



[Release Date]

Jun 08, 2017

[Applicable Hardware]

N16850_N12850_N16000_N12000_
N16000PRO_N12000PRO_N16000V_N12000V_N8900V_N8900_
N6850_N8850_N10850
N7770-10G_N8880U-10G
N7710_N7710-G_N8810_N8810U-G
N7700PROV2_N8800PROV2
N5810_N5810PRO
N2800_N4510U_N4510UPRO_N4800_N4800ECO_N5550_N7510

[Software Upgrade/Downgrade Note]

1. We recommend backup the RAID data before firmware upgrade. There is potential risk of data loss when upgrade the NAS firmware and Thecus is not responsible for any data loss and recovery.
2. Since new version firmware installed, the new software doesn't allow users to downgrade to any previous version firmware.
3. System Configuration Download/Upload does not support different software version.
Reminder: After upgrade to latest firmware, download configuration and save separately.

[New Features/Changes]

1. Force disabled the SMB1 & configured SMB2 as default for SAMBA security concern.
System force disable SMB1, if your client devices unsupported SMB2 would re-enable the SMB1, you may re-enable from NAS ADMIN WEB page: HOME -> NETWORK SERVICE -> SAMBA/CIFS -> SMB Min Protocol -> LANMAN1.
2. CVE-2017-7494.
3. Improve system thermal & FAN control.
4. Improve BTRFS folder quota function.
5. Improve TTY1 login timed out.
6. Improve internal dmesg about preallocate message.

[Bug Fixes]

1. -

[Limitations]



OS5 X64 FW 2.06.02.10

1. There is a capacity limit for different file systems. It means, if more than six 3 TB HDD installed, you may have select suitable file system when creating a RAID volume.

File System	Capacity Limit
EXT3	16 TB
EXT4	OS5 & OS7 > 16 TB OS6 16 TB (OS6 model N2310 / N4310 / N2520 / N2560 / N4520 / N4560)
XFS	> 16 TB
BTRFS	> 16 TB

2. N12000/N16000 support up to five RAID volumes. For HA RAID volume, just one is allowed.

3. RAID volume encryption : AES 256 bits

- a. NAS admin has to insert an USB flash disk to save encryption key file on it.
- b. To encrypt an existing RAID is not possible. Please do it while creating a new RAID.
- c. NAS performance will drop significantly while using encrypted RAID.
- d. The USB flash disk (key file) should exist whenever the NAS reboots/boots up and doing RAID configuring.
- e. Encrypted RAID doesn't support on-line Expansion, just off-line Expansion is doable.
- f. Encrypted RAID support file system check since V2.03.05.

g. If the USB flash disk (key file) lost or key file modified, the RAID data will be INACCESSIBLE FOREVER and no way to recover it.

4. Once the RAID created, there will be about 5% data used by EXT3/EXT4 file system. The capacity stores the journal and inodes; which are necessary to keep RAID data safer.

5. RAID rebuild : in case one HDD failed in RAID 1, 5, 6, 10, 50, and 60 configurations, please hot unplug failed one and hot plug in new one; then RAID rebuilding will automatically start. If the replacement is done after NAS shutdown, administrator has to manually add spare in Admin Web GUI to start the RAID rebuilding.

6. RAID Expansion: When changing the RAID 5 configuration from five smaller disks to five bigger disks, you have to change one disk at a time and then rebuild the RAID. Lastly, utilize the newly added capacity from Space Allocation page.

7. iSCSI Target : the maximum numbers of iSCSI target volumes depend on the physical memory size and also the CPU power of each Thecus NAS. No matter one RAID or multiple RAID volumes exist in a NAS, the maximum limit will be the same.

Max. No of iSCSI Targets					
Model Name	Model Name	Model Name	Model Name	Model Name	Model Name
N2800	25	N6850	50	N8900PRO	100



OS5 X64 FW 2.06.02.10

N2810	25	N7510	25	N10850	50
N4310	25	N7700PROv2	50	N12000V	25
N4510UPRO-R	25	N7710	50	N12000	25
N4510UPRO-S	25	N7710-G	50	N12000PRO	100
N4510U-R	25	N7770	50	N128510L/RU	50
N4510U-S	25	N7770-10G	50	N12850	200
N4520	25	N8800PROv2	50	N12910	50
N4560	25	N8810U	50	N12910SAS	200
N4800	25	N8810U-G	50	N16000V	25
N4800Eco	25	N8850	50	N16000	50
N4810	50	N8880U	50	N16000PRO	100
N5550	25	N8880U-10G	50	N16850	200
N5810	50	N8900V	25	N16910SAS	200
N5810PRO	50	N8900	50		

- a. For NAS admin without cluster based OS/applications to manage multiple initiators connected to the same iSCSI volume, we highly recommend every iSCSI volume is connected by single iSCSI initiator. However, in case NAS admin has cluster based OS/applications, up to 8 initiators is possible.
- b. **Uncontrolled concurrent access to the same iSCSI target volume may result data corruption or un-predicable results.**
- c. **iSCSI target may be disconnected from initiator if other RAID settings on the same target NAS being altered.**

d. Verified iSCSI initiators:

- Windows: Microsoft initiator v2.0.4
- StarPort initiator 3.5.2
- MAC OS: globalSAN iSCSI initiator version 4.1 (279)
- Linux: open-iscsi 2.0-865

e. There is a system advanced option to choose 4K or 512 bytes block size for iSCSI volume, and the default is 4K bytes. 512 bytes block size may encounter **2TB volume capacity limitation** on some initiators running 32bit OS. Nevertheless, 4K block size could slice the iSCSI volume over 2TB, but, there might be compatibility issue. For VMware, we recommend using 512 bytes block size.

8. iSCSI Expansion : there are some limitations applied.

- a. The maximum iSCSI volume would be 16TB (EXT3/EXT4), and the minimum expansion size is 1GB.
- b. There is no iSCSI volume size limitation with XFS RAID volume.
- c. iSCSI service will be stopped till the expansion completes.
- d. iSCSI expansion just handles the volume size. The partition(s) inside the volume



won't be adjusted.

- e. iSCSI expansion just support local RAID, does not support add-on RAID by iSCSI stackable.

9. Stackable function : Support of stackable function across Thecus N8900/N12000/N16000 NASes.

- a. **The concurrent connection on target iSCSI volume of Thecus NAS will be limited to 1 if the initiator comes from other Thecus NASes.**

- b. The internal file system format of stackable target is EXT4, and the maximum capacity is 16 TB.

10. iSCSI Thin-Provisioning

- a. The Thin-Provision capacity has to be determined first.
- b. Up to five iSCSI Thin-Provision target can be created on the Thin-Provision capacity.

c. The total virtual size of iSCSI Thin-Provision targets in a RAID:

Thin-Provisioning	
File System	Capacity Limit
EXT3	16 TB
EXT4	16 TB
XFS	64 TB
BTRFS	64 TB

- d. The virtual size should be larger than the real capacity and less than 16 TB.
- e. When determine the virtual size, the minimum increase is 100GB.
- f. When the total used capacity reaches 90% of real Thin-Provision capacity, NAS will send E-mail notifications out every 10 minutes until the capacity expanded. Also, system log will show capacity warning in admin web interface. The host server won't receive any notification before the iSCSI Thin-Provision target full.

11. iSCSI LUN ID in admin web interface

- a. The iSCSI LUN ID is between 0 and 254.
- b. Duplicate ID is not allowed excepting ID 0.
- c. Mac computer just recognized the first iSCSI volume.

12. Active Directory Support behavior : before AD Sync is pressed, search criteria has to be a fully match string to user account. After AD Sync is pressed, search criteria can be only beginning part of the user account. Only 1000 search results will be displayed.

13. To enable ADS support for Small Business Server 2003, we recommend do not install ISA server. Otherwise, N8900/N12000/N16000 series may fail to join the AD.

14. User Quota : user quota has been added since firmware version 1.00.01.

- a. Value "0" means "User Quota Disabled"
- b. A quota setting will be applied across multiple RAID volumes. It means, if you set 10GB quota for user John, he will be having 10GB on every RAID. For a NAS

- with three RAID volumes, John will have 30GB quota in total.
- c. "User Quota" is implemented in EXT3, EXT4, and XFS RAID.
 - d. When using "User Quota" in a Master and XFS RAID, disabling quota might not take effective until the NAS reboots.
 - e. When "User Quota" full, the user will have 10% tolerance within 7 days; thus he can do some data moving and deleting temporarily.
 - f. System log and Email Notification will remind the users whose "User Quota" reached the limit at 24:00 everyday.
 - g. The status of "User Quota" across multiple RAID will be displayed on [User and Group Authentication > Quota > Quota Setting] page.
 - h. It may take long time to enable the "User Quota" the 1st time.
 - i. "User Quota" is calculated by UID in the NAS.
 - j. When users put data into a public folder, the used capacity will not be added to quota calculation. Also, data copied through WebDisk will not be calculated either.
15. Some attributes may not be included with files and folders when copying to a USB drive with FAT32 format.
16. If a USB hard drive is connected to NAS formatted as FAT16/32, the following restrictions apply:
- Copy file with size greater than or equal to 2 GB to the NAS can not be performed due to FAT file system limitation.
 - Files created by Mac OS X like DS_Store can not be copied to the FAT16/32 USB drive.
17. NFS share is limited to public folders. In case you enable an NFS share on non-public (ACL) folder, the NFS client could successfully mount it but won't be able to read/write files. Currently we implemented NFS V3 & V4.
18. Reset button : In case the admin password or HTTP port lost, use Reset button to load factory default please. In that case, user accounts and groups will be erased, but RAID data won't be affected.
19. HTTP and HTTPS ports should follow the rules given below.
- Larger than 1024
 - Could not use 3169
 - Port 80 (HTTP) and 443 (HTTPS) are allowed
20. Mac OS Limitations
- a. When using Mac OS X (post 10.2 with AppleTalk) without SMB, do not use Japanese characters in folder or file names to prevent errors accessing the data over a network.
 - b. Mac OS 9 and Mac OS X can not see files on the network with names made up of over 32 characters.
 - c. Mac OS 8.x/9.x only supports local character encoding on file names (without



Unicode support).

- d. Occasionally, when a file is accessed by a Mac OS computer within a shared folder, an information file will be created in the same folder. If the file is then deleted by a Windows OS computer, the original file may no longer be accessible by Mac OS computers.
 - e. The following characters are not allowed to be included in the name used for a file or shared folder when using Mac OS (AppleTalk) devices.
? [] / \ = + < > ; : " , | *
 - f. Writing a file larger than 2 GB is not allowed by MAC OS-9.
21. NAS needs about 5 minutes to broadcast/register itself to other Mac OS through AppleTalk after booting up and service enabled.
 22. WebDisk : Only UTF-8 file name is supported.
 23. File size has to be less than 1GB to be uploaded to Thecus NAS from web browsers. FTP software has no such limitation.
 24. File names and folder names should not contain more than 250 characters in their entire directory path to prevent errors occur in the file copy operations.
 25. The following characters are not allowed to be included in the name used for files or folders on Thecus NAS.
/ \ : * ? " < > | [] = + ; ,
 26. File and directory attributes can not be modified by an FTP client when the FTP server of Thecus NAS is enabled.
 27. Anonymous FTP user could upload files into public folders but could not delete them.
 28. FTP client can list up to 2000 files in a single folder.
 29. Thecus NAS could work as a TFTP server since firmware 1.00.01.
 - a. TFTP service folder should be public and without any ACL rule.
 - b. Double byte file name (Chinese, Japanese, Korean, etc) may have problems in case the TFTP client doesn't support UTF8. Anyway we recommend using single byte characters as the file name.
 - c. TFTP service runs at port 69 by default. It is changeable from admin web interface. Please notify possible port conflicts, if any.
 - d. The biggest file size is 4GB while transferring thru TFTP.
 30. N8900/N12000/N16000 support specific 10 GbE NIC cards. There will be Additional LAN 1, 2, 3, and 4 to configure the network setting in admin web interface. However, the Link Aggregation functions will just work on original two on-board NIC, WAN/LAN1 and LAN2.
 31. File system check page is in English, no multilingual.
 32. Disk Power Management : some HDD may not respond to "idle spin down" command, and they won't get into stand by mode even if the specified idle time had been reached. In addition, N8900/N12000/N16000 do not support SAS HDD spin down at current moment.



- 33. Disk S.M.A.R.T. Test : N8900/N12000/N16000 do not support Disk S.M.A.R.T. Test on SAS HDD.
- 34. UPnP function only works on WAN interface.
- 35. The create date is the same with modify date for every file copied into the NAS.
- 36. Single file size upper limitation: 2TB for EXT3 file system.
- 37. Thecus NAS uses the following service ports by default.

Services	Default TCP port
FTP	20/21
SSH	22
DHCP	67/68
HTTP	80
Nfsd	111/2049
Samba	139/445
SNMP	161/162
HTTPS	443
Printer Server	631
Rsync	873
mail server	995/25
Nsync	2000
Upnp	2689
iSCSI	3260
Mysql	3306
iTunes	3689
DLM2 (amule)	4662
Media	8080
WebDAV	9800/9802
Apache module	10080
DLM2 (bt)	10000~10200
Twonky (UI)	9000/9001

- 38. BTRFS snapshot keep difference snapshot copy depend on NAS'default DRAM size.

- 2GB -> 64
- 4GB -> 128
- 8GB-> 256
- 16GB -> 512

Example

- N2810 2GB DRAM -> 64
- N2810 PLUS/PRO 4GB DRAM -> 128



- N4810 4GB DRAM -> 128
- N5550 2GB DRAM -> 64
- N5810(PRO) 4GB DRAM -> 128
- N8900PRO 8GB DRAM ->256
- N16850 16GB DRAM ->512
- N16910SAS 16GB DRAM ->512

[Known Problems]

1. Using samba protocol in MAC OS will not accept file names with blank characters in tail.
2. IE7 / IE8 will show certification error alert while user access WEB admin UI via HTTPS.

[Attention]

- 1. During firmware upgrade process, it is imperative that user DO NOT turn off the power to Thecus NAS or closes the browser window. This will lead to catastrophic result. If your browser is set to cache the screen, after firmware upgrade has started for 5 minutes, please press CTRL-F5 to reload browser screen from server instead of from browser cache.**
- 2. Thecus strongly recommends NAS admin to backup the RAID data before doing the RAID Migration and Expansion. There is potential risk of permanent data loss when doing Migration/Expansion with disk drives having physical problems, and Thecus is not responsible for any data loss and recovery expense.**
3. Enforce to enable the system beeper notification after firmware updated.
4. When installing the Windows Wizard program of Thecus NAS on Windows XP Professional SP1 or SP2, Windows Vista, and newer OS, the firewall UDP ports 10000 and 10001 need to be opened.
5. Reset to factory default function automatically resets all the system settings including network settings, administrator password, user groups, language setting, system notification setting, and time zone setting.
6. Users should obey the international RF regulatory rules as they set up the wireless RF channel on the NAS. The RF operating channels for different regions have been specified as following. Thecus has no responsibility for users attempting to violate the international RF regulation.
 - 11 for N. America
 - 14 Japan
 - 13 Europe (ETSI)
 - 2 Spain
 - 4 France