Red Hat
Ansible Automation
Platform

Red Hat Ansible Platform technical deck

Creating, operating, and consuming automation

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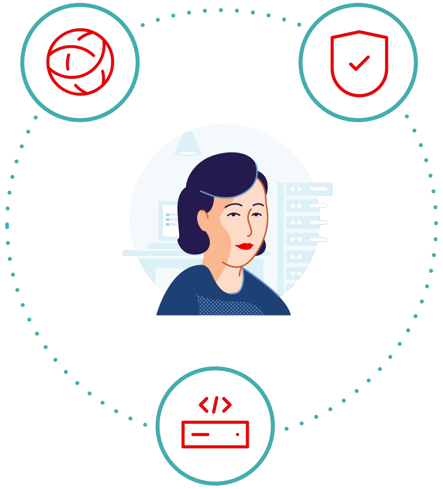
Solution Architect

Red Hat

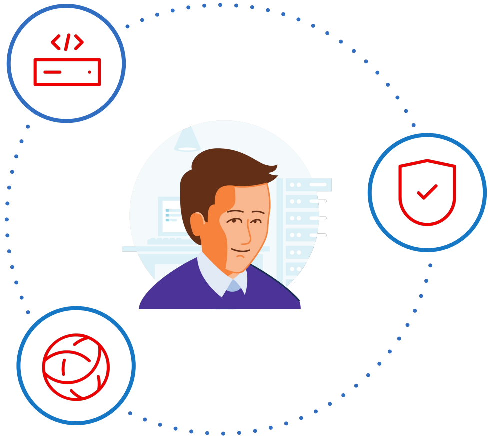
Anyone can automate... but an enterprise needs to coordinate and scale

Many organizations share the same challenge

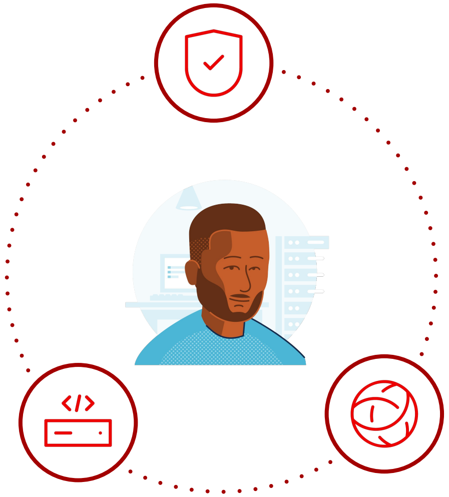
Too many unintegrated, domain-specific tools



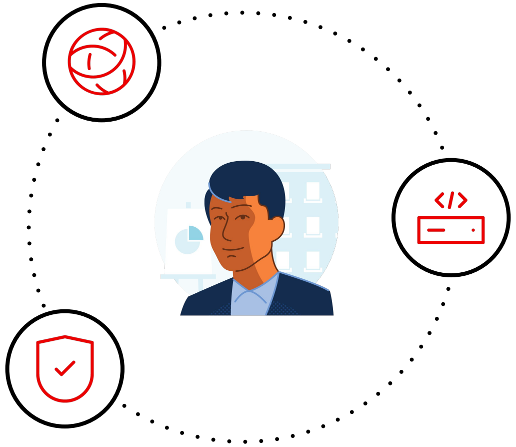
Network ops



SecOps



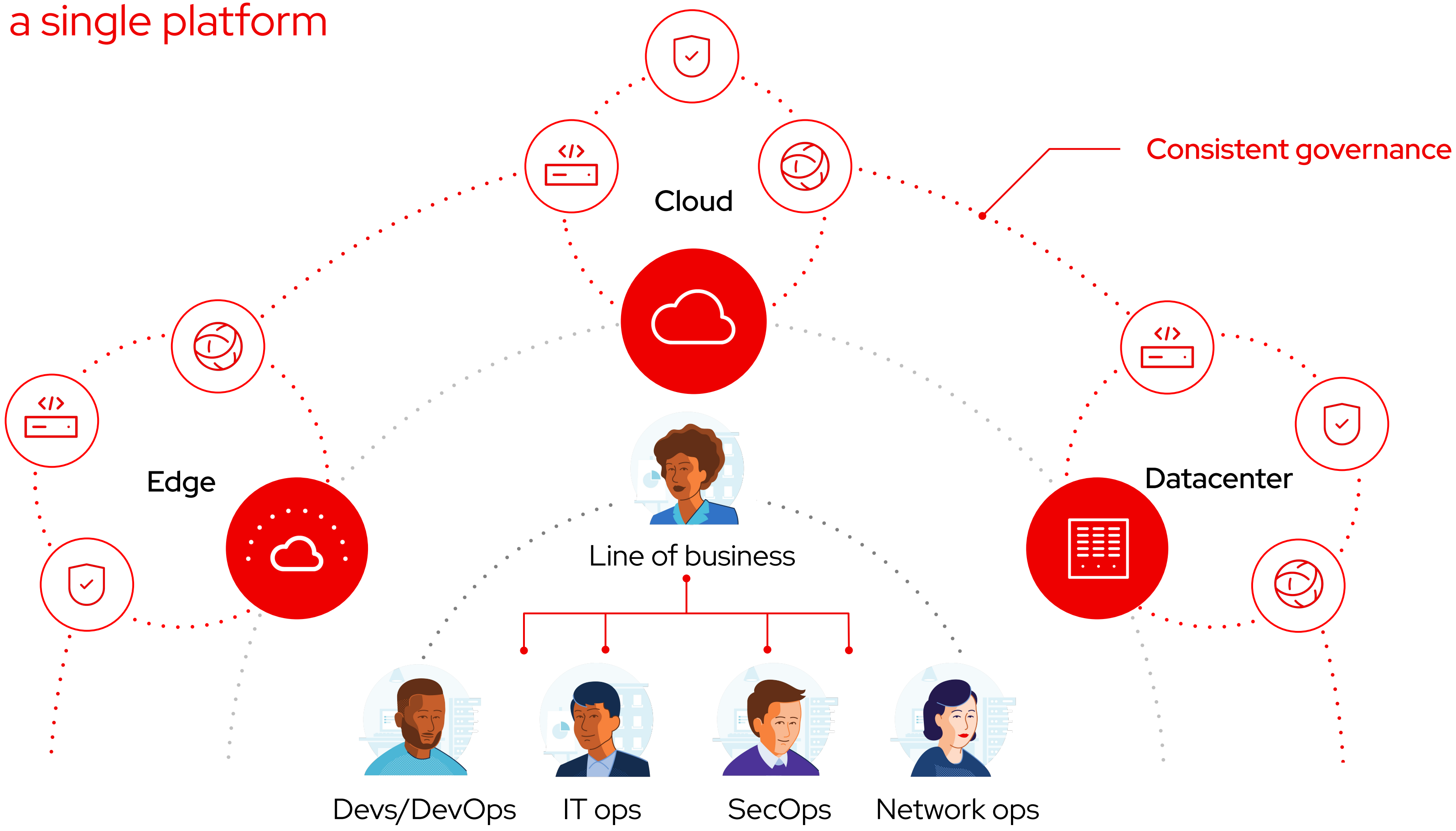
Devs/DevOps



IT ops

Break down silos

Different teams a single platform



Why the Red Hat® Ansible® Automation Platform?

Why the Ansible Automation Platform?

Powerful

Orchestrate complex processes at enterprise scale.

Simple

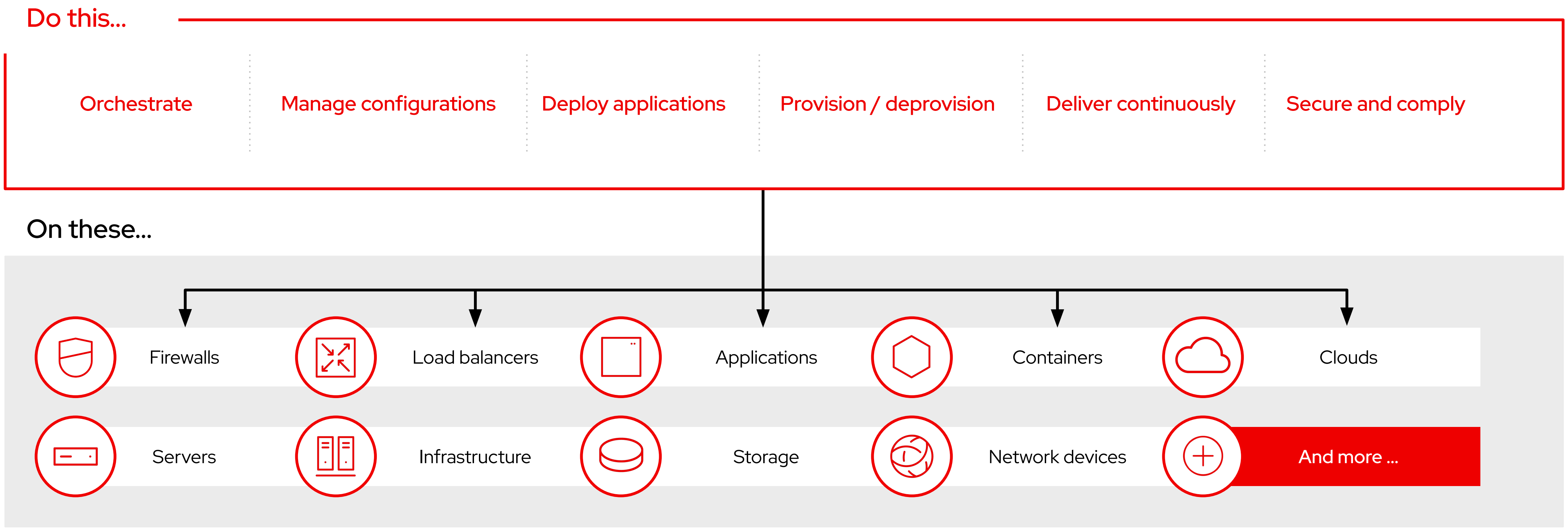
Simplify automation creation and management across multiple domains.

Agentless

Easily integrate with hybrid environments.

Automate the deployment and management of automation

Your entire IT footprint



Do this...

Orchestrate

Manage configurations

Deploy applications

Provision / deprovision

Deliver continuously

Secure and comply

On these...

Firewalls

Load balancers

Applications

Containers

Clouds

Servers

Infrastructure

Storage

Network devices

And more ...

90+

certified platforms

Infrastructure	Cloud	Network	Security
Red Hat	aws	ARISTA	Check Point SOFTWARE TECHNOLOGIES LTD
NetApp™	Google	CISCO™	CYBERARK®
IBM®	Microsoft	f5®	FORTINET®

What makes a platform?

Red Hat Ansible Automation Platform

Combining the universal automation language with cloud services and certified content for automating, deploying, and operating applications, infrastructure and services securely at enterprise scale.

Ansible automation

Providing scalable, secure implementation for describing, building, and managing the deployment of enterprise IT applications across diverse enterprise architectures.

Cloud services

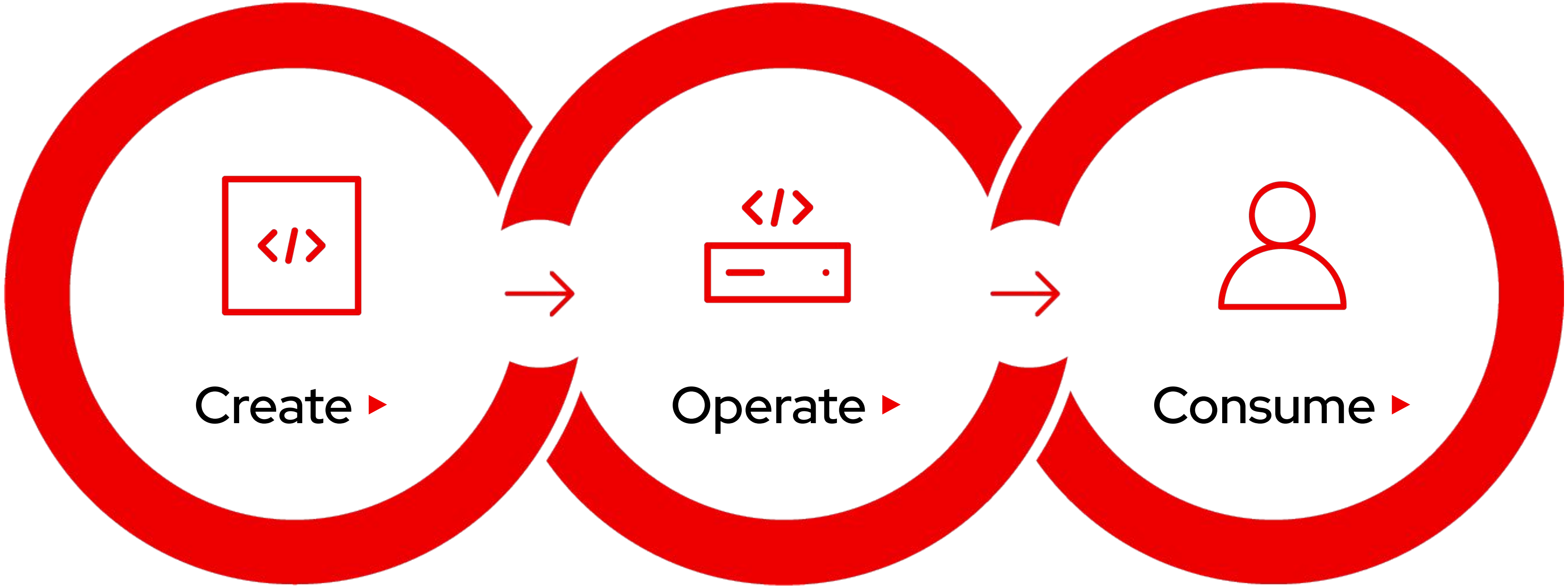
Cloud services that facilitate team collaboration and provide operational analytics for automating heterogeneous, hybrid environments.

Certified content

Extends native platform capabilities with certified, supported content designed to expand the automation domain and accelerate adoption for enterprise customers.

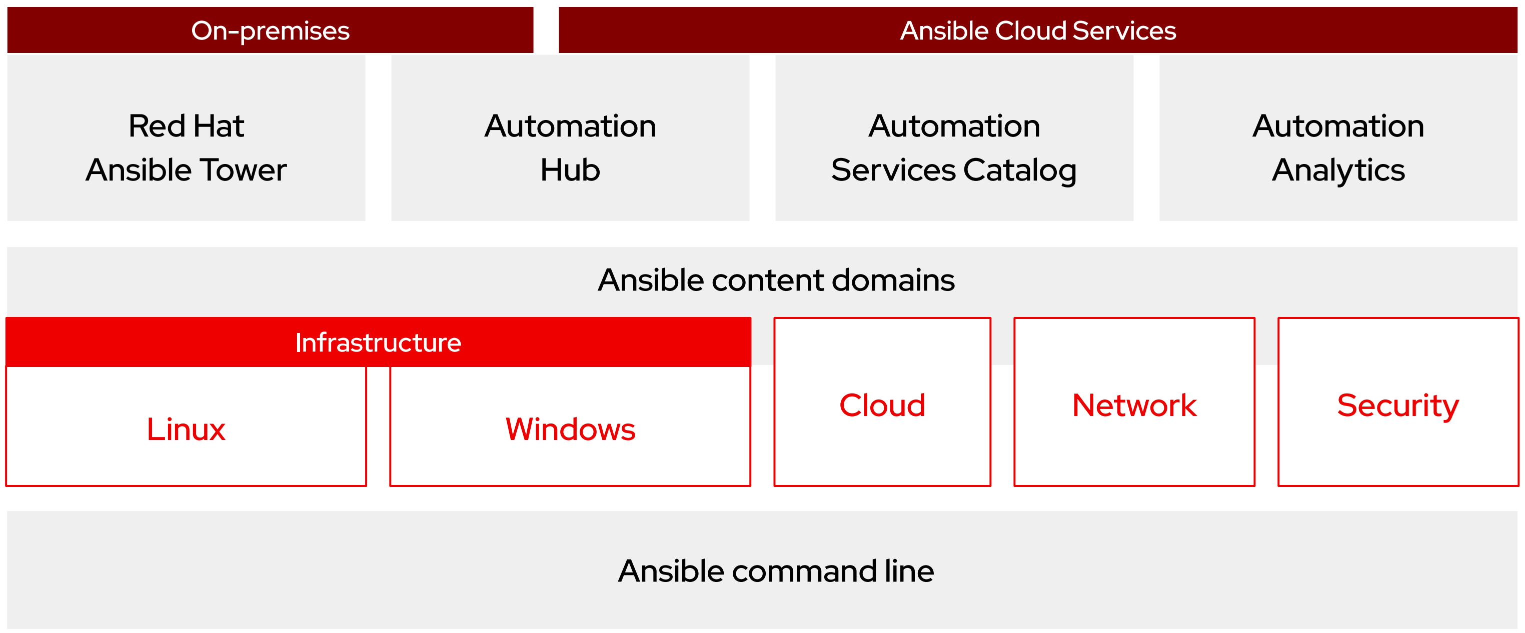
Red Hat Ansible Automation Platform

Holistic automation for your enterprise



Red Hat Ansible Automation Platform

- Content creators
- Operators
- Domain experts
- Users



On-premises

Ansible Cloud Services

Red Hat Ansible Tower

Automation Hub

Automation Services Catalog

Automation Analytics

Ansible content domains

Infrastructure

Linux

Windows

Cloud

Network

Security

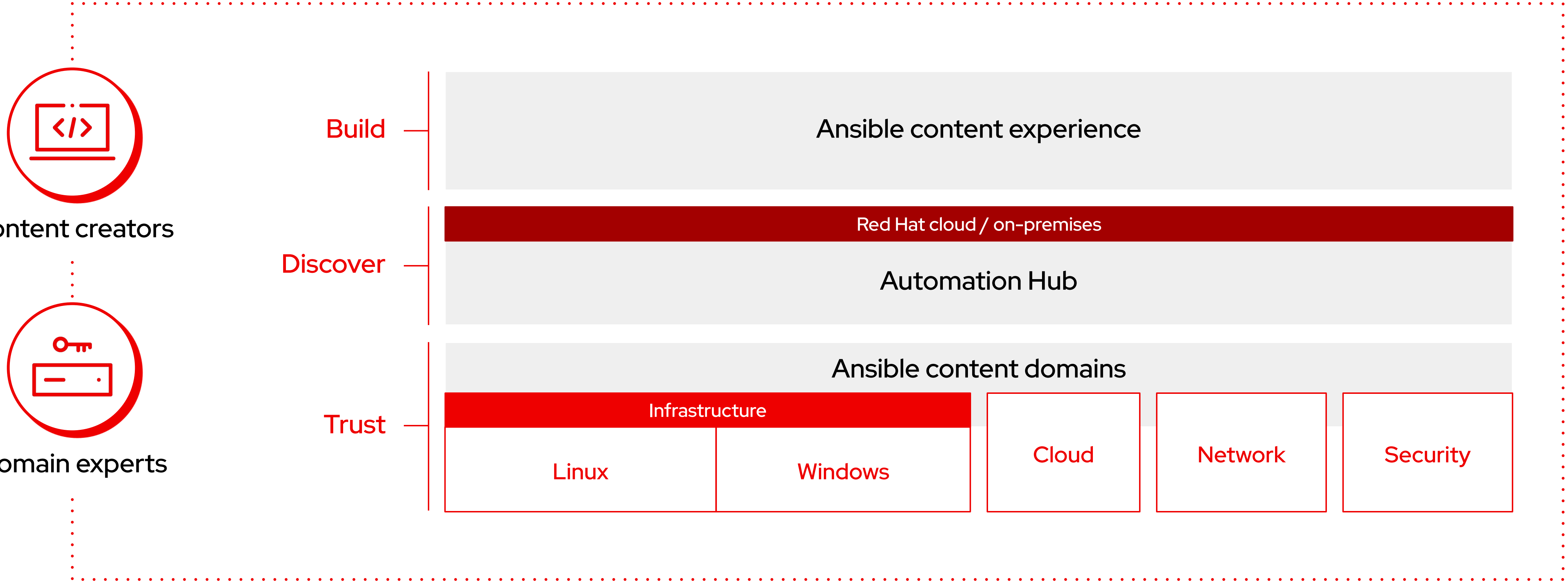
Ansible command line

Fueled by an open source community

Create

Create

The automation lifecycle



Content creators

Domain experts

Build — Ansible content experience

Discover — Red Hat cloud / on-premises — Automation Hub

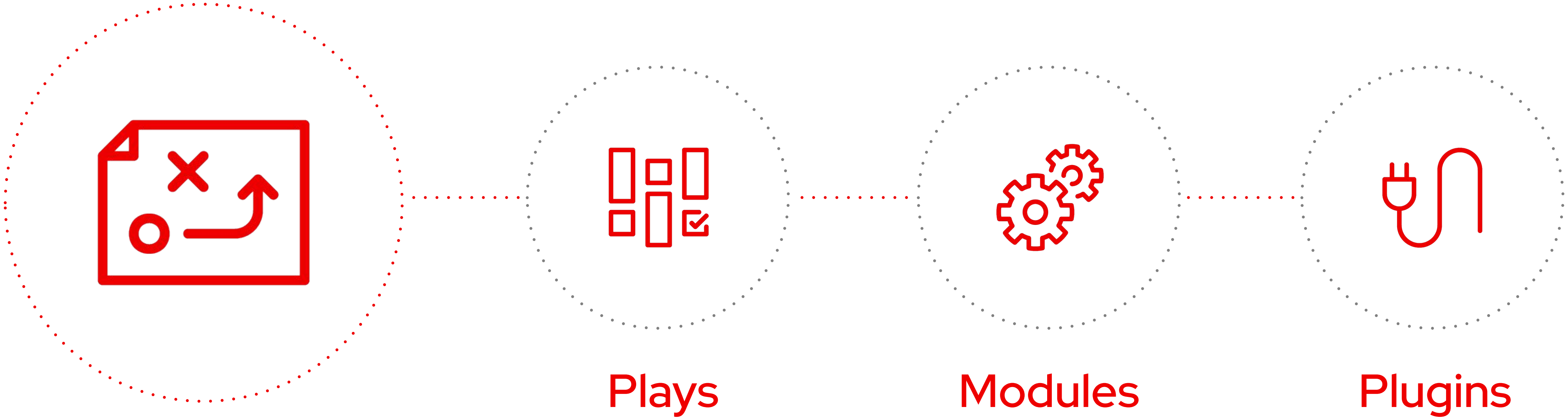
Trust — Ansible content domains

Infrastructure		Cloud	Network	Security
Linux	Windows			

Ansible playbooks

```
---
- name: install and start apache
  hosts: web
  become: yes

  tasks:
    - name: httpd package is present
      yum:
        name: httpd
        state: latest

    - name: latest index.html file is present
      template:
        src: files/index.html
        dest: /var/www/html/

    - name: httpd is started
      service:
        name: httpd
        state: started
```

What makes up an Ansible playbook?



Plays

Modules

Plugins

Ansible plays

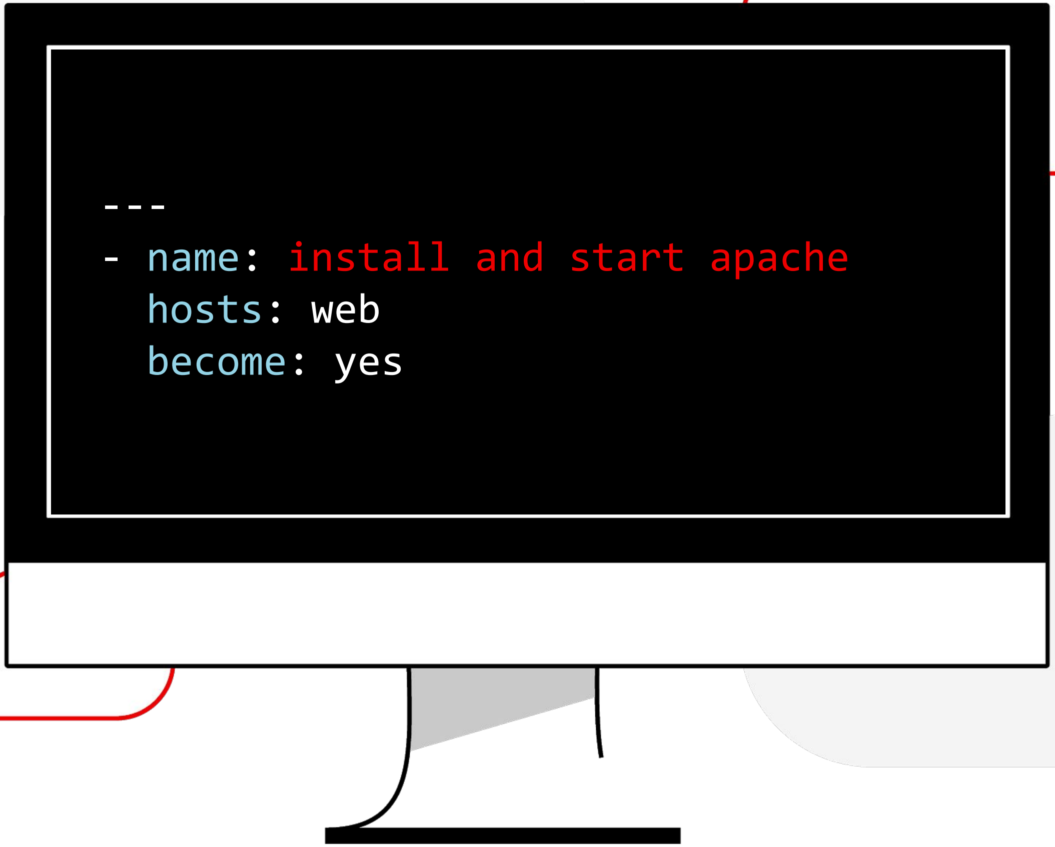
What am I automating?

What are they?

Top level specification for a group of tasks. Will tell that play which hosts it will execute on and control behavior such as fact gathering or privilege level.

Building blocks for playbooks

Multiple plays can exist within an Ansible playbook that execute on different hosts.



```
---
- name: install and start apache
  hosts: web
  become: yes
```

Ansible modules

The “tools in the toolkit”

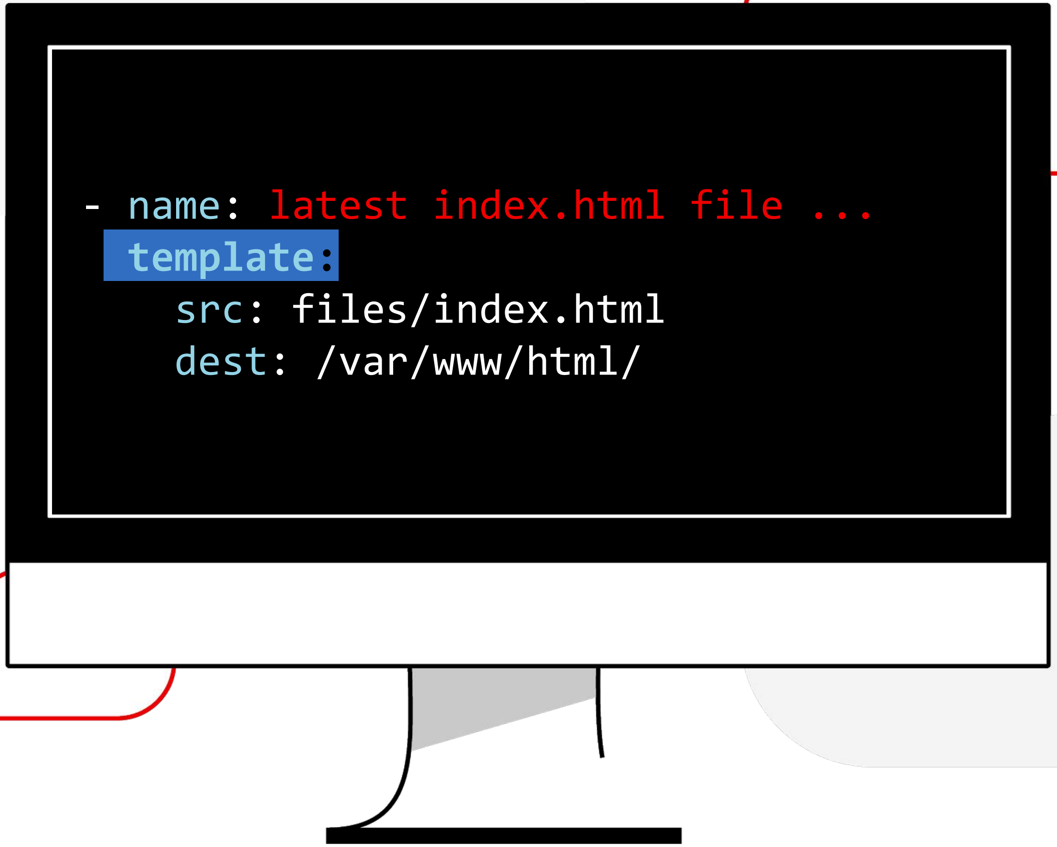
What are they?

Parametrized components with internal logic, representing a single step to be done.

The modules “do” things in Ansible.

Language

Usually Python, or Powershell for Windows setups. But can be of any language.



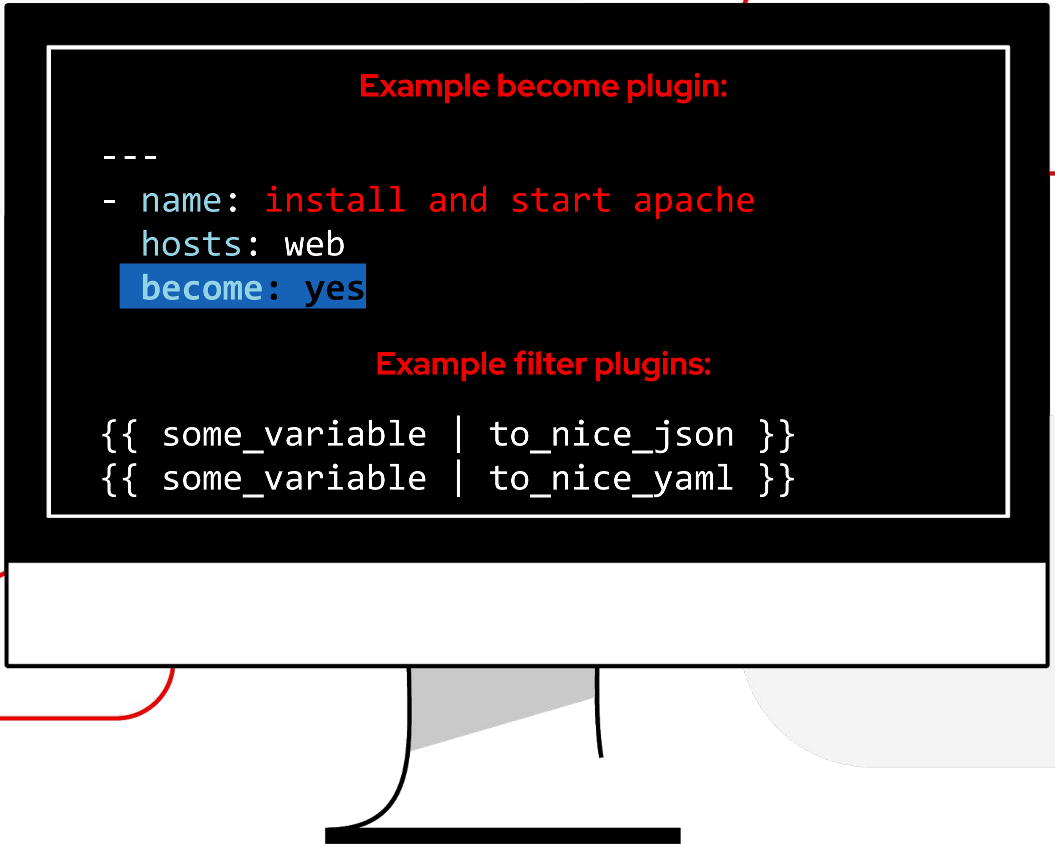
```
- name: latest index.html file ...
  template:
    src: files/index.html
    dest: /var/www/html/
```

Ansible plugins

The “extra bits”

What are they?

Plugins are pieces of code that augment Ansible’s core functionality. Ansible uses a plugin architecture to enable a rich, flexible, and expandable feature set.



Example become plugin:

```
---
- name: install and start apache
  hosts: web
  become: yes
```

Example filter plugins:

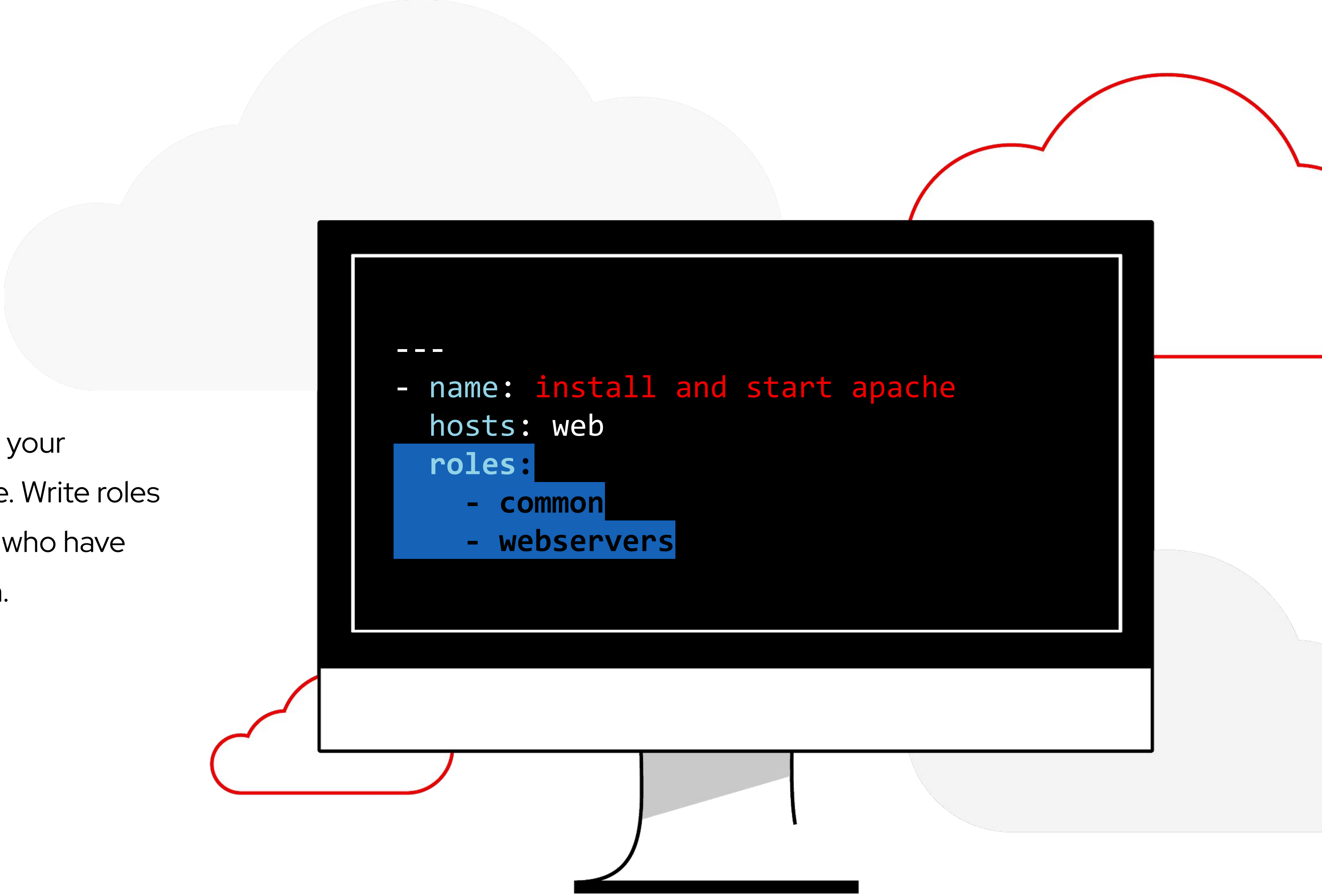
```
{{ some_variable | to_nice_json }}
{{ some_variable | to_nice_yaml }}
```

Ansible roles

Reusable automation actions

What are they?

Group your tasks and variables of your automation in a reusable structure. Write roles once, and share them with others who have similar challenges in front of them.



```
---
- name: install and start apache
  hosts: web
  roles:
     - common
     - webservers
```

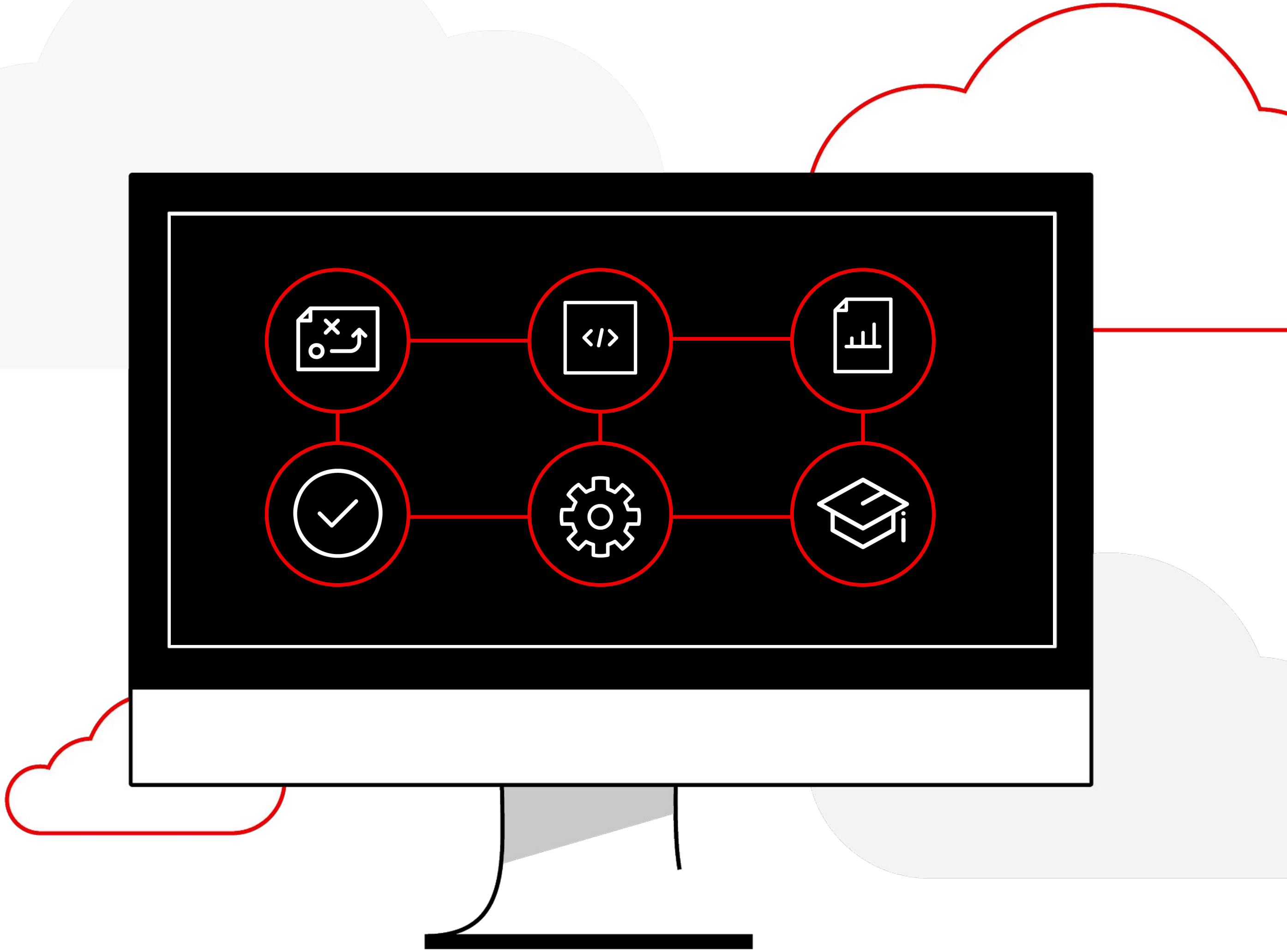
Collections

Simplified and consistent content delivery

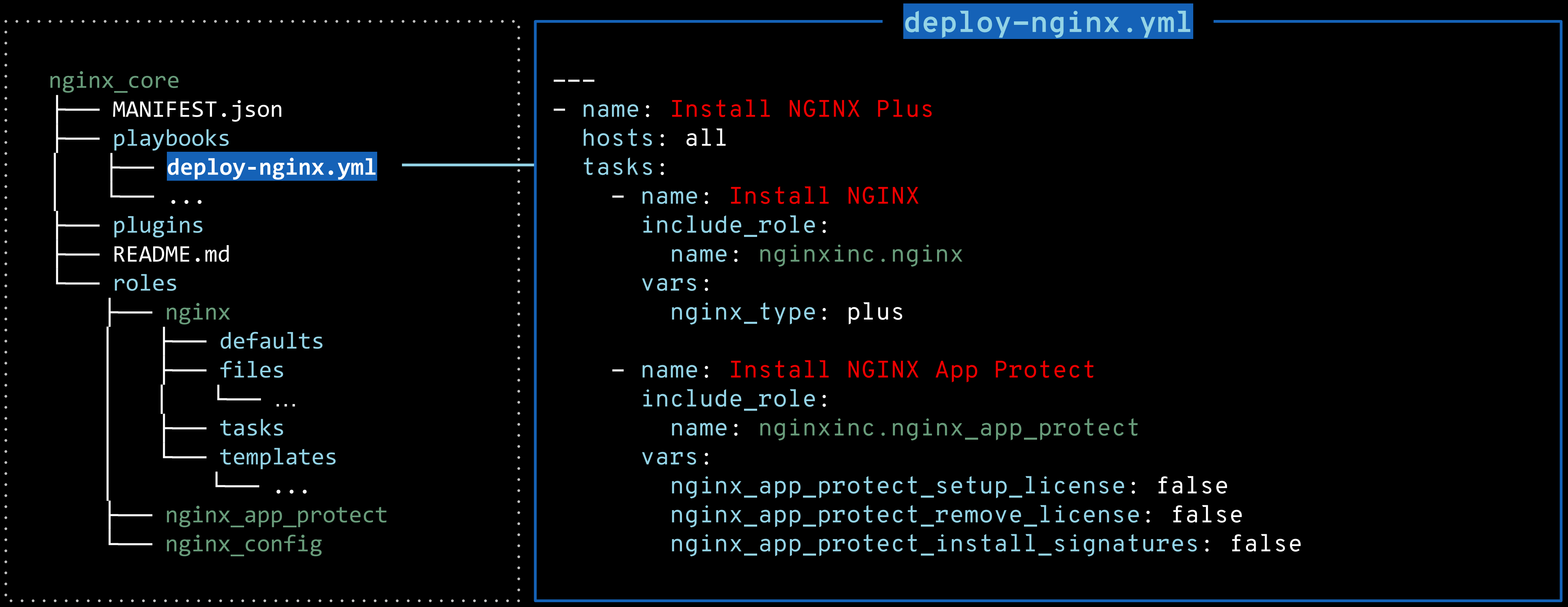
What are they?

Collections are a data structure containing automation content:

- Modules
- Playbooks
- Roles
- Plugins
- Docs
- Tests



Collections



```
nginx_core
├── MANIFEST.json
├── playbooks
│   ├── deploy-nginx.yml
│   └── ...
├── plugins
├── README.md
└── roles
    ├── nginx
    │   ├── defaults
    │   ├── files
    │   │   └── ...
    │   ├── tasks
    │   └── templates
    │       └── ...
    ├── nginx_app_protect
    └── nginx_config
```

deploy-nginx.yml

```yaml
---
- name: Install NGINX Plus
  hosts: all
  tasks:
    - name: Install NGINX
      include_role:
        name: nginxinc.nginx
      vars:
        nginx_type: plus

    - name: Install NGINX App Protect
      include_role:
        name: nginxinc.nginx_app_protect
      vars:
        nginx_app_protect_setup_license: false
        nginx_app_protect_remove_license: false
        nginx_app_protect_install_signatures: false
```

Automation Hub

Trusted source

Customer controlled

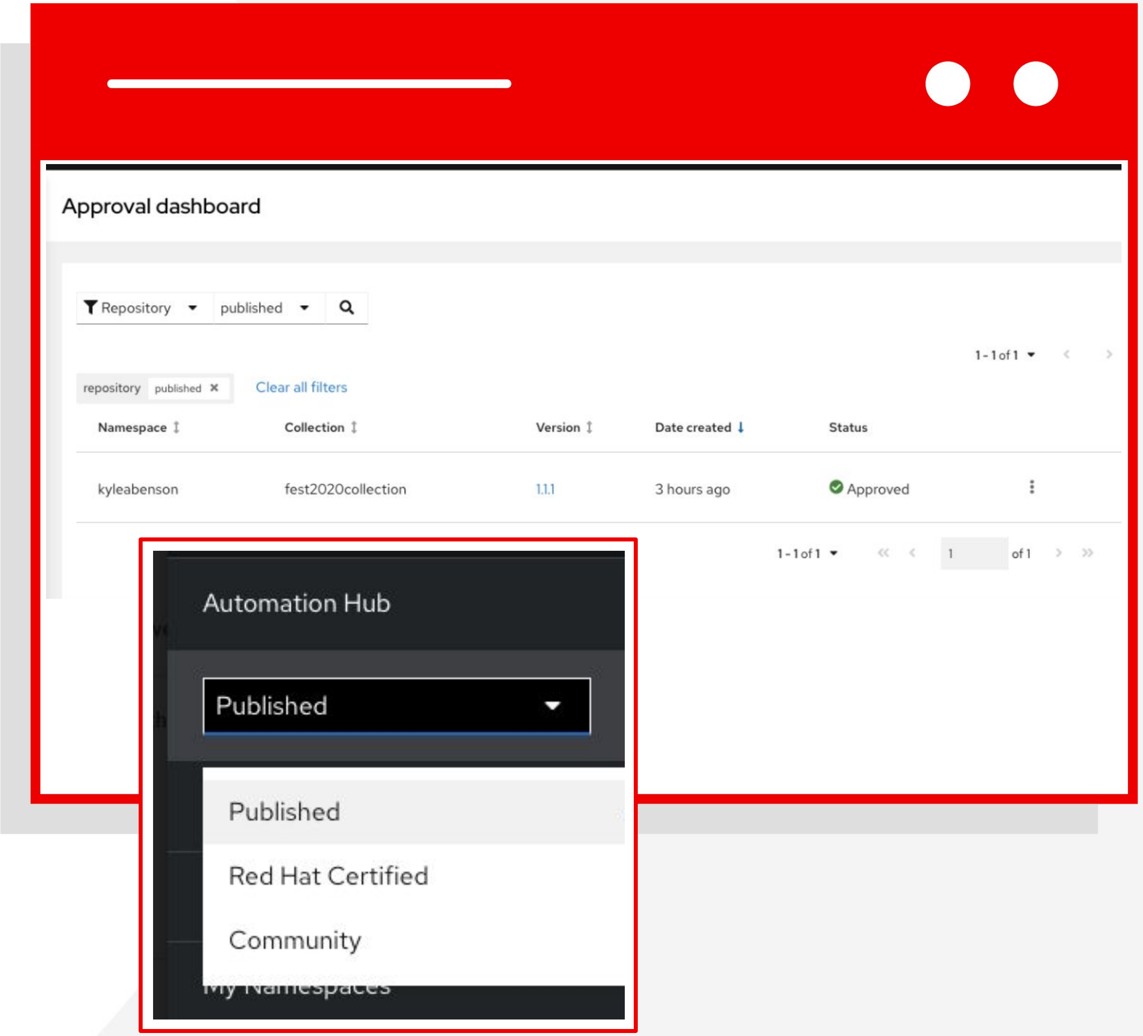
Deploying either on-prem or to a cloud, customers can run their own private instances of Automation Hub integrated into Red Hat Ansible Automation Platform.

Private content

Manage the lifecycle and internal distribution of in-house Ansible content within.

Customizable Content Catalog

Via synch from community (Galaxy) and supported (Automation Hub) sources, customers can supply internal users with approved content in one controlled location.



Approval dashboard

Repository: published

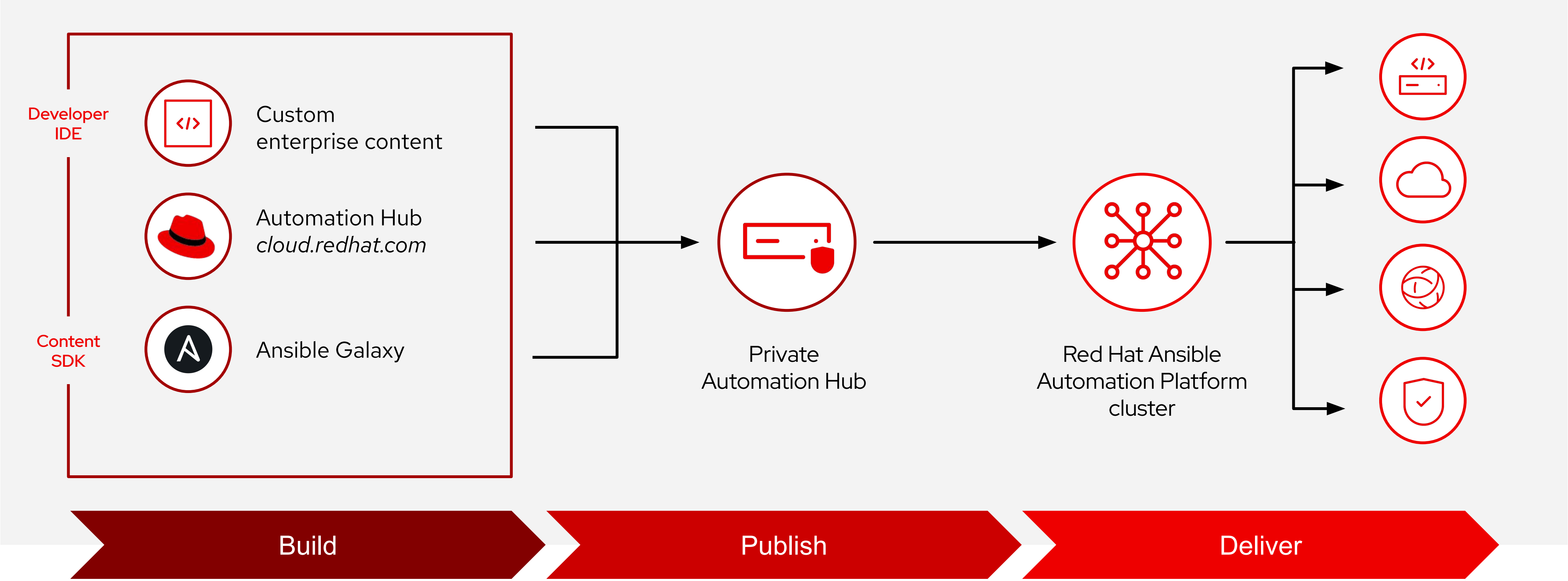
repository: published ✕ Clear all filters

Namespace	Collection	Version	Date created	Status
kyleabenson	fest2020collection	1.1.1	3 hours ago	✓ Approved

Red Hat

Private Automation Hub architecture

Value of private Automation Hub



Accessing collections

How to get them

Requirements file

Requirements file defines the required collections for a playbook

Pull via Tower

Ansible Tower pulls the collections from Automation Hub automatically

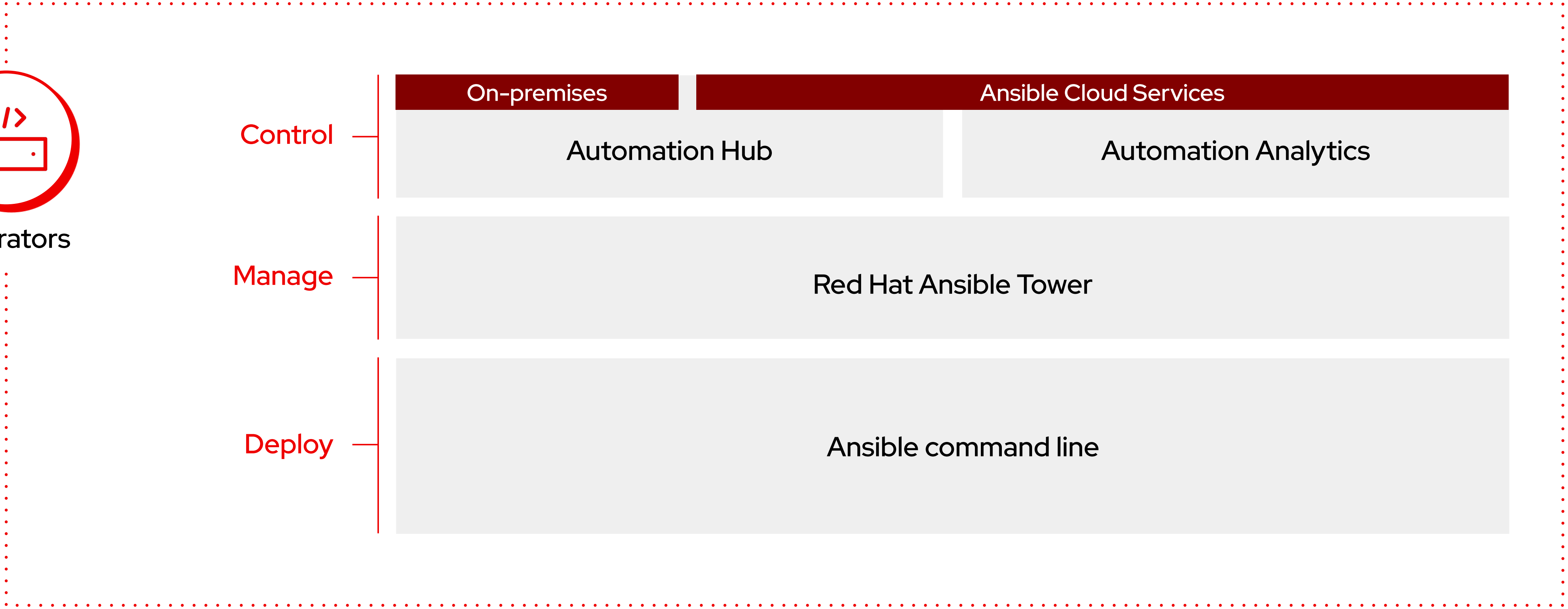
Command line

CLI access is also possible via ansible-galaxy command

Operate

Operate

The automation lifecycle



Operators

Control

On-premises

Ansible Cloud Services

Automation Hub

Automation Analytics

Manage

Red Hat Ansible Tower

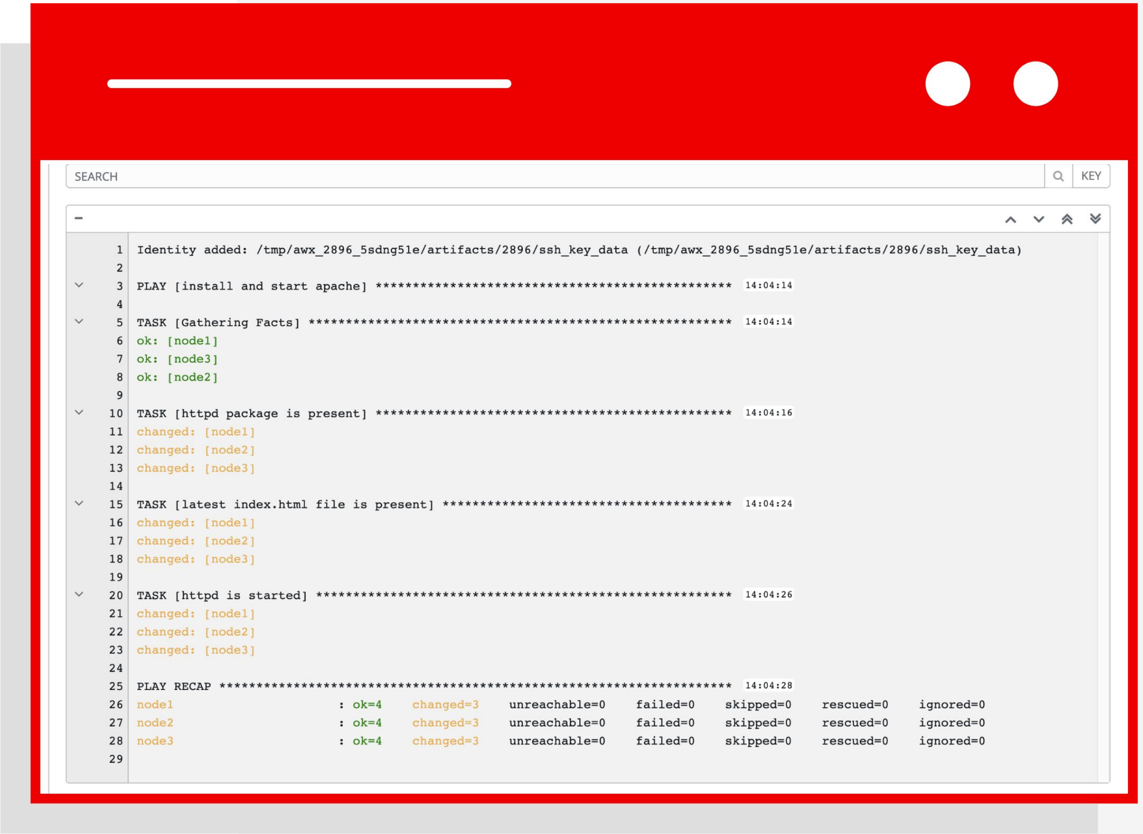
Deploy

Ansible command line

A playbook run

Where it all starts

- A playbook is interpreted and run against one or multiple hosts – task by task. The order of the tasks defines the execution.
- In each task, the module does the actual work.

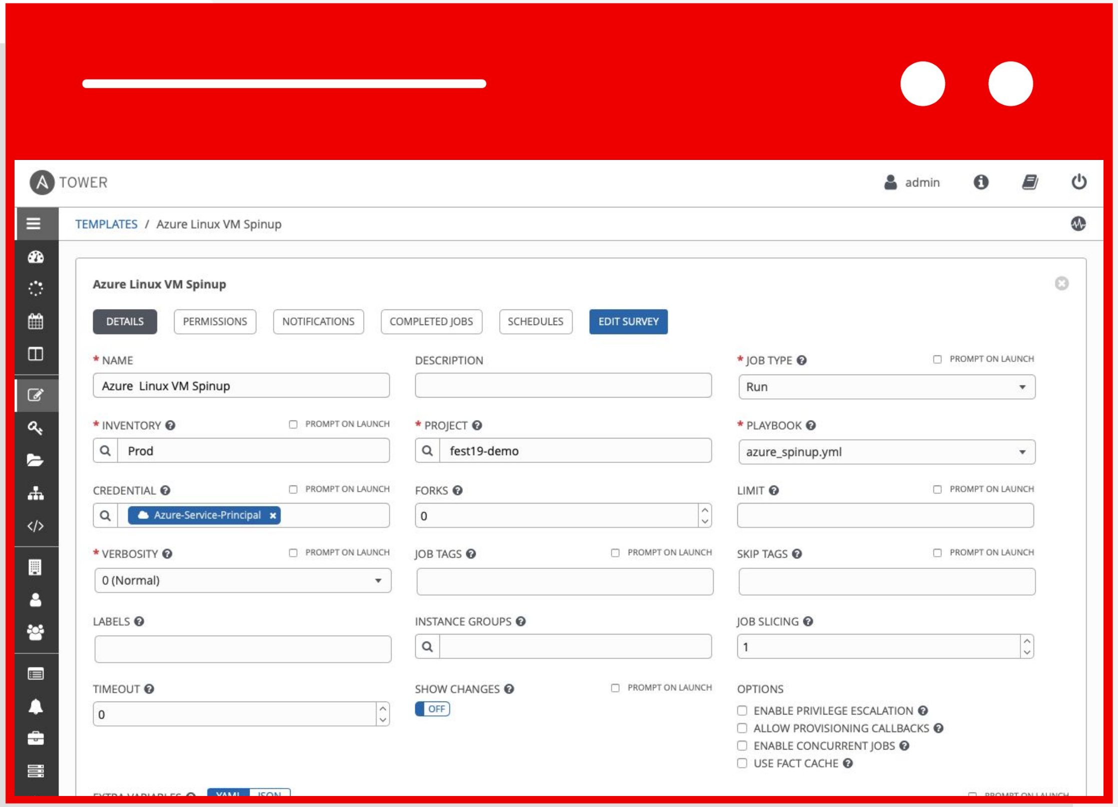


```
Identity added: /tmp/awx_2896_5sdng51e/artifacts/2896/ssh_key_data (/tmp/awx_2896_5sdng51e/artifacts/2896/ssh_key_data)

PLAY [install and start apache] ************************************************ 14:04:14

TASK [Gathering Facts] ********************************************************* 14:04:14
ok: [node1]
ok: [node3]
ok: [node2]

TASK [httpd package is present] ************************************************ 14:04:16
changed: [node1]
changed: [node2]
changed: [node3]

TASK [latest index.html file is present] *************************************** 14:04:24
changed: [node1]
changed: [node2]
changed: [node3]

TASK [httpd is started] ******************************************************** 14:04:26
changed: [node1]
changed: [node2]
changed: [node3]

PLAY RECAP ********************************************************************* 14:04:28
node1                      : ok=4    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
node2                      : ok=4    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
node3                      : ok=4    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

```

Execution of content

Running at the core

- The central execution of automation content is managed and done either via central cluster, or on separate nodes.
- Takes care of collections, can also sync git repositories, takes care of credentials and logging
- Full audit trail of the execution, including what version of content was executed, what variable values were provided, etc.



TEMPLATES / Azure Linux VM Spinup

Azure Linux VM Spinup

DETAILS | PERMISSIONS | NOTIFICATIONS | COMPLETED JOBS | SCHEDULES | EDIT SURVEY

* NAME: Azure Linux VM Spinup

DESCRIPTION:

* JOB TYPE: Run — □ PROMPT ON LAUNCH

* INVENTORY: Prod — □ PROMPT ON LAUNCH

* PROJECT: fest19-demo

* PLAYBOOK: azure_spinup.yml

CREDENTIAL: Azure-Service-Principal — □ PROMPT ON LAUNCH

FORKS: 0

LIMIT: — □ PROMPT ON LAUNCH

* VERBOSITY: 0 (Normal) — □ PROMPT ON LAUNCH

JOB TAGS: — □ PROMPT ON LAUNCH

SKIP TAGS: — □ PROMPT ON LAUNCH

LABELS:

INSTANCE GROUPS:

JOB SLICING: 1

TIMEOUT: 0

SHOW CHANGES: OFF — □ PROMPT ON LAUNCH

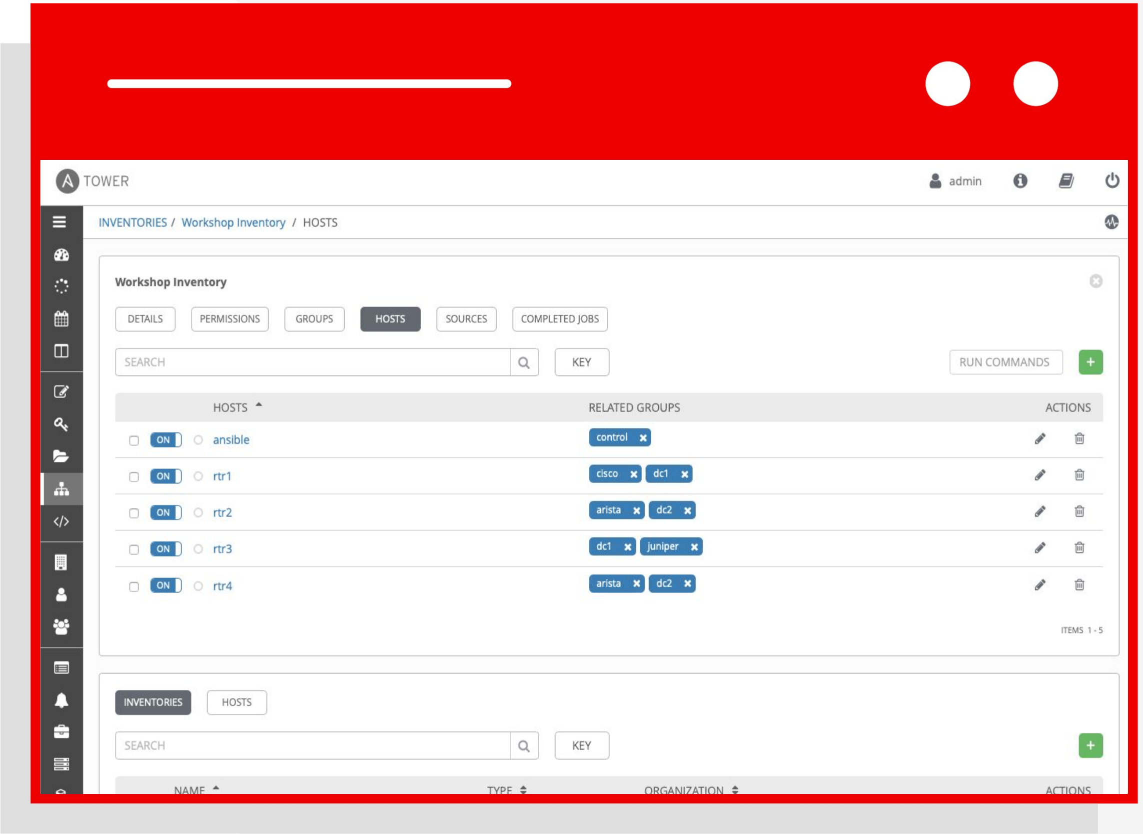
OPTIONS
- □ ENABLE PRIVILEGE ESCALATION
- □ ALLOW PROVISIONING CALLBACKS
- □ ENABLE CONCURRENT JOBS
- □ USE FACT CACHE

EXTRA VARIABLES: YAML | JSON — □ PROMPT ON LAUNCH

Inventories and credentials

How to talk to others

- An inventory is a collection of hosts (nodes) with associated data and groupings that the automation platform can connect to and manage:
  - Nodes
  - Groups
  - Can be static or dynamic
  - Smart inventories possible
- And what usernames and passwords do you use during connection? That is kept in the credentials.

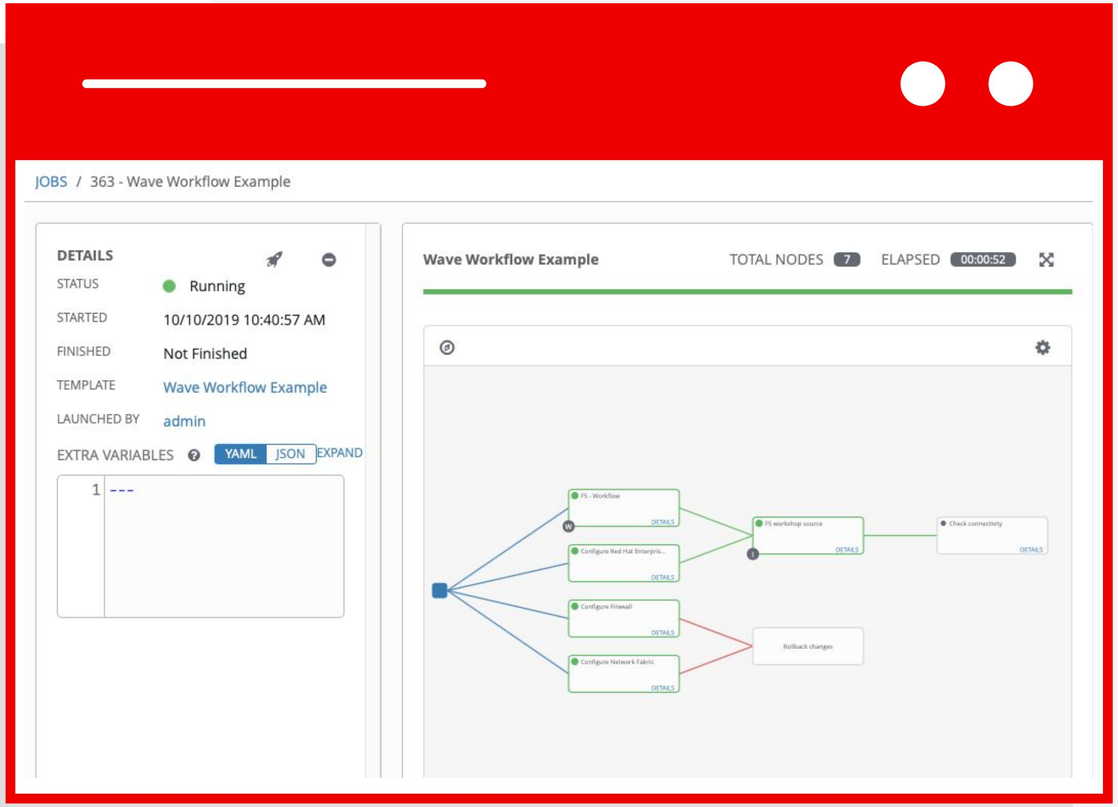


HOSTS	RELATED GROUPS	ACTIONS
ansible	control	
rtr1	cisco, dc1	
rtr2	arista, dc2	
rtr3	dc1, juniper	
rtr4	arista, dc2	

Workflows

Combine automation to create something bigger

- Workflows enable the creation of powerful holistic automation, chaining together multiple pieces of automation and events.
- Simple logic inside these workflows can trigger automation depending on the success or failure of previous steps.



JOBS / 363 - Wave Workflow Example

DETAILS

STATUS ● Running

STARTED 10/10/2019 10:40:57 AM

FINISHED Not Finished

TEMPLATE Wave Workflow Example

LAUNCHED BY admin

EXTRA VARIABLES

```
---
```

Wave Workflow Example

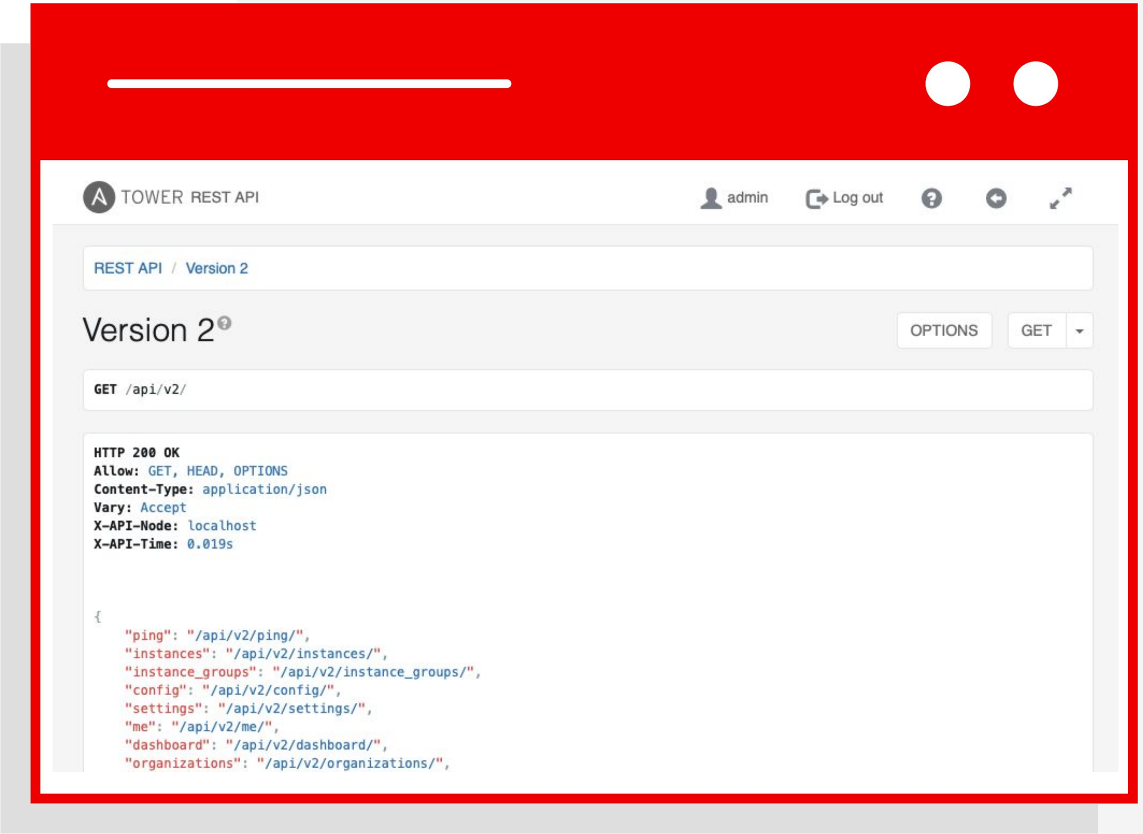
TOTAL NODES 7

ELAPSED 00:00:52

API

Integration of automation into larger workflows

- The API provides programmatic access to the automation via a defined interface.
- Underneath it is still powered by the same bits and pieces which are at the core: workflows, inventories, etc.
- It offers simple integration into other tools like ITSM, SOAR, etc.



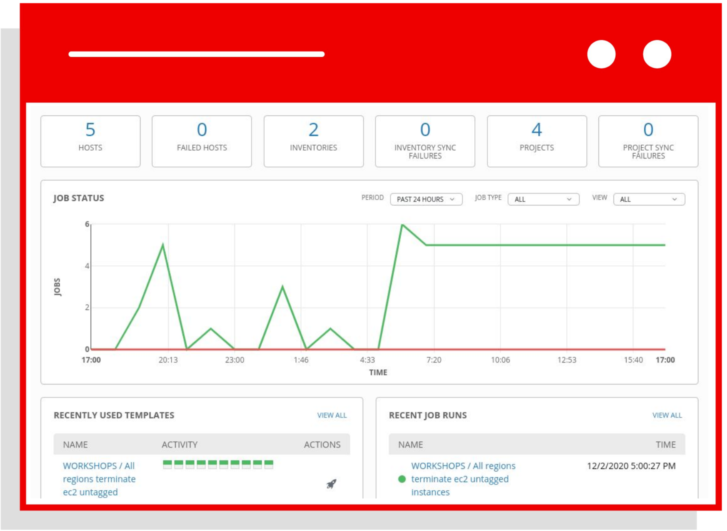
Version 2

```
GET /api/v2/
```

```
HTTP 200 OK
Allow: GET, HEAD, OPTIONS
Content-Type: application/json
Vary: Accept
X-API-Node: localhost
X-API-Time: 0.019s


{
    "ping": "/api/v2/ping/",
    "instances": "/api/v2/instances/",
    "instance_groups": "/api/v2/instance_groups/",
    "config": "/api/v2/config/",
    "settings": "/api/v2/settings/",
    "me": "/api/v2/me/",
    "dashboard": "/api/v2/dashboard/",
    "organizations": "/api/v2/organizations/",
```

Dashboards

Understand what is going on



5 HOSTS | 0 FAILED HOSTS | 2 INVENTORIES | 0 INVENTORY SYNC FAILURES | 4 PROJECTS | 0 PROJECT SYNC FAILURES

JOB STATUS

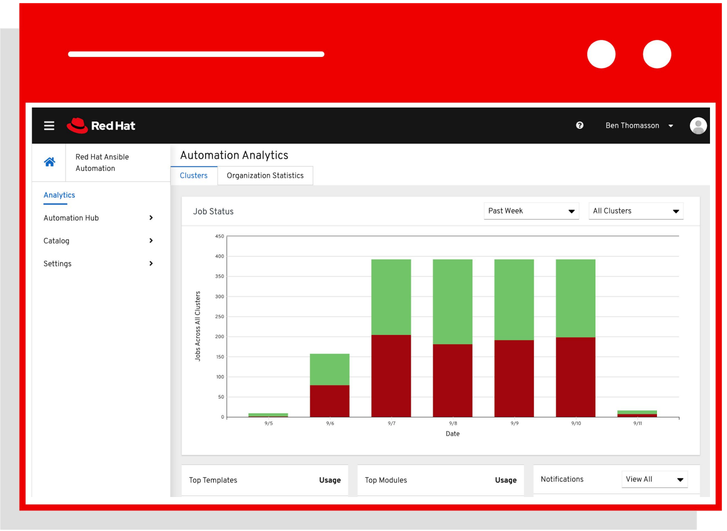
PERIOD: PAST 24 HOURS
JOB TYPE: ALL
VIEW: ALL

RECENTLY USED TEMPLATES — VIEW ALL

NAME	ACTIVITY	ACTIONS
WORKSHOPS / All regions terminate ec2 untagged	🟩🟩🟩🟩🟩🟩🟩🟩🟩🟩	🚀

RECENT JOB RUNS — VIEW ALL

NAME	TIME
● WORKSHOPS / All regions terminate ec2 untagged instances	12/2/2020 5:00:27 PM



Automation Analytics

Clusters | Organization Statistics

Job Status

Past Week
All Clusters

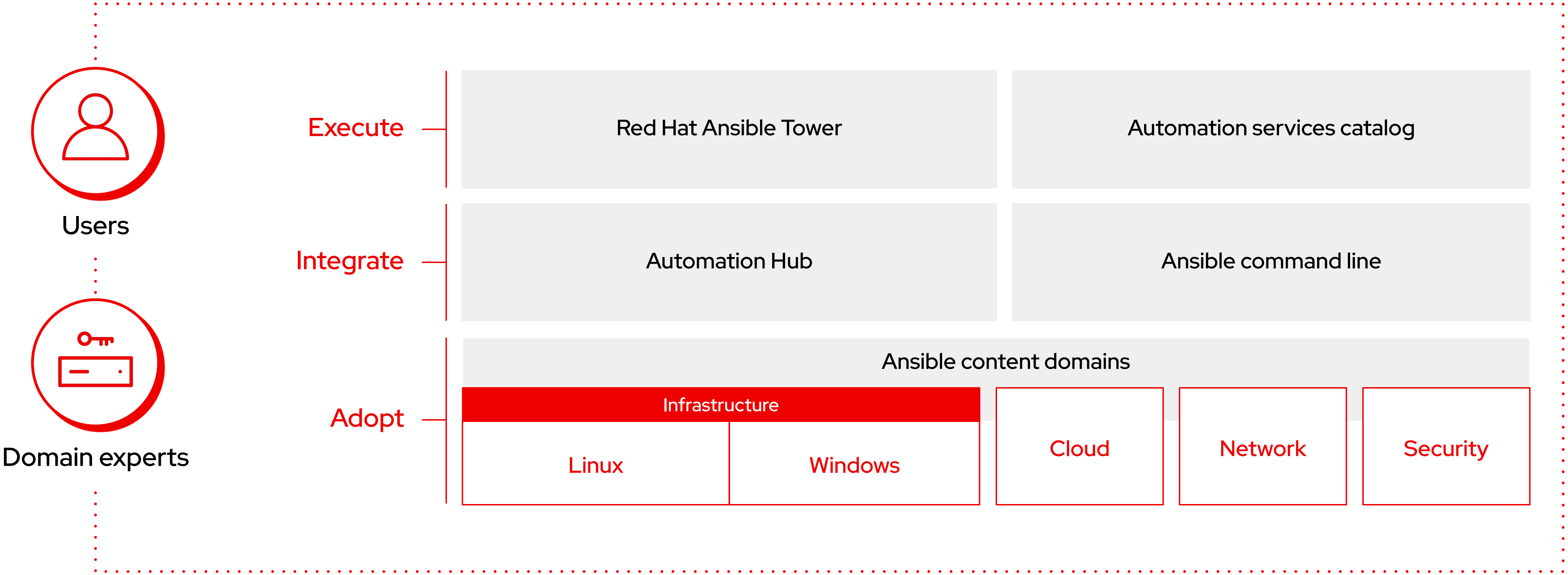
Overview of the actual cluster, the jobs happening, the nodes connected, what works and fails right at this moment.

Overview across clusters, better insight into use cases of automation; insight into adoption of automation per organization.

Consume

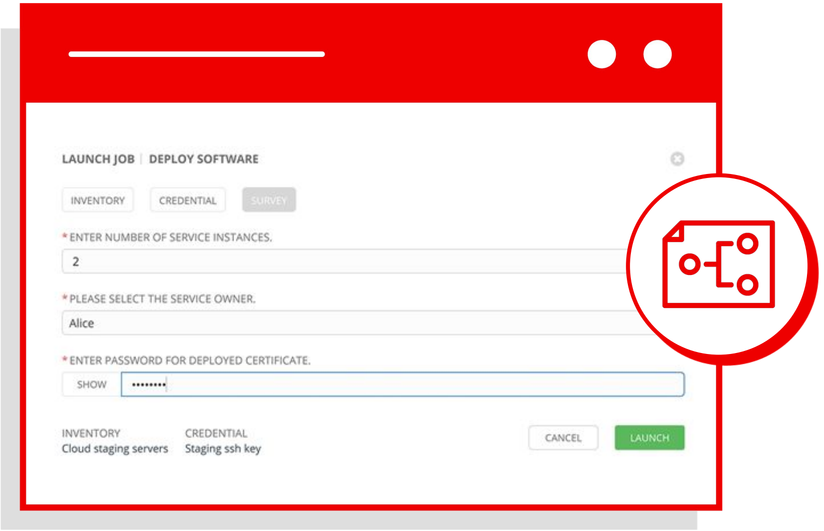
Consume

The automation lifecycle



Self service

Provide others the mean to consume



LAUNCH JOB | DEPLOY SOFTWARE

* ENTER NUMBER OF SERVICE INSTANCES.

2

* PLEASE SELECT THE SERVICE OWNER.

Alice

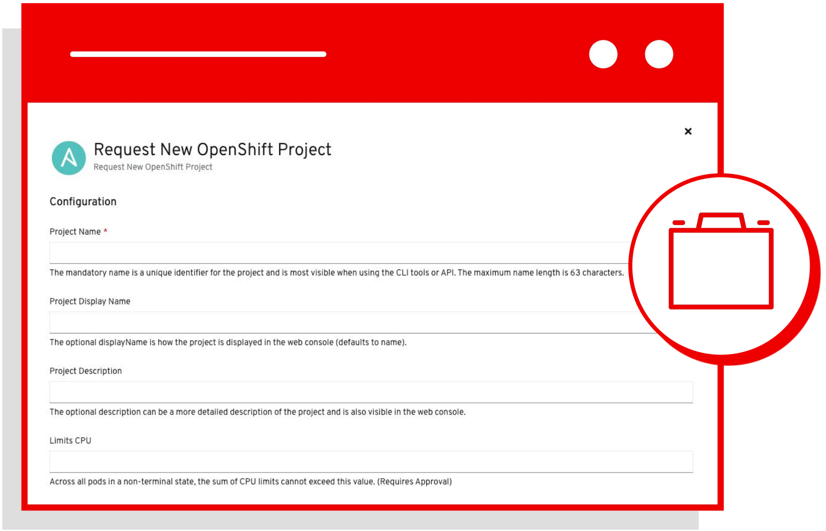
* ENTER PASSWORD FOR DEPLOYED CERTIFICATE.

••••••••

INVENTORY
Cloud staging servers

CREDENTIAL
Staging ssh key

For teams accessing directly the automation environment and are close to the automation platform processes.



Request New OpenShift Project

Request New OpenShift Project

Configuration

Project Name *

The mandatory name is a unique identifier for the project and is most visible when using the CLI tools or API. The maximum name length is 63 characters.

Project Display Name

The optional displayName is how the project is displayed in the web console (defaults to name).

Project Description

The optional description can be a more detailed description of the project and is also visible in the web console.

Limits CPU

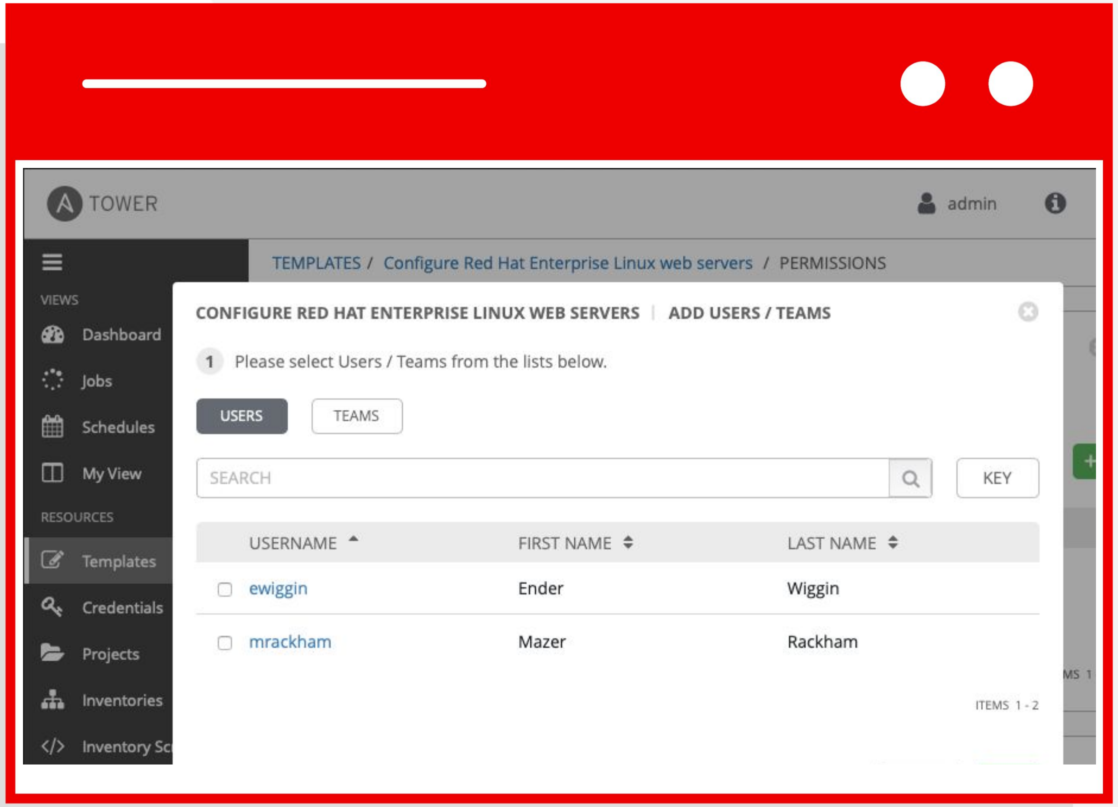
Across all pods in a non-terminal state, the sum of CPU limits cannot exceed this value. (Requires Approval)

For high level access distant or not even aware of the underlying automation environment; lines of business for example.

Role-based access control

How to manage access

- Role-based access control system: Users can be grouped in teams, and roles can be assigned to the teams.
- Rights to edit or use can be assigned across all objects.
- All backed by enterprise authentication if needed.



TEMPLATES / Configure Red Hat Enterprise Linux web servers / PERMISSIONS

CONFIGURE RED HAT ENTERPRISE LINUX WEB SERVERS | ADD USERS / TEAMS

1 Please select Users / Teams from the lists below.

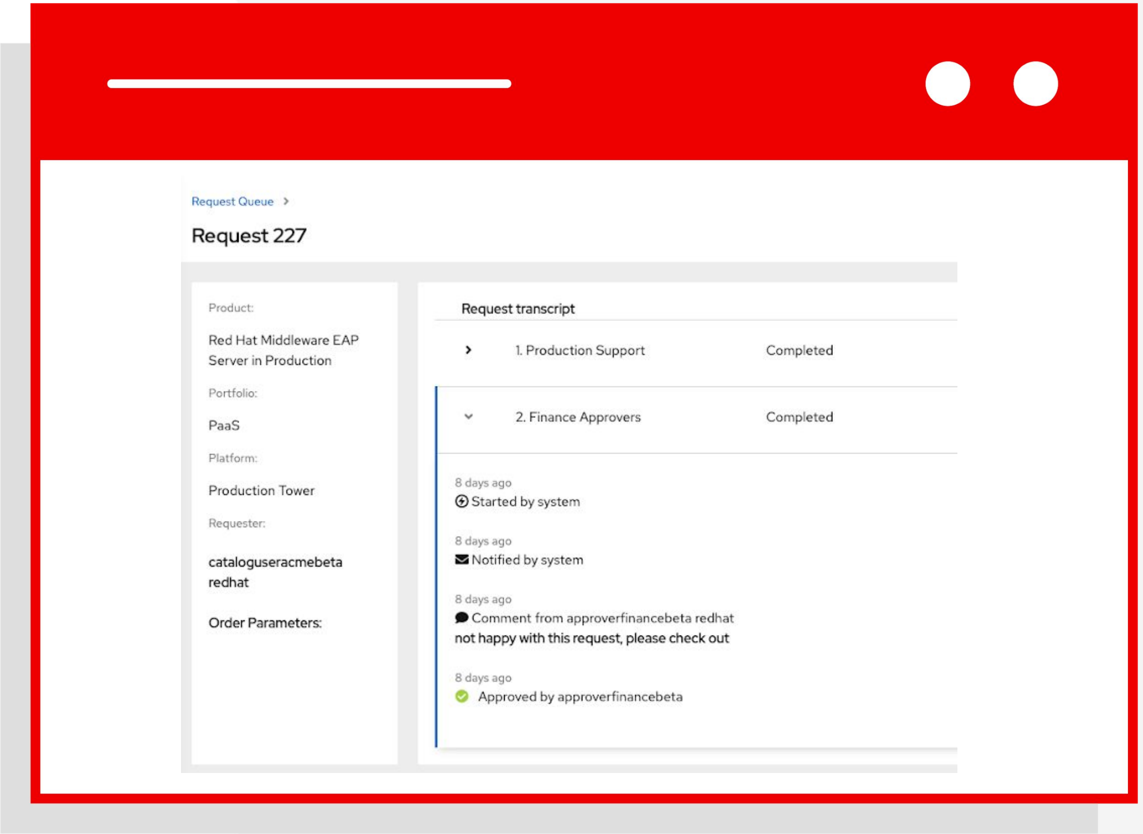
	USERNAME	FIRST NAME	LAST NAME
□	ewiggin	Ender	Wiggin
□	mrackham	Mazer	Rackham

ITEMS 1 - 2

Approval

Govern access

- Approval processes allow a human interaction to the automation, to add governance like human level administration.
- Both available at the operational level on the Tower automation UI as well as in the service catalog level.



Request Queue >

Request 227

Product:

Red Hat Middleware EAP Server in Production

Portfolio:

PaaS

Platform:

Production Tower

Requester:

cataloguseracmebeta redhat

Order Parameters:

Request transcript

›	1. Production Support	Completed
⌄	2. Finance Approvers	Completed

8 days ago
Started by system

8 days ago
Notified by system

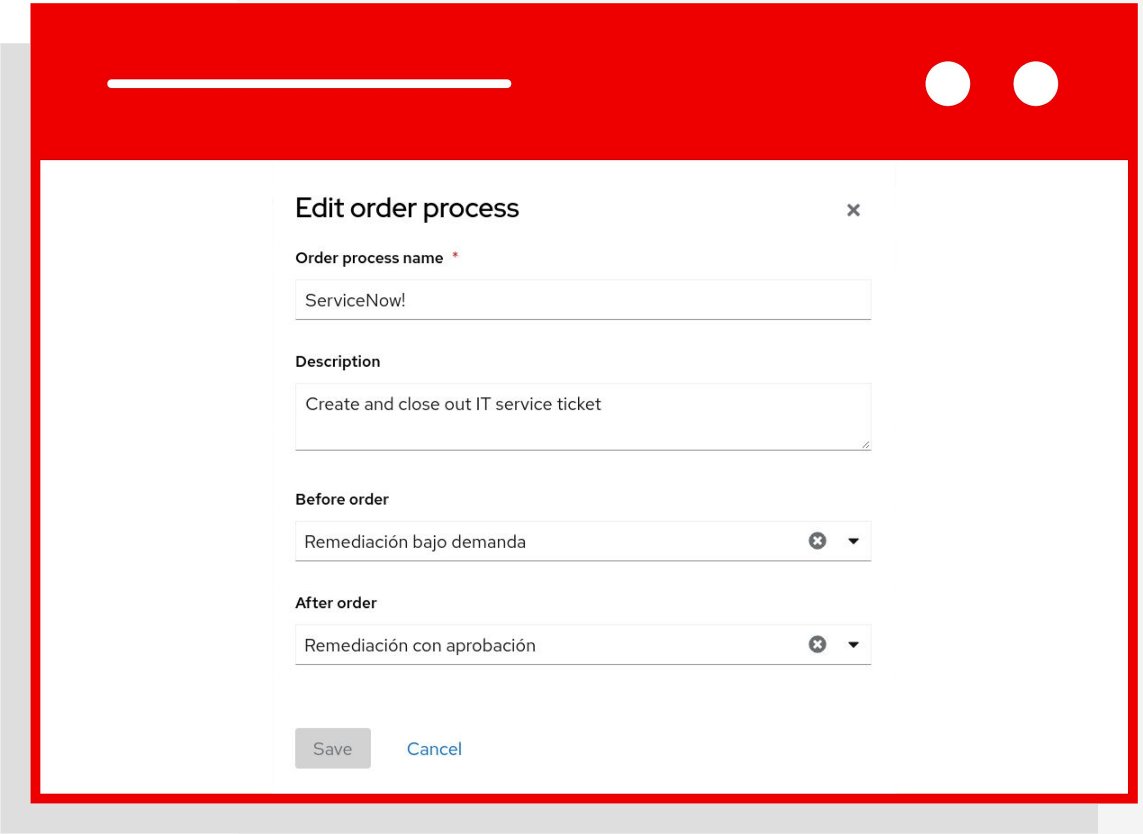
8 days ago
Comment from approverfinancebeta redhat
not happy with this request, please check out

8 days ago
✓ Approved by approverfinancebeta

IT service management integration (ITSM)

Incorporate automation into your ITSM

- Integrate high level workflows in existing ITSM toolsets with the automation platform.
- Have the automation platform reach out to the ITSM system whenever things are changing, including data transmission between the tools.



Edit order process

Order process name *

ServiceNow!

Description

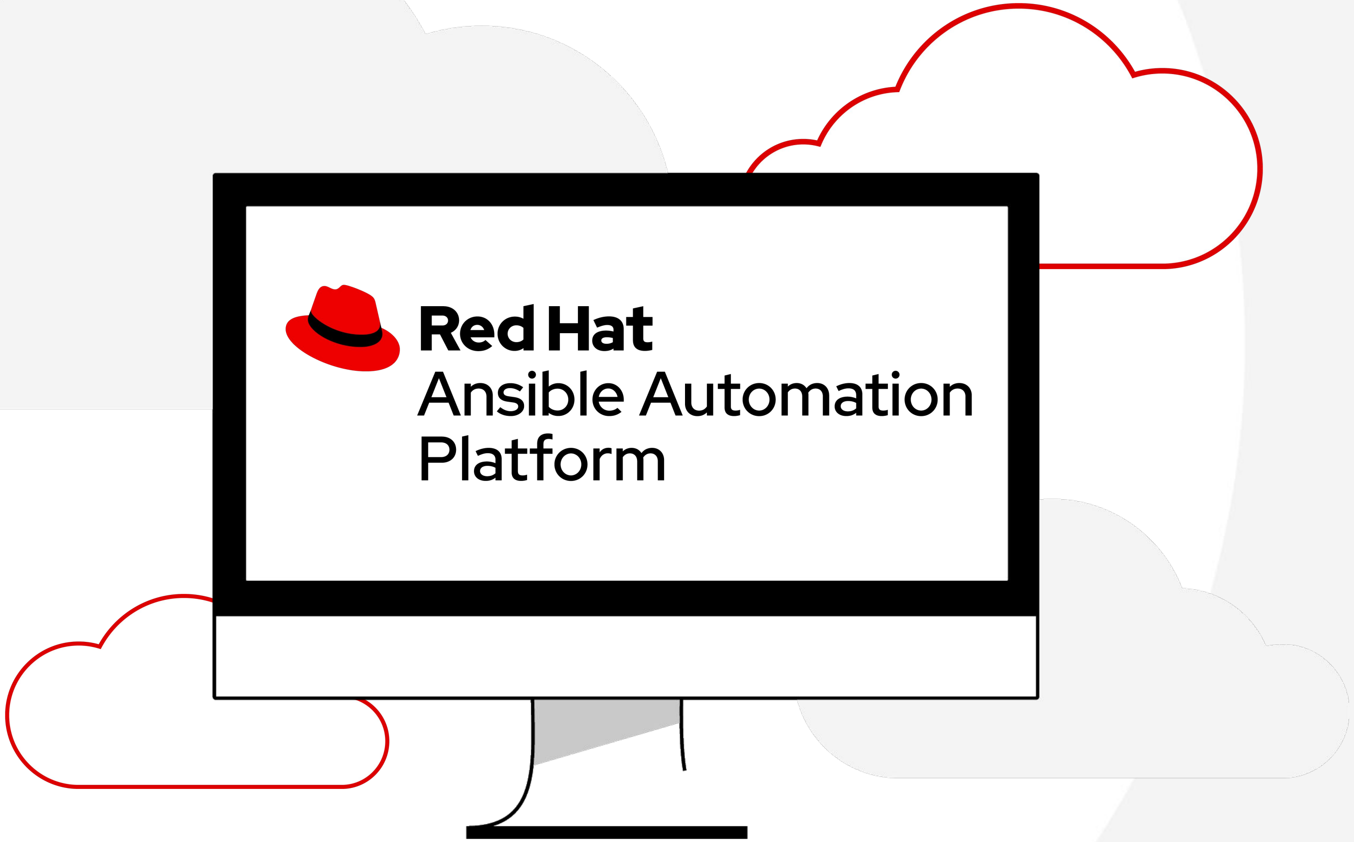
Create and close out IT service ticket

Before order

Remediación bajo demanda

After order

Remediación con aprobación



Where to go next

Learn more

- Workshops
- Documents
- Youtube
- Twitter

Get started

- Evals
- cloud.redhat.com

Get serious

- Red Hat Automation Adoption Journey
- Red Hat Training
- Red Hat Consulting

Thank you

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