Automating, Securing, and Managing Cox Automotive's (AutoTrader) Big Data Infrastructure

with Ansible, Insights, and Satellite

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Cox Automotive
Will Nix, Principal Technical Marketing Manager
Red Hat

Summit 2017
Abdi Hersi, Cox Automotive Big Data

Focused on IT infrastructure build and automation processes to deploy and manage Cox Auto’s Big Data infrastructure using Red Hat Platforms

Will Nix, Red Hat Management BU

Converged management solutions for Red Hat’s strategic partners and customers.
AGENDA

RED HAT MANAGEMENT OVERVIEW
WHY AUTOMATE?
BEFORE & AFTER
THE SOLUTION
DISCUSSION / Q & A
MANAGEMENT OVERVIEW
Management Portfolio

**Ansible**
- Automate your IT processes & deployments
  - Simple & powerful language
  - No agents to install
  - Scale with **Ansible Tower**

**Red Hat Insights**
- Prevent critical issues before they occur
  - Continuous Insights
  - Verified Knowledge
  - Proactive Resolution

**Red Hat Satellite**
- Build a trusted & secure Red Hat environment
  - Manage the Red Hat lifecycle
  - Provision & configure at scale
  - Standardize your environment

**CloudForms**
- Deliver services across your hybrid cloud
  - Hybrid cloud management
  - Self-service provisioning
  - Policy-driven compliance
INNOVATION IN A COMPLEX WORLD

Under increasing pressure, businesses need to bring new ideas to market rapidly through:

- Dynamic Platform Development
- Efficient Delivery
- Well Tested Changes
INNOVATION IN A COMPLEX WORLD

The required technology is becoming increasingly complex by nature demanding greater overhead to achieve:

- AVAILABILITY AND STABILITY
- OPTIMAL PERFORMANCE
- CONSISTENT SECURITY

Minimizing that overhead reduces cost and affords innovative focus.
COMPLEXITY IS RISK

80% Percent of commercial application outages caused by software failure and operational complexity

$336k/hr The median cost per hour of downtime for a production application for a large enterprise

$15m/yr Mean annualized cost of cybercrime deference and remediation large US-based corporations

Carnegie Mellon | Gartner | Ponemon Institute
# Management Portfolio

## Ansible by Red Hat

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## Management Portfolio

<table>
<thead>
<tr>
<th>Ansible</th>
<th>RED HAT® INSIGHTS</th>
<th>RED HAT® SATELLITE</th>
<th>RED HAT® CLOUDFORMS</th>
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<tbody>
<tr>
<td>AUTOMATE YOUR IT PROCESSES &amp; DEPLOYMENTS</td>
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<td>DELIVER SERVICES ACROSS YOUR HYBRID CLOUD</td>
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<td>Scale with Ansible Tower</td>
<td>Proactive Resolution</td>
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#redhat #rhsummit
MANAGING INFRASTRUCTURE RISK

Automatic remediation
INTEGRATED INTO THE TOOLS YOU USE

- Works on physical, cloud, and container-based workloads
- No new infrastructure to manage
- Integrated into Satellite 5.7, 6.1+ Cloudforms 4.0+, and the Red Hat Customer Portal
- API available for customer integration
- Insights + TAM drives deeper customer conversations and delivers regular assessments
- Insights + Satellite uses Insights to identify and prioritize risks and Satellite to patch so customers can fix things faster
We have taken a position that, by 2018, 25 percent of the Global 2000 will have deployed an IT Operations Analytics platform (...) up from about 2 percent today.

-WILL CAPPELLI, VP & Research Analyst, Gartner
Identify issues with Red Hat Insights

DIRTY COW

SSLv3

Playbook
... and automate remediations
Add insights = tower video
Management Portfolio

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Infrastructure

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RHEL
Gluster
RHV

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WHY AUTOMATE
Cox Automotive Network
Cox Automotive drives on-time delivery of IT resources

200+ LOCATIONS ACROSS THE GLOBE
WITH 30,000+ TEAM MEMBERS
WHY Build Hadoop Computing Cluster for Cox Automotive?
WHY AUTOMATE?
WHY CI/CD Pipeline?
WHY AUTOMATE?

● Difficult to manage growing infrastructure
● No centralized User authentication
● System provisioning was time consuming
● Configuration management
INFRASTRUCTURE SPRAWL

- Difficult to manage growing infrastructure
  - System provisioning was time consuming
- Many systems in different datacenters and the cloud and networks make difficult to manage
NO CENTRALIZED USER AUTHENTICATION

- Difftakj avbi
  - problem
- User auth
  - Problem
Challenges faced before integrating Cox-Auto Big Data with Ansible

- Significant time consumed during the Kickstart of a system.
- Manually configure (Storage, authentication, Kernel setting parameters, application setting in the conf file such as (ntp, sudoers, ulimit )
- Validate and test the system provision process such ( typos, configs, and etc..)
MANUAL PROVISIONING

● Location (DataCenter)
  ○ Identify where the system will live in

● OS Version
  ○ Identify which Linux OS version will be used (RHEL5.x, RHEL6.x, or RHEL7.x)

● Network and DNS
  ○ Add the appropriate Networking and create a DNS record for the system

● Start the Kickstart Process
  ○ Add system to the DHCP config and create MAC address filename and Symbolic link to the OS images (RHEL5.x, RHEL6.x, or RHEL7.x)
MORE manual provisioning

How we used to do it
CONFIGURATION MANAGEMENT

Configuration management:

Maintaining consistency, how hard it was to manage everything without a management suite and automation.
THAT'S A LOT OF MANUAL WORK
WHY AUTOMATE?

- Difficult to manage growing infrastructure
- Easier to manage infrastructure growth
- No centralized User authentication
- Centralized access control
- System provisioning was time consuming
- Fast deployments
- Configuration management
- Eliminate config drift
Deployed Infrastructure

Provisioning Cox Auto Big Data Infrastructure using
Red Hat Satellite 6 - Demo
OUR SOLUTION
Satellite at Autotrader

What Does Satellite do for Cox-Auto Big Data Infrastructure?

- Centralized location for provisioning BigData instance(s)
  - Automate Provisioning using PXE, Images & Containers

- Our dynamic source of Inventory for the Ansible Tower

- Integrated with Red Hat Insights
  - We can predict and prevent issue before they occur in our Big Data infrastructure and affects our business—And, tells us how to take correct of action
Deployed Infrastructure (Multi-Depart Org)
Deployed Infrastructure (Host Group Profile)

- **Host Group definition by key:** 
  
  ```
  "{{appname}}_{{approle}}_{{sd1c}}"
  ```
## Deployed Infrastructure (RHEL OS Images)

![Deployed Infrastructure (RHEL OS Images)](image)

<table>
<thead>
<tr>
<th>Host</th>
<th>Puppet Classes</th>
<th>Interfaces</th>
<th>Operating System</th>
<th>Virtual Machine</th>
<th>Parameters</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Architecture *</td>
<td>x86_64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Operating system *</td>
<td>RedHat 6.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Provisioning Method *</td>
<td>RedHat 5.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Build mode</td>
<td>RedHat 5.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Media Selection</td>
<td>RedHat 6.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Media *</td>
<td>coxauto_bigdata/Library/Red_Hat_Server/Red_Hat_En...</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Partition table *</td>
<td>bigdata default partitions</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Custom partition table</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Root password *</td>
<td></td>
<td>Password must be 8 characters or more</td>
<td></td>
</tr>
</tbody>
</table>
### Deployed Infrastructure (Global Parameters)

**Puppet class parameters**

<table>
<thead>
<tr>
<th>Puppet class</th>
<th>Name</th>
<th>Value</th>
<th>Use Puppet default</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Global parameters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>appname</td>
<td>hadoop</td>
<td>override</td>
</tr>
<tr>
<td>approve</td>
<td>edgenode</td>
<td>override</td>
</tr>
<tr>
<td>datacenter</td>
<td>sdc</td>
<td>override</td>
</tr>
<tr>
<td>department</td>
<td>CAI - The Force</td>
<td>override</td>
</tr>
<tr>
<td>description</td>
<td>[Freeform: Description of the hostgroup]</td>
<td>override</td>
</tr>
<tr>
<td>environment</td>
<td>bo</td>
<td>override</td>
</tr>
<tr>
<td>os</td>
<td>rhel6,rhel6-custom</td>
<td>override</td>
</tr>
<tr>
<td>rack_location</td>
<td>[Freeform: rack location if physical system]</td>
<td>override</td>
</tr>
<tr>
<td>sdic</td>
<td>ops</td>
<td>override</td>
</tr>
</tbody>
</table>

**Host parameters**

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>rack_location</td>
<td>H3 Zone</td>
</tr>
</tbody>
</table>

**Host Rack Location info**

Global Parameters define key-values pairs to use when provisioning hosts.
Deployed Infrastructure (Ansible-Template)

Provisioning Ansible user during the Kickstart and using Ansible Tower features a provisioning callback mechanism.
Insights at Autotrader

What does Insights do for us?

Deploys automatically on provisioning

Monitors for infrastructure performance and problems

Ensures big data systems meet security and stability standards

Provides zero-day alerts for emerging risks

Ability to automate remediation through Ansible
Ansible Tower at Autotrader

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## Deployed Infrastructure (Callback Feature)

**Inventory**
- `bigdata-inventory`
- Prompt on launch

**Project**
- `usg-bigdata-os-NONPROD`
- Prompt on launch

**Machine Credential**
- `ansprov`
- Prompt on launch

**Cloud Credential**
- `site.yml`

**Network Credential**
- None

**Forks**
- `30`

**Limit**
- None

**Verbosity**
- `0 (Normal)`

**Job Tags**
- None

**Skip Tags**
- None

**Options**
- Enable Privilege Escalation
- Allow Provisioning Callbacks

**Provisioning Callback URL**
- `https://:443/api/v1/job_templates/456/`
Ansible Tower at Autotrader

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Ability to automate remediation through Ansible
• No centralized User authentication
  ■ OneLogin Solution for Cox Auto Hadoop Computing Cluster
OneLogin: CENTRALIZED AUTHENTICATION

1. User Attempt to Access Domain Resource
2. SSSD gets user & group info from AD LDS via Metadirectory URL
3. Kerberos Forwards Authorization Request
4. TGT Kerberos Caching is received and stored in /tmp/krb5cc_*
Continuous Delivery (CICD Pipeline)
AUTOMATION HAS HELPED US

Increase Productivity

Manage Infrastructure growth

Significant time-savings

Maintain consistency
QUESTIONS
THANK YOU

plus.google.com/+RedHat
linkedin.com/company/red-hat
youtube.com/user/RedHatVideos

facebook.com/redhatinc
twitter.com/RedHatNews
LEARN. NETWORK.
EXPERIENCE
OPEN SOURCE.
Deployed Infrastructure

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