# Modernize IBM Z with Red Hat

# Ansible Automation Platform

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**Ehningen, Germany**

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**Associate Principal Solutions Architect @ Red Hat**

# About me

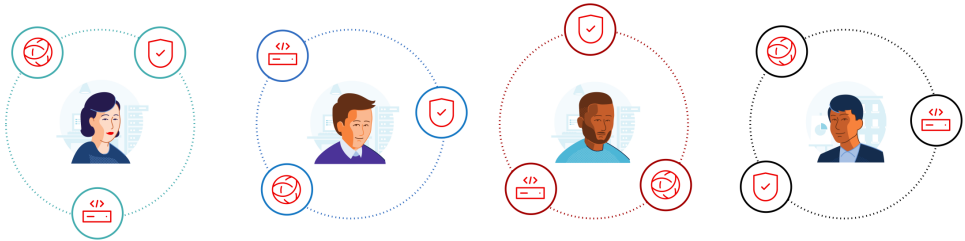
- Working in IT since 2004, mostly in consulting roles
- Ansible user since 2013
- Author of 5 books, 4 of which on Ansible:
  - Learning Ansible
  - Practical Ansible
  - Learning Ansible 2.7
  - Practical Ansible - Second edition (07/10/23)
- EMEA Associate Principal Specialist Solution Architect
- RHCA V


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

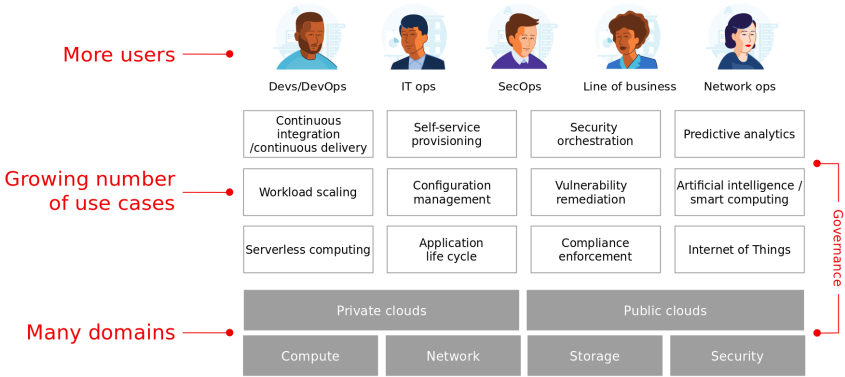
Too many unintegrated, domain-specific tools



Network ops SecOps Devs/DevOps IT ops

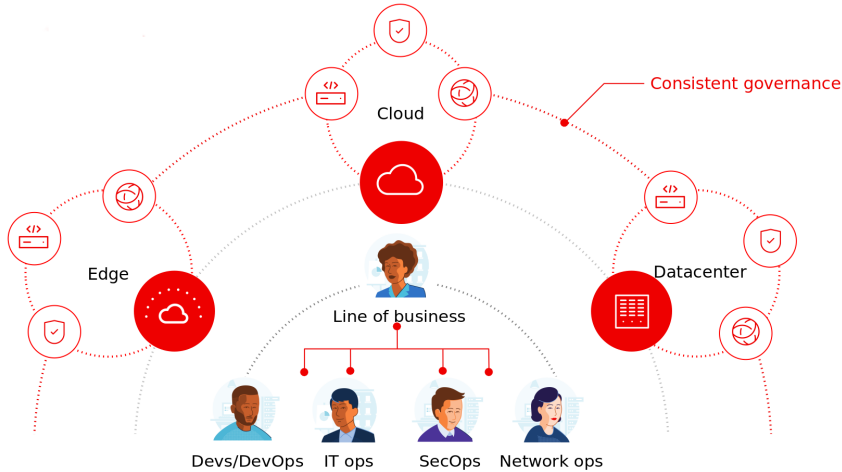
# Many organizations have a problem

## Too many unintegrated, domain-specific tools



# Break down silos

## Different teams a single platform




Red Hat

# Why Ansible?

# Idempotence

**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

- Agent-less
- Connects to managed machines via SSH
- Does not care about the state of the rest of the system
- Applies changes in a sequential way
- It has a very gentle learning curve
- Playbooks can be easily read by non-technical people (i.e.: auditors)
- It is very simple setup
- It is a swiss-knife tool (configuration, deployment, orchestration)

# 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

Galaxy NG

Collections

Collections

Namespaces

API token

Roles

Task Management

Documentation

Terms of Use

Thanks for trying out the new and improved Beta Galaxy, please share your feedback on github.com/ansible/galaxy_ng/discussions

# Collections

Keywords | ibm_zos

Keywords ibm_zos ×

Clear all filters

1 - 17 of 17

**ibm_zos_sysauto**
Provided by ibm
The IBM Z System Automation collection includes roles and sa...
0 Modules | 2 Roles | 0 Plugins | 0 Dependencies

**ibm_zos_core**
Provided by ibm
The IBM z/OS core collection includes connection plugins, ac...
20 Modules | 0 Roles | 21 Plugins | 0 Dependencies

**ibm_zos_ims**
Provided by ibm
The IBM z/OS IMS collection includes modules and sample
7 Modules | 0 Roles | 8 Plugins | 1 Dependency

**ibm_zos_cics**
Provided by ibm
The Red Hat Ansible Certified Content for IBM Z CICS collect...
5 Modules | 0 Roles | 2 Plugins | 0 Dependencies

**zos_python_operator**
Provided by ibm
IBM Z and Cloud Modernization Stack Operator for IBM Open
0 Modules | 0 Roles | 0 Plugins | 0 Dependencies

**zos_opencpp_operator**
Provided by ibm
IBM Z and Cloud Modernization Stack Operator for IBM C/C++
0 Modules | 0 Roles | 0 Plugins | 0 Dependencies

**zos_go_operator**
Provided by ibm
IBM Z and Cloud Modernization Stack Operator for IBM Open
0 Modules | 0 Roles | 0 Plugins | 0 Dependencies

**zos_zoau_operator**
Provided by ibm
IBM Z and Cloud Modernization Stack Operator for IBM Z Open
0 Modules | 0 Roles | 0 Plugins | 0 Dependencies

**zos_java_operator**
Provided by ibm
IBM Z and Cloud Modernization Stack Operator for IBM Java
0 Modules | 0 Roles | 0 Plugins | 0 Dependencies

**zos_nodejs_operator**
Provided by ibm
IBM Z and Cloud Modernization Stack Operator for IBM Open
0 Modules | 0 Roles | 0 Plugins | 0 Dependencies

**zos_ims_operator**
Provided by ibm

**zos_package_manager**
Provided by ibm

**ibm_zos_core_ftp**
Provided by daiki_shimizu

**zos_cics_operator**
Provided by ibm

**ibm_zosmf**
Provided by ibm

# Ansible in numbers

- **2M downloads** per month (Red Hat versions only)
- **2K customers** (Red Hat versions only)
- **4M+ systems** managed (Red Hat versions only)
- **4K modules**
- **140+ certified collections**
- **3550+ contributors**
- **55K+ GitHub stars**

# What makes it a platform?

# Holistic automation for your enterprise

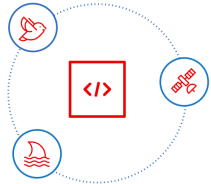
- Create
- Operate
- Consume

# Create

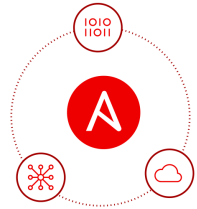
# Many technologies, different life cycles

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

Collections



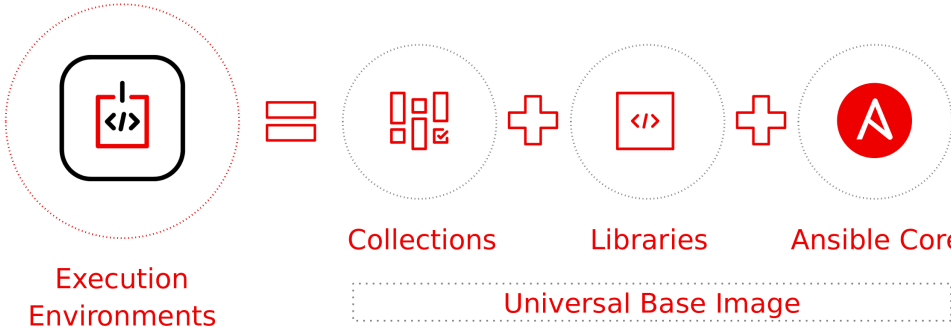
Dependencies



Runtime

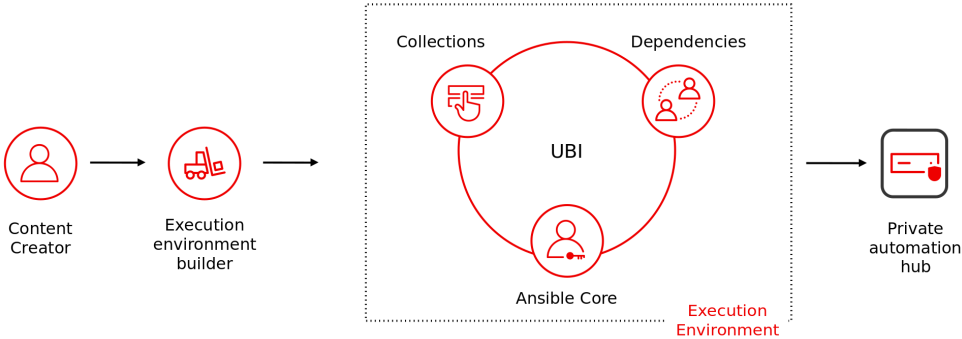
# Automation Execution Environments

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



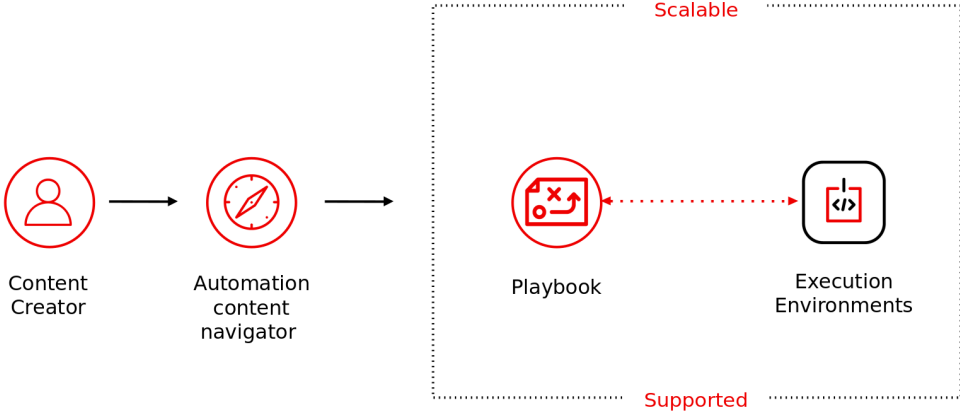
# Build, create, publish

## Development cycle of an automation execution environment



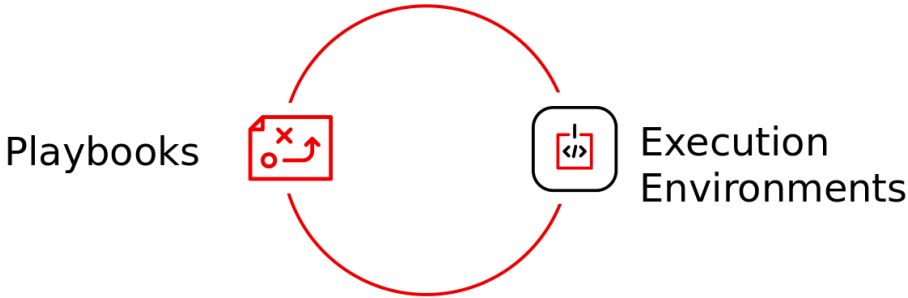
# Develop, test, run

How to develop, test and run containerized Ansible content

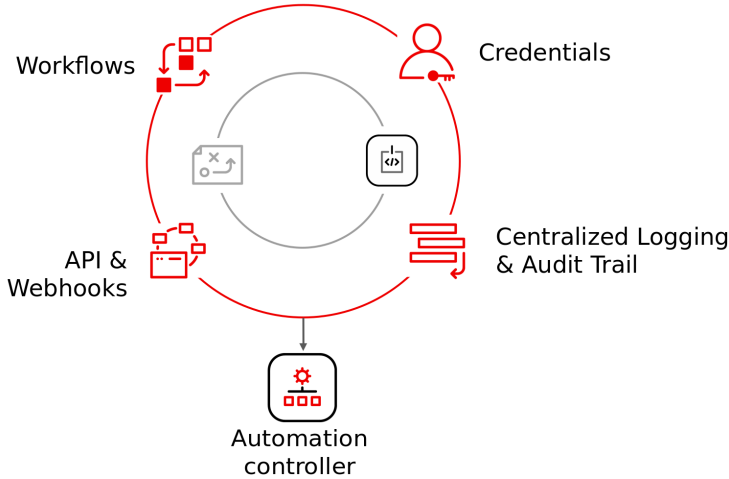


# Operate

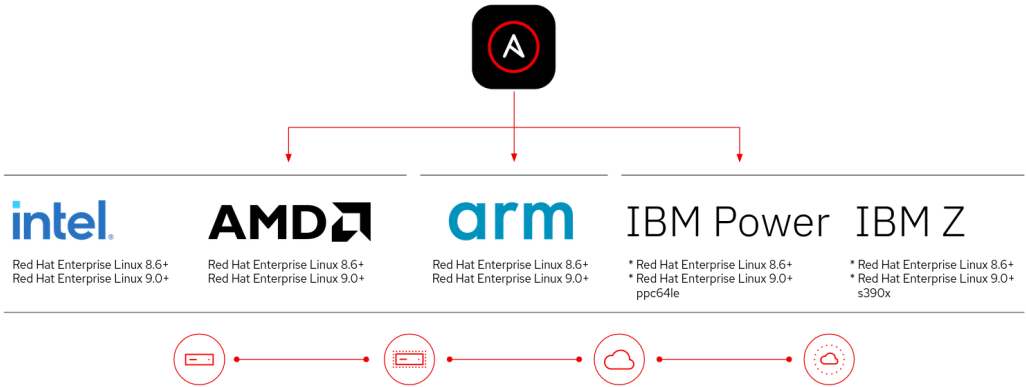
# Components of Automation



# Anatomy of Automation Operation

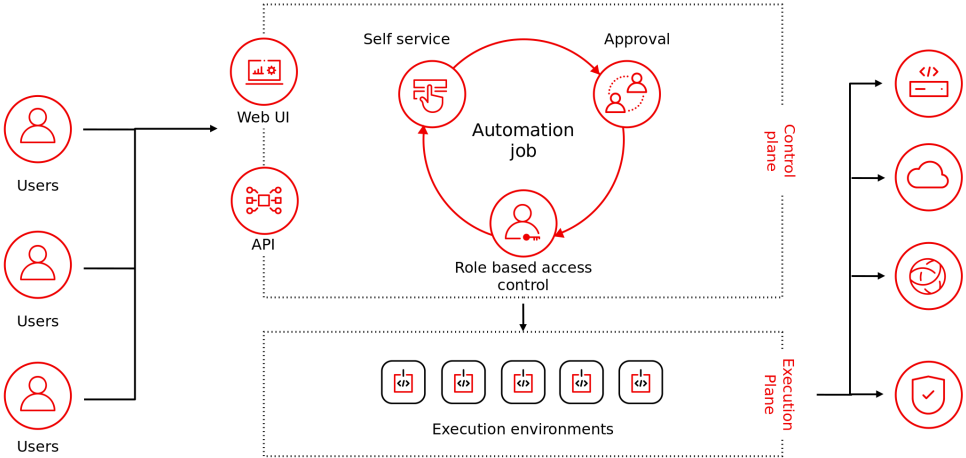


# Ansible Automation Platform across architectures



# Consume

# Full architecture



# 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

# Questions?

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