SURF NLT1 datacenter infrastructure

1. Networking tech we use
2. Topology
3. Configuration management and integration
4. 400G pilot

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Networking tech in use

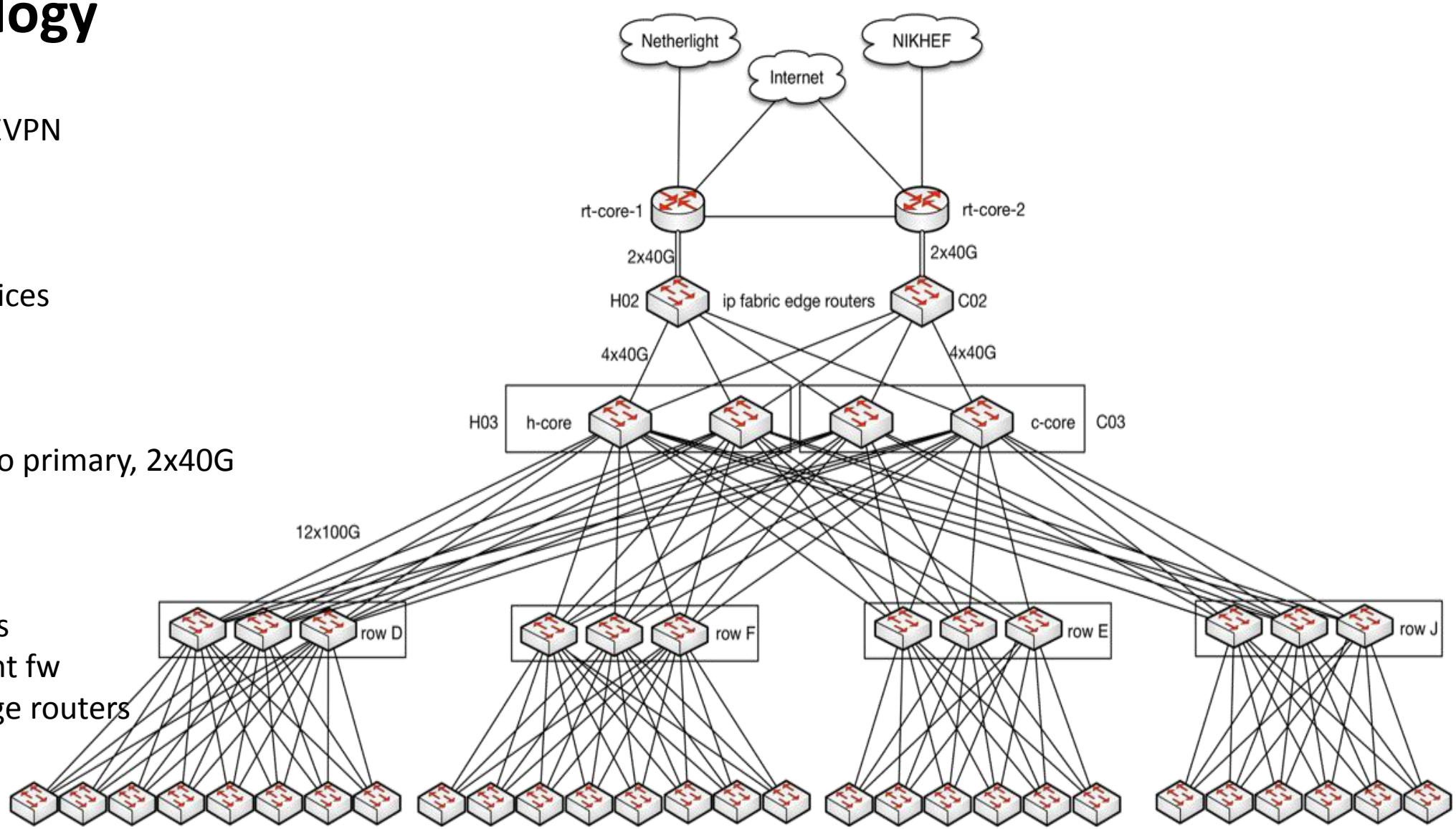
1. NOS: Cumulus Linux running BGP-EVPN overlay
2. NVIDIA/Mellanox Spectrum 1 (100G platform) series SN2100/SN2700
3. Ansible for deployment

EVPN topology

Controlplane: BGP-EVPN
Datalane: VXLAN

Facts:

- 101 network devices
- IPv4 + IPv6
- 6 rows
- 77 vlans
- 2 x 100G uplink to primary, 2x40G to secondary
- 67 gateways
- 900 ACL rules
- 7916 mAC entries
- Fortigate Segment fw connected to edge routers

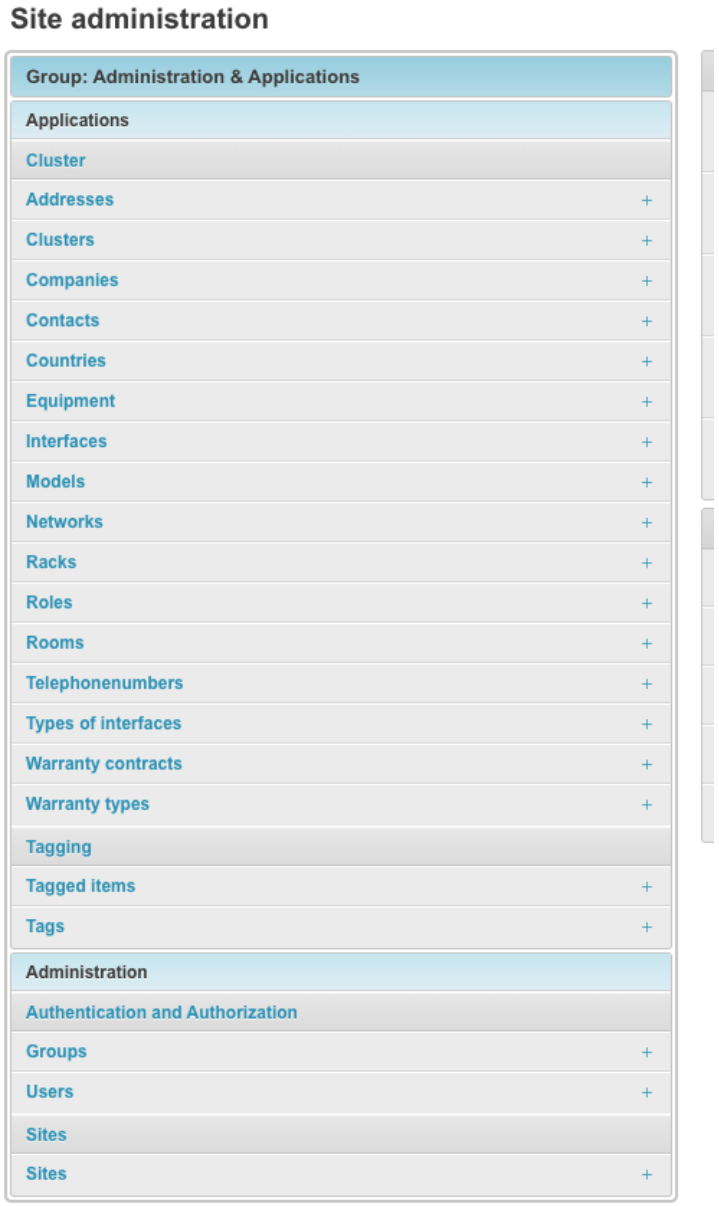


Configuration management

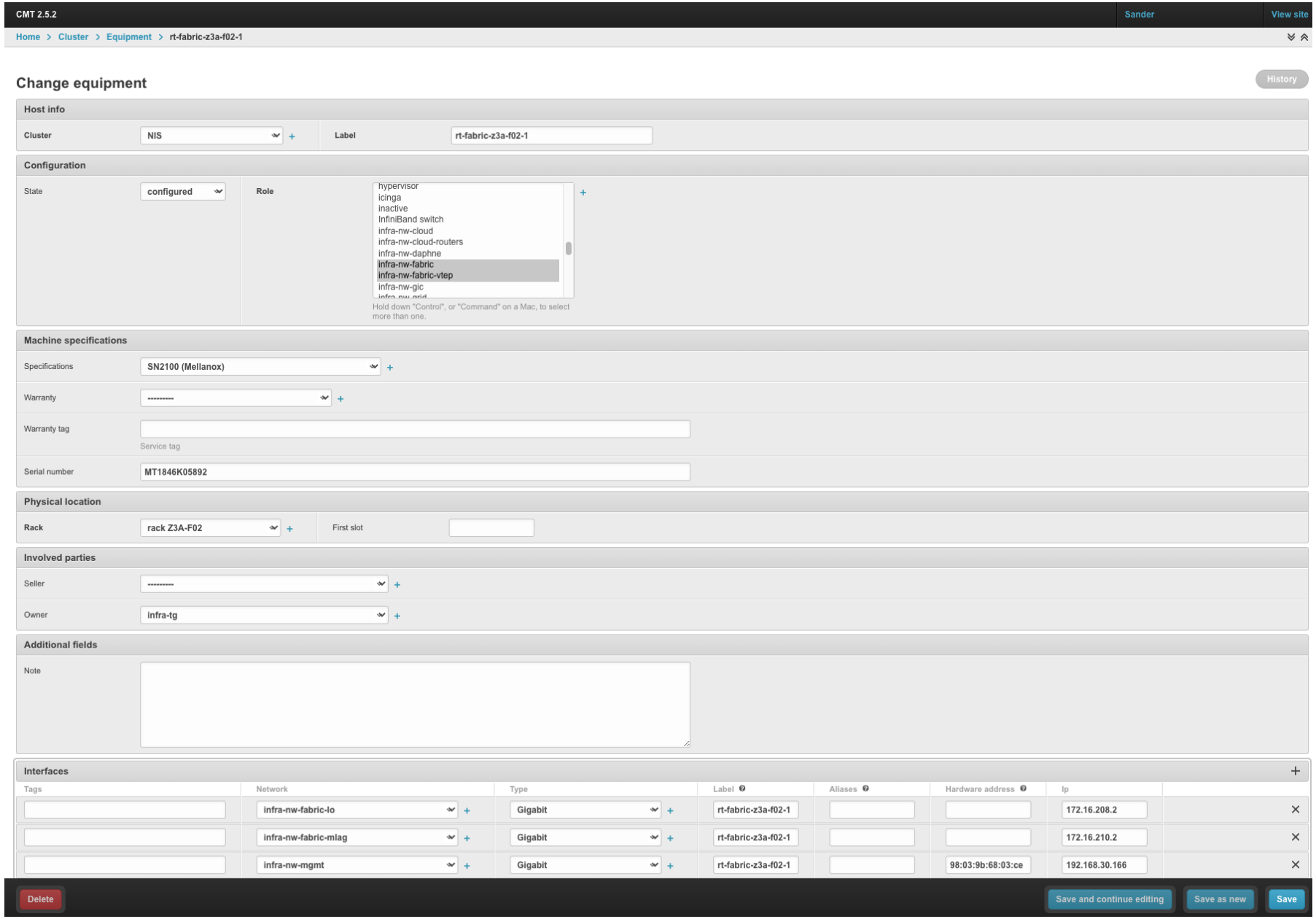
Tools we use

- CMT
  - switch loopback address
  - switch mgmt interface ip
  - switch mlag ip
  - host vlan profile
  - Source for DHCP/DNS config
- Patchmanager
  - How everything is connected
- Gitlab
  - Network config state
  - ASN’s
  - Vlan profiles
- Ansible
  - Push config to devices
- Python
  - Pull data from various sources to generate config

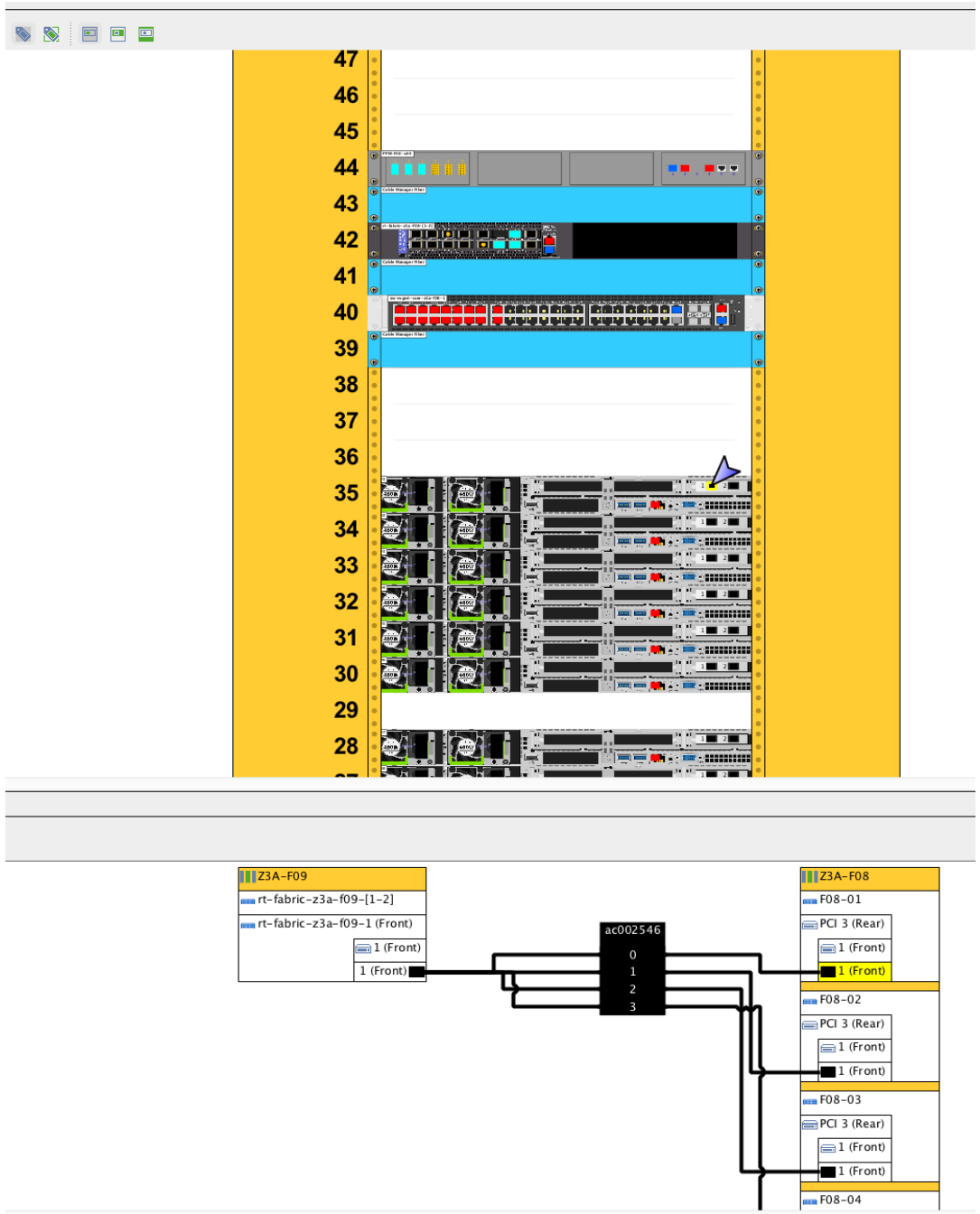
CMT overview



CMT equipment



Patchmanager



GIT

INTERFACE PROFILES
REFERENCED IN CMT

interface_profiles.yml 1.96 KB

```yaml
---

# The interface profile names must be unique with characters matching
# the following regular expression: [a-z][a-z0-9_]+
# To make the interface profile names unique and to derive ownership,
# each interface profile name should contain a prefix indicating the
# name of the cluster or admin group (e.g. 'ods', 'daphne' ...)
# To ease the administration it is advised to group the interface profiles
# with the same prefix together with a comment on top.

interface_profiles:
  #
  # Apollo Production Cluster
  #
  apollo_cluster_nodes:
    int_mode: trunk
    vids: 500
    pvid: 600
  #
  # DAPHNE Production-01
  #
  daphne_01_cell0_util_nodes:
    int_mode: trunk
    vids: "38 64-73 146-148 173 324 715"
    pvid: 141
  daphne_01_cell0_control_nodes:
    int_mode: trunk
    vids: "38 146 173"
    pvid: 141
  daphne_01_cell0_service_nodes:
    int_mode: trunk
    vids: "38 146"
    pvid: 141
  daphne_01_cell0_network_nodes:
    int_mode: trunk
    vids: "14 38 64-73 146-148 173 324 715"
    pvid: 141
  daphne_01_cell1_nodes:
    int_mode: trunk
    vids: "14 64-73 147-151 173 324 715"
    pvid: 150
  #
  # DAPHNE Production-02
  #
  daphne_02_cell1_util_nodes:
    int_mode: trunk
    vids: "74 174 702 704-708"
    pvid: 703
  daphne_02_cell1_control_nodes:
    int_mode: trunk
    vids: "74 174 702 704"
    pvid: 703
  daphne_02_cell1_network_nodes:
    int_mode: trunk
    vids: "174 702 704-708"
    pvid: 703
  daphne_02_cell1_nodes:
    int_mode: trunk
    vids: "174 702 704-708"
    pvid: 703
```

HOST CONFIG

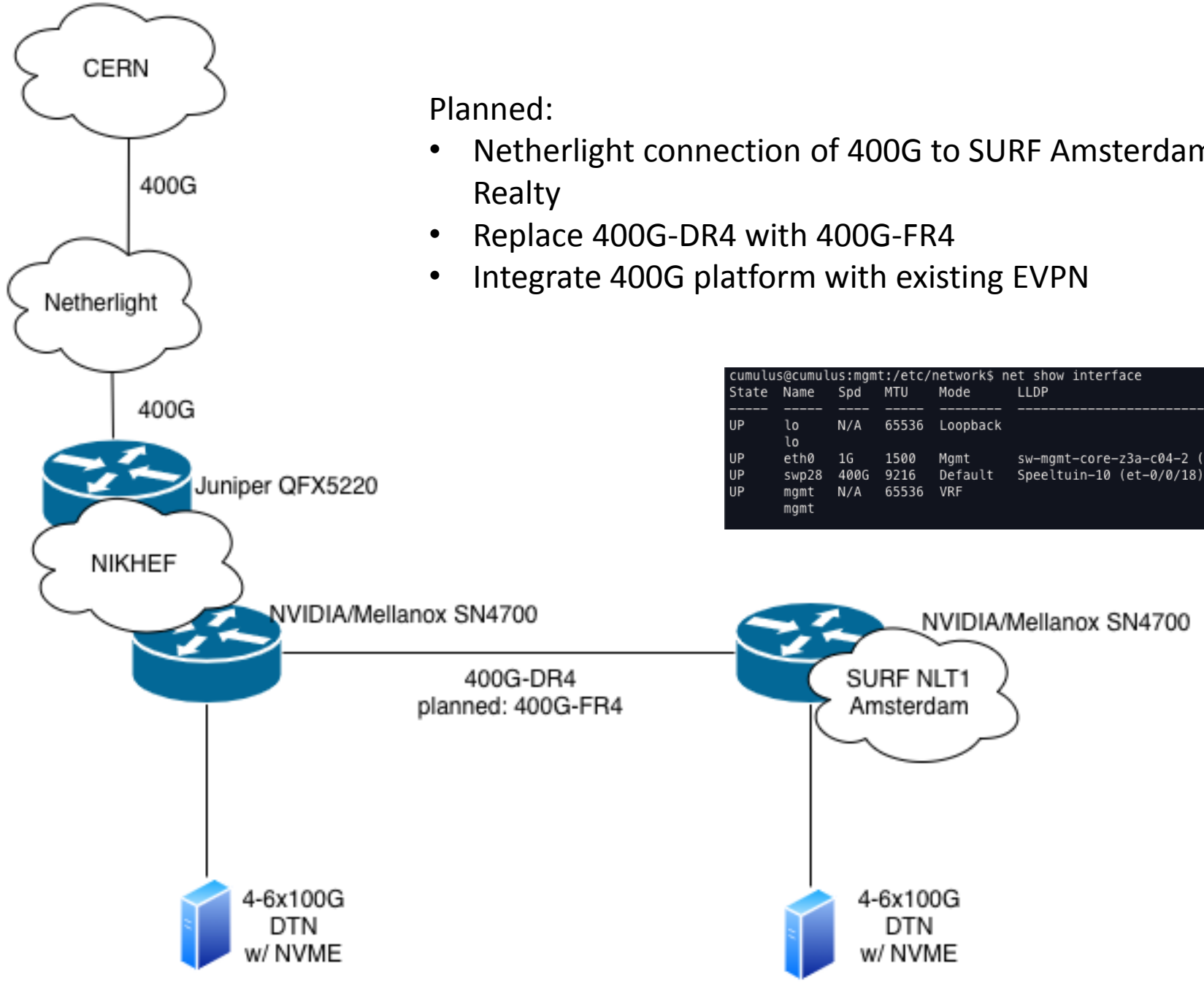
```yaml
  - name: DAPHNE_f15_bond
    admin_state: enabled
    alias: "DAPHNE production-01 nodes F15 ACCESS"
    interface_profile: daphne_01_cell1_nodes
    interfaces:
      - name: bond600
        alias: "Apollo node f15-01 ACCESS"
        bond_slaves: swp6s0
        interface_profile: apollo_cluster_nodes
      - name: bond601
        alias: "Apollo node f15-02 ACCESS"
        bond_slaves: swp6s1
        interface_profile: apollo_cluster_nodes
      - name: bond602
        bond_slaves: swp6s2
      - name: bond603
        bond_slaves: swp6s3
      - name: bond700
        bond_slaves: swp7s0
      - name: bond701
        bond_slaves: swp7s1
      - name: bond702
        bond_slaves: swp7s2
      - name: bond703
        bond_slaves: swp7s3
      - name: bond800
```

Configuration/onboarding workflow

1. Onboard new nodes in patchmanager, tag with asset tag (DCO)
2. Onboard new nodes in CMT, tag with interface profile (sysadmin)
3. Generate TOR config with python (network admin)
4. Commit to Git repo (network admin)
5. Push config with ansible (network admin)

400G testing

Mellanox SN4700
- Spectrum 3 ASIC
- 32 x 400G
- Runs Cumulus Linux



Planned:
- Netherlight connection of 400G to SURF Amsterdam @ Digital Realty
- Replace 400G-DR4 with 400G-FR4
- Integrate 400G platform with existing EVPN

```
cumulus@cumulus:mgmt:/etc/network$ net show interface
State  Name   Spd   MTU    Mode      LLDP                          Summary
-----  -----  ----  -----  --------  ----------------------------  ----------------
UP     lo     N/A   65536  Loopback                                IP: 127.0.0.1/8
       lo                                                          IP: ::1/128
UP     eth0   1G    1500   Mgmt      sw-mgmt-core-z3a-c04-2 (swp6) Master: mgmt(UP)
UP     swp28  400G  9216   Default   Speeltuin-10 (et-0/0/18)
UP     mgmt   N/A   65536  VRF                                     IP: 127.0.0.1/8
       mgmt                                                        IP: ::1/128
```

The End