



AUTOMATING DAY TWO OPENSIFT OPERATIONS WITH ANSIBLE

Instantaneous Intergalactic Containers

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AGENDA

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What we're going to talk about today.

- Ansible Engine and Ansible Tower Automation
- OpenShift Container Platform
- OpenShift Day Zero
- OpenShift Day Two Common Operations Tasks
 - Classifications of Task Type
 - Automation with Ansible
- Ansible powered OpenShift Online Ops Utilities
- Red Hat Insights
- Ansible Service Broker
- Hybrid Automation
- Leveraging Ansible and Openshift at CSX

ANSIBLE

What is Ansible?

(Other than an instantaneous intergalactic communications device)



RED HAT ANSIBLE TOWER

Scale + operationalize your automation

CONTROL

KNOWLEDGE

DELEGATION

RED HAT ANSIBLE ENGINE

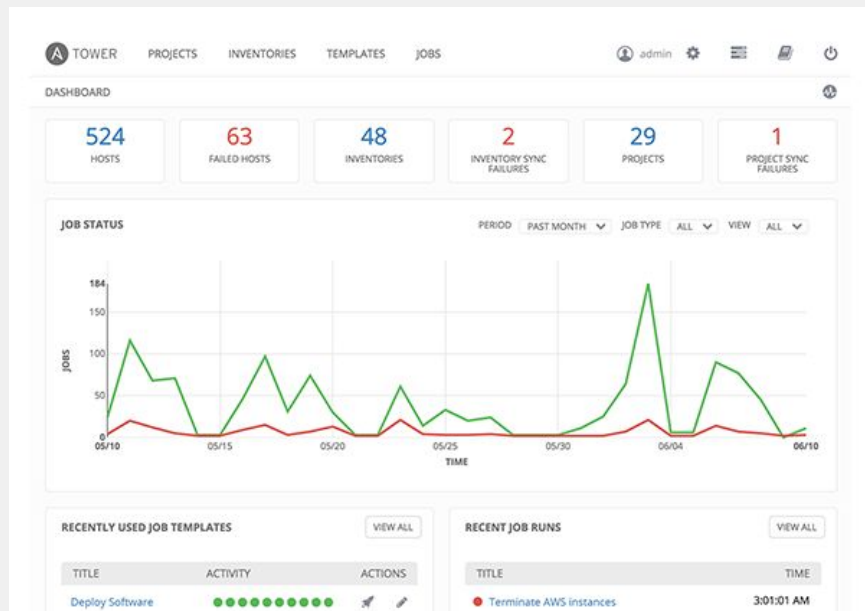
Support for your Ansible automation

SIMPLE

POWERFUL

AGENTLESS

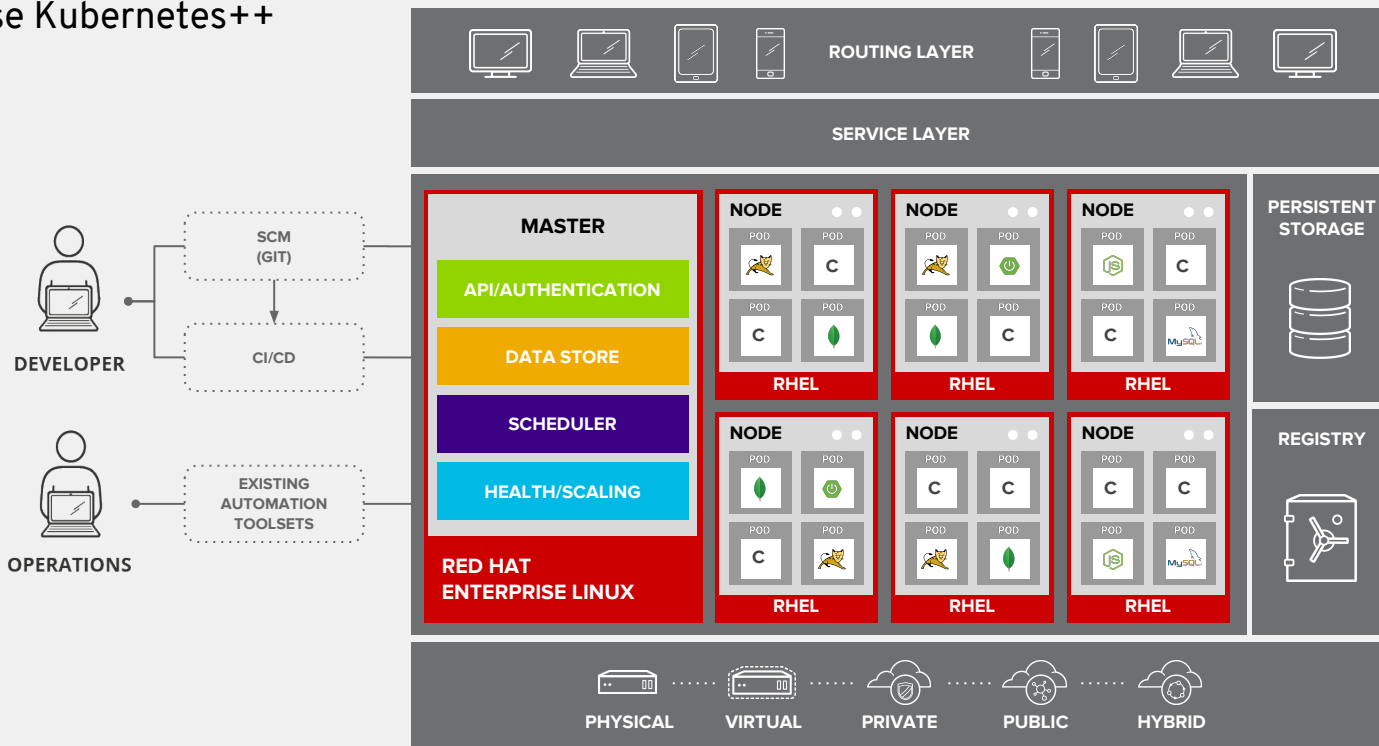
FUELED BY AN INNOVATIVE **OPEN SOURCE** COMMUNITY



OPENSIFT

OpenShift Container Platform

Enterprise Kubernetes++



OPENSIFT DAY ZERO

INSTALLING OPENSIFT

Day Zero

The OpenShift Installer

- Guided Install Utility (The “Installer”)
 - `atomic-openshift-installer install`
- Advanced Installation: `openshift-ansible`
- Fun Fact: These are the same!
 - The installer is a wrapper, everything is powered by Ansible on the backend

OPENSIFT DAY TWO OPERATIONS

Common OpenShift Operations Tasks

Categories

- Categories
 - Cluster Health Checks
 - Operating System Level
 - Project Level
 - Cluster Level
- Ansible-ization of tasks
 - OpenShift Native Modules: oc, openshift_raw, openshift_scale (more planned)
 - CLI Modules: command/shell (these should be wrapped for idempotency)
 - Creating use-case roles

Day 2 Operations

Cluster Health Checks

- **Project/App Validation**
 - Create a project, create an app, validate the app, delete the project , validate deletion
- **Host Health**
 - Verify node Ready-ness
 - Ensure etcd cluster health and cluster member list
- **OpenShift Router and Registry**
 - Check replica count and status
- **Network**
 - SkyDNS, cluster overlay network, REST API, MTU Size
- **Storage**
 - Cluster ephemeral pod storage, Docker storage, Gluster Container Native

Day 2 Operations

Host Level

- Adding master or node Hosts to a cluster
- Deprecation master or node Hosts
- Creating backups of master or node Hosts
 - Capturing OpenShift relevant information
- Adding or removing etcd Hosts
- Backing up etcd Hosts
 - Capturing etcd relevant information
- Relevant Procedures:
 - https://access.redhat.com/documentation/en-us/openshift_container_platform/3.9/html-single/installation_and_configuration/#install-config-adding-hosts-to-cluster
 - https://access.redhat.com/documentation/en-us/openshift_container_platform/3.9/html/day_two_operations_guide/day_two_host_level_tasks

Day 2 Operations

Project Level

- Project Backups
 - Exporting all doesn't actually export **all** as there's contextual data about the individual artifacts
 - `rolebindings serviceaccounts secrets imagestreamtags podpreset cms egressnetworkpolicies rolebindingrestrictions limitranges resourcequotas pvcs templates cronjobs statefulsets hpas deployments replicaset poddisruptionbudget endpoints`
- Persistent Volume Backups
 - `oc rsync`

Day 2 Operations

Cluster Level

- Pruning Objects
 - Deployments, Builds, Images (also redis-cache clean-up)
 - `oc adm prune <object_type> <options>`
 - https://access.redhat.com/documentation/en-us/openshift_container_platform/3.9/html-single/cluster_administration/#admin-guide-pruning-resources
- Docker Storage
 - Always evacuate the node
 - Stop the docker daemon
- Docker Maintenance
 - Docker Certificates
 - Secure/Insecure Registries
 - External registries whitelist/blacklist
 - Import of images and lifecycle management (imagestreams)

OPENSIFT ONLINE OPS

OpenShift Online

In case you didn't know!

OpenShift Online is OpenShift Container Platform, as a Service

- Provided and hosted by Red Hat
- Red Hat handles Operations for you

RED HAT OPENSIFT ONLINE



On-Demand Access

Quickly build, deploy, and manage containerized applications in the public cloud, operated and supported by Red Hat.

[LEARN MORE](#)

RED HAT OPENSIFT DEDICATED



Enterprise Public Cloud

Develop and manage powerful containerized applications with your own OpenShift cluster, operated by Red Hat.

[LEARN MORE](#)

RED HAT OPENSIFT CONTAINER PLATFORM



In Your Data Center

Bring the benefits of PaaS to the enterprise with a private application platform in your data center or private cloud.

[LEARN MORE](#)

OpenShift Online Ops Tools

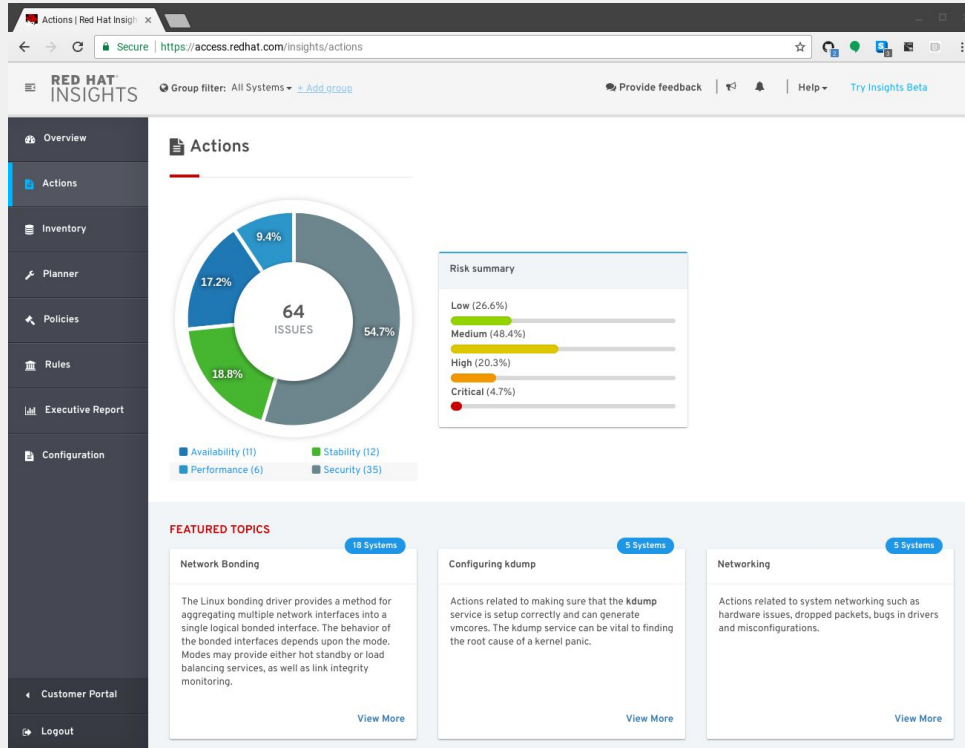
Utilities brought to you in part by OpenShift!

OpenShift Online Ops Team open sources the tools they use

- Ad-Hoc playbooks such as:
 - docker storage configuration and clean up
 - SDN operations
 - Metrics setup/deployment
- Over 100 Ansible Roles for various OpenShift Operations Tasks
- Important Notes:
 - These are not officially supported by Red Hat
 - There are some utils that are going to be very environment specific
- <https://github.com/openshift/openshift-tools/>
 - Released Open Source under Apache License 2.0

RED HAT INSIGHTS

What Is Red Hat Insights



Red Hat Insights is a predictive IT analytics service that enables customers to proactively identify and automatically resolve infrastructure risks before they impact business operations.

Red Hat Insights + OpenShift

Analytics for the Container Platform

Insights In OpenShift

- Scans Container Images to provide analytics
- Runs Container-Native
 - Insights API Pod
 - Scanning Daemon Set
 - Scanner Worker Pods
 - Results UI Service
- Results Web Console
 - View potential Risks with ranked impact and likelihood
 - Remediation Steps for each Risk

The screenshot displays the Red Hat Insights web console interface. At the top, the header reads "RED HAT INSIGHTS". Below it, a breadcrumb trail shows "Image List > docker-registry.default.svc:5000/insights-scan/insights-ocp-ui". The main content area shows a list of risks for the "Operating System" component. The risks are:

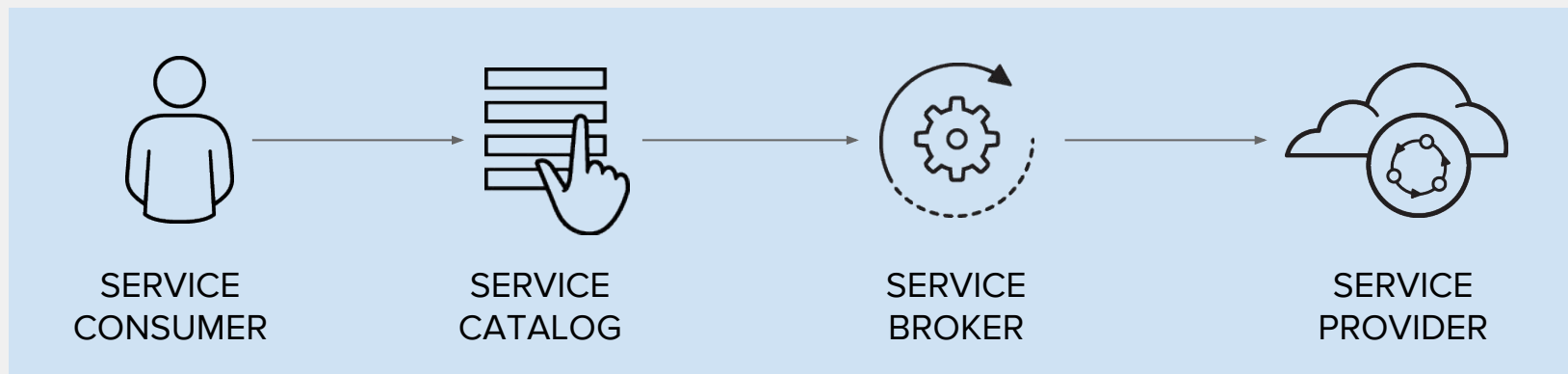
- Security > Decreased security in system logging (rsyslogd not running) - Impact: Low, Likelihood: Low, Total Risk: Low
- Stability > Other Linux release detected - Impact: Low, Likelihood: Medium, Total Risk: Low
- Security > Decreased security when Red Hat Product Signing Key not installed - Impact: Low, Likelihood: Low, Total Risk: Low
- Security > Decreased security in system auditing (audit not running) - Impact: Low, Likelihood: Low, Total Risk: Low

The fourth risk is expanded, showing details under the heading "Detected Issues". The text states: "Issues related to system logging and auditing were detected on your system. Important service is disabled. Audit package is not installed. The audit package is installed on RHEL by default and provides a logging facility for security auditing purposes. Red Hat recommends that the audit package be installed." Below this, a "Steps to Resolve" section recommends performing adjustments: "Install the audit package:" followed by a terminal command: `# yum install audit`. At the bottom, there are links for further information: "Why is /var/log/cron world readable in RHEL7?", "Using the chkconfig utility to configure services on RHEL 6", "Managing System Services to configure services on RHEL 7", and "The Customer Portal page for the Red Hat Security Team contains more information about policies, procedures, and alerts for Red Hat products." The Security Team blog is also mentioned at securityblog.redhat.com.

SERVICE BROKER

What is a Service Broker?

Automated, Standard, Consistent



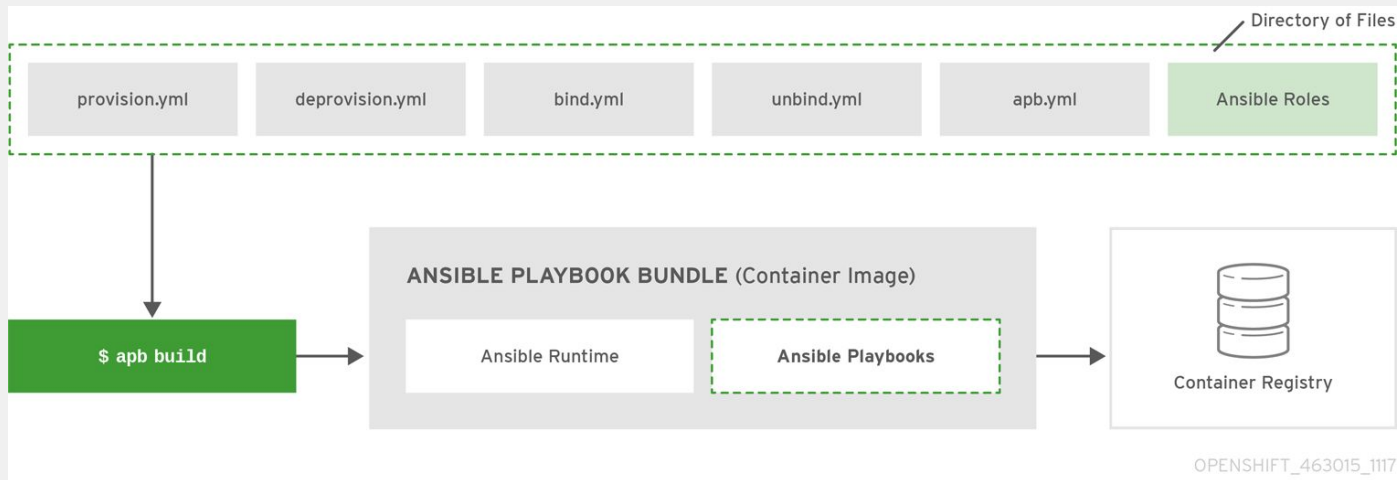
Automated, Standard and Consistent

OpenShift Ansible Broker

Using Ansible Playbook Bundles via the Service Catalog

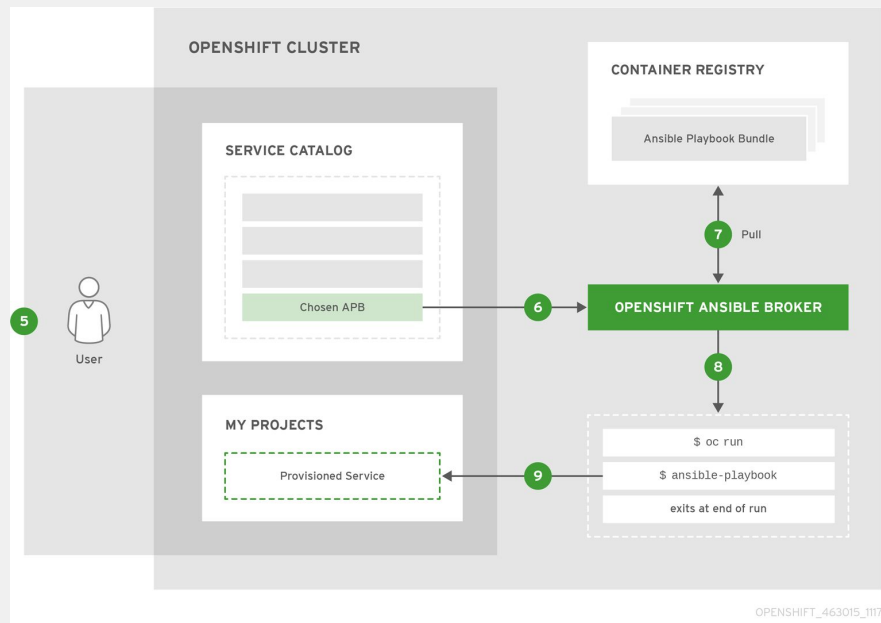
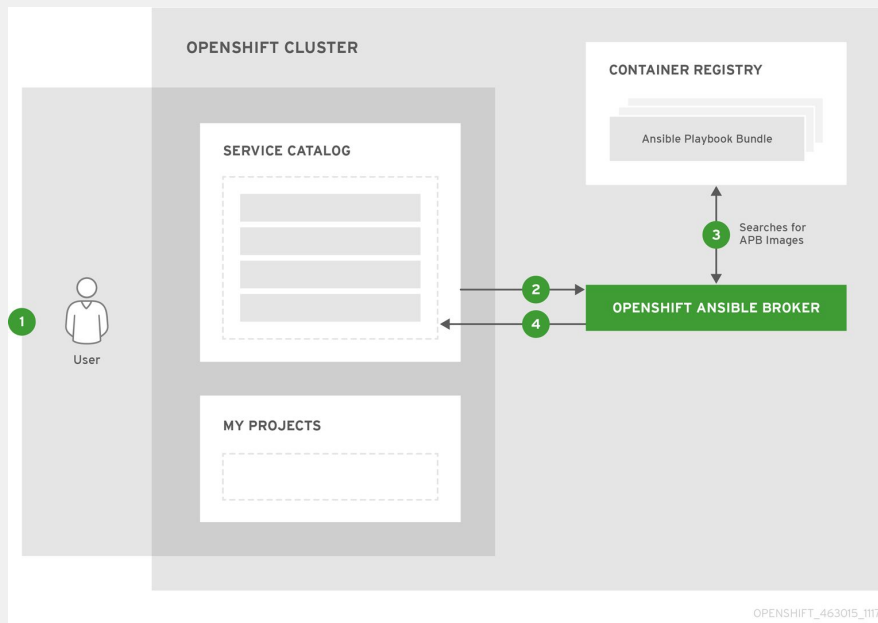
Ability to use Ansible to deploy applications into OpenShift

- Provision
- Deprovision
- Bind
- Unbind
- Bundled Roles



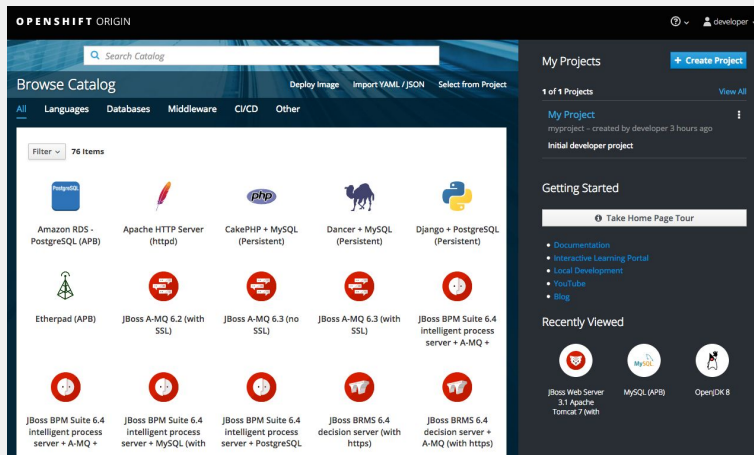
OpenShift Ansible Broker

Deploying a service

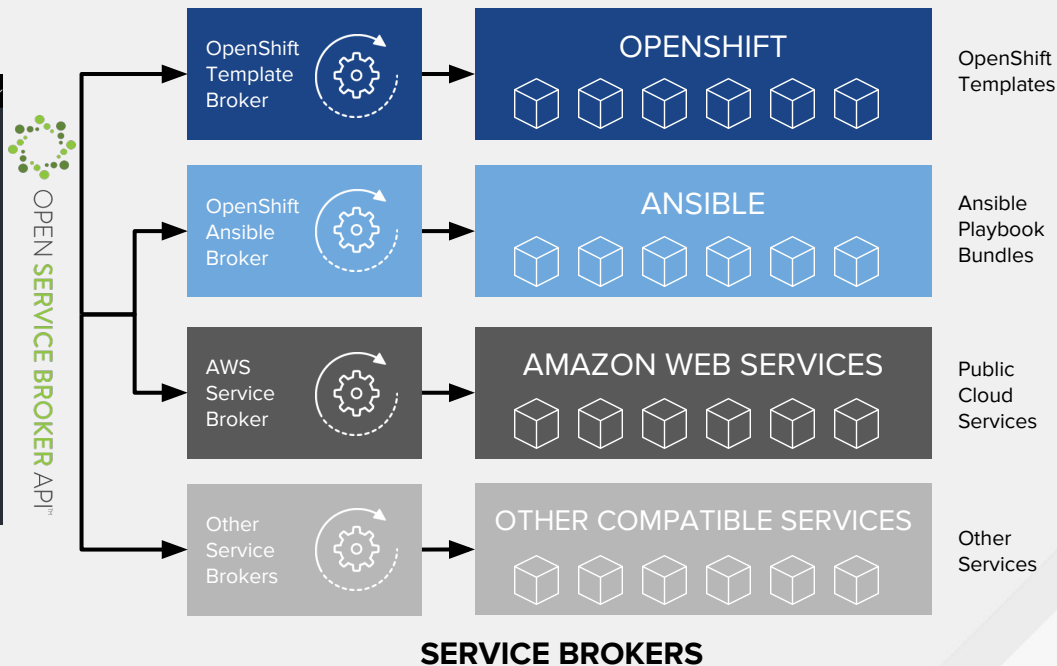


Service Brokers

To The Service Catalog and Beyond!



OPENSHIFT SERVICE CATALOG

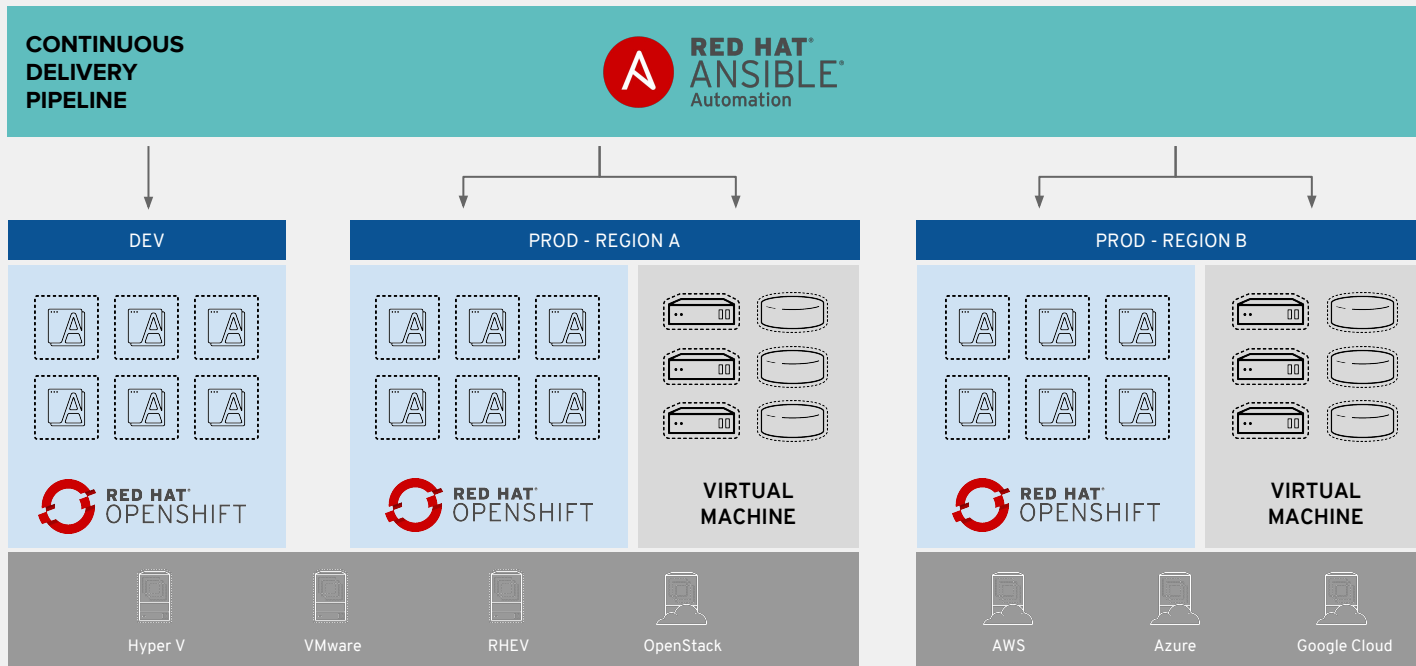


SERVICE BROKERS

HYBRID AUTOMATION

Hybrid Application Automation

OpenShift and Ansible



LEVERAGING ANSIBLE AND OPENSIFT AT CSX

DevOps at CSX

Leveraging Ansible and OpenShift to facilitate IT Transformation



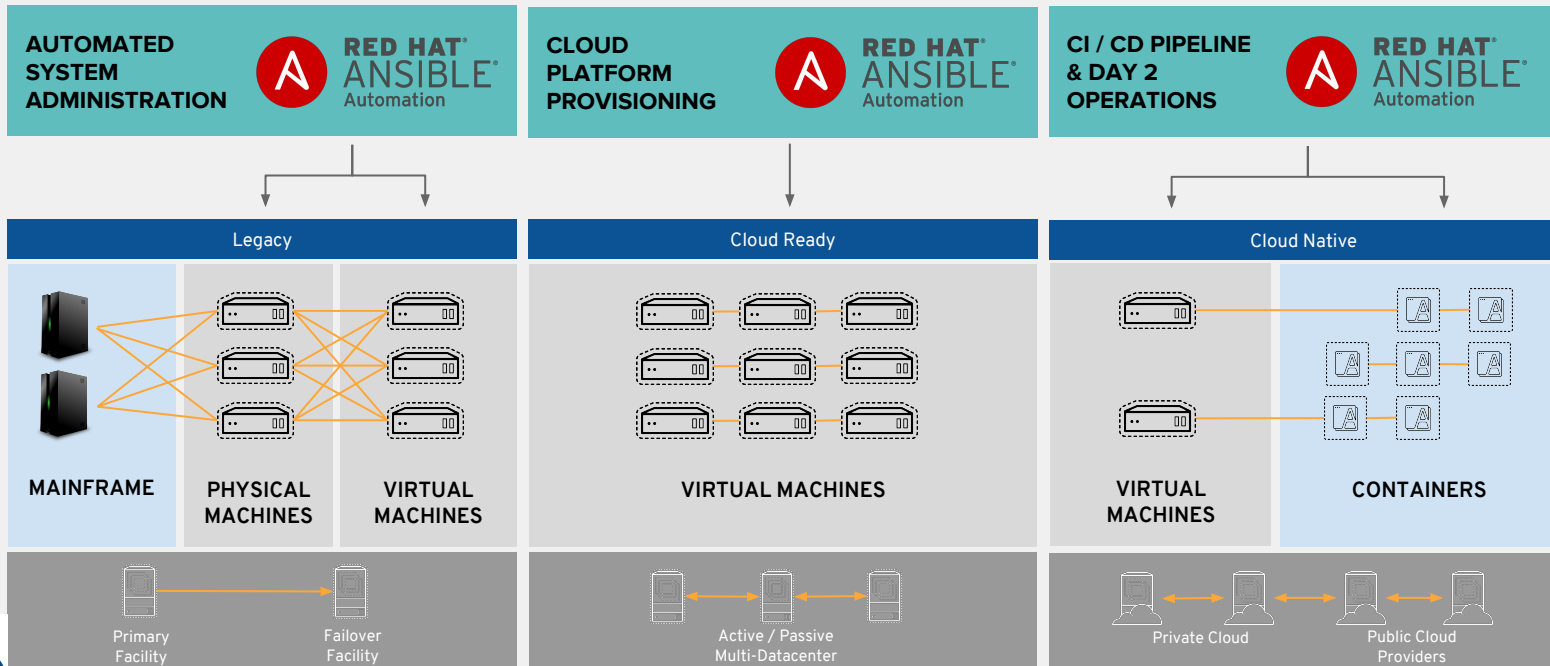
DevOps focuses on a combination of software development and operations – and as its name suggest, it's a melding of these two disciplines in order to emphasize communication, collaboration, and cohesion between traditionally separate developer and IT operations teams.



CSX Corporation, based in Jacksonville, Fla., is one of the nation's leading transportation suppliers. Our rail and intermodal businesses provide rail-based transportation services including traditional rail service and the transport of intermodal containers and trailers.

IT Automation for CSX

Legacy, Cloud Ready, and Cloud Native Environments



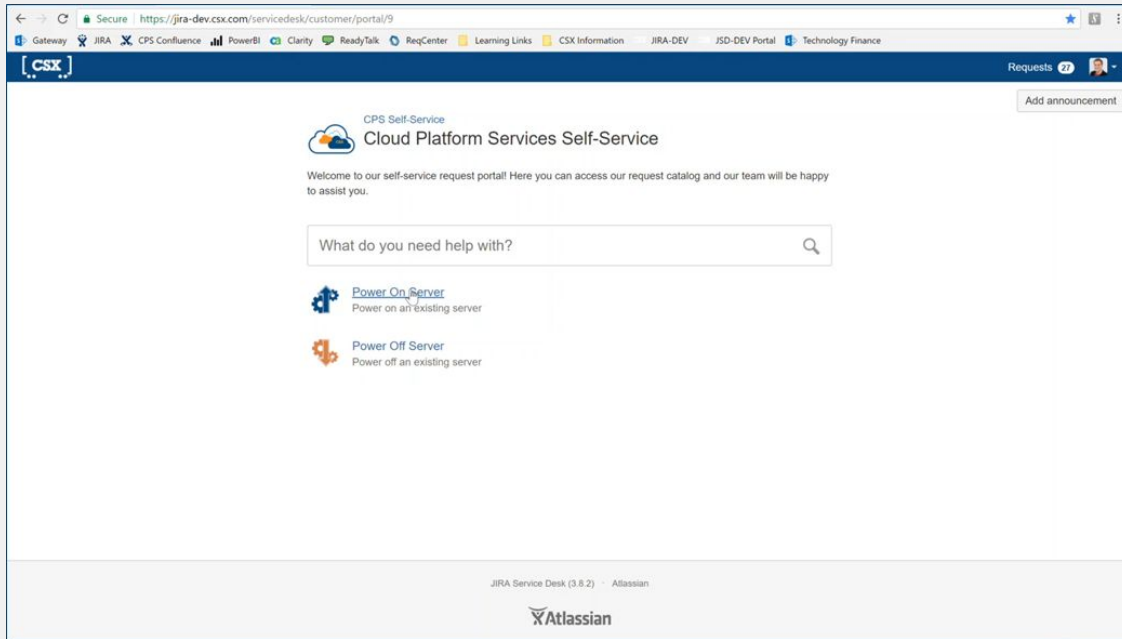
HOW TOMORROW MOVES



Automated System Administration

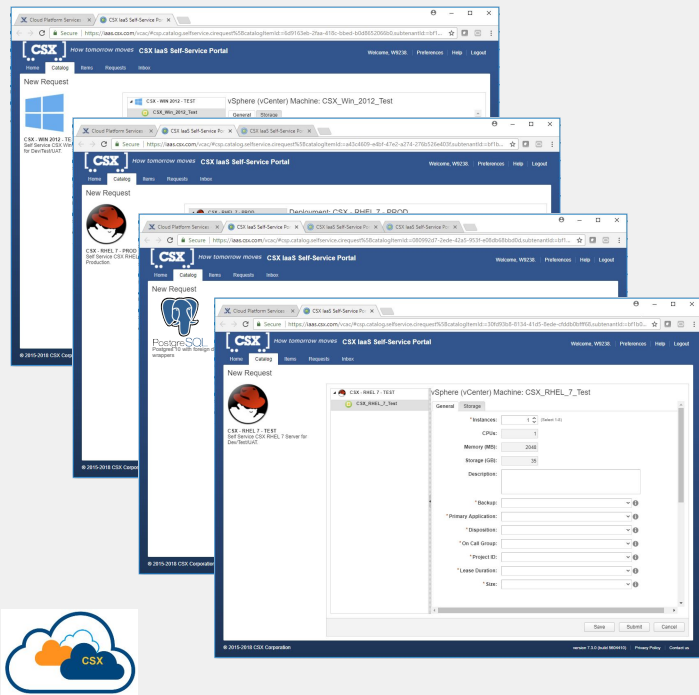
Using Tower API to integrate with existing tools

With Ansible Tower we are able to leverage API calls to Tower from multiple management systems to trigger playbooks to automate legacy administrative tasks, reducing overhead, and freeing up people to focus on transformation projects that support DevOps initiatives.



Cloud Platform Provisioning

Bridging the gap from Legacy to Cloud Native



Using Ansible playbooks to post-configure a small number of standardized images, we are able to rapidly deliver Infrastructure-as-a-Service.

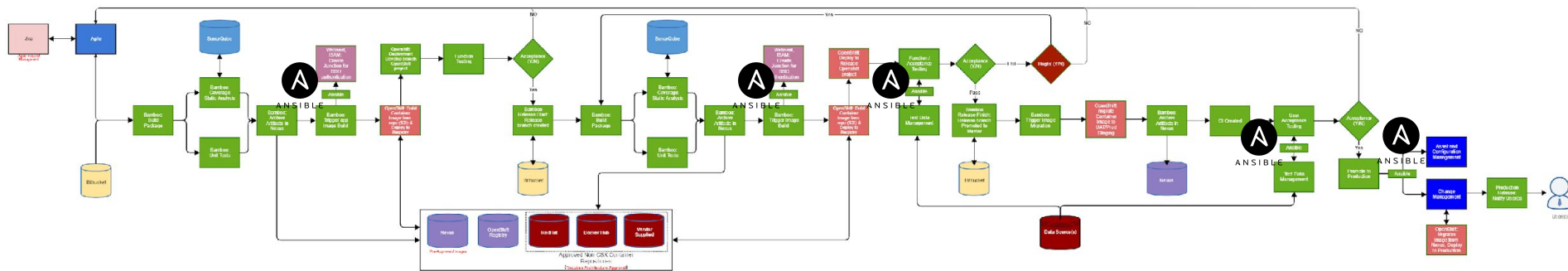
IaaS provides a transitional infrastructure architecture allowing us to break up highly consolidated infrastructure silos without having to go to the extent of re-factoring the applications.

This allows us introduce more open source infrastructure options and continue to drive out wasted manual effort and focus resources on transformation.



CI/CD Pipeline

Making CI/CD work in an ITIL aligned Hybrid Environment



Ansible is integrated across the CI/CD pipeline with OpenShift to interface with external systems for security configuration, test data management, configuration management, change control, and deployment.



HOW TOMORROW MOVES [CSX TECHNOLOGY]

Day 2 Operations

Building the Backlog

Health Check is underway at CSX now.

Current installation and configuration of OpenShift already heavily leverages built-in Ansible playbooks with appropriate configuration input.

Health check is expected to identify additional opportunities to leverage Ansible to automate management of the OpenShift environment.

Backlog items already include adding OpenShift configuration to source control and integrating provisioning of OpenShift environments from Ansible Tower.



HOW TOMORROW MOVES



RED HAT
SUMMIT

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**‘Management -
What’s New’**
*New products under
development*

Citations

Important Links

Special Thank You to all Content Creators of the following:

- <https://www.ansible.com/>
- <https://www.openshift.com/>
- <https://access.redhat.com/insights/overview/>
- <https://github.com/openshift/openshift-tools/>
- [https://docs.openshift.org/latest/day two guide/index.html](https://docs.openshift.org/latest/day_two_guide/index.html)
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