

User's Manual

N8900 series/N12000 series/N16000 series/N12850/N16850 N5550/N5810/N5810PRO/N6850/N8850/N10850/ N7700PRO V2/N7710 series/N8800PRO V2 / N8810U series/N4510U series/N7510/N7770-10G/N8880U-10G

Copyright and Trademark Notice

Thecus and other names of Thecus product_s are registered trademarks of Thecus Technology Corp. Microsoft, Windows, and the Windows logo are registered trademarks of Microsoft Corporation. Apple, iTunes and Apple OS X are registered trademarks of Apple Computers, Inc. All other trademarks and brand names are the property of their respective owners. Specifications are subject to change without notice.

Copyright © 2016 Thecus Technology Corporation. All rights reserved.

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 series / N12000 / N16000 series/N12850/N16850/N6850/N8850/N10850/N7700PRO V2/N8800PRO V2/N7710 series/N8810U series/N5550/N4510U series/N7510/N5810/N5810PRO/N7770-10G/N8880U-10G Manual Version: 6.3 Release Date: March 2016

Limited Warranty

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

Check the functions that are available on your particular Thecus NAS model at:

http://www.Thecus.com

Safety Warnings

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

- Read this manual thoroughly before attempting to set up your Thecus IP storage.
- Your Thecus IP storage is a complicated electronic device. DO NOT attempt to repair it under any circumstances. In the case of malfunction, turn off the power immediately and have it repaired at a qualified service center. Contact your vendor for details.
- DO NOT allow anything to rest on the power cord and DO NOT place the power cord in an area where it can be stepped on. Carefully place connecting cables to avoid stepping or tripping on them.
- Your Thecus IP storage can operate normally under temperatures between 5°C and 40°C, with relative humidity of 20% – 85%. Using Thecus IP storage under extreme environmental conditions could damage the unit.
- Ensure that the Thecus IP storage is provided with the correct supply voltage. Plugging the Thecus IP storage to an incorrect power source could damage the unit.
- 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.
- A 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.
- A Risk of explosion if battery is replaced by an incorrect type.
- Dispose of used batteries according to the instructions

Table of Contents

About This Menuel	2
About This Manual	2
Limited Warranty	2
Safety Warnings	3
Table of Contents	
Chapter 1: Introduction	7
Overview	
Product Highlights	
Package Contents Front Panel	
Rear Panel	
Chapter 2: Hardware Installation	
Overview	
Before You Begin	
Cable Connections	
Chapter 3: First Time Setup	46
Overview	46
Thecus Setup Wizard	
LCD Operation (N7700PRO V2/N8800PRO V2/ N7710 series/N8810U series/N5550/N5810/N5810PRO/N4510U	J
series/N7510/N7770-10G/N8880U-10G/N12850/N16850)	48
OLED Operation(Does not apply to the N7700PRO V2/N8800PRO V2/	
N7710 series/N8810U series/N5550/N5810/N5810PRO/N4510U	
series/N7510/N7770-10G/N8880U-10G)	
USB Copy	
Typical Setup Procedure	E 4
Chapter 4: System Administration	53
Overview	53 .53
Overview	53 53 53
Overview	53 53 53 54
Overview	53 53 53 54 56
Overview Web Administration Interface My Favorite Logout	53 53 53 54 56 56
Overview Web Administration Interface My Favorite. Logout . Language Selection. System Information General	53 53 53 54 56 56 57 57
Overview Web Administration Interface My Favorite Logout Language Selection System Information General Status	53 53 54 56 56 57 57 58
Overview Web Administration Interface My Favorite Logout Language Selection System Information General Status Logs.	53 53 53 54 56 56 57 58 58
Overview Web Administration Interface My Favorite Logout Language Selection System Information General Status Logs. Syslog Management	53 53 54 56 56 57 58 58 58 60
Overview Web Administration Interface My Favorite. Logout Language Selection. System Information General. Status. Logs. Syslog Management. System Monitor.	53 53 54 56 56 57 58 58 60 61
Overview Web Administration Interface My Favorite Logout Language Selection System Information General Status Logs. Syslog Management. System Monitor Hardware Information	53 53 54 56 57 58 58 58 60 61 61 63
Overview Web Administration Interface My Favorite Logout Language Selection System Information General Status Logs. Syslog Management. System Monitor Hardware Information User Access Log	53 53 54 56 57 57 57 58 57 58 60 61 63 63
Overview Web Administration Interface My Favorite Logout Language Selection System Information General Status Logs. Syslog Management System Monitor Hardware Information	53 53 53 54 56 57 57 57 57 57 57 57 57
Overview Web Administration Interface My Favorite. Logout Language Selection. System Information General Status. Logs. Syslog Management. System Monitor Hardware Information User Access Log System Management Date and Time: Setting system time Notification configuration	53 53 53 54 56 57 57 57 58 57 58 60 61 63 66 66 66 66
Overview Web Administration Interface My Favorite. Logout Language Selection. System Information General. Status. Logs. Syslog Management. System Monitor. Hardware Information User Access Log. System Management Date and Time: Setting system time Notification configuration. Firmware Upgrade.	53 53 53 54 56 57 57 57 57 58 60 61 63 66 66 66 66 66 67
Overview	53 53 53 54 56 57 57 57 57 58 60 61 63 66 66 66 66 66 66 66
Overview	53 53 53 54 56 57 57 57 57 57 57 57 57
Overview	53 53 54 56 57 57 57 57 58 57 58 57 58 60 61 63 66 66 66 66 66 67 68 69 70

	File System Check	72
	Wake-Up On LAN (WOL)	74
	SNMP Support	74
	UI Login Function	74
Syste	m Network	75
-	Networking	75
	VLAN	76
	DHCP/RADVD	77
	Linking Aggregation	78
	Additional LAN	80
Stora	ge Management	82
	Disk Information	82
	RAID Information	85
	NAS Stacking	98
	ISO Mount	.104
	Share Folder	.107
	Folder and sub-folders Access Control List (ACL)	. 110
	Snapshot	
	iSCSI	.116
	iSCSI Thin-Provisioning	.122
	Advance Option	
	Disk Clone and Wipe	
	High-Availability (N8900, N12000 series/N16000 series/N12850/N168	850
only)		.126
User a	and Group Authentication	135
	ADS/NT Support	.135
	Local User Configuration	.137
	Local Group Configuration	.139
	Batch Users and Groups Creation	.141
	User Quota	.142
	User and Group Backup	.142
	LDAP Support	.143
Netw	ork Service	143
	Samba / CIFS	.143
	AFP (Apple Network Setup)	
	NFS Setup	.147
	FTP	
	TFTP	.149
	WebService	
	UPnP	
	Bonjour Setting	
	SSH	.151
	DDNS	
	UPnP Port Management	
	WebDAV	
	Auto-Thumbnail	
	Thecus ID	
	VPN Client	
	VPN Server	.158
Applie	cation Server	
	iTunes® Server	.160
	App Installation	
	Auto App Installation	
Backı	лр	
	Dual DOM (N12000 series/N16000 series/N8900 series/N12850/N168	
only)		
	Rsync Target Server	
	ACL Backup and Restore	.164

Data Burn	
Data Guard (Remote Backup)	
Full Backup Custom Backup	
iSCSI Backup	
Restore	
Data Guard (Local Backup)	
USB Copy	
Volume Expansion Management	
Thecus Backup Utility	
Windows XP Data Backup	
Apple OS X Backup Utilities	
External Devices	199
Printers	
Uninterrupted Power Source	204
Chapter 5: Tips and Tricks	205
USB and eSATA Storage Expansion	205
Remote Administration	205
Part I - Setup a DynDNS Account	
Part II - Enable DDNS on the Router	
Part III - Setting up Virtual Servers (HTTPS)	
Firewall Software Configuration	
Replacing Damaged Hard Drives	
Hard Drive Damage	
Replacing a Hard Drive	
RAID Auto-Rebuild	
Chapter 6: Troubleshooting	208
Forgot My Network IP Address	208
Can't Map a Network Drive in Windows XP	208
Can't Map a Network Drive in Windows XP Restoring Factory Defaults	208 208
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings	208 208 209
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000	208 208 209 D
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only)	208 208 209) 209
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support	208 208 209 0 209 210
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics	208 208 209 0 209 210 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview	208 209 0 209 209 210 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits	208 208 209 209 209 209 210 211 211 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance	208 208 209 209 209 209 209 210 211 211 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance Data Security	208 208 209 209 209 209 209 209 209 209 210 211 211 211 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance Data Security RAID Levels.	208 209 209 209 209 210 211 211 211 211 211 211 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance Data Security RAID Levels Appendix C: How to open the top cover	208 209 209 209 209 209 210 211 211 211 211 211 211 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance Data Security RAID Levels. Appendix C: How to open the top cover	208 209 209 209 209 209 209 209 209 210 211 211 211 211 211 211 214
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance Data Security RAID Levels Appendix C: How to open the top cover N8900 series: N12000 series/N12850:	208 209 209 209 209 209 209 209 209 209 210 211 211 211 211 211 211 211 211 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Data Security RAID Levels Appendix C: How to open the top cover N8900 series: N12000 series/N12850: N16000 series/N16850:	208 209 209 209 209 210 210 211 211 211 211 211 211 211 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance Data Security RAID Levels Appendix C: How to open the top cover N8900 series: N12000 series/N12850:	208 209 209 209 209 209 210 211 211 211 211 211 211 211 211 214 214
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only). Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance Data Security RAID Levels Appendix C: How to open the top cover N8900 series: N12000 series/N12850: N16000 series/N16850: Appendix D: Active Directory Basics Overview	208 209 209 209 209 209 209 209 209 209 210 211 211 211 211 211 211 211 211 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance Data Security RAID Levels Appendix C: How to open the top cover N8900 series: N12000 series/N12850: N16000 series/N16850: Appendix D: Active Directory Basics Overview What is Active Directory?	208 209 209 209 209 210 210 211 211 211 211 211 211 214 214 214 215 215 215 216 216 216
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only). Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Data Security RAID Levels. Appendix C: How to open the top cover N8900 series: N12000 series/N12850: N16000 series/N16850: Appendix D: Active Directory Basics Overview What is Active Directory? ADS Benefits.	208 209 209 209 209 209 210 211 211 211 211 211 211 211 211 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance Data Security RAID Levels Appendix C: How to open the top cover N8900 series: N12000 series/N12850: N16000 series/N16850: Appendix D: Active Directory Basics Overview What is Active Directory?	208 209 209 209 209 209 210 211 211 211 211 211 211 211 211 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only). Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Data Security RAID Levels. Appendix C: How to open the top cover N8900 series: N12000 series/N12850: N16000 series/N16850: Appendix D: Active Directory Basics Overview What is Active Directory? ADS Benefits.	208 209 209 209 209 210 211 211 211 211 211 211 211 214 214 214
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance Data Security RAID Levels Appendix C: How to open the top cover N8900 series: N12000 series/N12850: N16000 series/N16850: Appendix D: Active Directory Basics Overview What is Active Directory? ADS Benefits Appendix E: Licensing Information	208 209 209 209 209 210 211 211 211 211 211 211 211 211 211
Can't Map a Network Drive in Windows XP Restoring Factory Defaults Problems with Time and Date Settings Dual DOM Supports for Dual Protection (N12000 series/N16000 series/N8900 series/N12850/N16850 only) Appendix A: Customer Support Appendix B: RAID Basics Overview Benefits Improved Performance Data Security RAID Levels Appendix C: How to open the top cover N8900 series: N12000 series/N12850: N16000 series/N16850: Appendix D: Active Directory Basics Overview What is Active Directory? ADS Benefits.	208 208 209 209 209 209 210 211 211 211 211 211 211 211 211 211

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 Series/N12000/N16000 Series/N12850/N16850/N8800PRO V2/N8810U

series/N4510U-R/N4510U PRO-R/N8880U-10G

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/N5810/N5810PRO/N7770-10G

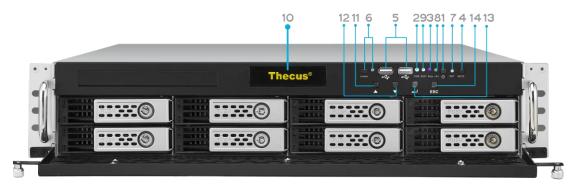
The Thecus IP storage should contain the following common items:

- 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

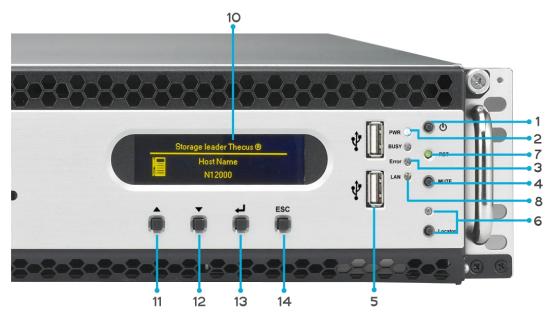
N8900 series:



Front Pane	
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:

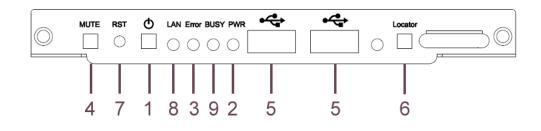


Front Pane	Front Panel	
Item	Description	
1.Power Button	Power on/off N12000	
2.Power LED	• Solid green: System is power on.	
3.System error LED	Solid RED: System error.	
4.Mute button	• Mute the system fan alarm.	
5.USB Port	 USB 2.0 port for compatible USB devices, such as USB disks and USB printers 	
6. Locator button /	 Press the button, the back led will light up to identify the system 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:

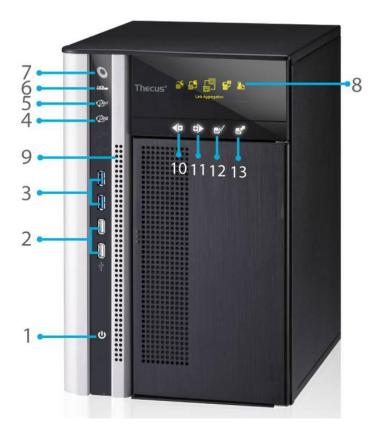




Front Pane	l de la companya de l
Item	Description
1.Power Button	Power on/off N16000
2.Power LED	• Solid green: System is power on.
3.System error LED	Solid RED: System error.
4.Mute button	• Mute the system fan alarm.
5.USB Port	 USB 2.0 port for compatible USB devices, such as USB disks and USB printers
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 ↓	 Push to enter OLED operate password for basic system setting
14.Escape Button	 Push to leave the current OLED menu
ESC	

N6850:

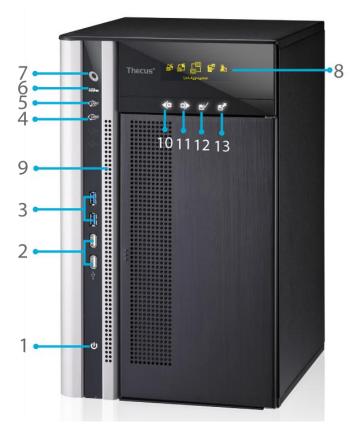
The Thecus N6850's front panel has the device's controls, indicators, and hard disk trays:



	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	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

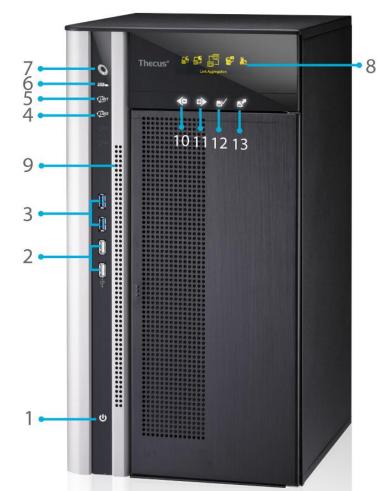
N8850:

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



Front Pane	
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	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

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



Front Pane	
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/N7770-10G: The Thecus N7700PRO V2/N7710 series front panel has the device's controls, indicators, and hard disk trays:



Front Pane	
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/N7770-10G
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/N8880U-10G: The Thecus N8800PRO V2/N8810U series front panel has the device's controls, indicators, and hard disk trays:



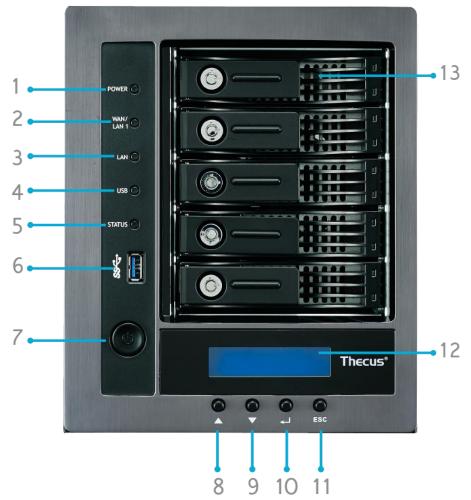
Front Pane	
Item	Description
1.Power Button	 Power on/off N8800PRO V2/N8810U series/N8880U-10G
2.Power LED	Solid green: System is power on.
3.Reboot Button	Press to system reboot
4.System fan alarm LED	Solid red: system fan failure notification
5. Mute button	Mute the system fan alarm.
6.USB Port	USB 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 V	 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.

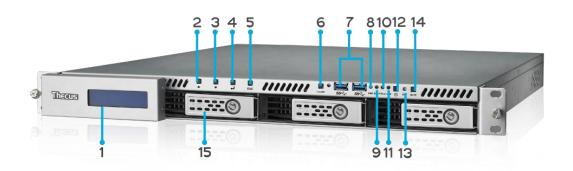
N5810/N5810PRO: The Thecus N5810/N5810PRO front panel has the device's controls, indicators, and hard disk trays:



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

N4510U:

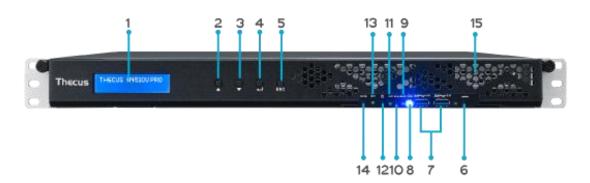
The Thecus N4510U front panel has the device's controls, indicators, and hard disk trays:



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:

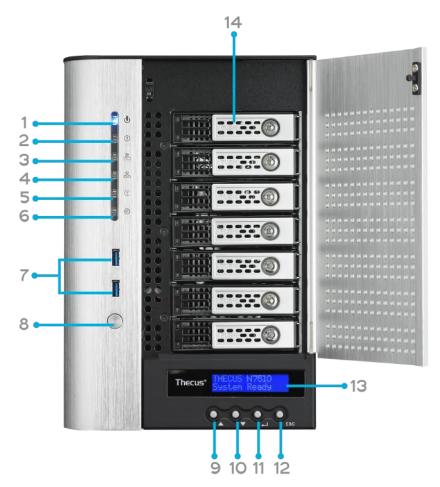
The Thecus N4510U PRO front panel has the device's controls, indicators, and hard disk trays:



	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:

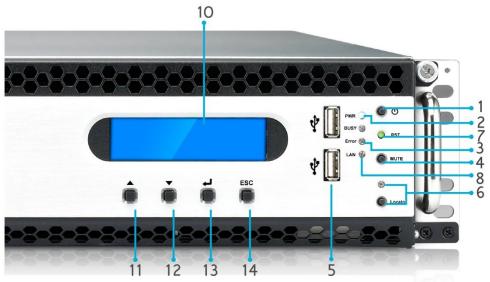
The Thecus N7510 front panel has the device's controls, indicators, and hard disk trays:



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

N12850:

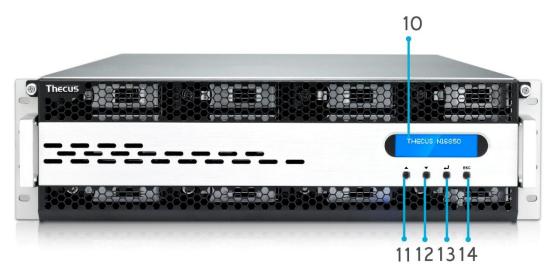
The Thecus N12850 front panel has the device's controls, indicators, and hard disk trays:

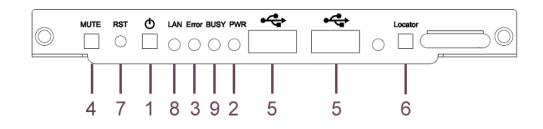


Front Panel	
Item	Description
1.Power Button	Power on/off N12850
2.Power LED	Solid green: System is power on.
3.System error LED	Solid RED: System error.
4.Mute button	• Mute the system fan alarm.
5.USB Port	\bullet USB 2.0 port for compatible USB devices, such as USB disks and
	USB printers
6. Locator 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.LCD	 Displays current system status and messages
	• LCD screen saver will be enabled after screen is idle for more than
	3 minutes
	 LCD screen will be turn off after idle for more than 6 minutes
11.Up Button ▲	 Push to scroll up when using the OLED display
12.Down Button ▼	 Push to enter USB copy operation screen
لے 13.Enter Button	 Push to enter OLED operate password for basic system setting
14.Escape Button	 Push to leave the current OLED menu
ESC	

N16850:

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

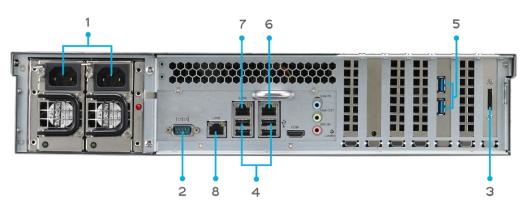




Front Pane	Front Panel	
Item	Description	
1.Power Button	Power on/off N16850	
2.Power LED	Solid green: System is power on.	
3.System error LED	Solid RED: System error.	
4.Mute button	• Mute the system fan alarm.	
5.USB Port	USB 2.0 port for compatible USB devices, such as USB disks and USB printers	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

Rear Panel

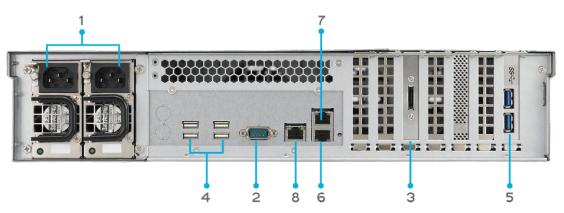
N8900



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:

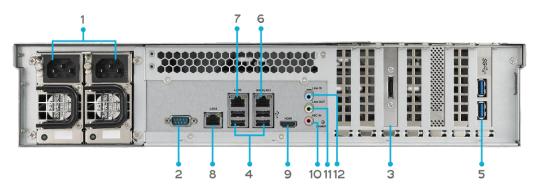
The N12000 rear panel features ports and connectors.



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.

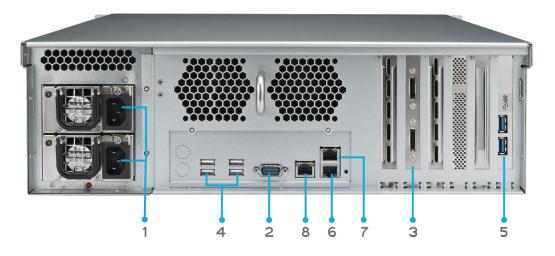
N12000V/N12000PRO: N12000V/N12000PRO rear panel features ports and connectors.



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

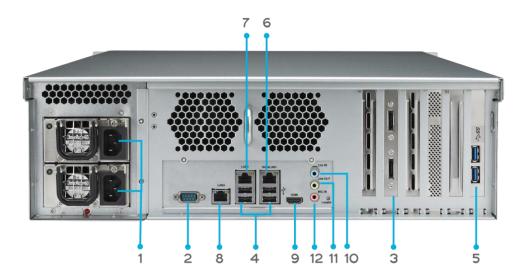
N16000:

The N16000 rear panel features ports and connectors.



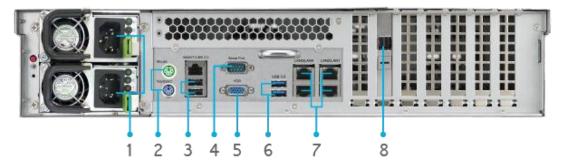
Back Panel	
Item	Description
1.Power Connector	 Connect the included power cords to these connectors
2.Serial Port	 This port is for external UPS device
3.eSATA Port	 eSATA port for high-speed storage expansion
4.USB Port	• USB 2.0 port for compatible USB devices, such as USB disks, and
	USB printers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

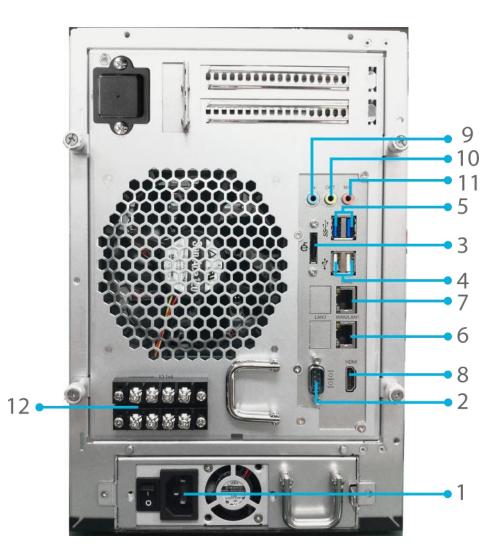
N12850/N16850: N12850/N16850 rear panel features ports and connectors.



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

N6850:

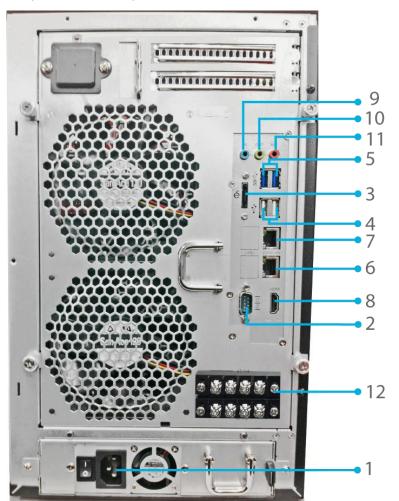
The N6850 rear panel features ports and connectors.



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:

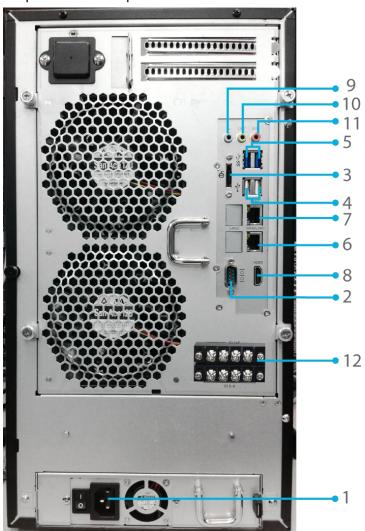
The N8850 rear panel features ports and connectors.



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:

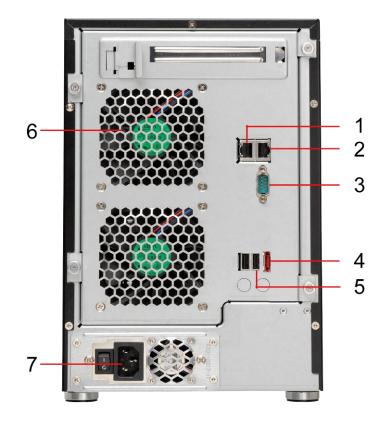
The N10850 rear panel features ports and connectors.



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:

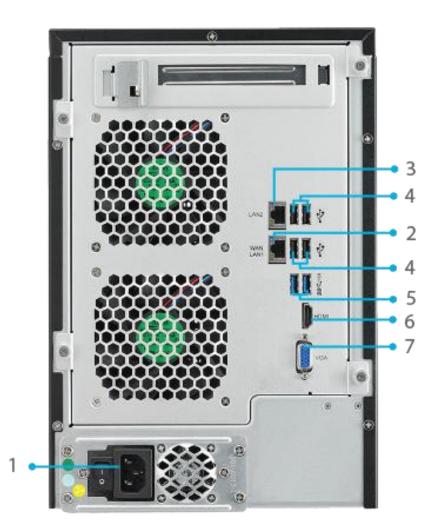
The N7700PRO V2 rear panel features ports and connectors.



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/N7770-10G:

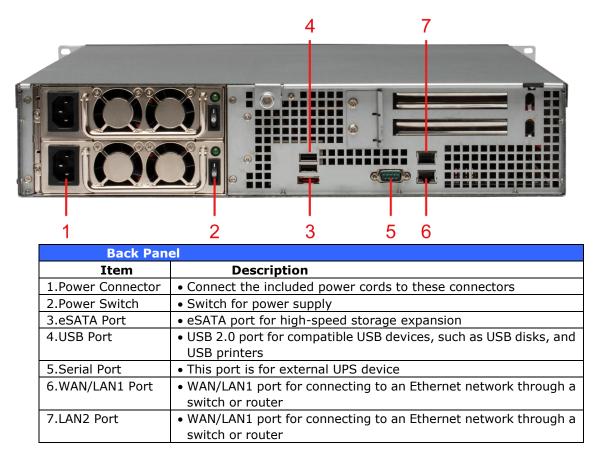
The N7710 series rear panel features ports and connectors.



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.



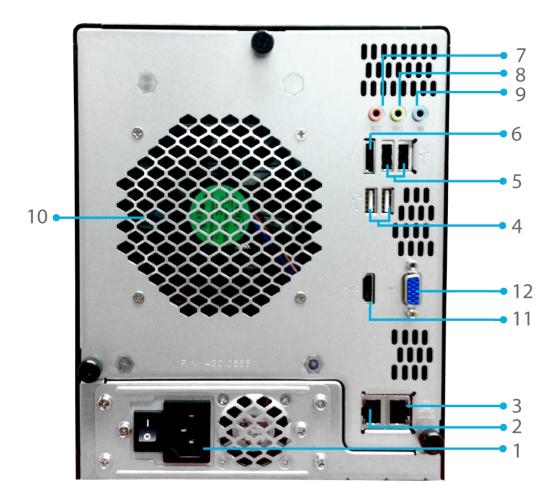
N8810U series/N8880U-10G: The N8810U series rear panel features ports and connectors.



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:

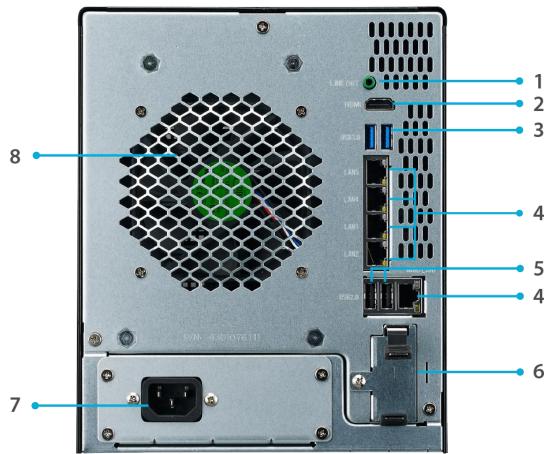
The N5550 rear panel features ports and connectors.



Back Pan	el		
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		
	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		

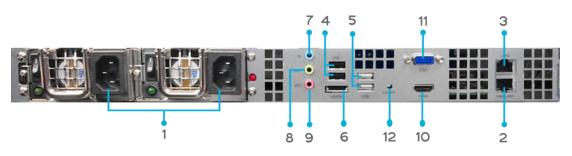
N5810/N5810PRO:

The N5810/N5810PRO rear panel features ports and connectors.



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

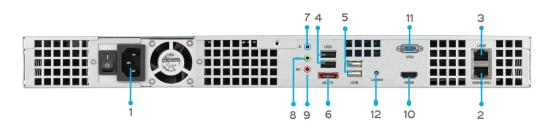
N4510U-R:



Back Pane				
Item	Description			
1.Power Connector	 Connect the included power cords to these connectors 			
2. WAN/LAN1 Port	'LAN1 Port • WAN/LAN1 port for connecting to an Ethernet network through 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:



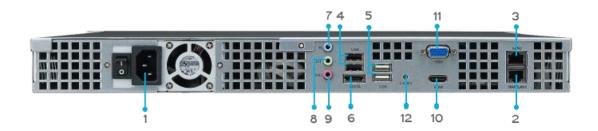
N4510U PRO-R:

			4 5			3
	•					
	1	89	6	12	10	2
Back Pane						
Item	Descriptio	n				
1.Power Connector	Connect the includ	ed pov	ver c	ords to t	hese	connectors
2. WAN/LAN1 Port	WAN/LAN1 port for	r conn	ecting	g to an E	thern	et network through a

2. WAN/LANI FOR	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.

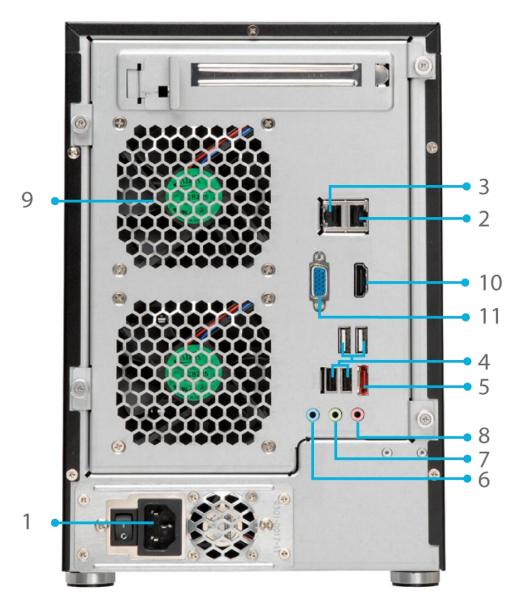
N4510U PRO-S:

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 sw 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:

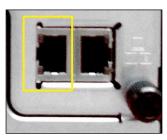
- 1. Read and understand the **Safety Warnings** outlined in the beginning of the manual.
- 2. If possible, wear an anti-static wrist strap during installation to prevent static discharge from damaging the sensitive electronic components on the Thecus IP storage.
- 3. Be careful not to use magnetized screwdrivers around the Thecus IP storage's electronic components.

Cable Connections

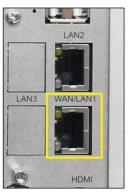
To connect the Thecus IP storage product to your network, follow the steps below:

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/N12850/N16850 WAN/LAN1 port



N6850/N8850/N10850
WAN/LAN1 port

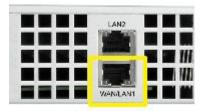


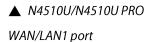
▲ N7700PRO V2 WAN/LAN1 port

▲N5550 WAN/LAN1 port



N8800PRO V2/N8810U series/N8880U-10G WAN/LAN1 port







series/N7770-10G WAN/LAN1

port



▲ N5810/N5810PRO WAN/LAN1 port

2. 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/N12850/N16850 power socket



▲ N6850/N8850/N10850 power socket





- ▲ N7700PRO V2 /N7710 series/N7510/ N7770-10G power socket
- N8800PRO V2/N8810U/N8880U-10G series power socket





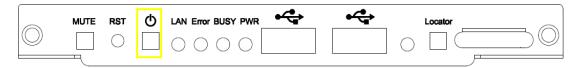
▲ N5550 power socket

▲ N4510U/N4510U PRO power socket



▲ N5810/N5810PRO power socket

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



▲ N12000 series/N16000 series/N8900 series/N12850/N16850 power button



▲ N6850/N8850/N10850 power button



▲ N5550 power button



▲ N5810/N5810PRO power button





- ▲ N7700PRO V2/N7710 series/ N7510/N7770-10G power button
- ▲ N8800PRO V2/N8810U series/N8880U-10G power button



▲ N4510U power button



▲ N4510U PRO 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	Stora	age Ap	oplia	inc
Device Discovery		De	vice Disc	overy	Ve	arsion: 2.0
Login System		Name 900 19	IP 2.168.0.102	MAC 00-14-FD-13-	98-BC	G 192
Network Configuration						
Change Password						
Complete						
	< [Alexand and a				•

- 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		

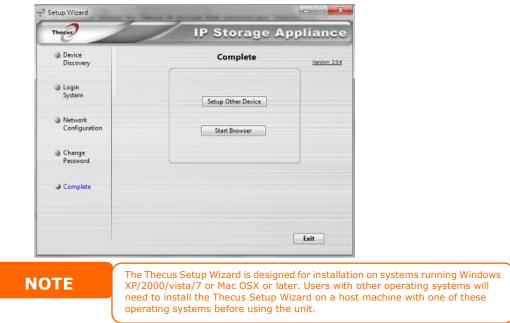
6. Name your Thecus IP storage and configure the network IP address. If your switch or router is configured as a DHCP Server, configuring the Thecus IP storage to automatically obtain an IP address is recommended. You may also use a static IP address and enter the DNS Server address manually.

Thegus	IP Storage App	olianc
Device Discovery	Network Configuration	Version: 2.0
Login System	Host Name: N8900 IP Type	
Syncin	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: 19236803	
		J

7. Change the default administrator password.

Thecus	IP Storage Ap	plianc
Device Discovery	Change Password	Version 20
Login System		
Network Configuration	New Password:	
Change Password	Contra ni reguna	
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/N5810/N5810PRO/N4510U series/N7510/N7770-10G/N8880U-10G/N12850/N16850)

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

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.		
ъ	Enter	Enter the selected menu option, sub-menu, or parameter setting.		
ESC	Escape	Escape and return to the previous menu.		

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**.

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/N5810/N5810PRO/N4510U series/N7510/N7770-10G/N8880U-10G)

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		
Icon Function		Description
	▲ Up Button Select the previous configuration settings option.	
▼	Down Button	USB copy confirmation display.
Image: LargeEnterEnter the selected menu option, sub-menu, or particularESCEscapeEscape and return to the previous menu.		Enter the selected menu option, sub-menu, or parameter setting.
		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)



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

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

User Name: admin Password: admin

NOTE

% 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 feature and enable the registration function. The registration page will confirm what system information will be stored. Users will receive regular firmware upgrades and module release notifications.	
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.

ThecusOS™						News Log Language: <mark>English v</mark>
× • • • • • • • • • • • • • • • • • • •	Home				🕜 Help 📿	۰-My favorite لل• Shutdown ภ المعامية Logout
System Information General Status System Log Online Registration Syslog Management Syslog Management Montor	Tunes Server	Share Folders	RAID Management	General	Notifications	Scheduled On/Off
User Access Log	System Log	FTP	ISCSI	Disk Information	Status	
System Management						
Storage +						
Ser and Group Authentication						
Application Server						
Backup						
External Devices						
II 🖸 🛛 🚺 🛋						THECUS N4800Eco V2.03.08.cdv

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.

٩	~	Home > System I	nformation > General	🕜 Help	♡• My favorite	ن Shutdown	纾 Logout
🕕 System Information	-	Product Infor	mation				
General Status		Manufacturer	Thecus	-			

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	Use the Network Service menu to make network
	service support settings.
Application Server	App and iTunes Server set-up of the Thecus IP storage.
Backup	Category of Backup Features setup of the Thecus IP storage.
External Devices	The Thecus IP storage supports printer server and UPS via USB interface.

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.
J	Temperature	Display system temperature, click to go to System Status page as shot cut.
4	Network.	Green: Connection to the network is normal. Red: abnormal connection to the network

Logout

এ∰ Logout

Click to logout Web Administration Interface.

Language Selection

The Thecus IP storage supports multiple Languages,

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



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.

General

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 🖃	N4800Eco	
🖳 🤐 General	2	
Status	Manufacturer:	Thecus
📲 System Log Wanagement	Product No.:	N4800Eco
System Monitor	Firmware Version:	2.05.08.cdv
Hardware Information	Up Time:	6 Minutes
🤐 🗐 User Access Log		

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.	

The Thecus N8900/N12000/N16000/N12850/N16850 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			
		Service Status N8900	D16000 - 4		
		CPU Activity:	0.25 %	Home > System Informatio	n > Status
		Memory Activity:	8.1 %		
Home > System Inform	ation > Status	CPU Fan Speed:	2934 RPM	Service Status N8900 D	16000 - 4
		System Fan Speed1:	5744 RPM		
Service Status N890	00 D16000 - 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 Temperature3	27 90/00 6 95
SMB/CIFS Status:	Running	System Temperature3:	28 °C/82.4 °F	System Temperature2:	37 °C/98.6 °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	system remperatured.	30 G100.4 P
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

Logs

System Information		10.000 V Record(s) Auto Expos	rt 🗸 🌍 Apply Display System 👻 All 🗸	Level H Export Record O Delete Record	Auto Refresh None
General Status		Date Time	Event		
System Log		2014-06-11 13:07:34	[N4510UPRO-S] : User admin logg	ed in from 172.16.64.149	
Online Registration		2014-06-11 13:01:25	[N4510UPRO-S] : SSH service start	s.	^
Syslog Management		2014-06-11 13:01:22	[N4510UPRO-S] : [N4510UPRO-S]	boot successfully.	
Hardware Information		2014-05-11 13:01:16	[N4510UPRO-S] : Healthy: The RA	ID [RAID] on system [N4510UPRO-S] is h	ealthy now.
User Access Log		2014-06-06 14:54:05	[N4510UPRO-S] : The system N45:	IOUPRO-S shutdown.	
	-	2014-05-29 11:20:04	[N4510UPRO-S] : SSH service start	5.	
System Management	*)*	2014-05-29 11:20:02	[N4510UPRO-S] : [N4510UPRO-S]	boot successfully.	
System Network	+1	2014-05-29 11:19:52	[N4510UPRO-S] : Healthy: The RA	ID [RAID] on system [N4510UPRO-S] is h	ealthy now.
	221	2014-05-28 13:18:08	[N4510UPRO-S] : The system N45	LOUPRO-S shutdown.	
Storage	*J'	2014-05-26 16:18:35	[N4510UPRO-S] : SSH service start	5.	
Juser and Group Authenticatic	2	2014-05-26 16:18:33	[N4510UPRO-S] : [N4510UPRO-S]	boot successfully.	
Network Service	1	2014-05-26 16:18:22	[N4510UPRO-S] : Healthy: The RA	[D [RAID] on system [N4510UPRO-S] is h	ealthy now.
		2014-05-26 16:18:16	[N4510UPRO-S] : Your system last	shutdown is abnormal.	~
 Application Server 	•	2014-05-21 18:16:10	[N4510UPRO-S] : User andv logge		
Backup	+1	14 4 1 / 3 Page 🕨	Page Size 50	Display 1 - 50 Re	cord(s) Total 119 Record(s)

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

Logs	
Item	Description
Number of records to	This can be selected from a dropdown list to export the log(s)
export	as a single file.
Export log option	This can be set to Auto Export or Auto Delete.
Log Type	The default logs displayed are for system events. From the
	dropdown list, administrators can choose from various forms

	of user access, such as AFP, Samba, etc.
	Note: Users need to enable the "User Access Log" service to
	view these details.
Log Level	ALL: Provides all log information including system, warning, and error messages.
	INFO: Shows information about system messages.
	WARNING: Shows only warning messages.
	ERROR: Shows only error messages.
Export Records	Export all logs to an external file.
Delete Records	Clear all log files.
Auto Refresh	Specify the auto refresh time interval.
The number of lines per	Specify the 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 through the log pages.
	Reload logs.
$ \mathcal{O} \rangle$	

Date Time	 Event 		
2014-06-11 13:07:34	♣↓ Sort Ascending	admin logged in from	172.16.64.149
2014-06-11 13:01:25	X↓ Sort Descending	service starts.	·
2014-06-11 13:01:22	A	10UPRO-S] boot succe	ssfully.
2014-06-11 13:01:16	Columns 🕨	Date Time	on system [N4510UPRO-S] is healthy now.
2014-06-06 14:54:05	[N4510UPRO-S] : The	Computer	shutdown.
2014-05-29 11:20:04	[N4510UPRO-S] : SSH	User	
2014-05-29 11:20:02	[N4510UPRO-S] : [N4	III IP	ssfully.
2014-05-29 11:19:52	[N4510UPRO-S] : Hea		on system [N4510UPRO-S] is healthy now.
2014-05-28 13:18:08	[N4510UPRO-S] : The		shutdown.
2014-05-26 16:18:35	[N4510UPRO-S] : SSH	🔄 Туре	
2014-05-26 16:18:33	[N4510UPRO-S] : [N4	V Event	ssfully.
2014-05-26 16:18:22	[N4510UPRO-S] : Hea	File Size	on system [N4510UPRO-S] is healthy now.
2014-05-26 16:18:16	[N4510UPRO-S] : You	r system last shutdown	is abnormal.
2014-05-21 18:16:10	[N4510UPRO-S] : Use	r andv logged in from 1	72.16.64.139
4 4 1 / 3 Page > > 6	🔁 Page Size 50 🔻 🗸		Display 1 - 50 Record(s) Total 119 Record(s)

Columns can also be added to display additional information about each event.

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
larget:	Local	🔿 Remote
Syslog folder:	NAS_Public ~	•
.og Level:	AL Y	
Remote IP Address:	172.16.65.14	7

Configuration with syslog client and target to store locally:

Syslog Daemon:	Enable	🔘 Disable
Syslog service:	🔘 server	elent
Target:	Ocal	🔘 Remote
Syslog folder:	NAS_Public ~	7
Log Level:	AI 👻	
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:	🔘 Local	Remote
Syslog folder:	NAS_Public 💙	
Log Level:	Al 💙	
Remote IP Address:	172.16.65.147	
Apply		

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

lime	
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 n de 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		One Image: Control of the second	O.05 MB Monitors • 0.025 MB
	_	Graphic Details Monitors •	Graphic Details Monitors -
X System Management			ℬ Fan (5)
System Network			Temperature (5)
Storage			
Ser and Group Authentication			
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:

Graphic Details Monitors -	Graphic Details Monitors -
20 Time: 19:07:53 20 CPU: 0 % Memory: 24.4 % 0 % 19:07 19:08 19:09 — CPU — Memory	Time: 19:08:13 eth0: 0 MB/s eth1: 0 MB/s eth2: 0 MB/s 0 MB 19:08 19:08 19:10
Saphic Details Monitors •	Graphic Details Monitors •
100 °C 10K RPM 0 °C 0K RPM 0 °C 0K RPM HDD_FAN1: 5625 RPM HDD_FAN2: 0 RPM HDD_FAN3: 5769 RPM HDD_FAN4: 0 RPM	4 100 MB

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

🔽 🏁 History

and system monitor will

display the history with different period for selection.



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 N4800Eco.

>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	Home > System Information > Hardware Information		
System Information	Conord	k Interface Card Universal Serial Bus Disk Controller	
🖳 General	General Networ	k Interface Card Oniversal Senai Bus Disk Controller	
👷 Status	CPU:	Intel CPU D2700 @ 2.13GHz	
📓 System Log	Managara	2004 MD	
Syslog Management	Memory:	2004 MB	
System Monitor	DOM:	Single DOM	
Hardware Information	0150		
User Access Log	OLED:	Agent Revision:1600.2.0 Pic Revision:13	

User Access Log

User Access Log:	Enable	O Disable			
Folder:	NAS_Public				
Service:	AFP	FTP	ISCSI	Samba/CIFS	SSH
Description	ist selected services	with associated ite	ms as shown below	v.	
AFP: Login, Logout FTP: Delete, Downlo ISCSI: Login, Logout Samba: Delete, Fold SSH: Login, Logout 2. To view the access I	er Create, Folder Op	ien, Read, Rename,	Write	ices.	

The **User Access Log Support** section allows administrators to select the desired protocols to record user activity for.

User Access Log	
Item	Description
User access log	Enable or disable the User Access Log service.
Folder	Select from the dropdown list where to store the user access log.
Service	Select from the check box which access details to record.
Apply	Click Apply to save changes.
Description	 The user access list will record different activities depending on which protocol is selected. 1. AFP: User login and logout. 2. FTP: User file deletion, uploads/downloads, folder creation, object renaming, and login and logout. 3. iSCSI (if applicable): User login and logout. 4. Samba: User file deletion, folder creation, folder opening, and object reading, renaming, and writing. 5. SSH (if applicable): User login and logout.

After the **User Access Log Support** has been set up and the "Apply" button selected, all selected services will restart.

To view user access details related to the selected service(s), please go to **System Log** and choose a service from the "Display" dropdown list.

Date	Comp	User	IP	Action	System	Event F	ile Size	
2014	andy	nobody	172.16	Open	and the second s	_Module_Folder_/Citrix Xen		
2014	andy	nebody	172.16	Open	Samba	_Module_Folder_		
2014	andy	nobody	172.16	Write	SSH	_Module_Folder_/Citrix Xen/XS_5.6_Server 2	88K	
2014	andy	nobody	172.16	Write	AFP	_Module_Folder_/Citrix Xen/XS_5.6_Server 3	04K	
2014	andy	nobody	172,16	Create	ISCSI	_Module_Folder_/Citrix Xen/XS_5.6_Server		
2014	andy	nobody	172.16	Write	File	_Module_Folder_/Citrix Xen/Citrix_XenServ 5	6K	
2014	andy	nobody	172.16	Write	File	_Module_Folder_/Citrix Xen/Citrix_XenServ 3	2K	
2014	andy	nobody	172.16	Write	File	_Module_Folder_/Citrix Xen/Citrix_XenServ 6	AK	
2014	andy	nobody	172.16	Write	File	_Module_Folder_/Citrix Xen/Citrix_XenServ 4	.0K	
2014	andy	nobody	172.16	Create	Folder	_Module_Folder_/Citrix Xen/Citrix_XenServ		
2014	andy	nobody	172.16	Write	File	_Module_Folder_/Citrix Xen/Citrix_XenApp 6	/92K	
2014	andy	nobody	172.16	Write	File	_Module_Folder_/Citrix Xen/Citrix_XenApp 4	00K	
2014	andy	nobody	172.16	Create	Folder	_Module_Folder_/Citrix Xen/Citrix_XenApp		,
2014	andv	nobody	172.16	Write	File	Module Folder /Citrix Xen/Apolication Ve 4	12K	

To export details from the User Access Log as a single file from target folder, administrators must first select the desired number of records from the dropdown list and also select the "Auto export" option. Please choose the number of logs export and click "Apply" to activate these settings.

10,000 🗸 Record(s) Auto Export 🗸	🕼 Apply Display System 🔻 All 🔽 Level 📑 Export Record 🥥 Delete Record 🛛 Auto Refresh None 💌	•
10,000	Event	
30,000 3:07 34	[N4510UPRO-S] : User admin logged in from 172.16.64.149	
50,000 3:01:25	[N4510UPRO-S] : SSH service starts.	`
2014-06-11 13:01:22	[N4510UPRO-S] : [N4510UPRO-S] boot successfully.	
2014-06-11 13:01:16	[N4510UPRO-S] : Healthy: The RAID [RAID] on system [N4510UPRO-S] is healthy now.	
2014-06-06 14:54:05	[N4510] IPRO-S] · The system N4510] IPRO-S shutdown	
10,000 🗸 Record(s) Auto Export 🗸	👸 Apply Display System 🗸 All 🗸 Level 🔚 Export Record 🥥 Delete Record 🛛 Auto Refresh None],
Date Time Auto Delete	Event	
2014-06-11 13:0 Auto Export	[N4510UPRO-S] : User admin logged in from 172.16.64.149	
2014-06-11 13:01:25	[N4510UPRO-S] : SSH service starts.	
2014 06 11 12:01:22	[MAS1010DO C] + [MAS1010DO C] boot successfully	

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

1-1112

access_log b dom_backu b dom_repair_log b syslog	up_log 🔊 log_20140611_161212
--	------------------------------

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.

Date and Time: Setting system time

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

•	<<	Home > System Management > Date and	Time
🕕 System Information	+	System Date and Time Settings	
🗙 System Management	=	Date:	06/28/2015
🔊 Date and Time		Time:	20:47 🗸
Notifications		Time Zone:	Asia/Taipei 💌
Firmware Upgrade		NTP Service:	© Enable
Administrator Password		Sync with an External NTP Server:	Yes O No
Config Mgmt		Select an external NTP server:	clock.isc.org
O Power Management		Apply	
File System Check			
Wake-On-LAN			
UI Login Functions			

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.
Select an external NTP	Choice an external NTP server.
server	
Apply	Click Apply to save changes.

WARNING

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

Notification configuration

From the **System Management** menu, choose the **Notifications** item, and the **Notifications 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.

	Home > System Management > Notific	ations			@+	Help 🗘 My favorite 🕻
i System Information	Notification Configuration					
🗙 System Management 🖃	Beep Notification	Enable	O Disable			
Date and Time	Email Notification	🔘 Enable	Oisable			
Eirmware Upgrade	Authorization Type:	~				
Scheduled On/Off	Security Type:	~				
- 🕵 Administrator Password - 🚰 Config Mgmt	TLS Certificate:	~				
Factory Default	SMTP Server:			Port:		
O Power Management	SMTP Account ID:					
- 🧽 File System Check - 🚅 Wake-On-LAN	Account Password:					
SNMP	Log Level:	v				
🖓 UI Login Functions	Sender's E-mail Address:					
	HELO/EHLO Domain Name:					
	Recipient's E-mail Address 1:					
	Recipient's E-mail Address 2:					
	Recipient's E-mail Address 3:					
	Recipient's E-mail Address 4:					
	E-Mail Test Apply					

Notification C	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.
Security Type	Select Security Type: SSL or StartTLS
TLS Certificate	On/off TLS Certificate.
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	
HELO/EHLO Domain	Enter the HELO/EHLO domain name.
Name	
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.

📕 System Information 🗈	- Manual Update	
🗙 System Management 📃		
- Date and Time		
- Notifications - Z Firmware Upgrade	Apply	
Scheduled On/Off Administrator Password Config Mgmt	Auto Update Auto Update Latest Update	
Factory Default Power Management Power Management File System Check Wake-On-LAN Solution UL Login Functions	Apply. 1. If checked, the system will automatically detect and download new firmware (either a Major or Latest Update). The firmware will be instal system is shut down or rebooted. 2. Major Update: The system will download and upgrade to the latest essential firmware available. 3. Latest Update: The system will download and upgrade to the latest firmware available.	lled when the

Manual Update

Follow the steps below to upgrade your firmware manually:

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.

ΝΟΤΕ	 The buzzer only beeps if it is enabled in the System Notification menu. Check Thecus website for the latest firmware release and release notes. Downgrading firmware is not permitted.
WARNING	Do not turns off the system during the firmware upgrade process. This will lead to a catastrophic result that may render the system inoperable.

Auto Update

If checked, the system will automatically detect and download new firmware (either a Major or Latest Update). The firmware will be installed when the system is shut down or rebooted.

Follow the steps below to upgrade your firmware automatically:

1. Check the Major Update or the Latest Update.

2. Press Apply.		
Firmware Upgrade-Auto Update		
Item	Description	
Major Update	The system will download and upgrade to the latest essential firmware available.	
Latest Update	The system will download and upgrade to the latest firmware available	

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 System Management 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.

•	**	Home > System Ma	nagement > Sche	duled On/Off	🕜 Help ♡	• My favorite 🕐 Shutdown	s∰ Logout
J System Information	٠	Scheduled On/O	Off				
💥 System Management	-	✓ Enable Schedu	iled On/Off				
- S Date and Time - Notifications	ŕ		Action	Time	Action	Time	
Scheduled On/Off	=	Sunday:	None 🚩	00:00	None 💙	00:00 💙	
S Administrator Password 		Monday:	Power Off ¥	00:00	Power On 💌	00:05 🛩	
Reboot & Shutdown	÷	Tuesday:	Power Off 💙	14:25 ¥	Power On 👻	14:30 ¥	
System Network	.+)	Wednesday:	None 🚩	00:00	None 💌	00:00	
Storage	۲	Thursday:	None 🚩	00:00	None 💙	00:00 💙	
Ser and Group Authentication		Friday:	None 💙	00:00	None 💙	00:00 🗸	
Network Service	۲	Saturday:	None 💌	00:00	None 💌	00:00	
Application Server							
📑 Backup	٠	Apply					
External Devices		•					,

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	**	Home > System Management > Administrato
System Information	•	Change Administrator Password
Date and Time		Confirm Password:
Firmware Upgrade	E	Apply
Administrator Password		

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.

٩		Home > System Management > Config Mgmt	⑦ Help ♡• My favorite 🕛• Shutdown 🔊 Logout
System Information	<u>.</u>	System Configuration Download/Upload	
X System Management	-		
Scheduled On/Off Administrator Password	Î	Upload: Please choose a file to upload.	
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.	

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

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.

×	Home > System Management > Factory Default
📕 System Information 💌	Reset To Factory Default
System Management Scheduled On/Off Administrator Password Config Mgmt Factory Default Reboot & Shutdown	Apply
WARNING	actory defaults will not erase the data stored in the hard disks, b Il the settings to the factory default values.

Power Management:

From the menu, choose **Power Management** item, and the **Shutdown/Reboot System** screen appears.

• Shutdown/Reboot System

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



• Automatic Resume

The setting determines how the Thecus IP Storage behaves when the power is restored after an unexpected power loss.

Power Automatic Resume		
Item	Description	
No	The Thecus IP Storage remains power off until power on manually.	
Yes	The Thecus IP Storage power on automatically when the power restores	
Previous Status	If Thecus IP Storage was on , it will power on when the power restores. If Thecus IP Storage was off, it will remains power off when the power restores.	
Apply	Press this to save your changes.	

WARNING	The Automatic Resume feature will only be enabled when power is lost for at least 10 seconds.

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.

٩	ee.	Home > System Management > File System Check	🕜 Help	♡• My favorite	心 • Shute
📜 System Information	٠	File System Check			
X System Management	-	The file system has been checked successfully. Reboot the sy	stem make the d	hanges effective.	
Administrator Password Config Mgmt Factory Default Reboot & Shutdown	Â	Encrypted RAID does not support file system checks! Press [Apply] to reboot the system now. Apply			
🗽 File System Check	E				

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.
	Yes No

Click **Yes** to reboot the system.

System Check	File System Check
t	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.

	Dista	Charles	Electrony Chabura	Date County	Last Charle Trees
RAID Level	Disks	Status	Filesystem Status	Data Capacity	Last Check Time
RAID	1,2,3,4		Normal	2223.9	
		system chackel	Π		
-	es not support file		Į.		
		system checks! Status	Filesystem Status	Data Capacity	Last Check Time

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



Status:	Press Start to Begin	
Latest 20 lines Information:		
Result:		
Start Reboot		

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.

Latest 20 lines Information:	[2009/6/8 14:5:33] 4 8 8
Lucion 20 miles incommunities.	[2009/6/8 14:5:33] Pass 5: Checking group summary information
	[2009/6/8 14:5:331 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 15 16
	[2009/6/8 14:5:33] 5 16 16
	[2009/6/8 14:5:33] /dev/vg0/syslv: 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	

NOTE

The system must be rebooted before Thecus IP storage can function normally after file system check completes.

Wake-Up On LAN (WOL)

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



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.

•	« ¢	Home > System Management > SNMP	⑦ Help ♡• My favorite
📜 System Information	۰	- SNMP Support	
System Management	-	SNMP Service: O Enable O Disable	
Administrator Password		Read Community:	(Allow 0~9, a~z, A~Z, -, _)
- All Config Mgmt - Stactory Default		System Contact:	
🔘 Reboot & Shutdown		System Location:	
- Wake-On-LAN	=	Trap Target IP:	
SNMP		Apply	
🖓 📲 UI Login Functions	*		

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 Functio	ons	
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			⑦ Help ♡• My favori
	Host Settings				
	Host Name:	PMA	Domain Name:	thecus.com	
	WINS Server 1:	172.16.66.135	WINS Server 2:		
	DNS Settings				
	Mode:	Manual OHCP (Get From WAN)	/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	Additional LAN7	
L		LAN3 Additional LAN4 Additional LAN5	<u>n</u>	Additional LAN7	
	Status:		Speed:	1000Mb/s	
	MAC Address:	00:14:FD:15:59:84	Link Status:	Connected	
	Jumbo Frame:	Disabled 🕶			
	IPv4		IPv6		
	Enable:	V	Enable:	V	
	Mode:	Manual	Mode:	Manual	
		O DHCP		C DHCP	
	IP:	172.16.66.25	IP:	fec0::1	
	Netmask:	255.255.252.0	Prefix Length:	64	
	Gateway:	172.16.66.135	Gateway:		
	Note:				
De	fault Gateway: W/	AN/LAN1 👻			
ſ	Apply				
U					
4					

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	Network Configuration (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 able to connect to your Thecus NAS after Jumbo Frame is turned on.

VLAN

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

WAN/LAN1 LAN2			
Status:	Normal	Speed:	1000Mb/s
MAC Address:	00:14:FD:17:99:76	Link Status:	Connected
Jumbo Frame:	1500 Y bytes	Enable VLAN:	
		VLAN ID:	

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.

AN/LAN1 LAN	2 LAN3	Additional LAN4	Additional LAN5	Additional LAN6	Additional LAN7	
tatus:						
lote:						
IPv4				IPv6		
Enable:	Enabled			Enable:	Enabled	
Mode:	Manual			Mode:	Manual	
IP:	172.16.	66.25		IP:	fec0::1	
Netmask:				Prefix Length:		
DHCP Service:				RADVD Service:		
Start IP:				Prefix:		
End IP:				Prefix Length:	64	
Default Gatewa	iy:					
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
WARNING	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	work > Linking Aggregatio	n	🕜 Help 🔿	• My favorite (신• Shutdown	⁄ 仕 Logout
WAN/LAN1 LAN2	2 LAN3 Additional LAN4	Additional LAN5	Additional LAN6	Additional LAN	7	
Status:			Speed:	1000Mb/s	$\mathbf{\vee}$	
Jumbo Frame:						
IPv4 (Origin	al Setting)		IPv6(Origina	al 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:	VAN/LAN1					
Apply						
1						•

The associated screen shot will appear after the "+" is clicked.

	Name	Selected Inte	erfaces	
	Name	Const		
	Than the	Speed		

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

	Available Interfaces			Selected Interfaces	
Name	Speed		Name	Speed	
WAN/LAN1	16		Additional LAN4	1G	
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	LAN3 Additional LAN4 Add	litional LAN5 Additional LAN6	Additional LAN7 LINK1 🛎 🚽
Status:	Additional LAN4, Additional L		
Jumbo Frame:	Disabled 💌	Link Type:	Load Balance
IPv4		IPv6	Load Balance
Enable:	V	Enable:	Failover Balance-XOR
Mode:	Manual	Mode:	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:	Datafice-ALD
		Note:	
efault Gateway:	NK1 ¥		
Apply			

Link1 Config	guration					
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.

РМА	Domain Name:		
	WINS Server 2:	thecus.com	
Manual O DHCP (Get From WAN)	/LAN1)		
LANZ LAN3 Additional LAN4 Additional LAN3	5 Additional LAN6	Additional LAN7 LINK1	
: 00:14:FD:15:59:84	Speed: Link Status:	1000Mb/s Connected	
	00:14:FD:15:59:84 e: Disabled	C 00:14:FD:15:59:84 Link Status:	Connected

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

to modify the settings or click on 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 > Syst	em Network > Lin	king Aggregati	ion	⑦ Help	♡• My favorite	ப் • Shutdown	归 Logout
WAN/LAN1	LAN2 LAN3	Additional LAN4	Additional LAN5	Additional LA	N6 Additional LA	N7	
Status:	L L			Speed.	1000Mb/s		
Jumbo Fr	rame:						
IPv4	(Original Setting)			IPv6(Ori	ginal Setting) –		
Enable	: Enable	d		Enable:	Enabled		
Mode:	Manual			Mode:	Manual		
IP:	172.16	.66.25		IP:	fec0::1		
Netma	sk: 255.25	5.252.0		Prefix Leng	jth: 64		
Gatew	ay: 172.16	.66.135		Gateway:			
				Note:			
Default Gatev	vay: WAN/LAN1	~					
Apply							
•							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.

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.

• The screen shot below is just an example from a Thecus IP Storage. The disk slots number can range from 8, 12 to 16 slots depending on the model of Thecus IP storage. Also it will list the disk info of JBOD devices if applicable
--

Disk Info	ormation							
€Smart (Detect Bad Block Stop D	Detect Bad Block						
Disk No	Model	Capacity	Firmware	Bad Block				
∃ N8900 ((7Disks)				^			
2	ST31000524NS	932 GB	SN11					
3	WD6000BKHG-02A29	559 GB	VG03					
4	WD6000BKHG-02A29	559 GB	VG03					
5	Hitachi HDS72101	932 GB	A3MA		E			
6	Hitachi HDS72101	932 GB	A3MA					
7	Hitachi HDS72101	932 GB	A25C					
8	Hitachi HDS72101	932 GB	A25C					
∃ D16000) - 4 (6Disks)							
J4-6	WD6000BKHG-02A29	559 GB	VG03			I		
34-7	WD6000BKHG-02A29	559 GB	VG03		-	☐ N8900 (7Disks)		
						2 ST31000524NS	932 GB	SI
fotal Capa	city: 9132 (GB)					3 WD6000BKHG-02A29	559 GB	V
						4 WD6000BKHG-02A29	559 GB	V
						5 Hitachi HDS72101	932 GB	A
Disk Pow	ver Management					6 Hitachi HDS72101	932 GB	A.
						7 Hitachi HDS72101	9 Position	

Disks Information				
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	ormation					
€ Smart (🖻 Detect Bad Block 🔳 Stop 🛙	etect Bad Block				
Disk No	Model	Capacity	Firmware		Bad Block	
∃ N8900 (7Disks)					<u>^</u>
2	ST31000524NS	932 GB	SN11			
3	WD6000BKHG-02A29	559 GB	VG03	Position		
4	WD6000BKHG-02A29	559 GB	VG03			
5	Hitachi HDS72101	932 GB	A3MA			E
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.

-	SMART INFO					×
	Info					
	Disk No.:		2			
	Model:		ST31000524NS			
	Power On Hours	5:	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:	shore	t	Ô	long	
	Test Result:	Click to s	tart			
	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.

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

— Dick Intormativ

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 Info	rmation		
🕲 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".

DISK INTO	mation			
€Smart (Detect Bad Block 🖲 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	
6	Hitachi HDS72101	932 GB	A3	
7	Hitachi HDS72101	932 GB	A25C	

For Thecus product (N8900/N12000/N16000/N12850/N16850 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.

H-7 WD60008KHG-02A29 559 GB VG03 H-8 WD60008KHG-02A29 559 GB VG03 H-10 WD60008KHG-02A29 559 GB VG03 H-11 WD60008KHG-02A29 559 GB VG03	isk No	Model	Capacity	Firmware	Bad Block
6 WD60008KHG-02A29 559 GB VG03 7 WD60008KHG-02A29 559 GB VG03 8 WD60008KHG-02A29 559 GB VG03 10 WD60008KHG-02A29 559 GB VG03 11 WD60008KHG-02A29 559 GB VG03	N8900	(7Disks)			
H-7 WD60008KHG-02A29 559 GB VG03 H-8 WD60008KHG-02A29 559 GB VG03 H-10 WD60008KHG-02A29 559 GB VG03 H-11 WD60008KHG-02A29 559 GB VG03	D16000	- 4 (6Disks)			
WD6000BKHG-02A29 559 GB VG03 I-10 WD6000BKHG-02A29 559 GB VG03 I-11 WD6000BKHG-02A29 559 GB VG03	4-6	WD6000BKHG-02A29	559 GB	VG03	
I-10 WD6000BKHG-02A29 559 GB VG03 I-11 WD6000BKHG-02A29 559 GB VG03	4-7	WD6000BKHG-02A29	559 GB	VG03	
-11 WD6000BKHG-02A29 559 GB VG03	4-8	WD6000BKHG-02A29	559 GB	VG03	
	4-10	WD6000BKHG-02A29	559 GB	VG03	
-12 W/D6000BKHG-02A20 550 GR V/G02	4-11	WD6000BKHG-02A29	559 GB	VG03	
-12 WD0000bkild-02A29 559 db V005	4-12	WD6000BKHG-02A29	559 GB	VG03	

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.

×	ŀ	Iome	> Stor	age > R	AID Manager	ment		⑦ Help	♡• My favorite	心 • Shutdown	\$₽ Logout
📜 System Information 🕚	Г	RA	ID Mai	nagemer	nt						
🗙 System Management 🔹		0	Create	🍰 Edit 🛛	Global Hot S	ipare					
System Network			Mas RAID	. ID	RAID Level	Status	Disks Used	Total Capacity	Data Capacity		
Storage		۲	*	RAID	5	Healthy	1,2,3,5	1389.7	. Used for HA		
And Management HAS Stacking ISO Image Mounting Share Folders											
🗳 User and Group Authentication 🗉											
Network Service											
Application Server 🔹											
📑 Backup 🔳											
External Devices											

RAID Informa	ation			
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 dek	Disk No.	Capacity (MB)	Model	Status	Used	Spare	
The arc of provintian year	3	572,326	WD6000BKHG	ок	17		
	4	572,326	WD60008KHG	ок	8	13	
	5	572,326	WD60008KHG	ОК	23	10	
	6	572,326	WD60008KHG	ОК	13	13	
			.11				٠
	Description:						
		us listed installed han	d disk with its statu	s and usage			
		us listed installed har	d disk with its statu	s and usage			
		us isted installed har	d disk with its statu	s and usage			
		us listed installed har	d disk with its statu	s and unage			
		us lated installed har	d disk with its statu	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 nestern hard dak	Disk No.	Capacity (MB)	Nodel	Status	Used	Spare			
The less of mastern twin day	4	572,326	W00000840-IG	OK	[9]	23			
	5	572,326	WD60008KHG	OK	2	E1			
	6	572,326	W000008KHG	OK	2	1	ii)		
	7	N/A	N/A	N/A					
EAD Land Injecture	<		.0.			-	•		
AND MUNHTLY SHOP	Description: The doks list has listed installed hard dok with its status and usage.								
NAD Tertam Setup									
	According to 1 3900, RAID 0,1	the selected dak(a), RAID 1,RAID 5	the available raid-lev	e(s) as the	rollowing:				
NATE Instante Casaban Confernation									
n 1942 witten Oxiden Conferator									

ΝΟΤΕ

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.

District	RAID Level 🕐 JBOD 🗟 RAID 9 😳 RAID 1 💭 RAID 5
2 RAID Level Selection	
System will list available RAID level can be choose from	Description: 180D: Combine multiple drives and capacities into one drive.
	RAID 0: Normally used to increase performance and useful for setups such as large read-only NPS server where mounting many deks is time-consuming or impossible and redundancy is inelevant.
	RAID 1: Create an exact copy (or minor) of a set of data on two or more daks. This is useful when read performance or reliability are more important than data strange canacity.

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

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

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.

Distin.	RAID ID: RAI			
Anto Layar Solution	Master RAID - Take e Encryption	ffect after checked box	102	
RAID Property Setup	Password:			
	Confirm Password:	****		
uation per needed	C Quick Raid			
	Description			
	RAID ID: alow 0-9, e-c, A	VZ and which is required	and unique.	
	Master RAID: optional, Encryption: optional and	password a imited to 1-	16 characters.	
AKED Sentem Setue	Quick Raid: optional and existed inside of hard disi	enable this setting to en	hance RAID creation time	f there is no partition
	and a second second second second			
AAZI Makena Graatian Gierferration				
), AAD Welene Chedon Conferradore . Proje				

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	🛛 😳 Ec	st 🎲 🤇	Slobal Hot Spar	e				
	Master RAID	ID	RAID Level	File Syst	Status	Disks Used	Total Capacity	Data Capacity	
۲	*	raid 🔒	J	xfs	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	RAID - Take effect after checked box
Encrypt	ion
Passwo	rd: ••••
Confirm Duick R	
ΝΟΤΕ	We recommend using the "Quick RAID" setting only if the hard disks are brand new 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				9
O Debu List	Stripe Size(KB):	64 👻		
IAD Level Selection	File System:	EXT4 💌		
KAE Property Setup	Data Percentage:	EXT3 EXT4		
RAID System Setup	Description:	XF5		
Select stripe stre (Faopkrable) and file system type for RAID volume created	device requests ac	cess to data more q setup what percenta	uicidy.	orage which is useful when a processing want to create rail. The redundant can
 MAD Volume Creation Confirmation Final 				
				Prev Next Cancel

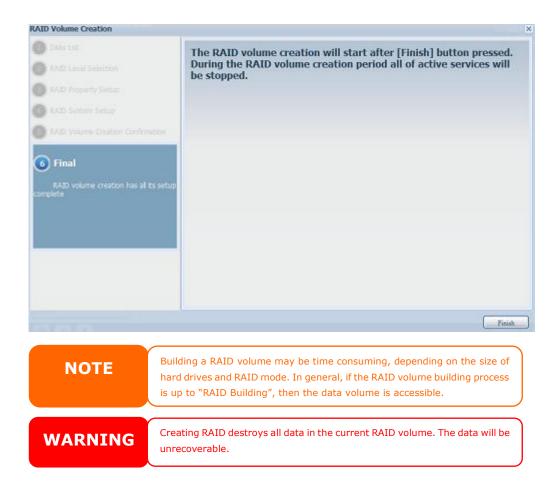


Single volume size supported: ext3 \rightarrow 8TB XFS \rightarrow 48TB ext4 \rightarrow 36TB

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

Level Selection Field Value Property Setup Disks List 4,5,6 System Setup RAID Level RAID 5 ID Volume Creation No Master RAID Value No Stripe Size(KB) 64 KB File System XFS Data Percentage 100 %		RAID Volume Creation O	Confirmation	
Property Setup System Setup RAID Level RAID 5 RAID 0 RAID Master RAID Yes Encryption No Quick Raid No Stripe Size(KB) 64 KB File System XFS Data Percentage 100 %		Field	Value	
perty Setup RAID Level RAID 5 tem Setup RAID ID RAID 0 Volume Creation No Quick Raid No on Stripe Size(KB) 64 KB File System XPS Data Percentage 100 %		Disks List	4.5.6	
Master RAID Yes Encryption No Quick Raid No Stripe Size(KB) 64 KB File System XFS Data Percentage 100 %		RAID Level		
Master RAID Yes Encryption No Quick Raid No Stripe Size(KB) 64 KB File System XFS Data Percentage 100 %		RAID ID	RAID0	
me Creation Quick Raid No Stripe Size(KB) 64 KB File System XFS Data Percentage 100 %		Master RAID	Yes	
eating configuration for		Encryption	No	
eating configuration for	me Creation	Quick Raid	No	
reating configuration for		Stripe Size(KB)	64 KB	
creating configuration for		File System	XFS	
		Data Percentage	100 %	
				Prev Submit
RAID Configuration	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	•	•	•	•	•	•	•	•
N16000 series	•	٠	•	•	•	•	•	•
N12850 series	•	٠	•	•	•	•	•	•
N16850 series	•	٠	•	•	•	•	•	•
N8900 series	•	٠	•	•	•	•	•	•
N6850	•	٠	•	•	•	•	•	
N8850	•	٠	•	•	•	•	•	•
N10850	•	٠	•	•	•	•	•	•
N7700PRO V2	•	٠	•	•	•	•	•	
N8800PRO V2	•	•	•	•	•	•	•	•
N7710 series/N7770-10G	•	•	•	•	•	•	•	
N8810U	•	•	•	•	•	•	•	•
series/N8880U-10G	·	÷	Ţ.	•	•	· ·	•	•
N5550	•	٠	•	•	•	•		
N5810/N5810PRO	•	٠	•	•	•	•		
N4510U series	•	•	•	•	•	•		
N7510	•	•	•	•	•	•	•	

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.						
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	i Edit	🍪 Global Hot S	ipare					
	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	
۲		KALD	0	715	nearthy	1,2,3,4	2223 68	2223.9 08	

Edit						
Disk No.	Capacity (MB)	Model	Status	Used	Spare	
1	572,326	WD6000BKHG	ОК	1		<u>^</u>
2	572,326	WD6000BKHG	ОК	V		
3	572,326	WD6000BKHG	OK	7		=
4	572,326	WD6000BKHG	OK	V		-
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 ID:	RAID	(Allow 0	~9, a~z, A~Z	() 🕅	laster RAID - Ta	ike effect after checked box
Quick Raid: Stripe Size(KB): File System: Apply, Remo		ble this setting to e	enhance RAID	creation time i	r there is no pa	rtition existed inside of hard disk)
R	AID Configuration		11 be stopped t		is in progress. 4	Are you sure to update setting now?
		RAID Confi	iguration			×
				ation update :	Successfully!	

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	1		A
2	572,326	WD6000BKHG	ОК	\checkmark		
3	572,326	WD6000BKHG	OK	\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) 🗸 M	laster RAID - Ta	ke 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 pa	rtition existed inside of hard disk)
Stripe Size(KB):	64 💌					
File System:	XFS 💌					
Apply Remove	RAID					
WA	RNING		RAID destr overable.	oys all data	in the selec	ted 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.

bal Hot Sp					
Disk No.	Capacity (MB)	Model	Status	Global Hot Spare	
7	953,870	SAMSUNG HD103	OK	V	
3	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.

D Configuration			
RAID Information	Expand	Migrate RAID	
Unused:		86.59 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	Available	2
1	572,326	WD6000BKHG	OK	1		<u>_</u>
2	572,326	WD6000BKHG	OK			E
3	572,326	WD6000BKHG	OK	<i>V</i>		
4	572,326	WD6000BKHG	OK		100	
5	572,326	WD6000BKHG	ОК		83	
<		III				•
	() RAID 1 -	> RAID 5 (Online)		C RAID 6	-> RAID 6 (Online)
RAID Level:	() RAID 1 -	> RAID 6 (Online)		C RAID 5	0 -> RAID 5	0 (Offline)
	🔘 RAID 5 -	> RAID 5 (Online)		C RAID 5	0 -> RAID 6	0 (Offline)
	RAID 5 -	> RAID 6 (Online)		🔘 RAID 6	0 -> RAID 6	0 (Offline)

- Altry	ou sure?
RAID Configurati	on X data lost caused by power failure, a full data backup is strongly recommanded. Please type in [Yes]
below to proceed	
	RAID Configuration
	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.

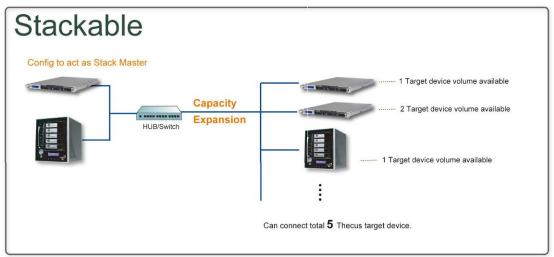
То			
From	RAID 0	RAID 5	RAID 6
RAID			[RAID 1] HDDx2 to [RAID 6] HDDx4
1		[RAID 1] HDDx2 to [RAID 5] HDDx4	[RAID 1] HDDx2 to [RAID 6] HDDx5
-		[RAID 1] HDDx2 to [RAID 5] HDDx5	[RAID 1] HDDx2 to [RAID 6] HDDx6
		[RAID 1] HDDx2 to [RAID 5] HDDx6	[RAID 1] HDDx2 to [RAID 6] HDDx7
		[RAID 1] HDDx2 to [RAID 5] HDDx7	[RAID 1] HDDx2 to [RAID 6] HDDx8
		[RAID 1] HDDx2 to [RAID 5] HDDx8	
		[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	
		[RAID 1] HDDx4 to [RAID 5] HDDx5	[RAID 1] HDDx4 to [RAID 6] HDDx5
		[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
	x		
RAID 5	^		[RAID 5] HDDx3 to [RAID 6] HDDx5 [RAID 5] HDDx3 to [RAID 6] HDDx6
5		[RAID 5] HDDx3 to [RAID 5] HDDx5	
		[RAID 5] HDDx3 to [RAID 5] HDDx6 [RAID 5] HDDx3 to [RAID 5] HDDx7	[RAID 5] HDDx3 to [RAID 6] HDDx7
			[RAID 5] HDDx3 to [RAID 6] HDDx8 HDDx16
		[RAID 5] HDDx3 to [RAID 5] HDDx8 HDDx16	
		[RAID 5] HDDx4 to [RAID 5] HDDx5	[RAID 5] HDDx4 to [RAID 6] HDDx7
		[RAID 5] HDDx4 to [RAID 5] HDDx7	
		[RAID 5] HDDx4 to [RAID 5] HDDx8	[RAID 5] HDDx5 to [RAID 6] HDDx7
			[RAID 5] HDDx5 to [RAID 6] HDDx8
		[RAID 5] HDDx5 to [RAID 5] HDDx6	
		[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	e 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		() н	elp ∵Ö•My fa	avorite 🕛 Sh	utdown	⁄扫 Logout
🟓 System Information	۲	Stacking Target List						
X System Management	*	Local Initiator IQN: iqn.2007-08.c			2			
System Network	۲	Add Add	Format J Rec	onnect Gapacity (Used/Total)	Status	Description	ign	
Storage	-			cupacity (oscartoui)	514103	Description	No.	
Usk Information								
NAS Stacking ISO Image Mounting Share Folders ISCSI 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	
Stackable Target IP:	172.16.65.143 Discovery	
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	
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.

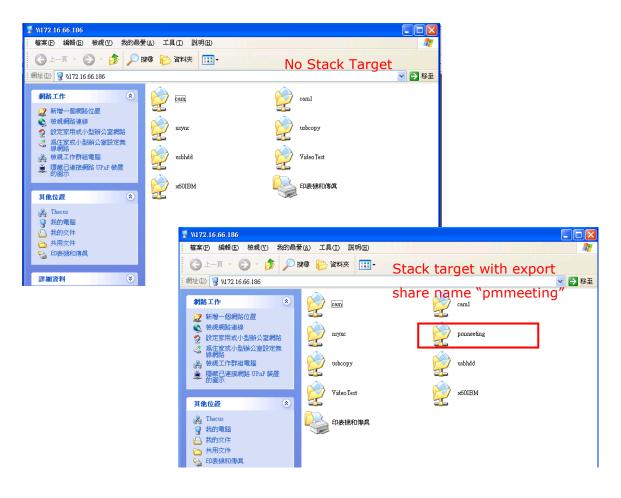
Once the volume IP has been set, you may need to input a valid user name and password to validate your access rights. If there is no user name and password needed to access target volume, then leave it blank.

Add iSCSI Target ((Add Stack Target)	×
Enable iSCSI Target:	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:	(Limit : (0~9, a~z))	
Description:		
Browseable:	◉ yes ◯ no	
Public:	© yes	
Stackable will moun	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	
iqn:	iqn.2011-11.com.thecus:RAID.iscsi0.vg0.pmdata	
Username:		
Password:		
Stacked Target Name:	pmmeeting (Limit : (0~9, a~z))	
Description:		
Browseable:	● yes ⑦ no	
Public:	🗇 yes 🛛 🔘 no	
Stackable will moun	It 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 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 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	
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.	
Apply		

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.

tacked Target Name	P	Capacity (Used/Total)	Status	De	scription	iqn
stack1	172.16.66.24	N/A	Unknow	wn file s <u>i</u>		iqn.2011-11.c
Stack Target List						
🔘 Add 🛛 🚷 Edit	\ominus Remove 🌸 Format 💋	enopment 🗳 ACL				
Export share name	IP	Capacity (Used/Total)	Status	Description	iqn	
The second s						
Export share name	IP 172.16.65.11		Status Unknown file :	The Property of the States of the States of the	ign ign.2009-05.0	C01
				The Property of the States of the States of the	1.000	COI
				The Property of the States of the States of the	1.000	COI
				The Property of the States of the States of the	1.000	COI
				The Property of the States of the States of the	1.000	C01
				The Property of the States of the States of the	1.000	C01
				The Property of the States of the States of the	1.000	COI
				The Property of the States of the States of the	1.000	COI
				The Property of the States of the States of the	1.000	COI
				The Property of the States of the States of the	1.000	coi

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:

Edit ISCSI 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:	⊛ yes ⊘ no	
Public:	🖲 yes 💿 no	
Stackable will moun	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		\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**.

Local Initiator IQN: ign.2007			28		
🔘 Add 🛛 🌍 Edit 🛛 🤤 Remov	e 🌸 Format 🖉 Rei	connect / 🚰 AQL			
Stacked Target Name	P	Capacity (Used/Total)	Status	Description	iqn
D stack1	172,16,66,24	N/A	Disable		ign.2011-11.co

🔘 Add 🛛 🤯 Edit 🔤 Rem	ove 🌸 Frank 🥖 Rec	onnect and a Cit			
Export share name	IP	Capacity (Used/Total)	Status	Description	iqn
🕫 🧰 isesi	172.16.65.157	0 GB / 0.1 GB	Disable		iqn.2009-05.ci
Success		×]		

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	Ů• Shutdown 1 Logout
📜 System Information 🔳	ISO Image Mounting		^
🗙 System Management 🔹	pm1 💌		
System Network	© Unmount		
Storage	Mounted Path -	ISO Path	ISO Size
Obik Information RAID Management MAS Stacking So Image Mounting Share Folders GCSI			E
Ser and Group Authentication			
Network Service			
Application Server			
📑 Backup 🕚	4 4 Page1 of1 ▶ ▶ @	No ISO im	age information to display
External Devices	•	m	

A. Add an ISO file

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

nsunc		
nsync usbhdd		
usbcopy	ISO Path	ISO Size
naswebsite	-	

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

V ISO filter	i Unmount		
 asswebsite BT Seed Andy Weekly Report AMD Besttech GT ACS 6xxx AKCC Thecus 02 iso Thecus 01 iso Adobe Acrobat 7.0 Pro ATOM Andy Private 	Mounted Path -	ISO Path	ISO Size
File Selected: Mount as:	Description Only ISO 9660 file system can be mov Top 50 Folders Top 50 Files Please type in the full path of the ISO i	nted.	No iso mount information to display
ISO filter answebsite B BT Sed Ady Weekly Report AdD B Besttech GT AdS 6xxx Adx6c Thecus 02 iso Adobe Acrobat 7.0 Pro Ady Private	Mounted Path *	ISO Path	ISO Size
File Selected: /naswebsite/Thecus 01 iso Mount as:	Description Only ISO 9660 file system can be mount Top 50 Files Please type in the full path of the ISO if the Source of th	ed.	avo iso moulti information to display

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.

V ISO filter		G Unmount	<u>ال</u>	
AMD Bestte ACS AMC Theor Theor	ed Weekly Report ch GT 2 3 02 Iso 3 02 Iso 3 01 Iso Acrobat 7.0 Pro 6	ISO Mount 2 Arc yea su 150°	e to mount the	TSO Size
File Selected. Mount as	/naswebsite/Thecus 01 iso	Description	N 3	No iso mount information to display
Add]	Only ISO 9660 file system can b Top 50 Folders Top 50 Files Please type in the full path of the		
Add]	Top 50 Files Please type in the full path of the	ISO if not listed.	

V ISO filter	😂 Unmount		
answebsite answebsite answebsite Andy Weekly Report AND Bestech GT ACS forx ACC	Mounted Path *	ISO Path	ISO Size
Therus 02.sio Therus 02.sio Therus 01.sio Therus 01.sio Therus 02.sio Therus 02.sio Therus 1.sio Therus 1.si	ISO Mount i naswebsite Thecus 01.iso OB	is mounted!	
File Selected /naswebsite/Thecus 01 iso	M ≪ Page of 1 D D	æ	No iso mount information to display
Mount as:	Description Only ISO 9660 file system can be mounted Top 50 Folders	i.	

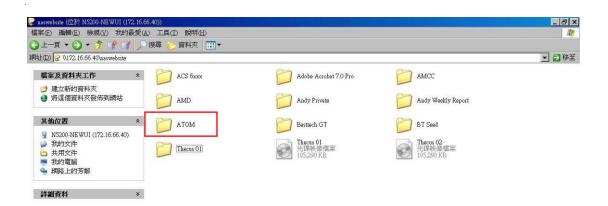
After completion, the page will display all mounted ISO files.

V ISO filter	Commount Commount		
a 🔁 naswebsite	Mounted Path *	ISO Path	ISO Size
BT Seed Andy Weekly Report AMD Thecus 01 Bestech GT ACS foxx AMCC Thecus 02 iso Adobe Acrobat 7.0 Pro Adobe Arobat 7.0 Pro	naswebsite Thecus 01	naswebsite/Thecus 01.iso	102.8MB
Andy Private	M ⊲ Pago <mark>1 of 1 D D ⊲</mark>	Displaying iso m	nount information 1 - 1 of 1
ile Selected:			
Add	Description Only ISO 9660 file system can be mounted. Top 50 Folders Top 50 Files Please type in the full path of the ISO if not 1	listed.	

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".



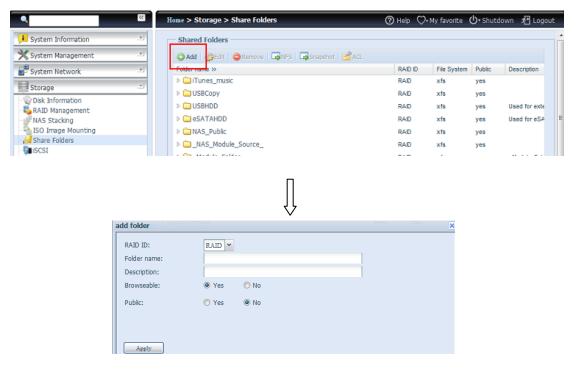
Share Folder

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	Ů • Shutdown	s∰ Logou
📁 System Information	٠	Shared Folders				
💥 System Management	۰	🔘 Add 🏾 🍪 Edit 🖕 Remove 🗖 NFS 🗖 Snapshot 🖻 ACL				
System Network		Folder name >>	RAID ID	File System	Public Des	cription
Storage	-	ITunes_music	RAID	xfs	yes	
		USBCopy	RAID	xfs	yes	
V Disk Information		▷ 🗀 USBHDD	RAID	xfs	yes Use	d for exte
NAS Stacking		SATAHDD	RAID	xfs	yes Use	d for eSA
SO Image Mounting		▷ 🗀 NAS_Public	RAID	xfs	yes	
실 Share Folders		NAS_Module_Source_	RAID	xfs	yes	
iscsi 🚛		s 🗛 and the polari				

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.



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

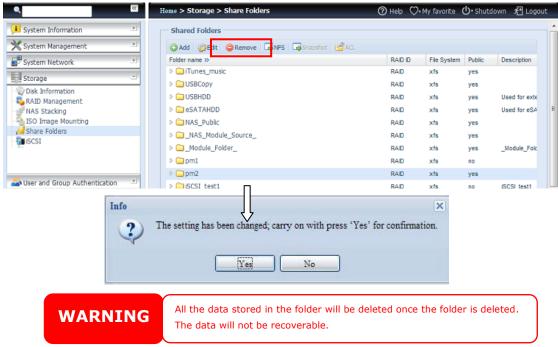
On the **Folder** screen, press the *Edit* button and the **Modify Folder** screen appears. This screen allows you to change folder information. After entering the information, press **Apply** to save your changes.

Modify Folder	ATAHDD			RAID	eXI3	×
RAID ID:	RAID 🕶					
Folder name:	1111					
Description:						
Browseable:	Yes	🔘 No				
Public:	Yes	🔘 No				
Apply						

Modify Folder			
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**.

IFS Add				
S3 Mount po S4 Mount po Sedit OR	pint: /pm2	a/_NAS_NFS_Expo	orts_/pm2	
lost Name	Privilege	OS Support	ID Mapping	Sync / Async

Config NFS share	
NFS Add	
Host Name:	XXX.XXX.XXX
All host please set Privilege:	***, other host 'xox.xox.xox.xox', host range 'xox.xox.xox/xox'
	Writable
OS Support:	Unix / Linux
	© AIX
ID Mapping:	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.
Sync / Async:	Sync
	O Async
Apply	

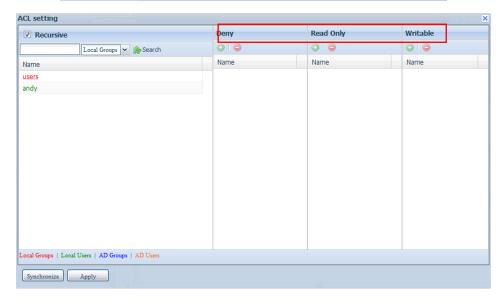
NFS Share				
Item	Description			
Hostname	Enter the name or IP address of the host			
Privilege	Host has either read only or writeable access to the folder.			
OS Support	There are two selections available:			
	Unix / Linux System			
	 AIX (Allow source port > 1024) 			
	Choose the one which best fits 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.

CL setting					3
Recurzive		1	Deny	Read Only	Writable
	Local Groups 😽 🍂 Sea	rch	0 0	0 0	0 0
Name			Name	Name	Name
users					
		ACL setting		×	
		and the second s	s process maybe need s		
		This Are	s process maybe need s you want sync accoun	12	
			Yes	•	
		-			
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 " P" symbol to extract sub folders list as screen shot shows below. You may carry on with same steps as share level ACL setting.

> insync aaaa ext3 no nsync > insync aaaa ext3 yes usbhdd > insbcopy aaaa ext3 no usbcopy > inswebsite aaaa ext3 no nswebs	🔾 Add 🛛 😨 Edit 🔤 Remove 🗖 NFS 🗔 Snapshot 🕍 ACL				
D is usbridd aaaa ext3 yes usbridd D is usbropy aaaa ext3 no usbcopy D is naswebsite aaaa ext3 no naswebs D is it funes_music aaaa ext3 yes iTunes_m D is test aaaa ext3 yes iTunes_m I is test1 aaaa ext3 no itest1 D is ECR no no itest3 no	Folder name >>	RAID ID	File System	Public	Description
□ usbcopy aaaa ext3 no usbcopy □ naswebsite aaaa ext3 no naswebs □ iTunes_music aaaa ext3 yes Tunes_m □ itest aaaa ext3 yes □ itest aaaa ext3 yes □ itest aaaa ext3 yes □ itest aaaa ext3 no □ itest no no □ itest no □ itest	D 🧰 nayne	aaaa	ext3	no	nsync
> inaswebsite aaaa ext3 no naswebs > iTunes_music aaaa ext3 yes iTunes_m > itest aaaa ext3 yes < test1	> 🧰 usbhdd	aaaa	ext3	yes	usbhdd
→ iTunes_music aaaa ext3 yes iTunes_m → itest aaaa ext3 yes → itest aaaa ext3 yes → itest aaaa ext3 no	C usbcopy	aaaa	ext3	no	usbcopy
itest aaaa ext3 yes itest1 aaaa ext3 no itest2 itest3 no itest3 no	> 🧰 naswebsite	aaaa	ext3	no	naswebsite
	iTunes_music	8888	ext3	yes	Tunes_mus
▷ 🚍 ECR no	🗀 test	aaaa	ext3	yes	
	e 😋 testl	aaaa	ext3	no	
▷ 📄 NetBench no	ECR			no	
	NetBench			no	
	NOTE The ACL can only be set for share			or mear	

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

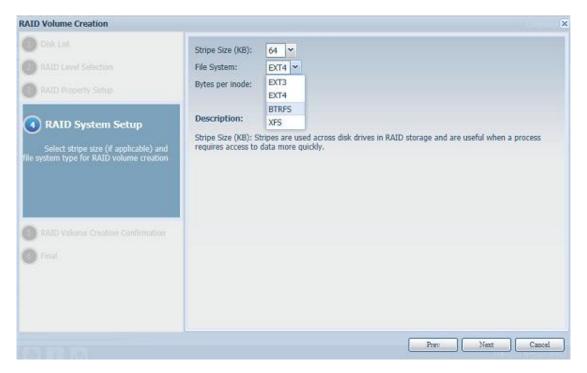
1. In the blank, enter the name of the user you would like to find.

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

а	Loca	I Users 🔽 I Groups I Users		
aaaa abcd		Groups	I	
N	DTE	· · · · ·	 to 1,000 users earch term in th	osen category. To r

Snapshot

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

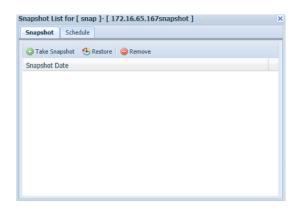


Any folder using a "BTRFS" file system is capable of being included in the Snapshot function. In the "Share Folder" submenu, the Snapshot button is available in the tool bar.

٩	**	Home > Storage > Share Folders	⑦ Help ♡• My favorite	ပံ• Shutdown	s∰ Logout
📜 System Information	۲	🔘 Add 🛛 😓 Edit 🥥 Remove 💆 NFS 🛛 Samba 🐻 Snapshot	acl.		-
X System Management		Folder name »	ota Limit RAID ID	File System	Public
System Network	(+)	NAS_Public	RAID	ext4	yes
		USBCopy	RAID	ext4	yes
Storage	-	▷ 🛄 USBHDD	RAID	ext4	yes
W Disk Information		▷Module_Folder	RAID	ext4	yes
RAID Management		DNAS_Media	RAID	ext4	yes
NAS Stacking		Discrete Action of the second seco	RAID	ext4	yes
Share Folders		▷ □_NAS_Picture	RAID	ext4	yes
iSCSI		DownLoad	RAID	ext4	yes
		▷ 🗀 eSATAHDD	RAID	ext4	yes
		D 🗀 iTunes_music	RAID	ext4	yes
		Þ 🛄 snap	RAIDsn	ap btrfs	yes
Ser and Group Authentication	n 🖭	>snapshot	RAID	ext4	no
Service	٠				

Taking a Snapshot

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



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

shot List for [snap]- [172.16.65.167snapshot]	
apshot Schedule	
Take Snapshot 🔁 Restore 🤤 Remove	
apshot Date	
14/07/30 16:17:06	
r doules retries	

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

Besides manual Snapshots, this feature also allows for scheduled backups. Click on "Schedule" and the setup screen will appear. Check "Enable Snapshot Schedule"

and select the desired Snapshot interval. Options include Daily, Weekly, or Monthly.

Home > Storage > Sl	nare Folders ⑦ Hel	p (C)
X X]- [172.16.65.167snapshot]	×
Snapshot Schedule		_
Enable Snapshot Sc		
Automatically removed	ve oldest snapshot	
Schedule Rule: Daily	▼ 5 ▼ Hour	
Apply		

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

Automatically remove oldest snapshot

Snapshot Restore

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

Home > Storage > Share Folders	⑦ Help	C
Snapshot List for [snap]- [172.16.65.167snapshot]		×
Snapshot Schedule		
💿 Take Snapshor 😷 Restore 🤤 Remove		
Snapshot Date		
2014/07/30 16:17:06		
2014/08/07 00:50:52		
2014/08/07 10:10:24		
2014/08/07 12:11:14		

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

For example, the NAS system at 172.16.65.167 has a folder named "snap" with a Snapshot version backed up. If the user were to browse to 172.16.65.167 snapshot, the following details would be visible:

🛃 🕞 🛄 = 1	snapsl	hot	-	
File Home Share	View			× 0
🕑 🌛 👻 🕆 🖳 🕨 Netw	rork → 172.16.65.167 → snapshot →	∨ 🖒 Se	earch snapshot	م
 ☆ Favorites ■ Desktop ↓ Downloads 3 3 Recent places 	Name 🌋	Date modified Type 8/6/2014 9:11 PM File fo	Size	
File Home Shar	re View	snap		
		hot ▶ snap ▶	✓ 🖒 Sear	ch snap
🔆 Favorites	Name	Date modif	ied Type	
Desktop	20140730-161706	7/30/2014 1		
Downloads	20140807-095952	8/5/2014 2:		720
 Recent places Libraries Documents 	20140807-101024 20140807-121114	8/6/2014 7: 8/6/2014 7:		
NOTE		Snapshot folde entication rights		equires the
NOTE	can only be r	ot folder is used estored from the feature) and ca	e WebUI (i.e. through

Snapshot Removal

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

"Remove".

Home > Storage > Share Folders	⑦ Help	\bigcirc
Snapshot List for [snap]- [172.16.65.167snapshot]		×
Snapshot Schedule		
💿 Take Snapshot 🧐 Restore 🥥 Remove		1
Snapshot Date		
2014/07/30 16:17:06		
2014/08/07 09:59:52		
2014/08/07 10:10:24		
2014/08/07 12:11:14		

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	N12000PRO
	N7510	N8800PRO V2	N16000PRO
		N7710 series	N7770-10G
		N8810U series	N8880U-10G
		N10850	N12850
		N8850	N16850
		N5810	
		N5810PRO	
Allowed iSCSI volume	15	25	50

Master ID	RAID	Status	Disks Used	Total	Data	File System
* RAID	0	Healthy	1,2,3,4	Capacity 2225	Capacity 12.8 GB / 2223.9 GB	xfs
SCSI Support						
CSI:	🔘 Enable	Disable				
					Apply	
iSCSI Target						
-						
iSCSI Target						
iSCSI	ify 🎲 Advance	ed i 🥥 Delete	:			
ISCSI	ify 🏠 Advance	ed 🥥 Delete	Status			
iSCSI	ify 🏀 Advance	ed i 🥥 Delete				
ISCSI O Add Mod Name	ify 🎡 Advance	ed 🤤 Delete	Status			
ISCSI O Add Mod Name	ify 🎲 Advance	ed 🥥 Delete	Status			
iSCSI Add Mode Name test1	ify 🏾 🍪 Advance	ed 🤤 Delete	Status			
ISCSI and Mode Name test1 LUN			Status			
iSCSI Add Mode Name test1			Status		LUN Alloc	

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

NAD I	nformatio						
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 S	upport -						
SCSI:		Enable	🔘 Disable				
		Entrole	0 00000			Appl	y
ISCSI T	arget						
ISCSI T	arget						
10.007							
iSCSI				-			
🕑 Add	Modify	/ 🎲 Advano	ed 🤤 Delete				
Name				Status			
1234				Enabled			
LUN							

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.

- Create iSCSI Volume	
iSCSI Target Volume:	Enable O 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
LUN Allocation:	Thin-Provision Instant Allocation
LUN Name:	Limit:(0~9, a~z)
Unused:	363 GB
Allocation:	[]GB
LUN ID:	0 🗸
iSCSI Block size:	512 Bytes(For older version)
- Description	
Please use [4K] block size whi	under system advance option, default is 512 Bytes. le more than 2TB capacity will be configured in Windows XP. size for application like VMware etc.
OK	

Create iSCS	Volume
Item	Description
iSCSI Target Volume	Enable or Disable the iSCSI Target Volume.
Target Name	Name of the iSCSI Target. This name will be used by the
	Stackable NAS function to identify this export share.
iqn_Year	Select the current year from the dropdown.
Iqn_Month	Select the current month from the dropdown.
Authentication	You may choose CHAP authentication or choose None.
Username	Enter a username.
Password	Enter a password.
Password Confirm	Reenter the chosen password
Mutual CHAP	With this level of security, the target and the initiator
	authenticate each other.
Username	Enter a username.
Password	Enter a password.
Password Confirm	Reenter the chosen password
RAID ID	ID of current RAID volume.
LUN Allocation	Two modes can be choose from:
	Thin-provision : iSCSI thin-provisioning shares the available physical capacity to multiple iSCSI target volumes. It allows virtual capacity to be assigned to targets prior to adding physical space when it has run out.
	Instant Allocation: Allocate available physical capacity to iSCSI target volumes.
LUN Name	Name of the LUN.
Unused	Unused space on current RAID volume.
Allocation	Percentage and amount of space allocated to iSCSI volume.

LUN ID	Specific Logic unit ID number.
iSCSI Block size	The iSCSI block size can be set under system advance option, default is 512 Bytes.
	[4K] block size while more than 2TB capacity will be configured in Windows XP. [512 Bytes] block size for application like VMware etc.

ΝΟΤΕ	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.

ISCSI		
🔾 Add 🔅 Modify 🎲 A	dvanced 🛛 🥥 Delete	
Name	Status	
test1	Disabled	
LUN		
	pand Odete	
LUN ② Add ② Modify ② E: Name	opand Ocete	LUN Allocation

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

ISCSI		×
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:	ign.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	irget			
iSCSI				
🗿 Add	🎇 Modify	🍪 Advance	d 🛛 🤤 Delete	:
Name				Status
1234				Disabled
5678				Disabled
LUN				
	Modify	Expand		
	- Control of the second	36 Expand	- Delette	
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.

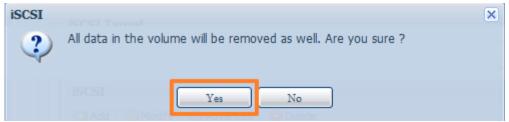
ISCSI			× logA
Expand iSCSI LUN			
Name: Unused: Expand Capacity:	1234 462 GB	GB GB	
Expand			

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.

1234 Disabled 5678 Disabled UIN Capacity(GB)	iSCSI Ta	rget			
Name Status 1234 Disabled 5678 Disabled LUN O Add OMONIFY Expand OPelete Name Capacity(GB) 1234 1	iSCSI				
1234 Disabled 5678 Disabled LUN O Add OMORIFY Capacity(GB) 1234 1	🕑 Add	Modify	🍪 Advanced	🔵 Delete	
1234 Disabled 5678 Disabled LUN O Add OMOdify Capacity(GB) 1234 1					
LUN O Add @Modify @Expand Oclete Name Capacity(GB) 1234 1					
Add Modify Expand Delete Name Capacity(GB) 1	5678				Disabled
Add Modify Expand Delete Name Capacity(GB) 1					
Add Modify Expand Delete Name Capacity(GB) 1	LUN				
Name Capacity(GB) 1234 1		Modify	Expand (Delete	
1234 1		Go Hourry	2 Expand		Cran eth (CD)
	1234				1



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	×
Create LUN	
RAID ID: LUN Allocation: LUN Name: Unused: Allocation: LUN ID: ISCSI Block size:	RAID Thin-Provision Instant Allocation Limit: (0~9, a~2) 16384 GB Image: Size Bytes(For older version)
	ler system advance option, default is 512 Bytes. ore than 2TB capacity will be configured in Windows XP. for application like VMware etc.

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 T	arget	
iSCSI		
🕑 Add	🎲 Modify 🛛 🎲 Advanced 🛛 🥥 Delete	
Name		Status
1234		Disabled
5678		Disabled
LUN		
	🛞 Modify 🌼 Expand 🥥 Delete	
	Sector Sector	
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.

iSCSI		
🔾 Add 🎲 Modify 💱 Adv	anced Oelete	
Name	Status	
test1	Disabled	
LUN		
	and OPlete	
LUN ② Add 🎲 Modify 🎲 Exp Name	and Opelete Capacity(GB)	LUN Allocation

iSCSI CRC/Checksum

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

iSCSI	KAID Hanagement	×
Advance Options		
iSCSI CRC/Checksum:	🔲 Data Digest 🔄 Header Digest	
Max Connections:	8 👻	
Error Recovery Level:	2	
ОК		

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).

Disk Clone and Wipe

Disks installed on this device are able to utilize the Disk Clone and Wipe function

×	Home > Storage > D	isk Clone and W	lipe		⑦ Help ♡+M	y favorite 🛈 • Shuto	lown 1⁄⊡ Logout
System Information 🕚	Disk Clone and	Wipe					
🗙 System Management 🗉	Action:	Clone	 Wipe 				
System Network 🕚	Mode:	🔘 Fast	Full				
Storage 🖃	Source Disk:	Please select	a disk		~		
- W Disk Information	Target Disk						
- NAS Stacking	Disk No.	Model		Capacity	Interface	Status	
SO Image Mounting	2	ST4000DM000	-1F21	3,726 GB	SATA		
Share Folders	4	SAMSUNG HD2	203WI	1,863 GB	SATA		
Disk Clone and Wipe	Apply	Abort					
User and Group Authentication	Description 1. The disk clone a 2. The disk wipe ac 3. Only in the Full r	tion will wipe the	data of many targ	get disks.		he status to downloa	d the log file.

Disk Clone:

Unused Disks that have been installed on this storage device can utilize the disk clone function. If disks have already been configured in a RAID volume or as a spare disk, they cannot perform disk clone.

To start disk clone, select the source disk from the drop down menu and target a disk from the dialog box as seen below. Carry on to press "Apply," then the task will start. It may take a few hours depending on the size of the disk.

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

Action:	Clone	Ø Wipe			
Mode:	🔘 Fast	Full			
Source Disk:	1		~		
Target Disk	2 , ST4000DM	4000-1F21 , 3,726	GB , SATA		
Disk No.	4 , SAMSUNG	HD203WI , 1,863	GB , SATA	Interface	Status
2	ST4000DM000	0-1F21	3,726 GB	SATA	
a	SAMSUNG HD	203WI	1,863 GB	SATA	

Disk Wipe:

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

Action:	Clone Wipe				
ode: 🔘 Fast 🔘 Full					
Source Disk:	Please select a disk		~		
Target Disk					
Disk No.	Model		Capacity	Interface	Status
2	ST4000DM000	0-1F21	3,726 GB	SATA	
4	SAMSUNG HD	203WI	1,863 GB	SATA	

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

High-Availability (N8900, N12000 series/N16000 series/N12850/N16850 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.



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 Ne	twork > Networking	🕐 Help	0.1	ly favorite	ن Shutdown	沿 Logout	
	Host Settings							
	Host Name:	PMA	Domain Name	e -	thecus.co	m		1
	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 LAN	2 LAN3 Additional LAN4						
	Status:	Normal	Speed:		1000Mb/s			
	MAC Address:	00:14:FD:15:40:1B	Link Status:		Connecte	d		
	Jumbo Frame:	1500 🕶 bytes						
	IPv4		IPv6					Ī
	Enable:	V	Enable:					
	Mode:	Manual	Mode:		Manu	al		
		C DHCP			C DHCP			
	IP:	172.16.66.25	IP:		fec0::1			
	Netmask:	255.255.252.0	Prefix Lengt	th:	64			•
۲.							•	

•me > Storage > RAID Management ⑦ Heb ♡• My favorite Ů• Shutdown 2 Logo									
O Create 🐲 Edit 🎲 Global Hot Spare 🧐 HA Recovery									
	Mas RAID	ID	RAID Level	Status	Disks Used	Total Capacity	Data Capacity		
$(\ $	*	RAID	3	Healthy	1	463.2 GB	5.6 GB / 434.3 G	в	

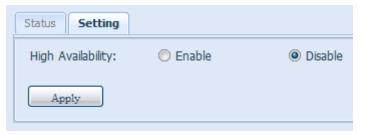
 2^{nd} unit: Host name: PMS (172.16.66.24) with JBOD RAID volume. This unit will be setup as the Secondary server.

e > System Network > Ne	tworking		🕐 Неір 🔇	ጋ∙My favorite ①•S	hutdown 🞢 Logout
st Name: PMS			Domain Name: WINS Server 2:	thecus.com	
IS Settings					
de: 🔍 Manual					
C DHCP (G	et From WAN/LAI	N1)			
15 1:					
15 2:					
IS 3:					
AN/LAN1 LAN2 LAN3	Additional LAN4	Additional LAN5			
Status: Normal			Speed:	1000Mb/s	
	0:15:CF:0D		Link Status:	Connected	
Jumbo Frame: 1500 ¥	bytes		IPv6		
Enable:			Enable:		
Mode: Mode:	ual		Mode:	Manual	
O DHC	P		House.	O DHCP	
IP: 172.16	5.66.24		IP:	fec0::1	
Netmask: 255.25	55.252.0		Prefix Length	64	
		m			
> Charges > DAID Man	o am an t		Quet	🗘 My favorite 🕛	Shutdown 🞢 Logo
storage > RAID Mana	igement	_	() Help	O- WA Lavoure O.	Shutdown x1 Logo
AID Management					
) Create 🛛 🎲 Edit 🛛 🧔 Global H	Hot Spare 😗 HA	Recovery			
Mas ID RAID RAID Level	Status	Disks Used	Total Capacity	Data Canacity	
* RAID J	Healthy	1		1.1 GB / 1859.9 GB)
					3 1
WARNING		be equ			ndary ser n the Prim

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.



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

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.

Off Off

Auto Failback

Auto Failback:	© Off ◯ On
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.

Ind	lica	tor	IP:	
THO	ICd	COL	IP.	

```
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	y		

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 192.108.5.201

Virtual IP H	eartbeat	
Interface:		Additional LAN4
IPv4 Primary	IP:	192.168.5.200
IPv4 Second	ary IP:	192.168.5.201

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

	Advanc	e options	Apply			
	Advance options				×	j
	Keepalive Time:	2		0		
	Deadtime:	30		0		
	Warntime:	10		0		
	Initial Deadtime:	120		0		
	UDP Port:	3694		0		
					OK	
i	ar ver renerary are		192110010	200		ł

Heart Beats C	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.



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.

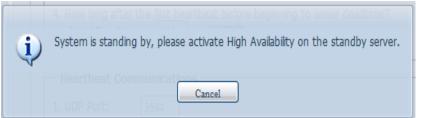
Status Setting		
High Availability:	Enable	🔘 Disable
Role:	Primary Server	Secondary Server
Primary Server IP:	172.16.66.25	
Detect		

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.



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:

Shutde	own/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.



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."

Н	ome > System Inform	ation > System Log	? Help	♡• My favorite	(), Shutdown	⁄行 Logout	
	System Log						-
	🔾 All 🛛 🌒 Info 🛛 🔥 Wa	arnings 🔞 Error					
	Download All Log Files	GTruncate All Log Files Number of lines per p	age 13				
	Time *	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	m [PMS] is	healthy now.			
	2012/06/05 17:14:39	[PMS] : User admin logged in from 172.16.	64.149				Ε

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 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							
HA Network S	Status:							
Primary Se	rver		Sec	ondary Server				
	7	Heartbeat	1					
6		Healtbeat	1					
	TP-	erface: WAN/LA 172.16.	A DATA DATA DATA DATA DATA DATA DATA DA					
HA RAID Sta	TP-		A DATA DATA DATA DATA DATA DATA DATA DA					
HA RAID Sta RAID ID	TP-		A DATA DATA DATA DATA DATA DATA DATA DA	Time Rem	Transfer	Used/Total	Status	
	Type -	172.16.	66.25	Time Rem	Transfer	Used/Total	Status	
RAID ID	Type -	172.16.	66.25	Time Rem	Transfer	Used/Total 200.1M/4		

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 > Storage > RAID Management						⑦ Help	Ů• Shutdown	1 Logout	
RAI	ID Man	agemei	nt						
00	reate	🤅 Edit	Global Ho	t 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 X
Heartbeat IP Address 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.

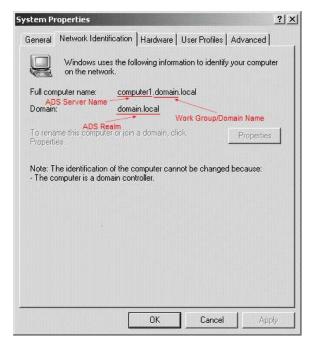
ADS/NT Support

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.

 		Home > User and Group Auth	entication > ADS Support
📕 System Information 🔹		ADS Support	
🗙 System Management 🔹		Work Group/Domain Name :	Workgroup
System Network		ADS Support :	Enable Disable
El Storage +		ADS Server Name :	
User and Group Authentication		ADS Realm :	
More than the second se		Administrator ID :	
Local Group Configuration		Administrator Password :	
Batch Input		Apply	
A description of each item folle	ows		
ADS/NT Support			

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 Ex	xample
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	~	Home > User a	nd Group	Authentication > Local User Configuratim Hel	⊙ 💭• My favorite	(). Shutdown	沿 Logout
J System Information	+	Local User	Configural	tion			
💥 System Management	•	📀 Add 🍪	Edit 🛛 🤤 Re	emove			
System Network	+	User ID		User Name			
Storage	+)	1000		andy			
	-						
ADS Support							
Local Group Configuration							
Network Service	+	14 4 Pag	el ofl	▶ N 2 ²		Displaying topics 1	1 - 1 of 1
Application Server	+						

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 Remove 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. Drag and drop to have this user join or leave a group.
- 6. Press the *Apply* button and the user is created.

Add						×
Local User Settin	ng			Group List		
User Name:				Search:		
User ID:		1000		Group ID	Group Name	
Password:						
Confirm Password	:					
Group Member	S					
Group ID	Group Name					
100	users					
Apply						,
			anad to I			
NOTE	All User	s are automatically assi	gned to i	the users g	roup.	

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 drag and drop list items to have this user join or leave a group. Click the **Apply** button to save your changes.

Local User Settin	lg	Group List		
User Name:	User-	Search:		
User ID:	1002	GroupID	Group Name	
Password:	•••••			
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.

	Home > User and Grou	p Authentication > Local User Configurati () Help	💭• My favorite	(), Shutdown	沿 Logout
	Local User Configu	ation			
	🔾 Add 🛛 🎲 Edit 😂	Remove			
	User ID	User Name			
	1000	andy			
Local	User Setting		×		
3	Do you want to de				
		Yazi No			

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	Ů• Shutdown	1 Logout
Γ	– Local Group Configu	ration			
	🔾 Add 🛛 🎲 Edit 🛛 🥥 Re	emove			
	Group ID	Group Name			
	100	users			
		N N I M			1.0
	4 4 Page 1 of 1	P PI I a ^p		Displaying topics 1	- 1 of 1

Local Group Configuration				
Item Description				
Add Press the Add button to add a user to the list of loc				
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 List		
Group Name:		Search:		
Group ID:	103	UserID	User Name	
Members List		1002	User	
	User Name			
UserID				
UserID	User Ivame			
UserID	User Martie			
UserID	User Marie			
UserID	User Mattie			
UserID	User Mattie			
UserID	User Mattie			
UserID	User Mattie			
UserID	User Natile			
UserID	User Adrile			

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, drag and drop the user from the **Users List** to move the user into the **Members List**.
- 4. To remove a user from a group, drag and drop the user from **Members** List.
- 5. Click the *Apply* button to save your changes.

Local Group Setting Group Name: Group Group ID: 103 Members List UserID User Nam				
Group ID: 103 Members List	5	Users L	ist	
Members List	Group	Search		
	103	UserID	User Name	
UserID User Nam		1002	User	
	ser 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 Gro	oup Authentication > Local Group Configura®nHelp	♡• My favorite	心 • Shutdown	s∰ Logou
	Local Group Conf	iguration			
	🔾 Add 🏼 🏀 Edit 📢	Remove			
	Group ID	Group Name			
	101	pm			
0	2 Do you want dek	ete this group?			
	14 4 Page 1 or	£1 ▶ ▶ @		Displaying topics 1	1 - 2 of 2

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.

٩	**	Home > User and Group Authentication > Batch Input	⑦ Help ♡+ My favorite	Ů• Shutdown 🞢 Logou
🕕 System Information	٠	Batch User and Group Creation		
💥 System Management	٠	Please choose a file to upload.	Import	
System Network			*	
Storage	-			
Ser and Group Authentication	-			
ADS Support				
Local Group Configuration				
Batch Input				
-				
			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.

Γ	-User Quota Quota Suppor	+		
	User Quota:	O 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.

.ocal Users				
	🌸 Search			
Vame	Quota Size (MB)	RAID	RAID1	
6666	1000	Disable	Disable	
obbb	3000	Disable	Disable	
5666	3000	Disable	Disable	

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	User and group 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.

× (Home > User and Group Authentication :	> LDAP Support		⑦ Help	♡• My favo
System Information	LDAP Support				
🗙 System Management 🔳	LDAP Support :	🔘 Enable	Oisable		
System Network	LDAP Server IP :]		
Storage 🔹	Base DN :		(ex:dc=example,dc=com)		
Ser and Group Authentication 🖃	Bind DN or LDAP administrator account :	:]		
ADS Support	Password :				
- 🗯 Local User Configuration	User Base DN :]		
Local Group Configuration	Group Base DN :				
- 🚰 Batch Input - 🕵 User Quota	LDAP Security :	none 💌			
User Group Backup	Current Samba ID :	S-1-5-21-4278180700-385	5975606-1258057255		
LDAP Support	Check objectClass Apply				
	Description				
	1. The LDAP server must have both samb		int ObjectClass account.		
	 The UID and GID account must be about 3. LDAP service must be enabled before C 		a.		
	If LDAP server has UID or GID less that	n 20,000 and duplicate with e	xisting local user, then the associated UID or GID		ocal user.
	5. If chooses the LDAP security TLS or SS	SL transmission encryption wa	y, determined whether LDAP server does have the	support.	

A description of each item follows:

LDAP Support	
Item	Description
LDAP Support	Enable or Disable LDAP service.
LDAP Server IP Input LDAP server IP address.	
Base DN	Input base domain information ex. dc=tuned, dc=com, dc=tw
Bind DN or LDAP administrator account	Input Administrator's name.
Password	Input Administrator's password.
User Base DN	Input organization unit information where users are stored.
Group Base DN	Input organization unit information where groups are stored.
LDAP Security	Choose the LDAP security type from drop-down list.
Current Samba ID	Display the current Samba ID.
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					
	Sumbuy CITO				
	Samba Service:	Enable		🔘 Disable	
	File Access Cache:	Enable		💿 Disable	
	Samba Anonymous Login Authentication:	🔘 Enable		Oisable	
	Samba Native Mode:	O Yes (Native Mode)		No (Compatible Mode)	
	Allow Trusted Domains:	Yes		No	
	Block Size:	4096 4096 4096	◎ 1024		
	Server Signing:	🔘 Auto	Mand	latory	Oisable
	Support Policy for LDAP:	🔘 Sign	🔘 Seal		Plain
	NT ACL Support:	🔘 Enable		Oisable	
	Allocated buffering size:	Enable	🔘 Dis		le

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 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.

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	Oisable	
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.

Samba/CIFS Options for Recycle Bin			
Samba Recycle Bin:	 Enable 	🔘 Disable	
Recycle bin contents are deleted after	r: 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)	

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".

Mas RAID	ID	RAID Level	File System	Status
۲	RAIDpm	J	EXT4	Healthy
◎ *	RAID	J	XFS	Healthy



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 **Network Service** 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:
🔁 AFP		Apply iTunes_music
MFS .		USBCopy
FTP		USBHDD
TFTP		eSATAHDD
Web Disk (HTTP)		NAS_Public E
Bonjour		_NAS_Module_Sour
C Songoan		_Module_Folder_
Application Server	+	pm1
		pm2
👫 Backup	۰	iSCSI_test1
External Devices	٠	< F

A description of each item follows:

Apple Network Configuration	
Item Description	
AFP Server	Enable or disable Apple File Service to use the Thecus IP storage with MAC OS-based systems.
MAC CHARSET	Specifies the code page from the drop down list.

Zone	Specifies Zone for Applet Talk service. If your AppleTalk network uses extended networks and is assigned with multiple zones, assign a zone name to the Thecus IP storage. If you do not want to assign a network zone, enter an asterisk (*) to use the default setting.
Time Machine	Click the enable checked box if you would like your MAC system to use the Thecus IP storage as MAC time machine backup.
Time Machine backup folder	Select from the drop down list to designate the folder for time machine backup destination.

NFS Setup

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

-NFS Support			
NFS:	Enable	💿 Disable	
NFS Threads:	Auto 🗸		
Advanced:	🔲 Add the Anon	ymous NFS User(nfsnobody:65534)	
Apply			
- Description			
The _NAS_NFS_Exp		older which cannot be accessed. of how to mount a network device.	
		aid0/data/_NAS_NFS_Exports_/SAMPLE 'SAMPLE /mnt/sample	/mnt/sample

A description of each item follows:

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

FTP

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

• • • • • • • • • • • • • • • • • • •	Home > Network Service > FTP		⑦ Help ♡+ My favorite 🖒+ Shutdown
📕 System Information 💌	FTP Support		
🗙 System Management 🔹	FTP Service:	Enable	💿 Disable
System Network	Secure FTP (Explicit):	🔘 Enable	Oisable
Storage 🕚	Port:	21	
Ser 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 ¥	
M NFS	Allow Anonymous FTP Access:	No Access 💌	
FTP	Auto Rename:		
Web Disk (HTTP)	Upload Bandwidth:		Unlimited
- 😤 UPnP - 😵 Bonjour	Download Bandwidth:	0	Unlimited
Application Server 🕚	Apply		
Rackup +			

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 Access	Upload/Download: Allow anonymous FTP users to upload or download files to/from public folders.
Access	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

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

📜 System Information	Ŧ	TFTP		
🗙 System Management	+	TFTP:	🔘 Enable	Oisable
System Network	+	NICs:	Available 🔻	
Storage	+	Port:	69	
Ser and Group Authentication	+	Share Folder:	•	
Service	-	The folder [] is not for Folder Permissions:	ound among the list.	
Samba/CIFS			Write	
AFP			Overwrite	
- 🧃 FTP		Apply		
TFTP				
- 🚰 WebService				

A description of each item follows:

TFTP	
Item	Description
TFTP	Enables TFTP Service on the Thecus IP storage.
NICs	Choose NICs 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.

me > Network Serv	vice > WebServ	ice	() Help	♥• My favorite	O• Shutdown	
- WebService (HTI	P) Support —					_
Sharing:	Enable	💿 Disable				
Port:	80					
Secure WebServ	ice (Secure HT	P) Support				_
Sharing:	Enable	💿 Disable				
Port:	443					
Certificate Type:	🔘 User	System				
CertificateFile:						
Certificate Key File:						
CA Certificate File:						
Aretu Rutur	All SSL Certificate	FX				
Apply Restore Description	All ool. Certificate	ries.				
	urs with an unio	aded SSL certificate file, default settings will be used automatically.				
The SSL certification	te file needs to	b Disk v2.x x and after.				

A description of each item follows:

Web Service	
Item	Description
WebService (HTTP)	Enable or disable WebDisk support. Enter the port number if
Support	this option is enabled. The port number is default 80.
Secure WebService	Enable or disable secure WebDisk support. Enter the port if
(Secure HTTP) Support	this option is enabled.
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 secure access.

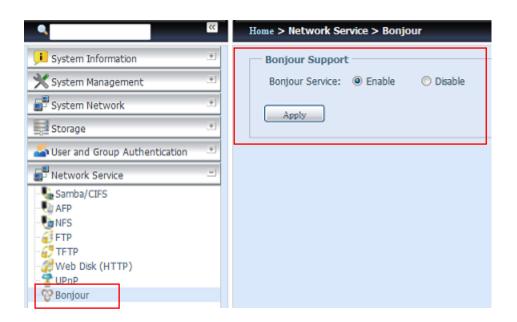
UPnP

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	٠	UPnP Support	
💥 System Management	٠	UPnP Service: 📀 Enable 💿 🛛	Disable
System Network		Description: N12000 IP Storage Serve	er 🔺
🔜 Storage	+		
🍰 User and Group Authentication	٠		T
Network Service	-	Apply	
Samba/CIFS			
AFP			
- the second sec			
TFTP			
Web Disk (HTTP)			
- TUPnP			

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.



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.

×	Home > Network Service > SSH	⑦ Help ♡+ My favorite ①+ Shutdown # Logou
📜 System Information 🔳	SSH Support	
🗙 System Management 🗉	SSH Service: O Enable O Disable	
System Network 🔳	Port: 22	
Storage 💌	SFTP: O Enable O Disable	
📥 User and Group Authentication 🛛 🖭	Apply	
Network Service		
Samba/CIPS APP AFP NFS FTP FTP WebService Bonjour SSH UPnP Port Management WebDAV Auto-Thumbnall FT Theus ID	 Description SSH account is 'root', and password is admin password. Port number must be > 1024 and < 65336, or Port=22 When enter NAS SSH service, does not delete or modify any file/folder, it maybe cause NAS to go If there is garbage file name appear during winscp transfer, please enable UTF-8 encoding option filenames: on] 	ienerate error n. [Winscp : Advance options / Environment / UTF-8 encoding for

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:

8	K	Home > Network Service > DDNS	0
System Information System Management System Network Storage Storage Network Service	•	DDNS Support DDNS: Enable DIsable Register: DynDNS.org (Dynamic DNS) User Name: family Password: Domain Name: www.thecus_share.com	
FTP TTTP WebService UPnP Service Bonjour SSH DDNS UPnP Prot Managment	•	Apply	

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.

Enable Disable
Enable Oisable
Save 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	🕐 Help	♡• My favorite	Ů • Shutdown	<i>s</i> 登 Logout
J System Information	+	Information					
🗙 System Management	+	Friendly Name:	UPnP router				
System Network	+	Manufacturer URL:	http://tomatousb.org/				
Storage	+	Model number:	1				
Subser and Group Authentication	+	Model URL:	http://tomatousb.org/				
Network Service	-	Model description:	UPnP router				
Samba/CIFS		UDN:	uuid:8daf93d2-e626-42eb-ab56-3	7d96463be8c6			
-	- 🛃 FTP - 🛃 TFTP	Connection rules	Modification rules			O D	eletion rules
- 20 WebService		Port 🔺	Protocol		Description		
- 🖗 Bonjour - SSH		∃ None Local Setting					
DDNS		11707	UDP				
UPnP Prot Managment		11707	TCP				
		26423	UDP				
		26423	TCP				
		45631	TCP				
		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		



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

WebDAV

The WebDAV is an extended protocol of http(s) which allows remote access to your NAS system.

To begin using WebDAV and WebDAV SSL, simply click enable and provide the port number. The default port number is 9800, under normal circumstances this will not need to be changed.

-WebDAV Support-						
inconstructure						
WebDAV:	Enable	🔘 Disable				
Port:	9800					
WebDAV SSL:	Enable	🔘 Disable				
Port:	9802					
Browser View:	Enable	🔘 Disable				
Apply						
Description						
 Port number must be > 1024 and < 65536 Please set WebDAV ACL at [Share Folder] function 						
FBrowser View] prov	vide valid user view	files on browsers				

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

Auto-Thumbnail

The auto thumbnail is a function on the GUI that can be used with the Thecus T-OnTheGo mobile application. It helps to resize a photo while when it is on written the NAS system. Enable this service allows you to speed up photo viewing on your Mobile device.

Auto-Thumbnail Thumbnail service:	Disphia					
Thumbhail service: Enable Disable Apply						
Description This feature helps users who access their photo folder via T-OnTheGo (or other related app) to quickly and easily browse their files.						
Auto Thumbnail Configuration						
Item	Description					
Auto Thumbnail Service	Press the Enable button to activate the auto thumbnail service.					

Thecus ID

Apply

Creating a Thecus ID will give you full access to all that Thecus has to offer. After creating a Thecus ID, you'll receive a free* DDNS (i.e"yourname.thecuslink.com".) You can use your DDNS to easily access your NAS, make use of the mobile T-OnTheGo[™] app, and share links to files with your friends. In the future, free cloud backup of your NAS configuration file will also be provided.

Click "Apply" to confirm the changes.

From here, it will display the current Thecus ID and DDNS information for the associated Thecus NAS system and also the port connection status. You can click logout if remote access is no longer needed.

If your Thecus NAS system is not currently logged in, or if DDNS has not yet been applied, then it can be done here.

• Login Thecus NAS system:

Simply input your existing Thecus ID and DDNS for this Thecus NAS then press **Apply**.

• Create free DDNS for your Thecus NAS:

With registered Thecus ID, you could create DDNS for your Thecus NAS by fill in valid Thecus ID and password. Then input desired DDNS name to complete DDNS creation.

DDNS settings	
DDNO Settings	
Thecus ID:	
Password:	
DDNS:	.thecuslink.com
Apply	
If you do not have	a Thecus ID, please register a new account.
Register	
Description	
Description	
For advanced My T	hecus ID settings, please go to: http://thecusid.thecuslink.com/mythecusid

If you don't have a Thecus ID, click "Register" and the screen below will appear. Please fill in the required information and click Apply.

Create Thecus ID	_
Thecus ID:	
Password:	
Confirm Password:	
First Name:	
Middle Name:	
Last Name:	
Apply	
Description	
For advanced My Thecus ID settings, please go to: http://thecusid.thecuslink.com/mythecusid	

Register Thecus ID	
Item	Description
Thecus ID	Input a valid email address. It will require confirmation to activate your Thecus ID.
Password	Input the password for your Thecus ID
Confirm Password	Re-input the password for your Thecus ID.
First Name	Input your First name
Middle Name	Input your Middle name

Last Name	Input your Last name
Apply	Click Apply to save your changes.

Once your ThecusID has been registered, you will be given access to a webpage providing more information (i.e. connection test, re-send password, etc.).

http://thecusid.thecuslink.com/mythecusid/index.php

The Creator in Stor	age
	My Thecus® ID
Home Login	Thank you for using Thecus® NAS.
Forgot Password Resend Activation Email	What is Thecus® ID?
	A Thecus® ID is your account for everything you do with Thecus®. After creating a Thecus® ID, you'll get a free" DDNS, such as "wow.thecuslink.com". You can use your DDNS to easily access your NAS, make use of the mobile T-OnTheGo™ app, and share links to files with your friends. In the future, free cloud backups of your NAS configuration file will also be provided.
	Please note that none of your information will be shared without your express permission.
	*Your DDNS is guaranteed for the duration of the warranty of your Thecus® NAS.

VPN Client

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

	~~	Home > Network Service > VPN Client	⑦ Help	♡• My favorite	心・Shutdown	招 Logout
🕕 System Information		VPN Client				
💥 System Management		VPN Server IP:				
System Network	.*)	Username:				
Storage		Password:				
Subsection State Authentication		Status:				
Network Service	-	Start Stopped				
TUPnP Service						
SSH		Description				
- State DDNS		Just support PPTP VPN server.				
UPnP Port Management						
- 🧬 WebDAV - 🦉 Auto-Thumbnail						
E Thecus ID						
- CI VPN Client						
Application Server						

Once a connection has been successfully made, the granted IP address will be displayed in your status.

- VPN Client -	
VPN Server IP:	172.16.64.152
Username:	andyliao
Password:	•••••
Status:	VPN Client IP Connected, your IP is 172.16.65.130
Start	Stopped
Description –	
Just support P	PTP VPN server.

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

VPN Server

NOTE

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

· · · · · · · · · · · · · · · · · · ·		Home > Network Service > VPN Server ⑦ Help ♡+ My favorite ①+ Shutdown 🔊 L	ogout
J System Information		Server Setting Client Management Connection List Log	-
🗙 System Management 🔹			_
System Network		Regular Settings	
Storage 🔹		Network Interfacre: WAN/LAN1	
Ser and Group Authentication		L2TP/IPSec	
Network Service		V Enable L2TP/IPSec VPN Server	
WebService		VPN Client IP Pool: 192.168.0.1 - 192.168.0.255	
- The Service - Of Bonjour		VPN Server remote IP: 192.168.0.2	
SSH DDNS		Authentication: PAP	
UPnP Port Management		IKE Authentication	
- 😚 WebDAV - 😤 Auto-Thumbnail		Pre-shared Key: share-your-key	
Thecus ID		Confirm Pre-shared Key: share-your-key	
- 🚥 VPN Client			
VPN Server	-1	Apply	
Application Server 🕑			
📑 Backup 🔳		Description	

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

VPN Server	
Item	Description
Network Interface	Select the NIC interface to use for VPN server
Enable L2TP/IPSec VPN	Check to enable L2TP/IPSec VPN server service
Server	
VPN Client IP Pool	Input the IP range for client IP.
VPN Server remote IP	Input the IP for the VPN server for VPN client connection
Authentication	Input domain name with DDNS registry.
IKE Authentication	Internet Key Exchange for authentication while connection is
	made.
Pre-shared key	Input the key for connection authentication in between VPN
	client and server.
Confirm Pre-shared Key	Confirm the key
Apply	Click "Apply" to confirm the changes.

Below is a description of each item:

For the VPN client access control, simply click on "Client Management" tab. It will list all the users on this system and default "Allowed" for VPN connection. Un-tick the check box and confirm with the "Apply" button if users are prohibited from connecting with this VPN server.

Server Setting	Client Manag	ement Connection List Log
🎲 Apply 💲 I	Refresh	
User Name	L2TP/IPSec	
pm1		
pm2		
pm3		
ааа		

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

Server Setting Clier	it Management	Connection List Log		
💲 Refresh				
Login Time	Uptime	User Name	Client Address	Service
Mon Jan 26 12:43	08:00:00	pm2	192.168.0.1	L2TP/IPSec

To retrieve the VPN service connection history information, click on "Log" tab. It will display the complete access log of the VPN service.

Server Setting Client	Management Connection List Log	
💲 Refresh 🛛 🤤 Delete		
Date & Time	Event	Client Address
2015-01-26 12:43:22	user pm2 logged in on tty pts/0 intf ppp0	192.168.0.1 remote to 192.168.0.2
2015-01-26 12:42:49	Connect time 36.0 minutes. user logged out.	

NOTE

The VPN server only supports L2TP/IPSec connection.

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 Service** menu, choose the *iTunes Server* 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 🔹	iTunes Configuration
🗙 System Management 🔹	iTunes Service: 📀 Enable 💿 Disable
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	
- 👕 Module Installation - 🕌 Auto Module Installation	

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

iTunes Server Configuration				
Item	Description			
iTunes Service	Enable or disable the iTunes Service.			
iTunes Server Name	ver 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.

App Installation

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

App Management								
Ena	Туре	Name	Version	Description	Last Status	Action	Show in Lo	
Yes	System	Usb/eSATA Schedule Bac	1.00.03	USB/eSATA S	٩	🗆 ×		

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 App Installation

Choose the **Auto App Installation** item and the **Auto App Installation** screen appears. The default for this apps 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 apps. Please refer the screen shot below.

•	~~	Ho	me > Applicati	ion Server > Auto	Module I	nstallation	Help 🖓 I	My favorite 🖞)• Shutdown	<i>s</i> ∰ Logo
📁 System Information		м	Iodule Package:				Lup	lozd	Rescan	
💥 System Management			Module Sou	irce List						
System Network	+		Installed	Name	Version	Description	Location	Document	Action	
Storage			Not Installed	NZBGet	v2.00.02	NZBGet download	Online			
Ser and Group Authentication			Not Installed	Mailserver	2.00.02	Mail server	Online		Ξ.	
Network Service	.+)		Not Installed	IP_Cam	2.0.1	Simple surveillance	Online	8		
P 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			
			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	.+	1								

Auto Module Sour	ce 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			

Module Sour	rce List —					
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 o
Not Installed	webserver	1.0.4	Webserver	Disk		Install Mod the o

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/N12850/N16850 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			
Daily 00.00			
🕽 Weekly 🛛 Sünday 🗙	00:00		
🗇 Monthly	00:00		
Status:			
Manually Apply			
Manually Apply			
Manually Apply 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	ப்• Shutdown	s∰ Logout
Rsync Target Settings						
Rsync Target Server :	e 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 Defaul	t Key. Download Ke	EY.				

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**



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.

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	⑦ Help ♡• My favorite	ப்• Shutdown	⊀ Logout	
ACL Backup/Restore				Shared Folders
ACL Service: Backup Restore				💿 Add 🎲 Edit 👄 Remove 💆 NE
Raid Name: PATT Y File System:xfs				Folder name >>
Raid Name: RAID Y File System:xts				Image: Second
Upload:				▷ 🧰 usbhdd
Recursive: (Applies ACL to all contained sub-folders a	as well. May extend restorat	ion time.)		Isotopy
				D aswebsite
Apply				▷ 🚞 iTunes_music
Description				Module_Folder_
Description				Description: NAS_Module_Source_
 Raid status must be healthy/degraded. ACL restoration from a ZFS file system can only be applied to an 				▶ 🛄 pm1
 Recursive ACL restoration does not apply to the USBHDD/usbhc While the RAID partition is restoring/backing up ACL, its folders ACL restoration/backup cannot be applied to stacked folders. 		e UI.		▷ 🧰 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 Folders
ACL Service:	O Backup Restore	Shareu Tolders
Raid Name:	RAIDpm V File System:xfs	⊘Add @Edit ⊜Remove
Upload:	Cifakepath/folder_acl.bin	Folder name >>
Recursive:	(Applies ACL to all contained sub-folders as well. May extend restoration time.)	Instruction
		▷ 🧰 usbhdd
Next		Isbcopy
Description —		Inaswebsite
	: be healthy/degraded. from a ZFS file system can only be applied to another ZFS file system.	iTunes_music
 Recursive ACL re 	istoration does not apply to the USBHDD/usbhdd folder. partition is restoring/backing up ACL, its folders will not be shown within the UI.	Module_Folder_
	backup cannot be applied to stacked folders.	Description: 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.

ear	ch:								
1	Folder name								
ĩ	_Module_Folder_								
	_NAS_Module_Source_								
	iTunes_music								
	naswebsite								
l	nsync								
l	pm1								
	usbcopy								
	usbhdd								
ot	tice: The target RAID p	artition is	not the	original RA	ID partition.				
lot		artition is	not the	original RA	ID partition.				

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	~~	Н	ome > Backup > Data I	Burn		⑦ Help	♡• My favorite	(). Shutdown	🕂 Logout
3 System Information									*
💥 System Management	(*)		Add data to start burr						
System Network			🔿 Add 🛞 Edit 🖨 Rer						
Storage	+		Name			Path			
Logical Composition Section	.*)		Wew Disc						
Service									Б
Application Server									
📑 Backup	-								
ODM Backup Rsync Target Server Rsync Rsync ACL Backup/Restore Data Burn									
			Total size: 0						
External Devices			Disc:	Select	Detec	t.disc.			

1. Write Files/folders to disc

Home > Backup > Data Burn		
Ad Write file/folders to disc process:	Add data to start burning pro	cess ×
Name	Image: Second Seco	name NAS_Public US8Copy US8HDD Module_Folder NAS_Module_Source_ NAS_Picture_ eSATAHDD SCSI_pm1 iSCSI_pm2 iTunes_music isp2 isptest snapshot test
		Select Cancel

- 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

Add data to start burning process:	
O Add geEdit GRemove GRemove All	
Name	Path
🖼 🙆 New Disc	
Product Meeting Weekly Report	/raid0/data/NAS_Public/Product Meeting Weekly Report
C son	/raid0/data/_NAS_Picture_/son

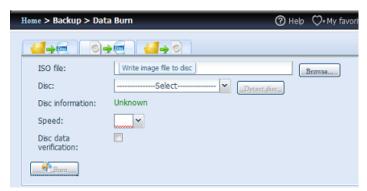
it and press "Edit" from menu bar. The selected folders/files also can be removed by clicking on them and then pressing "remove" or "remove all" for all selected items.

- 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.

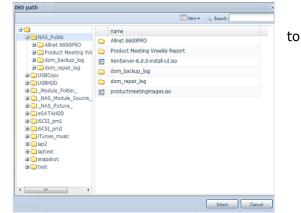
Disc:	MSI WIND DRI	VE U0882 💌	Detect disc
Disc information:	CD-R (Empty),	Disc space:702	.82 MB
Speed:	24x 💙		
Disc data verification:	V		
Burn			

f. Click "Burn" to start disc burning.

2. Write image file to disc



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



b. Select the ISO file.

ISO file:	id0/data/NAS_Public/XenServer-6.0.0-install-cd.iso

- 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

Home > Backup > Dat	a Burn		🕜 Help	♡• My favorite
		0		
ISO file:		Create image file from fil	le/folders	Browse
Disc:	Se	lect 🖌 🚺	Detect.disc	
Disc information:	Unknown			
Speed:	~			
Disc data verification:				
Burn				

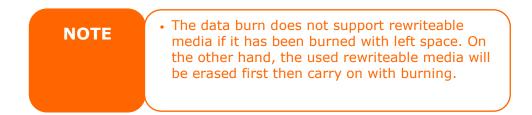
a. Click the Add button and the NAS share list will appear.

 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

🥶+@ 0+@ 💶+0	
Add data to start burning process:	
3 Add geldt GRemove GRemove All	
Name	Path
🖼 🎯 New Disc	
Product Meeting Weekly Report	/raid0/data/NAS_Public/Product Meeting Weekly Report
🗀 son	/raid0/data/_NAS_Picture_/son

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.



Data Guard (Remote Backup)

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 Configurat	tion
Task Name	Source Path	Source Folder	Target Path	Last Run Time	Backup Type	Status	
Category: remote (3)							

Remote Data back	sup state of the s
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 Backup	Source Path	Source Folder Target Path Last Run Time B:
	0	Full Backup Automatically sync all data (NOT including iSCSI folders) in RAID to remote target, folders not found on remote will be created to Master RAID.Folders already exist on remote will be replaced.
		Custom Backup Manually select folders (NOT including iSCSI folders) to backup.
		iSCSI Backup Backup iSCSI folders to remote target.(iSCSI target will be stop during backup task running.)
		Previous

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	ckup _{ie Path}	Source Folder	Target Path	Last Run Time	Ba
Remote Backup > Full Ba	ckup e Dath Remote Target: Encrypt with SSH: Account : Password : Connection Test	172.16.64.131		B73	Ba
			(Previous Cance	el

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	d! Click Next to co	ntinute.		

Click "Next" and more setting will appear.

Remote Backup > Full Ba	ickup _{e Path} So	ource Folder Taraet I	Path Last Run Time Bag
\$r	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: Speed Limit: Timeout Limit: Enable Schedul	555 Y 0 MB/Sec(set 0 to 600 Sec	o unlimit)
	<u></u>	Previo	ous Finish Cancel

-Fill out all the necessary details and choose your parameters

Add Rsync B	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.
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
Croad Limit	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.

ome > Backup > I	Data Guard			🕐 Help	o ♥•My favorite	டு -Shutdown	st Logo
🔇 Add 🎲Edit 🤤 Remove 🕞 Start 💿 Stop 🧐 Restore 🔋 Log					۰.	Restore NAS Cor	nfiguration
Task Name	Source Path	Source Folder	Target Path	Last Run Time	Backup Type	Status	
🗆 Category: rem	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.

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
×	Notice: Click highlight row to enter the folder	
	Select Folders to Backup	🔲 Select All
	Return to Parent Folder	
	📑 🗐 NAS_Public	
	USBCopy	
	UNAS_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	purce Folder Target F	Path Last Run Time Bac
*	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:	555 💌	
	Speed Limit:	0 MB/Sec(set 0 to) unlimit)
	Timeout Limit:	600 Sec	
		Previo	ous Finish Cancel

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

nove 🕟 Start 🖲 S	Stop 🕙 Restore 🔇	Log		•	Restore NAS Configuration
ource Path 9	Source Folder	Target Path	Last Run Time	Backup Type	Status
AID (USBCopy, snapshot	172.16.64.131:/Bac		Realtime	Processing
50	urce Path	urce Path Source Folder		urce Path Source Folder Target Path Last Run Time	urce Path Source Folder Target Path Last Run Time Backup Type

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
Remote Backup > iSCSI	Backup Path (5) Remote Target: Encrypt with SSH: Account : Password : Target Folder :	172.16.64.131 Off cheryl exee Backup /		873
	Connection Test	r		
			(Next Cancel

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

Remote Backup > ISUSI	васкир	Source Folder	Target Path	Last Run Time	Ba
\$1	Notice: Click hig	ghlight row to enter t	he folder		
	Select Folders	to Backup			
	isc 💽 💿	ISI_iscsi01			
			Previous	Next Cance	;l

 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 _{Dath}	ource Folder	Tarcet Path	Last Run Time Bao
	Task Name: Log Location: Speed Limit: Timeout Limit: └╵!Enable Schedu	600 Sec	(set 0 to unlimit)	
	Time: Schedule:	00 × : 00 Monthly 00 ×	Weekly Monday	Daily
			Previous	Finish Cancel

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

Ho	me > Backup > Dat	ta Guard			🕐 Help	♡•My favorite	ப்- Shutdown	沿 Logout
	🔾 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: remote	(1)						
	iscsibackup		iSCSI_iscsi01	172.16.64.131:/Ba		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
鷆 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
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.

RAI	ID Man	agemen	t					
00	reate	i) Edit	🍪 Global Hot S	pare				
	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".

RAI	D Man	agemen	it					
🔕 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		
\$c	Task Name:	FullBackup	
	Backup Type:	Realtime	💿 Schedule
	Sync Type:	Sync	💿 Incremental
	Compress:	Off	🔘 On
	Backup NAS Configs:	O Off	On
	Resume Partial Files:	Off	On On
	Handle Sparse Files:	 Off 	On On
	Keep ACL Settings:	Off	💿 On
	Log Location:	555 🗸	
	Speed Limit:	0 MB/Sec(set 0 to	o unlimit)
	Timeout Limit:	600 Sec	
		ie	
		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 🤤 I	Remove 🕞 Start 🤇	🗈 Stop 🕙 Restore 🛛	9Log			🕙 Restore NAS Configuration
Task Name	Source Path	Source Folder	Target Path	Last Run Time	Backup Type	e Status
ull Backup				<u>.</u>		
	Remote Targ Encrypt with Account : Password : Connection	SSH: Off cheryl	131 Port:	873		
				Can	icel	

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. Y download current config file. Then se the list. Download	ou can click the under button to elect the config you want to restore from
	Config Files List Name N5550_00:14:FD:16:8F:8A_fullback	Date 2013/01/22 10:19:04
		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	- Count	<u></u>	
	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	
	RAID setting in config file	RAID	
	RAID	RAID	
	RAID01	RAID	
	RAID20	RAID	
	System needs to be	reboot after configuration restoring.	~
	^k	Previous Finish Cancel	1

- 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 Mapping The under list shows the RAID setting in config file. You can simply click the right column to change the setting.		
E A	RAID setting in config file	RAID	
	RAID	RAID	
	RAID01	RAIDa 🗸	
	RAID20	RAID	
		RAIDa	=
			-
	System needs to be	reboot after configuration restoring.	~
		Previous Finish Cancel	

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 Data Guard (Remote backup).

🔾 Add 🎲 Edit 🌘	Remove Star	t Stop 👞 Rest	Restore NAS Configuration			
Task Name	Source Path	Source Folder	Target Path	Last Run Time	Backup Type	Status
□ Category: remote (3)						

Local 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":



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



Local Data backup		
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 C RAID C RAID C RAID
		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 Select Return to Parent Folder Asmedia_USB3 Intel_Graphi	t A11	Target C RAID RAID RAID60	
	N10850 N4200PRO_02 N4800 N6850 N7510 Please select source folders	•		

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

Local Backup > Import		
Local Backup > Import	Source Select Return to Parent Folder Asmedia_USB3 Structure Intel_Graphi ISVM2_03 ISVM2_03 IN10850 IN4200PRO_02 IN4800 IN4800 IN4800 IN4800 IN4800 IN4800 IN4800 IN4800 IN4800	elect All
		Previous Next Cancel

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			
	Set Public: Log Location:	Off Intel_Graphics_V6141053 Intel_Graphics_V61410	
		NAS_Public R6andy USBCopy USBHDD _Module_Folder_ _NAS_Picture_ andy_local eSATAHDD iSCSI_iscsiv502 iTunes_music	

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".

Local Backup > Import	
	 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. Duplicated Folder List Origin Folder:Intel_Graphics_V614105398_XP Will be rename to:Intel_Graphics_V614105398_XP-1
	Previous Finish Cancel

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

ome > Backuj	p > Data Guard			⑦ Help ♡+М	ly favorite (り・ Shutdown	纾 Logo
💿 Add 🎲 Edi	t 🤤 Remove 🕟 Sta	rt 🖲 Stop 🕙 Rest	tore 🕲Log			Restore NAS Co	onfiguration
Task Name	Source Path	Source Folder	Target Path	Last Run Time	Backup Typ	oe 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	ப் • Shutdo	own 🕂 Log
Shared Folders				
💿 Add 🎲 Edit 👄 Remove 💆 NFS 🖏 Samba 🐻 Snapshot	🖆 ACL			
Folder name >>	RAID ID	File System	Public	Description
Intel_Graphics_V614105398_XP	RAID60	ext4	yes	<u>_</u>
Intel_Graphics_V614105398_XP-1	RAID60	ext4	yes	
▷ 🧰 N10850	RAID60	ext4	yes)
NAS_Public	RAID	ext4	yes	
- Anne I				

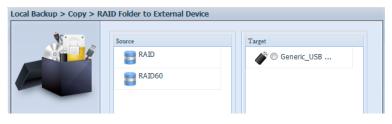
Copy: click on "Copy" and this screen appears.
 3 different options can be selected, folder to folder, folder to external device or external device to folder.



Folder to Folder



Folder to external device



External device to Folder

ocal Backup > Copy > Ext	ernal Device to RAID Folder	
	Source Select All	Target
	🂣 🗖 Generic_USB	and Raid
		RAID60

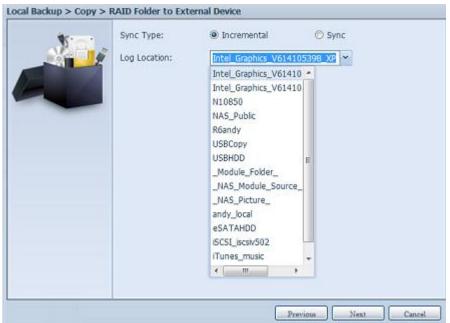
Let's take "Folder to External device" as an example. In the source pane, select the desired RAID volume and its associated folder list will appear; same method in the target pane for the associated external device.

No.	Source	Select All	Target	
	Return to Parer	nt Folder	Return to Parent Folder	^
	📑 📰 Intel_Grap	hi	🕘 🔘 LSVM2_03	
-	🧾 🖂 Intel_Grap	hi	J © N10850	
			0 N4200PRO_02	=
	📑 🖾 R6andy		🕘 🕲 R6andy	1
			🥘 🛛 Realtek_LAN	
			🥶 🔿 W2008_W7	1
			ggofactory	۲
			📑 🔿 temp	
	1.000			

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. Accept

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

A con Co con	t 🤤 Remove 🕞 Star	Camp Ones	an a real water	1	0.00	store NAS Configurat
Task Name	Source Path	Source Folder	Target Path	Last Run Time	Backup Type	Status
B Category: lo	cal (2)					
import	Generic_USB	Intel_Graphic	RAID60	2012/07/25	Import	Finish
CODY	RAID60	R6andv	Generic USB	2012/07/25	Conv	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	
<pre>O _NAS_Module O _NAS_Picture_ O _NAS_Picture_ O andy_local O O Tunes_music</pre>	E E Reandy	
🔠 🔿 snapshot	•	

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.
	IZ Accest
	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.

	t 🤤 Remove 💽 Star	Contra Onite	and claus		0	store NAS Configuratio
Task Name	Source Path	Source Folder	Target Path	Last Run Time	Backup Type	Status
Category: lo	cal (3)					
import	Generic_USB	Intel_Graphic	RAID60	2012/07/25	Import	Finish
сору	RAID60	R6andy	Generic_US8	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".

S.C	Source	Select All	Target	_
	Return to Parent	Folder	Return to Parent Folder	ŕ
	NAS_Public		0 LSVM2_03	
-	USBCopy		🧾 🗐 N10850	
	Module_Fo	lder_	3 N4200PRO_02	
	🥶 🗉 _NAS_Modu	le E	C R6andy	- 7
	NAS_Pictur	re_	🕘 🖲 Realtek_LAN	
	andy_local		🥶 🛇 W2008_W7	
	🧾 🗇 (Tunes_musi	c	ggofactory	1
	J 🖾 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) 	O Don not create(directly backup to target)
	Sync Type:	Incremental	O Sync
	Log Location:	Sandy 👻	
	Enable Sche	And a second sec	
	Time:	00 🛩 : 00 🛩	
	Schedule:	O Monthly O Weel	dy III Daily
		00 💌 Monday	*
	1		

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

1	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.
	IVI Accest

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
B 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".

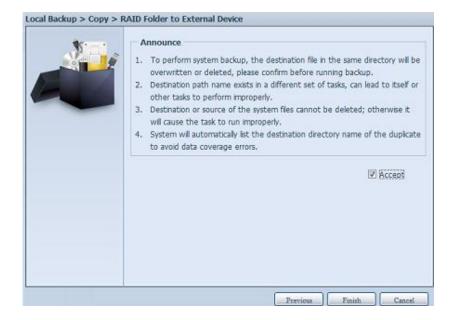
The source pane listed "iSCSI_iscsiv502" and "iSCSI_iscsiv50" where are iscsi volume has existed in this system with name "iSCSI_+iscsi target volume name".

Source	Target	
I III ISCSI ISCSIV507	Return to Parent Folder	-
SCSI_iscsiv50	NAS_Public	
	USBCopy	
	C_Module_Folder_	
	O_NAS_Module	a a
	INAS_Picture_	1
	andy_local	1
	🕘 🛛 iTunes_music	
	📑 🔿 snapshot	-
	I III ISCSI Iscalv502	Image: Scsl.scsiv502 Image: Scsl.scsiv502 Image: Scsl.scsiv50 Image: Scsl.scsiv502 Image: Scsl.scsiv50 <td< td=""></td<>

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".

Task Name Source Path Source Folder Target Path Last Run Time Backup Type Star Import siliconpowe NAS_Public, u RAID1 2012/07/23 Import Finite	us
import siliconpowe NAS_Public, u RAID1 2012/07/23 Import Finit	
	h
copy raid0iscsi0 msvs2010 RAID1/NAS_P 2012/07/23 Copy Fini	h
iscsiback01 iSCSI_iscsiv502 RAID/andy_local iSCSI Pro	

States change to "Finish" after task complete.

😳 Add 🎲Edi	t 🤤 Remove 🕟 Star	t 🖲 Stop 😷 Rest	ore SLog		🔁 Re	store NAS Config
Task Name	Source Path	Source Folder	Target Path	Last Run Time	Backup Type	Status
Category: lo	cal (3)					
import	siliconpowe	NAS_Public, u	RAID1	2012/07/23	Import	Finish
import copy	siliconpowe raid0iscsi0	NAS_Public, u msvs2010	RAID1 RAID1/NAS_P		Import Copy	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

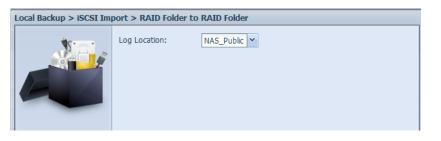
6. **iSCSI Import:** click on "iSCSI Import" and screen appear as below. It can be imported from two different storage pools, folder to iSCSI or external device to iSCSI. It is depend on where iSCSI volume has backup to.



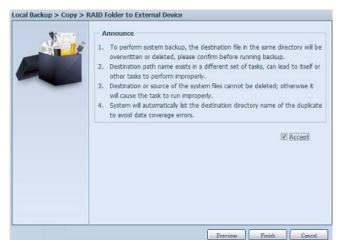
Let's take example to import "RAID folder to iSCSI" which is the iSCSI volume we have backup earlier to RAID volume folder andy_local than import to volume RAID.

0.00	Source	Target
3 m / 2	Return to Parent Folder	AID5
	NAS_Public	E BI RAID
	USBCopy	RAID60
	O _Module_Folder_	
	O_NAS_Module	E
	SANS_Picture_	
	andy_local Source	
	🥶 🔿 iTunes_music 🛛 🗟	Return to Parent Folder
	🥘 💿 snapshot 📒	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.

Chine Chine	Remove 🕞 Star	Contract Contract	and the second		0.0	store NAS Configurat
Task Name	Source Path	Source Folder	Target Path	Last Run Time	Backup Type	Status
E Category: lo	cal (5)					
mport	Generic_USB	Intel_Graphic	RAID60	2012/07/25	Import	Finish
сору	RAID60	R6andy	Generic_USB	2012/07/25	Copy	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 isosiv502	RAID	2012/07/26	ISCSI Import	Finish

USB Copy

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

٩	<u>~~</u>	Home > Backup > U	SB Copy		⑦ Help	♡• My favorite	心• Shutdown	⊀ Logout
i System Information		USB Copy						~
💥 System Management		USB Copy Service:		Enable	🔘 Disable	2		
System Network		Choose Backup Di	rection:	O USB to NAS	Copy al	I USB files to NAS	USBCopy 👻	
Storage				NAS to USB				
Super and Group Authentication		Choose Backup W	ay:	Sync	Incremntal	Create n	ew folder	
Network Service	.*)	Apply						
Application Server		O Add GEdit (emove .		Target Path			
👫 Backup	-	Source Paul			rarget Faul			
DOM Backup Rsync Target Server ACL Backup/Restore Data Bum Data Guard Amazon S3 USB Copy		The specified foll The source drive A source drive is Once file transf the device.	der on destination s contain folders empty fers have begun, t		moved or renamed			nnected fror
External Devices		<						>

Disable USB Copy

Simply select "Disable" for the USB Copy Service option and the USB Copy button or LCM/OLED USB Copy item will become inactive.

Home > Backup > USB Copy	/	⑦ Help (", My favorite (り・Shutdown 2
USB Copy				
USB Copy Service:	🔘 Enable	Oisable		
Choose Backup Direction:	USB to NAS	Copy all U	ISB files to NAS	USBCopy 💙
	NAS to USB			
Choose Backup Way:	Sync	Incremntal	Oreate net	w folder
Apply				

Using USB Copy

Enable the USB Copy service and select one of the 3 options available: "USB to NAS", "NAS to USB", and "Copy all USB files to NAS".

If select "USB to NAS" or "NAS to NAS", you will also need to set up the type of backup desired.

USB Copy Service	Transfer Options
ltem	Description
Sync	Makes your source match your target completely; deleting and adding files on your target as they are deleted and added on your source.
Incremental	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.
Create New Folder	Create new folder on target based on the task's "Date+Time".
Apply	Press Apply to confirm the settings.

Now, add the task for the USB Copy service you have selected (for ``USB to NAS" or ``NAS to USB").

Click on "Add" and select "Source Path" and "Target Path" from the drop-down list.

💿 Add 🍰 Edit 🤤 Remove	
Source Path	Target Path

Add Source:

	USB Copy × USB USB USB USD24 1 USD24 U	
USB Copy × Source Folder: Target Folder: Save	Select	USB Copy × Source Folder: /gofactory Target Folder:



	USB Copy	×	
	🖻 😋 NAS		
	🕀 🧰 NAS_Public	1	
	🕀 🧰 USBCopy		
	🕀 🧰 USBHDD		
	Module_Folder_		
	🗉 🧰 _NAS_Media		
	MAS_Module_Source		
	P2P_DownLoad_		USB Copy
USB Copy ×	🕀 🧰 eSATAHDD		Constant Constant
Source Folder: /gofactory		~	Source Folder: /gofactory
Target Folder:	🖻 🧰 iSCSI testa		Target Folder: NAS_Public
	< >		
Save	Select		Save
	empty	_	

Save the completed task:

Target Path
NAS_Public

To "Edit" or "Remove" a USB Copy task, select the task item and click on the associated function:

🔾 Add 🌈 Edit 🥥 Remove	
Source Path	Target Path
_NAS_Module_Source_	usb://
_NAS_Picture_	/gofactory

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

Choose Backup Direction:	O USB to NAS	Copy all USB files to NAS		USBCopy 🕶
	NAS to USB			snap
Choose Backup Way:	Sync	Incremntal	Oreate new f	USBCopy
Annha	- ,			NAS_Public
Apply				iTunes_music

ΝΟΤΕ	If "Sync" mode has been selected, the target-side redundant folders/files will be deleted after a comparison has been conducted of the source.
ΝΟΤΕ	Once the USB Copy service has completed, the USB device will un-mount from system. To start another task, please re-insert the USB device.

Volume Expansion Management

The user guide please refers to URL below.

http://www.thecus.com/download/manual/AllinOne_64bit/Volume_Expansion_v1.0.pdf

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.



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.

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

NOTE

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:

- 1. 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	33	Hor	me > External Devices > Printers	⑦ Help: ♡•My favorite: Ů• Shutdown: # Logou
📜 System Information			Printer Information	
💥 System Management	٠		Printer 1	
System Network	٠		Manufacturer:	N/A
J Storage			Model:	N/A
🗳 User and Group Authentication			Status:	No Printer Detected
Network Service	()		Remove document from queue:	Remoye
Application Server	٠		Restart printer service:	Restart
👫 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.

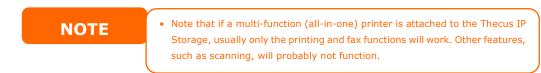
You can configure Thecus IP storage to act as a printer server. That way, all PCs connected to the network can utilize the same printer.

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.

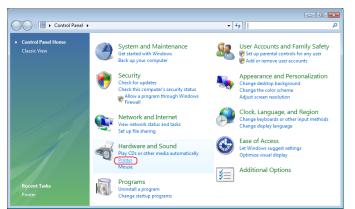
9. Click Finish.



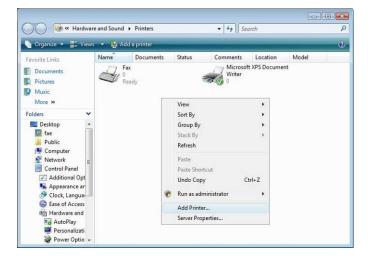
Windows Vista

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.



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

Add Printer Searching for available printers	
	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.

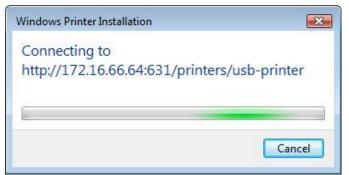
🖶 Add Printer	
Find a printer by name or TCP/IP address	
Browse for a printer	
Select a shared printer by name	
http:// <thecus_nas_ip>:631/printers/usb-printer</thecus_nas_ip>	Browse
Example: \\computername\printername or http://computername/printers/printername/.printer	
Add a printer using a TCP/IP address or hostname	
	Next Car

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**.

Manufacturer	*	Printers	
HP IBM infotec		WHP DeskJet 615C HP DeskJet 640C/642C/648C HP DeskJet 6500 Series	
Konica KONICA MINOL TA	+	HP Desk.let 6600	•

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 printe	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 be	een installed with the HP Deskjet 6500 Series driver.
This primer has be	een installed with the HP Desiget 6500 Senes driver.
this printer has be	een installed with the HP Desiget 6500 Senes driver.
nns printer nas be	een installed with the HP Desiget 6500 Senes driver.
nnis printer nas or	een installed with the HP Deskjet 6500 Senes driver.
nnis printer nas de	een installed with the HP Deskjet 6500 Senes driver.
nnis printer nas or	een installed with the HP Deskjet 6500 Senes driver.

9. Done! Click Finish.

🕞 🖶 Add Printer
You've successfully added usb-printer on http://172.16.66.64:631
To see if the printer is working correctly, or to see troubleshooting information for the printer, print a test page. Print a test page
Finish Cancel

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 Isable		
Remote UPS Monitoring:	© Enable Isable		
Remote UPS IP:			
Manufacture:	Ablerex 💌		
Model:	V		
	*product has been tested for compatibilit	у	
Battery Status:	N/A		
Power:	N/A		
Seconds between power failure and first notification			5 seconds
Seconds between subsequent power failure notifications			20 seconds
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 first notification	Delay between power failure and first notification in seconds.
Seconds between subsequent power failure notifications	Delay between subsequent notifications in seconds.
Shutdown the system when the battery charge is less than	Amount of UPS battery remaining before system 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.
- 3. 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:

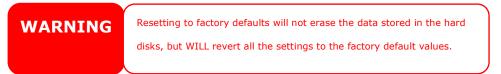
- 1. The network folder is currently mapped using a different user name and password. To connect using a different user name and password, first disconnect any existing mappings to this network share.
- 2. The mapped network drive could not be created because the following error has occurred: **Multiple 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

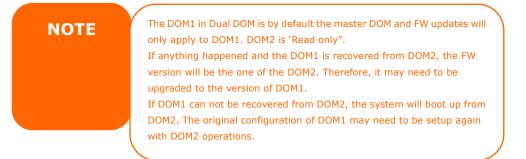
The administrator is able to select an NTP Server to keep Thecus IP storage time synchronized. However, if Thecus IP storage cannot access the Internet, you may encounter a problem when setting the Time and Time Zone. If this happens:

- 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/N12850/N16850 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.



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/sp_download.php

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

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

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

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

For Sales Information you can e-mail us at:

sales@thecus.com

Thank you for choosing Thecus!

Appendix B: RAID Basics

Overview

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

Benefits

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

Improved Performance

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

Data Security

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

RAID Levels

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

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

The following is a description of each RAID level:

RAID 0

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

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

RAID 1

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

This is excellent for complete data security.

RAID 5

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

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

RAID 6

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

This is a perfect solution for mission critical applications.

RAID 10

RAID 10 is implemented as a striped array whose segments are RAID 1 arrays. RAID 10 has the same fault tolerance as RAID level 1.

RAID 10 has the same overhead for fault-tolerance as mirroring alone. High I/O rates are achieved by striping RAID 1 segments.

Under certain circumstances, RAID 10 array can sustain up to 2 simultaneous drive failures

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

RAID 50

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

RAID 60

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

JBOD

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

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

Stripe Size

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

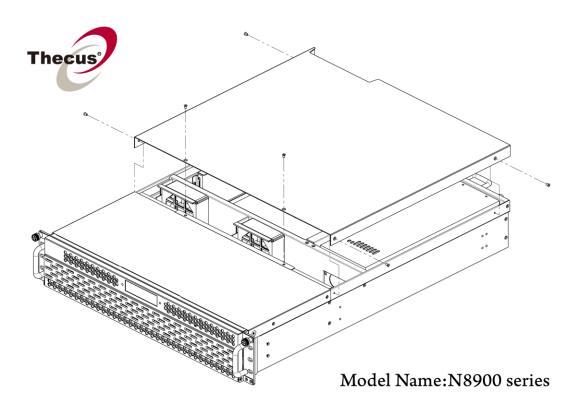
Disk Usage

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

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

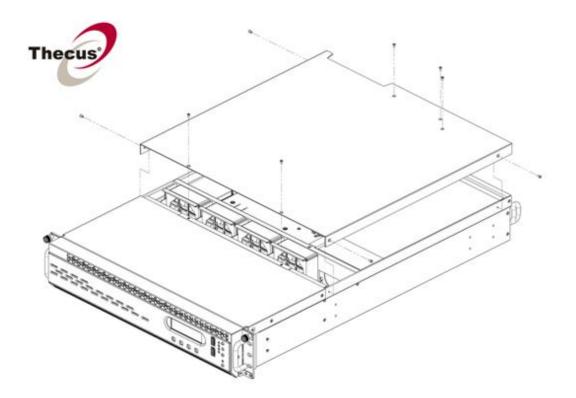
 $\mathsf{n}:\mathsf{HDD}\;\mathsf{number}$

Appendix C: How to open the top cover

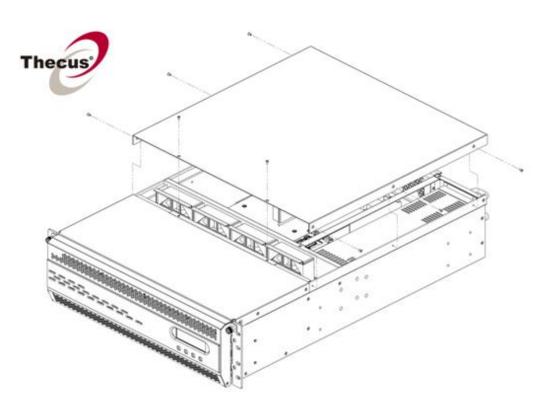


N8900 series:

N12000 series/N12850:



N16000 series/N16850:



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

This product included copyrighted third-party software licensed under the terms of GNU General Public License. Please see THE GNU General Public License for extra terms and conditions of this license.

Source Code Availability

Thecus Technology Corp. has exposed the full source code of the GPL licensed software. For more information on how you can obtain our source code, please visit our web site, http://www.thecus.com.

Copyrights

- This product includes cryptographic software written by Eric Young (eay@cryptsoft.com).
- This product includes software developed by Mark Murray.
- This product includes software developed by Eric Young (eay@cryptsoft.com).
- This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/).
- This product includes PHP, freely available from (http://www.php.net/).
- This product includes software developed by the University of California, Berkeley and its contributors.
- This product includes software developed by Winning Strategies, Inc.
- This product includes software developed by the Apache Group for use in the Apache HTTP server project (http://www.apache.org/).
- This product includes software developed by Softweyr LLC, the University of California, Berkeley, and its contributors.
- This product includes software developed by Bodo Moeller.
- This product includes software developed by Greg Roelofs and contributors for the book, "PNG: The Definitive Guide," published by O'Reilly and Associates.
- This product includes software developed by the NetBSD Foundation, Inc. and its contributors.
- This product includes software developed by Yen Yen Lim and North Dakota State University.
- This product includes software developed by the Computer Systems Engineering Group at Lawrence Berkeley Laboratory.
- This product includes software developed by the Kungliga Tekniska Högskolan and its contributors.
- This product includes software developed by the Nick Simicich.
- This product includes software written by Tim Hudson (tjh@cryptsoft.com).
- This product includes software developed by Christopher G. Demetriou for the NetBSD Project.

CGIC License Terms

Basic License

CGIC, copyright 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004 by Thomas Boutell and Boutell.Com, Inc.

Permission is granted to use CGIC in any application, commercial or noncommercial, at no cost. HOWEVER, this copyright paragraph must appear on a "credits" page accessible in the public online and offline documentation of the program. Modified versions of the CGIC library should not be distributed without the attachment of a clear statement regarding the author of the modifications, and this notice may in no case be removed. Modifications may also be submitted to the author for inclusion in the main CGIC distribution.

GNU General Public License

Version 2, June 1991

Copyright © 1989, 1991 Free Software Foundation, Inc. 51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

PREAMBLE

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users. This General Public License applies to most of the Free Software

Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Library General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is

modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another Language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program).

Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

- 2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:
 - a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.
 - b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.
 - c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate

copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

- 4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.
- 5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.
- 6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.
- 7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is

permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

- 11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.
- 12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS