Unified Computing & Virtualization

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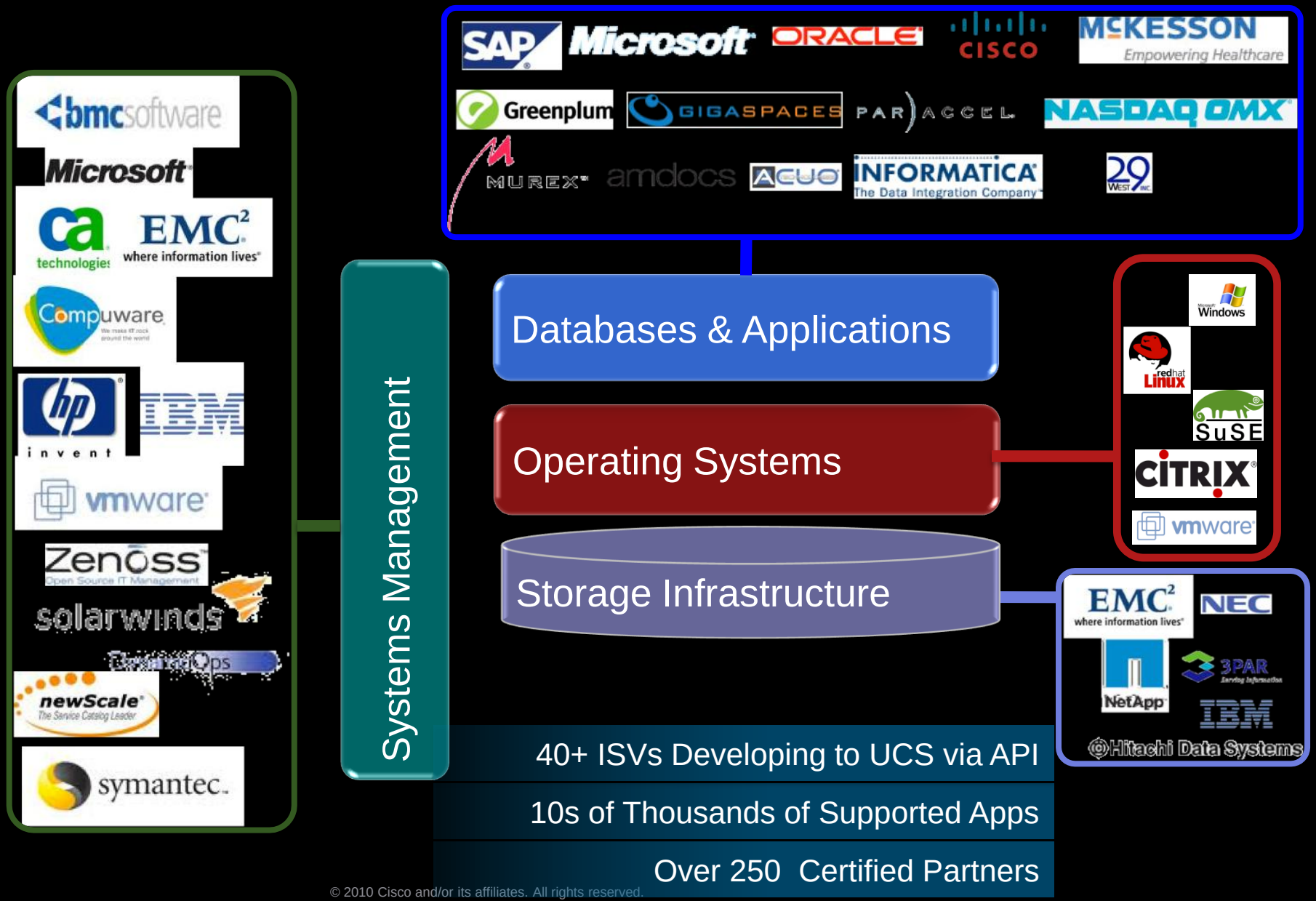
2009 Cisco Datacenter Announcement

- Cisco unveiled an evolutionary new data center architecture, innovative services and an open ecosystem of best in class partners to help customers develop next-generation data centers that unleash the full power of virtualization
- The Cisco **Unified Computing System unites compute, network, storage access, and virtualization resources in a single energy efficient system** that can reduce IT infrastructure costs and complexity, help extend capital assets and improve business agility well into the future.

Number of Ecosystem Partners



Number of Performance Records

Leadership in Two-Socket & 4-Socket Platforms

#1	Two-Socket X86 Record SPECjbb 2005 1,015,802 BOPS	#1	Four-Socket Record Vmmark* 76.1 score @ 51 tiles*
#1	Two-Socket X86 Blade Record SPECint*_rate_base2006 363 base score	#1	Four-Socket x86 Record SPECjbb*2005, 2,021,525 BOPS @126,345 BOPS/JV
#1	Two-Socket Record SPECompL*base2001 278,603 base score**	#1	Four-Socket Record SPECompM*2001 100,258 base score*
#1	Two-Socket Record SPECompM*base2001 52,314 base score*	#1	Single Node Record 4S LS-Dyna* Crash Simulation 41,727 seconds car2car
		#1	Four-Socket X86 Blade Record SPECint*_rate_base2006 720 base score

B230M1

B230M1

Highest ever VMMark score

InfoWorld 2010 Technology of the Year Awards

BEST OF INTEROP

BladeSystems insight — Driving ROI across the data center

eWEEK 2009 Products of the Year

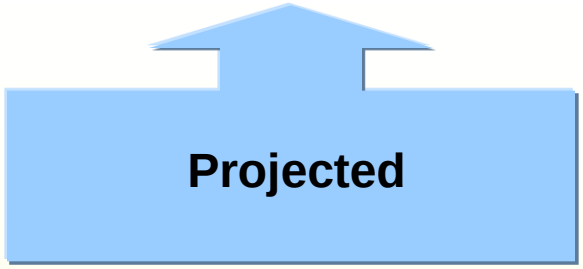
Results as of Sept 08, 2010:

[1]Two socket comparison based x86 Volume servers—Intel Xeon 5600 series and AMD Opteron 6100 Series)

[1]Four socket comparison based on x86 servers—Intel Xeon 7500 series and AMD Opteron 6100 Series)

THE FACTORS DRIVING THE ADOPTION

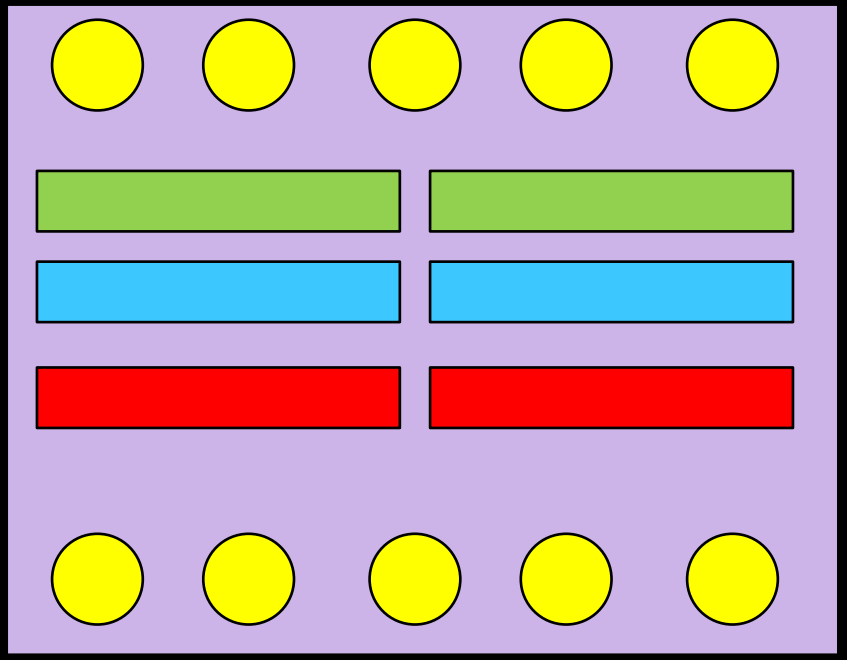
Legacy BladeSystem Value Proposition



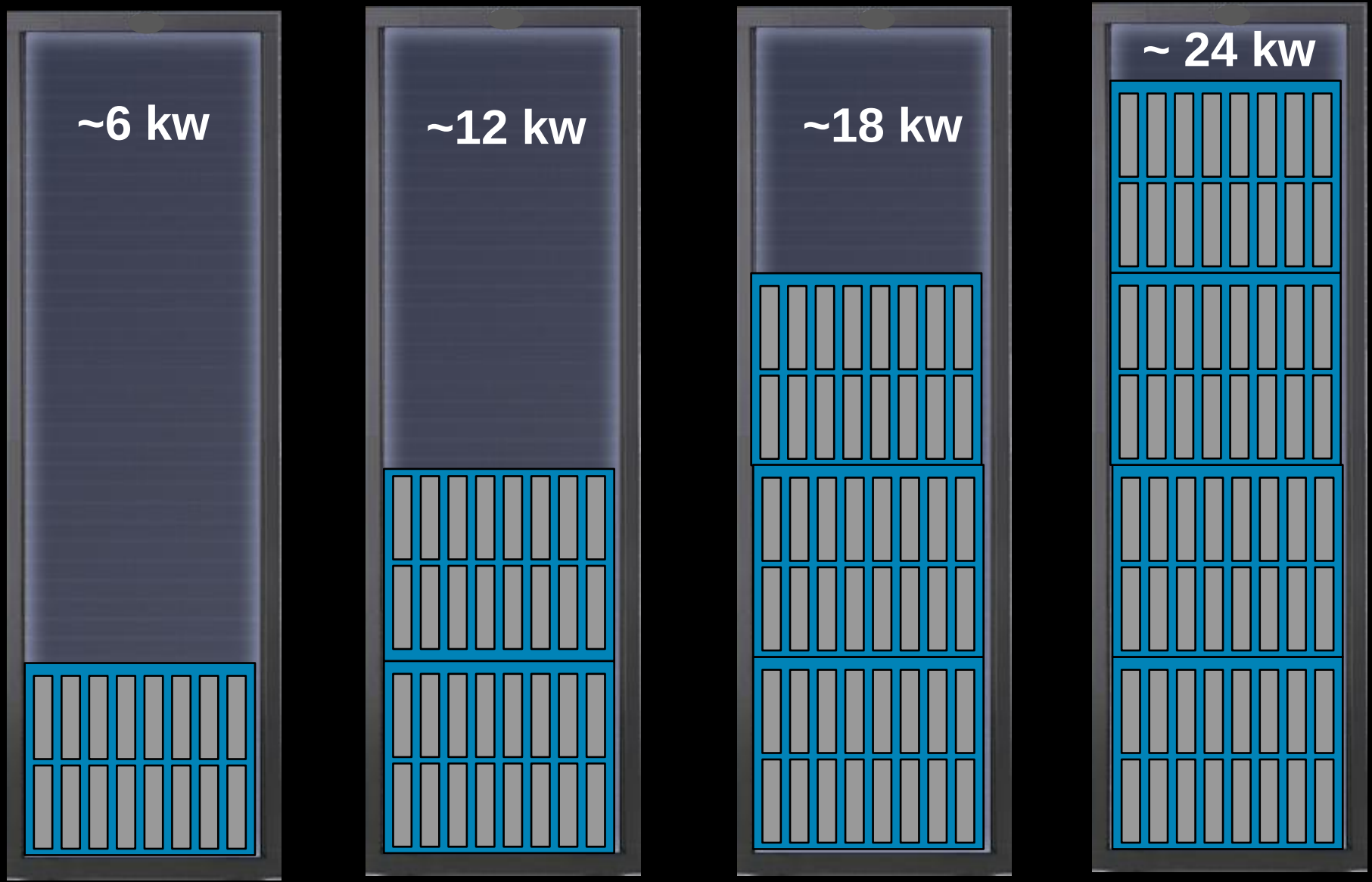
- Up to 30 % lower power
- Less rack space
- Infrastructure consolidation
- Simplified Management

Legacy Design – Impact on Power

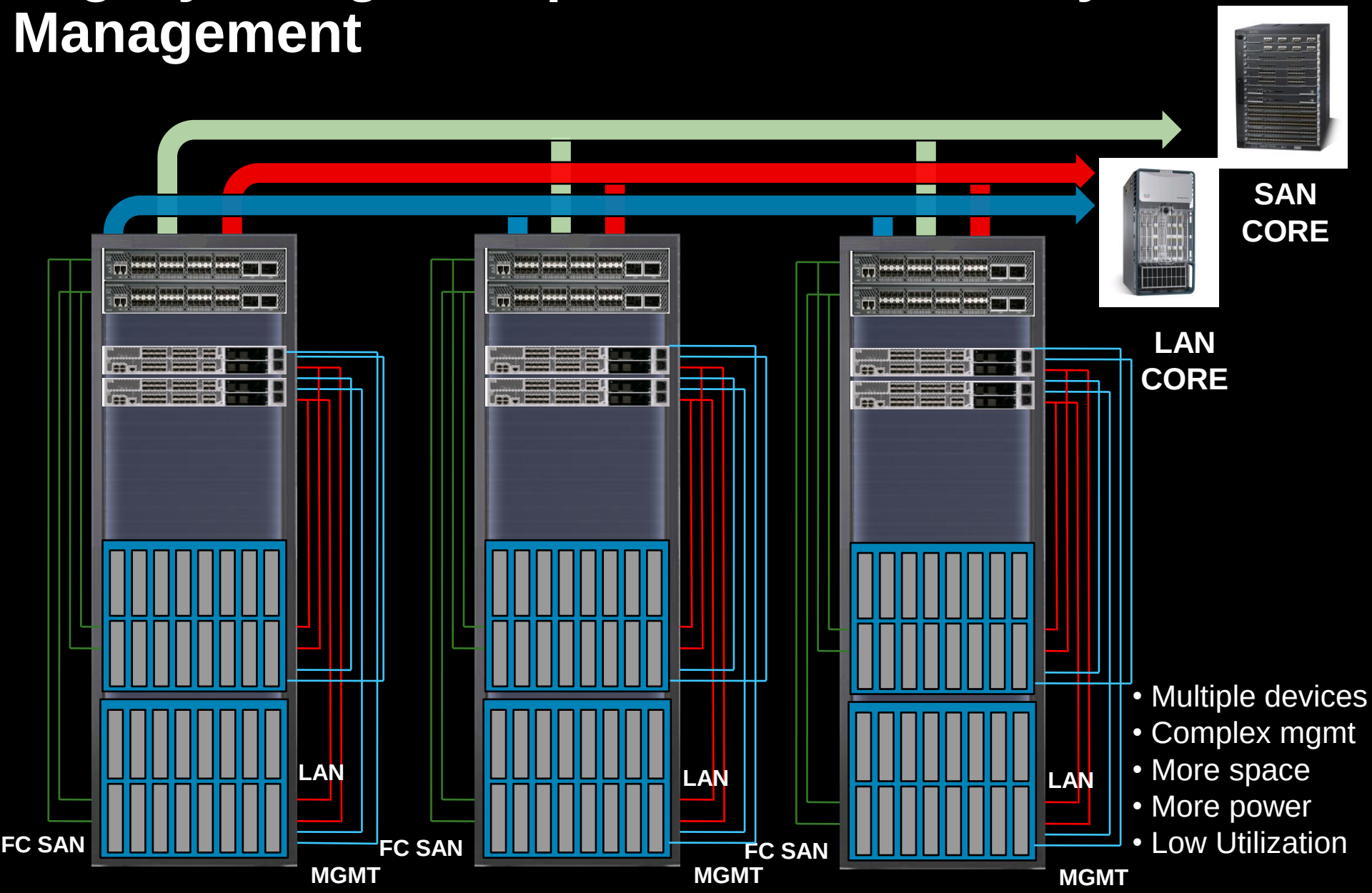
- Each Chassis has
  - Multiple fans
  - 2 LAN Switches
  - 2 SAN Switches
  - 2 Management Switches
- These devices increases the power consumption
- It increases the number of devices that needs to be managed



Legacy Design - Impact on Rack Density

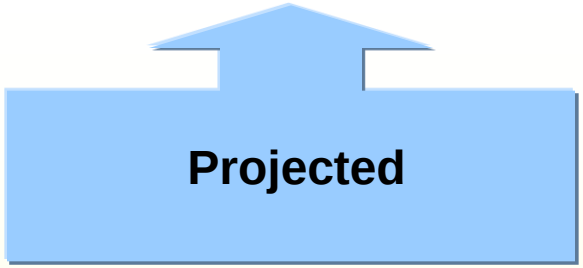


Legacy Design – Impact on Connectivity & Management



- Multiple devices
- Complex mgmt
- More space
- More power
- Low Utilization

Legacy BladeSystem Value Proposition



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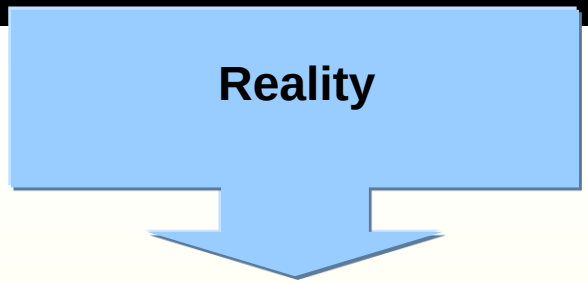
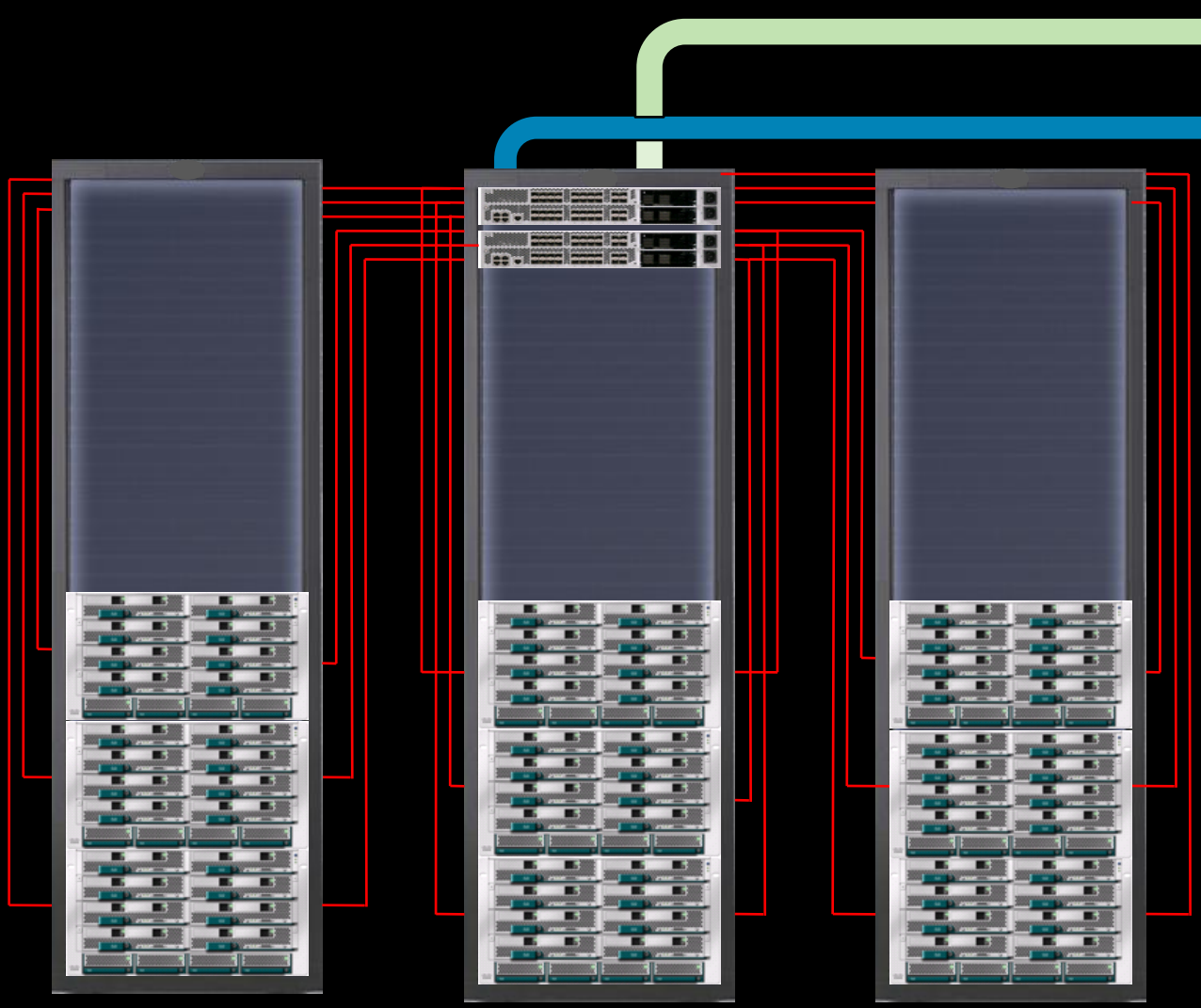


- Limited or higher
- Reduces rack density
- Increases complexity
- Increases complexity

The Cisco UCS Approach



SAN CORE

LAN CORE

- Less devices
- Simpler mgmt
- Less space
- Less power

Key Differentiators

Unified Fabric

Reduction of cost and complexity due to reduced cabling, adapter cards. 76% reduction in network cabling costs

Large Memory Footprint

Future blade will result in 2x the memory footprint of our competitors blades (384GB over 48 DIMM slots) – 50% - 80% cost savings in memory

Virtualization Efficiencies with VN-Link

IO Bypass of the hypervisor provides for 10% increased performance efficiencies

Unified and Embedded Management

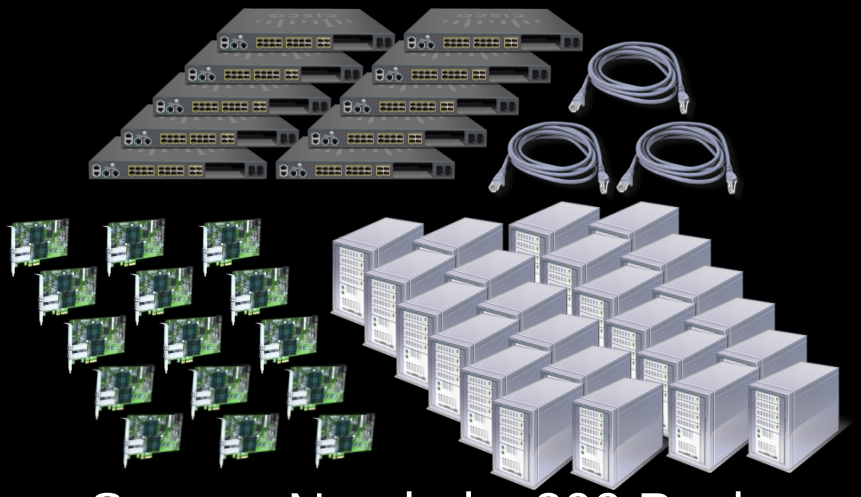
Lowers cost by reducing the need for licenses and also helps simplifies management

Stateless Computing

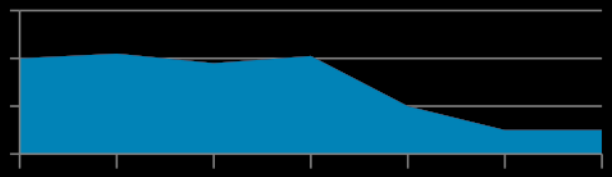
Less complexity = faster setup/provisioning time, automated setup for SAN / LAN.

Case Study - Two Service Offerings

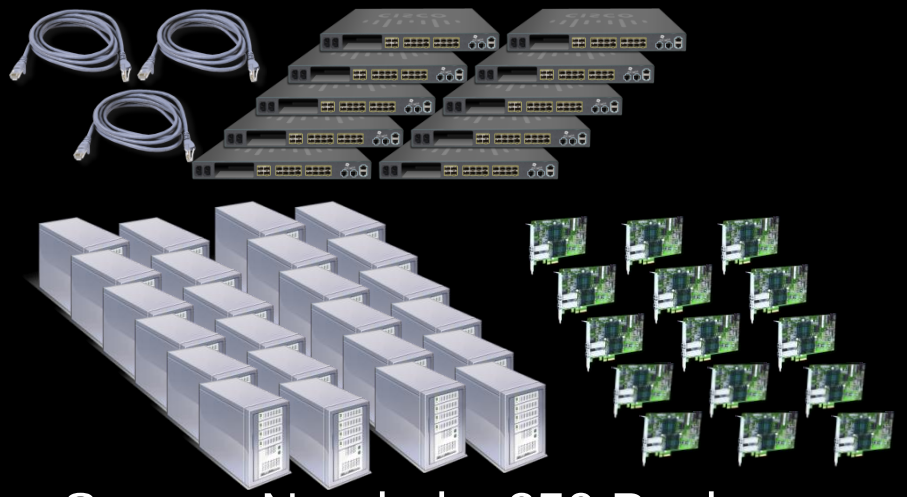
Voice over IP Service



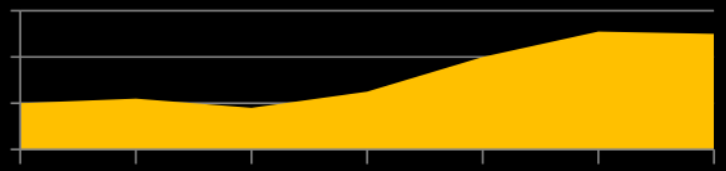
Servers Needed – 200 Peak



Video on Demand to Home Service



Servers Needed – 250 Peak



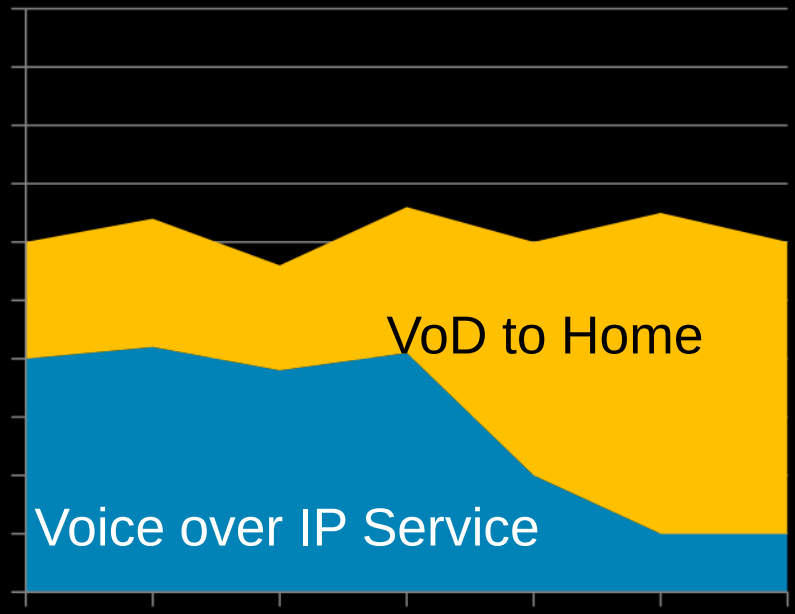
Infrastructure Savings from Rapid Re-Provisioning of Servers

Offset peak capacity for each service

UCS Service Profiles enable dynamic re-provisioning

Combined peak is less than 350 servers

Reduction of 100 servers



Cisco UCS Service Profile : End to End virtualization

- Profile Name = vmhost-a05
- UUID = 12345678-ABCD-F1E1-2B3C-ABCDEF123456
- Description = ESX4 – 5th Host in Cluster A
- LAN Config
  - vNIC0 Switch = Switch A
  - vNIC0 Pin Group = SwitchA-pingroupA
  - vNIC0 VLAN Trunking = Enabled
  - vNIC0 Native VLAN = VLAN 100
  - vNIC0 MAC Address = 02:25:B5:00:01:01
  - vNIC0 Hardware Failover Enabled = No
  - vNIC0 QoS policy = VMware-QoS-policy
  - vNIC1 Switch = Switch B
  - vNIC1 Pin Group = SwitchB-pingroupA
  - vNIC1 VLAN Trunking = Enabled
  - vNIC1 Native VLAN = VLAN 100
  - vNIC1 MAC Address = 02:25:B5:00:01:02
  - vNIC1 Hardware Failover Enabled = No
  - vNIC1 QoS policy = VMware-QoS-policy
- Local Storage Profile = no-local-storage
- Scrub Policy = Scrub local disks only
- SAN Config
  - Node ID = 20:10:20:30:1a:2b:3c:01:0f
  - vHBA0 Switch = Switch A
  - vHBA0 VSAN = VSAN-FabricA1
  - vHBA0 WWPN = 20:10:20:30:1a:2b:3c:01:01
  - vHBA1 Switch = Switch B
  - vHBA1 VSAN = VSAN-FabricB1
  - vHBA1 WWPN = 20:10:20:30:1a:2b:3c:01:02
- Boot Policy = boot-from-ProdSymmetrix
  - Boot order =
    1. Virtual CD-ROM
    2. vHBA0, 10:00:16:aa:bb:cc:0a:01, LUN 00, primary
    3. vHBA1, 10:00:16:aa:bb:cc:0b:01, LUN 00, secondary
    4. vNIC0
- Host Firmware Policy = EMLX-EMC-vSphere4
- Management Firmware Policy = latest-mgmt-fw
- IPMI Profile = ITSec-standard-IPMI
- Serial-over-LAN policy = VMware-SOL
- Monitoring Threshold Policy = VMware-Thresholds

$$ BENEFITS

Infrastructure Required for 100 Servers

Description	Legacy	Cisco UCS
Number of Servers	100	100
Number of Chassis	7	13
Number of Network Switches (Chassis)	14	0
Number of FC Switches in (Chassis)	14	0
Number of Management Modules	14	0
Number of LAN Access Switches	3	0
Number of SAN Access Switches	2	0
Number of FC Cables	56	0
Number of RJ-45 Cables	112	0
Number of Fabric Interconnects	0	2
Number of SFP+ Cables	0	104

Number of Active Devices = 47 vs 2

TCO Comparison

Description	Legacy	Cisco UCS
Cost of Switches	99,000	30,000
Cost of Cables	112,000	52,000
Cost of Power	59,288	10,092
Cost of Data Center Space	57,000	6,000
Cost of Management	141,000	6,000
Total (US$)	**468,288**	**104,092**

TCO – Server Virtualization

- Lets look at a deployment of 100 Virtual Machines, each with a memory capacity of 8 GB . The number of hosts needed for this:

  -Competitors with 96 GB memory : (100*8)/96 = 9 hosts*

  -Cisco UCS with 192 GB memory : (100*8)/192= 4 hosts

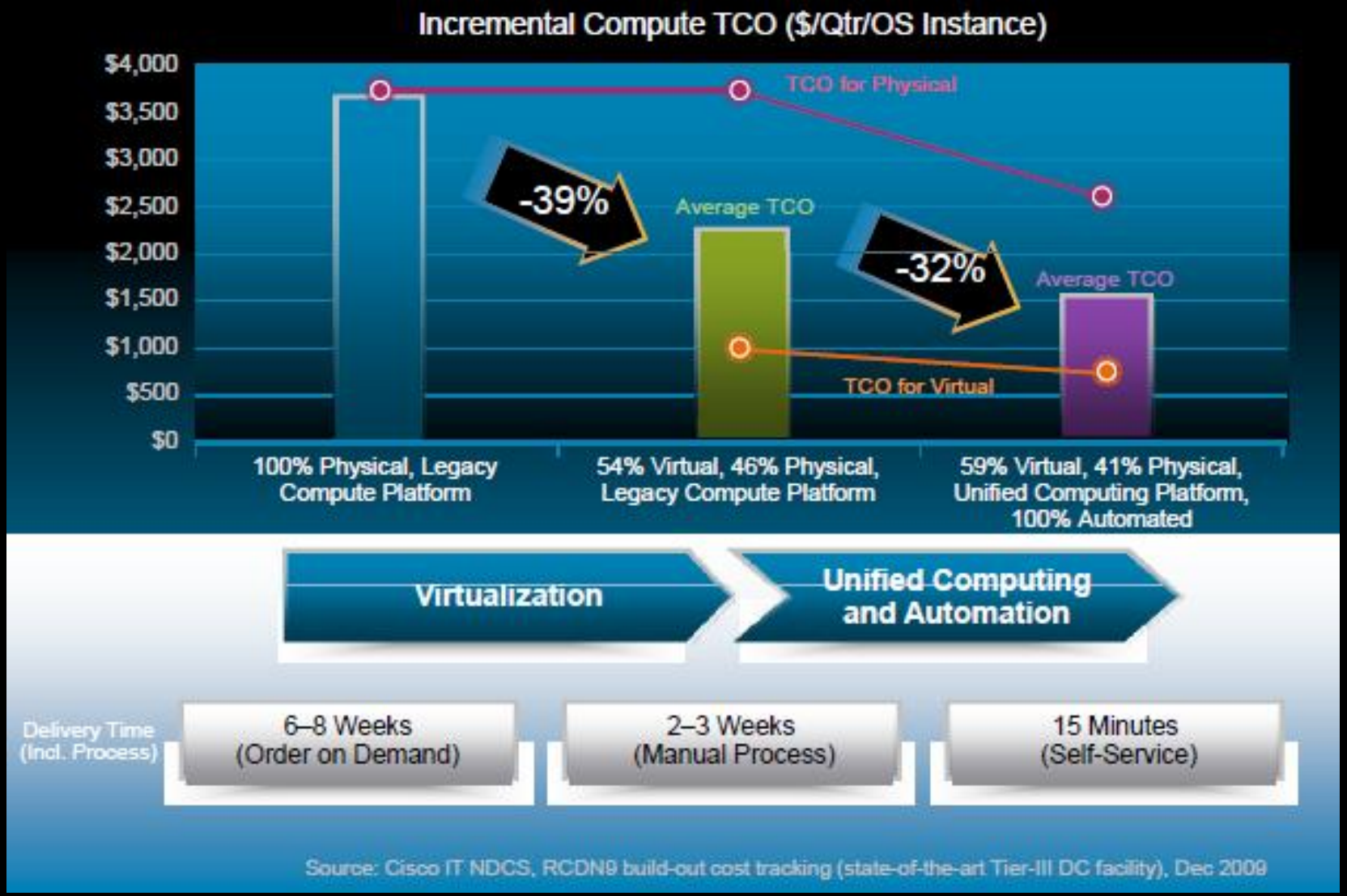
- The savings:

  •50 % lower number of virtualization licenses

  •50% lower number of servers to manage

  •50 % less power consumption

Real World Benefits



Summary

Reduces total cost of ownership

- CAPEX: Up to 20% reduction
- OPEX ： Up to 30% reduction
- Cooling and power efficient

Increases business agility

- Provision applications in minutes instead of days
- Automation reduces service outages
- Just-in-time resource provisioning

Investment protection

- Industry standards-based
- Co-exist with existing data center infrastructure
- Leverage existing management applications via API


CISCO