Red Hat Training and Certifications

[RH294]

Red Hat Enterprise Linux Automation with Ansible

Sanjay Singh
RHCA, RHCI, RHCX
sisanjay@redhat.com

Red Hat

Introduction

Debriefing ...

- Course introduction
- Course objectives
- Setting Expectations for this training

Red Hat

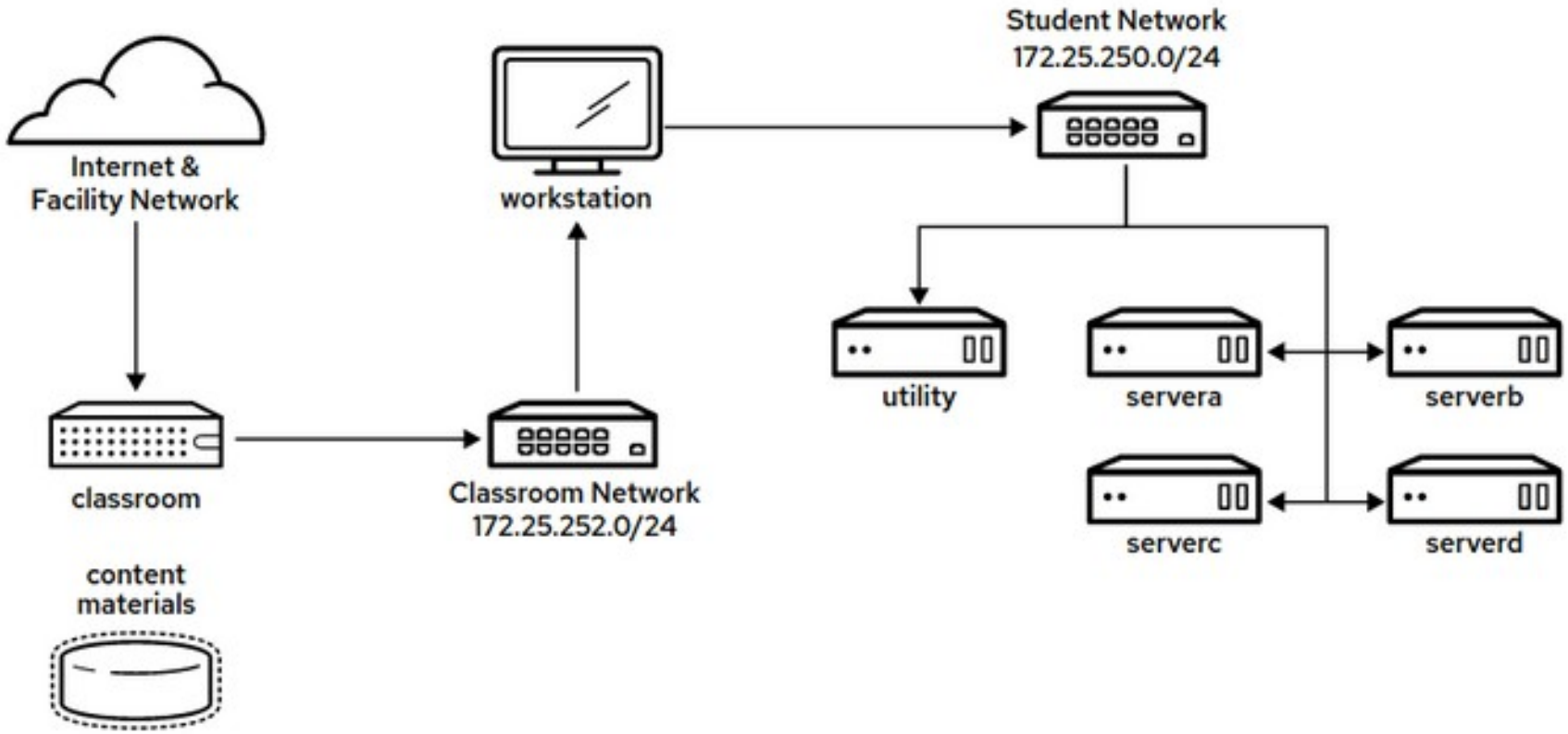
Setting Expectations …

- Basic RH Systems Administration Knowledge
- Linux familiarity
- Ability to work with the command line
- Lots of typing and formatting playbooks
- Can be … Stressful 5 days
  - Fast pace
  - Long lectures on new and existing concepts
  - Lots of GE’s (Guided exercises)
  - Limited time to complete GE’s
  - Limited breaks
- LAB’s to be done outside training hours

Red Hat

RedHat Online Learning Environment (ROLE)

LAB – Network Diagram



Red Hat

To DOs ...

- Introducing the ROLE environment
- Download of Student Guide PDF
- Introducing the lab environment
- Accessing the LABS

Red Hat

AGENDA

Session Plan

DAY 1
Chapter 1 – Introducing Ansible
Chapter 2 – Implementing an Ansible Playbook

DAY 2
Chapter 2 – Implementing an Ansible Playbook (Contd.)
Chapter 3 – Managing Variables and Facts
Chapter 4 – Implementing Task Control

DAY 3
Chapter 4 – Implementing Task Control (Contd.)
Chapter 5 – Deploying Files to Managed Hosts

DAY 4
Chapter 6 – Managing Complex Plays and Playbooks
Chapter 7 – Simplifying Playbooks with Roles and Content collections

DAY 5
Chapter 8 – Troubleshooting Ansible
Chapter 9 – Automating Linux Systems Administration Tasks

Red Hat

Chapter 1 – Introducing Ansible.

Automating Linux Administration with Ansible

Red Hat

Once upon a time, we had shell **scripts** and **SSH** loops

Red Hat

then it got
complicated …

then came a TON of automation tools BUT...

this is what we want:

No more daemons

No more agents

Not another PKI

Not another Server

No more ports

No databases

Automation should not require programming experience; it MUST [RFC 2119] be easy

compréhansible

Welcome to Ansible

What is Ansible?

Open source Automation Platform

- Describes an IT Application infrastructure in a playbook
- Automation Engine that runs playbooks

Simple

- Playbooks provide human-readable automation. No Code
- Get productive fast

Powerful

- Deploy Applications, CI/CM, Workflow Automation
- Network Automation, Orchestrate Application Life Cycle

Agentless

- Uses OpenSSH, No expensive servers and agents
- Pushes modules to complete tasks, Pull also possible

Red Hat

Ansible Strengths

Cross Platform

- Agentless support for Linux, Windows, Unix, Network devices in Physical, Virtual, Cloud and Container environments

Human-Readable

- Playbooks written in YAML which is English-like. This ensures consistent understanding across teams.

Documentation

- Playbooks are self documenting your IT environment

Easy to manage

- Ansible playbooks and projects are plain text and can be placed in a version control system

Red Hat

Ansible Strengths (Contd.)

Dynamic Inventories

- Integrates well with cloud environments to support dynamic inventories

Orchestration

- Integrates with other leading systems like, HP SA, Puppet, Jenkins, Chef, Red Hat Satellite Server

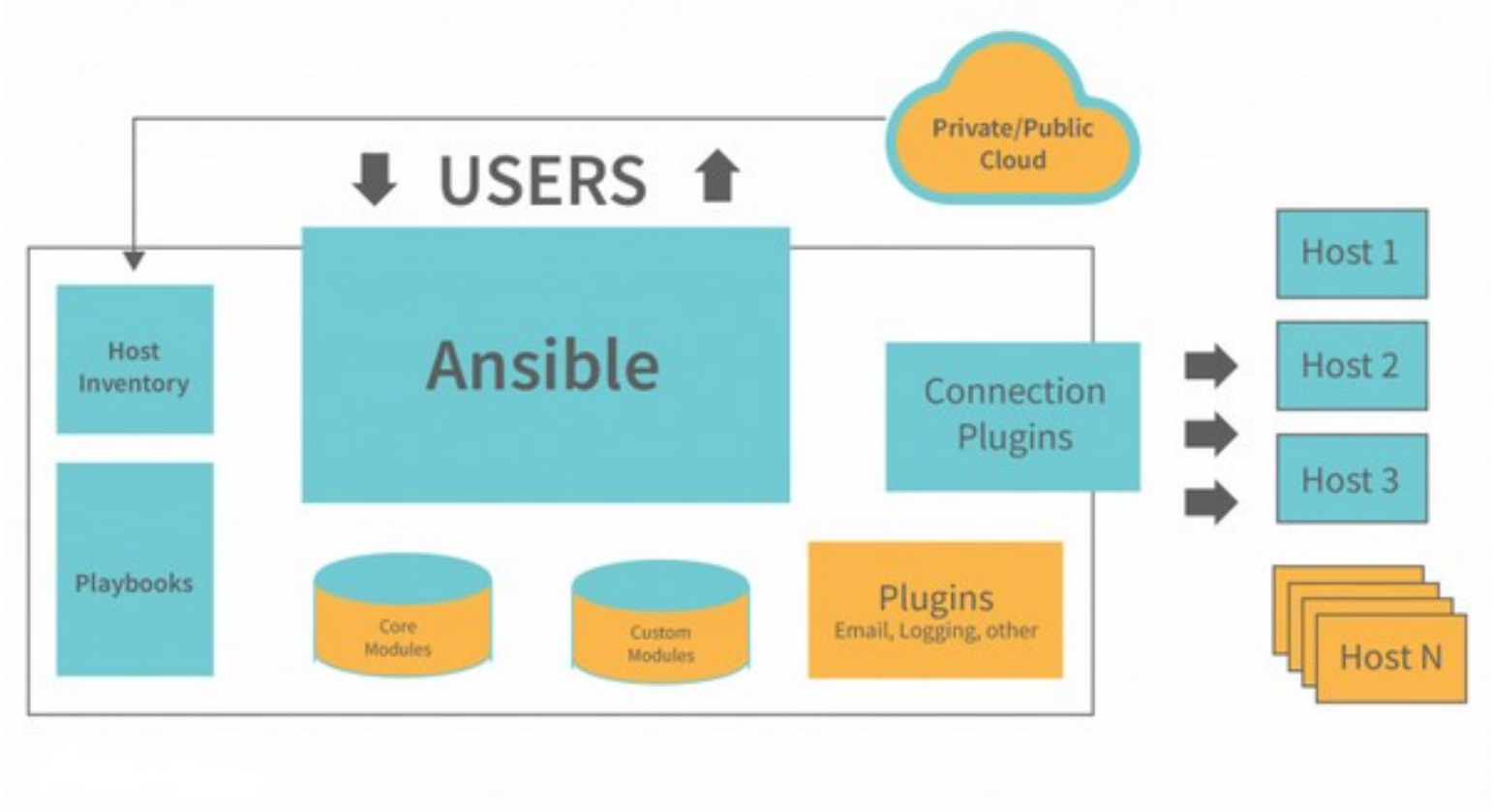
COMMUNICATIONS IS THE KEY TO DEVOPS

Ansible is the first automation language that can be read and written across IT

Ansible automation engine is capable of automating the entire application life cycle and continuous delivery pipeline

Red Hat

Ansible Architecture



Red Hat

Ansible Use-Cases

Configuration Management

Application Deployment

Provisioning

Continuous Delivery

Security and Compliance

Orchestration

Red Hat

QUIZ

Installing Ansible

How do you get Ansible?

You can obtain the Ansible software in three different ways:

- From the upstream community (Free - no support)
- As part of Red Hat Enterprise Linux (RHEL Subscription - limited support)
- As Red Hat Ansible Automation Platform product (AAP Subscription – full support)

Red Hat

1. Upstream Community - Ansible

Open source Ansible generally refers to Ansible created by the upstream community

The upstream Ansible community develops Ansible and distributes versions of it in two ways:

As ***Ansible Core***

- This is a minimalist component that consists of the core runtime that can interpret Ansible content
- Shipped with the `ansible.builtin` Ansible Content Collection which has a basic set of modules and plugins

As ***Community Ansible***

- Distribution of Ansible Core plus a selection of Ansible Content Collections selected by the open source community

Neither of the upstream community version of Ansible is supported by Red Hat

Lastly, open source ansible-core with the required content collection can be used to develop any kind of automation code. It has no limitations and comes in with a fully functional Ansible automation tool set. The possibilities are endless.

Red Hat

Installing Community Ansible

Open source Ansible created by the upstream community can be installed using Python pip

- Installing ***Ansible Core***

  $ pip install --user ‘ansible-core<2.14’

  NOTE: Installs ansible-core 2.13 with the ansible.builtin Ansible content collection

- Installing ***Community Ansible***

  $ pip install --user ‘ansible’

  NOTE: Installs the latest version of Ansible Core with a complete set of community selected Ansible content collections

  $ pip install --user ‘ansible<2.10’

  NOTE: Installs the last legacy version of Ansible 2.9 with a complete set of modules and plugins

Red Hat

2. RHEL – Ansible Core

Ansible Core is shipped with RHEL as part of the appstream repository with limited support

This Ansible is intended to enable support for any automation code created and shipped by Red Hat to support the RHEL operating system or a specific Red Hat product. The scope for support is limited to:

- System roles included in the rhel-system-roles package
- Red Hat Insights remediation playbooks
- OpenSCAP compliance Ansible Playbooks

Any other use cases is outside the scope of support.

Lastly, ansible-core with the required content collection can be used to develop any kind of automation code. It comes in with a fully functional Ansible automation tool set. The possibilities are endless.

Red Hat

Installing ansible-core on RHEL

Ansible Core is shipped with RHEL repositories and can be installed with a yum or a dnf command

- Installing ***Ansible Core*** on RHEL < 8.6

  $ sudo dnf install epel-release

  $ sudo dnf install ansible-core

  NOTE: Installs ansible-core with the ansible.builtin Ansible content collection

- Installing ***Ansible Core*** *on* RHEL >=8.6 and RHEL 9

  $ sudo dnf install ansible-core

  NOTE: Installs the latest version of Ansible Core with ansible-builtin content collection

Red Hat

3. Red Hat Ansible Automation Platform

Ansible Automation Platform is a fully supported suite of tools consisting Ansible Core, certified and supported content collection, container focused tools, Automation Controller, and set of cloud services.

Ansible Core

Ansible Core provides a basic set of command-line tools to drive automation. It provides the basic functionality used to run Ansible Playbooks. It defines the automation language that is used to write Ansible Playbooks in YAML text files.

Ansible Content Collection

Ansible Content Collections are a distribution format Ansible content that contains modules, roles and plug-ins around specific technologies and systems administration.

Red Hat

Automation Execution Environment

An automation execution environment is a container image that contains Ansible Core, Ansible Content Collections, Python libraries, operating system binaries and other dependencies needed to run your playbook

Red Hat

New Container focused tools

Automation Content Navigator

- Represented as the ansible-navigator command line tool
- Development tool that runs playbooks by using the automation execution environments
- Integrates, replaces and extends the functionality of existing command-line tools such as ansible-playbook, ansible-inventory, ansible-doc, ansible-config commands

Execution Environment Builder

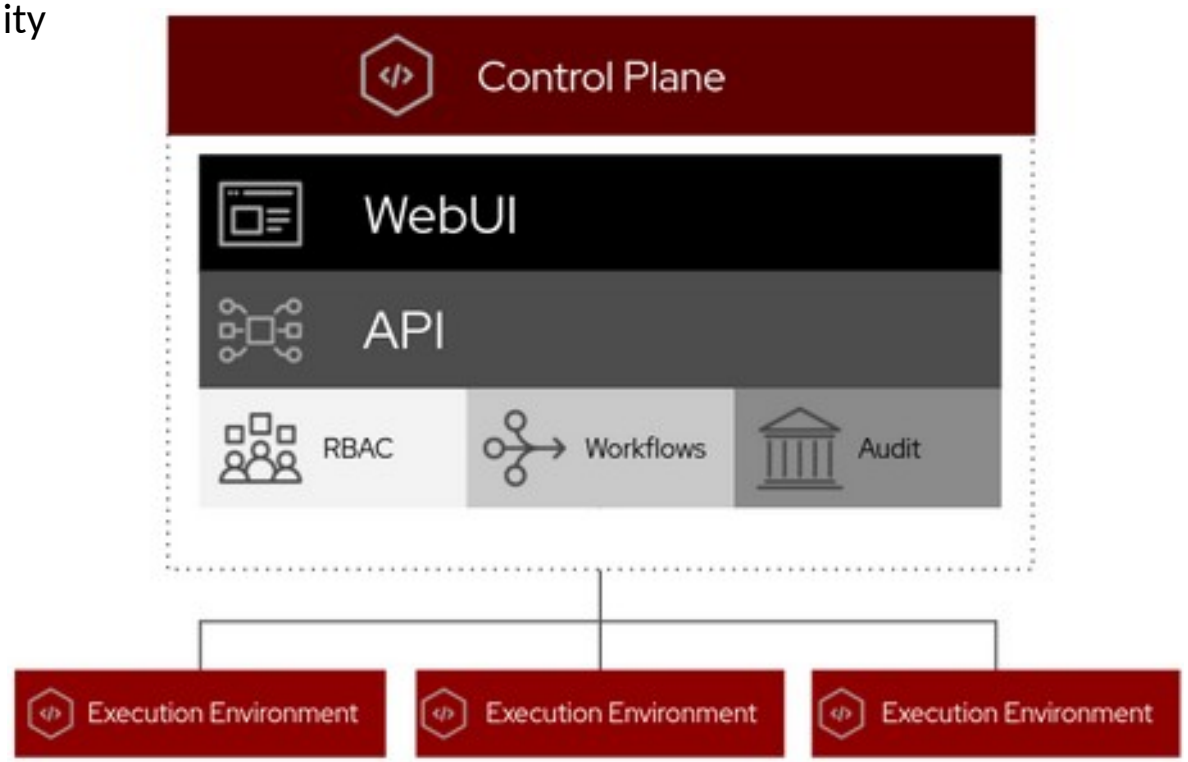
- Utility that helps create an automation execution environment that replaces build and deploy of Python venv's using containers
- Since AEE are containers they are easy to ship and use and make tower administration easy.
- Represented as the ansible-builder command line tool

Red Hat

Automation Controller

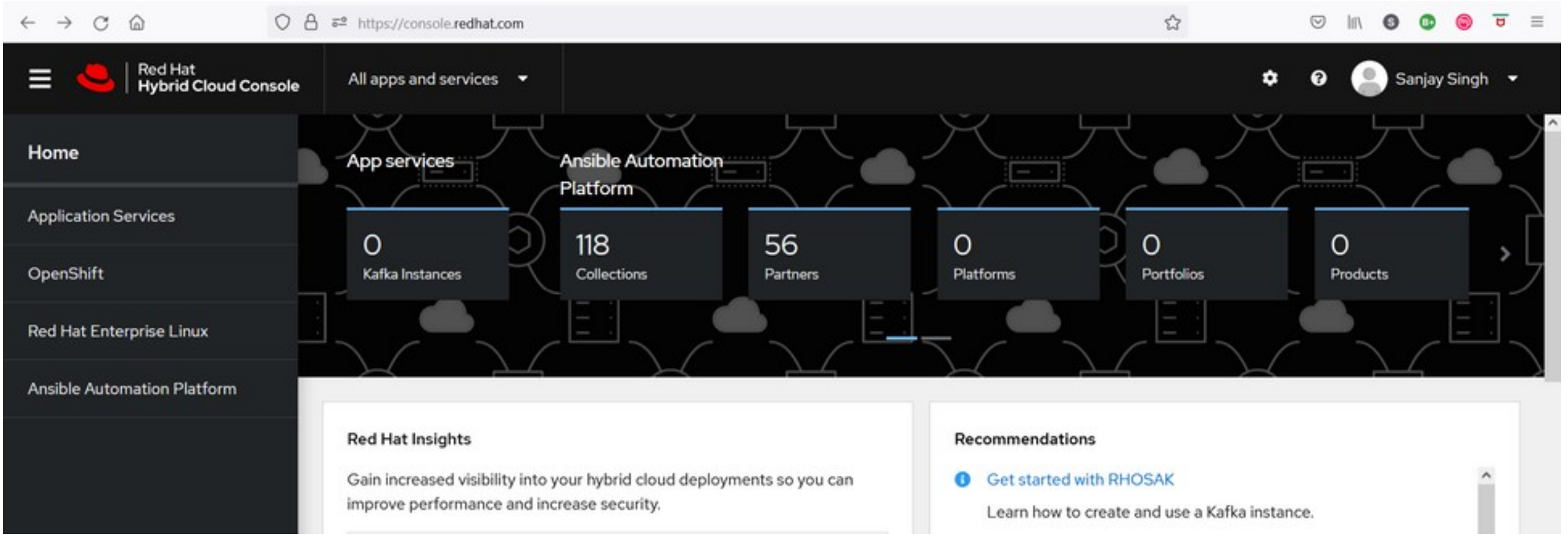
Automation Controller

- Erstwhile Ansible Tower product
- Is now the control plane only. Provides for RBAC, Workflows, Security and CI/CD pipelines
- Ensures efficiency and flexibility



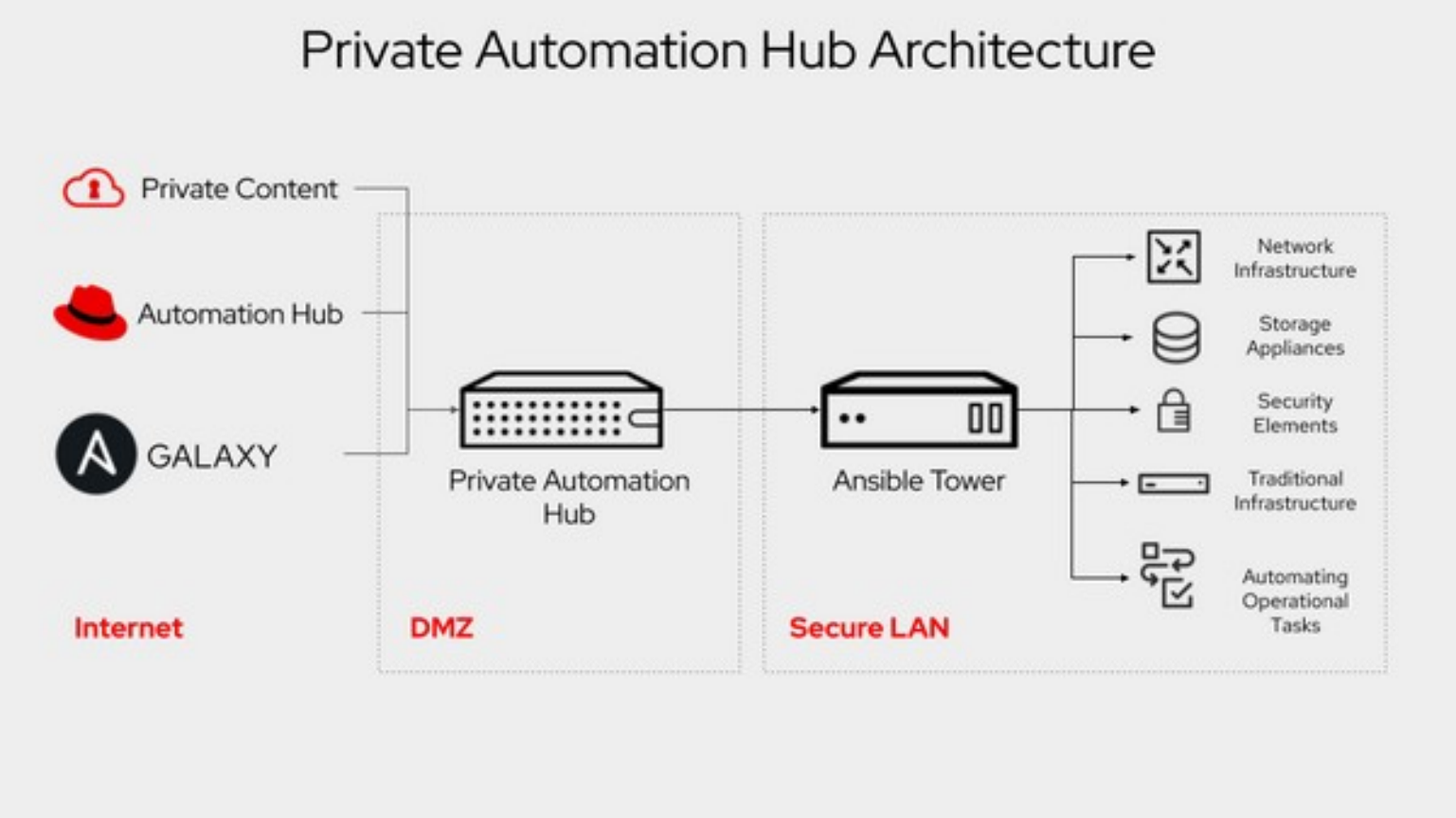
Red Hat

Ansible Automation Hub



Red Hat

Private Automation Hub



Red Hat

Hosted Services

Red Hat Insights

- Allows you to measure the success of running automation code
- Help evaluate the positive impact of automation

Automation Services Catalog

- Allows non-technical users to trigger automation
- Simplifies the processes needed for users to consume IT resources, by fostering self-service mechanisms that implement approvals and governance based on ITSM standards

Red Hat

Installing Ansible Automation Platform

Dev environment = Ansible Core + Content collections

- Installing ***Ansible Core*** on RHEL < 8.6

  $ sudo dnf install epel-release

  $ sudo dnf install ansible-core

  NOTE: Installs ansible-core with the ansible.builtin Ansible content collection

- Installing ***Ansible Core*** *on* RHEL >=8.6 amd RHEL 9

  $ sudo dnf install ansible-core

  NOTE: Installs the latest version of Ansible Core with ansible-builtin content collection

- Installing Ansible Content Collection

  $ ansible-galaxy collection install ansible.posix

  NOTE: Installs the ansible.posix content collection

Red Hat

Installing Ansible Automation Platform

Dev environment = Ansible Navigator + Automation Execution Environment

- Installing ***Ansible Content Navigator*** on RHEL 8

  $ subscription-manager attach --pool=<sku-pool-id>

  $ sudo subscription-manager repos --enable ansible-automation-platform-2.2-for-rhel-8-x86_64-rpms

  $ sudo dnf install ansible-navigator

  NOTE: Installs the latest version of the ansible-navigator command-line tool collection

- Installing Automation execution environment

  $ podman login registry.redhat.io -u <user_id> -p <password>

  $ podman pull registry.redhat.io/ansible-automation-platform-22/ee-supported-rhel8

  NOTE: Installs the ee-supported-rhel8 container image for the AAP 2.2

Red Hat

Thank You

Systems Automation is now *Easy*!!!

Credits:

- Ansible by Jan-Piet Mens, April 2013
- Ansible 2.0 Workshop by Marco Berube, Michael Lessard © Red Hat Inc.
- RH294 – Automation with Ansible © Red Hat Inc.