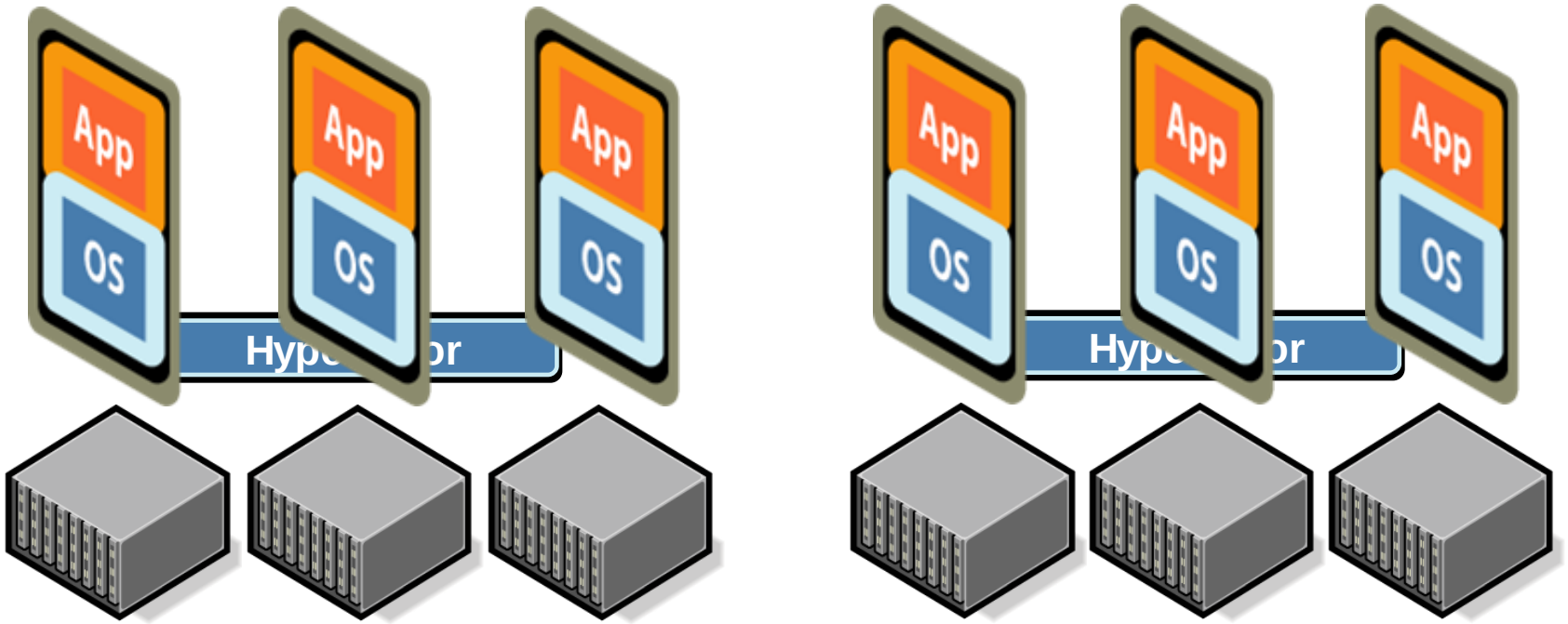
Virtual Datacenter Automation

Koh Eng Kheng

Regional Director

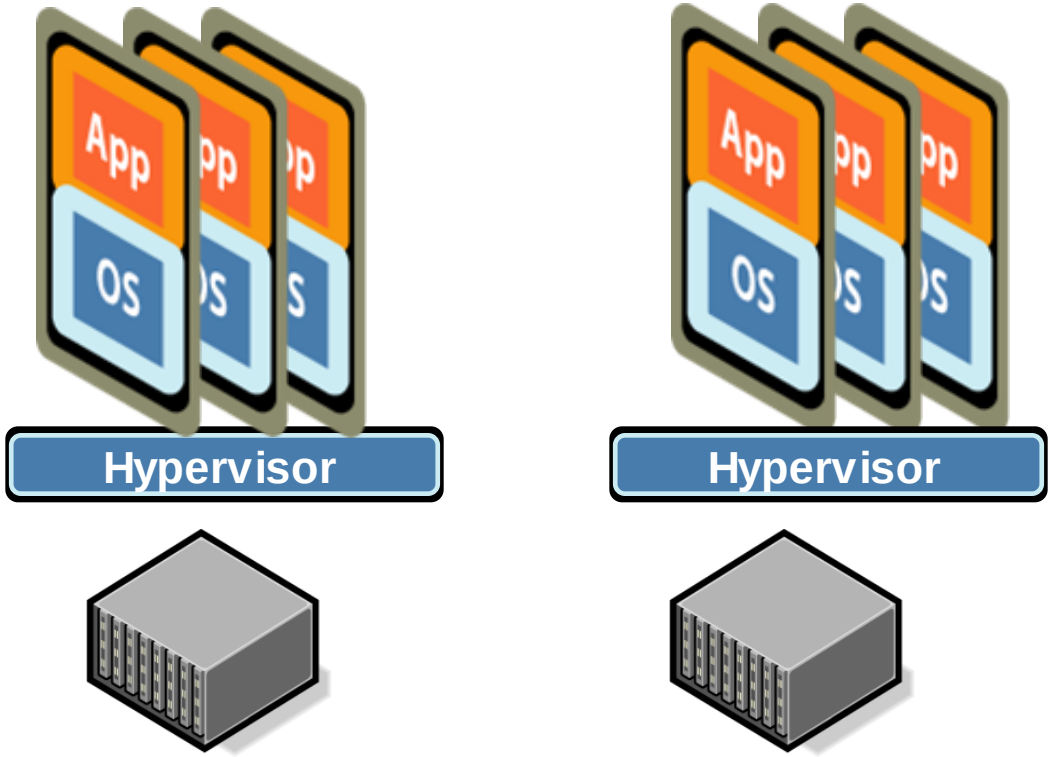
ASEAN

Phase 0: Server Consolidation



Virtualization: Phase 1

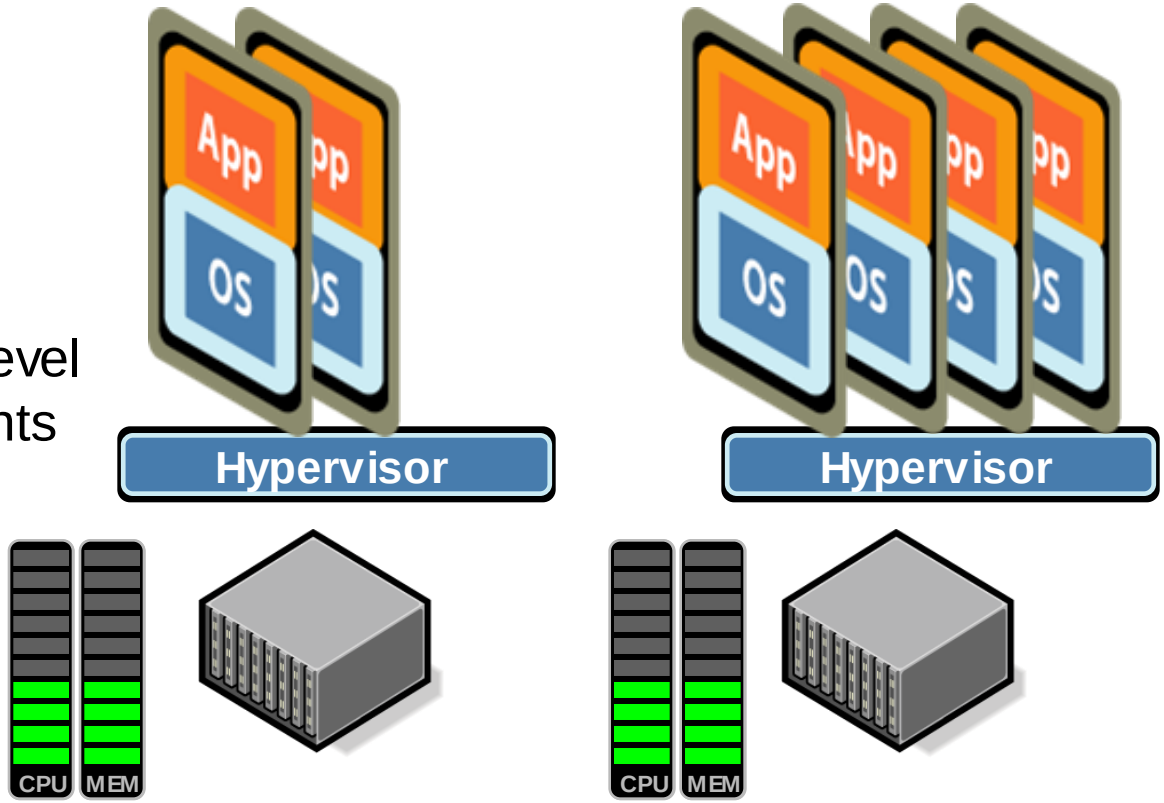
Add VMotion – Live Virtual Machine Migration



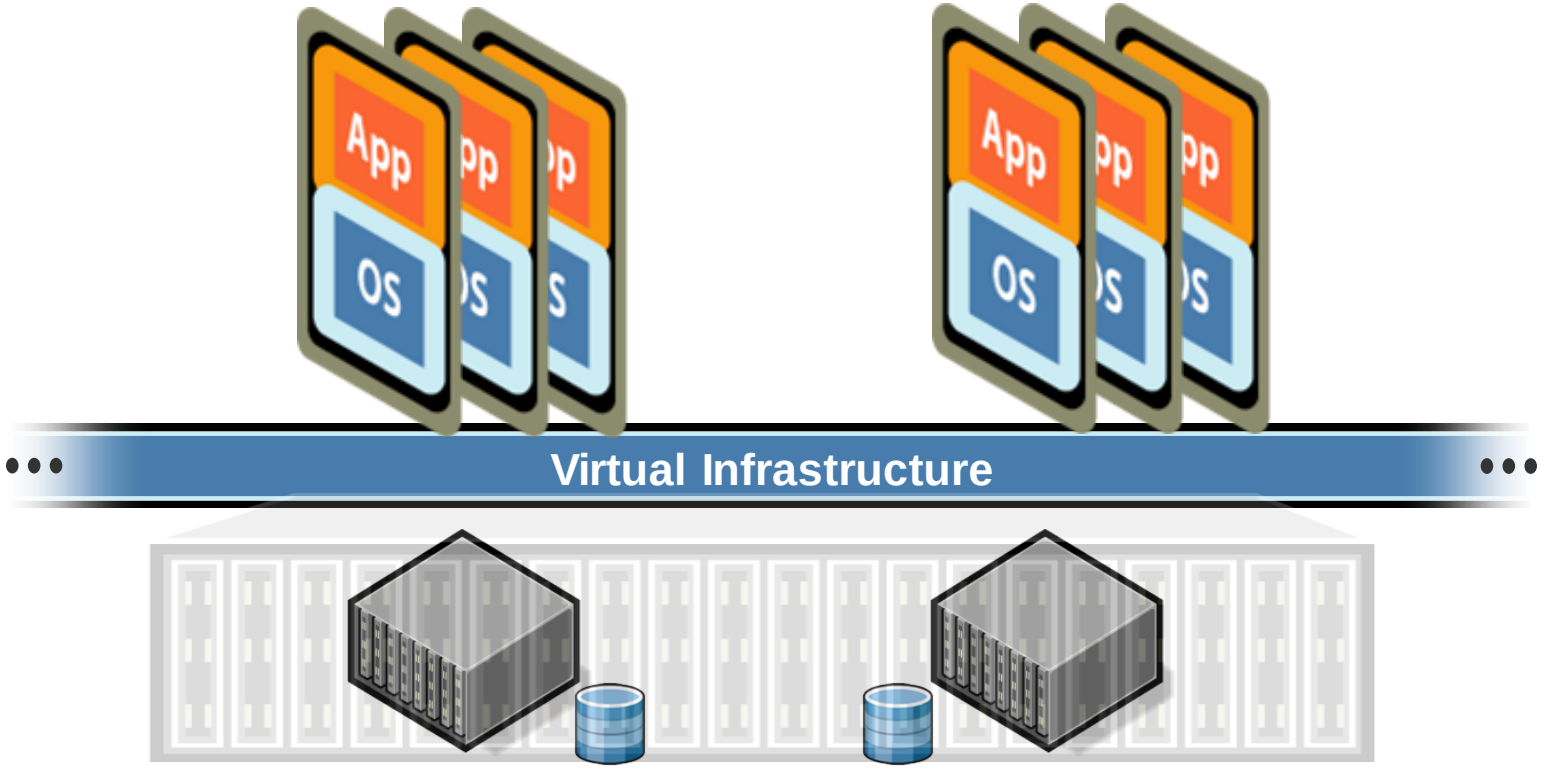
Add Distributed Resource Scheduler

Optimize

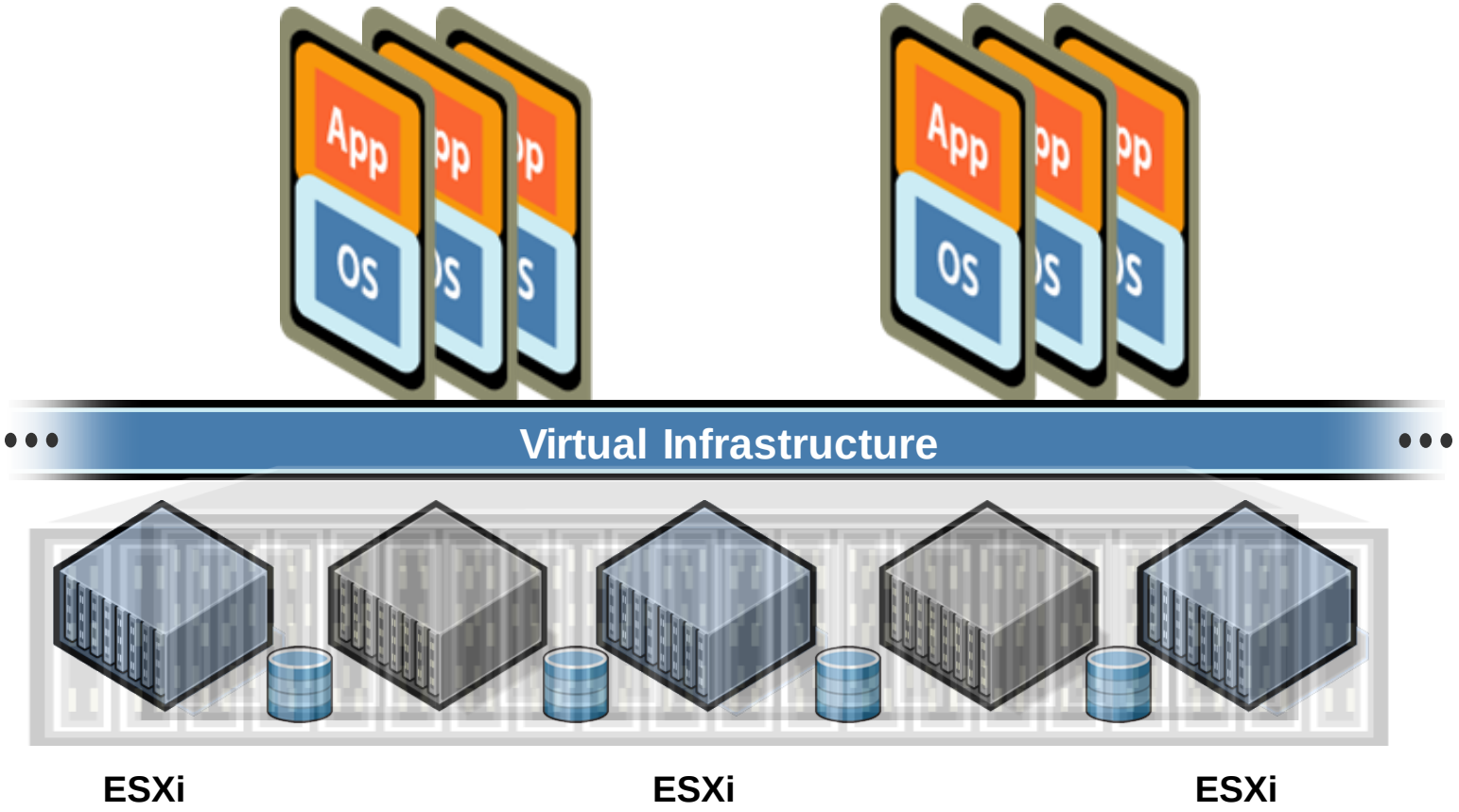
- Utilization
- Power
- Service Level Agreements



Virtual Infrastructure

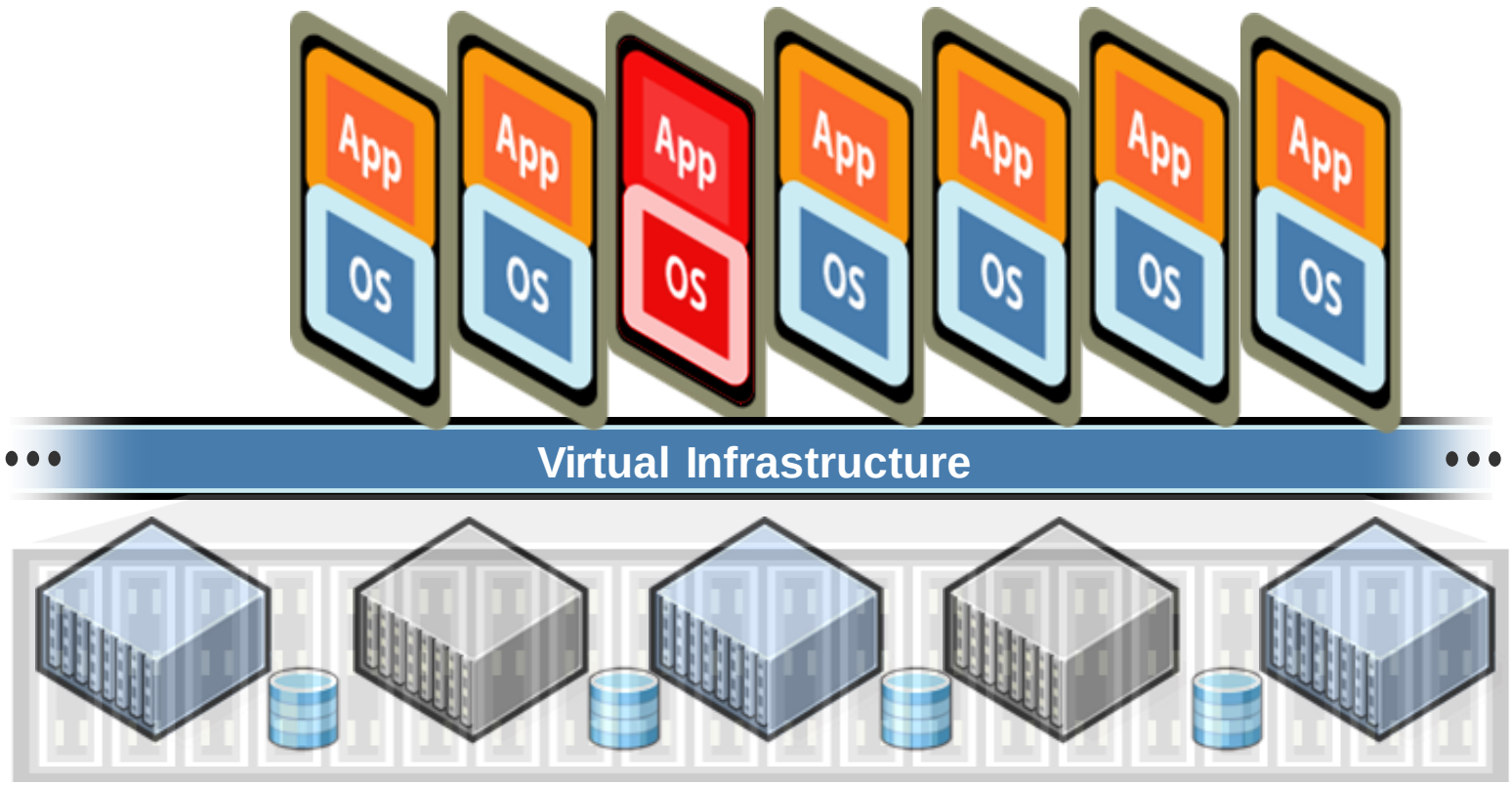


ESXi – Hardware That is VI3 Ready

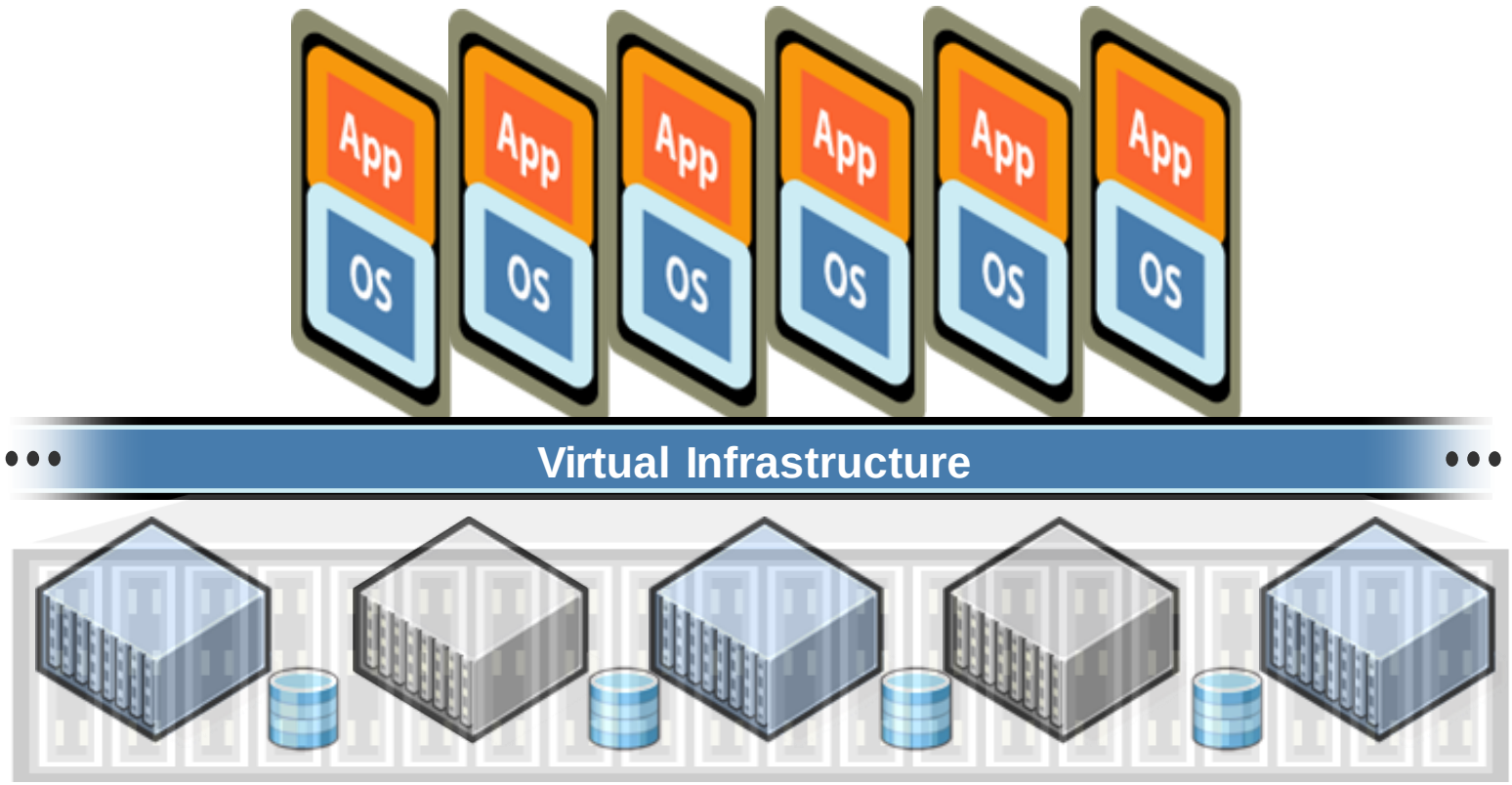


Phase 2 - Making Virtual Infrastructure a Better Platform

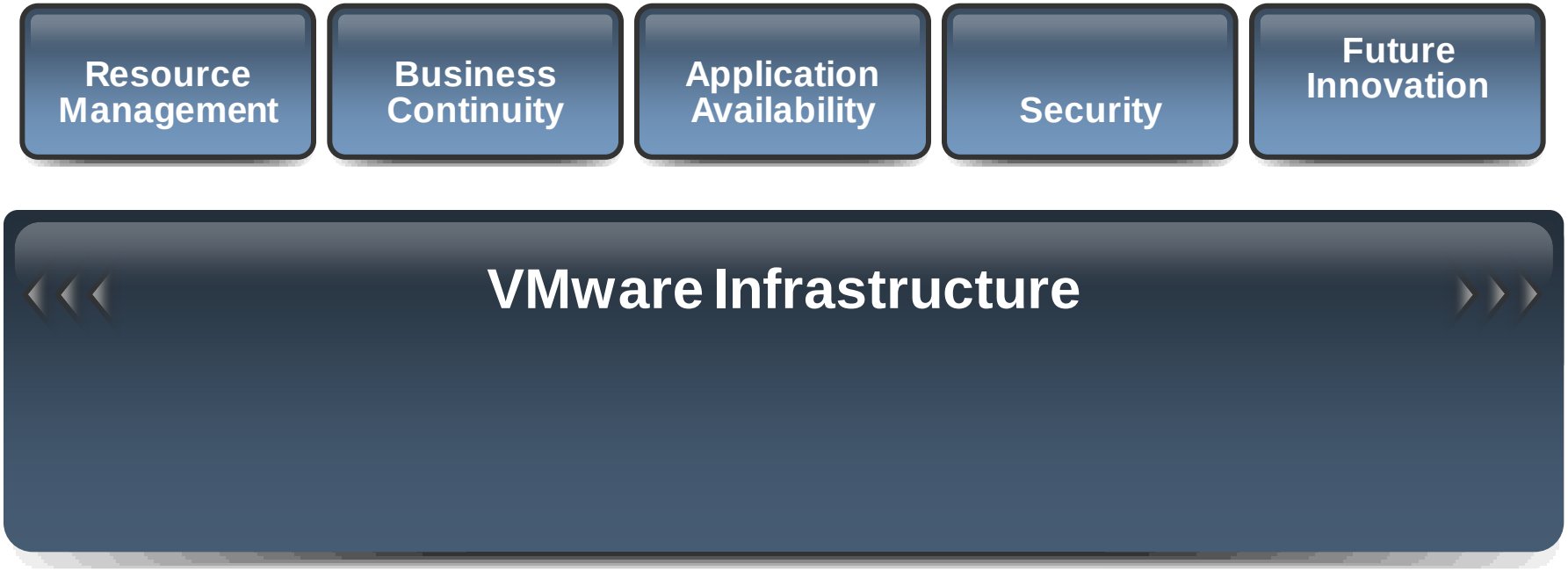
High Availability – Automatic Restart



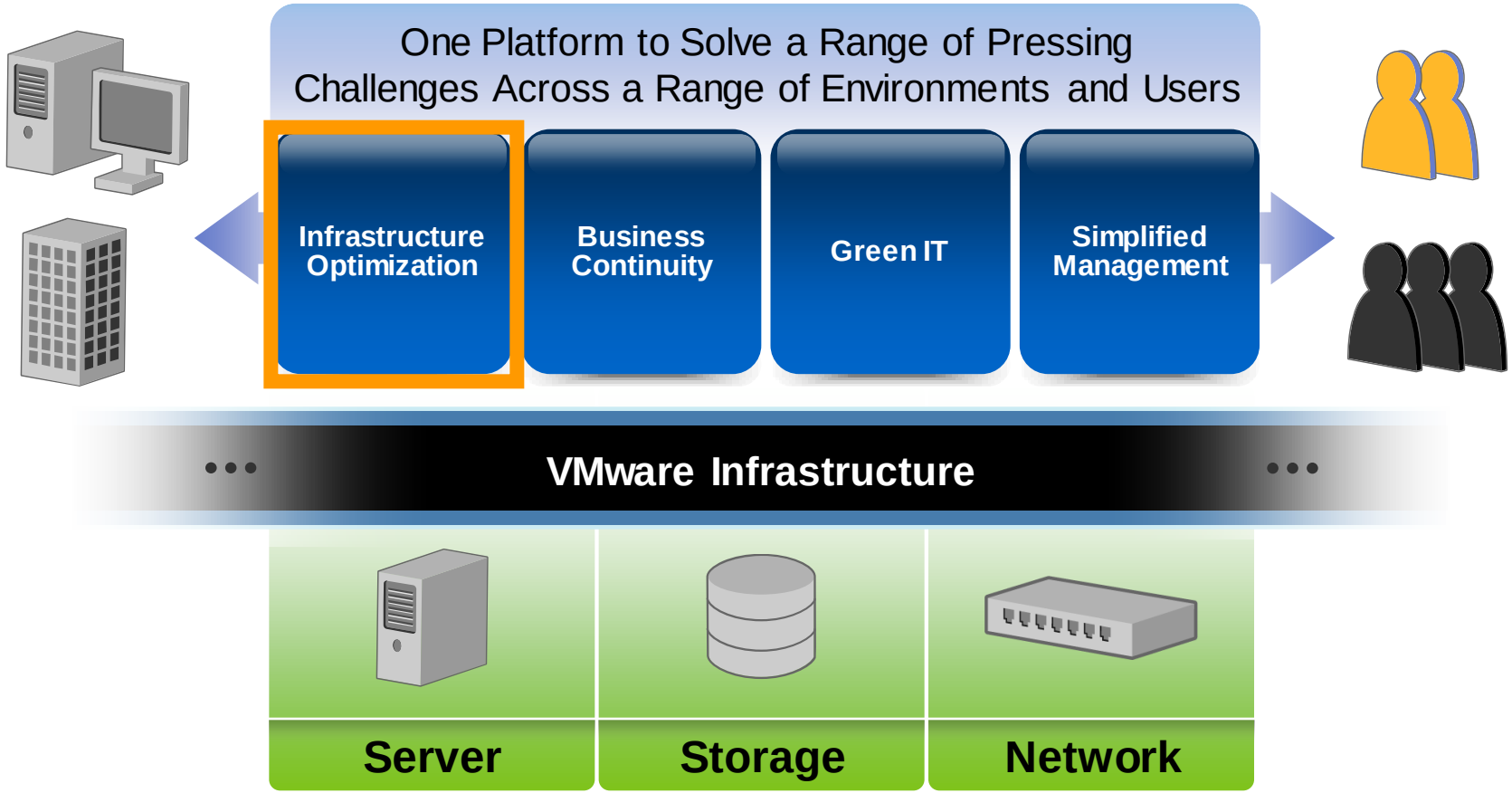
Continuous Availability – Tolerate HW Failure



Phase 2 and beyond: Feature-Rich Platform



The VMware Infrastructure Platform



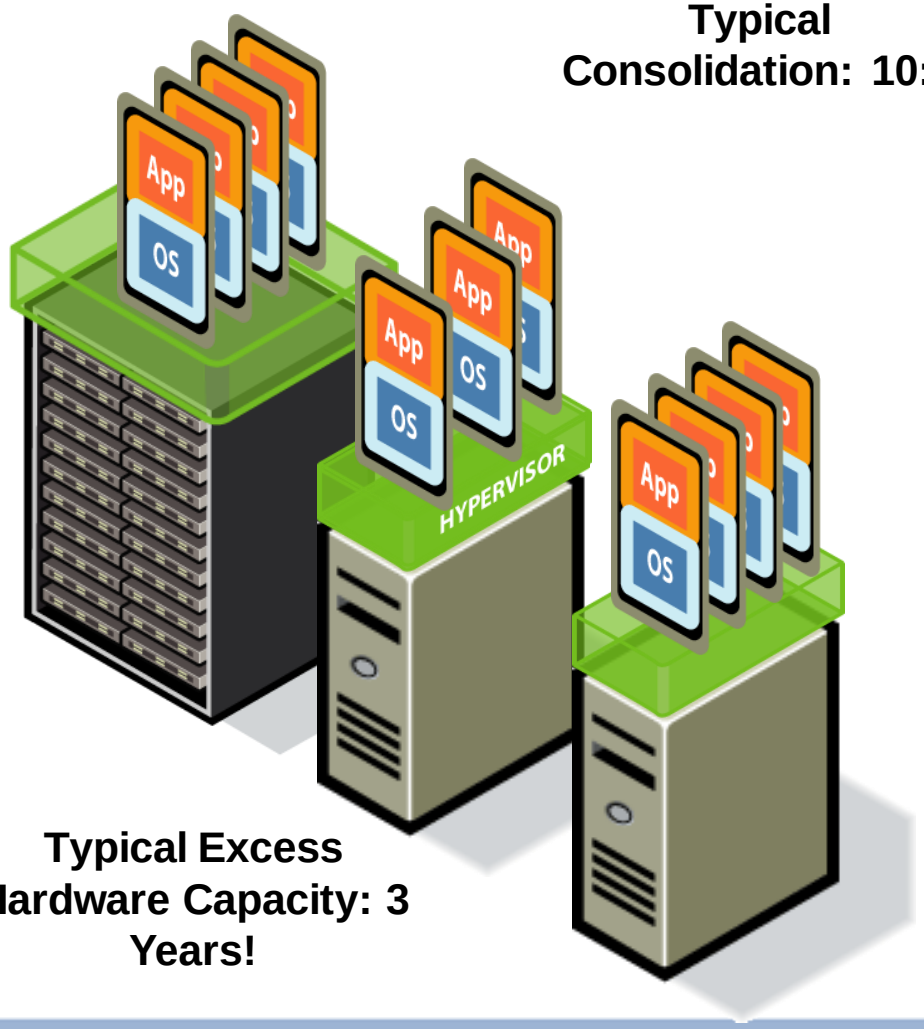
Reduce Server Spend Through Consolidation

VMware…

- **Decouples software from hardware**
- **Encapsulates Operating Systems and applications into "Virtual Machines"**

A Server or Desktop Virtual Machine

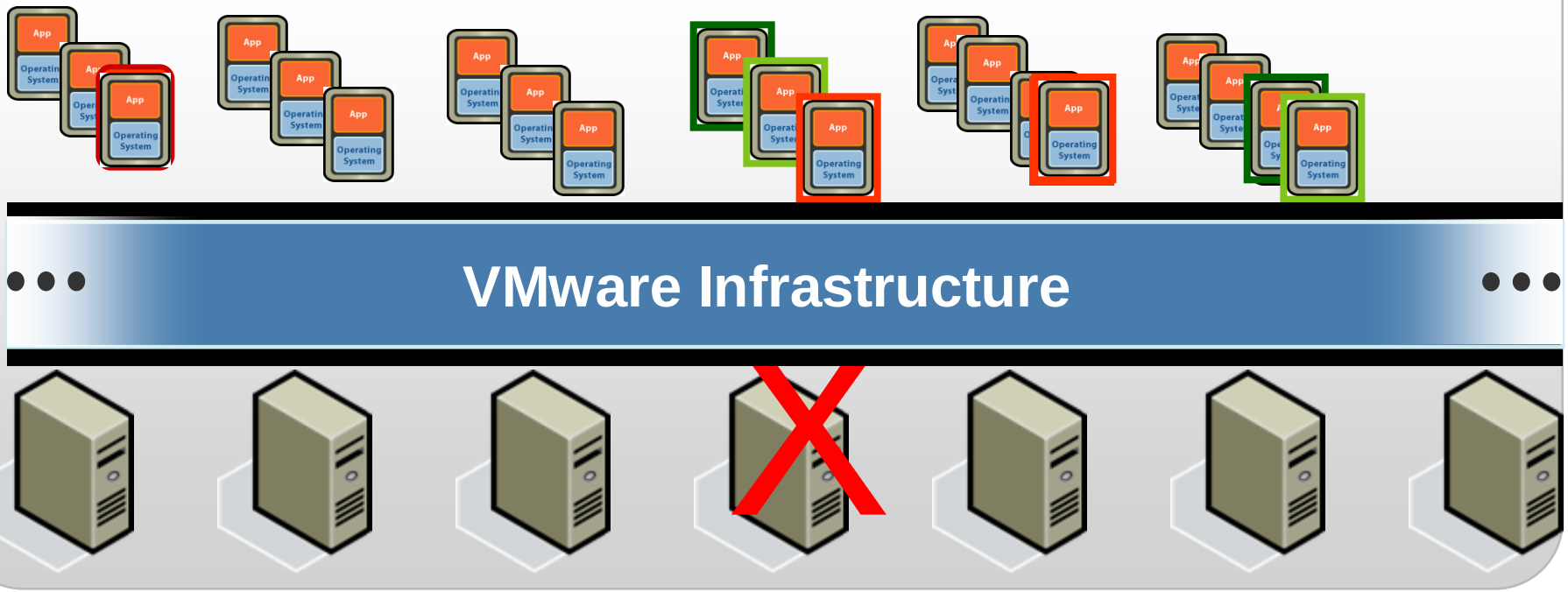
Typical Consolidation: 10:1



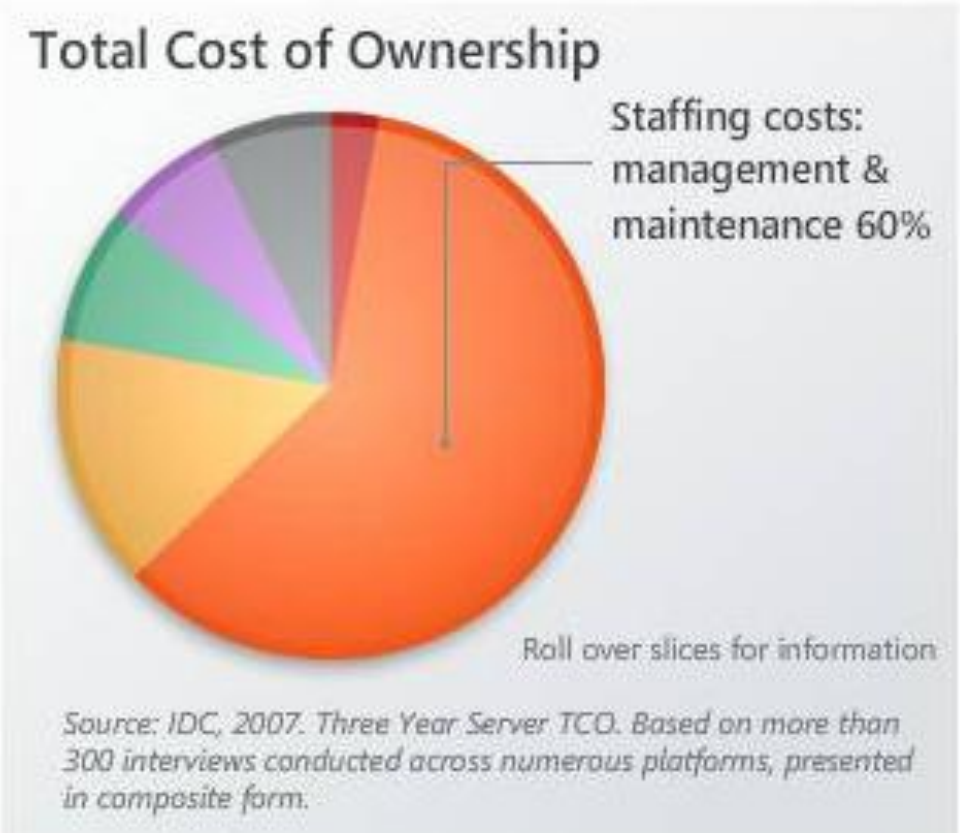
Typical Excess Hardware Capacity: 3 Years!

The Always On, Optimized, Energy Efficient Datacenter

- Shared pools of resources
- Self-optimizing
- Fault tolerant
- Self-protecting
- Automated



Reducing Operating Costs and Downtime is Critical



Initial software costs make up only 7 percent of total cost of ownership.

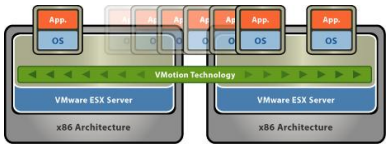
Did you know...

- Staffing—the cost of managing and maintaining IT systems—accounts for 60 percent of TCO.
- Downtime is 15 percent of TCO.

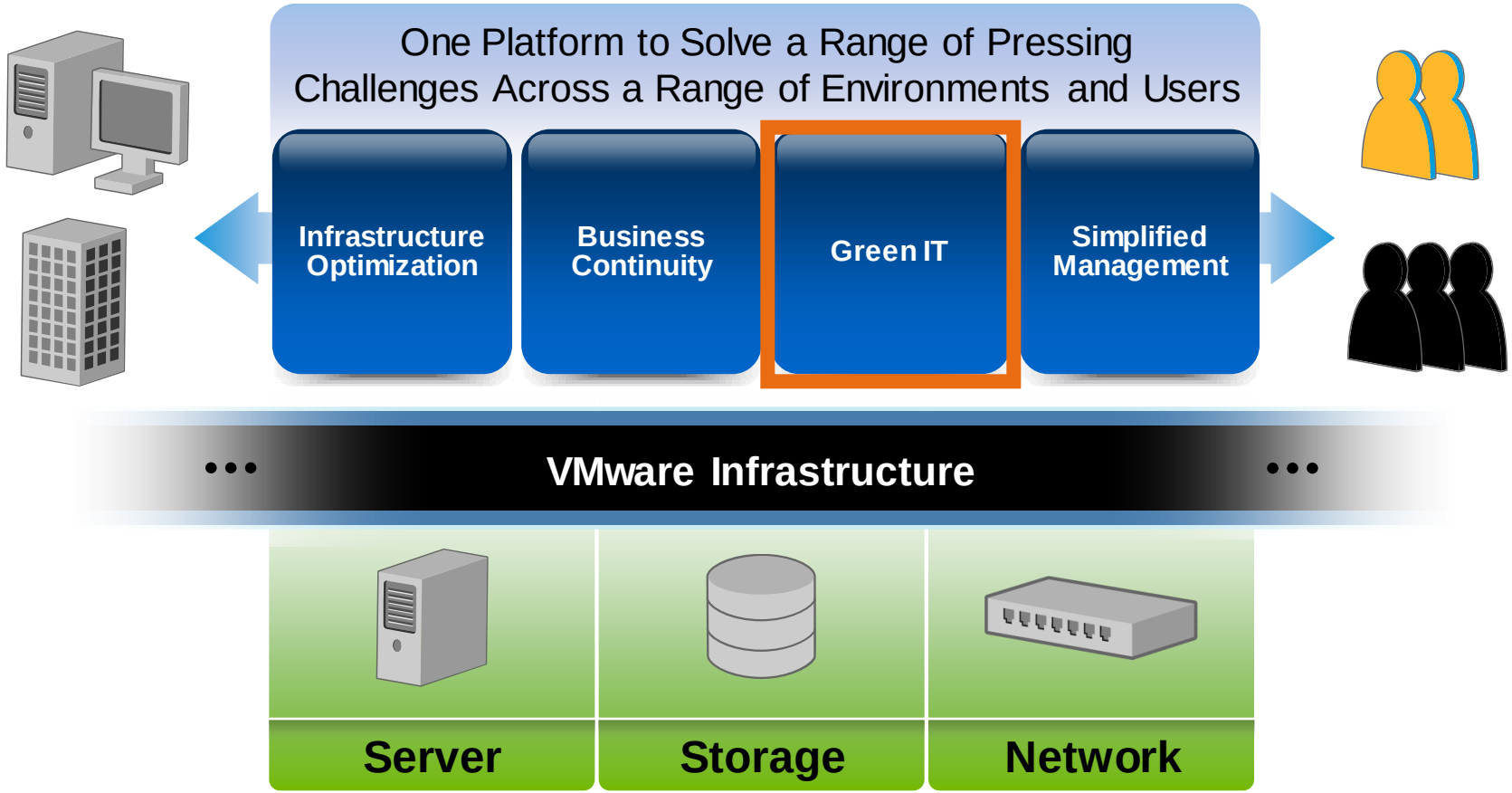
These two cost areas are the largest contributors to TCO over three years.

Source: Microsoft / IDC

Examples of Productivity using VMware

	BEFORE VMware	AFTER VMware
 **Instant Provisioning**	> 4-6 weeks	> Fully automated in days
 **Live Migration**	> Downtime required > App migration takes days/weeks of prep	> No maintenance window or planned downtime > Migrate apps in seconds
 **Patch Management**	> Patch each host manually with downtime	> Automated patching with no downtime
 **Centralized Desktops**	> Managing thousands of dispersed PCs	> Managed centrally in datacenter

The VMware Infrastructure Platform



Green Impact of Data Center Change

- **Datacenters are huge CO2 factories**
  - 1 full rack of blade servers = 20-25 kW = peak demand of 30 homes
- **Every server removed saves ~4 tons of CO2 emissions per year**
  - Equivalent to taking ~1.5 cars off the road (15,000 miles @ 20 mpg)
- **Un-utilized server capacity in the industry equates to:**
  - $140 billion, 3 year supply, more than 20 million servers (IDC)
  - 80 million tons of CO2 per year, more than half of ALL countries in South America produce

Sources: IDC, Virtualization 2.0, John Humphreys; http://carma.org/dig/show/world+country

Spiraling Power, Cooling and Space Requirements

"If performance per watt is to remain constant over the next few years, **power costs could easily overtake hardware costs**, possibly by a large margin."

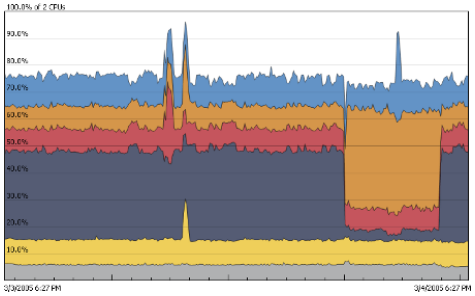
-Luiz Andre Barroso, Lead Technical Architect, Google

"Over the next 5 years, most enterprise data centers will spend as much on energy (power and cooling) as they do on hardware infrastructure."

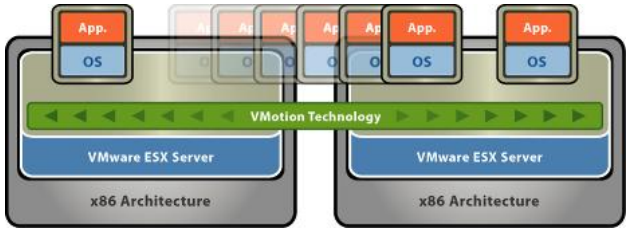
-Gartner, February 2007

1. "Pragmatic Approaches To Server Virtualization," Forrester, June 2006

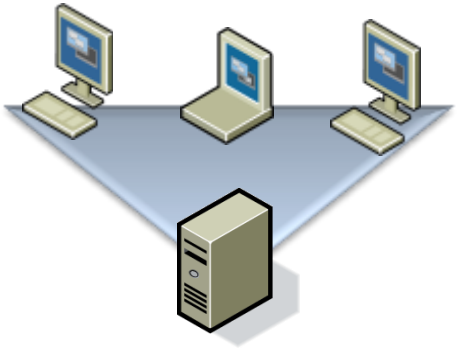
How VMware Reduces Energy Cost / Consumption



- Highest **consolidation** rates on most secure and reliable virtualization platform
- Safely improve utilization rates
- **80% energy reduction**

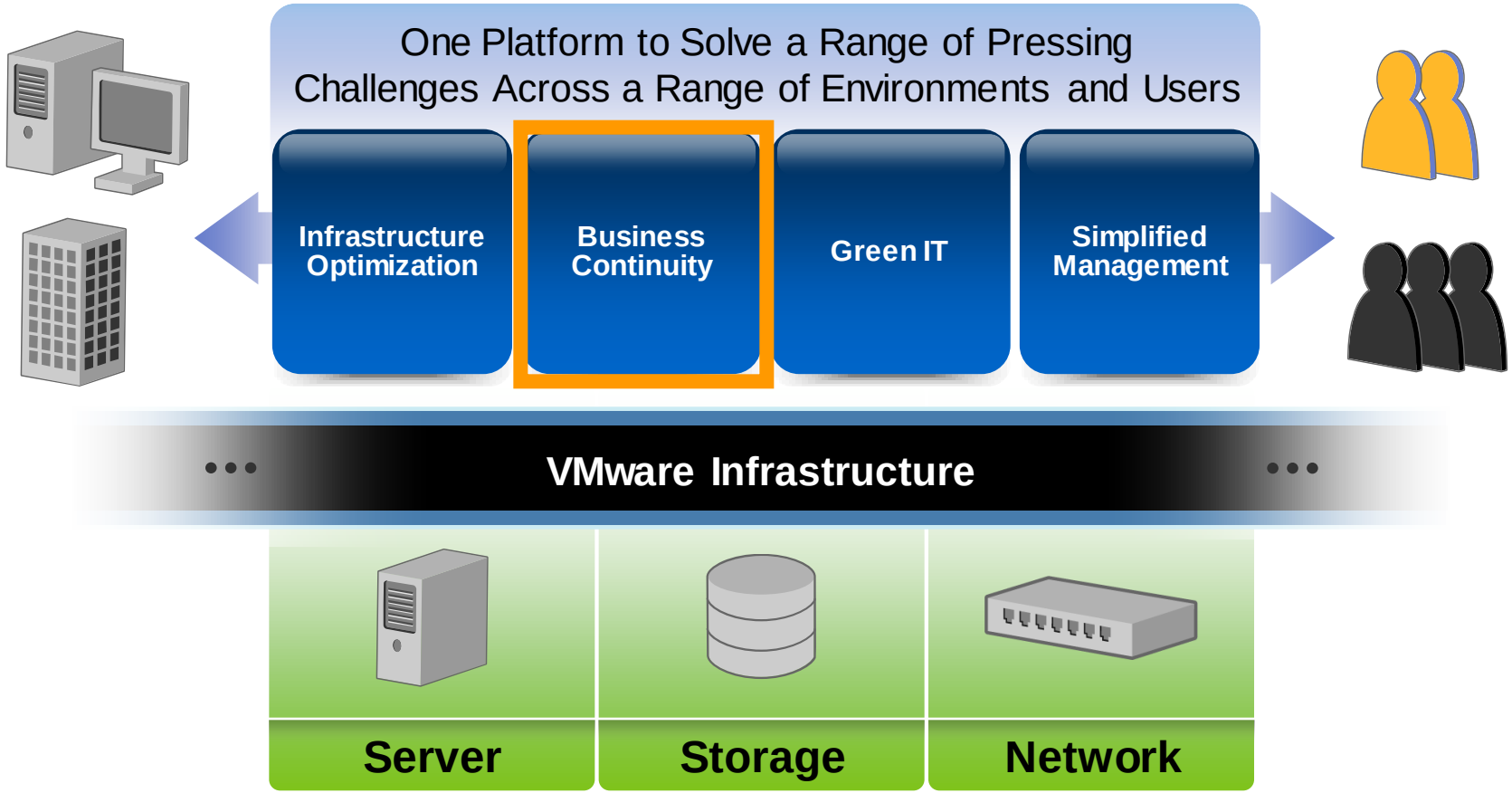


- Dynamic server and storage migration
- Power off unneeded servers in real-time
- Migrate storage dynamically
- **25% energy reduction**



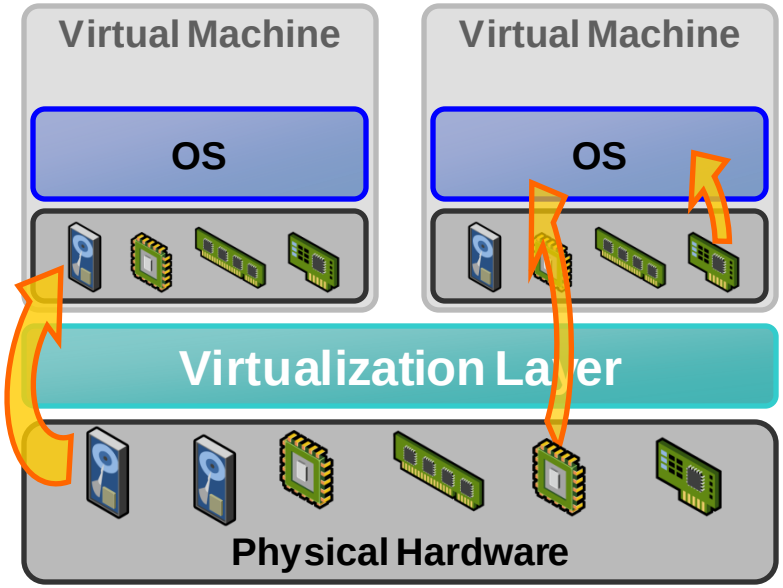
- Host desktop PCs in the datacenter
- Use thin clients, double refresh cycle
- Reduce storage for similar desktop images
- **70% energy reduction**

The VMware Infrastructure Platform



Virtualization Eliminates Hardware Dependencies

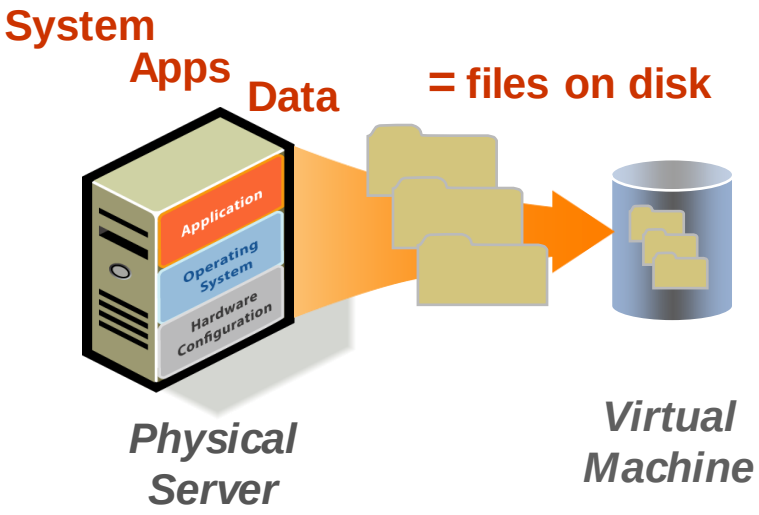
Virtual machines are hardware independent and can run on any server without modification



- OS in virtual machine sees "virtual hardware" (CPU, SCSI disk, memory, network)
- Virtualization layer maps virtual hardware to physical hardware
- Virtual hardware remains identical regardless of physical hardware

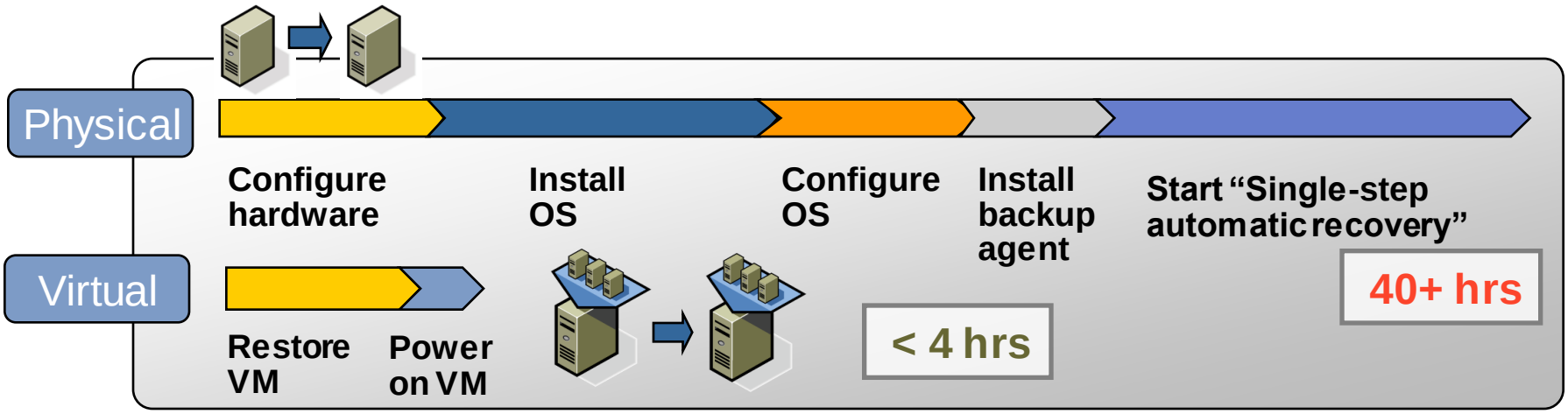
Virtualization Turns Systems into Data

Virtual machines encapsulate and entire system in a few files on disk



- Everything about a system stored in small number of files
- Simplifies copying and cloning of systems
- Simplifies provisioning systems for recovery and recovery testing

Simplifying the Disaster Recovery Process



Eliminate recovery steps

- No operating system re-install or bare-metal recovery
- No time spent reconfiguring hardware

Standardize recovery process

- Consistent process independent of operating system and hardware

Management
Data
Infrastructure

vmware

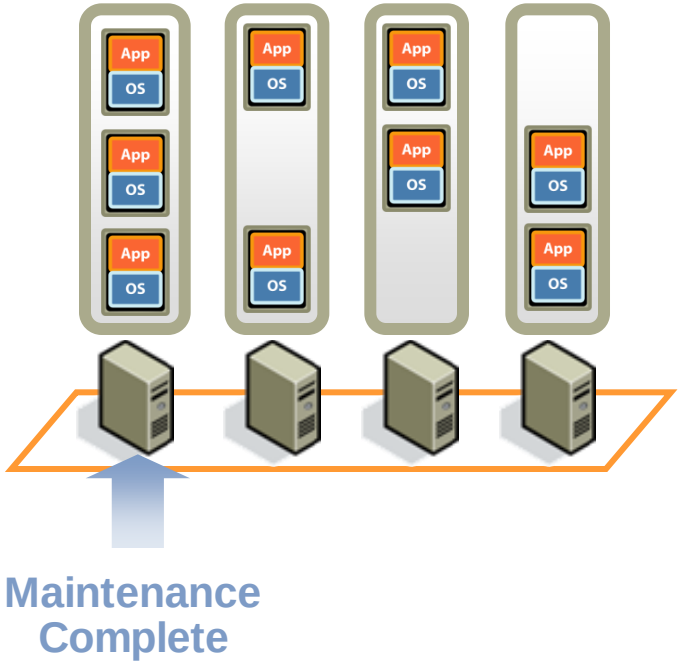
Eliminating Downtime for Hardware Maintenance

Hardware maintenance with VMware Infrastructure

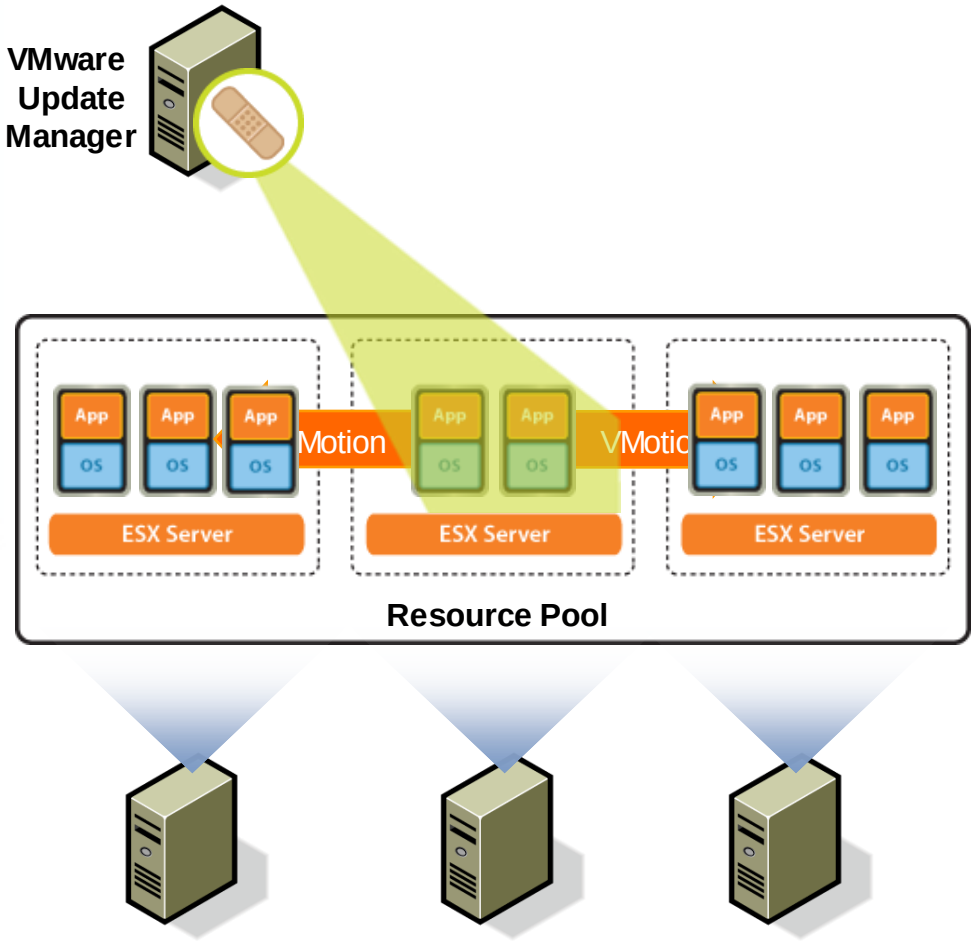
- Automated redistribution of workloads to other servers in pool
- Automatic redistribution when server maintenance complete

Impact

- Non-disruptive hardware maintenance:
  - *No* application downtime
  - *No* user impact
  - *No* downtime window

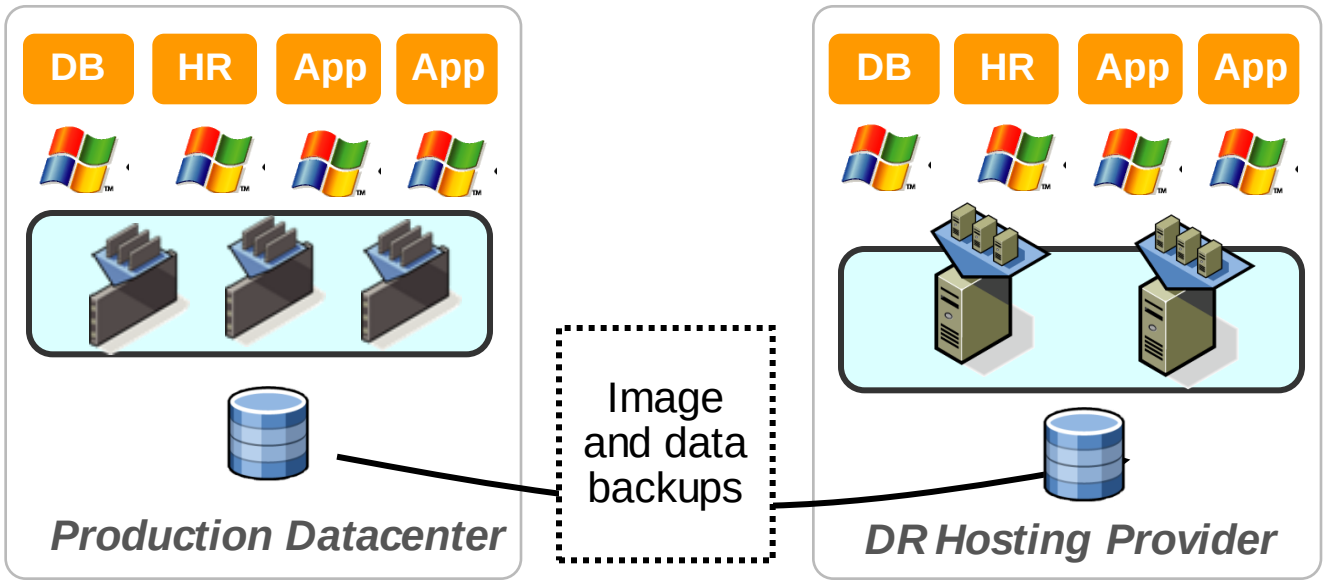


Non-Disruptive Automated Patch Management



- Automates patching of ESX hosts and virtual machines with NO DOWNTIME
  - Scans and remedies online and offline virtual machines
  - Snapshots virtual machines prior to patching and allows rollback to snapshot
- Patches entire DRS clusters
  - Each host enters maintenance mode, one at a time
  - Entirely automated – no intervention required

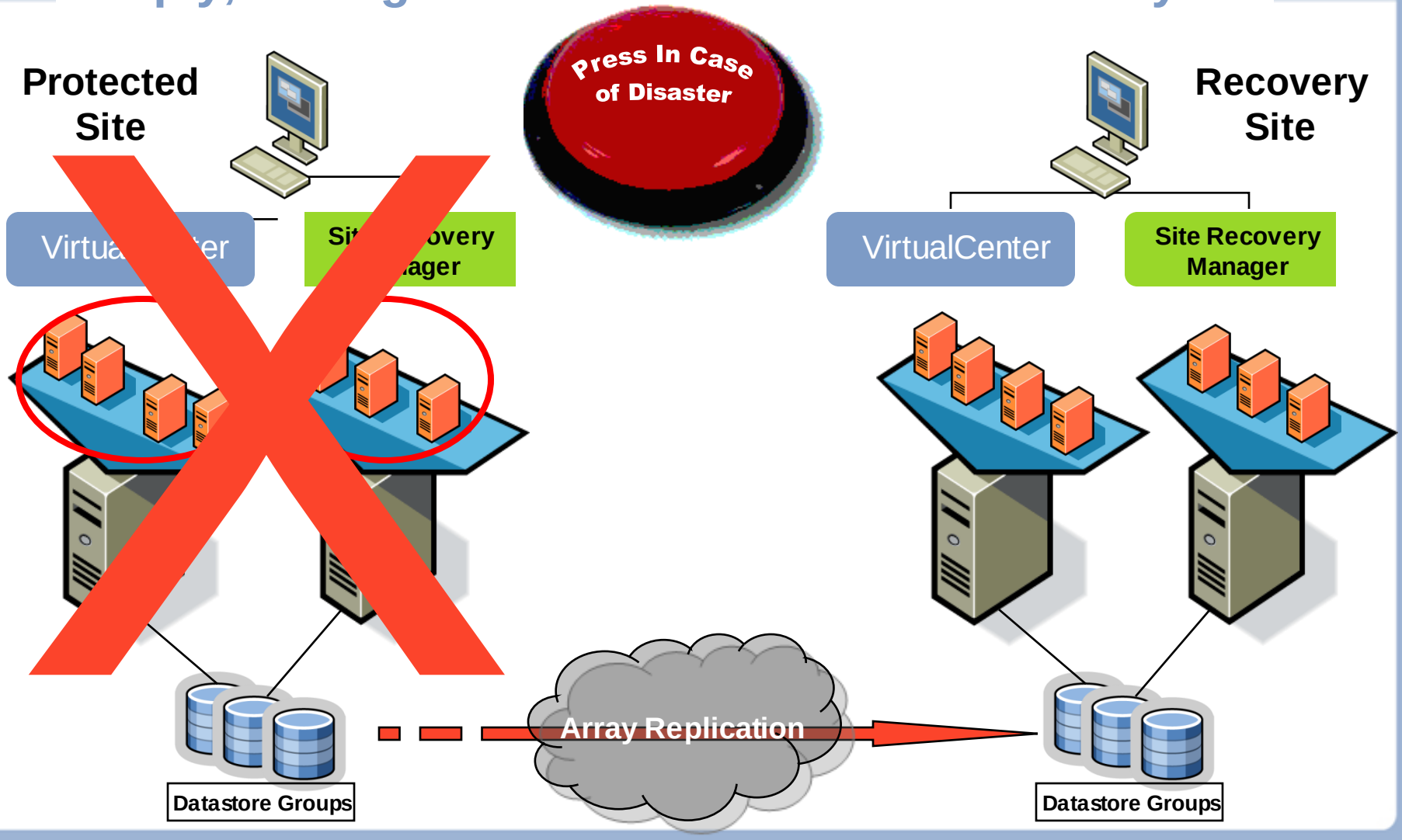
DR With Virtualization



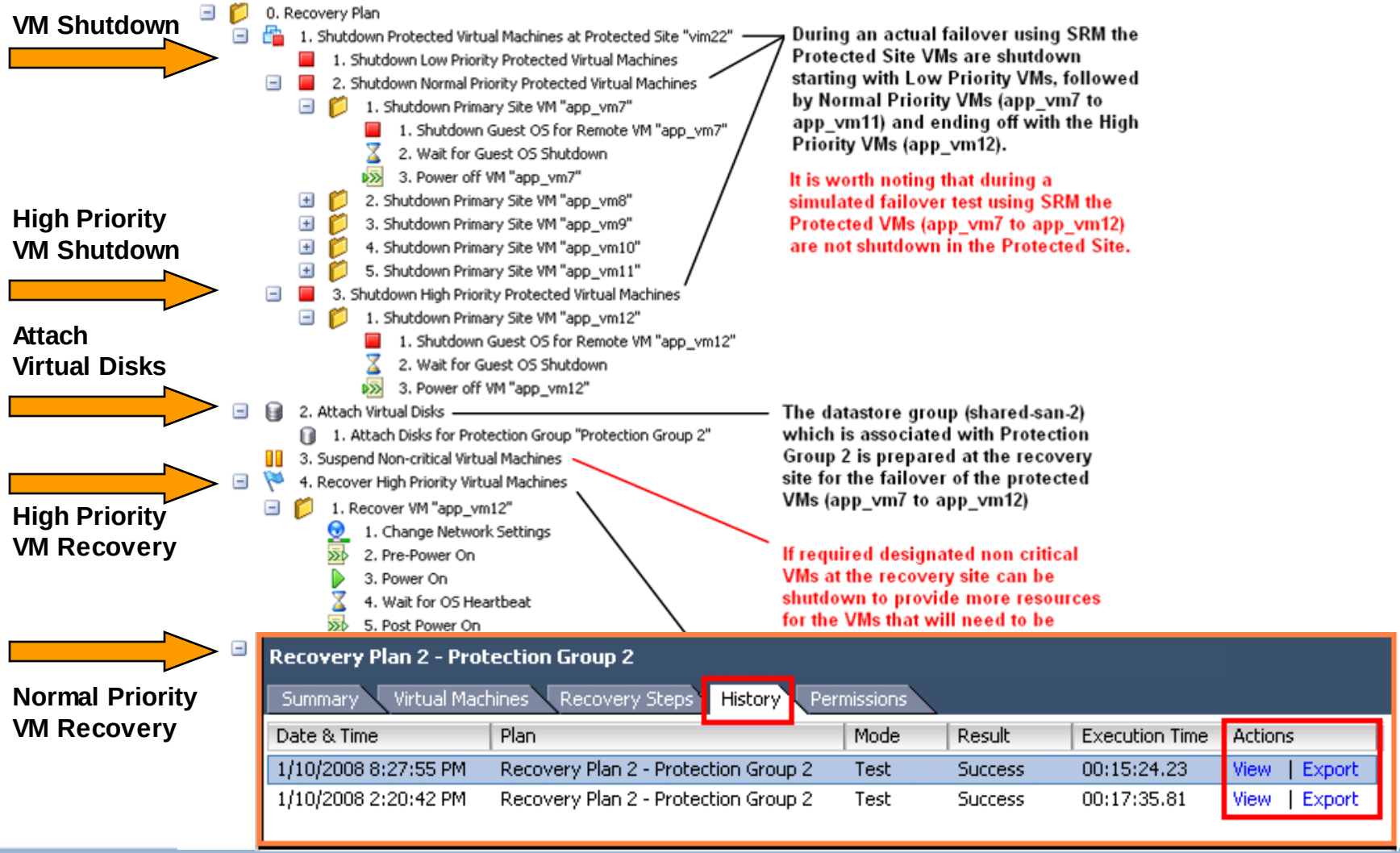
- Recovery to any hardware
- Recovery time within 24 hour objective
- Failback takes days, not months

> *"Without VMware Infrastructure, it would have taken us weeks to recover our critical systems when Hurricane Katrina hit our datacenter. VMware Infrastructure enabled us to get our critical systems up and running within 24 hours."*
>
> -- Scott Fontenette, Hancock Bank

Simply, Manage & Automate Disaster Recovery



Turn manual BC/DR run books into an automated process



Apply Virtualization to the Desktop

Transform the desktop

- Transform static desktop to a stateless virtual desktop
- Desktops run as virtual machines in secure data center
- Connect to virtual desktop from thick or thin clients
- Streamline & simplify Desktop Management
- Improve security and complance

Proven Virtualization Results in South East Asia

VMware

6-9 **mon**

35%-75

Consoli

- **10-**
- **15-** test

60%-80

Provisioning time cut from hours/days **to** minutes

130000 Customers Worlwide

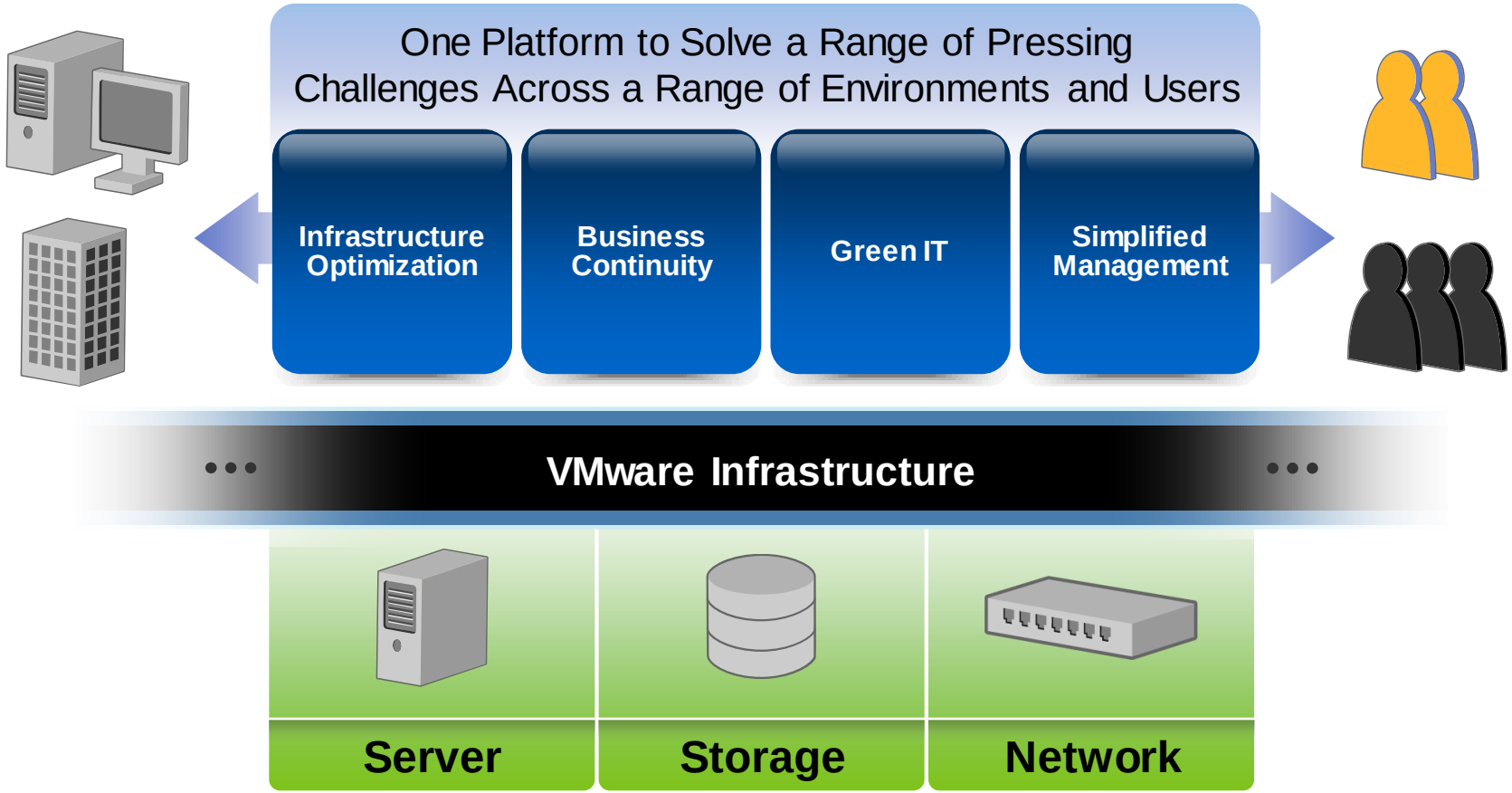
100% Fortune 100 Companies

25 Largest Commercial Banks

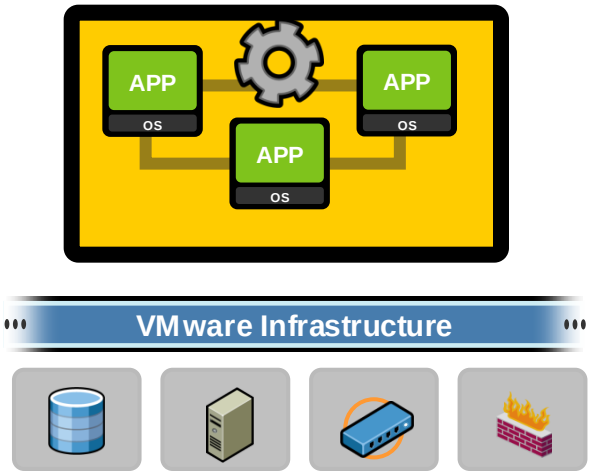
12 Largest Pharmaceutical Companies

5 Largest Chemical Companies

The VMware Infrastructure Platform



Reliable & Dynamic Infrastructure for Enterprise Apps



- **Rock-solid,** virtualizing servers, storage and networking on a secure platform
- **Adaptive,** re-configuring infrastructure quickly to guarantee application QoS
- **Fault tolerant**, recovering applications from any failure without disruption
- **Automated**, accelerating management processes while ensuring compliance
- **Self-protecting**, detecting and eliminating security threats proactively

Thank You

ekkoh@vmware.com