Manage Power machines with Ansible

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Principal Specialist Solutions Architect

Red Hat

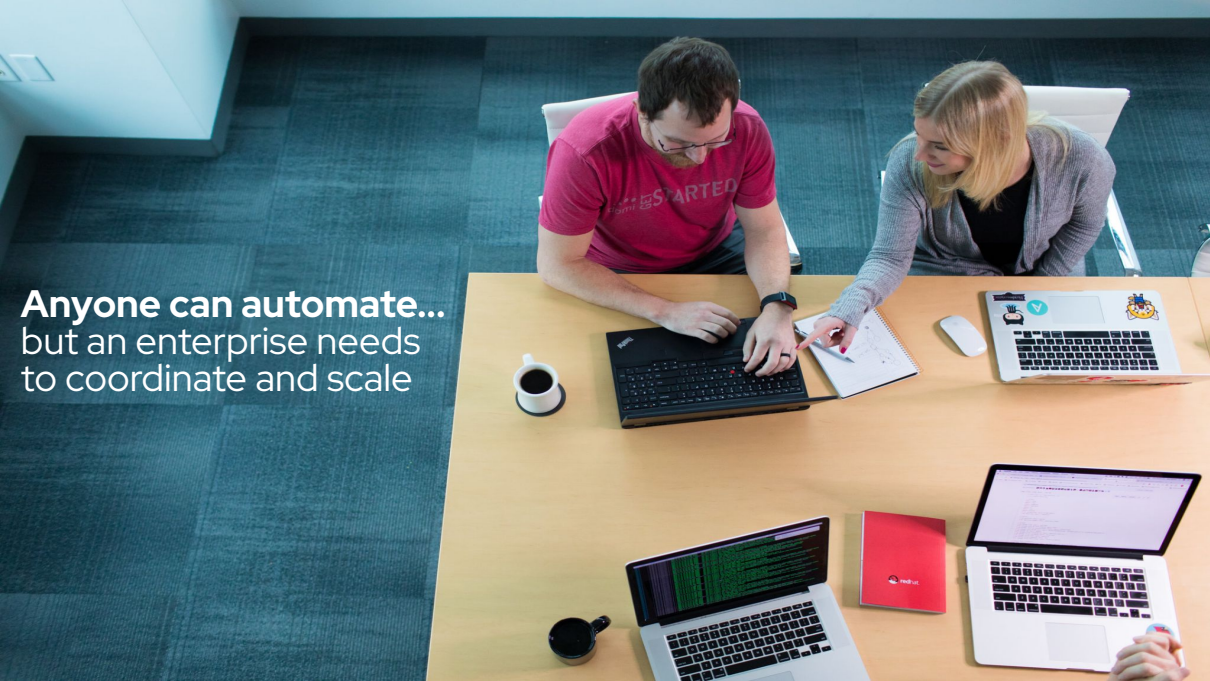
TOC

About me

- Working in IT since 2004, mostly in operations roles
- Active in open source (e.g.: Fedora FESCo)
- Ansible user since 2013
- Author of 5 books, 4 of which on Ansible
- EMEA Principal Specialist Solution Architect for Ansible @ Red Hat

Automation


Automation happens when one person meets a problem they never want to solve again

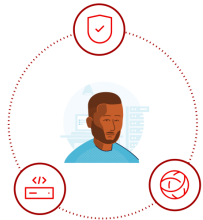

Anyone can automate...
but an enterprise needs
to coordinate and scale

Many organizations share the same challenge

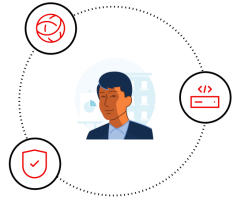
Too many unintegrated, domain-specific tools

Network ops

SecOps



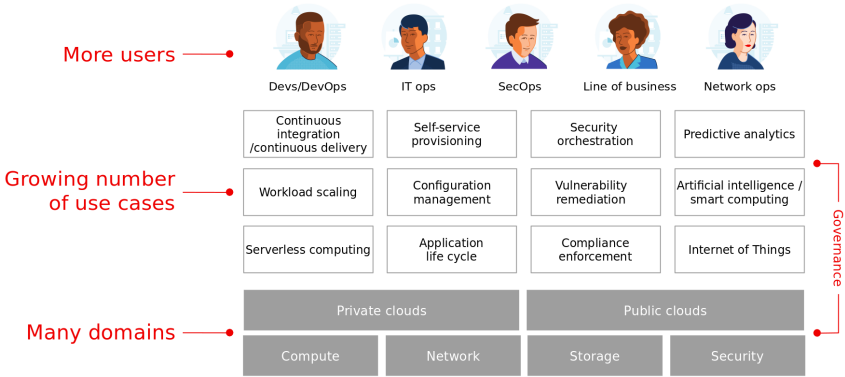
Devs/DevOps



IT ops

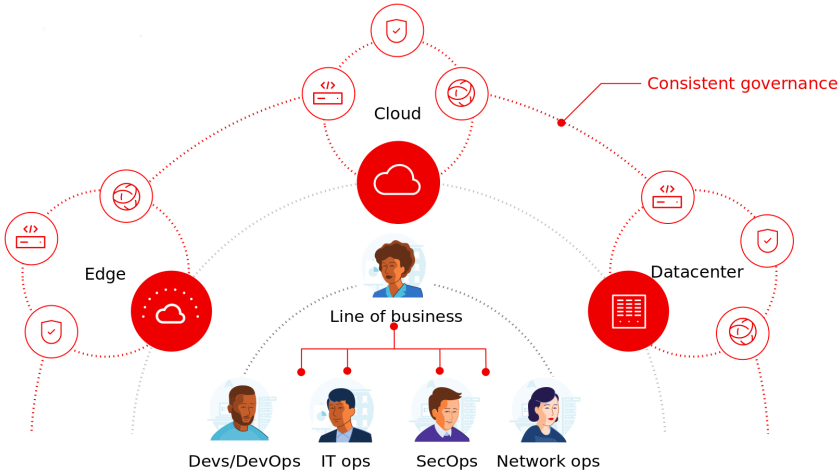
Many organizations have a problem

Too many unintegrated, domain-specific tools



Break down silos

Different teams a single platform



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Idempotence

Definition

Idempotence is the property of certain operations in mathematics and computer science, that can be applied multiple times without changing the result beyond the initial application.

Idempotent examples:

- $X = 100$ (always 100)
- $X = X^0$ (always 1)
- echo "TEST" > /root/example

Non-idempotent examples:

- $X = X * 2$
- echo "TEST" » /root/example

Idempotence - tricky/edge cases

- yum update
- yum install ...
- wget ...
- echo "$x" > /root/test

Ansible

Ansible

- Open Source
- Mainly push mode (agent-less)
- Infrastructure as Data (in YAML format)
- Very gentle learning curve
- Very readable code
- Collections to support code-reusability
- Ecosystem

Ansible key concepts

- **Host**: target of the execution
- **Group**: group of hosts
- **Inventory**: collection of Hosts and groups of Hosts
- **Module**: code to control system resources, like services, packages, or files (anything really), or handle executing system commands
- **Task**: instance of a Module
- **Role**: way to abstract a collection of tasks that has a specific role and is idempotent
- **Playbook**: multiple Tasks and Roles that could be idempotent (or not) in a single file
- **Collection**: multiple Modules and Roles distributed as a single bundle
- **Execution Environment**: a container containing the ansible executable, the collections, and needed libraries

Inventories

- **static**: human compiled (and maintained) lists
- **dynamic**: populated at runtime by a script
  - Amazon web Services
  - Azure
  - Digital Ocean
  - Google Cloud Engine
  - OpenStack
  - Many more
  - **Bring your own!**

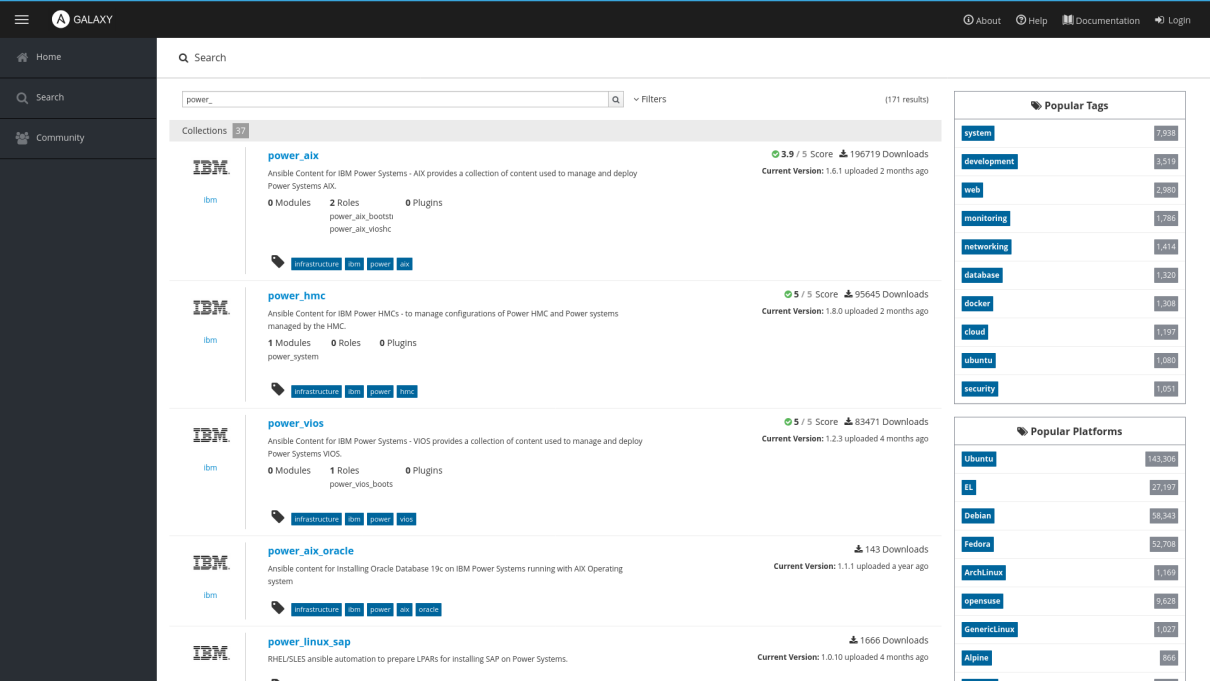
Ansible Playbook

```
---
 - hosts: all
   become: True
   tasks:
     - name: Ensure httpd is installed
       ansible.builtin.package:
         name: httpd
         state: latest
     - name: Ensure httpd is started
       ansible.builtin.service:
         name: httpd
         state: started
```

Collections

Collections are a data structure containing automation content:

- Modules
- Playbooks
- Roles
- Plugins
- Documentation
- Tests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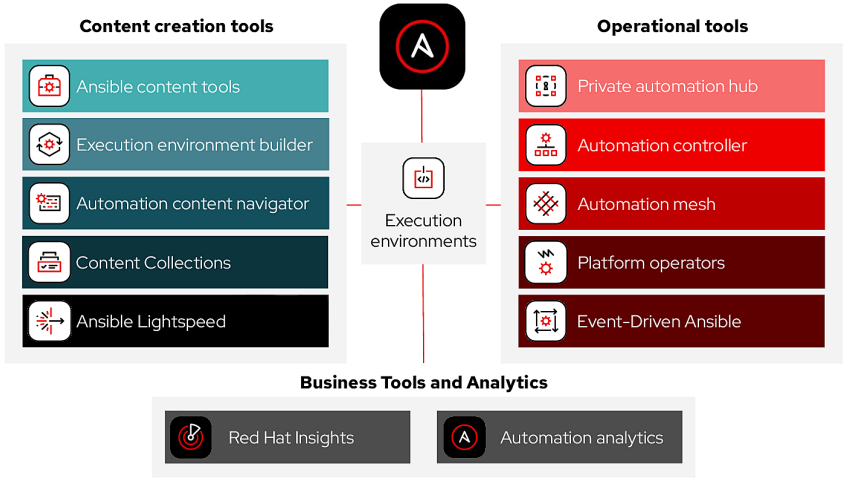
Ansible in numbers

- **55k+ commits** to the Ansible project
- **5k+ contributors** to the Ansible project
- **31k+ repositories** on GitHub depend on ansible/ansible
- **19th on the list** of key software engineer skills in 2023[1]
- **3k+ customers** (Red Hat versions only)

[1]Source Stackoverflow 2023 Developer Survey

From a tool to a platform

The Ansible Automation Platform



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Ansible Automation deployment options

Red Hat Enterprise Linux

Red Hat Enterprise Linux 8.6+ x86_64 (physical, virtual)

Red Hat OpenShift

Red Hat OpenShift via dedicated Ansible Automation Platform operator (physical, virtual)

Self Managed (on-premises or cloud)

Azure

On Microsoft Azure marketplace

Customer deployed Managed by Red Hat*

aws

On AWS marketplace

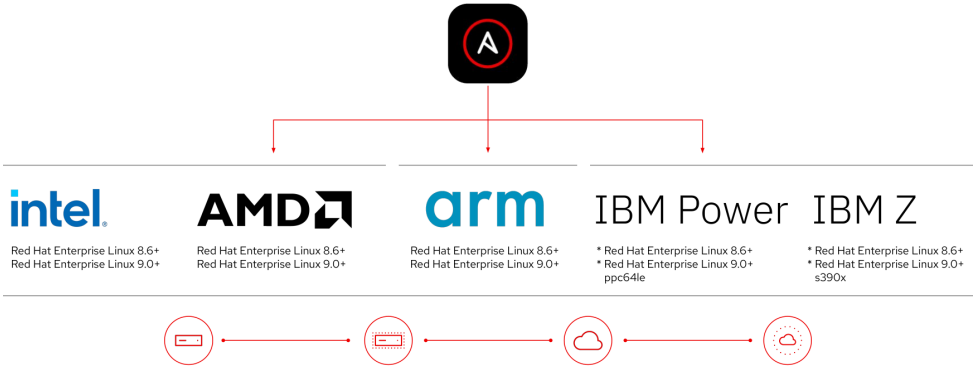
Google Cloud

On Google Cloud marketplace

Customer deployed, Self-managed

Red Hat

Ansible Automation Platform architectures options



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Holistic automation for your enterprise

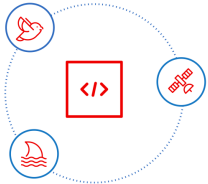
- Create
- Operate
- Consume

Create

Many technologies, different life cycles

How to keep runtime environment, collections, and dependencies aligned?

Collections

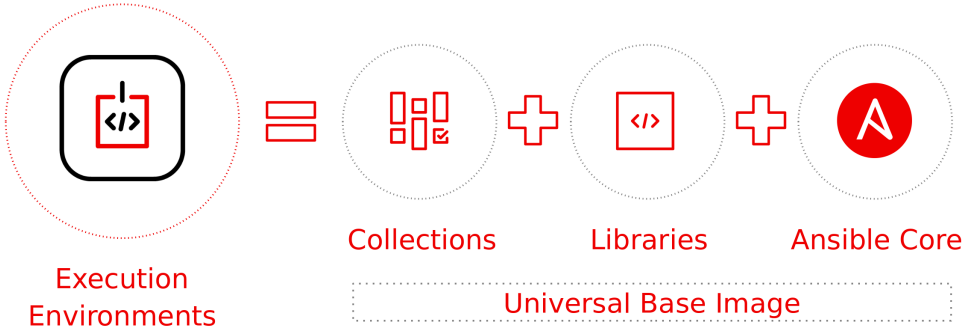


Dependencies

Runtime

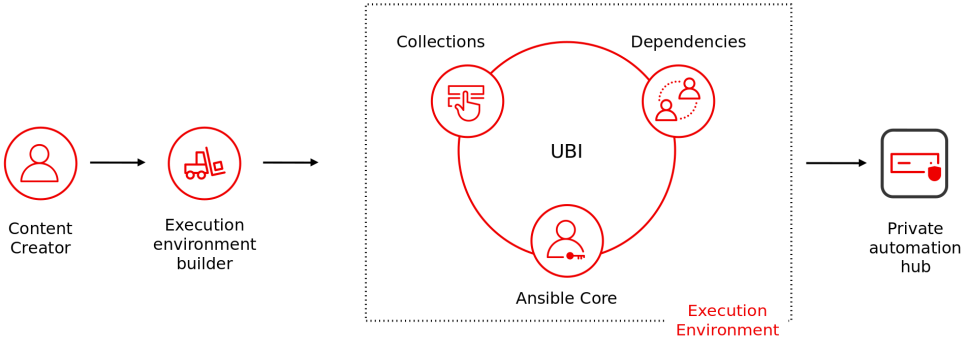
Automation Execution Environments

Components needed for automation, packaged in a cloud-native way



Build, create, publish

Development cycle of an automation execution environment



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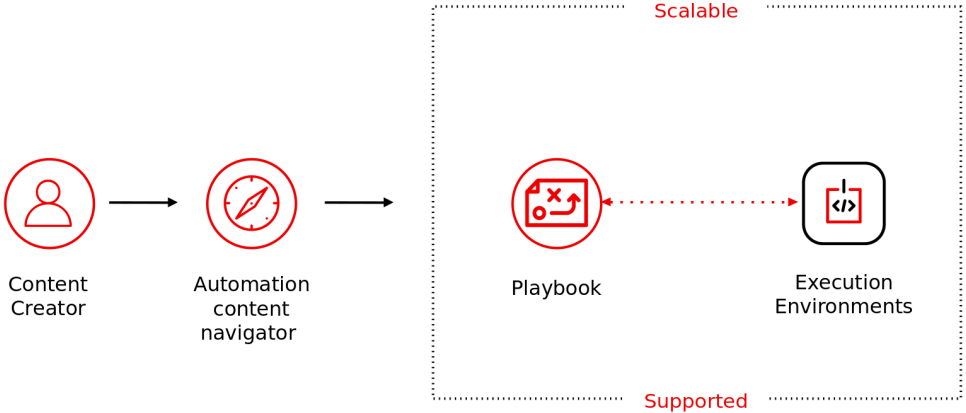
Develop, test, run

How to develop, test and run containerized Ansible content



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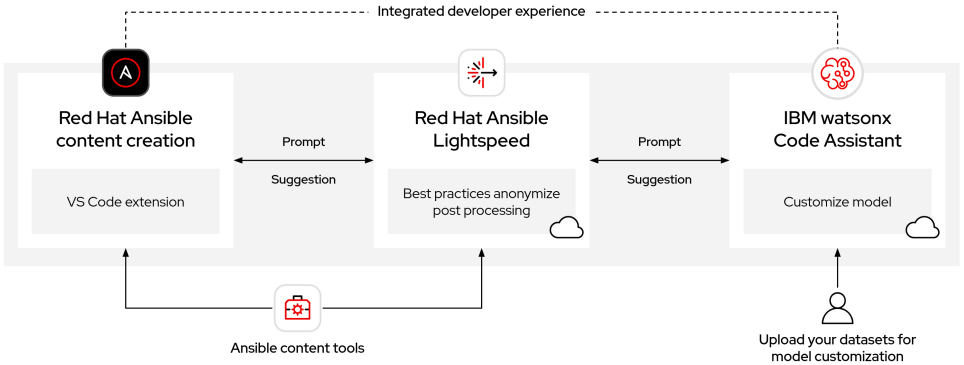
Why is not everything automated?

- Too much time required to automate processes
- Not enough people are able to create automation
- Difficult to find and reuse code

Generative AI has the potential to transform enterprise automation

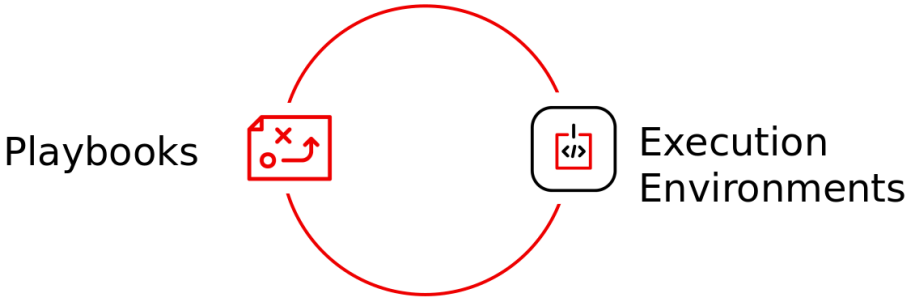
- **Enhance productivity**: With AI-generated code recommendations that are more accurate, more reliable, and integrated into your automation developers' existing Ansible workflows.
- **Expand who can create**: By reducing barriers to entry for automation code creation, and empowering automation SMEs with basic coding knowledge to translate their expertise into clean, compliant YAML code for Ansible Playbooks.
- **Extend trust and compliance**: With an automation code base that adheres to accepted Ansible best practices, options to customize data models, and significant data safeguards in place.

Ansible Lightspeed with IBM Watsonx Code Assistant

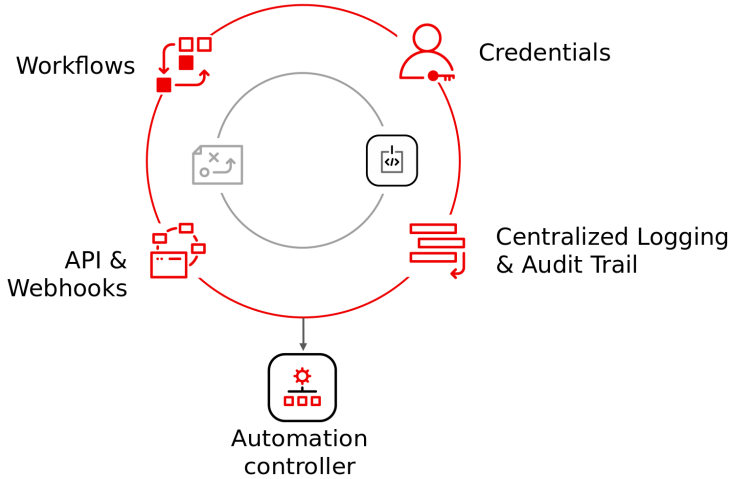


Operate

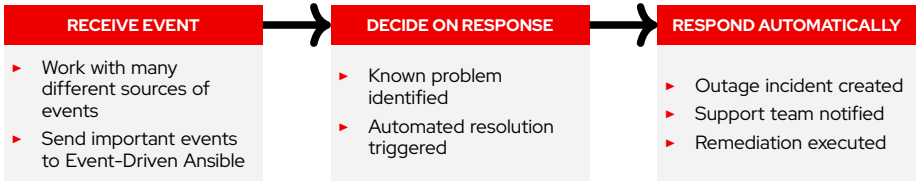
Components of Automation



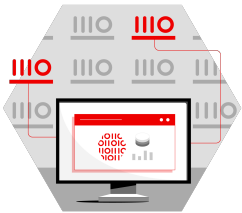
Anatomy of Automation Operation



Automate event workflow

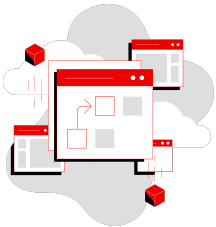


Key building blocks in EDA



Sources

All the sources of event data you want to use



Rules

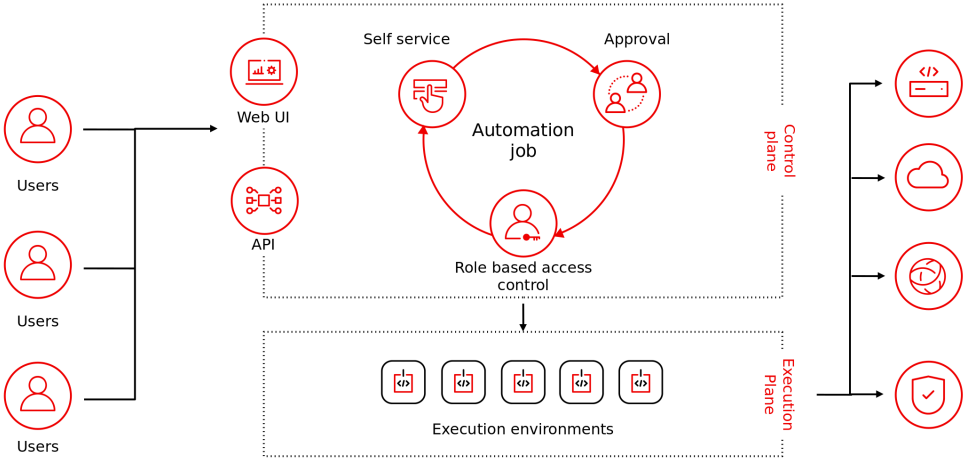
What you will create using Event-Driven Ansible

Actions

When a condition or event is met, the Ansible Rulebook executes

Consume

Full architecture



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Wrapping up

Wrapping up

- Automation is key to simplify and optimize IT operations
- A single automation platform will provide more value, by being shared
- An automation platform requires way more than just an automation tool
- Ansible has a full ecosystem that allows it to be a full automation platform

Thank you

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