Unknow | wn file s <u>r</u> | ic | n.2011-11.c |
| Add Bernove Format Status Description Ign Export share name IP Capacity (Used/Total) Status Description Ign | | | | | | | |
| Add Bernove Format Status Description Ign Export share name IP Capacity (Used/Total) Status Description Ign | | | | | | | |
| Export share name IP Capacity (Used/Total) Status Description ign | Stack Target List | | | | | | |
| Export share name IP Capacity (Used/Total) Status Description ign | | A | | | | | |
| | | | | 12000 | | | |
| | | | | | | | |
| ▷ □ iscsi 172.16.65.157 N/A Unknown file sy iqn.2009-05.col | | | | | To have a series of the second | 1 | |
| | Export share name | | | Status Unknown file | To have a series of the second | | |
| | | | | | To have a series of the second | 1 | |
| | | | | | To have a series of the second | 1 | |
| | | | | | To have a series of the second | 1 | |
| | | | | | To have a series of the second | 1 | |
| | | | | | To have a series of the second | 1 | |
| | | | | | To have a series of the second | 1 | |
| | | | | | To have a series of the second | 1 | |
| Second | ⊳ <mark>⊂</mark> iscai | | 57 N/A | | To have a series of the second | 1 | |
| Success | 0 🥁 iscsi | | 57 N/A | | To have a series of the second | 1 | |
| Success X You have successfully formatted stack folder - [iscsi] | D isosi | 172.16.65.1 | 57 N/A | | To have a series of the second | 1 | |

With this newly attached stack target device, you will see the information displayed and also have access to several options to choose from.

In general, if the attached stack target device has been used by another Thecus NAS as stack target volume, then the **Format** item will be display and system will recognize it straight away and display its capacity. Otherwise, the **Format** item will be available and the **Capacity** and **Status** items will show as "N/A" and "Unknown file system" respectively.

Next, click *Format* 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 **Stack Target List** screen.

C. Edit a Stack Target

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

| dit istst Target | |
|-------------------------|---|
| Enable iSCSI Target: | Enable Disable Disable |
| Stackable Target IP: | 172.16.65.143 Discovery |
| iqn: | iqn.2011-11.com.thecus:RAID.iscsi0.vg0.pmdata 💌 |
| Username: | |
| Password: | |
| Stacked Target Name: | pmmeeting (Limit : (0~9, a~z)) |
| Description: | |
| Browseable: | |
| Public: | ● yes ◎ no |
| Stackable will mour | nt the first LUN of the iSCSI target if it has more than one LUN. |

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

If the stack target **Public** setting set to **Yes**, then the **ACL** button will be grayed out. However, if **Public** setting is set to **No**, then the **ACL** button will be available for you to setup user access permissions for the stack target.

The **ACL** settings will be exactly the same as the system folder that you may have setup previously.

| ACL setting | | | Language 🗙 |
|---|------|-----------|----------------------|
| ✓ Recursive | Deny | Read Only | Writable |
| Local Groups 🗸 🏚 Search | | | \odot \bigcirc |
| Name | Name | Name | Name |
| users | | | |
| andy | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Local Groups Local Users AD Groups AD Users | | | |
| Synchronize Apply | | | |

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**.

| Stacking Target List Local Initiator ION: Ign.2007- | 08 com theousistack | able-server 0014fd14fb | 28 | | |
|--|---|------------------------|---------|-------------|----------------|
| O Add OEdit OR Remove | Contraction of the second s | | .0 | | |
| Stacked Target Name | IP | Capacity (Used/Total) | Status | Description | iqn |
| D C stack1 | 172.16.66.24 | N/A | Disable | | ign.2011-11.cr |

| 🔘 Add 🛛 🤔 Edit 🛛 🥥 Rem | ove 🌸 Format 🖉 Rec | onnect and all | | | |
|------------------------|------------------------------|------------------------|---------|-------------|---------------|
| Export share name | IP | Capacity (Used/Total) | Status | Description | iqn |
| 🕫 🧰 isesi | 172.16.65.157 | 0 GB / 0.1 GB | Disable | | iqn.2009-05.c |
| | | | | | |
| Success | | X |] | | |
| Success You have s | uccessfully reconnect to the | e stack folder [iscsi] |] | | |

ISO Mount

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

From the main menu, the ISO Mount feature is located under "Storage". Please refer the figure below for reference.

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

| • | | Home > Storage > ISO Image Mounting | ⑦ Help ♡• My favorite 🔱• Shutdown 🔊 Logout |
|---|---|-------------------------------------|--|
| 📕 System Information 🔹 | | ISO Image Mounting | ^ |
| 🗙 System Management 🔹 | | pm1 ¥ | |
| System Network | | G Unmount. | |
| Storage - | | Mounted Path - ISO Path | ISO Size |
| Disk Information RAID Management HAS Stacking ISO Image Mounting Share Folders SCSI | | | E |
| Ser and Group Authentication | | | |
| Network Service | | | |
| Application Server | | | |
| 📑 Backup 🔹 | | 4 4 Page 1 of 1 > > 2 | No ISO image information to display |
| External Devices | • | | * |

A. Add an ISO file

From the figure above, select an ISO file from the drop down share list.

| nsync | | |
|------------|----------|----------|
| usbhdd | | |
| usbcopy | ISO Path | ISO Size |
| naswebsite | | |

After selection, the system will bring up the Mount table screen for further settings.

| ▼ ISO filter | i Unmount | | |
|--|--|----------|-------------------------------------|
| maswebsite BT Seed Andy Weekly Report AAD Bestrech GT ACS 6xxx AACC Thecus 02.iso Thecus 01.iso Adobe Acrobat 7.0 Pro Adobe Arobat 7.0 Pro Andy Private | Mounted Path * | ISO Path | ISO Size |
| File Selected: Mount as: Add | Description Only ISO 9660 file system can be mount Top 50 Folders Top 50 Files Please type in the full path of the ISO if the | ed. | No iso mount information to display |
| ISO filter Basvebäte B Sed Andy Weekly Report AND Besttech GT ACS Saxx MACC Thecus 01 iso Adobe Acrobat 7.0 Pro Andy Private | Mounted Path * | ISO Path | ISO Size |
| File Selected: //naswebsite/Thecus 01.iso Mount as: | Description Only ISO 9660 file system can be mounted Top 50 Folders Top 50 Folders Please type in the full path of the ISO if nor | | |

To mount the new ISO file, select one file from the list of files and input the desired mounting name into the "Mount as:" field. Click "ADD" to confirm the completion of the mounting. If nothing is input in the "Mount as" ISO file export name field, the system will automatically give an export name to the ISO file. The mounting name will then be defined by the ISO file name.

| F | Mounted Path - | V | ISO Path | ISO Size |
|--------------------|--|--|--|-------------------------------------|
| | ISO Mount Are you su ISO? | x) re to mount the | | |
| | | | J | No iso mount information to display |
| Only Top Top | ISO 9660 file system can t 50 Folders 50 Files | | | |
| | cus 01.iso De Only Top | cus 01 iso Description Ody 150 9460 file system can Tage 50 Files | cus 01 iso Description Only 150 950 file system cas be mousted. Tay 50 File system cas 50 File sy | cus 01 iso |

| V ISO filter | linmount 😂 | | |
|---|---|----------|-------------------------------------|
| a sawebsite a sawebsite a sawebsite a sawebsite a sawebsite a satu a satu b a satu c a satu c a satu | Mounted Path * | ISO Path | ISO Size |
| Thecus 02 iso Thecus 01 iso Thecus 01 iso Thecus 01 iso Adobe Actobe 7.0 Pro Adobe 7.0 Pro A | ISO Mount inaswebsite Thecus 01 iso is mou | X | |
| File Selected: //naswebsite/Thecus 01 iso | 🕅 🍕 Page 🕇 of 1 🕨 🅅 🥭 | | No iso mount information to display |
| Mount as: | Description Only ISO 9660 file system can be mounted. Tops 50 Folders | | |

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

| a 🔄 naswebsite | Mounted Path * | ISO Path | ISO Size |
|---|-----------------------|---------------------------|---------------------------|
| BT Seed Andy Weekly Report Andy Meekly Report AMD Thecus 01 | naswebsite Thecus 01 | /naswebsite/Thecus 01.iso | 102.8MB |
| Besttech GT ACS 6xxx | | | |
| AMCC | | | |
| Adobe Acrobat 7.0 Pro | | | |
| ATOM Andy Private | | | |
| | | | |
| e Selected: | M 4 Page 1 of 1 D M 2 | Displaying iso m | ount information 1 - 1 of |
| e Selected. | Description | | |
| ount as: | | | |

You can click "Unmount" to eliminate a mounted ISO file.

B. Using ISO

The mounted ISO file will be located in the share folder of the same name as the file. Please refer the screen shot below. Here, the ISO file "Thecus 01" wasn't assigned a mounting name, so the system automatically created a folder "Thecus 01".



Share Folder

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

| ٩ | ~~ | Home > Storage > Share Folders | ⑦ Help ♡• | My favorite | ပံ• Shutdown | \$ <mark>8</mark> Logou |
|---|----|---|-----------|-------------|---------------------|-------------------------|
| 📜 System Information | ۲ | Shared Folders | | | | |
| 💥 System Management | ۰ | 🔕 Add 🎲 Edit 🥥 Remove 🗔 NFS 🗔 Snapshot 📸 ACL | | | | |
| 🚽 System Network | | Folder name >> | RAID ID | File System | Public De | escription |
| Storage | -1 | iTunes_music | RAID | xfs | yes | |
| | | USBCopy | RAID | xfs | yes | |
| - W Disk Information - B RAID Management | | ▷ 🗀 USBHDD | RAID | xfs | yes Us | sed for exte |
| NAS Stacking | | SATAHDD | RAID | xfs | yes Us | sed for eSA |
| SO Image Mounting | | NAS_Public | RAID | xfs | yes | |
| 😹 Share Folders | | Description of the second s | RAID | xfs | yes | |
| ISCSI ISCSI | | A module police | | | · . | |

Adding Folders

On the **Folder** screen, press the **Add** button and the **Add Folder** screen appears. This screen allows you to add a folder. After entering the information, press **Apply** to create new folder.

| ۹ | ~~ | Home > St | orage > Sl | hare Folder | s | | 🕜 Help | ♡• My favorite | (). Shutdow | n 17 Logout |
|---------------------|--------------|----------------------|------------|-------------|------------------------|-------|--------|----------------|-------------|----------------|
| System Information | ۲ | Shared | Folders | | | | | | | |
| X System Management | | 🚫 Add | 🚷 Edit 🛛 🧲 | Remove | 📣 NES 📔 📑 Snapshot 🛛 🚰 | ACL | | | | |
| System Network | | Folder na | | | | | RAID | D File System | n Public | Description |
| Storage | - | | ines_music | | | | RAID | xfs | yes | |
| Disk Information | | D 🗋 US | | | | | RAID | xfs | yes | |
| RAID Management | | D 🗀 US | | | | | RAID | xfs | yes | Used for exte |
| NAS Stacking | | E Contraction (1998) | | | | | RAID | xfs | yes | Used for eSA E |
| ISO Image Mounting | | Þ 🗀 NA | - | | | | RAID | xfs | yes | |
| Share Folders | | | AS_Module_ | | | | RAID | xfs | yes | |
| _ | | | | | Ų | | | | | |
| | add folder | | | | | NO-KI | | × | | |
| | RAID ID: | | RAID | | | | | | | |
| | Folder name | e: | | | | | | | | |
| | Description: | | | | | | | | | |
| | Browseable | : | Yes | O No | | | | | | |
| | Public: | | © Yes | No | | | | | | |

| 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. |
| 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.

Modify Folders

On the **Folder** screen, press the *Edit* button and the **Modify Folder** screen appears. This screen allows you to change folder information. After entering the information, press **Apply** to save your changes.

| Modify Folder | A TAHUU | | | KAID | ext3 | × |
|---------------|---------|------|--|------|------|---|
| RAID ID: | RAID 🛩 | | | | | |
| Folder name: | 1111 | | | | | |
| Description: | | | | | | |
| Browseable: | Yes | 🔘 No | | | | |
| Public: | Yes | 🔘 No | | | | |
| | | | | | | |
| | | | | | | |
| Apply | | | | | | |

| Modify Fol | lder |
|-------------|---|
| Item | Description |
| RAID ID | RAID volume where the 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. This |
| | setting will only apply while access via SMB/CIFS and web disk. |
| Public | Admit or deny public access to this folder. |

Remove Folders

To remove a folder, press the **Remove** button from the specified folder row. The system will confirm folder deletion. Press **Yes** to delete the folder permanently or **No** to go back to the folder list.



NFS Share

To allow NFS access to the share folder, enable the **NFS Service**, and then set up hosts with access rights by clicking **Add**.

| FS Add | | | | |
|--------------|------------------|-----------------|------------|--------------|
| 53 Mount poi | | | | |
| S4 Mount poi | int: /raid0/data | a/_NAS_NFS_Expo | orts_/pm2 | |
| Edit CRe | | | | |
| ost Name | Privilege | OS Support | ID Mapping | Sync / Async |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Config NFS share | | × |
|-----------------------------------|---|---|
| NFS Add | | |
| Host Name: | XXX.XXX XXX | |
| All host please set Privilege: | t ***', other host "xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx | |
| | Writable | |
| OS Support: | Unix / Linux | |
| | O AIX | |
| ID Mapping: | Guest system root account will have full access to this share (root:root). | |
| | O Guest system root account will be mapped to anonymous user (nobody:nogroup) on NAS. | |
| Sync / Async: | Sync | |
| | O Async | |
| Apply | | |
| | | |
| | | |
| | | |
| | | |

| 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. |

Folder and sub-folders Access Control List (ACL)

On the Folder screen, press the **ACL** button, and the **ACL setting** screen appears. This screen allows you to configure access to the specific folder and sub-folders for users and groups. Select a user or a group from the left hand column and then choose **Deny**, **Read Only**, or **Writable** to configure their access level. Press the **Apply** button to confirm your settings.

| ICL setting | | | | |
|-------------------|-----------------|--|-----------|----------|
| Recursive | | Deny | Read Only | Writable |
| Local Gro | oops 😽 🎥 Search | 0 0 | 0 0 | 0 0 |
| Name | | Name | Name | Name |
| wers | | | | |
| | | | | |
| | | | | |
| | ACL | setting | × | |
| | | | | |
| | 4 | This process maybe need Are you want sync accou | int? | |
| | | | | |
| | | Yes | No | |
| | L | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Synchronize Apply | | | | |



| ACL setting | |
|-------------|--|
| Item | Description |
| Deny | Denies access to users or groups who are displayed in this column. |
| Read Only | Provides Read Only access to users or groups who are displayed in this column. |

| Writable | Provides Write access to users or groups who are displayed in this |
|-----------|--|
| | column. |
| Recursive | Enable to inherit the access right for all its sub-folders. |

To configure folder access, follow the steps below:

- 1. On the **ACL** screen, all network groups and users are listed in the left hand column. Select a group or user from this list.
- 2. With the group or user selected, press one of the buttons from the three access level columns at the top. The group or user then appears in that column and has that level of access to the folder.
- 3. Continue selecting groups and users and assigning them access levels using the column buttons.
- 4. To remove a group or user from an access level column, press the *Remove*

button in that column.

5. When you are finished, press *Apply* to confirm your ACL settings.

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

To setup sub-folders ACL, click on " \triangleright " symbol to extract sub folders list as screen shot shows below. You may carry on with same steps as share level ACL setting.

| RAID ID aaaa aaaa aaaa aaaa | File System ext3 ext3 ext3 | Public no yes | Description |
|---|-------------------------------------|---------------------|---|
| aaaa | | yes | |
| | ext3 | | usbhdd |
| 0000 | | no | usbcopy |
| 9999 | ext3 | no | naswebsite |
| aaaa | ext3 | yes | Tunes_mus |
| aaaa | ext3 | yes | |
| aaaa | ext3 | no | |
| | | no | |
| | 8888 | | aaaa ext3 yes aaaa ext3 no no no |

The ACL screen also allows you to search for a particular user. To do this, follow the steps below:

1. In the blank, enter the name of the user you would like to find.

- 2. From the drop down select the group you would like to search for the user in.
- 3. Click *Search*.

| a | Local Users 💌 | |
|--------|---------------|---|
| | Local Groups | |
| | Local Users | |
| aaaa 🚽 | AD Groups | - |
| abcd | AD Users | |
| abcd | AD Users | |

iSCSI

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

| Model | N8900V | N8800PRO | N8900 |
|----------------------|---------------|---------------|--------|
| | N6850 | N12000V | N12000 |
| | N5550 | N16000V | N16000 |
| | N4510U series | N7700PRO V2 | |
| | N7510 | N8800PRO V2 | |
| | | N7710 series | |
| | | N8810U series | |
| | | N10850 | |
| | | N8850 | |
| Allowed iSCSI volume | 15 | 25 | 50 |

| RAID M | lanagement | | | | | | |
|---------------------------------|------------|---------------|--------------|---------------|-------------------|--------------------|-------------|
| Master RAID | ID | RAID Level | Status | Disks Used | Total Capacity | Data Capacity | File System |
| * | RAID | 0 | Healthy | 1,2,3,4 | 2225 | 12.8 GB / 2223.9 G | B xfs |
| ISCSI S | upport | | | | | | |
| CSI: | 6 | Enable @ |) Disable | | | Apply | |
| ICCCL T | | | | | | | |
| | arget | | | | | | |
| | arget | | | | | | |
| ISCSI T | | | | | | | |
| | | | | | | | |
| ISCSI T | | Advance | d 😑 Delete | | | | |
| ISCSI T | arget | i Advance | d i 🥥 Delete | Status | | | |
| ISCSI T | arget | i Advance | d i 🥥 Delete | | | | |
| ISCSI T ISCSI Add Name | arget | ige Advance | d 🛛 🥥 Delete | Status | | | |
| ISCSI T ISCSI Add Name | arget | i Advance | d 🥥 Delete | Status | | | |
| ISCSI T ISCSI Add Name | arget | ig Advance | d 🥥 Delete | Status | | | |
| ISCSI TA | arget | | | Status | | | |

iSCSI Target

To add iSCSI target volume, click **iSCSI** with associated RAID volume from its drop down list and select the desired RAID volume.

| iSCSI Target | |
|--------------|---|
| Item | Description |
| Add | Click to allocate space to iSCSI target from associated RAID volume. |
| Modify | Click this to modify the iSCSI Target. |
| Advanced | There are 3 options (iSCSI CRC/Checksum, Max Connections, Error Recovery Level) These currently allow the Admin to Enable/Disable the Thecus IP storage associated with the iSCSI setting. |
| Delete | Click this to delete the iSCSI Target. |

Allocating Space for iSCSI Volume

| IV-UD III | formation | | | | | | |
|--|-----------|---------------|---------------|-------------------|-------------------|-------------------|-------------|
| Master RAID | ID | RAID Level | Status | Disks Used | Total Capacity | Data Capacity | File System |
| * | HA | 30 | Healthy | 1,24 | 460.4 | 1.2 GB / 453.3 GB | ext4 |
| - ISCSI Su SCSI: - ISCSI Ta ISCSI Ta ISCSI | @ rget | Enable | ⊘ Disable | | | Apply | - |
| Add Name | Modify | 炎 Advance | ed 🛛 🤤 Delete | | | | |
| | | | | Status Enabled | | | |

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

1. Under the **iSCSI Target List**, select **iSCSI Target then click Add**. The **Create iSCSI Volume** screen appears.

| iSCSI Target Volume: | Enable Disable |
|--|---|
| Target Name: | Limit:(0~9, a~z) |
| iqn_Year: | 2010 💌 |
| iqn_Month: | 12 |
| Authentication: | None CHAP |
| | Limit:(0~9, a~z, A~Z) |
| | Limit:(0~9, a~z, A~Z,length between 12~16) |
| | |
| Mutual CHAP | |
| | Limit:(0~9, a~z, A~Z) |
| | Limit:(0~9, a~z, A~Z,length between 12~16) |
| | |
| Create LUN | |
| RAID ID: | RAID |
| | Thin-Provision Instant Allocation |
| LUN Allocation: | |
| LUN Allocation: LUN Name: | Limit:(0~9, a~z) |
| | 363 GB |
| LUN Name: | |
| LUN Name: Unused: | 363 GB |
| LUN Name: Unused: Allocation: | 363 GB |
| LUN Name: Unused: Allocation: LUN ID: ISCSI Block size: | 363 GB |
| LUN Name: Unused: Allocation: LUN ID: ISCSI Block size: Description | 363 GB 1 GB 0 512 Bytes(For older version) |
| LUN Name: Unused: Allocation: LUN ID: ISCSI Block size: Description The ISCSI block size can be s | 363 GB 1 GB 0 V 512 Bytes(For older version) V set under system advance option, default is 512 Bytes. |
| LUN Name: Unused: Allocation: LUN ID: ISCSI Block size: Description The ISCSI block size can be s lease use [4K] block size w | 363 GB 1 GB 0 512 Bytes(For older version) |

| Create iSCS | Create iSCSI Volume | | | |
|-------------|---------------------|--|--|--|
| Item | Description | | | |

| CCCL Tanaat Malana | Frable on Disable the iCCCI Tanget Values | | |
|---------------------|---|--|--|
| 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 | | |
| ISCSI DIUCK SIZE | | | |
| | 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. | | |
| | | | |
| NOTE Be s | sure the iSCSI target volume has been enabled | | |

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

- 2. Enable the **iSCSI Target Volume** by selecting *Enable*.
- 3. Enter a **Target Name**. This will be used by the **Stackable NAS** function to identify this export share.
- 4. Choose the current year from the **Year** dropdown.
- 5. Choose the current month from the **Month** dropdown.
- 6. Choose to enable *CHAP* authentication or choose *None*.
- If you've enabled CHAP authentication, enter a username and a password. Confirm your chosen password be reentering it in the Password Confirm box.
- 8. Choose Thin-Provision or Instant Allocation
- 9. Enter a LUN Name.
- 10. Designate the percentage to be allocated from the **Allocation** drag bar.

- 11. 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.
- 12. Choose [4K] block size to have iSCSI target volume over 2TB barrier or [512 Bytes] block size in some application needed.
- 13. Click **OK** to create the iSCSI volume.

Modify iSCSI Volume

To modify iSCSI target on the current RAID volume, follow the steps below:

1. Under the **iSCSI Target List**, click *Modify*. The **Modify iSCSI Volume** screen appears.

| 🛈 Add 🔅 Modify 🍪 Ar | Ivanced 🥥 Delete | |
|----------------------|---------------------------|----------------|
| Name | Status | |
| test1 | Disabled | |
| LUN | | |
| 2011 | | |
| O Add @Modify @E | cpand Selete | |
| | opand Oclete Capacity(GB) | LUN Allocation |

2. Modify your settings. Press **ok** to change.

| ISCSI | 6 |
|------------------------|---|
| Modify iSCSI Volume | |
| iSCSI Target Volume: | O Enable O Disable |
| Target Name: | test1 Limit:(0~9, a~z) |
| iqn_Year: | 2011 👻 |
| iqn_Month: | 11 ¥ |
| Authentication: | None O CHAP |
| Username: | Limit:(0~9, a~z, A~Z) |
| Password: | Limit:(0~9, a~z, A~Z,length between 12~16) |
| Password Confirm: | |
| Mutual CHAP | |
| Username: | Limit:(0~9, a~z, A~Z) |
| Password: | Limit:(0~9, a~z, A~Z,length between 12~16) |
| Password Confirm: | |
| iqn: | iqn.2011-11.com.thecus.n12000:iscsi.test1.raid0 |
| Initiator Information: | |
| OK | |

Expand Volume

The iSCSI volume is now able to expand its capacity from unused space (Instant Allocation mode only). From the volume list, simply select the iSCSI volume you like to expand and click the **Expand** button:

| iSCSI Ta | rget | | | |
|----------|----------|-----------|--------------|--------------|
| iSCSI | | | | |
| 🕢 Add | 🍪 Modify | 🍪 Advance | d 🛛 🤤 Delete | |
| Name | | | | Status |
| 1234 | | | | Disabled |
| 5678 | | | | Disabled |
| | | | | |
| LUN | | | | |
| | 🍪 Modify | 🎲 Expand | 🔾 Delete | |
| Name | | | • | Capacity(GB) |
| 1234 | | | | 1 |
| | | | | |
| | | | | |
| | | | | |

You will then see the dialog box displayed below. Drag the **Expand Capacity** bar to the size you want. Then press **Expand** to confirm the operation.

| ISCSI | | | |
|------------------|--------|----|--|
| Expand iSCSI LUN | | | |
| Name: | 1234 | | |
| Unused: | 462 GB | | |
| Expand Capacity: | | GB | |
| Expand | | | |
| | | | |
| | | | |



Delete Volume

To delete volume on the current RAID volume, follow the steps below:

- 1. Under the **Volume Allocation List**, click **Delete**.
- The **Space Allocation** screen appears.

| iSCSI Target | |
|--|-----------------------------------|
| iSCSI | _ |
| 💿 Add 🎲 Modify 🎲 Advanced 🥥 Delete | |
| Name | Status |
| 1234 | Disabled |
| 5678 | Disabled |
| | |
| | |
| LUN | |
| 📀 Add 🍪 Modify 🍪 Expand 🤤 Delete | |
| Name | Capacity(GB) |
| 1234 | 1 |
| | |
| | |
| | |
| iSCSI | X |
| All data in the volume will be | e removed as well. Are you sure ? |
| Y | |
| ISCSI Yes | No |
| | |

2. Press **YES**. All data in the volume will be removed.

iSCSI Thin-Provisioning

If iSCSI Thin-Provisioning is selected when creating an iSCSI target volume, virtual memory is assigned to the target, allowing the physical memory to reach maximum capacity and adding new disks only when needed.

To setup iSCSI thin-provisioning, simply select "Thin-Provision" mode from the "Create LUN" setting screen.

| ISCSI | 10 | × | | | |
|---|---|---|--|--|--|
| Create LUN | | 1 | | | |
| RAID ID: LUN Allocation: | Thin-Provision O Instant Allocation | | | | |
| LUN Name: | Limit:(0~9, a~z) | | | | |
| Unused: | 16384 GB | | | | |
| Allocation: | 1 GB | | | | |
| LUN ID: | 1 * | | | | |
| iSCSI Block size: | 512 Bytes(For older version) 🗡 | | | | |
| - Description | | 1 | | | |
| The ISCSI block size can be set under system advance option, default is 512 Bytes. Please use [4K] block size while more than 2TB capacity will be configured in Windows XP. Please use [512 Bytes] block size for application like VMware etc. | | | | | |
| OK | | | | | |

Next, allocate capacity for the iSCSI thin-provision volume by dragging the **Allocation** bar to the desired size.
After the size has been determined, click **OK** to confirm. Now you will see the iSCSI thin-provisioning volume is available from the list. Please refer to the screenshot below.

| iSCSI Target | |
|--|--------------|
| iSCSI | |
| 🔘 Add 🍪 Modify 🍪 Advanced 🥥 Delete | 2 |
| Name | Status |
| 1234 | Disabled |
| 5678 | Disabled |
| | |
| LUN | |
| | |
| O Add I I Modify I I Expand I O Delete | |
| Name | Capacity(GB) |
| 1234 | 1 |
| | |
| | |
| | |

If creating an iSCSI target volume under "Instant Allocation", physical memory is assign to the target, being limited by the available memory. For the iSCSI target volume created under "thin-provisioning", virtual memory is assigned to the volume, which can go up to 16384GB (16TB).

Advance Option

There are 3 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.

| 🔾 Add 🎲 Modify 🎲 Adv | /anced Oelete | |
|--------------------------------|------------------------|----------------|
| Name | Status | |
| test1 | Disabled | |
| LUN | | |
| | | |
| | and Oelete | |
| O Add ⊘Modify ⊘Exp Name | Delete Capacity(GB) | LUN Allocation |

iSCSI CRC/Checksum

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

| 150 | .51 | | × |
|-----|-----------------------|----------------------------------|---|
| | Advance Options | | |
| | iSCSI CRC/Checksum: | 🔲 Data Digest 🔄 Header Digest | |
| | Max Connections: | 8 🛩 | |
| | Error Recovery Level: | 2 ~ | |
| | OK | | |

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).

High-Availability (N8900, N12000 series/N16000 series only)

HA keeps your data active on two separate systems, Thecus Supports Active/Passive HA — provides a fully redundant instance of each node, which is only brought online when its associated primary node fails.

HA setup procedure:

HA needs two **identical** Thecus systems (same models and same hard disk slot installed) which are capable for high availability features. One needs to be setup as "Primary" and the second unit as "Secondary", both units' needs to have the RAID volume build up prior installation.

WARNING

Please be notified that if the system has been used as a standalone station before and contained more than one RAID volume with data inside, once it is used for HA, all of data will be destroyed.

Let's see an example with two Thecus Units.

 1^{st} unit: Host name: PMA (172.16.66.25) with JBOD RAID volume. This unit will be setup as the Primary server.

| Home > System N | etwork > Networking | 🕜 Help 📿 | My favorite 🛛 🕁 Shutdo | wn 🎢 Logout |
|-----------------|----------------------------|-----------------|------------------------|-------------|
| Host Settings | | | | |
| Host Name: | PMA | Domain Name: | thecus.com | |
| WINS Server 1: | | WINS Server 2: | | |
| | | | | |
| DNS Settings | | | | |
| Mode: | Manual | | | |
| | O DHCP (Get From WAN/LAN1) | | | |
| DNS 1: | | | | |
| DNS 2: | | | | 1 |
| DNS 3: | | | | |
| | | | | |
| WAN/LAN1 LA | N2 LAN3 Additional LAN4 | | | |
| Status: | Normal | Speed: | 1000Mb/s | |
| MAC Address: | 00:14:FD:15:40:1B | Link Status: | Connected | |
| Jumbo Frame: | 1500 ¥ bytes | | | |
| IPv4 | | ІРуб | | |
| Enable: | | Enable: | | |
| Mode: | Manual | Mode: | Manual | |
| Mode. | O DHCP | Mode. | O DHCP | |
| IP: | 172.16.66.25 | IP: | fec0::1 | |
| Netmask: | 255.255.252.0 | Prefix Length: | 64 | |
| 1 | 1001200120210 | i i rene congen | | |

| Ho | me > | > Stora | ge > RA | AID Managem | ent | | 🕜 Help | 🗘• My favorite | 心・ Shutdown | 外 Logout |
|----|------|-------------|----------|-----------------|---------------|---------------|-------------------|------------------|--------------------|-----------------|
| | RA | ID Man | agemen | t | | | | | | |
| | 00 | reate | 🔅 Edit 🛛 | 🍪 Global Hot Sp | are 🛛 🕙 HA Re | covery | | | | |
| | | Mas RAID | ID | RAID Level | Status | Disks Used | Total Capacity | Data Capacity | | |
| | ۲ | * | RAID | J | Healthy | 1 | 463.2 GB | 5.6 GB / 434.3 | GB | |
| | | | | | | | | | | |

 2^{nd} unit: Host name: PMS (172.16.66.24) with JBOD RAID volume. This unit will be setup as the Secondary server.

| | twork > Netwo | orking | | 🕜 Help 🤇 | ን• My favorite ዕ• Shutdo | own 🞢 Logout |
|-------------------|---------------|---------------|-----------------|----------------|--------------------------|--------------|
| ost Settings | | | | | | |
| ost Name: | PMS | | | Domain Name: | thecus.com | |
| /INS Server 1: | \square | | | WINS Server 2: | | |
| | | | | | - | |
| NS Settings | | | | | | |
| ode: | Manual | | | | | |
| | 🔘 DHCP (Get F | from WAN/LA | N1) | | | |
| NS 1: | | | | | | |
| NS 2: | | | | | | 7 |
| NS 3: | | | | | | |
| | | | | | | |
| IAN/LAN1 LAN | 2 LAN3 Ad | ditional LAN4 | Additional LAN5 | | | |
| Status: | Normal | | | Speed: | 1000Mb/s | |
| MAC Address: | 00:14:FD:15 | i:CF:0D | | Link Status: | Connected | |
| Jumbo Frame: | 1500 ¥ by | | | | connected | |
| IPv4 | 1000 | | | IPv6 | | |
| Enable: | 1 | | | Enable: | | |
| Mode: | Manual | | | Mode: | Manual | |
| | DHCP | | | | C DHCP | |
| IP: | 172.16.66 | 5.24 | | IP: | fec0::1 | |
| Netmask: | 255.255.2 | 52.0 | | Prefix Length | 64 | |
| | | | | | | |
| | | | | | | |
| e > Storage > | RAID Manage | ment | | ⑦ Help | ♡• My favorite 🕐• Shut | down 🞢 Logou |
| RAID Managem | ient | | | | | |
| Create Create | t Gobal Hot | Spare: ALHA | Recovery | | | |
| Selection Concert | RAID | apare i Orio | Disks | Total | Data | |
| 1100 | | Status | Used | Capacity | Capacity | |
| Mas RAID ID | Level | | 1 | 1860.5 | 1.1 GB / 1859.9 GB | |
| Mas ID | | Healthy | 1 | 1000-0-0-0 | 111 00 / 100000 00 | |

Setting up the Primary unit for HA. Let's use the Primary unit from our

example PMA (172.16.66.25):

- i. Login in to web UI of system 172.16.66.25. Then go to "High Availability" HA configuration page under the Storage category.
- ii. Click on "Enable" radio button, then the setting page will appear.

| Status Setting | | |
|--------------------|----------|---------|
| High Availability: | 🔘 Enable | Oisable |
| Apply | | |

iii. Choose the server role of the system, for this example, we will have this unit as 'Primary Server". So "Primary Server" is checked.

| Į | Status Setting | | |
|---|--------------------|----------------------------|------------------|
| | High Availability: | Enable | 🔘 Disable |
| | Role: | Primary Server | Secondary Server |

iv. Choose the "Auto Failback" option, the default is disabled. For more details about auto failback, please refer to the description below.

| Auto Fail Back: | In legacy Heartbeat clusters, the auto failback option would determine whether a resource would automatically fail back to its "Active" node, or remain on whatever node is serving it until that node fails, or an administrator intervenes. The possible values for auto failback were: |
|-----------------|--|
| | on - enable automatic failbacks off - disable automatic failback |
| | When auto failback is off (default): After the original active server is damaged and then returned to a healthy state, the original standby server will remain active and the original active server will go into standby mode. The servers will exchange roles. |
| | When auto failback is on: After the original active server is damaged and then returned to a healthy state, the original standby server will go back into standby mode and the original active server will become active again. The servers return to their original roles. |
| | With or without auto failback, synchronization will begin immediately without a break in service when the damaged server returns. The roles described above are assumed immediately and do not need to wait for synchronization. The virtual IP will always be mapped to the current active server. |

v. Fill in the "Virtual Server" hostname information for further access need. For this example, we will use "HApm" for the virtual server hostname.

| Virtual host name: | HApm |
|--------------------|------|
| | |

vi. Fill in the "Secondary Server" hostname information. For this example, we will use "PMS" for the secondary server hostname. Please make sure the associated Secondary server with the "PMS" host name has been setup.

| Secondary host name: | PMS | |
|----------------------|-----|--|

vii. Fill in the "Virtual IP" information:

1. Please select the network interface from the drop down list of physical connective available. It can be either on board LAN ports or additional add-in NIC, even 10G.

| Virtual IP Heartbeat | |
|----------------------|-----------------|
| Interface: | WAN/LAN1 |
| Indicator IP: | WAN/LAN1 |
| | LAN2 |
| IPv4 | LAN3 |
| Virtual IP: | Additional LAN4 |

2. Input "Indicate" IP address. This "indicate IP" is used for the system to ping out then check whether the system is still alive. So please input an IP address that is going to response properly.

172.16.66.243

3. Filled in IP information for the "Virtual IP" and "Secondary Server IP" in either IPv4 or IPv6. For our example we chose the "WAN/LAN1" for the connection interface and virtual IP 172.16.66.87. The secondary server IP address is 172.16.66.24 has mentioned earlier.

| Virtual IP Heartbeat | | | |
|----------------------|---------------|---------------|--|
| Interface: | WAN/LAN1 ¥ | | |
| Indicator IP: | 172.16.66.135 | | |
| IPv4 | | IPv6 | |
| Virtual IP: | 172.16.66.87 | Virtual IP: | |
| Primary IP: | 172.16.66.25 | Primary IP: | |
| Secondary IP: | 172.16.66.24 | Secondary IP: | |
| | | | |
| Advance options Appl | у | | |

viii. Choose the network interface for heartbeat in between the systems. It can be selected from the drop down list, if there is additional LAN card that has been installed, such as 10G card, it can be used for the heartbeat role. After inserting the IP addresses for direct link needed in between the primary and secondary servers, default value will appear. Normally, no modifications will be required.

The example here we will use the "Additional LAN4" which is a 10G NIC to be used for the heartbeat link between the primary and secondary servers.

| Virtual IP Heartbeat | |
|----------------------|----------------------------------|
| Interface: | Additional LAN4 |
| IPv4 Primary IP: | LAN3 |
| IPv4 Secondary IP: | Additional LAN4 192.108.3.201 |

| Virtual IP Heartbeat | |
|----------------------|-----------------|
| Interface: | Additional LAN4 |
| IPv4 Primary IP: | 192.168.5.200 |
| IPv4 Secondary IP: | 192.168.5.201 |

1

ix. Advance options can be setup by pressing the associated button.

| Advanc | e options Apply | y | | |
|-------------------|-----------------|--------|-----------------------|---|
| Advance options | | | O Disa <mark>x</mark> | 1 |
| Keepalive Time: | 2 | | | |
| Deadtime: | 30 | | | |
| Warntime: | 10 | | | |
| Initial Deadtime: | 120 | | | |
| UDP Port: | 3694 | | | |
| Taba da an | | | | |
| | | | OK | |
| IPV4 Phinary IP: | 192.100 | 101200 | | |

| Heart Beats Configuration | | |
|---------------------------|--|--|
| Item | Description | |
| Keep alive time | The keep alive directive sets the interval between heartbeat | |
| | packets. It is specified according to the Heartbeat time syntax. | |
| Dead time | The dead ping directive is used to specify how quickly Heartbeat should decide that a ping node in a cluster is dead. Setting this value too low will cause the system to falsely declare the ping node dead. Setting it too high will delay detection of communication failure. This feature has been replaced by the more flexible ping resource agent in Pacemaker, and should no longer be used. | |
| Warning time | The warn time directive is used to specify how quickly Heartbeat should issue a "late heartbeat" warning. | |
| Initial dead time | The initial dead parameter is used to set the time that it takes to declare a cluster node dead when Heartbeat is first started. This parameter generally needs to be set to a higher value, because experience suggests that it sometimes takes operating systems many seconds for their communication systems before they operate correctly. | |
| UDP port | The udp port directive specifies which port Heartbeat will use for its UDP intra-cluster communication. The default value for this parameter is UDP 694 port. | |

x. Click "Apply", the Primary server will prompt the message below and wait for the "Standby" server settings to be completed.

| (i) ⁽⁵⁾ | ystem is standing by, please activate High Availability on the secondary server. |
|---------------------------|--|
| Vi | Artual IP Heartbeat Cancel |

Setting up the Secondary unit for HA. The secondary unit for our example is PMS (172.16.66.24):

- xi. Login in to the web UI of the system 172.16.66.24 then go to "High Availability" HA configuration page under the Storage category.
- xii. Click on the "Enable" radio button, the setting page will appear.

| Status Setting | | |
|--------------------|----------|-----------------------------|
| High Availability: | 🔘 Enable | Disable |
| Apply | | |

xiii. Choose the server role of the system, for this example, we will have this unit set as the "Secondary Server". So "Secondary Server" is checked. After, please fill in the associated "Primary Server" IP address.

| Status Setting | | |
|--------------------|----------------|------------------|
| High Availability: | Enable | 🔘 Disable |
| Role: | Primary Server | Secondary Server |
| Primary Server IP: | 172.16.66.25 | |
| Detect | | |

xiv. Click "Detect" and the Secondary unit will start to check for the Primary server status. If the Primary server has replied properly, then the message will appear as below.

| 2 | Waiting for the active server to reboot |
|---|---|
| | Cancel |

Please check the Primary Server unit. You will see an interactive message saying to reboot both "Primary" and 'Secondary" server together to complete the High Availability settings.

The last state of the Primary server is: waiting for the Secondary server as shown in the screen shot below:



After the Secondary server has communicated with Primary Server successfully, then the state will changed to:

| Shutdown/Reboot System | | | |
|------------------------|---|--|--|
| Ŷ | Are you sure to reboot the system? | | |
| | Synchoronously action standby server with active server | | |
| | Yes No | | |

Click "Yes" to reboot both Primary and Secondary server.

If the communication has failed then you will see an error message as below.

| Warning | S |
|---------|--|
| 8 | Failed to retrieve the primary server`s settings files |
| | <u>OK</u> |

Conditions in which the secondary server will take over to play the role as

Active:

- 1. Primary server RAID is damaged
- 2. Loss of the primary server's data port connection
- 3. Primary server goes down for any other reason

When the primary server encounters the above-mentioned situations, the secondary server (PMS) will immediately take over to play the role as active. The secondary server's system log will show "HA changed to active, getting resources", and "Healthy: The RAID [HA] on system [PMS] is healthy now."

| Ho | me > System Informa | ation > System Log | ⑦ Help | ♡• My favorite | Ů• Shutdown | ⁄扫 Logout | |
|----|------------------------|---|------------|----------------|-------------|-----------|---|
| | System Log | | | | | | |
| | 🔾 All 🤃 Info 🔥 Wa | arnings 🚫 Error | | | | | |
| | Download All Log Files | OTruncate All Log Files Number of lines per p | age 13 | | | | |
| | rime * | Detais | | | | Help | |
| | 2012/06/05 17:23:30 | [PMS] : HA change to active, get resoures. | | | | | |
| | 2012/06/05 17:23:04 | [PMS] : Healthy: The RAID [HA0] on system | n [PMS] is | healthy now. | | | |
| | 2012/06/05 17:14:39 | [PMS] : User admin logged in from 172.16.6 | 54.149 | | | E | 1 |

At this time, the virtual IP address will be mapped to the PMS system because it is in an active state.

HA Ready:

After both Primary and Secondary systems has rebooted, the HA link status and the HA RAID volume can be seen from the HA status page.

Please note, it will take $1 \sim 2$ minutes to complete the primary and secondary servers' role played. If both servers are displayed as standby, please wait for the systems to synchronize with each other.

| Status Setting | Current role: Standby |
|---|---------------------------------|
| Current role: Active | HA Network Status: |
| HA Network Status: | Primary Server Secondary Server |
| Primary Server Secondary Server Heartbeat Interface: WAN/LAN1 IP: 172.16.66.25 | Heartbeat |

From the HA Primary server "PMA (172.16.66.25)" it will denote the role of "Active" and for the "PMS (172.16.66.24)", it will show the role as Standby.

The HA RAID volume status can be found as shown in the screen shot below.

| current role: | Active | | | | | | | |
|------------------------|---------|--------------------------------------|--------------|---------------|----------|------------|--------|--|
| A Network | Status: | | | | | | | |
| Primary Se | rver | | Seco | ondary Server | | | | |
| - | 2 | | | | | | | |
| 1000 | | | | | | | | |
| | | Heartbeat | | | | | | |
| | | | | | | | | |
| HA RAID Sta | TP- | Heartbeat face: WAN/LA 172.16. | | | | | | |
| HA RAID Sta | IP: | face: WAN/LA 172.16. | AN1 66.25 | Time Rem. | Transfer | Used/Total | Status | |
| HA RAID Sta RAID ID | Type * | face: WAN/LA | | Time Rem | Transfer | Used/Total | Status | |

The user can access this newly create HA system by its virtual IP. Using widows, the user can simply input 172.16.64.87 or HApm in the navigation bar then the available share files will be listed as below:

🚼 \\172.16.64.87

| - | Name 🔺 | Comments |
|---|------------------------------|----------------------------------|
| ork Tasks 🙁 | C_Module_Folder_ | _Module_Folder_ |
| dd a network place | NAS_Module_SourceNAS_Picture | |
| ew network connections | esatahdd | Used for eSATA HDDs only. |
| et up a home or small ifice network | ViTunes_music | |
| et up a wireless network or a home or small office | g snapshot | Used for snapshots only. |
| ew workgroup computers | USBCopy | Used for external USB HDDs only. |
| ide icons for networked PnP devices | Printers and Faxes | Shows installed printers and fax |

HA Recovery:

If one of the HA member is down and need to be recovered, simply go to the RAID management page and the "HA Recovery" icon will be available. Click on the "HA Recovery" icon, then the system will prompt a box to inquire about the Active server heartbeat link IP address. After inputting the IP address and pressing Apply, the unit will be recovered fully.

| ome > | Stora | ge > R | AID Manag | ement | | ⑦ Help | ♥• My favorite | 纪 Logout | |
|-------|---------------------------|--------|---------------|-----------------|---------------|-------------------|------------------|----------|--|
| RAJ | ID Man | agemei | nt | | | | | | |
| 00 | reate | öEdit | Global Ho | ot Spare 🛛 🕙 HA | Recovery | | | | |
| | Mas RAID | ID | RAID Level | Status | Disks Used | Total Capacity | Data Capacity | | |
| 0 | * | RAID | 3 | Healthy | 1 | 1860.5 | Used for HA | | |

| HA Recovery | | | × |
|------------------|-----|----------------------|---|
| Heartbeat IP Add | res | s of Active Server.: | |
| Additional LAN4 | ~ | : 192.168.5.200 | |
| | | Apply | _ |

Another circumstance where HA recovery might be needed is when the HA button has been enable but the system detected a previously existing HA configuration. Then the screen will prompt the message box as shown below:

| High Ava | ailability 172.16.66.25 |
|----------|----------------------------------|
| ? | Do you want to recovery HA RAID? |
| | Yes, recovery No, continue |

If the other HA member is running smoothly, please choose "Recovery HA" to complete HA recovery. Or select "No, continue" to let both HA members has they are.

| WARNING | If there are transfers in progress when the Primary server encounters problems and the Secondary server becomes active, the session will be stopped. Please contact your network administrator to determine whether or not your transfers were completed. |
|---------|---|
| WARNING | When the original primary server rejoins the HA environment, it will be updated with the newer data from the secondary server to synchronize for HA. Please be aware that the data on the original primary server will be replaced by the data from the secondary server. |

User and Group Authentication

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

ADS/NT Support

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

| ٩ | ~~ | Home > User and Group Authentication > ADS Support |
|---|--------|--|
| System Information System Management System Network Storage User and Group Authentication Local User Configuration Local Group Configuration Batch Input User Quota A description of each item f | • | ADS Support Work Group/Domain Name : Workgroup ADS Support : Image: Constraint of the second sec |
| A description of each item i ADS/NT Support | 011010 | J. |

| Item | Description |
|---------------------|---|
| Work Group / Domain | Specifies the SMB/CIFS Work Group / ADS Domain Name (e.g. |
| Name | 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 | Enter the ADS Administrator password. |
| 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 | domain | | | |
| Name | | | | |
| 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. |
|------|--|
|------|--|

Local User Configuration

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

| ٩ | ~ | H | ome > Us | er and G | roup | Authent | ication > | • Local U | lser Confi | i gurati@ He | þς | ∕∙ My favorite | (). Shutdown | s n de terre de la constante |
|------------------------------|---|---|----------|----------|--------|---------|-----------|-----------|------------|---------------------|----|-----------------------|-------------------|--|
| I System Information | + | | Local U | ser Conf | igurat | tion | | | | | | | | |
| 💥 System Management | • | | 🔇 Add | ()Edit | QRe | move | | | | | | | | |
| System Network | | | User ID | | | User Na | ne | | | | | | | |
| 📃 Storage | + | | 1000 | | | andy | | | | | | | | |
| Ser and Group Authentication | - | | | | | | | | | | | | | |
| ADS Support | | | | | | | | | | | | | | |
| User Quota | | | | | | | | | | | | | | |
| Network Service | + | | 14 4 | Page 1 | of 1 | | æ | | | | | | Displaying topics | 1 - 1 of 1 |
| Application Server | ٠ | | | | | | | | | | | | | |

| Local User Configuration | | | | |
|--------------------------|---|--|--|--|
| Item | Description | | | |
| Add | Press the Add button to add a user to the list of local users. | | | |
| Edit | Press the <i>Edit</i> button to modify a local user. | | | |
| Remove | Press the <i>Remove</i> button to delete a selected user from the | | | |
| | system. | | | |

Add Users

- 1. Click on the *Add* button on **Local User Configuration** screen, and **Local User Setting** screen appears.
- 2. On the Local User Setting screen, enter a name in the User Name box.
- 3. Enter a **User ID** number or leave blank to use the system default value.
- 4. Enter a password in the **Password** box and re-enter the password in the **Confirm** box.
- 5. Select which group the user will belong to. **Group Members** is a list of groups this user belongs to. **Group List** is a list of groups this user does not belong to. Use the << or >> buttons to have this user join or leave a group.
- 6. Press the *Apply* button and the user is created.

| Contraction of the second seco | *, Creator in Sto Add | | | Cuage: English |
|--|---|--------------------------------|--|----------------------|
| Menu System Information System Management System Network Storage User and Group Aut ADS Local User Group Batch Input. | Local User S User Name: User ID: Password: Confirm Password: Group Memil Group ID 102 | 1002 | Group List Search: Group ID Group Name 140 t5 | |
| Module management | Apply | users are automatically assign | ned to the 'users' group. | to topics to display |

Edit Users

- 1. Select an existing user from the **Local User Configuration** screen.
- 2. Click on the *Edit* button, and the Local User Setting screen appears.
- 3. From here, you can enter a new password and re-enter to confirm, or use the << or >> buttons to have this user join or leave a group. Click the *Apply* button to save your changes.

| Local User Settin | ng | Group List | | |
|-------------------|------------|------------|------------|--|
| Jser Name: | User | Search: | | |
| Jser ID: | 1002 | GroupID | Group Name | |
| assword: | ••••• | | | |
| Confirm Password: | ••••• | | | |
| Group Members | | | | |
| GroupID | Group Name | | | |
| 102 | Users | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Remove Users

- 1. Select an existing user from the **Local User Configuration** screen.
- 2. Click on *Remove* button and the user is deleted from the system.

| Hom | e > User and Group | Authentication > Local User Configurati | n Help 📿∙ My favo | rite 也・ Shutdown | 3 ²⁴ Logout |
|-----------|---------------------|---|-------------------|-------------------------|------------------------|
| - L | ocal User Configura | tion | | | |
| | Add 🎲 Edit 🔤 R | emove | | | |
| U | ser ID | User Name | | | |
| 1 | 000 | andy | | | |
| Local Use | er Setting | | × | | |
| ? | (| No No | | | |
| | | | | | |
| - it | Page 1 of 1 | ▶ N 2 | | Displaying topics 1 | - 2 of 2 |

Local Group Configuration

From the **Accounts** menu, choose the *Group* item, and the **Local Group Configuration** screen appears. This screen allows you to **Add**, **Edit**, and **Remove** local groups.

| H | ome > User and Group | Authentication > Local Group Configura®rHelp | ♡• My favorite | U- Shutdown | 纾 Logout |
|---|-----------------------|--|----------------|---------------------|----------|
| | Local Group Configu | ration | | | |
| | 🔾 Add 🛛 🍪 Edit 🛛 😂 Re | move | | | |
| | Group ID | Group Name | | | |
| | 100 | users | | | |
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| | | | | | |
| | | | | | |
| | 4 4 Page 1 of 1 | P PI 2 | | Displaying topics 1 | -1 of 1 |
| | | | | | |

| Local Group (| Configuration |
|---------------|--|
| Item | Description |
| Add | Press the Add button to add a user to the list of local groups. |
| Edit | Press the <i>Edit</i> button to modify a selected group from the system. |
| Remove | Press the Remove button to delete a selected group from the |
| | system. |

Add Groups

- 1. On the **Local Group Configuration** screen, click on the **Add** button.
- 2. The Local Group Setting screen appears.
- 3. Enter a **Group Name**.
- 4. Enter a **Group ID** number. If left blank, the system will automatically assign one.

- 5. Select users to be in this group from the **Users List** by adding them to the **Members List** using the **<<** button.
- 6. Click the *Apply* button to save your changes.

| Local Group | Setting | Users Lis | t | |
|-------------|-------------|-----------|-----------|--|
| Group Name: | | Search: | | |
| Group ID: | 103 | UserID | User Name | |
| Members Lis | t | 1002 | User | |
| UserID | User Name | | | |
| | Cost France | | | |
| | | | | |
| | | | | |
| | | | | |
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| | | | | |

Edit Groups

- 1. On the **Local Group Configuration** screen, select a group name from the list.
- 2. Press the *Edit* button to modify the members in a group.
- 3. To add a user into a group, select the user from the **Users List**, and press the **<<** button to move the user into the **Members List**.
- 4. To remove a user from a group, select the user from **Members List**, and press the **>>** button.
- 5. Click the *Apply* button to save your changes.

| Local Group | Setting | Users List | | |
|--------------|-----------|------------|-----------|--|
| Group Name: | Group | Search: | | |
| Group ID: | 103 | UserID | User Name | |
| Members List | | 1002 | User | |
| UserID | User Name | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Remove Groups

- 1. On the **Local Group Configuration** screen, select a group name from the list.
- 2. Press *Remove* to delete the group from the system.

| | Home > User and G | roup Authentication > Local Group Configura®nHelp | ♡• My favorite | (). Shutdown | r Logou |
|---|-------------------|---|----------------|--------------|---------|
| | Local Group Cor | figuration | | | |
| | 🔘 Add 🛛 🍥 Edit | © Remove | | | |
| | Group ID | Group Name | | | |
| | 101 | pm | | | |
| U | Do you want de | elete this group? | | | |
| | | | | | |

Batch Users and Groups Creation

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 comma-separated plain text (*.txt) file.

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

1. Click the **Browse** icon to locate your comma-separated text file. The information in the text file should follow this format:

[USERNAME], [PASSWORD], [GROUP]

- 2. Click **Open**.
- 3. Click *Import* to begin the user list import.

| | Home > User and Group Authentication > Batch Input | ⑦ Help ♡• My favorite | Ů• Shutdown 🞢 Logout |
|-----------------------------------|---|-----------------------|----------------------|
| 📜 System Information 🔹 | Batch User and Group Creation | | |
| 🗙 System Management 🔹 | Please choose a file to upload. | Import | |
| System Network | | * | |
| 📰 Storage 🔹 | | | |
| 🗳 User and Group Authentication 📃 | | | |
| ADS Support | | | |
| 💑 Local Group Configuration | | | |
| Batch Input | | | |
| | | | |
| | | | |
| | Apply | T | |
| | Apply | | |
| | Description | | |
| | Submit files containing user names, passwords, | | |
| | and group names separated by commas without any spaces, each line represents one user. | | |
| Network Service | (ex. Student1,password1,student_group) | | |

User Quota

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.

| User Quota Quota Support | | | |
|-----------------------------|----------|---------|-------|
| User Quota: | 🔘 Enable | Oisable | Apply |

Next, each user can be setup a global storage quota size for each RAID volume. Simply click on "Quota Size" for each user and input the desired capacity. After the setup is complete, please click on "Apply" to activate the user quota size.

| Local Users | | | | |
|-------------|------------------------|---------|---------|--|
| Local Users | A Samet | | | |
| Name | Bearch Quota Size (MB) | RAID | RAID1 | |
| 6666 | 1000 | Disable | Disable | |
| bbbb | 3000 | Disable | Disable | |
| | | | | |
| | | | | |
| Apply | | | | |

User and Group Backup

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.

| — User and group | e settings download/upload |
|------------------|--------------------------------|
| Upload: | Please choose a file to upload |
| Upload | Download |
| | |

LDAP Support

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.

| ٩ | 3 2 | Home > User and Group Authentication > LDAP Support 🕜 Help 📿 My favorite 🕛 Shutdown 🞢 Logout |
|---|------------|---|
| 📜 System Information | .+) | LDAP Support |
| 💥 System Management | .+) | LDAP Support : O Enable O Disable |
| System Network | .+1 | LDAP Server IP : |
| E Storage | 30 | Base Domain : (ex:dc=example,dc=com) |
| Ser and Group Authentication | - | Manager : |
| ADS Support Local User Configuration Batch Input User Quota User Quota User Group Backup LDAP Support | | Password : Chack objectClass Apply Description 1. Your LDAP server must have both Samba SAM account and POSIX account objectClass. 2. LDAP server must contain at least 20,000 user and group ids. 3. Starting or stopping LDAP service requires Samba service to restart. 4. check objectClass must be turn on LDAP clent. |
| - Network Service | | 5. If the LDAP server contains less that 20,000 user and group ids, it will be based on local. |
| Application Server | | |
| 🕂 Backup | | |
| External Devices | | |

A description of each item follows:

| 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. | |

Network Service

Use the **Network** Service menu to make network service support settings.

Samba / CIFS

There are options allow Admin to Enable/Disable to operate Thecus IP storage associated with Samba / CIFS protocol. With the option changed, it will need to reboot system to activate.

| -Samba/CIFS | | | | |
|---------------------------------------|---------------|--------|---------|------------------|
| Sambay err S | | | | |
| Samba Service: | Enable | | 🔘 Disał | ole |
| File Access Cache: | Enable | | 🔘 Disał | ole |
| Samba Anonymous Login Authentication: | 🔘 Enable | | 💿 Disał | ole |
| Samba Native Mode: | Yes (Native N | Mode) | 🔘 No (| Compatible Mode) |
| Allow Trusted Domains: | 🔘 Yes | | 🖲 No | |
| Server Signing: | 🔘 Auto | 🔘 Man | datory | Oisable |
| Support Policy for LDAP: | 🔘 Sign | 🔘 Seal | | 🖲 Plain |
| | | | | |

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.



File Access Cache

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

Samba Anonymous Login Authentication

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.

Samba is 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.

Optimize 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".

| -Samba/CIFS Options for Mac OS X- | | |
|-----------------------------------|----------|---------|
| UNIX Extensions: | 🔘 Enable | Oisable |

UNIX Extension

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

| Samba/CIFS Options for Recycle Bin | | | |
|---|----------|-------------------------------------|--|
| Samba Recycle Bin: | 🔘 Enable | Oisable | |
| Recycle bin contents are deleted after: | 0 days | (Set as 0 for manual deletion only) | |
| Recycle Bin Folder Display: | 🔘 Enable | O Disable | |
| Recycle Bin Max File Size: | 0 GB | (Set as 0 for unrestricted) | |

Samba Recycle Bin

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.

| ł | Samba/CIFS Options for Recycle Bin | | |
|---|--|--------|--|
| l | Sumbuy circ options for Recycle bin | | |
| | Samba Recycle Bin: | Enable | O Disable |
| l | | | |
| | Recycle bin contents are deleted after: | 0 day | vs (Set as 0 for manual deletion only) |
| l | | | |
| | Recycle Bin Folder Display: | Enable | O Disable |
| l | | | |
| | Recycle Bin Max File Size: | 0 GB | (Set as 0 for unrestricted) |
| | | | |
| | | | |
| | | | |

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".

| ~ | | 13- | | | |
|--|-------------|--------|---------------|-------------|---------|
| | Mas RAID | ID | RAID Level | File System | Status |
| ۲ | | RAIDpm | J | EXT4 | Healthy |
| \bigcirc | * | RAID | J | XFS | Healthy |
| _INAS_INIOQUIE_SOURCE_ NAS_Recycle_RAID NAS_Recycle_RAIDpm | | |] | | |

🗎 andv

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 (Apple Network Setup)

From the **System Network** 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.

| ٩ | « « | Home > Network Service > AFP |
|------------------------------|------------|------------------------------|
| J System Information | | AFP Support |
| 💥 System Management | .+] | AFP Service: |
| System Network | | MAC CHARSET: UTF-8 |
| Storage | | ZONE: * |
| Ser and Group Authentication | ٠ | Time Machine: |
| Network Service | - | Time Machine |
| Samba/CIFS | | backup folder: AS_Picture_ |
| | | Apply iTunes_music |
| NFS | | USBCopy |
| FTP | | USBHDD |
| Web Disk (HTTP) | | eSATAHDD |
| - TUPnP | | NAS_Public |
| Bonjour | | _NAS_Module_Sour |
| • | | _Module_Folder_ |
| Application Server | | pm1 |
| | +1 | pm2 |
| 📑 Backup | | iSCSI_test1 + |
| External Devices | | < > |

A description of each item follows:

| Apple Netwo | rk 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 | Select from the drop down list to designate the folder for time |
| folder | machine backup destination. |

NFS Setup

From the **System Network** 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.

| ٩ | 8 | Home > Network Service > NFS | ⑦ Help ♡• My favorite 🕛• Shuto |
|------------------------------|-----|--|--------------------------------|
| System Information | | NFS Support | |
| 💥 System Management | .41 | NFS: O Enable O Disable | |
| System Network | | | |
| Storage | 12 | Apply | |
| Ser and Group Authentication | | Description | |
| Network Service | - | The _NAS_NFS_Exports_ is a system folder which cannot be Please refer to the following examples of how to mount a n | e accessed. etwork device |
| Samba/CIFS | | NFS3: mount -t nfs 192.168.2.254:/raid0/data/_NAS_NFS_ NFS4: mount -t nfs4 192.168.2.254:/SAMPLE /mnt/sampl | Exports_/SAMPLE /mnt/sample |

A description of each item follows:

| NFS Server Server | etting |
|-------------------|--|
| Item | Description |
| NFS | Enable or Disable NFS support. |
| 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 **System Network** menu, choose the **FTP** item, and the **FTP** screen appears. You can change any of these items and press **Apply** to confirm your settings.

| × | Home > Network Service > FTP | | ⊘ Help 🗘• My favorite 🖒• Shutdown |
|-----------------------------------|-----------------------------------|-------------|-----------------------------------|
| 📃 System Information 👘 | FTP Support | | |
| 🗙 System Management 🔹 | FTP Service: | Enable | O Disable |
| System Network 🕚 | Secure FTP (Explicit): | Enable | Disable |
| Storage 🔹 | Port: | 21 | |
| 🗳 User and Group Authentication 🔹 | External IP: | | (for FTP on NAT environment) |
| Network Service | Passive Port Range (30000~32000): | 30000 | ~ 32000 |
| Samba/CIFS | FTP Character Set: | UTF-8 ¥ | |
| NFS | Allow Anonymous FTP Access: | No Access 👻 | |
| FTP | Auto Rename: | | |
| Web Disk (HTTP) | Upload Bandwidth: | | Unlimited |
| 🖓 UPnP 😳 Bonjour | Download Bandwidth: | | Unlimited |
| Application Server | Apply | | |

A description of each item follows:

| FTP | |
|------|---|
| Item | Description |
| FTP | Enables FTP Service on the Thecus IP storage. |

| Security FTP | Enable or disable Security FTP, be sure the client FTP software |
|---------------------|--|
| | has also security FTP setting enabled. |
| Port | Specifies the port number of an incoming connection on a |
| | non-standard port. |
| External 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 | Limited port range for the FTP server to use. |
| (30000-32000) | |
| 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. |
| 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. |
| 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. |
| | |

To access the share folder on the Thecus IP storage, use the appropriate user login and password set up on the **Users** page. Access control to each share folder is set up on the **ACL** page (*Storage Management* > **Share Folder** > *ACL*).

TFTP

TFTP

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

| J System Information | | TFTP | | |
|------------------------------|-----|---|----------------|------------------|
| 💥 System Management | | TFTP: | Ӧ Enable | Oisable |
| System Network | .*) | IP: | WAN/LAN | 1 (172.16.66.24) |
| Storage | * | | 🕅 LAN2 (192 | .168.2.254) |
| Ser and Group Authentication | | Port: | 69 | |
| Vetwork Service | - | Share Folder: | Y | |
| Samba/CIFS | | The folder [] is not Folder Permissions: | found among th | he list. |
| I FTP | | | 🛄 Write | 🕅 Overwrite |
| TETP | | Apply | | |
| Web Disk (HTTP) | | | | |

| 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 |

WebService

From the **Network Service** menu, choose the **WebService** item, and the **WebService Support** 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.

| WebService (HTTP) Support Sharing: | | |
|---|------|--|
| Port: 80 Secure WebService (Secure HTTP) Support Sharing: | | |
| Sharing: Enable Disable | | |
| Sharing: Enable Disable | | |
| | | |
| Port: 443 | | |
| | | |
| Certificate Type: 🔘 User 🔘 System | | |
| CertificateFile: | | |
| Certificate Key File: | | |
| CA Certificate File: | | |
| | | |

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) | Enable or disable secure WebDisk support. Enter the port if |
| Support | 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 | Click to set back to default certification details. |
| Files | |
| Apply | Click "Apply" to confirm the changes. |

| NOTE | • Disable HTTP support and Enable Secure HTTP support to guarantee |
|------|--|
| NOIL | secure access. |

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.

| ٩ | ~~ | Home > Network Service > UPnP | 0 |
|--|----|---------------------------------------|---|
| 📁 System Information | ۲ | UPnP Support | |
| 💥 System Management | ٠ | UPnP Service: 💿 Enable 💿 Disable | |
| System Network | | Description: N12000 IP Storage Server | * |
| Storage | | | |
| 🗳 User and Group Authentication | ٠ | | T |
| Network Service | | Apply | |
| Samba/CIFS AFP NFS FTP TFTP Web Disk (HTTP) | | | |

Bonjour Setting

Bonjour, is Apple Inc.'s trade name for its implementation of Zeroconf, a service discovery protocol. Bonjour locates devices such as printers, as well as other computers, and the services that those devices offer on a local network using multicast Domain Name System service records. This definitive guide walks you through Bonjour zero-configuration networking with a complete description of the protocols and technologies used to create Bonjour enabled applications and devices.

| ٩ | 33 | Home > Network Service > Bonjour |
|---|----|-------------------------------------|
| 🟓 System Information | ٠ | Bonjour Support |
| 💥 System Management | | Bonjour Service: 🔘 Enable 📀 Disable |
| System Network | ۲ | Apply |
| Storage | ٤ | |
| Subser and Group Authentication | ٠ | |
| Network Service | - | |
| Samba/CIFS AFP BNFS FTP FTP Web Disk (HTTP) Bonjour | | |

SSH

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.

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. |

| <u>ه</u> | Home > Network Service > SSH | @ Help 💭•My favorite 😃• Shutdown 🞢 Logout |
|---|---|--|
| 🕕 System Information 👘 | SSH Support | |
| 🗙 System Management 💷 | SSH Service: enable Oisable | |
| System Network | Port: 22 | |
| 📕 Storage 🕚 | SFTP: O Enable O Disable | |
| See and Group Authentication | | |
| Network Service | Apply | |
| NIS FTP TFTP WebService UpnP Service Bonjour SSH DDNS | Description SSH account is 'root', and password is admin password. Port number must be > 1024 and < 65536, or Port=22 When enter NAS SSH service, does not delete or modified | y any fle/folder, it maybe cause NAS to generate error |

DDNS

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.

| 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. |

A description for each item as following:

| ٩ | ~ | Home > Network Service > DDNS |
|-------------------------------|----|------------------------------------|
| System Information | ±. | DDNS Support |
| 🗙 System Management | | DDNS: 💿 Enable 📀 Disable |
| 🚽 System Network | | Register: DynDNS.org (Dynamic DNS) |
| Storage | ۰ | User Name: family |
| Ser and Group Authentication | | Password: |
| Network Service | - | Domain Name: www.thecus_share.con |
| FTP TFTP WebService | | Apply |
| PIP Service Bonjour SSH | ш | |
| DDNS | | |
| CUPnP Prot Managment | - | |

UPnP Port Management

One of the most convent way 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.

| PnP Configuration | |
|--------------------------------|----------------------------------|
| UPnP Service | Enable Disable |
| Clear port forwards at startup | 🔘 Enable 🔘 Disable |
| Sa | ve Apply Settings Cancel Changes |

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.

| ٩ | << | Home > Network Servic | e > UPnP Prot Managment | ⑦ Help 🖓 My favorite 🕻 | 🕽 Shutdown 🛛 🕂 Logou |
|------------------------------------|----|-----------------------|--------------------------------|------------------------|----------------------|
| 🟓 System Information | + | Information | | | |
| 🗙 System Management | + | Friendly Name: | UPnP router | | |
| System Network | Ŧ | Manufacturer URL: | http://tomatousb.org/ | | |
| Storage | + | Model number: | 1 | | |
| Ser and Group Authentication | + | Model URL: | http://tomatousb.org/ | | |
| Network Service | - | Model description: | UPnP router | | |
| Samba/CIFS | | UDN: | uuid:8daf93d2-e626-42eb-ab56-7 | 7d96463be8c6 | |
| - 🐌 NFS - 🎜 FTP | | Connection rules | | | |
| - 🦉 ТЕТР | | 👞 Refresh 🧿 Add Rule | Modification rules | | Deletion rules |
| - 🌈 WebService - 🝸 UPnP Service | | Port 🔺 | Protocol | Description | |
| - 😨 Bonjour | | ☐ None Local Setting | | | |
| SSH | | 11707 | UDP | | |
| UPnP Prot Managment | | 11707 | TCP | | |
| - | | 26423 | UDP | | |
| | | 26423 | TCP | | |
| | | 45631 | ТСР | | |
| | | 6208 | UDP | | |
| | | 6208 | TCP | | |

And click "Add Rule" to add more port mapping from Internet to access desired services or press "Refresh" to get most updated list.

| Connection rules | ; |
|------------------|---------|
| Start port: | 80 |
| End port: | 80 |
| Protocol: | TCP ~ |
| Description: | ТСР |
| | UDP |
| Apply | TCP/UDP |
| | |

A description for each item as following:

| 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 | |



Application Server

The Thecus IP storage supports build-in application such as iTunes server. The Thecus IP storage provides activation of the iTunes Server on the device. You will be able to play music files on this device with your iTunes client software directly. The following section shows you how.

iTunes® Server

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

From the **Network** menu, choose the *iTunes* item, and the *iTunes*

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.

| × * * * * | Home > Application Server > | > iTunes Server | |
|--------------------------------|-----------------------------|-----------------|---------|
| 🕕 System Information 🔹 | Tunes Configuration | | |
| 🗙 System Management 🔹 | iTunes Service: | 🔘 Enable | Oisable |
| System Network 💌 | iTunes Server Name: | N8900 | |
| Storage 💌 | Password: | | |
| Ser and Group Authentication 💿 | Rescan Interval: | 30 minutes 💌 | |
| Network Service | MP3 Tag Character Set: | ISO 🕶 | |
| Application Server = | Apply | | |
| J iTunes Server | | | |
| | | | |

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. | | |
| MP3 Tag Encode | Specify tag encoding for MP3 files stored in Thecus IP storage. All | | |
| | ID3 tags will be sent out in UTF-8 format. | | |

Once the iTunes service is enabled, Thecus IP storage will make all music located in the **Music** folder available for iTunes-equipped computers on the network.

Module Installation

From the login page, other than admin, web disk and Piczza (Photo server) the module icon is a newly added feature for this FW release. After a module has been installed, a new option will be available to "Show in Login".

| Module File: | | | | | | Install |
|----------------|---------------------|---------|-------------|-------------|--------|---------------|
| Module Manager | nent | | | | | |
| Ena Type Nar | me | Version | Description | Last Status | Action | Show in Login |
| Yes System Us | b eSATA Schedule Ba | 2.00.02 | USB_eSATA | ۵ | × | |
| | | | | | | |

If this option is enabled then, when login to the system, the module icon will be available for all valid users to login through.



Auto Module Installation

Choose the **Auto Module Installation** item and the **available system Module** screen appears. The default for this module list is located online. So if the Thecus IP storage is capable to connect to Internet, then it will automatically link to the Thecus official website and list the available modules. Please refer the screen shot below.

| ٩ | 33 | Ho | me > Applicati | ion Server > Auto | Module I | nstallation (? | Help 🗘 | • My favorite (| b• Shutdown | r Logo |
|---------------------------------|-----|----|-----------------|-------------------|----------|------------------------|----------|-----------------|-------------|--------|
| 🟓 System Information | ٤ | Μ | Iodule Package: | | | | | Upload | Rescan | |
| 💥 System Management | ٠ | | - Module Sou | irce List | | | | | | |
| System Network | .+) | | Installed | Name | Version | Description | Location | Document | Action | |
| Storage | | | Not Installed | NZBGet | v2.00.02 | NZBGet download | Online | | | |
| Subser and Group Authentication | + | | Not Installed | Mailserver | 2.00.02 | Mail server | Online | | □ | |
| | | | Not Installed | IP_Cam | 2.0.1 | Simple surveillance | Online | 8 | | |
| Network Service | | | Not Installed | Usb_eSATA_Bac | 1.0.2 | Schedule backup utilt. | Online | 8 | | |
| Application Server | - | | Not Installed | Raid_Replication | 2.0.2 | Duplication for create | . Online | | | |
| - 🕖 iTunes Server | | | Not Installed | Twonkymedia | 1.00.0 | Media server in DLNA | Online | | | |
| Module Installation | | | Not Installed | MySQL_5 | 1.00.02 | MySQL database | Online | | | |
| Auto Module Instalation | | | Not Installed | webserver | 1.0.4 | Web Server | Online | 8 | | |
| | | | Not Installed | Rsync_Backup | 1.0.5 | Rsync backup | Online | | | |
| | | | Not Installed | transmission | 2.12.2 | Transmission module | Online | | | |
| | | | Not Installed | Dashboard | 2.0.0 | Dashboard module | Online | | | |
| | _ | | | | | | | | | |
| 👫 Backup | ۰ | | | | | | | | | |
| External Devices | .+) | • | | | | | | | | _ |

Another way to have auto module installed is to use the universal CD shipped with system. It contains a file "modules.zip" which included all the modules available when the system was shipped. Please refer the screenshot below.



| ٩ | | He | ome > Applicat | ion Server > Au | to Module | Installation | @ Help (| 🤈 My favorite (| ይ• Shutd | own ≰∐Lo |
|---------------------------------|---------|----|----------------|-----------------|-----------|--------------|----------|-----------------|-----------------|----------|
| J System Information | ٠ | , | Module Package | : modules.zip | | | | Upload | Rescan |) |
| X System Management | | ſ | -Module Sou | rce List | | | | | | |
| System Network | | | Installed | Name | Version | Description | Location | n Document | Action | |
| Storage | | | Not Installed | IP_Carn | 2.0.1 | IP Cam | Disk | | | × |
| Subser and Group Authentication | | | | Twonkymedia | 1.0.0 | Twonkymedia | Disk | | | × |
| Network Service | * | | Not Installed | webserver | 1.0.4 | Webserver | Disk | | | × |
| Application Server | - | | | | | | | | | |
| - 🕼 iTunes Server | | | | | | | | | | |
| Auto Module Installation | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | i | | | | | | | | | |

| Auto Module Source List | | | | |
|-------------------------|--|--|--|--|
| Item | Description | | | |
| Installed | Status of module | | | |
| Name | Module name | | | |
| Version | The version of the released module | | | |
| Description | The description of the module | | | |
| Location | The module is either located on-line or disk | | | |
| Document | The available documentation of the module | | | |
| Action | To install or delete module. | | | |
| | p.s. If the module list from on-line, then no delete option will | | | |
| | be available | | | |
| Rescan | Click to rescan from both on-line and disk | | | |

| dule Package: modules.zig Module Source List | | | Upk | oad (| Rescan |
|---|---------|-------------|----------|----------|------------------------|
| Installed Name | Version | Description | Location | Document | Action |
| Not Installed IP_Cam | 2.0.1 | IP Cam | Disk | | 🔜 × |
| Not Installed Twonkymedia | 1.0.0 | Twonkymedia | Disk | | Install Module on Disk |
| Not Installed webserver | 1.0.4 | Webserver | Disk | | Install Module on Dis |

After clicking on "Action" to install a module, the module will become available under the list of Module Installation. Please go to Module installation and click "Enable" to activate the module.

Backup

There are a number of ways to back up data with the Thecus IP storage.

Dual DOM (N12000 series/N16000 series/N8900 series only)

The unique Dual DOM feature can now perform "Auto Repair". The Thecus NAS will backup up to five versions of the system configuration either by the default timing of 1:00am every day automatically or as scheduled by the user.

This unique "Auto Repair" will be triggered if the primary DOM has a booting issue. In this instance, the 2nd DOM will take over the boot function. Then, the system will automatically load the most recent system configuration backup image to repair the primary DOM.

| Enable Disable Dual DOM | schedule backup | | |
|---------------------------------------|-----------------|----------|--|
| Auto | | | |
| O Daily 00.00 | | | |
| 🔿 Weekly 🛛 Sunday 🕶 | 00:00 🕶 | | |
| 🛇 Monthly 🚺 📉 | 00:00 | | |
| Status: | | | |
| Manually Apply | | | |
| | | | |
| | | | |
| Dual DOM Backup Status - | | | |
| Dual DOM Backup Status - Task Name | Date | Firmware | |

Rsync Target Server



When it comes to backing up your data, it's very important to have flexibility. Data guard provides you with many options, including full backup for all shares, custom backup for selected shares and iSCSI volume backup. Being based on the Linux operating system, it is also much more stable and experiences much less frequent data loss during transfer than other remote backup systems.

-For this tutorial you will need to use Rsync Target Server (Step 1) and Data Guard (Step 2+3) under Backup for this client/server backup feature. It also can be named for function "Remote Replication".

Step 1 – Enabling Rsync on your target (backup) NAS

-Log in to your target (backup) NAS through the UI in your web browser -Go to Rsync Target Server under Backup in the menu of the UI

| Home > Backup > Rsync Ta | arget Server | | ⑦ Help | ♡• My favorite | Ů • Shutdown | 纪 Logout |
|--------------------------|-----------------|-----------------|--------|----------------|---------------------|----------|
| Rsync Target Settings | | | | | | |
| Rsync Target Server : | Enable | 🔘 Disable | | | | |
| Username: | andy | | | | | |
| Password: | •••• | | | | | |
| Encryption Support: | Enable | 🔘 Disable | | | | |
| Allowed IP 1: | 172.16.65.143 | | | | | |
| Allowed IP 2: | | | | | | |
| Allowed IP 3: | | | | | | |
| Public Key(Otional): | Please choose a | file to upload. | | | | |
| Private Key(Otional): | Please choose a | file to upload. | | | | |
| | | | | | | |
| Apply Restore Defau | lt Key Downloa | ad Key | | | | |
| | | | | | | |

1. Enable **Rsync Target Server**

- 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.

Data Guard (Remote Backup)

Step 2 – Setting up your backup task and schedule on your source NAS -Log in to your other NAS (your source NAS) through the UI in your web browser -Go to **Data Guard** under **Backup** in the menu of the UI

-From the Data Guard function list, choose Add

| 📀 Add 🎲 Edit (| Remove Star | t Stop 👞 Rest | tore Log | | 👟 Res | tore NAS Configuration |
|----------------------|-------------|---------------|-------------|---------------|-------------|------------------------|
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status |
| Category: remote (3) | | | | | | |

| Remote Data backup | | | | | |
|--------------------|--|--|--|--|--|
| Item | Description | | | | |
| Add | Add new task. | | | | |
| Edit | Edit select task. | | | | |
| Remove | Remove select task | | | | |
| Start | If associated task has been setup in schedule and like to | | | | |
| | start at once, click on to start task right away. | | | | |
| Stop | Stop the associated running task. The other scenario is if a | | | | |
| | task has been setup in real-time then clicking "Stop" can | | | | |
| | terminate the running process. Simple click 'Start" to | | | | |

| | re-start the real-time operation. |
|---------------------------|---|
| Restore | Restore the associated task |
| Log | Click to view the associated task in process details. |
| Restore NAS Configuration | Click to restore system configuration from selected destination to source unit. More details will describe in sections. |

The data backup setup wizard appears as below, click on 'Remote Backup":



Then 3 different selections appear and can be chosen from:



| Remote Data backup | | | | |
|--------------------|--|--|--|--|
| Item | Description | | | |
| Full Backup | The "Full backup" will have all shares from source backup to | | | |
| | destination. It could also create shares automatically from destination if it is not existent. This only applies if the target server is the same model as the source. |
|---------------|--|
| Custom Backup | The "Custom backup" allows user to choose desired shares |
| | backup to destination. |
| iSCSI Backup | The "iSCSI backup" can backup iSCSI volume as single file |
| | to destination. |

Full Backup

Click on full backup and the setup screen appear as below. 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.

Carry on with inputting valid remote target server account name and password.

| Remote Backup > Full Ba | ickup _{ne Path} | Source Folder | Target Path | Last Run Time | Ва |
|-------------------------|---|---------------|-------------|---------------|-----|
| | Remote Target: Encrypt with SSH: Account : Password : Connection Test | 172.16.64.131 | | 873 | |
| | | | (| Previous Can | cel |

After the settings are complete, please click on "Connection Test". The source unit will try to connect with the associated target system. If a connection can be built up successfully then "Connection passed" will be prompted, otherwise "Failed" will appear.

| Remote Target: | 172.16.64.131 | Port: 873 |
|-----------------------|------------------------------|-----------|
| Encrypt with SSH: | 🖲 Off 🛛 💿 On | |
| Account : | cheryl | |
| Password : | ••••• | |
| Connection Test | | |
| Connection test passe | ed! Click Next to continute. | |

Click "Next" and more setting will appear.

| Remote Backup > Full Ba | ckup en en en | ource Folder Taraet F | Path Last Run Time Bag |
|-------------------------|-----------------------|-----------------------|------------------------|
| | Task Name: | fullbackup01 | |
| | Backup Type: | Realtime | 🔘 Schedule |
| | Sync Type: | Sync | 🔘 Incremental |
| | Compress: | Off | 🔘 On |
| | Backup NAS Configs: | Off | 🔘 On |
| | Resume Partial Files: | Off | 🔘 On |
| | Handle Sparse Files: | Off | 🔘 On |
| | Keep ACL Settings: | Off | 🔘 On |
| | Log Location: | 555 👻 | |
| | Speed Limit: | MB/Sec(set 0 to | o unlimit) |
| | Timeout Limit: | 600 Sec | |
| | | U | |
| | | | |
| | | | |
| | | Previo | ous Finish Cancel |

-Fill out all the necessary details and choose your parameters

| Add Rsync Ba | ackup Task |
|---------------------|--|
| Item | Description |
| Task Name | This is how this task will appear in the task list. |
| Backup 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. |
| 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. |
| 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. |
| Backup NAS Config | Enabling this will back up the source unit system configurations to the designed path on the target system. |
| Resume Partial File | |
| Handle Sparse File | Try to handle sparse file efficiently so they take up less space on the destination. |
| Keep ACL Setting | It will backup not just data itself but also ACL configuration with associated folders/files. |
| 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. |
| Enable Schedule | If backup is set as "Schedule", please input the related period and time. |

After the required fields are filled and the parameters are setup, click 'Finish" to complete. The data guard task will appear in the list as shown below.

| me > Backup > I | Data Guard | | | 🕜 Help | ♡•My favorite | ப்- Shutdown | গ ∰ Loga |
|------------------|-----------------|------------------|-----------------|---------------|---------------|---------------------|-----------------|
| 🔾 Add 🌼 Edit | ⊖Remove € Start | 🖲 Stop 🕙 Restore | ©_Log | | ÷ | Restore NAS Cor | nfiguration |
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status | |
| 🗉 Category: remo | ote (1) | | | | | | |
| fullbackup01 | | * | 172.16.64.131:/ | | Realtime | Processing | |

From the task list, you can now see the newly added task "fullback01". The backup is setup as "real time". From the status field, "Processing" can be read as the back-up is performed on the fly.

Custom Backup

The custom backup setting is similar to the full backup. The only differences are explained below:

1. Inputs the share folder name of target sever where the source is going to backup. The sub-folder can be left as blank.

| Remote Backup > Custo | m Backup | Source Folder | Taraet Path | Last Run | Time Bar |
|-----------------------|---|--|-------------|----------|----------|
| | Remote Target: Encrypt with SSH: Account : Password : Target Folder : Connection Test Connection test pas | 172.16.64.131 Off cheryl Backup / | On Port: | 873 | |
| | | | | Next | Cancel |

2. Select the source share folder(s) which are desired to be backed up to the target server. You can also click on "Select All" from top right corner check box.

| Remote Backup > Custo | n Backup Source Folder Target Path | Last Run Time Ba | | | | | | |
|-----------------------|---|------------------|--|--|--|--|--|--|
| <u>م</u> | Notice: Click highlight row to enter the folder | | | | | | | |
| | Select Folders to Backup | 🔲 Select All | | | | | | |
| | 🗟 Return to Parent Folder | | | | | | | |
| | JAS_Public | | | | | | | |
| USBCopy | | | | | | | | |
| | 🔤 🔤 _Module_Folder_ | | | | | | | |
| | Image: Mage: Module | | | | | | | |
| | | | | | | | | |
| | 🧧 🕅 iTunes_music | | | | | | | |
| 🔤 🖳 📰 snapshot | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Previous | Next Cancel | | | | | | |

 Click "Next" and more setting appears. These are the as the settings for "Full backup"

| Remote Backup > Custo | m Backup | ource Folder Taraet (| Path Last Run Time Bag |
|-----------------------|---|-------------------------------------|------------------------|
| Ŵ | Task Name: | custombackup | |
| | Backup Type: | Realtime | 🔘 Schedule |
| | Sync Type: | Sync | 🔘 Incremental |
| | Compress: | Off | 🔘 On |
| | Backup NAS Configs: | ● Off | 🔘 On |
| | Resume Partial Files: | ● Off | 🔘 On |
| | Handle Sparse Files: | ● Off | 🔘 On |
| | Keep ACL Settings: | ● Off | 🔘 On |
| | Log Location: Speed Limit: Timeout Limit: Enable Schedul | 555 M MB/Sec(set 0 to 600 Sec | ə unlimit) |
| | | Previo | ous Finish Cancel |

4. Click "Finish" and the data guard task will appear in the list as shown below.

| Home > Ba | kup > Data Guard | | | 🕐 Help | ♡•My favorite | ப்- Shutdown | 纾 Logout |
|-----------|---------------------|------------------------|---------------------|---------------|---------------|---------------------|-------------|
| 📀 Add | 🍰Edit 🤤 Remove 🕞 St | art 💿 Stop 🕙 Restore 🕻 | Srog | | Ð | Restore NAS Cor | nfiguration |
| Task Na | me Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status | |
| □ Categ | ory: remote (1) | | | | | | |
| custom | ackup RAID | USBCopy, snapsho | t 172.16.64.131:/Ba | c | Realtime | Processing | |

From the task list, you can now see the newly added "customback01". This backup is setup as "schedule".

iSCSI Backup

If the source unit contains iSCSI volume, it can be backed up to the target unit as a single file. The procedure is the same as for the previous "Full backup" and "Custom backup", select "iSCSI backup" from data guard wizard.

1. Inputs the share folder name of the target sever where the source is going to backup. The sub-folder can be left as blank.

| Remote Backup > iSCSI | Backup _{Path} | ource Folder | Target Path | Last Run | Time Ba |
|-----------------------|---|----------------------|-------------|----------|---------|
| | Remote Target: Encrypt with SSH: | 172.16.64.131 Off | Port: | 873 | |
| | Account : Password : Target Folder : Connection Test | cheryl | 3 | | |
| | Connection test pass | ed! Click Next to (| continute. | | |
| | | | | | |
| | | | [| Next | Cancel |

2. Select the iSCSI target volume which you wish to back up to the target server.

| Remote Backup > iSCSI | Backup Path Source Folder | Target Path | Last Run Time | Ba |
|-----------------------|---|-------------|---------------|----|
| Remote Backup > iSCSI | Backup on Course Polder Notice: Click highlight row to enter t Select Folders to Backup Image: Course Folders Image: Course Folders | | Last Run Time | B |
| | | Previous | Next Cancel | |

3. Click "Next" and more settings will appear. It is slightly differing from "Full backup" and "Custom backup". Only "Schedule" backup is supported with less options.

| Remote Backup > iSCSI | Backup _{Path} | ource Folder | Target Path | Last Run Time B |
|-----------------------|--|------------------------------|---------------------|-----------------|
| | Task Name: Log Location: Speed Limit: Timeout Limit: ┌─ └✔ Enable Schedu | 600 Sec | (set 0 to unlimit) | |
| | Time: Schedule: | 00 ¥ : 00 Monthly 00 ¥ | V Weekly | Oaily |
| | | | | |
| | | | | |
| | | | Previous | Finish Cancel |

4. Click "Finish" and the data guard task will appear in the list as shown below.

| me > Backup > Da | ata Guard | | | 🕐 He | lp 💭∙My favorite | ப்- Shutdown | ⁄ 仕 Logou |
|-------------------|----------------|------------------|------------------|---------------|------------------|---------------------|-------------|
| 🗿 Add 🎲 Edit 🍕 | Remove 🕞 Start | 🖲 Stop 🕙 Restore | ©Log | | 4 | Restore NAS Con | ifiguration |
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status | |
| 🗉 Category: remot | e (1) | | | | | | |
| iscsibackup | | iSCSI_iscsi01 | 172.16.64.131:/E | 3ac | Schedule(Daily) | | |

From the task list, you can now see the newly added "iscsiback". This backup is setup as "schedule".



The iSCSI backup can see the result as below. The task "iSCSI_pmtest" has backup to target 172.16.66.131 and share folder NAS_Public with file "iSCSI_pmtest".

| 新増資料夾 | | | | |
|--------------|----------------|-------|----|---|
| 名稱 | 修改日期 | 類型 | 大小 | |
| iSCSI_pmtest | 2012/6/28 下午 0 | 檔案資料夾 | |] |

Restore

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 server restored to the source.

| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status |
|----------------|-------------|---------------|--------------|---------------|-------------|------------|
| E Category: re | mote (3) | | | | | |
| fulbackup01 | 1 | * | 172.16.66.11 | 2012/06/29 | Realtime | Processing |
| iscsiback01 | 1 | iSCSI_pmtest | 172.16.66.11 | 2012/06/29 | Schedule | Finish |
| customback0 | /raid0/data | test1, test2 | 172.16.66.11 | 2012/06/29 | Schedule | Finish |

Restore NAS Configuration

This is a useful feature if the system configuration needs to be restored to a brand new unit. Let's go thru the following example to see how it works.

The original source system has 3 RAID volume, "RAID", 'RAID10" and "RAID20", and has backed up the system configurations to the target server.

| RA | ID Man | agemen | t | | | | | |
|-----|-------------|---------|-----------------|---------|---------------|-------------------|--------------------|--|
|) c | reate | i) Edit | 🎲 Global Hot Sp | are | | | | |
| | Mas RAID | ID | RAID Level | Status | Disks Used | Total Capacity | Data Capacity | |
| ۲ | * | RAID | 1 | Healthy | 10 | 929 GB | 11.4 GB / 928.7 GB | |
| 0 | | RAID01 | J | Healthy | 9 | 929 GB | 928.5 GB | |
| 0 | | RAID20 | J | Healthy | 8 | 929 GB | 928.5 GB | |
| | | | | | | | | |

The brand new source unit only has a 1 RAID volume 'RAID".

| RAID Management | | | | | | | | |
|--|-------------|------|---------------|---------|---------------|-------------------|--------------------|--|
| 🔾 Create 🛛 🎲 Edit 🛛 🎲 Global Hot Spare | | | | | | | | |
| | Mas RAID | ID | RAID Level | Status | Disks Used | Total Capacity | Data Capacity | |
| ۲ | * | RAID | 1 | Healthy | 10 | 929 GB | 11.4 GB / 928.7 GB | |

1. When adding a new backup task with "Full backup" or "Custom backup" and enabling the option "Backup NAS Config" as shows below, the source unit system configurations are then backed up to the designed path on the target system every time the task is executed.

| Remote Backup > Full Ba | ckup | | <u></u> |
|-------------------------|-----------------------|-------------------------|-------------------|
| <u>م</u> | Task Name: | FullBackup | |
| | Backup Type: | Realtime | 🔘 Schedule |
| | Sync Type: | Sync | 🔘 Incremental |
| | Compress: | Off | 🔘 On |
| | Backup NAS Configs: | Off Off | On |
| | Resume Partial Files: | Off | On On |
| | Handle Sparse Files: | Off | 🔘 On |
| | Keep ACL Settings: | Off | 🔘 On |
| | Log Location: | 555 💌 | |
| | Speed Limit: | O MB/Sec(set 0 to | o unlimit) |
| | Timeout Limit: | 600 Sec | |
| | | | |
| | | | |
| | | | |
| | | Previ | ous Finish Cancel |

 Click on "Restore NAS Configuration" and the screen shown below will appear. Input the target server's IP address where the system configuration has been backed up, and necessary authentication info. Confirm by doing a "Connection Test" to make sure the communication between the source and the target server works.

| 🔾 Add 🎲 Edit 🤤 | Remove 🕞 Start (| 🗈 Stop 🕙 Restore | ©Log | | | 🟵 Restore NAS Configuration |
|----------------|---|-----------------------|-------------|---------------|-------------|-----------------------------|
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | e Status |
| Task Name | Source Path Remote Targ Encrypt with Account : Password : Connection | et: 172.16.64 SSH: | | 873 | Backup Type | e Status |
| | | | | Can | cel | |

3. Click "Next" and a screen will appear as shown below. It has the listed available system configuration backup files. Select the one you want and click next. You also have the option to download the current system configuration before restoring from the backup file.

| Custom Backup | Attention Restore config will reset all configs. Ye download current config file. Then se the list. Download | ou can click the under button to lect the config you want to restore from |
|---------------|--|--|
| | Config Files List | |
| | Name | Date |
| | N5550_00:14:FD:16:8F:8A_fullback | |
| | [<] | |
| | | Cancel |

4. After clicking "Next", a screen will appear as shown below. Listed on the left hand side, you will see the configuration backup details which contain the 3 RAID volumes. On the right hand side, you will see a list of single "RAID" volume. You may roll back to previous page to recall the example we have taken.

| Custom Backup | | | |
|---------------|---|---|---|
| | Backup Folder - RAID Mappin The under list shows the RAID suright column to change the setti | etting in config file. You can simply click the | |
| | RAID setting in config file | RAID | |
| | RAID | RAID | |
| | RAID01 | RAID | |
| | RAID20 | RAID | |
| | | | |
| | System needs to be n | eboot after configuration restoring. | • |
| | | Previous Finish Cancel | |

- 5. The backup configuration has different numbers of RAID volume than the current system (3 vs 1). It can be kept as the RAID volume mapping arranged by the system, then carry on to click "Finish". This means that all 3 RAID volumes configuration such as share folder etc. will all restore to the current unit in the RAID volume "RAID".
- 6. In other circumstances, if the current unit contains 2 RAID volumes, then it can be chosen from the left hand side of system backup configuration RAID volume list which RAID volume to map to the current system.

Let's see the following screen to make it clearer.

The current system has 2 RAID volumes, "RAID" and "RAIDa". Select the RAID volume from the backup configuration volume list which is going to be mapped to the RAID volume of the current system. Simply click on the right hand side of "RAIDa" and a drop down list will appear. Now you can choose which volume to map with. In this case the "RAID01" volume from the system backup

configuration will be mapped to the volume "RAIDa" of the current unit. Once again, it means all the shares that were created in the volume "RAID01" will be restored to volume "RAIDa" of the current system.

| Custom Backup | | | . ~ |
|---------------|---|--|-----|
| | Backup Folder - RAID Mappi The under list shows the RAID right column to change the set | setting in config file. You can simply click the | |
| PL 6 | RAID setting in config file | RAID | |
| | RAID | RAID | |
| | RAID01 | RAIDa 🗸 | |
| | RAID20 | RAID | |
| | | RAIDa | ≡ |
| | System needs to be | reboot after configuration restoring. | < |
| 1 | | Previous Finish Can | cel |

ACL Backup and 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.

Let's look at the example bellow to see how it works.

We have one system with a RAID volume "RAID", select "Backup" to backup this RAID volume's ACL to other location. The current RAID volume "RAID" has share folder as listed on right hand screen shot.

| Home > Backup > ACL Backup/Restore @ Help 📿 My fa | favorite 🕐 Shutdown 🞢 Logout |
|---|--------------------------------------|
| ACL Backup/Restore | Shared Folders |
| ACL Service: Backup Restore | 💿 Add 🌼 Edit 🔤 Remove 💆 NF3 |
| Raid Name: Patro v File System:xfs | Folder name >> |
| Raid Name: RAID Y File System:xts | ▷ 🧰 nsync |
| Upload: | 🗟 🛛 🕞 usbhdd |
| Recursive: (Applies ACL to all contained sub-folders as well. May extend r | I restoration time.) ▷ 📄 usbcopy |
| | D in aswebsite |
| Apply | ▷ 🗀 iTunes_music |
| - Description - | ▷ 🛄 _Module_Folder_ |
| Description | ▷ 🚞 _NAS_Module_Source_ |
| Raid status must be healthy/degraded. ACL restoration from a ZFS file system can only be applied to another ZFS file system | em. 🛛 🖉 🗁 pm1 |
| Recursive ACL restoration does not apply to the USBHDD/usbhdd folder. While the RAID partition is restoring/backing up ACL, its folders will not be shown w ACL restoration/backup cannot be appled to stacked folders. | within the UI. $ ho \ \square \ pm2$ |
| | |

For the ACL restore, it can be restored in the same system or used in another unit. For example, let's restore the ACL backup file to another unit. This unit has a RAID volume "RAIDpm" with share folders as listed on right hand screen shot.

| ACL Backup/Re | store | - Shared Fe | lders |
|--------------------------------------|--|---|-----------------|
| ACL Service: | O Backup Restore | Shared IV | Jucio |
| Raid Name: | RAIDpm 👻 File System:xfs | 🚫 Add 🍕 | Edit 🔤 Remove |
| Upload: | C\fakepath\folder_acl.bin | Folder name | » |
| Recursive: | (Applies ACL to all contained sub-folders as well, May extend restoration time,) | D Construction | |
| | | Image: Second | id |
| Next | | ▷ □ usbco | ру |
| Description — | | D Call nasw | ebsite |
| | be healthy/degraded. from a ZFS file system can only be applied to another ZFS file system. | ⊳ 🗀 iTune | s_music |
| Recursive ACL re | storation does not apply to the USBHDD/usbhdd folder. partition is restoring/backing up ACL, its folders will not be shown within the UI. | ⊳ 🗀_Mod | ule_Folder_ |
| | backup cannot be applied to stacked folders. | ▷ □_NAS | _Module_Source_ |
| | | ▷ □ pm3 | |
| | | ⊳ 🧀 pm1 | |

After inputting the ACL backup file and clicking the "Next" button, the system will show another screen to list the matched folders in between the backup file and this RAID volume. Just select the desired folders for the ACL restore.

| CL | Backup/Restore ACL Backup/Restore (0 Hal |
|------|---|
| Sear | reh: |
| V | Folder name |
| 7 | _Module_Folder_ |
| 7 | _NAS_Module_Source_ |
| / | iTunes_music |
| 7 | naswebsite |
| 7 | nsync |
| Z | pm1 |
| 7 | usbcopy |
| 7 | usbhdd |
| | |
| | |
| | |
| No | tice: The target RAID partition is not the original RAID partition. |
| _ | |
| _ | Restore |
| | |

| NOTE | • The ACL backup will only back to share folder level; it does not apply to its sub-layer. |
|------|---|
| | • The ACL backup/restore can be used among ext3/ext4/XFS file system. ZFS can only be used with other RAID volume with ZFS file system created. |
| | • If recursive has been checked during the ACL restoration, it will apply to all of its sub-folders with the same permission. |

Data Burn

The data burn is featured to support 3 different modes of data burning for files/folders to and from image file and physical optical disk. The 3 different modes are "Write Files/folders to disc", "Write image to disk" and "Write files/folders to image".

| ٩ | « I | iome > Backup > Data Burn | 🕐 Help | ♡• My favorite 🕑• Shutdown | 纾 Logout |
|--|-----|------------------------------------|----------|----------------------------|----------|
| J System Information | *) | | | | * |
| 🗙 System Management | +7 | Add data to start burning process: | | | |
| System Network | +) | 🔇 Add 💮 Edit 🥥 Remove 🥥 Remove All | | | |
| Storage | • | Name | Path | | |
| Ser and Group Authentication | +J | @New Disc | | | |
| Service | •) | | | | н |
| Application Server | +) | | | | |
| 📑 Backup | -7 | | | | |
| DOM Backup Rsync Target Server Rsync Rsync AcL Backup/Restore AcL Backup/Restore | | | | | |
| | | Total size: 0 | | | |
| External Devices | - | Disc:Select | eet dise | | |

1. Write Files/folders to disc

| Ad Write file/folders to disc process: | | | | |
|--|-------------------------------|------|---------------------|--|
| | Add data to start burning pro | cess | | |
| ⊙ Add 🌼Edit ⊜Remove ⊜Remove All | | | 💷 View 🕶 🖂 Search | |
| Name | 83 | | name | |
| New Disc | B DNAS_Public | 0 | NAS_Public | |
| | B USBCopy B USBHDD | 0 | USBCopy | |
| | BModule_Folder | 0 | USBHDD | |
| | BNAS_Module_Source_ | | _Module_Folder_ | |
| | B CNAS_Picture B CeSATAHDD | 0 | _NAS_Module_Source_ | |
| | B GCSI_pm1 | 0 | _NAS_Picture_ | |
| | B C SCSI_pm2 | 0 | eSATAHDD | |
| | B 🛄 (Tunes_music B 🛄 lap2 | 0 | iSCSI_pmi | |
| | 🗃 🦳 iaptest | 0 | iSCSI_pm2 | |
| | | | iTunes_music | |
| | ui 🔄 test | | iap2 | |
| | | 0 | iaptest | |
| | | 0 | snapshot | |
| | | | test | |
| | | | | |
| | | | | |

- a. Click the Add button and the NAS share list appears.
- b. Select files/folders which you would like to burn. All of the selected folders/files will be seen under the disc label name "New Disc". The disc label name can be changed by clicking on it and press "Edit" from

| Add data to start burning process: | |
|--|--|
| O Add @Edit @Remove @Remove All | |
| Name | Path |
| 🖃 🎡 New Disc | |
| Product Meeting Weekly Report | /raid0/data/NAS_Public/Product Meeting Weekly Repo |
| California and a son | /raid0/data/_NAS_Picture_/son |

menu bar. The selected folders/files also can be removed by clicking on them and then pressing "remove" or "remove all" for all selected items.

c. Select from the installed USB or SATA(for N6850/N8850/N10850) burning devices. Please click the "detect disc" button to check the status once the disc is inserted.

- d. Select the burning speed from the drop down list.
- e. Select whether disc data verification is required or not.
- f. Click "Burn" to start disc burning.
- 2. Write image file to disc

| Home > Backup > Data | a Burn | () Help | ♥• My favori |
|----------------------------|--------------------------|-------------|--------------|
| | | | |
| ISO file: | Write image file to disc | | Browse |
| Disc: | Select 💙 | Detect_disc | |
| Disc information: | Unknown | | |
| Speed: | × | | |
| Disc data verification: | | | |
| Born | | | |

Disc:

Speed:

Burn

Disc information:

Disc data verification: 🗹

a. Click "Browser" and the NAS share list will appear to locate the desired image file to burn.



MSI WIND DRIVE UO882 Y Detect disc

CD-R (Empty), Disc space:702.82 MB

24x 👻

b. Select the ISO file.



- c. Select from the installed USB or SATA(for N6850/N8850/N10850) burning devices. Please click the "detect disc" button to check the status once the disc is inserted.
- d. Select the burning speed from the drop down list.
- e. Select whether disc data verification is required or not.
- f. Click "Burn" to start disc burning.

3. Create image file from files/folders



- a. Click the Add button and the NAS share list will appear.
- b. Select the files/folders which you would like to burn. All of the selected folders/files will appear under the disc label name "New Disc". The disc label name can be changed by clicking on it and pressing "Edit" from



the menu bar. The selected folders/files also can be removed by clicking on them and pressing "remove" or "remove all" for all the selected items.

- c. Input the path where the ISO file is going to be stored, you can press the "Browse" button to have the share list appear.
- d. Input the ISO file name for burned image file.
- e. Click "Burn" to start the ISO file burning.



Thecus Backup Utility

The Thecus Backup Utility is on your Installation CD. When you click on the CD, the Backup Utility will be installed under **Program Groups** > **Thecus** > **Thecus Backup Utility**. If it is not installed, you can copy the file (**Thecus Backup Utility.exe**) to a convenient location on your hard disk and double click to execute it.



NOTE

If you can not find Thecus Backup Utility on your CD, please download it from the Thecus website (http://www.thecus.com).

When you execute this utility for the first time, it will ask you to create a DB file. Click **Yes**.

1. Click **Add** to create a Backup task. The **Add New Task** dialog box will appear.

| Add New Tas | k |
|---------------------|---|
| Item | Description |
| Task | Specifies a name for the current task. |
| Source | Click to specify the source folder/file location. |
| Incremental | Click to specify whether the backup will be incremental. |
| | If unchecked, the backup will be a full backup. |
| Destination | Click to specify the destination folder/file location. |
| Excluded extensions | Files with these file name extensions will be skipped and not |
| | backed up to the destination. |
| Comments | If you wish, enter a comment here for your records. |

- 2. To schedule the task to run at regular intervals, click on the *Schedule* icon for that task. You can schedule the task to run **Monthly** or **Weekly**.
- 3. To check the log for that task, click on the *Log* icon for that task.

NOTE Thecus Backup Utility also supports MAC OS X. Just copy the Thecus Backup Utility.dmg to your MAC OS X machine and double click to execute it.

Windows XP Data Backup

If you use Windows XP Professional, you can also use the Windows Backup Utility (Ntbackup.exe) to back up your files.

If you use Windows XP Home Edition, follow these steps to install the utility:

- Insert the Windows XP CD into a drive and double-click the CD icon in My Computer.
- 2. When the Welcome to Microsoft Windows XP screen appears, click **Perform Additional Tasks**.
- 3. Click *Browse this CD*.
- 4. In Windows Explorer, navigate to *ValueAdd* > *Msft* > *Ntbackup*.
- 5. Double-click *Ntbackup.msi* to install the backup utility.

Once installed, you can use the Windows Backup Utility by following the steps below:

- Click Start, and point to All Programs > Accessories > System Tools > Backup to start the wizard.
- 2. Click *Next* to skip past the opening page. Choose **Backup files and settings** from the second page, and then click *Next*.
- 3. Select which option you want to back up.

- 4. Click **Next** and in the Backup Type, Destination, and Name page, specify a backup location using the **Browse** button.
- 5. Find and select the drive that specifies your Thecus IP storage as your backup destination and click **Next**.
- Click *Next* to display the wizard's final page and click *Finish* to start backing up.

Apple OS X Backup Utilities

Mac OS X does not include any backup software. However, there are a number of backup solutions available for the Mac OS X, including: iBackup, Psyncx, iMSafe, Rsyncx, Folder Synchronizer X, Tri-BACKUP, Impression, Intego Personal Backup, SilverKeeper, and Apple's dotMac Backup utility to name just a few. To find even more freeware and shareware backup utilities to choose from, go to VersionTracker or MacUpdate and search on "backup".

External Devices

The Thecus IP storage supports printer server and UPS via USB interface. The integrated Print Server allows you to share a single USB printer with all users on the network. For the UPS, Thecus IP storage support via USB, Series and Network interface. The following section shows you how.

Printers

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

| ٩ | ** | Home > External Devices > Printers | ⑦ Help ♡• My favorite 🔱• Shutdown ⁄관 Logout |
|----------------------------|-----------|------------------------------------|---|
| 🟓 System Information | | Printer Information | |
| 💥 System Management | ٠ | Printer 1 | |
| System Network | + | Manufacturer: N/A | |
| J Storage | | Model: N/A | |
| Logical Section Section | | | ter Detected |
| Potwork Service | ٠ | Remove document from queue: | |
| Application Server | ٠ | Restart printer service: | = |
| 📑 Backup | ٠ | | |
| External Devices | - | | |
| - 💒 Printers | | | |
| Uninterrupted Power Source | | | |

| Printer Inform | nation |
|-------------------------|--|
| Item | Description |
| Manufacturer | Displays the name of the USB printer manufacturer. |
| Model | Displays the model of the USB printer. |
| Status | Displays the status of the USB printer. |
| Remove document | Click to remove all documents from printer queue |
| from Queue | |
| Restart Printer service | Click to restart printer service |

If a corrupt print job is sent to a printer, printing may suddenly fail. If your print jobs seem to be locked up, pressing the **Remove All Documents** button to clear the print queue may resolve the issue.

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.

Windows XP SP2

To set up the Printer Server in Windows XP SP2, follow the steps below:

- 1. Connect the USB printer to one of the USB ports (preferably the rear USB ports; front USB ports can be used for external HDD enclosures).
- 2. Go to **Start > Printers and Faxes**.
- 3. Click on **File > Add Printer**.
- 4. The Add Printer Wizard appears on your screen. Click Next.
- 5. Select the "*A network printer, or a printer attached to another computer*" option.
- Select "Connect to a printer on the Internet or on a home or office network", and enter "http://Thecus IP storage IP_ADDRESS:631/printers/usb-printer" into the URL field.
- 7. Your Windows system will ask you to install drivers for your printer. Select the correct driver for your printer.
- Your Windows system will ask you if you want to set this printer as "Default Printer". Select **Yes** and all your print jobs will be submitted to this printer by default. Click **Next**.
- 9. Click *Finish*.

NOTE

• Note that if a multi-function (all-in-one) printer is attached to the Thecus IP Storage, usually only the printing and fax functions will work. Other features, such as scanning, will probably not function.

Windows Vista

To set up the Printer Server in Windows Vista, follow the steps below:

1. Open *Printer Folder* from the Control Panel.



2. Click the right mouse button in anywhere on the **Printers** folder and then select *Add Printer*.



3. Select Add a network, wireless or Bluetooth printer.

| • | Add a local printer |
|---|---|
| | Use this option only if you don't have a USB printer. (Windows automatically installs USB printers when you plug them in.) |
| 4 | Add a network, wireless or Bluetooth printer |
| 1 | Make sure that your computer is connected to the network, or that your Bluetoot or wireless printer is turned on. |

4. Select The printer that I want isn't listed.

| Stop |
|------|
| |
| |

You can press **The printer that I want isn't listed** to go into next page without waiting for **Searching for available printers** to finish.



5. Click Select a shared printer by name.

Type http://<Thecus_NAS>:631/printers/usb-printer in the box, where <Thecus NAS IP> is the IP address of Thecus IP storage. Click **Next**.

6. Select or install a printer and then press **OK**.



7. Windows will attempt to connect to the printer.



8. You can choose to set this printer as the default printer by checking the **Set as the default printer** box. Click **Next** to continue.

| Type a print | er name |
|---------------------|---|
| Printer name: | usb-printer on http://172.16.66.64:631 |
| | Set as the default printer |
| This printer has be | een installed with the HP Deskjet 6500 Series driver. |
| This printer has b | een installed with the HP Deskjet 6500 Series driver. |
| This printer has b | een installed with the HP Deskjet 6500 Series driver. |
| This printer has b | een installed with the HP Deskjet 6500 Series driver. |

9. Done! Click *Finish*.

| You've su | ccessfully ac | dded usb-prin | ter on http:/ | //172.16.66.64:63 | 1 |
|--|---------------|----------------------|-------------------|---------------------------|--------|
| To see if the p a test page. Print a tes | | correctly, or to see | troubleshooting i | nformation for the printe | , prin |
| | | | | | |

Uninterrupted Power Source

From the **External Devices** menu, choose the **Uninterrupted Power Source** item and the **UPS Setting** screen appears. Make any changes you wish, and press **Apply** to confirm changes.

| UPS Settings | | | | |
|---------------------------|--|-----------------------------|---------|------------|
| UPS Monitoring: | 🔘 Enable | Oisable | | |
| Remote UPS Monitoring: | 🔘 Enable | Disable | | |
| Remote UPS IP: | | | | |
| Manufacture: | Ablerex 💌 | | | |
| Model: | × | | | |
| | *product has | been tested for compat | ibility | |
| Battery Status: | N/A | | | |
| Power: | N/A | | | |
| Seconds between p | ower failure and f | irst notification | | 5 seconds |
| Seconds between s | Seconds between subsequent power failure notifications | | | 20 seconds |
| Shutdown the syste | Shutdown the system when the battery charge is less than | | | 5 % |
| Apply | | | | |

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

| UPS Setting | |
|-----------------------------------|--|
| Item | Description |
| UPS Monitoring | Enable or disable UPS monitoring. |
| Remote UPS Monitoring | Enable or disable Remote UPS monitoring. |
| Remote UPS IP | Input the IP address of the NAS that the UPS |
| | device is connected to via USB or RS232. Input the |
| | IP address of your network UPS. |
| 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 |
| Seconds between power failure and | Delay between power failure and first notification |
| first notification | in seconds. |
| Seconds between subsequent power | Delay between subsequent notifications in |
| failure notifications | seconds. |
| Shutdown the system when the | Amount of UPS battery remaining before system |
| battery charge is less than | should auto-shutdown. |
| Apply | Press Apply to save your changes. |

Chapter 5: Tips and Tricks

USB and eSATA 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. The Thecus IP storage also supports eSATA hard disks with its eSATA port.

Before attaching an eSATA or 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 eSATA or 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



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.
- Check the Check boxes, select a user name (i.e.: N12000), 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.N12000.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.N12000.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, RAID 5, RAID 6, RAID 50 or RAID 60 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 OLED will display a warning message and the system will beep.

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, 5, 6, 10, 50 or 60 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. Check the OLED to see which disk has failed.
- 3. Follow the steps mentioned above to replace the failed hard disk.
- 4. The system automatically recognizes the new hard disk and starts the auto-rebuild sequence to resume its status before the hard disk crash.

Chapter 6: 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 either looking directly onto the Thecus IP storage OLED panel, or 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://esupport.thecus.com/support/index.php?_m=downloads&_a=viewdownload&downloaditemi d=57&nav=0

Restoring Factory Defaults

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



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 **System Management>Time**.
- 3. Under NTP Server, select No.
- 4. Set the **Date**, **Time**, and **Time Zone**.
- 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 **System Network** > **WAN/LAN1** > **DNS Server**)

Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series only)

The most advance and useful feature on the Thecus IP storage (depend on models) is the implemented Dual DOM. Under normal circumstances, there is no need to have this feature involved. But some unpredictable problems like power cut or human error can occur by accident, especially during system booting stage; the Dual Dom will become the best feature to prevent system down time. Practically while it happened, system will try to recover the DOM 1 from DOM 2 first. If it is unachievable then the system can boot from DOM 2. And all of these procedures can be operated through the OLED.



Chapter 7: Updates for FW v2.03.01

Changes for FW v2.03.01

- Added JBOD device info to **General** in the **System Information** category
- Modifed the Status layout in the System Information category
- Added Hardware Information in the System Information category
- Modified **Disk Information** layout and added support for JBOD device
- Added JBOD device to join RAID Management
- Added cloud backup Amazon S3 support
- Added Volume Expansion Management in the Storage category

General

The Thecus N8900/N12000/N16000 series are supporting the addition of the JBOD device Thecus D16000 to expand storage capacity. From **General** in **System Information**, JBOD device info will be displayed if applicable.

| N8900 D16000 - 4 | | N8900 D16000 - 4 | |
|-------------------|---------------------|-------------------|--------|
| Manufacturer: | Thecus | Manufacturer: | Thecus |
| Product No.: | N8900 | Product No.: | D16000 |
| Firmware Version: | 2.03.01 | Firmware Version: | 109D |
| Up Time: | 16 hours 19 minutes | Position: | 4 |

Status

From the **System Information** menu, choose the **Status** item, **System Service Status** and HW **Status** screens appear. These screens provide basic system and service status information.

| | | Home > System Informat | ion > Status | | |
|----------------------|----------------|------------------------|-----------------------|------------------------|----------------|
| | | Service Status N8900 | D16000 - 4 | | |
| | | CPU Activity: | 0.25 % | Home > System Informat | ion > Status |
| | | Memory Activity: | 8.1 % | | |
| Home > System Inform | ation > Status | CPU Fan Speed: | 2934 RPM | Service Status N8900 | D16000 - 4 |
| Service Status N890 | 0 D16000 - 4 | System Fan Speed1: | 5744 RPM | <u> </u> | |
| Service Status 10090 | 0 0 01000-4 | System Fan Speed2: | 5844 RPM | System Fan Speed1: | 3080 RPM |
| AFP Status: | Stopped | CPU Temperature: | 45 °C/113 °F | System Fan Speed2: | 3110 RPM |
| NFS Status: | Stopped | System Temperature1: | 29 °C/84.2 °F | System Temperature1: | 28 °C/82.4 °F |
| | | System Temperature2: | 30 °C/86 °F | System Temperature2: | 37 °C/98.6 °F |
| SMB/CIFS Status: | Running | System Temperature3: | 28 °C/82.4 °F | | |
| FTP Status: | Stopped | System Temperature4: | 32 °C/89.6 °F | System Temperature3: | 35 °C/95 °F |
| TFTP Status: | Stopped | Power Supply Unit: | Fail | System Temperature4: | 37 °C/98.6 °F |
| UPnP Status: | Stopped | WAN/LAN1: | RX: 0.0, TX: 0.0 MB/s | System Temperature5: | 30 °C/86 °F |
| | | LAN2: | RX: 0.0, TX: 0.0 MB/s | System Temperature6: | 38 °C/100.4 °F |
| SNMP Status: | Stopped | LAN3: | RX: 0.0, TX: 0.0 MB/s | | |
| Rsync Status: | Stopped | Additional LAN4: | RX: 0.0, TX: 0.0 MB/s | System Temperature7: | 42 °C/107.6 °F |
| | | Additional LAN5: | RX: 0.0, TX: 0.0 MB/s | System Temperature8: | 31 °C/87.8 °F |

Added Hardware Information

From the **System Information** category, choose the **Hardware Information** item and the system will display the related HW details for the associated model. Below is an example of the information for a Thecus N8900.

| ٩ | Home > Sy | stem Information > Hardwar | Information (| ∂ Help 🛛 My favorite | Ů • Shutdown | strate Angle Angl |
|----------------------|---------------------|---|----------------------------|----------------------|---------------------|---|
| 📙 System Information | - Hardwa | re Information | | | | |
| General Status | CPU | Intel i3-2120 CPU @ 3.30G | Hz | | | |
| System Log | Memory | 8077 MB | | | | |
| | BIOS | N8900_W30 X64 | | | | |
| Syslog Management | Network Device | | | | | |
| Hardware Information | WAN/LAI | Intel Corporation 82574L G | igabit Network Connection | _ | | |
| | LAN2 | Intel Corporation 82574L G | igabit Network Connection | | | |
| | LAN3 | Intel Corporation 82574L G | igabit Network Connection | | | |
| | USB Devi | :e | | | | |
| | USB2.0-1 | Intel Corporation Device 10 | 2d | | | |
| | USB2.0-2 | Intel Corporation Device 10 | 26 | | | |
| | USB3.0-1 | NEC Corporation Device 01 | 94 | | | |
| | DOM | Single DOM | | | | |
| X System Management | SATA Controller | | | | | |
| System Network | * SATA1 | Intel Corporation Device 10 | 02 | | | |
| 🔜 Storage | * SATA2 | LSI Logic / Symbios Logic S MPT SAS-2 [Falcon] | AS2008 PCI-Express Fusion- | | | |
| | OLED | Agent Revision:1600.1.7 Pi | c Revision:13 | | | |
| Potwork Service | • | | | | | |
| Application Server | * | | | | | |
| 👫 Backup | *) | | | | | |
| External Devices | + | | | | | |
| | | | | | THECUS N | 8900 V2.03.0 |

Disk Information

From the **Storage** menu, choose the **Disk Information** item and the **Disk Information** screen appears. From here, you can see various installed hard disks. The disk slot position will appear if the mouse is moved over the installed disk.

| | NOTE | s | lots number can | range from 8, 1 | 2 to 16 | 5 slot | rom a Thecus IP ts depending on t 30D devices if ap | he model of | |
|------------|----------------------------|------------------|-----------------|---------------------|----------|--------|---|-------------|-----|
| me > Sto | rage > Disk Information | | () Help ()+ My | favorite 🕛 Shutdown | 纪 Logout | | | | |
| Disk Info | ormation | | | | | | | | |
| Smart (| Detect Bad Block Stop I | | | | | | | | |
| Disk No | Model | Capacity | Firmware | Bad Block | | | | | |
| | | | | | ~ | | | | |
| ■ N8900 (| (7Disks) ST31000524NS | 932 GB | 0111 | | | | | | |
| 2 | WD6000BKHG-02A29 | 559 GB | SN11 VG03 | | | | | | |
| 3 | WD6000BKHG-02A29 | 559 GB | VG03 | | | | | | |
| 5 | Hitachi HDS72101 | 932 GB | A3MA | | = | | | | |
| 6 | Hitachi HDS72101 | 932 GB 932 GB | A3MA | | | | | | |
| 7 | Hitachi HDS72101 | 932 GB 932 GB | A25C | | | | | | |
| 8 | Hitachi HDS72101 | 932 GB | A25C | | | | | | |
| | | 552 65 | A250 | | — U | | | | |
| |) - 4 (6Disks) | | | | | | | | |
| 34-6 | WD6000BKHG-02A29 | 559 GB | VG03 | | | 🗆 N89 | 00 (7Disks) | | |
| 34-7 | WD6000BKHG-02A29 | 559 GB | VG03 | | - | 2 | ST31000524NS | 932 GB | SN |
| Total Cana | city: 9132 (GB) | | | | | 3 | WD6000BKHG-02A29 | 559 GB | Ve |
| | ,, | | | | | 4 | WD6000BKHG-02A29 | 559 GB | Ve |
| | | | | | | 5 | Hitachi HDS72101 | 932 GB | A3 |
| Disk Pov | ver Management | | | | | 6 | Hitachi HDS72101 | 932 GB | A3 |
| DIGR FOR | in management | | | | | 7 | Hitachi HDS72101 | 9 Position | 713 |
| | | | | | | 8 | Hitachi HDS72101 | | |

| Disks Inform | nation |
|----------------|--|
| Item | Description |
| Disk No. | Indicates disk location. |
| Capacity | Shows the SATA hard disk capacity. |
| Model | Displays the SATA hard disk model name. |
| Firmware | Shows the SATA hard disk firmware version. |
| Bad Block scan | Yes to start scan Bad Block. |

S.M.A.R.T. Information

On the **Disk Information** screen, select a disk then click on "Smart" to list the **S.M.A.R.T.** info of the associated disk.

| Disk Info | rmation | | | | | |
|-----------|---------------------------|-----------------|----------|----------|-----------|----------|
| & Smart | Detect Bad Block 💿 Stop D | etect Bad Block | | | | |
| Disk No | Model | Capacity | Firmware | | Bad Block | |
| ∃ N8900 (| 7Disks) | | | | | ^ |
| 2 | ST31000524NS | 932 GB | SN11 | | | |
| 3 | WD6000BKHG-02A29 | 559 GB | VG03 | Position | | |
| 4 | WD6000BKHG-02A29 | 559 GB | VG03 | | | |
| 5 | Hitachi HDS72101 | 932 GB | A3MA | | | = |
| 6 | Hitachi HDS72101 | 932 GB | A3MA | | | |

You may also perform a disk SMART test (doesn't apply to SAS HDD); simply click "Test" to start the SMART test. The result is only for reference and the system will not take any action from its results.

| SI | MART INFO | | | | | × |
|----|------------------|------------|--------------|---|--------------------|---|
| Г | Info | | | | | ٦ |
| | Disk No.: | | 2 | | | |
| | Model: | | ST31000524NS | | | |
| | Power On Hours | : | 344 Hours | | | |
| | Temperature: | | 27°C/80.6°F | | 38°C/100.4°F(Last) | |
| | Reallocated Sect | tor Count: | 1 | | 0(Last) | |
| | Current Pending | Sector: | 0 | | 0(Last) | |
| | Test | | | | | _ |
| | Test Type: | short | | 0 | long | |
| | Test Result: | Click to s | tart | | | |
| | Test Time: | | | | | |
| | Test | | | | | |

| S.M.A.R.T. Information | | |
|------------------------|--|--|
| Item | Description | |
| Tray Number | Tray the hard disk is installed in. | |
| Model | Model name of the installed hard disk. | |
| Power ON Hours | 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. | |
| Temperature Celsius | The current temperature of the hard disk in degrees Celsius. | |
| Reallocated Sector | Count of reallocated sectors. When the hard drive finds a | |
| Count | read/write/verification error, it marks this sector as "reallocated" | |

| | and transfers data to a special reserved area (spare area). This process is also known as remapping and "reallocated" sectors are called remaps. This is why, on a modern hard disks, you cannot see "bad blocks" while testing the surface - all bad blocks are hidden in reallocated sectors. However, the more sectors that are reallocated, the more a decrease (up to 10% or more) can be noticed in disk read/write speeds. |
|---------------------------|---|
| Current Pending Sector | Current count of unstable sectors (waiting for remapping). The raw value of this attribute indicates the total number of sectors waiting for remapping. Later, when some of these sectors are read successfully, the value is decreased. If errors still occur when reading sectors, the hard drive will try to restore the data, transfer it to the reserved disk area (spare area), and mark this sector as remapped. If this attribute value remains at zero, it indicates that the quality of the corresponding surface area is low. |
| Test Type | Set short or long time to test. |
| Test Result | Result of the test. |
| Test Time | Total time of the test. |
| | |

NOTE

If the Reallocated Sector Count > 32 or the Current Pending Sector of a hard disk drive > 0, the status of the disk will show "Warning". This warning is only used to alert the system administrator that there are bad sectors on the disk, and they should replace those disks as soon as possible.

Bad Block Scan

On the **Disk Information** screen, select a disk then click on "Detect Bad Block" to perform bad block scan of the associated disk. The result is only for reference and the system will not take any action from its results.

| Disk Inf | ormation | | |
|----------|-------------------------|------------------|----------|
| 𝒞 Smart | Detect Bad Block Stop I | Detect Bad Block | |
| Disk No | Model | Capacity | Firmware |
| ∃ N8900 | (7Disks) | | |
| 2 | ST31000524NS | 932 GB | SN11 |
| 3 | WD6000BKHG-02A29 | 559 GB | VG03 |
| 4 | WD6000BKHG-02A29 | 559 GB | VG03 |
| 5 | Hitachi HDS Position | | A3MA |
| 6 | Hitachi HDS | | A3MA |
| 7 | Hitachi HDS72101 | 932 GB | A25C |
| 8 | Hitachi HDS72101 | 932 GB | A25C |

The bad block scan can be terminated by clicking on "Stop Detect Bad Block".

| €Smart (| Detect Bad Blod: Stop I | Detect Bad Block | | |
|-----------|---------------------------|------------------|------------|-------------|
| Disk No | Model | Capacity | Firmware | Bad Block |
| ∃ N8900 (| (7Disks) | | | |
| 2 | ST31000524NS | 932 GB | SN11 | |
| 3 | WD6000BKHG-02A29 | 559 GB | VG03 | Scanning 3% |
| 4 | WD6000BKHG-02A29 | 559 GB | V Position | |
| 5 | Hitachi HDS72101 | 932 GB | A3 | |
| 5 | | | | |
| 6 | Hitachi HDS72101 | 932 GB | A3 | |

For Thecus product (N8900/N12000/N16000 series) which support JBOD device, the attached JBOD device and his associated disks will also list under the **Disk Information** page. Please see below for a screen shot of a N8900 with a Thecus D16000 attached and installed disks list on. The JBOD device will have a unique ID that ranges from 1 to 10. The disk no. lead ID will indicate the different JBOD devices. The screen shot below show a JBOD device with ID 4, so J4-6 is indicated under the JBOD device disk list with 6 slots.

| Disk No | Model | Capacity | Firmware | Bad Block |
|--------------|------------------|----------|----------|-----------|
| B N8900 | (7Disks) | | | |
| D1600 | 0 - 4 (6Disks) | | | |
| J4-6 | WD6000BKHG-02A29 | 559 GB | VG03 | |
|]4-7 | WD6000BKHG-02A29 | 559 GB | VG03 | |
| J4-8 | WD6000BKHG-02A29 | 559 GB | VG03 | |
| J4-10 | WD6000BKHG-02A29 | 559 GB | VG03 | |
| J4-11 | WD6000BKHG-02A29 | 559 GB | VG03 | |
| J4-12 | WD6000BKHG-02A29 | 559 GB | VG03 | |
| | | | | |

Data Guard (Local Backup)

The Thecus product provides complete backup solution between Thecus NAS systems as well as between folders of local systems. For remote data guard backup, please refer to chapter 4, Data Guard (Remote backup).

| 🔾 Add 🎲 Edit (| Remove Star | t Stop 👞 Rest | tore Log | | 👞 Res | tore NAS Configuration |
|----------------|-------------|---------------|-------------|---------------|-------------|------------------------|
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status |
| Gategory: rem | ote (3) | | | | | |

| Remote Data back | mote Data backup | | |
|---------------------------|---|--|--|
| Item | Description | | |
| Add | Add a new task. | | |
| Edit | Edit selected task. | | |
| Remove | Remove selected task. | | |
| Start | Click on start to start a scheduled scan task right away. | | |
| Stop | Stop the associated running task. Also can be used if a task has been setup as real-time, clicking "Stop" can terminate the running process. Simply click 'Start" to re-start the real-time operation. | | |
| Restore | Restore the associated task. | | |
| Log | Click to view the associated task process details. | | |
| Restore NAS Configuration | Click to restore the system configurations from a selected destination to a source unit. | | |

-From the **Data Guard** function list, select **Add**. The data backup setup wizard appears as below, click on "Local Backup":

| Data Backup Wizard | | |
|--------------------|--------------|--|
| | | Remote Backup Backup to an remote Thecus NAS |
| | | Local Backup Backup to folders / devices / iSCSI targets on local NAS |
| | web services | Amazon S3 Backup to Amazon S3 Service |
| | | |
| | | Cancel |

The local backup has 6 different selection you can choose from.



| Local Data ba | ickup |
|-----------------|--|
| Item | Description |
| Import | This is associated with external devices which are added to the |
| | system such as USB disk. You can select a folder from an external |
| | device and import it to the NAS as a share folder. |
| Сору | Copy folder to folder or NAS folder to external device or external |
| | device to NAS folder. This backup is within folder level. |
| Realtime Backup | The task will be executed on the fly between the source and the |
| | target. In other word, any changes made at the source will sync to |
| | the destination immediately. |
| Schedule Backup | The task will be executed on schedule between the source and the |
| | target. |
| iSCSI Backup | The iSCSI volume will be backup to the destination as a single file. |
| iSCSI Import | The iSCSI file can be imported from the iSCSI backup back to the |
| | destination as an iSCSI volume. |

 Import: click on "Import" and a screen will appear as below.
 If there is an external device installed on system such as USB disk, then it will be listed in the Source pane.

| Local Backup > Import | | |
|-----------------------|-----------------------------------|---|
| | Source Generic_USB Flash Disk1 | Target Target Target RAID RAID60 |
| | | Previous Cancel |

Click on the associated external device and the contain folders will be listed. Select the folders that are going to be imported to the NAS and select the available RAID volume which is listed in Target pane.

| Local Backup > Import | | | |
|-----------------------|---|-------------------------|-------------------------|
| Local Backup > Import | Source Return to Pa Asmedia Intel_Gr LSVM2_ | a_USB3 aphi ≡ .03 | Target C RAID RAID RAID |
| | N4200P | | |

In here, we have selected the "Intel Graphi..." and "N10850" folders from the external device and imported them to the NAS under the RAID60volume.

| Nicol . | Source Se | ect All | Target |
|---------|-------------------------|---------|-------------------------------|
| | Return to Parent Folder | | E O RAID |
| E | Asmedia_USB3 | | |
| | 📑 🗹 Intel_Graphi | E | |
| | USVM2_03 | | |
| | UN10850 | | |
| | UN4200PRO_02 | | |
| | UN4800 | | |
| | 🥘 🗖 N6850 | | |
| | UN7510 | - | |
| | | | Total share folder count : 15 |

Next, please select the path from the drop down list to save the log. Also, give the access permission whether these selected folders will be "Public" or not after the import.

| Local Backup > Import | | | |
|-----------------------|---------------|-------------------------|----------|
| N.O. | Set Public: | Off | 💿 On |
| | Log Location: | Intel_Graphics_V6141053 | 398_XP 🔽 |
| | | Intel_Graphics_V61410 | <u> </u> |
| | | NAS_Public | |
| | | R6andy | |
| | | USBCopy | |
| | | USBHDD | |
| | | _Module_Folder_ | |
| | | _NAS_Module_Source_ | |
| | | _NAS_Picture_ | |
| | | andy_local | |
| | | eSATAHDD | |
| | | iSCSI_iscsiv502 | |
| | | iTunes_music | - |
| | | 4 III + | |
| | | | |
| | | | |
| | | | |

Read the notes and check the "Accept" box for confirmation. If a share name already exists for the import, then the import will be rename automatically to "existing share name -1".

For esample, if the NAS RAID volume "RAID60" already has a folder named "Intel_Graphics_V614105398_XP", the import folder will then be rename to: "Intel_Graphics_V614105398_XP-1".



Now, you will see in the data guard task list that you have created a task .

| lome > Backup |) > Data Guard | | | ⑦ Help ♡•M | ly favorite (| b • Shutdown | s∰ Logo |
|----------------|-------------------|-----------------|-------------|---------------|---------------|---------------------|--------------|
| 🕑 Add 🎲 Edit | : 🤤 Remove 🕟 Star | t 💿 Stop 🕙 Rest | tore 🕲Log | | <u>.</u> | Restore NAS Co | onfiguration |
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Typ | e Status | |
| 🗉 Category: lo | cal (1) | | | | | | |
| import | Generic_USB | Intel_Graphic | RAID60 | 2012/07/25 | Import | Finish | |

And that the system has created 2 new share folders from the task just created.

| ome > Storage > Share Folders | 🕐 Help 🛇 | My favorite | டு • Shutd | lown 🞢 Loga |
|---|-----------|-------------|-----------------------|-------------|
| Shared Folders | | | | |
| 💿 Add 🎲 Edit 🔘 Remove 💆 NFS 🖏 Samba 🐻 Snapsho | t 🛛 🚰 ACL | | | |
| Folder name >> | RAID ID | File System | Public | Description |
| D Intel_Graphics_V614105398_XP | RAID60 | ext4 | yes | _ |
| Intel_Graphics_V614105398_XP-1 | RAID60 | ext4 | yes | |
| ▷ 🚞 N10850 | RAID60 | ext4 | yes | |
| NAS_Public | RAID | ext4 | yes | |
| - Charles I | | | | |

Copy: click on "Copy" and this screen appears.
 3 different options can be selected, folder to folder, folder to external device or external device to folder.



Folder to Folder



Folder to external device



External device to Folder

| ocal Backup > Copy > Ext | ernal Device to RAID Folder | |
|--------------------------|-----------------------------|--------|
| Nici . | Source Select Al | Target |
| | 🂣 🗖 Generic_USB | E RAID |
| | - | RAID60 |
| | | |
Let's take "Folder to External device" as an example. In the source pane, select the desired RAID volume and its associated folder list will appear; same method in the target pane for the associated external device.

| NO. | Source | Select All | Target | _ |
|-----|----------------|-------------|-------------------------|---|
| | 🧐 Return to Pa | rent Folder | Return to Parent Folder | - |
| | JIntel_G | raphi | 0 LSVM2_03 | |
| - | 🥘 🖾 Intel_Gr | raphi | 🕘 🔿 N10850 | |
| | | E. | 0 N4200PRO_02 | |
| | R6andy | | C R6andy | 1 |
| | | | 🥶 🛛 Realtek_LAN | |
| | | | 🕘 🕲 W2008_W7 | |
| | | | ggofactory | 4 |
| | | | 📑 💿 temp | |
| | Com | | | |

Select a folder from the source pane which is going to be copy over, then select in target pane it's destination.

| P. A. | Source | Select All | Target | 82 |
|-------|-----------|---------------|------------------|----|
| | Return to | Parent Folder | | ^ |
| | 📑 🖾 Intel | Graphi | O N10850 | _ |
| | E Intel | Graphi | @ N4200PRO_02 | |
| | | | all R6andy | |
| | R6an | | 🕘 🛛 Realtek_LAN | |
| | (Noain | | 🕘 © w2008_w7 | |
| | | | ggofactory | |
| | | | 📑 🕅 tema | |
| | | | 🥘 © xp3264-v5.71 | |
| | | | | |

Choosing the sync type, "Incremental" or 'Sync", and select the log path from the drop menu list.



Read the notes and check the "Accept" box for confirmation.

| Announce To perform system backup, the destination file in the same directory will be overwritten or deleted, please confirm before running backup. Destination path name exists in a different set of tasks, can lead to itself or other tasks to perform improperly. |
|--|
| Destination or source of the system files cannot be deleted; otherwise it will cause the task to run improperly. System will automatically list the destination directory name of the duplicate to avoid data coverage errors. |
| I Rccept |
| |

Now, you will see in the data guard task list that you have created a task.

| Auna Aran | t 🤤 Remove 🕞 Star | C Shap Ones | on end and | | 0.00 | store NAS Configurati |
|----------------|-------------------|---------------|-------------|---------------|-------------|-----------------------|
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status |
| E Category: lo | cal (2) | | | | | |
| import | Generic_USB | Intel_Graphic | RAID60 | 2012/07/25 | Import | Finish |
| CODY | RAID60 | R6andv | Generic USB | 2012/07/25 | Copy | Finish |

Realtime Backup: click on "Realtime Backup" and this screen will appear.
 2 different options can be selected from, folder to folder, folder to external device.

Let's take "Folder to Folder" backup for example. Select from the source pane the folder "NAS_Public", then select its destination in the target panefolder "R6andy".

| Source | Target |
|--|-------------------------|
| Return to Parent Folder Return to Parent Folder NAS_Public SOUSBCopy SOUSBCOPY SOUSBCOPy SOUSB | Return to Parent Folder |
| C ITunes_music | • |

Next, fill in the task name and related settings.

| W | Task Name: | realtimeback | | |
|-----|--------------------------|---|----------------|--|
| No. | Sync Type: | Incremental | 🔘 Sync | |
| | Backup Symbolic Link: | Off | On 🕐 | |
| | Log Location: | Intel_Graphics_Ve | 514105398_XP 👻 | |
| | Filter | M - 2020 - 202 | | |
| | Fie Size | | | |
| | | ✓ GB | (F) | |
| | Include File Ty | (and the second s | | |
| | Document | | Video 🔛 Music | |
| | C Other | | The state | |
| | - OUIGH | | | |
| | In a date of a | 222 | | |
| | Exclude File Ty | | | |
| | Document | | Video 🛄 Music | |
| | | | Video 🛄 Music | |
| | Document | | Video 🕅 Music | |
| | Document | | Video 🛄 Music | |

| Realtime Bac | kup |
|----------------------|---|
| Item | Description |
| Task Name | Input the task name, length limited to 4~12 characters. |
| Sync Type | Select "Incremental" or "Synchronize". |
| Backup Symbolic Link | Choose to backup symbolic link which is included in the source. |
| Filter | The filter can be set to be executed only in certain circumstances. If none of them has been selected, it will do the real time 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. |

Read the notes and check the $``\mbox{Accept}''$ box for confirmation.

| * | Announce |
|---|---|
| | To perform system backup, the destination file in the same directory will be overwritten or deleted, please confirm before running backup. Destination path name exists in a different set of tasks, can lead to itself or other tasks to perform improperly. Destination or source of the system files cannot be deleted; otherwise it will cause the task to run improperly. System will automatically list the destination directory name of the duplicate to avoid data coverage errors. |
| | V Accept |
| | Previous Finish Cancel |

Now, you can see in the data guard task list that your created task is listed. The task status will say "Processing" untill the "Stop" button is pressed.

| G (J. co. | Remove 🕑 Star | Contra Onite | and citing | | 0 | store NAS Configuratio |
|----------------|---------------|---------------|---------------|---------------|-------------|------------------------|
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status |
| E Category: lo | cal (3) | | | | | |
| import | Generic_USB | Intel_Graphic | RAID60 | 2012/07/25 | Import | Finish |
| сору | RAID60 | R6andy | Generic_USB | 2012/07/25 | Сору | Finish |
| realback01 | RAID | NAS_Public | RAID60/R6andy | 2012/07/25 | Realtime | Processing |

4. **Schedule Backup:** click on "Schedule Backup" and this screen will. 2 different choices can be selected from, folder to folder, folder to external device.

Let's use "Folder to External device" backup for our example. From the NAS volume RAID in the Source pane select the folder "NAS_Public", then in the target pane select the external USB disk folder "N10850".

| Source Source | * 🗵 | Select All | Target | _ |
|---------------|----------------------|------------|-------------------------|---|
| 12 0 | Return to Parent Fol | der | Return to Parent Folder | ^ |
| | NAS_Public | | USVM2_03 | |
| | USBCopy | | 10850 N10850 | |
| | Module_Folder | - | 3 N4200PRO_02 | |
| | NAS_Module_ | E | C R6andy | |
| | NAS_Picture_ | | 🔤 🖱 Realtek_LAN | |
| | andy_local | | 🥶 🔿 w2008_w7 | 1 |
| | Tunes_music | | ggofactory | 1 |
| | snapshot | + | 🗾 🔿 temp | |

Next, fill in the task name and related settings.

| Schedule Bac | :kup |
|-------------------|--|
| Item | Description |
| Task Name | Input the task name, length limited to 4~12 characters. |
| Create Sub-folder | If you choose to create a sub-folder, then it will use the task name |
| | as folder name then copy the source under it. Or it will copy the |
| | source to the same level as the destination. |
| Sync Type | Select "Incremental" or "Synchronize". |
| Log Location | Select from the drop down list where the task log will be stored. |
| Enable Schedule | Click to enable. If it is not checked, the task won't start unless you |
| | select the associate task and click "Start" from the task list page. |
| Time | Specify the time for the backup to start. |
| Schedule | Can choose daily, weekly or monthly. |

| * | Task Name: | shdback01 | | | | |
|---|-------------------|--|---|--|--|--|
| | Create Subfolder: | Create(named as task name) | Don not create(directly backup to target) | | | |
| | Sync Type: | Incremental | O Sync | | | |
| | Log Location: | Sandy 📉 | | | | |
| | Enable Schedule | | | | | |
| | Time: | 00 🕶 : 00 🛩 | | | | |
| | Schedule: | O Monthly O Wee | | | | |
| | | 00 👻 Monday | × | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

Read the notes and check the "Accept" box for confirmation.

| ** | Announce |
|----|---|
| | To perform system backup, the destination file in the same directory will be overwritten or deleted, please confirm before running backup. Destination path name exists in a different set of tasks, can lead to itself or other tasks to perform improperly. Destination or source of the system files cannot be deleted; otherwise it will cause the task to run improperly. System will automatically list the destination directory name of the duplicate to avoid data coverage errors. |
| | ⊠ Accept |

Now, you will see in the data guard task list that you have created a task.

| | | | | | | - |
|----------------|-------------|---------------|---------------|---------------|-------------|------------|
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status |
| E Category: lo | cal (4) | | | | | |
| import | Generic_USB | Intel_Graphic | RAID60 | 2012/07/25 | Import | Finish |
| сору | RAID60 | R6andy | Generic_USB | 2012/07/25 | Сору | Finish |
| realback01 | RAID | NAS_Public | RAID60/R6andy | 2012/07/25 | Realtime | Processing |
| shdback01 | RAID | NAS Public | Generic USB | 2012/07/26 | Schedule | Finish |

 iSCSI Backup: click on "iSCSI Backup" and screen appear as below. It can be backup to two different storage pool, iSCSI to folder, iSCSI to external device.



Let's take example to have "iSCSI to Folder" backup, from existed iSCSI volume "iSCSI_iscsiv502" to volume RAID folder "andy_local".

The source pane listed "iSCSI_iscsiv502" and "iSCSI_iscsiv50" where are iscsi volume has existed in this system with name "iSCSI_+iscsi target volume name".

| Source | Target | |
|-----------------------|-------------------------|---|
| I III ISCSI iscsiv502 | Return to Parent Folder | - |
| SCSI_jscsiv50 | NAS_Public | |
| | USBCopy | |
| | C_Module_Folder_ | 1 |
| | O_NAS_Module | a a |
| | INAS_Picture_ | 1 |
| | andy_local | 1 |
| | 🕘 🛛 iTunes_music | |
| | 🔠 🔿 snapshot | - |
| | I III ISCSI Iscalv502 | Image: State Stat |

Next, provide the task name and where the task log will store.

| Log Location: |
|---------------|
| |

Reading the note and check on "Accept" for confirmation.



Now, from the data guard task list will have created task listed. To start the iSCSI volume backup, select the task and click "Start" from task bar.

| 🔾 Add 炎 Edit | 😂 Remove 🕞 Star | t 🖲 Stop 🕙 Rest | ore 🕲Log | | 🕀 Res | tore NAS Configurati |
|----------------|-----------------|-----------------|-----------------|---------------|-------------|----------------------|
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status |
| B Category: lo | eal (3) | | | | | |
| import | silconpowe | NAS_Public, u | RAID1 | 2012/07/23 | Import | Finish |
| сору | raid0iscsi0 | msvs2010 | RAID1/NAS_P | 2012/07/23 | Сору | Finish |
| iscsiback01 | | iSCSI_iscsiv502 | RAID/andy_local | | iSCSI | |

Once "Start" click, the associated iSCSI volume will not allow to I/O during backup processing. And the task status will change to 'Processing".

| 📀 Add 🎲 Edit | \ominus Remove 🕟 Star | t 💿 Stop 🕙 Rest | ore 🕒 Log | | 🔁 Re | estore NAS Configurati |
|-----------------|-----------------------|-----------------|-----------------|---------------|-------------|------------------------|
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status |
| 🗏 Category: loc | eal (3) | | | | | |
| import | siliconpowe | NAS_Public, u | RAID1 | 2012/07/23 | Import | Finish |
| сору | raid0iscsi0 | msvs2010 | RAID1/NAS_P | 2012/07/23 | Сору | Finish |
| iscsiback01 | | iSCSI_iscsiv502 | RAID/andy_local | | iSCSI | Processing |
| | | | | | () | |

States change to "Finish" after task complete.

| S ADD SED | t 🤤 Remove 🕞 Star | (Charles Contest | ore (grog | | (Since | store NAS Config |
|----------------|-------------------|---------------------------|----------------------|---------------|-------------|------------------|
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status |
| Category: lo | cal (3) | | | | | |
| | 1.7 | NAS_Public, u | RAID1 | 2012/07/23 | Import | Finish |
| import copy | 1.7 | NAS_Public, u msvs2010 | RAID1 RAID1/NAS_P | | | Finish Finish |

From the RAID volume folder 'andy_local', it has backup iSCSI volume file stored. This backup iSCSI volume file is needed while it required import to storage. Next topic will describe about this.

| Edit View | Favorites Tools Help |
|--|--|
| Back - 🧲 |) - 🏂 🔎 Search 🜔 Folders 💷 - |
| ess 🛿 172. | 16.64.191\andy_local |
| File and Folde Make a nev Publish this Web | lokler iSCSI_iscsiv502 |
| | File Edit View Favorites Tools Help |
| Other Places | 🔇 Back 🔹 🔘 - 🎓 🔎 Search 🌔 Folders 🛄 - |
| 😼 N8900pm (| Address 🛅 \\172.16.64.191\andy_local\/5C51_lscs//502 |
| My Docume Shared Doc My Comput | File and Folder Tasks |

6. **iSCSI Import:** click on "iSCSI Import" and screen appear as below. It can be imported from two different storage pools, folder to iSCSI or external device to iSCSI. It is depend on where iSCSI volume has backup to.



Let's take example to import "RAID folder to iSCSI" which is the iSCSI volume we have backup earlier to RAID volume folder andy_local than import to volume RAID.

| Source | | Target |
|-----------|----------------|-----------------------|
| Return to | Parent Folder | RAID5 |
| 🕘 🔿 NAS_ | Public | |
| USBC | yqq | RAID60 |
| 📑 🔿 _Mod | ule_Folder_ | |
| 🥶 🔿 _NAS | _Module | |
| 🥶 🔿 _NAS | _Picture_ | |
| 🥶 🖲 andy_ | local Source | |
| 🕘 🗇 iTune | s_music 🛛 🔯 Re | turn to Parent Folder |
| 📑 🔿 snaps | hot 🧾 🕅 | SCSI iscsiv502 |

Next, provide where the task log will store.



Reading the note and check on "Accept" for confirmation.



Now, from the data guard task list will have created task listed.

| and areas | GRemove 🕑 Star | C S July Crimes | ore reaction | | Om | store NAS Configuration |
|----------------|-----------------|-----------------|---------------|---------------|--------------|-------------------------|
| Task Name | Source Path | Source Folder | Target Path | Last Run Time | Backup Type | Status |
| E Category: lo | cal (5) | | | | | |
| import | Generic_USB | Intel_Graphic | RAID60 | 2012/07/25 | Import | Finish |
| сору | RAID60 | R6andy | Generic_USB | 2012/07/25 | Сору | Finish |
| realback01 | RAID | NAS_Public | RAID60/R6andy | 2012/07/26 | Realtime | Lose target |
| shdback01 | RAID | NAS_Public | Generic_US8 | 2012/07/26 | Schedule | Finish |
| import iscsi | RAID/andy_local | ISCSI iscsiv502 | RAID | 2012/07/26 | ISCSI Import | Finish |

Volume Expansion Management

The user guide please refers to URL below. http://www.thecus.com/download/manual/AllinOne_64bit/Volume_Expansion_v1.0.pdf

Appendix A: Customer Support

If your Thecus IP storage is not working properly, we encourage you to check out **Chapter 6: 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/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/support_tech.php

Customers in the US should send all technical support enquiries to the US contact window included in the following web page:

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For Sales Information you can e-mail us at:

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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:

| Percentage Used |
|-----------------|
| 100% |
| 1/n x 100% |
| (n-1)/n x 100% |
| (n-2)/n x 100% |
| 50% |
| (n-1)/n x 100% |
| (n-2)/n x 100% |
| 100% |
| |

n : HDD number

Appendix C: How to open the top cover



N8900 series:

N12000 series:



Model Name:N16000 series

Appendix D: 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.

Appendix E: Licensing Information

Overview

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