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A journey to SDN

Ulf Fischer

Me

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My name is Ulf Fischer.
I‘m Network Engineer since more than 20 years.

Worked at different ISP‘s in Hamburg.
POP - (now Pop Interactive),
Hansenet - (now Telefonica),
broadnet mediascape - (now QSC),
Easynet - (now GTT),
Nexinto - (now Plusserver),
IPHH - (still IPHH),
and did consulting for several other Companies.

Now working at Kuehne+Nagel and responsible for the Global Datacenter Networks.

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Agenda

- How did this all start?
- The vendor game
- The Challenge
- Eve-ng / Ansible / DEV Network
- Pipeline
- DEMO
- Networkers toolset changed
- Q&A

How did this all start?

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Split SDN into two parts

1. Underlay – Hardware Routers / Switches including OS

2. Overlay – Software on top of the Underlay – the real SDN

There was a preselection regarding Hardware Vendors

The vendor game

Underlay	Overlay
Cisco / Nexus 9k	ACI
Nokia	Nuage
Juniper	Contrail
Mellanox / Cumulus	NSX-T

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What we choose:

- VMware NSX-T (Overlay)
- Mellanox – 2700 spine, 2100 leaf, 2400 low speed leaf
- EdgeCore for Management
- Mellanox and EdgeCore run on Cumulus Linux (Underlay)

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The challenge

- 4 Weeks to get the Underlay up and running incl. config
- Challenge accepted

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Ansible, GIT, DEV Network

- Revision and audit save – Code in Git (bitbucket)
- Infrastructure as Code (IaC)
- Ansible
- Cumulus VX, DEV Network

eve-ng

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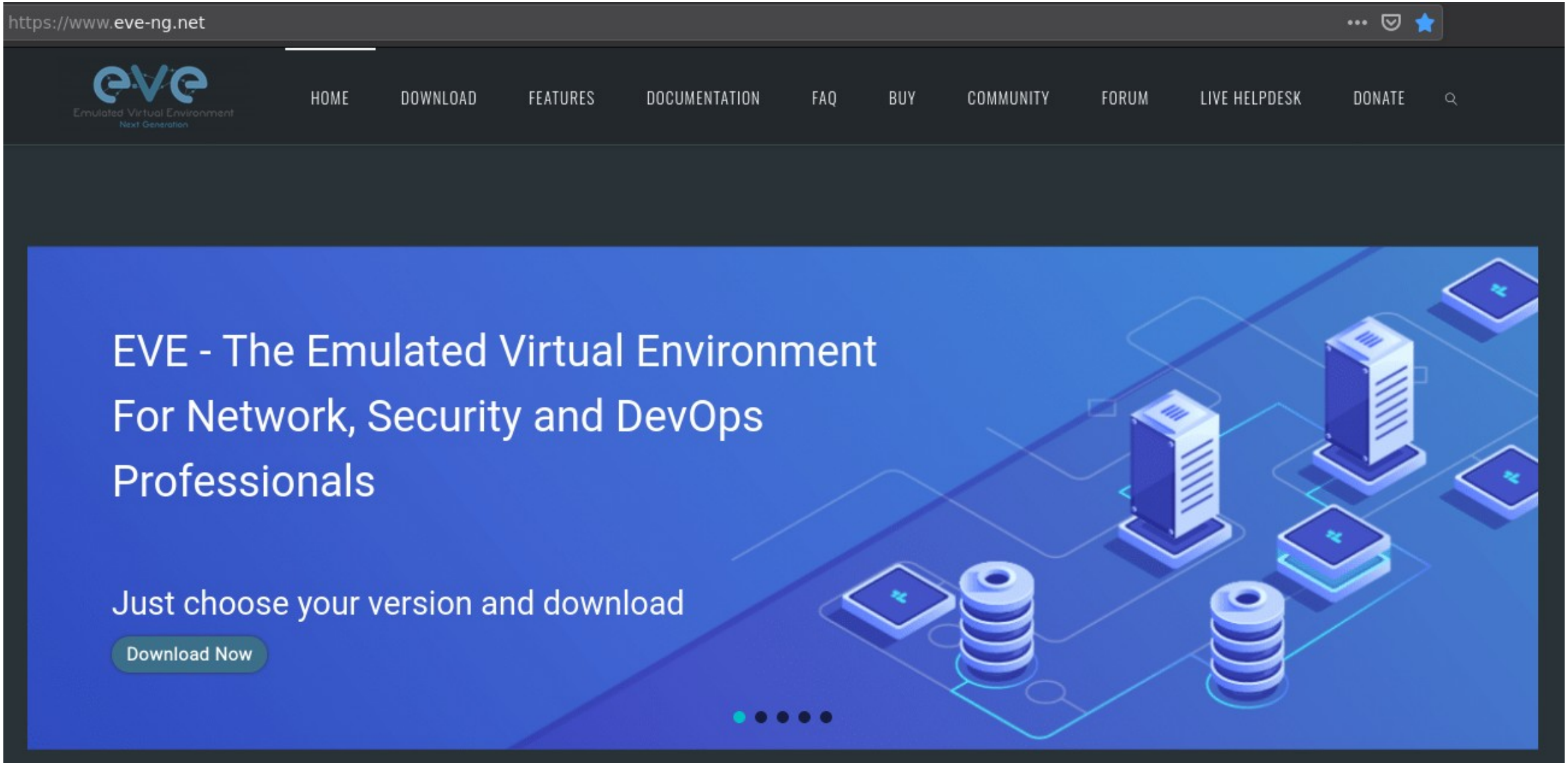

DEV Network

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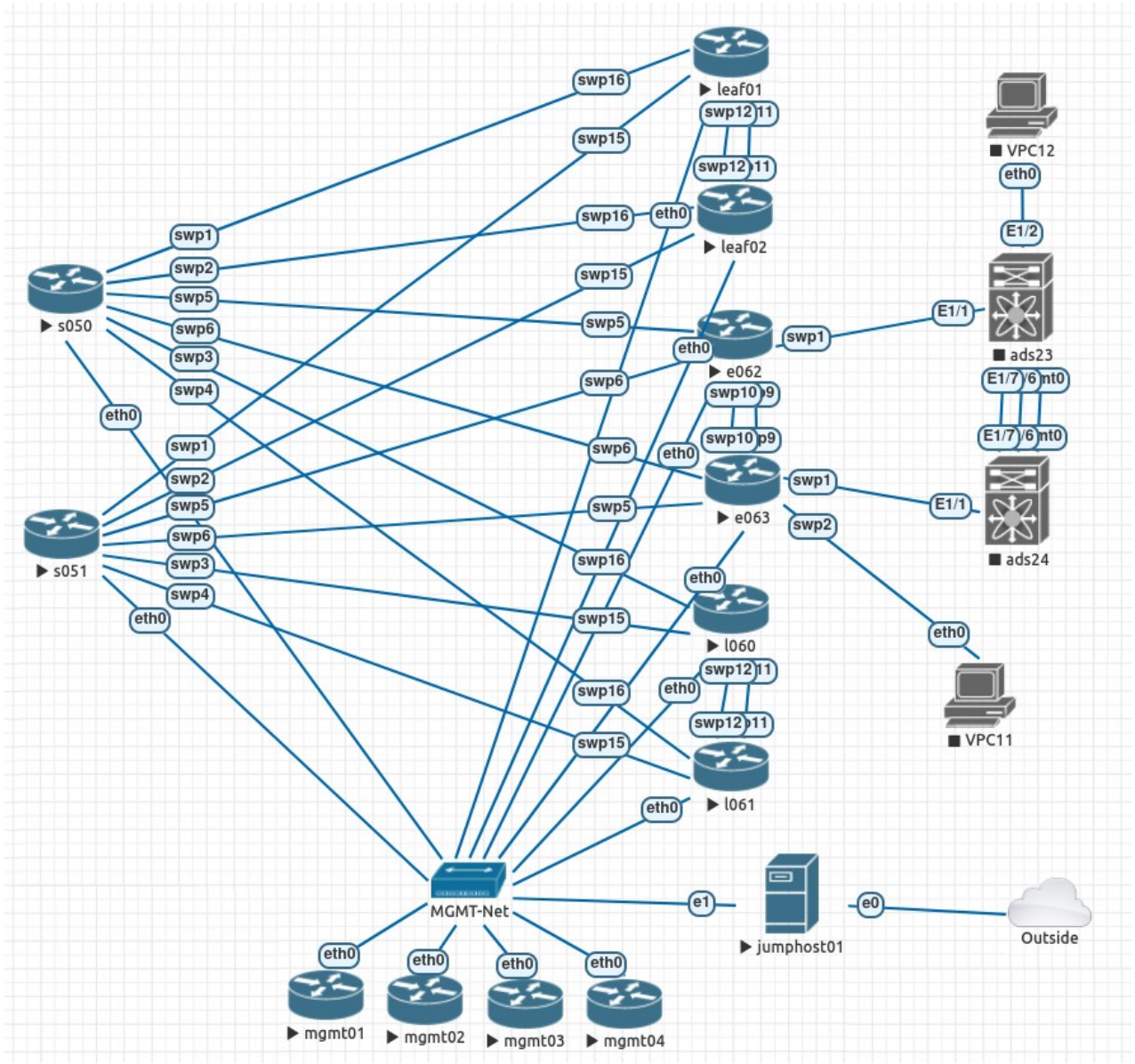

Ansible roles

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```
[ufischer@localhost cumulus-conf (master)]$ ls -l roles
total 92
drwxr-xr-x. 4 ufischer ufischer 4096 18. Jun 15:36 acl
drwxr-xr-x. 3 ufischer ufischer 4096 18. Jun 15:36 ansible_state
drwxr-xr-x. 4 ufischer ufischer 4096 18. Jun 15:36 apps
drwxr-xr-x. 4 ufischer ufischer 4096 18. Jun 15:36 apps_configs
drwxr-xr-x. 3 ufischer ufischer 4096 18. Jun 15:36 backup
drwxr-xr-x. 3 ufischer ufischer 4096 18. Jun 15:36 common
drwxr-xr-x. 4 ufischer ufischer 4096 18. Jun 15:36 dns
drwxr-xr-x. 5 ufischer ufischer 4096 18. Jun 15:36 frr
drwxr-xr-x. 4 ufischer ufischer 4096 18. Jun 15:36 hostname
drwxr-xr-x. 3 ufischer ufischer 4096 18. Jun 15:36 hosts
drwxr-xr-x. 5 ufischer ufischer 4096 18. Jun 15:36 interfaces
drwxr-xr-x. 4 ufischer ufischer 4096 18. Jun 15:36 kn_proxy
drwxr-xr-x. 5 ufischer ufischer 4096 18. Jun 15:36 license
drwxr-xr-x. 4 ufischer ufischer 4096 18. Jun 15:36 motd
drwxr-xr-x. 4 ufischer ufischer 4096 18. Jun 15:36 netd
drwxr-xr-x. 5 ufischer ufischer 4096 18. Jun 15:36 netdata
drwxr-xr-x. 5 ufischer ufischer 4096 18. Jun 15:36 ports
drwxr-xr-x. 5 ufischer ufischer 4096 18. Jun 15:36 ptm
drwxr-xr-x. 5 ufischer ufischer 4096 18. Jun 15:36 snmp
drwxr-xr-x. 5 ufischer ufischer 4096 18. Jun 15:36 ssh
drwxr-xr-x. 5 ufischer ufischer 4096 18. Jun 15:36 syslog
drwxr-xr-x. 5 ufischer ufischer 4096 18. Jun 15:36 time
drwxr-xr-x. 3 ufischer ufischer 4096 18. Jun 15:36 users
[ufischer@localhost cumulus-conf (master)]$
```

Manual ansible run

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```
[ufischer@jumphost01 cumulus-demo (master ✗)]$ ansible-playbook -i inventories/demo playbooks/initial_setup.yml -t interfaces

PLAY [everything] ***************************************************************************************************

TASK [Gathering Facts] **********************************************************************************************
ok: [l060]
ok: [leaf02]
ok: [s051]
ok: [s050]
ok: [mgmt01]
ok: [leaf01]
ok: [l061]
```

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What is a pipeline?

- With automation you get cool stuff.
- Automatic configuration changes on a bunch of devices in short time.

- With automation you get drawbacks.
- Automatic configuration changes on a bunch of devices in short time.

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Stages

- DEV (or TEST) - Syntax checks, if the change works
- QA (or Staging) - Load or stress tests, quality tests
- LIVE (or Prod) - Now it‘s Live.

Pipeline / Jenkins

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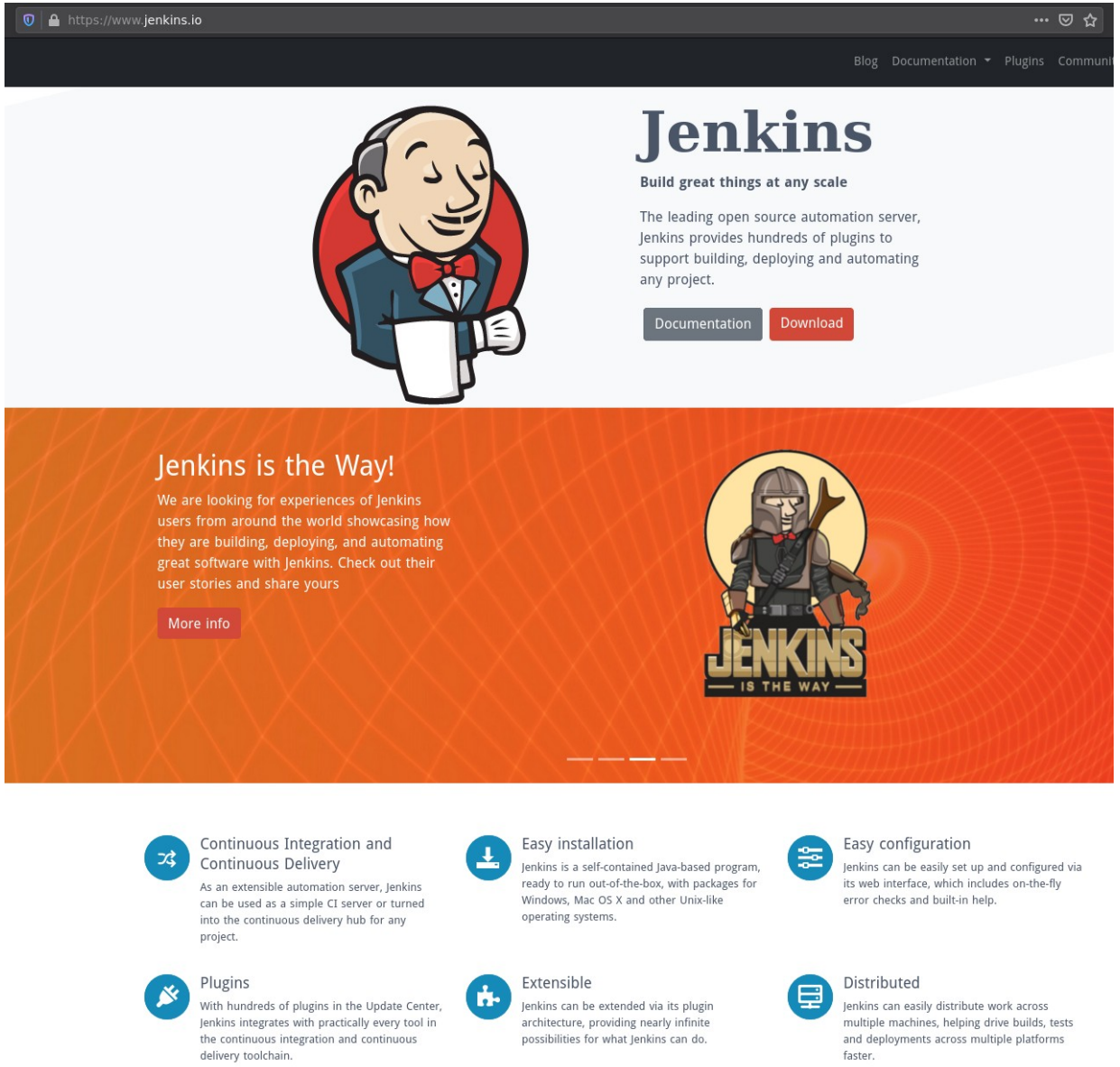

Pipeline / GoCD

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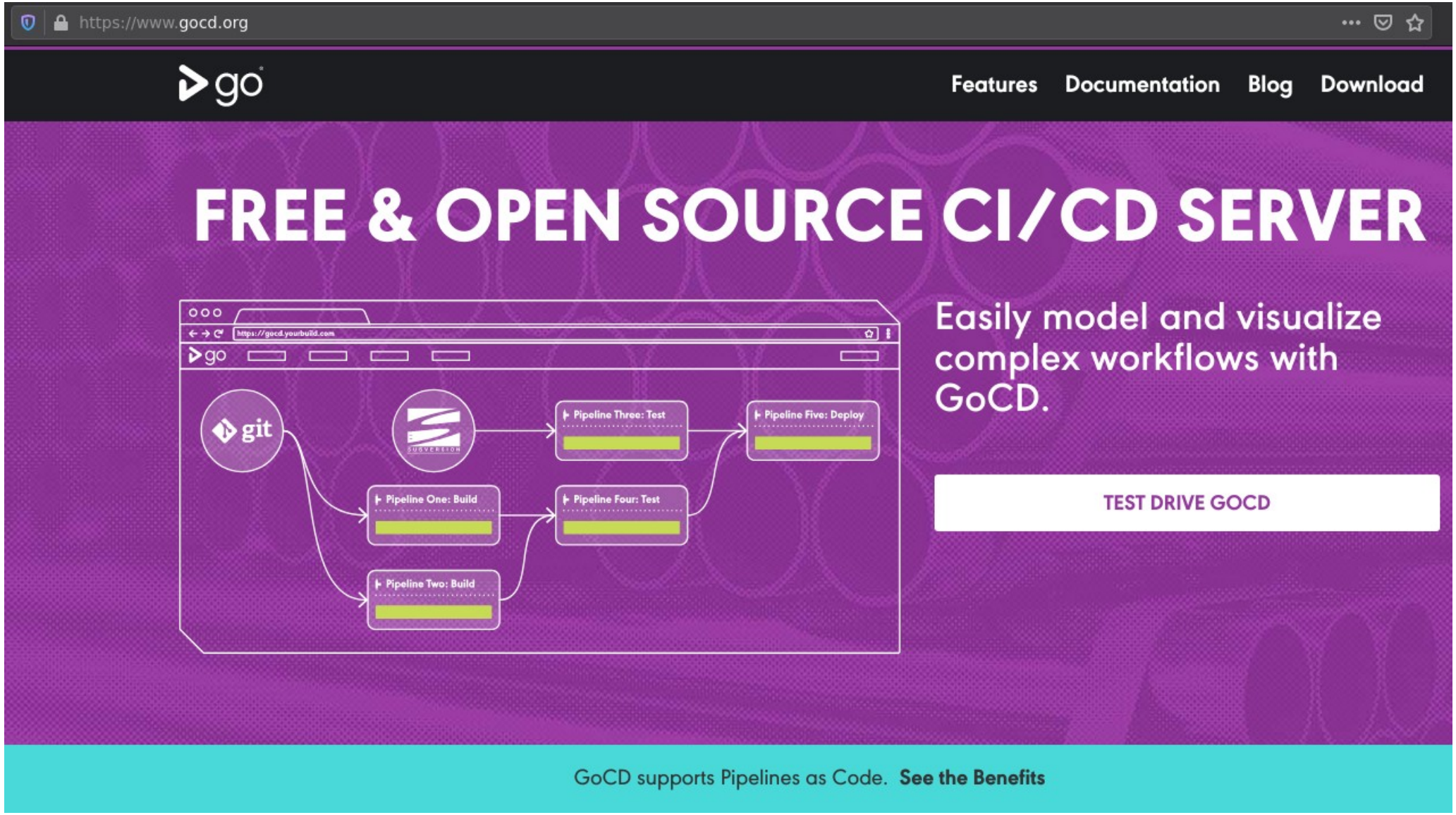

Pipeline / Value Stream Map

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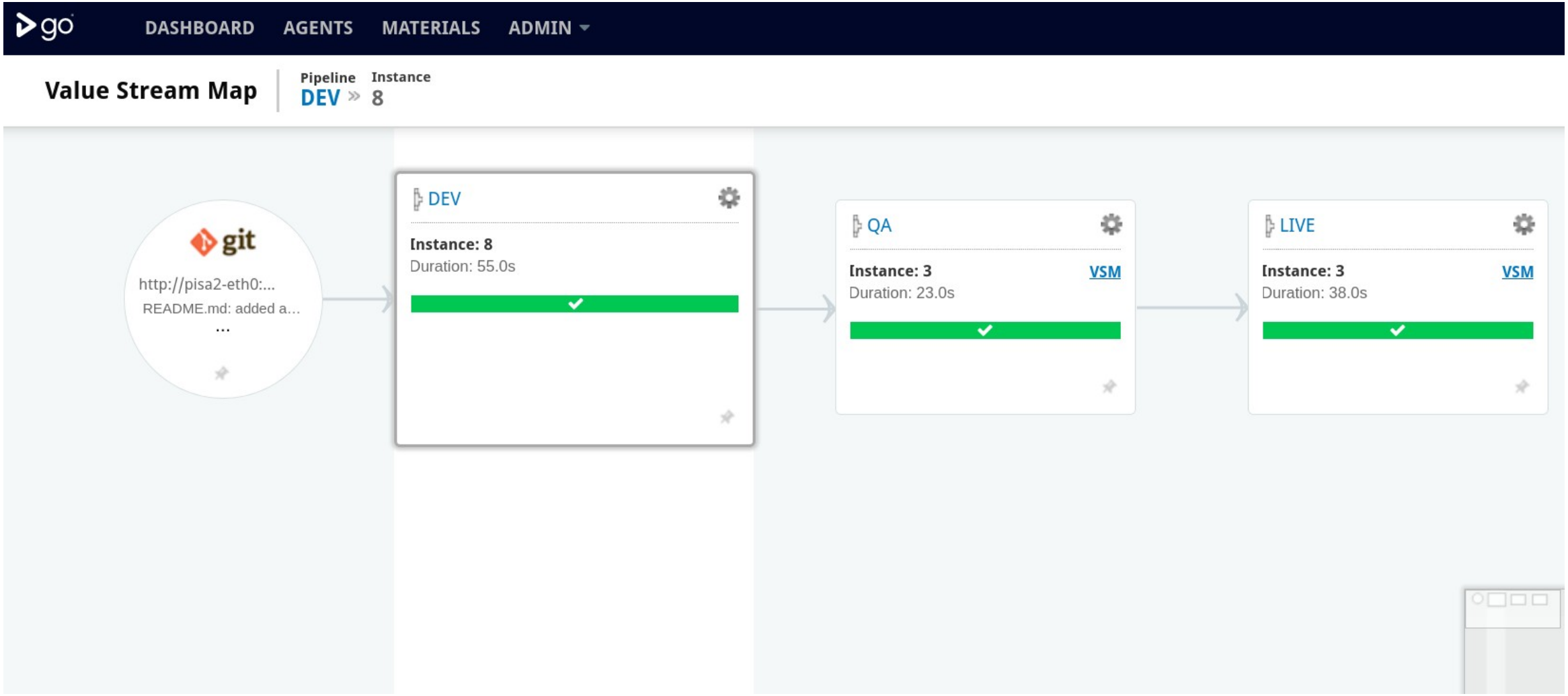

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How do we do configuration changes?

No ssh / putty – conf t anymore.
Not edit any script and run it.

Clone the repository (or pull if you have it already).
Edit the code / configuration.
Commit and push the change back to the repository. Done.

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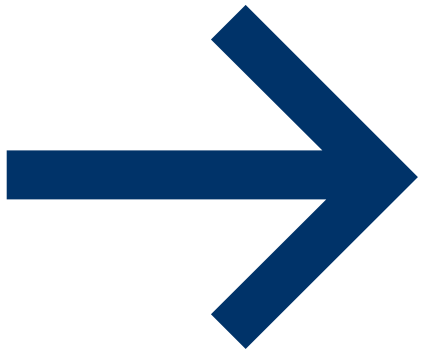

DEMO

Evolution of Networkers toolset

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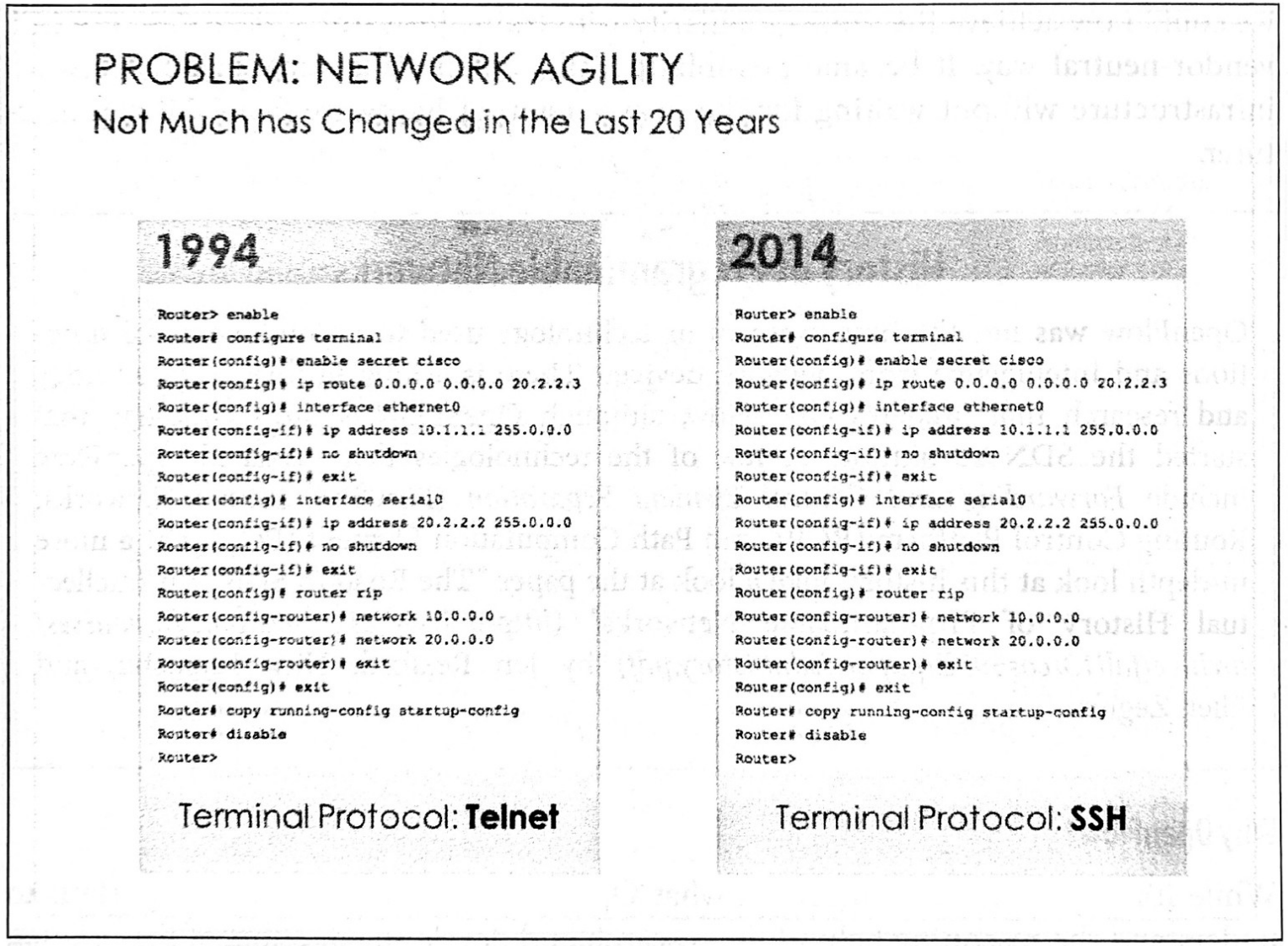

Figure 1-2. What's changed? From Telnet to SSH (source: Big Switch Networks)

2020

vi configfile
git add / git commit
git push

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Networkers toolset changed

- Shell / Commandline – vi and git

- „Git for Windows“ – https://git-scm.com
- Atom – https://atom.io (shortcut „Ctrl-Shift P“)
- Visual Studio Code (VSCode)

Networkers toolset changed / Atom Editor

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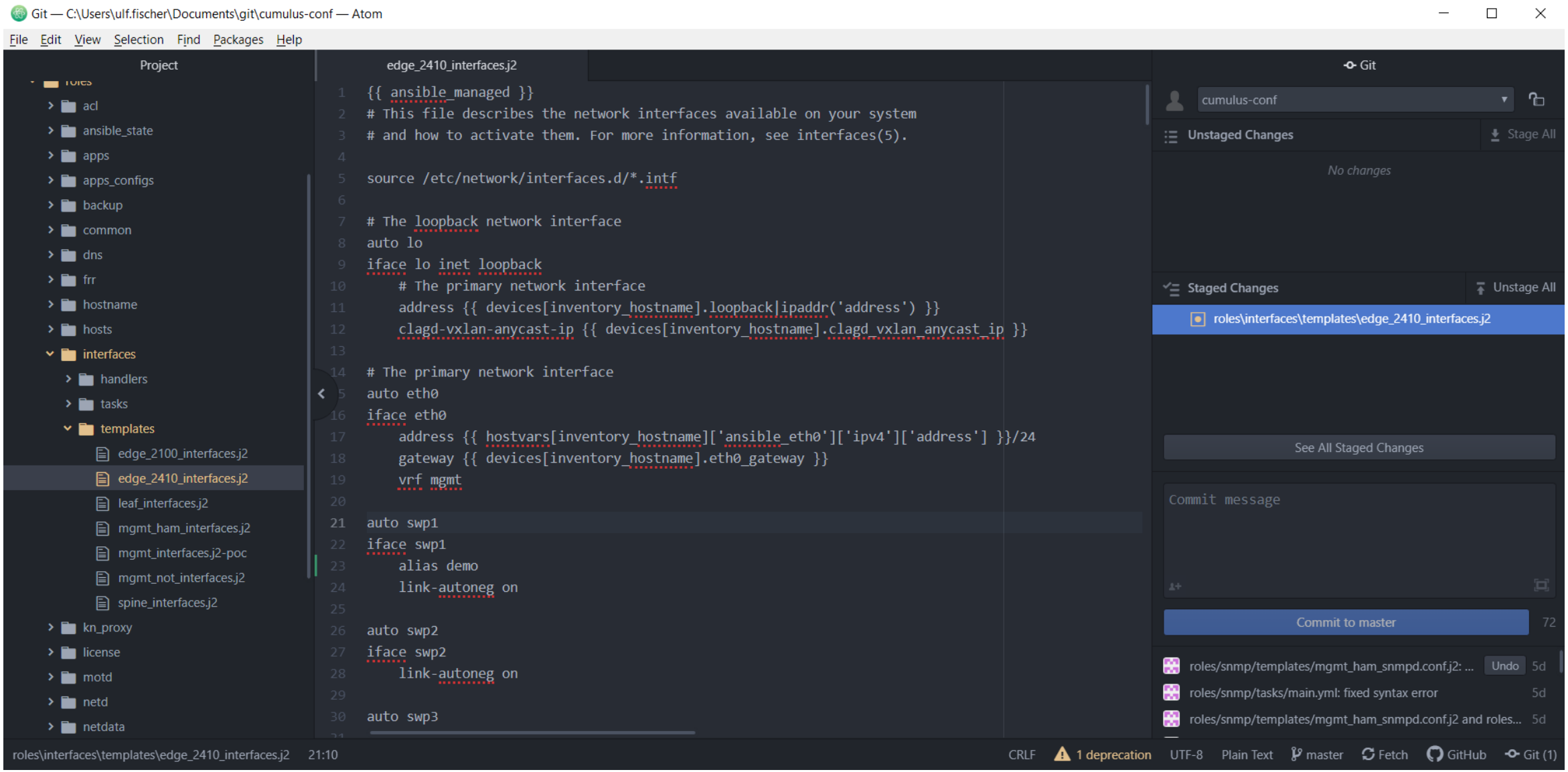

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Finally

- We won the challenge
- SDN Underlay was ready in time
- NSX-T (Overlay) installation was successful

Q&A

Inspire. Empower. Deliver.

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