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There and Back:

A Network Automation Journey

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@securenetwrk

DEVNET-1200

cisco Live!
Barcelona | January 27-31, 2020

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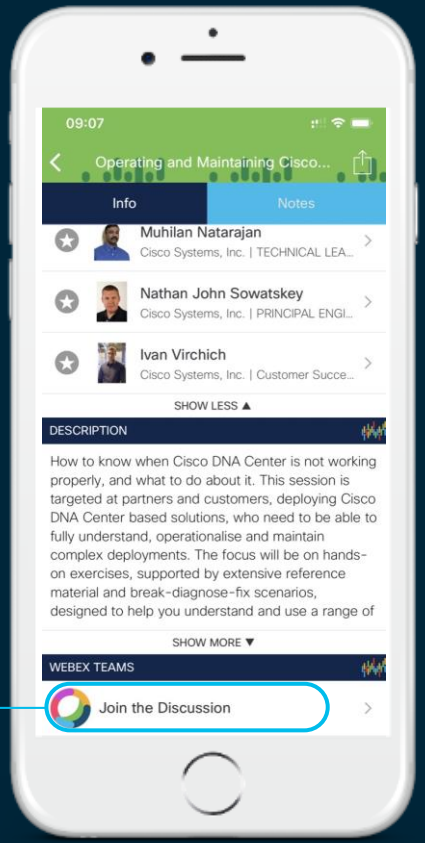


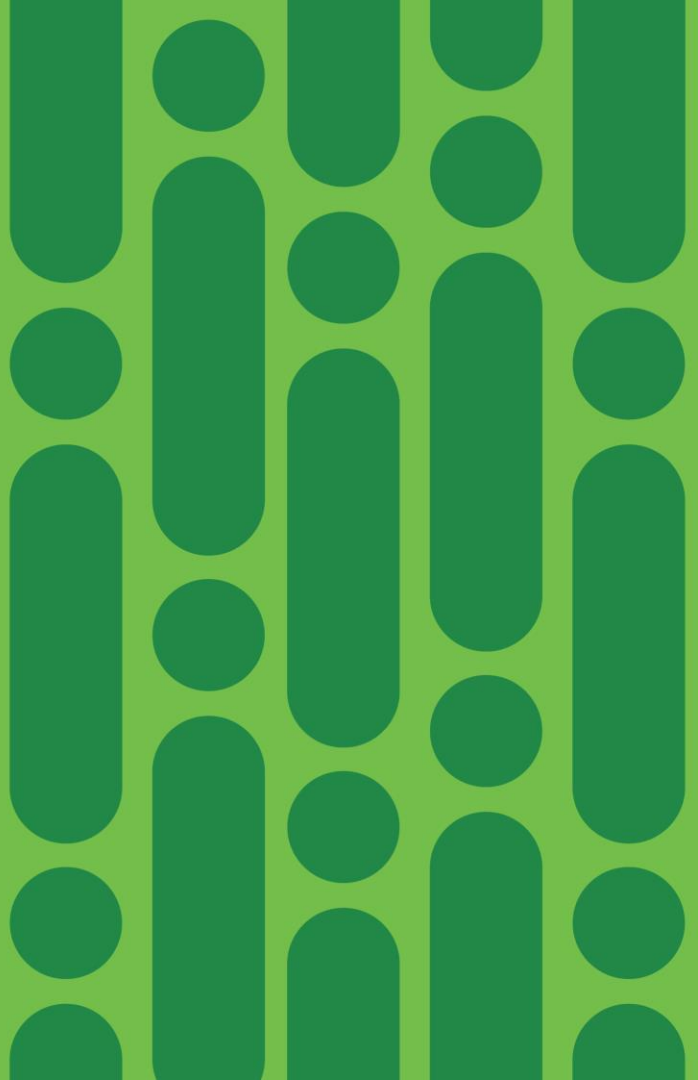
Agenda

- Introduction
- Automation Exchange Intro
- Brainstorming ideas
- Choosing your first project (Walk)
- Taking it to the next level (Run)
- Long-term goals (Fly)
- Conclusion

Who is this guy?

- **Eric Thiel**
- 1997 – Systems admin, DBA, network admin
- 2000 – Security Auditor
- 2001 – Solaris Admin
- 2001 – First CCIE (Security)
- 2003 – Full-Stack engineer
- 2005 – Wireless, Security, DC, Routing
- 2012 – Solutions Architecture
- 2015 – Automation, Programmability
- 2016 – Second CCIE (Data Center)
- 2018 – Developer advocacy leader

Automation Exchange



DevNet Automation Exchange

Bring intent-based networking to practice

Walk

Get visibility and insights into your network

Run

Activate network and security policies across your network

Fly

Proactively manage and optimize with DevOps workflow

DevNet Automation Exchange
Solving Real Use Cases

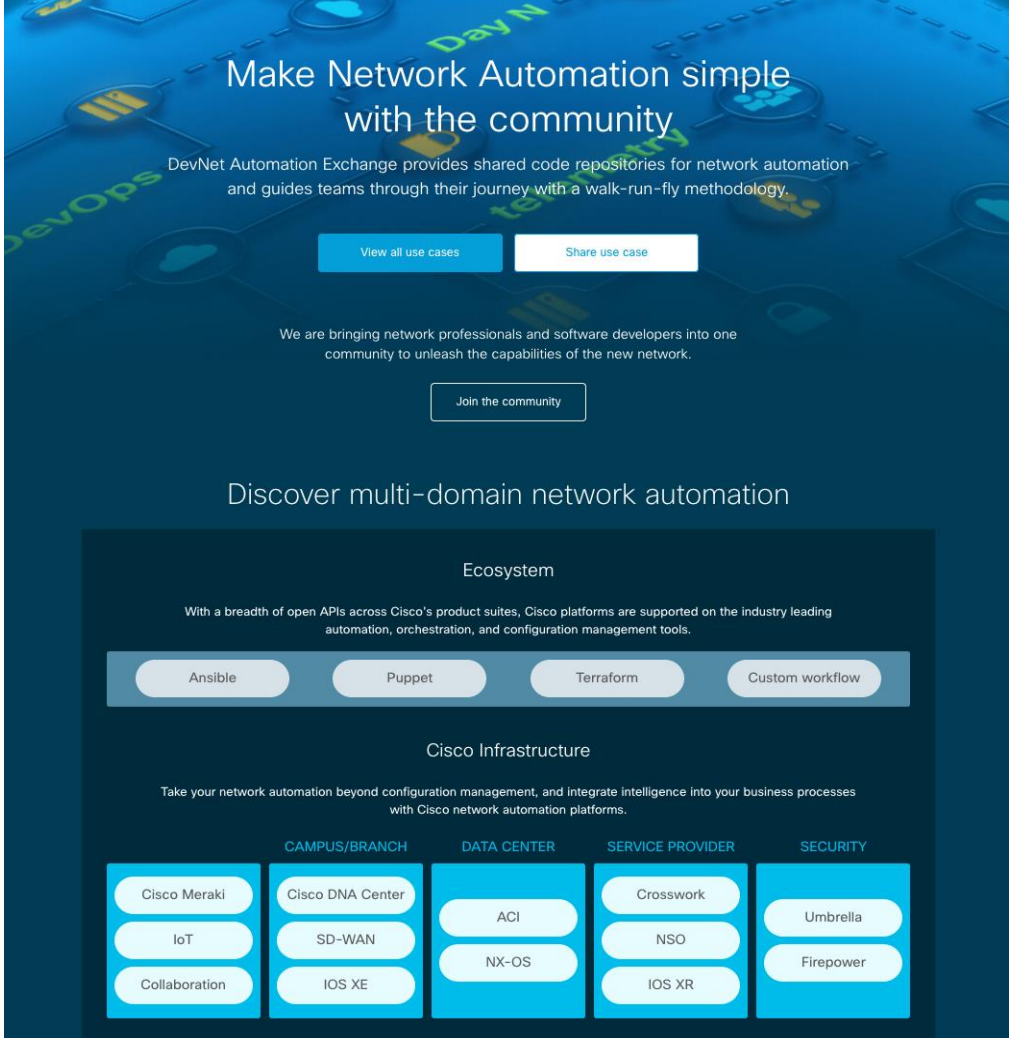
Telemetry and insights
Gather telemetry across the different domains

Multi-domain networking
How to treat applications consistently across the different domains

Monitoring
Holistic approach for monitoring Cisco infrastructure & extending to broader infrastructure

Automation at scale
Automating network configuration, hybrid cloud deployments, common and repeated tasks

Self-serve network operations
Beyond compute services to network implementation



Where do we begin?

Three levels of complexity

Walk

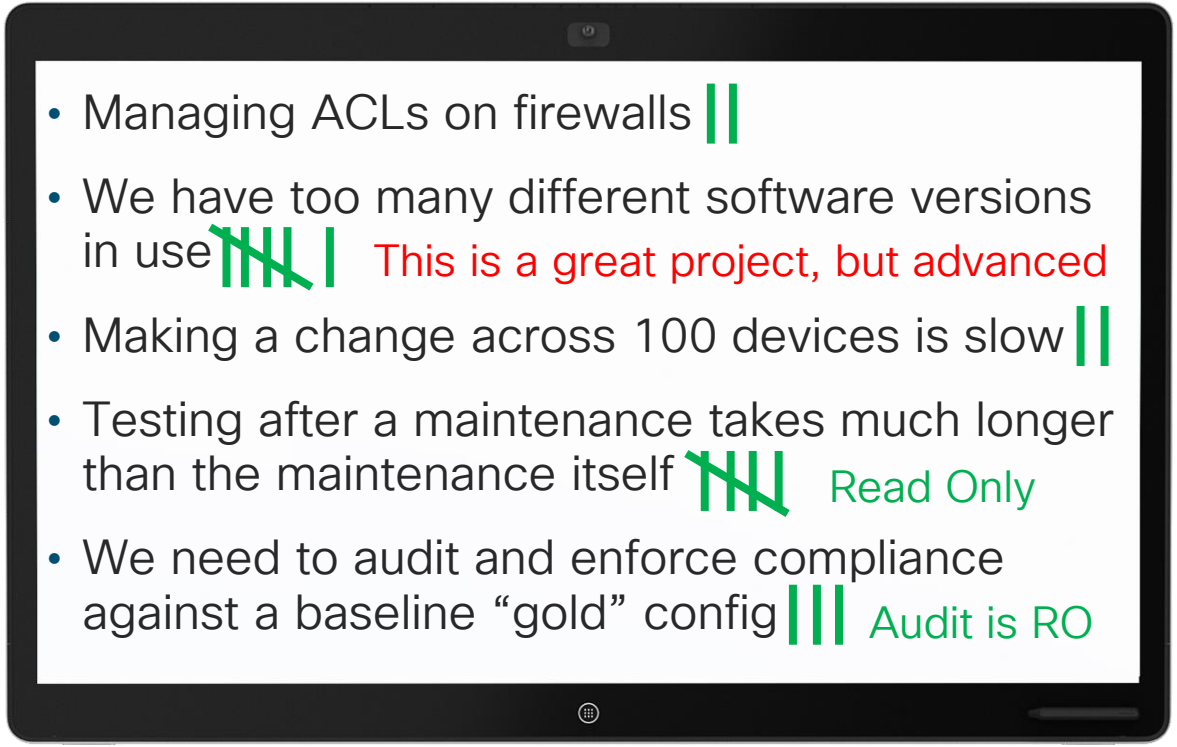
Run

Fly

Brainstorming Ideas

“Perfect is the enemy of good.”

Whiteboard ideas



Three levels of complexity

Walk

- Get visibility and insights into your network
- Gather telemetry and insights in a read-only manner
- Perform security and compliance auditing
- Read-only information gathering offers minimal risk
- This is a great place to start writing code

Run

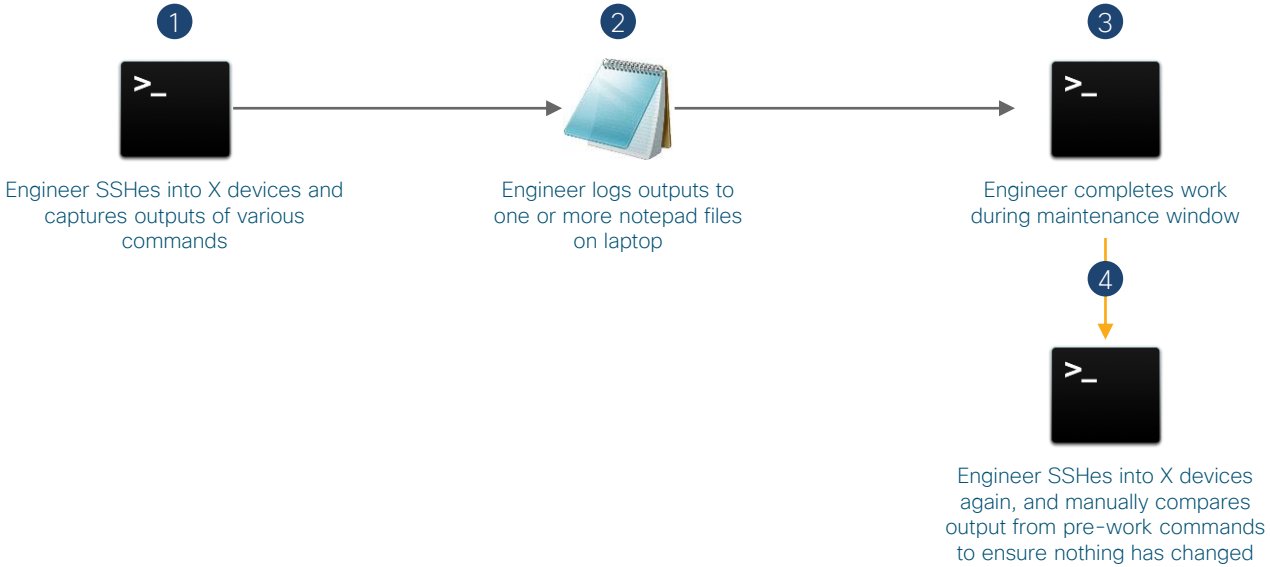
Fly

So what tools are in your toolbelt?

State validation before and after changes (aka MTTI)

Walk: Validation – Engineer manual workflow

Use case: An engineer is going to do some maintenance and needs to be able to validate everything is back to the expected state after the change window.



Customer challenge:

Manual auditing of state before and after a change is time-consuming and prone to errors.

Sandbox:

https://devnetsandbox.cisco.com/RM/Diagram/Index/1b83c4bf-f63e-4e4b-9119-9b385751f1b6?diagramType=Topology

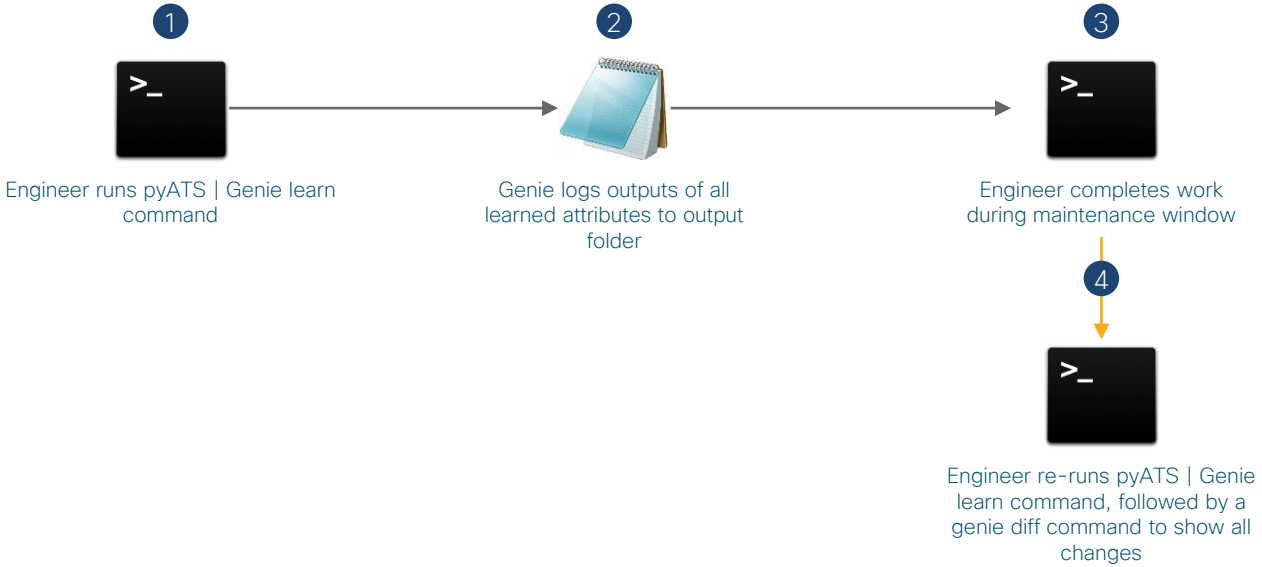
State validation – pyATS | Genie

- ‘Genie diff’ command can compare two different network states with a single command

```
--- gold_config/config_iosxe_csr1000v-1_ops.txt
+++ changed/config_iosxe_csr1000v-1_ops.txt
+Current configuration : 9351 bytes:
+interface Loopback1001:
+ description GenieLoop1001:
+ no ip address:
+interface Loopback1184:
+ description New Interface Created with Genie change:
+ no ip address:
-Current configuration : 9191 bytes:
```

Walk: Pre/Post maintenance validation

Use case: An engineer is going to do some maintenance and needs to be able to validate everything is back to the expected state after the change window.



Customer value:

Through automated audit and remediation, customers can eliminate a time-consuming task, while increasing frequency of audits by orders of magnitude.

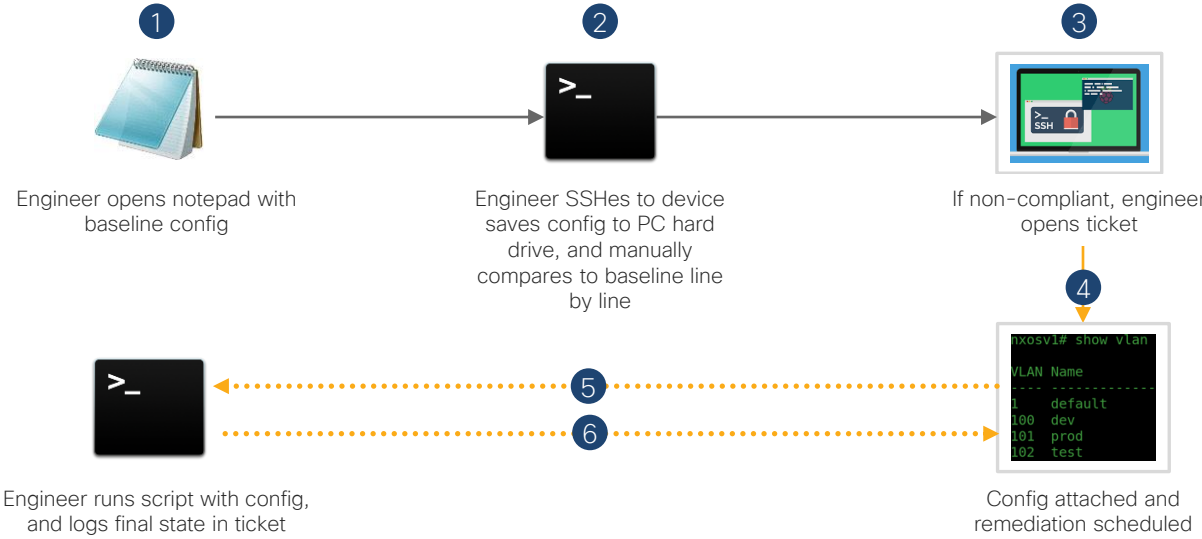
Sandbox:

https://devnetsandbox.cisco.com/RM/Diagram/Index/1b83c4bf-f63e-4e4b-9119-9b385751f1b6?diagramType=Topology

Security policy compliance audits

Walk: Engineer manual workflow

Use case: All customers have a need to monitor basic configurations, whether for compliance or network reliability. Solution?



Customer challenge:

Manual engineering is prone to typos, unexpected outcomes, and at scale can become a bottleneck.

Sandbox:

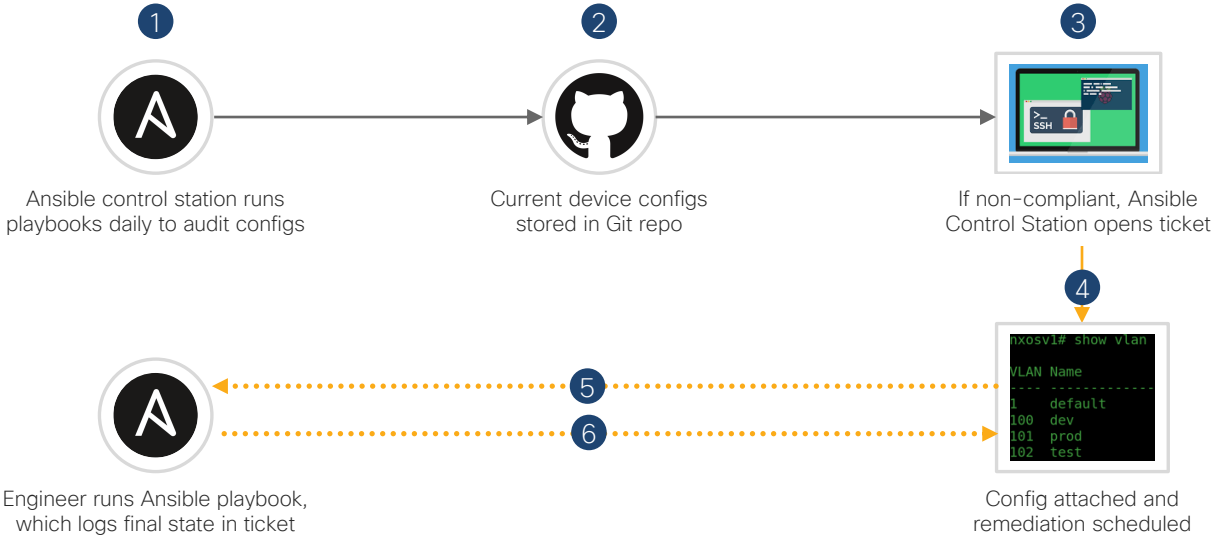
https://devnetsandbox.cisco.com/RM/Diagram/Index/1b83c4bf-f63e-4e4b-9119-9b385751f1b6?diagramType=Topology

Let’s choose a tool

We need to audit and enforce compliance against a baseline “gold” config

Walk: Zero touch audit of critical device config

Use case: All customers have a need to monitor basic configurations, whether for compliance or network reliability. Solution?



1. Ansible ▶ 2. GitHub ▶ 3. Ansible ▶ 4. ServiceNow

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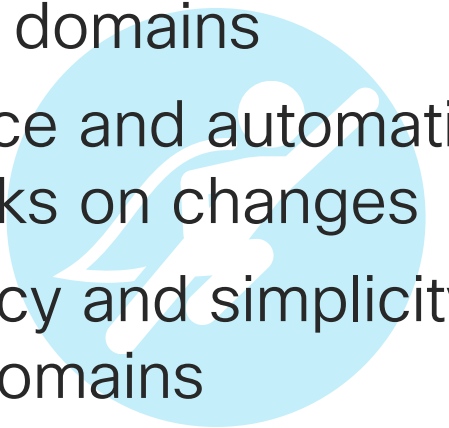
Three levels of complexity

Walk

Run



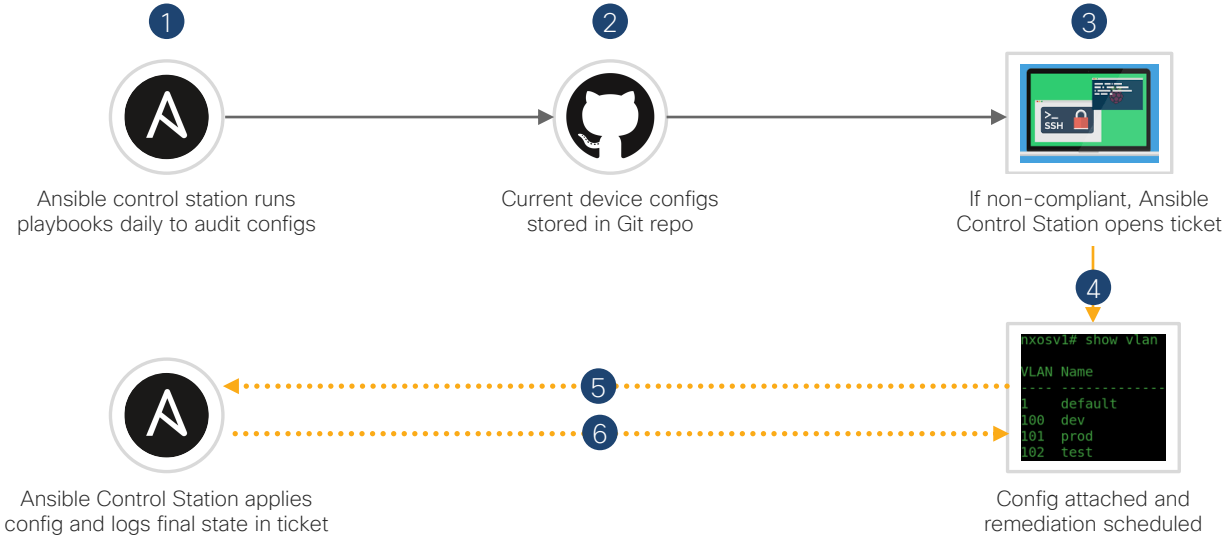
Fly

- Activate policy and intent across different network domains
- Enable self-service and automatic compliance checks on changes
- Ensure consistency and simplicity across multiple domains

So what tools are in your toolbelt?

Run: Zero touch remediation of critical device config

Use case: All customers have a need to monitor basic configurations, whether for compliance or network reliability. Solution?



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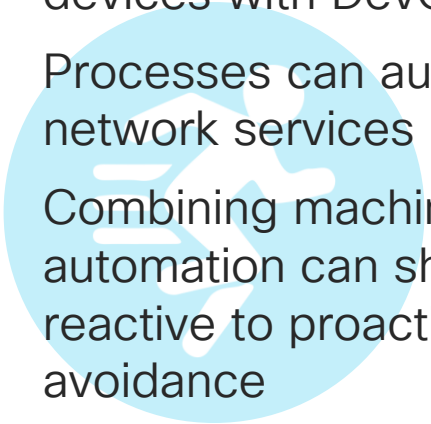
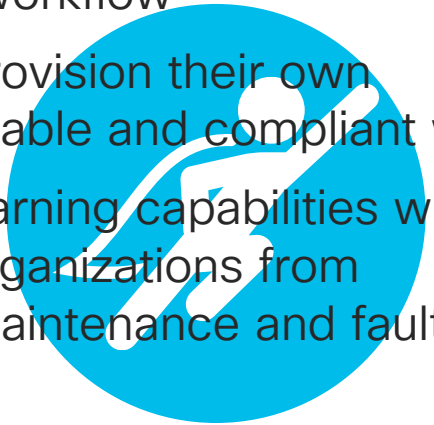
Three levels of complexity

Walk



Run



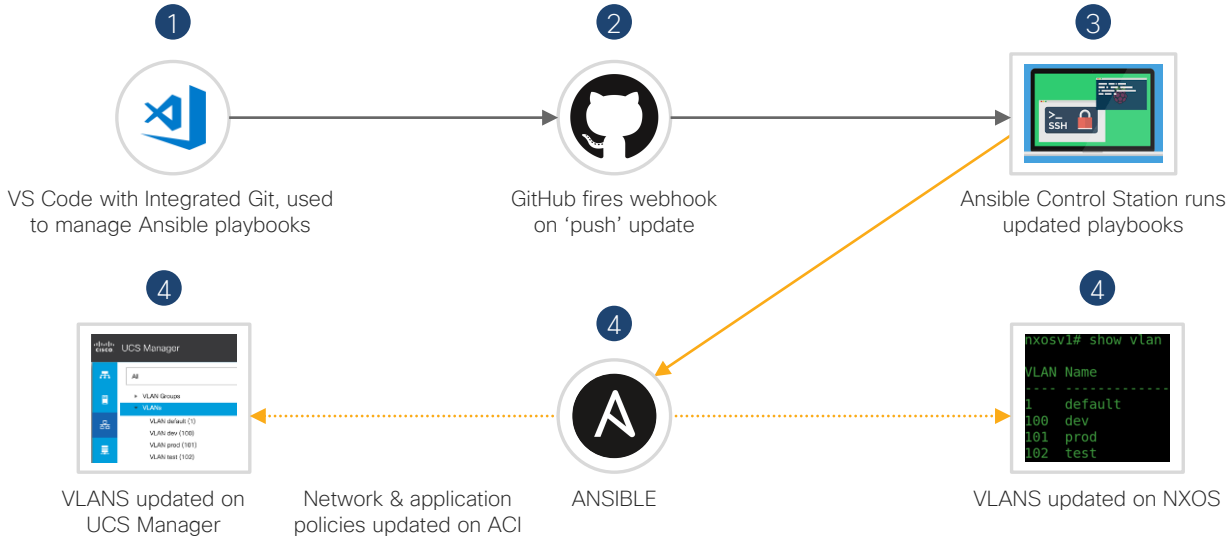
Fly

- Proactively manage applications, users, devices with DevOps workflow
- Processes can auto-provision their own network services in reliable and compliant way
- Combining machine learning capabilities with automation can shift organizations from reactive to proactive maintenance and fault avoidance

So what tools are in your toolbelt?

Fly: Network Automation for application policies deployment

Use case: All customers in need of basic network and server management



1. VS Code ▶ 2. GitHub ▶ 3. Ansible ▶ 4. UCS & NXOS ACI

Fly: Accelerate CI/CD application policy deployment via Network Automation by configuring UCS, ACI, and NX-OS policies with Ansible workflows

Certification: Prepare network configurations for application deployment using automated workflows

Walk Demo

Labs to get started

- https://developer.cisco.com/learning/modules
  - Walk:
    - Search for “Ansible” for a number of introduction labs with Ansible
  - Run:
    - Search for Programming Fundamentals/Python
  - Fly
    - Introduction to NetDevOps Configuration Pipelines with CICD
    - https://developer.cisco.com/codeexchange

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