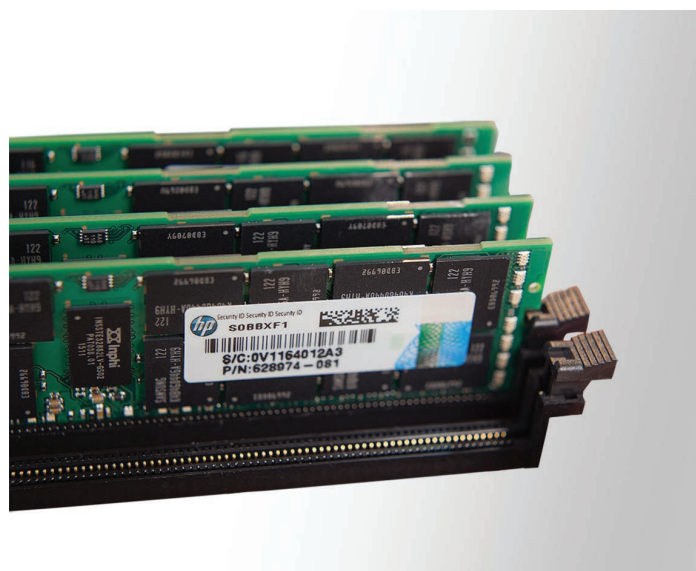


HPE SmartMemory

Choose the right memory with
HPE SmartMemory



As the insatiable demand for applications, data, and digital content grows exponentially, traditional server infrastructure—the digital foundation of business and society—has become resource constrained. At the same time, businesses demand greater performance and maximum uptime. IT trends such as server virtualization, cloud computing, and high-performance computing have increased the average gigabyte per server memory six-fold in the last six years. As a result, DRAM manufacturers are increasing chip component densities to support higher memory capacities. For example, today a single 4 GB DRAM chip contains more than 4 billion memory cells, and a single 32 GB DDR3 memory module has more than 288 billion memory cells.

Choose the right memory

The combination of increased memory demand and component complexity have raised the stakes higher as businesses require continuous availability of IT infrastructure. Memory is a critical system component, significantly defining the systems reliability, performance, and increasingly the server and data center power footprint. Therefore, choosing the right memory is the key to ensuring upmost reliability, highest performance, and deliver a faster return on your IT investment.

As one of largest DRAM buyers, HPE chooses only the highest quality memory. HPE SmartMemory is performance tested and tuned on HPE ProLiant servers using proprietary software that simulates extreme operating environments and conditions. HPE Qualified Options means every genuine HPE DIMM has been through our rigorous qualification process that extends beyond standard industry practice to help ensure compatibility, performance, and reliability.

Achieve reliability, performance, and manageability with HPE SmartMemory

HPE SmartMemory is a unique technology introduced for HP ProLiant Gen8 and Gen8 v2 servers, and unlike other third-party memory, HPE SmartMemory authenticates whether memory has passed HPE's rigorous qualification and test process, and provides you with the highest quality, genuine HPE SmartMemory.

More importantly, verification of HPE SmartMemory unlocks certain performance and high efficiency features optimized for HP ProLiant Gen8 and Gen v2 servers. In addition, HPE SmartMemory provides future enhanced support through HPE Active Health System and manageability software.

Key features and benefits

HPE SmartMemory is ideal for ProLiant Gen8 and Gen8 v2 customers who are looking to extract all the memory performance, dependability, and power savings that the ProLiant Gen8 server is designed to deliver. Memory plays an increasingly larger part of the server's power consumption and choosing the most efficient memory is a critical component in reducing your data center's overall power and cooling requirements. These savings translate to reduced operating cost and a faster return on investment (ROI), freeing up IT budget spent on power and cooling.

HPE SmartMemory introduces the new 1866 MHz Std. Voltage and 1600 MHz low voltage SmartMemory, designed to provide better performance and capacity at a competitive price.

Reduce power without sacrificing performance

HPE is committed to helping you achieve the maximum benefit per watt out of your IT infrastructure. With HPE SmartMemory power utilization is up to 20 percent less when compared to third-party memory or other OEMs' memory.¹

- 1600 MHz Low Voltage memory availability in all sizes for both RDIMM and UDIMM technologies.
- An industry-first, HPE has introduced 24 GB DDR3-1333 Registered DIMM (RDIMM) at 1.35 V

- While the industry supports DDR3-1866 RDIMM at 1.5 V at one DIMM per channel, our ProLiant Gen8 servers support DDR3-1866 RDIMM up to two DIMMs per channel at 1866 MT/s running at 1.5 V. Our ProLiant Gen8 v2 servers support DDR3-1600 LV RDIMM up to two DIMMs per channel at 1600 MT/s running at 1.35 V. This equates to up to 20 percent less power at the DIMM level with no performance penalty²
- HPE SmartMemory 1.35 V DDR3-1600 registered memory is engineered to achieve the same performance level as 1.5 V memory. This also simplifies the HPE memory portfolio making it easier to select the right memory
- HPE HyperCloud SmartMemory 32 GB 1.5 V DDR3-1333 registered memory is engineered to achieve 3 DPC @1333 in HPE ProLiant in DL380p Gen8 servers

Better performance

HPE SmartMemory supports DDR3 unbuffered ECC DIMMs (UDIMMs) at 2 DIMMs per channel at 1866 MT/s while the industry supports UDIMM at 2 DIMMs per channel at 1600 MT/s, or 25 percent greater bandwidth.² In addition, DDR3 UDIMMs are capable of low voltage operation, up to 20 percent less power usage:

- 1 DPC @1600 at 1.35 V
- 2 DPC @1600 at 1.35 V

HPE SmartMemory now supports DDR3-1866 LRDIMMs:

- 1 DPC @1866 at 1.5 V
- 2 DPC @1866 at 1.5 V
- 3 DPC @1333 at 1.5 V

HPE SmartMemory now supports DDR3-1866 RDIMMs:

- 1 DPC @1866 at 1.5 V
- 2 DPC @1866 at 1.5 V
- 3 DPC @1066 at 1.5 V

HPE SmartMemory supports low-voltage DDR3-1600 RDIMMs at same memory bandwidth as 1.5 V DDR3-1600 RDIMMs, up to 20 percent less power usage:

- 1 DPC @1600 at 1.35 V
- 2 DPC @1600 at 1.35 V
- 3 DPC @800 at 1.35 V

HPE SmartMemory supported on HP ProLiant Gen8 v2 Intel® Xeon® E5-2600 Series Processor Family

With the latest generation Intel® series based ProLiant Gen8 and Gen8 v2 servers, DDR3 provides additional features:

- 24 GB DDR3-1333 RDIMM 1.35 V support for maximum bandwidth on blades server
- New 32 GB Load Reduced DIMM (LRDIMM) increases capacity by 50 percent enabling HP ProLiant Gen8 and Gen8 v2 Intel 2-socket servers support of up to 768 GB
- DDR3-1600 Registered DIMMs supports either low-voltage 1.35 V or 1.5 V with no performance penalty
- HPE Advanced Memory Error Detection Technology increased memory related uptime by up to 35 percent by pinpointing errors more likely to cause unplanned downtime

DDR3 memory comparison for HP ProLiant Gen8 and Gen8 v2 servers

	RDIMMs	LRDIMM	UDIMMs	HDIMM
Maximum DIMM capacity	24 GB	32 GB	8 GB	32 GB
Maximum server capacity	AMD: 1 TB max capacity ³ (48 slots; 32 GB quad rank DIMMs) Intel 4 socket: 2 TB max capacity (64 slots; 32 GB quad rank DIMMs)	N/A Intel 2 socket: 768 GB (24 slots; 32 GB LRDIMMs)	AMD: 64 GB (16 slots; 4 GB dual rank DIMMs) Intel: 48 GB max capacity (12 slots; 4 GB dual rank DIMMs)	NA Intel 2 socket (only DL360p and DL380p Gen8): 384 GB max capacity
Maximum number of DIMMs/channel	3 dual rank	3 quad rank (LRDIMM only)	2 dual rank	3 dual rank
Low power option	4 GB, 8 GB, 16 GB, 24 GB, 32 GB	32 GB	2 GB, 4 GB, 8 GB	32 GB only
Address error detection	Yes	Yes	Yes	Yes

¹ "HPE Proprietary Software Test," August 2011.

² "HPE Proprietary Software Test," September 2011.

³ AMD 1 TB max capacity: AMD population rules require 4 rank DIMMs in center slot only for 3 DPC servers.

RDIMMs

647893-B21	HPE 4 GB (1x4 GB) Single Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit
647895-B21	HPE 4 GB (1x4 GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit
647897-B21	HPE 8 GB (1x8 GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit
647899-B21	HPE 8 GB (1x8 GB) Single Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit
647901-B21	HPE 16 GB (1x16 GB) Dual Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage Memory Kit
672631-B21	HPE 16 GB (1x16 GB) Dual Rank x4 PC3-12800R (DDR3-1600) Registered CAS-11 Memory Kit
700404-B21	HPE 24 GB (1x24 GB) Three Rank x4 PC3L-10600R (DDR3-1333) Registered CAS-9 Low Voltage FIO Memory Kit
713981-B21	HPE 4 GB (1x4 GB) Single Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit
713983-B21	HPE 8 GB (1x8 GB) Dual Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit
731765-B21	HPE 8 GB (1x8 GB) Single Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit
713985-B21	HPE 16 GB (1x16 GB) Dual Rank x4 PC3L-12800R (DDR3-1600) Registered CAS-11 Low Voltage Memory Kit
708637-B21	HPE 4 GB (1x4 GB) Single Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit
708639-B21	HPE 8 GB (1x8 GB) Dual Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit
731761-B21	HPE 8 GB (1x8 GB) Single Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit
708641-B21	HPE 16 GB (1x16 GB) Dual Rank x4 PC3-14900R (DDR3-1866) Registered CAS-13 Memory Kit

UDIMMs

647905-B21	HPE 2 GB (1x2 GB) Single Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit
647907-B21	HPE 4 GB (1x4 GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit
647909-B21	HPE 8 GB (1x8 GB) Dual Rank x8 PC3L-10600E (DDR3-1333) Unbuffered CAS-9 Low Voltage Memory Kit
713975-B21	HPE 2 GB (1x2 GB) Single Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit
713977-B21	HPE 4 GB (1x4 GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit
713979-B21	HPE 8 GB (1x8 GB) Dual Rank x8 PC3L-12800E (DDR3-1600) Unbuffered CAS-11 Low Voltage Memory Kit
708631-B21	HPE 2 GB (1x2 GB) Single Rank x8 PC3-14900E (DDR3-1866) Unbuffered CAS-13 Memory Kit
708633-B21	HPE 4 GB (1x4 GB) Dual Rank x8 PC3-14900E (DDR3-1866) Unbuffered CAS-13 Memory Kit
708635-B21	HPE 8 GB (1x8 GB) Dual Rank x8 PC3-14900E (DDR3-1866) Unbuffered CAS-13 Memory Kit

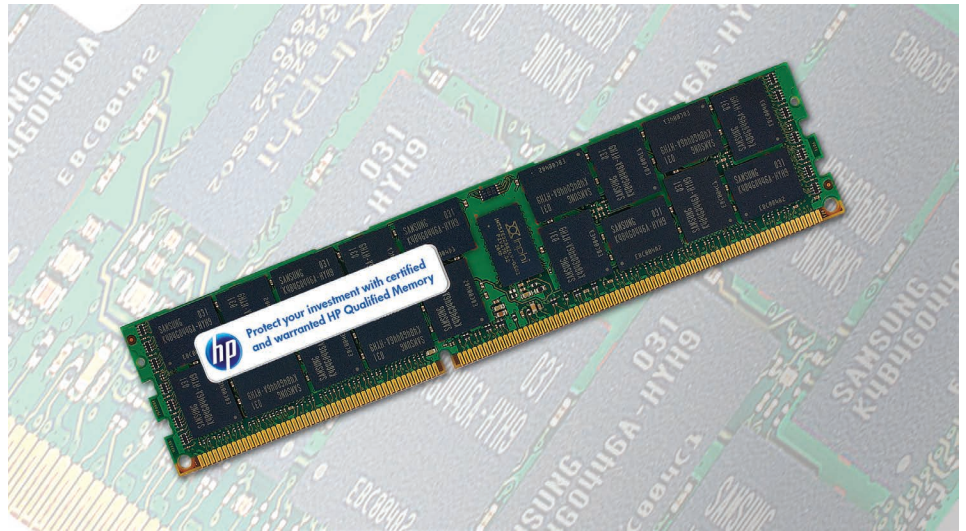
LRDIMMs

647903-B21	HPE 32 GB (1x32 GB) Quad Rank x4 PC3L-10600L (DDR3-1333) Load Reduced CAS-9 Low Voltage Memory Kit
708643-B21	HPE 32 GB (1x32 GB) Quad Rank x4 PC3-14900L (DDR3-1866) Load Reduced CAS-13 Memory Kit

HDIMMs

715166-B21	HPE 32 GB (1x32 GB) Dual Rank x4 PC3-10600H (DDR3-1333) HyperCloud CAS-9 Memory Kit
------------	---

- RDIMMs offer higher capacities, memory register support, and address error detection
- UDIMMs offer lower price points, smaller capacities, and basic ECC
- LRDIMMs support maximum capacity
- New HyperCloud DIMMs (HDIMMs) support maximum capacity of 768 GB at 3 DPC @1333 only for ProLiant DL380p Gen8 servers



Other resources

For more information on HPE SmartMemory, visit hp.com/products/memory.

For more information on qualified memory support for your HPE ProLiant server, visit HPE QuickSpecs: hp.com/products/quickspecs.

For latest news, videos, podcasts, and updates on HPE Qualified Options, visit hp.com/go/hpqq.

HPE ProLiant DDR3 Memory Configuration Tool

HPE provides a unique Web-based tool to help configure DDR3 memory in your HPE ProLiant server. The latest version supports HPE ProLiant servers based on the Intel E5-2600 Series Processors. For more information, visit hp.com/products/servers/options/tool/hp_memtool.html.

HPE Factory Express

HPE Factory Express provides customization and deployment services along with your storage and server purchases. You can customize hardware to your exact specifications



Sign up for updates

in the factory—helping to speed deployment. Visit hp.com/go/factoryexpress.

Customer technical training

Gain the skills you need with HPE ExpertOne training and certification. With HPE ProLiant training, you will accelerate your technology transition, improve operational performance, and get the best return on your HPE investment. Our training is available when and where you need it, through flexible delivery options and a global training capability. hp.com/learn/proliant

HPE Services

HPE Technology Services offers a set of consultancy, deployment, and support solutions designed to meet the lifecycle needs of your IT environments. HPE Care Pack Services for industry-standard servers includes support for qualified options at no additional cost.

HPE Foundation Care Services delivers scalable support-packages for HPE industry-standard servers and software. You can choose the type and level of service that is most suitable for your business needs. New to this portfolio is HPE Collaborative Support Service. This service offers a single point of contact for server problem diagnosis, hardware problem resolution, basic software problem diagnosis, fault isolation,

and resolution. In case, the issue is with HPE or supported third-party software product and cannot be resolved by applying known fixes, HPE contacts the third-party vendor and create a problem incident on your behalf.

If you are running business-critical environments, we offer HPE Proactive Care or HPE Critical Advantage. These services help you deliver high levels of application availability through proactive service management.

All service options include HPE Insight Remote Support for secure remote monitoring, diagnosis, and problem resolution. Also included is the HPE Support Center that provides access to the information, tools, and experts to support HPE business products.

For more information, visit hp.com/services/proliant or hp.com/services/bladesystem.

HPE Financial Services

HPE Financial Services provides innovative financing and financial asset management programs to help you acquire, manage, and ultimately retire your HPE solutions. Visit hp.com/go/hpfinancialservices.

Learn more at hp.com/products/memory