Thank you for attending Cisco Connect Toronto 2014, here are a few housekeeping notes to ensure we all enjoy the session today.

- Please ensure your cellphones are set on silent to ensure no one is disturbed during the session
- Please hold all questions until the end of these session to ensure all material is covered
Complete Your Paper Session Evaluation – Wednesday April 16

Give us your feedback and you could win 1 of 2 fabulous prizes in a random draw.

Complete and return your paper evaluation form to the Room Attendant at the end of the session.

Winners will be announced today at the end of the session. *You must be present to win!*

*Please visit the Concierge desk to pick up your prize redemption slip.*

Visit them at BOOTH# 407
Data Center Trends
Cisco’s vision and advantage

Market Transitions

Sustainable Differentiation

INNOVATION

Customer Driven

Services & Solutions

Technology

Biz Models & Capabilities
Model for Next Generation IT

Services
- Consulting Services
- IoE Exchanges
- Platform Services
- Managed Services
- Technical Services
  - Advanced/Professional Services

Unified Platform
- 3rd Party and Open Source EcoSystem
- Business Processes & Enterprise Apps
- IoT Solutions & Industry Apps
- Cisco Video and Collaboration

Infrastructure Platform
- Analytics + Management + Orchestration
- Services Platform – System Applications

Unified Data Center
Core Networking
Access
  - Wired
  - Mobile
Security
Model for Next Generation IT

Cisco’s Innovation Strategy & Roadmap for Unified Data Center

Unified Data Center
Expanding DC and Cloud Networking Portfolio

NEW!

OPEN
- APIs/ Open Source/ Application Policy Model

HIGH PERFORMANCE FABRIC
- 1/10/40/100 GE

SCALABLE SECURE SEGMENTATION
- VXLAN

DELIVERING TO YOUR DATA CENTER NEEDS

- Resilient, Scalable Fabric
- Workload Mobility Within/ Across DCs
- LAN/SAN Convergence
- Operational Efficiency—P-V-C
- Architectural Flexibility

55K+ NX-OS customers
17K+ FEX customers
8.5K+ Nexus 1KV customers
3K+ Fabric Path customers

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N2K – N7K Switching Portfolio Adoption
Cisco Unified Fabric Switching Innovations

SAN
- 12,000+ FEX Customers
- 3,000+ OTV Customers
- 78% 10G Market Share Purpose-Built Fixed Switching

LAN/SAN
- 600,000+ Chassis Shipped
- 3,000+ FabricPath Customers
- 83% 10G Market Share Modular Switching
- 50,000+ Customers

CISCO NX-OS: From Hypervisor to Core
CISCO DCNM: Single Pane of Management
Nexus Switching Portfolio
"I can now move to FabricPath and DFA on the same chassis I bought back in 2008" – Nexus 7000 Customer
Nexus 7000 Series: Simplicity & Lower TCO

Competition

At Least 3 Vendors, 3 OSs, and 3 NMSs
Complexity of Integration and Operations

Compared to

Cisco Nexus® 7000 Series

One OS – Cisco® NX-OS
One Consolidated System

Lower TCO Through Simplicity: One Module, Many Roles
Extending The Cisco Nexus 7000 Series

Cisco Nexus® 7000 Series

Cisco Nexus F3-Series Modules

Common Cisco® NX-OS

Common Fabric Architecture

Common Cisco’s Custom Silicon

Industry’s Most Proven Data Center Switching Platform

9,000+ Customers

45,000+ Chassis

8 Million+ Ports Shipped
## Cisco Nexus 7700 Series Switches

![Diagram showing Cisco Nexus 7700 Series Switches]

### Fabric Bandwidth

- **1.32 Tbps**

### Smaller Footprint

- **33% more compact**

### Environmental Efficiency

- True front-to-back airflow

---

<table>
<thead>
<tr>
<th></th>
<th>Nexus 7718</th>
<th>Nexus 7710</th>
<th>Nexus 7706</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application</strong></td>
<td>Large Spine/Core</td>
<td>Spine/Core/Agg/DCI</td>
<td>Small Core/Agg/DCI</td>
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<tr>
<td>1/10G density</td>
<td>768</td>
<td>384</td>
<td>192</td>
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<tr>
<td>40/100G density</td>
<td>384/192</td>
<td>192/96</td>
<td>96/48</td>
</tr>
</tbody>
</table>

---

Cisco Public
Cisco Nexus 7706 & F3 Modules

- Front-to-Back Airflow
- 2 Supervisors
- 4 I/O Modules
- 4 3-kW Power Supplies
- Maximum Density: 192 x 10-Gbps Ports or 96 x 40-Gbps Ports or 48 x 100-Gbps Ports
- Example of Configuration:
  - Redundant Sups
  - Slot 1: F3-40 (24 40G Ports)
  - Slot 2 and 3: F3-10 (96 10G Ports)
  - Slot 4: Ready for Future Growth

- VDC
- Scalability
- High Availability
- ISSU
- VPC
- FEX
- FabricPath
- DFA
- MPLS
- OTV/LISP
- VXLAN
- FCoE

Cisco Nexus 7706 & F3 Modules
Cisco Nexus I/O Module Evolution

- FabricPath
- FCoE
- Sampled NetFlow
- Layer 2
- Layer 3
- VPLS
- Full NetFlow
- LISP
- MPLS
- OTV
- VXLAN
- DFA

- F3 (2013)
- F2 (2011)
- F1 (2010)
- M2 XL (2012)
- M1 XL (2008)

- Cisco Catalyst® Heritage
- Layer 2 Multipath
- Adding Layer 3
- 10-Gbps Highest Scale
- Introducing 40 and 100 Gbps
- 40 and 100 Gbps at Scale
- M-Series Feature Parity
- Converged Architecture and Scale

- Sampled NetFlow
- Full NetFlow
- Large Tables and Buffers
- Large Tables and Buffers

- Sampled NetFlow
- Full NetFlow
- Layer 3
- LISP
- MPLS
- OTV
- VXLAN
- DFA

- FEX
- Large Tables
- and Buffers
- Large Tables
- and Buffers
- Large Tables
- and Buffers

- Layer 2
- Layer 3
- FEX
- Large Tables
- and Buffers
- Large Tables
- and Buffers

- F3 (2013)
- F2 (2011)
- F1 (2010)
- M2 XL (2012)
- M1 XL (2008)

- Cisco Catalyst® Heritage
- Layer 2 Multipath
- Adding Layer 3
- 10-Gbps Highest Scale
- Introducing 40 and 100 Gbps
- 40 and 100 Gbps at Scale
- M-Series Feature Parity
- Converged Architecture and Scale
F3 Modules: Flexibility & Simplification

Extensive Packet Manipulation*:

- FabricPath and DFA Support
  - Next-Gen Multi-Tenant Fabrics

- OTV, LISP and VxLAN
  - Hardware Overlays for Mobility and Virtualization

- MPLS (Layer 2 and Layer 3 VPNs)
  - High Performance MPLS deployments

- FCoE
  - Converged Network Infrastructure

- Classic Layer2 and Layer3
  **Innovation but also core functionalities**

*Not all features may be enabled at FCS
F3 Module: A Multi-Encapsulation Gateway

- Multi-encapsulation Gateway:
  - VXLAN, NVGRE, MPLS, LISP, VLAN, OTV
- Bridging (L2 Gateway)
- Routing (L3 Gateway)
- Multiple TEPs in independent VRFs
- Nesting of IP overlays into MPLS VPNs
- Available across the product line
VxLAN Support

VXLAN to VLAN Bridging (L2 Gateway)

VXLAN to VLAN Routing (L3 Gateway)

VXLAN to VXLAN Routing (L3 Gateway)
Fabric Relevance to a Hybrid Overlay

- Multicast Services
- Fast Re-route

- Distributed Routing Services

ECMP

L2/L3 Fabric

- IP Mobility Services
- L2 Services
- Overlay aware instrumentation

Overlay HW GWYs & TEPs

Site Demarcation

DCI WAN Integration

Physical

Virtual
Cisco Nexus 5600 & 6000

Nexus 6000
- High 40G Density
- Low Latency
- 100G Uplinks

Nexus 5600
- High 10G Density
- Low Latency
- 40G Uplinks

Nexus 5500
- Flexibility
- 10G Uplinks

Nexus 5010/5020

Fabric Innovations
- Highest Density

Programmability
- VXLAN

Network Visibility
- LAN/SAN Convergence
- FabricPath
- FEX Architecture

CUSTOMER VALUE
- CISCO INNOVATION
- 20K+ Customers Over 5 Years
- 25M+ Ports Shipped
- 125K+ Chassis Shipped
- 75%+ Market Share*
Nexus 5600: Next Generation Nexus 5500

- VXLAN – Bridging & Routing
- Dynamic Fabric Automation
- 40G Uplinks
- Programmability
- Network Visibility
- Lower End-to-end Latency
- Line Rate L3
- Bigger buffers and tables

- Unified Ports
- FEX Architecture
- FabricPath
- FCoE

- 75% Market Share*
- 25 Million Ports Shipped
- 20,000+ Customers
- 125K+ Chassis till date

Nexus 5500

Nexus 5600

Next Generation Nexus 5K
Nexus 5672UP & 56128P
## Nexus 5600 & 6000 Use Cases

### 10G Use Cases

<table>
<thead>
<tr>
<th>Server Connectivity</th>
<th>10G ToR</th>
<th>1G FEX Agg</th>
<th>10G FEX Agg (10G Uplink)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10G</td>
<td>1G</td>
<td>10G</td>
<td></td>
</tr>
<tr>
<td>n/a</td>
<td>10G</td>
<td>10G</td>
<td></td>
</tr>
<tr>
<td>n/a</td>
<td>10G/40G</td>
<td>10G/40G</td>
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</tr>
</tbody>
</table>

### 40G Use Cases

<table>
<thead>
<tr>
<th>10G FEX Agg (40G Uplink)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10G</td>
</tr>
<tr>
<td>40G</td>
</tr>
<tr>
<td>40G/100G</td>
</tr>
</tbody>
</table>

### FEX to Parent

- **Server Connectivity**
  - 10G
  - n/a
  - 10G/40G

### Parent Uplink to Next Layer

- **Server Connectivity**
  - 10G
  - n/a
  - 10G/40G

### Solution

**Nexus 5500, 5600**

- N2K: 2248
- N2K: 2232

**Nexus 6000**

- N2K: 2248PQ
Nexus 2000

2014

2013

2012

100M/1G FEX

1/10G FEX

N2K-C2248PQ
48 port 1/10G FEX SFP+ 4xQSFP

N2K-C2248TP-E-1GE
Expanded Memory FEX

N2K-C2232TM-E-10GE
RJ45 downlinks

N2348UP
48 port 1/10G UP 6 port QSFP

N2348T
48 port 1/10G BaseT 6 port QSFP

N2332T
32 port 1/10G BaseT 8p SFP+

N2348FC
48 port 16G FC 6p QSFP

Blade FEX

B22 FEX
1/10G FEX for HP Blade Servers FTS Blade servers Dell Blade Servers IBM Blade Servers

Indicates Lead Product
Indicates Planning
Indicates Radar

Indicates Radar
40G BiDi Optics

Value Proposition

• Utilize existing duplex fiber commonly deployed in 10G environment today
• Reduce 40G transition cost by eliminating the need to upgrade fiber plant
• 75% average savings over parallel fiber for new deployments

Support

<table>
<thead>
<tr>
<th>Platform</th>
<th>Support Release and Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nexus 7000 M2 40G Module</td>
<td>6.2(6) Q4CY13</td>
</tr>
<tr>
<td>Nexus 7000/7700 F3 40G Module</td>
<td>6.2(6) Q4CY13</td>
</tr>
</tbody>
</table>
Unified Computing System (UCS)
Cisco Unified Computing System
Fastest Growing Product in the Market

30,000+ UNIQUE UCS CUSTOMERS

#2 WW market share in x86 blades

Top 5 Server Vendor

$2B UCS Annualized Revenue Run Rate

More than 75% of all Fortune 500 customers have invested in UCS

3,600+ UCS CHANNEL PARTNERS

90 world record performance benchmarks to date

Source: ¹ IDC Worldwide Quarterly Server Tracker, Q4 2013, February 2014, Revenue Share
Source: ² As of Cisco Q3FY13 earnings results
Customers Have Spoken

**Worldwide**

- UCS #2 with **22.6%**

**Americas**

- UCS #2 with **31.8%**

- UCS momentum is fueled by game-changing innovation; Cisco is quickly passing established players

- UCS x86 Blade servers revenue grew 46% Y/Y in Q4CY13

- UCS #2 in Only Four Years

- Maintained #2 in Americas (31.8%), #2 in N. America (31.8%) and #2 in the US (32.1%)¹

- Maintained #2 worldwide in x86 Blades with 22.6%

Source: ¹ IDC Worldwide Quarterly Server Tracker, Q4 2013, February 2014, Revenue Share
Cisco Unified Computing System
A Differentiated/Revolutionary Approach

Simpler Architecture
- Networking with fewer components
- Lower cost and easier scaling
- Fewer Management Touch Points

Faster, More Flexible
- Automated Deployment / Provisioning
- 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

No Compromises
- No Trade-offs for Function
- Enhanced Design Capability
- Designed for the Future, Today
- Better TCO / ROI

Cisco UCS — Unified Infrastructure, Scalability and Management Automation
Unified Computing Product Innovation
Innovation to Improve Applications

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

**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
Legacy Infrastructure and Management

Legacy Infrastructure Designs

- Infrastructures designed separately – not as a unified system
- Marketed as “converged”, but really management layers on top of multiple infrastructure silos
- Sprawling patchwork of tools, agents and management points

Complexity Drives Up Management Costs

- Rigid models to upgrade and maintain system-level designs
- Multiple tools means multiple points of configuration
- Brittle design with complex inter-dependencies

Eliminating Silos – Fabric Centric Architecture – Single Point of Mgmt.

CISCO UCS
UNIFIED by DESIGN
Traditional Element Configuration

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

- 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

- 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

Compute, LAN, SAN Seamlessly Through Software
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

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

- 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
UCS: Programmable Infrastructure

Extends Abstraction Beyond the Hypervisor to System Elements

Infrastructure Automation Through API and Policy

Truly Elastic
Fully Orchestrated

Workload Defined
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

Net Policy
Storage Policy
Server Policy

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 Is Redefining Server Management

10,000 UCS SERVERS — Monitor and Manage Seamlessly

- Blade and Rack Servers in the same domain – Form Factor Agnostic
- Standards-based XML API presents bidirectional single interface to entire solution
- UCS offers the customers the broadest choice of Cisco or 3rd party management tools
## Simpler Architecture
Fewer Management Touch Points

### 32 blades – 2 x HP c7000

<table>
<thead>
<tr>
<th>Component</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabric Interconnects</td>
<td>0</td>
</tr>
<tr>
<td>Intra Chassis Switches</td>
<td>4</td>
</tr>
<tr>
<td>Chassis Mgmt Module</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total Mgmt Points</strong></td>
<td><strong>8</strong></td>
</tr>
</tbody>
</table>

### 32 blades – 4 x Cisco UCS

<table>
<thead>
<tr>
<th>Component</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabric Interconnects</td>
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</tr>
<tr>
<td>Intra Chassis Switches</td>
<td>0</td>
</tr>
<tr>
<td>Chassis Mgmt Module</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total Mgmt Points</strong></td>
<td><strong>1</strong></td>
</tr>
</tbody>
</table>
Faster, More Flexible - UCS Fast Automated Deployment

Add blades 77% faster

The Cisco UCS solution reduces time (hours:minutes:seconds - lower numbers are better)

1 blade scenario: 1:18:35 (Cisco UCS solution) vs. 0:17:54 (HP solution)
2 blade scenario: 1:23:41 (Cisco UCS solution) vs. 0:18:54 (HP solution)

with 67% fewer steps

Cisco UCS B200 M3 Blade Servers vs. HP BL460c Gen8 Servers

Read the White Paper

Watch the Video
http://www.youtube.com/watch?v=bSSQfNt7SFk

Cisco UCS - Model-based Management with Faster Deployment
More Automation - Fewer Touches Reduces Errors
Reducing Physical Infrastructure: Servers
UCS Compute Portfolio
Performance Optimized for Bare Metal, Virtualized, and Cloud Applications

**Cisco UCS: Many Server Form Factors, One System**
Industry-Leading Compute Without Compromise

### Scale Out
- **UCS C24 M3**: Entry, Expandable Rack Server for Storage Intensive Workloads
- **UCS C22 M3**: Entry Rack Server for Distributed and Web Infrastructure Applications

### Enterprise Performance
- **UCS C240 M3**: Ideal Platform for Big Data, ERP, and Database Applications
- **UCS C220 M3**: Versatile, General Purpose Enterprise Infrastructure, and Application Server

### Intensive/Mission Critical
- **UCS C460 M4**: Mission-Critical, 4-Socket Server for Large, CPU-Intensive Applications
- **UCS B460 M4**: Mission-Critical, 4-Socket Blade for Large, CPU-Intensive Bare Metal and Virtualized Applications
- **UCS B260 M4**: Mission-Critical, 2-Socket Blade for Large, CPU-Intensive Bare Metal and Virtualized Applications

**UCS B22 M3**: Entry Blade Server for IT Infrastructure and Web Applications
**UCS B200 M3**: Optimal Choice for VDI, Private Cloud, or Dense Virtualization/Consolidation Workloads
**UCS B420 M3**: Enterprise Class, 4-Socket Blade for Large, Memory-Intensive Bare Metal and Virtualized Applications
# Cisco UCS Captures 6 World-Record Performance Results with Intel® Xeon® processor E7 v2 Family

## Cisco UCS Server E7- v2 Benchmarks

<table>
<thead>
<tr>
<th>Two-socket Two-node Record</th>
<th>B260 M4</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMware® VMmark® 2.5.1 19.18@16 Tiles¹</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Two-socket Record</th>
<th>B260 M4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base2006 1170 base score</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Two-Socket Record</th>
<th>B260 M4</th>
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</thead>
<tbody>
<tr>
<td>SPECfp_rate_base2006 865 base score</td>
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</table>

<table>
<thead>
<tr>
<th>Two-Socket Record</th>
<th>B260 M4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECompG_base2012 8.91 base score</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Four-socket Record</th>
<th>C460 M4</th>
</tr>
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<tbody>
<tr>
<td>SPECint_rate_base2006 2320 base score</td>
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<table>
<thead>
<tr>
<th>Four-Socket Record</th>
<th>C460 M4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECCompG_base2012 17.9 base score</td>
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</tr>
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</table>


SPEC, SPECint, SPECfp and SPEComp are trademarks or registered trademarks of Standard Performance Evaluation Corporation. VMware VMmark is a product of VMware, Inc.
## Cisco UCS Performance: 90 Records

### Best CPU Performance

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>System</th>
<th>CPU</th>
<th>Memory</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECint_rate_base 2006</td>
<td>Blade Server B200 M1</td>
<td>X86 2-socket</td>
<td>4GB</td>
<td>SPECint_rate_base 2006</td>
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<tr>
<td>SPECint_rate_base 2006</td>
<td>Blade Server B200 M2</td>
<td>X86 2-socket</td>
<td>4GB</td>
<td>SPECint_rate_base 2006</td>
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</tbody>
</table>

### Best Virtualization & Cloud Performance

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>System</th>
<th>CPU</th>
<th>Memory</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMmark 1.x</td>
<td>B200 M1</td>
<td>Overall</td>
<td>2GB</td>
<td>VMmark 1.x</td>
</tr>
<tr>
<td>VMmark 1.x</td>
<td>Blade Server B440 M1</td>
<td>Overall</td>
<td>2GB</td>
<td>VMmark 1.x</td>
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<tr>
<td>VMmark 1.x</td>
<td>Oracle E Business Suite</td>
<td>Overall</td>
<td>2GB</td>
<td>VMmark 1.x</td>
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</tbody>
</table>

### Best Database Performance

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>System</th>
<th>CPU</th>
<th>Memory</th>
<th>Results</th>
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<tbody>
<tr>
<td>SPECjbb2013 MultiJVM</td>
<td>Blade Server B200 M2</td>
<td>X86 2-socket</td>
<td>4GB</td>
<td>SPECjbb2013 MultiJVM</td>
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</table>

### Best Enterprise Application Performance

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>System</th>
<th>CPU</th>
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<th>Results</th>
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<tbody>
<tr>
<td>Oracle E Business Suite</td>
<td>Ex-Large Model</td>
<td>Order-to-Cash</td>
<td>2GB</td>
<td>Oracle E Business Suite XL</td>
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<tr>
<td>Oracle E Business Suite</td>
<td>Medium Model</td>
<td>Payroll</td>
<td>2GB</td>
<td>Oracle E Business Suite</td>
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</tbody>
</table>

### Best Enterprise Middleware Performance

<table>
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<tr>
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<th>System</th>
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<th>Memory</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECompMbase2001</td>
<td>2-socket</td>
<td>B200 M2</td>
<td>2GB</td>
<td>SPECompMbase2001</td>
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</tbody>
</table>

### Best HPC Performance

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>System</th>
<th>CPU</th>
<th>Memory</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td>SPECAppServer 2004</td>
<td>OpenStack</td>
<td>2-node</td>
<td>2GB</td>
<td>SPECAppServer 2004</td>
</tr>
</tbody>
</table>

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Data Acceleration
Decision Time Has Shifted
From Days & Hours to Minutes & Seconds to Real-time

- **Data Analysis**
- **Modeling and Predicting**
- **Real-Time, Operational Analytics**
- **Automated Decision Governance**

- **Strategic Decision Making**
- **Real-time Decision Making**

- 2000
- 2005
- 2010
- 2015+
Bringing Data Acceleration to the Computing Domain

Application performance acceleration is moving from storage to server tier with solid-state memory.

UCS + Cisco UCS Invicta

- Brings scalable solid-state acceleration closer to the application.
- Drives greater application performance for business workloads: Big Data, database, etc.
- Seamlessly fits into UCS eco-systems.

New Innovation Zone

From: Fast storage
To: Scalable, persistent memory
Cisco UCS Invicta Series

UCS Invicta Appliance

First release:
250,000 IOPS
1.9 GB/s Bandwidth
Up to 24 TB RAW

Using Invicta OS 5.1.0

UCS Invicta Scaling System

First release:
Up to 1.3 Million IOPS
Up to 13.2 GB/s Bandwidth
Up to 240TB RAW

✅ Scalability
✅ Modularity
✅ Application Acceleration
✅ Data Optimization
✅ Multiple Workloads
✅ Tuning-Free Performance
UCS Ecosystem
UCS Solution Ecosystem

Vertical Solution Focus
- Healthcare
- Financial Services
- Manufacturing
- Retail

Applications
- Enterprise Apps
  - Oracle
  - SAP
  - PeopleSoft
  - SharePoint
  - Exchange
- Databases
  - Oracle
  - SQL Server
  - MySQL
  - Greenspan
  - HANA & BWA
  - Redgate
  - MySQL
  - Paradox
- Business Analytics/Big Data
  - SAP
  - HANA & BWA
  - SAS
  - Microsoft
  - VMware
- Virtual Desktop
  - Citrix
  - VMware
  - Microsoft

Management
- Cisco
- BMC Software
- Microsoft
- VMware
- SolarWinds
- DynamicOps
- CA
- Cloudera
- Symantec
- IBM
- HP
- Citrix
- Zenoss
- Emulex

Operating System and Hypervisor
- Windows Server 2008 R2
- SUSE
- VMware
- Oracle
- Citrix

Integrated Solutions
- Vblock
- VSPex
- FLEXPOD
- RISC Migration
## Cisco’s Building Relationships

### SAP
- Cisco and SAP deliver first HANA references (Medtronic, Maple Leaf)
- Cisco IT one of first major tech firms to deploy SAP HANA internally

### Microsoft
- Deliver three levels of Fast Track private cloud solutions
- Companies driving joint GTM with top partners

### Oracle
- Oracle announces #1 benchmarks on Cisco UCS in 2010, 2011
- Oracle taps Cisco as first validated partner for NoSQL big data solution
- John Chambers delivers #1 rated keynote at Oracle OpenWorld

### NetApp
- Cisco works with NetApp with FlexPod. FlexPod Premium Partners; Over 1000 customers worldwide

### EMC and VMware
- Cisco works with EMC on VSPEX and VCE on Vblocks to deliver reference architectures and fully integrated solutions

### RHEV
- RHEV integrated with UCS VM-FEX: Open source virtual networking
- Red Hat Storage on C-Series

### Red Hat
- XenDesktop and XenServer performance and density with UCS
- Public and private cloud solutions with UCS and CloudPlatform deployed globally in enterprise and service provider data centers
Cisco and EMC: Three Paths to Address Customer Needs

**Build Your Own**

- SAP HANA Solution
- Oracle DB/App Solution
- Data Warehousing Solutions

**VSPEX**

- **SMB Server Virtualization**
  - 500 and 199 VM Configs

- **Midrange Server Virtualization**
  - 125 and 250 VM Configs

- **Midrange End User Computing**
  - XenDesktop and VMware View and Configs (500 to 2000 Seats)

**Vblock**

- **System 100**: Branch Office
- **System 200**: Midmarket
- **System 320/720**: DC/SP

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Presentation_ID

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Cisco Public
FlexPod Evolution

**FlexPod**
- Validated Reference Architectures for Virtual Infrastructure and VDI
- Oracle Database and Applications

**FlexPod Data Center (N5K)**
Launched in 2010
Midmarket for Virtualized Infrastructure

**FlexPod Express**
**Designed for:**
- SMB and Midrange Server
- Virtualization
- Branch Office

**ExpressPod**
Launched in 2012
SMB and Midsized Companies

**FlexPod at Scale**
- Multisite Solution for Business Continuity
- Nexus 7K Option for Larger DC
- Scale and Service Provider Segments

**FlexPod Multisite**
Multisite and Large Data Centers
Uniquely Cisco: Enterprise Applications

**Enablers**

- Seamless Scale
- No Single Point of Failure
- Top Performance
- Bare Metal or Virtualized

**Focus Areas**

- Oracle Database, Apps, and Middleware
- SAP Business Suite (ERP, CRM, etc.)
- Microsoft SQL, Exchange, SharePoint
Cisco’s Approach With Big Data

Uniquely Cisco

- Architecture: Modular architecture common across different domains
- Management: Simplified and centralized management across domains
- Performance: Industry-leading performance and scalability with UCS rack-mount servers and 10G flexible networking
- Time to value: Rapid, consistent deployment with reduced risk
- Support: Enterprise-class service and support

Consumption Options

1. Big data bundles
2. Joint “NOSH” solution with NetApp
3. Exclusive with Oracle NoSQL
4. RA/papers with key partners
Cisco Provides Foundation for IaaS

**Today’s Infrastructure:**
Admins With CLI/ GUI

- Portal and Service Catalog

**Tomorrow’s Infrastructure:**
Programmers and APIs

- Business Support Systems
  - Chargeback
  - Asset Tracking

- Operational Support Systems
  - Monitoring
  - Config/Compliance
  - Provisioning
  - Performance Mgmt

**Infrastructure-as-a-Service Business Logic**

- Compute and Access Layer
- Core Network, WAN, Network Services
- Storage Arrays
UCS Driving Business Value for Customers

Reduced end of game processes from **hours** to **15 minutes**, saving on payroll costs

Reduced provisioning times from **12 weeks to 10 minutes** in Australia

Saved each clinician at least **45 minutes** per day through fast application performance

Reduced management costs per server from **$1574** to **$80** and the efficiencies provided by UCS freed up **10 hours weekly, per person**

Reduced the time to provision new servers from **two to three days** to just **minutes**
## Cisco Unified Computing System

**Benefits Beyond Efficiency: More Effective IT**

<table>
<thead>
<tr>
<th>Single Unified System</th>
<th>Eliminates cost manual integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unified Management</td>
<td>Consistent, error free alignment of policy, configuration, and workload</td>
</tr>
<tr>
<td>Intelligent Infrastructure</td>
<td>Automates IT processes to support any workload in minutes</td>
</tr>
<tr>
<td>Unified Fabric</td>
<td>Lower infrastructure cost per server Operational integration of physical &amp; virtual</td>
</tr>
<tr>
<td>Server Innovations</td>
<td>Superior price/performance and IT productivity for lower cost of computing</td>
</tr>
</tbody>
</table>
Cisco Unified Computing System (UCS)
Changing the Economics of the Data Center

NEW
Existing Maintenance Budget
100%

No Additional Budget
Maintenance Now
40-50%

Questions?
Thank you