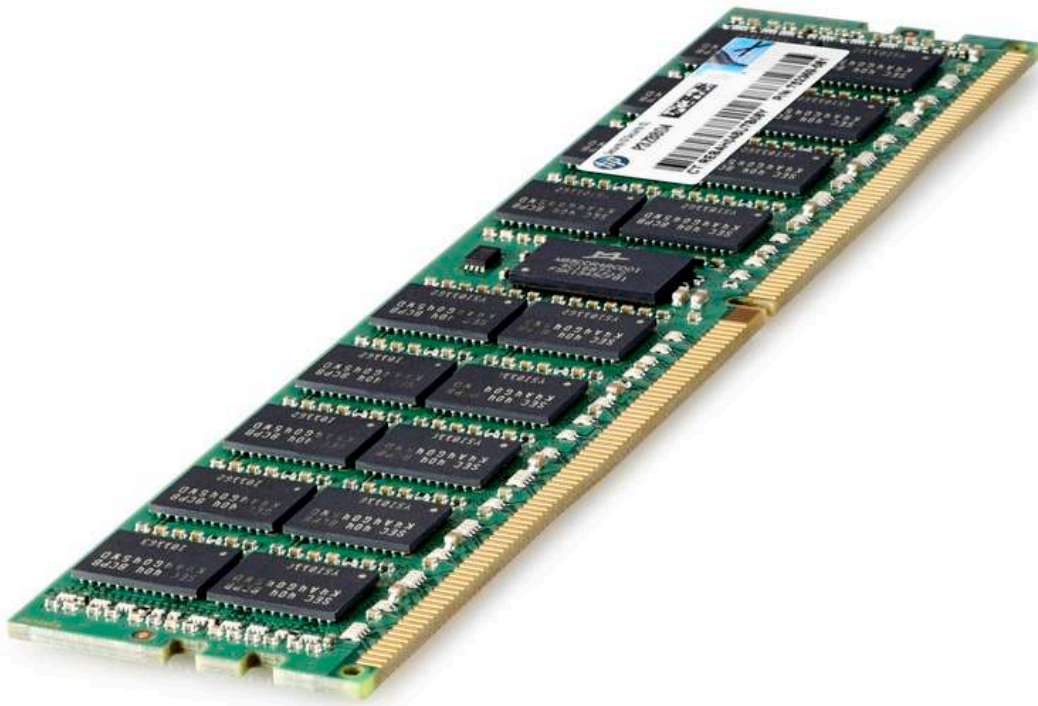


Overview

HPE DDR4 SmartMemory

Is finding reliable DRAM memory for your Hewlett Packard Enterprise Servers a major challenge?

When you choose HPE SmartMemory you get the high quality memory options for your servers. It enables the server virtualization, cloud computing, and the heavy workload computing of data centers and protect your business data from data loss. HPE SmartMemory has passed rigorous qualification and testing processes to ensure the best quality and performance of the memory option. Its unique technology unlocks features available only with Hewlett Packard Enterprise (HPE) servers and enables the reliability and compatibility of your systems.



What's New

- HPE SmartMemory DDR4 @2400 MHz memory options supported on HPE Gen9 Servers
- HPE SmartMemory LRDIMM supports 2400 MHz @ 3DPC (DIMMs per channel)

Models

HPE 4GB (1x4GB) Single Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726717-B21
HPE 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726718-B21
HPE 8GB (2x8GB) Dual Rank x8 DDR4-2133 CAS-15-15-15 Registered Memory Kit	759934-B21
HPE 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	726719-B21

Overview

HPE 32GB (1x32GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Registered Memory Kit	728629-B21
HPE 8GB (1x8GB) Single Rank x8 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805347-B21
HPE 16GB (1x16GB) Single Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805349-B21
HPE 16GB (1x16GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	836220-B21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Registered Memory Kit	805351-B21

Load Reduced DIMMs (LRDIMM)

HPE 16GB (1x16GB) Dual Rank x4 DDR4-2133 CAS-15-15-15 Load-reduced Memory Kit	726720-B21
HPE 32GB (1x32GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load-reduced Memory Kit	726722-B21
HPE 48GB (1x16GB +1x32GB) DDR4-2133 CAS-15-15-15 Load-reduced Memory FIO Kit	792278-B21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2133 CAS-15-15-15 Load-reduced Memory Kit	726724-B21
HPE 32GB (1x32GB) Dual Rank x4 DDR4-2400 CAS-17-17-17 Load-reduced Memory Kit	805353-B21
HPE 64GB (1x64GB) Quad Rank x4 DDR4-2400 CAS-17-17-17 Load-reduced Memory Kit	805358-B21
HPE 128GB (1x128GB) Octal Rank x4 DDR4-2400 CAS-17-17-17 Load-reduced Memory Kit ¹	809208-B21

NOTE 1: Available in June 2016

DIMM Option Compatibility

HPE P/N	Description	Where Use
726717-B21	HP 4GB 1Rx8 PC4-2133P-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/DL60 Gen9/DL80 Gen9/DL120 Gen9/DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9/DL388 Gen9(BTO)/ML110 Gen9/ML150 Gen9/ML350 Gen9
726718-B21	HP 8GB 1Rx4 PC4-2133P-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 6000/BL460c Gen9/BL660c Gen9/DL60 Gen9/DL80 Gen9/DL120 Gen9 DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9 DL388 Gen9(BTO)/DL560/DL580/ML110 Gen9/ML150 Gen9 ML350 Gen9/WS460c Gen9
759934-B21	HP 8GB 2Rx8 PC4-2133P-R Kit	
726719-B21	HP 16GB 2Rx4 PC4-2133P-R Kit	
728629-B21	HP 32GB 2Rx4 PC4-2133P-R Kit	
805347-B21	HPE 8GB 1Rx8 PC4-2400T-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 8000/BL460c Gen9 DL60 Gen9/DL80 Gen9/DL120 Gen9/DL160 Gen9/DL180 Gen9 DL360 Gen9/DL380 Gen9/DL388 Gen9(BTO)/ML110 Gen9 ML150 Gen9/ML350 Gen9/Synergy 480 Gen9/WS460c Gen9
805349-B21	HPE 16GB 1Rx4 PC4-2400T-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 8000/BL460c Gen9 Cloud Management IT/DL60 Gen9/DL80 Gen9/DL120 Gen9 DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9 DL388 Gen9(BTO)/ML110 Gen9/ML150 Gen9/ML350 Gen9 Synergy 480 Gen9/WS460c Gen9
836220-B21	HPE 16GB 2Rx4 PC4-2400T-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 8000/BL460c Gen9 DL60 Gen9/DL80 Gen9/DL120 Gen9/DL160 Gen9/DL180 Gen9 DL360 Gen9/DL380 Gen9/DL388 Gen9(BTO)/ML110 Gen9 ML150 Gen9/ML350 Gen9/Synergy 480 Gen9
805351-B21	HPE 32GB 2Rx4 PC4-2400T-R Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 8000/BL460c Gen9 Cloud Management IT/DL60 Gen9/DL80 Gen9/DL120 Gen9 DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9 DL388 Gen9(BTO)/ML110 Gen9/ML150 Gen9/ML350 Gen9 Synergy 480 Gen9/WS460c Gen9

Overview

HPE P/N	Description	Where Use
726720-B21	HP 16GB 2Rx4 PC4-2133P-L Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 6000/BL460c Gen9/BL660c Gen9/DL60 Gen9/DL80 Gen9/DL120 Gen9 DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9
726722-B21	HP 32GB 4Rx4 PC4-2133P-L Kit	DL388 Gen9(BTO)/DL560/DL580/ML110 Gen9/ML150 Gen9 ML350 Gen9/WS460c Gen9
792278-B21	HP 48GB (32+16)PC4-2133P-L Combo FIO Kit	BL460c Gen9/BL660c Gen9/WS460c Gen9
726724-B21	HP 64GB 4Rx4 PC4-2133P-L Kit	Apollo 4200/Apollo 4500/Apollo 6000/BL460c Gen9/BL660c Gen9/DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9 DL388 Gen9(BTO)/DL560/DL580 ML350 Gen9/WS460c Gen9
805353-B21	HPE 32GB 2Rx4 PC4-2400T-L Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 6000/BL460c Gen9 DL60 Gen9/DL80 Gen9/DL120 Gen9/DL160 Gen9/DL180 Gen9 DL360 Gen9/DL380 Gen9/DL388 Gen9(BTO) ML150 Gen9/ML350 Gen9/Synergy 480 Gen9/WS460c Gen9
805358-B21	HPE 64GB 4Rx4 PC4-2400T-L Kit	Apollo 2000/Apollo 4200/Apollo 4500/Apollo 6000/BL460c Gen9 DL160 Gen9/DL180 Gen9/DL360 Gen9/DL380 Gen9 DL388 Gen9(BTO)/ML350 Gen9/Synergy 480/WS460c Gen9
809208-B21	HPE 128GB 8Rx4 PC4-2400T-L Kit	Apollo 6000/BL460c Gen9/DL360 Gen9/DL380 Gen9/ML350 Gen9 Synergy 480 Gen9/WS460c Gen9

Standard Features

What is HPE SmartMemory?

HPE SmartMemory is unique technology designed for HPE systems. It passes rigorous qualification tests and optimizes the memory performance on the HPE ProLiant Rack and Tower servers, Apollo family, Blade systems, and Synergy systems. Authenticated HPE SmartMemory 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 SmartMemory undergoes rigorous qualification process to provide our customers with highest quality options. Its performance is tested and optimized for HPE servers, supporting unique features only available with HPE ProLiant Rack and Tower servers, Apollo family, Blade and Synergy systems. For example, HPE DDR4 SmartMemory provide 12% better performance when running at 2DPC on HPE ProLiant systems and 28% better performance at 3DPC¹.

NOTE: HPE ProLiant Gen9 DL and ML servers will work @2400 MHz at 2DPC whereas all the other competition will go down to 2133 MHz at 2DPC which means $[(2400-2133)/2133]=12\%$ better performance. With HPE SmartMemory LRDIMM at 3DPC, DL and ML servers can work @2400 MHz whereas other competition can only work at 1866 MHz. So the performance improvement rate would be $[(2400-1866)/1866]=28\%$ better performance. Benchmarking and tests done with equivalent storage products in a controlled environment. Hewlett Packard Enterprise Labs, Houston, January 2016.

HPE Active Health System

Future ROM updates will enable HPE SmartMemory to will work 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 diagnosing problems and deliver rapid resolutions if and when failures occur. Whereas the pre-failure alert simply notifies the administrator of an impending failure, HPE SmartMemory can provide insight with rich information on memory-related events like multi-bit errors or configuration issues.

Support Matrix

Please see the following URL for the latest list of supported servers:

<http://h22195.www2.hp.com/DDR4memoryconfig/>

Other Resources

For the latest updates on HPE Server Options, visit: <http://www.hp.com/go/hpqo>

For more information on the HPE Persistent Memory Options, visit:

<http://www.hpe.com/servers/persistentmemory>

Service and Support

HPE Support Center Personalized online support portal with access to information, tools and experts to support HPE business products. Submit support cases online, chat with HPE experts, access support resources or collaborate with peers. Learn more: <https://www.hpe.com/us/en/services/it-support.html>

The HPE Support Center Mobile App allows you to resolve issues yourself or quickly connect to an agent for live support. Now, you can get access to personalize IT support anywhere, anytime.

NOTE: HPE Support Center Mobile App is subject to local availability

Parts and materials HPE will provide HPE-supported replacement parts and materials necessary to maintain operating condition for covered hardware products, 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.

Warranty / Service Coverage For ProLiant servers and storage systems, this service covers HPE-branded hardware options qualified for the server, purchased at the same time or afterward, internal to the enclosure, as well as external monitors up to 22" and tower UPS products; these items will be covered at the same service level and for the same coverage period as the server unless the maximum supported lifetime and/or the maximum usage limitation has been exceeded. Coverage of the UPS battery is not included; standard warranty terms and conditions apply.

For details on the HPE Server Options Limited Warranty visit:

<http://h20566.www2.hpe.com/hpsc/wc/public/home>

General Memory Population Rules and Guidelines:

- 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.
- To maximize performance, it is recommended to balance the total memory capacity between all installed processors and load the channels similarly whenever possible.
- When two processors are installed, balance the DIMMs across the two processors.
- White DIMM slots denote the first slot to be populated in a channel.
- Place the DIMMs with the highest number of ranks in the white slot when mixing DIMMs of different ranks on the same channel.
- Mixing of DIMM types (UDIMM, RDIMM, and LRDIMM) is not supported.
- Mixing 128GB with other capacities is not supported.
- Quad rank LRDIMMs are capable of up to 3DPC.
- DIMMs of different speeds may be mixed in any order; the server 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 processor.

Technical Specifications

Memory Speed by Processor Model

With Intel® Xeon® E5-2600 v3 Series Processor Family

NOTE: To realize the performance memory capabilities listed in this document, HPE SmartMemory is required.

DIMM Rank	Register DIMM (RDIMM)					Load Reduced (LRDIMM)		
	Single Rank (1R)	Single Rank (1R)	Dual Rank (2R)	Dual Rank (2R)	Dual Rank (2R)	Dual Rank (2R)	Quad Rank (4R)	Quad Rank (4R)
DIMM Capacity	4GB	8GB	8GB	16GB	32GB	6GB	32GB	64GB
Voltage	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V
SLOTS THAT CAN BE POPULATED								
8 slot servers	8	8	8	8	8	NA	NA	NA
12 slot servers	12	12	12	12	12	12	12	12
16 slot servers	16	16	16	16	16	16	16	16
24 slot servers	24	24	24	24	24	24	24	24
32 slot server	32	32	32	32	32	32	32	32
48 slot server	48	48	48	48	48	48	48	48
96 slot server	96	96	96	96	96	96	96	96
MAXIMUM CAPACITY (GB)								
4 slot servers	16	32	32	64	128	NA	NA	NA
8 slot servers	32	64	64	128	256	NA	NA	NA
12 slot servers	48	96	96	192	384	192	384	NA
16 slot servers	64	128	128	256	512	256	512	1024
24 slot servers	96	192	192	384	768	384	768	1536
32 slot servers	128	256	256	512	1024	512	1024	2048
48 slot server	3072	3072	3072	3072	3072	3072	3072	3072
96 slot server	6144	6144	6144	6144	6144	6144	6144	6144

Technical Specifications

POPULATED DIMM SPEED (MT/s)								
1 DIMM Per Channel	2133	2133	2133	2133	2133	2133	2133	2133
2 DIMM Per Channel	2133	2133	2133	2133	2133	2133	2133	2133
3 DIMM Per Channel	1600	1600	1600	1600	1600	1866	1866	1866

With Intel® Xeon® E5-2600 v4 Series Processor Family¹:

NOTE: To realize the performance memory capabilities listed in this document, HPE SmartMemory is required.

DIMM Rank	Register DIMM (RDIMM)				Load Reduced (LRDIMM)		
	Single Rank (1R)	Single Rank (1R)	Dual Rank (2R)	Dual Rank (2R)	Dual Rank (2R)	Quad Rank (4R)	Octal Rank (8R)
DIMM Capacity ->	8GB	16GB	16GB	32GB	32GB	64GB	128GB²
Voltage	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V	1.2V
SLOTS THAT CAN BE POPULATED							
2 slot servers	NA	2	NA	2	NA	NA	NA
8 slot servers	8	8	8	8	NA	NA	NA
12 slot servers	12	12	12	12	12	12	NA
16 slot servers	16	16	16	16	16	16	16
24 slot servers	24	24	24	24	24	24	24
32 slot server	32	32	32	32	32	32	32
MAXIMUM CAPACITY (GB)							
2 slot servers	NA	32	NA	64	NA	NA	NA
8 slot servers	64	128	128	256	NA	NA	NA
12 slot servers	96	192	192	384	384	NA	NA
16 slot servers	128	256	256	512	512	1024	2048
24 slot servers	192	384	384	768	768	1536	3072
32 slot servers	256	512	512	1024	1024	2048	4096
POPULATED DIMM SPEED (MT/s)							
1 DIMM Per Channel	2400	2400	2400	2400	2400	2400	2400
2 DIMM Per Channel	2133	2133	2133	2133	2400 ³	2400 ³	2400
3 DIMM Per Channel	1866 ⁴	1866 ⁴	1866 ⁴	1866 ⁴	2400 ⁵	2400 ⁵	2400

NOTE 2: Available in June 2016.

Technical Specifications

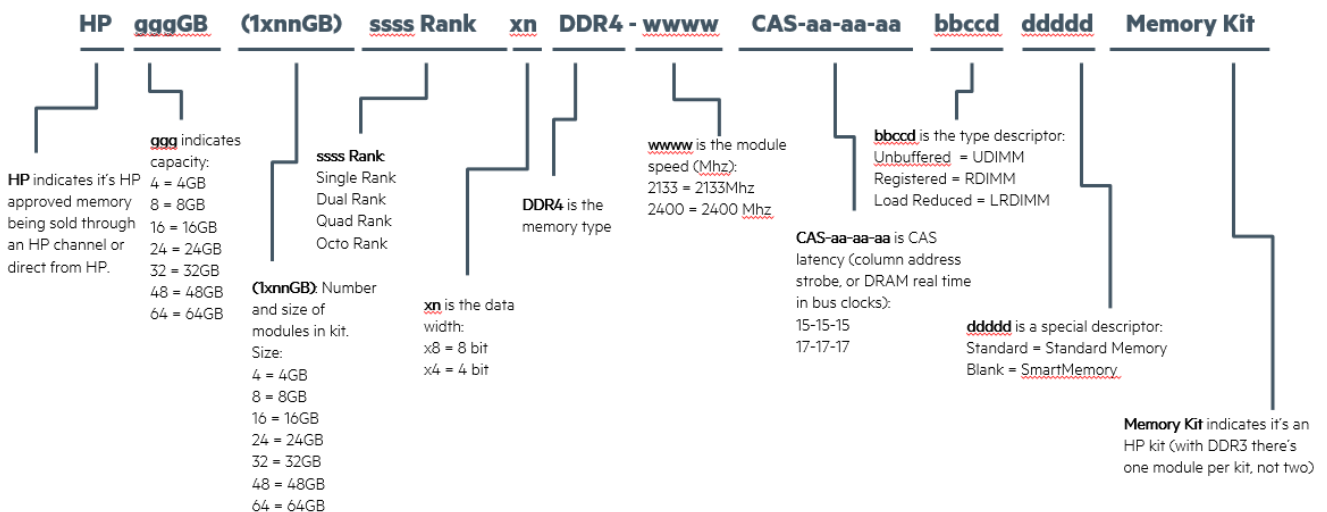
NOTE 3: Maximum memory speed varies from platforms to platforms. HPE SmartMemory 8GB and 16GB dual rank RDIMM can meet 2400 MHz at 2DPC on DL360 Gen9, DL380 Gen9, DL560 Gen9, ML350 Gen9, Synergy 480 and Synergy 660. HPE SmartMemory RDIMM will be running at 2133MHz systems at 2DPC on HPE Proliant DL100 and ML100 series, Apollo family and Blade systems. Benchmarking and tests done with equivalent storage products in a controlled environment. Hewlett Packard Enterprise Labs, Houston, January 2016.

NOTE 4: Maximum memory speed varies from platforms to platforms. HPE SmartMemory 8GB, 16GB, and 32GB RDIMM can meet 1866 MHz at 3DPC on DL360 Gen9, DL380 Gen9, DL560 Gen9, ML350 Gen9, Synergy 480 and Synergy 660. Benchmarking and tests done with equivalent storage products in a controlled environment. Hewlett Packard Enterprise Labs, Houston, January 2016.

NOTE 5: Maximum memory speed varies from platforms to platforms. HPE SmartMemory 32GB and 64GB LRDIMM can meet 2400 MHz at 3DPC on DL360 Gen9, DL380 Gen9, DL560 Gen9, and ML350 Gen9, and reaching 2133 MHz with Synergy 480. Benchmarking and tests done with equivalent storage products in a controlled environment. Hewlett Packard Enterprise Labs, Houston, January 2016.

Memory options part number decoder

Example: HP 8GB (1x8GB) Single Rank x4 DDR4-2133 CAS-15-15-15 Registered Standard Memory Kit



Summary of Changes

Date	Version History	Action	Description of Change
31-Mar-2016	From Version 5 to 6	Changed	Overview, Overview, Standard Features, Service and Support, and Technical Specifications
		Added	SKU Added in Models section: 805347-B21, 805349-B21, 836220-B21, 805351-B21, 805353-B21, 805358-B21, 726718-B21, 726719-B21, 728629-B21, 726722-B21, 809208-B21
01-Jun-2015	From Version 4 to 5	Added	SKU Added in Models section: 726724-B21
		Changed	What's new, Technical Specifications & Models sections were updated.
30-Mar-2015	From Version 3 to 4	Changed	Overview, Service and Support and Technical Specifications sections were updated
		Added	SKU Added on Models: 728629-B21
16-Jan-2015	From Version 2 to 3	Changed	Performance section on Standard Features was updated
01-Dec-2014	From Version 1 to 2	Changed	Overview and Technical Specifications sections were updated
		Added	SKUs added to Models: 726717-B21, 759934-B21, 726720-B21, 792278-B21



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