Fast Innovation requires Fast IT

UCS Session

Cisco Connect

Play To Win: Unified Computing Roadmap and Innovations

Ravi Mishra
Technical Marketing Engineer, UCS

Agenda
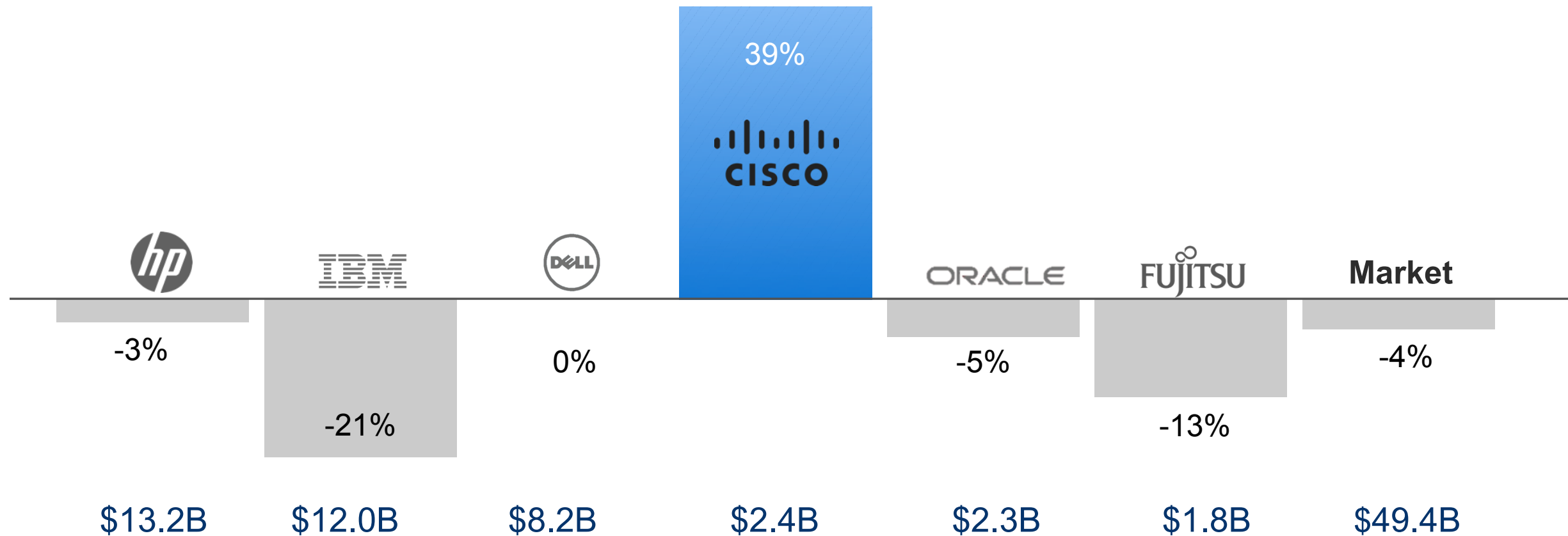
UCS Traction and Opportunity

UCS Differentiation and New Innovations

Cisco's recent server innovation launch

The Software Differentiation

Summary and Call to Action

Cisco UCS Leading Overall Server Revenue Growth (Y/Y)

HP	IBM	DELL	CISCO	ORACLE	FUJITSU	Market
-3%	-21%	0%	39%	-5%	-13%	-4%
$13.2B	$12.0B	$8.2B	$2.4B	$2.3B	$1.8B	$49.4B

Cisco Unified Computing System
Fastest Growing Product in the Market

Cisco Connect

36,500+ Unique UCS Customers

#2 Worldwide Revenue Share in x86 Blades

$3B+ Data Center Annualized Revenue Run Rate

Top 5 Server Vendor

>75% Of all Fortune 500 Customers Have Invested in UCS

3,650+ UCS Channel Partners

95 World-record Performance Benchmarks to Date

Application Challenges in Today's Data Centers

Business Requirements

- IT Budget Constraints
- Globalization
- Mergers and Acquisitions
- Rapidly Changing Business Requirements
- Rapidly Changing Capacity Requirements
- Evolving Skills Required

Application Requirements

- Scalability
- Performance
- Availability
- Security and Compliance
- Delivery Model
- Time to Provision

UCS Differentiation and New Innovations

Why Have We Seen Such Momentum
UCS Value Proposition

Cisco Connect

Data Center Silos	Virtualization	New Emerging Applications

Data Center Silos

- Legacy Apps
- Web Apps
- Collaboration Apps
- Business Critical Apps
- Dev./Test Sandboxes
- Desktop Virtualization

New Emerging Applications
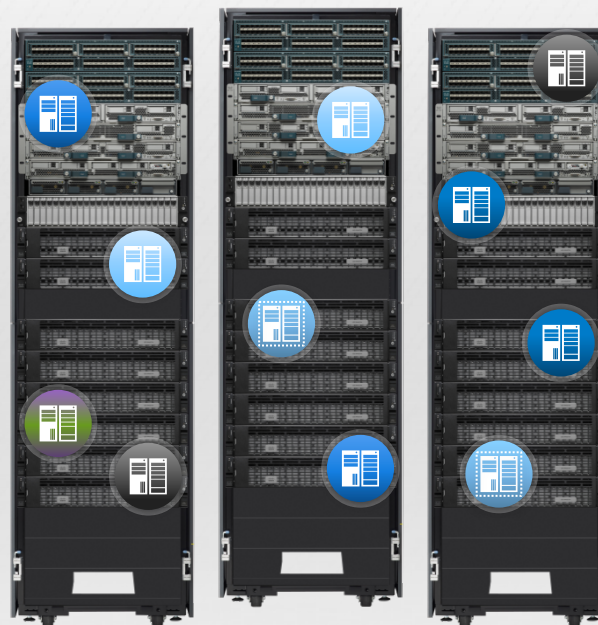
- Private
- HYBRID
- Public

Big Data & Business Analytics

Mobile Applications

Social Media Applications

Back End Consumer Applications

Cisco Unified Computing System
A differentiated/revolutionary approach

Simplified Architecture

- Networking with fewer components
- Lower cost and easier scaling
- Fewer management touch points
- Stateless: any resource, any time
- Better TCO/ROI

Unified Management

- Faster deploy/provision
- Unification leads to reduced complexity
- Management via a single interface

Higher Performance

- Brings out the best of x86 architecture
- Optimized resource utilization for compute, networking, and management

Scale

- Ultimate Scalability
- Enhanced design capability
- Designed for the future, today

Cisco UCS: Driving Business Outcomes

Proven value and over 36,500 customers world wide

"We're able to offer leading-edge solutions to our customers and continue to expand our business."

Martin Breslin
Infrastructure Architect, SEI

"Our Cisco Unified Computing System decision is a game-changer."

Wes Wright
CIO, Seattle Children's

"With Cisco UCS, we can adapt much more quickly to user demand."

Mark Adams
VP Information Technology, HireRight

84%	77%	61%	54%	94
Reduction in Provisioning Times	Cabling Reduction	Reduction of Management Costs	Reduction of Power and Cooling Costs	World-record Performance Benchmarks

Source: Cisco UCS Changing the Economics of the Datacenter, Customer Case Studies, Cisco UCS Performance Benchmarks

Cisco UCS Integrated Infrastructure

Cisco is **#1** and a partner in ~69% of all Integrated Infrastructure*

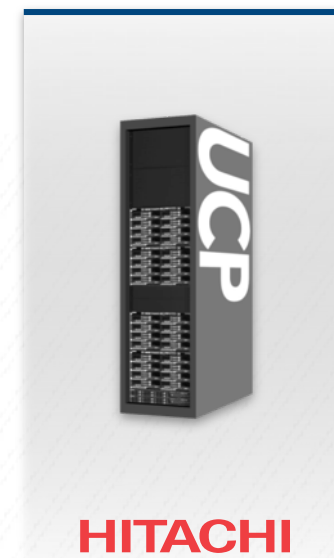Exclusive in the **top 2 solutions** (FlexPod and Vblock) and ~50% in the #3 solution (VSPEX)*

*IDC Worldwide Integrated Infrastructure & Platforms Tracker, April 29, 2014

FLEXPOD	VBLOCK	VSPEX	HDS UCP Select
NetApp™	VCE	EMC²	HITACHI

UCS Director

Cisco UCS

Cisco Nexus

UCS Integrated Infrastructure

Seamless Infrastructure Management with UCS Director

Cisco Connect

Unified Computing System

CISCO
UCS Director

Nexus Product Family

APIC

UCS Performance Manager

Out of the box monitoring rules and thresholds

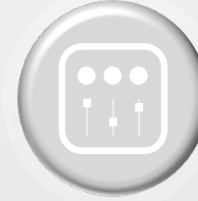**Manage congestion for integrated infrastructure**

Virtualization

Microsoft   vmware
redhat   Xen Server

L4-7 Services

Storage

EMC²   NetApp
UCS Invicta

New!
Integrated application containers for secure workload provisioning

New!
Hadoop integration to easily manage large clusters

New!
Wizard based configuration

New!
Open Developer Kit for Ecosystem Acceleration

Cisco ONE Software Suites

Software Suites

- Logical bundles for customer scenarios
- Greater value – more features
- Reduced complexity

Investment Protection

- Software license portability:
- To next-gen hardware
- Physical and virtual machines

On-going Innovation

- Access to the new products incorporated into the bundles

Flexible Licensing

- Perpetual and subscription options
- Amazing bundle value

Give your customers an easier and more valuable path to our software capabilities

Attend the Cisco ONE Software Suites breakout session
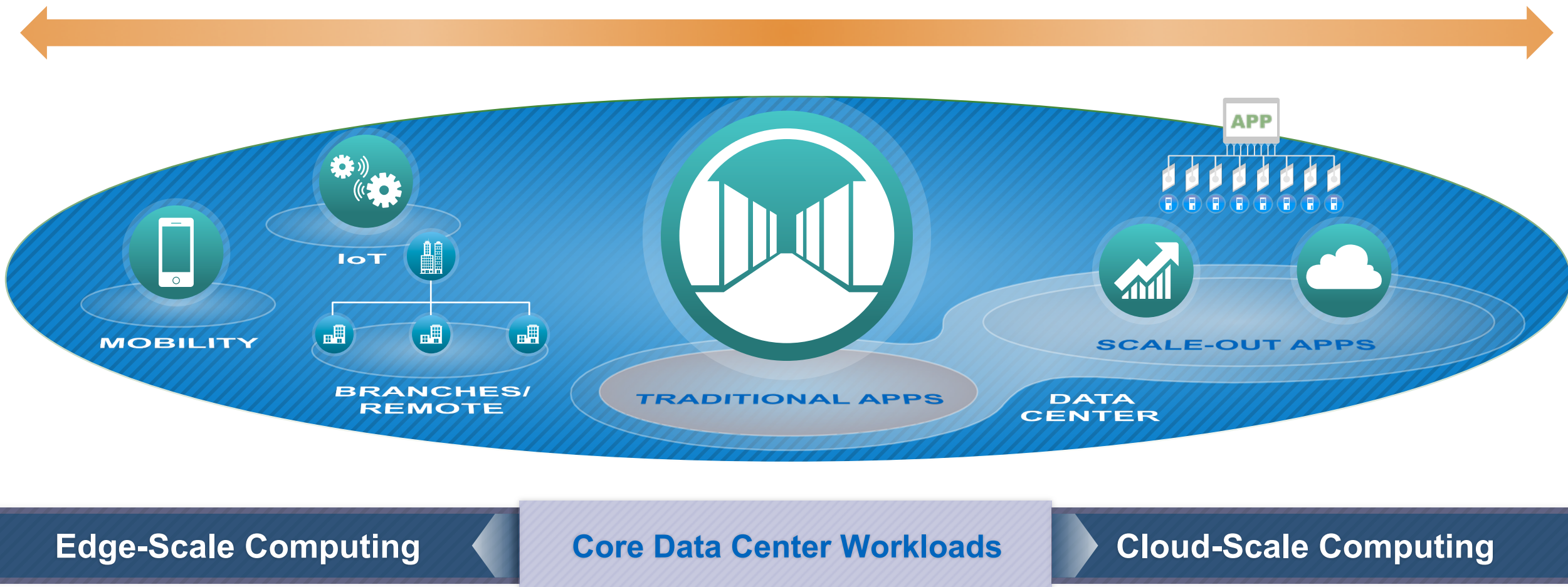
Recently Launched by Cisco

UCS 2.0

Applications Have Unique Requirements at Every Scale

Connecting to Opportunity   **Faster Decisions**   **Deeper Insight**

APP

MOBILITY

IoT

BRANCHES/ REMOTE

TRADITIONAL APPS

SCALE-OUT APPS

DATA CENTER

Edge-Scale Computing   **Core Data Center Workloads**   **Cloud-Scale Computing**

Powering Applications at Every Scale
The Next Wave of UCS Innovation

Edge-Scale Computing   **Core Data Center Workloads**   **Cloud-Scale Computing**

UCS Mini

UCS Invicta Blade

UCS Director Enhancements

UCS Blade & Rack M4 Servers

UCS M-Series

UCS C3160 Server

Core Data Center

Retail Operations

Virtual Desktops

Customer Premise Equipment

IoE Sensor Data

UCS Management

Compute • Network • Storage • Virtualization
Management and Automation
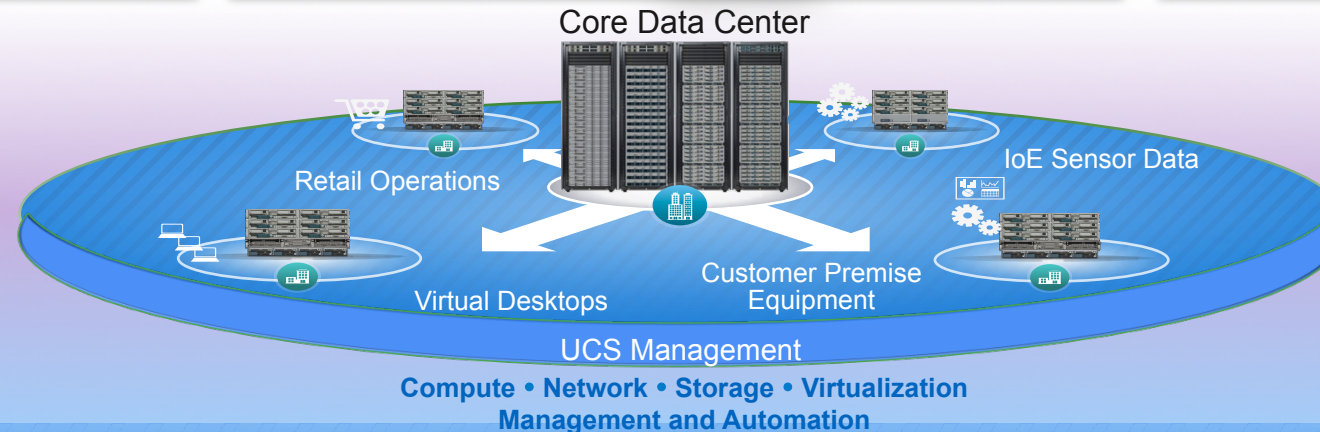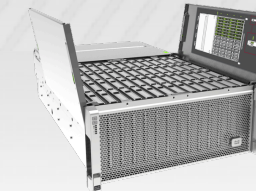
Unmatched Continuum of Scale

Powering Applications at Every Scale
The Next Wave of UCS Innovation

CiscoConnect

Edge-Scale Computing **Core Data Center Workloads** **Cloud-Scale Computing**

UCS Mini

UCS Invicta Blade

UCS Blade & Rack M4 Servers

UCS Director Enhancements

UCS M-Series

UCS C3160 Server
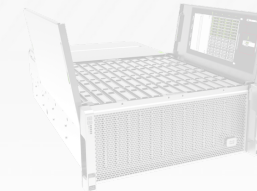
Unmatched Continuum of Scale

Cisco UCS M4 New Generation Servers

UCS B200 M4 Blade Server

Delivers market-leading performance, versatility, and density without compromise

UCS C220 M4 Rack Server

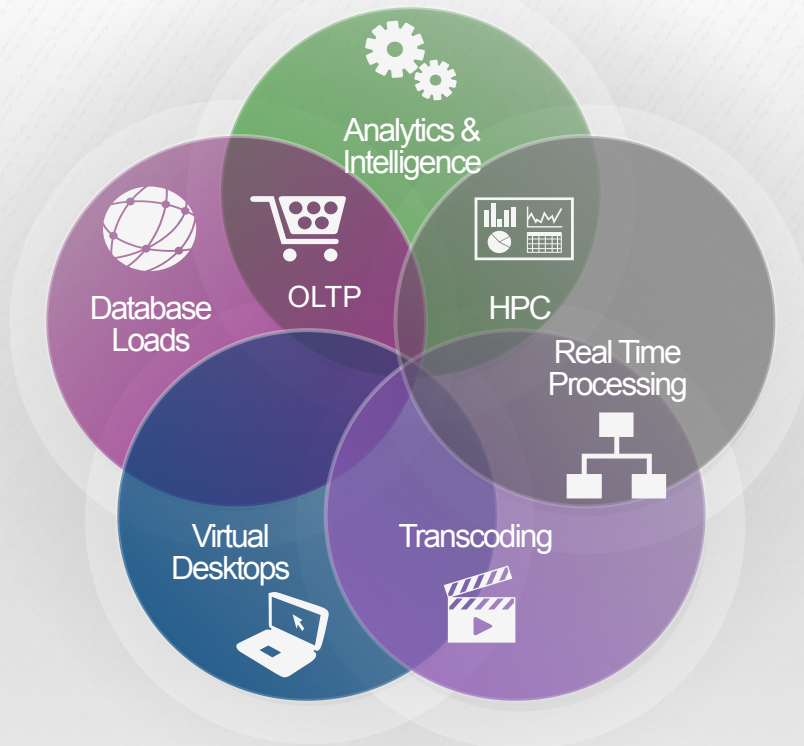Density-optimized enterprise-class rack server for general purpose workloads

UCS C240 M4 Rack Server

Storage and I/O-optimized for big data analytics, virtualization, and bare metal applications

Analytics & Intelligence

OLTP

HPC

Database Loads

Real Time Processing

Virtual Desktops

Transcoding

- **Optimize scalability and performance for Virtual Desktop Infrastructure**
- **Offload full or partial database structures to improve performance with less tuning**

Full Width UCS B-Series Blade form factor

Full HA design: Dual controllers with battery protection

All Management via UCS Manager with Service Profiles

- **~10.4 TB of Useable SATA SSD Storage (15TB raw)**
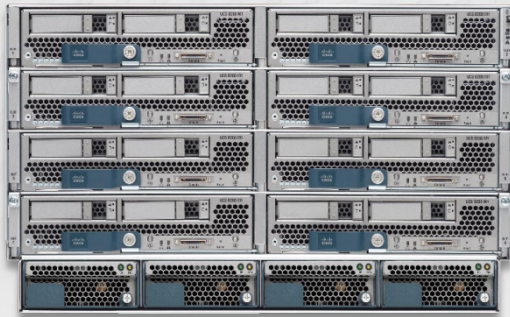- **iSCSI LUNs Sharable by all nodes in UCS Domain**

Powering Applications at Every Scale

The Next Wave of UCS Innovation

Cisco Connect

Edge-Scale Computing	Core Data Center Workloads	Cloud-Scale Computing

UCS Mini

UCS Invicta Blade

UCS Blade & Rack M4 Servers

UCS Director Enhancements

UCS M-Series

UCS C3160 Server

Unmatched Continuum of Scale

UCS Mini

New architectural entry point for Unified Computing

UCS in an All-in-One package:

- Compute
- Solid-state
- Networking
- UCS Manager
- Unified Computing in 6U
- Chassis-Integrated Fabric Interconnects
- UCS Manager
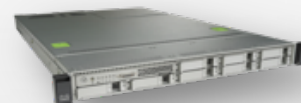- Standard UCS Blades / Fans / Power Supplies
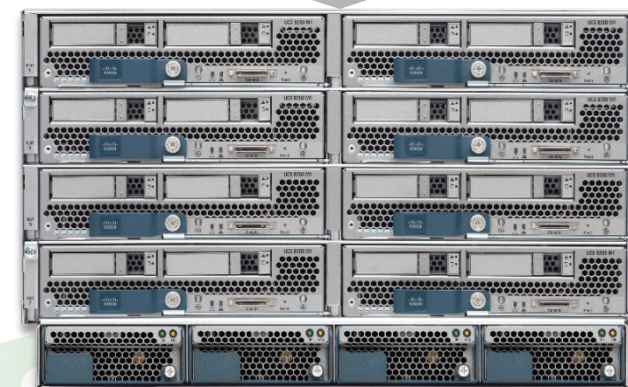
UCS Manager 3.0

C240 M3 Rack Server

C220 M3 Rack Server

B200 M3 Blade Server

6324 Fabric Interconnects

UCS Mini

Enterprise Capability at Edge Scale

Connect up to 7 C-Series rack servers for expanded capacity

UCS Mini

New architectural entry point for Unified Computing

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- Standard UCS Blades / Fans / Power Supplies
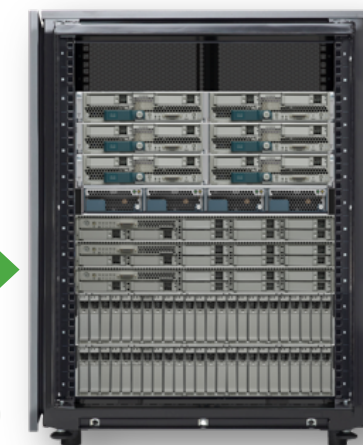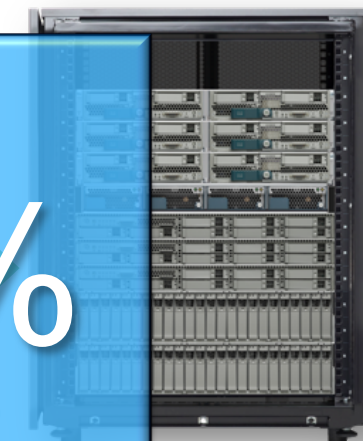
UCS Manager 3.0

C240 M3 Rack Server

C220 M3 Rack Server

B200 M3 Blade Server

6324 Fabric Interconnects

UCS Mini

Up to **29%** CapEx Savings

Up to **36%** TCO

Up to **34%** Lower Power
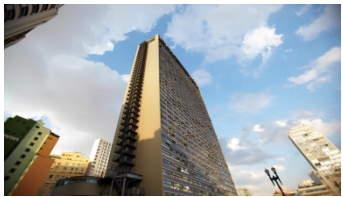
Up to **80%** Fewer Cables

Enterprise Capability at Edge Scale

Connect up to 7 C-Series rack servers for expanded capacity

UCS Mini

SMB

- Only need 4 – 8 servers
  - Expand to 16

- Not an IT shop
  - Simplicity is key

- UCSM makes things easy
  - Firmware updates
  - Faulty blade replacement

- Managed Service
  - Remotely managed through

ROBO & Industry Verticals

- Large number of geographically dispersed sites

- Need centralized management & control
  - Consistency
  - Compliance

- No local IT staff

- UCS Central & UCS Mini
  - Manage 100 sites like managing 1

Data Center/Mini Data Center

- Managed Services
  - Onsite premises
  - Application migration

- Security
  - DMZ
  - Hardware Separation for compliances
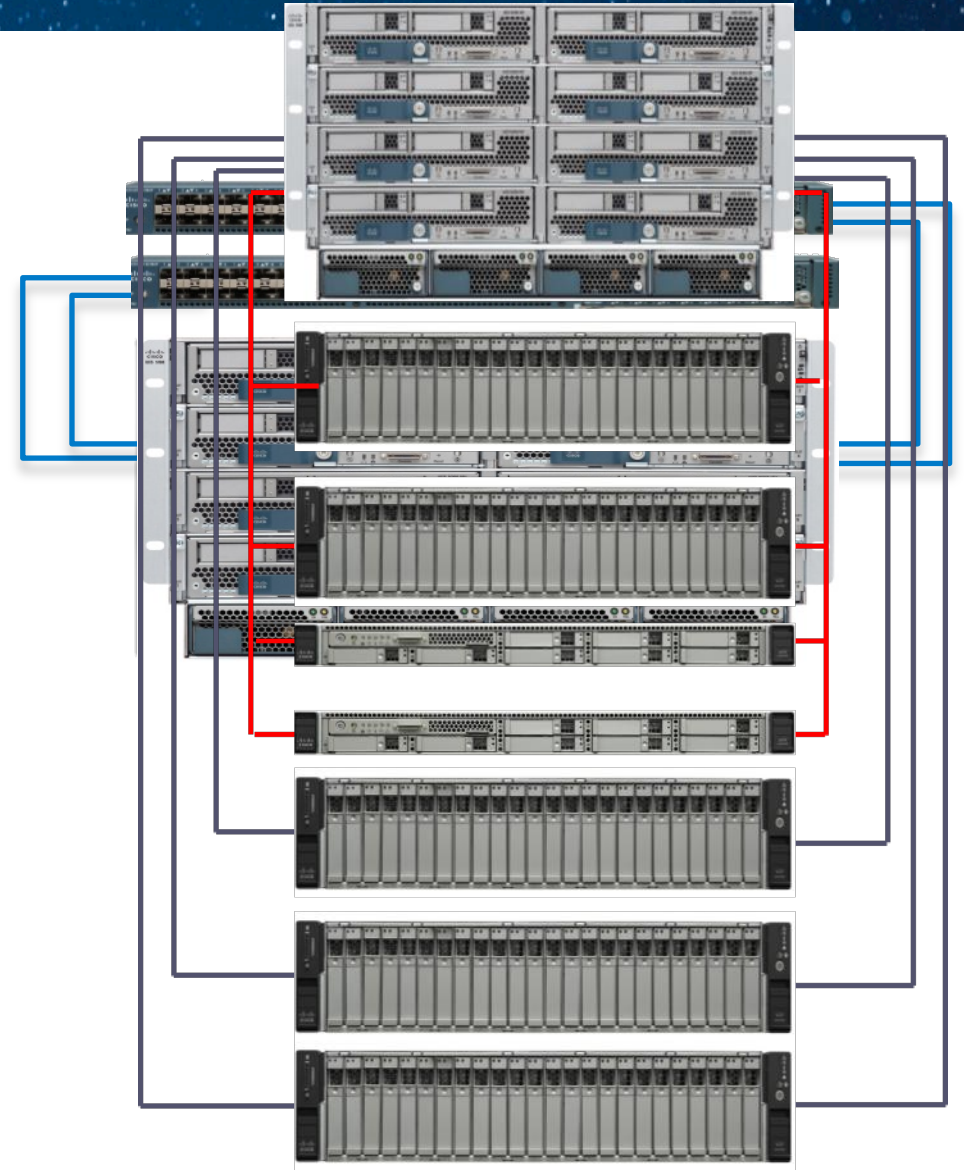
- Smaller failure domains

UCS Mini: Product Concept

- Based on current chassis
- Embed Fabric Interconnect Capability in the IOM slot
- Match current UCS Network model
  - Ethernet End Host Mode
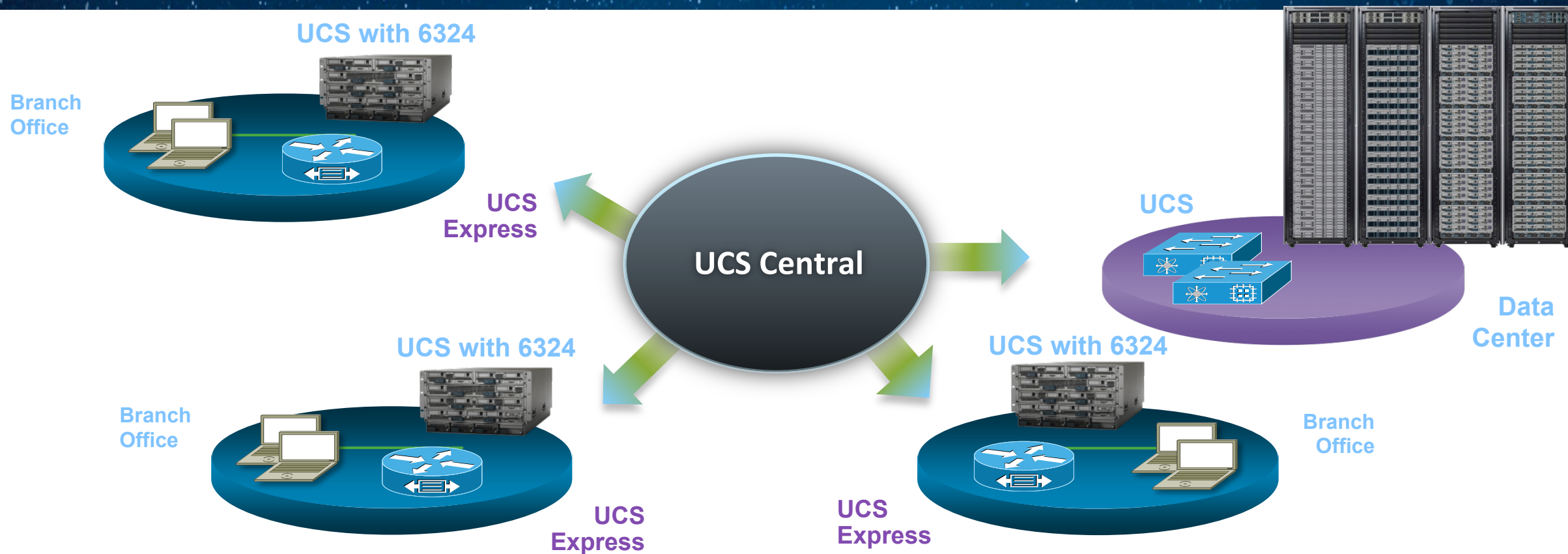- Common Management with UCS
  - UCSM, Service Profiles

Expansion

- Up to 8 Blades
  - Cisco UCS B200 M3
- Up to 7 rack mount servers
  - C220M3
  - C240M3
- Managed through UCSM

Unifying Branch and Datacenter Management

Centralizing Visibility and Control of UCS with UCS Central

UCS with 6324

Branch Office

UCS Express

UCS Central

UCS

Data Center

UCS with 6324

Branch Office

UCS Express
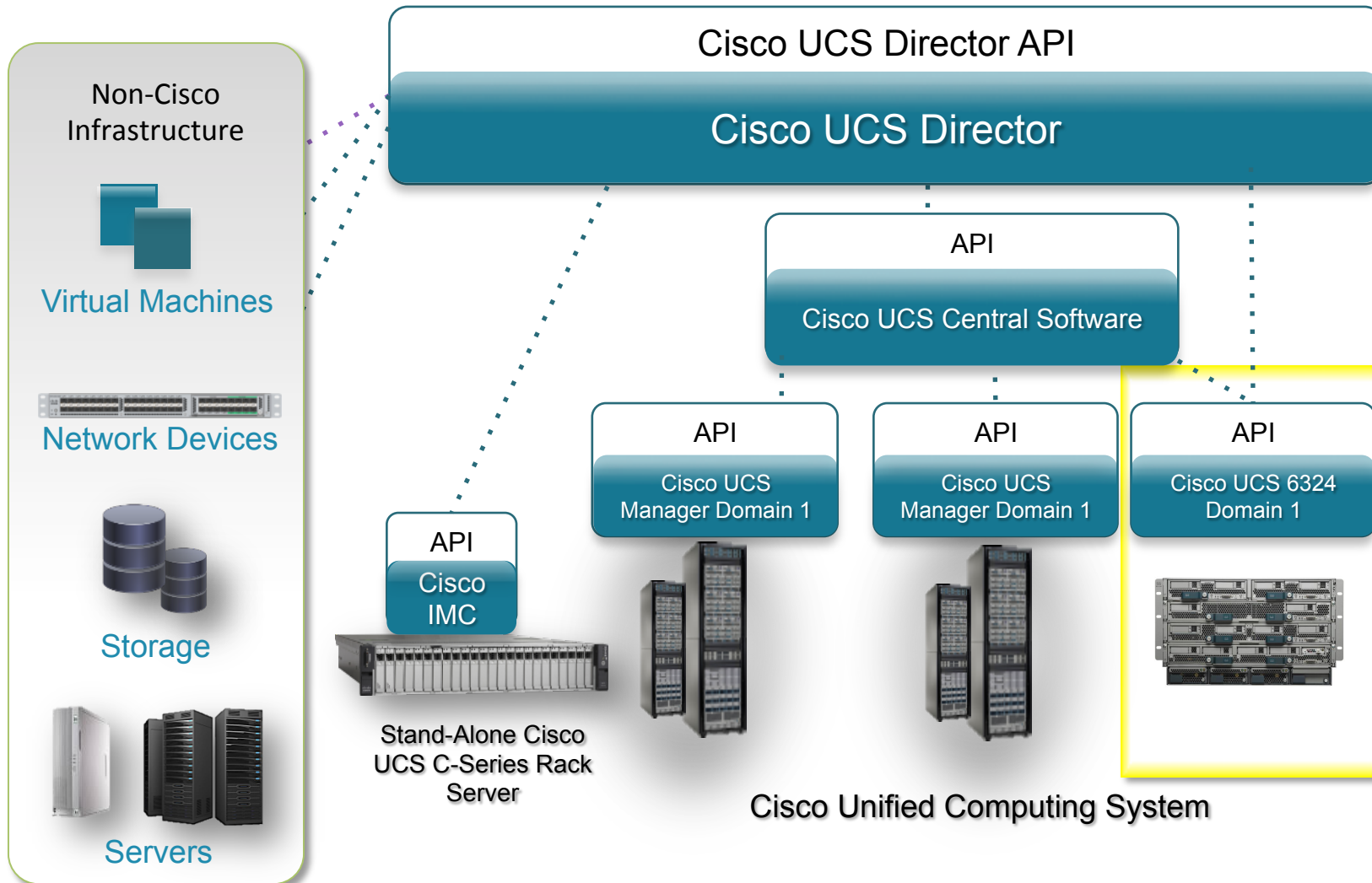
UCS with 6324

Branch Office

UCS Express

| Extend Management to Branch Offices | Centralize Control at Every Level of Virtual Infrastructure | Streamline, Standardize, and Automate Remote Infrastructure |

Cisco UCS Director API

Cisco UCS Director

Non-Cisco Infrastructure

Virtual Machines

Network Devices

Storage

Servers

API

Cisco UCS Central Software

API
Cisco IMC

API
Cisco UCS Manager Domain 1

API
Cisco UCS Manager Domain 1

API
Cisco UCS 6324 Domain 1

Stand-Alone Cisco UCS C-Series Rack Server

Cisco Unified Computing System

Basic Management Functionality

Advanced Infrastructure Abstraction & Automation

- **Single office locations**
  - UCSM converges management of servers, storage and networking
  - Full featured management no limitations

- **Datacenters**
  - Take advantage of the full Cisco Management Suite
  - Integrated with third-party ecosystems (Microsoft, VMware, CA, IBM)
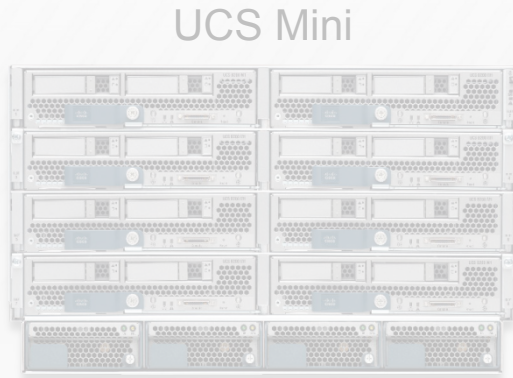 - Common management of UCS in the datacenter and 6324 Fabric Interconnect domains at remote offices

Powering Applications at Every Scale
The Next Wave of UCS Innovation

Cisco Connect

Edge-Scale Computing   **Core Data Center Workloads**   **Cloud-Scale Computing**

UCS Mini

UCS Invicta Blade

UCS Blade & Rack M4 Servers

UCS Director Enhancements
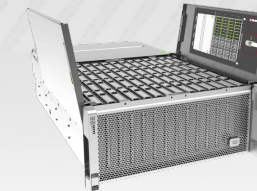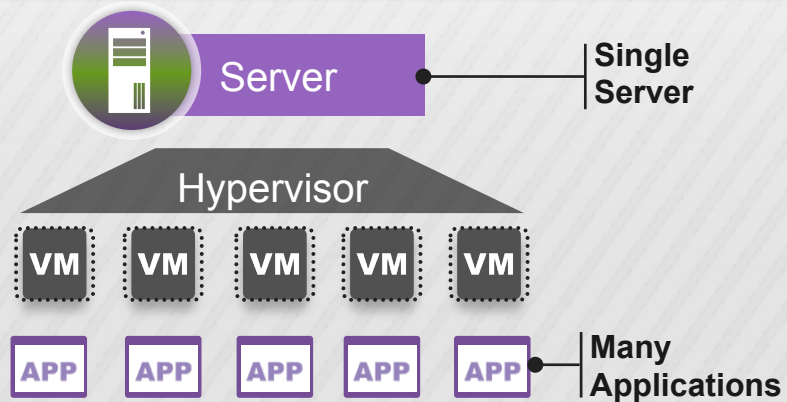
UCS M-Series

UCS C3160 Server

Unmatched Continuum of Scale

Cloud Scale Turns Computing Architecture Upside-Down

Mainstream IT Applications
Fixed Application Size

Server — Single Server

Hypervisor

VM VM VM VM VM

APP APP APP APP APP — Many Applications

Multi-Threaded on Bare Metal

ORACLE

SAS SAP

Virtualized Applications

Microsoft

vmware

Cloud Scale Applications
Horizontal Scaling

Single Application — APP

Many Servers
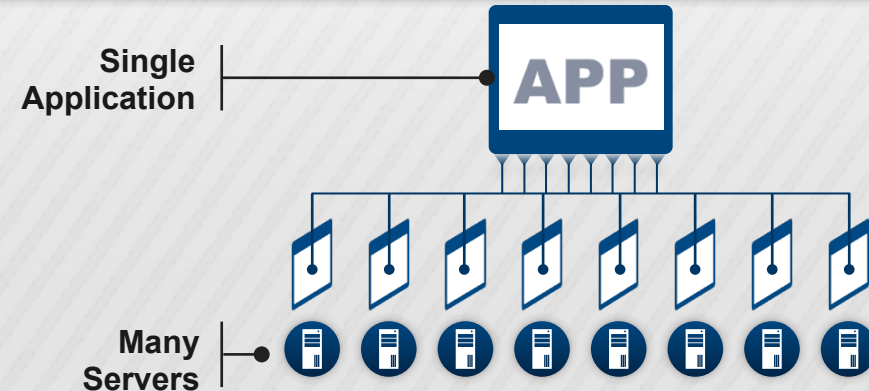
Software Built for the Cloud

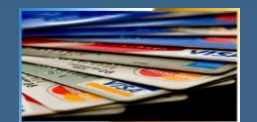hadoop Hortonworks

MAPR

cloudera cassandra mongoDB

Grid Computing

Traditional vs Disaggregated Servers-16 Server Footprint

Cisco Connect

32 x Redundant Fan kits

32 x Sets of cables

The Foundation for New Cloud-Scale Applications

16 x Traditional 1U Rack Servers

16 x 1GbE NIC Cards

32 x HDD

32 x PSU

Introducing UCS M-Series Modular Servers
UCS fabric for local server resources

Compact Chassis
8 Compute cartridges

Lightweight Compute Cartridge
Two Independent Intel Xeon E3 Servers
No adapters or HDDs

Shared Local Resources
Network & storage resources

UCS M-Series
Using Cisco Innovation to Disaggregate the Server

Based on Cisco Virtual Interface Card
3rd Gen VIC creates local fabric for compute nodes

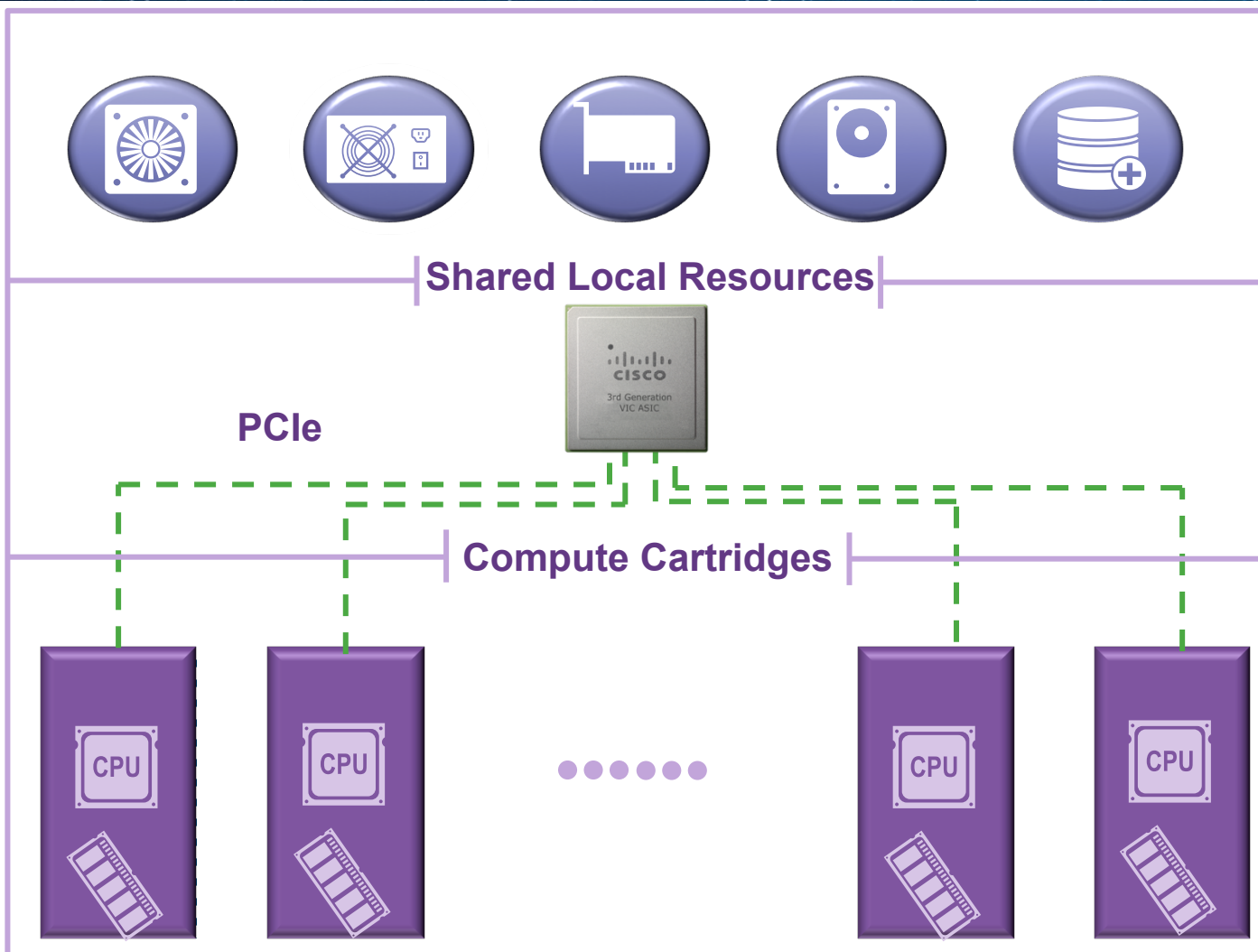**Shared Local resources**
4 shared SSDs in the chassis
Shared dual 40Gb connectivity

Compute Density
16 Intel Xeon E3 Compute nodes in 2RU chassis
Each cartridge holds 2 independent compute nodes

Deconstructing the Monolithic Server

Shared Local Resources

PCIe

Compute Cartridges

CPU CPU • • • • • • CPU CPU

Disaggregated Server

Shared Local Resources

Shared Local Resources

• Improved utilization of resources

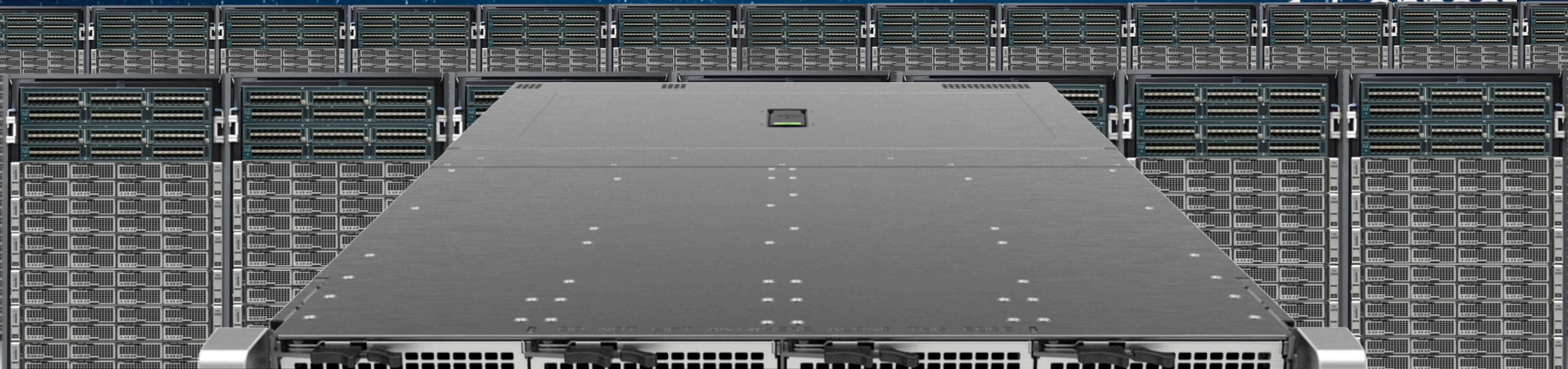• Resource amortization over smaller nodes

Modular Design

• Improved subsystem lifecycle management

• Ability to scale individual subsystems independently

Lean Componentry

• Improved compute density

• Cost and power optimization

Capacity Optimized Server
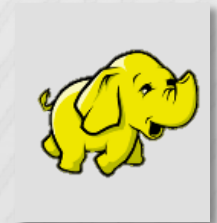## UCS C3000 Series Rack Server Family

UCS C3160 Rack Server

- High-density local disk combined with modular high-performance compute
- Scale compute and local storage as needed
- Up to 24 cores with Intel Xeon EP processors and 4TB or 6TB drives for 360TB in a compact 4U Form Factor

Virtualization and Bare-Metal

- Large scale content storage and data repositories
- Distributed file-systems and databases
- Big Data and Hadoop applications
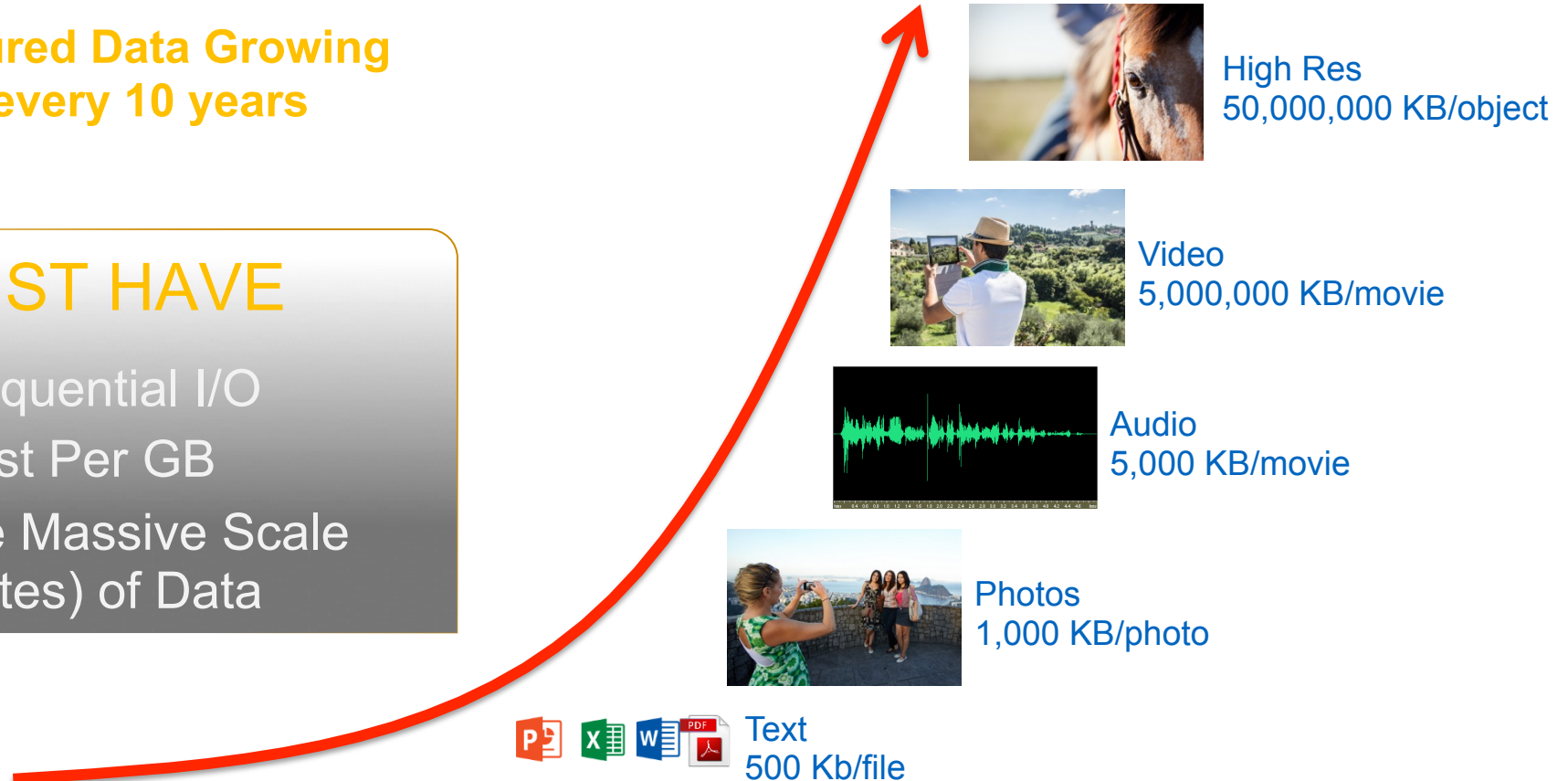- Media streaming and transcoding

The Unstructured Data Explosion

**Unstructured Data Growing
100X every 10 years**

MUST HAVE

- Best Sequential I/O
- Low Cost Per GB
- Manage Massive Scale (Petabytes) of Data

*Source: IDC and Other Online Research

High Res
50,000,000 KB/object

Video
5,000,000 KB/movie

Audio
5,000 KB/movie

Photos
1,000 KB/photo

Text
500 Kb/file

Organizations often have petabytes of unstructured data

Organizations often have petabytes of unstructured data

UCS C3160 Rack Server

- Designed for large unstructured data repositories, media streaming and content distribution

- High-performance compute and storage throughput

- Stand-alone CIMC Management

- Up to 240TB (with 4TB HDD) @ launch and 360TB (with 6TB HDD)-post-FCS of dense storage in a compact 4U Form Factor that fits in a standard rack

UCS C3160
Dense Rack Server

Single Server
Dual CPU socket per server

Up to 256GB Memory
8 DIMMs per socket

Up to 62 Drive Bays
60 LFF, plus 2 SFF

Up to 4GB RAID Cache
Enterprise storage features

Dual Modular LOM (mLOM)
Multiple Connectivity Options

Optional Bezel

Use Cases for the UCS C3000 Server Family

Cisco Connect

UCS C3160

Service Providers, Enterprise, Cloud	Service Providers	Enterprise	Service Providers, Enterprise
Object Store	Media Streaming & Content Distribution	Exchange	Big Data & Analytics

Addressable Market >$2B WW*

*Source: IDC

Cisco Virtual Interface Card (VIC)

Virtual Devices
Over 256 per adapter
Ethernet, HBA, USNIC, DPDK

Server Management
Cisco Single-Connect

Blade Servers
VIC 1240, 1280, 1340, 1380

Converged Network Infrastructure
Ethernet, Fibre Channel, IB Technologies

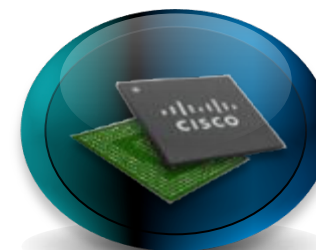Cisco VIC is an industry leading virtual network adapter for Cisco Blade and Rack servers.

Rack Servers
VIC 1225, 1225T, 1285, 1227

40Gb FCoE
Multiple ports of 10Gb and 40Gb. Up to 160Gb per server
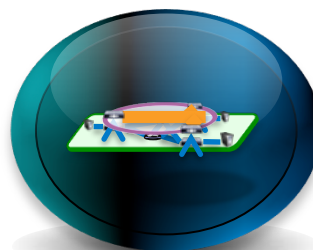
Advanced Network Features
VM-FEX for ESX and Hyper-V, NVGRE, VXLAN, USNIC, RoCE-ready

Cisco Developed ASIC
Built-in classification engine and network offload services

Cisco VIC Momentum

UCS Differentiators:

- ☐ Stateless computing: 1K PCIe devices (NICs or HBAs)
- ☐ Host Connectivity: 16 lanes of PCIe Gen3
- ☐ Network Connectivity: Dual 4x10Gb Capable, 40Gb ready
- ☐ Virtualization:
  - ☐ Consolidate virtual and physical switching
  - ☐ Bypass Hypervisor for near bare metal performance

Market & Eco System Momentum

- ☐ Port Shipments: **57%** of total 10Gb blade server ports *
- ☐ Revenue Share: **69%** of total 10Gb blade server ports revenue*
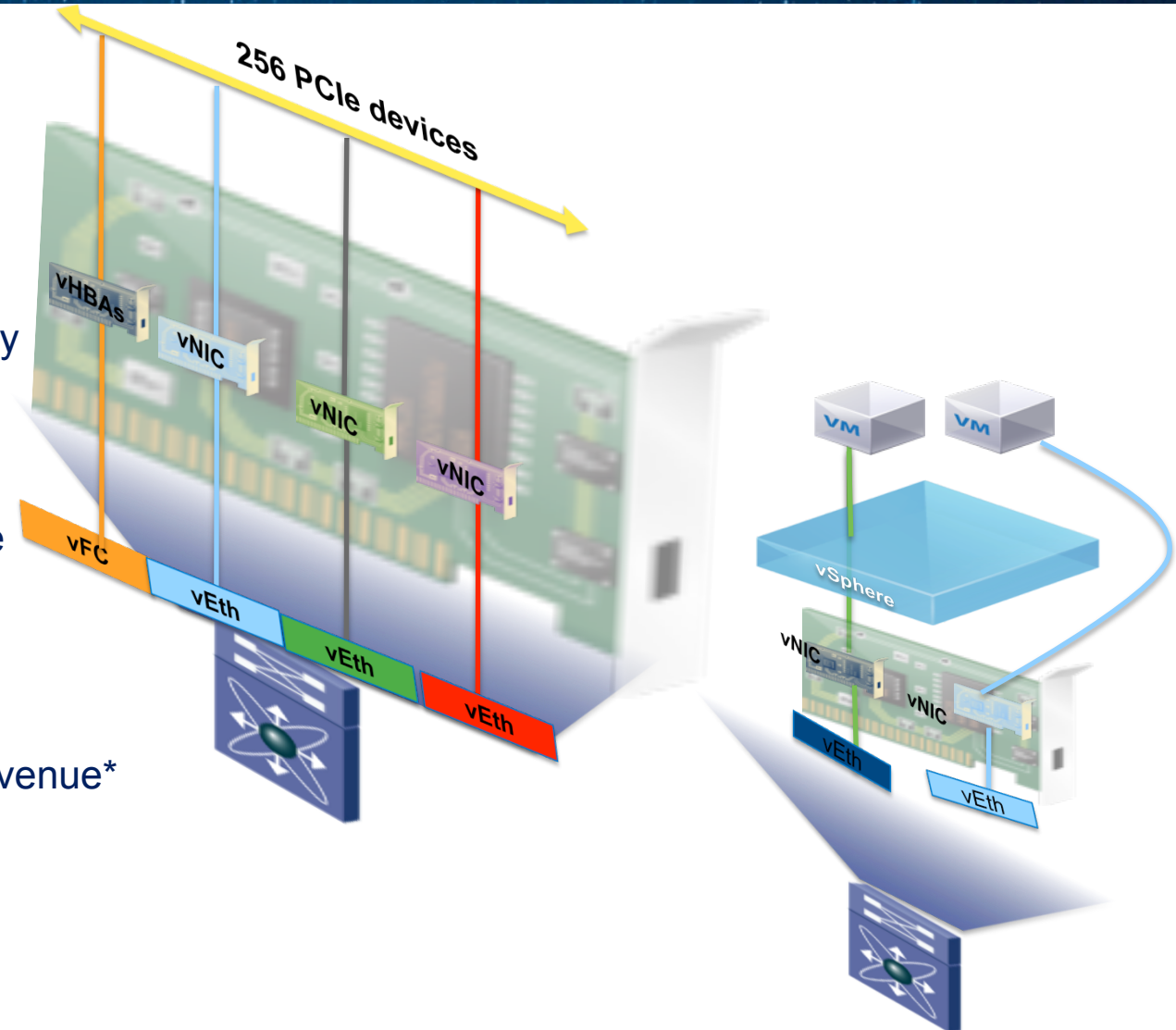
* Based on Crehan Research Q4 2013 Market Share Report

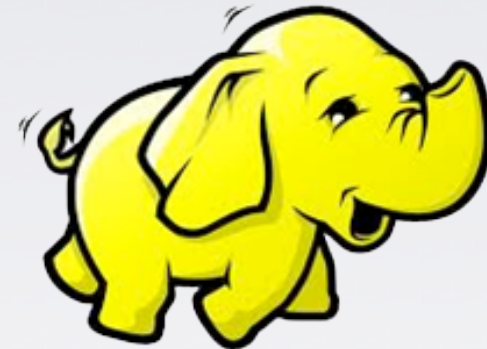# UCSD Express for Big Data
On-demand Hadoop Deployment

Zero Touch Deployment of Hadoop Clusters

On Demand Cluster Sizing

Dashboard for status and health monitoring

Centralized End-to-End Visibility

- Accelerating time to value for Hadoop Deployment
- Single Management Pane for Hadoop Clusters
- Extends UCS Management value prop into Hadoop Infrastructure

UCSD Express for Big Data:
Rapid Integrated, Policy-Based Hadoop Infrastructure Management

1 Subject Matter Expert Define Policies

2 Policies Used to Create Hadoop and Infrastructure Service Profile Templates

3 Service Profile Templates Create Service Profiles

4 Ready-for-use Hadoop Clusters

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

- Create Infrastructure Profile

- Create Hadoop Profile

- Create Hadoop Application Profile

Namenode, data node configuration
Configure Hadoop services
Setup heap size and memory buffers
HDFS, MapReduce configuration
Setup other hadoop services

Uplink and server port configuration
Network interface card (NIC)
configuration: MAC address,
VLAN, and QoS settings;
worldwide names (WWNs),,
and bandwidth constraints;
and firmware revisions

Unique user ID (UUID),
firmware revisions,
and RAID controller settings
Service profile assigned to server,
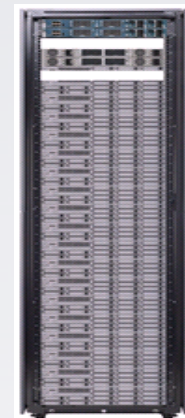chassis slot, or pool

Powering Applications at Every Scale
The Next Wave of UCS Innovation

Cisco Connect

Continuing to innovate original differentiation of the UCS Architecture: taking it to the next level

Infrastructure optimized for application performance: not constrained by it

Extending UCS into new markets, with new use cases: to drive new business outcomes for customers

Summary