Riot Direct Network

Infrastructure as Code Journey

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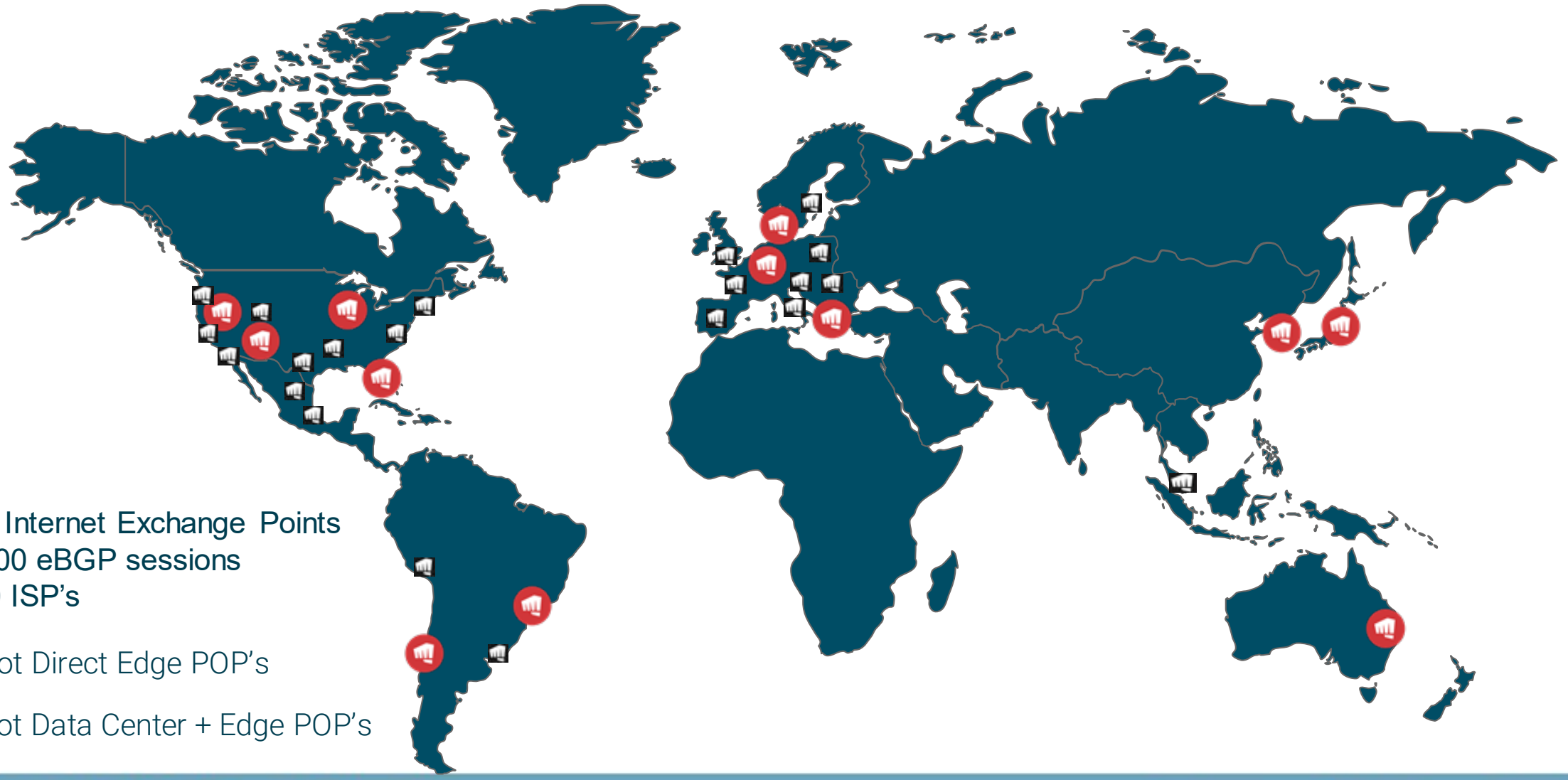
29674 INT20

League of Legends

And more games…

Riot Games Infrastructure



At 56 Internet Exchange Points
~ 2,500 eBGP sessions
~ 300 ISP's

Riot Direct Edge POP's

Riot Data Center + Edge POP's

Riot Direct Network as Code

*"Is how we define and **manage** riot direct network infrastructure via machine **friendly declaratives** using software **versioning** control and delivering changes via continuous integration and continuous **delivery** pipelines (CI/CD)"*

Riot Direct Network as Code

Key Design Principles

- ☑ **Master** branch is the Single Source of Truth (SSoT) and represents the state of the **Production** Network
- ☑ Minimal level of **abstraction**
- ☑ Full configuration **replace** is OP
- ☑ Jenkins CI/CD **tests** and **deploys** configuration to devices with some fault-tolerance
- ☑ Github Source Control allows easy **versioning** and **rollback**
- ☑ Actively maintained **open source** projects (Nornir, napalm, capirca, etc) are utilized to **speed up** development

Architecture // Overview

Branch: master ▾ rdnw-as-code-training / sites / euw / lab01 / rr / — Create new file | Upload files | Find file | History

Phillip Simonds and svc-github Add initial BGP schema — Latest commit 8489203 on Jun 15

..

bgp.yaml — Add initial BGP schema — 3 months ago

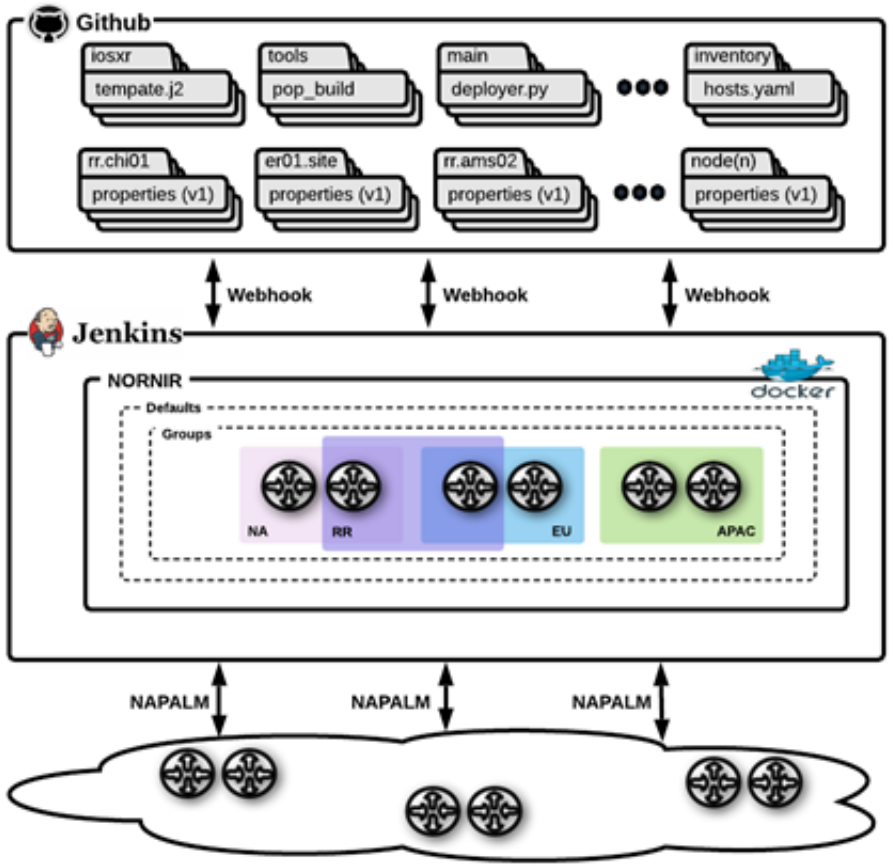
Branch: master ▾ rdnw-as-code-training / sites / euw / lab01 / rr / routing.yaml — Find file | Copy path

jbotello Adding loopback100 and include it in isis (#20) — 5bf22a9 11 days ago

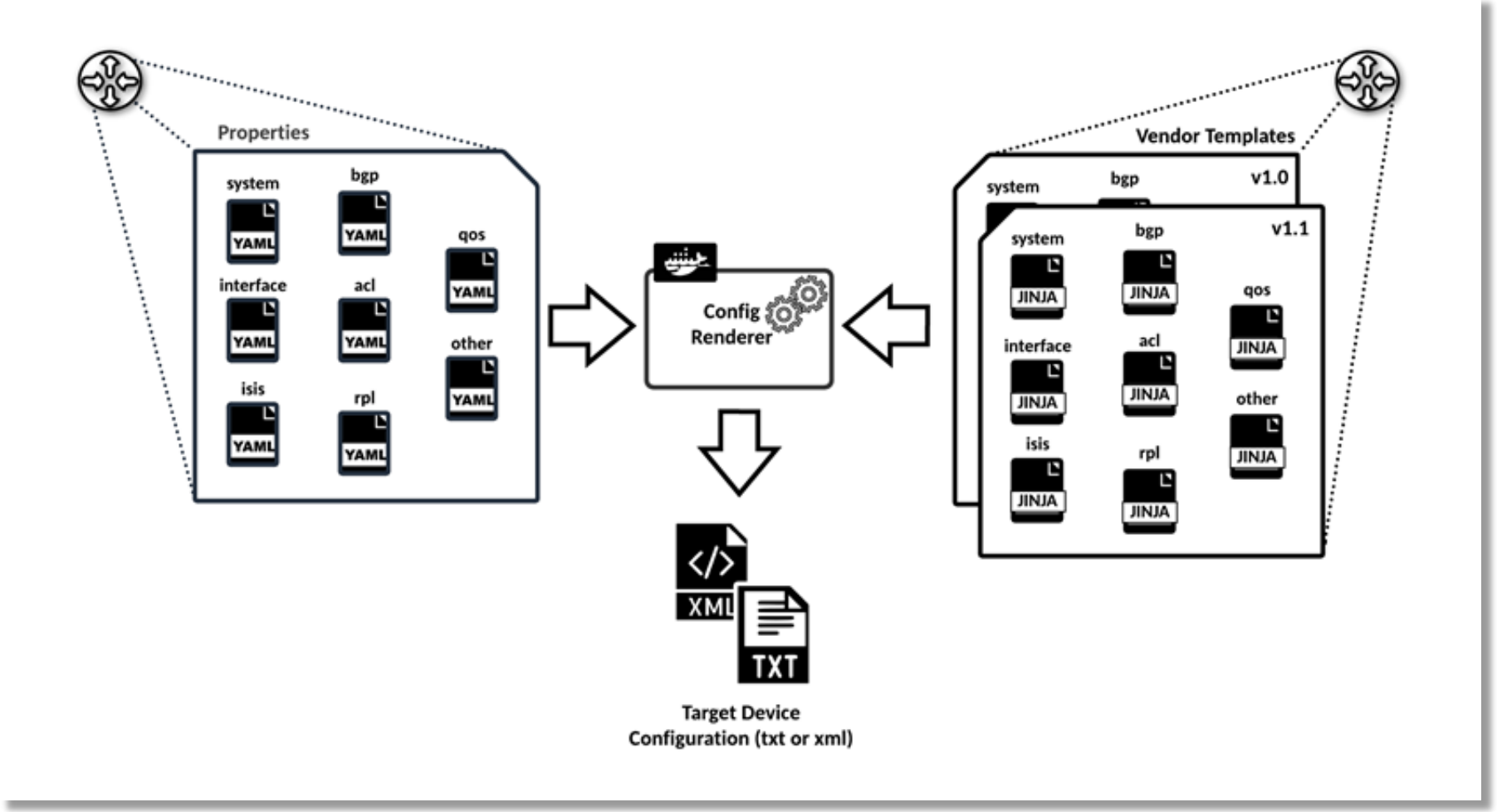
1 contributor

22 lines (19 sloc) | 465 Bytes — Raw | Blame | History

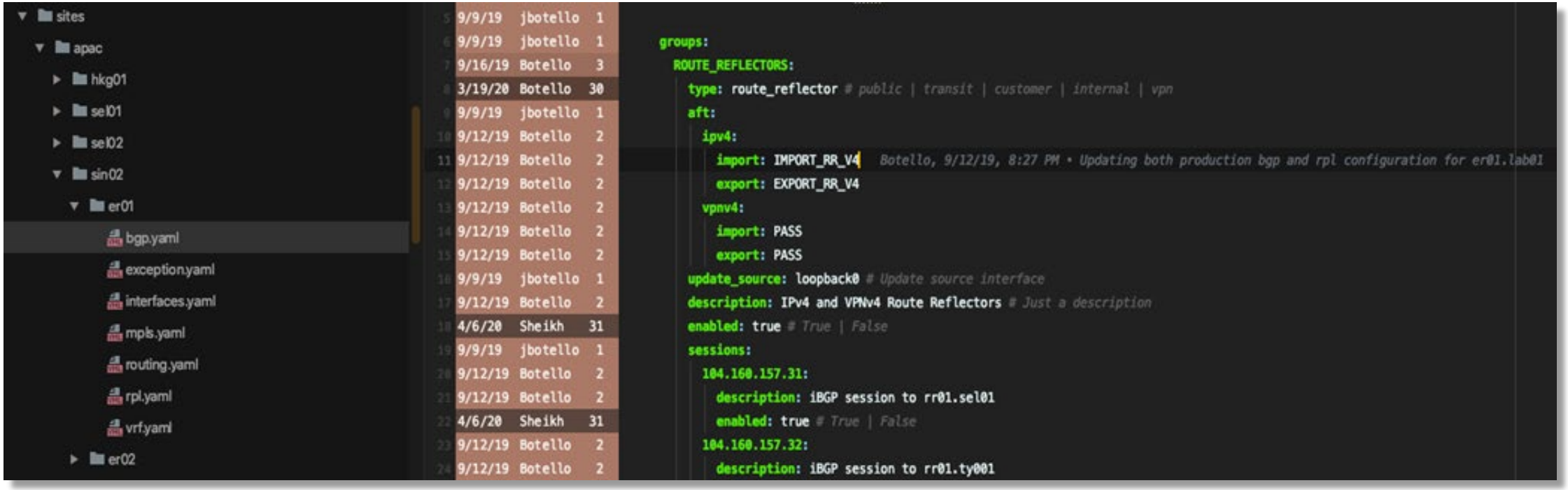
```yaml
---
global:
  asn: 6507 # Use 6507 as standard design

isis:
  net: 49.0001.0010.0012.5510.00 # ex. 49.0001.1921.6825.4001.00
  interfaces:
    Loopback0: # ex. Loopback0
      passive: True # True | False
      type: p2p # ex. p2p
    Loopback100:
      passive: True
      type: p2p
    GigabitEthernet0/0/0/1:
      passive: False
      type: p2p

static:
  10.0.0.0/8: # ex. 10.0.0.0/8
#    vrf: {{ vrf_name }} # ex. VPN-A
     nhop: 10.1.255.129 # ex. 10.1.1.1
```



Device Model

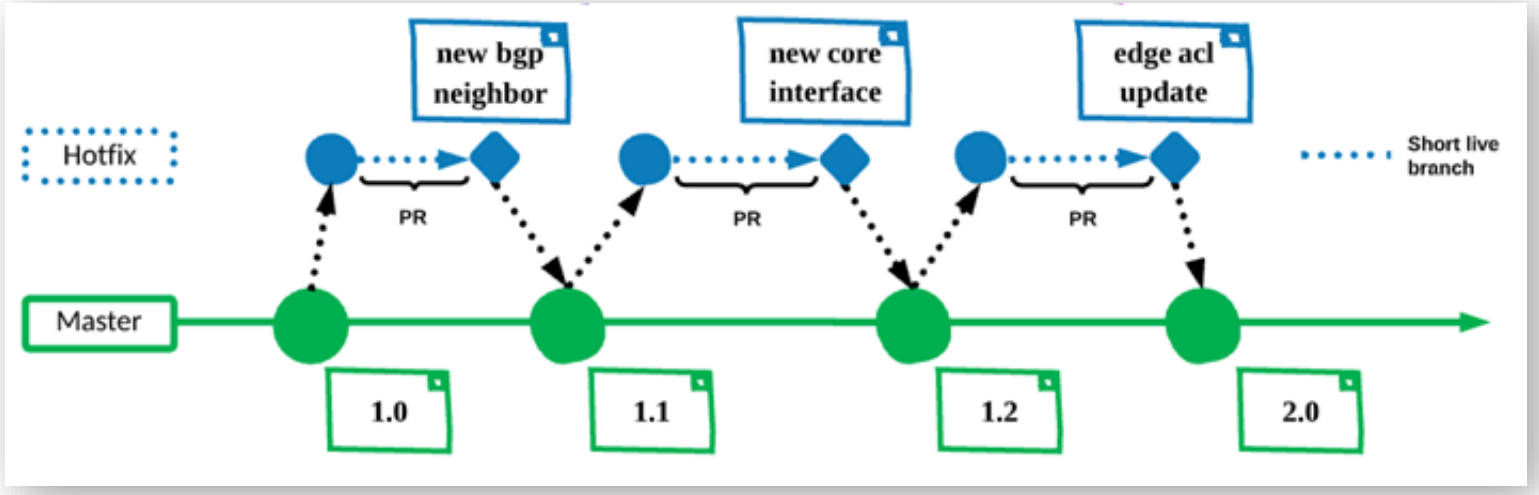


Tracking changes in 4k (HD)



How a network change looks like

Github



Hotfix - *These are short live branches with regular changes to the network infrastructure*

Master - *Reflect the production state of the network and is considered the SSoT for the network devices*

Change Network Engineer Workflow

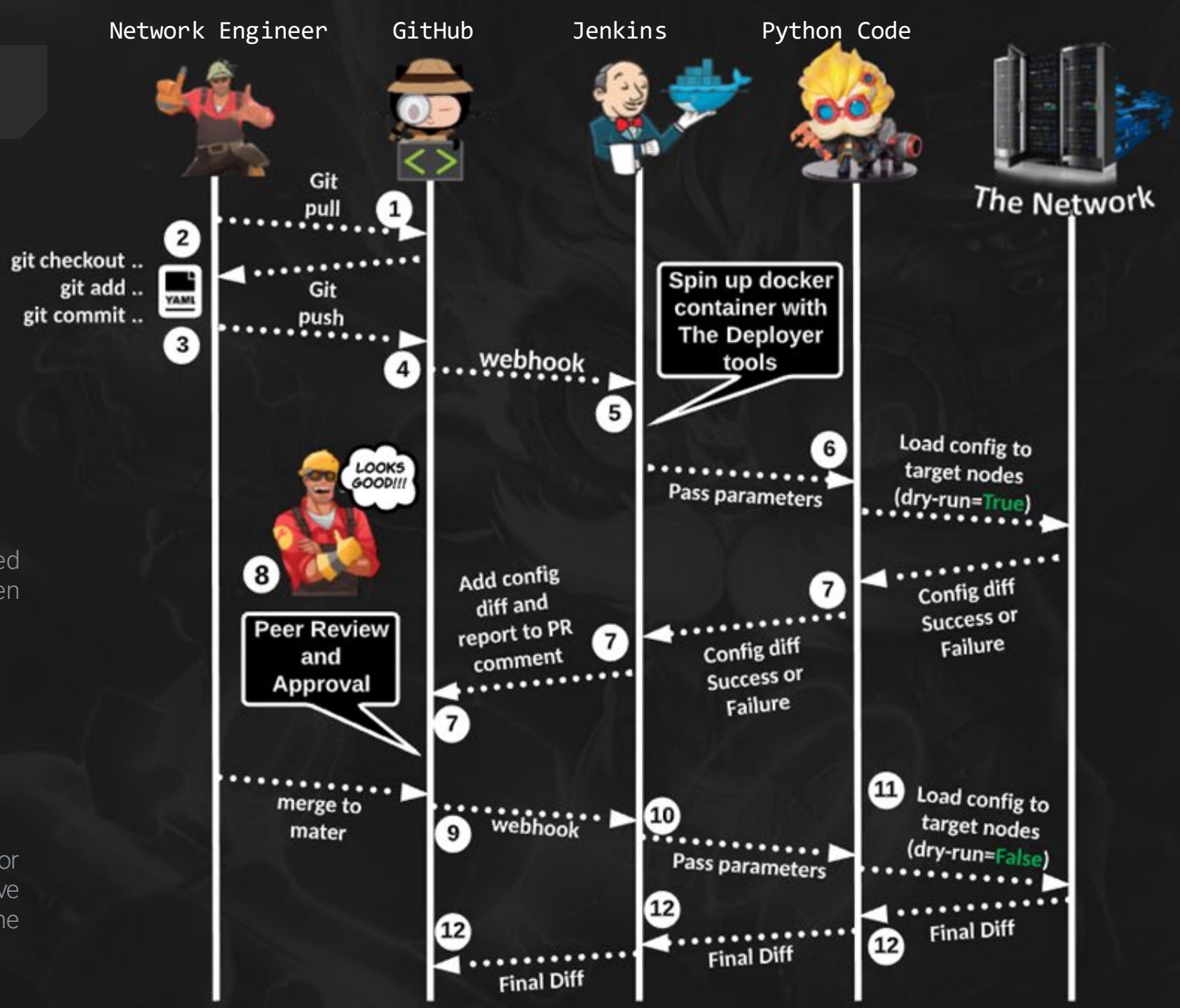
01
Config change
Make device config changes on new branch (ex. hotfix/new_change)

02
Pull Request
Open a github pull request (PR)

03
Validate
Review the change diff results provided by the device and added to the PR, then fx any issues and retest

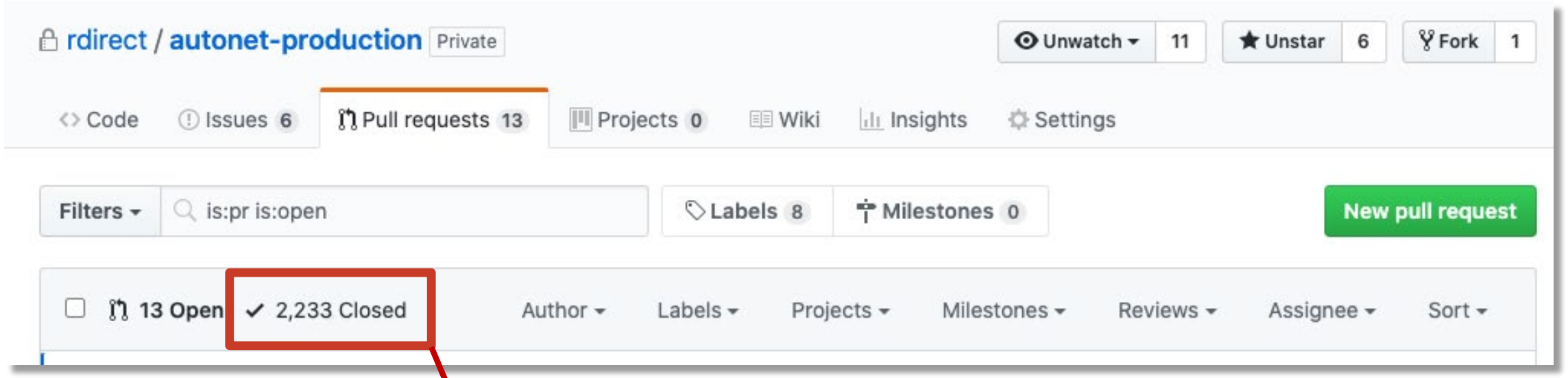
04
Peer Review
Ask for a peer review and approval

05
Merge
Comment on PR “autonet deploy this” for AutoNet to deploy changes to live network and merge the changes into the master branch



Stop!!! Demo Time

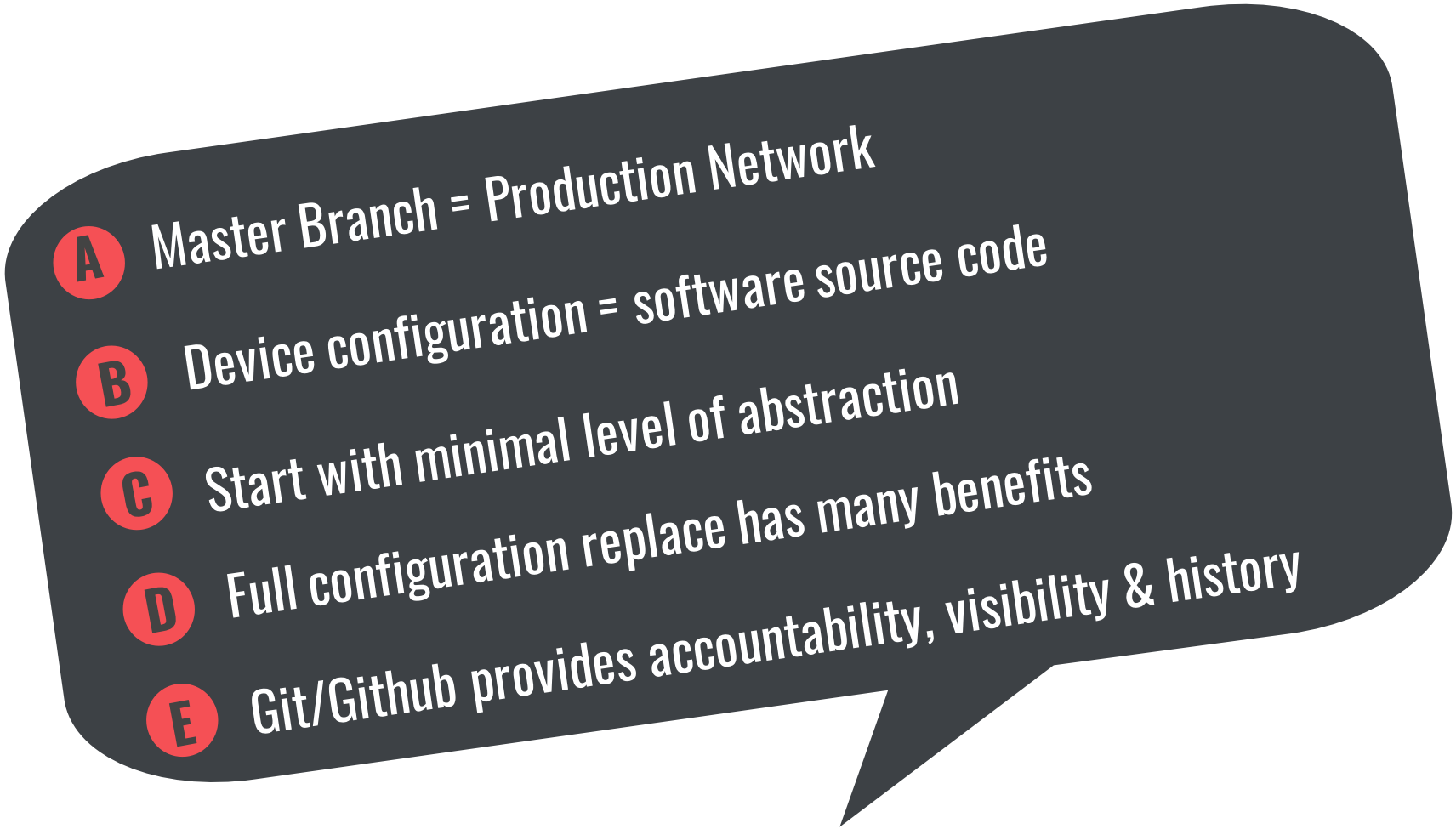
Our Production Repository



Changes to production since September 2019

What's next...

- ☑ Decouple core automation from the actual infrastructure as code definitions
- ☑ Implement network based linters (Batfish, PyATS, others?)
- ☑ End to End pipeline monitoring
- ☑ Unit Testing… More unit testing
- ☑ Hire… Team Composition


A Master Branch = Production Network
B Device configuration = software source code
C Start with minimal level of abstraction
D Full configuration replace has many benefits
E Git/Github provides accountability, visibility & history

Takeaways

Thank You

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