



## QSAN Storage Manager

# QSM 3

### Enterprise Data Management for Unified Storage / NAS

#### Key Benefits

##### Plan Ahead

- ZFS 128 bit based file system provides nearly unlimited file size, seamless generational system upgrade, and high performance

##### Trust

- With variety of built-in backup applications to help your data integrity and continues to evolve security level to protect data from software to physical

##### Simple

- Using QSM, your unified storage can be deployed, providing resource monitoring and auto load balancer, help the management of your digital assets across the world

#### Overview

QSM (QSAN Storage Manager) is an innovative storage operating system designed for QSAN unified storage products. Based on Linux and 128-bit ZFS (Zeta-byte File System), QSM not only inherits the outstanding native features of ZFS but also adjust with several bespoke optimization enhancements that make the unified storage series a high-performance, efficient and superior network-attached storage device.

#### Keep Business Always-On

The unwarned service interruption can cost a huge hidden cost for your company, QSM is a high availability and resiliency software with

- Smart failover, no downtime for software/hardware upgrading and replacement
- Disk roaming
- Dynamic data pool (RAID technology) to help the company minimize its system downtime and alleviates issues, ensuring business-critical applications stay online forever.

#### Store Data Safely and Completely

The growing tide of data breaches, leaks, and malicious software means your data security systems and procedures are vital. QSM builds security-first ideology storage with

- Network protection
  - Physical disk protection
  - Pool encryption
  - Data integrity
- to offer you full protection for the most essential asset and data.

#### Complete and Efficiency Data backup

QSM effectively addresses the modern businesses' data threats by providing comprehensive and effective backup solutions

- Versatile backup plan
- Enterprise feature that assist you design a complete and efficient backup solution to minimize the risk of data loss.

#### Complete All Business in QSM

QSM tailor-made storage pool technology effectively caters to diverse storage demands on data integrity, scalability, high performance, and availability.

- Fast deployment
  - Virtualization Server
  - Diverse RAID type, protocol and network speed
  - High scalability
- All these can be done with the QSM.

The QSAN logo, consisting of the word "QSAN" in a bold, white, sans-serif font, centered within a solid orange rectangular background.



## Software Feature

### ZFS Based Operating System

ZFS provides ZFS checksum and Copies on Write technology to keep data complete.

- **ZFS checksum** - ZFS will calculate the checksum and compare it with the original checksum, if not match, it automatically repairs the damage, using data from the other mirror to ensure the correctness of the data.
- **Copy on Write** - This mechanism guarantees that the old data is safely preserved in case of power loss or system crash that in other cases would result in loss of data.

### Comprehensive Business Backup Function

QSM server covers local and remote snapshots scheduled, giving you the flexibility and confidence to work worry-free. Also provides synchronous multi-site data replication to make sure business continuity.

- **Snapshot and Replica** - Snapshots record the status of shared folders and iSCSI LUNs as changes happen on write, and replication can transfer the changes between different devices.
- **Remote Replication** - Remote Backup Data copies can be distributed to your trusted storage locations through real-time remote backup.
- **XReplicator** - XReplicator is a free utility that is provided to help you easily backup an image of a disk, partition, folder, or file; or entire PC as a bare-metal backup.
- **Cloud Backup and S3** - QSM provides cloud services backup ensures that you can backup your data to multiple cloud services such as Amazon S3, iCloud S3, and S3 compliant services.



### Enlarge Storage Capacity

QSM server provides deduplication, compression, and thin provisioning functions to save storage space and achieve effective cost control.

- **Inline Deduplication** - Block-level function that checks the block similarity of data and auto removes the redundant data object to reduce the usage of storage capacity.
- **Compression** - Reducing data for your storage, helping ITs to reduce the amount of storage you need to purchase and maintain.
- **Auto Tiering** (for block level) - Demanding workloads of your business applications could be dramatically reduced and the performance increased.
- **Thin Provisioning** - lets various services and applications use the same storage space without limiting how much of the quota can be used by each.

### Facing Modern Security Threats Proactively

QSM secures your current data by delivers an actionable, proactive protection strategy to minimize potential risks.

- **WORM** (Write Once Read Many) - WORM can protect your data from encryption-based ransomware that installs covertly on a victim's system and encrypt their files, making them inaccessible.
- **SED** (Self-Encrypting Drive) - With the technology, even if the physical drive is stolen or misplaced, the data on it remains protected against data breach by generating the AK (Authentication Key) to prevent unauthorized access.
- **Pool Encryption with AES-256** - QSM supports up to AES 256-bit encryption for internal drives and external USB / eSATA drives.
- **Memory Cache Protection** (for XCubeNXT series) - This function will safely transfer the memory cache data to a non-volatile flash device when an unexpected power loss happens.

| Data Safety                    |                          |
|--------------------------------|--------------------------|
| Physical Protection <b>SED</b> |                          |
| Network                        | Software                 |
| <b>IP-Blocking</b>             | <b>WORM</b>              |
| <b>Internet SSL</b>            | <b>Antivirus</b>         |
| <b>Firewall</b>                | <b>AES-256</b>           |
| <b>Service Binding</b>         | <b>Security Evolving</b> |



### Powerful Storage Capacity

QSM is a ZFS based file system, ZFS is a "128-bit" file system, 128 bits is the largest size address and it can manage almost unlimited storage capacity. Each ZFS storage pool, file system, and a single file can store billions of files and snapshots. This feature allows you to upgrade your business without the need to purchase additional equipment, and unlimited capacity is suitable for all kinds of applications.

### Virtualization Ready

QSM is verified with VMware® Ready™ and Microsoft® Hyper-V™ certified. No matter which virtualization environment you've adopted, the QSM is a practical and efficient storage system for you to deploy in any virtualization platform. QSM can be used for primary storage repositories and as a backup to existing primary storage. As a backup storage device, the QSM supports a comprehensive list of 3rd-party virtual machine backup software to ensure that your VMs and data are never at risk of loss.

|         |         |
|---------|---------|
| redhat  | solaris |
| FreeBSD | CentOS  |
| Windows | ubuntu  |
| Linux   | android |

### Hypervisor Manager

In QSM, the built-in Hypervisor Manager is an easy-to-use application enabling you to create and manage virtual machines that run directly on the unified storage. Being capable of hosting multiple virtualized environments ensures various customized services and applications are well presented at the same time without the additional hardware investment. Additionally, those virtual machines are isolated reducing the risk of potential data leaks or operation interference. These features make the QSM an ideal multi-tenant environment for deploying business applications.

### RESTful API

QSM provides the standard RESTful API. The system can be deployed into the IT management system using RESTful API and let IT managers continuously use the existing management tool, even the first-time user can finish the management job confidently, which considerably reduce the learning cost for organizations.

### Advanced Technology

#### QSAN Always-On Technology

Keep your business on. With the growth of data usage, downtime can cost a huge cost for your business. QSM ensures business continuity by reducing downtime while keeping critical applications and data online and accessible by those who rely on them.

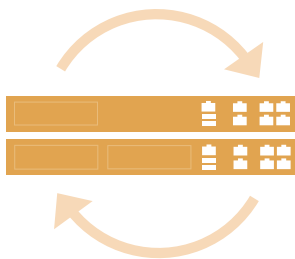
#### Simple Business Continuity with Active Cluster

Clustered controller design allows for the complete failure of a controller or any controller component without impacting operations. Both controllers concurrently provide storage services in real-time. If one controller fails, the other controller can transparently seamlessly take over all storage services.

#### Everything is Non-disruptive

Downtime will cost a huge hidden cost when your unified storage hosts hundreds of applications. That is why keeping storage activities is a critical part of the business. For instance:

- **Non-disruptive Hardware Upgrades and Replacement** - All of the critical components include controller, fan module, or PSU are hotly pluggable for failover without downtime.
- **Non-disruptive Software Upgrades** - With smart failover, both controllers can take over all service when the other controller fails or doing an upgrade.



## Software Specification

|                                |  |
|--------------------------------|--|
| Operating System               | 64-bit embedded Linux  |
| Service                        | CIFS / NFS / FTP <sup>1</sup> / AFP / WebDAV <sup>1</sup> / Bonjour / iSCSI / FCP  |
| User Management                | Local and domain user and group management / Application privilege / User quota / User home folder<br>Windows AD and LDAP support / Trust domain and support up to 200,000 domain user   |
| Folder Management              | Advanced ACL / Windows ACL / Hide shared folder on Windows network<br>WORM (Write Once Read Many) protection / Folder quota / File retention   |
| Backup Server                  | Snapshot and replication / Block-level snapshot and replication / Schedule snapshot and manual snapshot<br>Snapshot retention policy / XMirror / Time machine <sup>1</sup> / External storage device backup<br>Public cloud backup: Alibaba Cloud OSS, HiCloud S3, Amazon S3, and S3 compatible<br>Public cloud synchronization: Google Drive, Microsoft OneDrive, Dropbox   |
| Storage Management             | RAID 0, 1, 5, 6, Z3, 10, 50, 60<br>Global and dedicated spare disk / Disk management / Disk S.M.A.R.T. check / Instant RAID / Fast RAID rebuild<br>Multi-pool and volume management / Build in iSCSI initiator and target<br>Storage capacity management / Pool and volume threshold notification<br>Online pool expansion and migration / Online volume expansion<br>Auto tiering (for block level) / External storage device management / Pool encryption / Disk caching / Data scrubbing<br>Hybrid SSD cache / Deduplication (volume and LUN) / Snapshot (folder and LUN)<br>Compression (volume and LUN) / Thin provisioning for LUN / SED (Self-Encryption Drive) |
| High Availability <sup>2</sup> | Dual active (active/active) NAS controller<br>Support ALUA<br>Management port fault migration<br>Fault-tolerant and redundant module components for controllers, PSU, FAN modules, and dual-port disk interfaces<br>Dual port hard disk tray connector<br>Multipath I/O and load balancing support (MPIO, MC/S, Trunking, and LACP)<br>Firmware update without system downtime<br>Memory cache protection  |
| Networking                     | IP4 / IPv 6 / VLAN / Link aggregation (support 11 bonding modes) / Multi-IP settings / Gigabit jumbo frame   |
| Virtualization Certification   | Latest VMware vSphere certification / VMware VAAI for iSCSI & FC, VASA provider, vVol<br>Microsoft Windows Server Hyper-V certification / Microsoft ODX  |
| System Optimization Settings   | Service binding <sup>1</sup> / SSD Trim  |
| Log                            | System log / System connection and data transfer log   |
| Notification                   | Email / SNMP / syslog / RESTful API  |
| Power Management               | Power scheduling / Wake on LAN / UPS settings  |
| Multi-Browser Support          | Google Chrome / Microsoft Edge / Apple Safari / Mozilla Firefox  |
| Host Operating System Support  | Windows Server<br>SLES / RHEL / CentOS<br>Solaris / FreeBSD<br>Mac OS X  |
| Utility                        | XFinder / XInsight   |
| Notes                          | 1. The feature is supported only in selected models.<br>2. The features are supported in dual controller models.   |

## Specification Sheets

| Storage  |  |
|--|--|
| Maximum number of pools per system                                 | 64   |
| Maximum number of volumes per system                               | 256  |
| Maximum number of read caches in a pool                            | 1  |
| Maximum number of write caches in a pool                           | 1  |
| File System  |  |
| Maximum number of shared folders per system                        | 2,048 ~ 4,096 (depend on series and model) |
| Maximum number of remote folder / FTP / sFTP / cloud service / USB | 8  |
| iSCSI  |  |
| Maximum number of iSCSI targets per system                         | 64   |
| Maximum number of iSCSI LUNs per system                            | 255  |
| Backup   |  |
| Maximum number of snapshots per folder                             | 4,096                                      |
| Maximum number of backup destinations                              | 8  |
| Maximum number of replica tasks per destination                    | 16   |
| Maximum number of replica running tasks                            | 2  |
| Maximum number of remote backup tasks per destination              | 16   |
| Maximum number of remote backup running tasks                      | 2  |
| Maximum number of S3 backup tasks                                  | 16   |
| Maximum number of S3 backup running tasks                          | 2  |
| Maximum number of USB one-click backup rules                       | 10   |
| Cloud Sync   |  |
| Maximum number of Google Drive tasks                               | 10   |
| Maximum number of Dropbox tasks                                    | 10   |
| Maximum number of OndDrive tasks                                   | 10   |
| Maximum number of real-time running tasks                          | 10   |
| Maximum number of scheduled tasks                                  | 5  |
| Hypervisor Manage  |  |
| Maximum number of virtual machines per system                      | 4 ~ 16 (depend on series and model)        |
| Maximum number of hard disk attachments per virtual machine        | 3  |
| Maximum number of KVM snapshots per virtual machine                | 64   |
| Maximum total number of KVM snapshots per system                   | 1,024                                      |
| Maximum number of virtual machine backup tasks                     | 16   |
| Maximum number of virtual machine backup running tasks             | 4  |
| Accounts   |  |
| Maximum number of users per system                                 | 1,024 ~ 2,048 (depend on series and model) |
| Maximum number of groups per system                                | 512 ~ 1,024 (depend on series and model)   |