



From virtual machines to virtual infrastructures

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VMware

Topics

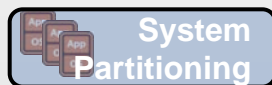
- Virtualization has matured into the mainstream
- From Consolidation to Virtual Infrastructure Services
- Customer Case Studies
- Simplifying the role of the OS
- Future directions for virtualization

The Virtualization Market Has Matured...

3rd Gen...
Infrastructure-wide
Virtualization

1st Generation
Single System
Hypervisor-based
Stack

1999-2001



2nd Generation
Virtual Infrastructure

2003-2005



**Central
Management**



**Enterprise-Class
Virtualization**



**Automation
Aggregation
Availability
Optimization**



**Central
Management**



**Enterprise-Class
Virtualization**

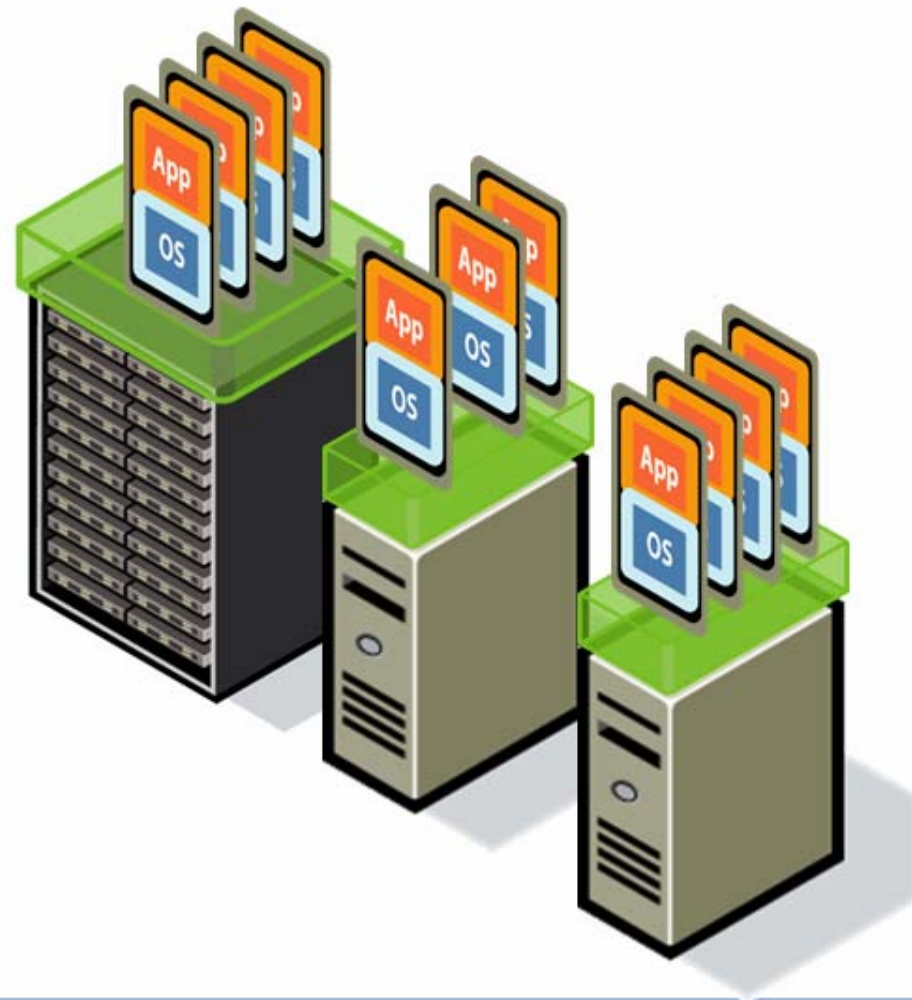


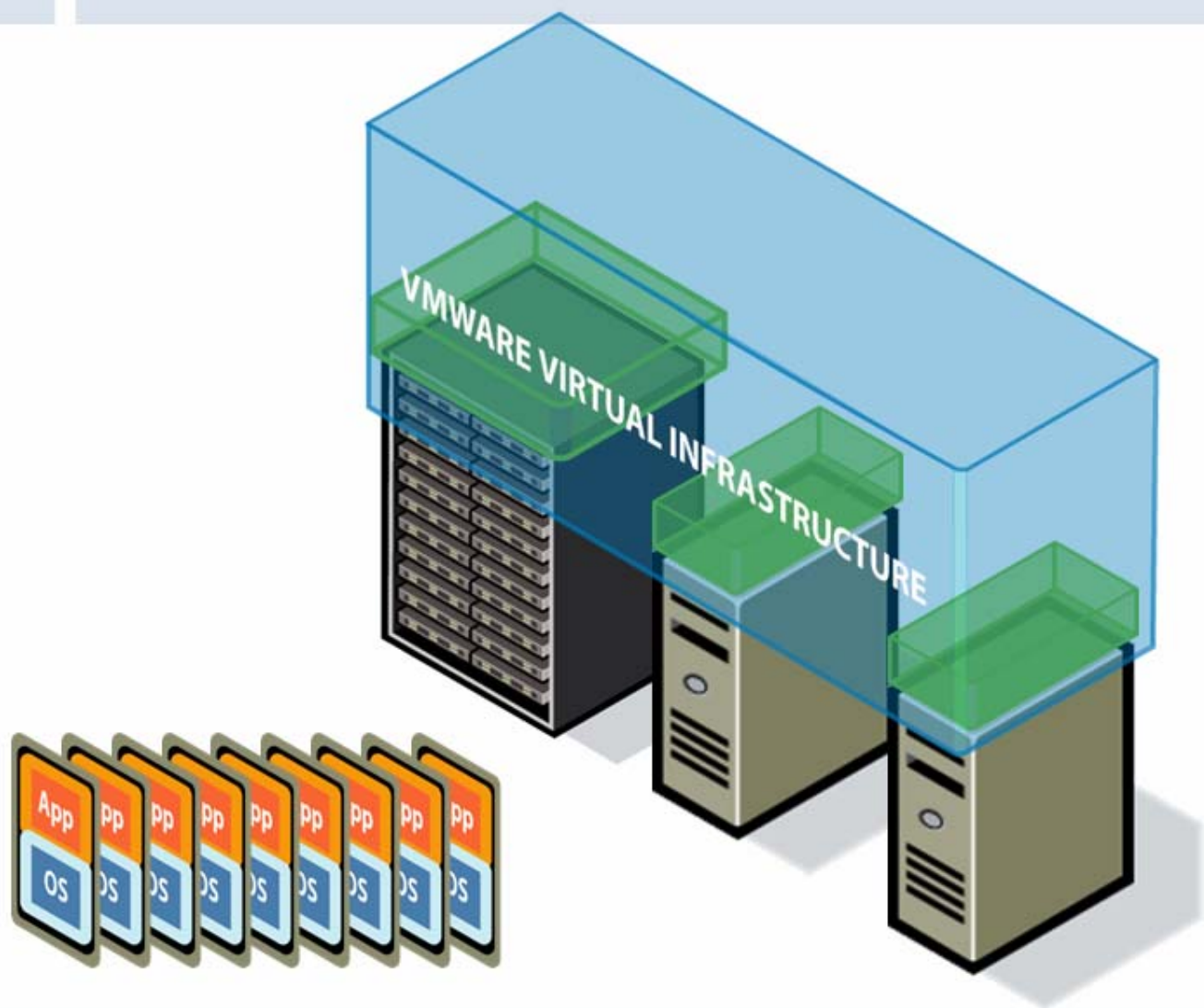
2006 + ...

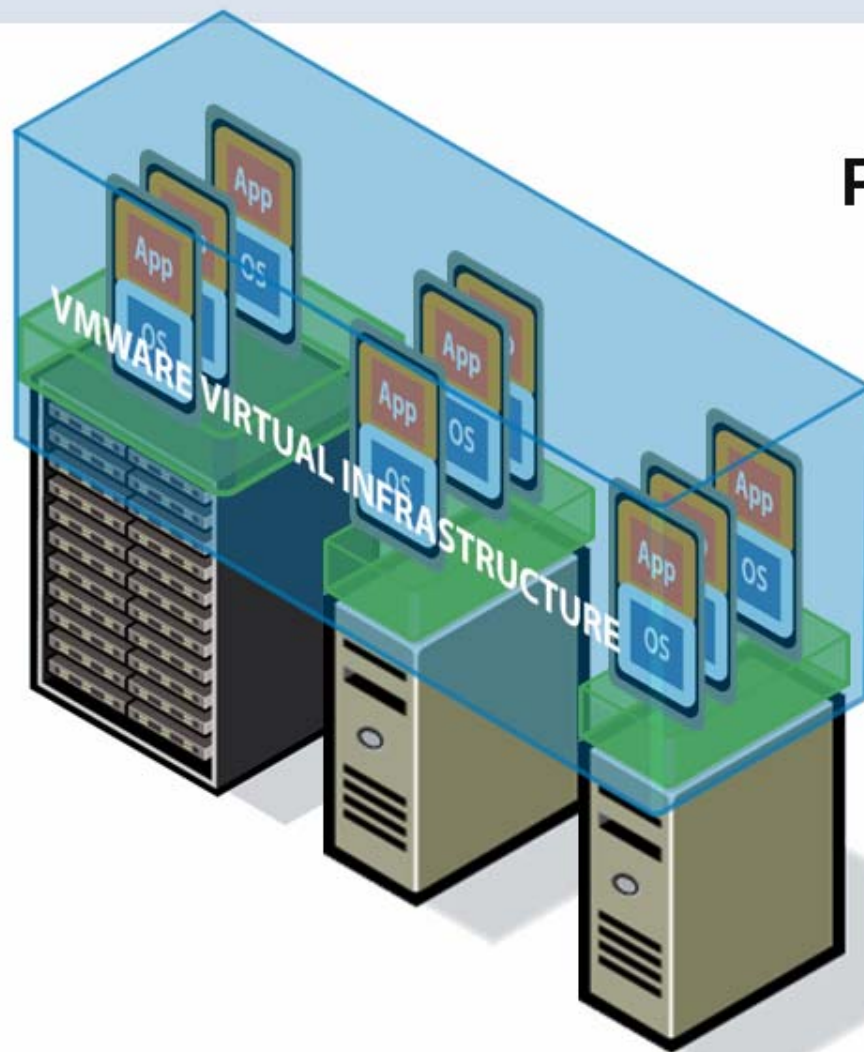




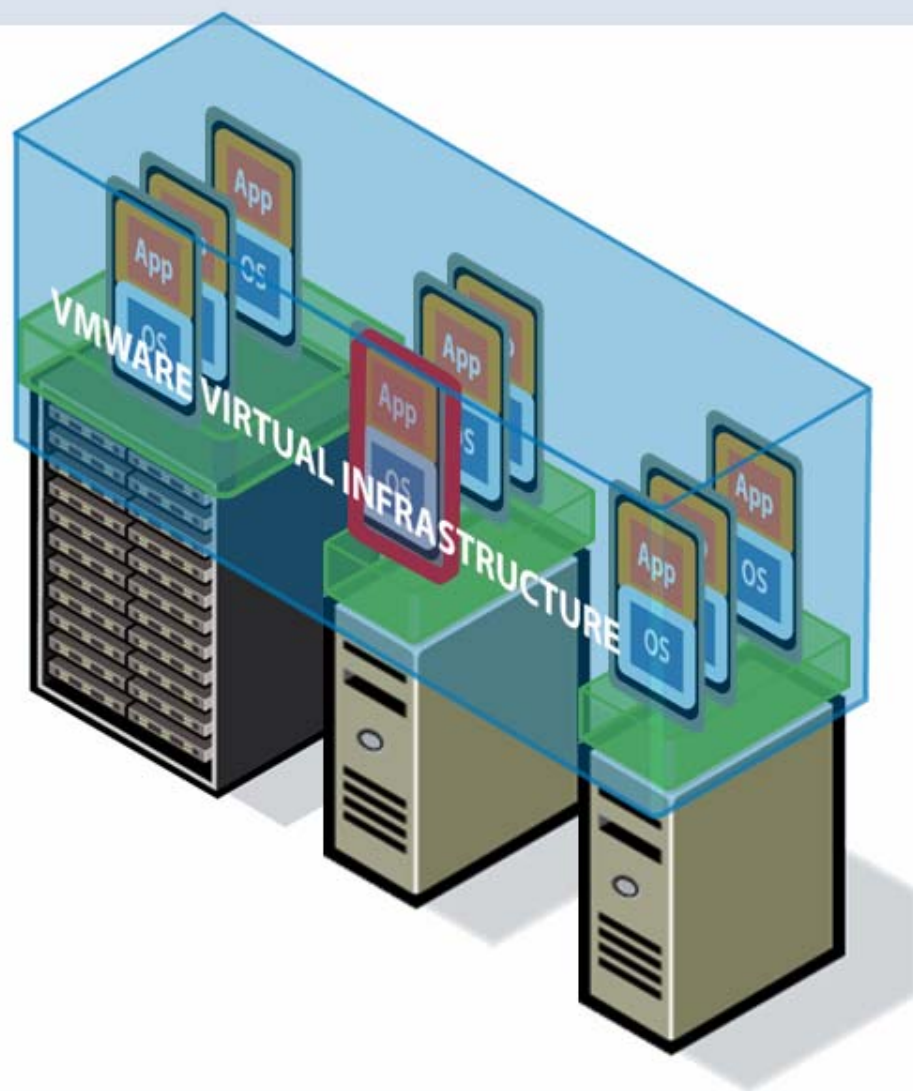


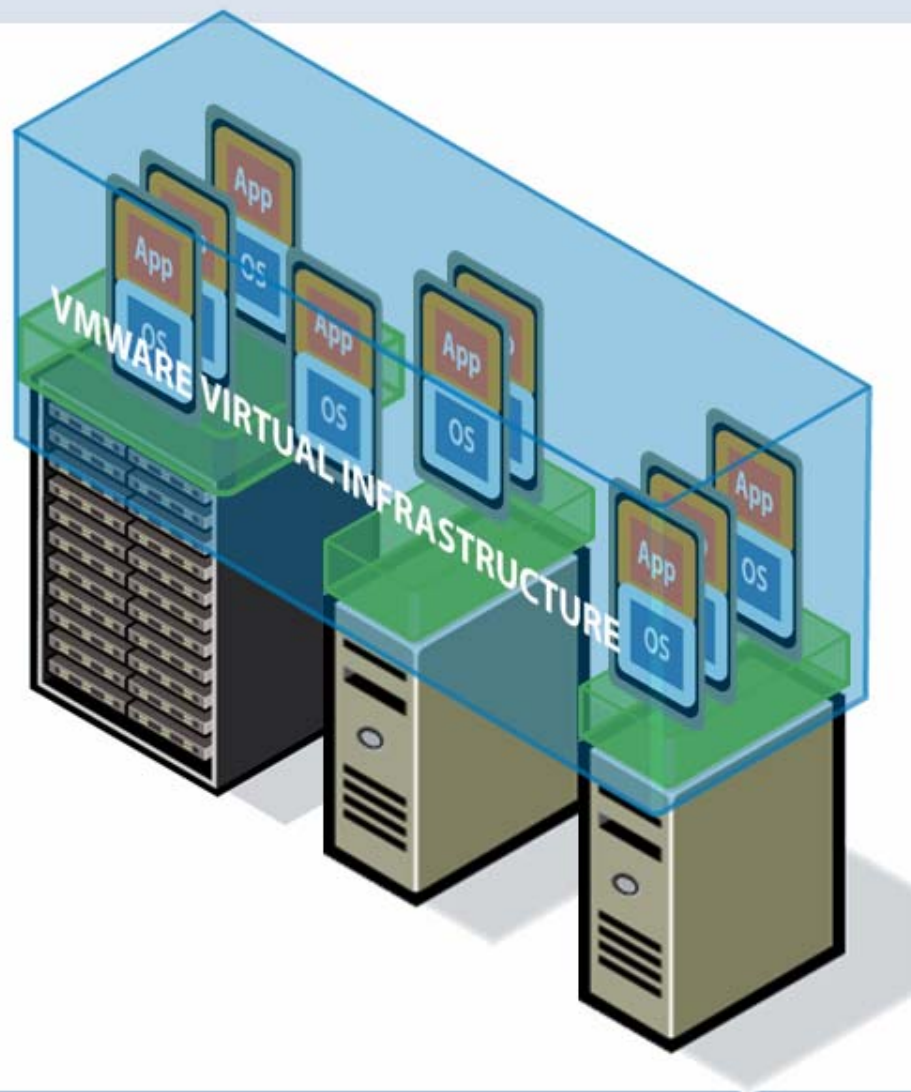




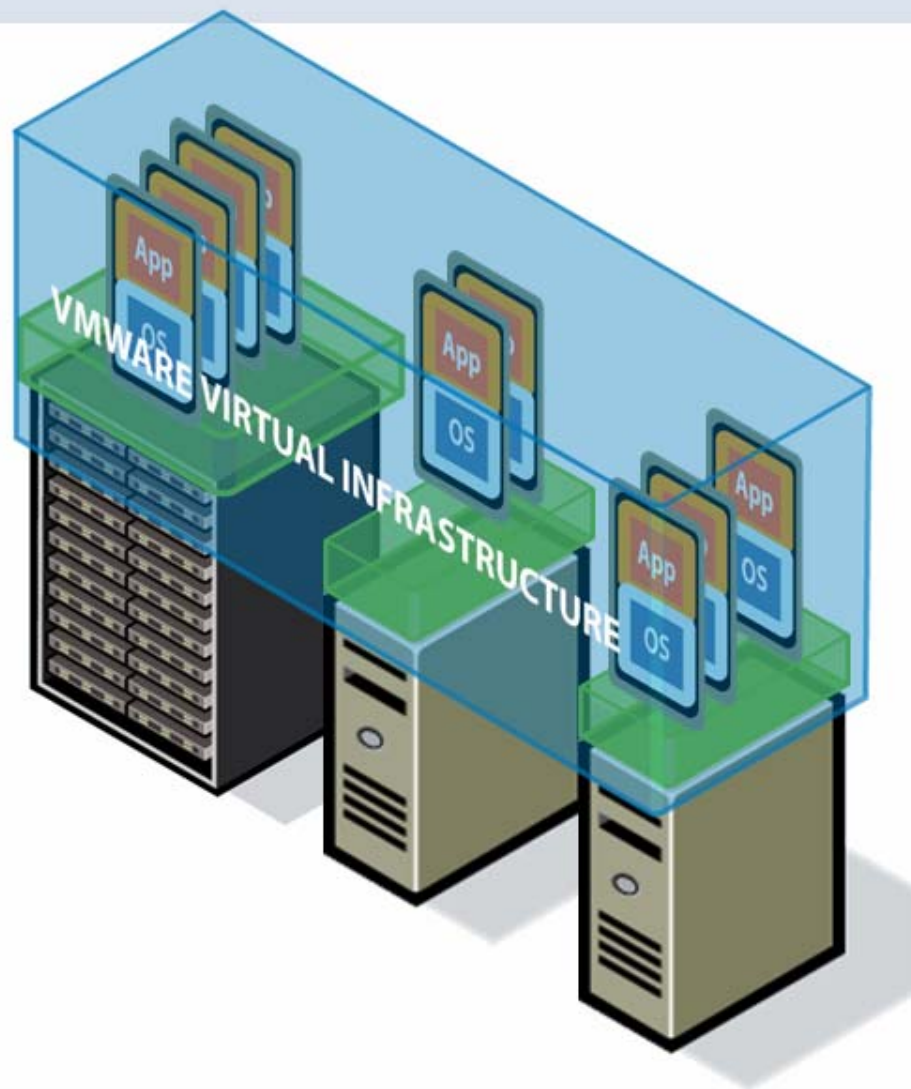


PROVISIONING





VMOTION



VMOTION

Virtualization has become mainstream

...and customers are overwhelmingly choosing VMware

- > 1M+ enterprise server workloads virtualized**
- > 800 Days continuous running**
- > 5B KW hours of power savings**

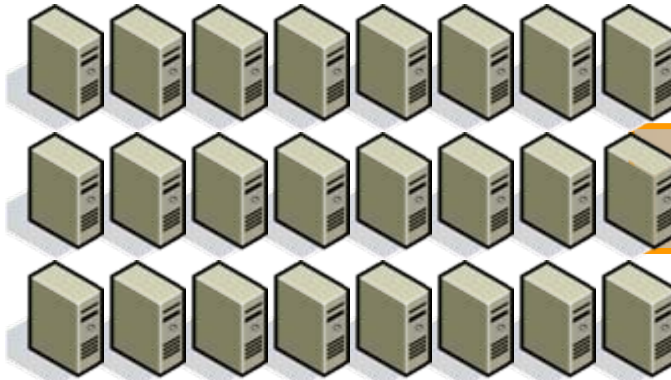
Server, storage, and network consolidation

BEFORE VMware

- Servers** > 1,000
- Storage** > Direct attach
- Network** > 3000 cables/ports
- Facilities**
 - > 200 racks
 - > 400 power whips

AFTER VMware

- > 50
- > Tiered SAN and NAS
- > 300 cables/ports
- > 10 racks
- > 20 power whips



Impact

Hard cost savings

- > 70-80% reduction in data center space, power infrastructure
- > \$8M cumulative savings since 2003

Operational efficiency

- > Server rebuild and application load went from 20-40 hrs =>15-30 min
- > 10,000 man hours saved per year

Now, its not just about Consolidation anymore, its about enterprise-wide VMware infrastructure services . . .

Transforming hardware and capacity management

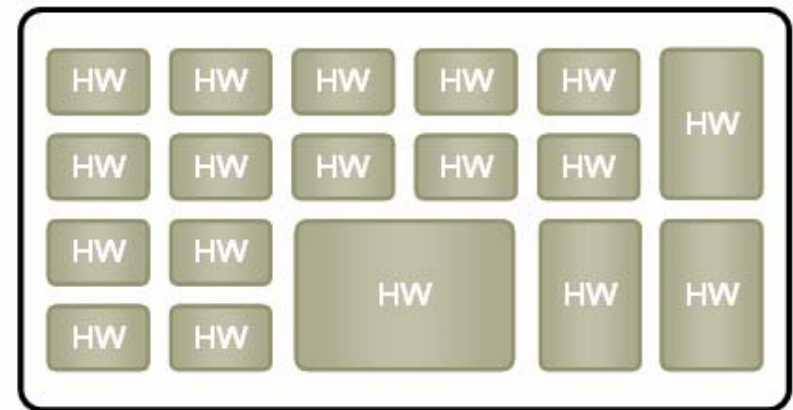
PHYSICAL



VIRTUALIZED



POOLED

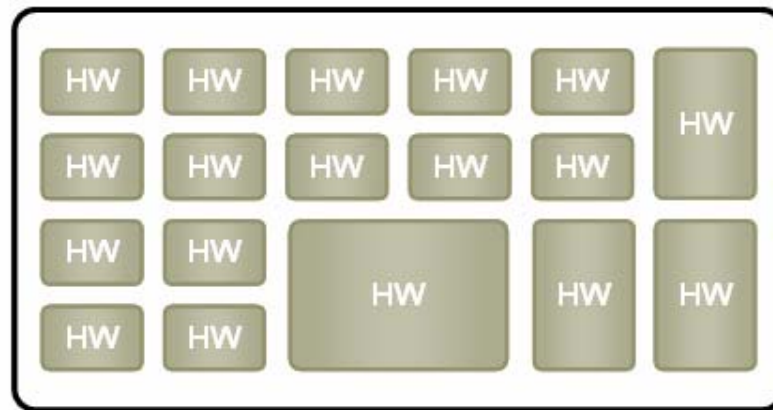


INDUSTRY FIRSTS:

- > Logical Resource Pooling (RP)
- > Distributed Resource Scheduler (DRS)

Transforming hardware and capacity management

POOLED

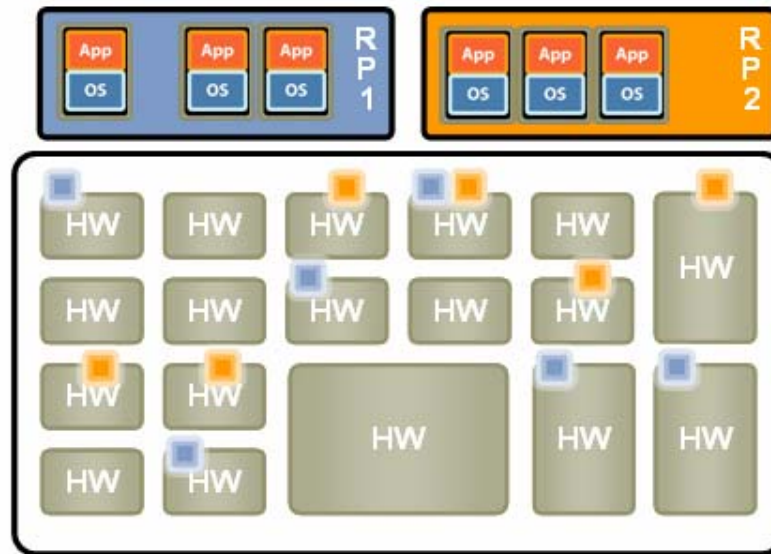


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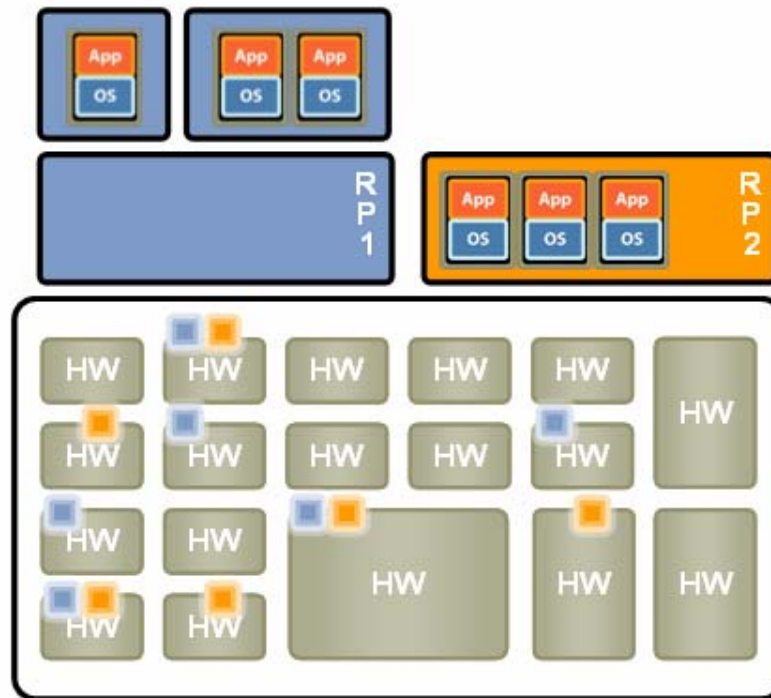


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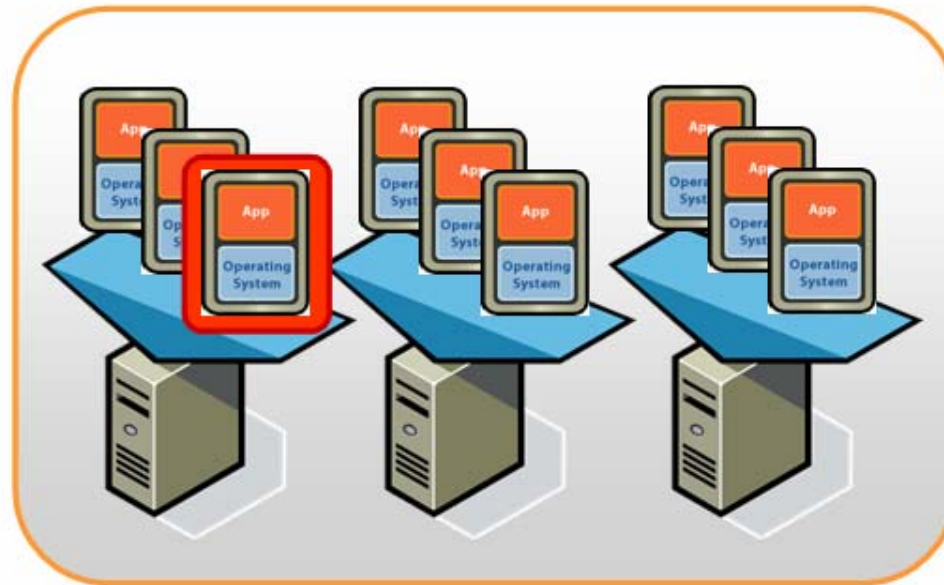
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Automate resource assurance for critical applications

DRS

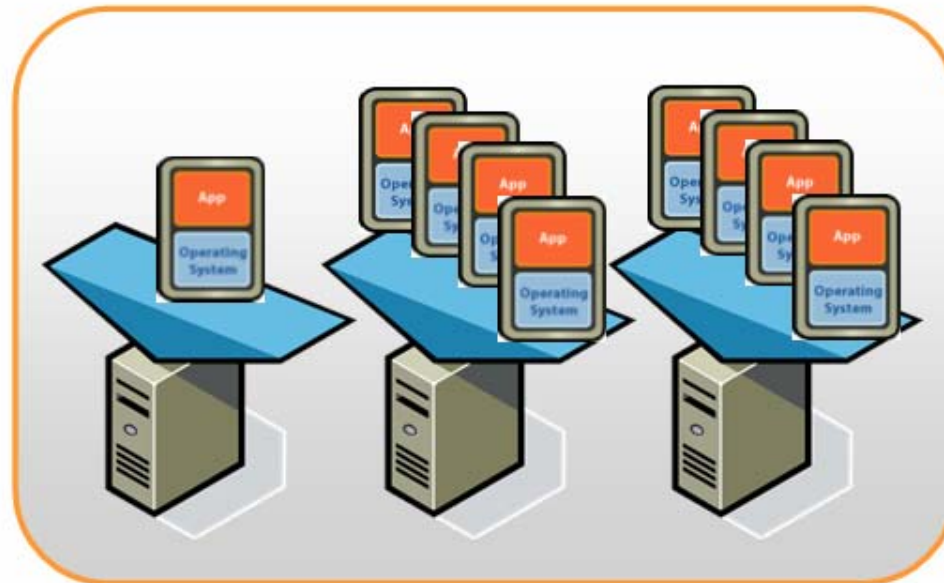
- > **Dynamic balancing**
- > **Continuous optimization**



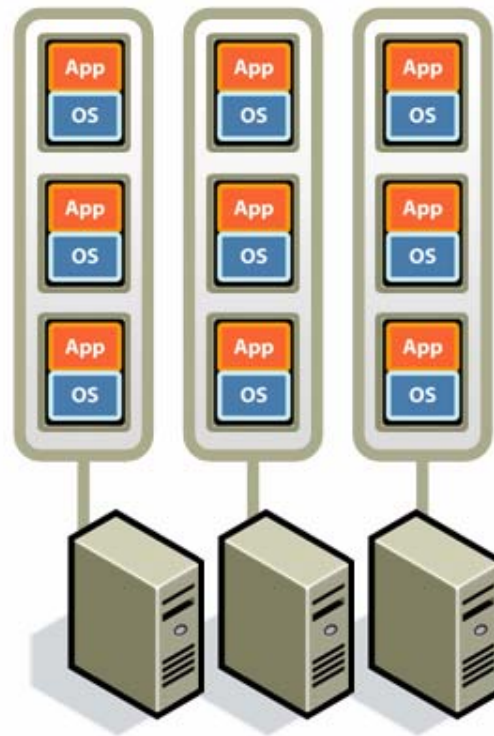
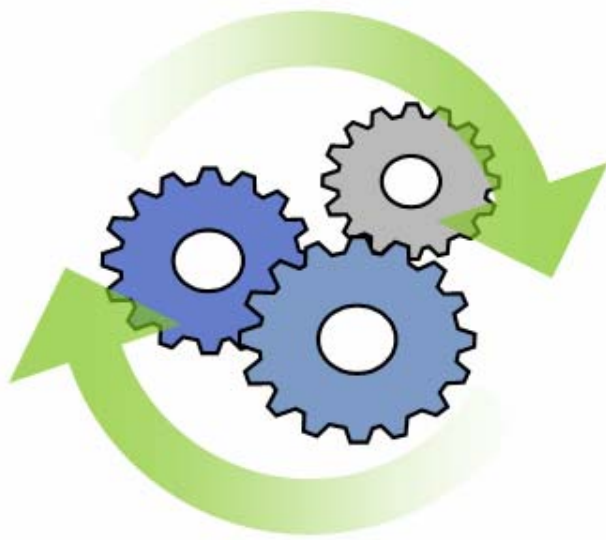
Automate resource assurance for critical applications

DRS

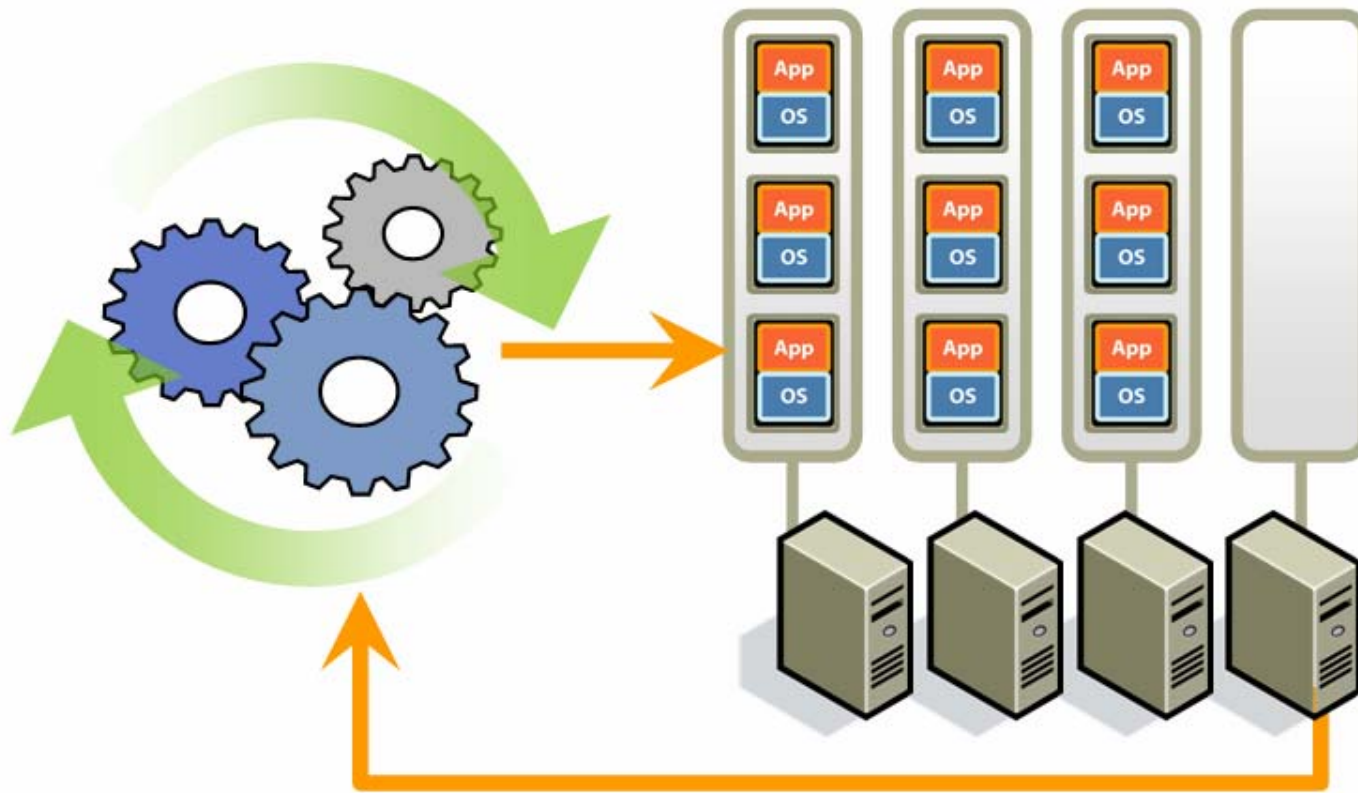
- > Dynamic balancing
- > Continuous optimization



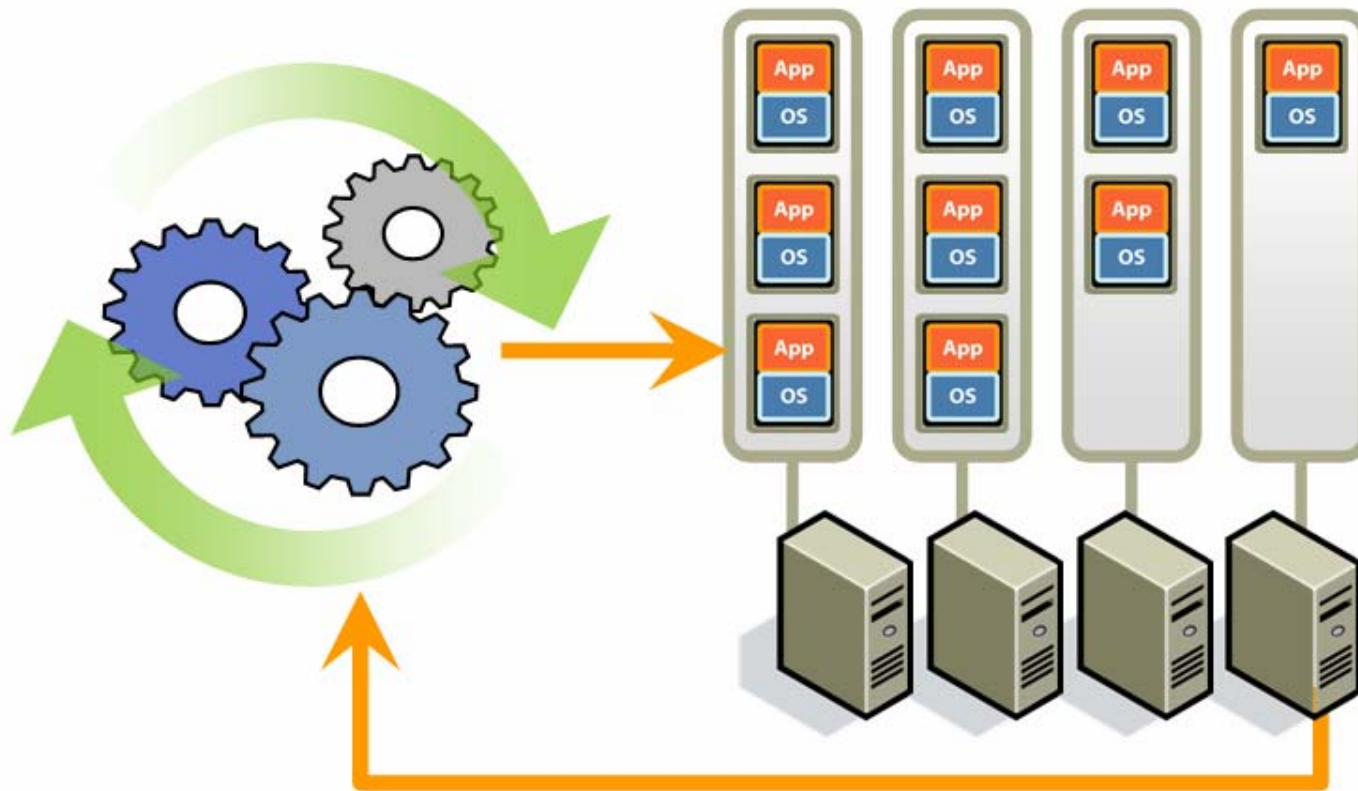
Non-disruptive capacity on demand



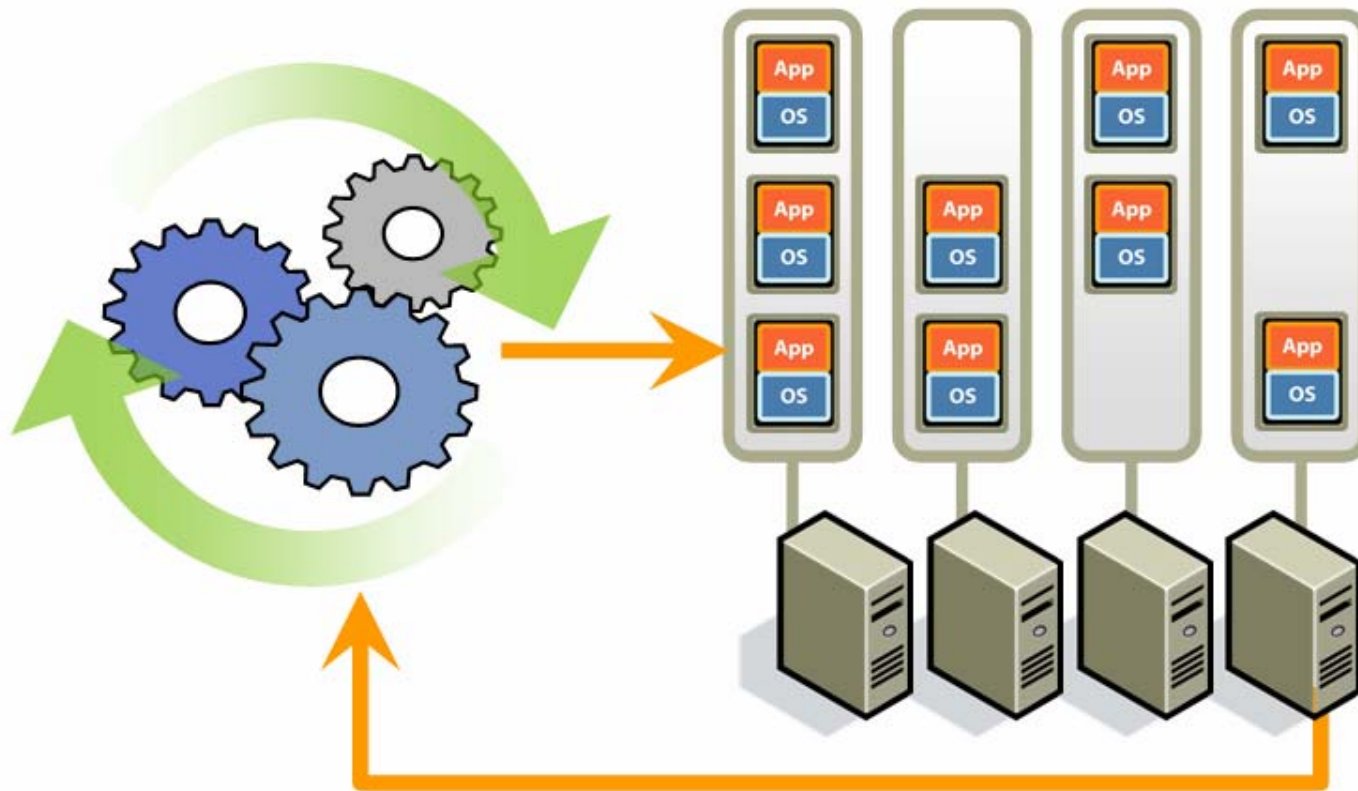
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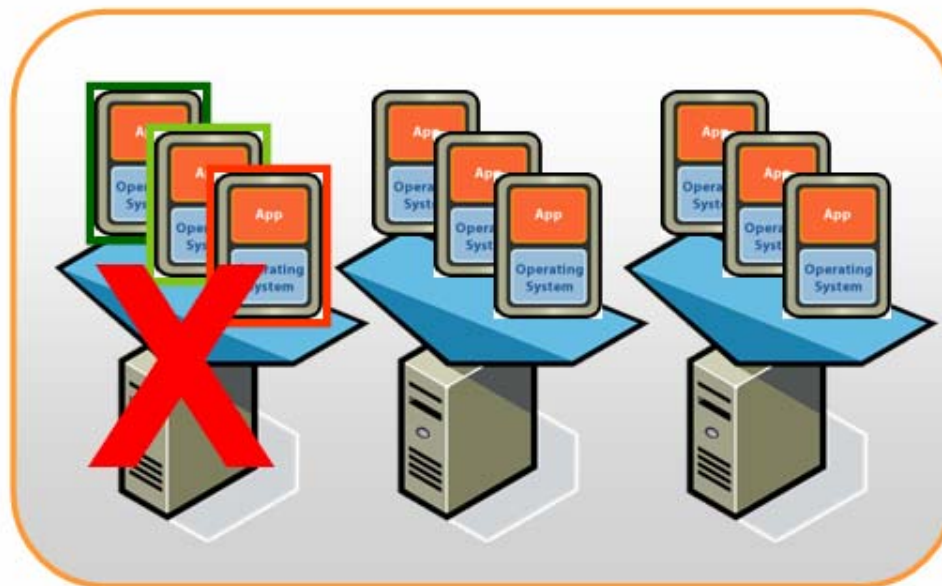


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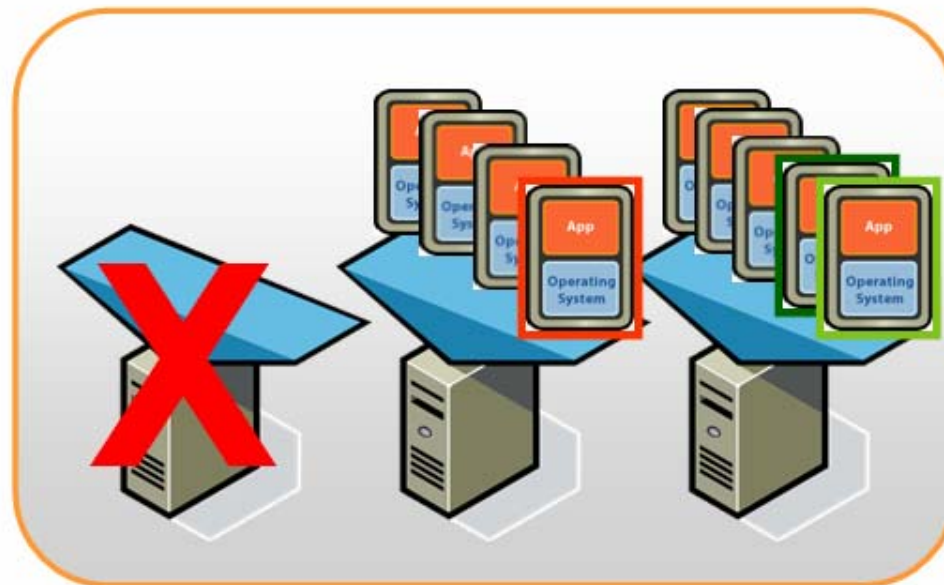
Automatic availability for all applications

VMWARE HA

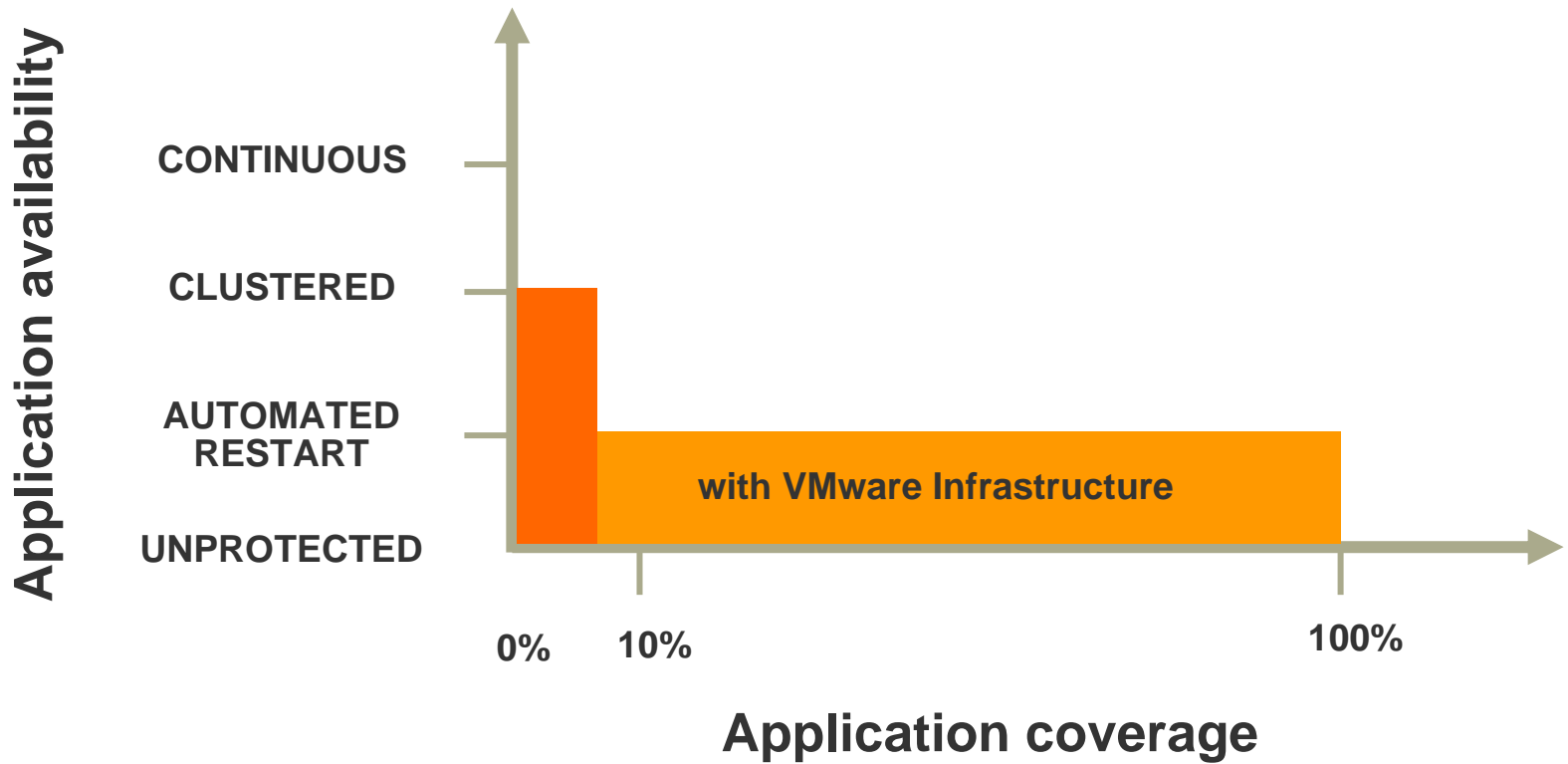


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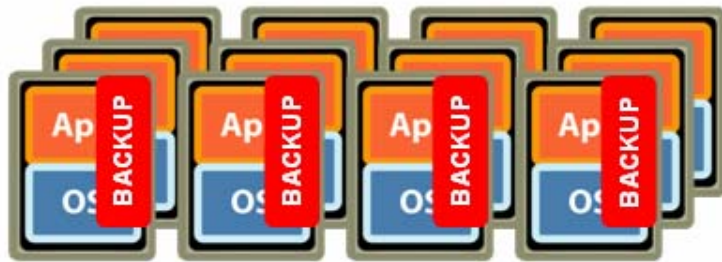
VMWARE HA



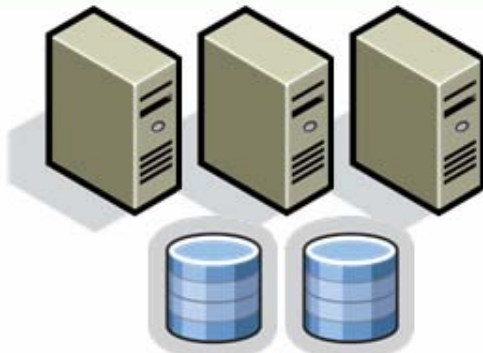
Transforming availability service levels



Backup anytime



... VMware Infrastructure ...



**VMWARE
CONSOLIDATED
BACKUP**

- > Decouple backup from production VMs
- > 20-40% better resource utilization
- > Pre-integrated with 3rd party backup products

Backup anytime



VMWARE CONSOLIDATED BACKUP

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VMware Infrastructure – Key Use Cases



Server Consolidation and Containment – Eliminate server sprawl by deploying systems into virtual machines



Infrastructure Provisioning – Reduce the time for provisioning new infrastructure to minutes with sophisticated automation capabilities.



Business Continuity – Reduce the cost and complexity of business continuity by encapsulating entire systems files that can be replicated and restored onto any target server



Test and Development – Rapidly provision and re-provision test and development servers; store libraries of pre-configured test machines



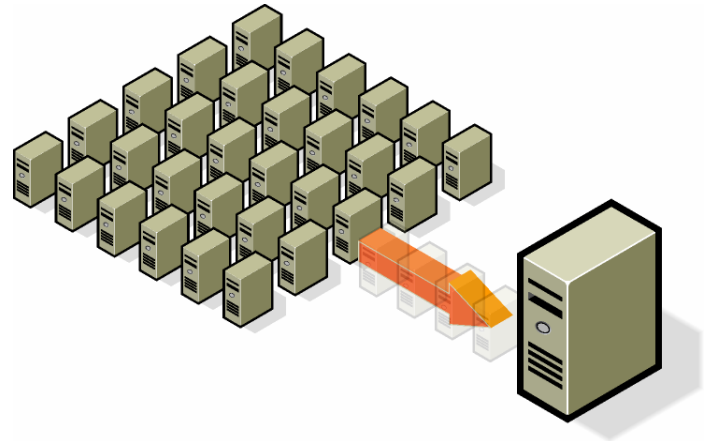
Enterprise Desktop – Secure unmanaged PCs. Alternatively, provide standardized enterprise desktop environments hosted on servers.



Legacy Application Re-hosting – Migrate legacy operating systems and software applications to virtual machines running on new hardware for better reliability

Tackling Server Sprawl with Consolidation

Conseco Finance	8:1
State of Montana	8:1
7-Eleven	10:1
Antares IT	10:1
National Gypsum	10:1
Applied Innovation	15:1
AIG Technology	20:1
Qualcomm	30:1



Server consolidation

- Implement as project with dedicated hardware and budget

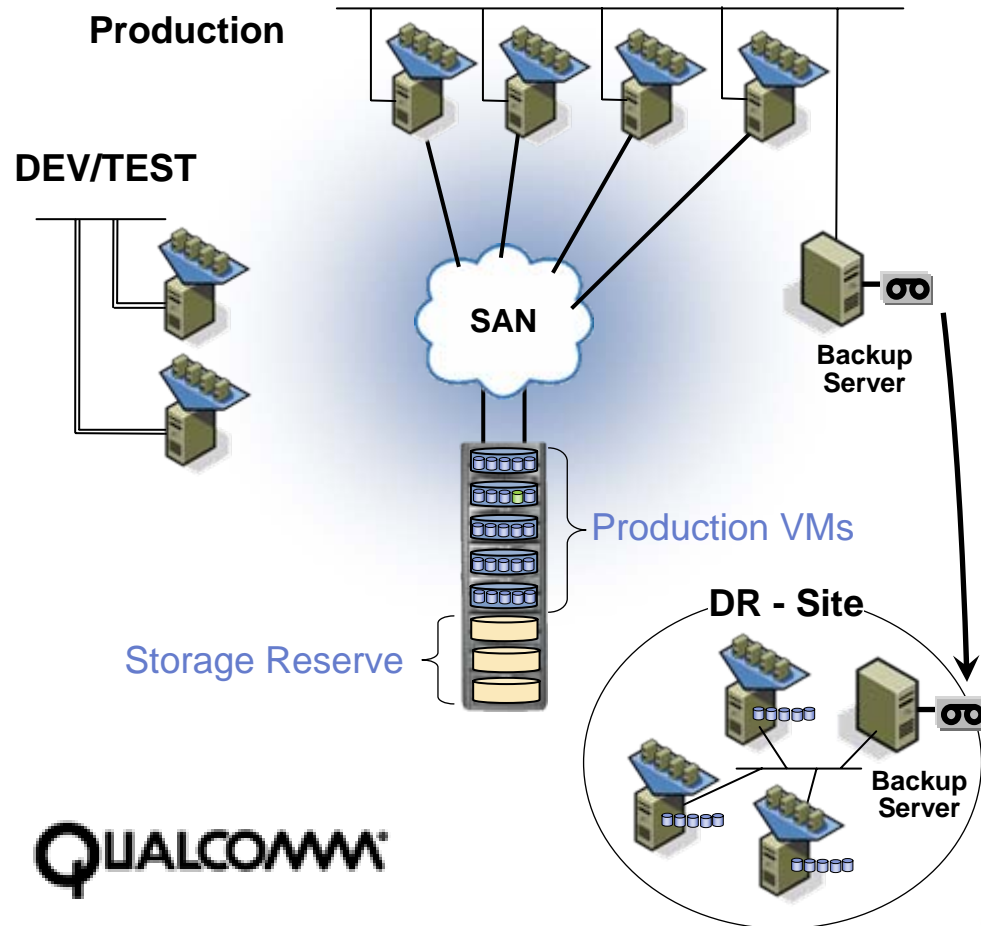
Server containment

- Create virtual machines instead of provisioning new hardware
- Reduces future hardware needs

Large Scale Server Consolidation at Qualcomm

1200 applications on 100 Physical Servers

- ▶ Increased server utilization to nearly 80% percent
- ▶ Consolidated servers by a 12:1 ratio
- ▶ Reduced data center space by a 20:1 ratio
- ▶ Virtualized 60% of x86 environment
- ▶ Staffing has not increased in 2.5 years
- ▶ Deploy new servers in hours rather than weeks



Case Study – Lonza Group Ltd.

Lonza is a \$1.8B Life Sciences company headquartered in Switzerland

- o Operates 18 production and R&D facilities in 8 countries.
- o Employs 5660 people worldwide
- o Supplies chemical ingredients, intermediates and compounds to pharmaceutical and agrochemical firms

Due to the nature of their business, they have mirrored environments:

- o One Production Environment
- o One Validation Environment
- o One Development Environment
- o One Training Environment

Case Study – Lonza Group Ltd.

The Production system is configured with:

- 2 Terminal Servers
- 2 Oracle Database Servers
- 2 Application Servers
- 2 Documentum Content Servers
- 2 Content Rendition Servers
- 2 PDF Aqua Print Servers
- 2 PDF Aqua View Servers
- Header/Footer Wizard

Everything is on Windows Servers

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**Will be run in a
virtualized
environment**

Everything is on Windows Servers

Case Study – Lonza Group Ltd.

The Production system is configured with:

- 2 Terminal Servers
- 2 Oracle Database Servers
- 2 Application Servers
- 2 Documentum Content Servers

Will also be run in a virtualized environment on the Validation system

- 2 Content Rendition Servers
- 2 PDF Aqua Print Servers
- 2 PDF Aqua View Servers
- Header/Footer Wizard

Will be run in a virtualized environment

Everything is on Windows Servers

Case Study – Lonza Group Ltd.

<i>W/O VMware</i>	<u># of Servers</u>	<u>Cost per Server*</u>	<u>Total in CHF</u>
Small Servers	2	8,000	16,000
Medium Servers	19	12,000	228,000
Large Servers	14	16,000	224,000
Total Cost:			(US\$375,570) 468,000

<i>With VMware</i>	<u># of Servers</u>	<u>Cost per Server*</u>	<u>Total in CHF</u>
Large Servers	8	16,000	128,000
VMware Servers*	4	32,000	128,000
Total Cost:			(US\$205,540) 256,000

Total cost savings: CHF212,000 (US\$170,030)

**Includes cost of VMware software*

Note: CHF represents Swiss Francs



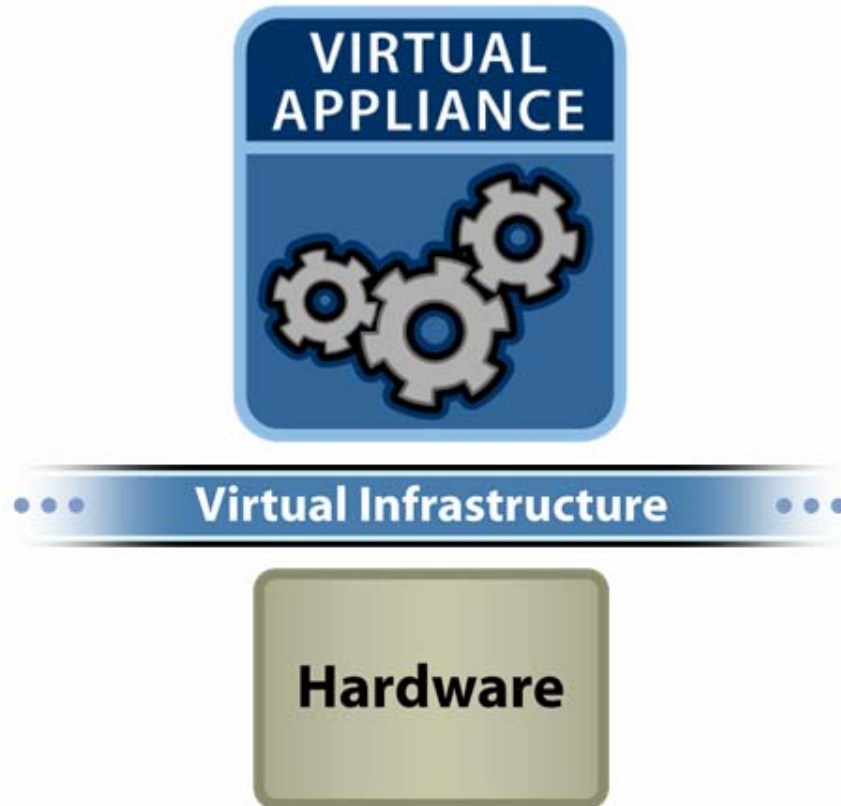
Virtual Applications changing the role of the OS

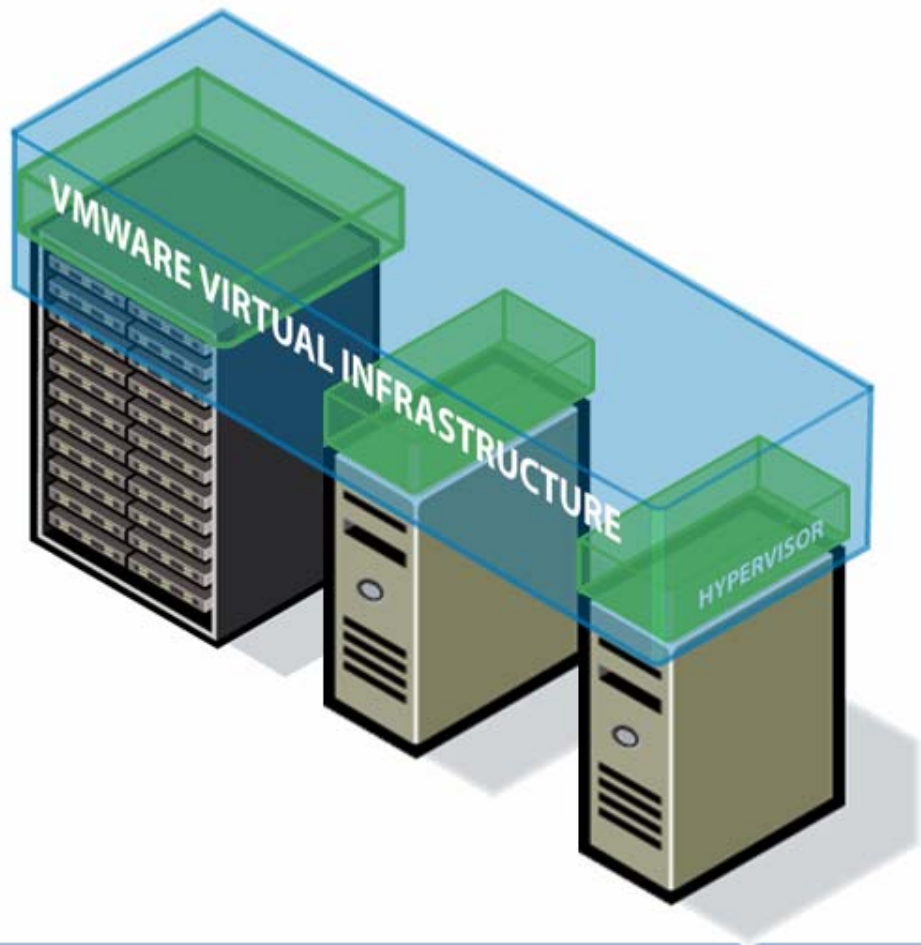


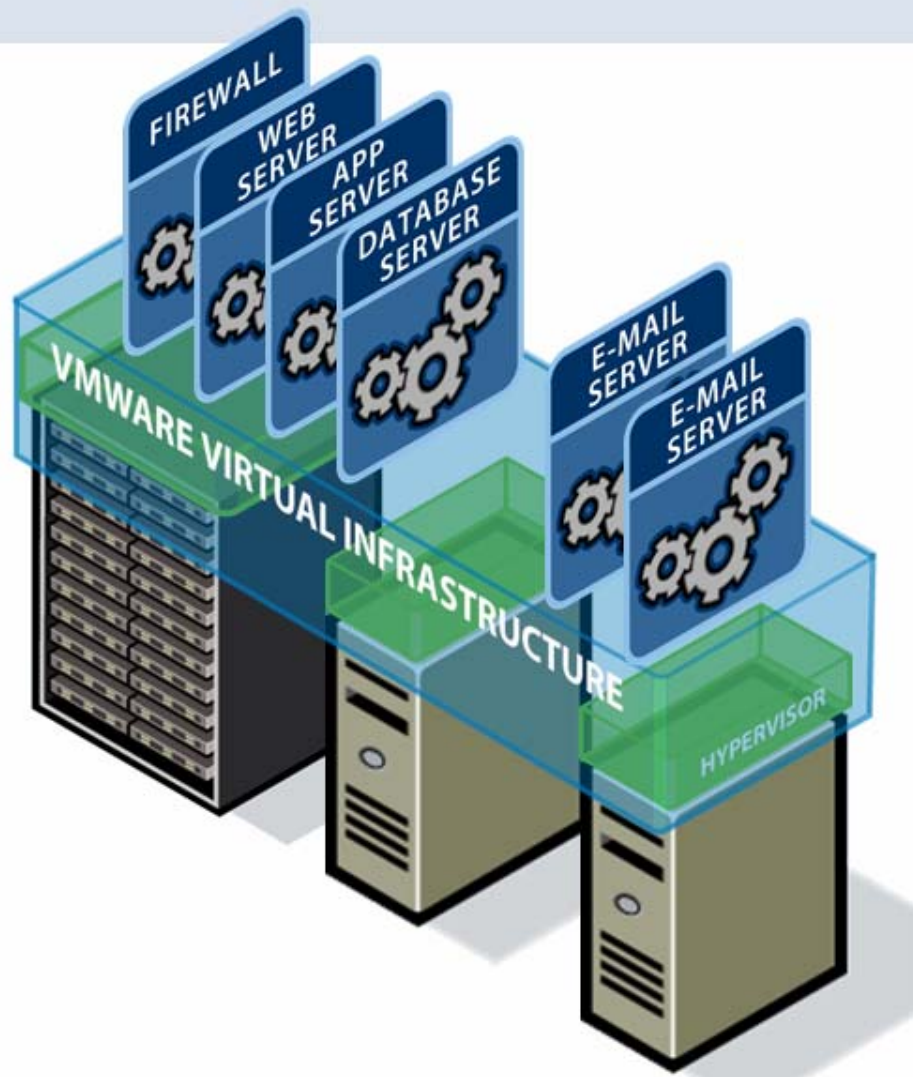
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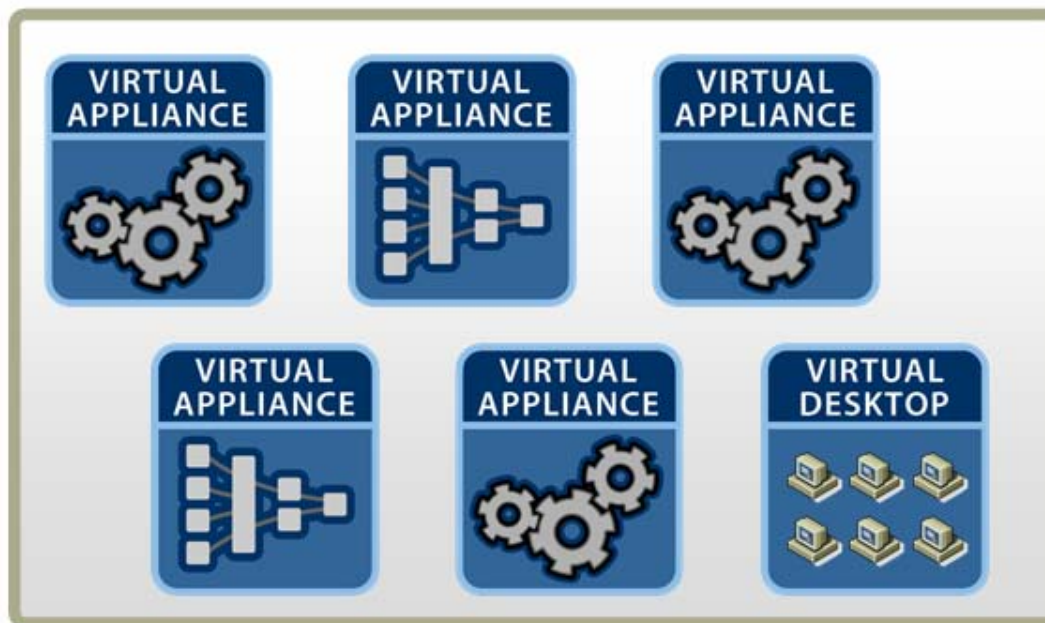
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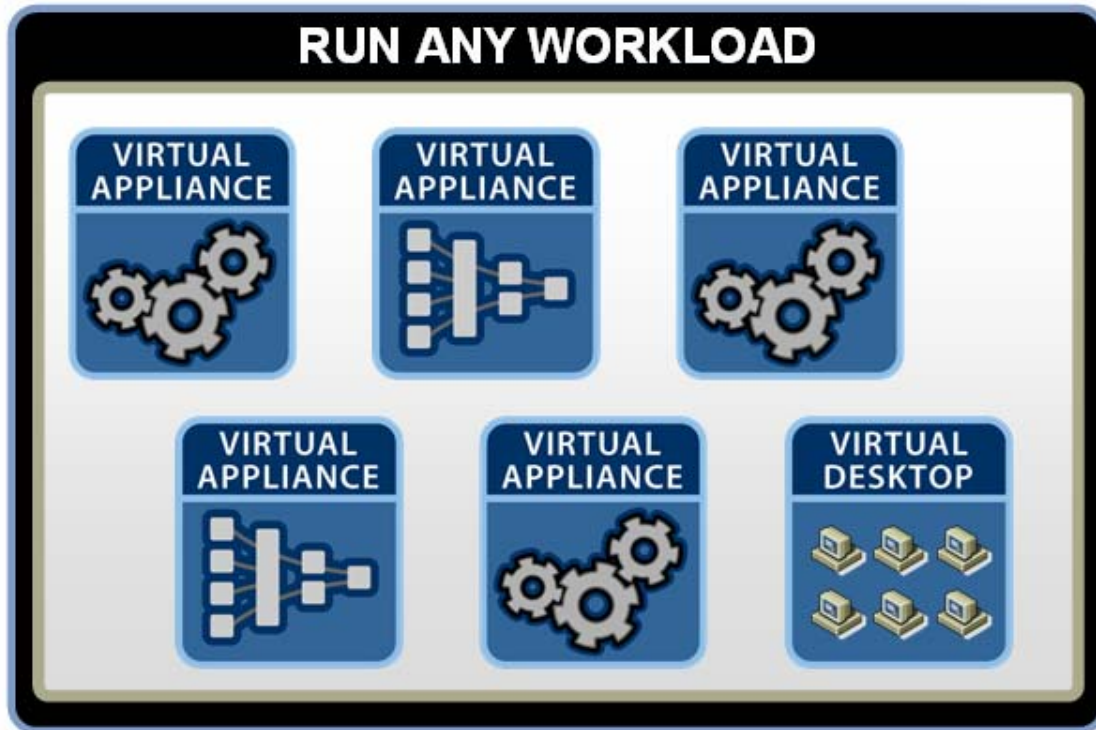




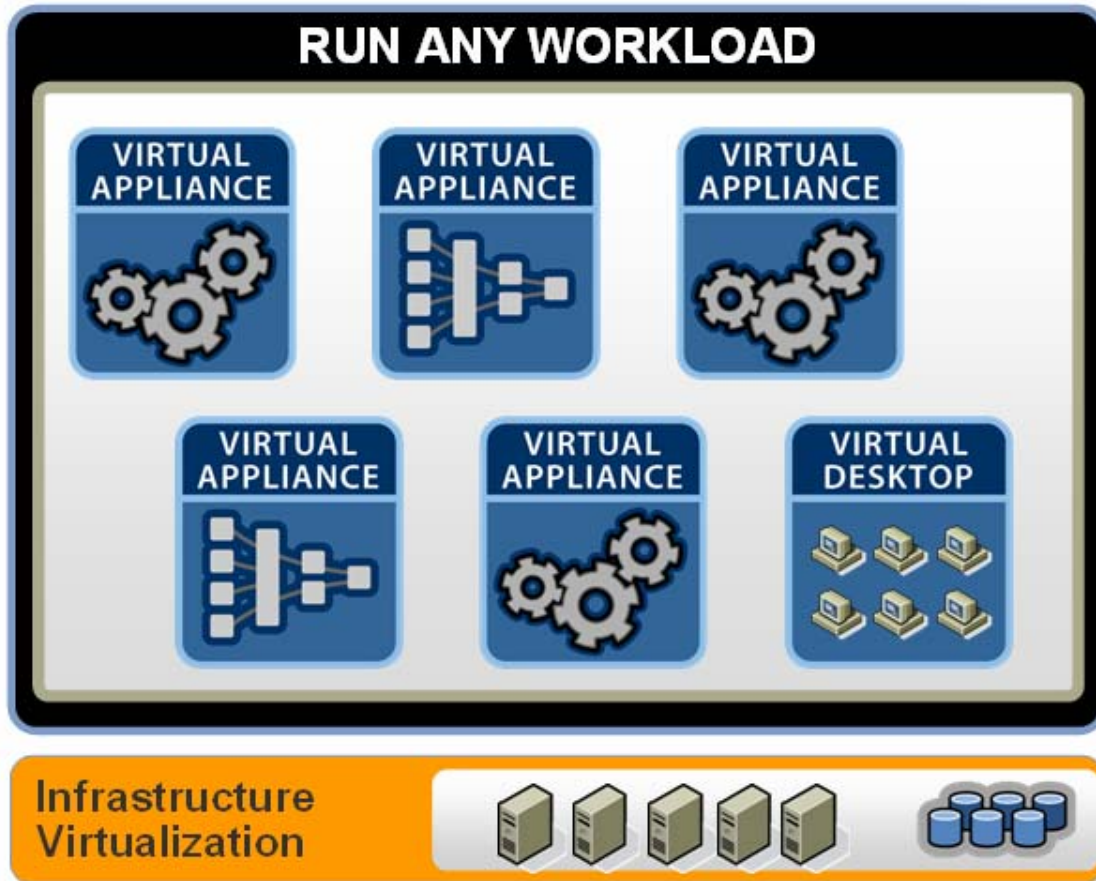
VMware Vision



VMware Vision



VMware Vision



VMware Vision

SOLUTIONS AND TOOLS

RUN ANY WORKLOAD

APPLIANCE MGMT

PROVISIONING

CAPACITY MGMT

VM LIFECYCLE

Lifecycle Management

VIRTUAL APPLIANCE

VIRTUAL APPLIANCE

VIRTUAL APPLIANCE

VIRTUAL APPLIANCE

VIRTUAL APPLIANCE

VIRTUAL DESKTOP

Infrastructure Virtualization



SECURITY & INTEGRITY

DATA PROTECTION

RESOURCE MANAGEMENT

AVAILABILITY

Systems Infrastructure Services



Beyond Boundaries

