Cisco Unified Computing System

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Data Center / Virtualization

2015

Unified Computing Product Innovation
Innovation to Improve Applications

UCS Management
- Reduced time to deploy new apps
- Reallocate resources quickly and efficiently

XML API

STANDARD APIs

Unified Fabric
- Reduced infrastructure
- Cohesive resource pools

Virtualized I/O
- Improved scalability and flexibility
- Increased performance

Compute With NO Compromise
- Blade and rack servers in a single UCS managed domain
- Physical and virtual workloads

Traditional Element Configuration

Storage SME
Server SME
Network SME

- Subject matter experts consumed by manual configuration chores

- Serial processes and multiple touches inhibit provisioning speed

- Configuration drift and maintenance challenges

LAN   SAN

- QoS settings
- Border port assignment per vNIC
- NIC transmit/receive rate limiting

- VLAN assignments for NICs
- VLAN tagging config for NICs

- Number of vNICs
- PXE settings
- NIC firmware
- Advanced feature settings

Compute, LAN, SAN Seamlessly Through Software

- Remote KVM IP settings
- Call home behavior
- Remote KVM firmware

- Server UUID
- Serial over LAN settings
- Boot order
- IPMI settings
- BIOS scrub actions
- BIOS firmware
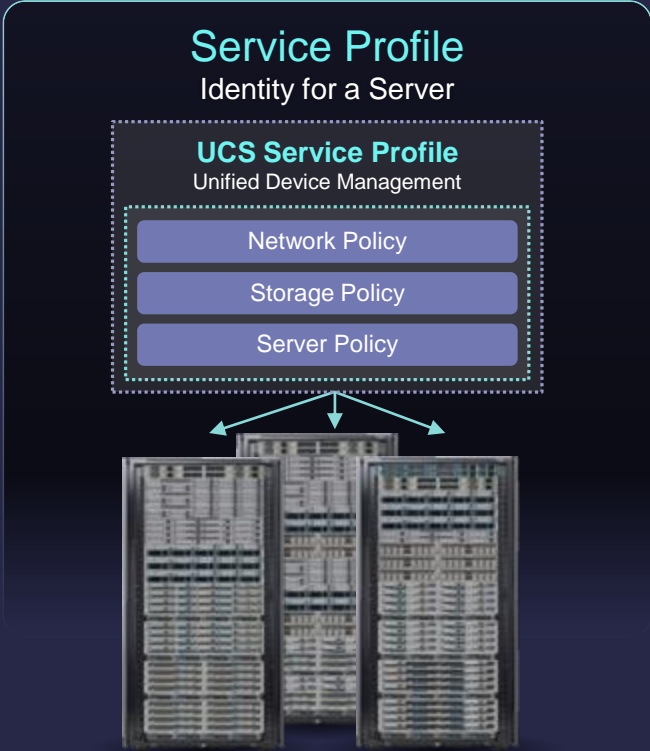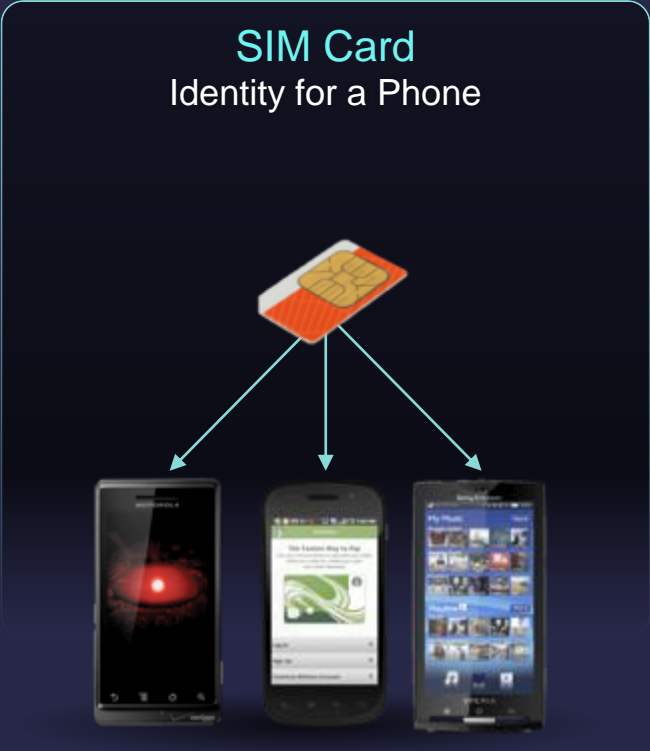- BIOS settings

- FC fabric assignments for HBAs

- Number of vHBAs
- HBA WWN assignments
- FC boot parameters
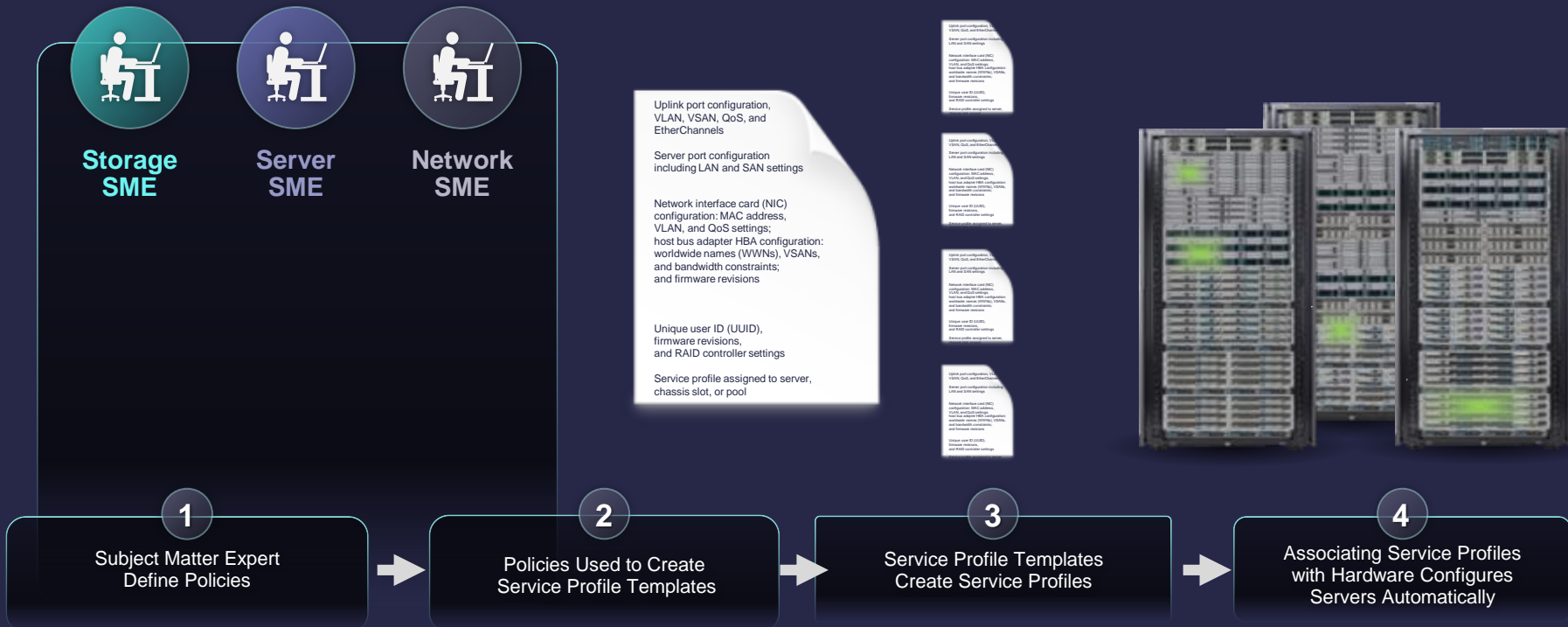- HBA firmware

- RAID settings
- Disk scrub actions

UCS Service Profiles
Configuration Portability

SIM Card
Identity for a Phone

Service Profile
Identity for a Server

UCS Service Profile
Unified Device Management

Network Policy

Storage Policy

Server Policy

UCS: Embedded Automation
Integrated, Policy-Based Infrastructure Management

Storage SME   **Server SME**   **Network SME**

Uplink port configuration, VLAN, VSAN, QoS, and EtherChannels

Server port configuration including LAN and SAN settings

Network interface card (NIC) configuration: MAC address, VLAN, and QoS settings; host bus adapter HBA configuration: worldwide names (WWNs), VSANs, and bandwidth constraints; and firmware revisions

Unique user ID (UUID), firmware revisions, and RAID controller settings

Service profile assigned to server, chassis slot, or pool

1 Subject Matter Expert Define Policies

2 Policies Used to Create Service Profile Templates

3 Service Profile Templates Create Service Profiles

4 Associating Service Profiles with Hardware Configures Servers Automatically
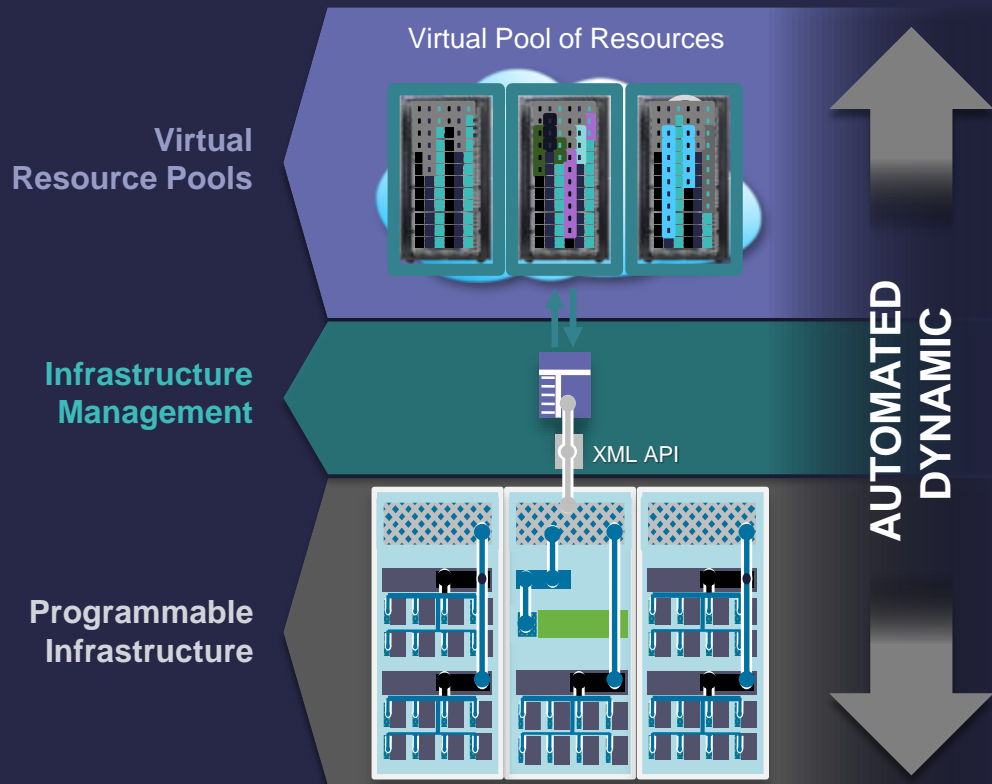
UCS: Programmable Infrastructure

Extends Abstraction Beyond the Hypervisor to System Elements

Infrastructure Automation Through API and Policy

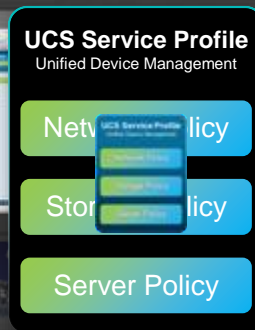Truly Elastic

Fully Orchestrated

Workload Defined

Virtual Pool of Resources

Virtual Resource Pools

Infrastructure Management

XML API

Programmable Infrastructure

AUTOMATED DYNAMIC

Unified Management
Blade and Rack Servers Managed a Cohesive Resource Pool

UNIFIED MANAGEMENT
A SINGLE UNIFIED SYSTEM FOR
BLADE AND RACK SERVERS

UCS Manager

UCS Service Profile
Unified Device Management

Netw...licy

Stor...licy

Server Policy

HyperThreading On

C-Series Rack
Optimized Servers

B-Series
Blade Servers

A Major Market Transformation in
Unified Server Management

Benefits of UCS Manager and
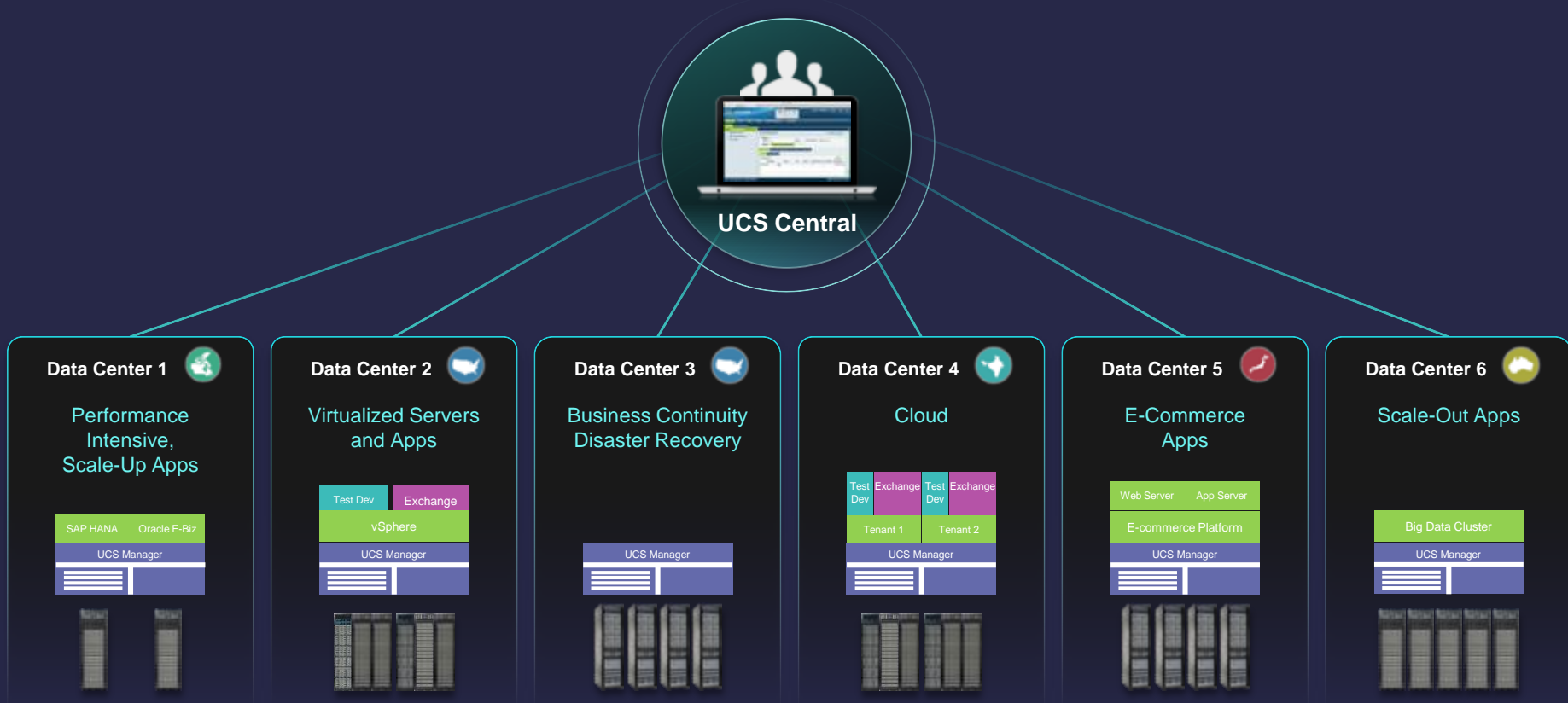Service Profiles for Both Blade and
Rack-Optimized Servers

Add Capacity
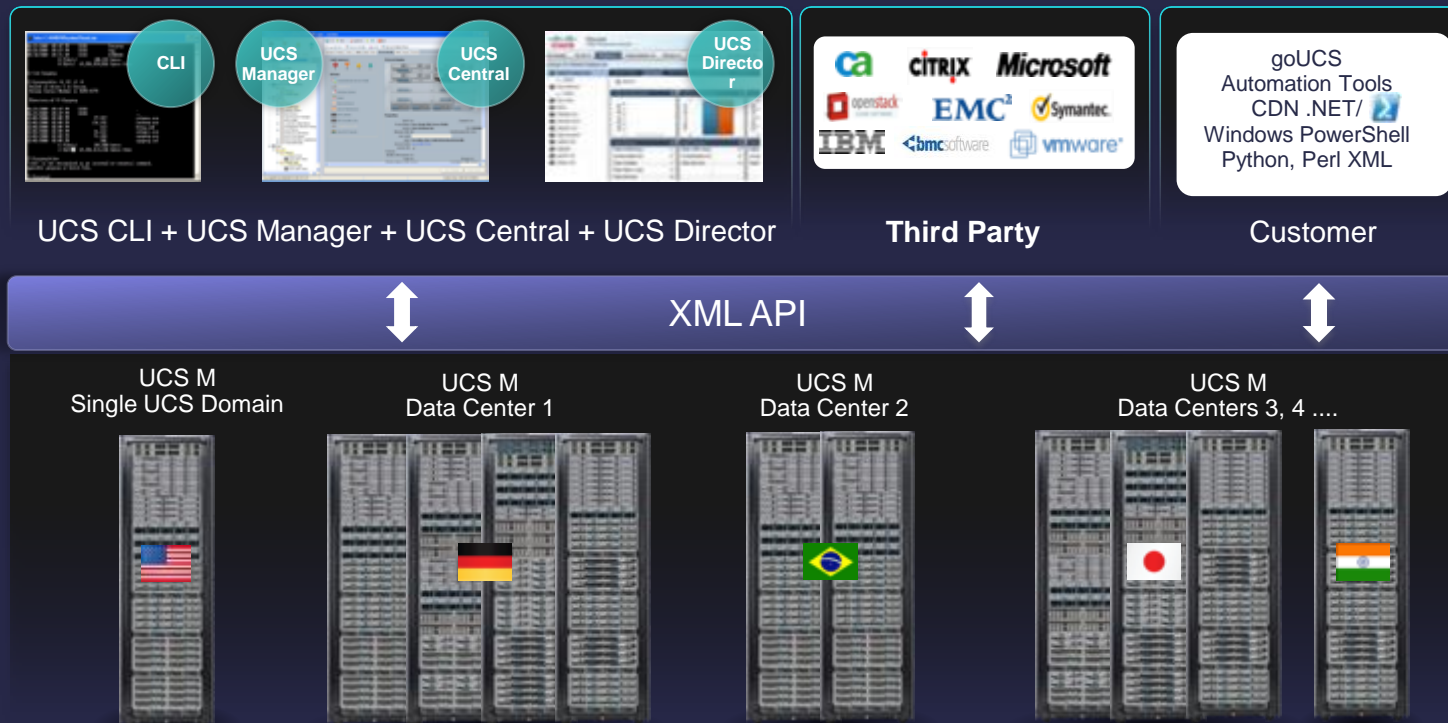Without Complexity

UCS Central
Global Stateless Computing

Data Center 1

Data Center 2

All Workloads, Common Platform Unified Management

UCS Central

Data Center 1

Performance Intensive, Scale-Up Apps

SAP HANA | Oracle E-Biz
UCS Manager

Data Center 2

Virtualized Servers and Apps

Test Dev | Exchange
vSphere
UCS Manager

Data Center 3

Business Continuity Disaster Recovery

UCS Manager

Data Center 4

Cloud

Test Dev | Exchange | Test Dev | Exchange
Tenant 1 | Tenant 2
UCS Manager

Data Center 5

E-Commerce Apps

Web Server | App Server
E-commerce Platform
UCS Manager

Data Center 6

Scale-Out Apps

Big Data Cluster
UCS Manager

UCS Is Redefining Server Management
10,000 UCS Servers: Monitor and Manage Seamlessly

CLI

UCS Manager

UCS Central

UCS Director

UCS CLI + UCS Manager + UCS Central + UCS Director

ca   CITRIX   Microsoft
openstack   EMC²   Symantec
IBM   bmc software   vmware

Third Party

goUCS
Automation Tools
CDN .NET/
Windows PowerShell
Python, Perl XML

Customer

Blade and rack servers in the same domain— form factor agnostic

XML API

UCS M
Single UCS Domain

UCS M
Data Center 1

UCS M
Data Center 2

UCS M
Data Centers 3, 4 ....

Standards-based XML API presents bidirectional single interface to entire solution

UCS offers the customers the broadest choice of Cisco or third-party management tools

Reducing Physical Infrastructure: Servers

UCS Simplifies

Rack Mount

Blade Servers

UCS

Server Deployment Today

Mgmt Server
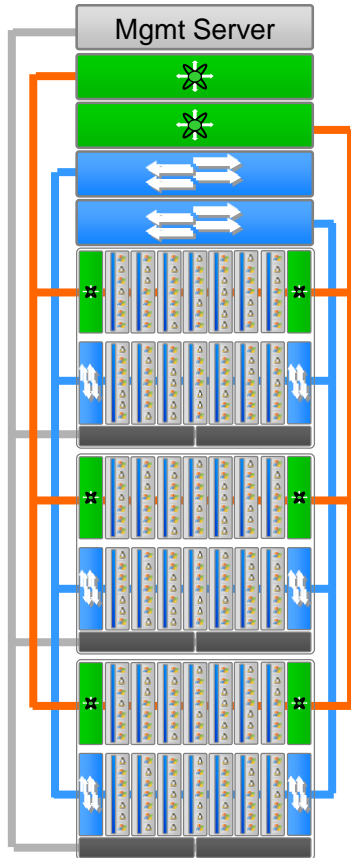
Over the past 20 years

- An evolution of size, not thinking
- More servers & switches than ever
- Virtualization only amplifies the problem
- Management applied, not integrated

Result

- More points of management
- More difficult to maintain policy coherence
- More difficult to secure
- More difficult to scale

Our Solution: Unified Computing System

A single system that encompasses:
- Network: Unified fabric
- Compute: Industry standard x86
- Storage: Access options
- Virtualization optimized

Unified management model
- Dynamic resource provisioning

Efficient Scale
- Same effort for 1 or 160 blades

Lower cost
- Fewer servers, switches, adapters, cables
- Lower power consumption
- Fewer points of management
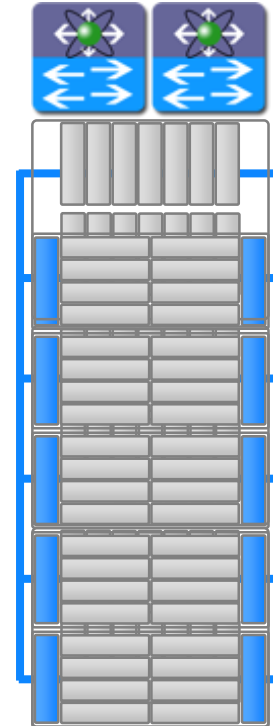
Integrates with existing infrastructure
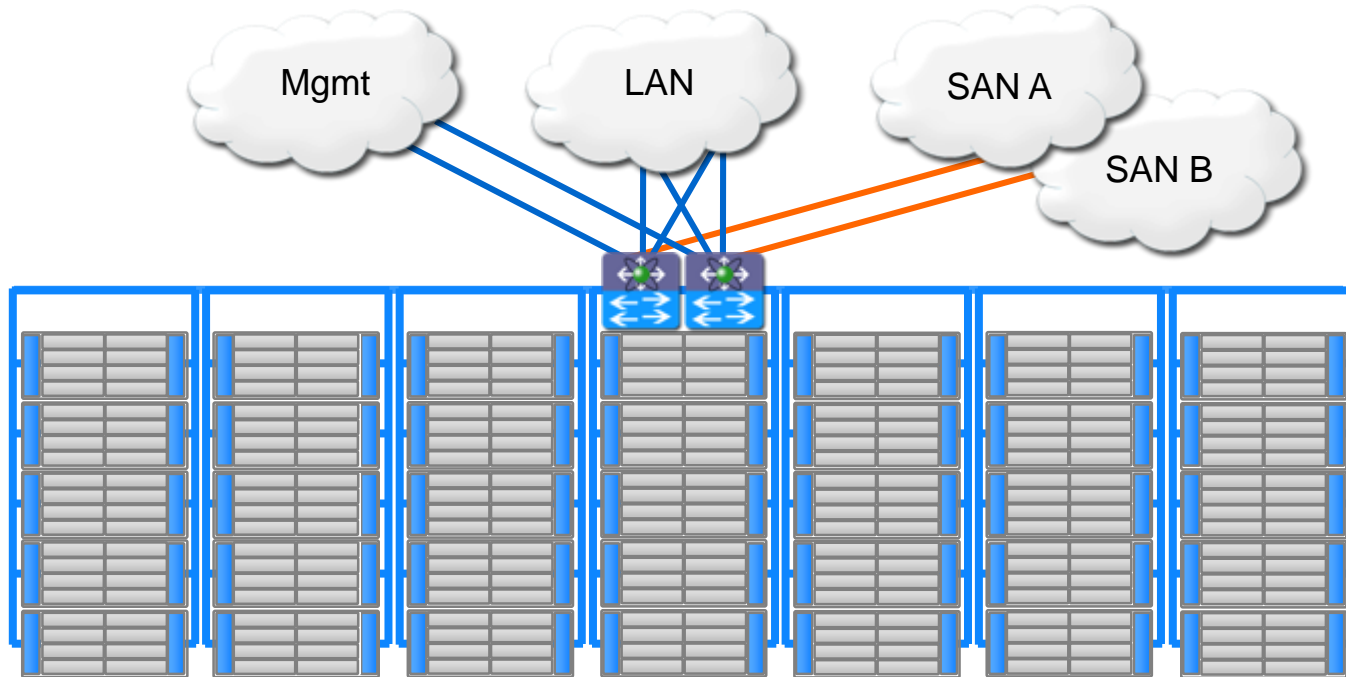
UCS Compute Portfolio
Performance Optimized for Bare Metal, Virtualized, and Cloud Applications

UCS B460 M4

Mission-Critical, 4-Socket Blade for CPU-Intensive Bare Metal and Virtualized Applications

Double-Height Blade – Four E7v2 CPUs – 96 DIMM Slots – Up to 320Gb of IO

UCS B260 M4

Mission-Critical, 2-Socket Blade for CPU-Intensive Bare Metal and Virtualized Applications

Full-Width Blade – Two E7v2 CPUs – 48 DIMM Slots – Up to 160Gb of IO

UCS B420 M4

Dense 4-Socket Blade for -Intensive Bare Metal and Virtualized Applications

Full-Width Blade - Four E5v3 CPUs – 48 DIMM Slots – Up to 160Gb of IO

UCS B200 M4

Ideal for Bare Metal Enterprise, VDI, or Dense Virtualization/ Consolidation Workloads

Half-Width Blade – Two E5v3 CPUs – 24 DIMM Slots - up to 80Gb of IO

UCS C460 M4

Mission-Critical Server for Large, CPU-Intensive Applications

4 RU - Four E7v2 CPUs – 96 DIMM Slots - 10 PCIe Slots

UCS C240 M4

Optimal Platform for Big Data, ERP, and Database Applications

2 RU - Two E5v3 CPUs – 24 DIMM Slots - 6 PCIe Slots – up to 26 HDD

UCS C220 M4

Versatile, General Purpose Enterprise Infrastructure, and Application Server

1 RU – Two E5v3 CPUs – 24 DIMM Slots - 2 PCIe Slots – up to 8 HDD

UCS C3160
UCS C3260

Ideal for large unstructured data repositories, media streaming and content distribution

4 RU - Two E5v2 CPUs – 16 DIMM Slots – up to 60 LFF HDD - up to 360TB

UCS M-Series

Designed for Cloud Scale Applications and Deployment

2 RU – 16 E3v3 Servers –4 DIMMs / Server - up to 32 Cores / RU

Cisco UCS Performance: 90+ Records

A History of World Record Performance on Industry-Standard Benchmarks

Best CPU Performance								
SPECfp_rate_base 2006 X86 2-Socket B200 M1	SPECfp_rate_base 2006 2-socke C260 M2	SPECint_rate_base 2006 X86 2-socket B200 M1	SPECint_rate_base2006 X86 4-Socket C460 M1	SPECfp_base2 006 X86 2-Socket C220 M3	SPECfp_rate_base2006 X86 2-Socket B200 M3	SPECint®_rate_base 2006 2-Socket B260 M4		
SPECint_rate_base 2006 X86 2-Socket B200 M2	SPECfp_rate_base 2006 X86 2-Socket B200 M2	SPECint_rate 2006 X86 4-Socket B200 M2	SPECfp_rate_base 2006 X86 2-Socket C220 M3	SPECint_rate_base 2006 X86 2-Socket C220 M3	SPECint®_base 2006 X86 2-Socket C220M3	SPECfp_rate_base 2006 2-Socket B260 M4		
SPECint_rate_base 2006 X86 2-socket B200 M1	SPECint_rate_base 2006 2-Socket C260 M2	SPECfp_rate_base 2006 X86 4-Socket C460 M1	SPECint_rate_base 2006 X86 2-Socket C220 M3	SPECfp_rate_base2006 X86 4-Socket C420 M3	SPECfp_rate_base 2006 X86 2-Socket C220 M3	SPECint®_rate_base 2006 4-Socket C460 M4		

Best Virtualization and Cloud Performance								
VMmark 1.x 2-Socket B200 M1	VMmark 1.x 2-Socket B250 M2	VMmark 2.1 4-Socket C460 M2	VMmark 2.1 Overall C460 M2	VMmark 2.1 2-Node, 2-Socket B200 M3	VMware View Planner 2-Socket B200 M3			
VMmark 1.x Overall C460 M1	VMmark 1.x 2–Socket Blade B230 M1	VMmark 1.x Overall C460 M1	VMmark 2.1 2–Node, 4-Socket C460 M2	VMmark 2.1 8–Node, 2-Socket B200 M3	VMmark 2.5.1 2-Node, 2-Socket B260 M4			
VMmark 1.x Blade Server B440 M1	VMmark 1.x 2-Socket B200 M1	VMmark 2.1 2-Socket Blade B200 M2	VMmark 2.0 Overall B200 M2	VMmark 2.5 2-Node, 2-Socket C240 M3				

Best Database Performance								
TPC-H 1000GB Microsoft SQL Server C460 M2	TPC-C Oracle DB 11g and OEL C250 M2	TPC-H 100GB VectorWise C250 M2	TPC-H 300GB VectorWise C250 M2	TPC-C Oracle 11g C240 M3	TPC-H 3000GB Price/Performance X86 Single- node C420 M3			

Best Enterprise Application Performance								
Oracle E-Business Suite Ex-large Model Payroll Batch B200 M2	Oracle E-Business Suite Medium Model Order-to-Cash B200 M2	Oracle E-Business Suite Xtra Large Model Payroll Batch B230 M2	Oracle E-Business Suite Xtra Large Model Payroll B200 M3	Oracle E-Business Suite XL Model Payroll B200 M3	Oracle E-Business Suite Large Model Order-to-Cash B200 M3	Oracle E-Business Suite Large Model Order-To-Cash B200 M3		
Oracle E-Business Suite Medium Model Payroll Batch B200 M2	Oracle E-Business Suite Medium Large Model Payroll Batch B200 M2	Oracle E-Business Suite Large Model Order-to-Cash B200 M2	SPECjEnterprise2010 Overall B440 M1	SPECjEnteprise2010 2-Node B440 M2	Oracle E-Business Suite XL Model Payroll B200 M3	Oracle E-Business Suite XL Model Payroll B200 M3		

Best Enterprise Middleware Performance								
SPECjAppServer 2004 1-Node, 2-Socket C250 M2	SPECjbb2005 X86 2-Socket B200 M2	SPECjbb2005 X86 4-Socket C460 M1	SPECjAppServer2004 2-Node B230 M1	SPECjbb2005 X86 2-Socket B230 M1	SPECjbb2005 X86 2-Socket C220 M3	SPECjbb2005 X86 2-Socket C220 M3	SPECjbb2013 MultiJVM X86 2-socket C240 M3	
SPECjbb2005 X86 2-Socket B230 M1	SPECjbb2005 2-Socket C260 M2	SPECjbb2005 2-Socket B230 M2	SPECjbb2005 2-Socket B230 M2	SPECjbb2005 4-Socket B440 M2	SPECjbb2013 X86 2-Socket C220 M3	SPECjbb2013 MultiJVM X86 2-Socket B200 M3		

Best HPC Performance								
SPECCompMbase 2001 2-Socket B200 M2	SPECCompLbase 2001 2-Socket B200 M2	LinPack 2-Socket B200 M2	LS-Dyna 4-Socket C460 M1	SPECCompMbase 2001 4-Socket C460 M1	SPECCompMbase 2001 4-Socket C460 M1	SPECCompMbase 2001 2-Socket C240 M3	SPEComp® G_base2012 2-Socket C240 M3	SPEComp® G_base2012 2-Socket B260 M4
SPECCompMbase 2001 2-Socket B200 M2	SPECCompLbase 2001 2-Socket B200 M2	SPECCompMbase 2001 2-Socket B230 M2	SPECCompLbase 2001 2-Socket B230 M2	SPECCompMbase 2001 4-Socket C460 M1	SPECCompMbase 2001 4-socket C460 M2	SPECCompLbase 2001 2-Socket C220 M3	SPEComp® G_base2012 4-Socket C460 M4	

Cisco UCS benchmarks that held world record performance records as of date of publication.
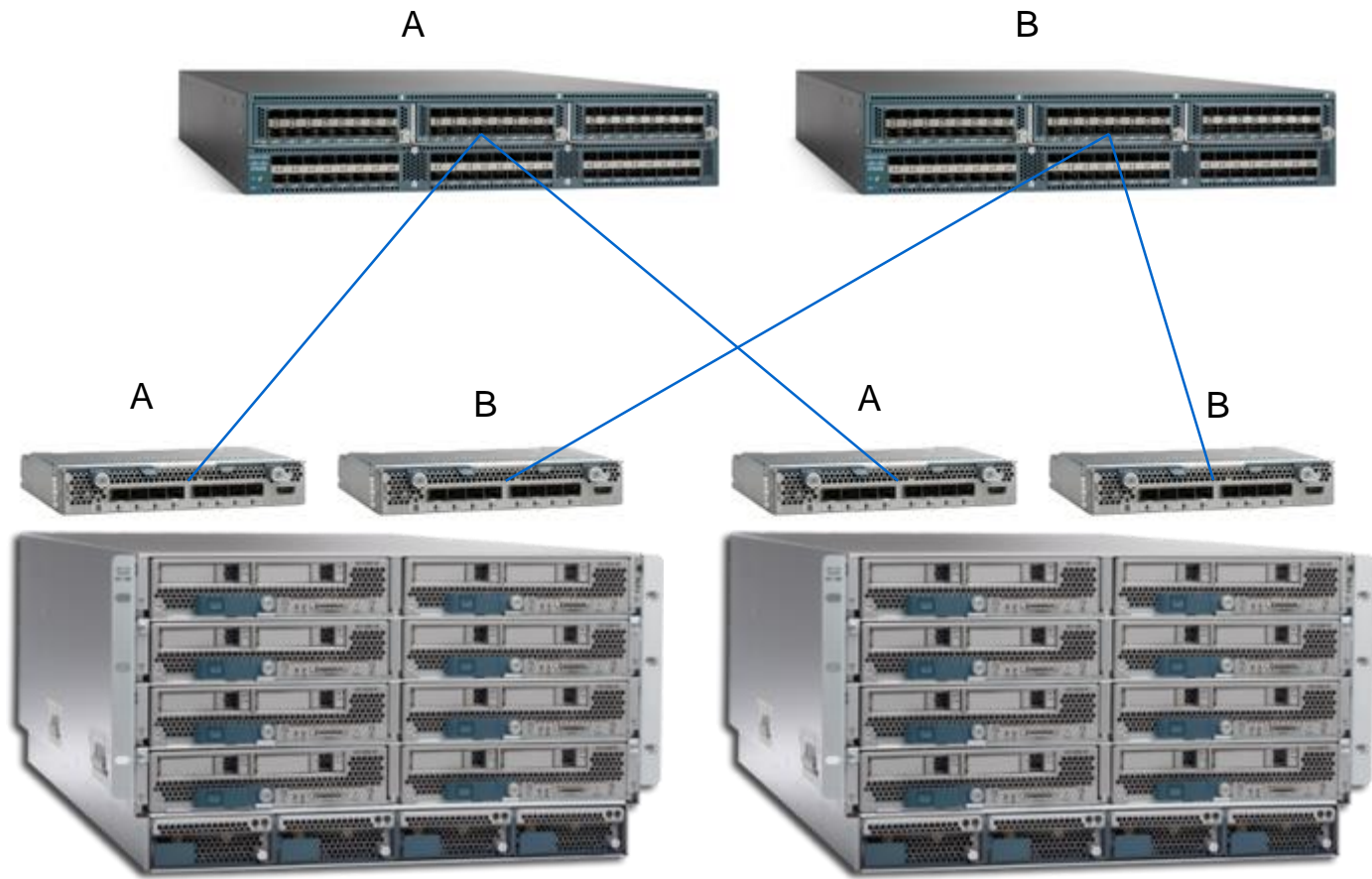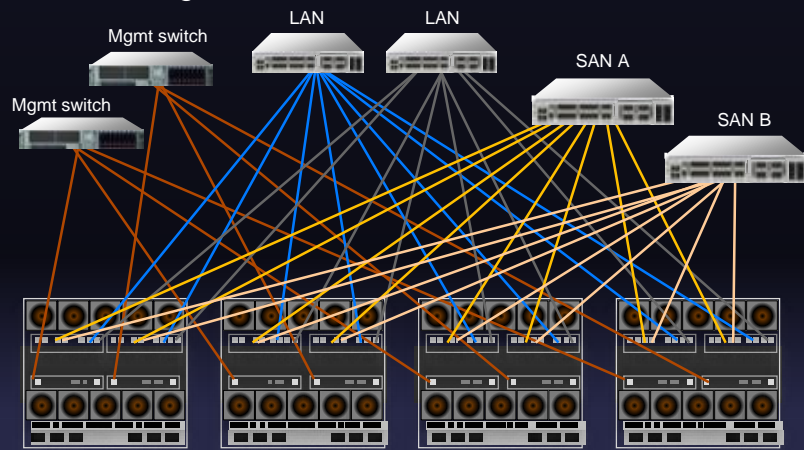
Simpler Architecture
## Dynamic Scaling

Industry

- Large hardware blocks to add compute capacity
- Multiple networking components
- Multiple touch points
- Multiple management points for servers and networking

Mgmt switch   LAN   LAN   SAN A

Mgmt switch   SAN B

64 Blades Shown Here

Cisco UCS

- Compute added in smaller increments
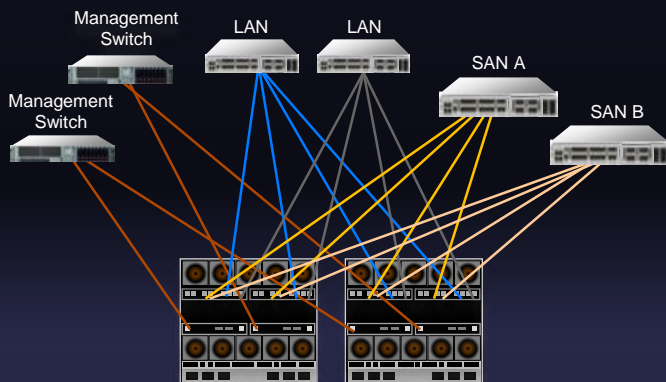- Networking with fewer components
- Management via a single interface

Management Switch   Management Switch

LAN   SAN A   LAN   SAN B
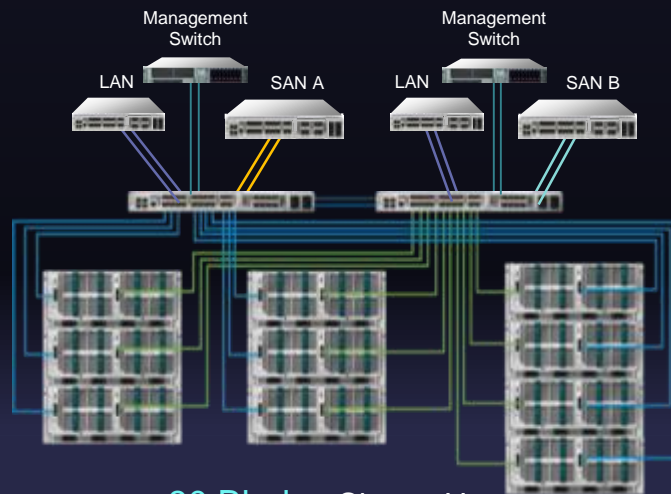
80 Blades Shown Here

Simple Architecture
Fewer Management Touch Points

32 Blades

Fabric Interconnects	0
Intra Chassis Switches	4
Chassis Management Module	4
Total Management Points	**8**

32 Blades

Fabric Interconnects	2
Intra Chassis Switches	0
Chassis Management Module	0
Total Management Points	**1**
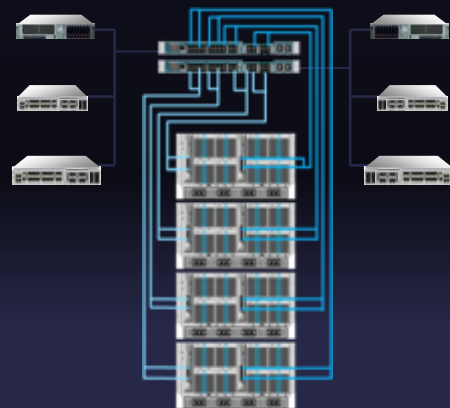
Simpler Architecture
HP Doubling Servers = Doubling Touches; UCS = One Touch Point

64 Blades

Fabric Interconnects	0
Intra Chassis Switches	8
Chassis Management Module	8
Total Management Points	**16**
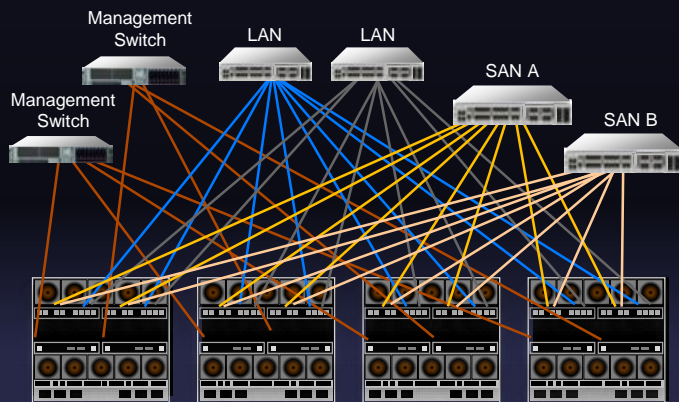
80 Blades
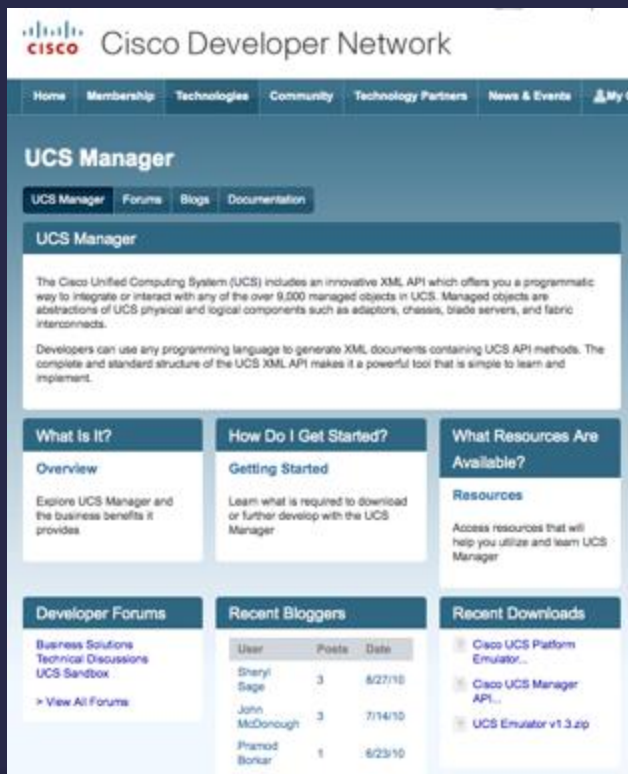
Fabric Interconnects	2
Intra Chassis Switches	0
Chassis Management Module	0
Total Management Points	**1**
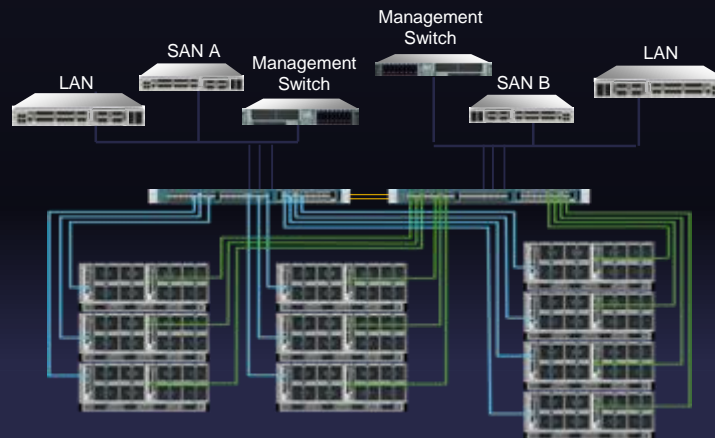
Where did all the cables go?

Cisco Developer Network

WEB-BASED DEVELOPER COMMUNITY
http://developer.cisco.com/web/unifiedcomputing/home

Downloads
- UCS Platform Emulator (UCSPE)
- goUCS automation tool
- XML API, Perl, PowerShell samples (44 and counting)
- Microsoft: PowerShell library, SCOM MP
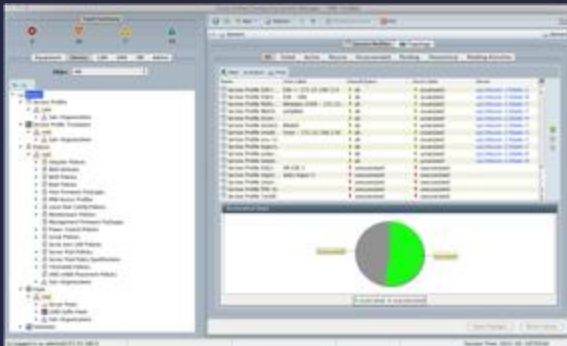- Plug-ins: VMware, Microsoft, Oracle

Documentation
- Programming and developer guides
- White papers
- Reference guides

Collaboration
- Blogs
- Peer to peer forums
- Videos
- Access to Cisco experts

UCS Platform Emulator

- Full-featured emulator for the UCS Manager
- Installs as a virtual machine
- Provides complete support for all XML API calls
- Import and replicate existing live UCS Manager physical inventory
- Drag-and-drop hardware builder to create custom physical inventory
- Use cases: Developers, dry-run changes, training, demonstrations

Thank you.