



# PnP & NFVO

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# Agenda

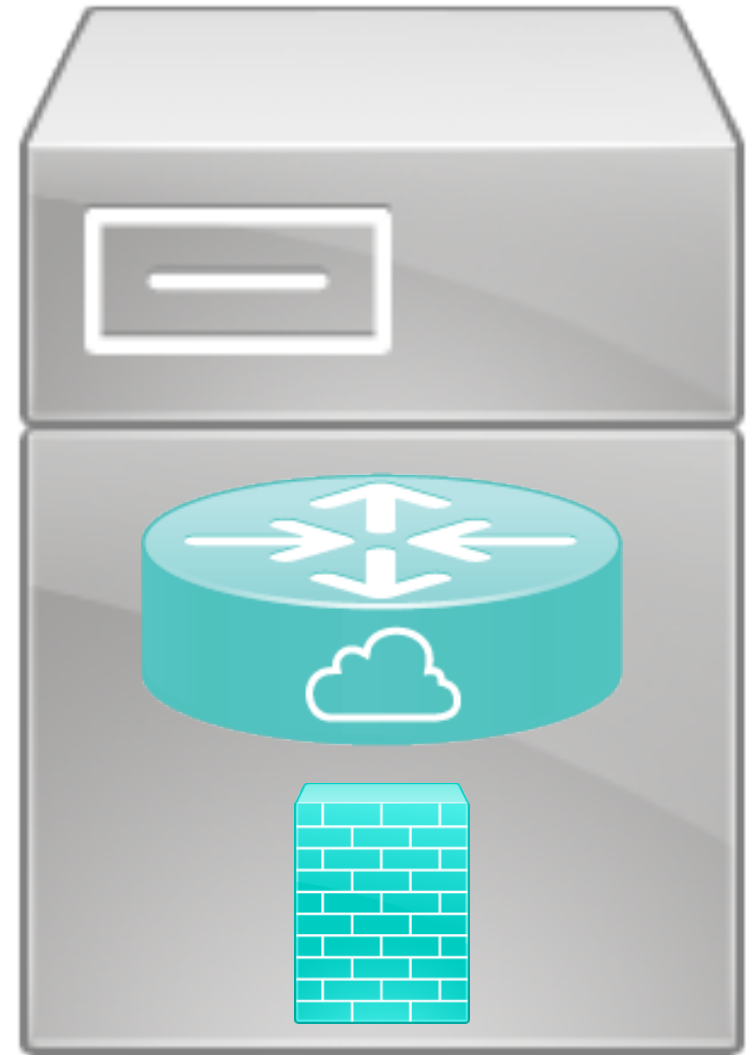
- vBranch
- Solution Overview
- PnP
- Demo Part 1
- NFVO
- Demo Part 2

# vBranch

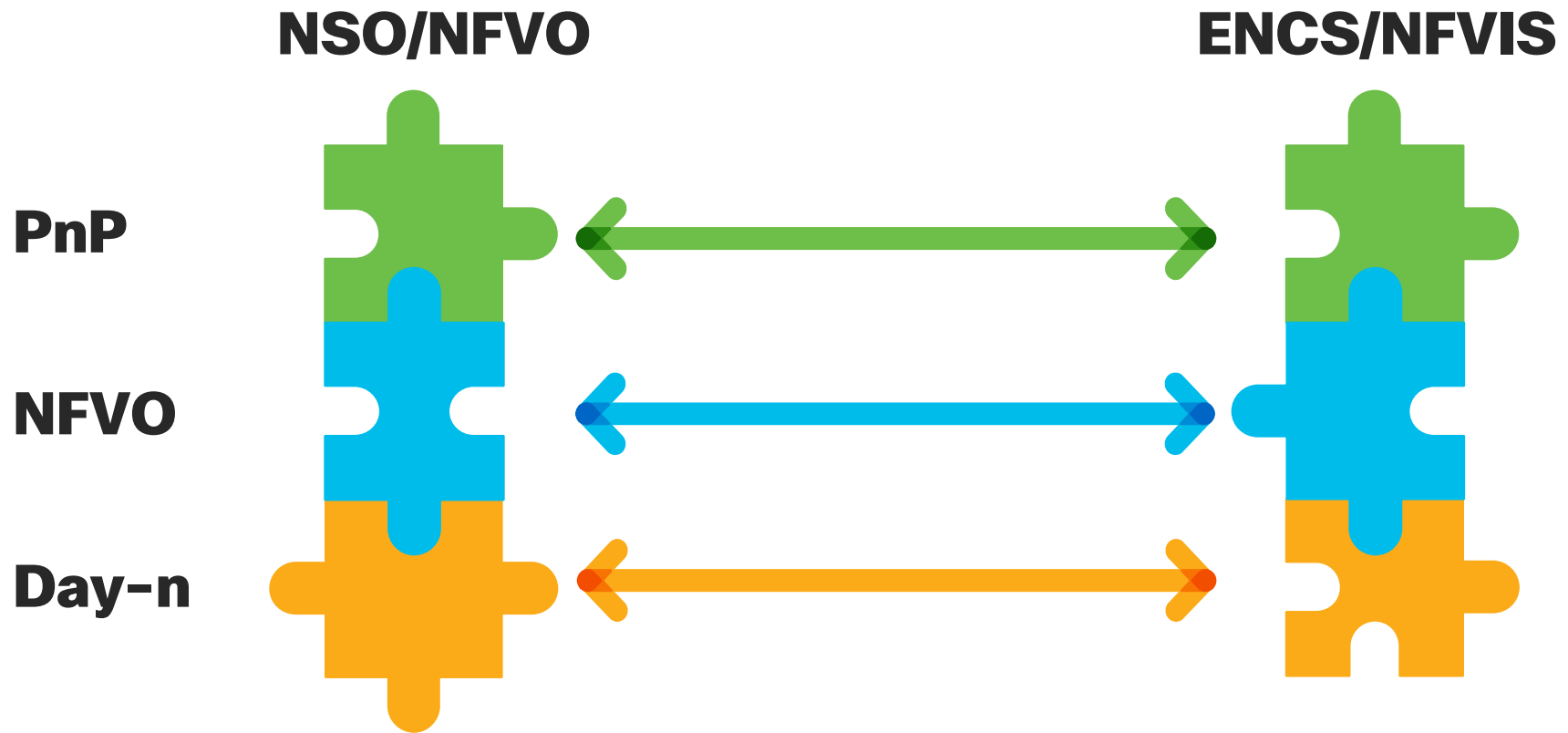
- ENCS
- NFVIS
- vBranch Function Pack
- IWAN Function Pack

# Virtual Branch Offices

- Standard(-ish) hardware
- Flexible



# Solution



PnP

# Cisco PnP

- Open Solution
  - Open protocol based on HTTP and XMPP
  - Publically available schema
- Zero Touch Installation
  - Fully automated network device installation
  - Day0 configuration

# PnP Server Discovery



DHCP with options 60 & 43

Option String: 5A1D;B2;K4;1.2.3.4;J80



DNS Lookup

pnpserver.localdomain → 1.2.3.4 (PnP Server)



Cloud Redirection Service

<https://devicehelper.cisco.com/device-helper> re-directs to 1.2.3.4 (PnP Server)



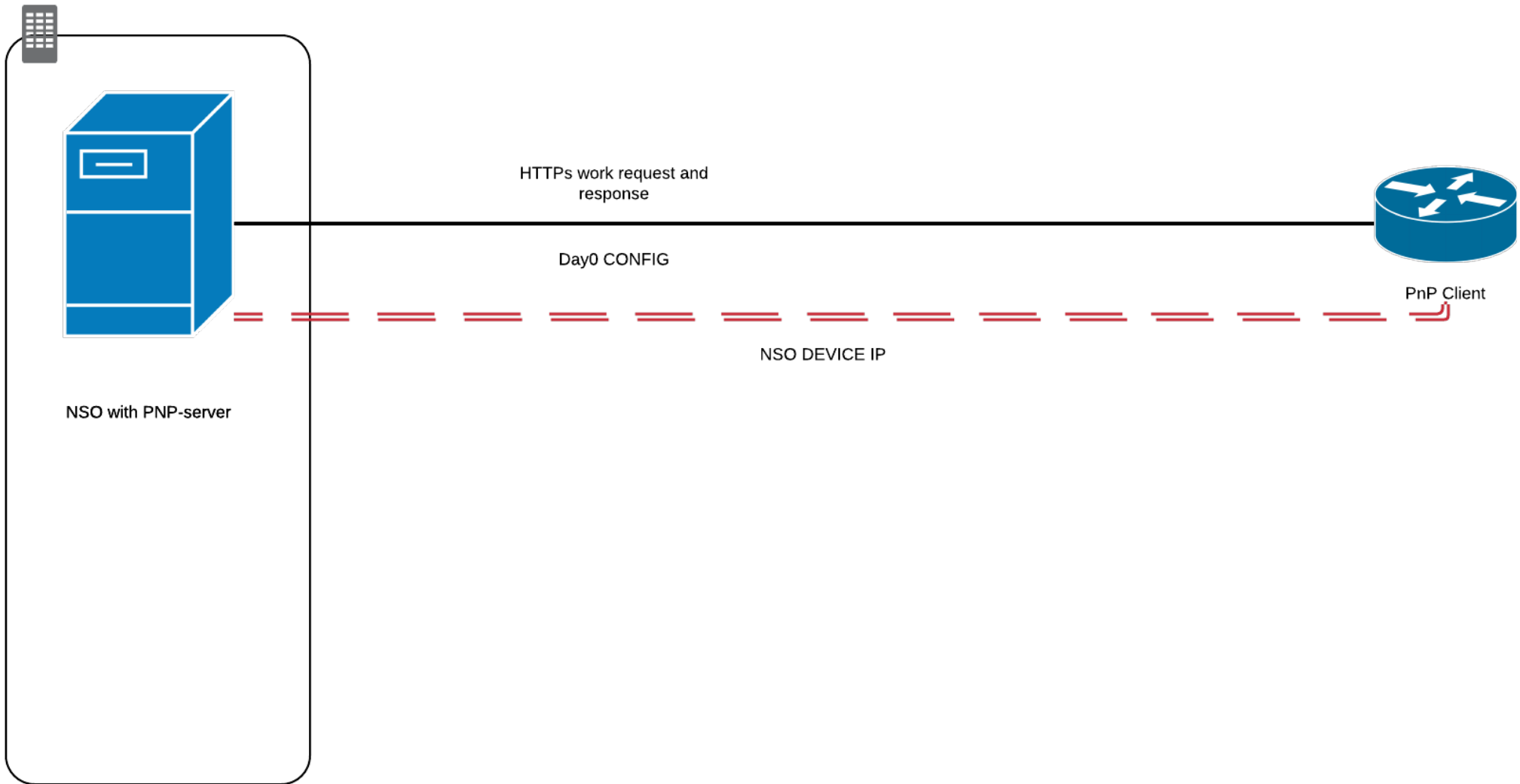
Pre-configured/Configurable

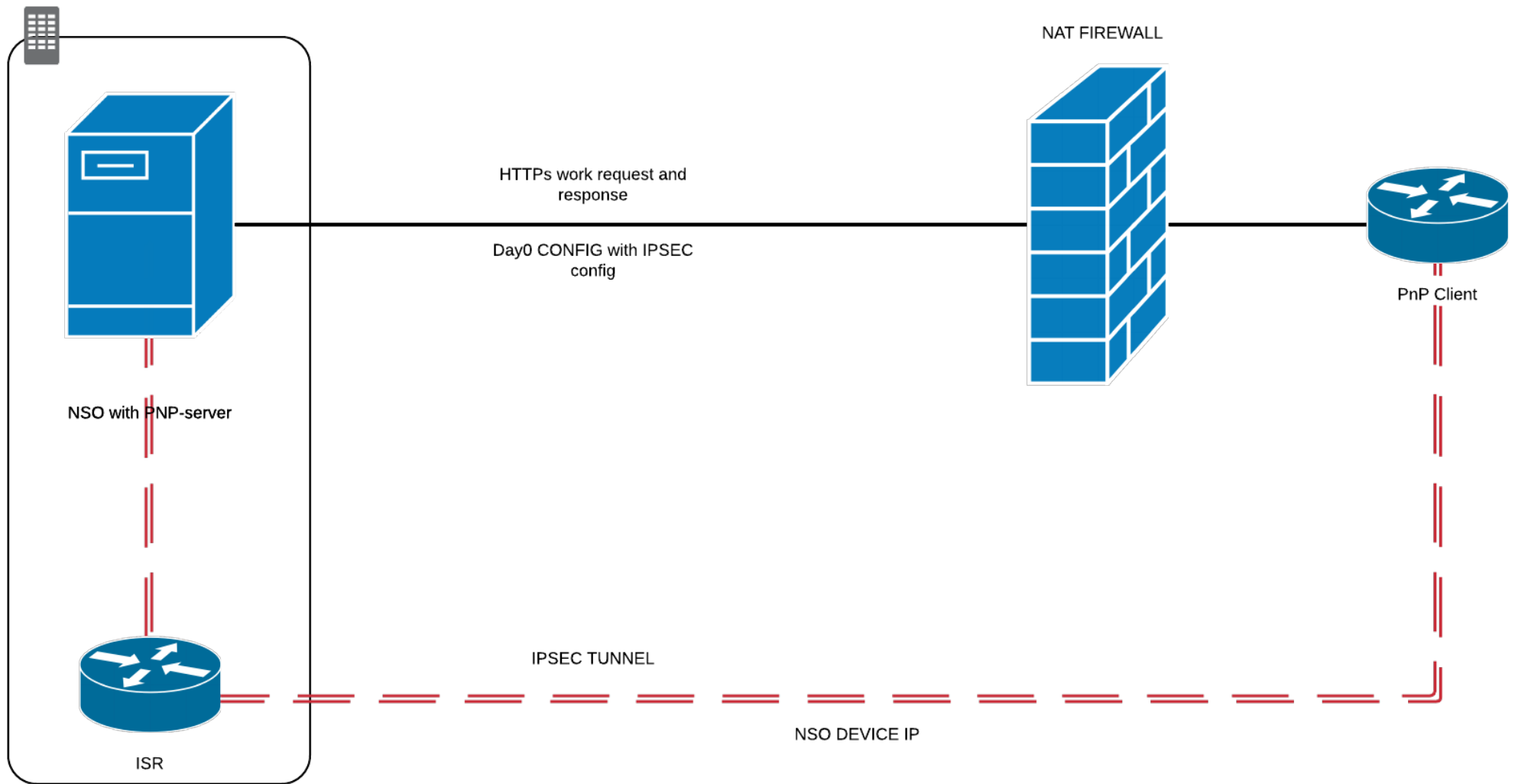




# NSO PnP Server

- Function Pack
- Supports PNP Version 1.0 devices
- PNP server plus NSO device management
- Supported





# PnP Communication flow

- NSO PNP Server is HTTP(s) only (not XMPP)
- All communication is driven from the PnP agent, i.e the server never initiates

# PnP Agent Queries

- HELLO
  - Method: GET
  - Description: PnP agent sends this message only during the discovery phase to ensure the discovered server is reachable.

# PnP Agent Queries

- WORK-REQUEST
  - Method: POST
  - Description: Work Request message is initiated by the PnP agent to check with the PnP server for any new work requests.

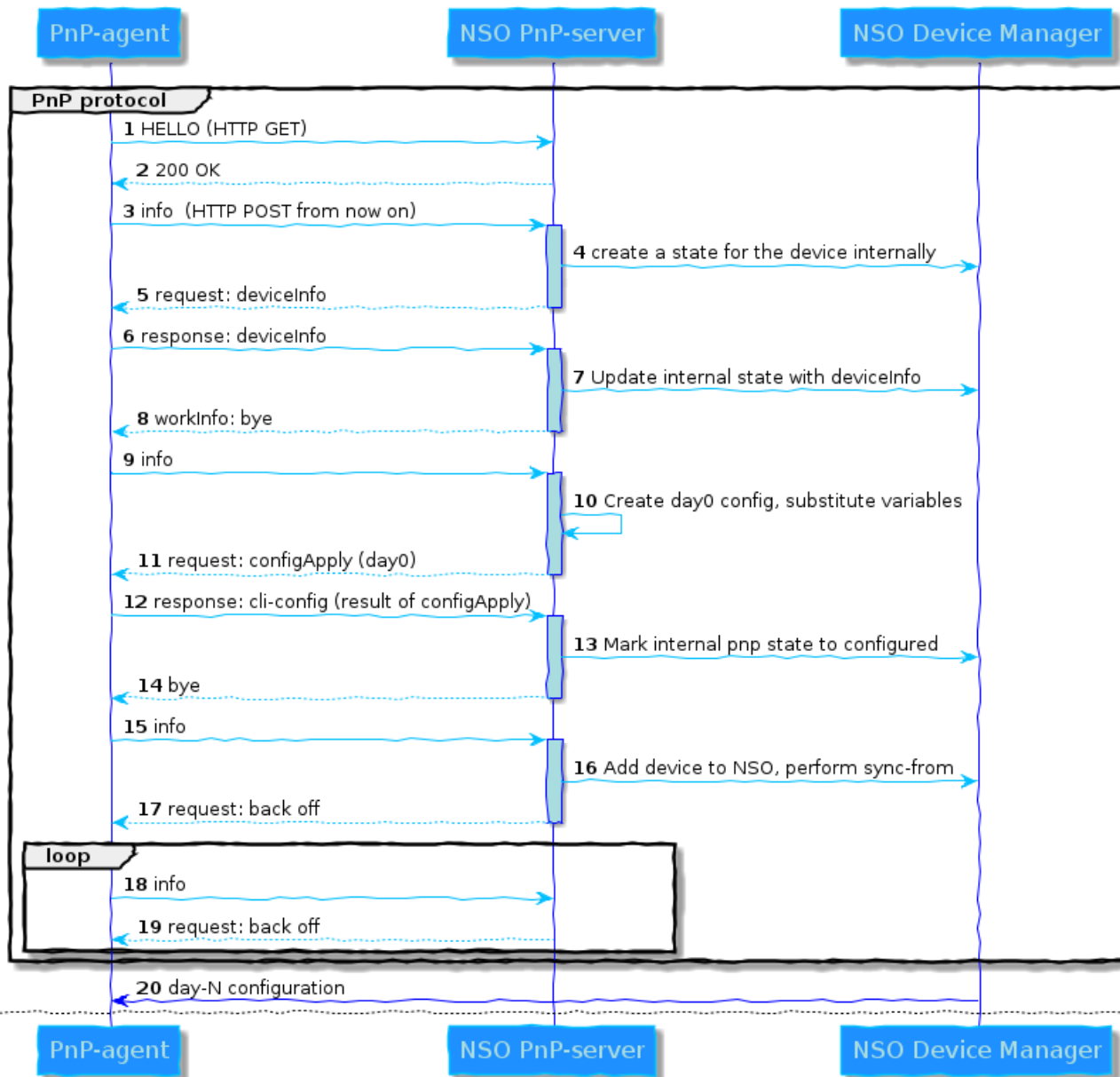
# PnP Agent Queries

- WORK-RESPONSE
  - HTTP Method: POST
  - Description: Work Response message is sent by the PnP agent to notify the server after completion of each Work Request initiated by the server to notify the status.

# PnP Server Response

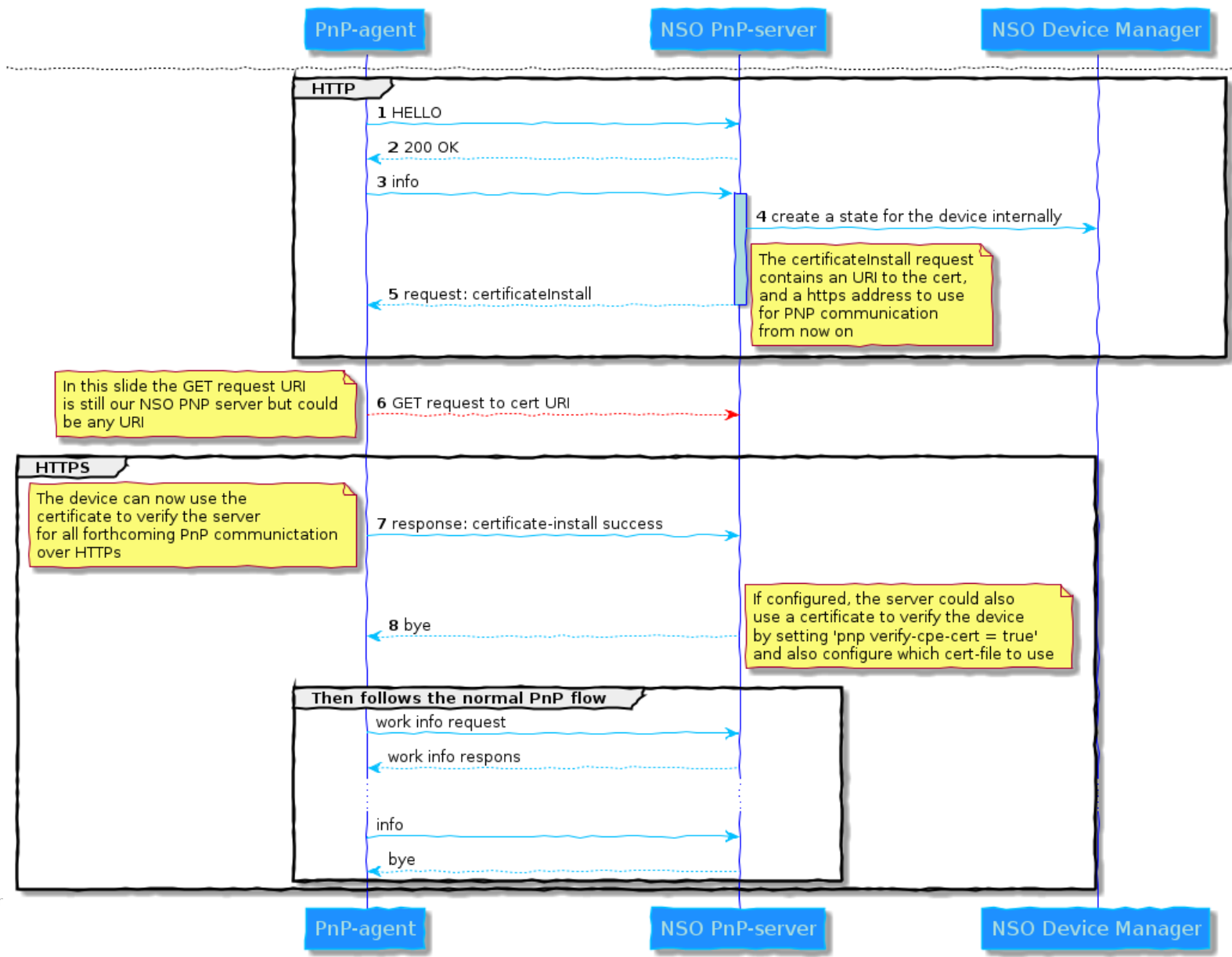
- HELLO
  - 200 ok
- WORK-REQUEST
  - 'Work'
  - 'Back off'
- WORK-RESPONSE
  - 'bye'

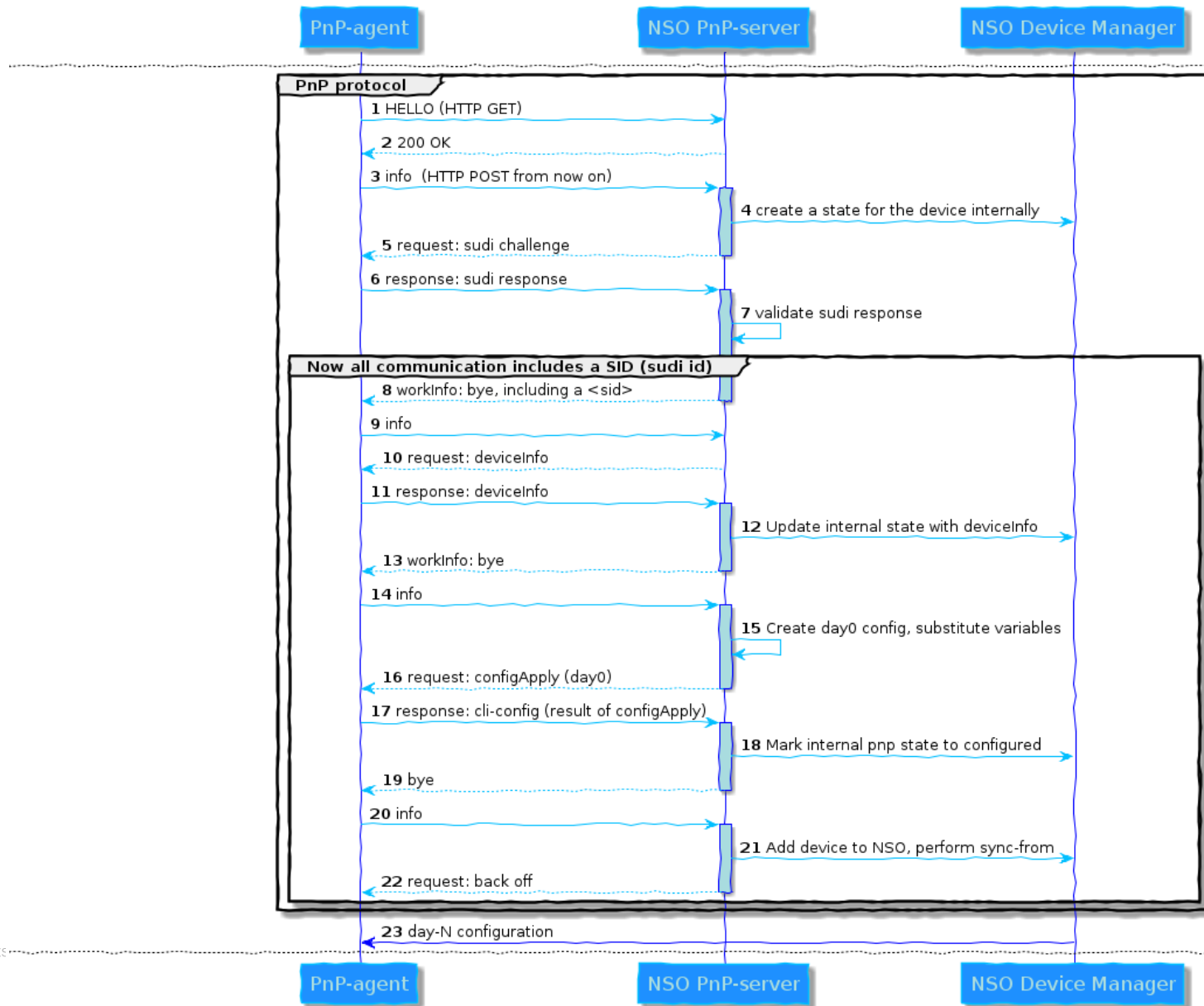




# PNP Security

- HTTPS
- SUDI





# Supported Device Sample

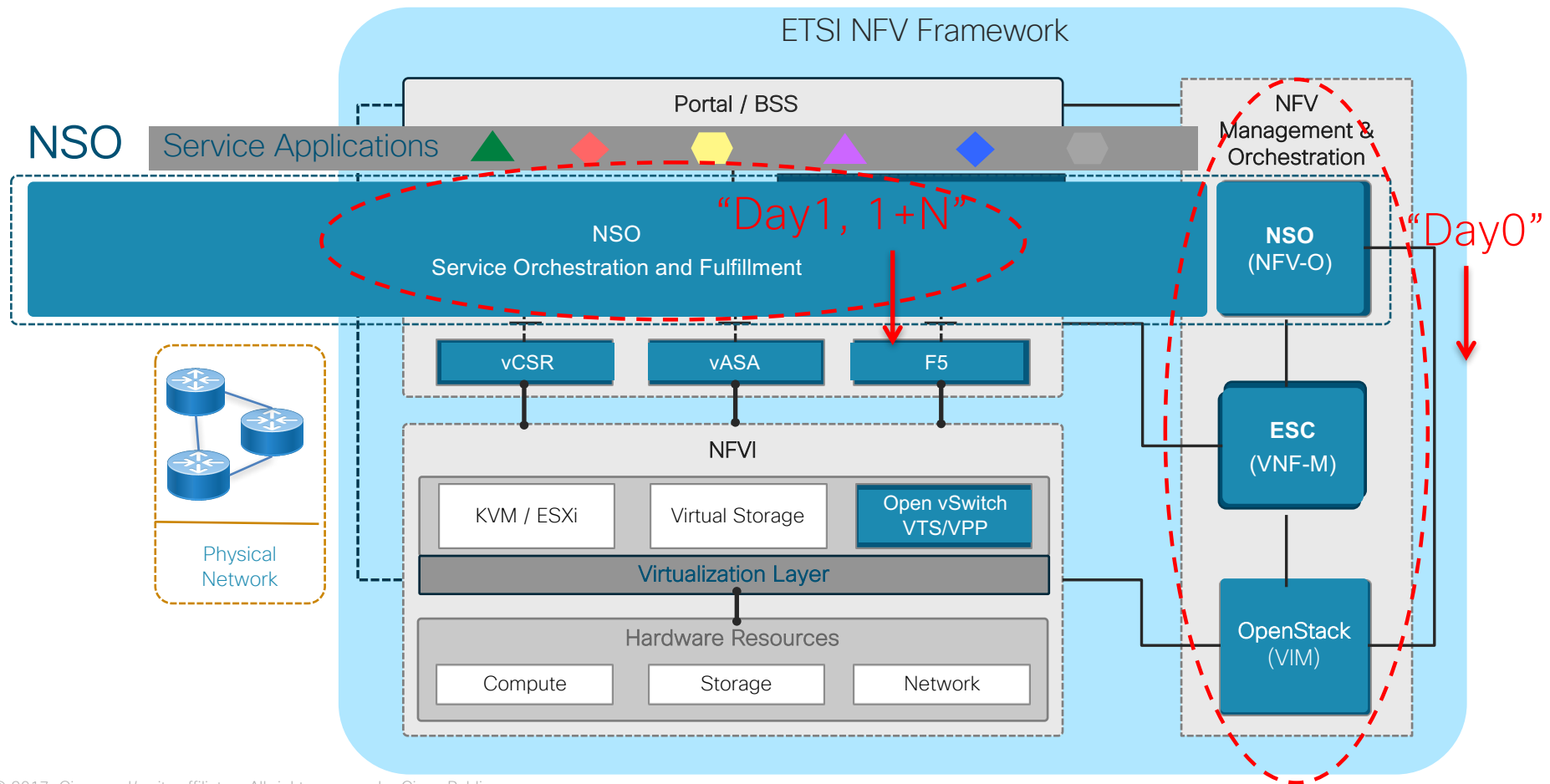
- Catalyst 2960, 3560, 3650, 3750, 3850, 4500 & 6500
- Nexus 5k & 7k
- ISR G2, 800, 4000
- ASR 1k, 9k
- Many Wireless LAN Controllers

PnP Demo

# NFVO

- ETSI Compliant
- Function Pack
- Openstack
- NFVIS
- Supported

# Solution Mapped to ETSI NFV Framework

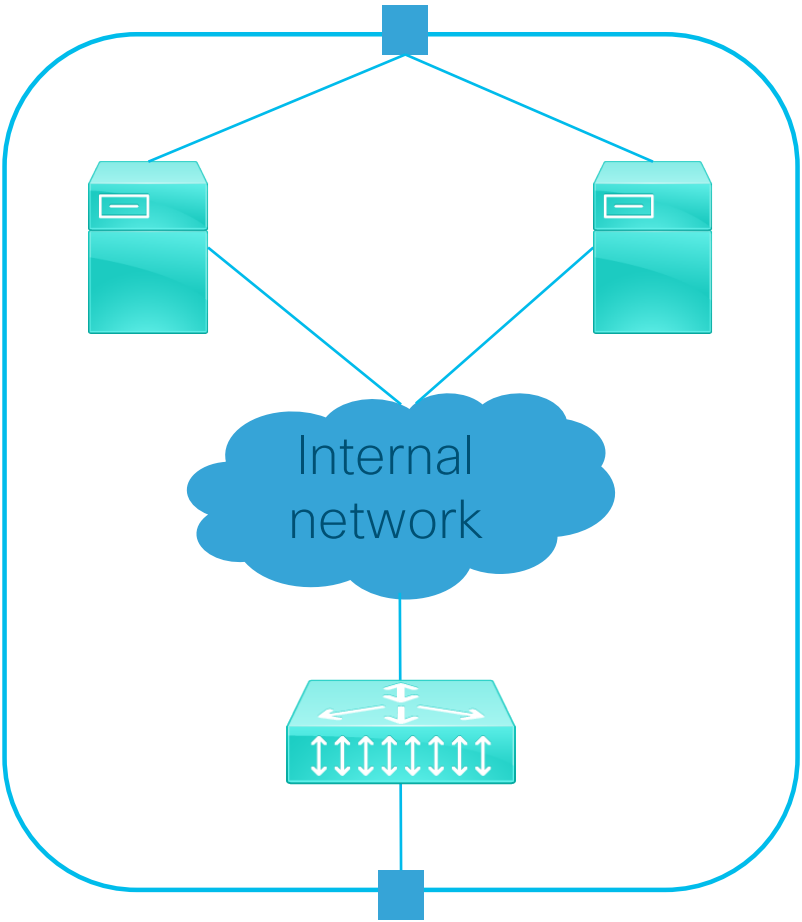
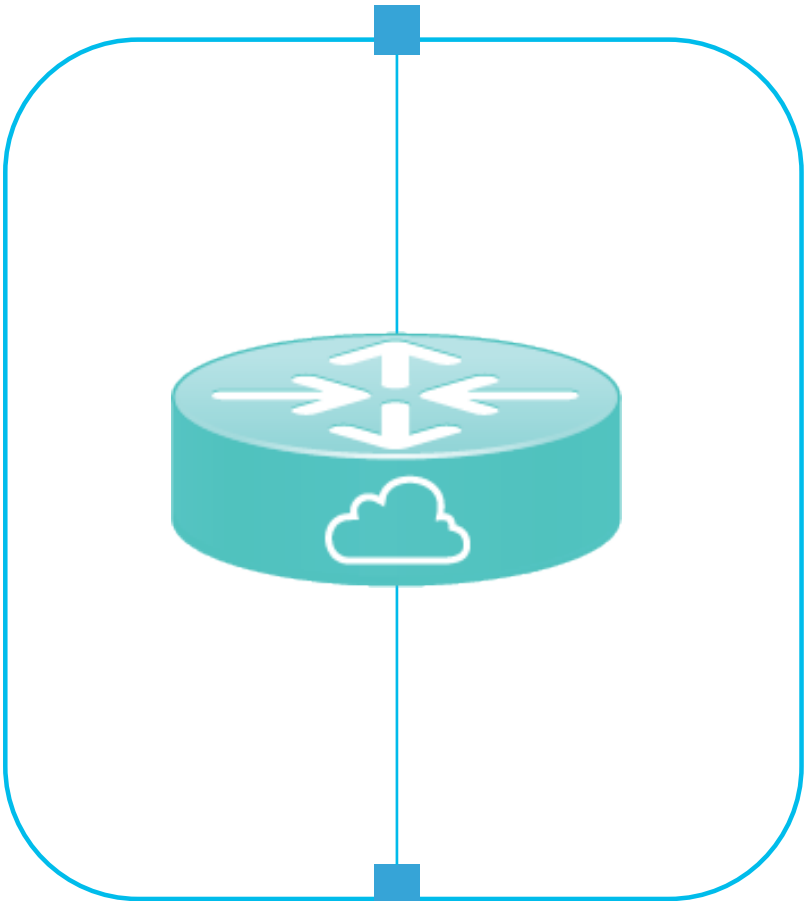




# VNFD

- Vendor
- Immutable
- Requirements
- Structure

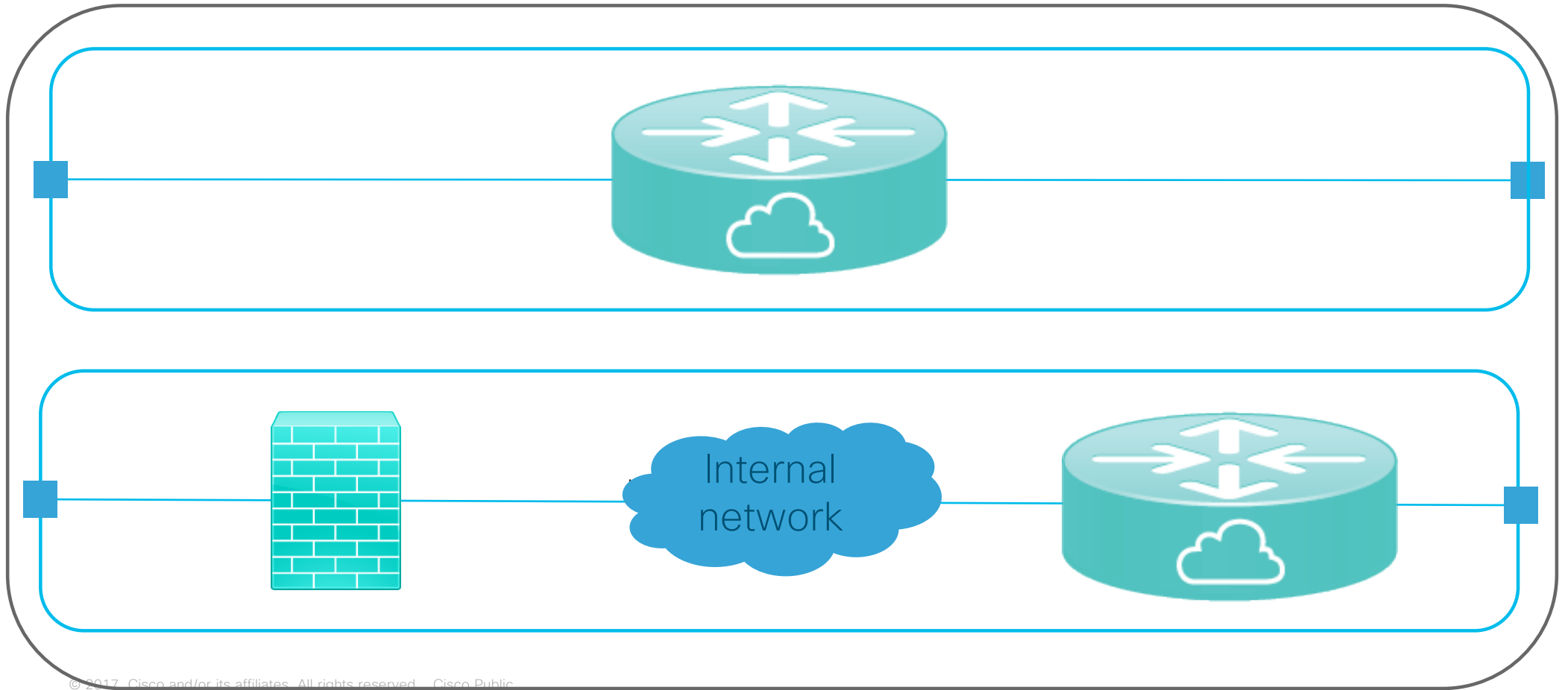
# VNFD



# NSD

- User
- Mutable
- Multi Vendor
- Structure

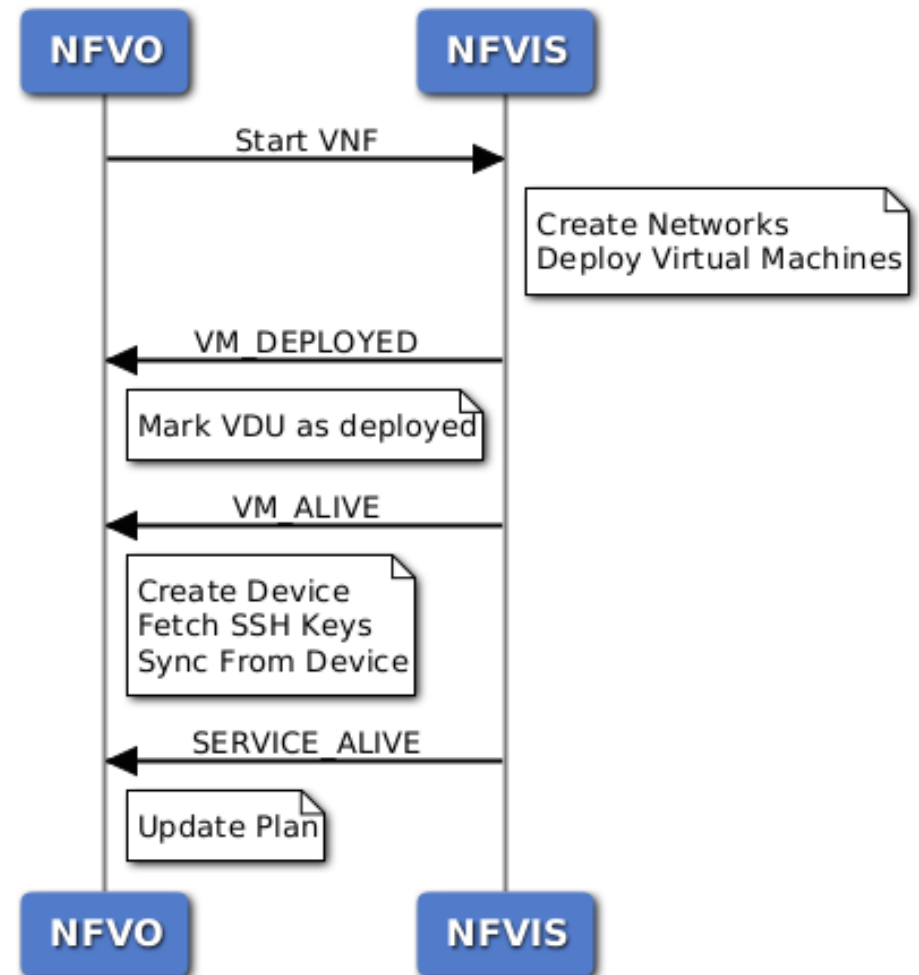
# NSD Can Consist of Multiple Deployment Flavors



# Why NFVO

- ETSI Aligned
- High Abstraction
- Hides Asynchronicity
  - Reactive FastMAP

# Why NFVO



# NFVO Demo