BIWIN Storage Technology

Enterprise
Storage Solutions



Global Headquarters:

BIWIN STORAGE TECHNOLOGY CO., LTD.

Email: sales@biwintech.com 2671

Address: Building #4, South Zone #2, Zhongguan Honghualing Industrial Zone, Nanshan District, Shenzhen 518055, Guangdong, China

America Headquarters:

BIWIN TECHNOLOGY LLC

Email: sales@biwintech.com

Address: 8725 NW 18th Terrace, Suite #400, Miami FL 33172, United States

Phone: 1-305-456-3288

Taiwan Office:

BIWIN SEMICONDUCTOR (HK) COMPANY LIMITED (TAIPEI OFFICE)

Email: sales@biwintech.com

Address: 3F, No. 162, Xinhu 2nd Rd., Neihu Dist., Taipei City 114065, Taiwan

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INFINITE STORAGE
UNLIMITED SOLUTIONS

BIWIN Storage Technology Co., Ltd. (SSE STAR Market 688525) produces high quality flash storage and is now known in embedded, consumer, corporate and industrial segments for its independent development capabilities in hardware, software, firmware, and storage algorithms.

BIWIN's experience in production (along with its complete packaging, testing, and production lines) ensures BIWIN products are superior in performance, earning BIWIN many awards and a reputation for providing global customers with high-quality storage products.

BIWIN recently opened its latest 110,000 m² facility, Greater Bay Advanced Technology Co., Ltd., with state-of-the-art R&D and production.

Our founders started in the flash storage business in Shenzhen, China in 1995, embracing the "WIN-WIN" business philosophy that would later become the hallmark for BIWIN. In 2009 they made a key decision for the business: to add IC encapsulation (or IC packaging) process into the factory. A remarkable milestone that the vast of majority of competing companies still don't have (they outsource the process or buy the packaged IC). This successful step led to the 2010 creation of the company we know today, BIWIN Storage Technology Company Limited.

BIWIN Advantages

Storage Algorithms & Firmware Development

Two expert R&D teams at BIWIN work on the latest firmware development. Each core team member has at least ten-year's experience in firmware development and a rich experience in the mass production of self-developed firmware.

Full-range Product Testing Capability

BIWIN continually develops memory chip testing algorithms and automation equipment. We lead the industries with our impressive test coverage and automation. Every product from us undergoes DVT and PVT.

Outstanding Customization, Fast Response

BIWIN's track record demonstrates our extraordinary customized R&D capabilities and our fast response to our customer's needs. With our experience, we can readily meet the embedded requirements for projects including wearables, smart devices, 5G, IoT, smart industry, smart city, and vehicle networks.

Advanced Packaging & Testing

With the leading multi-chip and SiP packaging technology, BIWIN can process wafers as thin as 25 μm, support the mass production of 16-layer die stacking, and achieve the smallest packages in the industry.



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Enterprise SATA SSD

SS811/821

Product Introduction

The BIWIN SS811/821 enterprise SATA SSDs, leveraging the SATA 3.2-6Gbps interface and external DDR cache, deliver sequential read and write speeds up to 530 MB/s and 500 MB/s, with 4K random read and write performance reaching 85K IOPS and 50K IOPS.

Available in both M.2 2280 and 2.5-inch form factors, the SS811/821 offers capacities including 240 GB, 480 GB, 960 GB, 1.92 TB, 3.84 TB, and 7.68 TB. These SSDs deliver dependable data throughput with a read-intensive 1DWPD endurance rating.

The SS811/821 supports multiple enterprise-grade advanced features, including Power Loss Protection (PLP), End-to-End Data Path Protection, Thermal Throttling, Dynamic and Static Wear Leveling, Power Dynamic Management, S.M.A.R.T., TRIM, Multiple Firmware Backups, Secure Boot, Secure Firmware Upgrade, Internal RAID, and Sanitize.

The BIWIN SS811/821 SSDs are built for high-performance computing environments such as data centers, AI, edge computing, cloud services, IoT, and machine learning. They offer broad application prospects across multiple industries, including internet, cloud computing, government, telecommunications, finance, and large-scale intelligent computing centers.

Product Highlights

- Supports SATA Revision 3.2- ATA/ATAPI Command Set-4
- NCQ/TRIM/S.M.A.R.T. Health Log, Elog, and Sanitize
- Supports Internal RAID, Power Loss Protection (PLP), Hot Swap, and End-to-End Data Path Protection
- Thermal Throttling, Power Management, OCP, OVP, and Anti-sulfidation Design
- Supports Secure Boot, Firmware Secure Update, Firmware Update Without Reset, and ATA Security

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Specifications

Model Name	SS811/821							
Interface	SATA 3.2							
NAND Type	3D eTLC NAND							
Command Set	ATA/ATAPI Command Set-4							
Form Factor	M.2 2280			2.5-inch				
Capacity	240GB	480GB	960GB	480GB	960GB	1.92TB	3.84TB	7.68TB
128KB Sequential Read (MB/s)	550	550	550	560	560	560	560	560
128KB Sequential Write (MB/s)	410	520	520	520	520	520	520	520
4KB Random Read (Up to) (IOPS)	92K	92K	92K	92K	92K	92K	92K	92K
4KB Random Write (Up to) (IOPS)	15K	40K	50K	40K	50K	50K	50K	50K
4KB Random Read Latency (μs)	115	115	115	110	110	110	110	110
4KB Random Write Latency (μs)	55	45	45	40	40	40	40	40
4KB Random Read IOPS Consistency	95%	95%	95%	98%	98%	98%	98%	98%
4KB Random Write IOPS Consistency	95%	95%	95%	99%	99%	99%	99%	99%
Read/Write Power Consumption (W)	1.9/2.6	1.9/2.8	1.9/2.8	1.9/2.5	1.9/2.5	2.0/2.6	2.1/2.7	2.3/3.0
Drive Writes Per Day (DWPD)	1							
Warranty	5-Year Limited							
Uncorrectable Bit Error Rate (UBER)	1 sector in 10^{17} bits read, max							
Mean Time Between Failures (MTBF)	2,500,000 hours							
Operating Temperature	0°C to +70°C							
Storage Temperature	-40°C to +85°C							

Enterprise SATA SSD

SS831

Product Overview

The BIWIN SS831 Enterprise 2.5" SATA SSD is designed for read-intensive and light mixed-write workloads, combining 1 DWPD endurance with consistent I/O performance, enterprise-grade reliability, and power-efficient operation. Built on the SATA 3.2, a 6 Gbps interface with enterprise-grade eTLC NAND and an external DDR cache, the SS831 provides a balanced storage solution for enterprise environments where predictable performance, data integrity, and operational efficiency are critical.

Available in capacities from 480 GB to 3.84 TB, the SS831 integrates comprehensive data protection, security, power management, and firmware capabilities to support reliable operation and efficient deployment across enterprise storage infrastructure.

Product Features

- Optimized for Read-Intensive Workloads
- Consistent and Reliable I/O Performance
- Enterprise-Grade Endurance and Data Protection
- Power-Efficient with Enterprise Security

BIWIN STORAGE TECHNOLOGY



Specifications

Model Name	SS831			
Interface	SATA 3.2			
Form Factor	2.5"			
Flash Type	eTLC			
Capacity	480 GB	960 GB	1.92 TB	3.84 TB
Sequential Read (Up to)	560 MB/s	560 MB/s	560 MB/s	560 MB/s
Sequential Write (Up to)	310 MB/s	520 MB/s	520 MB/s	520 MB/s
4K Random Read (Up to)	87K IOPS	88K IOPS	91K IOPS	92K IOPS
4K Random Write (Up to)	17K IOPS	28K IOPS	32K IOPS	38K IOPS
4K Random Read/Write Latency	120μs /40 μs			
4K Random Read/Write IOPS Consistency	95%			
Read Power Consumption (Max.)	1.9 W	1.9 W	2.0 W	2.1 W
Write Power Consumption (Max.)	2.5 W	2.5 W	2.6 W	2.7 W
Operating Temperature	0°C to +70°C			
Storage Temperature	-40°C to +85°C			
UBER	≤ 1 sector per10^{17} bits read			
MTBF	> 2,500,000 hours			
DWPD	1 DWPD			
Certifications	CE, FCC, RoHS, REACH, WEEE, HF, China RoHS			
Warranty	5-Year Limited			

Enterprise PCIe SSD

Gen5x4 SP506/516

Product Overview

The BIWIN SP506/SP516 series enterprise SSDs utilize the PCIe Gen5x4 interface, delivering twice the bandwidth of Gen4 solutions. Available in U.2, E1.S, and E3.S form factors, these SSDs are designed for diverse hardware platforms, including EDSFF servers, traditional servers, and workstations. Built on an innovative SSD controller architecture, the SP506/SP516 series achieves ultra-low, consistent read/write latency and exceptional power efficiency, achieving industry-leading KIOPS/Watt performance.

The SP506/516 series supports NVMe 2.0 and NVMe-MI 1.2, offering configurations for diverse workload requirements. It is available in 1 DWPD read-intensive and 3 DWPD mixed-use models, with capacities ranging from 2 TB to 16 TB. Tailored for the evolving demands of modern data centers, this series integrates advanced features such as AES-256 encryption, Sanitizing, Data-Path E2E Protection, Internal RAID, Secure Boot, and TCG Opal 2.0. BIWIN SP506/SP516 SSDs are well-suited for hyperscale data centers, cloud computing, compute-intensive servers, AI servers, and more.

Product Features

- OCP 2.0, TCG Opal 2.0, NVMe-MI 1.2
- Multiple Namespaces, Multiple Sector Sizes
- Atomic Write, Internal RAID, PLP (Power Loss Protection), Data-Path E2E Protection
- Thermal Throttling, Power Management, S.M.A.R.T. (Self-Monitoring, Analysis, and Reporting Technology), Health Log, Telemetry Log
- Secure Boot, AES (Advanced Encryption Standard), TCG (Trusted Computing Group)

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Specifications

Model Name	SP506/516					
Form Factor	U.2					
Protocol Standards	NVMe 2.0 & OCP 2.0 & NVMe-MI 1.2					
Interface	PCIe 5.0 x 4					
NAND Type	eTLC NAND					
Capacity	1.6 TB	3.2 TB	6.4 TB	1.92 TB	3.84 TB	7.68 TB
128KB Sequential Read (MB/s)	13600	13600	13600	13600	13600	13600
128KB Sequential Write (MB/s)	3400	7100	10500	3400	7100	10500
4KB Random Read (Up to) (IOPS)	2100K	3200K	3200K	2100K	3200K	3200K
4KB Random Write (Up to) (IOPS)	360K	730K	910K	185K	380K	500K
Random Read/Write QoS (99.9%, QD1, µs)	85/13	85/13	85/13	85/13	85/13	85/13
4KB Random Read Latency (µs)	67	67	67	67	67	67
4KB Random Write Latency (µs)	9	9	9	9	9	9
Power Consumption (W)	14.5/12.5	19/18	21/23	14.5/12.5	19/18	21/23
DWPD (Drive Writes Per Day)	3			1		
Warranty	5-Year Limited					
UBER (Uncorrectable Bit Error Rate)	1 sector per 10^{17} bits read					
MTBF (Mean Time Between Failures)	2,500,000 hours					
Operating Temperature	0°C to +70°C					
Storage Temperature	-40°C to +85°C					
Mechanical Environment	Vibration: 1.80 Grms @ 5-500 Hz (Operating); 3.13 Grms @ 5-800 Hz (Non-Operating) Shock: 1500G/0.5 ms					

Enterprise PCIe SSD

SP509/519



Specifications

Parameter	Options
Interface	PCIe 5.0 x4, NVMe 2.0, NVMe MI1.2
Form Factor	2.5" U.2
Flash Type	3D eTLC
Capacity	3.2 TB / 3.84 TB / 6.4 TB / 7.68 TB / 12.8 TB / 15.36 TB
Sequential Read (Up to)	14,700 MB/s
Sequential Write (Up to)	9000MB/s
Random Read 4K (Up to)	3,200K IOPS
Random Write 4K (Up to)	800K IOPS
4K Read/Write Latency	55 µs / 7 µs
99.99% Read/Write Latency	75us / 8us
Operating Power Consumption (Max.)	< 25 W
Idle Power Consumption (Max.)	5 W
Operating Temperature	0°C to +70°C
Storage Temperature	-40°C to +85°C
UBER	1 sector per 10^{18} bits read
MTBF	2,500,000 hours
DWPD	3.2 TB / 6.4 TB / 12.8 TB ≥ 3 DWPD 3.84 TB / 7.68 TB / 15.36 TB ≥ 1 DWPD
Certifications	CE, FCC, RoHS, REACH, WEEE, HF, China RoHS
Warranty	5-Year Limited

Enterprise PCIe SSD

SP50Y/51Y



Specifications

Parameter	Options					
Form Factor	2.5"U.2					
Interface	PCIe 5.0 x 4					
NAND Type	3D eTLC NAND					
Protocol	NVMe 2.0 & NVMe-MI 1.2					
Capacity	3.2 TB	6.4 TB	12.8 TB	3.84 TB	7.68 TB	15.36 TB
128KB Sequential Read (MB/s)	14000	14000	12000	14000	14000	12000
128KB Sequential Write (MB/s)	6000	11000	9000	6000	11000	9000
4KB Random Read (Up to) (IOPS)	3300K	3300K	3000K	3300K	3300K	3000K
4KB Random Write (Up to) (IOPS)	510K	1000K	900K	300K	500K	450K
Random Read/Write QoS (99.9%, QD1, µs)	70/6	70/6	70/6	70/6	70/6	70/6
4KB Random Read Latency (µs)	60	60	60	60	60	60
4KB Random Write Latency (µs)	5	5	5	5	5	5
Read/Write Power Consumption (W)	16/14	20/18	21/23	16/14	20/18	21/23
Drive Writes Per Day (DWPD)	3			1		
Warranty	5-Year Limited					
Uncorrectable Bit Error Rate (UBER)	1 sector in 10^{17} bits read, max					
Mean Time Between Failures (MTBF)	2,500,000 hours					
Operating Temperature	0°C to +70°C					
Storage Temperature	-40°C to+ 85°C					

DDR5 RDIMM



Product Introduction

BIWIN DDR5 RDIMM is a high-performance, highly reliable memory module designed for modern data centers, artificial intelligence, high-performance computing, and enterprise-grade server platforms. Adhering to JEDEC standards and incorporating the latest DDR5 technologies, it delivers robust data processing capabilities and exceptional operational stability for mission-critical applications.

Specifications

Parameter	Options
DIMM Organization	x80 ECC (EC8)
DIMM Dimensions (Nominal)	133.35 mm x 31.25 mm
Pin Count	288
DDR5 SDRAM Densities Supported	16 Gb, 24 Gb, 32 Gb
Capacity	64 GB, 96 GB, 128 GB
DDR5 SDRAM Width	x4
Data Transfer Rate	PC5-4800 to PC5-5600
Serial Presence Detect Hub with Temperature Sensor	1024 byte
Voltage (External Supply, Nominal)	VIN_Bulk: 12V VIN_MGMT: 3.3V
Voltage (PMIC Output)	V_{DD}: 1.1V V_{DDQ}: 1.1V V_{PP}: 1.8V 1.8V LDO output 1.0V LDO output
DDR5 Interface	1.1V signaling
DRAM Operating Temperature	TOPER = 0 to 95°C

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Core Features

Features	Key Parameters and Advantages
Enhanced Performance	1. DDR5-4800/DDR5-5600 high-frequency specifications with transfer rates up to 5600 MT/s. 2. Large capacity up to 128 GB. 3. The dual independent I/O subchannel design provides a 75% bandwidth improvement over DDR4. 4. Low latency: DDR5-4800 (0.416ns @ CL=40), DDR5-5600 (0.357ns @ CL=46).
Reliable Protection	1. Integrated ECC error detection and correction to help improve data transmission accuracy. 2. Multiple temperature sensors + triple-layer temperature monitoring enable real-time thermal regulation for harsh environments. 3. Rigorous environmental validation: Complies with industry standards for vibration, shock, bending, and twisting tests.
Energy Efficiency and Compatibility	1. Integrated On-DIMM PMIC power management chip with ≤15W load power consumption and outstanding conversion efficiency. 2. 288-pin RDIMM standard interface supporting I3C Basic / I2C sideband access. 3. Wide compatibility with major server platforms and operating systems.
Environmental Protection and Durability	1. Utilizes halogen-free eco-friendly manufacturing processes, meeting green production standards. 2. Gold finger enhances oxidation resistance and extends product life.

CXL 2.0 Memory AIC (Add-In Card)



Product Introduction

With the explosive growth of AI applications, the “memory wall” has emerged as one of the primary factors limiting computing system performance. Built upon the physical and electrical interfaces of PCIe, CXL (Compute Express Link) enables expansion of memory capacity and bandwidth beyond direct-attached DIMM slots in servers. It supports memory pooling and sharing, meeting the computational demands of high-performance CPUs and GPUs.

BIWIN has successfully developed and launched a CXL memory AIC (Add-In Card) that complies with the CXL 2.0 specification. The BIWIN CXL Memory AIC adheres to the AIC interface specification and offers expandable memory capacity up to 2 TB. It features a PCIe 5.0 ×8 interface with a maximum tested bandwidth of 30 GB/s. This card connects directly to server motherboards that support CXL specifications and AIC slots, enabling significant expansion of memory capacity and bandwidth.

Core Strengths

1. Ultra-High Capacity: Handling Massive Computing Demands Efficiently

Offering multiple capacity options including 64 GB, 96 GB and 128 GB, it supports loading AI models with hundreds of billions of parameters, meeting the needs of large-scale model training and massive data caching scenarios.

2. Ultra-High Bandwidth: Breaking Through Data Transfer Bottlenecks

5600 MT/s high-speed transfer + dual independent subchannel architecture delivers a 75% bandwidth increase over DDR4, significantly reducing task processing times for high-performance computing and cloud computing.

3. Enhanced Reliability: Controlling Quality at the Source

100% genuine OEM components with full traceability to eliminate substandard parts; manufactured in our own facilities with multi-OEM compatibility to ensure stable supply; operating temperature: 0°C to +95°C, storage temperature: -55°C to +100°C, designed for demanding environments.

4. Wide Compatibility: Flexibly Adapts to Diverse Needs

Compatible with major server platforms and operating systems; Sideband access technology (I3C/I2C) enhances system management efficiency.

5. Low-Power Energy Efficiency: Compliant with Green Data Center Standards

The PMIC chip precisely controls power delivery, with load power consumption ≤15W, reducing long-term operational energy consumption. Halogen-free manufacturing reduces environmental impact, aligning with corporate ESG development requirements.

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Product Advantages

CXL 2.0

Leading support for the CXL 2.0 protocol specification while maintaining backward compatibility with CXL 1.1, supporting standard Type 3 devices. The physical layer is based on the PCIe 5.0 standard, supporting 8 lanes with a theoretical bandwidth of up to 32 GT/s per lane.

High-Capacity Memory Expansion

Supports dual DDR5 RDIMM slots, with each slot supporting up to 1 TB of memory. Dual slots can expand memory capacity to a maximum of 2 TB (depending on RDIMM capacity).

Supports High-Speed DDR5 Memory up to 5600 MT/s

Supports DDR5 high-speed memory RDIMM expansion, with data transfer rates reaching up to 5600 MT/s. Faster memory speeds and higher memory bandwidth enhance overall system performance.

Extensive Out-Of-Band Management Capabilities

This card supports multiple low-speed communication interfaces, including SMBUS, I3C, I2C, and SPI, allowing easy access to essential RDIMM memory information for improved management.

Specifications

Form Factor	CXL Memory AIC (Add-In Card)			
Interface	PCIe 5.0 x8, AIC			
CXL Protocol	CXL 2.0			
Controller	Montage			
Dimensions	203.20 x 111.15 x 1.57 mm			
Supported DIMM Type	DDR5 RDIMM			
Supported RDIMM Configuration	1Rx8	2Rx8	1Rx4	2Rx4
RDIMM Slot	2 Slots			
Channel	1 Channel			
Supported RDIMM Capacity	16 GB to 1 TB			
DDR Speed	5600 MT/s			
Latency	Node0 to Node2: 247 ns		Node1 to Node2: 391 ns	
Bandwidth	Node0 to Node2: 30.28 GB/s		Node1 to Node2: 19.56 GB/s	
Power Consumption	16.38 W			
Warranty	5-Year Limited			
Operating Temperature	0°C to +85°C			
Storage Temperature	-55°C to +100°C			

Application Scenarios

Artificial Intelligence(AI):
Large-scale model training and inference, image/speech recognition

High-Performance Computing(HPC):
Scientific Computing, Weather Forecasting, Industrial Simulation

Cloud Computing / Data Center:
Cloud servers, distributed storage, massive data processing

Edge Computing:
Industrial edge nodes, smart gateways, low-latency data processing







CXL Memory Module

SX5002/5012



Product Introduction

With the explosive growth of AI applications, the “memory wall” has emerged as one of the primary factors limiting the performance of computing systems. Built upon the physical and electrical interfaces of PCIe, CXL (Compute Express Link) enables expansion of memory capacity and bandwidth beyond direct-attached DIMM slots in servers. It supports memory pooling and sharing, meeting the computational demands of high-performance CPUs and GPUs.

The BIWIN SX5002/5012 CXL memory modules adhere to the CXL Type-3, featuring an E3.S 2T form factor design. These modules offer capacities up to 256 GB per module, enabling high-speed, low-latency access via PCIe Gen5 x8/CXL interconnect channels. As a core component for memory expansion and resource pooling, these modules maintain coherency with host memory, eliminating traditional memory channel bottlenecks. This enables flexible memory configurations for AI, big data, cloud computing, and database applications.

The BIWIN SX5002/5012 memory modules feature multiple CRC and ECC error correction, temperature monitoring, SMBUS out-of-band management, and Telemetry management functions, enabling seamless integration into server platforms and data centers. With high-reliability design and flexible scalability, BIWIN CXL modules empower servers with “on-demand scaling,” high memory utilization, and optimized total cost of ownership (TCO), making them essential infrastructure for next-generation computing nodes.

Product Highlights

- CXL 2.0, a next-generation solution reducing latency to approximately 220 ns, further approaching DIMM performance
- Capacity up to 256 GB, enabling higher DDR density compared to the previous generation
- Supports temperature monitoring/SMBUS out-of-band management/Telemetry
- Link-layer features, including Link CRC verification, link retrain, and data poisoning marking, to improve the integrity and stability of data transfer.
- Memory-layer features include standard ECC, automatic data scrubbing, DDR verification mechanisms, error logging, proactive memory scrubbing, and hardware/software repair technologies to enhance memory reliability and maintainability across multiple dimensions.

Product Advantages

CXL 2.0

Based on the CXL 2.0 protocol, with backward compatibility with CXL 1.1, supporting standard Type 3 devices. The physical layer adheres to the PCIe 5.0 standard, supporting 8 lanes with a theoretical bandwidth of up to 32 GT/s per lane.

Supports High-Speed DDR5 Memory up to 6400 MT/s

Supports DDR5 high-speed memory DIMM expansion with a maximum data transfer rate of 6400MT/s. Faster memory speeds and higher memory bandwidth enhance overall system performance.

High-Capacity Memory Expansion

Supports significant memory capacity expansion beyond traditional DIMM form factors, achieving up to 256 GB per module to meet memory-intensive workload demands.

Comprehensive RAS Management Features

Supports extensive CXL RAS (Reliability, Availability, and Serviceability) features, with protection mechanisms at both the link and memory layers. Link-layer features include CRC checks, link retrain, data poisoning detection, and virus protection to ensure data integrity and stability of data transfer. Memory-layer features encompass standard ECC, automatic data scrubbing, DDR verification mechanisms, error logging, proactive memory inspection, and hardware/software page technologies, enhancing memory reliability and serviceability across multiple dimensions.

Specifications

Form Factor	E3.S 2T	
Interface	PCIe 5.0 x8, E3.S	
CXL Protocol	CXL 2.0	
Controller	Montage	
Dimensions	E3.S 2T: 112.75 x 76.00 x 16.80 mm	
Rank Configuration	2Rx4	
Channel	1 Channel	
Capacity	96 GB / 128 GB / 256 GB	
DDR Speed	6400 MT/s	
Latency	Node0 to Node2: 368 ns	Node1 to Node2: 226 ns
Bandwidth	Node0 to Node2: 23.7 GB/s	Node1 to Node2: 34.9 GB/s
Power Consumption	24 W /27 W / 33 W	
Warranty	5-Year Limited	
Operating Temperature	0°C to +95°C	
Storage Temperature	-55°C to +100°C	

Enterprise SSD Applications

Relational Database

Workload Characteristics

- Full table scan-sequential read, index access-random read, log file-sequential write, data file-random write.
- Log writing--sequential logging. When the transaction is initiated, the log is written sequentially at the same time, which requires high latency. The log file size is usually less than 4KB.
- Data file writing-in place update. The data file is written asynchronously when the transaction is submitted, without requiring high IO.

SSD Requirements

- Both HDD and SSD can be deployed, and there is a tendency to gradually switch to SSD. SSDs offer fast access times and high throughput, making them ideal for applications that require low latency and high performance.
- Writing small log files (that sequential logging writes to the same location repeatedly) will cause performance degradation in long-term writing due to the WL algorithm.
- The data file in place update generates a large number of random writes with relatively high write amplification, testing SSD endurance.
- Intensive read-write IO tests the IO performance of SSD under mix-use ratios.

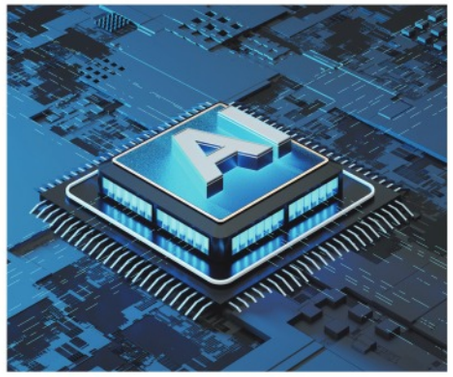


Enterprise SSD Applications

AI Server

Workload Characteristics

- CPU + GPU/CPU + TPU/CPU + DPU and other processors with different architectures are used together.
- Different stages of AI training and inference have different requirements for SSD storage. NVMe all-flash memory will be generally used to improve data transmission efficiency.
- DRAM capacity, HBM, and GPU influence how efficiently large amounts of data and complex computations can be processed.
- NAND capacity requirements are 3 times higher than normal servers, 36 TB.
- DRAM capacity requirement is 8 times higher than ordinary servers, 2 TB.



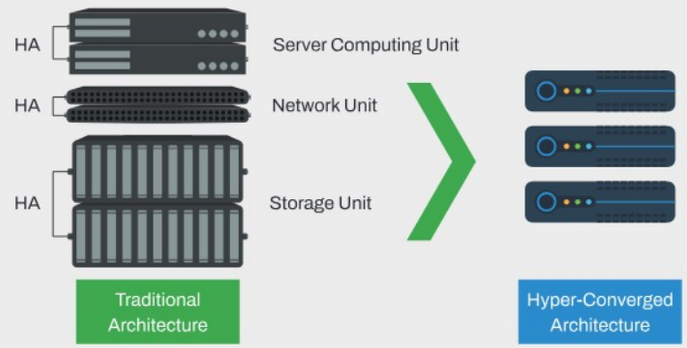
SSD Requirements

- Large-capacity SSD Requirements: Each Nvidia DGX H100 system requires eight 3.84 TB NVMe SSDs (RAID 0) and two 1.92 TB NVMe M.2 SSDs (RAID 1).
- High performance requires high random read and write IOPS.
- The current mainstream data disk capacity is 4 TB, and it will be increased to 8 TB in the next stage.
- The separation of storage and computing has given rise to the need for NVMe storage arrays to store data sets. NVMe is faster than flash storage – and enables vastly more efficient transport of data between storage systems and servers.
- Improving GPU utilization requires further low latency.

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Enterprise SSD Applications

Hyper-converged architecture server/all-in-one



Q: What is Hyper-Converged Architecture?

A: It is a software-defined unified architecture that integrates virtual resources such as storage, computation, and networking into a single standard x86 server. This forms a baseline architecture unit, and multiple devices can be aggregated through the network to achieve modular seamless horizontal expansion, creating a unified resource pool.

Workload Characteristics

- The three parts of the storage and computing network are integrated into one, which streamlines the structure, reducing the costs of the operation and maintenance.
- X86 standard vertical or horizontal expansion architecture achieves flexible and simple expansion.
- Faster response to rapidly changing business needs a hardware setup in hours and workloads that can be built in minutes.
- Total SSD capacity is just 10%-20% of the total HDD capacity.
- Replacing traditional RAID, software-defined distributed storage (with multiple nodes and replicas) ensures more reliability and stability.

SSD Requirements

- 2 cost-effective SATA SSDs in a RAID configuration will store OS, meta, journal, cache and other data-- requiring only 10%-20% of the total HDD capacity.
- DWPD > 1 Required.
- Today SSD is essential. When considering cost, most enterprises choose SATA SSD which suits most general applications.

Innovative System for Quality Assurance

NAND

Reliable Foundation, Comprehensive Quality Control



Manufacturing

Advanced Packaging and Testing, Capability of Developing Testing Equipment

Controller ICs

Self-developed Controller to Enhance Competitiveness and Ensure Reliable Supply

SSD Validation and Reliability Testing

Robust Testing Coverage across All Dimensions and Stages

Firmware

Developed to Meet Various Customer Requirements