Cisco UCS/UCSX M7 Memory Guide

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Introduction

The M7 Memory guide provides the detailed specifications of the M7 memory DIMMs including:

- Memory DIMMs features
- Cisco PID's description
- Memory DIMMs guidelines, mixing rules and populations
- All M7 supported DIMM configurations

The M7 Memory Guide document applies to the following Cisco M7 generation servers:

- M7 C220/C240 Racks servers
- M7 X-series X210c/X410c Compute nodes

CHAPTER 1 MEMORY ORGANIZATION CAPABILITIES AND FEATURE

The *Table 1* below describes the main memory DIMM features supported on Cisco UCS/UCSX M7 servers.

Table 1 Main Memory Features

M7 Memory DIMM Server Technologies	C220 M7	C240 M7	X210c M7	X410c M7
CPU Sockets	**1S or 2S**	**1S or 2S**	**1S or 2S**	**4S**
Intel® Xeon® CPU generation[1,2]	4th and 5th Gen.	4th and 5th Gen.	4th and 5th Gen.	4th Gen. Only
DDR5 memory clock speed	4th Gen. CPU: Up to 4800 MT/s 1DPC; Up to 4400 MT/s 2DPC			
	5th Gen. CPU: Up to 5600 MT/s 1DPC; Up to 4400 MT/s 2DPC			N/A
Operational voltage	1.1 Volts			
DRAM fab density	16Gb, 24Gb, and 32Gb			
DRAM DIMM type	RDIMM (Registered DDR5 DIMM with on die ECC)			
Memory DIMM organization	Eight memory DIMM channels per CPU; up to 2 DIMMs per channel			
Maximum number of DRAM DIMM per server	32 (2-Socket)			64 (4-Socket)
DRAM DIMM densities and ranks	16GB 1Rx8[3], 32GB 1Rx4, 48GB 1Rx4			N/A
	64GB 2Rx4, 96GB 2Rx4, 128GB 4Rx4, 128GB 2Rx4			
	N/A	256GB 8Rx8		
Maximum DRAM DIMMs system capacity	4TB (32x128GB)	8TB (32x256GB)		16TB (64x256GB)

Notes:

1. 4th Generation Intel® Xeon® Scalable Processors formerly codenamed Sapphire Rapids.
2. 5th Generation Intel® Xeon® Scalable Processors formerly codenamed Emerald Rapids.
3. SDDC and ADDDC RAS features are unsupported with x8 DIMMs. Therefore, 16GB 1Rx8 doesn't support SDDC and ADDDC RAS features.

Figure 1 2-socket memory organization

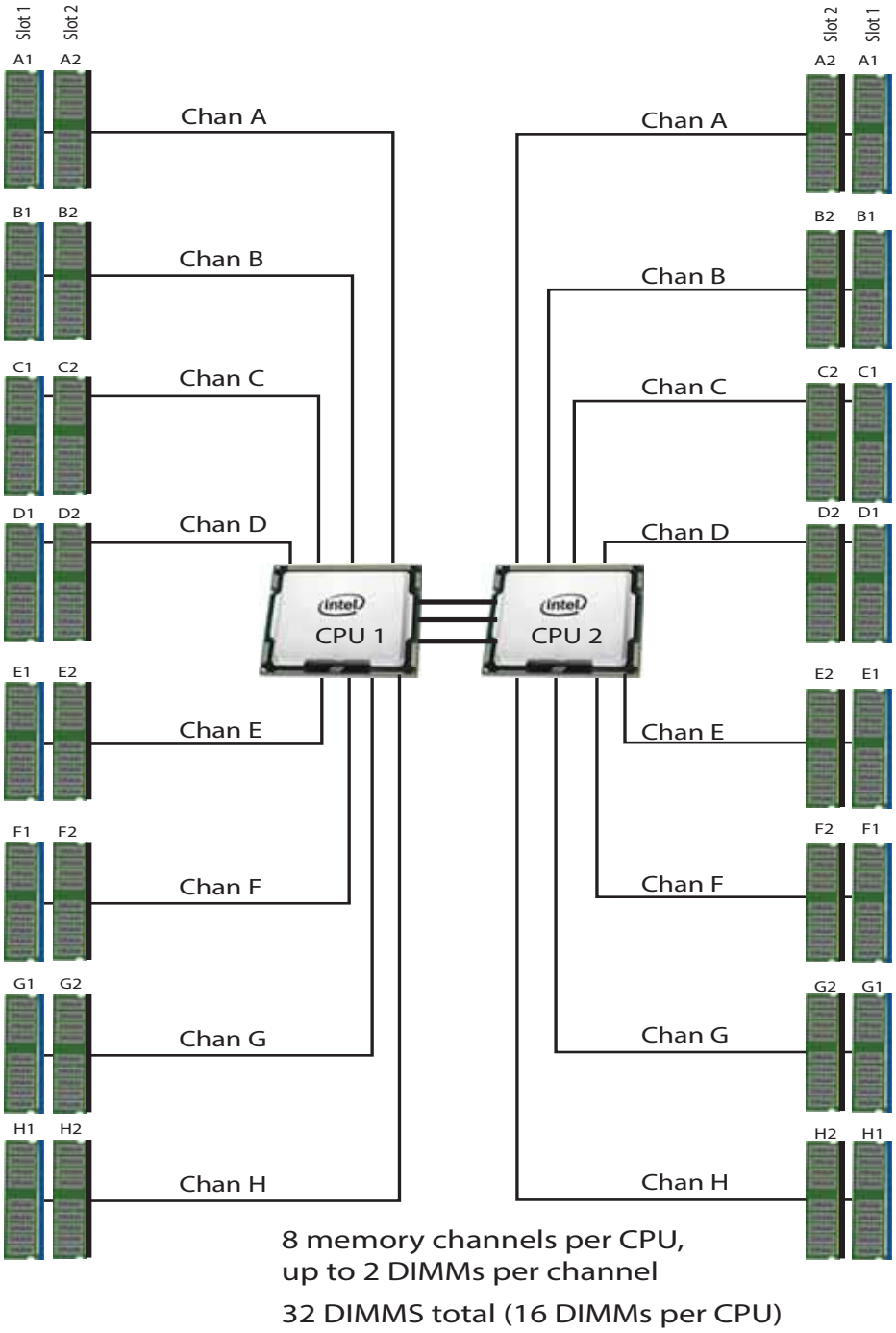
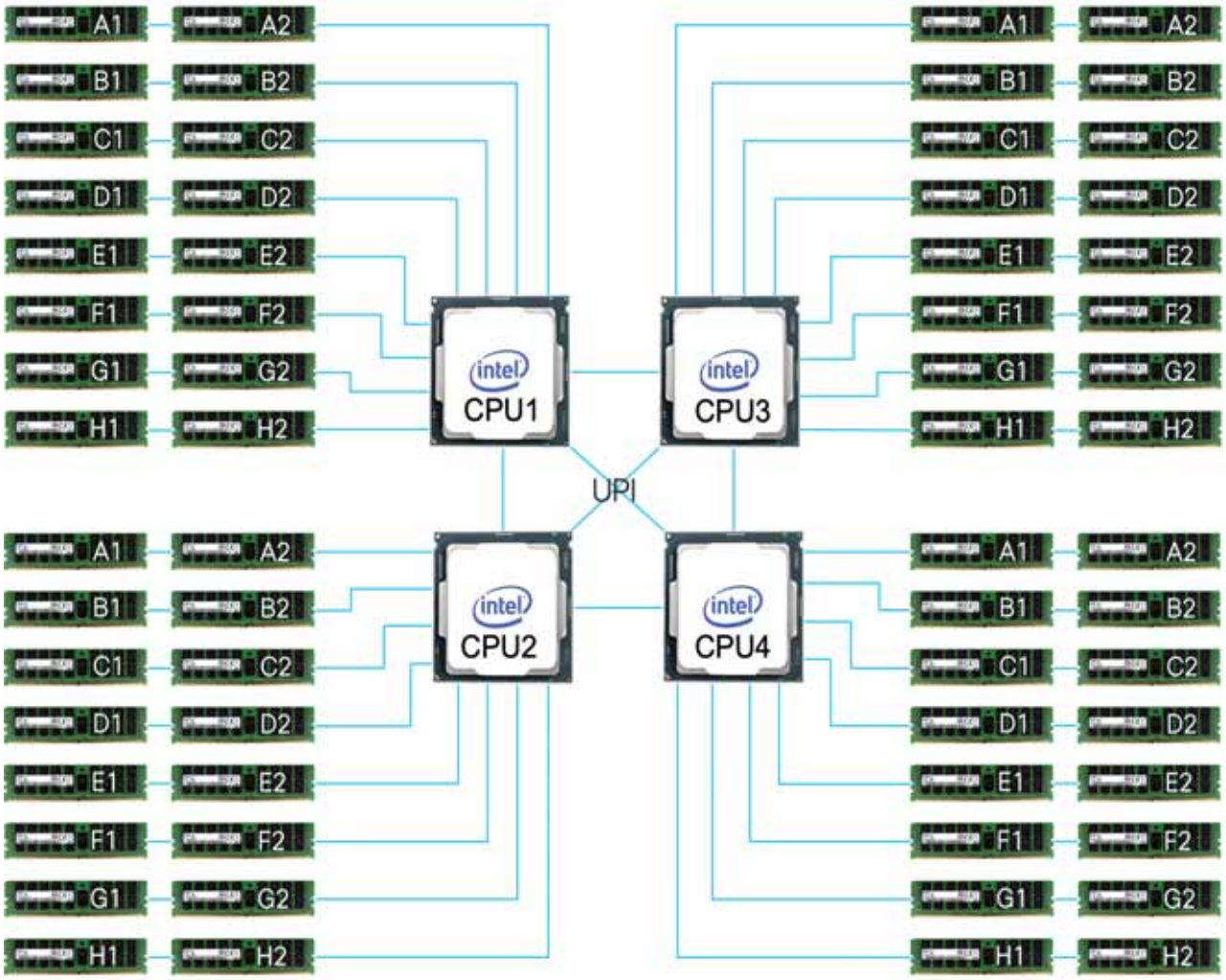


Figure 2 4-socket memory organization



CHAPTER 2 MEMORY OPTIONS

- The available memory devices for UCS and X-series M7 are listed in *Table 2*.**0** and *Table 2*.**1**
- The memory PID decoder for M7 Memory PIDs are shown in *Table 3*



NOTE:

- 256GB DIMMs are available on all C240 M7 server models, X210c M7 and X410C M7 compute nodes. They are not supported on C220 M7.
- Review the appropriate platform spec sheets for additional 256GB DIMM usage conditions.



CAUTION:

- On C240 M7, 256GB DIMMs cannot be combined with GPU cards and the ambient temperature shall be limited to a maximum of 28°C.
- On X210c M7, when populating 256GB DIMMs, the ambient temperature shall be limited to a maximum of 32°C.
- On X410c M7, when populating 256GB DIMMs, the ambient temperature shall be limited to a maximum of 32°C.

- DDR5-4800 memory End-Of-Sale (EOS):

  On September 30th, Cisco announced the End-Of-Life (EOL) and End-Of-Sale (EOS) for our DDR5-4800 memory DIMMs, which are currently supported on Cisco UCS M7 servers featuring Intel Xeon 4th Gen CPUs. *Table 10* below lists the product part numbers affected by this announcement.

- Alternative DIMMs to DDR5-4800MT/s DIMMs being EOLed:
  - To address the discontinuation of DDR5-4800MT/s DIMMs by our suppliers, the Cisco Engineering team has thoroughly qualified existing DDR5-5600 memory DIMMs for use in M7 servers with Intel 4th Generation Xeon Scalable processors. These DDR5-5600 DIMMs are already supported on Cisco M7 Rack and Blade servers with Intel 5th Generation Xeon CPUs.
  - The DDR5-5600 DIMMs are electrically compatible (1.1V) and will operate at the maximum memory speed supported by each M7 4th Gen CPU, ranging from 4000MT/s (for lower-end SKUs) up to 4800MT/s (for higher-end SKUs).
  - *Table 2*.**0** below summarizes the available memory DIMM options for Cisco M7 servers equipped with Intel 4th Generation Xeon Scalable processors.

Table 2.0 Memory Options for UCS M7 servers with Intel® Xeon® 4th Gen. CPUs.

Intel M7 Memory DIMM Densities & Cisco PIDs	Memory DIMM Description	C220 M7	C240 M7	X210c M7	X410c M7
DDR5-4800 MT/s Cisco Memory PIDs list[1]					
16GB	16GB RDIMM 1Rx8 1.1Volts (16Gb)	UCS-MRX16G1RE1		UCSX-MRX16G1RE1	
32GB	32GB RDIMM 1Rx4 1.1Volts (16Gb)	UCS-MRX32G1RE1		UCSX-MRX32G1RE1	

Table 2.0 Memory Options for UCS M7 servers with Intel® Xeon® 4th Gen. CPUs.

64GB	64GB RDIMM 2Rx4 1.1Volts (16Gb)	UCS-MRX64G2RE1		UCSX-MRX64G2RE1
128GB	128GB RDIMM 4Rx4 1.1Volts (16Gb TSV)	UCS-MR128G4RE1		UCSX-MR128G4RE1
256GB[2]	256 GB RDIMM 8Rx4 1.1Volts (16Gb TSV)	N/A	UCS-MR256G8RE1	UCSX-MR256G8RE1
DDR5-5600 MT/s Cisco Memory PIDs list[3]				
128GB 32Gb	128GB RDIMM 2Rx4 1.1Volts (32Gb)	UCS-MR128G2RG3		UCSX-MR128G2RG3
96GB	96GB RDIMM 2Rx4 1.1Volts (24Gb)	N/A		UCSX-MRX96G2RF3
64GB	32GB RDIMM 2Rx4 1.1Volts (16Gb)	UCS-MRX64G2RE3		UCSX-MRX64G2RE3
32GB	32GB RDIMM 1Rx4 1.1Volts (16Gb)	UCS-MRX32G1RE3		UCSX-MRX32G1RE3
16GB	16GB RDIMM 1Rx4 1.1Volts (16Gb)	UCS-MRX16G1RE3		UCSX-MRX16G1RE3

Notes:

1. These DDR5-4800 MT/s PIDs are no longer available for ordering through CCW and have been replaced by DDR5-5600 MT/s PIDs
2. There is no replacement part available for this 256GB memory PID.
3. Memory will operate at the maximum speed of the Intel 4th Gen. CPU memory controller, ranging from 4000 MT/s to 4800 MT/s. Check *Table 8*.**0** for details on 1DPC and 2 DPC maximum speed with 4th Gen. CPUs

- Mixing of DDR5-4800 and DDR5-5600 memory DIMMs in a server powered by Intel Xeon 4th Gen. CPUs
  - Mixing DDR5-4800 and DDR5-5600 memory DIMMs within a single server powered by Intel Xeon 4th Gen. CPUs is not supported
  - When configuring an M7 server with Intel Xeon 4th Gen. CPUs, ensure all installed memory DIMMs are of the same speed grade, DDR5-4800 or DDR5-5600.
  - When expanding the memory capacity of servers currently equipped with DDR5-4800 DIMMs, use only DDR5-4800 spare DIMMs for upgrades.

Table 2.1 Memory Options for UCS M7 servers with Intel® Xeon® 5th Gen. CPUs.[1]

Intel M7 Memory DIMM Densities & Cisco PIDs	Memory DIMM Description	C220 M7	C240 M7	X210c M7
DDR5-5600 MT/s Cisco Memory PIDs list				
16GB	16GB RDIMM 1Rx8 1.1Volts (16Gb)	UCS-MRX16G1RE3		UCSX-MRX16G1RE3
32GB	32GB RDIMM 1Rx4 1.1Volts (16Gb)	UCS-MRX32G1RE3		UCSX-MRX32G1RE3

Table 2.1 Memory Options for UCS M7 servers with Intel® Xeon® 5th Gen. CPUs.[1]

48GB[2]	48GB RDIMM 1Rx4 1.1Volts (24Gb)	UCS-MRX48G1RF3		UCSX-MRX48G1RF3
64GB	64GB RDIMM 2Rx4 1.1Volts (16Gb)	UCS-MRX64G2RE3		UCSX-MRX64G2RE3
96GB[2]	96GB RDIMM 2Rx4 1.1Volts (24Gb)	UCS-MRX96G2RF3		UCSX-MRX96G2RF3
128GB 16Gb TSV[3]	128GB RDIMM 4Rx4 1.1Volts (16Gb TSV)	UCS-MR128G4RE3		UCSX-MR128G4RE3
128GB 32Gb[3]	128GB RDIMM 2Rx4 1.1Volts (32Gb)	UCS-MR128G2RG3		UCSX-MR128G2RG3
256GB[4]	256 GB RDIMM 8Rx4 1.1Volts (16Gb TSV)	N/A	UCS-MR256G8RE3	UCSX-MR256G8RE3
DDR5-6400 MT/s Cisco Memory PIDs list				
16GB[2]	16GB RDIMM 1Rx8 1.1Volts (16Gb)	UCS-MRX16G1RE5		UCSX-MRX16G1RE5
32GB[2]	32GB RDIMM 1Rx4 1.1Volts (16Gb)	UCS-MRX32G1RE5		UCSX-MRX32G1RE5
64GB[2,5]	64GB RDIMM 2Rx4 1.1Volts (16Gb)	UCS-MRX64G2RE5		UCSX-MRX64G2RE5
96GB[2,5]	96GB RDIMM 2Rx4 1.1Volts (24Gb)	UCS-MRX96G2RF5		UCSX-MRX96G2RF5
128GB 32Gb[2]	128GB RDIMM 2Rx4 1.1Volts (32Gb)	UCS-MR128G2RG5		UCSX-MR128G2RG5
256GB 32Gb TSV[2,4]	256 GB RDIMM 4Rx4 1.1Volts (32Gb TSV)	N/A	UCS-MR256G4RG5	UCSX-MR256G4RG5

Notes:

1. Memory will operate at the maximum speed of the Intel 5th Gen. CPU memory controller, ranging from 4400 MT/s to 5600 MT/s. Check *Table 8*.**1** for details on 1DPC and 2 DPC maximum speed with 5th Gen. CPUs.
2. DDR5-5600 48GB and 96GB as well as DDR5-6400 16GB, 32GB, 64GB, 96GB, 128GB, 256GB memory DIMMs cannot be paired with Intel 5th Gen. CPUs 3508U, 4509Y, 4510, and 4510T SKUs.
3. 128GB 4Rx4 (16Gb) is now End-Of-Life and is replaced by 128GB 2Rx4 (32Gb).
4. 256GB DDR5-5600 PID is EOS and no longer orderable on CCW. UCS/UCSX-MR256G8RE3 PID will be replaced by DDR5-6400 256GB DIMM (UCS/UCSX-MR256G4RG5 PID), starting in Q3CY26.
5. 64GB and 96GB DDR5-6400 orderable in Q4CY26

Table 3 Memory PID Decoder

Identifier#1	Identifier#2	Identifier#3	Identifier#4	Identifier#5	Identifier#6	Identifier#7
Cisco Product Family	**Memory DIMM Type**	**DIMM Capacity (GB)**	**DIMM Org. (Rank)**	**DDR Generation & DRAM Density**	**DIMM Speed (Mega Transfers per second)**	**Option/Spare DIMM**
UCS UCSX	**MR:** RDIMM	X16G X32G X48G X64G X96G 128G 256G	**1R:** Single-Rank **2R:** Dual-rank **4R**: Quad-rank **8R:** Octa-rank	**E:** DDR5/16Gb **F**: DDR5/24Gb **G**: DDR5/32Gb	**1:** 4800 MT/s **3**: 5600 MT/s **5**: 6400 MT/s	**Blank:** Option **=:** Spare

- Mixing of DDR5-5600 and DDR5-6400 memory DIMMs in a server powered by Intel Xeon 5th Gen. CPUs
  - Mixing DDR5-5600 and DDR5-6400 memory DIMMs within a single server powered by Intel Xeon 5th Gen. CPUs is not supported
  - When configuring an M7 server with Intel Xeon 5th Gen. CPUs, ensure all installed memory DIMMs are of the same speed grade, DDR5-5600 or DDR5-6400.
  - When expanding the memory capacity of servers currently equipped with DDR5-5600 DIMMs, use only DDR5-5600 spare DIMMs for upgrades.

CHAPTER 3 DRAM GUIDELINES

GOLDEN RULE:

- Memory on every CPU socket shall be configured identically. Therefore, the memory configuration of CPU-1 will be identical to CPU-2 for a 2-Socket system and identical to CPU-3 and CPU-4 for a 4-socket system. Unbalanced populations are unsupported.
- DDR5-5600 memory DIMMs are supported on both Intel Xeon 5th Generation and 4th Generation CPUs, in accordance with *Table 2*.**0** and *Table 2*.1
- Mixing DDR5-4800 and DDR5-5600 DIMMs within a single server powered by Intel Xeon 4th Generation CPUs is not supported. When expanding the memory capacity of servers currently configured with DDR5-4800 DIMMs, only DDR5-4800 spare DIMMs should be used for upgrades.
- Mixing DDR5-5600 and DDR5-6400 DIMMs within a single server powered by Intel Xeon 5th Generation CPUs is not supported. When expanding the memory capacity of servers currently configured with DDR5-5600 DIMMs, only DDR5-5600 spare DIMMs should be used for upgrades.
- Intel 5th Generation CPUs do not support DDR5-4800 memories as these DIMMs have not been qualified for this processor generation.

- DIMM Count Rules:

Table 4.0 Allowed DIMM Count for 1-CPU and 2-CPU Only[1]

Allowed DIMM Count rules	Minimum Count	Maximum Count	Allowed Count	Not Allowed Count
16GB, 32GB, 64GB, 128GB, 256GB (4th and 5th Gen. CPUs)				
DIMM count for 1 CPU	1	16	1,2,4,6,8,12,16	3,5,7,9,10,11,13,14,15
DIMM count for 2-CPU	2	32	2,4,8,12,16,24,32	6,10,14,18,20,22,26,28,30
48GB (5th Gen. CPUs Only)[2]				
DIMM count for 1 CPU	1	8	1,6,8	2,3,4,5,7,9,10,11,12,13,14,15,16
DIMM count for 2-CPU	2	16	2,12,16	4,6,8,10,14,18,20,22,24,26,28,30,32
96GB (5th Gen. CPUs Only)[2]				
DIMM count for 1 CPU	1	16	1,6,8,12,16	2,3,4,5,7,9, 10,11,13,14,15
DIMM count for 2-CPU	2	32	2,12,16,24,32	4,6,8,10,14,18,20,22,26,28,30

Notes:

1. 12 DIMMs count for 1-CPU and 24 DIMMs count for 2-CPU are only allowed when all DIMMs have the same density.
2. 48GB and 96GB not supported on Intel 5th Gen. CPUs 3508U, 4509Y, 4510, and 4510T SKUs

Table 4.1 Allowed DIMM Count for 4-CPU Only[1]

Allowed DIMM Count rules	Minimum Count	Maximum Count	Allowed Count	Not Allowed Count
16GB, 32GB, 64GB, 128GB, 256GB (4th Gen. CPUs)				
DIMM count for 4-CPU	4	64	4,8,16,24,32,48,64	12,20,28,36,40,44,52,56,60

Table 4.1 Allowed DIMM Count for 4-CPU Only[1]

96GB (4th Gen. CPUs Only)[2,3]				
DIMM count for 4-CPU	32	64	32,64	4,8,12,16,20,24,28 36,40,44,48,52,56,60

Notes:

1. 48 DIMMs count for 4-CPU configurations are only allowed when all DIMMs have the same density.
2. x410c server model supports only 8xDIMMs and 16xDIMMs per CPU (32xDIMMs and 64xDIMMs for 4 CPUs).
3. For x410c server model, 96GB is only supported on Intel 4th Gen. CPUs Platinum Series 8444H, 8450H, 8454H, 8460H, 8468H, 8490H SKUs.

- DIMM Population Rules:
  - Each channel has two memory slots (for example, channel A = slots A1 and A2). See **golden rule** above.
    - A channel can operate with one or two DIMMs installed.
    - If a channel has only one DIMM, populate slot 1 first (the blue slot).
  - When both CPUs are installed, populate the memory slots of each CPU identically. Fill the blue slots (slot 1) in the memory channels first according to the recommended DIMM populations in *Table 5*.**0**, *Table 5*.**1**, *Table 5*.**2 and** *Table 5*.**3**

Table 5.0 M7 DIMM population order for 16GB, 32GB, 64GB, 128GB, 256GB

#DIMMs per CPU	DIMM Population - 16GB, 32GB, 64GB, 128GB, 256GB (4th and 5th Gen. CPUs)[1]	
	Slot 1 (Blue)	Slot 2 (Black)
1	A1	-
2	A1, G1	-
4	A1, C1, E1, G1	-
6	A1, C1, D1, E1, F1, G1	-
8	A1, B1, C1, D1, E1, F1, G1, H1	-
12[2]	A1, B1, C1, D1, E1, F1, G1, H1	A2, C2, E2, G2
16	A1, B1, C1, D1, E1, F1, G1, H1	A2, B2, C2, D2, E2, F2, G2, H2

Notes:

1. See DIMM Mixing Rules for allowed combinations across slots 1 and 2.
2. Only valid when DIMMs in blue and black slots are the same density.

Table 5.1 M7 DIMM population order for 48GB[1]

#DIMMs per CPU	DIMM Population - 48GB (5th Gen. CPUs only)[2,3]	
	Slot 1 (Blue)	Slot 2 (Black)
1	A1	-
6	A1, C1, D1, E1, F1, G1	-
8	A1, B1, C1, D1, E1, F1, G1, H1	-

Notes:

1. 48GB not supported on Intel 5th Gen. CPUs 3508U, 4509Y, 4510, and 4510T SKUs

2. 48GB DIMMs cannot be mixed with other DIMM capacities.
3. Only 1 DPC supported by 48GB.

Table 5.2 M7 DIMM population order for 96GB - C220, C240, and x210c server models only[1]

#DIMMs per CPU	DIMM Population - 96GB (5th Gen. CPUs only)[2]	
	Slot 1 (Blue)	Slot 2 (Black)
1	A1	-
6	A1, C1, D1, E1, F1, G1	-
8	A1, B1, C1, D1, E1, F1, G1, H1	-
12[3]	A1, B1, C1, D1, E1, F1, G1, H1	A2, C2, E2, G2
16[2]	A1, B1, C1, D1, E1, F1, G1, H1	A2, B2, C2, D2, E2, F2, G2, H2

Notes:

1. 96GB not supported on Intel 5th Gen. CPUs 3508U, 4509Y, 4510, and 4510T SKUs
2. 96GB DIMMs cannot be mixed with other DIMM capacities.
3. Only valid when DIMMs in blue and black slots are the same density.

Table 5.3 M7 DIMM population order for 96GB - x410c server model sonly

#DIMMs per CPU	DIMM Population - 96GB (4th Gen. CPUs only)[1],[2]	
	Slot 1 (Blue)	Slot 2 (Black)
8	A1, B1, C1, D1, E1, F1, G1, H1	-
16	A1, B1, C1, D1, E1, F1, G1, H1	A2, B2, C2, D2, E2, F2, G2, H2

Notes:

1. x410c server model supports only 8xDIMMs and 16xDIMMs per CPU (32xDIMMs and 64xDIMMs for 4 CPUs)
2. For x410c server model, 96GB is only supported on Intel 4th Gen. CPUs Platinum Series 8444H, 8450H, 8454H, 8460H, 8468H, 8490H SKUs

- DIMM Mixing Rules:
  - Higher rank DIMMs shall be populated on Slot 1.
  - Mixing different DIMM densities in the same slot across channels is not supported. All populated slots of the same color must have the same DIMM density.
  - Mixing DDR5-4800 and DDR5-5600 memory PIDs is not allowed (Intel 4th Gen. CPUs)
  - Mixing DDR5-5600 and DDR5-6400 memory PIDs is not allowed (Intel 5th Gen. CPUs)
  - Mixing X4 and X8 DIMMs is not allowed
  - Mixing 16Gb or 32Gb DRAM based with 24Gb DRAM based DIMMs is not allowed. Therefore, 48GB and 96GB cannot be mixed with any other memory DIMMs
  - Mixing 16Gb or 24Gb DRAM based with 32Gb DRAM based DIMMs is not allowed. Therefore, 128GB 2Rx4 (32Gb) cannot be mixed with any other memory DIMMs
  - 48GB supports 1 DIMM Per Channel (1DPC) only
  - The DIMM mixing rules matrix is described in the *Table 6* and *Table 7*, below

Table 6 Supported DIMM mixing and population across 2 slots in each channel - 16GB, 32GB, 64GB, 128GB, and 256GB DIMMs

Channel Mixing[1,2,3]		DIMM Slot 2 (Black)					
DIMM Slot 1 (Blue)		16GB	32GB	64GB	128GB	128GB (32Gb)	256GB
		1Rx8	1Rx4	2Rx4	4Rx4	2Rx4	8Rx4
16GB	1Rx8	Yes[1]	No	No	No	No	No
32GB	1Rx4	No	Yes[1]	No	No	No	No
64GB	2Rx4	No	Yes[2]	Yes[1]	No	No	No
128GB	4Rx4	No	No	No	Yes[1]	No	No
128GB (32Gb)	2Rx4	No	No	No	No	Yes[1]	No
256GB	8Rx4	No	No	No	Yes[2]	No	Yes[1]

Notes:

1. For 2,4,6, 8 DIMMs count, only populate slot 1 (Blue slot). see *Table 5*.**0** for details
2. When mixing two different DIMM densities, all 8 channels per CPU must be populated. Use of fewer than 8 channels (16 slots per CPU) is not supported.
3. Mixing DDR5-5600 and DDR5-6400 memory PIDs is not allowed (Intel 5th Gen. CPUs)
4. Mixing DDR5-4800 and DDR5-5600 memory PIDs is not allowed (Intel 4th Gen. CPUs)

Table 7 Supported DIMM mixing and population across 2 slots in each channel - 48GB and 96GB DIMMs

Channel Mixing		DIMM Slot 2 (Black)	
DIMM Slot 1 (Blue)		48GB	96GB
		1Rx4	2Rx4
48GB	1Rx4	No	No
96GB	2Rx4	No	Yes[1]

Notes:

1. Only 6 or 8 channels are allowed (for 2, 4, or 8 DIMMs you would just populate 1 DPC on 2, 4, or 8 channels). see *Table 5*.1, *Table 5*.2 and *Table 5*.3 for details

- Memory Limitations:
  - Memory on every CPU socket shall be configured identically. See golden rule from page 9.
  - Refer to *Table 5*.**0**, *Table 5*.**1,** *Table 5*.**2,** *Table 5*.**3** and *Table 6* and *Table 7*, for DIMM population and DIMM mixing rules.
  - Cisco memory from previous generation servers (DDR3 and DDR4) is not supported with the M7 servers.
- For best performance, observe the following:
  - For optimum performance, populate at least one DIMM per memory channel per CPU. When one DIMM per channel is used, it must be populated in DIMM slot 1 (blue slot farthest away from the CPU) of a given channel.
  - The maximum 2 DPC speed is 4400 MT/s, refer to *Table 8*.**0** and *Table 8*.**1** for the details.

Table 8.0 DDR5-4800 DIMM 1DPC and 2DPC max speed matrix - 4th Gen. CPU

4th Gen. CPU Shelves and Memory Speed	1DPC	2DPC
	All RDIMMs	All RDIMMs
Platinum Series 8	4800 MT/s	4400 MT/s
Gold Series 6	4800 MT/s	4400 MT/s
Gold Series 5	4400 MT/s	4400 MT/s
Silver Series 4	4000 MT/s	4000 MT/s
Bronze Series 3	4000 MT/s	4000 MT/s

Table 8.1 DDR5-5600 DIMM 1DPC and 2DPC max speed matrix - 5th Gen. CPU

5th Gen. CPU Shelves and Memory Speed	1DPC	2DPC
	All RDIMMs	All RDIMMs
Platinum Series 8	5600 MT/s	4400 MT/s
Gold Series 6	5200 MT/s	4400 MT/s
Gold Series 5	4800 MT/s	4400 MT/s
Silver Series 4	4400 MT/s	4400 MT/s
Bronze Series 3	4400 MT/s	4400 MT/s

CHAPTER 4 SUPPORTED DRAM DIMM CONFIGURATIONS

- *Table 9*.**0** and *Table 9*.**1** below shows the supported DIMM configurations with 1, 2, 4, 6, 8, 12, and 16 DIMMs per CPU.
- The only DIMM mixing configurations allowed are:
  - 32GB RDIMMs and 64GB RDIMMs
  - 128GB 4Rx4 RDIMMs (16Gb TSV) and 256GB RDIMMs; 128GB 2Rx4 (32Gb) is not mixable with any other RDIMM
  - DIMM mixing configurations are shown at the end of *Table 9*.**0** and *Table 9*.**1**.

Table 9.0 Supported Memory Configurations for 4th Gen. Intel® Xeon® Scalable Processors

DDR5 Memory Total System Capacity			Capacity Per CPU (GB)		Total DIMMs Per CPU
1-CPU	**2-CPU**	**4-CPU**	**Blue Slots A1 to H1**	**Black Slots A2 to H2**	
16GB RDIMMs					
16GB	32GB	64GB	1x16GB	-	1
32GB	64GB	128GB	2x16GB	-	2
64GB	128GB	256GB	4x16GB	-	4
96GB	192GB	384GB	6x16GB	-	6
128GB	256GB	512GB	8x16GB	-	8
192GB	384GB	768GB	8x16GB	4x16GB	12
256GB	512GB	1024GB	8x16GB	8x16GB	16
32GB RDIMMs					
32GB	64GB	128GB	1x32GB	-	1
64GB	128GB	256GB	2x32GB	-	2
128GB	256GB	512GB	4x32GB	-	4
192GB	384GB	768GB	6x32GB	-	6
256GB	512GB	1024GB	8x32GB	-	8
384GB	768GB	1536GB	8x32GB	4x32GB	12
512GB	1024GB	2048GB	8x32GB	8x32GB	16

Table 9.0 Supported Memory Configurations for 4th Gen. Intel® Xeon® Scalable Processors

DDR5 Memory Total System Capacity			Capacity Per CPU (GB)		Total DIMMs Per CPU
1-CPU	**2-CPU**	**4-CPU**	**Blue Slots A1 to H1**	**Black Slots A2 to H2**	
48GB RDIMMs					
N/A[1]					
64GB RDIMMs					
64GB	128GB	256GB	1x64GB	-	1
128GB	256GB	512GB	2x64GB	-	2
256GB	512GB	1024GB	4x64GB	-	4
384GB	768GB	1536GB	6x64GB	-	6
512GB	1024GB	2048GB	8x64GB	-	8
768GB	1536GB	3072GB	8x64GB	4x64GB	12
1024GB	2048GB	4096GB	8x64GB	8x64GB	16
96GB RDIMMs					
N/A	N/A	3072GB	8x96GB	-	8
N/A	N/A	6144GB	8x96GB	8x96GB	16
128GB 4Rx4 RDIMM					
128GB	256GB	512GB	1x128GB	-	1
256GB	512GB	1024GB	2x128GB	-	2
512GB	1024GB	2048GB	4x128GB	-	4
768GB	1536GB	3072GB	6x128GB	-	6
1024GB	2048GB	4096GB	8x128GB	-	8
1536GB	3072GB	6144GB	8x128GB	4x128GB	12
2048GB	4096GB	8192GB	8x128GB	8x128GB	16
128GB 2Rx4 (32Gb) RDIMMs[2]					
128GB	256GB	N/A	1x128GB	-	1
256GB	512GB	N/A	2x128GB	-	2
512GB	1024GB	N/A	4x128GB	-	4

Table 9.0 Supported Memory Configurations for 4th Gen. Intel® Xeon® Scalable Processors

DDR5 Memory Total System Capacity			Capacity Per CPU (GB)		Total DIMMs Per CPU
1-CPU	**2-CPU**	**4-CPU**	**Blue Slots A1 to H1**	**Black Slots A2 to H2**	
768GB	1536GB	N/A	6x128GB	-	6
1024GB	2048GB	N/A	8x128GB	-	8
1536GB	3072GB	N/A	8x128GB	4x128GB	12
2048GB	4096GB	N/A	8x128GB	8x128GB	16
256GB RDIMMs					
256GB	512GB	1024GB	1x256GB	-	1
512GB	1024GB	2048GB	2x256GB	-	2
1024GB	2048GB	4096GB	4x256GB	-	4
1536GB	3072GB	6144GB	6x256GB	-	6
2048GB	4096GB	8192GB	8x256GB	-	8
3072GB	6144GB	12288GB	8x256GB	4x256GB	12
4096GB	8192GB	16384GB	8x256GB	8x256GB	16
64GB RDIMMs + 32GB RDIMMs					
768GB	1536GB	3072GB	8x64GB	8x32GB	16
256GB RDIMMs + 128GB 4Rx4 RDIMMs					
3072GB	6144GB	12288GB	8x256GB	8x128GB	16

Notes:

1. N/A= Not Available
2. 128GB 2Rx4 (32Gb) is not mixable with any other RDIMM density.

Table 9.1 Supported Memory Configurations for 5th Gen. Intel® Xeon® Scalable Processors [1]

DDR5 Memory Total System Capacity			Capacity Per CPU (GB)		Total DIMMs Per CPU
1-CPU	**2-CPU**	**4-CPU**	**Blue Slots A1 to H1**	**Black Slots A2 to H2**	
16GB RDIMMs					
16GB	32GB	N/A[2]	1x16GB	-	1
32GB	64GB	N/A	2x16GB	-	2
64GB	128GB	N/A	4x16GB	-	4
96GB	192GB	N/A	6x16GB	-	6
128GB	256GB	N/A	8x16GB	-	8
192GB	384GB	N/A	8x16GB	4x16GB	12
256GB	512GB	N/A	8x16GB	8x16GB	16
32GB RDIMMs					
32GB	64GB	N/A	1x32GB	-	1
64GB	128GB	N/A	2x32GB	-	2
128GB	256GB	N/A	4x32GB	-	4
192GB	384GB	N/A	6x32GB	-	6
256GB	512GB	N/A	8x32GB	-	8
384GB	768GB	N/A	8x32GB	4x32GB	12
512GB	1024GB	N/A	8x32GB	8x32GB	16
48GB RDIMMs					
48 GB	96 GB	N/A	1x48GB	-	1
288 GB	576 GB	N/A	6x48GB	-	6
384 GB	768 GB	N/A	8x48GB	-	8
64GB RDIMMs					
64GB	128GB	N/A	1x64GB	-	1
128GB	256GB	N/A	2x64GB	-	2
256GB	512GB	N/A	4x64GB	-	4
384GB	768GB	N/A	6x64GB	-	6
512GB	1024GB	N/A	8x64GB	-	8

Table 9.1 Supported Memory Configurations for 5th Gen. Intel® Xeon® Scalable Processors [1]

DDR5 Memory Total System Capacity			Capacity Per CPU (GB)		Total DIMMs Per CPU
1-CPU	2-CPU	4-CPU	Blue Slots A1 to H1	Black Slots A2 to H2	
768GB	1536GB	N/A	8x64GB	4x64GB	12
1024GB	2048GB	N/A	8x64GB	8x64GB	16
96GB RDIMMs					
96 GB	192 GB	N/A	1x96GB	-	1
576 GB	1152 GB	N/A	6x96GB	-	6
768 GB	1536 GB	N/A	8x96GB	-	8
1152 GB	2304 GB	N/A	8x96GB	4x96GB	12
1536 GB	3072 GB	N/A	8x96GB	8x96GB	16
128GB 4Rx4 RDIMMs					
128GB	256GB	N/A	1x128GB	-	1
256GB	512GB	N/A	2x128GB	-	2
512GB	1024GB	N/A	4x128GB	-	4
768GB	1536GB	N/A	6x128GB	-	6
1024GB	2048GB	N/A	8x128GB	-	8
1536GB	3072GB	N/A	8x128GB	4x128GB	12
2048GB	4096GB	N/A	8x128GB	8x128GB	16
128GB 2Rx4 (32Gb) RDIMMs[3]					
128GB	256GB	N/A	1x128GB	-	1
256GB	512GB	N/A	2x128GB	-	2
512GB	1024GB	N/A	4x128GB	-	4
768GB	1536GB	N/A	6x128GB	-	6
1024GB	2048GB	N/A	8x128GB	-	8
1536GB	3072GB	N/A	8x128GB	4x128GB	12
2048GB	4096GB	N/A	8x128GB	8x128GB	16
256GB RDIMMs					
256GB	512GB	N/A	1x256GB	-	1

Table 9.1 Supported Memory Configurations for 5th Gen. Intel® Xeon® Scalable Processors [1]

DDR5 Memory Total System Capacity			Capacity Per CPU (GB)		Total DIMMs Per CPU
1-CPU	2-CPU	4-CPU	Blue Slots A1 to H1	Black Slots A2 to H2	
512GB	1024GB	N/A	2x256GB	-	2
1024GB	2048GB	N/A	4x256GB	-	4
1536GB	3072GB	N/A	6x256GB	-	6
2048GB	4096GB	N/A	8x256GB	-	8
3072GB	6144GB	N/A	8x256GB	4x256GB	12
4096GB	8192GB	N/A	8x256GB	8x256GB	16
256GB 32GB TSV RDIMMs					
256GB	512GB	N/A	1x256GB	-	1
512GB	1024GB	N/A	2x256GB	-	2
1024GB	2048GB	N/A	4x256GB	-	4
1536GB	3072GB	N/A	6x256GB	-	6
2048GB	4096GB	N/A	8x256GB	-	8
3072GB	6144GB	N/A	8x256GB	4x256GB	12
4096GB	8192GB	N/A	8x256GB	8x256GB	16
64GB RDIMMs + 32GB RDIMMs					
768GB	1536GB	N/A	8x64GB	8x32GB	16
256GB RDIMMs + 128GB 4Rx4 RDIMMs					
3072GB	6144GB	N/A	8x256GB	8x128GB	16

Notes:

1. DDR5-5600 48GB and 96GB as well as DDR5-6400 16GB, 32GB, 64GB, 96GB, 128GB, 256GB memory DIMMs cannot be paired with Intel 5th Gen. CPUs 3508U, 4509Y, 4510, and 4510T SKUs.
2. N/A= Not Available.
3. 128GB 2Rx4 (32Gb) is not mixable with any other RDIMM density.

NOTE:

- 256GB DIMMs are available on all C240 M7 server models, X210c M7 and X410C M7 compute nodes. They are not supported on C220 M7.
- Review the appropriate platform spec sheets for additional 256GB DIMM usage conditions.
- Mixing DDR5-4800 and DDR5-5600 DIMMs within a single server powered by Intel Xeon 4th Generation CPUs is not supported. When expanding the memory capacity of servers currently configured with DDR5-4800 DIMMs, only DDR5-4800 spare DIMMs should be used for upgrades.
- When DDR5-5600 memory DIMMs are populated on C220, C240, and x210x server powered by Intel Xeon 4th Gen. CPUs, the memory will operate at the maximum speed of the Intel Xeon 4th Gen. CPUs memory controller, ranging from 4000 MT/s to 4800 MT/s.
- Mixing DDR5-5600 and DDR5-6400 DIMMs within a single server powered by Intel Xeon 5th Generation CPUs is not supported. When expanding the memory capacity of servers currently configured with DDR5-5600 DIMMs, only DDR5-5600 spare DIMMs should be used for upgrades.
- When DDR5-6400 memory DIMMs are populated on C220, C240, and x210c server powered by Intel Xeon 5th Gen. CPUs, the memory will operate at the maximum speed of the Intel Xeon 5th Gen. CPUs memory controller, ranging from 4400 MT/s to 5600 MT/s.
- When DDR5-5600 96GB is populated on x410c, the memory will operate at the maximum speed of the Intel 4th Gen. CPU memory controller, ranging from 4000 MT/s to 4800 MT/s.
- X410c server model, a 4-Socket system, doesn't support 5th Gen. CPUs.

CHAPTER 5 INSTALLING a DIMM or DIMM BLANK

To install a DIMM or a DIMM blank into a slot on the blade server, follow these steps.

Procedure

Step 1 Open both DIMM connector latches.

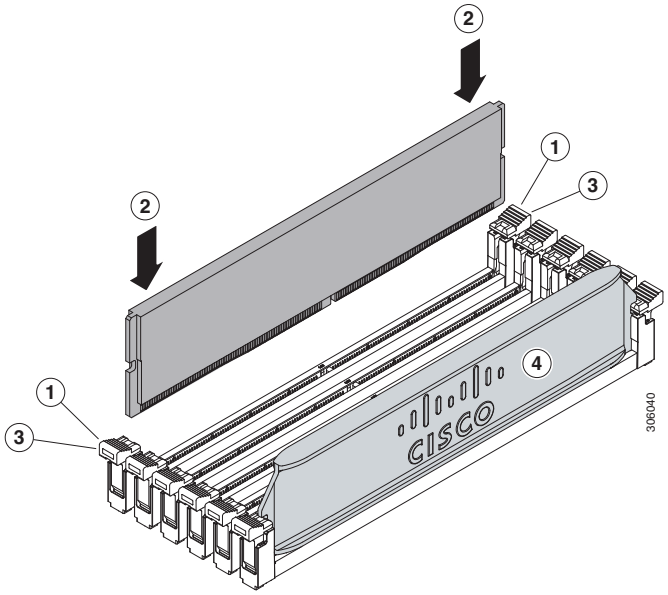
Step 2 Press evenly on both ends of the DIMM until it clicks into place in its slot

Note: Ensure that the notch in the DIMM aligns with the slot. If the notch is misaligned, it is possible to damage the DIMM, the slot, or both.

Step 3 Press the DIMM connector latches inward slightly to seat them fully.

Step 4 Populate all slots with a DIMM or DIMM blank. A slot cannot be empty.

Figure 3 Installing Memory



DISCONTINUED EOL MEMORY PIDs

Below is the list of parts were previously available for this product and are no longer sold. Please refer to the EOL Bulletin Links via table below to determine if still supported.

Table 10 EOS

Product ID	Description	EOL/EOS link
UCS-MRX16G1RE1	16GB DDR5-4800 RDIMM 1Rx8 (16Gb)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/ucs-accessories_eol.html
UCS-MRX32G1RE1	32GB DDR5-4800 RDIMM 1Rx4 (16Gb)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/ucs-accessories_eol.html
UCS-MRX64G2RE1	64GB DDR5-4800 RDIMM 2Rx4 (16Gb)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/ucs-accessories_eol.html
UCS-MR128G4RE1	128GB DDR5-4800 RDIMM 4Rx4 (16Gb)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/ucs-accessories_eol.html
UCS-MR128G4RE3[1]	128GB DDR5-5600 RDIMM 4Rx4 (16Gb)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/select-ucs-accessories-eol15570.html
UCS-MRX16G1RE3	16GB DDR5-5600 RDIMM 1Rx8 (16Gb)	Disabled Due to Material Shortage
UCS-MR256G8RE1	256GB DDR5-4800 RDIMM 8Rx4 (16Gb)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/ucs-accessories_eol.html
UCS-MRX16G1RE3[1]	16GB DDR5-5600 RDIMM 1Rx8 (16Gb)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/select-ucs-accessories-eol15570.html
UCS-MRX32G1RE3[1]	32GB DDR5-5600 RDIMM 1Rx4 (16Gb)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/select-ucs-ucsx-hci-accessories-eol15928.html
UCS-MR128G4RE3[1]	128GB DDR5-5600 RDIMM 4Rx4 (16Gb)	https://www.cisco.com/c/en/us/products/collateral/servers-unified-computing/ucs-c-series-rack-servers/select-ucs-ucsx-hci-accessories-eol15928.html

Notes:

1. DDR5-5600 16GB, 32GB, and 128GB memories are now End-Of-Life and are respectively replaced by DDR5-6400 16GB, 32GB, and 128GB memories.

Change log

Please find the below table for the recent changes happened in the document.

Table 11 Change log

Publication Date	Revision
Updated on March 2024	Adding 96GB support for x410c
	Adding x410c block diagram
	The DIMM count rules, population rules and mixing rules tables are updated for the X410c M7
Updated on May 2024	256GB now orderable.
Updated on December 2024	128GB 2Rx4 (32Gb) now orderable on C220, C240, x210 M7 together with Intel® Xeon® 5th Gen. CPUs.
Updated on October 2025	■ On September 30th, Cisco announced the End-Of-Life (EOL) and End-Of-Sale (EOS) for our DDR5-4800 memory DIMMs, which are currently supported on Cisco UCS M7 servers featuring Intel Xeon 4th Gen CPUs. *Table 10* for the lists the product part numbers affected by this announcement. ■ Added 32GB and 16GB PID to the *Table 2*
Updated on February 2026	DDR5-4800 Memory DIMMs being End-Of-sale and replaced by DDR5-5600 Memory DIMMs.
Updated on June 2026	Updated EOS/EOL memory PIDs on *Table 9*
Updated on August 2026	Adding DDR5-6400 for Intel Xeon 5th Gen. CPUs



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