An In-depth QNAP NAS selection guide for everyone
How many users?

Maximum user account count

- NAS local user accounts: 600 to 4,096
- NAS domain (AD/LDAP) user accounts: unlimited. For more powerful NAS, more users can be supported.
How much capacity?

Capacity: GB? TB?

- Additional expansion unit needed?
- RAID configuration?
  - =N-1 drive capacity: RAID 1/5
  - =N-2 drive capacity: RAID 6
  - >=N-2 drive capacity: RAID 10/50/60
Which form factor?

**Rackmount**
- 1U (1.75 inch/44 mm) to 4U height, 19 inch (480 mm) width
- Single & redundant power options

**Desktop**
- Low noise level with versatile exterior designs
- Multifunction & value
Which processor? It matters!

64-bit x86 processors
- Intel Xeon, Core i7/i5/i3, Celeron multi-core 1.5 GHz+
- AMD Ryzen, R-series, G-series multi-core 2.0 GHz+

64-bit & 32-bit ARM processors
- 64-bit Marvell 8040 quad-core 1.6 GHz
- 64-bit Annapurna Labs AL-324 quad-core 1.7 GHz
- 32-bit Annapurna Labs AL-314 quad-core 1.7 GHz / AL-212 dual-core 1.7 GHz
- 64-bit Realtek RTD1295/1296 quad-core 1.4 GHz
### How much memory do I need?

For every snapshot of an 1 TB volume/LUN, 0.5 MB of RAM is needed to mount each snapshot.

<table>
<thead>
<tr>
<th>CPU</th>
<th>RAM size</th>
<th>Maximum snapshots (NAS overall)</th>
<th>Maximum snapshots (single volume/LUN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMD/Intel (x86)</td>
<td>4 GB or more</td>
<td>1,024</td>
<td>256</td>
</tr>
<tr>
<td>Annapurna Labs/ Marvell/Realtek (ARM)</td>
<td>4 GB or more</td>
<td>256</td>
<td>64</td>
</tr>
<tr>
<td>Any</td>
<td>2 GB</td>
<td>64</td>
<td>32</td>
</tr>
<tr>
<td>Any</td>
<td>1 GB</td>
<td>32</td>
<td>16</td>
</tr>
</tbody>
</table>

**TS-x51/x51+ total snapshot count is 256 only instead of 1,024. For ARM models to use snapshots, you need to update to QTS 4.3.4 (and later) and re-create the storage pool.**
Which kind of connection?

**NAS**
- USB QuickAccess
- Thunderbolt 2 / Thunderbolt 3
- 10 Gigabit
- 1 Gigabit

**DAS (External Storage)**
- USB 3.0
- USB 3.1 Gen 2
- Thunderbolt 2 / Thunderbolt 3
Go faster! Upgrade to 10GbE

Use QNAP NAS with the QNAP QSW unmanaged 10GbE switch series (optional; sold separately) and upgrade your network infrastructure to enjoy faster transfer speeds and to accelerate bandwidth-demanding applications.
Multi-Gigabit 10GBASE-T

Multiple speeds

Enjoy faster speeds with existing cables with Multi-Gigabit NBASE-T standard support.
10GbE SFP+ ports

Supports 10GbE fiber-optic transceiver or use 1.5M/3M/5M SFP+ direct attached copper (DAC) cables
USB QuickAccess direct connection to your PC/Mac

1st time installation

Direct data access

QNAP Qfinder Pro for Windows & Mac for quick connection

Dedicated USB cable between PC/Mac & NAS

Max 100MB/s!
M.2 2280 & 2.5-inch SATA SSD ports

- SSD cache or storage space
- Qtier tiered storage solution

Multiple M.2 2280 /2260 SATA 6Gb/s SSD slots

Multiple 2.5-inch SATA 6Gb/s SSD ports
SSDs for auto-tiered hybrid architecture

Performance & cost efficiency
- All in one for SMB
- 2 x SSD for caching
- Boost application's random IO access performance!

Capacity & performance
- High capacity file and media server
- RAID1: Boost both sequential and random access performance!
- RAID5
Display 4K content via HDMI

Supports QNAP RM-IR004 remote control with QButton application!

The best compatibility with HDMI certification
4K video real-time transcoding

Provide multiple channels of H.264/H.265 video playback and transcoding via integrated GPU or a PCIe graphics card*

*model dependent
PCIe slot for versatile expansion

With 1 or more PCIe slots for various expansion cards

- 10G/1G network card
- USB 3.1 Gen2 10G card
- QM2 M.2/10G card
- SAS 12G card
- QWA-AC2600 wireless card
- Graphics card
Enterprise 16-bay NAS

- Multi-core for running many virtual machines
- Optional PCIe graphics card for Virtual Machine GPU passthrough or QTS
- HDMI output & transcoding

**Hugh capacity**
- 2 x 10GbE
- 3 x PCIe slots
- 4 x SAS expansion units

**TS-1685**
- AMD Ryzen 1200/1600/1700 up to 8 cores, 3GHz+
- 2 x 10GbE 10GBASE-T
- Up to 64 GB (4 x DDR4) RAM
- 4 x 2.5” SATA SSD bays
- 12 x 3.5” SATA HDD bays
- 3 x PCIe slots

**TS-1677X**
- Intel® Xeon® D-1531/D-1521 up to 6 cores, 2.2~2.4GHz
- 2 x 10GbE 10GBASE-T
- Up to 128 GB (4 x DDR4) RAM
- 6 x M.2 SATA SSD slots + 4 x 2.5” SATA SSD bays
- 12 x 3.5” SATA HDD bays
- 3 PCIe slots
SMB 6~12-bay NAS

- Multi-core for running many virtual machines
- Optional PCIe graphics card for Virtual Machine GPU passthrough or QTS
- HDMI output & transcoding

**Optional 10GbE**
- 2 or 3 x PCIe
- 4 x SAS expansion units

**TS-x77**
- AMD Ryzen 1600/1700 up to 8 cores, 3.0 ~ 3.7 GHz
- Optional PCIe 10GbE card
- Up to 64 GB (4 x DDR4 2400) RAM
- 2 x M.2 SATA SSD slots + 2/4 2.5” SSD slots
- Up to 3 PCIe slots

**TVS-x82**
- Intel® Core™ i3/i5/i7 up to 4 cores, 3.4 ~ 4.2 GHz
- Optional PCIe 10GbE card
- Up to 64 GB (4 x DDR4 2400) RAM
- 2 x M.2 SATA SSD slots + 2/4 2.5” SSD slots
- Intel® HD Graphics (3 x HDMI)
- Up to 3 PCIe slots
**SMB 6~12-bay NAS**

- **10GbE exp.**
  - TS-1635AX
  - Marvell® ARMADA® 8040 ARMv8 Cortex-A72 4-core 1.6 GHz
  - 2 x 10GbE SFP+
  - Up to 64 GB (4 x DDR4 2400) RAM
  - 2 x M.2 SATA SSD ports
  - 2 x PCIe Gen.3 x2/x1 slots

- **Quad cores**
  - TVS-x73e
  - AMD RX-421BD 4-core 2.1GHz, up to 3.4GHz
  - Optional PCIe 10GbE card
  - Up to 64 GB (4 x DDR4) RAM
  - 2 x M.2 SATA SSD ports
  - 2 x PCIe Gen.3 x4 slots
  - AMD Radeon™ R7 Graphics (2 x HDMI)

- **2 x PCIe**
  - TS-x73
  - AMD RX-421ND 4-core 2.1GHz, up to 3.4GHz
  - Optional PCIe 10GbE card
  - 2 x M.2 SATA SSD ports
  - Up to 64 GB (4 x DDR4 2400) RAM
  - 2 x PCIe Gen.3 x4 slots

- **SAS/USB Expansion**

- **Large capacity with 2 x 10GbE SFP+ at an affordable price**

- **Integrated GPU with dual HDMI outputs**

- **Optional PCIe graphics card for QTS HDMI output & transcoding**
## SMB 9-bay NAS

**TVS-951X**
- Intel Kaby Lake Celeron 3865U 2-core 1.8GHz
- 1 x 10GbE 10GBASE-T
- Up to 32 GB (2 x DDR4 2133) RAM
- 4 x 2.5” SSD Slots + 5 x 3.5” HDD/SDD Slots
- 1 x 4K HDMI v1.4b

**TS-963X**
- AMD GX-420MC 4-core 2.0GHz
- 1 x 10GbE 10GBASE-T
- Up to 16 GB (2 x DDR3L 1600) RAM
- 4 x 2.5” SSD Slots + 5 x 3.5” HDD/SDD Slots

**TS-932X**
- Annapurna Labs AL-324 4-core 1.7GHz
- 2 x 10GbE SFP+
- Up to 16 GB (1 x DDR4 2133) RAM
- 4 x 2.5” SSD Slots + 5 x 3.5” HDD/SDD Slots

- **x86 performance with HDMI and integrated GPU for transcoding**
- **4-core performance with a x86 CPU for more apps**
- **Affordability with 2 x 10GbE SFP+ and 4-core performance**
SMB 2~6-bay NAS

**TS-x53B**
- Intel Celeron J3455 4-core 1.5GHz, up to 2.3GHz
- Up to 8 GB (2 x DDR3L 1866) RAM
- 1 x PCIe Gen.2 x2 slot (10GbE)
- 1 x 4K HDMI v1.4b
- OLED, USB QuickAccess, SD card slot, remote

**TS-x53Be**
- Intel Celeron J3455 4-core 1.5GHz, up to 2.3GHz
- Up to 8 GB (2 x DDR3L 1866) RAM
- 1 x PCIe Gen.2 x2 slot (10GbE)
- 1 x 4K HDMI v1.4b

**TBS-453A**
- Intel Celeron N3150 4-core 1.6GHz, up to 2.08GHz
- Up to 8 GB (2 x DDR3L 1600) RAM
- 4 x M.2 SATA SSD slots
- 1 x GbE + 4 port GbE switch
- 2 x 4K HDMI v1.4b

- Fully loaded and highly upgradeable with a PCIe slot
- Highly upgradeable with a PCIe slot with affordability
- Compact B5-sized NASbook with a 4-port GbE LAN switch.
SMB 3~8-bay NAS

**Performance**
- TS-832X
  - Annapurna Labs 64-bit AL-324 4-core 1.7GHz
  - 10GbE quad-core ARM NAS with PCIe slots

**Affordability**
- TS-431X2
  - Annapurna Labs 32-bit AL-314 4-core 1.7GHz
  - 10GbE quad-core ARM NAS

- TS-332X
  - 10GbE quad-core ARM NAS with triple M.2 SATA SSD acceleration

- TS-431X
  - Annapurna Labs 64-bit AL-324 4-core 1.7GHz
  - 10GbE quad-core ARM NAS with PCIe slots

**ARM CPU**
- TS-832X
  - Annapurna Labs 64-bit AL-324 4-core 1.7GHz
  - 2 x 10GbE SFP+
  - Up to 16 GB (1 x DDR4) RAM
  - 2 x PCIe Gen.2 x2/x1 slots

- TS-431X2
  - Annapurna Labs 32-bit AL-314 4-core 1.7GHz
  - 1 x 10GbE SFP+
  - Up to 8 GB (1 x DDR3) RAM

- TS-332X
  - Annapurna Labs 64-bit AL-324 4-core 1.7GHz
  - 1 x 10GbE SFP+
  - Up to 16 GB (1 x DDR4) RAM
  - 3 x 3.5”/2.5” HDD/SSD + 3 x M.2 SATA SSD slots

- TS-431X
  - Annapurna Labs 32-bit AL-212 2-core 1.7GHz
  - 1 x 10GbE SFP+
  - Up to 8 GB (1 x DDR3) RAM
SOHO 2~4-bay NAS

**TS-251+/451+**
- Intel Celeron J1900 4-core 2.0GHz, up to 2.42GHz
- Up to 8 GB (2 x DDR3L 1600) RAM
- 2 x GbE
- 1x 1080p HDMI

**HS-251+**
- Intel Celeron J1900 4-core 2.0GHz, up to 2.42GHz
- 2GB fixed DDR3L RAM
- 2 x GbE
- 1x 1080p HDMI

**TS-251A**
- Intel Celeron N3060 2-core 1.6GHz, up to 2.48GHz
- Up to 8 GB (2 x DDR3L 1600) RAM
- 2 x GbE
- 1x 4K HDMI, **USB QuickAccess**, SD card slot

**X86 Intel Transcoding HDMI**

- x86 NAS with 1080p HDMI & transcoding
- Silent x86 fanless NAS with 1080p HDMI & transcoding
- Dual-core x86 NAS with USB access, 4K HDMI & transcoding
Home & SOHO 1~4-bay NAS

- **TS-231P2/431P2**
  - Annapurna Labs 32-bit AL-314 4-core 1.7GHz
  - 2 x GbE
  - Up to 8 GB (1 x DDR3) RAM

- **TS-328**
  - Realtek 64-bit RTD1296 4-core 1.4GHz
  - 2 x GbE
  - Fixed 2 GB DDR4 RAM
  - 4K video transcoding

- **TS-131P/231P/431P**
  - Annapurna Labs 32-bit AL-212 2-core 1.7GHz
  - 2 x GbE
  - Up to 8 GB (1 x DDR3) RAM

- **TS-128A/228A**
  - Realtek 64-bit RTD1295 4-core 1.4GHz
  - 1x GbE
  - Fixed 1 GB DDR4 RAM

- Quad-core personal cloud for containerized apps
- 3-bay personal cloud with 4K transcoding
- Up to 220MB/s performance
- Up to 110MB/s performance
Thunderbolt NAS line up

TVS-1582TU  TVS-882ST3  TVS-1282T3 & TVS-x82T series  TS-453BT3
Cross-platform collaboration

THUNDERBOLT™

Thunderbolt

Ethernet

Type-C

Adapter for Thunderbolt 2 Mac/PC

Apple Thunderbolt 3 to Thunderbolt 2 adapter
A flawless workflow

1. High-speed ingest/backup

2. Collaboration

3. Off-site backup (QNAP RTRR)

4. Off-site collaboration
Thunderbolt 3 NAS

TVS-1282T3
- Intel Core i5/i7 4 core, 3.4~4.2GHz
- Max 64GB (4 x DDR4) RAM, 2 x M.2 SATA SSD
- 8 x 3.5" HDD + 4 x 2.5" SSD
- 4 x Thunderbolt 3, 2 x 10GBASE-T, 3 x 4K HDMI
- Optional 5.25" LG Blu-ray drive or RDX drive

TVS-882ST3
- Intel Core i5/i7 4 core, 3.4~4.2GHz
- Max 64GB (4 x DDR4) RAM, 2 x M.2 SATA SSD
- 8 x 3.5" HDD + 4 x 2.5" SSD
- 4 x Thunderbolt 3, 2 x 10GBASE-T, 3 x 4K HDMI

TVS-882BRT3
- Intel Core i5/i7 4 core, 3.4~4.2GHz
- Max 64GB (4 x DDR4) RAM, 2 x M.2 SATA SSD
- 8 x 3.5" HDD + 4 x 2.5" SSD
- 4 x Thunderbolt 3, 2 x 10GBASE-T, 3 x 4K HDMI
- Optional 5.25" LG Blu-ray drive or RDX drive backup

TS-453BT3
- Intel Core i5/i7 4 core, 1.9 ~ 2.6GHz
- 32GB (2 x DDR4) RAM
- 8 x 2.5" SATA SSDs/HDDs, 2 x Thunderbolt 3
- 2 x 10GBASE-T, 1 x 4K HDMI

- Intel Celeron J3455 4 core 1.5GHz, up to 2.3GHz,
- 8GB DDR3L RAM, 2 x M.2 SATA SSD
- 2 x Thunderbolt 3
- 1 x 10GBASE-T, 2 x 4K HDMI

- Blu-ray disc drive or RDX drive backup
- 1500MB/s, for 4 Thunderbolt concurrent clients
- Compact yet powerful
- Affordability with Thunderbolt convenience
Thunderbolt 2 NAS

- TVS-1282T
- TVS-882T
- TVS-682T

- Intel Core i3/i5/i7, 4 core 3.4~4.2GHz
- Max 64GB (4 x DDR4) RAM
- 2 x M.2 SATA SSD
- 3.5" SATA HDD + 2.5" SATA SSD (hybrid design)
- 2 x Thunderbolt 2
- 2 x 10GBASE-T
- 3 x 4K HDMI

Thunderbolt 2
2 x 10GBASE-T
6 x TX expansion
Blu-ray & RDX NAS

Optional Blu-ray writer or RDX drive

TVS-882BR
TVS-882BRT3

- Intel Core i5/i7 quad-core up to 3.6 GHz
- Max. 64 GB (4 x DDR4) RAM, 2 x M.2 SATA SSD
- 8 x 3.5” HDD + 1 x 5.25” drive slots
- 5.25” SATA port for optional Blu-ray or RDX support
- 3 x 4K HDMI
- 3 x PCIe Gen.3 slots
- 4 x Thunderbolt 3 (TVS-882BRT3)
Thank you for choosing QNAP