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#### **Using Red Hat Systems Management Tools** in a Hybrid Cloud

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**Session #13836** 

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- Concurrent consumption of legacy and next generation IT
- Concurrent consumption of private and public clouds
- Concurrent consumption of IaaS and PaaS clouds
- Concurrent consumption of traditional applications and cloud applications
- Seamless management of private and public, laaS and PaaS
- Clouds for traditional and cloud applications



## **Defining Hybrid Cloud**





## "Bimodal IT" (Gartner) and Drivers for Hybrid Cloud



"MODE 1"

- Scale-up
- Proprietary
- Operator-deployed
- Integration via middle-ware
- Resilience in platform
- Built for efficiency
- C, Java, .Net
- Examples:
  - ERP's, Anything > 10 Years Old, Oracle

#### http://www.gartner.com/it-glossary/bimodal





- Scale-out
- Open source
- Developer-deployed
- Integration via API
- Resilience in application
- Built for change, agility, and speed
- Java, Ruby, Go, Python
- Examples:
  - Mobile back-ends, web apps





### Mix of Mode 1 and Mode 2 is a Good Place to Start

- "I'm Here."
  - On-premise physical and virtual systems
  - Stable, known, trusted implementations for (investments in) systems management



#### • "I Want to Get Here."

- -Leverage existing investments and systems management
- -Use cloud technology when appropriate
- Maintain consistent configuration management process across on-premise and public cloud environments





#### **Red Hat Technology for Systems Management**



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#### **A Common First Step for Red Hat Systems Management Technology**

- "I'm Here."
  - -Red Hat Satellite for provisioning, content, and configuration management



#### • "I Want to Get Here."

-Extend on-premise Red Hat Satellite environment to public cloud instances and hosted laaS







## Red Hat CloudForms Addresses Additional Hybrid Cloud Challenges

#### Red Hat CloudForms provides:

- Governance across traditional infrastructure and cloud services
- Dashboard with role-based access control (RBAC)
- -Service catalog
- -IT process orchestration
- -Monitoring and alerting
- -Analytics
- -Quota enforcement
- -Metering





#### Red Hat Systems Management Feature Mapping for Hybrid Cloud





- Considerations for integrating onpremise Red Hat Satellite with public cloud instances
- Red Hat Satellite technical walk-through on AWS
  - -What's been tested by Red Hat, what's not
- Introduction to Red Hat CloudForms architecture for hybrid cloud
- Summary and take-aways

## Agenda





#### Considerations for Integrating On-premise Red Hat Satellite with Cloud Instances

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#### **Cost and Technical Considerations**







## **Use Traditional Subscriptions with Red Hat Cloud Access**



- Q: Do I need a RHEL subscription for cloud instances?
  - -A: To use Satellite, yes. Red Hat Cloud Access should be used.
- Enables use of traditional RHEL subscriptions in the cloud
- Satellite certificate created as usual
   Avoid "double charge" for instances



- With Cloud Access, the Red Hat Support relationship is still with Red Hat.
  - -With OnDemand instances, both content/updates and support are through the service provider
- Current Cloud Access providers:
   AWS, GCE, Nifty Cloud (Japan)





## Use a Red Hat Certified Cloud & Service Provider (CCSP)



- Q: Can I use any cloud or managed service provider?
  - A: No. Use a Red Hat CCSP
- Red Hat CCSP's provide:
  - -A trusted destination for RHEL workloads.
  - -Fully supported, certified infrastructure

#### Magic Quadrant for Cloud IaaS









### **Configure Cloud Instances for Use with Red Hat Satellite**



- Q: Do I need to modify cloud instances -A: For most RH CCSP's, yes.
- Disconnect from the default, in-cloud Red Hat Update Infrastructure (RHUI) as needed, then register with the Satellite server.



- RHUI provides lightweight content/patches only (pull model) incloud.
- management (push model).





#### **Technical Walk-through: Using On-premise Red Hat Satellite** with Amazon Web Services (AWS) Instances

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#### Walk-through: Red Hat Satellite with Cloud Instances



instances





#### Assumptions

- An adequate quantity of RHEL <u>with</u> <u>Smart Management</u> subscriptions has been acquired and is accessible in a Red Hat Customer Portal account.
- An AWS account has already been created.
- Proper networking has been configured to enable DNS resolution between the Satellite server and cloud instances
  - -i.e. Virtual Private Cloud (VPC) in AWS
- Adequate bandwidth/latency between the on-premise Satellite server and cloud instances





#### Step #1: Prepare RHEL subscriptions using Red Hat Cloud Access

- Latest RHEL subscriptions (2013 and later) are Cloud Access enabled.
- Visit the Cloud Access website to register your RHEL subscriptions for use in the cloud.
  - -Option 1: Import an existing RHEL OS image to your cloud service provider
    - Called "Cloud Access Image Import"
  - -Option 2: For AWS, Cloud Access AMI's are already available
    - No additional AWS charge for RHEL

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	GET STARTED		
	It's easy to start using your Red Hat prod Certified Public Cloud	ducts on a Red Hat	
,	You need:		
	<ul> <li>Your Red Hat account number.</li> <li>Your cloud provider account number. (If you don't remember your provider account number, or need to sign up for a new one, please contact the provider directly.)</li> </ul>		
	<ol> <li>Check your eligibility: Review and confirm that you meet the eligibility requirements of Cloud Access.</li> <li>Enroll: When you click the ENROLL NOW button, you'll be prompted to log in to your Red Hat account where you can register for Red Hat Cloud Access for a Red Hat product on one of our Certified Public Cloud Providers.</li> </ol>		
	ENROLL NOW		

http://www.redhat.com/en/technologies/cloud-computing/cloud-access



## **Registering Subscriptions for Cloud Access Image Import**

- Required for most providers
  - -Exception: AWS has pre-existing Cloud Access RHEL AMI's
- Stand-alone images avoid double paying for RHEL
  - -OnDemand instances are typically charged automatically by the service provider
- Good use case is when a standard corporate image is already in use, may differ from providers standard image







#### **Cloud Access Image Import Provider Examples**

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🔛 Apps 🗀 Links

- Google Compute Engine
  - -https://cloud.google.com/ compute/docs/tutorials/ building-images
- Amazon (for Custom Images)
  - -http://aws.amazon.com/ec2/ vm-import/

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What is Google Compute Engine? ► Pricing and Quotas	Build a Compute Engine Image from Scratch							
<ul> <li>Getting Started</li> <li>User's Guide</li> </ul>	Google Compute Engine is capable of running a variety of operating systems, and you can build an image from scratch with the operating system of your choice and use it on Google Compute Engine virtual machines. However, Google Compute Engine is a unique environment, with certain requirements to ensure that all images run optimally. Those requirements are described here as an advanced							
▼ Tutorials	topic geared towards users who would like to use their own images instead of relying on public images.							
Build a Compute Engine Image from Scratch	This information and recommendations provided here are general in nature. Depending on your operating system, the steps to build your image can differ and you should refer to your operating system's documentation for specific instructions. Building an image is an advanced task and we suggest that only users who specifically need a new image should try to build one from scratch.							
Designing Robust Systems	Note: You'll find helpful video that demonstrates how to build custom images on our Samples and Videos page.							
Improving Application Performance								
Sending Email from an Instance	Basic operating system configuration Recommended							
Using the Javascript Client Library	Optional							
Using the Python Client Library	Kernel configurations							
SSH Port Forwarding and Load Testing	Required Linux Kernel Options Network configuration							
Building Scalable and Resilient Web Applications	Strongly recommended Recommended							
Automated Image Builds with Jenkins, Packer, and Kubernetes	Optional Installing packages Required packages							
Real-time logs analysis using Fluentd	Strongly recommended							
and BigQuery	Optional							
Batch processing with Autoscaler	Google Compute Engine image packages SSH configurations							







## **Step #2: Create Cloud Instances**

- After registering RHEL subscriptions for Cloud Access, create instances.
  - -AWS: Use AMI's with the 'Access' string included, which indicates Cloud Access AMI's (fee for compute/memory/storage only)
- Demo of this in the Red Hat booth, Public Cloud pod

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Reports					-		
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Instances		RHEL-5.10-GA-x86_64-7-Access2	ami-98e27ca8	309956199498/	309956199498	Private	available
Spot Requests		RHEL-5.10_GA-i386-7-Access2	ami-7ee27c4e	309956199498/	309956199498	Private	available
Reserved Instances		RHEL-5.10_GA-i386-8-Access2	ami-49a5dc79	309956199498/	309956199498	Private	available
IMAGES		RHEL-5.10_GA-i386-8-Access2-GP2	ami-b16a2981	309956199498/	309956199498	Private	available
AMIs		RHEL-5.10_GA-x86_64-8-Access2	ami-8fa2dbbf	309956199498/	309956199498	Private	available
Bundle Tasks		RHEL-5.10_GA-x86_64-8-Access2-GP2	ami-d56a29e5	309956199498/	309956199498	Private	available
ELASTIC BLOCK STORE		RHEL-5.11_Beta-i386-3-Access2-GP2	ami-25094c15	309956199498/	309956199498	Private	available
Volumes		RHEL-5.11_Beta-x86_64-3-Access2-GP2	ami-030e4b33	309956199498/	309956199498	Private	available
Snapshots		RHEL-5.11_GA-20141003-i386-2-Access2-GP2	ami-159cd125	309956199498/	309956199498	Private	available
NETWORK & SECURITY		RHEL-5.11_GA-20141003-x86_64-2-Access2-GP2	ami-c599d4f5	309956199498/	309956199498	Private	available
Security Groups		RHEL-5.11_GA-20150209-i386-1-Access2-GP2	ami-17a78227	309956199498/	309956199498	Private	available
Elastic IPs	Select an AMI above		000				
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AUTO SCALING							
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#### **Step #3: Disconnect instances from RHUI**, then register with Satellite

#### • Remove the RHUI configuration rpm and clean-up repo data:

[root@ip-172-31-18-123 ec2-user]# rpm -qa | grep rhui rh-amazon-rhui-client-2.2.117-1.el6.noarch



[root@ip-172-31-18-123 ec2-user]# rpm -e rh-amazon-rhui-client-2.2.117-1.el6.noarch warning: /etc/yum/pluginconf.d/rhui-lb.conf saved as /etc/yum/pluginconf.d/rhui-lb.conf.rpmsave warning: /etc/yum.repos.d/rhui-load-balancers.conf saved as /etc/yum.repos.d/rhui-load-balancers.conf.rpmsave warning: /etc/yum.repos.d/redhat-rhui.repo saved as /etc/yum.repos.d/redhat-rhui.repo.rpmsave warning: /etc/yum.repos.d/redhat-rhui-client-config.repo saved as /etc/yum.repos.d/redhat-rhui-client-config.repo.rpmsave

[root@ip-172-31-18-123 ec2-user]# subscription-manager

[root@ip-172-31-18-123 ec2-user]# yum clean all

Loaded plugins: security Cleaning repos: Cleaning up Everything

[root@ip-172-31-18-123 ec2-user]# yum repolist Loaded plugins: security repolist: 0

(\*\* this RPM name will vary by Cloud Service Provider)





#### **Step #3: Disconnect instances from RHUI,** then register with Satellite (cont.)

Now register with the Satellite server

[root@ip-172-31-18-123 ec2-user]# yum localinstall -y --nogpgcheck install http://172.31.18.123/pub/katello-ca-consumer-latest.noarch.rpm

[root@ip-172-31-18-123 ec2-user]# subscription-manager register --org="CCSP" –activationkey="rhel7Latest"

[root@ip-172-31-18-123 ec2-user]# subscription-manager repos --enable rhel-6-server-rpms --enable rhel-server-rhscl-6-rpms \ --enable rhel-server-6-satellite-6-beta-rpms

[root@ip-172-31-18-123 ec2-user]# yum install katello-agent

-See also http://docs.redhat.com  $\rightarrow$  Red Hat Satellite for additional instructions on Activation Key creation.



#### **Cloud Use Case Summary for Red Hat Satellite**

1. On-premise Satellite with cloud instances



3. Satellite and instances in the cloud



2. On-premise Satellite with cloud proxy and instances



4. Multi-region cloud with proxy









#### **Cloud Use Case Summary for Red Hat Satellite**





#### Introduction to **Red Hat CloudForms Architecture** for Hybrid Cloud Management

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#### **Red Hat CloudForms Provider Support**





#### **Red Hat CloudForms Provider Support**





#### **Red Hat CloudForms Architecture** for Providers with Native API Support

- Red Hat CloudForms provides native API support for OpenStack and AWS
  - -Additional providers TBD
    - Can leverage the ManagelQ upstream community project -http://manageig.org/
- Q: Does this mean Amazon is the only Service Provider (SP) I can use???

-A: No. (See next slide)





### **Red Hat CloudForms Architecture** for Managed Service Providers (MSP's)

- CloudForms uses a distributed architecture and can scale to remote datacenters, such as Managed Service Providers (MSP's).
- Requires MSP is using a Red Hat supported provider
  - -RHEV
  - -RHEL OpenStack Platform
  - -VMware vCenter
- As discussed previously, <u>use</u> a Red Hat **Certified Cloud & Service Provider** (CCSP)





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#### **Take-Aways**

- Existing on-premise Red Hat Satellite can be extended to manage public cloud instances and achieve a hybrid cloud architecture -Work with Red Hat to validate your hybrid cloud design: http://access.redhat.com/support
- Deploy Red Hat CloudForms to provide a complete cloud management platform (CMP) - Provides governance, orchestration, self-service, metering and other capabilities - By using CloudForms distributed worker architecture, not limited to AWS-only
- Leverage your existing RHEL subscriptions in the cloud using Red Hat Cloud Access -Required for Red Hat Satellite integration
- Leverage the Red Hat Certified Cloud & Service Provider (CCSP) ecosystem when choosing a cloud service provider: http://access.redhat.com/certifications







#### **For More Information**

- Red Hat Cloud Access:
  - -http://www.redhat.com/en/technologies/cloud-computing/cloud-access
- List of Red Hat Certified Cloud & Service Providers (CCSP's):
  - -https://access.redhat.com/certifications
- Red Hat Support
  - -https://access.redhat.com/certifications
- @RHSummit
  - -Visit the Certified Cloud & Service Provider Booth
    - Cloud Access and Satellite Demo's
  - -Get the slides

• This session and "Including the public cloud in your hybrid cloud strategy"



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