Red Hat
Ansible Automation
Platform

# Ansible Multi-Vendor Network Workshop


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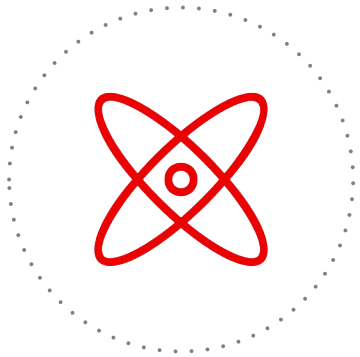
# Agenda

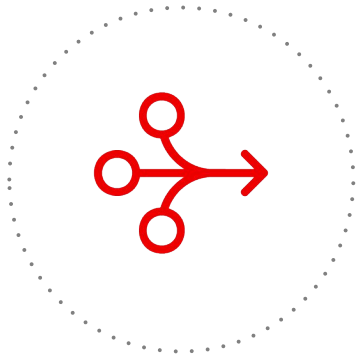
| | |
|---|---|
| **Overview network automation** | 10:00 AM - 10:30 AM |
| **Exercise-0 Lab setup** | 10:30 AM - 11:00 AM |
| **Exercise-1 Backups as code** | 11:00 AM - 11:20 AM |
| **Break** | 11:20 AM - 11:30 AM |
| **Exercise-2 Compliance dashboard** | 11:30 AM - 12:00 PM |
| **Lunch break** | 12:00 PM - 1:00 PM |
| **Exercise-3 Compliance and remediation** | 1:00 PM - 1:30 PM |
| **Exercise-4 Multi-Vendor routers with validated content (BGP)** | 1:30 PM - 2:00 PM |
| **Exercise-5 Brownfield NXOS switches with resource modules** | 2:00 PM - 2:20 PM |
| **Break** | 2:20 PM - 2:30 PM |
| **Exercise-6 Upgrades as code** | 2:30 PM - 3:00 PM |
| **Exercise-7 Tuning for production** | 3:00 PM - 3:30 PM |
| **Exercise-8 Configuration drift and restore as code** | 3:30 PM - 4:00 PM |

# Why the Ansible Automation Platform?



## Simple

Simplify automation creation and management across multiple domains.



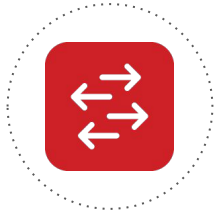
## Powerful

Orchestrate complex processes at enterprise scale.

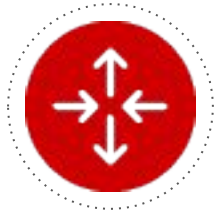
## Agentless

Easily integrate with hybrid environments.

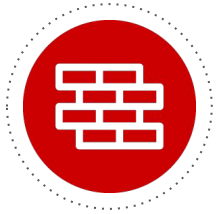
# Ansible Network Ecosystem and Collections



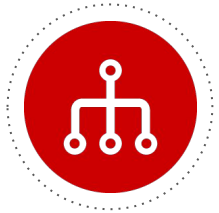
SWITCHES



ROUTERS



ENTERPRISE FIREWALLS



LOAD BALANCERS

CONTROLLERS

IP ADDRESS MGMT

A10

ARISTA

aruba NETWORKS

Check Point SOFTWARE TECHNOLOGIES LTD

CISCO

DELL EMC

paloalto NETWORKS

Infoblox NEXT LEVEL NETWORKING

f5

Open Switch

JUNIPER NETWORKS

VyOS

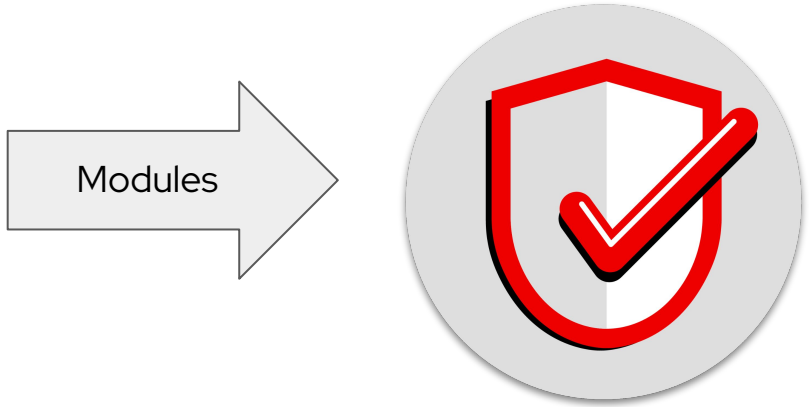


Red Hat Ansible Automation Platform

# Certified + Validated automation content from the ecosystem

## Red Hat Ansible Certified Content

*What do I want to automate?*




**Established** integration with Red Hat and 3rd-party platforms

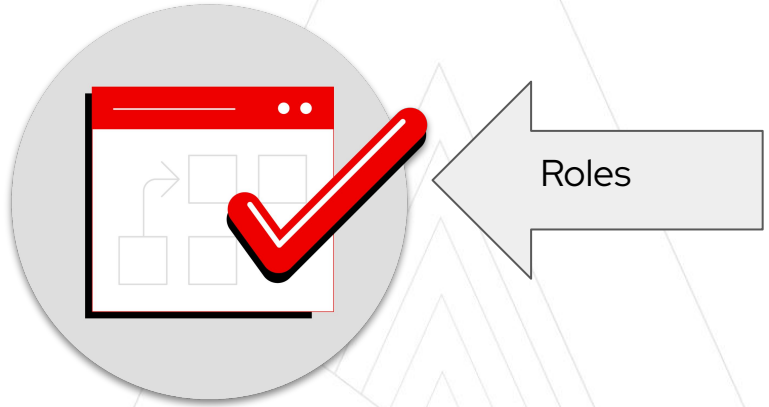
**From Red Hat** and trusted industry partners

**Tested and supported** for security, quality, and reliability

**Available** through console.redhat.com

## Ansible Validated Content

*How you should automate?*




**Provides** an opinionated path for performing operations on Red Hat and 3rd-party platforms

**From Red Hat** and trusted industry partners

**Tested** for security, quality, and reliability

**Available** through automation hub

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# Network modules

Ansible modules for network automation typically references the vendor OS followed by the module name.

- namespace.collection.facts
- namespace.collection.command
- namespace.collection.config
- namespace.collection.resource

**Validated Collections provide Roles to further abstract the above modules.**

Arista EOS = arista.eos.

Cisco IOS/IOS-XE = cisco.ios

Cisco NX-OS = cisco.nxos

Cisco IOS-XR = cisco.iosxr

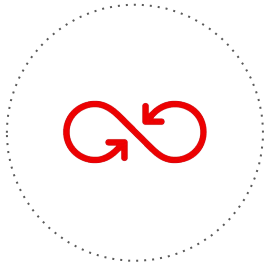
F5 BIG-IP = f5networks.f5_bigip_bigip.

Juniper Junos = junipsnetworks.junos.

VyOS = vyos.vyos.

# What does it do?

## Automate your network with a single tool

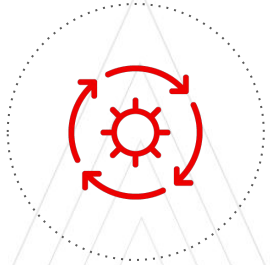


### Configuration Management

- Automate backup & restores
- Upgrades
- Scoped Config Management

### Infrastructure Awareness

- Dynamic Documentation
- Compliance and traceability



### Network Validation

- Validate operational steady-state
- Roll back if configuration changes don’t meet goals

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# Network Automation Journey and Use Cases

Complexity

**OPPORTUNISTIC**

*How can we simplify a task or set of tasks?*

- Backup & Restore
- Dynamic Documentation
- Firmware Upgrades

**SYSTEMATIC**

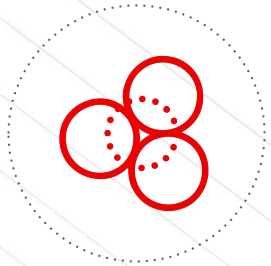
*How do we centralise our processes?*

- Scoped Config Management
- Network Compliance

**INSTITUTIONALIZED**

*How do we orchestrate our processes?*

- Operational State Validation
- Automated NetOps



Ansible Network Automation

# Intro to the Exercises and Use Cases

https://gitlab.com/redhatautomation/multi-vendor-network-workshop REPO



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# Exercise 0

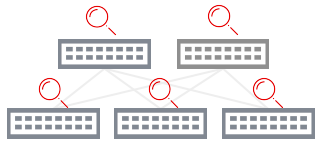
- Setup Workbench
- Setup  Gitea Repo
- Setup AAP as Code

https://gitlab.com/redhatautomation/multi-vendor-network-workshop/-/blob/main/README.md?ref_type=heads

# Exercise 1
# Backups as Code

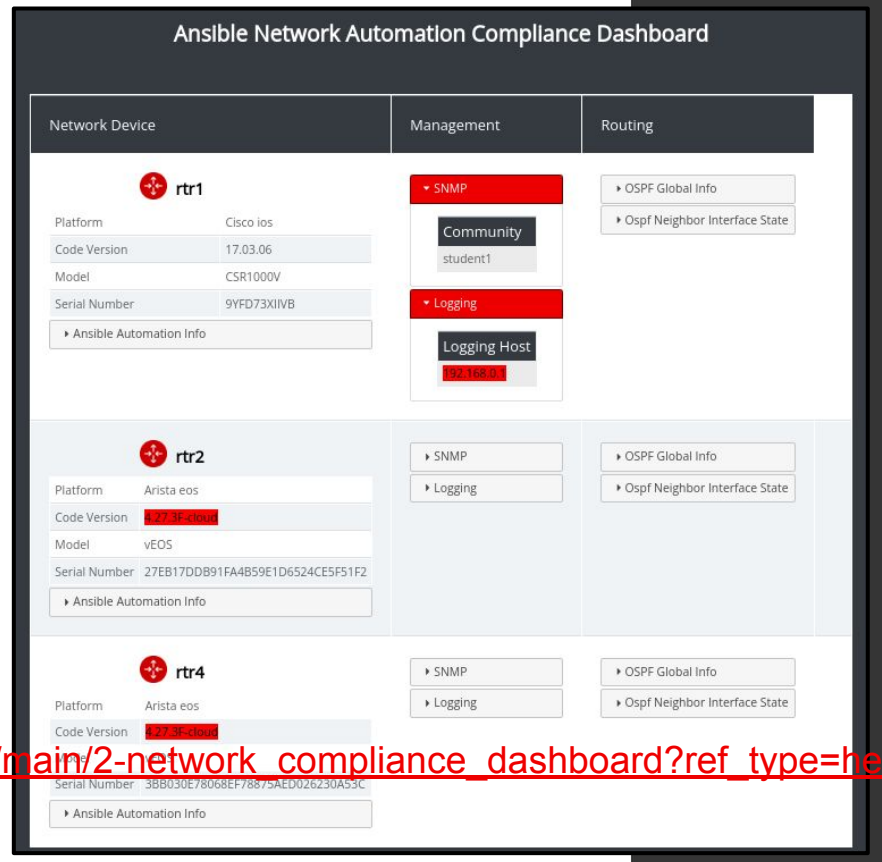

https://gitlab.com/redhatautomation/multi-vendor-network-workshop/-/blob/main/1-backups_as_code/README.md?ref_type=heads

# Exercise 2
# Compliance Dashboard



Gather ansible facts
Gather network resource facts

Scheduler



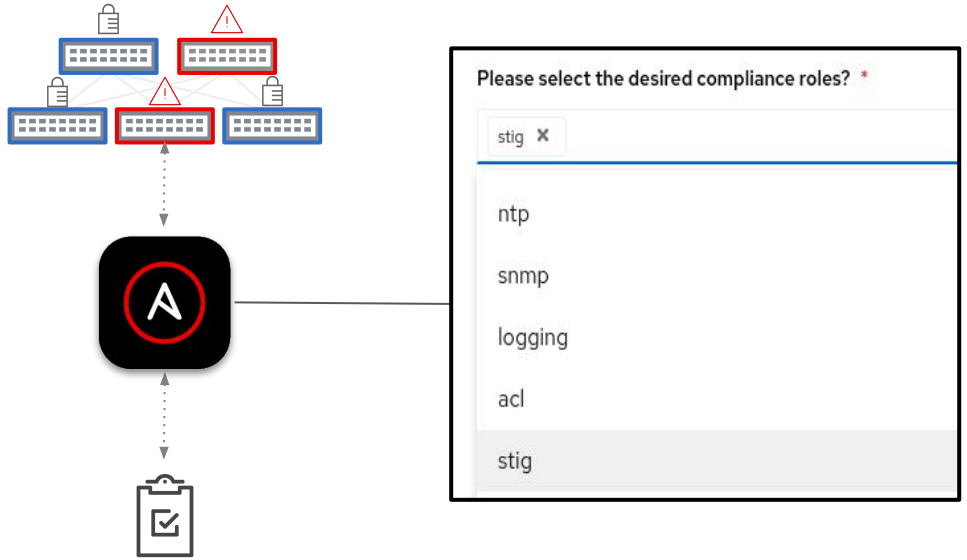



https://gitlab.com/redhatautomation/multi-vendor-network-workshop/-/tree/main/2-network_compliance_dashboard?ref_type=heads

# Exercise 3 Compliance/Remediation

- Check Mode
- Run Mode
- Approval Node
- State == Replaced

DISA STIG roles
https://public.cyber.mil/stigs/downloads/




Network Compliance

https://gitlab.com/redhatautomation/multi-vendor-network-workshop/-/tree/main/3-network_compliance_checks_remediations?ref_type=heads

# Exercise 4
# Multi-Vendor routers with Validated Content(BGP)

- Automated Troubleshooting
- Network.Base (persist)
- Network.BGP (deploy)
- Network.BGP (detect)
- Network.BGP (remediate)



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https://gitlab.com/redhatautomation/multi-vendor-network-workshop/-/blob/main/4-multi_vendor_validated_content_bgp/README.md?ref_type=heads

# Exercise 5
# Brownfield NXOS switches

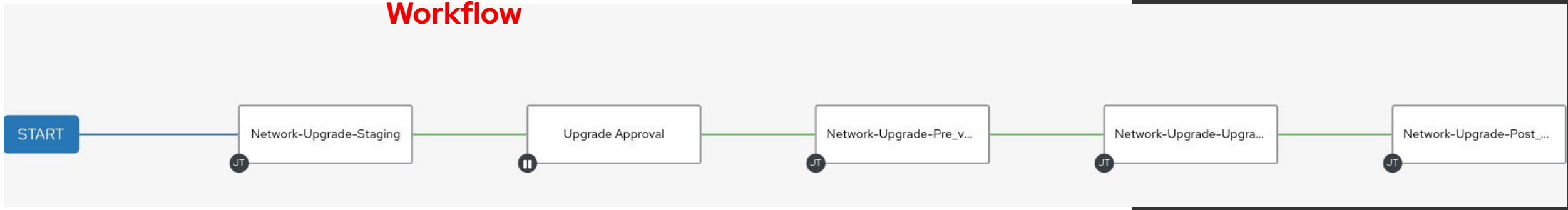
- Resource Modules
- Gather and create a YAML config from existing “brownfield” switches
- Push changes
- Detect Diffs
- Check for specific port configurations and list them out.



https://gitlab.com/redhatautomation/multi-vendor-network-workshop/-/tree/main/5-brownfield_switches_resource_modules?ref_type=heads

# Exercise 6
# Upgrades as Code

**Workflow**




https://gitlab.com/redhatautomation/multi-vendor-network-workshop/-/tree/main/6-network_upgrade_as_code?ref_type=heads



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# Exercise 7
# Tuning for Production

- Forks
- Rolling Updates
  - Batches (serial)
  - Max_Fail_Percentage

https://gitlab.com/redhatautomation/multi-vendor-network-workshop/-/tree/main/7-tuning_for_scale?ref_type=heads

# Exercise 8
# Configuration Drift and Restore


- Check intended configs from exercise 1 against running configs
- Restore to original configuration



https://gitlab.com/redhatautomation/multi-vendor-network-workshop/-/tree/main/8-config_drift_restore?ref_type=heads

# References

**References to learn Ansible Network Automation:**

Ansible4Networking Online Meetup Group (join for free) https://www.meetup.com/ansible4networking/
Video Replays: https://www.youtube.com/@Ansible4Networking
Updates to the Ansible Certified Network Automation Specialist EX457
Self service labs: https://www.redhat.com/en/interactive-labs/ansible
Network Use cases: https://www.ansible.com/use-cases/network-automation
Network Automation Ebook: https://www.redhat.com/en/engage/network-automation-guide-20221202
Network Blogs: https://www.ansible.com/blog/topic/network-automation

**Getting Started with Network Automation:**

https://docs.ansible.com/ansible/latest/network/getting_started/index.html
https://ansible.com/network-automation

**References to learn the Ansible Automation Platform (AAP)**

Try Ansible Automation Platform for free 60 days
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Ansible.com/webinars-training