Automated Virtualization
Where YOUR IT Budget Goes?

Traditional server architectures are not designed to support virtualized environments...

Why Virtualize?
Change the Business Value Contribution

Cost per VM hour
(2GB instance)

Increase utilization

Increase automation

Utilization

30% 35% 40% 45% 50% 55% 60% 65% 70% 75% 80%
What is on YOUR mind today?

When you think of virtualization…

- How can I lower my total cost of ownership including management?
- How can I lower my Oracle Database licensing and support costs?
- Can I maintain performance when running on a hypervisor?
- Can I easily add system resources to a virtual machine?
- Do I choose Oracle VM or VMware?
First,

Let’s Look at Server Architecture Specifically Designed for Virtualized Workloads
Cisco UCS – Designed for Virtualized Workloads

UCS Manager

Fabric Extenders (I/O modules)

XML API
STANDARD API’S

Industry
Standard APIs

FABRIC INTERCONNECTS
Cisco UCS 6296 XP

COMPUTE
Blade Form Factor

Rack Form Factor

Intel Xeon®
Cisco UCS—Reducing Complexity

- **Embed management**
- **Remove unnecessary:**
  - Switches
  - Adapters
  - Management modules
  - 10GbE unified fabric

- **Power and cooling**
  - 1/3rd less infrastructure
  - Lower power

- **Built for virtualisation**
  - Processor density
  - VM/host ratio
  - I/O improvement
  - Extended memory
Fibre Channel Over Ethernet

CEE provides the lossless infrastructure

- Mapping of FC Frames over Ethernet
- Enables FC to Run on a Lossless Ethernet Network

**FCoE Benefits**

![Diagram showing FCoE traffic mapping and benefits]

- Fewer Cables
  - Both block I/O & Ethernet traffic co-exist on same cable
- Fewer adapters needed
- Overall less power
- Interoperates with existing SAN’s
- No Gateway - Stateless
UCS Fabric Topologies: Chassis Bandwidth Options

- Wire once architecture
- All links active

20G per Chassis
40G per Chassis
80G per Chassis
160G per Chassis

UCS 1.0
UCS 2.0
Cisco 1280 VIC Adapter
Presents up to 116 Interfaces to the OS—NICs or HBAs

UCS 6248
Fabric Interconnect A

Fabric Extenders (2208)

Physical Port 1
Physical Port 2
Physical Port 3
Physical Port 4

UCS 6248
Fabric Interconnect B

Fabric Extenders (2208)

Physical Port 5
Physical Port 6
Physical Port 7
Physical Port 8

1280 VIC Mezzanine Adapter

vNIC 1
vNIC 2
vNIC 3
vNIC 4
vNIC 5
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vNIC 9
vNIC 10
vNIC 11
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vNIC 116

vHBA 1
vHBA 2

OS
Service Profiles
Workloads Easily Move to Align With System Resources

Benefits For Oracle Users
• Enables consistent setup, reduces service calls and downtime
• Add new instance in minutes, not hours or days
• Immediately test if workload is CPU or memory constrained
• Automatically load profile when new server added to system
• No LAN, SAN Zoning or any reconfiguration
Cisco is a Leader in the 2013 Gartner Magic Quadrant for Blade Servers

Read the Full Report here:
Gartner 2013 Magic Quadrant for Blade Servers

By Andrew Butler and George J. Weiss, G00250031, April 29, 2013, © 2013 Gartner Inc

This graphic was published by Gartner, Inc. as part of a larger research document and should be evaluated in the context of the entire document. The Gartner document is available upon request from Gartner 2013 Magic Quadrant for Blade Servers.

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Customers Have Spoken

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

UCS x86 Blade servers revenue grew 35% Y/Y in Q1CY13\(^1\)

UCS #2 in Only Four Years

Maintained #2 in N. America (27.9%) and #2 in the US (28.3%)\(^1\)

Advanced to #2 worldwide in x86 Blades with 19.3%

Source: \(^1\) IDC Worldwide Quarterly Server Tracker, Q1 2013, May 2013, Revenue Share
Now,

Let’s consider VMware…
Single VM Scalability

- Grow size of virtual machines
- By Adding vCPU and memory
- Database size constant
- Number of users constant
- Measure transaction rate

### Single VM scaling with increasing vCPUs

<table>
<thead>
<tr>
<th>Number of vCPU's / VM</th>
<th>Database Size Per VM</th>
<th>Number of concurrent users Per VM</th>
<th>Memory Per VM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1.1 TB</td>
<td>300</td>
<td>8 GB</td>
</tr>
<tr>
<td>4</td>
<td>1.1 TB</td>
<td>300</td>
<td>16 GB</td>
</tr>
<tr>
<td>6</td>
<td>1.1 TB</td>
<td>300</td>
<td>24 GB</td>
</tr>
<tr>
<td>8</td>
<td>1.1 TB</td>
<td>300</td>
<td>32 GB</td>
</tr>
</tbody>
</table>
Increase number of VMs on B200 Blade

Easily Consolidate Five Databases - With Excellent Performance

Unique to UCS For VMware – Hypervisor Bypass

High Performance IO for Blade Servers
- Industry’s first 80 Gbps to the blade solution

High Performance IO for Virtual Machines
- Virtualise high performance workloads

Software Switch
VM-FEX (Hypervisor Bypass)

Application Performance
- Up to 15% more performance (database workload)

Throughput
- Up to 10% more throughput at 30% lower CPU utilisation compared to a software switch

Latency
- Up to 40% lower end-to-end latency than a software switch

*All performance results shown (throughput, latency, server consolidation) were measured on Cisco UCS B200 M2 Servers using Cisco M81KR VIC and VMware ESXi 5.0. Microsoft SQL Server 2008 R2 database was used for Server consolidation. Results measured at Cisco labs, Dec 2011.

**VM-FEX is already available for Red Hat and VMware hypervisors, will ship with Windows Server 8 platform for HyperV
Oracle License/Support Savings
Oracle Enterprise Edition is $47,500/core!

Current Configuration

Five Servers

Four 4-core servers
16 cores Total

$ 760,000 Oracle License

VMware Consolidation

UCS B440 M2

$ 760,000
+ VMware

License Savings

$ 3,040,000

Additional Savings

- Oracle Support - $668,800/year
- Server HW Support
- Power
- Management
- Space

$ 3,800,000 Total Oracle License
FlexPod Datacenter for Oracle RAC Database on VMware

Oracle RAC Consolidation:
5 Blades
2 Socket/4-core blades
$81,500/core Oracle License

Five 2-node RAC Databases
With Oracle Partitioning

Total Savings of:
Licenses = $2,608,000
Support/Year = $573,760
“The Cisco UCS distinguishes itself for hosting virtualized Oracle applications because of its high RAM capacity…

Our experience is that performance issues in multi-customer environments result from memory constraints, not processor constraints…

Roger Schwanhausser,
Senior Vice President,
NaviSite, Inc

“Before, we adapted our business processes to the constraints of the computing system. Now the Cisco Unified Computing System is lifting that barrier.”

Bob Rudy
Chief Information Officer
Avago
Now,

Let’s consider Oracle VM…
Oracle VM Templates
Optimized for Rapid Oracle Application Deployment

Move Oracle Workloads to Oracle VM Quickly and Easily – in just a couple hours!

Evaluator Group Lab Validation: "Oracle VM – Quantifying The Value of Application-Driven Virtualization"
Oracle VM—Enables Sub-Capacity Pricing

- Allows customer to only license the number of CPU or sockets being utilised ($47,500 per core for DB)
- Customer can save support fees by shifting from older servers to an Oracle VM partition

Oracle VM Hard Partitioning Paper:
**FlexPod Datacenter for Oracle RAC Database on Oracle VM 3.1.1**

**Solution Hardware**
- 2 x Cisco UCS 5108 Chassis
- 4 B200 M3 Servers
- 2208XP Fabric Extenders
- 2 x Cisco UCS 6248 up Fabric interconnects
- 2 x Nexus 5548 up
- NetApp 3270

**Software Stack**
- Cisco UCS firmware 2.1(1a)
- Data ONTAP 8.1.2
- OVM Server 3.1.1
- Guest OS - Oracle Linux 6.2
- Oracle RAC – 11.2.0.3
Deployment Architecture
Oracle JD Edwards on Oracle VM with EMC VNX 5300

Solution Hardware
• 1 x Cisco UCS 5108 Chassis
• 6 B200 M3 Servers
• 2248 Fabric Extenders
• 2 x Cisco UCS 6248 up Fabric interconnects
• 2 x Nexus 5548 up
• VNX 5300

Software Stack
• Cisco UCS firmware 2.1(1a)
• JDE E1 9.0.2 with 8.98.4.10 Tools Release
• Weblogic 10.3.6
• OVM 3.1.1 (2.6.39-200.1.1.el5uek) (Build 612)
• Guest OS – Oracle Linux 5.8 – (using PVM) (2.6.18-308.el5xen/2.6.32-300.10.1.el5ue)
• Oracle RAC – 11.2.0.3
• Loadrunner 9.5
Who is running Oracle VM on Cisco UCS?

“Our decision to consolidate workloads using Oracle VM powered by Cisco UCS we see as the first step on the road to our private cloud environment. We are excited to be partnered with Cisco and Oracle in this effort.”

James White
Senior Solutions Architect

“Our clients want the lowest-cost solution but need the highest availability. It sounds a little counterintuitive, but with the Cisco UCS platform, we’re able to deliver that high performance and still yield cost savings.”

Secure-24
Benefits of Cisco UCS for Oracle Virtualization

**LIMIT ORACLE DB LICENSE COST**
- Sub-Capacity Pricing and server consolidation lowers YOUR license/support costs!

**UNIFIED FABRIC**
- Reduce investment and on-going support costs, cable up UCS one time and never touch cable again, 10GB bandwidth enables quick VM movement.

**CONVERGED ARCHITECTURE**
- NetApp or EMC – Select the storage you want to run your business on.
  The choice is YOURS, choose wisely!

**SCALABILITY & PERFORMANCE**
- 27 #1 Oracle based benchmarks

**DESIGNED FOR VIRTUALIZATION**
- VMware or Oracle VM – Leverage best extensive memory capacity, architecture designed specifically for virtualized workloads.
Thank you.