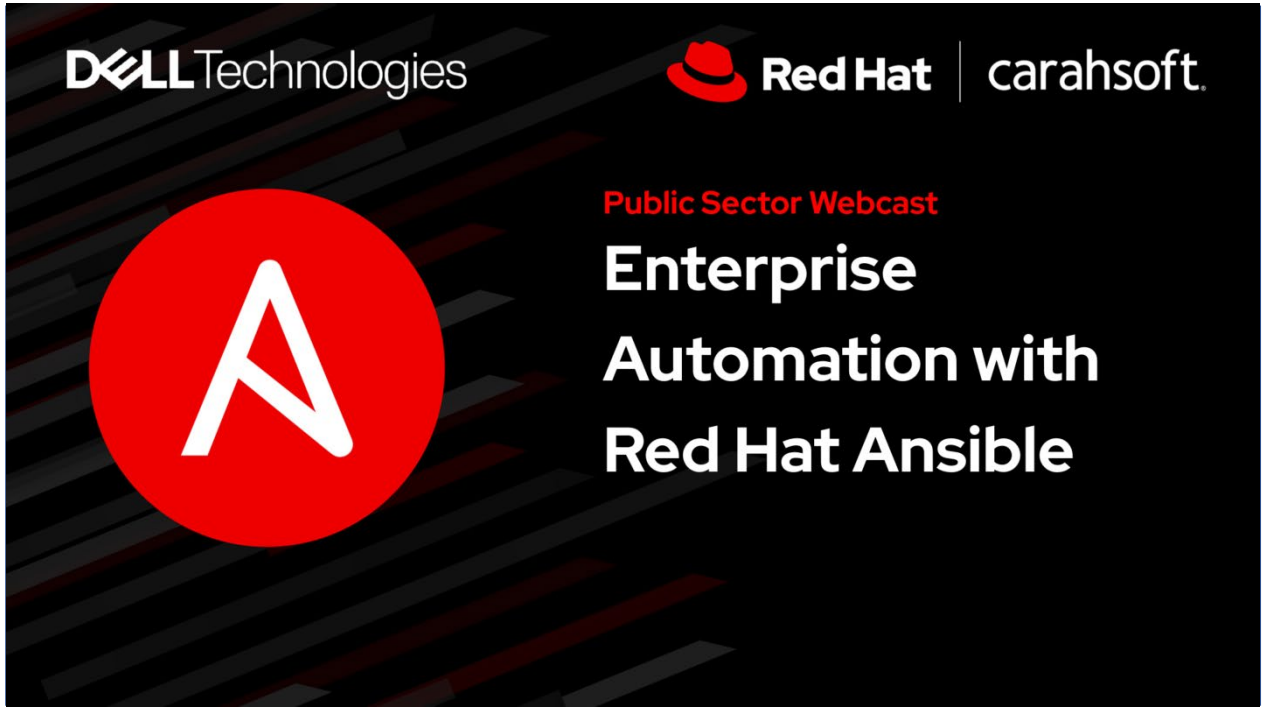
Enterprise Automation with Red Hat Ansible



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Public Sector Webcast

Enterprise Automation with Red Hat Ansible

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Red Hat Sales Director

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About Carahsoft

Carahsoft Technology Corp., **The Government IT Solutions Provider®**, is dedicated to helping government agencies find the best possible solution at the best possible value.

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Red Hat Ansible

Simple, powerful, agentless, IT automation

Red Hat Ansible Automation provides a foundation for building operating IT automation, at scale.

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Featured Experts:

Lance Abla
Senior Solutions
Architect
Red Hat

Keith Gienty
Red Hat
Cloud Specialist
Dell Technologies

Red Hat
Ansible Automation
Platform

Enterprise Automation with Red Hat Ansible

Lance Abla, Red Hat
Partner Solutions Architect

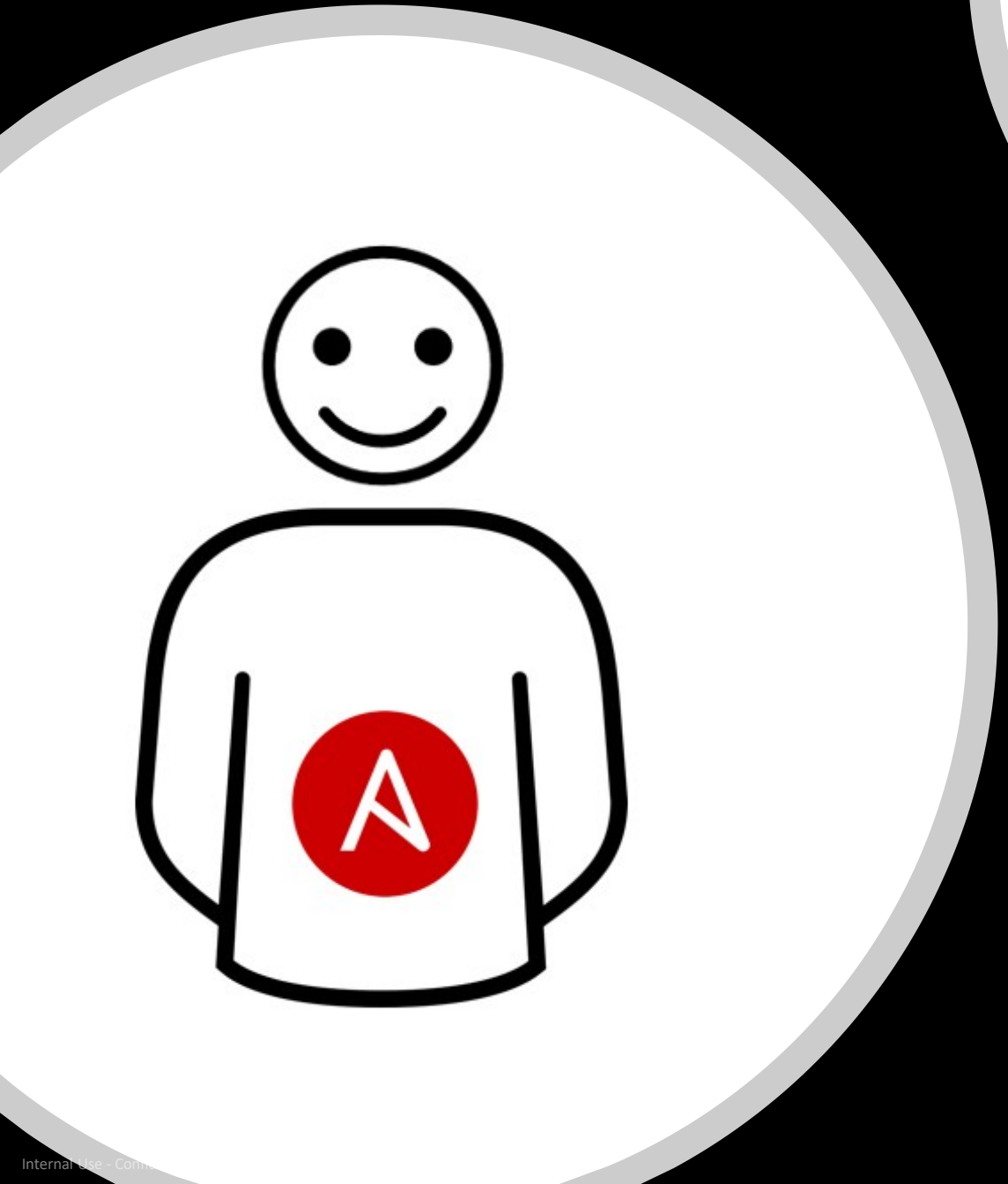
Keith Gienty, Dell
Technologies Cloud Specialist

DELL Technologies Red Hat

Red Hat
Ansible Automation
Platform

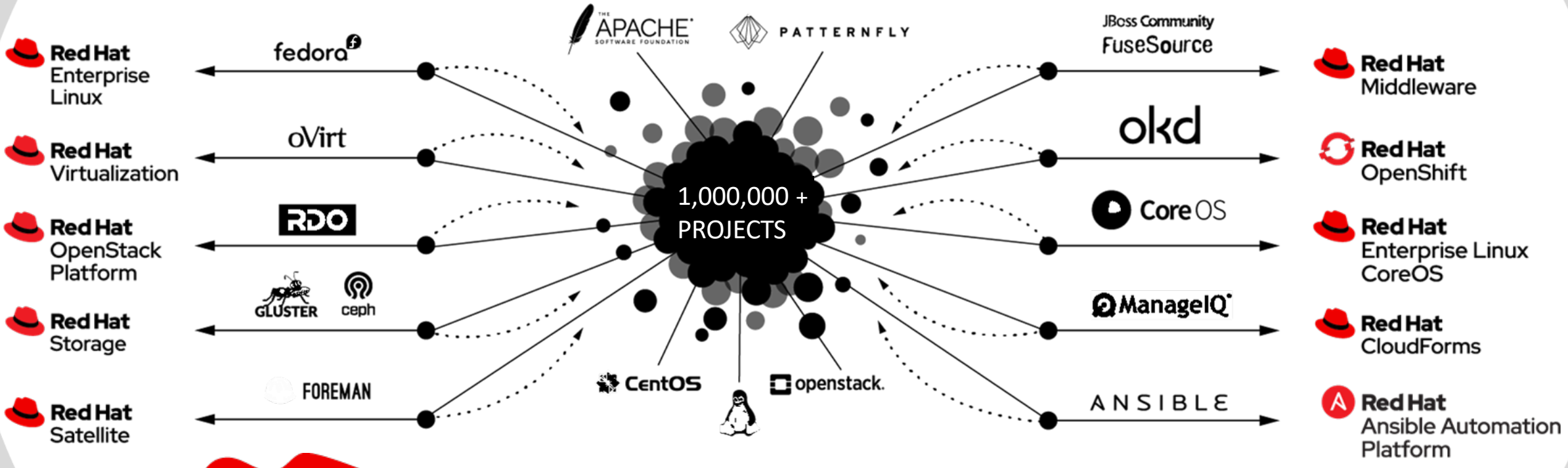
Agenda

- Why Red Hat?
- Why Ansible?
- Ansible Use Cases
- How does it work?
- Ansible Tower
- Security and Compliance
- Resources
- Q/A



Why Red Hat?

From community to enterprise



PARTICIPATE

Red Hat creates, catalyzes, and participates in community-powered upstream projects. We contribute code, collaborate on content, help maintain projects, provide critical infrastructure, mentor leaders, consult on licensing decisions, and sponsor events aimed at raising awareness of community-driven projects. In open source communities, we advocate for technological innovations that will benefit our customers.

INTEGRATE

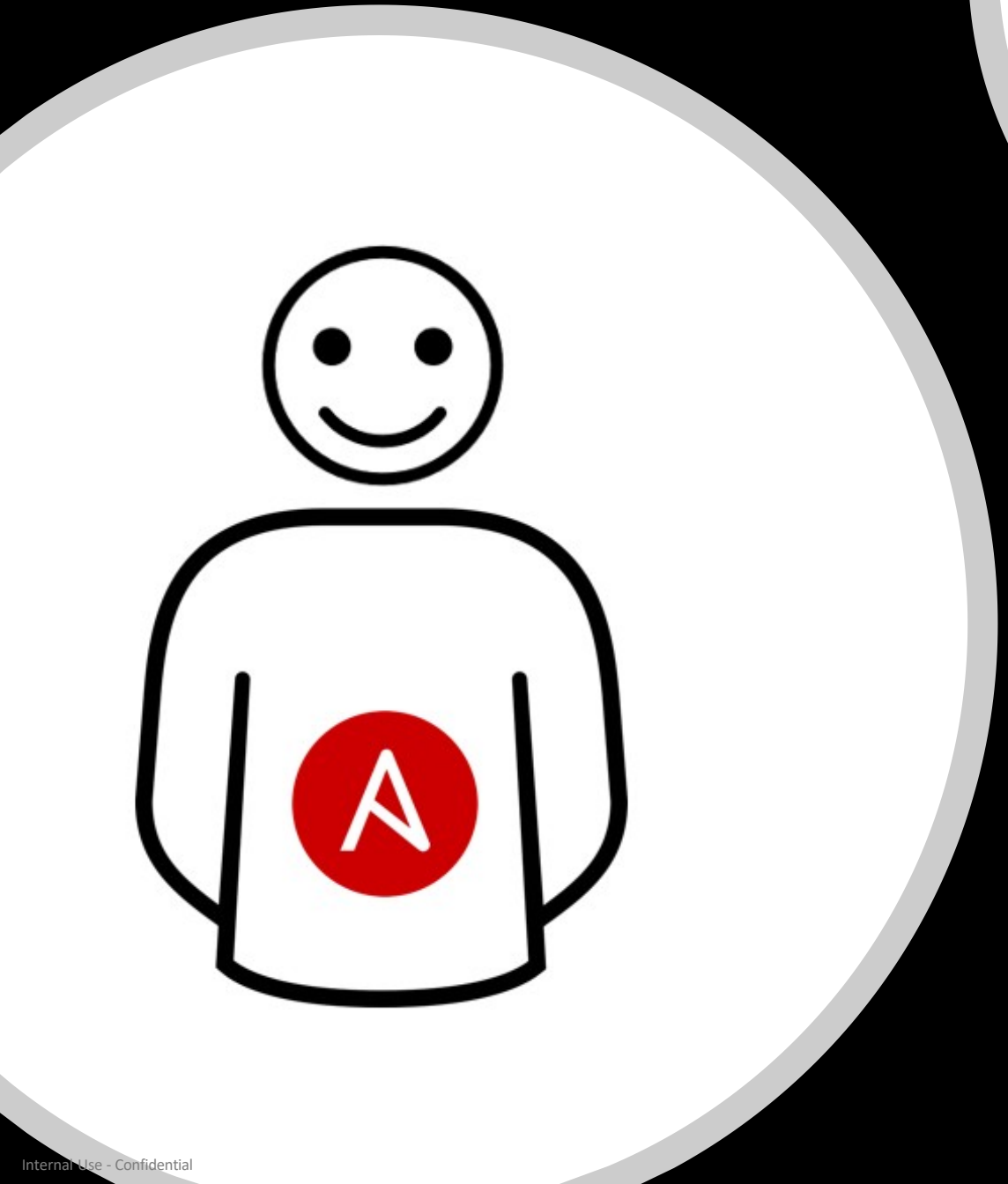
Red Hat integrates multiple upstream projects into open source community platforms on which others can build, ensuring individual component technologies integrate effectively into complete solutions. We validate and test these platforms in conjunction with third-party software, ensuring ease of installation and management across multiple projects. We also work in multi-organizational initiatives, integrating industry-recognized standard technologies into our own projects.

STABILIZE

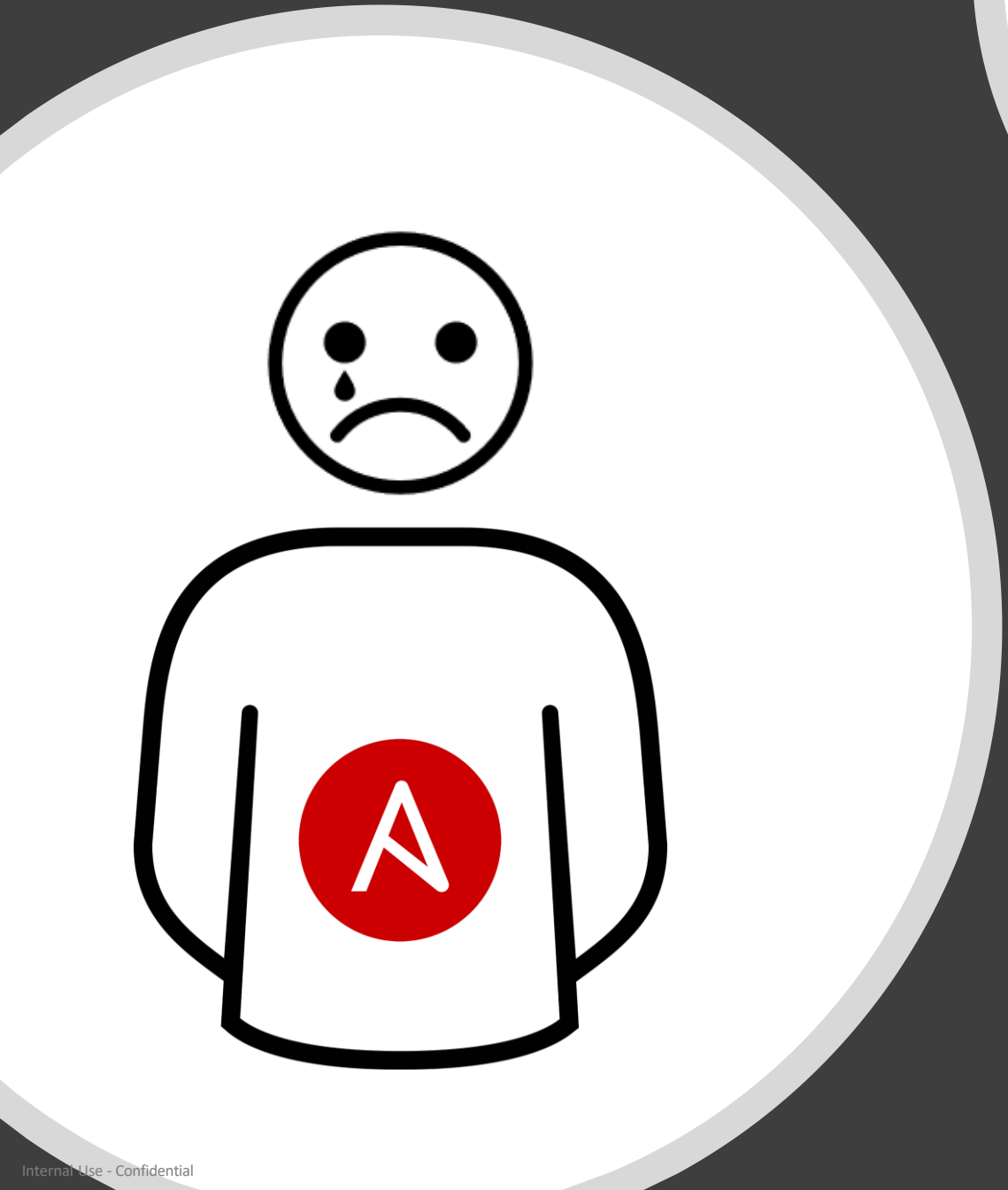
Red Hat stabilizes software platforms by refining them to meet enterprise specifications. We certify software to run on common industry hardware and help customers keep the software updated for specified durations. We offer training and certifications on the software platforms, and we consult with customers seeking to understand how open source platforms can impact their businesses.

MAINTAIN

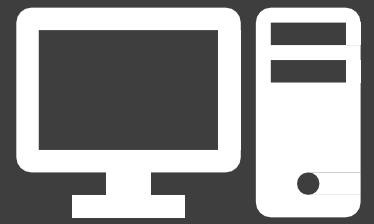
Red Hat maintains open source software platforms by providing technical support for customers. We help customers configure their software to provide additional, ongoing business insights. We provide patches for zero-day security exploits in coordination with community projects. And we contribute our modifications back to the upstream projects of which we are a part, propelling the open source life cycle forward.

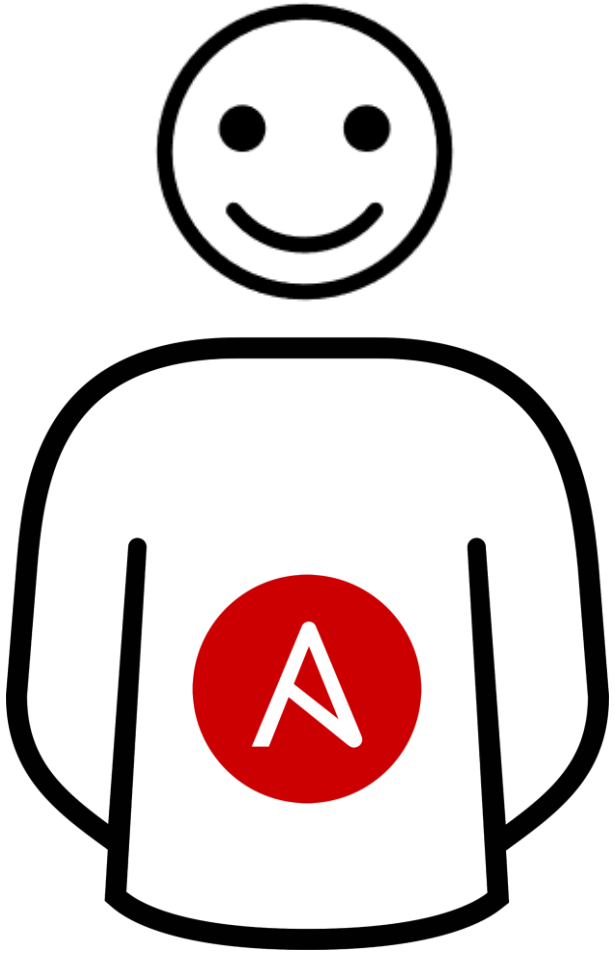


Why Ansible?



I have to setup 1,200 servers by Monday and it is Friday at 4PM.





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

Why Ansible?

One tool to do it all

3000+ modules and counting *3387 as of May 18th

Lowest Learning Curve

write YAML not code

Infrastructure Entropy

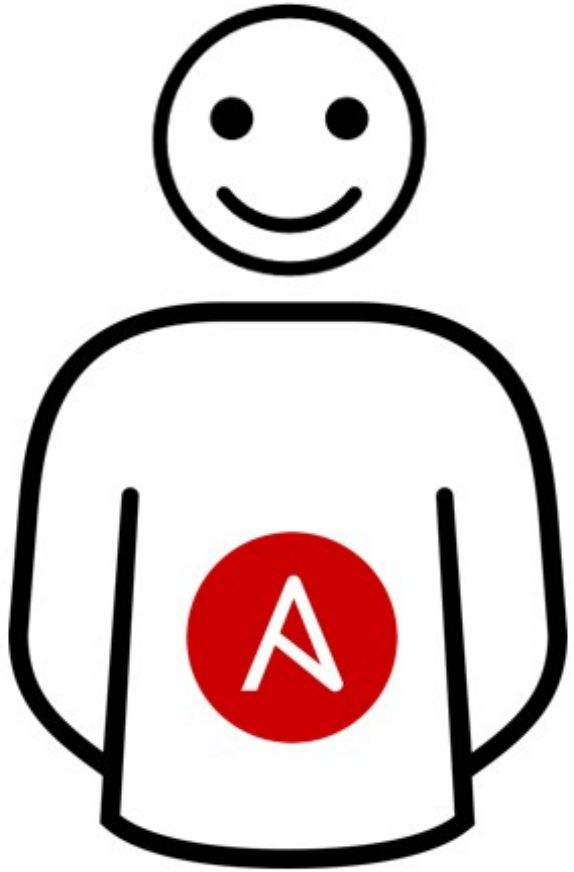
ensure consistency in the cross-team chaos

Agentless

ssh or winrm to use

Start Today

once you install Ansible engine you can start changing your world



Customers and Use Cases

Business value by the numbers

5x

5-year return on investment with 5 months to payback

1.13M

additional new revenue gained per year

135%

more applications developed per year

68%

more productive IT infrastructure management teams

25%

More efficient IT security teams

Source: IDC White Paper, sponsored by Red Hat, "Red Hat Ansible Automation Improves IT Agility and Time to Market," June 2019.

DELL Technologies Red Hat

Ansible Use Case Success

- Infrastructure - OS Configuration Management -- 75% DECREASED DELIVERY TIME
- Infrastructure - Virtual Infrastructure -- 99% REDUCED WORK HOURS FOR UPDATING
- Infrastructure - Maintaining Growing Infrastructure -- 50% REDUCED IT MGMT TIME
- Network - Configuration Consistency -- 3000 HOURS PER YEAR SAVED
- Security - Threat Hunting -- 94% REDUCTION IN MAN HOURS TO RECOVER
- Devops - Provision Environments -- 4h15m PROVISION ENVIRONMENT TIME

ARMY BE THE BEST

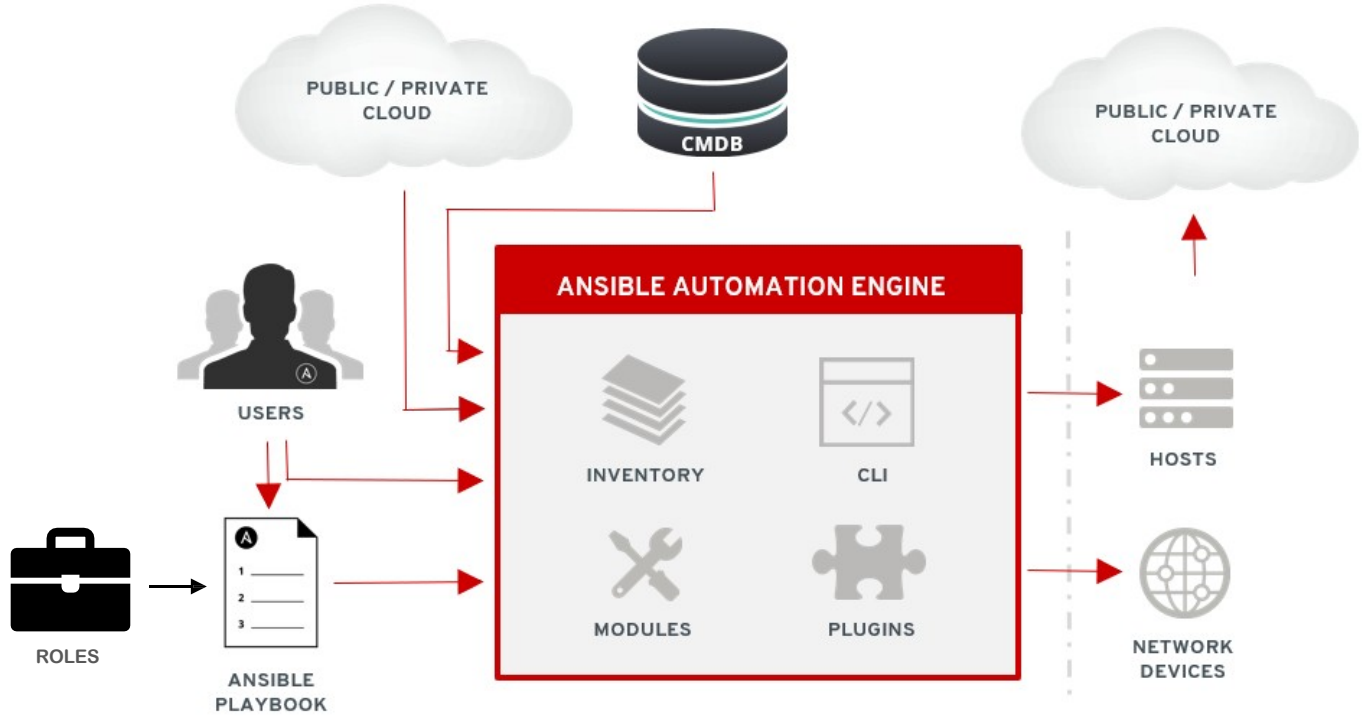
swisscom

ServiceMaster

Bundesanstalt für Landwirtschaft und Ernährung

FORRESTER

SoftBank



Cloud

AWS
Azure
Digital Ocean
Google
OpenStack
Rackspace
+more

Virt & Container

Docker
VMware
RHV
OpenStack
OpenShift
+more

Windows

ACLs
Files
Packages
IIS
Regedits
Shares
Services
Configs
Users
Domains
+more

Network

DELL Technologies

Arista
A10
Cumulus
Bigswitch
Cisco
F5
Juniper
Palo Alto
OpenSwitch
+more

Devops

Jira
GitHub
Vagrant
Jenkins
Bamboo
Atlassian
Subversion
Slack
Hipchat
+more

Monitoring

Dynatrace
Airbrake
BigPanda
Datadog
LogicMonitor
Nagios
New Relic
PagerDuty
Sensu
StackDriver
Zabbix
+more

Operating Systems

RHEL
Linux
UNIX
Windows
+more

Storage

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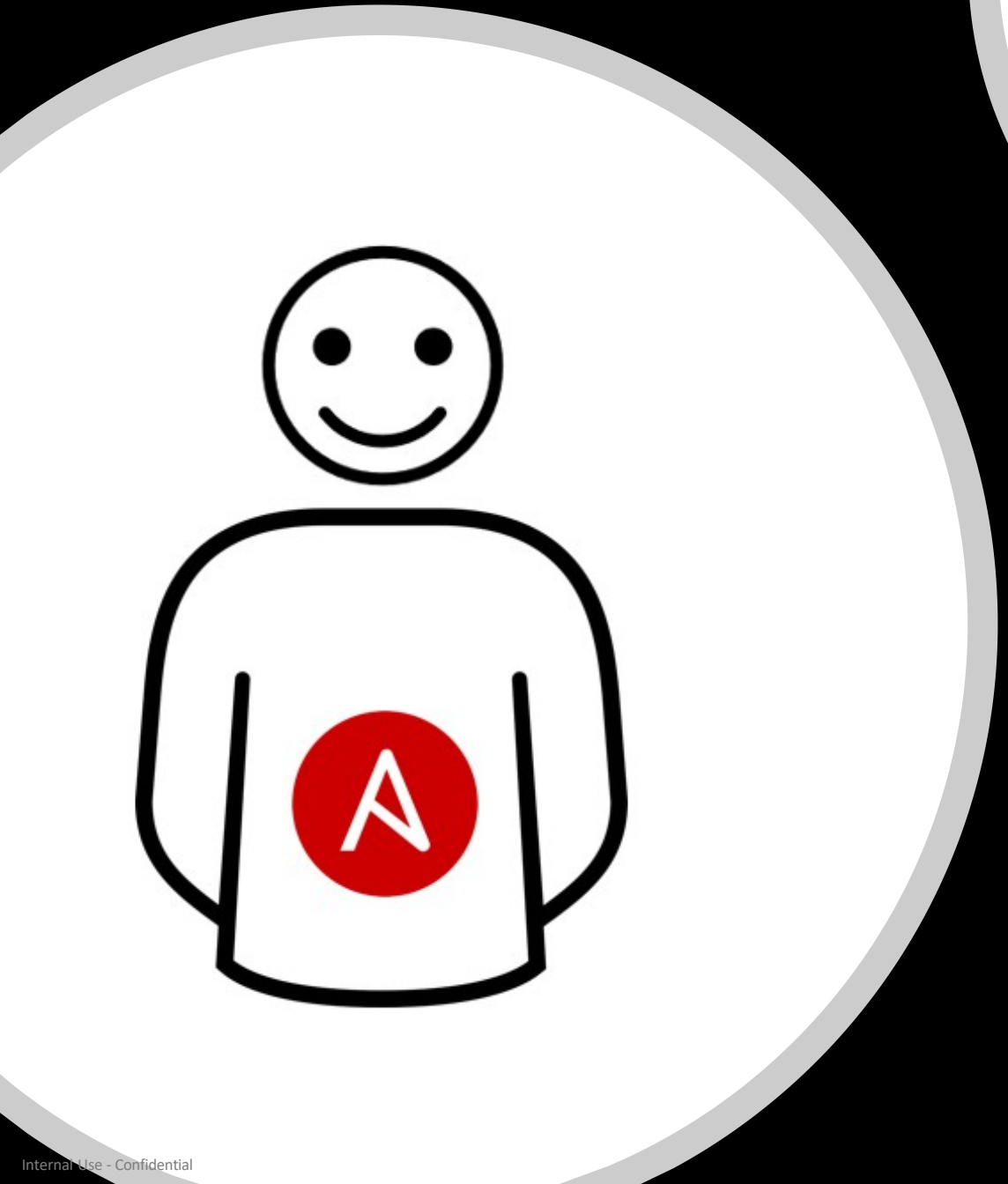
Storage
Infinidat
+more

Time to automate is measured in minutes

Ansible Automates Technologies You Use



How does it work?

Start with a simple text file containing hostnames

Inventory File

db Grouping →

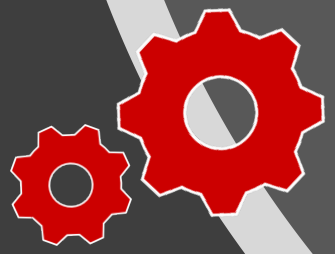
```
[db]
db1.example.com
db2.example.com
db3.example.com
```

apps Grouping →

```
[apps]
app1.example.com
app2.example.com
app3.example.com
```

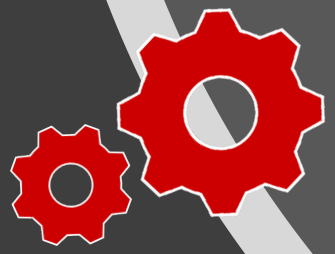
web Grouping →

```
[web]
www1.example.com
www2.example.com
www3.example.com
www4.example.com
www5.example.com
www6.example.com
www7.example.com
www8.example.com
www9.example.com
```



CLI

```
ansible web -m ping

ansible web -m command -a "uptime" -o

ansible web -m setup

ansible web -m dnf -a 'name=git state=present' -b
```



Modules

Here is a 'small' subset of the available configuration modules .....

```
- user:
    name: james18
    shell: /bin/zsh
    groups: developers
    expires: 1422403387
```

```
- copy:
    src: /mine/ntp.conf
    dest: /etc/ntp.conf
    owner: root
    group: root
    mode: 0644
    backup: yes
```

```
- template:
    src: /mine/sudoers
    dest: /etc/sudoers
    validate: 'visudo -cf %s'
```

```
- name: apply patch to one file
  patch:
    src: /tmp/index.html.patch
    dest: /var/www/index.html
```

```
- replace:
    path: /home/jdoe/.ssh/known_hosts
    regexp: '^old\.host\.name[^\n]*\n'
    owner: jdoe
    group: jdoe
    mode: 0644
```

```
- git:
    repo: https://github.com/ansible/ansible-examples.git
    dest: /src/ansible-examples
    archive: /tmp/ansible-examples.zip
```

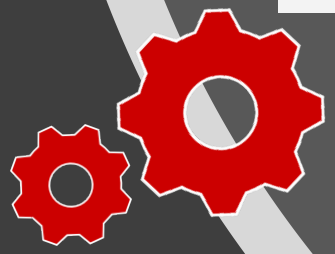
Plugins extend the capabilities of Ansible

Plugins

- Action Plugins
- Become Plugins
- Cache Plugins
- Callback Plugins
- Cliconf Plugins
- Connection Plugins
- Httpapi Plugins
- Inventory Plugins
- Lookup Plugins
- Netconf Plugins
- Shell Plugins
- Strategy Plugins
- Vars Plugins
- Filters
- Tests
- Plugin Filter Configuration

→

- doas – Do As user
- dzdo – Centrify's Direct Authorize
- enable – Switch to elevated permissions on a network device
- ksu – Kerberos substitute user
- machinectl – Systemd's machinectl privilege escalation
- pbrun – PowerBroker run
- pfexec – profile based execution
- pmrun – Privilege Manager run
- runas – Run As user
- sesu – CA Privileged Access Manager
- su – Substitute User
- sudo – Substitute User DO



Tasks, Plays and Playbooks

Task

```
tasks:
  - name: ensure apache is at the latest
version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf
```

Play

```
hosts: web
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf
```

Playbook

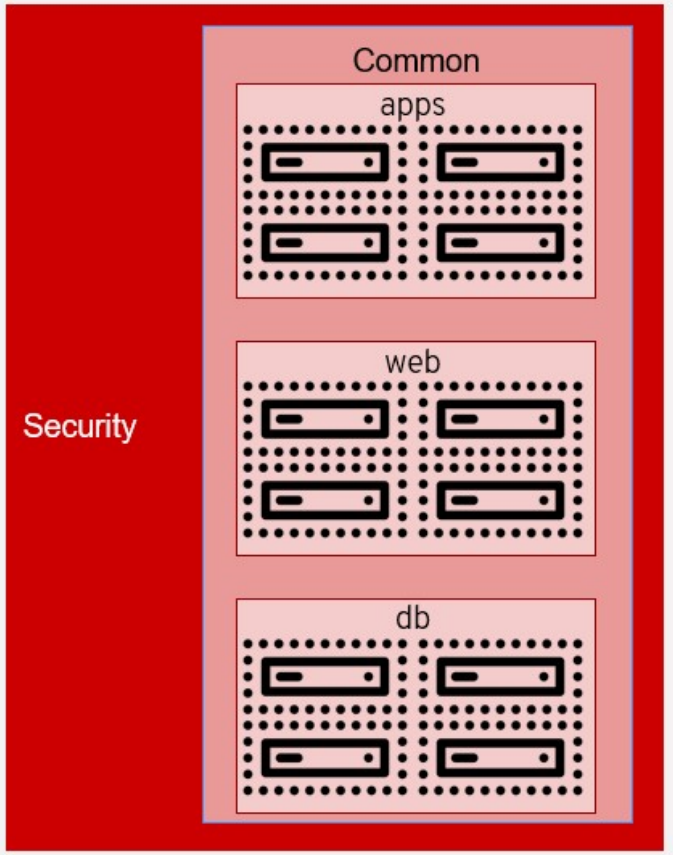
```
---
- hosts: web
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf

- hosts: db
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```

Roles

Roles are utilized for nested configuration callouts

```
---
- hosts: web
  tasks:
    - include_role:
        name: common
      vars:
        dir: '/opt/a'
        app_port: 5000
    - role: security
      vars:
        dir: '/opt/b'
        app_port: 5001
  ...
```

```
site.yml
web.yml
Apps.yml
db.yml
roles/
   common/
      tasks/
      handlers/
      files/
      templates/
      vars/
      defaults/
      meta/
   security/
      tasks/
      defaults/
      meta/
```



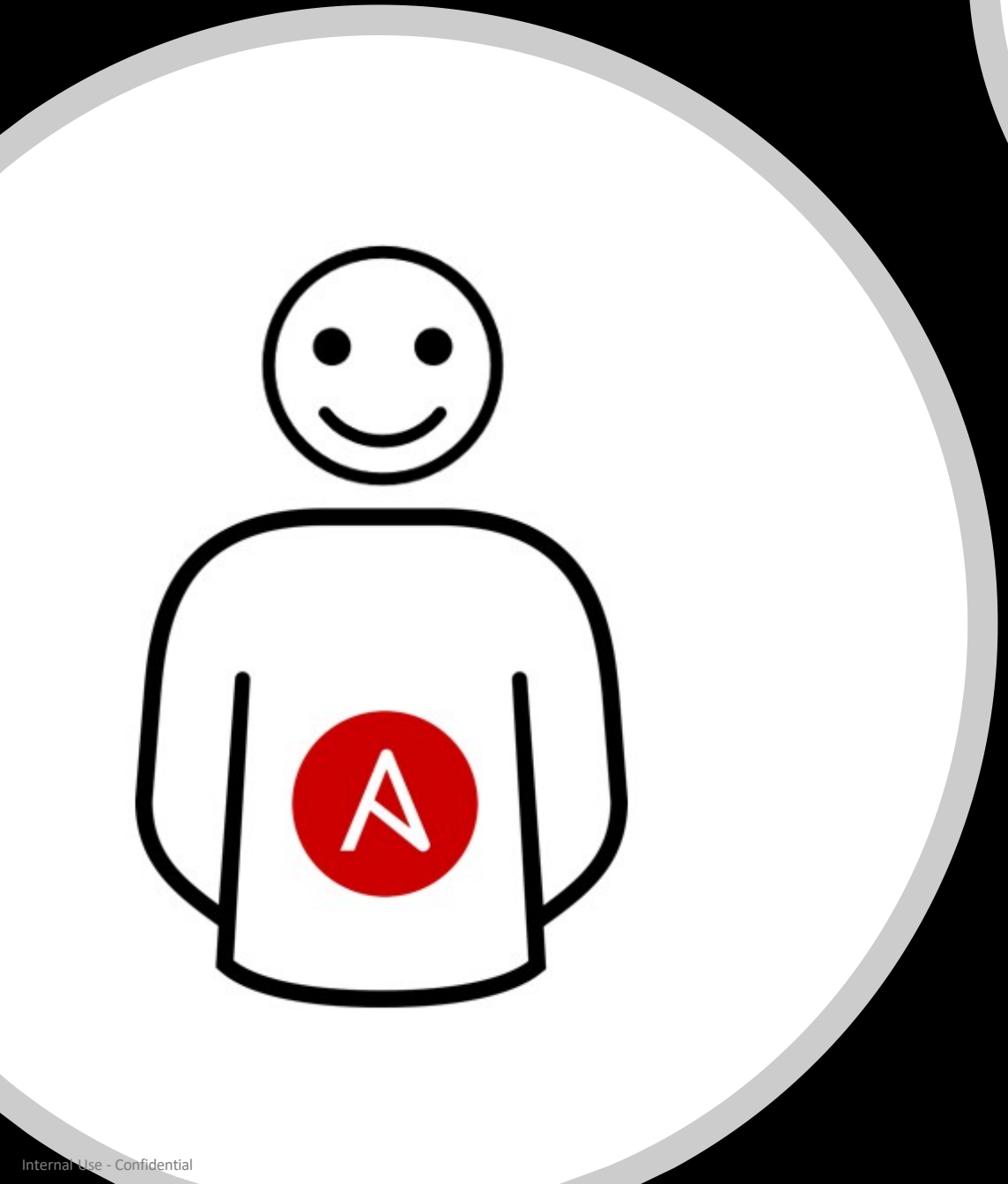
Ansible Galaxy
https://galaxy.ansible.com/

YAML

White Space Matters

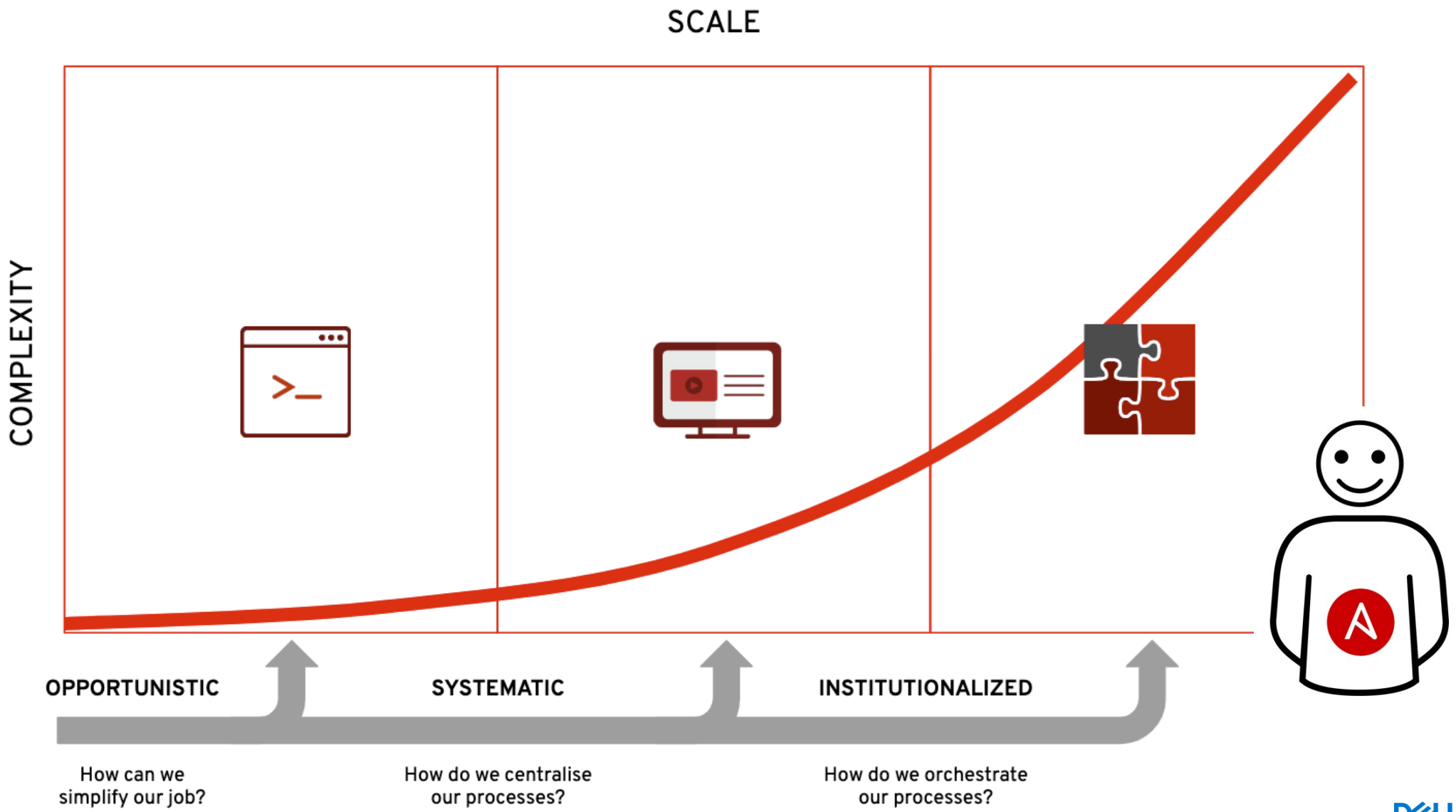
- *Use Spaces not Tabs*
- *Indentation indicates relationships*

```
---
- hosts: localhost
  tasks:
  - name: test connection
    ping:
...
```



Red Hat
Ansible Tower

Where are you on your automation journey?



Red Hat Ansible Automation Platform

Red Hat Ansible Tower

Push button

An intuitive user interface experience makes it easy for novice users to execute playbooks you allow them access to.

RESTful API

With an API first mentality every feature and function of Tower can be API driven. Allow seamless integration with other tools like ServiceNow and Infoblox.

RBAC

Allow restricting playbook access to authorized users. One team can use playbooks in check mode (read-only) while others have full administrative abilities.

Enterprise Integrations

Integrate with enterprise authentication like TACACS+, RADIUS, Azure AD. Setup token authentication with OAuth 2. Setup notifications with PagerDuty, Slack and Twilio.

Centralized logging

All automation activity is securely logged. Who ran it, how they customized it, what it did, where it happened - all securely stored and viewable later, or exported through Ansible Tower's API.

Workflows

Ansible Tower's multi-playbook workflows chain any number of playbooks, regardless of whether they use different inventories, run as different users, run at once or utilize different credentials.

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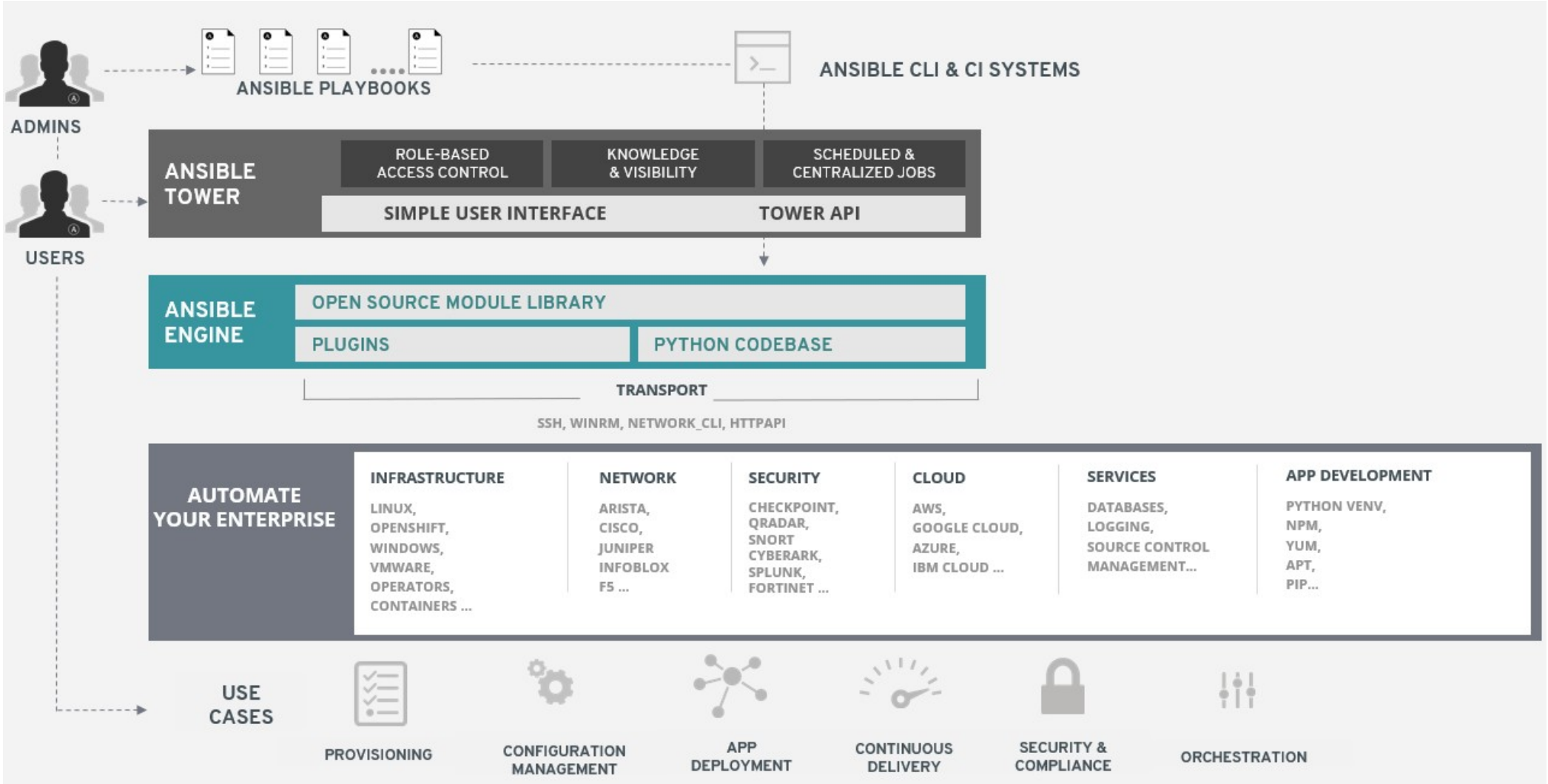
Ansible Automation Platform



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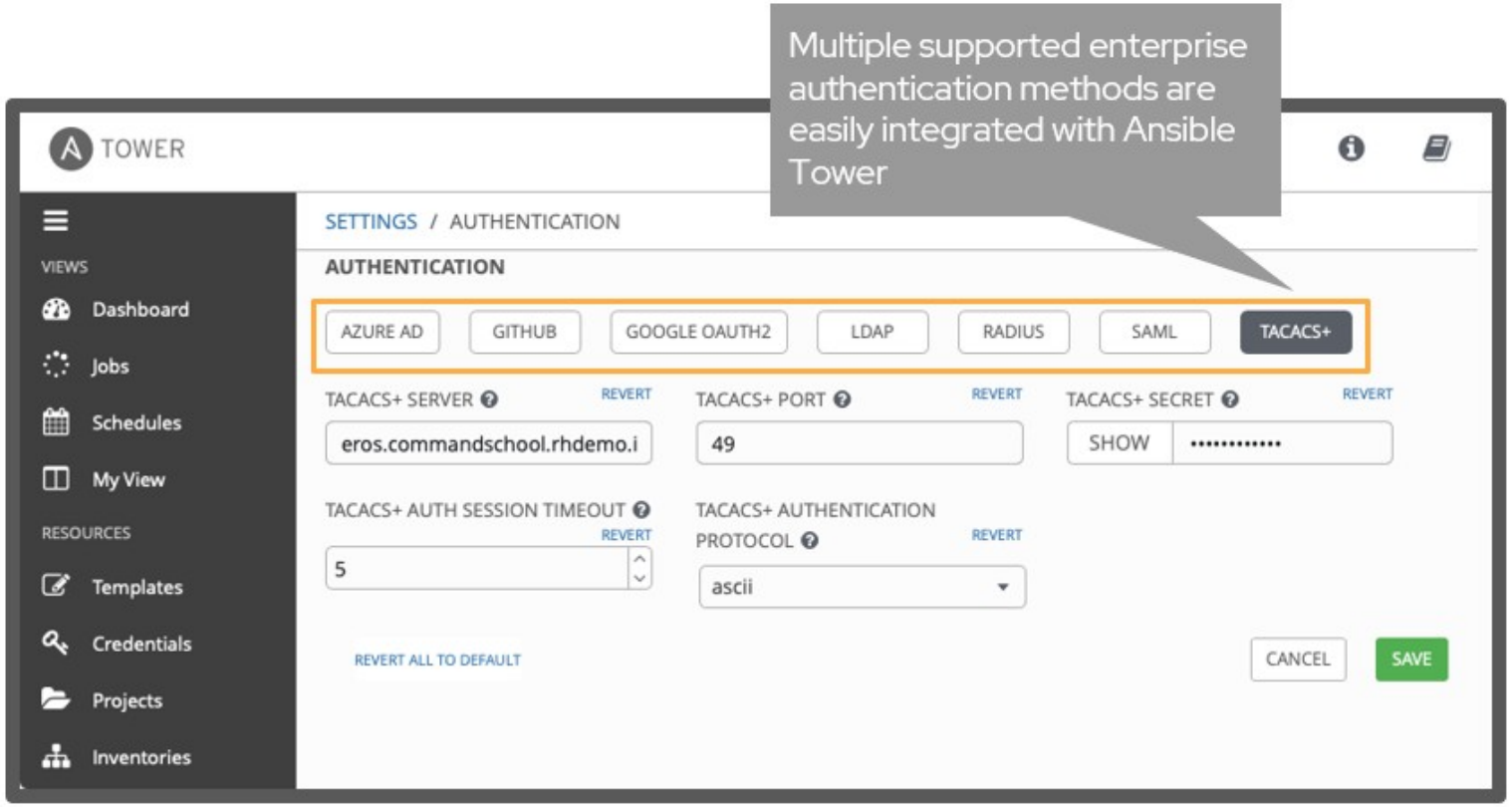
Enterprise Authentication

Use your existing enterprise authentication including:

- Azure AD
- Github
- Google OAuth2
- LDAP
- Radius
- SAML
- TACACS+



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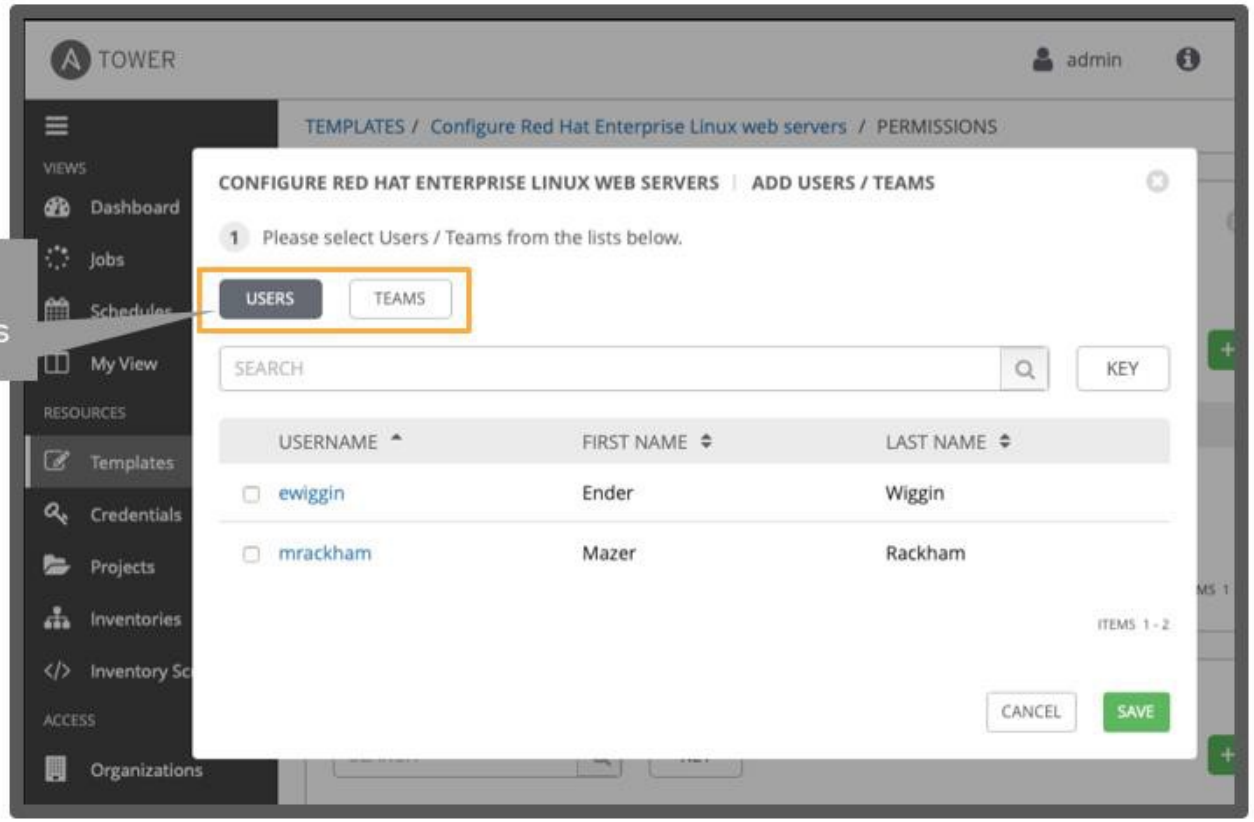
Role Based Access Control (RBAC)

Job Templates, Inventory, Credentials and Projects can be assigned to specific Users and Teams.

Clicking the USERS or TEAMS buttons shows available options



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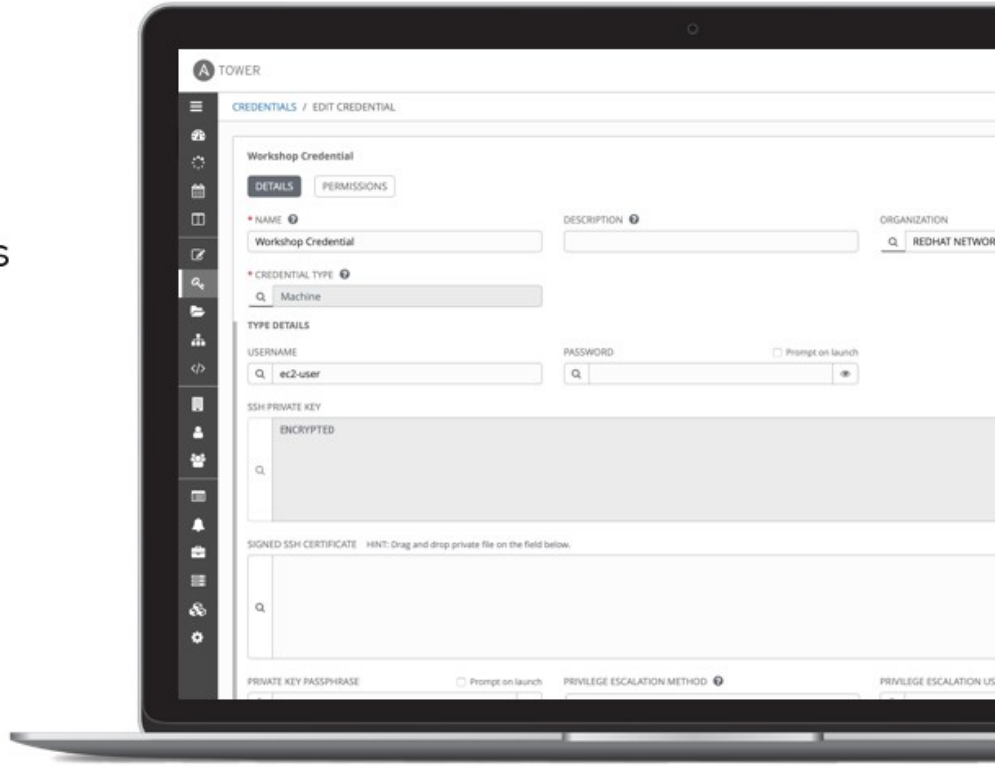
Credentials

Credentials are utilized by Ansible Tower for authentication with various external resources:

- Connecting to remote machines to run jobs
- Syncing with inventory sources
- Importing project content from version control systems
- Connecting to and managing network devices

Centralized management of various credentials allows end users to leverage a secret without ever exposing that secret to them.



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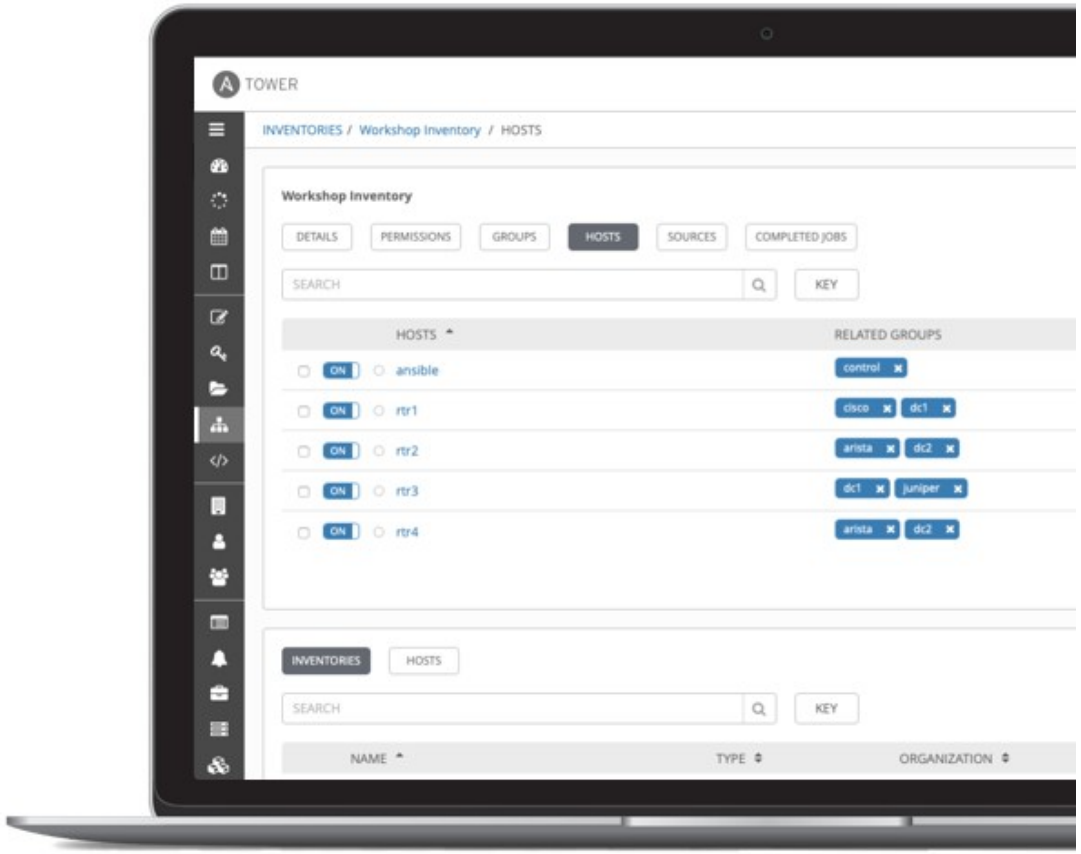
Inventory

Inventory is a collection of hosts (nodes) with associated data and groupings that Ansible Tower can connect to and manage.

- Hosts (nodes)
- Groups
- Inventory-specific data (variables)
- Static or dynamic sources



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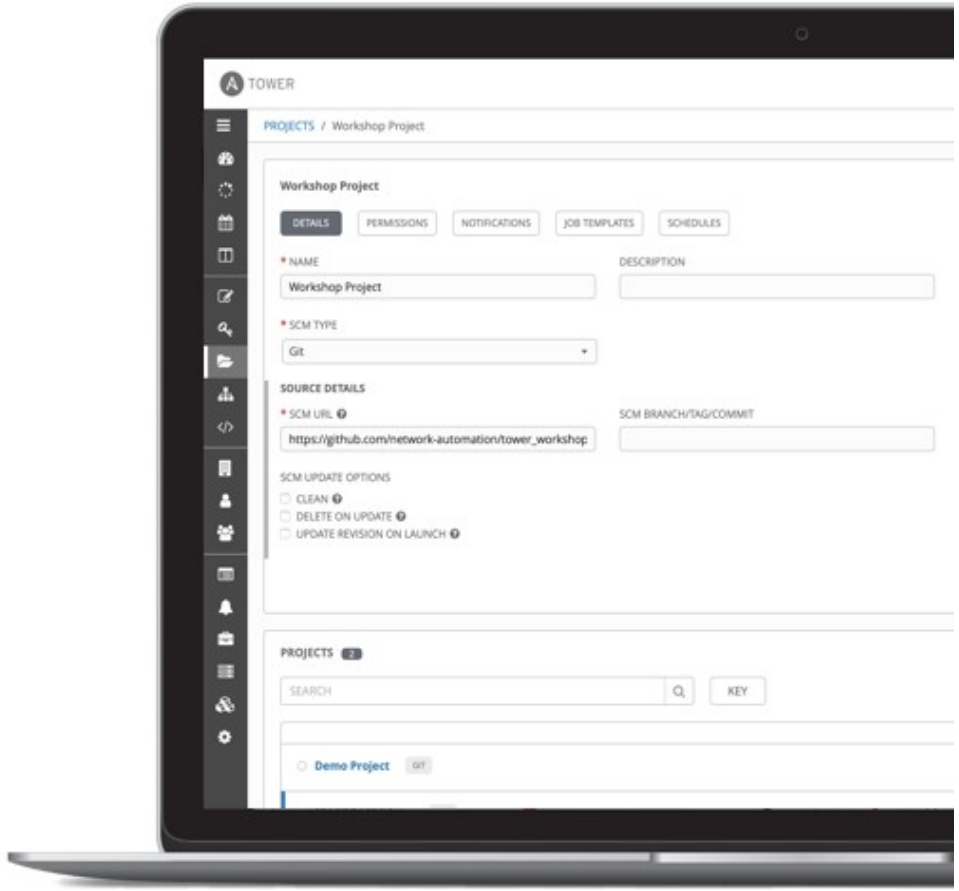
Project

A project is a logical collection of Ansible Playbooks, represented in Ansible Tower.

You can manage Ansible Playbooks and playbook directories by placing them in a source code management system supported by Ansible Tower, including Git, Subversion, and Mercurial.



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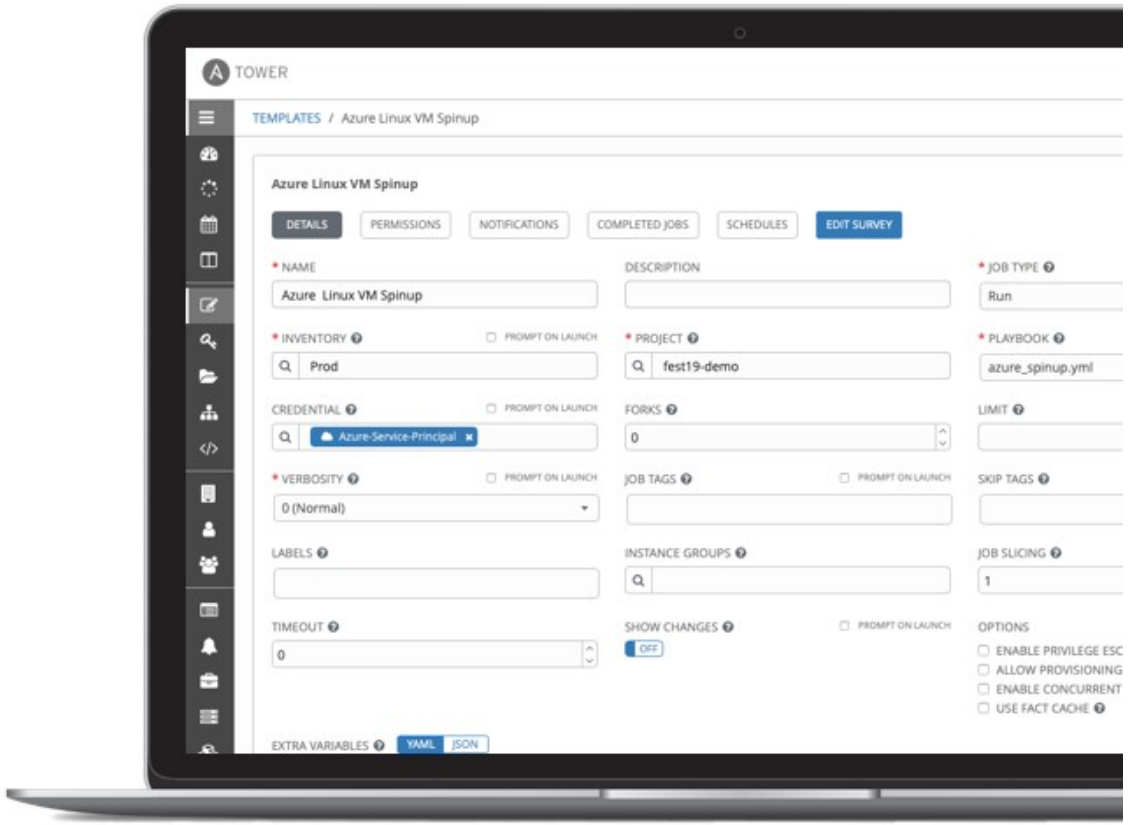
Job Templates

Everything in Ansible Tower revolves around the concept of a **Job Template**. Job Templates allow Ansible Playbooks to be controlled, delegated and scaled for an organization.

Job templates also encourage the reuse of Ansible Playbook content and collaboration between teams.

A **Job Template** requires:

- An **Inventory** to run the job against
- A **Credential** to login to devices.
- A **Project** which contains Ansible Playbooks



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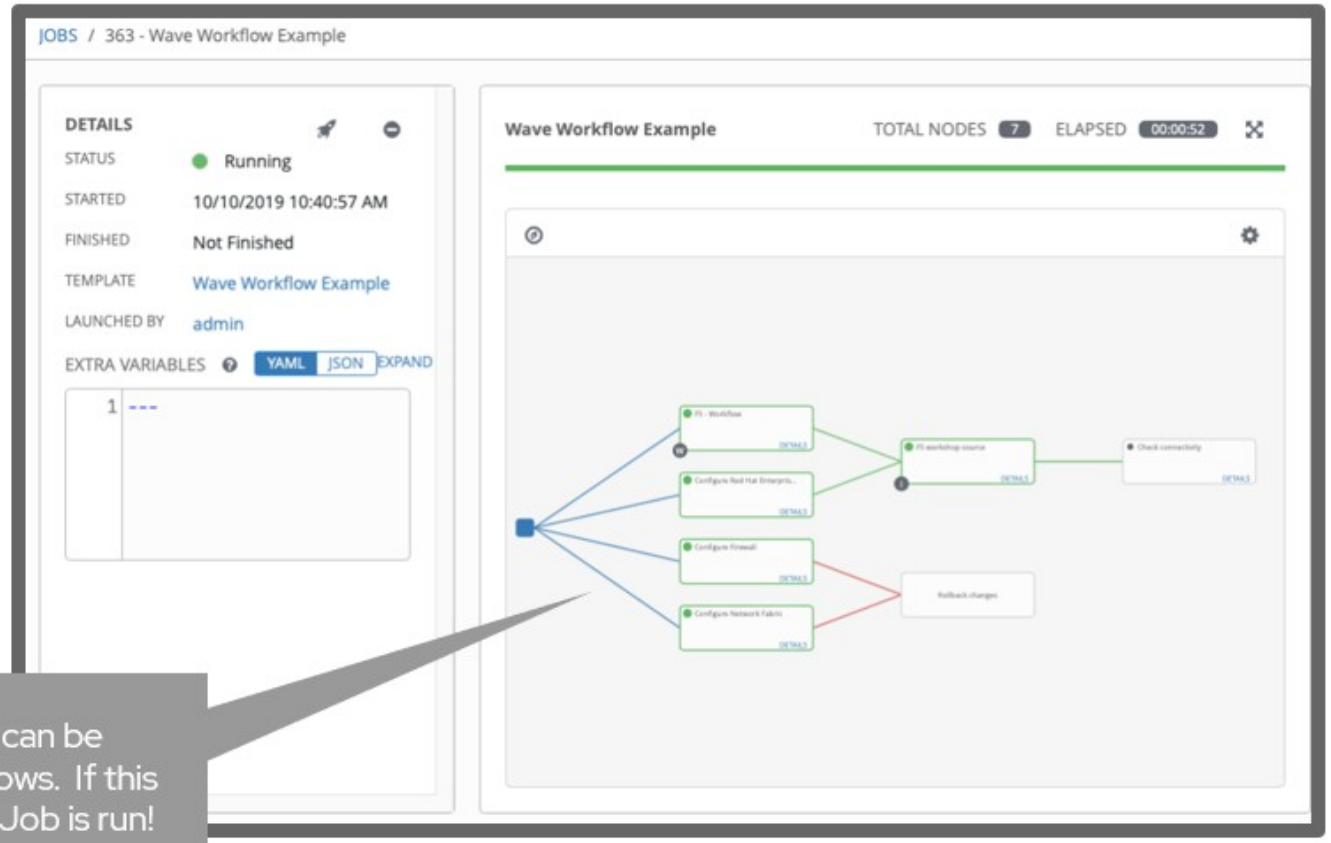
Ansible Automation Platform

Workflows

Create powerful holistic automation using Ansible Workflows.

Orchestration can easily be configured by linking Job Templates.

Workflow approvals allow Workflows to pause and wait for human interaction



Conditional logic can be applied to workflows. If this job fails this next Job is run!

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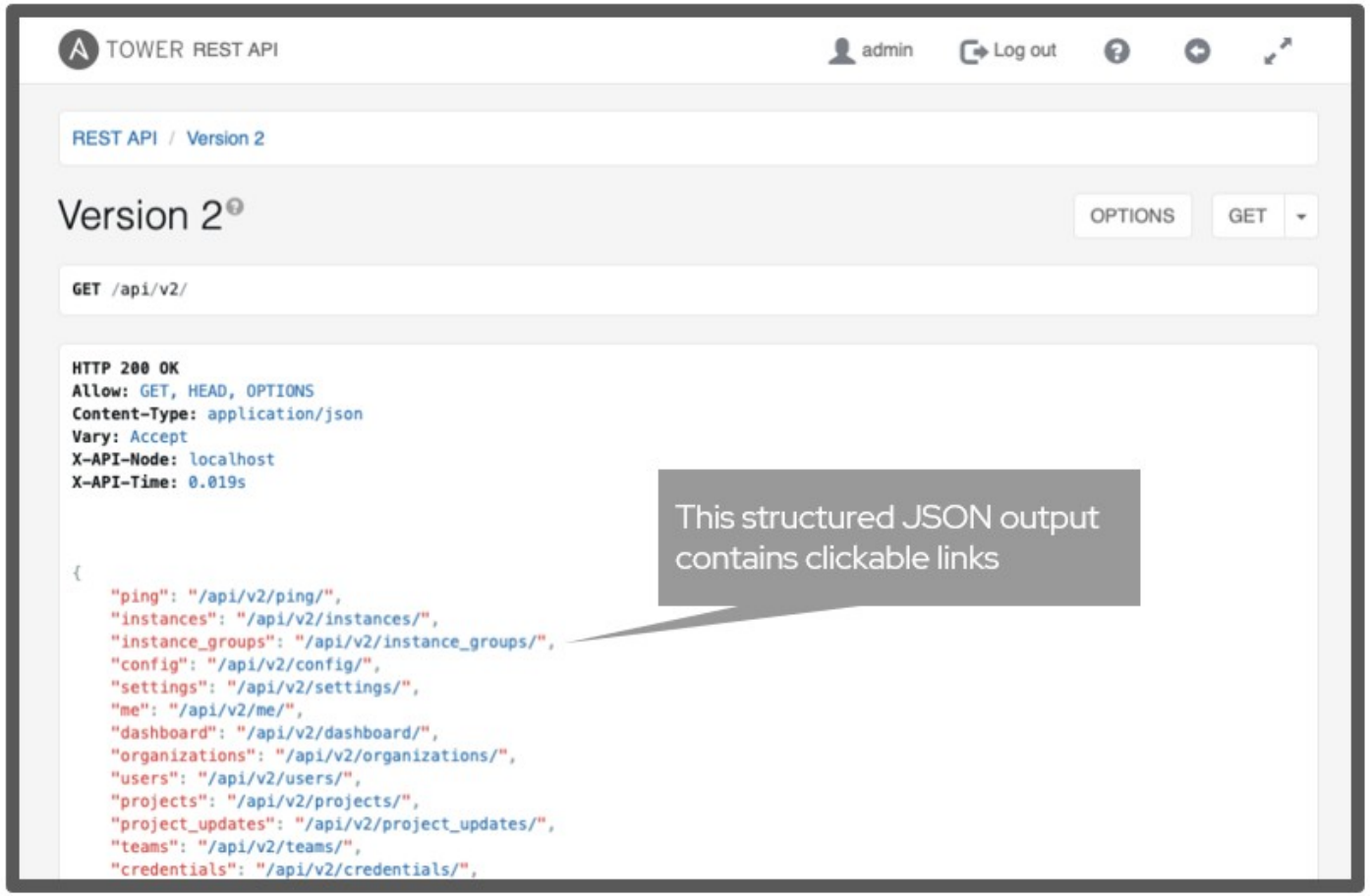
Ansible Automation Platform

RESTful API

Fully browsable API, everything within the Web UI can be accessed via the API for programmatic access



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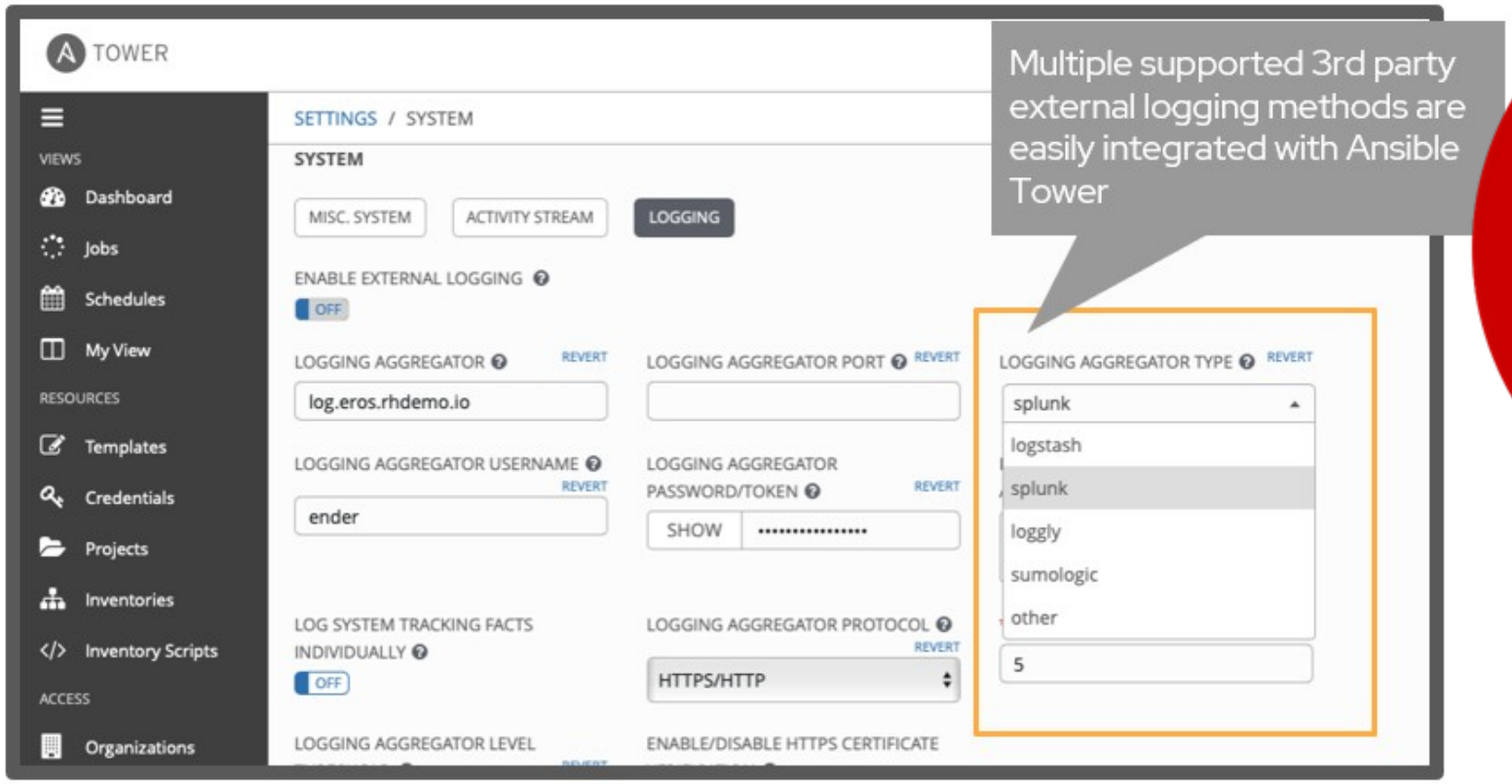
Platform

Centralized Logging

Ansible Tower creates a centralized control point for Ansible Automation. If desired Ansible Tower can integrated with existing log aggregation services.



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Platform

Webhooks - Enabling GitOps

Trigger Job Templates or Workflows straight via configurable webhooks

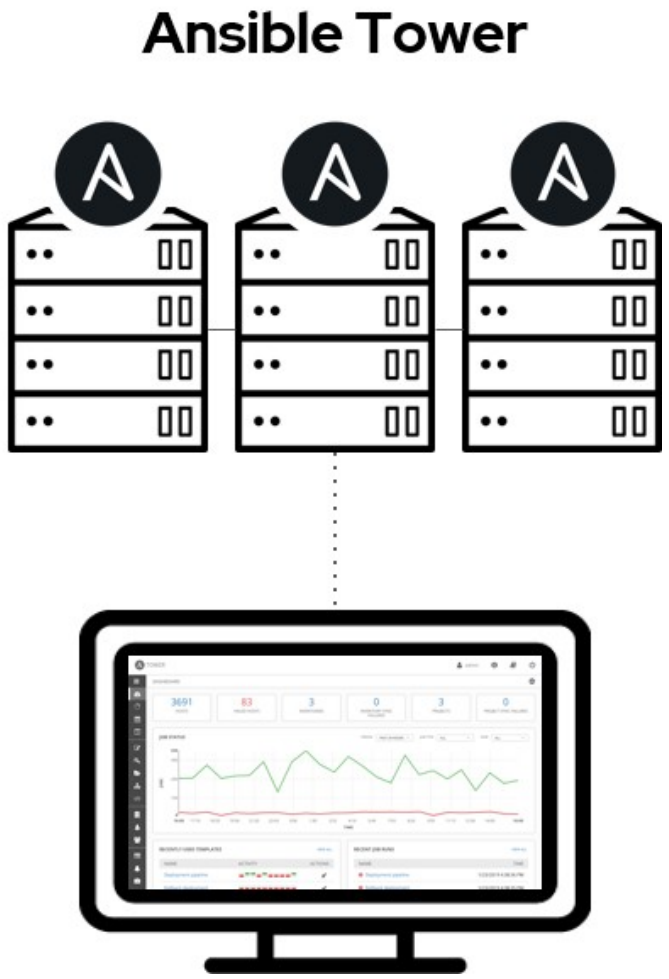
Automatically provision, update, configure, and apply based on pushes to your source control.

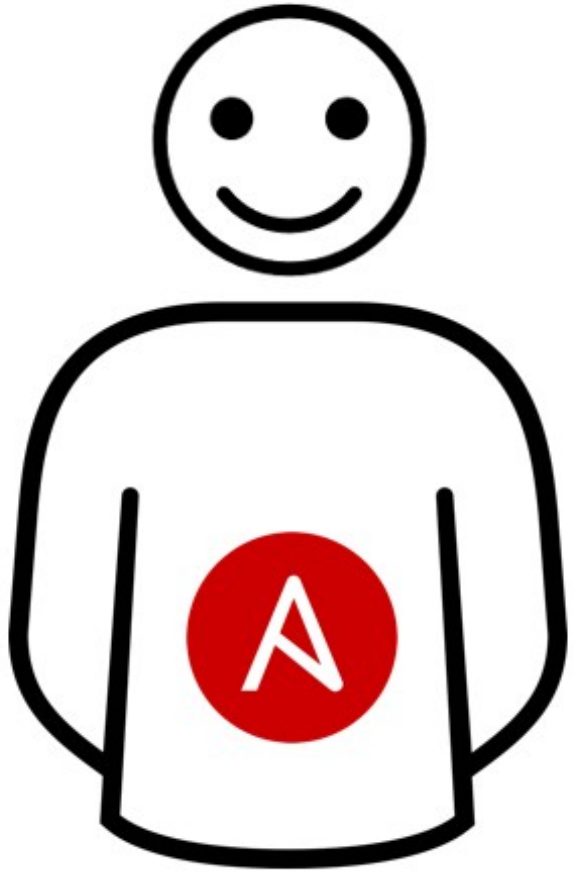
Red Hat Ansible Automation Platform

Scale

Ansible Tower clusters add redundancy and capacity, allowing you to scale Ansible automation across your enterprise.

- Unifying task execution across execution nodes
- Leverage Kubernetes and OpenShift to spin up execution capacity at runtime
- Expand execution to be able to pull jobs from a central Ansible Tower infrastructure





Security and Compliance

Automation strengthens management, security, and compliance

Hybrid environments at scale

- Increasing complexity
- Visibility and control
- Security policy management
- Controlled self-service environment for users

Manual security and compliance

- Resource and time consumption
- Human errors
- Non-repeatable, non-shareable, non-verifiable actions
- Configuration and patching consistency

Effectively address ineffective communication, configuration drift, and incomplete audit and tracking logs.

Red Hat Management and Automation

Life-cycle management, automated remediation, and prescriptive analytics

Red Hat Satellite

Unified life-cycle management

- Content and patch management
- Small- and large-scale operations
- Standardized operating environment (SOE)

Red Hat Ansible Automation

Centralized automation governance

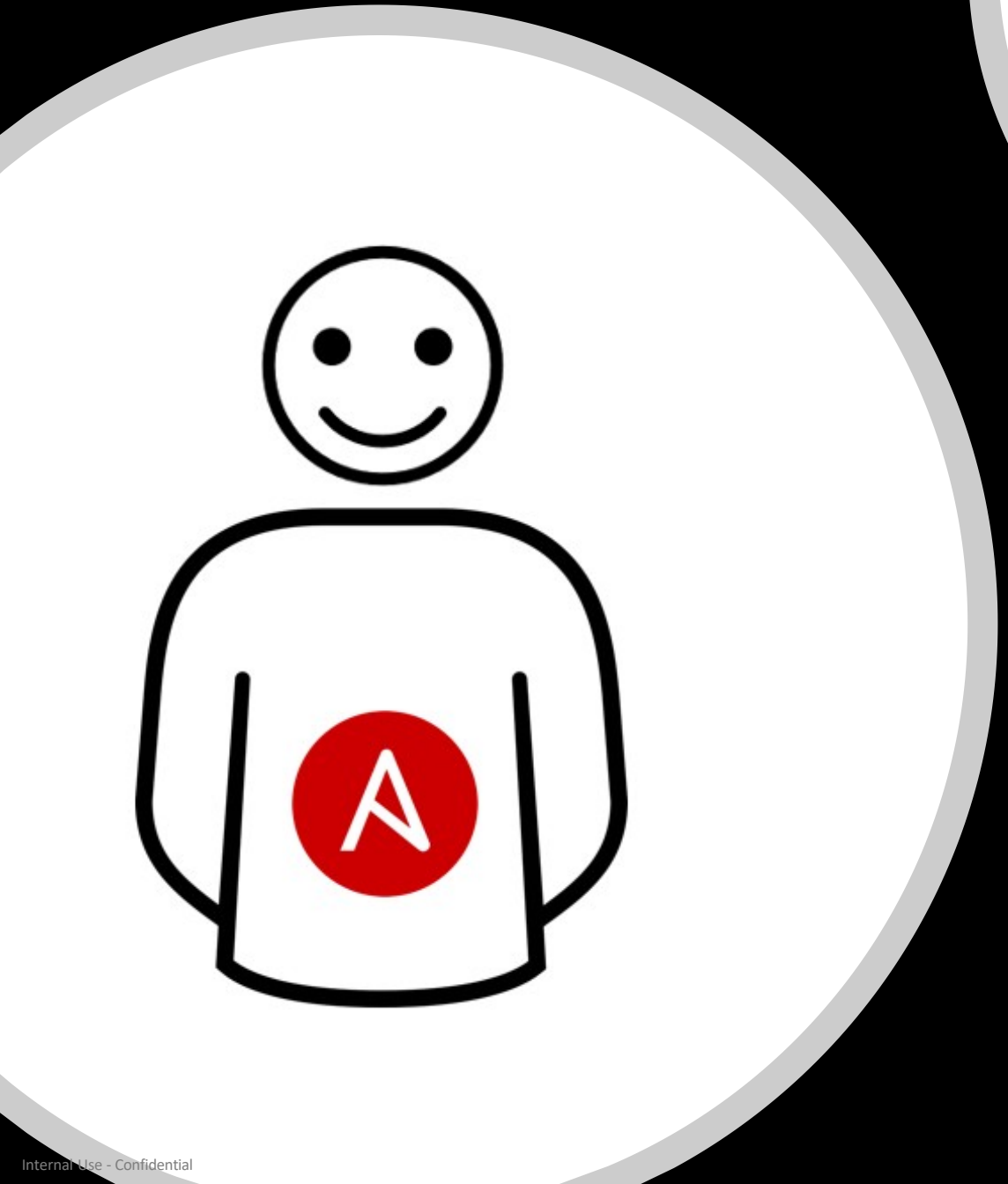
- Centralized control
- Team and user delegation
- Audit trail

Red Hat Insights

Proactive, automated resolution

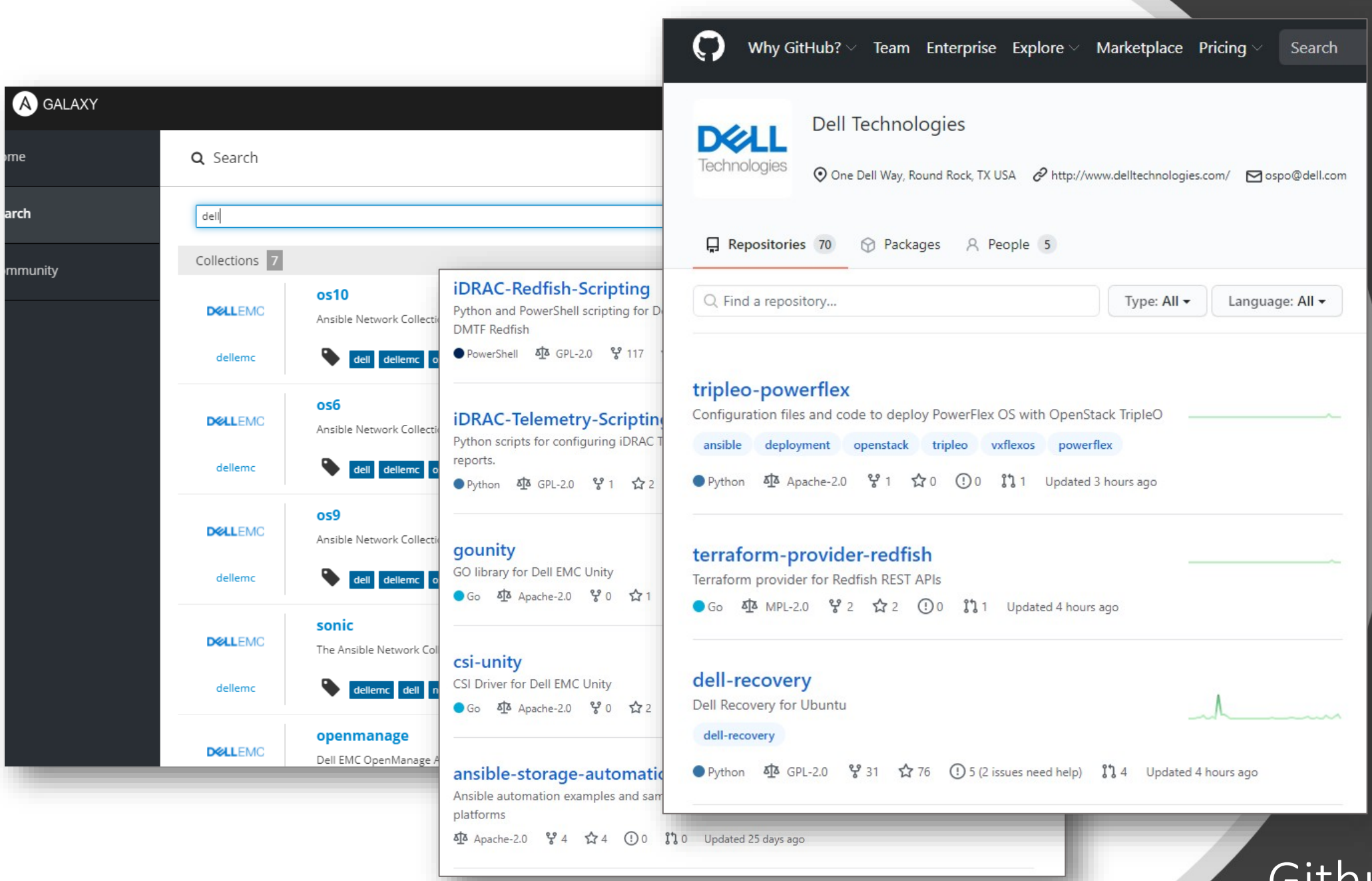
- Continuous insight
- Verified knowledge
- Proactive resolution

Red Hat Enterprise Linux



Resources

http://redhat.com/ansible
https://galaxy.ansible.com
https://github.com/dell
You Tube



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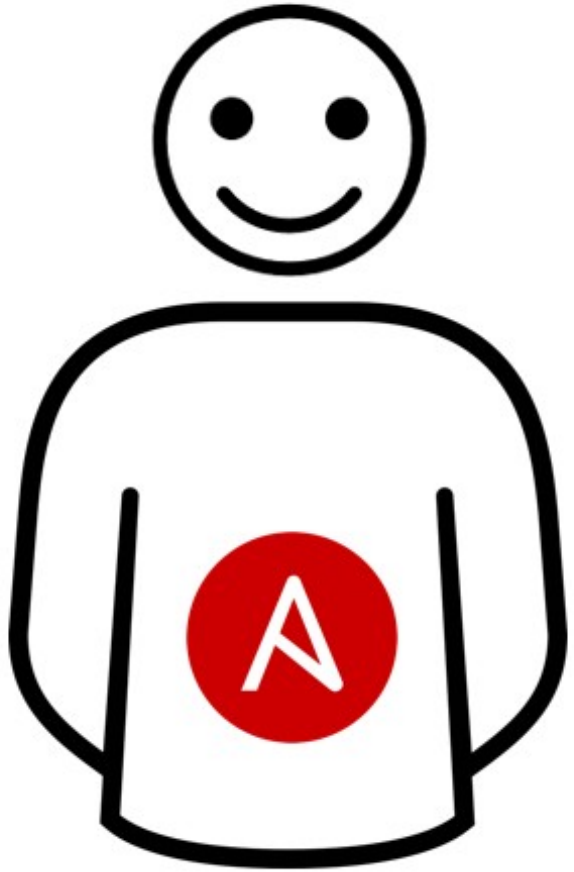

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Please contact us with questions.

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