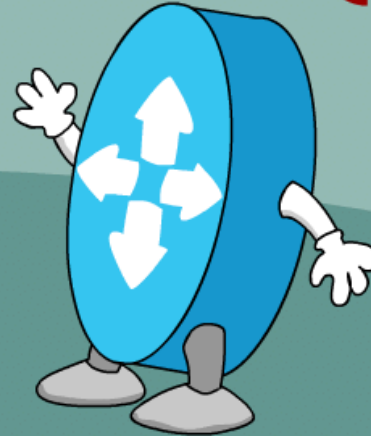




NETDEVOPS {LIVE!}



DEVNET

Fishing for Network Health with Batfish

Samir Parikh

Intentionet

Twitter: [@intentionet](https://twitter.com/intentionet)

Season 3, Talk 3

Hosted by Hank Preston, NetDevOps Engineer

Twitter: [@hfpreston](https://twitter.com/hfpreston)

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

INTENTIONET

YOUR NETWORK. EXACTLY AS YOU INTENDED.

Fishing for Network Health with Batfish

April 2020

Intentionet: Who Are We?

Headquarters: Seattle, WA

Funding: NSF, True Ventures, USAF

MISSION

Eliminate network outages and breaches

What We Are Building: Batfish



Started as a Microsoft Research project in 2012

- Open sourced in 2014 (Apache 2.0)
- Contributors from Intentionet, Amazon, Microsoft, BBN, Colgate University, Princeton, UCLA, USC, ...

Used by many Fortune 500 companies

A screenshot of the GitHub repository page for batfish/batfish. The page shows the repository name, navigation tabs for Code, Issues (116), Pull requests (9), Wiki, and Insights. A description of the tool is provided, along with a list of tags: network, configuration, configuration-parser, configuration-analysis, and network-verification. At the bottom, statistics for 6,295 commits, 87 branches, and 52 releases are visible.

batfish / batfish

<> Code Issues 116 Pull requests 9 Wiki Insights

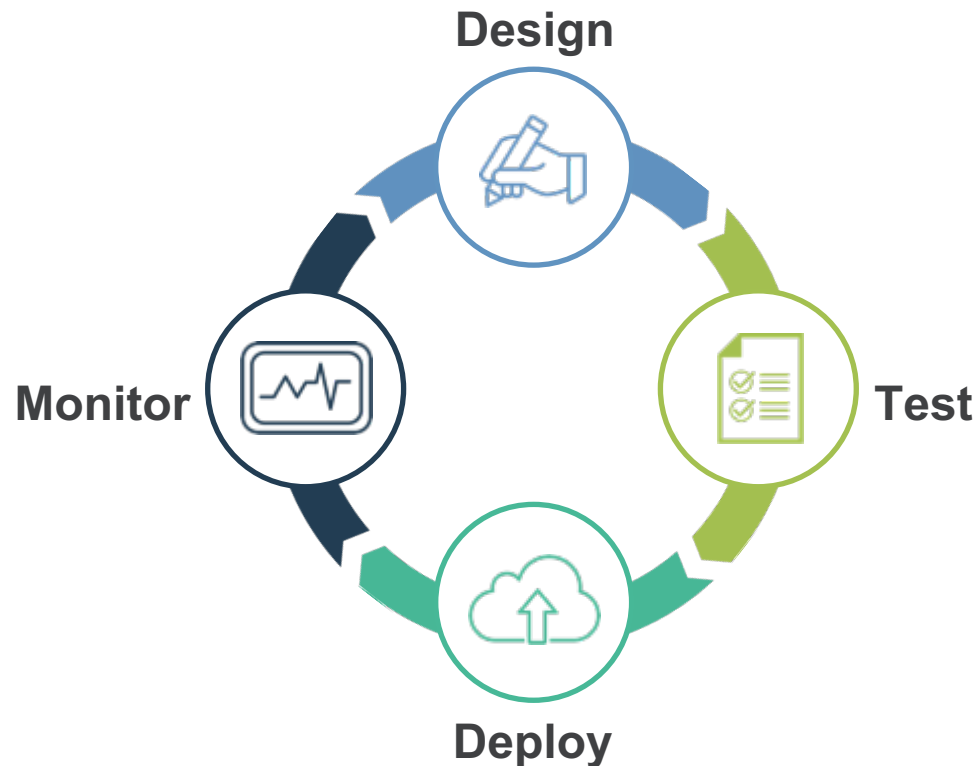
Batfish is a network configuration analysis tool that can find bugs and guarantee the network configurations. It enables network engineers to rapidly and safely evolve the security breaches. <http://www.batfish.org>

network configuration configuration-parser configuration-analysis network-verification

6,295 commits 87 branches 52 r

Why Batfish?

Testing is the weak link in network reliability and agility



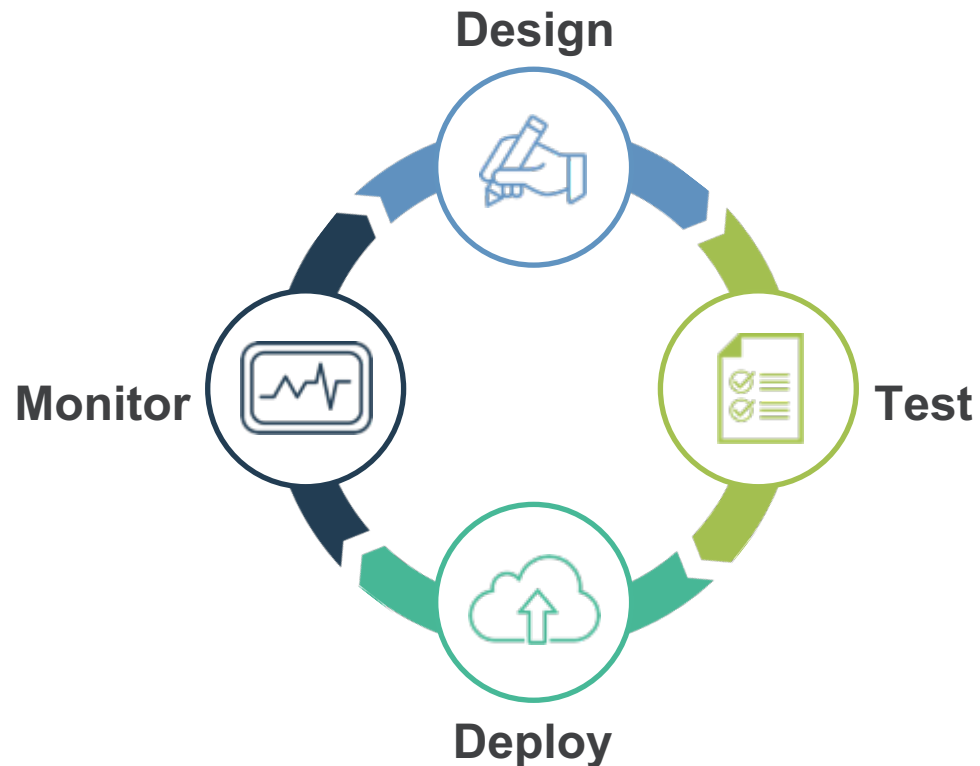
Emulation cannot mimic production networks



The next change may bring down the network
Slow pace of change

Why Batfish?

Test is the weak link in network reliability and agility



Batfish provides comprehensive pre-deployment validation



Bad changes don't reach the network
Make changes rapidly

How It Works

CUMULUS

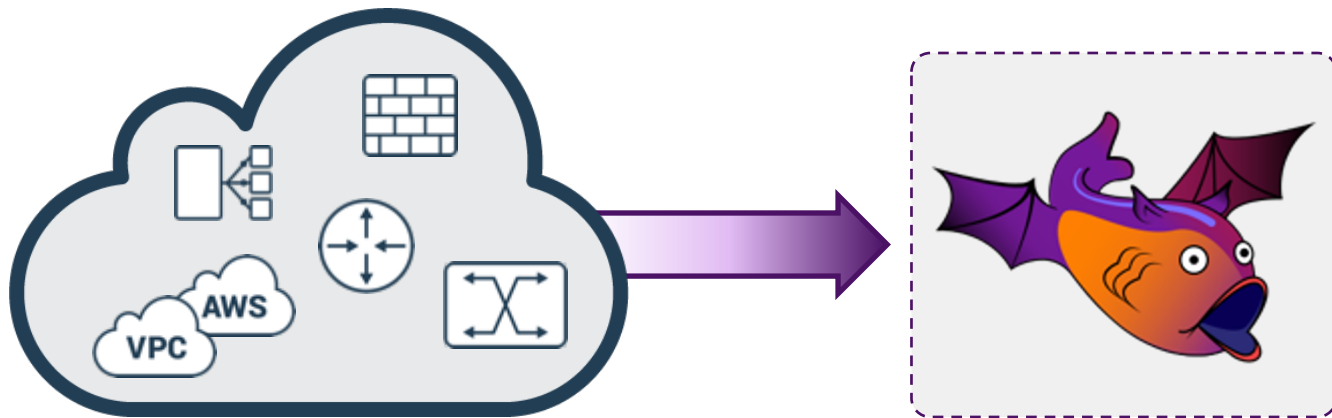


JUNIPER NETWORKS

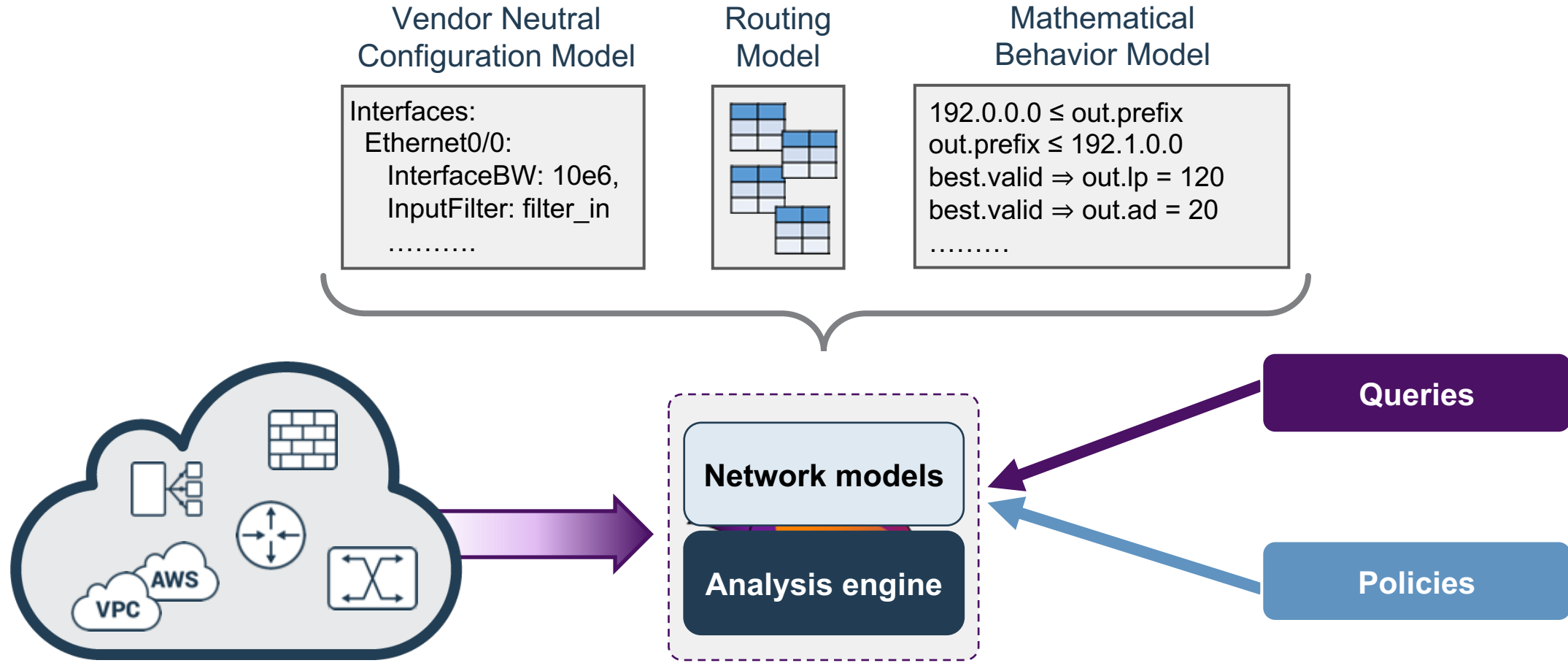
ARISTA



And many more...



How It Works



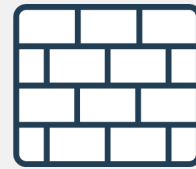
Batfish Provides Comprehensive Analysis

Configuration Audit



- Are all devices compliant with site standards?
- Are all protocol sessions (BGP, IPsec, MLAG, ...) compatible?

ACL and Firewall Analysis



- Is my firewall protecting sensitive services?
- What is the impact of this ACL change?

Routing and Forwarding Analysis



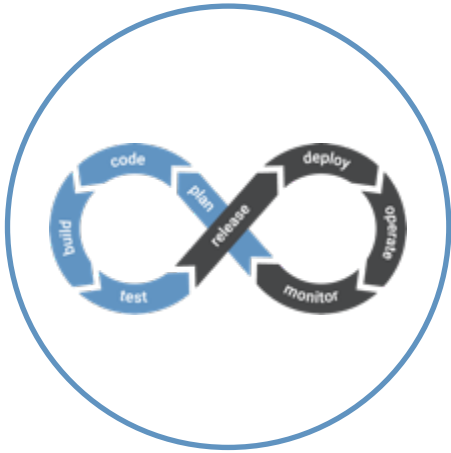
- Is my network redundant?
- What happens if I change this route policy?

Exhaustive Reachability Analysis



- Can any flow violate cross-site isolation?
- Is the DNS server accessible from anywhere?

How Organizations are Using Batfish



CI/CD



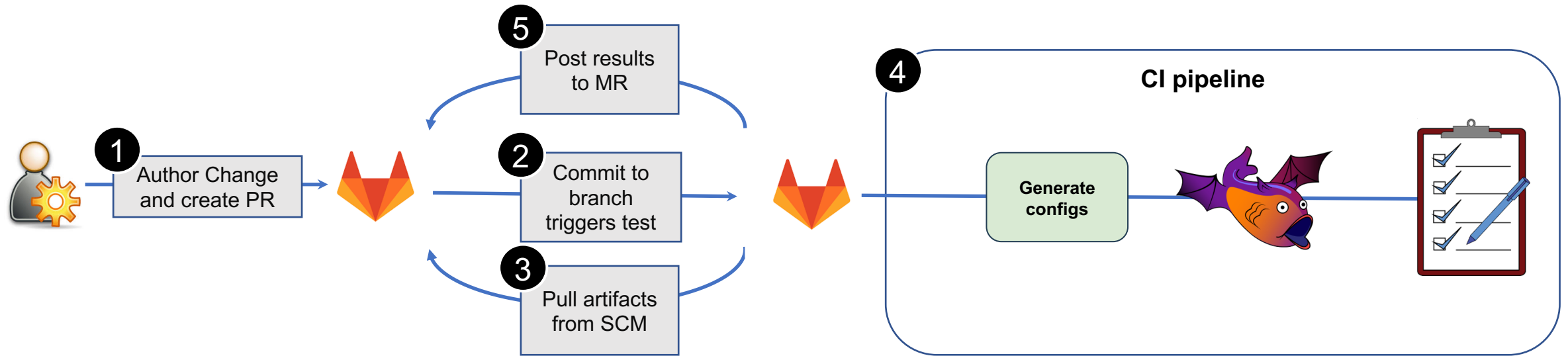
Change validation



Design analysis

DEMO

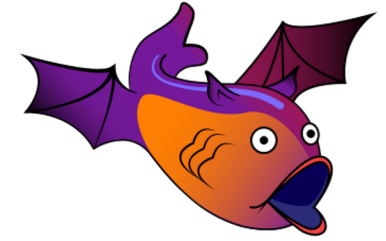
Demo workflow



Batfish Open-source vs Enterprise

Feature	Open-source	Enterprise
Multi-vendor device support	✓	✓
Vendor-neutral device models	✓	✓
Open APIs	✓	✓
Powerful query engine	✓	✓
Network Analyzers		✓
Dashboard / Graphical user-interface		✓
3rd party integrations		✓
RBAC w/ SSO & SAML		✓
Support		✓

Getting Started with Batfish



- Jupyter Notebooks
 - https://www.github.com/batfish/pybatfish/tree/master/jupyter_notebooks
- Videos
 - <https://www.youtube.com/c/intentionet>
- Slack
 - [Join Batfish Slack!](#)
- Documentation
 - <https://batfish.readthedocs.io/en/latest/>

GitHub, Inc. [US] | https://github.com/batfish/pybatfish/tree/master/jupyter_notebooks

File/Folder	Commit Message	Time Ago
networks	deleting unused files (#168)	7 days ago
Analyzing ACLs and Firewall Rules.ipynb	Improve notebook testing script (#176)	5 days ago
Getting started with Batfish.ipynb	Improve notebook testing script (#176)	5 days ago
Introduction to Forwarding Analysis.ipynb	Add forwarding analysis notebook (#179)	2 days ago
Introduction to Route Analysis.ipynb	Improve notebook testing script (#176)	5 days ago
Provably Safe ACL and Firewall Changes.ipynb	Improve notebook testing script (#176)	5 days ago
README.md	add video to README (#147)	19 days ago
Validating Configuration Settings.ipynb	Improve notebook testing script (#176)	5 days ago
startup.py	Improve notebook testing script (#176)	5 days ago

README.md

This folder contains Jupyter notebooks that show how to use Batfish for different analysis and validation tasks. All network snapshots used in the notebooks are in the `networks` subfolder.

The current list of notebooks are:

- [Getting Started with Batfish \[video\]](#)
 - Shows how to get started and provides an overview of the capabilities of Batfish.
- [Validating Configuration Settings \[video\]](#)
 - Shows how you can validate different types of configuration settings (NTP server, TACACS server, AAA, SNMP, etc...) using Batfish.
- [Introduction to Route Analysis \[video\]](#)
 - Shows how to analyze routing tables computed by Batfish.
- [Analyzing ACLs and Firewall Rules \[video\]](#)
 - Shows how to use analyze ACLs and firewalls rules using Batfish.
- [Provably Safe ACL and Firewall Changes](#)
 - Shows a workflow to ensure changes to ACLs and firewall rules are correct and safe.

We will continue adding notebooks that demonstrating additional use cases of Batfish.

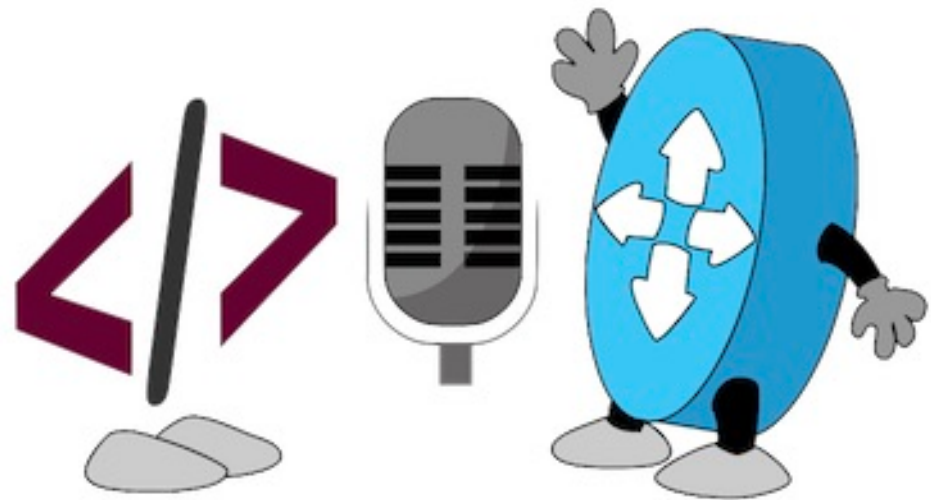
- You can reach us via [Slack](#) for any questions or suggestions for additional use cases.
- You can subscribe to the [Batfish YouTube channel](#) to be notified of new videos.

Summary

Build a reliable and agile network

Know before you change with Batfish

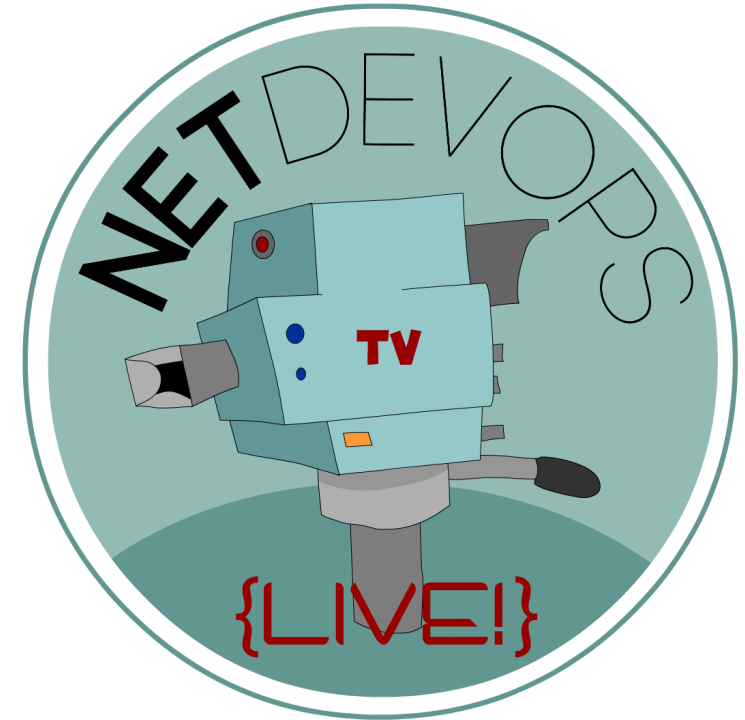
NetDevOps Tech Chat



</finish>

Webinar Resources on DevNet!

- Docs and Links
- Learning Labs
- DevNet Sandboxes
- Code Samples



developer.cisco.com/netdevops/live/#s03t02

NetDevOps Live! Code Exchange Challenge

developer.cisco.com/codeexchange

Let's go Fishing! Write a network validation test using Batfish.

Example: Verify that Access Control Lists are implementing the policy you actually want!

The image shows two overlapping screenshots of the Cisco Code Exchange website. The top screenshot is a search page with the heading "Discover code repositories related to Cisco technologies". It features a search bar with the placeholder text "What are you looking for?". Below the search bar are four circular icons representing different Cisco technologies: DNA, Cloud Managed Network, Kinetic, and Meraki. There are also dropdown menus for "Recommended", "Python", and "Networking". The bottom screenshot is the "Submit your project" form. It includes a "Git Repo URL" field with the example "https://github.com/organization/repository". Below this is a section titled "Select all technologies associated with this repo:" with a grid of checkboxes for IoT, Cloud, Networking, Data Center, Open Source, Collaboration, Analytic & Automation, Security, and Mobility. There are also checkboxes for "Do you own or have permission to submit this repo?" and "Is this a Cisco repo?". At the bottom, there is a checkbox for "Agree to Terms and Conditions" and a blue "Submit project" button. To the right of the form is a large illustration of three people (two men and one woman) sitting around a laptop, with a GitHub logo and code symbols above them.

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- NetDevOps Live!
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- NetDevOps Blogs
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HashiCorp Brings a Cloud Operating Model to Network Engineers




April 28, 2020 with Kevin Corbin

<https://developer.cisco.com/netdevops/live/#s03t04>

Got more questions? Stay in touch!



Hank Preston

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-  <http://github.com/hpreston>



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-  <http://github.com/CiscoDevNet>

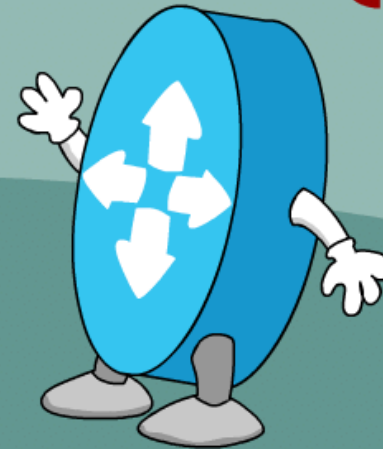


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