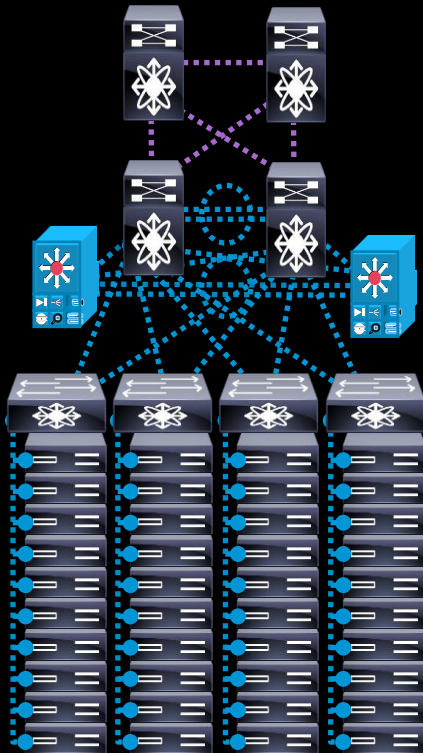# Unified Computing System:

Data Center Technologie erzeugt Kundennutzen

Oliver Müller
PRODUCT SPECIALIST DATA CENTER
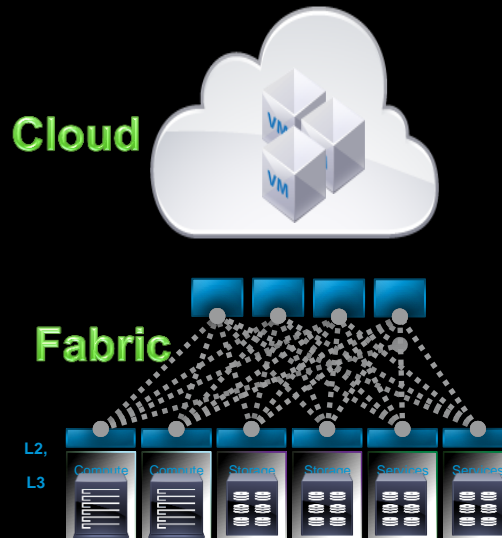
Evolution of the Data Center
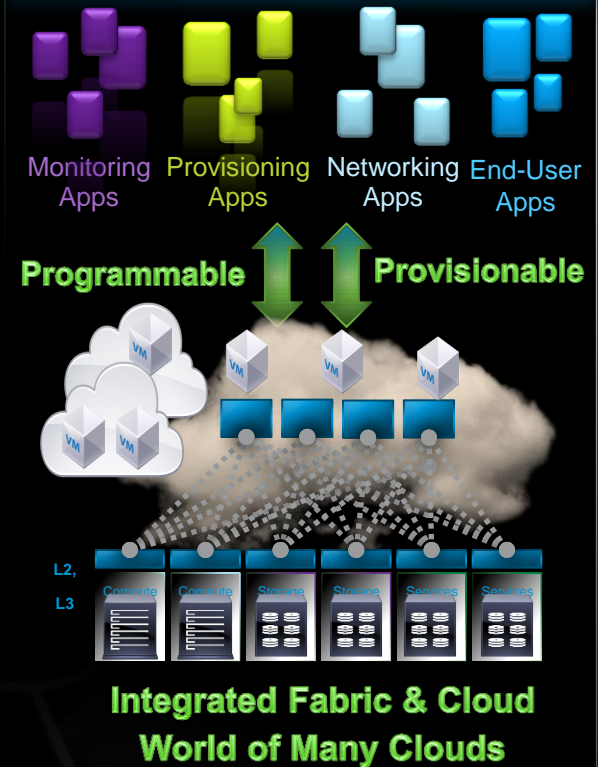
Distributed

- Manual Provisioning
- Limited scaling
- Rack-wide VM mobility

Fabric Based

Cloud

Fabric

L2, L3

- Policy-based Provisioning
- Scale Physical & Virtual/Cloud
- DC-wide/Cross-DC VM Mobility

Application Driven

Monitoring Apps Provisioning Apps Networking Apps End-User Apps

Programmable   **Provisionable**

L2, L3

**Integrated Fabric & Cloud
World of Many Clouds**

- Service-centric Provisioning
- Flexible – Anywhere, Anytime
- Cross-cloud VM Mobility

Cisco Unified Data Center
The Platform for Delivering IT-as-a-Service

HIGHLY SCALABLE, SECURE NETWORK FABRIC

UNIFIED FABRIC

MODULAR STATELESS COMPUTING ELEMENTS

UNIFIED COMPUTING

AUTOMATED RESOURCE MANAGEMENT (PHYSICAL AND VIRTUAL)

UNIFIED MANAGEMENT

UCS What?

XML API

Standard Apps

Industry Standard APIs

UCS Manager

FABRIC INTERCONNECTS

Cisco UCS 6296 XP

Fabric Extenders
(I/O modules)

COMPUTE

Blade Form Factor

Rack Form Factor

Complexity in Traditional Environments

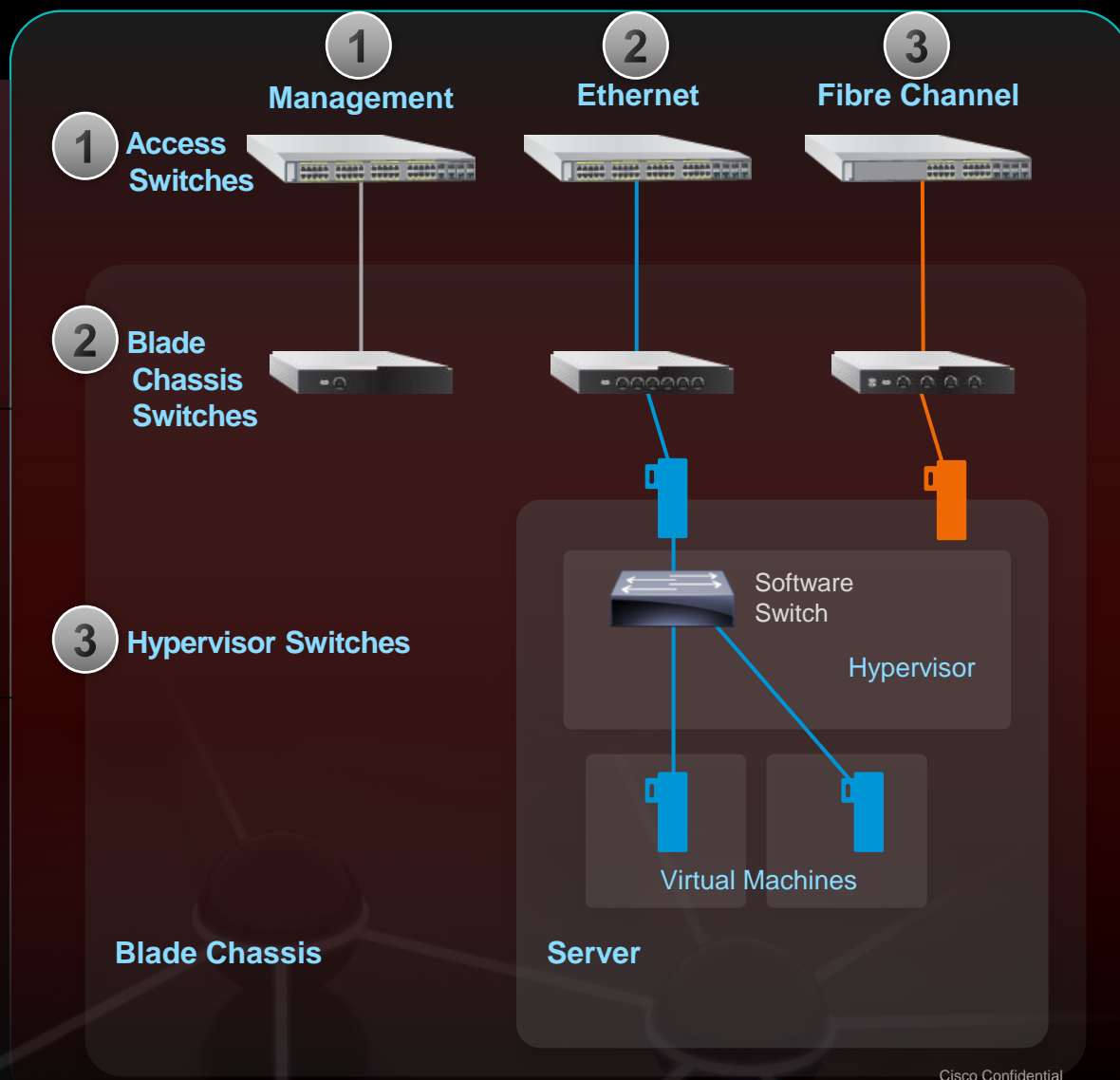- Three parallel networks
  - Device proliferation
  - Siloed bandwidth

- Access layer fragmented into three
  - Access layer
  - Chassis
  - Hypervisor

- Overly Complex
  - Too many devices
  - Too many cables
  - Too many management points
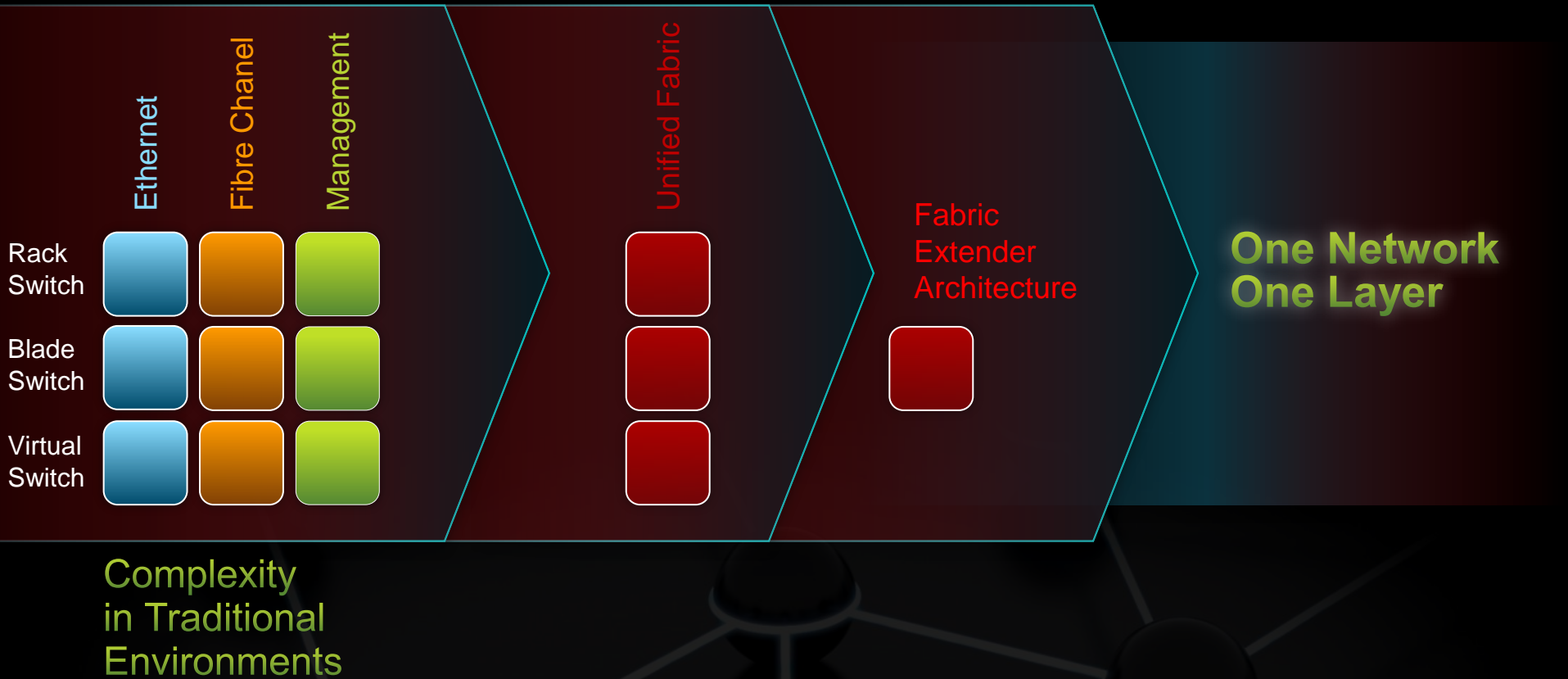
1 **Management**
2 **Ethernet**
3 **Fibre Channel**

1 **Access Switches**

2 **Blade Chassis Switches**

3 **Hypervisor Switches**

Software Switch

Hypervisor

Virtual Machines

Blade Chassis

Server

Unified Fabric in UCS
Radically Simplified Network Access for Blades and VMs

Unified Fabric

Cisco® Fabric Extender Architecture

Ethernet | Fibre Chanel | Management

Rack Switch

Blade Switch

Virtual Switch

Unified Fabric

Fabric Extender Architecture

One Network One Layer

Complexity in Traditional Environments

Unified Fabric in UCS
Physical Servers and VM's Connect Directly to the Network

Cisco® Fabric Extender Architecture
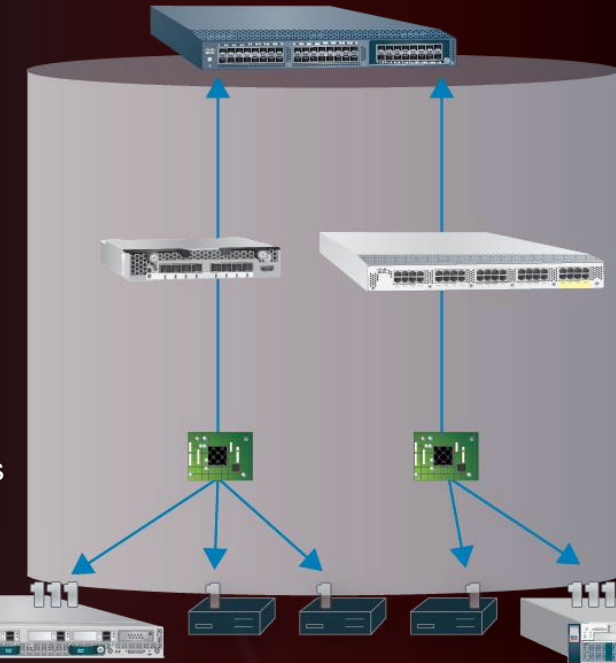
Fabric Extender Architecture

One Network One Layer

Cisco Fabric Interconnects

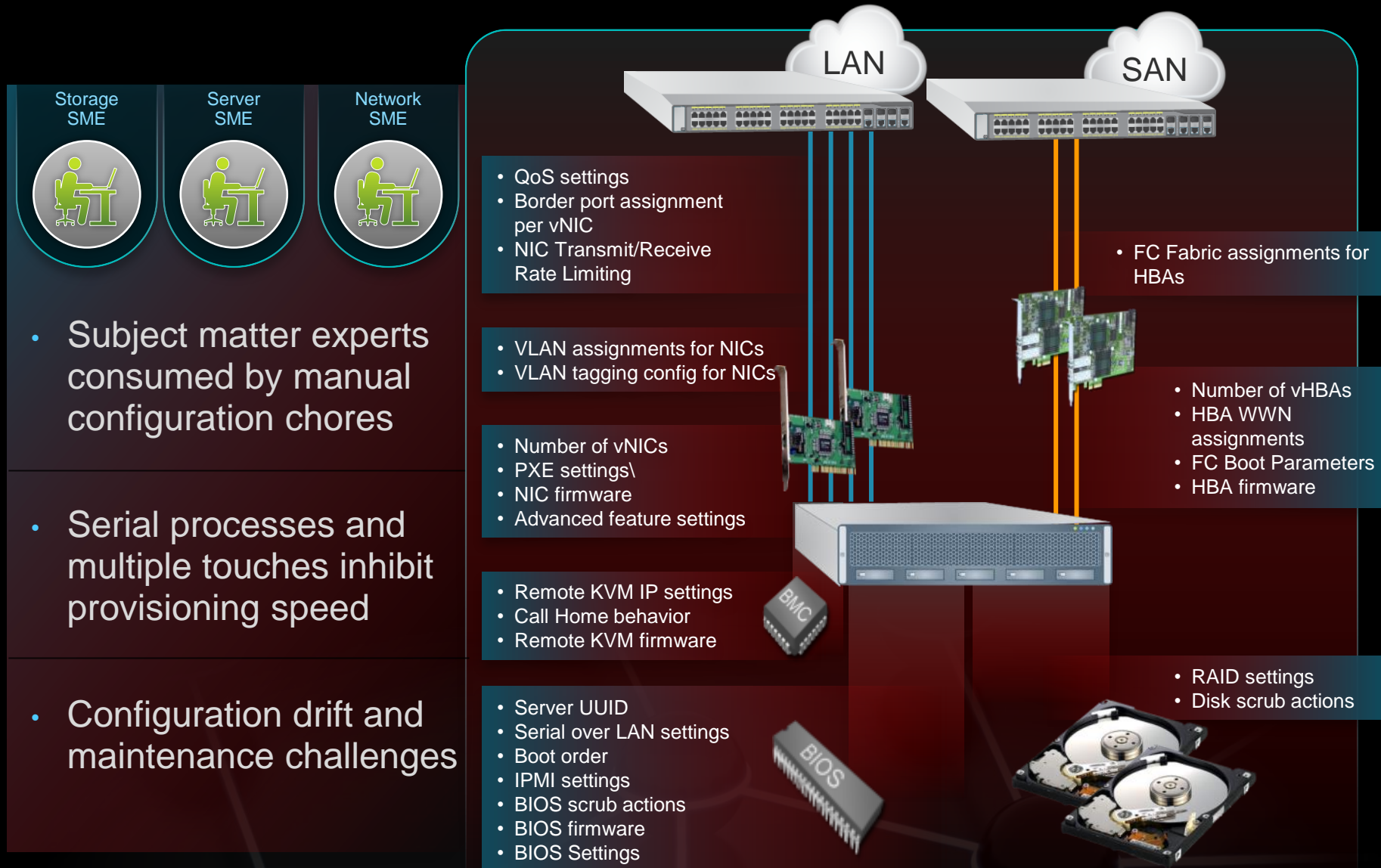Cisco Fabric Extenders

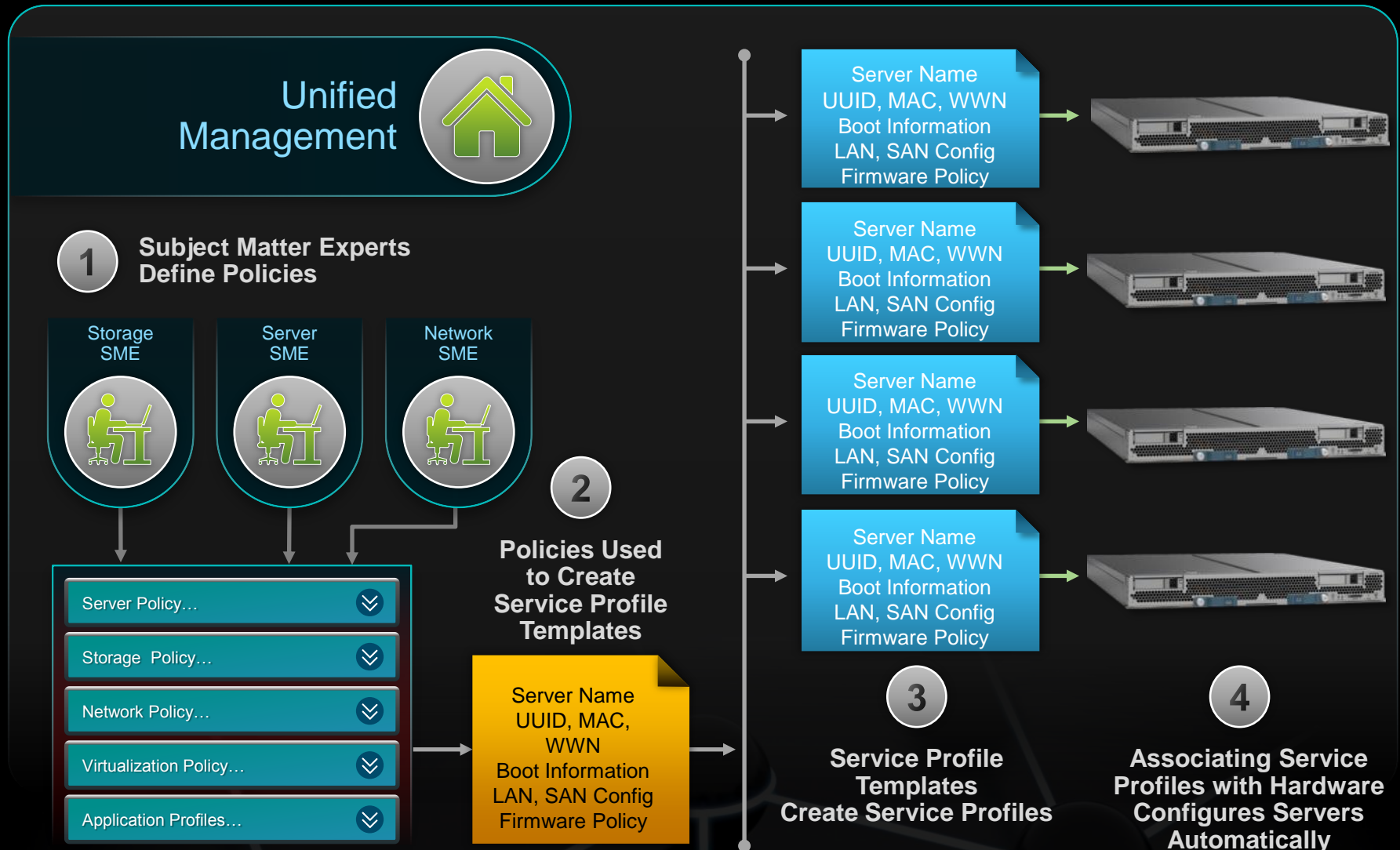Cisco Virtual Interface Cards

Blade Server

Virtual Machines

Rack-Mount Server

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

- FC Fabric assignments for HBAs

- VLAN assignments for NICs
- VLAN tagging config for NICs

- Number of vHBAs
- HBA WWN assignments
- FC Boot Parameters
- HBA firmware

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

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

BMC

- RAID settings
- Disk scrub actions

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

BIOS

Unified, Embedded Management
Aligns People, Policy, and Configuration With Workload

Unified Management

1 Subject Matter Experts Define Policies

Storage SME

Server SME

Network SME

Server Policy…

Storage Policy…

Network Policy…

Virtualization Policy…

Application Profiles…

2 Policies Used to Create Service Profile Templates

Server Name
UUID, MAC, WWN
Boot Information
LAN, SAN Config
Firmware Policy

Server Name
UUID, MAC, WWN
Boot Information
LAN, SAN Config
Firmware Policy

Server Name
UUID, MAC, WWN
Boot Information
LAN, SAN Config
Firmware Policy

Server Name
UUID, MAC, WWN
Boot Information
LAN, SAN Config
Firmware Policy

Server Name
UUID, MAC,
WWN
Boot Information
LAN, SAN Config
Firmware Policy

3 Service Profile Templates Create Service Profiles

4 Associating Service Profiles with Hardware Configures Servers Automatically

Unified Management
Extending Benefits of UCS Manager to Rack Servers

UCS Manager

Unified Management
A Single Unified System
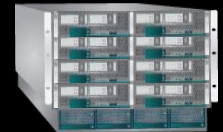For Blade and Rack Servers
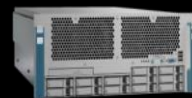
C-Series Rack Optimized Servers

UCS Service Profile
Unified Device Management

Network Policy

Storage Policy

Server Policy

B-Series Blade Servers

- A major market transformation in unified server management

- No management barriers between blades and rack optimized servers

- Extending fabric computing to rack optimized servers

- Add capacity without complexity

UCS Components
Hardware & Software support the unified approach

- Cisco UCS

  UCS Manager

  Interconnect

  Fabric Extender

  Enclosure

  Compute Node(s)

  IO Adapter(s)

UCS Manager
One Manager, One View
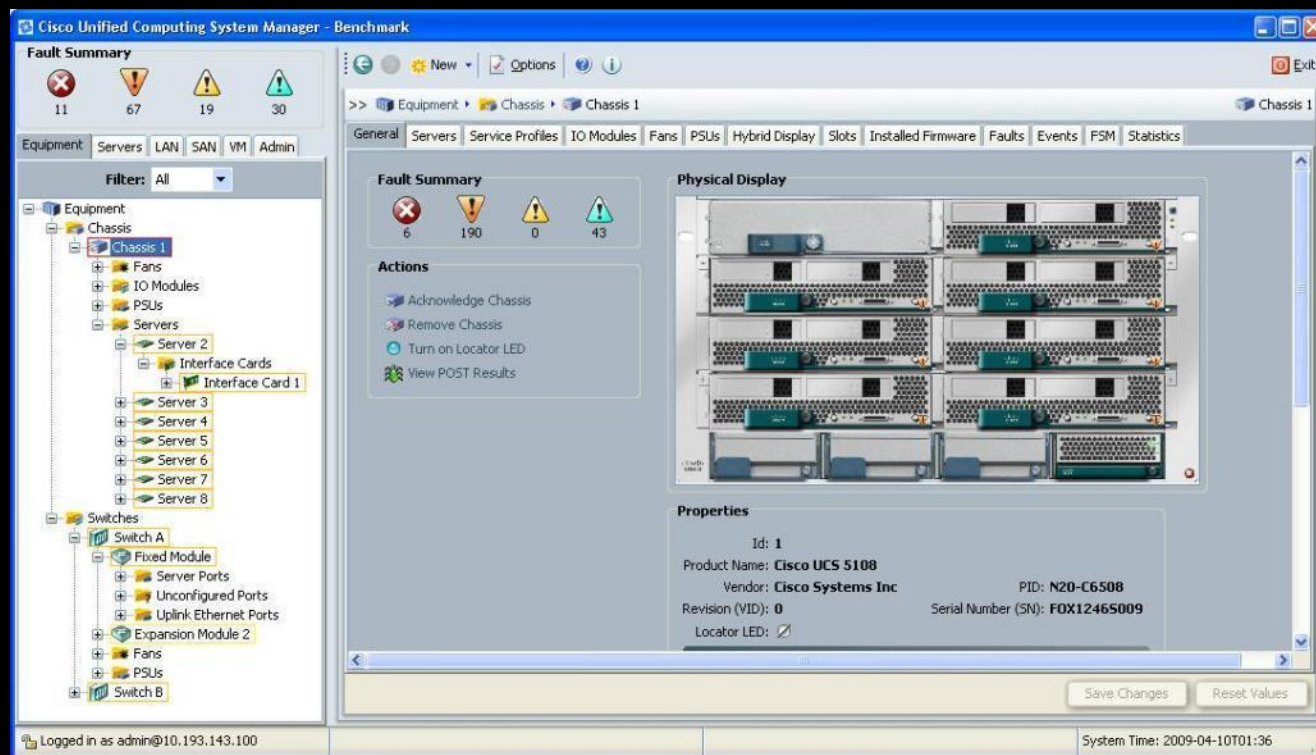
- Embedded device manager for family of UCS components

- Enables stateless computing via Service Profiles

- Efficient scale: Same effort for 1 to 1000s blades

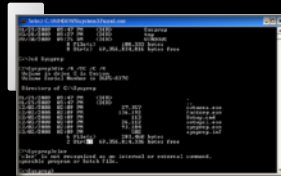- APIs for integration with new and existing data center infrastructure
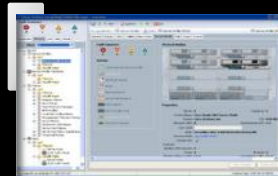
UCS Manager
Programmable Infrastructure

- Comprehensive XML API, standards-based interfaces
- Bi-Directional access to physical & logical internals
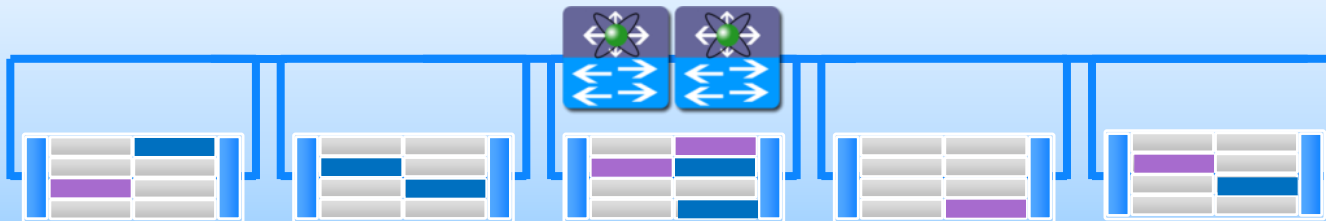
| Direct | UCS CLI | UCS GUI | 3rd Party | Customer |

Self Serve portals
Management Tools
Auditing Tools

XML API

System Status
Physical Inventory
Logical Inventory

- Broad 3rd party integration support
- Faster custom integration for customer use cases
- Consistent data and views across ALL interfaces

UCS Central
One Manager, One View

Unified Management at Scale

UCS Central

Multi-UCS Domain Management

Data Center 1

UCS Manager   UCS Manager

Data Center 2

UCS Manager   UCS Manager

Data Center 3

UCS Manager

- Unifies management of multi UCS domains
- Leverages UCS Manager technology
- Simplify global operations with centralized inventory, faults, logs and server consoles

- Delivers global policies, service profiles, ID pools and templates
  - Foundation for high availability, disaster recovery and workload mobility
- Model based API for large scale automation

This is an upcoming product—Feature set for first release subject to change

UCS Components
Hardware & Software support the unified approach

- Cisco UCS

  UCS Manager

  Interconnect

  Fabric Extender

  Enclosure

  Compute Node(s)

  IO Adapter(s)

UCS 6248: Unified Ports
Dynamic Port Allocation: Lossless Ethernet or Fibre Channel

FC

Eth

Native Fibre Channel

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

- Simplify switch purchase - remove ports ratio guess work

- Increase design flexibility

- Remove specific protocol bandwidth bottlenecks

- Flexible LAN & storage convergence based on business needs

- Service can be adjusted based on the demand for specific traffic

UCS Components
Hardware & Software support the unified approach

- Cisco UCS
  - UCS Manager
  - Interconnect
  - **Fabric Extender**
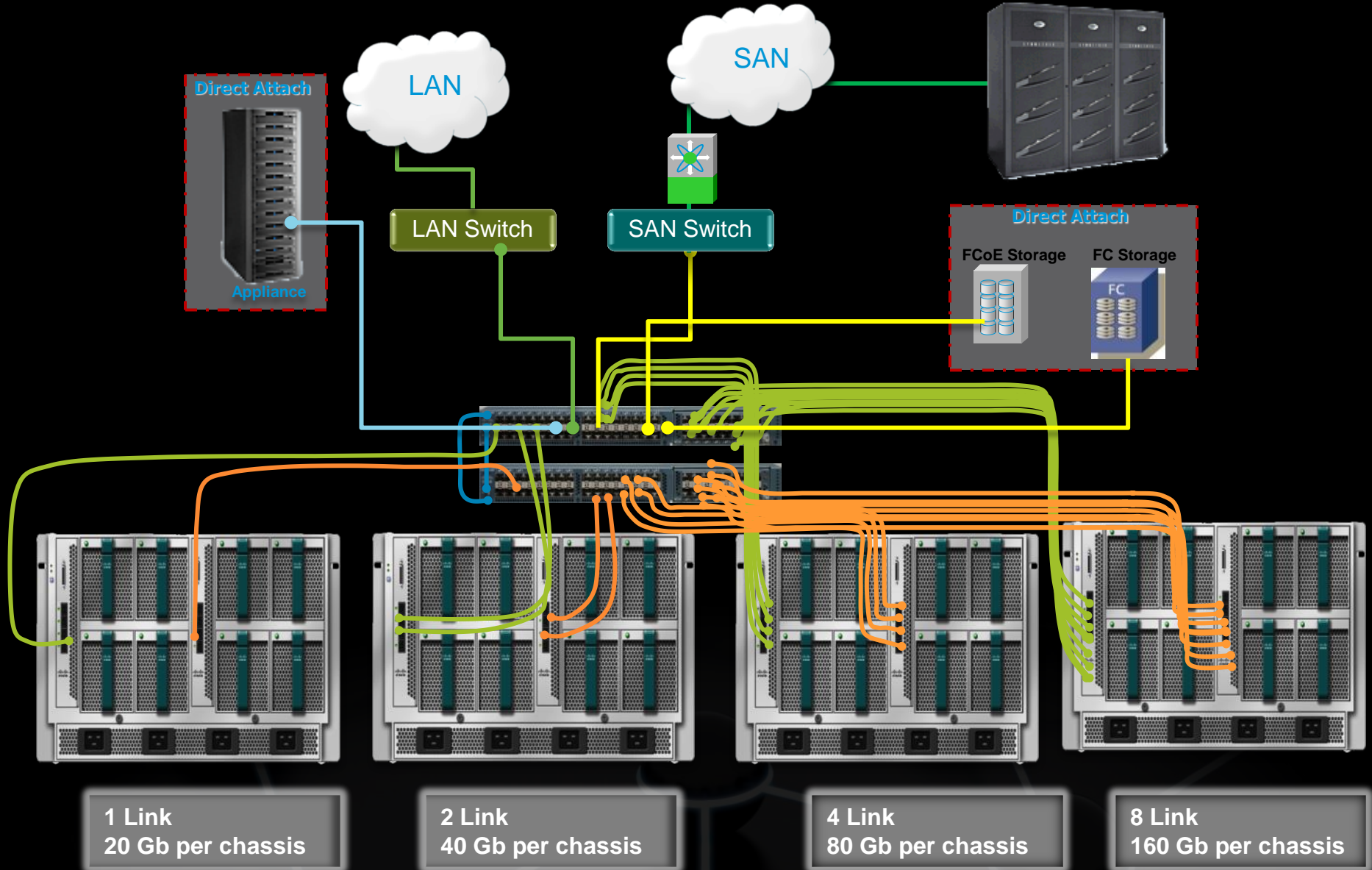 - Enclosure
  - Compute Node(s)
  - IO Adapter(s)

Cisco UCS 2100 Series and 2200 Fabric Extenders

2104/2204, and 2208 Fabric Extender

- Connects UCS blade chassis to the Fabric Interconnect

- Four or eight 10 Gigabit Ethernet, FCoE capable, SFP+ ports

- Up to 2 Fabric Extenders per chassis for redundancy and up to 160 Gbps of bandwidth per chassis

- Hardware based support for Cisco VN-Link technology

- Fully managed by UCS Manager through Fabric Interconnect

UCS System Connectivity

Direct Attach
Appliance

LAN

SAN

Direct Attach
FCoE Storage   FC Storage

LAN Switch

SAN Switch

1 Link
20 Gb per chassis

2 Link
40 Gb per chassis

4 Link
80 Gb per chassis

8 Link
160 Gb per chassis

UCS Components
Hardware & Software support the unified approach

- Cisco UCS

  UCS Manager

  Interconnect

  Fabric Extender

  Enclosure

  Compute Node(s)

  IO Adapter(s)

UCS 5108 Blade Chassis

Chassis

- Up to 8 half slot blades
- Up to 4 full slot blades
- 4x power supplies, N+N grid redundant, 2500 Watt each, 92% efficiency
- 8x fans included
- 2x UCS Fabric Extenders
- All items hot-pluggable

# UCS Components
Hardware & Software support the unified approach

- Cisco UCS
  - UCS Manager
  - Interconnect
  - Fabric Extender
  - Enclosure
  - **Compute Node(s)**
  - IO Adapter(s)

B200 M3 Blade Server
Enabling the Unified Computing Portfolio

- Enterprise performance and advanced capabilities

- Advanced I/O feature set:

  - Integrated 40GbE with over 200 vNIC / vHBA

  - Expandable to 80GbE

  - 24 DIMM

- Cisco Flexible Flash

UCS B200 M3
Performance-Optimized Enterprise
Blade Server

- **UCS Standard Advantages: Unified Fabric; UCS Manager; Optimized for virtualized environments; Adapter FEX and VM FEX**
- **Up to 16 processor cores, ¾ TB of memory in a half-width form factor**

UCS Components
Hardware & Software support the unified approach

Cisco VIC

- Cisco UCS
  - UCS Manager
  - Interconnect
  - Fabric Extender
  - Enclosure
  - Compute Node(s)
 - IO Adapter(s)

UCS VIC 1240 Modular LOM

- Unparalleled Flexibility
  - 256 PCIe devices, vNICs or vHBAs

- High Bandwith
  - 40 Gbps to the half width blade
  - 80 Gbps to the full width blade

- Simplicity and enhanced virtual networking with VM-FEX
  - Line rate to the VMs with VMDirectPath
  - Consolidate virtual and physical network with VM-FEX
  - VMWare, RedHat and MSFT Hyper-V (Future)

256 PCIe devices

vHBAs
vNIC
vNIC
vNIC

vFC
vEth
vEth
vEth
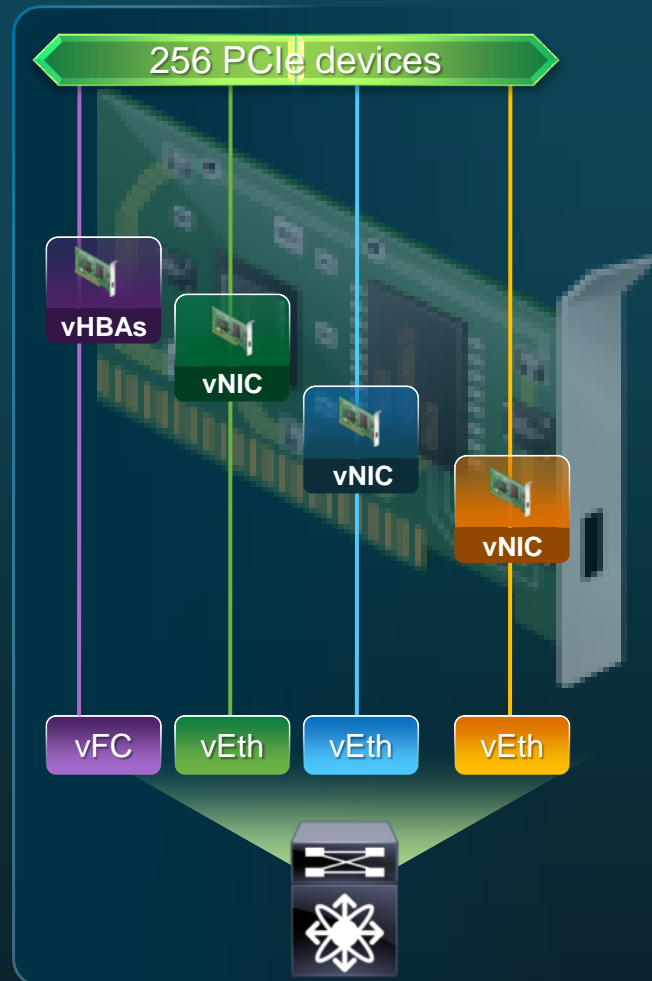
Port Expander
Flexibility and Power of a Mezzanine Slot

- Flexible Mezzanine Slot
  - Port Expander Card
  - Redundant VIC card
  - Future special function Mezz cards

- Industry leading performance
  - Aggregate 80Gbps to the half width blade
  - Aggregate 160Gbps to the full width blade
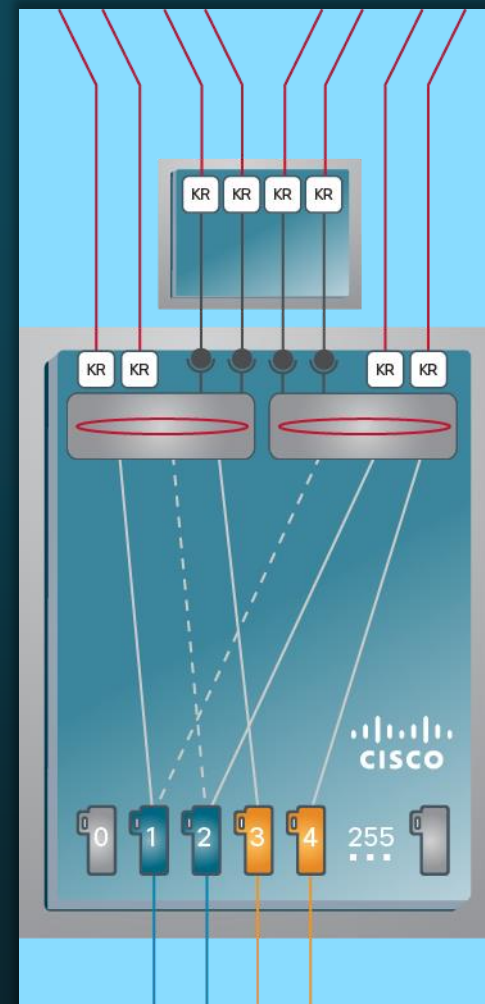
Powering Cloud Computing
Infrastructure Capabilities Matter More Than Ever

CLOUD REQUIREMENTS		IDEAL INFRASTRUCTURE
Low Cost Operations		• Simplified management • Lower service provisioning cost
Infrastructure as a Service		• Integrated compute, network, and storage resources
Self Service Consumption Model		• Physical resources deployed through API's and policies
Elastic Resource Allocation		• Rapid scalability of virtual and physical • Automated deployment
Shared Pools of Resources		• Virtualization optimized • Resource abstraction

UCS Customers
Benefits of a UCS Infrastructure

Naxoo
– Contained server growth
– Lower OPEX
– Lower energy **consumption**

Galliker
– **Less work, reduced space requirements**
– **Highly flexible provisioning of virtual servers**
– **Simplified scaling**
– **Future-proof**
– **High investment protection**

Bellevue Group
– Simplicity of solution
– **Easy management**
– **Highly scalable**
– **UC on UCS**

Cisco's Vision for Virtualization

- Stateless Chassis

- Stateless Servers

- Stateless Connectivity

- Simplified Connectivity

- Simplified Management

- Mobility of resources

- Leverage Assets

- Leverage Datacenters

"Virtualization doesn't start nor stop at the Hypervisor"

www.cisco.com/go/dcv

www.cisco.com/go/ucs

www.cisco.com/go/flexpod

www.cisco.com/go/vxi

www.csico.com/go/vxc

iTunes

UCS Tech Specs
By Vallard Benincosa
Open iTunes to buy and download apps.

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iTunes

FlexPod Tech Specs
By Vallard Benincosa
Open iTunes to buy and download apps.

View In iTunes

Thank you.

CISCO