IBM i and Red Hat Ansible Automation Platform

Anthony Lin
Senior Specialist
Solution Architect

Chai Mei Yang
Solution Architect

Lew Kok Hui
Specialist Solution Architect
Anthony Lin
Senior Specialist Solution Architect

Anthony was a DevOps engineer from Ericsson working on the AT&T Integrated Cloud/Network Cloud Project. In this role, he has used Ansible to deploy and upgrade more than 50 customized OpenStack cloud clusters across the U.S and international production sites. He is currently working as a regional Cloud Automation Specialist Solution Architect with Red Hat, focusing primarily on Ansible Automation solutions.
Chai Mei Yang
Solution Architect

Mei Yang is a platform Solutions Architect in Red Hat Malaysia. He is responsible for consulting and architect IT solutions encompassing services and technologies in focus areas of Red Hat Platform Solution such as Red Hat Cloud Infrastructure, Red Hat Virtualization, Red Hat Ansible Automation.
Lew Kok Hui
Specialist Solution Architect

Lew Kok Hui is a specialist solutions architect from Red Hat Malaysia, focusing on platform technologies. Lew has been working in IT for 17 years, across Telco and FSI industries and has over 15 years experience in Red Hat Linux and open source projects deployment and integration. With a particular interest in Ansible, containers and kubernetes.
This webinar will cover:

- Overview of Red Hat Ansible Automation Platform
- Overview of IBM i
- IBM i and Red Hat Ansible Automation Platform
- Use Cases
- Q&A
Overview of Red Hat Ansible Automation Platform
Open hybrid cloud

Open hybrid cloud is Red Hat’s recommended strategy for **architecting**, **developing**, and **operating** a hybrid mix of applications, delivering a truly flexible cloud experience with the speed, stability, and scale required for digital business transformation.
Ansible Automation

SIMPLE  AGENTLESS  EXTENSIBLE

Red Hat
Ansible Automation Platform
Top and Trending Python Open Source Projects

Python and its role in open source

Python’s open source community is more than just its members and what they do. It’s also the impact the community makes through an interrelated network of software packages and contributors that rely on Python. By contributing to the Python community, contributors and maintainers help support 266,966 packages, and the work of 361,832 fellow developers and contributors over the previous year from 202 countries and regions.³

This impact is due to the work of the entire Python community, but we would like to recognize the top repositories for their work and support for open source.

Top 10 Python packages with the most unique contributors over the last 12 months

<table>
<thead>
<tr>
<th>No.</th>
<th>Repository</th>
<th>Contributors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>tensorflow/tensorflow</td>
<td>11,138</td>
</tr>
<tr>
<td>2</td>
<td>home-assistant/core</td>
<td>8,162</td>
</tr>
<tr>
<td>3</td>
<td>pytorch/pytorch</td>
<td>5,934</td>
</tr>
<tr>
<td>4</td>
<td>ansible/ansible</td>
<td>5,150</td>
</tr>
<tr>
<td>5</td>
<td>ytdl-org/youtube-dl</td>
<td>4,810</td>
</tr>
<tr>
<td>6</td>
<td>huggingface/transformers</td>
<td>3,557</td>
</tr>
<tr>
<td>7</td>
<td>Azure/azure-cli</td>
<td>3,501</td>
</tr>
<tr>
<td>8</td>
<td>pandas-dev/pandas</td>
<td>3,340</td>
</tr>
<tr>
<td>9</td>
<td>FortAwesome/Font-Awesome</td>
<td>2,990</td>
</tr>
<tr>
<td>10</td>
<td>tensorflow/models</td>
<td>2,580</td>
</tr>
</tbody>
</table>

Source: Octoverse 2020 - GitHub
Ansible – the de facto standard in automation

Massive Growth in Job Openings

More than 46,000+ global openings on LinkedIn reference Ansible or Ansible skills

Seeking Education

AnsibleFest 2020 had more than 30,500 registrations from around the globe

Developer Validation

Top 10 framework on StackOverflow, Ansible #9 on Most Loved

Career Differentiator

The word “Ansible” is included in 2.8% of all United States technology job descriptions
Red Hat Ansible Automation Platform

**Ansible Tower**
- Role-based access control
- Knowledge & visibility
- Scheduled & centralized jobs

**Ansible Engine**
- Open source module library
- Plugins
- Python codebase

**Ansible Playbooks**

**Ansible CLI & CI Systems**

**Cloud.redhat.com**
- Automation hub
  - Certified collections
  - Partner collections
- Automation analytics
  - Performance dashboard
  - Organizational stats
- Services catalog
  - Self-service
  - Governance

**Use Cases**
- Provisioning
- Configuration management
- App deployment
- Continuous delivery
- Security & compliance
- Orchestration

**Automate Your Enterprise**
- Infrastructure
  - Linux, OpenShift, Windows, VMware, Operators, Containers...
- Network
  - Arista, Cisco, Juniper
  - Infoblox, F5...
- Security
  - Checkpoint, QRadar, Snort
  - CyberArk, Splunk, Fortinet...
- Cloud
  - AWS, Google Cloud, Azure, IBM Cloud...
- Services
  - Databases, logging, source control management...
- App development
  - Python VENV, NPM, YUM, APT, PIP...

**Transport**
SSH, WinRM, Network CLI, HTTPAPI
Key Ansible Concepts

**Agentless:** Ansible drives automation without the use of agents installed on the target machines or services. SSH is used for accessing Linux, Windows, network devices, etc alike.

**Declarative:** Ansible favors declaring state, so that automation reconciles the desired state idempotently. The concepts allow for composable modules, with a hierarchy of configuration overrides.

---

**INVENTORY**

```
[web]
webserver1 ansible_host=192.168.100.23
webserver2 ansible_host=192.168.100.24

[db]
dbserver1 ansible_host=192.168.100.33

[switches]
leaf01 ansible_host=192.168.100.1
leaf02 ansible_host=192.168.100.2

[firewalls]
checkpoint01.internal.com
```

* Groups define which hosts playbooks run on
** Inventories may be dynamically pulled

---

**PLAYBOOK**

```
---
- name: install and start apache
  import_playbook: rhel_host.yaml

- name: install and start apache
  hosts: http_servers
  become: yes

  tasks:
    - name: httpd package is present
      yum:
        name: httpd
        state: latest
        tags: ['packages']

    - name: httpd is started
      service:
        name: httpd
        state: started
        tags: ['service_state']
```

* tags allow only certain tasks to be executed

---

**ROLE**

Reusable set of tasks, templates, file, scripts, python scripts, etc that playbooks reference to achieve a desired state.

Roles be bundled as collections allowing multiple associated roles to be consumed together.

---

**AUTOMATION HUB**

A repository of published shared from other developers in your organization, Red Hat, and a large ecosystem of independent software / hardware vendors.

---

**TOWER**

Centralized enterprise execution of Ansible scalably managing jobs, secrets, RBAC, dynamic inventories, multi-step workflows, and collaboration.
Common Ansible Automation Use Cases (1)

- Infrastructure Automation & Orchestration
- ITSM Integration
- CyberArk Integration (AAM - CP/CCP)
- Continuous Integration & Delivery (CI/CD)
- Linux/Windows Servers Compliance & Hardening
- Patch Management
- Public Cloud Automation
- Ansible with HashiCorp Packer and Terraform
- Azure DevOps with Terraform and Ansible
- Database Management
- Disaster Recovery Automation
- Monitoring Tools Integration & Auto-Remediation
Common Ansible Automation Use Cases (2)

- Vulnerability Assessment (VA) Automation
- Antivirus Software Management
- Network Automation
- Windows Automation
- Security & Compliance Automation - Ops Team
- Security Automation - Security Team
- Red Hat Advanced Cluster Management & Red Hat Ansible Automation Platform
- OpenShift Multi-Cluster Management
- Kubernetes Platform Management
- Ansible for Telco - NFVi, RAN & Mobile Core
Overview of IBM i
What is IBM i

- IBM i (integrated) Operating Environment developed by IBM for Power Systems
- Midrange computer platform from IBM
- Runs on IBM Power System
- Replaced i5OS/AS400 Operating System but maintains Application Compatibility
What is IBM i

- Operating System is object based
- Using the block oriental terminal support (IBM 5250)
- Introduce LPAR allow multiple virtual systems to run on single hardware footprint
- Runs Mission Critical Business Applications
Why is IBM i Still in Used

- IBM Power Systems preserve the legendary IBM i performance and reliability.
- There are a good range of IBM i options available.
- Moving away from IBM Power Systems is not worth the expense.
- The IBM i managed cloud provides a complete solution
IBM i and Red Hat Ansible Automation Platform
Ansible support for IBM i

News

Abstract

The article introduces Ansible support for IBM i.

Content

You are in: IBM i > Technology Updates > Systems Management > Ansible support for IBM i

Latest Update

A new release 1.1.2 of Ansible Content for IBM Power Systems - IBM i has been released in both Ansible Galaxy and Red Hat Automation Hub. Please check out the latest information through below links:

IBM i collections in Ansible Galaxy: https://galaxy.ansible.com/ibm/power_ibmi

IBM i collections in Red Hat Automation Hub: https://cloud.redhat.com/ansible/automation-hub/ibm/power_ibmi

Documentation: https://ibm.github.io/ansible-for-ibmi.html
Ansible for IBM i System Requirements

- Python version 3.6 and above installed
- SSH service enabled
- IBM i OS version 7.3 and above

Ansible Automation Platform Requirements

- Ansible engine version 2.9 and above
- Python version 2.7 and above or Python version 3.6 and above
- Power IBM i collection for ansible
Benefit tie the knot between IBM i and Red Hat Ansible

- Centralize the automation tasks using the single pane of the automation tool
- Using the single push button to automate the task automation
- Cross mixture the culture between the Closed Proprietary Software vs Open Source
- Exchange the skills and knowledge between 2 different platform players
Use Cases
Problem Statement

- Manual management via access client solution – 5250 connection
- Had to allocate more resources to handle the manual execution of tasks

Objective

- Reduce execution time
- Improve consistency and ensures deployment integrity
- Optimize human resource allocation
Sample Architecture Overview

- UAT Environment Target Host - IBM i OS v7.3
Terminology

- CL command - control language command
- IBM i access client solution - 5250 emulator [Click here]
How to run Ansible for IBM i

- Power IBM i Collection File Path
- Example Playbook
What we have learnt

- Native CL command vs Programmed CL command (Third party)
- Current Ansible collection script is only supported on Native CL command.
- QShell similar to BASH shell in SSH session.
- QSYS.LIB directory as root mountpoint for CL library in SSH session.
Next steps:

Get started
ansible.com/get-started
ansible.com/tower-trial

Join the community
ansible.com/community

Workshops, training & services
ansible.com/workshops
Red Hat Training
Red Hat Services: Automation Adoption Journey

Share your story
Follow us @Ansible
Friend us on Facebook
Q&A
Thank you

Red Hat is the world’s leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.
Infrastructure Automation

- Repeatable processes to replace or reduce human interaction with IT systems
- Automation software works within the confines of processes, tools, and frameworks to perform tasks with little to no human intervention
- Streamline ongoing infrastructure operations
- Not just singular tasks, but entire workflows of multiple branching tasks
What kind of IT tasks and processes can be automated?
Types of Tasks to Automate

- Managing physical servers/networks, virtual/cloud environments
- Deploy standard operating environments
- Application lifecycle management
- Ongoing operations across your environment e.g. user/access management, troubleshooting/debugging, inventory management
How does holistic IT automation impact the business?
Organizations that deployed a holistic automation platform experience...

- 26% faster application patching\(^1\)
- 20% more efficient application security management\(^1\)
- 25% more efficient application configuration management\(^1\)

How IT Automation Impacts your Business

▸ Reduce human errors
▸ Unify not only processes but people
▸ Consolidated foundation on which multiple people can automate consistently
▸ Efficiently manage and share automation content across your organization
▸ Unified platform encourages teams to collaborate and share automation assets, best practices, and learnings
Faster bug discovery

Reduce deployment time

Break down knowledge silos

Align IT with the business

Faster provisioning

Increase time for innovation and strategy

Deploy more often and more reliably

Reduce shadow IT

Deploy automated patching

Transform your IT with infrastructure automation

Increase cross team collaboration
How does Red Hat Ansible Automation Platform bring your IT automation and teams together?
Red Hat Ansible Automation Platform: Brings IT Automation and Teams together

- Single framework to automate all aspects of your infrastructure, from servers and network devices to operating systems, application, and security
- Modules connect your existing automation tools and processes with a common language
- Agentless, enabling automation of components without installing automation software on them
- Includes monitoring and logging capabilities to help you understand and manage how automation is used across your organization
- Certified and supported automation content via Ansible Automation Hub
What comes next?
Start small and get an early win

- Create read / check only automation
- Move to simple jobs
- Iterate and test frequently
- CI/CD vital - all changes should be tested end to end as development happens, not after
What comes next?

- Red Hat Services’ Automation Adoption Journey guides customers through the culture, platform, and portfolio changes required to adopt and realize the benefit of enterprise-wide automation.
- The Journey provides a hands-on services engagement to iteratively deploy and manage a portfolio of workflows and orchestrations while simultaneously driving cultural change in evolutionary steps.
- The journey is aimed at helping customers develop self-sufficiency and ultimately realize the benefits of automation at scale across the enterprise.
MAKE THE MOST OF RED HAT
CONNECTING PLATFORMS, PROCESS, AND CULTURE TO ACCELERATE VALUE IN AN OPEN WAY

WHAT
exists for customers today
AGING TOOLS, SKILLS, AND TECHNOLOGY

WHY
customers need change
AGILITY, COMPETITIVE THREAT, MARKET OPPS
MAKE THE MOST OF RED HAT
CONNECTING PLATFORMS, PROCESS, AND CULTURE TO ACCELERATE VALUE IN AN OPEN WAY

WHAT
exists for customers today
AGING TOOLS, SKILLS, AND TECHNOLOGY

HOW
Red Hat Consulting
BRIDGES THE GAP

WHY
customers need change
AGILITY, COMPETITIVE THREAT, MARKET OPPS

Proven practices and unmatched expertise from the source enables you to build skills while accelerating adoption and time to value
Automation adoption

Empower business transformation with highly scalable automation, orchestration of capabilities, and evolved ways of working in a culture of collaboration.
Foundation of the journey
Automation adoption is centered on these three (3) themes:

- **Use case documentation**: Most organizations do not have the time or take the time to properly document their automation use cases with all the required information, such as dependencies, integration points, personas involved and (most importantly) with an ROI ranking.

- **Break automation into smaller chunks**: Embracing the concept that it is OK to break automation use cases into small chunks with limited functionality, instead of going for it all at once. The "foundational use case" is how we quickly demonstrate the value in this method.

- **Cultural transformation**: To realize enterprise-wide automation, change in approach, communication, and collaboration is essential. Helping organizations adopt open practices and create internal Communities of Practice is how we initiate and sustain transformation.
Navigate

An overarching strategy is drafted to identify objectives and address process, tooling, and skill gaps with measurable outcomes.

Foundation

An initial set of workflows is automated and deployed in production, managed by a cross-functional "Adoption Pilot Team" using Ansible Automation Platform.

Integrate

A set of standardized workflows is integrated with initial operational or business support systems for increased oversight, orchestration, or other benefits.

Accelerate

An "Adoption Core Team" guides cross-functional initial automation teams in standardizing and applying automation approaches across projects and processes.

Optimize

Organization-wide automation teams rapidly launch, combine, and enhance workflows and orchestrations to meet changing requirements.

<table>
<thead>
<tr>
<th>Increment 0</th>
<th>Increment 1</th>
<th>Increment 2</th>
<th>Increment 3</th>
<th>Increment 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Navigate</td>
<td>Foundation</td>
<td>Integrate</td>
<td>Accelerate</td>
<td>Optimize</td>
</tr>
</tbody>
</table>

Transform your IT with infrastructure automation

Automation adoption journey map

Translating theory into practice and plan
### Automation maturity

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aware</strong></td>
<td><strong>Standardized</strong></td>
<td><strong>Proactive</strong></td>
<td><strong>Institutionalized</strong></td>
<td><strong>Optimized</strong></td>
</tr>
<tr>
<td>- Minimal automation</td>
<td>- Automation addresses specific pains</td>
<td>- Automation targets defined / measured</td>
<td>- Roadmap scaled across the institution</td>
<td>- Automation becomes adaptive to the processes being automated</td>
</tr>
<tr>
<td>- Individual driven</td>
<td>- Team / project-driven</td>
<td>- Expertise driven</td>
<td>- Organization driven</td>
<td>- Self learning, self healing, and auto-optimization methods in place</td>
</tr>
<tr>
<td>- Typically script based</td>
<td>- Reactive in nature</td>
<td>- Proactive in nature</td>
<td>- Automation realized with portfolio of platforms and tools</td>
<td></td>
</tr>
<tr>
<td>- Some tools adopted, no formal evaluation</td>
<td>- Platform and tools evaluated / adopted</td>
<td>- Roadmap specified</td>
<td>- Automation becomes way of working</td>
<td></td>
</tr>
<tr>
<td>- Experimentation</td>
<td>- Level 1 Feedback</td>
<td>- Process re-engineering</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Governance</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Transform your IT with infrastructure automation
Value of automation maturity

Transform your IT with infrastructure automation

Effort per change

Speed
Scale
Reliability

Level 1: Aware
Level 2: Standardized
Level 3: Proactive
Level 4: Institutionalized
Level 5: Optimized