Hewlett Packard Enterprise

HPE Smart Array Gen10 Controllers

Boost storage performance, security, efficiency, and reliability

What's new?

- Improved efficiency with mixed mode for Smart Array Controllers
- Enhanced performance (65%)[2] and power savings (45%)[3]
- Rapid configuration with UEFI configuration tool

[1] insideBIGDATA, "The Exponential Growth of Data," February 2017.

[2] Internal lab testing performed January 2017 comparing HPE Gen9 to Gen10 Smart Array Controllers with 4 KB random read test.

[3] Internal lab testing performed October 2016 comparing HPE Gen9 versus Gen10 Smart Array Controllers.

With trends like Big Data, mobility, IoT, and cloud-native technologies fueling the digital economy, more organizations are shifting from traditional to digital enterprises. They're putting applications and data at the center of innovation, which, in part, is causing the data landscape to change rapidly. At this pace, the size of the digital universe will double every two years at least, which is a 50-fold growth from 2010 to 2020.[1]

Storage technology that was adequate in the recent past is now becoming an IT stranglehold. In response, IT is looking to deploy new technologies that can handle the scale, speed, and variety of data to drive faster, more intelligent business insight. Security, too, is a high priority, as data breaches continue to rise. To help address these issues, organizations are turning to **HPE** to boost the performance, scalability, and resiliency of their server-attached storage.

HPE's new portfolio of **Smart Array Gen10 Controllers** can help. Providing industry-leading performance with unmatched data protection, HPE's new generation of controllers are designed to enhance server uptime while enabling greater flexibility for future growth.

HPE Smart Array Gen10 Controller portfolio

HPE's new line of enterprise-class RAID controllers for Gen10 servers help maximize performance, data availability, and storage capacity. They deliver up to 1.6 million IOPS—65% better performance[2]—while using up to 45% less power[3] than previous generation controllers. Customers can choose from Smart Array S-Class software RAID, and Smart Array E-Class or P-Class controllers—each delivering a broad feature set and related benefits.

Encrypt at the controller level
Protect data-at-rest on any drive attached to HPE Smart Array Gen10 Controllers with HPE Smart Array SR Secure Encryption.

Ideal for **entry-level solutions** that use SATA drives in basic RAID configurations, **HPE Smart Array Software RAID** delivers the efficiency needed to address evolving data storage needs. Features include RAID levels 0/1/5/10, support for 6G SATA, and access to the Unified Extensible Firmware Interface (UEFI) configuration tool. HPE Smart Array Software RAID is supported on HPE ProLiant rack and tower, BladeSystem, and Apollo servers, and Synergy Compute Modules.

Cost-effective **HPE Smart Array E-Class Controllers** provide simple RAID storage and enablement for software-defined storage with enterprise-class reliability and security. They're supported on **HPE ProLiant rack and tower** and **Apollo servers**, and **Synergy Compute Modules**. Key features include RAID on Chip (ROC) and RAID levels 0/1/5/10. You also get added flexibility with mixed-mode capabilities, security with HPE Smart Array SR Secure Encryption, and simplicity with the UEFI configuration tool.

Maximize the performance of enterprise-class **server storage** with **HPE Smart Array P-Class Controllers**. These controllers are supported on **HPE ProLiant rack and tower**, **BladeSystem**, and **Apollo servers**, and **Synergy Compute Modules**. Key features include ROC, support for flash-backed write cache (FBWC), and advanced RAID levels 0/1/5/6/10/50/60/1ADM/10ADM. This controller operates in mixed mode, encrypts any drive connected to it with HPE Smart Array SR Secure Encryption, and provides simplicity with the UEFI configuration tool.

For complete product details and specifications, visit the product page on the **HPE Smart Array Gen10 Controller** website.

Better performance, faster insight

Drive faster data insights with a range of data acceleration technologies that boost read and write performance.

- HPE Smart Array Gen10 Controllers deliver up to 65% better performance over previous generation controllers—that's **1.6 million IOPS (4 KB random reads)**.[2]

- Increase RAID 5 and RAID 6 performance by up to 25% for sequential workloads such as active archiving and video surveillance.[4]

- Save time and boost performance on RAID 5 or RAID 6 logical drives with rapid parity initialization (RPI).[5]

- Enhance performance in storage environments where data is read repeatedly from a large number of SSDs. Using **HPE SSD Smart Path**, you can create a faster I/O path between the controller and SSD.

- Accelerate access to frequently used data by up to 4X faster by caching hot data from HDDs onto SSDs with **HPE Smart Array SR SmartCache**.

Built-in reliability and security

- Protect sensitive, mission-critical data and meet compliance regulations. Innovative HPE storage technology provides encryption at the controller level, as well as status alerts and health monitoring capabilities.

- Gain broad encryption coverage and comply with regulations for sensitive data, such as HIPAA and Sarbanes-Oxley with **HPE Smart Array SR Secure Encryption**—a FIPS 140-2 Level 1 validated[6] enterprise-class controller-based encryption solution for data-at-rest on all SAS/SATA drives.

[4] Based on Gen9 versus Gen10 with 256 KB sequential writes.

[5] For example, the parity initialization for a RAID 5 volume with ten 8 TB HDDs could take several months to complete as the controller must initialize 80 TB of storage (10 drives x 8 TB) with numerous pauses every time the controller (reads data from/writes data to) the drives. RPI would initialize all 10 drives at the same time while keeping the newly created volume offline to avoid any interruptions, which results in completing parity initialization in just a few hours.

[6] HPE Smart Array SR Secure Encryption has provided a FIPS 140-2 Level 1 Validation on HPE Smart Array Gen9 Controllers and HPE Smart Array Gen10 Controllers are currently on the Validation Program FIPS 140-2 Implementation Under Test List and are expected to complete FIPS 140-2 Level 1 Validation in 2018.

HPE Smart Array Gen10 Controllers use up to **45% less power**[3] than previous generation controllers without sacrificing performance.

• Preserve data integrity with **HPE SmartSSD Wear Gauge**, which alerts you to potential drive issues before a drive fails.

• Easily monitor the health of your server and component parts online or through your mobile device with **HPE Integrated Lights Out (iLO)**.

• Extend the time needed to replace a failed drive due to power loss. Integrated flash-backed write cache (FBWC) enables long-term data retention for improved data reliability.

More efficient operation

Preserve resources with HPE Smart Array Gen10 Controllers. Reduce power consumption by up to 45%,[3] simplify storage management, and add support services for greater efficiency and a lower total cost of ownership.

• Use both HBA and RAID mode simultaneously on one controller for added flexibility. **Mixed mode for Smart Array controllers** frees up a PCIe slot for other uses and eliminates the expense of having to purchase another controller.

• Quickly setup, configure, and manage your HPE Smart Array Gen10 Controllers with **HPE Smart Storage Administrator (SSA)**. With a single, intuitive interface, you can create RAID volumes, manage advanced controller features, and deploy Smart Array solutions such as SmartCache or Secure Encryption. Includes advanced scripting and diagnostic features.

• Rapidly configure simple RAID volumes on unconfigured servers with the **UEFI configuration tool**.

• Monitor the health of your data center, including HPE servers and storage, with **HPE OneView 3.1**—the most comprehensive infrastructure automation engine in the industry.

• Quickly update your storage solution with a simple click of a button. **HPE Service Pack for ProLiant (SPP)** bundles firmware and software updates into regular releases.

• Get support, when and where you need it. HPE's **global server option support** coverage is delivered 24x7 in more than 140 countries and 30+ languages.

HPE Smart Storage Controllers on HPE ProLiant and Apollo Gen10 servers

	S100i Software RAID	E208i-a (804326-B21 & 869079-B21)	P408i-a (804331-B21 & 869081-B21)	P816i-a (804338-B21 & 869083-B21)	E208i-p (804394-B21)	P408i-p (830824-B21)	E208e-p (804398-B21)	P408e-p (804405-B21)
Form factor: Type-A modular controller		✓	✓	✓				
Form factor: Standard PCIe plug-in controller					✓	✓	✓	✓
Internal lanes	14	8	8	16	8	8		
External lanes							8	8
Ports/Connectors		2	2	4	2	2	2	2
Cache size (FBWCache)			2 GB	4 GB		2 GB		4 GB
Storage protocol: 12G SAS		✓	✓	✓	✓	✓	✓	✓
Storage protocol: 6G SATA	✓	✓	✓	✓	✓	✓	✓	✓
I/O slot: PCI Express 3.0	x4 link	x8 link	x8 link	x8 link	x8 link	x8 link	x8 link	x8 link
Maximum physical drives (up to)	14	240	240	240	240	240	240	240
Maximum logical drives		64	64	64	64	64	64	64
RAID: 0/1/5/10	✓	✓			✓		✓	
RAID: 0/1/5/6/10/50/60/1ADM/10ADM			✓	✓		✓		✓
Mixed mode (HBA & RAID)		✓	✓	✓	✓	✓	✓	✓
Boot mode: UEFI	✓	✓	✓	✓	✓	✓	✓	✓
Boot mode: Legacy		✓	✓	✓	✓	✓	✓	✓
HPE SSD Smart Path		✓	✓	✓	✓	✓	✓	✓
HPE Smart Array SR Secure Encryption (license)		Optional	Optional	Optional	Optional	Optional	Optional	Optional
HPE Smart Array SR SmartCache (license)			Optional	✓		Optional		Optional
FIPS 140-2 Level 1 Validation*			✓	✓		✓		✓
OS: Microsoft® Windows®	✓	✓	✓	✓	✓	✓	✓	✓
OS: Red Hat® Enterprise Linux®		✓	✓	✓	✓	✓	✓	✓
OS: SUSE Linux Enterprise		✓	✓	✓	✓	✓	✓	✓
OS: VMware vSphere®		✓	✓	✓	✓	✓	✓	✓

* Currently on the Validation Program FIPS 140-2 Implementation Under Test List. Expected completion of FIPS 140-2 Level 1 Validation is in 2018.

HPE Smart Storage Controllers on HPE ProLiant BladeSystem Gen10

	S100i Software RAID	P204i-b (804367-B21)	P408e-m (804381-B21)
Form factor: Type-B modular controller		✓	
Form factor: Mezzanine PCIe controller			✓
Internal lanes	14	4	
External lanes			8
Cache size (FBWCache)		1 GB	2 GB
Storage protocol: 12G SAS		✓	✓
Storage protocol: 6G SATA	✓	✓	✓
I/O slot: PCI Express 3.0	x4 link	x8 link	x8 link
Maximum physical drives (up to)	14	240	240
Maximum logical drives		64	64
RAID: 0/1/5/10	✓		
RAID: 0/1/5/6/10/50/60/1ADM/10ADM		✓	✓
Mixed mode (HBA & RAID)		✓	✓
Boot mode: UEFI	✓	✓	✓
Boot mode: Legacy		✓	✓
HPE SSD Smart Path		✓	✓
HPE Smart Array SR Secure Encryption (license)		Optional	Optional
HPE Smart Array SR SmartCache (license)			Optional
FIPS 140-2 Level 1 Validation*		✓	✓
OS: Microsoft Windows	✓	✓	✓
OS: Red Hat Enterprise Linux		✓	✓
OS: SUSE Linux Enterprise		✓	✓
OS: VMware vSphere		✓	✓

* Currently on the Validation Program FIPS 140-2 Implementation Under Test List. Expected completion of FIPS 140-2 Level 1 Validation is in 2018.

HPE Smart Storage Controllers on HPE Synergy Compute Models Gen10

	S100i Software RAID	E208i-c (823852-B21)	P204i-c (804424-B21)	P408i-c (823856-B21)	P416ie-m (804428-B21)
Form factor: Type-C modular controller		✓	✓	✓	
Form factor: Mezzanine PCIe controller					✓
Internal lanes	14	8	4	8	8
External lanes					8
Cache size (FBWCache)			1 GB	2 GB	2 GB
Storage protocol: 12G SAS		✓	✓	✓	✓
Storage protocol: 6G SATA	✓	✓	✓	✓	✓
I/O slot: PCI Express 3.0	x4 link	x8 link	x8 link	x8 link	x8 link
Maximum physical drives (up to)	14	240	240	240	240
Maximum logical drives		64	64	64	64
RAID: 0/1/5/10	✓	✓			
RAID: 0/1/5/6/10/50/60/ 1ADM/10ADM			✓	✓	✓
Mixed mode (HBA & RAID)		✓	✓	✓	✓
Boot mode: UEFI	✓	✓	✓	✓	✓
Boot mode: Legacy		✓	✓	✓	✓
HPE SSD Smart Path		✓	✓	✓	✓
HPE Smart Array SR Secure Encryption (license)		Optional	Optional	Optional	Optional
HPE Smart Array SR SmartCache (license)					Optional
FIPS 140-2 Level 1 Validation*		✓	✓		✓
OS: Microsoft Windows	✓	✓	✓	✓	✓
OS: Red Hat Enterprise Linux		✓	✓	✓	✓
OS: SUSE Linux Enterprise		✓	✓	✓	✓
OS: VMware vSphere		✓	✓	✓	✓

* Currently on the Validation Program FIPS 140-2 Implementation Under Test List. Expected completion of FIPS 140-2 Level 1 Validation is in 2018.

Why HPE Smart Array Controllers?

At HPE, we're committed to innovation, quality, and the best possible customer experience. We introduced the first commercial implementation of the RAID controller in 1989. And today we've sold over 7 million units. We continue to refine and perfect our storage technology—instilling excellence across our product lifecycle process, from our designs, to our supplier relationships, to our labs and manufacturing, all the way to our customers' data centers.

Learn more at
hpe.com/servers/smartarray

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