Spec Sheet

Compute Cartridges for Cisco UCS M-Series Modular Servers

CISCO SYSTEMS
170 WEST TASMAN DR.
SAN JOSE, CA, 95134
WWW.CISCO.COM

PUBLICATION HISTORY

REV A.2 AUGUST 11, 2015

CONTENTS

OVERVIEW

Cisco UCS® M-Series Modular Servers are designed to meet the high-density, low-power demands of massively parallelized and cloud-scale applications. The unique design of the Cisco UCS M4308 Modular Chassis uses Cisco System Link technology to provide infrastructure resources to the Cisco UCS M-Series compute cartridges, including power, cooling, I/O, and local disk—all managed within the stateless computing environment of Cisco UCS Manager. UCS M-Series Compute Cartridges eliminate the complexity of a traditional server, delivering discrete compute and memory, fully separated from the infrastructure components provided by the M4308 Chassis. The UCS M-Series Compute Cartridges and UCS M4308 Modular Chassis provide easy scalability to meet the needs of your applications without over-provisioning.

The cartridges that are supported in the Cisco UCS M4308 Modular Chassis are:

- ***CISCO UCS MI42 COMPUTE CARTRIDGE, page 4***
- ***CISCO UCS MI414 COMPUTE CARTRIDGE, page 11***
- ***CISCO UCS M2814 COMPUTE CARTRIDGE, page 19***

CISCO UCS MI42 COMPUTE CARTRIDGE

The Cisco UCS M142 Compute Cartridge (***Figure 1***) has two independent server nodes. Each server node has a single-socket Intel® Xeon® processor E3-1200L v3 series CPU with up to 32 GB of memory. Meeting the density and power efficiency objectives of cloud-scale computing, the Cisco UCS M142 supports low-power-consumption CPUs that provide optimal performance for specific applications. Applications that are suited to run on the Cisco UCS M142 include online content delivery, dedicated hosting, financial modeling, and business analytics.

Figure 1 Cisco UCS M142 Compute Cartridge

BASE CARTRIDGE STANDARD CAPABILITIES and FEATURES

Table 1 lists the capabilities and features of the base Cisco UCS M142 compute cartridge. Details about selecting a cartridge are provided in *CONFIGURING the CARTRIDGE, page 6*.

The Cisco UCS M142 Compute Cartridge loads directly into the front of the Cisco UCS M4308 Modular Chassis.The Cisco UCS M4308 chassis can hold up to eight Cisco UCS M142 Compute Cartridges. The cartridges are hot pluggable and can be serviced without needing any tools. The system and domain discovery of all cartridges and the subsequent management is provided entirely by Cisco UCS Manager, which is embedded in the external Cisco UCS fabric interconnects.

Table 1 Capabilities and Features

Capability/Feature	Description
Independent Servers	Each cartridge contains two independent servers, each powered by one Intel Xeon processor E3-1200L v3 series CPU and up to 32GB of memory.
CPU Options	CPU options: ■ Intel® Xeon® processor E3-1275L v3 (8-MB cache, 2.7 GHz), 4 cores, and 45W ■ Intel® Xeon® processor E3-1240L v3 (8-MB cache, 2.0 GHz), 4 cores, and 25W ■ Intel® Xeon® processor E3-1220L v3 (4-MB cache, 1.1 GHz), 2 cores, and 13W
DIMM Memory	Up to four 8 GB unregistered DIMM slots (UDIMMS) per server node for up to 32 GB per server node.
M4308 Chassis Slot Usage	8 independent front-load Cisco UCS M142 cartridges per Cisco UCS M4308 chassis

CONFIGURING the CARTRIDGE

Follow these steps to configure the Cisco UCS M142 compute cartridge:

STEP 1 SELECT COMPUTE CARTRIDGES

The Cisco UCS M142 Compute Cartridge consists of two single-socket server nodes with 4 DIMM slots each.

Select Compute Cartridge

The available cartridge configurations are listed in ***Table 2***.

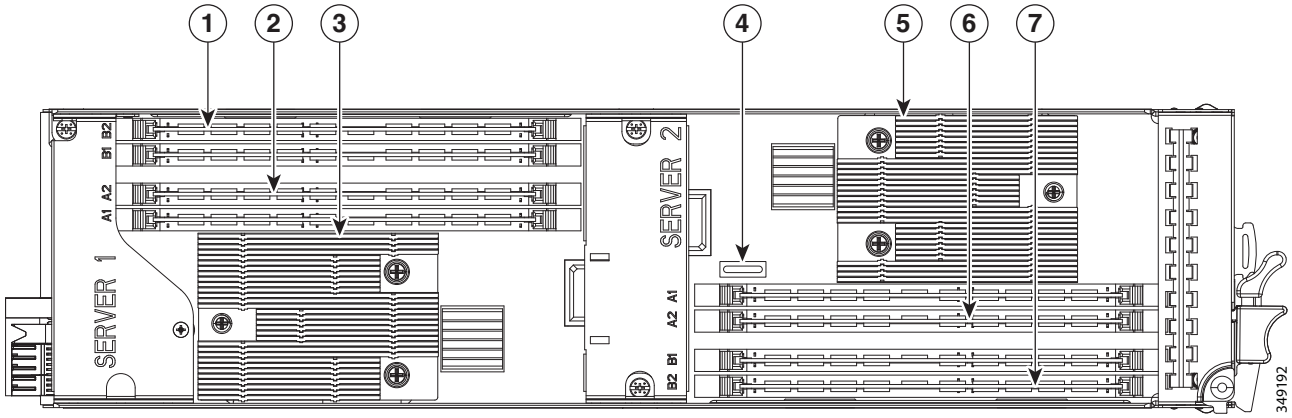
Table 2 PIDs of Compute Cartridges

Product ID (PID)	Description
UCSME-142L1-M4	Cisco UCS M142 Compute Cartridge w two 2.70 GHz CPU, 64 GB memory ■ 1 x Intel Xeon Processor E31275L D (8M Cache, 2.70 GHz) per node ■ 4 x 8GB DDR3-1600-MHz ECC UDIMM/PC3-12800/dual rank/x8/1.35v per node
UCSME-142M1-M4	Cisco UCS M142 Compute Cartridge w two 2.00 GHz CPU, 64 GB memory ■ 1 x Intel Xeon Processor E31240L D (8M Cache, 2.00 GHz) per node ■ 4 x 8GB DDR3-1600-MHz ECC UDIMM/PC3-12800/dual rank/x8/1.35v per node
UCSME-142S1-M4	Cisco UCS M142 Compute Cartridge w two 1.10 GHz CPU, 64 GB memory ■ 1 x Intel Xeon Processor E31220L D (4M Cache, 1.10 GHz) per node ■ 4x 8GB DDR3-1600-MHz ECC UDIMM/PC3-12800/dual rank/x8/1.35v per node
UCSME-142S2-M4	Cisco UCS M142 Compute Cartridge w two 1.10 GHz CPU, 32 GB memory ■ 1x Intel Xeon Processor E31220L D (4M Cache, 1.10 GHz) per node ■ 2 x 8GB DDR3-1600-MHz ECC UDIMM/PC3-12800/dual rank/x8/1.35v per node

SUPPLEMENTAL MATERIAL

An internal view of the Cisco UCS M142 compute cartridge with the top cover removed is shown in ***Figure 2***.

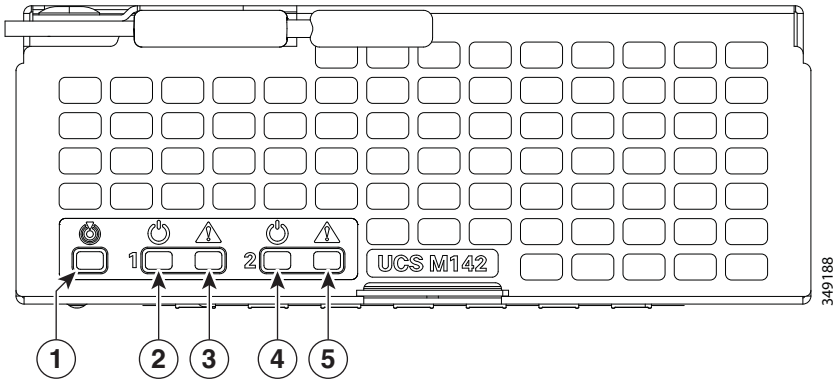
Figure 2 M142 Compute Cartridge With Top Cover Off



1	Server 1 DIMM slots (B1, B2)	**5**	Server 2 CPU and heatsink
2	Server 1 DIMM slots (A1, A2)	**6**	Server 2 DIMM slots (A1, A2)
3	Server 1 CPU and heatsink	**7**	Server 2 DIMM slots (B1, B2)
4	12 V standby battery	**—**	

A view of the Cisco UCS M142 compute cartridge front panel is shown in ***Figure 3***.

Figure 3 M142 Compute Cartridge Front View



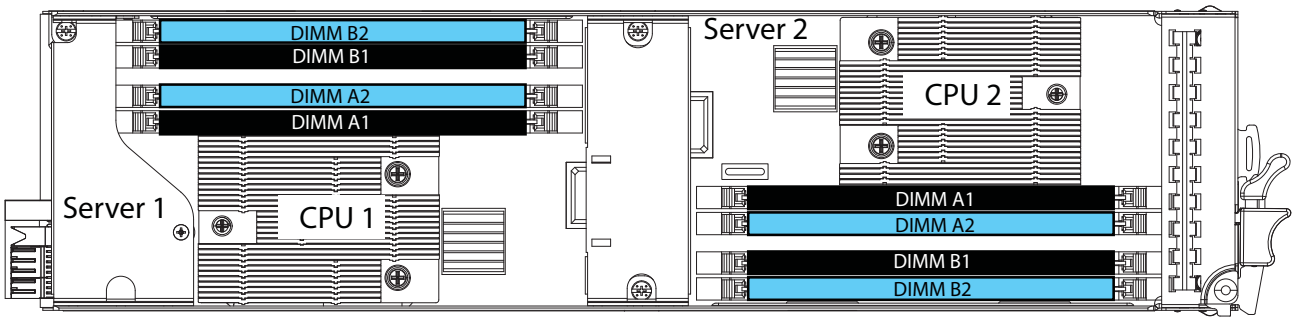
1	Unit identification LED	**4**	CPU 2 power LED
2	CPU 1 power LED	**5**	CPU 2 health LED
3	CPU 1 health LED	**—**	

Physical Layout

Each server node has a single CPU. Each CPU has two memory channels and two DIMMs per channel (DPC). DIMMs are installed in Bank 1 (blue socket) first, then Bank 2 (black socket).

Figure 4 shows how slots and channels are physically laid out on the motherboard. The DIMM slots on the left half of the motherboard (channels A and B) are associated with CPU 1/Server 1, while the DIMM slots on the right half of the motherboard (channels A and B) are associated with CPU 2/Server 2.

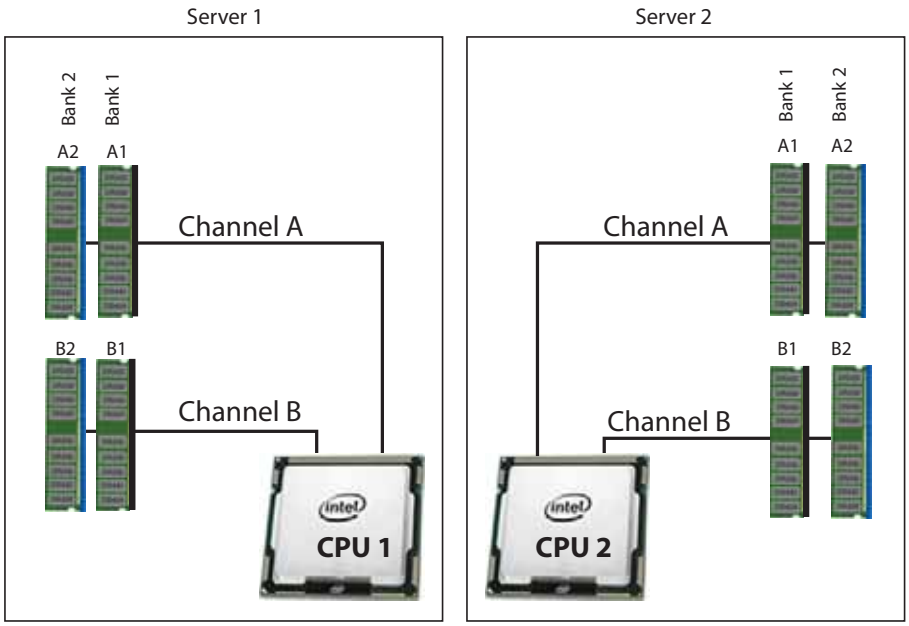
Figure 4 Physical Layout of CPU DIMM Channels and Slots



Logical Layout

The logical layout of the CPU DIMM channels and slots is shown in ***Figure 5***. There is no communication channel between CPU 1 and CPU 2.

Figure 5 Logical Layout of CPU DIMM Channels and Slots



CISCO UCS MI414 COMPUTE CARTRIDGE

The Cisco UCS M1414 Compute Cartridge (*Figure 6*) has one server node. The server node uses an Intel® Xeon® E3 1200 v3 CPU, with up to 32 GB of DDR3 1600 MHz memory. The high-frequency CPUs used in the Cisco UCS M1414 M-Series cartridge are ideal for electronic design automation and simulation (EDA or ECAD).

Figure 6 Cisco UCS M1414 Compute Cartridge

BASE CARTRIDGE STANDARD CAPABILITIES and FEATURES

Table 3 lists the capabilities and features of the base Cisco UCS M1414 compute cartridge. Details about selecting a cartridge are provided in *CONFIGURING the CARTRIDGE, page 13*.

The Cisco UCS M1414 Compute Cartridge loads directly into the front of the Cisco UCS M4308 Modular Chassis.The Cisco UCS M4308 chassis can hold up to eight Cisco UCS M1414 Compute Cartridges. The cartridge is hot pluggable and can be serviced without needing any tools. The system and domain discovery of all cartridges and the subsequent management is provided entirely by Cisco UCS Manager, which is embedded in the external Cisco UCS fabric interconnects.

Table 3 Capabilities and Features

Capability/Feature	Description
Single Server Node	The cartridge contains one server node, powered by one Intel Xeon E3-1200 v3 series CPU
CPU Options	CPU options: ■ Intel® Xeon® Processor E3 1231 V3 (8M Cache, 3.40 GHz, 80 W) ■ Intel® Xeon® Processor E3 1241 V3 (8M Cache, 3.50 GHz, 80 W) ■ Intel® Xeon® Processor E3 1271 V3 (8M Cache, 3.60 GHz, 80 W) ■ Intel® Xeon® Processor E3 1281 V3 (8M Cache, 3.70 GHz, 82 W)
DIMM Memory	Four 8 GB unregistered DIMM slots (UDIMMs), for 32 GB of memory
M4308 Chassis Slot Usage	8 independent front-load Cisco UCS M1414 cartridges per Cisco UCS M4308 chassis

CONFIGURING the CARTRIDGE

Follow these steps to configure the Cisco UCS M1414 compute cartridge:

- *STEP 1 SELECT COMPUTE CARTRIDGES, page 14*

STEP 1 SELECT COMPUTE CARTRIDGES

The Cisco UCS 1414 Compute Cartridge consists of one single-socket server node with 4 DIMM slots.

Select Compute Cartridge

The available cartridge configurations are listed in ***Table 4***.

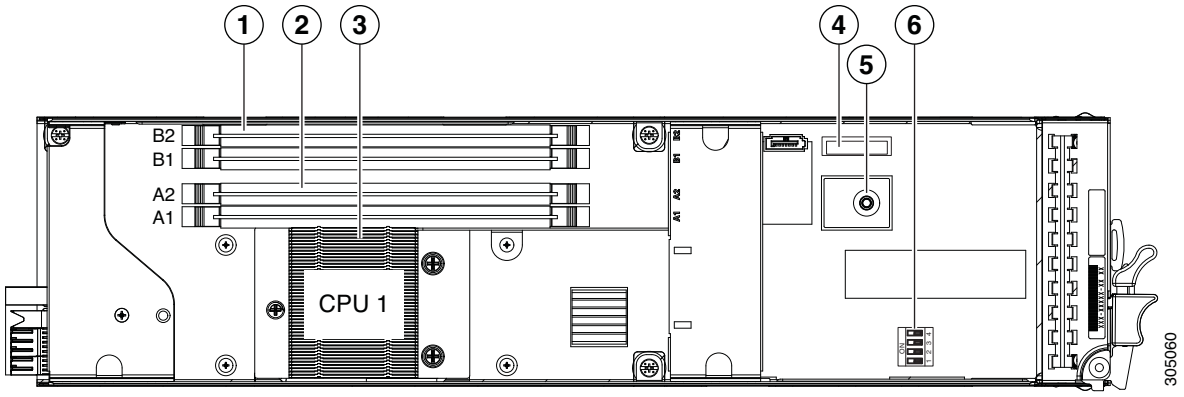
Table 4 PIDs of Compute Cartridges

Product ID (PID)	Description
UCSME-1414-1231	Cisco UCS M1414 Compute Cartridge w one 3.40 GHz CPU, 32 GB memory ■ 1 x Intel Xeon Processor E3 1241 V3 (8M Cache, 3.50 GHz) ■ 4 x 8GB DDR3-1600-MHz ECC UDIMM/PC3-12800/dual rank/x8/1.35v
UCSME-1414-1241	Cisco UCS M1414 Compute Cartridge w one 3.50 GHz CPU, 32 GB memory ■ 1 x Intel Xeon Processor E3 1271 V3 (8M Cache, 3.50 GHz) ■ 4 x 8GB DDR3-1600-MHz ECC UDIMM/PC3-12800/dual rank/x8/1.35v
UCSME-1414-1271	Cisco UCS M1414 Compute Cartridge w one 3.60 GHz CPU, 32 GB memory ■ 1 x Intel Xeon Processor I E3 1271 V3 (8M Cache, 3.60 GHz) ■ 4 x 8GB DDR3-1600-MHz ECC UDIMM/PC3-12800/dual rank/x8/1.35v
UCSME-114-1281	Cisco UCS M1414 Compute Cartridge w one 3.70 GHz CPU, 32 GB memory ■ 1 x Intel Xeon Processor E3 1281 V3 (8M Cache, 3.70 GHz) ■ 4 x 8GB DDR3-1600-MHz ECC UDIMM/PC3-12800/dual rank/x8/1.35v

SUPPLEMENTAL MATERIAL

An internal view of the Cisco UCS M1414 compute cartridge with the top cover removed is shown in ***Figure 7***.

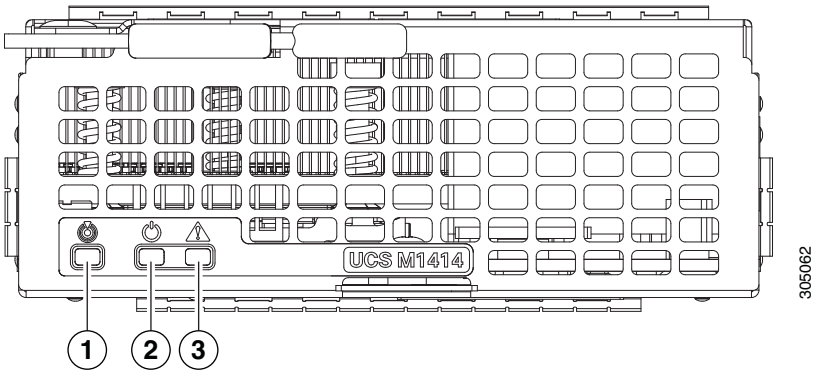
Figure 7 M1414 Compute Cartridge With Top Cover Off



1	DIMM bank B (slots B1, B2)	4	RTC battery
2	DIMM bank A (slots A1, A2)	5	—
3	CPU and heatsink	6	Service DIP switches

A view of the Cisco UCS M1414 compute cartridge front panel is shown in ***Figure 8***.

Figure 8 M1414 Compute Cartridge Front View



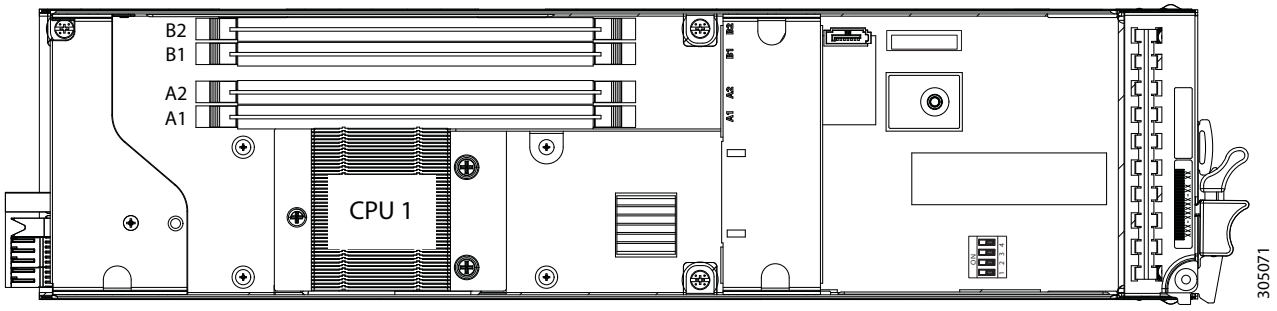
1	Cartridge identification LED Activated via software interface	■ Blue, blinking—identification function is in use. ■ Off—identification function is not in use.
2	Cartridge power LED	■ Green—The CPU subsystem is in main power mode. Do not remove the cartridge from the chassis. ■ Amber—The CPU subsystem is in standby power mode. Do not remove the cartridge from the chassis. ■ Off—There is no power to the cartridge. The cartridge can be safely removed from the chassis.
3	Cartridge health LED	■ Green—The cartridge is running in normal operating condition ■ Amber—The cartridge is in a degraded operational state. For example: • At least one DIMM is faulty ■ Amber, blinking—The cartridge is in a critical operational state. For example: • Boot failed. • Fatal processor and/or bus errors are detected. • Excessive thermal conditions.

Physical Layout

The CPU has two memory channels and two DIMMs per channel (DPC). DIMMs are installed in Bank 1 (blue socket) first, then Bank 2 (black socket).

Figure 9 shows how slots and channels are physically laid out on the motherboard.

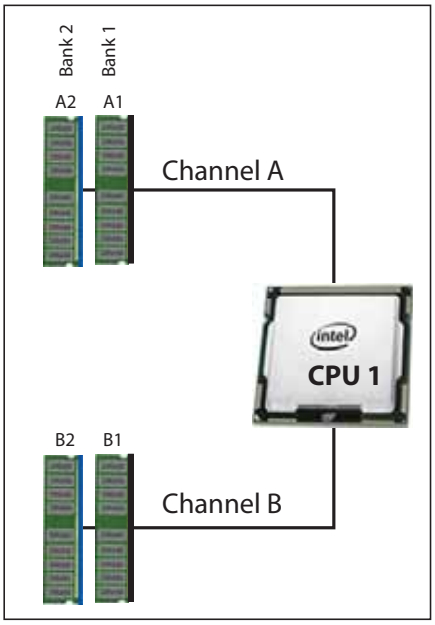
Figure 9 Physical Layout of CPU DIMM Channels and Slots



Logical Layout

The logical layout of the CPU DIMM channels and slots is shown in ***Figure 10***. Only channel A is implemented.

Figure 10 Logical Layout of CPU DIMM Channels and Slots



4 DIMM sockets per CPU

2 memory channels per CPU,
up to 2 DIMMs per channel

CISCO UCS M2814 COMPUTE CARTRIDGE

The Cisco UCS M2814 Compute Cartridge (*Figure 11*) contains one server node and occupies two horizontal slots in the M4308 Modular Chassis. The UCS M2814 Compute Cartridge is a dual-socket server using Intel® Xeon® E5 2600 v3 CPUs, with up to 256 GB of DDR4 2133-MHz memory. The M2814 M-Series cartridge enables ultra-dense virtual deployments, as well as cloud infrastructure applications that benefit from a high memory to core ratio and applications that leverage the large L2 CPU cache such as dynamic web content delivery and small in-memory databases.

Figure 11 Cisco UCS M2814 Compute Cartridge

BASE CARTRIDGE STANDARD CAPABILITIES and FEATURES

Table 5 lists the capabilities and features of the base Cisco UCS M2814 compute cartridge. Details about selecting a cartridge are provided in *CONFIGURING the CARTRIDGE, page 21*.

The Cisco UCS M2814 Compute Cartridge loads directly into the front of the Cisco UCS M4308 Modular Chassis and occupies two horizontal slots. The Cisco UCS M4308 chassis can hold up to four double-wide Cisco UCS M2814 Compute Cartridges. The cartridges are hot pluggable and can be serviced without needing any tools. The system and domain discovery of all cartridges and the subsequent management is provided entirely by Cisco UCS Manager, which is embedded in the Cisco UCS fabric interconnects.

Table 5 Capabilities and Features

Capability/Feature	Description
Server node	The cartridge contains one server node, powered by two Intel Xeon processor E5 series CPUs in a dual-socket configuration.
CPU Options	CPU options currently are the following: ■ Intel® Xeon® processor 2.40 GHz E5-2630 v3/85W 8C/20MB Cache/DDR4 1866MHz ■ Intel® Xeon® processor 2.60 GHz E5-2640 v3/90W 8C/20MB Cache/DDR4 1866MHz ■ Intel® Xeon® processor 2.30 GHz E5-2650 v3/105W 10C/25MB Cache/DDR4 2133MHz ■ Intel® Xeon® processor 2.60 GHz E5-2660 v3/105W 10C/25MB Cache/DDR4 2133MHz The server node contains two identical Intel Xeon E5-2600 v3 series processor family CPUs.
DIMM Memory	Sixteen DIMM slots supporting 16 GB DDR4 2133-MHz memory, for up to 256 GB.
M4308 Chassis Slot Usage	■ The M2814 Compute Cartridge occupies two horizontal slots. ■ The M4308 Modular Chassis supports up to four M2814 Compute Cartridges.

CONFIGURING the CARTRIDGE

Follow these steps to configure the Cisco UCS M2814 compute cartridge:

STEP 1 SELECT COMPUTE CARTRIDGES

The Cisco UCS M2814 Compute Cartridge consists of one dual-socket server node with 16 DIMM slots.

Select Compute Cartridge

The available cartridge configurations are listed in ***Table 6***.

Table 6 PIDs of Compute Cartridges

Product ID (PID)	Description
UCSME-2814-2630	Cisco UCS M2814 Compute Cartridge w two 2.40 GHz CPU, 64 GB memory ■ 2 x Intel Xeon Processor 2.40 GHz E5-2630 v3/85W 8C/20MB Cache/DDR4 1866 MHz ■ 4 x 16 GB DDR4-2133-MHz RDIMM/PC3-17000/dual rank/x4/1.2v
UCSME-2814-2640	Cisco UCS M2814 Compute Cartridge w two 2.60 GHz CPU, 64 GB memory ■ 2 x Intel Xeon Processor 2.60 GHz E5-2640 v3/90W 8C/20MB Cache/DDR4 1866 MHz ■ 4 x 16 GB DDR4-2133-MHz RDIMM/PC3-17000/dual rank/x4/1.2v
UCSME-2814-2650	Cisco UCS M2814 Compute Cartridge w two 2.30 GHz CPU, 64 GB memory ■ 2 x Intel Xeon Processor 2.30 GHz E5-2650 v3/105W 10C/25MB Cache/DDR4 2133 MHz ■ 4 x 16 GB DDR4-2133-MHz RDIMM/PC3-17000/dual rank/x4/1.2v
UCSME-2814-2660	Cisco UCS M2814 Compute Cartridge w two 2.60 GHz CPU, 64 GB memory ■ 2 x Intel Xeon Processor 2.60 GHz E5-2660 v3/105W 10C/25MB Cache/DDR4 2133 MHz) ■ 4 x 16 GB DDR4-2133-MHz RDIMM/PC3-17000/dual rank/x4/1.2v

STEP 2 ADD DIMMs (OPTIONAL)

All of the Cisco UCS 2814 Compute Cartridges come with four 16 GB DIMMs. Additional DIMMs can be added in quantities of two.

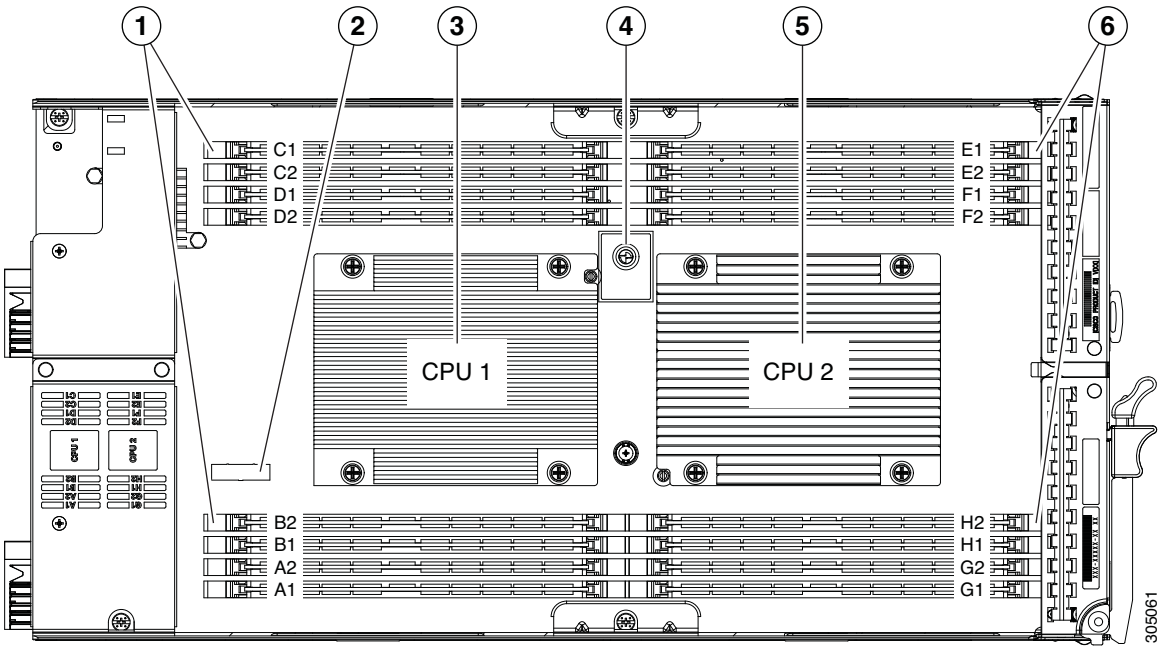
Table 7 DIMM PIDs

Product ID (PID)	Description
UCS-MR-1X162RU-A	16GB DDR4-2133-MHz RDIMM/PC3-17000/dual rank/x4/1.2v

SUPPLEMENTAL MATERIAL

An internal view of the Cisco UCS M2814 compute cartridge with the top cover removed is shown in ***Figure 12***.

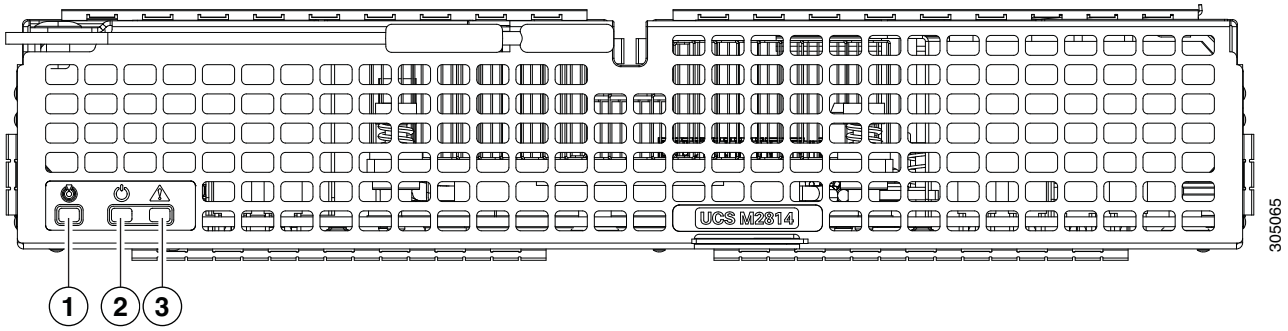
Figure 12 M2814 Compute Cartridge With Top Cover Off



1	CPU 1 DIMM banks A, B, C, D	4	Trusted platform module (TPM), not implemented
2	RTC battery	5	CPU 2 and heatsink
3	CPU 1 and heatsink	6	CPU 2 DIMM banks E, F, G, H

A view of the Cisco UCS M2814 compute cartridge front panel is shown in ***Figure 13***.

Figure 13 M2814 Compute Cartridge Front View



1	Cartridge identification LED Activated via software interface	■ Blue, blinking—identification function is in use. ■ Off—identification function is not in use.
2	Cartridge power LED	■ Green—The CPU subsystem is in main power mode. Do not remove the cartridge from the chassis. ■ Amber—The CPU subsystem is in standby power mode. Do not remove the cartridge from the chassis. ■ Off—There is no power to the cartridge. The cartridge can be safely removed from the chassis.
3	CPU health LED	■ Green—Both CPUs are running in normal operating condition. ■ Amber—One or more CPUs are in a degraded operational state.

Physical Layout

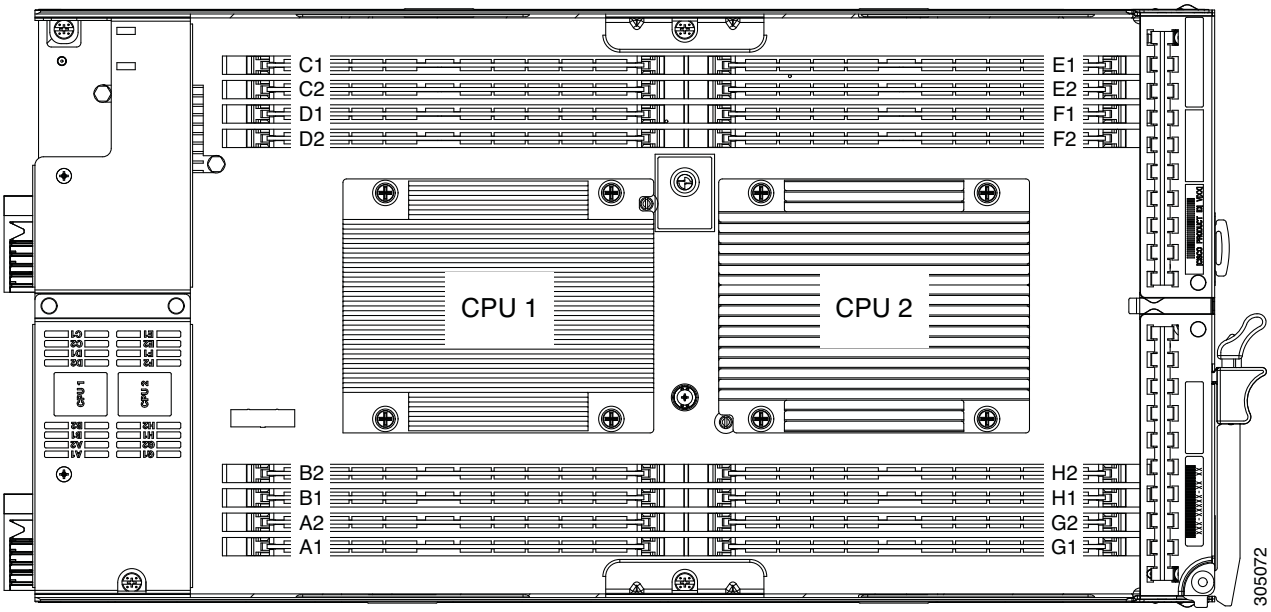
Each CPU has four memory channels and two DIMMs per channel (DPC).

- CPU1 uses channels A, B, C, D
- CPU2 uses channels E, F, G, H

DIMMs are installed in Bank 1 (blue socket) first, then Bank 2 (black socket).

Figure 14 shows how slots and channels are physically laid out on the motherboard. Channels A, B, C, and D) are associated with CPU 1, and Channels E, F, G, and H) are associated with CPU 2.

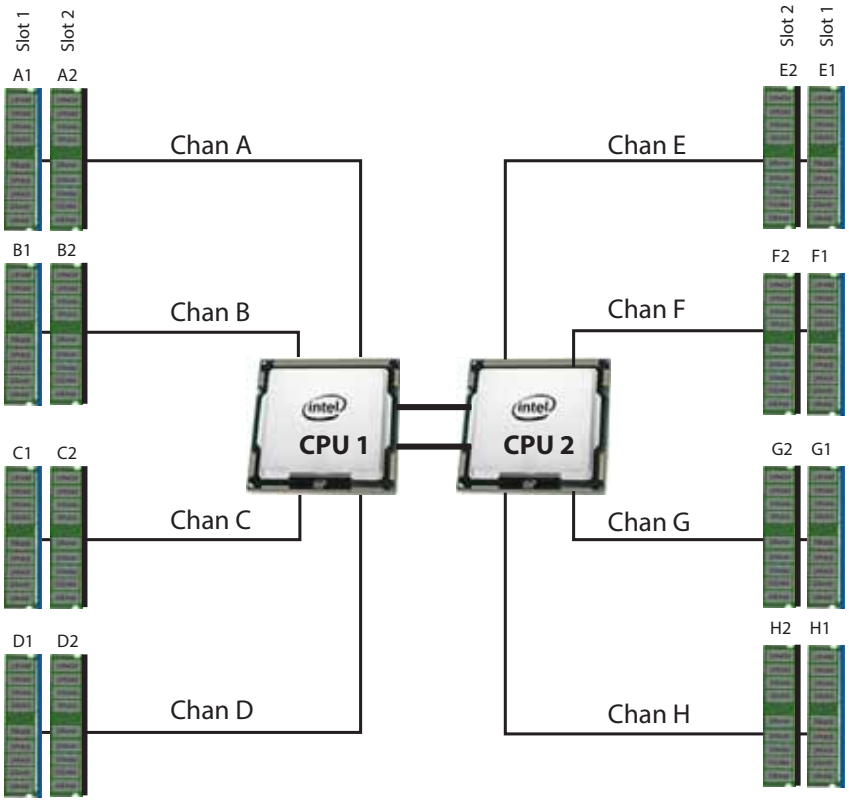
Figure 14 Physical Layout of CPU DIMM Channels and Slots



Logical Layout

The logical layout of the CPU DIMM channels and slots is shown in ***Figure 15***. There is no communication channel between CPU 1 and CPU 2.

Figure 15 Logical Layout of CPU DIMM Channels and Slots



Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at **www.cisco.com/go/offices.**