

RED HAT  
**SUMMIT**

**LEARN. NETWORK.  
EXPERIENCE OPEN SOURCE.**

June 11-14, 2013  
Boston, MA



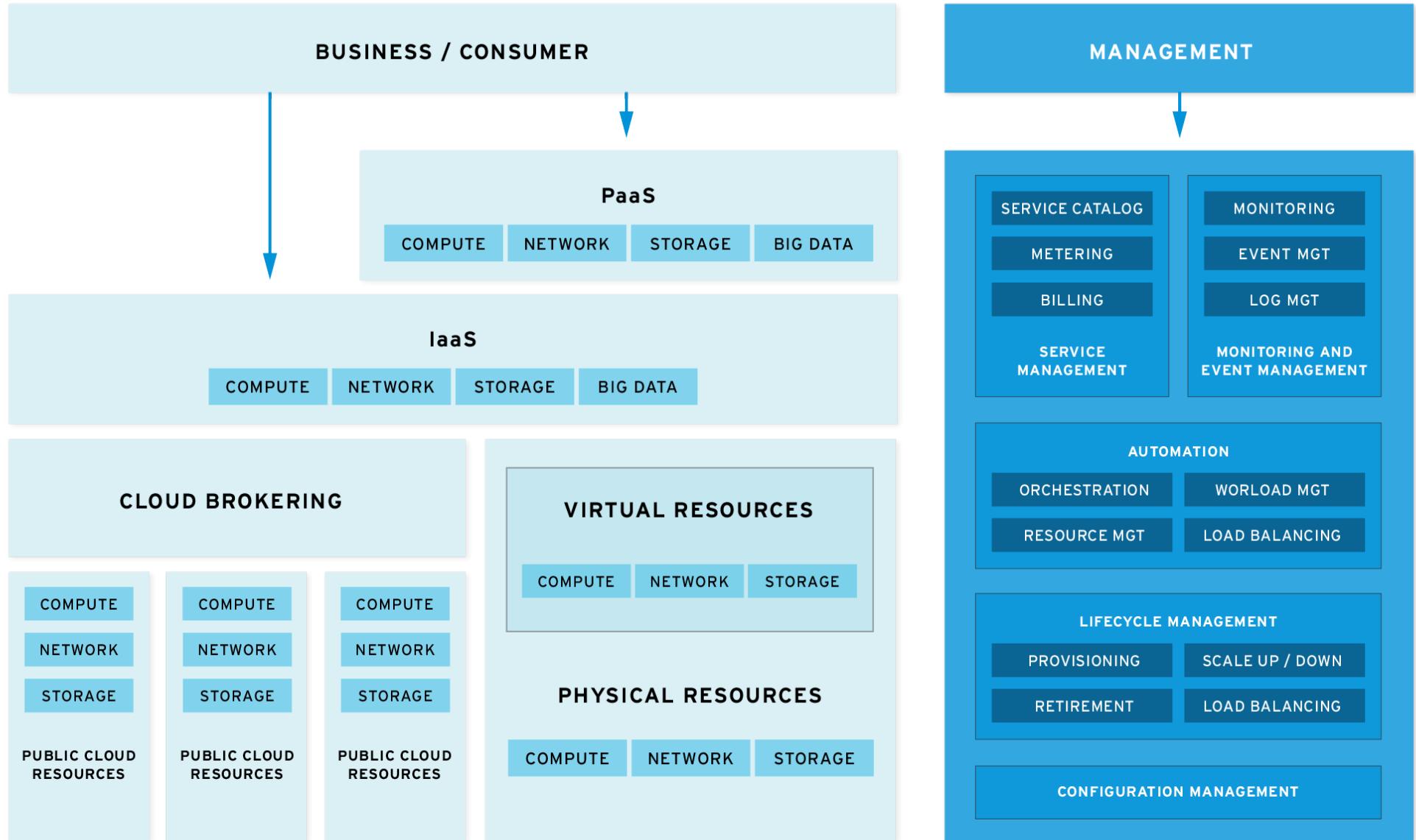
# Choose Your Own Path to the Cloud with Red Hat

Gordon Haff  
Greg Kleiman  
James Labocki

06.12.13



# NEXT GENERATION I.T. INFRASTRUCTURES

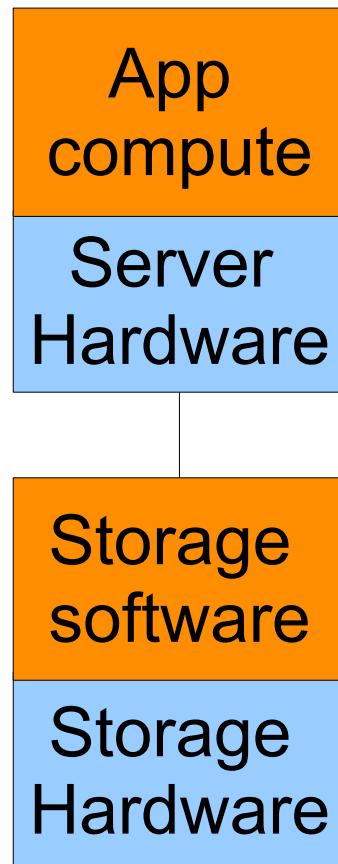


# Agenda

- Convergence of compute & storage into a single entity
- Big data as a specific convergence use case
- Building and managing a unified self-service resource pool for IaaS and PaaS
  - For the developer
  - For operations

# Traditional approach to compute & storage has limitations in a cloud infrastructure

Connected through a wire (SAN, IP)

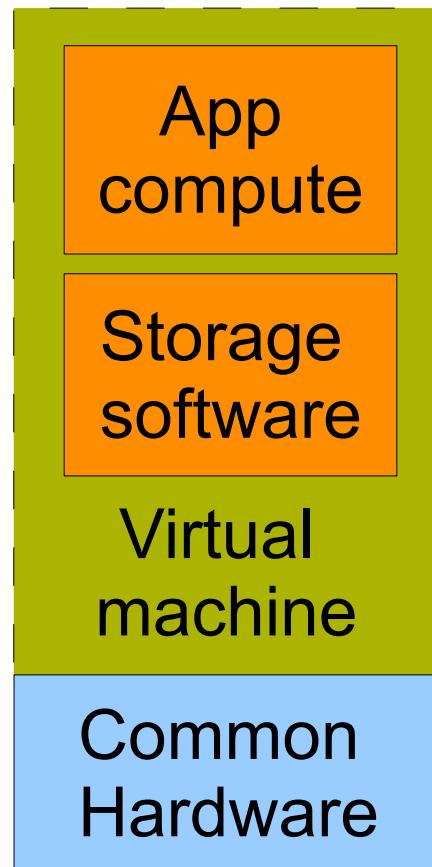


Cloud infrastructure needs:

- Deploy compute and storage as a single virtual entity
- Scale out, share nothing storage
- Storage supports all protocols (file, block, object)

# Cloud infrastructure best served by open software-defined storage

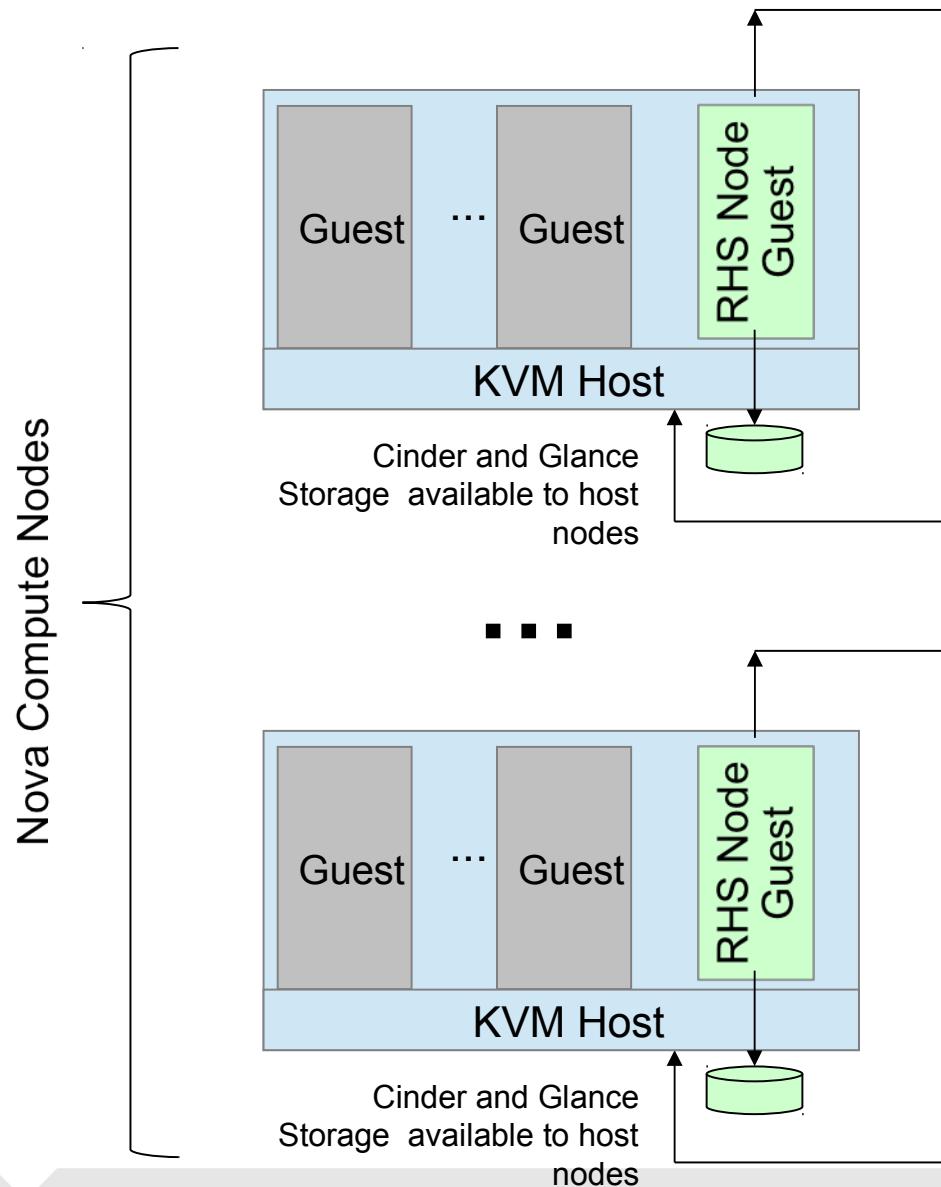
Compute  
and  
Storage  
converged  
onto a  
single  
server



Software-defined storage benefits:

- Easier to scale out, deploy and manage
- Higher performance without network latency
- Lower operating costs with less hardware

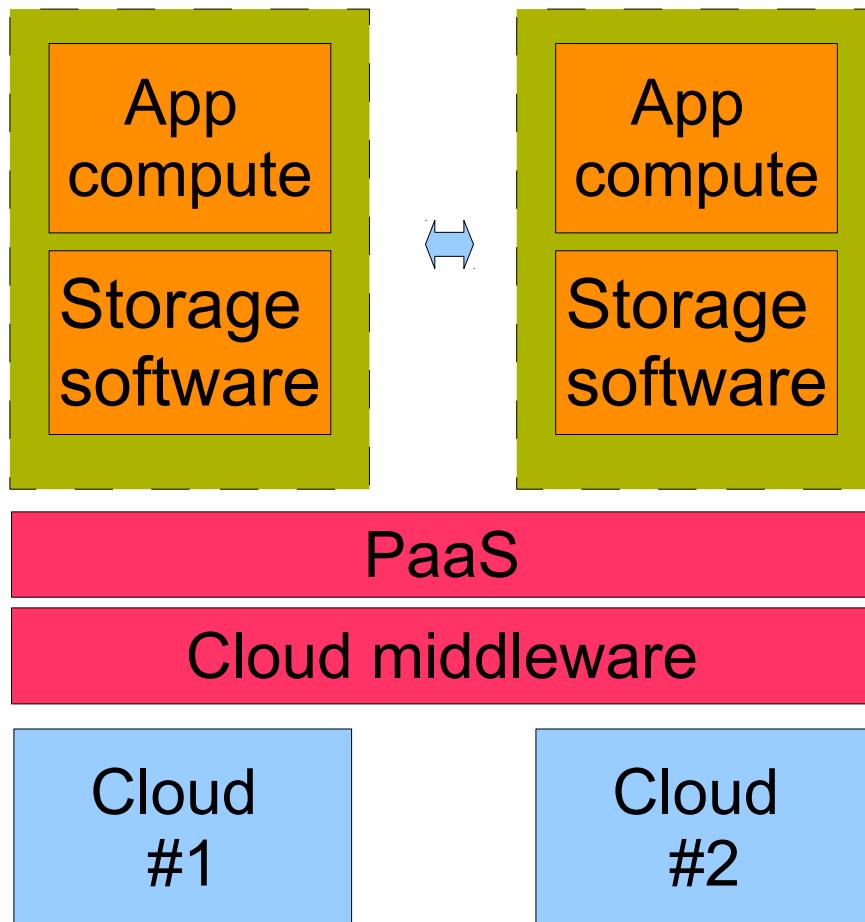
# Software-defined storage in OpenStack



Nova compute nodes  
ARE the storage pool

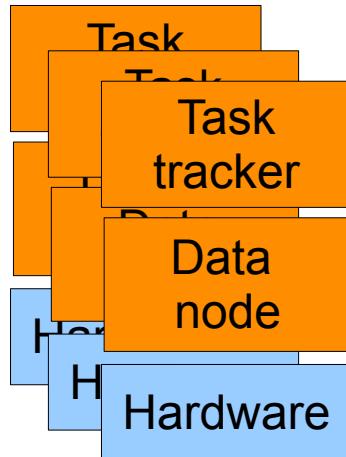
- Red Hat Storage runs as guest consuming 2-4 cores
- Utilizes local DAS storage, shared with Nova instance storage
- Provides storage services for Cinder, Glance and Swift

# Hybrid clouds require even more of storage

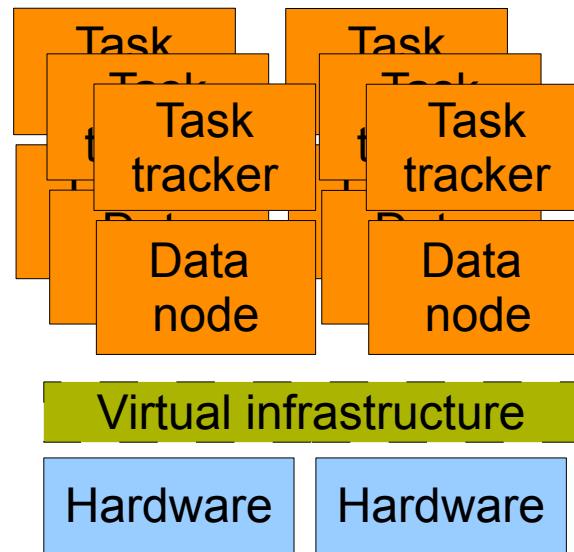


- Geographically distributed, common global file system
- High performance, eventually consistent replication
- Runs in all types of clouds
- Interoperates with open cloud middleware & PaaS

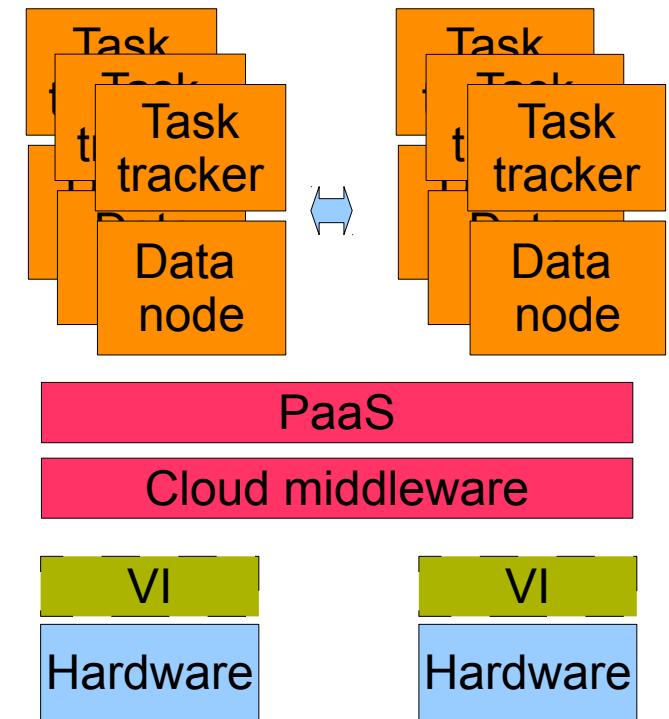
# Big data evolution to open hybrid cloud



Traditional approach

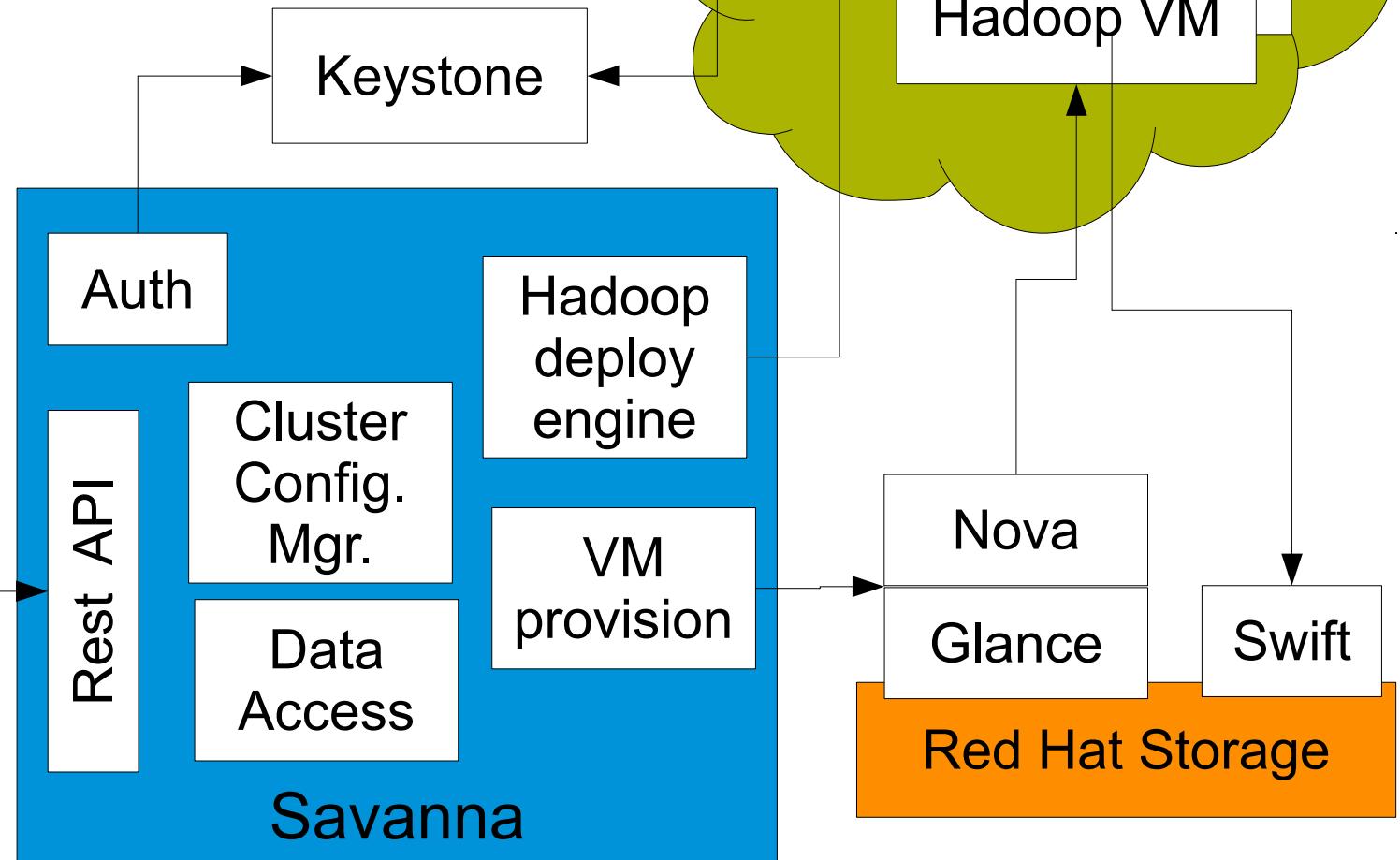
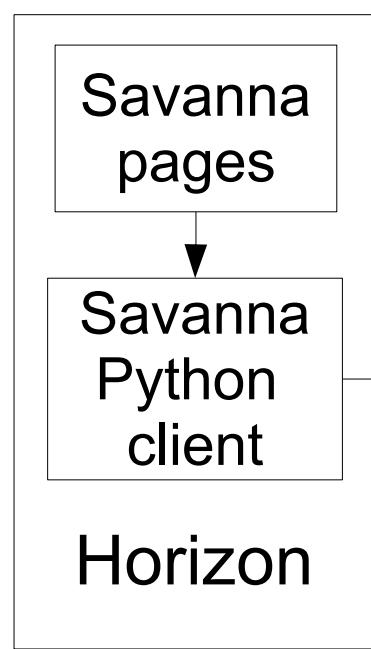


Software defined  
Hadoop compatible storage  
enables elastic Hadoop  
on Savanna

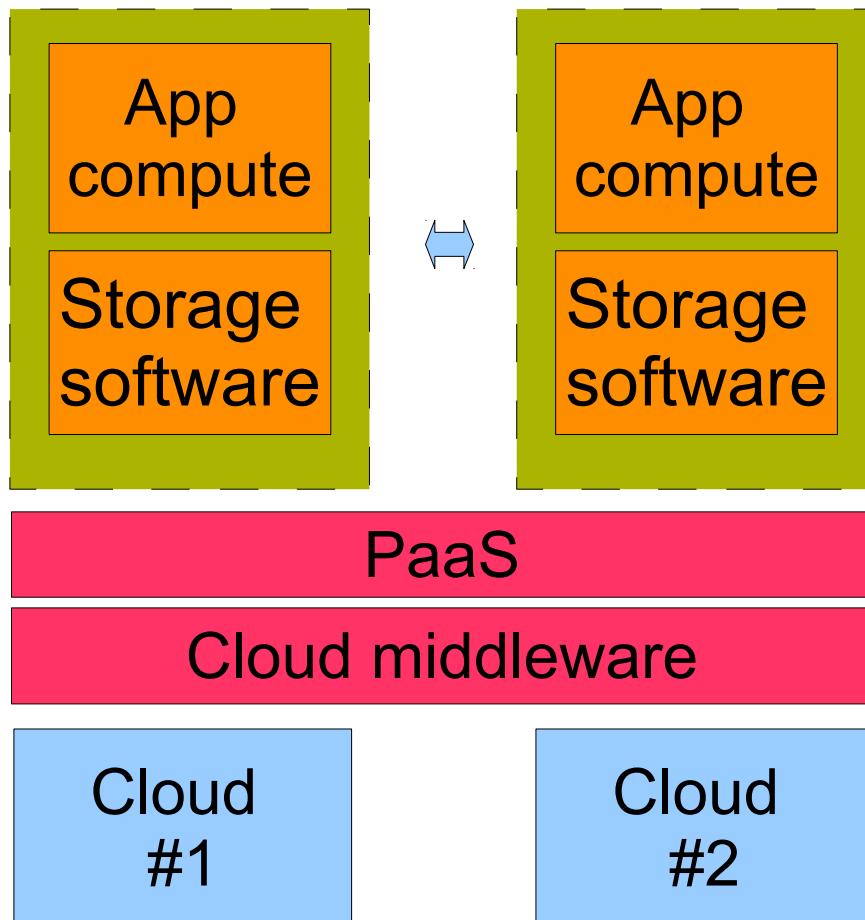


Hybrid cloud enables  
portability & bursting  
between different clouds  
with Heat

# Savanna architecture



# Open hybrid cloud best served by open software-defined storage



Open software-defined storage benefits:

- Leverage public cloud efficiency when desired
- Seamless workload movement between clouds
- Open source community innovation and flexibility

# **Integrating IaaS and PaaS: Cloud addresses many different use cases**

# Developers



Nelson Pavlosky/flickr under CC  
<http://www.flickr.com/photos/skyfaller/113796919/>

Self-Service Portals  
Service Catalogs  
Automated Provisioning  
Role-based Delegation

# Operations



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Resource Management

Configuration Management

Capacity & Utilization

Dashboards & Timelines

Change & Drift Tracking

# Management



Financial Management

Governance & Compliance

Forecasting & Planning

Health & Availability

Chargeback

Victor1558/flickr under CC  
<http://www.flickr.com/photos/76029035@N02/6829465065/>

# Unifying IaaS and PaaS to the benefit of developers *and* operations



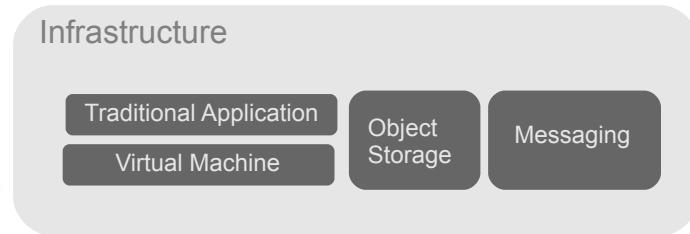
PaaS



No Awareness  
No Relationship

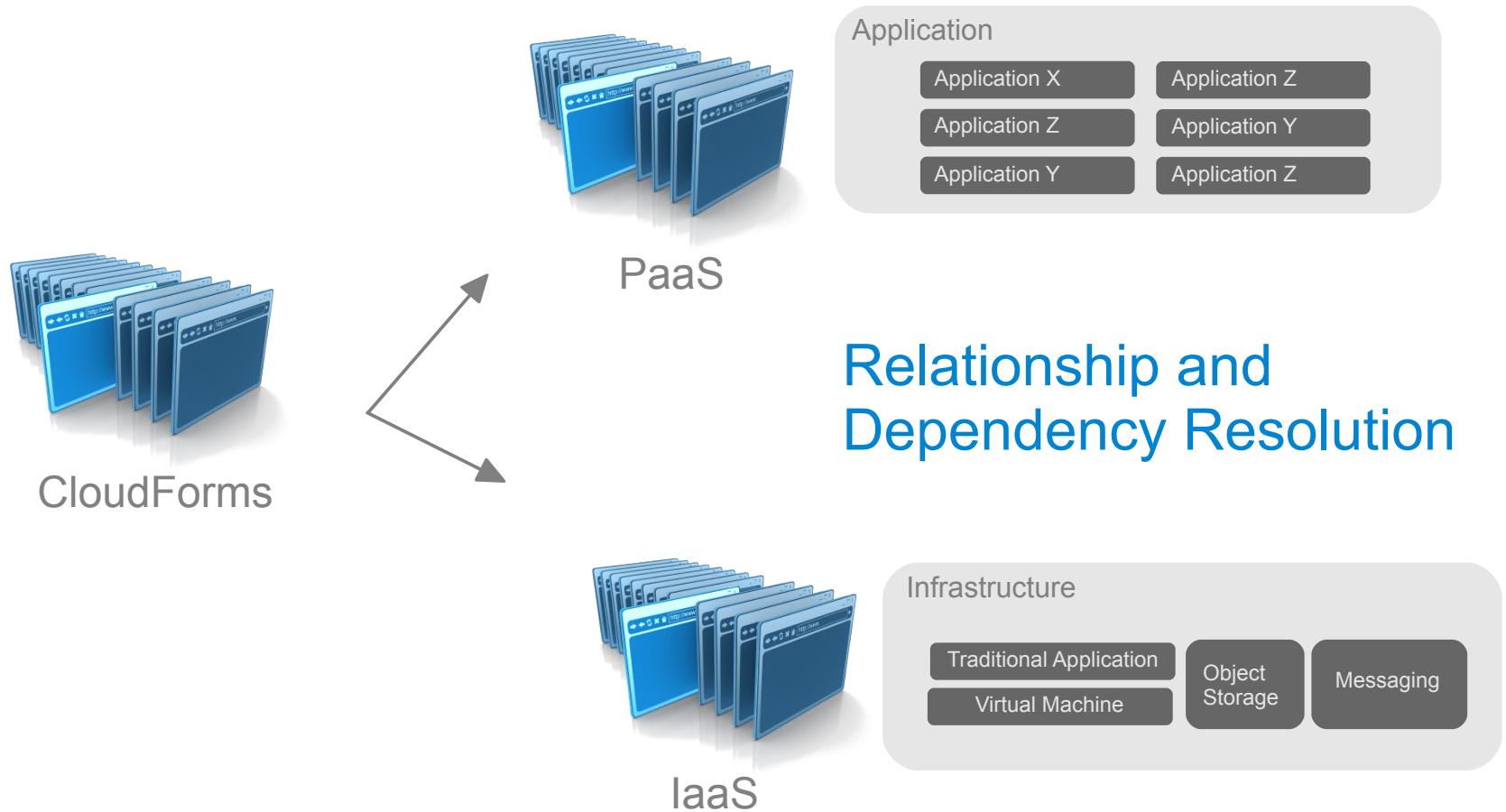


IaaS



- Slow service delivery
  - Developer requires operations team
  - Manual configuration leads to higher error rates
- Loss of flexibility
  - Two self-service portals, tightly tied to implementation

# The goal



# Result

- Faster delivery of services
  - DevOps now possible
  - Automation removes human error
- Increase in flexibility
  - Developer utilizing a single self-service portals not tightly coupled to underlying resource provider

# Developer Experience (Compose)

RED HAT CLOUDFORMS  
MANAGEMENT ENGINE

redhat.

Virtual Intelligence Services

My Services Catalogs Requests Virtual Machines

PaaS Admin | EVM

Service Catalogs

Catalog Items

All Catalog Items Unassigned

Finance Development

- CreditProcessing
- Hadoop-Small
- JBossEAP6
- Perl5.10
- Python2.6
- RHEL6-Small
- Ruby1.8
- Win2k8-Small

Finance Production Finance QE Human Resource Production Human Resources Development Human Resources QE Research Development Research Production Research QE

Service Catalog Item "Python2.6"

Basic Info Details

Basic Information

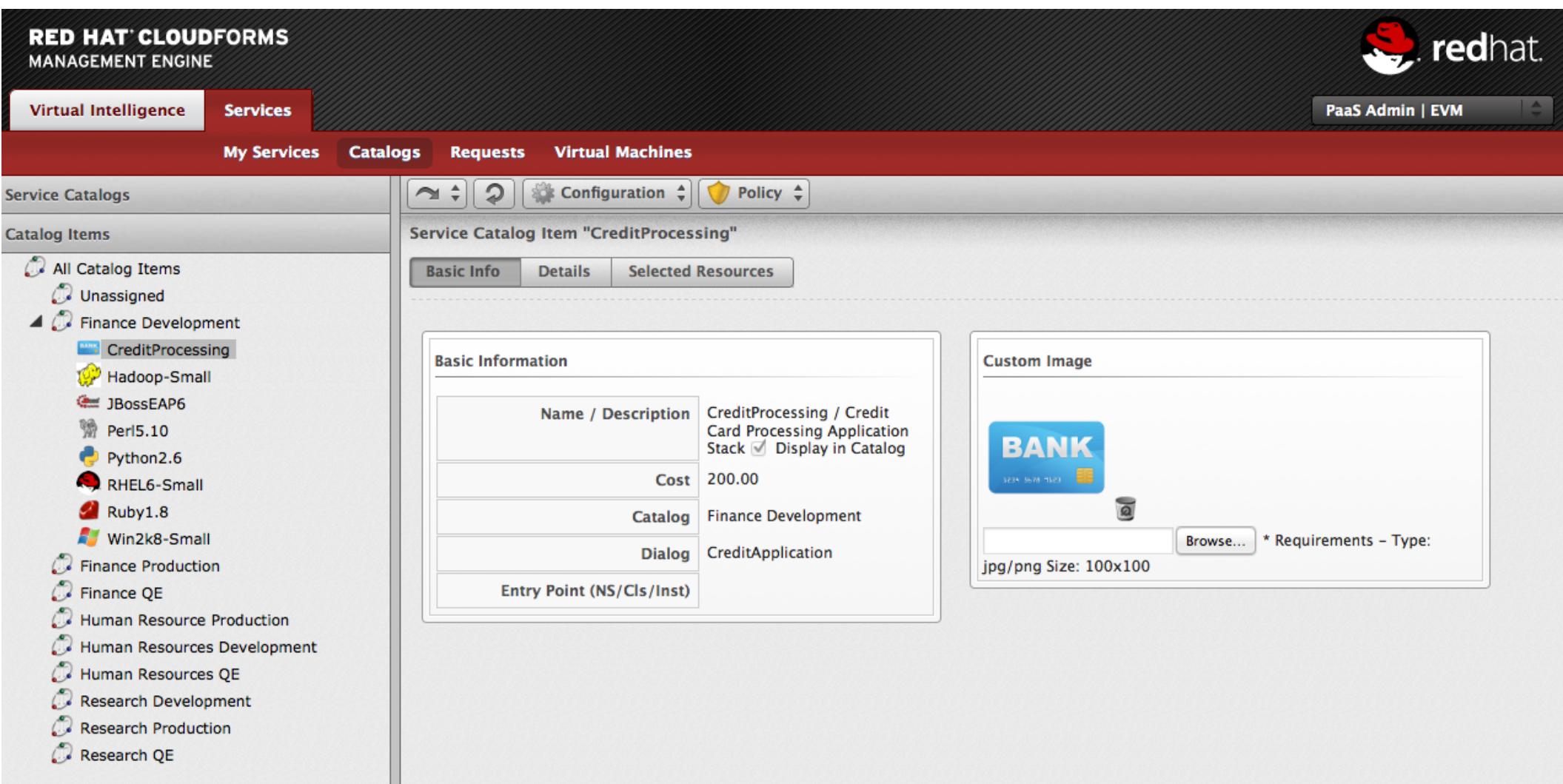
Name / Description	Python2.6 / Python on OpenShift Enterprise <input checked="" type="checkbox"/> Display in Catalog
Cost	15.00
Catalog	Finance Development
Dialog	OpenShiftApplication
Entry Point (NS/Cls/Inst)	/Factory/Service/provision

Custom Image



Browse... \* Requirements – Type: jpg/png Size: 100x100

# Developer Experience (Compose)



The screenshot shows the Red Hat CloudForms Management Engine interface. The top navigation bar includes 'Virtual Intelligence', 'Services', 'My Services', 'Catalogs' (which is the active tab), 'Requests', and 'Virtual Machines'. The top right corner shows the Red Hat logo and 'PaaS Admin | EVM'. The left sidebar is titled 'Service Catalogs' and 'Catalog Items', listing various service catalog items under categories like 'All Catalog Items', 'Unassigned', and 'Finance Development' (which is expanded to show 'CreditProcessing', 'Hadoop-Small', 'JBossEAP6', etc.). The main content area is titled 'Service Catalog Item "CreditProcessing"' and contains tabs for 'Basic Info', 'Details', and 'Selected Resources'. The 'Basic Info' tab displays the following details:

Basic Information	
Name / Description	CreditProcessing / Credit Card Processing Application Stack <input checked="" type="checkbox"/> Display in Catalog
Cost	200.00
Catalog	Finance Development
Dialog	CreditApplication
Entry Point (NS/Cls/Inst)	

The 'Custom Image' tab shows a preview of a blue button with the word 'BANK' and a file upload section with a 'Browse...' button and a note: '\* Requirements – Type: jpg/png Size: 100x100'.

# Developer Experience (Compose)

RED HAT CLOUDFORMS  
MANAGEMENT ENGINE

redhat.

Virtual Intelligence Services

PaaS Admin | EVM

My Services Catalogs Requests Virtual Machines

Service Catalogs

Catalog Items

- All Catalog Items
- Unassigned
- Finance Development
  - CreditProcessing
    - Hadoop-Small
    - JBossEAP6
    - Perl5.10
    - Python2.6
    - RHEL6-Small
    - Ruby1.8
    - Win2k8-Small
  - Finance Production
  - Finance QE
  - Human Resource Production
  - Human Resources Development
  - Human Resources QE
  - Research Development
  - Research Production
  - Research QE

Editing Catalog Bundle "CreditProcessing"

Basic Info Details Resources

Resources

Add a Resource <Choose>

<Choose>  
Hadoop-Small  
Perl5.10  
Ruby1.8  
Win2k8-Small

Selected Resources

Name	Group Order	Action		Delay (mins)		Scaling	
		Start	Stop	Start	Stop	Min	Max
Python2.6	1	Power On	Shutdown	1	5	1	10
JBossEAP6	2	Power On	Shutdown	3	3	1	3
RHEL6-Small	3	Power On	Shutdown	5	1	1	5

# Developer Experience (Self-Service)

RED HAT CLOUDFORMS  
MANAGEMENT ENGINE

redhat.

Virtual Intelligence Services PaaS User | EVM

My Services Catalogs Requests

Service Catalogs

All Services

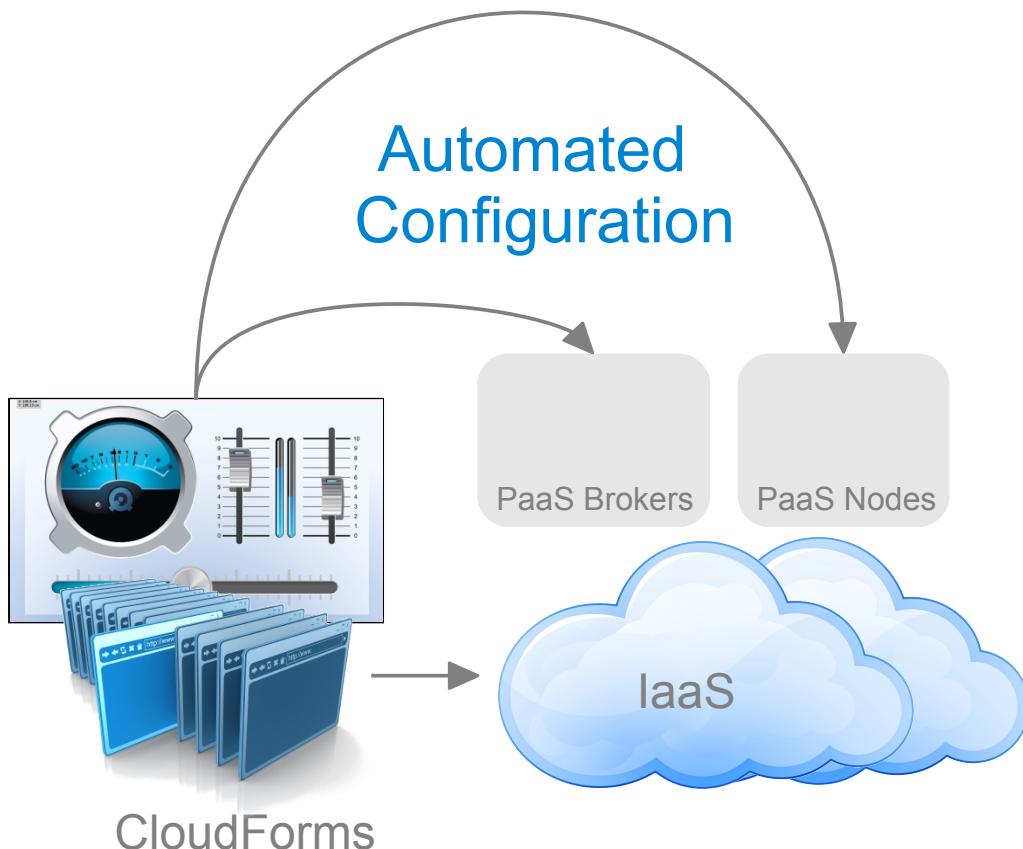
- Finance Development
  - CreditProcessing
  - Hadoop-Small
  - JBossEAP6
  - Perl5.10
  - Python2.6
  - RHEL6-Small
  - Ruby1.8
  - Win2k8-Small

Service "CreditProcessing"

Service Order was cancelled by the user

	<p>Name: CreditProcessing</p> <p>Description: Credit Card Processing Application Stack</p> <p>Cost: 200.00</p> <p>Long Description: Credit Processing Application Stack (10) Python 2.6 Gear (4) JBoss EAP 6 Gear (2) RHEL6-Small with Postgres</p> <p>Order</p>
---	--

# How about operations?



- **Faster delivery of services**
  - Automated deployment results in faster availability of PaaS infrastructure
- **Reduce human error**
  - Automation leads to decrease in errors
- **Choice of infrastructure**

# Operations Experience

RED HAT CLOUDFORMS  
MANAGEMENT ENGINE

redhat.

Virtual Intelligence Services Infrastructure Control Automate Optimize Administrator | EVM

My Services Catalogs Requests Virtual Machines

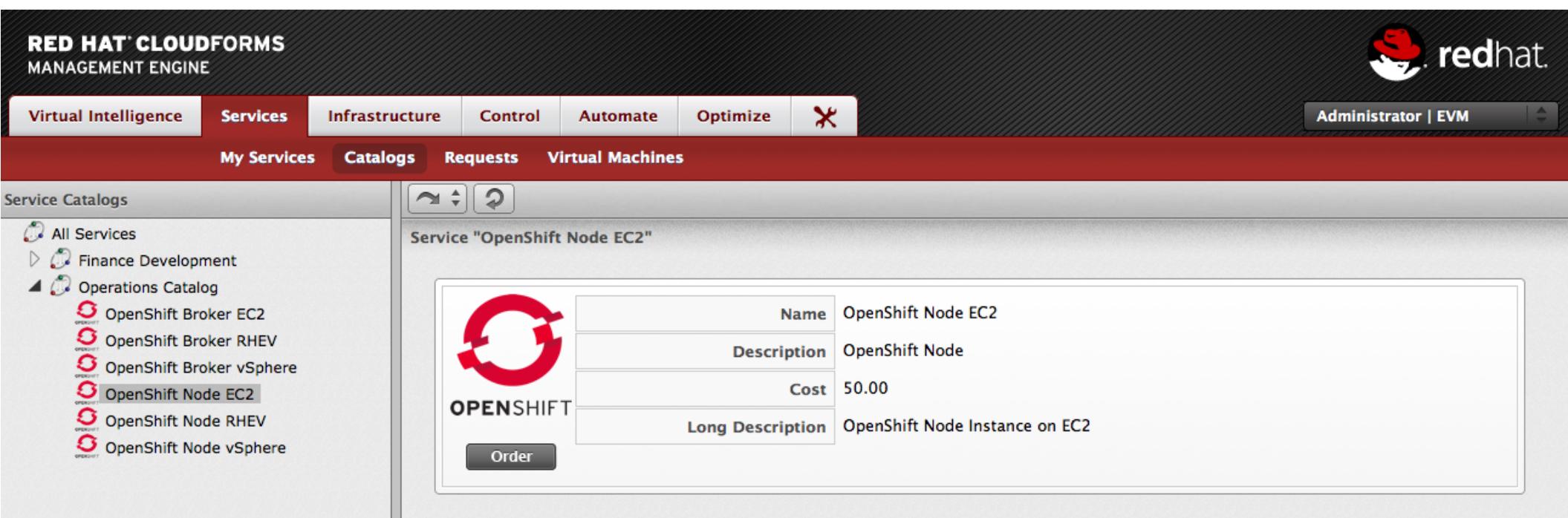
Service Catalogs

- All Services
- Finance Development
- Operations Catalog
  - OpenShift Broker EC2
  - OpenShift Broker RHEV
  - OpenShift Broker vSphere
  - OpenShift Node EC2**
  - OpenShift Node RHEV
  - OpenShift Node vSphere

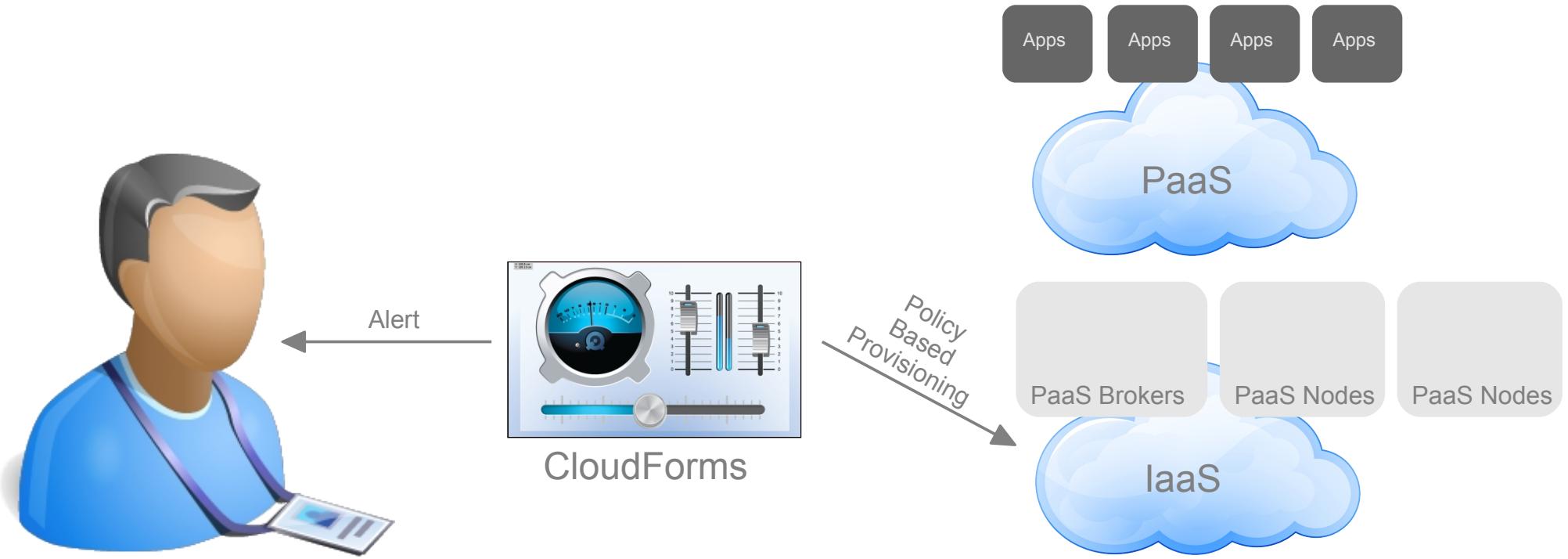
Service "OpenShift Node EC2"

 OPENSHIFT	Name	OpenShift Node EC2
	Description	OpenShift Node
	Cost	50.00
	Long Description	OpenShift Node Instance on EC2

Order



# Also enables auto-scaling of OpenShift nodes



- Reduced cost of ownership
  - Single tool for monitoring and scaling
- Maximum utilization of resources
  - PaaS scaled appropriate for load

# Integrating IaaS and PaaS gets you



- Empowered Developers
- Automated Deployment
- Dynamic Resource Allocation
- Happy management



# Hybrid cloud solutions in support of the big trends

- Converged IaaS and PaaS
  - Interoperable: catalogs, autoscaling, composite services
- Big data
  - Deploy, manage, and optimize
- Developer operations (DevOps)
  - Toolchain integration: CMDB, PMDB, repos, build systems
- Cloud storage
  - Hybrid software-only storage configuration and management
- OpenStack Enterprise
  - Mature, robust, and enterprise-ready

# Thank you.

# Questions?