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Modernize operations with Red Hat Ansible Automation Platform

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PT

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MUSCULAR DYSTROPHY UK
OUR MUSCLES MATTER

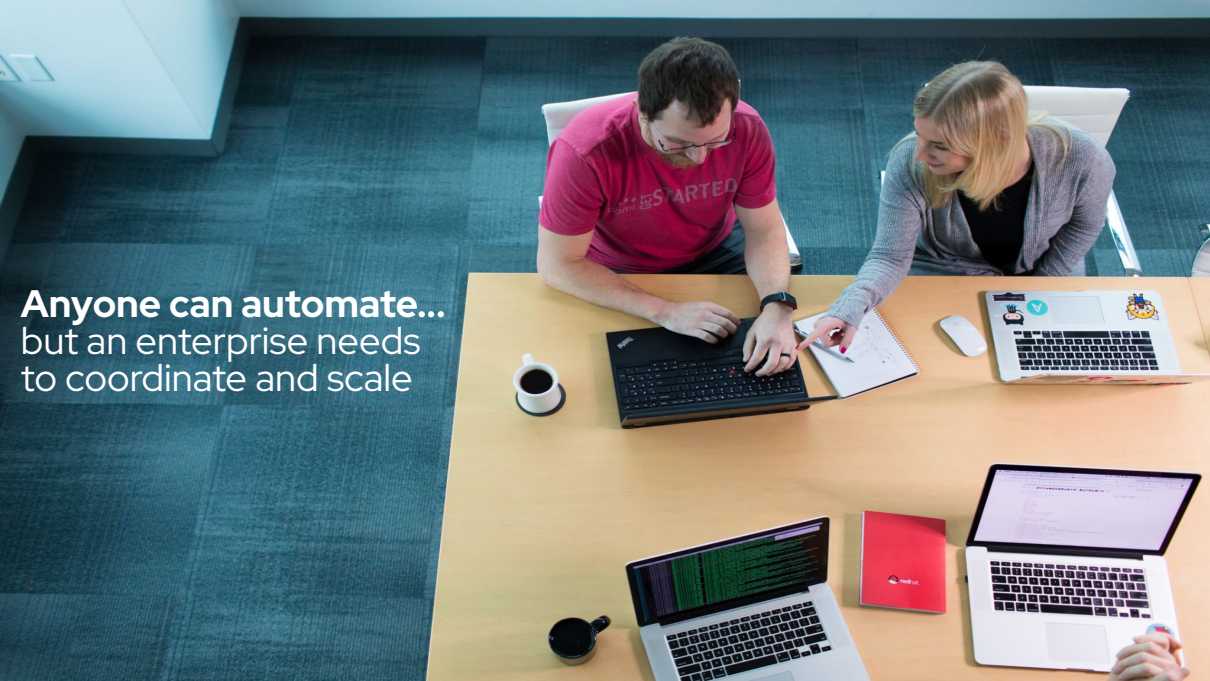
TOC

About me

- Working in IT since 2004, mostly in operations roles
- 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



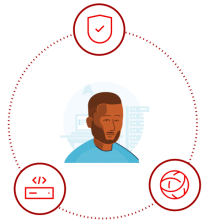
Anyone can automate...
but an enterprise needs
to coordinate and scale

Many organizations share the same challenge

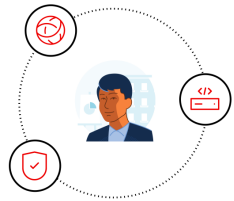
Too many unintegrated, domain-specific tools

Network ops

SecOps



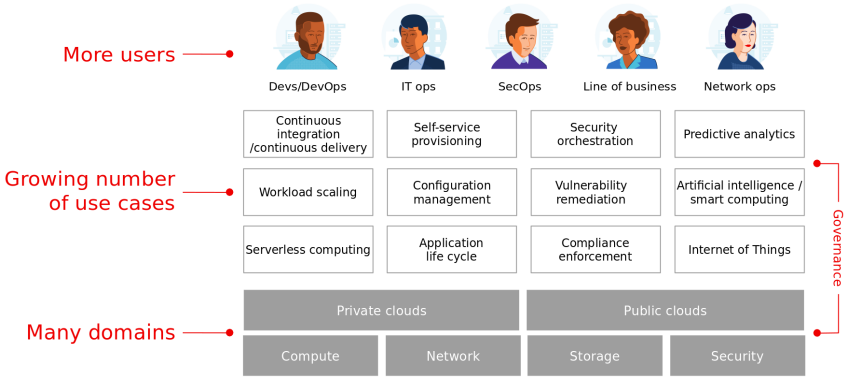
Devs/DevOps



IT ops

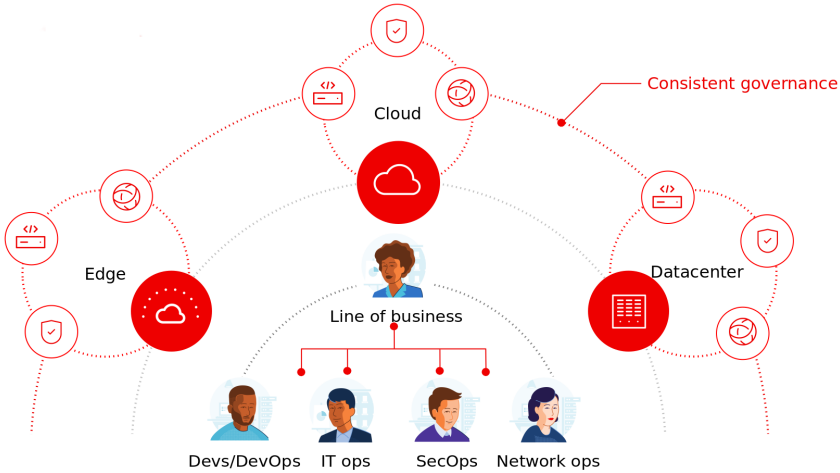
Many organizations have a problem

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

ibm_zos_*

Filters

(13 results)

Collections 13

ibm_zos_core

The IBM z/OS core collection includes connection plugins, action plugins, modules, filters and ansible-doc to automate tasks on z/OS.

ibm | z | zos | z_os | core | zos_core | ibm_zos_core | data_set | jcl | uss | mvs

5 / 5 Score 89708 Downloads

Current Version: 1.4.0-beta.2 uploaded 18 days ago

ibm_zos_sysauto

The IBM Z System Automation collection includes roles and sample playbooks to access the IBM Z System Automation Operations REST server.

ibm | z | zos | z_os | zos_sa | ibm_zos_sa | system_automation

5 / 5 Score 1483 Downloads

Current Version: 1.0.0 uploaded 2 years ago

ibm_zos_ims

The IBM z/OS IMS collection includes modules and sample playbooks to automate tasks for IBM IMS.

ibm | z | zos | z_os | core | zos_core | data_set | jcl | uss | mvs | ims | zos_ims

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ibm_zos_cics

The Red Hat Ansible Certified Content for IBM Z CICS collection includes connection plugins, action plugins, modules and sample playbooks to automate tasks for CICS

ibm | z | zos | z_os | cics | cmci

5 / 5 Score 4978 Downloads

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zos_python_operator

IBM Z and Cloud Modernization Stack Operator for IBM Open Enterprise SDK for Python

ibm | z | z_os | zos | zos_cloud_broker | zpm | zos_package_manager_operator | product_install | z_and_cloud_modernization_stack_operator | zos_python_operator

43 Downloads

Current Version: 1.0.2 uploaded a month ago

zos_java_operator

IBM Z and Cloud Modernization Stack Operator for IBM Java SDK

ibm | z | z_os | zos | zos_cloud_broker | zpm | zos_package_manager_operator | product_install | z_and_cloud_modernization_stack_operator | zos_java_operator

161 Downloads

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Popular Tags

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docker	1,252
cloud	1,181
ubuntu	1,042
security	1,006

Popular Platforms

EL	25,886
Ubuntu	134,619
Debian	55,207
Fedora	47,706
ArchLinux	1,113
opensuse	9,347
GenericLinux	1,014
Alpine	834

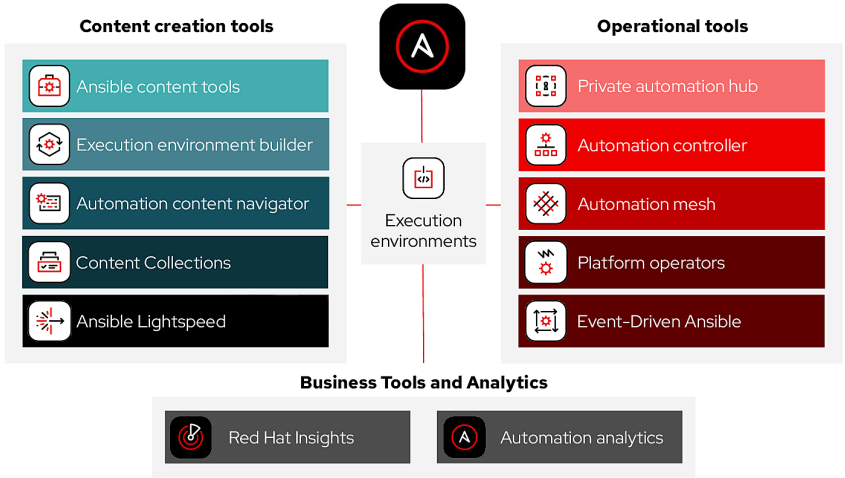
Ansible in numbers

- **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

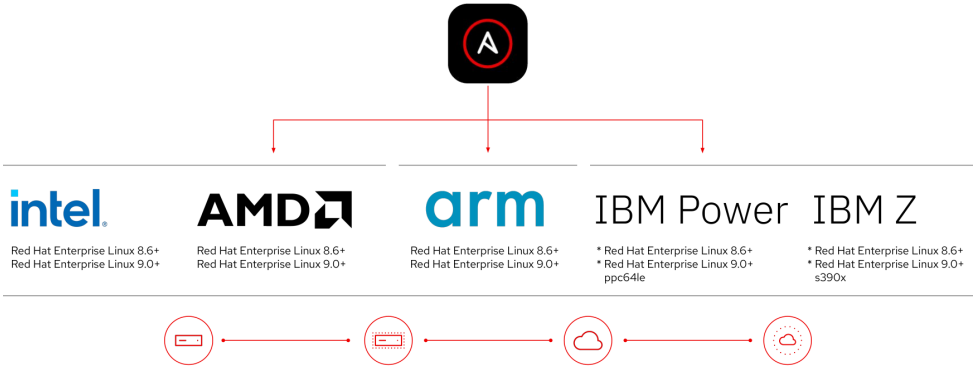
Google Cloud

On Google Cloud marketplace

Customer deployed, Self-managed

Red Hat

Ansible Automation Platform architectures options



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Holistic automation for your enterprise

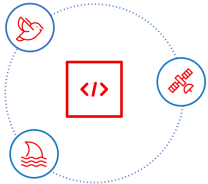
- Create
- Operate
- Consume

Create

Many technologies, different life cycles

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

Collections

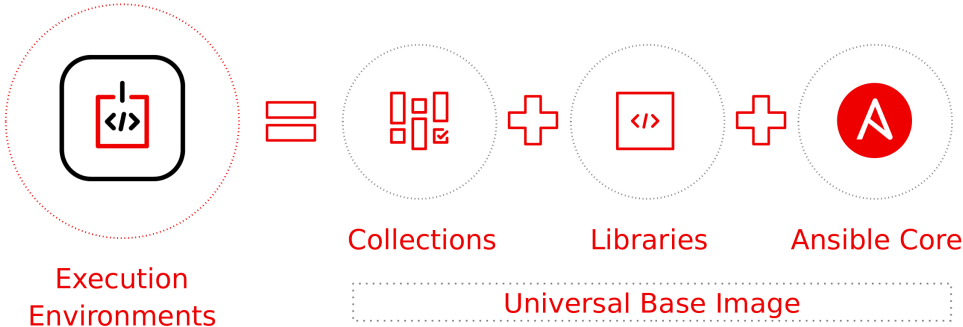


Dependencies

Runtime

Automation Execution Environments

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



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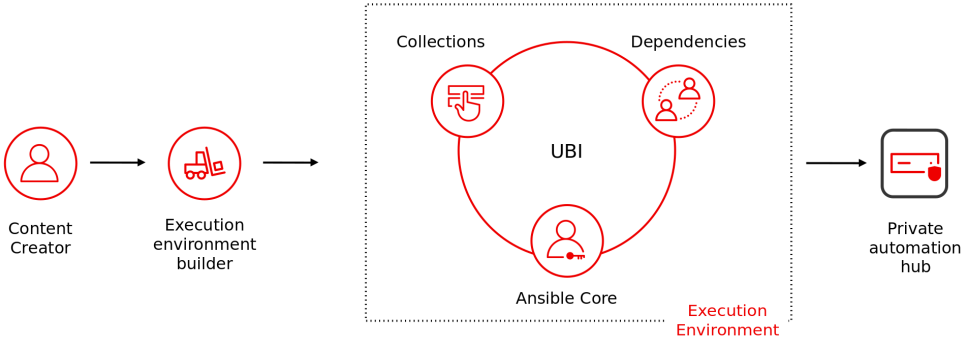
Build, create, publish

Development cycle of an automation execution environment



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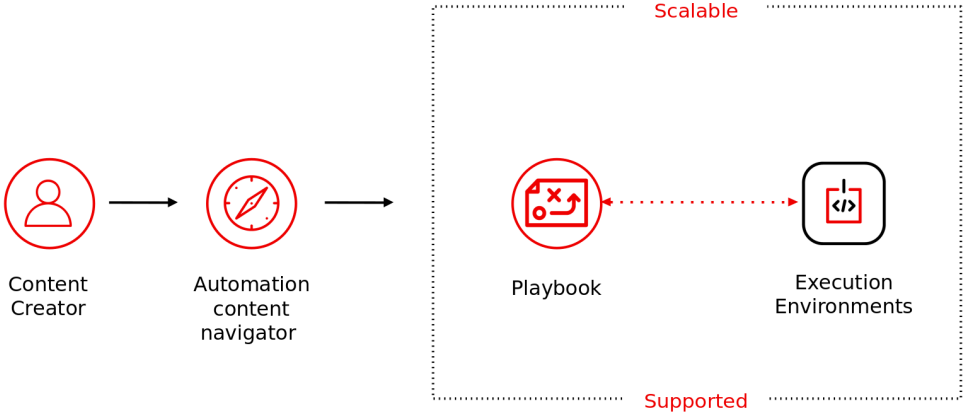
Develop, test, run

How to develop, test and run containerized Ansible content



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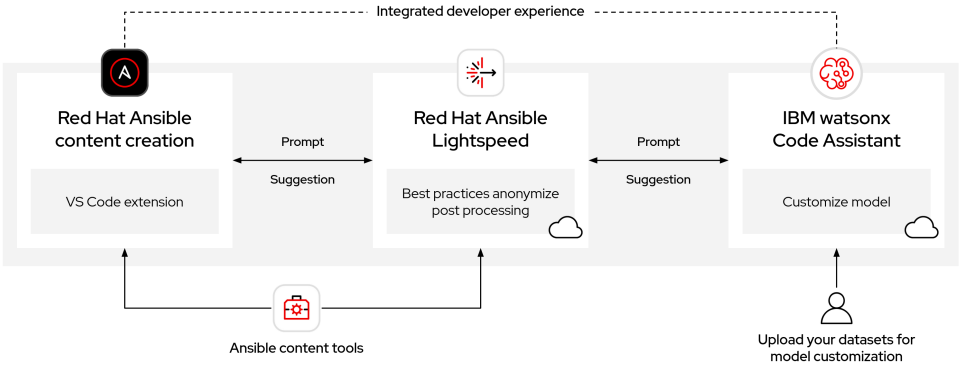
Why is not everything automated?

- 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



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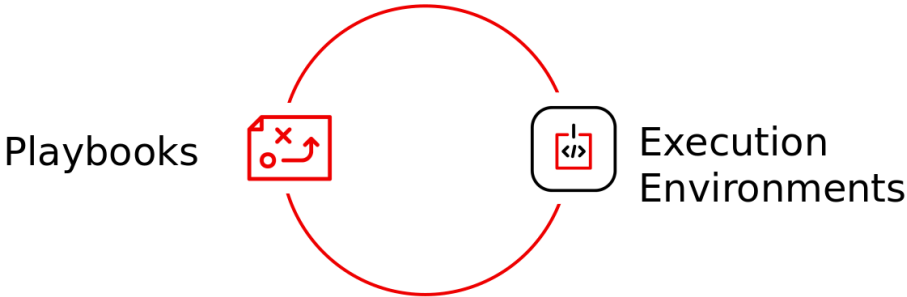
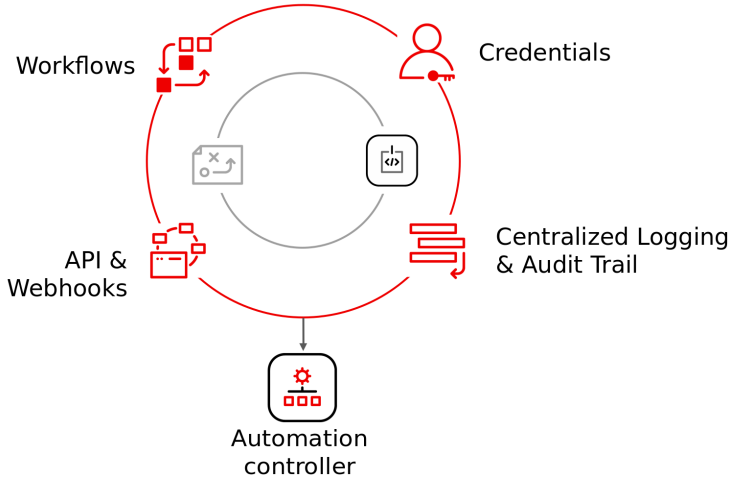
Operate

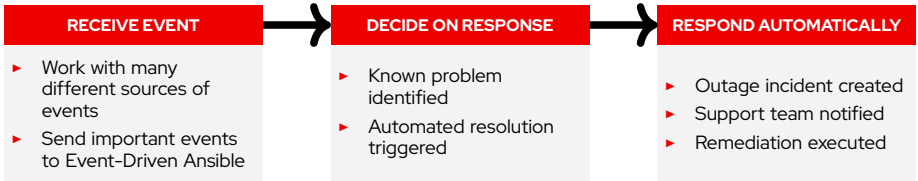
Components of Automation



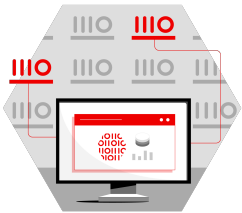
Anatomy of Automation Operation



Automate event workflow

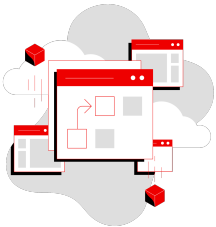


Key building blocks in EDA



Sources

All the sources of event data you want to use



Rules

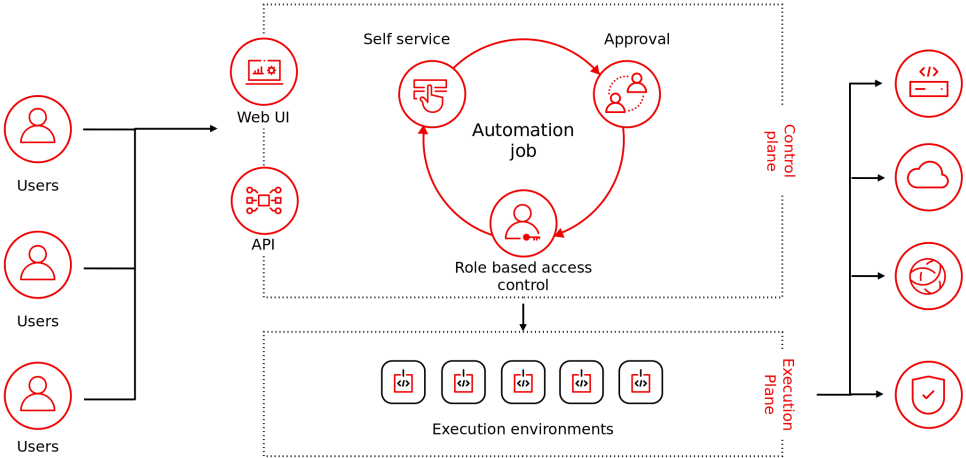
What you will create using Event-Driven Ansible

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

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