

# User Manual

## Configuration Industrial Edge Gateway OpEdge

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# 1 Start Here

## 1.1 About OpEdge

OpEdge is an industrial gateway designed for secure remote connectivity and Industrial Internet of Things (IIoT) applications.

OpEdge enables highly secure and reliable device-to-device and device-to-cloud communications. The gateway includes a serial (RS-232) port and multiple Ethernet ports, allowing for local connectivity to devices like PAC/PLCs, RTUs, DCS systems, smart instruments, electronic billboards, and communication towers.

OpEdge can be configured and managed through the webpage or via the Belden Horizon platform. Belden Horizon is a secure and intuitive cloud native platform that supports multiple applications like on-demand (secure machine access) or always-on (persistent data network) connectivity, data monitoring and alert notification.

OpEdge provides cloud connectivity to Belden Horizon via the Ethernet port.

## 1.2 Information sheet

The Hirschmann Safety and general information sheet and the OpEdge information sheet are provided in the OpEdge packaging. They provide basic installation and configuration information.

## 1.3 Installation Guide

The OpEdge Installation Guide provides detailed power, wiring, cables, and diagnostics information. It can be downloaded from [www.doc.hirschmann.com](http://www.doc.hirschmann.com).

# 2 Initial Configuration

This chapter covers the initial configuration of the OpEdge via the webpage. Once the OpEdge is registered on Belden Horizon, the OpEdge can be maintained via Belden Horizon (See [Chapter 3](#) for more details).

The initial configuration includes setting up the LAN port. These steps must be followed, even if the OpEdge is going to be registered via Belden Horizon for cloud connectivity.

## 2.1 Minimal CLI

- 1. Connect the modules with their respective console cables
  - a. OpEdge-8D : COM2
  - b. OpEdge-4D : SERIAL



- 2. Open the serial port in host machine with baud rate 115200
  - a. OpEdge-8D :

```
#####  
#  
#           OpEdge-8D Command Line Interface           #  
#-----#  
#           Date: 03/08/2023           Time: 08:19:49           #  
#-----#  
#           Interface/Bridge Details           #  
#-----#  
#           lan1 : 192.168.0.250           #  
#           lan7 : 0.0.0.0           #  
#-----#  
#-----#  
#####
```

b. OpEdge-4D :

```
#####  
#  
#           OpEdge-4D Command Line Interface           #  
#           #                                         #  
#           Date: 27/07/2020           Time: 08:27:15           #  
#           #                                         #  
#           Interface/Bridge Details           #  
#           #                                         #  
#           lan1 : 192.168.0.250           #  
#           lan2 : 0.0.0.0           #  
#           #                                         #  
#           #                                         #  
#####  
>
```

3. **get ip** : To check the ip address of the device

```
>get ip  
#           #  
#           #  
#           lan1 : 192.168.0.250           #  
#           lan7 : 0.0.0.0           #  
#           #                                         #  
#           #                                         #  
>
```

4. **set ip** : To set the ip address of the device

- a. set ip <IP Address> gw <Gateway> dev <Name of the lan part to set IP>
- b. Press **Enter**
- c. Enter username: root
- d. Password is **password** and if UI password has been changed already, then use the updated password <Local UI Password>
- e. Press enter

```
>set ip 10.20.254.72/24 gw 10.20.254.1 dev lan1  
IP address 10.20.254.72 is valid  
IP address 10.20.254.1 is valid  
Please input Login credentials  
Login: admin  
Password:  
Login Successfull !!!  
Please wait ...  
IP updated successfully!!!  
>
```

5. **factory-reset** : This command can be used to perform the factory reset operation

- a. Enter **factory-reset** command
- b. It will ask if we want to continue : press **y** if you want to perform a factory reset or else press **n** and then press **Enter**

```
>factory-reset  
  
Warning:Performing factory reset will remove all configuration and data from device and reset to factory setting  
Are you sure you want to continue(y/n)?  
y  
  
System resetting to default IPs  
  
Please wait for 5 minutes before logging again....  
Resetting ...  
>
```

6. **reboot** : Enter the **reboot** command and it will restart the module.



## 2.2 Connecting to the OpEdge Webpage

Perform the following steps to connect to the OpEdge webpage:

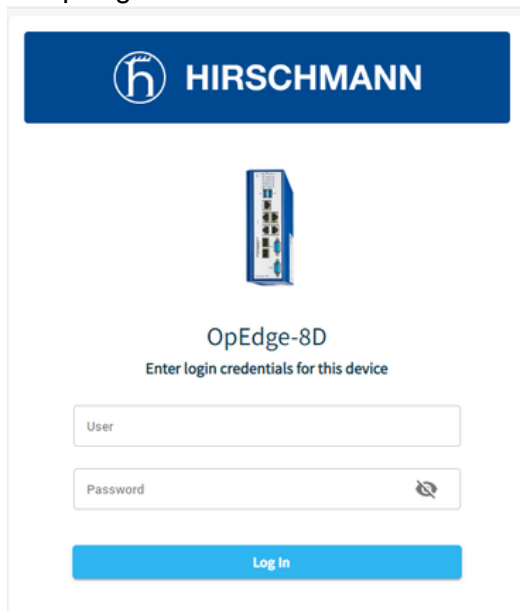
- 1 Ensure that the module is connected to the network to Ethernet port 1, and apply power to the module.

**NOTE:** The PC must be on the same subnet as the OpEdge's default IP address settings.

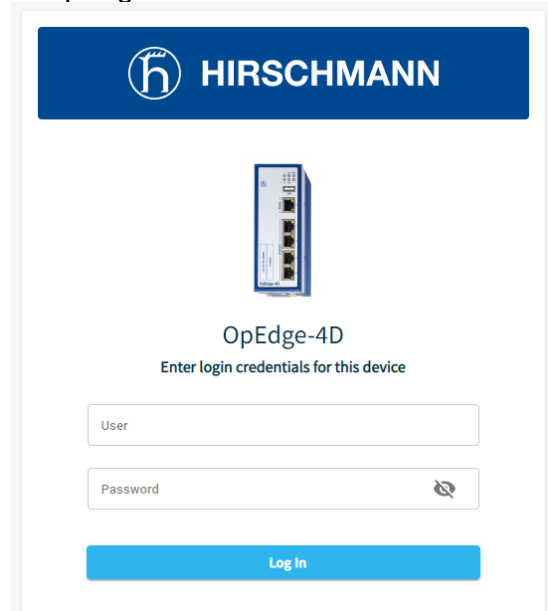
- 2 Open a web browser and log in to the OpEdge configuration webpage. The default IP address is: **https://192.168.0.250:8080**. If the PC is on a different subnet, temporarily set the IP address of the PC to **192.168.0.xxx** with a subnet of **255.255.255.0**.

The login page is displayed.

a. OpEdge-8D



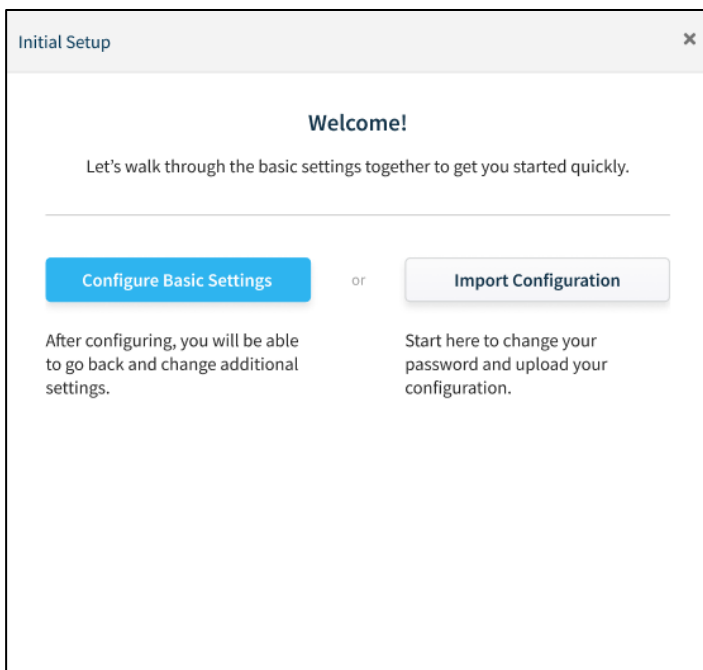
b. OpEdge-4D



- 3 Enter the login credentials. The default *username* and *password* are **admin** and **password**.

**NOTE:** The user is prompted to change the password after the first login. Provide a new password and apply the changes. After successful login with the new password, further password changes are done from the *System* tab on the webpage.

- 4 The *Initial Setup* dialog allows the following operations:
  - Change Default Login Credentials
  - Configure Basic Settings
  - Import Configuration
  - Manual Configuration



A. **Change Default Login Credentials:** To change the default login credentials for the OpEdge webpage:

i. Close the *Initial Setup* dialog to display another dialog as shown below:

Initial Setup

**⚠ Login Details**

For security reasons, please change your default password before proceeding.

Username

Password

Confirm Password

● One lowercase character      ● One special character  
● One uppercase character      ● 8 characters minimum  
● One number                      ● Password match

**Save**

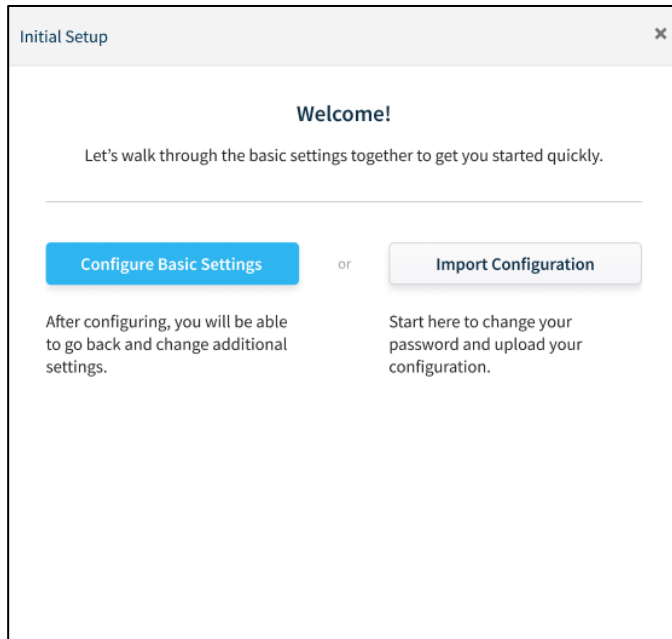
ii. Enter the new login credentials.

**NOTE:** The password must be a minimum of 8 characters, including 1 lowercase character, 1 uppercase character, 1 special character, and 1 number.

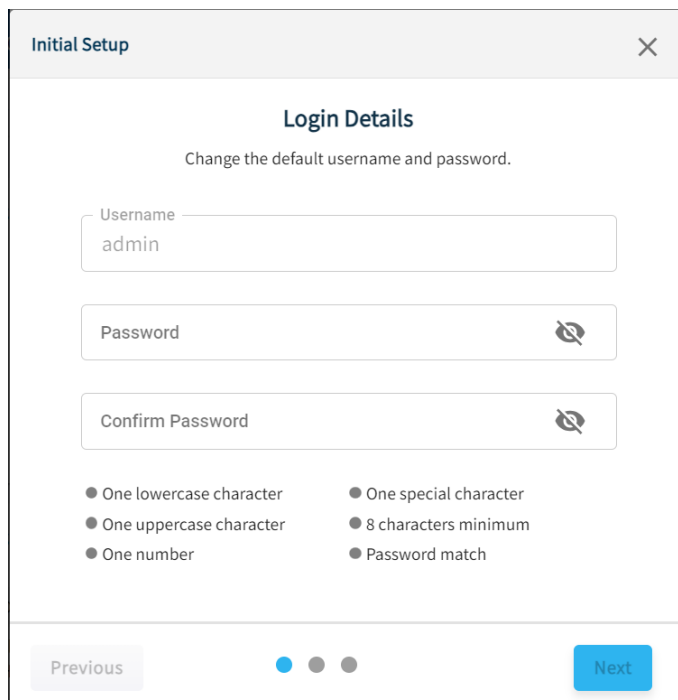
iii. Click **SAVE** to save the changes.

**B. Configure Basic Settings:** To perform basic configuration settings:

- i. In the *Initial Setup* dialog, click **CONFIGURE BASIC SETTINGS**.



- ii. In the *Login Details* dialog, change the default login credentials and click **NEXT**.



iii. In the *Gateway Config* dialog, provide the module name. Click **NEXT**.

a. OpEdge-8D

Initial Setup ✕

**Gateway Config**

Set the module name (e.g. OpEdge-8D).

Module name

---

Previous ● ● ● Next

b. OpEdge-4D

Initial Setup ✕

**Gateway Config**

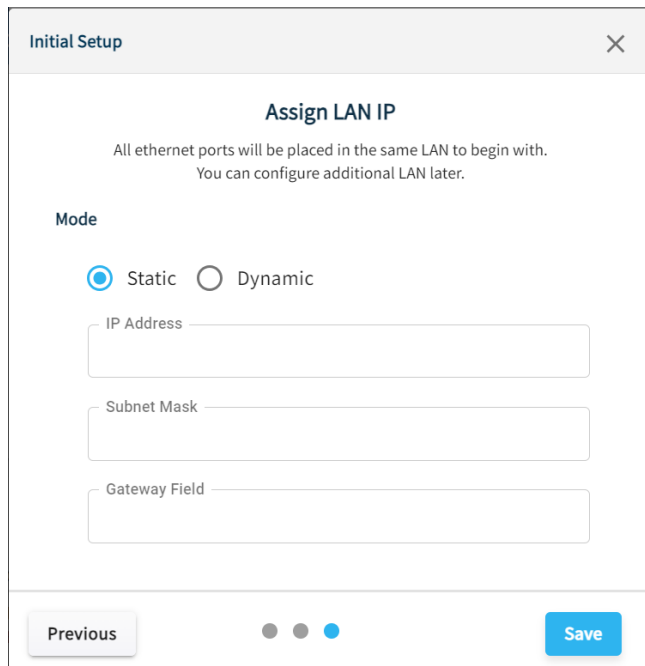
Set the module name (e.g. OpEdge-4D).

Module name

---

Previous ● ● ● Next

- iv. In the *Assign LAN IP* dialog, select a mode (*Static* or *Dynamic*). Enter the OpEdge's *IP Address*, *Subnet Mask* and *Gateway*.



The screenshot shows a dialog box titled "Initial Setup" with a close button (X) in the top right corner. The main title of the dialog is "Assign LAN IP". Below the title, there is a note: "All ethernet ports will be placed in the same LAN to begin with. You can configure additional LAN later." Under the heading "Mode", there are two radio buttons: "Static" (which is selected) and "Dynamic". Below the mode selection, there are three text input fields labeled "IP Address", "Subnet Mask", and "Gateway Field". At the bottom of the dialog, there is a "Previous" button on the left, a progress indicator consisting of three dots (the third dot is filled), and a "Save" button on the right.

- v. Click **SAVE** to save the configuration changes.

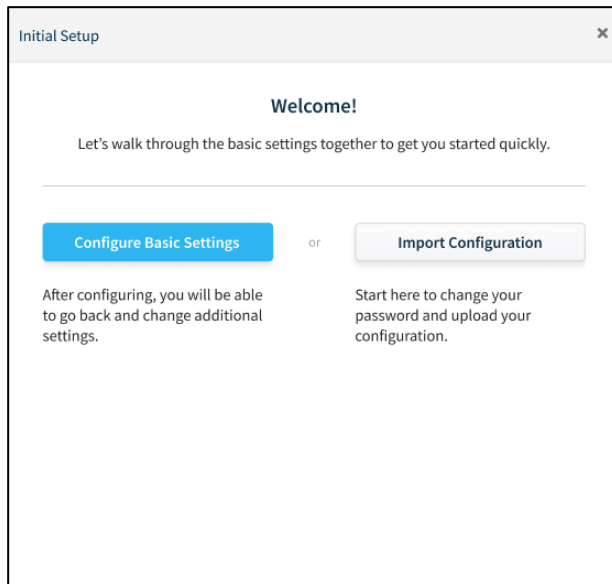
## C. Import Configuration:

**NOTE:** For information on exporting the configuration to a `.tar.gz` file, please see [section 4.1.2](#).

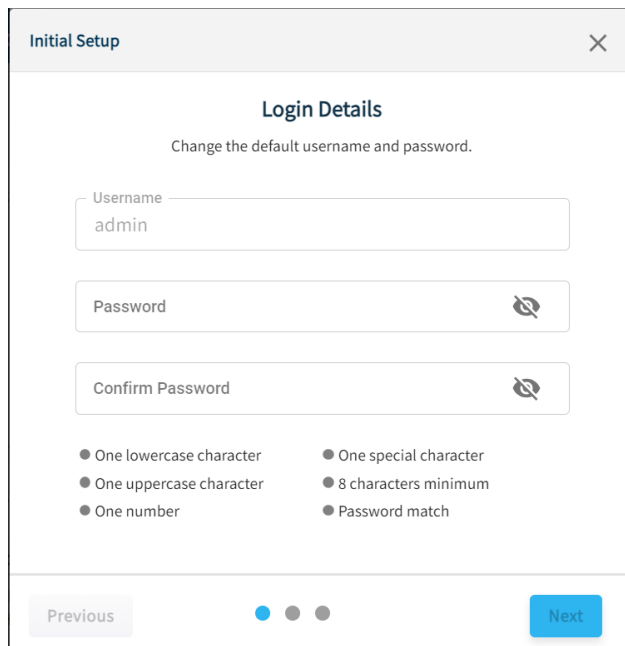
**NOTE:** During the initial module configuration, the default Username and Password must be changed.

To import a configuration file:

- i. In the *Initial Setup* dialog, click **IMPORT CONFIGURATION**.

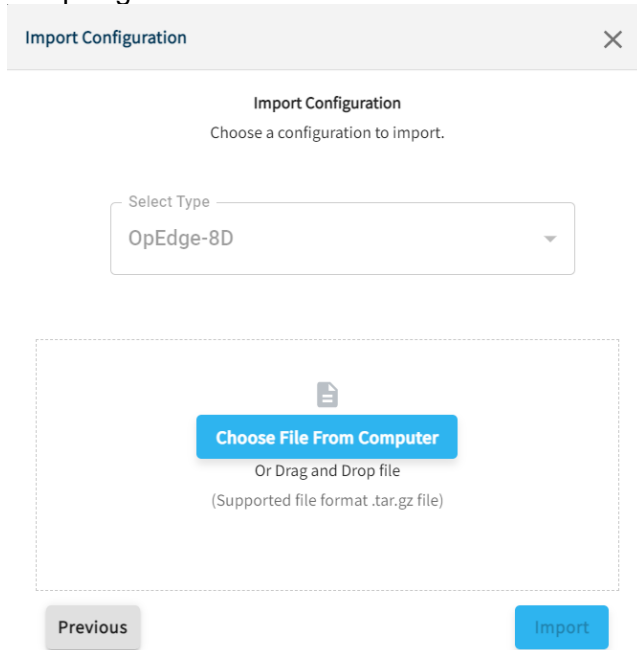


- ii. In the *Login Details* dialog, change the default login credentials and click **NEXT**.

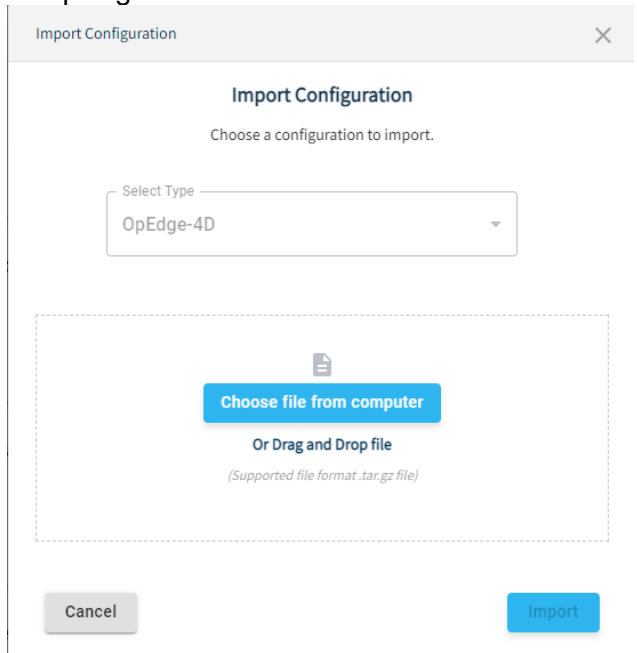


- iii. In the *Import Configuration* dialog, drag and drop a *.tar.gz* configuration file in the dialog or click **CHOOSE FILE FROM COMPUTER** to browse and upload a file.

a. OpEdge-8D



b. OpEdge-4D



- iv. Click **IMPORT** to import the selected configuration file.

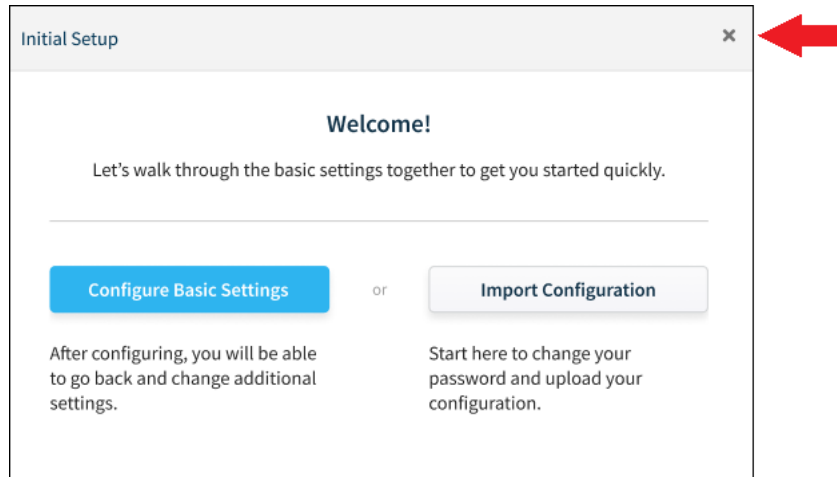


---

## D. Exit from Initial Setup Dialog to Manually Configure:

**NOTE:** During the initial module configuration, the default Username and Password must be changed.

- i. Click 'X' to bypass the initial setup process.

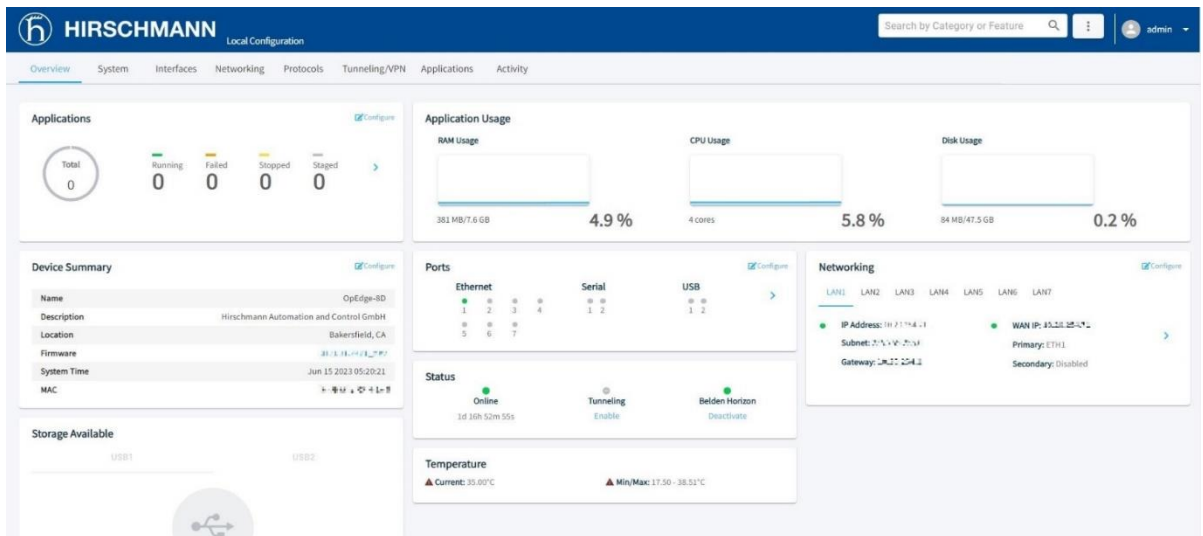


- ii. Log in to the OpEdge.

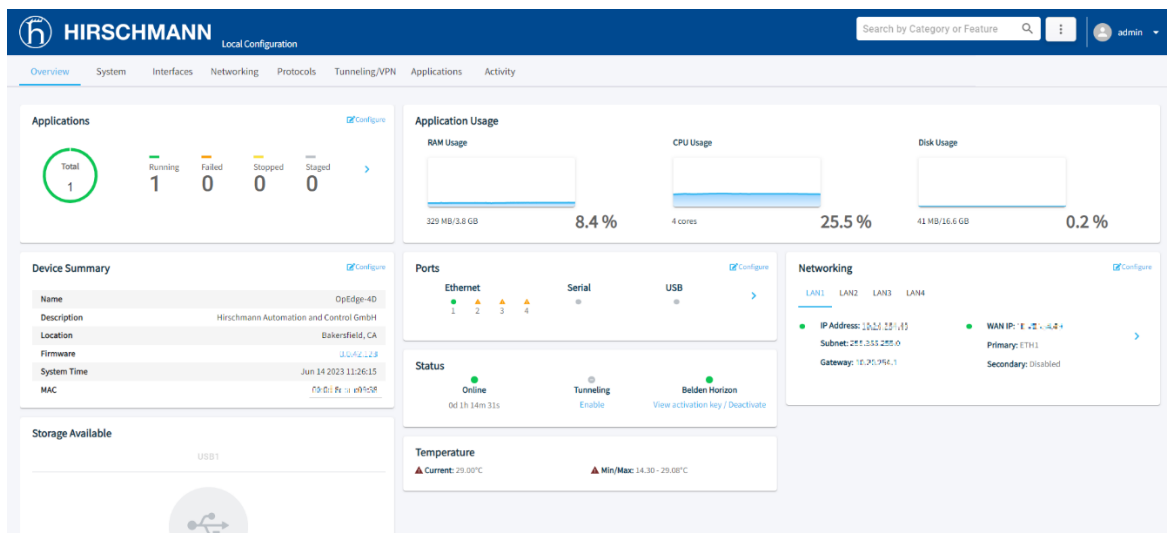
5 After a successful login, the *Overview* tab is displayed and contains the following information:

- Status (such as *Online*, *Tunneling*, and *Belden Horizon*)
- Device Summary (such as *Gateway Name*, *Description*, *Location*, *Firmware*, *System Time* and *MAC*)
- Ports (Ethernet: OpEdge-8D has 7 ports and OpEdge-4D has 4 ports)
- Networking (such as *Status* for LAN and WAN)
- Device temperature
- Available storage
- Other features

a. OpEdge-8D



b. OpEdge-4D



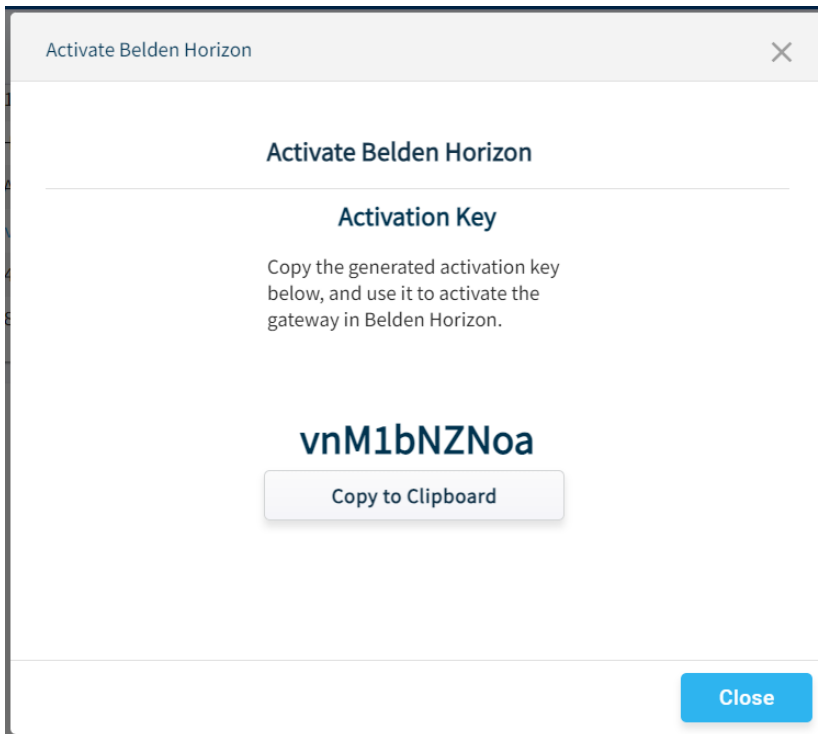
**NOTE:** The status of each parameter will vary.

**NOTE:** The user is automatically logged out after 15 minutes of inactivity.

## 3 Registration in Belden Horizon

Belden Horizon is a secure and intuitive cloud-native platform. It supports multiple applications like on-demand (secure machine access) or always-on (persistent data network) connectivity, data monitoring, and alert notification. The OpEdge can be managed in Belden Horizon once registered. This includes making configuration changes and scheduling firmware changes.

Before using the OpEdge, it must be registered in Belden Horizon by entering an Activation Key.

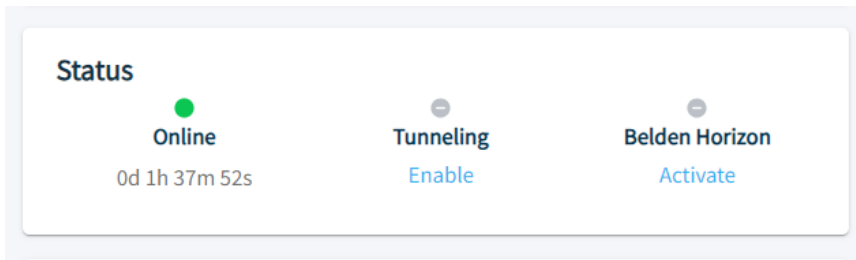


### 3.1 Registration Using Activation Key

Use the following procedure to obtain the activation key from the OpEdge, and to register the OpEdge with Belden Horizon:

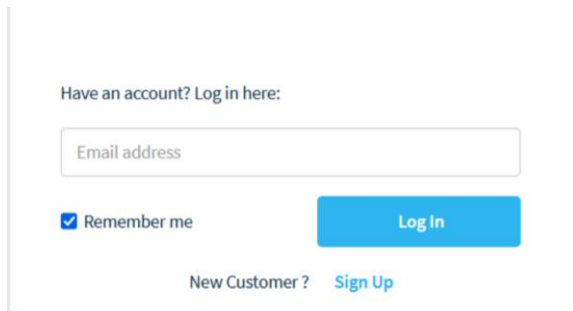
**NOTE:** The OpEdge must be connected to the Internet through the WAN port. See *WAN Configuration* in [section 5.3.1](#) for more details.

- 1 Establish a default connection to the OpEdge and perform the initial setup as described in the *Initial Configuration* [section 2](#).
- 2 In the *Overview* tab > *Status* tile, click the **ACTIVATE** link under the *Belden Horizon* label.

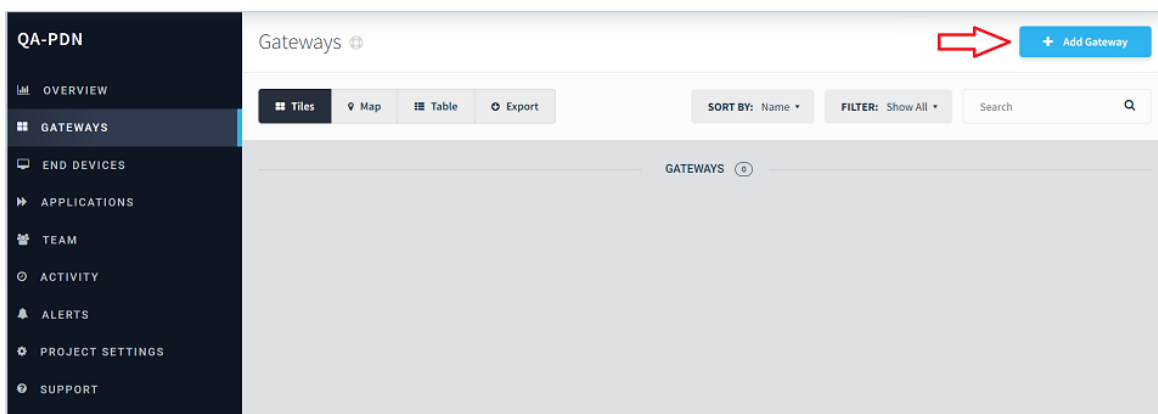


**NOTE:** If the OpEdge is already connected to a Belden Horizon account, the link reads “Deactivate”.

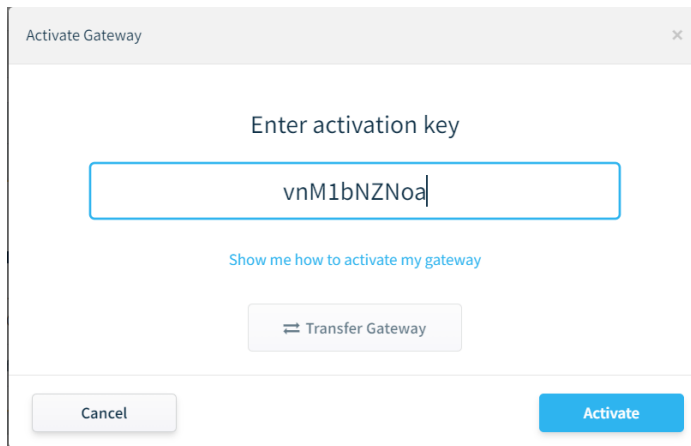
- 3 The OpEdge securely retrieves an alphanumeric activation key from Belden Horizon that is only valid for three hours. Record this activation key.
- 4 Open a new tab in a web browser, enter **www.belden.io** in the address bar, and press **ENTER**.
- 5 On the *Belden Horizon Login* screen, enter the Belden Horizon login email and click **LOG IN**, or click **SIGN UP** to create a new account. Login credentials are not interchangeable between Belden Horizon and the webpage.



- 6 Once logged in, follow the prompts to create a project.
- 7 Click the *Gateways* tab, and then click **ADD GATEWAY**.

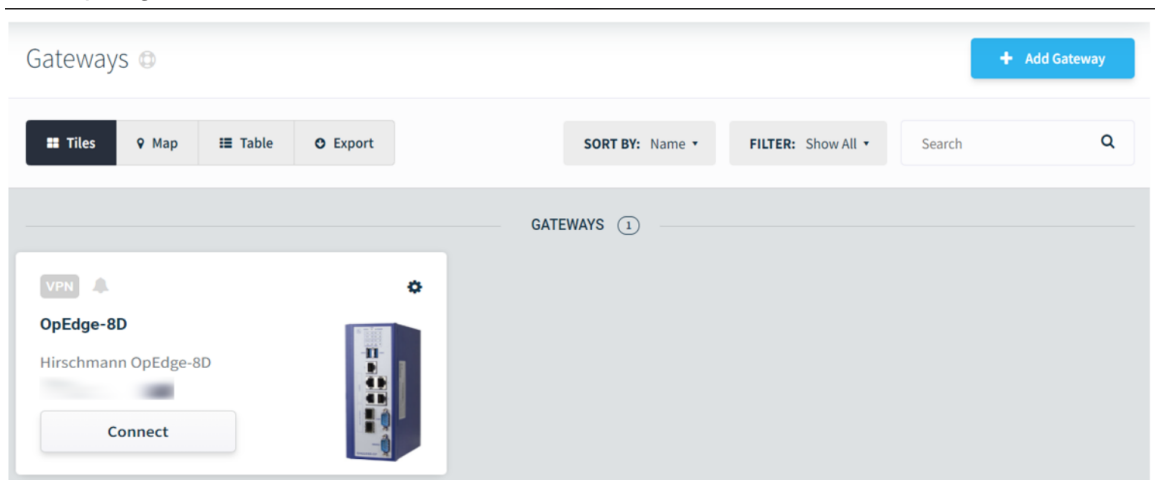


- 8 The user will be prompted for the activation key recorded earlier. Click **ACTIVATE**.

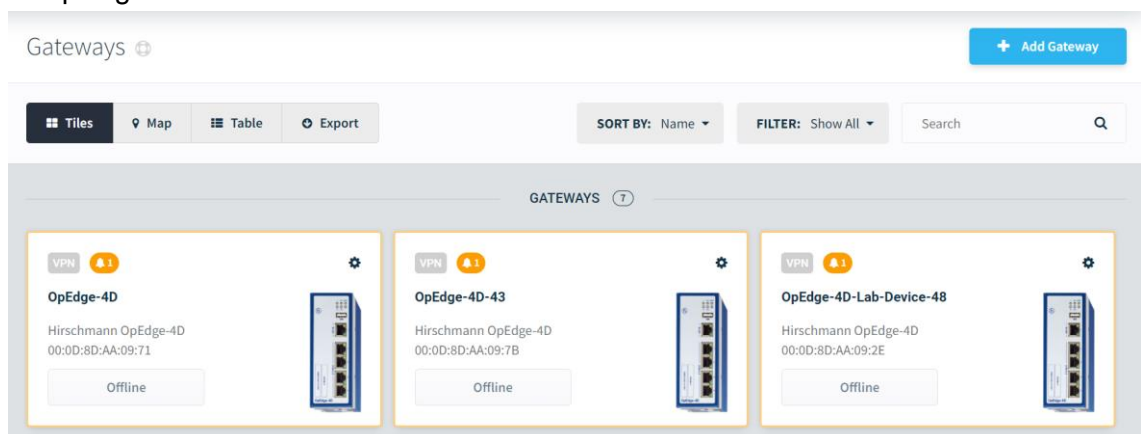


- 9 Upon successful activation, the OpEdge appears on the *Gateways* tab.

a. OpEdge-8D



b. OpEdge-4D



The same will be updated in Activity logs as well.

The screenshot displays the 'All Activity' page in the BELDEN HORIZON interface. At the top, the navigation bar shows 'VPN 0 Open Tunnels', 'Alerts', 'Activity', and 'Projects'. The main content area is titled 'All Activity' and contains a list of activity entries. The first entry is 'Hirschmann OpEdge-8D 00000000000000000000000000000000 activated' with a timestamp of '10:37:24 AM'. The entry includes a user profile for 'Vishal', a dropdown menu for 'Prosoft', a list of '1 2 3 device 8080 71', and '0 comments'. The interface also features a search bar, pagination controls (1-200 of 3477 entries), and a 'Filter Activity' button.

---

## 3.2 Activation Errors

The following error messages correspond to failed registration issues:

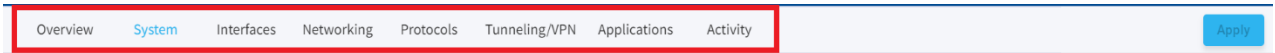
| <b>Error</b>  | <b>Description</b>  | <b>Solution</b>                                    |
|---|---|--|
| Key is corrupted.   | The key is invalid.   | Please make sure this is the correct key.          |
| Device Activation record was not found for activation key.      | Failed to find an activation record in the Belden Horizon database. | Please try another activation key.                 |
| Found a Device Activation record in ACTIVATED state for device. | The device is already activated.                                    | Please try another activation key.                 |
| Activation key has expired.                                     | This activation key has expired, and a new one has been generated.  | Please check device for the latest activation key. |

# 4 Overview

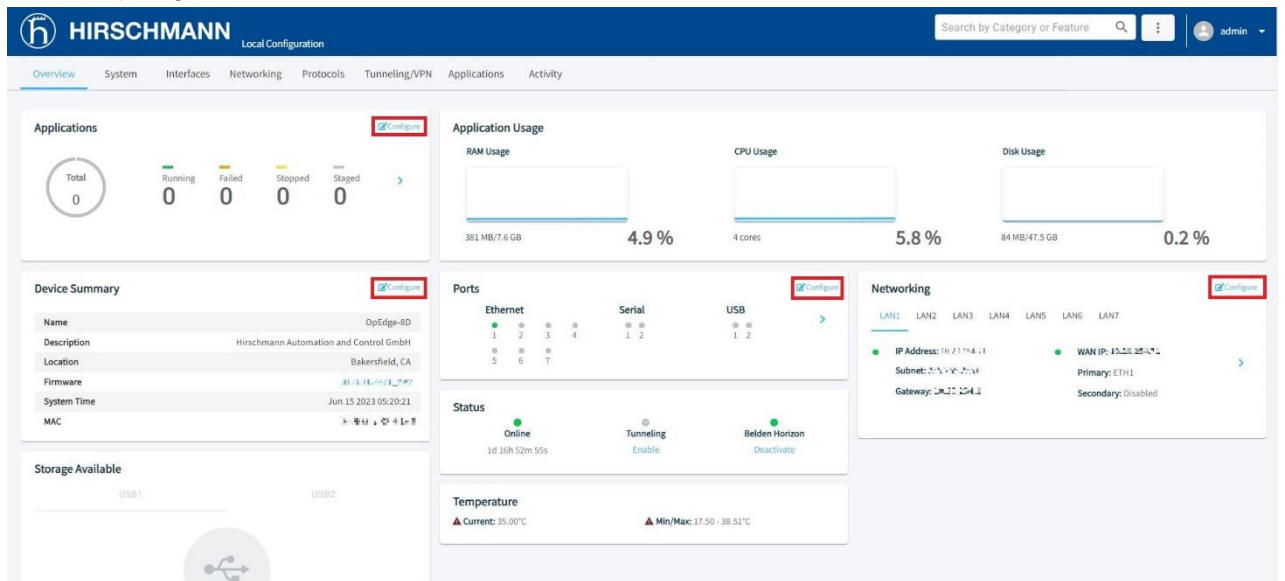
## 4.1 OpEdge Webpage Navigation

The OpEdge webpage is used for configuration and diagnostics. There are different ways to access the configuration parameters of the OpEdge webpage:

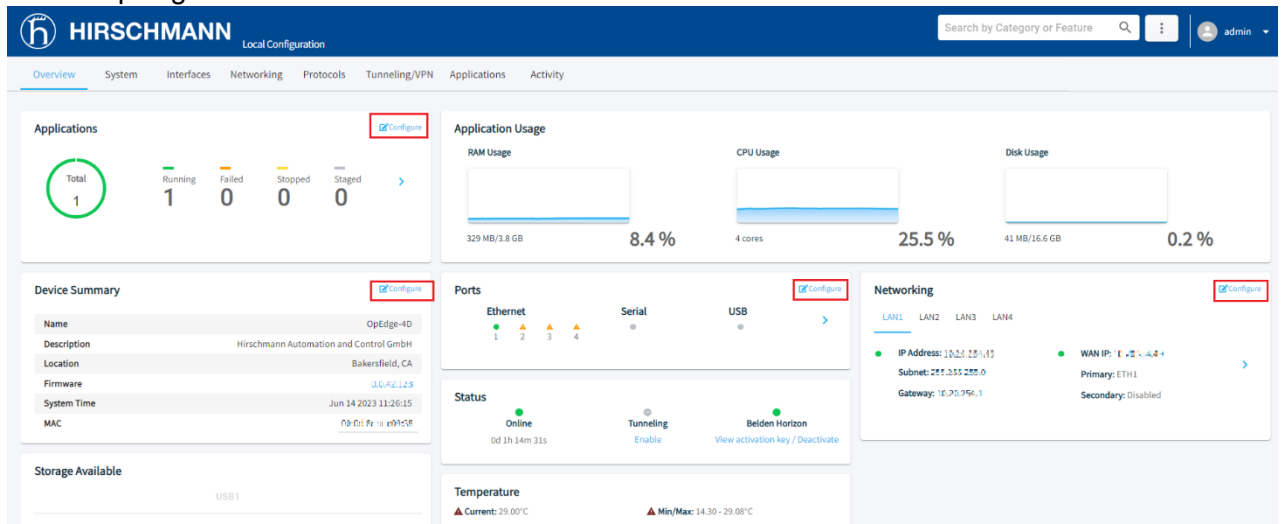
- From the tabs on the *Local Configuration* webpage.



- From the **CONFIGURE** link in each tile of the *Overview* tab.
  - OpEdge-8D



- OpEdge-4D





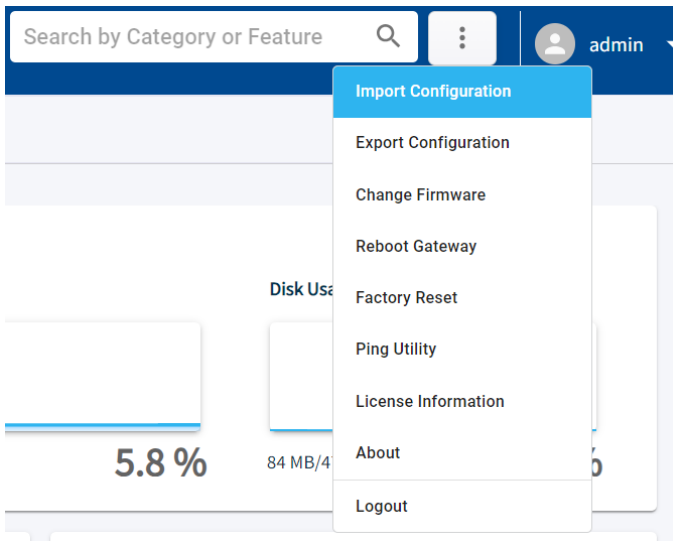
### 4.1.1 Search Bar

The search bar allows the user to navigate to a specific configuration by searching for a keyword in the search box.



### 4.1.2 [...] Button

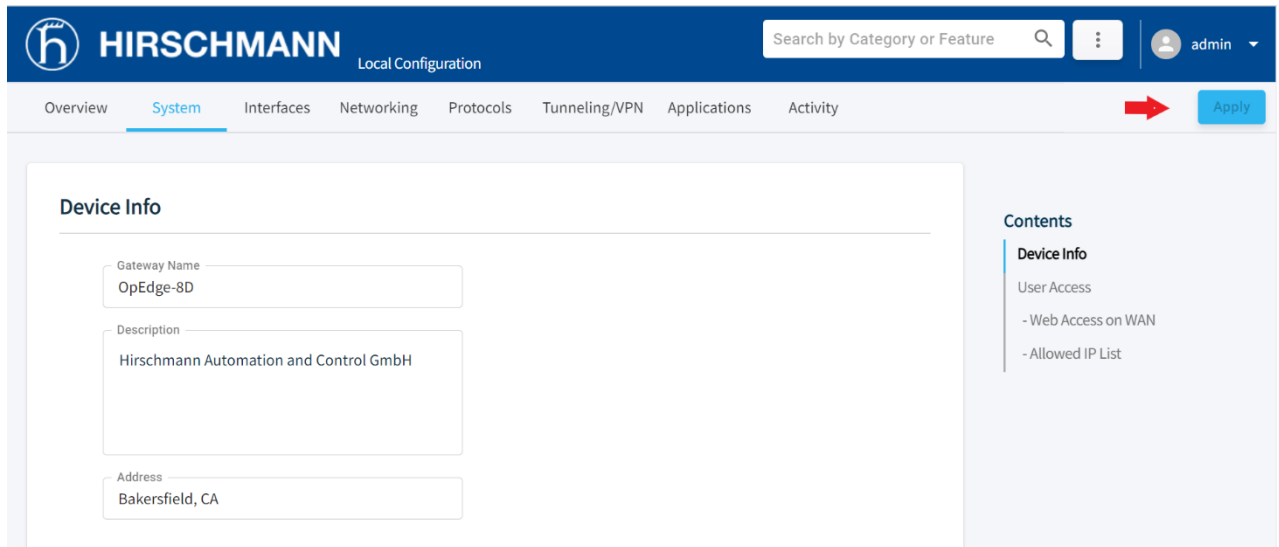
The  button includes additional options for the OpEdge.



| Parameter            | Description  |
|----------------------|--|
| Import Configuration | Imports an OpEdge configuration.                     |
| Export Configuration | Exports an OpEdge configuration.                     |
| Change Firmware      | Updates the OpEdge firmware.                         |
| Reboot Gateway       | Reboots the OpEdge.                                  |
| Factory Reset        | Resets the OpEdge settings to default configuration. |
| Ping Utility         | Tests internet connection.                           |
| License Information  | Information about the present licenses.              |
| About                | Information about device and firmware.               |
| Logout               | Logs out the current user.                           |

### 4.1.3 Apply Button

The *Apply* button is used to send the current configuration to the OpEdge.



### 4.1.4 Side sheet Launcher

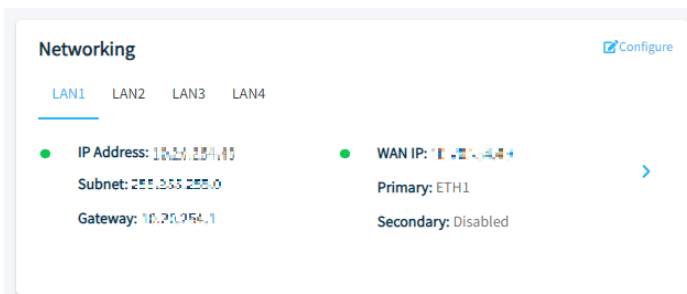
Within the configuration tiles, the  icon expands the menu to display additional details.

Example:

#### a. OpEdge-8D



#### b. OpEdge-4D



## 4.1.5 Side Menu Scrolling

The scrolling menu within each tab can be used to quickly jump to each parameter.

The screenshot displays the Hirschmann Local Configuration web interface. The top navigation bar includes the Hirschmann logo, the text "HIRSCHMANN Local Configuration", a search bar, and a user profile icon labeled "admin". Below the navigation bar, a menu shows "Overview", "System", "Interfaces", "Networking" (selected), "Protocols", "Tunneling/VPN", "Applications", and "Activity".

The main content area is titled "WAN" and contains two sections: "Interface Preferences" and "WAN Health".

**Interface Preferences:** This section has two tabs: "Primary Interface" (selected) and "Secondary Interface". Under "Primary Interface", there is a dropdown menu for "Primary Interface" set to "ETH1", a text input for "DNS1" with the value "8.8.8.8", and a text input for "DNS2" with the value "8.8.4.4".

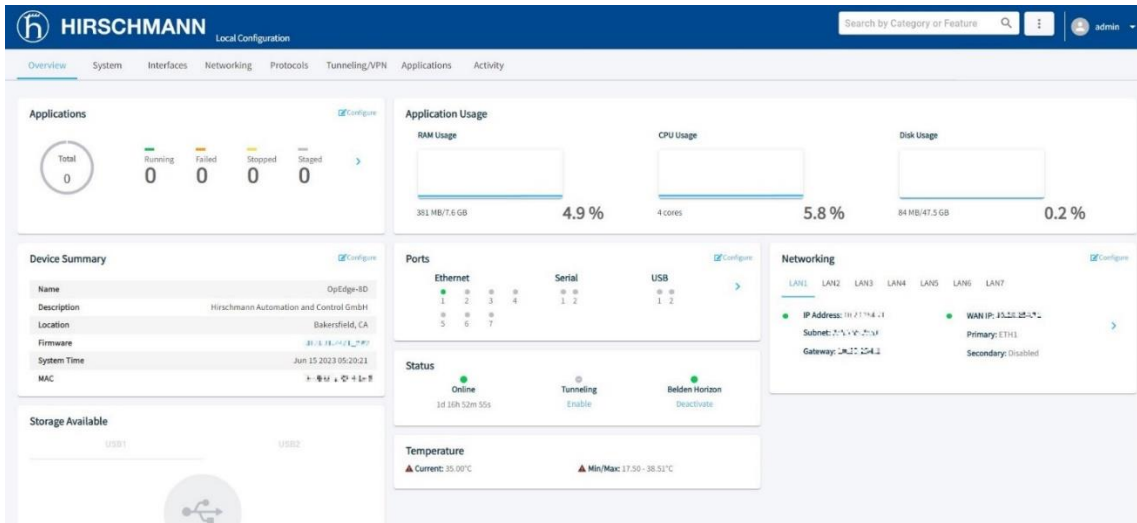
**WAN Health:** This section includes a "Validation" subsection with radio buttons for "IP" (selected) and "DNS". It contains several text input fields: "Validation IP" (8.8.8.8), "Validation DNS Name" (www.google.com), "WAN Failover Timeout (Minutes)" (2), "WAN Fallback Timeout (Minutes)" (2), "WAN Health Intervals (Seconds)" (5), and "Retry Count" (0). A note below the "WAN Fallback Timeout" field states: "0 Minutes means don't go back unless backup fails".

On the right side of the interface, there is a "Contents" sidebar menu, which is highlighted with a red border. The menu items are: "WAN", "- Interface Preferences", "- WAN Health", "LAN", "- LAN Configuration", "- Port Settings", "- DHCP Server", "NTP", "Static Routes", "SNMP", "Firewall", "- Port Forwarding", "- Packet Filtering", "NAT", "- Dynamic NAT", and "- Static NAT".

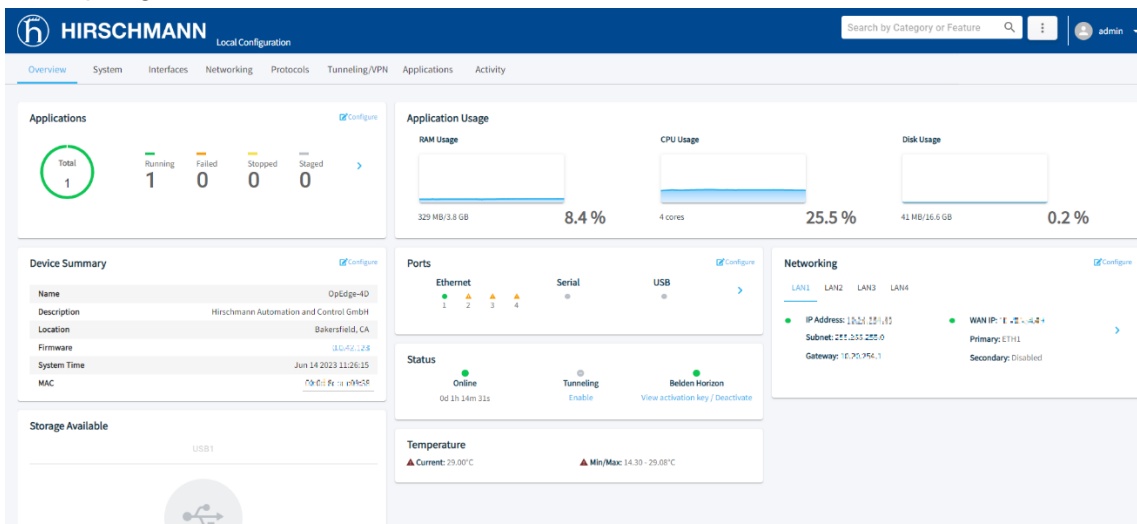
## 4.2 Overview Tab

Use the *Overview* tab to view details of the device status, storage, networking interface, and ports.

### a. OpEdge-8D

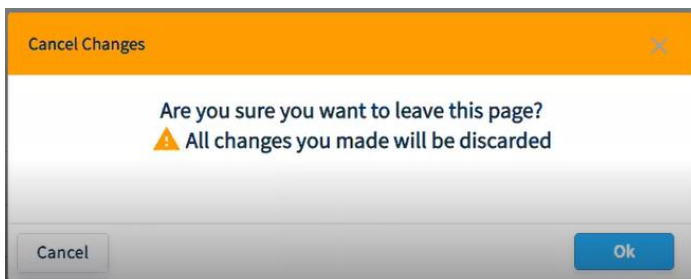


### b. OpEdge-4D



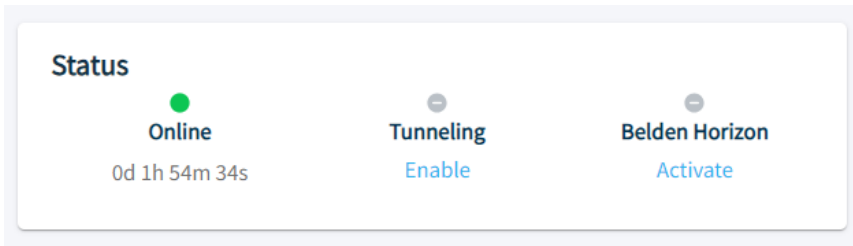
Additionally, click **CONFIGURE** to open the configuration option for a specific tile.

**NOTE:** Click **APPLY** on each configuration page to apply the changes. Otherwise, the system will display a pop-up message. Click **OK** to discard the changes, or **CANCEL** to close the pop-up message.



## 4.2.1 Status

The *Status* tile displays the following device status parameters:



| Parameter      | Description  |
|----------------|--|
| Online         | The current status of the OpEdge:<br><b>Online</b> (Green)<br><b>Offline</b> (Grey)<br><br><b>Note:</b> The status will be Online only if WAN is connected.  |
| Tunneling      | The icon displays the current Belden Horizon tunneling status of the OpEdge.<br>Grey: Tunneling is not in operation<br>Green: Tunneling is in operation<br><br>Click <b>ENABLE</b> to enable tunneling, or <b>DISABLE</b> to disable tunneling   |
| Belden Horizon | The current OpEdge status in Belden Horizon.<br><b>Activate</b> (Grey), <b>View activation key/Deactivate</b> (Green), or <b>Deactivate</b> (Green)<br><br><b>Note:</b> View activation key status is displayed only if the activation key is generated but not activated in Belden Horizon. |

## 4.2.2 Device Summary

The *Device Summary* tile displays the following device information:

### a. OpEdge-8D

| Device Summary <a href="#">Configure</a> |  |
|--|--|
| Name                                     | OpEdge-8D                              |
| Description                              | Hirschmann Automation and Control GmbH |
| Location                                 | Bakersfield, CA                        |
| Firmware                                 | U.0.42.123                             |
| System Time                              | Jun 15 2023 05:20:21                   |
| MAC                                      | 00:01:00:00:00:00                      |

### b. OpEdge-4D

| Device Summary <a href="#">Configure</a> |  |
|--|--|
| Name                                     | OpEdge-4D                              |
| Description                              | Hirschmann Automation and Control GmbH |
| Location                                 | Bakersfield, CA                        |
| Firmware                                 | U.0.42.123                             |
| System Time                              | Jun 14 2023 11:26:15                   |
| MAC                                      | 00:01:00:00:00:00                      |

| Parameter   | Description                                    |
|-------------|--|
| Name        | Gateway name configured by user.               |
| Description | Gateway description configured by user.        |
| Location    | Location of gateway configured by user.        |
| Firmware    | Current firmware version loaded on the OpEdge. |
| System Time | Date and time in UTC format.                   |
| MAC         | OpEdge MAC Address.                            |

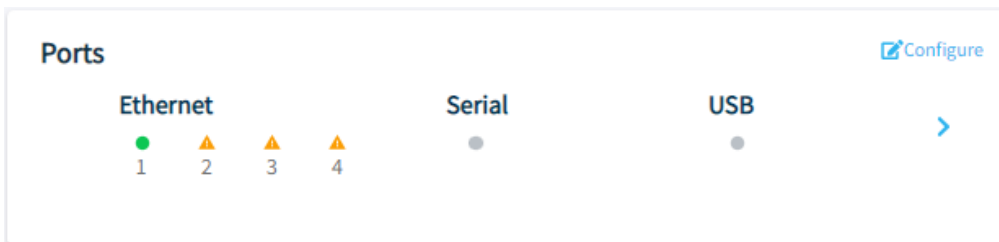
### 4.2.3 Ports

The *Ports* tile displays indicators for the Ethernet ports on the OpEdge.

a. OpEdge-8D



b. OpEdge-4D



| Port Indicator | Description  |
|----------------|--|
| Green          | The port is configured and communicating.                                    |
| Grey           | The port is not configured and no cable detected.                            |
| Yellow         | The port is configured but not communicating, or no cable has been detected. |

Click the [>](#) icon to display the *Ports Details* dialog.

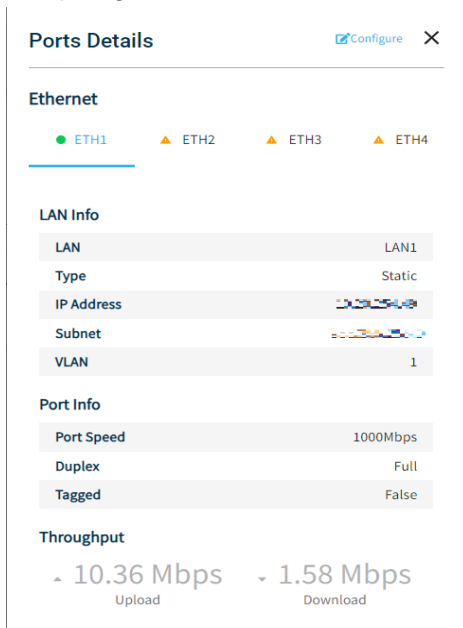
### 4.2.3.1 Ports Details

#### a. OpEdge-8D

| Parameter |            | Description  |
|-----------|------------|--|
| Ethernet  | ETH1       | Green = Port is configured and communicating.<br>Grey = Port is not configured.<br>Yellow Triangle = Port is configured but no communications, or no cable detected. |
|           | ETH2       |  |
|           | ...        |  |
|           | ETH7       |  |
|           |            |  |
| LAN Info  | LAN        | LAN configuration assigned to the port.  |
|           | Type       | Type of mode, dynamic or static.   |
|           | IP Address | IP address assigned to the port.   |
|           | Subnet     | Subnet mask of the IP address.   |
|           | VLAN       | VLAN ID.   |
| Port Info | Port Speed | Data transfer speed for the port.  |
|           | Duplex     | Transmission mode for the port, such as half-duplex or full-duplex.  |
|           | Tagged     | VLAN tagging.  |

|            |          |   |
|------------|----------|---|
| Throughput | Upload   | Upload speed (Mbps) of data on the Ethernet port.   |
|            | Download | Download speed (Mbps) of data on the Ethernet port. |

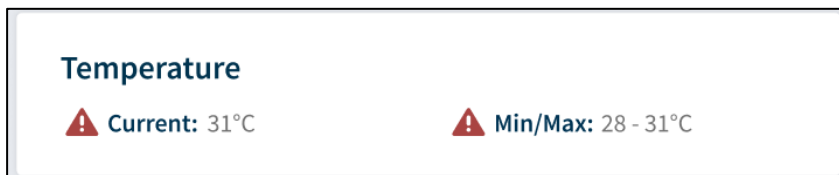
### b. OpEdge-4D



| Parameter  |            | Description   |
|------------|------------|---|
| Ethernet   | ETH1       | Green = Port is configured and communicating.                                     |
|            | ETH2       | Grey = Port is not configured.  |
|            | ETH3       | Yellow Triangle = Port is configured but no communications, or no cable detected. |
|            | ETH4       |   |
| LAN Info   | LAN        | LAN configuration assigned to the port.   |
|            | Type       | Type of mode, dynamic or static.  |
|            | IP Address | IP address assigned to the port.  |
|            | Subnet     | Subnet mask of the IP address.  |
|            | VLAN       | VLAN ID.  |
| Port Info  | Port Speed | Data transfer speed for the port.   |
|            | Duplex     | Transmission mode for the port, such as half-duplex or full-duplex.               |
|            | Tagged     | VLAN tagging.   |
| Throughput | Upload     | Upload speed (Mbps) of data on the Ethernet port.                                 |
|            | Download   | Download speed (Mbps) of data on the Ethernet port.                               |

### 4.2.4 Temperature

View the current, minimum and maximum operating temperature of the OpEdge.

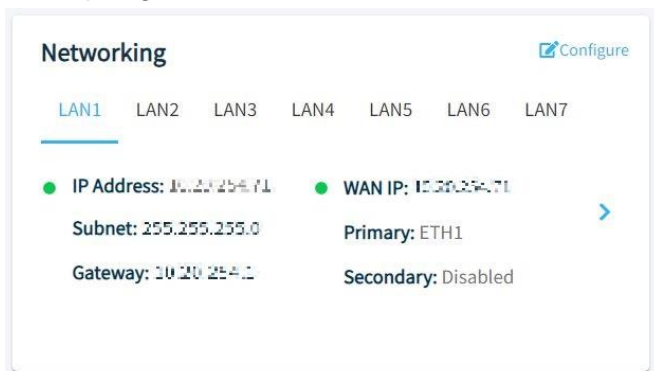




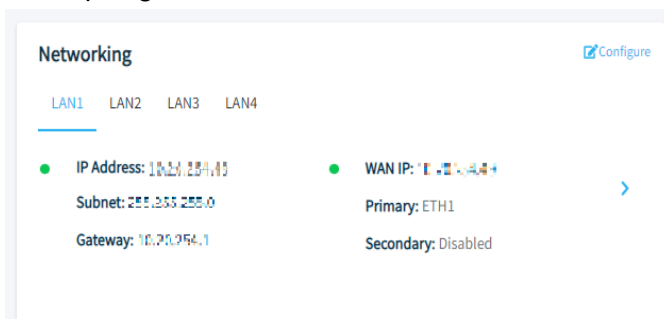
## 4.2.5 Networking

The *Networking* tile displays the LAN and WAN configurations for OpEdge.

### a. OpEdge-8D



### b. OpEdge-4D



| Parameter         | Description                          |
|-------------------|--------------------------------------|
| IP                | IP address provided by the operator. |
| Subnet            | Subnet mask of the IP address.       |
| Gateway           | Default IP address of the gateway.   |
| WAN IP            | IP address assigned to the WAN.      |
| Primary/Secondary | Primary and Secondary WAN interface. |

Click the [>](#) icon to display the *Networking Details* dialog.

## 4.2.5.1 Network Details

The *Networking Details* dialog provides the following additional information:

The screenshot shows the 'Networking Details' dialog for LAN3. The LAN tabs are LAN1, LAN2, LAN3 (selected), and LAN4. The details table is as follows:

| Details         |    |
|-----------------|----|
| IP Address      | NA |
| Subnet          | NA |
| Default Gateway | NA |
| VLAN ID         | 1  |
| LAN Membership  | NA |

Throughput: Upload 0 bps, Download 0 bps.

Below the LAN section, the WAN section is visible with the following details:

| WAN        |               |
|------------|---------------|
| IP Address | 10.20.254.71  |
| Subnet     | 255.255.255.0 |
| Gateway    | 10.20.254.1   |

The screenshot shows the 'Networking Details' dialog for LAN5. The LAN tabs are LAN4, LAN5 (selected), LAN6, and LAN7. The details table is as follows:

| Details         |    |
|-----------------|----|
| IP Address      | NA |
| Subnet          | NA |
| Default Gateway | NA |
| VLAN ID         | NA |
| LAN Membership  | NA |

Throughput: Upload 0 bps, Download 0 bps.

Click the **LAN1** to **LAN7** tabs to view the details for each LAN for OpEdge-8D and **LAN1** to **LAN4** tabs for OpEdge-4D

| Parameter  |                   | Description                                       |
|------------|-------------------|---|
| <b>LAN</b> | <b>Details</b>    | View the following details for LAN configuration. |
|            | IP Address        | IP address assigned to the LAN.                   |
|            | Subnet            | Subnet mask of the IP address.                    |
|            | Default Gateway   | Default IP address of the gateway.                |
|            | VLAN ID           | Displays the VLAN ID assigned to the port.        |
|            | LAN Membership    | Defines LAN membership of Ethernet ports.         |
|            | <b>Throughput</b> |   |
|            | Upload            | Upload speed (Mbps) of data on the LAN network.   |
|            | Download          | Download speed (Mbps) of data on the LAN network. |

| Parameter  |                   | Description   |
|------------|-------------------|---|
| <b>WAN</b> | IP Address        | IP address assigned to the WAN.   |
|            | Subnet            | Subnet mask of the IP address.  |
|            | Gateway           | IP address of the gateway.  |
|            | <b>Throughput</b> |   |
|            | Upload            | Upload speed (Mbps) of data on the WAN network.   |
|            | Download          | Download speed (Mbps) of data on the WAN network.   |
|            | <b>Status</b>     |   |
|            | Primary           | Primary WAN Interface.  |
|            | Failover          | The failed timeout, in minutes, after which primary network will be switched to secondary, or vice versa. |
|            | Validation IP     | The system will ping the IP and confirm if the WAN network is operational.                                |
|            | Timeout/Failback  | WAN failback time in minutes.   |

# 5 Configuring the OpEdge

## 5.1 System Tab

The *System* tab contains the *Device Info* and *User Access* parameters, and OpEdge-4D additionally contains *Logs* parameters as well.

### 5.1.1 Device Info

*Device Info* allows the user to define the gateway name, description, and the address of the device including latitude and longitude coordinates.

#### a. OpEdge-8D

The screenshot shows the Hirschmann Local Configuration web interface. The 'System' tab is selected, and the 'Device Info' section is active. The form contains the following fields:

- Gateway Name: OpEdge-8D
- Description: Hirschmann Automation and Control GmbH
- Address: Bakersfield, CA

Below the address field, there is a link for '+ Advanced Configuration'. The right sidebar shows a 'Contents' menu with 'Device Info' selected, and sub-items: 'User Access', '- Web Access on WAN', and '- Allowed IP List'. The top navigation bar includes 'Overview', 'System', 'Interfaces', 'Networking', 'Protocols', 'Tunneling/VPN', 'Applications', and 'Activity'.

#### b. OpEdge-4D

The screenshot shows the Hirschmann Local Configuration web interface. The 'System' tab is selected, and the 'Device Info' section is active. The form contains the following fields:

- Gateway Name: OpEdge-4D
- Description: Hirschmann Automation and Control GmbH
- Address: [Empty field]

Below the address field, there is a link for '- Advanced Configuration'. Further down, there are fields for Latitude (0.0) and Longitude (0.0). The right sidebar shows a 'Contents' menu with 'Device Info' selected, and sub-items: 'User Access', '- Web Access on WAN', '- Allowed IP List', 'Logs', and '- Syslog Server'. The top navigation bar includes 'Overview', 'System', 'Interfaces', 'Networking', 'Protocols', 'Tunneling/VPN', 'Applications', and 'Activity'.

| Parameter    | Description                      |
|--------------|----------------------------------|
| Gateway Name | Name of the device.              |
| Description  | Brief description of the device. |
| Address      | Address of the device.           |
| Latitude     | Latitude coordinate.             |
| Longitude    | Longitude coordinate.            |

## 5.1.2 User Access

The OpEdge allows managing user access to the device WAN. The OpEdge configuration webpage allows adding users (up to 8) and assigning different roles to these users to limit their access.

The following types of roles are assigned to a user:

- **Admin:** Includes complete user privileges. An admin can make any desired change. Maximum two admins are allowed.
- **Viewer:** Includes permissions to view the configurations and to monitor the gateway and activity feed. A viewer cannot change any configuration.

| User  | Password | Role  | Action |
|-------|----------|-------|--------|
| admin |          | admin |        |

[Add User](#)

Use the following steps to add a new user:

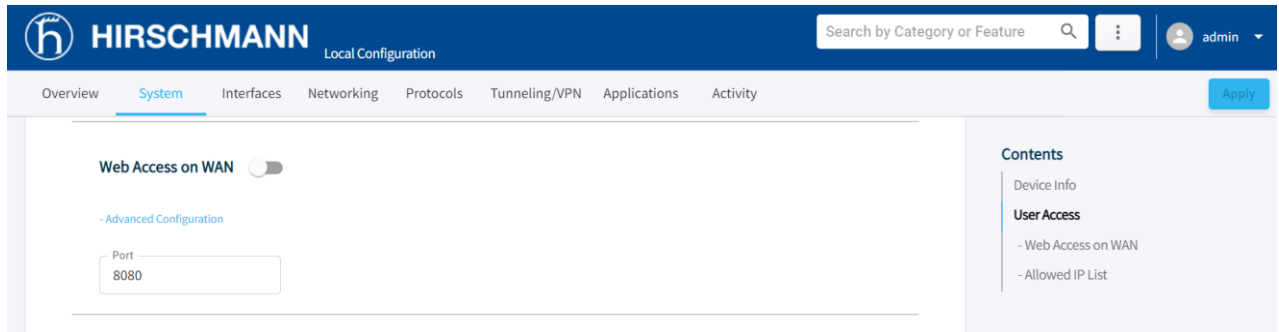
- 1 Open the OpEdge configuration webpage and click the *System* tab.
- 2 Under *User Access*, enter the following parameters:

| Parameter | Description  |
|-----------|--|
| User      | User name to be defined.   |
| Password  | Default password for the user account.<br><b>Note:</b> The user name and password are used for the first time login by the new user. After the first login, the new user is prompted to change the default password. |
| Role      | Role to be assigned to the new user. <i>Admin</i> or <i>Viewer</i> (read only)   |

### 5.1.2.1 Web Access on WAN

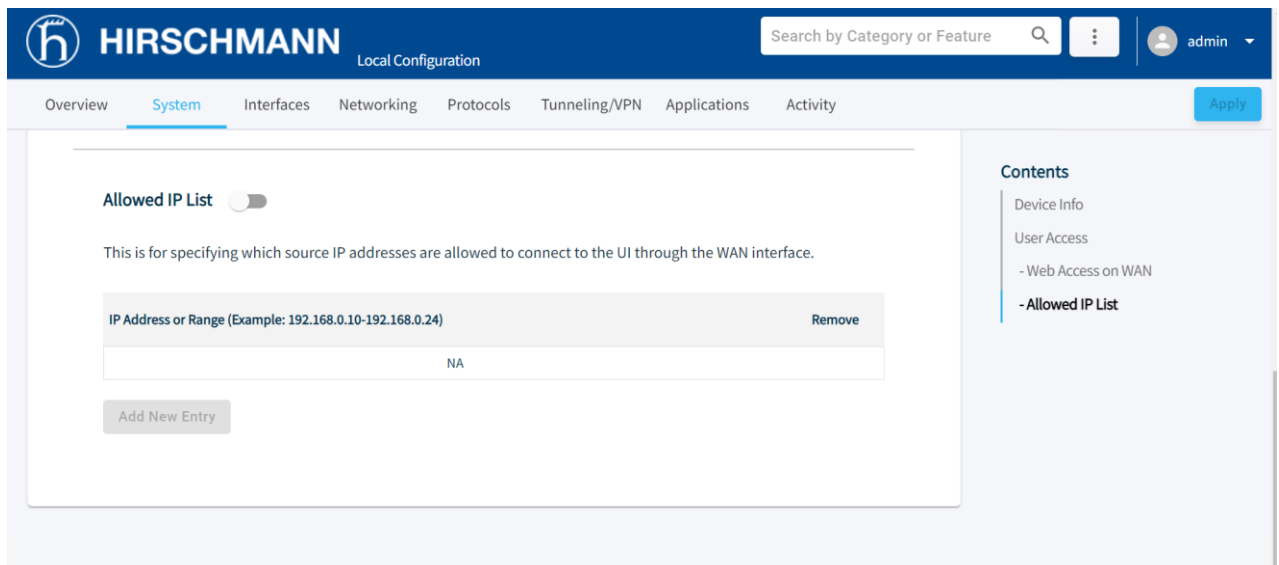
This feature allows or blocks webpage access on the WAN.

**Warning:** Belden Horizon currently uses port 443 to tunnel. Selecting port 443 will prevent Belden Horizon from functioning properly. HTTPS can function properly using port 8080 or other ports.



### 5.1.2.2 Allowed IP List

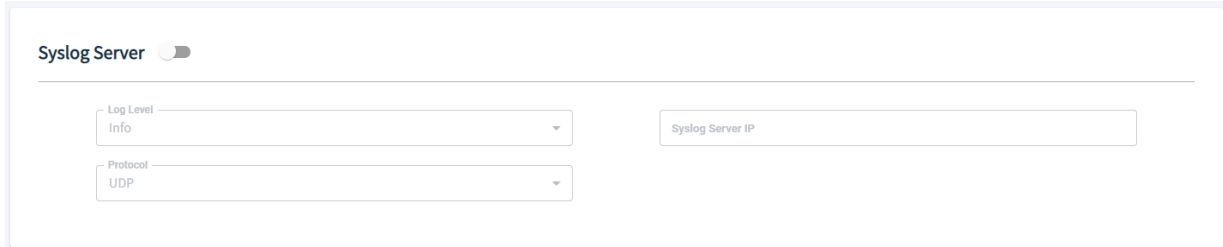
To specify which source IP addresses are allowed to connect to the webpage through the WAN interface, toggle the **ALLOWED IP LIST** button. Then enter the source IP addresses.



### 5.1.3 Syslog Server

This feature is only present in OpEdge-4D.

A Syslog server allows us to send the log information of all our network devices to one centralized place.



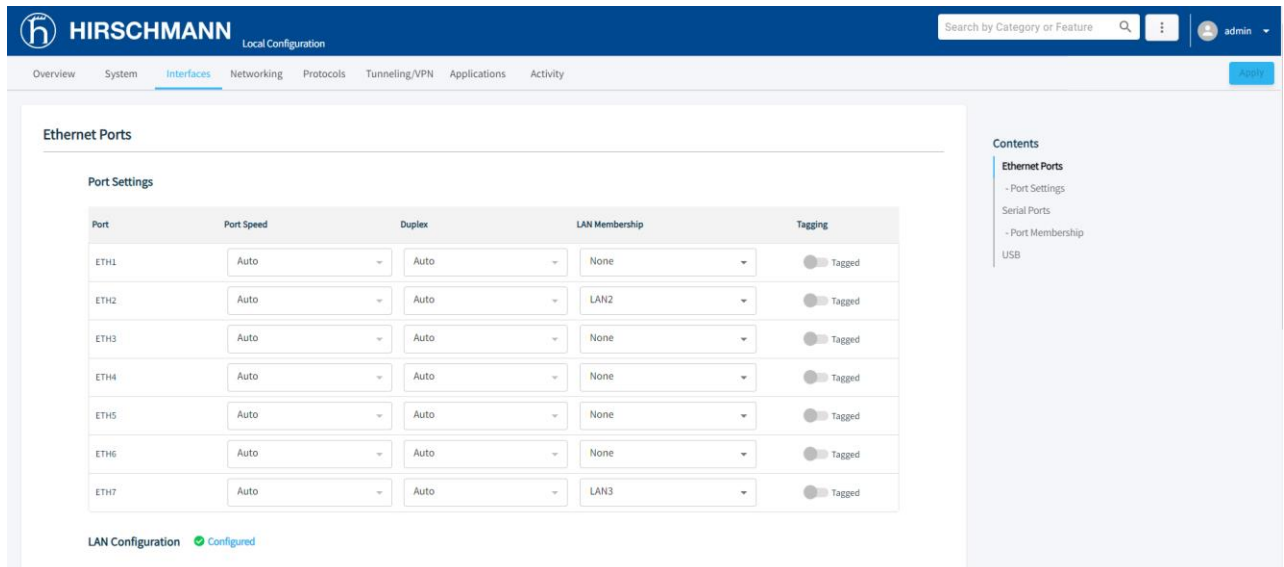
The Syslog server can be configured by providing the required details.

| Parameter | Description  |
|-----------|--|
| Log Level | Select the log level from the drop-down depending on the severity of the logs. |
| Protocol  | The Protocol which you wish to use to send information to the server           |
| Server IP | The IP address of the server where you want to store the system logs           |

## 5.2 Interfaces Tab

The *Interfaces* tab is used to configure the *Ethernet ports*, *Serial Ports* and *USB* on the OpEdge.

### a. OpEdge-8D



| Port | Port Speed | Duplex | LAN Membership | Tagging |
|------|------------|--------|----------------|---------|
| ETH1 | Auto       | Auto   | None           | Tagged  |
| ETH2 | Auto       | Auto   | LAN2           | Tagged  |
| ETH3 | Auto       | Auto   | None           | Tagged  |
| ETH4 | Auto       | Auto   | None           | Tagged  |
| ETH5 | Auto       | Auto   | None           | Tagged  |
| ETH6 | Auto       | Auto   | None           | Tagged  |
| ETH7 | Auto       | Auto   | LAN3           | Tagged  |

**HIRSCHMANN** Local Configuration Search by Category or Feature    admin

Overview System **Interfaces** Networking Protocols Tunneling/VPN Applications Activity

### Serial Ports

**Port Membership**

| Port | Port Mode | Baud Rate | Data Bits | Parity | Stop Bits |
|------|-----------|-----------|-----------|--------|-----------|
| COM1 | RS232     | 115200    | 8 Bits    | None   | 1 Bits    |
| COM2 | RS232     | 115200    | 8 Bits    | None   | 1 Bits    |

Protocol ⊘ Not Configured

---

### USB

Allow USB devices to be connected

**Contents**

- Ethernet Ports**
- Port Settings
- Serial Ports
- Port Membership
- USB

## b. OpEdge-4D

**HIRSCHMANN** Local Configuration Search by Category or Feature    admin

Overview System **Interfaces** Networking Protocols Tunneling/VPN Applications Activity

### Ethernet Ports

**Port Settings**

| Port | Port Speed | Duplex | LAN Membership | Tagging                                    |
|------|------------|--------|----------------|--|
| ETH1 | Auto       | Auto   | LAN1           | <input checked="" type="checkbox"/> Tagged |
| ETH2 | Auto       | Auto   | LAN2           | <input checked="" type="checkbox"/> Tagged |
| ETH3 | Auto       | Auto   | LAN2           | <input checked="" type="checkbox"/> Tagged |
| ETH4 | Auto       | Auto   | LAN2           | <input checked="" type="checkbox"/> Tagged |

LAN Configuration ⊙ Configured

---

### Serial Ports

**Port Membership**

| Port | Port Mode | Baud Rate | Data Bits | Parity | Stop Bits |
|------|-----------|-----------|-----------|--------|-----------|
| COM1 | RS232     | 9600      | 8 Bits    | None   | 1 Bits    |

Protocol ⊘ Not Configured

---

### USB

Allow USB devices to be connected

**Contents**

- Ethernet Ports**
- Port Settings
- Serial Ports
- Port Membership
- USB



## 5.2.1 Ethernet Ports

The OpEdge configuration webpage allows configuring seven Ethernet ports for OpEdge-8D and four Ethernet ports for OpEdge-4D on the module and assigning specific LAN configurations. Additionally, the OpEdge can be configured as a DHCP server for end devices.

The configuration options for OpEdge Ethernet ports include *Port Speed*, *Duplex*, *LAN Membership*, and *Tagging*.

**Note:** The *Port Speed*, *Duplex*, and *Tagging* configuration options are currently disabled for user editing.

To configure an Ethernet port on OpEdge:

- 1 Click the *Interfaces* tab on the OpEdge configuration webpage.
- 2 Under *Port Settings*, provide the following details:

### a. OpEdge-8D

| Port | Port Speed | Duplex | LAN Membership | Tagging |
|------|------------|--------|----------------|---------|
| ETH1 | Auto       | Auto   | None           | Tagged  |
| ETH2 | Auto       | Auto   | LAN2           | Tagged  |
| ETH3 | Auto       | Auto   | None           | Tagged  |
| ETH4 | Auto       | Auto   | None           | Tagged  |
| ETH5 | Auto       | Auto   | None           | Tagged  |
| ETH6 | Auto       | Auto   | None           | Tagged  |
| ETH7 | Auto       | Auto   | LAN3           | Tagged  |

LAN Configuration ✔ Configured

### b. OpEdge-4D

| Port | Port Speed | Duplex | LAN Membership | Tagging |
|------|------------|--------|----------------|---------|
| ETH1 | Auto       | Auto   | LAN1           | Tagged  |
| ETH2 | Auto       | Auto   | LAN2           | Tagged  |
| ETH3 | Auto       | Auto   | LAN2           | Tagged  |
| ETH4 | Auto       | Auto   | LAN2           | Tagged  |

LAN Configuration ✔ Configured

| Parameter      | Description   |
|----------------|---|
| Port           | OpEdge-8D: Ethernet port number: <b>ETH1</b> to <b>ETH7</b><br>OpEdge-4D: Ethernet port number: <b>ETH1</b> to <b>ETH4</b>                    |
| LAN Membership | LAN configuration to be assigned to the port. More information is detailed in the <i>LAN Configuration</i> in <a href="#">section 5.3.2</a> . |

- 3 Click **APPLY** to save the changes.

## 5.2.2 Serial Ports

The OpEdge-8D device has 2 and the OpEdge-4D has 1 serial port which could be configured for different parameters which include port mode, baud rate, data bits, parity and stop bits.

To configure an Ethernet port on OpEdge:

- 1 Click the *Interfaces* tab on the OpEdge configuration webpage.
- 2 Under *Port Membership*, provide the following details:

### a. OpEdge-8D

**Serial Ports**

---

**Port Membership**

| Port | Port Mode | Baud Rate | Data Bits | Parity | Stop Bits |
|------|-----------|-----------|-----------|--------|-----------|
| COM1 | RS232     | 115200    | 8 Bits    | None   | 1 Bits    |
| COM2 | RS232     | 115200    | 8 Bits    | None   | 1 Bits    |

**Protocol** ✖ Not Configured

### b. OpEdge-4D

**Serial Ports**

---

**Port Membership**

| Port | Port Mode | Baud Rate | Data Bits | Parity | Stop Bits |
|------|-----------|-----------|-----------|--------|-----------|
| COM1 | RS232     | 9600      | 8 Bits    | None   | 1 Bits    |

**Protocol** ✖ Not Configured

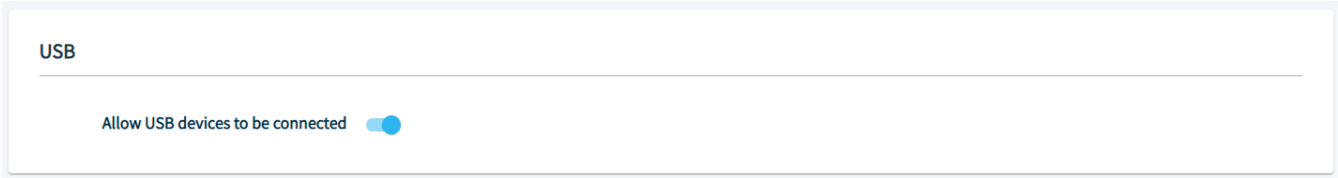
| Parameter | Description  |
|-----------|--|
| Port Mode | OpEdge provides 1 mode, i.e. <b>RS232</b>  |
| Baud Rate | Selects the speed at which data is transmitted between devices or over a communication channel. Measured in bits per second (bps). |
| Data Bits | Selects the size of the information chunk being sent or received.  |
| Parity    | Selects the error checking mechanism in serial data transmission.  |
| Stop Bits | Selects the specific bit that is added to end of each transmitted data.  |

- 3 Click **APPLY** to save the changes.

---

### 5.2.3 USB

The OpEdge-8D device has 2 USB ports, and the OpEdge-4D device has 1 USB port available. The port can be enabled or disabled using the USB toggle button.



## 5.3 Networking Tab

The *Networking* tab contains details on WAN, LAN, NTP, Static Routes, SNMP, Firewall, and NAT features.

The screenshot displays the Hirschmann Local Configuration web interface. The top navigation bar includes the Hirschmann logo, the text "Local Configuration", a search bar, and a user profile icon labeled "admin". Below the navigation bar, a menu contains "Overview", "System", "Interfaces", "Networking" (highlighted), "Protocols", "Tunneling/VPN", "Applications", and "Activity".

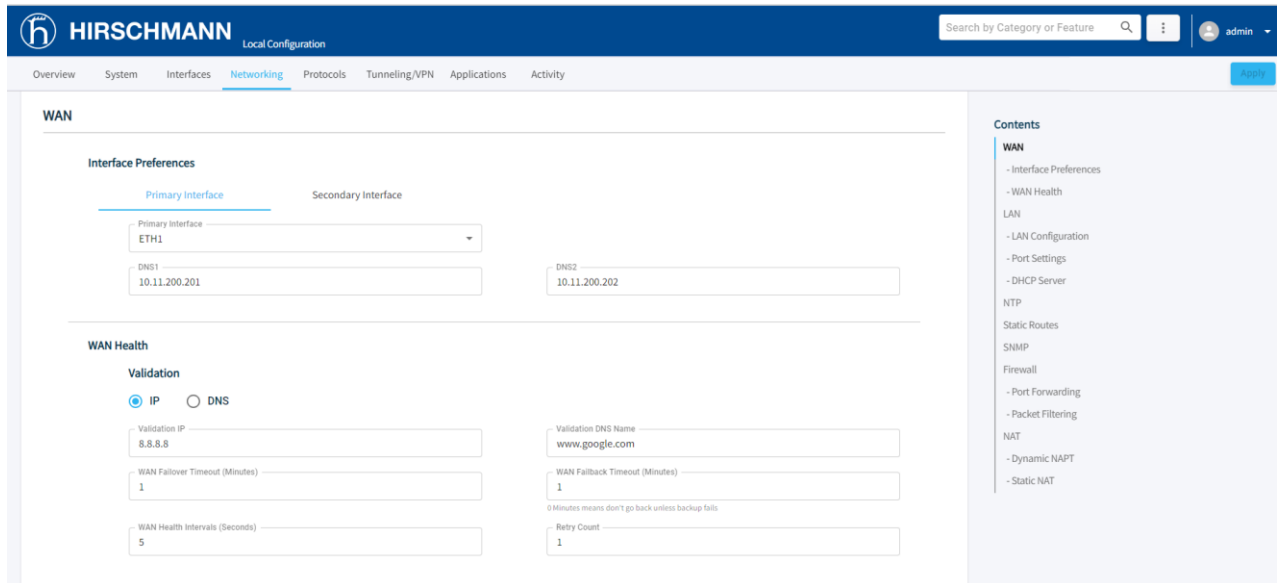
The main content area is titled "WAN" and is divided into two sections:

- Interface Preferences:** This section has two tabs: "Primary Interface" (selected) and "Secondary Interface". Under the "Primary Interface" tab, there is a dropdown menu for "Primary Interface" set to "ETH1", a text input for "DNS1" with the value "10.11.200.201", and a text input for "DNS2" with the value "10.11.200.202".
- WAN Health:** This section includes a "Validation" subsection with two radio buttons: "IP" (selected) and "DNS". Below these are four text input fields: "Validation IP" (8.8.8.8), "Validation DNS Name" (www.google.com), "WAN Failover Timeout (Minutes)" (1), and "WAN Failback Timeout (Minutes)" (1).

On the right side of the interface, there is a "Contents" sidebar with a tree view of configuration options: WAN (selected), LAN, NTP, Static Routes, SNMP, Firewall, and NAT. Each item has a minus sign next to it, indicating it is expanded.

### 5.3.1 WAN Configuration

The WAN configuration is used to set up interfaces used for WAN, backup WAN, and conditions to switch WANs.



**Note:** Internet access is possible via one of the seven (four in OpEdge-4D) LAN ports. WAN interface is disabled when LAN is enabled.

---

### 5.3.1.1 WAN Interface Preferences

| Parameter                      | Description  |
|--------------------------------|--|
| Primary or Secondary Interface | ETH1 to ETH7 (OpEdge-8D) and ETH1 to ETH4 (OpEdge-4D)<br><b>Note:</b> The ETHx port must be assigned to a specific LAN configuration. More information is detailed in the <i>LAN Configuration</i> <a href="#">section 5.3.2</a> . |
| DNS1 and DNS2                  | DNS IPs assigned by the user.  |

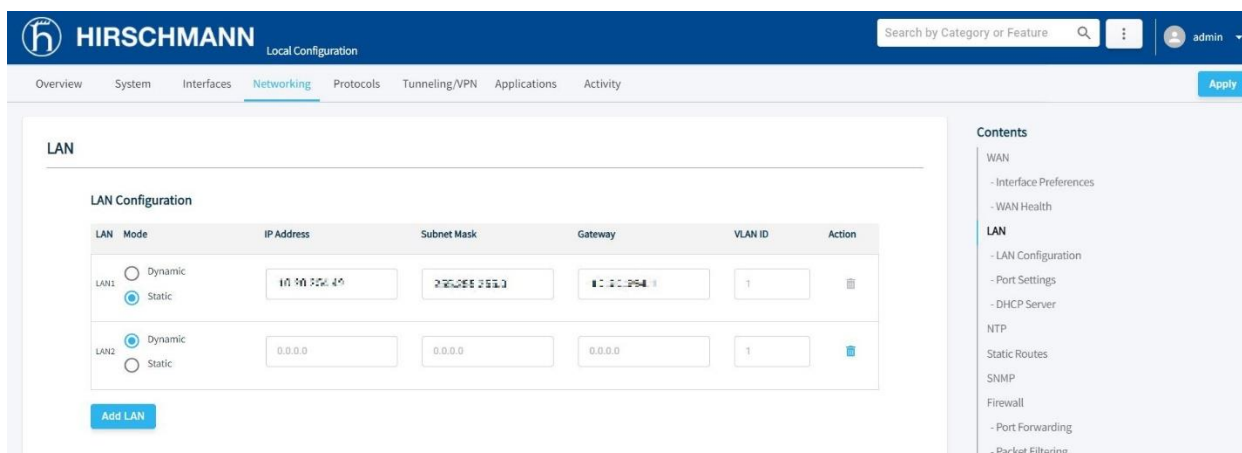
### 5.3.1.2 WAN Health

| Parameter            | Description  |
|----------------------|--|
| Validation IP        | The system will ping the IP and confirm if the WAN network is operational.   |
| Validation DNS Name  | The system will ping the DNS and confirm if the WAN network is operational.  |
| WAN Failover Timeout | The failed timeout, in minutes, after which primary network will be switched to secondary, or vice versa.                                |
| WAN Fallback Timeout | If the primary network fails after timeout period, in minutes, the system will re-check the network. If successful, it will switch back. |
| WAN Health Intervals | The time period, in seconds, for which the system will test the WAN network.   |
| Retry Count          | The retry count to confirm that the network is operational.  |

## 5.3.2 LAN Configuration

The *LAN Configuration* defines the type of Ethernet connection for a port, i.e. static or dynamic. To create a LAN configuration:

- 1 Click the *Networking* tab on the OpEdge configuration webpage.



- 2 Under **LAN Configuration**, click the **ADD LAN** button.

**Note:** The user can add a maximum of seven LAN ports for OpEdge-8D and a maximum of four LAN ports for OpEdge-4D.

- 3 Select the *Mode*: **DYNAMIC** or **STATIC**.

For **STATIC** configuration, enter the following parameters:

| Parameter   | Description                       |
|-------------|-----------------------------------|
| IP Address  | Static IP Address for the port.   |
| Subnet Mask | Subnet mask of the IP Address.    |
| Gateway     | Default IP Address of the OpEdge. |
| VLAN ID     | VLAN identification number.       |

- 4 Click **APPLY** to save the changes.
- 5 To assign a LAN Configuration to a specific OpEdge Ethernet port, click the *Interfaces* tab.
- 6 Under *Ethernet Ports* > *Port Settings*, assign the *LAN Membership* to the LANx configuration made in the previous section (*LAN Configuration* in [section 5.3.2](#)).

### a. OpEdge-8D

Ethernet Ports

Port Settings

| Port | Port Speed | Duplex | LAN Membership | Tagging                                    |
|------|------------|--------|----------------|--|
| ETH1 | Auto       | Auto   | LAN1           | <input checked="" type="checkbox"/> Tagged |
| ETH2 | Auto       | Auto   | None           | <input checked="" type="checkbox"/> Tagged |
| ETH3 | Auto       | Auto   | None           | <input checked="" type="checkbox"/> Tagged |
| ETH4 | Auto       | Auto   | None           | <input checked="" type="checkbox"/> Tagged |
| ETH5 | Auto       | Auto   | None           | <input checked="" type="checkbox"/> Tagged |
| ETH6 | Auto       | Auto   | None           | <input checked="" type="checkbox"/> Tagged |
| ETH7 | Auto       | Auto   | LAN7           | <input checked="" type="checkbox"/> Tagged |

LAN Configuration ✔ Configured

### b. OpEdge-4D

HIRSCHMANN Local Configuration

Search by Category or Feature

admin

Overview System **Interfaces** Networking Protocols Tunneling/VPN Applications Activity

Apply

Ethernet Ports

Port Settings

| Port | Port Speed | Duplex | LAN Membership | Tagging                                    |
|------|------------|--------|----------------|--|
| ETH1 | Auto       | Auto   | LAN1           | <input checked="" type="checkbox"/> Tagged |
| ETH2 | Auto       | Auto   | LAN2           | <input checked="" type="checkbox"/> Tagged |
| ETH3 | Auto       | Auto   | LAN2           | <input checked="" type="checkbox"/> Tagged |
| ETH4 | Auto       | Auto   | LAN2           | <input checked="" type="checkbox"/> Tagged |

LAN Configuration ✔ Configured

Contents

- Ethernet Ports
  - Port Settings
  - Serial Ports
  - Port Membership
  - USB

7 Click **APPLY** to save the changes.



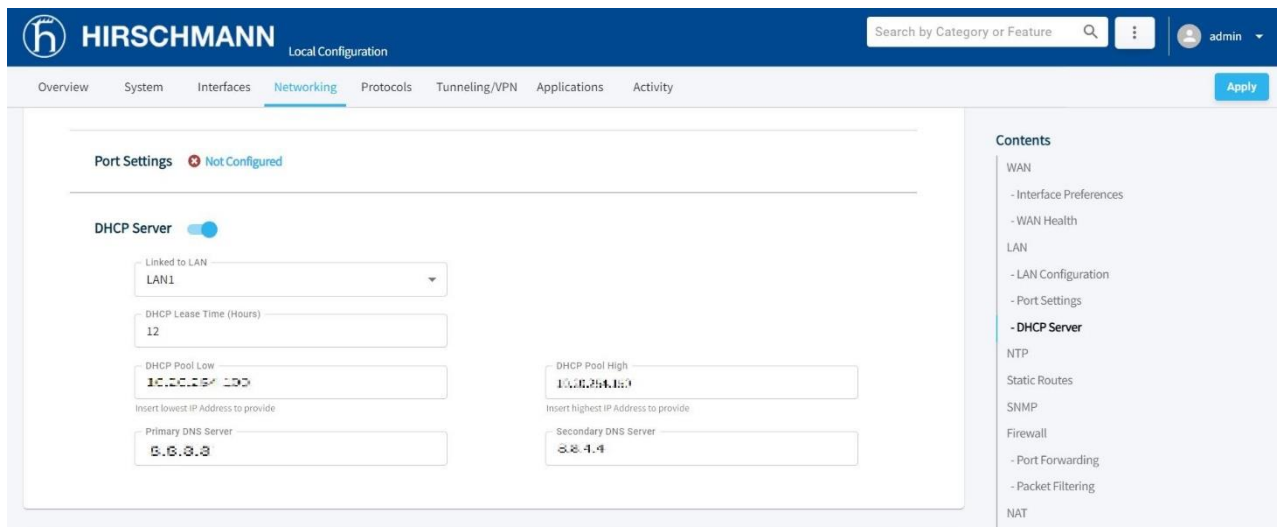
### 5.3.2.1 DHCP Server

The OpEdge can operate as a DHCP server that assigns IP address, DNS server, and default gateway address configurations to all devices connected via LAN. By default, this feature is disabled.

Dynamic allocation allows automatic reuse of addresses by granting temporary address leases to hosts as they are requested. When a lease expires, the host must renew the lease with the server. If a lease is not renewed, that address may be allocated to a new host. For dynamic allocation, a set of address pools (or "ranges") are configured on the server and new addresses are selected from these pools.

To configure the DHCP server on OpEdge:

- 1 Click the *Networking* tab on the OpEdge configuration webpage.



- 2 Click the **DHCP SERVER** toggle button to enable the *DHCP Server* configuration.
- 3 Enter the following values:

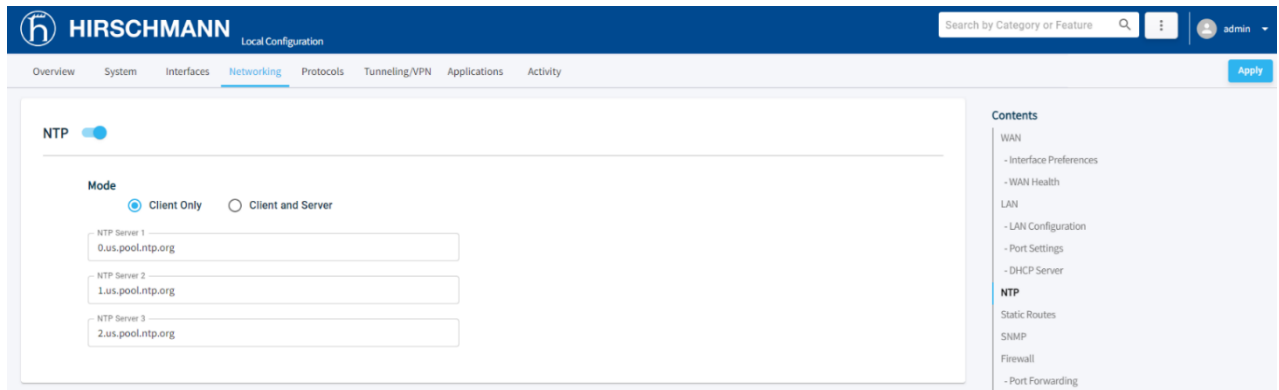
| Parameter            | Description   |
|----------------------|---|
| Linked to LAN        | LAN port to be used to connect the end device to the network.                     |
| DHCP Lease Time      | Lease period in hours (Range: 0 to 23)  |
| DHCP Pool Low        | Start of the range for the pool of IP addresses in the same subnet as the device. |
| DHCP Pool High       | End of the range for the pool of IP addresses in the same subnet as the device.   |
| Primary DNS Server   | Primary DNS server IP address.  |
| Secondary DNS Server | Secondary DNS server IP address.  |

- 4 Click **APPLY** to save the changes.

### 5.3.3 NTP

This feature enables the Network Time Protocol (NTP) to synchronize the clocks of data networks and the OpEdge.

Click the **NTP** toggle button to enable the *NTP* configuration.

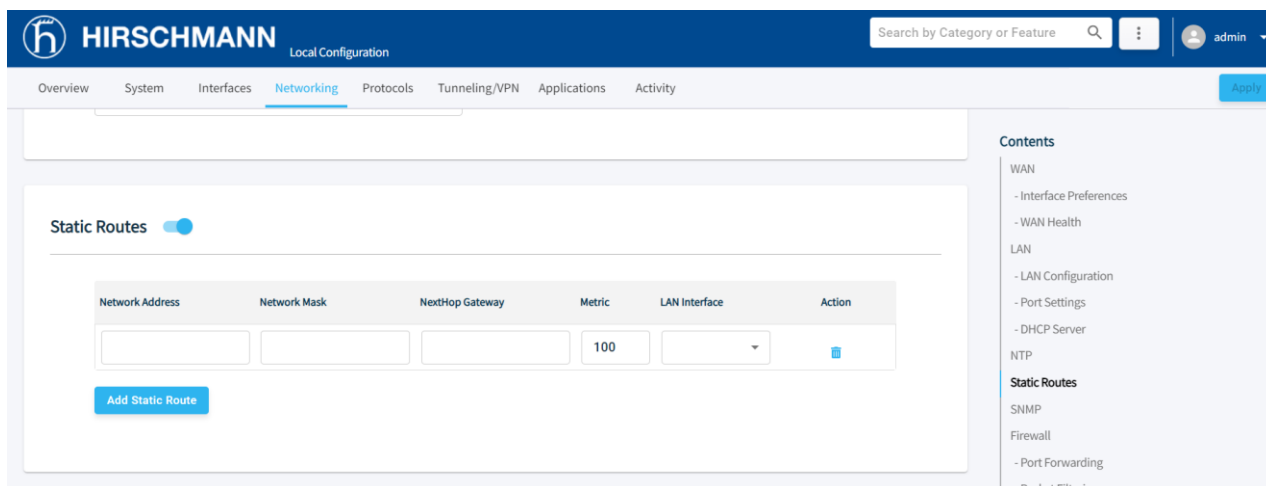
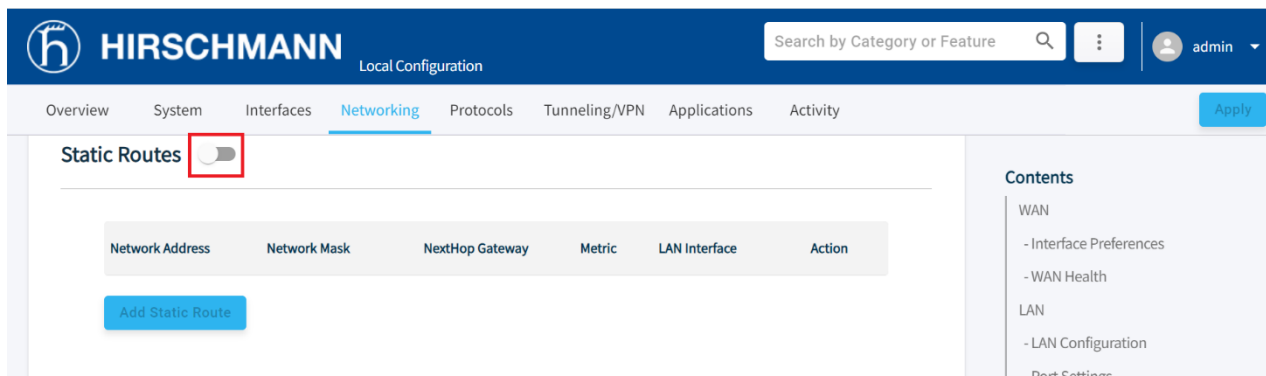



| Parameter          | Description  |
|--------------------|--|
| Mode               | <b>Client Only</b> - NTP process will query NTP server and update OpEdge system time.<br><b>Client/Server</b> - NTP process will query NTP server and update OpEdge system time and resolve NTP requests from the LAN clients. |
| NTP Server 1, 2, 3 | Server time updates for the OpEdge. Example: pool.ntp.org  |

### 5.3.4 Static Routes

Static routing is a form of routing that occurs when a router uses a manually configured routing entry, rather than information from dynamic routing traffic.

Click the **STATIC ROUTES** toggle button to enable the *Static Routes* configuration.



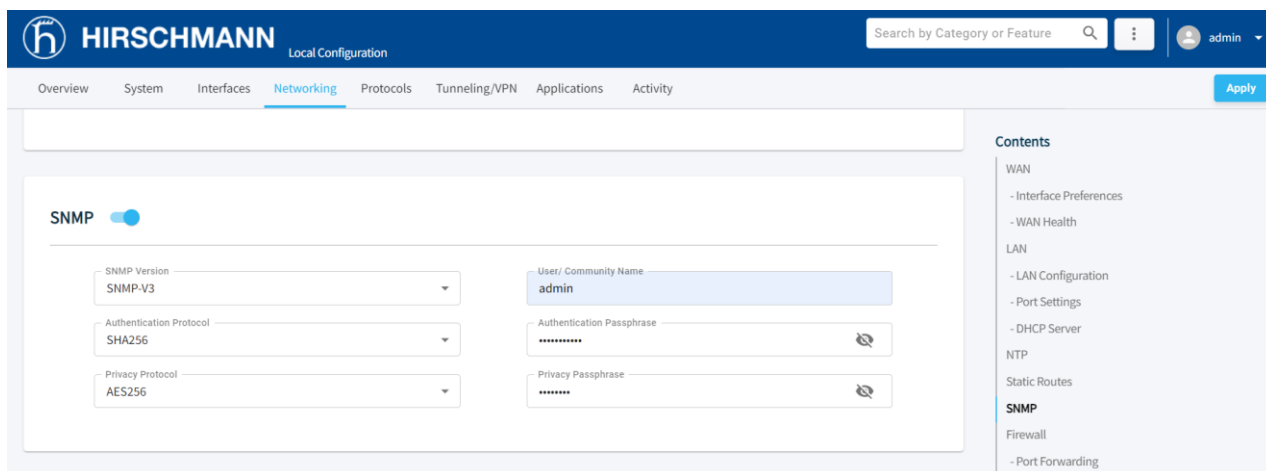
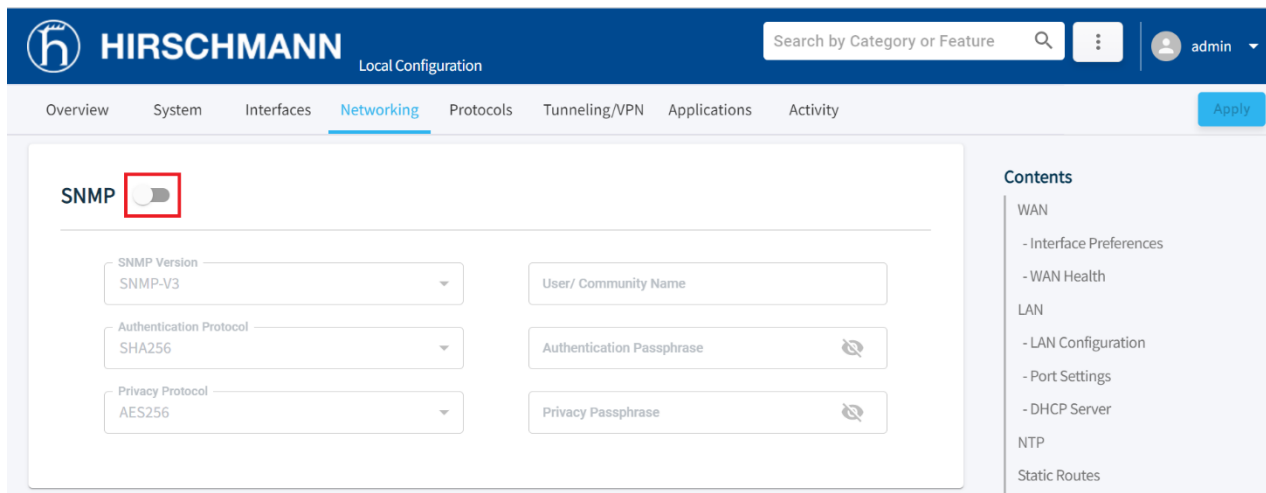
| Parameter  | Description   |
|--|---|
| Network Address  | IP Address of the network.  |
| Network Mask   | Subnet mask of the network.   |
| NextHop Gateway  | Nexthop gateway address.  |
| Metric   | Metric can be any positive 32-bit number. Default is <b>100</b> .             |
| LAN Interface  | Select from the available LAN interfaces where static route need to be added. |
| Action  | Action button provides the option to delete the static route.                 |

### 5.3.5 SNMP

Simple Network Management Protocol (SNMP) is an application-layer protocol for monitoring and managing network devices on a local area network (LAN) or wide area network (WAN).

The purpose of SNMP is to provide network devices, such as routers, servers and printers, with a common language for sharing information with a network management system.

Click the **SNMP** toggle button to enable the *SNMP* configuration.



**Note:** The *User/Community Name* must be 5-20 characters alphanumeric. The *Authentication Passphrase* and *Privacy Passphrase* must be 8-20 characters alphanumeric.

| Parameter                 | Description   |
|---------------------------|---|
| SNMP Version              | Version of SNMP which is preset to SNMP-V3.                             |
| Authentication Protocol   | Protocol used for authentication which is preset to SHA256.             |
| Privacy Protocol          | Privacy protocol – Default: AES256.                                     |
| User/ Community Name      | User name to be provided by user.                                       |
| Authentication Passphrase | Password required for authentication to be added by the user.           |
| Privacy Passphrase        | This is the password for privacy which needs to be provided by the user |

## 5.3.6 Firewall

The OpEdge implements the firewall feature to control the traffic flow between a trusted network (such as corporate LAN) and an untrusted or public network (such as Internet). It supports Port Forwarding and Packet Filtering.

### 5.3.6.1 Port Forwarding

This feature allows a remote client device to access the multiple server devices connected to the OpEdge LAN by associating each one of these devices to an OpEdge port number. Up to 10 mappings can be created.

To configure Port Forwarding:

- 1 Open the OpEdge configuration webpage.
- 2 Click the *Networking* tab and toggle the **PORT FORWARDING** button.


#### Firewall

- 3 Enter the following parameters:

| Parameter      | Description   |
|----------------|---|
| Application    | Name of the mapping.  |
| Protocol       | Select the protocol for packet delivery: <i>TCP</i> , <i>UDP</i> or <i>Both</i> |
| LAN IP Address | IP address of the destination LAN device.                                       |

**Note:** When configuring the end device, make sure:

---

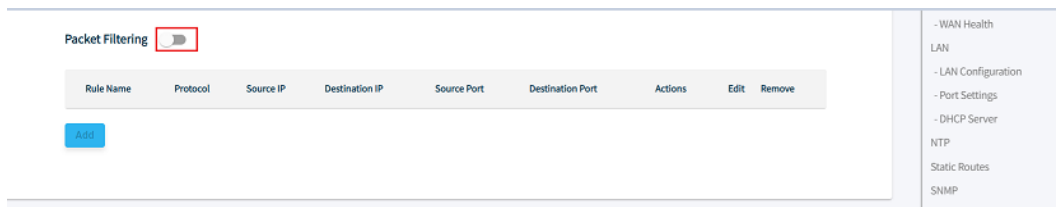
|  |   |
|--|---|
|  | The IP Address of the end device must match the value entered in the <i>End Device Address</i> field in the OpEdge. |
|  | The Gateway address on the end device must point to the OpEdge IP Address and Subnet Mask addresses.                |
| From Port Range  | The WAN port range through which data must be forwarded to each device.   |
| To Port Range  | The LAN device port range listening to the forwarded traffic.   |
| Action  | Deletes the mapping.  |

- 4 Click **ADD PORT** to add ports.
- 5 Click **APPLY** to save the changes.

### 5.3.6.2 Packet Filtering

Packet Filtering allows the user to specify values for 5 fields in the Transport/Network layer header of TCP/IP protocol suite. The user can choose to accept the packet for forwarding OR drop the packet silently. The Packet filter feature, called as 5T firewall, applies to routed (forwarded) traffic only - it controls the packets that are allowed to pass from **WAN-to-LAN** or **LAN-to-WAN** or **LAN-to-LAN** interface.



Click the **PACKET FILTERING** toggle button to enable the *Packet Filtering* configuration.



- 1 Click on the **ADD** button to configure a packet filtering rule.

- 2 Provide values for the following parameters:

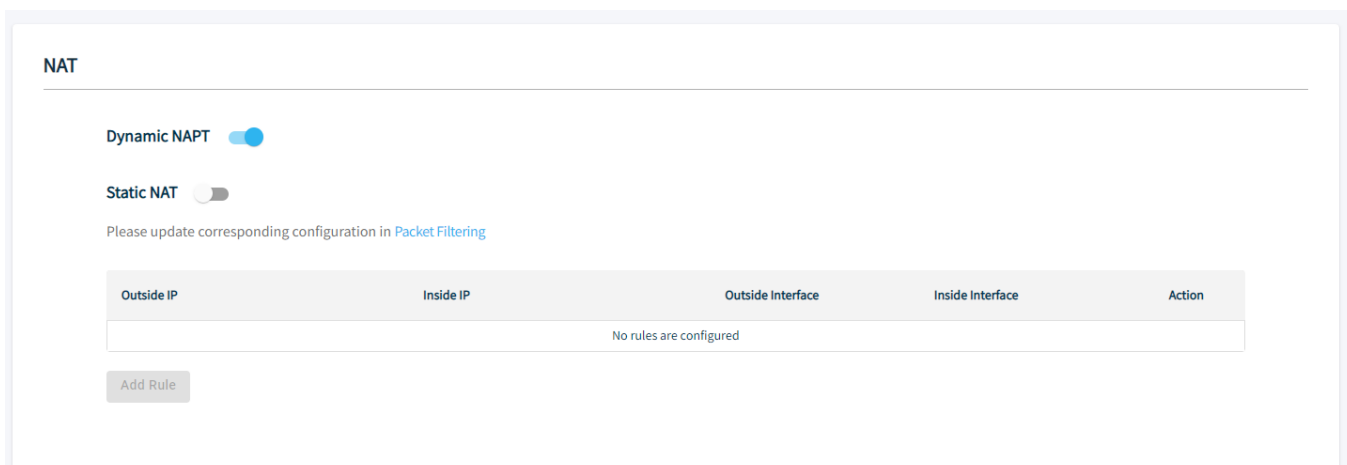
| Parameter      | Description  |
|----------------|--|
| Rule Name      | Name of the rule. Allows up to 40 alphanumeric and special characters “_”, “-” |
| Protocol       | Protocol used for packet filtering.  |
| Source IP      | IP of the source device.   |
| Destination IP | IP address of destination device.  |
| Source Port    | Port used for source device.   |

|  |  |
|--|--|
| Destination Port   | Port used for destination device.  |
| Actions  | The action to <b>Accept</b> the packet for forwarding or <b>Drop</b> the packet. |
| Edit    | The rule can be edited by using this option.                                     |
| Remove  | Removes the rule from the list.  |

- 3 Click on the **SAVE** button.

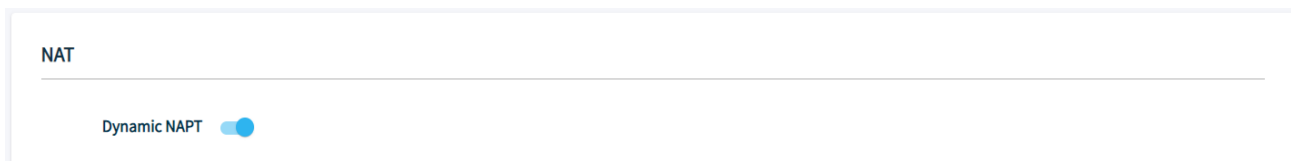
### 5.3.7 NAT

The OpEdge supports Dynamic NAPT and Static NAT. It allows the port and the address to connect to the internet or outside world.



#### 5.3.7.1 Dynamic NAPT

The OpEdge supports dynamic network address and port translation (DNAPT). This allows the port and address to dynamically change while accessing the WAN from the LAN. Multiple devices can then connect to the outside.



#### 5.3.7.2 Static NAT

Static Network Address Translation (NAT) is a one-to-one mapping of a private IP address to a public IP address. *Static NAT* is useful when a network device inside a private network needs to be accessible from the internet.

To configure *Static NAT*, the *Packet Filter* rules must be pre-configured. Refer to [section 5.3.6.2](#) to configure the *Packet Filtering* rules.

Click the **Static NAT** toggle button to enable its configuration and then click on **Add Rule** to add entry.



Static NAT

Please update corresponding configuration in [Packet Filtering](#)

| Outside IP              | Inside IP | Outside Interface | Inside Interface | Action |
|-------------------------|-----------|-------------------|------------------|--------|
| No rules are configured |           |                   |                  |        |

Add Rule

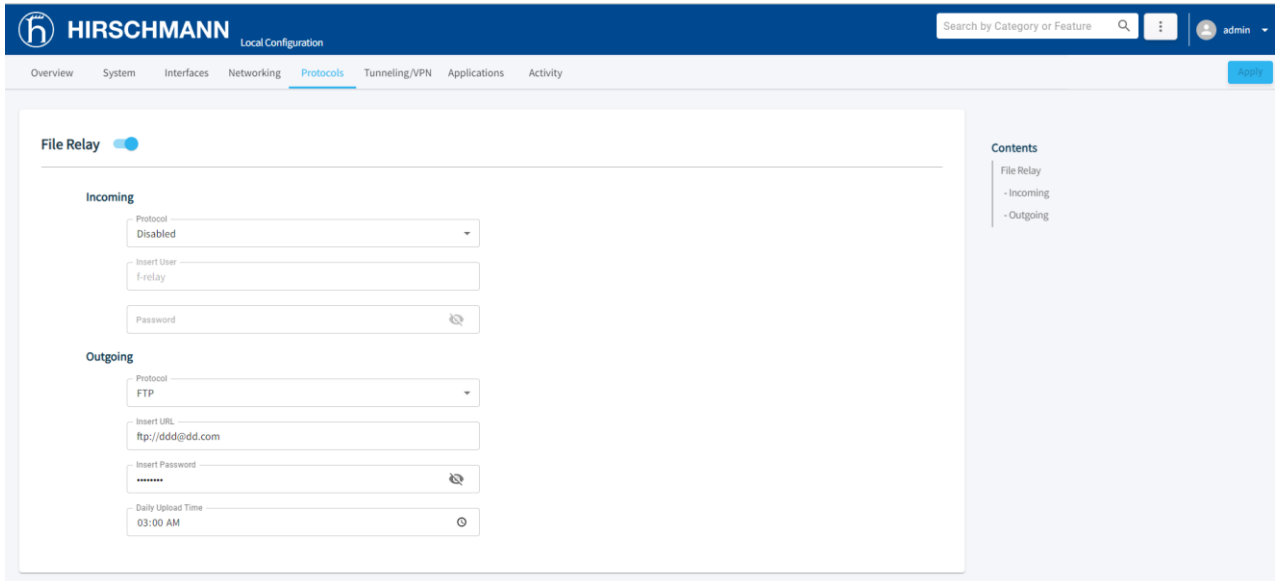
1 Provide values for the following parameters:

| Parameter         | Description   |
|-------------------|---|
| Outside IP        | The public IP address on which the user will access the end device.             |
| Inside IP         | The private IP address on which the end device is actually connected to OpEdge. |
| Outside Interface | WAN/Internet interface  |
| Inside Interface  | LAN/End-device interface.   |
| Action            | Delete icon removes the rule.   |

2 Click on the **APPLY** button.

## 5.4 Protocols Tab

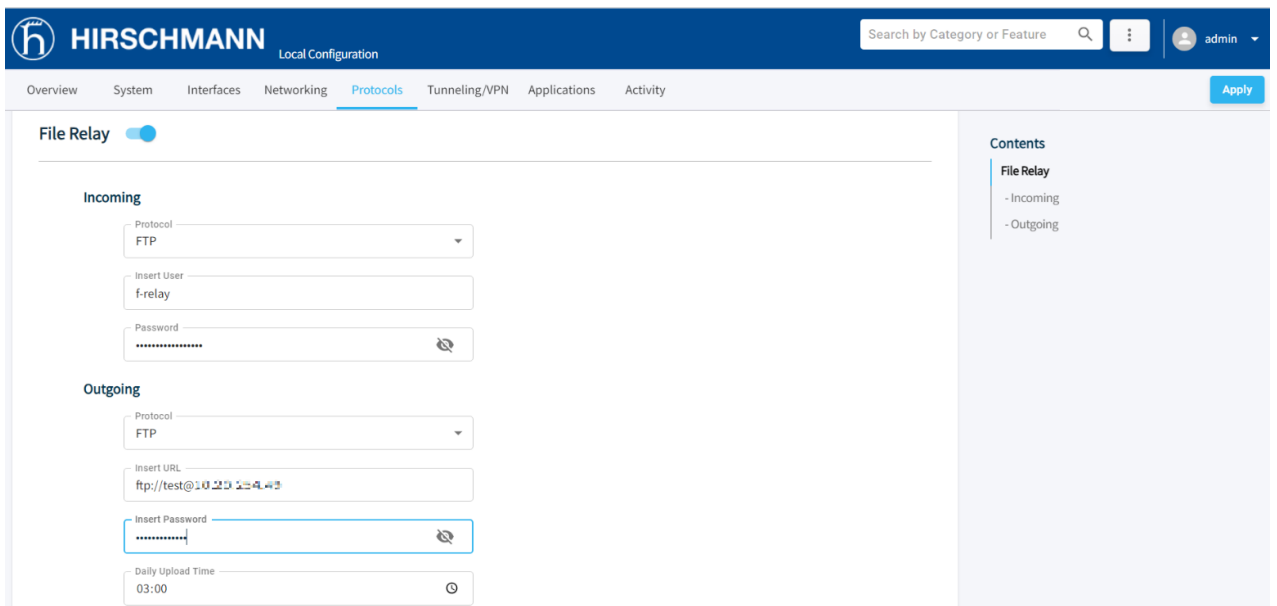
The *Protocols* tab is used to transfer files from the device to Belden Horizon.



### 5.4.1 File Relay

The LAN and WAN ports on the OpEdge are physically isolated. The File Relay functionality enables simple and secure transfer of files across segmented networks. For example, if the customer would like to back up all of their OT equipment configuration files on the server without wanting to create a link between the IT and OT network, the OpEdge can be used to segment between the two networks.

The *File Relay* tab allows you to use the Internal Storage (/user folder) on the device as a temporary storage medium for large files that can be automatically transferred to a remote location. Files can be copied to the OpEdge Internal Storage from an FTP/SFTP Client. The files can then be transferred to a remote FTP/SFTP Server, or via Belden Horizon.



- 1 In the *Incoming* [section](#) of the *File Relay* tab, select the **FTP** or **SFTP** protocol to enable FTP or SFTP Incoming file transfer.
- 2 Use the following table to enter the appropriate parameters:

| Parameter         | Description   |
|-------------------|---|
| <b>Incoming</b>   |   |
| Protocol          | FTP (File Transfer Protocol)<br>SFTP (Secure File Transfer Protocol)  |
| User              | The user name is for uploading files through FTP to the Internal storage.<br>The default value is <b>f-relay</b> .  |
| Password          | Password for FTP access. The password must have at least 8 characters, contain at least one uppercase letter, one lowercase letter, and 1 special character.  |
| <b>Outgoing</b>   |   |
| Protocol          | Protocol of the server used as final destination for the File Relay.<br><input type="checkbox"/> Supported protocols for upload are FTP/SFTP/Belden Horizon   |
| URL               | URL of the server used as final destination for the File Relay. <ul style="list-style-type: none"> <li>• Supported protocols for upload are FTP/SFTP/Belden Horizon</li> <li>• For FTP the format is specified in the field: <a href="#">ftp://user@host/</a></li> <li>• For SFTP the format is: <a href="#">sftp://user@host:port/</a></li> </ul>  |
| Password          | Password used to upload to the remote server. You can view the configured value by pressing the "eye" button. <ul style="list-style-type: none"> <li>• Password is used only for FTP</li> </ul>   |
| Host Key          | Public Key that authenticates SFTP Server and proves its identity to OpEdge client. This should be copied from SFTP Server and pasted here.<br>Public Key from SFTP Server should be exported as <b>OpenSSH</b> format.   |
| SSH-Key           | SSH-Key is the public key that authenticates the SFTP Server user for file transfer. Once generated, it should be copied to the SFTP Server as a .pub file and associated with the designated user.<br>The SSH-Key pair generation takes place the first time it is requested. Subsequent requests return the same public key.<br><br>SSH keys will be removed upon gateway factory reset. <ul style="list-style-type: none"> <li>• Used only for SFTP</li> </ul> |
| Daily Upload Time | The upload time, shown in the Local UI is UTC – similar to the time on the <i>Overview</i> page. The default time value is 03:00.   |

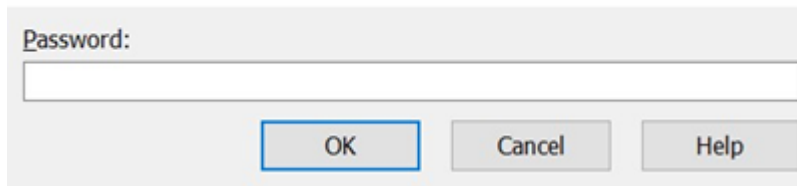
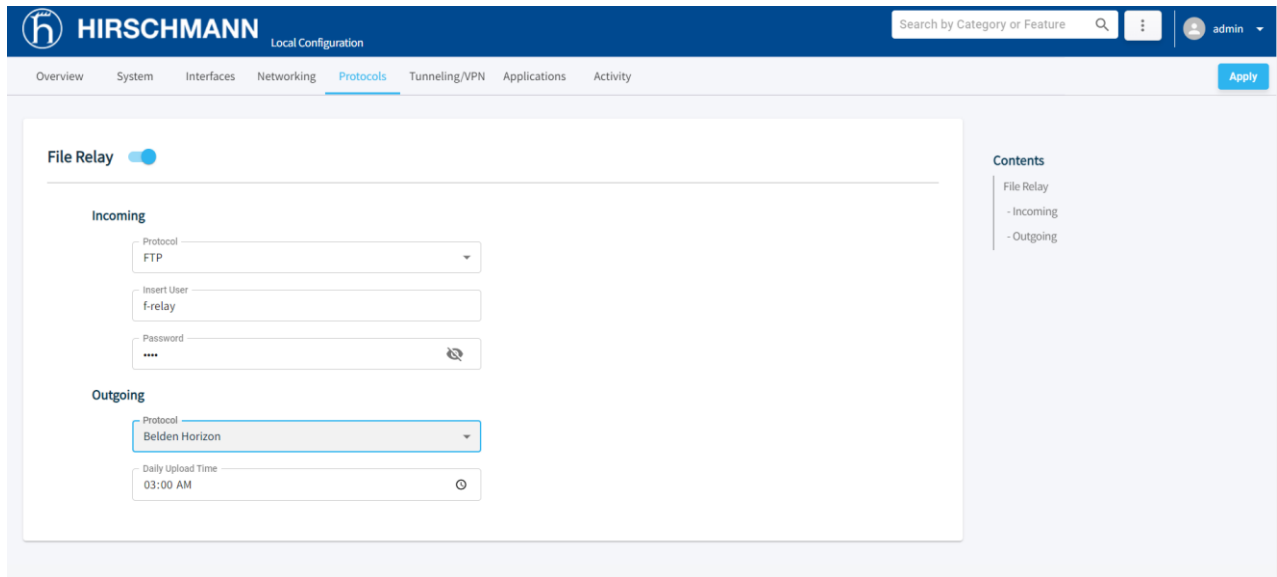
- 3 Click **APPLY** when complete.

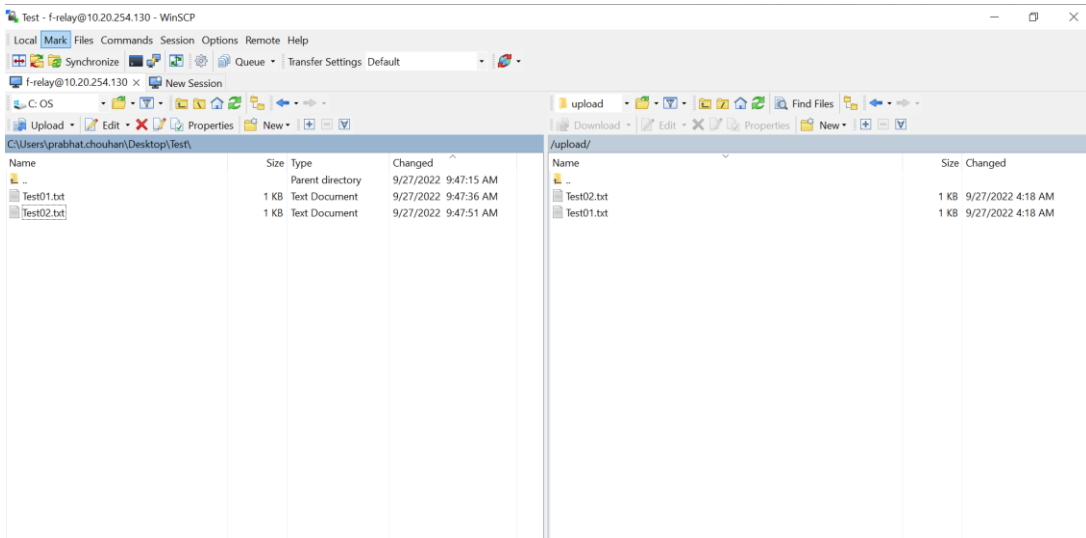
## 5.4.2 File Transfer to Belden Horizon

Users can transfer files from OpEdge to Belden Horizon. Below is the example for Belden Horizon file transfer.

- 1 Generate the Activation key from the overview page and add gateway on Belden Horizon. Detailed steps are given in [section 3.1](#) for activating the gateway on Belden Horizon.
- 2 From the WinSCP Client, open a SFTP/FTP session to OpEdge and transfer a few files to the Upload folder on OpEdge Internal Storage. Select *Belden Horizon* for *Outgoing* and also set a time for the file transfer.

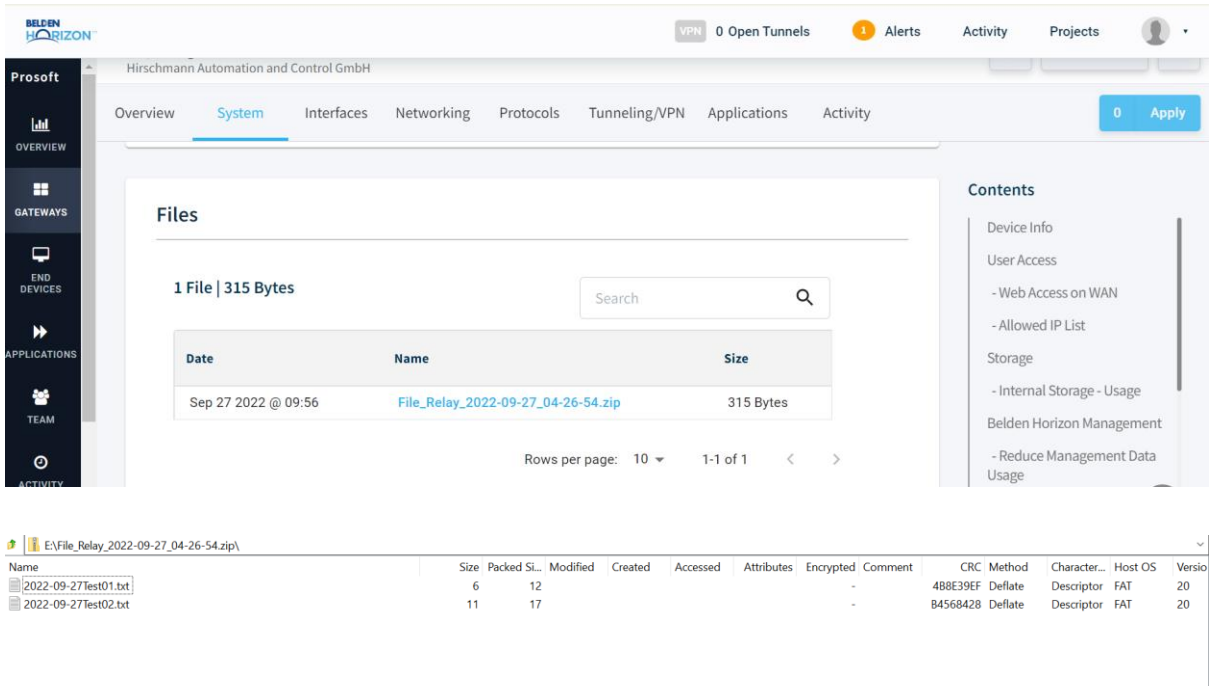
Use the same username and password for the SFTP/FTP session as given on the OpEdge Incoming file relay [section 5.4.2](#).





- After uploading the files to the upload folder, the user can find the transferred file on Belden Horizon. It may take up to 10 minutes from the time given for the file transfer, as the file transfer cycle is triggered once in 10 minutes.

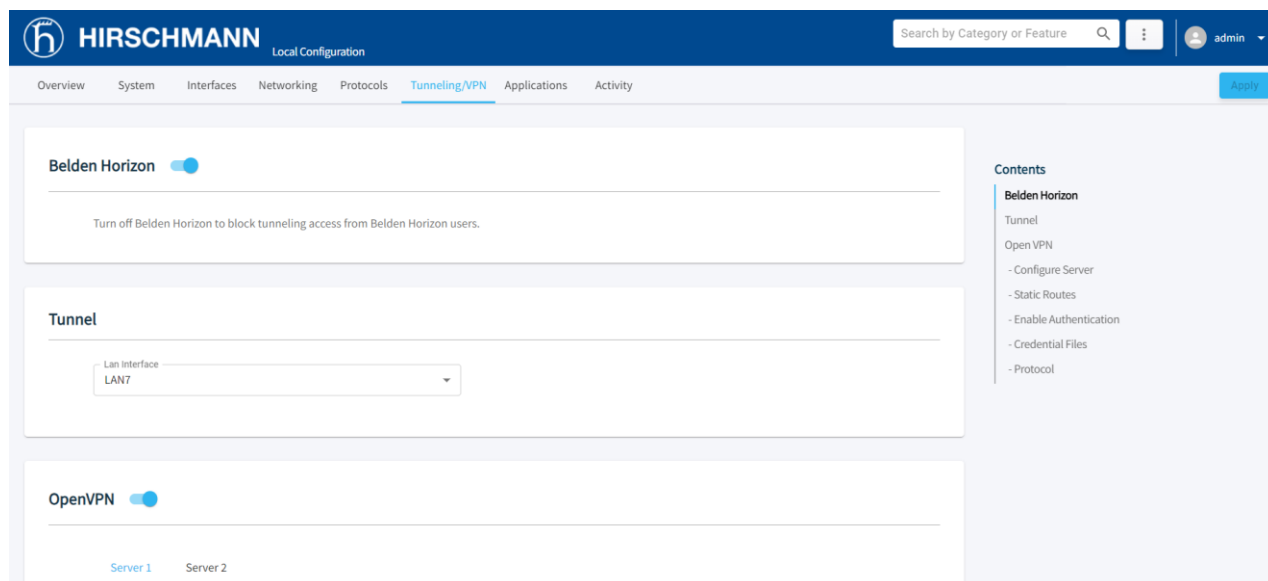
The files can be found on Gateway > System tab > Files of Belden Horizon. The user can download the zip file and extract the transferred files from it.



**Note:** Belden Horizon files can be transferred only once in 24 hours.

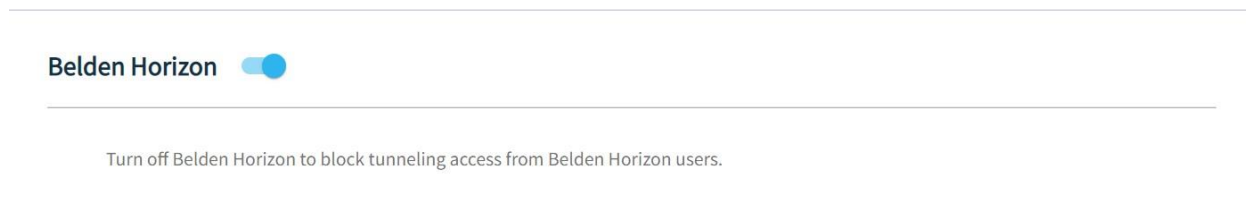
## 5.5 Tunneling / VPN Tab

The *Tunneling/VPN* tab allows the configuration of a Virtual Private Network (VPN) tunnel using Belden Horizon, SRA & PDN Tunnel and Open VPN.



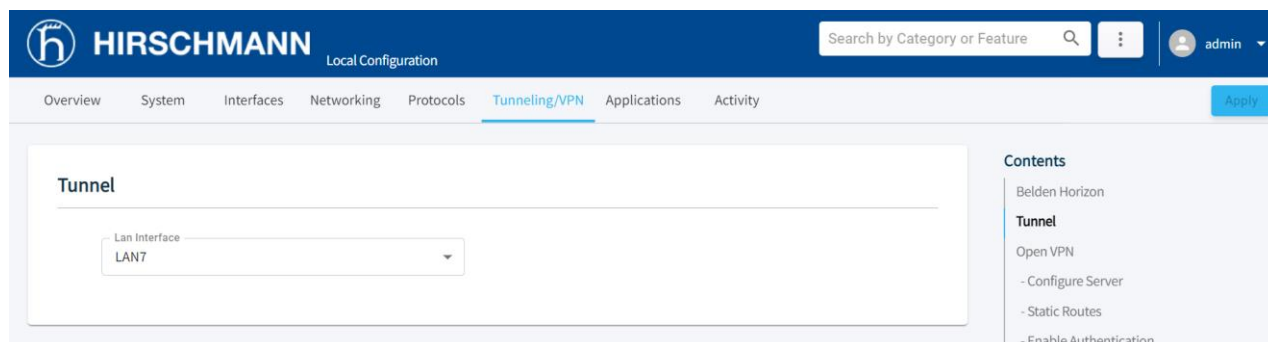
### 5.5.1 Belden Horizon

The **BELDEN HORIZON** toggle button allows the user to turn off Belden Horizon to block tunneling access from Belden Horizon users.



### 5.5.2 Tunnel

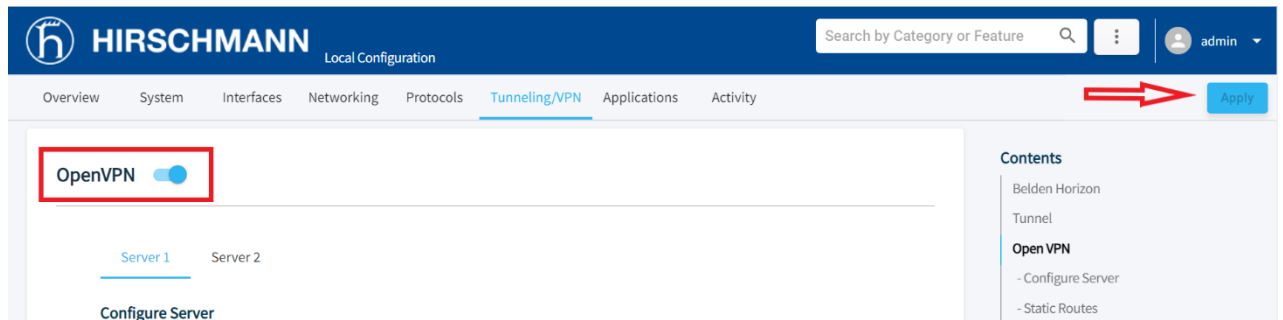
The Tunnel section provides a dropdown to select LAN interfaces to be members of SRA/PDN tunnel Hub. In the **LAN INTERFACE** dropdown list, the currently available LAN interfaces, which are not being used as WAN interfaces will be displayed.



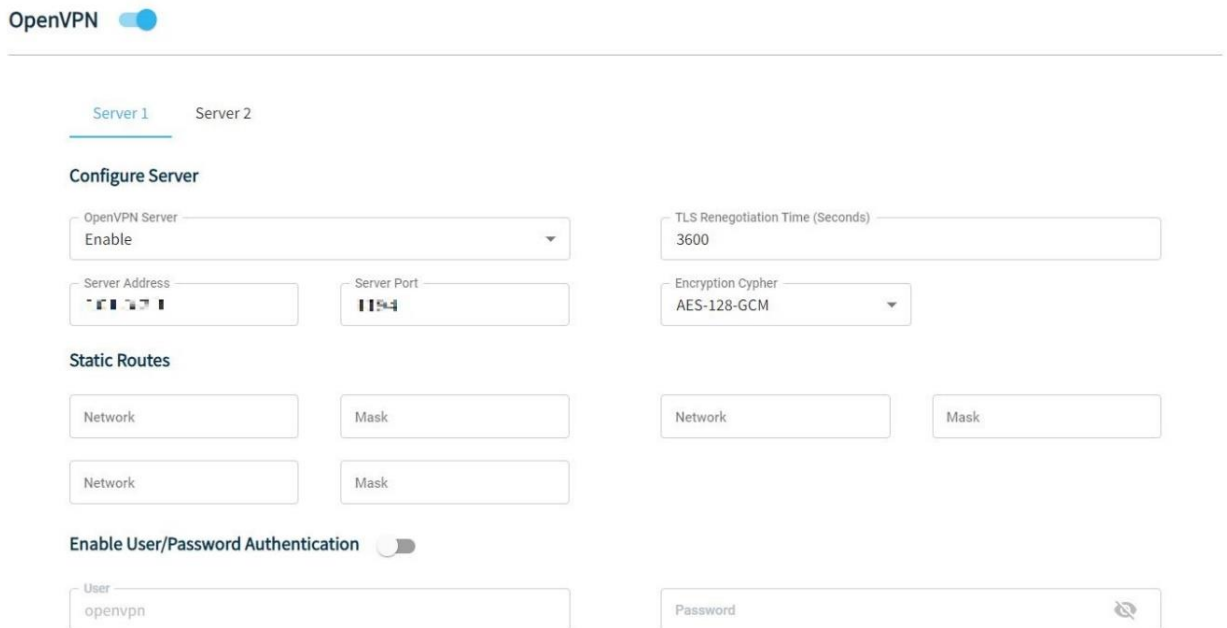
### 5.5.3 OpenVPN

The Virtual Private Network (VPN) Tunnel allows you to access a private local network. OpenVPN is an open-source software application that implements virtual private network (VPN) techniques for creating secure point-to-point or site-to-site connections in routed or bridged configurations and remote access facilities. It uses a custom security protocol that utilizes SSL/TLS for key exchange.

- 1 The *OpenVPN* toggle button allows the user to turn on/off the feature after clicking on the apply button.



- 2 To configure *OpenVPN* you need to provide the following parameters



## Credential Files

| Name                      | File name | Browse File                                   | Remove |
|---------------------------|-----------|---|--------|
| Certificate Authority     |           | <input type="button" value="Browse File..."/> |        |
| Client Certificate        |           | <input type="button" value="Browse File..."/> |        |
| Client Key                |           | <input type="button" value="Browse File..."/> |        |
| Custom Configuration File |           | <input type="button" value="Browse File..."/> |        |

## Protocol

TCP
  UDP

| Parameter                             | Description  |
|---------------------------------------|--|
| OpenVPN server                        | A dropdown to enable or disable the server.  |
| TLS Renegotiation Time                | Transport layer Security renegotiation time in seconds. This controls how often the underlying SSL/TLS session renegotiates. This provides additional security by frequently rekeying the session keys. Default value: <b>3600</b> .   |
| Server Address                        | IP address or hostname of the VPN server. This is the IP Address that you are creating the tunnel to. Default value: <b>3.216.155.83</b>   |
| Server Port                           | Service port number on the VPN server. This is the port number for the OpenVPN. Port <b>1194</b> is the default port designated for OpenVPN.   |
| Encryption Cypher                     | Cipher used to encrypt data channel packets. Some of the ciphers that are supported by OpenVPN are not available in this list because they are considered insecure. However, these can still be used by using a custom configuration file.   |
| Static Routes                         | Static routes to remote networks to be specifically accessed through the configured OpenVPN connection. A maximum of 3 static routes are supported per tunnel.   |
| Enable User / Password Authentication | Alternative authentication method based on username and password. Enter a Username and Password.   |
| Credential Files                      | <p>Certificate Authority - VPN authentication that issues certificates for VPN, Secure Internal Communication (SIC), and users.</p> <p>Client Certificate - Issued by a certificate authority as proof of identity.</p> <p>Client Key - Password to the corresponding client certificate.</p> <p>Click the Choose File button to locate these files.</p> <p><b>Note:</b> These Credential files are mandatory to enable OpenVPN. They can either be uploaded individually or have their content added inline, within the custom configuration file. If mistakenly you uploaded them and also have them inline in the configuration file, the files uploaded individually will take precedence.</p> |
| Custom Configuration File             | Click the Choose File button to locate and upload a custom OpenVPN configuration file, which overrides any credential files previously loaded. If you have not previously uploaded any credential files, the Custom Configuration File should include them.  |
| Protocol                              | The protocol to use when connecting with the remote: TCP or UDP  |

**3** Click on **APPLY** button when complete.

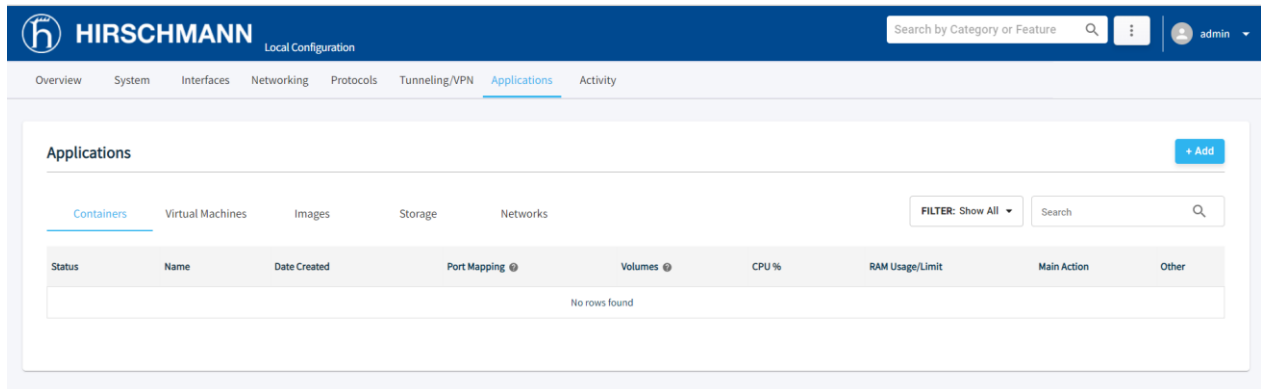


## 5.6 Applications Tab

The *Applications* tab allows the user to perform actions on containers and virtual machines. For more information about the *Applications* tab and its features, please see the *Applications* chapter in [section 6](#).

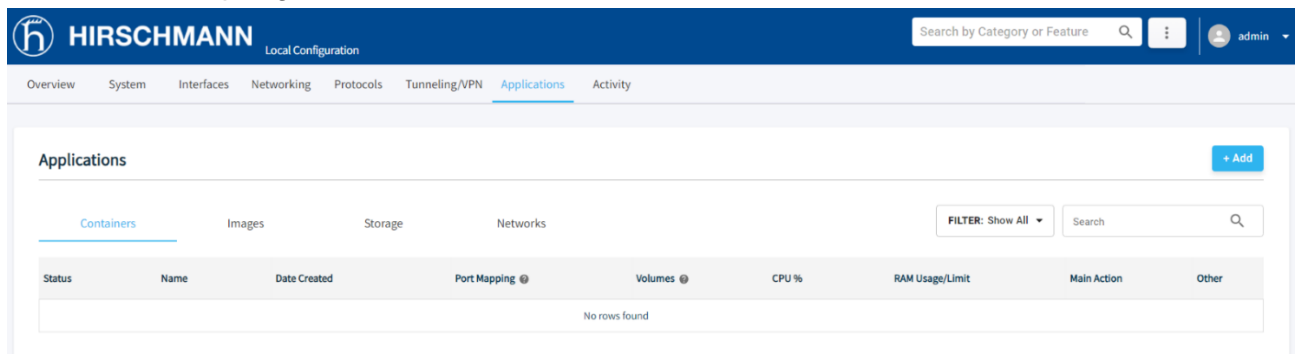
**Note:** For OpEdge-4D, **VIRTUAL MACHINES** tab will not be displayed under Applications.

### a. OpEdge-8D



The screenshot shows the Hirschmann Local Configuration web interface for OpEdge-8D. The top navigation bar includes the Hirschmann logo, the text "HIRSCHMANN Local Configuration", a search bar, and a user profile icon labeled "admin". The main navigation menu contains "Overview", "System", "Interfaces", "Networking", "Protocols", "Tunneling/VPN", "Applications" (which is highlighted), and "Activity". The "Applications" section has a "+ Add" button in the top right corner. Below this, there are sub-tabs: "Containers" (selected), "Virtual Machines", "Images", "Storage", and "Networks". A filter dropdown is set to "Show All" and a search bar is present. A table with the following columns is shown: "Status", "Name", "Date Created", "Port Mapping", "Volumes", "CPU %", "RAM Usage/Limit", "Main Action", and "Other". The table currently contains the text "No rows found".

### b. OpEdge-4D:



The screenshot shows the Hirschmann Local Configuration web interface for OpEdge-4D. The top navigation bar includes the Hirschmann logo, the text "HIRSCHMANN Local Configuration", a search bar, and a user profile icon labeled "admin". The main navigation menu contains "Overview", "System", "Interfaces", "Networking", "Protocols", "Tunneling/VPN", "Applications" (which is highlighted), and "Activity". The "Applications" section has a "+ Add" button in the top right corner. Below this, there are sub-tabs: "Containers" (selected), "Images", "Storage", and "Networks". A filter dropdown is set to "Show All" and a search bar is present. A table with the following columns is shown: "Status", "Name", "Date Created", "Port Mapping", "Volumes", "CPU %", "RAM Usage/Limit", "Main Action", and "Other". The table currently contains the text "No rows found".

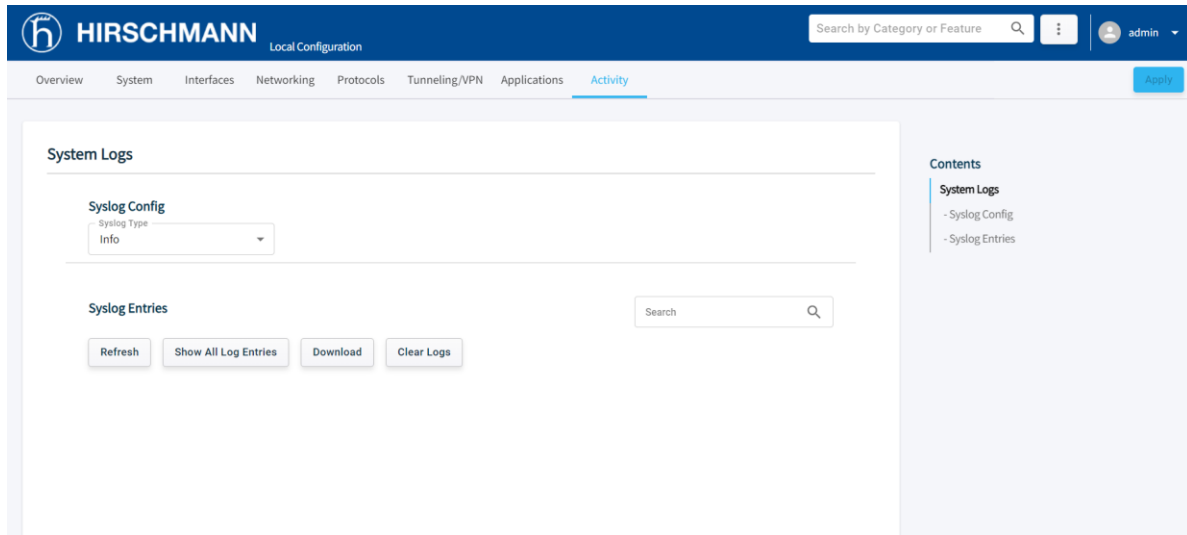
## 5.7 Activity Tab

The *Activity* tab displays OpEdge diagnostics information including System Logs.

### 5.7.1 System Logs

The OpEdge supports **System Logs** which captures various system log or event messages in a local log file.

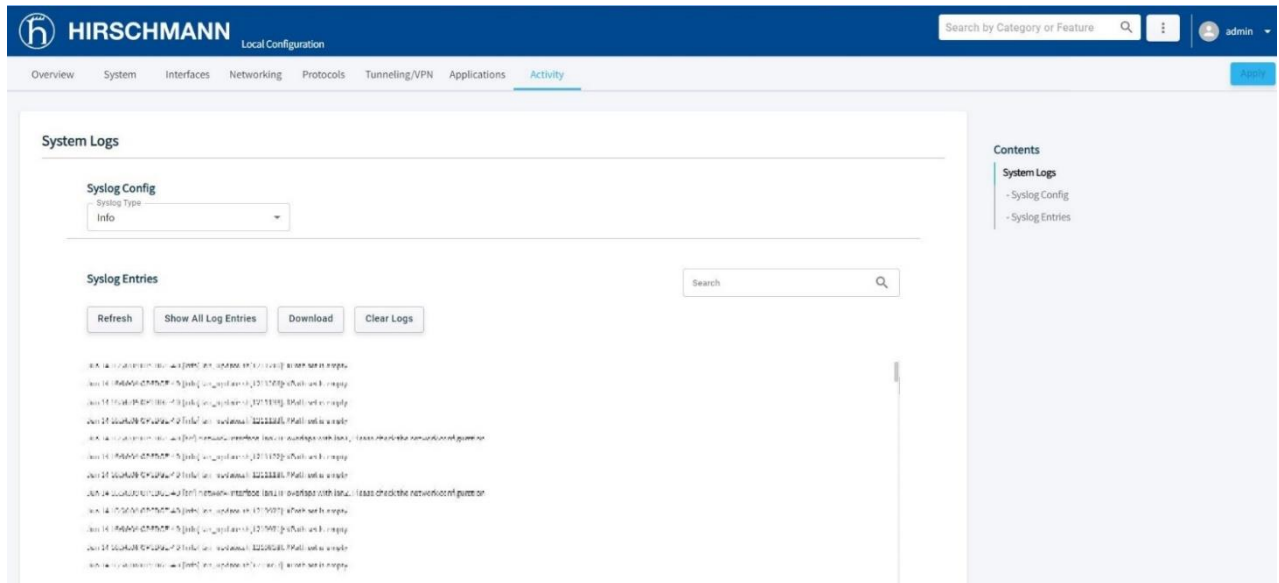
#### 5.7.1.1 System Log Configuration



| Parameter     |             | Description  |
|---------------|-------------|--|
| Syslog Config | Syslog Type | <b>WARNING</b> - Displays system messages and failures only.<br><b>INFO</b> - Displays all Warning messages, plus additional messages.<br><b>DEBUG</b> - Logs all messages; used for resolving issues. |

## 5.7.1.2 System Log Entries

The *System Log Entries* displays the details of the following parameters:

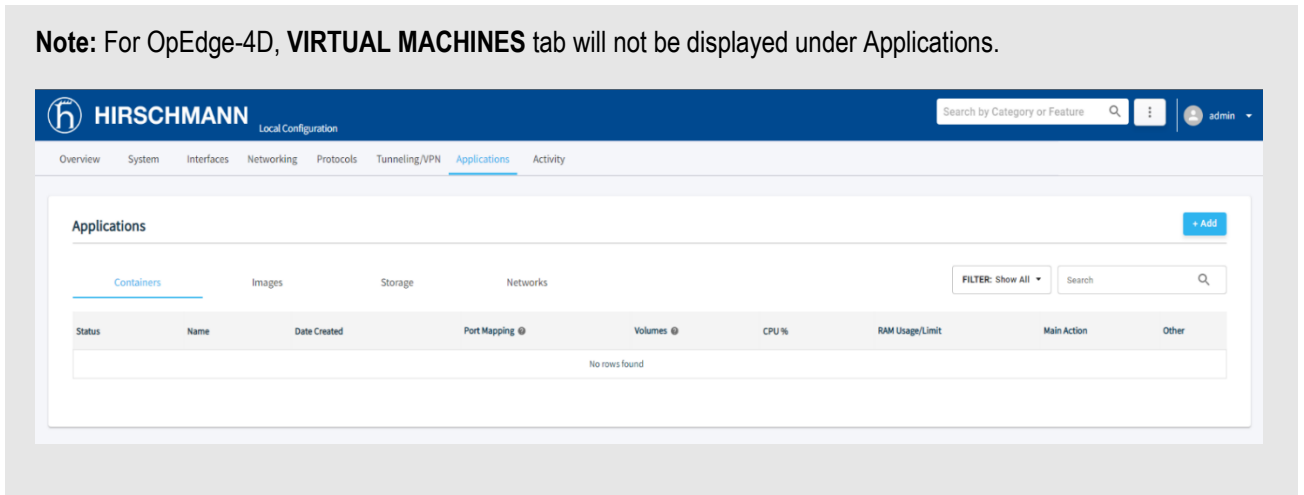


| Parameter            | Description                                   |
|----------------------|---|
| Refresh              | Refreshes the log results.                    |
| Show All Log Entries | Refreshes and displays all log entries.       |
| Download             | Transfers the log file from the OpEdge to PC. |
| Clear Logs           | Clears the recorded logs.                     |
| Search/Filter bar    | Search/filter for a specific log.             |

# 6 Applications

The OpEdge allows users to run Edge applications as containers or virtual machines. The OpEdge supports Docker containers technology to allow user applications to run independently of the OpEdge software.

**Note:** For OpEdge-4D, **VIRTUAL MACHINES** tab will not be displayed under Applications.



## 6.1 Containers

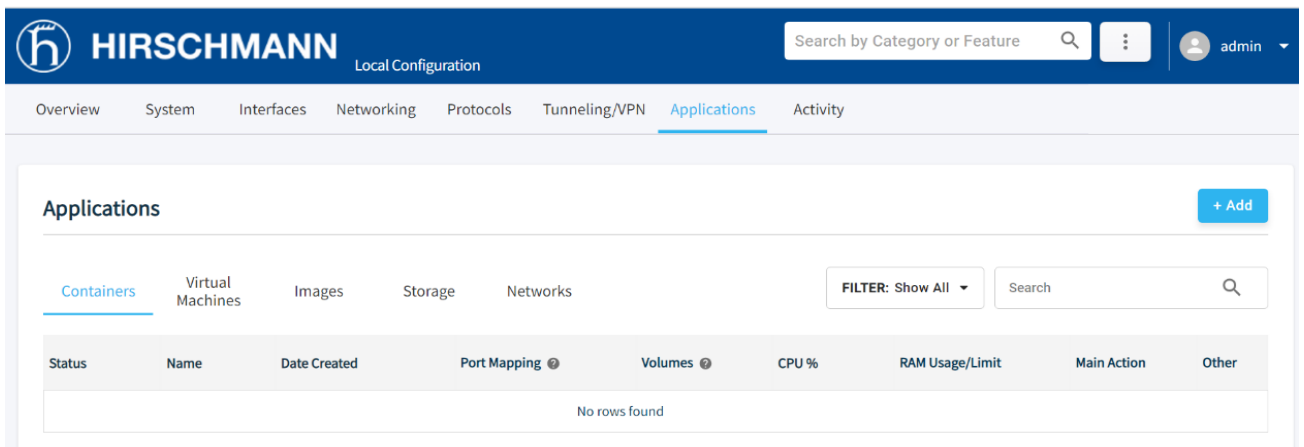
A container is a lightweight virtual computer system with its own CPU, memory, network interface, and storage, created on a physical hardware system (located off- or on-premises).

This feature allows the user to create multiple containers and run them on the same host operating system.

The user can monitor the following information for a particular container:

- Processor used in percentage
- Memory used in MB

All containers on the host machine run in isolation from one another and share the same physical hardware resources. The user can manage container operations such as start, stop, pause, etc.

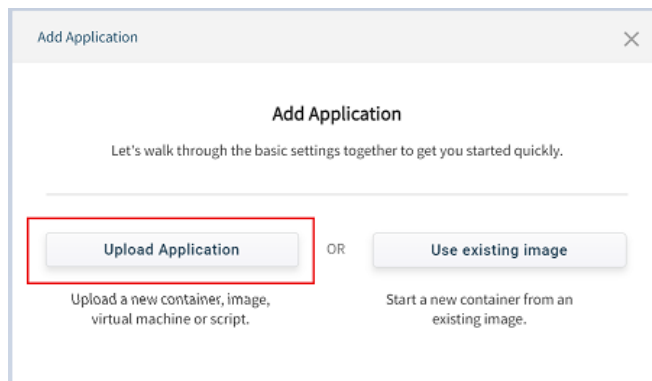


## 6.1.1 Creating a Container

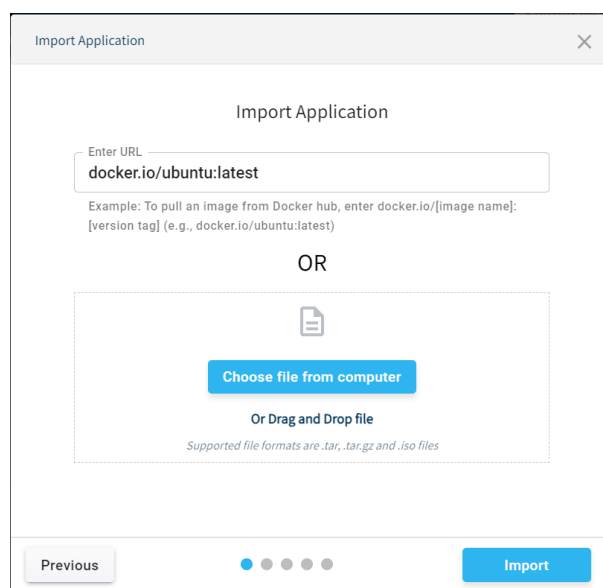
Perform the following steps to create a container:

- 1 Navigate to the *Containers* tab.
- 2 Click the **+ Add** button to open the *Add Application* wizard.
- 3 There are two options in the *Add Application* wizard:
  - **Upload Application**: Uploads a new docker image for container creation.
  - **Use existing image**: Creates a container with the existing docker image on the device.

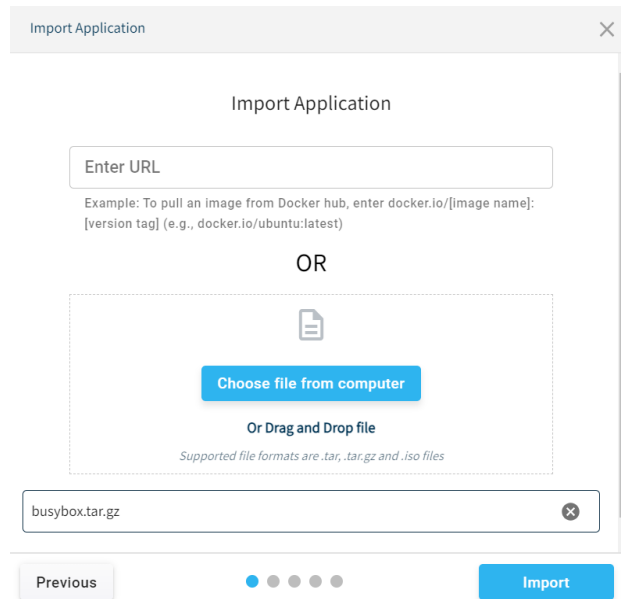
### a) Upload Application option.



- i. There are two ways to upload the image:
  - In the *Import Application* window, enter the URL in the *Enter URL* field to add the image from the docker hub: **docker.io/<image\_name>**
  - The user can also enter the tag value along with the image name as: **docker.io/<image\_name>:<tag\_value>**

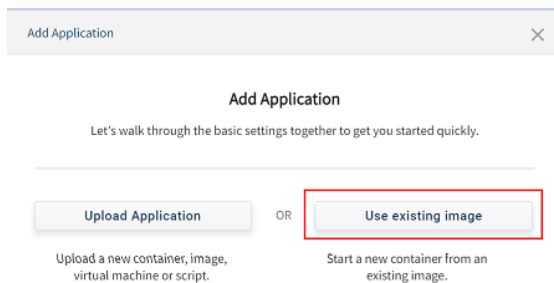


- In the *Import Application* window, click on **CHOOSE FILE FROM COMPUTER** and select the docker image from the local PC.



- ii. Click **IMPORT** to add image.

**b) Use existing image option.**



- i. Select an image from the list of existing images and click **NEXT**.

Add Application ✕

### Choose Application

Choose an application from the list.

| Name                                   | Tag    | Image ID     | Image Type    | Size    |
|--|--------|--------------|---------------|---------|
| <input type="radio"/> Core-current.iso |        |              | Virtual Image | 16.1 MB |
| <input type="radio"/> busybox          | latest | b539af69bc01 | Docker Image  | 5.0 MB  |
| <input type="radio"/> ubuntu           | latest | 1f6ddc1b2547 | Docker Image  | 78.0 MB |

Previous ● ● ● ● ● Next

4 In the *Name* field, enter the name of the container.

The screenshot shows a window titled "Add Application" with a close button in the top right. The main heading is "File Description". Below it, the text reads "ubuntu:latest has been identified as a Docker Image." A horizontal line separates this from the "Extra Identification" section. Under "Extra Identification", there is a "Name\*" label and a text input field containing "ubuntu". Below the input field, a note states "Alphanumeric and Underscore only, ex: container\_ubuntu". At the bottom, there are "Previous" and "Next" buttons, and a progress indicator with seven dots, the second of which is highlighted in blue.

**Note:** The user can create a container name with an alphanumeric character with a minimum length of 1 and a maximum length of 49.

The following characters are allowed:

a to z

A to Z

0 to 9

Only the special character “\_” is allowed for container name creation.

5 Click **NEXT** for **Ports** wizard to choose the network type.

The screenshot shows a window titled "Add Application" with a close button in the top right. The main heading is "Ports". Below it, the text reads "This is optional to set up now." There is a toggle switch for "Enable Network" which is turned on. Below this is a "Networks" section containing a table with columns: "Adapter", "Attached to", "Static IP", and "Action". The table has one row with "Adapter 1" in the "Adapter" column, a dropdown arrow in "Attached to", an empty "Static IP" input field, and a trash icon in the "Action" column. Below the table is a "+ Add Network" button. At the bottom, there are "Previous" and "Next" buttons, and a progress indicator with seven dots, the third of which is highlighted in blue.

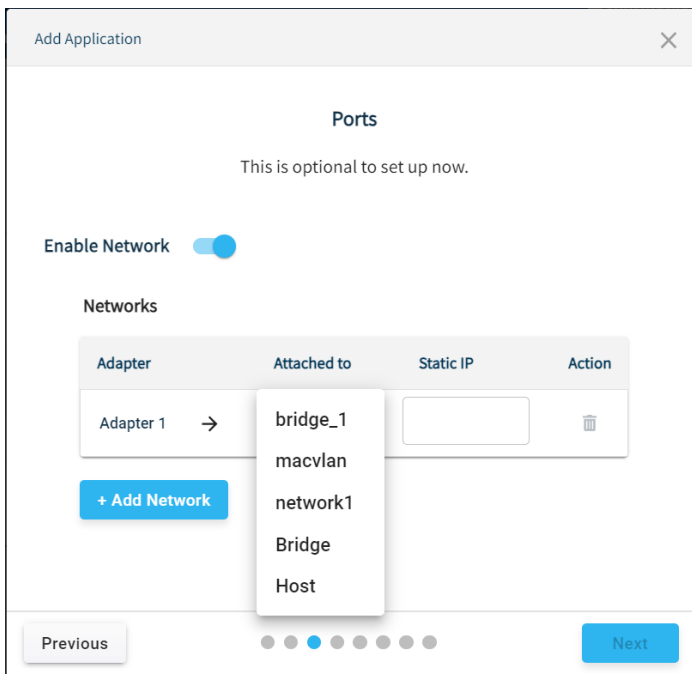


**Note:** The user can add a maximum of four network adapters.

- 6 The *Ports* wizard contains the *Networks* configuration. Select an option for attaching the network adapter to the container:
- Bridge
  - Host
  - User created custom network (MACVLAN/Bridge)

The user can also enter the Static IP (optional) corresponding to the selected network in the Static IP field.

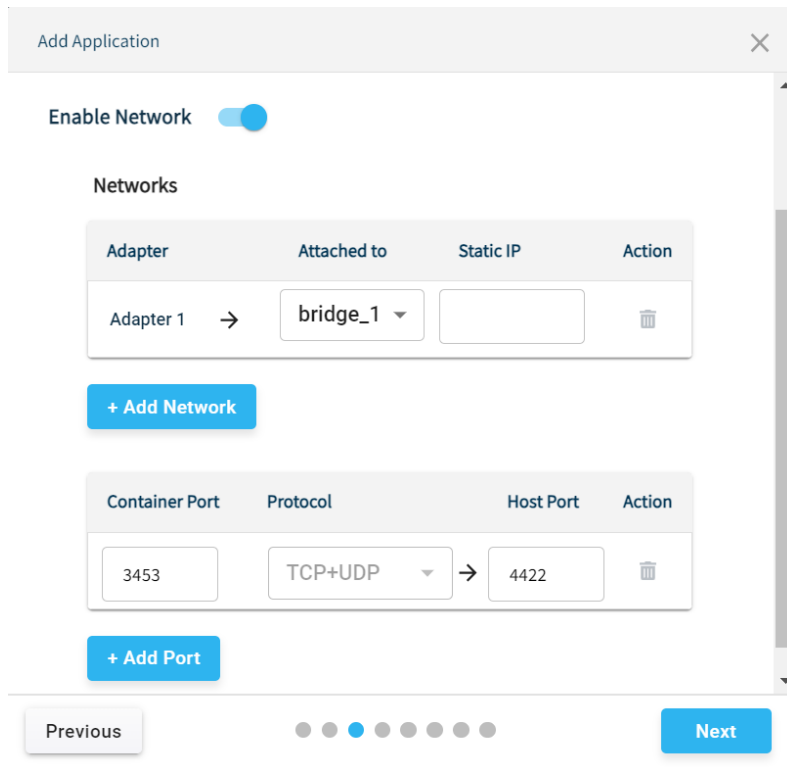
**Note:** The user must create the custom network first to be able to create container using that particular network. The detailed information regarding the creation of the custom network can be found under [section 6.5](#).



- a) For networks of Bridge type, users need to configure the container and host ports.
- In the *Container Port* box, enter the container port number.
  - In the *Host Port* box, enter the host port number.

**Note:** The user can add a maximum of four Container and Host ports.

The user is not allowed to create a container without a Container port and Host port in **Bridge mode**; minimum one Docker and Host port is required to create a container with Bridge type network.



The screenshot shows the 'Add Application' dialog box with the following configuration:

- Enable Network:** Toggled on (blue).
- Networks:**

| Adapter     | Attached to | Static IP | Action |
|-------------|-------------|-----------|--------|
| Adapter 1 → | bridge_1 ▾  |           | 🗑️     |

+ Add Network
- Container Port:**

| Container Port | Protocol  | Host Port | Action |
|----------------|-----------|-----------|--------|
| 3453           | TCP+UDP ▾ | → 4422    | 🗑️     |

+ Add Port

Navigation: Previous (disabled), Next (active), and a progress indicator with 7 dots (3rd dot active).

7 Click **NEXT FOR** *Memory & CPU* wizard to configure Memory and CPU.

The screenshot shows a window titled "Add Application" with a close button (X) in the top right corner. The main heading is "Memory & CPU". Under "RAM (Memory) Limit", there is a text input field containing "1023" and a "MB" unit selector. Below this is the text "Maximum memory allocated to docker container (1024 MB recommended)". Under "CPU Cores", there is a dropdown menu showing "3" and a downward arrow. Below this is the text "Minimum CPU usage available on a node to run a task". At the bottom, there is a "Previous" button on the left, a progress indicator with six dots (the third dot is blue), and a "Next" button on the right.

- In the *Memory* field, enter the size of memory (MB) for the container.

**Note:** The minimum allowed memory value for creating containers is 4MB.

- In the *CPU* field, enter the number of CPU cores to be used by the container. The number of processors is expressed in the number of physical CPU cores

8 Click **NEXT** for **Volumes** wizard.

- 9 (Optional) In the **Volumes** wizard, enter *Container Path* and select the *Volume* from an existing list to attach to the container.

**Note:** Refer to [section 6.2.1](#) to add a new volume when there is no volume available to attach to the container.

The screenshot shows the 'Add Application' wizard at the 'Volumes' step. The title bar reads 'Add Application' with a close button. The main heading is 'Volumes' with the subtext 'This is optional to set up now.' Below this is a table with three columns: 'Container Path', 'Volume', and 'Action'. The 'Container Path' field contains '/path'. The 'Volume' field is a dropdown menu showing 'vol1'. The 'Action' column has a trash icon. Below the table is a blue button labeled '+ Add Volume'. At the bottom, there are 'Previous' and 'Next' buttons, and a progress indicator with six dots, the fourth of which is filled.

| Container Path | Volume | Action |
|----------------|--------|--------|
| /path          | vol1   |        |

+ Add Volume

Previous  Next

- 10 Click **NEXT** for the **Environment Variables** wizard.

- 11 (Optional) In the **Environment Variables** wizard, enter the Name and Value of the environment variable.

The screenshot shows the 'Add Application' wizard at the 'Environment Variables' step. The title bar reads 'Add Application' with a close button. The main heading is 'Environment Variables' with the subtext 'This is optional to set up now.' Below this is a table with three columns: 'Name', 'Value', and 'Action'. The 'Name' field contains 'edge'. The 'Value' field contains '2121'. The 'Action' column has a trash icon. Below the table is a blue button labeled '+ Add Environment Variable'. At the bottom, there are 'Previous' and 'Next' buttons, and a progress indicator with six dots, the fourth of which is filled.

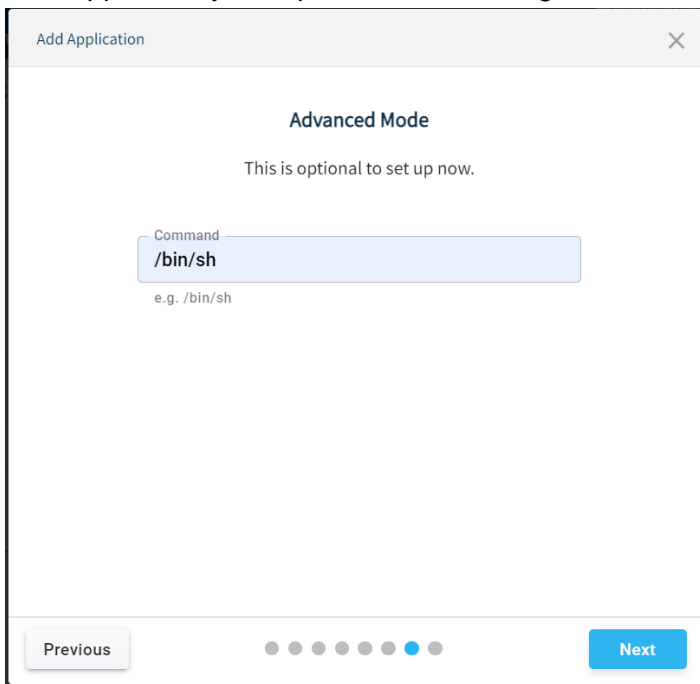
| Name | Value | Action |
|------|-------|--------|
| edge | 2121  |        |

+ Add Environment Variable

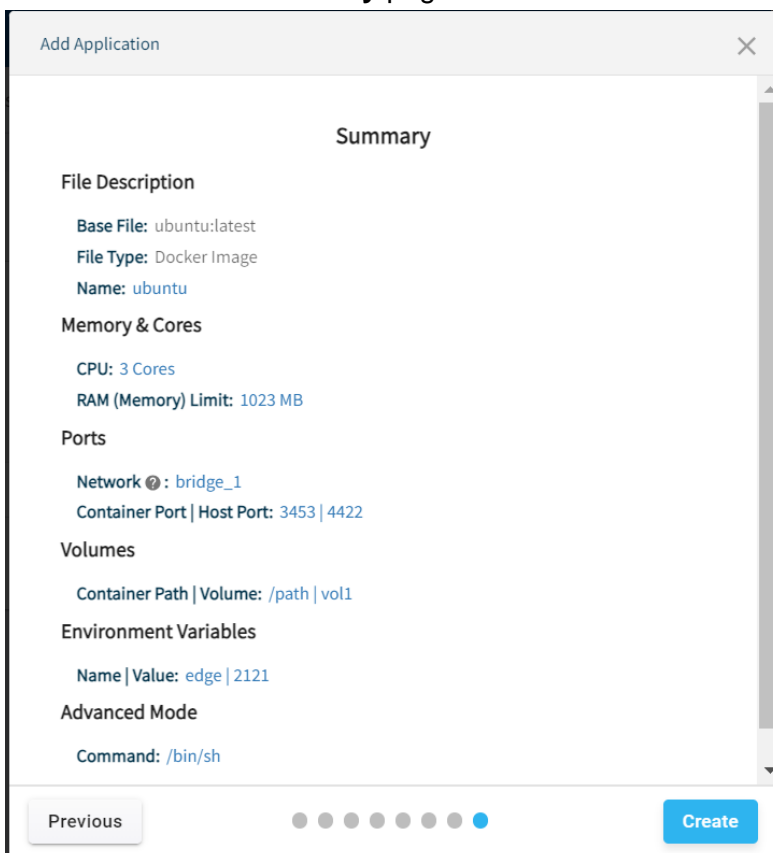
Previous  Next

12 Click **NEXT** for the **Advanced Mode** wizard.

13 (Optional) In the Advanced Mode, the user can enter advanced Docker commands which are supported by the specific Docker image.



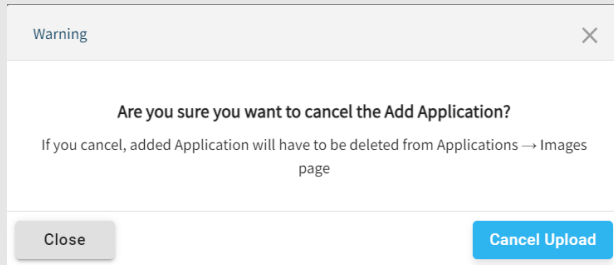
14 Click **NEXT** for the **Summary** page.



15 Check all details entered in the Summary wizard and click **CREATE** to create the container.

**Note:** If edits are needed before creating the container, click the **PREVIOUS** button in the wizard.

**Note:** If clicked at “X” button on top-right corner of the popup at any step while creating a container, the following popup will display.

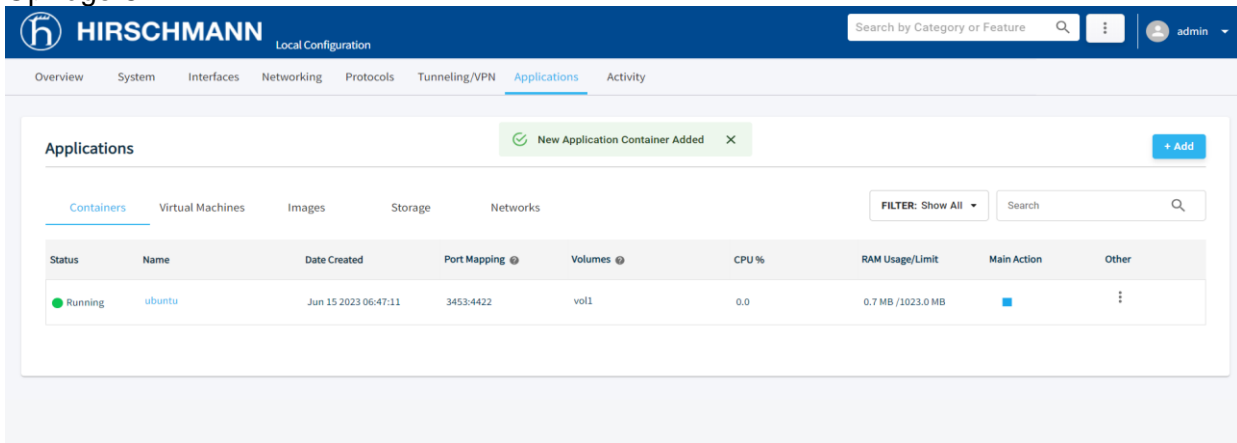


On clicking the “Cancel Upload” button, container creation will be stopped and Image will be added under the Images Tab and has to be manually deleted.

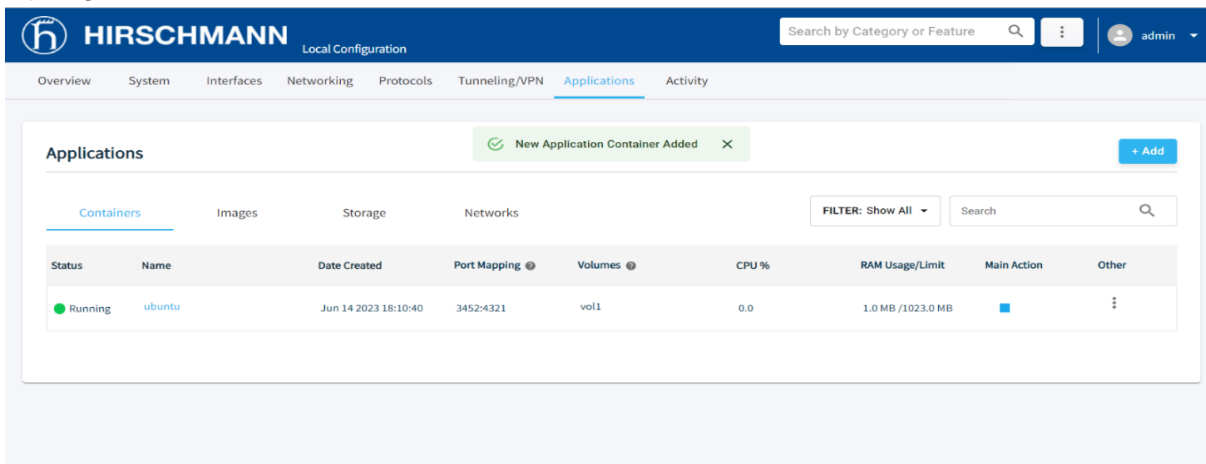
### 6.1.2 Container Status

Upon successful creation of a container, the status information is displayed as follows:

OpEdge-8D:












OpEdge-4D:



| Parameter       | Description  |
|-----------------|--|
| Status          | The current operating status of a container: <ul style="list-style-type: none"> <li>• Running</li> <li>• Stopped</li> <li>• Paused</li> </ul>  |
| Name            | Name of a container.   |
| Date Created    | Date of container creation   |
| Port Mapping    | This field describes the detail of the following ports: <ul style="list-style-type: none"> <li>• Container <i>Port</i>: The Container port number.</li> <li>• Host <i>Port</i>: The Host port number.</li> </ul> |
| Volumes         | The container volumes attached with a particular container.  |
| CPU %           | The sum of work handled by a processor on the container. It is also used to estimate system performance.   |
| RAM Usage/Limit | The memory utilization of a container and total allocated memory to a container.   |
| Main Action     | Main Action is quick action available according to the state of container.   |

Action buttons

Click on the Actions button  on a container:

| Action Button  | Description  |
|--|--|
|  Start                    | Power On the Stopped container.  |
|  Stop                     | Stop the container.  |
|  Pause                    | Pause the container.   |
|  Restart                  | Restart the container.   |
|  Shell                    | User can log in a Docker container from GUI with the help of Docker exec shell functionality.                        |
|  Save                   | Save the container as an image. See <a href="#">Saving a Container as an Image section 6.1.2.1</a> for more details. |
|  Edit container details | Edit the container.<br><b>Note:</b> User is allowed to edit the Name of a container.                                 |
|  Delete                 | Delete the container.  |
|  Resume                 | Resume a Paused container.   |

**Note:** The *Restart*, *Pause* and *Shell* buttons are disabled when a container is in the Stopped state.



**Note:** The *Stop*, *Restart* and *Shell* buttons are disabled when a container is in the Paused state.

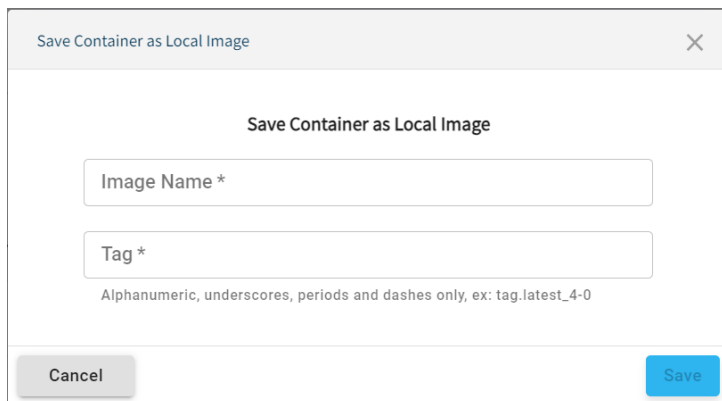
### 6.1.2.1 Saving a Container as an Image

The user can save a particular container as a container image that is visible under the *Images* tab under *Applications*.

**Note:** The Container state will become Paused from Running for a few seconds while the image is being saved.

To save a container as an image:

- 1 In the *Containers* tab, click the Actions button .
- 2 Click the  **Save** button.



- 3 Enter the image name and tag number.

**Note:** The user is allowed to use “/” in the *Name* field. These images will not be downloaded directly to the local machine. To download to the local machine, browse to the *Images* tab and select *Download*.



- 4 Click **SAVE**.



---

### 6.1.3 SSH Connectivity to Containers

The user can access the shell of a container and run different commands on it.  
To access the shell of a container:

- 1 In the *Containers* tab, click the Actions button  .
- 2 Click the  Shell button to open a prompt to run commands.

```
# bash
root@abf17aeb7fe6:/#
```

---

## 6.2 Container Volumes

A container volume allows data to persist, even when a container is deleted. Volumes are also a convenient way to share data between two or more containers.

**Note:** Volume size is dynamic and subject to host storage.

From the container, the volume acts like a folder to store and retrieve data. The volume can be mounted on the container directory.

When the user creates a container, two default volumes are created (one default private and one default public). If a Docker image has any volumes included, then the same will be created and mapped with the container.

For volume deletion, a scheduler will run every 5 minutes to check the consumed volume space when it exceeds 90% of the reserved space.

Advantages of Volume containers:

- A docker volume resides outside the container. Since the container resides on the host machine, the size remains the same after volume creation.
- User can manage volumes using OpEdge UI.
- Volumes work on both Linux and Windows containers.
- Storing data within volumes allows different internal operations (e.g. redeploying a container with another tag version) to be performed without affecting or losing data.

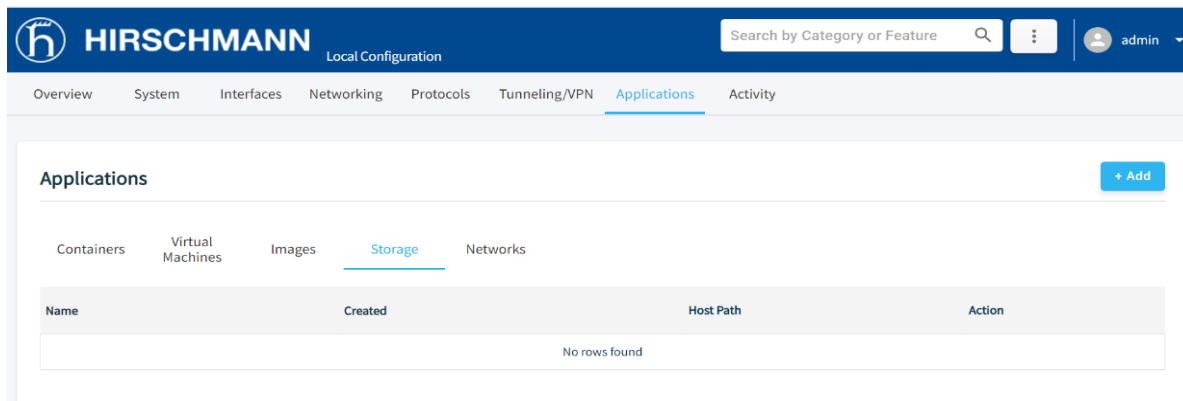
Common use cases for docker volumes:

- Providing persistent data volumes for use with containers.
- Sharing a defined data volume at different locations on different containers on the same container instance.
- If a container is recreated due to a failure, a reboot, a new release or any other reason, the volume data will not be lost.

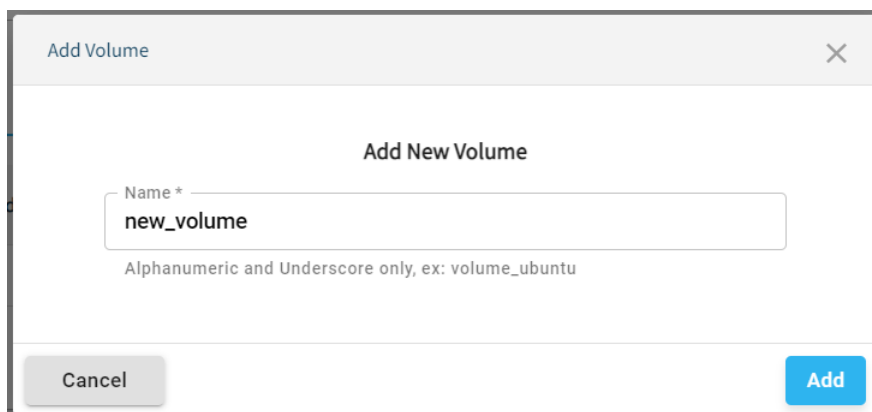
## 6.2.1 Adding a Volume

To add a volume:

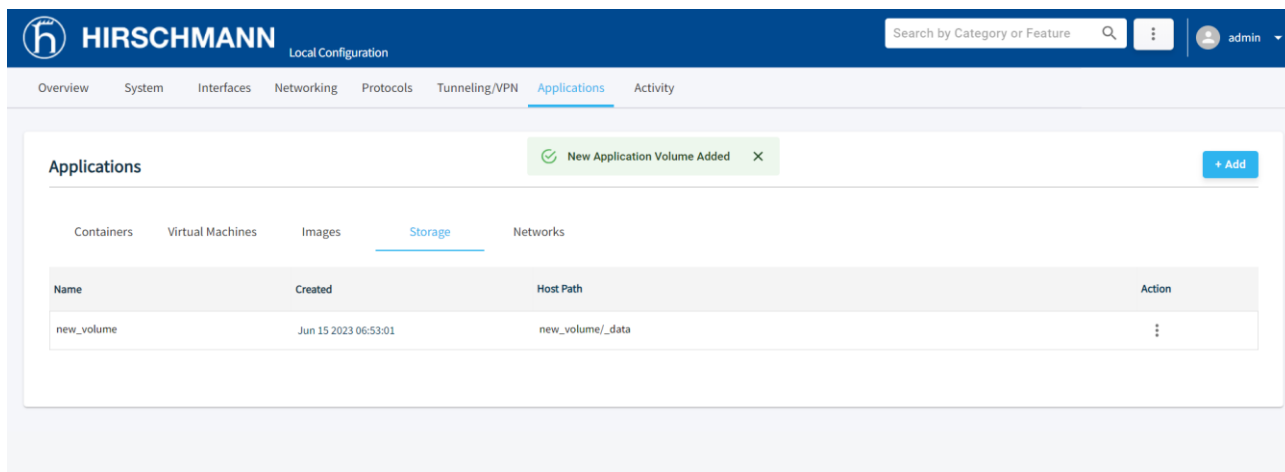
- 1 Navigate to the *Storage* tab.



- 2 Click on **+ Add** button.
- 3 Enter the name of the volume in the *Name* field and click **ADD**.





- 4 The list of *Volumes* is updated.

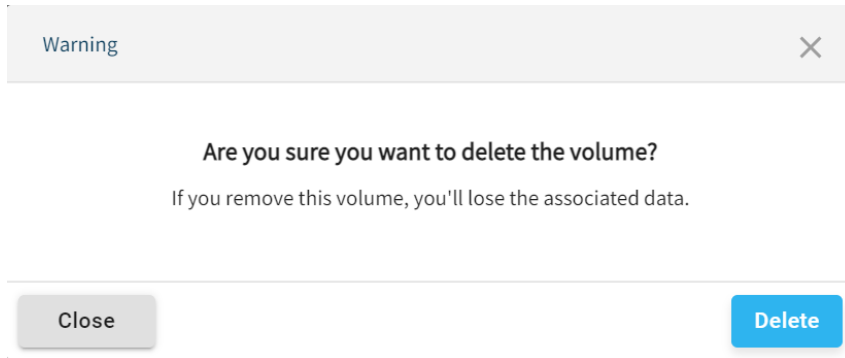


---

## 6.2.2 Deleting a Volume

To delete a volume:

- 1 For the volume to be deleted, click on the Actions button .
- 2 Click on  **Delete** button.
- 3 The user will be asked for the confirmation to delete.



- 4 Click **DELETE** to confirm.

## 6.3 Images

This page lists all Docker and Virtual Machine Images present on the device.

For OpEdge-4D, only Docker images will be listed.

OpEdge-8D:

The screenshot shows the Hirschmann Local Configuration web interface. The 'Applications' page is active, with the 'Images' tab selected. The table below lists the images present on the device.




| Name             | Tags          | Image ID     | Image Type    | Date Created         | Operating System | Size    | Other |
|------------------|---------------|--------------|---------------|----------------------|------------------|---------|-------|
| Core-current.iso |               |              | Virtual Image | Jun 06 2023 07:15:42 |                  | 16.1 MB | ⋮     |
| alpine           | latest        | d74e625d9115 | Docker Image  | Feb 10 2023 21:24:08 |                  | 7.0 MB  | ⋮     |
| busybox          | In Use latest | 8135583d97fe | Docker Image  | May 19 2023 20:19:22 |                  | 5.0 MB  | ⋮     |

OpEdge-4D:

The screenshot shows the Hirschmann Local Configuration web interface. The 'Applications' page is active, with the 'Images' tab selected. The table below lists the images present on the device.

| Name                         | Tags              | Image ID     | Image Type   | Date Created         | Operating System | Size     | Other |
|------------------------------|-------------------|--------------|--------------|----------------------|------------------|----------|-------|
| centos                       | latest            | e6a0117ec169 | Docker Image | Sep 15 2021 17:39:42 |                  | 272.0 MB | ⋮     |
| inductiveautomation/ignition | In Use latest     | b70c68f71d90 | Docker Image | Apr 25 2023 16:50:59 |                  | 1.8 GB   | ⋮     |
| mysql                        | In Use latest     | 5371f8c3b63e | Docker Image | Apr 17 2023 22:41:01 |                  | 592.0 MB | ⋮     |
| test                         | In Use latest_001 | 5724744b510c | Docker Image | Apr 25 2023 09:06:33 |                  | 272.0 MB | ⋮     |
| ubuntu                       | In Use latest     | bab80c5c00ca | Docker Image | Mar 08 2023 04:32:41 |                  | 69.0 MB  | ⋮     |
| volume                       | In Use 1          | efe48e000670 | Docker Image | May 01 2023 07:45:55 |                  | 272.0 MB | ⋮     |

| Parameter        | Description                                 |
|------------------|---|
| Name             | The name of the Image.                      |
| Tags             | The version/tag of the Image.               |
| Image ID         | The unique ID of each Image                 |
| Image Type       | Image type: Docker or Virtual Machine.      |
| Date Created     | The date of Image upload on device.         |
| Operating System | Operating system of the Image.              |
| Size             | The disk size in MB/GB of the virtual disk. |



| Other | Action Button  | Description   |
|-------|--|---|
|       |  Push to registry | Push Image to registry.<br>Enter the <i>URL</i> , <i>Username</i> , and <i>Password</i> .   |
|       |  Download         | Download Base Image.<br><b>Note:</b> The user can check the default download folder selected in the browser for the Base Image file downloaded. |
|       |  Delete           | Deletes Base Image.   |

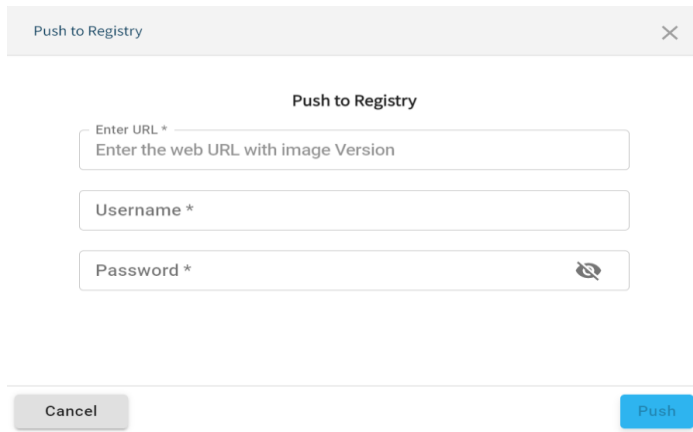
**Note:** Images being used for Container/Virtual Machine will show **In Use**.

**Note:** The *Push to registry* and *Download* actions are supported for Docker images only. The *Delete* action is supported for both Docker and ISO images.

### 6.3.1 Push Docker Image to Registry

The user can push a Docker image from the OpEdge to the Docker registry.  
To push an image to the registry:

- 1 Locate the Docker image and click on Actions button .
- 2 Click the  Push to registry button.
- 3 Enter the *URL*, *Username*, and *Password* for the registry.




Push to Registry

Push to Registry

Enter URL \*  
Enter the web URL with image Version

Username \*

Password \* 

Cancel Push

- 4 Click the  button to push the image.

**Note:** To push an image to the Docker registry, the image name should be the same as the name of the registry.

# 6.4 Virtual Machines

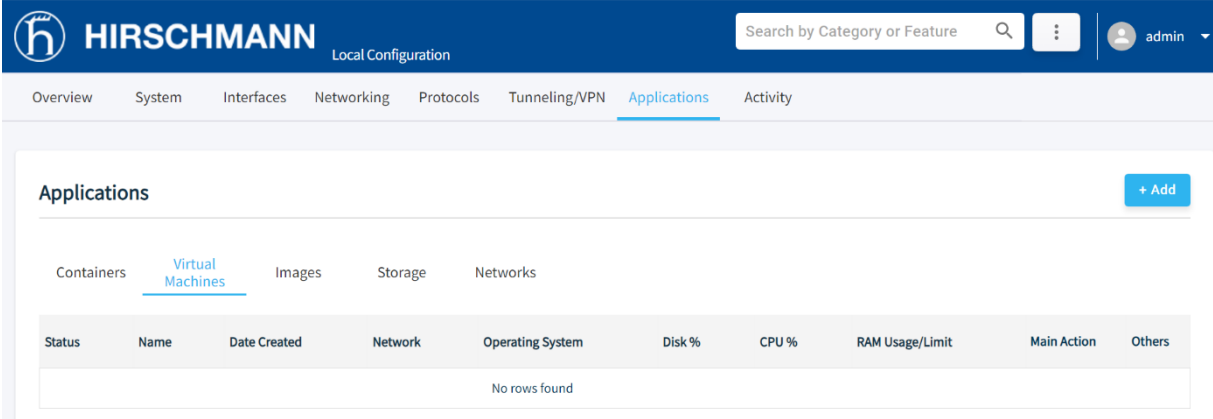
**Note:** VIRTUAL MACHINES are not applicable for OpEdge-4D.

A virtual machine functions as a virtual computer system with its own CPU, memory, network interface, and storage, created on a physical hardware system (located off- or on-premises). This feature allows the user to create multiple virtual machines and run them on the same physical server.

The user can monitor the following information for a virtual machine:

- Processor used in percentage
- Memory used in percentage
- Disk used in percentage

All virtual machines on the host machine run in isolation from one another and share the same physical hardware resources. The user can manage operations such as start, stop, pause, and delete.



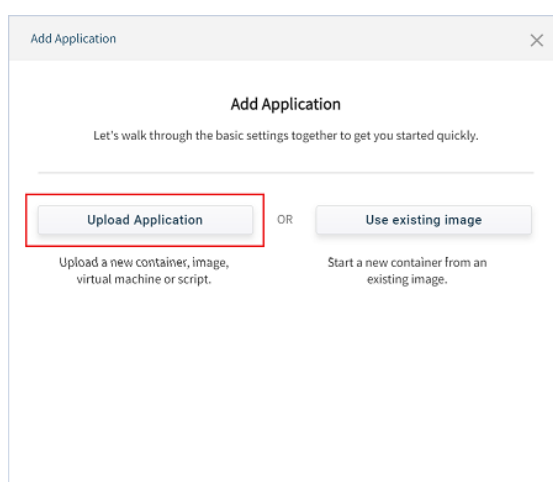


## 6.4.1 Creating a Virtual Machine

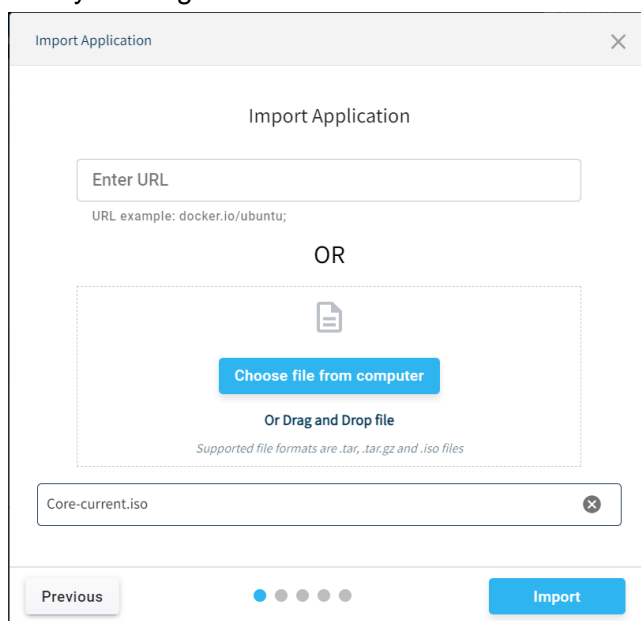
To create a guest virtual machine:

- 1 Go to the *Virtual Machines* tab.
- 2 Click **+ Add** to open the *Add Application* wizard.
- 3 Click **NEXT** to navigate through the wizard.
- 4 There are two options for adding a .iso image for virtual machine creation:
  - **Upload Application:** Uploads a new .iso Image for virtual machine creation.
  - **Use existing image:** Creates a virtual machine with an existing .iso image on the device.

### a) Upload Application option.

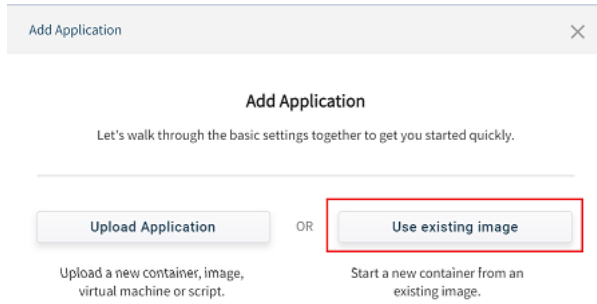


- i. Upload the virtual machine image by selecting a virtual machine image from local PC by clicking **CHOOSE FILE FROM COMPUTER**.

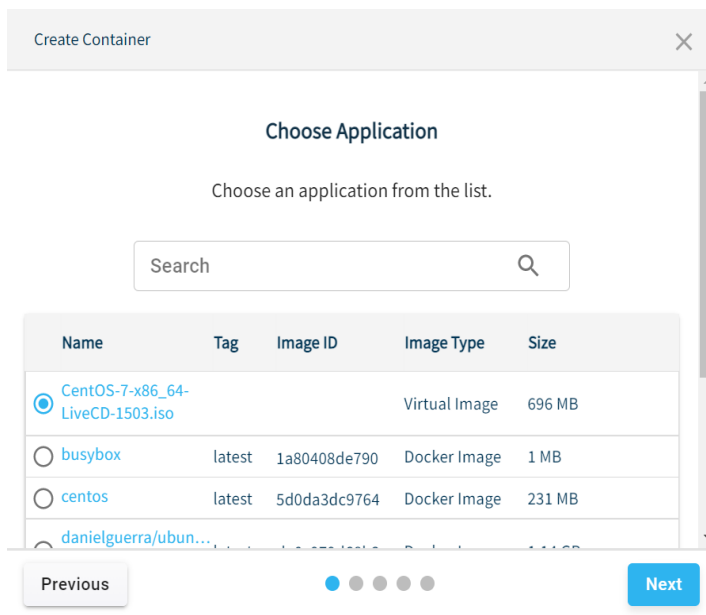


- ii. Click **IMPORT** to add the image.

b) Use Existing Image option.



i. Select an .iso image from a list.



ii. Click **NEXT**.

5 Enter a name for the virtual machine.

The screenshot shows a dialog box titled "Add Application" with a close button (X) in the top right corner. The dialog is divided into two sections: "File Description" and "Extra Identification".

**File Description**  
Core-current.iso  
has been identified as a virtual machine.

**Extra Identification**

Name \*  
Core-current  
Alphanumeric, Hyphen and Underscore only, ex: vm-ubuntu\_2

At the bottom of the dialog, there is a "Previous" button on the left, a "Next" button on the right, and a progress indicator consisting of five dots, with the second dot from the left being filled with blue.

**Note:** The user can create a virtual machine name with an alphanumeric character with a minimum length of 1 and a maximum length of 30.

The following characters are allowed:

a to z

A to Z

0 to 9

Only the special character “\_” is allowed for container name creation.

6 Click **NEXT**.

7 In the *Operating System* wizard, enter the *Type* and *Version* of the Operating System.

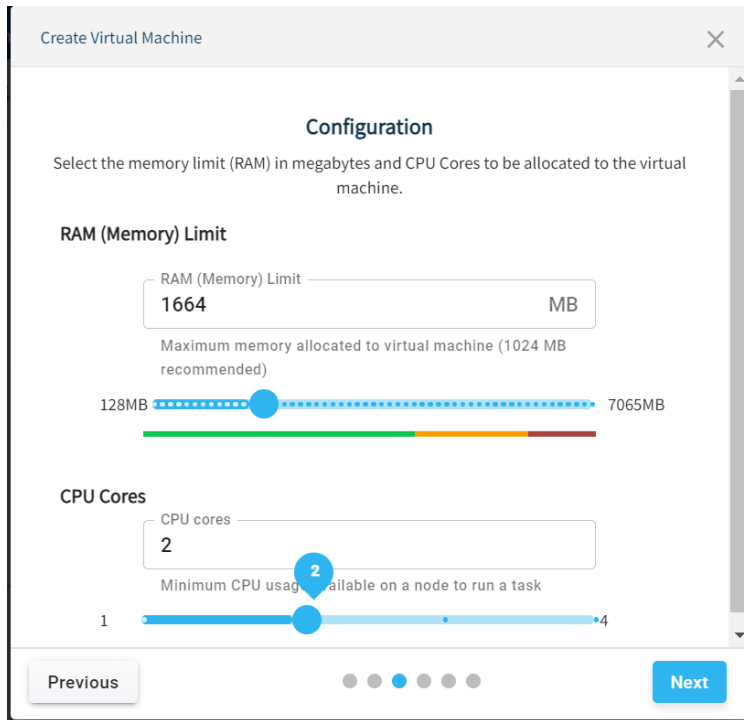
| Parameter | Description  |
|-----------|--|
| Type      | The operating system of a virtual machine. User can select the respective operating system: Linux and Windows. |
| Version   | Type or select the respective OS family. For example, Linux OS type user can select OS family as Ubuntu.       |

The current supported OS Types and Operating Systems:

| Parameter | Description  |
|-----------|--|
| Linux     | CentOS 7.6<br>CentOS 7.7<br>CentOS 7.8<br>Ubuntu 16.04<br>Ubuntu 18.04 |
| Windows   | Microsoft Windows Server 2008<br>Microsoft Windows Server 2012         |

8 Click **NEXT**.

- In the *Configuration* wizard, select the *RAM (Memory) Limit* and *CPU Cores* for the virtual machine.



| Parameter          | Description   |
|--------------------|---|
| RAM (Memory) Limit | Select or provide the memory for the virtual machine.   |
| CPU Cores          | Select the number of CPU Cores for the virtual machine. |

- Click **NEXT**.

11 In the *Hard Disk* wizard, select a hard disk option:

- Do not add a virtual hard disk.
- Create a virtual hard disk now.
- Use an existing virtual hard disk file.

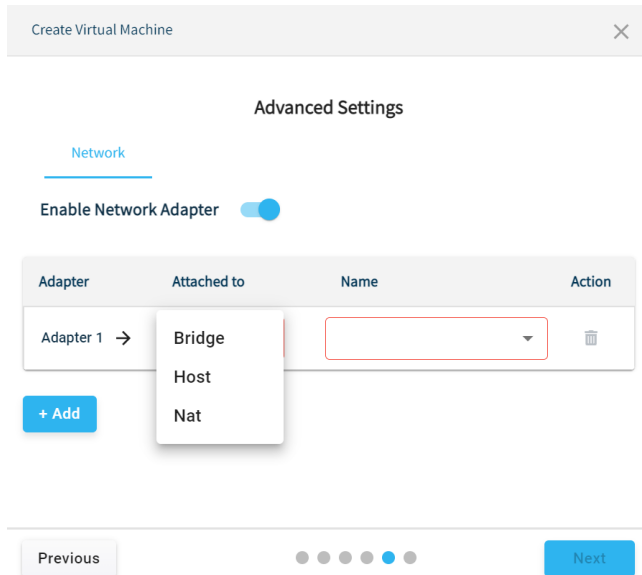
The screenshot shows a window titled "Create Virtual Machine" with a close button (X) in the top right corner. The main heading is "Add Virtual Disk Storage". There are three radio button options: "Do not add a virtual hard disk.", "Create a virtual hard disk now. (Default)", and "Use an existing virtual hard disk file.". The "Create a virtual hard disk now. (Default)" option is selected. Below this, it states "The recommended Virtual Hard Disk size is 1 GB". There is a text input field for "Virtual Hard Disk (Storage) Limit" containing the number "9" and "GB". Below the input field is a slider labeled "Minimum hard disk allocated to virtual machine (1 GB)". The slider has a blue handle positioned at "9", with "1GB" on the left and "44.9GB" on the right. At the bottom of the window, there is a "Previous" button on the left, a progress indicator with five dots (the second dot is blue), and a "Next" button on the right.

**Note:** The **CREATE A VIRTUAL HARD DISK NOW** option is the only available option in the current implementation.

12 Click **NEXT**.

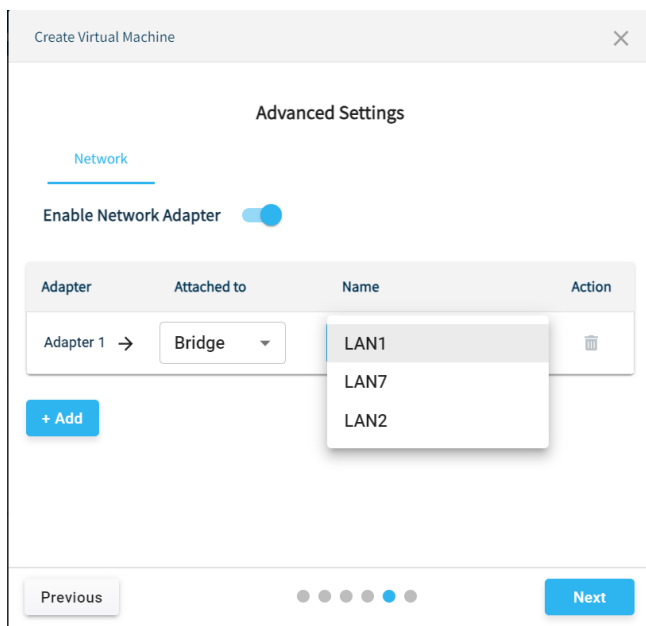
13 In the *Advanced Settings* wizard, toggle the **ENABLE NETWORK ADAPTOR** button and select a *Network Adapter* to attach with the virtual machine:

- **Bridge**
- **Host**
- **NAT**




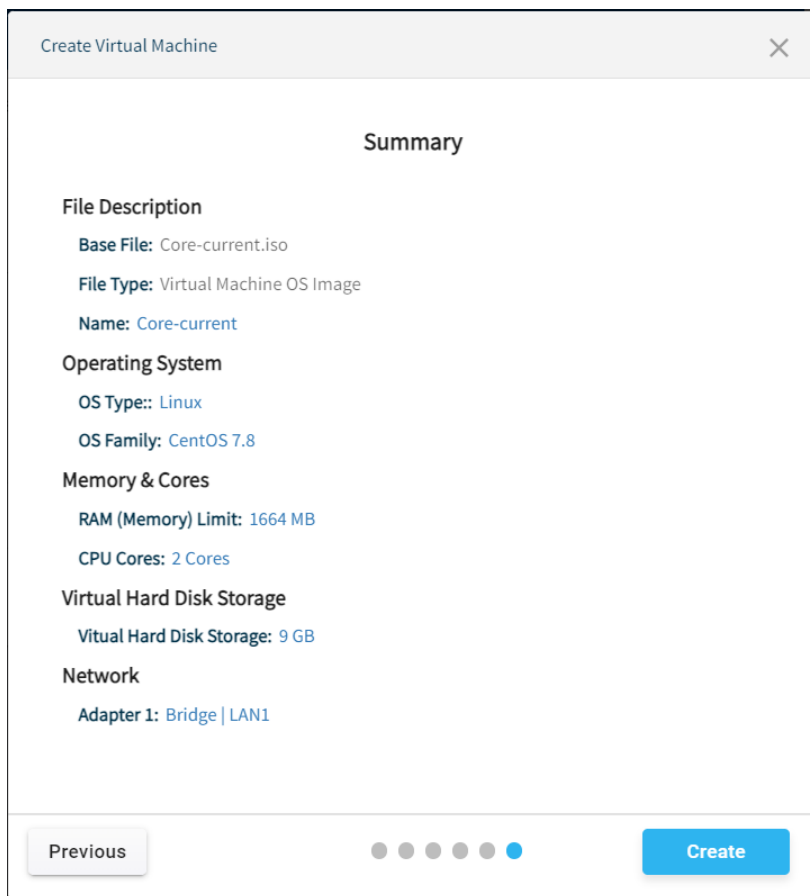
14 Select the **NAME** associated with the selected *Network Adapter*:

- **Bridge**: Select a virtual LAN port. (Example: **LAN1**)
- **Host**: Select a physical Ethernet port. (Example: **ETH1**).
- **NAT**: Select **DEFAULT**.

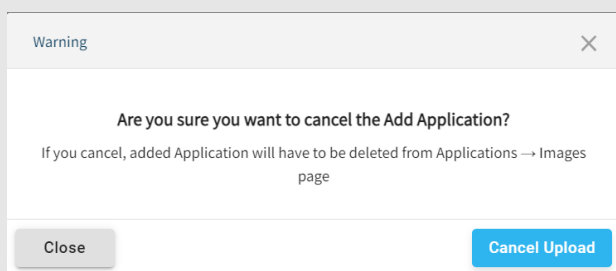


15 Click **NEXT**.

16 In the *Summary* wizard, verify all details and click  to create the virtual machine.



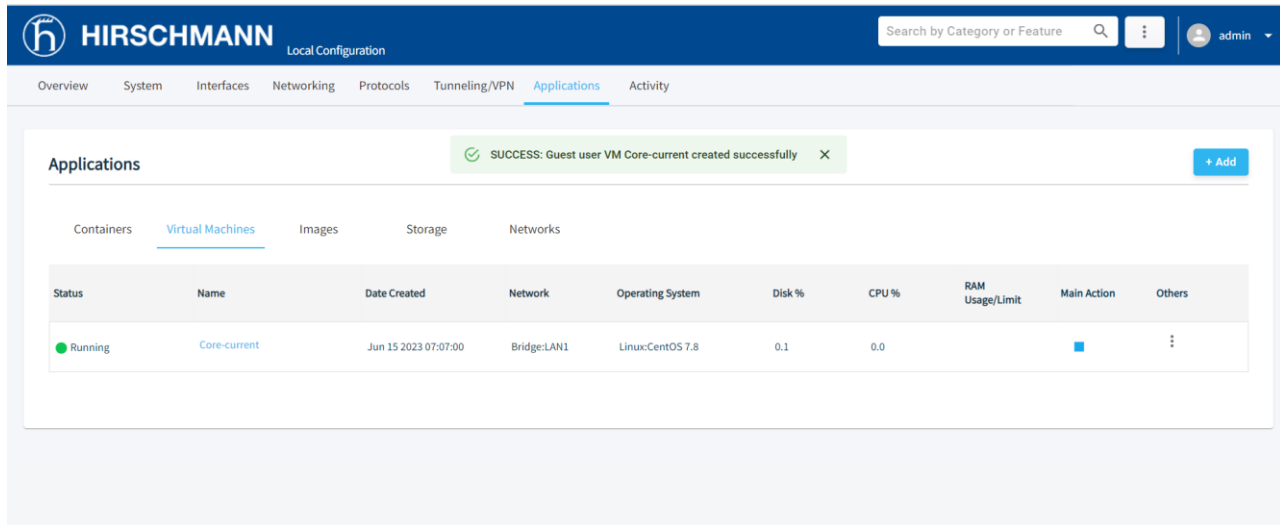
**Note:** If clicked at "X" button on top-right corner of the popup at any step while creating a virtual machine, the following popup will display.













On clicking the "Cancel Upload" button, the VM creation will be stopped and the Image will be added under the Images Tab and has to be manually deleted.



## 17 Example of a successfully created virtual machine:




| Parameter        | Description   |  |
|------------------|---|--|
| Status           | <b>Status</b>   | <b>Description</b>   |
|                  |  Running   | Virtual machine is in Running state.   |
|                  |  Paused   | Virtual machine is in Paused state.  |
|                  |  Stopped   | Virtual machine is Powered Off state.  |
| Name             | Lists the name of all virtual machines.   |  |
| Date Created     | It shows the date of virtual machine creation.  |  |
| Network          | It shows the type of network given at the time of the virtual machine creation.   |  |
| Operating System | The operating system of a particular virtual machine.   |  |
| Disk%            | The amount of storage space used in a percentage of total storage allocated at a certain point of time.   |  |
| CPU%             | The sum of work handled by a processor on the virtual machine. It also used to estimate system performance.   |  |
| RAM Usage/Limit  | The amount of RAM used by a particular virtual machine at a certain point of time/ The total RAM allocated to the virtual machine.                      |  |
| Main Action      | This option enables user to perform quick action on the virtual machine. For example, When a virtual machine is stopped, the Start button is displayed. |  |
| Others           | <b>Action Button</b>  | <b>Description</b>   |
|                  |  Start   | Power On or resumes the virtual machine.<br><b>Note:</b> When resuming a suspended machine, the operating system and applications start from the point the user suspended the virtual machine.   |
|                  |  Stop  | Power Off the virtual machine.<br>The virtual machine is stopped. The state of the virtual machine is Powered-off after the shutdown is complete.  |
|                  |  Suspend   | Suspend the virtual machine.<br>When suspended, the current state of the operating system and applications is saved. When the user resumes the virtual machine, the operating system and applications continue from the same point the user suspended the virtual machine. |
|                  |  Restart   | Restart the virtual machine.   |

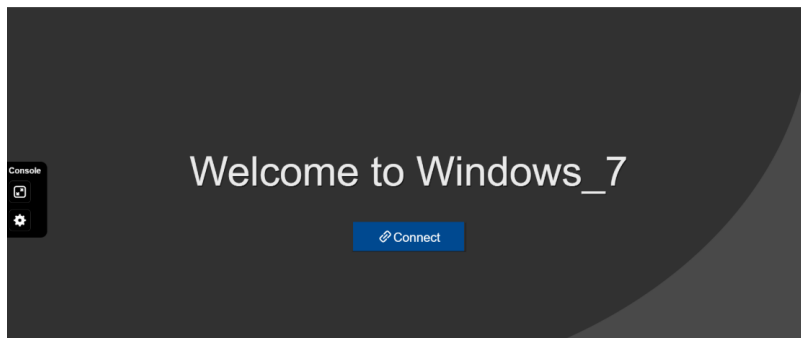
|   |  |
|---|--|
|  Console | Console for virtual machine.<br>The console is the remote control system of virtual machine, and enables the user to work and interact with the created virtual machines. Please see <i>Connecting to a Virtual Machine</i> in <a href="#">section 6.4.1.1</a> for more information. |
|  Edit    | Edit the virtual machine.  |
|  Delete  | Delete the virtual machine.  |

### 6.4.1.1 Connecting to a Virtual Machine

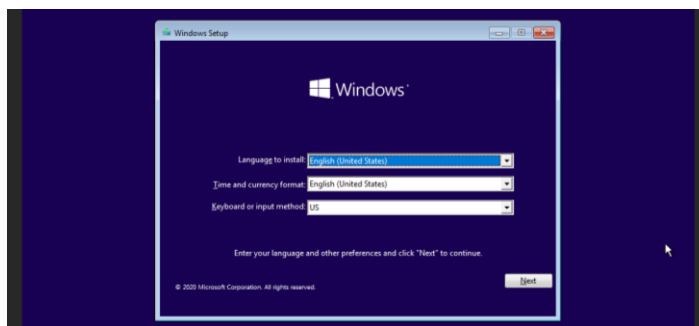
The user can connect to a virtual machine by using its console. The console is the remote control system of a virtual machine.

**Note:** For first time login to the virtual machine, the user must install the operating system selected for the virtual machine.



- 1 In the *Virtual Machines* tab, place the cursor on a particular virtual machine to display the Action buttons.
- 2 Click the  **Console** button to open a new tab in the browser.



- 3 Click on **Connect** to proceed with the installation of VM.



### 6.4.1.2 Editing a Virtual Machine

- 1 In the *Virtual Machines* tab, click on a container's Action button  .
- 2 Click  **Edit** to open the *Edit Virtual Machine* wizard.
- 3 Follow the steps in the wizard to edit the virtual machine.

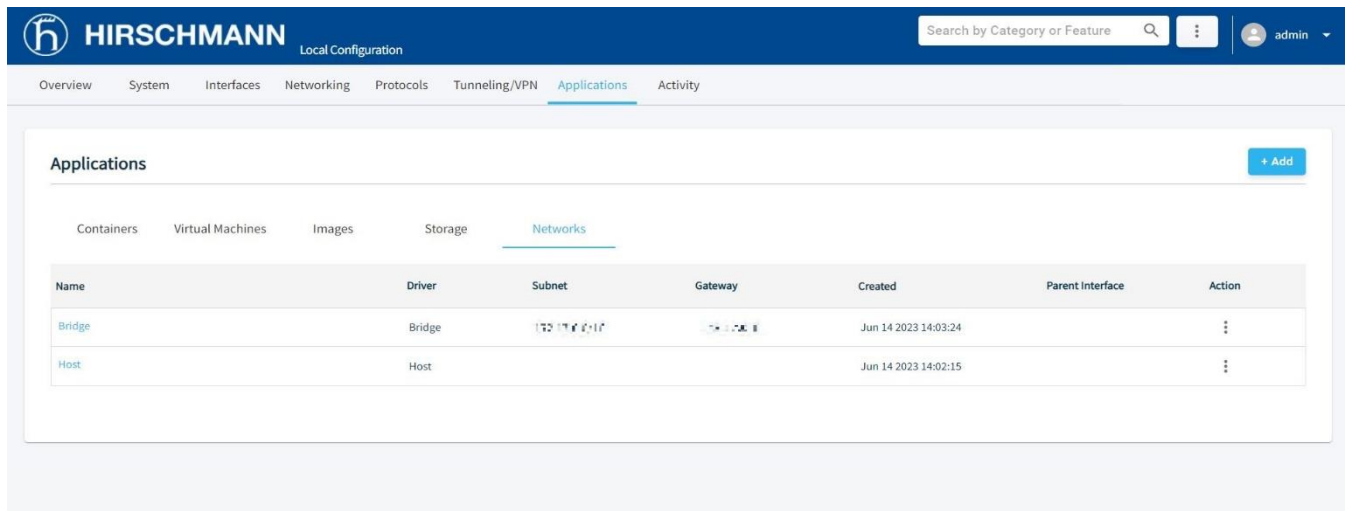
**Note:**

The user is allowed to edit *Name*, *CPU Cores* and *RAM* when the virtual machine is in Powered Off state. The user is allowed to edit *Network Adapters* and *Storage* when the virtual machine is in Power On state. The user is allowed to edit *RAM* and *Storage* when the virtual machine is in Paused state.

## 6.5 Container Networks

A network is a collection of interconnected devices or systems that can communicate and share resources with each other. This section concentrates specifically on virtual networks between containers also known as Docker networks.

Docker network is a powerful feature that enables containers to communicate with each other and the outside world. It provides isolated and secure networking environments, allowing seamless connectivity and easy management of containerized application.



**Note:** The *Networks* tab will have 2 default networks, namely Bridge and Host, and these 2 networks cannot be deleted.

To create a network:

1. Go to the *Networks* tab.
2. Click **+ Add** to open the Add Network wizard.
3. Scroll to navigate through the wizard.
4. Enter the name for the network you are creating.

**Add Network**

**Add New Network**

Name  
Alphanumeric and Underscore only

Driver  
Bridge

Driver to be used for the network

IP Range  
eg. 192.168.3.2/24

Assign IP Range in CIDR format

Subnet  
eg. 192.168.3.0/24

Subnet in CIDR format that represents a network segment

Gateway  
eg. 192.168.3.1

IPv4 Gateway for the master subnet

Cancel Add

**Note:** The user can create a network name with an alphanumeric character with a minimum length of 2 and maximum length of 49.

The following characters are allowed:

a to z

A to Z

0 to 9

Only the special character “\_” is allowed in network name creation.

5. Choose the driver for the network from the Dropdown menu.

**Add Network**

**Add New Network**

Name

**MACVLAN**

**Bridge**

Driver to be used for the network

IP Range  
eg. 192.168.3.2/24

Assign IP Range in CIDR format

Subnet  
eg. 192.168.3.0/24

Subnet in CIDR format that represents a network segment

Gateway  
eg. 192.168.3.1

IPv4 Gateway for the master subnet

Cancel Add

6. If the chosen driver is “MACVLAN”, then the ‘Parent Interface’ field is also required. Select the Interface from the dropdown.

**Add Network**

**Add New Network**

Name  
netw

Driver  
MACVLAN

Driver to be used for the network

**Parent Interface**

Required

IP Range  
eg. 192.168.3.2/24

Assign IP Range in CIDR format

Subnet  
eg. 192.168.3.0/24

Subnet in CIDR format that represents a network segment

Cancel Add

**Add Network**

**Add New Network**

Name  
netw

Driver  
MACVLAN

Driver to be used for the network

**LAN1**

**LAN7**

IP Range  
eg. 192.168.3.2/24

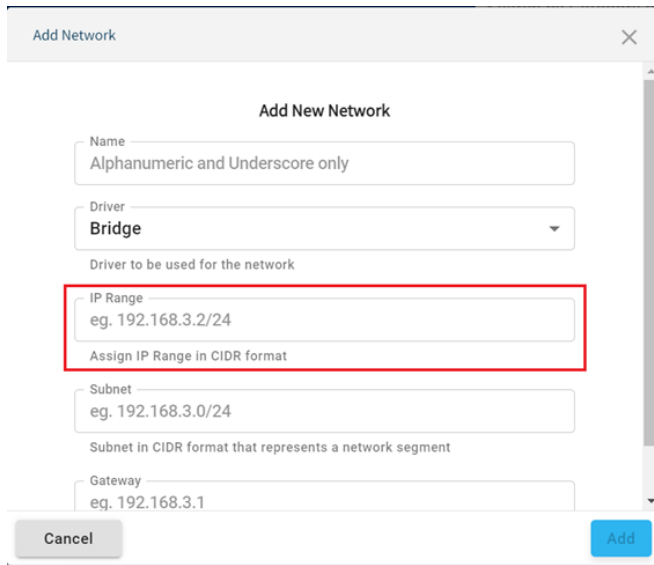
Assign IP Range in CIDR format

Subnet  
eg. 192.168.3.0/24

Subnet in CIDR format that represents a network segment

Cancel Add

7. Assign the IP range to the network in the CIDR (Classless Inter Domain Routing) format.

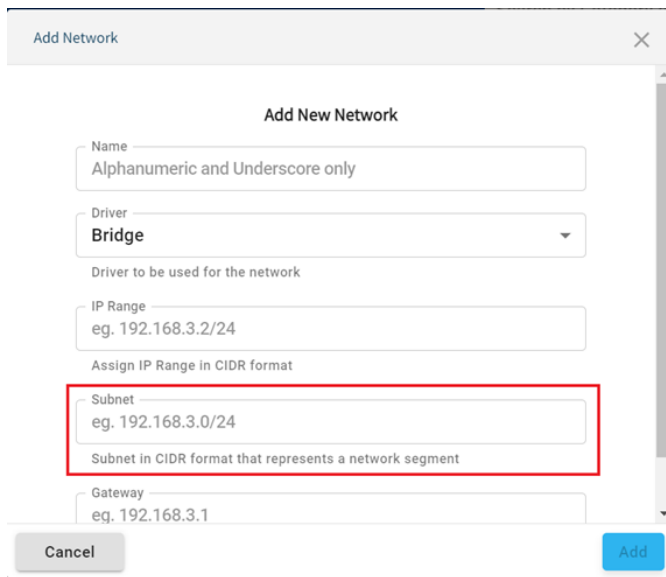


The screenshot shows a dialog box titled "Add Network" with a close button (X) in the top right corner. Inside the dialog, there is a section titled "Add New Network". The fields are as follows:

- Name:** A text input field with the placeholder "Alphanumeric and Underscore only".
- Driver:** A dropdown menu with "Bridge" selected. Below it, the text "Driver to be used for the network" is displayed.
- IP Range:** A text input field containing "eg. 192.168.3.2/24". This field is highlighted with a red rectangular border. Below it, the text "Assign IP Range in CIDR format" is displayed.
- Subnet:** A text input field containing "eg. 192.168.3.0/24". Below it, the text "Subnet in CIDR format that represents a network segment" is displayed.
- Gateway:** A text input field containing "eg. 192.168.3.1".

At the bottom of the dialog, there are two buttons: "Cancel" on the left and "Add" on the right.

8. Assign IP range to the subnet in CIDR format.

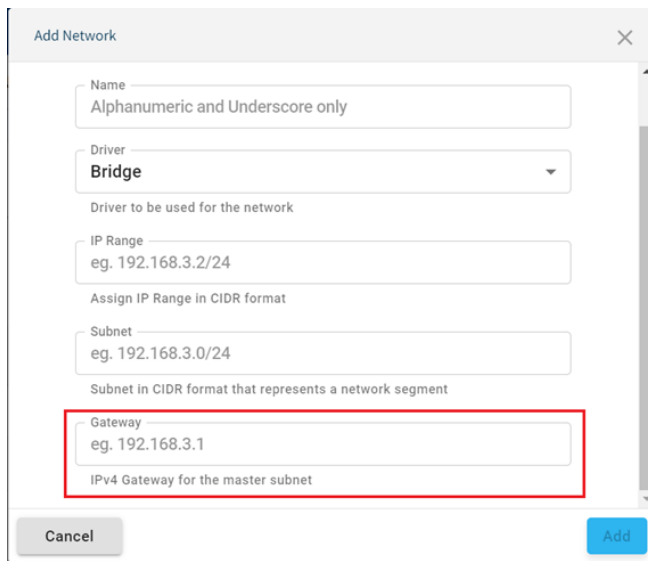


The screenshot shows the same "Add Network" dialog box as in step 7. The fields are:

- Name:** "Alphanumeric and Underscore only".
- Driver:** "Bridge" (selected), with "Driver to be used for the network" below it.
- IP Range:** "eg. 192.168.3.2/24", with "Assign IP Range in CIDR format" below it.
- Subnet:** "eg. 192.168.3.0/24". This field is highlighted with a red rectangular border. Below it, the text "Subnet in CIDR format that represents a network segment" is displayed.
- Gateway:** "eg. 192.168.3.1".

Buttons "Cancel" and "Add" are at the bottom.

9. Specify IP address for the gateway to master subnet in IPv4 format.

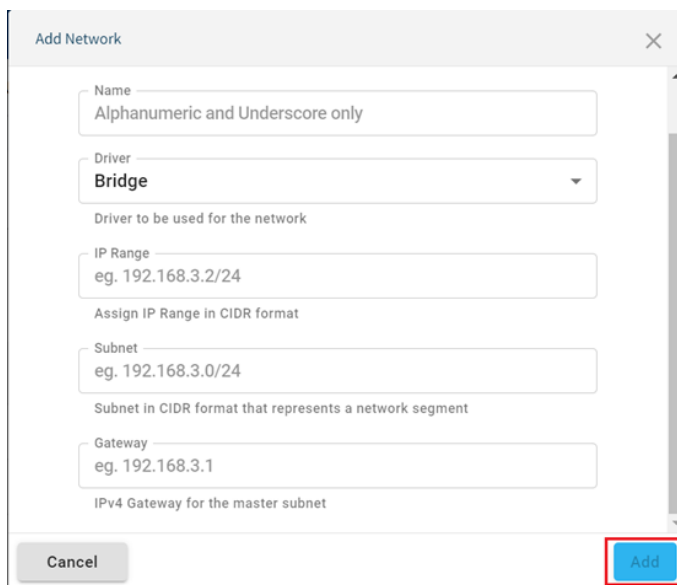


The screenshot shows the 'Add Network' dialog box with the following fields and values:

- Name: Alphanumeric and Underscore only
- Driver: Bridge
- IP Range: eg. 192.168.3.2/24
- Subnet: eg. 192.168.3.0/24
- Gateway: eg. 192.168.3.1 (highlighted with a red box)

Buttons: Cancel, Add

10. Click on Add

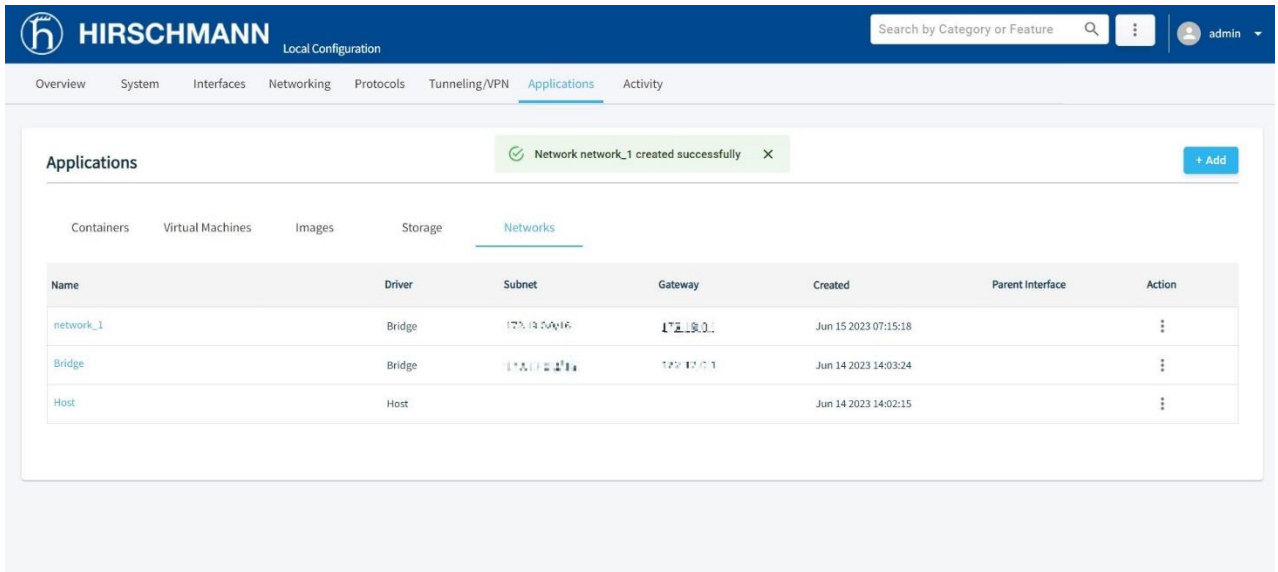


The screenshot shows the 'Add Network' dialog box with the following fields and values:

- Name: Alphanumeric and Underscore only
- Driver: Bridge
- IP Range: eg. 192.168.3.2/24
- Subnet: eg. 192.168.3.0/24
- Gateway: eg. 192.168.3.1

Buttons: Cancel, Add (highlighted with a red box)

11. Your network is successfully created.




|                  |   |
|------------------|---|
| Name             | Lists the name of all networks                                |
| Driver           | Driver chosen from MACVLAN and bridge during network creation |
| Parent Interface | Interface (on host) to be used for MACVLAN network            |
| Subnet           | This refers to the IP range for the master subnet.            |
| Gateway          | IP address of the gateway associated to master subnet.        |
| Created          | Time stamp of network creation                                |
| Action           | Delete Network using this parameter                           |

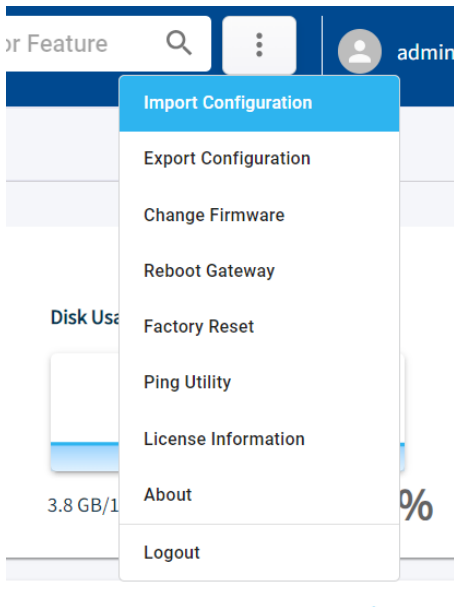
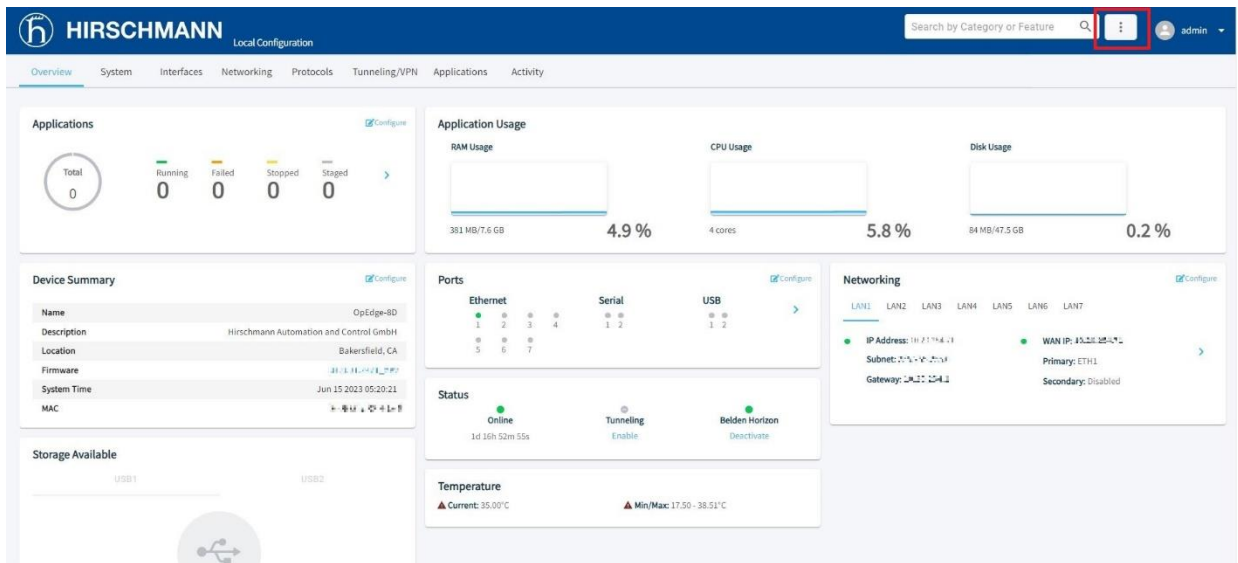


# 7 Diagnostics

## 7.1 Factory Reset – Configuration Webpage

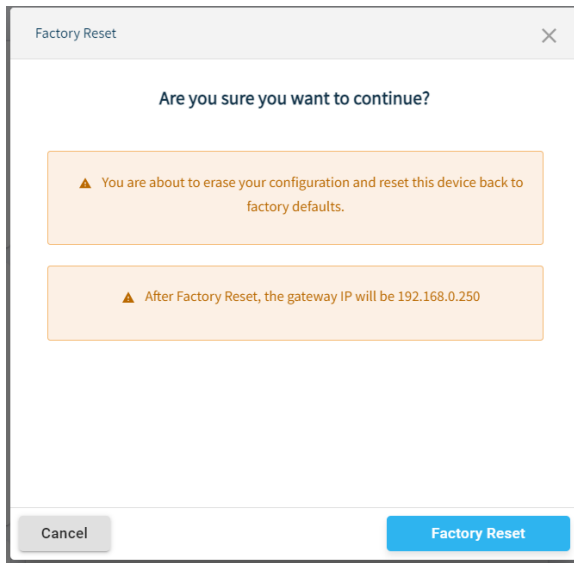
To reset the OpEdge to factory default, perform the following steps:

- 1 Establish a default connection to the OpEdge and perform the initial setup as described in the *Initial Configuration* in [section 2](#).
- 2 On the OpEdge webpage, click the **SETTINGS** button  in the top right corner of the page.

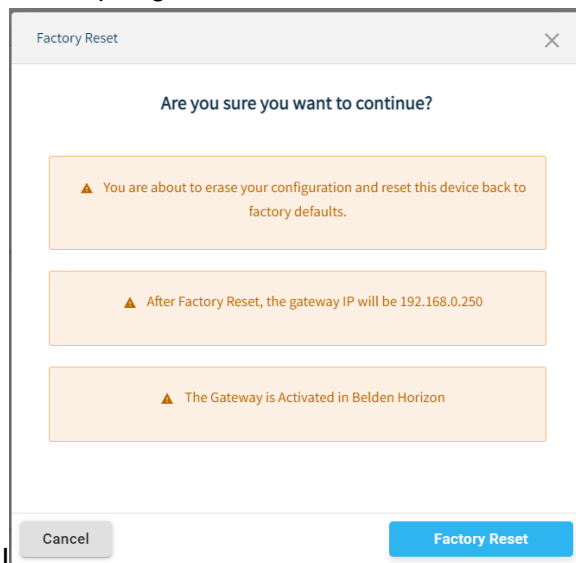


- From the displayed drop-down list, select **FACTORY RESET**.

The *Factory Reset* pop-up is displayed.



If the OpEdge device is connected with Belden Horizon, the below pop-up is displayed.



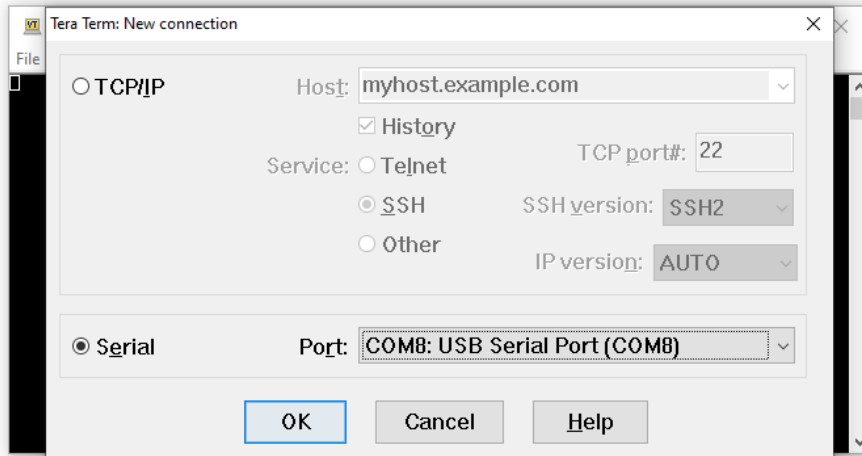
- Click **FACTORY RESET** to initiate the factory reset procedure.

Once the factory reset procedure is completed, log in to the gateway using the default credentials (admin/password). After the initial login, the user is prompted to change the default password.

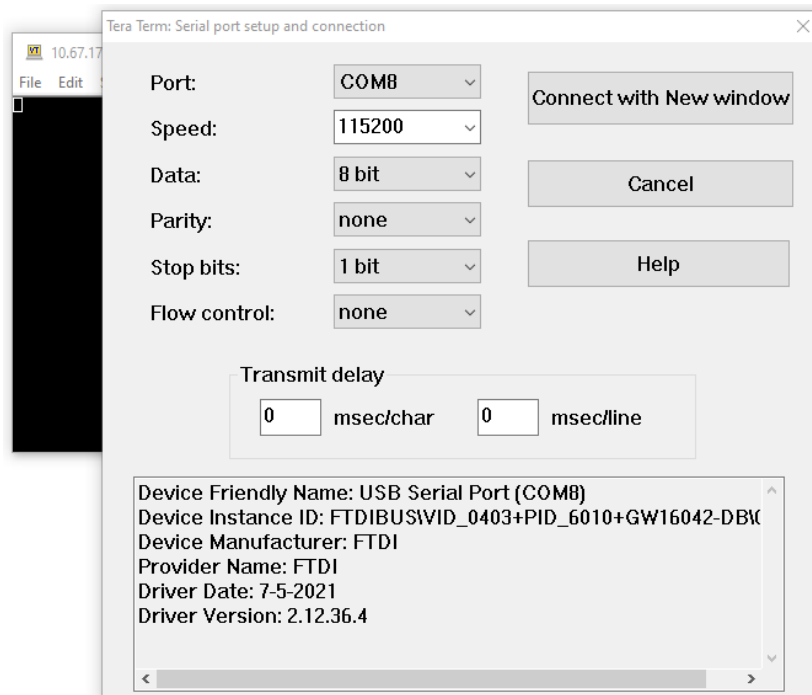
## 7.2 Factory Reset – Command Line Interface

To reset the OpEdge to factory default using the CLI, perform the following steps:

- 1 Connect to the console port of the OpEdge using a Terminal Emulator like Tera Term or Putty.
- 2 Select the COM Port on which the console shall be connected.

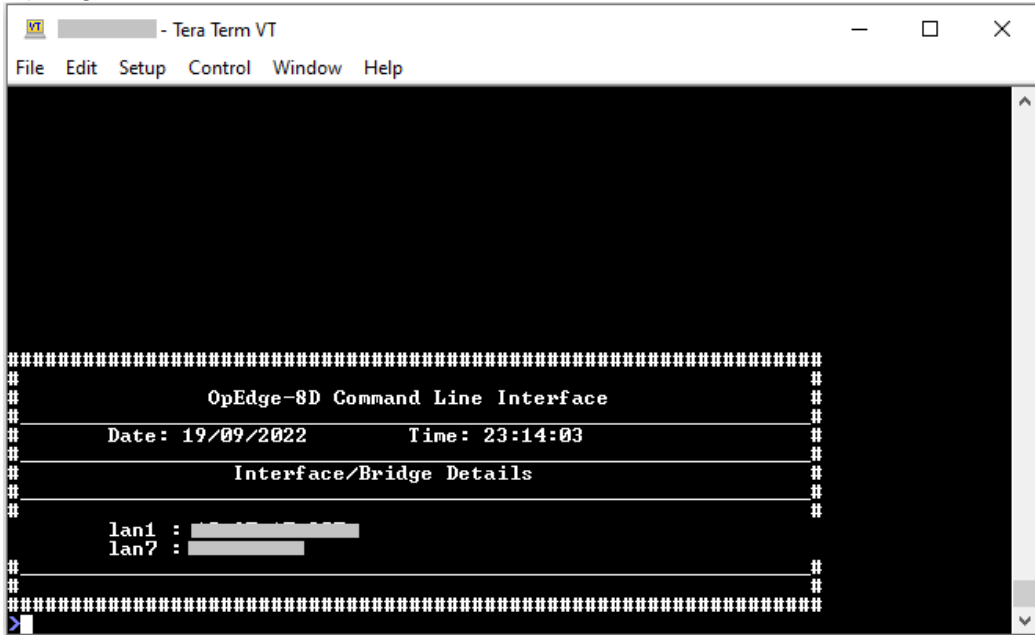


- 3 Set the below-mentioned parameters for the serial ports:
  - a) Baud Rate/ Speed: 115200
  - b) Data: 8 bit
  - c) Parity: None
  - d) Stop Bits: 1 bit
  - e) Flow Control: None



- The command line interface will be available, on successful console connection to the OpEdge.

OpEdge-8D:



```
#####  
#  
#           OpEdge-8D Command Line Interface           #  
#-----#  
#   Date: 19/09/2022           Time: 23:14:03           #  
#-----#  
#           Interface/Bridge Details                   #  
#-----#  
#   lan1 : [REDACTED]                                   #  
#   lan7 : [REDACTED]                                   #  
#-----#  
#####  
>
```

OpEdge-4D:



```
#####  
#  
#           OpEdge-4D Command Line Interface           #  
#-----#  
#   Date: 02/05/2023           Time: 18:58:50           #  
#-----#  
#           Interface/Bridge Details                   #  
#-----#  
#   lan1 : [REDACTED]                                   #  
#           lan2 : [REDACTED]                           #  
#-----#  
#####  
>
```

- 
- 5 The help command on the CLI will display all the supported commands.

```
>help  
  
Command          Description  
factory-reset    Reset to factory default  
set ip           Change the IP of device  
get ip           Get IP of device  
reboot           Reboot the device  
>
```

- Execute the *factory-reset* command to reset the OpEdge to factory settings. Confirm with a y (for yes) to do the factory-reset.

```
>help
Command      Description
factory-reset  Reset to factory default
set ip        Change the IP of device
get ip        Get IP of device
reboot        Reboot the device
>factory-reset
Warning:Performing factory reset will remove all configuration and data from device and reset to factory setting
Are you sure you want to continue(y/n)?
y
```

- The OpEdge will go into the factory-reset state and will be available to be connected on the default IP of 192.168.0.250 on LAN1 port after the process completes.

```
>help
Command      Description
factory-reset  Reset to factory default
set ip        Change the IP of device
get ip        Get IP of device
reboot        Reboot the device
>factory-reset
Warning:Performing factory reset will remove all configuration and data from device and reset to factory setting
Are you sure you want to continue(y/n)?
y
System resetting to default IPs
Please wait for 5 minutes before logging again.....
Resetting ...
>
```

## 7.3 Updating Firmware

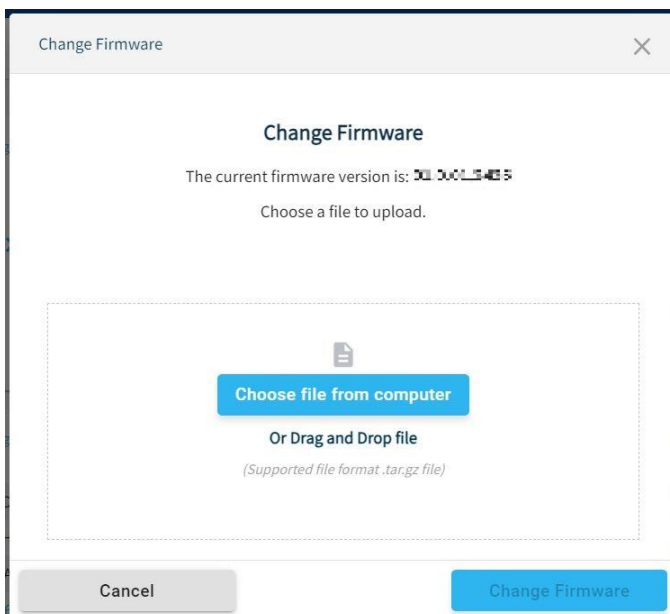
The current firmware versions can be found in the *Device Summary* tile in the *Overview* tab:



| Device Summary |  | Configure |
|----------------|--|-----------|
| Name           | OpEdge-8D                              |           |
| Description    | Hirschmann Automation and Control GmbH |           |
| Location       | Bakersfield, CA                        |           |
| Firmware       | 01.00.01.001_2023                      |           |
| System Time    | Jun 15 2023 05:20:21                   |           |
| MAC            | 88:63:83:45:12:34                      |           |

To upgrade the gateway firmware on the device, perform the following steps:

- 1 Open the OpEdge configuration webpage.
- 2 In the *Overview* tab > *Device Summary* tile, click on the **FIRMWARE VERSION NUMBER** to open the *Change Firmware* dialog box.



- 3 Drop the **.tar.gz** file into the *Change Firmware* dialog box or click the **CHOOSE FILE FROM COMPUTER**, then click **OK**.
- 4 Click **SUBMIT** to upgrade the OpEdge firmware. The installation process takes approximately 5 minutes, and automatically reboots the OpEdge.
- 5 Verify the Firmware version in the *Overview* tab > *Device Summary* tile.

---

# A. Abbreviations

| Abbreviation | Description   |
|--------------|---|
| ASCII        | American Standard Code for Information Interchange.   |
| CIDR         | Classless Inter-Domain Routing. A CIDR address is written with a forward slash preceding a suffix indicating the number of bits in the prefix length, such as 192.168.0.0/16. |
| DHCP         | Dynamic Host Configuration Protocol.  |
| HTTP         | Hyper Transfer Protocol   |
| HTTPS        | Hypertext Transfer Protocol Secure  |
| IIoT         | Industrial Internet of Things   |
| IP           | Internet Protocol   |
| LAN          | A computer network covering a small geographic area, like a home, office, or group of buildings. Compare to WAN.  |
| MAC          | Media Access Control. A MAC address is a unique identifier attached to most forms of networking equipment.  |
| MIB          | Management Information Base. A database used by SNMP to manage devices such as switches and routers in a network.   |
| PC           | Personal Computer   |
| QR           | Quick Response  |
| RTU          | Remote Terminal Unit. A device that collects data from data acquisition equipment and sends it to the main system over a network.   |
| SSH          | Secure Shell. A network protocol using public key cryptography to provide secure remote login.  |
| SSL          | Secure Socket Layer. A cryptographic protocol that creates a secure data transfer session over a standard TCP connection.   |
| Syslog       | A protocol for sending event messages over an IP network to remote servers called "event message collectors."   |
| TCP          | Transmission Control Protocol   |
| TLS          | Transport Layer Security.   |
| UDP          | User Datagram Protocol. One of the communications protocols of the Internet Protocol Suite. Replaces TCP when a reliable delivery is not required.                            |
| URL          | Uniform Resource Locator  |
| VID          | VLAN Identifier   |
| VLAN         | Virtual Local Area Network. A logical subgroup within a local area network that is created with software rather than by physically manipulating cables.                       |
| WAN          | Wide Area Network. A computer network that crosses metropolitan, regional, or national boundaries. Compare to LAN.  |



---

## B. Appendix

### B.1 Syslog Description

The OpEdge supports a System Logging Protocol used to send system log or event messages to a specific server, called a Syslog server. It is primarily used to collect various device logs from multiple machines/applications to monitor and examine the device.

The OpEdge supports the System Logs feature, which allows capturing various system logs or event messages in a local OpEdge log file.

The Syslog protocol supports the following severity levels:

| Code | Severity    | Description            |
|------|-------------|------------------------|
| 0    | Warning     | Warning conditions     |
| 1    | Information | Informational messages |
| 2    | Debug       | Debug-level messages   |

Example of Syslog messages:

```
<165> 2017-05-11T21:14:15.003Z mymachine.example.com appname[su] – ID47  
[exampleSDID@32473 iut="3" eventSource=" eventID="1011"] BOMAn application log entry...
```

Part of Syslog message:

| Part            | Value   | Information  |
|-----------------|---|--|
| PRI             | 165   | Facility = 20, Severity = 5  |
| VERSION         | 1   | Version 1  |
| TIMESTAMP       | 2017-05-11T21:14:15.003Z                                    | Message created on 11 May 2017 at 09:14:15 pm, 3 milliseconds into the next second                             |
| HOSTNAME        | mymachine.example.com<br>appname                            | Message originated from host "mymachine.example.com"   |
| APP-NAME        | su  | App-Name: "su"   |
| PROCID          | -   | PROCID unknown   |
| MSGID           | ID47  | Message ID: 47   |
| STRUCTURED-DATA | [exampleSDID@32473 iut="3"<br>eventSource=" eventID="1011"] | Structure data element with a non-IANA controlled SD-ID of type "examp"eSDID@3243", which has three parameters |
| MSG             | BOMAn application log entry...                              | BOM indicates UTF-8 encoding, the message itself is "An Application log entry..."                              |

### B.2 Maintenance

Hirschmann is continually working on improving and developing their software. Check regularly whether there is an updated version of the software that provides you with additional benefits. You find information and software downloads on the Hirschmann product pages on the Internet at: <http://www.hirschmann.com>

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## C. Troubleshooting the OpEdge

### 1. How do I configure one of the Ethernet ports on the OpEdge as a WAN port?

There are seven Ethernet ports on the OpEdge-8D and four Ethernet ports on the OpEdge-4D. Any port can be configured as a WAN or LAN port. There can only be a maximum of one WAN port. The WAN and LAN ports can have different subnets. The ports can be configured using the local webserver or via Belden Horizon.

### 2. What is an Allowed IP List?

The terms *Allowed IP List* and *IP Whitelist* have the same meaning. It is a list of specific IP addresses or a range of IP addresses that will be allowed to connect to the OpEdge's webpage through the WAN interface. To configure the OpEdge's *Allowed IP List*, go to the *System* tab.

**NOTE:** The OpEdge's *Allowed IP List* is different from the *Allowed IP Connections* setting in Belden Horizon. *Allowed IP Connections* can only be configured in Belden Horizon. This is a list of specific end device IP addresses that a user can access when they tunnel (remotely connect via Belden Horizon) into the OpEdge. To configure the *Allowed IP Connections* setting, make sure the OpEdge is activated in Belden Horizon and then go to the *Tunneling/VPN* tab.

### 3. Can more than one of the on-board Ethernet ports be configured as a WAN port?

No, only 1 of the Ethernet ports can be configured as a WAN interface.

### 4. Can the Ethernet ports be on different subnets?

Yes, the LAN and WAN ports can be on different subnets. The LAN interfaces will only support a single subnet.

### 5. How do I activate the OpEdge in Belden Horizon? Do I need to do this?

It is highly recommended that the OpEdge be activated in Belden Horizon. Please refer to the User Manual or the Quick Start Guide for more details.

### 6. Can I access the internet through the OpEdge?

Yes, the internet can be accessed through the OpEdge. Internet access is disabled by default. It is not recommended to 'always' enable the internet access.

### 7. Does the OpEdge include a firewall?

Yes, it includes integrated firewall capabilities.

### 8. Does the OpEdge support port forwarding?

Yes, it supports port forwarding.

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## D. Further support

### ■ Technical Questions

For technical questions, please contact any Hirschmann dealer in your area or Hirschmann directly.

You will find the addresses of our partners on the Internet at <http://www.hirschmann.com>

A list of local telephone numbers and email addresses for technical support directly from Hirschmann is available at

<https://hirschmann-support.belden.com>

This site also includes a free of charge knowledge base and a software download section.

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