Maipu MPS5500G2 Storage Datasheet

Overview

Maipu MPS5500G2 series storage adopts advanced design concepts and technical architecture, which can be horizontally expanded to 32 controllers, and ensures the data security of users through advanced features such as storage symmetric double active, replication, mirroring, continuous snapshot protection, etc. Maipu MPS5500G2 has a 1.5TB/dual control super cache, which greatly improves the storage performance. The maximum number of host interfaces for a single storage can reach 80, and it has strong service support and data management capabilities. MPS5500G2 adopts open storage management software and open storage API interface, supports customizing specification function, implanting functional features, and secondary development, and truly integrates the storage system with the user service system seamlessly. MPS5500G2 series has high stability and reliability, and is widely used in government, finance, education, medical treatment, power and energy industries.

MPS5520G2 is an integrated form of disk control with 24 bays, dual controllers with 6*1Gb/s Ethernet interfaces and 8*10Gb/s Ethernet interfaces.

Key Features

High-End Storage with Super Cache

- **High-End Cache Specification**: 32 controllers with a maximum 24TB cache. High-end storage specification meets users' performance requirements.
- **High-Performance Architecture**: MPS5500G2 supports 10/25/100 Gb/s Ethernet, 8/16/32 Gb/s FC, 10Gb/s FCoE and other host interfaces; The new-generation PCI-E 3.0 bus is used internally, and SAS 3.0 high-speed interface is used at the back end, with comprehensive leading performance and specifications.
- **Multi-Dimensional Expansion**: It adopts horizontal SAN expansion architecture, supports online non-downtime horizontal expansion of 10/25/100GE Ethernet and 16/32G FC network dual protocols, and can be expanded to 32 storage controllers at most to build a large-scale parallel storage system, which aims to process many simultaneous data IO requests in parallel. At the same time, it can tolerate at least half of the controller failures without service interruption and data loss, improving the reliability of the storage system.

Tested Stability and Reliability

- **Full Redundancy and Modular Design**: The full redundancy architecture ensures the system reliability. The main components of the controller, such as chassis, controller, power supply, fan, battery, and host interface card, adopt modular design, and support hot-swap and online replacement of individual components. When some components fail, it can realize rapid fault isolation and component replacement to avoid great impact on the whole system.
- **Perfect Hard Disk Security Policy**: The unique IDDC+CRAID technology can realize minute-class rapid reconfiguration of partially damaged hard disks. A single RAID group can tolerate the failure of any three hard disks without data loss. Based on the global load technology, IO is distributed to all hard disks, greatly improving IO concurrency and realizing rapid reconfiguration. The reconfiguration time of 1TB data can be shortened to within 25 minutes, and it allows multiple disks of a RAID group to have media failures without data loss. At the same time, combined with the slow power-on technology of the hard disk of the storage system, avoid the risk of current overload and tripping caused by the simultaneous power on of a large number of hard disks, so as to further ensure the high reliability of the system.
- **Cache Power-Down Protection**: Adopt the cache drop technology. When the dual-control storage suddenly powers down, the cache data is distributed to the hard disk for permanent storage through the battery of the dual-control storage, which can ensure that the data in the cache is not lost.
- **Cache Freezing Technology**: When the data cannot be written due to flash failure or failure of the data disk, the data in the cache can be frozen. After the data disk is repaired, the frozen cache data will be distributed to the data disk to ensure that the data is not lost.
- **Data Consistency Protection**: It supports data consistency protection based on T10 PI. In the process of data reading and writing, it ensures the data integrity of the whole path from the host port to the hard disk, prevents silent data errors, and ensures the safety of user data.
- **Controller Self-Healing Technology**: It supports cache mirroring. When two nodes of dual control storage are abnormal at the same time (crash or software and hardware failure, etc.), the storage operating system can quickly and automatically repair to the normal operation state and ensure that the cache data is not lost and the upper-layer service is not interrupted.

Flash-oriented smart storage platform

The high performance of flash disk has been unanimously recognized in the industry. With the help of MPSP storage operating system, MPS series storage integrates this leading hard disk technology into its high-performance architecture to provide the ultimate flash converged solution.

- **Intelligent Media Identification Realizes Extreme Performance**: MPSP storage operating system can intelligently identify the back-end storage media, automatically execute flash optimization algorithm for flash disk, reduce the operation frequency of hard disk, shorten the IO path, and provide extreme performance.
- **Global Wear Balance Improves The Service Life Of Flash**: Based on CRAID3.0 and integrating the characteristics of flash memory, the CRAID3.0 flash memory optimization technology can cut each flash disk into several small blocks to form a global resource pool, and then intelligently distribute IO to all small blocks through a certain discrete algorithm, to achieve global wear balance and greatly improve the service life of flash memory.

Rich functions

MPS5500G2 provides rich data protection functions, including data snapshot, data replication, data mirroring, symmetric active-active, and other features. Through these features, it realizes data management and protection from online to offline, from local to remote, and easily provides users with multi-level and cross-regional storage solutions.

- **Leading symmetrical Dual-Active Scheme**: Without introducing any third-party software and hardware, directly realize the dual-active operation of two storages through two MPS5500G2 series storage arrays, which are redundant to each other. When one storage fails, the other storage can take over the service in real time, realizing zero RPO and RTO. The dual-active link between devices supports 10/25/100GE Ethernet and 16/32Gb FC.
- **Data Snapshot**: It supports continuous data snapshot function and can create up to 2048 incremental historical time point copies for a single data volume. When data "soft" failures occur, such as data damage, virus damage, accidental deletion caused by software programs, data can be quickly recovered by "rolling back" the appropriate time point mark. This function is especially suitable for continuous data protection of critical services.
- **Data Replication**: Maipu can provide the data replication function of 1:2, continuous hop, 64-to-1 points, support the graphical management interface to customize the remote data transmission time interval (the adjustable asynchronous transmission time interval is less than 10s), provide users with flexible data replication policies, realize the remote backup of data, and can quickly recover data in case of unexpected disasters, so as to ensure the services continuity of users. The replication link supports 10/25/100GE Ethernet and 16/32G FC. For the IP link, it can be seamlessly docked with the replication link of the WAN through the replication interface, realizing long-distance data disaster recovery across the WAN without protocol conversion, and effectively reducing the cost of the disaster recovery link.
- **Local Cloning**: The local cloning function can online provide highly available and flexible data copies that are completely consistent with the production volume at a certain time and can continuously protect the data. In case of failure, it can ensure that the data is not lost, and independently provide the cloned volume to the front-end services for use. It is suitable for application scenarios that often analyze or test the generated data.
- **Data Mirroring**: The data mirroring function saves a fully synchronized real-time mirror of the main data by establishing mirrored data between two hard disk arrays. Each written IO will be saved to the primary storage and the mirrored storage at the same time. When the primary storage fails, the mirrored storage can provide storage services.
- **Auto Layering**: After the ICMT technology is adopted, there is no binding relationship between LUN and RAID, hard disk. Through cell-based data copy and migration, the free flow of data on different hard disk media can be realized according to the frequency of data access, to realize auto layering.
- **Intelligent Cache Scheduling**: Adopt asymmetric cache scheduling technology to dynamically adjust the

size of read and write cache according to the actual situation, to meet the real-time changing performance requirements of LUN and realize QoS requirements.

- **Dynamic Load Balancing**: Support dynamic load balancing between controllers, adjust workload between controllers without interruption, eliminate performance bottlenecks, and achieve strict service-class goals.
- **SAN/NAS Integration**: In the same set of hardware equipment, both SAN and NAS services are provided at the same time, without configuring additional NAS gateway equipment, reducing equipment investment, shortening data access paths, and effectively reducing the complexity of deployment and operation and maintenance.
- **Thin Provisioning**: ICMT-based thin provisioning technology, the system automatically identifies front-end service IO and dynamically allocates storage resources, which can greatly reduce the difficulty of capacity planning for system administrators.
- **Quality of Service Control QoS**: Integrate and pool storage resources such as CPU, memory, bandwidth, and give priority to service requests with higher priority according to the importance of the service, to make the system resource allocation more reasonable.
- **Non-Interrupt Data Migration (NDM)**: The NDM technology can realize data migration within a single device and across devices, without front-end perception and service interruption during the migration process. Hybrid arrays can realize non-interrupt data migration between the NDM technology and full flash arrays.
- **Online Global Deduplication**: Utilizing the MPSP storage software platform, this feature enables global, block-level, online, and lossless deduplication. It selects deduplication areas based on data read/write frequency, ensuring no impact on business access performance. A secondary verification is conducted before deleting duplicate data to prevent data loss. This reduces the actual data write volume and the number of writes to SSDs, thereby extending their lifespan. The deduplication function seamlessly integrates with other software features such as replication and snapshots, creating a comprehensive storage solution that minimizes the risk of data failure.
- **Online Compression:** The storage system's built-in data compression module performs online compression at the moment data is written. It uses lossless data compression to prevent data loss due to compression. By leveraging robust hardware resources and optimized compression algorithms, the impact of data compression on front-end business systems is minimized, ensuring smooth business access from SSDs.

Technical Specifications

Product Model	MPS5520G2
General Specification	
Max. Controllers	32
Max. Cache (per dual-control)	1536GB
Level-2 Cache (Per dual control)	12.8TB (Expand with the controller)
IO Module Type	1/10/25/100Gb/s Ethernet module, PCIE module, 8/16/32Gb/s FC module, 10Gb/s FCoE module, 24/48Gb/s SAS module and so on
Host Interfaces (Per Dual Control)	54
Expand Hard Disk Cabinet Type	4U hard disk cabinet: 24 Bays, supporting 2.5/3.5-inch hard disk drive 2U hard disk cabinet: 25 Bays, supporting 2.5-inch hard disk drive 2U hard disk cabinet: 25 Bays, supporting 2.5-inch NVMe SSD
Hard Disk Type	NVMe(only MPS5580G2), SSD, SAS, NL-SAS, SATA and so on (support mixed insertion of different types of hard disks)
Max. Hard Disks	32000 (dual-control 3200)
Max. LUNs	65536
Hard Disk Detection and Diagnosis	Support periodic hard disk detection and intelligent dynamic adjustment of hard disk detection speed
RAID Class and Hot Backup Feature	RAID/CRAID(CRAID3.0) 0, 1, 3, 4, 5, 6, 10, 50, 60, X0 and so on, support dedicated hot backup, global hot backup, and hot backup of idle hard disk
CRAID Feature	CRAID group allows media errors in multiple hard disks, tolerates physical failures in any three disks, and supports normal reconstruction, local reconstruction, and fast reconstruction
LUN Synchronization Feature	Support asynchronization, check synchronization, and fast synchronization
OS Supporting	AIX, HP-UX, Solaris, Windows, Linux and so on
Virtualization Platform Supporting	VMware, Citrix, Hyper-V, OpenStack, KVM, XEN and so on
Basic Management Software	Management Suite, including basic storage management, CRAID, system monitoring, log and alarm functions
Management Mode	Support graphical, CLI interface, provide WebService access interface, provide SMI-S, Cinder management interface
Advanced Features	Thin provisioning, intelligent tiered storage, non-interrupt data migration (NDM), performance monitoring, data snapshots, data replication, data mirroring, local cloning, local mirroring, symmetric dual-active, quality of service control (QoS), online global deduplication, online compression, etc.
Max. IOPS	6.1 million (SPC-1 test model)
NAS Features	Support CIFS, NFS, HTTP, FTP, and other protocols
Hardware Specification	
Number of SPs	2
Number of Fan Modules	2
Number of Battery Modules	2
Number of Power Supply Modules	2
Number of Onboard Front-End Ports/SP	3*GE ports (including a console ETH port), 4*10GE ports

Number of Front-End IO Card Slots/SP	3 (Optional)
Number of Onboard SAS Ports/SP	4*48Gbps Mini SAS HD ports
Number of Disk Module Slots	24
Dimension (H×W×L)	175mm(4U)×446mm×650mm
Bare Weight	⩽42kg
Full Weight	⩽69kg
Average Power Consumption with Full Configuration	580W
Peak Power Consumption with Full Configuration	600W
Power Input	100V-240V±20% AC; 60Hz±2%/50Hz±2%; 240V HVDC
Power Module	Equipped with redundant platinum AC power supply
Temperature	Work temperature: 0°C -40°C; recommended 10°C -35°C
	Non-work temperature: -20°C -60°C
Humidity	Working humidity: 10%-85%, no-condensing; 20% - 80% recommended, no condensing
	Non-work humidity: 10%-90%, non-condensing

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