

# HPE Gen10 Frequently Asked Questions

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## **HPE Gen10 technologies**

### **Question: What are the key features of HPE Gen10—why HPE Gen10 is important?**

**Response:** HPE Gen10 announcement is a Genesis Moment that dovetails with Discover 2017, Las Vegas. Hewlett Packard Enterprise unveiled some very compelling, rich features across our DCIG server portfolio that provides A New Compute Experience for our customers.

Only Hewlett Packard Enterprise is uniquely able to deliver on this new compute experience not only because of the incredible innovation already brought to market, such as composable infrastructure, HPE Synergy, but also enhancing the experience with new capabilities, powered by HPE Gen10, scalable persistent memory, Intelligent System Tuning (IST) that offer customers the ability to accelerate applications and business insights. The following are the highlights aligned to three categories: Agility, Security, and Economic Control.

### **Question: What are the key new features that support the Agility story?**

**Response:** Simplify server operations.

HPE Integrated Lights-Out (iLO) is an industry leading server management solution, two decades running. The HPE iLO solution differentiates itself by enabling three crucial tenets of server management—configuration, monitoring, and remote management. The new HPE iLO 5 comes with several improvements to simplify operations such as reducing maintenance windows with updates performed efficiently at scale with the least possible impact to production and the ability to easily roll back changes if problems arise.

### **Accelerate data-centric applications**

We are building on in-memory compute with HPE Scalable Persistent Memory. You can now do much larger in-memory compute with persistence (TB instead of low 100s of GBs with NVDIMMs).

Use cases: Accelerate applications for fast caching and storage, reduce transaction costs for latency-sensitive workloads, deploy bigger, more affordable data sets to gain new insights from large memory pools.

How it works: Data is written to actual server memory marked as Persistent Memory via BIOS/CPLD means.

We use a backup power source (800W power supply unit/400W battery backup unit) to hold up power during a power loss event and move from DRAM to NVMe SSDs for persistence.

**Restore solution example:** An in-memory Microsoft® Hekaton DB recovered with SSDs in 20 mins. The same Microsoft Hekaton DB is recovered with HPE Scalable Persistent Memory in 45 seconds (Yes, you read that correctly.) We are also doubling the capacity of the HPE NVDIMMs (flash-backed DIMMs designed to eliminate smaller storage bottlenecks) 16 Gb up to 192 GB total capacity in a single server (cannot be mixed with HPE Scalable Persistent Memory in the same server).

**Use cases:** Ideal for smaller database storage bottlenecks write caching tiers and any workload constrained by storage bottlenecks. Software licensing reduction achieved through using NVDIMMs with fewer server core pairs (reduced core pair licensing from database vendors) versus using block storage devices.

### **Automate application deployment**

HPE OneView is our infrastructure automation engine to simplify operations, increasing the speed of IT delivery for new applications and services. Through software-defined intelligence, HPE OneView 3.1 brings a new level of automation to infrastructure management by taking a template-driven approach to provisioning, updating, and integrating compute, storage, and networking infrastructure.

Designed with a modern, standard-based API and supported by a large and growing partner ecosystem, HPE OneView also makes it easy to integrate powerful infrastructure automation into existing IT tools and processes.

We are extending the partner ecosystem with new integrations from Mesosphere, Densify.com, Red Hat®, ServiceNow, and InfraKit. The integration of Mesosphere with HPE OneView 3.1 allows IT and DevOps to automate deployment and streamline operations of Mesosphere Enterprise DC/OS on HPE infrastructure for large-scale production environments.

### **HPE Intelligent System Tuning**

We are making it easier to manage your on-prem infrastructure by dynamically tuning the performance on HPE ProLiant servers to match the needs of your workloads. HPE Intelligent System Tuning available on select HPE ProLiant Gen10 servers.

**Jitter Smoothing:** Engaging processor turbo boost can cause frequency fluctuations or “jitter” which results in a constant struggle between maximum output and deterministic performance needs. HPE’s Jitter Smoothing technology mitigates processor frequency fluctuation to reduce latency and deliver deterministic and reliable performance. In variable workloads where processor frequency changes occur often, Jitter Smoothing can improve overall throughput above turbo boost mode alone.

- Jitter Smoothing is ideal for high frequency traders, high performance computing, and workloads where processor frequency is highly variable.
- Available on all Gen10 servers with iLO 5 and an iLO Advanced or above license.

**Core Boosting:** Core Boosting enables higher processor frequencies on more active cores than standard Intel® processor profiles. Higher performance across fewer processors can result in significant savings when it comes to core-based licensing. In some cases, customers with core-based licensing like Oracle can experience up to \$100K in annual savings or \$500K over 5 years.

- Core Boosting is ideal for virtualized environments, Big Data workloads, core-based licensing applications, and workloads where performance is a competitive advantage.
- Available on Gen10 platforms paired with select Intel processors, iLO 5, and an iLO Advanced or above license. Available 2H2017.

**Workload Matching:** Select from preconfigured workload profiles to automatically tune internal server resources to experience up to a 9% performance improvement over server default settings.<sup>3</sup>

- Available on all ProLiant Gen10 servers with iLO 5

**Question: What are the key new features that support the Security story?**

**Response:** We are introducing the world’s most secure industry-standard servers.<sup>4</sup> This is a big claim founded on our new Silicon Root of Trust technology along with a myriad of other differentiating security technologies that only HPE offers.

The Silicon Root of Trust starts protecting our servers, early in the production process and all the way through the product lifecycle, which we have branded as the HPE Secure Compute Lifecycle.

We are delivering an end-to-end security solution, starting at the very inception of the product with our Silicon Root of Trust. HPE is in a unique position here because we develop our own custom HPE iLO 5 chipset in the fabrication facility even before the server goes into production. We tie the server essential firmware (HPE iLO 5, Unified Extensible Firmware Interface [UEFI], CPLD, IE, and ME) into our custom silicon with an unbreakable link, which anchors our firmware.

We are also providing unparalleled detection and recovery capabilities. As soon as the server is booted and HPE iLO firmware comes alive, it looks into the silicon for the immutable fingerprint that verifies that all the firmware code is valid and uncompromised. Over a million lines of firmware code run, before the operating system starts, making it essential to confirm that all server essential firmware is free from malware or compromised code.

During server operation, HPE has a new technology that conducts Runtime Firmware Verification that checks the firmware stored in the server. At any point, if compromised code or malware is inserted in any of the critical firmware, an HPE iLO audit log alert is created to notify the customer that a compromise has occurred. In the unlikely event of a breach, the customer may then securely recover the firmware automatically to a previous known good state. HPE provides this function through a new HPE license called, HPE iLO Advanced Premium Security Edition.

Aruba ClearPass creates a strong networking security clearance protocol for clearing anyone requesting access to the network. ClearPass creates a profile of potential users and clears access of users into our Aruba networks. Our recently acquired company Niara, will be responsible for monitoring activity of users inside the network. Once ClearPass vets and clears users into networks, Niara takes over and using machine learning, works to predict any nefarious behaviour before any serious damage can be done. If Niara identifies abnormal activity resembling potential malicious behaviour, it communicates to ClearPass, temporarily terminating the

suspected user's access to the network until more thorough vetting can be conducted. In the case of a rogue employee, this predictive capability block potential bad actors from the network, before any damage is done. HPE is the first industry server manufacturer to announce support for the Commercial National Security Algorithm (CNSA) suite.<sup>5</sup> This is the very highest level of security, typically used for the most confidential and top secret information. HPE also has FIPS validation on firmware and offers that as another level of protection during the operation phase of the server's life. Scalable encryption is another differentiated offering from HPE protecting data stored in the server. Unlike competitor servers, who use self-encrypting drives that require management of separate keys in every drive, HPE offers secure encryption through our Smart Array Controller cards that contain all encryption keys and manage those at scale. Going one step further, the HPE Atalla Enterprise Secure Key Manager (ESKM) is also qualified with our controller cards that take key management to a higher level. Through this technology, we are saving customers the agony of tracking an unmanageable number of encryption keys—sometimes on spreadsheets.

Closely related to security, are the numerous government regulations that customers must comply with. To aid our customers, HPE is applying the NIST 800-53 security controls to a solution stack of storage, networking, servers, and software creating a secure baseline. This secure baseline will provide customers with the comfort to issue an authority to operate (ATO) before putting IT infrastructure into operation. Additionally, this NIST 800-53 control set will assist customers with certifications like FedRAMP, HIPAA, and ISO 207001. Earlier this month, the President issued an executive order mandating all federal agencies follow NIST guidelines for cybersecurity protections. The private sector is also beginning to use the same NIST controls as standards with preventing cybercrime.

The final part of HPE Secure Compute Lifecycle comes after the servers and other equipment have reached their full use and entered end of life. The security and protection services from HPE Pointnext provide final disposal of customer equipment ensuring the data is properly disposed off according to NIST standards.

**Question: What are the key new features that support the Economic Control story?**

**Response:** Economic Control is a better way to consume and pay only for what you use.

Customers have to manage trade-offs—benefits of cloud with the control of on-prem. HPE Flexible Capacity offers both.

HPE provides active capacity management—the customer has sufficient supply to meet demands available in minutes either on-prem or cloud. Customers have full architectural control of the solution with contemporary hardware—including HPE Gen10, software from HPE and ISV partners, and services—paying only for what they use. HPE Flexible Capacity has been in market for five years; net promoter scores in the 90s and has never lost a customer. At Discover, we announced HPE Capacity Care Service. It gives customers access to some benefits of HPE Flexible Capacity today and can be attached to an HPE ProLiant Gen10 sale. HPE Capacity Care is designed to help mid-sized companies through our extensive partner network. It can be purchased or consumed through a subscription model.

HPE has also developed innovative investment models to accelerate the journey from legacy IT to Hybrid IT. HPE offers customers the ability to monetize existing assets, with HPE Accelerated Migration, to ease the transition to newer technology or to shift to flexible usage models. For IT organizations to make rapid business decisions with limited risk, we provide the ability for customers to acquire equipment ahead of actual need with HPE Pre-Provisioning and return infrastructure without penalty with HPE Flexible Asset Return. For those customers who value predictable payments and smooth technology transitions, we leverage our financial services organization to provide a pathway from HPE Gen9 to HPE Gen10 with no additional cost or change in monthly payments. These are part of a broader portfolio of investment strategies to deliver the financial outcomes customers require.

**Question: Is there a handbook or guide that explains the technology—what is it, what are the benefits, what kind of improvements?**

**Response:** Within our Gen10 announcement, there are a myriad of new enhancements, innovations, and technologies that support A New Compute Experience, focused on their areas of Security, Agility, and Economic Control. Collectively, we have created an HPE Gen10 customer NDA uber deck that highlights these new enhancements and improvements. Further, we are developing an HPE Gen10 Asset Compendium, which provides quick links to more detailed information. [Compendium is located here](#)

## Security

**Question: If HPE Gen10 is the world's most secure industry-standard servers, does this mean that previous generation servers were not secure?**

**Response:** All current HPE solutions are secure. HPE Gen9 offers FIPS Level 1, UEFI Secure Boot, Measured Boot, Trusted eXecution Technology, and secure options like TPM 2.0. However, as security threats have increased exponentially recently, HPE is responding by building onto our current security features by introducing new security measures to provide customers with even higher levels of protection. In HPE Gen10 servers with iLO 5, we provide Silicon Root Trust, Runtime Firmware Verification, secure recovery of essential firmware and security options such as chassis intrusion detection.

**Question: On what basis does HPE stake the HPE Gen10 servers as the world's most secure industry-standard servers?**

**Response:** The world's most secure industry-standard servers the following is a supporting quote from Jason Shropshire, CTO InfusionPoints. *"Innovation in the server hardware industry has traditionally prioritized functionality and accessibility of platform management features with a limited focus on security. Hardware and platform firmware have been an accepted area of weakness, relying on external physical and logical countermeasures to provide security. As advances have been made in application and operating system security, attackers have been increasingly focused on hardware and platform firmware weaknesses as viable attack vectors to gain long-term persistent access.*

*Seeking to address these threats head-on, HPE engaged InfusionPoints to conduct an independent, comparative assessment of the security of the Gen10 line hardware and platform firmware against three of HPE's industry competitors. Our team conducted time-boxed testing included attacks against physical interfaces, platform firmware, and network interfaces. Initial test results show that the HPE Gen10 Server takes a significant step ahead of its competitors.*

*HPE's commitment to innovation and ongoing testing will serve to continuously improve platform security and maintain its lead position. Specifically, we believe that HPE's introduction of Silicon Root of Trust will set a new standard in providing auditable control of the integrity of platform firmware. HPE's overall forward-leaning security culture touches all phases of the Gen10 platform lifecycle including design, implementation, and maintenance."*

**Question: What is scanned during runtime?**

**Response:** HPE iLO flash memory is scanned. This is analogous to virus scanning your hard drive but much better. The contents of the flash memory must be exactly right down to the bit or else it is flagged as compromised and recovery will kick in. The UEFI startup code is also scanned. *Note: You may be asked about run-time scanning of RAM. HPE iLO runs on a proprietary operating system on an ARM® processor. There are no virus definitions or for that matter any known viruses that run in this environment.*

**Question: How does CNSA mode work?**

**Response:** In HPE iLO, CNSA mode is a subset of FIPS mode. FIPS restricts cryptography to what is allowed by FIPS. CNSA further restricts it to what is allowed by the U.S. Government for top-secret installations. CNSA grade cryptography is available in all HPE iLO security modes.

**Question: What kind of performance penalty will I suffer when HPE iLO is in CNSA mode?**

**Response:** Actually, performance is much better. ECDH is faster than conventional Diffie-Hellman. AES is fast because it is hardware accelerated by HPE iLO. For this and security reasons, HPE iLO is set up to prefer these ciphers even in the lower security modes.

**Question: Why have security modes? Why not have many security settings instead?**

**Response:** This is to simplify, make less expensive to operate, and to allow the customer to know at a glance what the true security state of HPE iLO is. It simplifies the internal design making it less likely that it will have security vulnerabilities.

**Question: With all of this security, is it possible for me to lock myself out?**

**Response:** No, but you can create a major hassle for yourself. If you lose your password, it is possible to put yourself into a situation where recovery is only possible by removing power from the server and then removing the coin battery for a long time. Removal of the battery for 20 to 30 minutes is typically required.

**Question: What exactly is secure wipe?**

**Response:** Devices that store security parameters or customer identifiable parameters are erased following the NIST 800-88r1 standard. This is invoked through Intelligent Provisioning. Doing this should not be taken lightly because it typically takes about 26 hours to complete. Almost all of this is what it takes to wipe the NAND flash.

**Question: How does HPE Secure Start compare to Intel Boot Guard support? Isn't that a HW root of trust?**

**Response:** Intel Boot Guard functionality only authenticates a small portion of the BIOS (the BIOS Boot Block). Implementations may or may not extend that to authenticate the entire BIOS. Also, Boot Guard does nothing to authenticate BMC FW, whereas HPE Secure Start solution provides a comprehensive solution to authenticate all of HPE iLO firmware and BIOS. In addition, Intel Boot Guard requires permanently installing the hashes and public keys in the factories manufacturing the system to achieve a hardware root of trust. HPE Secure Start solution does not require any action during system manufacturing and does not require any trust of the factory manufacturing the system to achieve HPE Silicon Root of Trust. The factory manufacturing the system cannot subvert HPE Secure Start solution, whereas they can subvert an Intel Boot Guard solution.

**Server**

**Question: What was publicly disclosed in June 2017?**

**Response:** In June, we talked about the high-level Genesis story including Agility, Security, and Control, HPE Innovations such as HPE Persistent Memory and HPE iLO 5, names of select Snap1 and Snap1 FF server/server lines and select Snap1 server specs. The following table lists a few select server specifications or capabilities that can be shared publicly starting 5 June 2017 in response to questions from the press, analysts, partners, or customers.

**Table 1.** HPE ProLiant Gen10 Server capabilities by category

Category	HPE ProLiant Gen10 Server capabilities (based on Gen10 Snap1 servers)
<b>Security</b>	HPE Secure Compute Lifecycle is enabled by Silicon Root of Trust that anchors HPE server essential firmware directly into its custom-made silicon, enabling HPE industry-standard servers featuring HPE iLO 5 ability to not only protect themselves but also detect any compromised firmware and fully recover to a known good state.
<b>Agility</b>	Increased performance due to increased capacity for HPE Scalable Persistent Memory (up to 1 TB), NVMe drives (up to 20 NVMe PCIe SSDs), and GPUs (up to 5 single or 3 double wide). Increased direct attach storage with up to 30 SFF HDDs or SSDs, and 19 LFF + 2 SFF for a total of up to 198 TBs of capacity.
<b>Simplicity</b>	Simplified management enabled by HPE iLO 5; HPE iLO with integrated Smart Update to schedule, stage, and rollback updates, Intelligent Provisioning integration with HPE Smart Array Controller for simpler and faster configuration, HPE iLO Amplifier Pack with the power to discover, inventory, and update HPE servers at unmatched speed and scale (rapidly discover and inventory up to 10,000 servers).

**Question: When will all your HPE Gen10 products become available?**

**Response:** Through the end of 2017 and into 2018, Hewlett Packard Enterprise plans to bring many products to market across our business segments. Please see the following table for the details.

**Table 2.** Product shipment details for 2017

	Enterprise & SMB	Mission critical	High performance computing & artificial intelligence	Service provider
<b>Shipping Summer 2017</b>	HPE ProLiant BL460c Gen10 Server Blade	HPE ConvergedSystem 500 for SAP HANA®	Compute platforms to be announced	
	HPE ProLiant DL360 Gen10 Server			
	HPE ProLiant DL380 Gen10 Server			
	HPE ProLiant DL560 Gen10 Server			
	HPE Synergy 480 Gen10 Compute Module			
	HPE Synergy 660 Gen10 Compute Module			
<b>Shipping Fall 2017</b>	HPE ProLiant ML110 Gen10 Server	Compute platforms to be announced	Compute platforms to be announced	Compute platforms to be announced
	HPE ProLiant ML350 Gen10 Server			
	HPE ProLiant DL120 Gen10 Server			
	HPE ProLiant DL160 Gen10 Server			
	HPE ProLiant DL180 Gen10 Server			
	HPE ProLiant DL580 Gen10 Server			

**Note:** This information is subject to change at any time without prior notification. Future plans of Hewlett Packard Enterprise may differ significantly as a result of, among other things, changes in product strategy resulting from technological, internal corporate, market, and other changes.

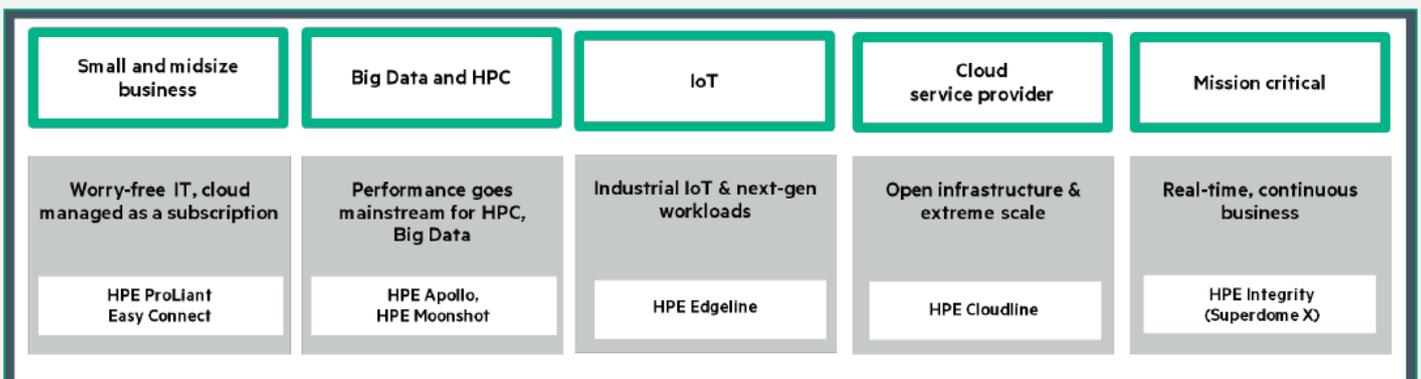
**Question: Is the HPE MicroServer Gen10 part of the HPE world’s most secure industry-standard servers?**

**Answer:** No, HPE MicroServer Gen10 is not because it does not have HPE iLO 5 and therefore does not have root of trust. However, with ClearOS™ preloaded, HPE MicroServer Gen10 can become a unified threat management system protecting the network edge from the most sophisticated attacks with gateway and network applications built into ClearOS and installed from the application Marketplace.

**Question: How do I help my customers pick which server will suit their needs?**

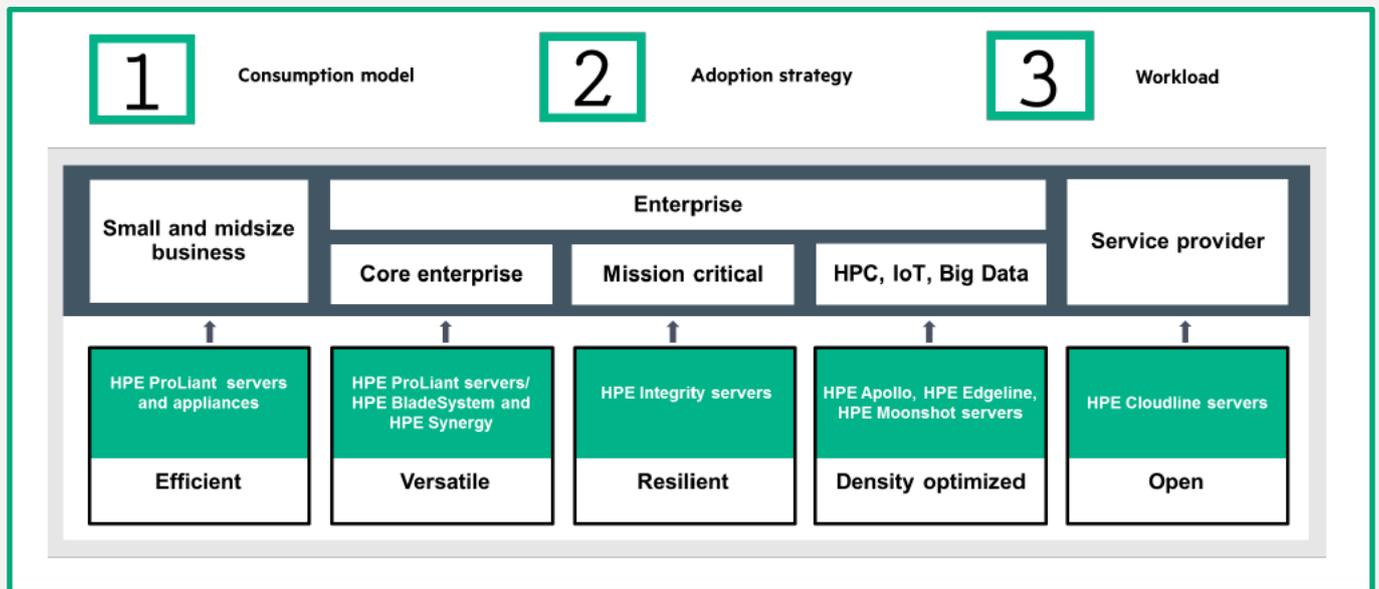
**Response:** In order to choose the right system for your business needs, you should start by answering the right questions: what is the consumption model, what is the adoption strategy, what workloads are these systems accommodating.

Looking first at the consumption model, decide if they will need preconfigured systems or have an IT staff able to build out the data centre. Next, think about density. If they have limited physical space, they will need to ensure that compute density is maximized. Examine what form factor is typically purchased such as rack, tower, or blade platforms. Alternatively, does the workload require hardware that is purpose-built to solve the compute needs? If so, HPE has the answer.



Now, look at the adoption strategy. Are they growing at a consistent pace over time or is this a net new project that is being deployed all at once. For example, if the project is a 2400-seat VDI migration, are they migrating 200 seats a month target completion in one year or are they migrating all 2400 seats at one time.

Finally, consider the workloads and applications that the systems will be running. The broad HPE compute portfolio can accommodate every workload and with service and finance, offerings can deliver the right support and economics as well.



**Question: What latest processor is in the HPE Gen10 products? You do not mention Intel—what is happening?**

**Response:** HPE regularly refreshes or creates new servers and products across our entire DCIG compute portfolio and uses specific moments in time to announce these updates or changes. The next big announcement for DCIG is HPE Gen10, which is part of the overarching Genesis campaign. The updates in our Gen10 release reflect many innovations, technologies, and components, which we will disclose on announcement day (5 June). Important note: Given the Intel embargo, Hewlett Packard Enterprise and other vendors are prohibited from revealing Intel® Xeon® Processor Scalable family (Skylake) information including SKUs, performance characteristics, other product details, and so on.

## Solutions and RAs

### Question: When will I start seeing RA and RCs for HPE Gen10? Where can I find them?

**Response:** In support of HPE Gen10 Snap1 release, we will be publishing a number of reference configurations and reference architectures. The RC/RAs will be covering key workloads including data management, security, private cloud, VDI, collaboration, Big Data analytics, and business continuity. Server platforms covered in the individual papers will vary based on the needs of specific use cases; however, there will be strong coverage across the portfolio including HPE DL360, HPE DL380, HPE DL560, HPE Synergy, and blades. Looking ahead, expect to continue to see our portfolio of solutions built on our HPE Gen10 Server family.

## HPE Server Management

### Question: What's new with HPE iLO 5 versus HPE iLO 4?

**Response:** HPE iLO 5 features a number of new enhancements over HPE iLO 4 that help make server management simpler, faster, and more secure than ever before. Here are a few highlights:

#### Security

Fuelling the world's most secure industry-standard servers<sup>6</sup> is our new HPE iLO 5 ASIC. Together with HPE Gen10 hardware upgrades, we deliver unparalleled security through key innovations that protect your HPE servers from attacks, detect intrusions, and allow you to recover your firmware securely.

#### Protect

Remove vulnerabilities that expose infrastructure firmware to malicious attacks with our exclusive Silicon Root of Trust. HPE Secure Start uniquely ensures that only HPE signed firmware will boot by validating through HPE's Silicon Root of Trust, so you can be confident that your booted firmware is safe. New secure access controls like CNSA and Common Access Card (CAC) 2 factor authentication are also new in HPE Gen10.

#### Detect

Runtime Firmware Verification ensures that your firmware is checked at regular intervals to identify any potential intrusions that may occur post boot.

#### Recover

Avoid lasting damage to your business by quickly restoring firmware to the factory settings or the last known authenticated safe setting in the unlikely event of a breach.

#### Speed

With 2X the CPU MHz in HPE iLO 5, Virtual Media performance is twice as fast<sup>7</sup> compared to HPE iLO 4. Also, available on HPE Gen10 servers, the new HPE iLO service port, is a USB port for integrated remote console and active health system downloads that gives you direct, front of server access to HPE iLO. This new feature also allows you to give HPE iLO access without the need to connect and authenticate on your network, making it simpler to access the information you need quickly.

#### Simplicity

With HPE iLO 5, we're moving to full agentless management. Freedom from the hassle of inventorying and updating various management agents, agentless management allows for a more simplified and streamlined way to monitor your servers. Also, new in HPE Gen10, System Management Assistant (SMA) support for HPE Gen10 Agentless Management enables routing of SNMP information sourced from HPE iLO via the operating system.

IPMI enhancements also allow for increased interoperability with industry IPMI tools.

In the new HPE Gen10 servers, HPE iLO services and access options can be enabled or disabled.

**Question: What are the different HPE iLO licenses and what is new?**

**Response:** With HPE Gen10 servers, we're introducing a new HPE iLO license. Exclusively available on HPE Gen10 servers, the new HPE iLO Advanced Premium Security Edition license brings together a unique combination of our iLO Advanced management capabilities and new, premium security features like Commercial National Security Algorithm (CNSA) mode.

Here is a quick breakdown of some of the new security features in each license:

- HPE iLO Standard—Silicon Root of Trust and manual firmware secure recovery
- HPE iLO Advanced—Common Access Card (CAC) 2 factor authentication

New HPE iLO Advanced Premium Security Edition—CNSA mode, Runtime Firmware Verification, automatic firmware secure recovery, and secure erase of NAND/user data.

We also continue to offer the HPE iLO Essentials license for our SMB community and the HPE iLO Scale-Out license for massive scale-out needs.

**Question: What is new with firmware management (SPP, SPP Custom Download, SUM)?**

**Response:** Smart Update Technology has a longstanding reputation for solving the problem of time-consuming, expensive, and error-prone server updates. The Service Pack for ProLiant (SPP) provides an end-to-end, tested set of firmware, drivers, and system software. Smart Update Manager (SUM) provides an innovative update process that applies updates in an efficient order to reduce impact on operations. New in HPE Gen10 and HPE Gen9 servers, Smart Update has been enhanced to provide secure, tamper-free updates. HPE firmware, driver, and software updates now include a digital signature that prevents unauthorized or modified updates from being applied. Through integrations with HPE iLO Amplifier Pack and HPE OneView, Smart Update Technology has been extended to provide simple and secure server updates at scale from a few servers to thousands of servers.

Firmware and driver updates are also smarter than ever with Smart Update. HPE iLO with Integrated Smart Update utilizes the HPE iLO Repository to reduce maintenance windows, overall downtime and the number of personnel required to execute firmware updates. Enhanced rollback capabilities also ensure peace of mind by enabling IT administrators to revert back to a known good update, so you can be confident and in control of your environment. Staging and scheduling of updates is also a new feature executed through the RESTful API.

**Question: What are the enhancements to Intelligent Provisioning?**

**Response:** With Intelligent Provisioning, deployment is now 3X faster on HPE Gen10 servers<sup>8</sup> and users can also expect to see up to 22% faster initial setup over previous generations.<sup>9</sup> Always-on Intelligent Provisioning can now be accessed from the HPE iLO browser user interface anytime without rebooting your server with the same capabilities as accessing from F10 from the POST screen. User can now manage advanced BIOS Settings on Intelligent Provisioning.

**Question: What is new with UEFI?**

**Response:** Unified Extensible Firmware Interface (UEFI) is also improved with HPE Gen10 Server users experiencing up to a 67% reduction in boot time versus HPE Gen9, so you can get your systems up and running faster.<sup>10</sup> Users are now able to configure their Smart Array Controller in UEFI boot mode. There are 14 Workload Matching profiles based on customer performance, which allows you to auto-tune all internal server resources. Finally, enablement of memory RAS features such as Address-Based Memory Mirroring and HPE Fast Fault Tolerant Memory for better protection.

## HPE Options

**Question: The terms HPE NVDIMM and HPE Persistent Memory are used interchangeably. Are they the same or is there a difference that defines the two?**

**Response:** HPE Persistent Memory is the product category name. HPE NVDIMMs are a product line within the HPE Persistent Memory category. HPE Scalable Persistent Memory is also a product line within the HPE Persistent Memory category.

**Question: What is HPE Scalable Persistent Memory?**

**Response:** It is an integrated storage solution that runs at memory speeds with terabyte capacity unlocking new levels of performance for your business workloads. It's ideal for in-memory compute, large databases, and analytics workloads needing terabyte-scale capacity and the highest levels of performance.

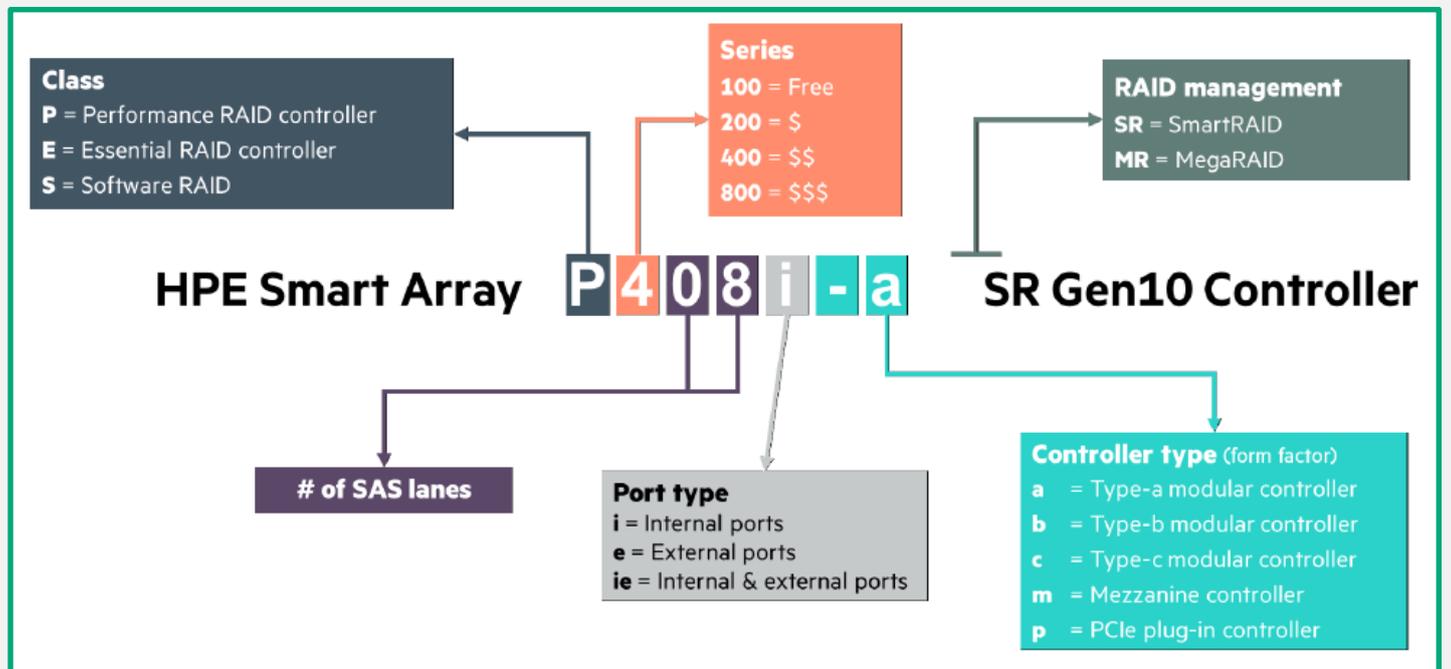
**Question: What's changed from HPE Gen9 to HPE Gen10 Smart Array Controllers?**

**Response:** HPE Smart Array Gen10 Controllers feature

<b>Mixed Mode</b>	Flexibility to use both HBA and RAID mode simultaneously on a single controller, freeing up a PCIe slot for other uses.
<b>Better Performance</b>	HPE Gen10 controllers deliver up to 1.6M IOPS (4 KB random reads), 65% more performance over the previous generation controllers. <sup>11</sup>
<b>Less Power</b>	HPE Gen10 controller uses up to 46% less power than the previous generation, resulting in power and cooling savings. <sup>12</sup>
<b>Security</b>	HPE Smart Array SR Secure Encryption provides encryption for data-at-rest on all SAS/SATA drives.
<b>Caching Solution</b>	HPE Smart Array SR SmartCache accelerates access to your data on HDDs by up to 4X by caching the hot data on SSDs. <sup>13</sup>
<b>UEFI Config. Tool</b>	New UEFI Configuration Tool reduces the time it takes to configure simple RAID volumes on an unconfigured server.

**Question: Has the naming for the HPE Gen10 Smart Array Controllers changed?**

**Response:** Yes, the new naming is meant to make it intuitive to know the class, series, number of SAS lanes, port type, and controller type at a glance. Note: HPE Gen9 controller naming has not changed. The following illustration provides an example of the HPE Gen10 naming rules.



**Question: What's new with the HPE Server Memory portfolio?**

**Response:** With the introduction of HPE Gen10, new HPE SmartMemory will be introduced that provides increased performance supporting speeds of up to 2666 MT/s, matching the performance capabilities of the new generation of Intel Xeon Processor Scalable Family. Also, a RAS feature called Fast Fault Tolerance will be available that enables the system to boot with full memory performance while monitoring for DRAM device failures. In the event of a memory failure, the memory subsystem automatically reorganizes the way data is stored in memory to create a protected region. It is just large enough to correct the DRAM failure while allowing the remaining portions of memory to continue to run at full performance.

**Question: Can customers confirm whether or not a drive has digitally signed firmware? For example, when setting up or installing a drive, will it be indicated on the monitor or in HPE iLO?**

**Response:** DS has been added to the product descriptions of all HPE drives that have digitally signed firmware. Additionally, each drive's capacity label has DS on it. Currently, there is no indication in HPE iLO. To see a list of drives, please refer to the HDD and SSD QuickSpecs.

## Services

**Question: How can I get the services involved with customers to accelerate better business outcomes?**

**Response:** HPE Pointnext is one organization aligned to your needs. As part of the HPE Pointnext portfolio, there are three types of services across the different stages of your transformation journey: Advisory and Transformation, Professional, and Operational.

### Advisory and Transformation Services

Our Advisory and Transformation Services group is at the forefront, where we focus on your business outcomes and goals. We design your transformation and build a road map tuned to your unique challenges to help you digitize the core, innovate offerings, and drive better experiences for your customers.

### Professional Services

The Professional Services team specializes in flawless and on-time implementation, on-budget execution, and creative configurations that get the most out of software and hardware alike.

### Operational Services

Our Operational Services team understands that success means being accountable for the whole solution, accountable across your ecosystem, and accountable across your old and new infrastructure and apps.

**Question: What options do we have available for customer deployment?**

**Response:** HPE customers have multiple options for deployment assistance. HPE Server Hardware Installation service provides basic hardware installation of HPE branded servers, storage devices, and networking options to assist you in bringing your new hardware into operation in a timely and professional manner. HPE Installation and Startup Service provides installation and startup of HPE technology including BladeSystem, c-Class enclosure, HPE ProLiant c-Class, and Integrity server blades, storage blades, SAN switch blades, HPE Virtual Connect modules (Ethernet and Fibre Channel), Ethernet network interconnects, and InfiniBand, as well as the installation of one supported operating system type (Windows® or Linux®). Ask for one of these services to be added to your configuration or talk to your sales rep for more information on custom solutions.

**Question: My customers like the consumption model that the public cloud provides. Is there some way that I could get that in my Data Centre for HPE Gen10?**

**Response:** Yes, HPE Flexible Capacity provides a public cloud experience in the privacy of your Data Centre. Start with HPE Gen10 servers that you need, and gain usage-based payment, rapid scalability, and services to simplify Hybrid IT operations.