Analog transformation: Scaling network automation culture with Ansible Tower at Microsoft

Bart Dworak
Software Engineering Manager
May 8th 2019
This is the story of how an organization at Microsoft implemented Ansible and Ansible Tower. The resulting changes not only changed the way the network is managed, but also sparked a cultural transformation.
Some history..

| 2015 – ~13,000 | 2019 – 17,000+ |
| 400+ infrastructure engineers | 600+ buildings worldwide | Network scale |
Automation was basic scripting

Sparse developer skillset, primarily network engineers

Router# conf t
Router(config)# interface fastethernet 0
Router(config-int)# shutdown
Router(config-int)# exit
Router(config)# exit
Router# copy run start

Scripts had little to no logic

Primary tools used
Agenda

Engineering Problems
Engineering Principles
Cultural Transformation
Big Bets
Engineering Problems

Environment purpose

Version Control

Promote to production
Environment Purpose

Network access environments did not have a well defined purpose, leading to the problem of running production workloads from a non production environment.
Code was not checked-in, version controlled, or peer reviewed. Additionally, the old platform did not support storing these scripts in a VCS natively.
Since Pre-Production was available, very little code made it into production. Most code ran from PPE with no testing/approvals.
Engineering Principles

Testing environments

Version control

Promote to production
In order to enable testing of playbooks, three environments were created for testing playbooks.
A Version Control System was put in place and using Ansible Tower integration all playbook development is centralized.
A promote to production workflow was created to protect code quality and release to production. Strict enforcement of code review was implemented and a release schedule was established.
We built integrations on top of Ansible Tower to interact with our existing systems and environment.
Cultural Transformation

How do we measure cultural transformation?

Building new skillsets

Zero to Hero

Automation Community
Culture Transformation

Level 0
Scripting, Manual changes

Level 1
Reactive Automation, Automating processes Code Check-in

Level 2
All Initiatives are automation driven, CI/CD deployment

Level 3
Single source of truth, network is modeled, event based automation

Level 4
Service oriented, deployed, and maintained via automation

Level 5
Machine Learning makes changes to network

Maturity Levels
Building new skillsets

Our engineers went through optional internal git training. Many started learning python and hosting their own python learning groups to learn from each other.
One of our engineers created a training series and named it Zero to Hero. This training was intended to teach engineers how to write Ansible playbooks and start understanding various automation concepts such as roles, reusability, and our promote to production workflows.
Automation community

In order to encourage knowledge sharing and learning between our engineers, we created a Teams channel and constantly moderate it. Engineers ask questions about automation and we have discussions that allow everyone to participate to learn and grow.
Cultural Transformation

Automation became advanced playbooks and reusable roles

Network engineers are becoming network developers

Primary tools used
Big Bets

Network modeling

Single source of truth

Event based automation
Network Modeling

Change configuration from a text based configuration, to modeled configuration, where services, dependencies, and relationships are modeled in a single source of truth.
Centralize the configuration for our infrastructure in a single source of truth and make changes to the infrastructure when the configuration deviates from the single source of truth.
Create an event based automation pipeline and allow for events to trigger other workflows. These triggers can trigger automation, advanced telemetry, logging, or analytics services.
“We want to empower every person and every organization on the planet to achieve more.”

- Satya Nadella, CEO of Microsoft
Have questions about this session?

I’ll be at the Microsoft Booth #815 from 5:30pm – 7:00pm

Grab some SWAG!

For more details visit
Azure.com/Linux
Azure.com/RedHat
THANK YOU

linkedin.com/company/Red-Hat
youtube.com/user/RedHatVideos
facebook.com/RedHatInc
twitter.com/RedHat