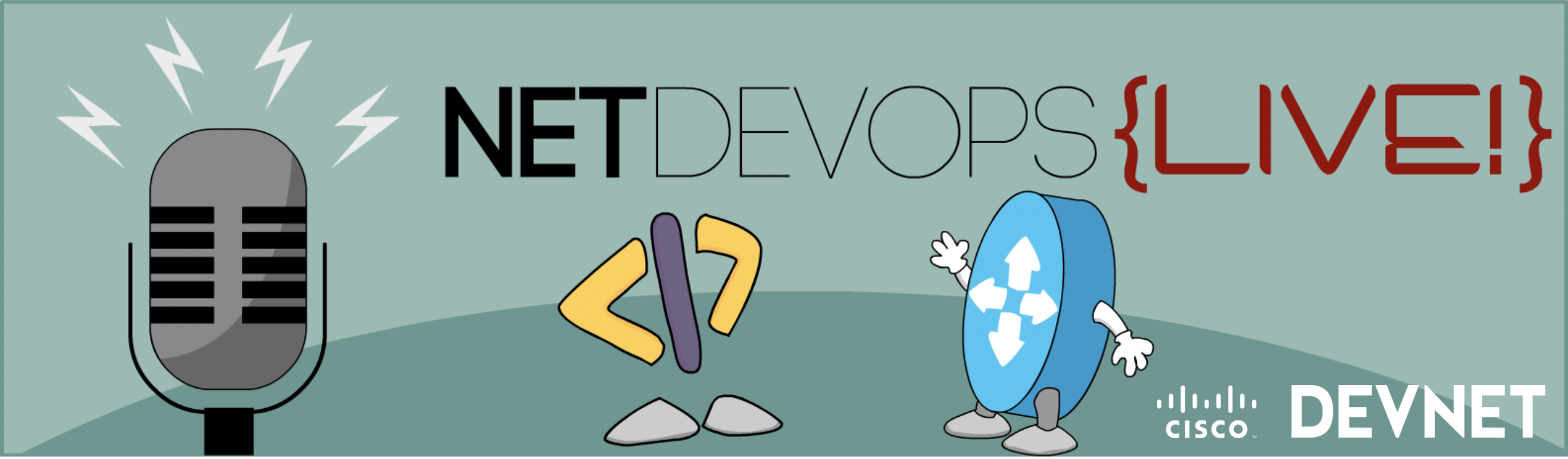


It's Not a Dream, NetDevOps CICD Pipelines Can Develop, Test, and Deploy Network Configurations Today

Hank Preston, ccie 38336 R/S

Developer Advocate, DevNet

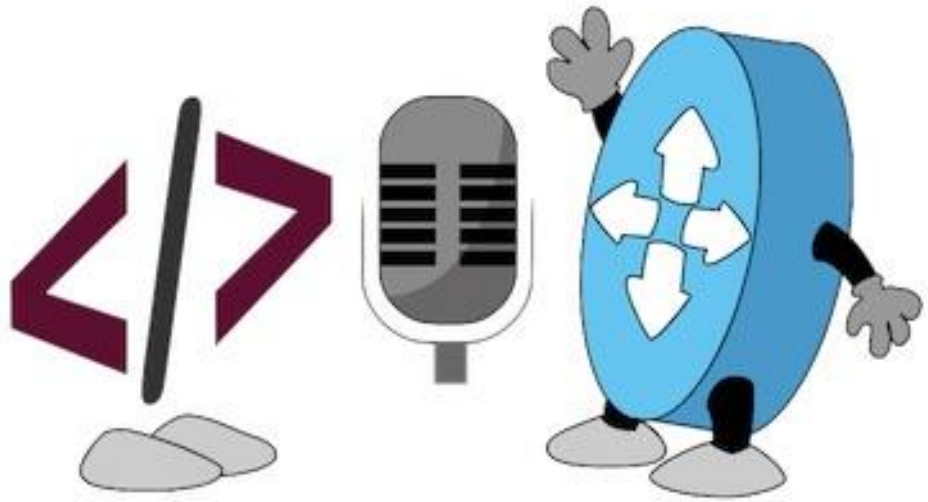
Twitter: @hfpreston

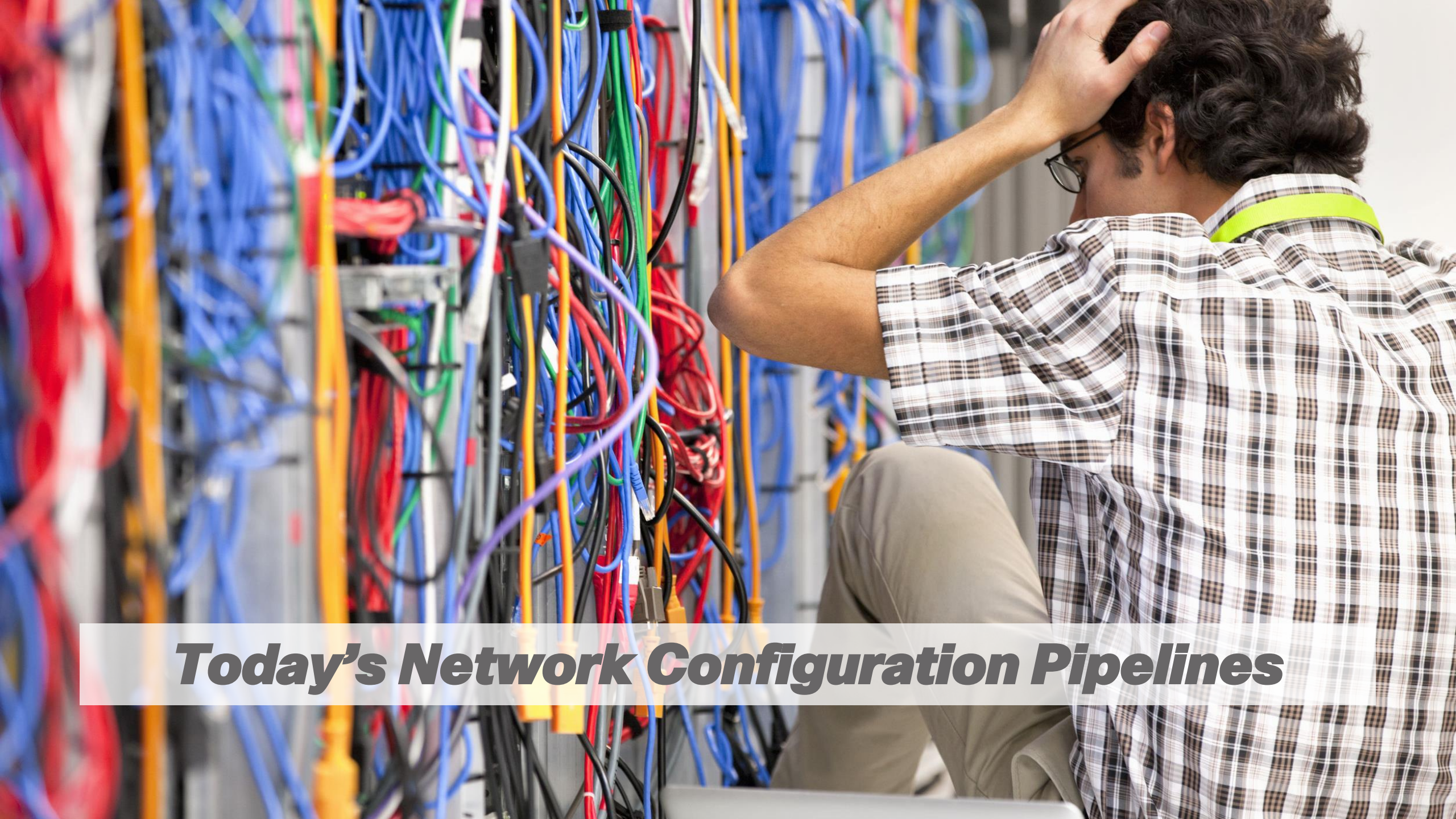
Season 1, Talk 2

https://developer.cisco.com/netdevops/live

What are we going to talk about?

- Today's Network Configuration Pipelines
- NetDevOps CICD Pipeline in Concept
- NetDevOps CICD in Action





Today's Network Configuration Pipelines

“Every time we implement a network change something goes wrong…”

“Isn’t it great, our switch hasn’t been rebooted in 6 years”

“We can’t update/change the network, our business won’t allow it”

** Paraphrased quotes from actual network operators*

From [redacted]
Date
To:
Cc:
Subject: switch uptime

r-secmgte1-1>sh ver
Cisco Internetwork Operating System Software
IOS (tm) s72033_rp Software (s72033_rp-ADVENTERPRISEK9_WAN-M), Version
12.2(18)SXF3, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2006 by Cisco Systems, Inc.
Compiled Tue 14-Feb-06 17:18 by kehsiao
Image text-base: 0x40101040, data-base: 0x42D90000

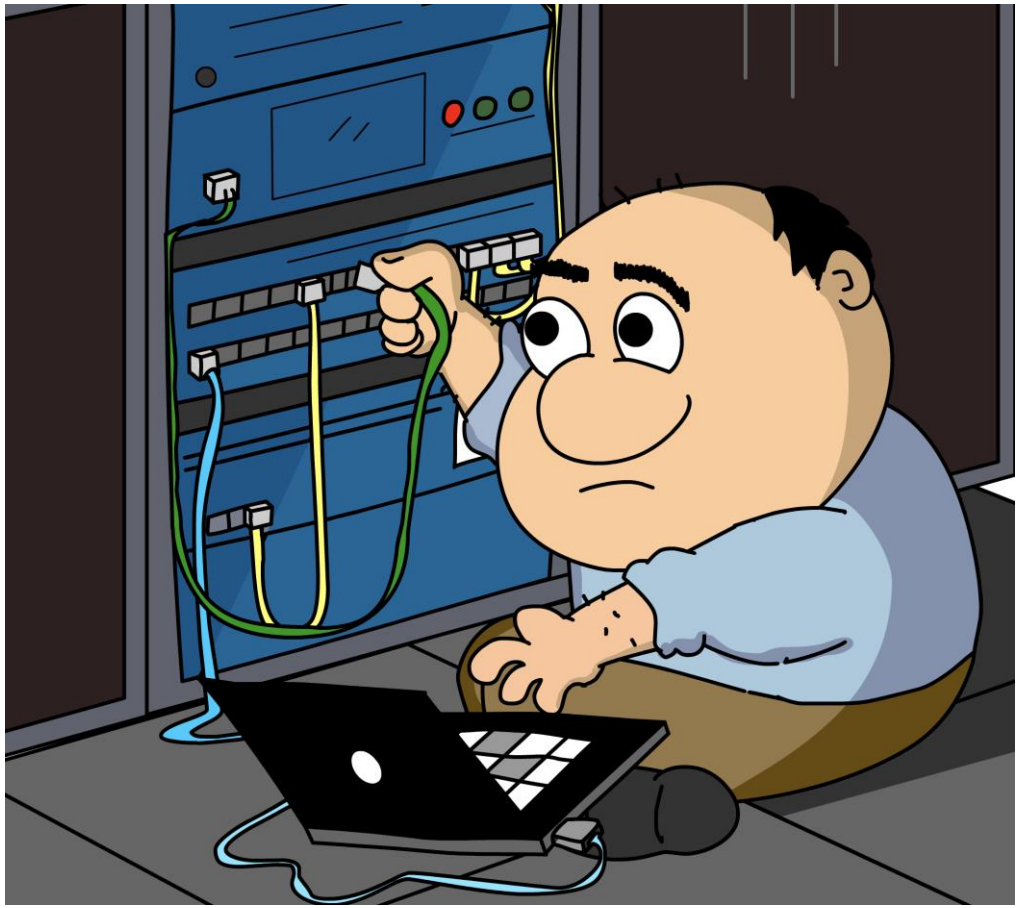
ROM: System Bootstrap, Version 12.2(17r)S2, RELEASE SOFTWARE (fc1)
BOOTLDR: s72033_rp Software (s72033_rp-ADVENTERPRISEK9_WAN-M), Version
12.2(18)SXF3, RELEASE SOFTWARE (fc1)

r-secmgte1-1 uptime is 11 years, 31 weeks, 1 day, 16 hours, 46 minutes
Time since r-secmgte1-1 switched to active is 11 years, 31 weeks, 1 day, 17
hours, 29 minutes
System returned to ROM by s/w reset (SP by power-on)
System restarted at 20:47:24 UTC Thu Mar 9 2006

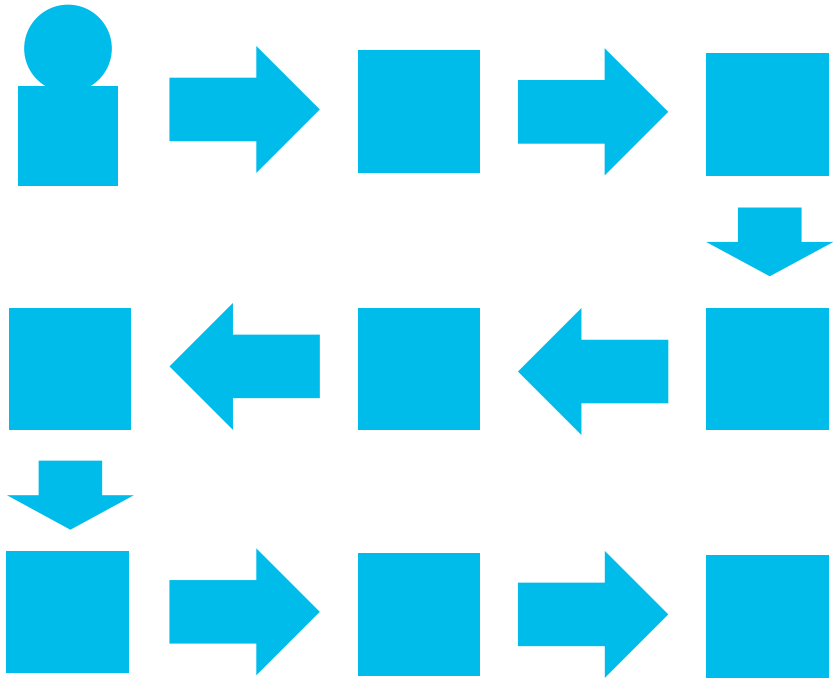
Don't encourage this kind of behavior!!!!

Today's reality…

- Functional but considered fragile
- Network configuration more "art than science"
- Tribal knowledge of key engineers

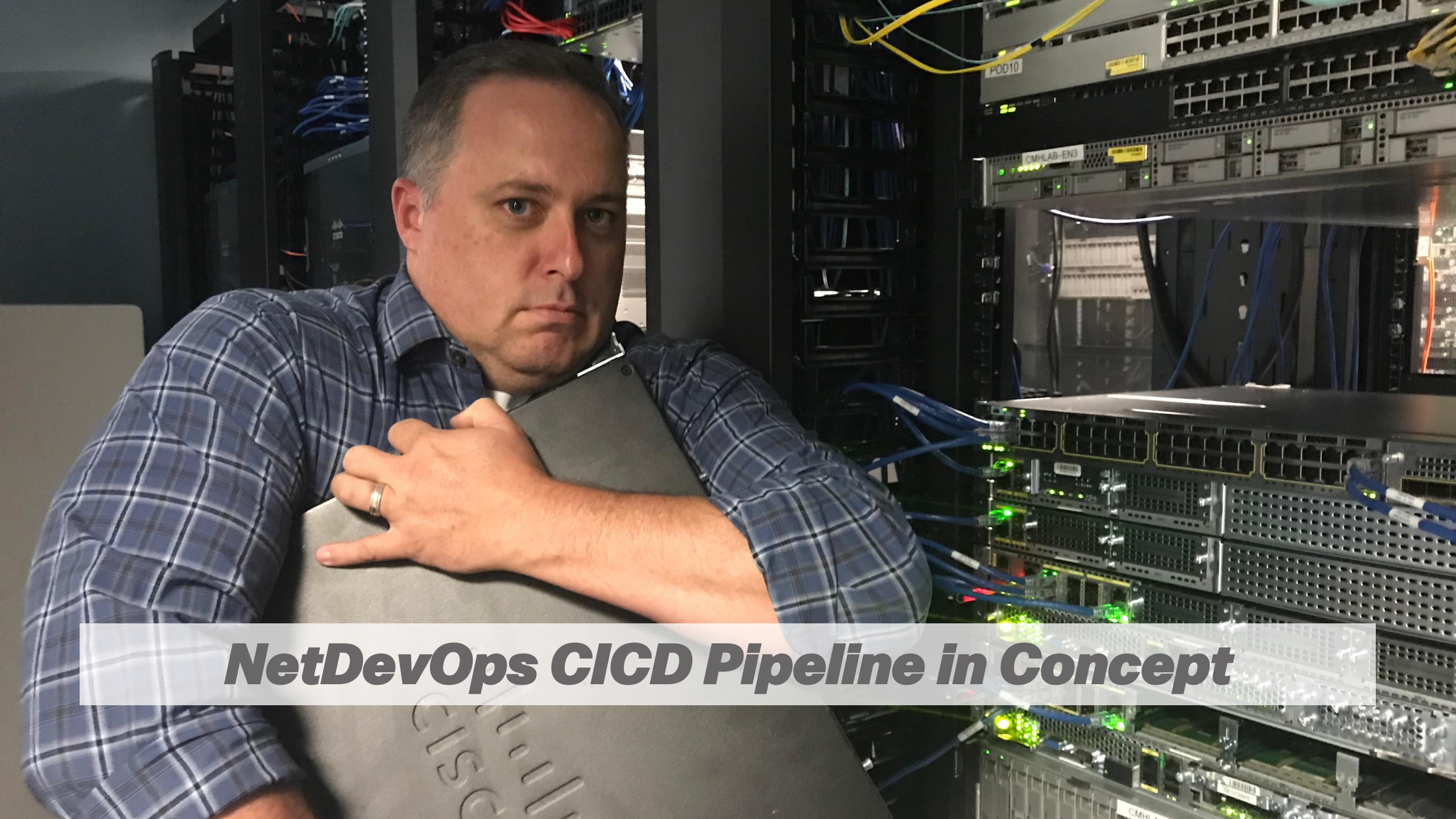


Today's Pipeline Realities



Sequential and Manual Infrastructure Provisioning

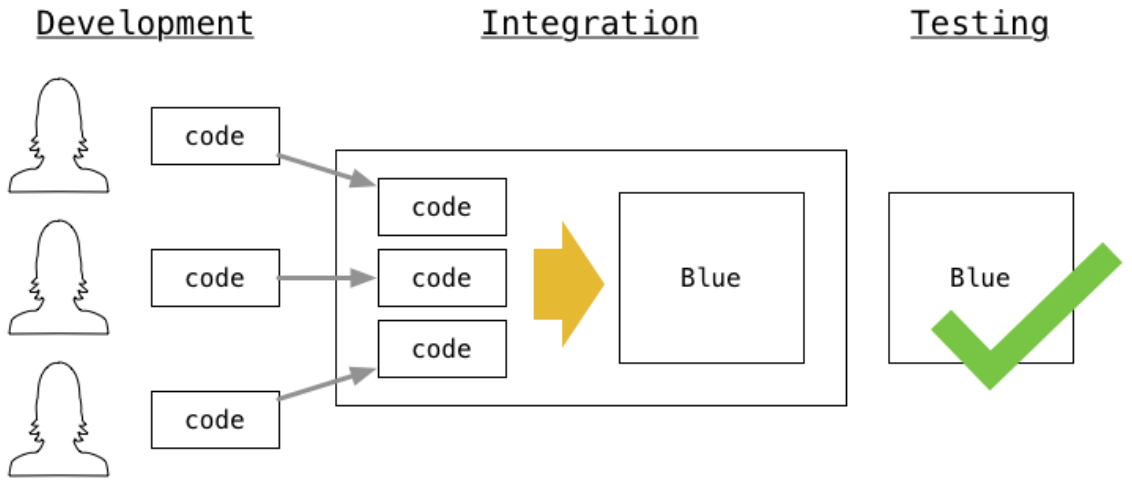
Snowflake Infrastructure with Organic Configurations



NetDevOps CICD Pipeline in Concept

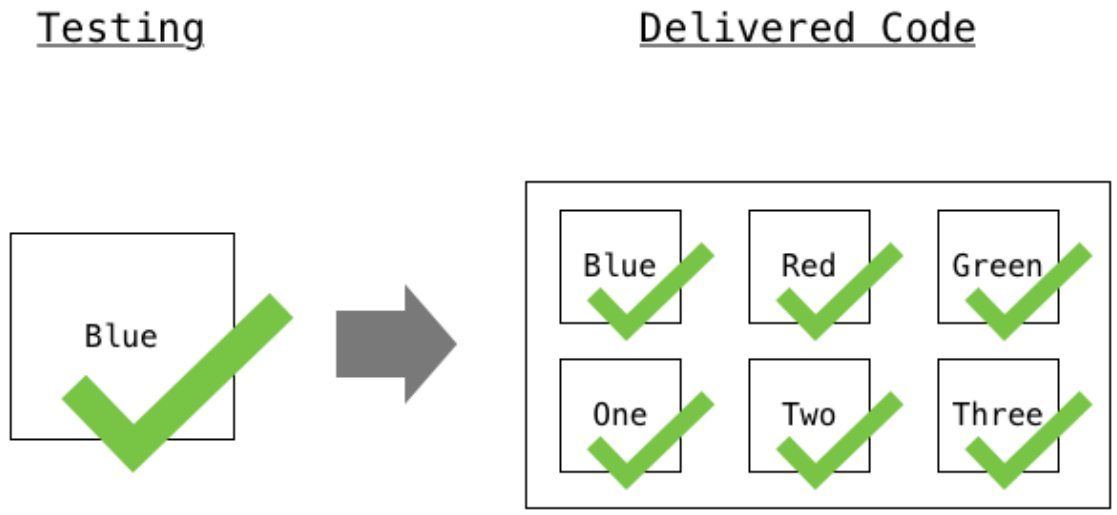
Software Development Process – Integration

- Bring together individual developers code
- Compile/Build components
- Execute Tests



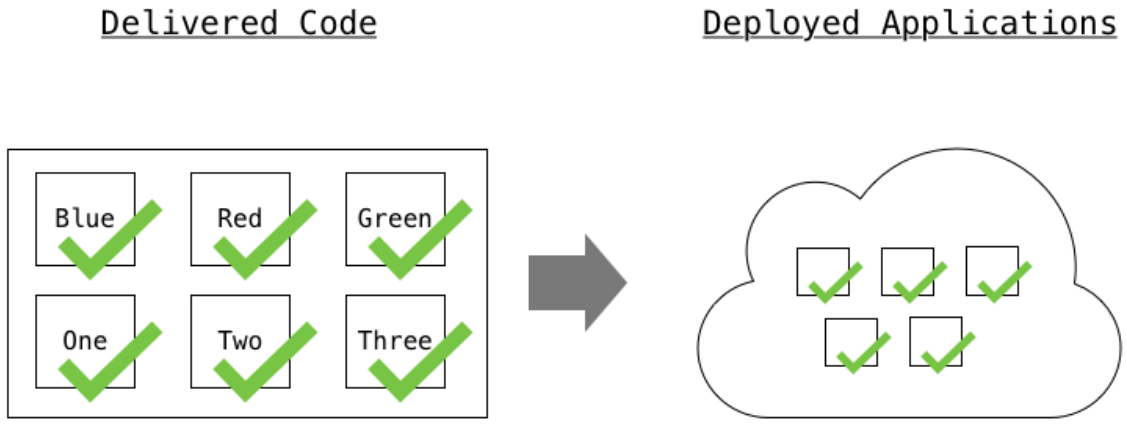
Software Development Process – Delivery

- On tested and working code
- Create final artifacts
- Make available for usage



Software Development Process – Deployment

- Install application
- Configure for use

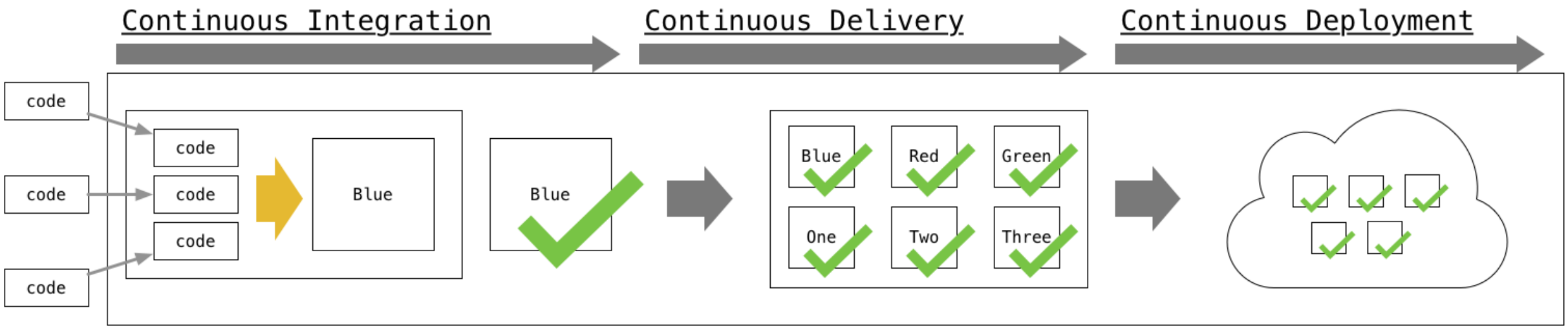


Continuous Development (or CICD)

- Continuous development is the natural progression of iteration times shrinking into insignificance. Through heavy use of automation, flexible infrastructure and modular architecture, software development leaders have come to the point where each code change is its own deployment.

http://searchsoftwarequality.techtarget.com/essentialguide/Next-generation-Agile-Guide-to-continuous-development

Continuous Development Process Flow



Continuous Integration

Merging of development work with code base constantly so that automated testing can catch problems early

Continuous Delivery

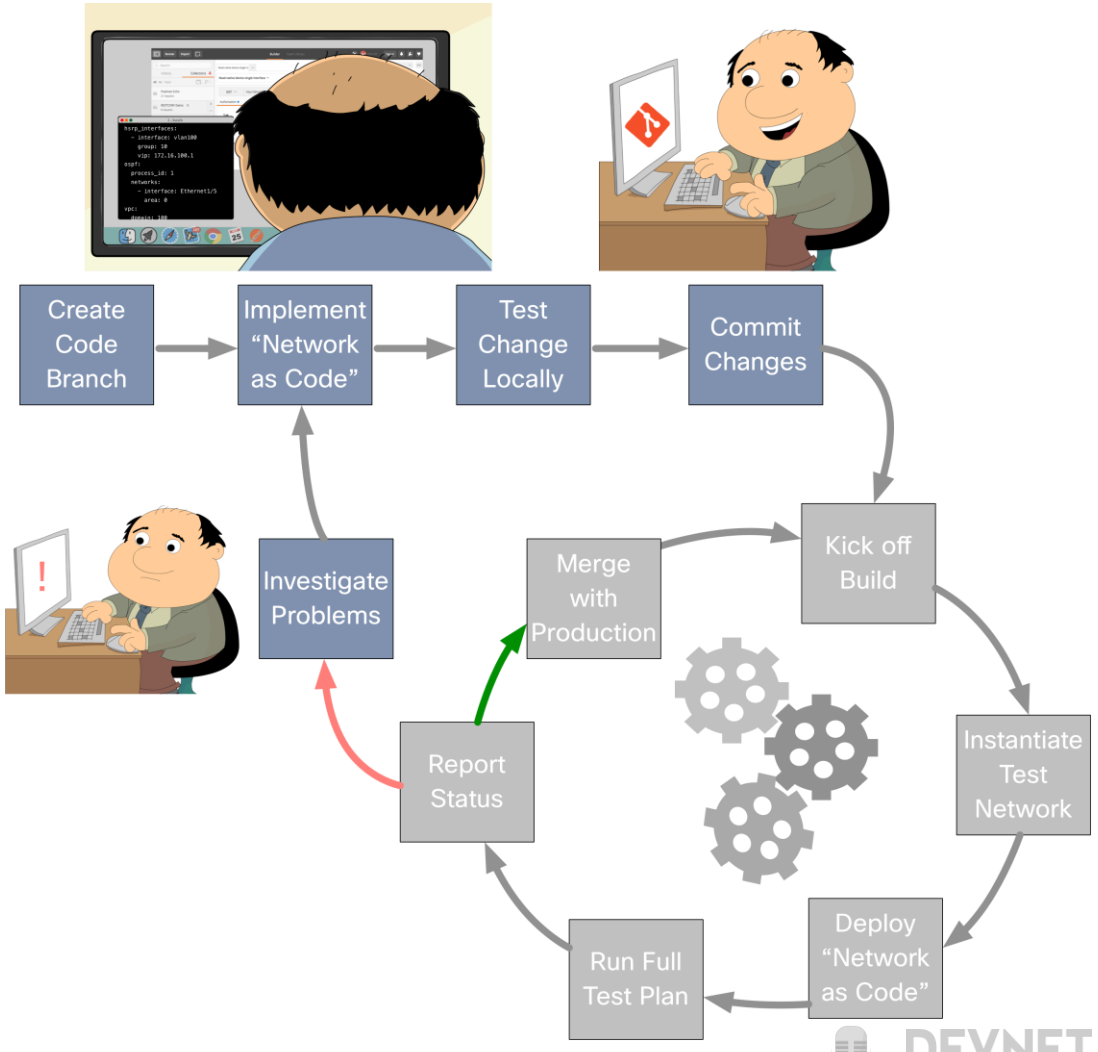
Software package delivery mechanism for releasing code to staging for review and inspection

Continuous Deployment

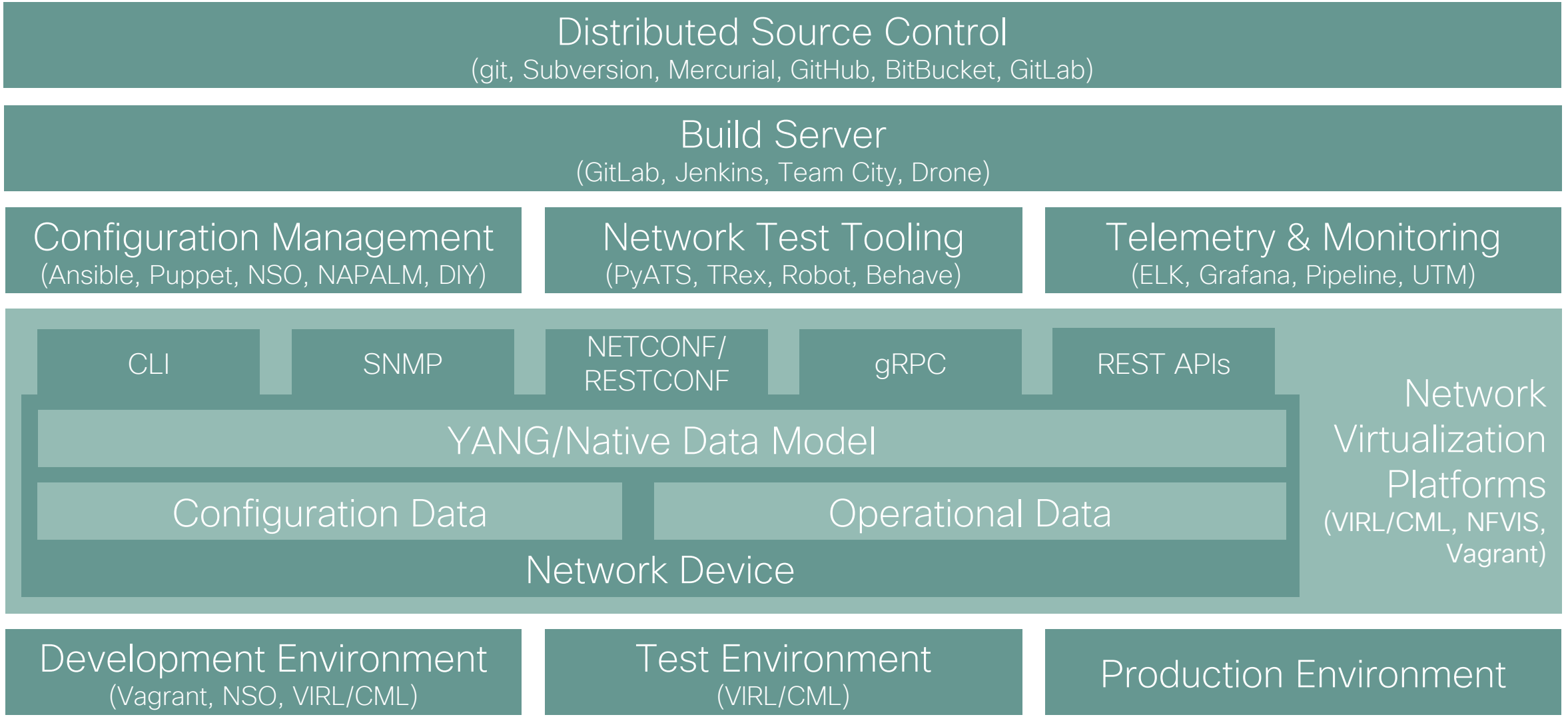
Relies on CI and CD to automatically release code into production as soon as it is ready. Constant flow of new features into production

NetDevOps Configuration Pipeline

- "Treating the Network as Code"
- Network Configuration stored in Source Control
- Changes are proposed in code "branches"
- CICD Build Servers deploy and test proposed configurations
- Successful configurations ready for deployment to "Production"



The NetDevOps Engineers Tool Bag
(Example tools, not comprehensive)



NetDevOps CICD in Action

So... Who's pumped about the possibilities?

NetDevOps CICD Demo Environment

Version Control

Infrastructure as Code

Dev Network Environment

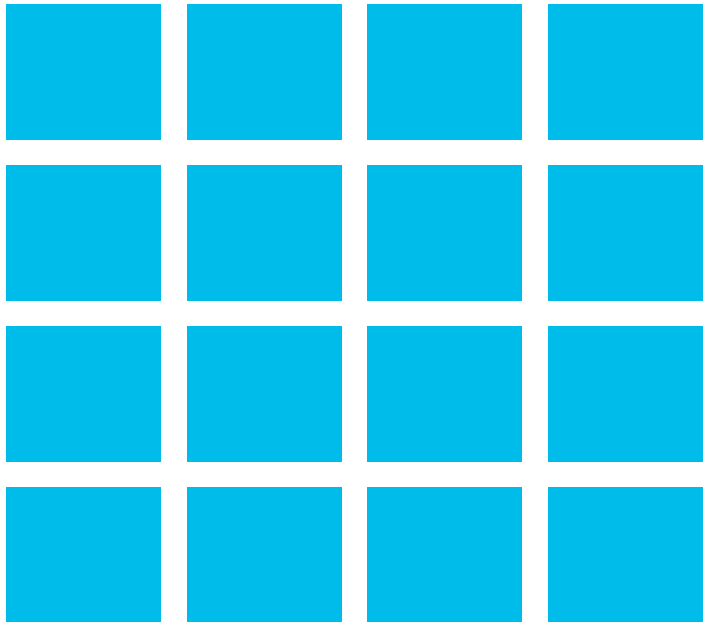
Source Control/ Build

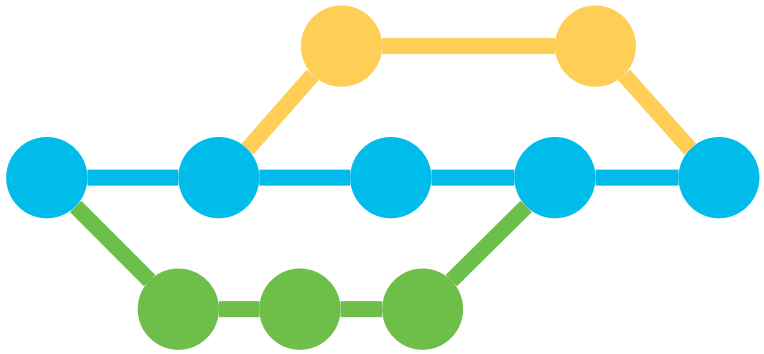
Network Simulation

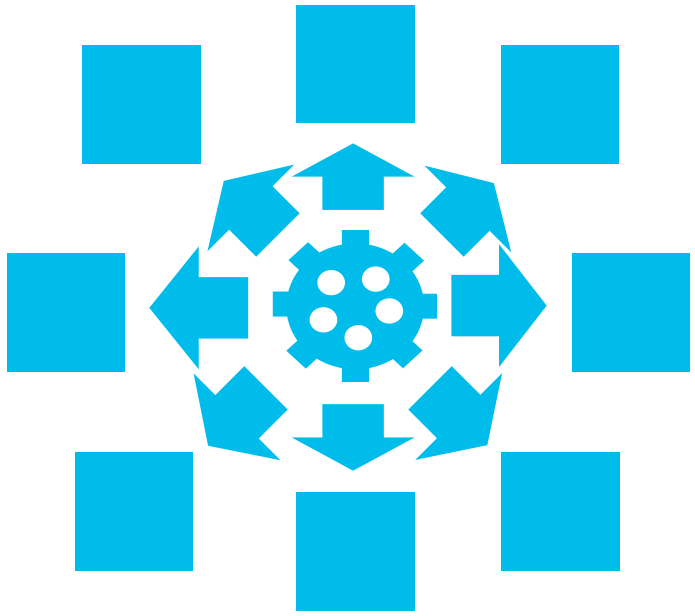
Network Testing

Chat and Notifications

NetDevOps Will Deliver

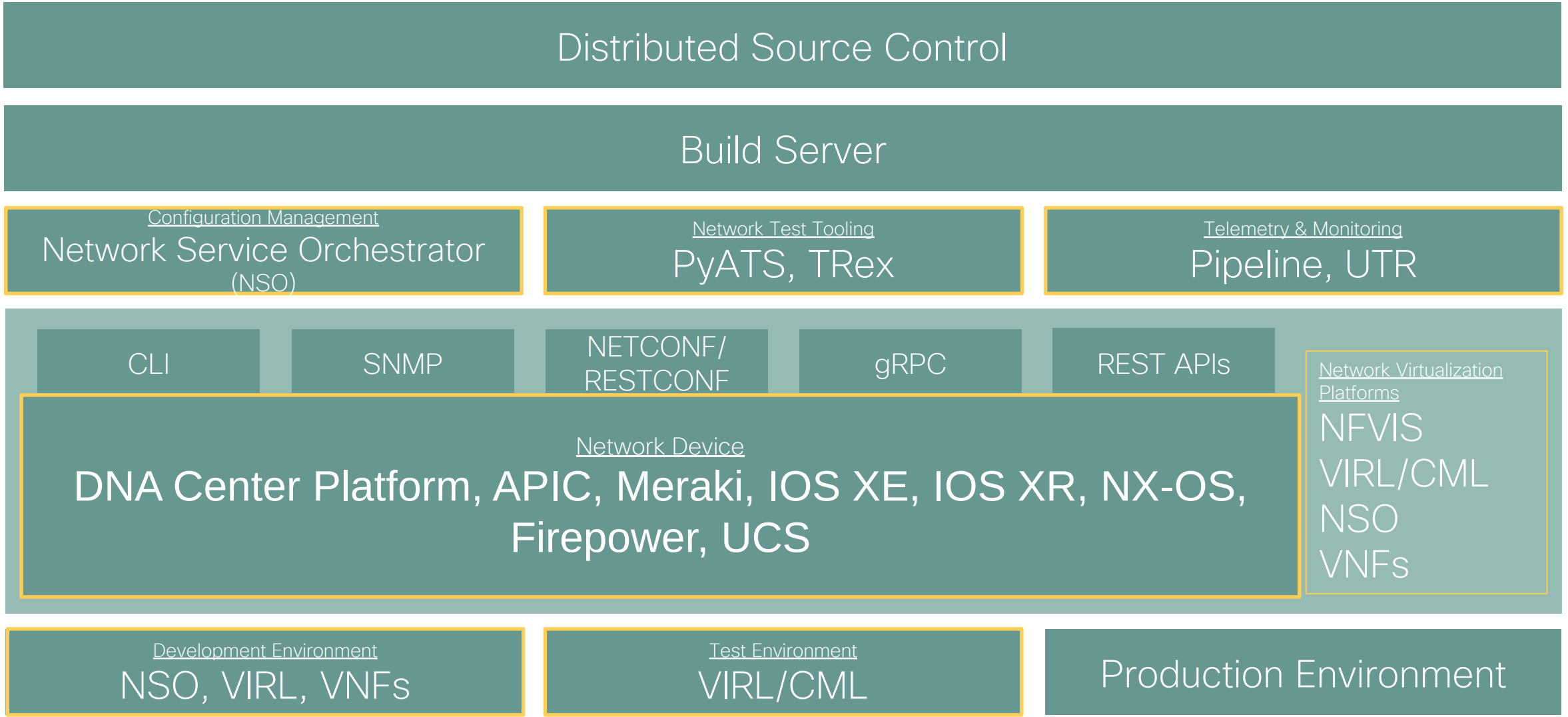






Consistent Version Controlled Infrastructure deployed with Parallel & Automated Provisioning

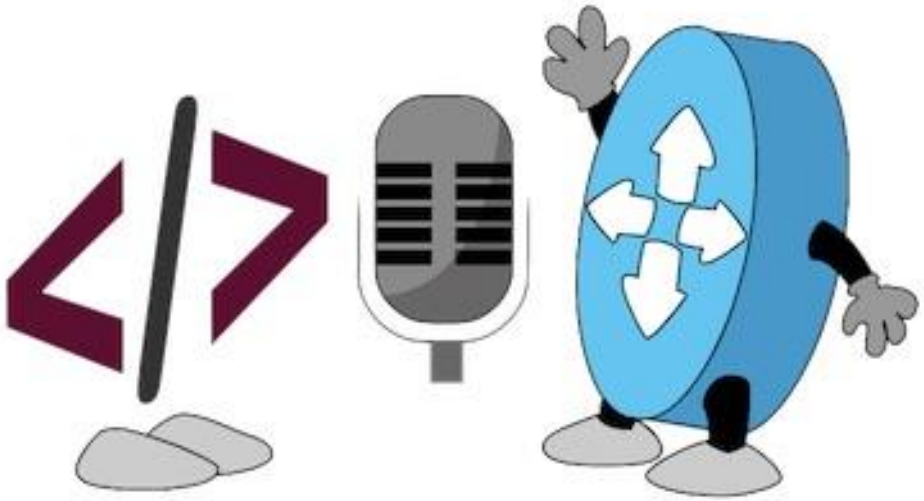
The NetDevOps Engineers Tool Bag



Summing up

What did we talk about?

- Today's Network Configuration Pipelines
- NetDevOps CICD Pipeline in Concept
- NetDevOps CICD in Action



Webinar Resource List

- Docs and Links
  - https://developer.cisco.com/netdevops
  - https://developer.cisco.com/pyats
  - http://virl.cisco.com
  - https://developer.cisco.com/nso
- Learning Labs
  - Jumpstart Your NetDevOps Journey http://cs.co/lab-netdevops
  - Introduction to NetDevOps CICD Pipelines http://cs.co/lab-netcicd
  - Introduction to Ansible on IOS XE http://cs.co/lab-ansible-iosxe
- DevNet Sandboxes
  - Multi-IOS Sandbox with CICD Demo http://cs.co/sbx-multi
- Code Samples
  - http://cs.co/code-sbx-multi

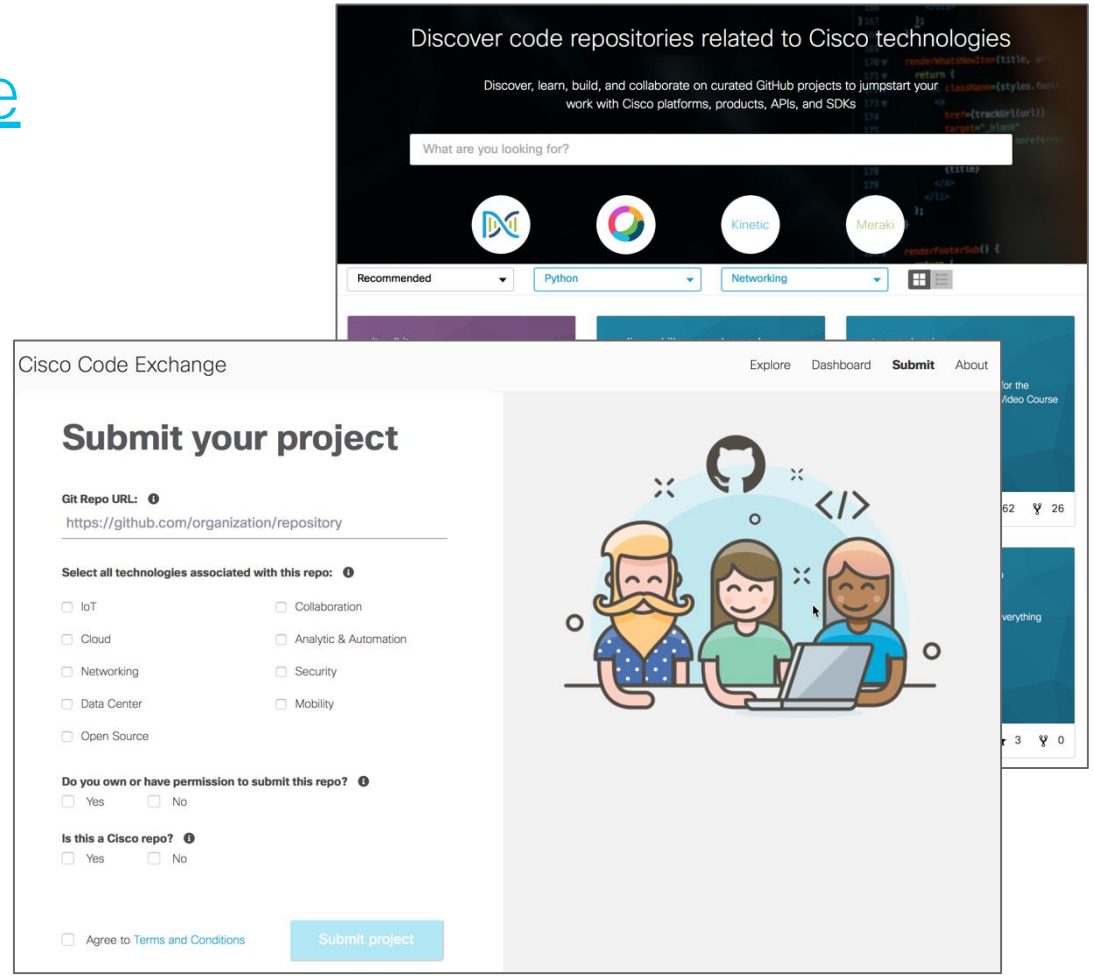
Related NetDevOps Live! Episodes

- DevOps style configuration management for the network with Open Source – Live on Oct 2nd
- What's the big deal about Source Control? Why your network configurations should be in "git“ – Live on Oct 9th
- Introduction to Network Services Orchestrator – the single API and CLI for your network – Live on Oct 16th
- Profile, test and verify your network is running smoothly with pyATS – Live on Oct 30th

NetDevOps Live! Code Exchange Challenge

developer.cisco.com/codeexchange

Create a sample VIRL topology file and submit to Code Exchange for others to check out.



Example: A Multi-Site DMVPN Network Topology.

Looking for more about NetDevOps?

- NetDevOps on DevNet
  developer.cisco.com/netdevops
- NetDevOps Live!
  developer.cisco.com/netdevops/live
- NetDevOps Blogs
  blogs.cisco.com/tag/netdevops
- Network Programmability Basics Video Course
  developer.cisco.com/video/net-prog-basics/

Got more questions? Stay in touch!

Hank Preston

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@hfpreston
http://github.com/hpreston

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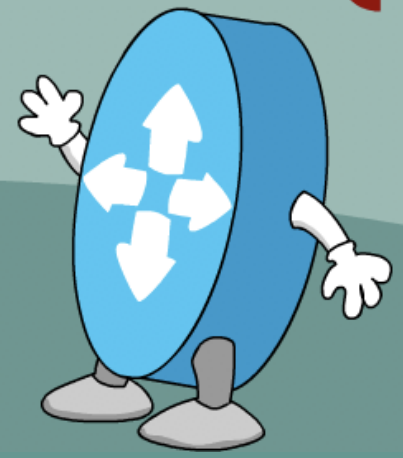

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