



UCS Fabric & Networking Product Roadmap

FI, IOM, VIC & 3rd Party PCIe Adapters

Cisco DCBG
Mar 14 2019

NDA Required

Legal Disclaimer

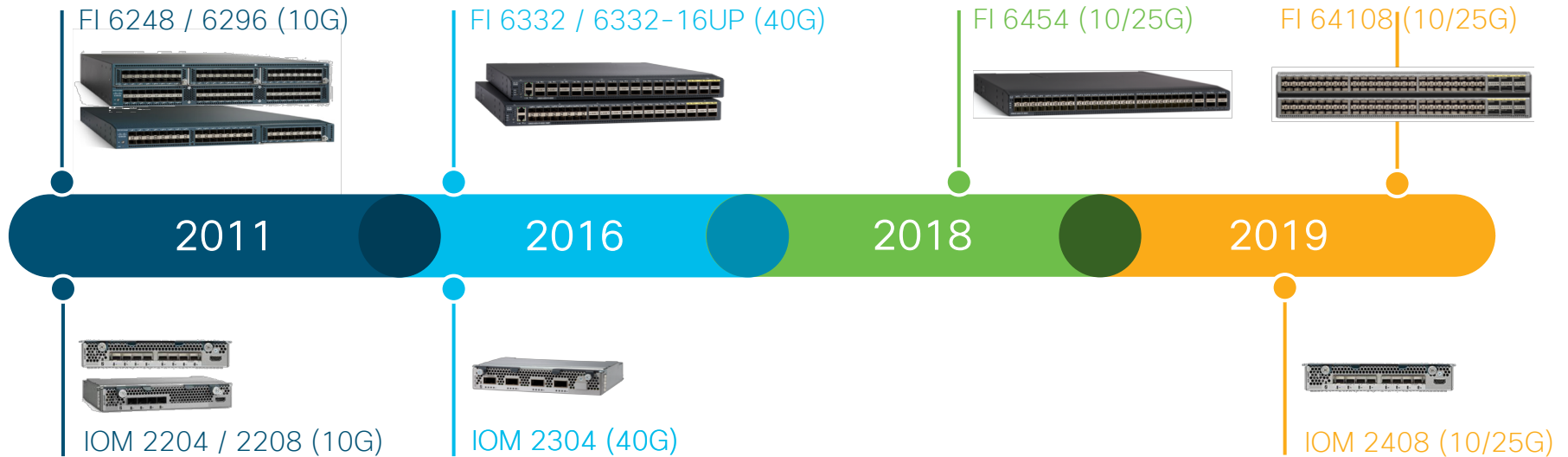
Many products and features described herein remain in varying stages of development and will be offered on a when-and-if-available basis

This roadmap is subject to change at the sole discretion of Cisco and Cisco will have no liability for delay in the delivery or failure to deliver any of the products or features set forth in this document



Fabric Interconnect Overview

UCS Fabric Interconnect & IOM Roadmap



UCS Fabric Interconnect 6454 Overview

Next generation Fabric Interconnect for B-Series, C-Series and S-Series

Fabric Interconnect Overview

- Enables deployment flexibility and investment protection by supporting 10/25GbE and connectivity to M4/M5 servers
- Provides next generation high performance 32G Fibre Channel SAN connectivity for blades and rack servers
- UCS Manager helps reduce management and administration expenses by automating tasks to increase operational agility.
- Unifies management across data center, cloud-scale, and edge-scale workloads



UCS FI 6454 Hardware

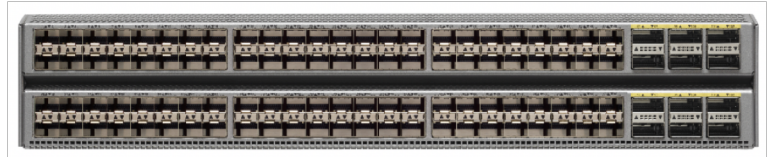
- 3.82 Tbps switching performance
- 48 x 10/25GbE (8 x UP) + 6 x 40/100GbE
- Unified ports support support 10/25GbE or 8/16/32G Fibre Channel
- 2 x power supplies
- 4 x variable speed fans
- 2 x L1/L2, 1 x console, 1 x GbE ports
- 1RU fixed platform

UCS Fabric Interconnect 64108 Overview

Next generation Fabric Interconnect for B-Series, C-Series and S-Series

Fabric Interconnect Overview

- Enables deployment flexibility and investment protection by supporting high density 10/25GbE and connectivity to M4/M5 servers
- Provides next generation high performance 32G Fibre Channel SAN connectivity for blades and rack servers
- UCS Manager helps reduce management and administration expenses by automating tasks to increase operational agility.
- Unifies management across data center, cloud-scale, and edge-scale workloads

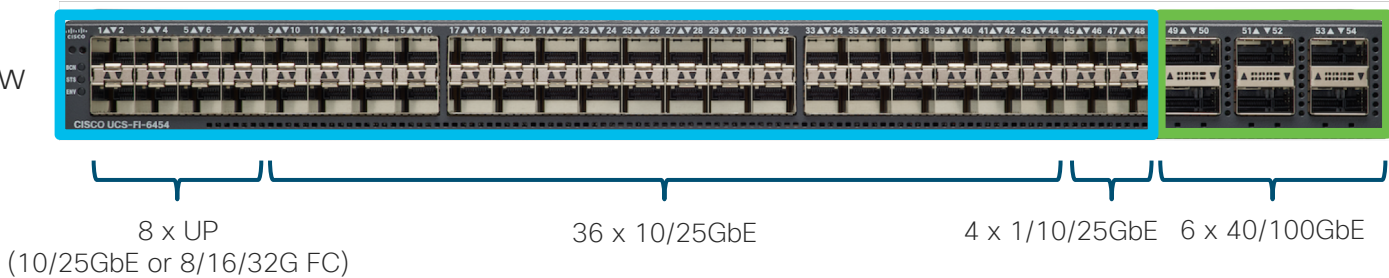


UCS FI 64108 Hardware

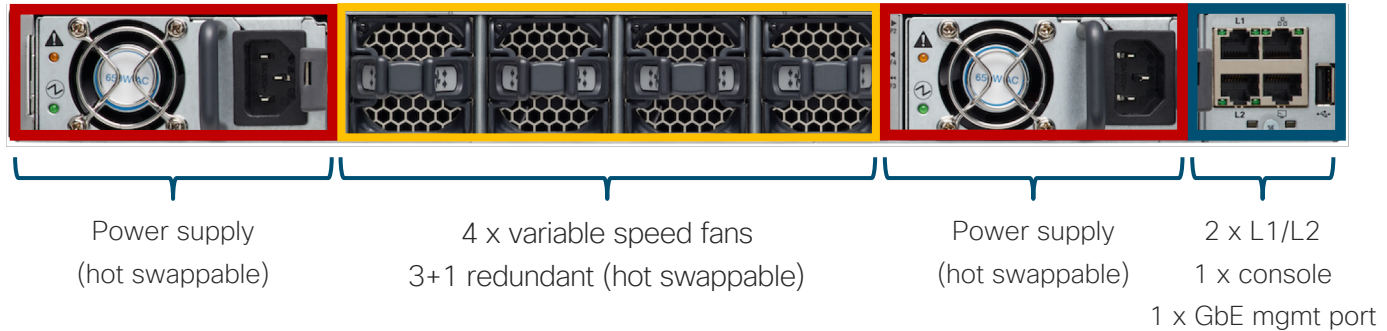
- 7.64 Tbps switching performance
- 96 x 10/25GbE (32 x UP) + 12 x 40/100GbE
- Unified ports support support 10/25GbE or 8/16/32G Fibre Channel
- 2 x power supplies
- 3 x variable speed fans
- 2 x L1/L2, 1 x console, 1 x GbE ports
- 2RU fixed platform

Next Gen Fabric Interconnect 6454

Rear View



Front View



Fabric Interconnect Product Family Overview

FI 6200 series, 6300 series & 6454

	FI 6200 Series		FI 6300 Series		FI 6400 Series	
Feature	FI 6248	FI 6296	FI 6332	FI 6332-16UP	FI 6454	FI 64108
Height	1RU	2RU	1RU	1RU	1RU	2RU
Form factor	Modular	Modular	Fixed	Fixed	Fixed	Fixed
Physical ports	48 (using GEM)	96 (using GEM)	32	40	54	108
Max 10/25G ports	48 x 10G	96 x 10G	-	16 x 10G	48 x 10/25G	96 x 10/25G
Max 40/50/100G ports	-	-	32 x 40G	24 x 40G	6 x 40/50/100G	12 x 40/50/100G
Max FC ports	48 x 2/4/8G FC	96 x 2/4/8G FC	-	16 x 4/8/16G FC	8 x 8/16/32G FC	32 x 8/16/32G FC
Max unified ports	48	96	-	16	8	32
Expansion module	1 x module	3 x modules	-	-	-	-

Fabric Interconnect Licenses

Fabric Interconnect	Licensed ports on base PID	License PIDs	Description
6248	12 x 10GbE	<ul style="list-style-type: none"> UCS-LIC-10GE UCS-L-6200-10G-C 	<ul style="list-style-type: none"> B-Series, C-Series, S-Series C-Series only
6296	18 x 10GbE	<ul style="list-style-type: none"> UCS-LIC-10GE UCS-L-6200-10G-C 	<ul style="list-style-type: none"> B-Series, C-Series, S-Series C-Series only
6332	8 x 40GbE	<ul style="list-style-type: none"> UCS-LIC-6300-40G UCS-LIC-6300-40GC 	<ul style="list-style-type: none"> B-Series, C-Series, S-Series C-Series only
6332-16UP	4 x 40GbE + 8 x UP	<ul style="list-style-type: none"> UCS-LIC-6300-40G UCS-LIC-6300-40GC UCS-LIC-6300-10G UCS-LIC-6300-10GC 	<ul style="list-style-type: none"> B-Series, C-Series, S-Series C-Series only B-Series, C-Series, S-Series C-Series only
6454	18 x 10/25GbE + 2 x 40/100GbE	<ul style="list-style-type: none"> UCS-LIC-6400-25G UCS-LIC-6400-25GC UCS-LIC-6400-100G 	<ul style="list-style-type: none"> B-Series, C-Series, S-Series C-Series only Nexus, MDS
64108	38 x 10/25GbE + 4 x 40/100GbE	<ul style="list-style-type: none"> UCS-LIC-6400-25G UCS-LIC-6400-25GC UCS-LIC-6400-100G 	<ul style="list-style-type: none"> B-Series, C-Series, S-Series C-Series only Nexus, MDS

Performance & Scale Limits

FI 6200 series, 6300 series & 6454

Feature	FI 6200 series	FI 6300 series	FI 6400 series
Unicast MAC address per FI	20,000	32,000	32,000
Multicast MAC address per FI	7,000	7,000	7,000
Active VLAN per UCS domain	2,000	3,000	3,000
STP logical interfaces / VLAN port count	64,000	64,000	64,000
IGMP groups	4,000	4,000	4,000
QoS system classes	6	6	6
Appliance ports	16	16	16
Native FC ports	48-96	16	8
VSANs	32	32	32
vFC	320	320	320
Chassis per UCS domain	20	20	20
IP storage appliance per FI	4	4	4

Feature Overview

FI 6200 series, 6300 series & 6454

Feature	FI 6200 Series	FI 6300 Series	FI 6400 Series
End host mode	Supported	Supported	Supported
Ethernet switch mode	Supported	Supported	Supported
FC / FCoE NPV mode	Supported	Supported	Supported
FC / FCoE switch mode	Supported	Supported	Supported
VMFEX	Supported	Supported	Not supported
NetFlow	Supported	Supported	Not supported
PVLAN	Supported	Supported	Supported
Port-security	Supported	Supported	Supported
MAC filtering for MC packets	Supported	Supported	Not supported
IOM	2200 series	2200 / 2300 series	2200 series, 2408 (1HCY19)

FI 6400 Series Hardware Support

FI 6454 Support

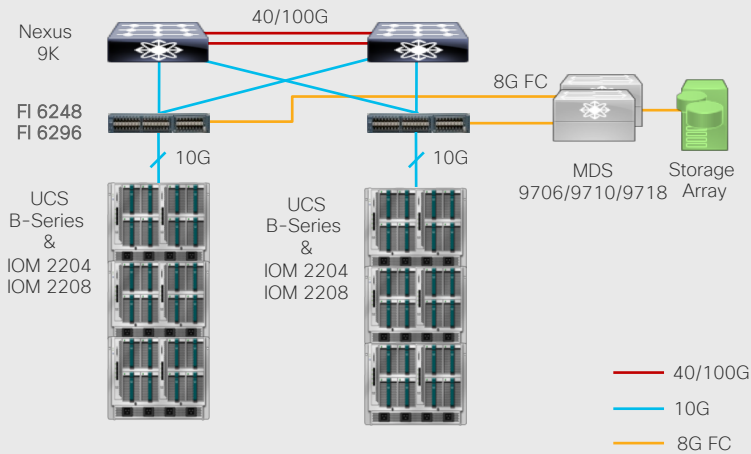
- UCS 5108 rev 1 & 2 chassis
- B-Series, C-Series & S-Series M3, M4 & M5 servers
- IOM 2200 series
- VIC 1200 / 1300 / 1400 series
- Nexus 2232PP & 2232TM-E FEX

FI 64108 Support (TBD)

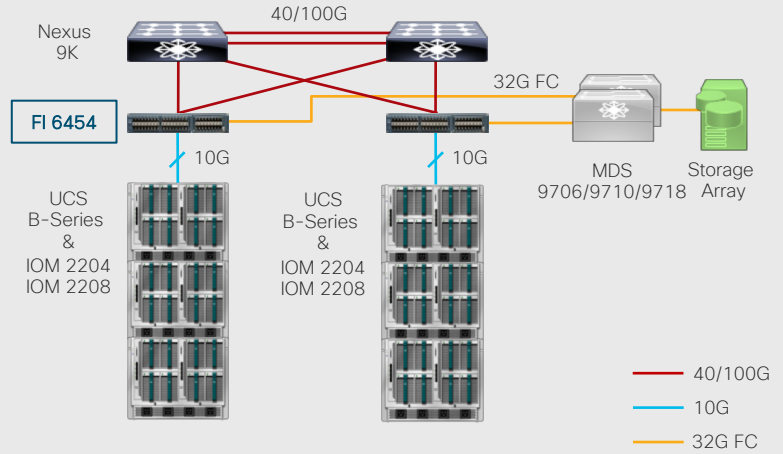
- UCS 5108 rev 1 & 2 chassis
- B-Series, C-Series & S-Series
- IOM 2200 series & 2408
- VIC 1300 & 1400 series

FI 6454 Use Case with B-Series

Existing Infrastructure

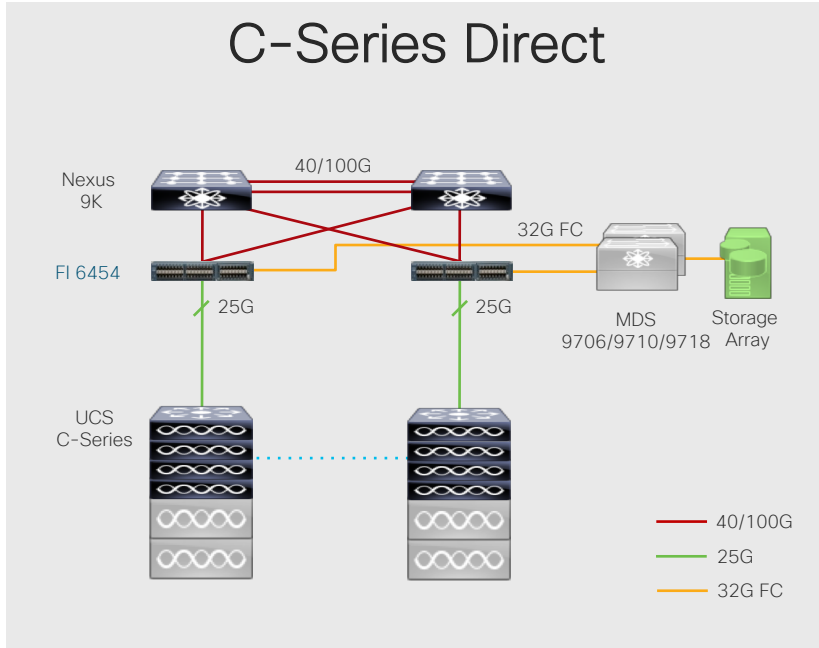


FI 6454 Use Case

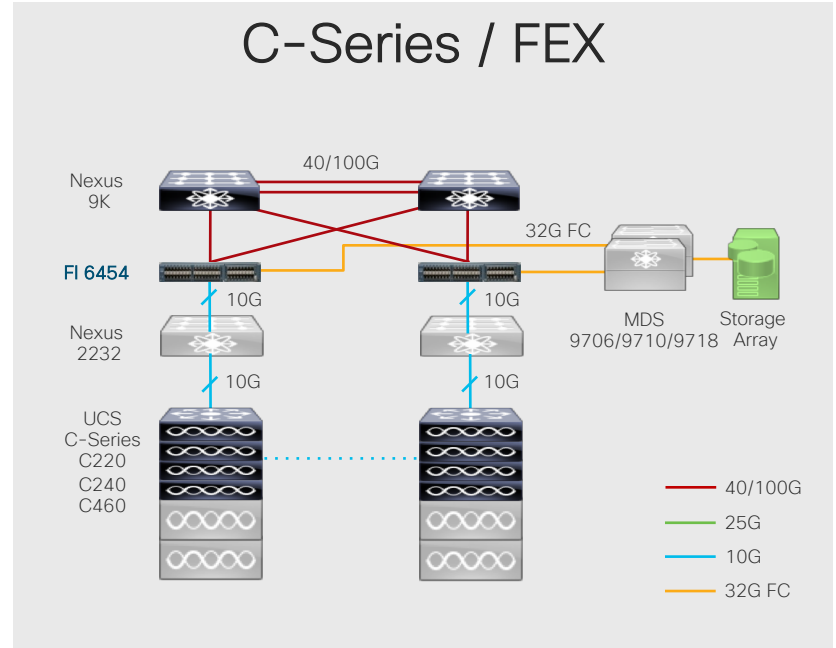


FI 6454 Use Cases with C-Series

C-Series Direct



C-Series / FEX



FI 6200 Series EOL & EOS Schedule

FI 6454 (10/25G)



UCS Manager 4.0(1)

FCS Sep 20, 2018

2018

2019



3 months



5 years of support post EOS date

Fabric Interconnect Positioning

FI 6200 vs 6300 vs 6400 series

FI 6200 Series

- 10GbE
- 10G FCoE
- 2/4/8G FC
- Modular platform
- EOL / EOS in 1HCY19
- FI 6248 → 6454
- FI 6296 → 6300 / 6400 series

FI 6300 Series

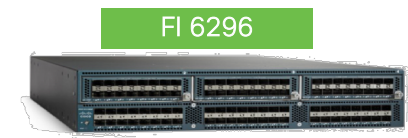
- 40GbE
- 40G FCoE
- 4/8/16G FC
- Fixed platform
- FI 6332 (Ethernet & FCoE)
- FI 6332-16UP (Ethernet, FCoE and FC)

FI 6400 Series

- 10/25GbE
- 10/25G FCoE
- 8/16/32G FC
- Fixed platform
- FI 6454 shipping today
- FI 64108 FCS ~2HCY19

Fabric Interconnect 6200 Series Migration Options

FI 6200 Series



Replacement Options

FI 6454



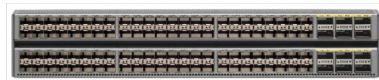
FI 6332-16UP



FI 6454



FI 64108



FI 6332-16UP Advantages

- 6332-16UP supports 24x 40G + 16 x UP (supports 1/10 GbE or 4/8/16G FC)
- 6332-16UP supports 88 x 10 GbE + 6 x 40 GbE uplink ports using 40GbE to 4x10 GbE breakout cables
- Native 40GbE ports

FI 6454 Advantages

- 6454 supports 48 x 10/25G + 6 x 40/100G
- 6248 + expansion module base unit supports 20 port licenses
- 6454 base unit supports 20 port licenses

FI 64108 Advantages

- 64108 is the ideal replacement for 6296: supports 96 x 10/25G (32xUP)+ 12 x 40/100G

UCS FI 6454 Feature Roadmap

FI 6454 (10/25G)



UCS Manager 4.0(1)

FCS Sep 20, 2018

UCS Manager 4.0(4)

- Support 16xUP

2018

2019

UCS Manager 4.0(2)

- FC/FCoE switch mode
- Ethernet switch mode
- Port security
- Slow-drain
- HVDC PSU
- Uplink ports breakout cable support to Nexus switches

UCS Manager 4.x(x)

- FI 64108

* Disclosure: Roadmap features are subject to change without notice. For updated info contact UCS PM team.

UCS 4th Gen IOM Overview

UCS 4th Gen IOM Overview

Next generation 25G IOM for UCS 5108 Blade Chassis

IOM Overview

- Enables deployment flexibility and investment protection by supporting 10/25GbE connectivity to B-Series M5 servers with FI 6454
- Supports end-to-end 25GbE when connected to FI 6454 and VIC 1300/1400 series
- Increases bandwidth 2.5x compared to IOM 2208
- UCS Manager helps reduce management and administration expenses by automating tasks to increase operational agility.



UCS IOM 2408 Hardware

- 1.04Tbps switching performance
- 8 x 10/25GbE & 32 x 10GbE downlinks to B-Series
- Same form factor as IOM 2208
- Hardware support with 5108 blade chassis
- Hardware support with FI 6454 only
- Target launch ~1HCY19

IOM Comparisons

IOM 220x, 2304 & 2408

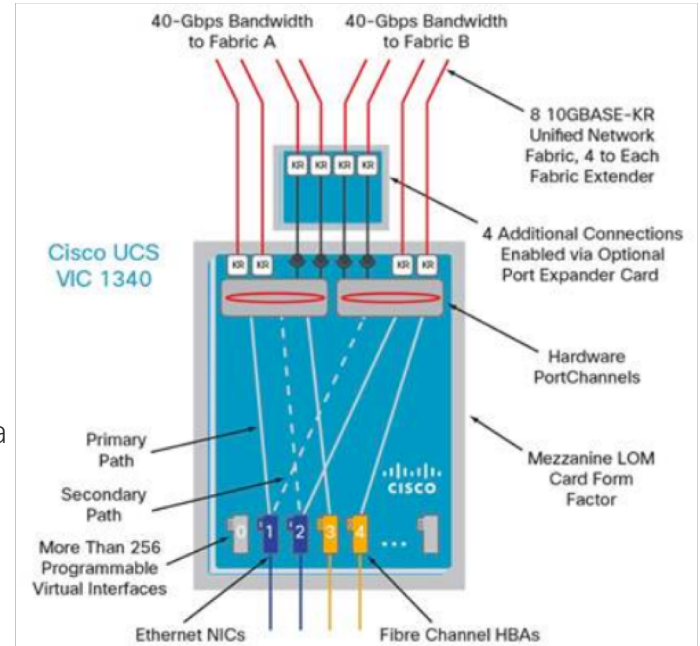
	2 nd Gen IOM		3 rd Gen IOM	4 th Gen IOM
	IOM 2204XP	IOM 2208XP	IOM 2304	IOM 2408
Form Factor	Modular	Modular	Modular	Modular
Switching performance	720Gbps	800Gbps	960Gbps	1.04Tbps
Total ports	20	40	12	40
Uplink ports	4 x 10GbE	8 x 10GbE	4 x 40GbE	8 x 25GbE
Server ports	16 x 10GbE	32 x 10GbE	8 x 40GbE	32 x 10GbE
Supported FI's	FI 6200 series, 6300 series & 6454	FI 6200 series, 6300 series & 6454	FI 6300 series only	FI 6454 only

UCS VIC Overview

VIC Overview

Enabling a simple, intelligent & efficient fabric

- VIC enables a policy-based, stateless, agile server infrastructure that can present over 256 PCIe interfaces to the host that can be dynamically configured as NICs or HBAs
- The personality of the VIC is determined dynamically at boot time using the service profile associated with the server. The number, type (NIC or HBA), identity (MAC address & WWN), failover policy, bandwidth, and QoS policies of the PCIe interfaces are all determined using the service profile. The capability to define, create, and use interfaces on demand provides a stateless and agile server infrastructure.
- Hardware classification engine provides support for advanced data center requirements including stateless network offloads for NVGRE and VXLAN, low-latency features for usNIC, RDMA, and performance optimization applications such as VMQ, DPDK, and Cisco NetFlow.



Cisco Virtual Interface Card (VIC) Innovation

1st Gen VIC 2010

- M81KR, P81E
- 10GbE
- 16x PCIe Gen1
- 128 PCIe devices
- Hypervisor bypass for ESX, KVM

2nd Gen VIC 2013-2014

- VIC 1227, 1227T, 1285
- 10GbE, 10GBase-T
- Low latency
- USNIC
- DPDK
- NetFlow

4th Gen VIC 2018

- VIC 1440, 1455, 1457, 1480, 1495, 1497
- 10/25/40/100 GbE
- PCIe Gen 3
- NVGRE / VXLAN
- VMMQ
- TCAM filters

2nd Gen VIC 2012

- VIC 1225, 1225, 1240, 1280
- 10/40GbE
- 16x PCIe Gen 2
- 256 PCIe devices
- Single wire management
- SR-IOV for Win 2012, HyperV

3rd Gen VIC 2014-2016

- VIC 1340, 1380, 1385, 1387
- 40GbE
- PCIe Gen 3
- NVGRE / VXLAN
- RoCEv1

UCS 4th Gen VIC 1400 Series Overview

Next generation VIC delivers high bandwidth, features and performance

VIC Overview

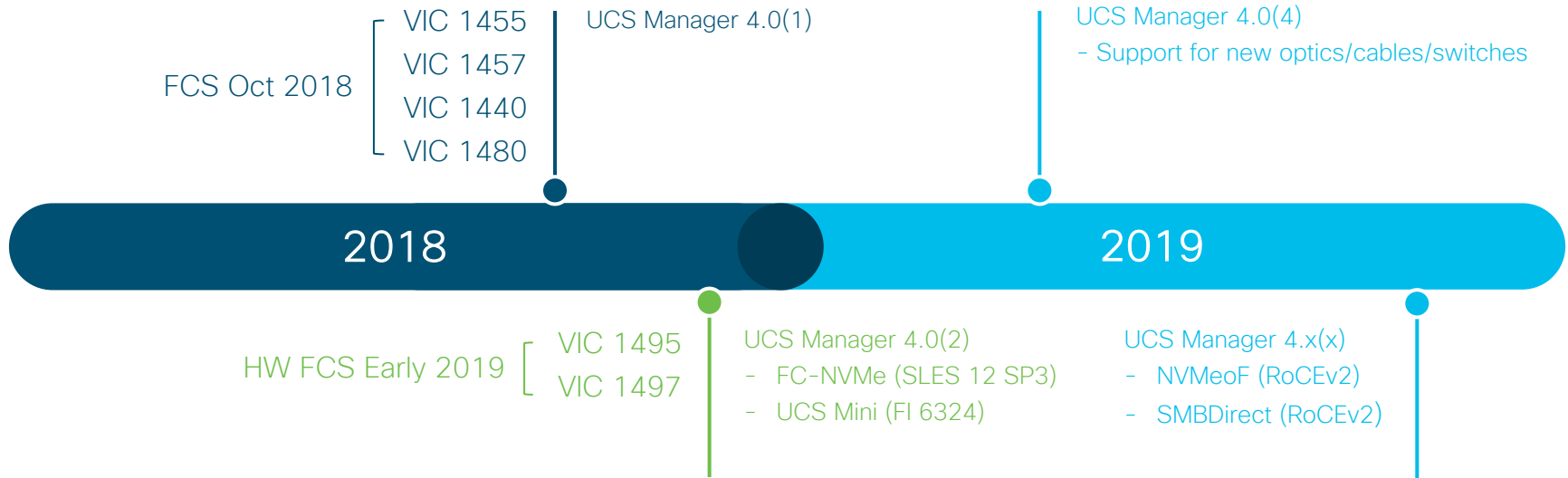
- Cisco VIC is an industry leading virtual network adapter for Cisco blade and rack servers
- VIC is a hardware virtualization device that manages, accelerates, identifies, and unifies fabric and compute resources
- 4th Gen VIC supports high bandwidth 10/40 GbE for B-Series and 10/25/40/100 GbE for C-Series
- Supports Ethernet, FCoE, VXLAN, NVGRE, VMQ/VMMQ, SR-IOV, usNIC, DPDK



VIC 1400 Series Comparison

	VIC 1455	VIC 1457	VIC 1495	VIC 1497	VIC 1440	VIC 1480
Speed	10/25G	10/25G	40/100G	40/100G	10/40G	10/40G
Ports	4	4	2	2	4	4
Form Factor	PCIe	mLOM	PCIe	mLOM	mLOM	mezz
Type	C-Series, S-Series	C-Series	C-Series, S-Series	C-Series	B-Series	B-Series
Servers supported	M5	M5	M5	M5	M5	M5
FI	6200/6300 /6454	6200/6300 /6454	6200/6300 /6454	6200/6300 /6454	6200/6300 /6454	6200/6300 /6454
IOM	-	-	-	-	2200/2304	2200/2304









UCS VIC 1400 Series Roadmap



* Disclosure: Roadmap features are subject to change without notice. For updated info contact UCS PM team.

3rd Party PCIe Adapters

Ethernet Adapter Terminology

NIC	Ethernet connectivity, stateless offloads	Cost  Power 
CNA	Supports multiple functions (programmable I/O), Ethernet, block storage (FCoE, iSCSI stateless offloads), RDMA/RoCE, intelligence for protocol and CPU offloads	Cost  Power 
Intelligent NIC	SoC consisting of Ethernet controller and programmable data plane (ACI and GFT use cases), hardware offloads and acceleration, SDN, NFVi, reduce CPU overhead	Cost  Power 
Smart NIC	Intelligent NIC and coprocessor (CPU or FPGA), fully programmable, assumes ecosystem of tools	Cost  Power 

UCS C-Series 3rd Party Adapter Portfolio

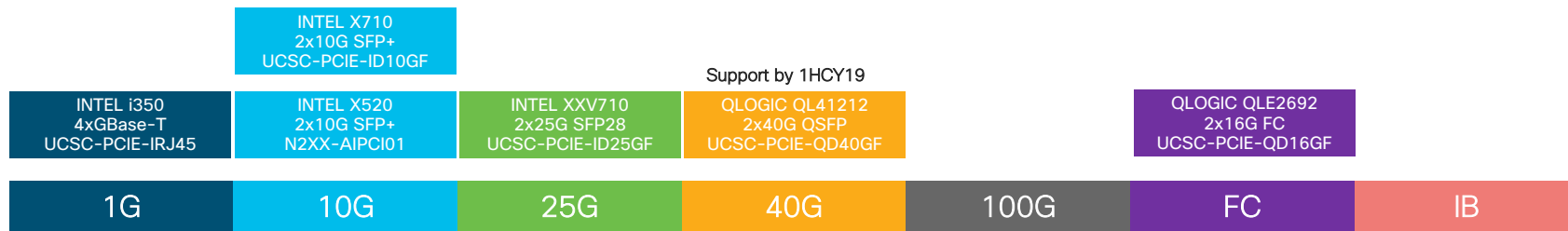
PCIe adapter support with C-Series M5 servers

	SOLARFLARE SFN8522 2x10G SFP+ (HCL)						
	INTEL X710 4x10GBase-T UCSC-PCIE-IQ10GC					EMULEX LPe32002 2x32G FC UCSC-PCIE-BD32GF	
	INTEL X550 2x10GBase-T UCSC-PCIE-ID10GC			SOLARFLARE SFN8542 2x40G SFP+ (HCL)		EMULEX LPe32000 1x32G FC UCSC-PCIE-BS32GF	
	INTEL X710 4x10G SFP+ UCSC-PCIE-IQ10GF	MELLANOX MCX4121A-ACAT 2x25G SFP28 (HCL)	MELLANOX MCX416A-BCAT 2x40G QSFP28 (HCL)	MELLANOX MCX516A-CCAT 2x100G QSFP28 (HCL)	EMULEX LPe31002 2x16G FC UCSC-PCIE-BD16GF	MELLANOX MCX556A-ECAT 2x100G IB (HCL)	
INTEL i350 4xGBase-T UCSC-MLOM-IRJ45	INTEL X710 2x10G SFP+ UCSC-PCIE-ID10GF	QLOGIC QL41212 2x25G SFP28 UCSC-PCIE-QD25GF	QLOGIC QL41212 2x40G QSFP UCSC-PCIE-QD40GF	MELLANOX MCX416A-CCAT 2x100G QSFP28 (HCL)	QLOGIC QLE2742 2x32G FC UCSC-PCIE-QD32GF	MELLANOX MCX456A-ECAT 2x100G IB (HCL)	
INTEL i350 4xGBase-T UCSC-PCIE-IRJ45	INTEL X520 2x10G SFP+ N2XX-AIPC101	INTEL XXV710 2x25G SFP28 UCSC-PCIE-ID25GF	INTEL XL710 2x40G QSFP UCSC-PCIE-ID40GF	QLOGIC 45611HLCU * 1x100G QSFP28 UCSC-PCIE-QS100GF	QLOGIC QLE2692 2x16G FC UCSC-PCIE-QD16GF	MELLANOX MCB194A-FCAT 2x56G IB (HCL)	
1G	10G	25G	40G	100G	FC	IB	

* Qlogic 45611HLCU single port 100G is only supported with C480ML

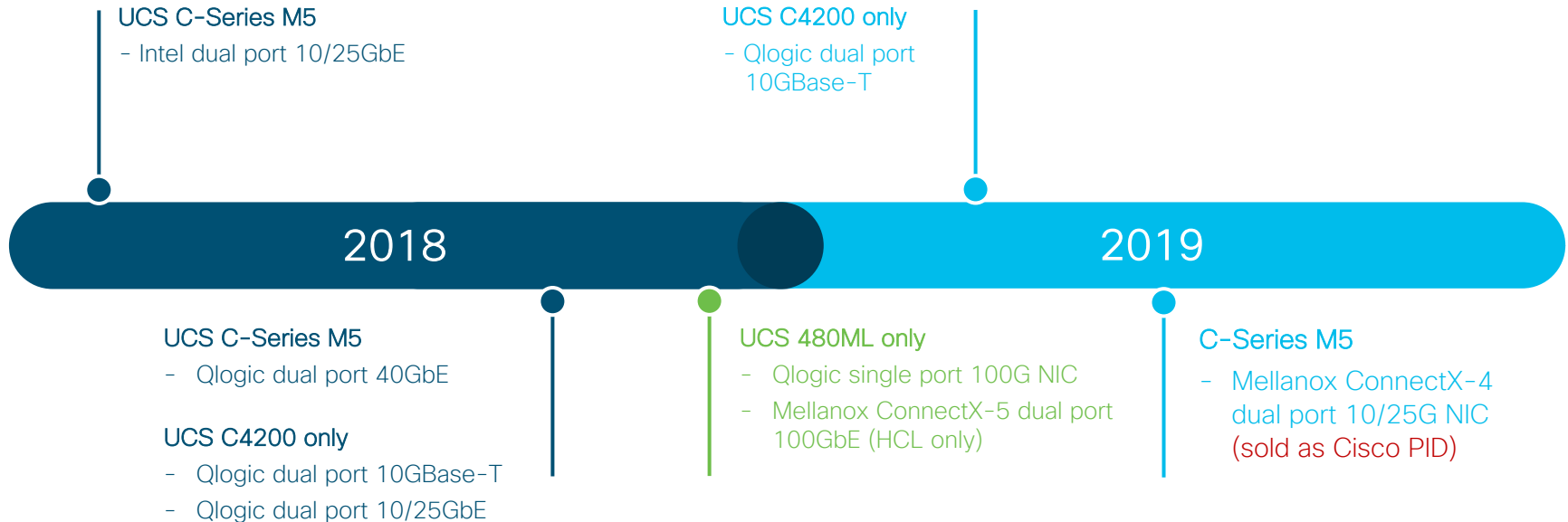
UCS S-Series 3rd Party Adapter Portfolio

PCIe adapter support with S-Series M5 server



* Qlogic 45611HLCU single port 100G is only supported with C480ML

3rd Party PCIe Adapter Roadmap



* Disclosure: Roadmap features are subject to change without notice. For updated info contact UCS PM team.

