RETIRED: This document has been officially retired, and the base products listed herein are now considered obsolete and are no longer available for sale. Consequently, the information contained within may no longer be current. This document is provided exclusively for reference and informational purposes.

Overview

HPE Synergy 480 Gen10 Plus Compute Module – Carrier Grade Supplement

HPE Synergy, the first platform built from the ground up for Composable Infrastructure, offers an experience that empowers IT to create and deliver new value instantly and continuously. It is a single infrastructure that reduces operational complexity for traditional workloads and increases operational velocity for the new breed of applications and services. Through a single interface, HPE Synergy composes physical and virtual compute, storage, and fabric pools into any configuration for any application. As an extensible platform, it easily enables a broad range of applications and operational models such as virtualization, hybrid cloud, and DevOps. With HPE Synergy, IT can become not just the internal service provider but the business partner to rapidly launch new applications that become the business.

HPE Synergy supports new two-socket compute modules which provide the performance, scalability, density optimization, storage simplicity, and configuration flexibility to power a variety of workloads, including business processing, IT infrastructure, web infrastructure, collaborative, and high-performance computing.

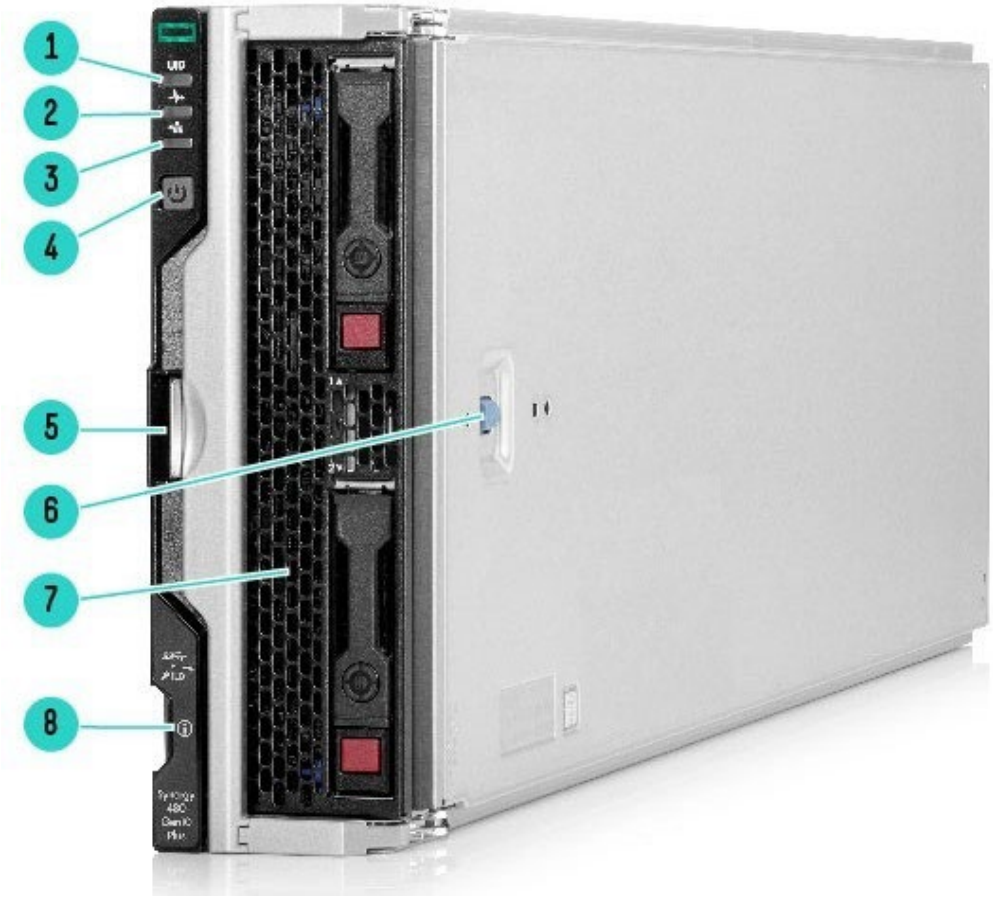
The HPE Synergy 480 Gen10 Plus Compute Module delivers superior capacity, efficiency, and flexibility in a two-socket, half-height form factor to support demanding workloads. Powered by the latest Intel® Xeon® Scalable processors, HPE DDR4 Smart Memory supporting up to 4TB per processor, flexible storage controller options, three I/O connectors, and designed to create a pool of flexible compute capacity within a composable infrastructure the HPE Synergy 480 Gen10 Plus Compute Module is the ideal platform for general-purpose enterprise workload performance now and in the future.

Get the right balance of performance, flexibility, and density for your traditional or new style of business applications. The HPE Synergy 480 Gen10 Plus Compute Module delivers even more choice of performance, capacity and flexibility to meet your workload needs. Powered with newest Intel® Xeon® Scalable processors, HPE Smart Memory, more storage solutions and capacity, unique Smart Arrays and new GPU options the Synergy 480 Gen10 Plus Compute is ideal to fit any workload you have, now and in the future

This QuickSpecs document focuses on the HPE Synergy 480 Gen10 Plus Compute Module – Carrier Grade Supplement. This document includes all the options that have been NEBS (GR-63 and GR-1089) and ETSI (EN 300 132-2 and EN 300 386) certified.

Notes: The HPE Synergy Gen10 Plus compute modules installation involves a minimum upgrade requirement for component compatibility purposes. To ensure proper system functionality, you must update your system to Release Set Version 3.00.20170707 (or later) before installing and operating your compute module.
Go to: **http://www.hpe.com/downloads/synergy.**

Overview



Front View – HPE Synergy 480 Gen10 Plus Compute Module

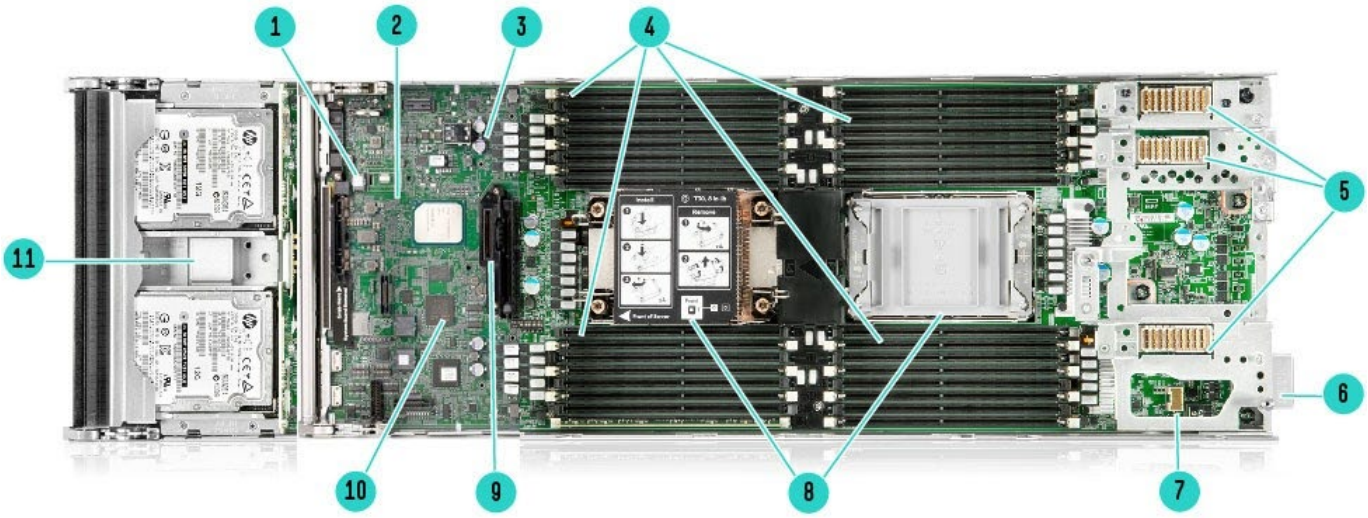
1. UID LED
2. Health Status LED
3. Mezzanine NIC status LED
4. Power On/Stand by button and system power LED
5. Compute Module handle release latch
6. Quick Access Panel
7. Removable drive cage[1]
8. Pull Out Label[2]

Notes:

– [1]Options for 2, 4 drive bays, drive less or single PCIe slot GPU options.

– [2]Tab used for ID information on product. External USB 3.0 connector & iLO USB connection (behind serial label pull tab)

Overview



Synergy 480 Gen10 Plus Compute Module
(Drive Cage removed)

1. Single microSD Slot
2. TPM connector[2]
3. USB 3.0[3]
4. Thirty Two (32) DDR4 DIMM memory slots[4]
5. Mezzanine connectors[5] (3 x16 PCIe 4.0)
6. Compute Module Power and Management connector
7. Smart Array Energy Pack connection
8. Up to two (2) Gen3 Intel® Xeon® Scalable Family processors
9. Connection point for Optional Drive Cage solutions[6]
10. iLO chipset[2]
11. Selectable front cage options[1]

Notes:

- [1]2x Drive bays(SAS/SATA), 4x Drive Bays(4x NVMe or 2x NVMe + 2x SAS/SATA), Drive less or Single PCIe Cage for select GPU options.
- [2]Under drive cage
- [3]Boot port under drive cage (mSD or USB)
- [4]16 per processor
- [5]3 x16 PCIe 4.0
- [6]Including Dual M.2 Boot Drive HW RAID1 Boot Solution. (HPE NS204i-d Gen10+ Boot Controller connects under drive cage)

Overview

ErP Lot9 Quick Summary

The European Parliament (ErP) is responsible for setting the ecological standards for products that are imported into the EU. The European Parliament Commission Regulation 2019/424 (also known as the ErP Lot 9 regulation) are a new set of product standards that deal with servers and data storage devices and goes into effect on March 1, 2020. Products that are not compliant with Lot 9 requirements cannot be imported into the European Union after March 1, 2020. For details see Tech Specs section of this document. See Configure to Order section for details on configurable options.

SY480 Gen10 Plus meets Lot9 in all configurations

For additional information, please visit: **https://www.hpe.com/us/en/about/environment/msds-specs-more.html** .

Documents provided by HPE: Lot 9 Declarations, White paper, and FAQ.

Platform Information

Form Factor

- Single Slot Blade – Half-Height

Chassis Types

- Single Compute chassis for CTO
- 2 SFF Drive Cage Option(CTO/BTO), same as in use for Gen10

System Fans

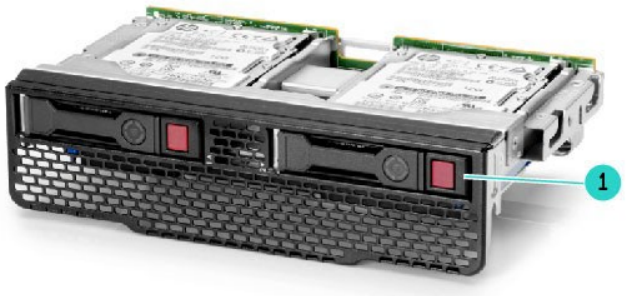
- Come with Frame by default and not this product.

Synergy Gen10 Plus – Front Cage Options

With introduction of Gen10 Plus, Synergy has moved to a single base chassis with multiple selectable drive and controller option kits. These options include multiple **Front Cage options** for boot, storage, or single system GPUs.

Notes:

- The Front Cage options are offered as factory installed and BTO options offered for later field updates.
- One of the below Drive Chassis options is required to ship to any customer
- This Drive Cage solution along with it options are available as a BTO option for either Gen10 or Gen10 Plus Compute Field installations/updates.



HPE SY480 Gen10 Plus Standard 2Drive Kit

1. SAS/SATA or uFF

Standard Features

Synergy Management

HPE Composer powered by OneView

Notes: Read and learn more about **OneView**

On Compute Management Chipset

HPE iLO 5 ASIC

Notes: Read and learn more in the **iLO QuickSpecs**

Processors

Synergy 480 Gen10 Plus is designed and consumes on Intel Xeon Scalable Family Generation 3 processors(x3xx)

Up to 2 of the following..

Notes:

- The 2nd digit of the processor model number "x3xx" is used to denote the processor generation (i.e. 3 = 3rd generation).
- This table covers the public Intel offering only.

For more information regarding Intel Xeon processors, please see the following: **http://www.intel.com/xeon**.

Intel Xeon Processor		
Processor Suffix	**Description**	**Offering**
N	NFV/Networking Optimized	SKUs specifically designed for NFV and networking workloads, such as: L3 fwding, 5G UPF, OVS DPDK, VPP FIB router, VPP IPsec, web server/NGINX, vEPC, vBNG, and vCMTS. SKUs have higher base frequency with lower TDPs to enable best performance/Watt Up to 4. TB addressable memory per socket
P	High performance IaaS	Optimized for orchestration efficiency, IaaS higher frequency for VM markets
S	Max SGX Enclave	Supports Software Guard Extensions maximum enclave size (512GB)
V	High VM Density	Optimized for orchestration efficency and high density, lower power VM environments
Y	Speed Select – Performance Profile	Intel® SST-PP (performance profile) provides the ability to set a guaranteed base frequency for a specific number of cores, and assign this performance profile to a particular application/workload to guarantee performance requirements. Also enables configuration of settings during runtime and provides additional frequency profile arrangement opportunities.
M		Optimized around AVX frequencies to deliver better performance/Watt around Media, AI and HPC workloads.

Notes:

- 4.0TB maximum RAM per socket.
- PCIe 4.0 lanes.
- 1.5 MB L3 cache/core, except on 6354 and 6346 processors (2.16 and 2.25 MB L3/core respectively).
- Intel SST-CP (Core Power)- Enables flexibility for workloads that benefit from higher base frequency on a subset of the processor's cores. While the max turbo frequency across the cores remain constant across the cores, a subset of the cores can be assigned as to run at a higher base frequency than specified, while the other cores run at lower base frequency.
- Intel SST-TF (Turbo Frequency)- Enables flexibility for workloads that benefit from higher turbo frequency on a subset of the processor's cores. While the base frequency remains constant across the cores, a subset of the cores can be assigned to run at a higher turbo frequency than specified, while the other cores run at lower turbo frequency.
- Intel SST-BF (Base Frequency)- Allows the configuration of a guaranteed higher base frequency, for a specific number of cores, to support those workloads and applications that are not optimized for turbo frequencies.
- Intel Speed select SST-BF, SST-TF, SST-CP supported on Gold and Platinum processors. Power Profile (SST-PP) only suppported on Y processors.

Standard Features

3rd Generation Intel® Xeon® Scalable Processor Family							
Intel Xeon Models	**CPU Frequency (GHZ)**	**Cores**	**L3 Cache (MB)**	**Power (Watts)**	**UPI Lanes (GT/s)**	**DDR4 (MT/s)**	**SGX Enclave size (GB)**
Gold 6330N Processor [1]	2.2	28	42	165	3 @ 11.2	2667	64

Notes:

- 8-channel DDR4 @ 3200 MT/s (lower DDR4 speed may be used in segment optimized processors (i.e. NFV, etc).
- 2 sockets capable, 3 UPI @ 11.2 GT/s.
- Advanced RAS, AVX-512 2 FMA, SGX 64GB, TME-MT 64 keys.
- Limited Support for all Optane 200 Series Memory
- [1]Deterministic base frequency rating only applicable for NFV workloads. Other workloads may see throttling.
- [2]Default Speed Select Performance Profile value.

3rd Generation Intel® Xeon® Scalable Processor Family							
Intel Xeon Models	**CPU Frequency (GHz)**	**Cores**	**L3 Cache (MB)**	**Power (Watts)**	**UPI Lanes (GT/s)**	**DDR4 (MT/s)**	**SGX Enclave size (GB)**
Gold 5318Y Processor	2.1 [3] 1.9 2.0	24[3] 24 22	36	165[3] 150 150	3 @ 11.2	2933	64
Gold 5318S Processor [1]	2.1 [3] 1.9 2.0	24[3] 24 22	36	165[3] 150 150	3 @ 11.2	2933	512
Gold 5318N Processor [1,2]	2.1 [3] 2.0	24[3] 20	36	150[3] 135	3 @ 11.2	2667	64
Gold 5317 Processor	3.0	12	18	150	3 @ 11.2	2933	64
Gold 5315Y Processor	3.2 [3] 3.2 3.4	8[3] 6 4	12	140[3] 125 115	3 @ 11.2	2933	64

Notes:

- 8-channel DDR4 @ 2933 MT/s (lower DDR4 speed may be used in segment optimized processors (i.e. NFV, etc).
- 2 sockets capable, 3 UPI @ 11.2 GT/s.
- Advanced RAS, AVX-512 2 FMA, SGX 64GB, TME-MT 64 keys.
- Limited Support all Intel Optane 200 Series Memory
- [1]Supports Intel® Speed Select Performance Profile (SST-P), even though not being a "Y" processor.
- [2]Deterministic base frequency rating only applicable for NFV workloads. Other workloads may see throttling.
- [3]Default Speed Select Performance Profile value.

Standard Features

3rd Generation Intel® Xeon® Scalable Processor Family							
Intel Xeon Models	**CPU Frequency (GHz)**	**Cores**	**L3 Cache (MB)**	**Power (Watts)**	**UPI Lanes**	**DDR4 (MT/s)**	**SGX Enclave size (GB)**
Silver 4316 Processor	2.3	20	30	150	2 @ 10.4	2667	8
Silver 4314 Processor [1]	2.4	16	24	135	2 @ 10.4	2667	8
Silver 4310 Processor	2.1	12	18	120	2 @ 10.4	2667	8
Silver 4309Y Processor	2.8 [2] 2.6 2.3	8[2] 8 8	12	105 [2] 95 85	2 @ 10.4	2667	8

Notes:

- 8-channel DDR4 @ 2667 MT/s.
- 2 sockets capable, 2 UPI @ 10.4 GT/s.
- Standard RAS, AVX-512 2 FMA, SGX 8GB, TME-MT 64 keys.
- [1]Does not support Intel Optain 200 Series Memory (working future resolution)
- [2]Default Speed Select Performance Profile value

Chipset

Intel C621A Chipset

Notes: For more information regarding Intel® chipsets, please see the following URL:
https://www.intel.com/content/www/us/en/products/chipsets/server-chipsets.html

System Management Chipset

HPE iLO 5 ASIC

Notes: Read and learn more in the **iLO QuickSpecs**.

Memory

Type	HPE DDR4 Smart Memory	Registered (RDIMM), Load Reduced (LRDIMM)
DDR4 DIMM Slots Available	32	16 DIMM slots per processor, 8 channels per processor, 2 DDR4 DIMMs per channel
Maximum capacity (LDIMM)	8.0 TB	32 x 256 GB LRDIMM @ 3200 MT/s
Maximum capacity (RDIMM)	2.0 TB	32 x 64 GB RDIMM @ 3200 MT/s
Maximum capacity (Optane & DDR4 Memory)	12.0 TB	16 x 512 GB Intel Persistent Memory 200 Series for HPE plus 16 x 256GB HPE DDR$ Memory

Notes:

- All processors support up to 4TB memory per socket.
- Mixing of RDIMM and LRDIMM memory is not supported.
- To realize the performance memory capabilities listed in this document, HPE DDR4 Smart Memory is required.
- For additional information, please see the **HPE DDR4 Smart Memory QuickSpecs**.
- Intel Persistent Memory 200 series only supported on Gold and Platinum Processors.
- For General Server Memory and Persistent Memory Population Rules and Guidelines for Gen10 Plus see details here: **http://www.hpe.com/docs/memory-population-rules**

Memory Protection

Memory RAS Technologies

HPE Fast Fault Memory

Notes: For information please refer to:

Standard Features

Memory RAS technologies for HPE ProLiant/Synergy/Blade Gen10 servers with Intel Xeon Scalable processors technical white paper

Advanced ECC

Advanced ECC uses single device data correction to detect and correct single and all multibit error that occurs within a single DRAM chip.

Online Spare

Memory online spare mode detects a rank that is degrading and switches operation to the spare rank.
Notes: For more information see our **Memory RAS feature technical whitepaper**.

Memory

One of the following depending on model

The following memory supports Intel® Xeon® Scalable Family processors 3nd generation (Models x3xx)

- HPE 8GB (1x8GB) Single Rank x8 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit
- HPE 32GB (1x32GB) Dual Rank x4 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit
- HPE 64GB (1x64GB) Dual Rank x4 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit

Notes: Important: Empty memory slots require DIMM Slot Blanks for improved thermal control. (HPE DDR-4 DIMM Blanks Kit, P07818-B21)

HPE memory from previous generation servers (DDR3) is not compatible with this compute module. HPE DDR4 Smart Memory is required to realize the memory performance improvements and enhanced functionality listed in this document for Gen10. Please see Memory Speed Tables for memory speed changes based on processors selected.

For additional information, please see the
HPE DDR4 Smart Memory QuickSpecs.

Notes:

- The 128 GB LRDIMM may not be mixed with other DIMM capacities/types.
- LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a compute module.

Memory Protection

- **Advanced ECC**
  Advanced ECC uses single device data correction to detect and correct single and all multibit error that occurs within a single DRAM chip.
- **Online Spare**
  Memory online spare mode detects a rank that is degrading and switches operation to the spare rank.
- **Online Mode**
  Memory Online Spare Mode (Rank Spare Mode)

Notes:

- For details on the HPE Server Memory Options RAS feature, visit: **http://www.hpe.com/docs/memory-ras-feature**
- For additional information, please see the **HPE Smart Memory QuickSpecs.**
- LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a compute module.
- For the latest information on **Memory Speed.**

If you want to know more about the memory, reference the **RAS feature whitepaper.**

System requirements

Notes: Hewlett Packard Enterprise recommends that you implement best practice configurations for high availability (HA) such as clustered configurations.

The following hardware components are required for a complete Synergy Solution:

- HPE SY480 Gen10 Plus with Third -generation Intel Xeon Scalable processors

Standard Features

- HPE DDR4 Standard Memory RDIMMs or LRDIMMs
- Boot and Storage solutions
- Network and IO Mezzanine
- Synergy 12000 Frame
  - Composer/OneView
  - Network and IO InterConnect Modules

Supported firmware versions:

- Latest System ROM version
- Server Platform Services (SPS) Firmware latest version
- HPE iLO Firmware latest version
- HPE Innovation Engine Firmware latest version.

Operating Systems and Virtualization Software Support for HPE Servers

HPE servers are designed for seamless integration with partner Operating Systems and Virtualization Software. By collaborating closely with our partners, we ensure that their products are optimized, certified, and fully supported within your HPE server environment.

Access the certified and supported servers for each of the OS and Virtualization software: **HPE Servers Support & Certification Matrices**

Client OS

With GPU Options Only

- Windows & Enterprise Client OS
- Red Hat Enterprise Linux Desktop/Workstation
- SLES Desktop (64 bit - includes XEN &KVM)

Notes: For Operating Systems tested with the GPU options, please see the Graphics Adapter QuickSpecs for details **https://h20195.www2.hpe.com/v2/getdocument.aspx?docname=a00016718enw**

Mezzanine Connectors (PCIe 4.0)

Three (3) I/O expansion mezzanine connectors:

- **Mezzanine 1 -- x16 PCIe 4.0 Type D**
  - Supports Type C and Type D mezzanine cards

  Notes: This mezzanine connector supports dual-port mezzanine cards: one port is routed to interconnect module bay 1 and the other to bay 4.
- **Mezzanine 2 -- x16 PCIe 4.0**
  - Supports Type C and Type D mezzanine cards

  Notes:
  - This mezzanine connector supports dual-port mezzanine cards: one port is routed to interconnect module bay 2 and the other to bay 5.
  - A second processor must be installed (in processor slot 2) to have access to mezzanine connector 2.
- **Mezzanine 3 -- x16 PCIe 4.0**
  - Supports Type C mezzanine cards

  Notes: This mezzanine connector supports dual-port mezzanine cards: one port is routed to interconnect module bay 3 and the other to bay 6.

Standard Features

Network & Storage Adapters or Mezzanine options include:

- HPE Synergy 4820C 10/20/25Gb CNA Converged Network Adapter
- HPE Synergy 6820C 25/50Gb CNA Converged Network Adapter
- HPE Synergy 5330C 32G Fibre Channel Host Bus Adapters

Notes: Please refer to the Fabric/Network Options Quick Specs for more details.

HPE Compute Module ROM

HPE ROM (read only memory) is now digitally signed using the HPE Corporate Signing Service. As part of the Secure Start, this signature is verified before the flash process starts, reducing accidental programming and preventing malicious efforts to corrupt system ROM.

HPE ROM provides for essential initialization and validation of hardware components before control is passed to the customer-installed operating system. The ROM also provides the capability of booting from various fixed media (HDD, CD-ROM) and removable media (USB), to continue operation to the operating system.

HPE ROM performs very early configuration of the video controller, to allow monitoring of initialization progress via an attached monitor. If configuration or hardware errors are discovered during this early phase of hardware initialization, suitable messages are now displayed on the connected monitor. Additionally, these configuration or hardware errors are logged to the Integrated Management Log (IML) to assist in diagnosis.

HPE Synergy Compute ROM is used to configure the following:

- Processor and chipset status registers
- System memory, memory map, and memory initialization
- System hardware configuration (integrated PCI devices and optional PCIe Mezzanine cards).
- Customer-specific BIOS configuration using the UEFI System Utilities.

Notes: For further information, please refer to the
https://support.hpe.com/hpsc/doc/public/display?docId=a00016407en_us en

Storage Drive cages and Controllers

One of the following depending on model

Drive Cage Options

HPE SY480 Gen10 Plus Standard 2Drive Kit

- Supports 2 SFF SAS or SATA Drives and/or up to 2 of the uFF Dual Drive options.
- Requires one E208i-c HBA

Software RAID Solutions

HPE Smart Array S100i SR Gen10 SW RAID

Notes:

- HPE Smart Array S100i SR Gen10 SW RAID is off by default and can be enabled RBSU.
- For legacy support select Legacy mode settings part, 758959-B22.

Performance RAID Controller

- HPE Smart Array P204i-c SR Gen10 12G SAS Modular Controller
  (4 internal lanes/1GB cache)

Notes: For more details on HPE Smart Array Controller solutions please see their **QuickSpecs**

Standard Features

Maximum Internal Storage		
Drive	**Capacity**	**Configuration**
Hot Plug SFF SAS SSD	30.6 TB	2 x 15.3 TB (with standard front SFF drive cage)

Interfaces

- One (1) internal USB 3.0 connector for USB flash media drive keys
  Notes: The above options are intended for integrated hypervisor virtualization environments.
- One (1) internal microSD connection for boot.
- External USB 3.0 Port for updates to Server Code.
- One (1) external USB 3.0 connector for USB flash media drive keys
- One external iLO Service Port

Frames

HPE Synergy 12000 Frame, is the base for all Synergy products and supports:

- Up to 12 half-height, 6 full-height single-wide, or 3 full-height double-wide Compute Modules (mixing allowed)
- Up to 5 half-height double-wide HPE Synergy D3940 Storage Modules (mixing with compute modules in any to any ratio allowed)
- One HPE Synergy 12000 Frame will support up to twelve (12) HPE Synergy 480 Gen10 Plus Compute Modules

Industry Standard Compliance

- Microsoft® Logo certifications
- WOL enabled on some adaptors
- PXE support enabled
- USB 3.0 Compliant; iLO USB 2.0 Compliant
- TPM 2.0 Support(RBSU support for TPM 1.2)
- IEEE (specific IEEE standards depending on Ethernet adapter card(s) installed)
- Advanced Encryption Standard (AES)
- Triple Data Encryption Standard (3DES)
- SNMP v3
- SSL 2.0
- DMTF Systems Management Architecture for Server Hardware Command Line Protocol (SMASH CLP)
- Active Directory v1.0
- PCIe 3.0 Compliant
- UEFI (Unified Extensible Firmware Interface Forum)
- Redfish API (iLO5)
- Energy Star Compliant
- Top Runner – Japan Compliant
- ErP Lot9 Compliant (see Technical Specifications see **HPE Environmental Declarations website** for HPE Lot9 Declarations, a White Paper, FAQs and products list of verified products.

Notes: See requirements at end of this document or in OCA for valid configurations to meet ErP Lot9 requirements.

Standard Features

Graphics (iLO)

Integrated Matrox G200eH2 video standard with 16 MB of Video RAM

- 1280 x 1024 (32 bpp)
- 1920 x 1200 (16 bpp)

HPE iLO 5 on system management memory

- 32 MB Flash
- 512 MB with ECC (224 MB after ECC and video)

HPE Server UEFI/Legacy ROM

Unified Extensible Firmware Interface (UEFI) is an industry standard that provides better manageability and more secured configuration than the legacy ROM while interacting with your server at boot time. HPE ProLiant Gen10 servers have a UEFI Class 2 implementation and support both UEFI Mode (default) and Legacy BIOS Mode.

Notes: The UEFI System Utilities tool is analogous to the HPE ROM-Based Setup Utility (RBSU) of legacy BIOS. For more information, please visit **https://support.hpe.com/hpsc/doc/public/display?docId=c04398276**
https://itpfdoc.hitachi.co.jp/manuals/ha8000v/hard/Gen10/UEFI/30-293E3364-104_en.pdf

UEFI enables numerous new capabilities specific to HPE Synergy Compute Modules such as:

- Secure Boot and Secure Start enable for enhanced security
- Operating system specific functionality
- Support for > 2.2 TB (using GPT) boot drives
- USB 3.0 Stack
- Embedded UEFI Shell
- Mass Configuration Deployment Tool using iLO RESTful API that is Redfish API Conformant.
- PXE boot support for IPv6 networks
- Workload Profiles for simple performance optimization
-

UEFI Boot Mode only:

- TPM 2.0 Support
- NVMe Boot Support
- Platform Trust Technology (PTT) can be enabled.
- iSCSI Software Initiator Support.
- HTTP/HTTPs Boot support as a PXE alternative.
- Boot support for option cards that only support a UEFI option ROM

Notes:

– For UEFI Boot Mode, boot environment and OS image installations should be configured properly to support UEFI.
– UEFI FIO Setting (758959-B22) can be selected to configure the system in Legacy mode in the factory for your HPE Synergy Gen10 Plus Server.

Standard Features

Embedded Management

HPE Synergy Composer powered by HPE OneView

HPE Synergy integrates HPE OneView to deliver 'Composable infrastructure' with a view of resources. This flexible and scalable solution provides IT managers with the architecture to implement their Software-Defined data center (SDDC) -- and to address the changing business needs and the challenges of today's enterprise data centers.

HPE Integrated Lights-Out (HPE iLO)

Silicon Root of Trust. Protect, detect, recover with iLO. Monitor your servers for ongoing management, service alerting, reporting and remote management with HPE iLO. Learn more at **http://www.hpe.com/info/ilo**.

UEFI

Configure and boot your servers securely with industry standard Unified Extensible Firmware Interface (UEFI). Learn more at **UEFI System Utilities (hpe.com)**

iLO RESTful API

iLO RESTful API is Redfish API conformance and offers simplified server management automation such as configuration and maintenance tasks based on modern industry standards. Learn more at **http://www.hpe.com/info/restfulapi**.

Security

Newest forms of security based on iLO 5 features.

- Secure Start, with hardware root of trust.
- HPE hardware designed logic in iLO chip validates iLO firmware burned in chip.
- iLO then validates system/compute ROM firmware for digital signature.
- iLO completes the chain of trust.
- ROM validates option ROMs and OS Bootloader via UEFI Secure Boot.

Standard security features

- Power-on password
- Administrator's password
- Keyboard password (QuickLock)
- HPE iLO Management On System Management Chipset with SSL encryption, Secure Shell version 2, Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface, AES and RC4 encryption of video
- External USB port enable/disable
- Network server mode
- Serial interface control
- TPM (Trusted Platform Module) 1.2 or 2.0 option
- Advanced Encryption Standard (AES)
- Intel® Advanced Encryption Standard-New Instructions (AES-NI)

Standard Features

About Trusted Platform Module

Trusted Platform Module (TPM) is a separate processor that monitors the system state. TPM is a passive component needing to be updated and not able to lock down any component in the system except access to its own memory. It also provides some cryptographic operations - among them: creating RSA keypairs, and working with them.

The first verification of signatures happens by code on the CPU, which can be intercepted and replaced. Emulating a "properly" booted system is possible by sending the right values to the TPM.

The bootblock, the part of the firmware that contains the first instructions executed by the CPU, comes first and anchors the root of trust. But if you can't trust the bootblock to send a truthful state into the TPM, this is a vulnerability.

About HPE Silicon Root of Trust

As soon as the server is powered on and the iLO firmware comes alive, it looks into the silicon for the immutable fingerprint that verifies all the firmware code is valid and uncompromised. Over a million lines of firmware code run before the operating system starts, making it vital to confirm that all server essential firmware is free from malware or compromised code.

During operation of the server, HPE has a new technology that conducts run-time firmware validation 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 iLO audit log alert is created to notify the customer that a compromised has occurred. It is achieved by storing iLO 5 and UEFI firmware in non-volatile Flash memory which is thoroughly scanned at regular user determined intervals. The contents of the firmware stored in memory must be exactly right, down to the individual bit, or else it is flagged as compromised. See the iLO 5 Quickspecs for recovery processes.

Warranty

This product is covered by a global limited warranty and supported by HPE Services and a worldwide network of HPE Authorized Channel Partners resellers. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Enhancements to warranty services are available through HPE Services operational services or customized service agreements. Hard drives have either a one year or three year warranty; refer to the specific hard drive QuickSpecs for details.

Notes: Server Warranty includes 3-Year Parts, 3-Year Labor, 3-Year Onsite support with next business day response. Warranty repairs may be accomplished through the use of Customer Self Repair (CSR) parts. These parts fall into two categories: 1) Mandatory CSR parts are designed for easy replacement. A travel and labor charge will result when customers decline to replace a Mandatory CSR part; 2) Optional CSR parts are also designed for easy replacement but may involve added complexity. Customers may choose to have Hewlett Packard Enterprise replace Optional CSR parts at no charge. Additional information regarding worldwide limited warranty and technical support is available at:
http://www.hpe.com/services/support.

Optional Features

Server Management

HPE OneView Advanced

HPE OneView 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. It provides full-featured licenses which can be purchased for managing Gen9, Gen10 and Gen10 Plus servers.

HPE iLO Advanced (standard with Synergy Compute)

HPE iLO Advanced licenses offer smart remote functionality without compromise. The license includes the full integrated remote console, virtual keyboard, video, and mouse (KVM), multi-user collaboration, console record and replay, and GUI-based and scripted virtual media and virtual folders. You can also activate the enhanced security and power management functionality

HPE iLO Advanced Premium (optional)

Security Edition for iLO 5 includes iLO Advanced License plus high-end security modes, unique security capabilities, like Automatic FW recovery; Runtime FW verification, and Secure erase.

Fibre Channel Support

Up to two (2) optional Fibre Channel mezzanine HBAs are supported on the HPE Synergy 480 Gen10.

- HPE Synergy 5330C 32G Fibre Channel Host Bus Adapters

Compatible SAN

HPE Synergy 480 Gen10 Plus Compute Modules are optimized for HPE MSA, Nimble, Primera, and Alletra.

HPE Virtual Connect

HPE Synergy composable fabric delivers high performance and composability for the delivery of applications and services. The composable fabric is based on primary/satellite architecture.

The HPE Virtual Connect SE 100Gb F32 Module or Virtual Connect SE 40Gb F8 Module, primary modules, based on composable fabric is designed for Composable Infrastructure. Its disaggregated, rack-scale design uses a primary/satellite architecture to consolidate data center network connections, reduce hardware and scales network bandwidth across multiple HPE Synergy Frames.

The primary module contains intelligent networking capabilities that extend connectivity to satellite frames through Interconnect Link Modules. This eliminates top of rack switch need and substantially reduces cost. The reduction in components also simplifies fabric management at scale while consuming fewer ports at the data center aggregation layer.

The HPE VC SE 100Gb F32 Module or HPE VC SE 40 Gb F8 module eliminate up to 95% of network sprawl at the compute module edge with one device that converges traffic inside frames and directly connects to external LANs. Each redundant pair of Virtual Connect modules provide eight adjustable downlink connections (six Ethernet and two Fibre Channel, or eight Ethernet) to dual-port 10 Gb and in case of 20 Gb Converged Network Adapters 16 adjustable downlinks connections 14 Ethernet and two Fibre Channel) on each compute module. Up to six uplinks using QSFP+ interfaces are available for connection to upstream Ethernet switches. Including splitter cables up to 24 uplinks are available for connection to upstream Ethernet and Fibre Channel. The HPE VC SE 100 Gb F32 or VC SE 40 Gb F8 module avoid the confusion of traditional and other converged network solutions by eliminating the need for multiple Ethernet and Fibre Channel switches, extension modules, cables and software licenses. Also, Virtual Connect wire-once connection management is built-in enabling compute modules adds, moves and replacement in minutes instead of days or weeks. The Primary/Satellite disaggregated architecture removes fixed of ratios of interconnects in every frame and allows extending networking resources pool for Virtual Connect to satellite frames.

For more information on Virtual Connect and converged network options, see **VC SE 40Gb F8 Module** **or** **HPE Virtual Connect SE 100Gb F32 Module for Synergy** for more details**.**

Optional Features

One Config Simple (SCE)

SCE is a guided self-service tool to help sales and non-technical people provide customers with initial configurations in 3 to 5 minutes. You may then send the configuration on for configuration help, or use in your existing ordering processes. If you require "custom" rack configuration or configuration for products not available in SCE.

Service and Support

HPE Services

No matter where you are in your digital transformation journey, you can count on HPE Services to deliver the expertise you need when, where and how you need it. From planning to deployment, ongoing operations and beyond, our experts can help you realize your digital ambitions.

https://www.hpe.com/services

Consulting Services

No matter where you are in your journey to hybrid cloud, experts can help you map out your next steps. From determining what workloads should live where, to handling governance and compliance, to managing costs, our experts can help you optimize your operations.

https://www.hpe.com/services/consulting

HPE Managed Services

HPE runs your IT operations, providing services that monitor, operate, and optimize your infrastructure and applications, delivered consistently and globally to give you unified control and let you focus on innovation.

HPE Managed Services | HPE

Operational services

Optimize your entire IT environment and drive innovation. Manage day-to-day IT operational tasks while freeing up valuable time and resources. Meet service-level targets and business objectives with features designed to drive better business outcomes.

https://www.hpe.com/services/operational

HPE Complete Care Service

HPE Complete Care Service is a modular, edge-to-cloud IT environment service designed to help optimize your entire IT environment and achieve agreed upon IT outcomes and business goals through a personalized experience. All delivered by an assigned team of HPE Services experts. HPE Complete Care Service provides:

- A complete coverage approach -- edge to cloud
- An assigned HPE team
- Modular and fully personalized engagement
- Enhanced Incident Management experience with priority access
- Digitally enabled and AI driven customer experience

https://www.hpe.com/services/completecare

HPE Tech Care Service

HPE Tech Care Service is the operational support service experience for HPE products. The service goes beyond traditional support by providing access to product specific experts, an AI driven digital experience, and general technical guidance to not only reduce risk but constantly search for ways to do things better. HPE Tech Care Service delivers a customer-centric, AI driven, and digitally enabled customer experience to move your business forward. HPE Tech Care Service is available in three response levels. Basic, which provides 9x5 business hour availability and a 2-hour response time. Essential which provides a 15-minute response time 24x7 for most enterprise level customers, and Critical which includes a 6-hour repair commitment where available and outage management response for severity 1 incidents.

https://www.hpe.com/services/techcare

Service and Support

HPE Lifecycle Services

HPE Lifecycle Services provide a variety of options to help maintain your HPE systems and solutions at all stages of the product lifecycle. A few popular examples include:

- Lifecycle Install and Startup Services: Various levels for physical installation and power on, remote access setup, installation and startup, and enhanced installation services with the operating system.
- HPE Firmware Update Analysis Service: Recommendations for firmware revision levels for selected HPE products, taking into account the relevant revision dependencies within your IT environment.
- HPE Firmware Update Implementation Service: Implementation of firmware updates for selected HPE server, storage, and solution products, taking into account the relevant revision dependencies within your IT environment.
- Implementation assistance services: Highly trained technical service specialists to assist you with a variety of activities, ranging from design, implementation, and platform deployment to consolidation, migration, project management, and onsite technical forums.
- HPE Service Credits: Access to prepaid services for flexibility to choose from a variety of specialized service activities, including assessments, performance maintenance reviews, firmware management, professional services, and operational best practices.

Notes: To review the list of Lifecycle Services available for your product go to:
https://www.hpe.com/services/lifecycle

For a list of the most frequently purchased services using service credits, see the **HPE Service Credits Menu**

Other Related Services from HPE Services:

HPE Education Services

Training and certification designed for IT and business professionals across all industries. Broad catalogue of course offerings to expand skills and proficiencies in topics ranging from cloud and cybersecurity to AI and DevOps. Create learning paths to expand proficiency in a specific subject. Schedule training in a way that works best for your business with flexible continuous learning options.
https://www.hpe.com/services/training

Defective Media Retention

An option available with HPE Complete Care Service and HPE Tech Care Service and applies only to Disk or eligible SSD/Flash Drives replaced by HPE due to malfunction.

Consult your HPE Sales Representative or Authorized Channel Partner of choice for any additional questions and services options.

Parts and Materials

HPE will provide HPE-supported replacement parts and materials necessary to maintain the covered hardware product in operating condition, including parts and materials for available and recommended engineering improvements.

Parts and components that have reached their maximum supported lifetime and/or the maximum usage limitations as set forth in the manufacturer's operating manual, product quick-specs, or the technical product data sheet will not be provided, repaired, or replaced as part of these services.

How to Purchase Services

Services are sold by Hewlett Packard Enterprise and Hewlett Packard Enterprise Authorized Service Partners:

- Services for customers purchasing from HPE or an enterprise reseller are quoted using HPE order configuration tools.
- Customers purchasing from a commercial reseller can find services at **https://ssc.hpe.com/portal/site/ssc/**

Service and Support

AI Powered and Digitally Enabled Support Experience

Achieve faster time to resolution with access to product-specific resources and expertise through a digital and data driven customer experience

Sign into the HPE Support Center experience, featuring streamlined self-serve case creation and management capabilities with inline knowledge recommendations. You will also find personalized task alerts and powerful troubleshooting support through an intelligent virtual agent with seamless transition when needed to a live support agent.
https://support.hpe.com/hpesc/public/home/signin

Consume IT On Your Terms

HPE GreenLake edge-to-cloud platform brings the cloud experience directly to your apps and data wherever they are—the edge, colocations, or your data center. It delivers cloud services for on-premises IT infrastructure specifically tailored to your most demanding workloads. With a pay-per-use, scalable, point-and-click self-service experience that is managed for you, HPE GreenLake edge-to-cloud platform accelerates digital transformation in a distributed, edge-to-cloud world.

- Get faster time to market
- Save on TCO, align costs to business
- Scale quickly, meet unpredictable demand
- Simplify IT operations across your data centers and clouds

To learn more about HPE Services, please contact your Hewlett Packard Enterprise sales representative or Hewlett Packard Enterprise Authorized Channel Partner. Contact information for a representative in your area can be found at "Contact HPE"
https://www.hpe.com/us/en/contact-hpe.html

For more information
http://www.hpe.com/services

Configuration Information

Notes:

- 2Drive Standard Backplane CTO Chassis is designed for flexible use of the Compute Module for most workloads. This SKU may use the SATA Board Option, or Smart Array options. This SKU may also use the Mezzanine MicroChip Smart RAID P416ie-m for connection to the HPE D3940 Storage Module. Links to local front drive only come with the 4x Drive Cage Module.
- The Drive-Less CTO option is intended for stateless on SAN/NAS boot use cases and will supports the MicroChip Smart RAID P416ie-m x16 Lanes 2GB Cache SAS 12G Controller for HPE mezzanine Smart Array for Synergy D3940 Storage Modules. Additional, this model supports adding the HPE NS204i-d SY Gen10+ Boot Controller for dual M.2 drive HW RAID options. This SKU may also use the Mezzanine MicroChip Smart RAID P416ie-m for connection to the HPE D3940 Storage Module (no connection to the M.2 Module).
- The 4 Drive Premium Backplane CTO option supports 4 NVMe drives Direct Connect to the Front Drive cage. This option may be converted to a 2x2 drive option with 2x SATA/SAS drives may be optionally supported in the Front Drive Cage through SAS Cable connection to new MicroChip Smart RAID P416ie-m x16 Lanes 2GB Cache SAS 12G Controller for HPE which may also connect with the D3940 Storage Module.
- Optional NS204i-d Gen10+ Boot Controller is a Direct Connect to PCIe from the processor and contains 2 M.2 480GB capacity drive included for Hardware RAID Boots. This option resides below the front drive cages and allows for dual configurations with most drive cage options.
- [1]HPE offers multiple Trade Agreement Act (TAA) compliant configurations to meet the needs of US Federal Government customers. These products are either manufactured or substantially transformed in a designated country.

Step 1: Base Configuration

HPE Synergy 480 Gen10 Plus CTO Compute Module	P22139-B21
HPE Synergy 480 Gen10 Plus TAA CTO Compute Module	P22139-B22

Step 2: Choose your Boot, Drive Cage and Controller Options

Option 1: Front Drive Cage	
HPE SY480 Gen10 Plus Standard 2Drive Kit.	P36675-B21
Optional Controllers for above Drive Cage:	
HPE Smart Array P204i-c SR Gen10 (4 Internal Lanes/1GB Cache) 12G SAS Modular Controller	804424-B21

Step 3: Choose Required Options

Please select up to two matching processors.

Notes:

- Mixing of 2 different processor models is not supported.
- CTO server includes appropriate heatsinks with your selection of 1 or 2 processors.
- For Single processors DIMM blanks kit (P07818-B21) recommended with processors to enhance cooling.

Processor Option Kits

3rd Generation Intel® Xeon®-Platinum

Notes:

- All SKUs below ship with appropriate heatsinks.
- 3200 MT/S maximum memory speed unless otherwise noted.
- 64GB SGX Enclave unless otherwise noted.

Configuration Information

3rd Generation Intel® Xeon®-Gold

Notes:

- All SKUs below ship with appropriate heatsinks.
- 3200 MT/S maximum memory speed unless otherwise noted.
- 64GB SGX Enclave unless otherwise noted.

Intel Xeon-Gold 6330N 2.2GHz 28-core 165W Processor for HPE — P37604-B21

Notes: 2667 MT/s max. memory speed.

Intel Xeon-Gold 5318Y 2.1GHz 24-core 165W Processor for HPE — P36924-B21

Notes:

- 24/24/22 cores would result in 2.1/1.9/2.0 GHz operating points at 165W/150W/150W TDPs.
- 2933 MT/s max. memory speed.

Intel Xeon-Gold 5318S 2.1GHz 24-core 165W Processor for HPE — P37612-B21

Notes:

- Supports Intel® Speed Select Performance Profile (SST-P), even though not being a “Y” processor.
- 24/20 cores would result in 2.1/2.0 GHz operating points at 150W/135W TDPs.
- 2933 MT/s max. memory speed.

Intel Xeon-Gold 5318N 2.1GHz 24-core 150W Processor for HPE — P37605-B21

Notes:

- Supports Intel® Speed Select Performance Profile (SST-P), even though not being a “Y” processor.
- 24/24/22 cores would result in 2.1/1.9/2.0 GHz operating points at 165W/150W/150W TDPs.
- 2667 MT/s max. memory speed.

Intel Xeon-Gold 5317 3.0GHz 12-core 150W Processor for HPE — P36931-B21

Notes: 2933 MT/s max. memory speed.

Intel Xeon-Gold 5315Y 3.2GHz 8-core 140W Processor for HPE — P36930-B21

Notes:

- 8/6/4 cores would result in 3.2/3.2/3.4 GHz operating points at 140W/125W/115W TDPs.
- 2933 MT/s max. memory speed.

3rd Generation Intel Xeon-Silver

Notes:

- All SKUs below ship with processor and appropriate heatsinks.
- 2666 MT/S maximum memory speed.
- 8GB SGX Enclave unless otherwise noted.

Intel Xeon-Silver 4316 2.3GHz 20-core 150W Processor for HPE — P36923-B21

Intel Xeon-Silver 4314 2.4GHz 16-core 135W Processor for HPE — P36922-B21

Notes: Intel Optane 200 Series persistent memory not supported with 43xx Series except 4314 processor.

Intel Xeon-Silver 4310 2.1GHz 12-core 120W Processor for HPE — P36921-B21

Intel Xeon-Silver 4309Y 2.8GHz 8-core 105W Processor for HPE — P36920-B21

Notes: 8/8/8 cores would result in 2.8/2.6/2.3 GHz operating points at 105W/95W/85W TDPs.

Configuration Information

Step 4: Choose Memory Options

Please select one or more memory DIMMs from below.

For new Gen10 Plus memory population rule whitepaper and optimal memory performance guidelines, please go to: **http://www.hpe.com/docs/memory-population-rules**

For Gen10 Plus memory speed table, please go to: **https://www.hpe.com/docs/memory-speed-table**

For memory Reliability, Accessibility, Serviceability (RAS) features whitepaper like Gen10 Plus Fast Fault Tolerance and legacy mirrored memory feature etc. please go to: **http://www.hpe.com/docs/memory-ras-feature.**

Notes:

- The maximum memory speed and capacity is a function of the memory type, memory configuration, and processor model.
- Quantity of memory DIMMs selected per socket must be 1, 2, 4, 6, 8, 12 or 16.
- For additional information, please see the **HPE DDR4 Smart Memory QuickSpecs**

Registered DIMMs (RDIMMs)

HPE 8GB (1x8GB) Single Rank x8 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit	P07525-B21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit	P06033-B21
HPE 64GB (1x64GB) Dual Rank x4 DDR4-3200 CAS-22-22-22 Registered Smart Memory Kit	P06035-B21
HPE DDR4 DIMM Blank Kit	P07818-B21

Notes:

- Important: Empty memory slots require DIMM Slot Blanks for improved thermal control. (HPE DDR-4 DIMM Blanks Kit, P07818-B21)
- HPE memory from previous generation servers (DDR3) is not compatible with this compute module. HPE Smart Memory is required to realize the memory performance improvements and enhanced functionality listed in this document for SY480 Gen10 Plus. For additional information, please see the **HPE Smart Memory QuickSpecs .**
- LRDIMM and RDIMM are distinct memory technologies and cannot be mixed within a compute module.
- For the latest information on **Memory Speed.**
- If you want to know more about the memory, reference the **RAS feature whitepaper**.
- See Server Memory and Persistent Memory Population Rules for details.

Server Memory and Persistent Memory Population Rules for HPE Gen10 Plus servers with 3rd Gen Intel Xeon Scalable Processors technical white paper

For additional information regarding HPE Persistent Memory Population Rules and Guidelines for Gen10 Plus visit: **http://www.hpe.com/docs/memory-population-rules**

Step 5: Choose Networking Adapters

Notes: Only one or more of the following from each list unless otherwise noted

HPE Synergy 4820C 10/20/25Gb Converged Network Adapter	876449-B21
HPE Synergy 6820C 25/50Gb Converged Network Adapter	P02054-B21

Notes: Networking adapters must have matched Interconnect Modules or Interconnect Links matched in the corresponding ICM slot on the rear of the Synergy 12000 Frame. See Specifications Section below for Mezzanine to ICM Best Practices and matching requirements.

Step 6: Additional Factory Integratable Options

HPE Storage Controllers

HPE FIO Enable Smart Array SW RAID	784308-B21

Configuration Information

HPE Smart Array P204i-c SR Gen10 (4 Internal Lanes/1GB Cache) 12G SAS Modular Controller	804424-B21
HPE Smart Storage Hybrid Capacitor with 260mm Cable Kit	P02381-B21

Notes: New MicroChip Smart RAID P416ie-m manages the drives in the HPE D3940 Synergy Storage Module(40 Frame shared drives) amd is for SATA/SAS drive use with Front 4 Drive Premium Cage module (2x local drives). For more information on the 4 Drive Premium Cage with SAS Cable defined, see the Drive Cage sections of documents above.

HPE I/O Expansion Options

HPE Synergy 6820C 25/50Gb Converged Network Adapter	P02054-B21
HPE Synergy 4820C 10/20/25Gb Converged Network Adapter	876449-B21
HPE Synergy 5330C 32Gb Fibre Channel Host Bus Adapter	870828-B21

Notes: See Specfications sections below for Best Practices and requirements for options placement in correct mezzanine slots that match with Interconnect model slotting for correct operations.

Step 7: Choose additional options for Factory Integration from Additional Options sections below or the following:

- HPE Synergy 12000 Frame QuickSpecs
  https://www.hpe.com/h20195/v2/GetHtml.aspx?docname=c04815113
- HPE Synergy Interconnect and Mezzanine Components QuickSpecs
  https://www.hpe.com/h20195/v2/GetHtml.aspx?docname=c04815110
  https://www.hpe.com/h20195/v2/GetHtml.aspx?docname=c04815110
- HPE Synergy D3940 Storage Module QuickSpecs
  https://www.hpe.com/h20195/v2/GetHtml.aspx?docname=c04815141

Step 8: Choose from Pointnext Services for HPE Synergy

HPE Synergy Operational Services

HPE 5Y Tech Care Essential Service	HU4A6A5
HPE 5Y Tech Care Critical Service	HU4A3A5
HPE 5Y Complete Care Addon Essential Service	HU4D5A5
HPE 5Y Complete Care Addon Critical Service	HU4D2A5

Additional Options

Additional Options Available

Notes: wDMR, Defective Media Retention; cDMR, Comprehensive Defective Media Retention

HPE 3Y Tech Care Basic Service	HU4B2A3
HPE 3Y Tech Care Basic with Defective Media Retention Service	HU4B3A3
HPE 3Y Tech Care Basic with Comprehensive Defective Material Retention Service	HU4B4A3
HPE 3Y Complete Care Addon Basic Service	HU4D8A3
HPE 3Y Complete Care Addon Basic with Defective Media Retention Service	HU4D9A3
HPE 3Y Complete Care Addon Basic with Comprehensive Defective Material Retention Service	HU4E0A3
HPE 3Y Tech Care Essential Service	HU4A6A3
HPE 3Y Tech Care Essential with Defective Media Retention Service	HU4A7A3
HPE 3Y Tech Care Essential with Comprehensive Defective Material Retention Service	HU4A8A3
HPE 3Y Complete Care Addon Essential Service	HU4D5A3
HPE 3Y Complete Care Addon Essential with Defective Media Retention Service	HU4D6A3
HPE 3Y Complete Care Addon Essential with Comprehensive Defective Material Retention Service	HU4D7A3
HPE 3Y Tech Care Critical Service	HU4A3A3
HPE 3Y Tech Care Critical with Defective Media Retention Service	HU4A4A3
HPE 3Y Tech Care Critical with Comprehensive Defective Material Retention Service	HU4A5A3
HPE 3Y Complete Care Addon Critical Service	HU4D2A3
HPE 3Y Complete Care Addon Critical with Defective Media Retention Service	HU4D3A3
HPE 3Y Complete Care Addon Critical with Comprehensive Defective Material Retention Service	HU4D4A3
HPE 4Y Tech Care Basic Service	HU4B2A4
HPE 4Y Tech Care Basic with Defective Media Retention Service	HU4B3A4
HPE 4Y Tech Care Basic with Comprehensive Defective Material Retention Service	HU4B4A4
HPE 4Y Complete Care Addon Basic Service	HU4D8A4
HPE 4Y Complete Care Addon Basic with Defective Media Retention Service	HU4D9A4
HPE 4Y Complete Care Addon Basic with Comprehensive Defective Material Retention Service	HU4E0A4
HPE 4Y Tech Care Essential Service	HU4A6A4
HPE 4Y Tech Care Essential with Defective Media Retention Service	HU4A7A4
HPE 4Y Tech Care Essential with Comprehensive Defective Material Retention Service	HU4A8A4
HPE 4Y Complete Care Addon Essential Service	HU4D5A4
HPE 4Y Complete Care Addon Essential with Defective Media Retention Service	HU4D6A4
HPE 4Y Complete Care Addon Essential with Comprehensive Defective Material Retention Service	HU4D7A4
HPE 4Y Tech Care Critical Service	HU4A3A4
HPE 4Y Tech Care Critical with Defective Media Retention Service	HU4A4A4
HPE 4Y Tech Care Critical with Comprehensive Defective Material Retention Service	HU4A5A4
HPE 4Y Complete Care Addon Critical Service	HU4D2A4
HPE 4Y Complete Care Addon Critical with Defective Media Retention Service	HU4D3A4
HPE 4Y Complete Care Addon Critical with Comprehensive Defective Material Retention Service	HU4D4A4
HPE 5Y Tech Care Basic Service	HU4B2A5
HPE 5Y Tech Care Basic with Defective Media Retention Service	HU4B3A5
HPE 5Y Tech Care Basic with Comprehensive Defective Material Retention Service	HU4B4A5

Additional Options

HPE 5Y Complete Care Addon Basic Service	HU4D8A5
HPE 5Y Complete Care Addon Basic with Defective Media Retention Service	HU4D9A5
HPE 5Y Complete Care Addon Basic with Comprehensive Defective Material Retention Service	HU4E0A5
HPE 5Y Tech Care Essential Service	HU4A6A5
HPE 5Y Tech Care Essential with Defective Media Retention Service	HU4A7A5
HPE 5Y Tech Care Essential with Comprehensive Defective Material Retention Service	HU4A8A5
HPE 5Y Complete Care Addon Essential Service	HU4D5A5
HPE 5Y Complete Care Addon Essential with Defective Media Retention Service	HU4D6A5
HPE 5Y Complete Care Addon Essential with Comprehensive Defective Material Retention Service	HU4D7A5
HPE 5Y Tech Care Critical Service	HU4A3A5
HPE 5Y Tech Care Critical with Defective Media Retention Service	HU4A4A5
HPE 5Y Tech Care Critical with Comprehensive Defective Material Retention Service	HU4A5A5
HPE 5Y Complete Care Addon Critical Service	HU4D2A5
HPE 5Y Complete Care Addon Critical with Defective Media Retention Services	HU4D3A5
HPE 5Y Complete Care Addon Critical with Comprehensive Defective Material Retention Service	HU4D4A5

HPE Drives

Notes:

- The HPE Synergy 480 Gen10 Plus Compute Module supports the HPE hot-plug small form factor (SFF) Smart Drive carrier for enhanced management and reduced maintenance errors. HPE drives from generation G7 servers and before are not compatible with the HPE Synergy 480 Gen10 drive bays.
- The mixing of standard SAS drives with SAS SSD is supported within the compute module, but limits the RAID configuration to two separate RAID 0 volumes. Mixing of other drives types is not supported.
- HPE drives have either a one year or three year warranty; refer to the specific drive QuickSpecs for details. **HPE Hard Disk Drives** or **HPE Solid State Drives**
- The drive options are not required when configuring a drive-less model.

HPE Synergy 480 Gen10 Plus Compute Module support all small form factor (SFF) SAS and SATA HDDs and SSDs currently certified in HPE Smart Carriers. Any exceptions to this qualification will be listed on this page by drive description and part number.

SATA Drives (listed by capacity)

HPE 1TB SATA 6G Business Critical 7.2K SFF SC 1-year Warranty HDD	655710-B21

SAS Drives (listed by Capacity)

HPE 2TB SAS 12G Business Critical 7.2K SFF SC 1-year Warranty 512e HDD	765466-B21
HPE 2.4TB SAS 12G Mission Critical 10K SFF SC 3-year Warranty 512e Multi Vendor HDD	881457-B21
HPE 300GB SAS 12G Mission Critical 10K SFF SC 3-year Warranty Multi Vendor HDD	872475-B21
HPE 600GB SAS 12G Mission Critical 10K SFF SC 3-year Warranty Multi Vendor HDD	872477-B21
HPE 1.2TB SAS 12G Mission Critical 10K SFF SC 3-year Warranty Multi Vendor HDD	872479-B21
HPE 1.8TB SAS 12G Mission Critical 10K SFF SC 3-year Warranty 512e Multi Vendor HDD	872481-B21
HPE 300GB SAS 12G Mission Critical 15K SFF SC 3-year Warranty Multi Vendor HDD	870753-B21
HPE 600GB SAS 12G Mission Critical 15K SFF SC 3-year Warranty Multi Vendor HDD	870757-B21
HPE 900GB SAS 12G Mission Critical 15K SFF SC 3-year Warranty Multi Vendor HDD	870759-B21
HPE 960GB SAS 12G Read Intensive SFF SC Value SAS Multi Vendor SSD	P36997-B21

Additional Options

Drive Qualification Exceptions:

At this time there are no exceptions to list.

HPE Security

HPE Trusted Platform Module 2.0 Gen10 Plus Black Rivets Kit	P13771-B21
HPE Gen10 TPM 1.2 FIO Setting	872108-B21
HPE iLO Common Password FIO Setting	P08040-B21

Notes:

- The TPM (Trusted Platform Module) is a microcontroller chip that can securely store artifacts used to authenticate the server platform. These artifacts can include passwords, certificates and encryption keys. Windows® BitLocker™ Drive Encryption (BitLocker) is a data protection feature available in Windows Server® 2012. BitLocker leverages the enhanced security capabilities of a Trusted Platform Module (TPM) version 1.2. The TPM works with BitLocker to help protect user data and to ensure that a server running Windows Server 2012 has not been tampered with while the system was offline.
- For more information about **TPM.**
- HPE Synergy OS pre-installed units will come with the partition required for TPM deployment.
- The TPM key is unique to every TPM deployed server and must be retained. Misplacing or losing the key could result in data loss.

HPE Networking Mezzanine CNA's

Notes:

- The compute module requires a minimum of one (1) mezzanine network adapter.
- Mezzanine network adapters can be installed in any mezzanine connector. Hewlett Packard Enterprise best practice is to install the first network adapter in mezzanine connector 3 to facilitate installation of Type C and D mezzanines in mezzanine connectors 1 or 2

HPE Synergy 4820C 10/20/25Gb Converged Network Adapter	876449-B21
HPE Synergy 6820C 25/50Gb Converged Network Adapter	P02054-B21

HPE Fibre Channel

HPE Synergy 5330C 32Gb Fibre Channel Host Bus Adapter	870828-B21

HPE Storage Controllers

HPE Synergy Compute Chipset SATA FIO Board Kit	872955-B21
HPE Smart Array P204i-c SR Gen10 (4 Internal Lanes/1GB Cache) 12G SAS Modular Controller	804424-B21
HPE Smart Storage Hybrid Capacitor with 260mm Cable Kit	P02381-B21

Notes:

- Contains 2x M.2 NVMe 480GB Drives
- HPE Smart Array S100i SR Gen10 SW RAID is off by default and can be enabled RBSU.
- HPE NS204i-d Gen10Plus Boot Controller (includes 2x 480GB M.2 22110 SSDs – does not work with SY480 Gen10). For use with SY480 Gen Plus product only.
- Premium Backplane Modules, CTO offers a Premium Backplane Compute Module for use with 4 NVMe drives in front drive cage. Also, supports MicroChip Smart RAID P416ie-m SAS Controller for HPE with HPE SY480 Gen10+ SlimSAS Cable Opt Kit (P29010-B21) connections allowing it to manage 2x SATA/SAS drives and with Backplane Direct Connect support 2x NVMe drives in front drive cage. The MicroChip Smart RAID P416ie-m also supports/manages the HPE D3940 Storage Module.

Memory

Memory Subsystem Architecture

Each processor socket contains eight memory channels that support two DIMMs each for a total of 16 DIMM per installed processor or a grand total of thirty two (32) DIMMs for the compute module with 2 processors..

Memory Population Rules and Guidelines

- A minimum of one DIMM is required per processor.
- Install DIMMs only if the corresponding processor is installed.
- If only one processor is installed in a two processor system, only half of the DIMM slots are available.
- DIMM sizes can be mixed in channel. To maximize performance, it is recommended to balance the total memory capacity between all installed processors and to load the channels similarly whenever possible.
- LRDIMM and RDIMMs are all distinct memory technologies and cannot be mixed within a compute module.
- DIMMs of different speeds may be mixed in any order; the compute module will select a common optimal speed.
- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- The maximum memory capacity is a function of the memory type and number of installed processors.
- HPE memory from previous generation servers is not compatible with the HPE Synergy 480 Gen10 Plus Compute Module – Carrier Grade Supplement.

To realize the performance memory capabilities listed in this document, HPE Smart Memory is required. For additional information, please see the **HPE DDR4 Smart Memory QuickSpecs**

Synergy 480 Gen10 Compute Module Memory Tables

Memory Speed Table for Memory used with Intel Scalable Family Gen3 Processors		
	Register DIMM (RDIMM)	
HPE SKU P/N	P07525-B21	P06033-B21
SKU Description	HPE 8GB 1Rx8 PC4-3200AA-R Memory Kit	HPE 32GB 2Rx4 PC4-3200AA-R Memory Kit
DIMM Rank ->	Single Rank (1R)	Dual Rank (2R)
DIMM Capacity ->	8GB	32GB
Voltage	1.2V	1.2V
DRAM depth [bit]	1G	2G
DRAM Width [bit]	x8	x4
DRAM Density	8Gb	8Gb
CAS Latency	22-22-22	22-22-22
DIMM Native Speed (MT/s)	3200	3200
Max Capacity GB	256	1024

Memory

	Register DIMM (RDIMM)				
HPE Server Memory speed (MT/s): Intel® Xeon® Platinum/Gold 83xx/63xx processors					
1 DIMM Per Channel	3200	3200	3200	3200	3200
2 DIMM Per Channel (HPE)	3200	3200	3200	3200	3200
HPE Server Memory speed (MT/s): Intel Xeon Gold 53xx processors					
1 DIMM Per Channel	2933	2933	2933	2933	2933
2 DIMM Per Channel	2933	2933	2933	2933	2933
HPE Server Memory speed (MT/s): Intel Xeon Silver 43xx processors					
1 DIMM Per Channel	2666	2666	2666	2666	2666
2 DIMM Per Channel	2666	2666	2666	2666	2666

Memory Speed Table for Memory used with Intel Scalable Family Gen3 Processors	
	Register DIMM (RDIMM)
HPE SKU P/N	P06035-B21
SKU Description	HPE 64GB 2Rx4 PC4-3200AA-R Memory Kit
DIMM Rank ->	Dual Rank (2R)
DIMM Capacity ->	64GB
Voltage	1.2V
DRAM depth [bit]	4G
DRAM Width [bit]	X4
DRAM Density	16Gb
CAS Latency	22-22-22
DIMM Native Speed (MT/s)	3200
Max Capacity GB	2048
1 DIMM Per Channel	3200
2 DIMM Per Channel (HPE)	3200
HPE Server Memory speed (MT/s): Intel Xeon Gold 53xx processors	
1 DIMM Per Channel	2933
2 DIMM Per Channel	2933
HPE Server Memory speed (MT/s): Intel Xeon Silver 43xx processors	
1 DIMM Per Channel	2666
2 DIMM Per Channel	2666

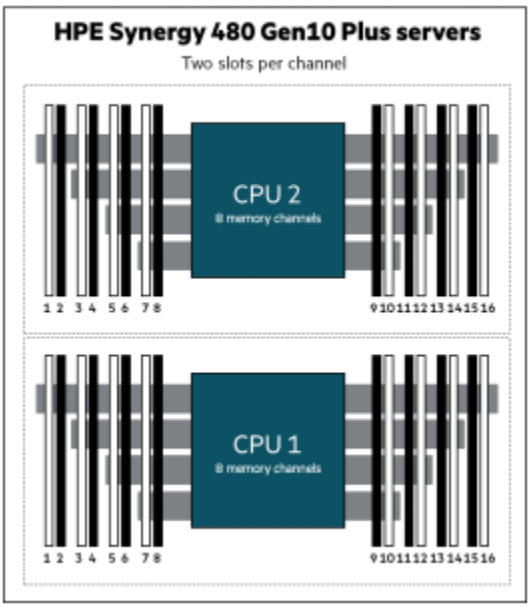
Notes:

- The maximum memory speed is a function of the memory type, memory configuration, and processor model.
- The information contained herein is subject to change without notice. HPE Confidential. Not for customer viewing. Do not distribute.

Memory

Memory Population Rules and Guidelines

Drawing showing SY480 Plus system board layout for processors and memory.



Population guidelines for HPE Smart Memory DIMMs in HPE Synergy 480 Gen10 Plus Compute Modules

HPE Synergy 480 Gen10 Plus Compute Modules have twelve DIMM slots per CPU.

Table: Population guidelines for HPE Smart Memory DIMMs in HPE Synergy 480 Gen10 Plus Compute Modules

HPE Synergy 480 Gen10 Plus servers per CPU DIMM population order																
CPU 1																
1 DIMM														14		
2 DIMMs			3											14		
4 DIMMs			3				7			10				14		
6 DIMMs	1		3				7			10				14		16
8 DIMMs	1		3		5		7			10		12		14		16
12 DIMMs*	1	2	3	4			7	8	9	10			13	14	15	16
12 DIMMs**	1		3	4	5		7	8	9	10		12	13	14		16
16 DIMMs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
CPU 2																
1 DIMM			3													
2 DIMMs			3											14		
4 DIMMs			3				7			10				14		
6 DIMMs	1		3				7			10				14		16
8 DIMMs	1		3		5		7			10		12		14		16
12 DIMMs*	1	2	3	4			7	8	9	10			13	14	15	16
12 DIMMs**	1		3	4	5		7	8	9	10		12	13	14		16
16 DIMMs	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

Memory

Notes:

- *Supported for 6-way interleave.
- **Unbalanced: Supported for SNC 2, 2-/4-/8-way interleave.
- Cells without entries represent configurations not supported, and if populated, the server may result in non-optimal memory performance or other unexpected behavior.

For more information or additional DIMM configurations go to:
https://h20195.www2.hpe.com/v2/getdocument.aspx?docname=a00017079enw

Population Guidelines for HPE Smart Memory DIMMs.

For data-intensive workloads where latency and capacity are key considerations, HPE Synergy servers deliver faster data access at a reasonable price point when equipped with HPE Persistent Memory 128, 256, or 512 GB modules featuring Intel Optane 200 Persistent Memory. This new persistent memory offering, based on phase-change memory technology, must be included alongside HPE Smart Memory DIMMs.

DIMMs and HPE Persistent Memory modules are installed in specific configurations based on the workload requirements of the server. Supported configurations are optimized for persistent memory capacity, volatile memory capacity, and performance.

- Persistent memory capacity—the available capacity is equal to the HPE Persistent Memory capacity.

Volatile memory capacity

- App Direct (1 LM) mode—the volatile capacity is equal to the DIMM capacity.
- Memory (2 LM) mode—the volatile capacity is some or all of the HPE Persistent Memory capacity.

Performance

- Uses all channels to efficiently utilize processor resources.
- Memory (2 LM) mode—more regular DIMMs provide a better cache ratio.

HPE Synergy 480 Gen10 Plus servers per CPU DIMM population order

CPU 1

Mode	DDR4+ PMem	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15	Slot 16
AD, MM	4+4	D		P		D		P			P		D		P		D
AD	6+1	D		D				D			D		P		D		D
AD	8+1	D		D		D		D			D		D	P	D		D
AD, MM	8+4	D		D	P	D		D	P	P	D		D	P	D		D
AD, MM	8+8	D	P	D	P	D	P	D	P	P	D	P	D	P	D	P	D
AD	12+2	P		D	D	D	D	D	D	D	D	D	D	D	D		P

CPU 2

Mode	DDR4+ PMem	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6	Slot 7	Slot 8	Slot 9	Slot 10	Slot 11	Slot 12	Slot 13	Slot 14	Slot 15	Slot 16
AD, MM	4+4	D		P		D		P			P		D		P		D
AD	6+1	D		D		P		D			D				D		D
AD	8+1	D		D	P	D		D			D		D		D		D
AD, MM	8+4	D		D	P	D		D	P	P	D		D	P	D		D
AD, MM	8+8	D	P	D	P	D	P	D	P	P	D	P	D	P	D	P	D
AD	12+2	P		D	D	D	D	D	D	D	D	D	D	D	D		P

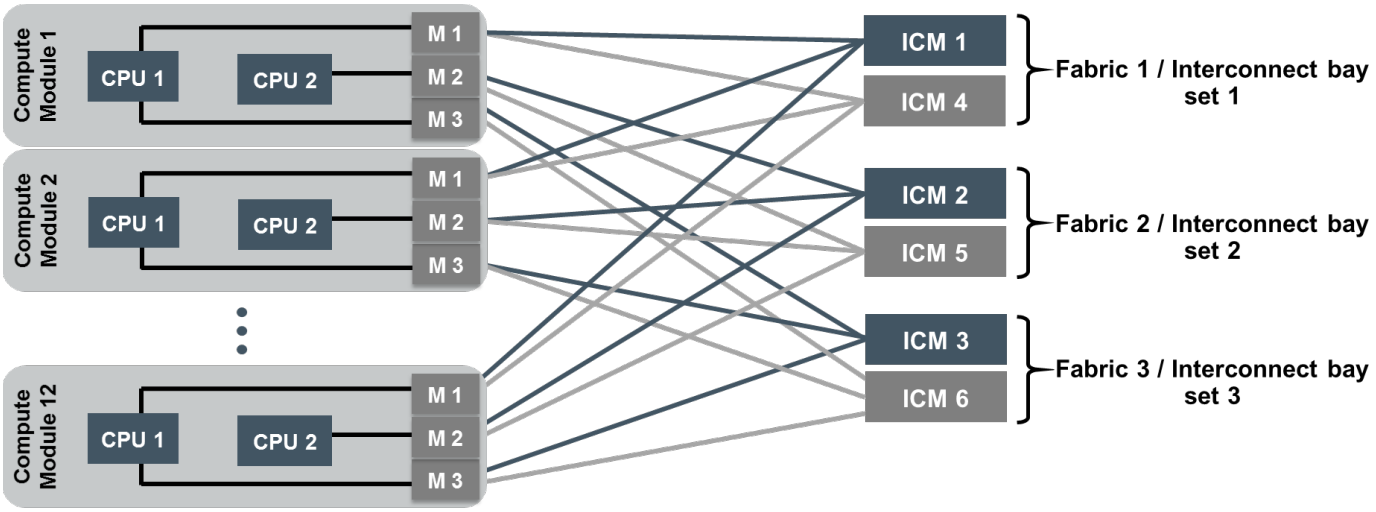
Notes:

- Persistent Memory (P)
- DIMMs (D)

Memory

- App Direct mode (AD)
- Memory mode (MM)
- P07525-B21 – HPE 8GB 1Rx8 3200 RDIMM does not support pairing with Intel Optane PMem 200 series for HPE

Internal Fabric Routing



Japan Top Runner Report

Energy Efficiency

Target Fiscal Year is set to be FY2021 for server-type computers	
Manufacture Name	Hewlett Packard Enterprise Company
Product Name	HPE Synergy 480 Gen 10 Plus
HDD Information	HPE / EH000900JWCPN
CPU Model Information	Intel / Silver 4309Y
Number of Memory DIMMs	16
Memory DIMM Size (GB)	8
Processor Type	X86
Number of CPU Sockets	2
Category	B (2)
SERT Efficiency Score	22.4
Target	11.9

Technical Specifications

System Unit

Dimensions (H x W x D)

With Bezel

- 6.35 x 21.4 x 60.0 cm
- 2.5 x 8.43 x 23.62 in

Weight (approximate)

- 8.16 kg / 18 lb
  Maximum: all processors, 24 DIMMs, drives, mezzanine cards, and one flash cache battery installed)
- 6.57 kg / 14.5 lb
  Minimum: one processor and 1 DIMM installed

Power Specifications

For power specifications including input requirements, BTU rating, and power supply output, please see the HPE Synergy Frame QuickSpecs.

To review typical system power ratings use the HPE Power Advisor which is available via the online tool located at **http://www.hpe.com/info/hpepoweradvisor.**

System Inlet Temperature

- Operating: 10°C to 35°C (50°F to 95°F)
  - The upper limit may be limited by the type and number of options installed.
  - System performance may be reduced if operating with a fan fault.
- Non-operating: -30C to 60C (-22F to 140F).
- Standard Operating Temperature 10° to 35°C (50° to 95°F) at sea level with an altitude derating of 1.0°C per every 305 m (1.8°F per every 1000 ft) above sea level to a maximum of 3050 m (10,000 ft), no direct sustained sunlight. Maximum rate of change is 20°C/hr (36°F/hr). The upper limit and rate of change may be limited by the type and number of options installed.

  System performance during standard operating support may be reduced if operating with a fan fault or above 30°C (86°F).
- Extended Ambient Operating Temperature For approved hardware configurations, the supported system inlet range is extended to be: 5° to 10°C (41° to 50°F) and 35° to 40°C (95° to 104°F) at sea level with an altitude derating of 1.0°C per every 175 m (1.8°F per every 574 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: http://www.hpe.com/servers/ashrae For approved hardware configurations, the supported system inlet range is extended to be: 40° to 45°C (104° to 113°F) at sea level with an altitude derating of 1.0°C per every 125 m (1.8°F per every 410 ft) above 900 m (2953 ft) to a maximum of 3050 m (10,000 ft). The approved hardware configurations for this system are listed at the URL: **http://www.hpe.com/servers/ashrae**

  System performance may be reduced if operating in the extended ambient operating range or with a fan fault.
- Non-operating -30° to 60°C (-22° to 140°F). Maximum rate of change is 20°C/hr (36°F/hr

Extended Ambient Operating Support

Qualifications for extended ambient configurations are detailed at: **https://www.hpe.com/servers/ASHRAE**

Technical Specifications

Relative Humidity (non-condensing)

- Operating: 10% to 90% @ 28C (82.4F)
- Non-operating: 5% to 95% @ 38.7C (101.7F)

Acoustic Noise

For acoustic noise specifications, please see the HPE Synergy 12000 Frame QuickSpecs.

Notes:

- For technical information on the controllers for this product, visit the HPE Smart Array E208i-c SR Gen10 (8 Internal Lanes/No Cache) 12G SAS Modular Controller **QuickSpecs.**
- For technical information on the controllers for this product, visit the HPE Smart Array P204i-c SR Gen10 (4 Internal Lanes/1GB Cache) 12G SAS Modular Controller **QuickSpecs**.
- For technical information on the controllers for this product, visit the MicroChip Smart RAID P416ie-m x16 Lanes 2GB
- Cache SAS 12G Controller for HPE Mezzanine Controller **QuickSpecs.**

Network Options QuickSpecs/Details:

- For information on the HPE Smart Array S100i SR Gen10 Controller please refer to their **QuickSpecs**.
- For information on the HPE Smart Array E208i-c SR Gen10 Controller please refer to their **QuickSpecs**.
- For information on the HPE Smart Array P204i-c SR Gen10 Controller please refer to their **QuickSpecs**.
- For information on the MicroChip Smart RAID P416ie-m x16 Lanes 2GB Cache SAS 12G Controller for HPE please refer to their **QuickSpecs**
- Support for Network Partitioning (NPAR) when using Pass-thru modules. **http://h20195.www2.hpe.com/v2/redirect.aspx?/products/quickspecs/15418_div/15418_div.PDF**

ErP Lot9

The European Parliament (ErP) is responsible for setting the ecological standards for products that are imported into the EU. The European Parliament Commission Regulation 2019/424 (also known as the ErP Lot 9 regulation) are a new set of product standards that deal with servers and data storage devices and goes into effect on March 1, 2020. Products that are not compliant with Lot 9 requirements cannot be imported into the European Union after March 1, 2020. For details see Tech Specs section of this document. See Configure to Order section for details on configurable options.

For additional information, please visit: **https://www.hpe.com/us/en/about/environment/msds-specs-more.html .**
Documents provided by HPE: Lot 9 Declarations, White paper, and FAQ.

Environment-friendly Products and Approach - End-of-life Management and Recycling

Hewlett Packard Enterprise offers **End-of-life product return, Trade-in, and Recycling programs**, in many geographic areas, for our products. Products returned to Hewlett Packard Enterprise will be recycled, recovered or disposed of in a responsible manner.

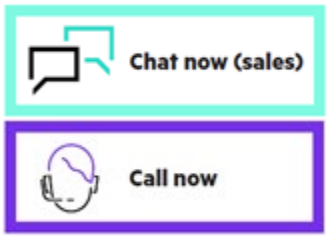
The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard Enterprise web site. These instructions may be used by recyclers and other WEEE treatment facilities as well as Hewlett Packard Enterprise OEM customers who integrate and re-sell Hewlett Packard Enterprise equipment.

Summary of Changes

Date	Version History	Action	Description of Change
16-Sep-2024	Version 3	Changed	Operating Systems information was updated.
08-Jan-2024	Version 2	Changed	Service and Support section was updated
05-Dec-2022	Version 1	Created	New QuickSpecs

Copyright

Make the right purchase decision.
Contact our presales specialists.



Get updates

© Copyright 2024 Hewlett Packard Enterprise Development LP. The information contained herein is subject to change without notice. The only warranties for Hewlett Packard Enterprise products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. Hewlett Packard Enterprise shall not be liable for technical or editorial errors or omissions contained herein.

Intel® and Xeon® are registered trademarks of Intel Corporation in the U.S. and other countries. Microsoft®, Windows®, and Windows Server® are U.S. registered trademarks of the Microsoft group of companies.

Hewlett Packard Enterprise

For hard drives, 1GB = 1 billion bytes. Actual formatted capacity is less

a50004318enw - 16922 - Worldwide - V3 - 16-September-2024