TOMORROW starts here.

UCS Management Deep Dive

BRKCOM-2001

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Director, Technical Marketing

Agenda

- Introductions
- UCS Architecture, Topology
- Physical Building Blocks
- Logical Building Blocks
- Policy Driven Management
- UCS Manager, behind the scenes
- UCS Central
- Typical Use Cases (Live UCS Manager & UCS Central Demo)
- UCSM 2.2 New Features

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What to Expect

- This session will not cover UCS hardware components
  - Please check out BRKCOM-1005 UCS Architecture Overview for that
- This session will not cover UCS Performance Troubleshooting
  - Please check out BRKCOM-3002 UCS Performance Troubleshooting
- This session will not cover Networking in detail
  - Please check out BRKCOM-2003 UCS Networking Deep Dive for that
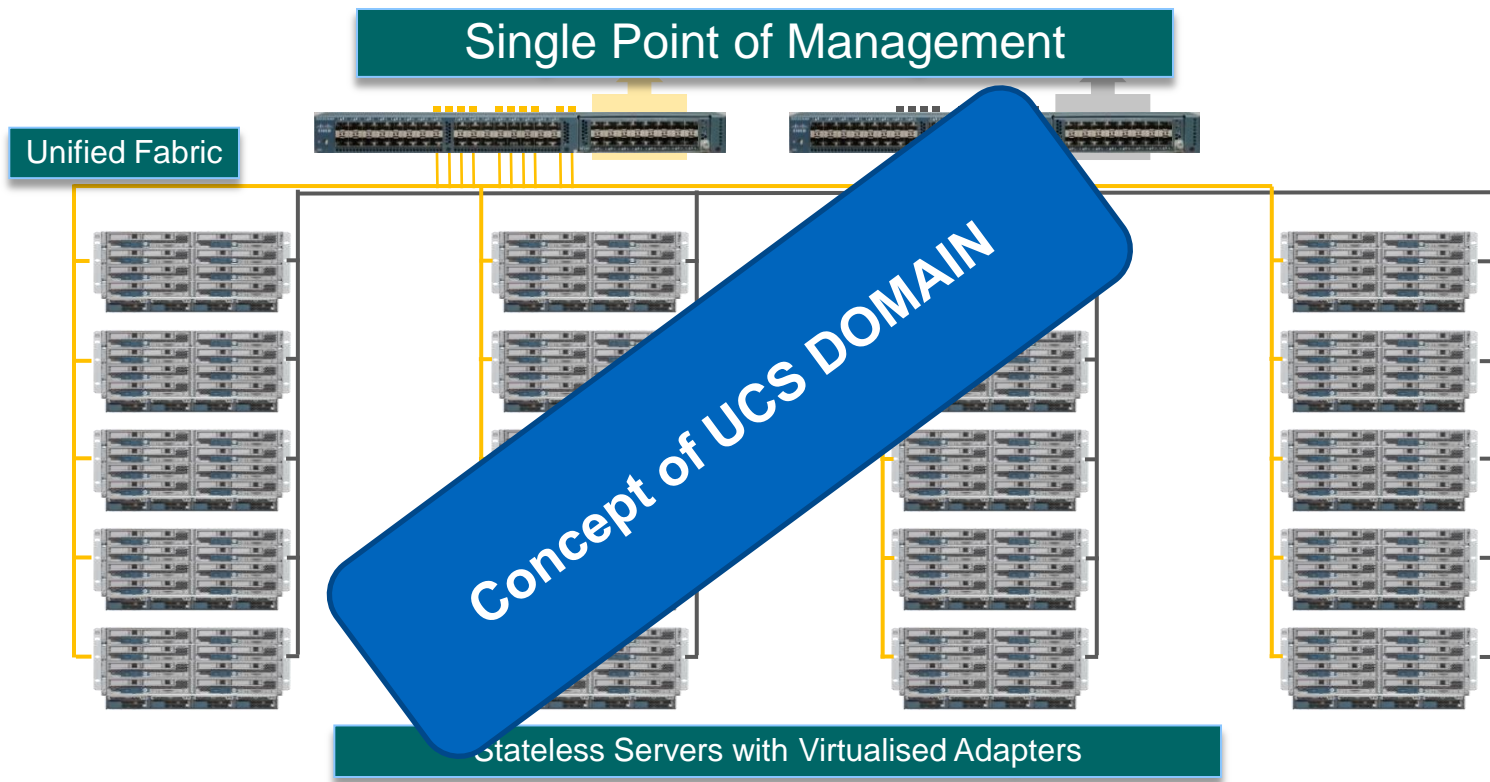- On the other hand, this session **will cover UCS Management** quite a bit!

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UCS Building Blocks and Connectivity

Unified Computing System Manager

- Embedded device manager for family of UCS components
- Deepest possible abstraction of hardware and connectivity
- Efficient at scale: Same effort for 1 or *N* servers, Blade or Rack

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Unified Computing System (UCS)

Single Point of Management

Unified Fabric

Concept of UCS DOMAIN

Stateless Servers with Virtualised Adapters

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Unified Computing System Components

Cisco UCS Central
Multi - UCS Manager

Cisco UCS Manager
Embedded Element Manager, GUI and CLI

Cisco UCS Fabric Interconnects
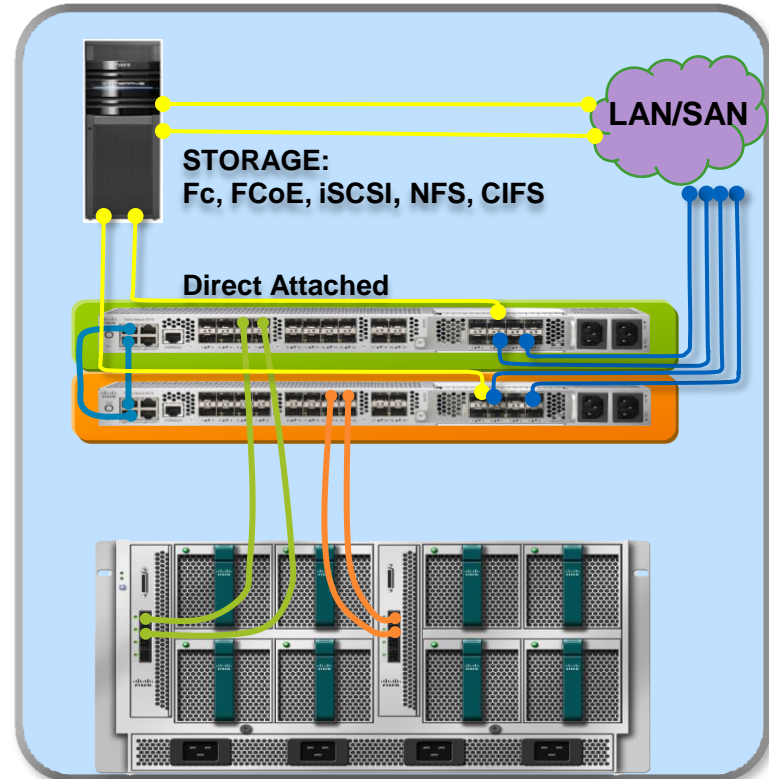SNMP, Syslog, SMTP, SMASH, CLP,
CIM XML, Smart Call Home

Cisco UCS I/O & FEX Modules

Cisco UCS Blade Server Chassis

Cisco UCS Blade and Rack Servers
(Cut through interfaces to CIMC)
Serial over LAN, KVM, IPMI

Cisco UCS I/O Adapters

LAN/SAN

STORAGE:
Fc, FCoE, iSCSI, NFS, CIFS

Direct Attached

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UCS Stateless, Policy Driven by Design
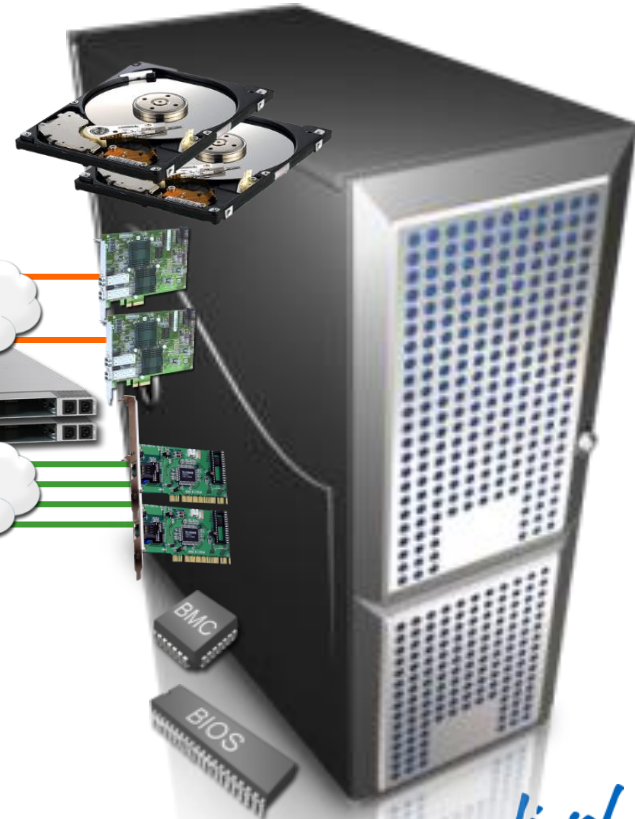
UCS Service Profiles

Policies, Templates

- NIC MACs
- HBA WWNs
- Server UUID
- VLAN Assignments
- VLAN Tagging
- FC Fabrics Assignments
- FC Boot Parameters
- Number of vNICs
- Boot order
- PXE settings
- IPMI Settings
- Number of vHBAs
- QoS
- Call Home
- Template Association
- Org & Sub Org Assoc.
- Server Pool Association
- Statistic Thresholds
- BIOS scrub actions
- Disk scrub actions
- BIOS firmware
- Adapter firmware
- BMC firmware
- RAID settings
- Advanced NIC settings
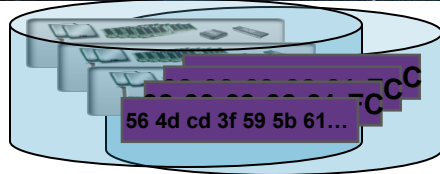- Serial over LAN settings
- BIOS Settings

Service Profile

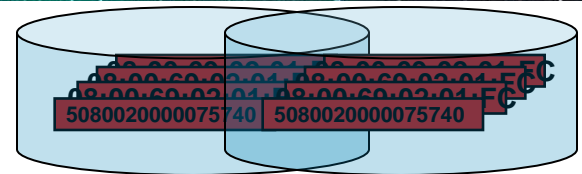SAN

LAN

UCS Pools, Role Based Access

Server Pools
UCD Pools

MAC Address Pools

WWPN Address Pools
WWNN Address Pools

56 4d cd 3f 59 5b 61...

08:00:69:02:01:FC

5080020000075740   5080020000075740

Server
Administrator

Network
Administrator

Storage
Administrator

Cisco UCS Manager

UCS Policies, Role Based Access

Cisco UCS Manager

Server Administrator

Server Polices:
Discovery, Boot, Bios
settings, Firmware,
Scrub, Templates, Pre
Provisioning, etc

Network Administrator

LAN Policies:
vLAN, QoS,
Pin Groups,
Port Channels,
Northbound ports, etc

Storage Administrator

Storage Policies:
vSAN, Adapter,
Pin Groups,
Thresholds,
Northbound ports, etc

UCS Device Management, Role Based Access

Server Polices:
Discovery, Boot, Bios settings, Firmware, Scrub, Templates, Pre Provisioning, etc
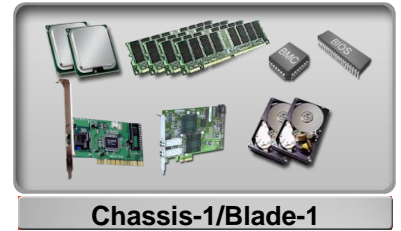
LAN Policies:
vLAN, QoS, Pin Groups, Port Channels, Northbound ports, etc

Storage Policies:
vSAN, Adapter, Pin Groups, Thresholds, Northbound ports, etc

Server Administrator

Server Name: LS-A
UUID: 56 4d cd 3f 59 5b 61…
MAC : 08:00:69:02:01:FC
WWN: 5080020000075740
Boot Order: SAN, LAN

Service Profile

Association

Chassis-1/Blade-1

Cisco UCS Manager

56 4d cd 3f 59 5b 61…

08:00:69:02:01:FC

5080020000075740

5080020000075740
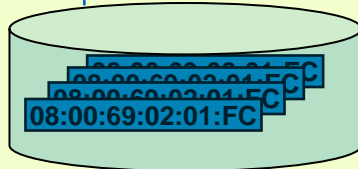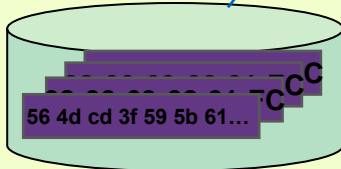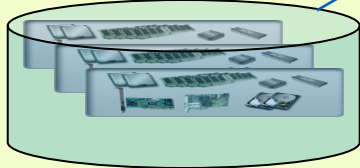
Server Pools

UUID Pools

MAC Address Pools

WWPN Address Pools

WWNN Address Pools

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Stateless Computing, Benefits

- Server identity no longer has to be tied to physical server hardware
  - Profiles provide identity
  - Seamless server mobility
  - Stateless components
- Boot over network (LAN or SAN)
  - Boot order and boot devices are part of the pre-defined logical server profile
  - On-board disks can be used for temp, swap, etc.
- LAN and SAN Connectivity
  - # of NIC's
  - # of HBA's

- No infrastructure changes needed when moving a Service Profile

LAN

SAN

Server Name: Bob
UUID: 56 4d cd 3f 59 5b 61...
MAC : 08:00:69:02:01:FC
WWN: 5080020000075740
Boot Order: SAN, LAN

Chassis-1/Blade-1
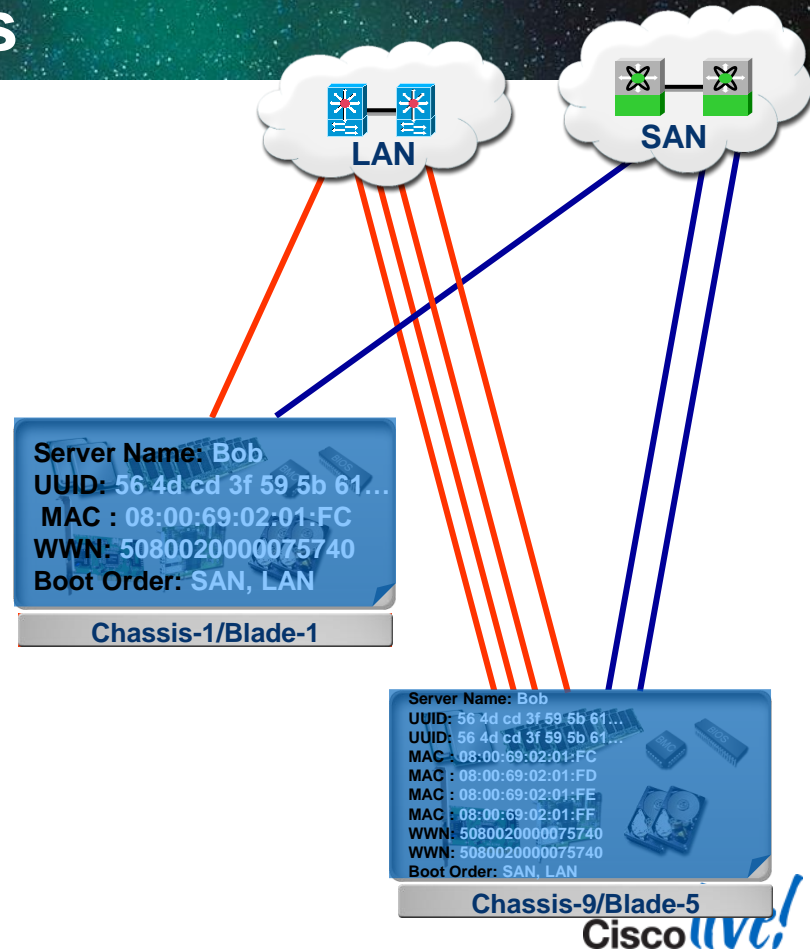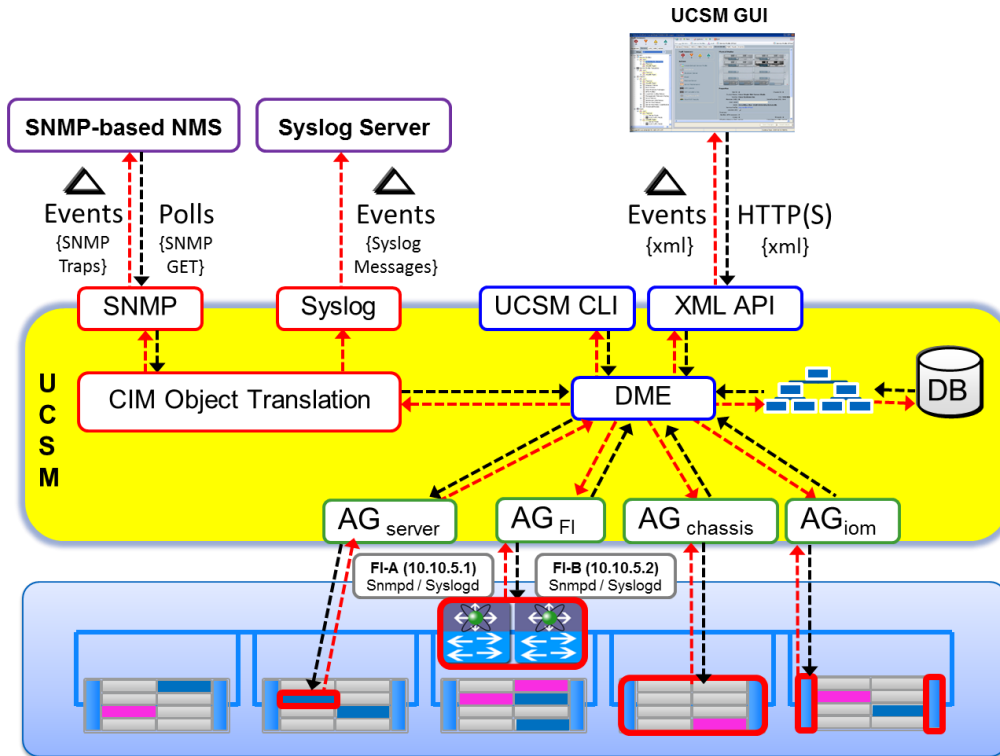
Server Name: Bob
UUID: 56 4d cd 3f 59 5b 61...
UUID: 56 4d cd 3f 59 5b 61...
MAC : 08:00:69:02:01:FC
MAC : 08:00:69:02:01:FD
MAC : 08:00:69:02:01:FE
MAC : 08:00:69:02:01:FF
WWN: 5080020000075740
WWN: 5080020000075740
Boot Order: SAN, LAN

Chassis-9/Blade-5

UCS Manager: Behind the Scenes

UCSM Management Information Model Summary:

- Data Management Engine (DME) contains full representative object model stored in the Management Information Tree (MIT)

- Interaction with DME occurs via Northbound External Interface Layer

- Northbound interfaces all resolve down to XML API

- Application Gateways couple UCSM with end points

UCS Central

UCS Central: What Is It?
Policy Driven Remote Global Policy Resolution Engine… (or Multi-UCS Manager)

- Efficient at scale: Same effort for 1 or *N UCS Domains (Up to 10,000 Servers)*

- First 5 UCS Domains are free licensed, with option of support *(Up to 800 Servers)*

- Multi UCS Domain benefits:
  - Global Policies
  - Global Service Profiles
  - Global ID name spaces
  - Global Fault Management

- Single UCS Domain, no growth plans, can still benefit:
  - Extended stats collection history
  - Automatic firmware downloads
  - Automatic Backup's

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Intro: UCS Central Feature Details

Provides 5 Key "<u>Global</u>" UCS Functions:

1. **Information Dashboard**
   - Inventory
   - Faults / Logs
   - Statistics
2. **Identifier / ID Pool Management**
3. **Domain-wide Infrastructure Policies**
   - Admin Settings & Enforcement
4. **Server Policies**
   - Component Settings
   - Policy Subscription
5. **Workload Mobility**
   - Global Service Profiles
   - Site Specific Settings

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Policy-based Management Architecture

- Simplified, Centralised Management

- Based on UCS Manager, which remains the execution engine

- Global policies are read-only in UCS Manager and are only stored on UCS Manager instances when they are in use

- Local policies are read-only in UCS Central with the option to search for and import them into UCS Central

- Global policies, local policies, or a combination of both may be used at the same time.

UCS Central

User Access

Full two way configuration changes with traceability

User Access
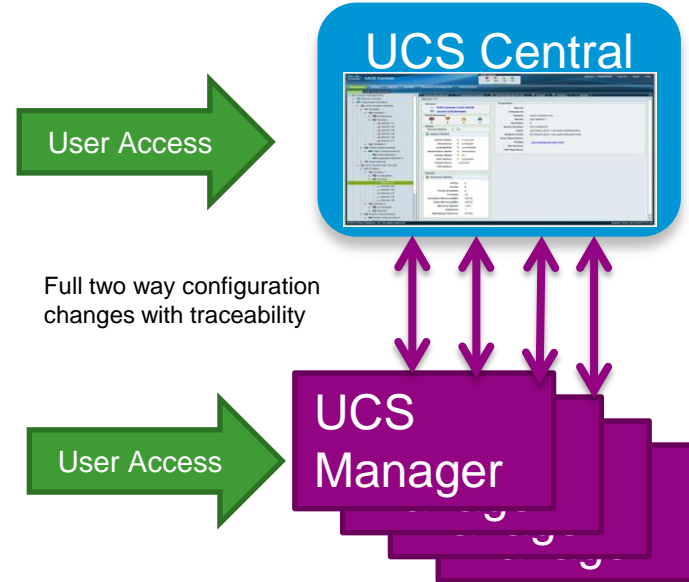
UCS Manager

UCS Central: Not your typical Manager of Managers

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Management of Multiple UCS Systems - Review

UCS Admin

Settings:
- Pools
- Policies
- Profiles
- VLANs
- VSANs

CISCO UCS Central

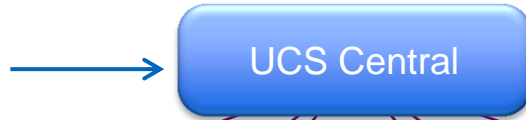**UCS Central will Simplify & Enhance Your Multi-UCS Management**

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UCS Central: High-level Logical View

UCS Admin
View

UCS Central

UCS Central is the Information Focal Point

Information:
- **Faults**
- **Events**
- **Inventory**
- **Statistics**

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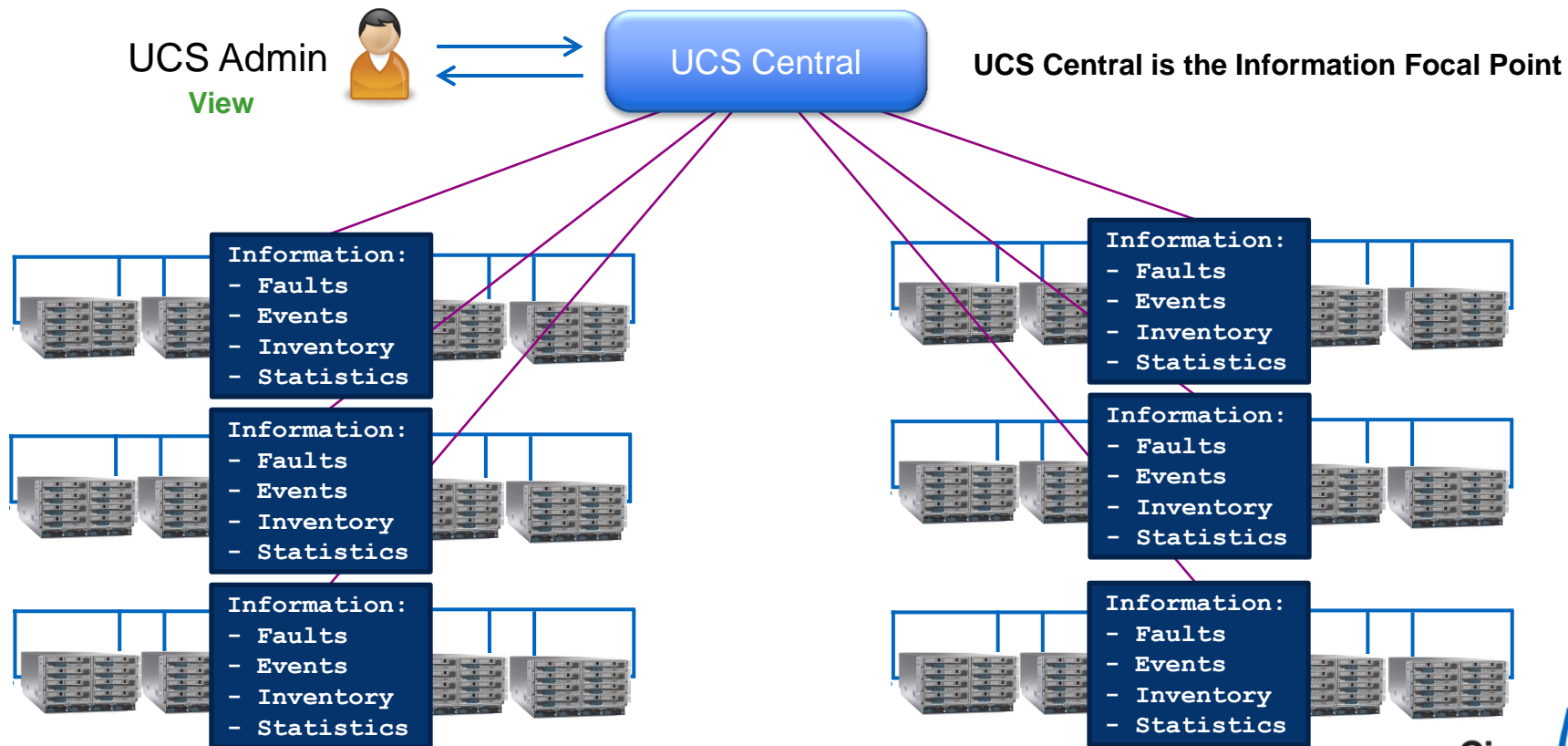
UCS Central: High-level Logical View

UCS Admin
Configure / View

UCS Central

Management of Remote Domains

Melbourne

Sydney

Australia

Perth

UCS Central: High-level Logical View

UCS Admin
Configure

Settings:
- Pools
- Policies
- Profiles
- VLANs
- VSANs

UCS Central is the Configuration Focal Point

Opt In

Settings:
- DNS
- NTP
- Backup
- Time Zone
- LDAP

Settings:
- Time Zone
- LDAP

Settings:
- Time Zone

Opt In

Opt In

Opt In

Opt In

Opt In
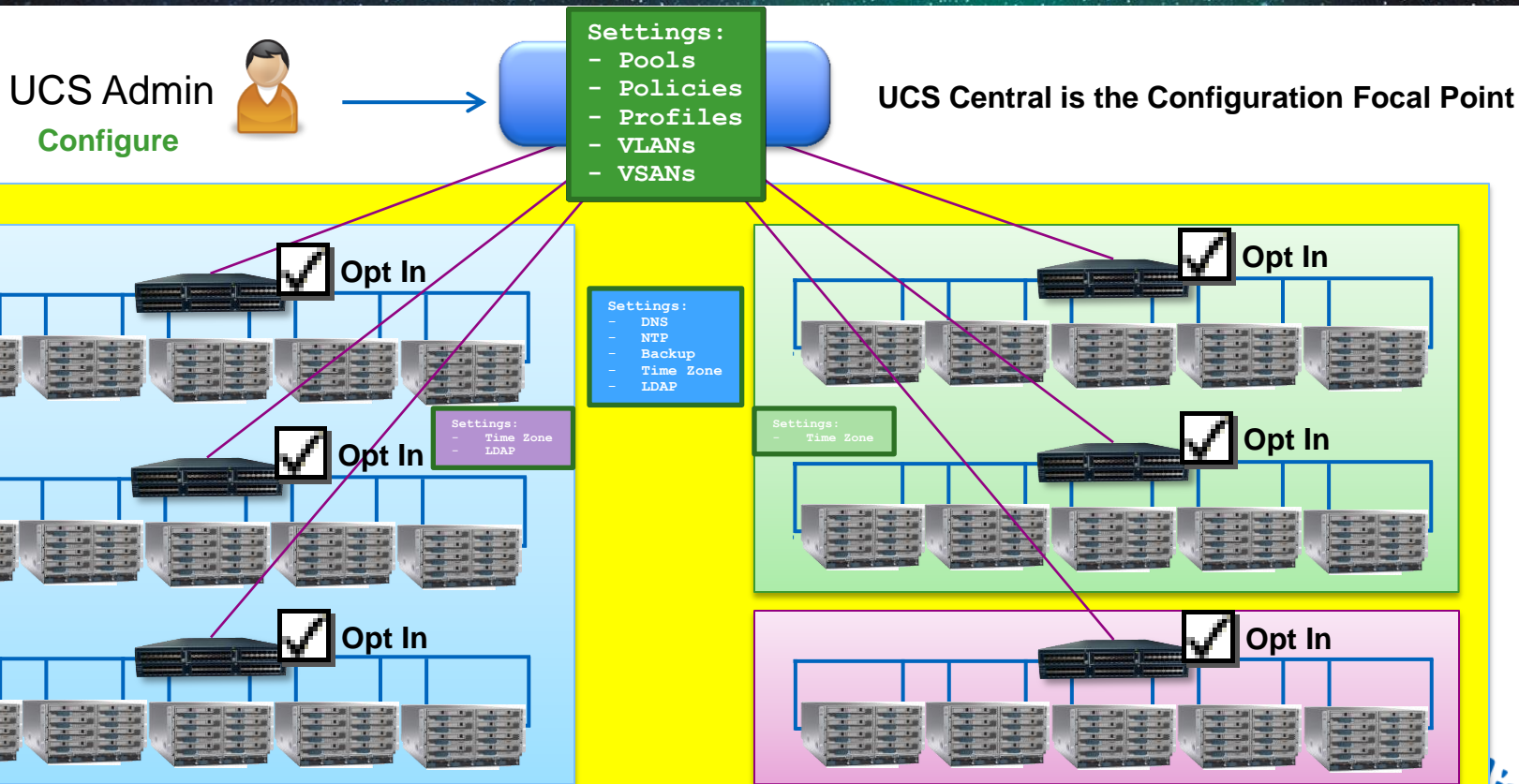
UCS Management Portfolio

UCS Director API

UCS Director
Infrastructure Automation and Orchestration

Non-Cisco Infrastructure

Virtual Machines

Network Devices

Storage

Servers

API

UCS Central
Policy Driven Multi DC, Multi-Domain Management

API
UCS Manager Domain 1

API
UCS Manager Domain x

API
CIMC

Stand-Alone UCS C-Series

Unified Computing System

Element Management Functionality

VBLOCK

NetApp

VCE

FlexPod   **vBlock**

Integrated & Converged Infrastructure

Advanced Infrastructure Abstraction & Automation

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It's Demo Time

UCS Manager is Policy Driven by a Single Data Model

Logical
- Pools & policies
- Service Profiles & Templates
- Port Profiles
- vNICs & vHBAs

Management Access
- GUI
- CLI
- PowerShell / Python
- XML API

UCS Model

In-Band Management
- KVM & Virtual Media
- Power Management
- IPMI

Physical
- Auto Discovery
- Device Inventory
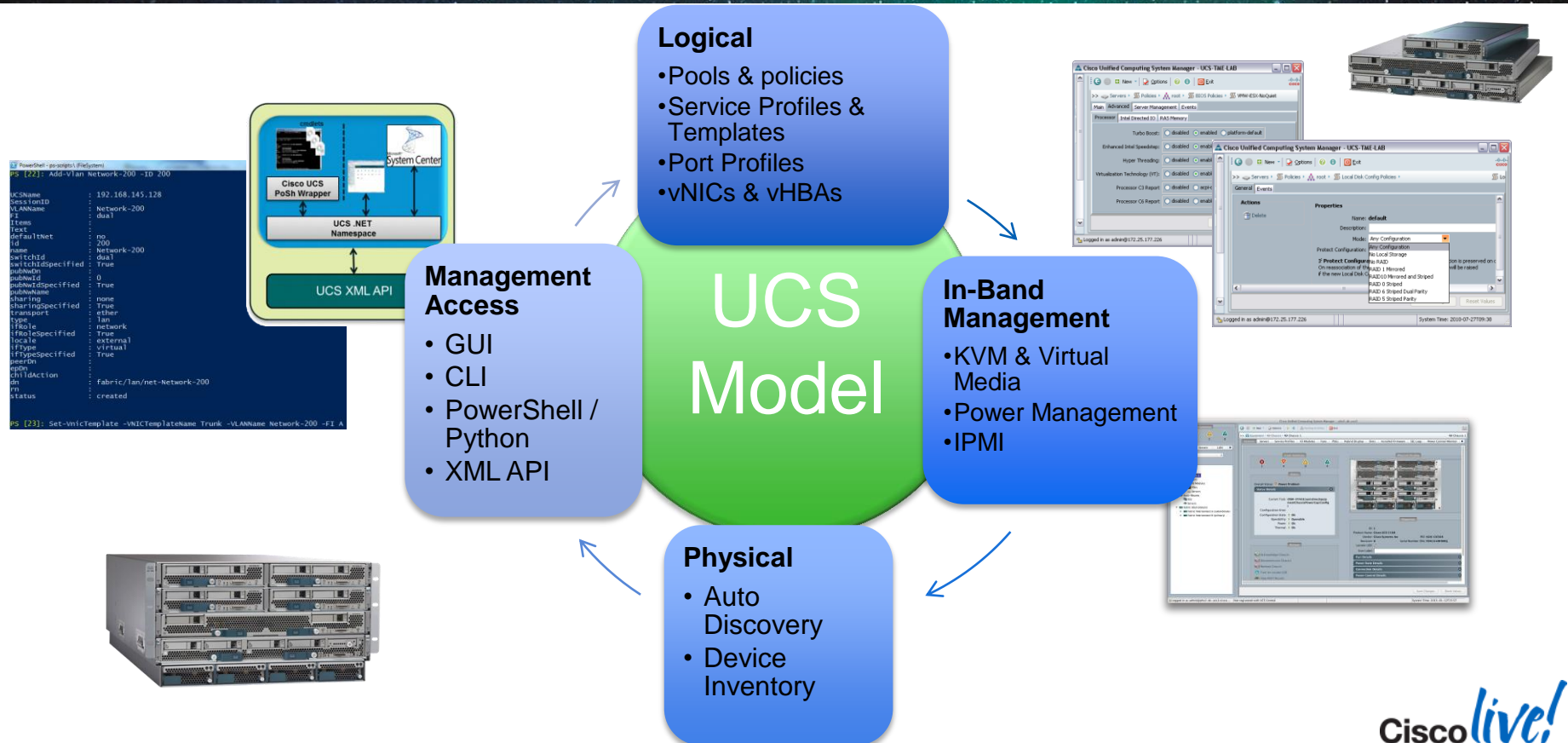
UCS Manager 2.2(1) "El Capitan"
Features Overview

Fabric Enhancements
- Fabric scaling: VLANs, VIFs, IGMP Groups, Endpoints
- IPv6 Management Support
- Uni-Directional Link Detection (UDLD) Support
- User Space NIC (usNIC) for Low Latency
- Support for Virtual Machine Queue (VMQ)

Operational Enhancements
- Direct Connect C-series to FI without FEX
- Two-factor Authentication for UCS Manager Logins
- VM-FEX for Hyper-V Mgmt with Microsoft SCVMM
- Cisco IMC In-band Management
- Direct KVM Access
- Server Firmware Auto Sync

Compute Enhancements
- Secure Boot
- Enhanced Local Storage Management
- Flash Adapters & HDD Firmware Mgmt
- Precision Boot Order Control
- FlexFlash (Local SD card) Support
- Trusted Platform Module (TPM) Inventory
- DIMM Blacklisting and Correctable Error Reporting

Cisco UCS User Community
Web Based End User Community

http://communities.cisco.com/ucs

http://communities.cisco.com/ucsintegrations

- Tools, Downloads, Examples
  - UCS Platform Emulator (UCSPE)
  - goUCS Automation Tool
  - XML API, PowerShell code Examples
  - Cisco UCS PowerTool (PowerShell Module)
  - Microsoft SCOM Management Pack for Cisco UCS
  - Microsoft SCVMM UI Extension for Cisco UCS
  - Microsoft SCO Integration Pack for Cisco UCS

- Documentation
  - Programming & Developer Guides
  - Whitepapers
  - Reference Guides (XML Model, Faults)

- Collaboration
  - Blogs
  - Peer to peer forums
  - Videos
  - Access to Cisco Subject Matter Experts

Q & A

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