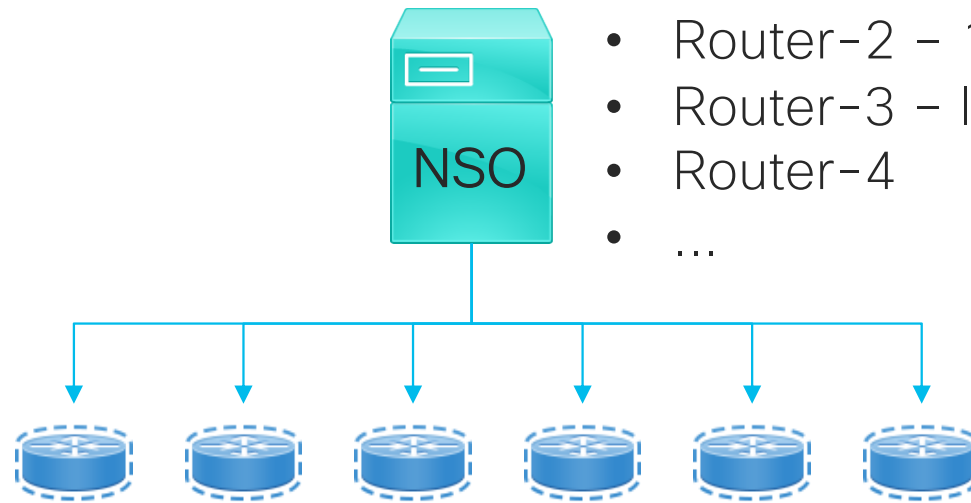




# NETCONF Call Home

Fredrik Jansson  
Speaker title  
Subtitle goes here

# Typical NSO Setup



- Router-1 – 10.0.10.2
- Router-2 – 10.0.10.4
- Router-3 – lab-2-gw.cisco.com
- Router-4
- ...

Not always that  
easy...

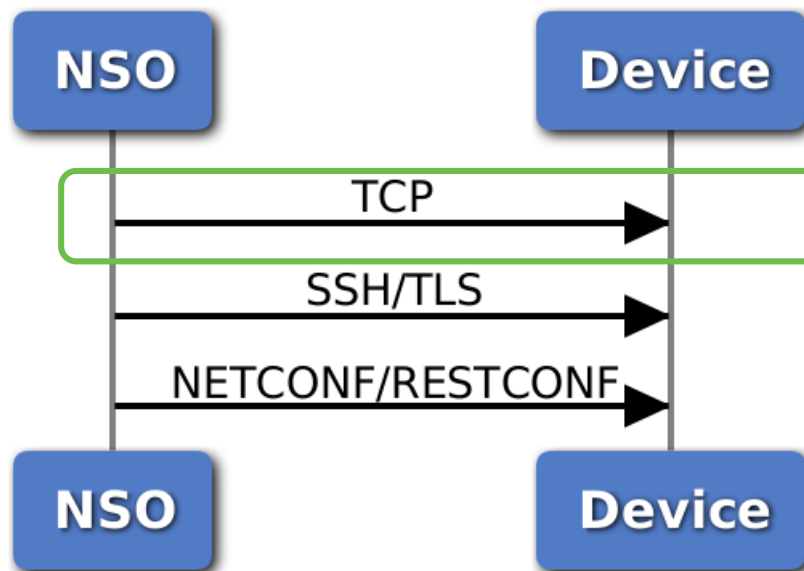
- Device behind NAT
- No outside access
- Unknown address
- Don't know when/where the device is plugged in
- IP Address Changing
  - Mobile Devices
  - DHCP

# Meet NETCONF Call Home!

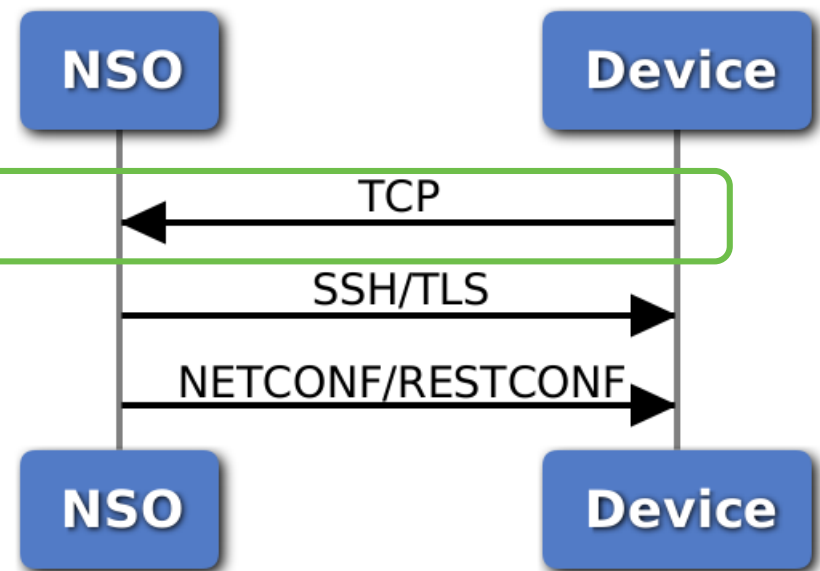
- RFC 8071
  - RESTCONF Call Home
  - SSH & TLS
  - “Only TCP Changing Direction”

# Difference

## NETCONF



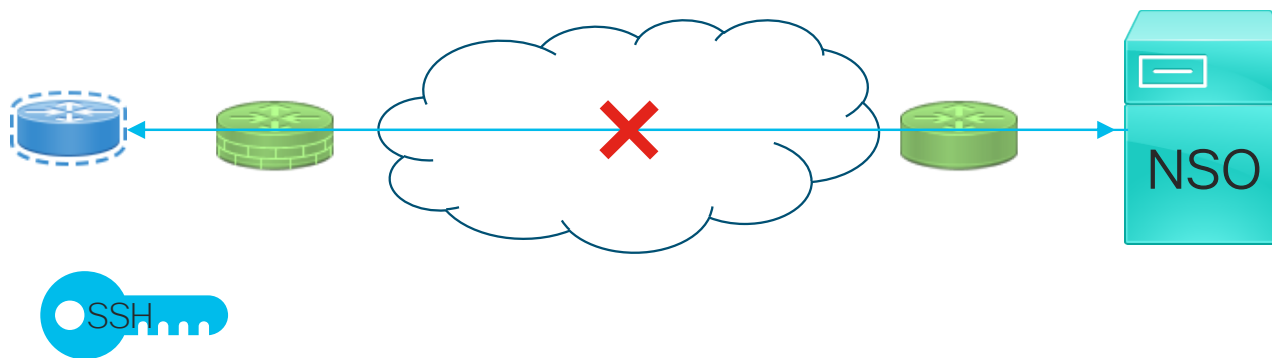
## NETCONF Call Home



# What About Cisco?

- NSO & ConfD
  - NETCONF Call Home
  - ConfD 6.7.1
  - NSO 5.1
- IOS XE Backlog

# How does NSO know what device it is?



- router-1  
ssh AAB
- router-2  
ssh CCA
- ...

~~CALL\_HOME\_DEVICE\_ID\_REQUIRED~~

# This Must Be Super Complicated? – Not Really!

## NSO

```
<netconf-call-home>
  <enabled>true</enabled>
  <transport>
    <tcp>
      <ip>0.0.0.0</ip>
      <port>4334</port>
    </tcp>
  </transport>
</netconf-call-home>
```

## NSO

```
devices device router-1
  local-user admin
  ssh host-key ssh-rsa
    key-data "AAA.."
  !
  authgroup default
  device-type netconf ned-id netconf
  state admin-state call-home
  !
```

## ConfD

```
m = maapi.Maapi()
m.netconf_ssh_call_home("10.0.10.2", 4334)
```



# NSO Events

## CALL\_HOME\_UNKNOWN\_DEVICE

```
{  
  'type': CALL_HOME_UNKNOWN_DEVICE,  
  'ip4': '10.117.108.147',  
  'port': 50271,  
  'ssh_host_key': AAB...,  
  'ssh_key_alg': 1,  
  ...  
}
```

# NSO Events

CALL\_HOME\_DEVICE\_CONNECTED

```
{  
  'type': CALL_HOME_DEVICE_CONNECTED,  
  'device': 'router-1',  
  'ip4': '10.117.108.147',  
  'port': 17205,  
  'ssh_host_key': CCB...,  
  'ssh_key_alg': 1,  
  ...  
}
```

# Demo

