CUMULUS

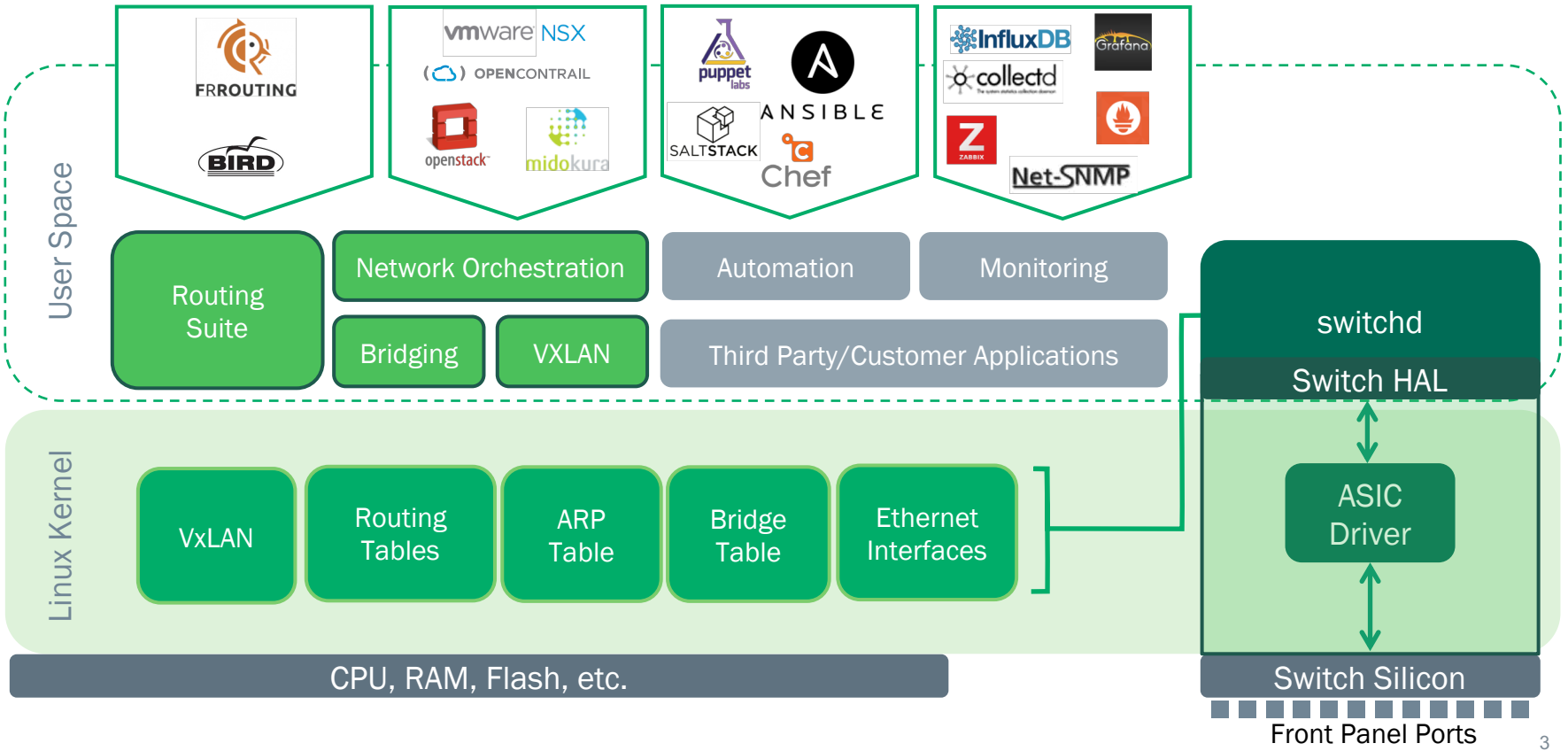
Ansible Meetup

Pete Crocker (Thanks to @packetninja)

2018-10-15

Basics

Cumulus Linux architecture
Uniform operating model – write any tools, use any apps



Cumulus Networks & Open source

Creating new technology

Open networking concept

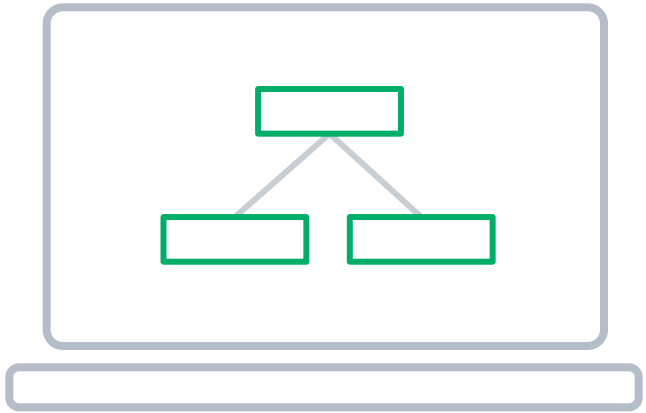
- ONIE
- APD

Linux networking development

- VRF
- Quagga / Free Range Routing
- Ifupdown2
- Iproute2

Next Generation Network Ops – Virtual Testing and Training

- Cumulus Virtual Experience (Vx)
  - Free, full featured, VM
  - <1G RAM/instance
  - Virtual copy of physical datacenter
  - Sandbox testing
  - Team Training
  - What-if planning
  - Integration with DevOps tools like Vagrant



SIMPLE RELIABLE PREDICTABLE

Network Orchestration

Software defining your network

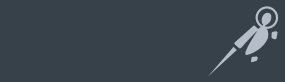
How to do Orchestration

Linux DevOps tools

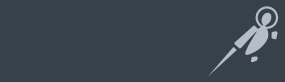
- Ansible, Puppet, Chef, Saltstack

Orchestration

- Infrastructure as code
- Telemetry data
- Continuous integration



Who recently made a network change?



Did anyone have a change without issues?

What is CI / CD

Continuous Integration (CI)

A system where all changes are automatically tested before being pushed to production or seen by others

Continuous Deployment (CD)

Built on a CI system where changes are automatically pushed to production after tests past, often multiple times per day

Why aren't you doing this?

Not for everyone

Infrastructure as Code
Build tools

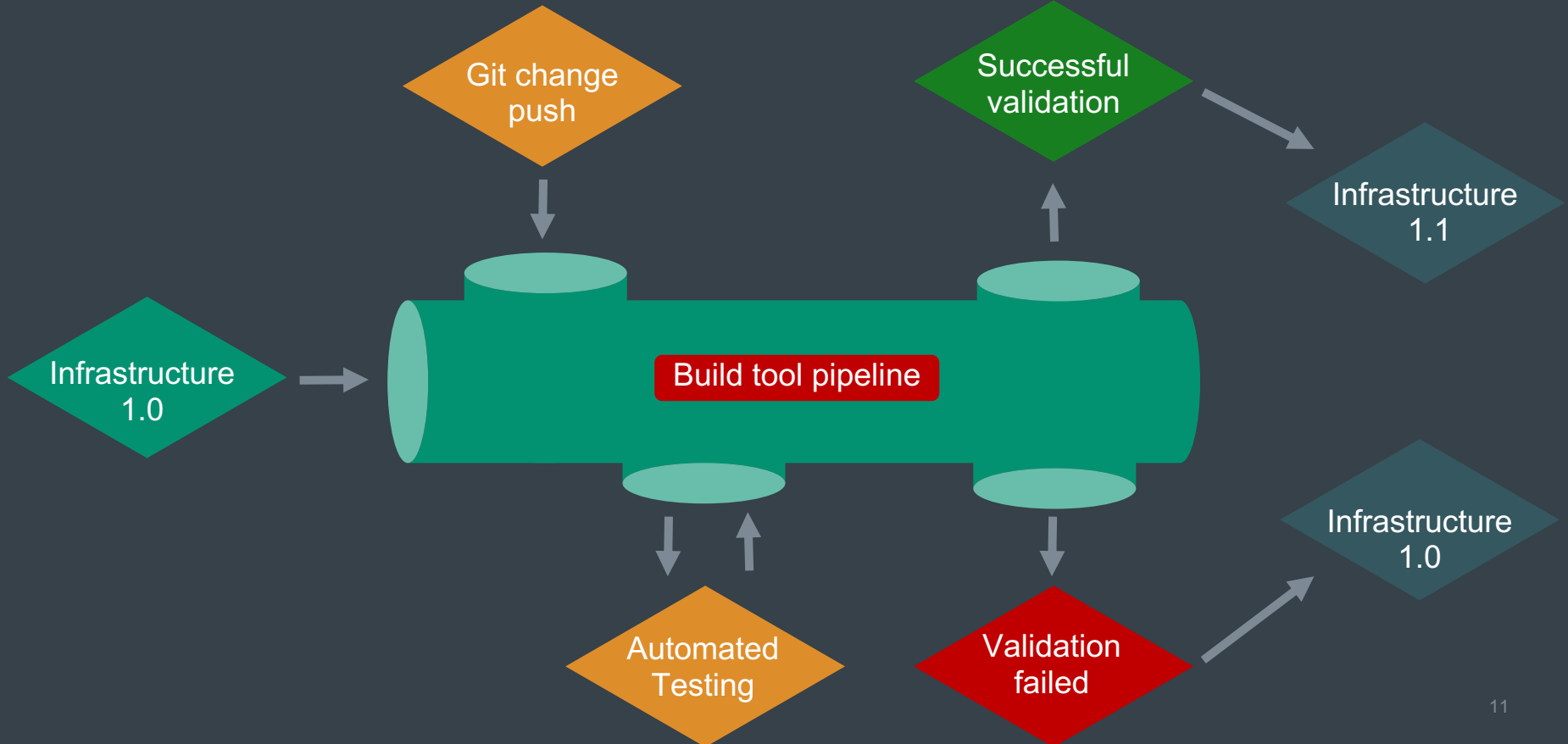
Implementing CI/CD

Build Tool?
- The digital duct tape

Common Tools
- Gitlab
- Jenkins
- Travis CI
- Atlassian Bamboo

Infrastructure as Code

Pipeline



Automated testing
Testing infrastructure

Traditional networking

Testing environment
- Physical lab
- Virtualization environment?

DevOps integration?
- Proprietary modules
- Vendor tools

Infrastructure validation
- Vendor APIs?

Cumulus Linux

Testing environment
- Physical lab or
- Cumulus VX

DevOps integration!
- Native modules
- Vagrant, Virtualbox, Libvirt

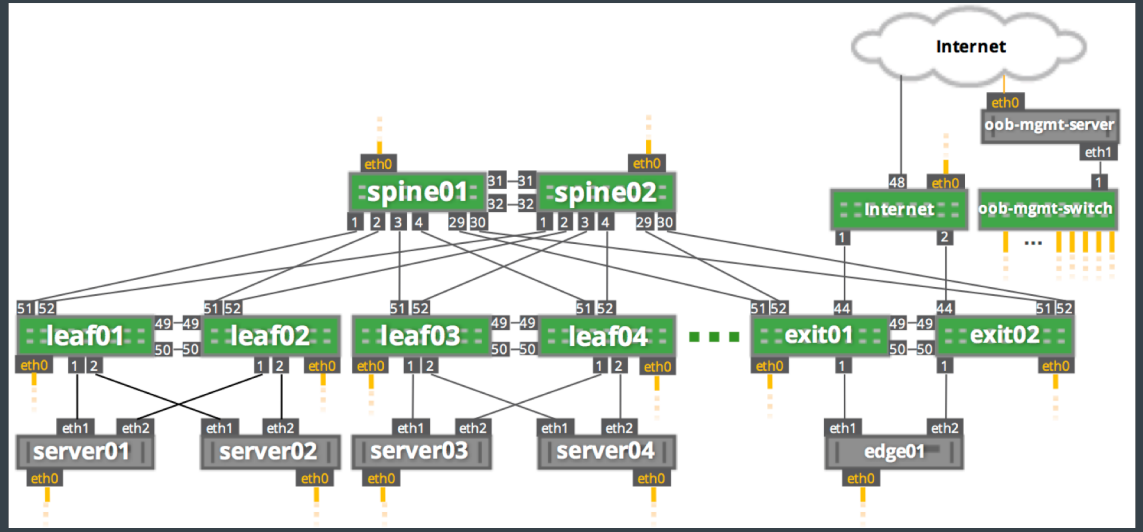
Infrastructure validation
- Home grown tools (Python, etc.)
- Stackstorm
- Cumulus NetQ

Automated testing
Cumulus VX

Linux network virtualization

Cumulus VX
- Linux networking
- Familiarizing

Copying production
- Virtualbox, VMware, Libvirt
- Vagrant
- Topology Generator



Automated testing
Validation

Linting tests

Code validation
- Test Yaml / Jinja
- Enforce a style
- Easy troubleshooting

```
./.gitlab-ci.yml
  6:4       error    wrong indentation: expected 2 but found 3  (indentation)
  10:4      error    wrong indentation: expected 2 but found 3  (indentation)
  12:7      error    wrong indentation: expected 5 but found 6  (indentation)
  15:4      error    wrong indentation: expected 2 but found 3  (indentation)
  17:7      error    wrong indentation: expected 5 but found 6  (indentation)
  20:1      error    too many blank lines (1 > 0)  (empty-lines)
```

Unit and System tests

Validating the infrastructure
- Unit tests are limited
- Combining Unit and System tests

Testing multiple verticals
- Does my BGP session work?
- Are routes being learned?

AND

- Is my application redundant?
- Does my application still work?

Automated testing
NetQ Agent

NetQ Agent

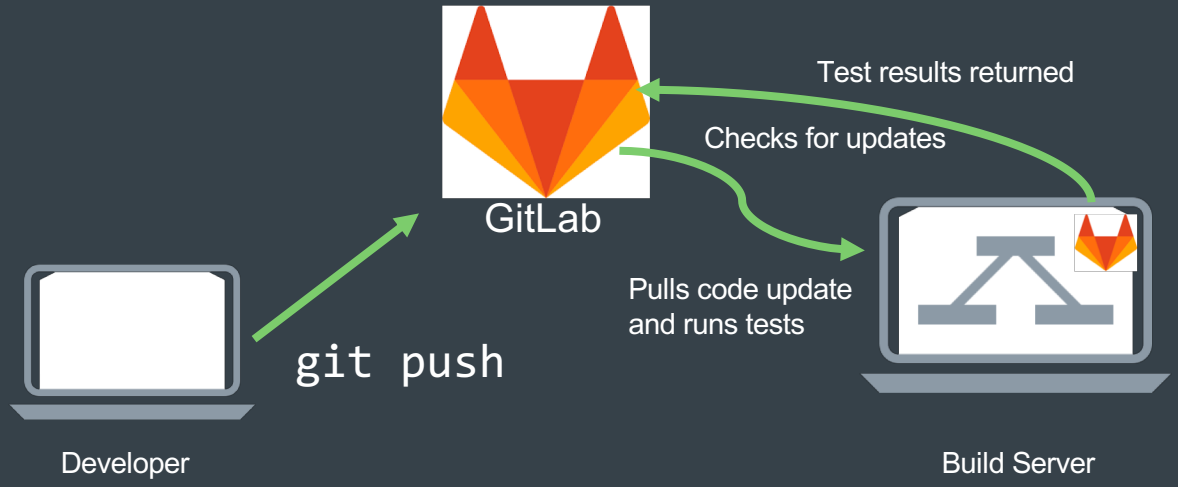
Subscribes to Linux Kernel Events
- Interface State
- MTU
- Routes learned
- Macs learned
- (M)LAG state

Polls routing Information
- OSPF, PIM, BGP, EVPN
- Neighbor state
- Error conditions

Automated testing

Fabric state testing over time

Automated testing
Gitlab testing



Automated testing
Gitlab testing

Gitlab Pipeline

Stages, before_script, after_script
- Stages run in order on success
- *_script run at each stage

Script defines testing steps
- Git repository is cloned on build server
- Each script step is run in environment
- If step fails, validation fails
- Simple bash scripts can be added

Before/After stages for setup / cleanup
- vagrant up / vagrant destroy -f

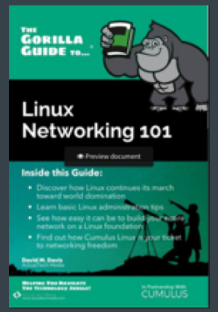
```
stages:
  - staging
  - production

staging:
  tags:
    - staging
  before_script:
    - cd automation
  stage: staging
  script:
    - 'ansible-playbook deploy.yml'
    - sleep 25
    - netq check bgp
    - netq check mtu
    - netq check vxlan

production:
  tags:
    - production
  before_script:
    - cd automation
  stage: production
  when: manual
  script:
    - 'ansible-playbook deploy.yml'
    - sleep 10
    - netq check bgp
```

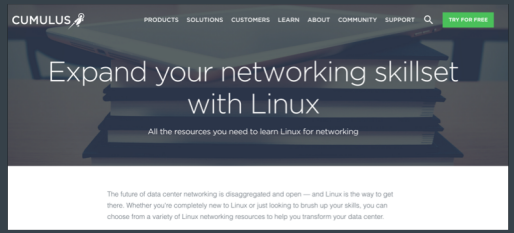
CI/CD Demo

Join the Linux Networking Revolution



Linux 101 eBook

Linux Networking Guides



Linux Resource Center

www.cumulusnetworks.com/lp/linux-networking-resources/

QUESTIONS?

Join the Cumulus Networks Community!

Get involved in the conversation:

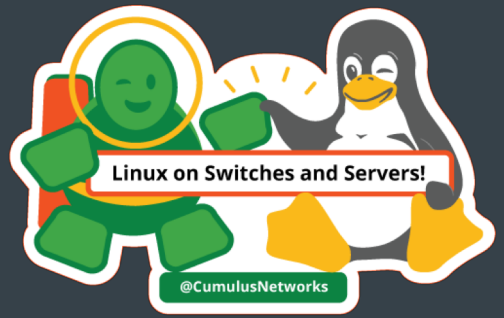
- Join the community & share your Cumulus Linux tips and experiences: https://getsatisfaction.cumulusnetworks.com/cumulus
- Chat with others on our Slack channel: https://cumulusnetworks.slack.com/
- Keep on learning: https://community.cumulusnetworks.com

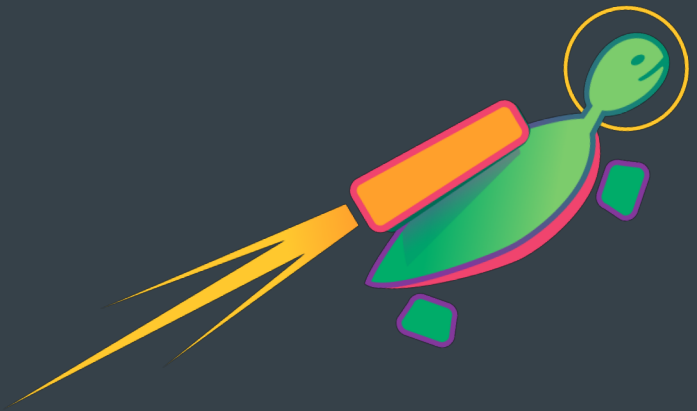
Download Cumulus VX to work on proofs of concept, test your automation and continue practicing:

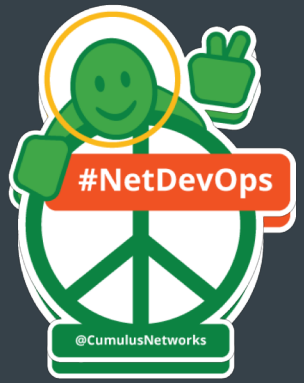
- https://cumulusnetworks.com/cumulus-vx/

Learn at your own pace with demos using our reference topology:

- https://github.com/CumulusNetworks/cldemo-vagrant
- https://cumulusnetworks.com/products/cumulus-in-the-cloud/


Linux on Switches and Servers!
@CumulusNetworks




#NetDevOps
@CumulusNetworks

Thank you!