s620 SATA SSD
Enterprise-Class Solid-State Device

Frequently Asked Questions

HGST
a Western Digital company

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Q: What about advanced data protection?

A: In mission-critical enterprise and datacenter applications, you cannot afford data loss due to unscheduled power outages or 'silent' data corruption of storage media. HGST enterprise-class MLC-based SSDs provide built-in power back-up capacitors to protect against electrical power failures, in addition to internal data-path protection with built-in error correction codes (ECC), cyclic redundancy checks (CRC) and parity-based error detection and correction to maximize data integrity.

Q: Are you getting the lowest cost per IO?

A: To understand the value of an SSD under datacenter workloads, you need to consider the cost per IO of your enterprise applications. This analysis will help you determine the best deployment strategy for MLC SSDs, single-level cell (SLC) SSDs and hard disk drives. An SSD is more than just flash storage media. Enterprise applications demand the long-term reliability, consistent performance, minimized downtime, and advanced data protection provided by true enterprise-class SSDs. This class of product is available only from HGST, the enterprise SSD market leader.

Q: Will SSDs complement your existing enterprise HDD business?

A: HGST continues to deliver the most comprehensive portfolio of enterprise-class SSDs for high performance and capacity-optimized applications. We expect SSDs to be used interchangeably in tiered pools of storage, depending on the need for capacity, performance and power efficiency.

Q: How will SSDs be priced compared to traditional hard drives?

A: HGST is not a consumer-focused company, and therefore we do not disclose OEM or channel partner pricing. Although the initial investment in SSD storage is typically higher than traditional hard drives, the performance attributes of SSDs translate to fewer drives needed to support a given set of IOPS requirements. This dramatically offsets higher initial purchase costs and reduces long-term operating expenses.

Q: What enterprise-class SATA SSD products does HGST offer?

A: HGST has announced its new high-performance, high-endurance and high-reliability HGST s620 Enterprise SATA SSDs for Tier-0 cache, mid-range server and enterprise applications. The new s620 family delivers 50GB, 100GB, 200GB and 400GB capacities, in both 2.5-inch and 1.8-inch standard SATA form factors.

Q: Which NAND supplier is used for the s620?

A: HGST utilizes NAND flash from multiple suppliers, which helps to ensure continuity of supply. Each supplier is regularly audited and provides NAND that has been specifically screened and tested for SSD use. HGST currently ships s620 drives with Samsung and Toshiba as the primary approved sources.

Q: How long will the HGST s620 last, and what restrictions exist?

A: HGST SLC s620 drives carry up to a 5-year unlimited warranty. s620 drives based on MLC carry a 3-year warranty and allow for 10 full-capacity writes per drive per day.

Q: When will HGST SSDs be available?

A: HGST is currently shipping and qualifying HGST SSD drives with all major OEMs. Broader qualification samples are now available, with more new products scheduled in 2012 for distribution through partner channels.

Q: What applications will drive SSD adoption at the enterprise level?

A: The answer depends on the industry segment and goals. As a starting point, whenever IO is the most important metric, SSDs should be incorporated at some level. You should consider HGST s620 solid-state drives whenever you need speed and performance, such as for database acceleration, Web services and financial applications. This can be applied to any business process or use case that benefits from throughput and performance.

Q: How do SSDs differ from hard drives?

A: While both serve the primary function of storing and accessing data, an SSD works entirely differently than a typical hard disk drive. SSDs do not use a spinning disk to store data. Instead, information is stored on flash memory chips that are much faster, operate at cooler temperatures and occupy less physical space than rotating disks. SSDs have extremely short access times because they do not require the storage medium to spin-up for data access. The benefit is that all data on an SSD can be accessed instantaneously, without the delays of mechanical 'seek' times. SSDs have no motors and no moving parts, and this provides greater durability, much lower power consumption, less heat production and zero noise.

Q: Will you get consistent performance?

A: CellCare Technology is designed to create consistent read and write performance over the entire life of the drive as demanded by enterprise applications. MLC SSDs featuring CellCare Technology are available exclusively from HGST. This patented technology is based on advanced signal processing algorithms that dynamically adjust to ensure consistent read and write performance over the entire life of the drive.

Q: What differentiates HGST SSDs from those of other suppliers?

A: No other supplier can match HGST's total value solutions when you factor in HGST's proven expertise in SATA, SAS and FC design, firmware, reliability, and customer qualification and system integration. HGST is the world leader in ASIC controller designs for SATA, SAS PCIe and FC enterprise-class SSDs. Together, these capabilities create a new generation of industry-leading SSDs with high endurance, reliability and sustained performance for Tier-0 mission-critical servers and storage.

Q: Does the s620 support the TRIM command?

A: Yes.

Q: Does your drive have a near-zero failure rating?

A: Shrinking flash chip geometries enable greater capacities and lower cost in MLC-based SSDs, but if not managed correctly, higher densities can lead to a higher rate of media errors and reduced reliability. HGST's patent-pending Secure Array of Flash Elements™ (SAFE) Technology delivers a near-zero failure rate.Advanced redundancy technology developed by HGST enables the SSD to recover from most flash media failure scenarios. If you are not using SSDs like those from HGST, your enterprise data could be at risk.

Q: What type of NAND flash is used in the s620?

A: HGST s620 uses SLC NAND flash to meet high-performance enterprise and industrial application requirements. s620 also delivers options with MLC NAND flash for cost-effective, low-write applications. The endurance of MLC flash is extended using CellCare Technology to provide a three-year standard warranty at 10 full-capacity drive writes per day. In addition, NAND flash media wear-out constraints are further minimized by Secure Array of Flash Elements (SAFE) Technology, an HGST exclusive.

Q: What is the temperature range of the s620 SAS SSD?

A: s620 supports both Commercial (0 to 60'C) and Industrial (-40 to 85'C) temperature ranges.

Q: Does the HGST s620 have any performance degradation problems?

A: HGST leads the SSD industry for sustained and repeatable performance in enterprise-class SSDs. HGST has designed the CellCare flash management algorithm to ensure that all performance measurements are consistent over the life of the drive.

Q: How do you measure SSD endurance and reliability?

A: SSD endurance is defined as the total amount of random host data that can be written within the life of the drive. Factors that affect SSD endurance include NAND technology, write workloads, reserve capacity and SSD controller firmware. HGST SSDs use advanced error detection and correction, as well as highly efficient firmware algorithms engineered by HGST to provide data integrity and maximize product life.

Q: I've heard myths and misperceptions about SSD technology; what are the facts?

A: The first thing to keep in mind is that SSDs are not new. The second is that people talk about SSDs being too expensive. This misperception persists despite the fact that the best and fastest storage servers are using SSDs today. SSD technology for next the few years will be about a relatively small amount of capacity that can save a tremendous amount of IO. In fact, you may be able to meet 80 percent of your IO requirements with 20 percent of your storage capacity. Even when measured in terms of today's pricing, cost per IO, or IO per Watt for solid-state storage, is very compelling. The third point that people talk about is the ruggedness of SSDs, including write endurance, wear leveling and ECC.

Q: Why does the s620 SATA SSD support such a variety of ATA SMART commands?

A: The T13 organization is defining specifications for self-monitoring, analysis and reporting technology (SMART) in SSDs. s620 drives support these proposed SMART commands and attributes with additional data to ensure the host has the capabilities needed.

Q: Do I need to install any new drivers to use my SSD?

A: s620 SATA SSDs will run on the existing drivers used by your original hard disk, so there is no need to install additional drivers. Internal devices require the BIOS to be able to communicate with the SSD, so HGST recommends that you update your BIOS to the latest version to ensure compatibility.

Q: What is the difference between SLC and MLC flash memory chips?

A: Today, most SSDs use NAND flash memory that can be subdivided into two categories: SLC and MLC. SLC SSDs store only one data bit per NAND flash cell, which enables faster transfer speeds, higher cell endurance and lower power consumption. One downside to SLC chips in SSDs is the manufacturing cost per megabyte and lower capacity per NAND cell compared to MLC flash. SLCs are intended for high-end markets and have approximately 10 times more endurance compared to MLCs.

Q: Should SSDs be used as cache or persistent storage?

A: The answer depends on what you are trying to achieve. If you want to speed-up traditional hard drive storage, then you will need to use SSDs as a cache, which can provide performance improvements throughout your storage infrastructure. Your hot IO data can be used at the SSD cache within the appropriate software and application environment.

Q: How will solid-state technology impact enterprise storage in 2012?

A: With an increased focus on performance in the enterprise datacenter during 2012, no other advancement delivers the cost-effective performance of SSDs. The most significant impact is the maturation of the technology, which is leading to broader availability and wider understanding of the benefits of SSDs. The true benefit is not cost per gigabyte, but rather what SSDs can do for you from an IO perspective – or cost per IO. Widespread understanding of that benefit will accelerate SSD adoption in the enterprise.

Q: What architecture is used in the s620?

A: The s620 controller was designed in-house by HGST to continue our 15-year history of industry-leading solid-state drive (SSD) products. It is customizable for specific application requirements and has no reliance on any third party outside of HGST.

Q: What are the benefits of SSDs for enterprise customers?

A: HGST's SSD family delivers ultra-high IO operations per second (IOPS) for transaction-intensive server and storage applications. HGST SSDs also reduce total cost of ownership (TCO) through low power consumption, efficient cooling and minimal space requirements, since fewer SSDs are required to support the same high-IOPS applications compared to traditional enterprise hard disk drives (HDDs). When they are combined in servers and tiered storage pools, HGST's new throughput-enhancing SSDs and traditional HDDs provide a cost-effective, end-to-end enterprise-class storage solution.

Q: Where do SSDs fit in typical enterprise storage environments?

A: Enterprise storage environments were typically classified into long-term archive (Tier-3), capacity-optimized (Tier-2) and high performance (Tier-1) workloads. IO-intensive applications such as financial transactions and e-commerce have now pushed the envelope of storage and processor capabilities. This has led to the creation of a new tier in storage: ultra-performance (Tier-0), primarily for SSDs. This new tier includes applications that require ultra-high performance and power efficiency.

Q: Does the s620 protect against unexpected power-down data loss?

A: HGST pioneered internally supported backup power with our super capacitor-based implementation. HGST utilizes a sophisticated algorithm for writing host data to ensure data loss does not occur and short-term power is supplied by the built-in capacitors.

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