

# TurboNAS Business Series

Superior Performance NAS with iSCSI for Business

- 4/ 8-bay hot-swappable, 1U/ 2U rackmount chassis
- Leading iSCSI storage for server clustering and virtualized environments
- Built-in iSCSI initiator for stackable capacity expansion
- Single disk, JBOD, RAID 0/ 1/ 5/ 5+hot spare/ 6/ 6+hot spare
- Online RAID capacity expansion and online RAID level migration
- Cross-platform data sharing including DFS, CIFS, SMB, NFS, AFP, and WebDAV
- All-in-one powerful business-class server features
- Dual Gigabit LAN: Failover, load balancing and multiple IP setting
- AES 256-bit volume-based data encryption to prevent data breach
- Complete backup solution including cloud-based and Apple Time Machine backup



TS-459U-RP/SP



TS-859U-RP

## Available Models

**TS-459U-RP/ TS-859U-RP:**  
Includes two power supply units (PSU)

**TS-459U-SP:**  
Includes one PSU upgradable to RP model

**SP-4BAY1U-R-PSU:**  
Optional PSU, used to upgrade SP model to RP model





## Overview

Modern businesses face the challenges of dramatic growth of digital data as well as raising productivity and efficiency. To well deploy the business IT environment with a reliable, affordable, scalable, and easy-to-maintain storage center to securely store, share and back up the digital assets has become the top task for the server managers nowadays in small and mid-sized companies. The Turbo NAS is the brand-new rackmount chassis network attached storage (NAS) server to satisfy these requirements.

The Turbo NAS is equipped with the next-generation Intel® Atom D510 1.66GHz Dual-Core processor delivering exceptionally high performance, yet with low power consumption for energy-saving commitment. The Turbo NAS provides versatile business applications to maximize server consolidation in the business environment. The Turbo NAS is integrated as a powerful all-in-one application server, which requires no extra time and efforts for software installation. The server managers can adopt the NAS in many of the system integration projects or office applications quickly. The Turbo NAS is also an affordable solution capable of business-class server applications, secure data backup and sharing, and iSCSI service for virtualized and clustered environment.

### The Most Affordable and Flexible Virtualization Solution

The Turbo NAS is certified as compatible with VMware® vSphere4 (ESX 4.0 and above) virtualization platform. The NAS can be utilized as the networked shared storage of VMware virtualization environments and Windows cluster servers. Comparing with traditional SAN (Storage Area Network), the Turbo NAS is a competitive alternative with much lower setup and maintenance costs in an IP SAN.

### The Feature-rich and Integrated Applications for Business

The NAS supports file sharing across Windows, Mac, Linux, and UNIX platforms. Versatile business applications such as file server, FTP server, printer server, web server, and Windows AD support are provided. The dominant features, such as WebDAV, Share Folder Aggregation (also known as DFS), IPv6 and IPv4 dual-stack, Wake on LAN, scheduled power on/ off, HDD S.M.A.R.T, comprehensive log systems, and policy-based unauthorized IP blocking are also available.

## New iSCSI for Virtualization Deployments

The Turbo NAS provides flexible and secure storage server deployment with the following enhanced iSCSI features:

#### NAS + iSCSI storage solution:

The Turbo NAS can serve as a NAS for file sharing and iSCSI storage concurrently.

#### Flexible multiple LUNs management:

The NAS supports multiple LUNs (Logical Unit Numbers) and iSCSI targets. The LUNs can be flexibly mapped to, unmapped from, and switched among different iSCSI targets.

#### Secure IP SAN environment deployment:

Designed with CHAP authentication and LUN masking, the advanced ACL (Access Control List) offers you the capability to block the access from unauthorized initiators.

#### Designed for virtualized and clustered environments:

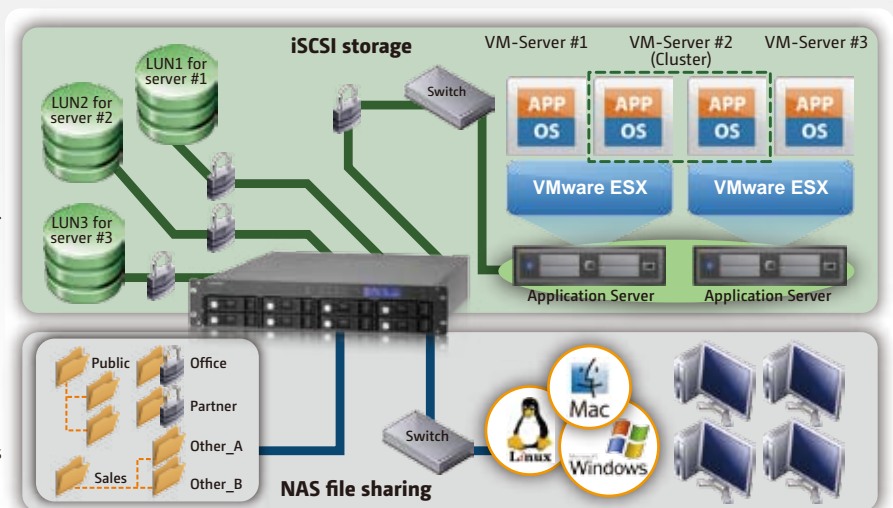
Comparing with the high cost Fibre Channel SAN, the Turbo NAS is an affordable system that can be deployed as a storage center for virtualized and clustered server environments, such as VMware and Microsoft Windows Failover Cluster.

#### SPC-3 Persistent Reservation Supported

The built-in iSCSI service supports enterprise level features such as SPC-3 persistent reservation for clustering in VMware and Windows 2008. You can set up Microsoft Failover Cluster environment and use Cluster Shared Volume for Hyper-V. This allows you to execute virtual machine live migration between Hyper-V hosts.

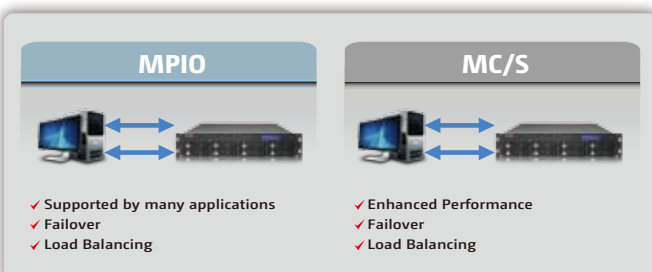
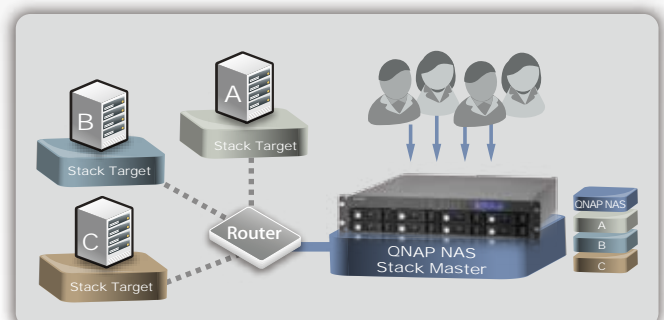
#### Advanced MPIO and MC/S Supported

With the support of MPIO (Multipath Input Output) and MC/S (Multiple Connections per Session) on the Turbo NAS, you can connect to the QNAP iSCSI targets using 2 or more network interfaces from your server with failover and load balancing. Furthermore, you can achieve better data transmission performance with MC/S setting.



## Virtual Disk Expansion

The unique "Virtual Disk Drive" adds flexibility to expand the capacity of NAS. By using the built-in iSCSI initiator, the NAS can connect to other iSCSI targets on the network and turn them into virtual disks, which become multiple single volumes on the NAS. Up to 8 virtual disks can be stacked. The NAS serves as the storage stack chaining master. The user only needs to connect to this single entry (QNAP NAS) and is able to reach and use all the iSCSI LUN on the network.

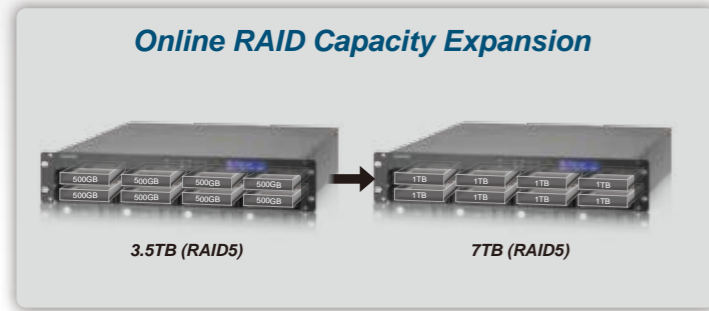


## Advanced RAID Management with Hot-swap Design

The Turbo NAS offers RAID 0, 1, 5, 5+hot spare, 6, 6+hot spare\*, single disk, and JBOD disk configurations. It also supports hot-swap design that a failed member drive of a RAID configuration (RAID 1 or above only) can be replaced by hot swapping without turning off the server.

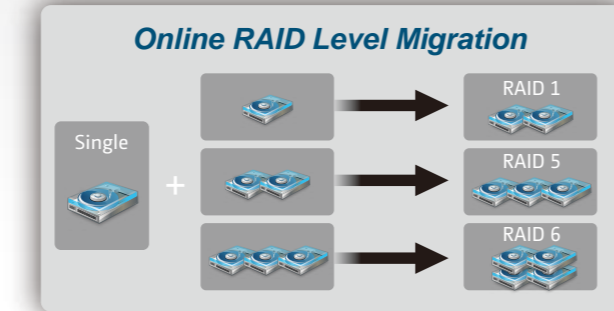
### Online RAID Capacity Expansion:

The storage capacity of a RAID configuration can be expanded by replacing the larger hard drives. All the data will be kept and seamlessly moved to the newly installed hard drives without turning off the server.



### Online RAID Level Migration:

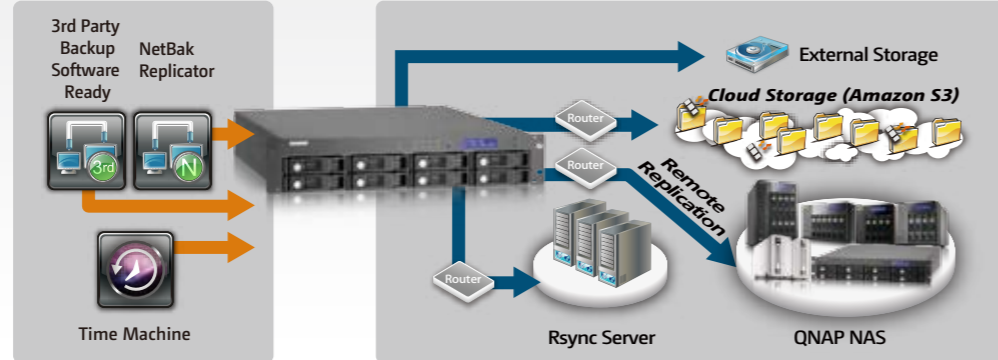
You can upgrade the disk configuration to higher RAID level with the data retained without turning off the server.



\* The RAID configurations available vary according to the product models and the number of hard disk drives installed.

## Complete Backup Solution

The NAS offers complete backup solution for data protection, including cloud-based storage backup (Amazon S3), Apple Time Machine support, encrypted remote replication, third party software backup, one-touch-copy backup and QNAP exclusive Windows-based utility NetBak Replicator. The users can choose different backup modes for redundant data backup.



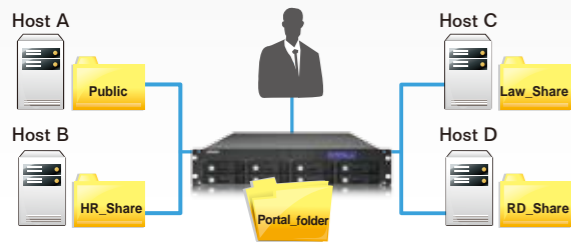
## Convenient Authority Control Management

### Windows Active Directory (AD):

The Windows AD feature enables you to retrieve the user accounts from the Windows AD server to the NAS to reduce the time and effort for account setup. The users can use the same set of login name and password to access the NAS.

### Share Folder Aggregation:

You can easily access the share folders of other servers on Microsoft Networking through the "portal folder" on the Turbo NAS. This saves your time and effort to login different servers one by one.



## DOM Architecture and Fail-safe Dual OS



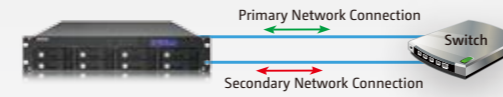
Two operating systems are built on the DOM of the Turbo NAS for system booting alternatively upon every system startup. When one fails, the other one will be used to boot up the NAS, and the failed OS is recoverable from the other healthy OS.

## Benefits of Dual LAN Deployment

The Turbo NAS supports multiple bonding modes: Balance-rr (Round-Robin), Active Backup, Balance XOR, Broadcast, IEEE 802.3ad, Balance-tlb (Adaptive Transmit Load Balancing) and Balance-alb (Adaptive Load Balancing).

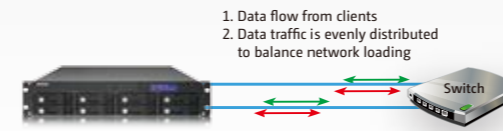
### Failover:

The LAN ports can be configured as failover which allows the Turbo NAS server to sustain the failure of one network port to provide continuous services.



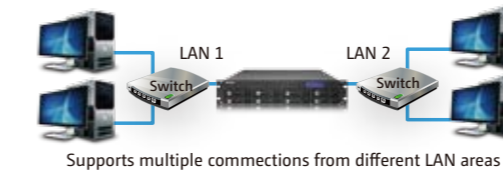
### Load Balancing:

The dual LAN ports can also be configured as load balancing mode for bandwidth aggregation to boost the file transfer speed. (It works with managed Ethernet switch with 802.3ad configured.)



### Multi-IP Setting:

The Turbo NAS can be deployed with two different IP settings for sharing among different workgroups in two different subnets.



## Practical System Management Tools

The Turbo NAS provides a number of powerful features for you to manage the server more efficiently at lower cost.



### Instant SMS & Email Alert:

You can configure the SMTP server and SMSC server settings on the NAS to receive instant system warning or error messages by email and/or SMS.



### SNMP (Simple Network Management Protocol):

You can collect the information, warning or error of the Turbo NAS and send to maximum 3 SNMP servers for centralized management and real-time monitoring.



### Comprehensive Event Logs:

Detailed logs of file-level data access to the Turbo NAS via SAMBA, iSCSI, FTP, AFP, HTTP, HTTPS, Telnet, and SSH, and networking services accessed by online users are all recorded.



### Wake on LAN:

Enable this option to power on the Turbo NAS remotely by Wake on LAN. Wake on LAN helps you manage your NAS conveniently.



### S.M.A.R.T. & Advanced HDD Health Scanning (HHS)

S.M.A.R.T. (Self-Monitoring Analysis and Reporting Technology) helps you to monitor the HDD status. Moreover, the Turbo NAS is embedded with HHS (HDD Health Scan) which supports disk checking and bad blocks scanning.

## AES 256-bit Volume-based Data Encryption



The disk volume with AES 256-bit encryption can only be accessed by an authorized encryption password or key. This prevents the NAS data from unauthorized access and data breach even if the hard drives were stolen.\*

\* Data encryption functions may not be available in accordance to the legislative restrictions of some countries.

## Abundant Business Features

The Turbo NAS provides diversified server applications in the business environment.

### Printer Server:

The Turbo NAS supports USB printer sharing over the network (max. 3 USB printers).

### Web Server:

You can easily host a website to publish information over the Internet using the built-in web server by the Turbo NAS.

### Backup Server:

The Turbo NAS offers you the most complete backup solution with Apple Time Machine support, remote replication to an Rsync server, Windows client backup software NetBak Replicator, third party backup software support, and so on.

### IPv6:

The Turbo NAS supports IPv6 (Internet Protocol Version 6) which makes your NAS a dual-stack IP host running IPv4 and IPv6 at the same time.



### Surveillance Station:

The Turbo NAS enables you to configure and connect to multiple IP cameras simultaneously for remote monitoring, video recording, and playback.



### FTP Server:

You can establish your own FTP server by the Turbo NAS and share the files conveniently with your colleagues or customers.



### Encrypted Remote Replication:

The data on the Turbo NAS can be backed up to or received from other Turbo NAS or Rsync servers over the network.



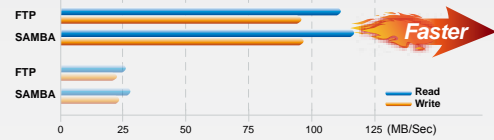
### File Server:

The Turbo NAS allows file sharing across Windows, Mac, Linux, and UNIX platforms. It also supports WebDAV for you to access the share folders via HTTP/HTTPS protocol remotely.

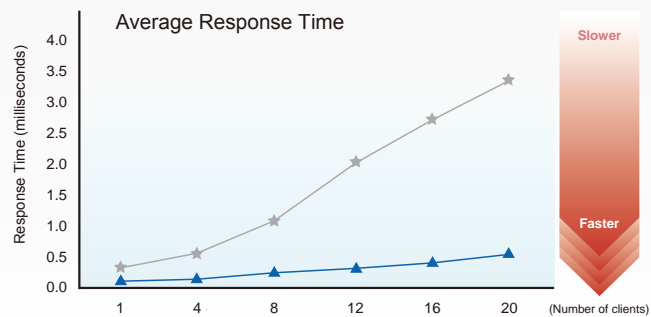
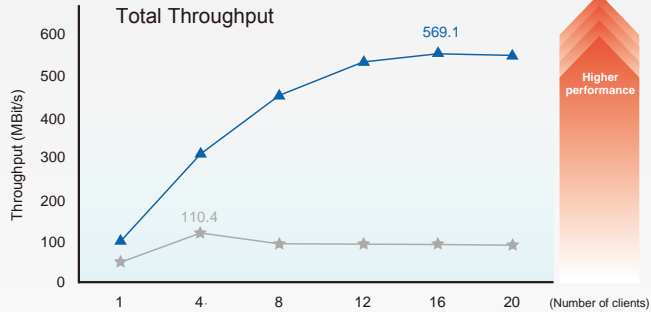
## Superior System Performance

TS-859U-RP  
(RAID 5)

Other NAS  
(RAID 5)

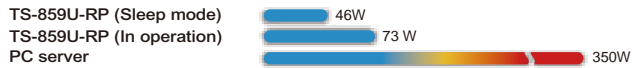


\* FTP/SAMBA Testing Environment: Intel Core2 Quad CPU Q8300 2.50GHz/ 4GB DDRII RAM, WD1500HLFS, Windows 7 Enterprise 32 Bits, Intel PRO 1000 PT Dual Port Server Adapter 82571  
 \* FTP/ SAMBA Testing Method: Connect the TS-859U-RP /SP and PC to switch, upload/download 5GB File without Jumbo Frame, FTP Tool: File Zilla



▲ TS-859U-RP, RAID 5    ★ Other NAS, RAID 5  
 • Testing benchmark program: ZD NetBench version 7.0.3  
 • Client PCs (20 Total): Intel Celeron 1.6GHz CPU, 1GB DDRII 667, Atheros AR8121 GbE Chip, Windows XP SP3

### Low Power Consumption



## Secure Measures for Data Storage and Access

### Policy-based Unauthorized IP Blocking:

The server manager can allow, deny or auto block specified IP address or network domain which attempts to connect to the Turbo NAS via SSH/ Telnet/ HTTP(S)/ FTP/ samba/ AFP.

### Remote Login:

The Turbo NAS supports remote login by SSH (secure shell) or Telnet connection.

### SSL Security (HTTPS):

The Turbo NAS can be accessed and configured by the web browser securely. The administrator can also upload a secure certificate and RSA private key in X.509PEM format issued by a trusted provider for the users to access the Turbo NAS by secure SSL login.

### Secure FTP:

The data can be transmitted with SSL/TLS (explicit) encryption. Passive FTP port range setup is also supported.

### Encrypted Remote Replication by Rsync:

Data on the Turbo NAS can be backed up to or from another Turbo NAS or Rsync server over the network securely.

### User Authority Management:

The Turbo NAS allows the server manager to create multiple user ID and password, and define the authority and quota for each user.

## Smart Power Management

### Redundant Power Supply:

The TS-459U-RP/ TS-859U-RP is equipped with two power supply units, each of which is capable of supplying the power for the entire NAS independently. If one of the units fails, the other one will take over to supply the power to ensure continuous operation of the NAS. You can replace the failed power supply unit without turning off the server.

### Hard Disk Standby:

The hard disks can be configured to enter standby mode if there is no disk access within the specified period.

### Scheduled Power on/off:

The flexible scheduled power on/off feature is provided on the NAS for you to manage the NAS server's up time according to the working hours.

### UPS Support:

The NAS supports the majority of USB UPS devices which enables you to store the data in time and avoid critical data loss when power outage occurs during data transfer.

## Turbo NAS Business Series (Rackmount Models)



	TS-809U-RP	TS-859U-RP	TS-459U-RP/SP	TS-419U
CPU	Intel Core 2 Duo 2.8 GHz (E7400)	Intel Atom D510 1.66GHz (Dual-Core)	Intel Atom D510 1.66GHz (Dual-Core)	Marvell 6281 1.2GHz
RAM	2GB DDRII	1GB DDRII	1GB DDRII	512MB DDRII
Flash	128MB (DOM for dual OS)	512MB (DOM for dual OS)	512MB (DOM for dual OS)	16MB
Disk Management	Single disk, JBOD, RAID 0/ 1/ 5/ 6/ 5 + hot spare / 6 + hot spare		Single disk, JBOD, RAID 0/ 1/ 5/ 6/ 5 + hot spare	
Maximum of HDD Trays	8		4	
Maximum volume size*	16 TB		8 TB	
LCD Display	Yes		-	
Rack slide Rail kit	Yes		Yes	
Form Factor	2U		1U	
eSATA	-	2	2	2
USB 2.0 Port	4		5	4
NetBench** (Mbit/s)	1177.3	569.1	546.3	126.1
SMB** (MB/sec)	Read: 114.9 Write: 103.1	Read: 114.5 Write: 94.6	Read: 114.7 Write: 93.2	Read: 51.2 Write: 31.4
FTP** (MB/sec)	Read: 113.7 Write: 100.2	Read: 109.8 Write: 92.9	Read: 111.3 Write: 93.8	Read: 55.7 Write: 32.2
Power Consumption** (W)	Sleep mode: 53 In operation: 101	Sleep mode: 46 In operation: 73	Sleep mode: 40 In operation: 62	Sleep mode: 15 In operation: 29
Power	Output: 300W Input: 100-240Vac, 47-63Hz, 5A-2.5A		Output: 150W Input: 100-240Vac, 50-60Hz, 2A***	Output: 250W Input: 100-240V AC, 50-60Hz

\* Aggregation by using 2TB hard drives. If using the hard drives with larger capacity, the maximum volume size will be 16TB in EXT3 and 10<sup>6</sup>TB in EXT4.  
 \*\* Testing results may vary in different system condition.  
 \*\*\* TS-459U-RP: 2 power supply units included; TS-459U-SP: 1 power supply unit included.

## Hardware Specifications

### CPU

- Intel® Atom™ Processor D510 1.66GHz (Dual-Core)

### RAM

- 1GB DDRII RAM

### Flash Memory

- 512 MB (DOM)

### Hard Drive

- Hot-swappable and Lockable HDD Tray

\* TS-459U-RP/ SP only.

- 2.5"/3.5" SATA (The Standard System is Shipped without HDD)

### Network

- LAN: Gigabit RJ-45 Ethernet Port x 2

### I/O Interface

- USB 2.0 Port: TS-459U-RP/ SP: 5 TS-859U-RP: 4
- eSATA Port: 2

- VGA (Reserved)

### System Information Display

- LED Indicators: Status, LAN, HDD, USB\*

### Buttons

- System: Power, Reset, USB One Touch Copy\*
- Smart Fan

### Dimensions and Weight

- TS-459U-RP/ SP:

- 44(H) x 439(W) x 499(D) mm
- 1.73(H) x 16.97(W) x 19.65(D) inch
- TS-859U-RP: 88.9(H) x 482.6(W) x 531.5(D) mm
- 3.5(H) x 19(W) x 20.93(D) inch
- Operation Environment**
- Temperature: 0-40°C/ 32-104°F
- Humidity: 0-95% R.H.

## Software Specifications

### Operating System

- Embedded Linux

### Supported Operating System

- Microsoft Windows 2000, XP, Vista (32-/64-bit), Windows 7 (32-/64-bit), Windows Server 2003/ 2008

- Apple Mac OS X

- Linux & Unix

### File System

- Internal HDD: EXT3, EXT4
- External HDD: EXT3, EXT4, NTFS, FAT32

### Access Right Management

- Max. User Accounts: 4,096
- Max. Groups: 512
- Max. Share Folders: 512

### Networking

- TCP/IP (IPv4 & IPv6: Dual Stack)
- Dual Gigabit NICs with Jumbo Frame
- Multi-IP Setting, Port Trunking/ NIC Teaming
- DHCP Client, DHCP Server
- Protocols: CIFS/ SMB, AFP, NFS, FTP, HTTP, HTTPS, Telnet, SSH, iSCSI, and SNMP
- Network Service Discovery (UPnP, Bonjour)

### Network File Sharing

- CIFS/ SMB (Plus DFS Support), AFP, NFS, FTP, WebDAV

### Backup Solution

- USB One Touch Copy Backup\* (Import/ Export)
- Apple Time Machine Support
- Block-level Remote Replication
- Works as Both an Rsync Server & Client

- Supports Encrypted Replication between QNAP NAS Servers

- Data Backup to External Storage Devices
- Data Backup to Online Cloud Storage (Amazon S3)

### Security

- AES 256-bit Volume-based Data Encryption\*\*
- IP Filter

- Network Access Protection with Auto-blocking

- HTTPS Connection

- FTP with SSL/ TLS (Explicit)

- Encrypted Remote Replication (Rsync over SSH)

- Importable SSL Certificate

- Instant E-mail and SMS Alert

### Disk Management

- Single Disk, JBOD, RAID 0/ 1/ 5/ 6/ 5+Hot Spare/ 6+Hot Spare\*\*\*

- Online RAID Capacity Expansion

- Online RAID Level Migration

- HDD S.M.A.R.T.

- Bad Block Scan

- RAID Recovery

- Bitmap Support

### iSCSI

- iSCSI Target
- Multi-LUNs per Target
- Supports LUN Mapping & LUN Masking
- Supports SPC-3 Persistent Reservation
- Supports MPIO
- Supports MC/S

- Virtual Disk Drive (via iSCSI Initiator)

- Stack Chaining Master

- Max. Virtual Disk Drives: 8

### Server Virtualization & Clustering

- Supports VMware vSphere (ESX/ ESXi 4.0 and above)

- Supports Windows Server 2008 Hyper-V & Failover Clustering

### Power Management

- Wake on LAN
- Scheduled Power on/ off (Max. 15 Settings)
- Automatic Power on after Power Recovery

### Access Right Management

- User Accounts Management
- Groups Management

- Share Folders Management

- Batch Creating Users

- Import User List

- User Quota Management

### Web Administration

- AJAX-based User Interface
- HTTP/ HTTPS Connections
- Alert Notification (Email & SMS)
- Smart Fan Control
- DDNS
- SNMP (v2 & v3)
- UPS Support with SNMP & USB
- Resource Monitor
- Network Recycle Bin for CIFS/ SMB and AFP
- Comprehensive Logs (Events & Connections)

- Real-time Online User List

- Syslog Client

- Backup and Restore System Settings

### QPKG

- Web Applications

- Joomla!

- phpMyAdmin

- WordPress

- AjaXplorer

- P2P Application

- MLDonkey (eMule)

- SABnzbd+

- Server Application

- SSOTS (Squeezebox Server)

- Tomcat

- Asterisk

- XDove (Mail Server)

- Misc.

- Optware IPKG

- Python

- Java Runtime Environment

### Supported Web Browsers

- Internet Explorer 7 & 8 or Later

- Firefox 3 or Later

- Safari 3 & 4 or Later

- Google Chrome

### Multilingual Support

- Chinese (Traditional & Simplified), Czech, Danish, Dutch, English, Finnish, French, German, Italian, Japanese, Korean, Norwegian, Polish, Russian, Spanish, Swedish

\* TS-459U-RP/ SP only.

\*\* Data encryption functions may not available in accordance to the legislative restrictions of some countries.

\*\*\* The RAID configurations available vary according to the product models and the number of hard disk drives installed.

## Powerful All-in-one Server

### File Server

- File Sharing across Windows, Mac OS and Linux/ Unix Platforms
- Protocols: CIFS/ SMB, AFP, NFS, FTP, HTTP, HTTPS
- QNAP Web File Manager

### FTP Server

- FTP over SSL/ TLS (Explicit)
- Max. Concurrent Connections: 256
- FXP Supported
- Passive FTP Port Range Control
- FTP Bandwidth & Connection Control
- Unicode Support

### Web Server

- HTTP/ HTTPS Connections
- Supports WebDAV Connection
- Importable SSL Certificate

### Database Server

- Built-in MySQL Server
- Web-based Management via

phpMyAdmin (QPKG)

### Backup Server

- Remote Replication Server (over Rsync)
- Apple Time Machine Support
- QNAP Client Backup Application – NetBak Replicator
- 3rd Party Backup Software Support: Acronis True Image, CA BrightStor, ARCserve Backup, EMC Retrospect, Symantec Backup Exec, LaCie SilverKeeper

### Printer Server

- Network Printer Sharing (Max. 3 USB Printers)

### iTunes Server

- Audio and Video Sharing
- Smart Playlist for iTunes Client (Windows & Mac OS)

### UPnP Media Server

- Built-in TwonkyMedia Server

(DLNA 1.5 Certified)

- Real-time & Background Photo Transcoding
- Supports UPnP/ DLNA Media Players
- Game Console: PlayStation 3, PSP, and Xbox 360
- Digital Media Adapter/Player
- Mobile Device (e.g. iPhone/ iPod Touch with UPnP/ DLNA App)
- Supported Formats
- Video: ASF, FLV, F1V, F4V, MP4, MPEG
- Audio: MP3, WAV
- Picture: BMP, GIF, JPG, PNG
- Download Station**
- PC-less BitTorrent/ FTP/ HTTP Download (Up to 500 Tasks)
- BitTorrent Download
- Supports TCP/ UDP Tracker Protocol
- Scheduled Download
- Configurable Port Range

- Bandwidth Control

- UPnP NAT Port Forwarding

- HTTP/ FTP Download

- Configurable Saving Directory

- Bulk Download with Wildcard Setting

- RapidShare Download Support

- QNAP Download Management

- Software: QGet

- For Both Windows & Mac OS

- Manage the Download Tasks on Multiple QNAP NAS over LAN or WAN

### Surveillance Station

- Supports IP Cameras (Not Included) for Network Surveillance

## QNAP Systems, Inc.

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