# Infortrend®

# EonStor GS SAS HDD Storage
## Scale-out High Availability
## Unified Storage for Enterprises

## Highlights

### High Performance and Scalability

- Massive sequential throughput of up to 16GB/s read and 12GB/s write per appliance
- Scale-out and scale-up expansions, providing more than 70PB in a single GS cluster

### Easy to Use and Manage

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

### High-Density Design

- Reduce hardware footprint with 4U 40/60/90-bay models

### Lower Total Cost of Ownership

- Save budgets by using only a few SAS/U.2 NVMe SSDs for cache to reach near all-flash system performance, in both SAN and NAS environments

### 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 SAS HDD storage series is a unified storage solution for enterprises of all sizes in various applications. Supporting hybrid environments that integrate SAN, NAS, and cloud services, this series includes a wide range of models ready to meet different needs, from performance-hungry applications, general enterprise workloads, to storage solutions requiring a high-density hardware design. With its high performance, flexibility, and scalability, EonStor GS can help organizations boost overall productivity and efficiency.*

### High Performance

EonStor GS provides high throughput to handle large amounts of I/O and file transfers, even under heavy workloads. The G3 models, which feature high-speed transmission interfaces and protocols, deliver up to 16GB/s read and 12GB/s write in throughput on a single appliance.

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

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

Through scale-up expansion, each GS unit can be connected to JBOD expansion enclosures to add up to 896 drives. Together with scale-out expansion, GS supports more than 3000 drives with over 70PB storage capacity.

### Easy Data Access 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.

## High-Density Design

Enterprises with limited rack space can still get a powerful and high capacity storage solution. Leveraging the high-density 4U 40, 60, or 90-bay models, you can easily achieve your workload requirements with a reduced hardware footprint.

## Storage Efficiency with Better TCO

EonStor GS supports SSD cache, which leverages the high speed and low latency of SSDs to deliver faster performance for frequently accessed data. By using only a few SSDs on an HDD-based appliance, SSD cache can help meet enterprises' requirements for both high I/O loads and large storage capacity at a reduced total cost of ownership (TCO). This feature brings advantages to read-intensive SAN environments, such as online transaction processing (OLTP) and email service (e.g. Microsoft Exchange). It also enhances read and write performance for NAS and improves user experience with file operation when a large number of files are stored on a GS unit.

In addition, EonStor GS comes with inline compression and offline deduplication, which reduces the storage capacity required and thus saves further storage costs. The inline compression feature compresses raw files in real-time, which 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.

## Complete Data Protection and Backup

EonStor GS 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 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, to controllers, the EonStor GS appliance is built in a modular, redundant, and hot-swappable hardware design, which reduces maintenance complexity and ensures uninterrupted services, whether during a regular system upgrade or even in an unplanned maintenance event due to a component failure.

In addition, EonStor GS 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

EonStor GS 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 1000 Gen2 | GS 2000 | GS 3000 G3 | GS 4000 G3 |
|---|---|---|---|---|---|
| Form Factor | 2U 12-bay | GS 1012**R2C/S2C** | GS 2012**R/S**<br>GS 2012**RT/ST** | GS 3012**R3/S3** | GS 4012**R3/S3** |
| | 3U 16-bay | GS 1016**R2C/S2C** | GS 2016**R/S**<br>GS 2016**RT/ST** | GS 3016**R3/S3** | GS 4016**R3/S3** |
| | 4U 24-bay | GS 1024**R2C/S2C** | GS 2024**R/S**<br>GS 2024**RT/ST** | GS 3024**R3/S3** | GS 4024**R3/S3** |
| | 4U 40-bay | - | - | GS 3040**RT3/ST3**<br>GS 3040**RT3C/ST3C** | GS 4040**R3/S3**<br>GS 4040**R3C/S3C** |
| | 4U 60-bay | - | - | GS 3060**RT3/ST3**<br>GS 3060**RT3C/ST3C** | GS 4060**R3/S3**<br>GS 4060**R3C/S3C** |
| | 4U 90-bay | - | - | GS 3090**RT3/ST3**<br>GS 3090**RT3C/ST3C** | GS 4090**R3/S3**<br>GS 4090**R3C/S3C** |
| | **Note: R**: Dual redundant controllers    **S**: Single upgradable to dual redundant controllers    **2**: Gen2    **3**: G3    **T**: High performance    **C**: Super capacitor (GS 1000 Gen2, GS2000)    **C**: U.2 SSD cache (GS 3000/4000 G3) | | | | |
| Controller | | Dual redundant or single upgradable to dual redundant | | | |
| Cache Backup Technology | | Super capacitor + flash module | | | |
| CPU | | Intel® Atom® 4-Core | Intel® Pentium® 2-Core<br>Intel® Pentium® 4-Core<br>(for T models) | Intel® Xeon® D 4-Core | Intel® Xeon® D 6-Core |
| Cache Memory | Single Controller | Default DDR3 8GB,<br>up to 16GB | Default DDR4 8GB,<br>up to 64GB | • 2U 12-bay/3U 16-bay/4U 24-bay:<br>  Default DDR4 8GB, up to 192GB<br>• 4U 40-bay/4U 60-bay: Default DDR4 12GB, up to 192GB<br>• 4U 90-bay: Default DDR4 16GB, up to 192GB | |
| | Redundant Controllers | Default DDR3 16GB,<br>up to 32GB | Default DDR4 16GB,<br>up to 128GB | • 2U 12-bay/3U 16-bay/4U 24-bay:<br>  Default DDR4 16GB, up to 384GB<br>• 4U 40-bay/4U 60-bay: Default DDR4 24GB, up to 384GB<br>• 4U 90-bay: Default DDR4 32GB, up to 384GB | |
| Supported Drives | | • 2.5" SAS SSD<br>• 2.5" 12Gb/s SAS 10,000 RPM HDD<br>• 3.5" 12Gb/s NL-SAS 7,200 RPM HDD<br>• 2.5" SATA SSD, 3.5" 6Gb/s SATA 7,200 RPM HDD (for single-controller models only)<br>• 2.5" U.2 NVMe SSD (for U.2 SSD cache models; must be purchased from Infortrend) | | | |
| | | **Note:** For the latest compatibility details, refer to our official website for the latest Compatibility Guide. | | | |
| Max. Drive Number | Via Expansion Enclosures, per Appliance | 448 | 896 | 896 | 896 |
| | Via Scale-out with Other Series of Appliances, per Cluster | 3136 | 3584 | 3584 | 3584 |
| Max. SSD Cache Pool (Block Level) | | 1TB | 3.2TB | 4TB | 4TB |
| Onboard 1GbE Ports (RJ45) | | 8 | 8 | 0 | 0 |
| Onboard 25GbE Ports (SFP28) | | 0 | 0 | 4 | 0 |
| Onboard SAS Expansion Ports | | 2 | 2 | 4 | 4 |
| Max. Host Board Slots | | 2 | 4 | 4 | 4 |
| Host Board Options | | • 16Gb/s FC x 4<br>• 32Gb/s FC x 2<br>• 1GbE (RJ45) x 4<br>• 10GbE (SFP+) x 2<br>• 12Gb/s SAS x 2 | • 16Gb/s FC x 4<br>• 32Gb/s FC x 2<br>• 32Gb/s FC x 4<br>• 1GbE (RJ45) x 4<br>• 10GbE (SFP+) x 2<br>• 25GbE (SFP28) x 2<br>• 12Gb/s SAS x 2 | • 16Gb/s FC x 4   • 32Gb/s FC x 2<br>• 10GbE (SFP+) x 2   • 25GbE (SFP28) x 2<br>• 12Gb/s SAS x 2<br>• 100GbE (QSFP28) x 1, RDMA<br>  (for 40-bay/60-bay/90-bay models only)<br>• 100GbE (QSFP28) x 2, RDMA<br>  (for 40-bay/60-bay/90-bay models only) | • 32Gb/s FC x 2<br>• 25GbE (SFP28) x 4 |
| | | **Note:** 1. One 100GbE x 2 host board delivers a maximum throughput of 100Gb/s.<br>    2. At least 24GB memory is required per controller to use 100GbE RDMA.<br>    3. It is strongly recommended that you refer to the latest Host Board and Memory Guide on our website for complete<br>       information, including supported combinations and important notes, before purchasing any host board for your model. | | | |
| Max. 16Gb/s FC Ports | | 8 | 16 | 16 | 16 |
| Max. 32Gb/s FC Ports | | 4 | 16 | 16 | 16 |
| Max. 1GbE Ports (RJ45) | | 8 | 16 | 0 | 0 |
| Max. 10GbE Ports (SFP+) | | 4 | 8 | 8 | 8 |
| Max. 25GbE Ports (SFP28) | | 0 | 8 | 16 | 16 |
| Max. 12Gb/s SAS Ports | | 4 | 8 | 8 | 8 |
| Expansion Enclosures (JBODs) | | JB 3012A, JB 3016A, JB 3024BA,<br>JB 3025BA, JB 3060L, JB 3090 | | JB 3012A, JB 3016A, JB 3060L, JB 3090 | |
| Dimensions (Without Chassis Ears and Protrusions) (W x H x D) | | • 2U 12-bay: 449 x 88 x 500 mm<br>• 3U 16-bay: 449 x 130 x 500 mm<br>• 4U 24-bay: 449 x 174.4 x 500 mm | | • 2U 12-bay: 449 x 88 x 509.8 mm<br>• 3U 16-bay: 449 x 130 x 509.8 mm<br>• 4U 24-bay: 449 x 174.6 x 509.8 mm<br>• 4U 40-bay: 443.2 x 176 x 735.8 mm<br>• 4U 60-bay: 443.2 x 176 x 849.8 mm<br>• 4U 90-bay: 435 x 176 x 1088.8 mm | |
| Package Dimensions (W x H x D) | | • 2U 12-bay: 780 x 379 x 588 mm    • 3U 16-bay: 780 x 423 x 588 mm    • 4U 24-bay: 780 x 465 x 588 mm<br>• 4U 40-bay: 625 x 460 x 1032 mm    • 4U 60-bay: 620 x 460 x 1140 mm    • 4U 90-bay: 620 x 500 x 1400 mm | | | |
| Power Supply Unit | Power Supplies (Redundant and Hot-swappable) — Global | 460W x 2 (80 PLUS Bronze) | | • 2U 12-bay/3U 16-bay/4U 24-bay: 530W x 2 (80 PLUS Bronze)<br>• 4U 40-bay/4U 60-bay: 1200W x 2 (80 PLUS Platinum)<br>• 4U 90-bay: 1600W x 2 (80 PLUS Titanium) | |
| | Power Supplies — EU | • 2U 12-bay/3U 16-bay/4U 24-bay: 800W x 2 (80 PLUS Titanium)<br>• 4U 40-bay/4U 60-bay: 1300W x 2 (80 PLUS Platinum) | | • 4U 90-bay: 1600W x 2 (80 PLUS Titanium) | |
| | AC Voltage — Global | • 2U 12-bay/3U 16-bay/4U 24-bay: 100-240VAC @10-5A<br>• 4U 40-bay/4U 60-bay: 100-127VAC @10A, 200-240VAC @8A | | • 4U 90-bay: 100-127VAC @12A, 200-240VAC @10A | |
| | AC Voltage — EU | • 2U 12-bay/3U 16-bay/4U 24-bay: 100-127VAC @10A, 200-240VAC @5A<br>• 4U 40-bay/4U 60-bay: 100-127VAC @10A, 200-240VAC @8.5A | | • 4U 90-bay: 100-127VAC @12A, 200-240VAC @10A | |
| | 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 | 416 (per controller) | |
| 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, iSCSI, SAS |
| | 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<br>• 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<br>• 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<br>• 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.<br>**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, Citrix XenServer, OpenStack Cinder<br>**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 | |
|---|---|---|---|---|---|
| | | Block Level | Default | Snapshot images per source volume: 64 | Snapshot images per system: 128 |
| | | | Optional | Snapshot images per source volume: 256 | Snapshot images per system: 4096 |
| | Volume Copy/Mirror | | Default | Replication pairs per source volume: 4 | Replication pairs per system: 16 |
| | | | Optional | Replication pairs per source volume: 8 | Replication pairs per system: 256 |

| Remote Replication | File Level | Default | Support Rsync with 128-bit SSH encryption | |
|---|---|---|---|---|
| | Block Level | Optional | Replication pairs per source volume: 8 | Replication pairs per system: 64 |
| | | | **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 |
|---|---|---|---|
| | | Optional | Appliances per cluster: 4 |
| | Block Level | Default | Appliances per cluster: 4 |

| HA Service | File Level | Optional | Delivering continuous availability and eliminating downtime for mission-critical workloads that require non-stop operations |
|---|---|---|---|
| | Block Level | | **Note:** HA service is available on GS 3000/4000 G3 only. |

| SSD Cache | File Level | Optional | Accelerating file operations and data access performance for both read and write<br>Max. SSD number: 8 |
|---|---|---|---|
| | Block Level | Optional | Accelerating data access in random read-intensive environments (e.g. OLTP)<br>Max. SSD number: 4 |
| | | | Recommended DIMM capacity per controller for SSD Cache pool for GS 1000 Gen2、GS 2000 |
| | | | DRAM : 8GB — Max SSD cache pool size : 0.4TB |
| | | | DRAM : 16GB — Max SSD cache pool size : 0.6TB |
| | | | DRAM : 32GB — Max SSD cache pool size : 1TB |
| | | | DRAM : 64GB — Max SSD cache pool size : 1.6TB |
| | | | DRAM : 128GB and up — Max SSD cache pool size : 3.2TB |
| | | | Recommended DIMM capacity per controller for SSD Cache pool for GS 3000/4000 G3 |
| | | | DRAM : 8GB — Max SSD cache pool size : 0.5TB |
| | | | DRAM : 12GB — Max SSD cache pool size : 0.75TB |
| | | | DRAM : 16GB — Max SSD cache pool size : 1TB |
| | | | DRAM : 24GB — Max SSD cache pool size : 1.5TB |
| | | | DRAM : 32GB — Max SSD cache pool size : 2TB |
| | | | DRAM : 48GB — Max SSD cache pool size : 3TB |
| | | | 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 (batteries are covered under warranty for 2 years) |
|---|---|---|
| | 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: phone, web, and email support + onsite diagnostics in 4 hours |
| | | **Note:** Options may vary by region. For more details, please contact our sales representatives. |
| | Technical Support | Get information on system installation and maintenance, download technical documents and software, or issue a support ticket |
| | Product Services | Register products, download firmware, apply for licensing services, create product repair tickets, or check product repair status |

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