TOMORROW
starts here.
CISCO
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UCS Systems Management Deep Dive with UCS Foundational Software

BRKCOM-2017

Brad TerEick

#clmel

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What To Expect…

Best Practice

Many Hidden
("For Your Reference")
&
Animated Slides

For Your Reference

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Agenda

- Review: UCS Fundamentals
  - Building Blocks & Connectivity
  - Stateless, Policy Driven by Design
  - UCS Manager Architecture – Underneath the Hood
- UCS Notifications
  - Finding the Needle in the Haystack with UCSM
- Scaling UCS Management with UCS Central
  - Role
  - Getting Started – Domain Registration
  - Use-cases
  - What's New / Next?
- Managing Stand-alone C-Series
- Automating Configuration Tasks w/UCS PowerTool

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Review:
UCS Building Blocks and Connectivity

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Unified Computing System Components

Cisco UCS Central
Multi - UCS Manager

Cisco UCS Manager
Embedded Element Manager, GUI and CLI

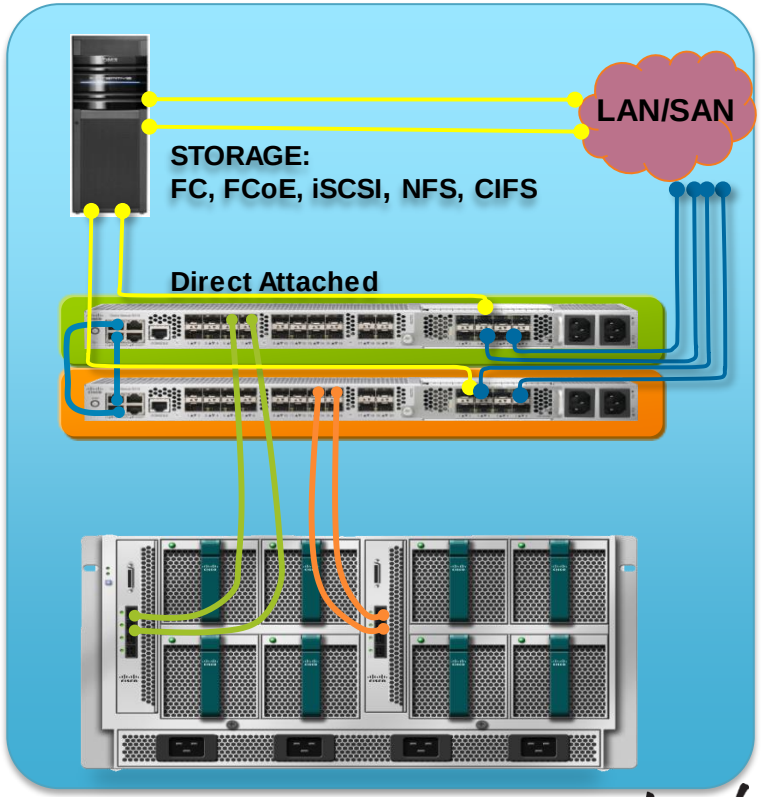
Cisco UCS Fabric Interconnects
SNMP, Syslog, SMTP, SMASH, CLP,
CIM XML, Smart Call Home

Cisco UCS I/O & FEX Modules

Cisco UCS Blade Server Chassis

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

Cisco UCS I/O Adapters



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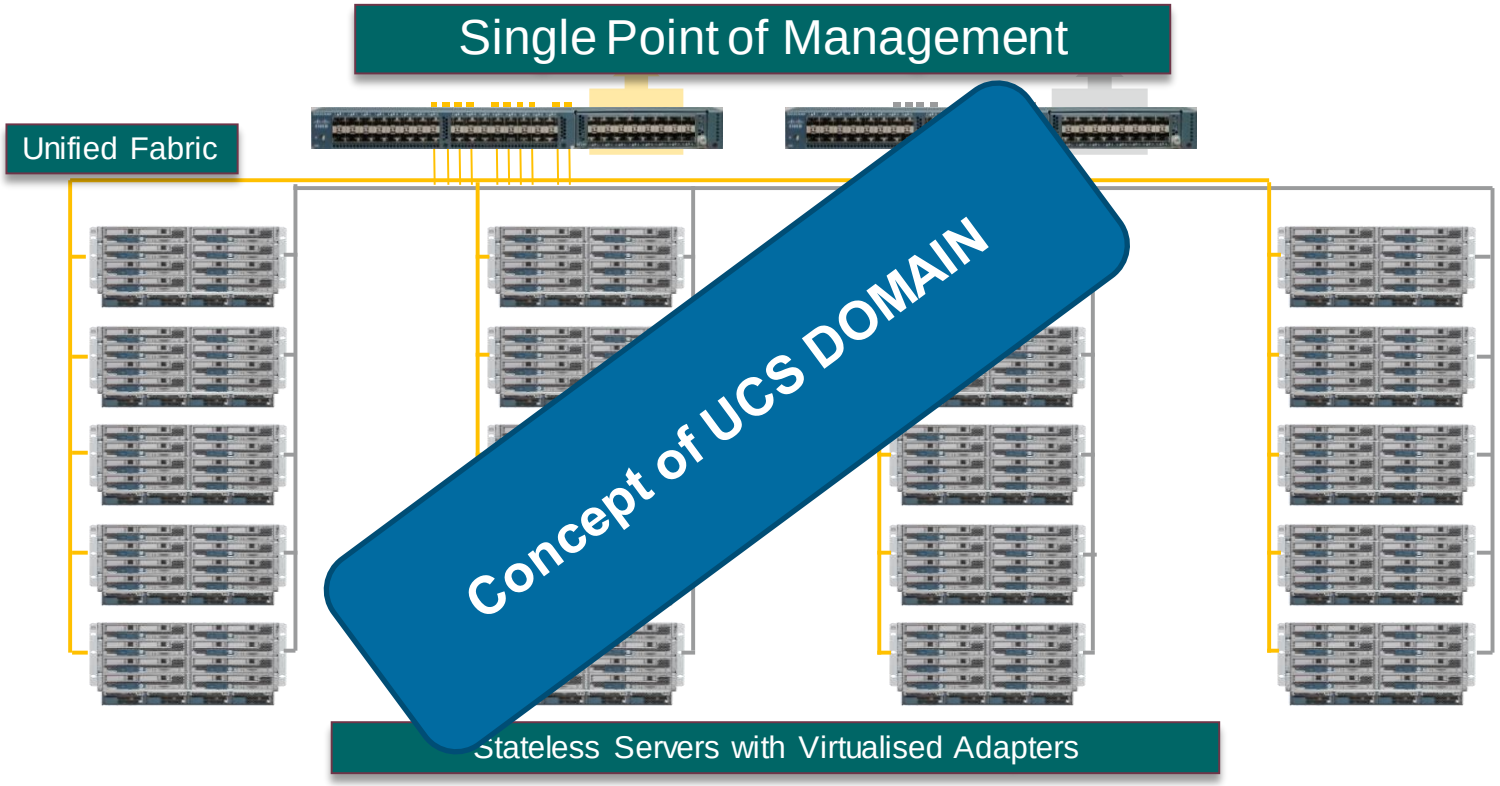
Unified Computing System (UCS)



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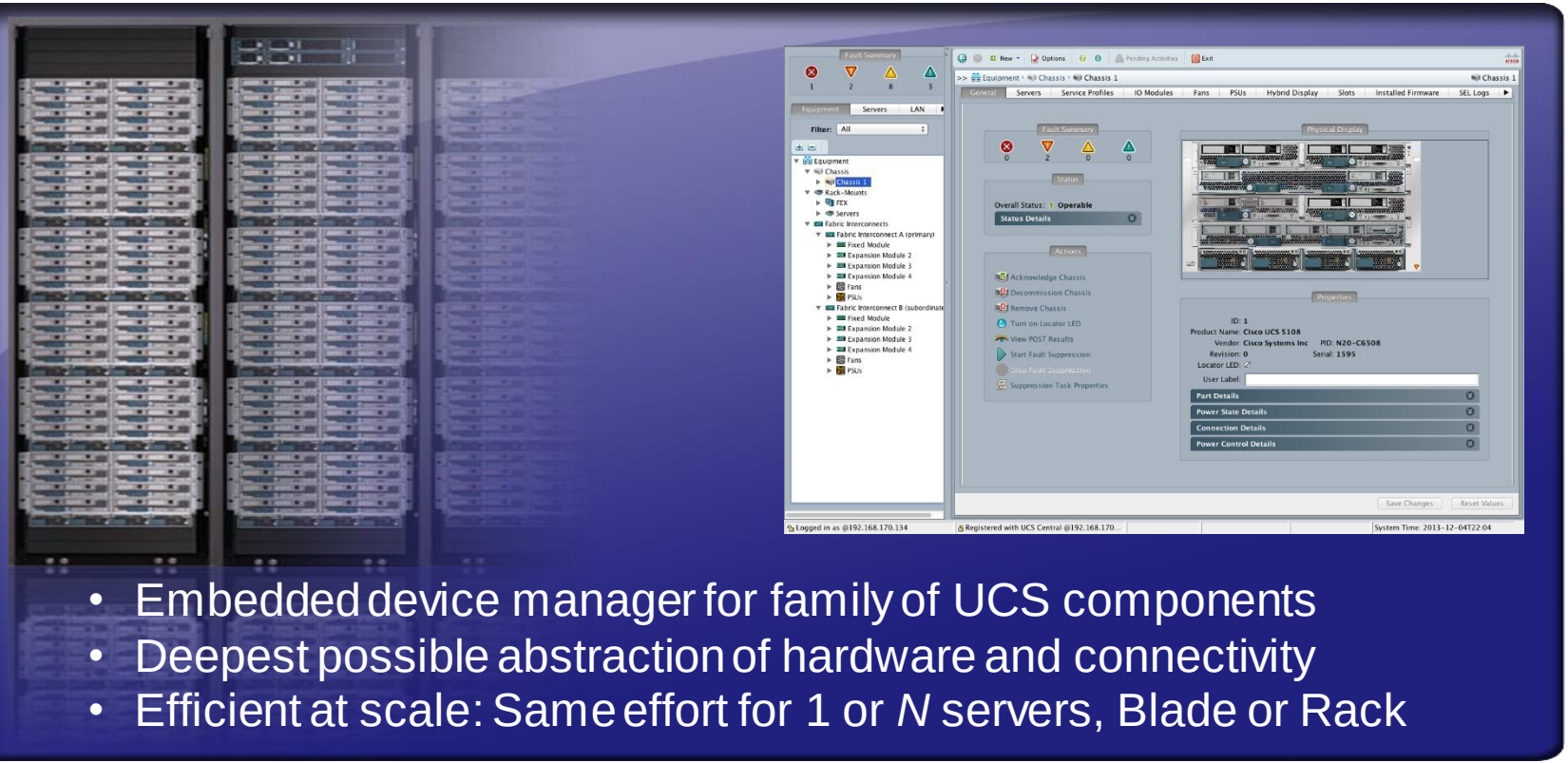
Unified Computing System Manager



- 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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Review:
UCS Stateless, Policy Driven by Design

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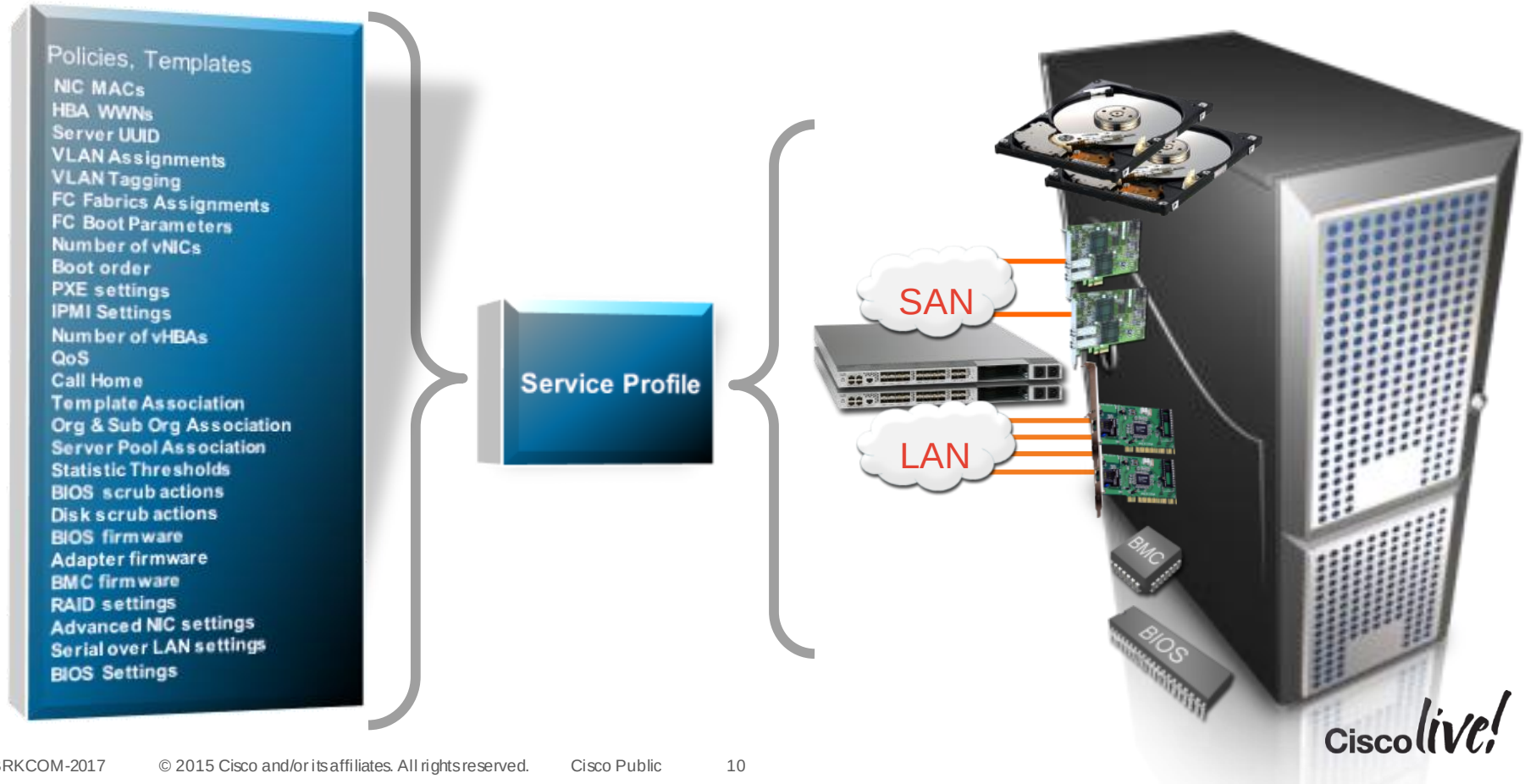
UCS Service Profiles



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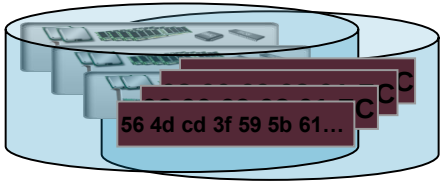
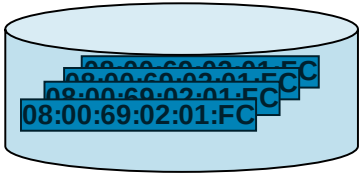
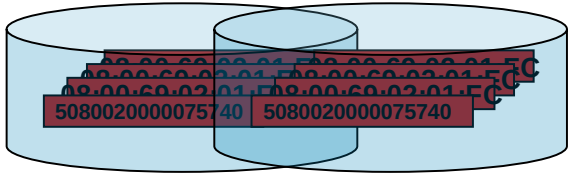
UCS Pools, Role Based Access, Example



Server Pools



MAC Address Pools



UUID Pools

WWPN Address Pools

WWNN Address Pools

Server Administrator

Network Administrator

Storage Administrator

Cisco UCS Manager

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UCS Policies, Role Based Access, Examples

Cisco UCS Manager

Server Administrator

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

Network Administrator

LAN Policies: vLAN ID's, QoS, Port Channels, Connectivity, vNIC Templates,etc

Storage Administrator

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

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UCS Device Management, Role Based Access

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

LAN Policies:
vLAN ID's,
QoS, Port Channels, Connectivity, vNIC Templates
etc

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

Server Administrator

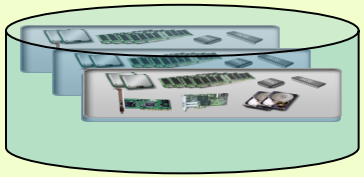
Server Name: Bob
UUID: 56 4d cd 3f 59 5b 61…
MAC : 08:00:69:02:01:FC
WWN: 5080020000075740
Boot Order: SAN, LAN

Service Profile

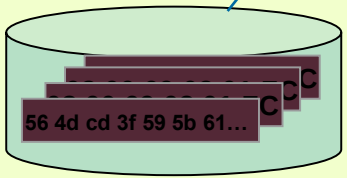
Association

Chassis-1/Blade-1

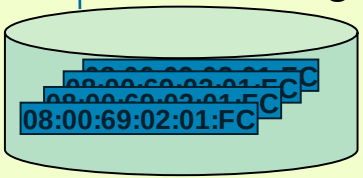
Cisco UCS Manager



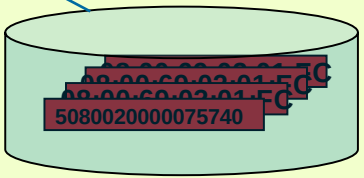
Server Pools



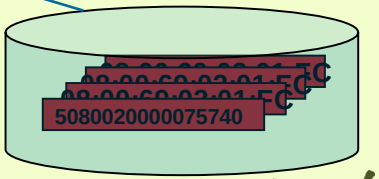
UUID Pools



MAC Address Pools



WWPN Address Pools



WWNN Address Pools

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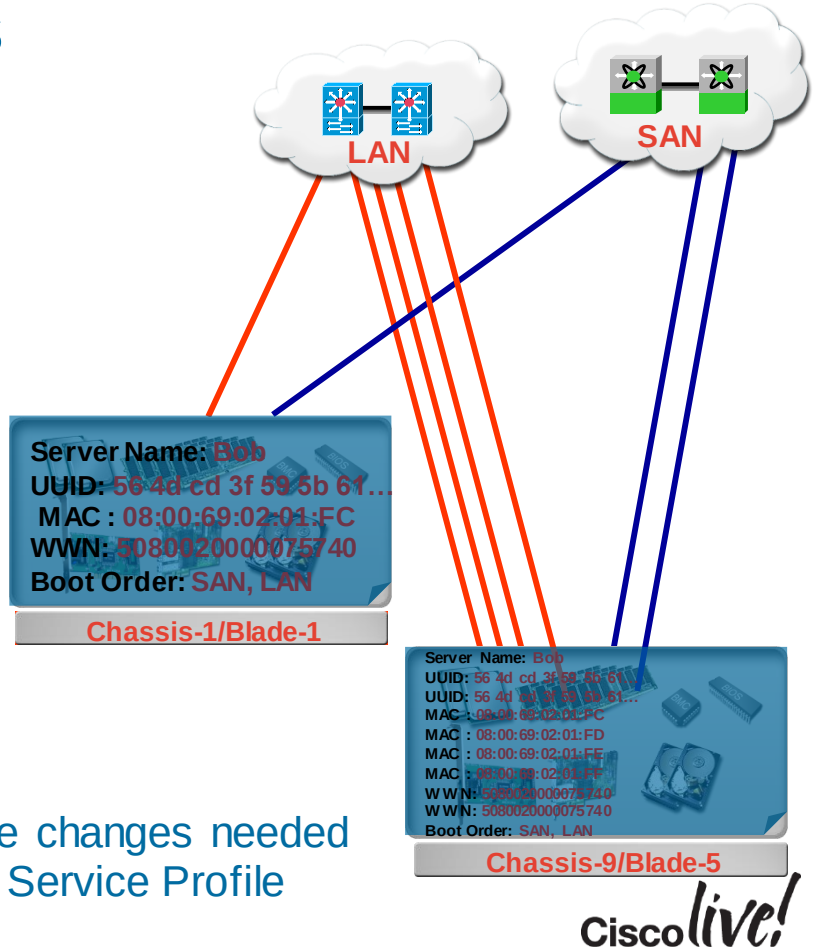
Stateless Computing, Benefits

- Server identity no longer 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

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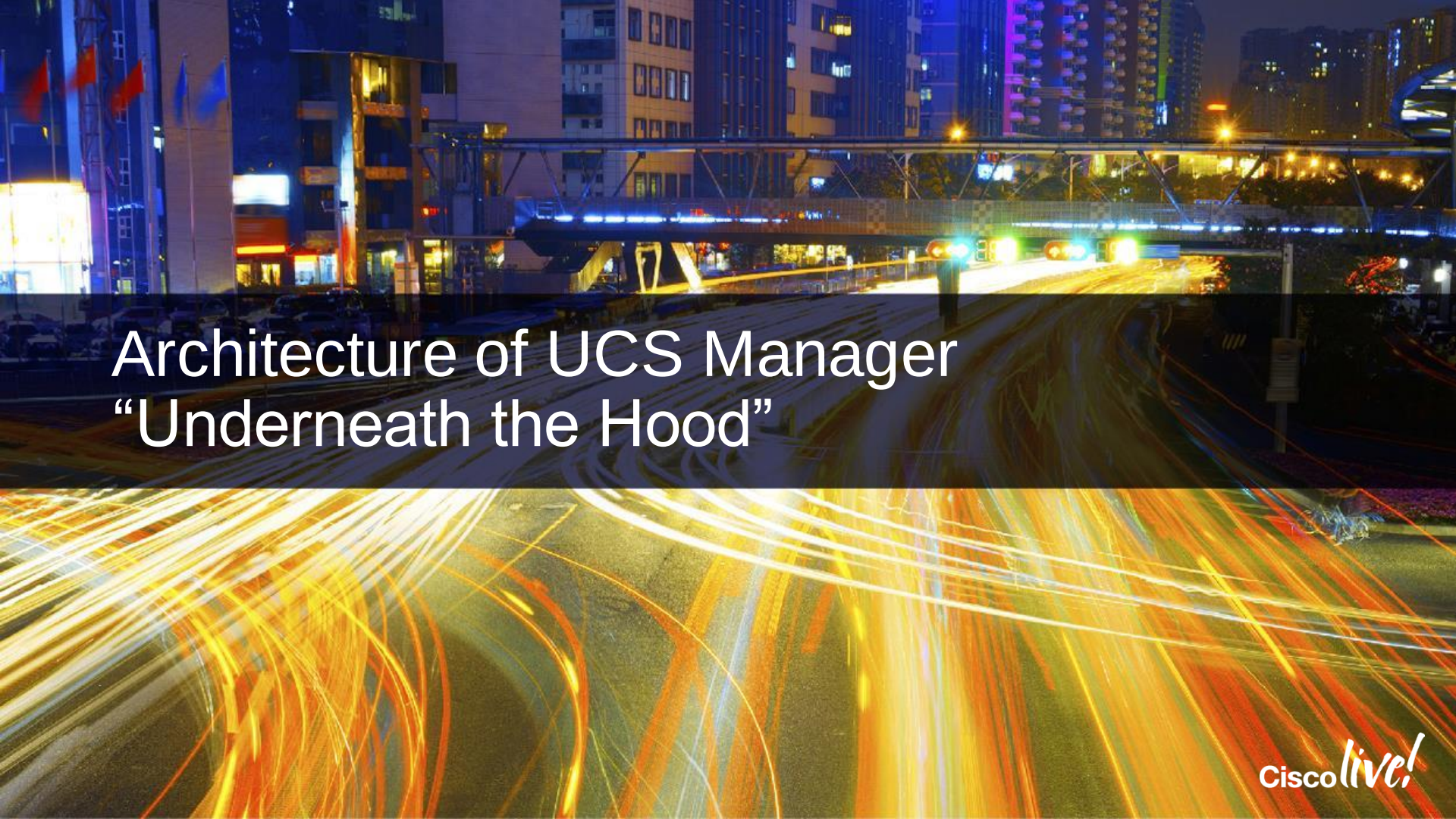

Architecture of UCS Manager
“Underneath the Hood”

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The Foundation

- Model Driven Framework
  - Everything is an object
    - Component
    - Events
    - Faults
  - Management Information Tree (MIT)
    - Maintains object relationships
    - Lifecycle of objects
- Architectural Components
  - Server Array Manager (SAM) aka: UCSM
  - Data Management Engine (DME)
  - Application Gateways (AG)
  - Managed Endpoints

- UCS Reference Guide
  - ISBN-10: 1587141930
  - http://www.amazon.com/dp/1587141930

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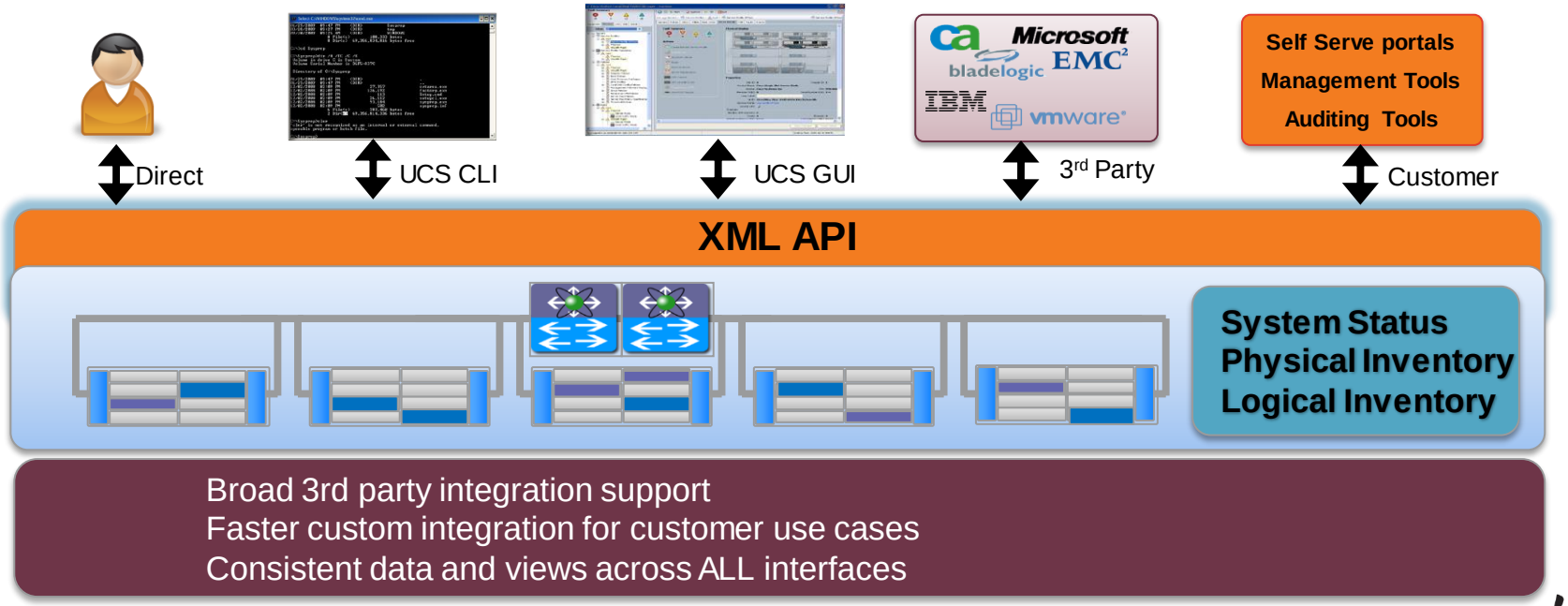
Programmatic Infrastructure

- Comprehensive XML API, standards-based interfaces
- Bi-Directional access to physical & logical internals



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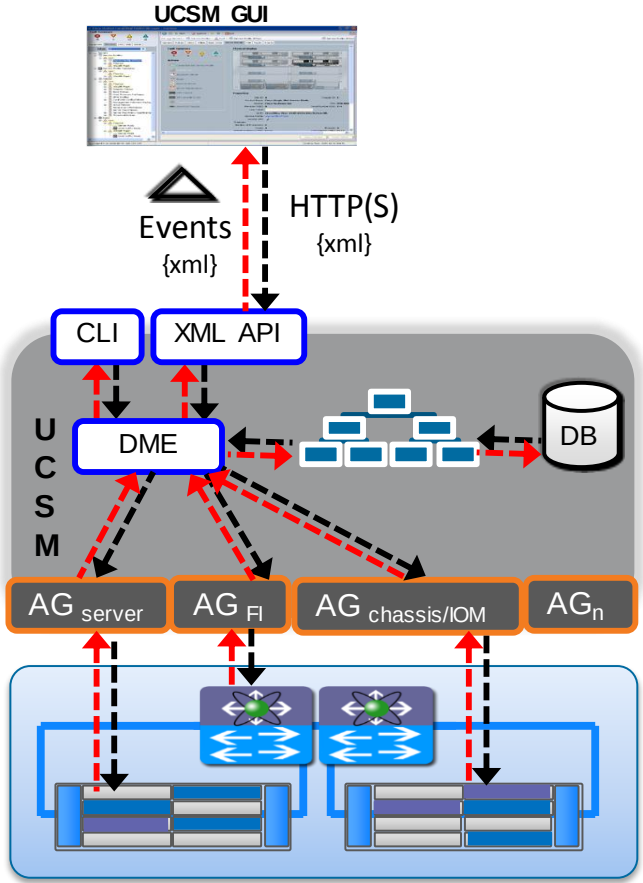
Architecture of UCS Manager



Data Management Engine (DME)

- "Traffic Cop" of the entire UCS Domain
- Entry point of XML API
- Owner of UCS XML Database
  - Physical Inventory (FI's, IOM's, FEX's, Servers w/components, Chassis)
  - Logical Configuration (Service Profiles, Connectivity Templates, Pools, Policies)
- Manages configuration, inventory, health of all end points
- Manages and monitors FSM task sequence execution handled by AG's

Application Gateways (AG)

- "Worker Bee" for a particular type of endpoint in UCS Domain
- Monitors health and state of endpoints in UCS Domain
- Configures endpoints to desired state configuration as defined by input from DME as the UCS XML Database mutates
  - Executes stimuli for FSM tasks on end point
  - Reports back to DME the ongoing status of task success or failure

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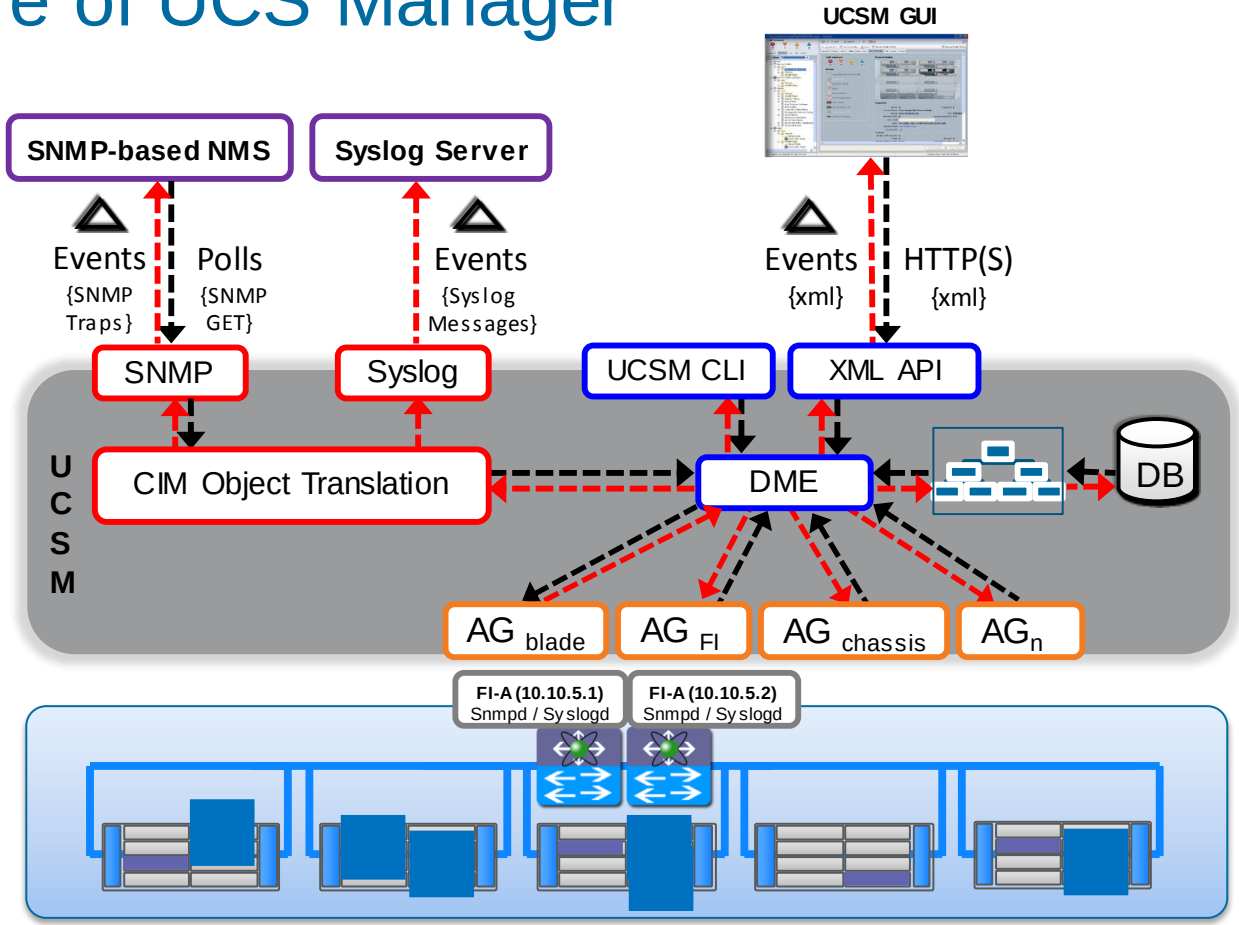
The Core of UCS Manager



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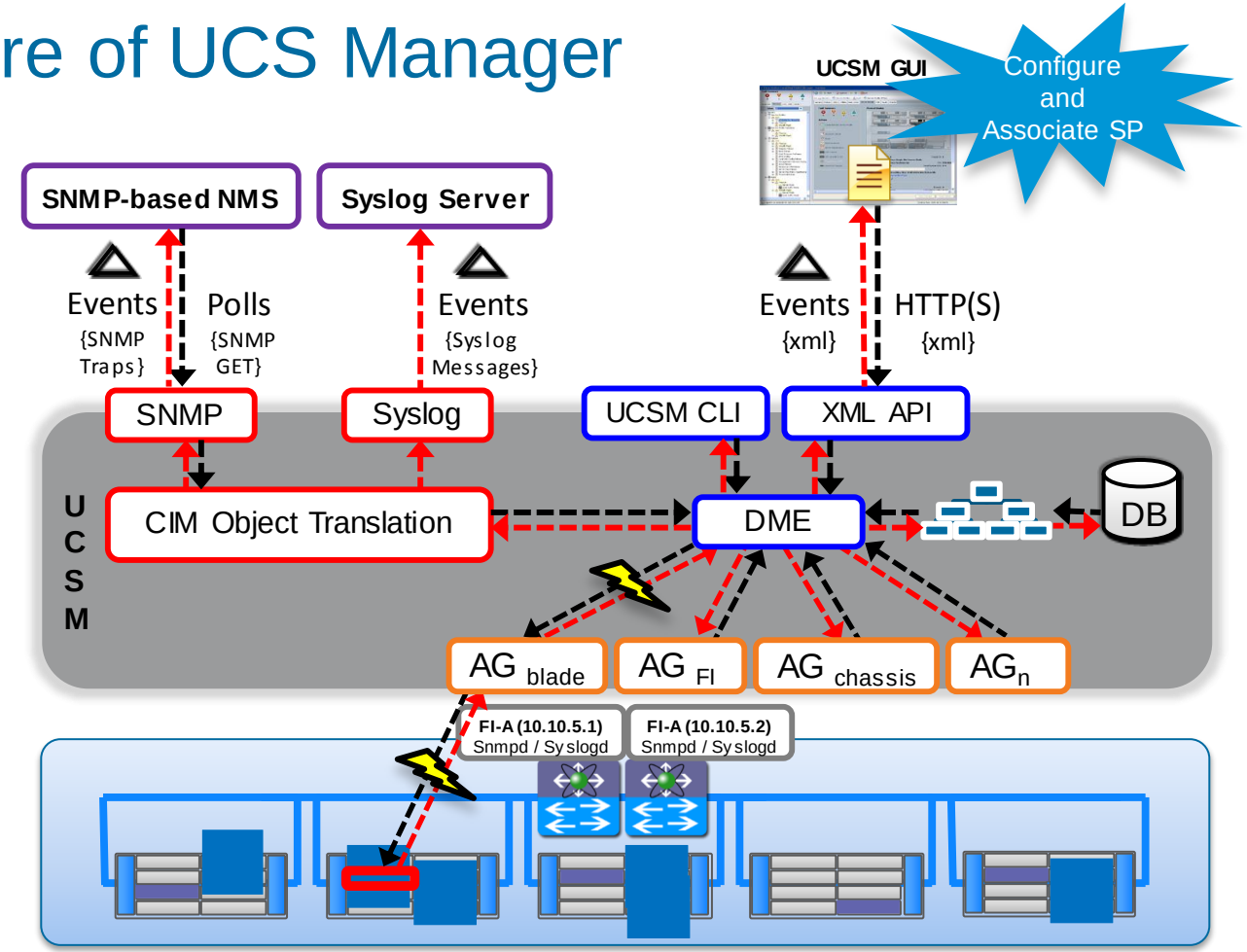
The Core of UCS Manager



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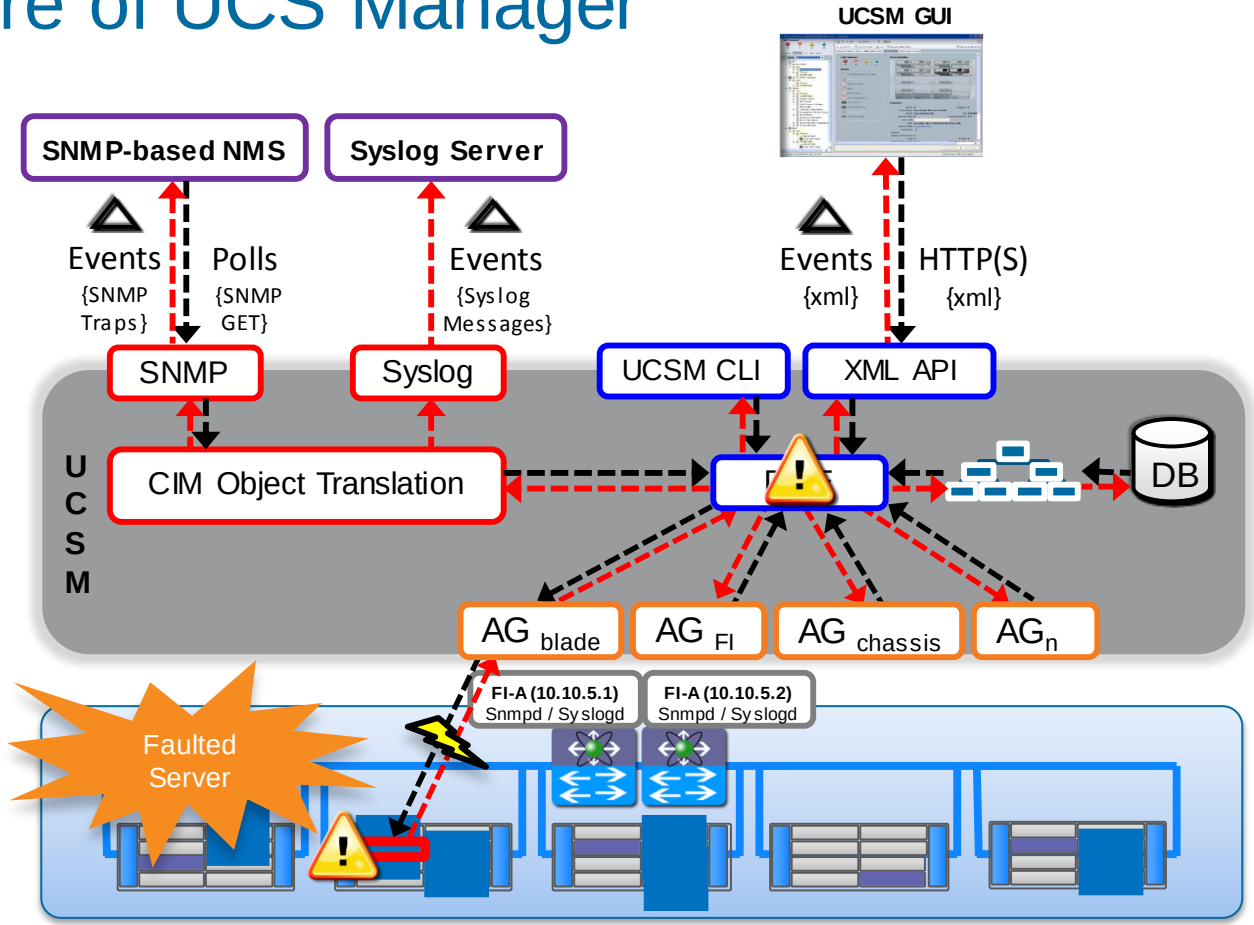
The Core of UCS Manager



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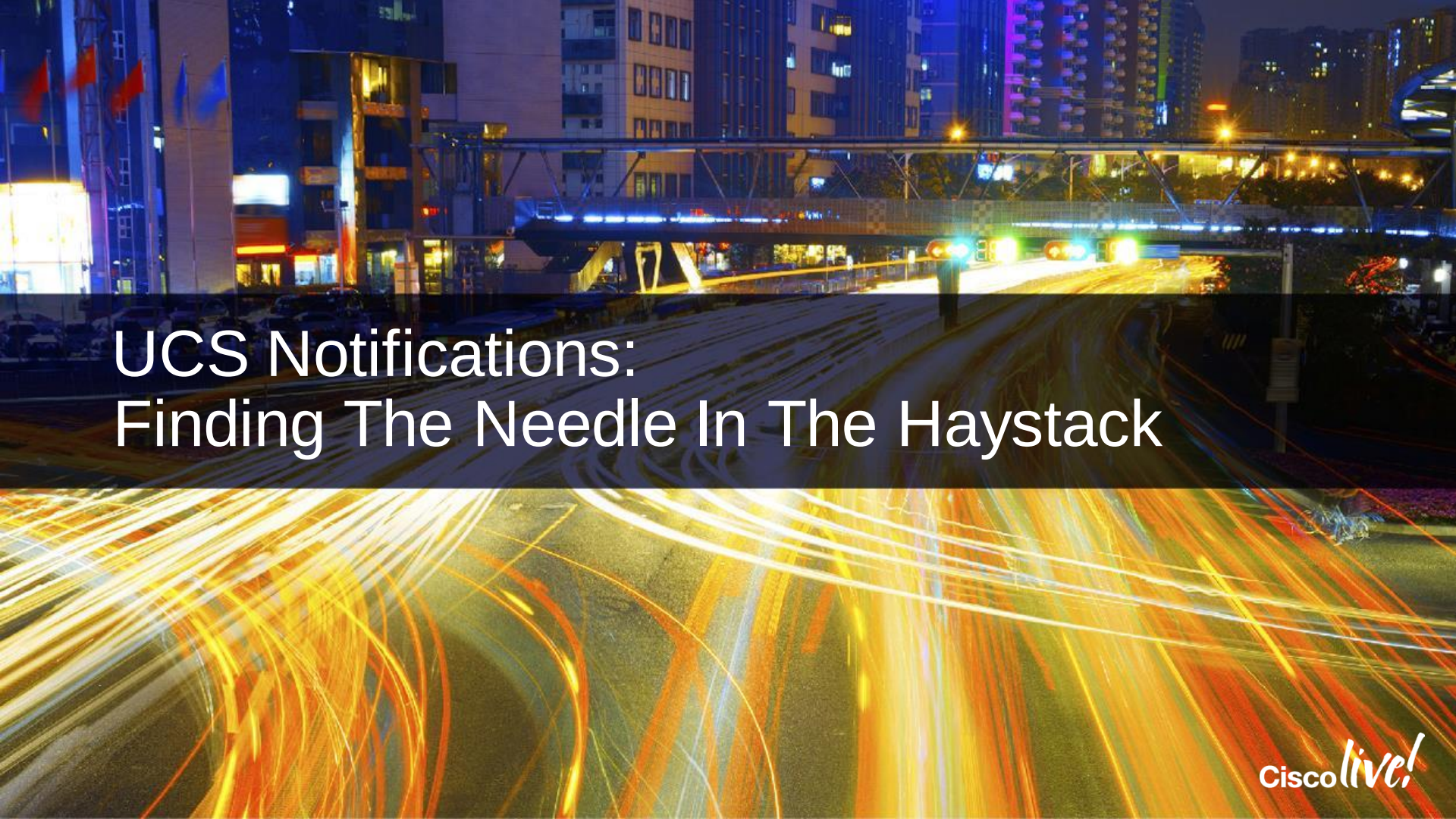

UCS Notifications:
Finding The Needle In The Haystack

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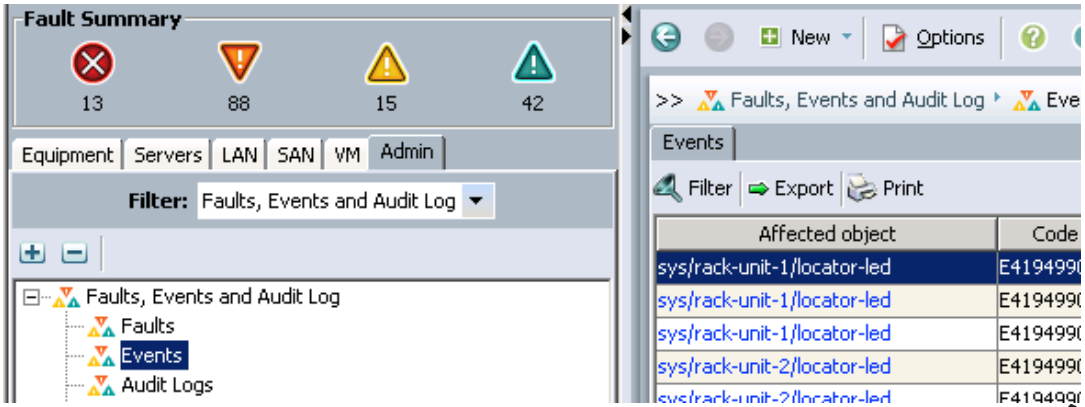
Definition #1 : UCS Events

- Object managed by UCSM
  - Immutable
- Examples:
  - Server power on
  - Turn off locator LED
- Causes
  - Non-persistent condition
- Persistence
  - None

- Properties
  - Affected Object
  - Description
  - Cause
  - User
  - Code



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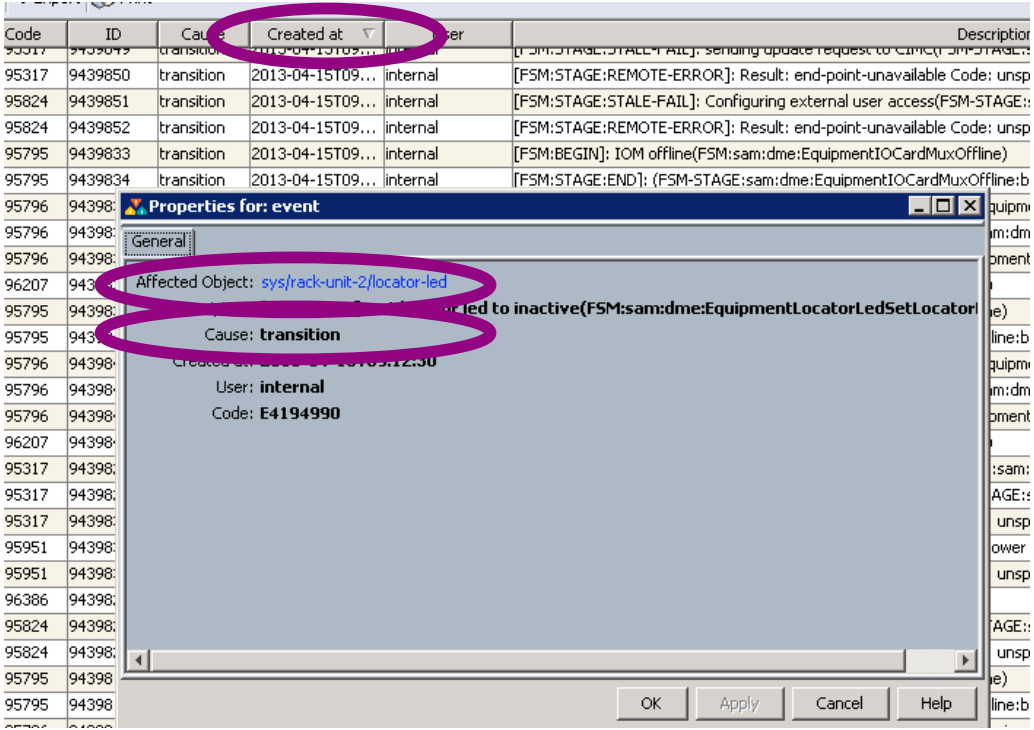
UCS Event Examples

Enable Locator LED




```
PS C:\> Get-UcsEvent -Code E4194990


Affected    : sys/rack-unit-1/locator-led
Cause       : transition
ChangeSet   :
Code        : E4194990
Created     : 2013-04-15T09:20:10.525
Descr       : EquipmentLocatorLedSet)
Id          : 9439976
Ind         : state-transition
Severity    : info
Trig        : special
TxId        : 17452229
User        : internal
Dn          : event-log/9439976
Rn          : 9439976
Ucs         : RCDN-UCS01
```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Definition #2 : UCS Fault

- Object managed by UCSM
  - Mutable
  - Includes operational state
- Causes
  - Instance of failure in UCS
  - Alarm Threshold
- Persistence
  - Remain until resolved AND cleared
  - Controlled by collection policy

- Properties
  - Severity
  - Last transition
  - Affected Object
  - Description
  - ID
  - Type
  - Cause
  - # of Occurrences
  - Original Severity
  - Previous Severity
  - Highest Severity

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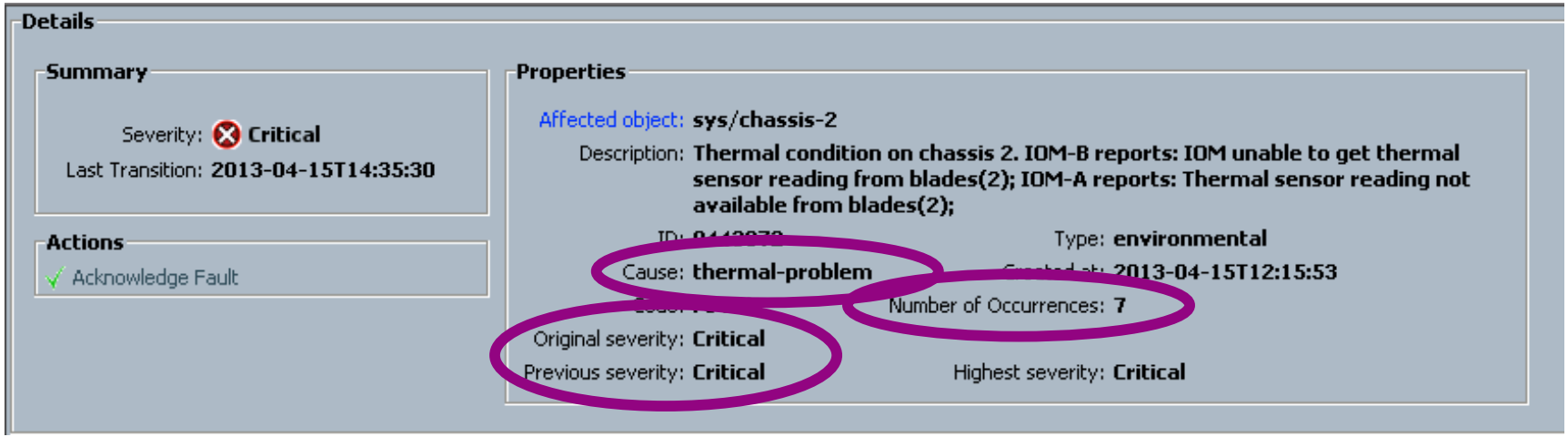
UCS Fault Example

Thermal Error




```
PS C:\>       Get-UcsFault -Code F0411 |ft

Ack       Cause              Code      Created             Descr              HighestSeverity Id      LastTransition
---       -----              -----     -------             -----              --------------- --      --------------
no        thermal-problem    F0411     2013-04-15T12:1...  Thermal conditi... critical        9443872 2013-04-15T14:
```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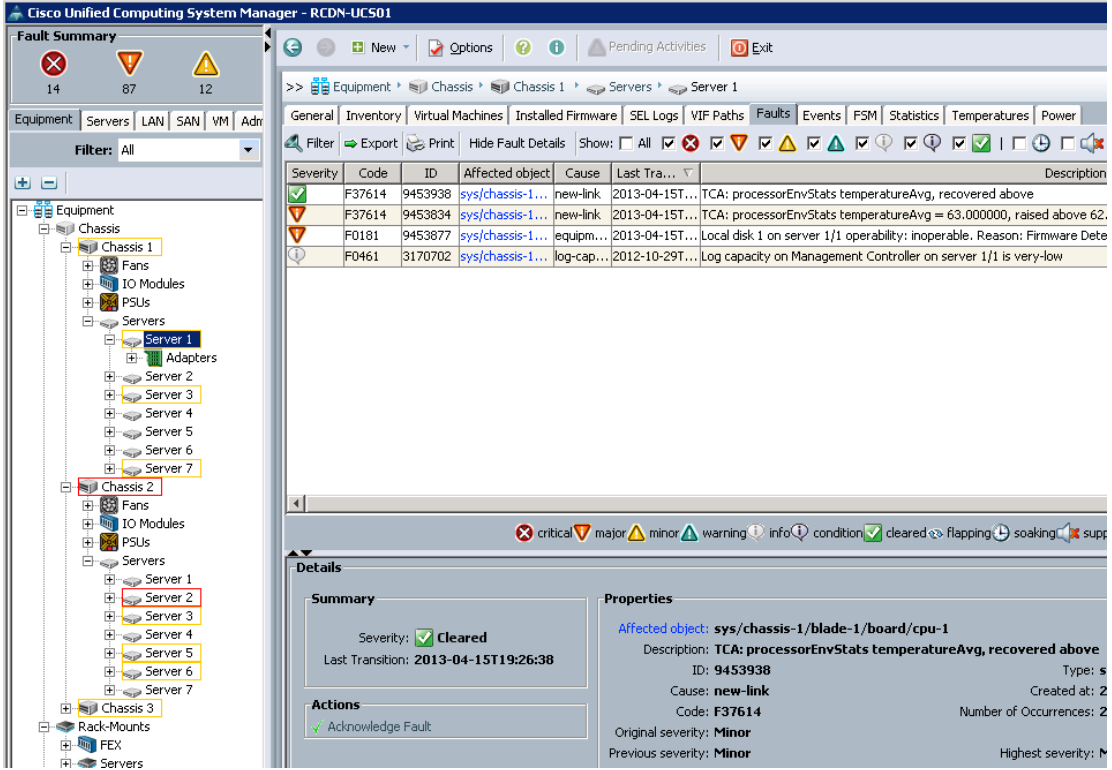
Clearing and Acknowledging Faults

- Requisites for Removal
  - Resolve Fault Condition (Clear)
  - Acknowledge Fault
- Removal Methods
  - Manual
  - Automated with Policy
    - Global Fault Policy
  - Scripted
- Other Factors
  - Retention Interval
  - Flapping/Soaking Interval



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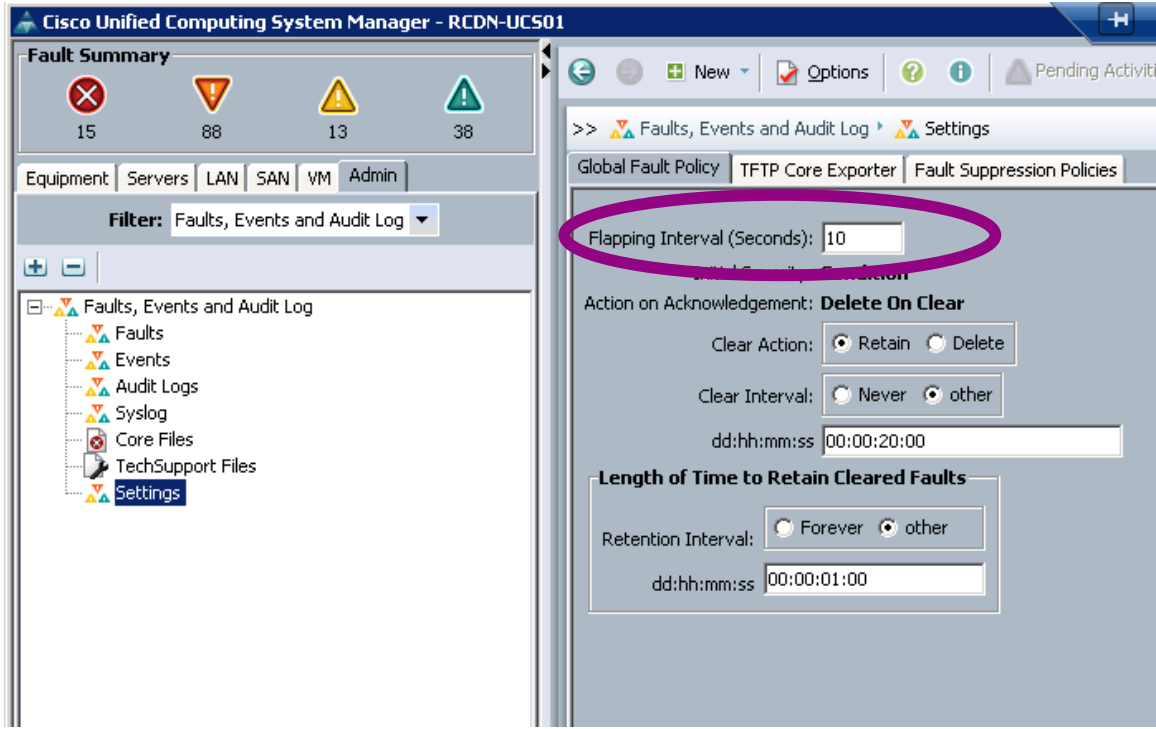
Flapping/Soaking Interval

- Time between fault raised and condition cleared
- Prevents excessive notifications
  - "Flapping"
  - e.g. "interface down"
- User Definable
  - Admin > Settings > Global Fault Policy



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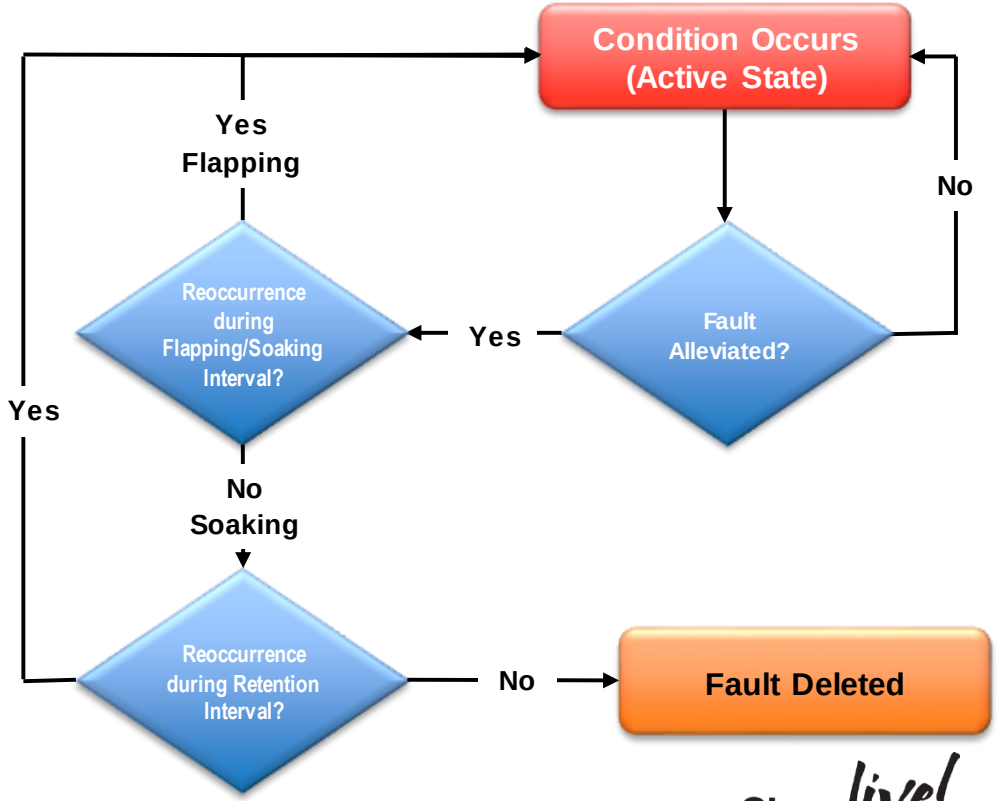
Fault Lifecycle

Seve...	Code	ID	Affected object
	F37614	9374820	sys/chassis-1/blade-1/board...
	F37614	9374791	sys/chassis-1/blade-1/board...

Seve...	Code	ID	Affected object
	F37614	9374791	sys/chassis-1/blade-1/board...
	F37614	9374688	sys/chassis-1/blade-1/board...



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Configuring Notifications in UCSM

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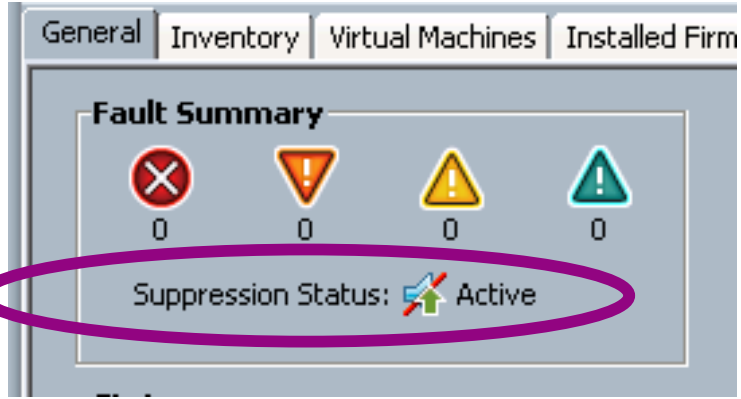
Fault Suppression

- Faults maintained in UCSM
- What's Suppressed?
  - SNMP Traps
  - Call Home Notifications
- Duration
  - Fixed time interval
  - Manually Stopped
  - Schedule
- Policies
  - Pre-defined in UCSM
    - Admin > Faults, Events… > Settings > Fault Suppression Policies



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Using Fault Suppression Demo

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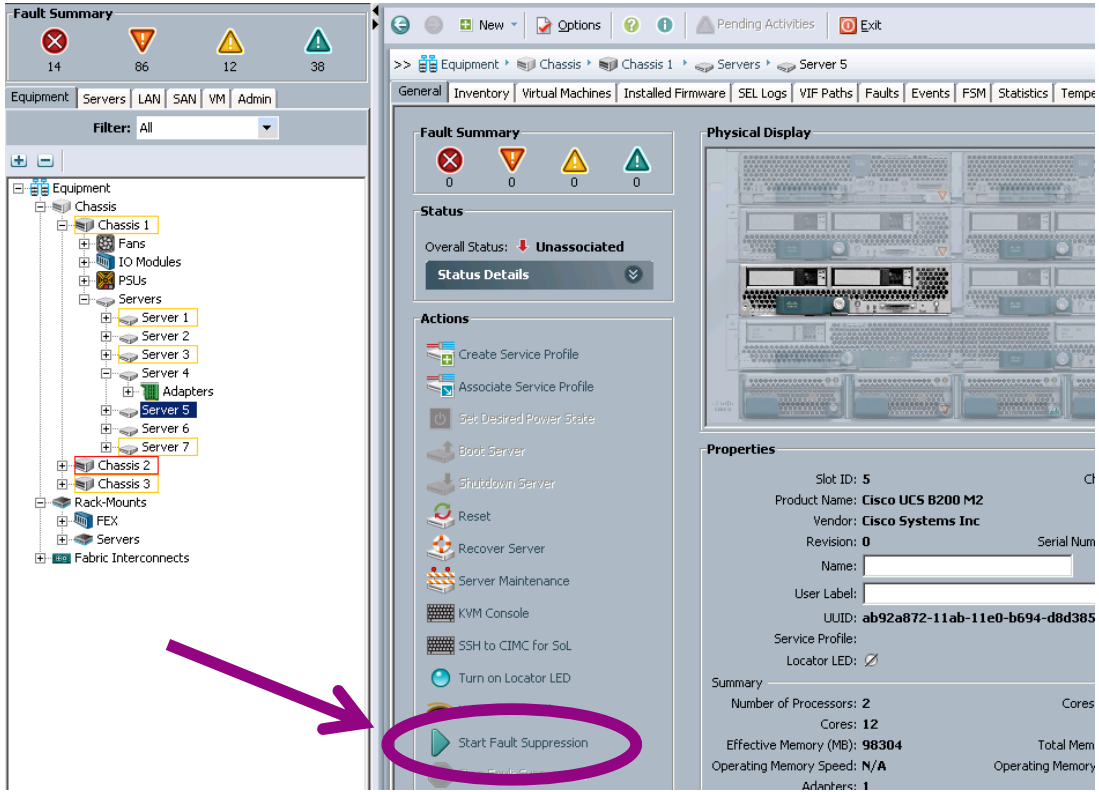
Fault Suppression – Demo

Select Device:

- Chassis
- IOM
- Server
- Service Profile
- Organisation



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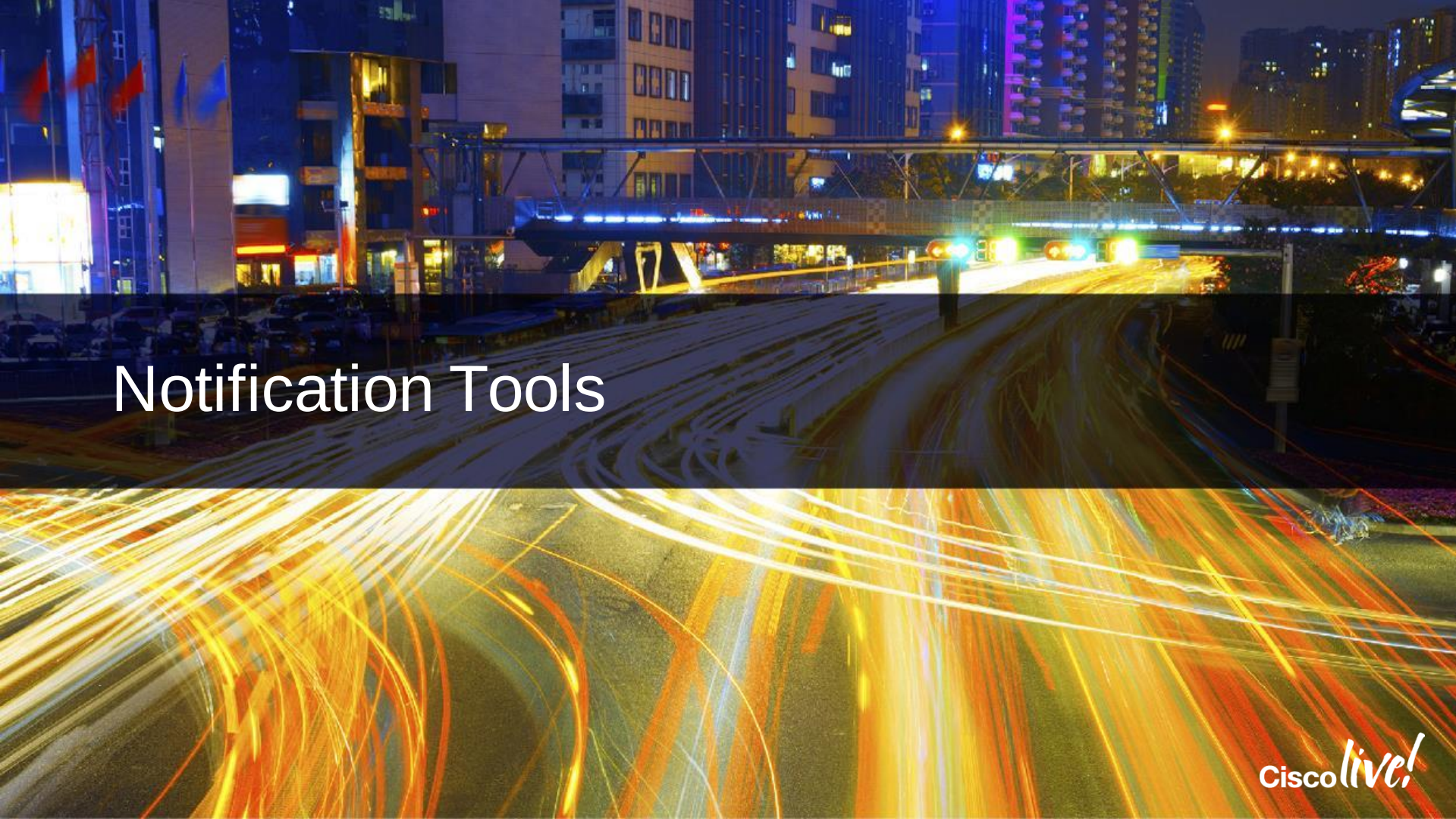
Notification Tools

UCS Fault SNMP Traps

- **cucsFaultActiveNotif**
  - Sent when a fault is active, or when any of the fault attributes change
    - Severity changes, number of occurrences changes…
- **cucsFaultClearNotif**
  - Sent when a fault is cleared
- Trap Variable Bindings help to identify the nature and cause of the problem

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UCS Fault SNMP Trap VarBinds

- **Fault Instance ID (Table INDEX)**: A unique integer identifying the fault
- **Affected Object DN**: The distinguished name of the MO that has this fault
- **Affected Object OID**: The OID of the MO that has this fault
- **Creation Time**: the time when the fault object was created
- **Last Modification**: the time when any of the attributes below were modified
- **Code**: A code providing specific information about the nature of the fault
  - 1400 fault codes: board power error, link down, fan module identity…
- **Type**: The type of the fault (broad categorisation)
  - 9 fault types: environmental, management, equipment…
- **Cause**: A probable cause of the fault
  - 241 fault probable causes: firmware upgrade problem, equipment offline, power problem…
- **Severity**: The severity of the fault
  - 6 fault severities: minor, major, critical, clear…
- **Occurrence**: the number of time this fault has occurred since it was created
- **Description**: a human readable string providing more information about the fault, including possibly more information about the probable cause

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UCS Manager Fault Types

Type	Description
fsm	UCSM was executing a Finite State Machine (FSM) and the FSM failed to complete successfully, or UCSM is retrying one of the FSM stages
equipment	UCSM has detected a physical component is inoperable, such as component health problems, equipment missing or unidentified
Server	UCSM is unable to complete a server task. For example, it is unable to associate a Service Profile to a blade, or a blade server has diagnostic failures
configuration	UCSM was unable to successfully configure a component
environmental	UCSM has detected an environmental issue, such as power problems, thermal problems, voltage problems, or loss of CMOS settings
management	UCSM has detected a serious management issue, such as failing to start critical services, failing to elect the primary switch, detecting that a management service has become unresponsive, or detecting software version incompatibilities
connectivity	UCSM has detected a connectivity issue to one of its components
network	UCSM has detected a network link failure
operational	UCSM has detected an operational issue, such as a log datastore reaching its maximum capacity, being unable to transfer files, or being unable to discover components

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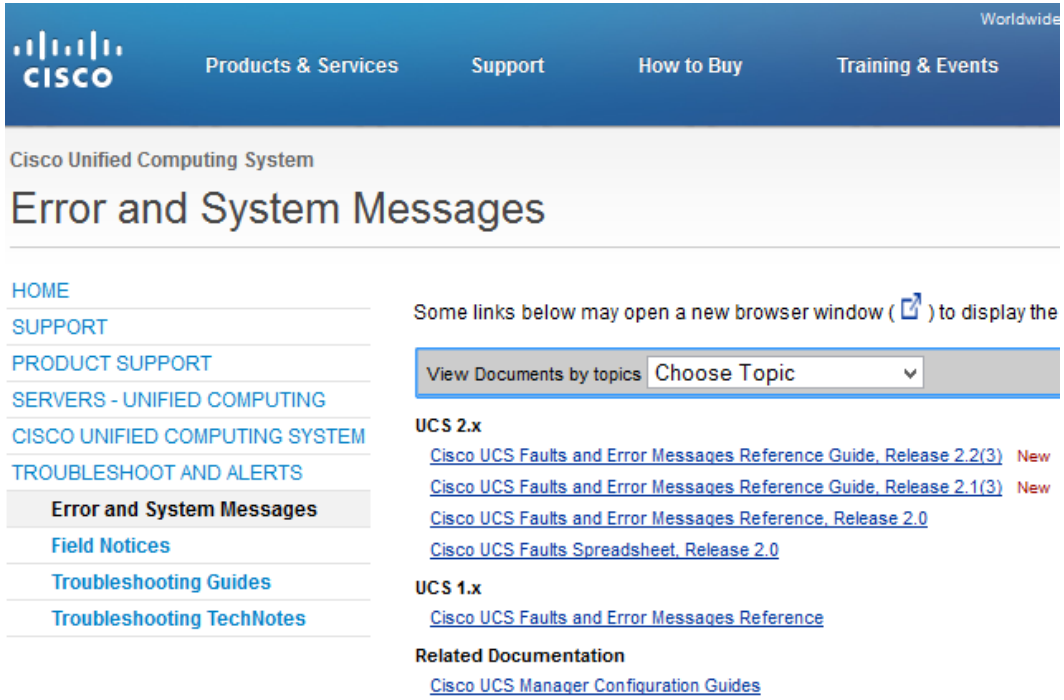
UCS Errors and System Messages

- UCS Faults and Error Messages Reference Guide
- UCS Faults Spreadsheet
  - Fault Codes
    - Not all user Threshold Codes included
  - Call Home
    - Diagnostic
    - Environmental
- Go to:
  - http://www.cisco.com/en/US/products/ps10477/products_system_message_guides_list.html



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Fault Reference Guide

- http://www.cisco.com/c/en/us/td/docs/unified_computing/ucs/ts/faults/reference/2-2/UCSFaultsErrorsRef_2-2.pdf

fltMemoryUnitDisabled

Fault Code:F0844

Message

DIMM [location] on server [chassisId]/[slotId] operState: [operState]DIMM [location] on s
operaState: [operState]

Explanation

This fault is raised when the server BIOS disables a DIMM. The BIOS could disable a DIMM
reasons, including incorrect location of the DIMM or incompatible speed.

Recommended Action

If you see this fault, refer to the Cisco UCS B-Series Troubleshooting Guide for informatio
resolve the DIMM issues.

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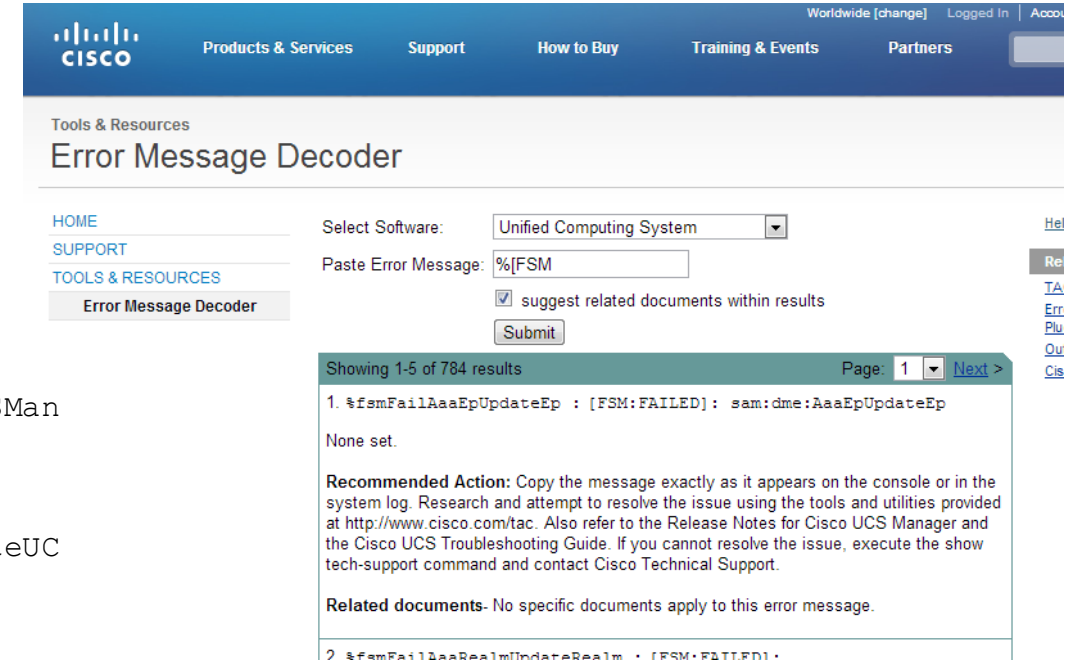
Error Message Decoder

- http://www.cisco.com/cgi-bin/Support/Errordecoder/index.cgi



- Limited info for UCS
  - `%fsmRmtErrMgmtControllerUpdateUCSManager: start : [FSM:STAGE:REMOTE-ERROR]: Scheduling UCS manager update(FSM-STAGE:sam:dme:MgmtControllerUpdateUCSManager:start)`
  - `%fsmFailMgmtControllerUpdateUCSManager : [FSM:FAILED]: sam:dme:MgmtControllerUpdateUCSManager`

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Scaling UCS Management with UCS Central

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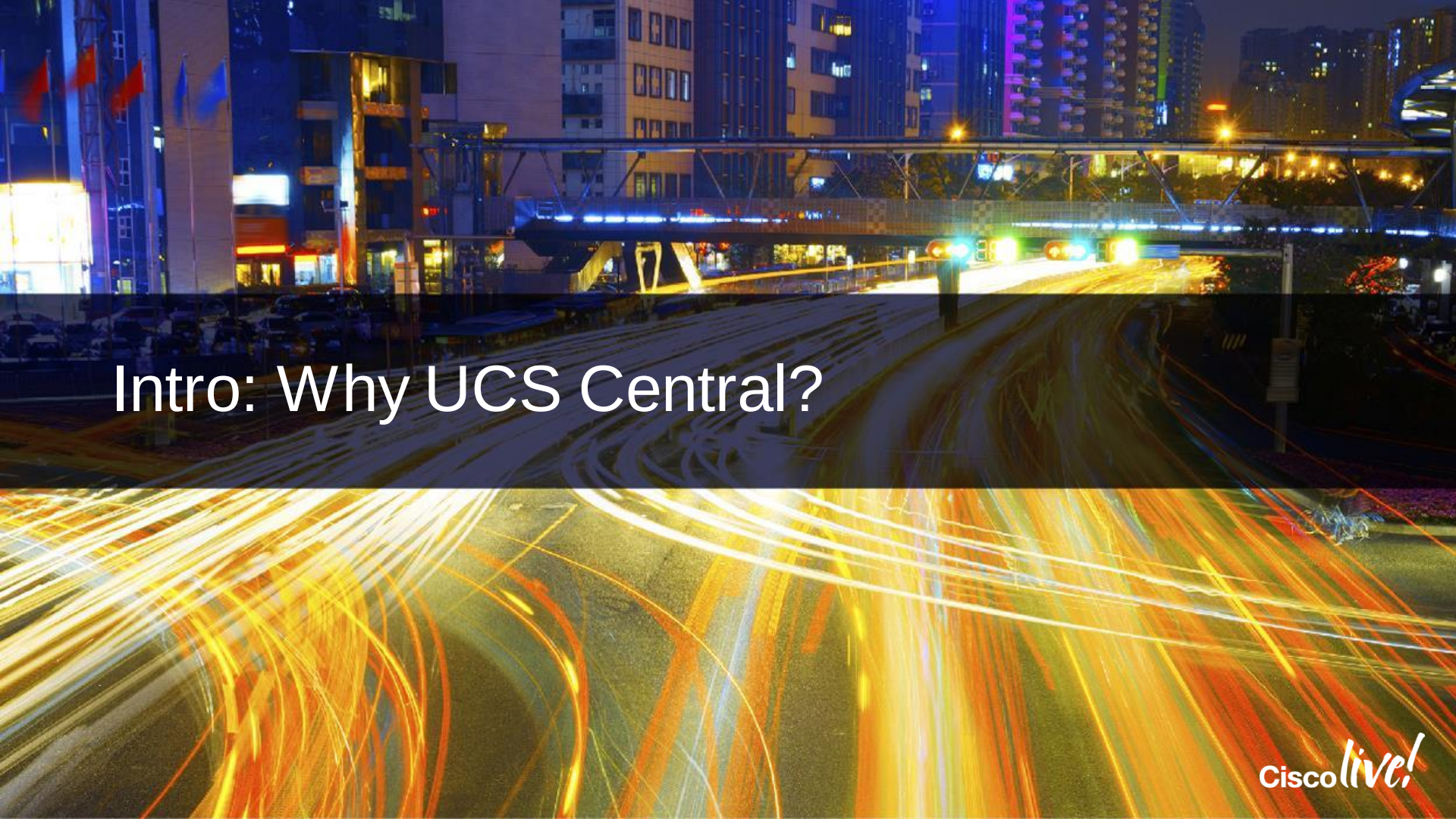

Intro: Why UCS Central?

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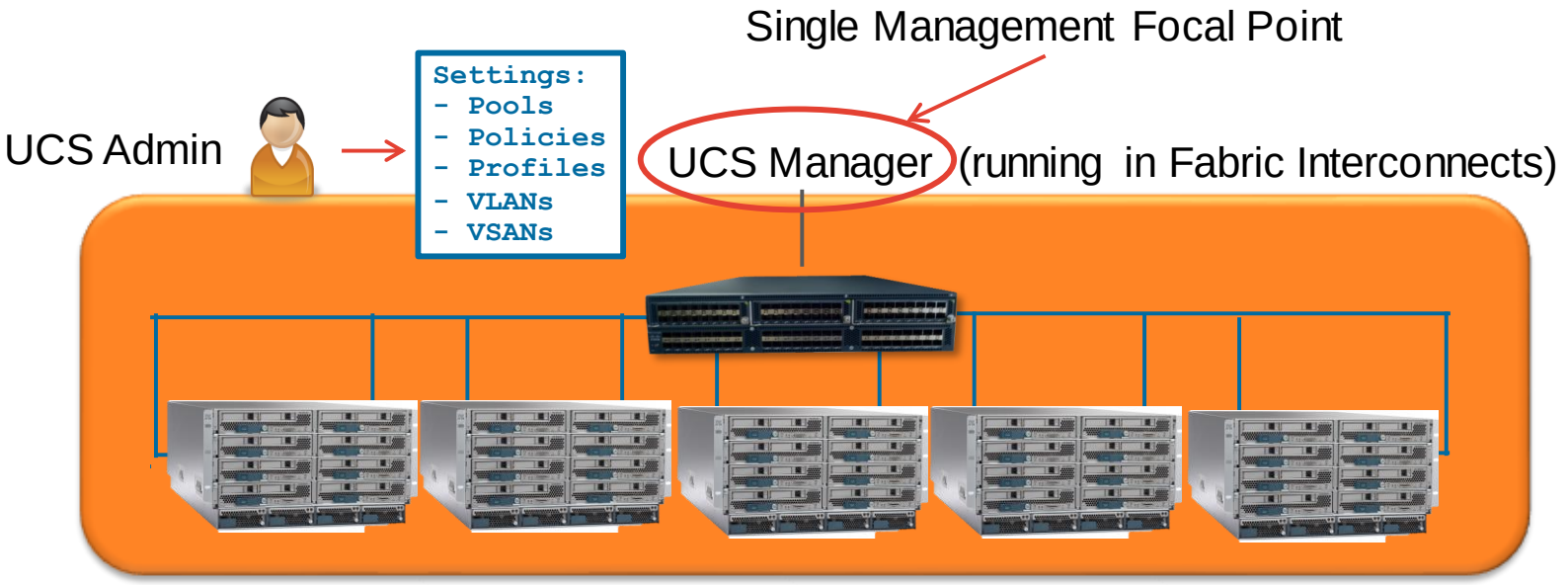
Management of Multiple UCS Systems - Review

Management of One UCS "Domain"



Many physical servers – Up to 160 (blade or rack-mount)

1 "manager" for entire UCS "Domain" or "pod" or "system" or "instance"

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Management of Multiple UCS Systems - Review

UCS Admin

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

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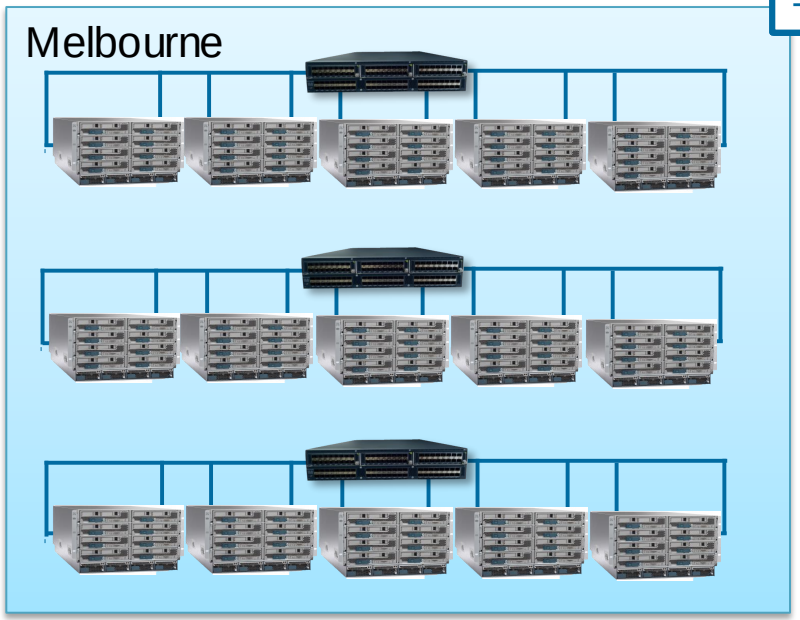
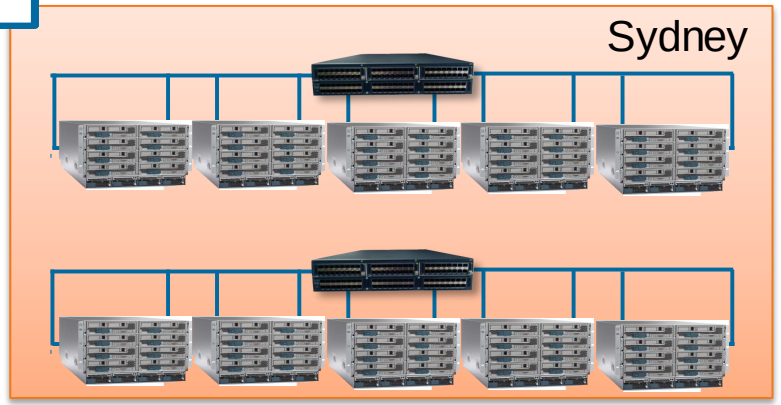
UCS Central will Simplify & Enhance Your Multi-UCS Management





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Role of UCS Central

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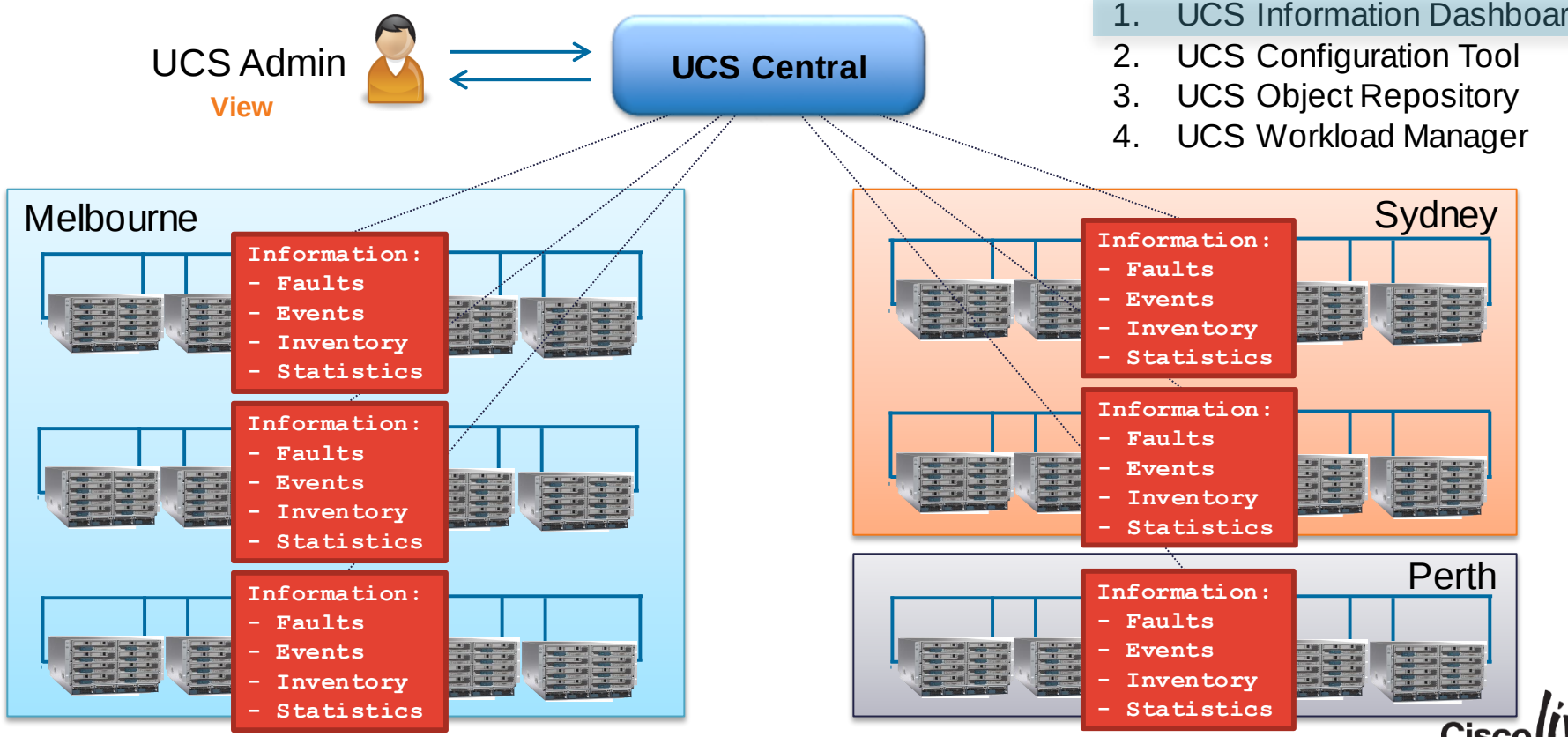
UCS Central: High-level Logical View

1. UCS Information Dashboard
2. UCS Configuration Tool
3. UCS Object Repository
4. UCS Workload Manager



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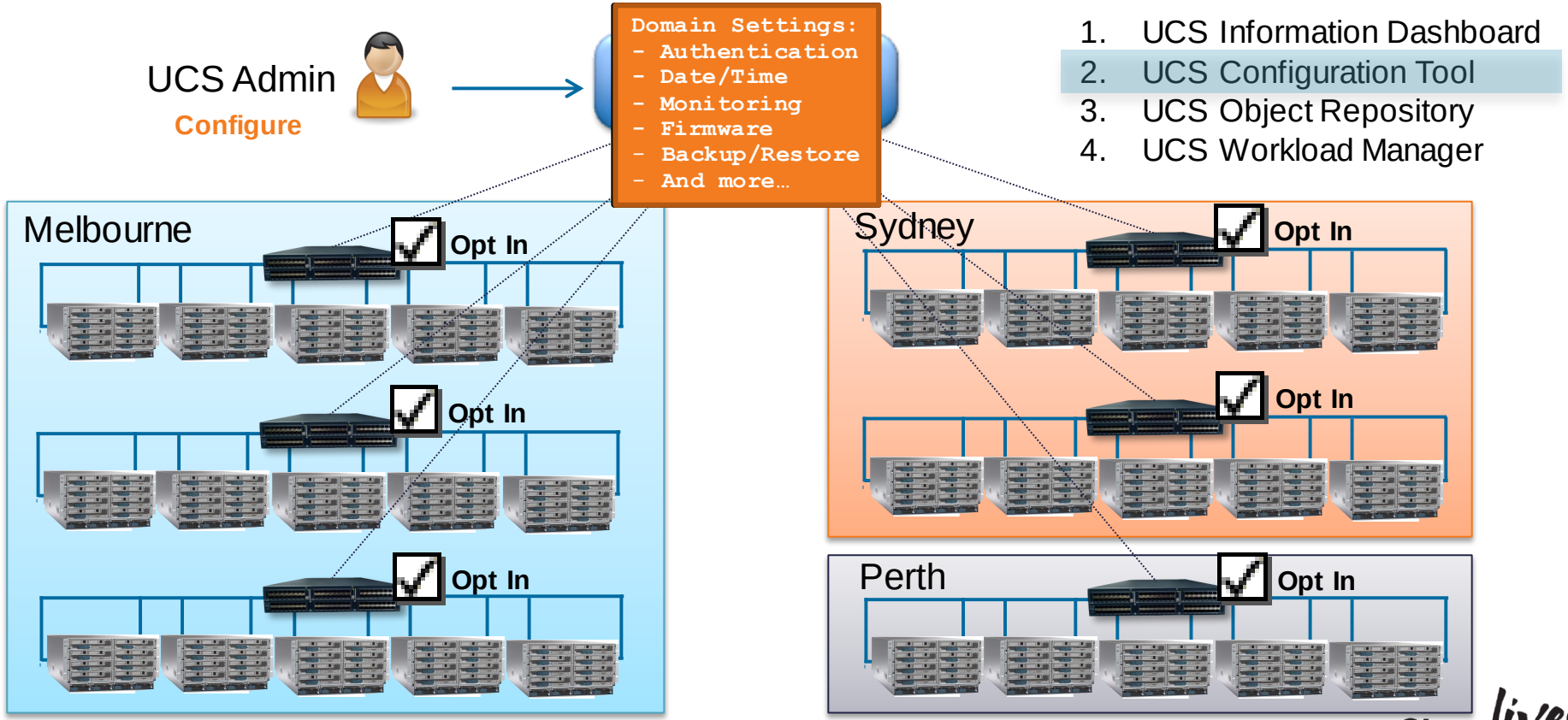
UCS Central: High-level Logical View



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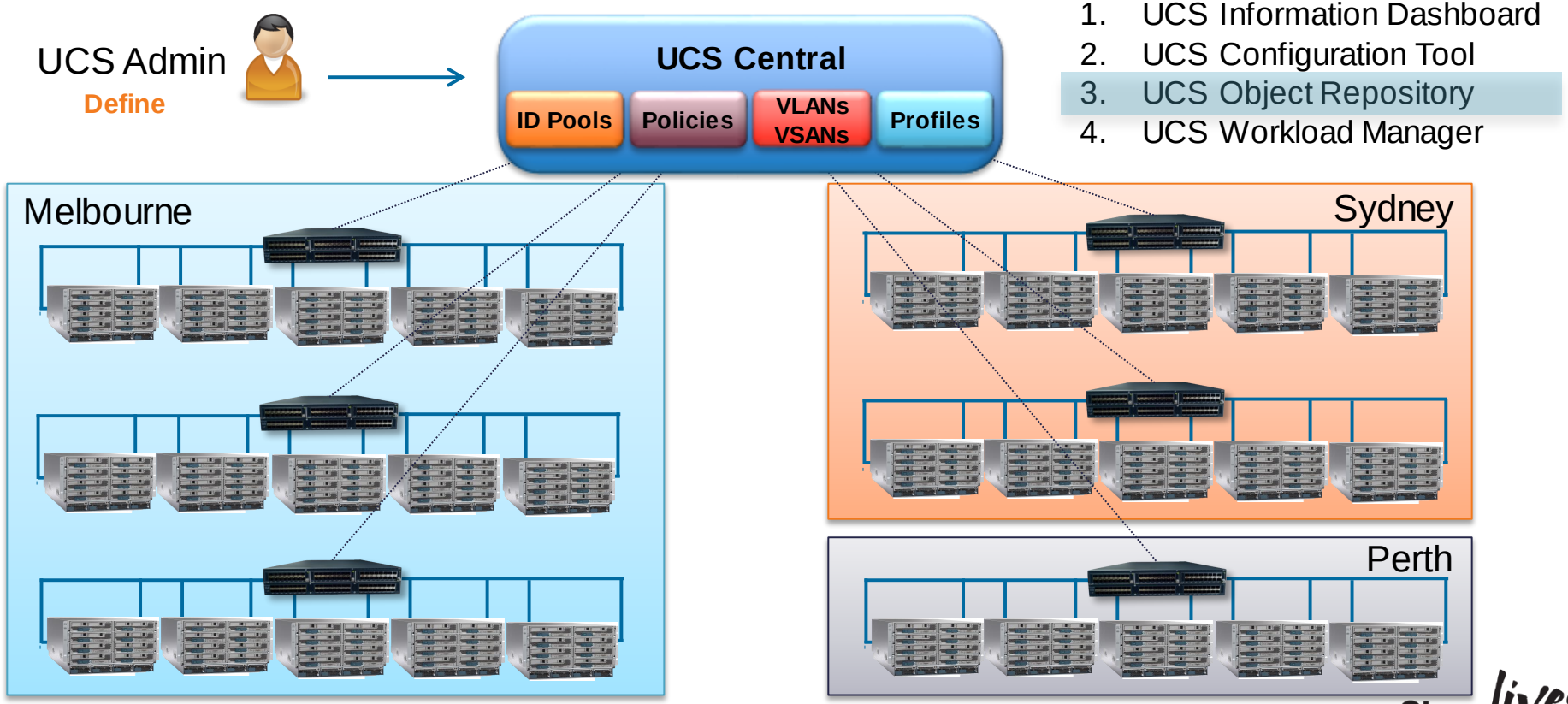
UCS Central: High-level Logical View



1. UCS Information Dashboard
2. UCS Configuration Tool
3. UCS Object Repository
4. UCS Workload Manager

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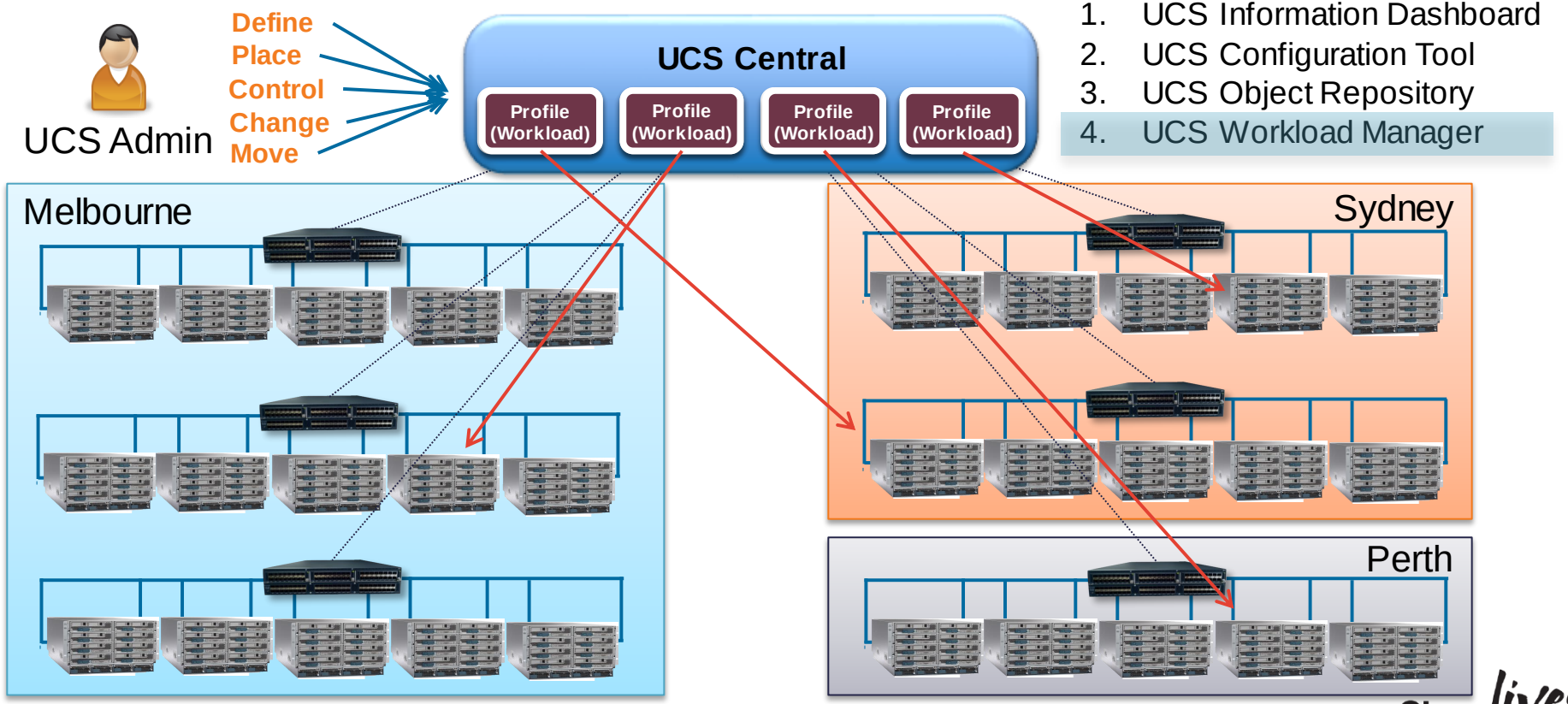
UCS Central: High-level Logical View



1. UCS Information Dashboard
2. UCS Configuration Tool
3. UCS Object Repository
4. UCS Workload Manager

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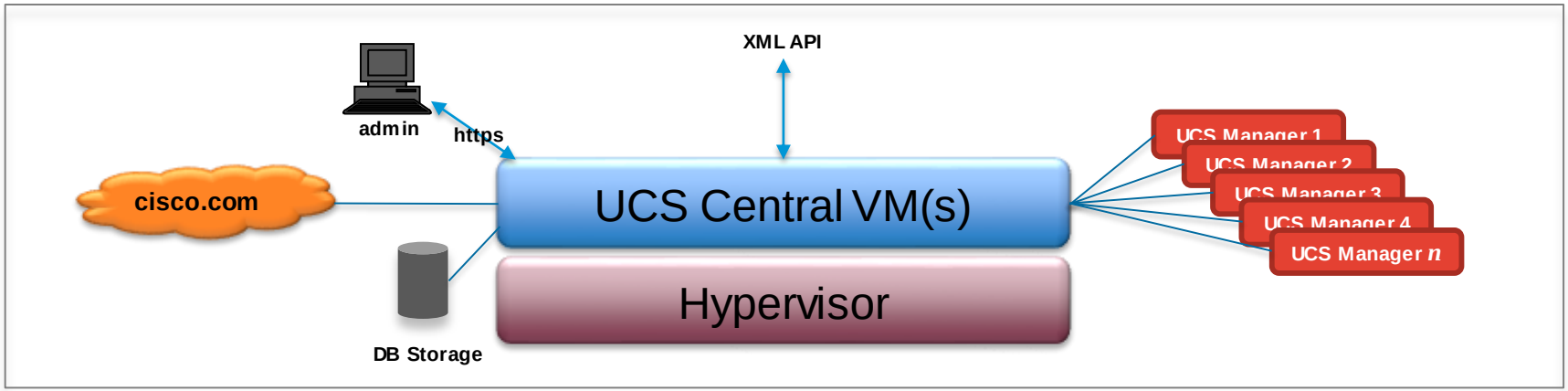
UCS Central: What Is It?

What Does It Look Like?

- External, VM-based management appliance
- Download as .OVA or .ISO from cisco.com
- Architecture:



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Intro: UCS Central Capabilities

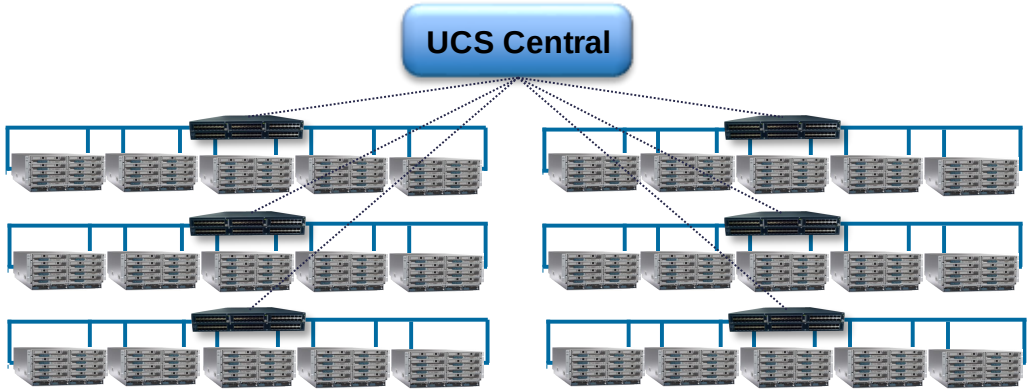
High-level Summary

Four Main Global Capabilities:

1. **UCS Information Dashboard**
2. **UCS Domain Configuration Tool**
3. **UCS Object Repository**
4. **UCS Workload Manager**

cisco UCS Central

What is it not?



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Getting Started: Domain Registration

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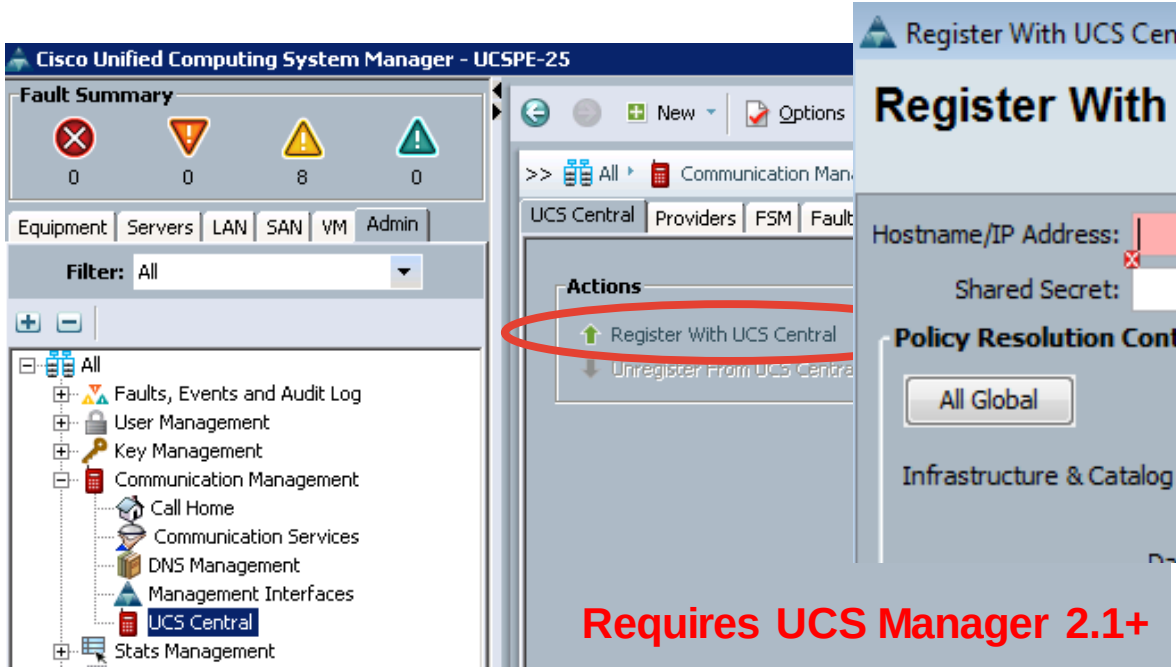
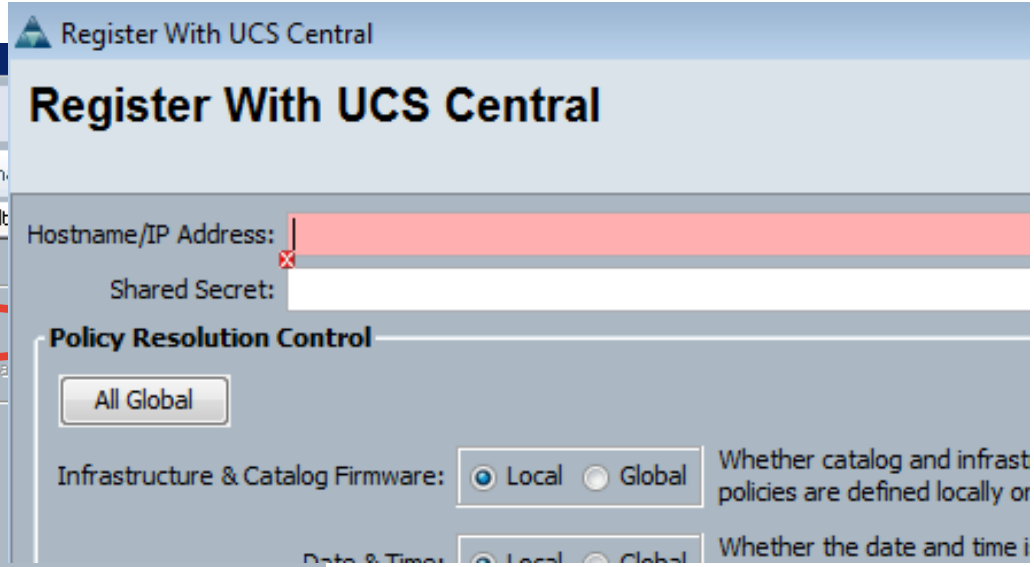
Enabling My UCS Domain

- UCS Central cannot manage a UCS Domain until it is “registered” with UCS Central
- Registration initiated by UCS Domain admin





Requires UCS Manager 2.1+

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What Happens During Domain Registration

- Shared Secret & Certificate exchange
- Initial Inventory: Hardware, Fault Counts, Local Objects (IDs, profiles, policies)
- Policy & Profile map definition established → Dependencies
- Initial feature exchange between UCSM and UCS Central
- Globalised Domain admin settings are resolved (if necessary) → Warning!
- Registration process may be automated – XML API

Note: Requires UCSM 2.1+

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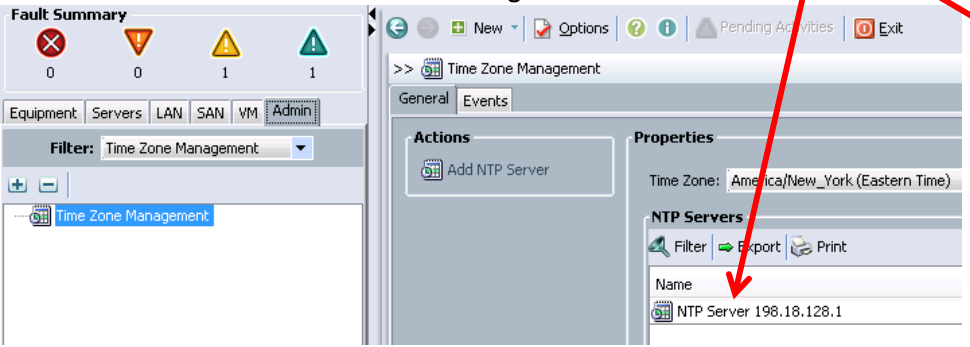
Domain Registration - Challenges

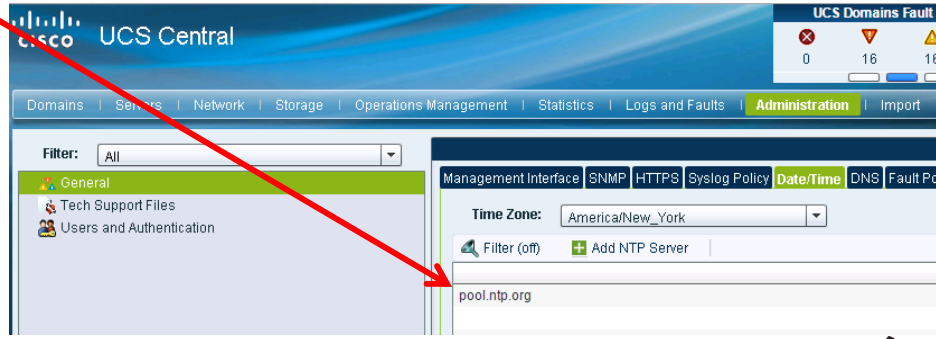
- Number 1 Issue = Time Synchronisation
- UCSM and UCS Central time must be identical
- Use NTP time source for
  - UCS Domain
  - UCS Central

Specify NTP Source

UCS Manager



UCS Central



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Domain Registration with UCS Central

Common Questions

1. Does UCS Central "take over" my domain as soon as it is registered?
   - No - Registration "enables" UCS Central, but does not "empower" UCS Central
   - UCS Manager admin may enable policy specific control of Domain-wide settings
2. Can UCS Central make changes to a Domain upon Registration?
   - Technically, yes (but not by default) – Domain Group "auto-registration policies"

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Using UCS Central – Changing UCS Management Paradigm

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UCS Central Use-Cases

1. **Information Dashboard**
   - Inventory
   - Faults/Logs
   - Statistics
2. **Domain Configuration**
   - Domain Admin Settings/Enforcement
3. **Object Repository**
   - IDs / ID Pools
   - Policies
   - Service Profiles & Templates
   - Connectivity Templates
4. **Workload Manager**
   - Service Profile Usage & Placement

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UCS Central Use-Cases

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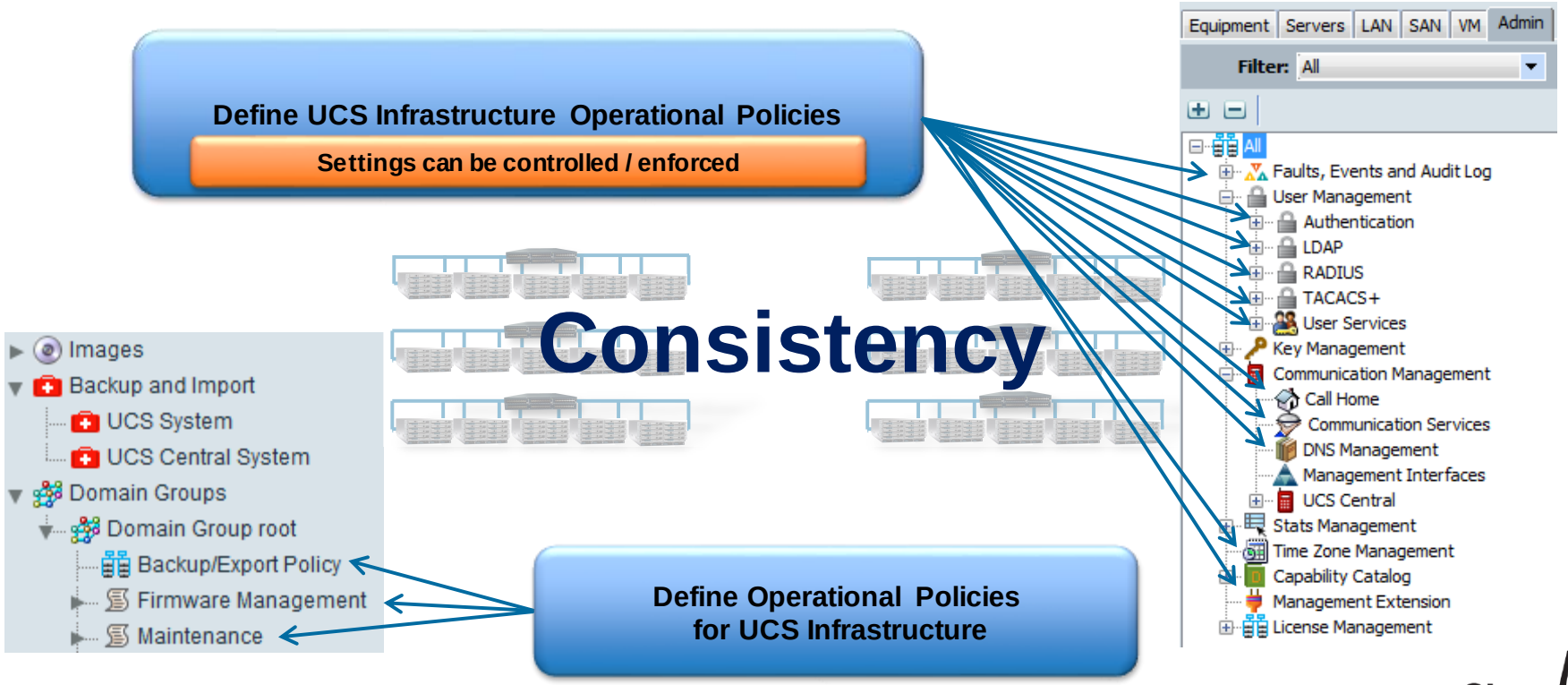
UCS Central Use-Case: Domain Configuration

Globally Defined – Domain-wide Infrastructure Policies



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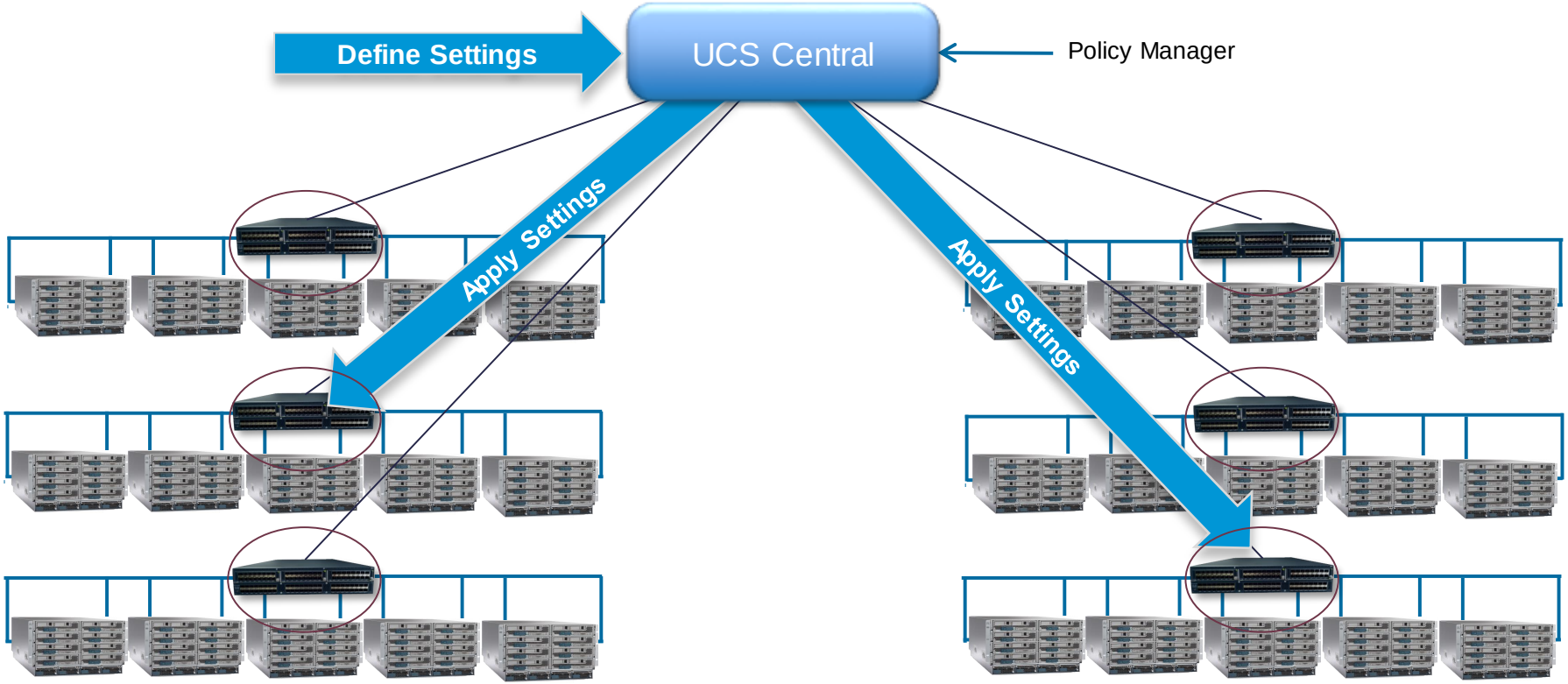
UCS Central – Global Configuration Policies



Each UCS Manager becomes the policy recipient and resolver

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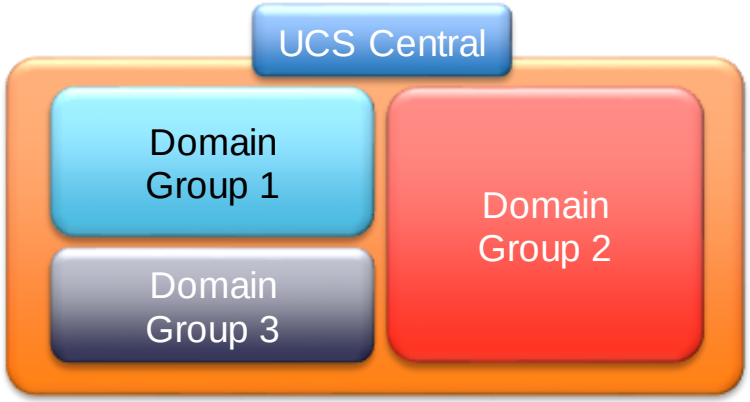
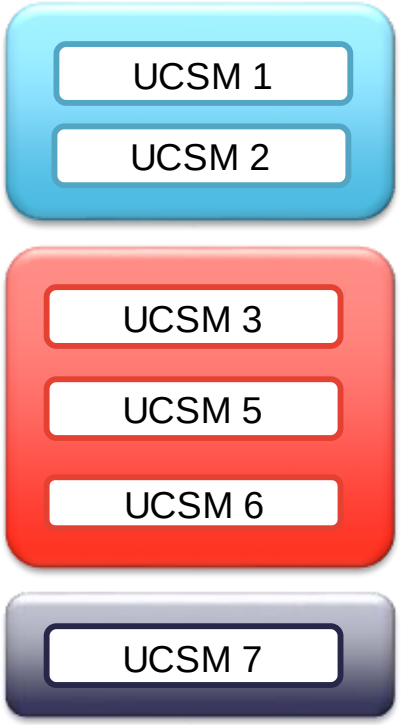
Controlling the Configuration

UCS Central Domain Groups





- **Domain Group (DG) is arbitrary grouping of UCS domains**

- Domains can be a part of only one DG at a time
- Policies defined in the DG are in effect for all domains in the DG
- Domains can move between DGs
- DG to DG move for domain can be disruptive depending on new policies
- Domain can auto-join DG based on qualification policies at registration

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Using UCS Central Domain Groups – Opt In / Out

Example: Time Zone Management

Time Zone Policy: US Central

- UCSM 1 — Time Zone Management: Local / Global
- UCSM 2 — Time Zone Management: Local / Global

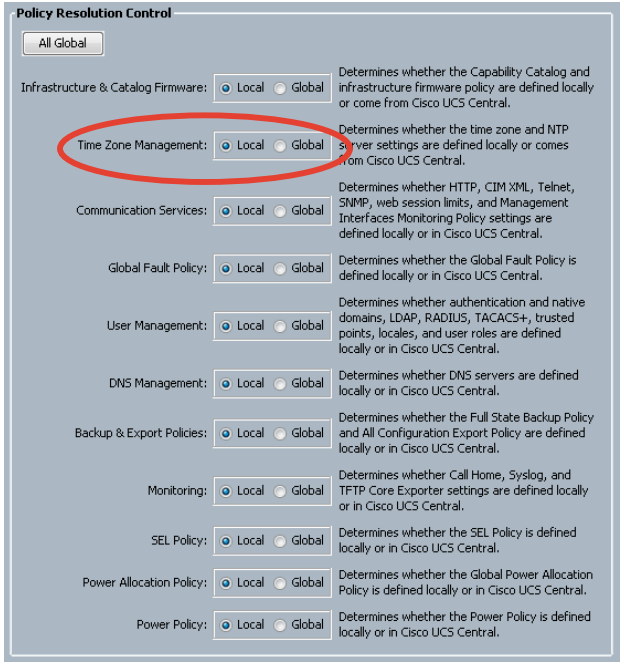
Time Zone Policy: US Eastern

- UCSM 3 — Time Zone Management: Local / Global
- UCSM 5 — Time Zone Management: Local / Global
- UCSM 6 — Time Zone Management: Local / Global

Time Zone Policy: US Pacific

- UCSM 7 — Time Zone Management: Local / Global

UCS Manager → UCS Central Menu



UCS Central does not take control - Control is given

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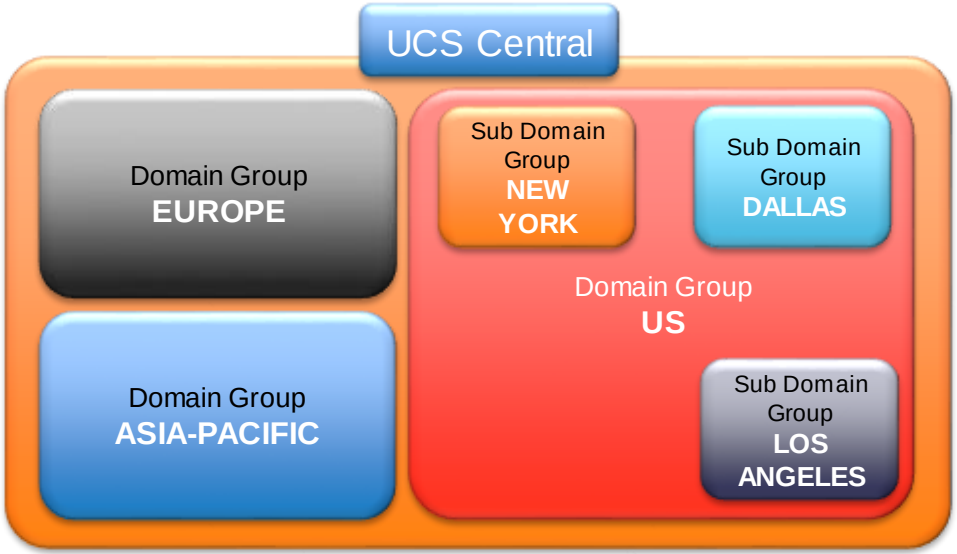
UCS Central Domain and Sub Domain Groups

- Domain Groups can have up to 5 levels of sub domains
- Sub domains have hierarchical relationship with their parent
- Easy to manage policy exceptions while administering large number of UCS domains



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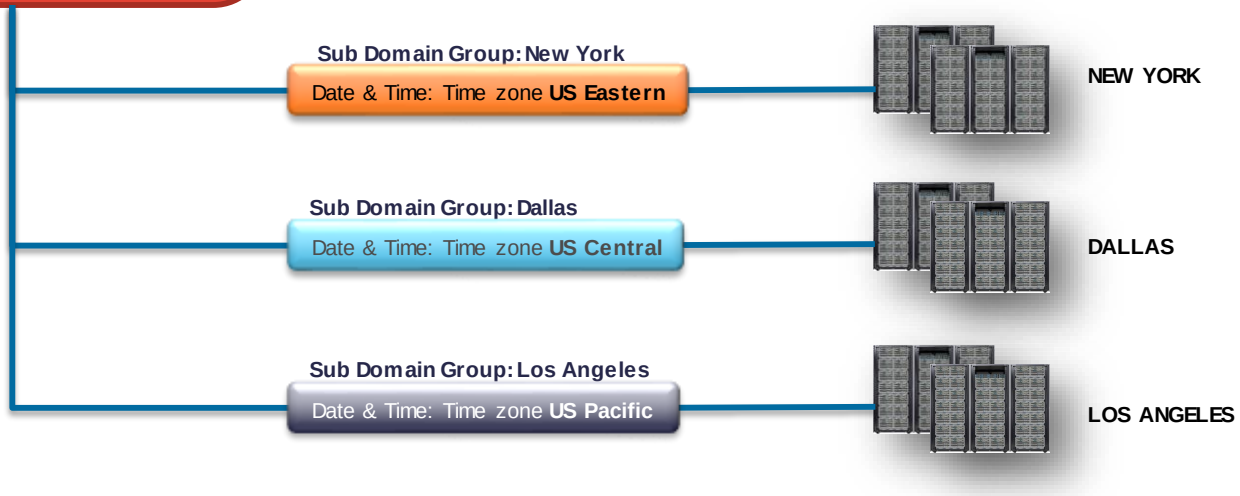
Global Configuration Settings in Sub Domains

Domain Group: US

Date & Time: NTP
DNS
Remote Access
SNMP
Debug Settings
Call Home
Authentication (LDAP, Radius, TACACS)
Equipment Power and SEL policies
Firmware

Sub domain groups inherit properties from parent domain(s)
Easy way to manage exceptions to “master” policies
Exceptions get defined at the sub-domain level

Any domain in the sub-domain has all parent properties
+
the local policies defined at the sub-domain level



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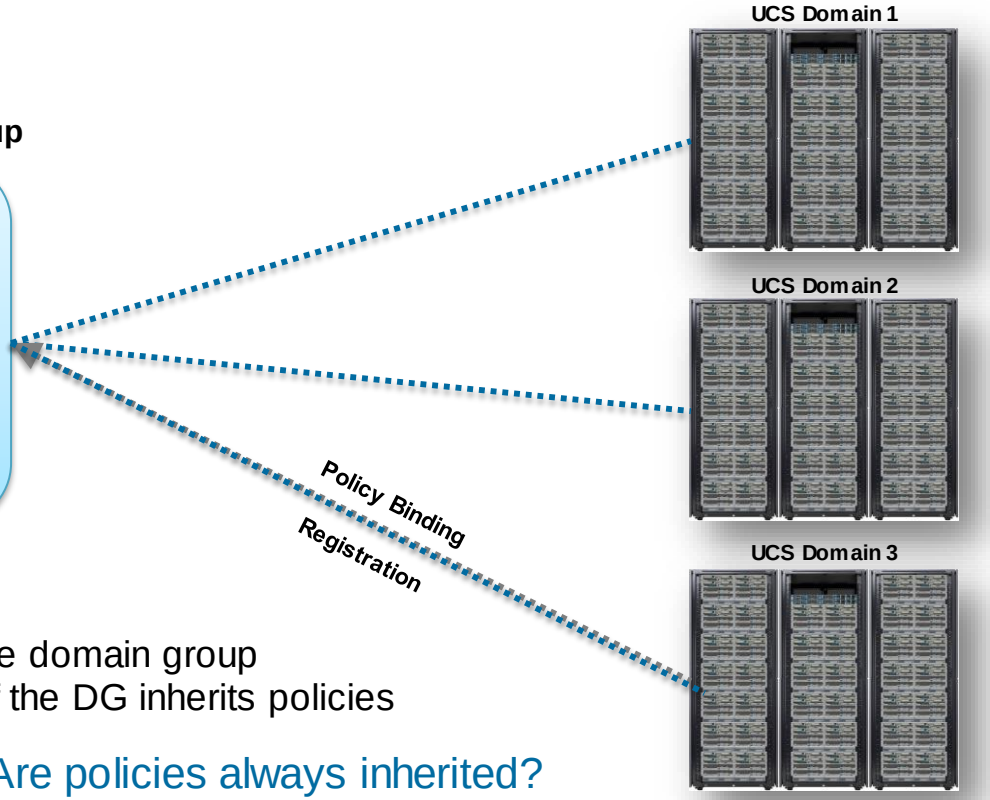
Global Configuration Policies - Standardisation

Global Admin Policies in a Domain Group

Date & Time: NTP, Time zone
DNS
Remote Access
SNMP
Debug Settings
Call Home
Authentication (LDAP, Radius, TACACS)
Equipment Power and SEL policies
Firmware



- Admin Policies are defined at the domain group
- Any domain that is a member of the DG inherits policies

Question: Are policies always inherited?

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Configuration Policies Demo

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Domain-wide Global Configuration Policies Demo

Administrative Configuration – Domain-wide Global Configuration Policies

- Domain Groups
  - Explore / Create
  - Membership
- Admin Policies
  - Create
  - Use
- UCS Manager Policy Resolution Control
  - Opt In / Out
  - Observe UCS Manager “effective settings”

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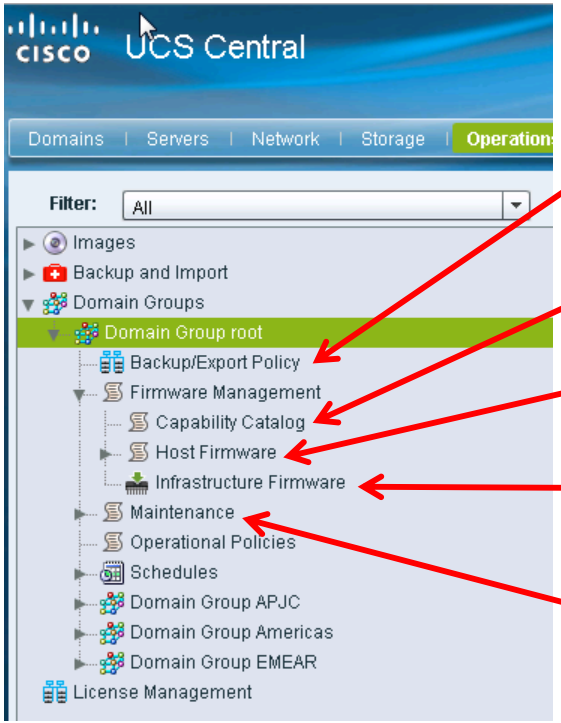
Other Domain-wide Global Configuration Policies



Defines how member domains are backed up (both full-state & config-all)

Defines capability catalog in use for member domains (opt-in)

Defines host firmware bundles available for Local Service Profiles only

Defines infrastructure firmware bundle in use member domains (opt-in)

Defines maintenance policies available for Infrastructure and Local Service Profiles

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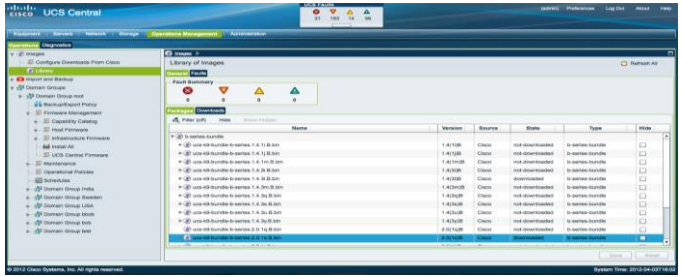
Global Configuration Policies – Firmware Management

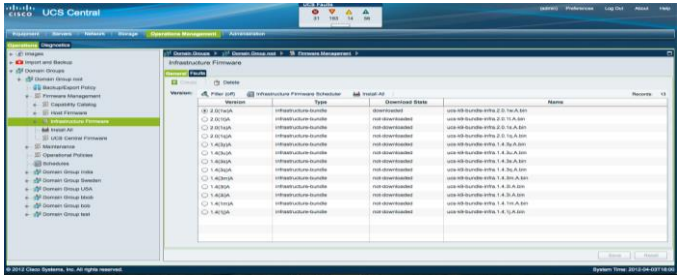
Cisco.com

Automated Firmware versions list downloads from Cisco.com

Firmware Auto Install



UCS Central Firmware Library



Global Firmware Policies

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UCS Central Use-Cases

1. **Information Dashboard**
   - Inventory
   - Faults/Logs
   - Statistics
2. **Domain Configuration**
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3. **Object Repository**
   - IDs / ID Pools
   - Policies
   - Service Profiles & Templates
   - Connectivity Templates
4. **Workload Manager**
   - Service Profile Usage & Placement

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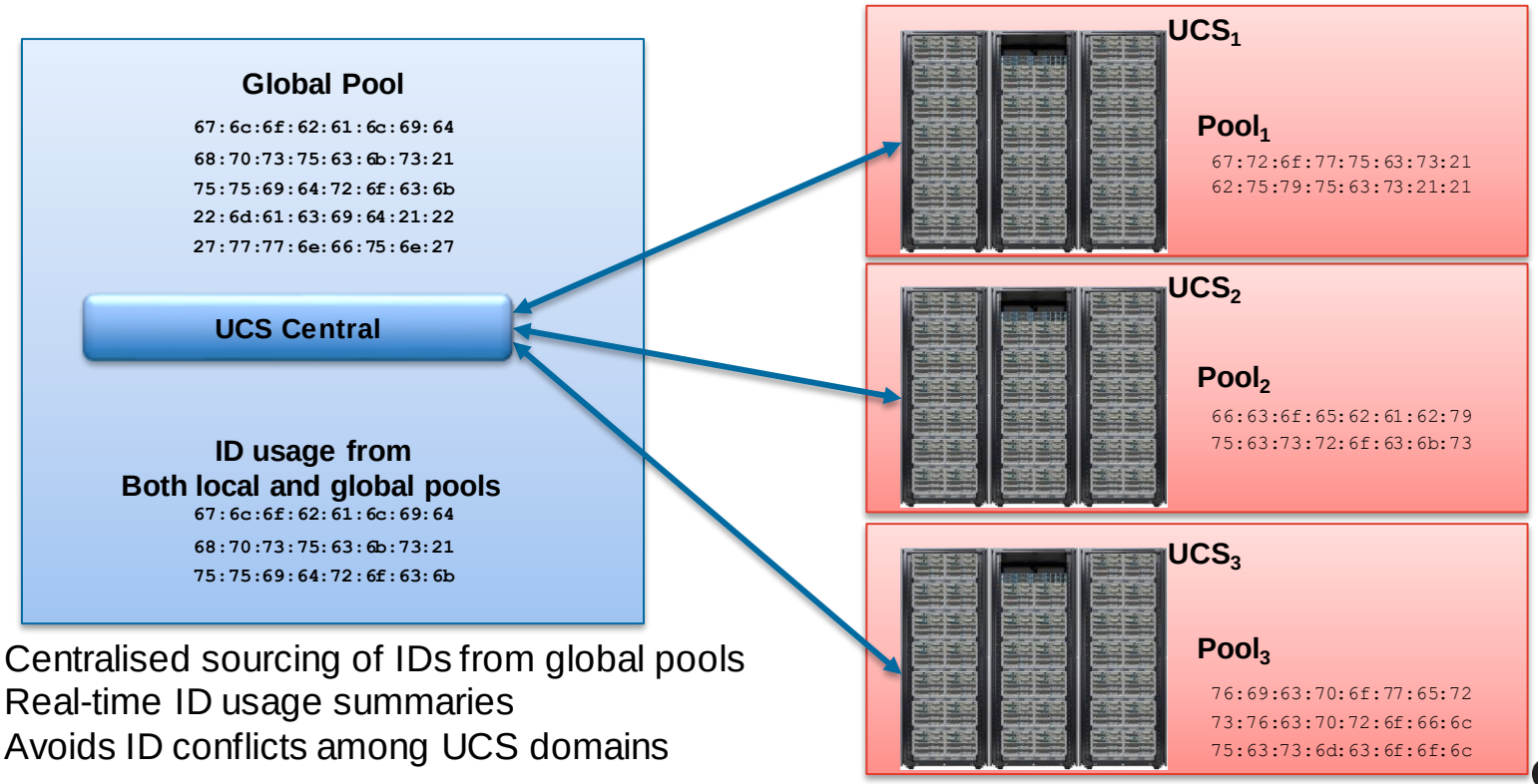
UCS Central Use-Case: Object Repository

Global ID & ID Pool Management



- Centralised sourcing of IDs from global pools
- Real-time ID usage summaries
- Avoids ID conflicts among UCS domains

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UCS Central Use-Cases

1. **Information Dashboard**
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   - Statistics
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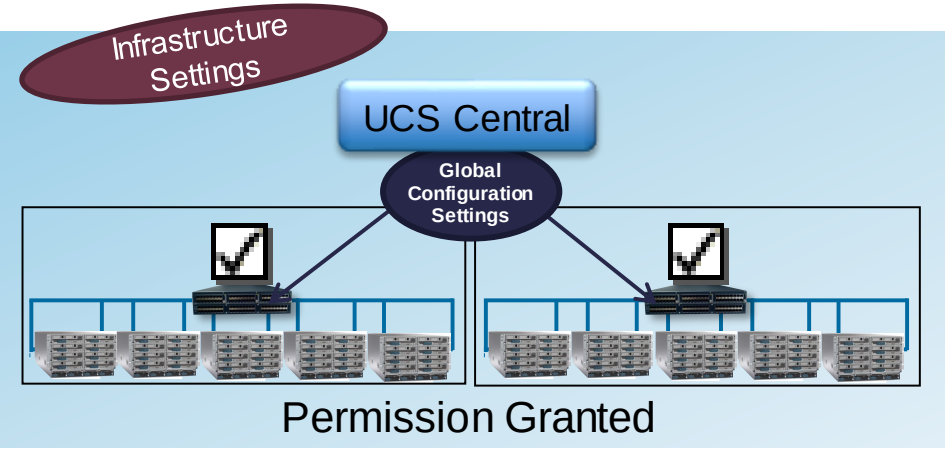
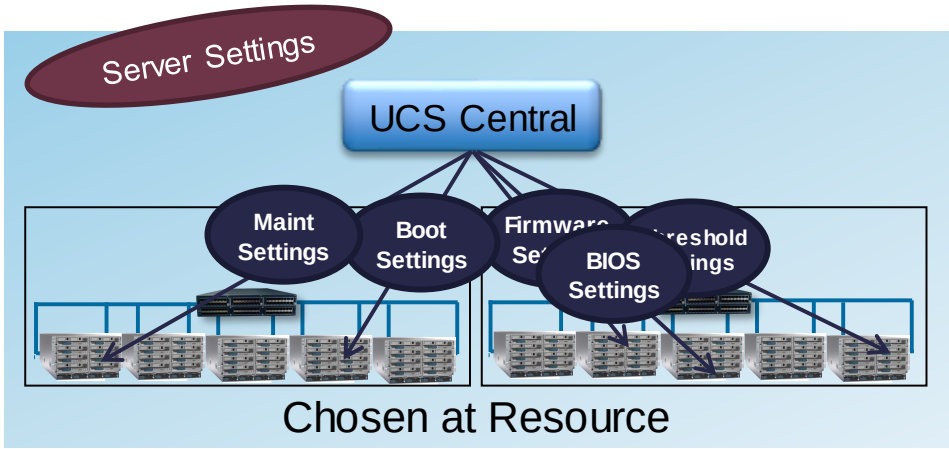
UCS Central Use-Cases – Object Repository

Global Policy Usage Scenarios

"Policies" used in two ways:

1. **Domain Configuration Settings** – Domain Admin "opts-in" to globally-defined Domain-wide Policy
2. **Server Settings** – Global Policy "Object" chosen from UCS Central Repository (database)





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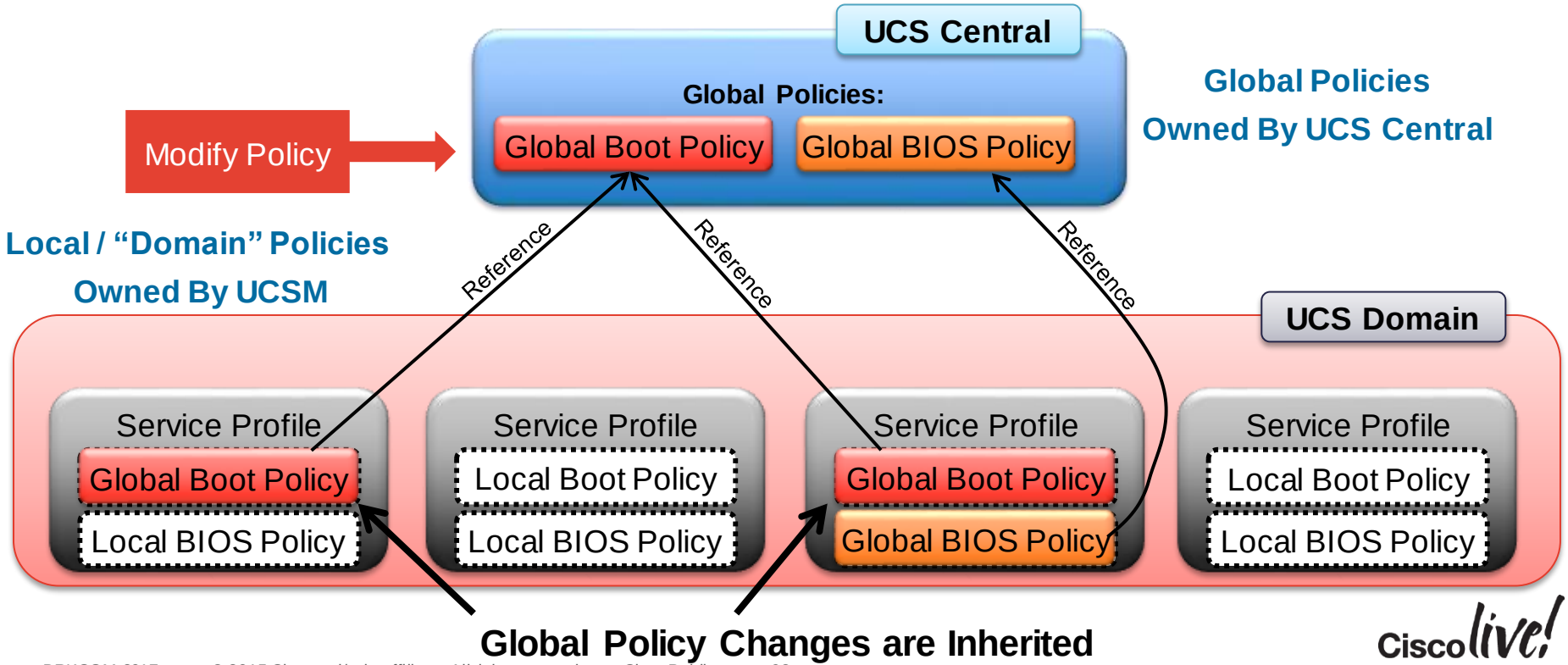
UCS Central Use-Cases – Object Repository

Global Resource Policy Object Ownership – Example



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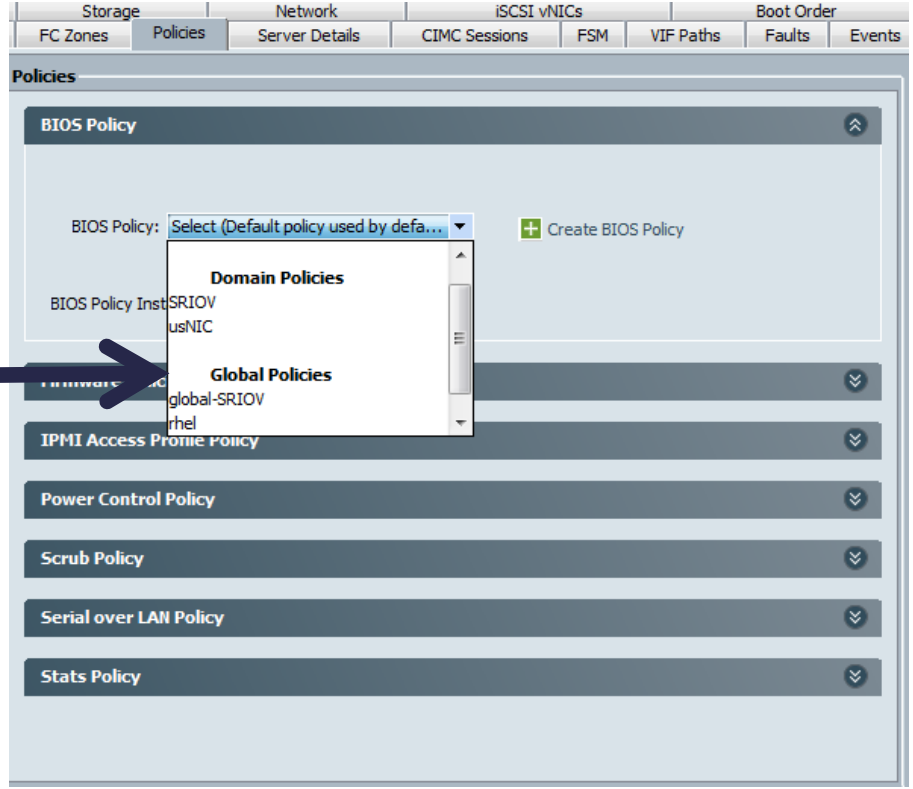
UCS Central Use-Cases – Object Repository

Global Policy Usage Scenarios: BIOS Policies

UCSM admin selects, either:
- Local (Domain) Policy
- Global Policy



UCS Manager

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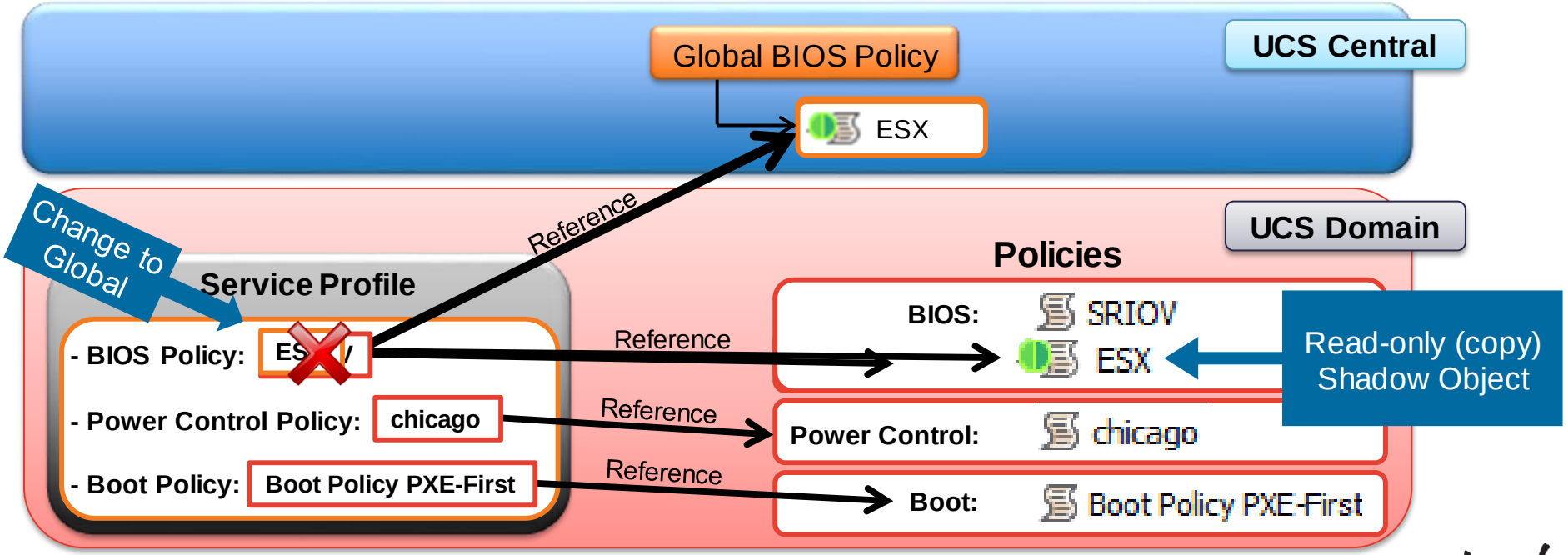
Where Does a Global Policy Live?

Shadow-Object Creation - Example



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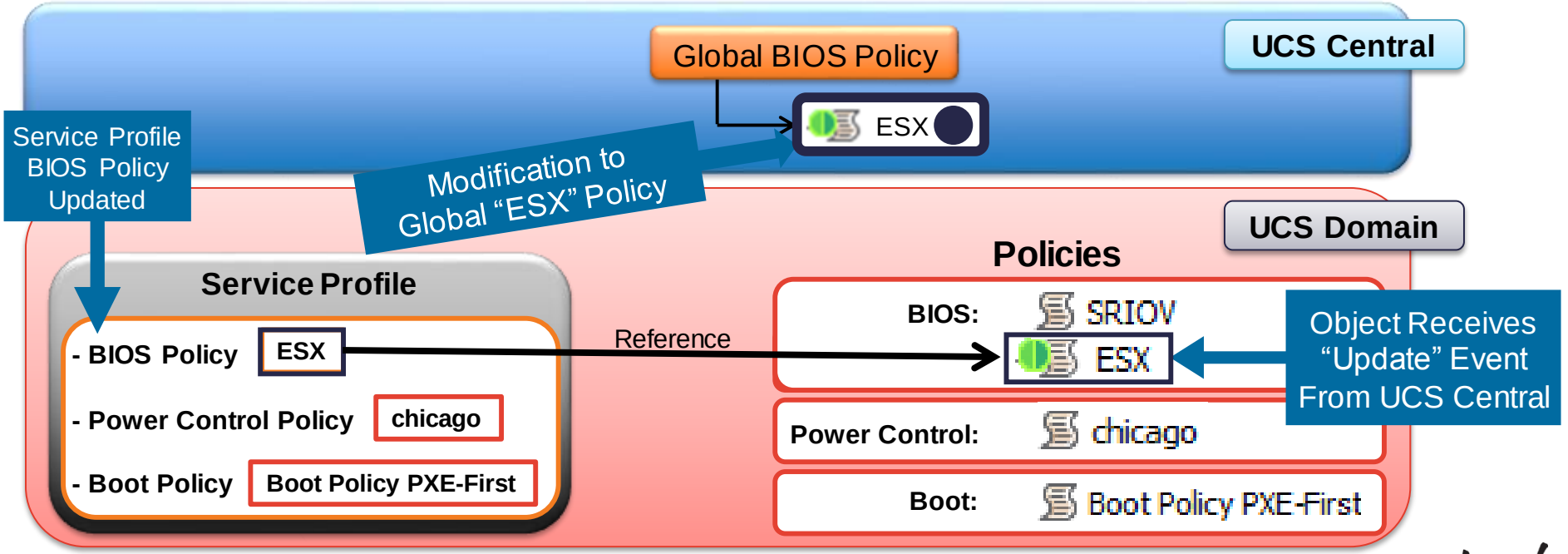
Where Does a Global Policy Live?

Shadow-Object Modification - Example



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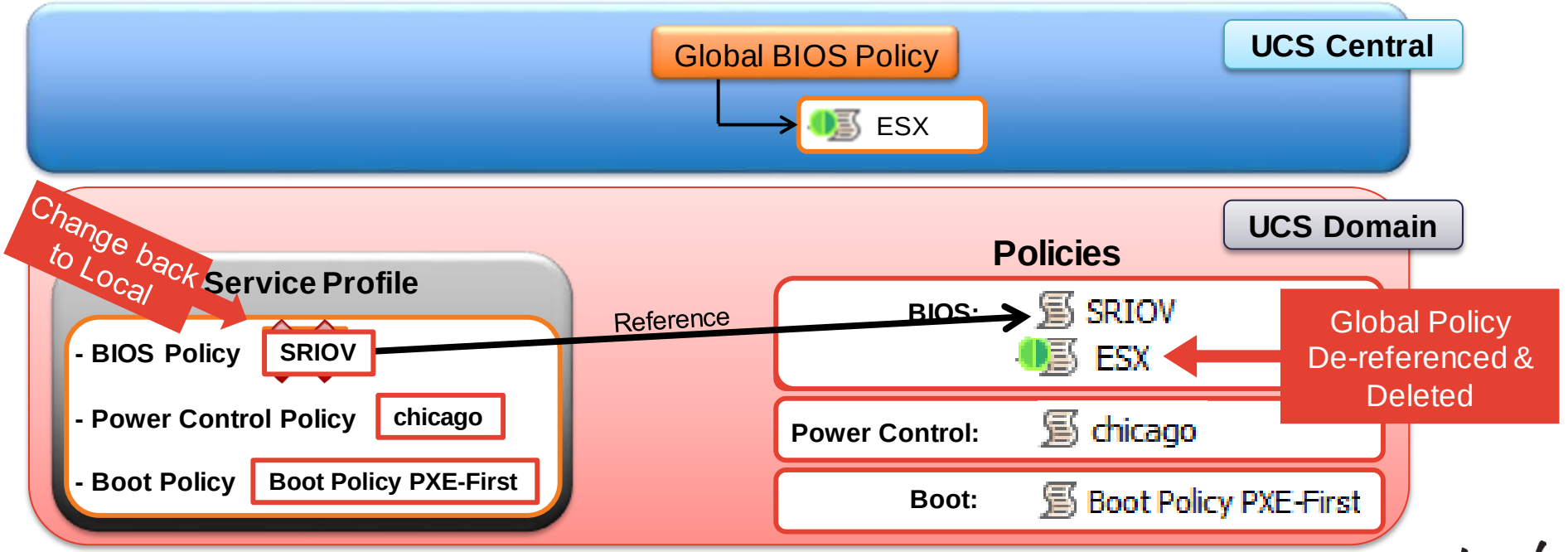
Where Does a Global Policy Live?

Shadow-Object De-reference - Example



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Global Policies Demo

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Controlling Server Settings with Global Policies Demo

Controlling Server Settings with Global Policies

- Create & Use Global Policies
  - Maintenance Policies
  - BIOS Policies
  - Others
- Change Global Policy
- Dereference Global Policy

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UCS Central Use-Cases

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4. **Workload Manager**
   - Service Profile Usage & Placement

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Workload Mobility

Requires: Common / Global Resources

Why – Common / Global Resources?

- ☑ Simplification → One "Source of Truth" vs. Many Disjoint Resources
- ☑ Enforceability → Admin Policies can be Prescribed for Standardisation
- ☑ Consistency → Same Experience in all UCS Domains

  - Portability →Requires all of the above….

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Analogy: Local Traffic Rules = Local Traffic Policies

- Two specific regions
  - Mainland China – RH driving
  - Hong Kong – LH driving
- Independent ecosystems
  → No problem
- Vehicle moves from Mainland China to Hong Kong?
  → Problem
- Need: Common "Driving" Policy
  → U.S. to/from Canada

Source: www.fastcompany.com/1660258/ingenious-flipper-bridge-melds-left-side-drivers-right-side-drivers and www.tourist-spots.lv2lvu.com

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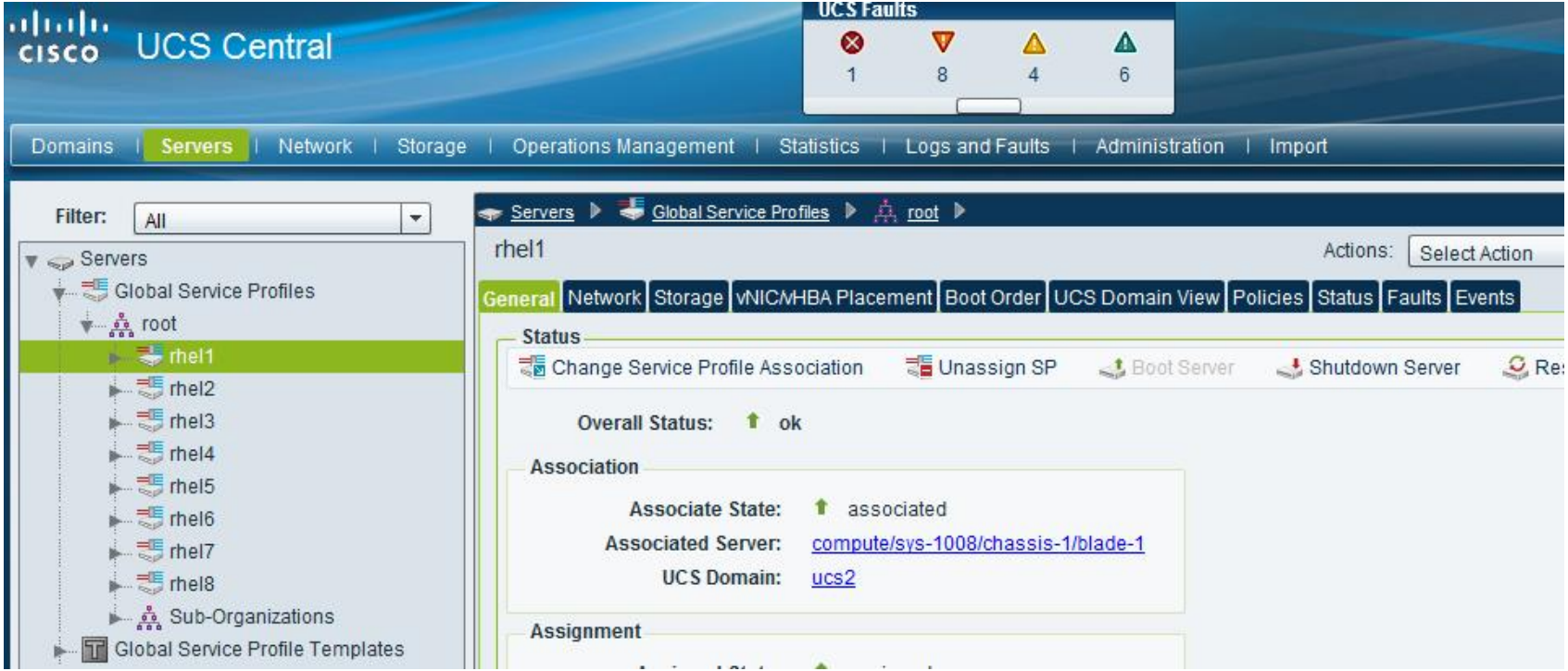
Workload Mobility

The “vehicle” for workload mobility is a Global Service Profile



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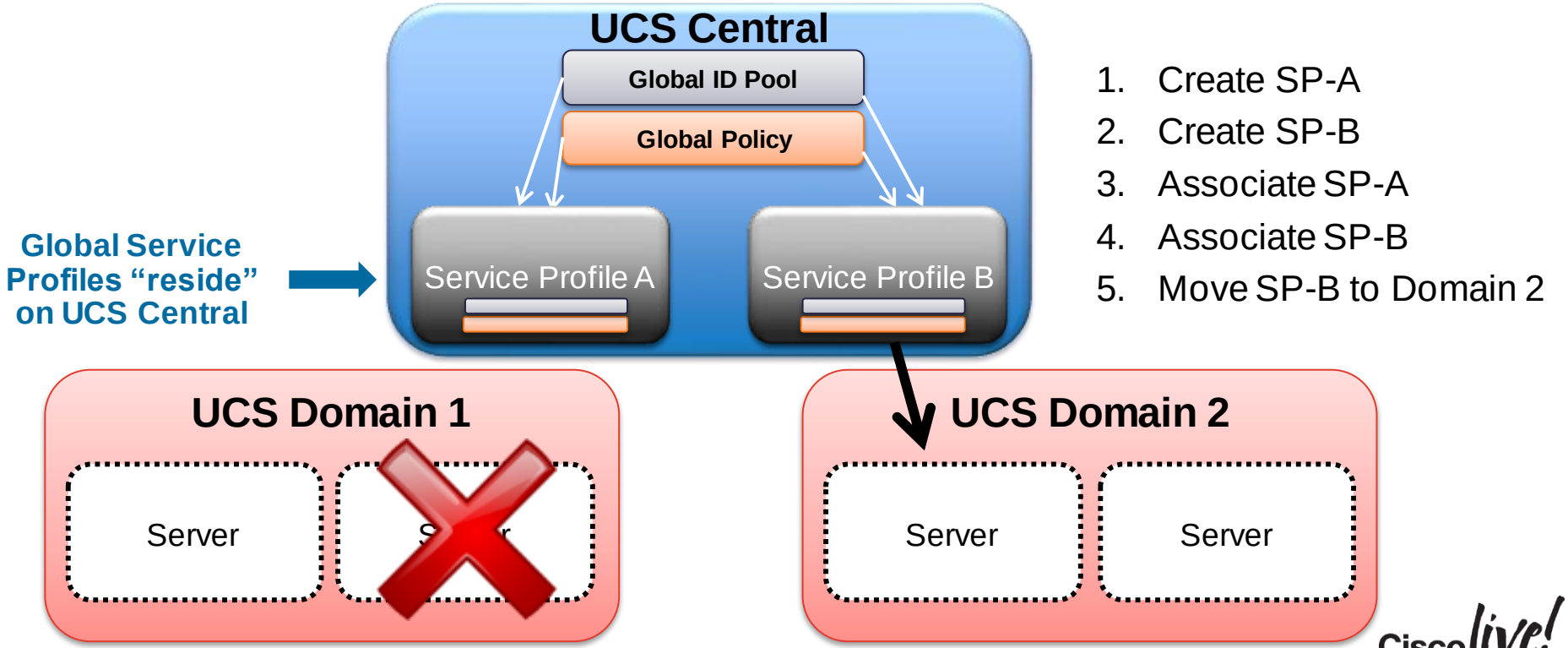
Global Service Profiles



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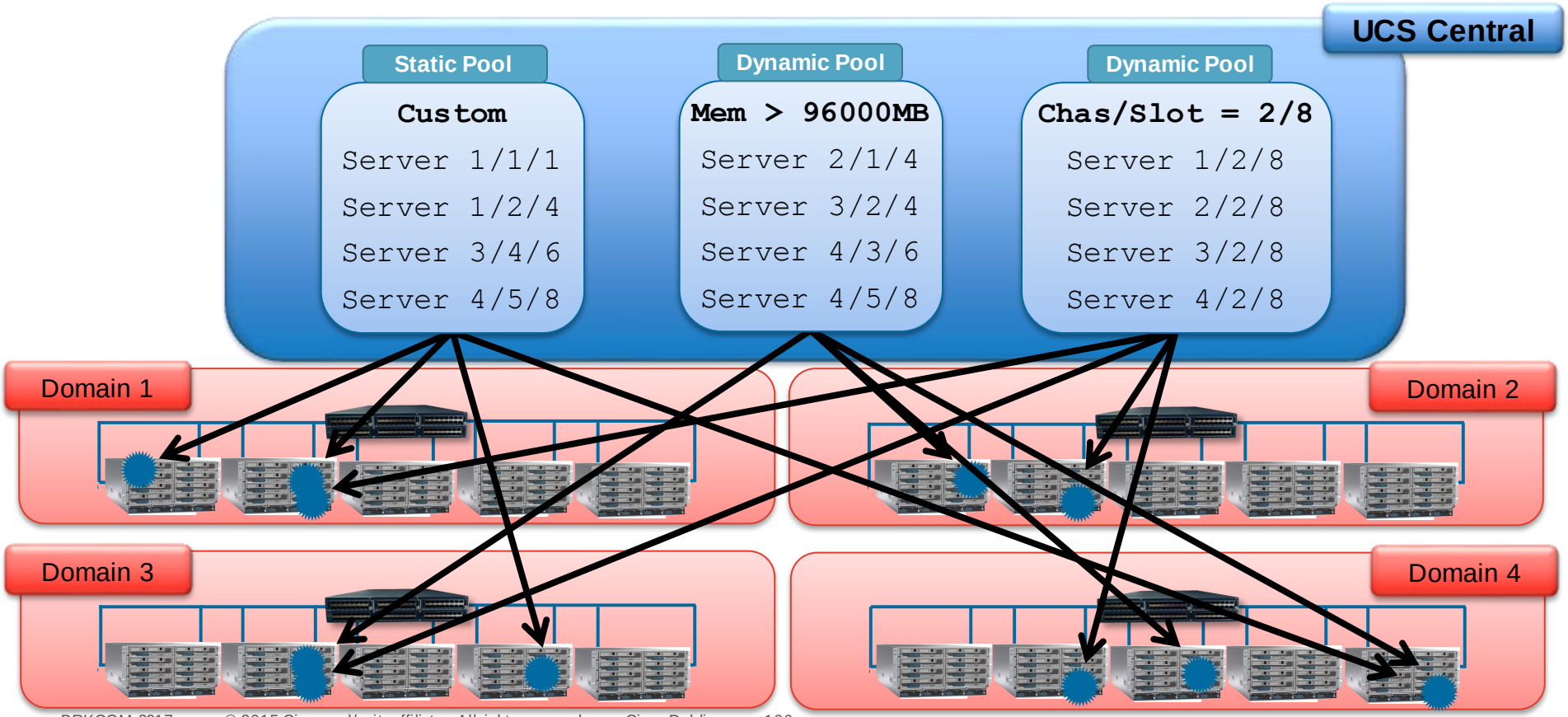
Global Server Pools



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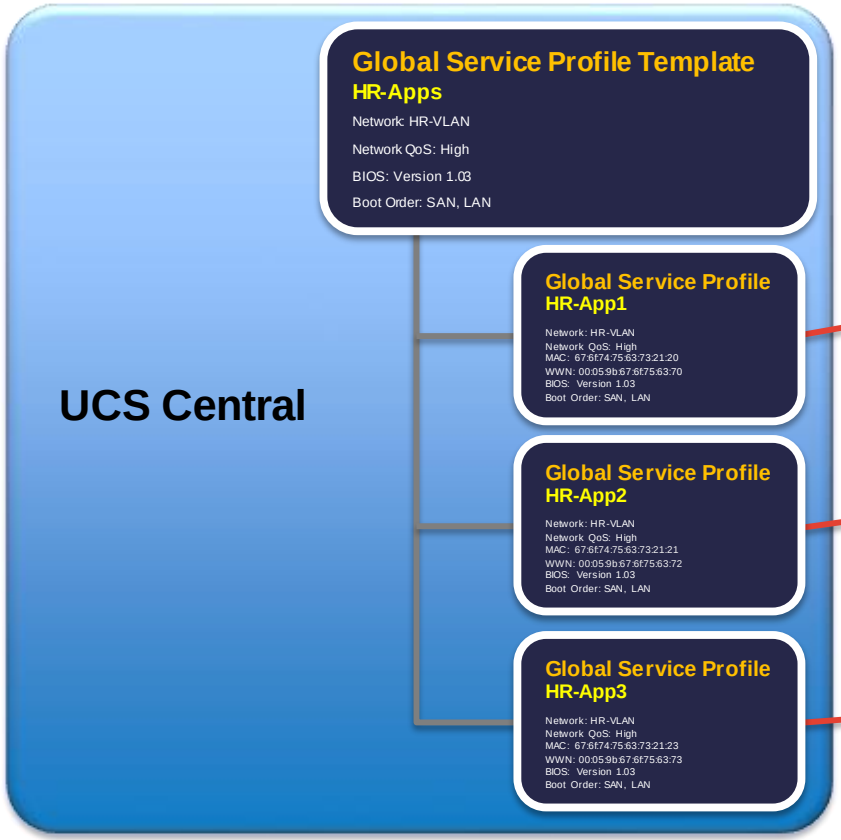
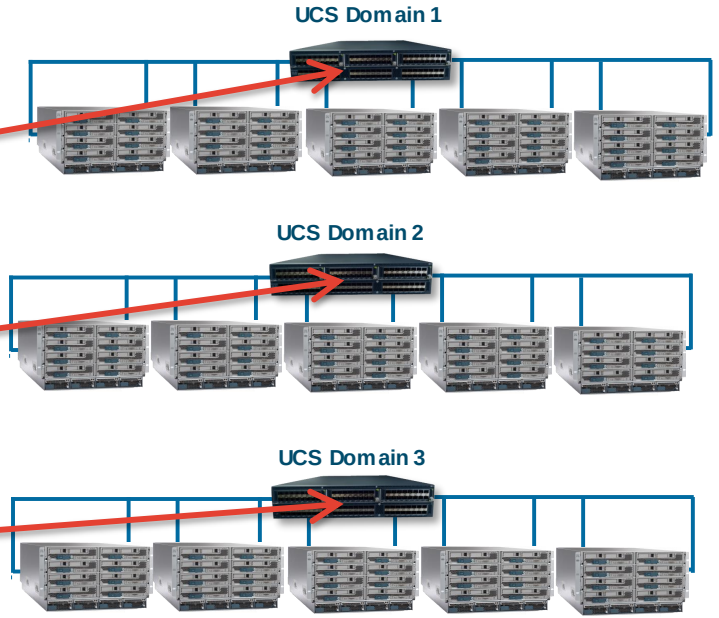
Global Service Profile Templates



Global Service Profile Templates may:

- Leverage "Global Server Pools"
- Be "Updating" or "Initial"



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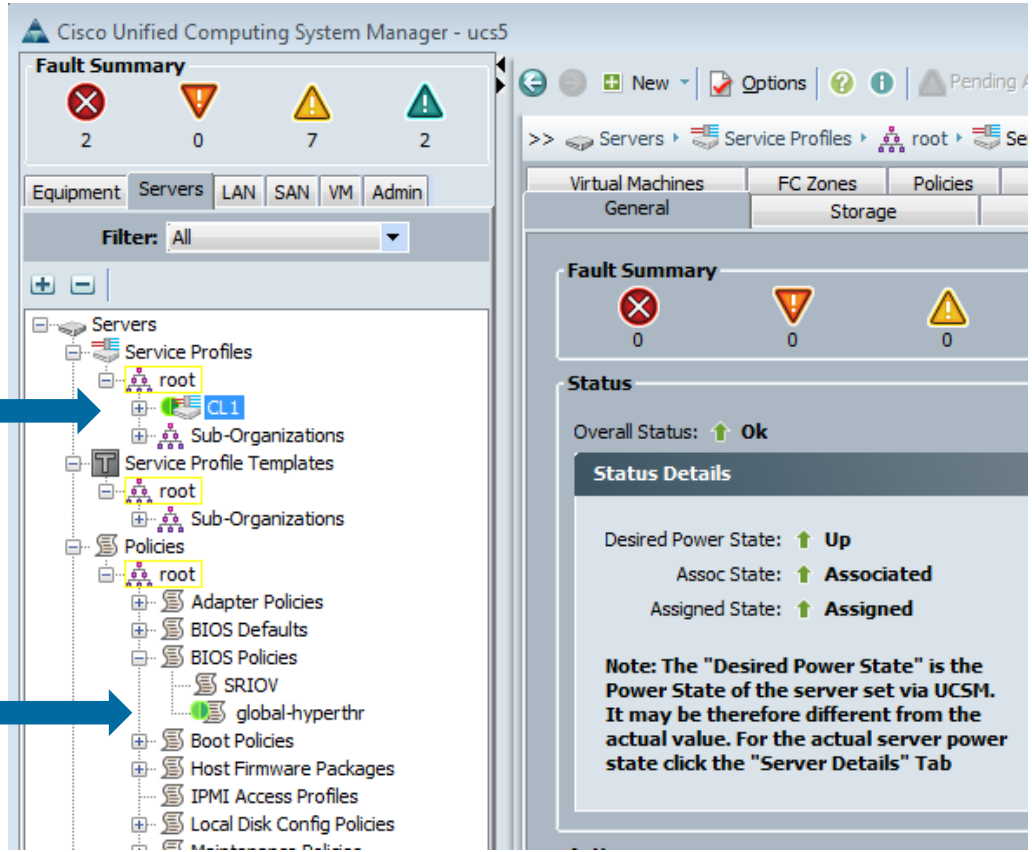
How Does a Global Service Profile Look in UCSM?

Global Service Profile

Global Policy



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UCS Central Use-Cases

1. **Information Dashboard**
   - Inventory
   - Faults/Logs
   - Statistics
2. **Domain Configuration**
   - Domain Admin Settings/Enforcement
3. **Object Repository**
   - IDs / ID Pools
   - Policies
   - Service Profiles & Templates
   - Connectivity Templates
4. **Workload Manager**
   - Service Profile Usage & Placement

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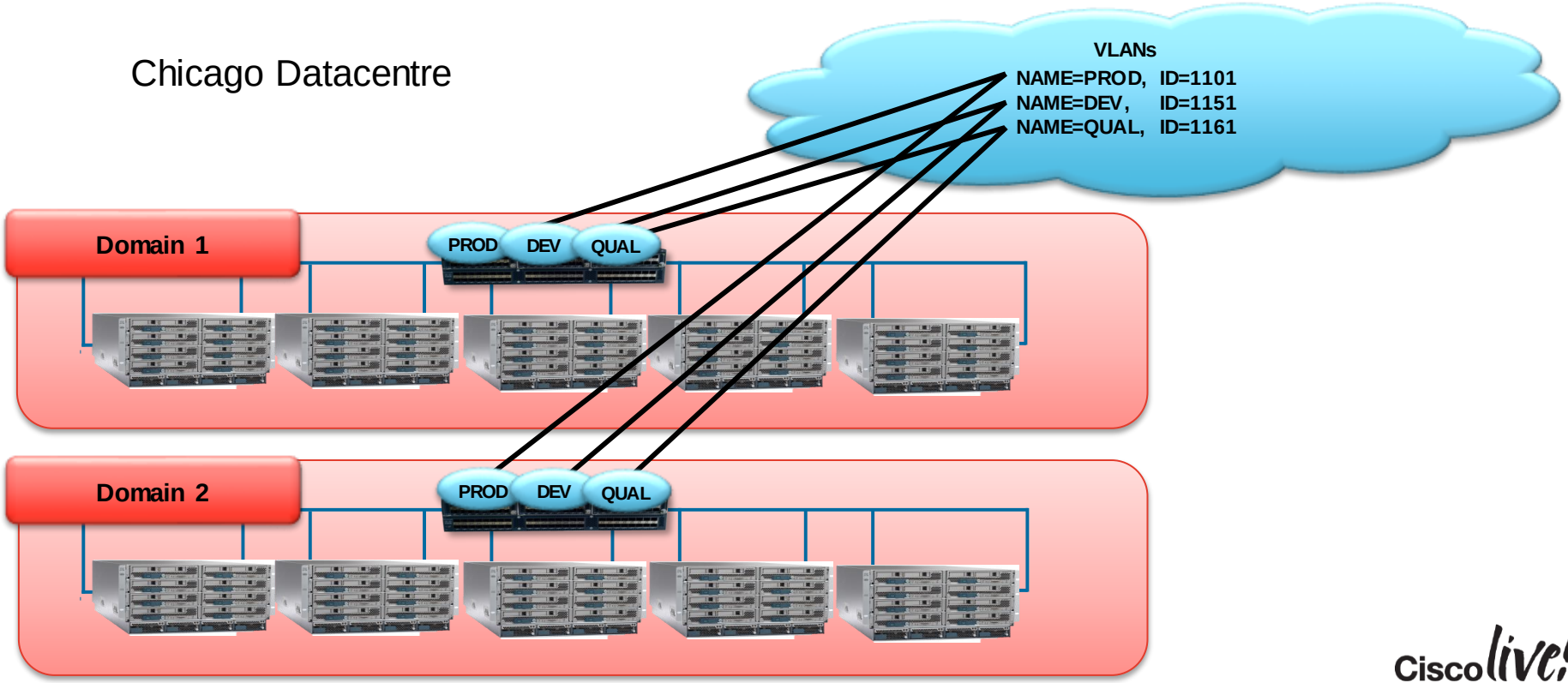
Connectivity Templates

Review: Provisioning VLANs without UCS Central



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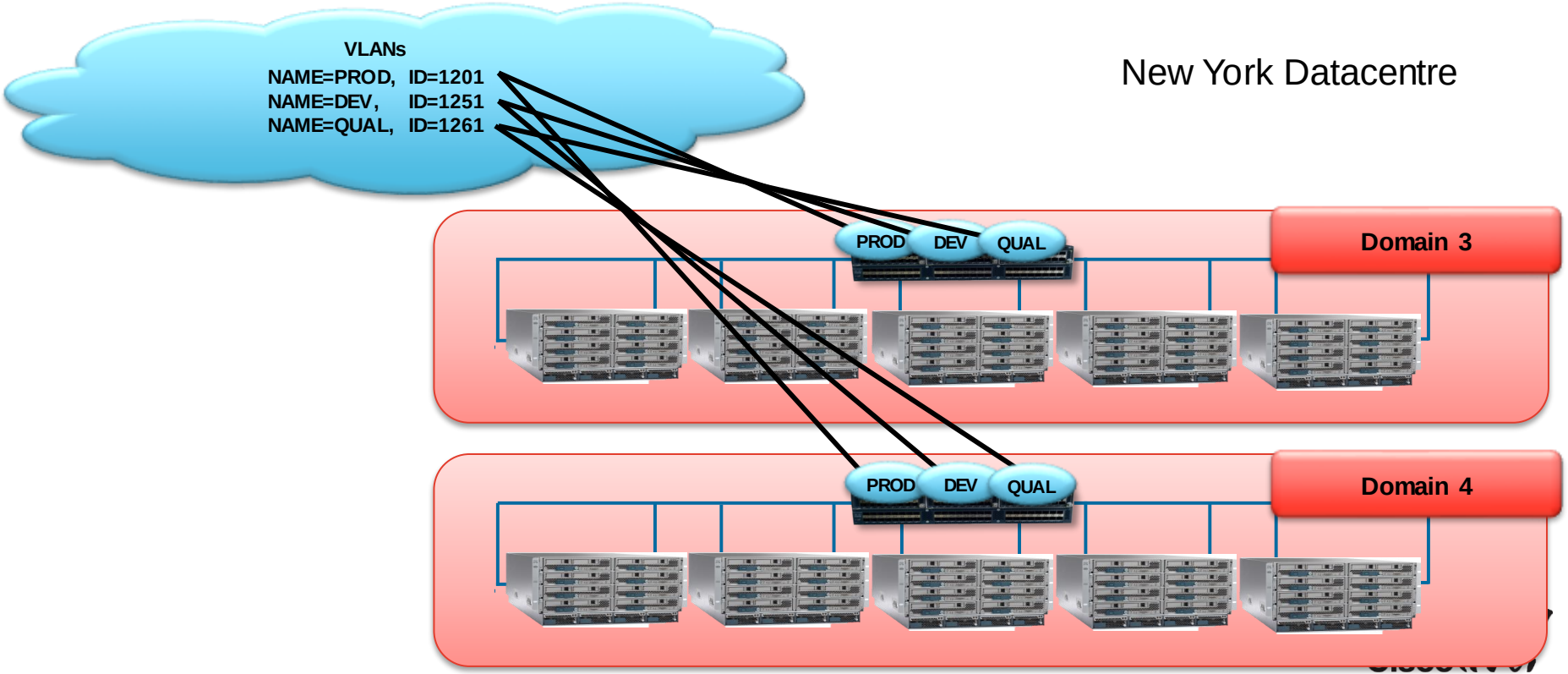
Connectivity Templates

Review: Provisioning VLANs without UCS Central



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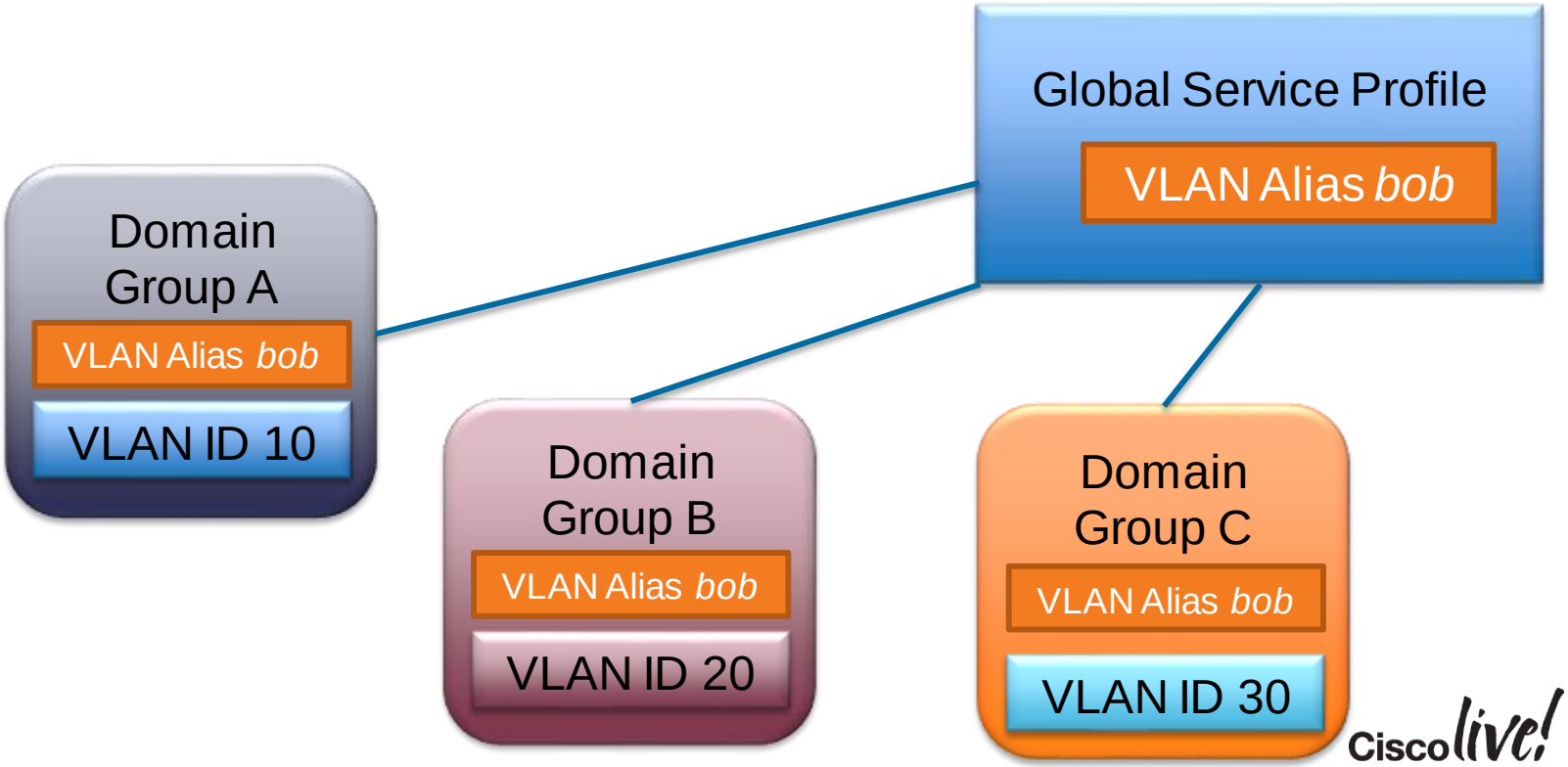
111

Site Specific Settings

UCS Central VLAN ID Aliasing



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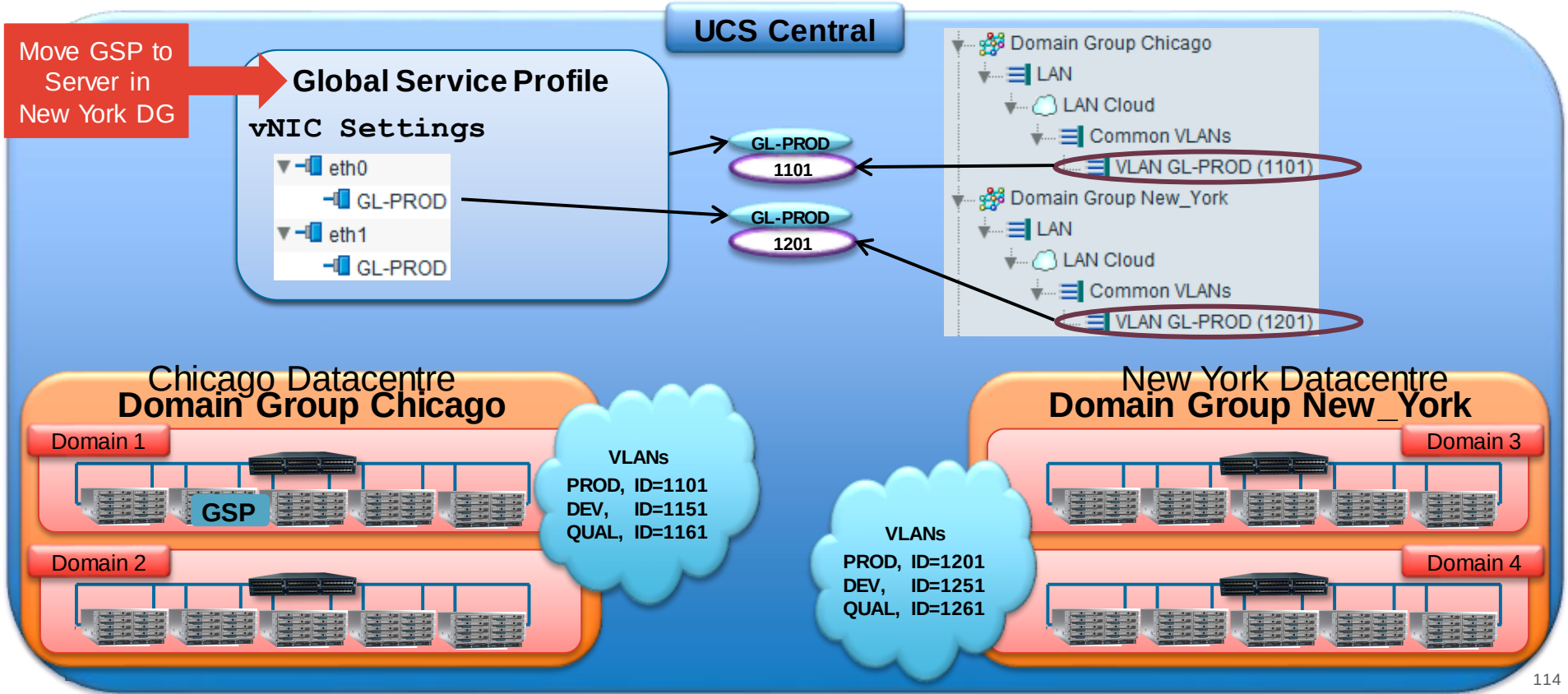
Provisioning VLANs with UCS Central

Using VLAN ID Aliasing Across Two Sites (Example)



UCS Central Use-Cases

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   - Inventory
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   - Connectivity Templates
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Workload Mobility Demo

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Workload Mobility Demo

Workload Mobility & Global Server Pools

- Create Global Service Profile
  - Use Global Policies & Global Pools
  - Associate with any server
- Create Global Service Profile Template (time permitting)
  - Associate with Global Server Pool
  - Create Global Service Profiles from Global Service Profile Template
- Migrate Global Service Profile from one Domain to another Domain

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UCS Central Use-Cases - Review

1. **Information Dashboard**
   - Inventory
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   - Connectivity Templates
4. **Workload Manager**
   - Service Profile Usage & Placement

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UCS Central - What's New / Next?

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What's Next?

These Features are Expected in the very near Future – No Timeline Commitments

- Enhanced user interface – HTML5 Support
- Improved SDK and scripting support – PowerTool beta
- Support for new hardware
- Feature Enhancements, including:
  - Scriptable vMedia Support (shipping today with 1.2(1e) patch)
  - Scheduled UCSM & UCS Central Backup Times
  - Domain Specific ID pools for Global Service Profiles
  - Additional Hypervisor Support

- Your feedback drives features
- Use http://communities.cisco.com/ucs
- Be vocal, be heard!!

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HTML5 UI Preview

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What About Stand-alone C-Series?

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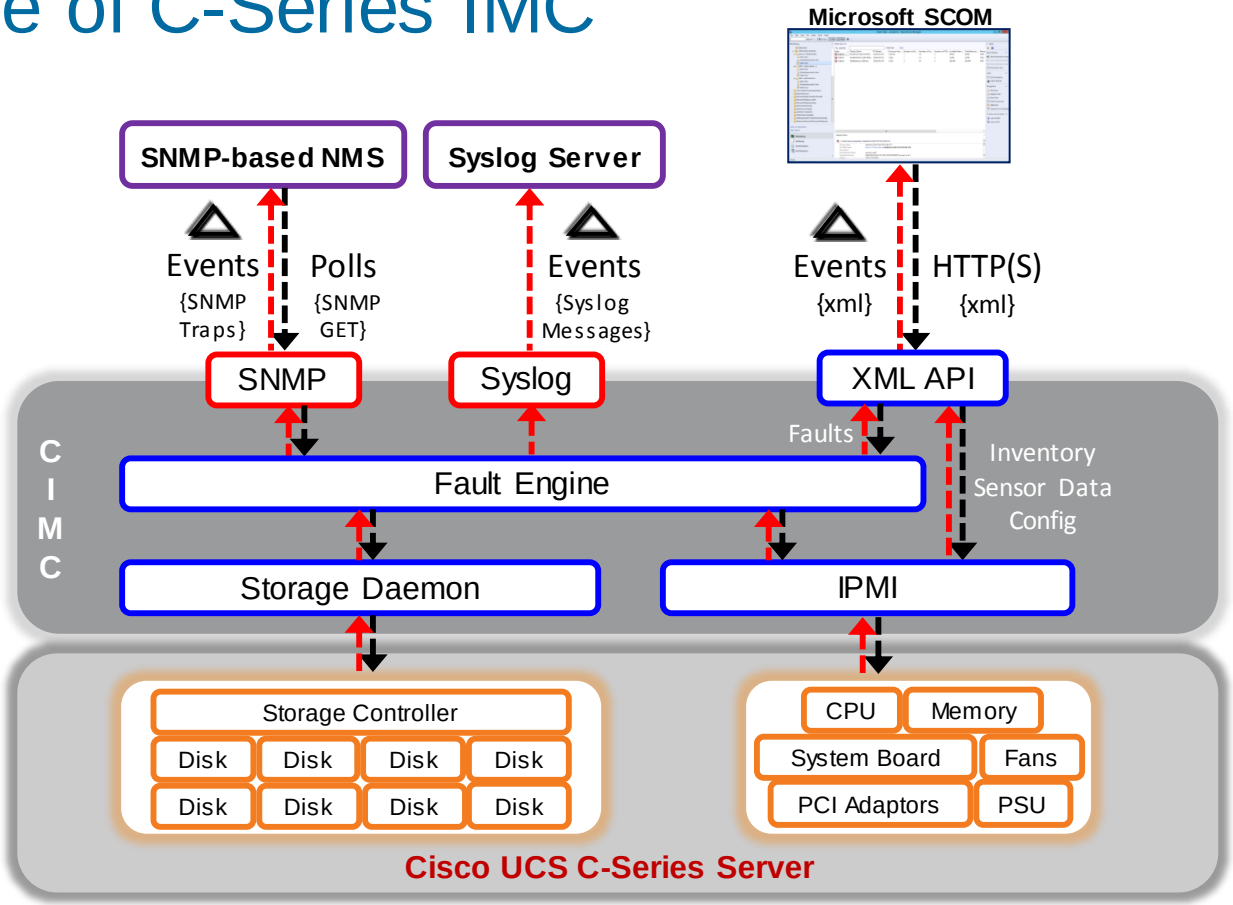
The Core of C-Series IMC



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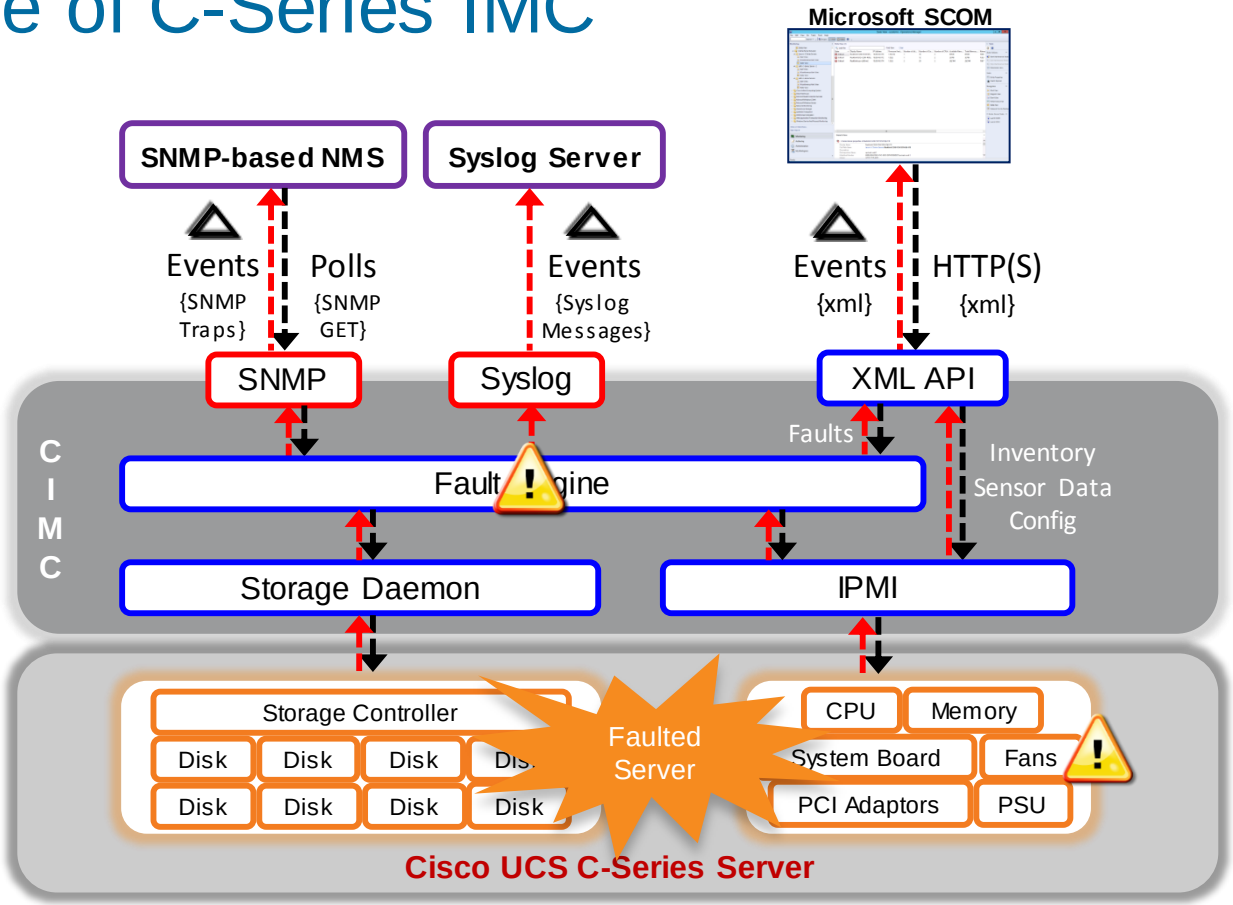
The Core of C-Series IMC



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IMC Supervisor Features and Capabilities

IMC Supervisor enables:

- Hardware Health Status (Monitoring)
- Platform Hardware Inventory
- Platform Management with vKVM Launcher
- Firmware Inventory + Management
- Call Home (E-mail Alerting – Critical Faults)
- Platform Grouping & Tagging
- Group Discovery

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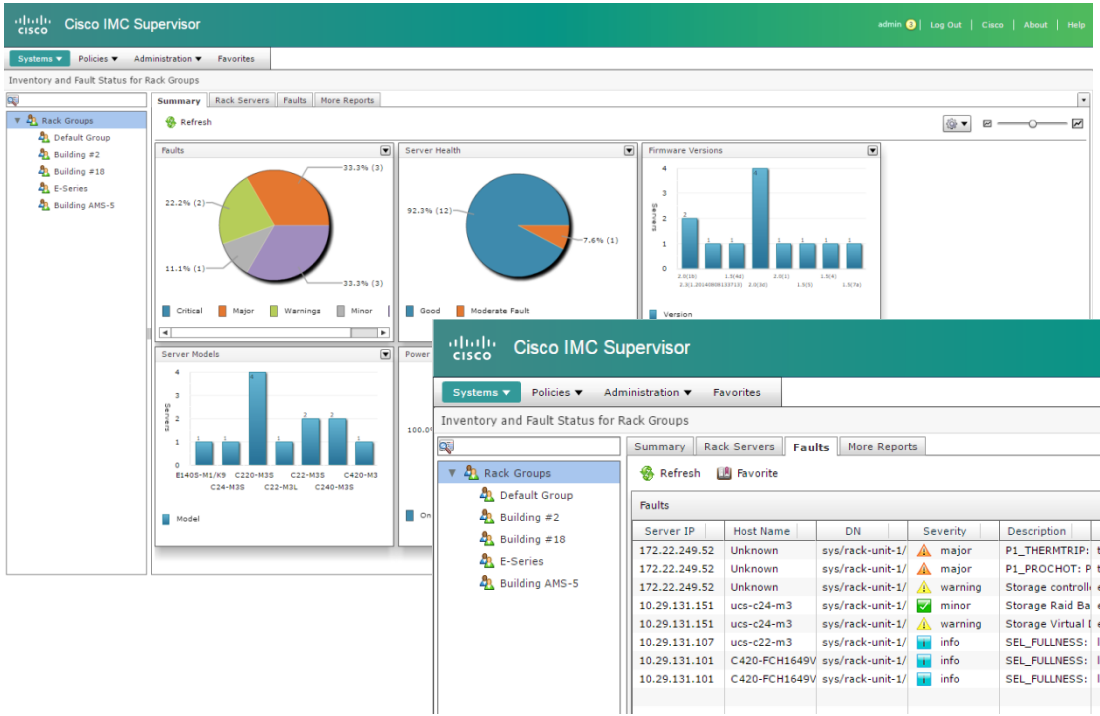
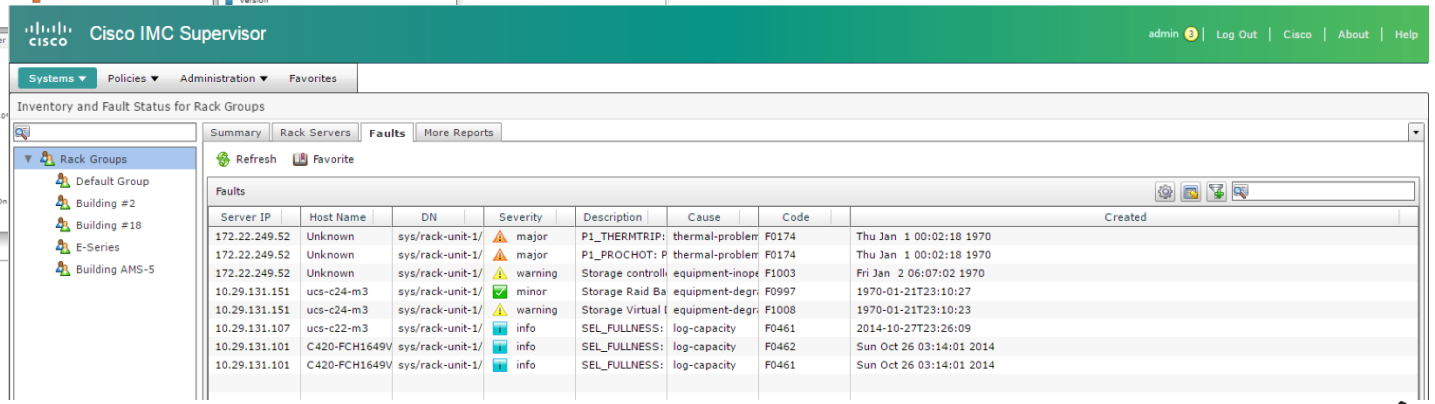
Monitoring Data

Presented in List & Graphical views





Fault Data is available:

- Globally
- Filtered by Group
- Dashboard View Available

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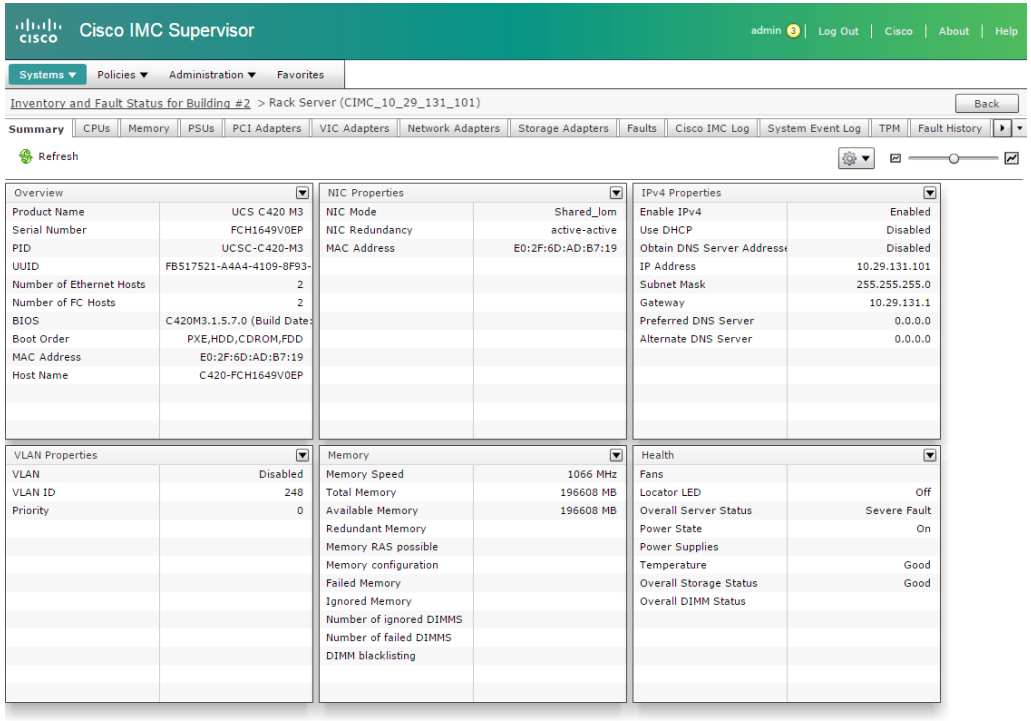
Platform Inventory

- Platform Information (Summary)
  - Processors
  - Memory
  - Power Supplies
  - PCI Adaptors (Including VIC)
  - Network Adapters
  - Storage Adapters
  - Trusted Platform Module
- Logs
  - Fault Log
  - Cisco IMC Log
  - System Event Log



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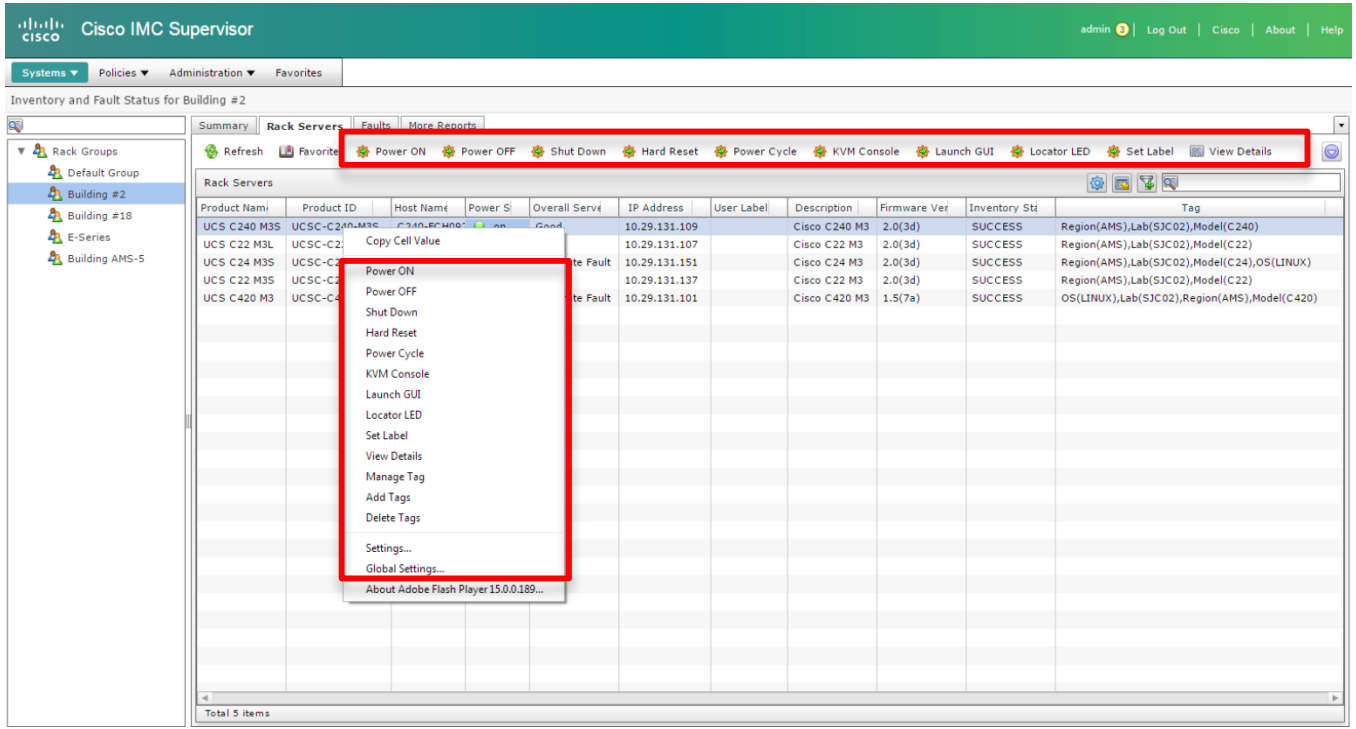
Manage and Control System

Perform Platform Management Tasks including:

- Launch vKVM
- Power On
- Power Off
- Shut Down
- Power Cycle
- Launch WebUI
- Enable LED
- Set Label



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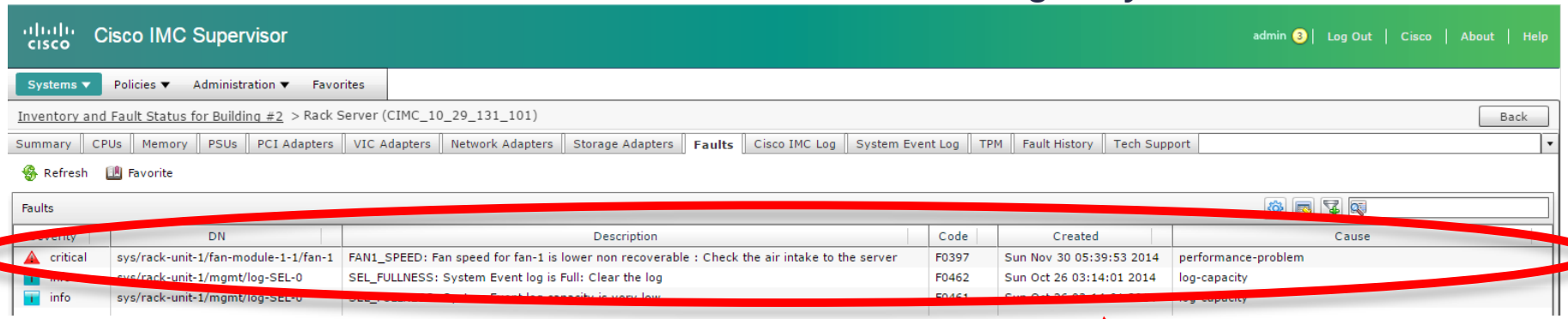
Call Home E-Mail Alerting

E-Mails can be configured to send when there is a critical fault on managed system



Subject: Critical Faults occured in the IMC Supervisor server 10.29.131.180

Server IP	Host name	Severity	Code	Cause	Description	Created	Affected DN
10.29.131.101	C420-FCH1649V0EP	critical	F0397	performance-problem	FAN1_SPEED: Fan speed for fan-1 is lower non recoverable : Check the air intake to the server	Sun Nov 30 05:39:53 2014	sys/rack-unit-1/fan-module-1-1/fan-1

1. Critical Fault Recorded
2. E-Mail Notification Sent

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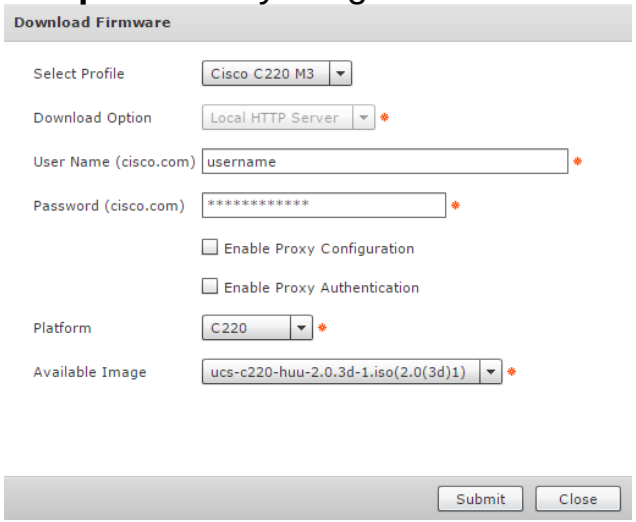
Firmware Updates

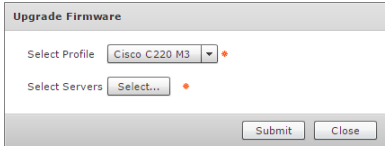
Manage firmware across systems

- Download Firmware with Cisco ID (C220 M3/C240 M3)
- Use existing (CIFS/NFS) repositories
- Update 1+ systems concurrently (Using HUU)

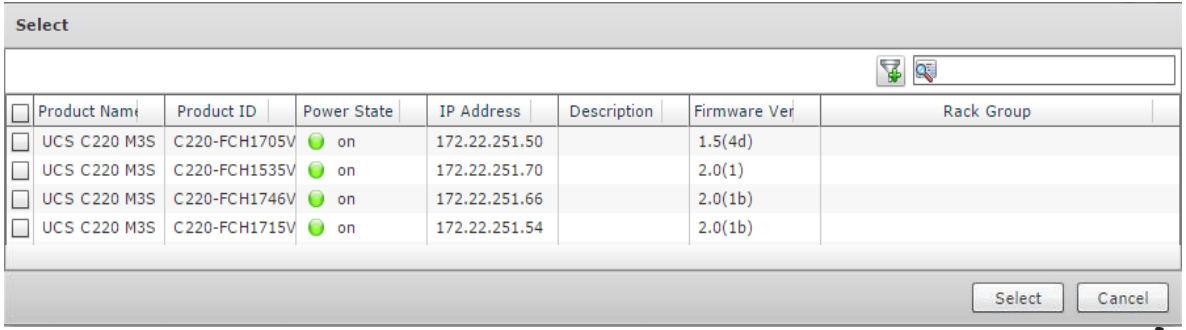
Step 1: Identify Image



Step 2: Select Image



Step 3: Select System(s)



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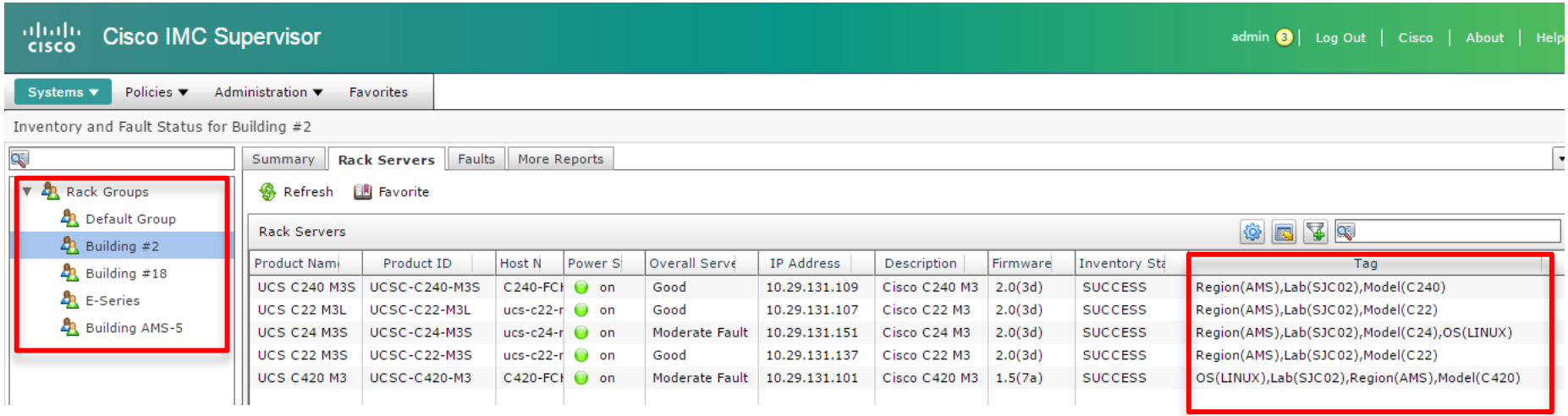
Grouping and Tagging

Systems can be grouped & tagged for easy sorting and identification

- Groups: Sorted using left navigation menu
- Tags are metadata labels that can be applied across groups



Groups: Primary sorting mechanism

Tags: User defined Metadata that can be assigned by system

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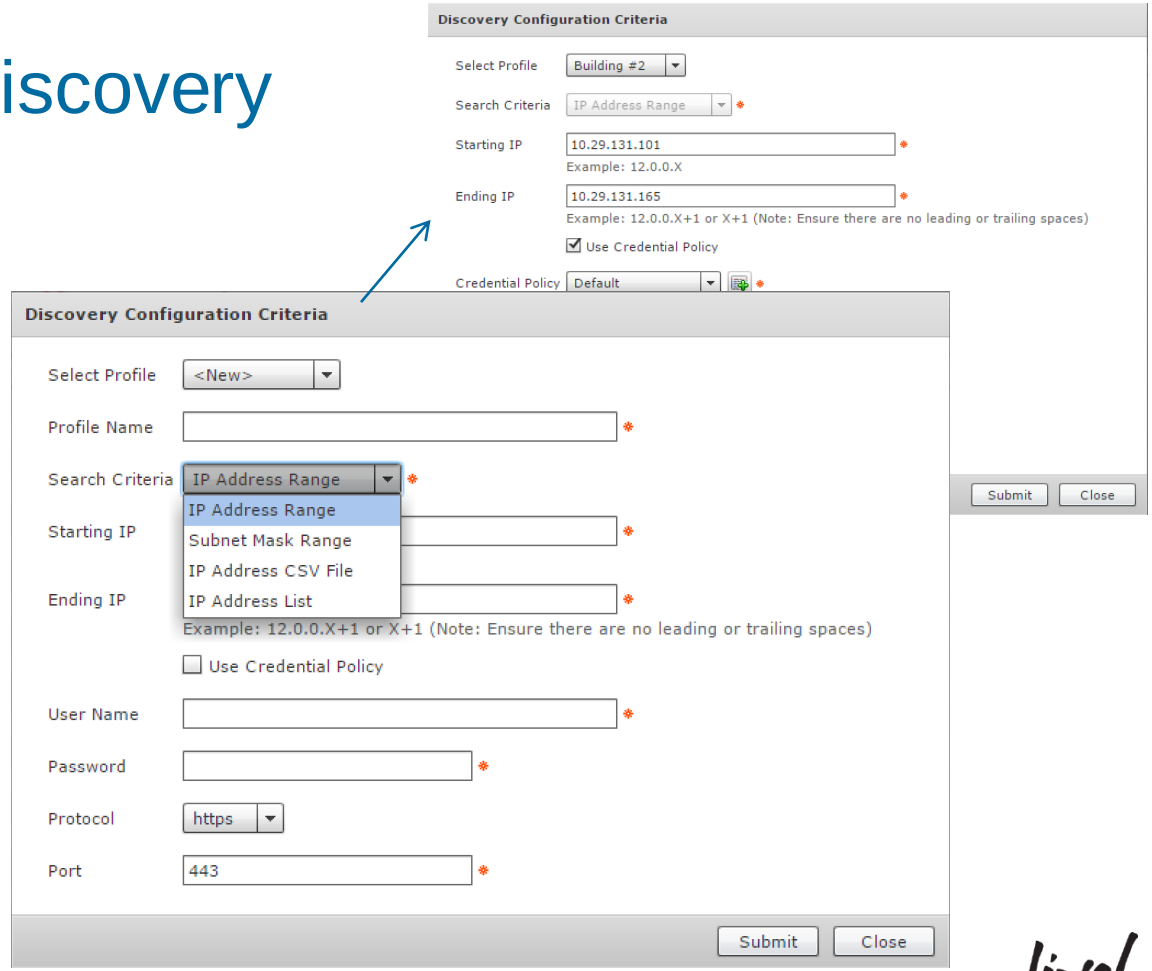
Managed System Discovery

Systems can be discovered:

- By Individual System
- By Discovery Profile
  - IP Range
  - Subnet
  - Comma separated list
  - CSV file
- Discovery profiles can be re-run at any time



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IMC Supervisor Demo

Automating Configuration Tasks with UCS PowerTool

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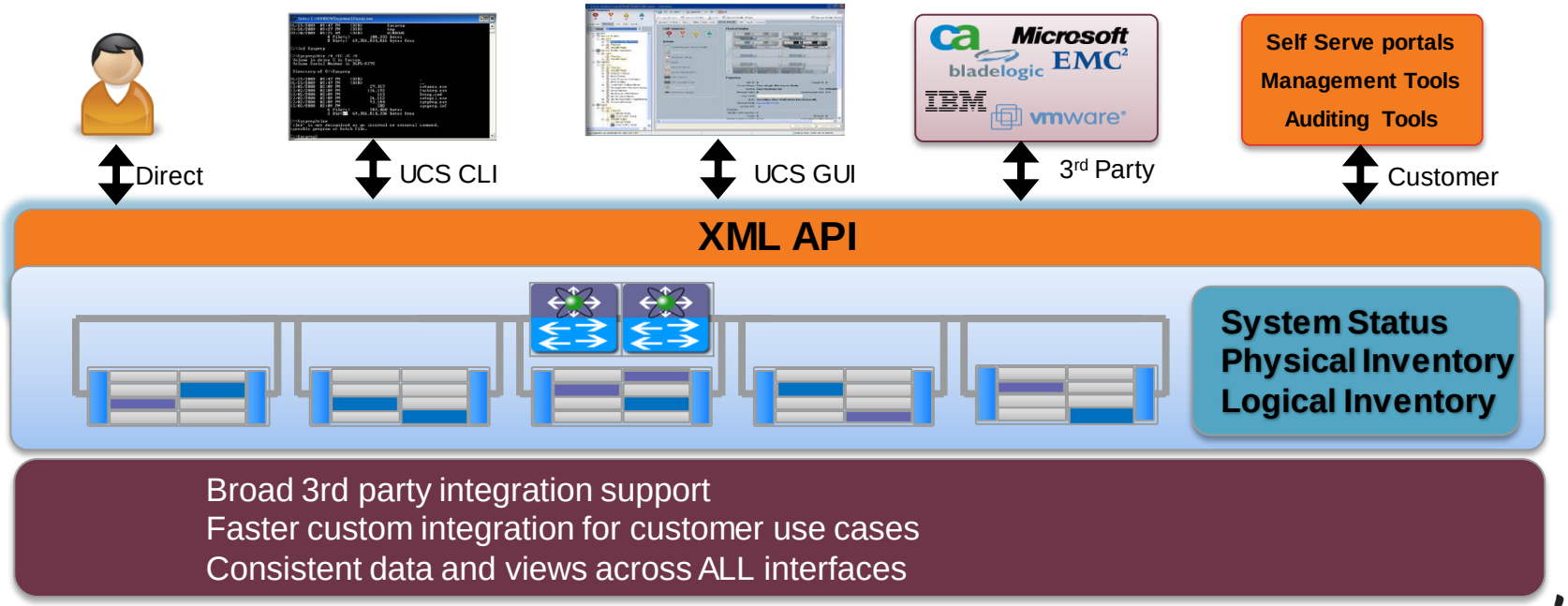
Programmatic Infrastructure

- Comprehensive XML API, standards-based interfaces
- Bi-Directional access to physical & logical internals



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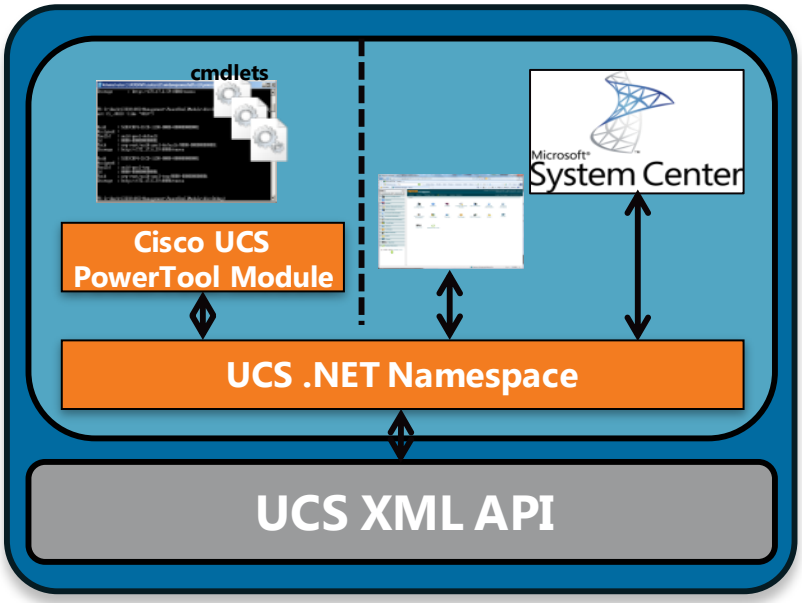
Cisco UCS PowerTool

Programmatic control over UCS hardware

- Architected for Flexibility and coverage
  - PowerShell Wrapper
    - Cmdlet definition and structure
    - Get-help support
  - .NET UCS Namespace Library
    - XML API call construction
    - Class Definition
    - Validation
- PowerShell Design
  - In-line get-help support
  - Full Pipelining support
  - Fully classed object definition
  - All ‘legal’ verbs
- .NET Namespace provides common base for all Microsoft focused integration
- Targeted to support full manageability of UCS across multiple releases



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Cisco UCS PowerTool for UCS Manager

Most Commonly Used Objects and Assets

- Chassis
  - Hardware – Power Supply / Fan Modules / IO Modules
  - Environmental statistical data (Power, cooling, network)
  - Config and Hardware Faults
- Fabric Interconnect
  - Hardware – Power Supply / Fan Modules / Network Expansion Modules
  - Power / cooling / network/ environmental statistical data
  - Network Elements (VLAN, VSAN, QoS, Port Profiles)
  - Config and Hardware Faults
- Service Profiles
  - Policies (Firmware, Boot Order, vNIC / vHBA config, Storage, IPMI, SoL, BIOS)
  - Pools (WWN, UUID, MAC, IP)
  - Configuration Faults
  - Launch UCS KVM for SP
- Servers
  - Hardware - CPU, Memory, Adaptors, CIMC
  - Power Operations
  - Power / cooling / network /environmental statistical data
  - Hardware Faults
- Config. Operations
  - Pools (WWN, UUID, MAC, IP)
  - Policy creation, manipulation, deletion, and consumption
  - vNIC / vHBA Templates
  - Service profile template creation, cloning, deletion, and consumption
    - Simplistic service profile creation (with a limited scope of what is available to configure)
    - Expert SP creation (use variabilised XML w/ config file)
  - Compare Managed Objects across orgs and/or domains
  - Sync Managed Objects across orgs and/or domains

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Getting Started: ConvertTo-UcsCmdlet

- The best way to discover usage of PowerTool cmdlets and usage
- Usage: Option #1
  - Launch UCS GUI & Login
  - `C:\> ConvertTo-UcsCmdlet`
- Usage: Option #2
  - `C:\> Connect-Ucs 1.2.3.4`
  - `C:\> Start-UcsGuiSession -LogAllXml`
  - `C:\> ConvertTo-UcsCmdlet`
- Usage: Option #3
  - Create a 'config-all' XML backup from UCS Manager
  - `C:\> ConvertTo-UcsCmdlet -UcsBackup -LiteralPath backup.xml -OutputPath output.ps1`

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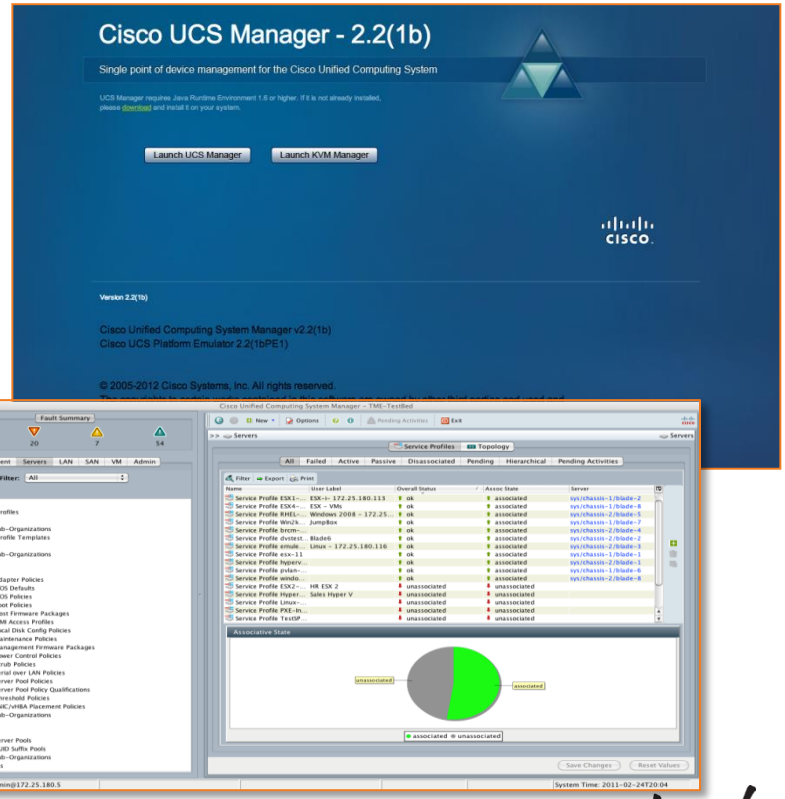
UCS Platform Emulator (UCSPE)

http://communities.cisco.com/ucspe

- No UCS Hardware Needed for API integration Development
  - 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



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UCS PowerTool Demo

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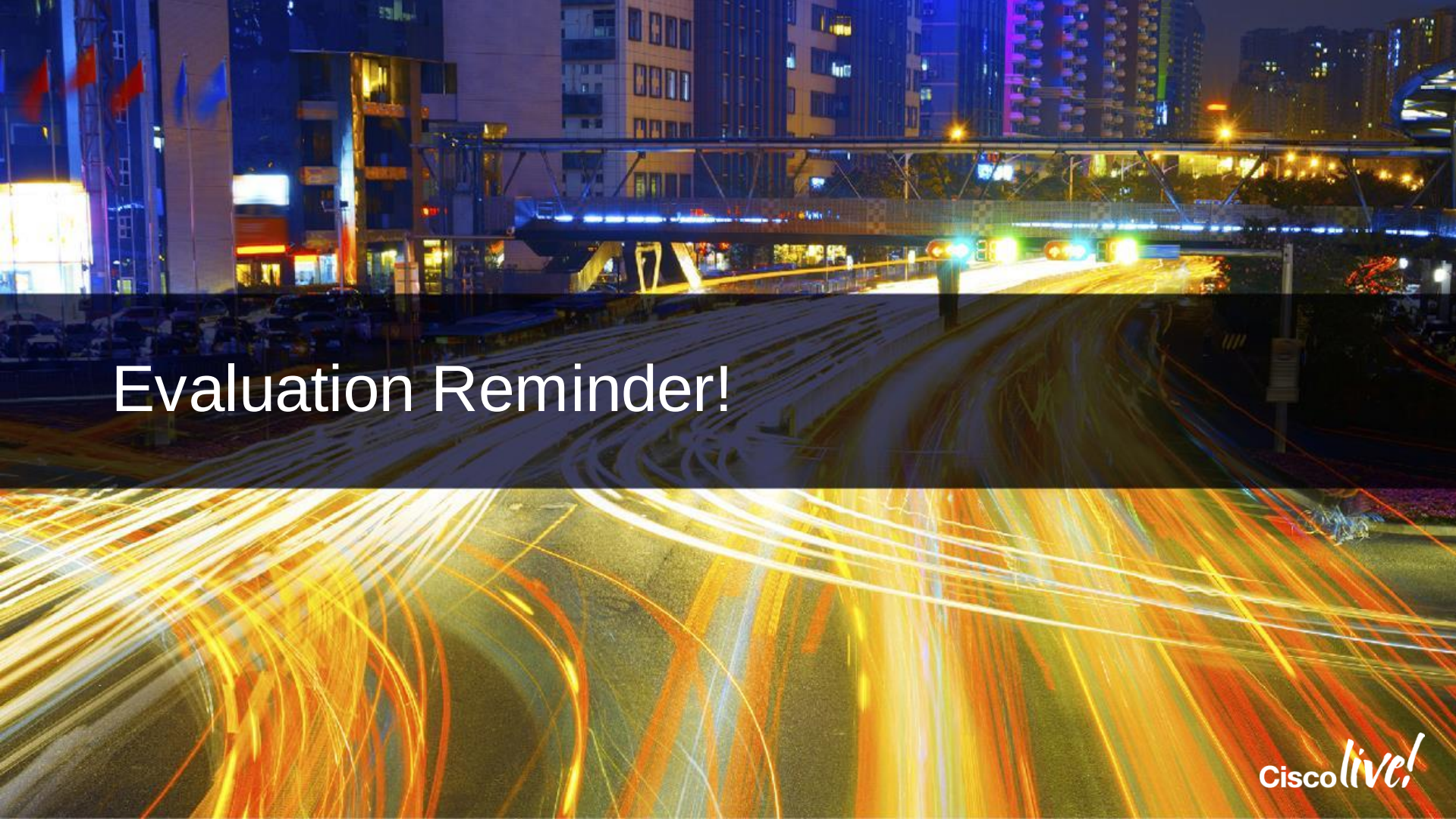
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Call to Action

- Visit the World of Solutions for
  - Cisco Campus
  - Walk in Labs
  - Technical Solution Clinics
- Meet the Engineer – Available Wednesday afternoon
- Lunch time Table Topics
- DevNet zone related labs and sessions
- Recommended Reading: for reading material and further resources for this session, please visit www.pearson-books.com/CLMilan2015

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Q & A

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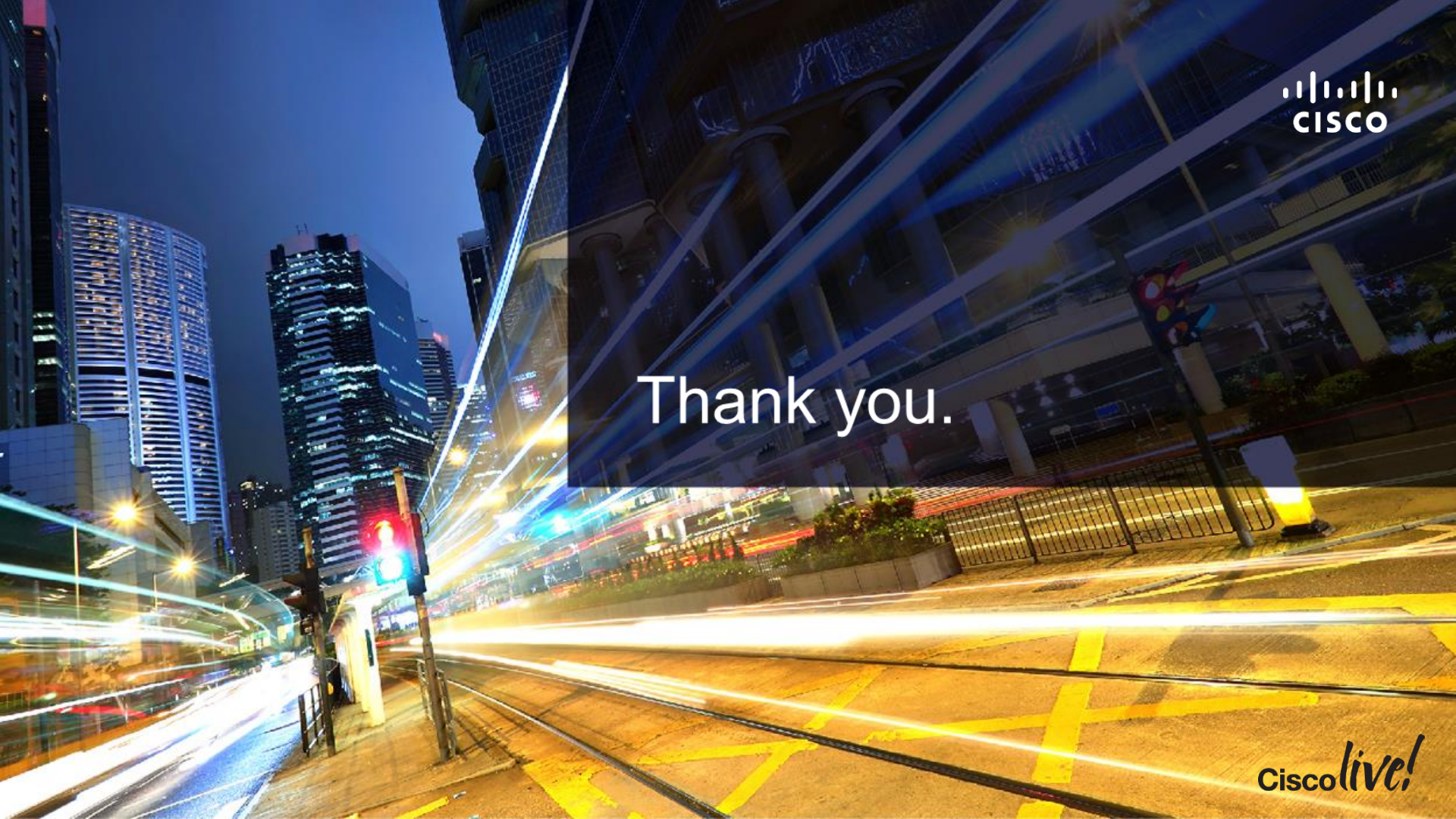
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