VMware
Management and Automation

Q2 2009

vmware

The Reality in Most Datacenters

Where the IT Budget Goes

5%
Infrastructure
Investment

42%
Infrastructure
Maintenance

30%
Infrastructure
Maintenance

23%
Application
Investment
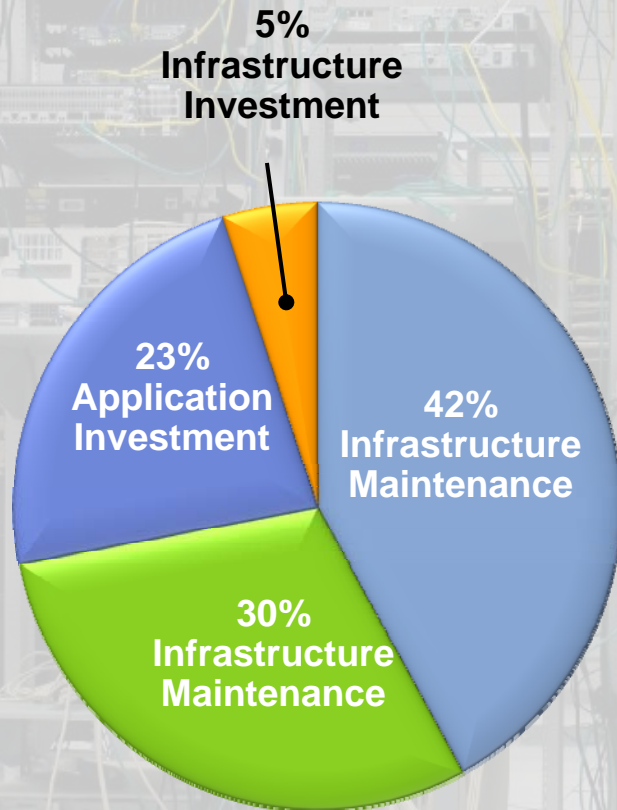
- **Overwhelming complexity**
- **>70% of IT budgets just to keep the lights on**
- **<30% of IT budgets goes to innovation and competitive advantage**

Business Can Change Only as Fast as IT Can

vmware

The Dilemma

> **Speed of change**

> **Scalability**

> **Efficiency**

Automation

> **Control**

> **Predictability**

> **Consistency**

vmware

Virtualization Fundamentally Changes the Game

New Considerations

- **New items and relationships not present in physical environment**

    - New entities to manage: VMs, templates, clones, etc.

    - New attributes and relationships: snapshots, lineage, mappings

    - New associated actions: VMotion, clone, record/replay

VMs

Snapshots

Clones

Templates
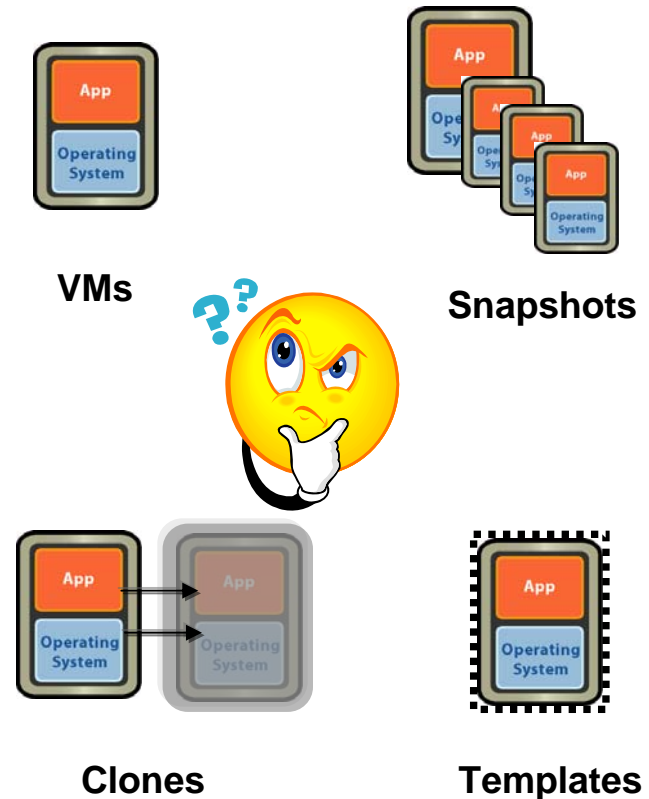
Virtualization Fundamentally Changes the Game

New Considerations

- **Dynamic and fast growing environment**

  - Workload location changes

  - Quick entry/exit of VMs

  - Temporal state of VMs (e.g., suspend, delete)

  - Lower barriers to change

Virtualization Fundamentally Changes the Game

New Opportunities

- **Enables greater automation**

  - VMs are standardized software containers

  - Software files that can easily be move, copied, managed

  - New types of automation operations are available (clone, VMotion, snapshot)

vmware

Virtualization Fundamentally Changes the Game

New Opportunities

- **Properties can be leveraged to solve IT management problems in a new way**

  - Linked clone provisioning, capacity over-subscription

  - Ease of introspection

  - Ability to control any VI action via policies

  - Auto-remediation to meet performance, availability, security SLAs

vmware

Evolution of Virtualization Management

Phase 1

Element management of **hypervisors** and **VMs**

Phase 2

Management of a **distributed**, **dynamic**, **shared** infrastructure

Phase 3

Management of an **internal cloud**

Transition physical to virtual, manage new element types

Assess, convert to virtual, manage inventory, VM provisioning, patching

Manage large & complex virtual datacenters that run tier 1 workloads

Scalability, configuration automation and compliance, operations mgmt

Utility computing - policy driven lights-out automation

Self service, policy driven automation, IT service costing, SLA based mgmt

vmware

VMware vSphere™ – The Industry's First Cloud Operating System

Application Services

- Clustering
- Data Protection

Availability

- Firewall
- Anti-virus
- Intrusion Prevention
- Intrusion Detection

Security

- Dynamic Resource Sizing

Scalability

vSphere 4.0 Cloud OS

Infrastructure Services

vCompute

- Hardware Assist
- Enhanced Live Migration Compatibility
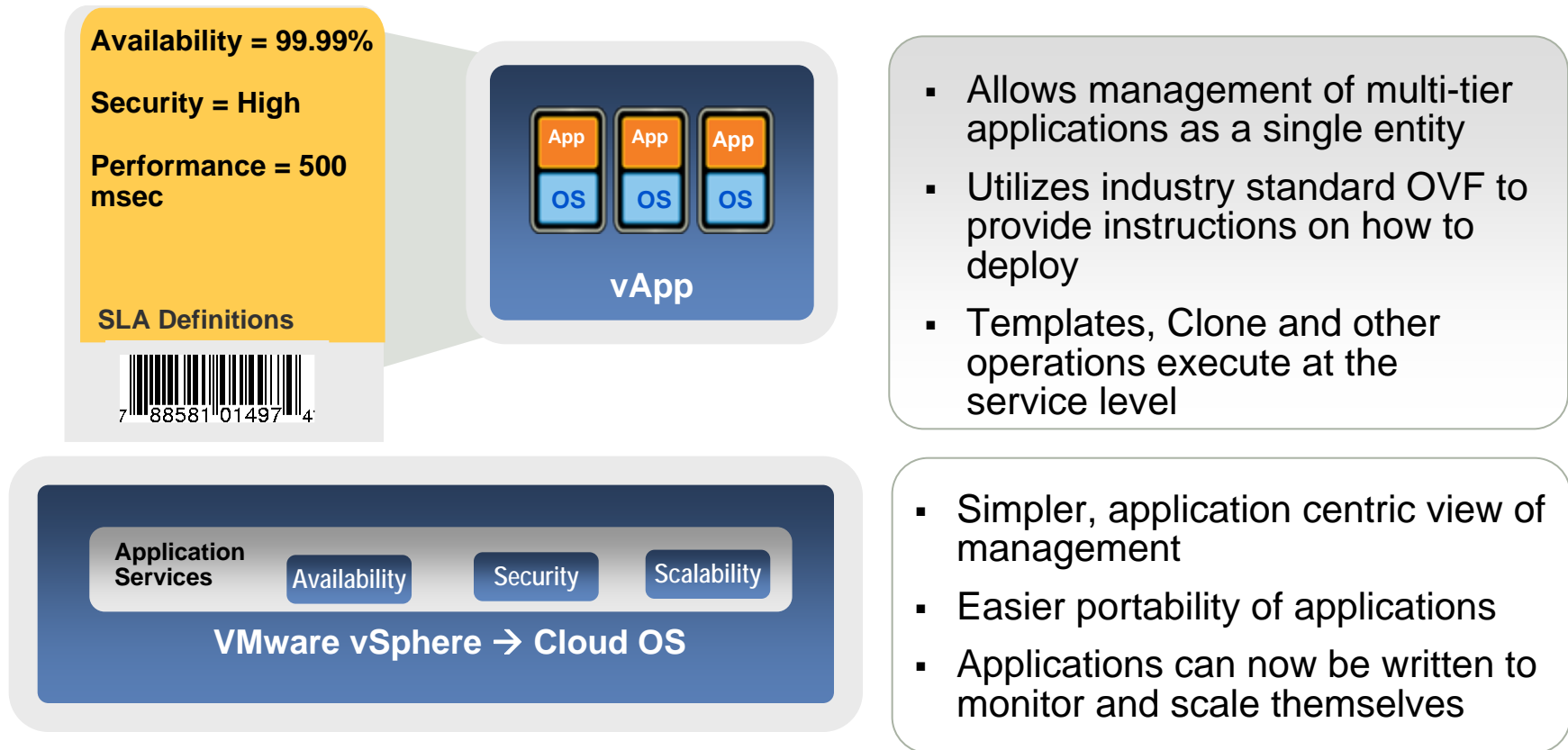
vStorage

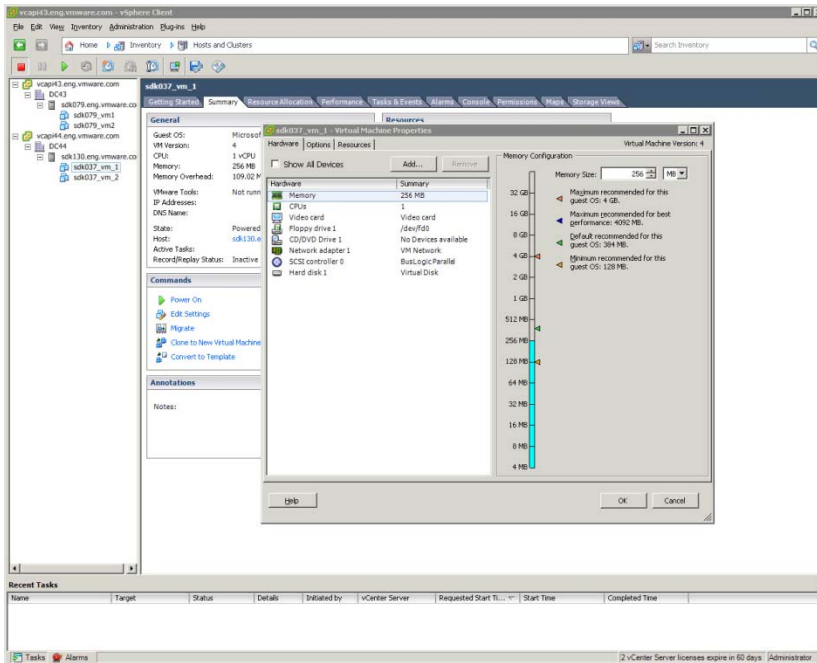- Storage Management & Replication
- Storage Virtual Appliances

vNetwork

- Network Management

vmware

vApp – New Model for Describing and Deploying Apps

Availability = 99.99%

Security = High

Performance = 500 msec

SLA Definitions

7 88581 01497 4

vApp

Application Services

Availability   Security   Scalability

VMware vSphere → Cloud OS

- Allows management of multi-tier applications as a single entity
- Utilizes industry standard OVF to provide instructions on how to deploy
- Templates, Clone and other operations execute at the service level

- Simpler, application centric view of management
- Easier portability of applications
- Applications can now be written to monitor and scale themselves
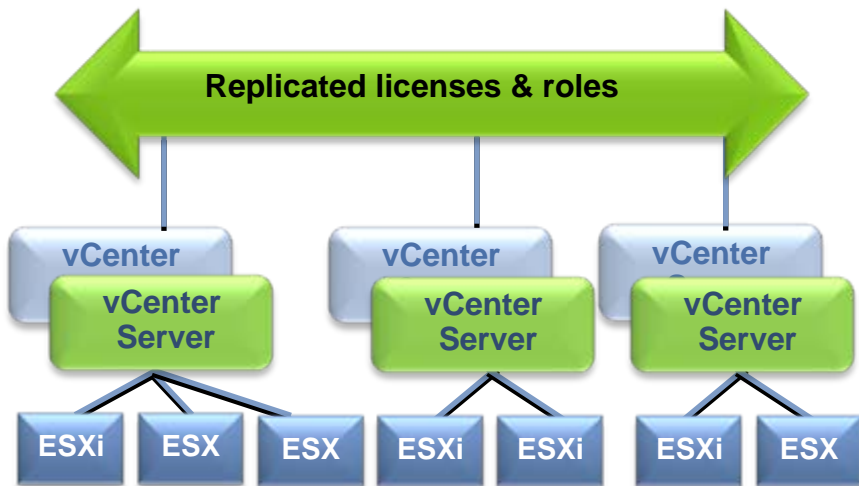
vmware

vCenter Server: Unified, centralized management for the dynamic Cloud-OS

- Consolidated and simplified management of infrastructure, including servers, storage, networking

- Centralized management of vCenter Server instances, ESX hosts, VMs

- Performance and health monitoring

- Extensible platform

vmware

Scalable vCenter Platform

vCenter Linked Mode

Replicated licenses & roles

vCenter
vCenter Server
vCenter
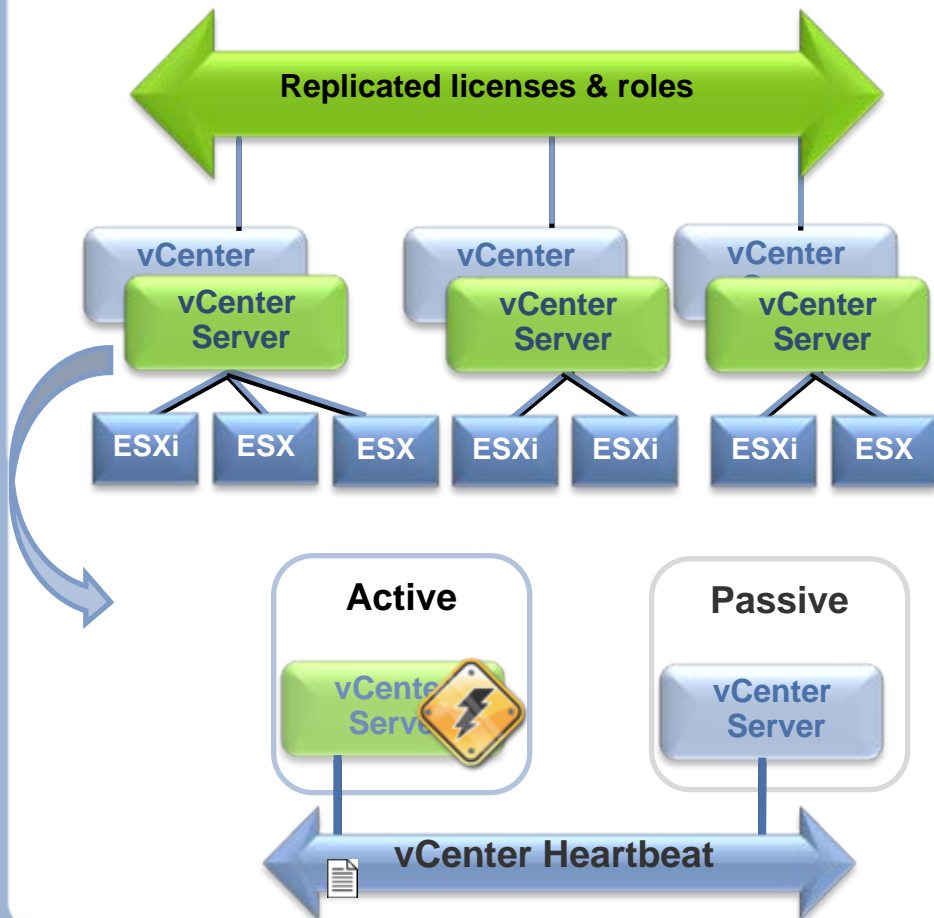vCenter Server
vCenter
vCenter Server

ESXi ESX ESX ESXi ESXi ESXi ESX

- Role and license data available globally via LDAP backbone
- Standard VI Client can access inventory across entire environment
- Search and action based interface allows VI Client to manage across multiple vCenter Servers
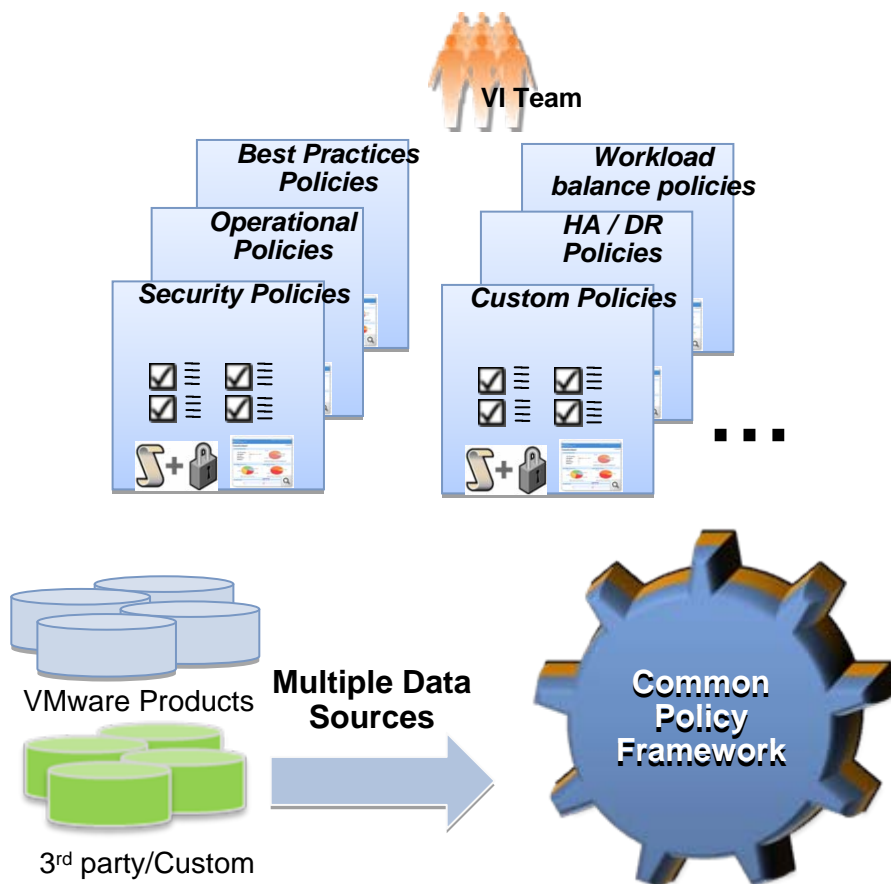- Enables scale out of managed infrastructure

Scalable vCenter Platform

vCenter Linked Mode

Replicated licenses & roles

vCenter	vCenter	vCenter
vCenter Server	vCenter Server	vCenter Server

ESXi | ESX | ESX | ESXi | ESXi | ESXi | ESX

- Role and license data available globally via LDAP backbone
- Standard VI Client can access inventory across entire environment
- Search and action based interface allows VI Client to manage across multiple vCenter Servers
- Enables scale out of managed infrastructure

Active

vCenter Server

Passive

vCenter Server

vCenter Heartbeat

- High Availability solution for vCenter Server
  - Protect against hardware, operating system, application, database failures
  - Lower complexity
- Provides vCenter specific monitoring capabilities (license server)
  - Flexible deployment scenarios (physical/virtual/WAN combinations)
- Uses host based replication to keep the application state consistent

vmware

vCenter Orchestrator
Unified Real-time Policy Framework

VI Team

Best Practices Policies

Operational Policies

Security Policies

Workload balance policies

HA / DR Policies

Custom Policies

. . .

VMware Products

Multiple Data Sources

3rd party/Custom

Common Policy Framework

- ▪ Enables high degree of automation via codifying decision making and mass action
- ▪ Enables closed loop infrastructure management across different tools
- ▪ Helps reduce OpEx via improved resource utilization, enhanced SLAs, improved management efficiency & IT responsiveness

- ▪ Common, unified underlying infrastructure service for policy management and policy execution
- ▪ Real-time, light-weight & high performance
- ▪ Extensible: data source, evaluator, action context, authoring

vmware

vCenter Host Profiles

Policy-based one-click mass configuration automation
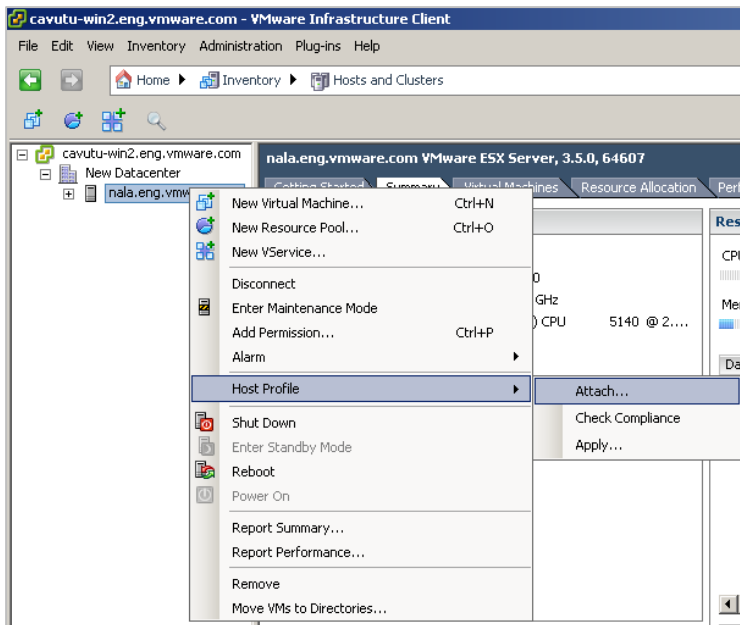
- Quick mass automation or complex configuration automation across VI for large number of ESX hosts/clusters

- Automate replicating a golden profile from a host to other hosts via baselines

- Remediate out of policy compliance violations

- View drift from golden baselines

vCenter Lifecycle Manager

Automated provisioning and decommissioning

increase service levels and control.


Automated Provisioning
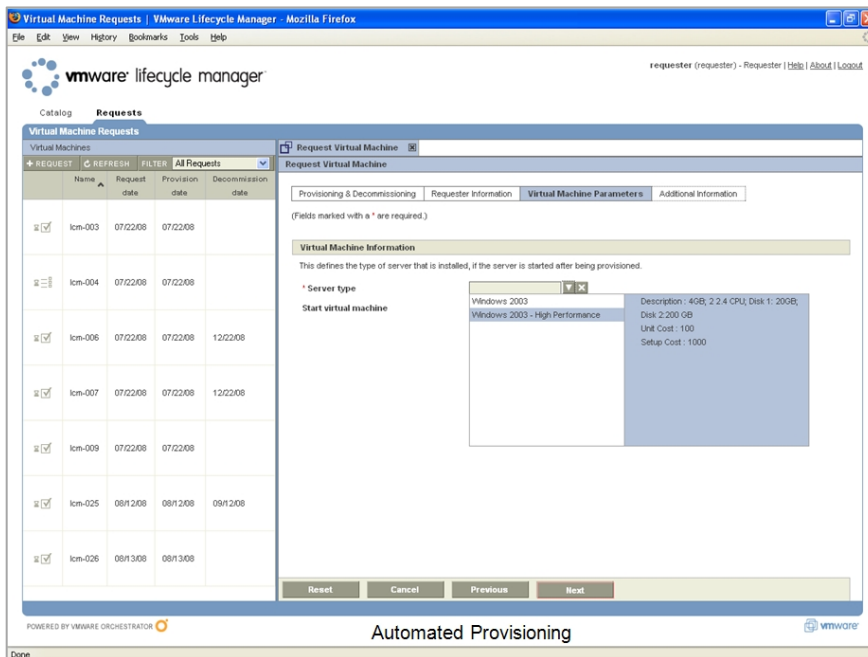
- Auto-provision and deploy VMs based on pre-defined standards

- Utilized proper resources based on VM type and purpose

- Track VM owners and purpose; implement changes as needed

- Decommission to reclaim resources

- Eliminate manual, repetitive admin tasks

- Set up end-to-end provisioning once and manage by exception

- Admins only select from existing and known template configurations owned by IT

- VMs always use the correct resources (datastores, networks, templates, etc.)

- Decommissioning tracked and implemented based on designated lifespan

vCenter ConfigControl

Richer configuration data –
and a better way to get it.
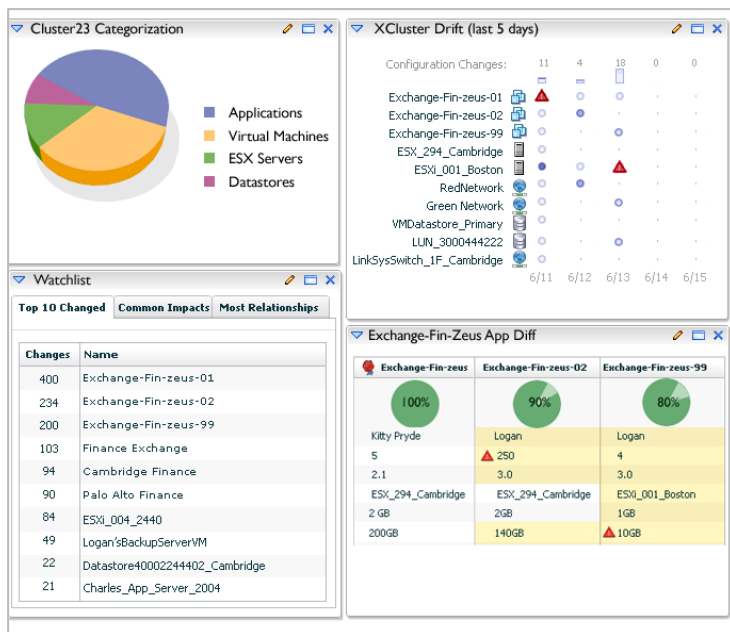
- Tracking of configuration items that are part of a virtual infrastructure
- Automated discovery of accurate config, dependency and historical data
- Application/IT visibility via rich modeling capabilities, dynamic search and reports

- Discover, track, model, search, analyze (impact and drift), report
- Standards based, extensible, comprehensive, continuous, multi-source capture of CIs
- Applications, inside guests, virtual entities, associated hw, custom tags
- Rollup impact reporting by business unit, organization unit, etc

Capacity

vCenter CapacityIQ
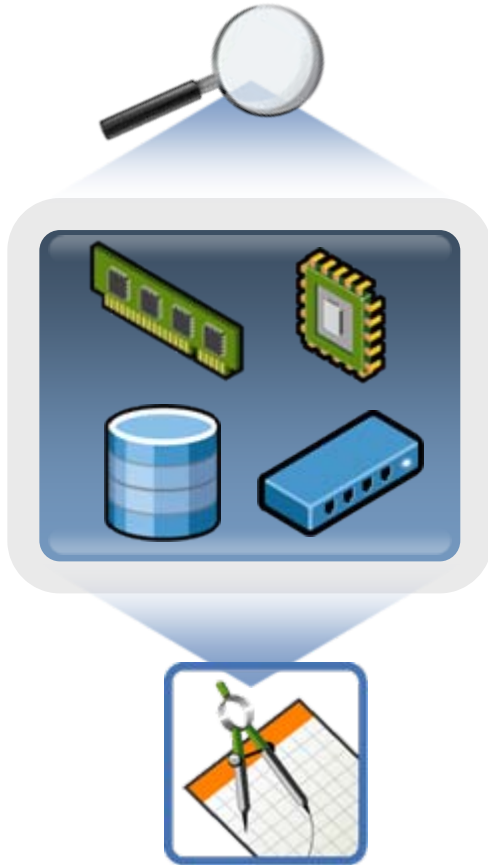
Capacity intelligence for the virtual datacenter

- Deliver the right capacity at the right time
- Make informed planning, purchasing, and provisioning decisions
- Enable capacity to be utilized most efficiently and cost-effectively

- Perform "What-If" impact analysis to model effect of capacity changes
- Identify and reclaim unused capacity
- Forecast timing of capacity shortfalls and needs

vCenter AppSpeed

Policies (SLA)

✓ 99.9% Uptime

✓ Fault Protection

✓ Encryption Enabled

| **75** Users | **4** Servers | **1** Database |

Quality of Service

LATENCY 110ms — SLA 89%
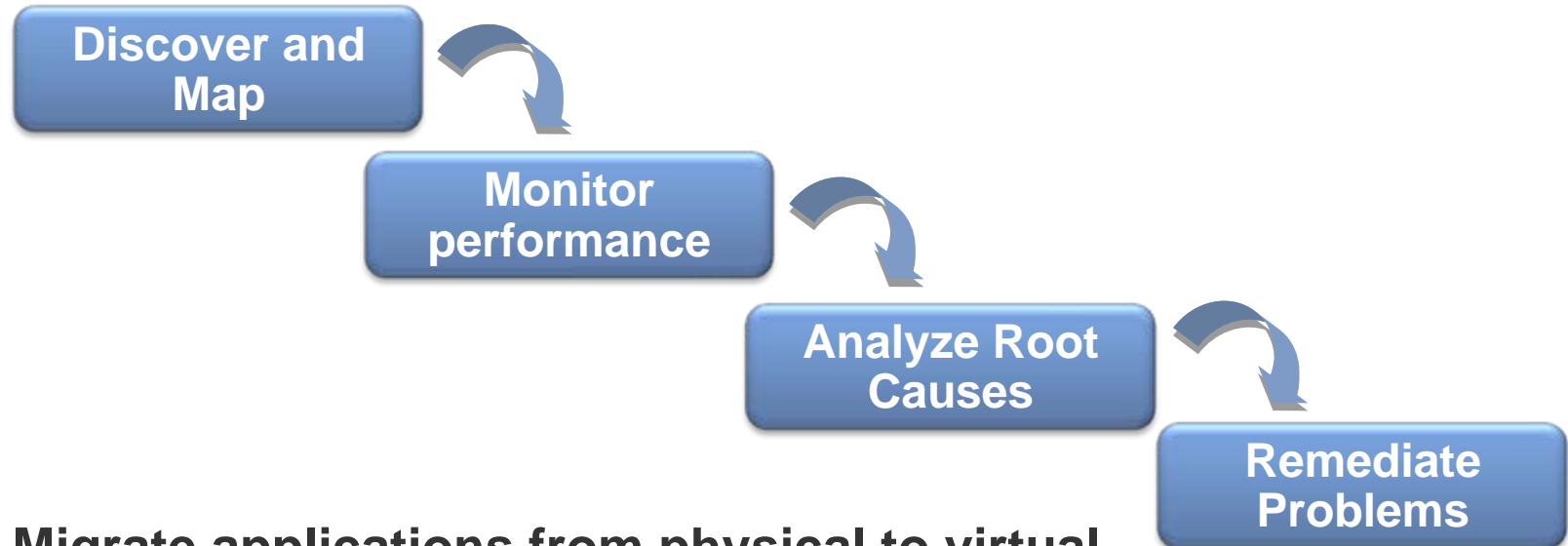
- Monitor application performance from end-user perspective

- Collect and correlate across tiers and in VI

- Automated SLA management

- Enables proactive detection of end user performance issues

- Integration with VI enables root cause and remediation
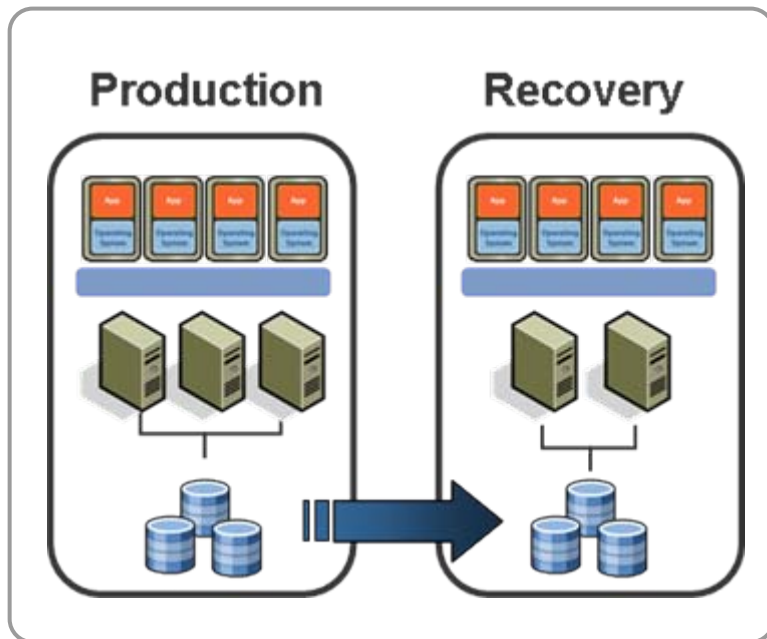
vCenter AppSpeed Use Scenarios

1 **Allows IT to guarantee application service level**

Discover and Map

Monitor performance

Analyze Root Causes

Remediate Problems

2 **Migrate applications from physical to virtual**

Develop pre-virtualization end-user application baseline

Measure post virtualization performance

vCenter Site Recovery Manager

Makes disaster recovery
rapid, reliable, manageable, affordable

Production   Recovery

- Simplifies and automates disaster recovery workflows:
  - Setup, testing, failover, failback
- Turns manual recovery runbooks into automated recovery plans
- Provides central management of recovery plans from vCenter Server
- Easy integration with leading vendors' storage replication systems

vmware

VMware's Vision for Self-Service Access

VM Users
app owners, test/dev, trainers, etc.

Zone 1
Locked Down for Production

Self-Service Policy

*Read only.
VI Admin approval
required for all actions*

Access Control

LDAP Group

Resources

Templates

Zone 2
Hybrid for Pre-Production

Self-Service Policy

*Leases > 30 days
require approval*

Access Control

LDAP Group

Resources

Templates

Zone 3
Internal Cloud for dev/test/demo

Self-Service Policy

*Full self-service with
chargeback*

Access Control

LDAP Group

Resources

Templates

VI Admin

- Segments infrastructure into zones with people, resources and self-service provisioning policies that match use cases

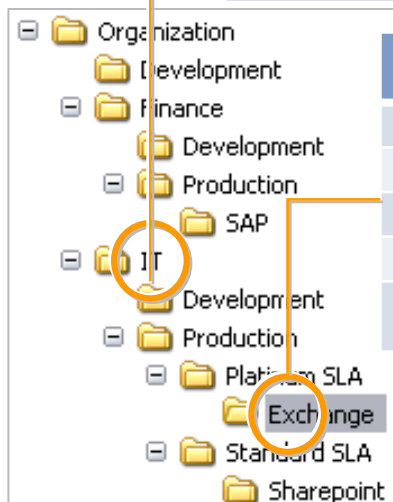- Achieves maximum efficiency, predictability and control

VM Users

- Access to VMs and monitoring data (performance, chargeback) via unified interface

- Self-service provisioning and sandboxing enhances productivity across application lifecycle

vmware

vCenter Chargeback

Drive accountability and costing into VM deployments

Fixed Cost per VM
Real Estate = $20
HA Enabled = $10
Software = $200
Power = $3
Custom Fixed Costs

Organization
- Development
- Finance
  - Development
  - Production
    - SAP
- IT
  - Development
  - Production
    - Platinum SLA
      - Exchange
    - Standard SLA
      - Sharepoint

Metering Element	Multiple Rate
CPU – GHz Used	1.5
Memory – GB Used	1.8
Disk – GB Used	2.0
Disk I/O – GB used	1.4
Network I/O – GB used	0

- Understand costs of VMs
- Associate VM deployments to appropriate business units
- Report on usage costs

- Targeted at VI Administrators with tight integration to vCenter
- Flexible costing model with built in APIs
  - Supports costing based on allocation, utilization or a mix of both
  - Add fixed costs & multiple rates at any level, including VM level
- Automatically propagate costs down the organization structure
  - Build custom organization model or use vCenter (VC) Inventory

Rich Ecosystem of VMware Partners
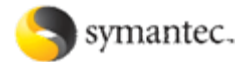
Solutions:
- Remedy ITSM
- Atrium Orchestrator (RBA)

Solutions:
- CA Advanced Systems Management
- CA Data Center Automation

Solutions:
- HP Operations Manager
- HP Server Automation

Solutions:
- IBM Tivoli Monitoring
- IBM Tivoli Usage and Accounting Manager

Solutions:
- Altiris Deployment Solution
- Server Management Suite

Solutions:
- EMC Application Discovery Manager
- IT Compliance Analyzer

Solutions:
- NetIQ AppManager
- NetIQ Aegis

Solutions:
- MP for Systems Center Operations Manager
- SPI for HP Operations

Solutions:
- Quest vFoglight
- Quest vConverter

Solutions:
- Tripwire Enterprise
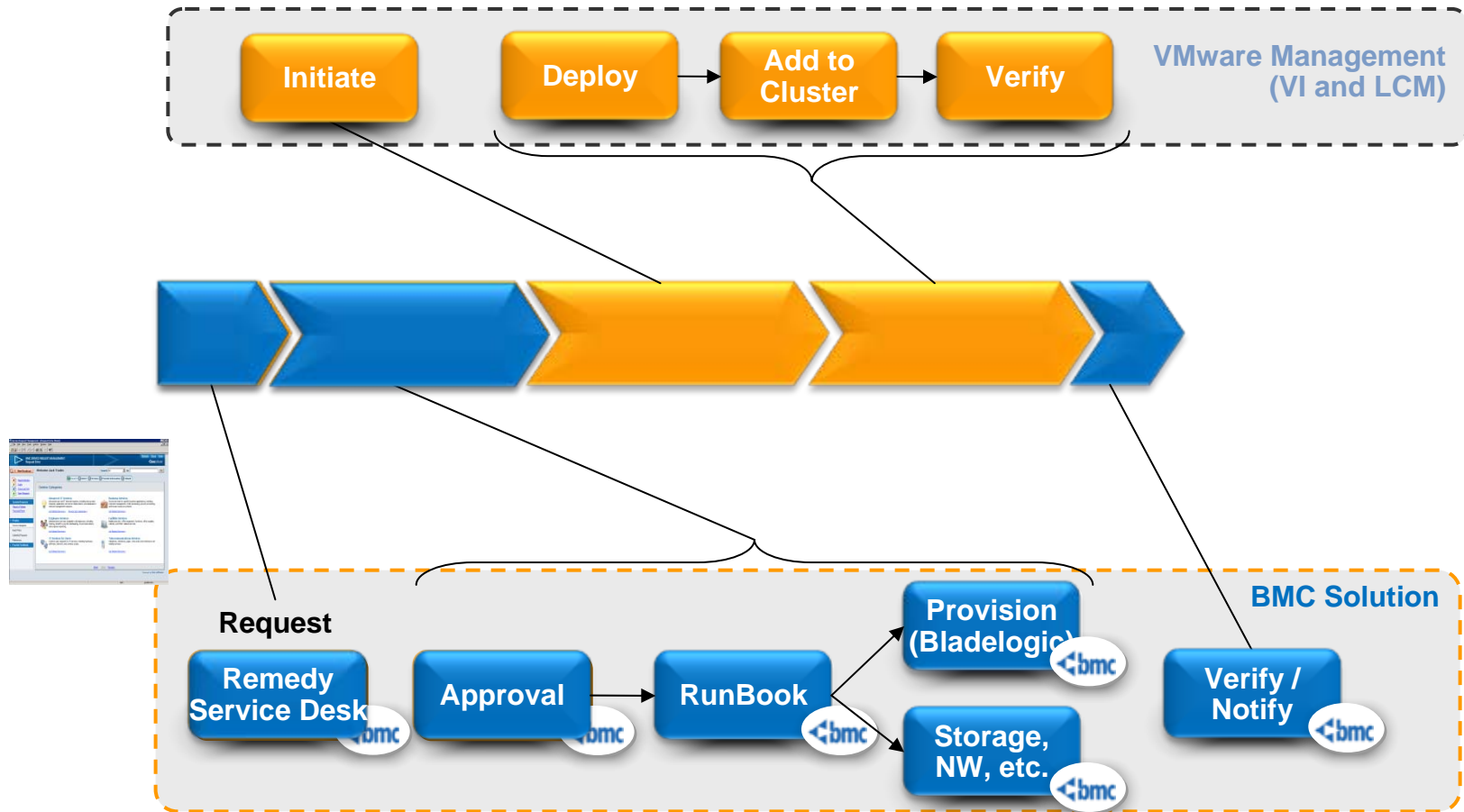- Tripwire ConfigCheck

Partnering

✦ **Objectives**

➤ GTM – leverage management vendors as highly-skilled channel

➤ Partner Influence– management partners present in customer accounts preference VMware and pull in VI + virtualization management tools

➤ Competitive Advantage – industry leading management offerings well-integrated and bundled with VMW

✦ **Approach**

➤ VMware Ready Management program

➤ GTM

  ◼ Channel intersect - Alliance Affiliate (BMC, CA, HP, Symantec)

  ◼ Direct resell/co-sell

➤ Solutions – BMC, CA, HP

Integrated Automated Provisioning with BMC

VMware Management (VI and LCM)

- Initiate
- Deploy
- Add to Cluster
- Verify

BMC Solution

Request

- Remedy Service Desk
- Approval
- RunBook
- Provision (Bladelogic)
- Storage, NW, etc.
- Verify / Notify

Computer Associates OEMs Stage Manager

Automate and manage the application release process from cradle to grave across IT infrastructures and teams

VMware Stage Manager

CA Data Center Automation Manager

Operational Transformation

Operational Capability

Automate
- ☑ Service Level Mgt
- ☑ Availability Mgt
- ☑ Change Mgt

Manage
- ☑ Chargeback
- ☑ Resource Cap. Mgt
- ☑ Configuration Mgt

Consolidate
- ☑ Prob./ Incident Mgt
- ☑ Bus. Continuity Planning
- ☑ Capacity Planning

VMware Maturity Model (VMM) Levels

Virtual Maturity and Business Value

⑤ Optimized

>70% Total Cost Savings

All Apps under DR Plan

>90% Apps have >99.9% availability

Most processes Standardized / Automated

④ Managed

50-60% Total Cost Savings

>50% Apps under DR Plan

Improve response times by > 60%

③ Defined

30-50% Total Cost Savings

Recovery time down to mins

② Repeatable

20-30% Total Cost Savings*

① Initial

Explore　　　　**Expand**　　　　**Standardize**

Scope of Deployment

vmware

The VMware Effect: Customer Breakthroughs

2–3x Gain in Productivity

100–250

30–75

Before VMware   **After VMware**

Workloads per Admin
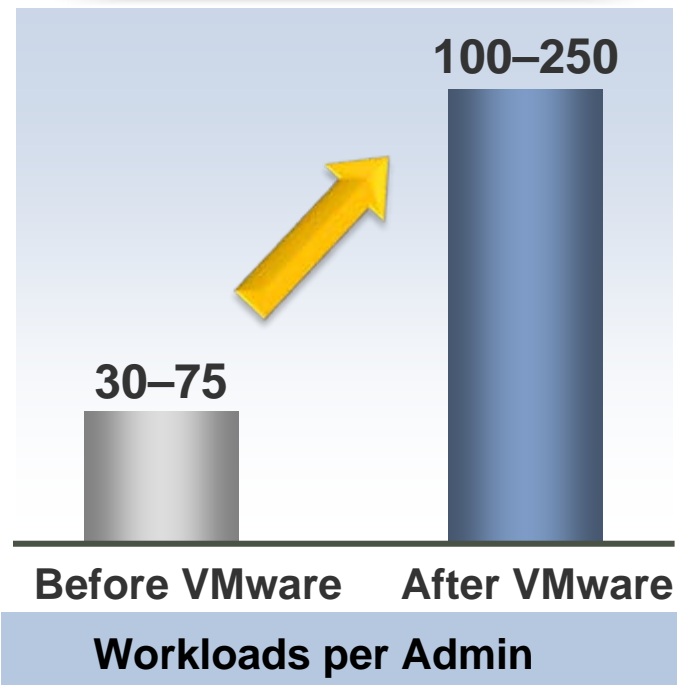
Reduce Capital Expenses
- Optimize infrastructure resource utilization through better capacity management
- Enabling chargeback

Reduce Operational Expenses
- Process orchestration for task automation and management of tasks "en masse"
- Improve compliance with IT/business policy

Increased Service Levels
- Enable IT to improve and guarantee application service levels through self-managing capabilities
- Proactively detect, diagnose and remediate problems at various levels – application, configuration, host, and so on

*Source: IDC and VMware TAM program

Backup