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UCS Fundamentals

BRKCOM-1001

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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

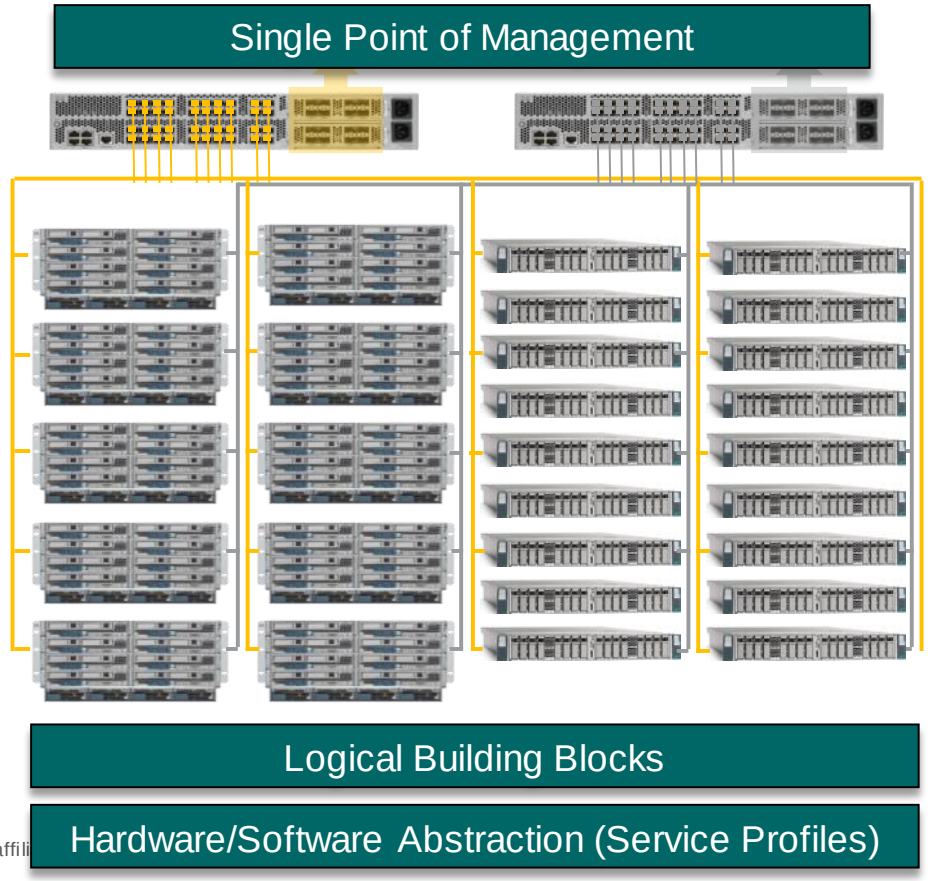
Check out www.ciscolive.com for previous session presentations and videos

- 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

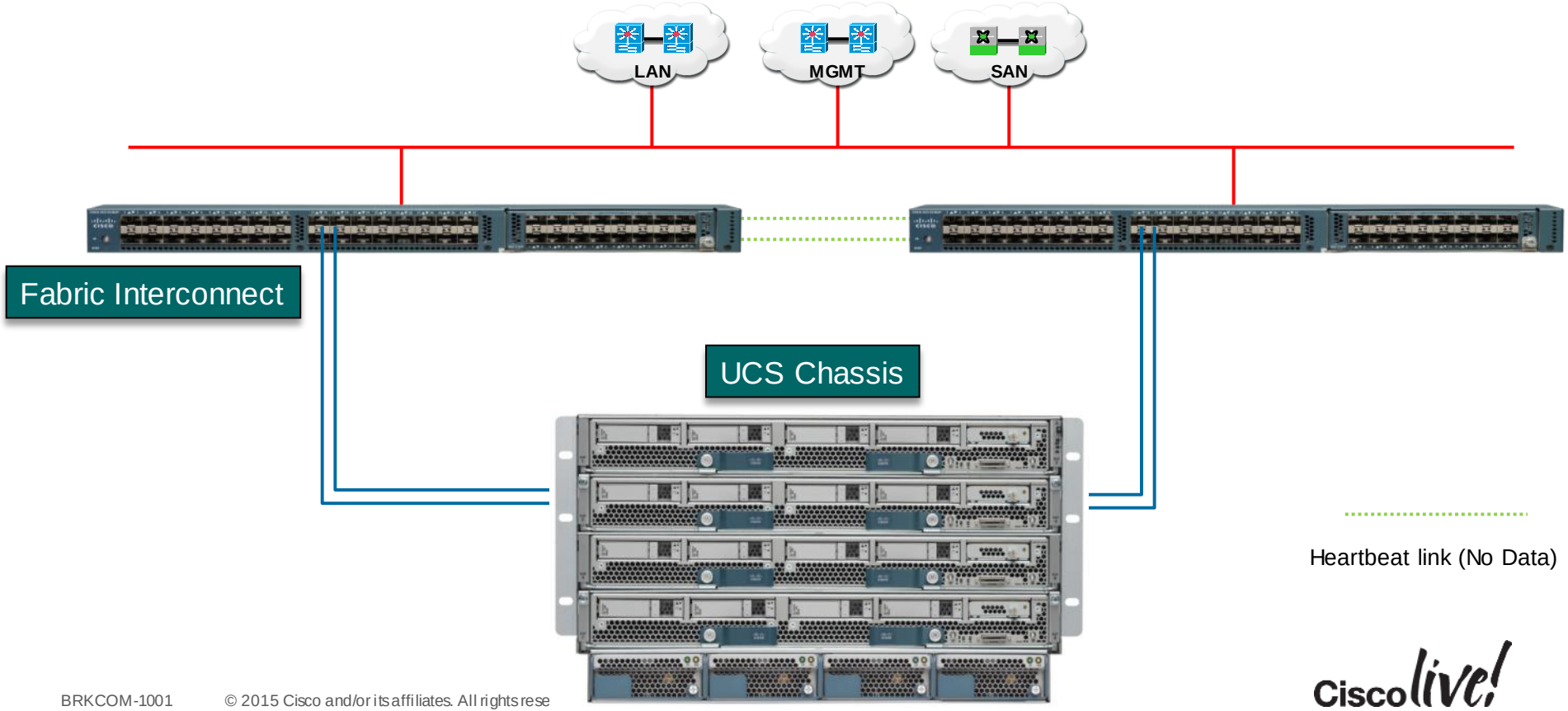
Agenda

- 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

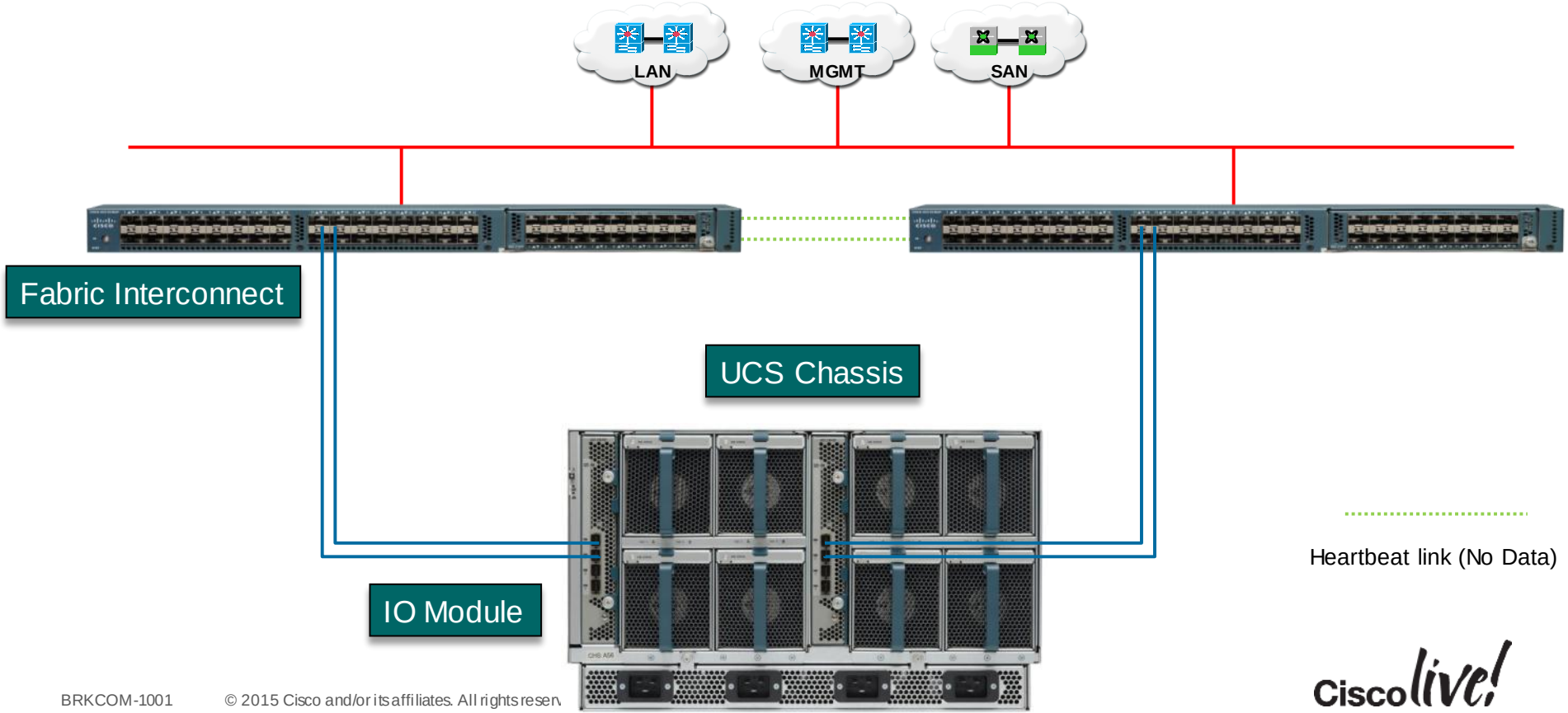
Cisco Unified Computing System (UCS)



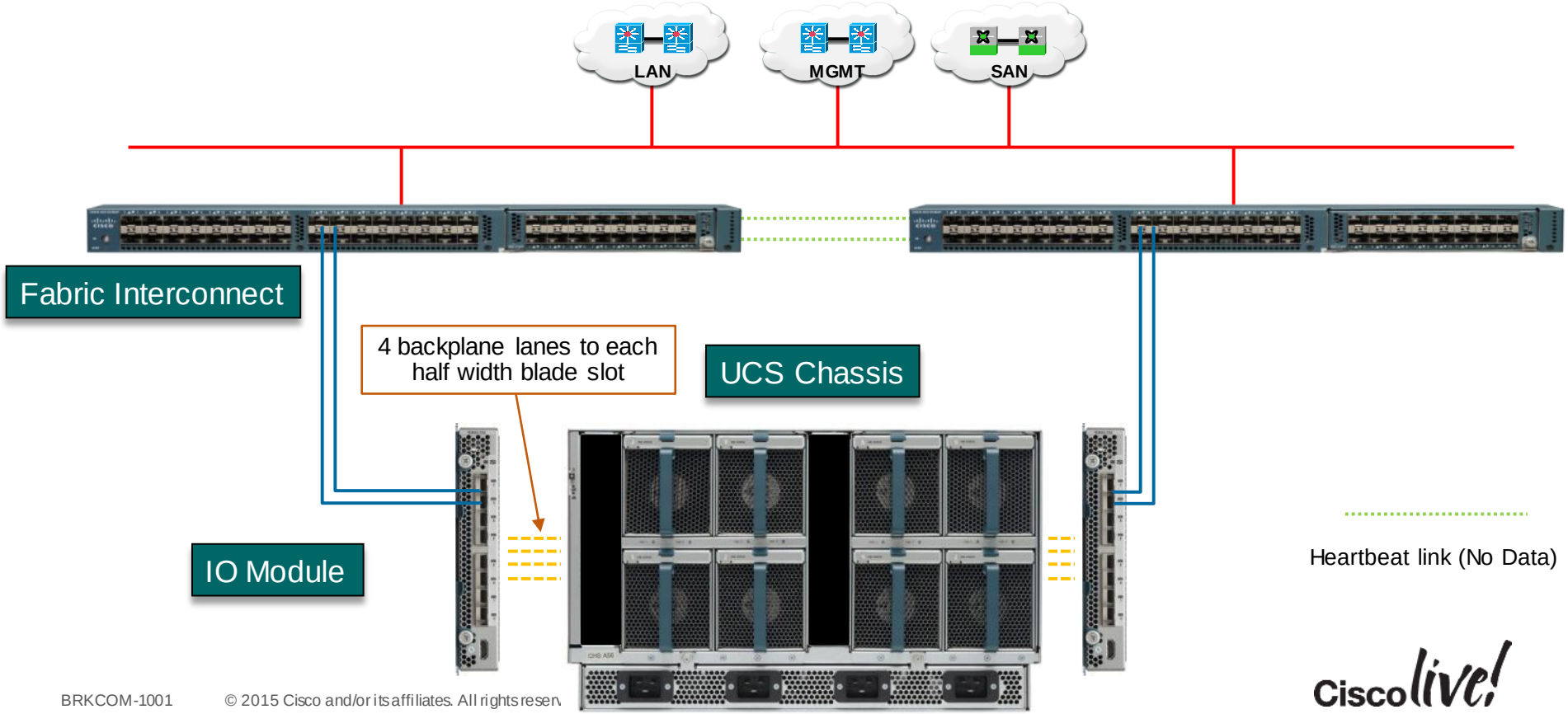
UCS Components



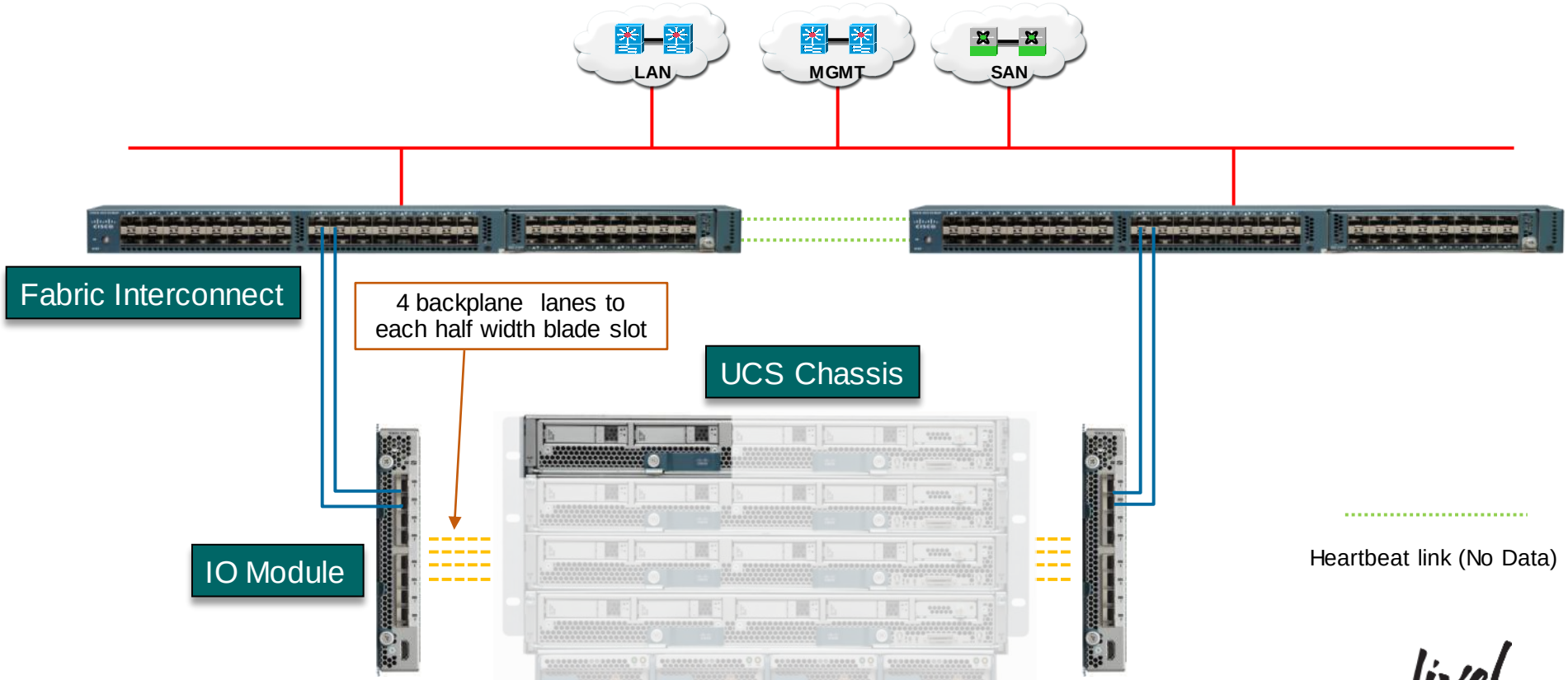
UCS Components



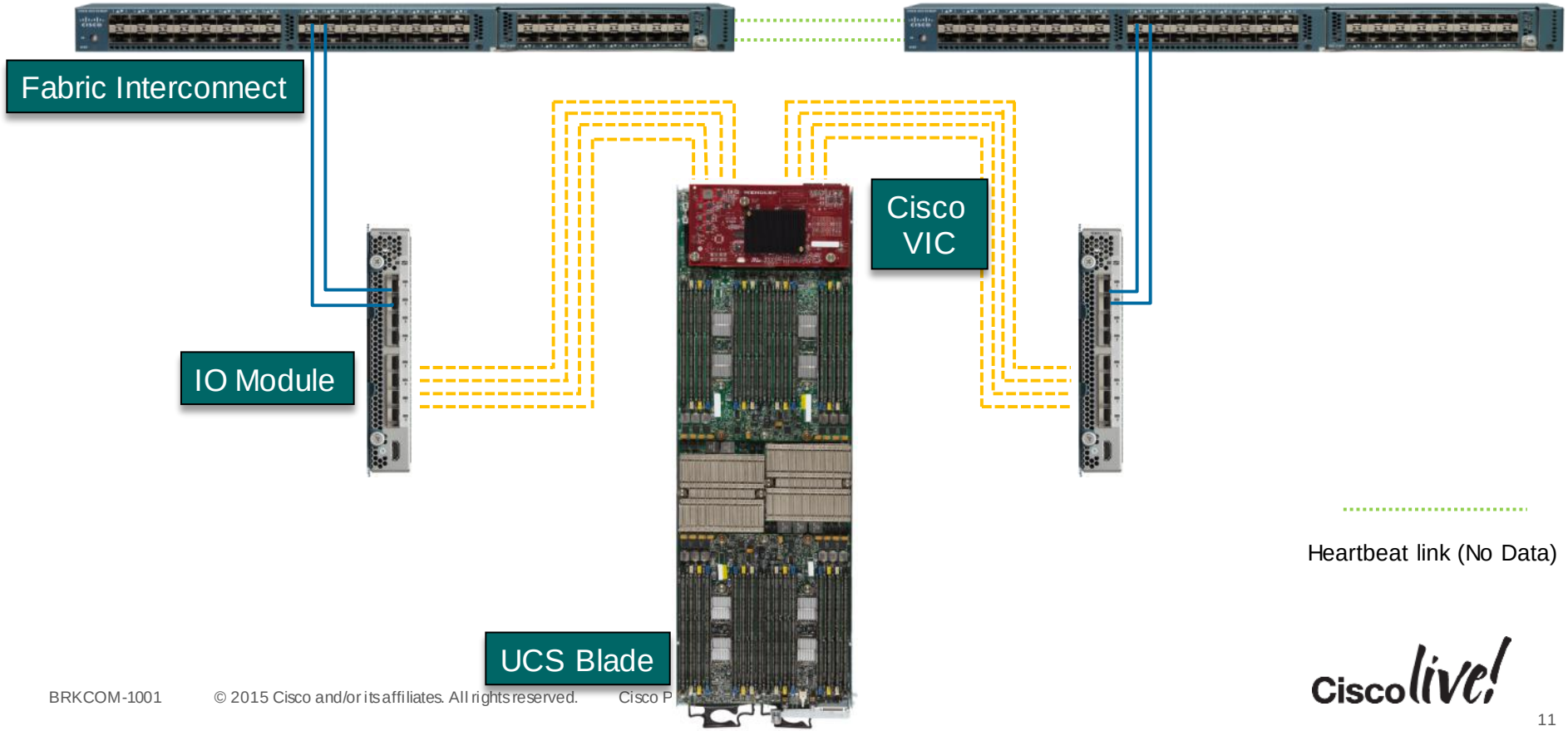
UCS Components



UCS Components

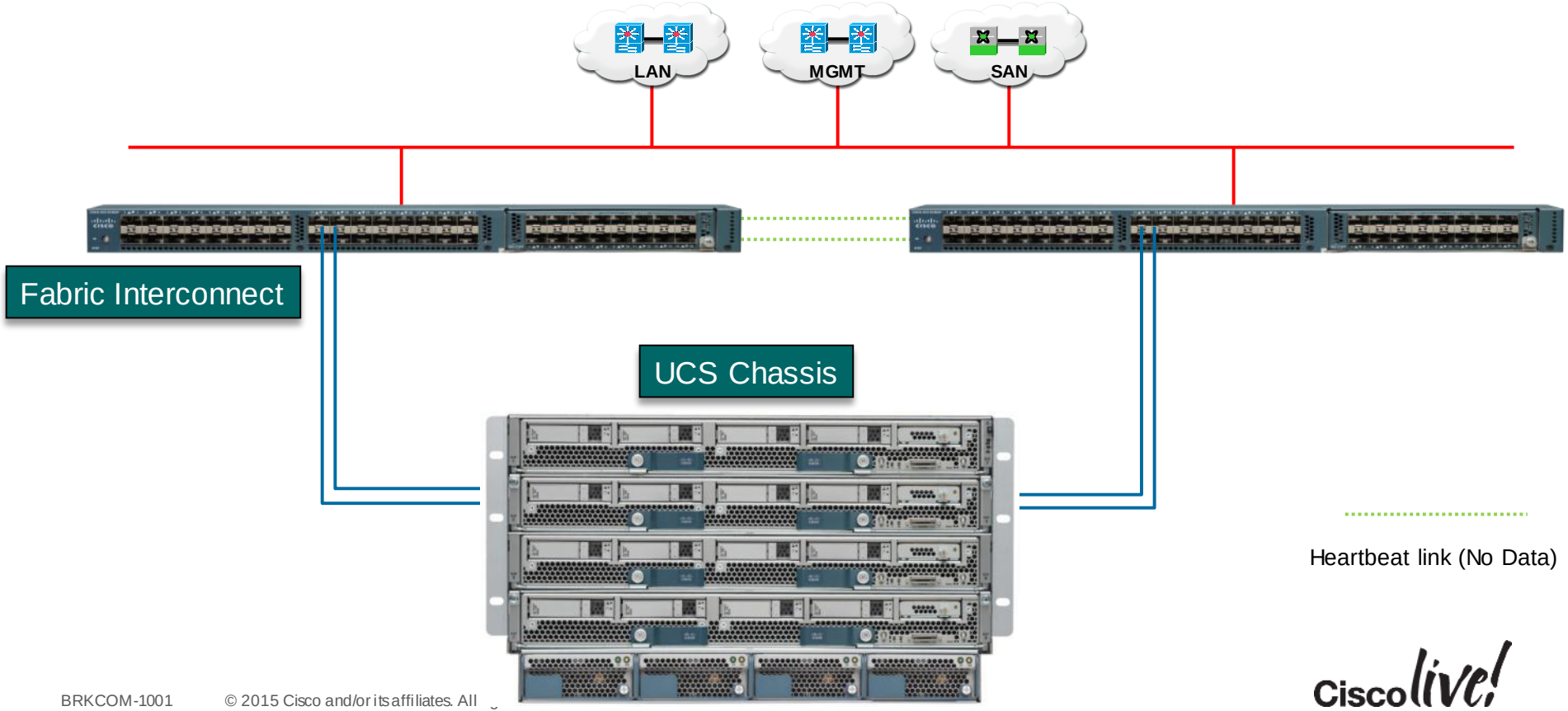


UCS Components



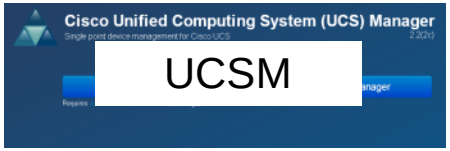
UCS Components

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

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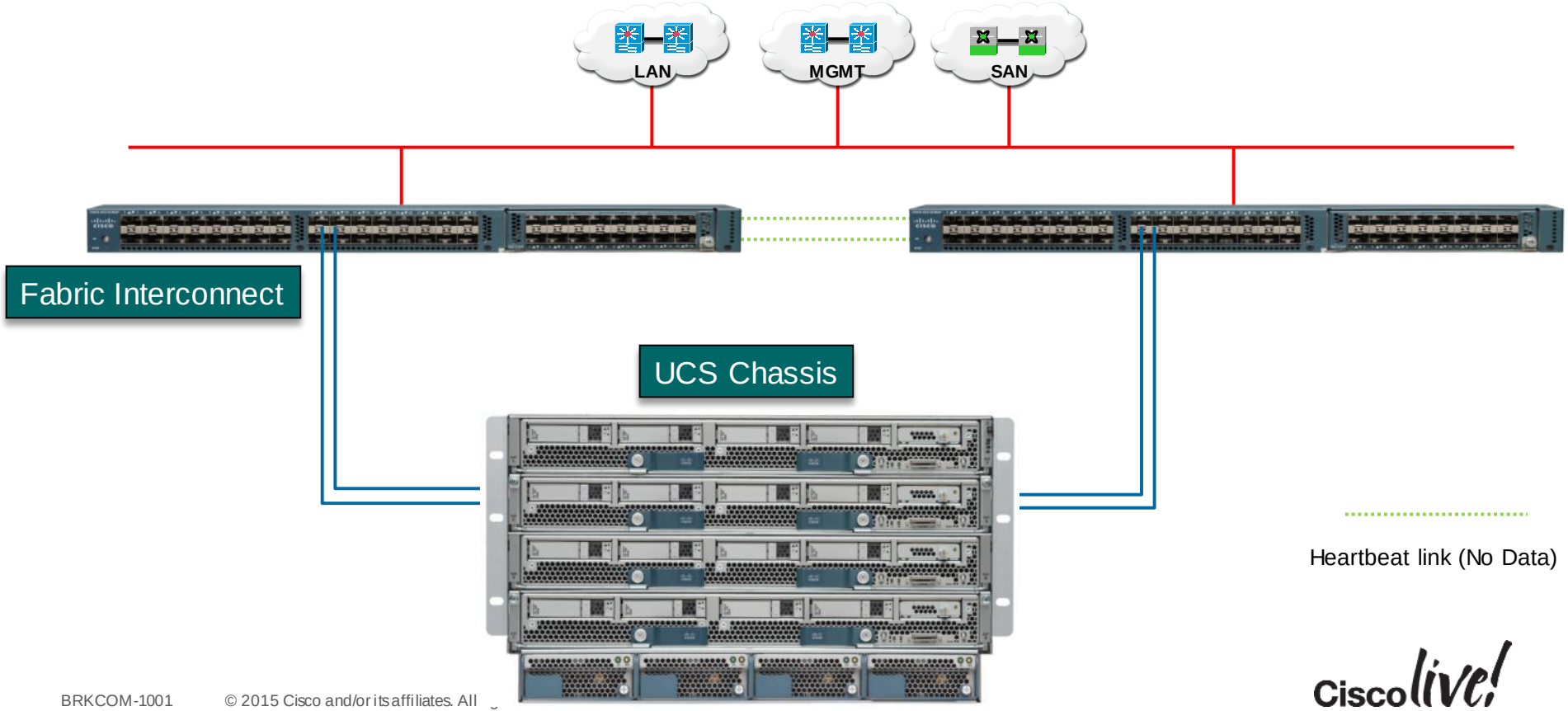
UCS Components

5108 Chassis



UCS Components

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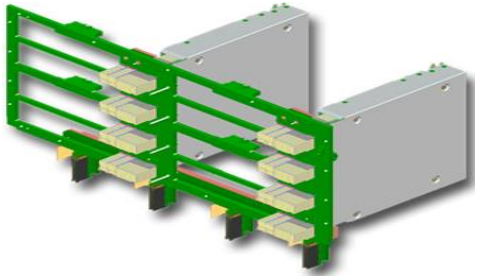
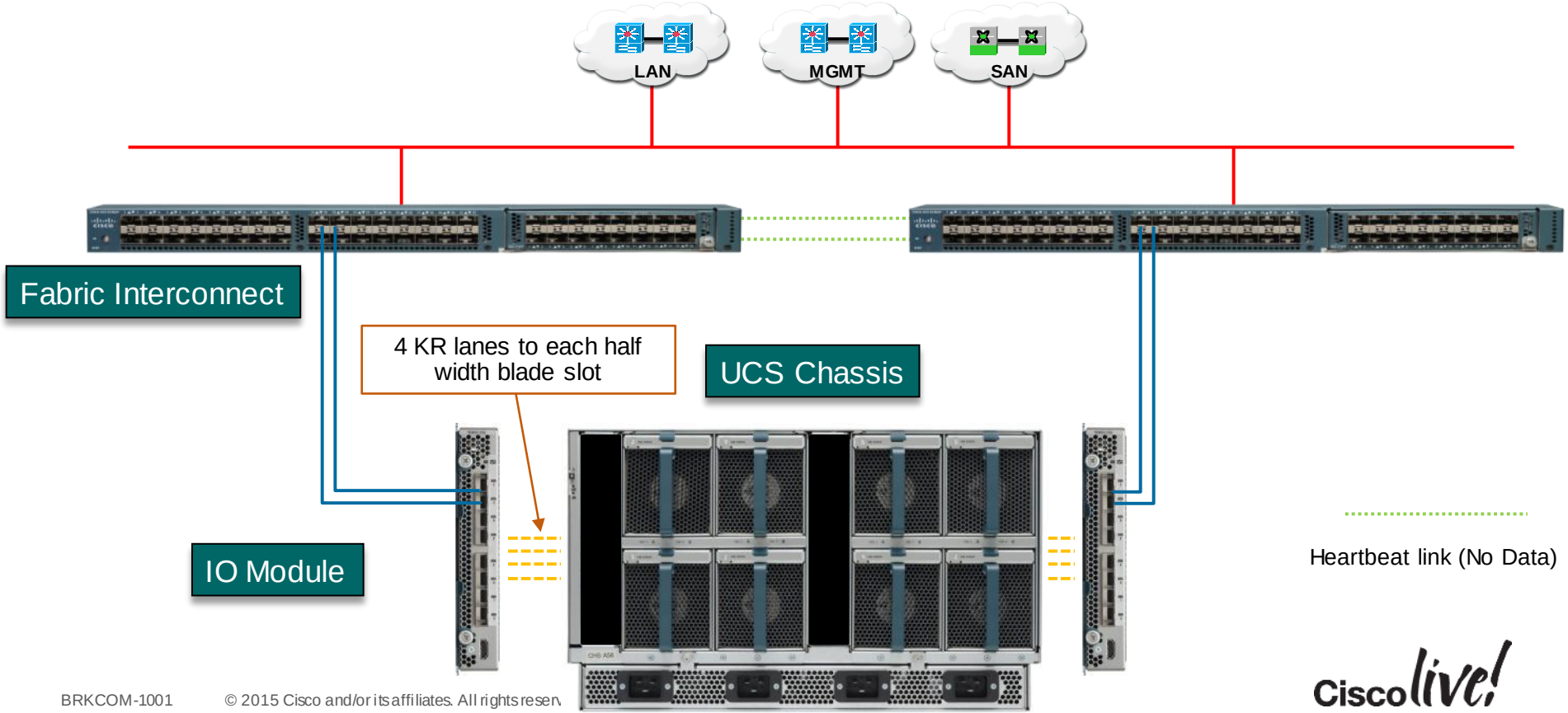


6RU Chassis
32” deep
Passive backplane

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

UCS Components

IO Modules



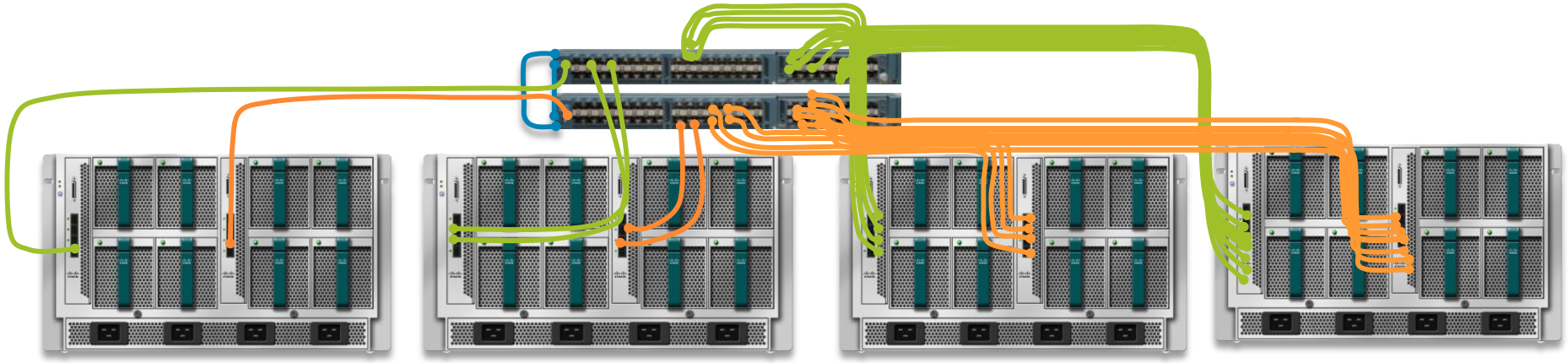
UCS Components
IOM Modules

- 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



2x 1 Link 20 Gbps per Chassis	2x 2 Link 40 Gbps per Chassis	2x 4 Link 80 Gbps per Chassis	2x 8 Links 160 Gbps per Chassis

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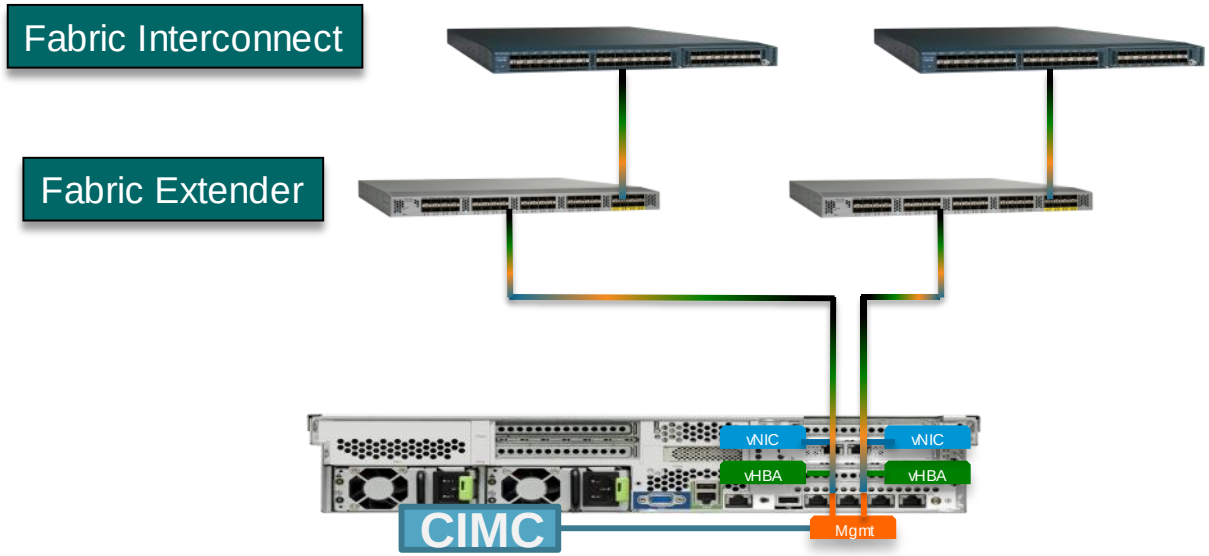
UCS Components

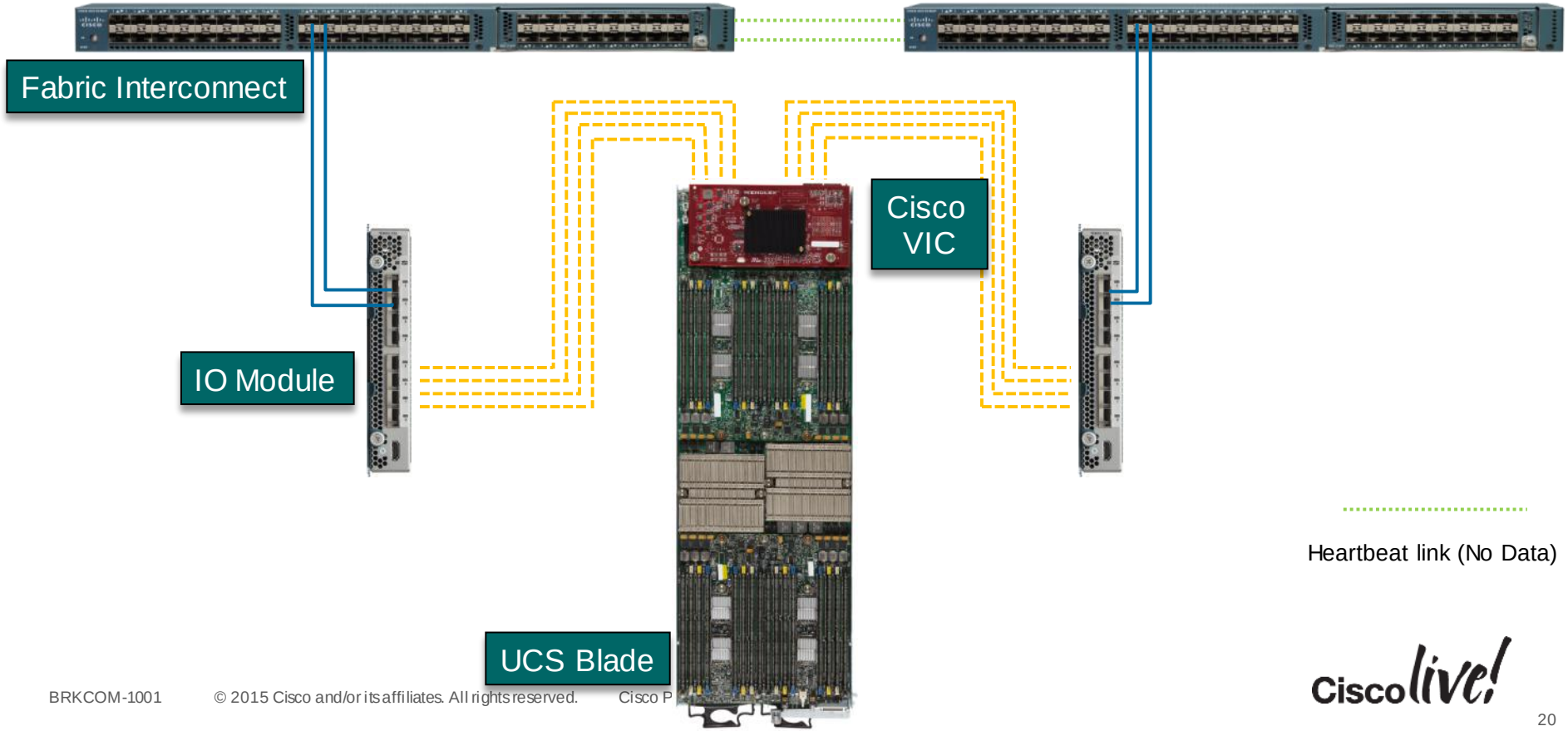
C-Series Rack Integration – Through FEX



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

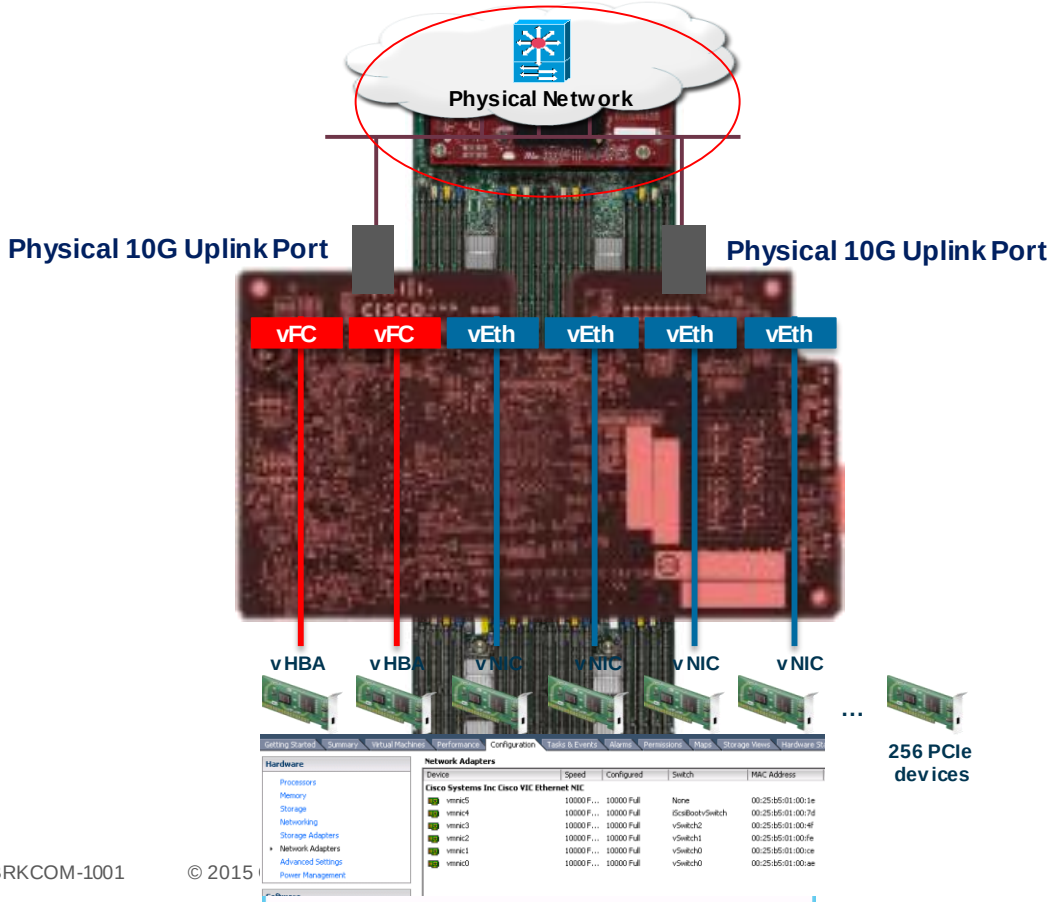
UCS Components

UCS Rack Servers

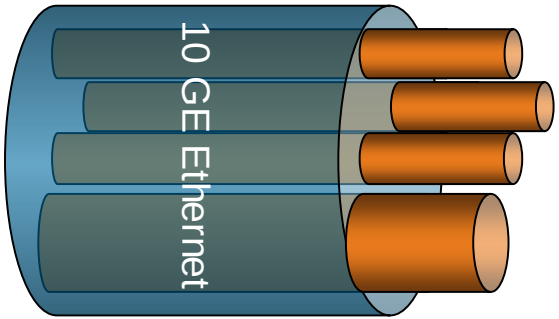
	C22 M3	C24 M3	C220 M3	C220 M4	C240 M3	C240 M4	C260 M2	C420 M3	C460 M2	C460 M4
RU	1	2	1	1	2	2	2	2	4	4
CPU	E5-2400 v2 and E5-2400	E5-2400 v2 and E5-2400	E5-2600 v2 and E5-2600	E5-2600v3	E5-2600 v2 and E5-2600	E5-2600v3	E7-2800/8800	E5-4600	E7-4800/8800	E7-4800/8800 v2
Max Cores	20	20	24	36	24	36	20	32	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

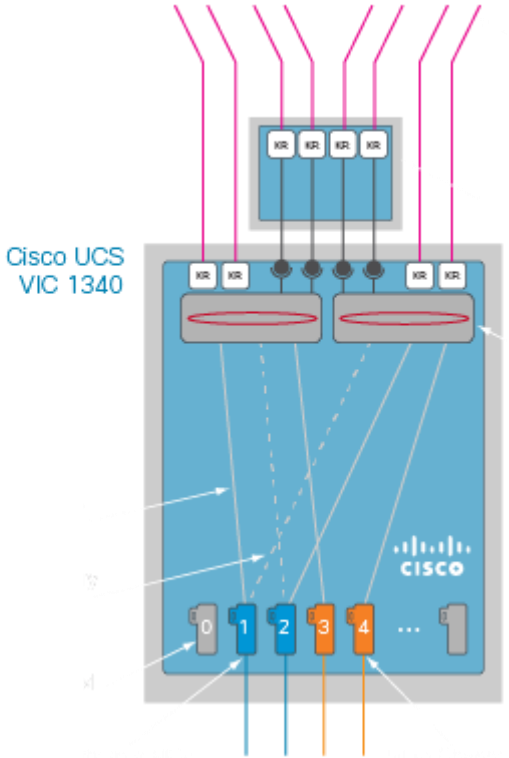


Network Interface Virtualisation

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

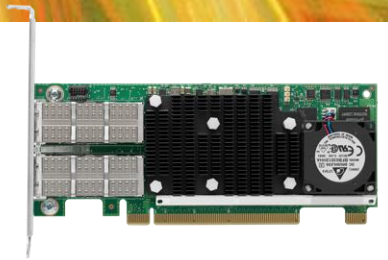


UCS Components

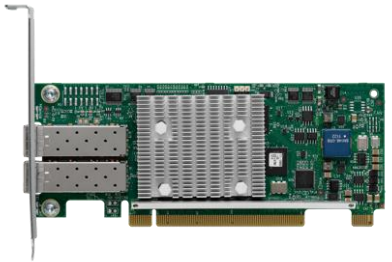
Rack VIC's

- 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

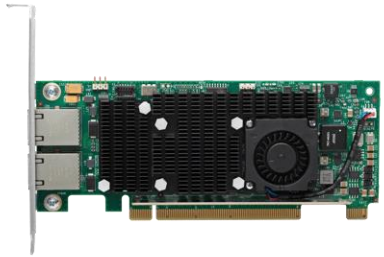
VIC 1285
40Gb QSFP



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

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  - UCS – XML API and Other Hidden Gems
- New UCS Form Factors
  - UCS Mini
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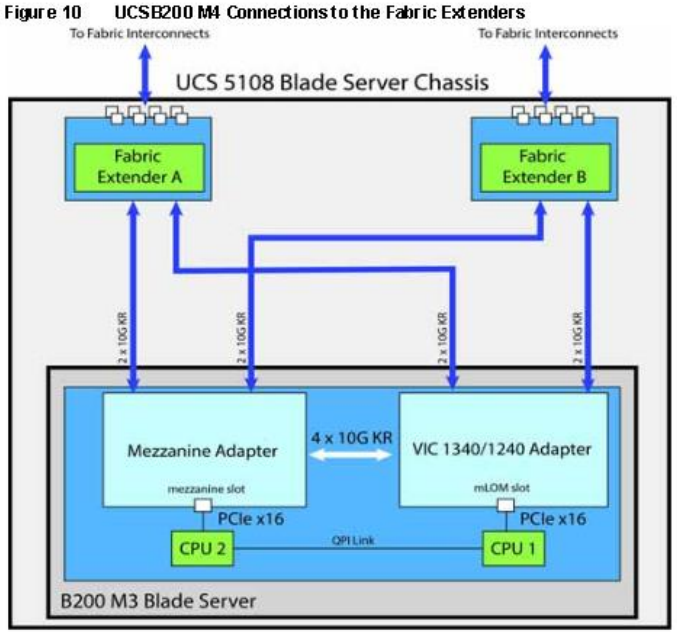
UCS Connectivity and Networking In Depth

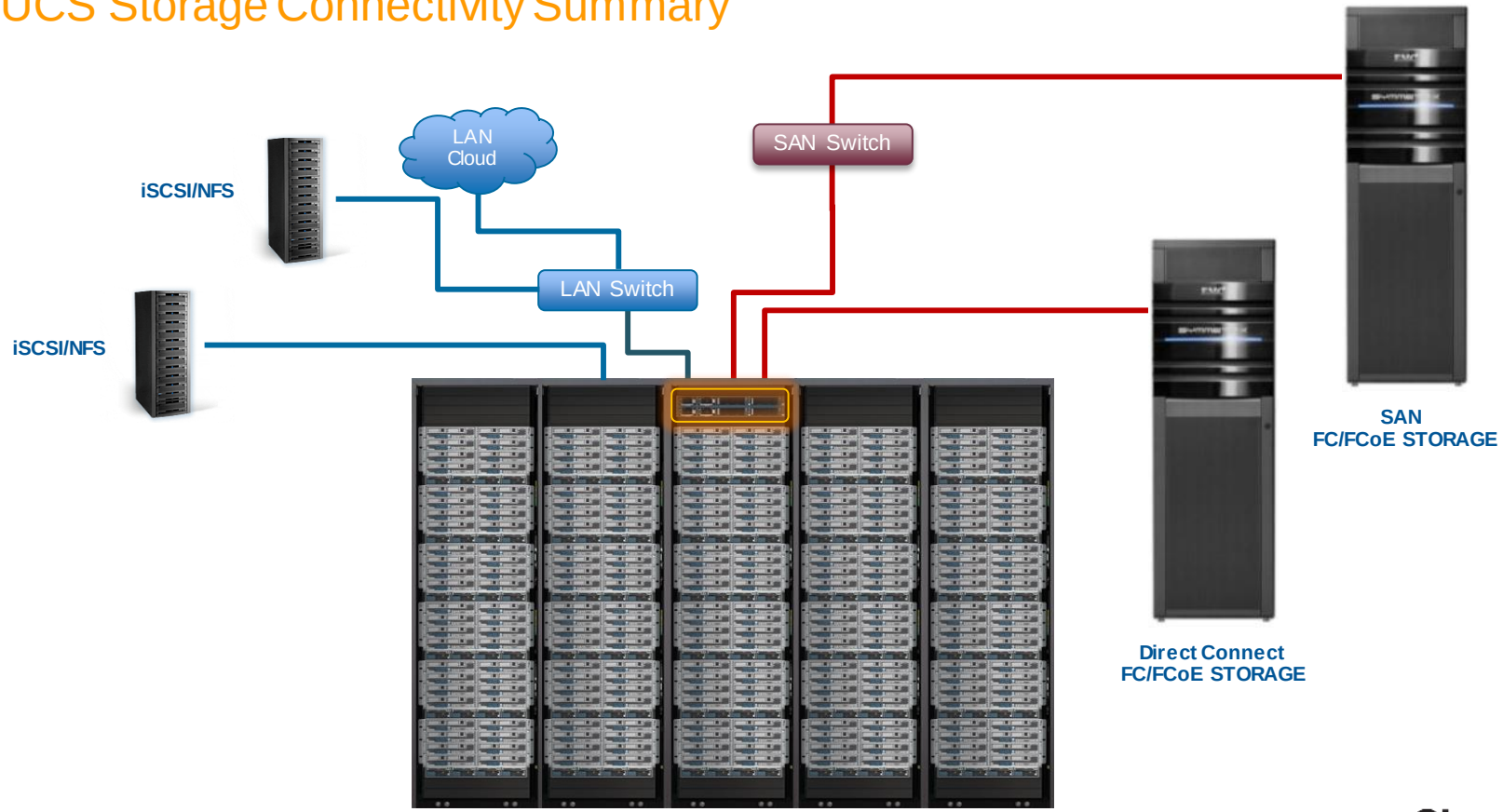
- BRKCOM 2003 – UCS Networking Deepdive

- 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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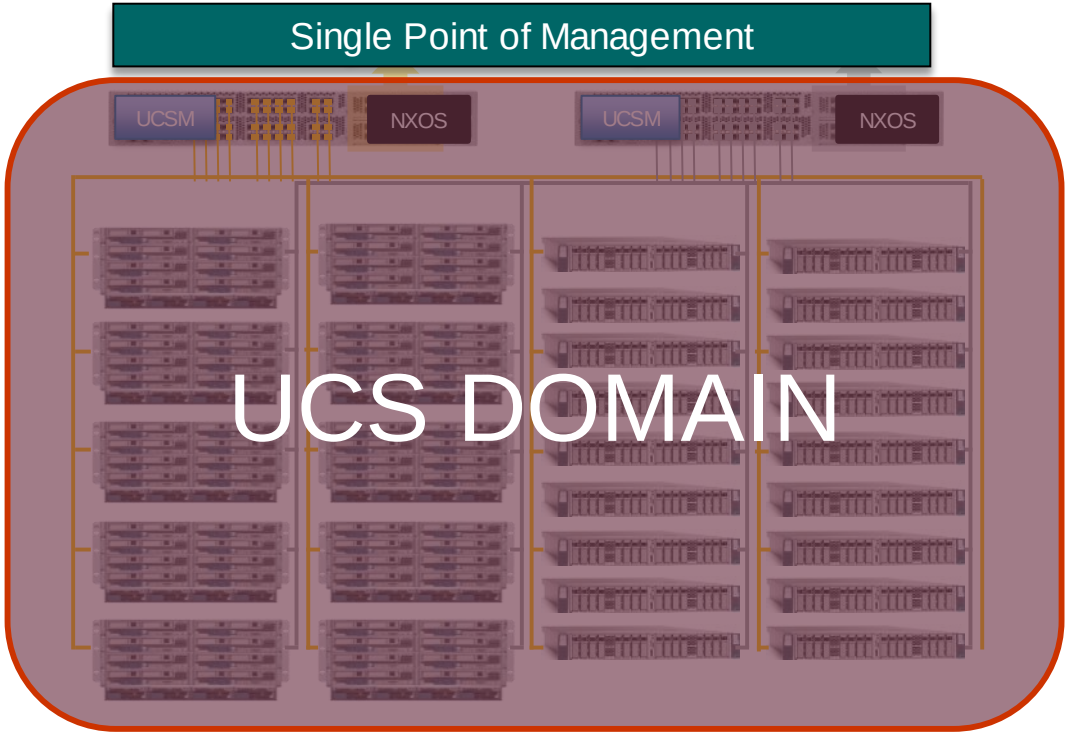
UCS Key Features

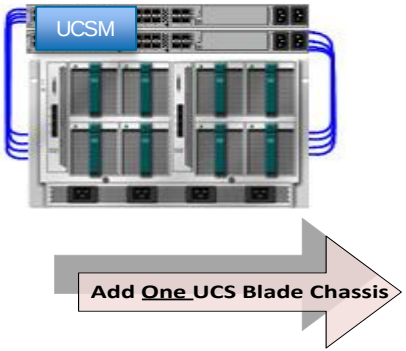
Single Point of Management and Scaling – UCS Manager



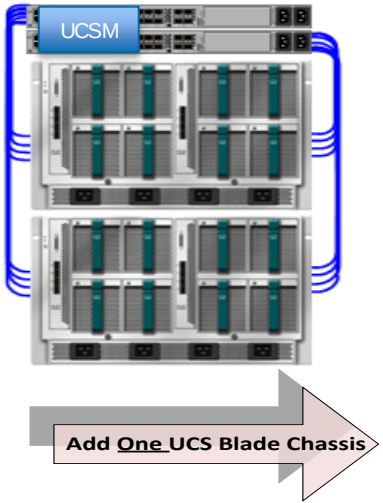
UCS Key Features

Single Point of Management and Scaling

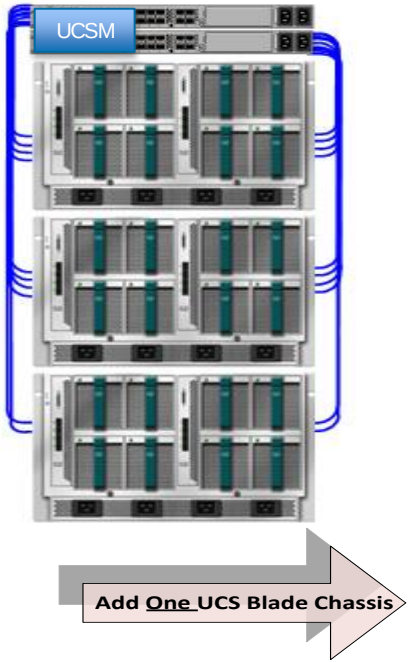
8 Cisco UCS Blades
1 UCS Manager



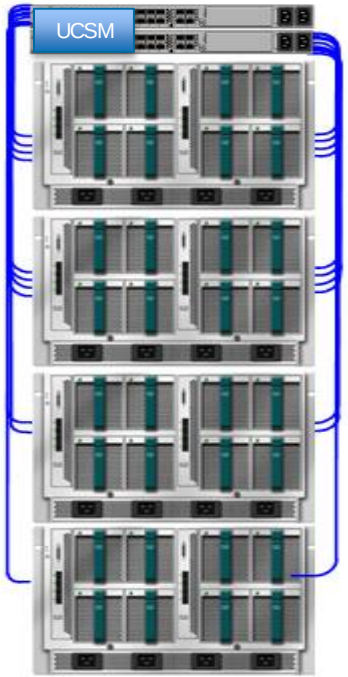
16 Cisco UCS Blades
1 UCS Manager



24 Cisco UCS Blades
1 UCS Manager

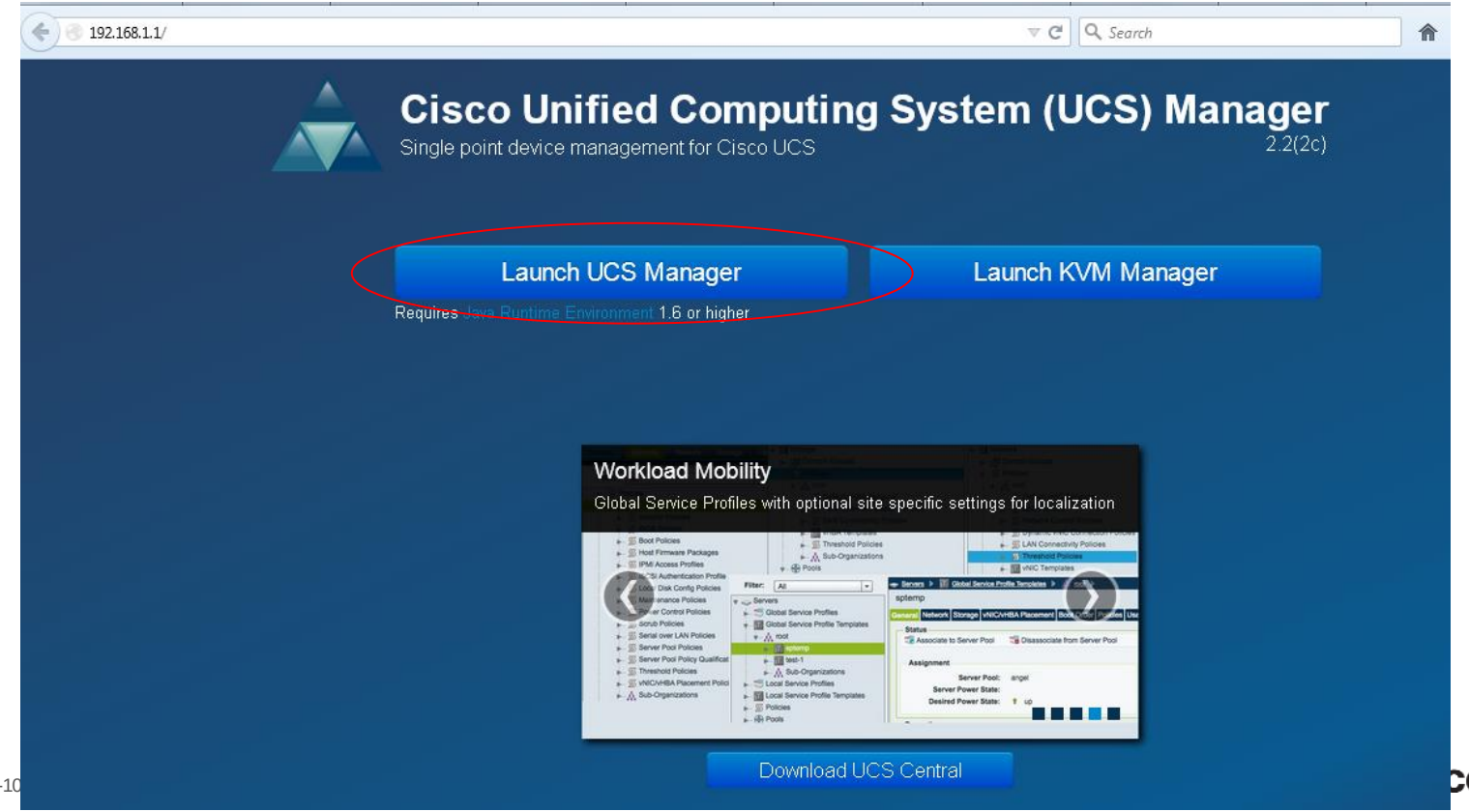


32 Cisco UCS Blades
1 UCS Manager



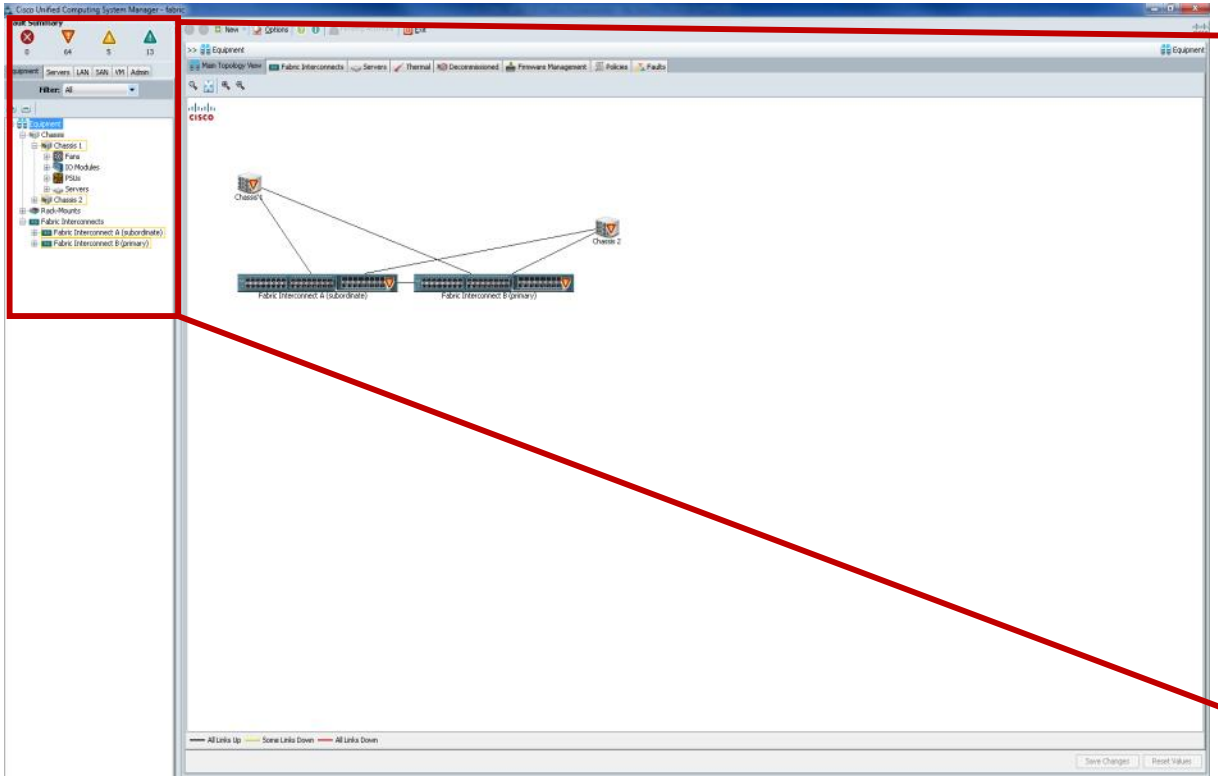
UCS Key Features

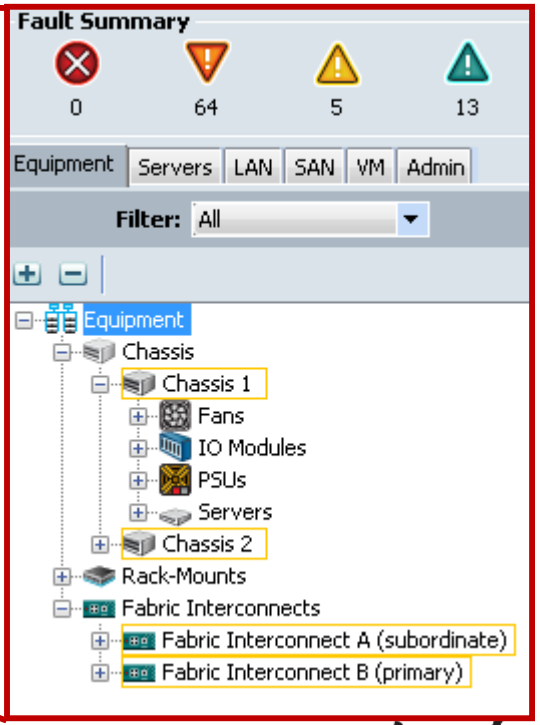
Single Point of Management – Through Browser – Java Client



UCS Key Features

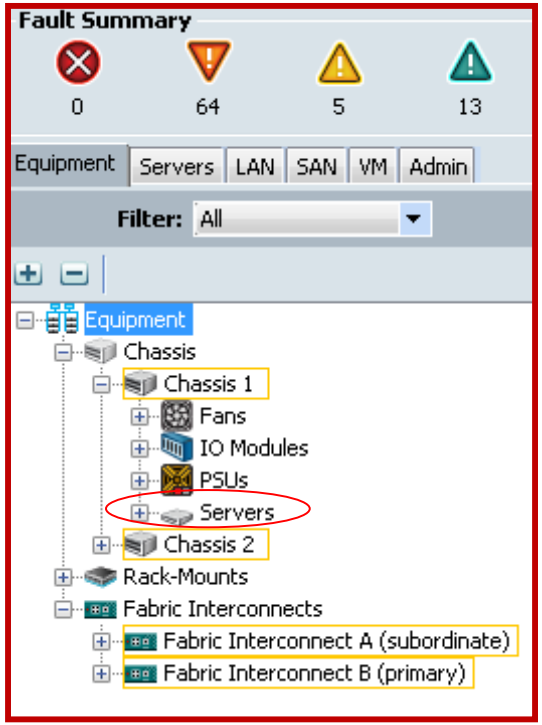
Single Point of Management – Equipment

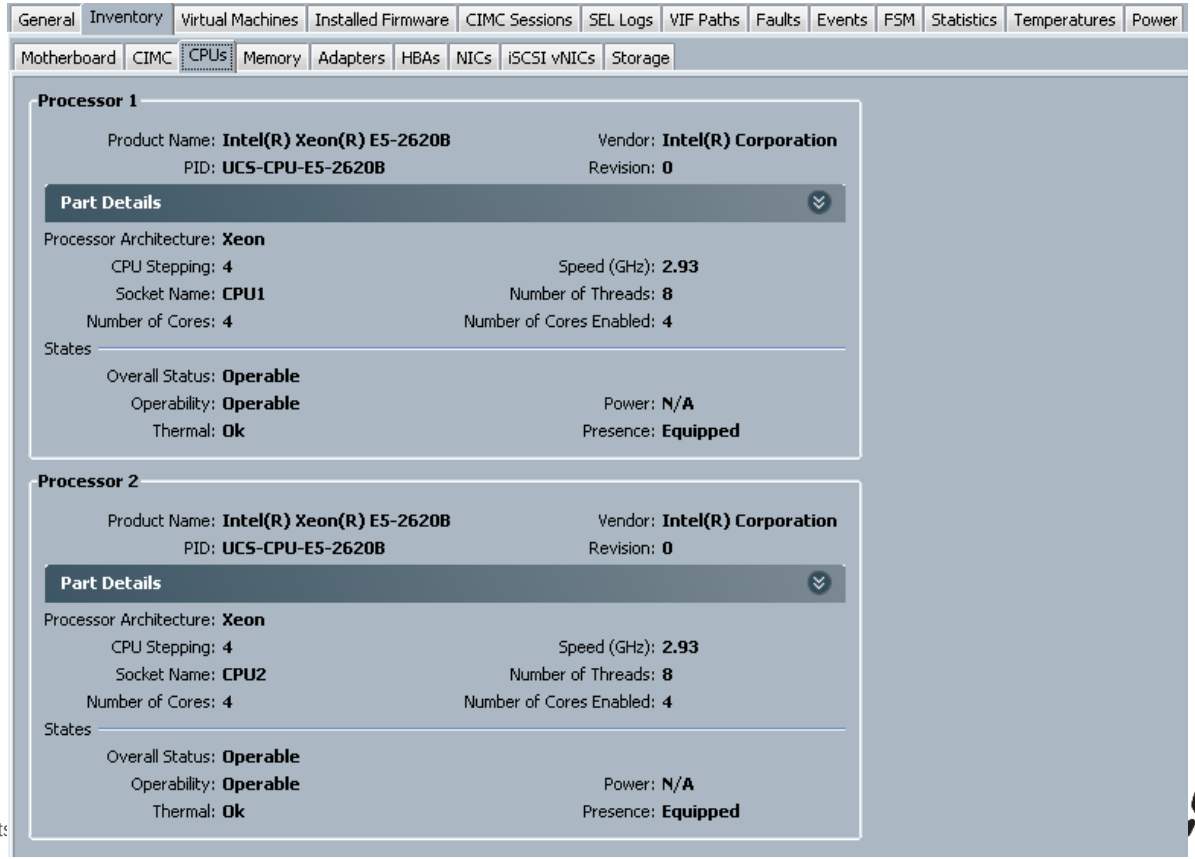




UCS Key Features

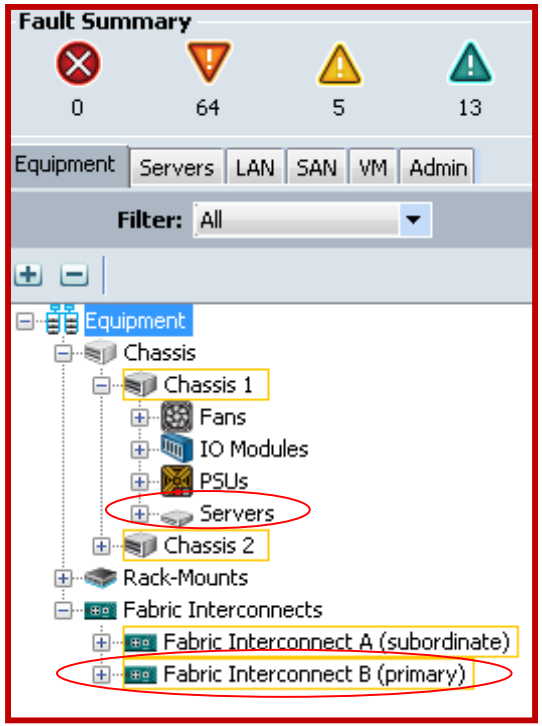
Single Point of Management – Equipment – Server Inventory

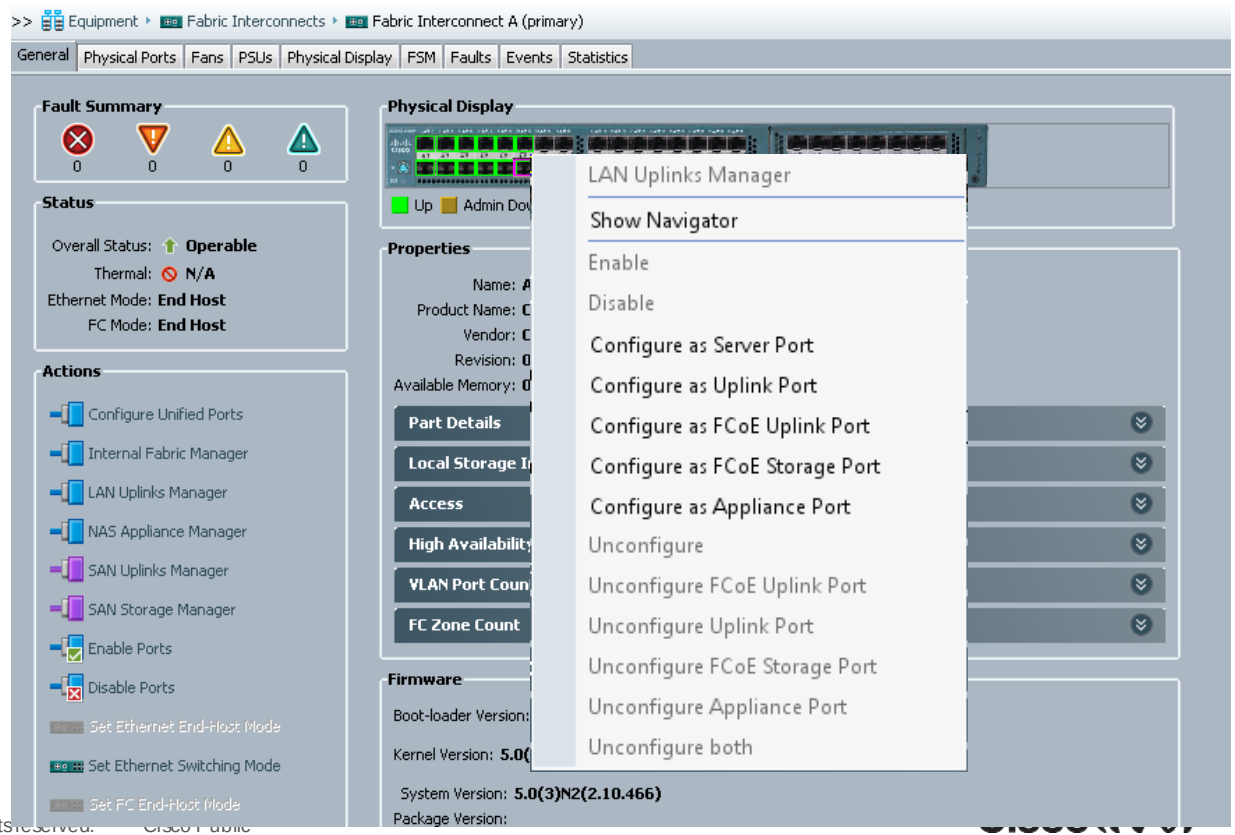




UCS Key Features

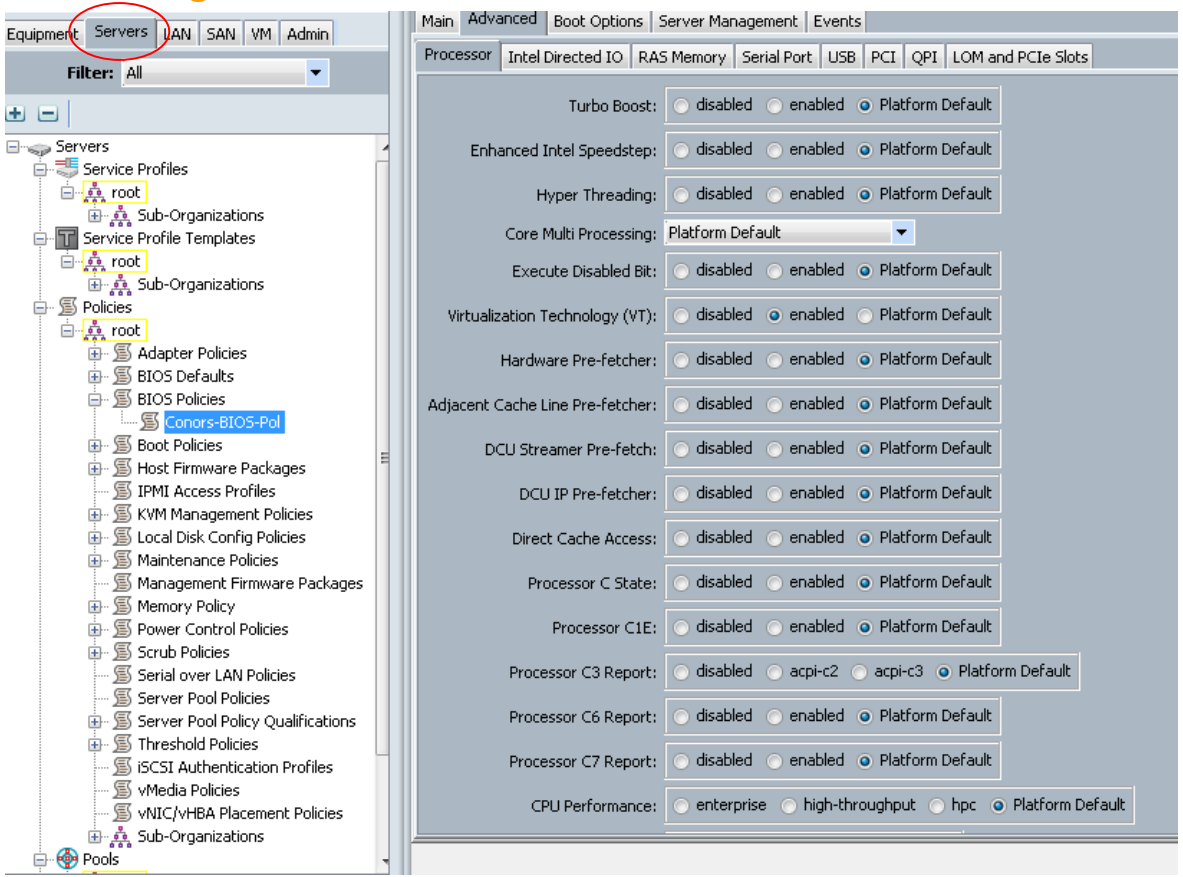
Single Point of Management – Equipment – Fabric Interconnects





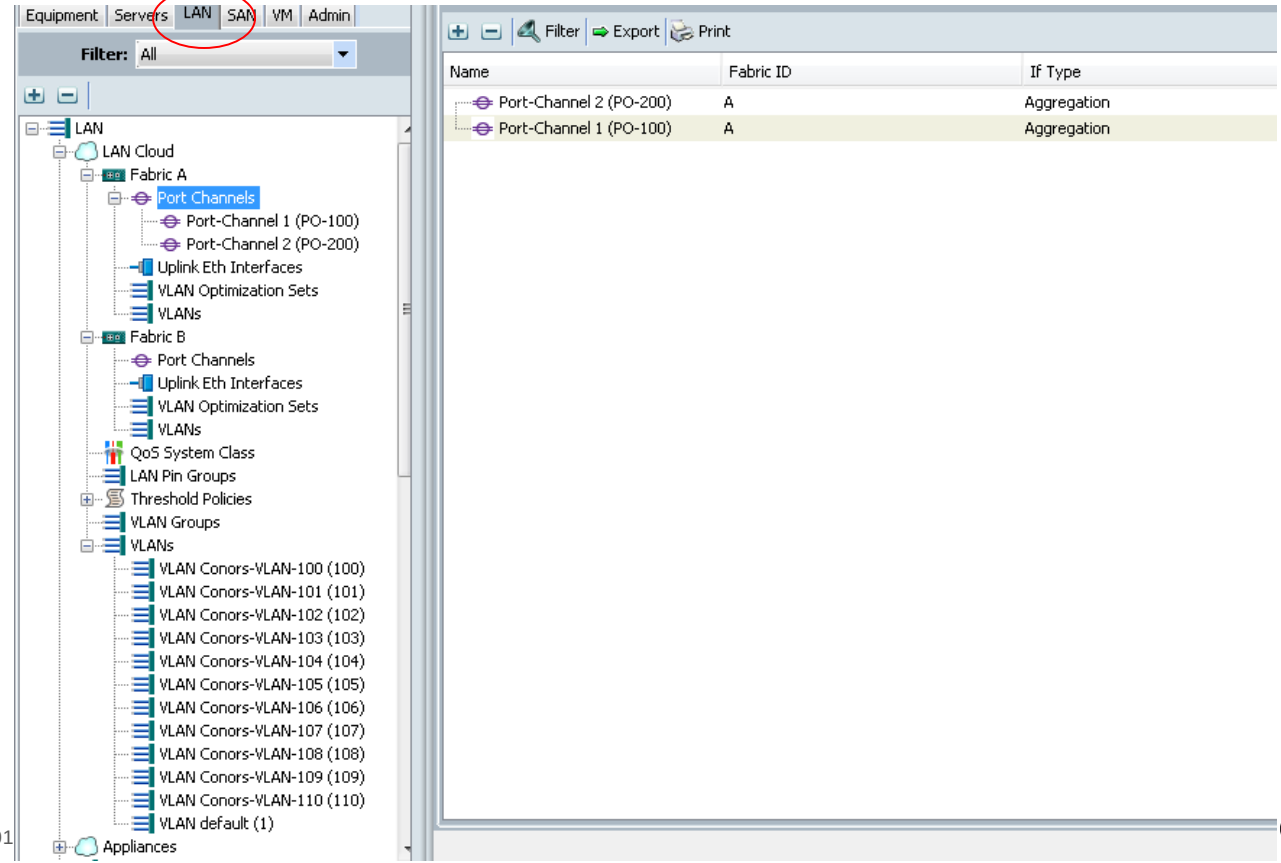
UCS Key Features

Single Point of Management – Servers



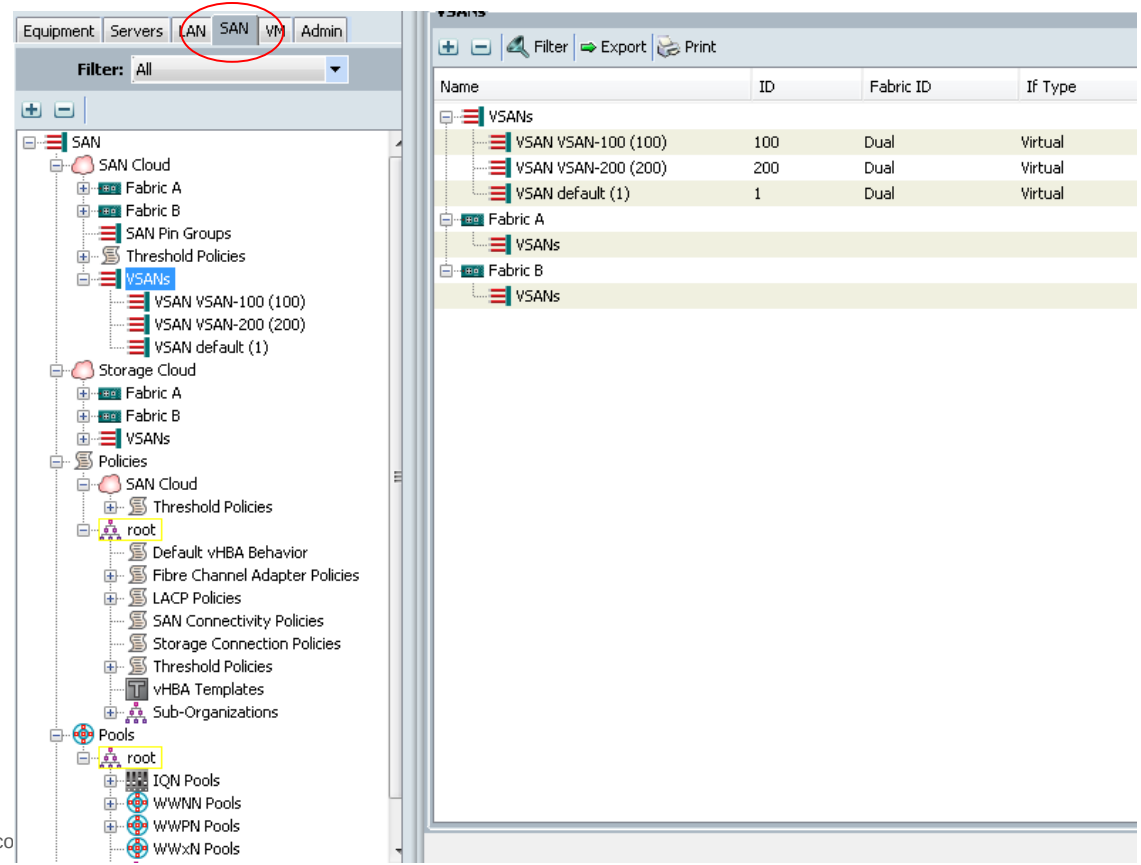
UCS Key Features

Single Point of Management – LAN Connectivity



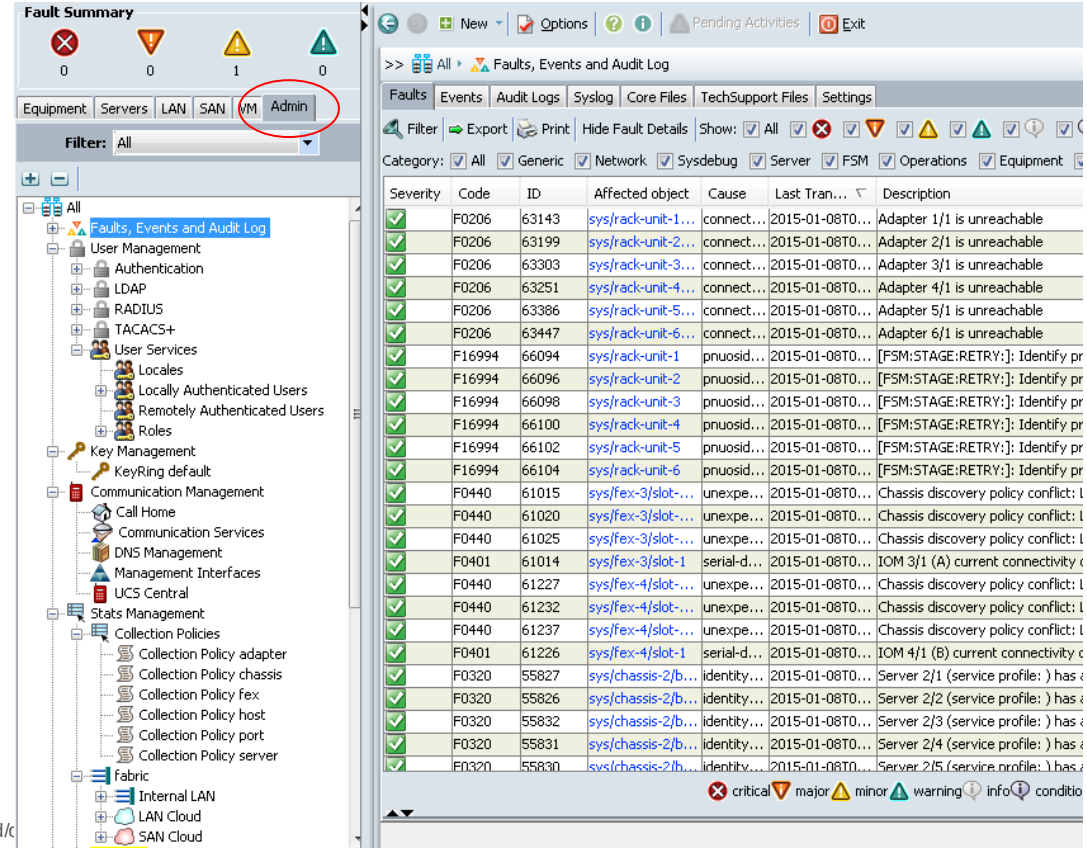
UCS Key Features

Single Point of Management – SAN Connectivity



UCS Key Features

Single Point of Management – Central Administration



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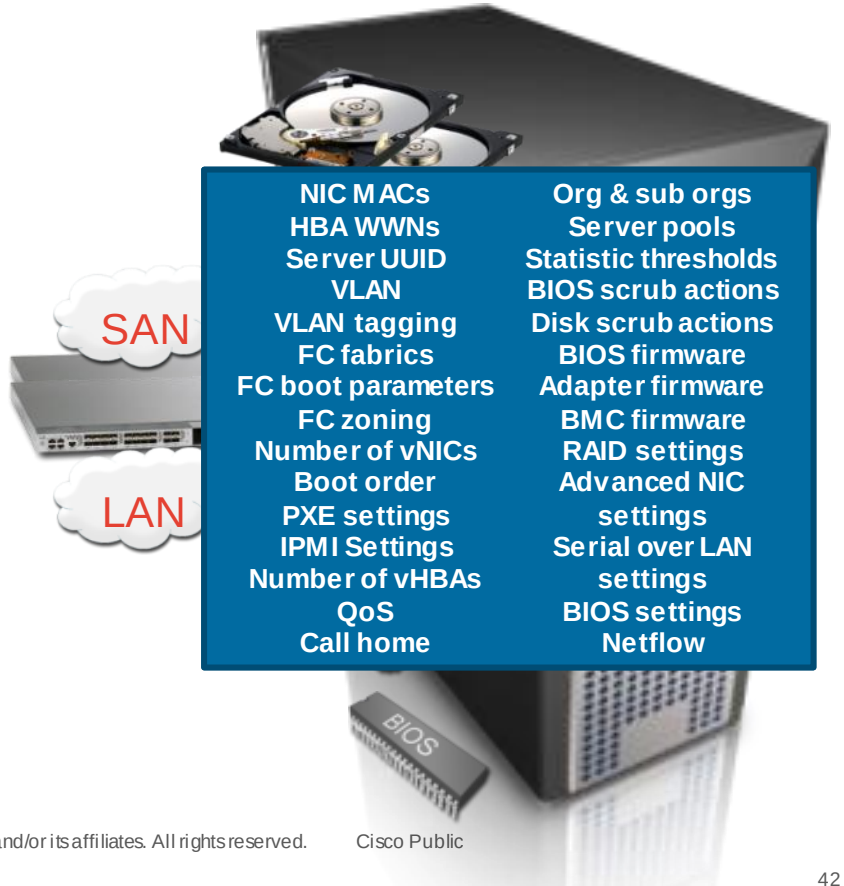
UCS Key Features

Traditional Approach



UCS Key Features

Logical Building Blocks – UCS Stateless Computing



4.

Service Profile	Service Profile	Service Profile
MAC : 00:25:B5:01:00:05	MAC : 00:25:B5:01:00:06	MAC : 00:25:B5:01:00:07
WWN: 20:01:00:25:B5:01:00:05	WWN: 20:01:00:25:B5:01:00:06	WWN: 20:01:00:25:B5:01:00:07
Firmware 2.2 Boot:SAN	Firmware 2.2 Boot:SAN	Firmware 2.2 Boot:SAN

3.

Service Profile	Service Profile	Service Profile
MAC : 00:25:B5:01:00:05	MAC : 00:25:B5:01:00:06	MAC : 00:25:B5:01:00:07
WWN: 20:01:00:25:B5:01:00:05	WWN: 20:01:00:25:B5:01:00:06	WWN: 20:01:00:25:B5:01:00:07
Firmware 2.1 Boot:SAN	Firmware 2.1 Boot:SAN	Firmware 2.1 Boot:SAN

2.

Templates - Service Profile

MAC : Derived WWN: Derived

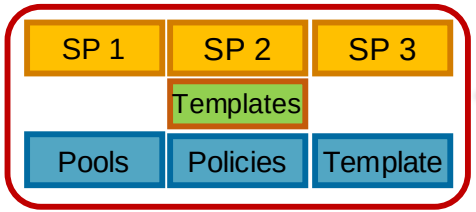
Firmware 2.2 Boot:SAN

1.

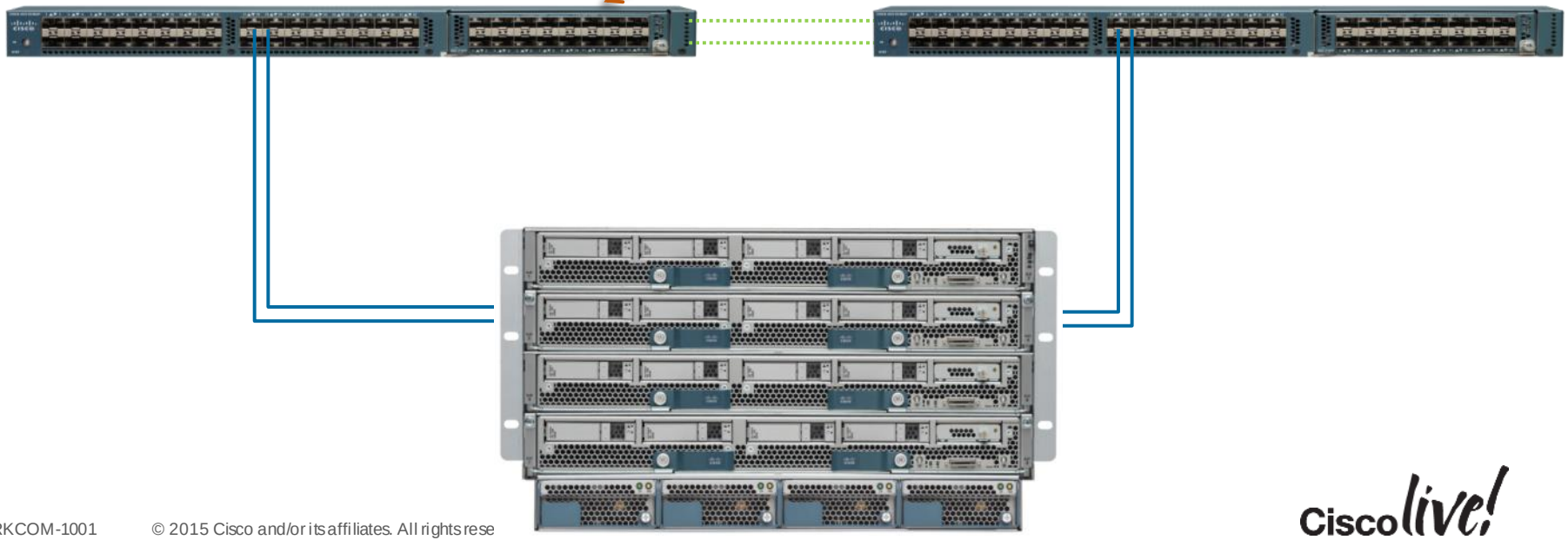
Pools	Policies	Templates
UUID	Boot Devices/Order	vNICs
MAC	Host F/W	vHBAs
WWNN / WWPN	QoS	

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



Cisco live!

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

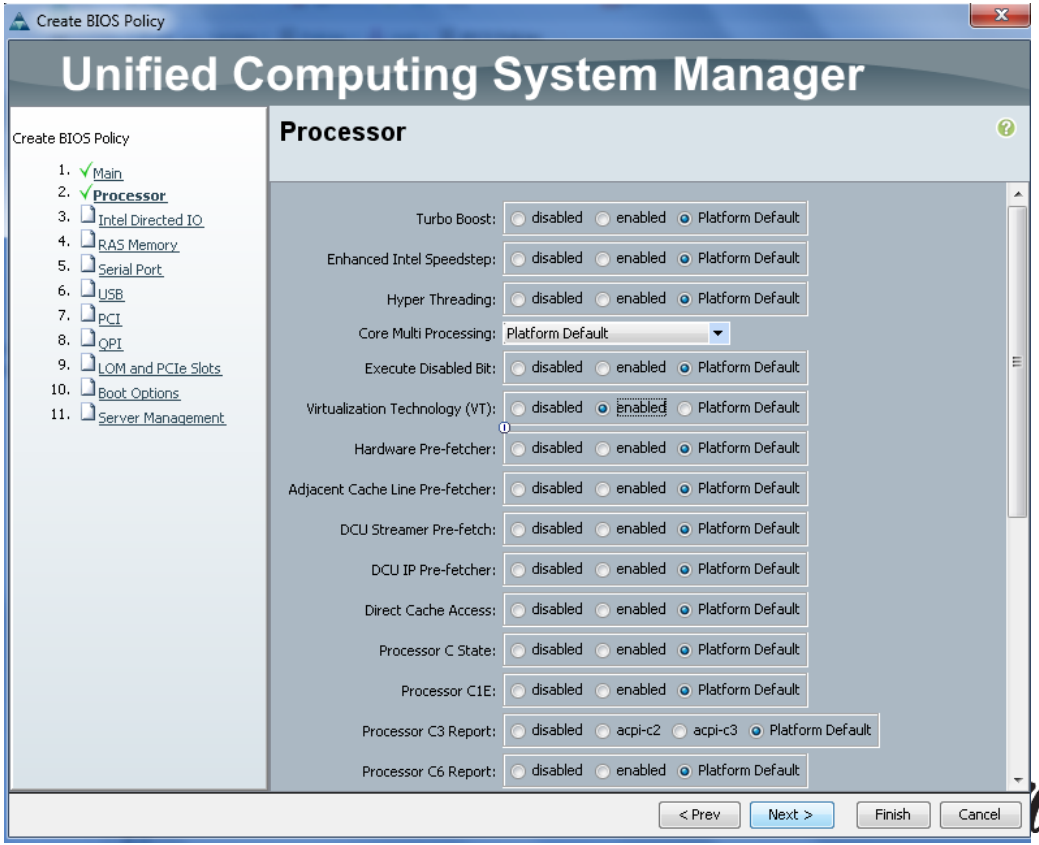
Pools	Policies	Templates
UUID	Boot Devices/Order	vNICs
MAC	Host F/W	vHBAs
WWNN / WWPN	QoS	

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

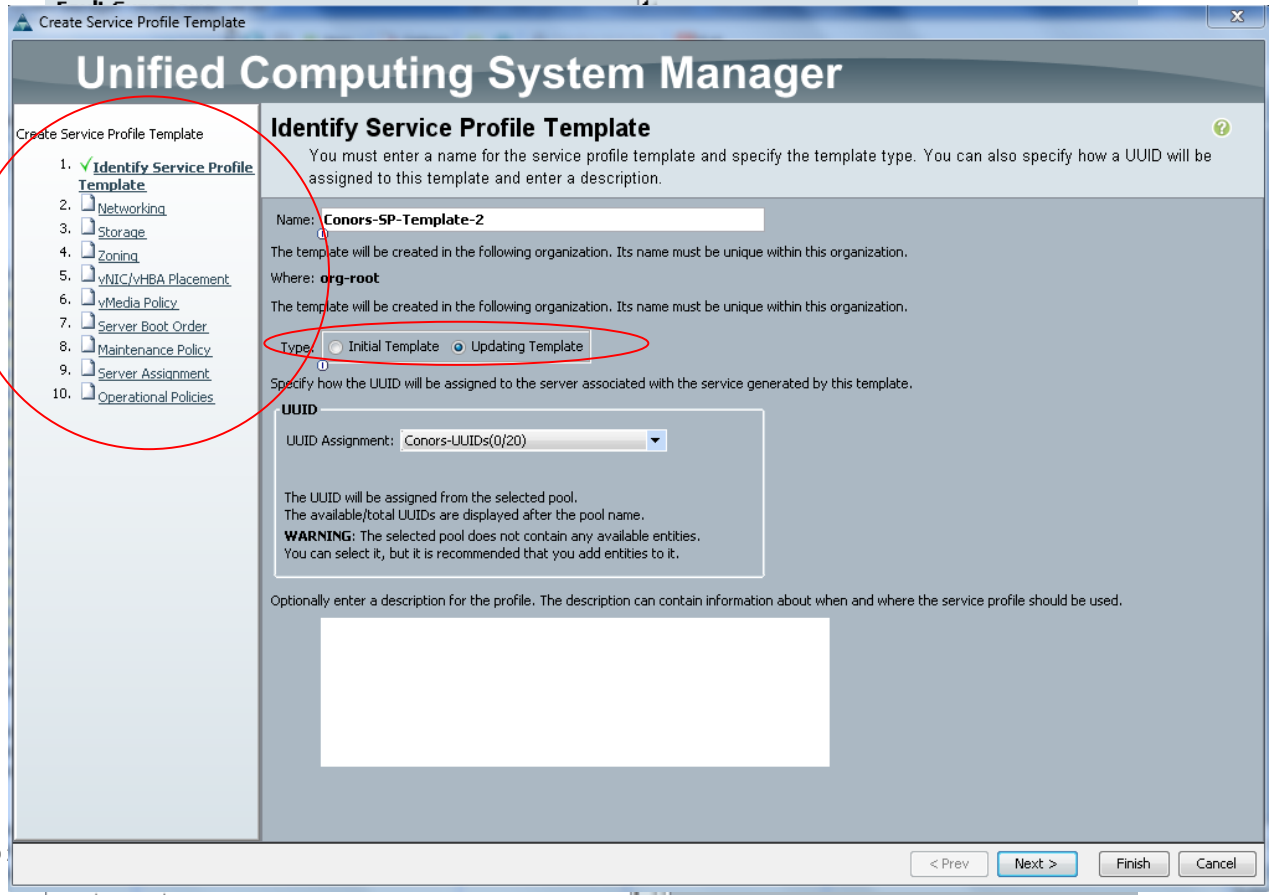
MAC : Derived **WWN: Derived**

Firmware 2.2 **Boot:SAN**

Step 2
Build A Server Group Template

UCS Key Features

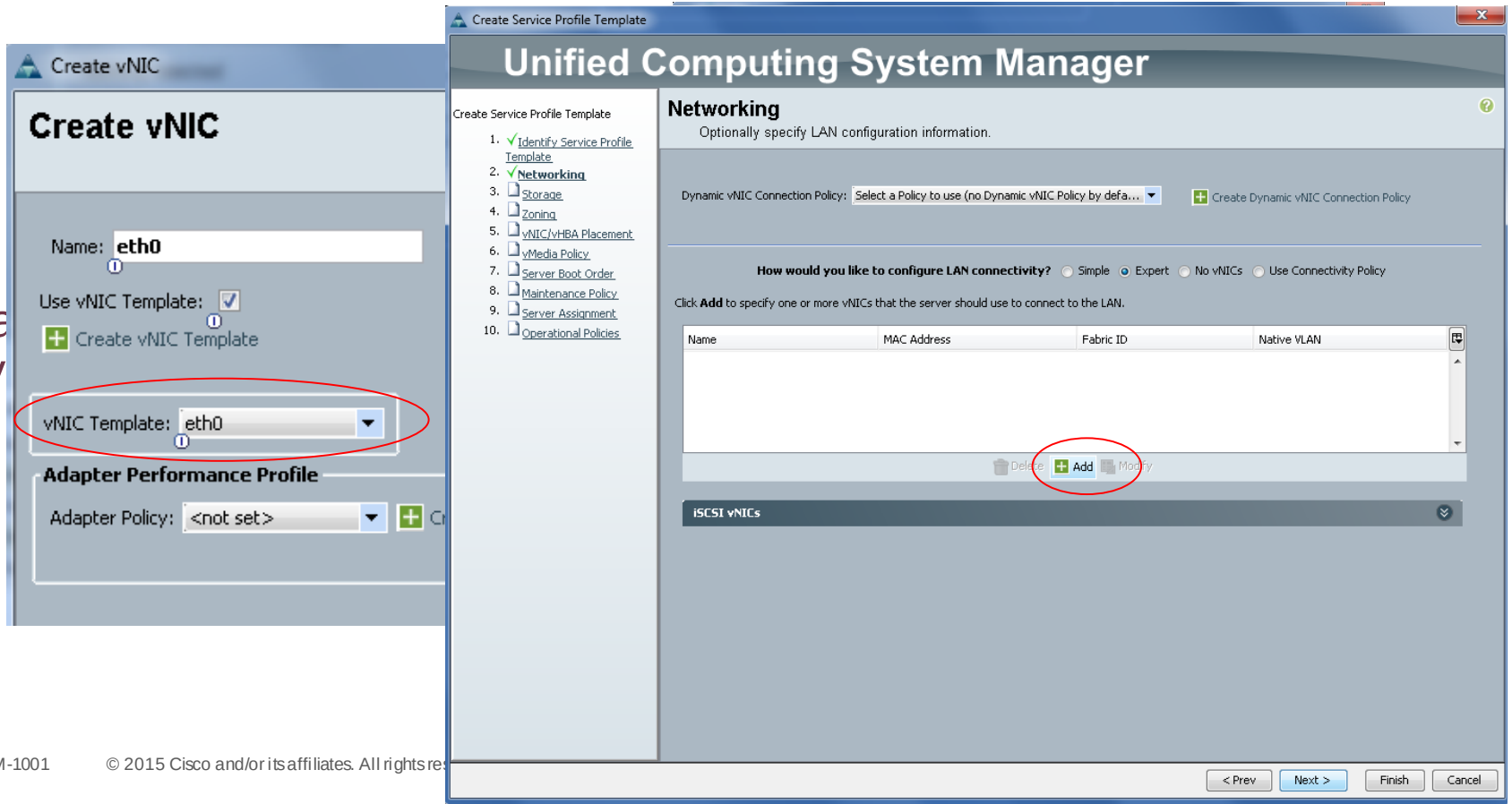
Logical Building Blocks – Building A Server – Service Profile Template



UCS Key Features

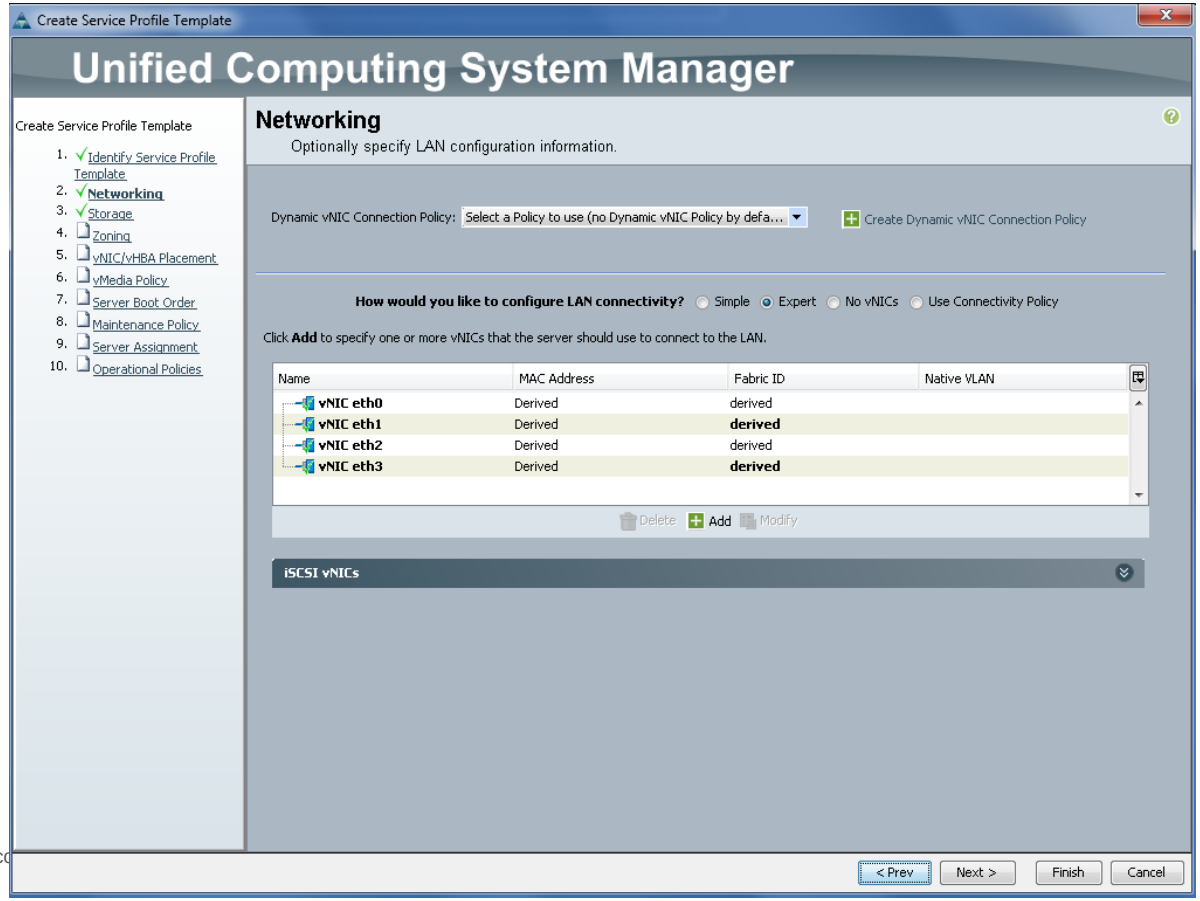
Logical Building Blocks – Building A Server – Service Profile Template

Howa
my



UCS Key Features

Logical Building Blocks – Building A Server – Service Profile Template



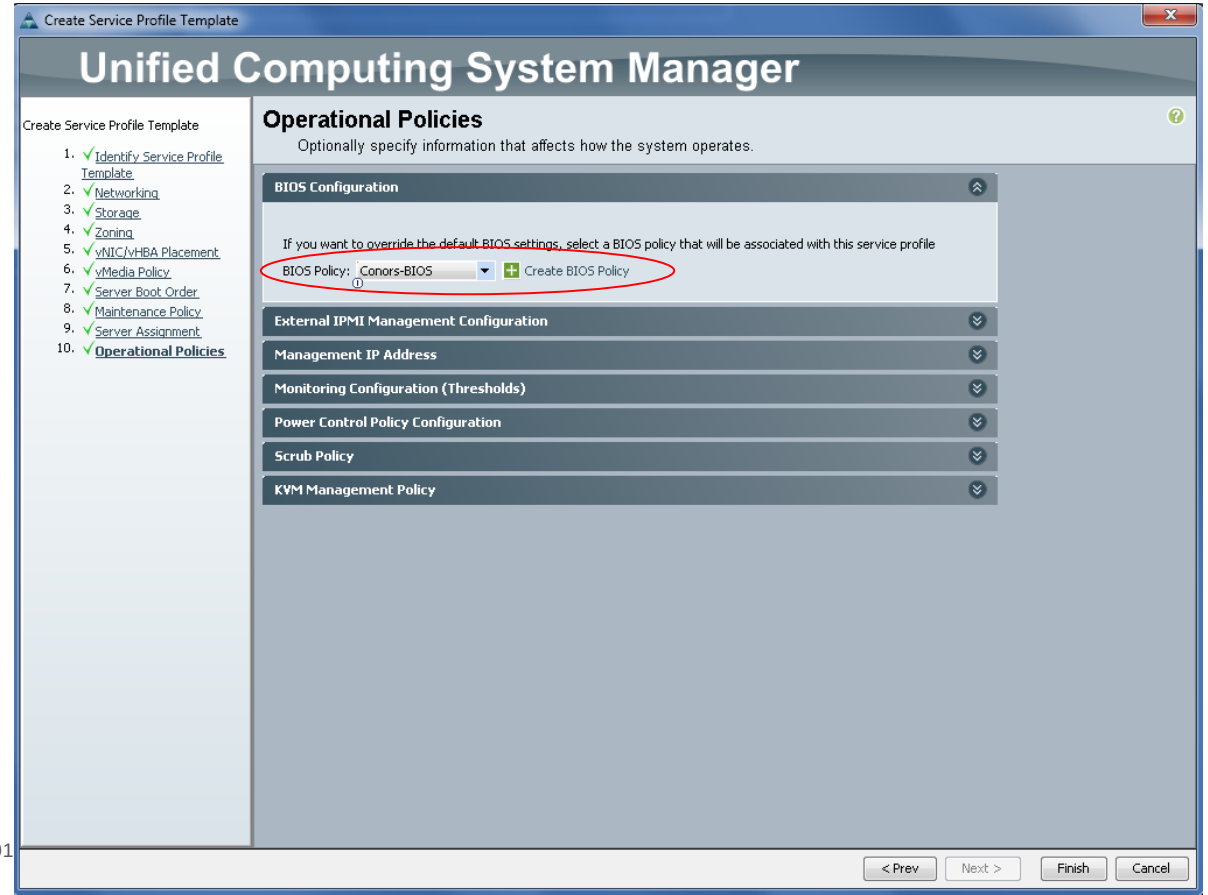
UCS Key Features

Logical Building Blocks – Building A Server – Service Profile Template

Cisco live!

UCS Key Features

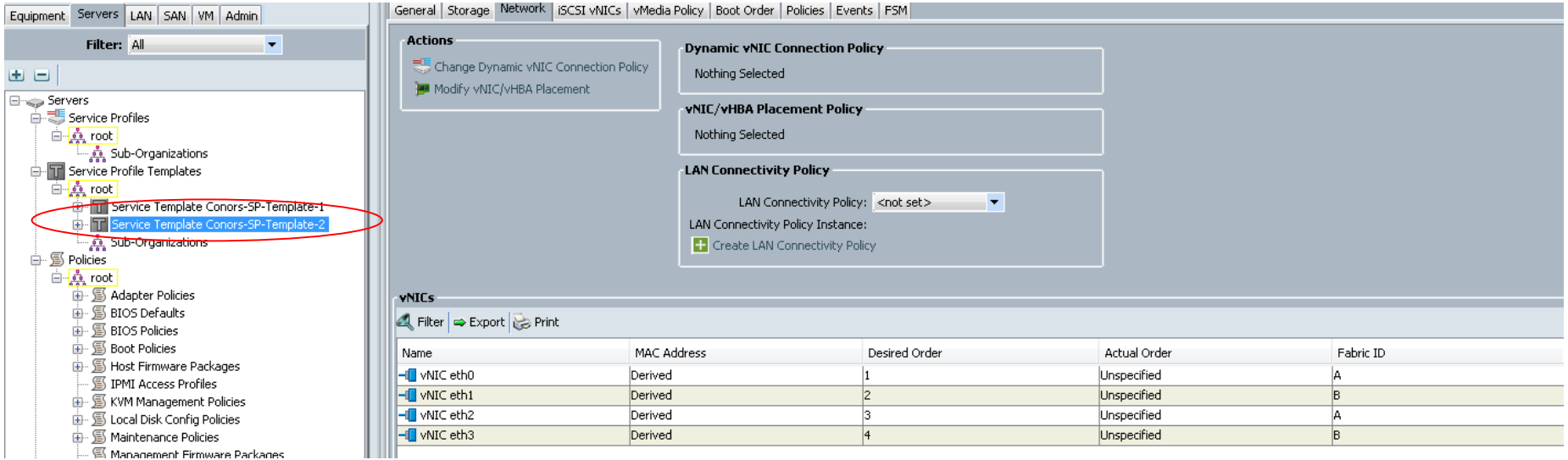
Logical Building Blocks – Building A Server – Service Profile Template

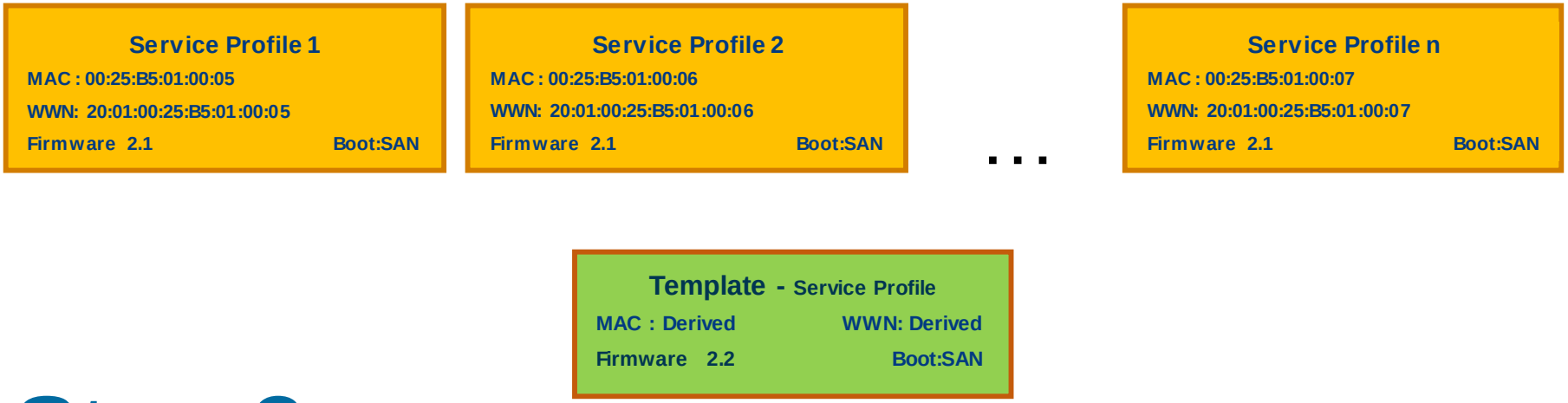


UCS Key Features

Logical Building Blocks – Building A Server – Service Profile Template

Our finished template – ready to deploy servers?



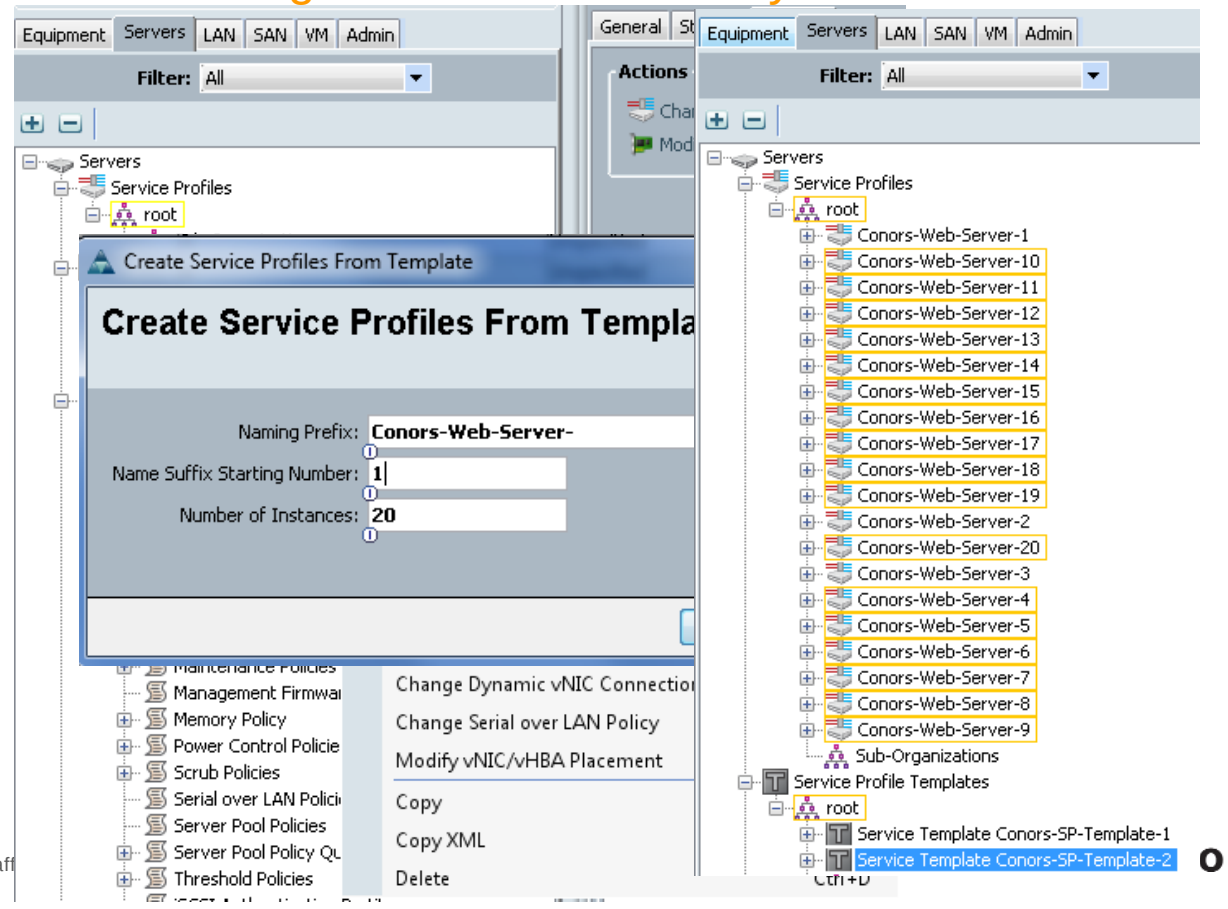


Step 3

Create The Logical Servers (Service Profiles)

UCS Key Features

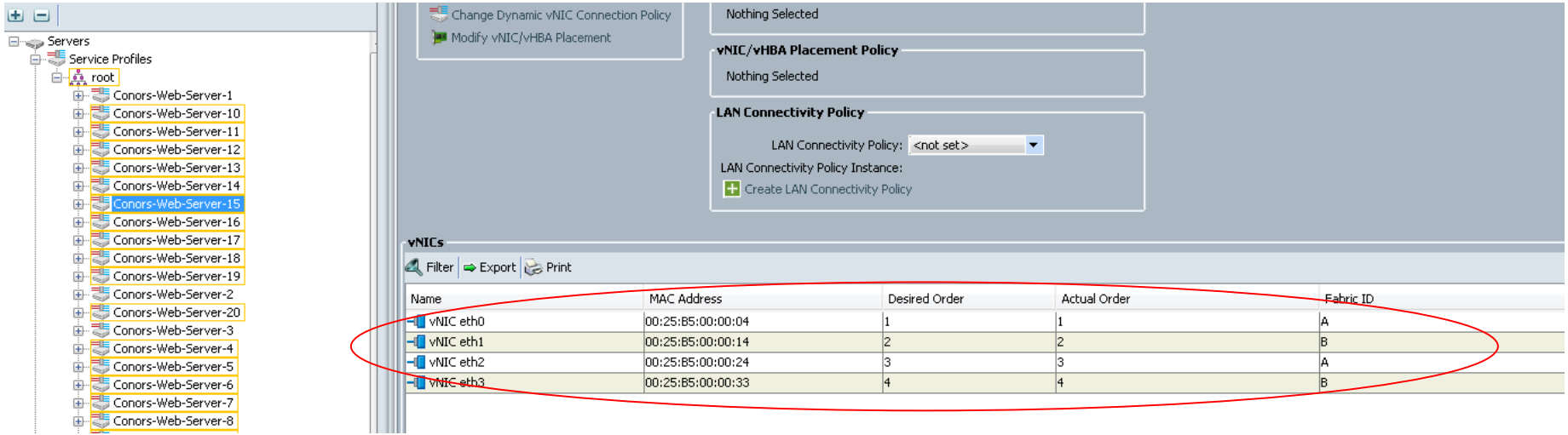
Logical Building Blocks – Building A Server – How Many Servers Do We Need?



UCS Key Features

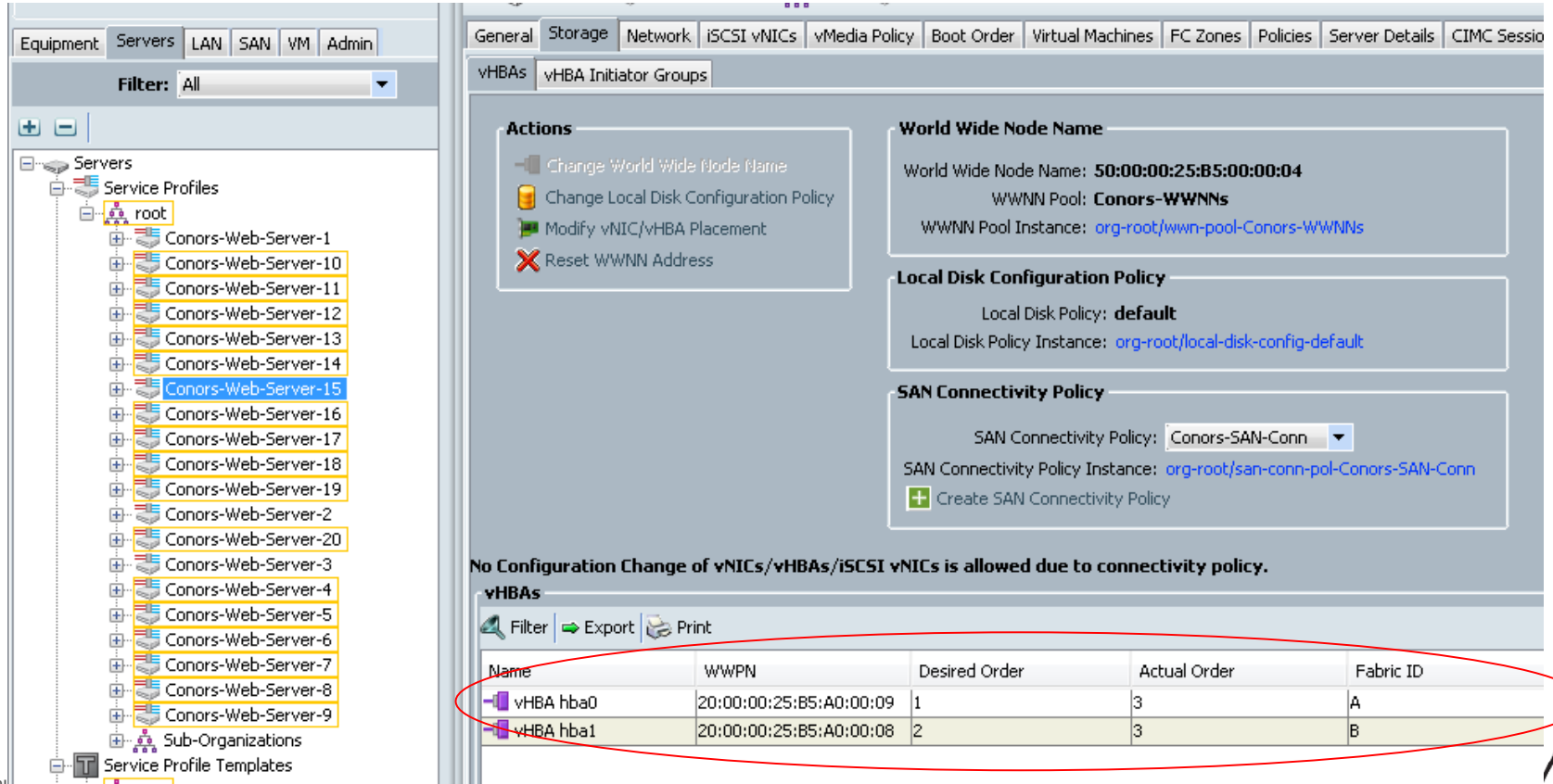
Logical Building Blocks – Building A Server – Our Logical Server

Confirming the config



UCS Key Features

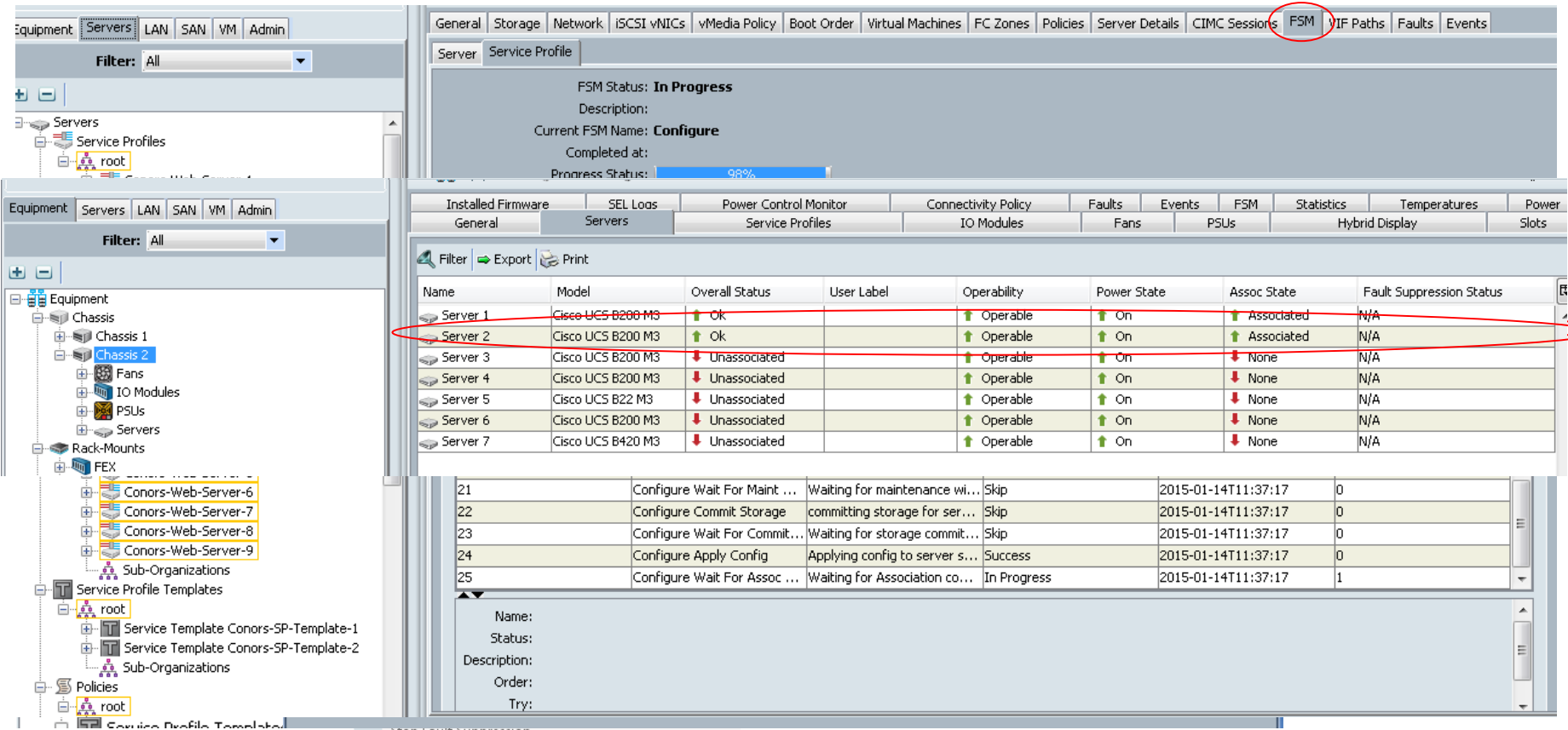
Logical Building Blocks – Building A Server – Our Logical Server



Step 4
Associate To Hardware

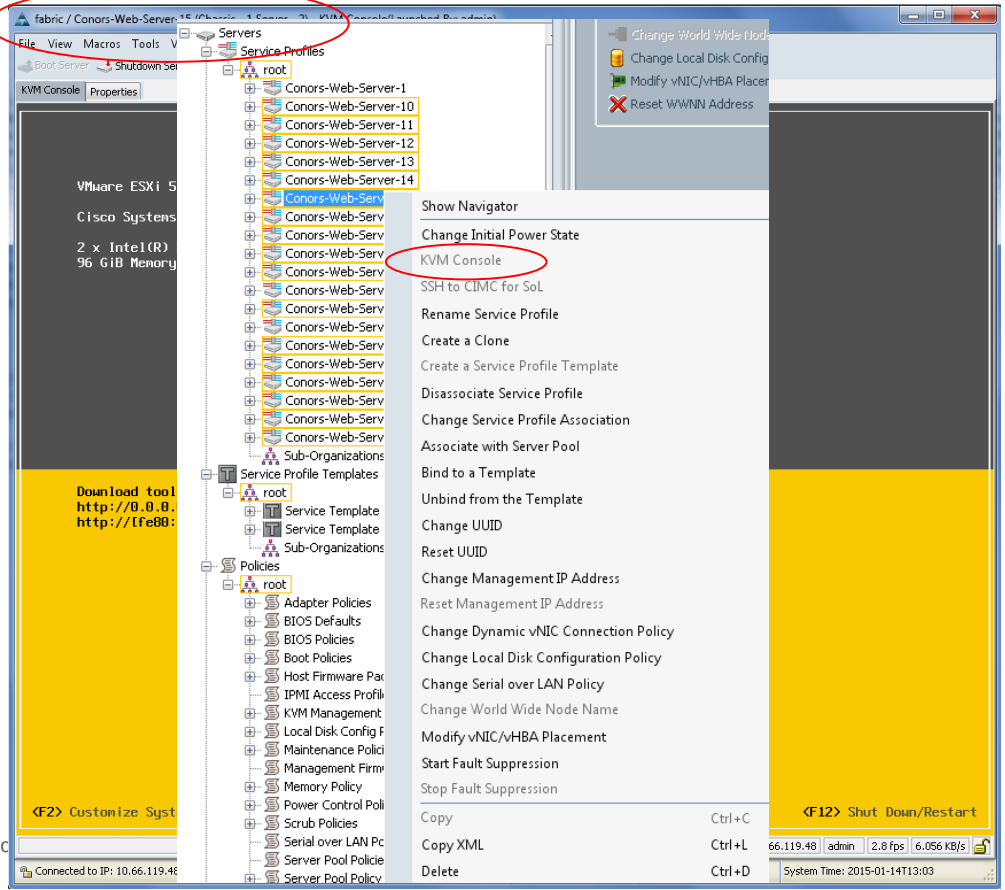
UCS Key Features

Logical Building Blocks – Associating Service Profile To Hardware



UCS Key Features

Logical Building Blocks – Accessing The Server - KVM

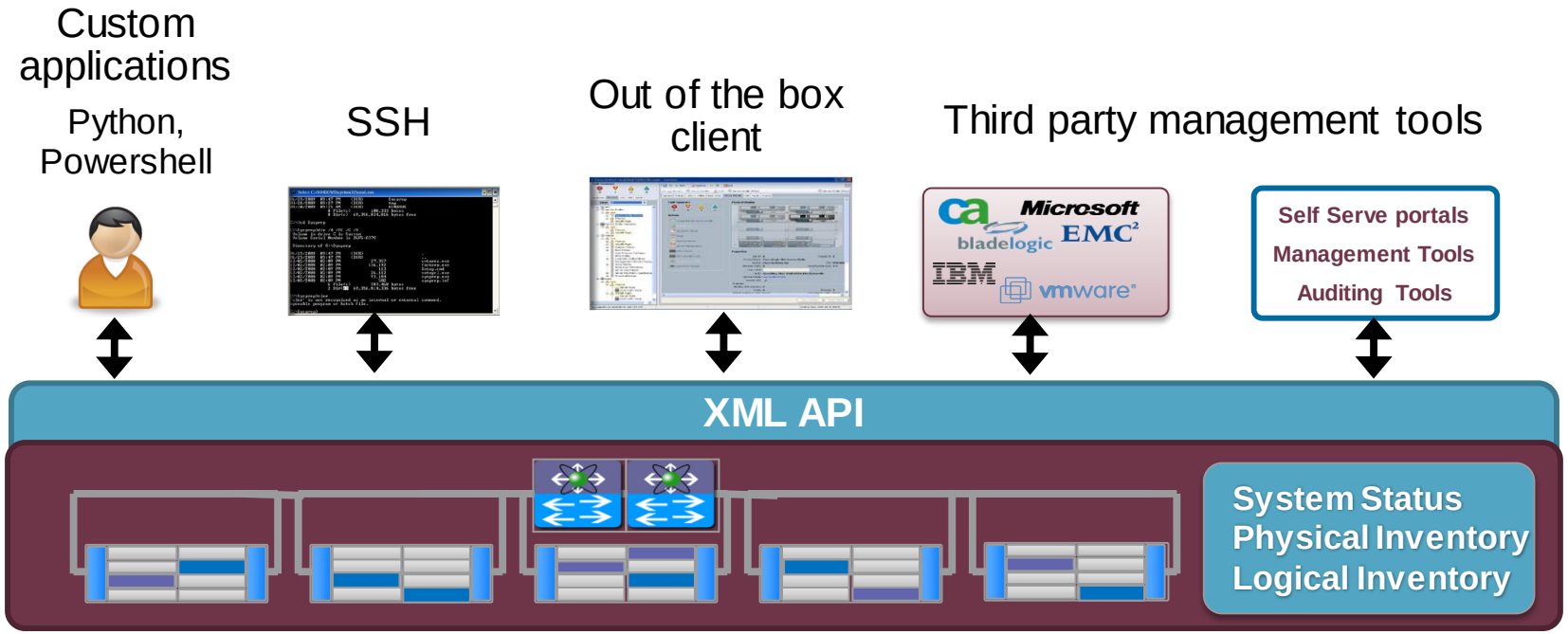


Agenda

- 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

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/

cisco DevNet

Menu | Overview | Documentation | Communities | IVT Testing | UCS Management Ecosystem | VM-FEX | Flexpod

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.

Developer Guides

Download all files in section as ZIP

Cisco UCS Manager XML API Programmer's Guide.pdf
22 Sep 2011:

Cisco UCS Interfaces White Paper.pdf
15 Jul 2010:

Cisco UCS Manager API Management Information...
19 Apr 2010

Third Party Tools.pdf
31 Mar 2010:

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

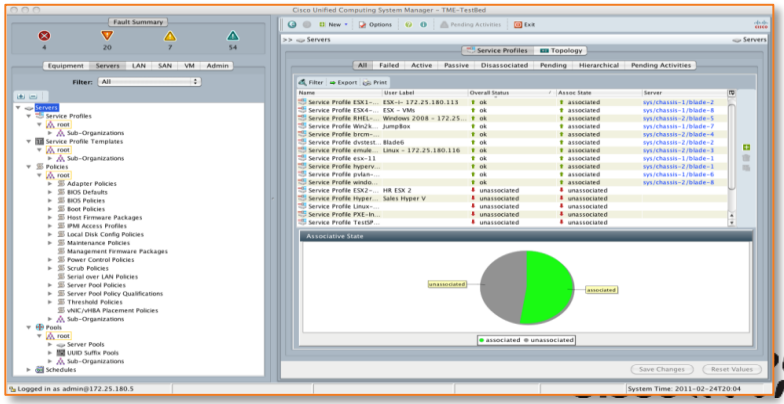
Cisco UCS Python SDK for UCS Manager is a Python module that helps automate and manage configurations within UCS Manager including service profiles, policies, pools, equipment, and network and storage management. Cisco UCS Python SDK for IMC is a Python module that helps automate and manage configurations 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

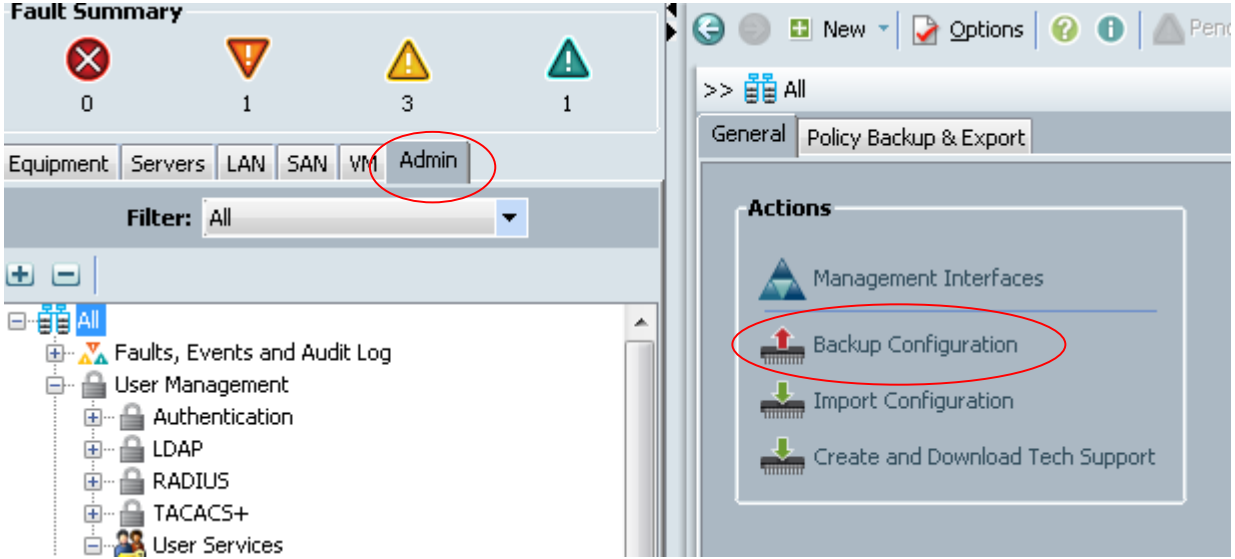
http://communities.cisco.com/ucspe

- 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



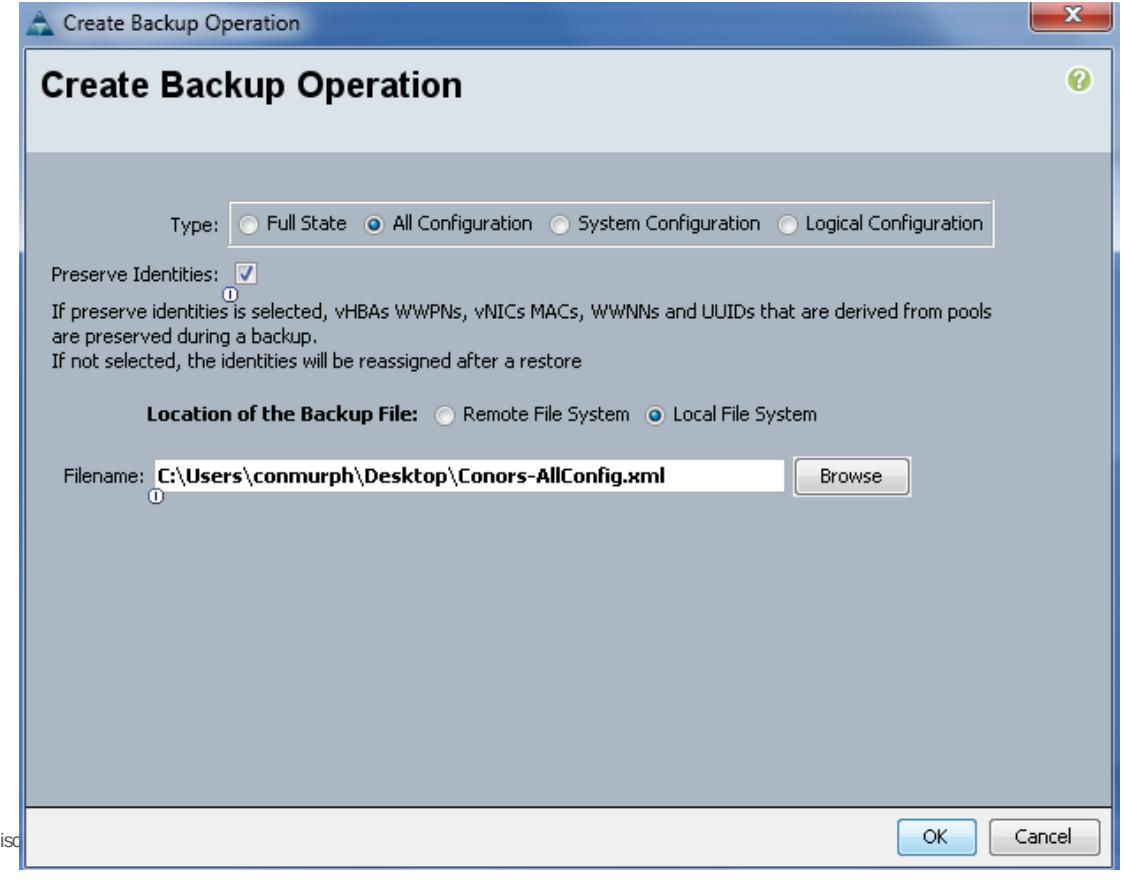
UCS Key Features

XML API and Other Hidden Gems – Simple Backup



UCS Key Features

XML API and Other Hidden Gems – Simple Backup



UCS Key Features

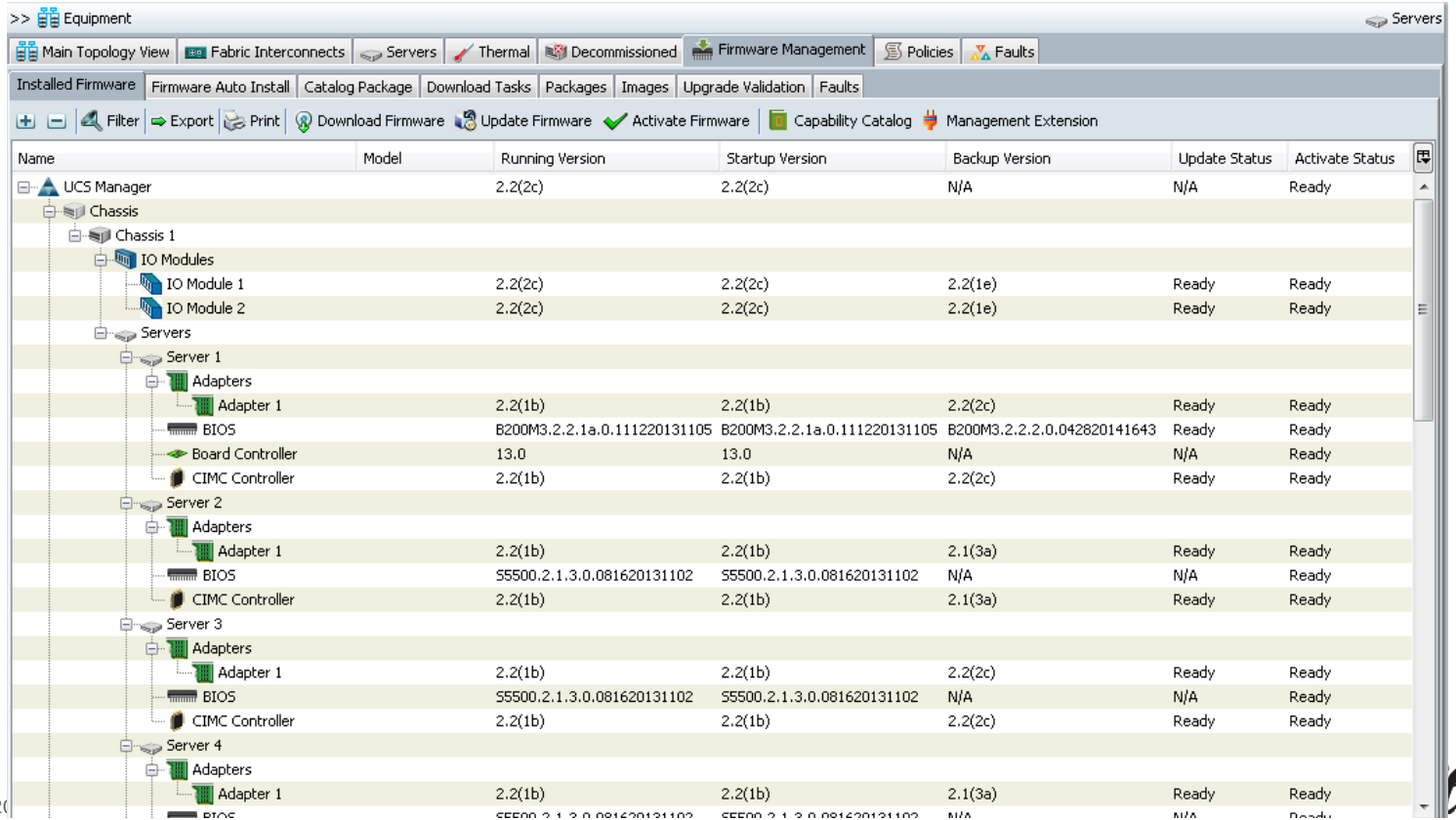
XML API and Other Hidden Gems – Simple Backup – Conors-AllConfig.xml


```
<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>
```


Cisco live!

UCS Key Features

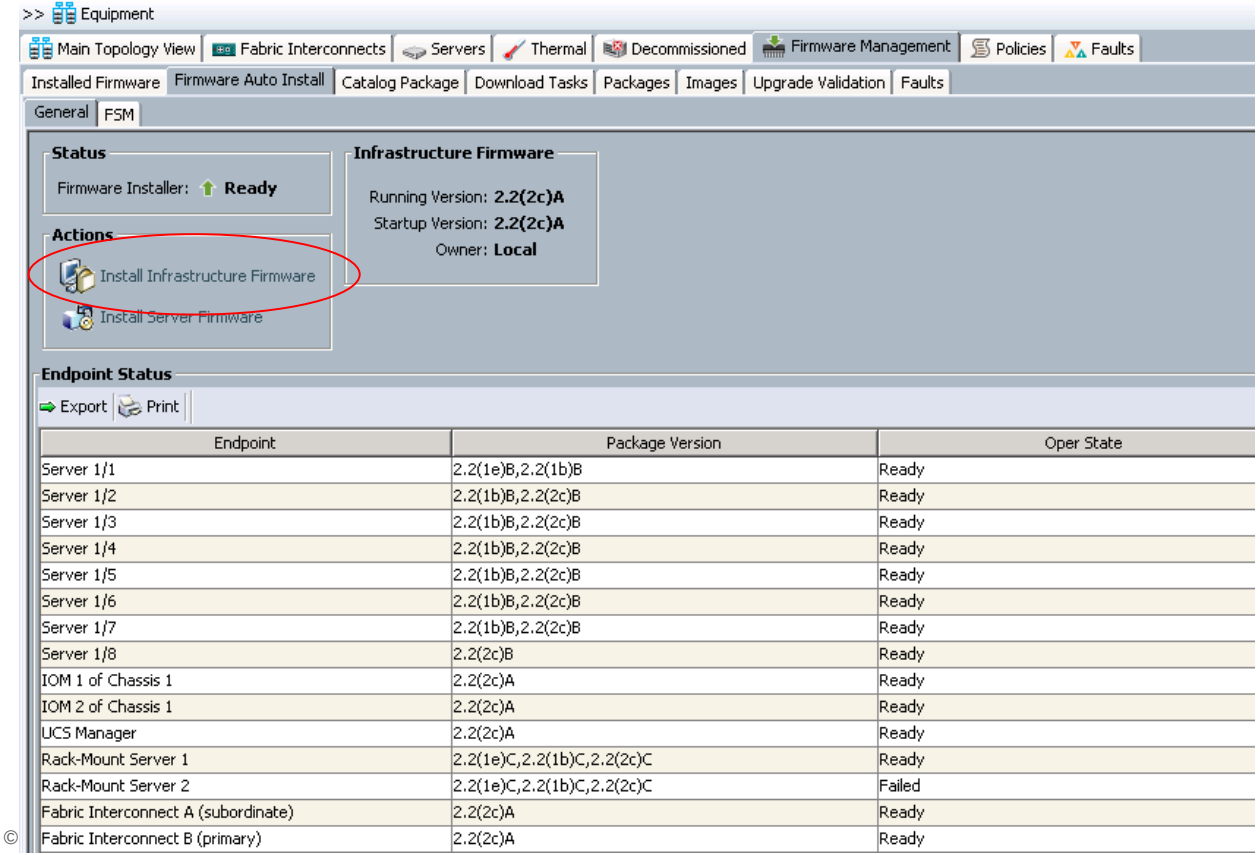
XML API and Other Hidden Gems – Firmware Visibility



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	B200M3.2.2.2.0.042820141643	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	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	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

UCS Key Features

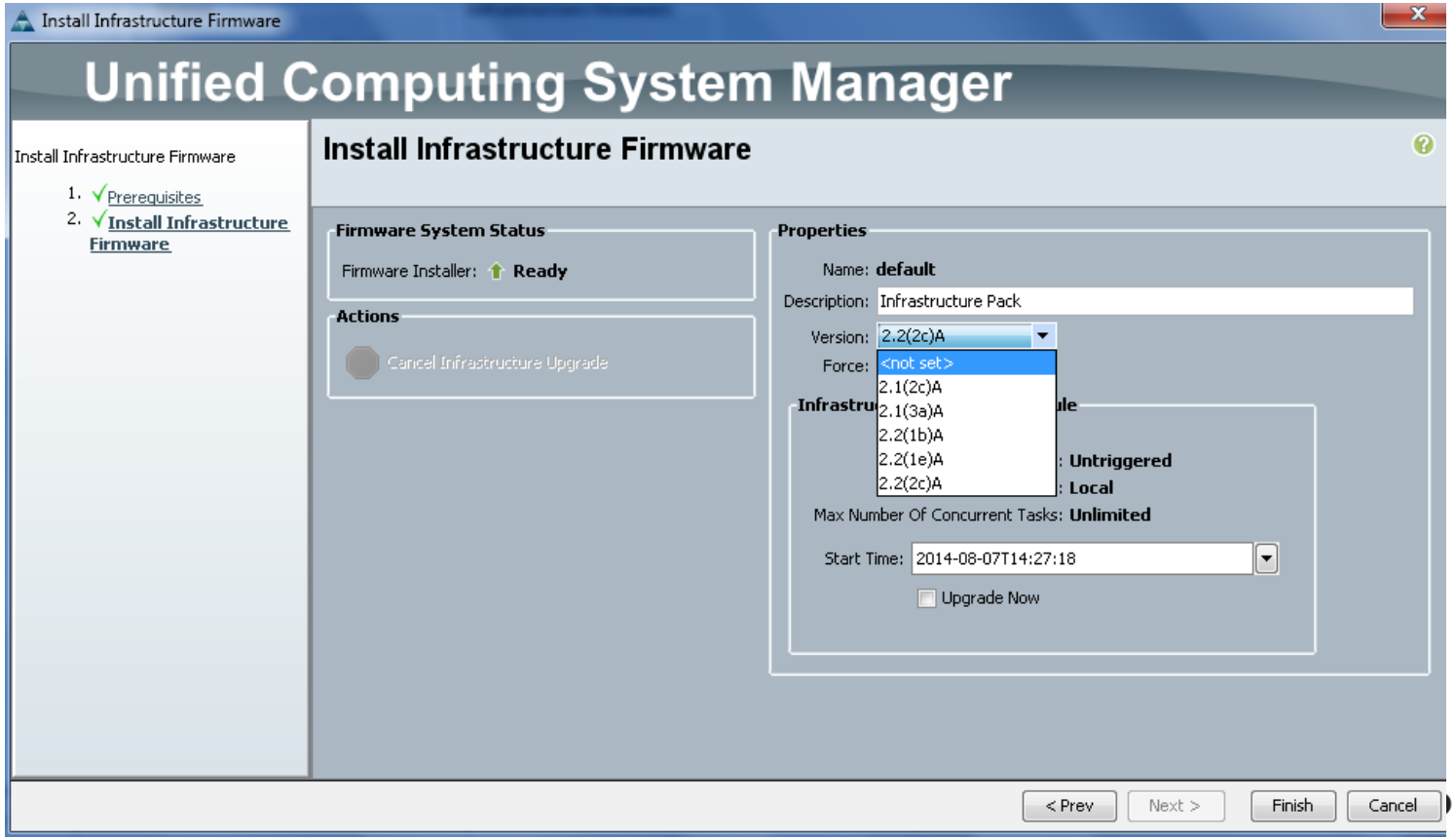
XML API and Other Hidden Gems – Firmware Visibility



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

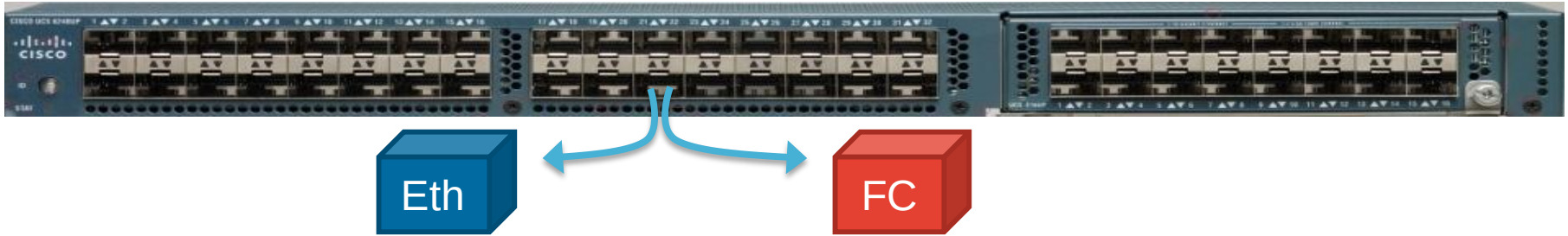
UCS Key Features

XML API and Other Hidden Gems – Firmware Auto-install



UCS Key Features

XML API and Other Hidden Gems – Unified Ports



Native Fibre Channel

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

Benefits

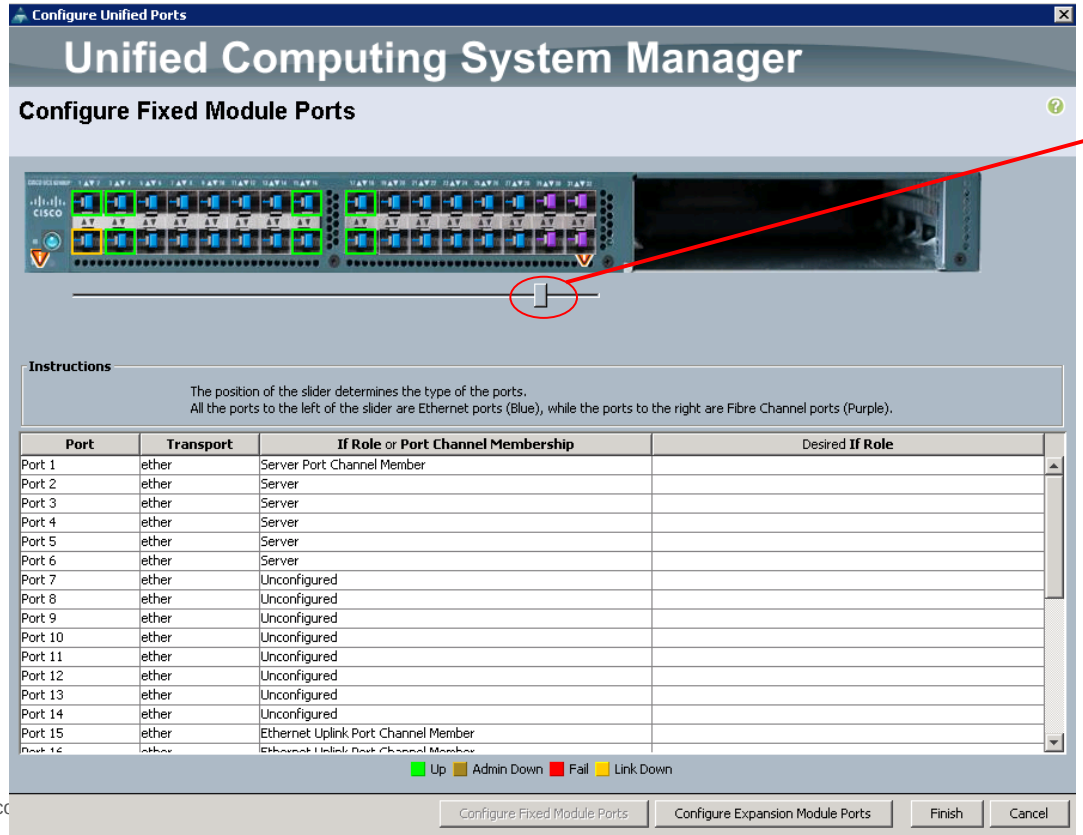
- Simplify switch purchase - remove ports ratio guess work
- Increase design flexibility
- Remove specific protocol bandwidth bottlenecks

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



Use slider to configure unified ports

Ethernet on the left

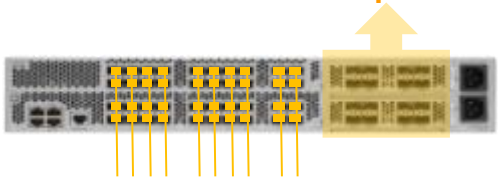
Fibre Channel on the right

Agenda

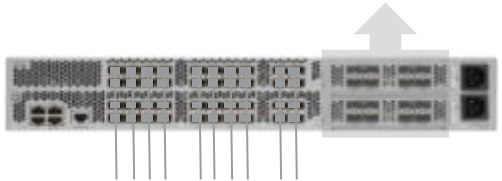
- UCS Overview
  - Components – Traditional blade and rack servers
  - Basic Connectivity – Compute, LAN, SAN
- Key Features
  - Scaling with Single Point of Management
  - UCS Service Profiles – Logical Building Blocks
  - UCS – XML API and Other Hidden Gems
- New UCS Form Factors
  - UCS Mini
  - UCS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

New UCS Form Factors

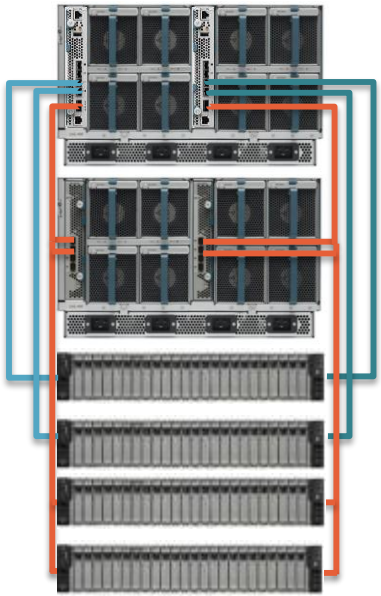
UCS Mini – Scale up to 20 Servers



New Form Factor Fabric Interconnects 6324



Traditional Fabric Interconnects

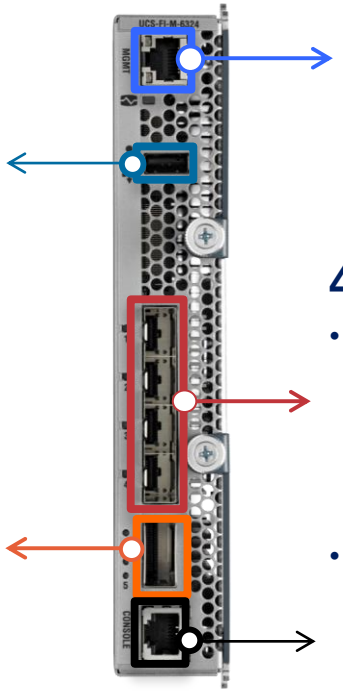


Same Great Features

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

New UCS Form Factors

UCS Mini – FI 6324



Management Port

- 10/100/1000 Mbps

USB Port

- Firmware upgrades

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

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

New UCS Form Factors

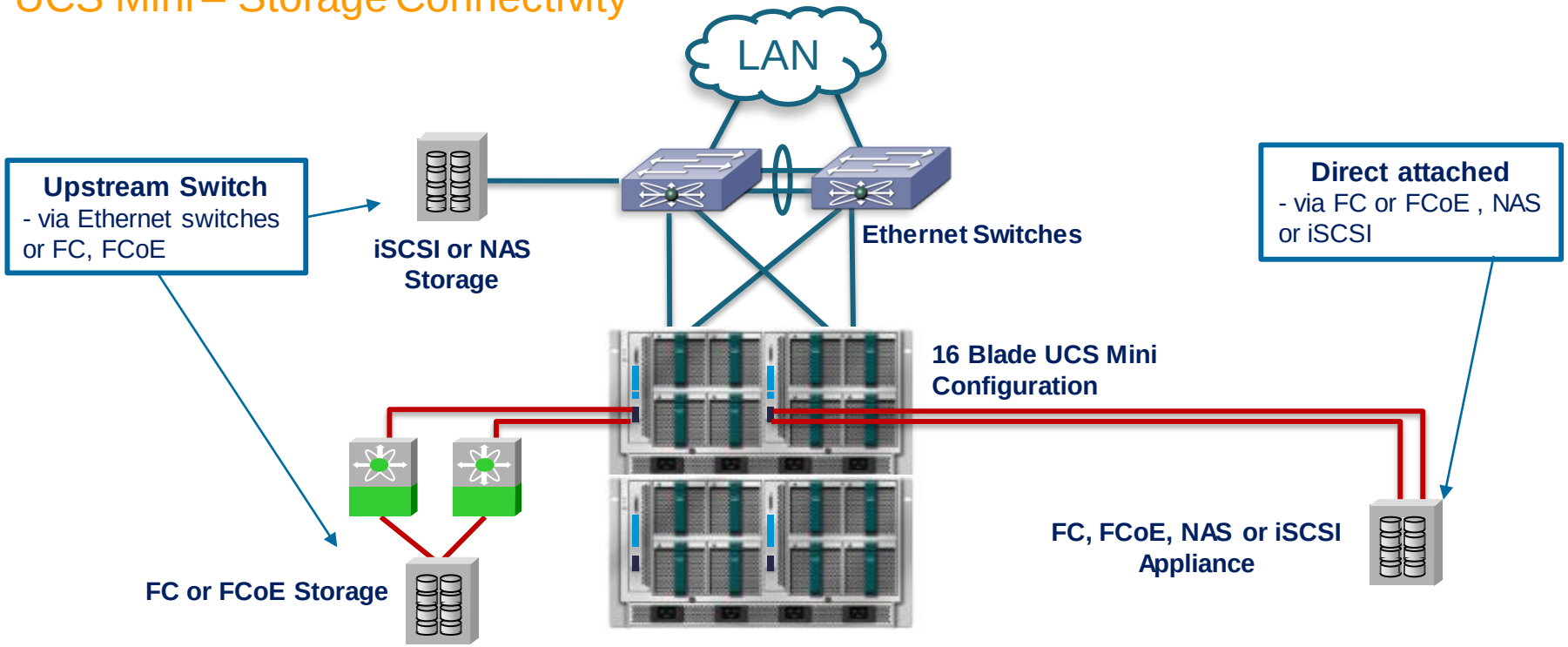
UCS Mini – Software Feature Support

- 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

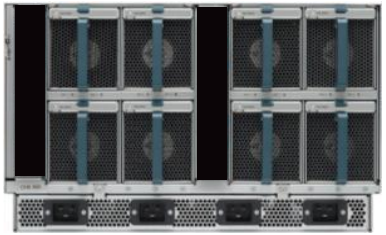


Currently no NPV support

New UCS Form Factors

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

More than 20 Servers

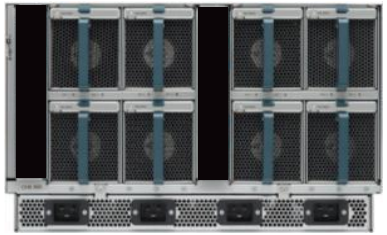


UCS 5108 Chassis
Supports existing and future blades

IO Modules

6248 or 6296 Fabric
Fabric Interconnects

Less than 20 Servers



UCS 5108 Chassis
Supports existing and future blades

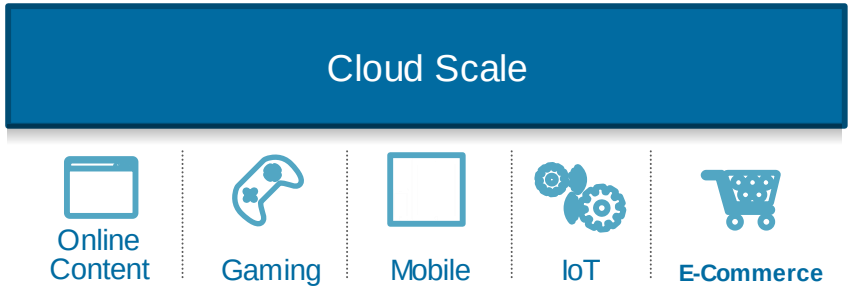
6324 Fabric Interconnect

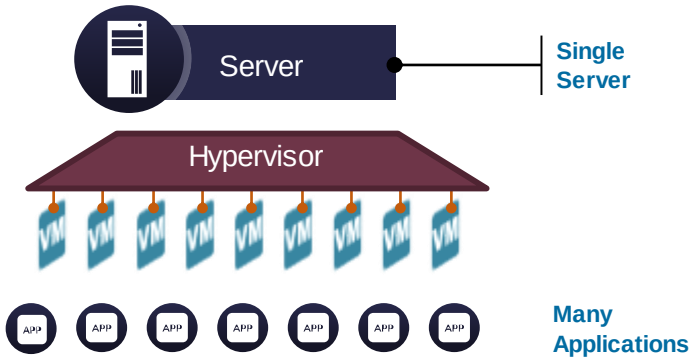
Agenda

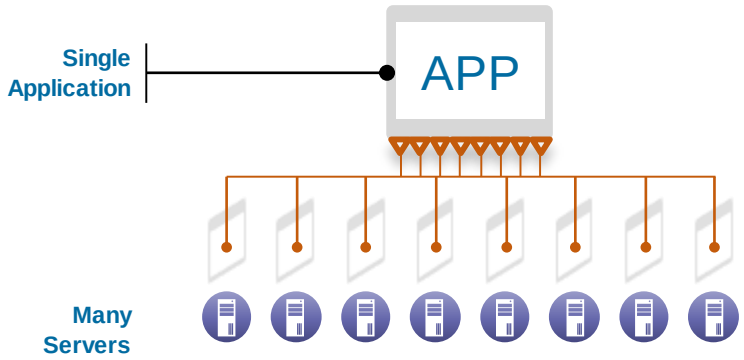
- UCS Overview
  - Components – Traditional blade and rack servers
  - Basic Connectivity – Compute, LAN, SAN
- Key Features
  - Scaling with Single Point of Management
  - UCS Service Profiles – Logical Building Blocks
  - UCS – XML API and Other Hidden Gems
- New UCS Form Factors
  - UCS Mini
  - UCS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

New UCS Form Factors

UCS M-Series – Cloud-Scale Inverts Computing Architecture



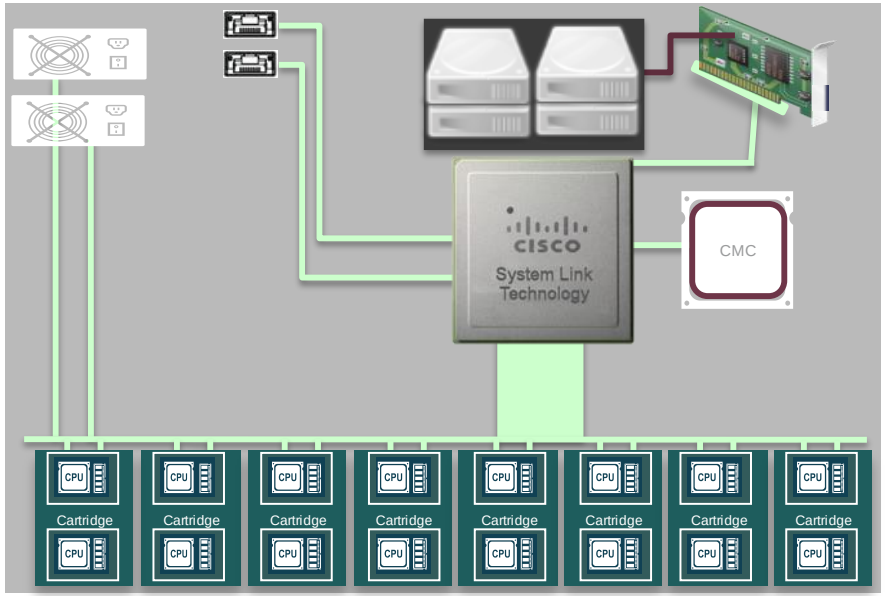




New UCS Form Factors

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

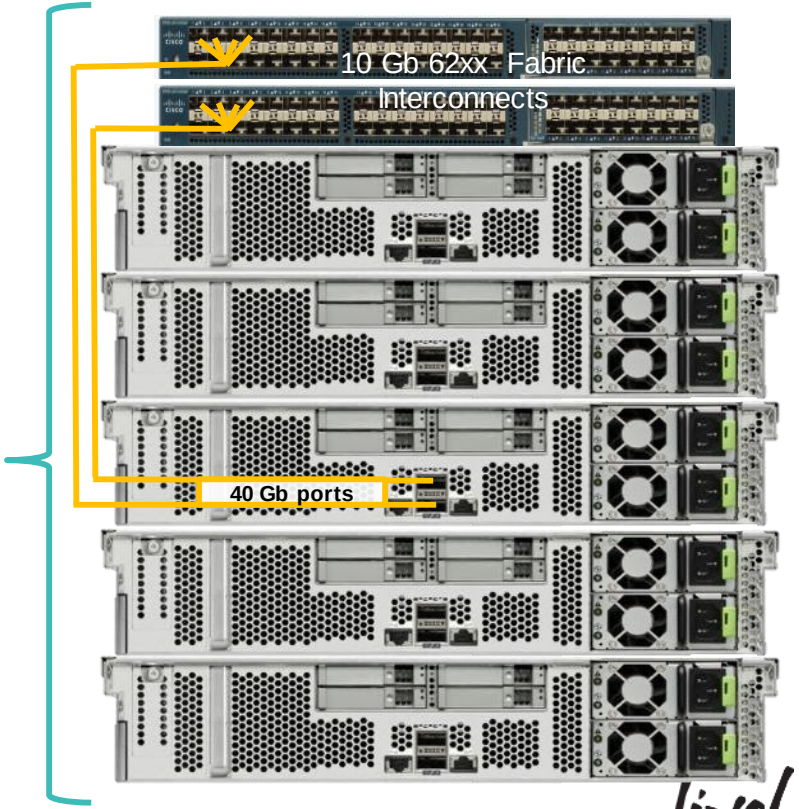
Chassis – 20

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

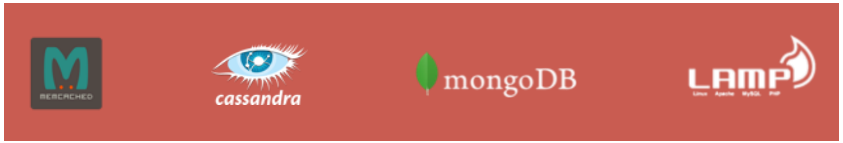
- Gaming

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 McQuerry

Cisco live!

Cisco Unified Computing System (UCS)

Single Point of Management

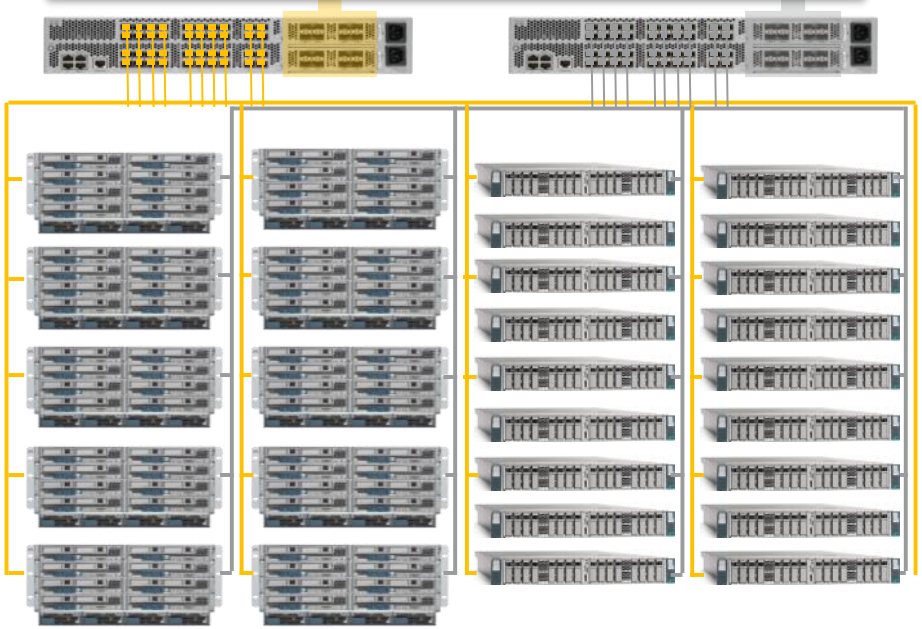
Choice of Form Factor

UCS Platform Emulator

Unified Ports

Simple Backup

Scale With Ease



Firmware Auto-install

Blade, Rack or Cartridge

XML API

Multi-Tenanted

Unified Fabric

Logical Building Blocks

Hardware/Software Abstraction (Service Profiles)

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  - 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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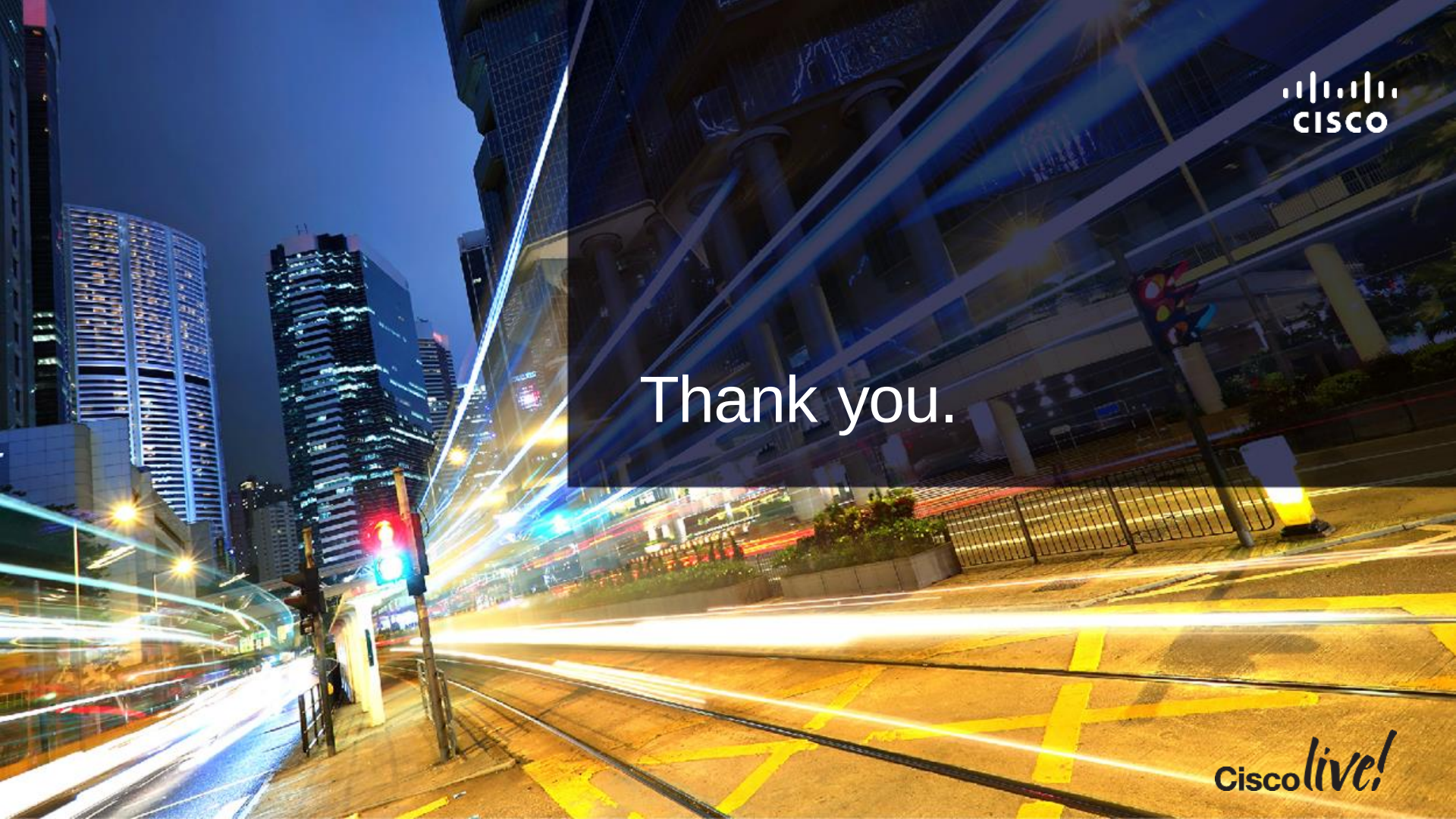
Thank you.


CISCO

Reference Slides

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

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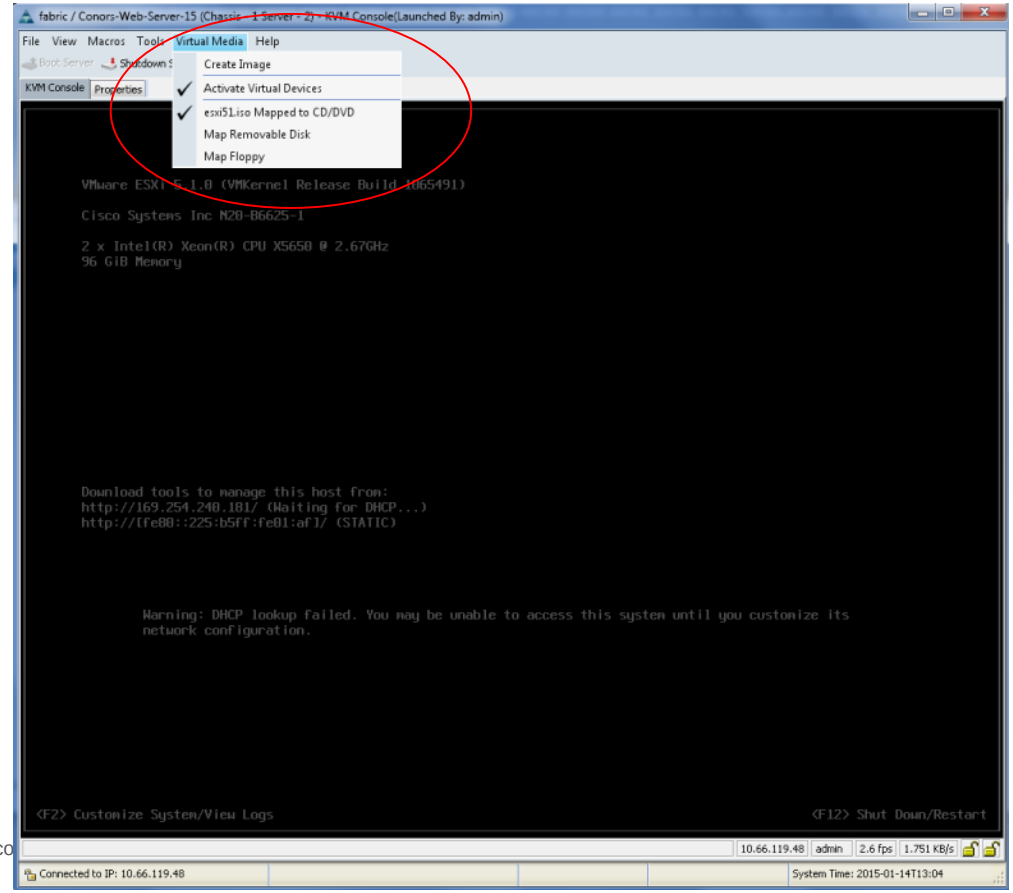
UCS Components

Cable for bandwidth, not for protocol

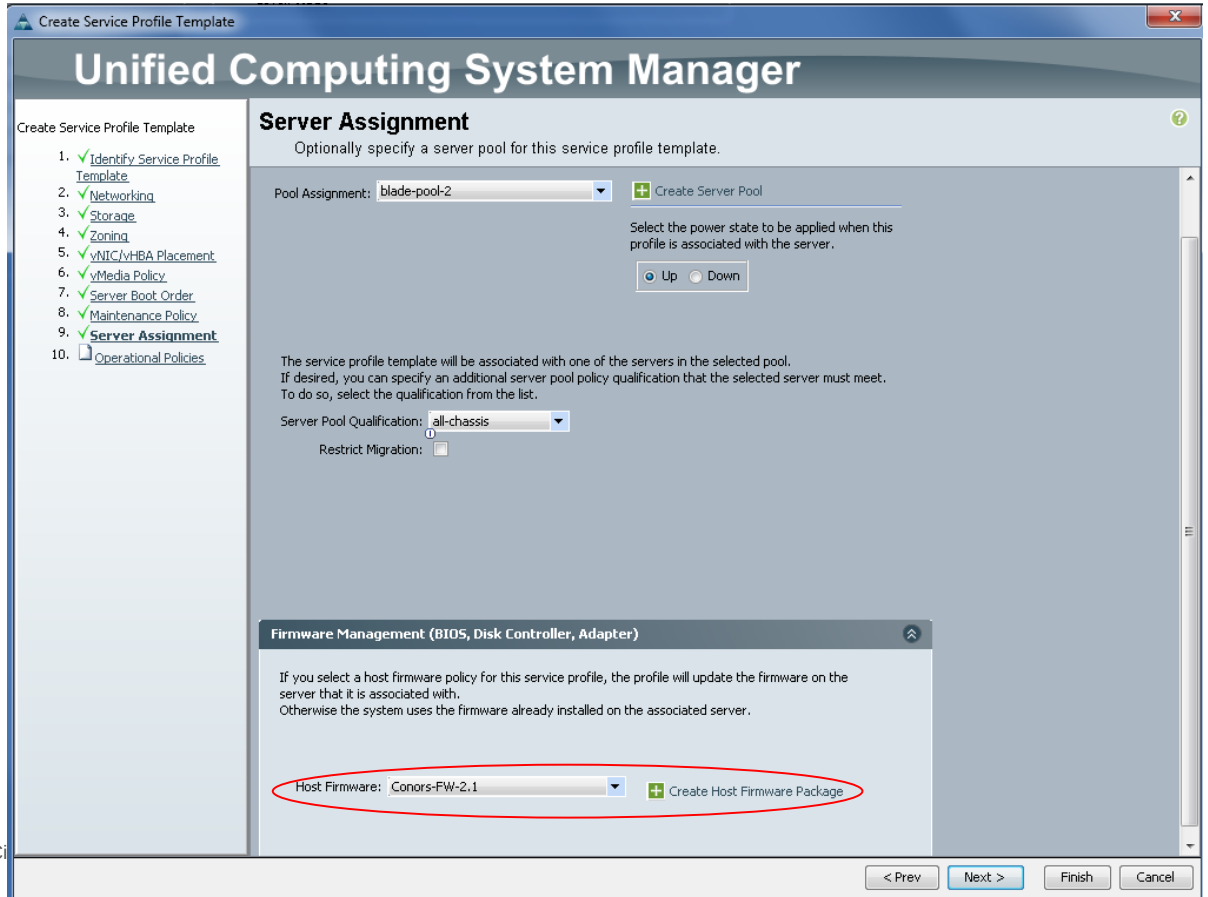
UCS Key Features

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



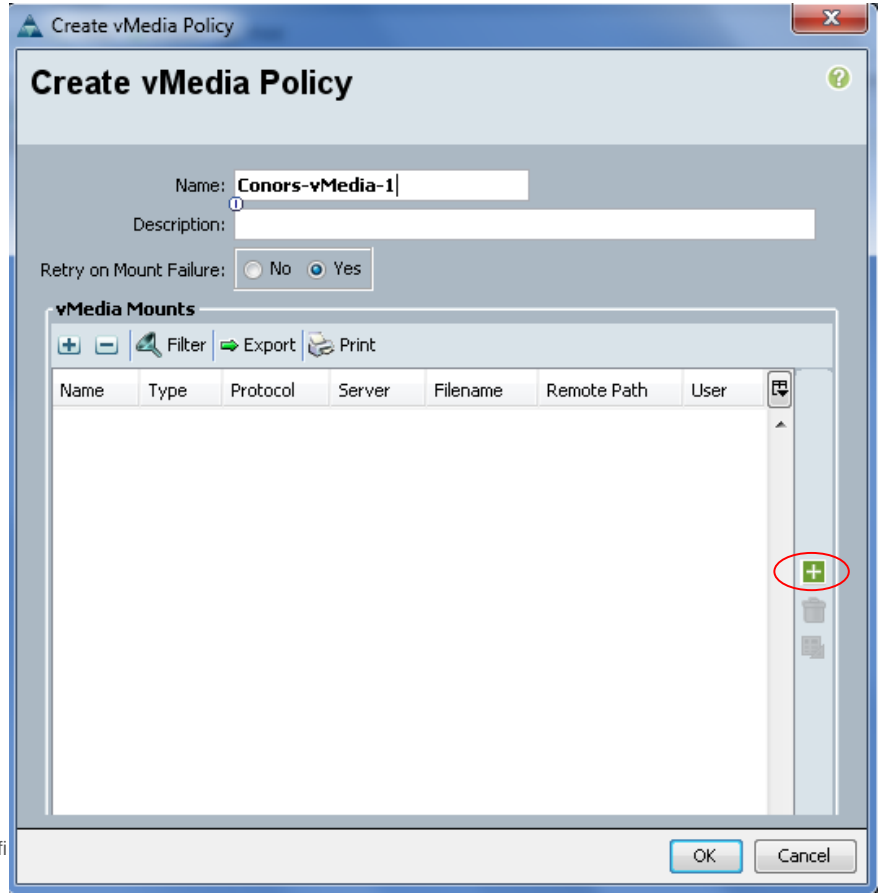
UCS Key Features

Logical Building Blocks – Building A Server – Service Profile Template



UCS Key Features

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



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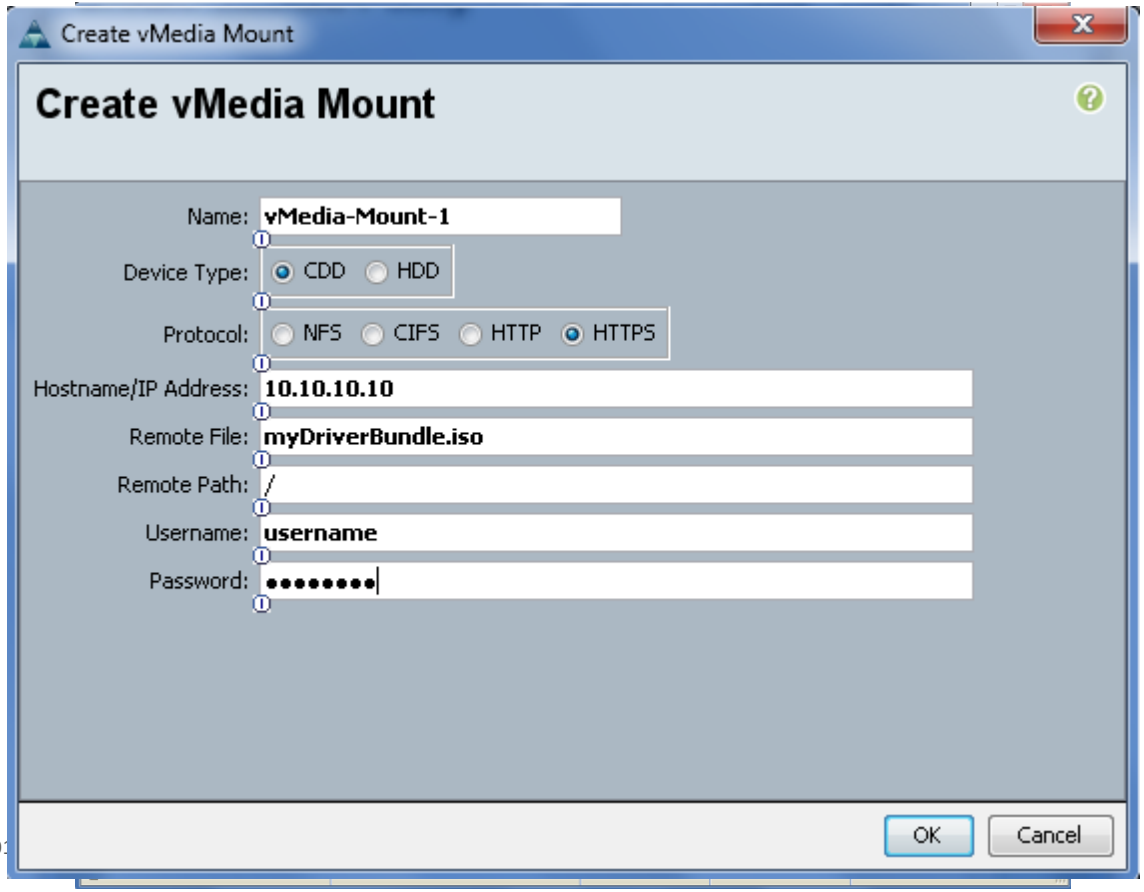
UCS Key Features

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



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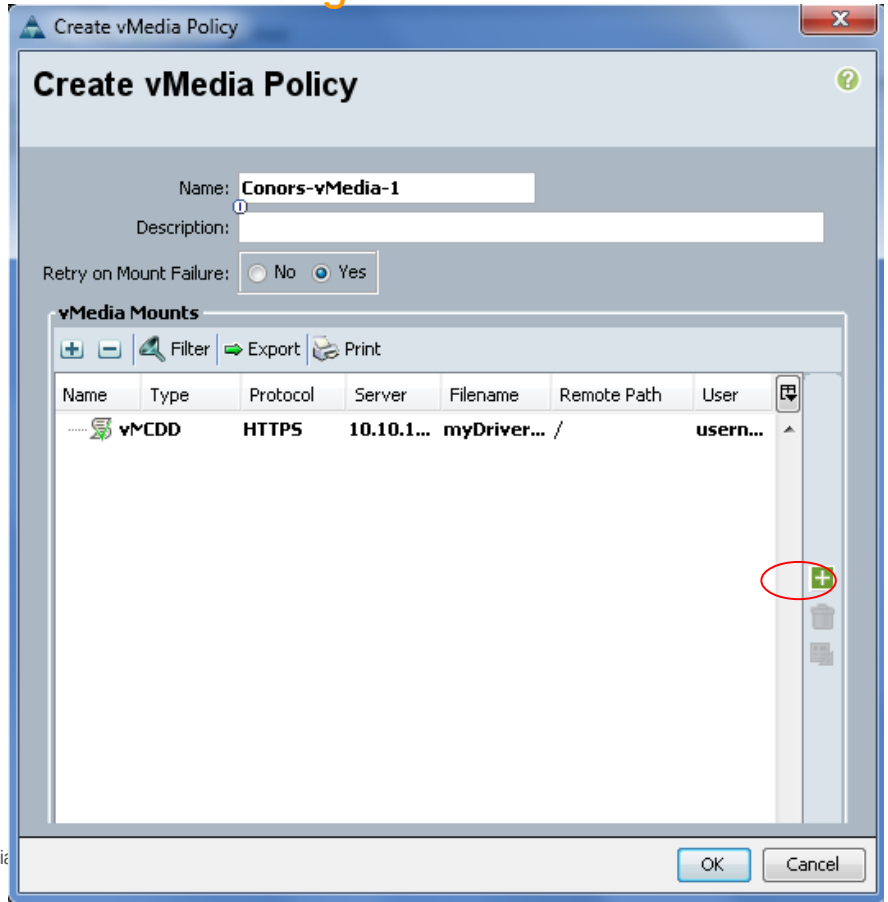
UCS Key Features

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



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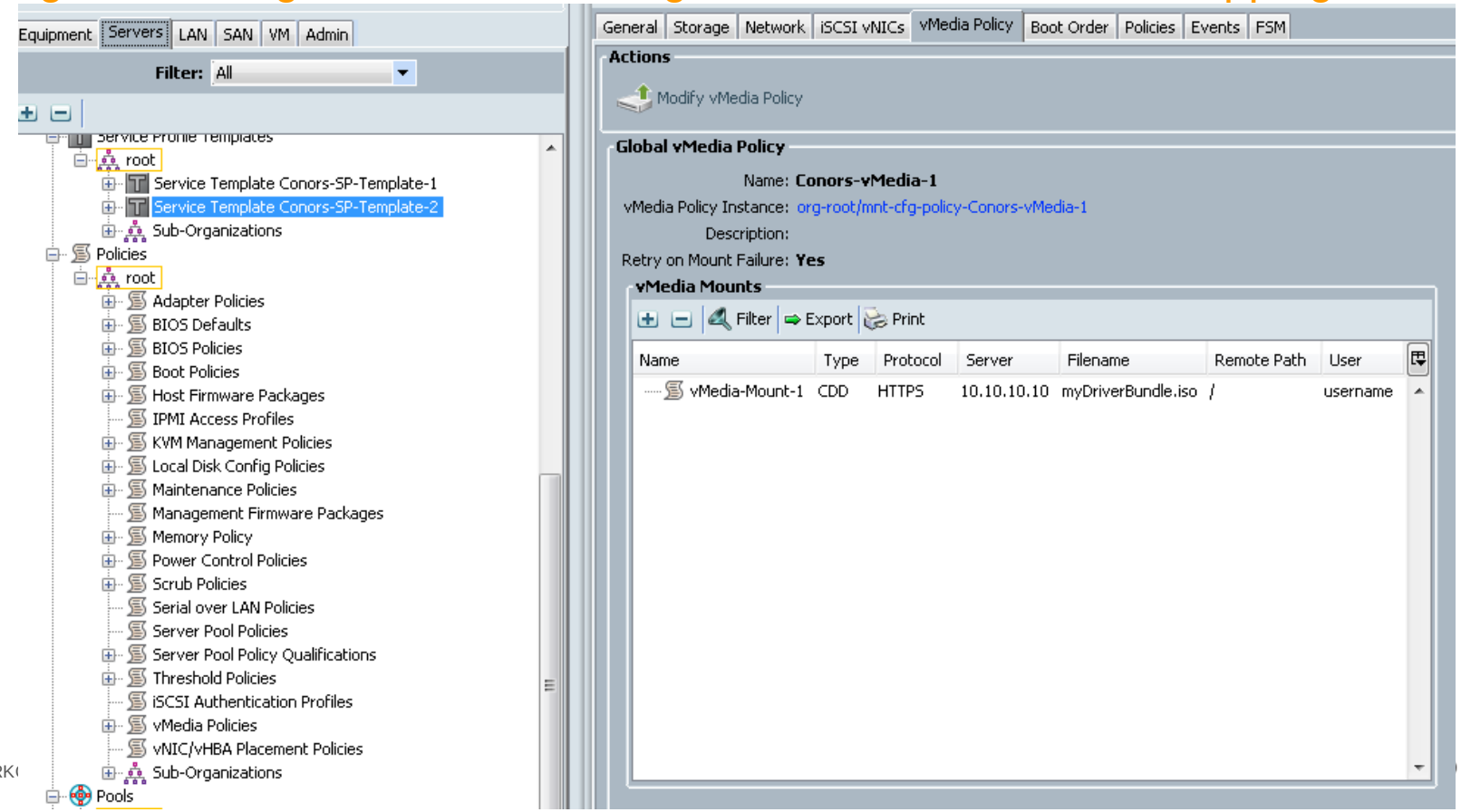
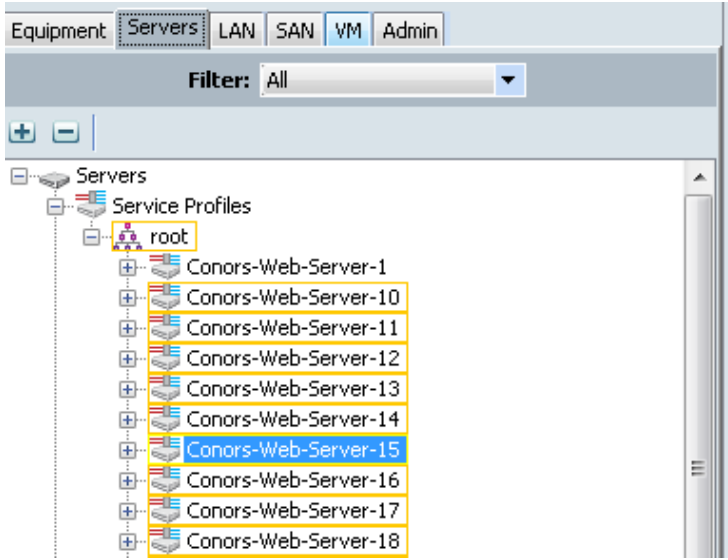
UCS Key Features

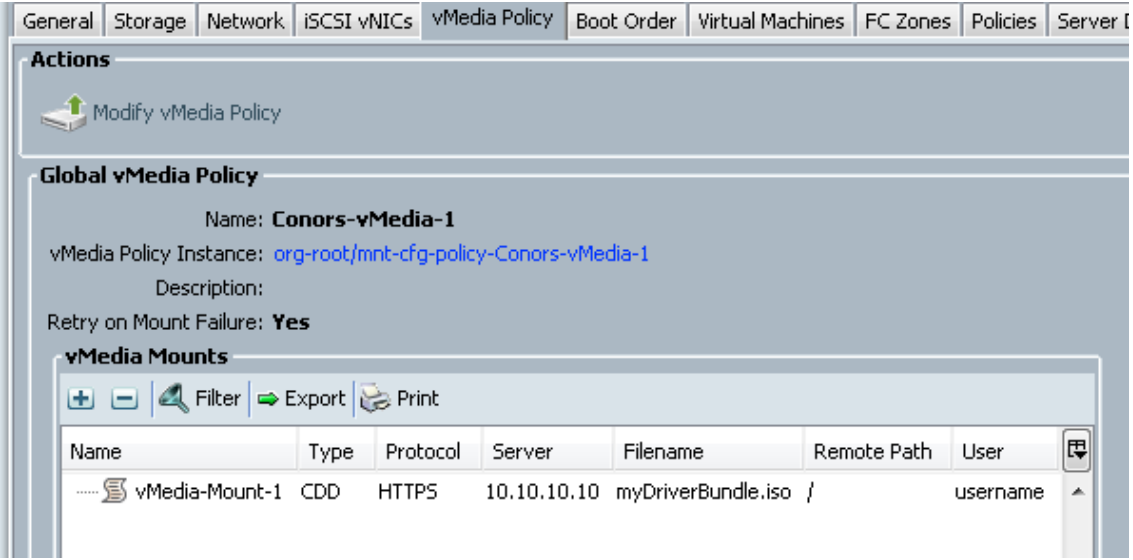
Logical Building Blocks – Accessing The Server – Automatic Mapping - vMedia



UCS Key Features

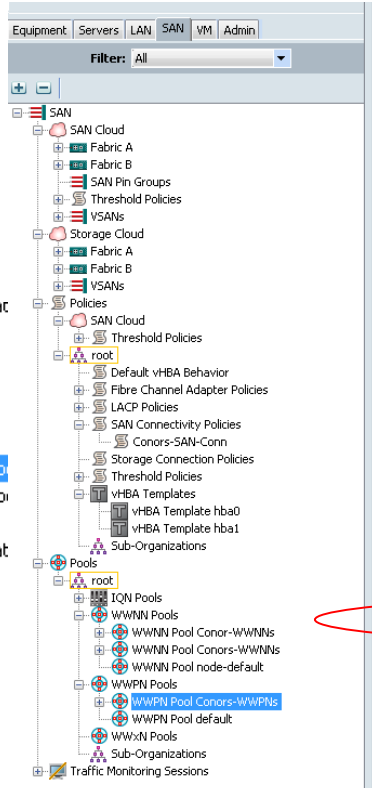
Logical Building Blocks – Accessing The Server – Automatic Mapping - vMedia

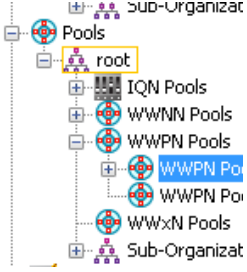


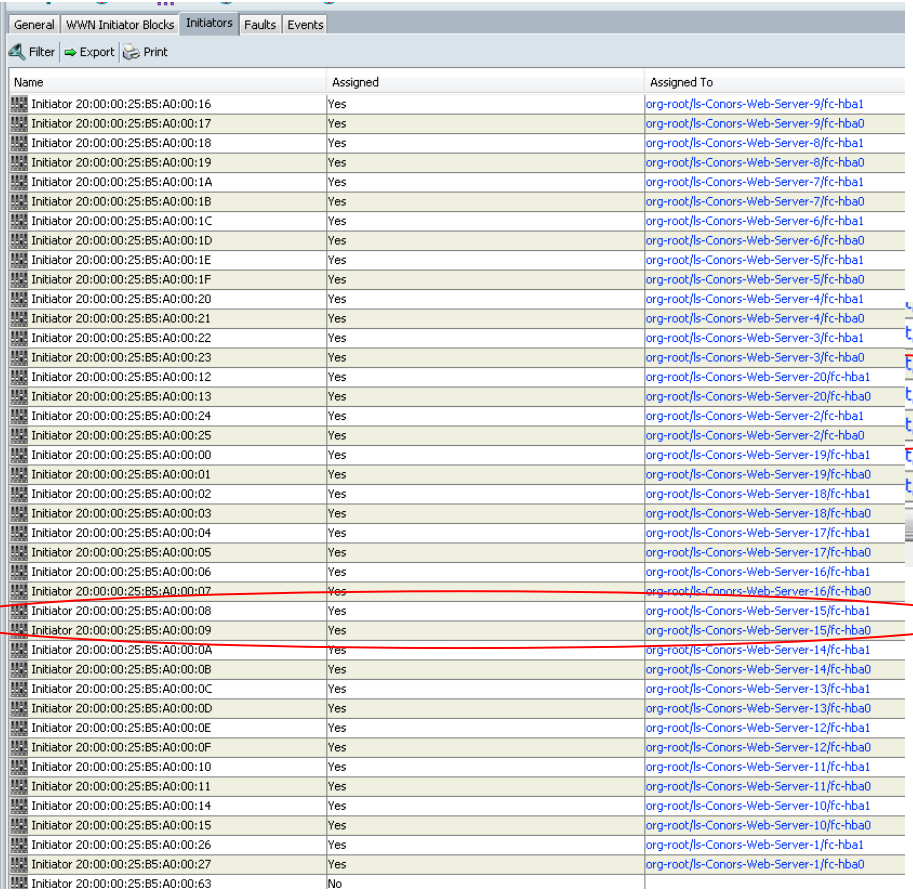


UCS Key Features

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

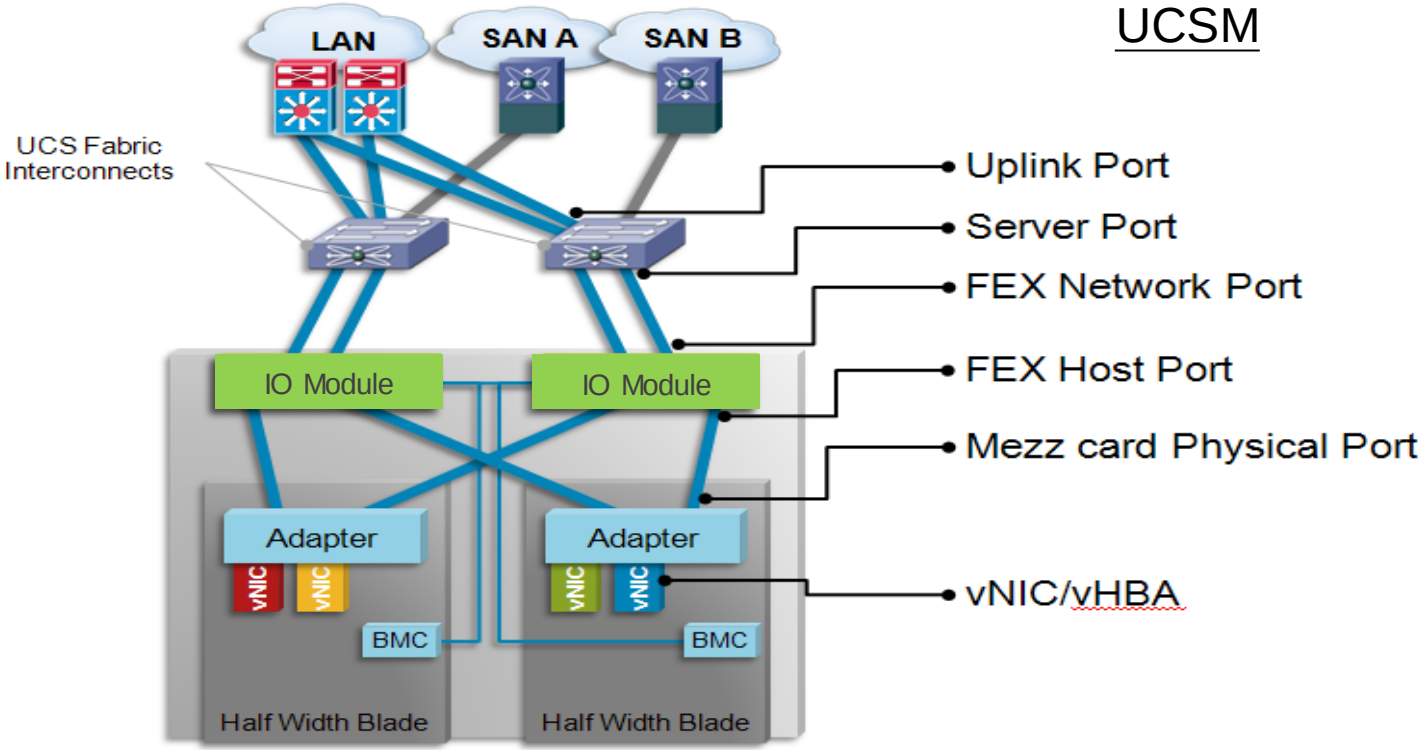






Connectivity – Components and LAN

UCS Ports Defined



UCSM	NXOS
Uplink Port	BIF (Border)
Server Port	SIF (Server/Fabric)
FEX Network Port	NIF (Network)
FEX Host Port	HIF (Host)
Mezz card Physical Port	UIF (Uplink - DCE)
vNIC/vHBA	VIF (Virtual)

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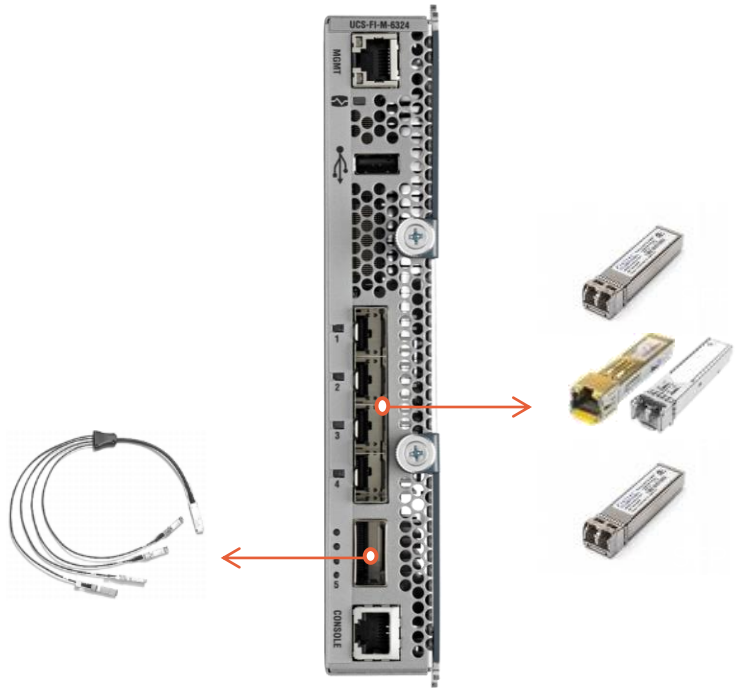
New UCS Form Factors

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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