Overview

HPE DDR5 Smart Memory

As CPU core counts continue to increase, bandwidth per core cannot continue to scale with DDR4. New memory architectures are required to meet next-generation bandwidth per core requirements in x86 CPUs.? With the changing landscape of ever-increasing CPU core counts, DDR5 was designed to increase bandwidth delivered to systems.?
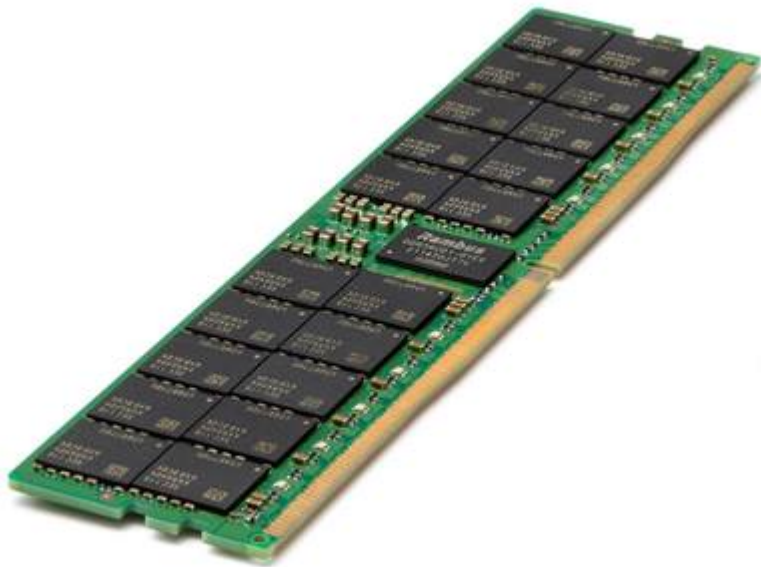
DDR5 is the latest evolution in DRAM, delivering a long list of new features designed to increase reliability, availability, and serviceability (RAS); reduce power; and dramatically improve performance - all features that modern data centers require.?

Advanced workloads resulting from rapidly expanding datasets and compute-intensive applications have fueled processor core count growth which will be bandwidth-starved by current DDR4 DRAM technology over time.? DDR5, the most technologically advanced DRAM to date, will enable the next generation of server workloads by delivering as much as an 85% increase in memory performance.? DDR5 doubles memory density while improving reliability at a time when data center system architects seek to supply rapidly growing processor core counts with increased memory bandwidth and capacity.?

The need for higher bandwidth and density has been posing a huge challenge for the tech industry, and DDR5 is the new standard that is expected to meet these requirements for years to come.?

HPE DDR5 Smart Memory delivers great performance, reliability, and efficiency. Our large selection of server memory solutions provides the compatibility, capacity and bandwidth you need to productively manage your expanding workload with HPE ProLiant Gen11 servers, Apollo family servers, Synergy systems, and Blade systems. ?

As workloads grow and data center trends such as server virtualization, cloud computing, and the use of large database applications increase the need for higher-capacity memory with greater uptime, the quality and reliability of DRAM become ever more important. HPE Smart Memory goes through additional rigorous qualification and testing processes that unlock extended memory performance features available only with HPE Gen11 servers. This extensive testing ensures that HPE server memory is completely compatible with and optimized for HPE servers.

HPE DDR5 Smart Memory

What's New

- HPE DDR5 Smart Memory 5600 MT/s memory supported on HPE Gen11 Intel based servers

?

Models

Overview

Registered Memory Kits - Intel based Servers

HPE 16GB (1x16GB) Single Rank x8 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P43322-B21
HPE 16GB (1x16GB) Single Rank x8 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P43322-K21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P43328-B21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P43328-K21
HPE 64GB (1x64GB) Dual Rank x4 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P43331-B21
HPE 64GB (1x64GB) Dual Rank x4 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P43331-K21
HPE 96GB (1x96GB) Dual Rank x4 DDR5-4800 CAS-46-45-45 EC8 Registered Smart Memory Kit	P66675-B21
HPE 128GB (1x128GB) Dual Rank x4 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P69974-B21
HPE 128GB (1x128GB) Dual Rank x4 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P69974-K21
HPE 128GB (1x128GB) Quad Rank x4 DDR5-4800 CAS-46-39-39 EC8 Registered 3DS Smart Memory Kit	P43334-B21
HPE 128GB (1x128GB) Quad Rank x4 DDR5-4800 CAS-46-39-39 EC8 Registered 3DS Smart Memory Kit	P43334-K21
HPE 256GB (1x256GB) Octal Rank x4 DDR5-4800 CAS-46-39-39 EC8 Registered 3DS Smart Memory Kit	P43337-B21
HPE 256GB (1x256GB) Octal Rank x4 DDR5-4800 CAS-46-39-39 EC8 Registered 3DS Smart Memory Kit	P43337-K21
HPE 16GB (1x16GB) Single Rank x8 DDR5-5600 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64705-B21
HPE 16GB (1x16GB) Single Rank x8 DDR5-5600 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64705-K21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-5600 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64706-B21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-5600 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64706-K21
HPE 64GB (1x64GB) Dual Rank x4 DDR5-5600 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64707-B21
HPE 64GB (1x64GB) Dual Rank x4 DDR5-5600 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64707-K21
HPE 96GB (1x96GB) Dual Rank x4 DDR5-5600 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64708-B21
HPE 96GB (1x96GB) Dual Rank x4 DDR5-5600 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64708-K21
HPE 128GB (1x128GB) Dual Rank x4 DDR5-5600 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69976-B21
HPE 128GB (1x128GB) Quad Rank x4 DDR5-5600 CAS-52-45-45 EC8 Registered 3DS Smart Memory Kit	P64709-B21
HPE 128GB (1x128GB) Quad Rank x4 DDR5-5600 CAS-52-45-45 EC8 Registered 3DS Smart Memory Kit	P64709-K21
HPE 256GB (1x256GB) Octal Rank x4 DDR5-5600 CAS-52-45-45 EC8 Registered 3DS Smart Memory Kit	P64710-B21

Unregistered Memory Kits - Intel based Servers

Overview

HPE 16GB (1x16GB) Single Rank x8 DDR5-4800 CAS-40-39-39 Unbuffered Standard Memory Kit	P64336-B21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-4800 CAS-40-39-39 Unbuffered Standard Memory Kit	P64339-B21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69727-B21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69727-H21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69727-K21
HPE 64GB (1x64GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69728-B21
HPE 64GB (1x64GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69728-H21
HPE 64GB (1x64GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69728-K21
HPE 96GB (1x96GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69729-B21
HPE 96GB (1x96GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69729-H21
HPE 96GB (1x96GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69729-K21
HPE 128GB (1x128GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69730-B21
HPE 128GB (1x128GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69730-H21
HPE 128GB (1x128GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P69730-K21

Notes:

– Memory DIMM availability for a specific server platform is dependent upon completion of certification testing.

– Memory compatibility may vary or be limited within a specific server family depending upon the specific configuration being requested.? Because each server environment and requirements can vary, memory compatibility is based not only upon the server family, but may also be affected by the amount and type of additional hardware options installed within a specific server configuration.? For this reason, some HPE memory DIMMs may be qualified for a server model or family and yet occasionally not be supported with limited configurations within that server family.

– Please consult with the HPE server QuickSpecs or your HPE representative if you have any questions regarding memory compatibility with a specific HPE server configuration.

?

Models	
Registered Memory Kits - AMD based Servers	
HPE 16GB (1x16GB) Single Rank x8 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P50309-B21
HPE 32GB (1x32GB) Single Rank x4 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P50310-B21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P50311-B21
HPE 64GB (1x64GB) Dual Rank x4 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P50312-B21

Overview

HPE 96GB (1x96GB) Dual Rank x4 DDR5-4800 CAS-46-45-45 EC8 Registered Smart Memory Kit	P66676-B21
HPE 128GB (1x128GB) Dual Rank x4 DDR5-4800 CAS-40-39-39 EC8 Registered Smart Memory Kit	P69982-B21
HPE 128GB (1x128GB) Quad Rank x4 DDR5-4800 CAS-46-39-39 EC8 Registered 3DS Smart Memory Kit	P50313-B21
HPE 256GB (1x256GB) Octal Rank x4 DDR5-4800 CAS-46-39-39 EC8 Registered 3DS Smart Memory Kit	P50314-B21
HPE 16GB (1x16GB) Single Rank x8 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64984-B21
HPE 16GB (1x16GB) Single Rank x8 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64984-K21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64985-B21
HPE 32GB (1x32GB) Dual Rank x8 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64985-K21
HPE 64GB (1x64GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64986-B21
HPE 64GB (1x64GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64986-K21
HPE 96GB (1x96GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64987-B21
HPE 96GB (1x96GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64987-K21
HPE 128GB (1x128GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64988-B21
HPE 128GB (1x128GB) Dual Rank x4 DDR5-6400 CAS-46-45-45 EC8 Registered Smart Memory Kit	P64988-K21

?

Notes:

− Memory DIMM availability for a specific server platform is dependent upon completion of certification testing.

− Memory compatibility may vary or be limited within a specific server family depending upon the specific configuration being requested.? Because each server environment and requirements can vary, memory compatibility is based not only upon the server family, but may also be affected by the amount and type of additional hardware options installed within a specific server configuration.? For this reason, some HPE memory DIMMs may be qualified for a server model or family and yet occasionally not be supported with limited configurations within that server family.

− Please consult with the HPE server QuickSpecs or your HPE representative if you have any questions regarding memory compatibility with a specific HPE server configuration.

?

Fast Fault Tolerance Factory Setting

HPE Smart Memory Fast Fault Tolerance FIO Setting	875293-B21

?
Notes: Select this part number to enable HPE Fast Fault Tolerance, which allows server memory to run at the resiliency of double device data correction (DDDC), but with significantly higher performance. HPE Fast Fault Tolerance is available on all HPE Gen10 servers with an Intel¢ç central processing unit.

?

?

Overview

Understanding Memory Speed Limitations

Server memory speed will determine the rate at which the CPU can process data. The higher the clock rating on the memory, the faster the system is able to read and write information from the memory. All memory is rated at a specific data rate - stated in megatransfers per second (MT/s) - which is the maximum data bandwidth that the memory supports.?

In every case the maximum speed capability of the memory system is governed by the combination of the CPU and any other DIMMs installed in the server.? If higher speed DIMMs are installed with a CPU that only supports a lower memory speed, the DIMMs will only run at the (lower) memory speed supported by the processor.? Likewise, if memory DIMMs are mixed with slower DIMMs within a server, all DIMMs will run at the slower memory speed.

?

?

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

What is HPE Smart Memory?
HPE Smart Memory uniquely optimizes memory performance on HPE ProLiant Rack and Tower servers, Apollo family servers, Blade systems, and Synergy systems. Authenticated HPE Smart Memory supports extended memory performance in the competitive landscape and provides customers with service enhancement through HPE Active Health Systems and other HPE proprietary software.

Quality and Performance
HPE Smart Memory undergoes a rigorous qualification process to provide customers with the highest server memory quality options. Its performance is tested and optimized for HPE servers, supporting unique features only available with HPE servers and systems. In addition, it enhances memory throughput up to 23% and achieves an improvement in latency of up to 25%.

HPE Active Health System
HPE Smart Memory works in conjunction with the HPE Active Health System which monitors changes to the server hardware configuration to enable lifecycle monitoring of memory health status. Having insight into memory-related service events will shorten problem diagnosis and deliver rapid resolutions if and when failures occur. Whereas the pre-failure alert simply notifies the administrator of an impending failure, HPE Smart Memory can provide rich insight into memory-related events like multi-bit errors or configuration issues.

Reporting Correctable memory errors
Beginning with the HPE Gen10 Plus server generation, the server ROM will provide an option that allows users to control the RAS policies, (including the ability to expose corrected memory errors to the OS and allow it to log them which may make them visible to the user).? This new ROM option may be set to either "Firmware First" or "OS First" mode.?
Firmware First Mode?
When in Firmware First Mode (default), the BIOS will implement RAS features as before, to monitor corrected errors and log an event for any cases where the customer needs to take action on corrected errors. The OS will not monitor and log corrected errors.?
Operating System (OS) First Mode?
In OS First Mode, corrected errors are unmasked to the OS and the OS will control the policy for logging corrected errors. With some operating systems, while in OS First mode, corrected errors are unmasked to the OS and the OS will control the policy for logging corrected errors. Additionally, the OS may be able to create its own protection from these events by triggering a Page Retire, or other OS level mitigation. When these events happen, they are not deemed to be a trigger for a service action.
With the understanding that corrected memory errors are an expected and natural occurrence and that no action is required based on OS logging of corrected errors (unless the BIOS has also logged an event - which would also occur in the "Firmware First" mode), HPE recommends that this option is left in its default "Firmware First" setting.?
However, for customer installations which choose to configure this option for "OS First" mode, no service action should be triggered based solely on the OS logging of corrected memory errors.? Service action should only occur if the errors are logged to the Integrated Management Log (IML) by the BIOS.

Other Resources
For the latest updates on HPE Server Options, visit: **http://www.hpe.com/us/en/servers/memory.html**

For more information on HPE Persistent Memory options, visit:
?**https://www.hpe.com/us/en/servers/persistent-memory.html**

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 QuickSpecs, 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**?
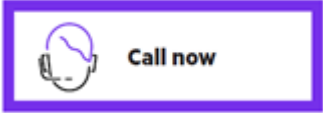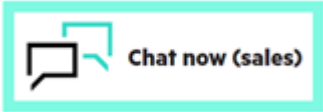For more information
http://www.hpe.com/services

Summary of Changes

Date	Version History	Action	Description of Change
04-Nov-2024	Version 8	Changed	Overview Section was updated and obsolete SKUs were removed
07-Oct-2024	Version 7	Changed	Overview Section was updated
06-May-2024	Version 6	Changed	Overview Section was updated
14-Dec-2023	Version 5	Changed	Model Section, SKUs, Service and Support Section were updated.
05-Sep-2023	Version 4	Changed	QuickSpecs name was updated
06-Feb-2023	Version 3	Changed	Model Section and SKUs were updated
10-Jan-2023	Version 2	Changed	Overview Section was updated
10-Nov-2022	Version 1	New	New QuickSpecs.

Copyright

Make the right purchase decision. Contact our presales specialists.
?

?

Chat now (sales)

Call now

?

Get updates

?

?

Hewlett Packard Enterprise
?

?