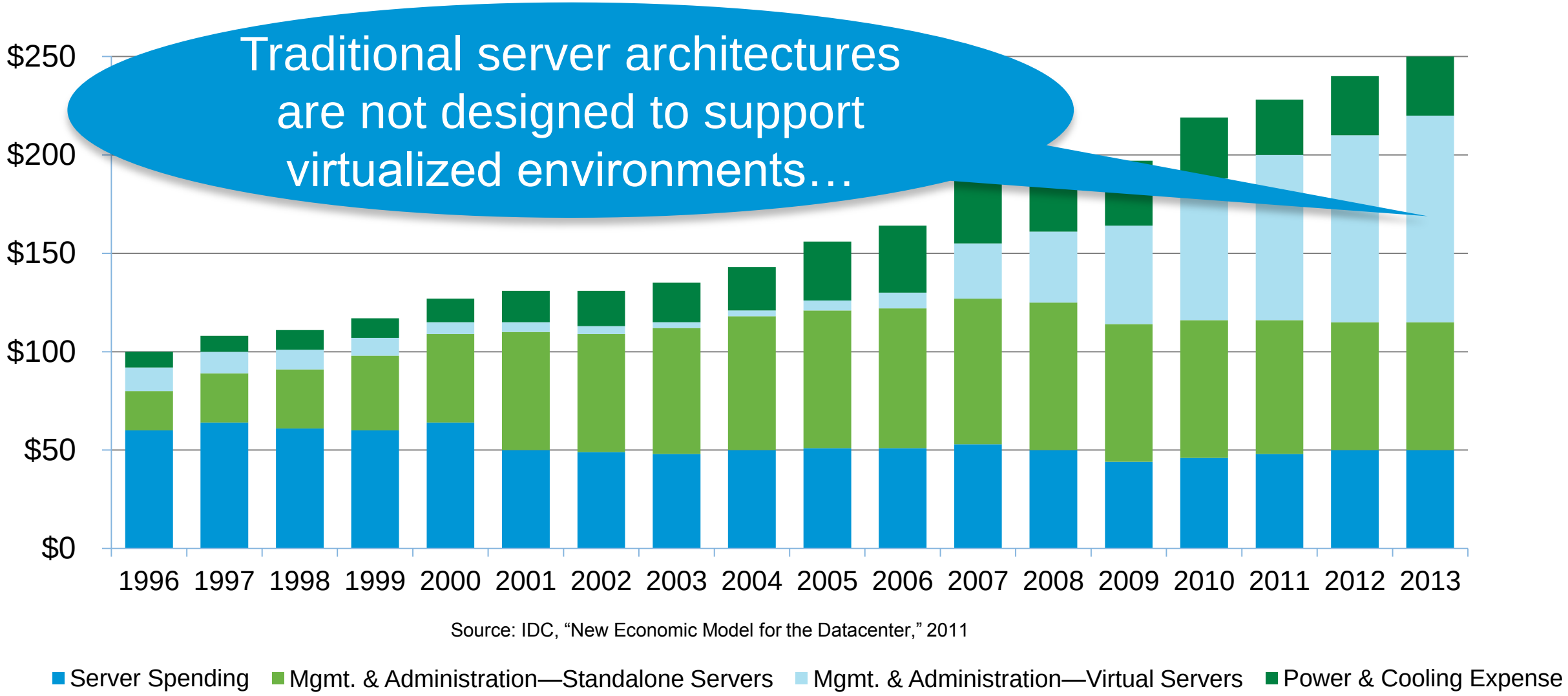
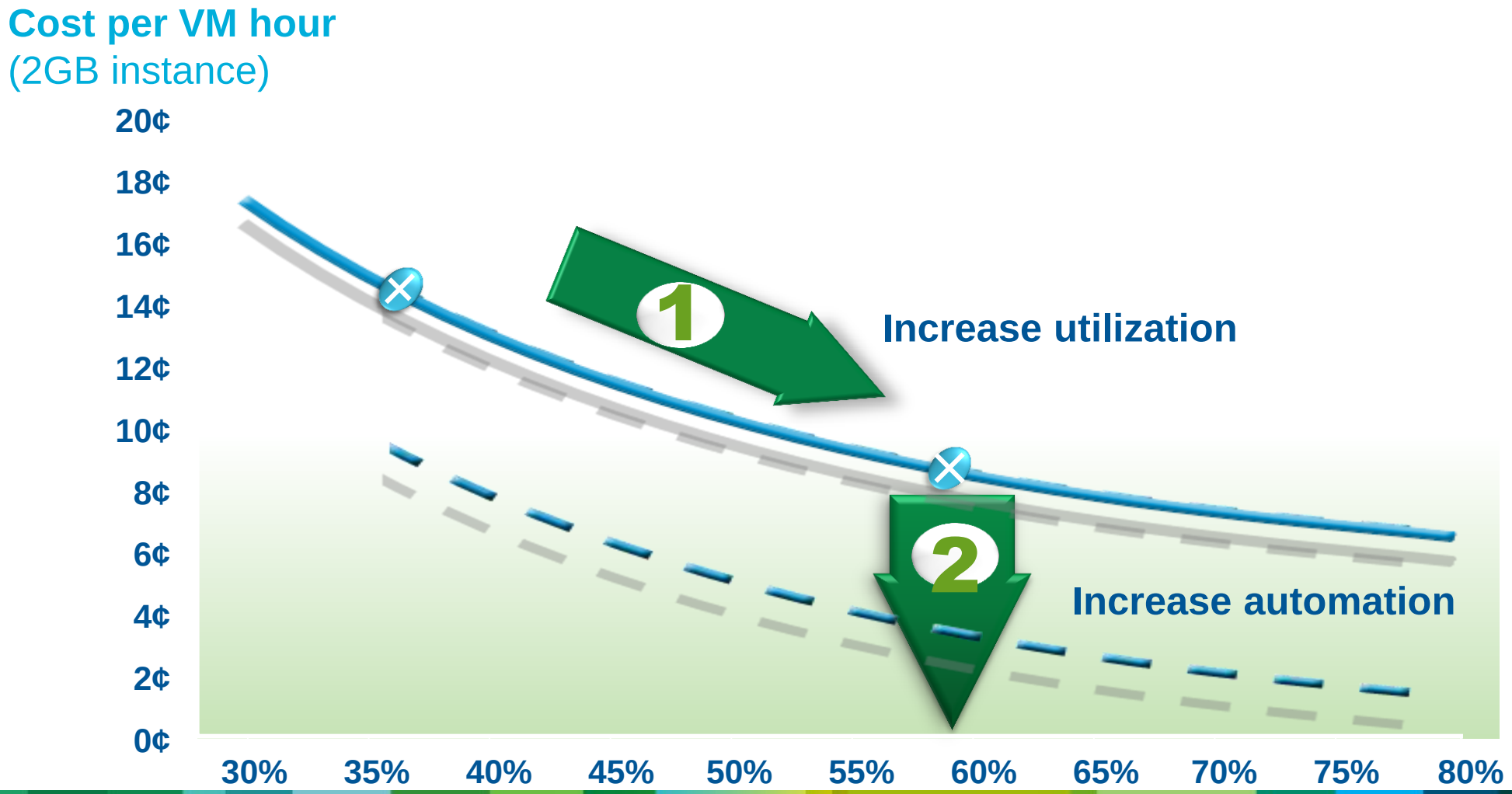
Automated Virtualization

Where YOUR IT Budget Goes?



Source: IDC, "New Economic Model for the Datacenter," 2011

Why Virtualize?
Change the Business Value Contribution



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 ower 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

Industry Standard APIs

UCS Manager

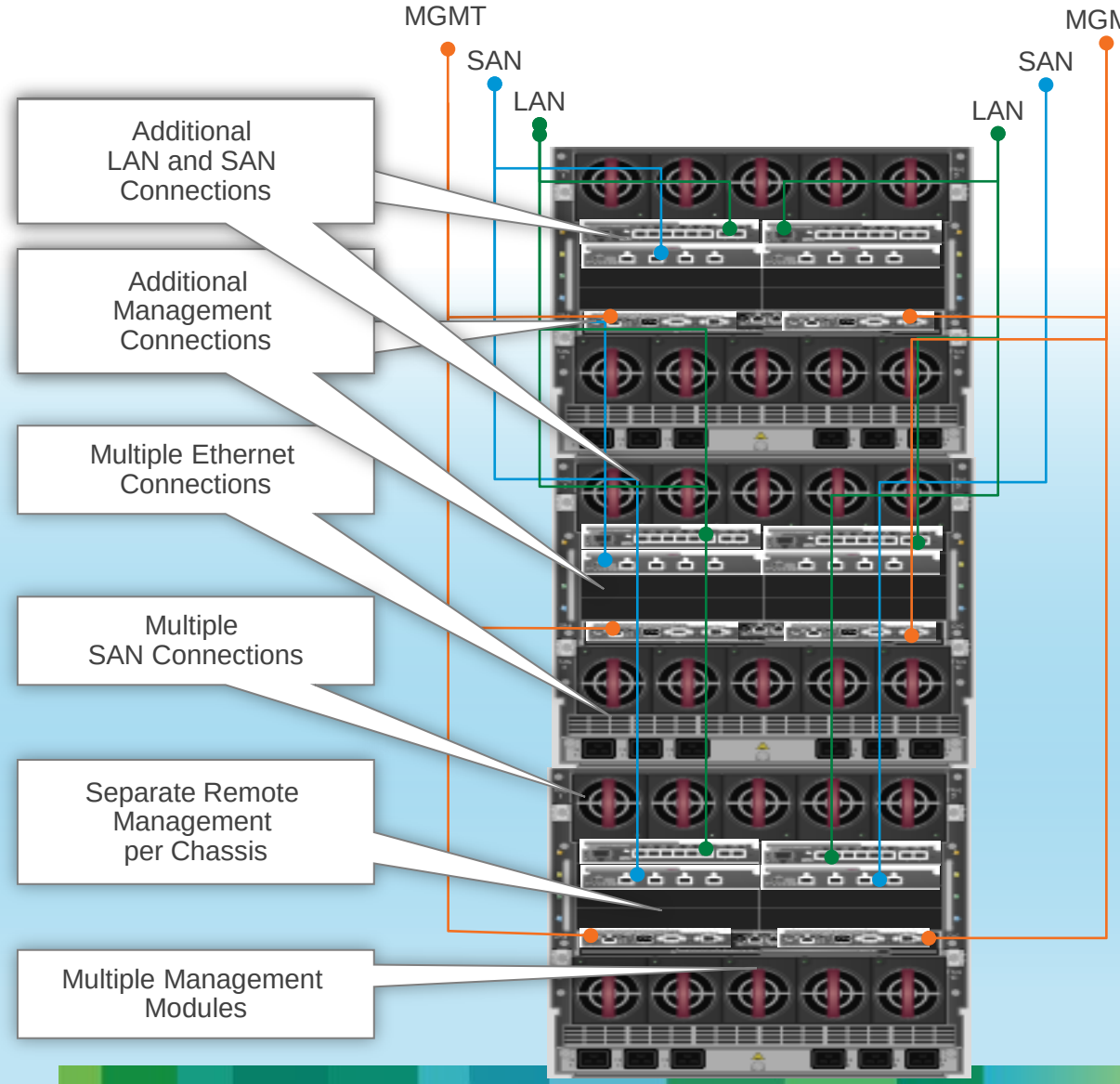
FABRIC INTERCONNECTS
Cisco UCS 6296 XP

Fabric Extenders
(I/O modules)

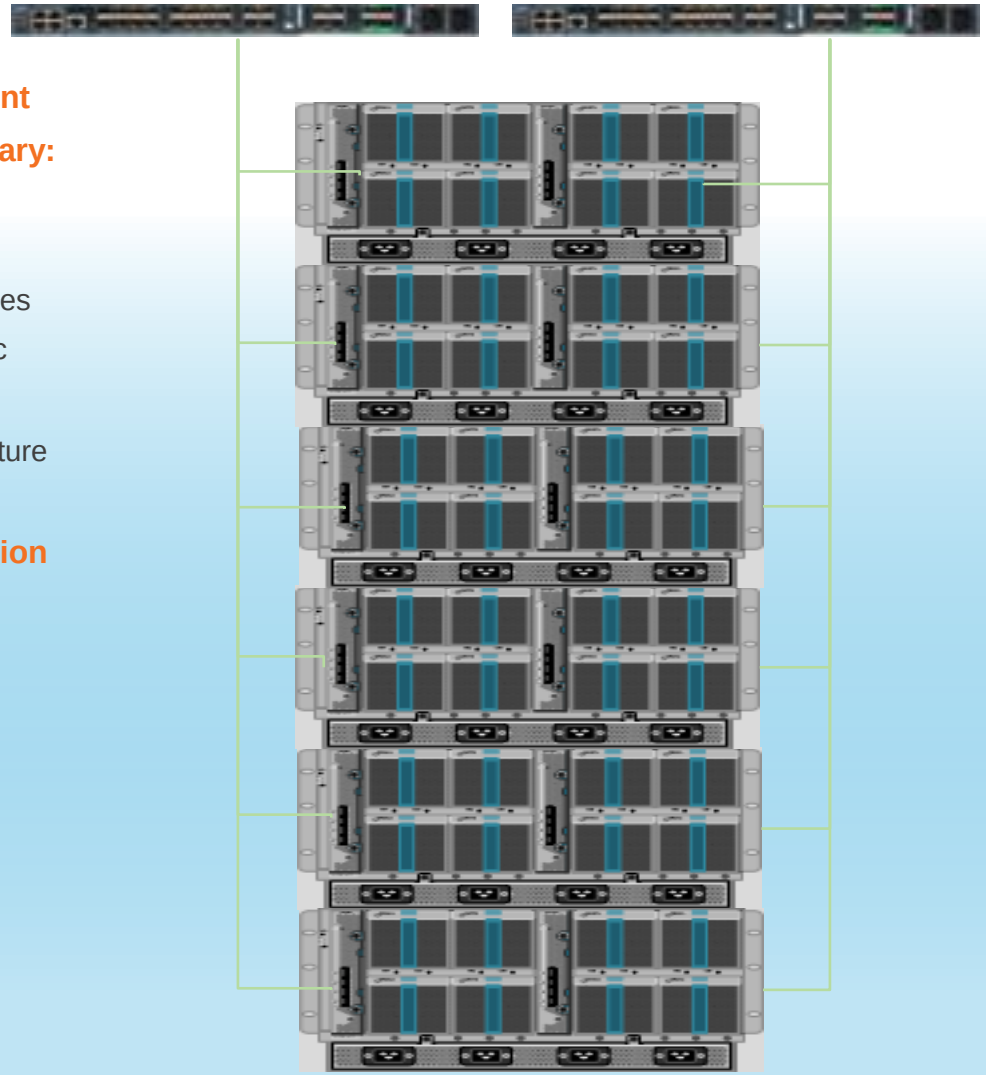
COMPUTE
Blade Form Factor

Rack Form Factor

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

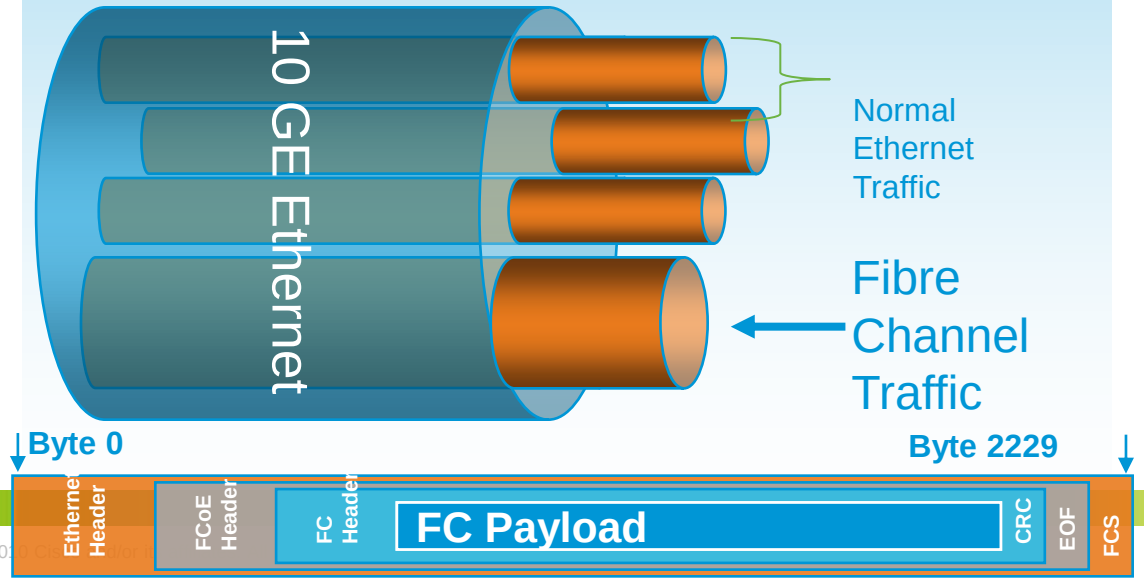


Fibre Channel Over Ethernet

CEE provides the lossless infrastructure

FCoE

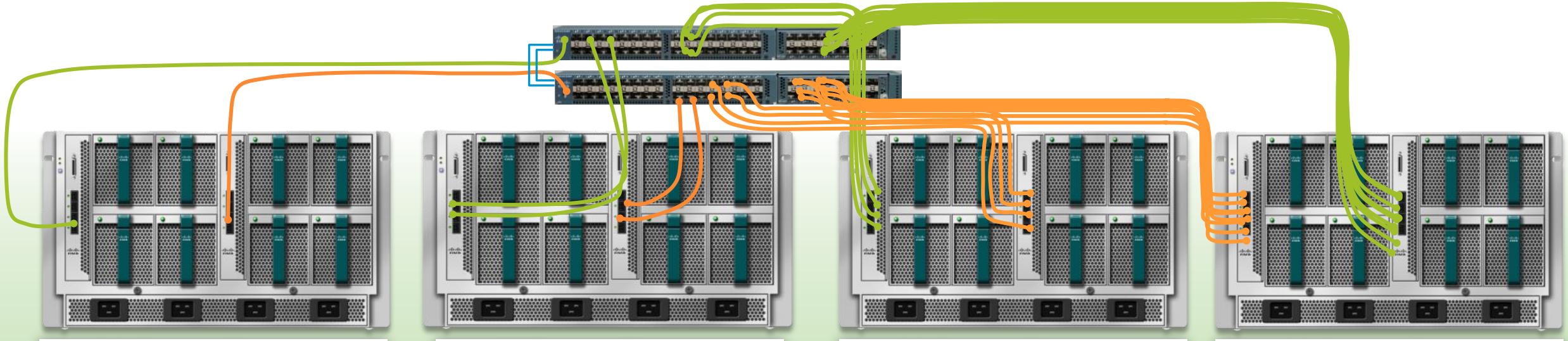
- Mapping of FC Frames over Ethernet
- Enables FC to Run on a Lossless Ethernet Network



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



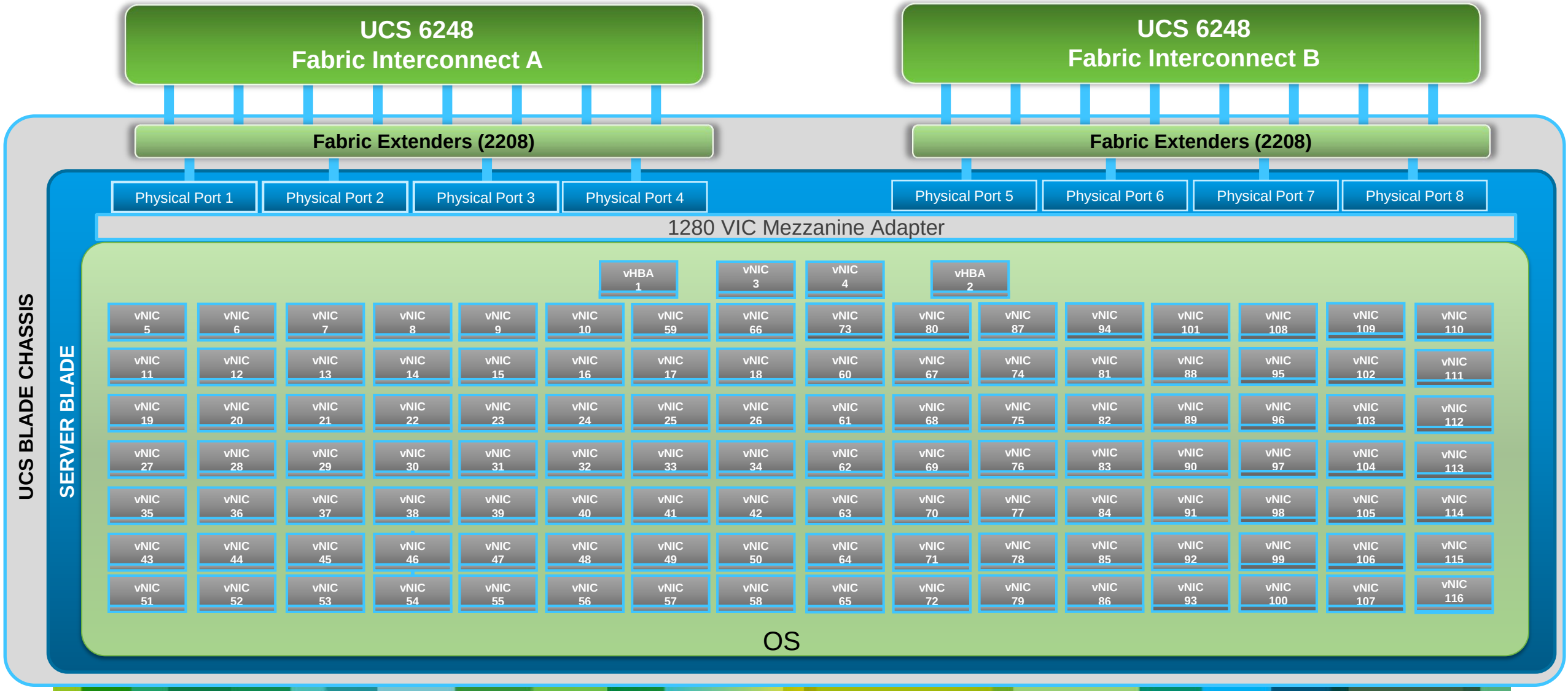
20G per Chassis | 40G per Chassis | 80G per Chassis | 160G per Chassis

UCS 1.0

UCS 2.0

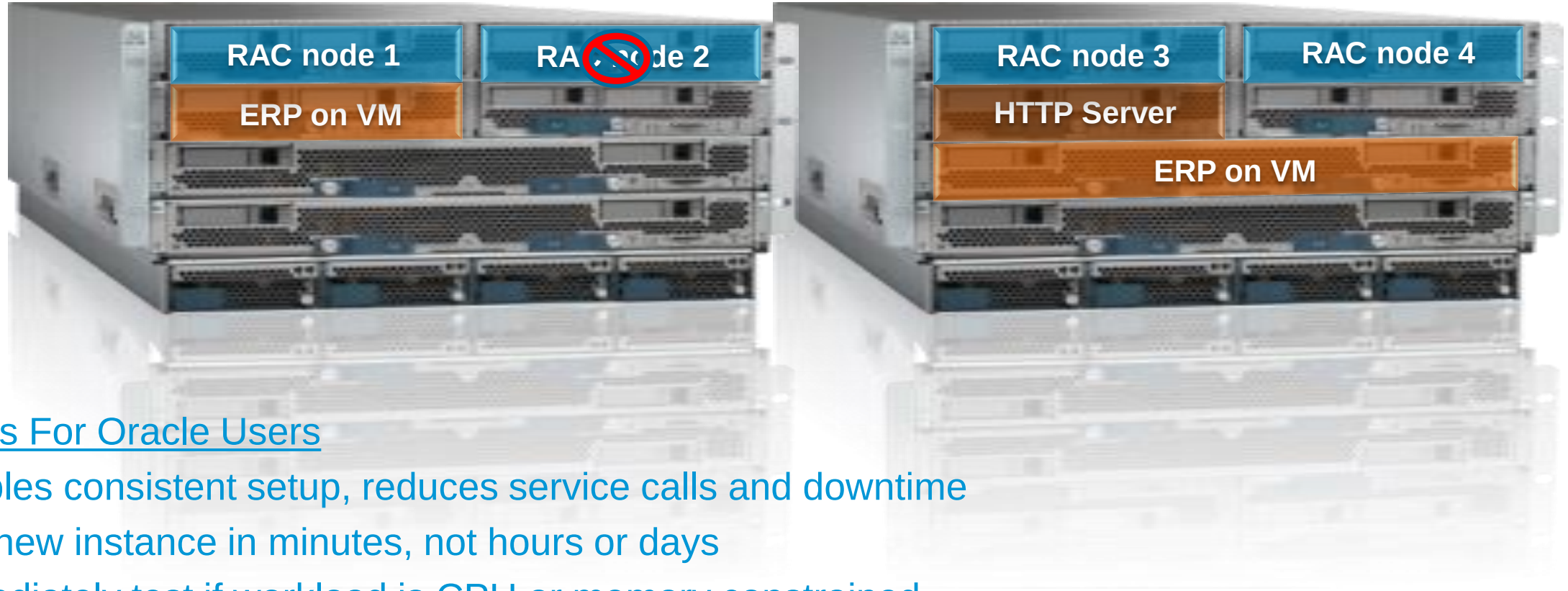
- Wire once architecture
- All links active

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



Service Profiles

Workloads Easily Move to Align With System Resources

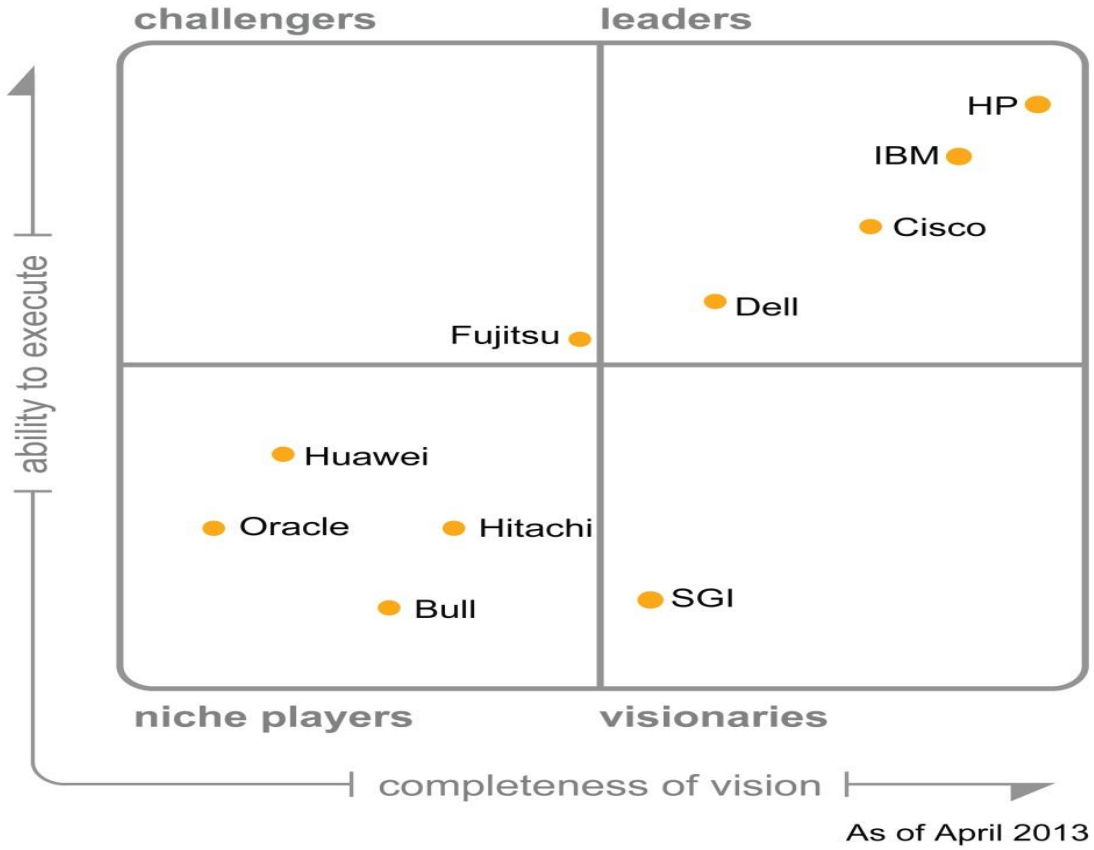


Benefits For Oracle Users

- 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

Figure 1. Magic Quadrant for Blade Servers



Source: Gartner (April 2013)

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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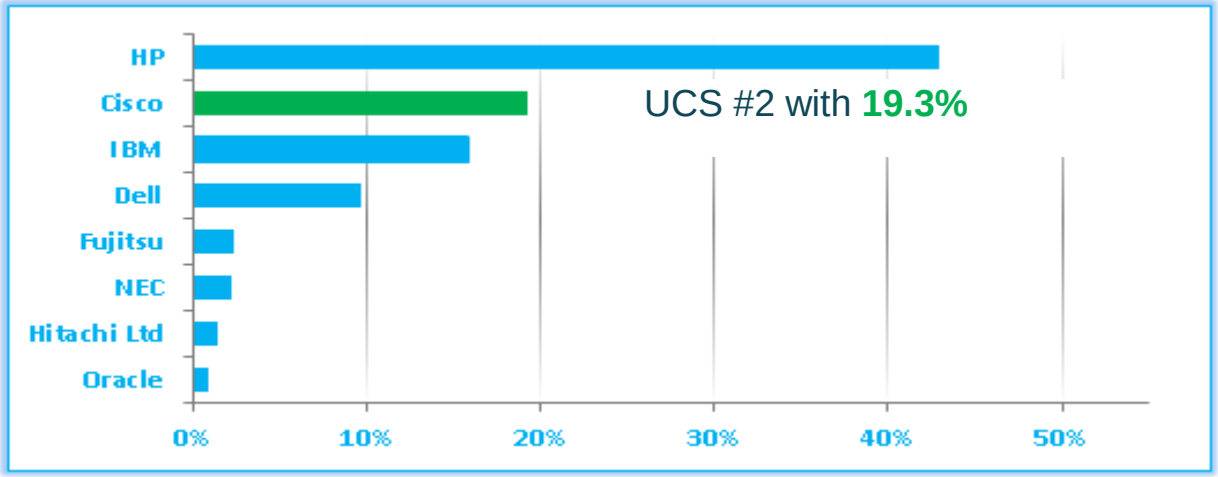
Customers Have Spoken

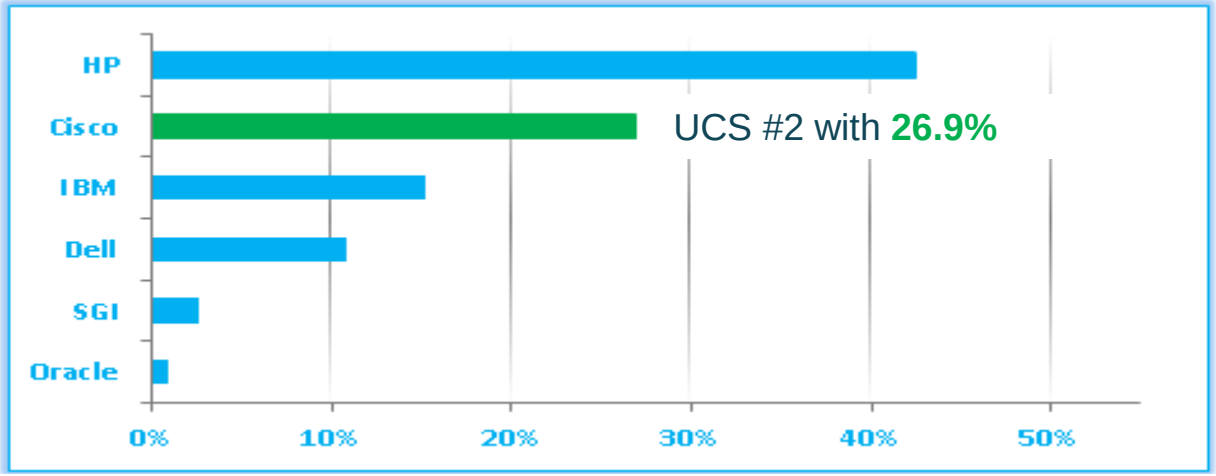
ORACLE
2010 ENABLE THE ECO-ENTERPRISE AWARD

X86 Server Blade Market Share, Q1CY13[1]

Worldwide



Americas



Source: [1] IDC Worldwide Quarterly Server Tracker, Q1 2013, May 2013, Revenue Share

- 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]

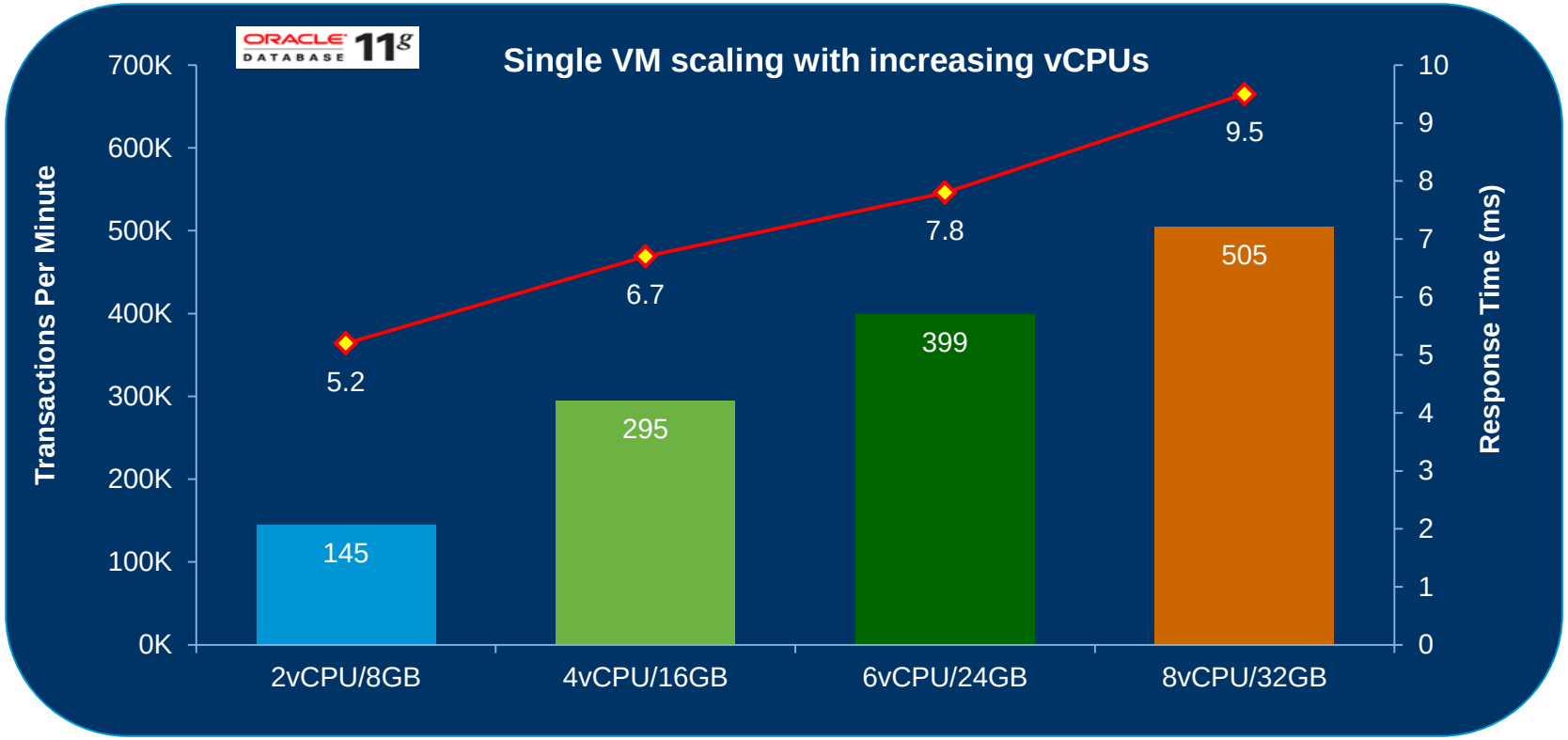
UCS #2 in Only Four Years

- 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%

Now,

Let’s consider VMware…

Oracle Database VMware Scaling Study

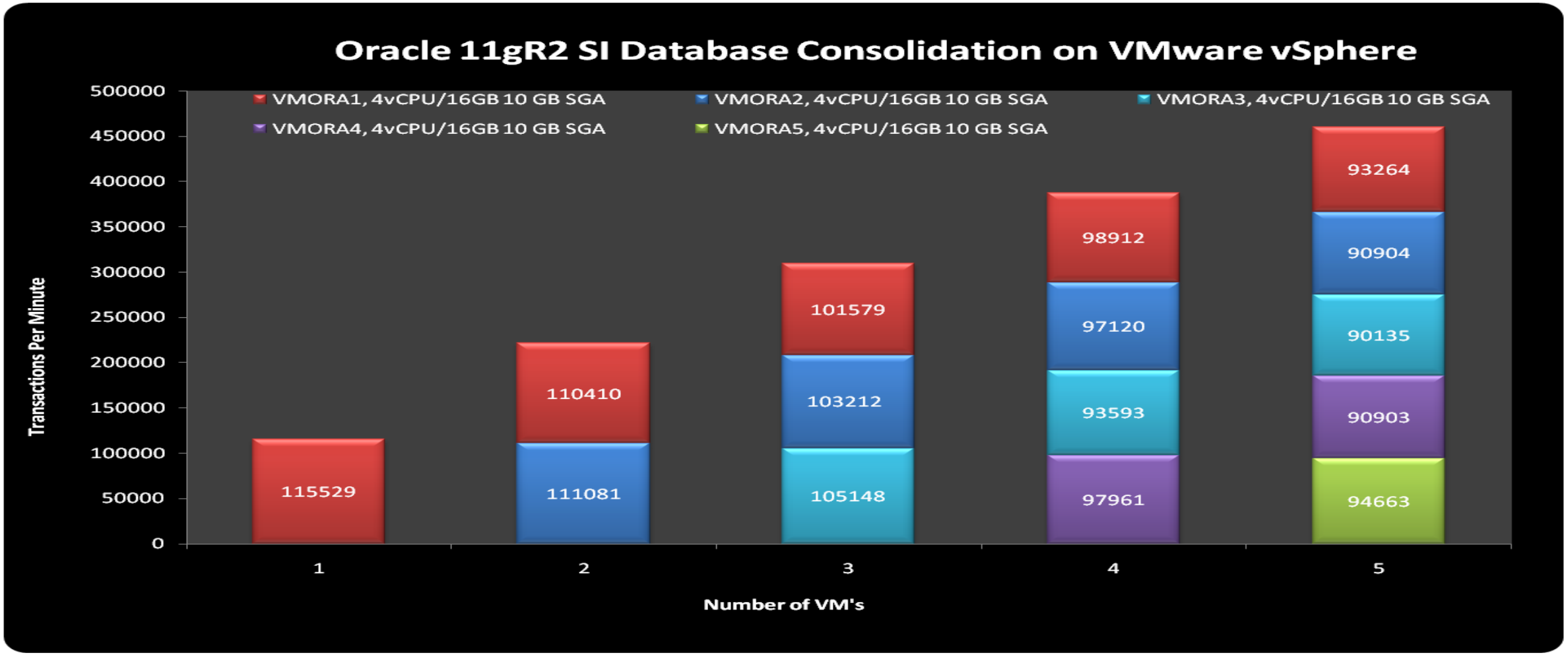


Single VM Scalability

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

Number of vCPU's / VM	Database Size Per VM	Number of concurrent users Per VM	Memory Per VM
2	1.1 TB	300	8 GB
4	1.1 TB	300	16 GB
6	1.1 TB	300	24 GB
8	1.1 TB	300	32 GB

Oracle Database Consolidation on VMware



Increase number of VMs on B200 Blade

Easily Consolidate Five Databases - With Excellent Performance

http://www.cisco.com/en/US/solutions/collateral/ns340/ns517/ns224/ns955/ns967/ucs_tr100026_emc_wp.pdf

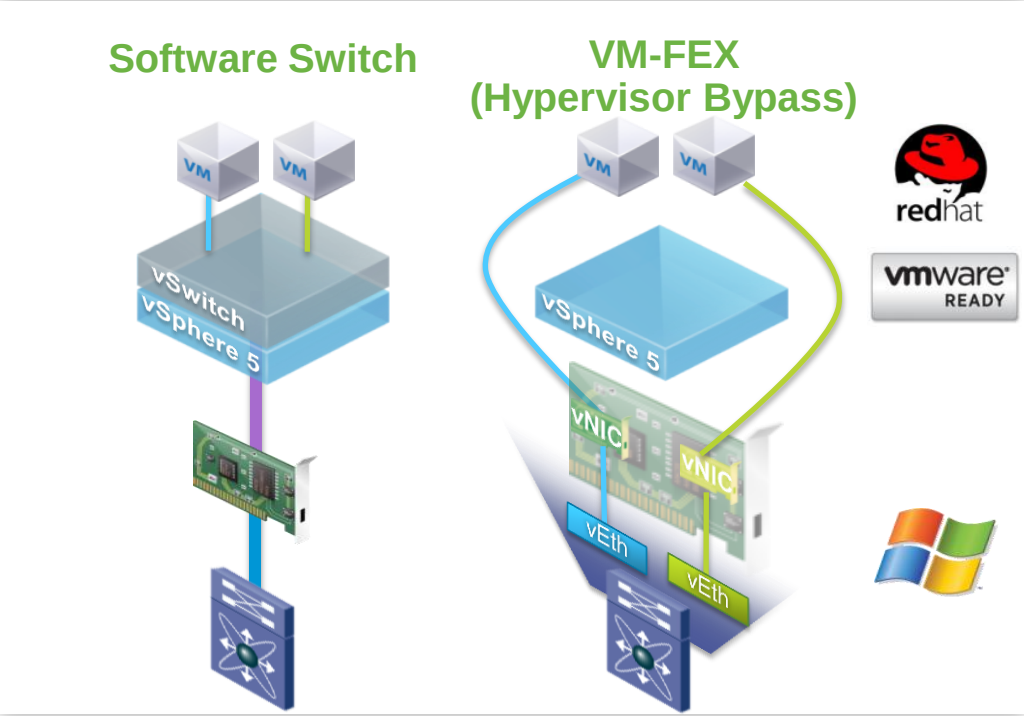
Unique to UCS For VMware – Hypervisor Bypass

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



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

VMware Consolidation

License Savings

Five Servers

Four 4-core
16 cores Total

$ 760,000 Oracle License

$ 3,800,000 Total Oracle License

UCS B440 M2

$ 760,000
+ VMware

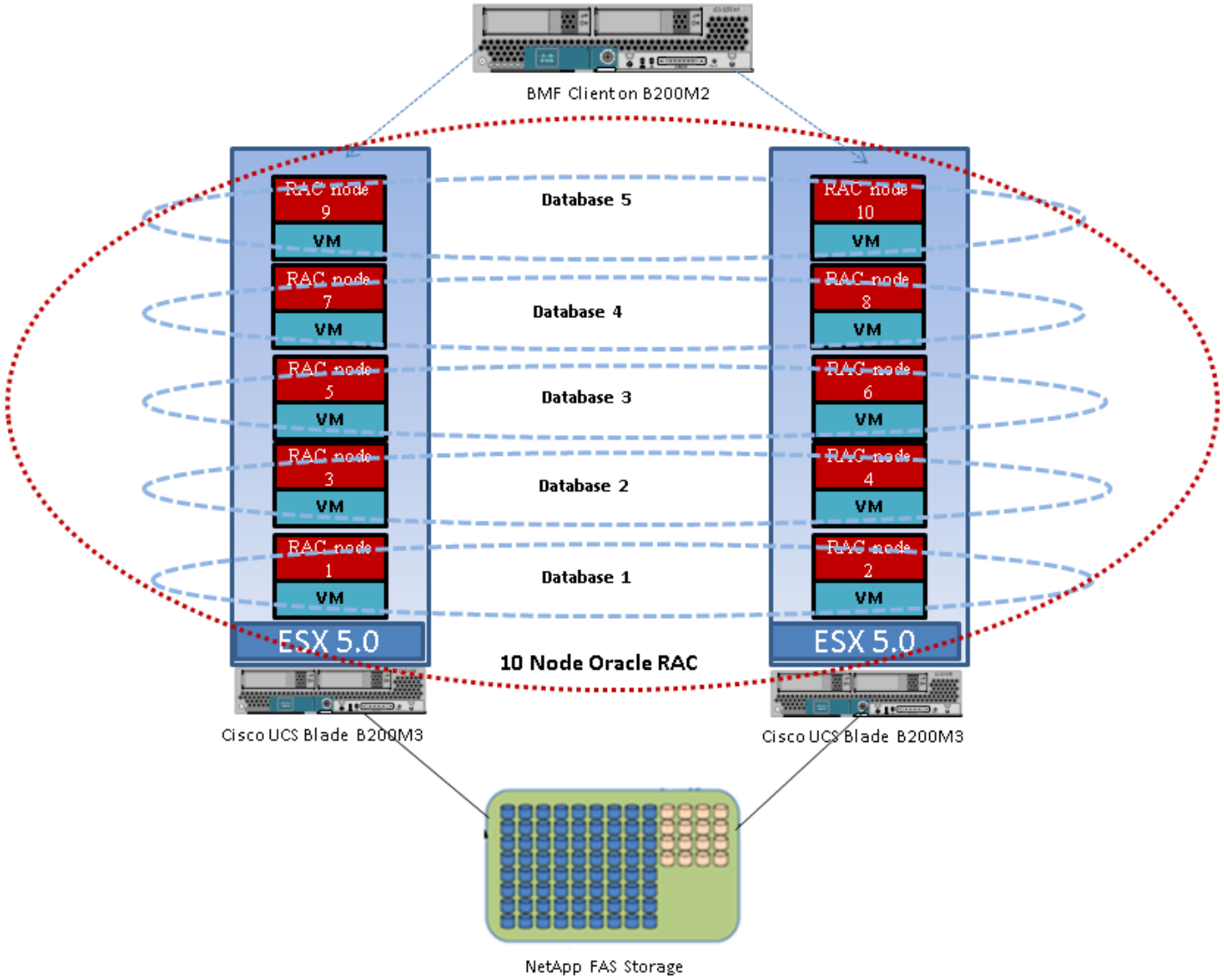
$ 3,040,000

Additional Savings

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

FlexPod Datacenter for Oracle RAC Database on VMware

New



Oracle RAC build on FlexPod
Validated with VMware vSphere 5.1

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

Who's Running VMware for Oracle on Cisco UCS?

"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

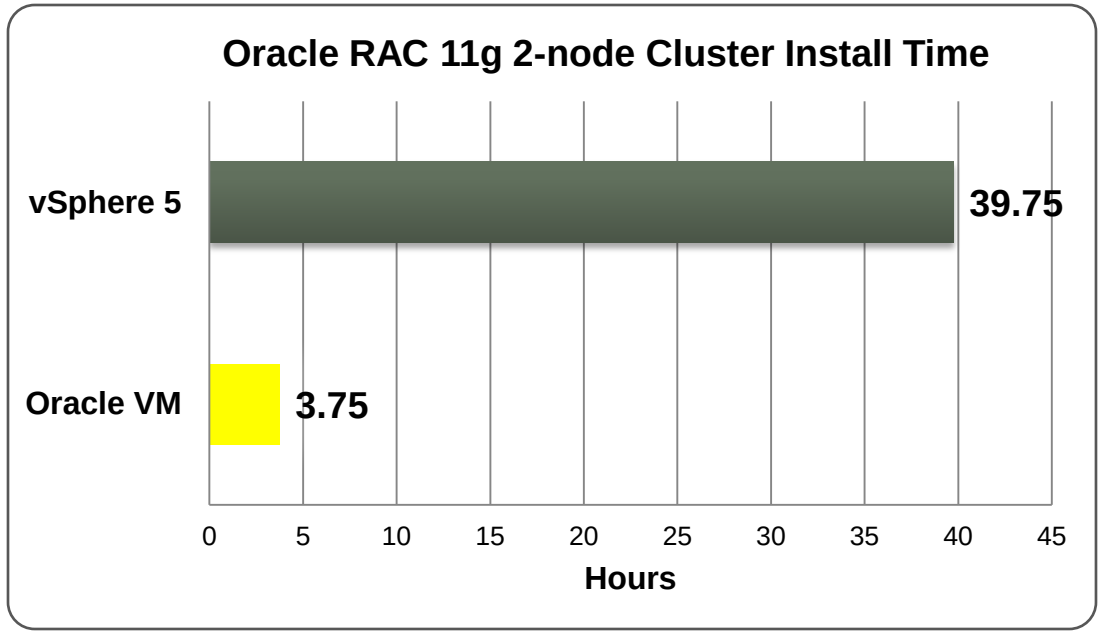
Avago

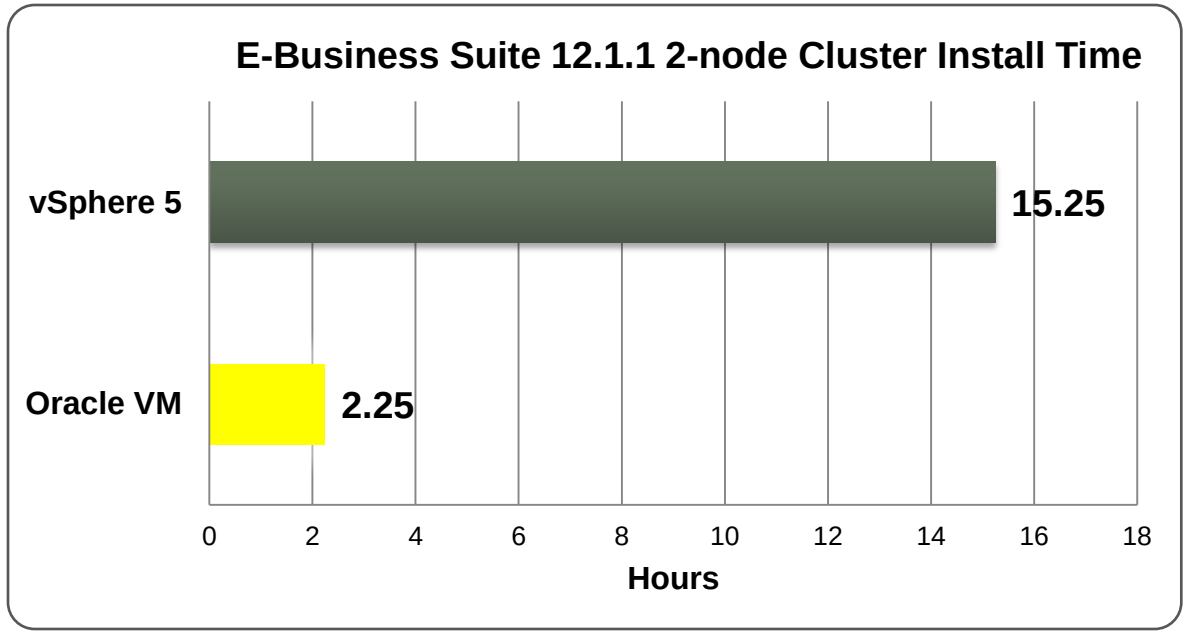
Now,

Let’s consider Oracle VM…

Oracle VM Templates

Optimized for Rapid Oracle Application Deployment

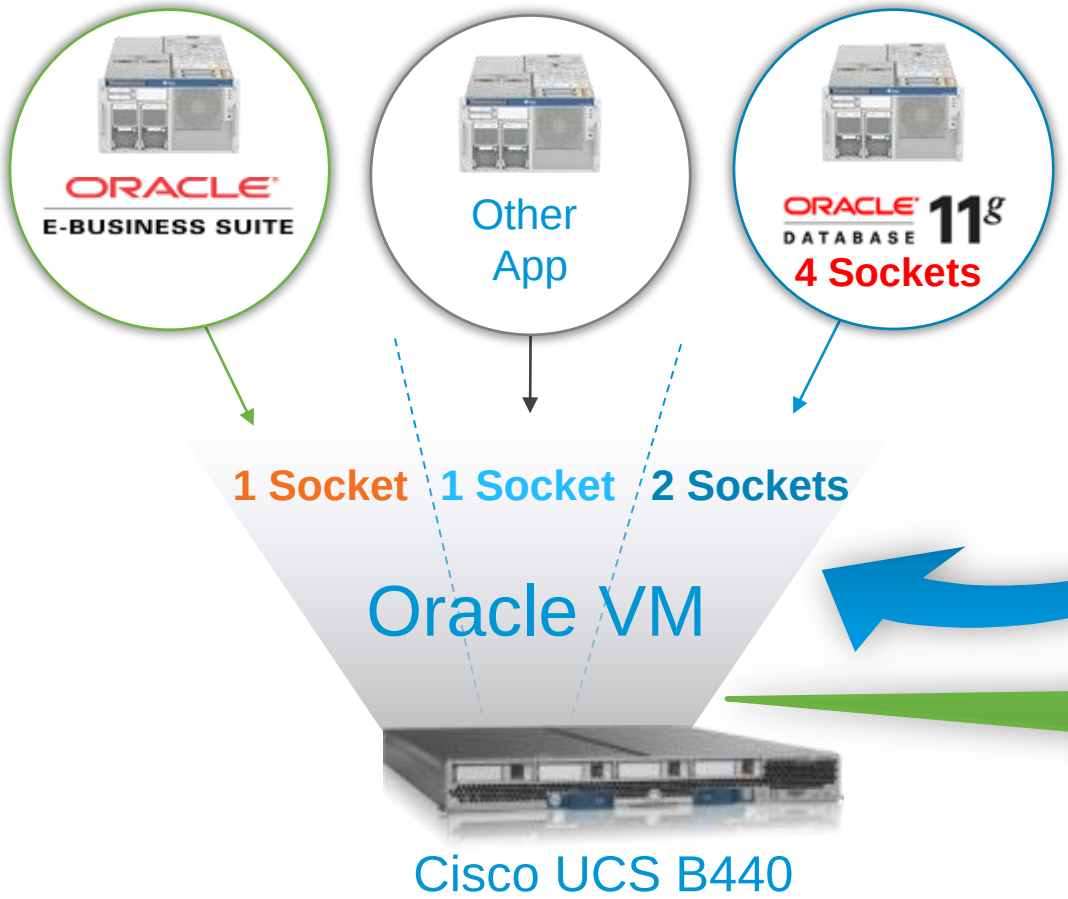




Move Oracle Workloads to Oracle VM Quickly and Easily – **in just a couple hours!**

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 a oracle VM partition

Hard Partitioning Allocates System Resources; Similar to LPAR for AIX or Containers in Solaris

DB Support Is 22% of List License/Year
Customer Saves $31,350/Year

Oracle VM Hard Partitioning Paper:
http://www.oracle.com/technology/tech/virtualisation/pdf/ovm-hardpart.pdf

FlexPod Datacenter for Oracle RAC Database on Oracle VM 3.1.1

NetApp FAS 3270

NetApp

NetApp FAS 3270

vPC-120

vPC-121

FCoE 2 X 10 Gbps

FCoE 2 X 10 Gbps

Cisco Nexus 5548 UP

Cisco Nexus 5548 UP

vFC-101

vFC-102

vPC (Public-LiveMigration-Storage1)

vPC (Private-LiveMigration-Storage2)

Cisco UCS 6248 FI

Cisco UCS 6248 FI

Orarac- Node3

Orarac- Node4

B200 M3

B200 M3

B200 M3

B200 M3

ORACLE VM

ORACLE VM

ORACLE DATABASE 11g

Cisco UCS 2208XP IOM

Cisco UCS 2208XP IOM

Orarac- Node1

Orarac- Node2

Chassis 01: Cisco UCS 5108

Chassis 02: Cisco UCS 5108

Solution Hardware

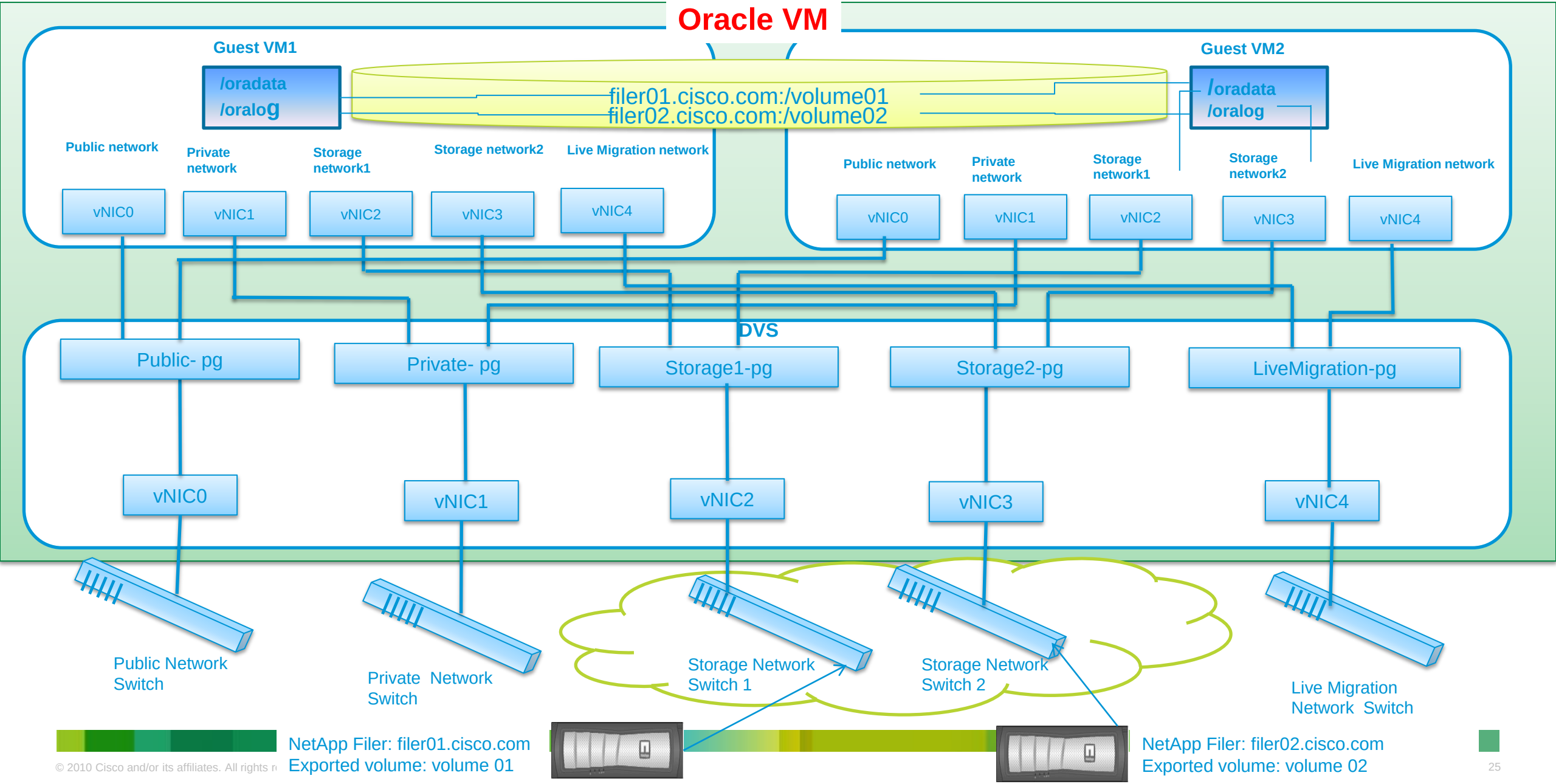
- 2 x Cisco UCS 5108 Chassis
- 4 B200 M3 Servers
- 2208XP Fabric Extenders
- 2 x Cisco UCS 6248 up Fabric interconnects
- 2 x Nexus 5548 up
- NetApp 3270

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

New

FlexPod Datacenter for Oracle RAC Database on Oracle VM 3.1.1



Deployment Architecture
Oracle JD Edwards on Oracle VM with EMC VNX 5300

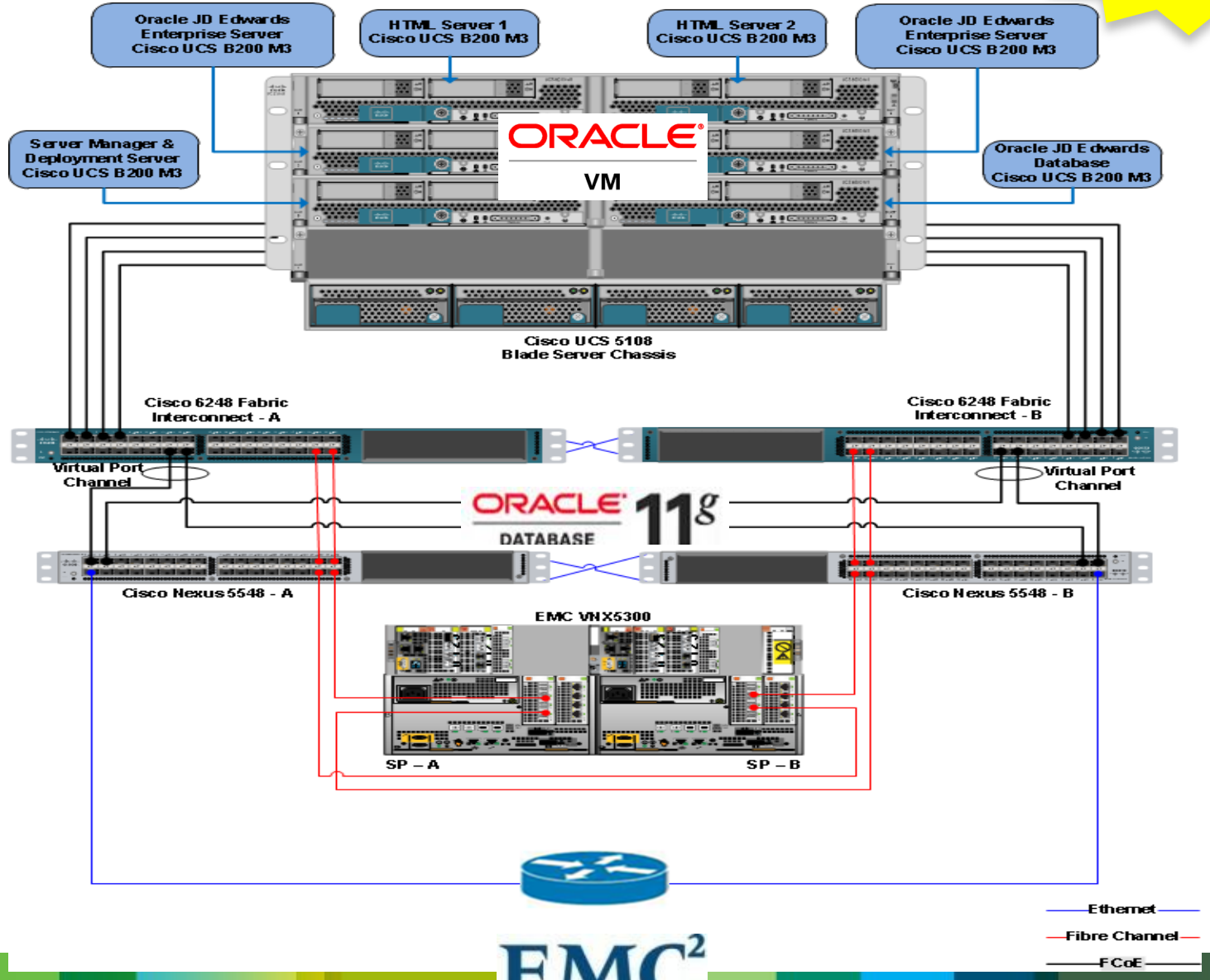
New

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



EMC²

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."

"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."

James White
Senior Solutions Architect

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.