

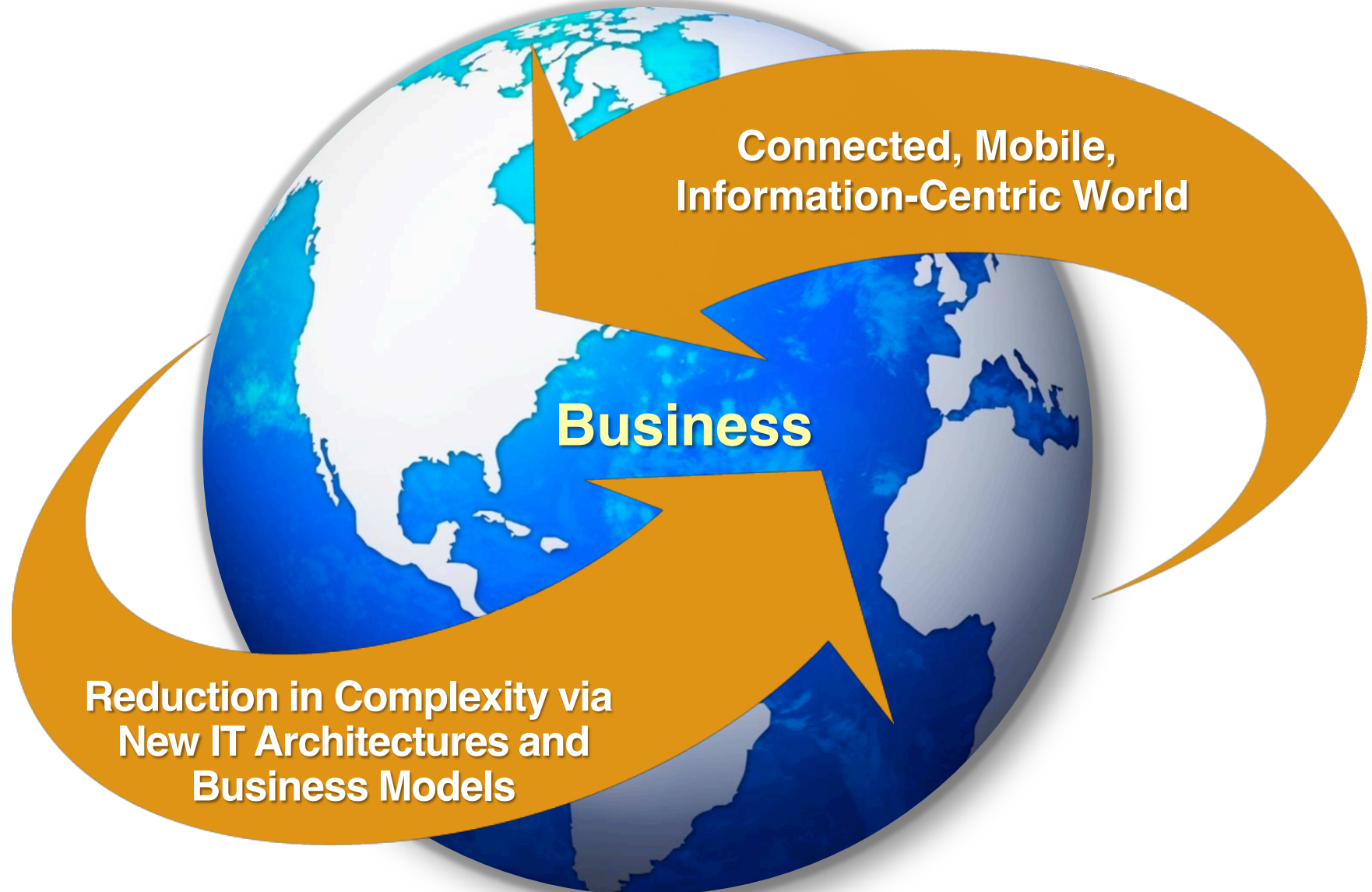
VMware Cloud Infrastructure Product Roadmap

Yu-Shen Ng, Director of Product Management, vSphere

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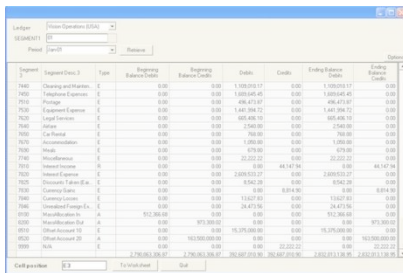
The Cloud Era: Two Forces of Change



The New IT: Promises & Challenges

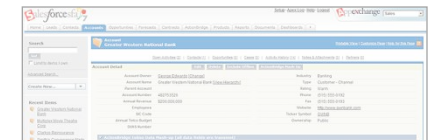
Empowered, Secure, Mobile Workforce

- Any app on any device, anytime, anywhere – securely!



Segment	Segment Desc 2	Type	Beginning Balance	Beginning Balance (Adj)	Debit	Credit	End of Period Balance	End of Period Balance (Adj)
1400	Operating Profit	0	0.00	1,180,000.00	0.00	1,180,000.00	1,180,000.00	1,180,000.00
1400	Telephone Expense	0	0.00	1,000,000.00	0.00	1,000,000.00	1,000,000.00	1,000,000.00
1400	Postage	0	0.00	40,000.00	0.00	40,000.00	40,000.00	40,000.00
1400	Equipment Expense	0	0.00	1,400,000.00	0.00	1,400,000.00	1,400,000.00	1,400,000.00
1400	Travel Expense	0	0.00	400,000.00	0.00	400,000.00	400,000.00	400,000.00
1400	Utilities	0	0.00	2,500.00	0.00	2,500.00	2,500.00	2,500.00
1400	Auto Expense	0	0.00	700.00	0.00	700.00	700.00	700.00
1400	Entertainment	0	0.00	1,000.00	0.00	1,000.00	1,000.00	1,000.00
1400	Insurance	0	0.00	670.00	0.00	670.00	670.00	670.00
1400	Manufacturing	0	0.00	22,222.22	0.00	22,222.22	22,222.22	22,222.22
1400	Interest Expense	0	0.00	48,157.94	0.00	48,157.94	48,157.94	48,157.94
1400	Interest Income	0	0.00	2,000,000.00	0.00	2,000,000.00	2,000,000.00	2,000,000.00
1400	Unrealized Gain/Loss	0	0.00	8,824.90	0.00	8,824.90	8,824.90	8,824.90
1400	Contingency	0	0.00	1,000.00	0.00	1,000.00	1,000.00	1,000.00
1400	Unrealized Foreign Ex.	0	0.00	24,473.94	0.00	24,473.94	24,473.94	24,473.94
1400	Manufacturing Inv.	0	952,000.00	0.00	0.00	952,000.00	952,000.00	952,000.00
1400	Manufacturing Exp.	0	952,000.00	0.00	0.00	952,000.00	952,000.00	952,000.00
1400	Other Account 20	0	163,900,000.00	0.00	0.00	163,900,000.00	163,900,000.00	163,900,000.00
1400	Other Account 21	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 22	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 23	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 24	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 25	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 26	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 27	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 28	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 29	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 30	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 31	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 32	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 33	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
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1400	Other Account 36	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
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1400	Other Account 38	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 39	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 40	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 41	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 42	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 43	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 44	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 45	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 46	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 47	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 48	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 49	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22
1400	Other Account 50	0	0.00	0.00	22,222.22	0.00	22,222.22	22,222.22

Existing Apps



Search

Account Name

Account Name	Address	Phone	Email
Account 1	123 Main St	555-123-4567	info@account1.com
Account 2	456 Elm St	555-987-6543	contact@account2.com
Account 3	789 Oak St	555-234-5678	sales@account3.com

New Generation of Enterprise Apps

- Combining the social, mobile experience with enterprise requirements

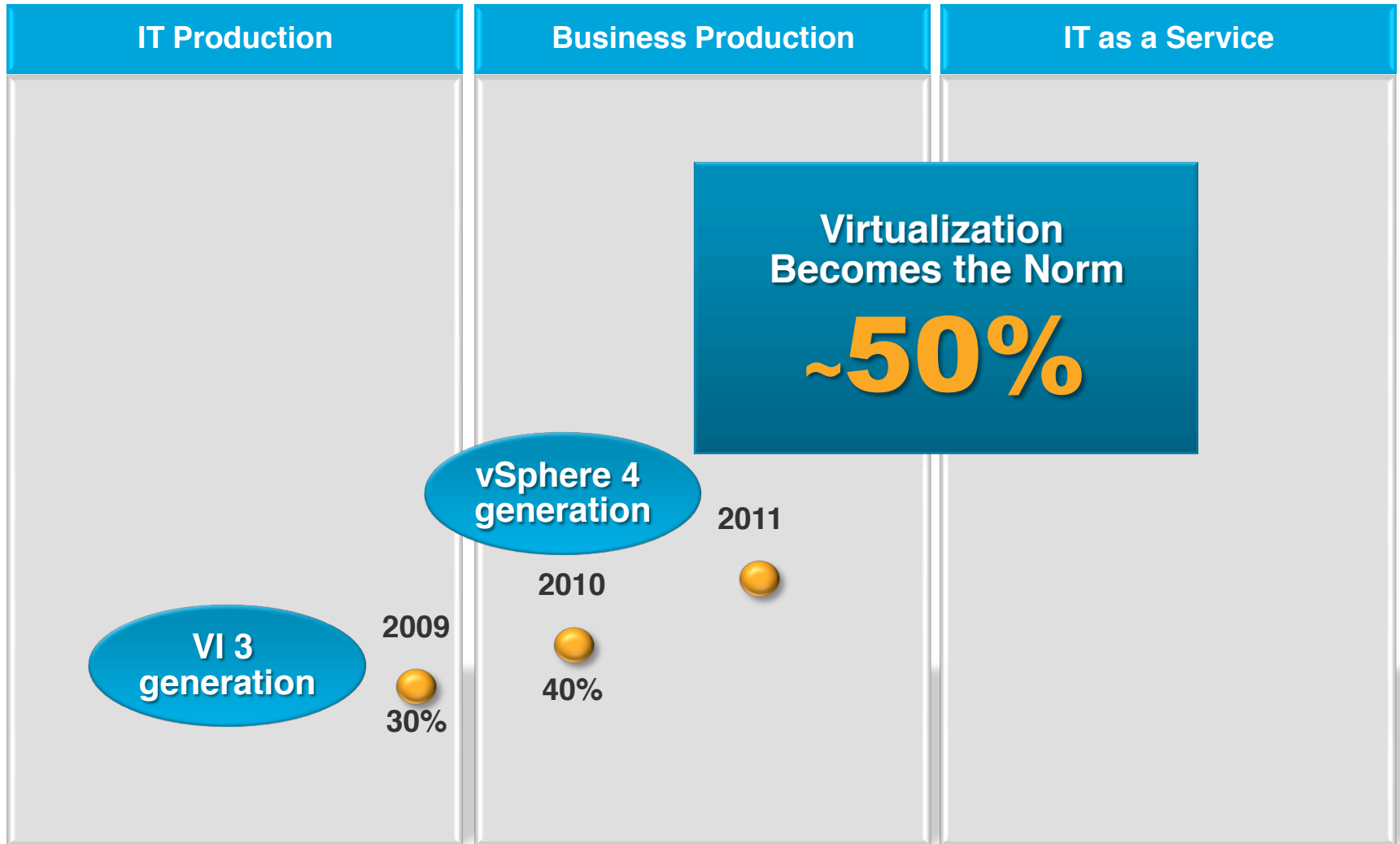
A More Flexible, Efficient Infrastructure

- Exploiting modern, cost-effective hardware
- Creating & spanning both internal and external resource pools

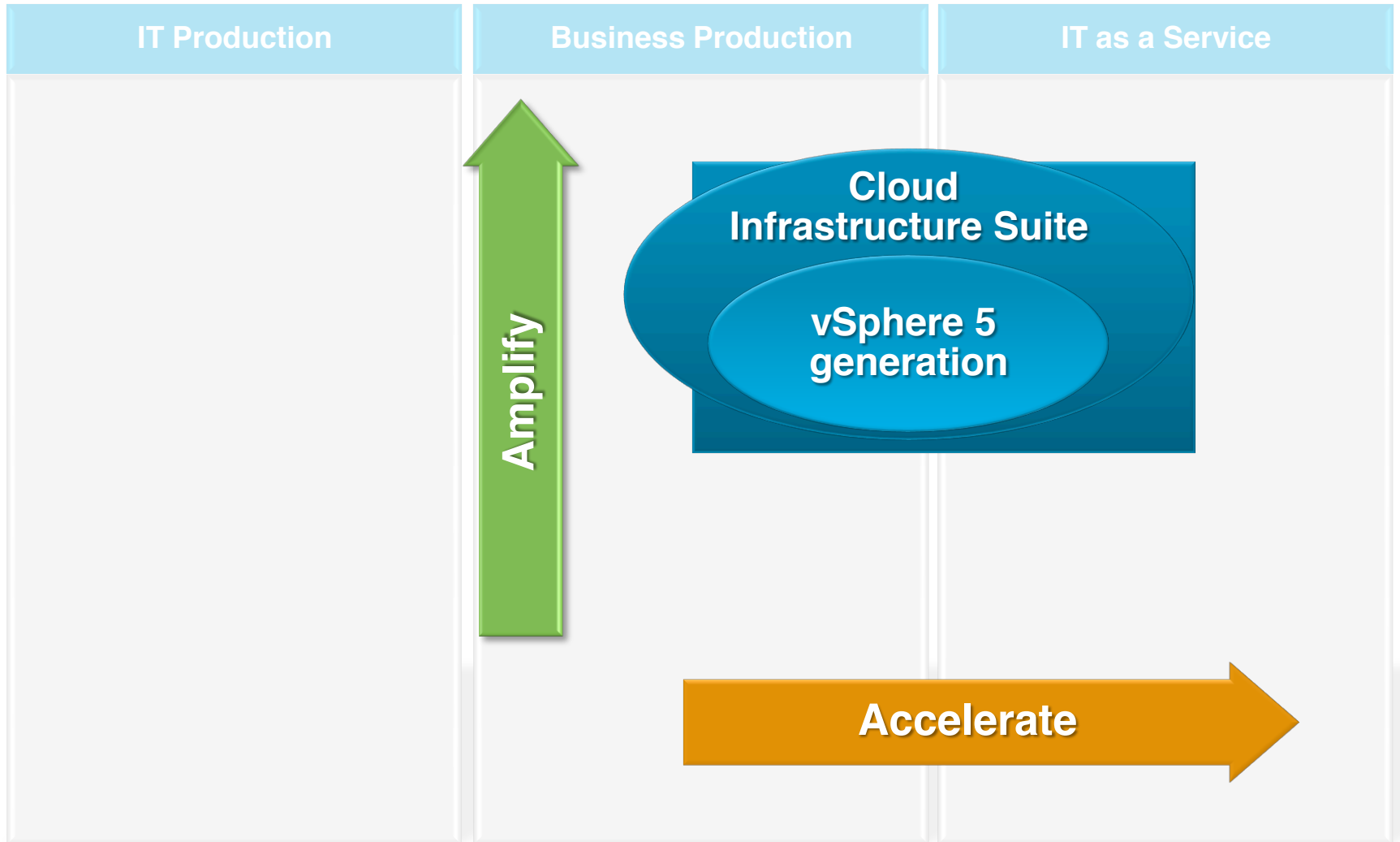
Existing Datacenters

Public Cloud Services

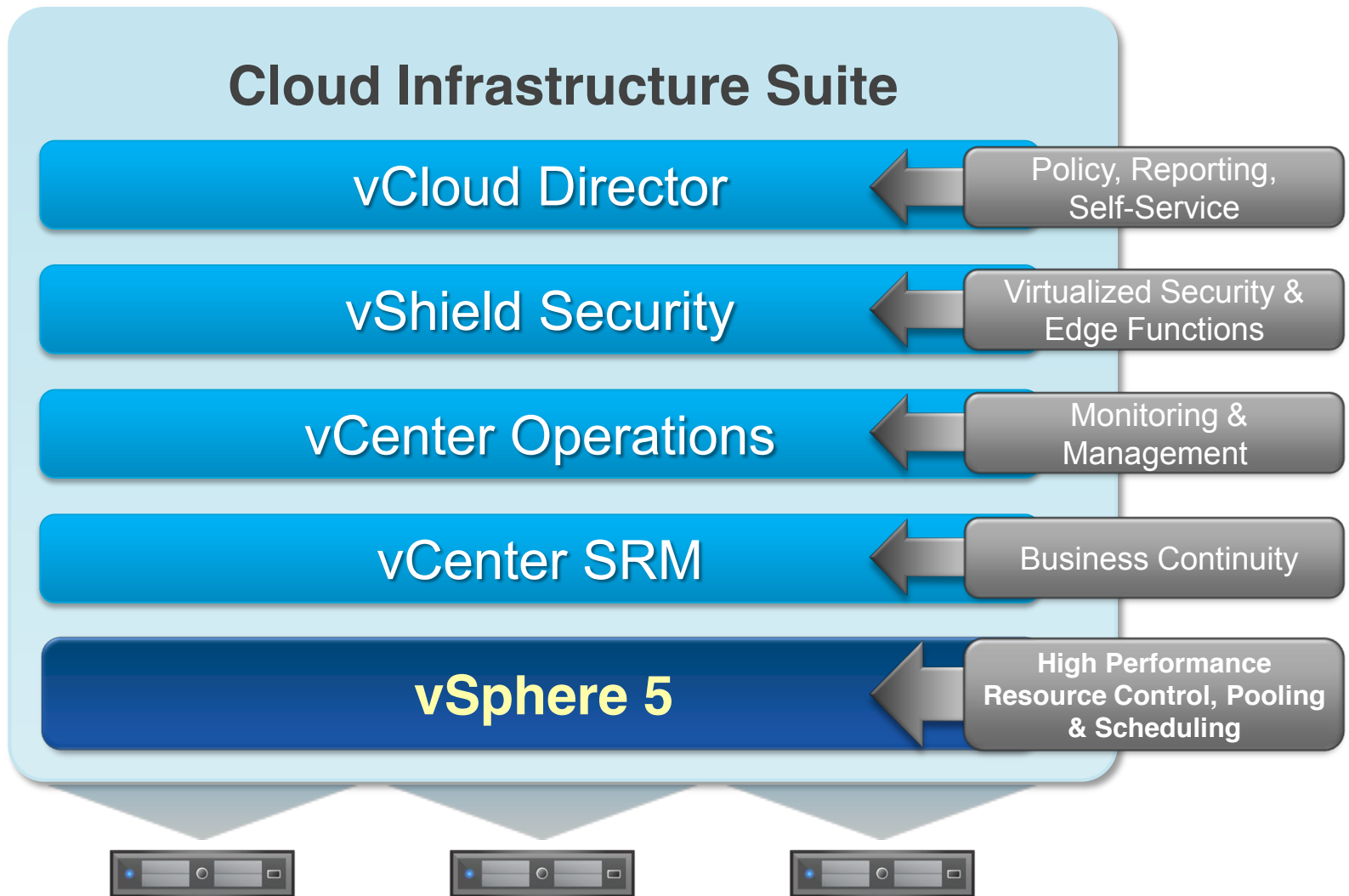
The IT Transformation Journey



The IT Transformation Journey



The First Comprehensive Cloud Infrastructure Suite



Delivering Choice: Hybrid Cloud Model

Apps

VMware vCloud	VMware vCloud	VMware vCloud	VMware vCloud	VMware vCloud	VMware vCloud	VMware vCloud	VMware vCloud
100	100	100	100	100	100	100	100
101	101	101	101	101	101	101	101
102	102	102	102	102	102	102	102
103	103	103	103	103	103	103	103
104	104	104	104	104	104	104	104
105	105	105	105	105	105	105	105
106	106	106	106	106	106	106	106
107	107	107	107	107	107	107	107
108	108	108	108	108	108	108	108
109	109	109	109	109	109	109	109
110	110	110	110	110	110	110	110
111	111	111	111	111	111	111	111
112	112	112	112	112	112	112	112
113	113	113	113	113	113	113	113
114	114	114	114	114	114	114	114
115	115	115	115	115	115	115	115
116	116	116	116	116	116	116	116
117	117	117	117	117	117	117	117
118	118	118	118	118	118	118	118
119	119	119	119	119	119	119	119
120	120	120	120	120	120	120	120

Apps

VMware vCloud	VMware vCloud	VMware vCloud	VMware vCloud	VMware vCloud	VMware vCloud	VMware vCloud	VMware vCloud
100	100	100	100	100	100	100	100
101	101	101	101	101	101	101	101
102	102	102	102	102	102	102	102
103	103	103	103	103	103	103	103
104	104	104	104	104	104	104	104
105	105	105	105	105	105	105	105
106	106	106	106	106	106	106	106
107	107	107	107	107	107	107	107
108	108	108	108	108	108	108	108
109	109	109	109	109	109	109	109
110	110	110	110	110	110	110	110
111	111	111	111	111	111	111	111
112	112	112	112	112	112	112	112
113	113	113	113	113	113	113	113
114	114	114	114	114	114	114	114
115	115	115	115	115	115	115	115
116	116	116	116	116	116	116	116
117	117	117	117	117	117	117	117
118	118	118	118	118	118	118	118
119	119	119	119	119	119	119	119
120	120	120	120	120	120	120	120



vCloud Partners: e.g.

Private Cloud

vCloud Service Provider

Cloud Infrastructure

VMware vCloud = Hybrid

Cloud Infrastructure

VMware Cloud Infrastructure Product Roadmap

Yu-Shen Ng, Director of Product Management, vSphere

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Disclaimer

- **This presentation may contain product features that are currently under development.**
- **This overview of new technology represents no commitment from VMware to deliver these features in any generally available product.**
- **Features are subject to change, and must not be included in contracts, purchase orders, or sales agreements of any kind.**
- **Technical feasibility and market demand will affect final delivery.**
- **Pricing and packaging for any new technologies or features discussed or presented have not been determined.**
- **This information is confidential**

Three Core Focus Areas

Re-think End-User Computing

Modernize Application Development

Evolve the Infrastructure

Existing Datacenters

Public Cloud Services

Cloud Computing Drives New Business Model For IT

End User Desire for Simplicity and Agility

Simplicity

Easy, self-service access

Affordable

Pay for what you use, without upfront investments

Agility

Faster time-to-market without long approval cycles

User-centric

A feeling of being in control of their business

Cost Pressures

The pricing below includes the cost to run private and public AMIs on the specified operating system. Amazon also provides you with additional instances with other option for [Amazon EC2 running Microsoft](#) and [Amazon EC2 running IBM](#) that are priced differently.

United States		Europe	
Standard On-Demand Instances		Linux/UNIX Usage	Windows Usage
Small (Default)		\$0.10 per hour	\$0.125 per hour
Large		\$0.40 per hour	\$0.50 per hour
Extra Large		\$0.80 per hour	\$1.00 per hour
High CPU On-Demand Instances		Linux/UNIX Usage	Windows Usage
Medium		\$0.20 per hour	\$0.30 per hour
Extra Large		\$0.80 per hour	\$1.20 per hour

Pricing is per instance-hour consumed for each instance type, from the time an instance is launched until it is terminated. Each partial instance-hour consumed will be billed as a full hour.

Enable our customers to build and manage **enterprise-class, elastic** (dynamic) computing clouds at radically **lower costs** and with **greater simplicity**

The First Comprehensive Cloud Infrastructure Suite

Cloud Infrastructure Suite

vCloud Director

vShield Security

vCenter Operations

vCenter SRM

vSphere 5



Transforming Today's Infrastructure to Cloud Infrastructure



Storefront

vCloud Director

Management

vShield
vCenter Operations

The Compute Cloud

vCenter SRM
vSphere

Self-service

**Automation via policy
Security and trust**

**Pooling of resources
Virtualization of every
datacenter resource**

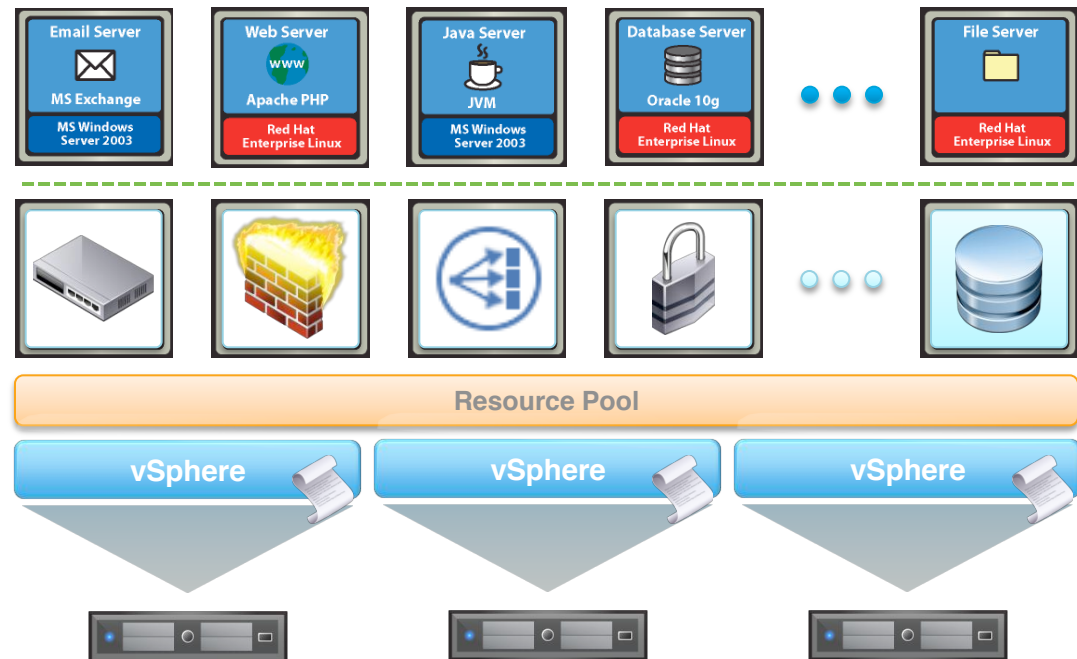


The Compute Cloud

Cost-effective infrastructure to rival public IaaS offerings

Metric: hardware cost per VM

- Deliver a flexible, software-driven giant computer on industry-standard hardware
- Leverage industry standard HW advances
- **Virtualize every datacenter resource.** Migrate network, storage and security functions into scale-out virt. appliances
- **Pool resources** at large scale for maximal efficiency and non-stop resilience
- Leverage geo-distributed sites for availability and load-balancing (flex capacity, DR, DA, maintenance, etc.)



Resource Pooling

Pooling

For efficiency & resilience

- Pooling of
 - Hosts
 - Clusters
 - Datacenters
 - Providers



Technology Roadmap: Resource Pooling

Pooling

For efficiency & resilience

- Pooling of

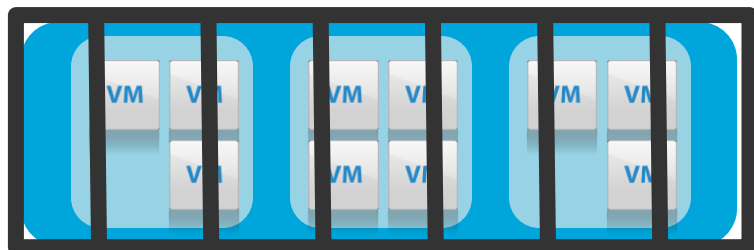
- Hosts
- Clusters
- Datacenters
- Providers
- Management

	<u>2011</u>	<u>2012</u>	<u>2013</u>	<u>Benefit</u>
Hosts	▪ HA, FT, DRS, SDRS, vNDS		▪ SMP FT (vSphere)	Non-stop service upon hardware failure
Clusters	▪ Elastic VDC (VCD - for Pay as you go VMs)	▪ Elastic VDC (VCD – for all VM's)		Cross-cluster load-balancing to drive up utilization efficiency
Datacenters			▪ Metro clusters (vSphere)	Leverage metro-sites for load-balancing & BC/DR
Providers	▪ vCloud Connector	▪ DR to cloud (SRM)		Backup/DR to a third-party cloud provider
Management	▪ Linked mode	▪ Tagging & search (vCenter)	▪ Content library, VM movement (vCenter)	Scalable management views Sharing of content across VCs

Technology Roadmap: Virtualizing Every Datacenter Resource

Today's Challenges

- Lack of mobility: VMs are pinned to their physical environment (clusters, VLANs, arrays, etc.)
- Inflexible, purpose-built hardware prevents us from delivering “just-in-time” scale & flexibility.



The roadmap

2012

2013

More portable abstractions

- VDL2 (vSphere networking)

- vVols (vSphere storage)

Flexible, just-in-time, scale-out resources

- Network & security datapath insertion (vSphere, vShield)

- SAN on local storage (vSphere add-on)

Transforming Today's Infrastructure to Cloud Infrastructure



Storefront

vCloud Director

Self-service

Management

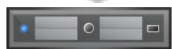
vShield
vCenter Operations

Automation via policy
Security and trust

The Compute Cloud

vCenter SRM
vSphere

Pooling of resources
Virtualization of every
datacenter resource

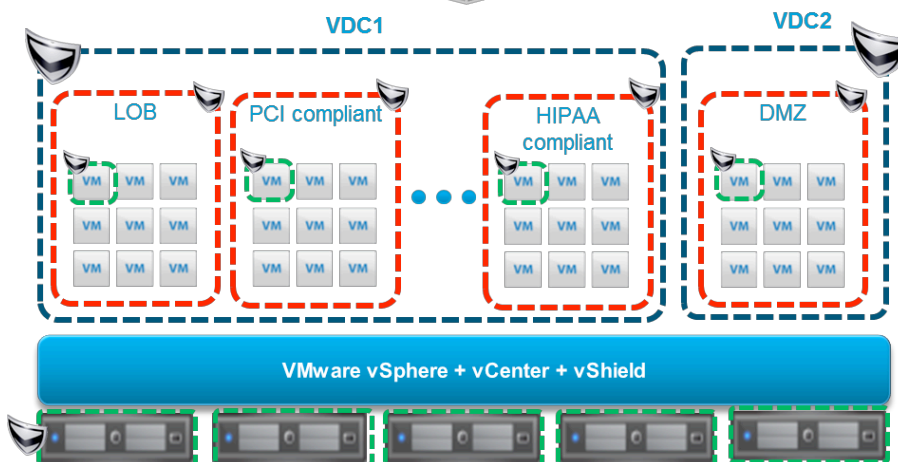


Security and Trust in the Cloud Infrastructure

Transforming the way Apps and Data are protected and compliant

vShield

Elastic
Efficient
Automated
Programmable
Security as a Service



2011

- Edge – network and security services at the Edge of the VDC
- App – vApp micro segmentation
- Endpoint – Efficient AV
- Data – Sensitive Data Discovery

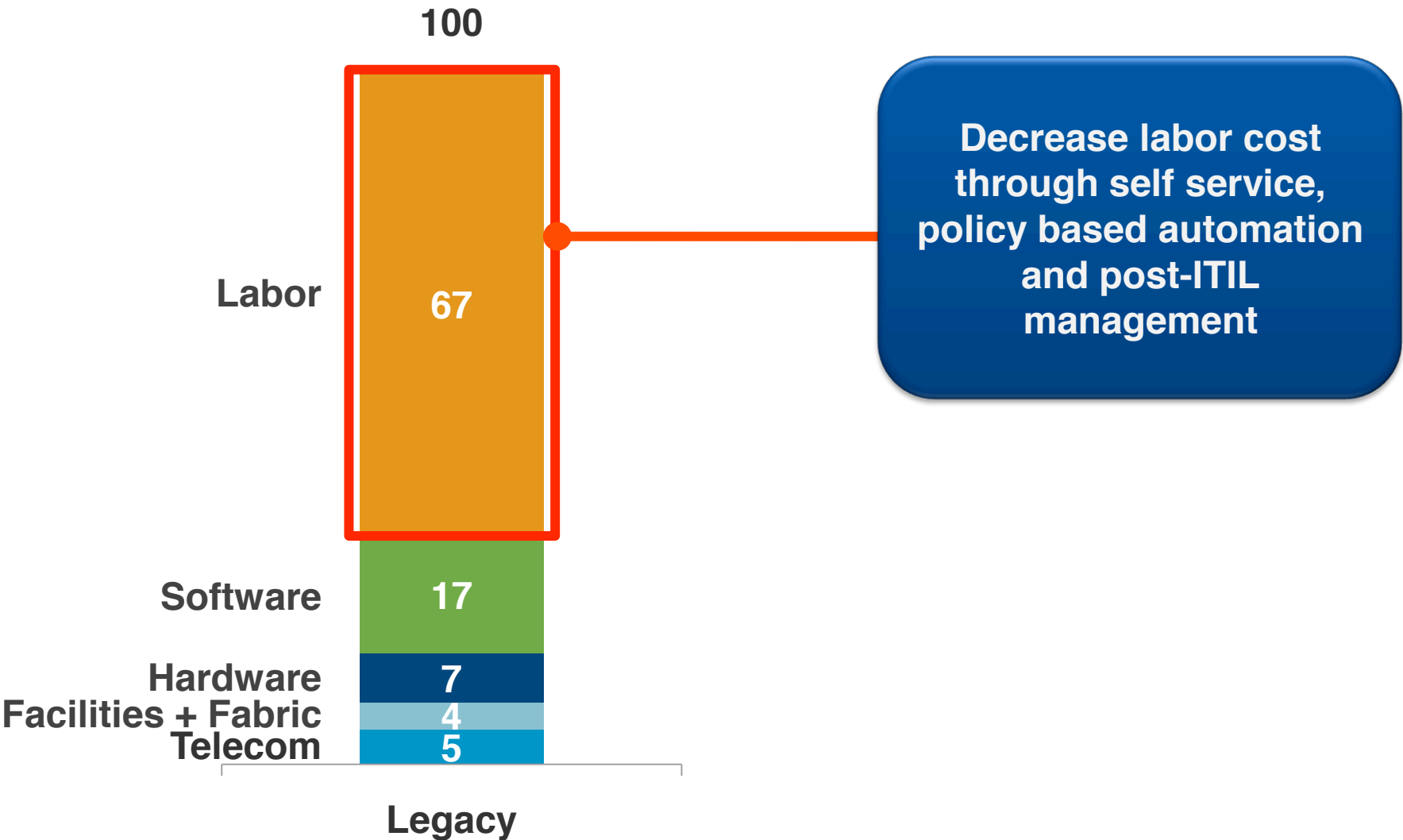
2012

- App & Edge NetSec insertion framework
- App – automated micro segmentation
- Endpoint – AV scale out, vulnerability scanning and white listing use cases
- Data – Dynamic Groups, RSA upgrade
- Trusted Boot update

2013

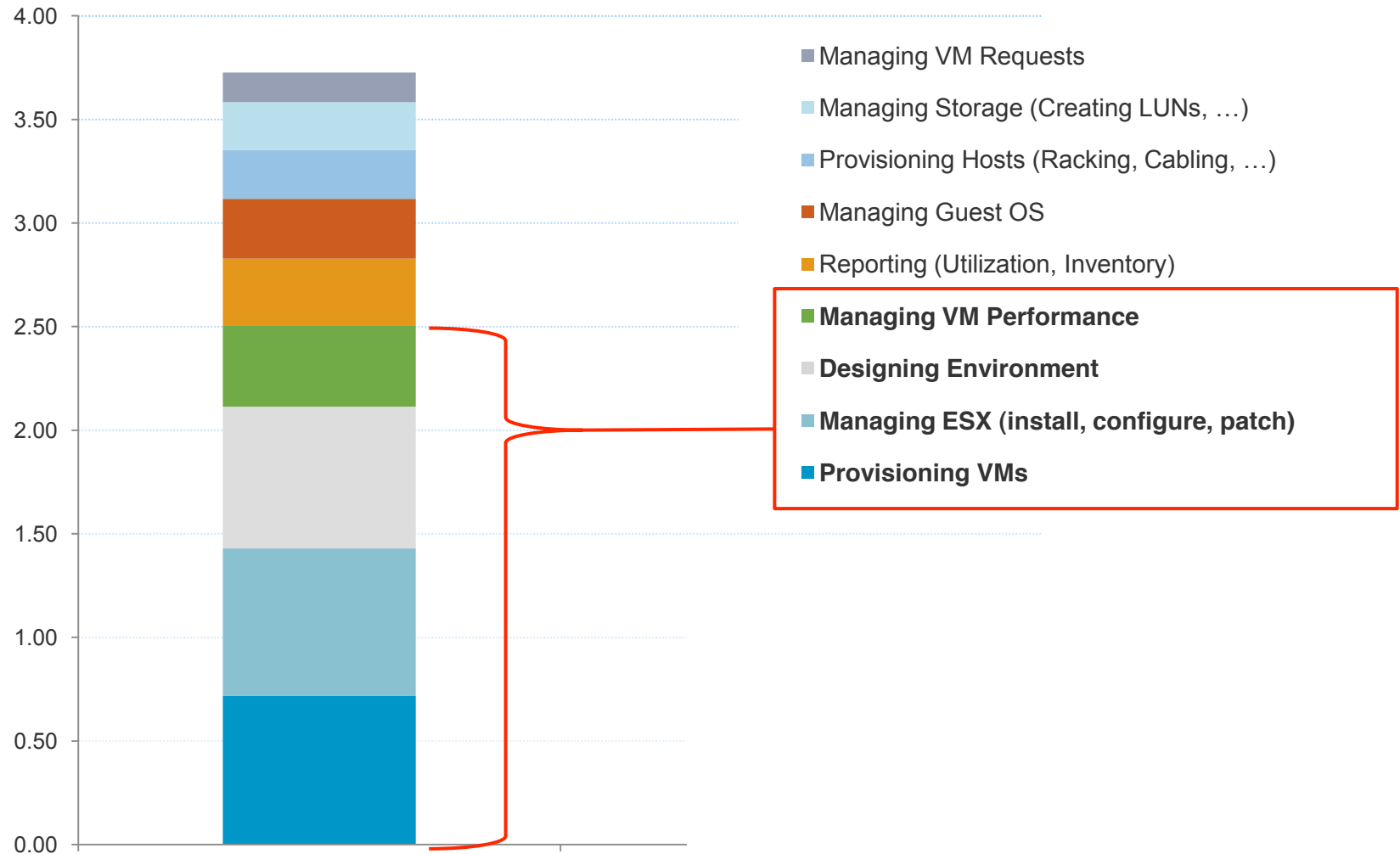
- App – App and Identity auto discovery
- App and Edge – NetSec scale out
- Endpoint – even wider set of use cases
- Data – VMDK Encryption
- **Security Policy Based Management**

The Goal : Next Breakthrough in Datacenter Economics



Source: TMT Value Migration Database, Gartner IT Key Metrics Data 2009; McKinsey

Where the time goes

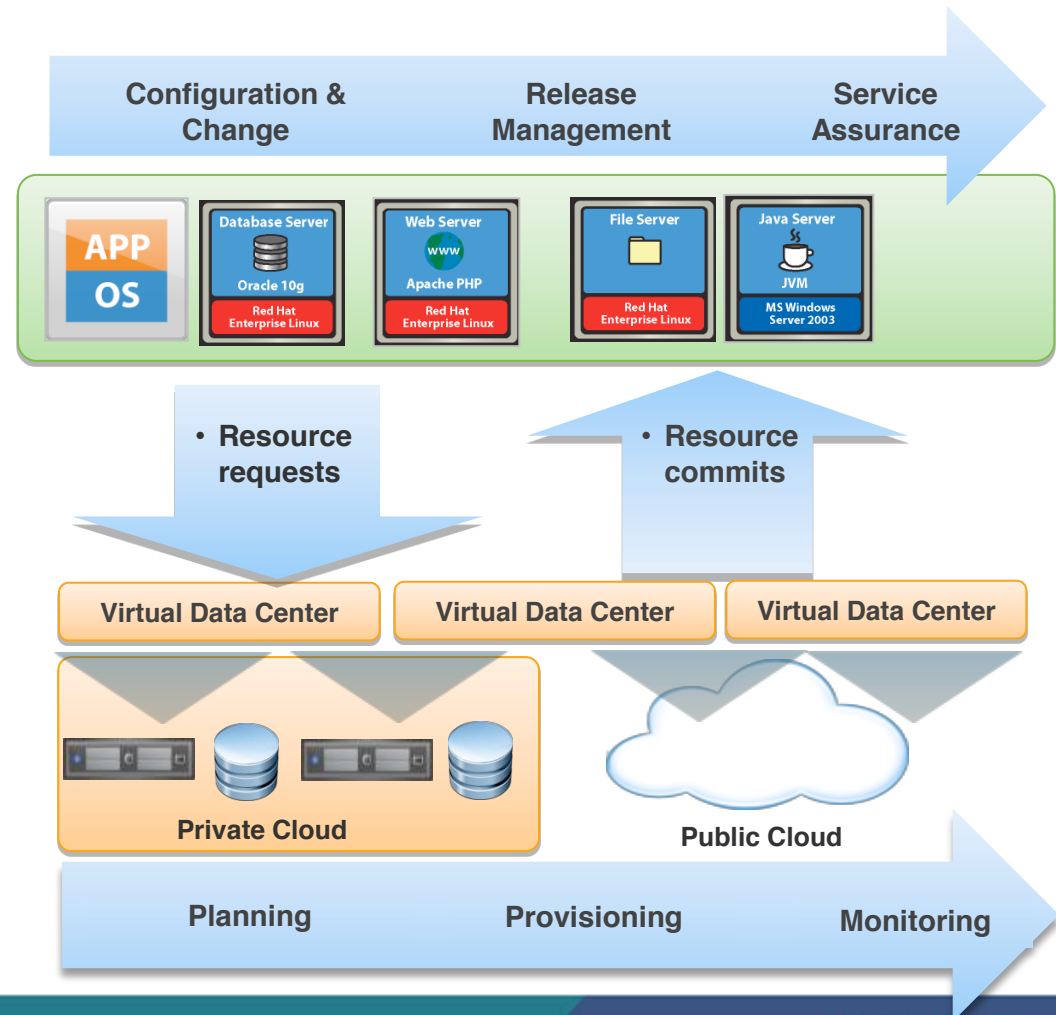


Cloud Management

Efficient operations while delivering enterprise service

*Metrics: admin hours per 1000 VMs,
achievement against performance, uptime, security, and SLA promises*

- Simplified management – esp. at scale
- **Automated via policy**
- Particular attention to provisioning automation
- More prescriptive design & deployment patterns
- **Cloud-scale tools for day-to-day operations**
- A robust management platform



Automation via policy

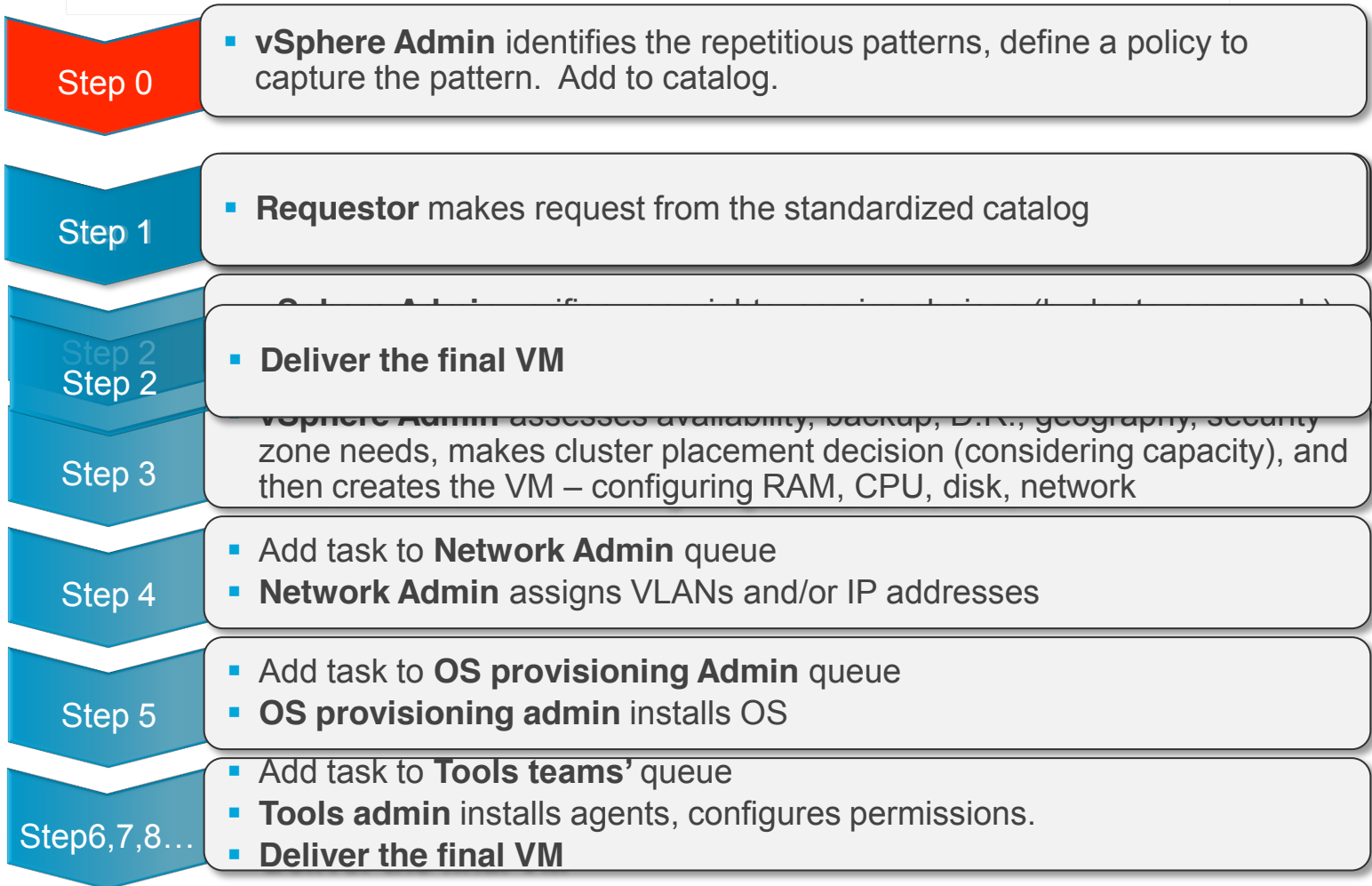
- This is your life – with policies.



Policy-based management: simplify or eliminate processes through intelligent designs.

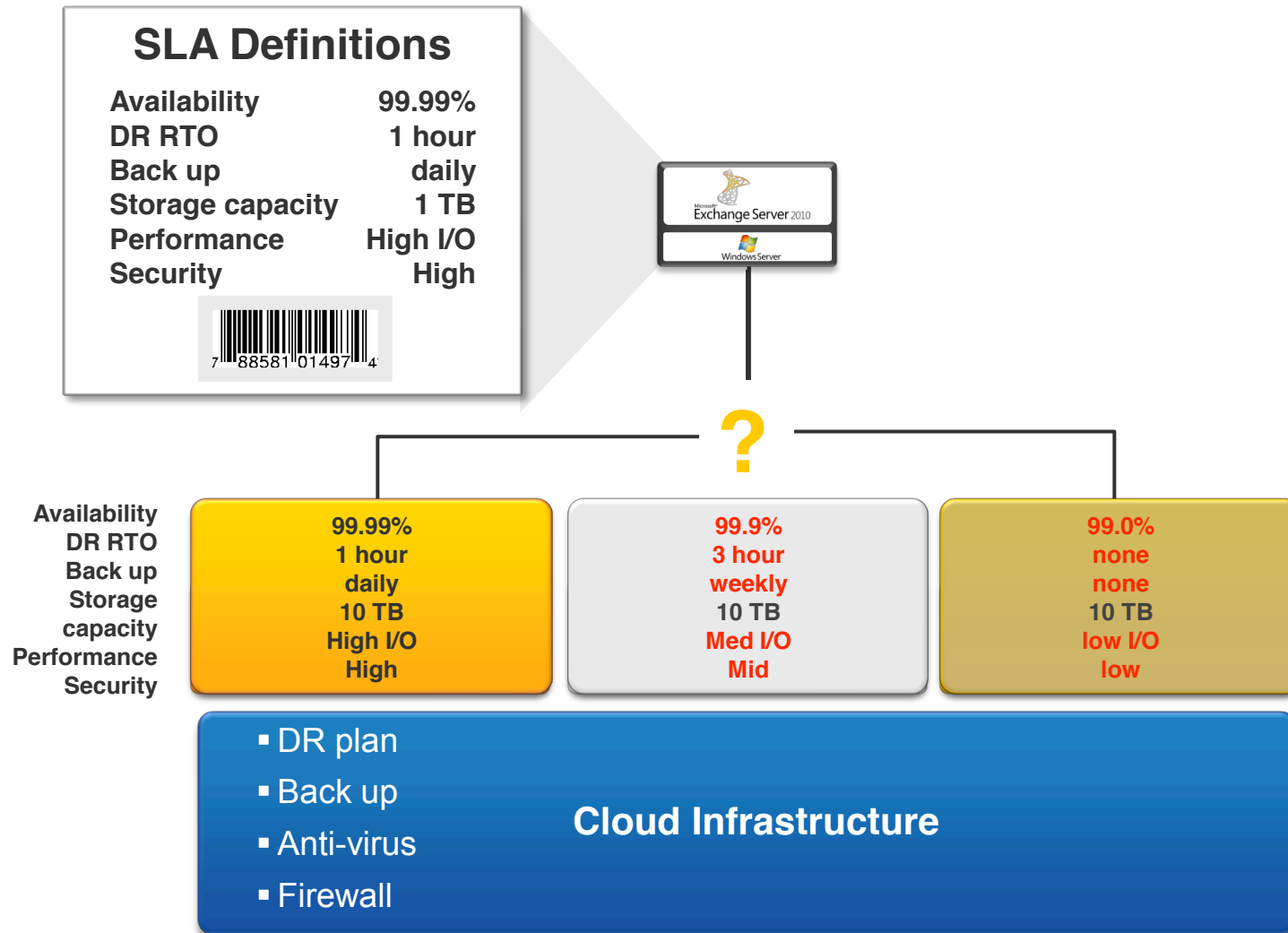
Intelligent Policy Management – VM Provisioning

Eliminating Steps Rather Than Automating Steps



Minutes

Intelligent Policy Management – Standardized Service Tiers



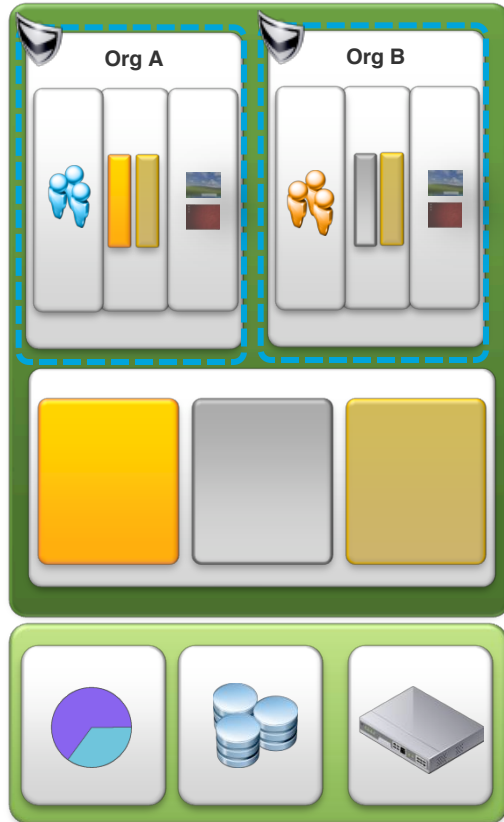
Automated....

Placement

Provisioning of infra services

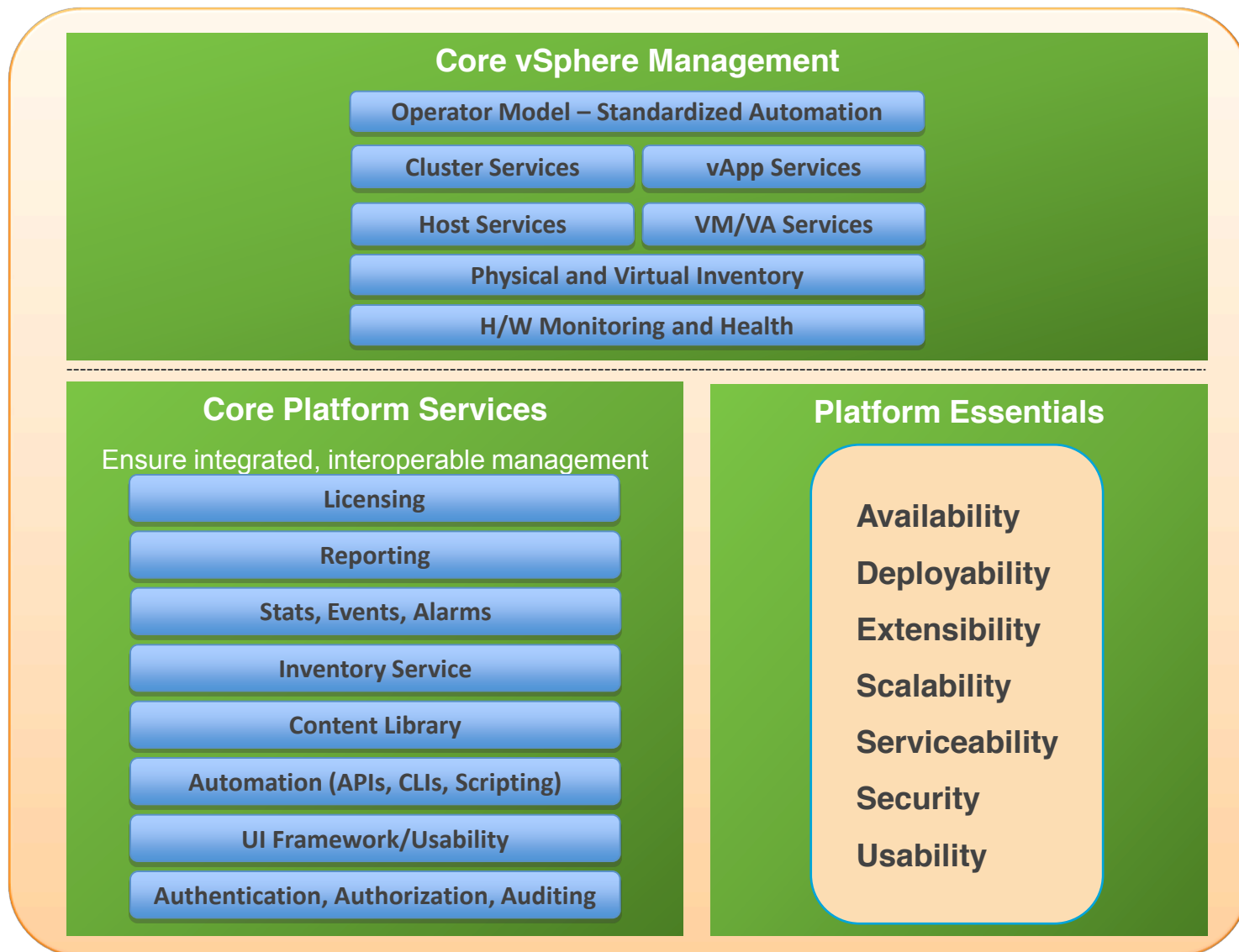
vCloud Director: Automation Roadmap

- Policy: simplify or eliminate processes through intelligent designs.



	<u>Present</u>	<u>2012</u>	<u>2013</u>
Storefront-facing features	<ul style="list-style-type: none">▪ Catalogs▪ VSM	<ul style="list-style-type: none">▪ Tiered Provider VDC's (gold, silver, etc.)	
Capacity-management features		<ul style="list-style-type: none">▪ Elastic VDC: initial VM placement in a cluster	<ul style="list-style-type: none">▪ Elastic VDC: on-going

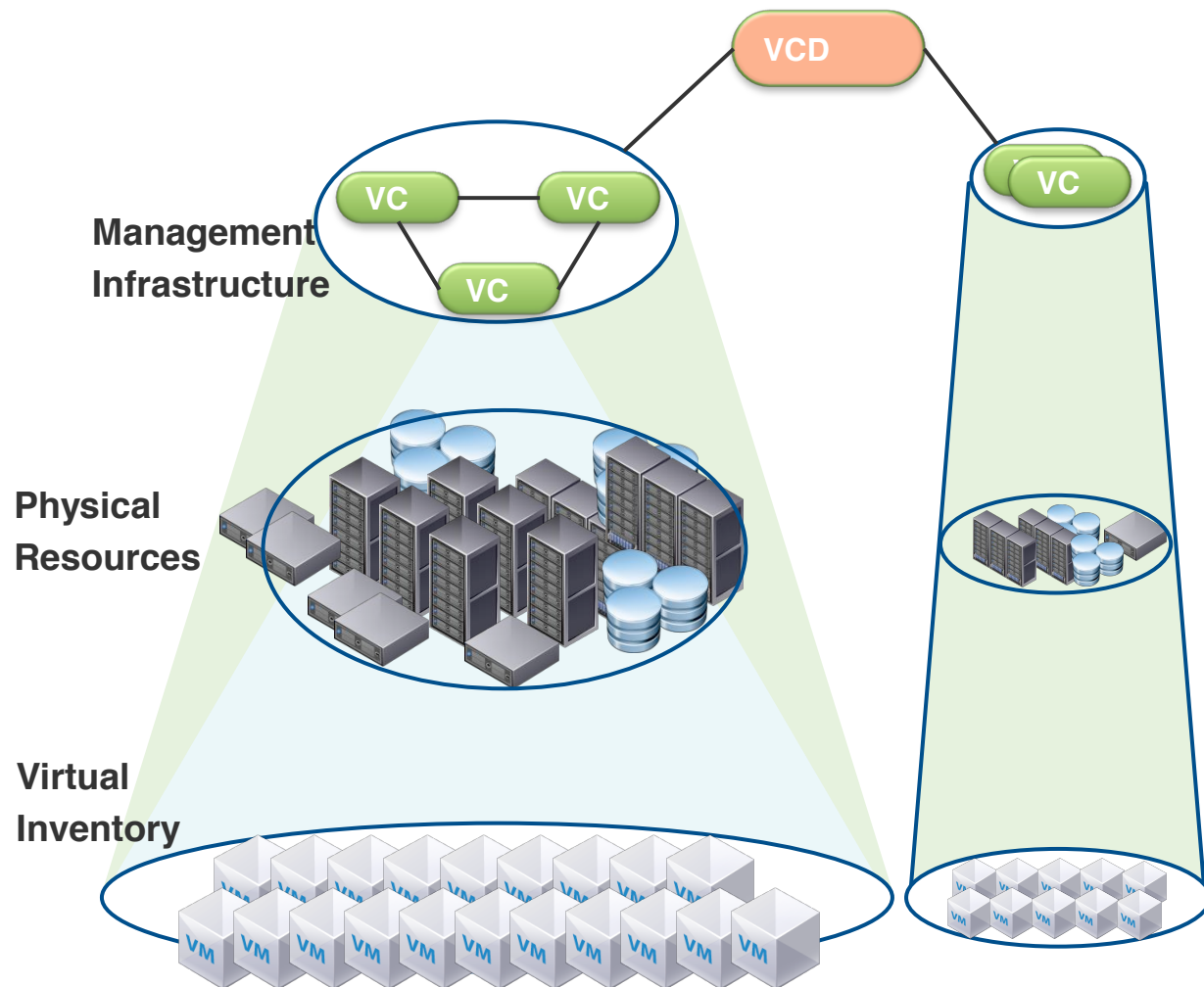
vCenter Management Platform Directions



Scaling your datacenter

Description

- Scale is not just about a single vCenter any more
- It is about having
 - a pool of VCs that can manage
 - a datacenter of physical resources that host
 - a cloud of virtual resources
- Create multiples depending on your needs
- Manage all your datacenters with vCloud Director



vCenter as a Collection of Services

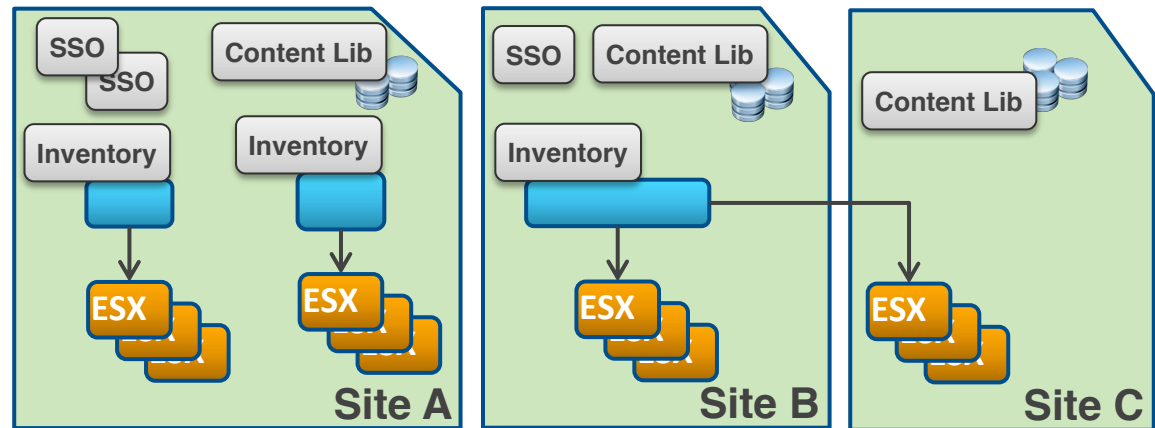
Roadmap

- Services are embedded within each vCenter deployment (such as Licensing) while others are separable and shareable (Authentication, Content Library) as Virtual Machines
- VMs can be vMotioned between vCenters within a site or migrated from one datacenter to another.

Benefits

- Services can be independently scaled and shared across multiple deployments of vCenter

vSphere Client



What's different about Operations Management in a Virtual Environment?

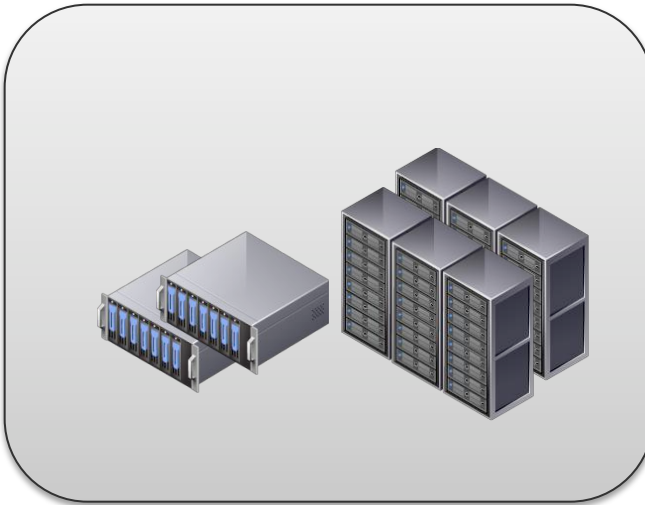
OPERATIONS

Dedicated resources
Pre-committed

Static 1-1 mapping
Limited movement

Shared infrastructure
Resource abstraction
Mobility
Speed / self-service

INFRASTRUCTURE



Physical Datacenters



Virtual Datacenters

vCenter Operations - Solution Overview

Performance

(formerly Integrion Alive)



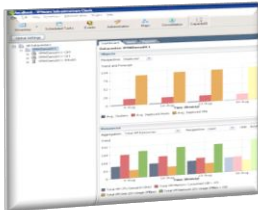
Patented Performance Analytics

- Self-learning of “normal” performance conditions
 - Service health baseline and trending
- Smart alerts of impending performance degradation



Capacity

(our current CapacityIQ product)



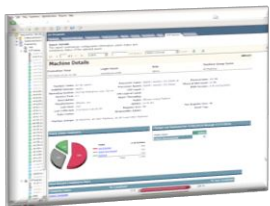
Purpose Built Capacity Planning & Analysis

- Integrated capacity analysis and forecasting
- Decision support & automation via views, alerts, reports
 - VM right sizing and capacity reclamation



Config Compliance

(our current VMware Config Mgr product)



Automated Configuration & Compliance

- Automated Patching and Provisioning
- Comprehensive change tracking to isolate root cause
- Single-click rollback to remediate and return to normal

vCenter Operations Roadmap: Convergence into the Cloud Infrastructure Suite

Optimize the
3 indep
products
for vSphere

2010



Bundle

2011



Unify &
Converge

2011/12

■ 2011/2012 Convergence:

- Migration of UIs to shared UI model based on Next-Gen Client
- Out-of-the box use case based integrations across the VC Ops products
- VCO plug-ins to enable cross-product workflows and 3rd party integrations

■ 2012/2013 Convergence:

- Integration into the vCenter UI

Transforming Today's Infrastructure to Cloud Infrastructure



Storefront

vCloud Director

Self-service

Management

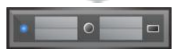
vShield
vCenter Operations

Automation via policy
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vCenter SRM
vSphere

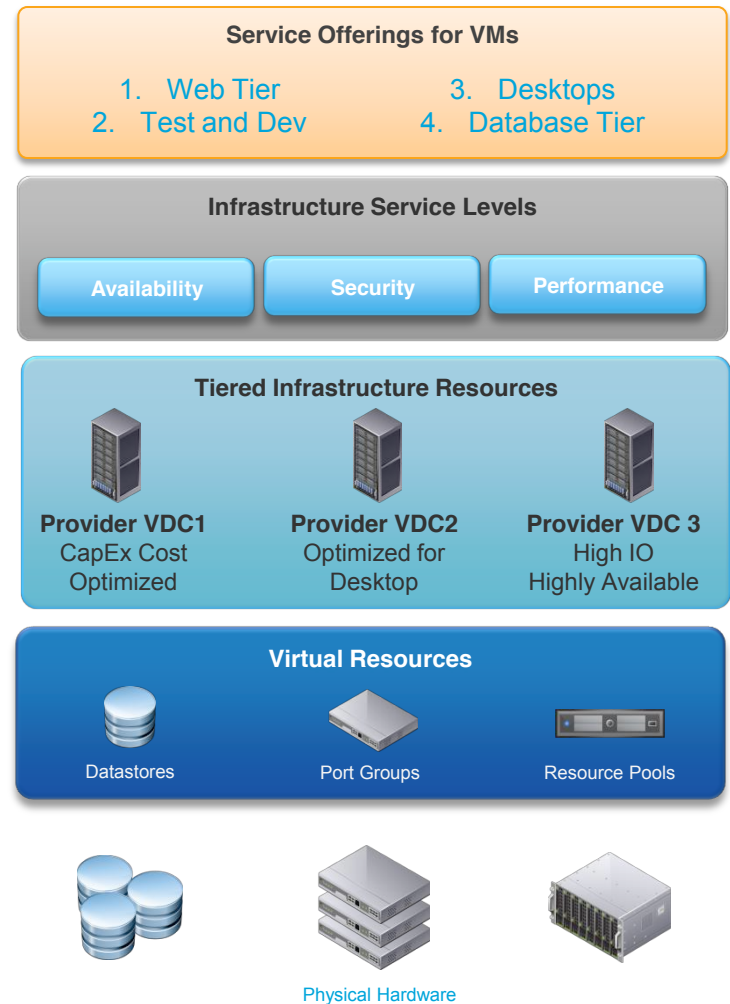
Pooling of resources
**Virtualization of every
datacenter resource**



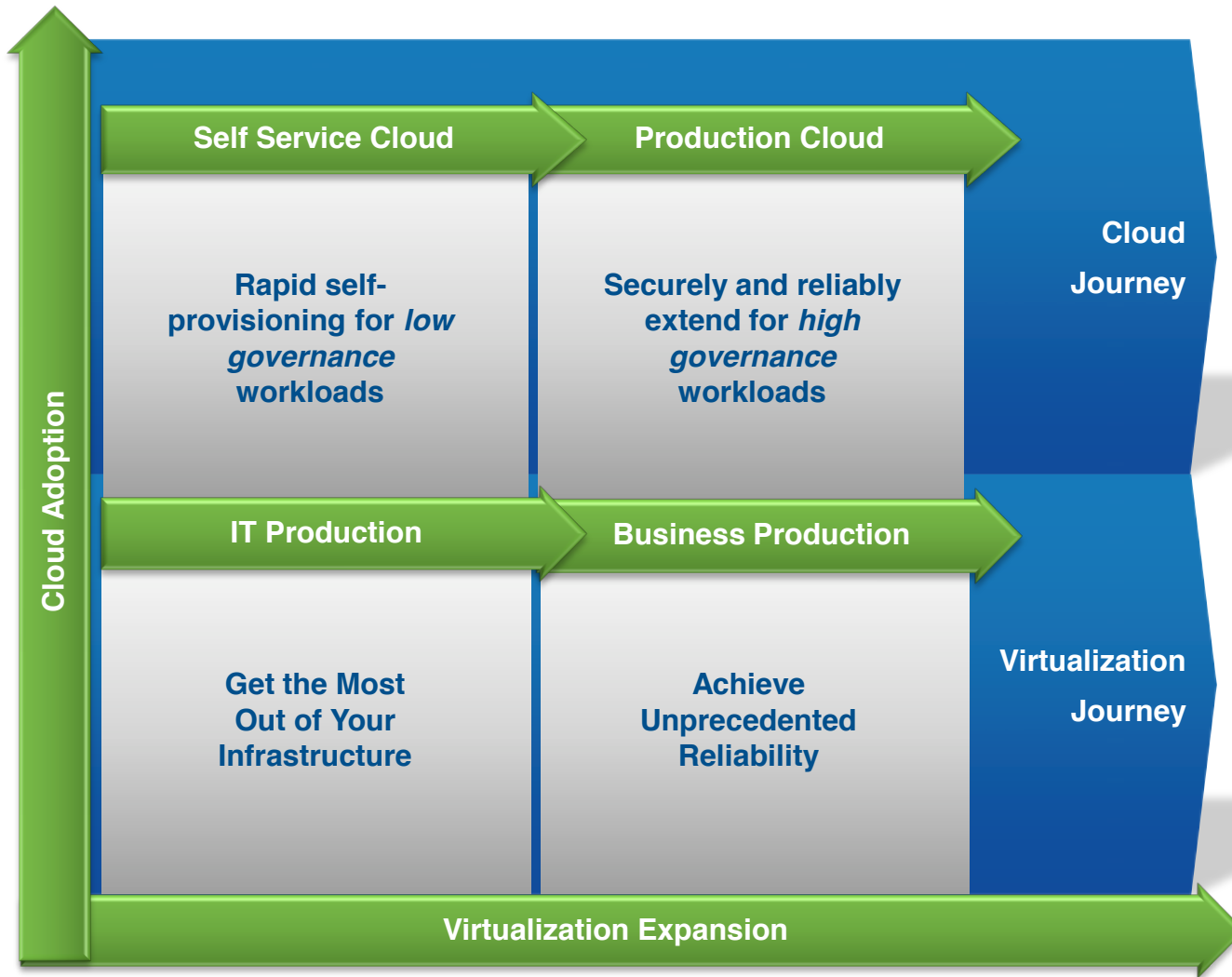
Enable the new business model for IT

Metric: Time to provision app infrastructure

- Self-service requests
- Mass customization vs. maximum standardization: automate where possible
- Chargeback/showback
- A superior user experience



The Journey to Self-Service: from low to high governance



vCloud Director: Self-Service Roadmap

- Enable an optimal consumer experience
- Chargeback or showback to enable a virtuous feedback cycle



	<u>2011</u>	<u>2012</u>	<u>2013</u>
Web portal	<ul style="list-style-type: none">▪ Low governance▪ High governance: approval process	<ul style="list-style-type: none">▪ Simpler portal▪ Broader services	<ul style="list-style-type: none">▪ Hybrid
Integration with Enterprise Systems	<ul style="list-style-type: none">▪ ESM (IPAM, CMDB, Service Desk)	<ul style="list-style-type: none">▪ Network firewalls & load-balancers	
Catalog Enhancements	<ul style="list-style-type: none">▪ Templates▪ Deployment customization	<ul style="list-style-type: none">▪ Embedded policy▪ PAAS & App provisioning	
Cost Control Enhancements	<ul style="list-style-type: none">▪ Chargeback▪ Showback	<ul style="list-style-type: none">▪ Analytics to support dynamic pricing (e.g. spot)	

CloudFoundry & vFabric roadmaps / synergies with cloud infrastructure

- Developers want a VM... fast!
- They want to be productive... with their preferred toolsets



Opportunity: beyond VMs and IAAS, deliver pre-packaged application infrastructure as a service



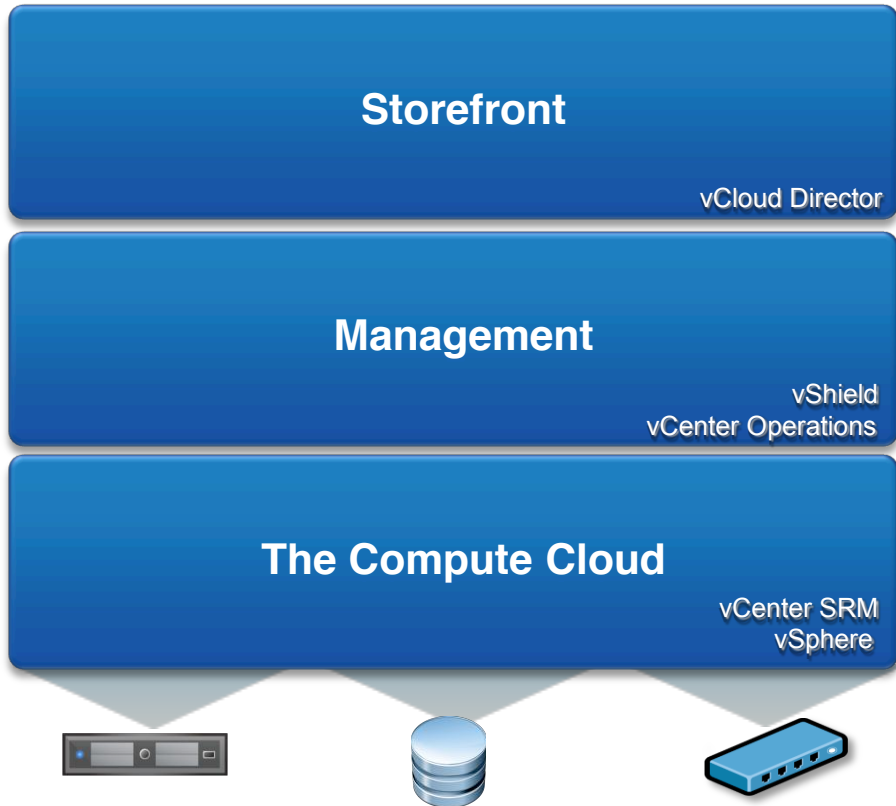
**CloudFoundry
roadmap & synergy**

- 1. They come seeking synergy**
- 2. You suggest synergies**

**vFabric
roadmap & synergy**

- | | <u>2011</u> | <u>2012</u> | <u>2013+</u> |
|--|---|--|-----------------------------|
| | ▪ μCloudFoundry
(VAM virt. appliance) | ▪ Private
CloudFoundry
(as a VCD extension
feature) | |
| | | | ▪ Blob Storage
(vFabric) |
| | ▪ vFabric 5 suite | | |
| | ▪ Elastic Memory for
Java (vFabric tcServer) | | |
| | ▪ RelationalDB
on vSphere
(vFabric) | ▪ RelationalDB
on VCD
(vFabric) | |

Transforming Today's Infrastructure to Cloud Infrastructure



Self-service

Automation via policy
Security and trust

Pooling of resources
Virtualization of every
datacenter resource

Cloud Infrastructure – 2013



vCloud Director

- Users & Policies
- VDCs
- Catalogs

The Storefront

- Self-service user access
- Standardized offerings

vShield

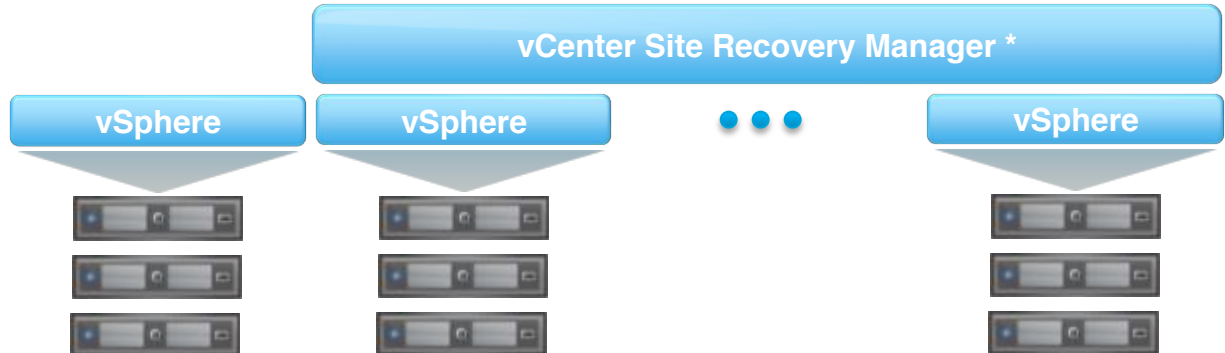
- Network
- Application
- Data

Simplified Management

- Virtualized & virtual-aware security
- Automation via policy
- Cloud-scale operational tools

vCenter Operations

- Performance
- Capacity
- Compliance



The Compute Cloud

- Pooling of resources
- Virtualization of every datacenter resource
- Leverage of geo-distributed sites and providers

VMware's Private/Hybrid Cloud Infrastructure Suite

vSite Recovery M.

vCenter Ops Suite

vCloud Director

vShield

vSphere

vCenter

Availability

Core

Security

Storage

Network

Reference slides

Cluster Scalability and Mobility

- Foundation for Availability & Resource Mgmt
 - Increase Scale
 - Increase Distance



2011

2012

2013+

Compute clusters

32 Hosts per cluster
512 VMs per host
3,000 VMs per cluster

32 Hosts per cluster
512 VMs per host
4,000 VMs per cluster

64 Hosts per cluster
512 VMs per host
6,000 VMs per cluster

2012 – Consolidated view of vSphere, VCD, vShield

	Goals	Products / subsystems		
		ESX / VC	Network, Storage, Avail	VCD & vShield
Cloud	Provisioning			<ul style="list-style-type: none"> Elastic VDC Business rules integration with ESM via VCO (2011)
	Network & security		<ul style="list-style-type: none"> Multi-tenant network: VDL2 vDS data path filter Monitoring & troubleshooting improvements 	<ul style="list-style-type: none"> Multi-tenant network (VDL2) vShield App in VCD vShield Edge Fit & Finish
	Operations	<ul style="list-style-type: none"> VC modular patching VCD-vSphere consistency SNMP v3 		<ul style="list-style-type: none"> vApp Backup (2011) VCD-vSphere consistency
	Workloads	<ul style="list-style-type: none"> Optimizations for VoIP servers, Gemfire 		<ul style="list-style-type: none"> Cloud Foundry Support Storage independent from VMs
Desktop	User experience & TCO	<ul style="list-style-type: none"> Support for Windows 8 Beta Optimizations for VoIP 3D graphics hardware assist 	<ul style="list-style-type: none"> Storage efficiency <ul style="list-style-type: none"> SE sparse disk Native snapshots 	
Core	Scale, resilience, eco	<ul style="list-style-type: none"> 20K VMs per VC Web Client, single sign-on 	<ul style="list-style-type: none"> Windows clustering / MSCS: 5 node configs 	<ul style="list-style-type: none"> API parity with UI (2011)
	Leveraging the hardware	<ul style="list-style-type: none"> HW enablement: CPU (Haswell, etc.), 16Gb FC HBA*, NPA NICs (Intel) 		

* Items in bold were not mentioned earlier in the deck

vSphere Feature Highlights in 2012

- More powerful, more efficient VMs
- Next-gen client
- Storage
 - Storage efficiency: SE sparse
 - Storage efficiency: native snapshots
- Networking
 - VDL2
 - Improved monitoring & troubleshooting
 - 3rd party extensibility framework
- Management
 - SSO

vCloud Director 2012 Release Themes

Scale & Elasticity

1. Elastic VDC
2. Network Multi-tenancy (VDL2)
3. Multiple classes of capacity

Layer-2 Support

1. Cloud Foundry on vCloud
2. Storage independent of VM
3. Multiple classes of capacity

Usability

1. Install/upgrade improvements
2. SSO
3. VCD as an appliance
4. Tenant improvements (basic)
5. API/UI Consistency
6. vShield App Integration
7. Networking Usability and feature improvements

Extensibility

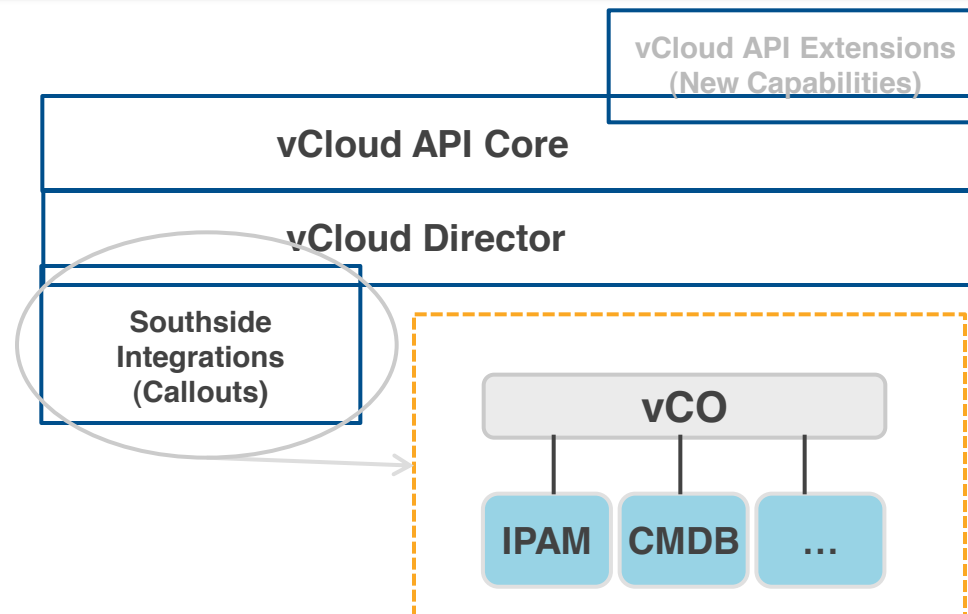
1. UI/API Consistency
2. vCloud Extensibility

Description

- vCO **Plug-Ins** and **Workflows** that integrate vCD with Enterprise IT Management Systems (ESM)
- Integrate vApp Lifecycle Management operations in vCD with:
 - IP Address Management (IPAM)
 - CMDB
 - Service Desk
 - Provisioning
- Toldeo vs. T2:
 - Toledo – integrations with select leading ESM products
 - T2 – integrations with additional ESM products

Benefits

- Rapidly stand up a vCloud that is compatible with your existing management processes
- Customizable reference implementations and guidelines for integrating leading enterprise management tools with your vCloud



vCD Integration Roadmap

Integration	Toledo	T2
IPAM	Infoblox NIOS	Lucent-Alcatel VitalQIP Bluecat Networks Proteus
CMDB	BMC Atrium	HP UCMDB CA CMDB
Service Desk	BMC Remedy	HP Service Manager CA Service Desk Manager Service-Now.com
Provisioning	BMC BladeLogic	HP Opsware Symantec Altiris

[Back](#)

vCloud Director Releases

2010



Enable creation of Public and Private vClouds

2011



Make vCloud Director a market competitive solution for private clouds

Respond to SP Market Feedback

2012



Reduce operational cost of successful vCloud

Expand addressable workloads for vClouds

Lay extensibility foundations for the product

2013



Federation of internal and external clouds

Establish Hybrid Cloud UI & API interfaces for consumption

Integrate Cloud Management with vSphere

Develop vCloud Ecosystem on extensibility foundations

Virtual Machine Maximums

	vSphere 4.1	vSphere 5.0	vSphere in 2012	Business Justification / Use Case
vCPUs per VM	8	32	64	Virtualize even larger workloads. Data mining, ERP and IT infrastructure. This also allows for next-gen mainframe-sized workloads.

ESX Host Maximums

	vSphere 4.1	vSphere 5.0	vSphere in 2012
Logical CPUs per host	128	160	256
RAM per host	1 TB	2 TB	2 TB
Physical NICs per host	32	32	50
VMDirectPath PCI/PCIe devices per host	32	32	48

Cluster Maximums

	vSphere 4.1	vSphere 5.0	vSphere in 2012
Hosts per cluster	32	32	32
VMs per cluster	3000	3000	4000

vCloud Director Maximums

	2012
Total VM Count	50,000
Maximum VMs per organization	10,000
Maximum orgs	25,000
Maximum vApps per org at max size – scale out style	10,000
Maximum org networks per org	64
Max. VMs per vApp	128

vCloud Director Maximums

	2012
Max VMs per org	10,000
Maximum vApps	50,000
Maximum number of networks	25,050
Maximum users per org	10,000
Max VMs created and destroyed (across mult. VCs)	5,000
Max active API calls per minute (to a single VC)	250

vCenter Server Maximums

	2010	2011	2012
Powered-On VMs per VC	10000	10000	20,000
Number of hosts per DC	400	500	1,000
Concurrent storage vMotions per datastore	8	8	128
USB devices connected to Web Client	-	-	20

Storage Maximums

	vSphere, View in 2010	vSphere, View, & VCD in 2011	vSphere, View, & VCD in 2012
Hosts per base image (for linked clones)	8	8	32