HUAWEI

Data Sheet

High-End SSDs for AI

Huawei eKitStor LC 560



The HUAWEI AI SSD is a high-end, high-performance, large-capacity SSD specially designed for modern AI workloads. It boosts training efficiency and inference by improving GPU training and inference efficiency, slashing cost per token, and enhancing AI data reliability. This accelerates the intelligent transformation of various industries and strengthens AI infrastructure foundations.

The eKitStor LC 560 large-capacity AI SSD is designed for data-intensive application scenarios like large-scale multimodal corpora, AI inference KV cache storage pools, big data analytics, online analytical processing (OLAP), and data archiving. The SSD offers high capacity density, energy efficiency, and lower total cost of ownership (TCO) for AI infrastructure, cloud, Internet, and enterprise applications.

- In multimodal corpus applications, SSDs replace HDDs to improve AI data loading efficiency by 40x.
- A persistent KV cache extends the inference memory retention time from 2 hours to 1 day.

eKitStor LC 560 provides 15.36 TB, 30.72 TB, 61.44 TB, and 122.88TB capacity configuration options. Equipped with the next-gen SSD controller, the SSD supports the Non-Volatile Memory Express (NVMe) 2.0 protocol and Peripheral Component Interconnect Express (PCIe) 5.0 interfaces. It integrates innovative Huawei media application technologies like hardware-accelerated I/O path, intelligent multi-stream, and Rigid-Flex PCB structure optimization. This enables software-hardware synergy for fast, green, and resilient AI SSD storage.

Highlights

Resilient

The Huawei DiskBooster software helps reduce write amplification factor by up to 60%*, prolonging the service life of large-capacity SSDs.

The uncorrectable bit error rate (UBER) is as low as 10^{-18}, 10 times better than the industry standard, providing reliable storage assurance for services.

Fast

Up to 14.8 GB/s sequential read bandwidth and 3.2M random read IOPS ensure superior performance for read-intensive services.

Green

Single-disk wind resistance is reduced by 10%, and system operating temperature is reduced by 2° C. This reduces the heat dissipation pressure and cooling load of data centers, boosting performance and reducing TCO.

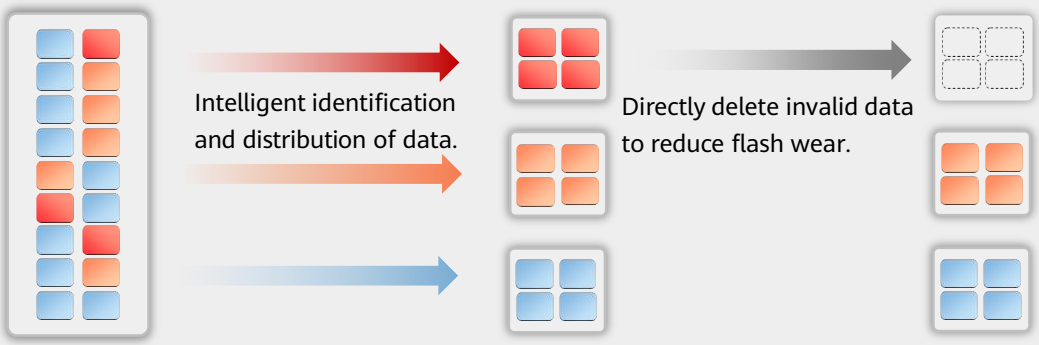
* The actual reduction effect of the write amplification factor varies, depending on the data popularity distribution, access mode, and data write feature in specific service scenarios.

Resilient

Huawei has developed advanced technologies that deliver high stability, endurance, and reliable data protection for complex environments and demanding workloads. These technologies include the DiskBooster intelligent multi-stream algorithm, enhanced LDPC code error correction, intelligent wear leveling, and end-to-end data protection.

Intelligent Multi-Stream Algorithm

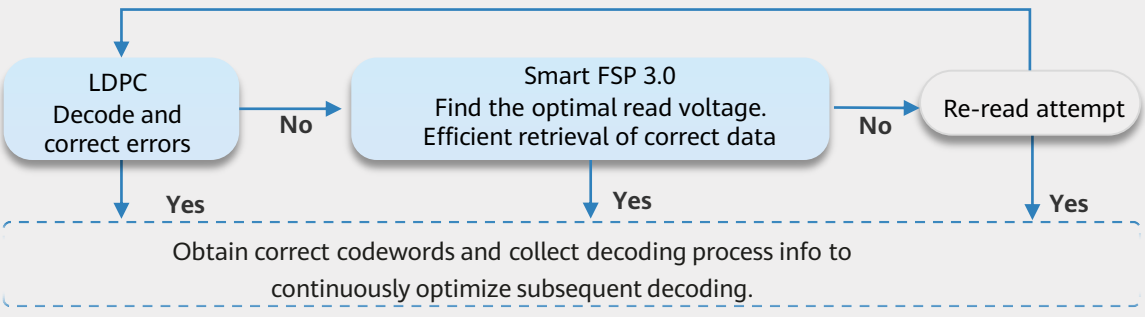
Huawei DiskBooster uses the algorithm to intelligently identify and distribute cold, warm, and hot data. This reduces the amount of data migrated, minimizes flash wear, and lowers the write amplification factor by up to 60%*.



* The actual reduction effect of the write amplification factor varies, depending on the data popularity distribution, access mode, and data write feature in specific service scenarios.

LDPC + Smart FSP 3.0

The enhanced LDPC code error correction algorithm and Smart Flash Signal Processor (FSP) 3.0 are integrated to efficiently read correct data and improve data read reliability for NAND flash in a high-wear state. The uncorrectable bit error rate (UBER) of the SSD is as low as 10^{-18}.

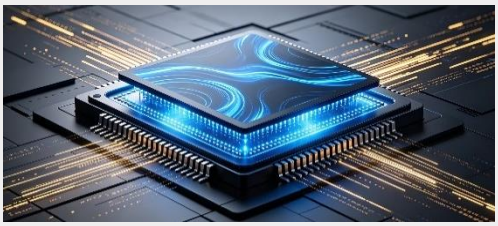


Fast

The brand-new SSD-dedicated controller, advanced NVMe 2.0 protocol, and PCIe 5.0 high-speed interface—combined with Huawei-developed technologies such as a hardware-accelerated I/O path, intelligent prefetch, and data-control plane separation—deliver higher bandwidth and lower latency.

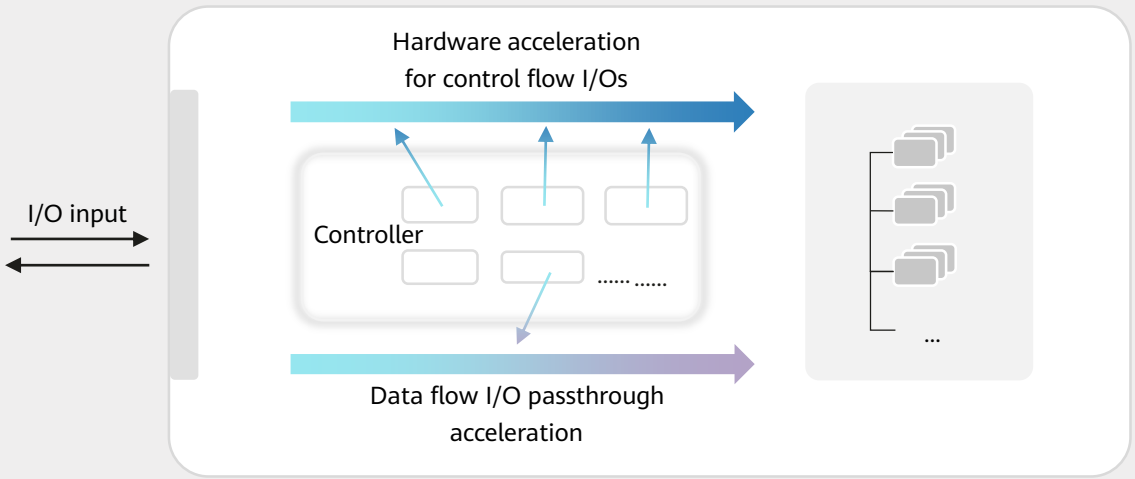
SSD Controller

The new-gen Huawei-developed controller dedicated to SSDs greatly improves data read and write efficiency. Sequential read bandwidth reaches up to 14.8 GB/s and sequential write bandwidth reaches up to 4.5 GB/s. Random read performance reaches up to 3.2M IOPS (4 KB), while random write performance reaches up to 220k IOPS (4 KB), with write latency as low as 7 µs.



Hardware-Accelerated I/O Path

Control flow: The dedicated hardware acceleration engine replaces conventional CPU computing, significantly boost-ing the FTL query and update efficiency.
Data flow: The independent module performs data flow encoding and decoding without waiting for the control flow processing results, significantly boosting data read and write efficiency.



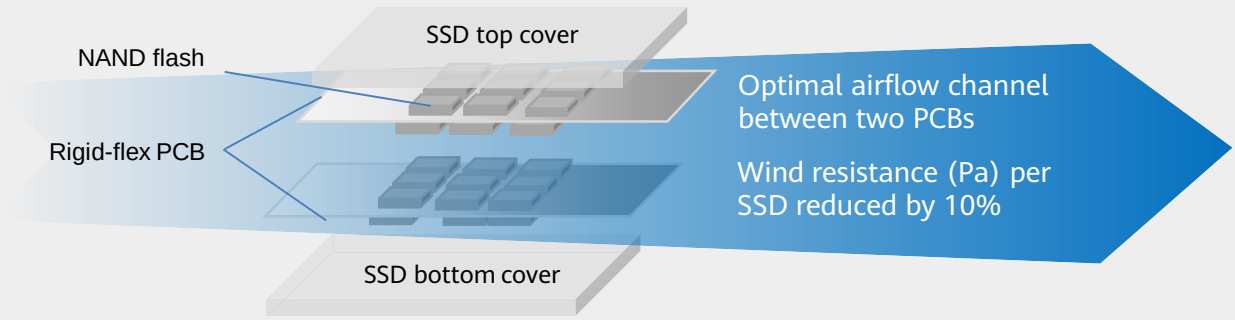
* Flash Translation Layer (FTL): maps the logical address space of the host to the physical address space of the flash memory.

Green

The capacity of a single SSD reaches 122.88 TB, with a 4 U capacity density 6x higher than HDDs. A rigid-flex printed circuit board (PCB) with an advanced airflow design improves the efficiency of heat dissipation, significantly reducing the energy consumption of data centers. In addition, Huawei-developed power supply modules are used to stably support a high-voltage power supply even with a high-density disk layout, achieving better energy efficiency.

Optimized Rigid-Flex PCB Structure

Calling on Huawei's advanced system engineering capabilities, the layout between two PCBs is optimized to achieve the optimal airflow channel. This achieves 10% lower wind resistance per SSD and a 2° C lower system operating temperature, slashing data center energy consumption.



*Rigid-flex PCB: a hybrid circuit board that integrates the features of rigid PCBs and flexible printed circuit (FPC) boards.

Intelligent

Huawei DiskBooster is an AI-powered O&M tool that reliably predicts failures and disk service lives. After detecting slow disks, it reminds IT personnel to replace or repair the disks or back up data to improve service performance. This reduces the impact of faulty or sub-healthy disks on services, ensuring data resilience and service continuity.

Pre-failure detection

By analyzing over 20 key indicators, including wear degree, UNC threshold-crossing, and die failure, the impact of disk faults on services is halved.

Slow disk detection

Over 10 slow disk criteria are collected and analyzed by decision and processing algorithms, delivering a detection accuracy of 99%.

Disk life prediction

Over 10 disk service life indicators and advanced predication algorithms enable disk service life prediction with an accuracy of within five days (down from over a month).

Disk logical failure repair

The multi-level incremental repair policy reduces the fault return rate by 50%.

Technical Specifications

Huawei eKitStor LC 560

Model Number	HSSD-E4215TP5ABN	HSSD-E4230TP5ABN	HSSD-E4261TP5ABN
Basic Specifications			
Form Factor	U.2 2.5-inch（15mm thickness）		
Interface Protocol	PCIe 5.0 1 x4，NVMe 2.0		
Capacity[1]	15.36TB	30.72TB	61.44TB
Performance			
128KB Sequential Read Bandwidth(MB/s)	14,800	14,800	14,700
128KB Sequential Write Bandwidth(MB/s)	4,500	4,500	4,200
Random read IOPS	3,200k@4KB	3,200k@4KB	2,900k@4KB
Random write IOPS	220k@4KB	220k@4KB	60k@16KB
Average Read Latency(μs)	85	85	90
Average write Latency(μs)	7	8	16
Reliability			
Endurance[2]	0.6 DWPD, 5 years		
Reliability	MTBF(Mean Time Between Failures): 2.5 million hours; AFR(Annual Failure Rate) : ≤ 0.35%; UBER(Uncorrectable Bit Error Rate) : 10^{-18}		
Temperature	Non-operational: –40°C to 85°C (–40° F to 185°F); operational: 0°C to 83°C (32°F to 181.4°F)		
TRIM	Supported		
Power Failure Protection	Supported		
Media Failure Protection	Supported		
Power Consumption			
Average Power Consumption	< 6.5W, 25W (idle, Active)		

Notes: Performance results are based on internal testing and use. Results and performance may vary according to configurations and systems, including device capacity, operating system versions, and test tools.

1. Capacity definition: 1 TB = 1,000 GB, 1 GB = 1,000,000,000 bytes.
2. DWPD represents drive writes per day tested according to the JESD219 standards. An SSD can be used for five years if the DWPD stays below the specified value; otherwise, the SSD service life will be affected.
3. For details about 122.88 TB SSDs, contact Huawei sales staff.

For More Information

To learn more about Huawei storage, please contact your local Huawei office or visit the Huawei eKit website: http://ekit.huawei.com.

Huawei eKit APP

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