Prelude Network Automation

Documentation

Table of contents

1. Home

1.1 Welcome to Prelude Network Automation Documentation

This documentation is related to Prelude v1.x.

Looking for **installation** or **upgrade** instructions for Prelude OneBoard or Prelude Gateway, have a look to the Installation Guide

Looking for instructions on **user management** or **permissions** for Prelude OneBoard, have a look to the Admin Guide
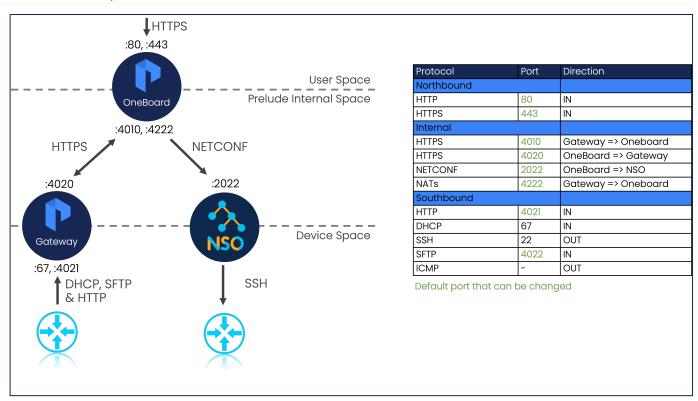
Looking for instructions on **device onboarding** or **any other Prelude OneBoard feature**, have a look to the User Guide

---

If you are looking for an information that is not present in the documentation, reach out to your contact at Arolo Solutions so we add it.

2. Install Guide

2.1 Installation

2.1.1 Installation Options

Protocol	Port	Direction
Northbound		
HTTP	80	IN
HTTPS	443	IN
Internal		
HTTPS	4010	Gateway => Oneboard
HTTPS	4020	OneBoard => Gateway
NETCONF	2022	OneBoard => NSO
NATs	4222	Gateway => Oneboard
Southbound		
HTTP	4021	IN
DHCP	67	IN
SSH	22	OUT
SFTP	4022	IN
ICMP	–	OUT

Default port that can be changed

Prelude automation software is built on following components:

- **OneBoard** is mainly the UI interface the user has access to.

- **Gateway** serves as a gateway to the devices for different purposes, presently mostly used for ZTP feature and software upgrades.

- **Cisco NSO** is Cisco Network Service Orchestrator Software

> ℹ️ **Info**
>
> Above components are provided as *separated Docker containers*

Hosting Prelude application

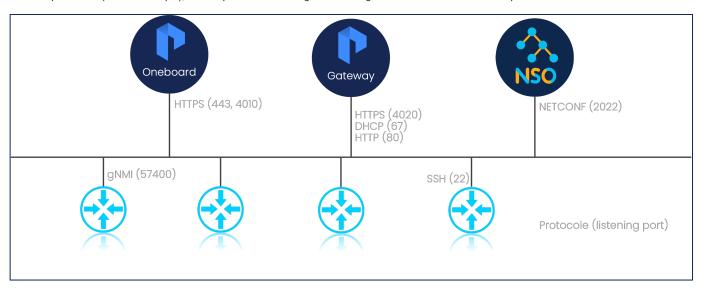For security purposes, Prelude can support up to three airgap spaces :

- **The user space**: where users can connect to Prelude OneBoard web UI.

- **The internal space**: this space provides internal connectivity between Prelude components.

- **The device space**: this space provides connectivity to network devices in the field.

The following installation options explains, how to set up Prelude with one to three spaces.

OPTION 1 - SINGLE SPACE OPTION

In its simplest form (Lab for example), all the spaces can be merged into a single network as described in the picture below:

In this option all the components can be installed on a single host.

Installation instructions for option 1

Requirements

- vCPUs: 32
- RAM: 64GB
- Disk: 500GB

OPTION 2 - TWO SPACES OPTION

Typical installation in a production network comes with a separation between the management and the user subnets. In this option, the user space and the internal space are merged. All Internal communications are using the northbound interface.

In this option all the components can be installed on a single host.

Installation instructions for option 2

Requirements
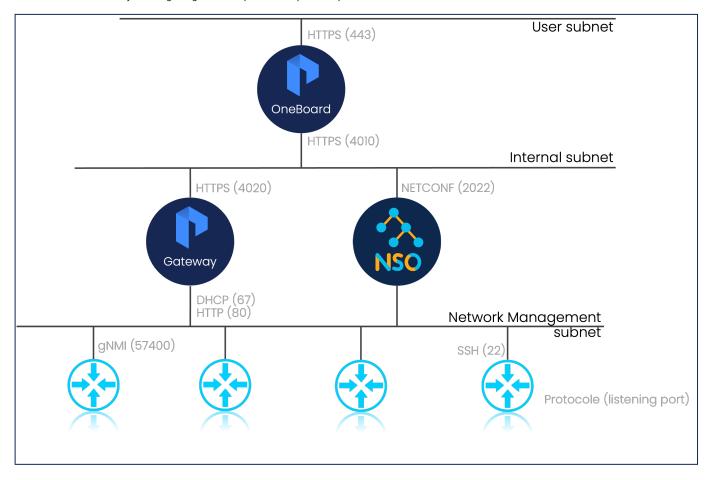
- vCPUs: 32
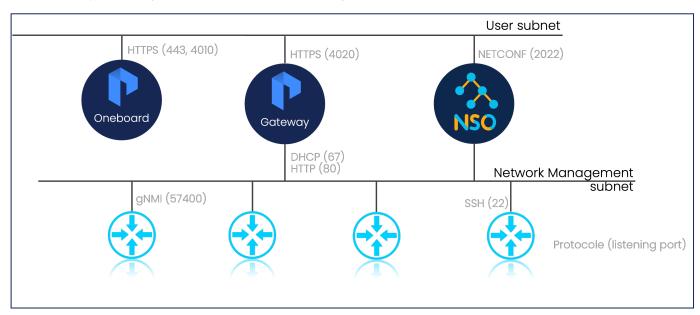- RAM: 64GB
- Disk: 500GB

OPTION 3 - THREE SPACES OPTION

An even more secure way of doing things is to keep all three spaces separates as follows:

In this option all the components have to be installed on two different hosts.

Installation instructions for option 3

Prelude OneBoard requirements

- vCPUs: 12
- RAM: 16GB
- Disk: 500GB

Prelude Foundation requirements

- vCPUs: 32
- RAM: 64GB
- Disk: 200GB

> 🔥 **Tip**
>
> If you want to keep Prelude instances even more secure, we recommend to activate and configure host firewalls (UFW or iptables) to allow the protocols given in the table above and filter out everything else.
>
> You can do this no matter what option is choosen for network connectivity.

Additional information

Any decent Linux distribution is enough to run Prelude as long as the following prerequisites are met.

Prelude is available as docker container and the installation is relying on docker compose.

2.1.2 Docker installer

The following instructions describe how to deploy Prelude with our docker installer.

> ✏️ **Note**
>
> If you are installing the demo version of Prelude, you won't need the registry account

Before starting, make sure :

- your host is matching the minimum requirements
- docker and docker compose are installed (Docker Installation Guide)
- you have your registry account credentials (if you don't have an Arolo registry account, contact us)
- downloading Cisco NSO 6.1 container from cisco.com

> ✏️ **Note**
>
> For the demo version of Prelude, you can get Cisco NSO trial version from NSO website.

You are ready to start !

The docker installer can be run from anywhere, it will then connect to the Prelude host(s) via SSH.
We are recommending to keep the installer folder secured as it contains security details about your Prelude installation and will be needing to upgrade Prelude later.

The following guide is considering that you are installing Prelude in the `/opt/prelude` folder on all hosts.

> ⚠️ **Warning**
>
> The installation process have been validated on Ubuntu. We are working on validating other operating systems.

Launch installer

For all the installation options, start one the single host or OneBoard host by launching the installer:

```
docker run --name prelude-installer --rm \
  -v <installation folder>:/app/workdir \
  -p 8000:8000 \
  -e INSTALLER_IP=<installer host ip> \
  registry.arolo-solutions.com/install/prelude-installer:1.3
```

- **installation folder** a folder that will store the installation details, log, etc. **This folder must be different than the one you want to install Prelude into**. It will be needed for Prelude upgrades later
- **installer host ip** the IP the installer will be available on

If the installer started successfully, you should see:

```
[2025-08-21 14:52:14 +0000] [1] [INFO] Starting gunicorn 21.2.0
[2025-08-21 14:52:14 +0000] [1] [INFO] Listening at: https://0.0.0.0:8000 (1)
[2025-08-21 14:52:14 +0000] [1] [INFO] Using worker: gthread
[2025-08-21 14:52:14 +0000] [14] [INFO] Booting worker with pid: 14
```
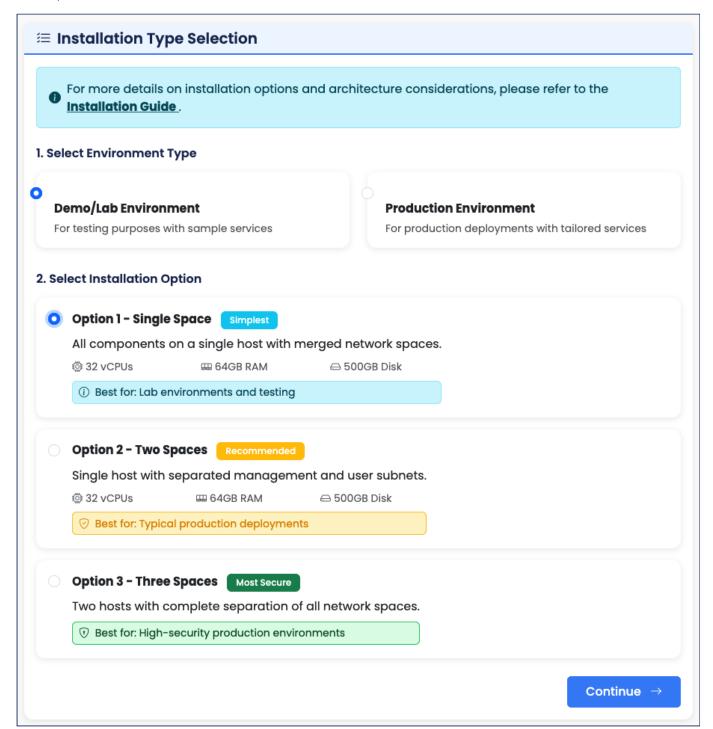
Then navigate to https://host-ip:8000/ to start the installation

Installation Type
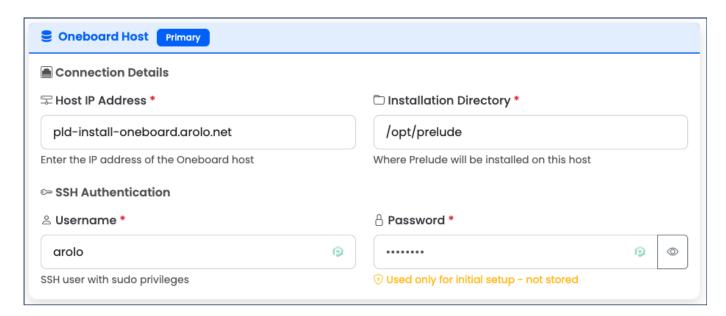
Then, select the installation type and option.

· **Demo/Lab** for test purpose if you are not yet a Prelude customer

· **Production** if you are already a Prelude customer with tailored services

For the options selection see the dedicated documentation section.

Connection Setup

First you need to provide the host(s) details to deploy Prelude on.

The **Host IP address** can also be a domain name.

If you choose the installation option 3, you will have to fill the form for each host.

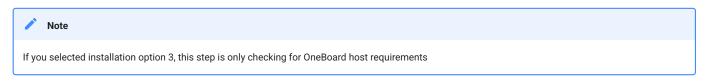Before moving to the next step, the installer will validate the SSH connection(s).

As the password of each host is not stored persistently but only in memory for maximum 1h. You may encounter the following warning that inform you that you need to re-enter the password(s).
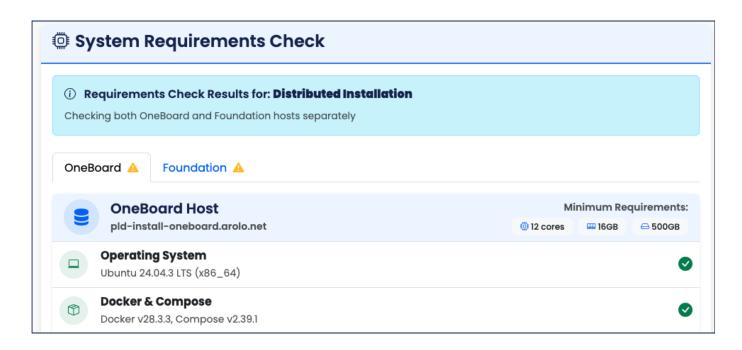

System Requirements

You don't need to do anything specific at the step, just validate that you meat the minimum requirements.

Only the host OS and docker version is blocking the installation, all other checks will raise warnings but won't prevent installing Prelude.
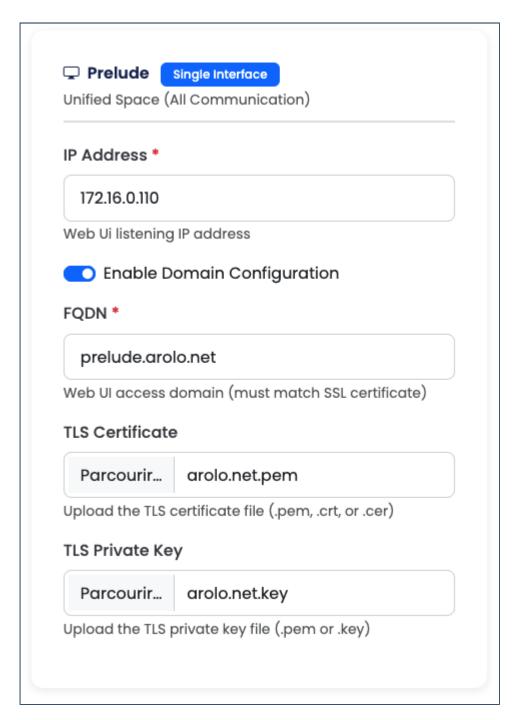
> ✏️ **Note**
>
> If you selected installation option 3, this step is only checking for OneBoard host requirements

⚙ System Requirements Check

ⓘ **Requirements Check Results for: Distributed Installation**

Checking both OneBoard and Foundation hosts separately

OneBoard ⚠   **Foundation** ⚠

🛢 **OneBoard Host**
pld-install-oneboard.arolo.net

Minimum Requirements:
⚙ 12 cores   16GB   500GB

💻 **Operating System**
Ubuntu 24.04.3 LTS (x86_64)   ✅

📦 **Docker & Compose**
Docker v28.3.3, Compose v2.39.1   ✅

Network configuration

INSTALLATION OPTION 1

🌐 **Management Network** ——— 🖥 **Prelude Host**
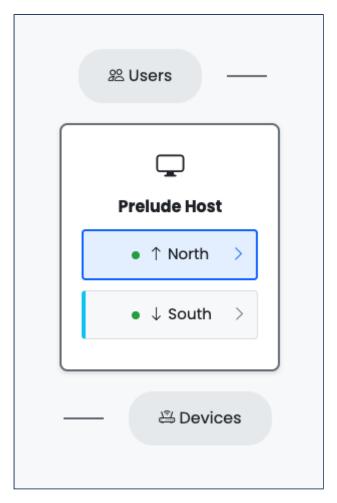● 🖼 **Interface** ›

For installation option 1 you need to provide information about OneBoard single interface.
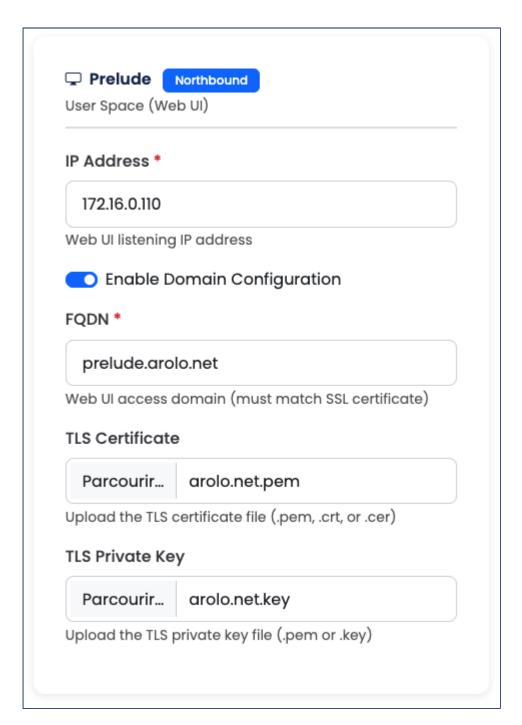
- **IP Address** The IP address of the host

- **FQDN** The Fully Qualified Domain Name of the host. It must match with the TLS certificate

- **TLS Certificate** TLS Certificate for the FQDN
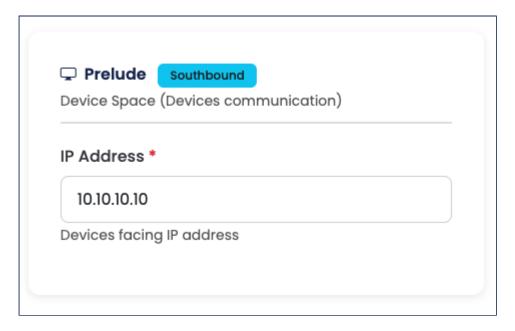
- **TLS Private Key** TLS Private Key for the FQDN

INSTALLATION OPTION 2

For installation option 2 you need to provide information about OneBoard northbound and southbound interface.

• **IP Address** The IP address of the northbound interface of the host

• **FQDN** The Fully Qualified Domain Name northbound interface of the host. It must match with the TLS certificate

• **TLS Certificate** TLS Certificate for the FQDN

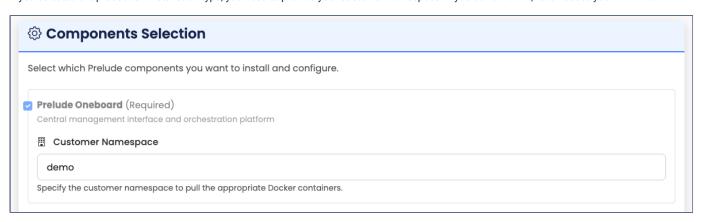• **TLS Private Key** TLS Private Key for the FQDN

- **IP Address** The IP address of the southbound interface of the host
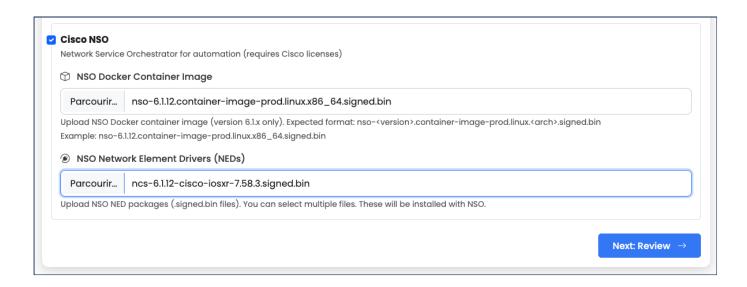
Coming soon

Components configuration

If you selected the production installation type, you need to provide your customer namespace. If you don't know it, reach out to your Arolo team.
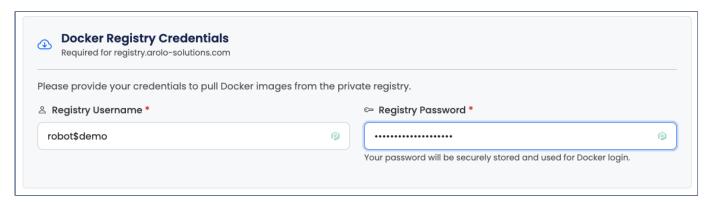

Then you will have to select Cisco NSO in the Foundation components and upload the linux container image and the NEDs you got from Cisco.
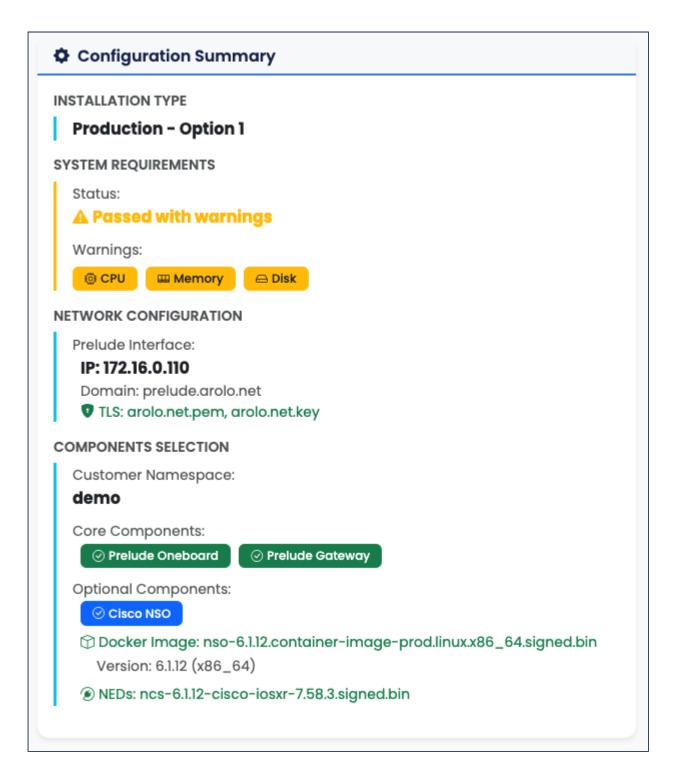
Cisco NSO

Network Service Orchestrator for automation (requires Cisco licenses)

☐ NSO Docker Container Image

| Parcourir… | nso-6.1.12.container-image-prod.linux.x86_64.signed.bin |

Upload NSO Docker container image (version 6.1.x only). Expected format: nso-<version>.container-image-prod.linux.<arch>.signed.bin
Example: nso-6.1.12.container-image-prod.linux.x86_64.signed.bin

◉ NSO Network Element Drivers (NEDs)

| Parcourir… | ncs-6.1.12-cisco-iosxr-7.58.3.signed.bin |

Upload NSO NED packages (.signed.bin files). You can select multiple files. These will be installed with NSO.

Next: Review →

Docker registry credentials

If you selected the production installation type, you need to provide your registry account. If you don't have tem, reach out to your Arolo team.
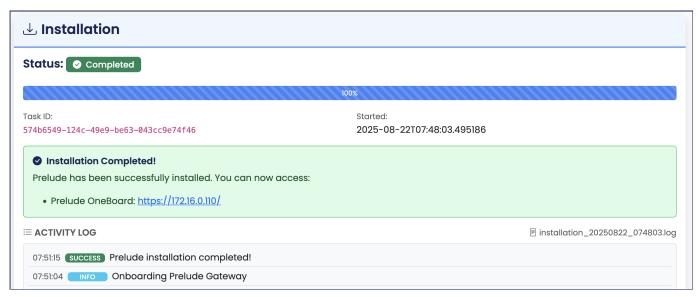
Docker Registry Credentials
Required for registry.arolo-solutions.com

Please provide your credentials to pull Docker images from the private registry.

👤 **Registry Username** *

| robot$demo |

🔑 **Registry Password** *

| •••••••••••••••••• |

Your password will be securely stored and used for Docker login.

Configuration review

Finally, review the config parameters and start the installation.

⚙ Configuration Summary

INSTALLATION TYPE

Production - Option 1

SYSTEM REQUIREMENTS

Status:

⚠ **Passed with warnings**

Warnings:

⚙ CPU   ▦ Memory   ⛃ Disk

NETWORK CONFIGURATION

Prelude Interface:

IP: 172.16.0.110

Domain: prelude.arolo.net

🛡 TLS: arolo.net.pem, arolo.net.key

COMPONENTS SELECTION

Customer Namespace:

demo

Core Components:

⊘ Prelude Oneboard   ⊘ Prelude Gateway

Optional Components:

⊘ Cisco NSO

📦 Docker Image: nso-6.1.12.container-image-prod.linux.x86_64.signed.bin

    Version: 6.1.12 (x86_64)

⊛ NEDs: ncs-6.1.12-cisco-iosxr-7.58.3.signed.bin

After a while, the installation will be done.

⤓ Installation

Status: ✓ Completed

100%

Task ID:

574b6549-124c-49e9-be63-043cc9e74f46

Started:

2025-08-22T07:48:03.495186

✓ **Installation Completed!**

Prelude has been successfully installed. You can now access:

- Prelude OneBoard: https://172.16.0.110/

≡ **ACTIVITY LOG**   ▤ installation_20250822_074803.log

07:51:15 SUCCESS Prelude installation completed!

07:51:04 INFO Onboarding Prelude Gateway

✓ **Success**

Congratulations, you are now ready to enjoy Prelude features !!

2.2 Upgrade Instructions

2.2.1 Upgrade from v1.1 to v1.2

This documentation consider that Prelude is installed on two hosts in the `/opt/prelude` folder. It can be easily adapted for a single host installation.

Backup

Start by a backup of OneBoard database:

```
docker compose exec -it db-oneboard pg_dump --dbname=prelude --username=prelude > oneboard.backup.sql
```

Then, Stop both Prelude OneBoard and Prelude Foundation components.

```
docker compose down
```

Upgrade: Prelude OneBoard

Set the OneBoard container tag to v1.2 in docker-compose.yml.

```
image: registry.arolo-solutions.com/<setup-name>/prelude-oneboard:1.2
```

Pull the new images and start Oneboard :

```
docker compose pull
docker compose up -d
```

Migrate the database:

```
docker compose exec -it prelude /app/prelude-oneboard migrate
```

Connect to PostgreSQL and execute the SQL queries:

```
docker compose exec -it db-oneboard psql 'postgres://prelude:password@127.0.0.1:5432/prelude?password=<set password here>'
```

Queries

```
UPDATE prelude_device_interfaces SET interface_speed = interface_type;
UPDATE prelude_device_interfaces SET interface_type = 'plain-interface', usage = 'customer';
```

Migrate the plugins data:

```
docker compose exec -it prelude /app/prelude-oneboard eline migrate_v1_2
docker compose exec -it prelude /app/prelude-oneboard cpe_mgmt migrate_v1_2
```

Check that all containers are up and running (the name could be slightly different depending on the setup):

```
NAME                    IMAGE                                              COMMAND               SERVICE      CREATED
STATUS                  PORTS
prelude-oneboard-db-1   postgres:16.1-alpine                               "docker-entrypoint.s…" db-oneboard  6 minutes ago   Up 6
minutes                 5432/tcp
prelude-nats-1          nats:2.10-linux                                    "/nats-server -c /et…" nats         6 minutes ago   Up 6
minutes                 6222/tcp, 0.0.0.0:4222->4222/tcp, [::]:4222->4222/tcp, 8222/tcp
prelude-oneboard-1      registry.arolo-solutions.com/demo/prelude-oneboard:1.2  "/app/prelude-oneboa…" prelude   6 minutes ago   Up 6
minutes                 0.0.0.0:443->443/tcp, [::]:443->443/tcp, 0.0.0.0:4010->4010/tcp, [::]:4010->4010/tcp
```

OneBoard upgrade is done.

Upgrade: Prelude Foundation

Start by setting Gateway container tag to v1.2 in docker-compose.yml.

```
image: registry.arolo-solutions.com/prelude/prelude-gateway:1.2
```

Then pull the new images and start Gateway:

```
docker compose pull
docker compose up -d
```

Migrate the database:

```
docker compose exec -it gateway /app/prelude-gateway migrate
```

Add the new package ncs-6.1-prelude-interfaces-utils-1.2.tar.gz to NSO packages:

```
cp ~/ncs-6.1-prelude-interfaces-utils-1.2.tar.gz /opt/prelude/volumes/nso/run/packages
```

Then log in NSO and reload packages:

```
docker compose exec -it nso ncs_cli -u admin
> request packages reload
```

The expected output is:

```
admin@ncs> request packages reload

>>> System upgrade is starting.
>>> Sessions in configure mode must exit to operational mode.
>>> No configuration changes can be performed until upgrade has completed.
>>> System upgrade has completed successfully.
reload-result {
    package cisco-iosxr-cli-7.58
    result true
}
reload-result {
    package prelude-core
    result true
}
reload-result {
    package prelude-interfaces-utils
    result true
}
reload-result {
    package prelude-qos
    result true
}
reload-result {
    package prelude-ztp
    result true
}
... for each tailored service ...
reload-result {
    package prelude-<customer>-<service>
    result true
}
...

[ok][2025-07-09 09:02:15]
```

Check that all containers are up and running (the name could be slightly different depending on the setup):

```
NAME                 IMAGE                                                  COMMAND              SERVICE    CREATED
STATUS          PORTS
prelude-gateway-db-1    postgres:16.1-alpine                                "docker-entrypoint.s…"  db-gateway  6 minutes ago  Up 6
minutes           5432/tcp
prelude-gateway-1       registry.arolo-solutions.com/prelude/prelude-gateway:1.2  "/app/prelude-gatewa…"  gateway    6 minutes ago  Up 6
minutes           0.0.0.0:67->67/udp, [::]:67->67/udp, 0.0.0.0:4020-4021->4020-4021/tcp, [::]:4020-4021->4020-4021/tcp
prelude-nso-1           cisco-nso-prod:6.1.12                               "/run-nso.sh"        nso        6 minutes ago  Up 6 minutes
(healthy)   0.0.0.0:2022->2022/tcp, [::]:2022->2022/tcp
```

Foundation upgrade is done.

2.2.2 Upgrade from v1.2 to v1.3

This documentation consider that Prelude is installed on two hosts in the `/opt/prelude` folder. It can be easily adapted for a single host installation.

Backup

Start by a backup of OneBoard database:

```
docker compose exec -it db-oneboard pg_dump --dbname=prelude --username=prelude > oneboard.backup.sql
```

Then, Stop both Prelude OneBoard and Prelude Foundation components.

```
docker compose down
```

Upgrade: Prelude OneBoard

Add the following volume to the OneBoard container in `docker-compose.yml` :

```
- ./volumes/nats:/app/storage/nats
```

And remove the seed file binding:

```
- ./seed-oneboard.txt:/app/seed.txt
```

The OneBoard container definition should look like this:

```
oneboard:
    image: registry.arolo-solutions.com/<setup-name>/prelude-oneboard:1.2
    restart: unless-stopped
    volumes:
      - ./oneboard-config.json:/app/config.json
      - ./volumes/oneboard-storage/:/app/storage/
      - ./volumes/nats:/app/storage/nats
      - ./ssl:/ssl
    ports:
      - 443:443
      - 4010:4010
    depends_on:
      - oneboard-db
      - nats
```

Edit the NATS configuration file `volumes/nats/nats-server.conf` to match the following:

```
server_name: "prelude-nats"

host: 0.0.0.0
port: 4222
https_port: 8222

tls: {
  cert_file: "/tls/<your tls cert file>"
  key_file: "/tls/<your tls key file>"
  handshake_first: true
}

system_account: SYS

include ./nats-auth.conf
```

Then, set the OneBoard container tag to v1.3 in docker-compose.yml.

```
image: registry.arolo-solutions.com/<setup-name>/prelude-oneboard:1.3
```

Pull the new images and start OneBoard :

```
docker compose pull
docker compose up -d
```

Generate the NATS authentication file:

```
docker compose run --entrypoint="/app/prelude-oneboard init-nats" oneboard
docker compose up -d --remove-orphans
```

Finally, migrate the database:

```
docker compose exec -it oneboard /app/prelude-oneboard migrate
```

Check that all containers are up and running (the name could be slightly different depending on the setup):

```
NAME                IMAGE                                                COMMAND             SERVICE     CREATED
STATUS              PORTS
prelude-oneboard-db-1   postgres:16.1-alpine                             "docker-entrypoint.s…"  db-oneboard  6 minutes ago   Up 6
minutes             5432/tcp
prelude-nats-1      nats:2.10-linux                                      "/nats-server -c /et…"  nats        6 minutes ago   Up 6
minutes             6222/tcp, 0.0.0.0:4222->4222/tcp, [::]:4222->4222/tcp, 8222/tcp
prelude-oneboard-1      registry.arolo-solutions.com/demo/prelude-oneboard:1.3    "/app/prelude-oneboa…"  prelude      6 minutes ago   Up 6
minutes             0.0.0.0:443->443/tcp, [::]:443->443/tcp, 0.0.0.0:4010->4010/tcp, [::]:4010->4010/tcp
```

OneBoard upgrade is done.

Upgrade: Prelude Foundation

Remove the following volume of the Gateway container in `docker-compose.yml`:

```
- ./seed-gateway.txt:/app/seed.txt
```

The Gateway container definition should look like this:

```
gateway:
    image: registry.arolo-solutions.com/prelude/prelude-gateway:1.2
    restart: unless-stopped
    volumes:
      - ./gateway-config.json:/app/config.json
      - ./volumes/gateway-storage/:/app/storage/
      - ./ssl:/ssl
    ports:
      - 4020:4020
      - 4021:4021
      - 67:67/UDP
    depends_on:
      - gateway-db
      - prelude
```

Start by setting Gateway container tag to v1.3 in docker-compose.yml.

```
image: registry.arolo-solutions.com/prelude/prelude-gateway:1.3
```

Then pull the new images and start Gateway:

```
docker compose pull
docker compose up -d
```

Migrate the database:

```
docker compose exec -it gateway /app/prelude-gateway migrate
```

Connect to OneBoard UI, navigate to the Gateway connector and click on "Reset Onboarding", then copy the onboarding certificate and run the following command on the foundation host:

```
docker compose exec -it gateway /app/prelude-gateway onboard -force true -cert <onboarding-cert>
```

Check that all containers are up and running (the name could be slightly different depending on the setup):

```
NAME                IMAGE                                                COMMAND             SERVICE     CREATED
STATUS                  PORTS
prelude-gateway-db-1    postgres:16.1-alpine                             "docker-entrypoint.s…"  db-gateway   6 minutes ago   Up 6
minutes             5432/tcp
prelude-gateway-1       registry.arolo-solutions.com/prelude/prelude-gateway:1.3   "/app/prelude-gatewa…"  gateway      6 minutes ago   Up 6
minutes             0.0.0.0:67->67/udp, [::]:67->67/udp, 0.0.0.0:4020-4021->4020-4021/tcp, [::]:4020-4021->4020-4021/tcp
prelude-nso-1       cisco-nso-prod:6.1.12                                "/run-nso.sh"       nso         6 minutes ago   Up 6 minutes
(healthy)   0.0.0.0:2022->2022/tcp, [::]:2022->2022/tcp
```

NSO PACKAGES UPGRADE

On the OneBoard host, get the NSO packages:

```
docker compose cp oneboard:/nso-packages ./
```

Copy all the packages from the OneBoard host to the foundation host:

```
scp -r ./nso-packages user@foundation:/home/user
```

Remove previous version packages:

```
sudo rm /opt/prelude/volumes/nso/run/packages/ncs-*-prelude-*.tar.gz
```

Then, move the new files to the NSO packages folder:

```
sudo cp /home/user/nso-packages/* /opt/prelude/volumes/nso/run/packages
```

Finally, reload NSO packages

```
docker compose exec -it nso ncs_cli -u admin
> request packages reload
```

Foundation upgrade is done.

2.2.3 Upgrade from v1.3 to v1.4

This documentation consider that Prelude is installed on two hosts in the `/opt/prelude` folder. It can be easily adapted for a single host installation.

Backup

Start by a backup of OneBoard database:

```
docker compose exec -it db-oneboard pg_dump --dbname=prelude --username=prelude > oneboard.backup.sql
```

Then, Stop both Prelude OneBoard and Prelude Foundation components.

```
docker compose down
```

Upgrade: Prelude OneBoard

Then, set the OneBoard container tag to v1.4 in docker-compose.yml.

```
image: registry.arolo-solutions.com/<setup-name>/prelude-oneboard:1.4
```

Pull the new images :

```
docker compose pull
```

Migrate the database and start the containers:

```
docker compose run --entrypoint="/app/prelude-oneboard migrate" oneboard
docker compose up -d --remove-orphans
```

Check that all containers are up and running (the name could be slightly different depending on the setup):

```
NAME                   IMAGE                                              COMMAND                SERVICE        CREATED
STATUS                 PORTS
prelude-oneboard-db-1  postgres:16.1-alpine                               "docker-entrypoint.s…"  db-oneboard   6 minutes ago   Up 6
minutes                5432/tcp
prelude-nats-1         nats:2.10-linux                                    "/nats-server -c /et…"  nats          6 minutes ago   Up 6
minutes                6222/tcp, 0.0.0.0:4222->4222/tcp, [::]:4222->4222/tcp, 8222/tcp
prelude-oneboard-1     registry.arolo-solutions.com/demo/prelude-oneboard:1.4  "/app/prelude-oneboa…"  prelude   6 minutes ago   Up 6
minutes                0.0.0.0:443->443/tcp, [::]:443->443/tcp, 0.0.0.0:4010->4010/tcp, [::]:4010->4010/tcp
```

OneBoard upgrade is done.

Upgrade: Prelude Foundation

Start by setting Gateway container tag to v1.4 in docker-compose.yml.

```
image: registry.arolo-solutions.com/prelude/prelude-gateway:1.4
```

Then pull the new images and start the containers:

```
docker compose pull
docker compose up -d
```

Migrate the Gateway database:

```
docker compose exec -it gateway /app/prelude-gateway migrate
```

Check that all containers are up and running (the name could be slightly different depending on the setup):

```
NAME                   IMAGE                                              COMMAND                SERVICE        CREATED
STATUS                 PORTS
prelude-gateway-db-1   postgres:16.1-alpine                               "docker-entrypoint.s…"  db-gateway    6 minutes ago   Up 6
minutes                5432/tcp
prelude-gateway-1      registry.arolo-solutions.com/prelude/prelude-gateway:1.4  "/app/prelude-gatewa…"  gateway   6 minutes ago   Up 6
minutes                0.0.0.0:67->67/udp, [::]:67->67/udp, 0.0.0.0:4020-4021->4020-4021/tcp, [::]:4020-4021->4020-4021/tcp
```

```
prelude-nso-1          cisco-nso-prod:6.1.12                                "/run-nso.sh"        nso         6 minutes ago   Up 6 minutes
(healthy)   0.0.0.0:2022->2022/tcp, [::]:2022->2022/tcp
```

NSO PACKAGES UPGRADE

On the OneBoard host, get the NSO packages:

```
docker compose cp oneboard:/nso-packages ./
```

Copy all the packages from the OneBoard host to the foundation host:

```
scp -r ./nso-packages user@foundation:/home/user
```

Remove previous version packages:

```
sudo rm /opt/prelude/volumes/nso/run/packages/ncs-*-prelude-*.tar.gz
```

Then, move the new files to the NSO packages folder:

```
sudo cp /home/user/nso-packages/* /opt/prelude/volumes/nso/run/packages
```

Finally, reload NSO packages

```
docker compose exec -it nso ncs_cli -u admin
> request packages reload
```

Foundation upgrade is done.

3. Admin Guide

3.1 Prelude Network Automation - Admin Guide

This guide will help you to manage your Prelude instance.

3.1.1 Table of Contents

3.2 Connectors Management

3.2.1 Cisco NSO connector
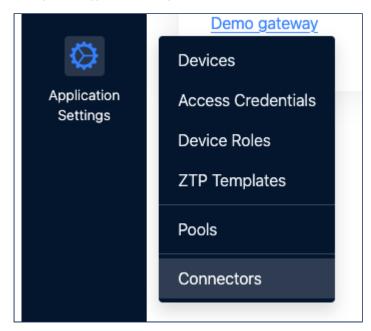
To add a Prelude Gateway to your Prelude instance, log in Prelude OneBoard

Access Credentials

First, we need to create a new Access Credentials.
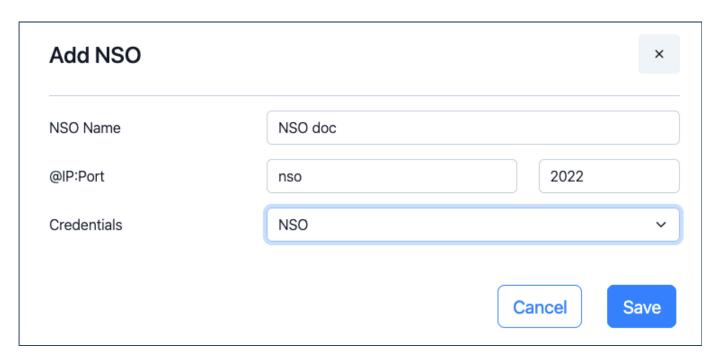
Register a Cisco NSO

Then, go in the **Application Settings** > **Connectors** view.
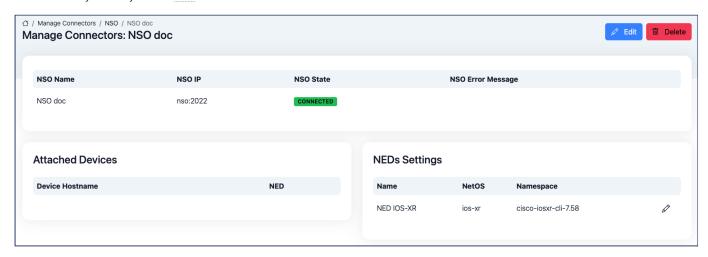
Then, select the **Cisco NSO** tab and click **+ New**.
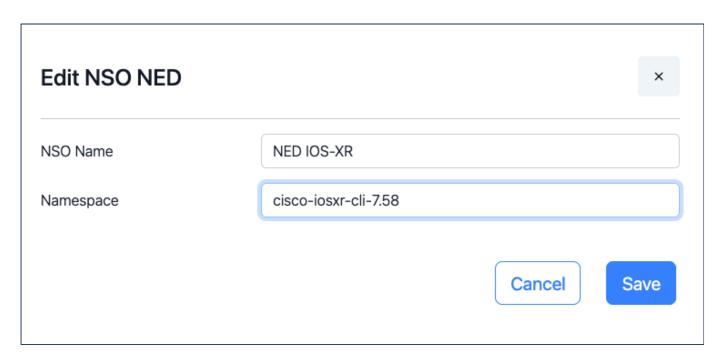
• **NSO Name** A name to identify which NSO you are adding in case of multi-NSO setup

• **IP** Use the IP address of your NSO host or `nso` if you are using the NSO docker image

• **Port** The NETCONF northbound API port, by default 2022

• **Credentials** Select in the list the Access Credentials created earlier

Add NSO

NSO Name	NSO doc
@IP:Port	nso 2022
Credentials	NSO ⌄

Cancel   Save

Make sure that your newly created NSO instance state is **connected**.

⌂ / Manage Connectors / NSO / NSO doc

Manage Connectors: NSO doc

✎ Edit   🗑 Delete

NSO Name	NSO IP	NSO State	NSO Error Message
NSO doc	nso:2022	CONNECTED	

Attached Devices

Device Hostname	NED

NEDs Settings

Name	NetOS	Namespace	
NED IOS-XR	ios-xr	cisco-iosxr-cli-7.58	✎

Finally, you need to set the NED namespace. Here for IOS-XR CLI NED:

Edit NSO NED

×

NSO Name

NED IOS-XR

Namespace

cisco-iosxr-cli-7.58

Cancel   Save
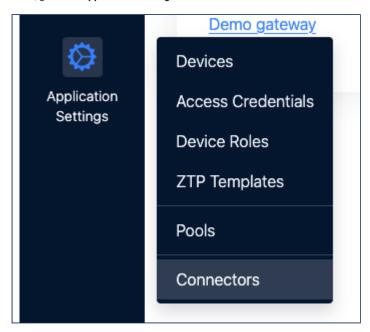
You can now use this Cisco NSO in Device settings.

3.2.2 Prelude Gateway connector
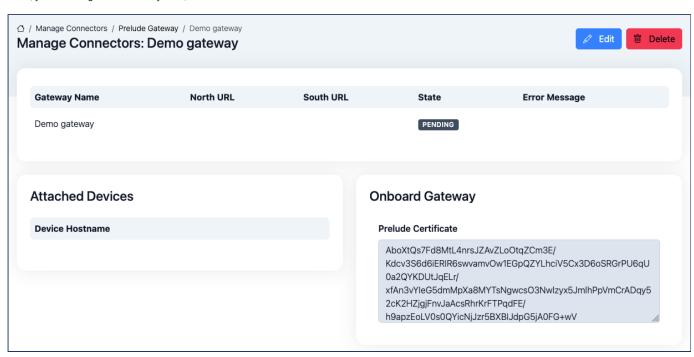
To add a Prelude Gateway to your Prelude instance, log in Prelude OneBoard

Then, go in the **Application Settings** > **Connectors** view and select the Prelude Gateway tab

Add a new Gateway, you will only need to provide a name to identify the gateway.

Then, you should get the Gateway view, with the Prelude Certificate.

Copy it, and run the following command:

```
docker compose exec -it gateway /app/prelude-gateway onboard -cert <certificate from OneBoard>
```

Prelude Gateway should now show up as "connected" in Prelude OneBoard.

⌂ / Manage Connectors / Prelude Gateway / Demo gateway

Manage Connectors: Demo gateway

✎ Edit   🗑 Delete

Gateway Name	North URL	South URL	State	Error Message
Demo gateway	https://prelude-demo.arolo.net:4020	http://100.75.134.107:4021	CONNECTED	
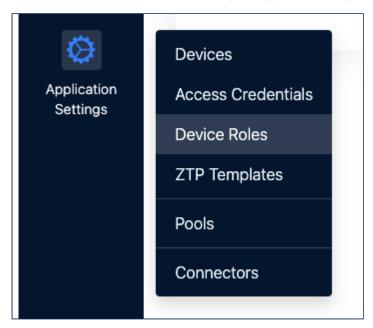
3.3 Devices Management

3.3.1 Device Roles

The device roles are used in Prelude OneBoard as a template of protocols to use to communicate with the device.

> ✏️ **Note**
>
> In futur version, the Device Role will also enabled/disabled Prelude capabilities based on chosen license.
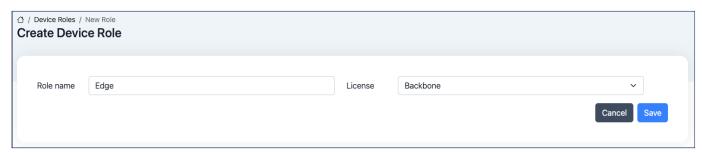
To add a Device Role in Prelude OneBoard, navigate to **Application Settings** > **Device Roles**.

Fill the form with the following information:

- **Role Name** A name to identify the usage of this role

- **License** Select the level of license you want to attach to the devices with this role (*it has currently no effect*)
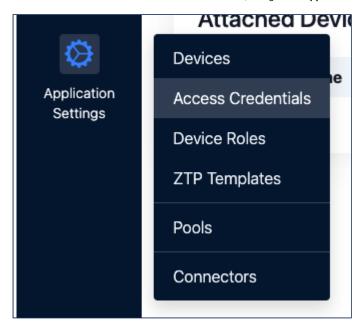
Your Device Role is ready to use.

3.3.2 Access Credentials

Access Credentials are used to authenticate against devices and Cisco NSO.

To add an Access Credentials in Prelude OneBoard, navigate to **Application Settings** > **Access Credentials**.

Fill the form with the following information:

- **Name** A name to identify the usage of this Access Credentials

- **Username** The username to use to authenticate against NSO, by default admin

- **Password** The NSO admin password, you set earlier

Your Access Credentials are ready to use.
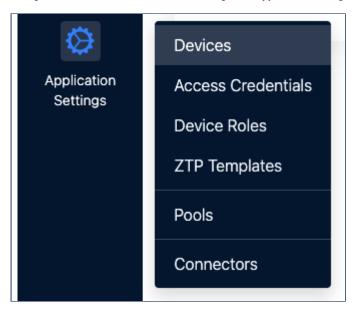
3.3.3 Devices

The Devices settings view is the where you can register devices that you want to push configuration on.

This is different from the Infrastructure Device view which is displaying operational and configurational information about devices.

Register a Device
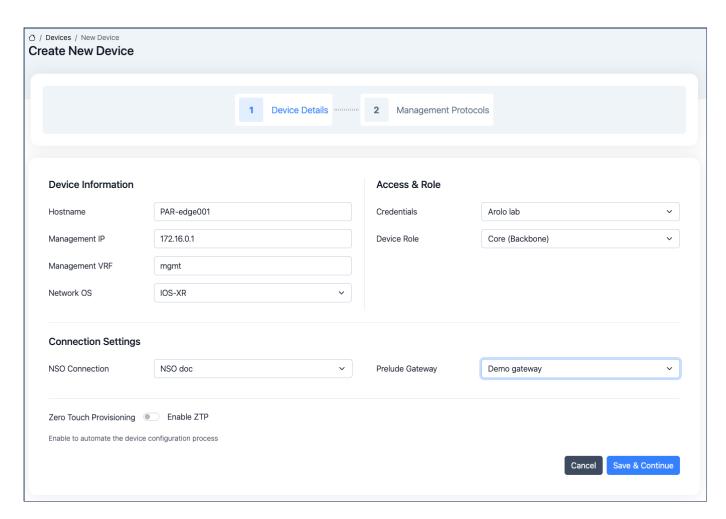
To register a Device in Prelude OneBoard, navigate to **Application Settings** > **Devices**.
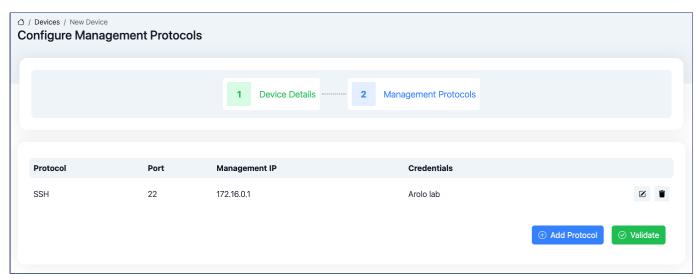
Then click on the "+ New Device" button.

First, you need to give the device details:

- **Hostname** The device hostname, it has to match the hostname configured on the device
- **Management IP** The management IP address of the device. Keep it blank if you are using a ZTP extension that will allocate it
- **Management VRF** The management VRF of the device. Keep it blank if management doesn't use a VRF.
- **Network OS** The Network Operating System of the device
- **Credentials** The credentials to access the device
- **Device Role** The role you want to apply to the device (the list of protocols and the license of the Device role will be applied to the device)
- **NSO Connection** Select the NSO instance you want to use to manage the device configuration. Keep it blank if you don't want to configure this device via Prelude
- **Prelude Gateway** Select the Gateway instance you want to use to manage the device
- **Enable ZTP** See the Prepare a Device for ZTP Section

⌂ / Devices / New Device

Create New Device

| 1 Device Details .... | 2 Management Protocols |

Device Information

Hostname | PAR-edge001

Management IP | 172.16.0.1

Management VRF | mgmt

Network OS | IOS-XR

Access & Role

Credentials | Arolo lab

Device Role | Core (Backbone)

Connection Settings

NSO Connection | NSO doc

Prelude Gateway | Demo gateway

Zero Touch Provisioning ◯ Enable ZTP

Enable to automate the device configuration process

Cancel Save & Continue

Then, you can customize the protocols that have been applied from the Device Role.

⌂ / Devices / New Device

Configure Management Protocols

| 1 Device Details .... | 2 Management Protocols |

Protocol	Port	Management IP	Credentials		
SSH	22	172.16.0.1	Arolo lab	✎	🗑

⊕ Add Protocol ⊘ Validate

For each protocol, you can change the port, management IP or credentials.

Then, you can validate your device settings.

PREPARE A DEVICE FOR ZTP
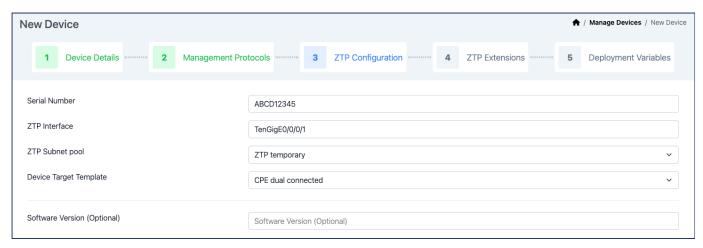
If you selected the **Enable ZTP** option on the first step of the device registration wizard, after validating the device protocols settings, you will get to the ZTP settings view.

For more details about **Zero Touch Provisioning**, see our ZTP guide

See our vendor support page to identify what wee are supporting.

This view will allow you to specify the parameters to automatically onboard the device when it will be connected to the network.

- **Serial Number** The serial number of the target device
- **ZTP Interface** The interface that will start the ZTP process on the target device
- **ZTP Subnet pool** The Subnet pool to allocate a prefix from for the first phase of the ZTP process (see our ZTP guide)
- **Device Target Template** The configuration template that will be push to the device during the second phase of the ZTP process (see our ZTP guide)
- **Software Version** Optional software version to install on the device during the ZTP process

New Device   🏠 / **Manage Devices** / New Device

| 1 Device Details | 2 Management Protocols | 3 ZTP Configuration | 4 ZTP Extensions | 5 Deployment Variables |

Serial Number	ABCD12345
ZTP Interface	TenGigE0/0/0/1
ZTP Subnet pool	ZTP temporary ⌄
Device Target Template	CPE dual connected ⌄
Software Version (Optional)	Software Version (Optional)

Then, select if you want to do Out-of-band ZTP or In-band ZTP

Out-of-band ZTP

For out-of-band ZTP, you need to specify additional parameters:

- **ZTP Subnet Gateway** The gateway to use during the first phase of the ZTP process (see our ZTP guide)
- **ZTP Subnet Netmask** The netmask of the prefix used during the first phase of the ZTP process (see our ZTP guide)

In-Band ZTP ⬜ Enable

Enable to configure in-band ZTP with attachment device

| ZTP Subnet Gateway | 10.100.0.254 |
| ZTP Subnet Netmask | 24 |

Cancel   🗑 Delete   ✓ Save

In-band ZTP

For in-band ZTP, you need to specify additional parameters:

- **Attachment Device** The device that will forward the ZTP requests
- **Attachment Interface** The Interface on the attachment device that will forward the ZTP requests
- **Attachment ZTP VRF** The VRF to use on the attachment device to forward the ZTP request
- **Attachment AS Number** The AS Number of the attachment device.

The VRF and ASN are used to announce the ZTP prefix in VRF BGP configuration on the attachment device.

In-Band ZTP ◉ Enable		
Enable to configure in-band ZTP with attachment device		
Attachment Device & Interface	Edge5	GigabitEthernet0/0/0/9 ▾ ⚙
Attachment ZTP VRF	ztp	
Attachment AS Number	64001	

Cancel 🗑 Delete ✓ Save

ZTP Extension

ZTP Extension are Prelude plugins that can extend the default ZTP process with additional steps to integrate the newly onboarded device in your infrastructure.

As ZTP Extension are specific plugins, you need to refer to your extensions' documentation.

Template Variables

Finally, you will have to give values to the user defined variables in the ZTP template you selected.

The variables defined in the templates are automatically displayed here. If a variable is not shown, you should check your template syntax.

Template Variables

Variable	Value
bgp_router_id BGP router-id	Value

Preview templates Save

The "Preview template" button allow you to visualize the selected template with all the variables populated.

NSO Connector

If you selected a NSO connector for the device, you will see on the Device settings page the **NSO sync state** and the **NSO Device ID**.

NSO SYNC STATE

The NSO sync state should be to **in-sync**, if it is showing **failed** click on the state to get more details.

NSO DEVICE ID

Before NSO 6.4, the device ID in NSO are difficult to change. So, we made the choice to use a UUID instead of the device hostname.

So, if you need to connect directly to NSO, you will need to use the UUID.

Connection Information

NSO Connector	NSO Device ID	NED
Demo NSO	b9202478-18a9-4e9f-a98b-b4bc05f46276	NED IOS-XR (cisco-iosxr-cli-7.58)
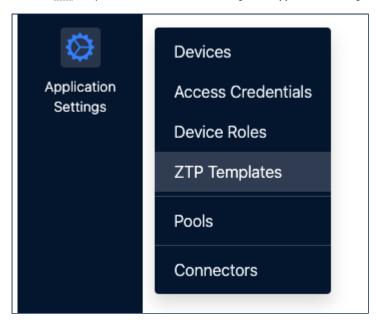
> ✏️ **Note**
>
> This behavior will most probably change in the futur.

3.3.4 ZTP Templates

ZTP templates are device configuration templates which are used as day0 configuration during ZTP process.
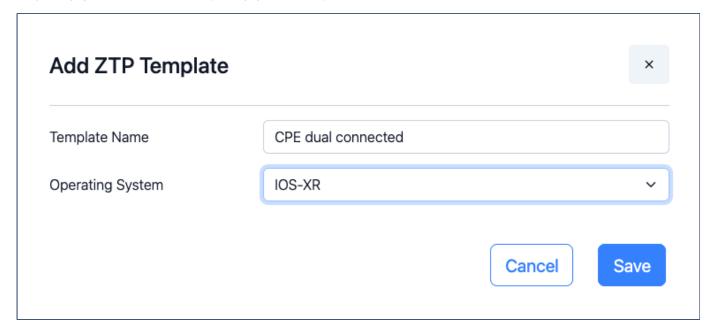
Create a ZTP Template

To add a ZTP Template in Prelude OneBoard, navigate to **Application Settings** > **ZTP Templates**.
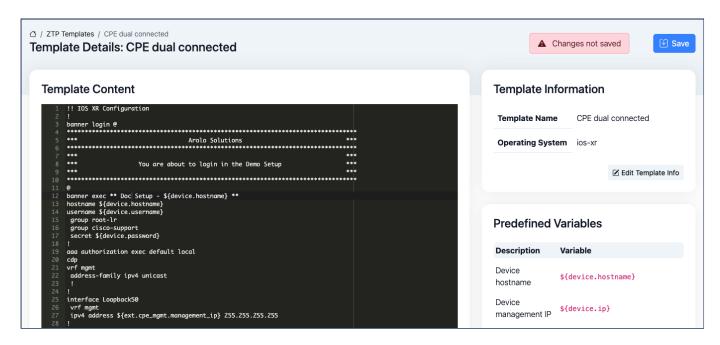
Fill the form with the following information:

- **Template Name** A name to identify the usage of this template
- **Operating System** Select the Network Operating System the template if for

Edit a ZTP Template

When editing a ZTP Template, don't forget to save it if the **"Changes not saved"** alert is shown.

Your ZTP Template is ready to use.

ZTP Template variables

In a ZTP template, you have three types of variables: - **OneBoard variables** which are automatically populated by OneBoard - **ZTP Extension variables** which are populated by the ZTP Extension you activated on a device - **User variables** which are define and populated by the user

ONEBOARD VARIABLES

List of variables define by OneBoard regarding the target device:

Variable	Description
${device.hostname}	Device hostname
${device.ip}	Device management IP
${device.management_vrf}	Device management VRF
${device.username}	Device username (from the access credentials)
${device.password}	Device password (from the access credentials)
${device.ztp_interface}	Interface that will be used for ZTP

In addition, if the in-band ZTP option is enable, OneBoard is providing these variables:

Variable	Description
${attachment.device}	Edge device which will forward the ZTP requests
${attachment.interface.id}	Interface ID on the edge device (i.e. for a Cisco XR device: 0/0/1/12)
${attachment.interface.speed}	Interface Speed on the edge device (i.e. for a Cisco XR device: TenGigE)
${attachment.vrf}	VRF on the edge device which will carry the ZTP traffic (it must route the traffic to Prelude Gateway)
${attachment.asn}	AS Number of the edge device

ZTP EXTENSION VARIABLES

The ZTP extension variables are define per extension, so you need to refer to your extension documentation to get the list.

The ZTP extension variables are using the format `${ext.<var-name>}`

USER VARIABLES

User can define as many variable as he needs.

The User variables are using the format `${<var-name>:"<description>"}`.

> ⚠️ **Warning**
>
> The `var-name` of a User variable cannot start with `device.`, `attachment.` or `ext.`.
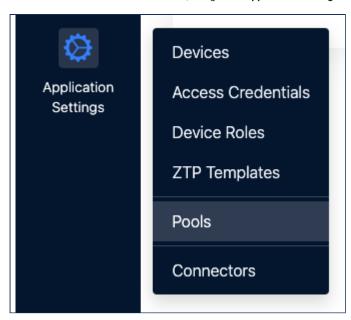
3.4 Pools Management

3.4.1 ID Pools

The ID pools allow you to allocate integers for the need of services.
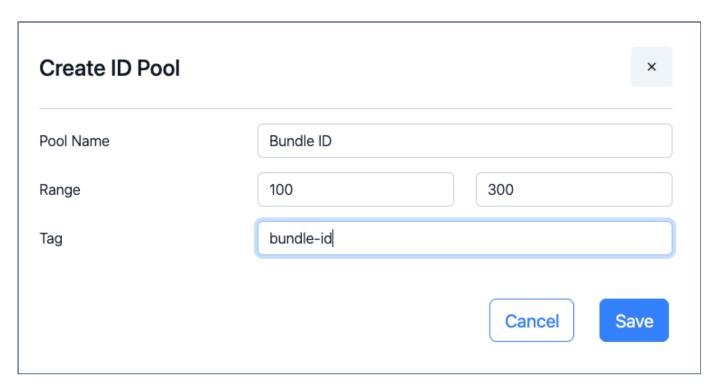
Create ID Pool

To add an ID Pool in Prelude OneBoard, navigate to **Application Settings** > **Pools**, then select the **ID Pools** tab.

Fill the form with the following information:

- **Pool Name** A name to identify the usage of this pool

- **Range** The first and last ID that can be allocated (including first and last)

- **Tag** Tag the pool to identify what type of data it is (see the Pool Tag section)
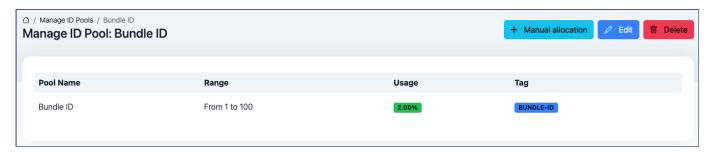
Your ID Pool is ready to use.

Manual Allocation
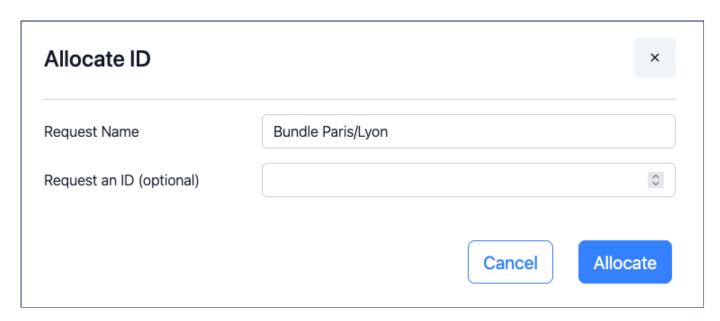
There is two ways to allocate IDs, automatically from Prelude services or manually.

To manually allocate an ID, navigate to the pool detail view.

Then click on the "+ Manual allocation" and fill the form with the following information:

 • **Request Name** A name to identify the usage of the ID

 • **Request an ID** Optional field, to request a specific value

Allocate ID

Request Name   Bundle Paris/Lyon

Request an ID (optional)

Cancel   **Allocate**

You can then release the requested ID by clicking on the "Release" button.

Only manually allocated IDs can be released from the pool view.

Pool Tag

The Pool Tag is used to identify what type of data the pool is allocating (bundle IDs, ASNs, EVIs, etc.).

⚠️ **Warning**

The range of multiple pools with the same tag cannot overlap!
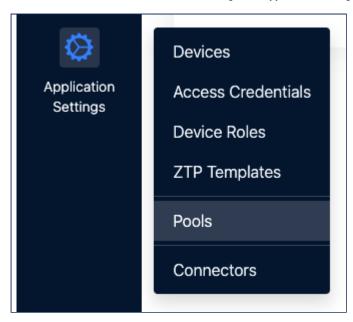
3.4.2 Subnet Pools

The Subnet Pools allow you to allocate IPv4 subnets for the need of services.
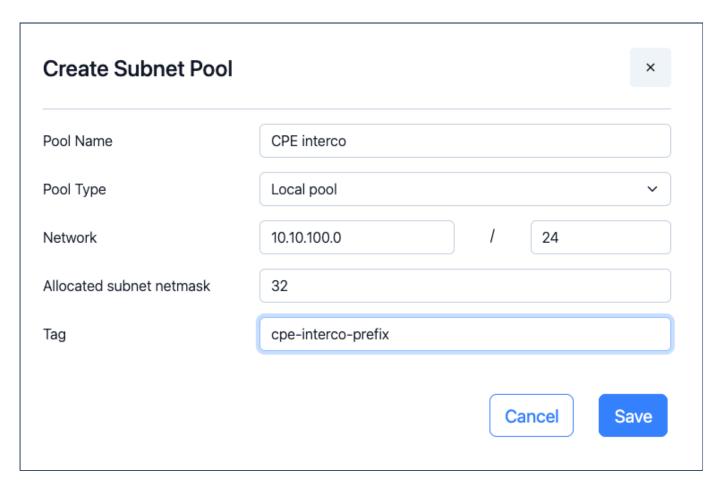
Create Subnet Pool

To add a Subnet Pool in Prelude OneBoard, navigate to **Application Settings** > **Pools**, then select the **Subnet Pools** tab.

Fill the form with the following information:

- **Pool Name** A name to identify the usage of this pool

- **Pool Type** Select the type of pool (only option for now is local, later pool delegation to external tool will be added)

- **Network** The parent prefix to allocate subnet from

- **Allocated subnet netmask** The size of the allocated subnet

- **Tag** Tag the pool to identify what type of data it is (see the Pool Tag section)

Create Subnet Pool

Pool Name	CPE interco
Pool Type	Local pool
Network	10.10.100.0 / 24
Allocated subnet netmask	32
Tag	cpe-interco-prefix

Cancel   Save
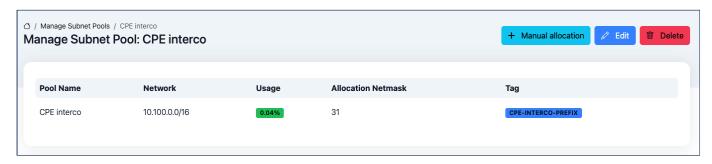
Your Subnet Pool is ready to use.

Manual Allocation
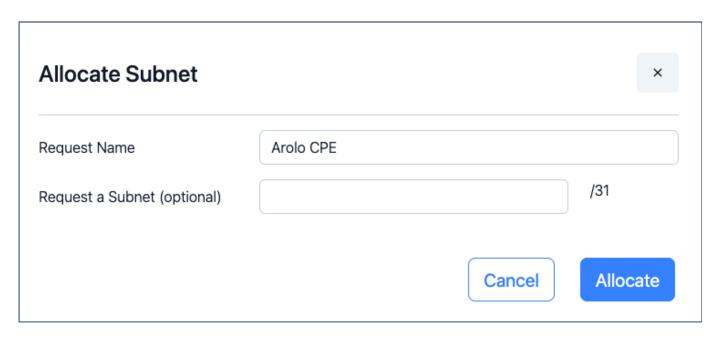
There is two ways to allocate subnets, automatically from Prelude services or manually.

To manually allocate a subnet, navigate to the pool detail view.

⌂ / Manage Subnet Pools / CPE interco
Manage Subnet Pool: CPE interco

+ Manual allocation   ✏ Edit   🗑 Delete

Pool Name	Network	Usage	Allocation Netmask	Tag
CPE interco	10.100.0.0/16	0.04%	31	CPE-INTERCO-PREFIX

Then click on the "+ Manual allocation" and fill the form with the following information:

• **Request Name** A name to identify the usage of the subnet

• **Request a Subnet** Optional field, to request a specific subnet

Allocate Subnet

×

Request Name

Arolo CPE

Request a Subnet (optional)

/31

Cancel   **Allocate**

You can then release the requested subnet by clicking on the "Release" button.

Only manually allocated subnets can be released from the pool view.

Pool Tag
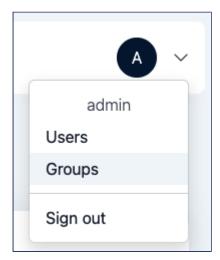
The Pool Tag is used to identify the usage of the subnets allocated by the pool (cpe-interco, cpe-management, etc.).

> ⚠️ **Warning**
>
> The Network of multiple pools with the same tag cannot overlap!

3.5 Users Management

3.5.1 Groups & Permissions Management

To manage Prelude groups and permissions, navigate to the user icon in the top right corner > "Groups".

3.5.2 Create Group

To create a Group, fill the following parameter:

• **Group Name** The name of the group

3.5.3 Permissions

On the group view, you can set the permissions for the group.

Prelude is using a node based permission system with three type of permissions:
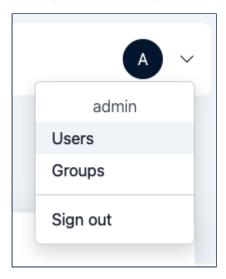
• **Read** Can access to the permission node in read mode

• **Write** Can access to the permission node in write mode. This also include the actions like deploying a service

• **Delete** Can delete object in the permission node

The permission nodes are different for the UI and the API:

- **foundation.ui.devices** Is managing the devices operation via the web UI

- **foundation.api.devices** Is managing the devices operation via the API

3.5.4 Users Management
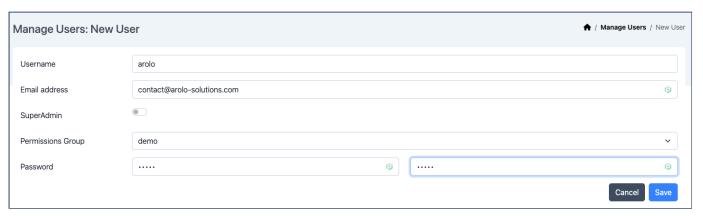
To manage Prelude users, navigate to the user icon in the top right corner > "Users".

3.5.5 Create User

To create a User, fill the following parameters:

• **Username** The username that will be display for the user

• **Email address** It will be later used to send monitoring alerts

• **SuparAdmin** If enabled, the user will have maximum permissions. SuparAdmin users can be identified by a little crown.

• **Permissions Group** The group that the user belong to. It will inherit of the permissions of the group

• **Password** User's password

3.6 Zero Touch Provisioning

Zero Touch Provisioning or ZTP is a mechanism to automatically onboard and configure device when they are connected to the network.

3.6.1 Classic ZTP

A classic ZTP process is following these steps:

1. The device send a DHCP request on all activated interface
2. It gets a DHCP response with the usual IP information plus a URL to download a script or a configuration file
3. It downloads the file
4. It executes the script or loads the configuration

3.6.2 Prelude ZTP

In Prelude, we are going further to provide additional feature and avoid caveats with certain network operating system.

Our ZTP process is divided in phases :

- **Phase 1** It is the classic ZTP process but instead of sending the target day0 config file, we are sending to the device a minimal config file that only enable SSH management.
- **Phase 2** If required, a software upgrade is done via the SSH connection
- **Phase 3** The day0 config file is loaded in the device. If the device support it, the config file is validated before loading.

In case of In-band ZTP, the required configuration on the attachment device is automatically handle by Prelude ZTP process.

We also support ZTP extension which are Prelude plugins that can add phases to the process.

If the device support it, Prelude is doing a rollback of the day0 configuration if the device is not reachable on its management IP 5 minutes after the config have been loaded.

4. User Guide

4.1 Prelude User Guide

Prelude OneBoard application is split in four different parts:

- **Services** for end customer related services and features

- **Infrastructure** for device and transport related inventory, monitoring and services

- **Maintenance** for Software Upgrade

- **Application Settings** to manage the devices, pools, connectors, etc. See the Admin Guide section

4.1.1 Table of Contents

4.2 Services

4.2.1 Customers Management
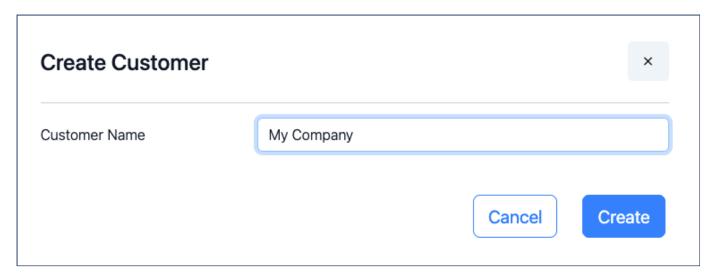
In Prelude OneBoard, the customer related services are grouped by end customer, so you need to register the end customer before creating a new customer service.

Create a customer

To create a new customer in Prelude OneBoard, navigate to **Services** > **Customers**.

Set the customer name:

You can now create services for this customer.

4.3 Infrastructure
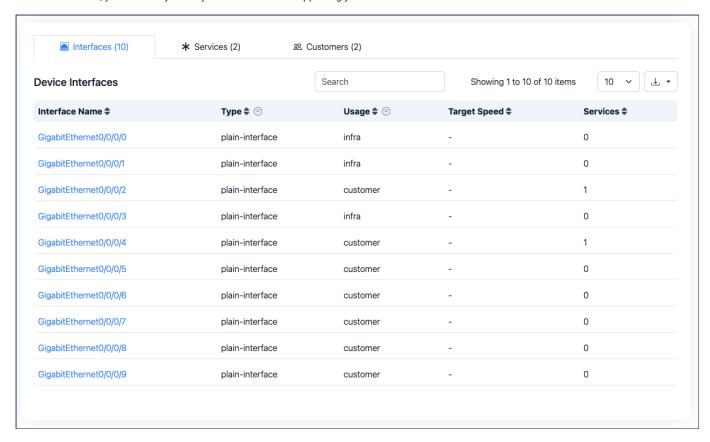
4.3.1 Infrastructure Devices

The infrastructure Devices view in Prelude OneBoard allow you to easily identify where your services are and set some parameters on interfaces.

Services Inventory

DEVICE VIEW

On the device view, you can easily identify which interface is supporting your customer or infrastructure services.

	Interfaces (10)	✳ Services (2)	🖧 Customers (2)		
Device Interfaces		Search	Showing 1 to 10 of 10 items	10 ⌄	⬇ ▾

Interface Name ⇕	Type ⇕ ≡	Usage ⇕ ≡	Target Speed ⇕	Services ⇕
GigabitEthernet0/0/0/0	plain-interface	infra	-	0
GigabitEthernet0/0/0/1	plain-interface	infra	-	0
GigabitEthernet0/0/0/2	plain-interface	customer	-	1
GigabitEthernet0/0/0/3	plain-interface	infra	-	0
GigabitEthernet0/0/0/4	plain-interface	customer	-	1
GigabitEthernet0/0/0/5	plain-interface	customer	-	0
GigabitEthernet0/0/0/6	plain-interface	customer	-	0
GigabitEthernet0/0/0/7	plain-interface	customer	-	0
GigabitEthernet0/0/0/8	plain-interface	customer	-	0
GigabitEthernet0/0/0/9	plain-interface	customer	-	0

Which are the services configure on this device.

Interfaces (10)	✳ Services (2)	🖧 Customers (2)		
Device Services	Search	Showing 1 to 2 of 2 items	10 ⌄	⬇ ▾

Service Name ⇕	Type ⇕	Customer ⇕	State ⇕	Interfaces ⇕
DCI_PAR-LYO	evpn-eline	Jupiter Networks	↗ DEPLOYED	1
demo-ce-10	demo-cpe-mgmt	Saturn Corp	↗ DEPLOYED	1

And what customers have services on this device.

Interfaces (10)	✷ Services (2)	👥 Customers (2)

Device Customers   Search   Showing 1 to 2 of 2 items   10 ⌄   ⬇ ▾

Customer Name ⇕	Services on this Device ⇕
Jupiter Networks	1
Saturn Corp	1
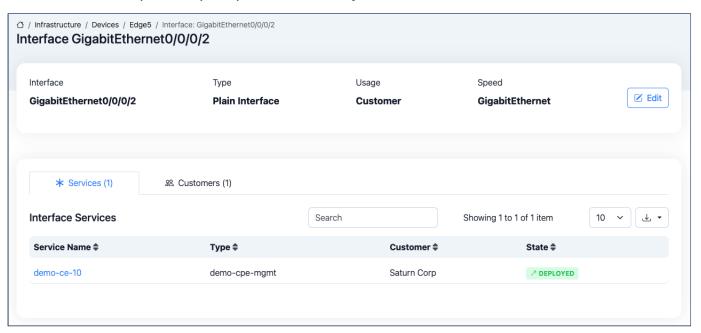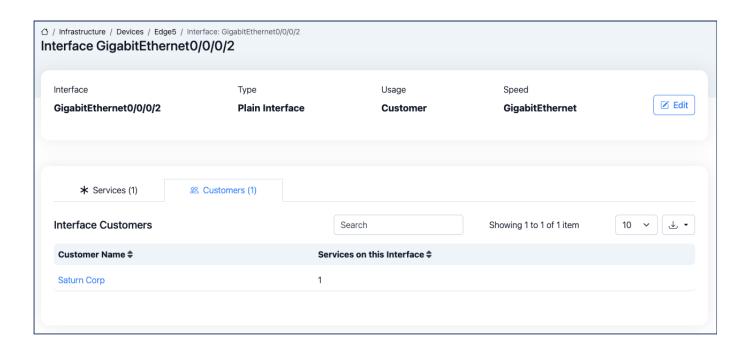
INTERFACE VIEW

On the device interface view, you can easily identify which services are using this interface.

⌂ / Infrastructure / Devices / Edge5 / Interface: GigabitEthernet0/0/0/2

Interface GigabitEthernet0/0/0/2

Interface	Type	Usage	Speed	
GigabitEthernet0/0/0/2	**Plain Interface**	**Customer**	**GigabitEthernet**	✎ Edit

✷ Services (1)	👥 Customers (1)

Interface Services   Search   Showing 1 to 1 of 1 item   10 ⌄   ⬇ ▾

Service Name ⇕	Type ⇕	Customer ⇕	State ⇕
demo-ce-10	demo-cpe-mgmt	Saturn Corp	↗ DEPLOYED

And what customers have services on this interface.

⌂ / Infrastructure / Devices / Edge5 / Interface: GigabitEthernet0/0/0/2

Interface GigabitEthernet0/0/0/2

Interface	Type	Usage	Speed	
GigabitEthernet0/0/0/2	**Plain Interface**	**Customer**	**GigabitEthernet**	✎ Edit

✳ Services (1)	👥 Customers (1)

Interface Customers   Search   Showing 1 to 1 of 1 item   10 ⌄   ⬇ ▾

Customer Name ⇅	Services on this Interface ⇅
Saturn Corp	1

Interface settings

From the infrastructure interface view, you can set some parameters of the interface:

Interface Settings ✕

Target Speed

```
Select Target Speed                                    ⌄
```

Usage

```
Customer                                               ⌄
```

Force Interface Speed

```
no forced speed (default)                              ⌄
```

Close

TARGET SPEED

This is a Cisco IOS-XR specific parameter that allow to specify that the configuration to push on this interface needs to use a different speed than the current one.

For exemple if the interface is currently TenGigE0/0/2/12, but after plugging a new SFP it will become GigabitEthernet0/0/2/12, setting the Target Speed to GigabitEthernet will push the configuration as `preconfigure` .

USAGE

To specify if this interface can be used to configure customer services or infrastructure services.

- **Customer services** LxVPN, Internet Access, etc. They are services on interfaces facing a customer's device

- **Infrastructure services** IGP, etc. They are services on interfaces facing internal infrastructure

FORCE INTERFACE SPEED

This is a Cisco specific parameter that allow to force the interface speed to 1Gbps or lower.

Options are : auto-negotiation, 1G, 100M & 10M

4.4 Maintenance

4.4.1 Software Upgrade

Prelude OneBoard provide a simple software upgrade system.

Check the Vendor Support table to know what Operating Systems are supported.
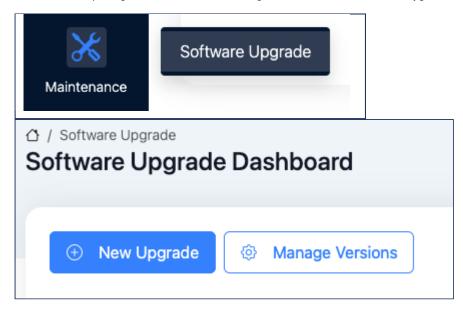
> ✏ **Note**
>
> The Software Upgrade system in Prelude is a preview of a more complete feature that will come later.

Software Packages
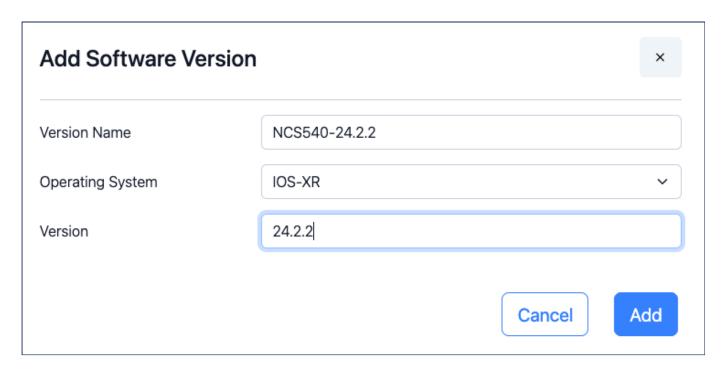
Before starting an upgrade, you need to upload in Prelude the required packages.

To add Software packages in Prelude OneBoard, navigate to **Maintenance** > **Software Upgrade** and then **Manage Versions**.

Create a new Software Version:

- **Version Name** a distinguished name
- **Operating System** the target operating system
- **Version** The version identifier

Then, add all the required files:

You can now, start an upgrade using this version.
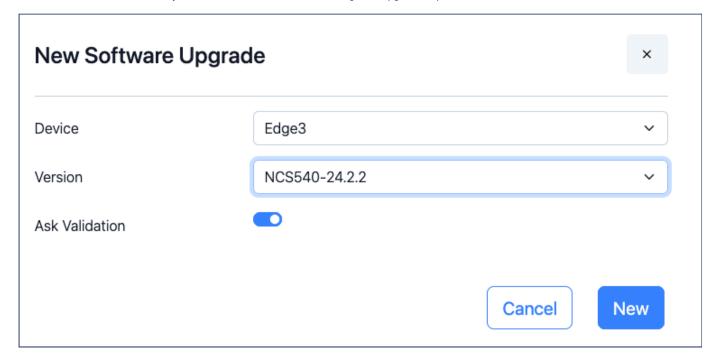
Software Upgrade

To start a Software Upgrade in Prelude OneBoard, navigate to **Maintenance** > **Software Upgrade**.
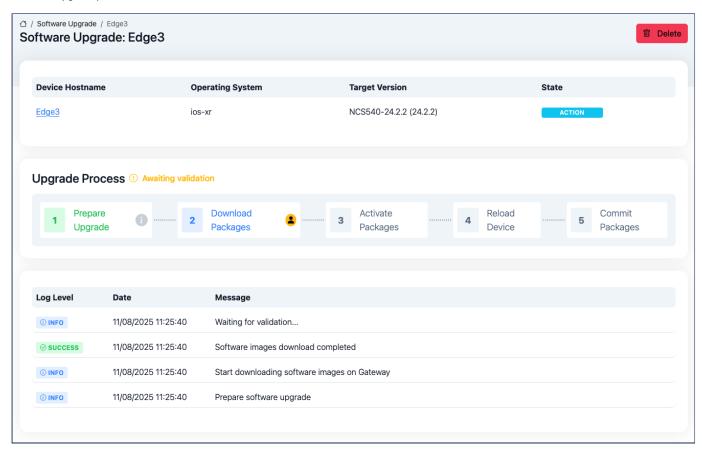
Then, click **New Upgrade** and fill the form:

- **Device** select the device to upgrade
- **Version** select the version to install
- **Ask Validation** if enabled, the system will ask validation before starting each upgrade step

New Software Upgrade

Device	Edge3
Version	NCS540-24.2.2
Ask Validation	(toggle on)

Cancel   New

Then, the upgrade process will start and ask for validation, if asked for it.

⌂ / Software Upgrade / Edge3

Software Upgrade: Edge3   🗑 Delete

Device Hostname	Operating System	Target Version	State
Edge3	ios-xr	NCS540-24.2.2 (24.2.2)	ACTION

Upgrade Process ⚠ Awaiting validation

| 1 Prepare Upgrade | ⓘ | 2 Download Packages | 👤 | 3 Activate Packages | 4 Reload Device | 5 Commit Packages |

Log Level	Date	Message
ⓘ INFO	11/08/2025 11:25:40	Waiting for validation...
⊘ SUCCESS	11/08/2025 11:25:40	Software images download completed
ⓘ INFO	11/08/2025 11:25:40	Start downloading software images on Gateway
ⓘ INFO	11/08/2025 11:25:40	Prepare software upgrade

In case of failure, you can restart the upgrade process from any successful state.

4.5 Demo Services

4.5.1 EVPN Eline - demo service
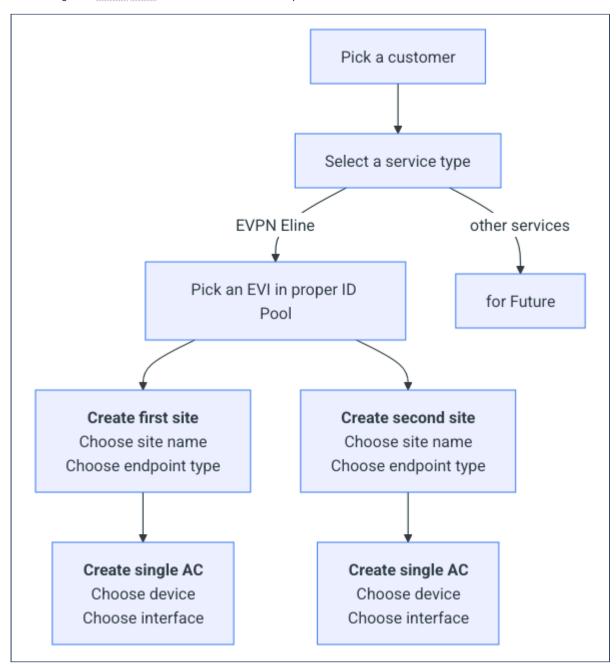
The demo version of Prelude come with a simple EVPN Eline demo service to showcase the Prelude service capabilities.

What we want to highlight with this service is level of abstraction we are bringing in Prelude. In the demo service as in all the tailored services we are shipping to our customers, we are trying to offer the highest level of abstraction of the underlying technology and configuration.

For exemple in the EVPN Eline demo service, you will be asked to choose between CPE endpoint or MMR (Meet Me Room) endpoint and this simple choice will lead to different configuration underneath.

EVPN Eline provisioning graph

Provisioning of an L2VPN EVPN ELine service could be sum up as follows:

Step-by-step procedure to build an Eline service

CHOOSE A CUSTOMER AND SELECT A SERVICE TYPE

To create a new customer in Prelude OneBoard:
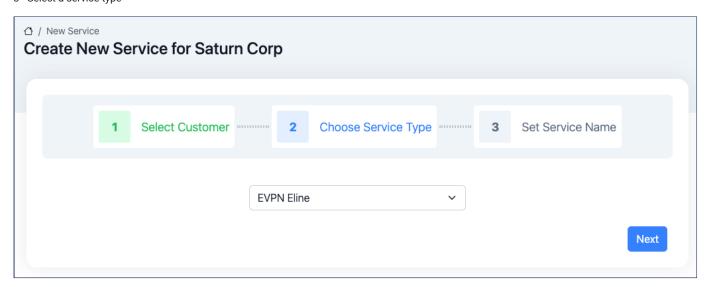
1 - Navigate to **Services** > **Dashboard** and then click on **New Service**.
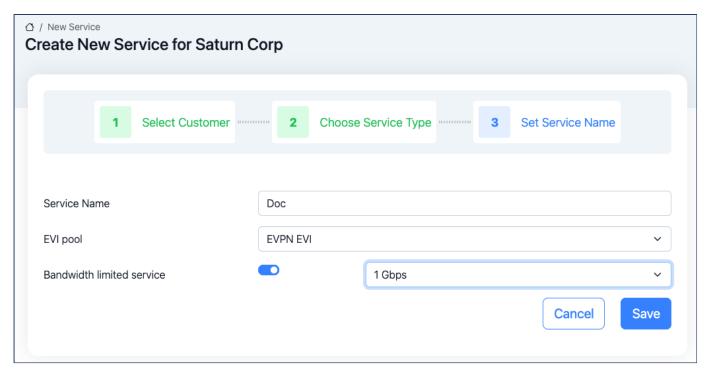
2 - Select a customer

3 - Select a service type
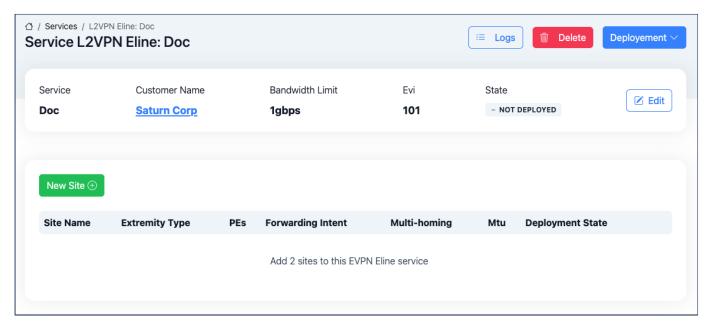
CREATE THE NEW SERVICE

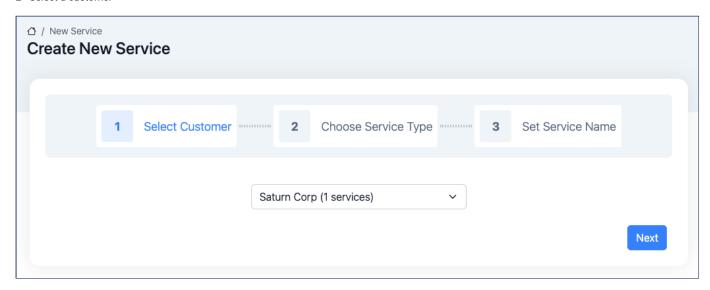⌂ / New Service

Create New Service for Saturn Corp

1 Select Customer	**2** Choose Service Type	**3** Set Service Name

Service Name	Doc
EVI pool	EVPN EVI ⌄
Bandwidth limited service	🔵 1 Gbps ⌄

Cancel   Save
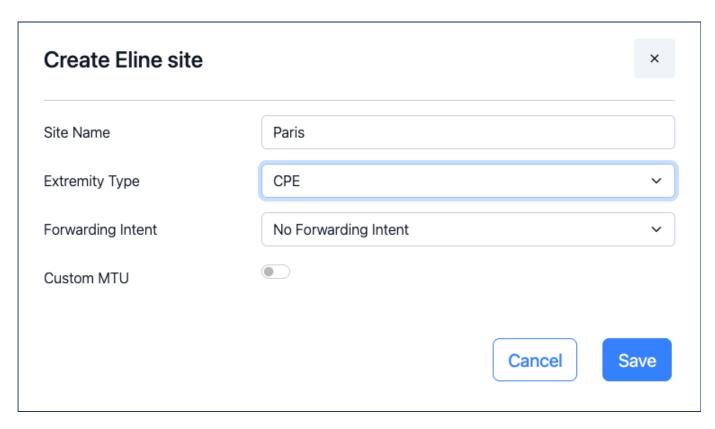
CREATE BOTH SITES

Then, you need to create two sites (extremity).

1 - Service overview

⌂ / Services / L2VPN Eline: Doc

Service L2VPN Eline: Doc

≡ Logs   🗑 Delete   Deployement ⌄

Service	Customer Name	Bandwidth Limit	Evi	State	
Doc	**Saturn Corp**	**1gbps**	**101**	– NOT DEPLOYED	✎ Edit

New Site ⊕

Site Name	Extremity Type	PEs	Forwarding Intent	Multi-homing	Mtu	Deployment State

Add 2 sites to this EVPN Eline service

2 - Create a site

Create Eline site

Site Name	Paris
Extremity Type	CPE
Forwarding Intent	No Forwarding Intent
Custom MTU	

Cancel   Save

3 - Service overview after sites creation

New Site ⊕

Site Name	Extremity Type	PEs	Forwarding Intent	Multi-homing	Mtu	Deployment State			
Lyon	MMR		-	Single-Homed	default	– NOT DEPLOYED			˄

Attachment circuit 1

＋ Attachment Circuit

| Paris | CPE | | - | Single-Homed | default | – NOT DEPLOYED | | | ˅ |

CREATE ATTACHMENT CIRCUITS ON BOTH SITES

Create an attachment circuit on each site.

During the AC creation, the interface selection dropdown help you to select a usable interface.
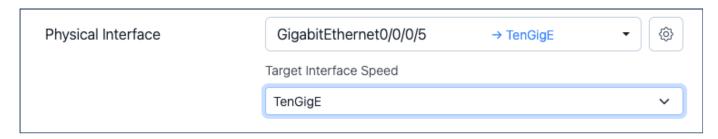
The interface dropdown shows you all the device interface but prevents you from choosing an interface that won't work.
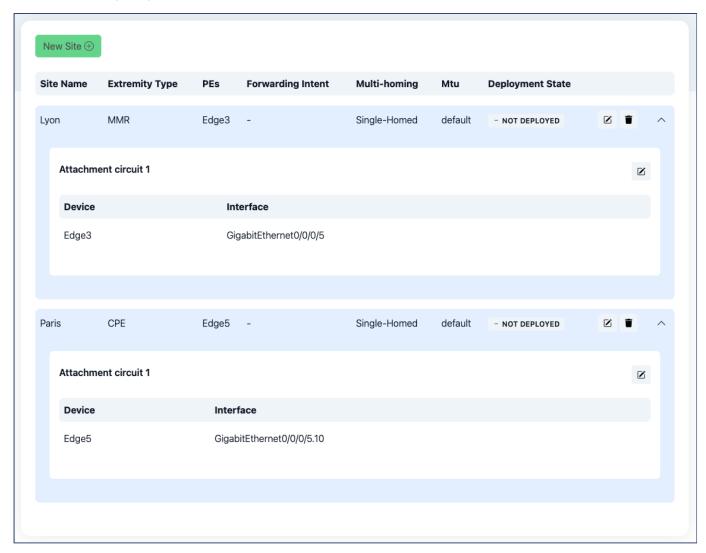
The excluded interfaces are:

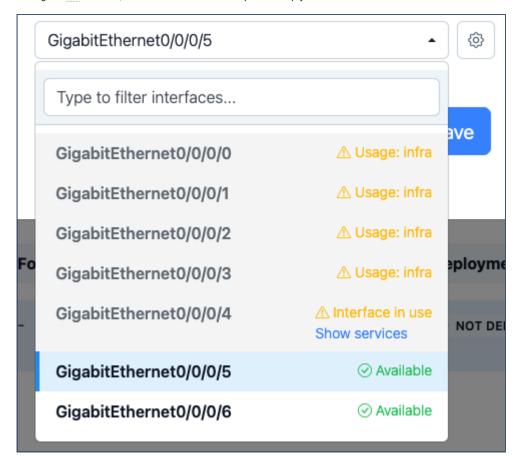- **Infra interfaces** Interfaces that are supposed to be used for infrastructure purpose not customer services.
- **Incompatible interfaces** Interfaces that are already supporting services which are not compatible with the service you want to configure.

Once the interface is selected, you can change the speed to make the configuration on this interface pushed with `preconfigure` (**Only for Cisco IOS-XR**).

Now, the service is fully configured in Prelude OneBoard.

DEPLOY THE SERVICE

In Prelude OneBoard, all the services configuration is only done locally and only when explicitly requested, the configuration is pushed to the devices.

Everything that have been done until now, is only impacted OneBoard database.
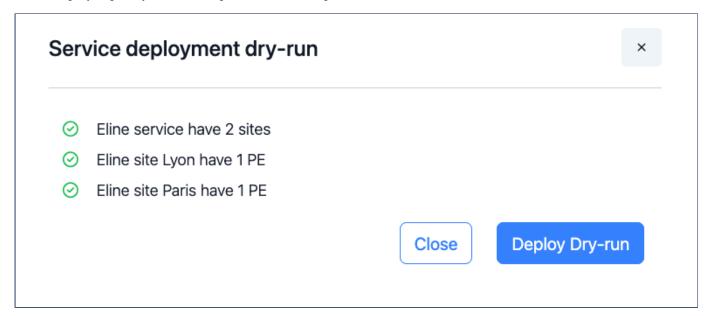
To deploy the configuration to the network, you need to follow these steps:

1. Dry run the service's configuration to validate everything is ok

Navigate to the **Deploy dry-run** button.

Before doing anything, the system is checking that the service configuration is correct.

Then, OneBoard is asking Cisco NSO to generate the configuration dry-run for the service.

Service deployment dry-run

×

Edge5	Edge3	NSO Payload

```
interface GigabitEthernet 0/0/0/5
 description Saturn Corp
 lldp
 exit
 no shutdown
exit
interface GigabitEthernet 0/0/0/5.10 l2transport
 description [ELINE DOC]  Saturn Corp (1gbps)
 encapsulation dot1q 10
 service-policy input eline-1gbps
 no shutdown
 rewrite ingress tag pop 1 symmetric
exit
evpn
 evi 101
  bgp
   route-target import 101:101
   route-target export 101:101
  exit
 exit
exit
l2vpn
 xconnect group evpn-vpws
  p2p DOC
   interface GigabitEthernet0/0/0/5.10
   neighbor evpn evi 101 service 101
    !
  exit
 exit
exit
```

Close   Deploy   Deploy Dry-run

1. If you are happy with the target configurations you can click on "deploy" to try service deployment:

Service deployment dry-run

✕

- ⊘ Eline service have 2 sites
- ⊘ Eline site Lyon have 1 PE
- ⊘ Eline site Paris have 1 PE
- ⊘ Connected to Edge3
- ⊘ Connected to Edge5
- ⊘ Service deployed

Close

Prelude will ensure that we can connect to all devices before starting the configuration.

Fix deployment errors

> ✏️ **Note**
>
> You cannot break a service with Prelude because of the checks that are performed on actual devices configuration. In other words, Prelude will fail if there is an existing configuration on a given device, conflicting with configuration intent of the new service you are willing to deploy.

If the service failed to deploy, it will go in state `failed` and you can get the deployment error from NSO by clicking on the state badge.

You can then fix the problem and simply re-try the service deployment.

One the of the usual deployment error is device `out-of-sync`, to fix this issue, simply go in **Application Settings > Devices > Out-of-Sync device** and click **Sync-From** in the NSO actions dropdown.

5. Vendor Support

5.1 Prelude Vendor Support

The following tables describe what is currently supported in Prelude per vendor/Operating System.

We are adding support per customer request so don't hesitate to contact us if you are interested in a Prelude feature but for a different vendor.

5.1.1 Services

Feature	Cisco IOS-XR	Other Vendors
Demo EVPN Eline	✅	
Services Configuration Lifecycle	✅	✅
Services Inventory	✅	✅

5.1.2 Software Upgrade

Feature	Cisco IOS-XR
Software Upgrade	✅

5.1.3 ZTP

Feature	Cisco IOS-XR	Ciena SAOS6
ZTP Onboarding	✅	✅
On failure rollback	✅	

6. FAQ

6.1 Frequently Asked Question

6.1.1 Cisco NSO

How to access NSO CLI

To access NSO CLI, connect to the Prelude Foundation host, got to the `/opt/prelude` folder (or your installation folder).

Run:

```
docker compose exec -it nso ncs_cli -u admin -C
```

NSO is complaining about "no matching host key found"

With some legacy routers NSO might end up with the following failure:

```
Oct 30 10:14:48.406 UTC: SSHD_[65944]: %SECURITY-SSHD-6-INFO_GENERAL :
no matching hostkey found:
client ssh-ed25519,ecdsa-sha2-nistp256,ecdsa-sha2-nistp384,ecdsa-sha2-nistp521,rsa-sha2-512,rsa-sha2-256
server ssh-dss
```

The server (ie the legacy router) proposal is ssh-dss only.

However the client (NSO) does not support ssh-dss since it is deprecated.

Simple fix: allow NSO to negotiate ssh-dss with that specific device.

You can do so with that simple CLI:

```
set devices device <device_id> ssh-algorithms public-key [ ssh-dss ]
```

7. Helpdesk

7.1 Helpdesk

If you are encountering issues with Prelude, open a ticket at contact@arolo-solutions.com

www.arolo-solutions.com