# STORANDER

# GS Series

## Highlights

### Extreme Performance

- Up to 1.3M end-to-end IOPS to accelerate storage operations
- Massive sequential throughput of up to 50GB/s

### Cost-Effective Storage

- U.2 NVMe SSD to deliver better performance at lower costs
- QLC SSD support for higher capacity at reduced costs
- Automated storage tiering to fully utilize SSD and HDD

### Flexible Scalability

- Scale-out and scale-up expansions to easily expand performance and capacity to more than 70PB

### Easy to Use and Manage

- Single namespace for easier data access
- Auto-balancing to reduce the burden of storage management for IT staff

### Nondisruptive Operations

- HA service ensures non-stop operations with a near-zero RTO (recovery time objective) by deploying two storage devices to provide services from two separate sites.

## Introduction

*EonStor GS U.2 NVMe hybrid flash storage is a high performance storage solution for enterprises. Equipped with U.2 NVMe SSD, it provides higher IOPS and throughput and is more cost-effective. GS U.2 is a unified storage that supports both SAN and NAS services. With block-level and file-level scale-out support, it can linearly increase performance and capacity. Complete data protection allows IT staff to focus on higher value projects. It is a perfect fit for such applications as AI, HPC, M&E, virtualization, and database.*

### End-to-End High Performance with U.2 NVMe SSD

The most high-end model, GS 5000U, features PCIe 5.0, 100GbE connectivity with RDMA, and NVMe over Fabrics (NVMe-oF), achieving up to 50GB/s read throughput and 1.3M IOPS on a single appliance.

### Cost-Effectiveness and High Storage Efficiency

U.2 NVMe SSD is becoming mainstream in the market as it combines the advantages of SAS and SATA SSDs, allowing enterprises to enjoy higher performance at a competitive price.

With significant improvement in performance and durability in recent years, quad-level cell (QLC) SSDs have become a compelling option for applications requiring high capacity and flash-level performance. QLC SSDs offer 33% more storage capacity per cell compared to triple-level cell (TLC) SSDs, all while costing less. EonStor GS U.2 NVMe storage supports QLC SSDs to provide greater flexibility, catering to a wide range of enterprise applications and requirements.

EonStor GS U.2 NVMe storage supports hybrid storage, and with automated storage tiering, the storage system can automatically leverage the high throughput and low latency of U.2 NVMe SSDs for frequently accessed data, while using HDDs on expansion enclosures as data backup media, thereby boosting system performance at a reduced total cost of ownership.

The storage solution also comes with data compression and offline deduplication, which reduces the storage capacity required and thus saves storage costs. The compression feature greatly reduces the data size and the transfer time. To deal with repeated files saved by manual backups or archiving, offline deduplication helps you automatically remove duplicate data from an appliance or a cluster to free up storage space.

## Flexible Scalability with Scale-out and Scale-up

Through scale-out expansion, you can linearly increase performance and capacity for both block-level and file-level environments. When one storage appliance is no longer able to provide enough performance or capacity, you can simply add more appliances to form a cluster—with a maximum of 4 appliances.

Through scale-up expansion, each storage appliance can be connected to JBOD expansion enclosures to add up to 896 drives. Together with scale-out expansion, EonStor GS U.2 NVMe storage supports more than 3000 drives in total.

## Easy Data Access for Users and Simple IT Management

Users can access shared folders in a single root directory under a single namespace, without having to worry about where the data is stored. Auto-balancing is also supported to achieve load balancing, which relieves the burden of manual planning and configuration for IT personnel.

## Smart Management of SSD

EonStor GS U.2 NVMe storage uses an intelligent algorithm to handle data writes and optimize SSD usage. The algorithm not only extends     SSD lifespan by reducing the total amount of writes on an SSD but also prevents multiple SSDs from failing at the time and causing data loss. Moreover, as EonStor GS U.2 NVMe storage monitors SSD status in real time, it estimates the remaining lifespan of each SSD and sends the administrator a reminder to replace the SSD that is about to fail.

## Complete Data Protection and Backup

EonStor GS U.2 NVMe offers various data protection mechanisms to guarantee data safety. First, Infortrend's unique RAID technology ensures your data remains intact even in case of a drive failure. With snapshot, a flexible backup tool, you can back up local resources on a storage system by schedule, including volumes and shared folders, and roll back to a previous version when needed. For further protection, you can back up data to a remote GS appliance using the remote replication feature, or to a public cloud with EonCloud Gateway.

Immutable object storage, another crucial feature for data protection, safeguards data against ransomware attacks. It retains data with WORM (write once read many) storage protection, where data gets "locked" and therefore cannot be modified, deleted, overwritten, or even encrypted by ransomware. By setting a retention period, you can easily follow government compliance requirements or company policies on data retention.

For companies requiring an easy-to-use and reliable storage solution for file backup, EonStor GS U.2 NVMe storage can be utilized as a backup appliance, allowing you to leverage its backup server function to back up data from PC, file servers, and public cloud through a GUI interface. Additionally, you can set options such as a backup schedule and a retention period to best fit your needs.

## New Level of High Availability

From power supplies, cooling fans, controllers, to host boards, the modular design of all these hardware components lowers maintenance complexity and provides fast, precise technical support and RMA services, keeping EonStor GS U.2 NVMe storage safe from any downtime to maintain nonstop services, increase productivity, and enhance competitiveness.

In addition, EonStor GS U.2 NVMe storage offers HA service to deliver continuous availability with a near-zero RTO (recovery time objective) and a zero RPO (recovery point objective). With two storage devices deployed at near sites, the HA service provides block-level active-active storage and file-level active-passive storage for business-critical applications that have an extremely low tolerance for downtime. Featuring synchronous remote replication and auto-failover, this solution ensures identical and complete copies of data are stored on both storage devices and avoids service downtime due to planned or unexpected events. Auto-failback is available in block-level HA service, allowing a storage device to resume services without switching manually.

## Intuitive Management Software

GS U.2 NVMe storage adopts EonOne, a web-based management software tool, to assist customers in raising storage and service efficiency     for increased productivity. With its intuitive interface design, IT administrators can easily manage a cluster and multiple appliances, monitor performance and capacity usage, and complete system configurations, all from one centralized interface.

# PHYSICAL SPECIFICATIONS

| Product Series | | | GS 2000U | GS 3000U | GS 3000UT | GS 4000U | GS 5000U |
|---|---|---|---|---|---|---|---|
| Form Factor | 2U 24-bay | | GS 2024**UR** | GS 3024**UR** | GS 3024**URT** | GS 4024**UR** | GS 5024**URE** |
| | 4U 48-bay | | - | - | GS 3048**URT** | GS 4048**UR** | - |
| | **Note: U**: NVMe storage **R**: Dual redundant controllers **T**: High performance | | | | | | |
| Controller | | | Dual redundant | | | | |
| Cache Backup Technology | | | Super capacitor + flash module | | | | |
| CPU | | | Intel® Xeon® D 2-Core | Intel® Xeon® D 4-Core | Intel® Xeon® D 4-Core | Intel® Xeon® D 6-Core | Intel® Xeon® Scalable 12-Core |
| Cache Memory | | | Default DDR4 16GB, up to 128GB | | Default DDR4 48GB, up to 384GB | | Default DDR5 128GB, up to 1024GB |
| Supported Drives | | | 2.5" U.2 NVMe SSD (must be purchased from STORANDER) | | | | |
| | | | **Note:** For the latest compatibility details, refer to our official website for the latest Compatibility Guide. | | | | |
| Max. Drive Number | Via Expansion Enclosures, per Appliance | | 896 | 896 | 896 | 896 | 896 |
| | Via Scale-out with Other Series of Appliances, per Cluster | | 3584 | 3584 | 3584 | 3584 | 3584 |
| Max. SSD Cache Pool (Block Level) | | | 4TB | | | | |
| Onboard 10GbE Ports (SFP+) | | | 0 | 4 | 0 | 0 | 0 |
| Onboard 25GbE Ports (SFP28) | | | 0 | 0 | 4 | 0 | 0 |
| Max. Host Board Slots | | | 4 | 4 | 4 | 4 | 6 |
| Host Board Options | | | • 16Gb/s FC x 4<br>• 32Gb/s FC x 2<br>• 32Gb/s FC x 4<br>• 10GbE (SFP+) x 2<br>• 25GbE (SFP28) x 2<br>• 25GbE (SFP28) x 4<br>• 12Gb/s SAS x 2 | | • 16Gb/s FC x 4<br>• 32Gb/s FC x 2<br>• 32Gb/s FC x 4<br>• 10GbE (SFP+) x 2<br>• 25GbE (SFP28) x 2<br>• 25GbE (SFP28) x 4<br>• 100GbE (QSFP28) x 1, RDMA<br>• 100GbE (QSFP28) x 2, RDMA<br>• 12Gb/s SAS x 2 | | • 32Gb/s FC x 4<br>• 25GbE (SFP28) x 2<br>• 25GbE (SFP28) x 4<br>• 100GbE (QSFP28) x 1, RDMA<br>• 100GbE (QSFP28) x 2, RDMA<br>• 12Gb/s SAS x 2 |
| | | | **Note:** 1. One 100GbE x 2 host board delivers a maximum throughput of 100Gb/s.<br>2. It is strongly recommended that you refer to the latest Host Board and Memory Guide on our website for complete information, including supported combinations and important notes, before purchasing any host board for your model. | | | | |
| Max. 16Gb/s FC Ports | | | 16 | 16 | 16 | 16 | 0 |
| Max. 32Gb/s FC Ports | | | 16 | 16 | 16 | 16 | 24 |
| Max. 10GbE Ports (SFP+) | | | 8 | 8 | 8 | 8 | 0 |
| Max. 25GbE Ports (SFP28) | | | 16 | 16 | 16 | 16 | 24 |
| Max. 100GbE Ports (QSFP28) | | | 0 | 0 | 8 | 8 | 12 |
| Max. 12Gb/s SAS Ports | | | 8 | 8 | 8 | 8 | 12 |
| Expansion Enclosures (JBODs) | | | JB 3012A, JB 3016A, JB 3024BA, JB 3025BA, JB 3060L, JB 3090 | | | | |
| Dimensions (Without Chassis Ears and Protrusions) (W x H x D) | | | 449 x 88 x 500 mm | | • 2U 24-bay: 449 x 88 x 530 mm<br>• 4U 48-bay: 449 x 176 x 530 mm | | 449 x 88 x 830 mm |
| Package Dimensions (W x H x D) | | | • 2U 24-bay: 588 x 338 x 780 mm<br>• 4U 48-bay: 588 x 423 x 780 mm | | | | 594 x 235 x 1106 mm |
| Power Supply Unit | Power Supplies (Redundant and Hot-swappable) | Global | • 2U 24-bay: 530W x 2 (80 PLUS Bronze)<br>• 4U 48-bay: 1300W x 2 (80 PLUS Titanium) | | | | 1600W x 2 (80 PLUS Titanium) |
| | | EU | • 2U 24-bay: 800W x 2 (80 PLUS Titanium)<br>• 4U 48-bay: 1300W x 2 (80 PLUS Titanium) | | | | |
| | AC Voltage | Global | • 2U 24-bay: 100-240VAC @10-5A<br>• 4U 48-bay: 100-127VAC @12A, 200-240VAC @8.5A | | | | 100-127VAC @12A, 200-240VAC @10A |
| | | EU | • 2U 24-bay: 100-127VAC @10A, 200-240VAC @5A<br>• 4U 48-bay: 100-127VAC @12A, 200-240VAC @8.5A | | | | |
| | Frequency | | 50-60 Hz | | | | |
| Safety Standards | | | • Electromagnetic compatibility: CE, BSMI, FCC    • Safety: UL, BSMI, CB | | | | |

# SOFTWARE SPECIFICATIONS

| | | |
|---|---|---|
| Max. Logical Drive Number | 30 | |
| Max. Logical Drive Capacity | 512TB | |
| Stripe Size | 16KB, 32KB, 64KB, 128KB, 256KB, 512KB, 1024KB (per logical drive) | |
| Write Policy | Write-back or write-through (per logical drive) | |
| Max. Pool Size | 2PB | |
| Max. Pool Number | 30 | |
| Max. Volume Size | 2PB | |
| Max. Volume Number | 1024 | |
| Max. Host LUN Mapping Number | 4096 | |
| Max. Reserved Tag Number | 256 (per Host-LUN connection) | |
| Max. iSCSI Initiators | 832 | |
| Max. Host Connection Number | 128 (per FC) | |
| RAID Options | RAID 0, RAID 1, RAID 3, RAID 5/5F, RAID 6/6F, RAID 10, RAID 30, RAID 50, RAID 60 | |
| Supported Protocols | File Level | CIFS/SMB (version 2.0/3.0), NFS (version 2/3/4), AFP (version 3.1.12), FTP/FXP (vsftp 2.3.4), WebDAV (httpd package 2.4.6) |
| | Block Level | FC, FCoE, iSCSI, SAS, NVMe-oF (12 cores controllers), NVMe-oTCP (12 cores controllers), NVMe-oFC (12 cores controllers) |
| | Object Level | RESTful API |
| File Level | Max. File System Size | 2PB |
| | Max. Number of User Accounts | 20000 |
| | Max. Number of User Groups | 512 |
| | Max. Number of Shared Folders | 2048 (NFS/CIFS/FTP) \| 255 (AFP) |
| | Max. Number of Rsync Jobs | 1024 |
| | Max. Number of Concurrent Rsync Processes | 64 |
| | Max. Number of Connections | 2048 (NFS/CIFS/AFP) \| 1024 (FTP) |
| Management | • Web-based EonOne management software<br>• User account management<br>• Group management<br>• Folder management - folder access control<br>• Quota management<br>• Folder encryption with AES | • Integration with Microsoft Active Directory (AD) and Linux LDAP<br>• Storage Resource Management to analyze history of resource usage<br>• Multi-factor authentication login mechanism<br>• File-level QoS (network traffic control)<br>• SMI-S standard interface for hypervisor management applications |
| Availability and Reliability | • Immutable object storage<br>• Hot-swappable hardware modules<br>• Device mapper<br>• Antivirus<br>• Trunk group | • Cache safe technology<br>• UPS<br>• WORM (file level only)<br>• SMB Multichannel |
| Efficiency | • Inline compression | • Offline deduplication |
| Notification | • Email | • SNMP traps |
| Applications | • Anti-virus<br>• Backup Server<br>• Docker<br>• LDAP Server<br>• Mail Server<br>• Nextcloud | • Project Server<br>• Proxy Server<br>• Syslog Server<br>• VPN Server<br>• Web Server |
| Supported Cloud Services | EonCloud Gateway supports integration with the following cloud providers:<br>Amazon S3, Microsoft Azure, Alibaba Cloud, OpenStack, Baidu Cloud, Google Cloud, Tencent Cloud, Wasabi Cloud, etc. | |
| | **Note:** For complete information about supported cloud providers, please refer to EonCloud Gateway webpage https://www.infortrend.com/global/solutions/eoncloud | |
| Supported OS | Microsoft Windows Server, Red Hat Enterprise Linux, SUSE Linux Enterprise, Sun Solaris, MacOS X, VMware | |
| | **Note:** For supported OS versions, please refer to the Compatibility Guide. | |

# DATA SERVICES

| | | | |
|---|---|---|---|
| Thin Provisioning | Block Level | Default | "Just-in-time" capacity allocation optimizes storage utilization and eliminates allocated but unused storage space. |
| Local Replication | Snapshot — File Level | Optional | Snapshot images per folder: 1024 | |
| Local Replication | Snapshot — Block Level | Default | Snapshot images per source volume: 64 | Snapshot images per system: 128 |
| Local Replication | Snapshot — Block Level | Optional | Snapshot images per source volume: 256 | Snapshot images per system: 4096 |
| Local Replication | Volume Copy/Mirror | Default | Replication pairs per source volume: 4 | Replication pairs per system: 16 |
| Local Replication | Volume Copy/Mirror | Optional | Replication pairs per source volume: 8 | Replication pairs per system: 256 |

| | | | |
|---|---|---|---|
| Remote Replication | File Level | Default | Support Rsync with 128-bit SSH encryption |
| Remote Replication | Block Level | Optional | Replication pairs per source volume: 8     Replication pairs per system: 64 |
| Remote Replication | Block Level | Optional | **Note:** The maximum number of replication pairs per source volume is 8, whether they are remote asynchronous pairs, remote synchronous pairs, or local volume pairs |

| | | | |
|---|---|---|---|
| Automated Storage Tiering | | Optional | Storage tiers per pool: 4 |

| | | | |
|---|---|---|---|
| Scale-out | File Level | Default | Appliances per cluster: 1 |
| Scale-out | File Level | Optional | Appliances per cluster: 4 |
| Scale-out | Block Level | Default | Appliances per cluster: 4 |

| | | | |
|---|---|---|---|
| HA Service | File Level / Block Level | Optional | Delivering continuous availability and eliminating downtime for mission-critical workloads that require non-stop operations |
| HA Service | File Level / Block Level | Optional | **Note:** HA Service is not available on GS 2000**U**. |

| | | | |
|---|---|---|---|
| SSD Cache | File Level | Optional | Accelerating file operations and data access performance for both read and write<br>Max. SSD number: 8 |
| SSD Cache | Block Level | Optional | Accelerating data access in random read-intensive environments (e.g. OLTP)<br>Max. SSD number: 4 |
| SSD Cache | Block Level | Optional | Recommended DIMM capacity per controller for SSD Cache pool |
| SSD Cache | Block Level | Optional | DRAM : 8GB     Max SSD cache pool size : 0.5TB |
| SSD Cache | Block Level | Optional | DRAM : 16GB     Max SSD cache pool size : 1TB |
| SSD Cache | Block Level | Optional | DRAM : 32GB     Max SSD cache pool size : 2TB |
| SSD Cache | Block Level | Optional | DRAM : 64GB and up     Max SSD cache pool size : 4TB |

# WARRANTY AND SERVICE

| | | |
|---|---|---|
| Service and Support | Standard Service | 3-year limited hardware warranty and 8 x 5 phone, web, and email support |
| Service and Support | Upgrade or Extension Options | Warranty extension: Can extended standard service up to 5 years<br>The following Service can be upgraded to 5 years<br>• Upgrade: Replacement part dispatch on the next business day<br>• Advanced service: phone, web, and email support + onsite diagnostics on the next business day<br>• Premium service: under the request on particular installation |
| Service and Support | Upgrade or Extension Options | **Note:** Options may vary by region. For more details, please contact our sales representatives. |
| Service and Support | Technical Support | Get information on system installation and maintenance, download technical documents and software, or issue a support ticket |
| Service and Support | Product Services | Register products, download firmware, apply for licensing services, create product repair tickets, or check product repair status |

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