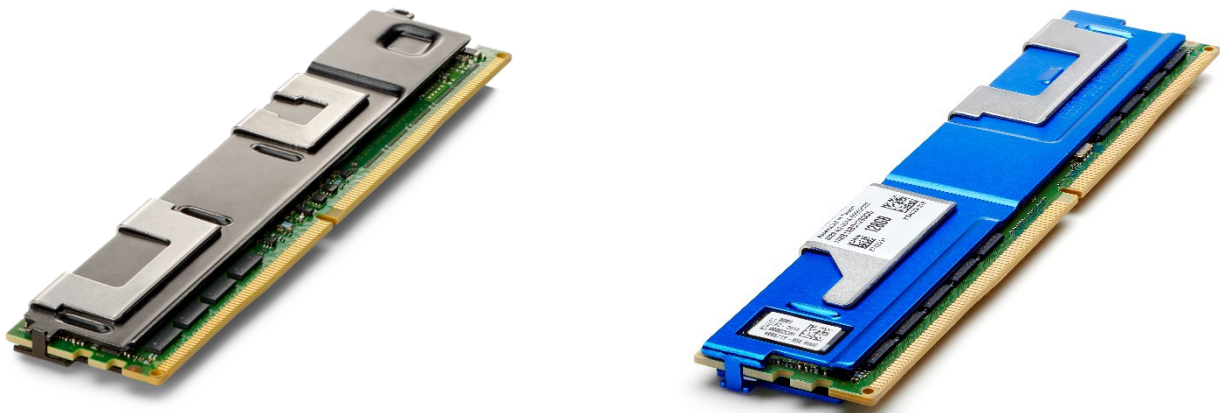## Overview

Intel® Optane® Persistent Memory for HPE

Do you need to increase the performance of your data center database and analytics applications?

With traditional storage technology not always able to keep pace with today's demanding workloads, customers are looking for solutions that provide faster access to their data so they can make quicker business decisions and achieve business outcomes in real time. This means bottlenecks that restrict that data flow must be removed so customers can access, analyze, and act on data more quickly to gain competitive advantage, thus increasing revenue and/or lowering total cost of ownership.

Intel® Optane™ persistent memory 100 series for HPE and Intel® Optane™ persistent memory 200 series for HPE

What's new:
- New HPE ProLiant optimized for data-intensive workloads and featuring Intel® Optane™ persistent memory 200 series for HPE
- 128 GB, 256 GB, 512 GB capacities Support on third-generation Intel Xeon Scalable processors

Models

Intel Optane 128GB persistent memory 100 Series for HPE	835804-B21
Intel Optane 256GB persistent memory 100 Series for HPE	835807-B21
Intel Optane 512GB persistent memory 100 Series for HPE	835810-B21
Intel Optane 128GB persistent memory 200 Series for HPE	P23532-B21
Intel Optane 256GB persistent memory 200 Series for HPE	P23535-B21

Notes:
– Intel Optane persistent memory 100 series for HPE
– Supported on select HPE ProLiant Gen10 servers with second-generation Intel Xeon Scalable processors (DL360, DL380, DL560, DL580), Apollo 2000 Gen10, Apollo 4200 Gen10, and HPE Synergy Gen10 Compute Modules (SY480 and SY660) includes configure-to-order support.
– Intel Optane persistent memory 100 series for HPE supported with select second-generation Intel Xeon Scalable Series Processors ONLY (82xx/62xx/62xxR/52xx/52xxR/4215) and can only be mixed with either RDIMMs or LRDIMMs.
– For configurations exceeding 1 TB/socket, the "M" series (2 TB/socket) or "L" series processors (4.5 TB/socket) are required.
– Intel Optane persistent memory 200 series for HPE
– Intel Optane persistent memory 200 series for HPE supported with select third-generation Intel Xeon Scalable Series Processors ONLY (83xx/63xx*/53xx) and can only be mixed with either RDIMMs or LRDIMMs.

Overview

   *6330 processor will only support 2933 MT/s @ 2DPC
− Intel Xeon Scalable 8380 Processor cannot be selected with 16 x Intel Optane 512GB persistent memory 200 Series for HPE and 16 x HPE 256GB 8Rx4 PC4-3200AA-L 3DS Smart Memory (P06039-X21)

XXXXXX**-X21** is SKU designation formed by a common six digit part number and a **-X21** suffix that identifies a SKU that is available across multiple server family lines. Refer to the table below to find the SKU suffix that applies to the specific server product line this option can be ordered with.

-B21	-H21	-K21
COMPUTE Server Line	**SPECIALIZED COMPUTE Server Line**	**STORAGE Line**
HPE Cloudline CL2100/CL2200/CL2800/CL3100/CL4100/CL5200/CL5800 Servers HPE Composable Cloud for ProLiant DL HPE ProLiant BL460c/BL660c Servers HPE ProLiant DL20/DL160/DL180 Servers HPE ProLiant DL325/DL360/DL380/DL385/DL560/DL580 Servers HPE ProLiant DX360/DX380 Servers HPE ProLiant MicroServer HPE ProLiant for Microsoft Azure Stack HPE ProLiant ML30/ML110/ML350 Servers HPE Synergy 480/660 Systems HPE ProLiant DX170r/DX190r, DX2000 Servers HPE ProLiant DX560 Gen10 server HPE ProLiant DX4200 Gen10 server	HPE Apollo 35/40/70 Systems HPE Apollo 2000/6000 Servers HPE XL170r/XL190r/XL270d (Apollo 6500) Gen10 Server for BlueData Software HPE Converged System 300/500/700/750 HPE Edgeline Systems and Servers HPE Integrity BL860c i6/BL870c i6/BL890c i6 Server Blades HPE Integrity MC990 X Server HPE Integrity rx2800 i6 Server HPE Integrity Superdome HPE SGI 8600 System HPE Solutions for SAP HANA (TDI)	HPE Apollo 4200 Gen9/Gen10 Servers HPE Apollo 4200 Gen10 LFF Server for BlueData Software HPE Apollo 4510 Gen10 System HPE D2220sb/D2500sb Storage Blade HPE D3000/D6020/D8000 Disk Enclosures HPE Scalable Object Storage with Scality RING HPE SimpliVity 2600 HPE SimpliVity 325/380 Gen10 HPE Storage File Controllers HPE StoreEasy 1460/1560/1650/1660/1860 Disclaimer: This may not be a complete listing of applicable servers

Standard Features

Modes of Operation
New class of memory that can be configured as either large server memory or fast storage
- Flexibility to deploy as dense memory or fast storage
- Single technology used as memory or storage reducing datacenter complexity

Solutions Designed Around Your Business Workloads
Intel Optane persistent memory for HPE is designed around industry applications and workloads to deliver the persistence of storage to complete hardware and software ecosystem providing a comprehensive persistent memory solution for your business

Optimized for HPE servers, including select ProLiant and BladeSystem servers and Synergy Compute Modules.
Intel Optane persistent memory 100 series for HPE is supported on HPE Gen10 servers featuring second-generation Intel Xeon processors

Intel Optane persistent memory 100 series for HPE is supported on the following Gen10 servers:

- HPE ProLiant Gen10: DL360, DL380, DL560 and DL580
- HPE Synergy Gen10: SY480 and SY660
- HPE Apollo 2000 Gen10: XL170r and XL190r
- HPE Apollo 4200 Gen10
- HPE Apollo 4510 Gen10

Intel Optane persistent memory 200 series for HPE is supported on HPE Gen10 Plus servers featuring third-generation Intel Xeon processors

Intel Optane persistent memory 200 series for HPE is supported on the follow Gen10 Plus servers:
- HPE ProLiant Gen10 Plus: DL360 and DL380
- HPE Synergy Gen10 Plus: SY480
- HPE Apollo 2000 Gen10 Plus: XL220 (only Intel Optane 512GB persistent memory 200 series for HPE is supported)
- HPE Apollo 4x00 Gen10 Plus

Standard Features

Operating Systems

Intel Optane persistent memory 100 series for HPE
- Microsoft Windows Server 2012 R2 (HPE driver)
- Microsoft Windows Server 2016 (HPE driver)
- Microsoft Windows Server 2019
- Red Hat Enterprise Linux 7.6
- Red Hat Enterprise Linux 8.0
- SUSE Linux Enterprise Server 12 SP4
- SUSE Linux Enterprise Server 15 SP1
- SUSE Linux Enterprise Server 15 (with SUSE-SU-2019:0224-1 kernel update)
- VMware 6.7 U1

Intel Optane persistent memory 200 series for HPE
- Microsoft Windows Server 2016 (HPE driver)
- Microsoft Windows Server 2019
- Red Hat Enterprise Linux 7.9
- Red Hat Enterprise Linux 8.2
- Red Hat Enterprise Linus 8.3
- SUSE Linux Enterprise Server 12 SP5
- SUSE Linux Enterprise Server 15 SP2
- VMware 7.0 U2

Warranty

For details on our worldwide limited warranty and technical support for HPE ProLiant and IA-32 servers and options.
http://h17007.www1.hpe.com/us/en/enterprise/servers/warranty

Other Resources

For information regarding HPE Persistent Memory visit: **http://www.hpe.com/info/persistentmemory**
For the latest updates on HPE Server Options visit: **http://www.hpe.com/info/serveroptions**

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
www.hpe.com/services

Technical Specifications

Intel Optane 128GB persistent memory 100 Series for HPE (835804-B21)	
Capacity	128GB
Height	1.23 in (3.13 cm)
Length	5.25 in (13.34 cm)
Interface	DDR-T
Transfer Rate Synchronous	2666 MT/s
Maximum Power	18W
Intel Optane 256GB persistent memory 100 Series for HPE (835807-B21)	
Capacity	256GB
Height	1.23 in (3.13 cm)
Length	5.25 in (13.34 cm)
Interface	DDR-T
Transfer Rate Synchronous	2666 MT/s
Maximum Power	18W
Intel Optane 512GB persistent memory 100 Series for HPE (835810-B21)	
Capacity	512GB
Height	1.23 in (3.13 cm)
Length	5.25 in (13.34 cm)
Interface	DDR-T
Transfer Rate Synchronous	2666 MT/s
Maximum Power	18W
Intel Optane 128GB persistent memory 200 Series for HPE (P23532-B21)	
Capacity	128GB
Height	1.23 in (3.23 cm)
Length	5.25 in (13.34 cm)
Interface	DDRT
Transfer Rate Synchronous	3200 MT/s
Maximum Power	18W (15W sustained)
Intel Optane 256GB persistent memory 200 Series for HPE (P23535-B21)	
Capacity	256GB
Height	1.23 in (3.23 cm)
Length	5.25 in (13.34 cm)
Interface	DDRT
Transfer Rate Synchronous	3200 MT/s
Maximum Power	18W (15W sustained)
Intel Optane 512GB persistent memory 200 Series for HPE (P23538-B21)	
Capacity	512GB
Height	1.23 in (3.23 cm)
Length	5.25 in (13.34 cm)
Interface	DDRT-2
Transfer Rate Synchronous	3200 MT/s
Maximum Power	18W (15W sustained)

Maximum Usage Limitations

PBW (Petabyte Written – 10^{15} bytes) based on bandwidth and media endurance considerations over 5 years lifetime assuming maximum bandwidth at stated power level for 24/7, 365 days per year.

	Write endurance specifications for Intel Optane persistent memory 100 series for HPE		
	128 GB	256 GB	512 GB

Technical Specifications

	15 W	18 W	15 W	18 W	15 W	18 W
Endurance 100% Writes 256B	292 PBW	N/A	363 PBW	505 PBW	300 PBW	458 PBW
Endurance 100% Writes 64B	91 PBW	N/A	91 PBW	126 PBW	75 PBW	114 PBW

PBW (Petabyte Written – 10^{15} bytes) based on bandwidth and media endurance considerations over 5 years lifetime assuming maximum bandwidth at stated power level for 24/7, 365 days per year.

	Write endurance specifications for Intel Optane persistent memory 200 series for HPE		
	128 GB	256 GB	512 GB
	15 W	15 W	15 W
Endurance 100% Writes 256B	292 PBW	497 PBW	410 PBW
Endurance 67% Read; 33% Write 256B	224 PBW	297 PBW	242 PBW
Endurance 100% Writes 64B	73 PBW	125 PBW	103 PBW
Endurance 67% Read; 33% Write 64B	56 PBW	74 PBW	60 PBW

Data Retention

Intel Optane persistent memory 100 series for HPE

Stress	Criteria	Accelerated Condition
10 full module write cycles	40 °C 5 years	85 °C 260 hours
100% endurance used	40 °C 3 months	85 °C 13 hours
Capacity	128 GB, 256 GB, and 512 GB	
Native Speed (MT/s)	2,666	
Non-volatile media	3D XPoint	
Max number of PMEMs	2s (12) and 4s (24)	
Max NVDIMM capacity (single server)	**Standard Processor** 2 TB (2s) and 4 TB (4s), **M-Processor** 4 TB(2s) and 8 TB(4s), **L-Processor** 6 TB(2s) and 12 TB(4s)	
Compatible DIMM Types	RDIMMs and LRDIMMs	
What's included in kit	Intel Optane 128GB PMem 100 for HPE or Intel Optane 256GB PMem 100 for HPE or Intel Optane 512GB PMem 100 for HPE	
Imperial Dimensions (W x D x H)	5.25 in x .32 in x 1.23 in	
Metric Dimensions (W x D x H)	13.34 cm x .81 cm x 3.13 cm	
Imperial Weight	1.87 oz	
Metric Weight	53 ± 2 g	

Intel Optane persistent memory 200 series for HPE

Stress	Criteria	Accelerated Condition
10 full module write cycles	40 °C 5 years	85 °C 260 hours
100% endurance used	40 °C 3 months	85 °C 13 hours
Capacity	128 GB, 256 GB, and 512 GB	
Native Speed (MT/s)	3,200	
Non-volatile media	3D XPoint	
Max number of PMEMs	2s (16)	
Max NVDIMM capacity (single server)	**Standard Processor** 8 TB (2s)	
Compatible DIMM Types	RDIMMs and LRDIMMs	

Technical Specifications

What's included in kit	Intel Optane 128GB PMem 200 for HPE or Intel Optane 256GB PMem 200 for HPE or Intel Optane 512GB PMem 200 for HPE
Imperial Dimensions (W x D x H)	5.25 in x .31 in x 1.23 in
Metric Dimensions (W x D x H)	13.34 cm x .79 cm x 3.13 cm
Imperial Weight	1.9 oz
Metric Weight	54 ± 2 g

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.
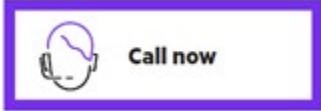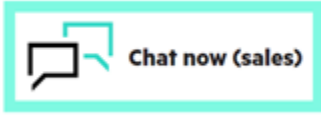
Summary of Changes

Date	Version History	Action	Description of Change
04-Dec-2023	Version 10	Changed	Service and Support Section was updated
01-Nov-2021	Version 9	Changed	Service and Support Section was updated
07-Jun-2021	Version 8	Changed	Technical Specifications Section was updated
04-May-2021	Version 7	Changed	Models Section was updated
06-Apr-2021	Version 6	Changed	Technical Specifications Section was updated
17-Aug-2020	Version 5	Changed	SKUs names were updated
17-Feb-2020	Version 4	Changed	Models Section was updated
12-Aug-2019	Version 3	Changed	Models Section was updated
01-Jul-2019	Version 2	Changed	Technical Specifications Section was updated
03-Jun-2019	Version 1	New	New QuickSpecs

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