



*TOMORROW
starts here.*

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UCS Fundamentals

BRKCOM-1001

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#clmel

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Abstract

- This session provides an introduction to Cisco UCS. It does not assume previous UCS familiarity and is intended as a basic introduction for server, LAN and SAN administrators. This session will offer an overview of the UCS System Architecture, including the components which make up UCS, their purpose, how they connect and many of the technical innovations that UCS delivers.



= Reference Slide

Complementary UCS Sessions

Check out www.ciscolive.com for previous session presentations and videos

- BRKCOM-2003 UCS Networking Deep Dive
- BRKCOM-2017 UCS Systems Management Deep Dive with UCS Foundational Software
- BRKCOM-2015 Cisco UCS Network Performance Optimisation and Best Practices for VMware
- BRKCOM-2640 UCS C-Series Deployment Options, Best Practice and UCSM Integration
- BRKCOM-2602 Next Generation Computing Architectures for Cloud Scale Applications
- BRKCOM-2601 Hyper-Converged Computing
- BRKCOM-3002 UCS Performance Troubleshooting

Agenda

- **UCS Overview**

- Components – Classic UCS blade and rack servers
- Connectivity – Compute, LAN, SAN

- **Key Features**

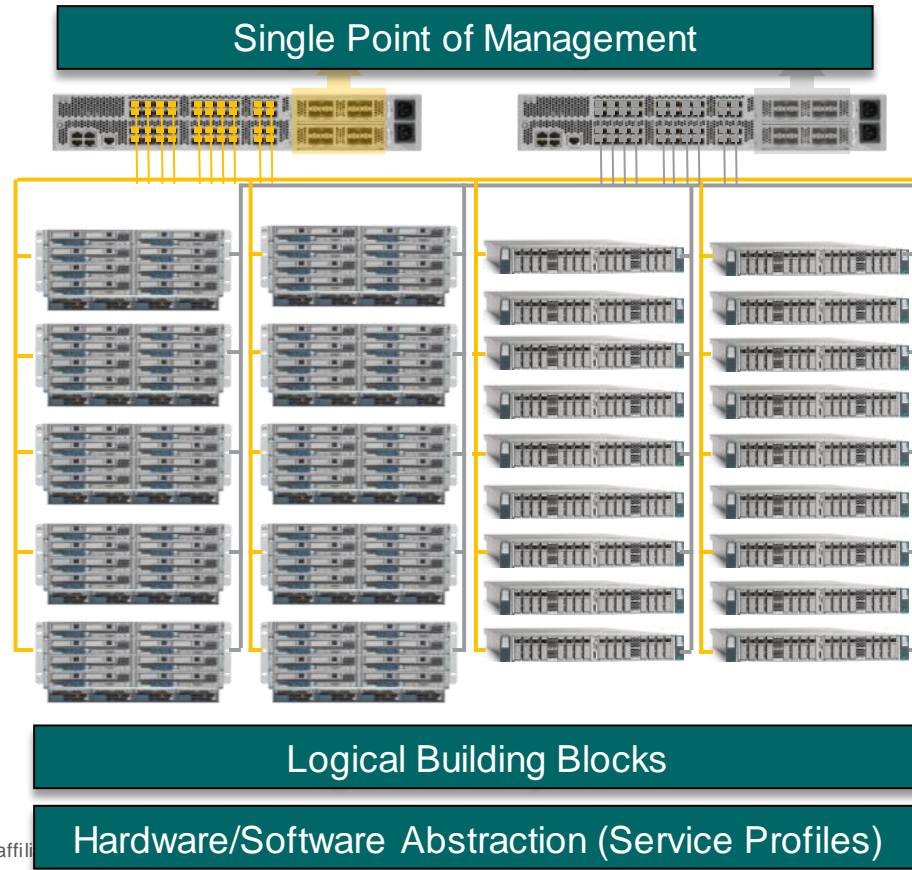
- Scaling with Single Point of Management
- UCS Service Profiles – Logical Building Blocks
- UCS – XML API and Other Hidden Gems

- **New UCS Form Factors**

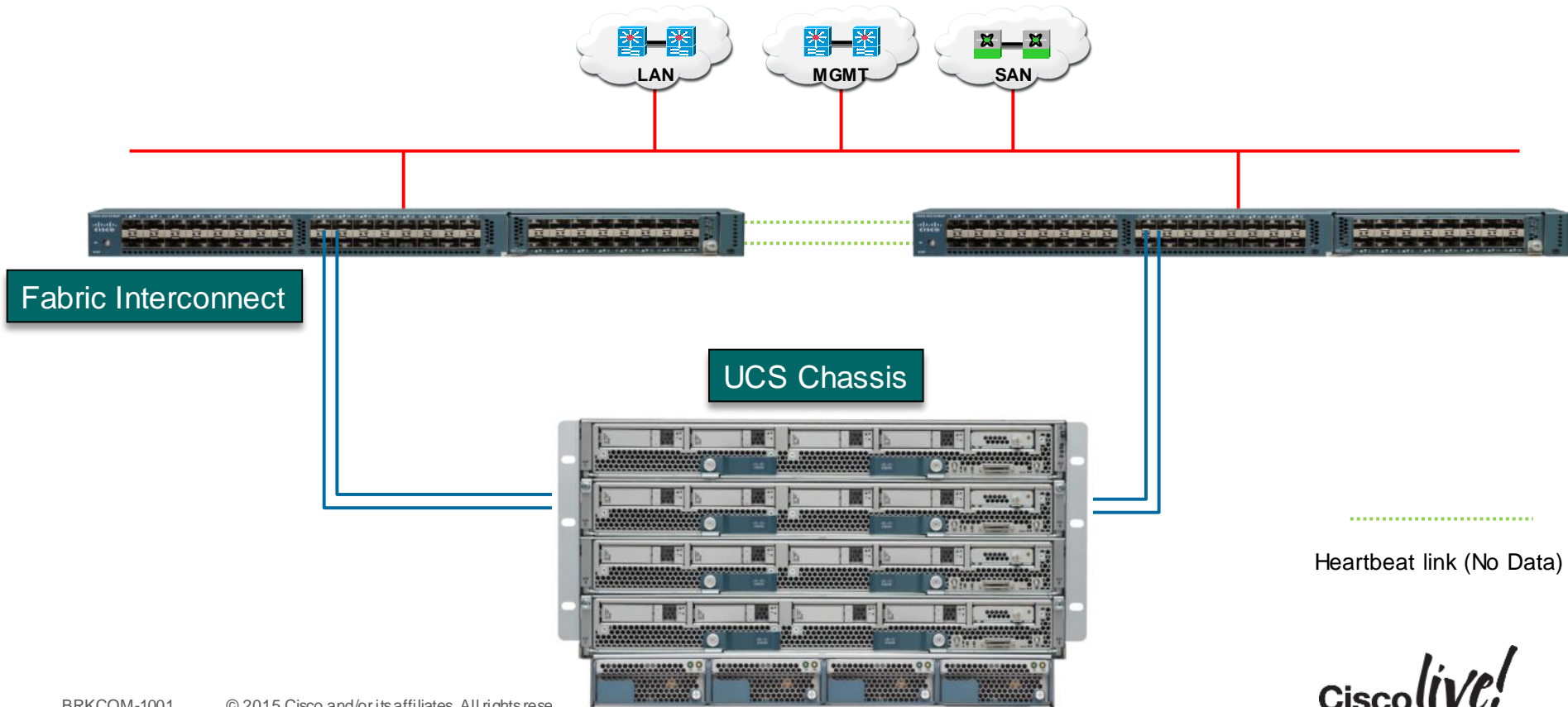
- UCS Mini
- UCS M-Series

- **Resources**

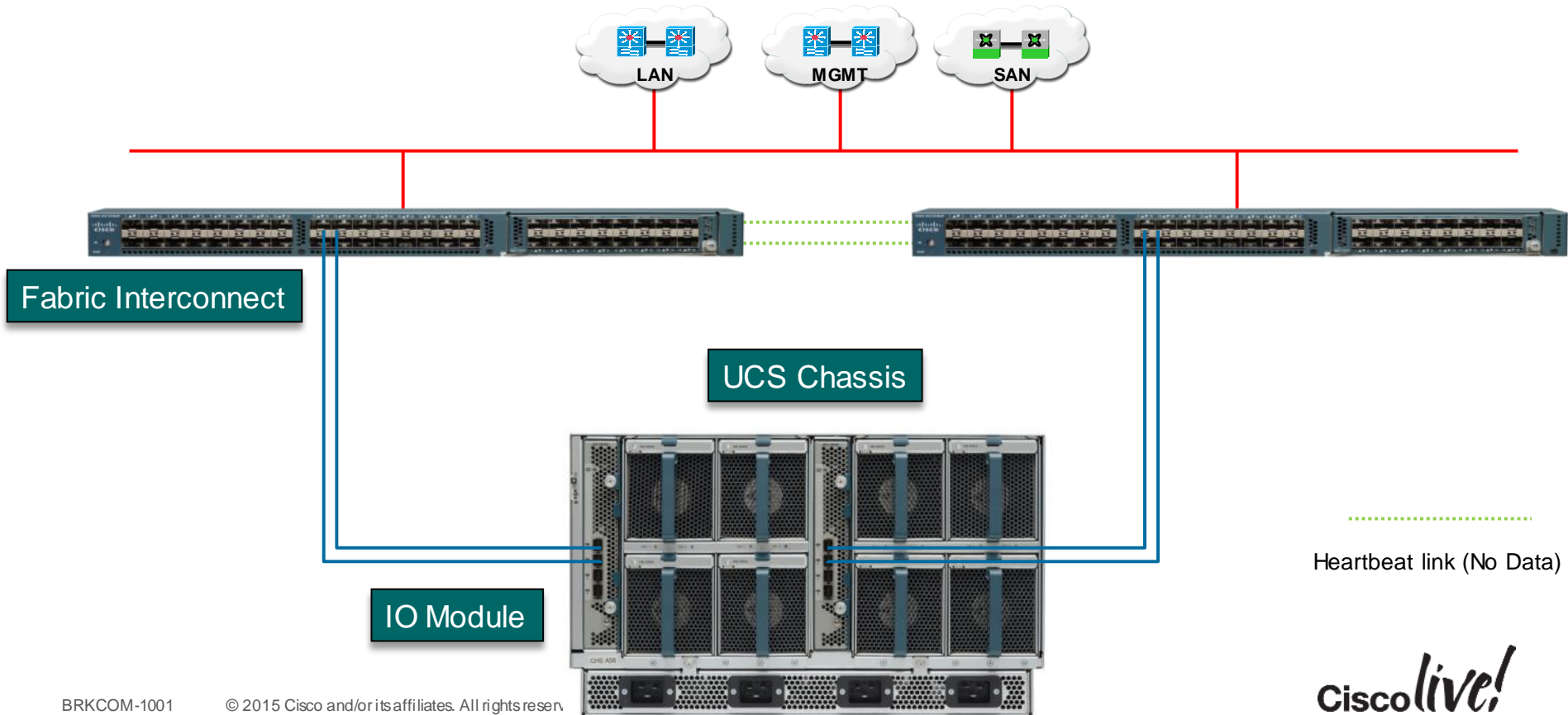
Cisco Unified Computing System (UCS)



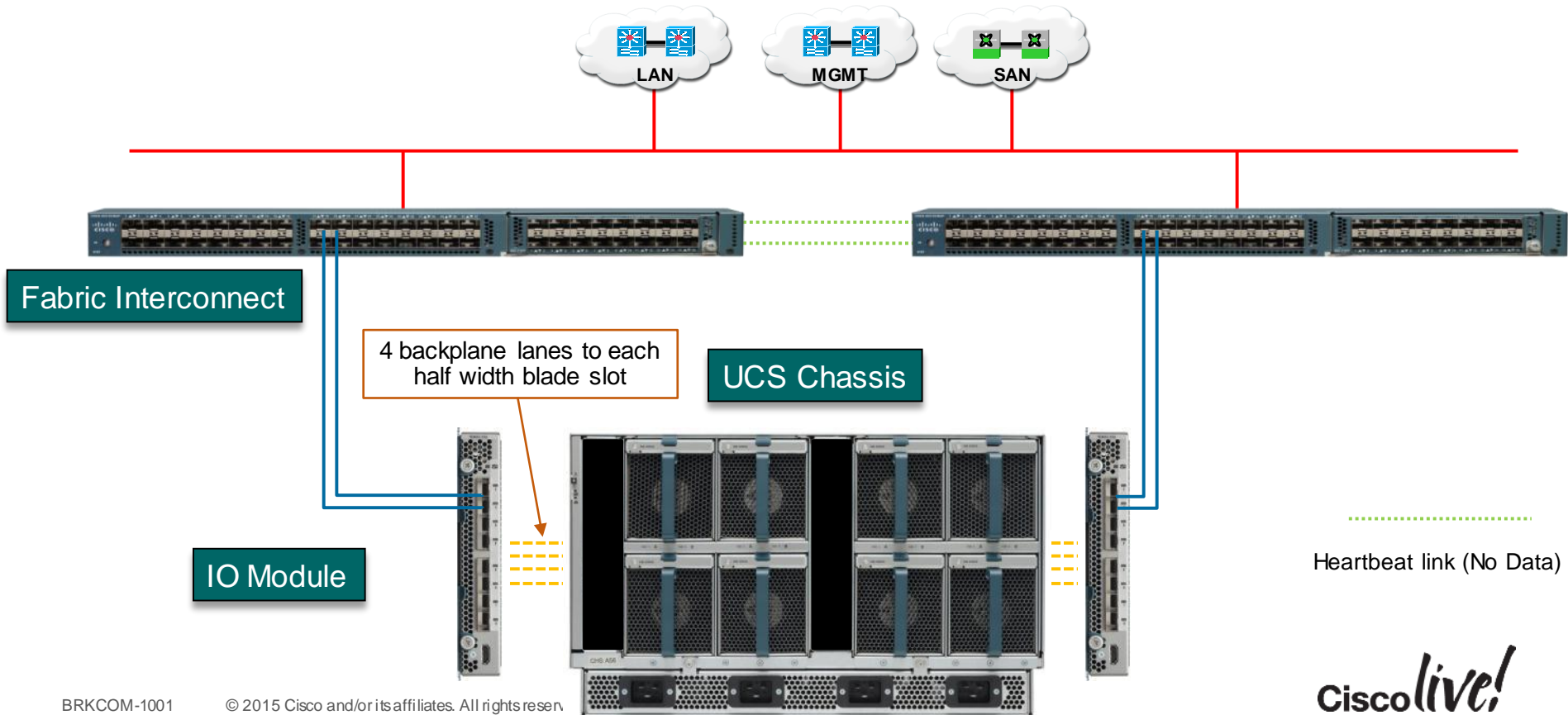
UCS Components



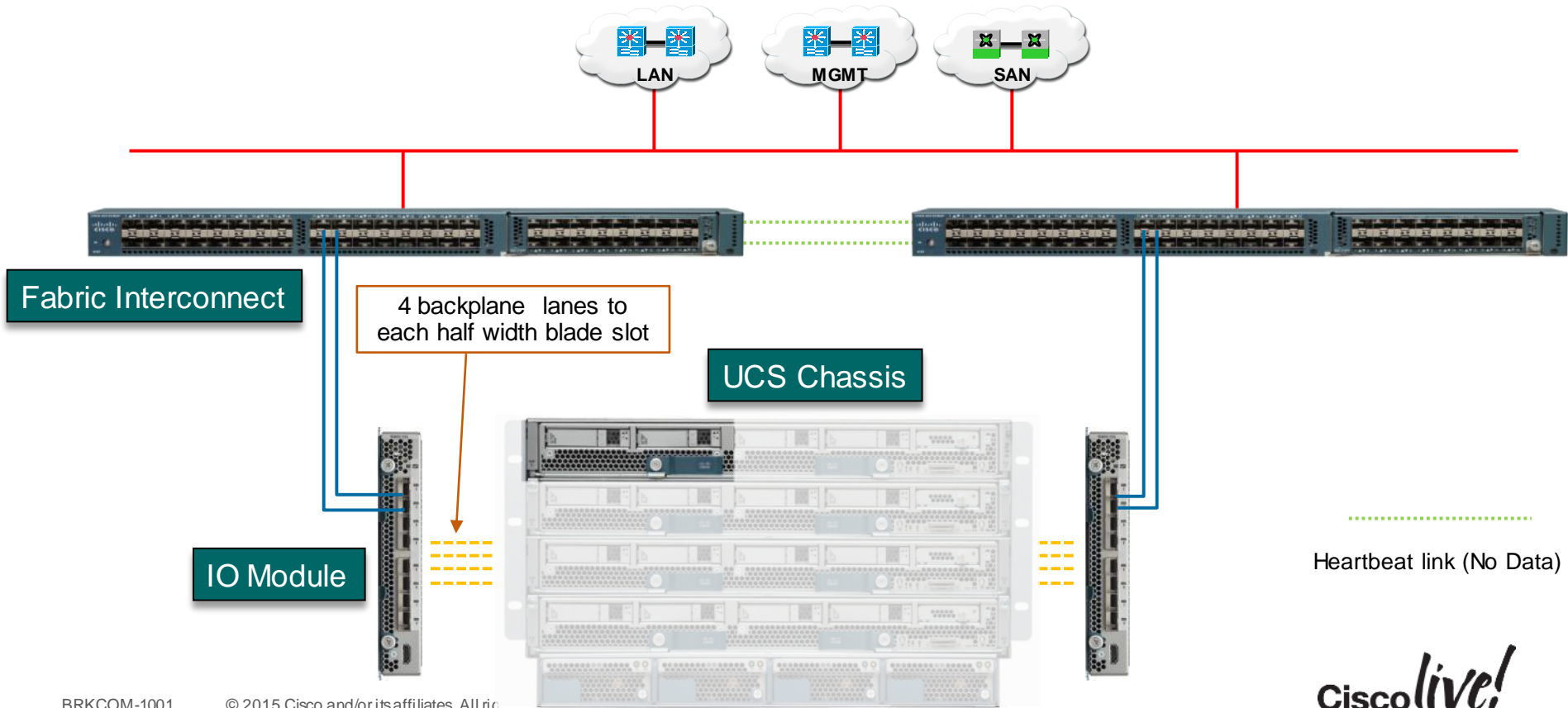
UCS Components



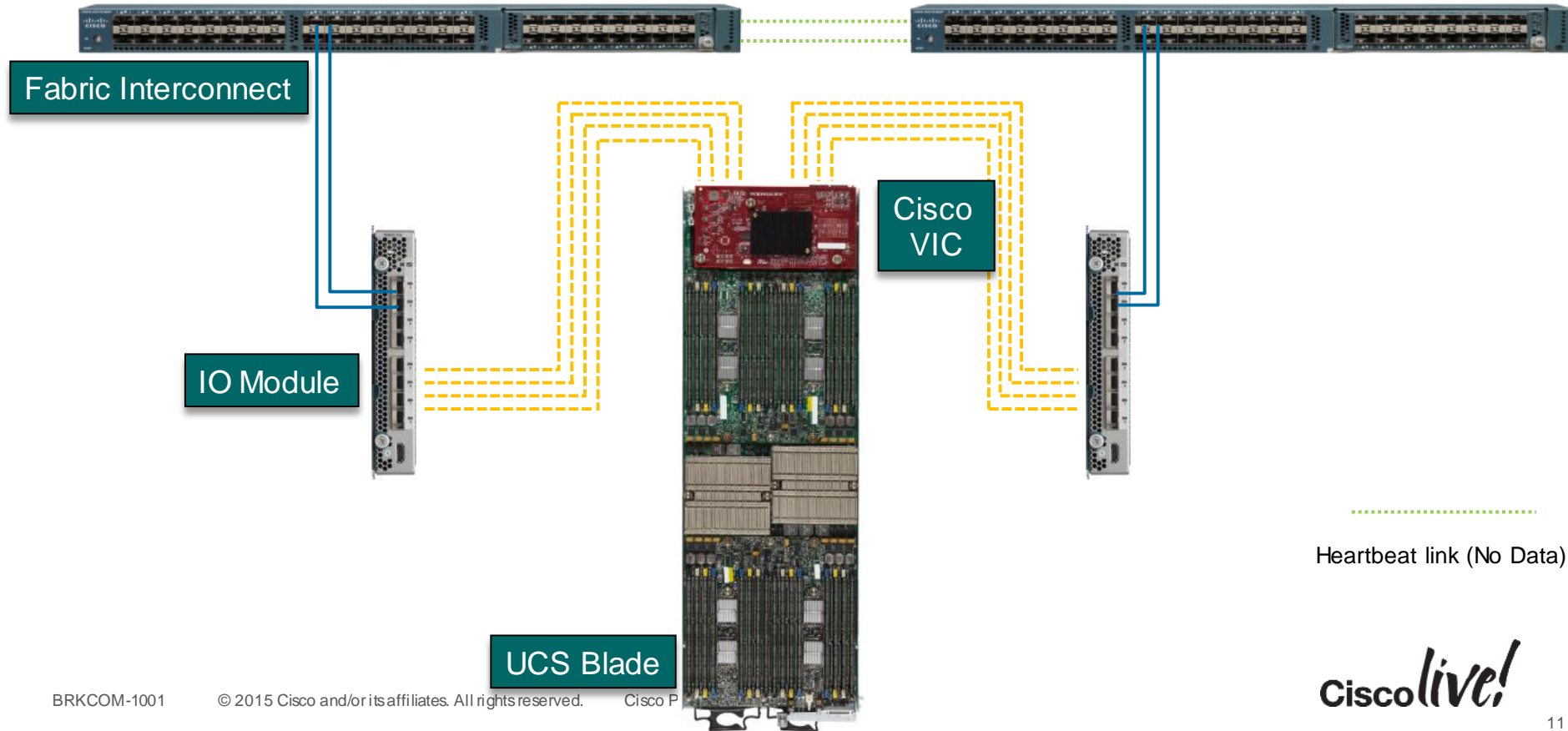
UCS Components



UCS Components

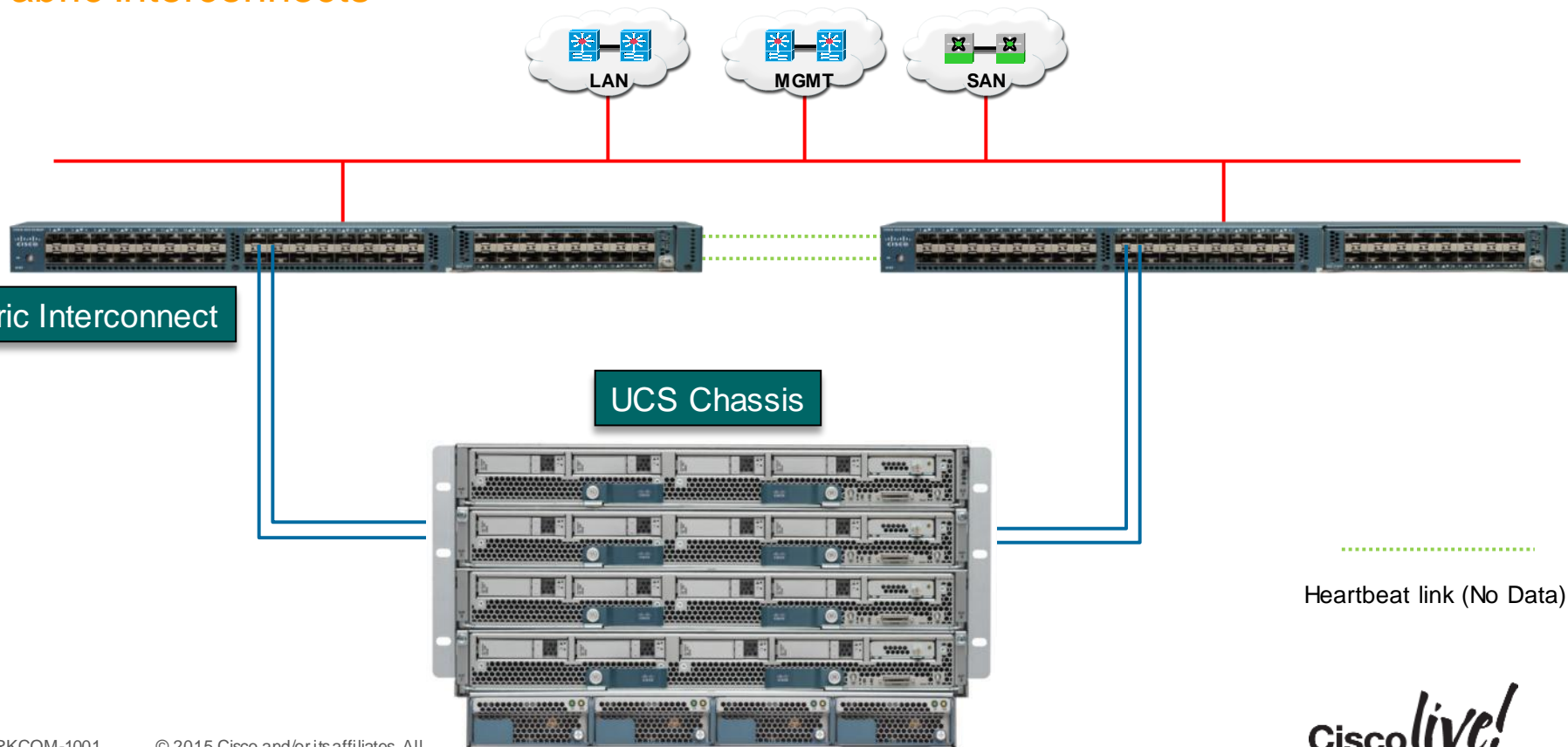


UCS Components



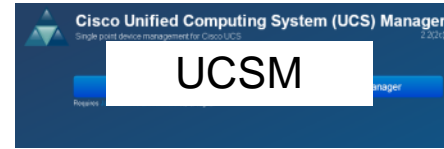
UCS Components

Fabric Interconnects



UCS Components

Fabric Interconnects – 6248UP



32 x Fixed ports: 1/10 GE or 1/2/4/8 FC

Expansion Module (GEM)

Fabric Interconnect
Cluster Connectivity

Out of Band Mgmt
10/100/1000



Console

Fan Module

Fan Module

Power Entry

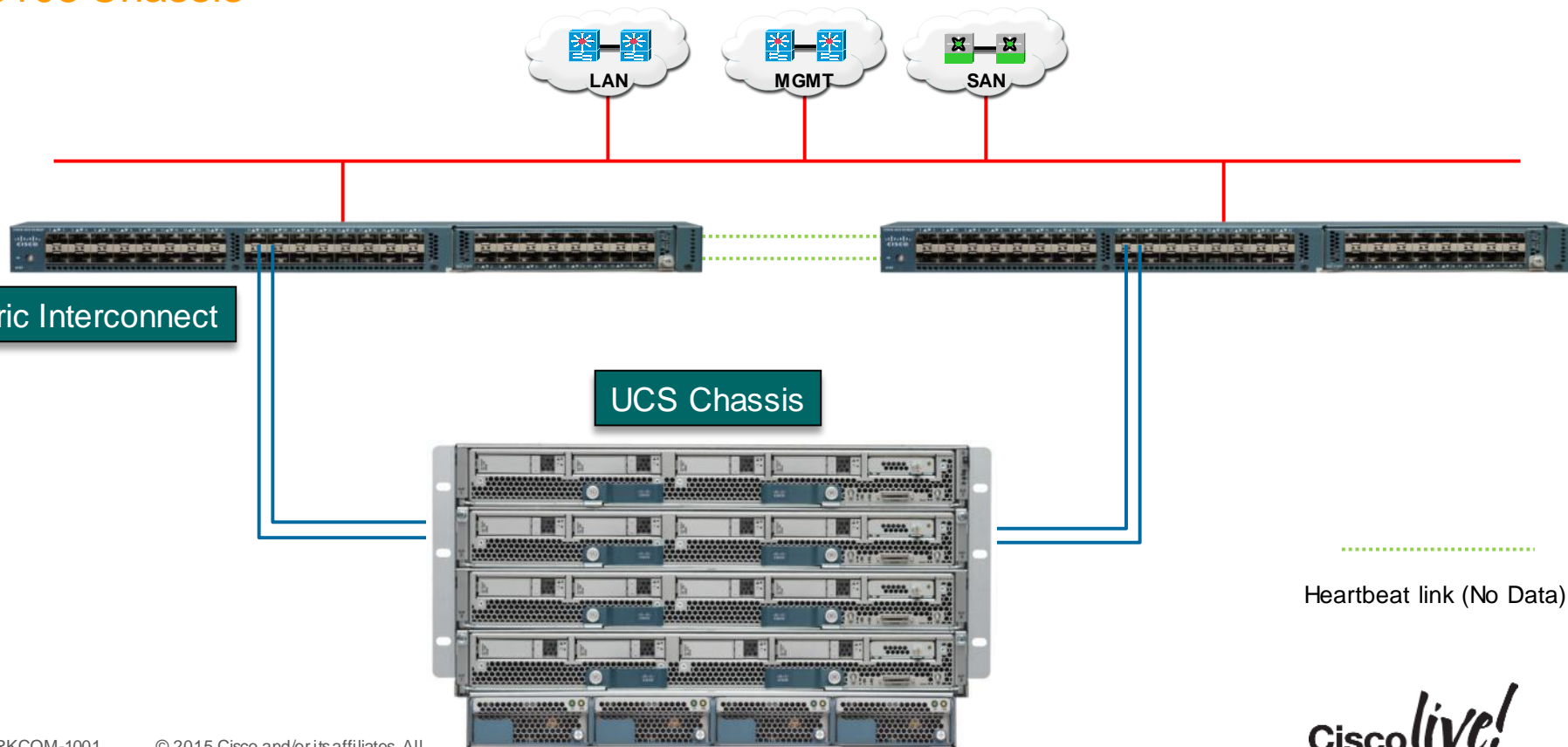
Power Entry

N + N Redundant Fans

N + N Power Supplies

UCS Components

5108 Chassis



UCS Components

5108 Chassis

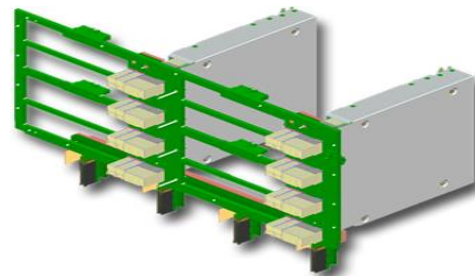


6RU Chassis

32" deep

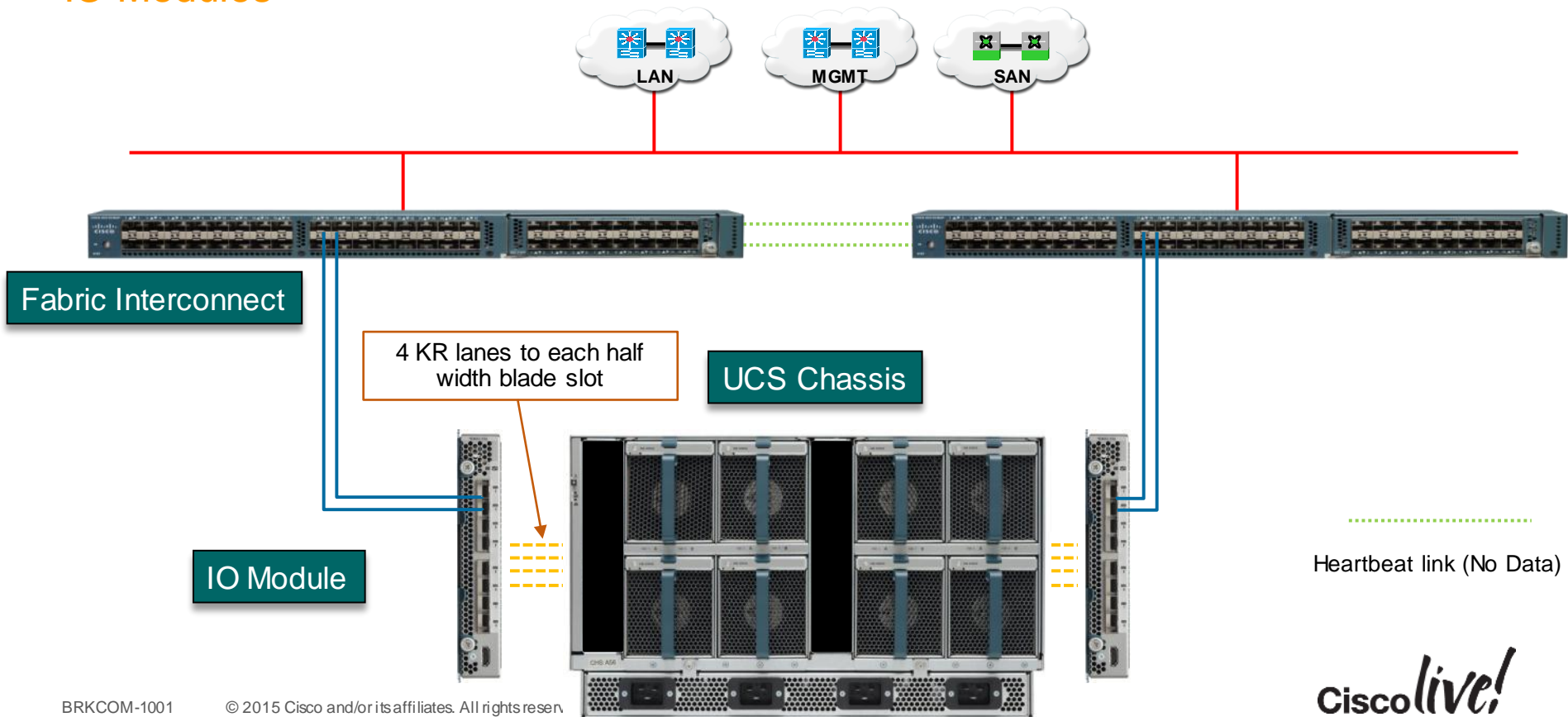
Passive backplane

8 half width blades, 4 full width or a mix of both



UCS Components

IO Modules



UCS Components

IOM Modules

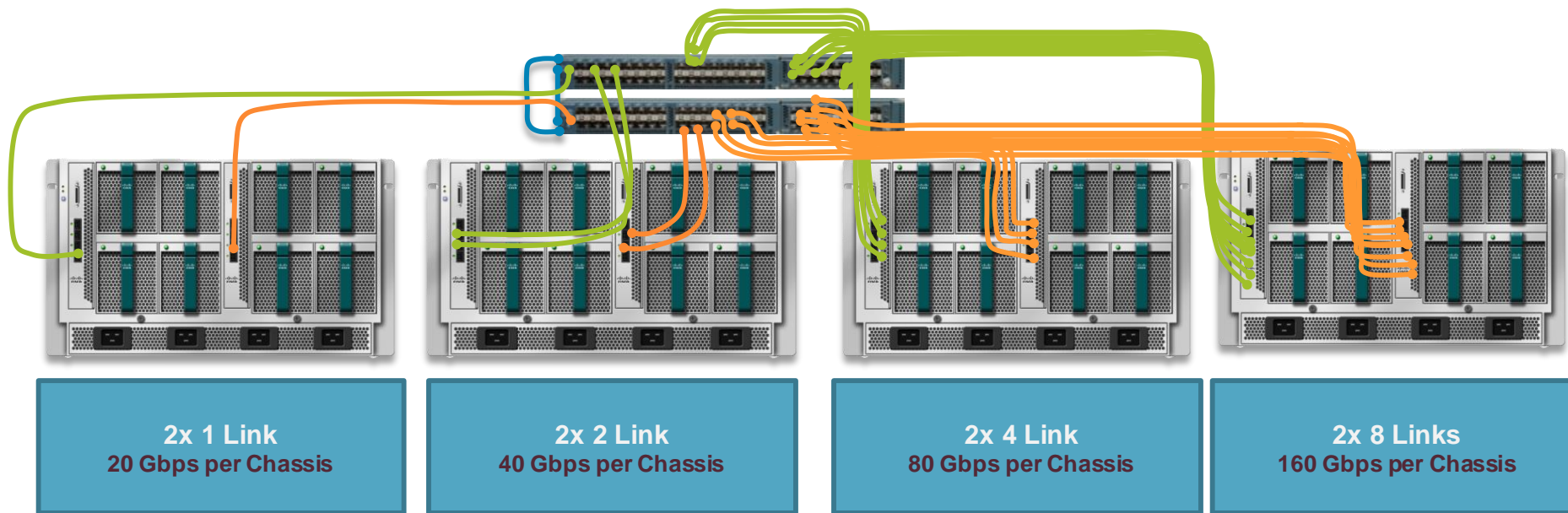
- A IOM (sometimes called 'Fabric Extender') provides
 - 1 interface for internal management
 - Internal sever facing links (HIF)
 - External fabric links (NIF)
- 2204XP
 - 40G to the network
 - 80G to the host redundant
 - Latency lowered to 0.5us within IOM
- 2208XP
 - 80G to the network
 - 160G to the host redundant
 - Latency lowered to 0.5us within IOM

Not a traditional
chassis switch!



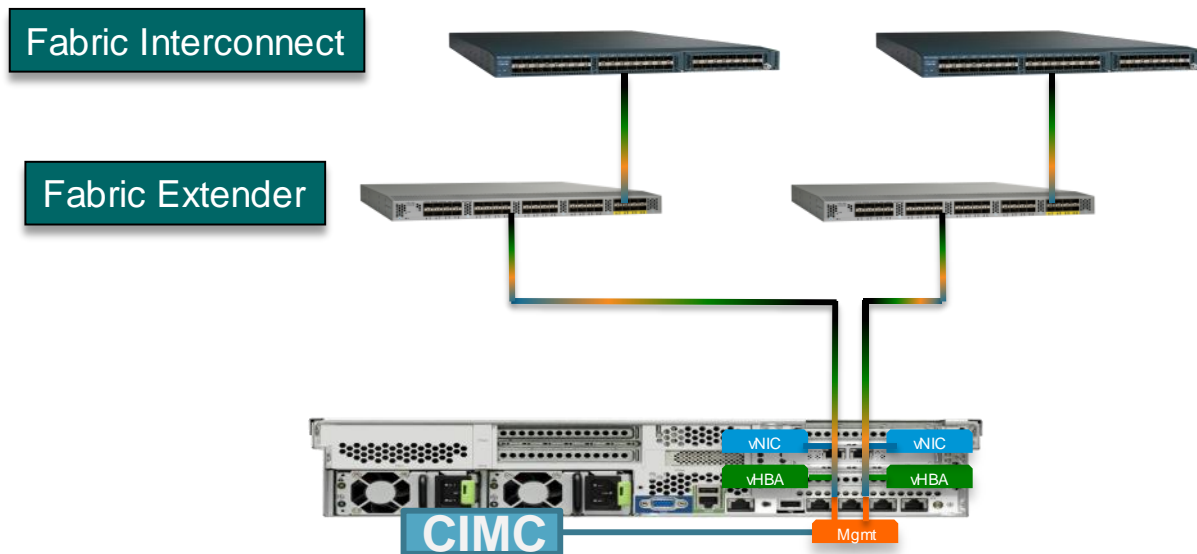
UCS Components

Cable for bandwidth, not for protocol



UCS Components

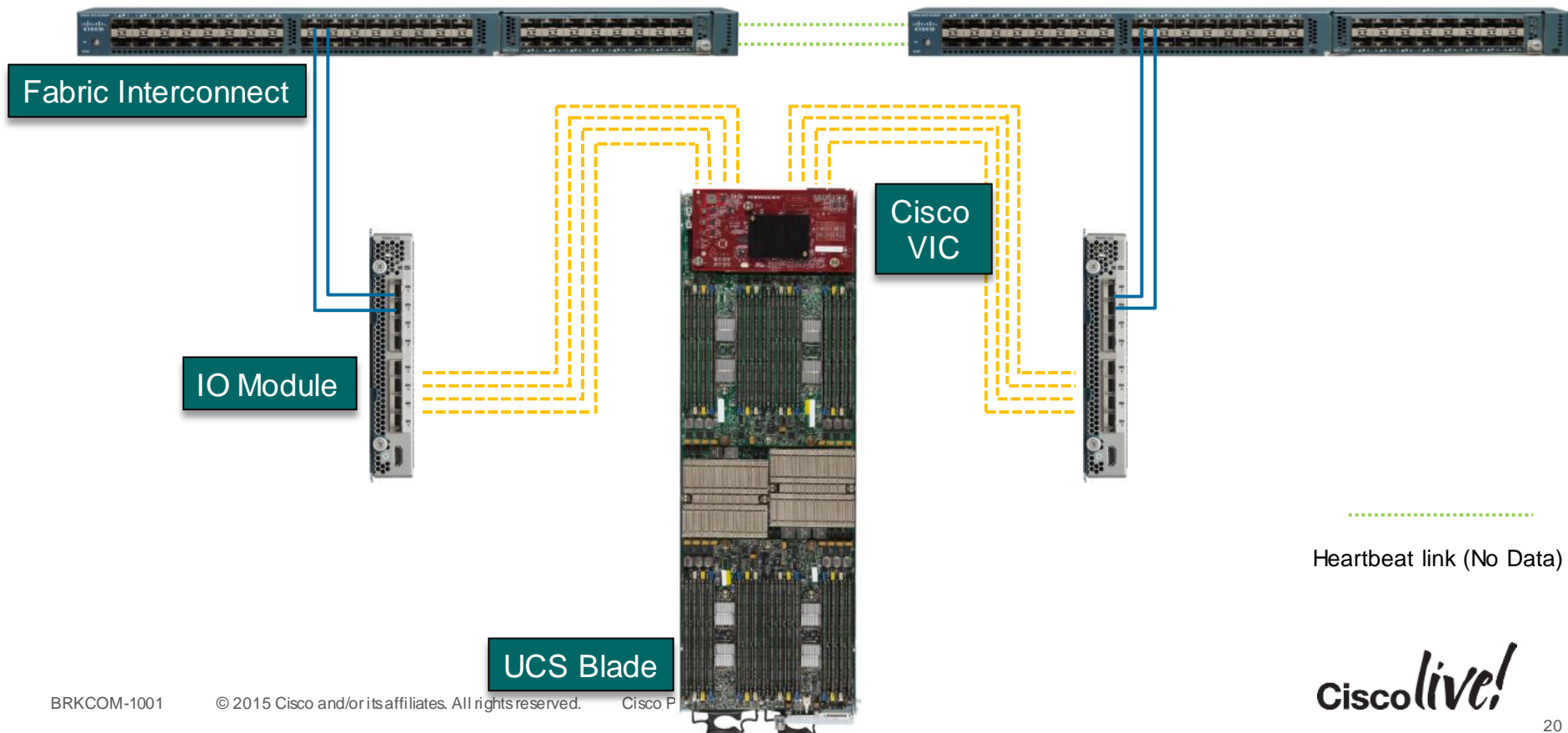
C-Series Rack Integration – Through FEX



BRKCOM-2010 - C-Series UCSM Integration Best Practices

UCS Components

Blade and Rack Servers



UCS Components

UCS Blade Servers



	B22 M3	B200 M3	B200 M4	B230 M2	B420 M3	B440 M2	B260 M4	B460 M4
Blade Size	Half-Width	Half-Width	Half-Width	Half-Width	Full-Width	Full-Width	Full-Width	Double-High, Full-Width
CPU	E5-2400 v2 and E5-2400	E5-2600 v2 and E5-2600	E5-2600v3	E7-2800/8800	E5-4600 v2 and E5-4600	E7- 4800/8800	E7- 2800/4800/8800 v2	E7-4800/8800 v2
Max Cores	20	24	36	20	48	40	30	60
DIMM slots	12 DDR3	24 DDR3	24 DDR4	32 DDR3	48 DDR3	32 DDR3	48	96
Max memory	384 GB*	768 GB	768GB	512 GB	1.5 TB	1 TB	1.5 TB (32 GB) 3 TB (64 GB)*	3 TB (32 GB) 6 TB (64 GB)*
Local disk	2 x 2.5"	2 x 2.5"	2 x 2.5"	2 x SSD	4 x 2.5"	4 x 2.5"	2 x 2.5"	4 x 2.5"
IO throughput	Dual 40Gb/s	Dual 40Gb/s	Dual 40Gb/s	Dual 40Gb/s	Dual 80Gb/s	Dual 80Gb/s	Dual 80Gb/s	Dual 160Gb/s
Mezz slots	2	2	2	1	3	2	3	6

UCS Components

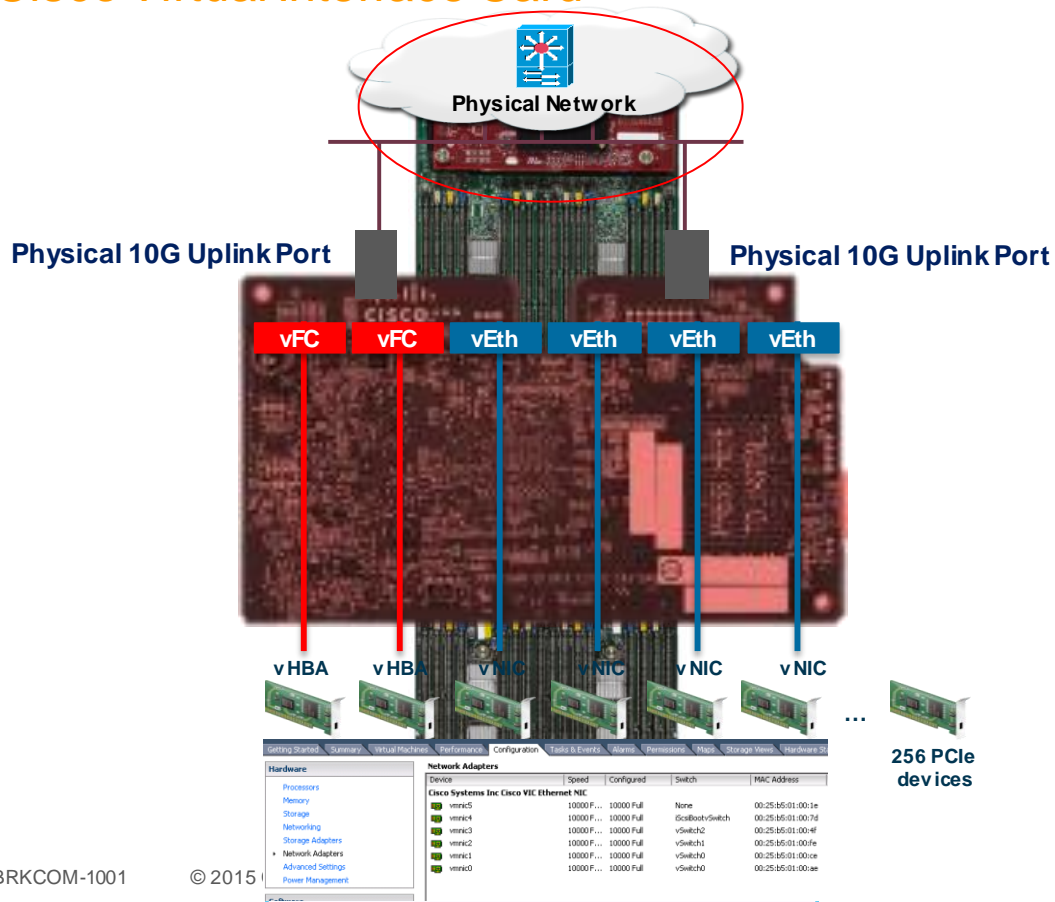
UCS Rack Servers



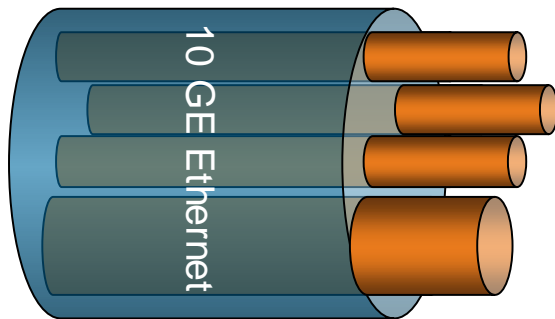
	C22 M3	C24 M3	C220 M3	C220 M4	C240 M3	C240 M4	C260 M2	C420 M3	C460 M2	C460 M4
RU	1	2	1	1	2	2	2	2	4	4
CPU	E5-2400 v2 and E5-2400	E5-2400 v2 and E5-2400	E5-2600 v2 and E5-2600	E5-2600v3	E5-2600 v2 and E5-2600	E5-2600v3	E7-2800/8800	E5-4600	E7-4800/8800	E7-4800/8800 v2
Max Cores	20	20	24	36	24	36	20	32	40	60
DIMMs	12	12	16	24 DDR4	24	24 DDR4	32	48	64	96
Max GB	384 GB*	384 GB*	512 GB	512GB	768 GB	768GB	1 TB	1.5 TB	2 TB	3 TB (32 GB) 6 TB (64 GB)*
Disk	8 x 2.5" or 4 x 3.5"	24 x 2.5" or 12 x 3.5"	8 x 2.5" or 4 x 3.5"	8 SFF or 4 LFF	24 x 2.5" or 12 x 3.5"	26 SFF or 14 LFF	16 x 2.5" or 32 x SSD	16 x 2.5"	12 x 2.5"	12 x 2.5"
LoM	2 x 1Gb	2 x 1Gb	2 x 1Gb	2 x 1Gb	4 x 1Gb	2 x1Gb	2 x 1Gb + 2 x 10Gb	2 x 10Gb	2 x 1Gb + 2 x 10Gb	2 x 1Gb + 2 x 10Gb
PCIe Slots	2 x PCIe 3.0	5 x PCIe 3.0	2 x PCIe 3.0	2 x PCIe 3.0	5 x PCIe 3.0	6 x PCIe 3.0	5 x PCIe 2.0	7 x PCIe 3.0	10 x PCIe 2.0	10 x PCIe 3.0

UCS Components

Cisco Virtual Interface Card



- Stateless computing: 256 PCIe devices (NICs or HBAs)
- Host Connectivity: PCIe Gen3
- Network Connectivity: Multiple Physical 10Gb, 40Gb ready



Network Interface
Virtualisation

Cisco *live!*

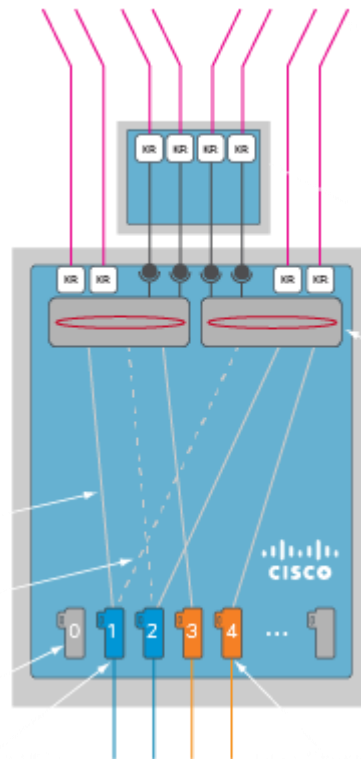
UCS Components

Blade VIC's

- 3rd Generation
 - VIC 1340 mLOM
 - optional port expander card
 - VIC 1380 Mezz
- 2nd Generation
 - VIC 1240
 - optional port expander card
 - VIC 1280



Cisco UCS
VIC 1340



UCS Components

Rack VIC's

- 3rd Gen
 - VIC 1385 Dual Port 40Gb QSFP PCIe
- 2nd Gen
 - VIC 1285 Dual Port 40Gb QSFP PCIe
 - VIC 1225 Dual Port SFP+ PCIe
 - VIC 1225T Dual Port 10GBaseT PCIe
 - VIC 1227 Dual Port SFP+ mLOM
 - VIC 1227T Dual Port 10GBaseT mLOM

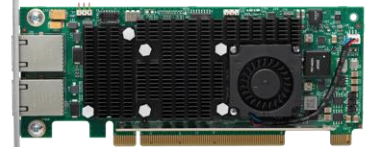
VIC 1285
40Gb QSFP



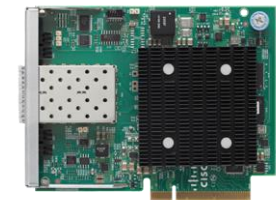
VIC 1225
10Gb SFP+



VIC 1225T
10Gb RJ-45



VIC 1227
10Gb SFP+ mLOM



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UCS Components

Product Names and Numbers

UCS Fabric Interconnect

UCS Fabric Interconnect – UCS 6248UP

- 1RU
- 32 unified base ports and 1 expansion slot
- Line rate – 960Gbps

UCS Fabric Interconnect – UCS 6296UP

- 2RU
- 48 unified base ports and 3 expansion slots
- Line rate – 1920 Gbps



UCS Fabric Extender

UCS IO Module (IOM) – 2204 or 2208

- 4 or 8 10GbE fabric links (to Fabric Interconnect)
- Up to 32 10GbE server links (to servers)

Nexus 2232PP

- 8 10GbE fabric links (to Fabric Interconnect)
- 32 10GbE server links (to servers)



UCS Components

Blade/Rack/Modular servers

- B-Series Blade – Half width, full width
- C-Series Rack – 2 socket, 4 socket
- M-Series Modular – Cartridge based

Virtual Interface Cards

- VIC 1340
- VIC 1380
- VIC 1385

Accessories

- nVIDIA GPUs
- Flash storage – FusionIO/LSI

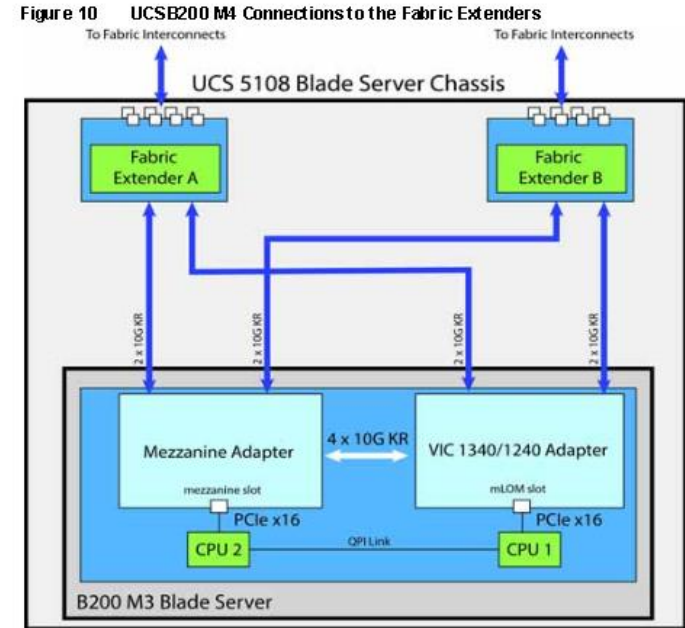


Agenda

- **UCS Overview**
 - Components – Traditional blade and rack servers
 - **Basic Connectivity – Compute, LAN, SAN**
- **Key Features**
 - Scaling with Single Point of Management
 - UCS Service Profiles – Logical Building Blocks
 - UCS – XML API and Other Hidden Gems
- **New UCS Form Factors**
 - UCS Mini
 - UCS M-Series
- **Resources**

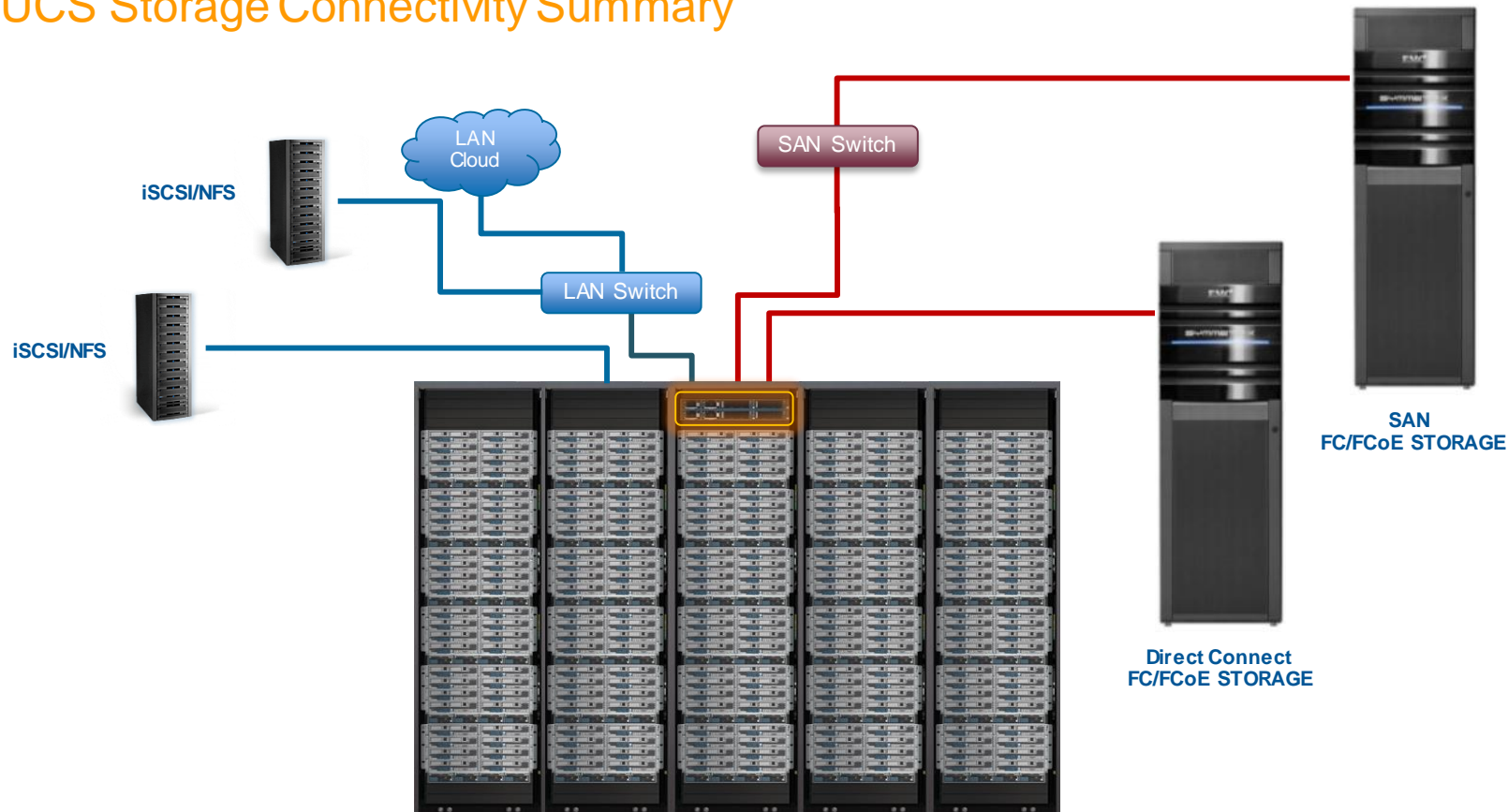
UCS Connectivity and Networking In Depth

- BRKCOM 2003 – UCS Networking Deepdive
- Tech Specs – E.g. B200 M4
- <http://www.cisco.com/c/dam/en/us/products/collateral/servers-unified-computing/ucs-b-series-blade-servers/b200m4-specsheet.pdf>



Connectivity – SAN

UCS Storage Connectivity Summary

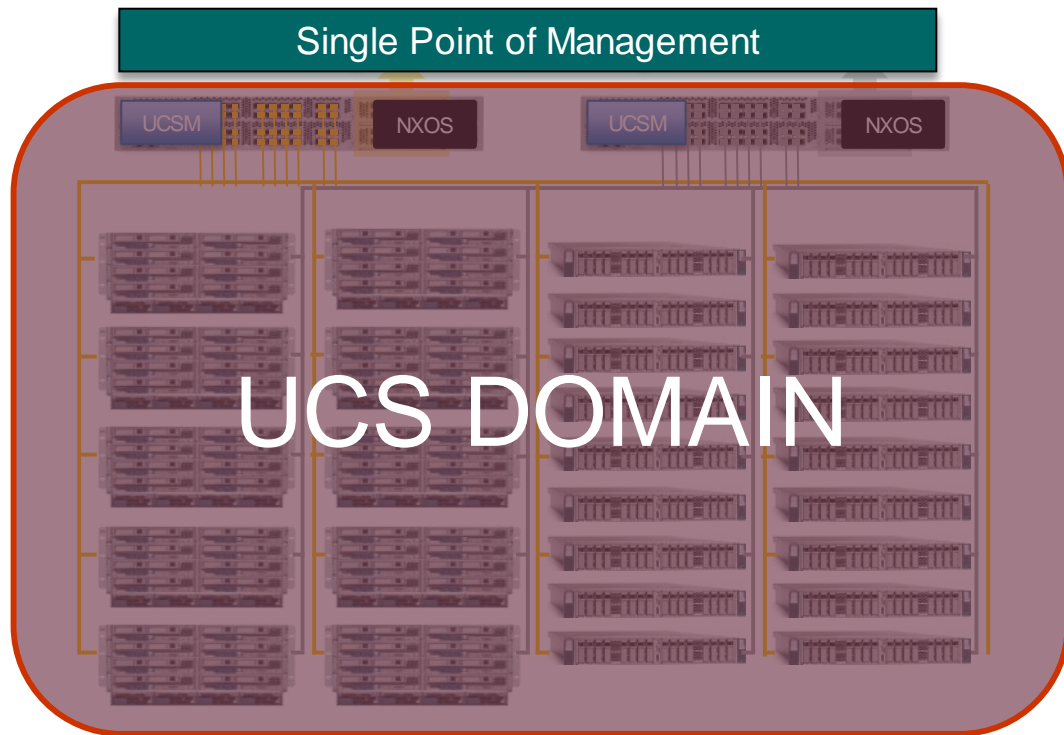


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UCS Key Features

Single Point of Management and Scaling – UCS Manager



UCS Key Features

Single Point of Management and Scaling

8 Cisco UCS Blades
1 UCS Manager

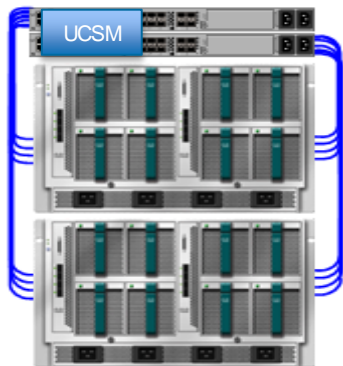
16 Cisco UCS Blades
1 UCS Manager

24 Cisco UCS Blades
1 UCS Manager

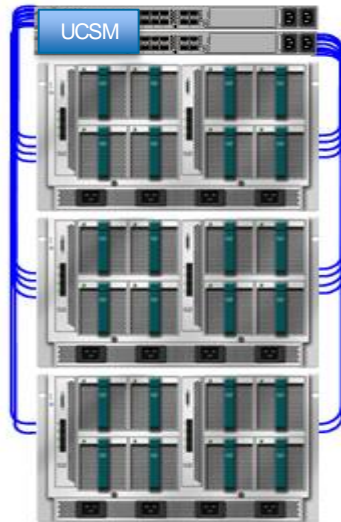
32 Cisco UCS Blades
1 UCS Manager



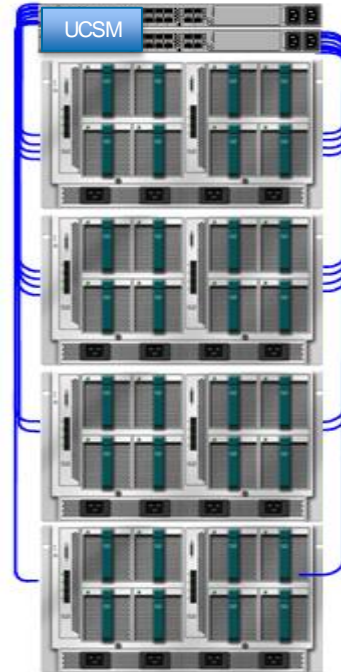
Add One UCS Blade Chassis



Add One UCS Blade Chassis



Add One UCS Blade Chassis



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UCS Key Features

Single Point of Management – Through Browser – Java Client

192.168.1.1/

Search

Cisco Unified Computing System (UCS) Manager
Single point device management for Cisco UCS 2.2(2c)

Launch UCS Manager **Launch KVM Manager**

Requires Java Runtime Environment 1.6 or higher

Workload Mobility
Global Service Profiles with optional site specific settings for localization

Filter: [All]

- Boot Policies
- Host Firmware Packages
- IPMI Access Profiles
- UCS Authentication Profile
- Local Disk Config Policies
- Mail Archive Policies
- Server Control Policies
- Serial Policies
- Serial over LAN Policies
- Server Pool Policies
- Server Pool Policy Qualifier
- Threshold Policies
- vNIC/IBA Placement Policies
- Sub-Organizations

Global Service Profiles

- Global Service Profile Templates
- Local Service Profiles
- Local Service Profile Templates
- Policies
- Ports

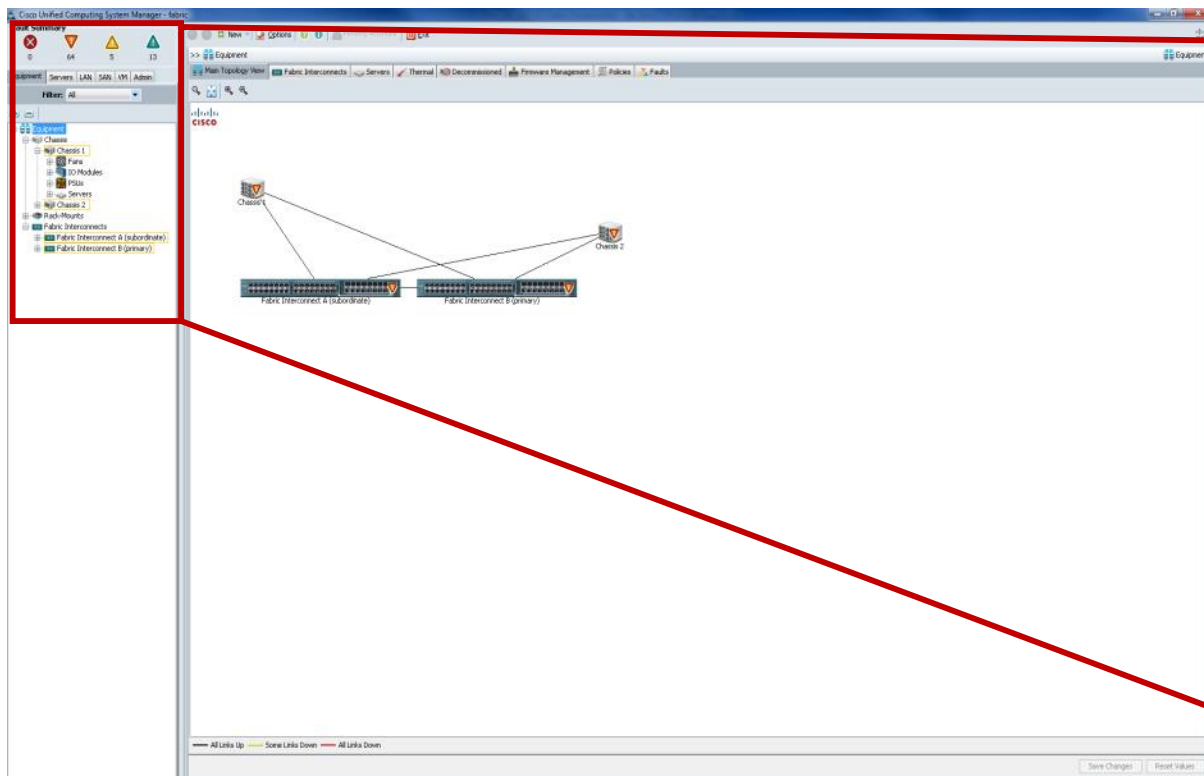
Assignment

Server Pool: angel
Server Power State:
Desired Power State:

Download UCS Central

UCS Key Features

Single Point of Management – Equipment



Fault Summary



0



64



5



13

Equipment

Servers

LAN

SAN

VM

Admin

Filter: All

Equipment

Chassis

Chassis 1

Fans

IO Modules

PSUs

Servers

Chassis 2

Rack-Mounts

Fabric Interconnects

Fabric Interconnect A (subordinate)

Fabric Interconnect B (primary)

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UCS Key Features

Single Point of Management – Equipment – Server Inventory

Fault Summary

0	64	5	13

Equipment: Servers LAN SAN VM Admin

Filter: All

Equipment

- Chassis
 - Chassis 1
 - Fans
 - IO Modules
 - PSUs
 - Servers**
 - Chassis 2
- Rack-Mounts
- Fabric Interconnects
 - Fabric Interconnect A (subordinate)
 - Fabric Interconnect B (primary)

General Inventory Virtual Machines Installed Firmware CIMC Sessions SEL Logs VIF Paths Faults Events FSM Statistics Temperatures Power

Motherboard CIMC **CPUs** Memory Adapters HBAs NICs iSCSI vNICs Storage

Processor 1

Product Name: **Intel(R) Xeon(R) E5-2620B** Vendor: **Intel(R) Corporation**
PID: **UCS-CPU-E5-2620B** Revision: **0**

Part Details

Processor Architecture: **Xeon**
CPU Stepping: **4** Speed (GHz): **2.93**
Socket Name: **CPU1** Number of Threads: **8**
Number of Cores: **4** Number of Cores Enabled: **4**

States

Overall Status: **Operable**
Operability: **Operable** Power: **N/A**
Thermal: **Ok** Presence: **Equipped**

Processor 2

Product Name: **Intel(R) Xeon(R) E5-2620B** Vendor: **Intel(R) Corporation**
PID: **UCS-CPU-E5-2620B** Revision: **0**

Part Details

Processor Architecture: **Xeon**
CPU Stepping: **4** Speed (GHz): **2.93**
Socket Name: **CPU2** Number of Threads: **8**
Number of Cores: **4** Number of Cores Enabled: **4**

States

Overall Status: **Operable**
Operability: **Operable** Power: **N/A**
Thermal: **Ok** Presence: **Equipped**

UCS Key Features

Single Point of Management – Equipment – Fabric Interconnects

UCS Key Features

Single Point of Management – Servers

The screenshot displays the UCS Manager web interface. The top navigation bar includes tabs for Equipment, Servers, LAN, SAN, VM, and Admin. The 'Servers' tab is selected and highlighted with a red circle. Below the navigation bar, a 'Filter: All' dropdown is visible. The left sidebar shows a tree view of the UCS hierarchy, with 'Servers' expanded. Under 'Servers', there are 'Service Profiles' and 'Policies'. The 'Policies' section is expanded, showing a list of policy types such as Adapter Policies, BIOS Defaults, BIOS Policies, Boot Policies, Host Firmware Packages, IPMI Access Profiles, KVM Management Policies, Local Disk Config Policies, Maintenance Policies, Management Firmware Packages, Memory Policy, Power Control Policies, Scrub Policies, Serial over LAN Policies, Server Pool Policies, Server Pool Policy Qualifications, Threshold Policies, iSCSI Authentication Profiles, vMedia Policies, vNIC/vHBA Placement Policies, and Sub-Organizations. The 'Conors-BIOS-Pol' policy is selected. The main content area on the right shows the 'Processor' configuration page. It includes tabs for Processor, Intel Directed IO, RAS Memory, Serial Port, USB, PCI, QPI, LOM and PCIe Slots. The 'Processor' tab is active, displaying various configuration options with radio buttons for 'disabled', 'enabled', and 'Platform Default'. The options include Turbo Boost, Enhanced Intel Speedstep, Hyper Threading, Core Multi Processing, Execute Disabled Bit, Virtualization Technology (VT), Hardware Pre-fetcher, Adjacent Cache Line Pre-fetcher, DCU Streamer Pre-fetch, DCU IP Pre-fetcher, Direct Cache Access, Processor C State, Processor C1E, Processor C3 Report, Processor C6 Report, Processor C7 Report, and CPU Performance. Most options are set to 'Platform Default'.

Equipment **Servers** LAN SAN VM Admin

Filter: All

Servers

- Service Profiles
 - root
 - Sub-Organizations
- Service Profile Templates
 - root
 - Sub-Organizations
- Policies
 - root
 - Adapter Policies
 - BIOS Defaults
 - BIOS Policies
 - Conors-BIOS-Pol
 - Boot Policies
 - Host Firmware Packages
 - IPMI Access Profiles
 - KVM Management Policies
 - Local Disk Config Policies
 - Maintenance Policies
 - Management Firmware Packages
 - Memory Policy
 - Power Control Policies
 - Scrub Policies
 - Serial over LAN Policies
 - Server Pool Policies
 - Server Pool Policy Qualifications
 - Threshold Policies
 - iSCSI Authentication Profiles
 - vMedia Policies
 - vNIC/vHBA Placement Policies
 - Sub-Organizations

Pools

Main Advanced Boot Options Server Management Events

Processor Intel Directed IO RAS Memory Serial Port USB PCI QPI LOM and PCIe Slots

Turbo Boost: ☐ disabled ☐ enabled ☒ Platform Default

Enhanced Intel Speedstep: ☐ disabled ☐ enabled ☒ Platform Default

Hyper Threading: ☐ disabled ☐ enabled ☒ Platform Default

Core Multi Processing: Platform Default

Execute Disabled Bit: ☐ disabled ☐ enabled ☒ Platform Default

Virtualization Technology (VT): ☐ disabled ☒ enabled ☐ Platform Default

Hardware Pre-fetcher: ☐ disabled ☐ enabled ☒ Platform Default

Adjacent Cache Line Pre-fetcher: ☐ disabled ☐ enabled ☒ Platform Default

DCU Streamer Pre-fetch: ☐ disabled ☐ enabled ☒ Platform Default

DCU IP Pre-fetcher: ☐ disabled ☐ enabled ☒ Platform Default

Direct Cache Access: ☐ disabled ☐ enabled ☒ Platform Default

Processor C State: ☐ disabled ☐ enabled ☒ Platform Default

Processor C1E: ☐ disabled ☐ enabled ☒ Platform Default

Processor C3 Report: ☐ disabled ☐ acpi-c2 ☐ acpi-c3 ☒ Platform Default

Processor C6 Report: ☐ disabled ☐ enabled ☒ Platform Default

Processor C7 Report: ☐ disabled ☐ enabled ☒ Platform Default

CPU Performance: ☐ enterprise ☐ high-throughput ☐ hpc ☒ Platform Default

UCS Key Features

Single Point of Management – LAN Connectivity

The screenshot displays the Cisco UCS Management Center interface. The top navigation bar includes tabs for Equipment, Servers, LAN, SAN, VM, and Admin. The 'LAN' tab is selected and circled in red. Below the navigation bar, a 'Filter: All' dropdown is visible. The left pane shows a hierarchical tree structure under the 'LAN' category, including LAN Cloud, Fabric A, Port Channels, Uplink Eth Interfaces, VLAN Optimization Sets, VLANs, Fabric B, QoS System Class, LAN Pin Groups, Threshold Policies, VLAN Groups, and a list of VLANs (VLAN Conors-VLAN-100 (100) through VLAN default (1)). The right pane shows a table with the following data:

Name	Fabric ID	If Type
Port-Channel 2 (PO-200)	A	Aggregation
Port-Channel 1 (PO-100)	A	Aggregation

UCS Key Features

Single Point of Management – SAN Connectivity

The screenshot displays the UCS Management GUI. In the top navigation bar, the 'SAN' tab is selected and circled in red. The left pane shows a tree view of the configuration hierarchy. The 'SAN' folder is expanded, showing sub-items like 'SAN Cloud', 'Fabric A', 'Fabric B', 'SAN Pin Groups', 'Threshold Policies', and 'VSANs'. The 'VSANs' folder is further expanded, showing 'VSAN VSAN-100 (100)', 'VSAN VSAN-200 (200)', and 'VSAN default (1)'. The right pane shows a table of VSANs.

Name	ID	Fabric ID	If Type
VSANs			
VSAN VSAN-100 (100)	100	Dual	Virtual
VSAN VSAN-200 (200)	200	Dual	Virtual
VSAN default (1)	1	Dual	Virtual
Fabric A			
VSANs			
Fabric B			
VSANs			

UCS Key Features

Single Point of Management – Central Administration

The screenshot displays the UCS Management Center interface. On the left, the 'Fault Summary' panel shows four status icons: a red 'X' for critical faults (0), an orange triangle for major faults (0), a yellow triangle for minor faults (1), and a green triangle for warning faults (0). Below these are tabs for 'Equipment', 'Servers', 'LAN', 'SAN', 'VM', and 'Admin', with 'Admin' highlighted by a red circle. The 'Filter' dropdown is set to 'All'. The main pane on the right, titled 'Faults, Events and Audit Log', shows a table of faults. The table has columns for Severity, Code, ID, Affected object, Cause, Last Tran..., and Description. The faults listed include various network adapter unreachable errors (F0206) and chassis discovery policy conflicts (F0440).

Severity	Code	ID	Affected object	Cause	Last Tran...	Description
✓	F0206	63143	sys/rack-unit-1...	connect...	2015-01-08T0...	Adapter 1/1 is unreachable
✓	F0206	63199	sys/rack-unit-2...	connect...	2015-01-08T0...	Adapter 2/1 is unreachable
✓	F0206	63303	sys/rack-unit-3...	connect...	2015-01-08T0...	Adapter 3/1 is unreachable
✓	F0206	63251	sys/rack-unit-4...	connect...	2015-01-08T0...	Adapter 4/1 is unreachable
✓	F0206	63386	sys/rack-unit-5...	connect...	2015-01-08T0...	Adapter 5/1 is unreachable
✓	F0206	63447	sys/rack-unit-6...	connect...	2015-01-08T0...	Adapter 6/1 is unreachable
✓	F16994	66094	sys/rack-unit-1	pnuosid...	2015-01-08T0...	[FSM:STAGE:RETRY:]: Identify pr
✓	F16994	66096	sys/rack-unit-2	pnuosid...	2015-01-08T0...	[FSM:STAGE:RETRY:]: Identify pr
✓	F16994	66098	sys/rack-unit-3	pnuosid...	2015-01-08T0...	[FSM:STAGE:RETRY:]: Identify pr
✓	F16994	66100	sys/rack-unit-4	pnuosid...	2015-01-08T0...	[FSM:STAGE:RETRY:]: Identify pr
✓	F16994	66102	sys/rack-unit-5	pnuosid...	2015-01-08T0...	[FSM:STAGE:RETRY:]: Identify pr
✓	F16994	66104	sys/rack-unit-6	pnuosid...	2015-01-08T0...	[FSM:STAGE:RETRY:]: Identify pr
✓	F0440	61015	sys/fex-3/slot...	unexpe...	2015-01-08T0...	Chassis discovery policy conflict: l
✓	F0440	61020	sys/fex-3/slot...	unexpe...	2015-01-08T0...	Chassis discovery policy conflict: l
✓	F0440	61025	sys/fex-3/slot...	unexpe...	2015-01-08T0...	Chassis discovery policy conflict: l
✓	F0401	61014	sys/fex-3/slot-1	serial-d...	2015-01-08T0...	IOM 3/1 (A) current connectivity c
✓	F0440	61227	sys/fex-4/slot...	unexpe...	2015-01-08T0...	Chassis discovery policy conflict: l
✓	F0440	61232	sys/fex-4/slot...	unexpe...	2015-01-08T0...	Chassis discovery policy conflict: l
✓	F0440	61237	sys/fex-4/slot...	unexpe...	2015-01-08T0...	Chassis discovery policy conflict: l
✓	F0401	61226	sys/fex-4/slot-1	serial-d...	2015-01-08T0...	IOM 4/1 (B) current connectivity c
✓	F0320	55827	sys/chassis-2/b...	identity...	2015-01-08T0...	Server 2/1 (service profile:) has i
✓	F0320	55826	sys/chassis-2/b...	identity...	2015-01-08T0...	Server 2/2 (service profile:) has i
✓	F0320	55832	sys/chassis-2/b...	identity...	2015-01-08T0...	Server 2/3 (service profile:) has i
✓	F0320	55831	sys/chassis-2/b...	identity...	2015-01-08T0...	Server 2/4 (service profile:) has i
✓	F0320	55830	sys/chassis-2/b...	identity...	2015-01-08T0...	Server 2/5 (service profile:) has i

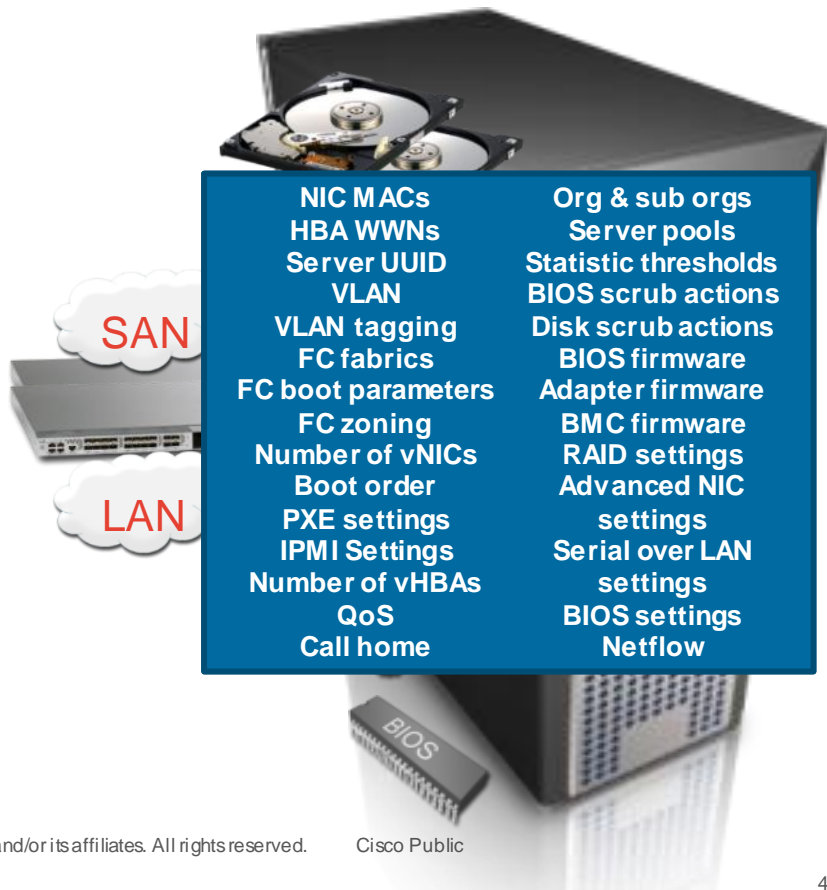
Legend: ✗ critical ⚠ major ⚠ minor ⚠ warning i info c condition

Agenda

- UCS Overview
 - Components – Traditional blade and rack servers
 - Basic Connectivity – Compute, LAN, SAN
- Key Features
 - Scaling with Single Point of Management
 - UCS Service Profiles – Logical Building Blocks
 - UCS – XML API and Other Hidden Gems
- New UCS Form Factors
 - UCS Mini
 - UCS M-Series
- Resources

UCS Key Features

Traditional Approach



UCS Key Features

Logical Building Blocks – UCS Stateless Computing



4.

Service Profile

MAC : 00:25:B5:01:00:05

WWN: 20:01:00:25:B5:01:00:05

Firmware 2.2

Boot:SAN

3.

Service Profile

MAC : 00:25:B5:01:00:05

WWN: 20:01:00:25:B5:01:00:05

Firmware 2.1

Boot:SAN

2.

Templates - Service Profile

MAC : Derived

WWN: Derived

Firmware 2.2

Boot:SAN

1.

Pools

UUID

MAC

WWNN / WWPN

Policies

Boot Devices/Order

Host FW

QoS

Templates

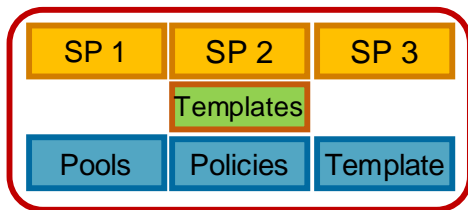
vNICs

vHBAs

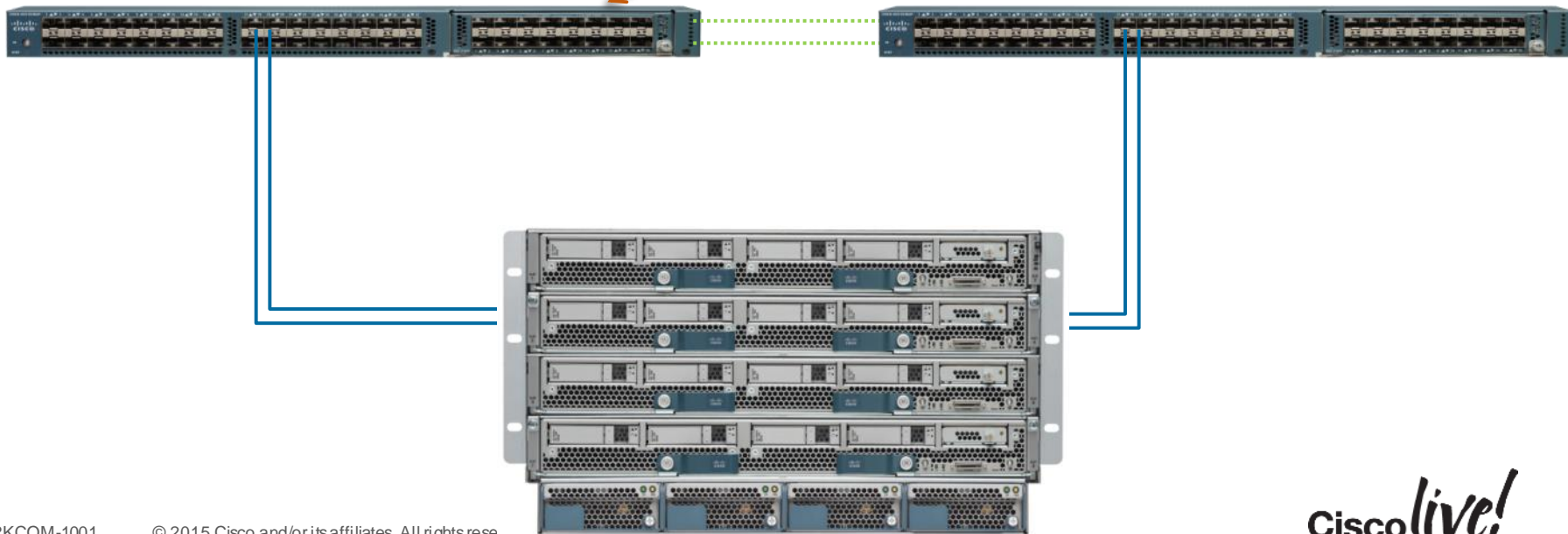
ive!

UCS Key Features

Logical Building Blocks – Storing The Config



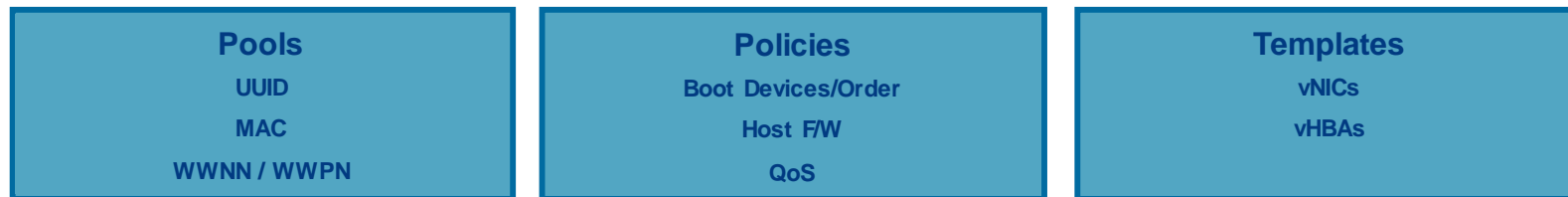
All pools, policies, templates, service profiles stored as XML representation on Fabric Interconnects. Only applied to physical compute platform when associated



UCS Key Features

Logical Building Blocks – Deploying Servers in 4 Easy Steps

1. Create the pools and policies
2. Build a template
3. Create the logical servers (Services Profiles)
4. Associate to hardware



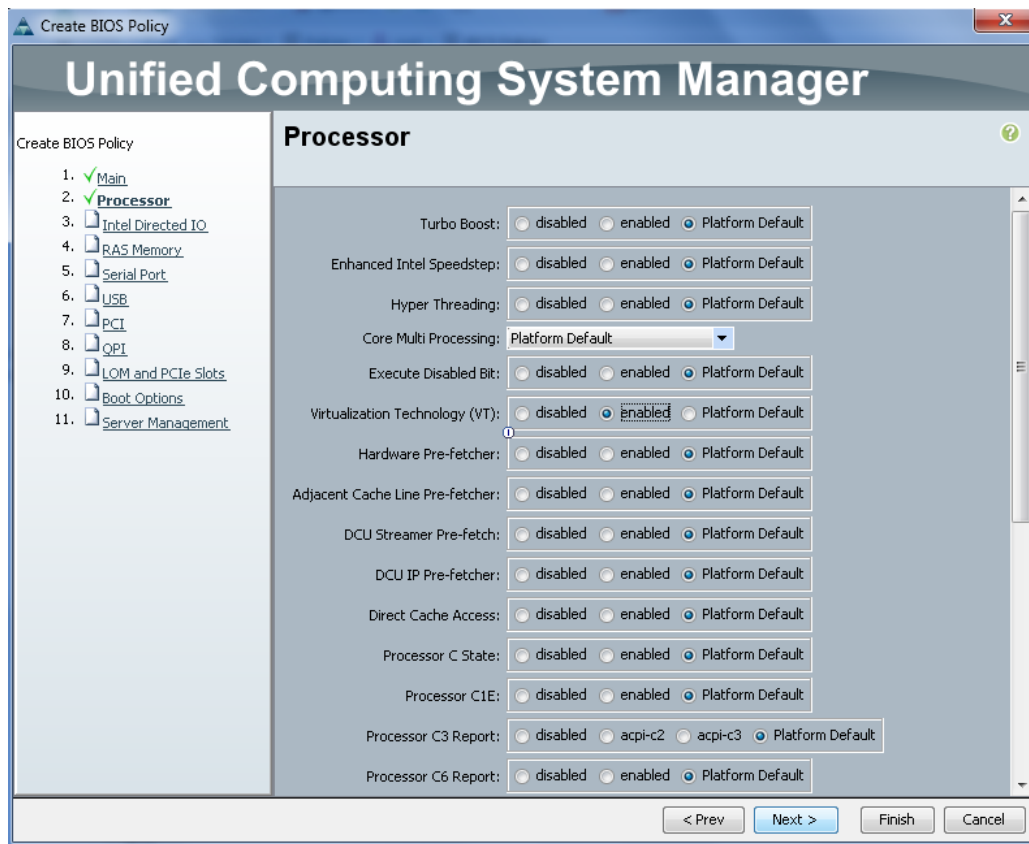
Step 1

Create The Pools and Policies

UCS Key Features

Logical Building Blocks – Building A Server – Create Pools and Policies

- Sample BIOS Policy
- Other pools and policies include:
 - Firmware policy
 - Boot order policy
 - Ethernet interface policy
 - FC interface policy
 - QoS policy
 - Server pool
 - WWN pool
 - MAC pool



Templates - Service Profile

MAC : Derived

WWN: Derived

Firmware 2.2

Boot:SAN

Step 2

Build A Server Group Template



UCS Key Features

Logical Building Blocks – Building A Server – Service Profile Template

Create Service Profile Template

Unified Computing System Manager

Create Service Profile Template

1. **Identify Service Profile Template**
2. [Networking](#)
3. [Storage](#)
4. [Zoning](#)
5. [vNIC/vHBA Placement](#)
6. [vMedia Policy](#)
7. [Server Boot Order](#)
8. [Maintenance Policy](#)
9. [Server Assignment](#)
10. [Operational Policies](#)

Identify Service Profile Template

You must enter a name for the service profile template and specify the template type. You can also specify how a UUID will be assigned to this template and enter a description.

Name:

The template will be created in the following organization. Its name must be unique within this organization.

Where: **org-root**

The template will be created in the following organization. Its name must be unique within this organization.

Type: ☐ Initial Template ☒ Updating Template

Specify how the UUID will be assigned to the server associated with the service generated by this template.

UUID

UUID Assignment:

The UUID will be assigned from the selected pool.
The available/total UUIDs are displayed after the pool name.

WARNING: The selected pool does not contain any available entities.
You can select it, but it is recommended that you add entities to it.

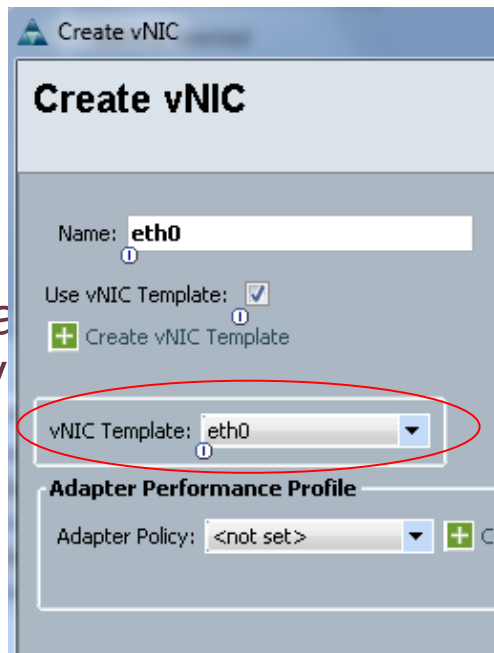
Optionally enter a description for the profile. The description can contain information about when and where the service profile should be used.

< Prev Next > Finish Cancel

UCS Key Features

Logical Building Blocks – Building A Server – Service Profile Template

How
my



Create vNIC

Name:

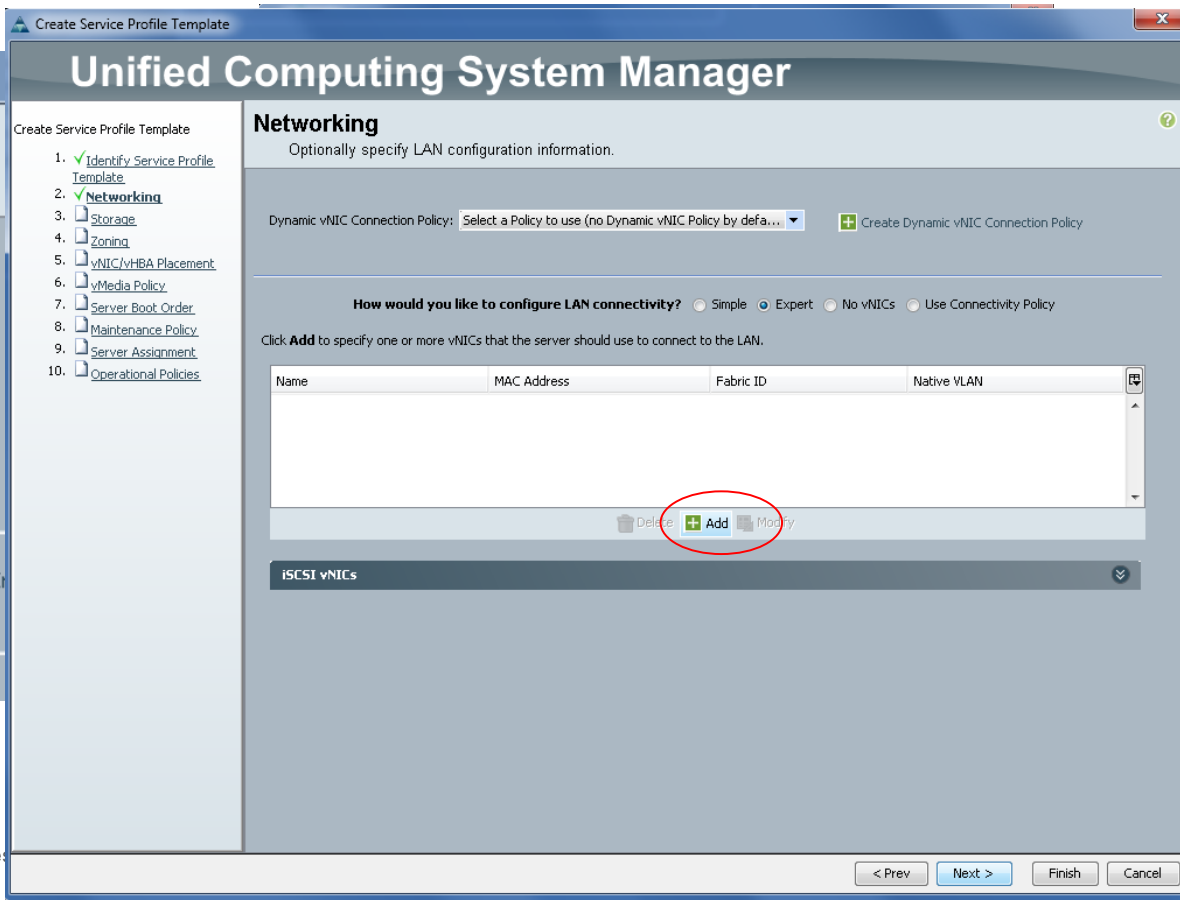
Use vNIC Template: ☒

[+ Create vNIC Template](#)

vNIC Template:

Adapter Performance Profile

Adapter Policy:



Unified Computing System Manager

Create Service Profile Template

1. ☒ [Identify Service Profile Template](#)
2. ☒ [Networking](#)
3. ☐ [Storage](#)
4. ☐ [Zoning](#)
5. ☐ [vNIC/vHBA Placement](#)
6. ☐ [vMedia Policy](#)
7. ☐ [Server Boot Order](#)
8. ☐ [Maintenance Policy](#)
9. ☐ [Server Assignment](#)
10. ☐ [Operational Policies](#)

Networking

Optionally specify LAN configuration information.

Dynamic vNIC Connection Policy: [+ Create Dynamic vNIC Connection Policy](#)

How would you like to configure LAN connectivity? ☐ Simple ☒ Expert ☐ No vNICs ☐ Use Connectivity Policy

Click **Add** to specify one or more vNICs that the server should use to connect to the LAN.

Name	MAC Address	Fabric ID	Native VLAN
+ Add			

[Delete](#) [+ Add](#) [Modify](#)

iSCSI vNICs

< Prev Next > Finish Cancel

UCS Key Features

Logical Building Blocks – Building A Server – Service Profile Template

Create Service Profile Template

Unified Computing System Manager

Create Service Profile Template

1. [Identify Service Profile Template](#)
2. **[Networking](#)**
3. [Storage](#)
4. [Zoning](#)
5. [vNIC/vHBA Placement](#)
6. [vMedia Policy](#)
7. [Server Boot Order](#)
8. [Maintenance Policy](#)
9. [Server Assignment](#)
10. [Operational Policies](#)

Networking

Optionally specify LAN configuration information.

Dynamic vNIC Connection Policy: Select a Policy to use (no Dynamic vNIC Policy by defa... + Create Dynamic vNIC Connection Policy

How would you like to configure LAN connectivity? ☐ Simple ☒ Expert ☐ No vNICs ☐ Use Connectivity Policy

Click **Add** to specify one or more vNICs that the server should use to connect to the LAN.

Name	MAC Address	Fabric ID	Native VLAN
vNIC eth0	Derived	derived	
vNIC eth1	Derived	derived	
vNIC eth2	Derived	derived	
vNIC eth3	Derived	derived	

Delete + Add Modify

ISCSI vNICs

< Prev Next > Finish Cancel

UCS Key Features

Logical Building Blocks – Building A Server – Service Profile Template

Create Service Profile Template

Unified Computing System Manager

Create Service Profile Template

1. [Identify Service Profile Template](#)
2. [Networking](#)
3. [Storage](#)
4. [Zoning](#)
5. [vNIC/vHBA Placement](#)
6. [vMedia Policy](#)
7. **[Server Boot Order](#)**
8. [Maintenance Policy](#)
9. [Server Assignment](#)
10. [Operational Policies](#)

Server Boot Order

Optionally specify the boot policy for this service profile template.

Select a boot policy.

Boot Policy: [+ Create Boot Policy](#)

Name: **Conors-SANBoot**

Description:

Reboot on Boot Order Change: **No**

Enforce vNIC/vHBA/SCSI Name: **Yes**

Boot Mode: **Legacy**

WARNINGS:
The type (primary/secondary) does not indicate a boot order presence.
The effective order of boot devices within the same device class (LAN/Storage/SCSI) is determined by PCIe bus scan order.
If **Enforce vNIC/vHBA/SCSI Name** is selected and the vNIC/vHBA/SCSI does not exist, a config error will be reported.
If it is not selected, the vNICs/vHBAs/ISCSI are selected if they exist, otherwise the vNIC/vHBA/SCSI with the lowest PCIe bus scan order is used.

Boot Order

[+](#) [-](#) [Filter](#) [Export](#) [Print](#)

Name	Order	vNIC/vHBA/SCSI vNIC	Type	Lun ID	WWN
CD/DVD	1				
San	2				
SAN primary		hba0	Primary		
SAN Target primary			Primary	0	20:04:50:54:04:50:45:04
SAN secondary		hba1	Secondary		
SAN Target primary			Primary	0	20:50:40:54:04:50:45:04

[Create iSCSI vNIC](#) [Set iSCSI Boot Parameters](#)

< Prev Next > Finish Cancel

UCS Key Features

Logical Building Blocks – Building A Server – Service Profile Template

Create Service Profile Template

Unified Computing System Manager

Create Service Profile Template

1. ✓ [Identify Service Profile Template](#)
2. ✓ [Networking](#)
3. ✓ [Storage](#)
4. ✓ [Zoning](#)
5. ✓ [vNIC/vHBA Placement](#)
6. ✓ [vMedia Policy](#)
7. ✓ [Server Boot Order](#)
8. ✓ [Maintenance Policy](#)
9. ✓ [Server Assignment](#)
10. ✓ **Operational Policies**

Operational Policies ⓘ

Optionally specify information that affects how the system operates.

BIOS Configuration ⌵

If you want to override the default BIOS settings, select a BIOS policy that will be associated with this service profile

BIOS Policy: Conors-BIOS + Create BIOS Policy

External IPMI Management Configuration ⌵

Management IP Address ⌵

Monitoring Configuration (Thresholds) ⌵

Power Control Policy Configuration ⌵

Scrub Policy ⌵

KVM Management Policy ⌵

< Prev Next > Finish Cancel

UCS Key Features

Logical Building Blocks – Building A Server – Service Profile Template

Our finished template – ready to deploy servers?

The screenshot displays the UCS Manager web interface. On the left, the navigation tree shows the hierarchy: Servers > Service Profile Templates > root > Service Template Conors-SP-Template-2, which is highlighted with a red oval. The main panel shows the configuration for this template, with tabs for General, Storage, Network, iSCSI vNICs, vMedia Policy, Boot Order, Policies, Events, and FSM. The Network tab is active, showing sections for Actions, Dynamic vNIC Connection Policy, vNIC/vHBA Placement Policy, LAN Connectivity Policy, and vNICs. The vNICs section contains a table with the following data:

Name	MAC Address	Desired Order	Actual Order	Fabric ID
vNIC eth0	Derived	1	Unspecified	A
vNIC eth1	Derived	2	Unspecified	B
vNIC eth2	Derived	3	Unspecified	A
vNIC eth3	Derived	4	Unspecified	B

Service Profile 1

MAC : 00:25:B5:01:00:05

WWN: 20:01:00:25:B5:01:00:05

Firmware 2.1

Boot:SAN

Service Profile 2

MAC : 00:25:B5:01:00:06

WWN: 20:01:00:25:B5:01:00:06

Firmware 2.1

Boot:SAN

...

Service Profile n

MAC : 00:25:B5:01:00:07

WWN: 20:01:00:25:B5:01:00:07

Firmware 2.1

Boot:SAN

Template - Service Profile

MAC : Derived

WWN: Derived

Firmware 2.2

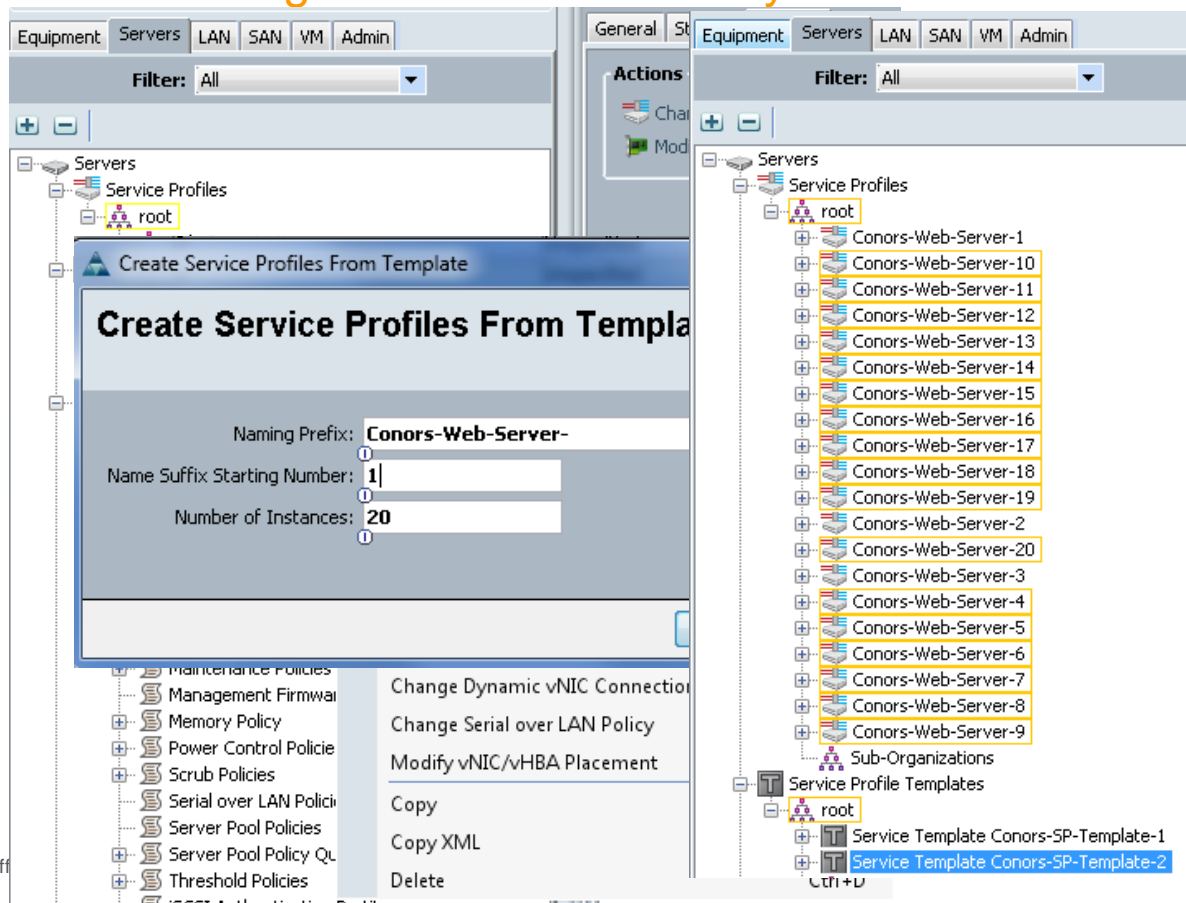
Boot:SAN

Step 3

Create The Logical Servers (Service Profiles)

UCS Key Features

Logical Building Blocks – Building A Server – How Many Servers Do We Need?



UCS Key Features

Logical Building Blocks – Building A Server – Our Logical Server

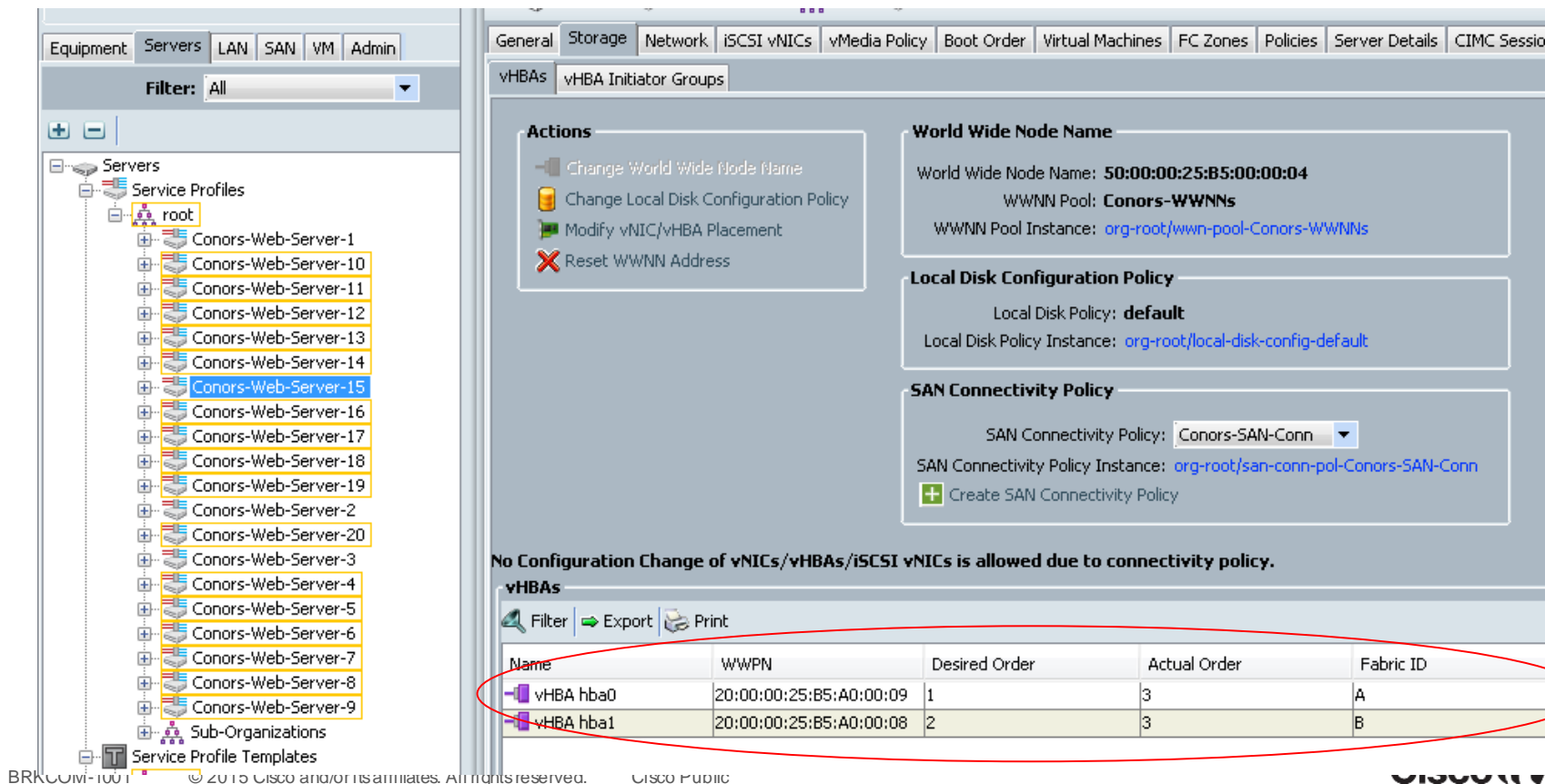
Confirming the config

The screenshot displays the UCS Manager interface. On the left, a tree view shows the hierarchy: Servers > Service Profiles > root > Conors-Web-Server-15. The right pane shows configuration options for the selected server. The 'vNIC/vHBA Placement Policy' is set to 'Nothing Selected'. The 'LAN Connectivity Policy' is set to '<not set>'. Below these, a table lists the vNICs for the selected server.

Name	MAC Address	Desired Order	Actual Order	Fabric ID
vNIC eth0	00:25:B5:00:00:04	1	1	A
vNIC eth1	00:25:B5:00:00:14	2	2	B
vNIC eth2	00:25:B5:00:00:24	3	3	A
vNIC eth3	00:25:B5:00:00:33	4	4	B

UCS Key Features

Logical Building Blocks – Building A Server – Our Logical Server



The screenshot displays the UCS Manager GUI. On the left, the 'Servers' tab is active, showing a tree view of servers. 'Conors-Web-Server-15' is selected. The right pane shows the configuration for 'vHBA Initiator Groups'. The configuration includes actions, world wide node name, local disk configuration policy, and SAN connectivity policy. A table at the bottom lists vHBAs and their WWPNs, with a red circle highlighting the table.

Actions

- Change World Wide Node Name
- Change Local Disk Configuration Policy
- Modify vNIC/vHBA Placement
- Reset WWNN Address

World Wide Node Name

World Wide Node Name: **50:00:00:25:B5:00:00:04**

WWNN Pool: **Conors-WWNNs**

WWNN Pool Instance: [org-root/wwn-pool-Conors-WWNNs](#)

Local Disk Configuration Policy

Local Disk Policy: **default**

Local Disk Policy Instance: [org-root/local-disk-config-default](#)

SAN Connectivity Policy

SAN Connectivity Policy: **Conors-SAN-Conn**

SAN Connectivity Policy Instance: [org-root/san-conn-pol-Conors-SAN-Conn](#)

No Configuration Change of vNICs/vHBAs/iSCSI vNICs is allowed due to connectivity policy.

vHBAs

Name	WWPN	Desired Order	Actual Order	Fabric ID
vHBA hba0	20:00:00:25:B5:A0:00:09	1	3	A
vHBA hba1	20:00:00:25:B5:A0:00:08	2	3	B



Service Profile

MAC : 00:25:B5:01:00:05

WWN: 20:01:00:25:B5:01:00:05

Firmware 2.1

Boot:SAN

Service Profile

MAC : 00:25:B5:01:00:06

WWN: 20:01:00:25:B5:01:00:06

Firmware 2.1

Boot:SAN

Service Profile

MAC : 00:25:B5:01:00:07

WWN: 20:01:00:25:B5:01:00:07

Firmware 2.1

Boot:SAN

Step 4

Associate To Hardware

UCS Key Features

Logical Building Blocks – Associating Service Profile To Hardware

The screenshot displays the UCS Manager interface, specifically the **FSM** (Fabric Service Module) status page. The **FSM** tab is selected in the top navigation bar. The **FSM Status** is **In Progress**, and the **Current FSM Name** is **Configure**. The **Completed at** field is empty, and the **Progress Status** is shown as a blue progress bar at 98%.

Below the status information, there is a table listing the servers and their configurations. The table has columns: **Name**, **Model**, **Overall Status**, **User Label**, **Operability**, **Power State**, **Assoc State**, and **Fault Suppression Status**.

Name	Model	Overall Status	User Label	Operability	Power State	Assoc State	Fault Suppression Status
Server 1	Cisco UCS B200 M3	Ok		Operable	On	Associated	N/A
Server 2	Cisco UCS B200 M3	Ok		Operable	On	Associated	N/A
Server 3	Cisco UCS B200 M3	Unassociated		Operable	On	None	N/A
Server 4	Cisco UCS B200 M3	Unassociated		Operable	On	None	N/A
Server 5	Cisco UCS B22 M3	Unassociated		Operable	On	None	N/A
Server 6	Cisco UCS B200 M3	Unassociated		Operable	On	None	N/A
Server 7	Cisco UCS B420 M3	Unassociated		Operable	On	None	N/A

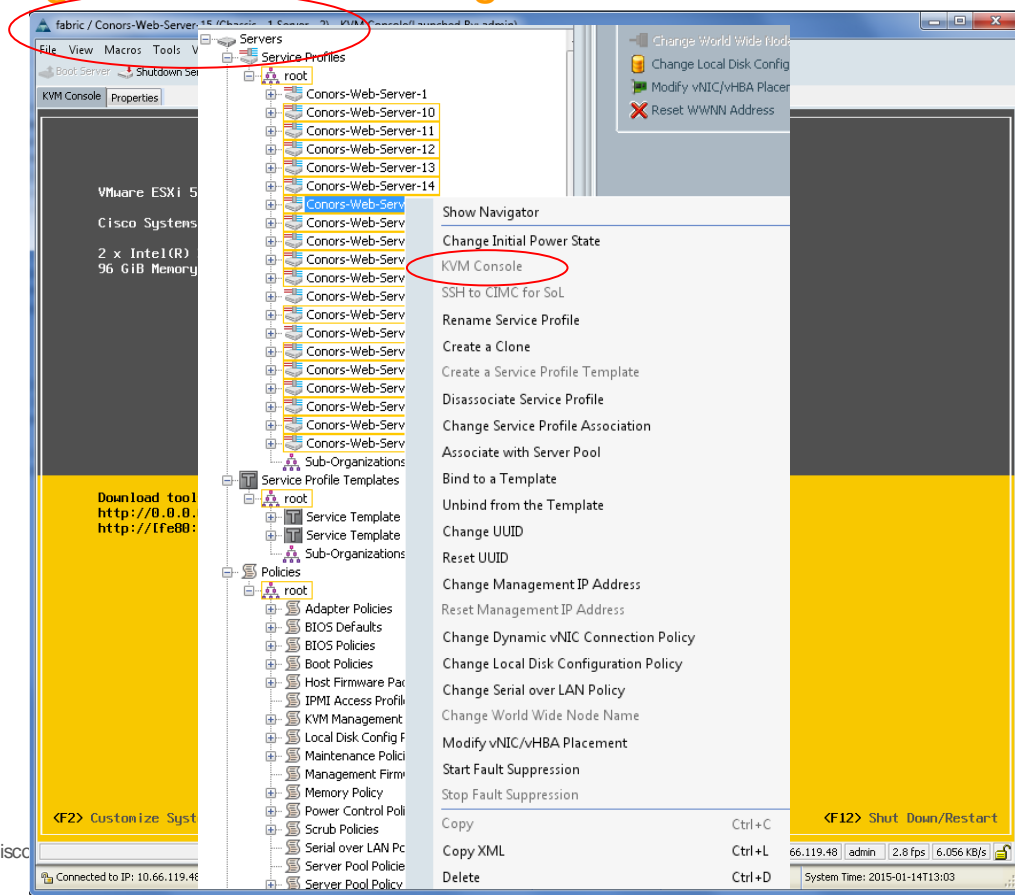
Below the table, there is a list of tasks with columns: **ID**, **Name**, **Status**, **Description**, **Order**, **Try**, **Timestamp**, and **Count**.

ID	Name	Status	Description	Order	Try	Timestamp	Count
21	Configure Wait For Maint ...	Waiting for maintenance wi...	Skip			2015-01-14T11:37:17	0
22	Configure Commit Storage	committing storage for ser...	Skip			2015-01-14T11:37:17	0
23	Configure Wait For Commit...	Waiting for storage commit...	Skip			2015-01-14T11:37:17	0
24	Configure Apply Config	Applying config to server s...	Success			2015-01-14T11:37:17	0
25	Configure Wait For Assoc ...	Waiting for Association co...	In Progress			2015-01-14T11:37:17	1

The left sidebar shows the **Equipment** tree with **Servers** and **Service Profiles** expanded. The **Service Profiles** tree shows **root** and **Service Profile Templates** expanded. The **Service Profile Templates** tree shows **root** and **Service Template Conors-SP-Template-1** and **Service Template Conors-SP-Template-2** expanded.

UCS Key Features

Logical Building Blocks – Accessing The Server - KVM

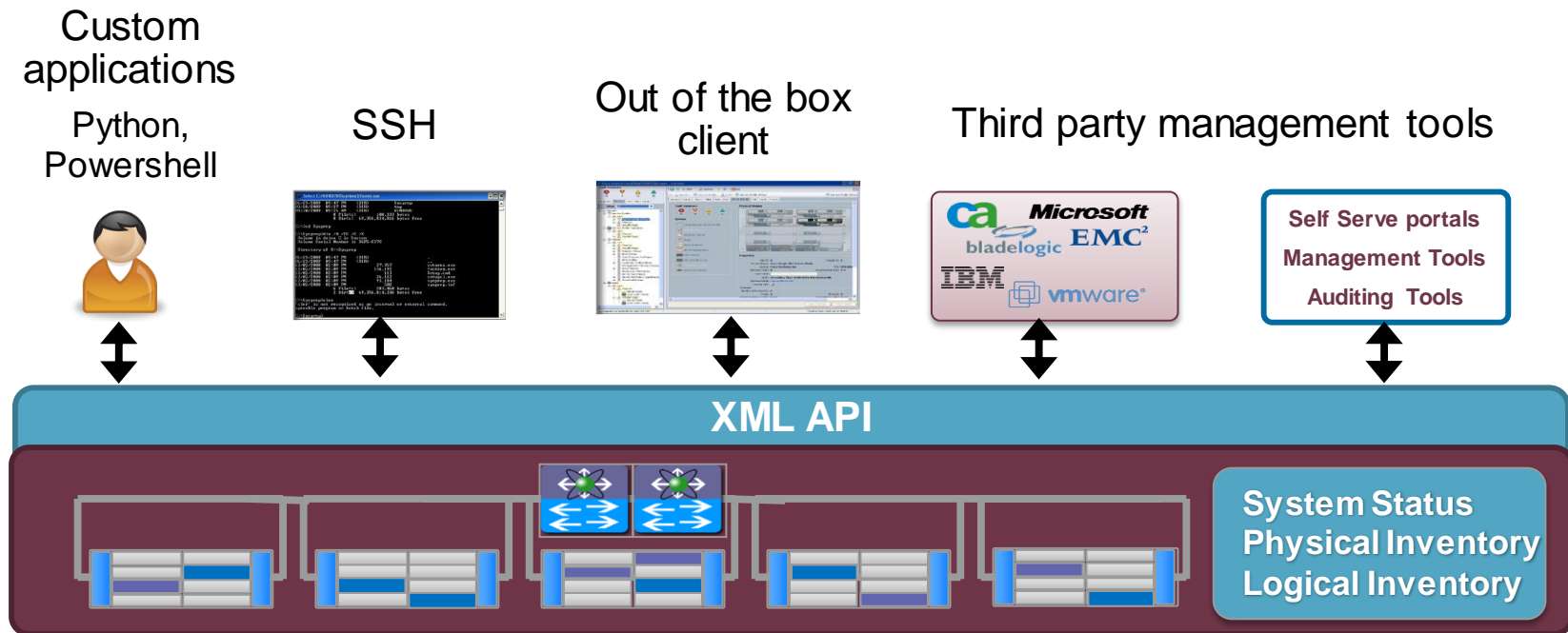


Agenda

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 - Components – Traditional blade and rack servers
 - Basic Connectivity – Compute, LAN, SAN
- Key Features
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 - UCS M-Series
- Resources

UCS Key Features

XML API and Other Hidden Gems - Programmatic interface



UCS Key Features

XML API and Other Hidden Gems – Developer Network

<https://developer.cisco.com/site/ucs-dev-center/documentation/>

Developer Guides

 Download all files in section as ZIP

 [Cisco UCS Manager XML API Programmer's Guide.pdf](#)  [Cisco UCS Interfaces White Paper.pdf](#)

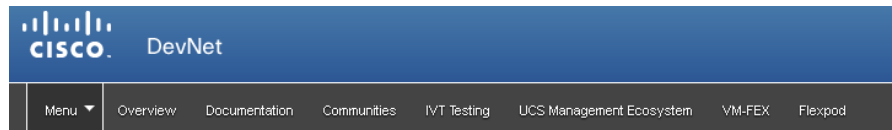
22 Sep 2011:

15 Jul 2010:

 [Cisco UCS Manager API Management Information...](#)  [Third Party Tools.pdf](#)

19 Apr 2010

31 Mar 2010:



HOME > UCS MANAGER CENTRAL - STAND-ALONE C-SERIES > DOCUMENTATION

UCS Manager Developer API Toolkit

The UCS Manager Developer API Toolkit provides a comprehensive portal for UCS software tools all in one location. See each essential tools listed below.



Getting Started with UCS Manager

Get started by understanding the fundamentals for the working with UCS Technology. Watch the video to get the details.

[Get Started](#)

UCS Python SDK

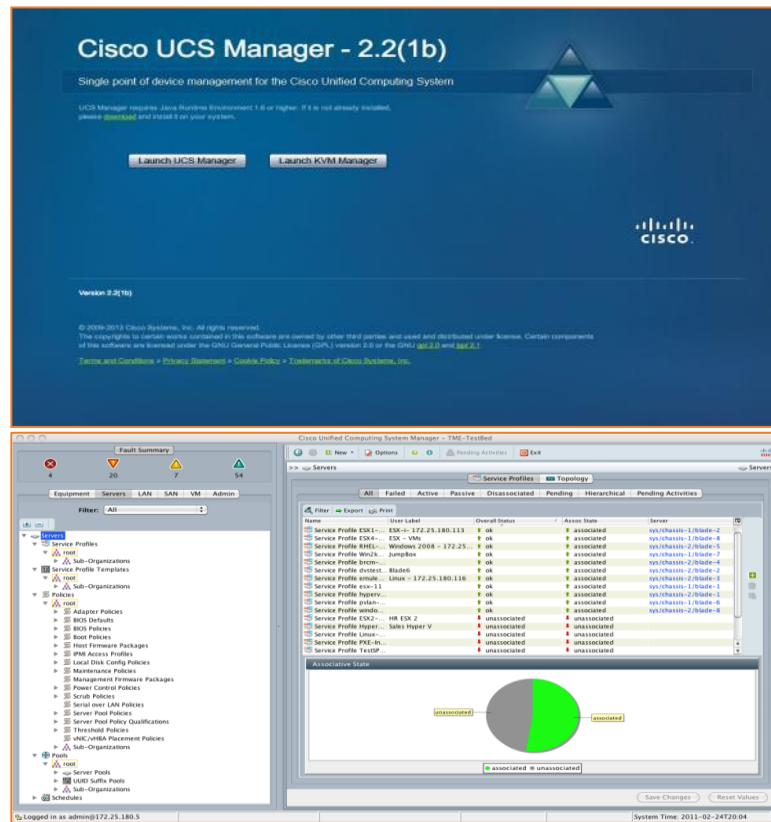
Cisco UCS Python SDK for UCS Manager is a Python module that helps automate and manage configurations within UCS Manager including service profiles, policies, pools, equipment, and network and storage management. Cisco UCS Python SDK for IMC is a Python module that helps automate and manage configurations within a standalone C-Series rackmount server including BIOS settings, boot order, firmware

UCS Key Features

XML API and Other Hidden Gems – UCS Platform Emulator

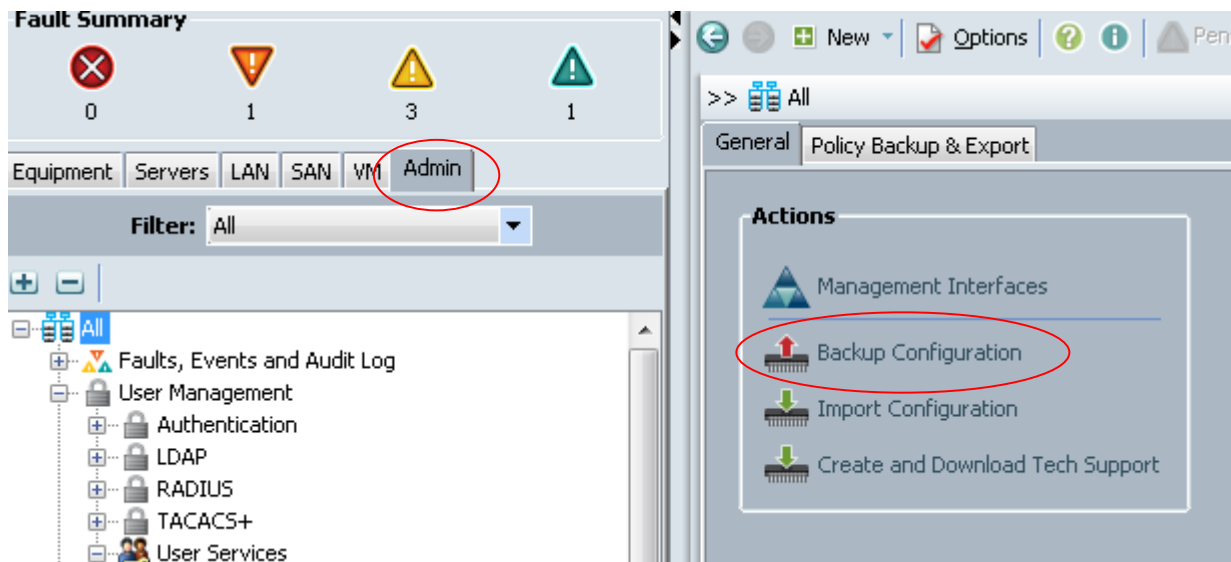
<http://communities.cisco.com/ucspe>

- Full featured emulator for the UCS Manager
- Installs as a Virtual Machine
- Provides complete support for all XML API calls
- Object Browser to peruse the UCSM model
- Import & replicate existing live UCS Manager physical inventory
- Share saved physical inventories among UCS Platform Emulators
- Drag-n-drop hardware builder to create custom physical inventory



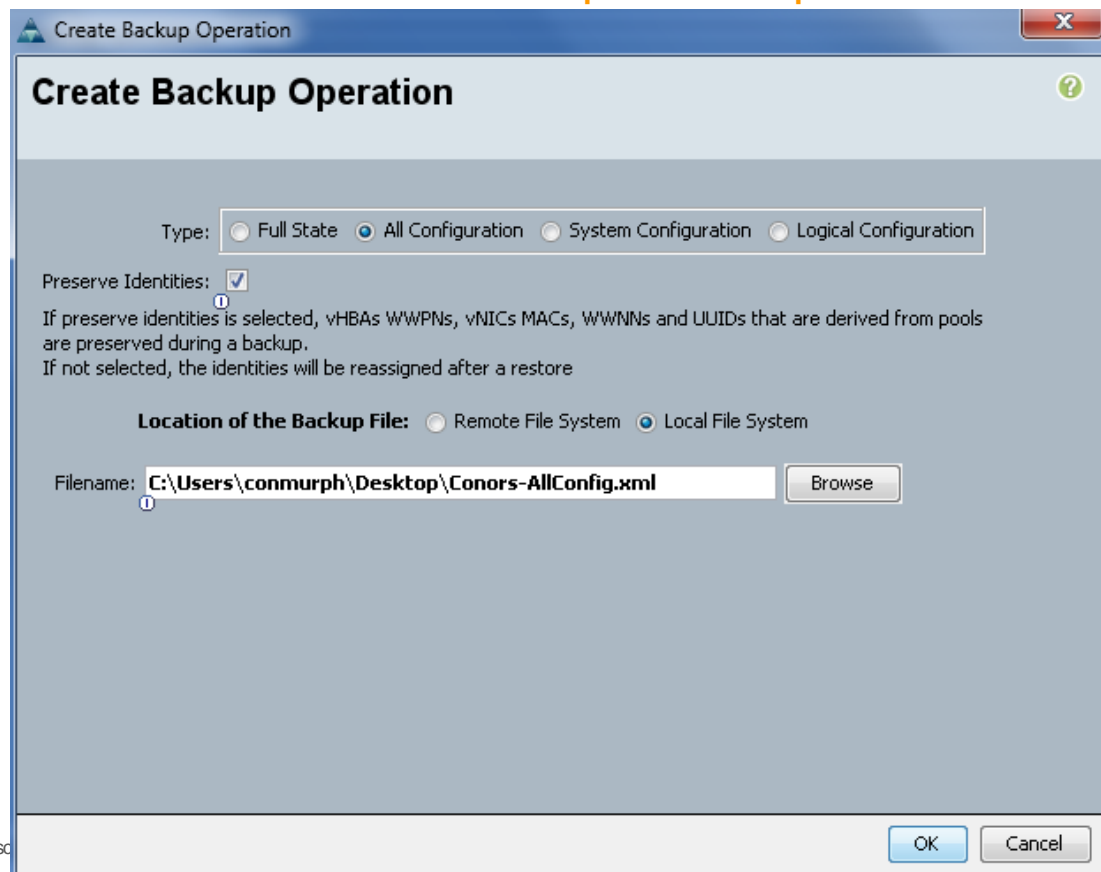
UCS Key Features

XML API and Other Hidden Gems – Simple Backup



UCS Key Features

XML API and Other Hidden Gems – Simple Backup



The screenshot shows a 'Create Backup Operation' dialog box. At the top, the title bar says 'Create Backup Operation' with a close button. Below the title bar, the main heading is 'Create Backup Operation' with a help icon. The 'Type' section has four radio buttons: 'Full State', 'All Configuration' (selected), 'System Configuration', and 'Logical Configuration'. The 'Preserve Identities' section has a checked checkbox, with a tooltip explaining that it preserves vHBAs WWPNs, vNICs MACs, WWNNs, and UUIDs. The 'Location of the Backup File' section has two radio buttons: 'Remote File System' and 'Local File System' (selected). The 'Filename' field contains 'C:\Users\conmurph\Desktop\Conors-AllConfig.xml' and has a 'Browse' button next to it. At the bottom, there are 'OK' and 'Cancel' buttons.

Create Backup Operation

Create Backup Operation

Type: ☐ Full State ☒ All Configuration ☐ System Configuration ☐ Logical Configuration

Preserve Identities: ☒
 If preserve identities is selected, vHBAs WWPNs, vNICs MACs, WWNNs and UUIDs that are derived from pools are preserved during a backup.
 If not selected, the identities will be reassigned after a restore

Location of the Backup File: ☐ Remote File System ☒ Local File System

Filename:

OK Cancel

UCS Key Features

XML API and Other Hidden Gems – Simple Backup – Conors-AllConfig.xml

```
<topMetaInf name="meta-sec" ecode="E001"/>
- <orgOrg descr="" name="root">
  <computeChassisConnPolicy adminState="global" chassisId="2" descr="" name="" policyOwner="local" switchId="B"/>
  <computeChassisConnPolicy adminState="global" chassisId="1" descr="" name="" policyOwner="local" switchId="B"/>
  <computeChassisConnPolicy adminState="global" chassisId="4" descr="" name="" policyOwner="local" switchId="B"/>
  <computeChassisConnPolicy adminState="global" chassisId="3" descr="" name="" policyOwner="local" switchId="A"/>
  <computeChassisConnPolicy adminState="global" chassisId="2" descr="" name="" policyOwner="local" switchId="A"/>
  <computeChassisConnPolicy adminState="global" chassisId="1" descr="" name="" policyOwner="local" switchId="A"/>
  <ippoolPool assignmentOrder="default" descr="" extManaged="internal" guid="00000000-0000-0000-0000-000000000000" isNetBIOSEnabled="disabled" name="iscsi-initiator-pool" policyOwner="local" supportsDHCP="disabled"/>
- <lsServer agentPolicyName="" biosProfileName="Conors-BIOS-Pol" bootPolicyName="Conors-SAN-Boot" descr="" dynamicConPolicyName="" extIPPoolName="ext-mgmt" extIPState="none" hostFwPolicyName="" identPoolName="" kvmMgmtPolicyName="" localDiskPolicyName="default" maintPolicyName="" mgmtAccessPolicyName="" mgmtFwPolicyName="" name="Conors-ServiceProfile-Web" policyOwner="local" powerPolicyName="default" resolveRemote="yes" scrubPolicyName="" solPolicyName="" srcTemplName="" statsPolicyName="default" type="instance" usrLbl="" uuid="00000000-0000-0000-0000-000000000001" vconProfileName="" vmediaPolicyName="">
  <lsVConAssign adminVcon="any" order="6" transport="ethernet" vnicName="eth5"/>
  <lsVConAssign adminVcon="any" order="5" transport="ethernet" vnicName="eth4"/>
  <lsVConAssign adminVcon="any" order="4" transport="ethernet" vnicName="eth3"/>
  <lsVConAssign adminVcon="any" order="3" transport="ethernet" vnicName="eth2"/>
  <lsVConAssign adminVcon="any" order="2" transport="ethernet" vnicName="eth1"/>
  <lsVConAssign adminVcon="any" order="1" transport="ethernet" vnicName="eth0"/>
  <lsVConAssign adminVcon="any" order="8" transport="fc" vnicName="hba1"/>
  <lsVConAssign adminVcon="any" order="7" transport="fc" vnicName="hba0"/>
  <vnicDefBeh action="none" descr="" name="" nwTemplName="" policyOwner="local" type="vhba"/>
  <lsVersionBeh pciEnum="static-zero-func" vconMap="round-robin" vnicMap="physical-cap-first" vnicOrder="dynamic-all-last"/>
- <vnicEther adaptorProfileName="" addr="20:00:00:00:20:2F" adminVcon="any" identPoolName="mac-pool-1" mtu="1500" name="eth5" nwCtrlPolicyName="" nwTemplName="eth1" order="6" pinToGroupName="" qosPolicyName="" statsPolicyName="default" switchId="B">
  <vnicEtherIf defaultNet="no" name="Conors-VLAN-101"/>
  <vnicEtherIf defaultNet="no" name="Conors-VLAN-100"/>
</vnicEther>
```

UCS Key Features

XML API and Other Hidden Gems – Firmware Visibility

Equipment

Main Topology ViewFabric InterconnectsServersThermalDecommissionedFirmware ManagementPoliciesFaults

Installed FirmwareFirmware Auto InstallCatalog PackageDownload TasksPackagesImagesUpgrade ValidationFaults

FilterExportPrintDownload FirmwareUpdate FirmwareActivate FirmwareCapability CatalogManagement Extension

Name	Model	Running Version	Startup Version	Backup Version	Update Status	Activate Status
UCS Manager		2.2(2c)	2.2(2c)	N/A	N/A	Ready
Chassis						
Chassis 1						
IO Modules						
IO Module 1		2.2(2c)	2.2(2c)	2.2(1e)	Ready	Ready
IO Module 2		2.2(2c)	2.2(2c)	2.2(1e)	Ready	Ready
Servers						
Server 1						
Adapters						
Adapter 1		2.2(1b)	2.2(1b)	2.2(2c)	Ready	Ready
BIOS	B200M3.2.2.1a.0.111220131105	B200M3.2.2.1a.0.111220131105	B200M3.2.2.1a.0.111220131105	B200M3.2.2.2.0.042820141643	Ready	Ready
Board Controller	13.0	13.0		N/A	N/A	Ready
CIMC Controller	2.2(1b)	2.2(1b)	2.2(2c)	Ready	Ready	
Server 2						
Adapters						
Adapter 1		2.2(1b)	2.2(1b)	2.1(3a)	Ready	Ready
BIOS	S5500.2.1.3.0.081620131102	S5500.2.1.3.0.081620131102	S5500.2.1.3.0.081620131102	N/A	N/A	Ready
CIMC Controller	2.2(1b)	2.2(1b)	2.1(3a)	Ready	Ready	
Server 3						
Adapters						
Adapter 1		2.2(1b)	2.2(1b)	2.2(2c)	Ready	Ready
BIOS	S5500.2.1.3.0.081620131102	S5500.2.1.3.0.081620131102	S5500.2.1.3.0.081620131102	N/A	N/A	Ready
CIMC Controller	2.2(1b)	2.2(1b)	2.2(2c)	Ready	Ready	
Server 4						
Adapters						
Adapter 1		2.2(1b)	2.2(1b)	2.1(3a)	Ready	Ready
BIOS	S5500.2.1.3.0.081620131102	S5500.2.1.3.0.081620131102	S5500.2.1.3.0.081620131102	N/A	N/A	Ready



UCS Key Features

XML API and Other Hidden Gems – Firmware Visibility

>> Equipment

Main Topology View Fabric Interconnects Servers Thermal Decommissioned Firmware Management Policies Faults

Installed Firmware Firmware Auto Install Catalog Package Download Tasks Packages Images Upgrade Validation Faults

General FSM

Status

Firmware Installer: **Ready**

Actions

Install Infrastructure Firmware

Install Server Firmware

Infrastructure Firmware

Running Version: 2.2(2c)A
Startup Version: 2.2(2c)A
Owner: Local

Endpoint Status

Export Print

Endpoint	Package Version	Oper State
Server 1/1	2.2(1e)B, 2.2(1b)B	Ready
Server 1/2	2.2(1b)B, 2.2(2c)B	Ready
Server 1/3	2.2(1b)B, 2.2(2c)B	Ready
Server 1/4	2.2(1b)B, 2.2(2c)B	Ready
Server 1/5	2.2(1b)B, 2.2(2c)B	Ready
Server 1/6	2.2(1b)B, 2.2(2c)B	Ready
Server 1/7	2.2(1b)B, 2.2(2c)B	Ready
Server 1/8	2.2(2c)B	Ready
IOM 1 of Chassis 1	2.2(2c)A	Ready
IOM 2 of Chassis 1	2.2(2c)A	Ready
UCS Manager	2.2(2c)A	Ready
Rack-Mount Server 1	2.2(1e)C, 2.2(1b)C, 2.2(2c)C	Ready
Rack-Mount Server 2	2.2(1e)C, 2.2(1b)C, 2.2(2c)C	Failed
Fabric Interconnect A (subordinate)	2.2(2c)A	Ready
Fabric Interconnect B (primary)	2.2(2c)A	Ready

UCS Key Features

XML API and Other Hidden Gems – Firmware Auto-install

Install Infrastructure Firmware

Unified Computing System Manager

Install Infrastructure Firmware

1. [Prerequisites](#)
2. [Install Infrastructure Firmware](#)

Firmware System Status

Firmware Installer: **Ready**

Actions

Cancel Infrastructure Upgrade

Properties

Name: **default**

Description: Infrastructure Pack

Version: **2.2(2c)A**

Force: **<not set>**

Infrastructure

Policy: **Untriggered**

Location: **Local**

Max Number Of Concurrent Tasks: **Unlimited**

Start Time: 2014-08-07T14:27:18

☐ Upgrade Now

< Prev Next > Finish Cancel

UCS Key Features

XML API and Other Hidden Gems – Unified Ports



Native Fibre Channel



Lossless Ethernet:
1/10GbE, FCoE, iSCSI, NAS

Benefits

- Simplify switch purchase - remove ports ratio guess work
- Increase design flexibility
- Remove specific protocol bandwidth bottlenecks

Use-cases

- Flexible LAN & storage convergence based on business needs
- Service can be adjusted based on the demand for specific traffic


UCS Key Features

XML API and Other Hidden Gems – Unified Ports

Configure Unified Ports

Unified Computing System Manager

Configure Fixed Module Ports



Instructions

The position of the slider determines the type of the ports.
All the ports to the left of the slider are Ethernet ports (Blue), while the ports to the right are Fibre Channel ports (Purple).

Port	Transport	If Role or Port Channel Membership	Desired If Role
Port 1	ether	Server Port Channel Member	
Port 2	ether	Server	
Port 3	ether	Server	
Port 4	ether	Server	
Port 5	ether	Server	
Port 6	ether	Server	
Port 7	ether	Unconfigured	
Port 8	ether	Unconfigured	
Port 9	ether	Unconfigured	
Port 10	ether	Unconfigured	
Port 11	ether	Unconfigured	
Port 12	ether	Unconfigured	
Port 13	ether	Unconfigured	
Port 14	ether	Unconfigured	
Port 15	ether	Ethernet Uplink Port Channel Member	
Port 16	ether	Ethernet Uplink Port Channel Member	

Legend: ■ Up ■ Admin Down ■ Fail ■ Link Down

Configure Fixed Module Ports | Configure Expansion Module Ports | Finish | Cancel

Use slider to
configure
unified ports
Ethernet on
the left

**Fibre
Channel** on
the right

Agenda

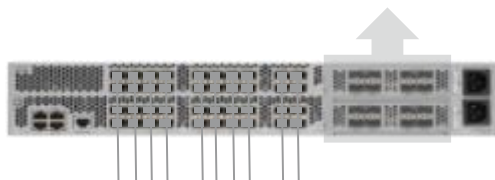
- **UCS Overview**
 - Components – Traditional blade and rack servers
 - Basic Connectivity – Compute, LAN, SAN
- **Key Features**
 - Scaling with Single Point of Management
 - UCS Service Profiles – Logical Building Blocks
 - UCS – XML API and Other Hidden Gems
- **New UCS Form Factors**
 - **UCS Mini**
 - UCS M-Series
- **Resources**

New UCS Form Factors

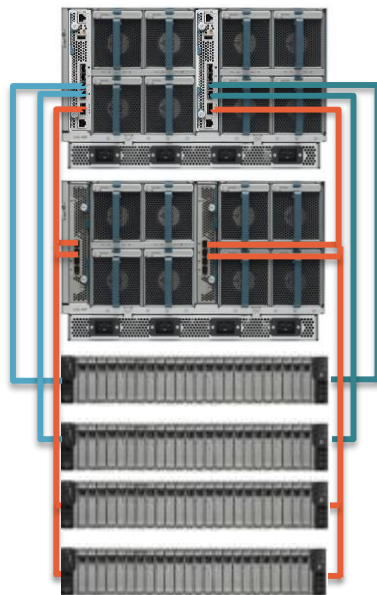
UCS Mini – Scale up to 20 Servers



New Form
Factor Fabric
Interconnects
6324



Traditional Fabric
Interconnects



Same Great Features

- Single Point of Management
- Logical Building Blocks
- Hardware/Software Abstraction (Service Profiles)

New UCS Form Factors

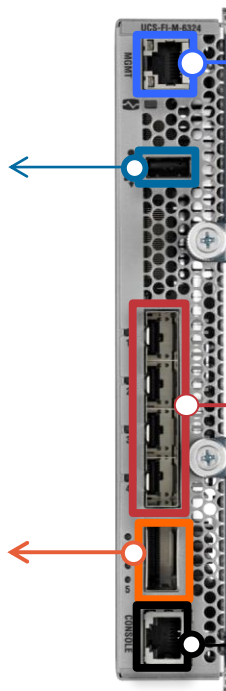
UCS Mini – FI 6324

USB Port

- Firmware upgrades

1x40G QSFP+

- Eth/FCoE only
- 4x10G break out or 1x40G (Post FCS)
- Scalability port
- Licensed Port
 - 2nd Chassis (post-FCS)
 - Direct-attached C-series, no FEX
 - Appliance Port
 - FCoE Storage Port



Management Port

- 10/100/1000 Mbps

4 x10G SFP+

- Unified Ports
 - Uplink (Eth/FC/FCOE)
 - Server – Direct-attached only, no FEX
 - Appliance port
 - FC/FCoE Storage Port
- Supports 1G or 10G

New UCS Form Factors

UCS Mini – Software Feature Support

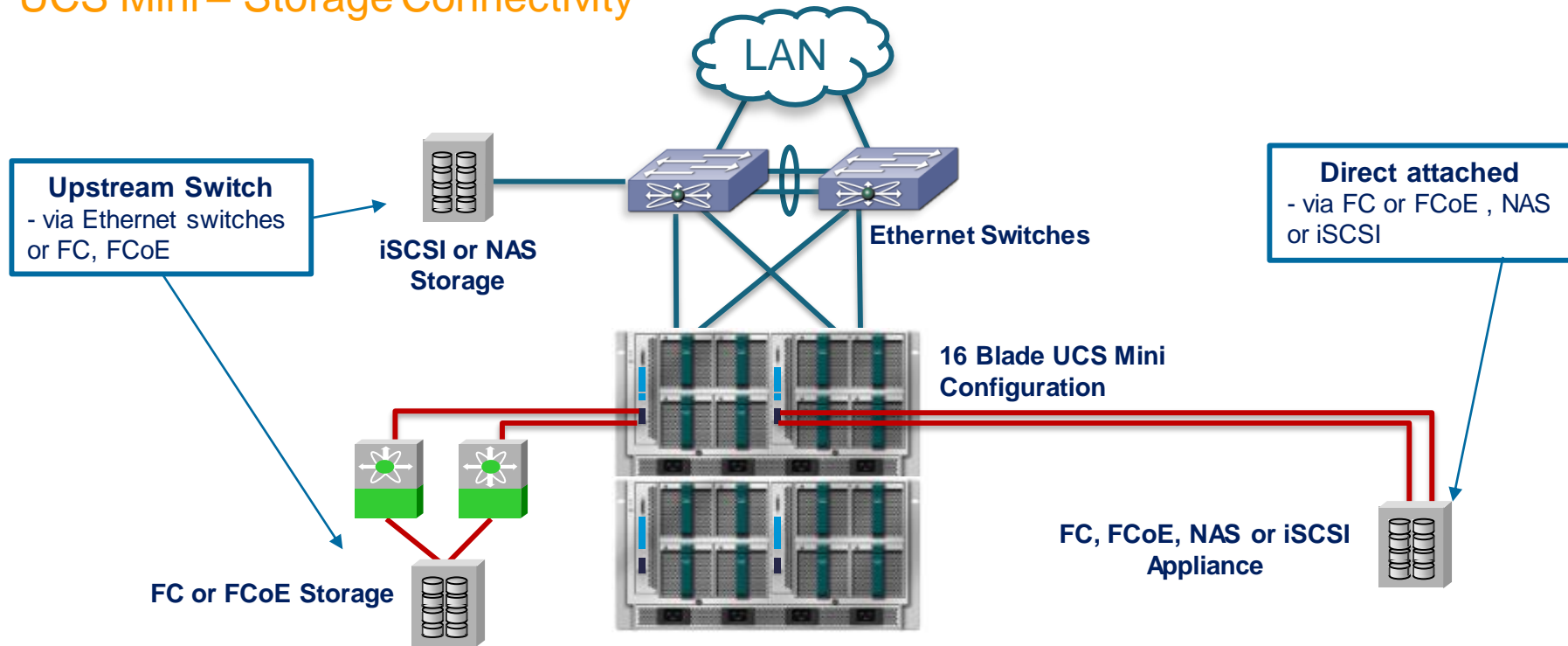
- Feature Parity with 2.2(1b)
 - B200 M3 Blade Only
 - End Host Mode
 - NIV
 - VLAN
 - QoS
 - SPAN (Ethernet only)
 - FC/FCOE Direct Attach Storage Ports
 - FC Switch Mode Only
 - VMFEX (SCVMM)



- **Features not supported at FCS**
 - PVLAN
 - LACP enhancement (fast rate and suspend-individual-links)
 - Netflow+
 - FC Uplink (NPV)
 - Port Security
 - FC SPAN destination

New UCS Form Factors

UCS Mini – Storage Connectivity

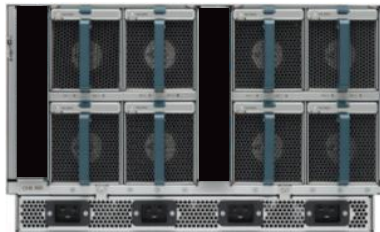


Currently no NPV support

New UCS Form Factors

UCS Mini – CHOICE - A Form Factor Specific To Your Needs

More than 20
Servers



UCS 5108 Chassis

Supports existing and future blades

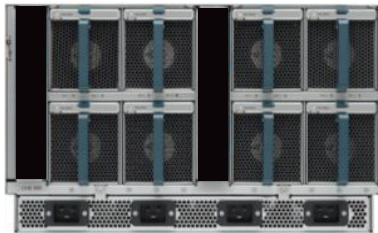


IO Modules



6248 or 6296 Fabric
Fabric Interconnects

Less than 20
Servers



UCS 5108 Chassis

Supports existing and future blades



6324 Fabric Interconnect

Agenda

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- **Resources**

New UCS Form Factors

UCS M-Series – Cloud-Scale Inverts Computing Architecture

Core Enterprise Workloads



SCM



ERP/Financial



Legacy



CRM



Email

Cloud Scale



Online
Content



Gaming



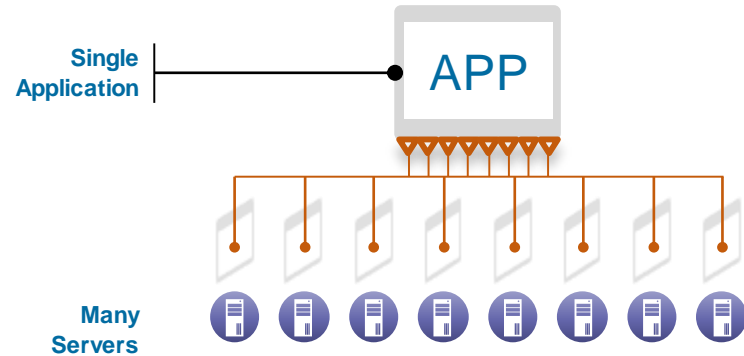
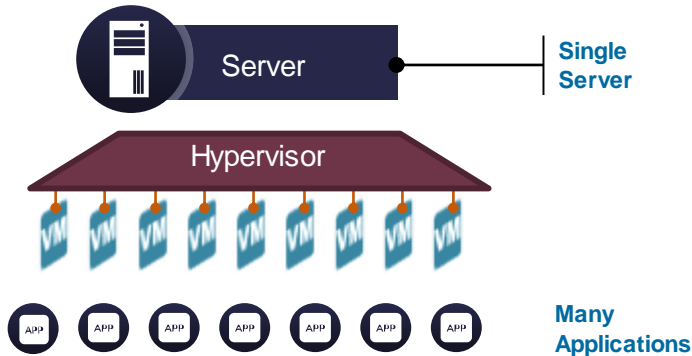
Mobile



IoT



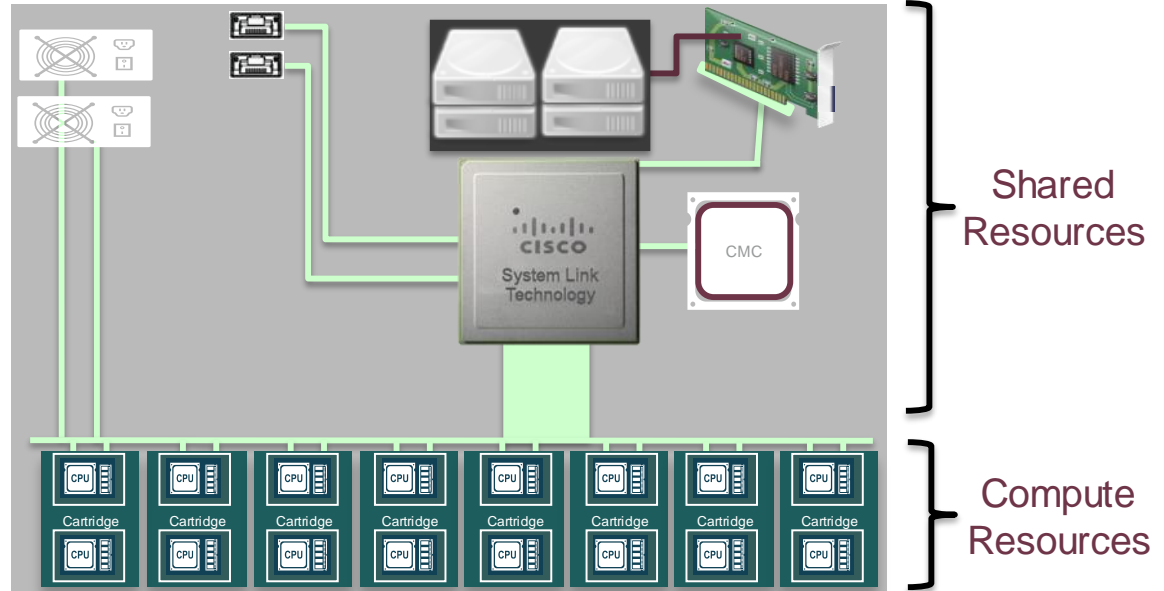
E-Commerce



New UCS Form Factors

UCS M-Series – Architecture

- Redundant power supplies
- 2 x 40Gb uplinks
- 4 x Local disks



New UCS Form Factors

UCS M-Series – UCS M-Series Modular Servers



Compact Chassis
8 Compute cartridges

Lightweight
Compute Cartridge

Two Independent Intel
Xeon E3 Servers per cartridge
No adapters or HDDs

Shared Local Resources
Network and storage resources

M-Series at a glance

With a 2RU Form Factor, the maximums are;

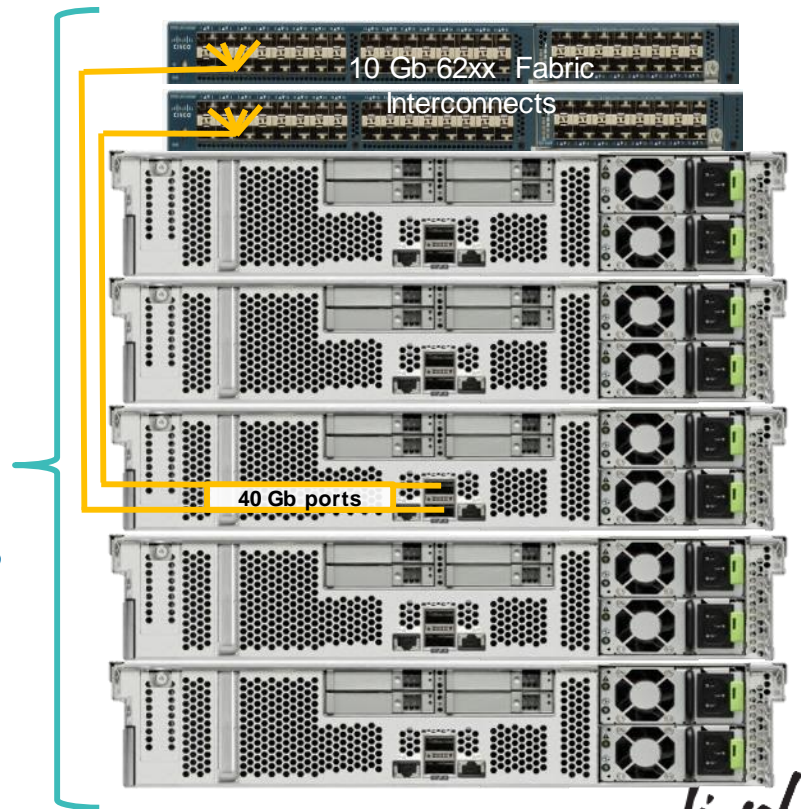
- 16 Hosts independent hosts
- 64 physical cores
- 512GB RAM
- Shared HDDs
- Shared Network Peripherals
- UCSM Integration for Scale Up

New UCS Form Factors

UCS M-Series – UCS M-Series Modular Servers – UCSM Integrated



Rack Capacity
Chassis – 20
Servers – 320
Cores – 1280
Memory – 10TB
Storage – 128TB



New UCS Form Factors

UCS M-Series – Target Verticals

Software Built for the Cloud

Magnitude and elasticity of cloud offerings
demand horizontal scaling

Operational scale dictates application
level resilience

Cloud Service Providers

- IaaS
- SaaS

Online Content Providers

- Gaming

Enterprise

On premise Cloud Scale
Computing:

- Operational Intelligence
- Content management

Off premise: SaaS



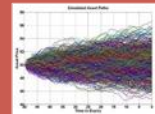
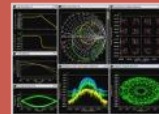
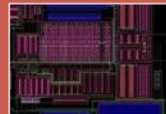
Grid Computing

Distributed “task based” computing

Each task is a repeated stateless or
“soft state” process

Enterprise and Public Sector

- Financial modelling
- Electronic design automation (EDA)
- Scientific simulations



New UCS Form Factors

UCS M-Series – In-depth session

BRKCOM-2602 - Next Generation Computing Architectures for Cloud Scale Applications

The purpose of this session is to cover the next generation of computing architectures being developed. The session focuses on the expansion of the UCS platform to provide a... [View More](#)

90 min Breakout

Steve McQuerny

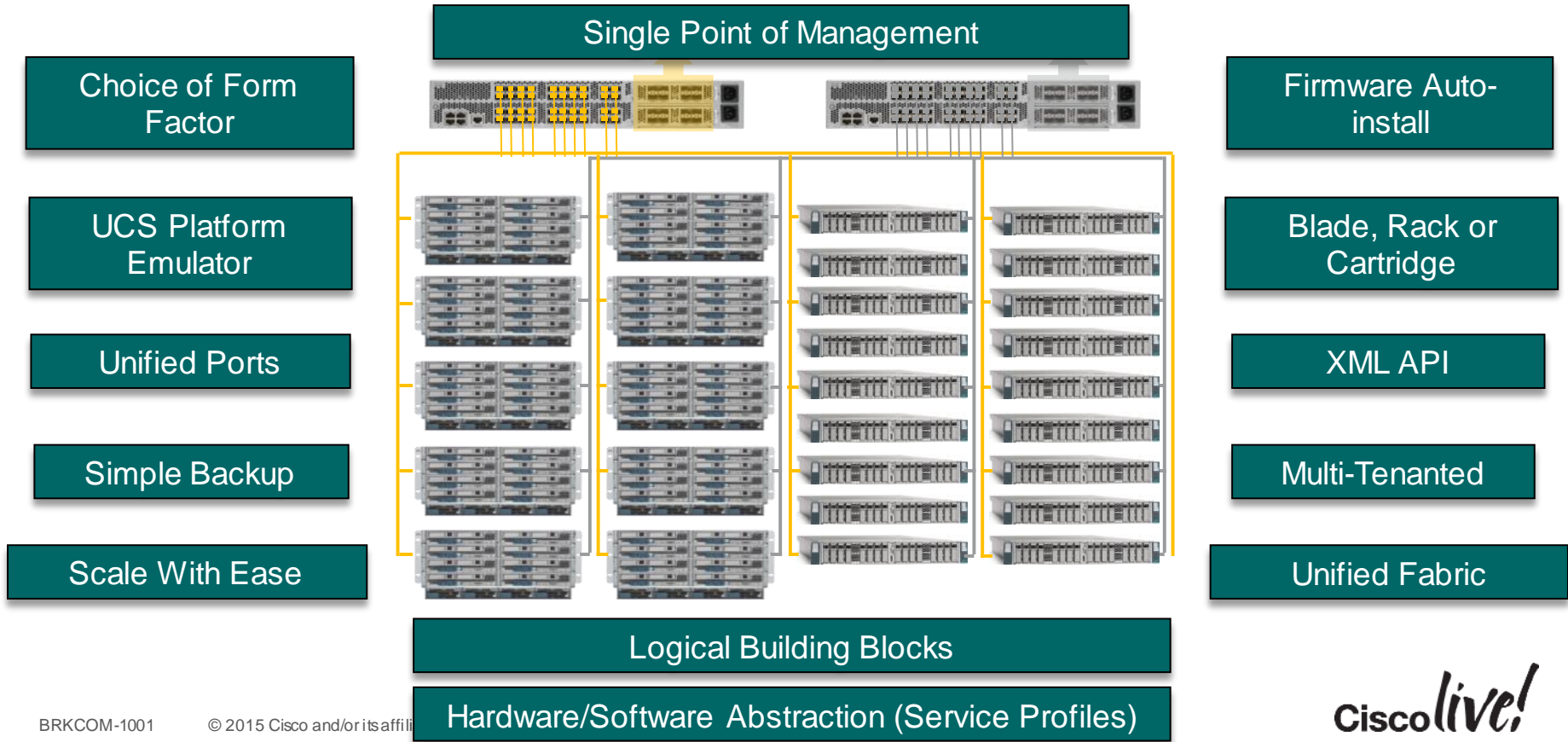


Wednesday 18 Mar 1:00 PM - 2:30 PM – 220



[Add to My Interests](#)

Cisco Unified Computing System (UCS)



Agenda

- **UCS Overview**
 - Components – Traditional blade and rack servers
 - Basic Connectivity – Compute, LAN, SAN
- **Key Features**
 - Scaling with Single Point of Management
 - UCS Service Profiles – Logical Building Blocks
 - UCS – XML API and Other Hidden Gems
- **New UCS Form Factors**
 - UCS Mini
 - UCS M-Series
- **Resources**

Resources

- UCS Platform Emulator
<http://developer.cisco.com/web/unifiedcomputing/ucsemulatordownload>
- UCS Quick Start Guide
http://www.cisco.com/en/US/prod/collateral/ps10265/ps10281/whitepaper_c11-697337.html
- C-Series Rack Server Adapter Comparison
http://www.cisco.com/en/US/prod/ps10265/ps10493/c_series_net_adapter.html
- Cisco UCS 6100 and 6200 Series Configuration Limits for Cisco UCS Manager, Release 2.2
http://www.cisco.com/en/US/docs/unified_computing/ucs/sw/configuration_limits/2.2/b_UCS_Configuration_Limits_2_2.html
- Storage Best Practices
http://www.cisco.com/en/US/prod/collateral/ps10265/ps10276/whitepaper_c11-702584.html
- Storage Interoperability Matrix
<http://www.cisco.com/en/US/docs/switches/datacenter/mds9000/interoperability/matrix/Matrix8.html>
- Storage Interoperability
<http://www.cisco.com/en/US/prod/ps10265/interoperability.html#~storage>



Q & A

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Reference Slides

#clmel

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UCS Components

Fabric Interconnects – FI6248UP



Flexibility

Scalability

Multi-
purpose

Product Features and Specs	UCS 6120XP	UCS 6140XP	UCS 6248UP	UCS 6296UP
Switch Fabric Throughput	520 Gbps	1.04 Tbps	960 Gbps	1.92 Tbps
Switch Footprint	1RU	2RU	1RU	2RU
1 Gigabit Ethernet Port Density	8	16	48	96
10 Gigabit Ethernet Port Density	26	52	48	96
8G Native FC Port Density	6	12	48	96
Port-to-Port Latency	3.2us	3.2us	2.0us	2.0us
Active # of VLANs	982	982	2000	2000

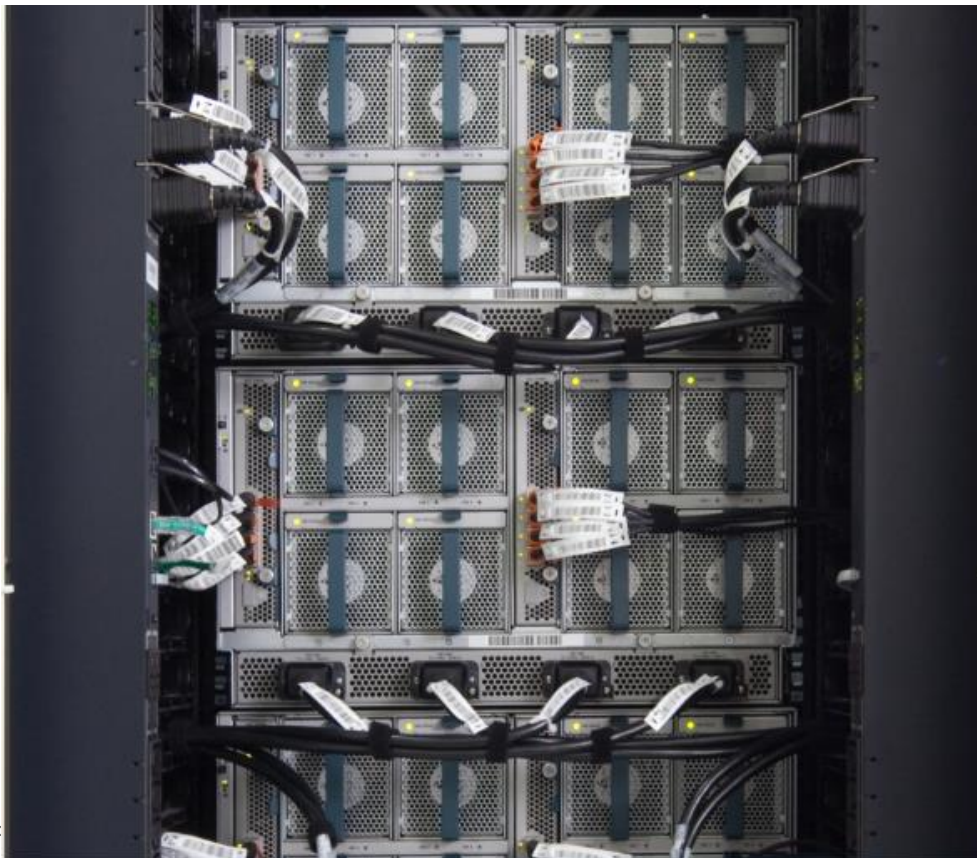
BACKWARD COMPATIBILITY

AND

FORWARD COMPATIBILITY

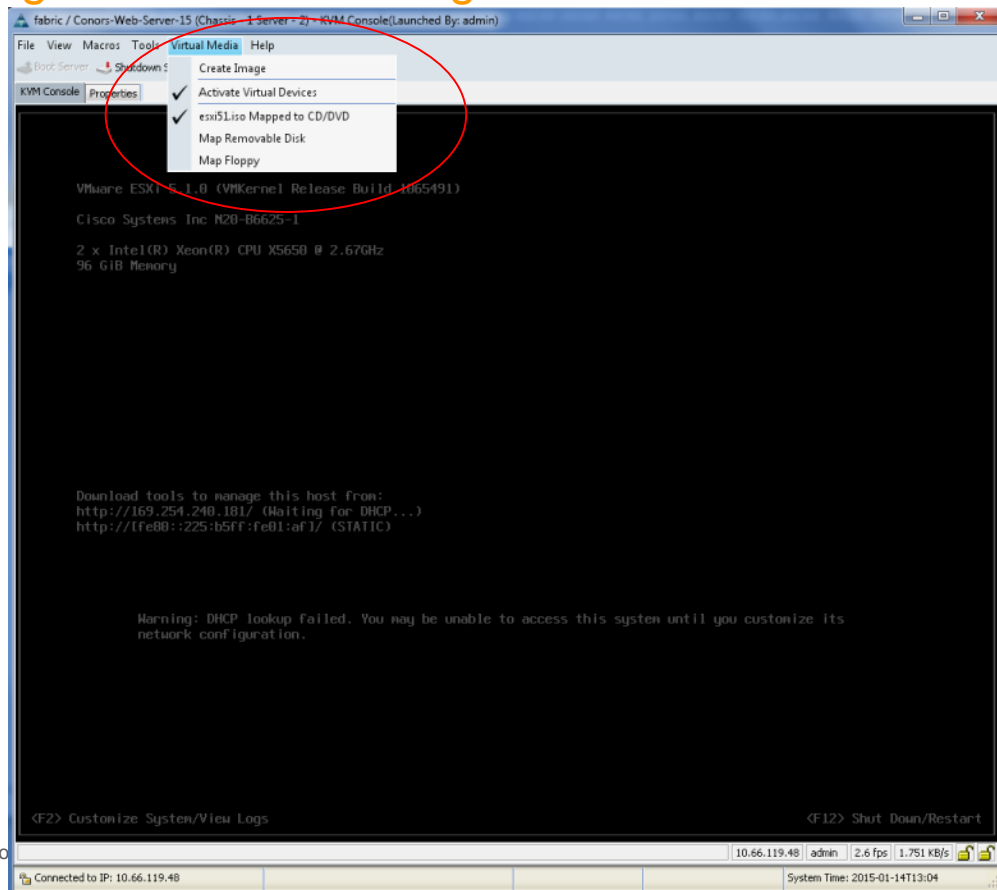
UCS Components

Cable for bandwidth, not for protocol



UCS Key Features

Logical Building Blocks – Accessing The Server – Automatic Mapping - vMedia



UCS Key Features

Logical Building Blocks – Building A Server – Service Profile Template

Create Service Profile Template

Unified Computing System Manager

Create Service Profile Template

- ✓ [Identify Service Profile Template](#)
- ✓ [Networking](#)
- ✓ [Storage](#)
- ✓ [Zoning](#)
- ✓ [vNIC/vHBA Placement](#)
- ✓ [vMedia Policy](#)
- ✓ [Server Boot Order](#)
- ✓ [Maintenance Policy](#)
- ✓ [Server Assignment](#)
- [Operational Policies](#)

Server Assignment

Optionally specify a server pool for this service profile template.

Pool Assignment: [+ Create Server Pool](#)

Select the power state to be applied when this profile is associated with the server.

☒ Up ☐ Down

The service profile template will be associated with one of the servers in the selected pool. If desired, you can specify an additional server pool policy qualification that the selected server must meet. To do so, select the qualification from the list.

Server Pool Qualification:

Restrict Migration: ☐

Firmware Management (BIOS, Disk Controller, Adapter)

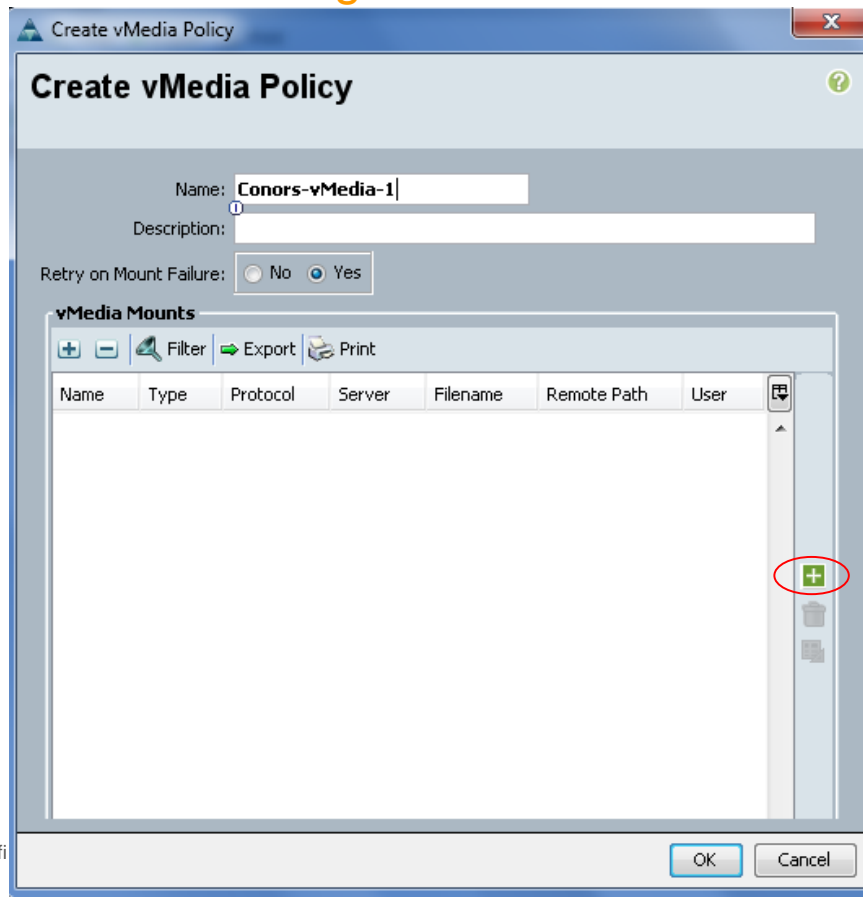
If you select a host firmware policy for this service profile, the profile will update the firmware on the server that it is associated with. Otherwise the system uses the firmware already installed on the associated server.

Host Firmware: [+ Create Host Firmware Package](#)

< Prev Next > Finish Cancel

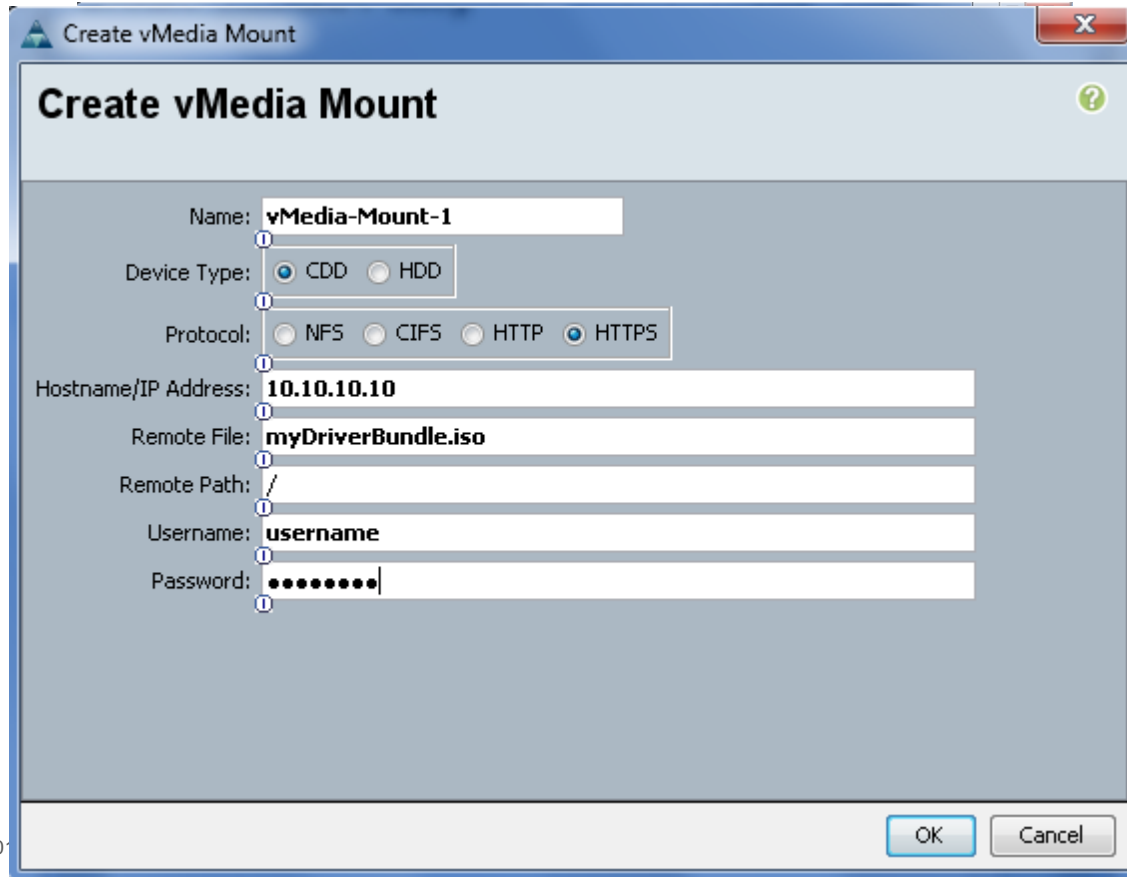
UCS Key Features

Logical Building Blocks – Accessing The Server – Automatic Mapping - vMedia



UCS Key Features

Logical Building Blocks – Accessing The Server – Automatic Mapping - vMedia



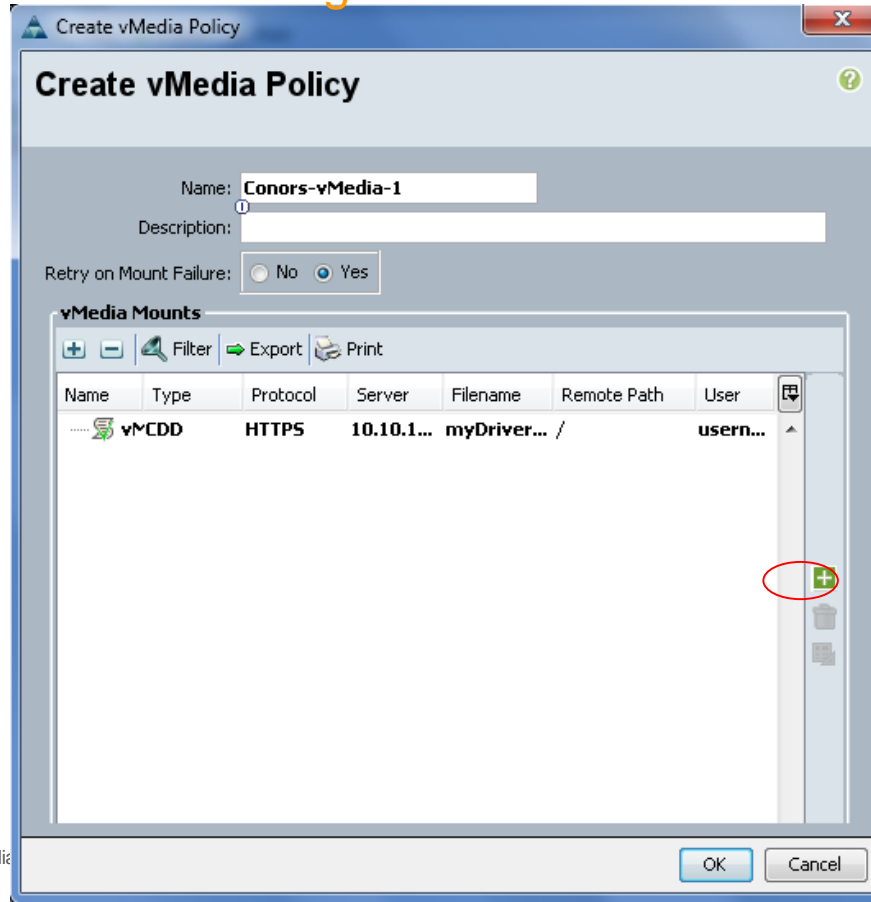
The screenshot shows a 'Create vMedia Mount' dialog box with the following fields and options:

- Name:** vMedia-Mount-1
- Device Type:** ☒ CDD ☐ HDD
- Protocol:** ☐ NFS ☐ CIFS ☐ HTTP ☒ HTTPS
- Hostname/IP Address:** 10.10.10.10
- Remote File:** myDriverBundle.iso
- Remote Path:** /
- Username:** username
- Password:** (masked with dots)

Buttons at the bottom: OK, Cancel

UCS Key Features

Logical Building Blocks – Accessing The Server – Automatic Mapping - vMedia



UCS Key Features

Logical Building Blocks – Accessing The Server – Automatic Mapping - vMedia

The screenshot displays the UCS Manager web interface. On the left, a navigation tree shows the hierarchy: Equipment > Servers > LAN > SAN > VM > Admin. The 'Policies' folder is expanded, showing a list of policy categories such as Adapter Policies, BIOS Defaults, BIOS Policies, Boot Policies, Host Firmware Packages, IPMI Access Profiles, KVM Management Policies, Local Disk Config Policies, Maintenance Policies, Management Firmware Packages, Memory Policy, Power Control Policies, Scrub Policies, Serial over LAN Policies, Server Pool Policies, Server Pool Policy Qualifications, Threshold Policies, iSCSI Authentication Profiles, vMedia Policies, vNIC/vHBA Placement Policies, and Sub-Organizations. The 'vMedia Policies' folder is selected, and the 'Global vMedia Policy' is displayed on the right.

The 'Global vMedia Policy' section shows the following details:

- Name: **Conors-vMedia-1**
- vMedia Policy Instance: [org-root/mnt-cfg-policy-Conors-vMedia-1](#)
- Description:
- Retry on Mount Failure: **Yes**

The 'vMedia Mounts' section contains a table with the following data:

Name	Type	Protocol	Server	Filename	Remote Path	User
vMedia-Mount-1	CDD	HTTPS	10.10.10.10	myDriverBundle.iso	/	username

In the bottom right corner, there is a handwritten-style text "live!" in black.

UCS Key Features

Logical Building Blocks – Accessing The Server – Automatic Mapping - vMedia

The screenshot displays the UCS Manager interface. On the left, the 'Servers' tab is active, showing a tree view of service profiles. The 'root' profile is expanded, revealing a list of servers: Conors-Web-Server-1, Conors-Web-Server-10, Conors-Web-Server-11, Conors-Web-Server-12, Conors-Web-Server-13, Conors-Web-Server-14, Conors-Web-Server-15 (highlighted in blue), Conors-Web-Server-16, Conors-Web-Server-17, and Conors-Web-Server-18. The main panel on the right shows the 'vMedia Policy' configuration for 'Conors-vMedia-1'. The 'Global vMedia Policy' section includes the name 'Conors-vMedia-1', the instance 'org-root/mnt-cfg-policy-Conors-vMedia-1', and the description 'Retry on Mount Failure: Yes'. Below this, the 'vMedia Mounts' section contains a table with one entry:

Name	Type	Protocol	Server	Filename	Remote Path	User
vMedia-Mount-1	CDD	HTTPS	10.10.10.10	myDriverBundle.iso	/	username

UCS Key Features

Logical Building Blocks – Building A Server – Pre-provision Storage

The screenshot displays the UCS Manager interface, specifically the SAN configuration page. The left sidebar shows a hierarchical tree of configuration objects, including SAN, Storage Cloud, Policies, and Pools. The main area shows a table of WWPN Pools, which are used for pre-provisioning storage for servers.

Left Sidebar (SAN Configuration):

- SAN
 - SAN Cloud
 - Fabric A
 - Fabric B
 - SAN Pin Groups
 - Threshold Policies
 - VSANS
 - Storage Cloud
 - Fabric A
 - Fabric B
 - VSANS
 - Policies
 - SAN Cloud
 - Threshold Policies
 - Pools
 - root
 - IQN Pools
 - WWNN Pools
 - WWPN Pools
 - WWxN Pools
 - Sub-Organizations

Main Table (WWPN Pools):

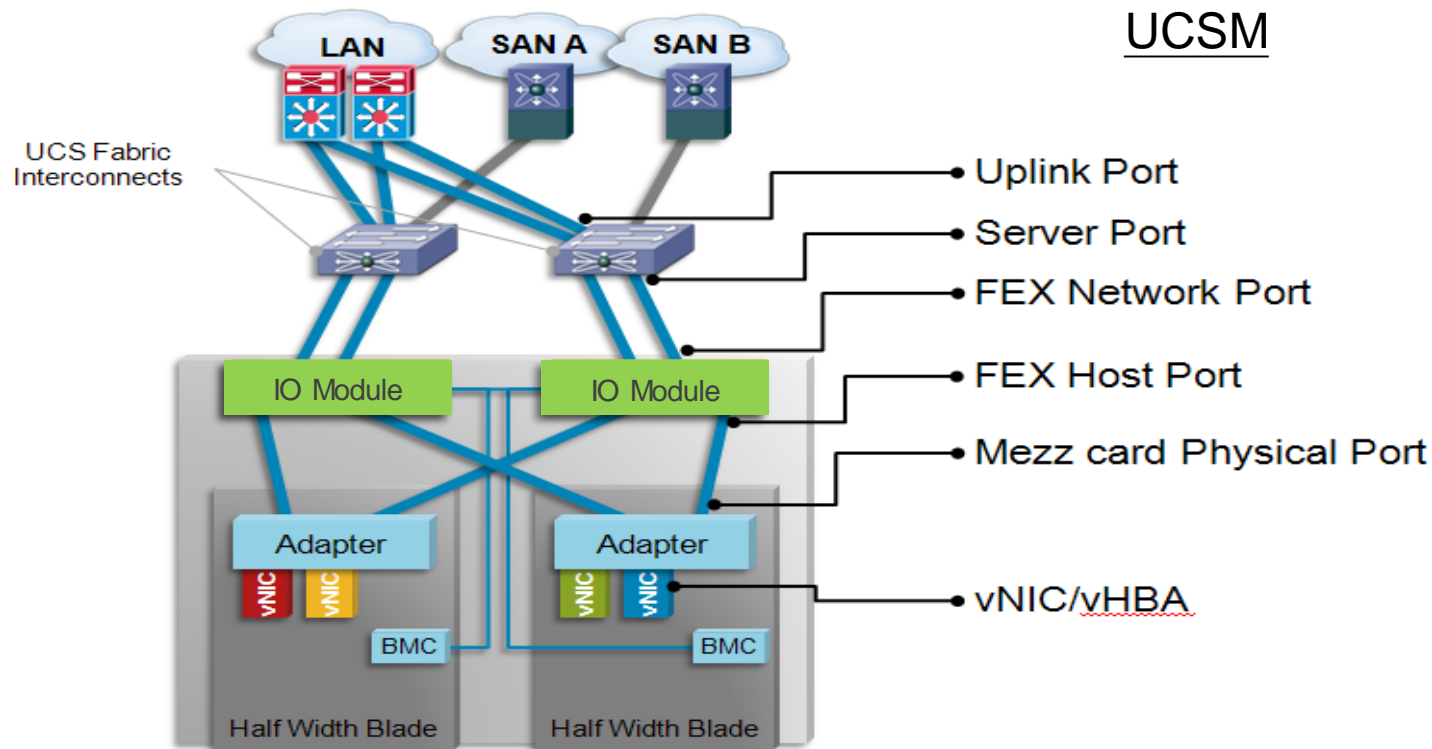
Name	Assigned	Assigned To
Initiator 20:00:00:25:BS:A0:00:16	Yes	org-root/Is-Conors-Web-Server-9/fc-hba1
Initiator 20:00:00:25:BS:A0:00:17	Yes	org-root/Is-Conors-Web-Server-9/fc-hba0
Initiator 20:00:00:25:BS:A0:00:18	Yes	org-root/Is-Conors-Web-Server-8/fc-hba1
Initiator 20:00:00:25:BS:A0:00:19	Yes	org-root/Is-Conors-Web-Server-8/fc-hba0
Initiator 20:00:00:25:BS:A0:00:1A	Yes	org-root/Is-Conors-Web-Server-7/fc-hba1
Initiator 20:00:00:25:BS:A0:00:1B	Yes	org-root/Is-Conors-Web-Server-7/fc-hba0
Initiator 20:00:00:25:BS:A0:00:1C	Yes	org-root/Is-Conors-Web-Server-6/fc-hba1
Initiator 20:00:00:25:BS:A0:00:1D	Yes	org-root/Is-Conors-Web-Server-6/fc-hba0
Initiator 20:00:00:25:BS:A0:00:1E	Yes	org-root/Is-Conors-Web-Server-5/fc-hba1
Initiator 20:00:00:25:BS:A0:00:1F	Yes	org-root/Is-Conors-Web-Server-5/fc-hba0
Initiator 20:00:00:25:BS:A0:00:20	Yes	org-root/Is-Conors-Web-Server-4/fc-hba1
Initiator 20:00:00:25:BS:A0:00:21	Yes	org-root/Is-Conors-Web-Server-4/fc-hba0
Initiator 20:00:00:25:BS:A0:00:22	Yes	org-root/Is-Conors-Web-Server-3/fc-hba1
Initiator 20:00:00:25:BS:A0:00:23	Yes	org-root/Is-Conors-Web-Server-3/fc-hba0
Initiator 20:00:00:25:BS:A0:00:12	Yes	org-root/Is-Conors-Web-Server-20/fc-hba1
Initiator 20:00:00:25:BS:A0:00:13	Yes	org-root/Is-Conors-Web-Server-20/fc-hba0
Initiator 20:00:00:25:BS:A0:00:24	Yes	org-root/Is-Conors-Web-Server-2/fc-hba1
Initiator 20:00:00:25:BS:A0:00:25	Yes	org-root/Is-Conors-Web-Server-2/fc-hba0
Initiator 20:00:00:25:BS:A0:00:00	Yes	org-root/Is-Conors-Web-Server-19/fc-hba1
Initiator 20:00:00:25:BS:A0:00:01	Yes	org-root/Is-Conors-Web-Server-19/fc-hba0
Initiator 20:00:00:25:BS:A0:00:02	Yes	org-root/Is-Conors-Web-Server-18/fc-hba1
Initiator 20:00:00:25:BS:A0:00:03	Yes	org-root/Is-Conors-Web-Server-18/fc-hba0
Initiator 20:00:00:25:BS:A0:00:04	Yes	org-root/Is-Conors-Web-Server-17/fc-hba1
Initiator 20:00:00:25:BS:A0:00:05	Yes	org-root/Is-Conors-Web-Server-17/fc-hba0
Initiator 20:00:00:25:BS:A0:00:06	Yes	org-root/Is-Conors-Web-Server-16/fc-hba1
Initiator 20:00:00:25:BS:A0:00:07	Yes	org-root/Is-Conors-Web-Server-16/fc-hba0
Initiator 20:00:00:25:BS:A0:00:08	Yes	org-root/Is-Conors-Web-Server-15/fc-hba1
Initiator 20:00:00:25:BS:A0:00:09	Yes	org-root/Is-Conors-Web-Server-15/fc-hba0
Initiator 20:00:00:25:BS:A0:00:0A	Yes	org-root/Is-Conors-Web-Server-14/fc-hba1
Initiator 20:00:00:25:BS:A0:00:0B	Yes	org-root/Is-Conors-Web-Server-14/fc-hba0
Initiator 20:00:00:25:BS:A0:00:0C	Yes	org-root/Is-Conors-Web-Server-13/fc-hba1
Initiator 20:00:00:25:BS:A0:00:0D	Yes	org-root/Is-Conors-Web-Server-13/fc-hba0
Initiator 20:00:00:25:BS:A0:00:0E	Yes	org-root/Is-Conors-Web-Server-12/fc-hba1
Initiator 20:00:00:25:BS:A0:00:0F	Yes	org-root/Is-Conors-Web-Server-12/fc-hba0
Initiator 20:00:00:25:BS:A0:00:10	Yes	org-root/Is-Conors-Web-Server-11/fc-hba1
Initiator 20:00:00:25:BS:A0:00:11	Yes	org-root/Is-Conors-Web-Server-11/fc-hba0
Initiator 20:00:00:25:BS:A0:00:14	Yes	org-root/Is-Conors-Web-Server-10/fc-hba1
Initiator 20:00:00:25:BS:A0:00:15	Yes	org-root/Is-Conors-Web-Server-10/fc-hba0
Initiator 20:00:00:25:BS:A0:00:26	Yes	org-root/Is-Conors-Web-Server-1/fc-hba1
Initiator 20:00:00:25:BS:A0:00:27	Yes	org-root/Is-Conors-Web-Server-1/fc-hba0
Initiator 20:00:00:25:BS:A0:00:63	No	

Right Sidebar (Pools):

- Pools
 - root
 - IQN Pools
 - WWNN Pools
 - WWPN Pools
 - WWxN Pools
 - Sub-Organizations

Connectivity – Components and LAN

UCS Ports Defined



UCSM

NXOS

BIF (Border)

SIF (Server/Fabric)

NIF (Network)

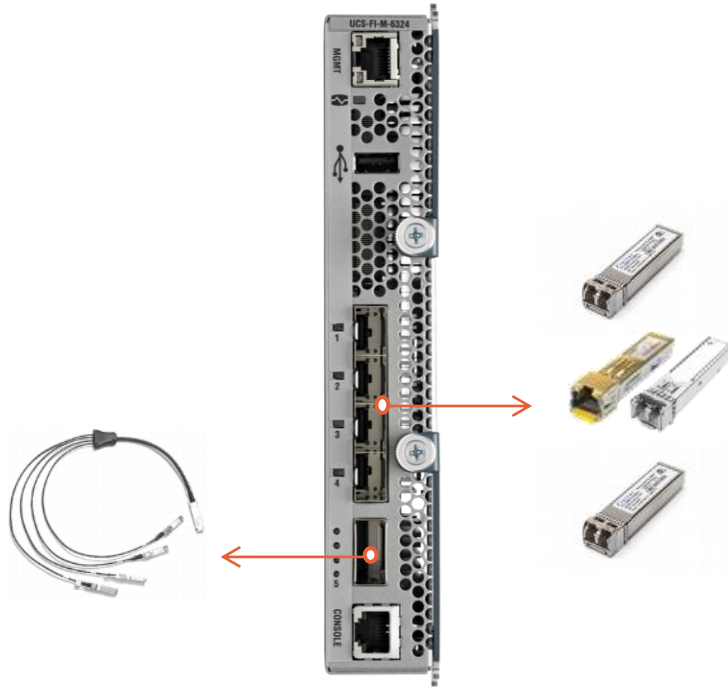
HIF (Host)

UIF (Uplink - DCE)

VIF (Virtual)

New UCS Form Factors

UCS Mini – Optics



Transceiver Type	Speed	Cable Type	Distance
QSFP-4SFP10G	40G	DAC	1, 3, 5m
QSFP-4X10G-AC	40G	DAC	7, 10m
SFP-10G-SR SFP-10G-SR-X	10G	MMF	300m
SFP-H10GB-CU	10G	DAC	1, 3, 5m
SFP-H10GB-AC	10G	DAC	7, 10m
GLC-T GLC-GE-T	1G	Cat5	100m
GLC-LH-SM	1G	SMF	10Km
GLC-SX-MM	1G	MMF	1Km
DS-SFP-FC (DS-SFP-FC4G-SW, DS-SFP-FC8G-SW)	4, 8G	MMF	150m/380m

* FCOE supported distance is 100m

New UCS Form Factors

UCS Mini – Server and Adapter Support



Hardware	Supported Model	Timeline
Blade	B200M3 (Ivy Bridge)	Available
Rack	C220M3 (Ivy Bridge)	Available
	C240M3 (Ivy Bridge)	Available

Hardware	Supported Model	Timeline
Adaptors	VIC1240	Available
	Port Expander for VIC1240	Available
	VIC1280	Available
	Fusion-IO 365GB	Available
	Fusion-IO 785GB	Available

New UCS Form Factors

UCS Mini – Storage Support



Protocol	Vendor
iSCSI	NetApp FAS
	EMC VNX
	Nimble
	Invicta
Fibre Channel	NetApp FAS
	UCS Invicta
	EMC VNX



CISCO