Cisco Unified Computing System (UCS) - Changing the Economics Datacenter

Bill Shields, Sr. Marketing Manager, @HighTechBill
PSODCT-1014
Agenda

• Connecting UCS Technology Innovations to TCO Improvement
• Real World Customer Results
• Q&A
Data Center Economics

Overall Spend Distribution

- People: 22%
- Software: 11%
- Energy / Facilities: 12%
- Servers: 7%
- Networking: 7%
- Disaster Recovery: 2%
- Storage: 7%
- Overhead: 2%

Server-Related Spend

 WW New Server, Power, Cooling, Management, and Administration Spending Share

Source: Gartner, Cisco IT, “Data Center Cost Portfolio”

Cost Categories Impacted by Cisco UCS

**Unified Fabric**
- Radical infrastructure simplification
- Efficient scaling
- High performance

**Unified Management**
- Embedded device management
- Self-integrating
- Stateless
- Automated
- Programmable
Provisioning
Provisioning and Admin Cost Reduction

ELIMINATE MANUAL CONFIGURATION

AUTOMATION REPLACES REPETITIVE TASKS

EXTEND INVESTMENT IN EXISTING TOOLS

EXTEND THE REACH OF SME’s

UCS Manager Embedded in All System Devices

UCS Manager: Auto-discovery, Self-integrating Components

UCS Service Profiles

Policy-based Management

Seamless Integration with Existing Tools = No Stranded Systems Management Investments

UCS Manager and UCS Central Allow Administrators to Scale Across Larger Installations and Across Data Center/Geos
System Management

True “Single Pane of Glass” Management

UCS Manager for a Single Domain
System Management

True “Single Pane of Glass” Management
UCS Manager for a Single Domain

UCS Central Across Multiple Domains
Traditional Element Configuration

- Subject matter experts consumed by manual configuration chores
- Serial processes and multiple touches inhibit provisioning speed
- Configuration drift and maintenance challenges
UCS: Bare Metal Abstraction

- Abstraction of bare-metal configuration and server identity
- Encapsulated in Cisco service profiles
- Available through an intuitive GUI, CLI, or XML API

**Cisco Service Profile**

- Uplink port configuration, VLAN, VSAN, QoS, and EtherChannel
- 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

**Automated, Policy-based Configuration of Entire Hardware Stack**

- Cisco UCS B-Series Blade or C-Series Rack-Mount
- Cisco UCS 6200/6300 Series Fabric Interconnects
- Cisco Virtual Interface Cards

Programmable Infrastructure
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

Cisco live!
Unified, Embedded Management

1. Subject Matter Experts Define Policies

- Storage SME
- Server SME
- Network SME

- Server Policy
- Storage Policy
- Network Policy
- Virtualization Policy
- Application Profiles

Provisioning | Ongoing Administration | Servers | Infrastructure and Cabling | Power and Cooling | System Management | Real World TCO Examples
# Unified, Embedded 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

---

**Provisioning**

**Ongoing Administration**

**Servers**

**Infrastructure and Cabling**

**Power and Cooling**

**System Management**

**Real World TCO Examples**
Unified, Embedded Management

1. Subject Matter Experts Define Policies

   - Storage SME
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   - 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

3. Service Profile Templates Create Service Profiles

   - Server name
   - UUID, MAC, WWN
   - Boot information
   - LAN, SAN config
   - Firmware policy

4. Associates Service Profiles with Hardware Configures Servers Automatically

   - Server name
   - UUID, MAC, WWN
   - Boot information
   - LAN, SAN config
   - Firmware policy
UCS Configuration

Open Programmatic Interfaces

Cisco UCS Management

Infrastructure Pools

Security, Redundancy, and Role-Based Access Control (RBAC)

Templates with Consistent Scaling

Provisioning

Ongoing Administration

Servers

Infrastructure and Cabling

Power and Cooling

System Management

Real World TCO Examples
UCS Blades Deploy 77% Faster with 67% Fewer Steps

Deployment Times

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Cisco UCS</th>
<th>HP ProLiant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Blade</td>
<td>0:17:54</td>
<td>0:18:54</td>
</tr>
<tr>
<td>2-Blade</td>
<td>1:18:35</td>
<td>1:23:41</td>
</tr>
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</table>

Number of Steps

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Cisco UCS</th>
<th>HP ProLiant</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Blade</td>
<td>10</td>
<td>31</td>
</tr>
<tr>
<td>2-Blade</td>
<td>14</td>
<td>43</td>
</tr>
</tbody>
</table>

Additional Information

Principled Technologies Test Report–July 2013 | YouTube Video
“Now, if new blade servers need to be added, almost anyone can plug a new blade into the chassis and deploy it from Cisco UCS Manager in under an hour...”

“Cisco UCS helps us deploy infrastructures five times faster, allowing our best engineers to work on customer-driven initiatives instead of data center deployment.”

“The model-based service profiles make it easier for junior engineers to provision new deployments, which enables our more experienced engineers to focus on more strategic initiatives.”
# Ongoing Administration

<table>
<thead>
<tr>
<th>Provisioning</th>
<th>Ongoing Administration</th>
<th>Servers</th>
<th>Infrastructure and Cabling</th>
<th>Power and Cooling</th>
<th>System Management</th>
<th>Real World TCO Examples</th>
</tr>
</thead>
</table>

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Industry-Leading Compute Infrastructure API

Standards-Based XML API Presents Bi-Directional Single Interface to Entire Solution

UCS Offers the Customers the Broadest Choice of Cisco or Third-Party Management Tools

UCS CLI  UCS Manager  UCS Central  UCS Director  Third Party  Customer

PowerShell, Perl, Python, etc.
UCS Platform Emulator

XML API

UCSM Single UCS Domain
UCSM Data Center 1
UCSM Data Center 2, 3,…

Provisioning  Ongoing Administration  Servers  Infrastructure and Cabling  Power and Cooling  System Management  Real World TCO Examples
Cisco UCS: Systems Management Choice

Cisco Unified Computing System Management Ecosystem:
Service Orchestration, Provisioning and Configuration, and Monitoring

Seamless Management Across Global Operations
Automated Infrastructure Deployment

Consistent Infrastructure Policies Enforce Best Practices
Manage Hardware with the Flexibility of Software

Provisioning
Ongoing Administration
Servers
Infrastructure and Cabling
Power and Cooling
System Management
Real World TCO Examples
Extend SME Reach and Scale

- Unifies management of multiple UCS domains and **thousands of servers**
- Centralizes global policies, service profiles, ID pools, and templates
- Simplifies global operations with centralized inventory, faults, logs, and server consoles
- Foundation for efficient global administration, high availability, and workload mobility
- Built on UCS Manager technology; combines local performance and tiered control
- Model-based API for large scale automation and integration
“Cisco UCS has helped to revitalize our operations. We can focus on delivering higher-value, innovative new services to citizens and spend less time troubleshooting issues and performing routine tasks.” Country Fire Authority, Melbourne

“Service profiles have already cut firmware upgrade time from 16 hours to 2 hours— with no additional headcount required.”

“The team tells me that UCS is easier and faster to manage than other servers due to Cisco UCS Manager with service profiles,” Heiden says. “They are really happy with it and we freed up resources for other important projects.”
Servers
Server Cost Reduction

- **Eliminate I/O Adapters**
  - Virtual Interface Cards and Unified Fabric
  - Pool and Reduce Hot Spares Using UCSM Service Profiles
  - Eliminate Management Servers
  - Improve Consolidation with Large Memory and Industry-leading Performance

- **Buy Fewer Servers**

---

Provisioning  | Ongoing Administration  | Servers  | Infrastructure and Cabling  | Power and Cooling  | System Management  | Real World TCO Examples
Virtual Interface Cards

Replaces Traditional Approach of Multiple NICs and HBAs per Server: SingleConnect

Over 256 Interfaces vs. 8 to 64 per 2-Port Adapter

Up to 80 Gb Bandwidth vs. 20 Gb

VM-FEX
Eliminating Server I/O Adapters

- Ethernet Management Network Switch
- Ethernet Top-of-Rack Switches
- Fibre Channel Top-of-Rack Switches
- 1 x 1-Gbps Management
- 2 x 1-Gbps Production Data
- 1 x 1-Gbps Production Data
- 1 x 1-Gbps vMotion
- 1 x 1-Gbps VM Console
- 1 x 1-Gbps VMkernel
- 2 x 8-Gbps Fibre Channel

<table>
<thead>
<tr>
<th>Traditional Rack Server</th>
<th>Per Server</th>
<th>Cisco UCS C-Series Rack Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Physical NICs/HBAs</td>
<td>1</td>
</tr>
<tr>
<td>9</td>
<td>Cables</td>
<td>2</td>
</tr>
</tbody>
</table>

Cisco UCS Fabric Interconnects
Cisco Nexus Fabric Extenders
2x 10-Gbps Unified Fabric Data and Management
Buy Fewer Servers

Without UCS Service Profiles:
Silos Individually Provisioned for Peak Demand and Failures
Idle Hotspare Servers Require Application-Specific HW and Firmware Image Configurations

Total Servers: 18

With UCS Service Profiles:
Configure and Provision Bare Metal on the Fly with Application-specific Service Profile Templates
Availability and Burst Capacity Delivered with Fewer Spares

Total Servers: 14

Without UCS Service Profiles:
Silos Individually Provisioned for Peak Demand and Failures
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Total Servers: 14
Buy Fewer Servers
CISCO UCS: 126 WORLD RECORDS

Superior Technology Fueling Industry-leading Application Performance

Superior Performance

- Improved end-user experiences
- Increased business velocity
- Reduced software licensing costs
- Reduced infrastructure footprint

Buy Fewer Servers
CISCO UCS: 126 WORLD RECORDS

Superior Technology Fueling Industry-leading Application Performance

17 Virtualization

Fewer VMware Licenses

$995–$3,495+

$323–$874 Support

Infrastructure and Cabling
Infrastructure Cost Reduction

**ELIMINATE SWITCHES**

Unified Fabric for Blade and Rack Servers

**ELIMINATE CABLES**

Fewer Switches = Fewer Cables
UCS Cabling: Radical Simplification

Traditional Rack: Ad Hoc and Inconsistent

Traditional Blade: Structured, but Siloed and Complicated

Cisco UCS: Simplified

Provisioning

Ongoing Administration

Servers

Infrastructure and Cabling

Power and Cooling

System Management

Real World TCO Examples
Evolution of Complexity

Traditional Rack

Infrastructure

Servers

2 x FC Switches
2 x Enet Switches
2 x Rack Mgrs for 40 Rack Servers

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Evolution of Complexity

Traditional Rack

2 x Enet Switches
2 x FC Switches
2 x Rack Mgrs for 40 Rack Servers

Replicate Complexity for Every 16 Servers

Mini-Rack 1
2 x Enet Switches
2 x FC Switches
16 x Blade Servers
2 x Chassis Mgrs

Mini-Rack 2
2 x Enet Switches
2 x FC Switches
16 x Blade Servers
2 x Chassis Mgrs

Mini-Rack 3
2 x Enet Switches
2 x FC Switches
16 x Blade Servers
2 x Chassis Mgrs

Mini-Rack 4
2 x Enet Switches
2 x FC Switches
16 x Blade Servers
2 x Chassis Mgrs
Eliminating Complexity with Unified Fabric

Complexity in Traditional Environments

- Ethernet
- Fibre Channel
- Management

Provisioning | Ongoing Administration | Servers | Infrastructure and Cabling | Power and Cooling | System Management | Real World TCO Examples
Eliminating Complexity with Unified Fabric

Complexity in Traditional Environments
- Ethernet
- Fibre Channel
- Management

Single, Multi-Protocol Fabric SingleConnect

Real World TCO Examples

Infrastructure and Cabling
Eliminating Complexity with Unified Fabric

- Complexity in Traditional Environments
  - Ethernet
  - Fibre Channel
  - Management

- Single, Multi-Protocol Fabric SingleConnect

- Physically Distributed, Centrally Managed

One Network Fabric
One Network
One Layer
SingleConnect

Provisioning
Ongoing Administration
Servers
Infrastructure and Cabling
Power and Cooling
System Management
Real World TCO Examples
Fabric-Based Infrastructure
BLADE and RACK

SingleConnect

• Common access layer networking model
• Data, storage, and management combined
• Cable for bandwidth vs. connectivity
Blade Infrastructure Costs: Chassis/Switching

BLADE CHASSIS SAVINGS AT SCALE–BLADE SLOT SOLUTION

|Cisco UCS 5108: UCS 5108 chassis with UCS 6248 FI (Two Uplinks per FEX) | HPE c7000: HPE c7000 Plat Chassis with 2x VC Flex Fabric FlexFabric 10Gb/24, OneView | Lenovo Flex: Lenovo Flex Chassis with 2x CN4093 Switches, One Management Node Every Four Chassis, FSM License Each Chassis|

Cisco pricing MSRP on July 06 2016; HPE & Lenovo pricing publically available on June 30, 2016. All pricing is for blade chassis and networking only. Servers are not included.
Unified Fabric: Rack Server Environment

- Ethernet Management Network Switch
- Ethernet Top-of-Rack Switches
- Fibre Channel Top-of-Rack Switches
- 1x 1-Gbps Management
- 2x 1-Gbps Production Data
- 1x 1-Gbps Production Data
- 1x 1-Gbps vMotion
- 1x 1-Gbps VM Console
- 1x 1-Gbps VMkernel
- 2x 8-Gbps Fibre Channel
- 2x 10-Gbps Unified Fabric Data and Management
- Cisco UCS Fabric Interconnects
- Cisco Nexus Fabric Extenders

Infrastructure and Cabling
## Comparison of Rack Server I/O

<table>
<thead>
<tr>
<th></th>
<th>Traditional Rack Server</th>
<th>Cisco Rack Server</th>
<th>Cisco Wins: Deltas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Server</td>
<td>4 Adapters</td>
<td>1 Adapters</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>9 Cables</td>
<td>2 Cables</td>
<td>7</td>
</tr>
<tr>
<td>10 Servers</td>
<td>40 Adapters</td>
<td>10 Adapters</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>90 Cables</td>
<td>20 Cables</td>
<td>70</td>
</tr>
<tr>
<td>50 Servers</td>
<td>200 Adapters</td>
<td>50 Adapters</td>
<td>150</td>
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<tr>
<td></td>
<td>450 Cables</td>
<td>100 Cables</td>
<td>350</td>
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<tr>
<td>100 Servers</td>
<td>400 Adapters</td>
<td>100 Adapters</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>900 Cables</td>
<td>200 Cables</td>
<td>700</td>
</tr>
</tbody>
</table>
Switching and Cabling Savings: Rack Servers
CISCO UCS C240 M4 VS. HPE DL380 Gen9

3-Year TCO

• 39% overall savings
• $14,625 3-year per node overall savings

<table>
<thead>
<tr>
<th>Savings Breakdown</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server hardware and warranty</td>
<td>29%</td>
</tr>
<tr>
<td>Switch hardware and warranty, cabling</td>
<td>75%</td>
</tr>
<tr>
<td>Power and cooling</td>
<td>8%</td>
</tr>
<tr>
<td>Initial provisioning and ongoing server and networking administration</td>
<td>40%</td>
</tr>
<tr>
<td>Systems management software licenses and warranty</td>
<td>100%</td>
</tr>
</tbody>
</table>
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Switch Hardware and Warranty, Cabling: 75%
Switching and Cabling Savings: Rack Servers
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Switch Hardware and Warranty, Cabling: 75%
This graph compares the 3-year TCO for 96 HPE ProLiant DL380 Gen9 Servers with the 3-year TCO for 96 Cisco UCS C240 M4 Rack Servers. Each server has two Intel® Xeon® processor E5-2643v4 CPUs, 256 GB of memory. HPE networking includes six 1 Gigabit Ethernet and two 8-Gbps Fibre Channel connections for the servers and corresponding HPE switches. This is compared with the Cisco VIC 1227 mLOM dual-port 10-Gbps Unified Fabric adapter for Cisco rack servers and corresponding switches. Pricing is as of June 2, 2016.
Average 78% Reduction in Cabling with an Average Cost Savings of 68%

BASED ON 33 AND 9 CUSTOMER CASE STUDIES, RESPECTIVELY

Simplified cable management: With a unified fabric design and integrated network and storage access, the new Cisco Unified Computing System deployment uses 66 percent less cabling.

... Schrey found a key selling point in the system’s unification services, which aggregate server cables including Ethernet and fiber channels. “Multiple fabrics are a lot more costly and can be difficult to manage, so having the unified fabric option was ideal.” Florida Institute of Technology Aviation

Cable management was an ongoing challenge in the previous environment. “With its integrated network and storage access, Cisco UCS required the fewest cables to purchase and manage of any platform we evaluated.”
Power and Cooling
Power and Cooling Cost Reduction

ELIMINATE INFRASTRUCTURE

Unified Fabric for Blade and Rack Servers

Fewer Servers

Fewer Switches

Provisioning  Ongoing Administration  Servers  Infrastructure and Cabling  Power and Cooling  System Management  Real World TCO Examples
Power and Cooling
SYSTEM-LEVEL SAVINGS

• Smaller blade server increments reduces “stranded capacity”
• Fewer adapters to support I/O requirements
• Easier power management with UCS Manager
  • No extra software to buy saving both CapEx and OpEx

• Industry-leading virtualization performance improves server consolidation ratios
• Fewer switches with a Unified Fabric
  • In the chassis and ToR
• Fewer cables for better airflow through the rack
Average 49% Reduction in Power and Cooling Costs
BASED ON 71 CUSTOMER CASE STUDIES

“We funded the implementation of Cisco UCS with an energy efficiency grant from Salix Finance and The Higher Education Funding Council for England. So far, we’ve seen a 10 percent reduction in power usage, and we expect the solution to pay for itself within 12 months.”

The significant electricity, power, and cooling savings that will result from the integration of UCS into its server operations positions MnDOT for eligibility for a significant rebate, dependent on the energy savings that are being monitored for the next two years.

Energy savings, in particular, have been impressive both in terms of reduced power consumption and cooling requirements. Hi3G Access AB
System Management
System Management Software

ELIMINATE SYSTEMS MANAGEMENT LICENSING

UCS Manager Embedded in the Product, No Additional Charge

ELIMINATE MANAGEMENT SERVERS

UCS Manager Runs in the Fabric Interconnects, Accessed via API
## Complexity vs. Simplicity

<table>
<thead>
<tr>
<th>Function</th>
<th>Legacy HPE</th>
<th>Cisco</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local and Remote Administration</td>
<td>iLO/Onboard Administrator</td>
<td>UCS Manager</td>
</tr>
<tr>
<td>Detect Hardware Faults</td>
<td>Systems Insight Manager</td>
<td></td>
</tr>
<tr>
<td>Update System Software</td>
<td>Systems Insight Manager</td>
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<tr>
<td>Inventory Tracking</td>
<td>Systems Insight Manager</td>
<td></td>
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<tr>
<td>Spot Deploy Critical Server Updates</td>
<td>Onboard Administrator</td>
<td></td>
</tr>
<tr>
<td>Virtualized LAN/SAN Connectivity</td>
<td>Virtual Connect</td>
<td></td>
</tr>
<tr>
<td>Multi-chassis Address Server Management</td>
<td>Virtual Connect Enterprise Manager</td>
<td></td>
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<tr>
<td>Logical Server Abstraction</td>
<td>Matrix Operating Environment</td>
<td></td>
</tr>
<tr>
<td>Power Management</td>
<td>Insight Control/iLO</td>
<td></td>
</tr>
<tr>
<td>Required Management Interfaces</td>
<td>7</td>
<td>1</td>
</tr>
</tbody>
</table>

- **Provisioning**
- **Ongoing Administration**
- **Servers**
- **Infrastructure and Cabling**
- **Power and Cooling**
- **System Management**
- **Real World TCO Examples**
UCS Eliminates Management SW Complexity

Legacy HPE c7000
HPE Server Hardware Management; Multiple Layers of Software Required

Virtual Connect Enterprise Manager
- Insight Control
- System Insight Manager

- Virtual Connect Manager
- ILO Advanced for BladeSystem
- Onboard Administrator

No Mixing of Rack and Blade
Separate Management: Every Chassis, All Software
Separate Ethernet and Fibre Channel I/O Leaving the Chassis

Cisco UCS
UCS Manager - One Console, No Added Cost - Blade and Rack

- Up to 160 Blade & Rack Servers
- Unified Management and Unified Fabric

Provisioning
Ongoing Administration
Servers
Infrastructure and Cabling
Power and Cooling
System Management
Real World TCO Examples
UCS Eliminates Management HW Complexity

HPE OneView
HPE Server Hardware Management; Multiple Layers of Software Required

Synergy

Cisco UCS
UCS Manager - One Console, No Appliance
No Added Cost, support for Blade and Rack

Provisioning
Ongoing Administration
Servers
Infrastructure and Cabling
Power and Cooling
System Management
Real World TCO Examples
UCS Eliminates Management SW Complexity

HPE OneView Dashboard

Geo A
- Synergy
- Proliant
- OneView 3.0 Virtual Appliance
- Synergy OneView Physical Appliance

Geo B
- Synergy
- Proliant
- OneView 3.0 Virtual Appliance
- Synergy OneView Physical Appliance

Cisco UCS Central

Geo A
- UCS
- Synergy
- Proliant
- Synergy OneView Physical Appliance

Geo B
- UCS
- Synergy
- Proliant
- Synergy OneView Physical Appliance

HPE Dashboard

Global Policies
Global RBAC
Global Backup & Recovery

Provisioning
Ongoing Administration
Servers
Infrastructure and Cabling
Power and Cooling
System Management
Real World TCO Examples
Extend Reach of SMEs Globally

UCS Manager

Server
Chassis
Domain

Provisioning | Ongoing Administration | Servers | Infrastructure and Cabling | Power and Cooling | System Management | Real World TCO Examples
Extend Reach of SMEs Globally

UCS Manager

UCS Central

Server
Chassis
Domain

Single Data Center
Global Data Centers

Provisioning
Ongoing Administration
Servers
Infrastructure and Cabling
Power and Cooling
System Management
Real World TCO Examples
Real World TCO Examples
When we compared the legacy server and network with one based on Cisco UCS, **TCO effectively halves** over a five-year investment lifecycle.

Dr. Phil Richards  
Director of IT, Loughborough University
Loughborough University

5-Year TCO

- 48% overall savings
- $18,542 5-year per node overall savings

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<tr>
<td>Switch hardware and warranty, cabling</td>
<td>80%</td>
</tr>
<tr>
<td>Power and cooling</td>
<td>49%</td>
</tr>
<tr>
<td>Initial provisioning and ongoing server</td>
<td>79%</td>
</tr>
<tr>
<td>and networking administration</td>
<td></td>
</tr>
<tr>
<td>Virtualization software licenses</td>
<td>39%</td>
</tr>
<tr>
<td>and warranty</td>
<td></td>
</tr>
</tbody>
</table>
Comparison of existing 47 rack servers and associated switching infrastructure plus projected growth transitioning to Cisco UCS B200. 5-year lifecycle. Study conducted May 1, 2012 to July 26, 2012.
Major Travel Services Provider

5-Year TCO

• 39% overall savings
• $11,522 5-year per node overall savings

Savings Breakdown

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</tbody>
</table>
Comparison of existing 482 rack servers and associated switching infrastructure plus projected growth vs. Cisco UCS B-Series. 5-year lifecycle. Study conducted May 2011 to September 2011.
Real Innovation Improves TCO

Traditional Solution

Unified Fabric
- Radical infrastructure simplification
- Efficient scaling
- High performance

Unified Management
- Embedded device management
- Self-integrating
- Stateless
- Automated
- Programmable

UCS Solution

Provisioning
- Infrastructure and Cabling
- Power and Cooling
- Systems Management Software

Real World TCO Examples

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Yvette Kanouff | Senior Vice President and General Manager, SP Business
Joe Cozzolino | Senior Vice President, Cisco Services

Thursday, July 14th, 2016
11:30 am - 12:30pm, In the Oceanside A room

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