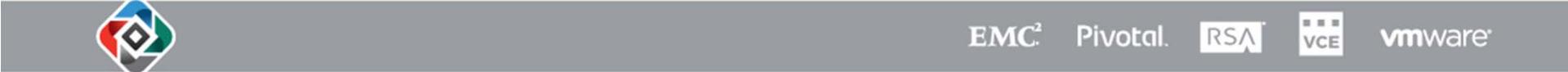




Enterprise Hybrid Cloud *Enabling* ~~Software~~ *Defined Data Center*

Travis Howerton

Mike Colson,
Senior vSpecialist – EMC Federal
Michael.Colson@EMC.com
@Mike_Colson





**I am software defined fear
my lack of business value!**



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Fundamental Challenges



Lower
Operational
Costs



Increase
Efficiency



Reduce
Risk



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Why Policy Defined Data Centers for ORNL

- Implement cloud first when possible
- IT should be self-service
- IT is all about supporting our research mission
- Security is baked into everything we do
- Provide full cost transparency and SLAs to our customers



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ORNL of Yesterday



Shadow IT

Aging Infrastructure



IT Silos



ORNL of Today

Where we started

- Storage on Demand and its benefits
- SaaS and PaaS
- Collaboration tools

Investments in 2015

- Secure DNS and IP Address Management
- Hyper-V Replacement
- Core Router Upgrade
- Federated IDM
- NOC/SOC
- IT Financial Transparency



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Where we are going next:

- VMware SuperCluster
- Self-Service Enterprise Cloud
- Converged Infrastructure
- CADES - self-service big data cloud for R&D
- NSX
- Office 365 - Exchange, Lync, and OneDrive in the cloud
- HCM in the Cloud



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Two Approaches to Workloads

Pets (2nd Platform approach)



- Servers are valuable
- Servers have unique names
- Tune and groom your servers
- Spend hours fixing broken servers
- Servers have long shelf-life

Livestock (3rd Platform Approach)



- Servers are disposable
- Servers are homogeneous
- Tune and groom your applications
- Shoot and replace your servers
- Servers have short shelf-life



What's the difference?

Pets (2nd Platform approach)



- Pets need care and feeding and scale up
- Need 100% uptime
- Will never go away

Livestock (3rd Platform Approach)



- Livestock grazes
- Redundancy in deployment
- Requires re-tooling

Bimodal IT = Marathon Runners + Sprinters Deeply Different, Both Essential

Mode 1		Mode 2
Reliability	Goal	Agility
Price for performance	Value	Revenue, brand, customer experience
Waterfall, V-model, high-ceremony IID	Approach	Agile, Kanban, low ceremony IID
Plan driven, approval based	Governance	Empirical, continuous, process based
Enterprise suppliers, long-term deals	Sourcing	Small, new vendors, short-term deals
Good at conventional process, projects	Talent	Good at new and uncertain projects
IT-centric, removed from customer	Culture	Business-centric, close to customer
Long (months)	Cycle times	Short (days, weeks)

Think
Marathon
Runner



Think
Sprinter



#GartnerSYM

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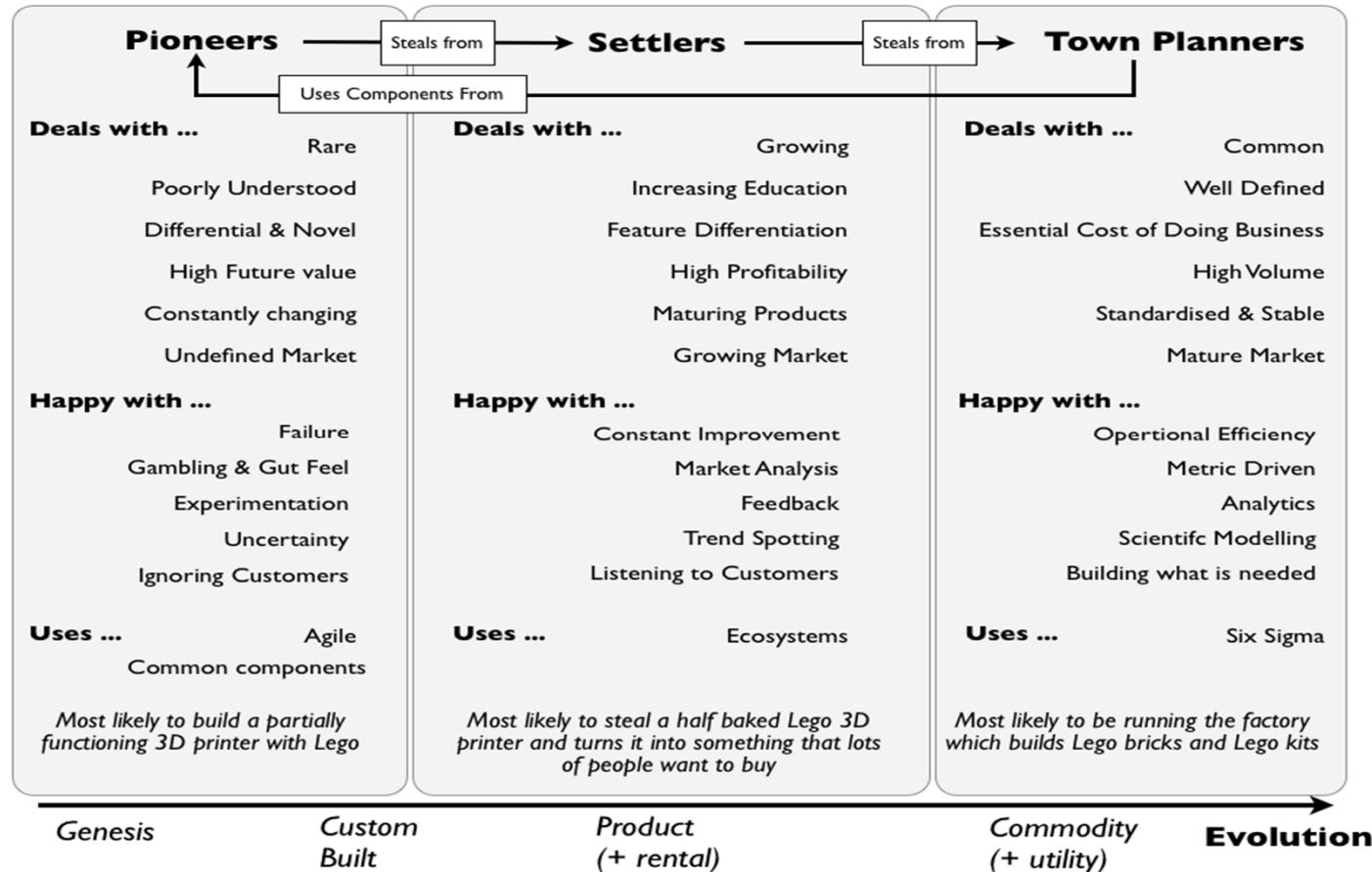
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This is about enablement and DevOps



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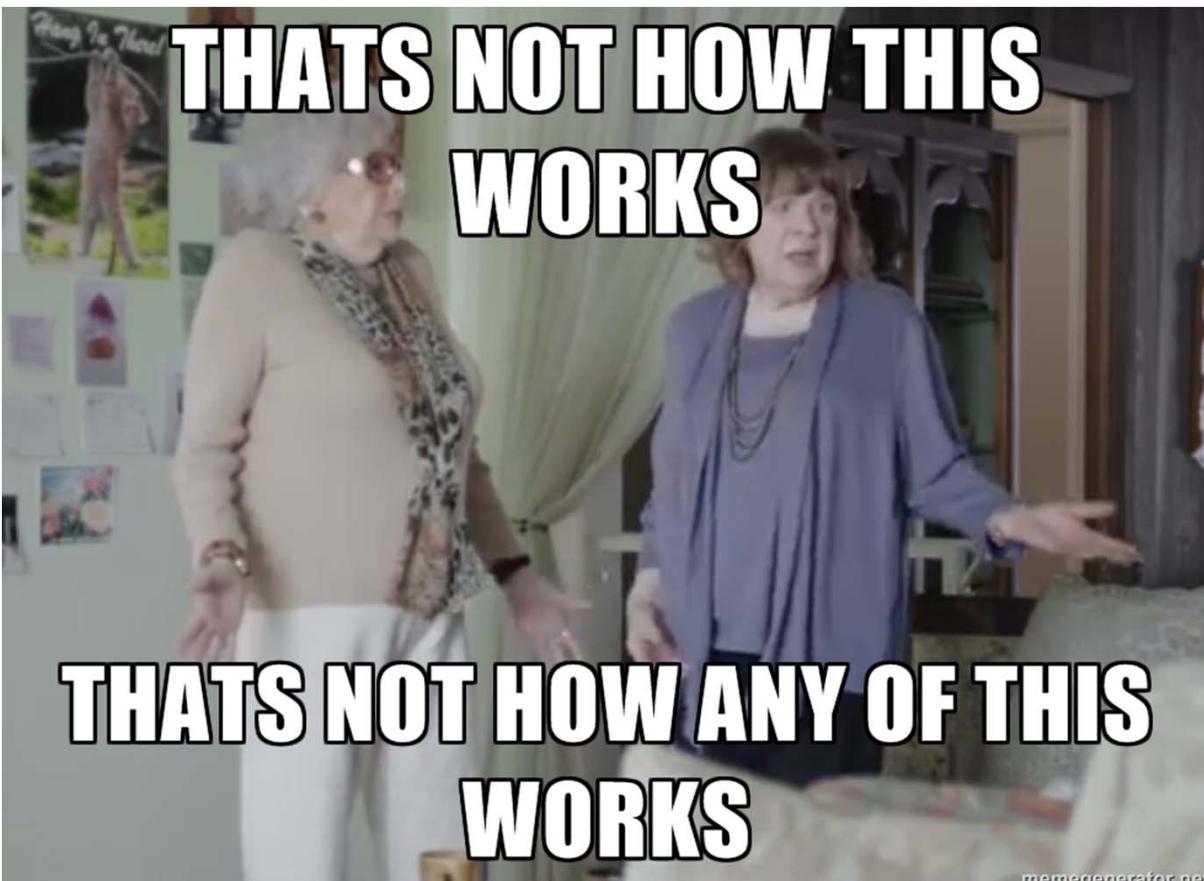
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**THATS NOT HOW THIS
WORKS**

**THATS NOT HOW ANY OF THIS
WORKS**

memegenerator.net



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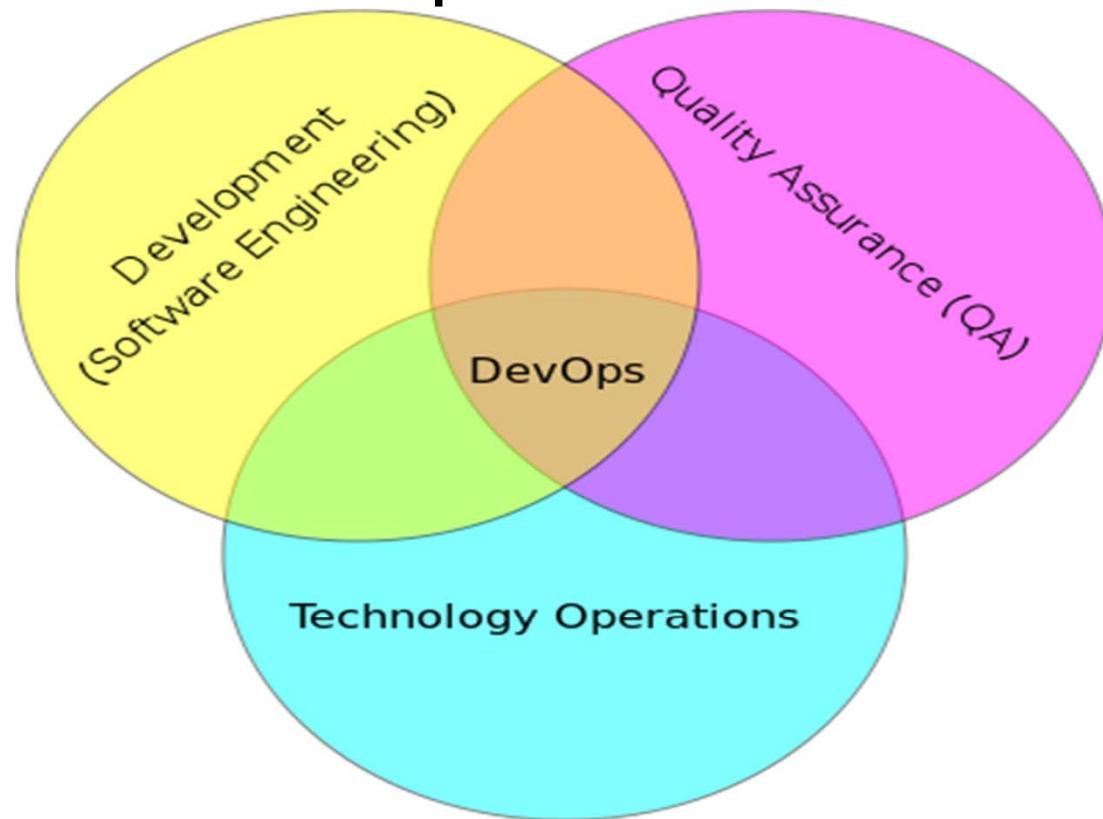
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What is DevOps



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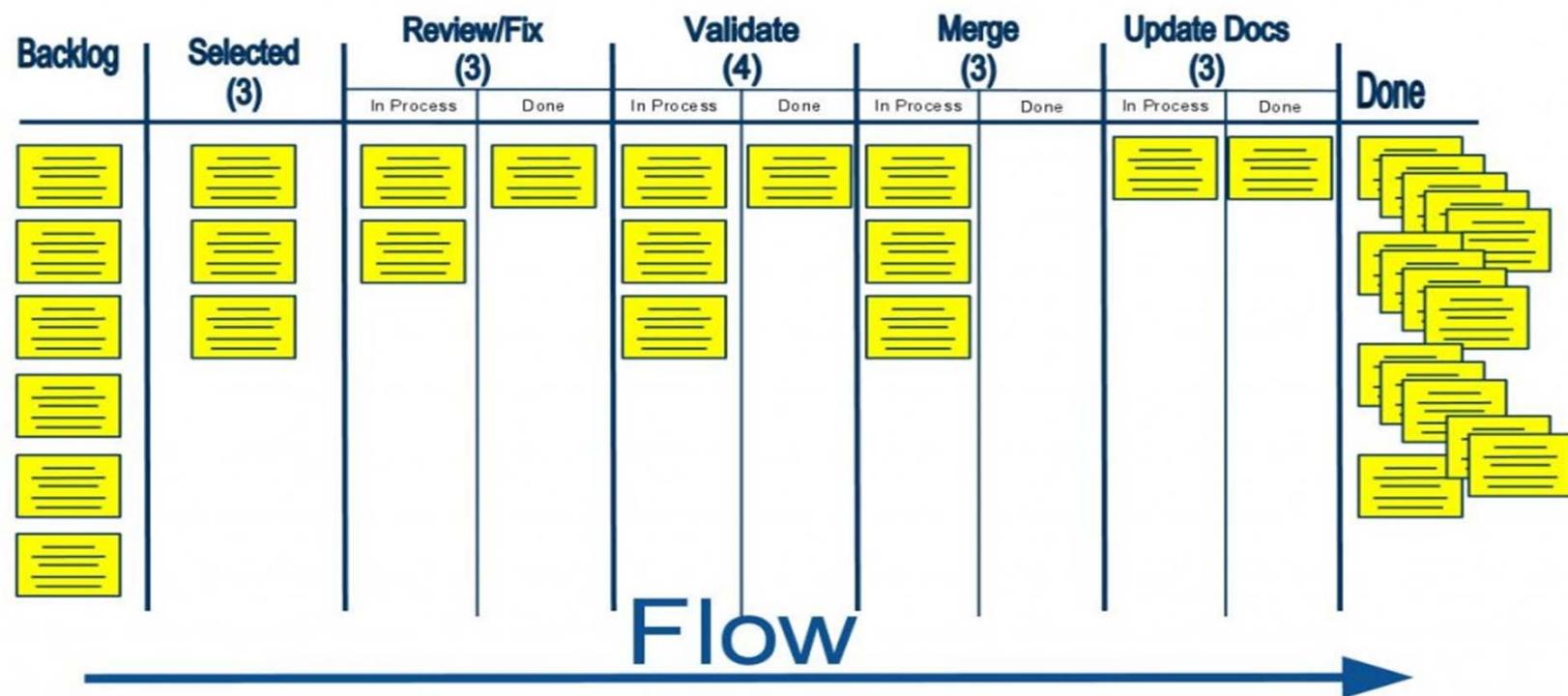
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Tracking Work in Progress (WIP)



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EMC² has Built a Differentiated Stack

Best Of Breed, Architected Horizontally... Unparalleled Choice



PLATFORM FOR CLOUD, BIG/FAST DATA APPS



SOFTWARE-DEFINED DATA CENTER



INFORMATION INFRASTRUCTURE

SECURITY



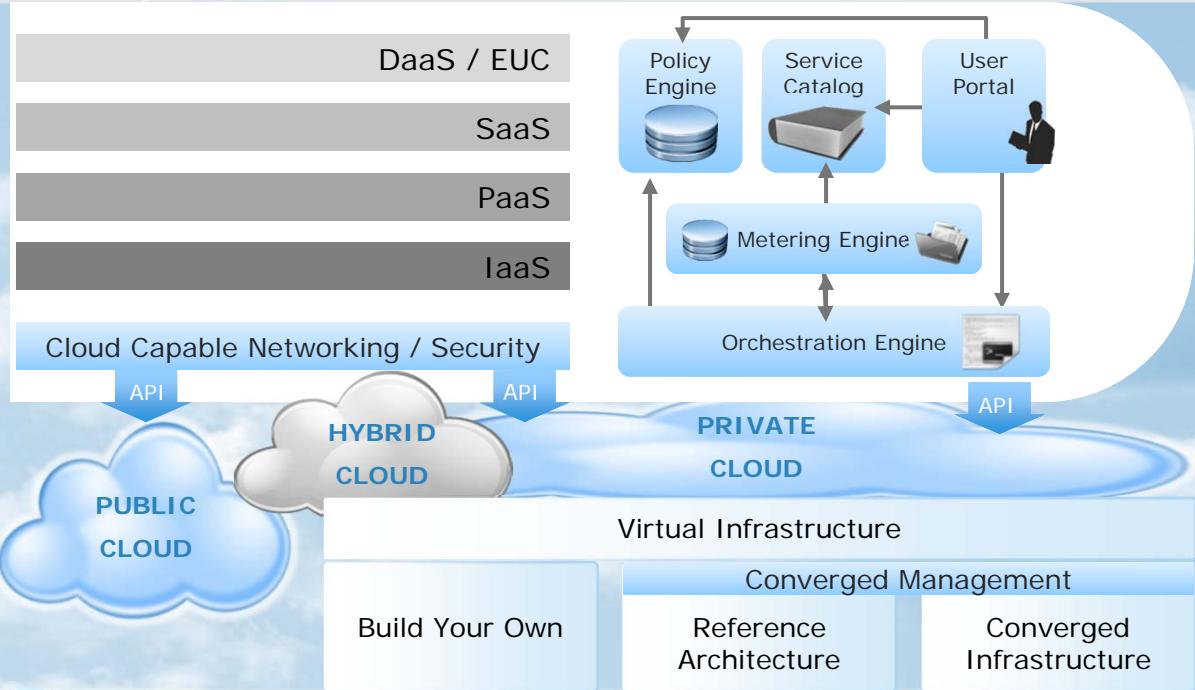
ADVANCED



Cloud Service Delivery – Generic Architecture

Professional Services

Security



Management and Operations

Availability Management

Performance Management

Service Level Management

Capacity Planning

Configuration Compliance

Chargeback Reporting

Data Protection & Availability

Enterprise Reporting



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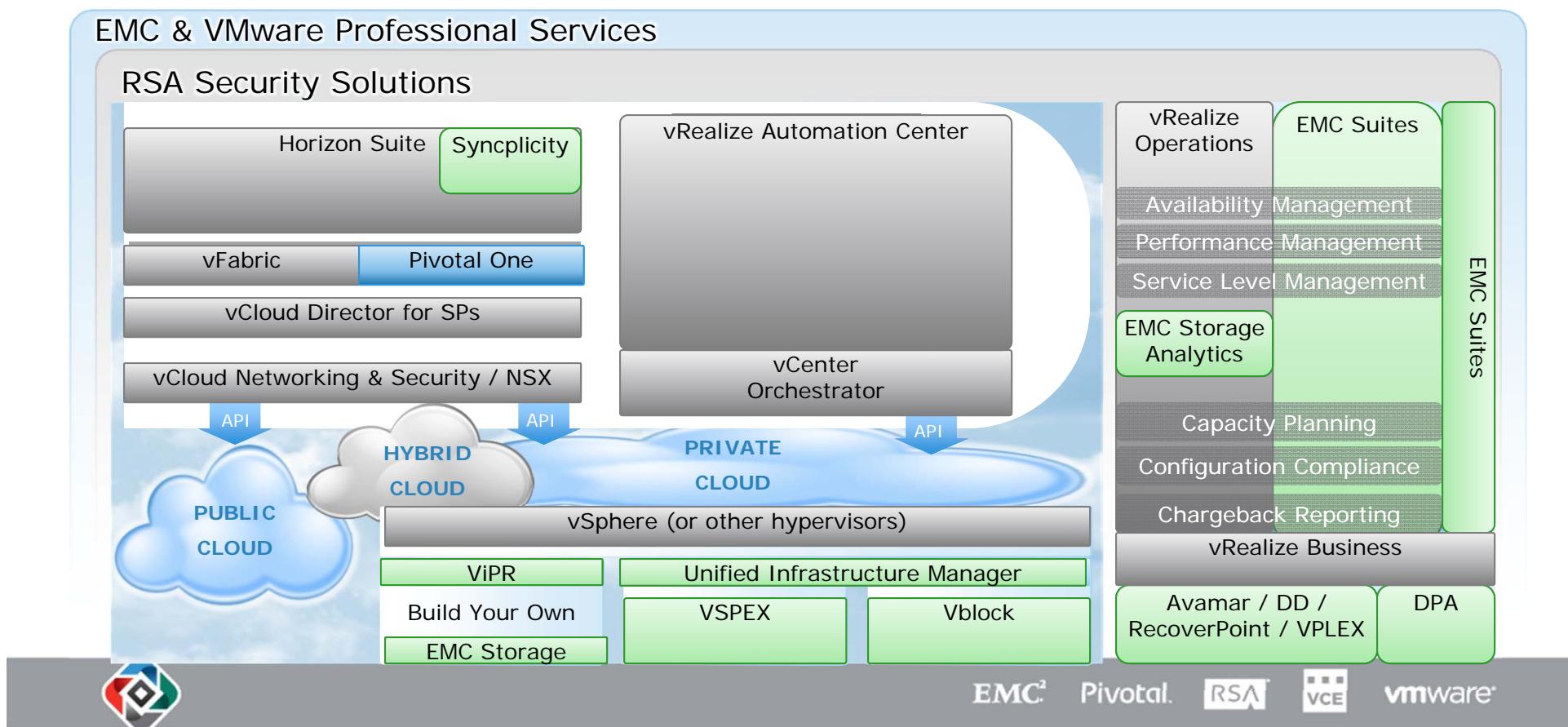
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Cloud Service Delivery – EMC/VMware



CooP & Application Mobility

Business Value

- Make Self-Provisioned Apps "Always-On"
- Enable Mobility Of Apps/VMs Over Distance
- Increase Operational Savings

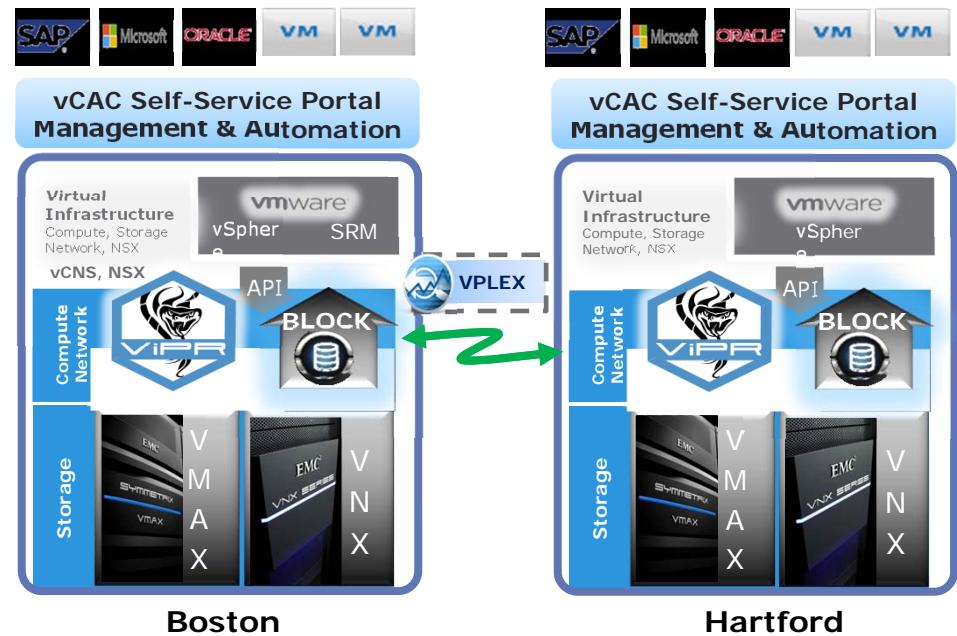
Technical Value

- Cloud Admin offers continuous availability as an option or embedded in Blueprints
- End-user can select their own availability

Solution Elements

- VMware vCAC, VCO, EMC VPLEX

Always On Protection



Unified Service Catalog: Infrastructure , Apps and XaaS

The screenshot shows a service catalog interface with the following features highlighted:

- Portal branding per tenant**: A callout pointing to the top left corner where "Your logo" is displayed.
- Service category**: A callout pointing to the sidebar categories: All Services, HRaaS, IaaS, and PaaS.
- Extensible to new services**: A callout pointing to the bottom left corner.
- Custom Service**: A callout pointing to a service item labeled "Create a user with a ...".
- App store experience**: A callout pointing to the right side of the interface.
- Entitlements and Approvals for each item**: A callout pointing to the bottom right corner.

The main content area displays a grid of service items:

All Services - 10 items			
Apache Tomcat Server Apache Tomcat Server	Large Linux Large Linux for development	Large Red Hat Enterprise Linux... Red Hat Enterprise Linux 6 (64 bit)	Micro Windows 2K8 Micro Windows 2K8
Request	Request	Request	Request
Windows Server 2008 R2 Standard	Red Hat Enterprise Linux 6 (64 bit)	Small Windows Small windows machine - no hardening	Create an organizational unit... Creates an organizational unit in an existing organizational unit.
Request	Request	Request	Request
Tiny Linux tiny linux for development - no hardening	Windows Server 2008 R2 Standard	Create a user with a ... Creates a user in an organizational unit and sets a password for the user. This ...	Request
Request	Request	Request	Request



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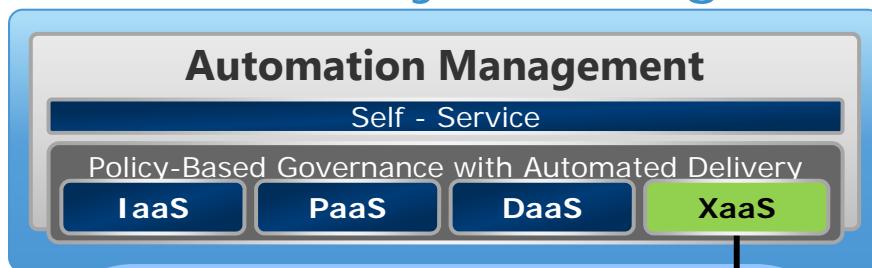
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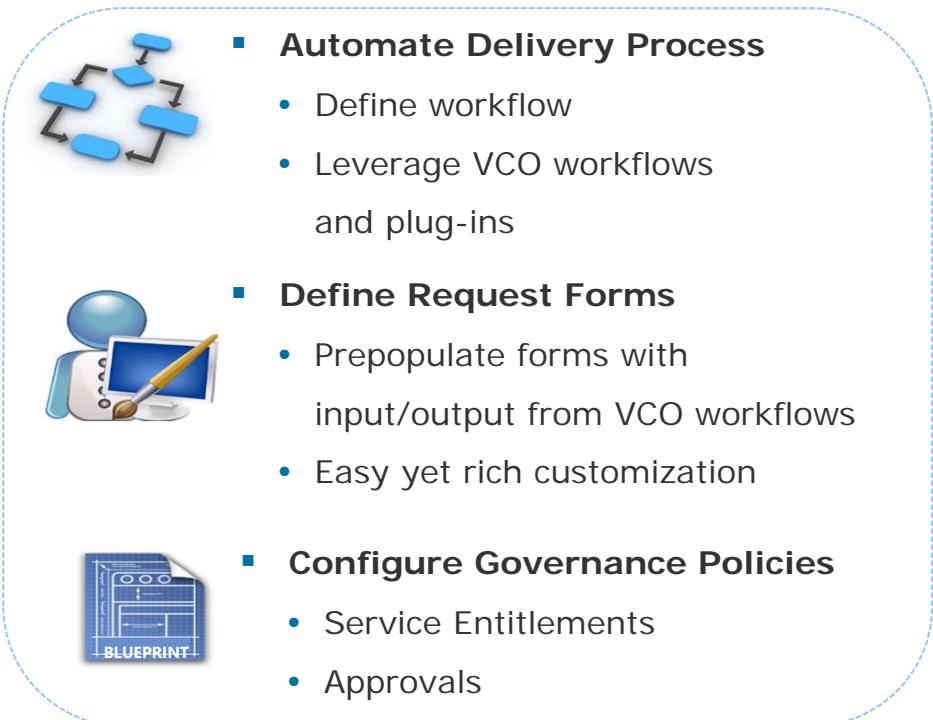
Extensibility: Adding New IT Services (XaaS)



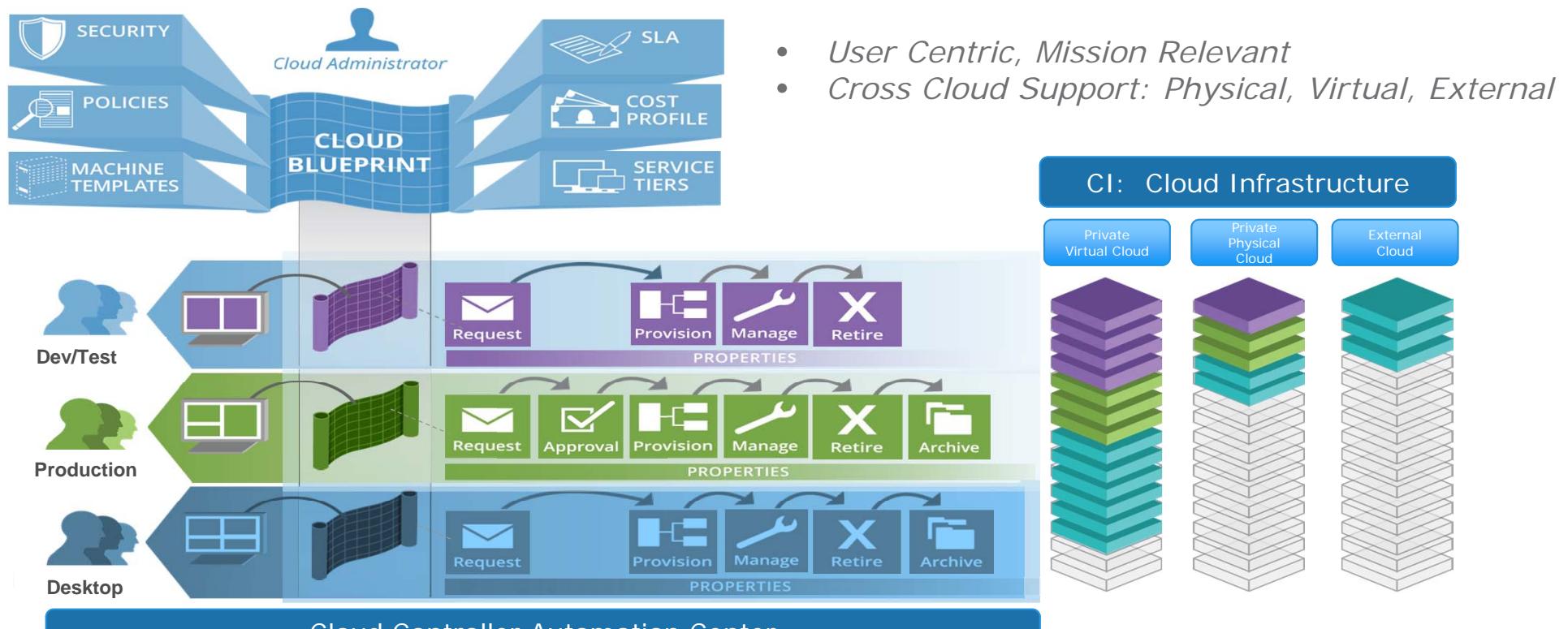
Example Use Cases

- New Employee On-boarding
- Email/Mail Box Setup
- Storage as a Service
- Network services
- Backup/recovery
- Security/Compliance
- AD Management tasks
- Software Install/Update
- Password Management

"Wizard Driven Service Designer"



Policies to Enforce Mission Relevant Clouds



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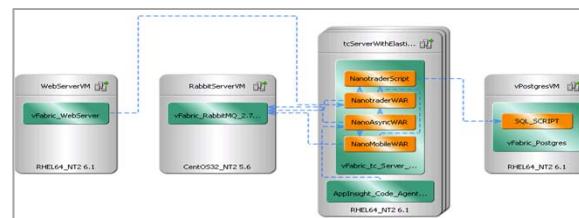
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Rapidly Application Delivery

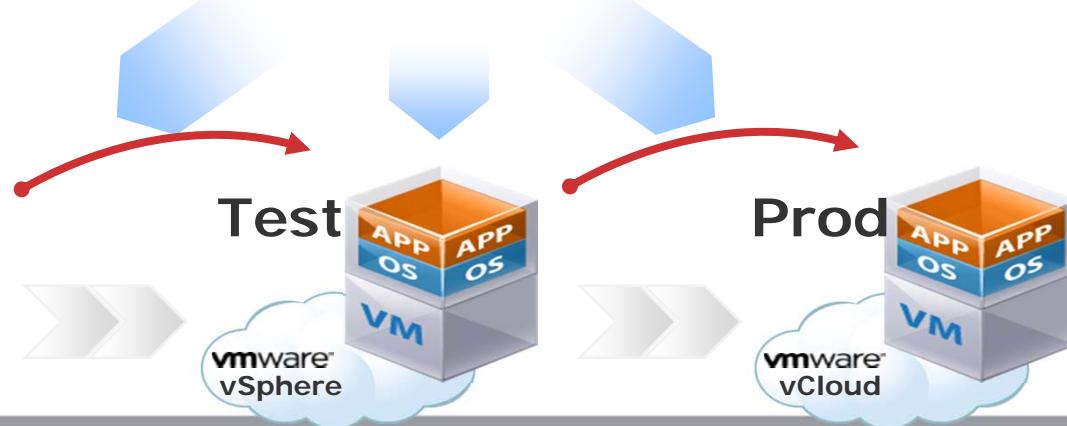
- Instantaneous provisioning of consistent environments across clouds
- Swift promotion of consistent changes across environments
- Automate the Application Release Process

Re-use application blueprints to ensure consistency



Re-use update profiles to ensure consistency*

CHANGE

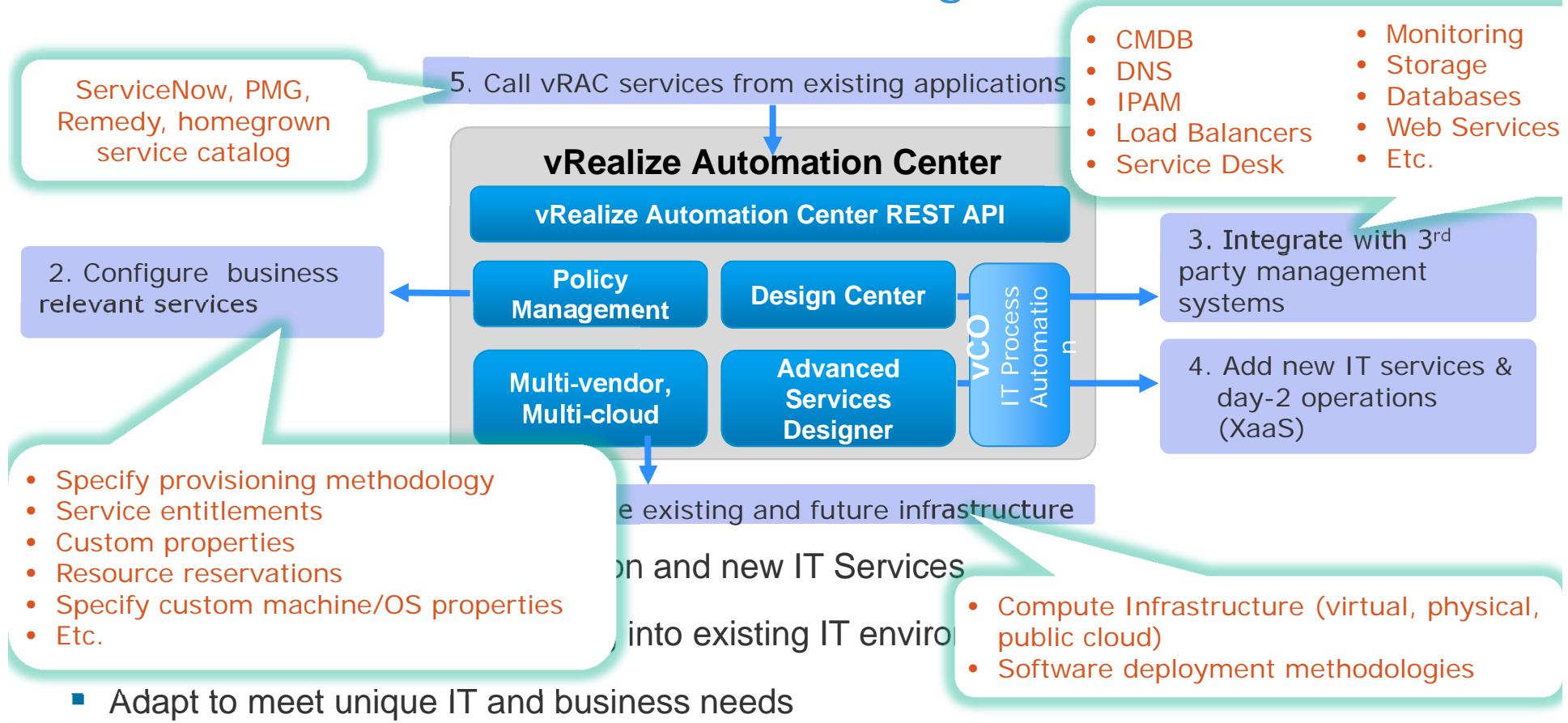


*New capability scheduled for Q4/13

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vRealize Automation Center – Designed to be Extensible



Today – Customers are using Excel!

Creating Manual Rate Cards

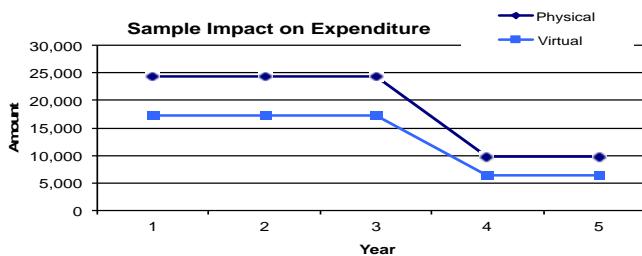
Cost Analysis Charts



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$E - > ? - 10' @ @$	I;	HE;	HEE;	$= ; P ;$	=HCHHREE
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[Back to Cost Calculator](#)



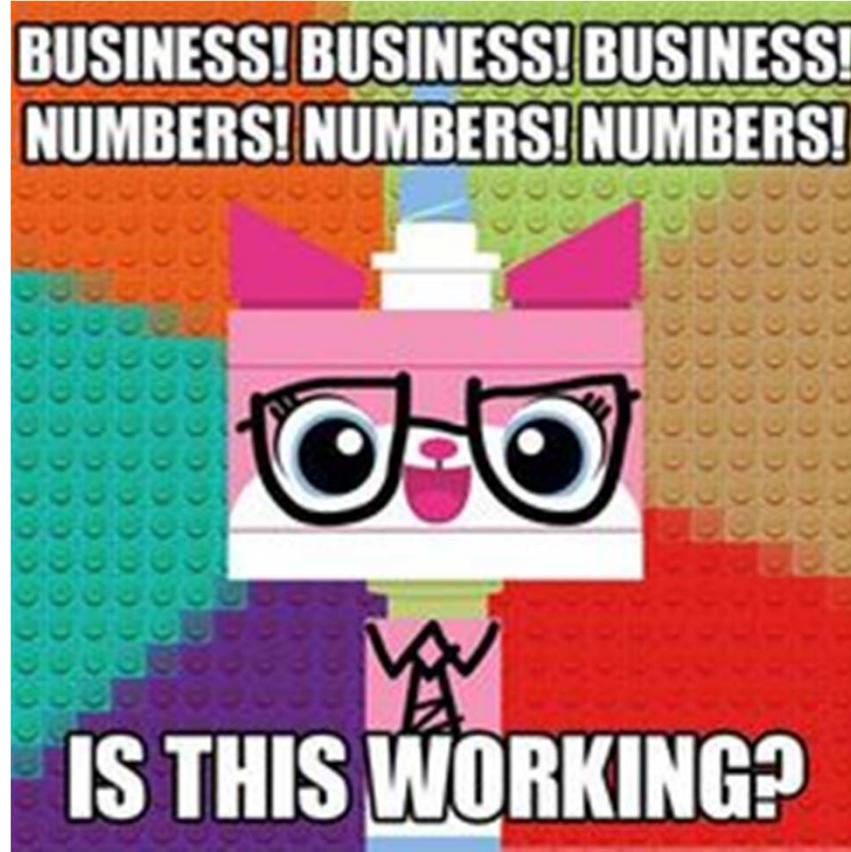
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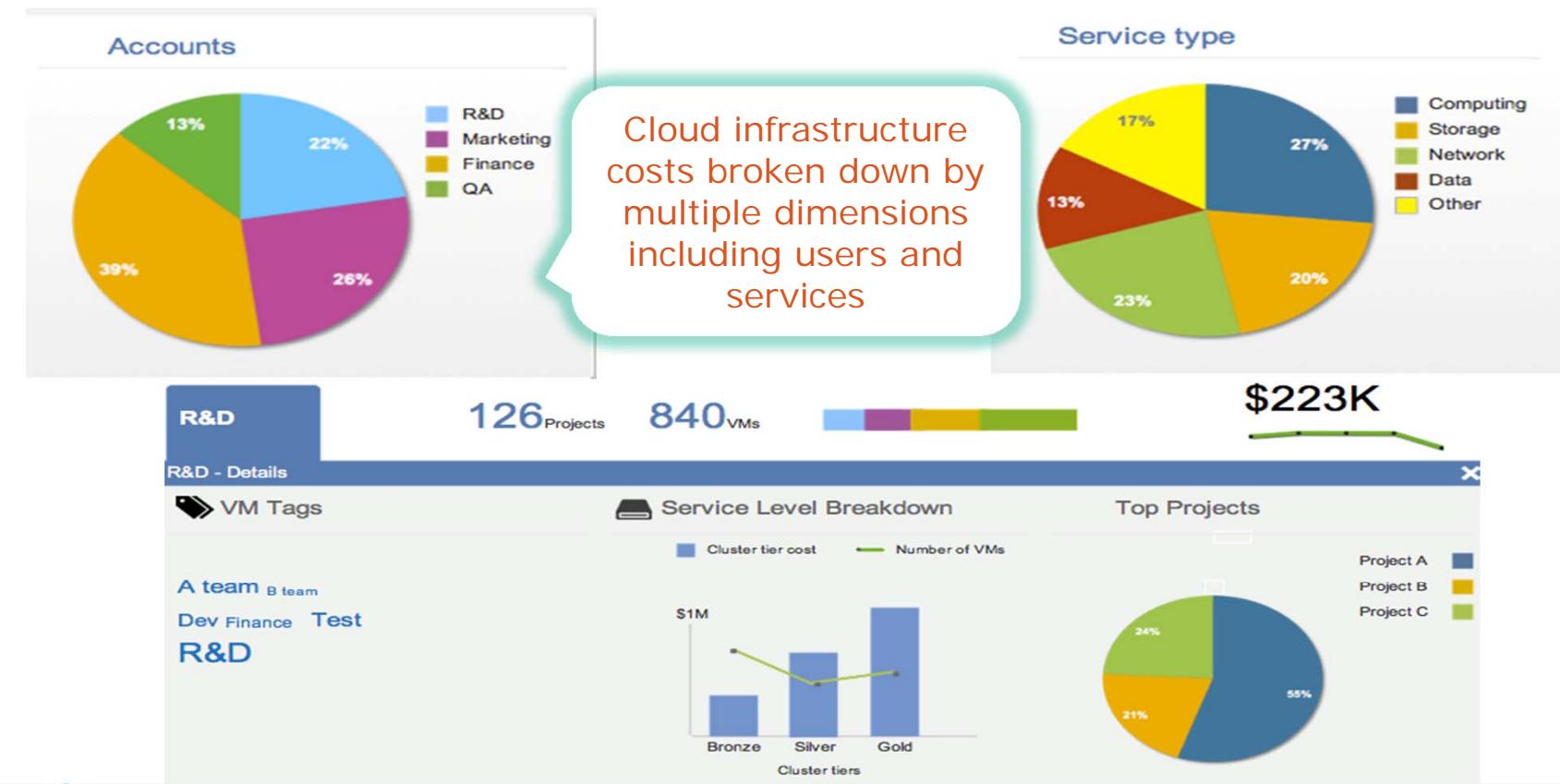
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Cloud Costs by Multiple Dimensions



Cloud Comparisons

Create VM groups to plan private cloud costs and compare it with public cloud pricing*			
	Private Cloud	amazon web services™	Windows Azure
 Small VM  	\$418 per month \$14 1 X Gold 1 NAS: 0.0 GB , SAN: 0.0 GB	 amazon web services™ \$985 per month \$172 1 X m1.medium NAS: 0.0 GB , SAN: 0.0 GB	 Windows Azure \$657 per month \$102 1 X A1 NAS: 0.0 GB , SAN: 0.0 GB
 Medium VM  	 \$28 1 X Gold 1 NAS: 0.0 GB , SAN: 0.0 GB	 \$308 1 X m1.large NAS: 0.0 GB , SAN: 0.0 GB	 \$169 1 X A2 NAS: 0.0 GB , SAN: 0.0 GB
 Large VM  	 \$55 1 X Gold 1 NAS: 0.0 GB , SAN: 0.0 GB	 \$418 1 X m2.xlarge NAS: 0.0 GB , SAN: 0.0 GB	 \$303 1 X A3 NAS: 0.0 GB , SAN: 0.0 GB
 Multiple projects  	 \$321 1 X Gold 1 NAS: 28.78 GB , SAN: 0.0 GB	 \$87 1 X m3.xlarge NAS: 28.78 GB , SAN: 0.0 GB	 \$83 1 X A4 NAS: 28.78 GB , SAN: 0.0 GB

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Compare Costs across Clouds

Compare Private Cloud costs to Public Cloud for "like" offerings

Detailed cost breakdowns support deeper level comparisons between alternatives

VM Cost details	
Cost for 1 VMs and Storage:	\$204
Cost of a single VM:	\$154
CPU cost: \$170.52/GHz X 1 GHz X 2 Cores X 15% usage =	\$51
Memory cost: \$4.41/GB X 1.93 GB X 70% usage =	\$6
Direct VM cost:	\$100
External Network deduction:	-\$3
Cost Drivers:	
Server hardware cost:	\$64
OS Licensing cost:	\$0
Maintenance cost:	\$16
Labor cost:	\$53
Internal Network cost:	\$7
Facilities cost:	\$14
Other cost:	\$0
Group storage cost details	
SAN storage cost:	\$0
NAS storage cost:	\$50

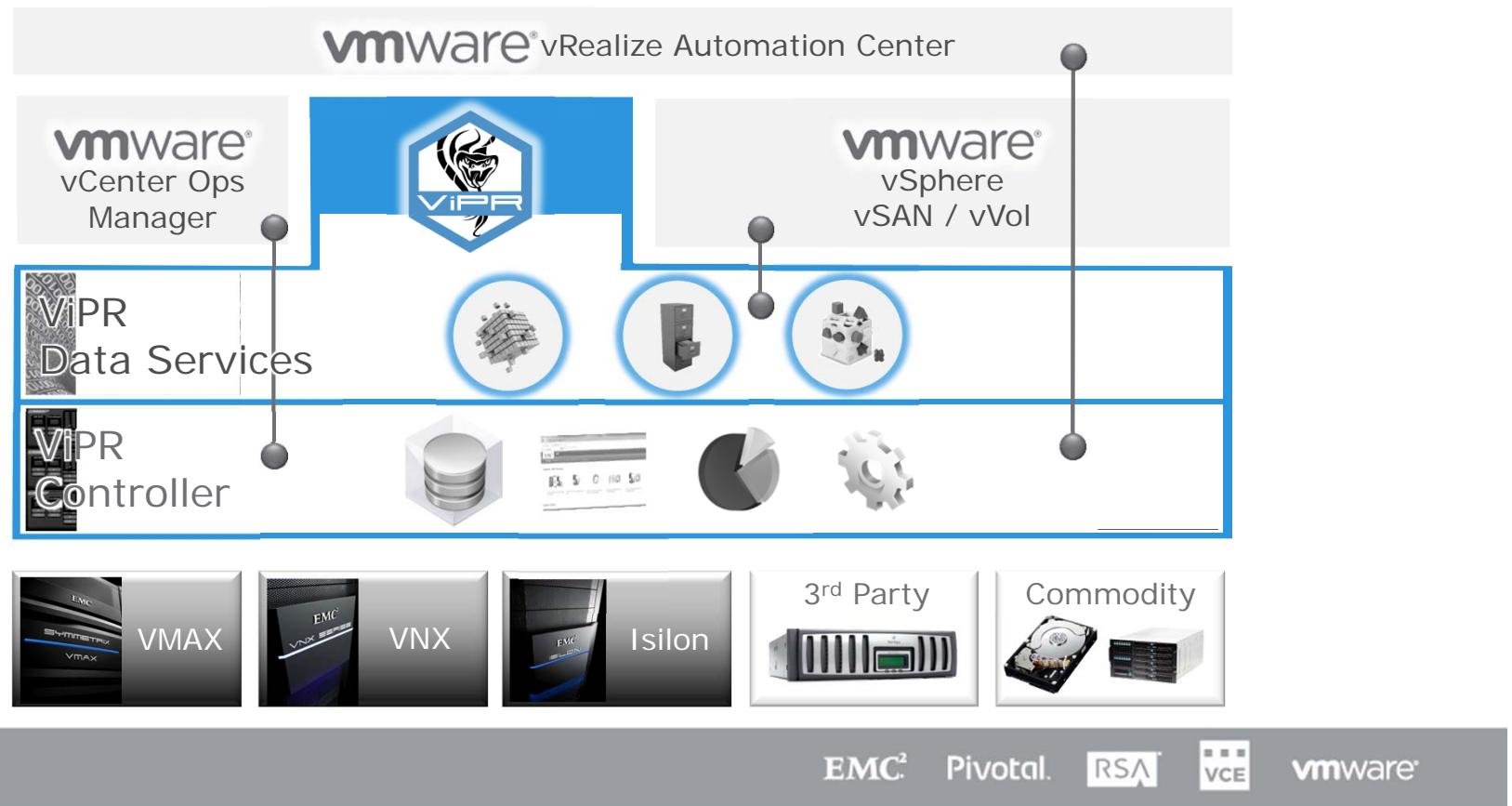


Software Defined Storage w/ EMC ViPR Controller

Completely Separate from the Data Plane



Integrated with VMWare & SDDC



Works With OpenStack & Microsoft



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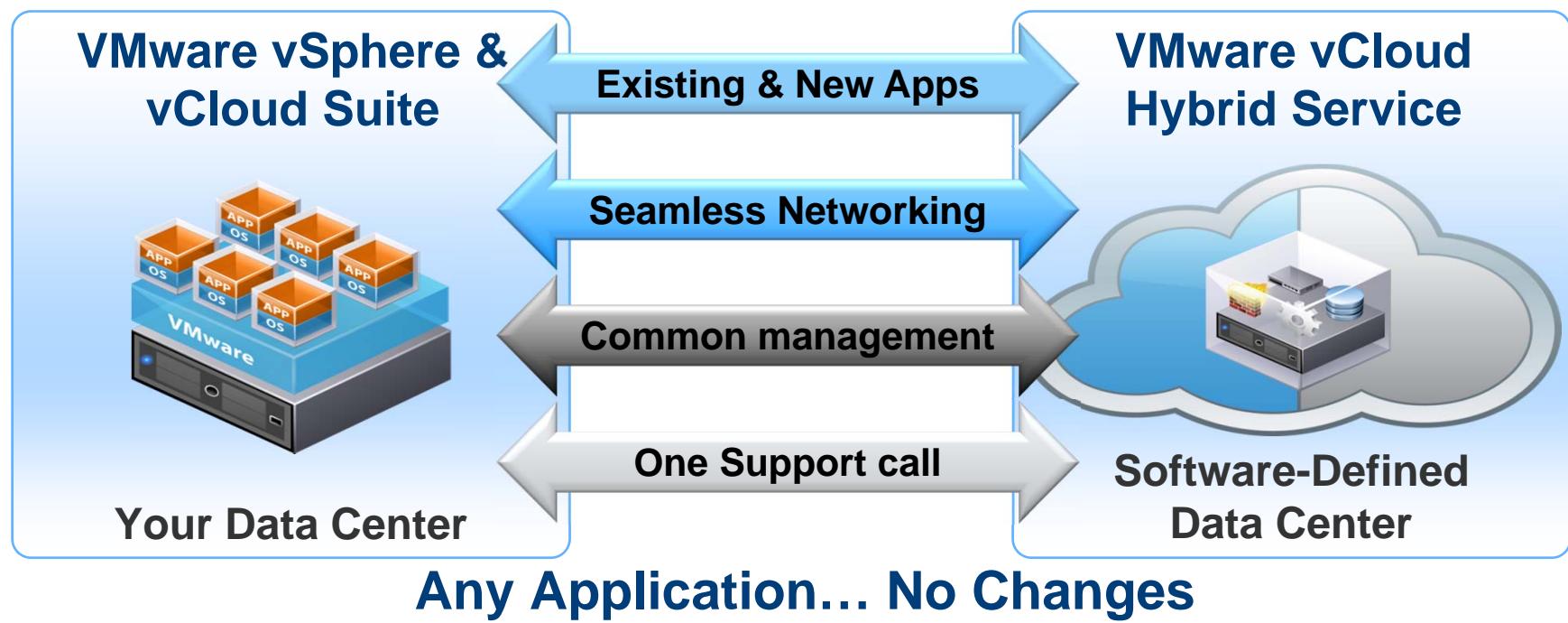
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vCloud Hybrid Service: Extending To The Cloud



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vRealize Automation Center with vCHS

The screenshot shows the vCloud Automation Center Service Catalog interface. On the left, there's a sidebar with categories: All Services, Applications, Infrastructure, and Workspace. The main area is titled "Applications - 27 items". It lists several services, each with a "Request" button. Two specific services are highlighted: "Project Vulcan" (vSphere) and "Project Vulcan" (vCloud Hybrid Service). A blue box surrounds the first "Project Vulcan" entry, and a red box surrounds the second. Below the catalog, two boxes are overlaid: a blue box labeled "Service in vSphere in datacenter" pointing to the blue-outlined service, and a red box labeled "Service in vCHS" pointing to the red-outlined service.

Service Catalog
Browse the catalog for services you need to be productive.

All Services

Applications

Infrastructure

Workspace

Applications - 27 items

SugarCRM Server KVM Customer relationship management software Request

SugarCRM Server KVM Customer relationship management software Request

SugarCRM Server vSphere Customer relationship management software Request

Project Vulcan vSphere Civil engineering collaboration application - "IT-Managed" Request

Project Vulcan vCloud Hybrid Service Civil engineering collaboration application - "IT-Managed" Request

Project Vulcan Amazon EC2 Civil engineering collaboration application Request

Oracle SOA Suite Server KVM Build, deploy and manage Service-Oriented Architectures Request

IBM DB2 10.1 Server KVM Relational Model Database (Linux) Request

MediaWiki Server Amazon EC2 Feature Rich Request

Build 6.0-1259676 | Privacy Policy | Contact Us

Service in vSphere in datacenter

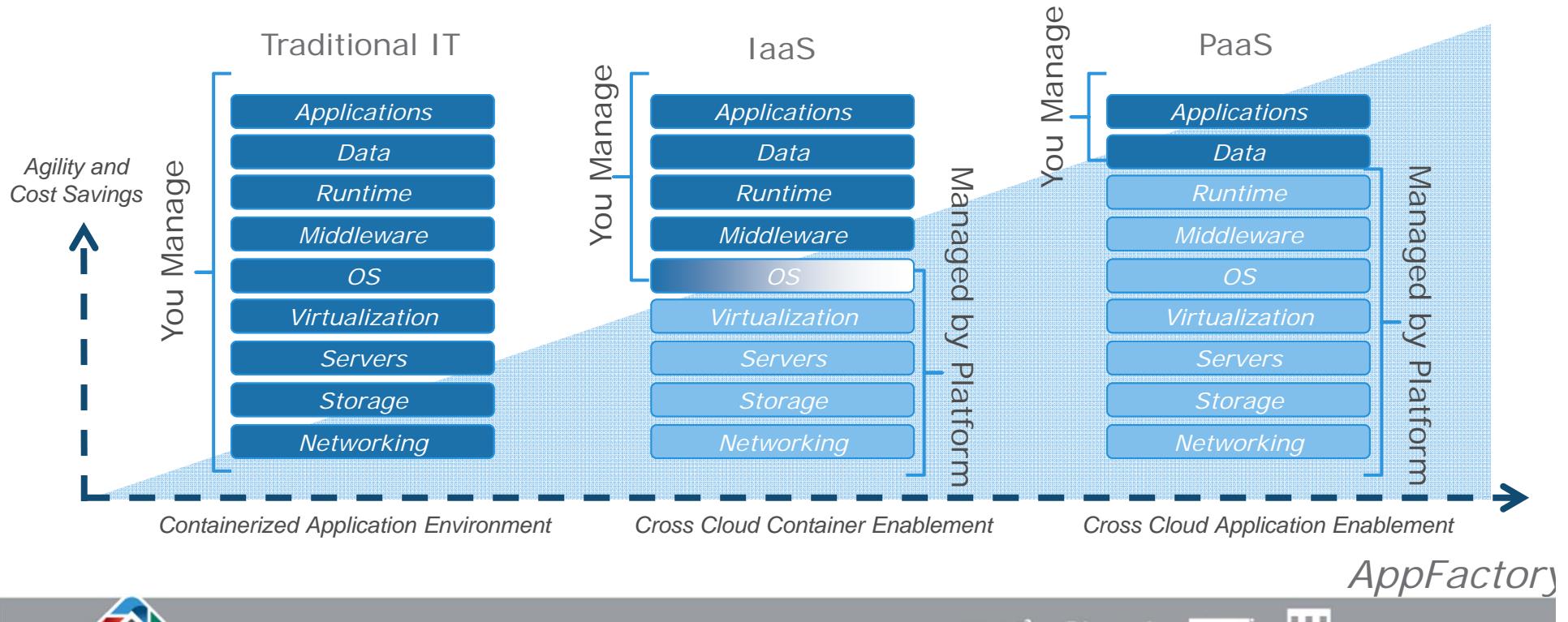
Service in vCHS

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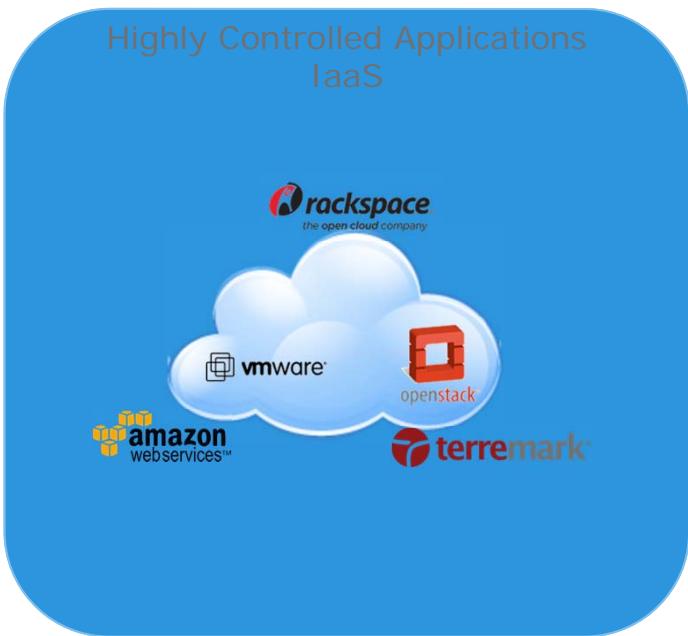
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The Power and Promise of PaaS

Application Modernization Initiative on the Road to PaaS



Custom Applications Destinations



Complete control of the OS, No. of VMs,
VM Size



Platform manages configuration, machines and
VMs.

With EHC



Build Your Own



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