



QNAP TS- h1090FU NAS Rack (1U) EPYC 7232P 64 GB DDR4 0 TB QuTS hero Black, Grey



Model: TS-H1090FU-7232P-64G

Manufacturer: QNAP

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TS-h1090FU

ZFS-based, 1U high-density U.2 NVMe PCIe Gen 4 / SATA 6Gbps SSD all-flash storage built for low-latency file servers, virtualized workloads, data centers, and 4K/8K streams

The TS-h1090FU high-density NVMe all-flash storage is designed for providing extreme performance with high cost-efficiency. Featuring ten U.2 NVMe Gen 4 x4 SSD bays, the TS-h1090FU delivers remarkable random read/write IOPS with ultra-low latency. The ZFS-based QuTS hero operating system supports inline data deduplication and compression for reducing I/O and SSD storage consumption, which significantly extends SSD lifespan with a higher price-performance ratio for all-

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flash storage arrays. Ideal for I/O-intensive and latency-sensitive applications, the TS-h1090FU eliminates productivity bottlenecks in virtualization, modern data centers, multimedia storage, and mission-critical backup/restore tasks□ suitable for Tier 2 storage workloads with an ideal low cost-per-GB.

Build high-performance storage infrastructure for IOPS-demanding applications

Virtualization

Eliminates storage bottlenecks for unstructured data and I/O intensive workloads; ideal for server virtualization and virtual desktop infrastructure (VDI).

Data Centers

Delivers ultra-low latency and high IOPS performance, providing response times within microseconds for data centers that host significant business-critical systems and data.

Media and Entertainment (M&E) production

Satisfies smooth 4K/8K media streaming and post-production, empowering multimedia workflows with faster data transfer, access, and backup for boosted efficiency.

Powerful, reliable, and multitasking with up to 1 TB DDR4 ECC memory

The TS-h1090FU is armed with 2nd Gen AMD EPYC™ 7002 series processors (Rome), based on the “Zen 2” architecture with cutting-edge 7nm process technology. With DDR4 ECC memory that detects and corrects single-bit memory errors for higher reliability, the TS-h1090FU provides 12 Long-DIMM slots for up to 1 TB memory to fulfill memory-intensive workloads. Demonstrating immense computing power and multi-tasking capabilities, the TS-h1090FU is the ideal choice for uncompromising performance demands in HPC, virtualization, and 4K/8K multimedia applications.

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U.2 NVMe PCIe Gen 4 x4 – faster speed, optimal I/O, and lower latency

The 1U rackmount TS-h1090FU has 10 drive bays that support high-performance U.2 NVMe PCIe Gen 4 x4 SSDs or economical SATA 6Gb/s SSDs. Latency-sensitive applications can be bolstered with U.2 NVMe PCIe SSDs to attain optimized performance and utmost application response times. Coupled with powerful ZFS data deduplication and SSD optimization technologies, the TS-h1090FU provides solid foundations for overcoming performance demands while also maximizing your SSD investments!

Leverage the M.2 PCIe NVMe SSD to U.2 Adapter

Install one or more QDA adapters in the TS-h1090FU to maximize PCIe bandwidth utilization in a cost-effective way by using M.2 PCIe NVMe SSD instead of the U.2 SSD for optimizing data-intensive applications. It can also boost IOPS performance when configuring SSD caching. Users can monitor drive health and manage SSD usage from the QTS Storage & Snapshots Manager. The M.2 SSD installed in the QDA adapter is hot swappable.

Dual 25GbE connectivity multiplies all-flash superior performance

The NVMe-ready TS-h1090FU provides breakthrough network connectivity with two 25GbE SFP28 SmartNIC ports (compatible with 10GbE SFP+ / 1GbE SFP) that also support iSCSI Extensions for RDMA (iSER) to increase performance of data transfer between NAS and VMware® ESXi server and offload CPU workloads. With Port Trunking and Auto-Negotiation, the TS-h1090FU empowers your organization with the bandwidth and reliability to allow thousands of endpoint users to smoothly access data stored on the NAS while satisfying the most performance-demanding applications. The TS-h1090FU is also ideally matched with QNAP's managed and unmanaged 2.5GbE/10GbE/25GbE switches to form high-speed, secure, and scalable network environments without going over budget.

Multiple PCIe Gen 4 slots for flexible expansion

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The TS-h1090FU is equipped with two PCIe Gen 4 slots. With twice the I/O performance of PCIe Gen 3, the TS-h1090FU can take advantage of PCIe cards to expand application potential.

Robust hardware paralleled to boost all-flash NVMe performance

TS-h1090FU features high-level hardware with an expandable architecture to provide businesses with high performance and low latency access.

ZFS-based QuTS hero operating system enhances NAS performance and data integrity

QuTS hero combines the app-based QTS with the 128-bit ZFS file system to provide flexible storage management, comprehensive data protection, and optimized performance to tackle the complexity and performance demands of modern IT. From storage management, virtualization, to collaborative media workflows, QuTS hero streamlines your business-critical tasks.

Data integrity is key

QuTS hero's self-healing ensures data integrity and reliability. Write Once, Read Many (WORM) is also supported.

Data reduction improves storage efficiency and performance

Inline data deduplication, compression, and compaction reduce file sizes to conserve storage capacity and optimize performance.

Multi-level cache technology

Main memory read cache (L1 ARC), SSD second-level read cache (L2 ARC), and ZFS Intent Log (ZIL) for synchronous transactions with power failure protection are supported to boost performance and security.

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RAID Z enables robust data protection

Multiple RAID levels allow flexible capacity utilization. RAID Triple Parity and Triple Mirror deliver higher levels of data protection.

QSAL (QNAP SSD Antiwear Leveling) enhances data protection

RAID-level SSD lifespan is automatically and regularly detected to prevent simultaneous SSD failure, improving your data protection and system reliability.

App Center ecosystem extends NAS functionality

Apps for backup/sync, virtual machines/containers, content management, productivity, and more features can be used to expand the application potential of the NAS.

Inline data deduplication, compression, and compaction improve SSD endurance

QuTS hero supports advanced block-based data reduction technologies (including inline data deduplication, compression, and compaction) to reduce file sizes, conserve storage capacity, and optimize performance. For example, if 20 virtual machines on a NAS are replicated using the same template, then storage space requirements for all 20 virtual machines can be reduced by up to 95%. Whether acting as primary or backup storage, the TS-h1090FU optimizes storage utilization to provide a reliable storage cornerstone in the Big Data era. All-flash solutions thus achieve higher cost efficiency while improving both random write performance and SSD lifespan.

More SSD performance and lifespan optimization technologies

Write Coalescing

Transforms all random writes to sequential writes along with reduced I/O, effectively increasing write performance in all-flash environments.

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Pool Over-provisioning

Dedicated space can be flexibly reserved in an SSD storage pool to allow new data to be written into a complete block even if the pool is almost full, thus improving the performance of fragmented pools.

TRIM

Allows QuTS hero to inform SSDs to delete unneeded data blocks and process the deletion tasks during system idle times, meaning it does not have to wait for when new data is written to the block.

Comprehensive backup and disaster recovery solution

The TS-h1090FU supports various apps that cover all your backup needs. Practice safe IT habits by regularly backing up files and device content, allowing them to be easily restored when needed.

Remote backup for NAS

Hybrid Backup Sync makes it easy to back up data from a TS-h1090FU to another QNAP NAS or remote server to fulfill your 3-2-1 backup strategy.

VM backup

Enjoy license-free VMware® and Hyper-V VM backup with source-side incremental backup, global deduplication, and recovery compression.

SaaS backup

Safeguard enterprise cloud data by backing up/syncing files, emails, calendars, and contacts from Google™ Workspace and Microsoft® Office 365® to the NAS.

Cloud backup for NAS

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Hybrid Backup Sync supports mainstream cloud storage for NAS data backup. For backup to object cloud storage, VJBOD Cloud is especially useful to reduce bandwidth usage and backup time.

QuDedup technology

Hybrid Backup Sync eliminates redundant data at the source and then backs up the deduplicated data, helping to save time and storage costs while providing efficient multi-version backups.

Real-time SnapSync

Real-time SnapSync immediately synchronizes data changes with the destination storage, ensuring the primary and secondary NAS always have the same data. RPO is minimal to achieve real-time disaster recovery.

Multi-version snapshots mitigate ransomware threats

The TS-h1090FU supports block-based snapshots that record the state of the system at any time. It helps protect data, which can be restored back to a specific point of time, greatly helping in mitigating the threat of ransomware.

Up to 65,536 snapshots

QuTS hero supports enough snapshots for you to create 1 snapshot every hour for 7 years without needing to delete any! Copy-on-write technology makes snapshot creation almost instantaneous without affecting ongoing data writing.

Back up snapshots

Multiply data protection by backing up snapshot files! Replicate volume/LUN snapshots in the TS-h1090FU to a remote NAS (Snapshot Replica) by copying only the changes made. This helps save time & bandwidth, and can be run manually or on a scheduled basis.

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All-in-one solution for hosting virtual machines and containers

By running multiple virtual machines and containers on the TS-h1090FU, you can deploy multi-tenant environments and applications to increase management efficiency and save hardware costs. Coupled with the Network & Virtual Switch app that boosts interoperability between virtual machines, containers, QNAP NAS, and other physical devices on the network, you can flexibly allocate physical and virtual network resources to simplify network deployment.

Virtualization Station

Run multiple Windows®, Linux®, UNIX®, Android™, and QuTScloud virtual machines and access them via a web browser or Virtual Network Computing (VNC). Businesses can run virtualized server applications on a single NAS without needing additional physical servers.

Container Station

Experience Docker®, LXD, and Kata Containers lightweight virtualization technologies, download apps from the built-in Docker Hub Registry®, import/export containers, and create abundant microservices.

Single Root I/O Virtualization (SR-IOV)

By installing an SR-IOV compatible PCIe SmartNIC in the TS-h1090FU, you can allocate bandwidth resources from a physical network card directly to VMs, increasing network efficiency and reduced CPU overheads.

QuTScloud virtual NAS

QuTScloud is a virtual appliance based on the QTS operating system. Enterprises can quickly launch QuTScloud on hypervisors including Linux® KVM, Microsoft® Hyper-V, and VMware ESXi™ to acquire advanced NAS features without requiring additional NAS hardware.

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Reliable, high-performance storage for virtualization

The TS-h1090FU supports block-based iSCSI LUN as a reliable, high-performance, and affordable storage solution for mainstream virtualization environments. It supports VMware® VAAI and Microsoft® ODX to increase performance by offloading server loading for ESXi server and Hyper-V respectively.

Comprehensive security and privilege settings

The TS-h1090FU is loaded with flexible privilege settings and security measures. Besides IP blocking, 2-step verification, HTTPS connection, there are more apps that help ensure optimal NAS protection against threats like malware and hackers.

Simplified privilege settings

The TS-h1090FU supports comprehensive access right settings for shared folders, Azure Active Directory Domain Services (Azure AD DS), LDAP, and Windows ACL to help IT staff efficiently manage user accounts and access rights for multiple NAS systems.

QuFirewall protection

Supports IPv6, firewall access lists, and GeoIP filtering to restrict access based on geographical locations for higher NAS network security.

Superior security with QVPN

A virtual private network (VPN) allows secure access to network resources and services across public networks. QVPN supports creating a VPN client, using the TS-h1090FU as a VPN server, and WireGuard® VPN service with an easy-to-use interface for setting up a secure connection.

QuWAN SD-WAN

To facilitate digital transformation, multi-site expansion and remote working, QuWAN SD-WAN helps automatically mesh multi-site VPN. It features IPsec encryption and cloud-centric management,

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allowing secure multi-site network including QNAP NAS and VMware ESXi platforms.

Security Counselor

A security portal for the TS-h1090FU to check for weaknesses and offer recommendations for enhancing NAS security. It also integrates anti-virus and anti-malware scanning software.

Malware Remover

Regularly scan your TS-h1090FU using the latest malware definitions. If infected files are detected, they will be immediately removed to ensure NAS data security.

The best file storage and collaboration center

The TS-h1090FU integrates rich apps for storing, managing, synchronizing, searching, and archiving files. It supports SMB/CIFS, AFP, and NFS protocols for streamlined file sharing across Windows®, Mac®, and Linux®/UNIX®, and provides the smartest NAS solution for professionally managing your files.

File Station

Manage, access, and share all the files in the TS-h1090FU and view snapshots files – all from your web browser. You can also easily mount remote NAS folders and cloud storage.

Qsync

Make any file uploaded to a TS-h1090FU available to linked devices, such as computers, laptops and mobile devices. You can sync shared folders and team folders for group file sharing to enhance the flexibility of team projects and collaboration.

Qsirch

QNAP's powerful, Google-like search tool helps you quickly find images, music, videos, documents, and emails by keywords, color, and more search conditions. It also supports Qfiling to perform one-

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time or automatic archival tasks based on your search criteria.

Free exFAT support

exFAT is a file system that supports files up to 16EB and is optimized for flash storage (such as SD cards and USB devices) - helping accelerate large media file transfer and sharing.

Build an affordable Fibre Channel SAN environment

Common Fibre Channel Storage Area Networks (SAN) devices are often costly. By installing QNAP dual-port 16Gb/32Gb Fibre Channel expansion cards in the TS-h1090FU, you have more budget-friendly options to add a NAS to a SAN environment. You can set a Fibre Channel Target using the iSCSI & Fibre Channel app. Moreover, the LUN Masking and Port Binding features provide an additional layer of data security.

Flexible and economical storage expansion

QNAP provides easy ways to expand your storage capacity. Here are several ways to expand your TS-h1090FU storage as needed to accommodate data and business growth.

Attach QNAP expansion enclosures

Connect expansion enclosures to the TS-h1090FU, and manage NAS storage expansion with the user-friendly Storage & Snapshots Manager app.

Mount cloud storage or remote file servers

Mount cloud storage or remote file servers to expand the capacity of the TS-h1090FU while also centrally managing files on the NAS, cloud storage, and remote devices.

Migrate to a new NAS

Install your NAS hard drives into a larger QNAP NAS and retain all your existing data and configurations.

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Upgrade RAID capacity

Hot-swap lower-capacity drives with larger-capacity drives to expand your NAS capacity so it can grow with your business.

A health check for your hard drives

Hard drives are at the heart of your NAS, and ensuring their long-term health and reliability is absolutely crucial. QNAP provides various methods and tools to help you monitor hard drive health, ensuring that you can take proactive decisions to safeguard your data and files.

S.M.A.R.T. and back block scanning

If any of the S.M.A.R.T. values are reported as abnormal, or bad blocks are detected, you can take early action and replace drives before potential data loss occurs.

DA Drive Analyzer

The DA Drive Analyzer leverages ULINK cloud-based AI to predict the expected lifespan of drives, assisting you in planning future drive replacements to protect against NAS downtime and data loss.

Seagate® IronWolf™ Health Management

When using supported IronWolf™ or IronWolf Pro™ hard drives, overall system reliability is improved by providing you with actionable prevention, intervention, and recovery options.

Flexibly switch to QTS operating system

The TS-h1090FU also supports QTS - QNAP's standard NAS operating system – that provides greater everyday performance, efficient memory utilization, and the advantage of Qtier auto-tiering. You can also migrate drives from your current QTS-based NAS to the TS-h1090FU.

QTS

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Suited for performance-demanding tasks, cross-teams file sync, and HDD-SSD hybrid storage applications

QuTS hero

Featuring highly reliable data protection and data reduction, and optimized for SSD-based applications

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