Unified Computing System

Software Release 1.4 (*Balboa*)

An Overview

UCS Product Management

SAVBU

LBI + HD 110607

UCS Software Release 1.4 *(Codename: Balboa)*
Feature Summary

Compute
- Support for new UCS B230 Blade Server
- UCS C-Series server integration into UCS Manager
- Multi-chassis power capping for UCS B-Series
- Support for upto 20 UCS B-Series Chassis

Ethernet and Fibre Channel
- Full vNIC failover w/o NIC teaming/bonding with FabricFailover/FabricSync
- SPAN support on UCS 6100
- Higher VLAN scalability 1024
- Higher logical port scalability 8000
- Higher virtual interface Scalability 2000
- PVLAN support
- FC trunking and port channel (in NPV mode)
- Direct connect Ethernet Appliance
- Limited Direct Connect FC Storage

Authentication & Security
- Simpler integration with MSFT Active Directory
- Multiple simultaneous authentication systems
- Multi-user KVM enhancements

Stateless Computing
- Scheduling of service profile changes
- CIMC IP address abstraction

Management & Monitoring
- SNMP GET support for ALL UCS components
- Syslog enhancements
- UCS 6100 licensing enforcement/warnings
- Usability enhancements

UCS
Software Release 1.4

Compute

Ethernet

Fibre Channel

Authentication & Security

Stateless Computing

Management & Monitoring

UCS Manager 1.4 supports UCS B230 M1

Industry leading compute density in half-blade form factor

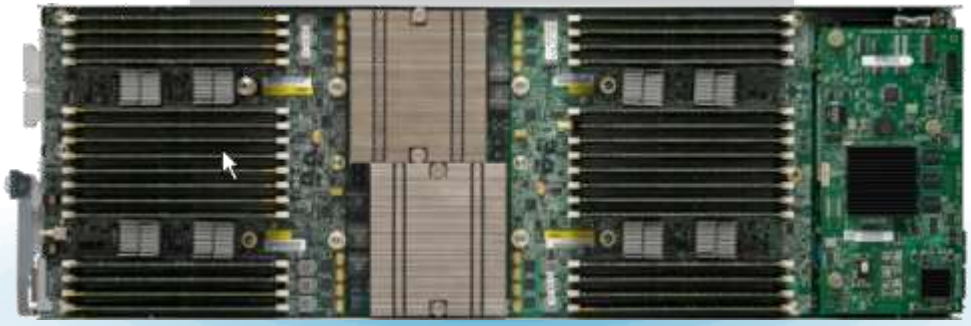
- 2 Intel Xeon 7500 or 6500 (Nehalem EX)
- 32 DIMM Slots; up to 512 GB Memory
- Dual Port Converged I/O Adapter; 20 MB/s
- Two Optional SSD

OPTIMIZED FOR

Single instance and transaction—intensive database

Desktop virtualization (VDI)

Financial Services and SPs



BENEFITS

Lower operating and licensing expenses

Higher density

Reduced foot-print

High Density Compute: 16 cores per blade

What's changing with Intel® Xeon® processor E7 Family?

Blade

B200 M2
2-Socket Intel 5600, 2 SFF Disk, 12 DIMM

B250 M2
2-Socket Intel 5600, 2 SFF Disk, 48 DIMM

B230 M2
2-Socket Intel E7-2800, 2 SSD, 32 DIMM

Updated

B440 M2
4-Socket Intel E7-4800, 4 SFF Disk, 32 DIMM

Updated

Rack Mount

C200 M2
2-Socket Intel 5600, 4 Disks, 12 DIMM, 2 PCIe 1U

Updated

C210 M2
2-Socket Intel 5600, 16 Disks, 12 DIMM, 5 PCIe 2U

C250 M2
2-Socket Intel 5600, 8 Disks, 48 DIMM, 5 PCIe 2U

C260 M2
2-Socket Intel E7-2800, 16 Disks, 64 DIMM, 6 PCIe 2U

New

C460 M2
4-Socket Intel E7-4800, 12 Disks, 64 DIMM, 10 PCIe 4U

Updated

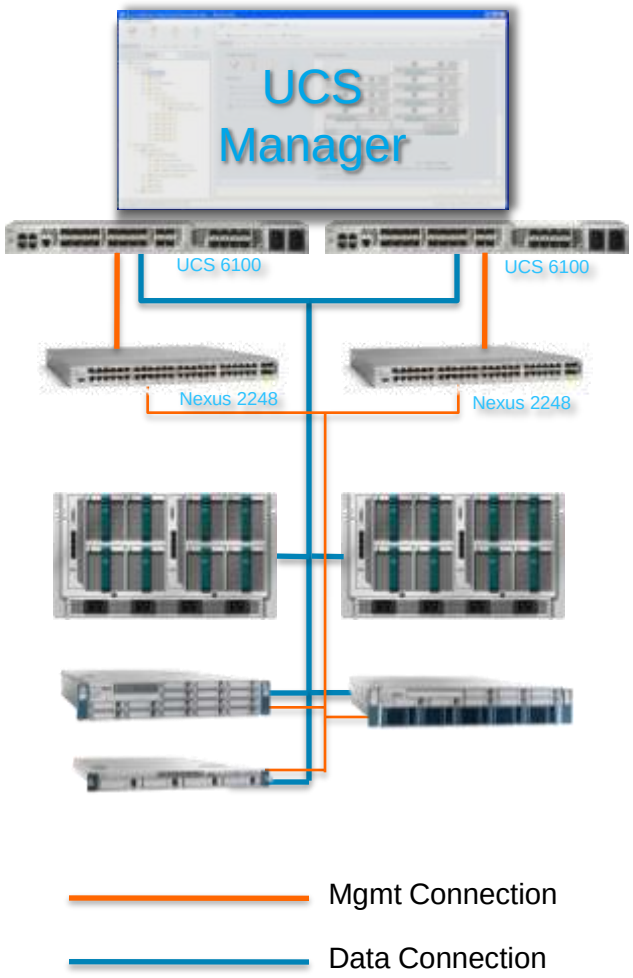
UCS Manager C-Series Integration

Customer benefits

- Unified Management across entire UCS portfolio
- Advanced capabilities extended to rack servers

Feature details

- C-Series servers connectivity
  - Management connectivity through FEX to FI
  - Data connectivity directly to Fabric Interconnect
- Stateless computing
  - Service profiles extended to C-series
  - Migration among compatible B & C series servers
- All UCSM management services
  - Automated discovery
  - Fault and monitoring
  - Firmware updates



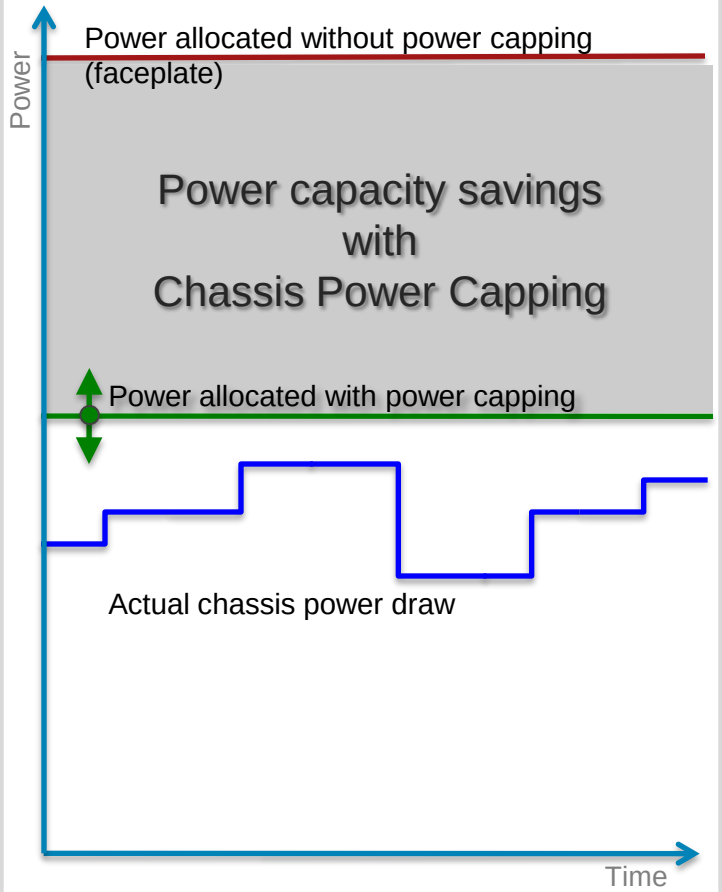
UCS Chassis and Multi-Chassis Power Cap

Customer benefits

- Eliminate power capacity wastage in Data Center
- Cap multiple chassis from a single interface

Feature details

- Group Level Power cap
  - Set a single cap for multiple chassis that share a power feed
  - Automatic static distribution of power to chassis in group
- Dynamic Intra-chassis power redistribution
  - Blade power allocation based on priority and blade configuration
  - High power blades can borrow power from low power blades
  - No performance impact under normal operation
- Service Profile Priorities
  - Customer control of application performance
  - Ensures high priority workloads get more power when group/chassis cap is reached



UCS Software Bundling
Infrastructure & Server Bundles

Customer benefits

- HW support decoupled from major SW releases
- Quicker adoption of new server & adapter types

Feature details

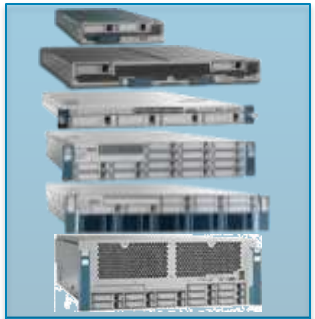
- Unbundling of UCS software bundles
- Server and adapter packs aimed at new server and adapter hardware
- Off-cycle introduction of server and adapter packs in-sync with hardware releases
- Next major software releases will incorporate previous modular server and adapter packs
- Enables faster introduction of new server and adapters without waiting for next major SW release

Infrastructure Bundle:

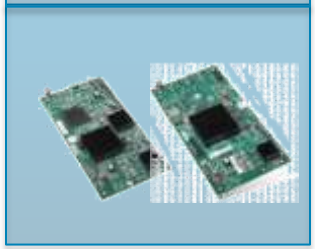
- UCSM
- Fabric Interconnect (NX-OS)
- Fabric Extender (IOM) Firmware
- Chassis Mgmt. Controller

Server Bundle:

- CIMC
- BIOS
- RAID Controller FW
- Catalog File
- UCSM Mgmt Extn.



- Adapter FW
- Catalog File
- UCSM Mgmt Extn.



UCS Software Bundling
What bundles do you need?

- If your environment has
  - Fabric Interconnect and B-Series Chassis only:

    Infrastructure Bundle

    B-Series Blade Server Bundle

  - C-Series servers as well:

    \+ **C-Series Rack-Mount Server Bundle**

  - Off-cycle addition of memory DIMMs or hard drives

    \+ **Capability Catalog**

    The Capability Catalog will be cumulatively bundled into every Infrastructure Bundle.

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Software Release 1.4

Compute

Ethernet

Fibre Channel

Authentication & Security

Stateless Computing

Management & Monitoring

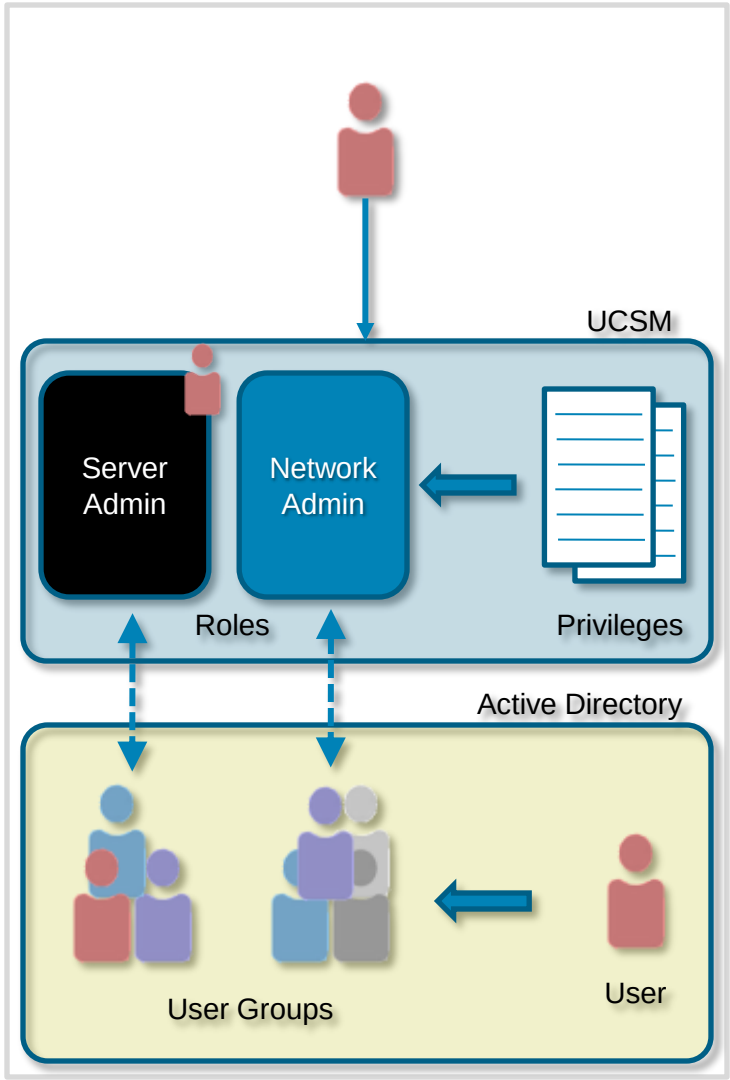
UCS Manager
Active Directory (LDAP) Groups Integration

Customer benefits

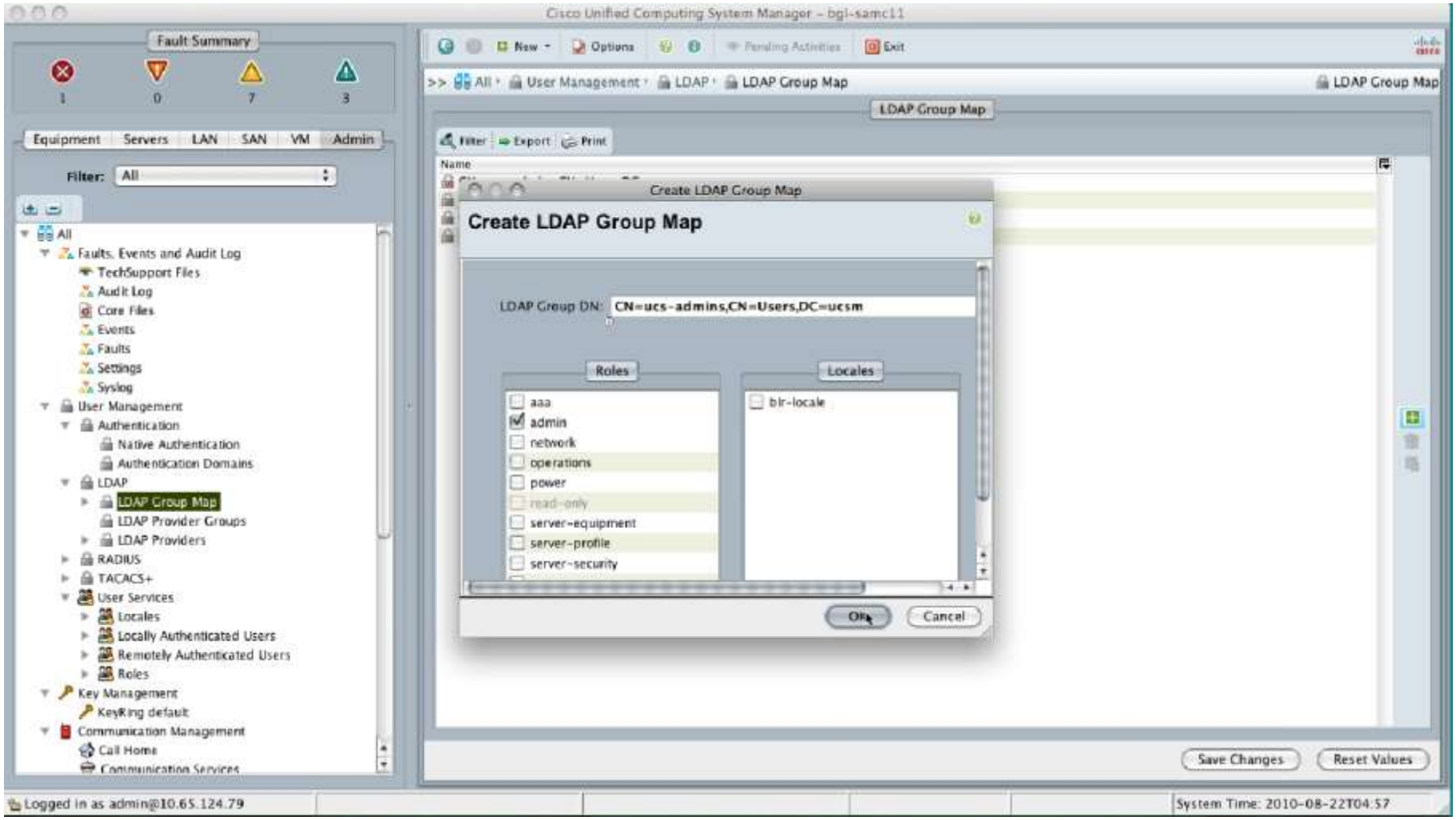
- Unified user privilege control within AD
- Easier alignment for security and server admin

Feature details

- AD user groups looked up by UCSM
- UCSM role assignment to AD groups
- Users' role membership based on AD group membership
- Single place control of user privileges by changing user AD group membership



UCS Manager
Active Directory (LDAP) Groups Integration



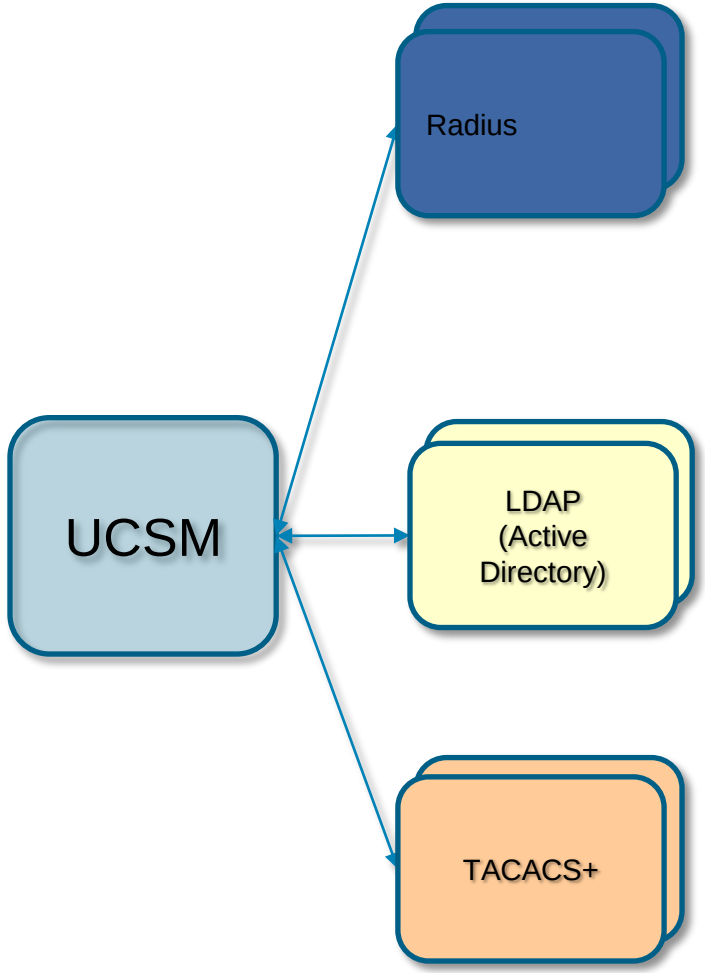
UCS Manager
Multi Scheme Authentication

Customer benefits

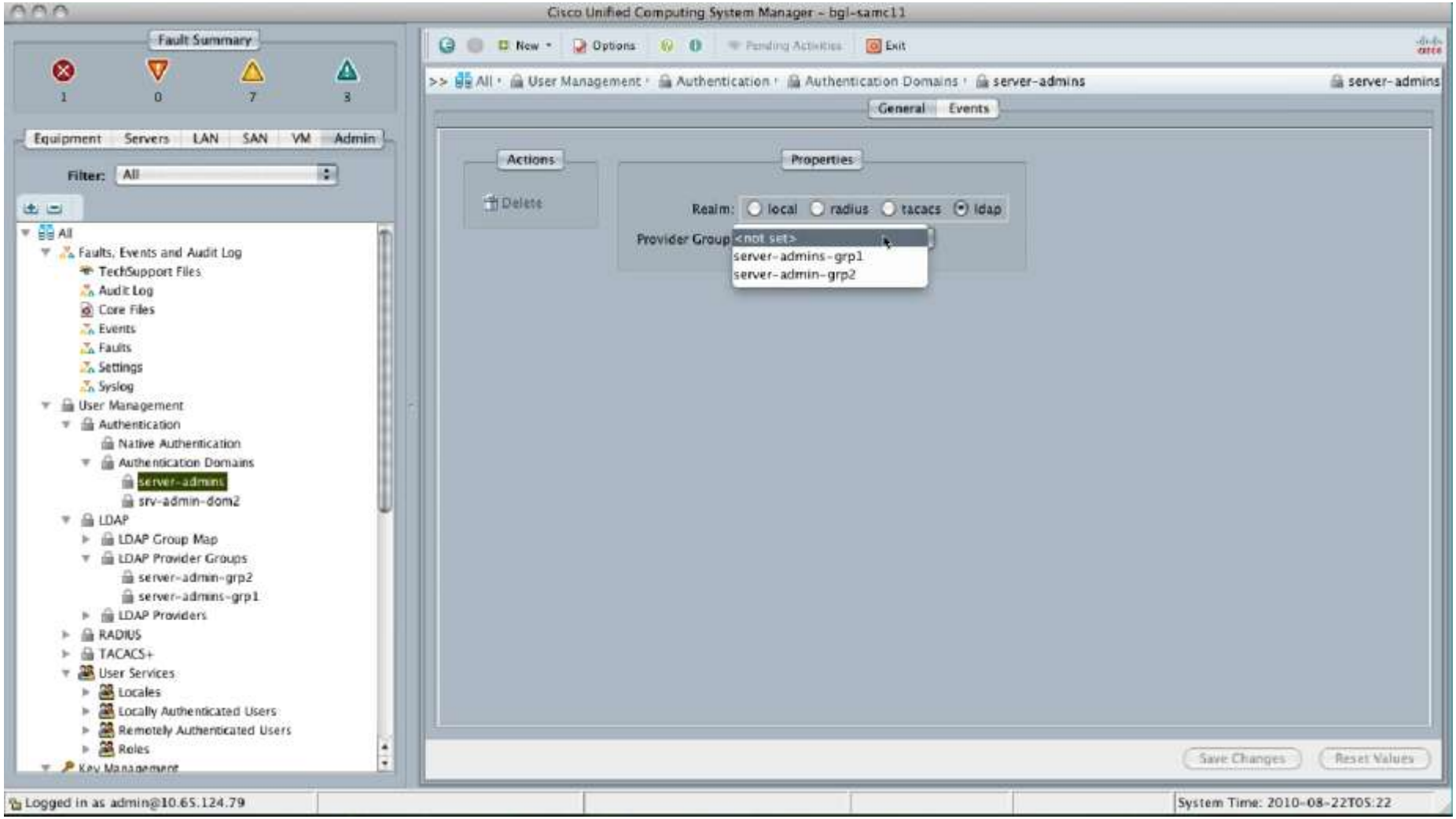
- Integration into mixed authentication environs.
- Support for segmented authentication

Feature details

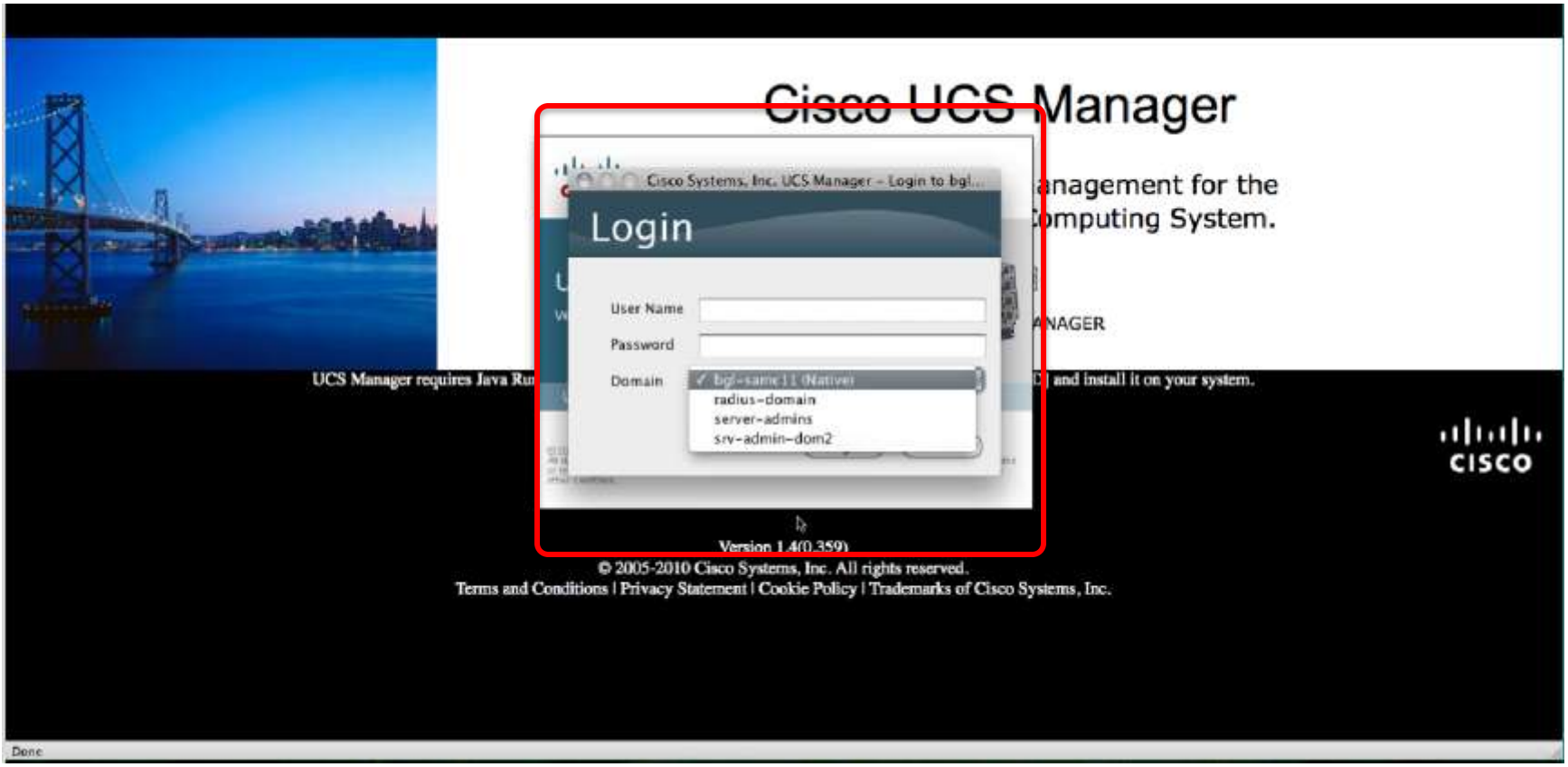
- Concurrent multi-scheme authentication
  - LDAP (Active Directory)
  - TACACS+
  - RADIUS
- Authentication with multiple AD domains
  - Multiple AD domains segmentation by region, organization etc. can be input into UCSM
  - UCSM communicates with multiple AD domain controllers to authenticate a user



UCS Manager
Multi Auth Domain Setup



UCS Manager
Multi Auth Login Screen & API



Problems | Javadoc | Declaration | Console

<terminated> Login [Java Application] /System/Library/Frameworks/JavaVM.framework/Versions/1.6.0/Home/bin/java (Aug 20, 2010 11:07:17 AM)

```
<aaaLogin inName ="ucs-local-domain/admin" inPassword ="Nbv12345"/>
 <aaaLogin cookie="" response="yes" errorCode="551" invocationResult="unidentified-fail" errorDescr="Authentication failed"> </aaaLogin>
```

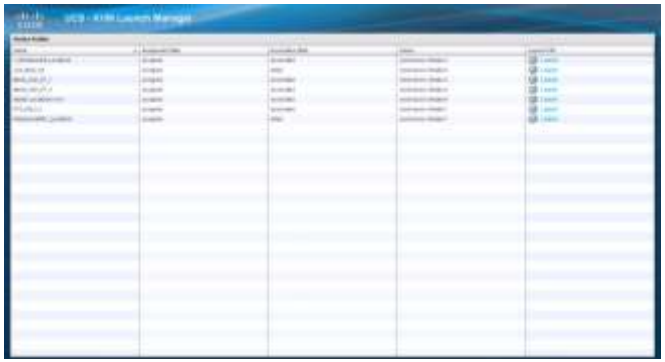
UCS Manager
Multi-User KVM Security Enhancements

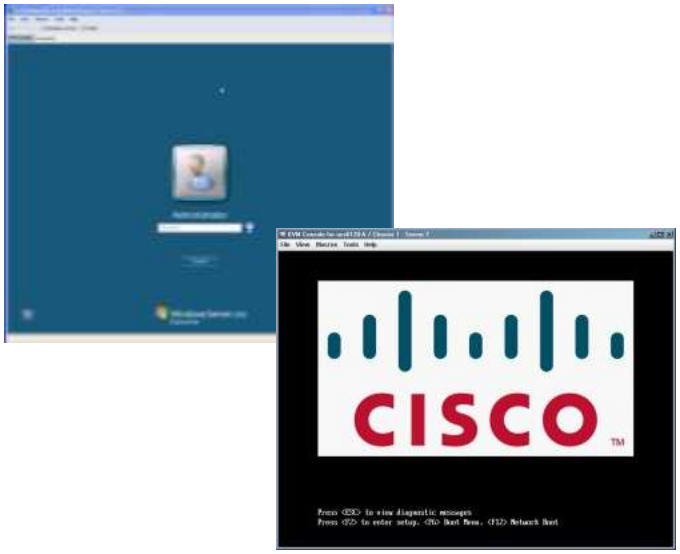
Customer benefits

- Secure KVM use in multi-user environments
- Granular control of KVM access

Feature details

- First user KVM ownership
  - First KVM user gets RW privileges to session
  - First user grants permission for other sessions
  - Second KVM session is read-only by default
- KVM admin control
  - KVM forced termination by UCS admin user





UCS
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Compute

Ethernet

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Management & Monitoring

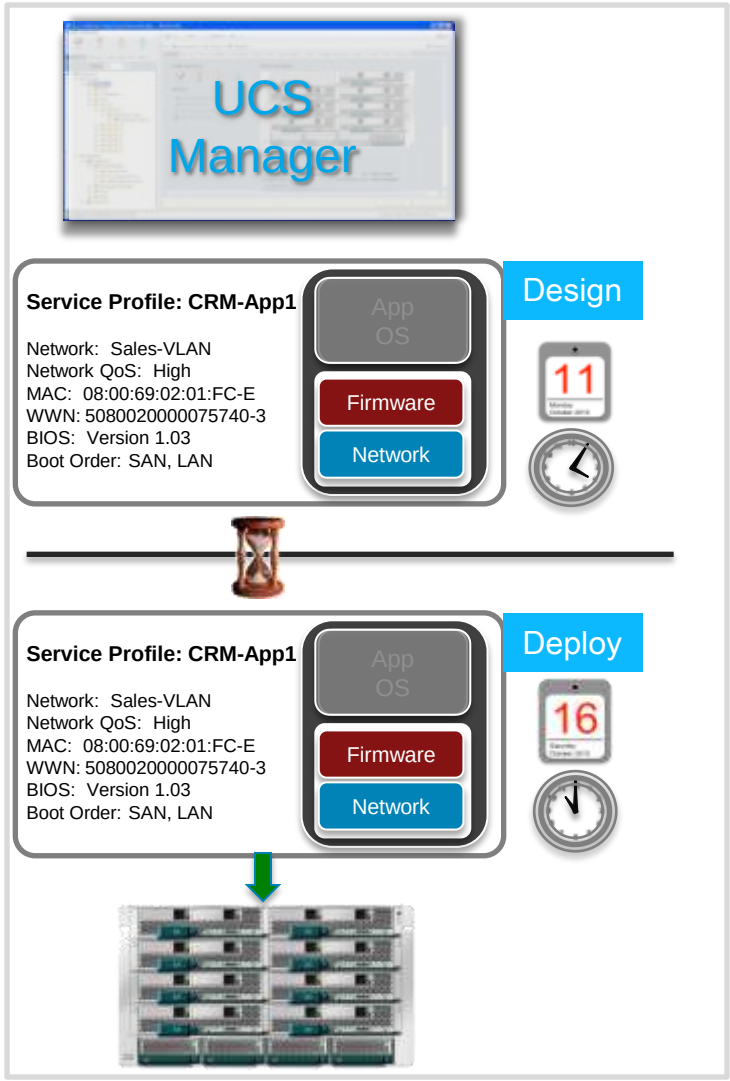
UCS Manager
Service Profile Deployment Scheduling

Customer benefits

- Service Profile disruptions in maint. windows
- Plan ahead design changes for service profiles

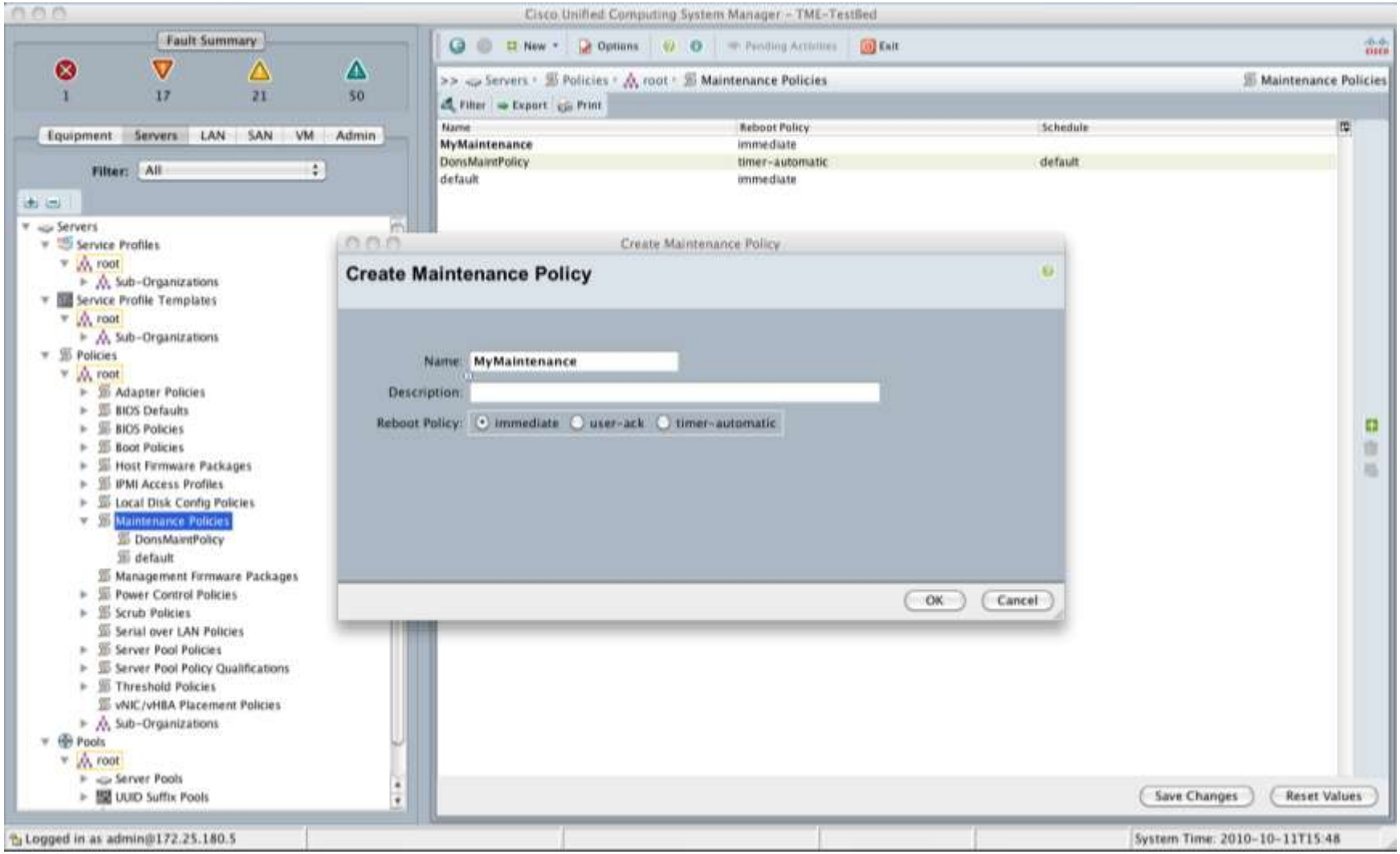
Feature details

- Maintenance policies
  - New policy contains schedule when SP can be changed
  - Policy can be mapped to one or more SPs
- Schedule disruptions
- Resource reservation
  - SP acquires required resources prior to deployment
  - Resources are held until deployment
  - Eliminates future resource contention



UCS Manager
Service Profile Deployment Scheduling

Maintenance Policies are part of Service Profiles



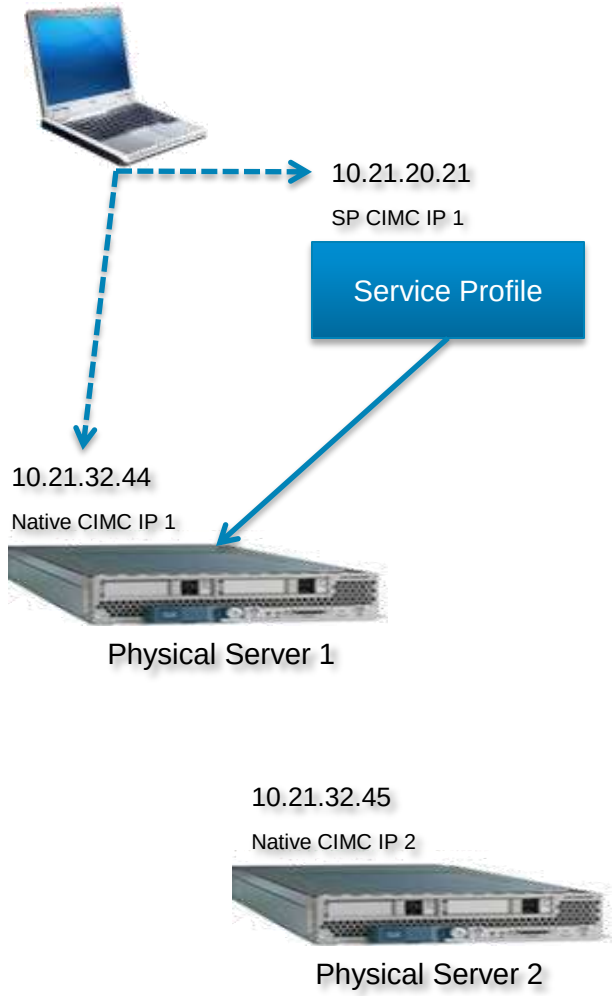
UCS Manager
CIMC IP address in Service Profile

Customer benefits

- "Follow the server" KVM access
- Fully self contained server identification

Feature details

- Current IP address assignment continues
- New , second IP address for CIMC
- Second IP address associated with Service Profile
- Upon SP deployment CIMC can be accessed through both IP addresses
- When SP moves, second IP address moves to new server



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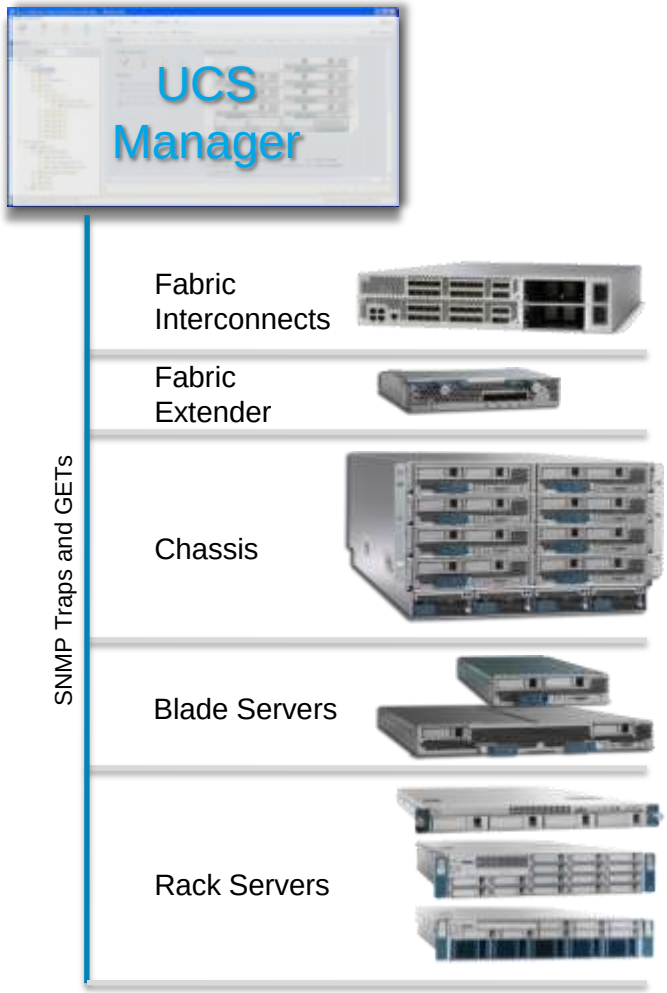
UCS Manager SNMP GET support

Customer benefits

- Easy integration to 3rd party mgmt tools
- SNMP based correlation for trap information

Feature details

- Release 1.3 provided SNMP trap support earlier
- Access to full information model of UCS:
  - **Access same information as XML API**
    - Fabric interconnects & Fabric extenders
    - Chassis
    - Blades (B-Series)
    - Rack servers (C-Series)
- 63 new MIBs available on Cisco.com
- Any additions/changes to model, automatically results in regeneration of MIBs
- **SNMP access is read-only, no SNMP SET support planned**



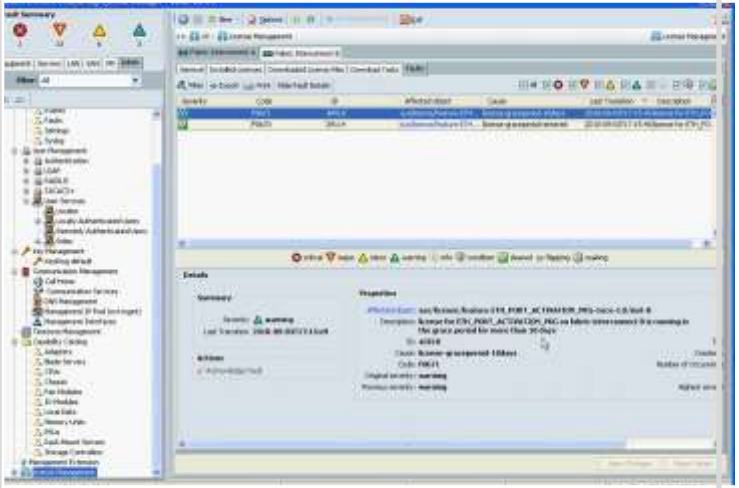
UCS Manager Licensing Enhancements

Customer benefits

- Licensing now integrated and accessible directly from UCS Manager
- Easy “check-in/check-out” of licenses (for example, for device replacement)

Feature details

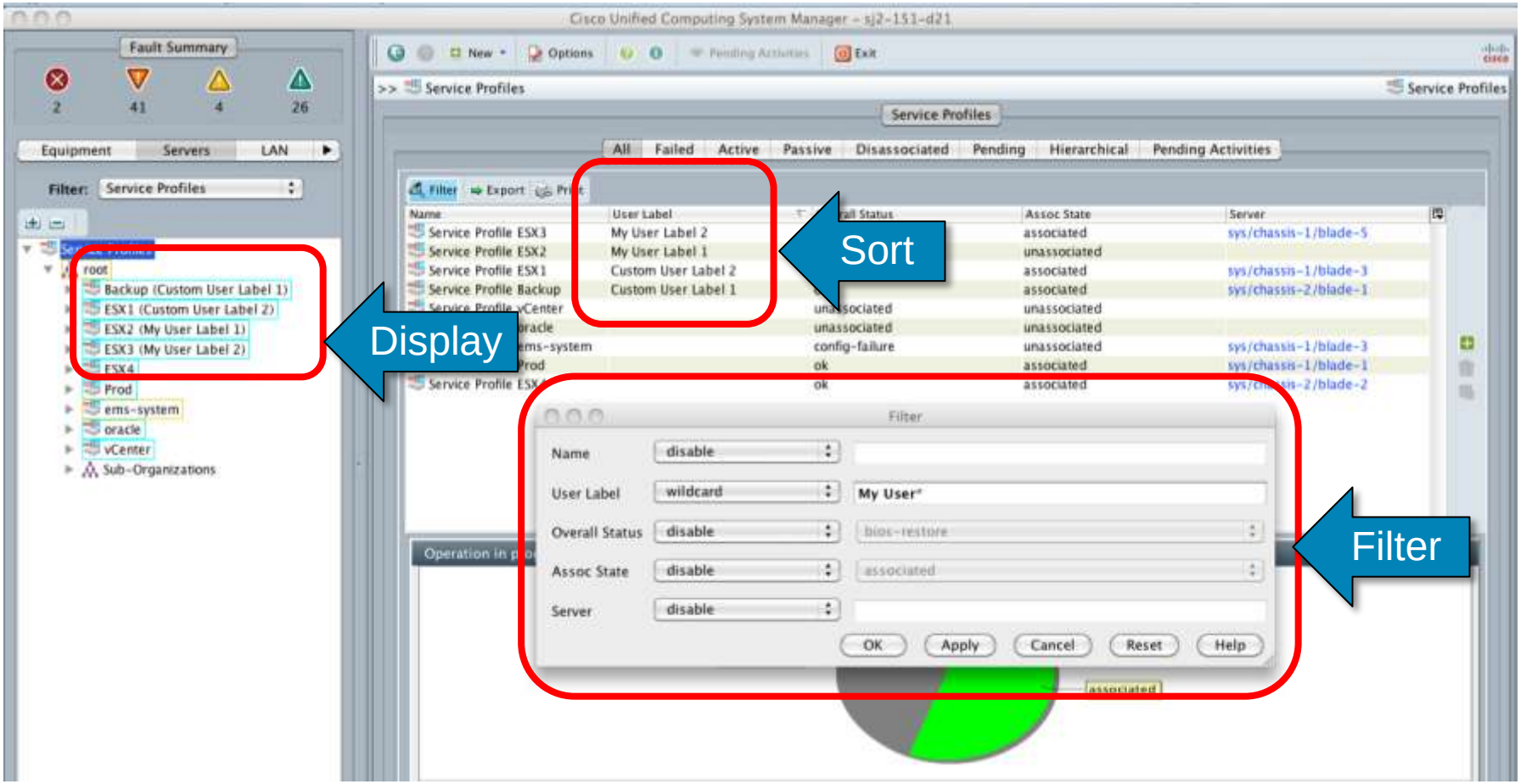
- UCS Manager integration
  - Licenses can now be assigned / revoked from UCS Manager
- Ports are licensed by count
  - User does not need to re-assign a port license to use different physical ports on the UCS 6100 Series fabric interconnects
  - Only fixed ports need to be licensed (in other words, expansion module ports **do not** require a license)
  - Same 8/16 freely-licensed ports included with UCS 6120XP / 6140XP
  - Ports must be licensed whether configured as 1GE or 10GE
- Grace period
  - Each port that is activated but for which there is no available license count will start on a 120-day grace period
  - Status of ports on grace period / days remaining visible in UCS Manager
  - If ports are used in grace period, WARNING level alerts are generated
  - **Note**: Upon expiration, UCS Manager will generate CRITICAL level alerts but will **not** shutdown active ports



```
> show license usage
Switch A:
Feature                          Status       Expires
Count Used Switch      File               Id
ETH_PORT_ACTIVATION_PKG       ok            never
8     8 FLC12110018 20080612113521765  1
```

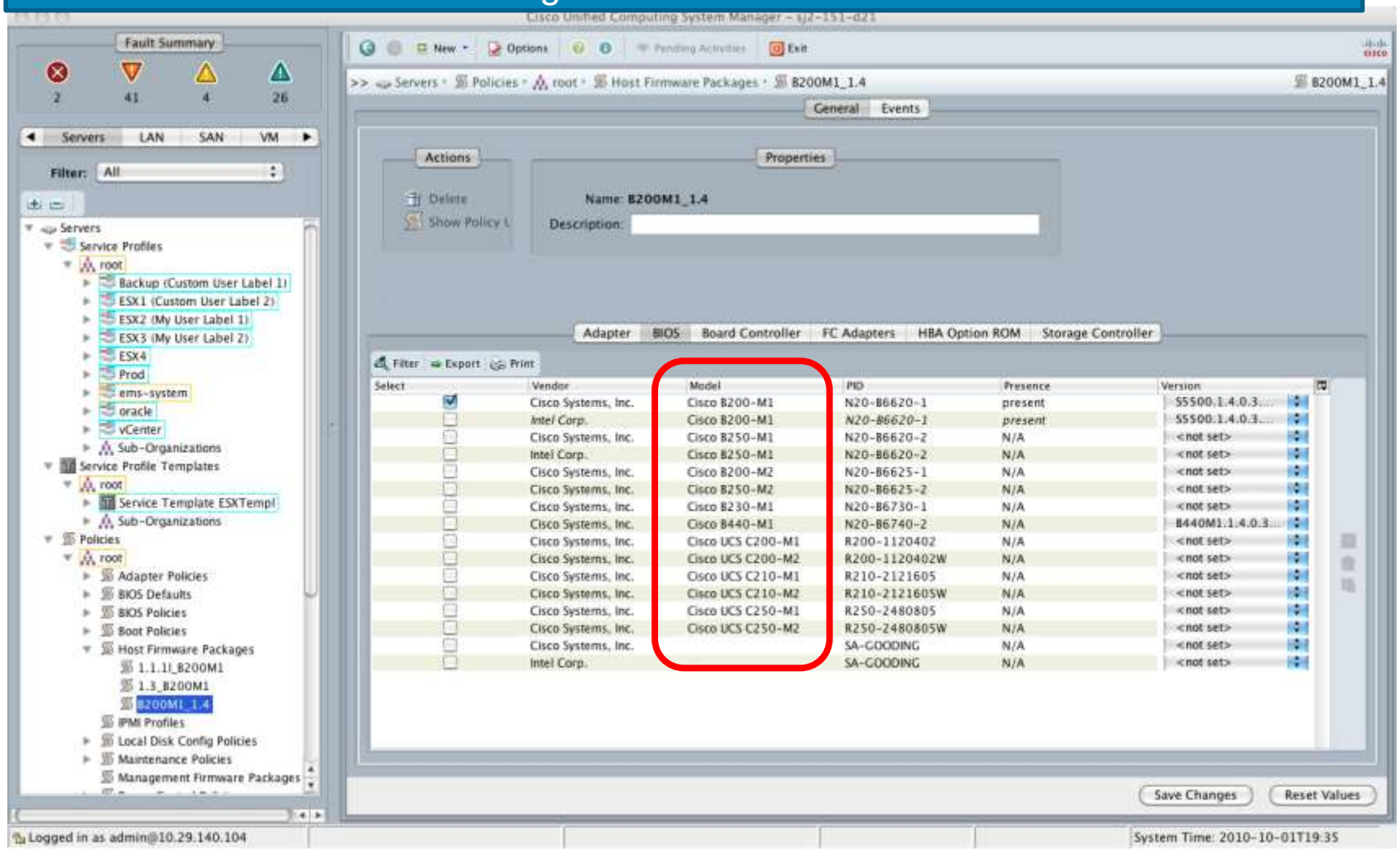
UCS Manager Custom Naming

Users will be able to enter custom labels for Service Profiles, Chassis, Servers. Labels can be free form text and can be displayed, sorted and filtered



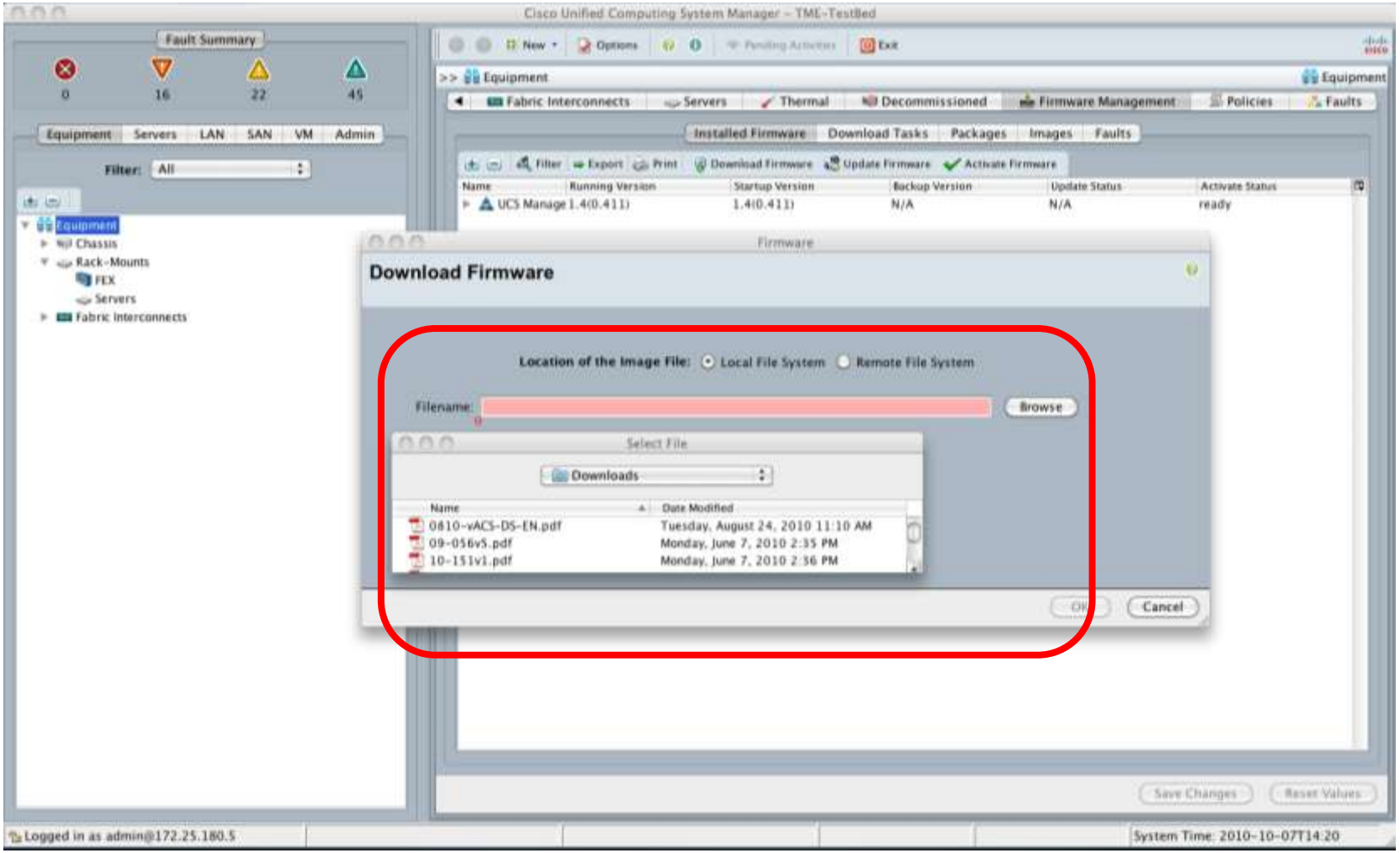
UCS Manager Firmware Descriptions

Additional information including model name for easier selection of firmware



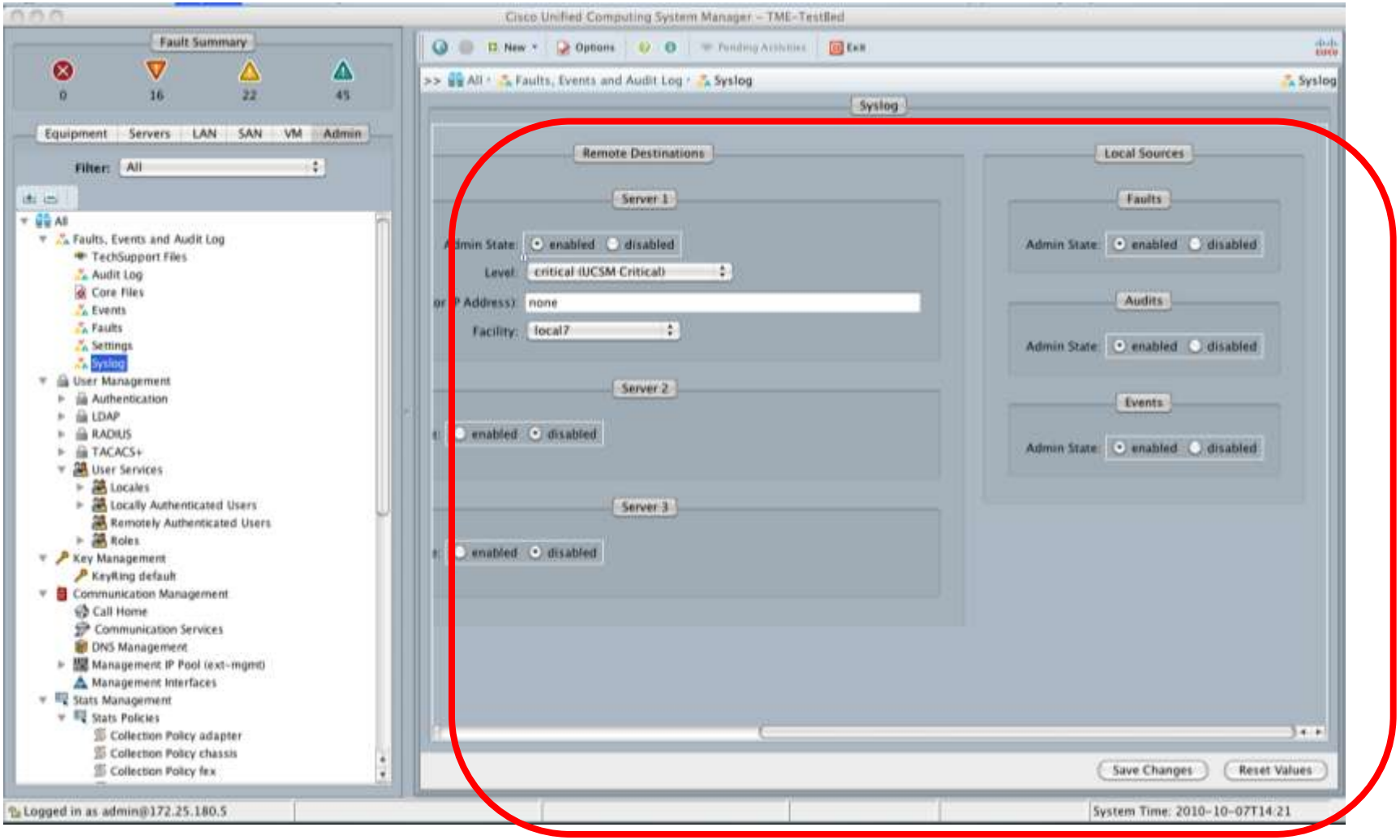
UCS Manager Usability – Firmware upload

Support for direct upload from client running UCSM GUI



UCS Manager
Syslog Categorization

New categorization to differentiate components & additional filtering capabilities



UCS Manager Resources

- UCS Manager Product Page on Cisco.com

  http://www.cisco.com/en/US/products/ps10281/index.html

- UCS Manager Whitepapers

  http://www.cisco.com/en/US/products/ps10281/prod_white_papers_list.html

- Cisco Developer Network for UCS Manager

  http://developer.cisco.com/web/cdc/tech/unifiedcomputing

- UCS Platform Emulator (UCSPE) download

  http://developer.cisco.com/web/unifiedcomputing/ucsemulatordownload

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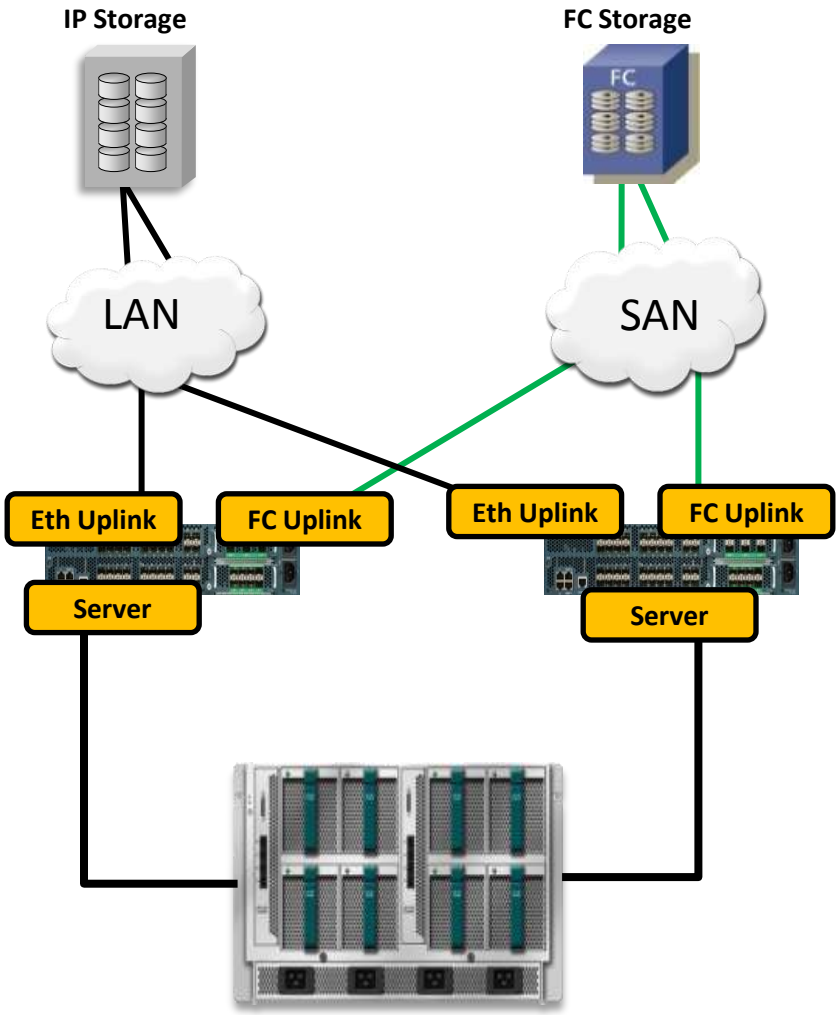
UCS Manager 1.3(1) Release

Existing Connectivity Types



Uplinks FC/Eth

Upstream Links connecting to LAN and SAN

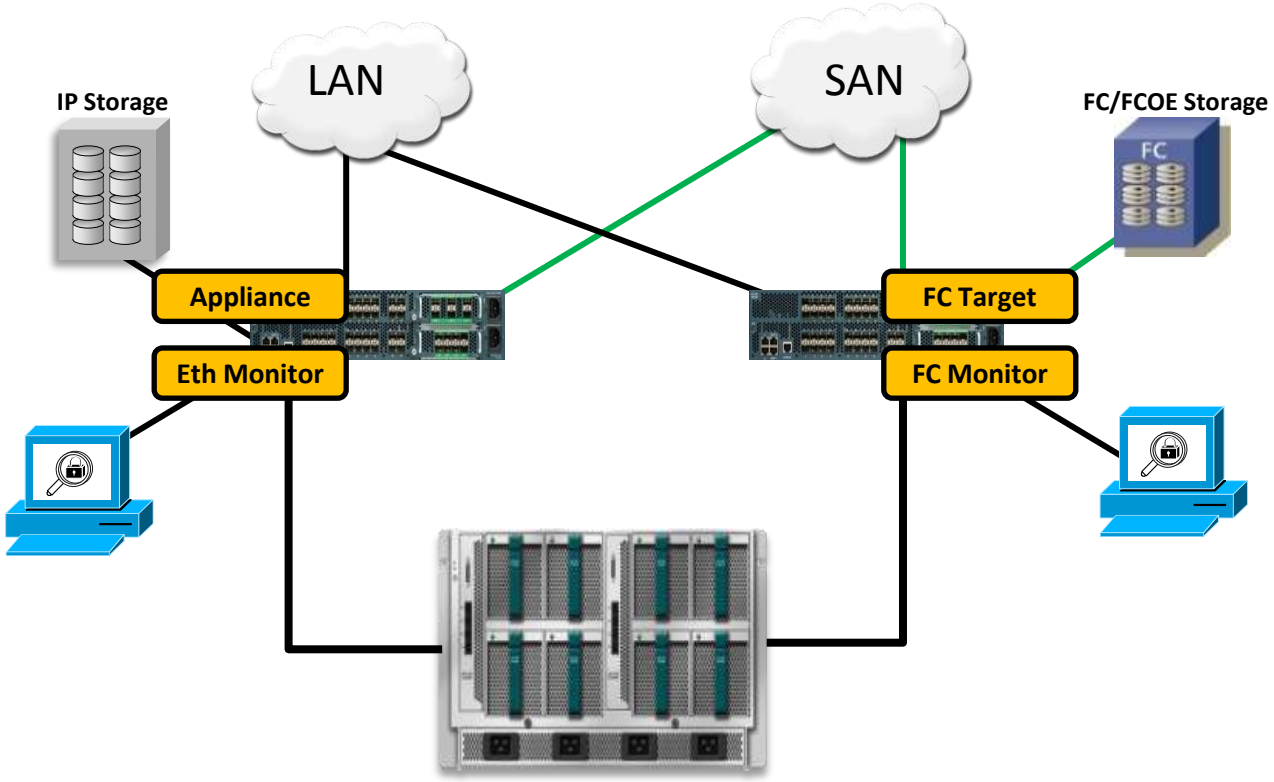
Server Ports

Downstream links connecting to servers though IOM

UCS Manager 1.4(1) Release

New Connectivity Options

New connectivity choices are **Appliance, Monitoring (FC and Eth) and Storage target (FC and FCOE)**

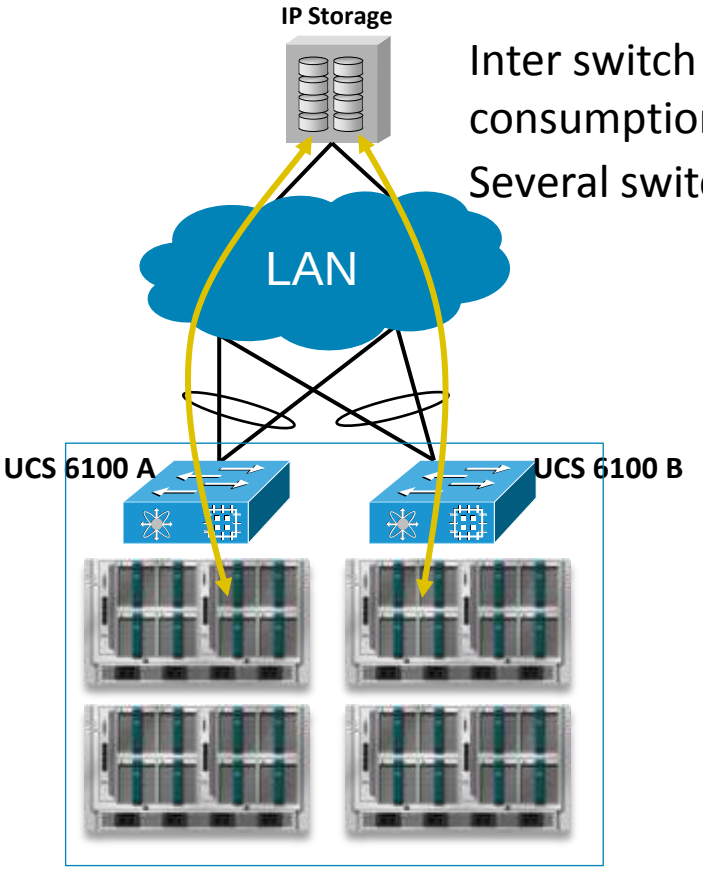


UCS Manager 1.4(1) Release

Appliance Direct Connection "End Host"

UCS simplifies appliance connectivity

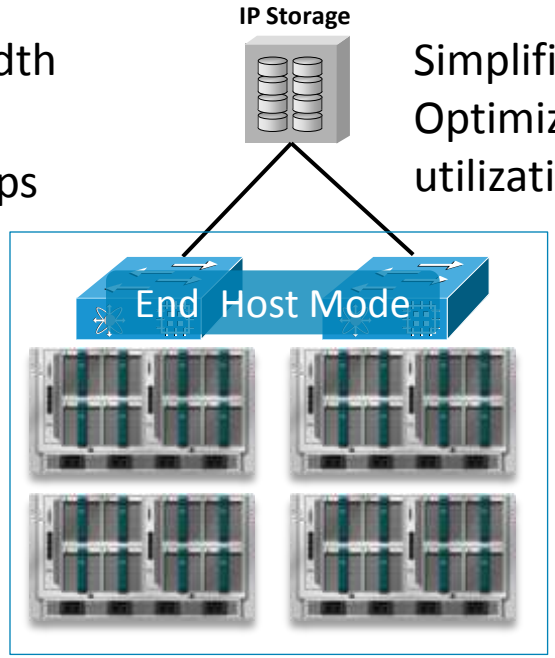
In-direct Connection



Inter switch bandwidth consumption

Several switches/hops

Direct Connection



Simplified connectivity

Optimized uplink bandwidth utilization

UCS 6100 Switching Modes

End Host Mode

- The external LAN sees the UCS 6100 as an end-host with multiple adapters. No Spanning Tree protocol on uplink ports.
- Active/Active use of uplinks by pinning
- All uplink ports should be connected to the same Layer 2 network
- More scalable than switch mode since the control plane is not stressed as an Layer 2 switch.

Switch Mode

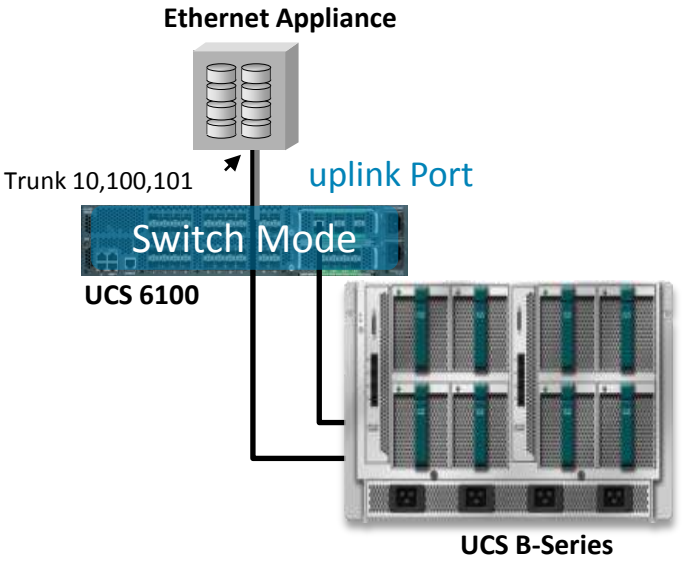
- The UCS 6100 acts like a traditional Ethernet switch with support for Spanning Tree protocol on the uplink ports
- Some uplinks connected to the external switches may be blocked by STP.
- Only PVST+ is supported
- Mac-add learning is enabled on uplink/server interfaces

UCS Manager 1.4(1) Release

Appliance Direct Connection "End Host"

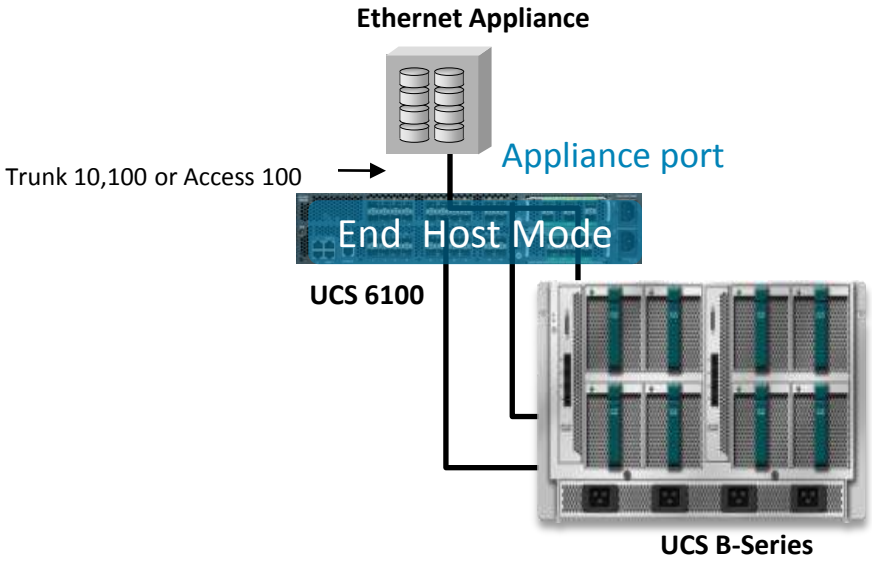
Ethernet appliance support enhanced to include "End Host" mode

Today, UCS 1.3 (Aptos+)



- Fabric Interconnect mode - Switch mode
- Port type – Uplink only
- Can't define VLANs on uplink to appliance (VLAN filtering)
- Advanced feature such as QOS not available

UCS 1.4 (Balboa)



- Fabric Interconnect mode - End-host mode
- Port type - Appliance
- VLAN filtering available
- Advanced features such as QOS available

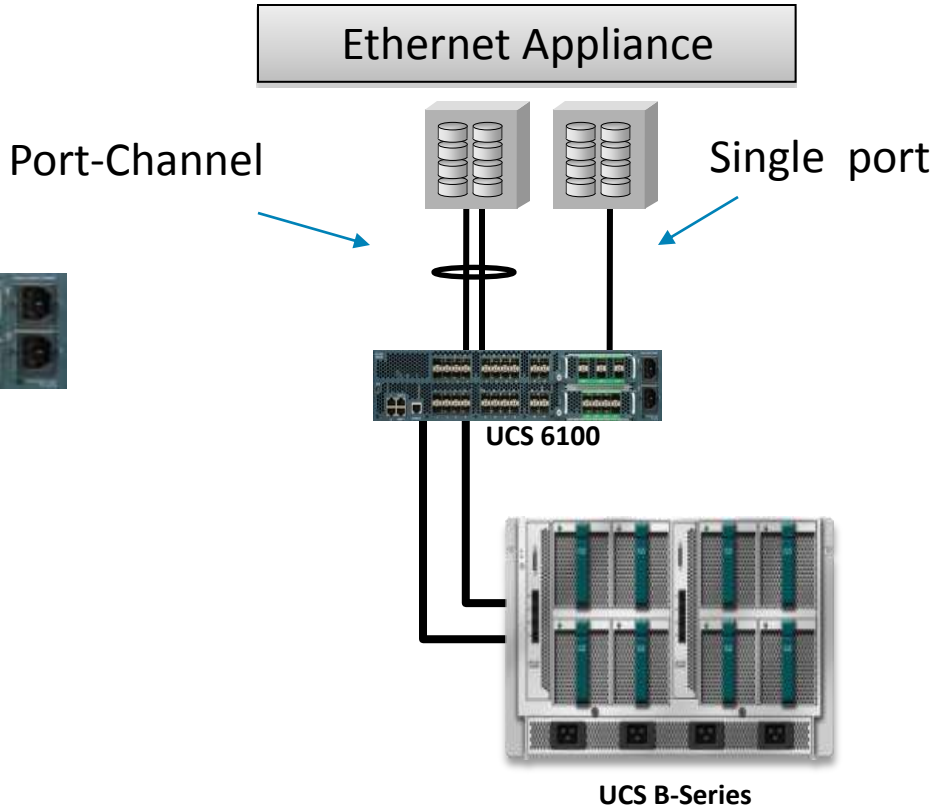
UCS 1.4 (Balboa) onwards "End host" mode is recommended

UCS Manager 1.4(1) Release

Supported Ports and Configuration

- **Any fixed 10G or 1G**
- **Any expansion port**

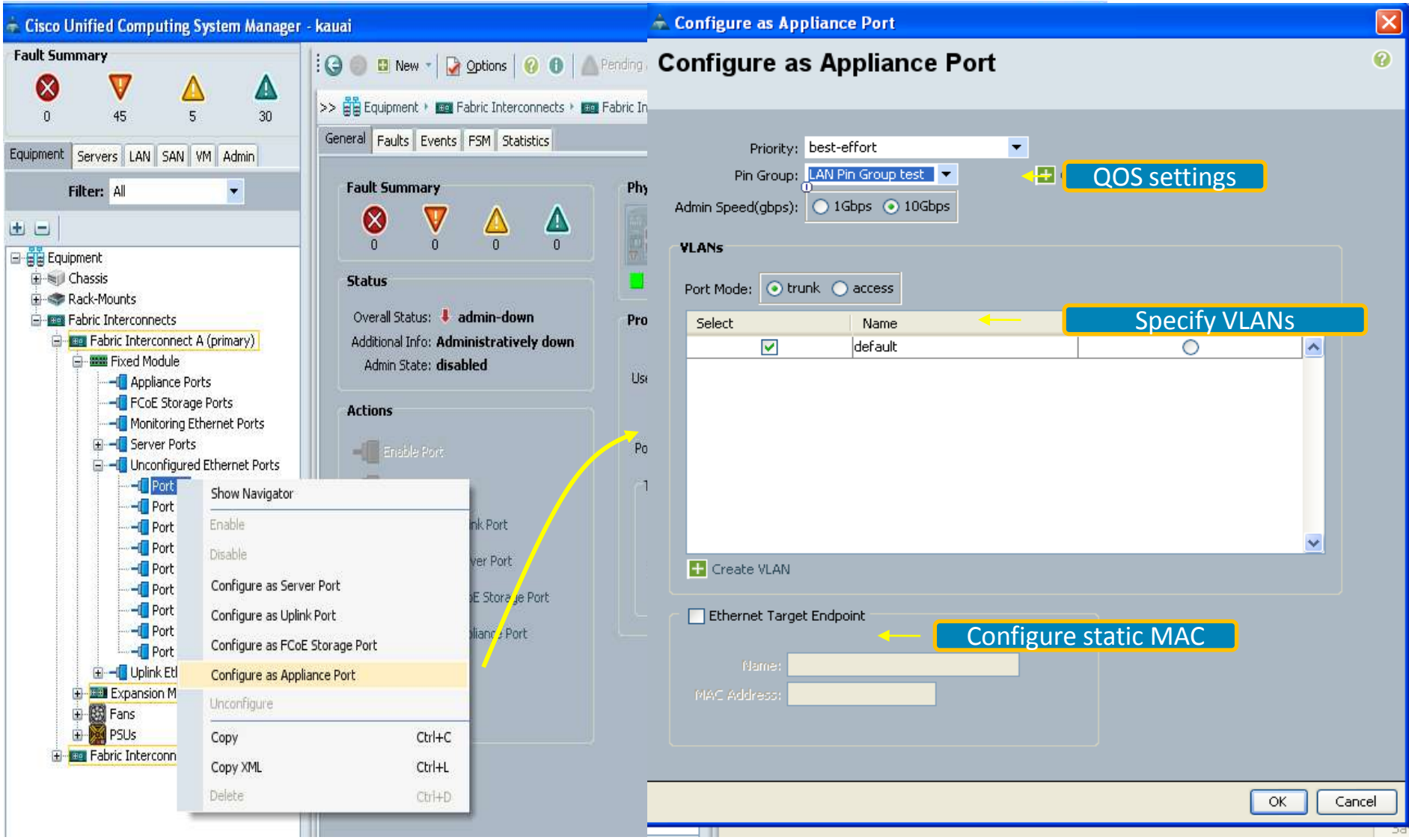
UCS 6100



- Non-vPC port-channel and single port configurations are supported
- NIC teaming or port-channeling is required on the appliance to have resilient connectivity

UCS Manager 1.4(1) Release

UCSM Appliance port - Visual



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- CIMC IP address abstraction

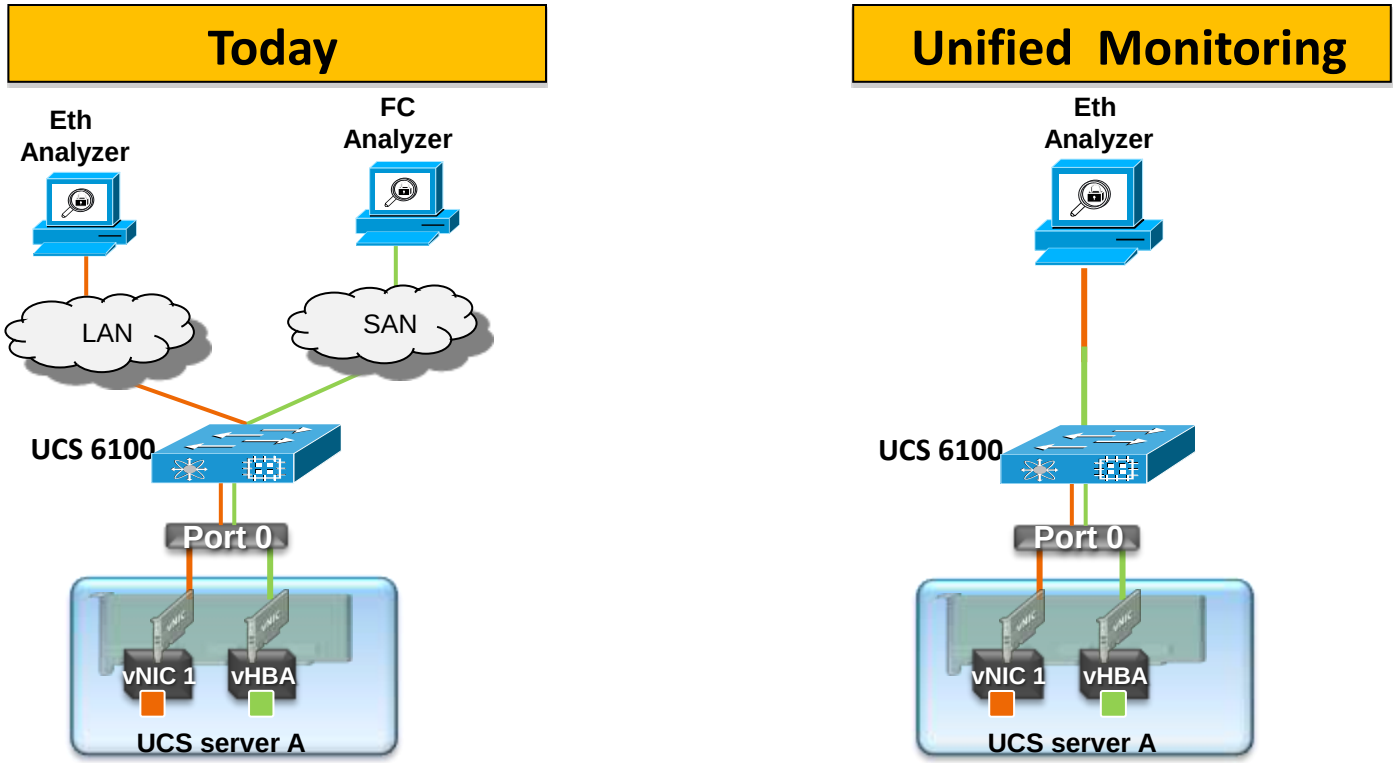
Management & Monitoring

- SNMP GET support for ALL UCS components
- Syslog enhancements
- UCS 6100 licensing enforcement/warnings
- Usability enhancements

UCS Manager 1.4(1) Release

Unified Monitoring

Monitor FC and Ethernet traffic with a single analyzer



- Requires a dedicated FC analyzer
- Need separate analyzers for FC and Eth
- Requires specialized in-line TAP, expensive

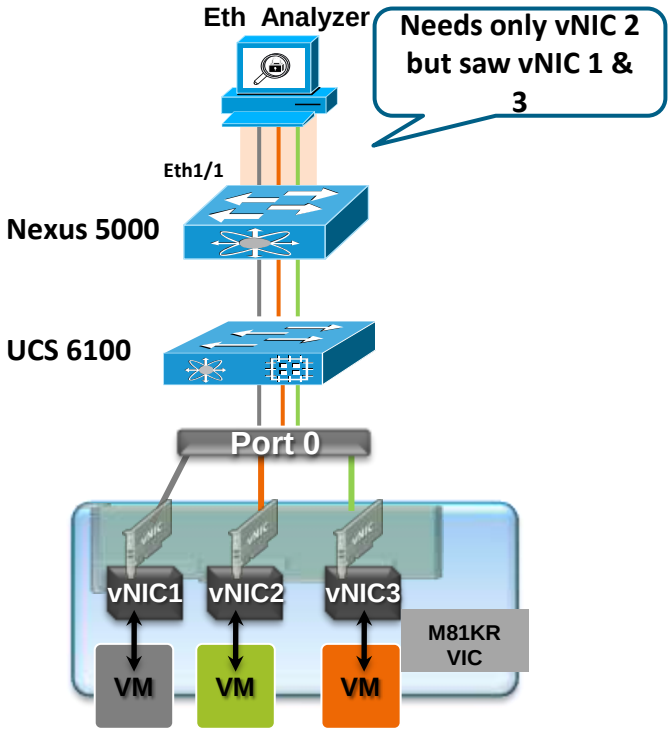
- Ability to monitor FC and Eth traffic using a Eth analyzer
- Single analyzer to monitor FC and Eth
- Eliminates expensive FC analyzer

UCS Manager 1.4(1) Release

vNIC and vHBA Level Monitoring

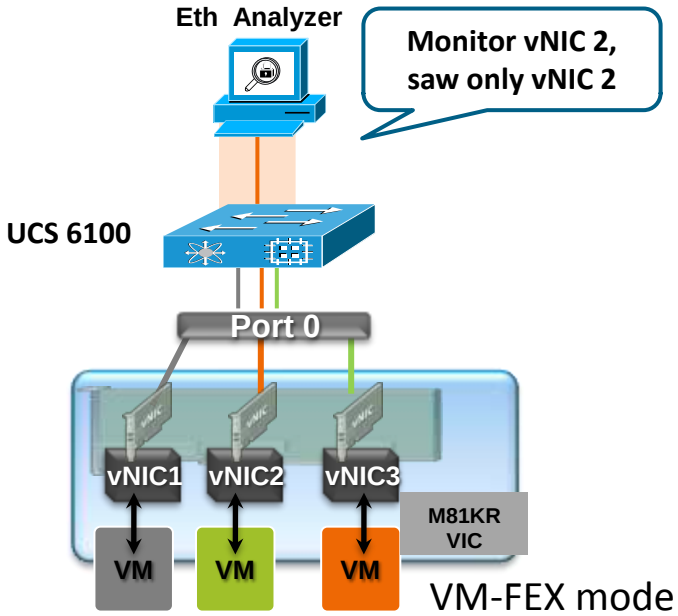
vNIC level monitoring and troubleshooting capability

Traditional SPAN



- Complex connectivity
- Inability to monitor specific VM traffic
- Lack of visibility (bulk capture)

vNIC Level Monitoring



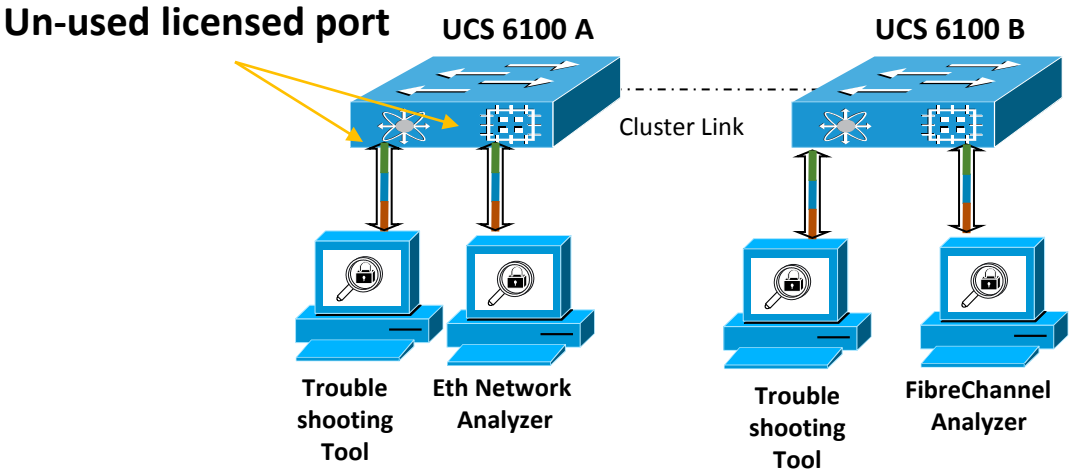
VM-FEX mode

- Simple connectivity
- Ability to monitor specific VM traffic
- Granular visibility

UCS Manager 1.4(1) Release

Summary

A total of 4 local SPAN sessions per UCS system, 2 on each UCS 6100



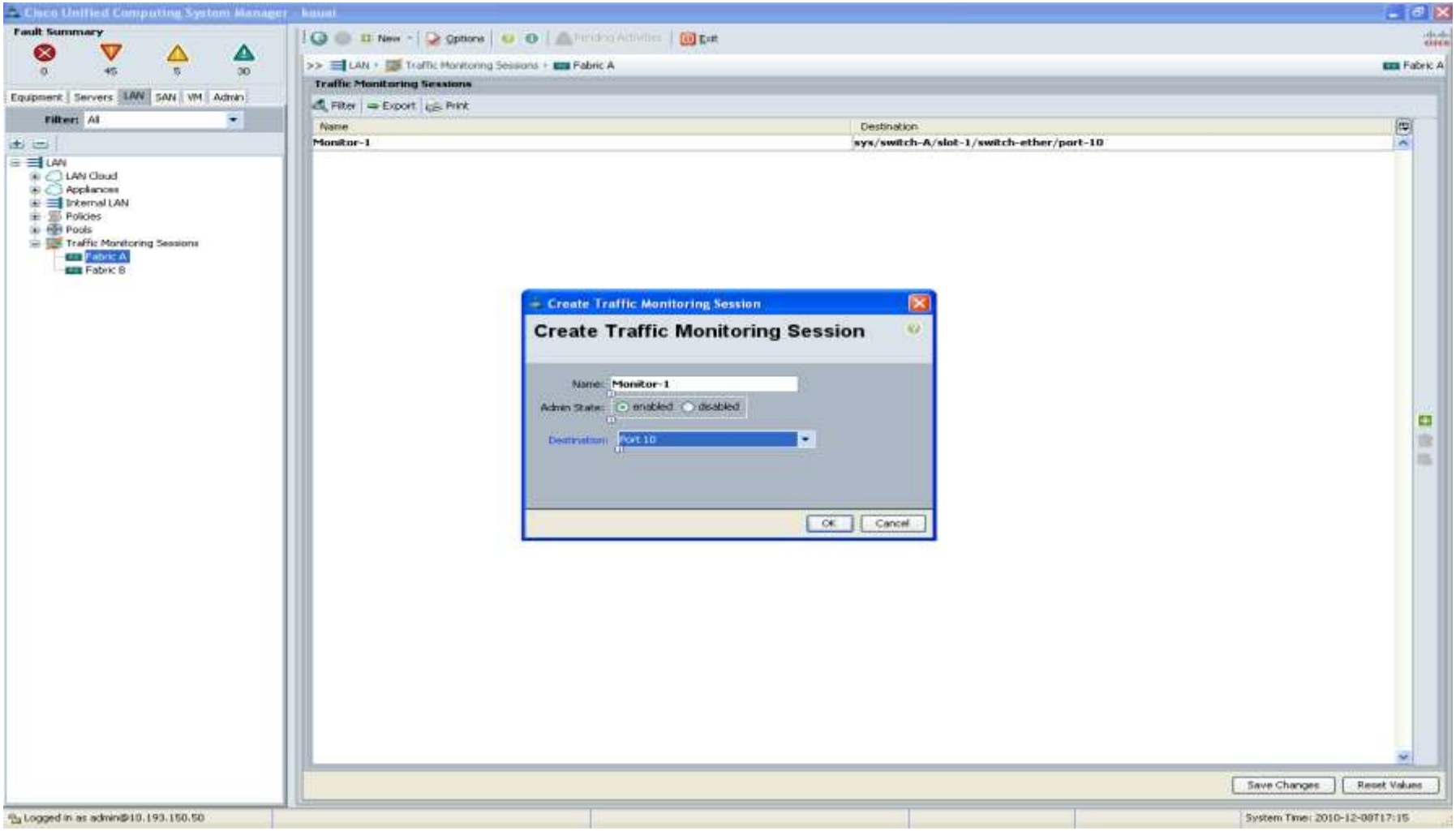
Things to remember :

- **Configure identical monitoring sessions in both fabrics for failover and load-balanced traffic flows.**
- **vHBA is available to be monitored in both FC and Eth monitoring configurations**
- **Monitoring session of a VM using PTS not persistent after a vMotion (VIF is changed) Future enhancement.**

UCS Manager 1.4(1) Release

UCSM Monitoring- Visual

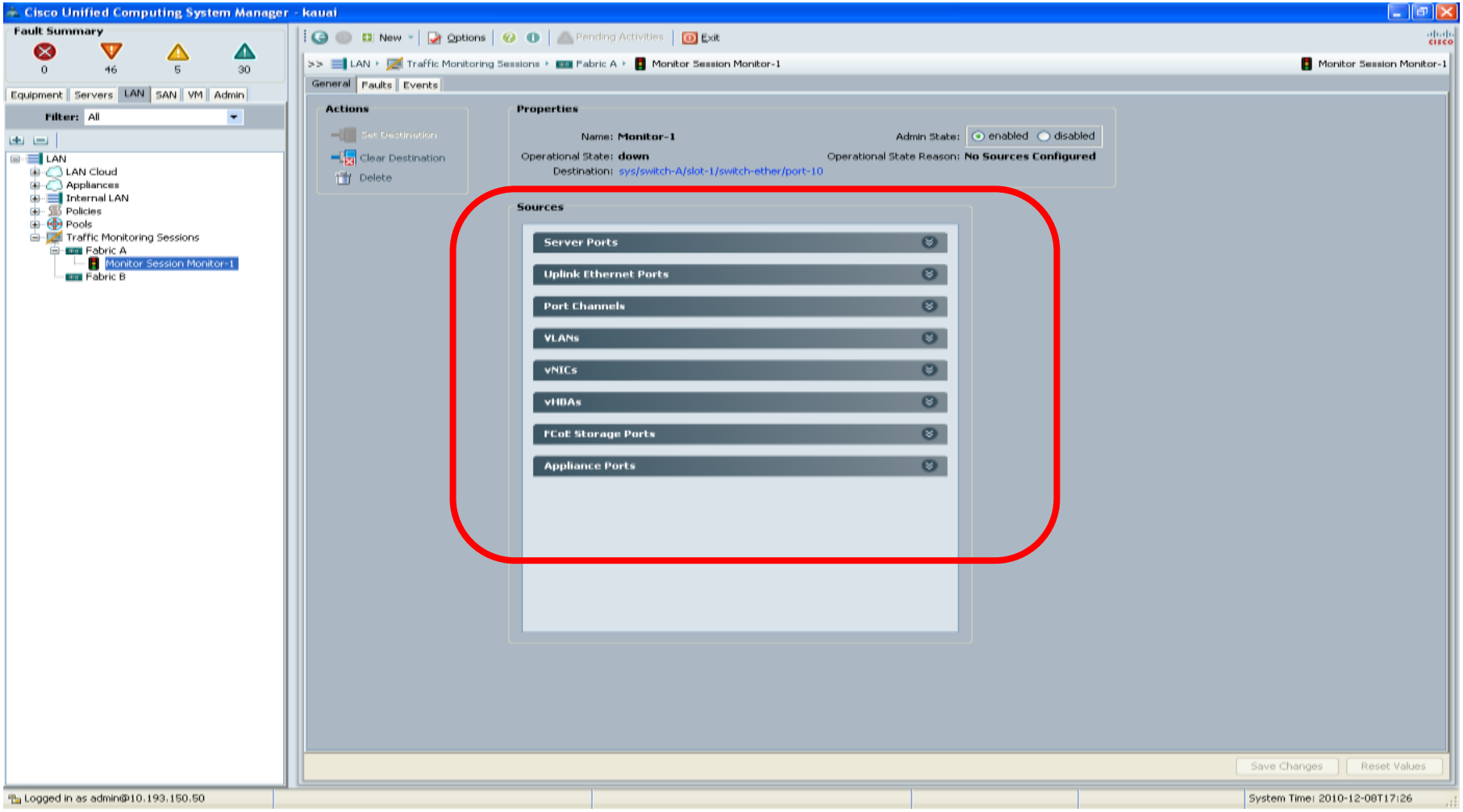
SPAN destination can be any unused licensed port



UCS Manager 1.4(1) Release

UCSM Monitoring- Visual

Support for various Eth and FC monitoring sources



UCS Software Release 1.4 *(Codename: Balboa)*
Feature Summary

Compute

- Support for new UCS B230 Blade Server
- UCS C-Series server integration into UCS Manager
- Multi-chassis power capping for UCS B-Series
- Support for upto 20 UCS B-Series Chassis

Ethernet and Fibre Channel

- Direct connect Ethernet Appliance
- SPAN support on UCS 6100
- **PVLAN Isolated access support**
- Full vNIC failover w/o NIC teaming/bonding with FabricFailover/FabricSync
- Higher VLAN scalability 1024
- Higher logical port scalability 6000
- Higher virtual interface Scalability 2000
- Fabric Extender Transceiver Support
- Management Interface monitoring and failover
- FC trunking and port channel (in NPV mode)
- Limited Direct Connect FC Storage

Authentication & Security

- Simpler integration with MSFT Active Directory
- Multiple simultaneous authentication systems
- Multi-user KVM enhancements

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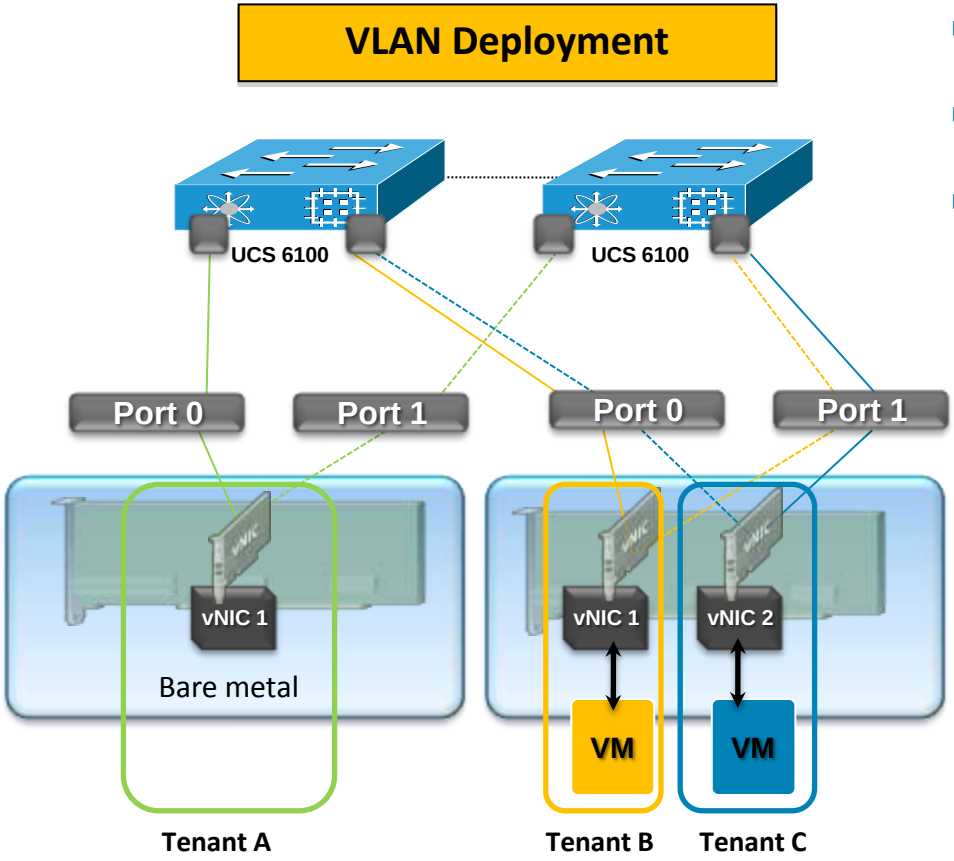
UCS Manager 1.3(1) Release

VLAN based Layer-2 separation



- L2 separation with VLANs
- A vlan or more per tenant/application/function
- VLAN scalability on various platforms is a deciding factor of NW scale

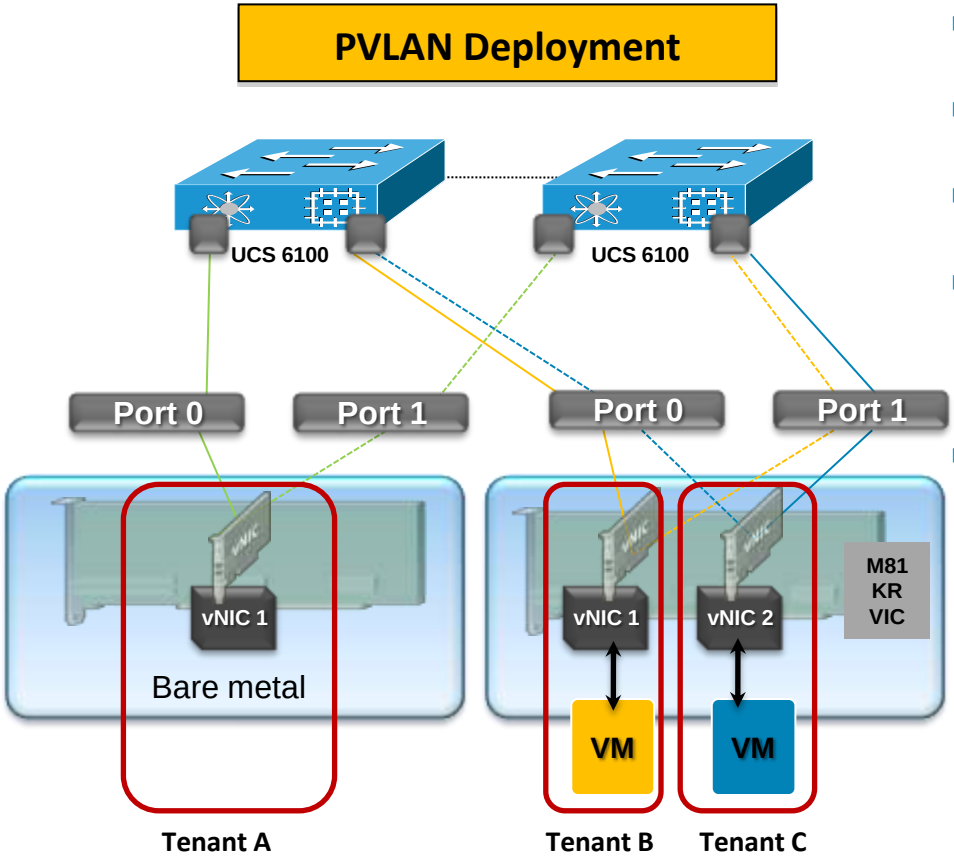
No of VLANs used = 3

VLAN A
VLAN B
VLAN C

UCS Manager 1.4(1) Release

PVLAN based Layer-2 separation

Single Isolated PVLAN to provide v NIC level layer 2 separation



- L2 Separation with Isolated PVLAN
- Single isolated VLAN for all tenants/apps
- Provides same level of isolation as with VLAN
- VLAN limits is no longer scalability limiting factor
- Useful for Bronze tier separation

No of VLANs used = 1

Isolated VLAN A

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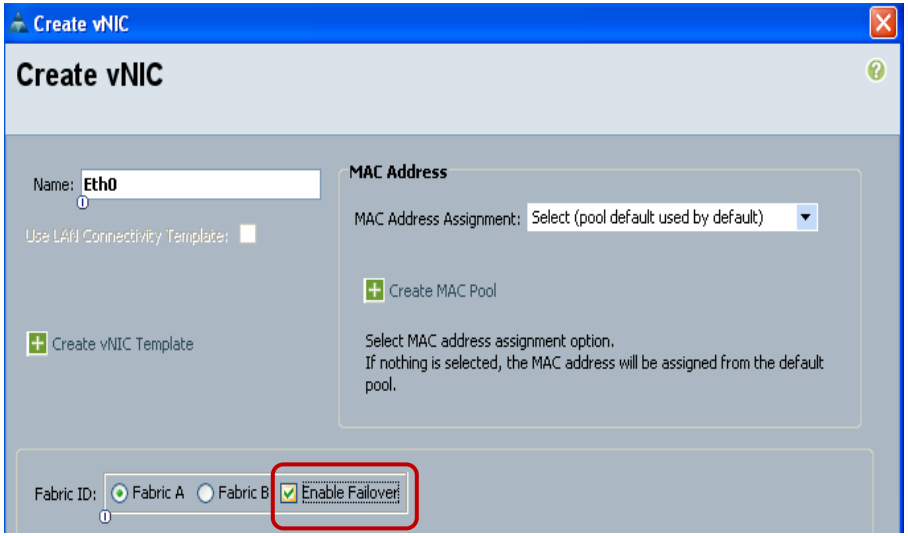
UCS Manager 1.3(1) Release or earlier

Fabric based NIC teaming

FabricFailover

- Chassis backplane (or Fabric) provides redundant path for each vNIC
- HW based active/standby failover mechanism for Eth traffic
- Host OS un-aware of failure and recovery
- Unlike OS NIC Teaming, redundancy provided with single interface
- After failover:
  - Transmit GARP
  - Multicast Group reRegistration



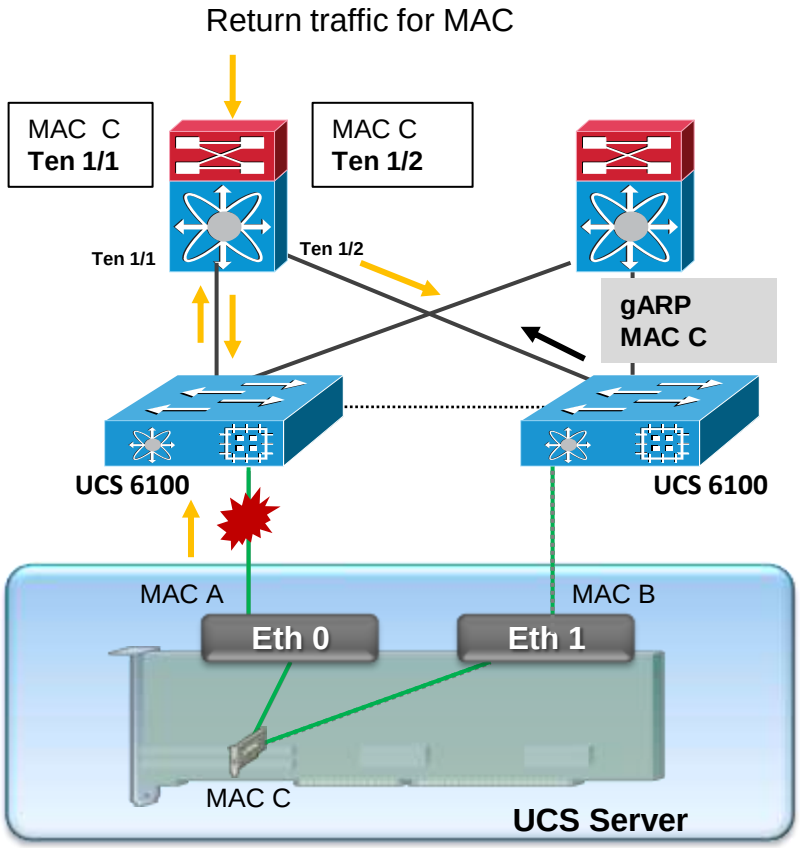
Enable fabric failover in vNIC creation

UCS Manager 1.3(1) Release or earlier Animated Slide

FabricFailover on UCS

FabricFailover

- Fabric failover load-balances traffic on per vNIC basis
- Palo provides up to 58 vNICs
- Each vNIC maps to one of the fabric for active data path
- When active path fails, failover to standby fabric.
- 6100 updates path changes to upstream switches via **gARP of vNIC MAC** upon active link failure



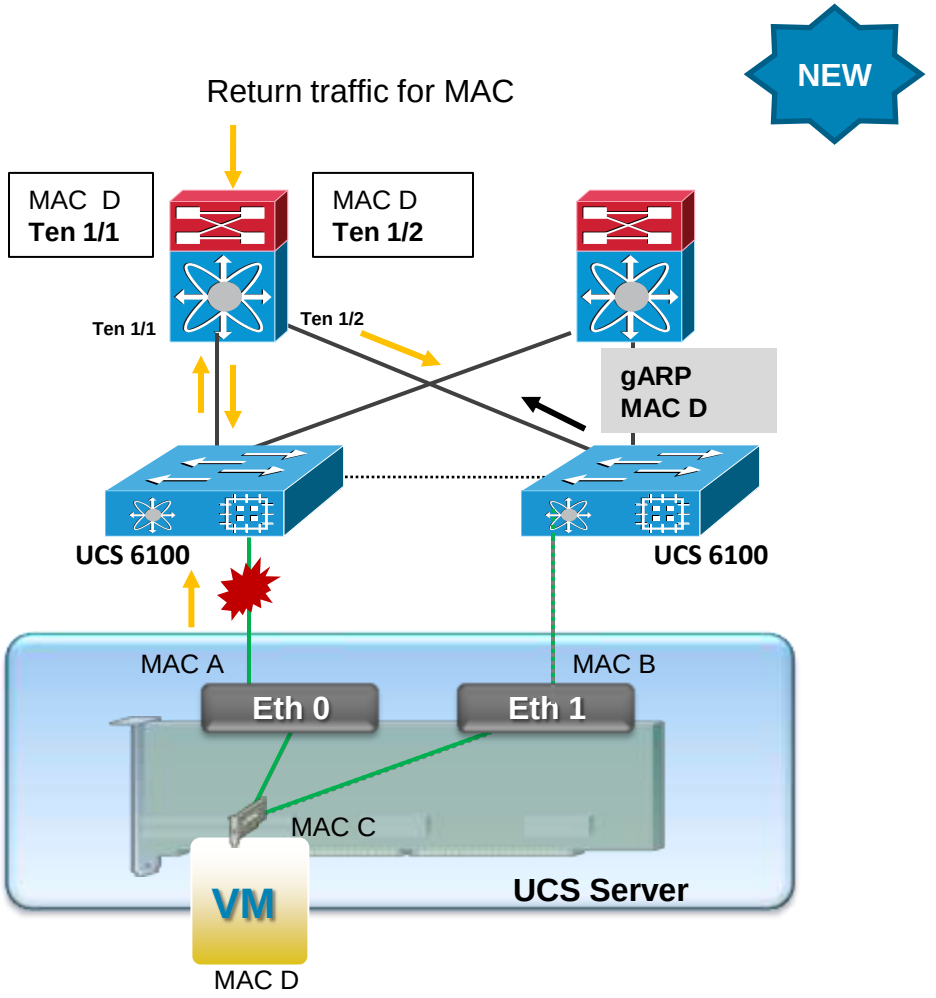
UCS Manager 1.4(1) Release

FabricFailover and Sync on UCS

Animated Slide

FabricSync

- Keeps mac address table synchronized between FI's
- 6100 updates path changes to upstream switches via **gARP not only vNIC MACs but also VM MACs behind a vSwitch** upon active link failure
- Always enabled



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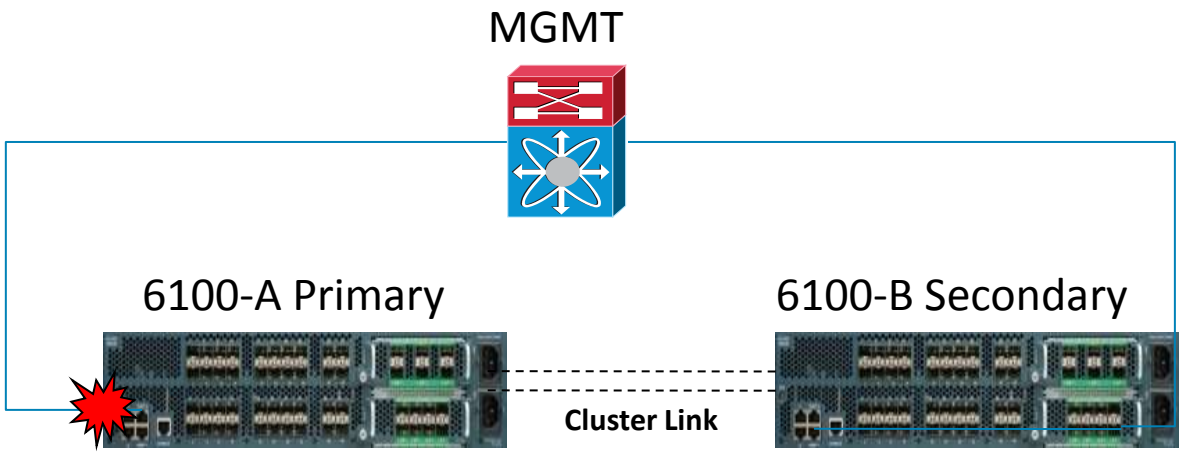
UCS Manager 1.4(1) Release

Management Interface Failover

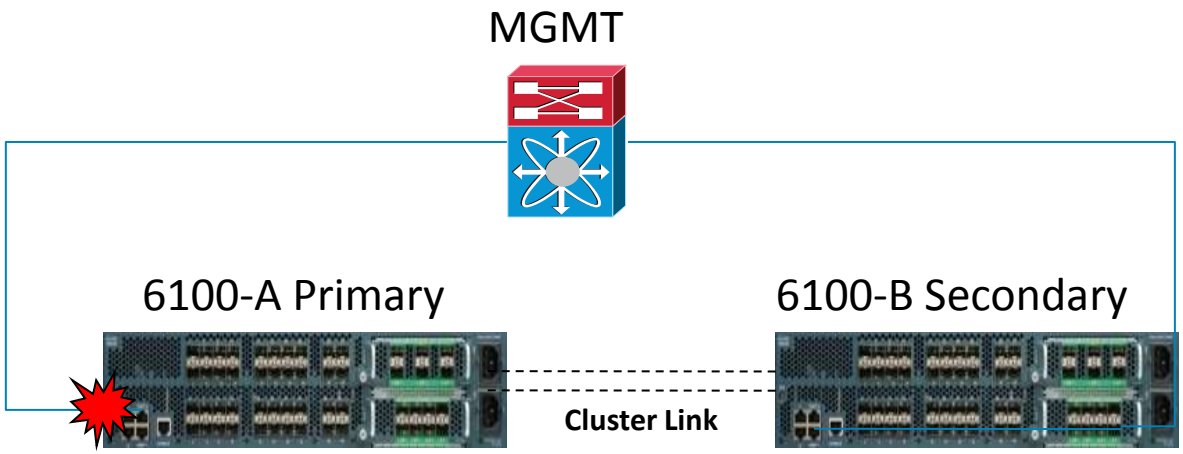


1.3(1) or earlier :

- VIP does not failover to UCS 6100 secondary
- Recover access by manual failover using CLI of the UCS 6100 secondary
- KVM/IPMI/SSH IP does not failover

UCS Manager 1.4(1) Release

Management Interface Failover

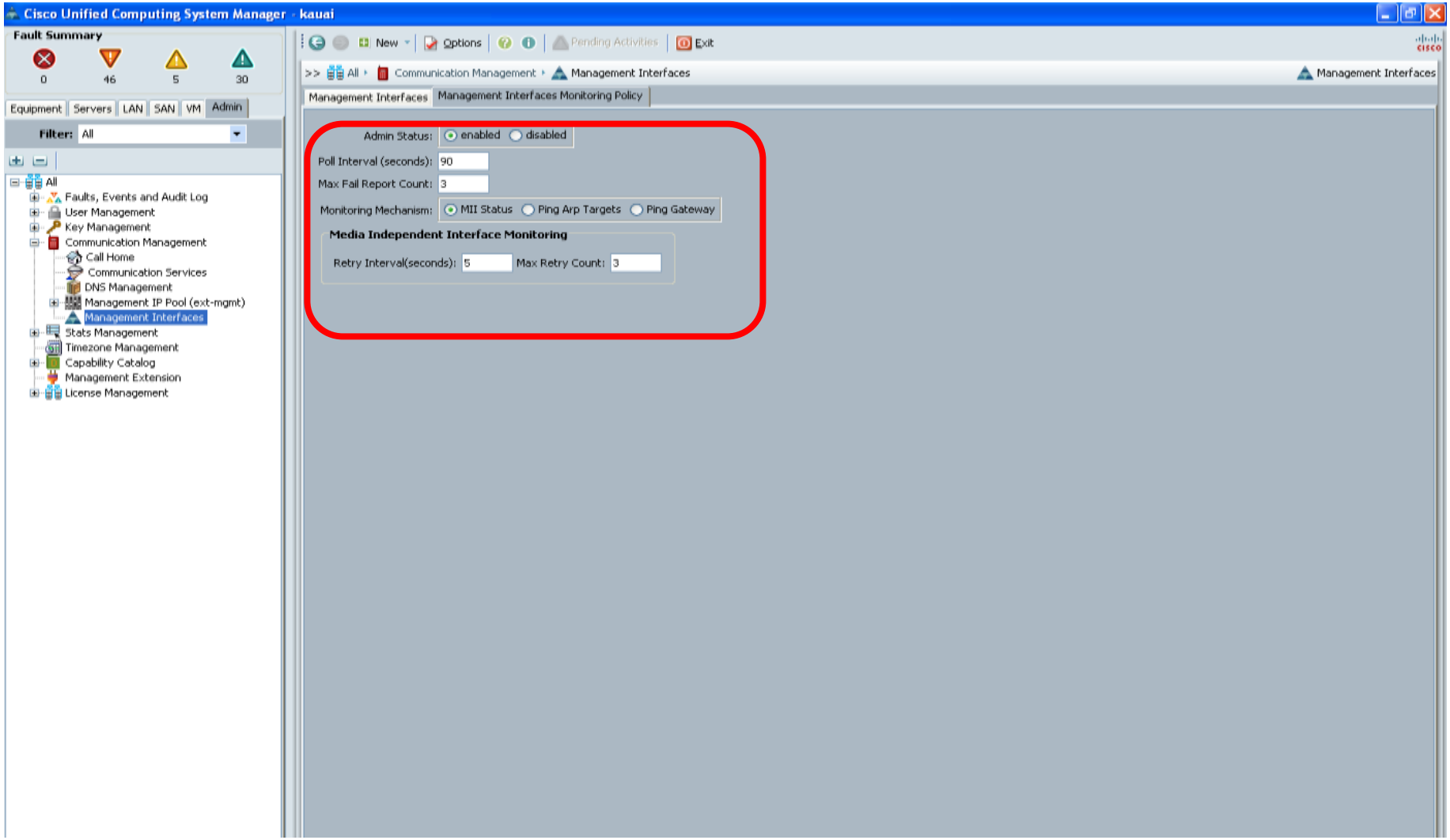


1.4(1) :

- VIP failover to UCS 6100 secondary upon active MGMT port failure
- KVM/IPMI/SSH IP fails over to the available fabric
- Failover delay is 90 sec to limit CPU churn due to continues interface flaps
- Managing instance is not state full. Re-login is required for VIP and KVM/IPMI/SSH IP.

UCS Manager 1.4(1) Release

Management Interface Failover



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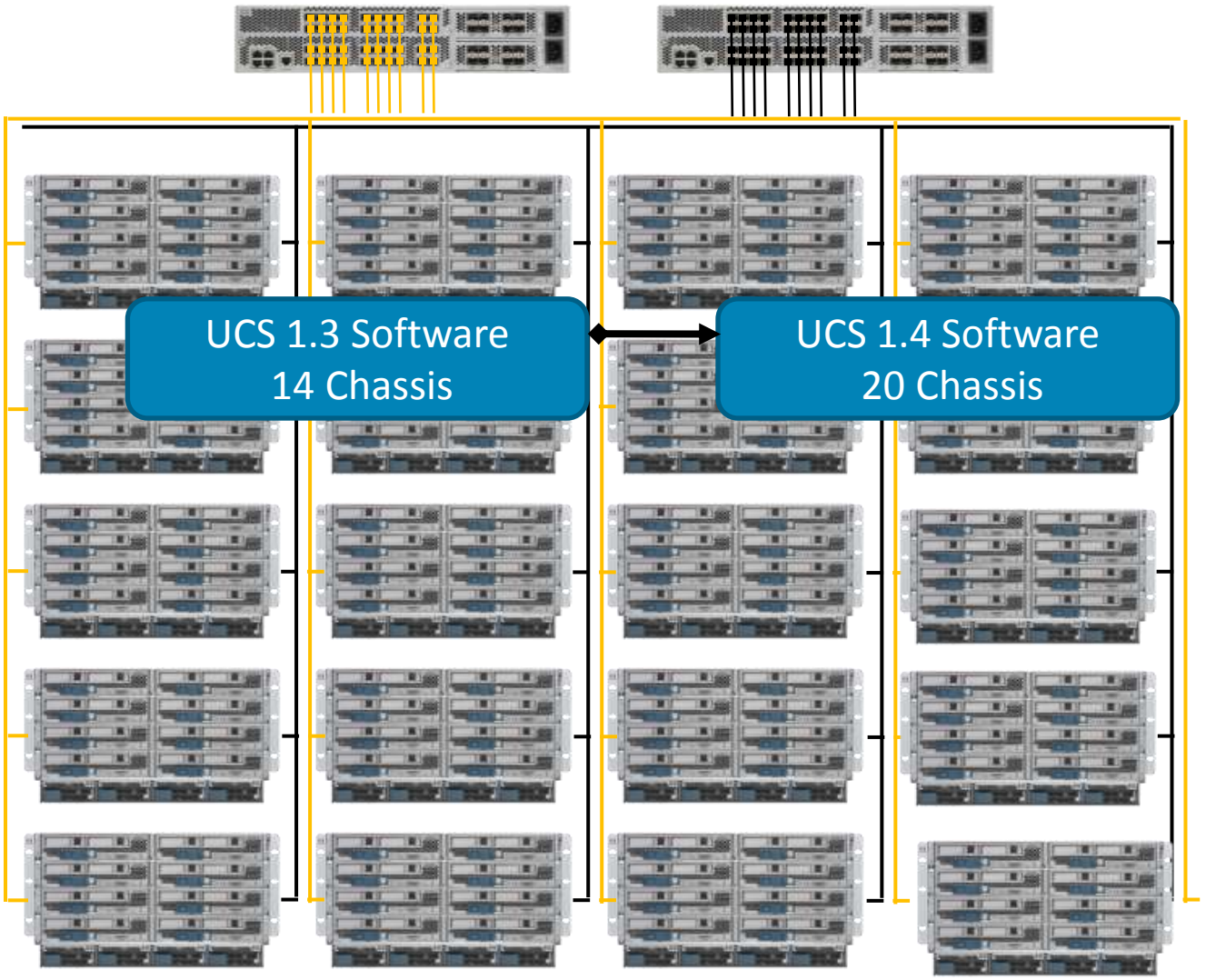
UCS Manager 1.4(1) Release
Increased Scalability

UCS 1.4 Software (Balboa) Increases overall scalability of the UCS system, following table provides comparison between UCS 1.3 and UCS 1.4 Software

Feature Name	UCS 1.3 (Aptos+) June 2010	UCS 1.4 (Balboa)
VLANs per FI	512	1024
STP logical ports	3800	6000
VIFs	1000	2000
Number of Chassis	14	20

Increasing Chassis support



UCS
Software Release 1.4

Compute

Ethernet

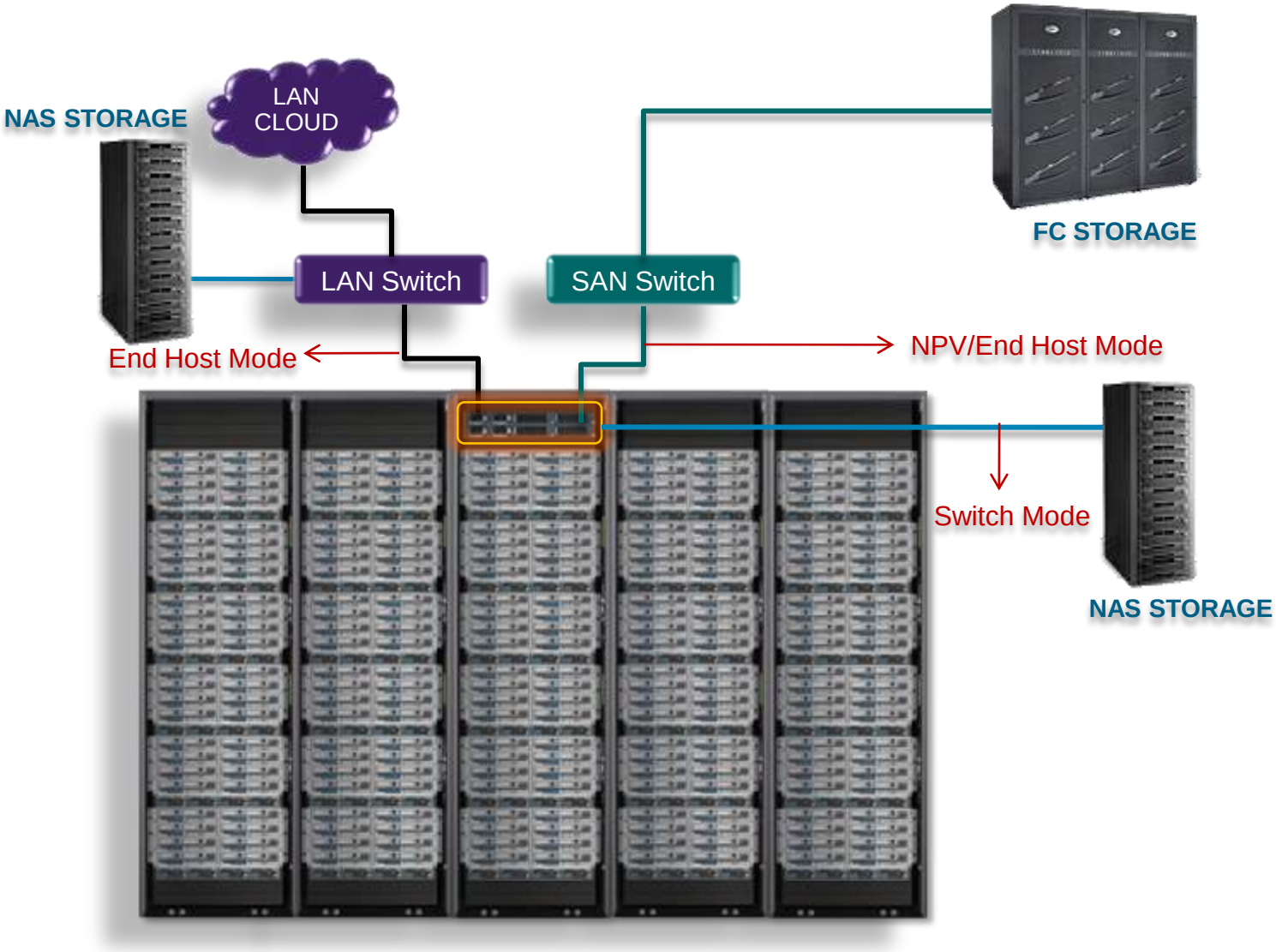
Fibre Channel

Authentication & Security

Stateless Computing

Management & Monitoring

Storage Connectivity with UCS 1.3(1)



Exec Summary: UCS 1.4 Storage Features

- New Direct Connect Topologies introduced
  - Both FC and NAS
  - Allows lower cost point for small UCS Pod like deployments
- FC Port Channeling and VSAN Trunking
  - More flexibility in engineering FC traffic

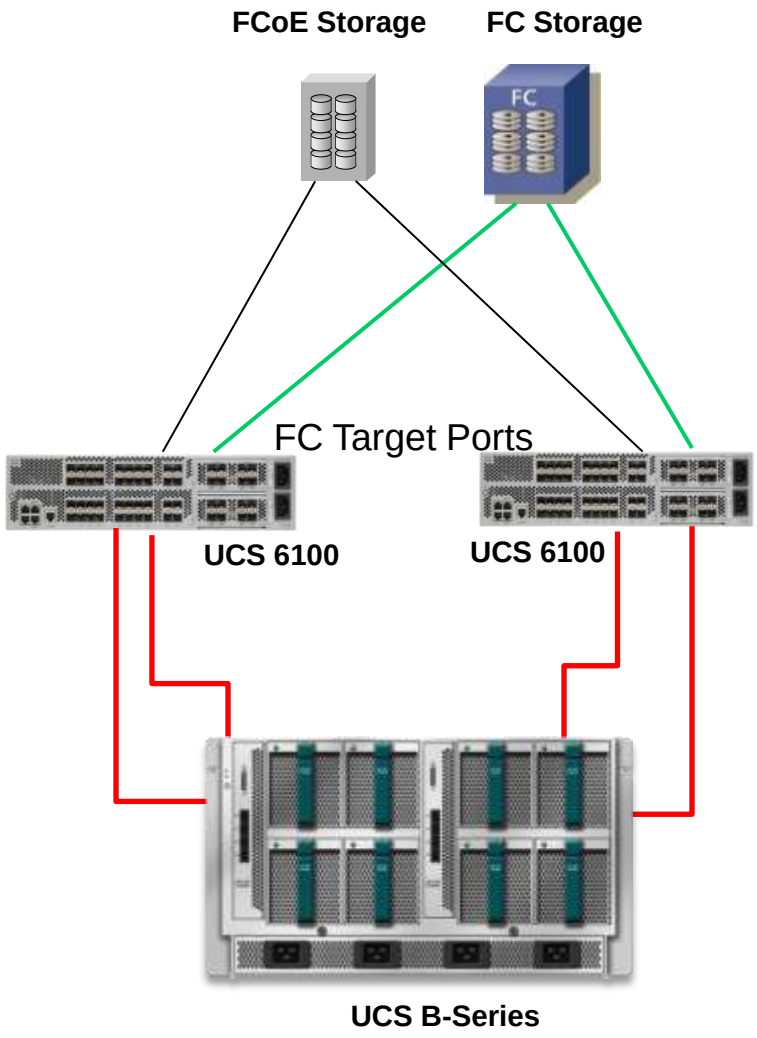
Enable Direct Connection of FC Storage

Customer benefits

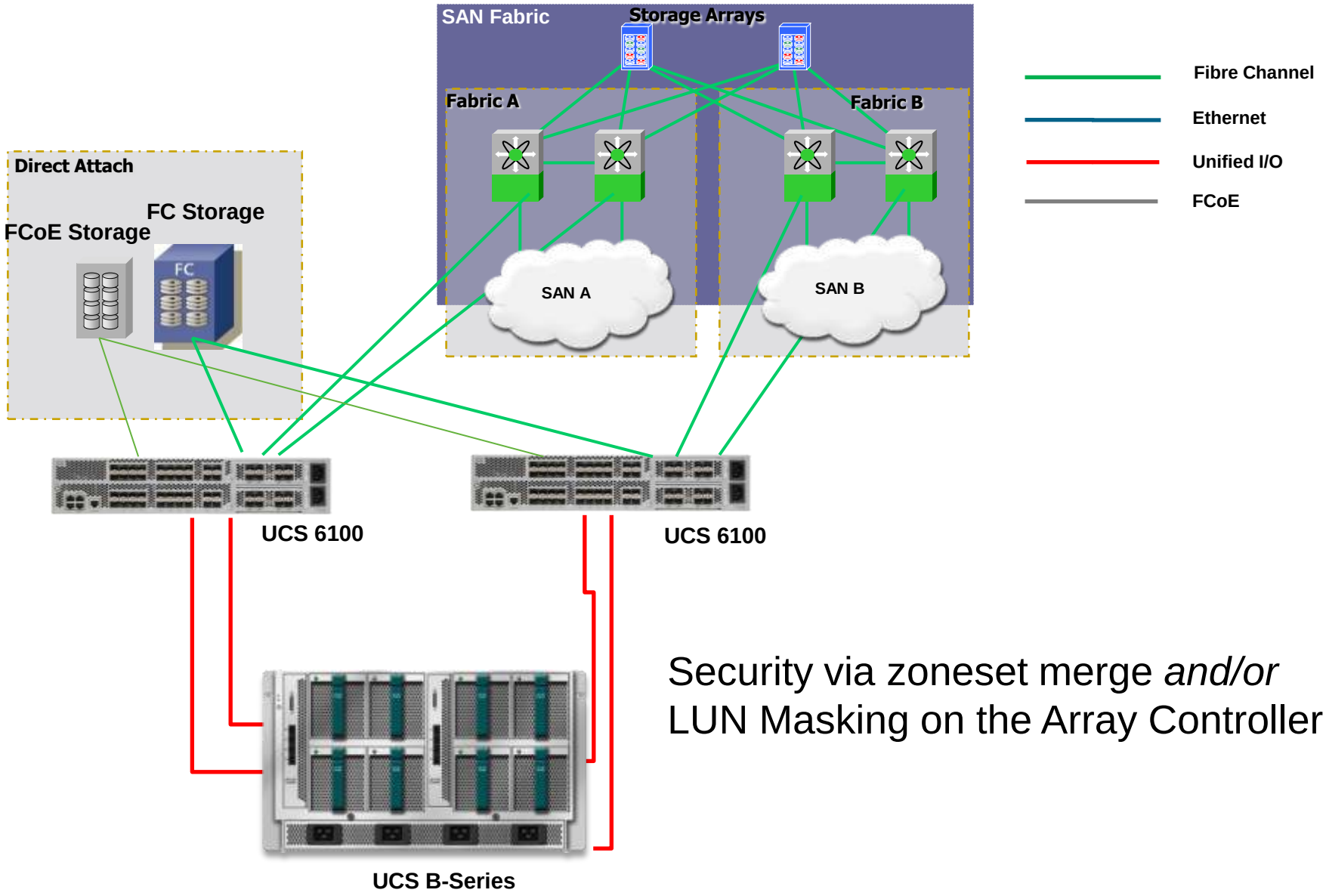
- Support to connect FC and FCoE storage to 6100
- Fewer hops and reduced latency to access the storage
- End to end FCoE topologies possible

Feature details

- Support for NetApp and EMC direct connect storage
- Zoning configuration not supported, but zoning may be inherited from upstream switch
- LUN security through LUN masking in the array
- Ethernet and FC switching modes are independent



Hybrid Topology with direct-attach and SAN



Security via zoneset merge *and/or*
LUN Masking on the Array Controller

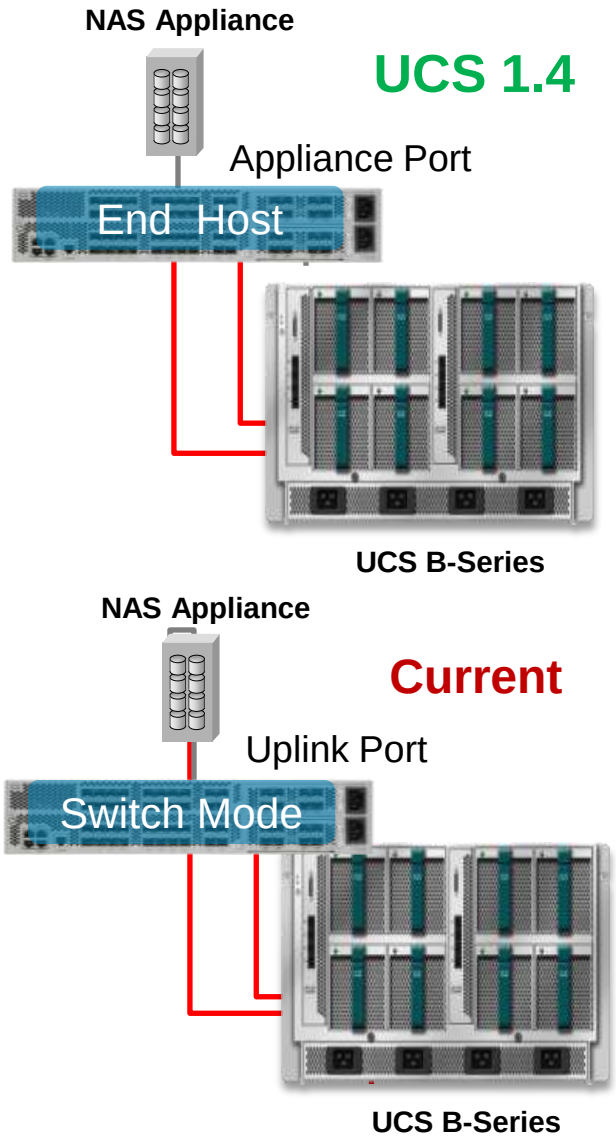
Enable Direct Connection of NAS Appliances

Customer benefits

- NAS appliance connected to Fabric Interconnects in “END HOST” Mode
- Eliminates additional access-layer switches

Feature details

- Support for NAS (Ethernet appliance) in End Host (general best practice) without putting 6100 in switch mode
- New NAS port type to support this functionality
- Support for advanced features like VLAN Filtering and QoS



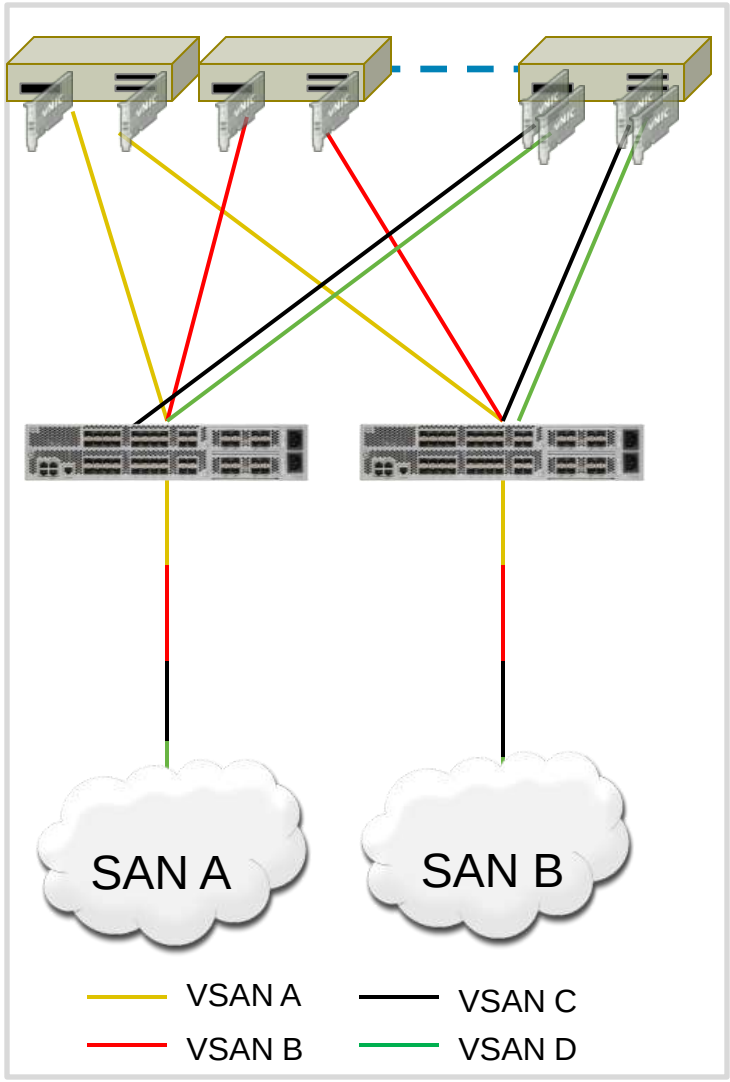
FC Port Trunking

Customer benefits

- Provide isolation to SAN traffic over the same physical FC link
- Help consolidate FC infrastructure

Feature details

- fNICs (of vHBAs) can be on different VSANs
- All VSANs will be trunked on every uplink FC port
- Scalability: Max of 32 VSANs per UCS system
- FC trunking supported in FC end host and switch mode



FC Port Channels

Customer benefits

- Aggregate and maximize available bandwidth while maintaining isolation
- Increases resiliency and guard against port failures

Feature details

- Up to 16 FC ports can be aggregated together for a single port channel
- Different combination of FC ports from different expansion modules on the FI can be placed on the same port channel
- VSANs can be trunked over the port channel
- VSAN trunking and port channel supported for both NPV and switch mode FI operation