Agenda

- UCS Direct Attached Storage Options
- Cisco Converged Infrastructure Solutions
- Cisco High Density Storage Server
- Integrated Infrastructure for Big Data
- UCS Invicta
Direct Attached Storage Options
UCS M4 Blade Servers

An uncompromised combination of CPU, Memory, IO, and expansion capabilities in a modular blade form-factor

- Flexible Storage Options
- SAS HDD Options
- SAS/SATA SSD Options
- FlexFlash SD Card for Booting
- PCIe attached Flash Drives
- All Managed by UCSM

UCS B200 M4
Density-Optimized
Enterprise-Class, Blade Server

- Two Intel® Xeon® E5 family processors
- 24 DDR4 DIMM Slots
  Up to 2133 MHz speeds
- Cisco FlexStorage Controller / Cache / Media Options
- Up to 80GbE of I/O
  One PCIe 3.0 mezzanine slot
- Modular LOM (mLOM)
  3rd Generation VIC
Cisco UCS M4 Rack Servers

A modular blend of CPU, Memory, Storage, IO and expansion capabilities in a 2RU form-factor

- Multiple RAID Controllers, with Write Cache Options
- SFF, LFF Server Version
- SAS HDD Options
- SAS/SATA SSD Options
- FlexFlash SD Card for Booting
- PCIe attached Flash Drives
- All Managed by UCSM

Two Intel® Xeon® E5 family processors | 24 DDR4 DIMM Slots Up to 2133 MHz speeds | Security Bezel Optional | Six PCIe 3.0 Slots Four Full / Full - Four NCSI | Modular LOM (mLOM) VIC or CNA Options | Cisco FlexStorage Up to 24 SFF or 12 LFF +2 SFF boot drives

© 2013-2014 Cisco and/or its affiliates. All rights reserved.
Cisco Converged Infrastructure Solutions
Cisco UCS: Foundation for Integrated Infrastructure
Cisco is #1 and a Partner in ~50% of All Integrated Infrastructure Solutions

Integrated Infrastructure Market Share
(Q4 2014 vendor revenue)

- Cisco UCS 50.4%
- EMC 16.9%
- HP 16.0%
- Lenovo 5.5%
- Hitachi 2.4%
- Dell 6.6%
- Others 2.2%

With Cisco UCS

- 28.6% Cisco/Net App
- 21.8% VCE

Source: IDC Worldwide Integrated Infrastructure & Platforms Tracker Q4 2014 Vendor Revenue

Cisco is exclusive in the top 2 solutions – Vblock and FlexPod
Cisco Converged Infrastructure Vision

- **Cisco captured the vision of Converged Infrastructure 5 years ago**
  - Cisco based Converged Infrastructure solutions lead the industry
- **Bring the same simplicity model to all Converged Infrastructure solutions**
  - Not dependent on a specific storage type (Physical, SdS, HCI, or All Flash)
Cisco Converged Infrastructure

- Pretested and preconfigured bundled solutions, acting as whole, consisting of **compute**, **network**, **storage**, and **management** software.
- Provide platform to meet customer challenges and growing infrastructure demands
- Consistent, financially efficient, operationally simplified, independently scalable solution
- Rapidly deployable, allows granular upgrades

**Customer Challenges & Infrastructure Demands**

- Proliferation of applications; Need for any application on any device
- Roll out new and/or business critical database applications quickly & consistently
- Single system operation – Reduced infrastructural and management complexity
- Add capacity and storage when needed
- Accelerated implementation
- Streamlined support

---

Cisco UCS
UCS Director
Cisco Nexus

© 2013-2014 Cisco and/or its affiliates. All rights reserved.
Cisco Converged Infrastructure

- Open Eco-System with industry leading partners
- Example of compelling partners (EMC, Netapp, IBM, Hitachi, Nimble)
- Cisco Validated to minimize business risk
- Delivered with all of the programmatic and operational benefits of Cisco UCS
  - Unified Management
  - UCS Director integration
  - Unified Fabric
Converged Infrastructure Support – Coordinated Model

Cisco Solution Support Services (SSPT)

1. Access a team of Cisco DC Infrastructure experts who are ready to lead in resolution of any issues found within the supported infrastructure.

2. Providing Solution expertise and Coordinating support actions required by any product support team.

3. The Solution Support team will work with you to get your issue resolved, regardless of where that issue leads or who needs to be involved in resolution.
Cisco High Density Storage Server
UCS C3000 Rack Server Family

Shared Local Resources
Designed for large unstructured data repositories, media streaming and content distribution

Compute Resources

Full-Featured Two-Socket Xeon Server
Stand-alone CIMC Management

Storage Resources

Massive Local Storage
Up to 240TB (with 4TB HDD) @ and 360TB (with 6TB HDD) of dense storage in a compact 4U Form Factor that fits in a standard rack
Capacity Optimized Server
UCS C3000 Series Rack Server Family

C3160 Rack Storage Server

- High-density local disk combined with modular high-performance compute
- Dual processor server with up to 360TB in a compact 4U Form Factor

Bare Metal and Virtualization

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

Single/Dual Server
- Dual CPU Socket per server

Up to 1TB Memory
- 512GB per Server

Dual Modular LOM (mLOM)
- Multiple Connectivity Options

4GB RAID Cache
- Enterprise Storage Features

Up to 64 Drive Bays
- 60 LFF, plus 4 SFF

Security Bezel
- Optional

*Dual Server Model Available 2HCY15
## Use Cases for the UCS C3000 Server Family

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Providers, Enterprise, Cloud</td>
<td>Cisco UCS C3160</td>
</tr>
<tr>
<td>Object Store</td>
<td>openstack, ceph</td>
</tr>
<tr>
<td>Media Streaming and Content Distribution</td>
<td>CentOS, Red Hat</td>
</tr>
<tr>
<td>Service Providers</td>
<td></td>
</tr>
<tr>
<td>Enterprise</td>
<td></td>
</tr>
<tr>
<td>Exchange</td>
<td>Microsoft Exchange</td>
</tr>
<tr>
<td>Service Providers, Enterprise</td>
<td></td>
</tr>
<tr>
<td>Big Data and Analytics</td>
<td></td>
</tr>
</tbody>
</table>
Integrated Infrastructure for Big Data
Like Linux, different companies take a base of open code, add differentiated value to make a profit from selling the public software.
Cisco Common Platform Architecture (CPA) for Big Data

Pre-tested and pre-validated configuration

Fabric-based infrastructure integrates computing, networking, and storage resources

Programmability accelerates infrastructure deployment, automates management

Designed for high performance and availability to accelerate delivery of insights, with a lower TCO

UCS Manager

UCS 6200 Series Fabric Interconnects

LAN Management

Optional Nexus 2232 Fabric Extenders

LAN/Server Management

UCS 240 M4 Servers
Easily Scale Cisco UCS CPA for Big Data

- **SINGLE RACK**
  - 16 Servers

- **SINGLE DOMAIN**
  - Up to 10 Racks, 160 Servers

- **MULTIPLE DOMAINS**

UCS Manager

UCS Central / UCS Director Express for Big Data
Solutions – 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** to Hadoop Infrastructure
Cisco UCS Invicta
A Lack of Performance Forces Trade-Offs

With HDDs You’re Always Trading Performance for Protection or Vice Versa

- **DATA PERSISTENCE**
  - FASTEST PERFORMANCE
  - HIGHEST PROTECTION
  - COST

- **RAID**
- **RPMs**

© 2015 Cisco and/or its affiliates. All rights reserved. Cisco Confidential
Trade-offs Are Complex and Inefficient

3 TYPES OF DRIVES, 3 TYPES OF RAID

1,000 Persistent Desktops will require:
< 10TB of capacity
~80K backend IOPS

TOTAL IOPS: 114,950
TOTAL CAPACITY: 63.2 TB

Reference Architecture for 1,000 Desktops
Maximizing Data Center efficiency

Dollars per IOPS

- 2.5" SAS 10K
- 2.5" SAS 15k
- 2.5" Enterprise SSD
- PCIe Flash

Lower is better

IOPS per Watt

- 2.5" SAS 10K
- 2.5" SAS 15k
- 2.5" Enterprise SSD
- PCIe Flash

Higher is better
The Use Case for Flash Memory
Is Faster Applications

Application Performance

SLOW
24 HDDs
4,500 IOP, Milliseconds

FAST
24 Hybrid HDDs
12,750 IOPS, Milliseconds

HYPER-FAST
24 SSDs
290,000 IOPS, Fractions-of-Milliseconds
UCS Invicta Appliance
Primary Advantages and Use Cases

UCS Invicta Appliance
Up to 290,000 IOPS*
1,160 MB/s Bandwidth
Up to 24 TB RAW
FC & iSCSI

*100% 4k Random Reads

✔️ VDI – Non Persistent
✔️ 2MB – 5TB OLAP
✔️ Batch Reporting
✔️ Data Optimization
✔️ Multiple Workloads
✔️ Tuning-Free Performance
Cisco UCS UCS Invicta Appliance
Faster Applications = Faster Business Operations

- Analytics and Intelligence
- Virtual Desktops
- Image and Media Applications
- Batch Processing
- Database Loads
- OLTP

OLTP

© 2015 Cisco and/or its affiliates. All rights reserved. Cisco Confidential
UCS Invicta Appliance
Operating Modes and Performance

UCS | UCSD

INVICTA OS OPERATING MODES

HIGH PERFORMANCE

DATABASES

REDUCE QUERY TIME

REDUCE BATCH TIME

DATA REDUCTION

VDI

IMPROVE USER EXPERIENCE
Summary
UCS Integrated Infrastructure Strategy

Bringing the same simplicity model to ANY storage type

- Cisco Converged Infrastructure
- Software Defined Storage (SdS) Hyper-converged Infrastructure
- Cisco Storage Products: UCS Invicta / Colusa
- Application specific Infrastructure
- Big Data Analytics

Cisco Confidential
Thank you.