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User Manual

Configuration
Industrial Edge Gateway
OpEdge

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Contents

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.

The OpEdge supports deployment of edge applications vis containers, which can be installed either locally through the device interface or remotely through the Belden Horizon Console. See *Chapter 6.1 Containers* for more information

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.

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 Connecting to the OpEdge Webpage

Perform the following steps to connect to the OpEdge webpage:

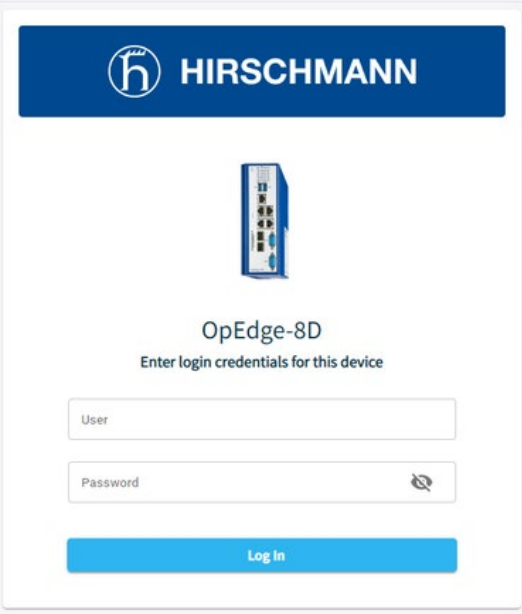
1 Ensure that the module is connected to the network to Ethernet port 1, and apply power to the module.

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

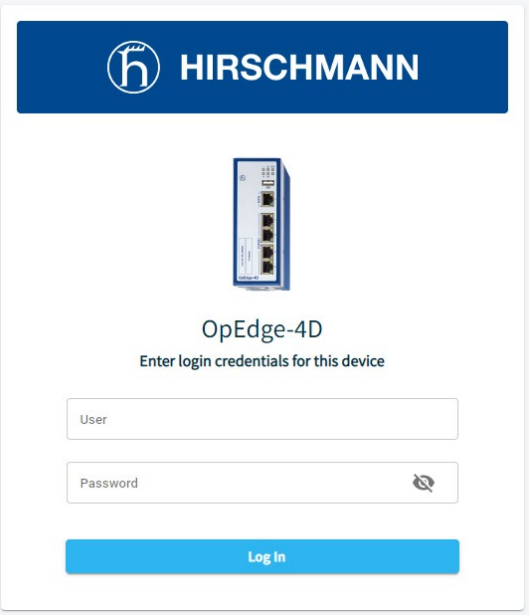
2 Open a web browser and log in to the OpEdge configuration webpage. The default IP address is: **https://192.168.0.250:8080**. If the PC is on a different subnet, temporarily set the IP address of the PC to **192.168.0.xxx** with a subnet of **255.255.255.0**.

The login page is displayed.

a. OpEdge-8D



b. OpEdge-4D

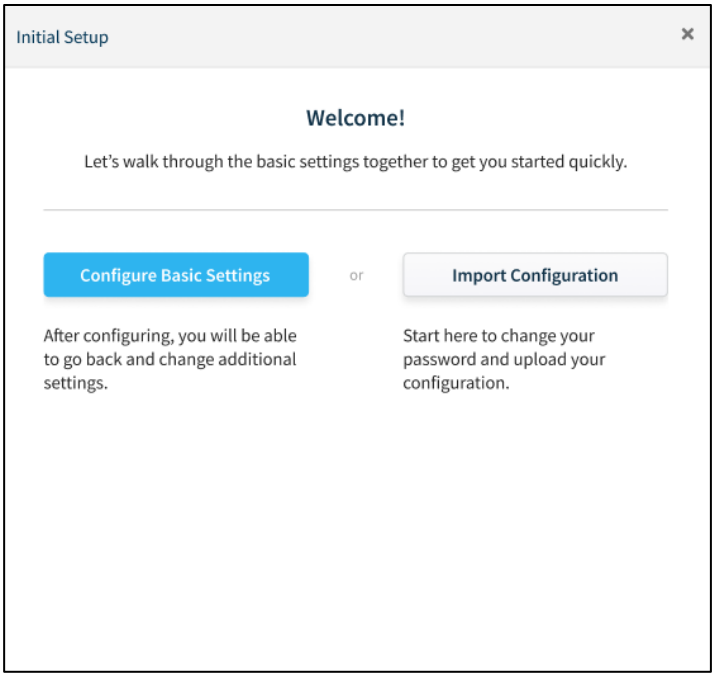


3 Enter the login credentials. The default *username* and *password* are **admin** and **password**.

> **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.

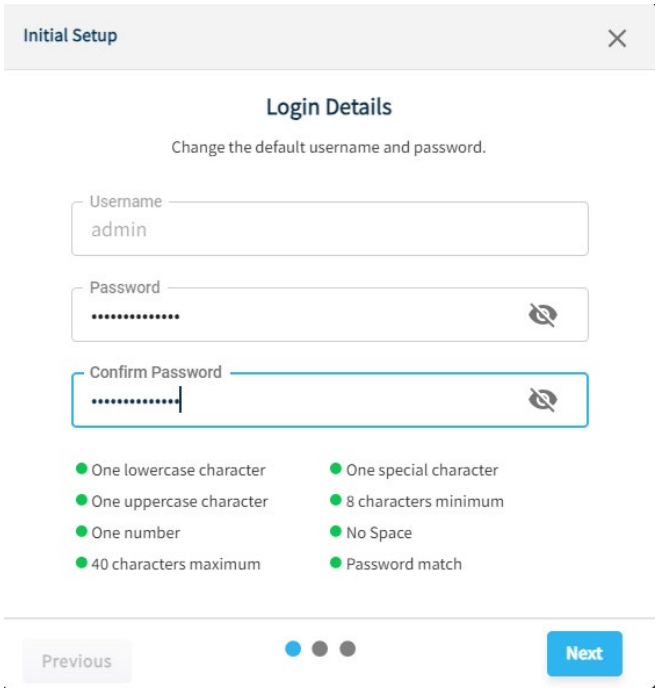
4 The *Initial Setup* dialog allows the following operations:

- 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:



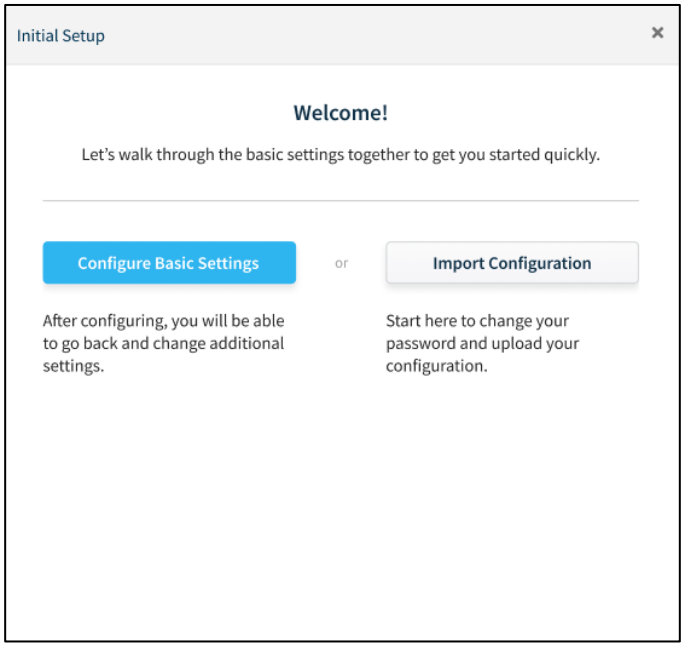
ii. Enter the new login credentials.

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

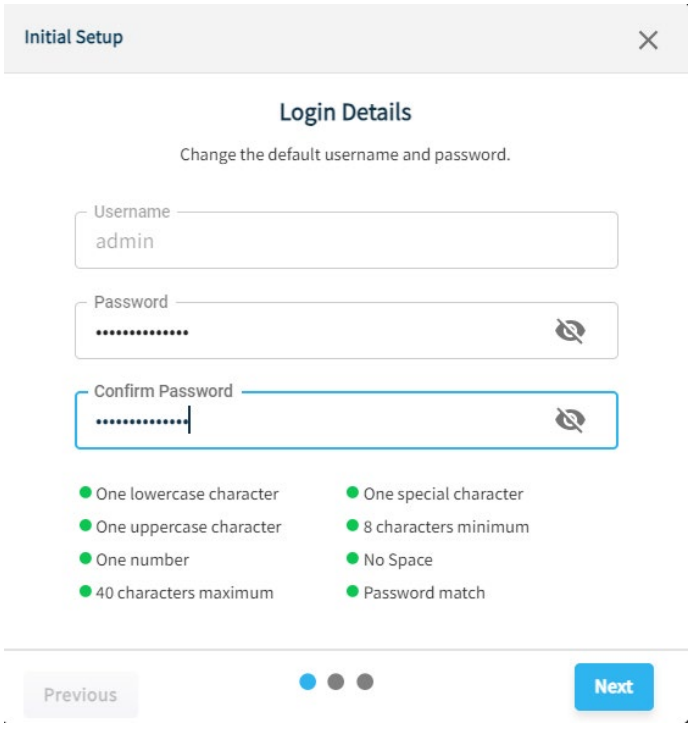
iii. Click **SAVE** to save the changes.

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

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

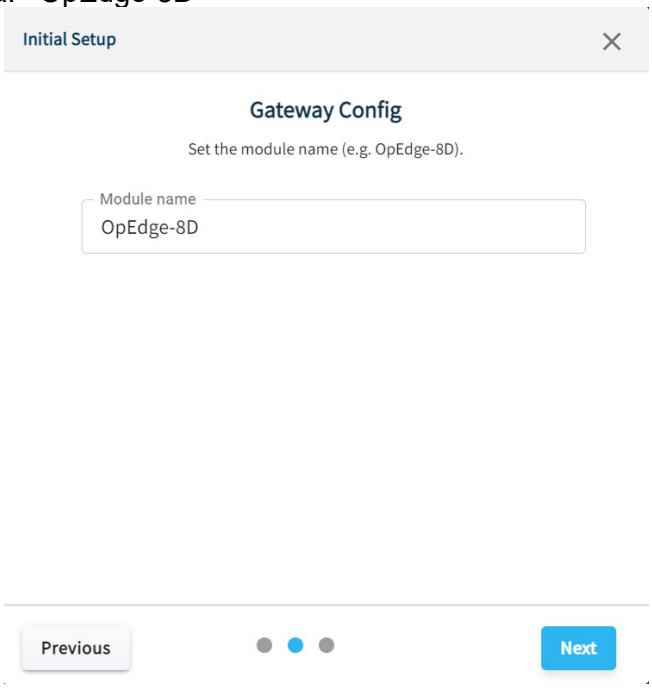


ii. In the *Login Details* dialog, change the default login credentials and click **NEXT**.

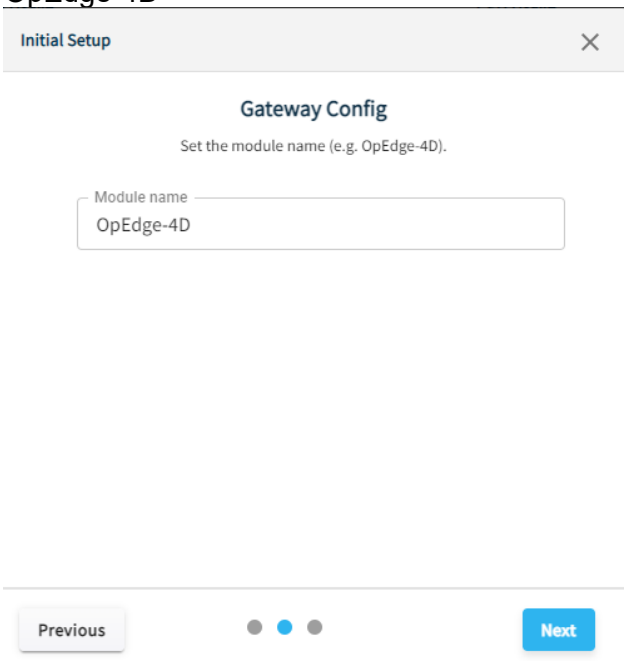


iii. In the *Gateway Config* dialog, provide the module name. Click **NEXT**.

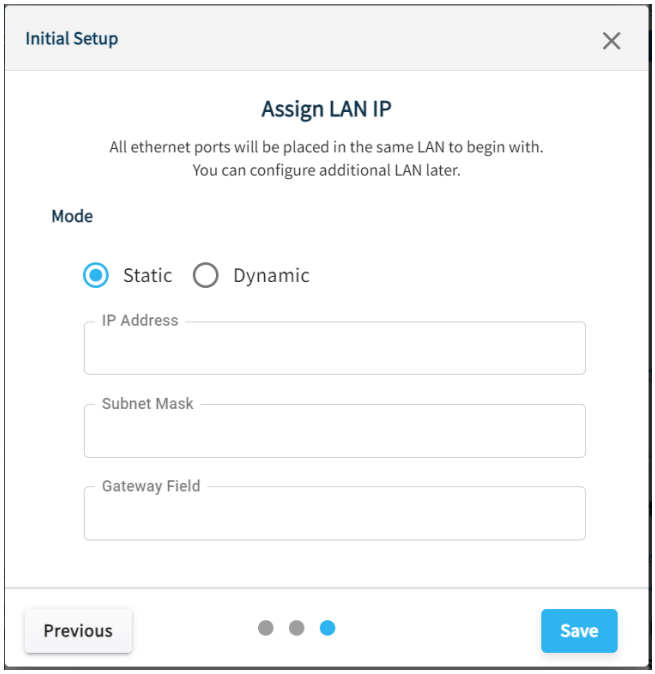
a. OpEdge-8D



b. OpEdge-4D



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



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

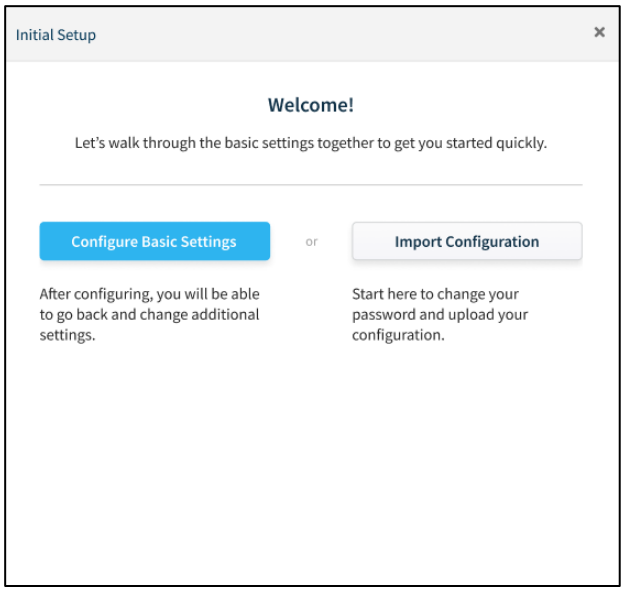
C. **Import Configuration**:

NOTE: For information on exporting the configuration to a *.tar.gz* file, please see section 4.1.2.

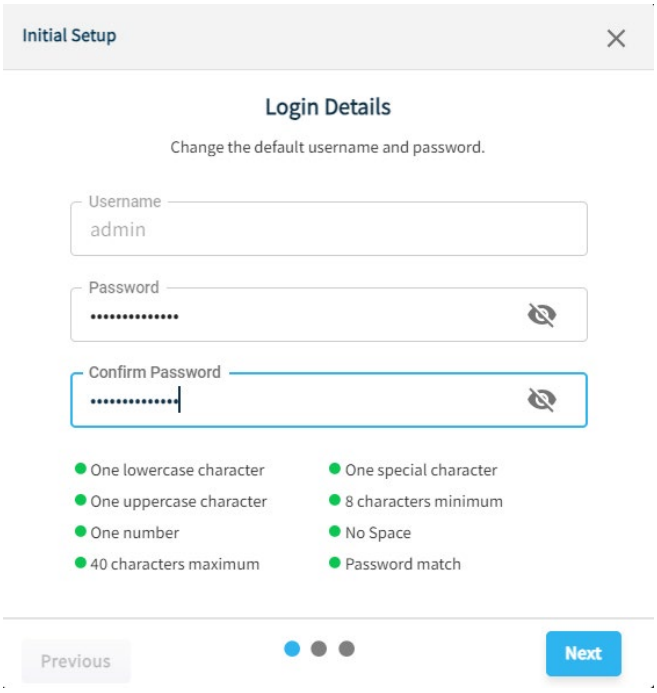
NOTE: During the initial module configuration, the default Username and Password must be changed.

To import a configuration file:

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

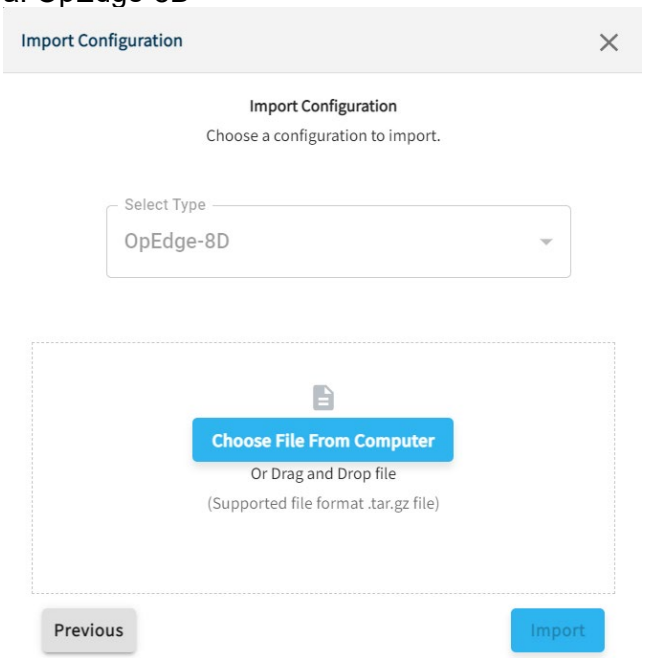


ii. In the *Login Details* dialog, change the default login credentials and click **NEXT**.

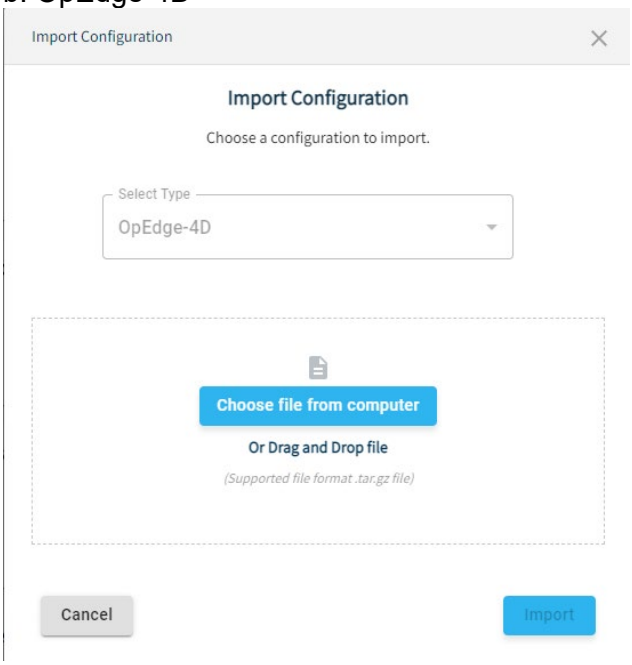


iii. In the *Import Configuration* dialog, drag and drop a *.tar.gz* configuration file in the dialog or click **CHOOSE FILE FROM COMPUTER** to browse and upload a file.

a. OpEdge-8D



b. OpEdge-4D

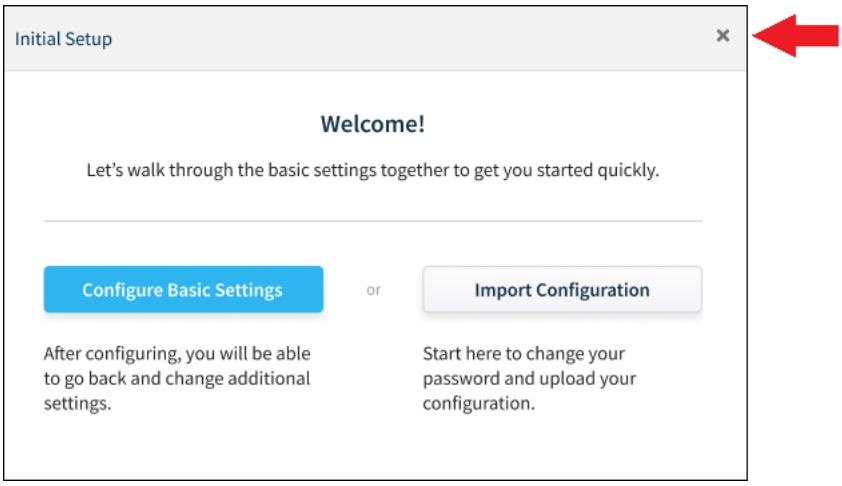


iv. Click **IMPORT** to import the selected configuration file.

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.

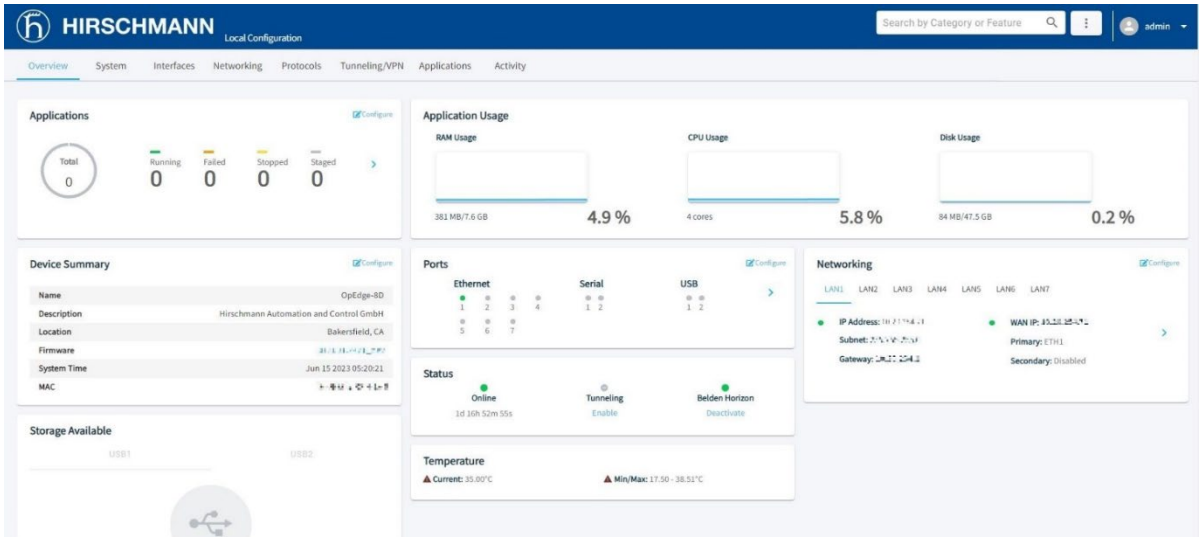


ii. Log in to the OpEdge.

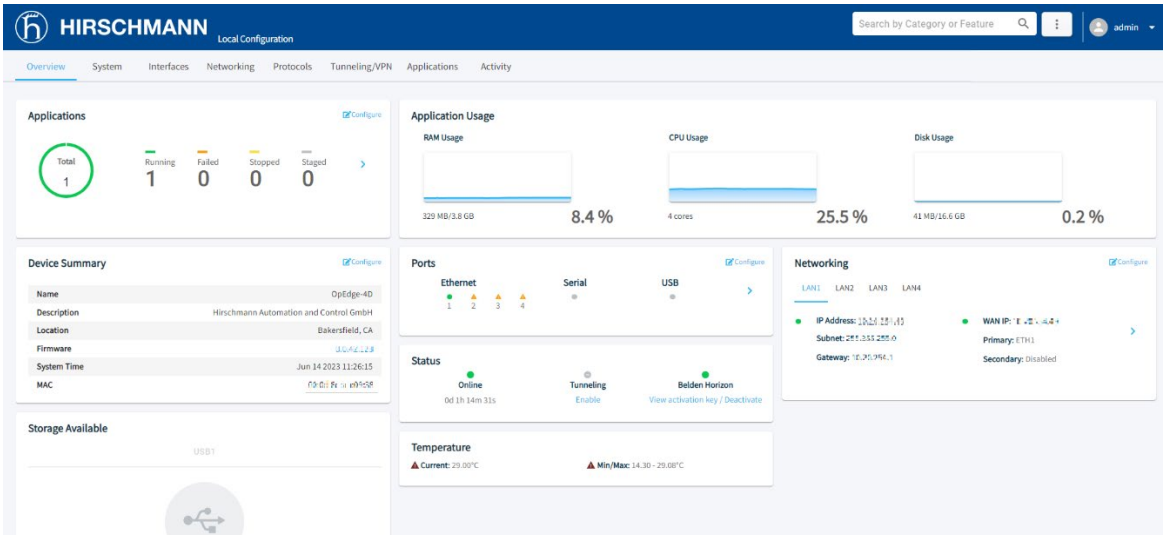
5 After a successful login, the *Overview* tab is displayed and contains the following information:

- 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 4ports)
- Networking (such as *Status* for LAN and WAN)
- Device temperature
- Available storage
- Other features

a. OpEdge-8D



b. OpEdge-4D



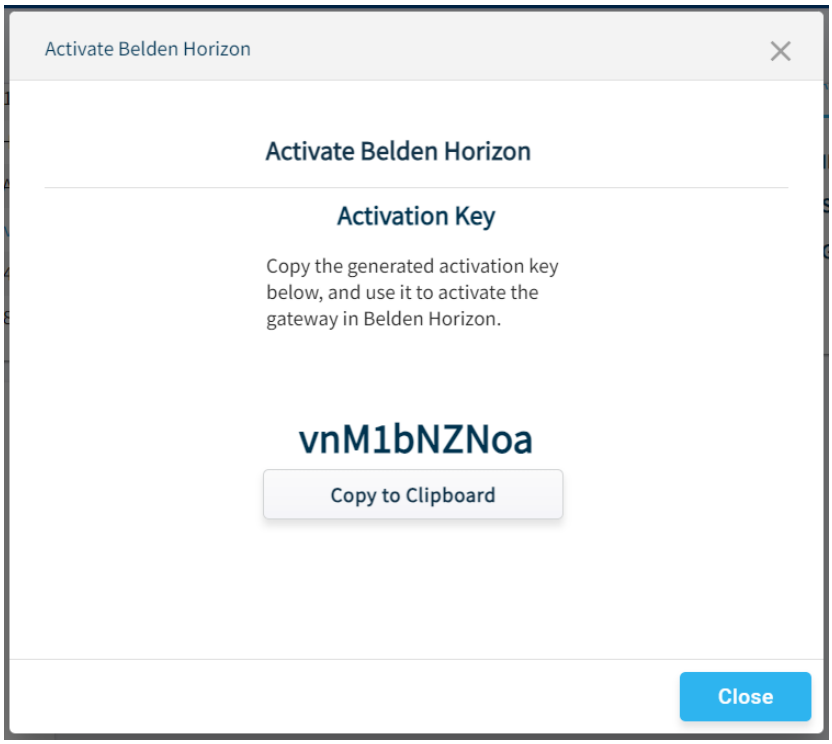
NOTE: The status of each parameter will vary.

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.

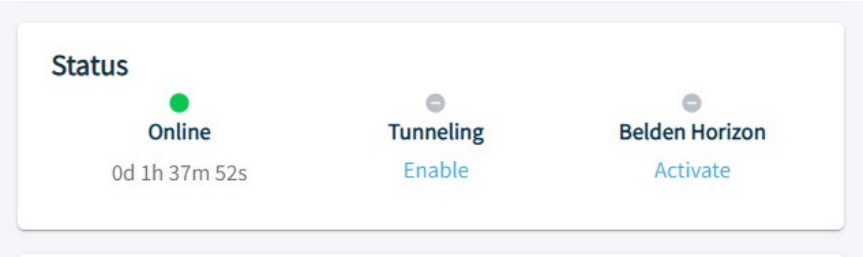


3.1 Registration Using Activation Key

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* on 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.

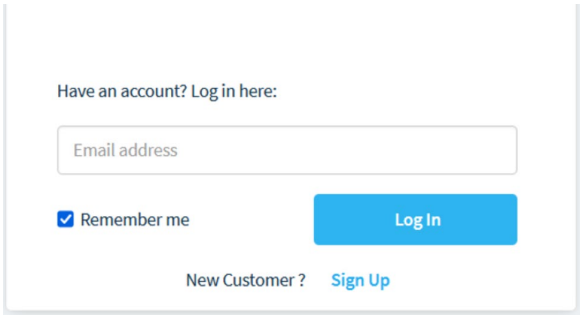


NOTE: If the OpEdge is already connected to a Belden Horizon account, the link reads “Deactivate”.

3 The OpEdge securely retrieves an alphanumeric activation key from Belden Horizon that is only valid for 3 hours. Record this activation key.

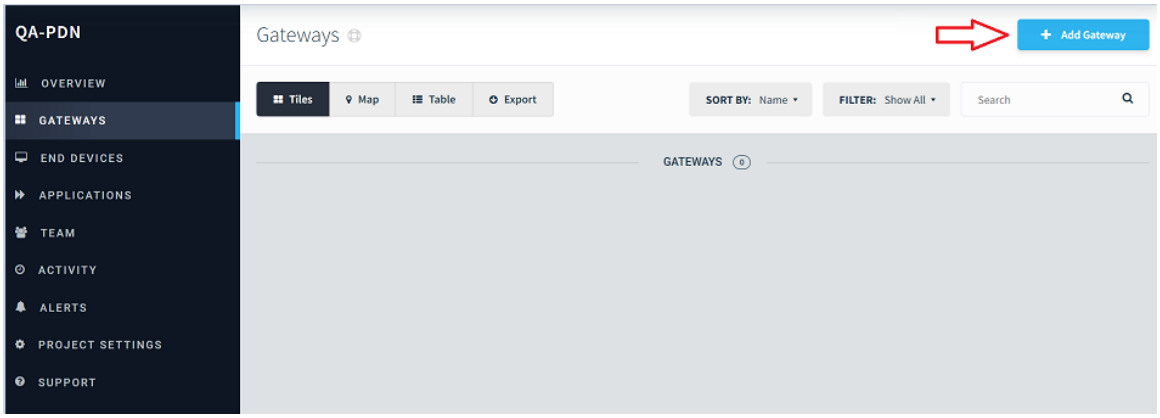
4 Open a new tab in a web browser, enter **www.belden.io** in the address bar, and press **ENTER**.

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.

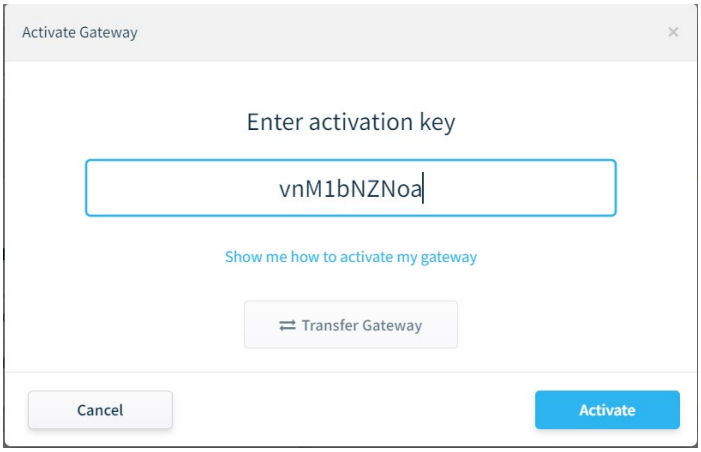


6 Once logged in, follow the prompts to create a project.

7 Click the *Gateways* tab, and then click **ADD GATEWAY**.

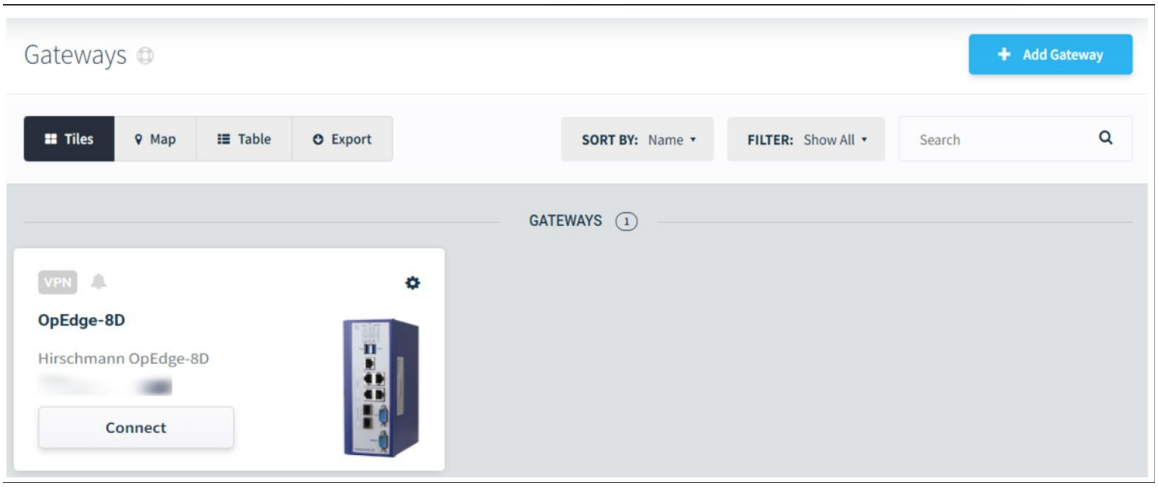


8 The user will be prompted for the activation key recorded earlier. Click **ACTIVATE**.

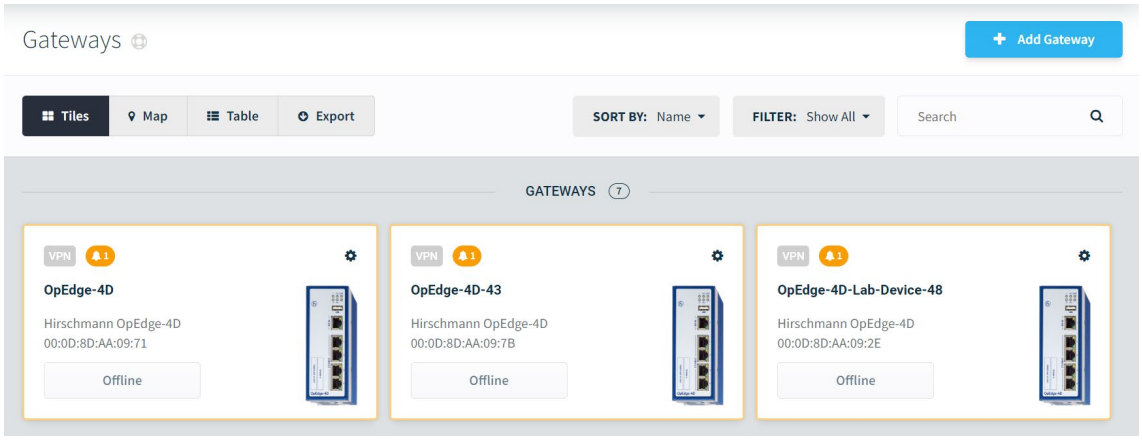


9 Upon successful activation, the OpEdge appears on the *Gateways* tab.

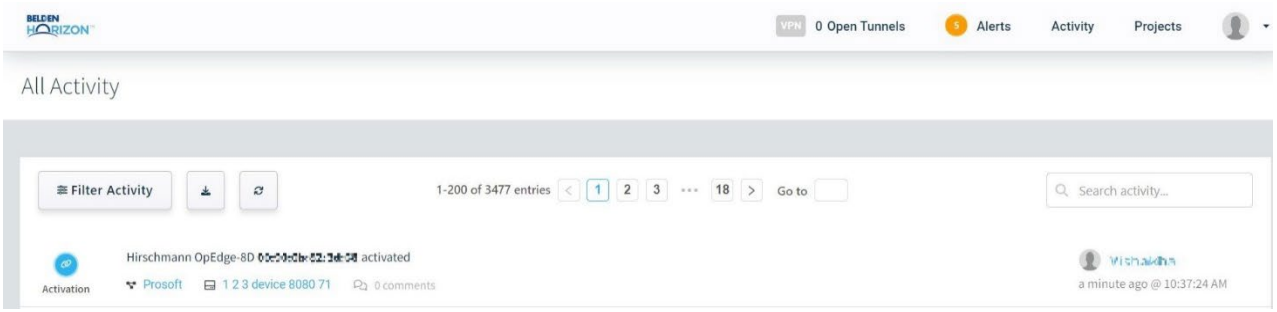
a. OpEdge-8D



b. OpEdge-4D



The same will be updated in Activity logs as well.



3.2 Activation Errors

The following error messages correspond to failed registration issues:

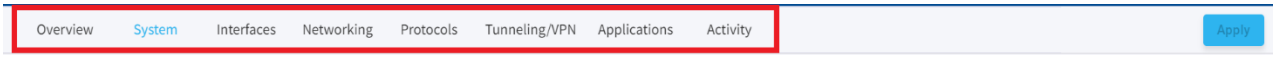
Error	Description	Solution
Key is corrupted.	The key is invalid.	Please make sure this is the correct key.
Device Activation record was found for activation key.	Failed to find an activation record in the Belden Horizon database.	Please try another activation key.
Found a Device Activation record in 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

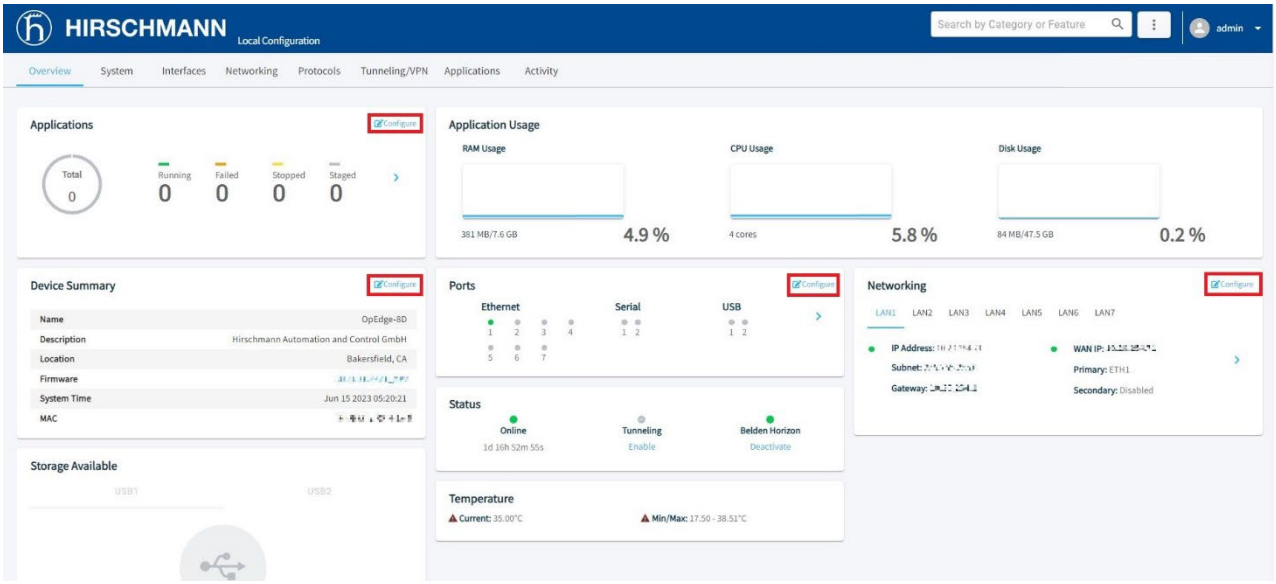
4.1 OpEdge Webpage Navigation

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

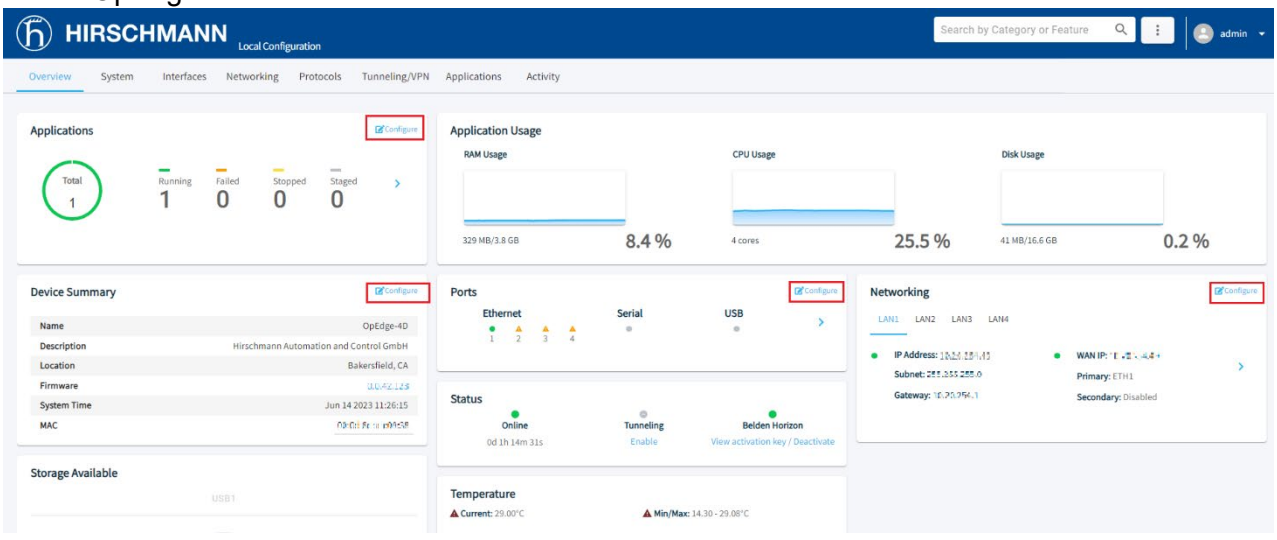
- From the tabs on the *Local Configuration* webpage.



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



  b. OpEdge-4D

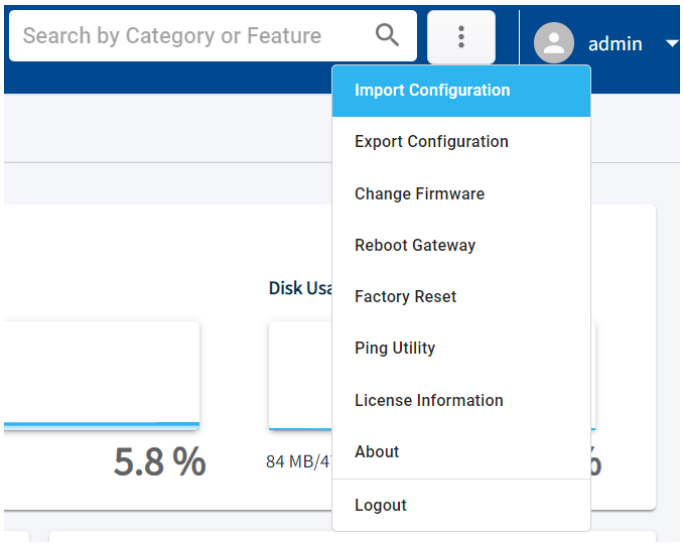


4.1.1 Search Bar

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

4.1.2 […] Button

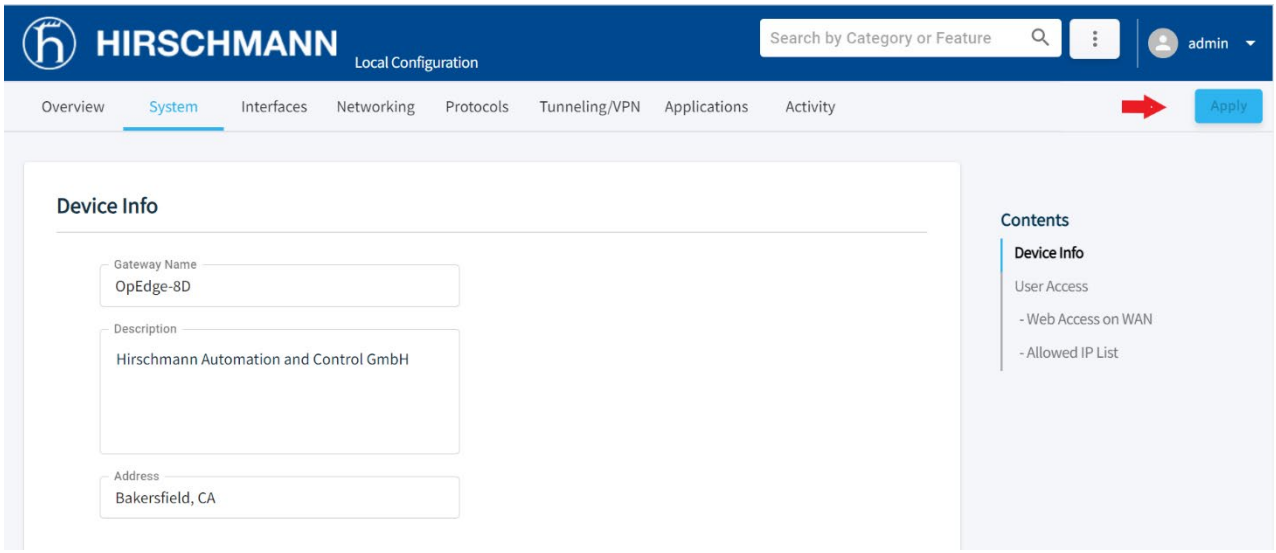
The ⋮ button includes additional options for the OpEdge.



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.



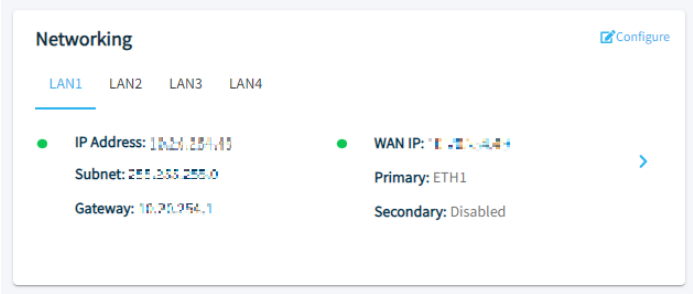
4.1.4 Side sheet Launcher

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

Example:

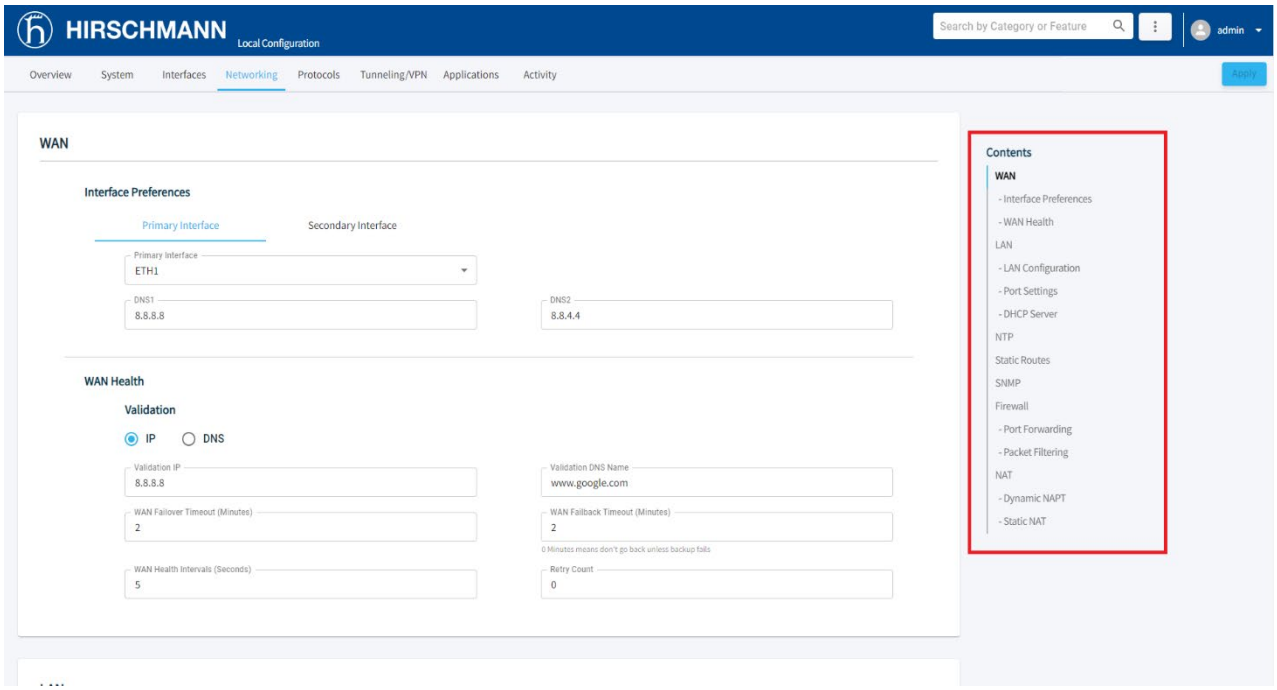
a. OpEdge-8D

b. OpEdge-4D



4.1.5 Side Menu Scrolling

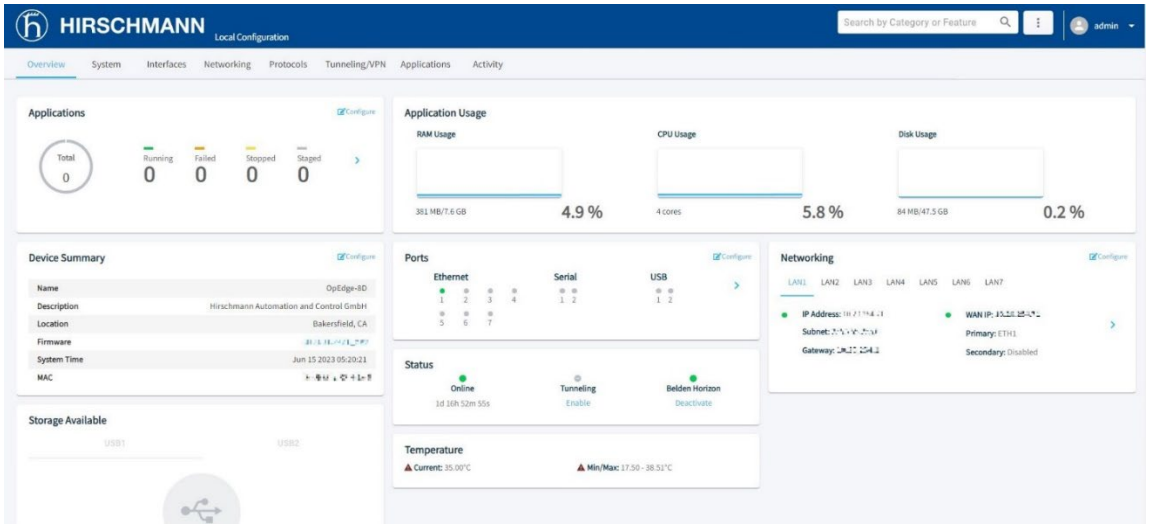
The scrolling menu within each tab can be used to quickly jump to each parameter.



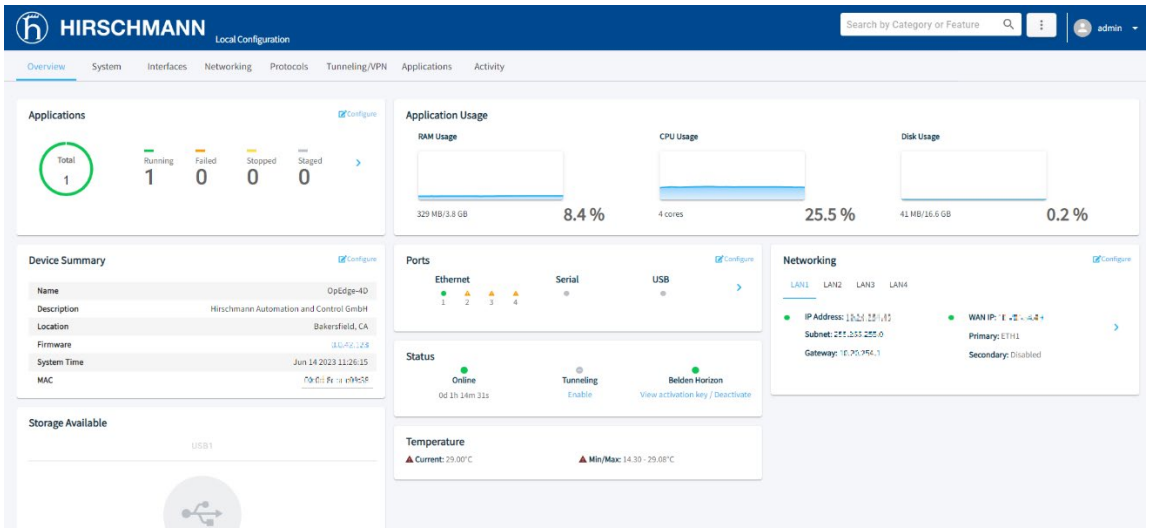
4.2 Overview Tab

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

a. OpEdge-8D

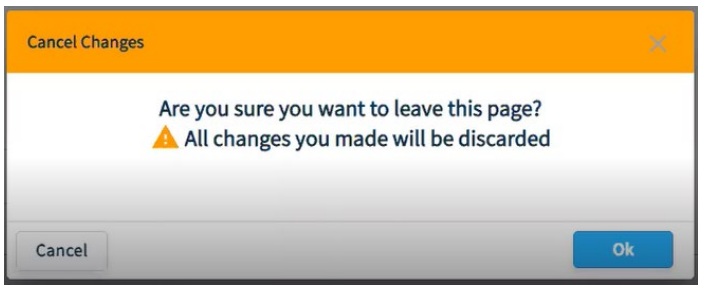


b. OpEdge-4D



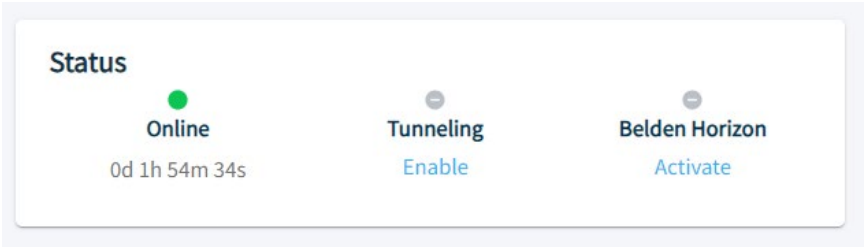
Additionally, click **CONFIGURE** to open the configuration option for a specific tile.

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:



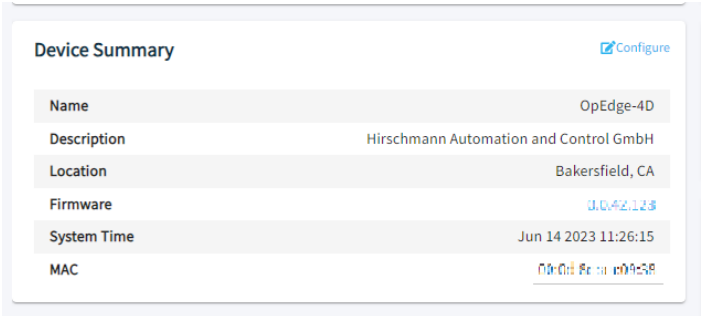
Parameter	Description
Online	The current status of the OpEdge: **Online** (Green) **Offline** (Grey) **Note:** The status will be Online only if WAN is connected.
Tunneling	The icon displays the current Belden Horizon tunneling status of the OpEdge. Grey: Tunneling is not in operation Green: Tunneling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

b. OpEdge-4D



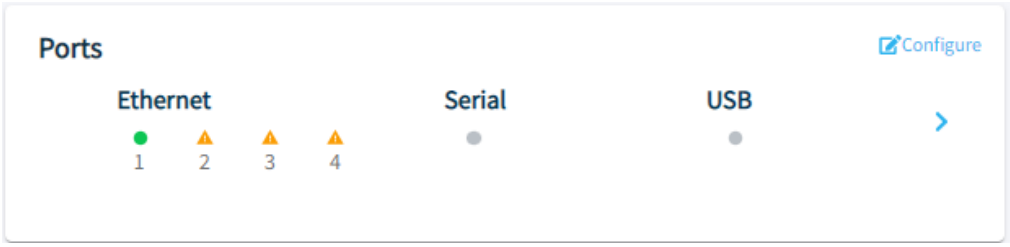
Parameter	Description
Name	Gateway name configured by user.
Description	Gateway description configured by user.
Location	Location of gateway configured by user.
Firmware	Current firmware version loaded on the OpEdge.
System Time	Date and time in UTC format.
MAC	OpEdge MAC Address.

4.2.3 Ports

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

a. OpEdge-8D

b. OpEdge-4D

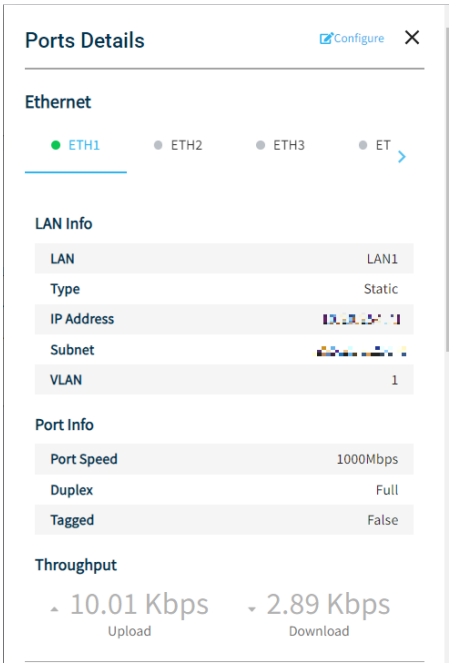


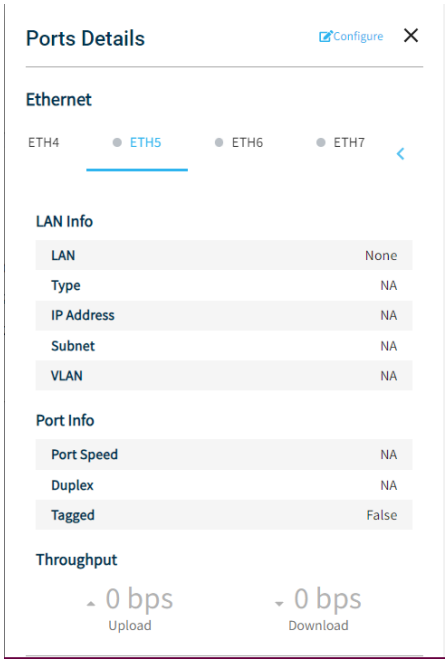
Port Indicator	Description
Green	The port is configured and communicating.
Grey	The port is not configured and no cable detected.
Yellow	The port is configured but not communicating, or no cable has been detected.

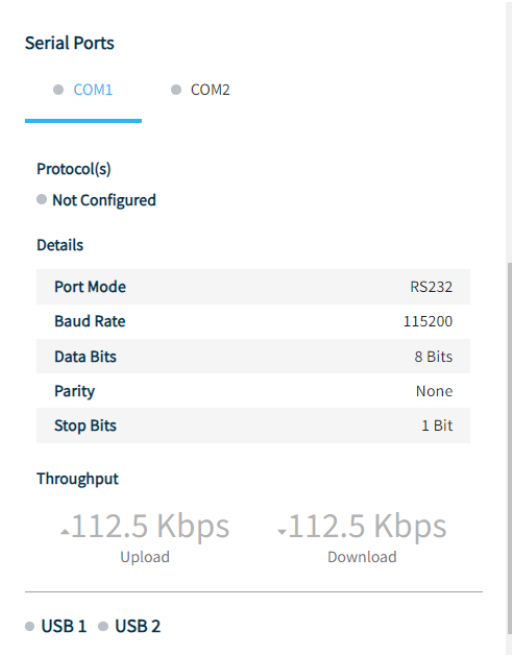
Click the › icon to display the *Ports Details* dialog.

4.2.3.1 Ports Details

a. OpEdge-8D



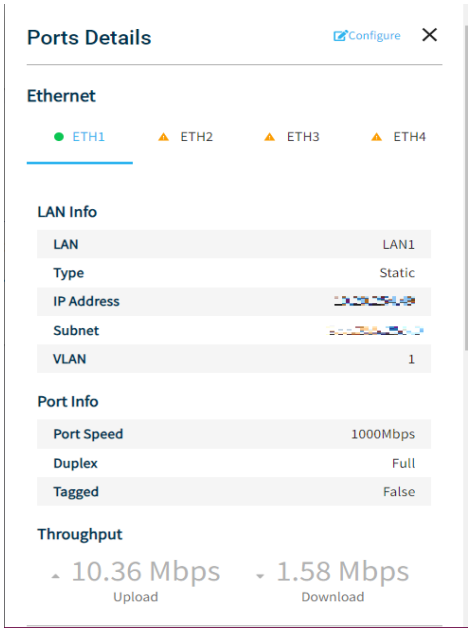




Parameter		Description
Ethernet	ETH1 ETH2 … ETH7	Green = Port is configured and communicating. Grey = Port is not configured. Yellow Triangle = Port is configured but no communications, or no cable detected.
LAN Info	LAN	LAN configuration assigned to the port.
	Type	Type of mode, dynamic or static.
	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 ETH2 ETH3 ETH4	Green = Port is configured and communicating. Grey = Port is not configured. Yellow Triangle = Port is configured but no communications, or no cable detected.
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.

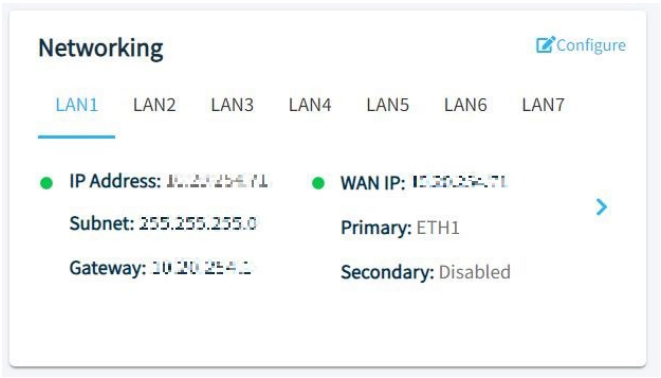
4.2.4 Temperature

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

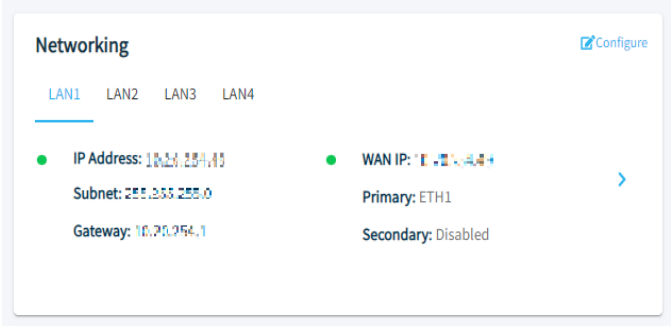
4.2.5 Networking

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

a. OpEdge-8D



b. OpEdge-4D

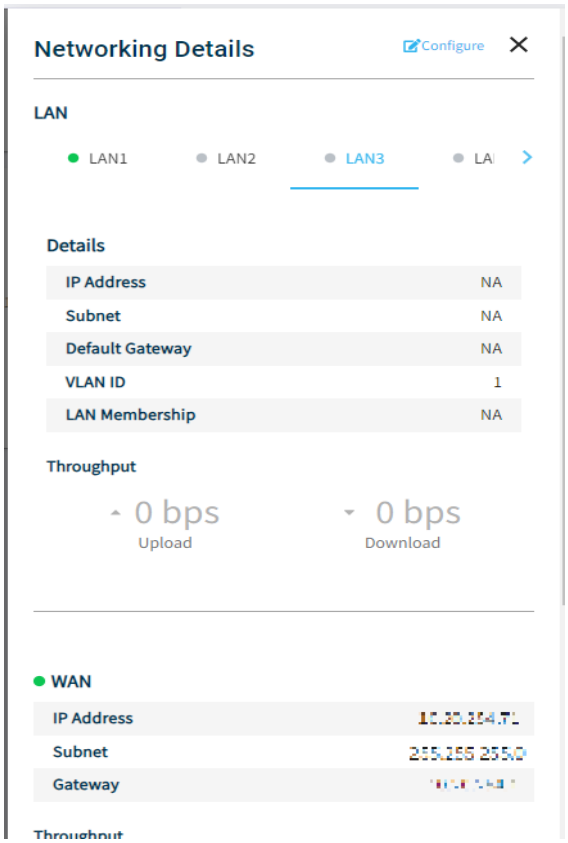


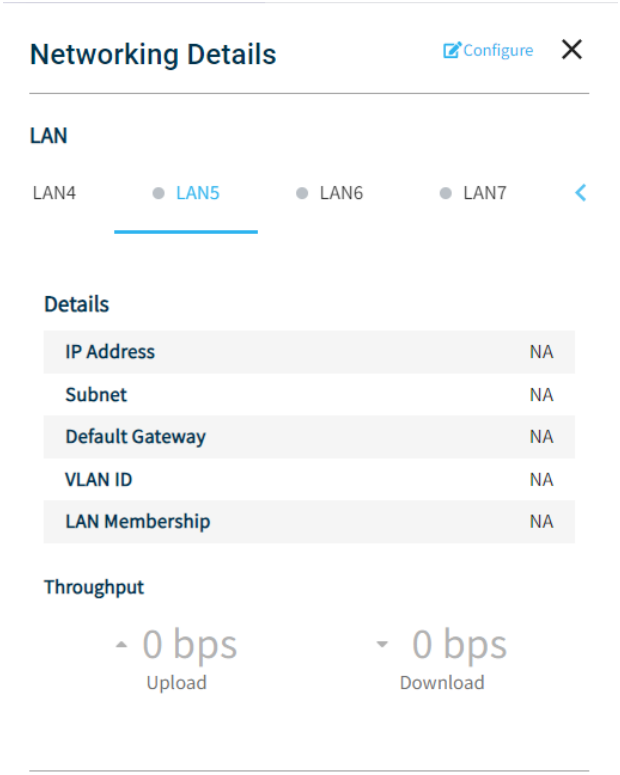
Parameter	Description
IP	IP address provided by the operator.
Subnet	Subnet mask of the IP address.
Gateway	Default IP address of the gateway.
WAN IP	IP address assigned to the WAN.
Primary/Secondary	Primary and Secondary WAN interface.

Click the › icon to display the *Networking Details* dialog.

4.2.5.1 Network Details

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





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
LAN	**Details**	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.
	Throughput	
	Upload	Upload speed (Mbps) of data on the LAN network.
	Download	Download speed (Mbps) of data on the LAN network.

Parameter		Description
WAN	IP Address	IP address assigned to the WAN.
	Subnet	Subnet mask of the IP address.
	Gateway	IP address of the gateway.
	Throughput	
	Upload	Upload speed (Mbps) of data on the WAN network.
	Download	Download speed (Mbps) of data on the WAN network.
	Status	
	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

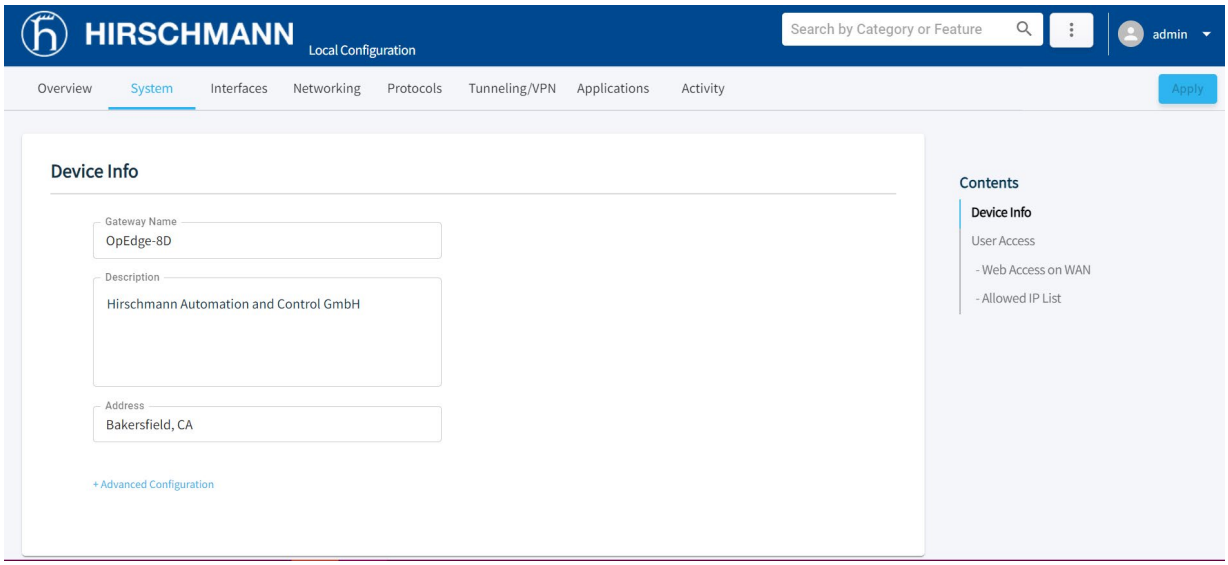
5.1 System Tab

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

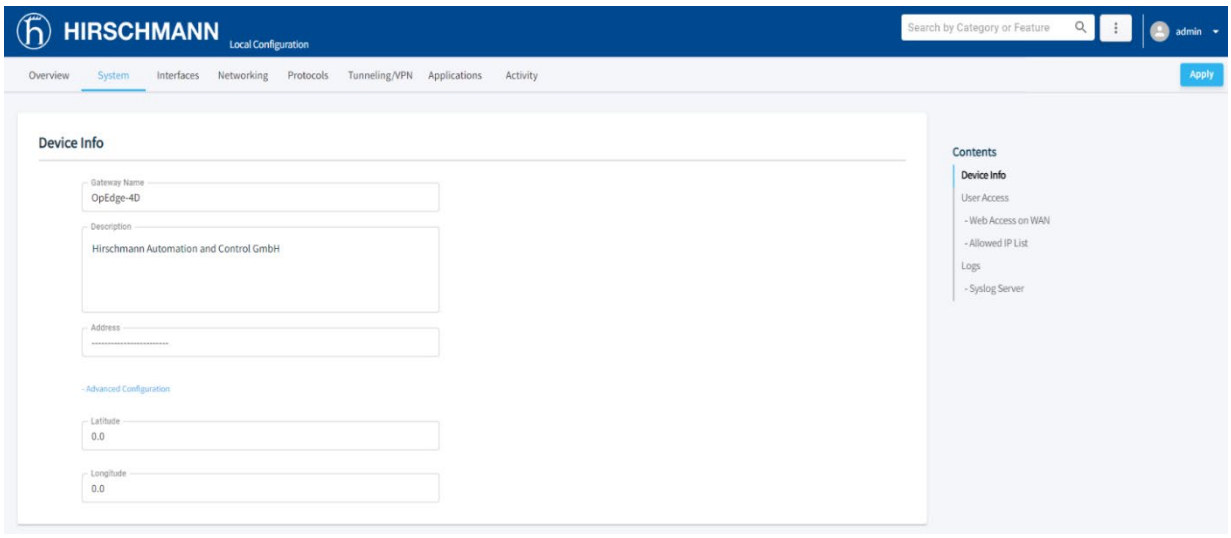
5.1.1 Device Info

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



b. OpEdge-4D



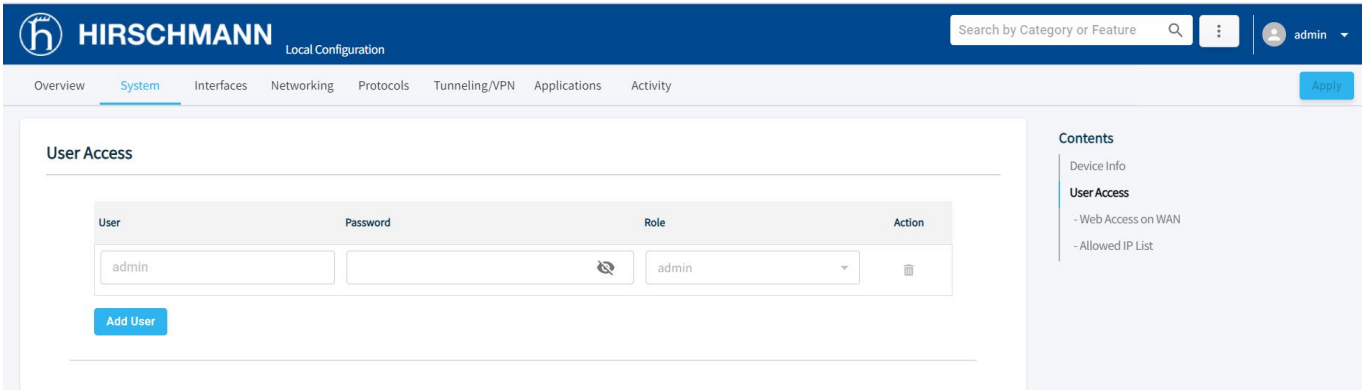
Parameter	Description
Gateway Name	Name of the device.
Description	Brief description of the device.
Address	Address of the device.
Latitude	Latitude coordinate.
Longitude	Longitude coordinate.

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 for limiting their access.

The following types of roles are assigned to a user:

- **Admin**: Includes complete user privileges. An admin can do any desired change. Maximum 2 admins are allowed.
- **Viewer**: Includes permissions to view the configurations and to monitor the gateway and activity feed. A viewer cannot change any configuration.



Use the following steps to add a new user:

1 Open the OpEdge configuration webpage and click the *System* tab.

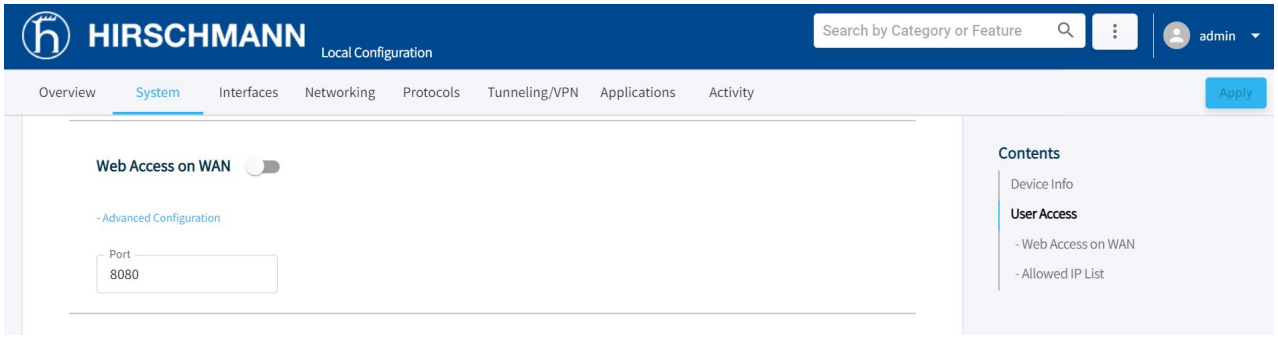
2 Under *User Access*, enter the following parameters:

Parameter	Description
User	User name to be defined.
Password	Default password for the user account. **Note:** 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. *Admin* or *Viewer* (read only)

5.1.2.1 Web Access on WAN

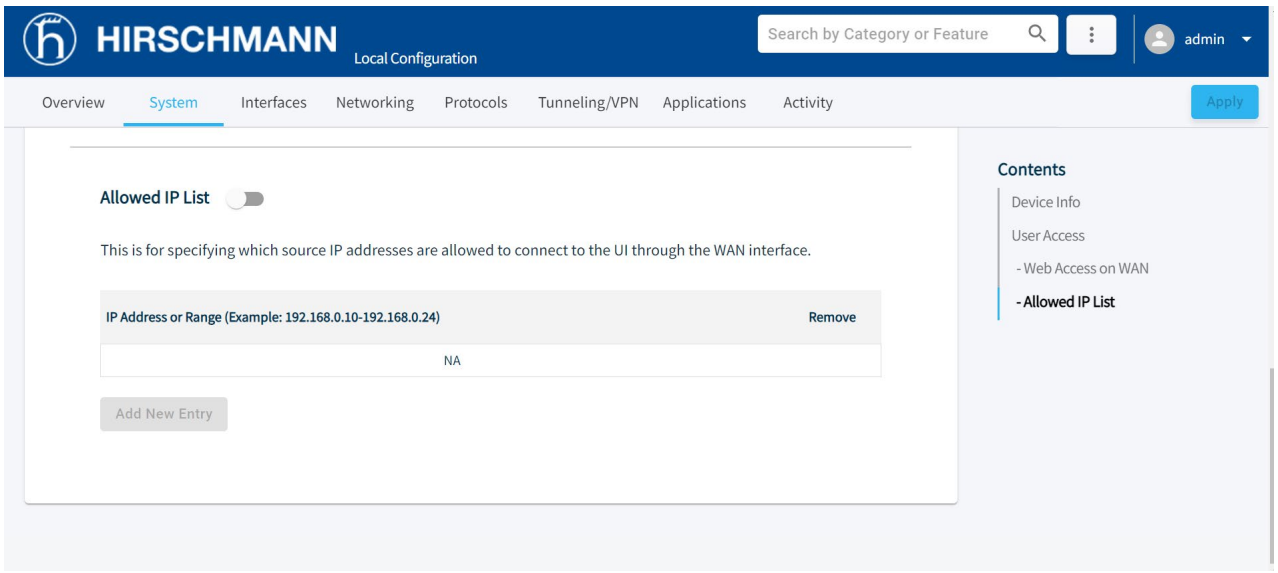
This feature allows or blocks webpage access on the WAN.

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

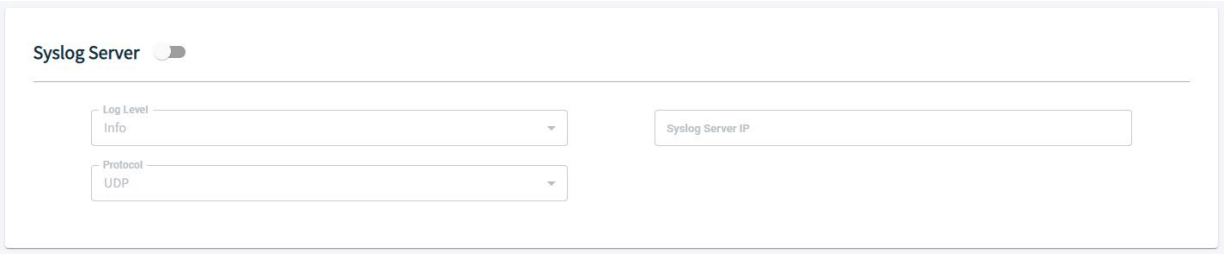
To specify which source IP addresses are allowed to connect to the webpage through the WAN interface, toggle the **ALLOWED IP LIST** button. Then enter the source IP addresses.



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

Note: Please ensure the configuration file “/etc/rsyslog.conf“ on the remote server is formatted for log print as shown below:

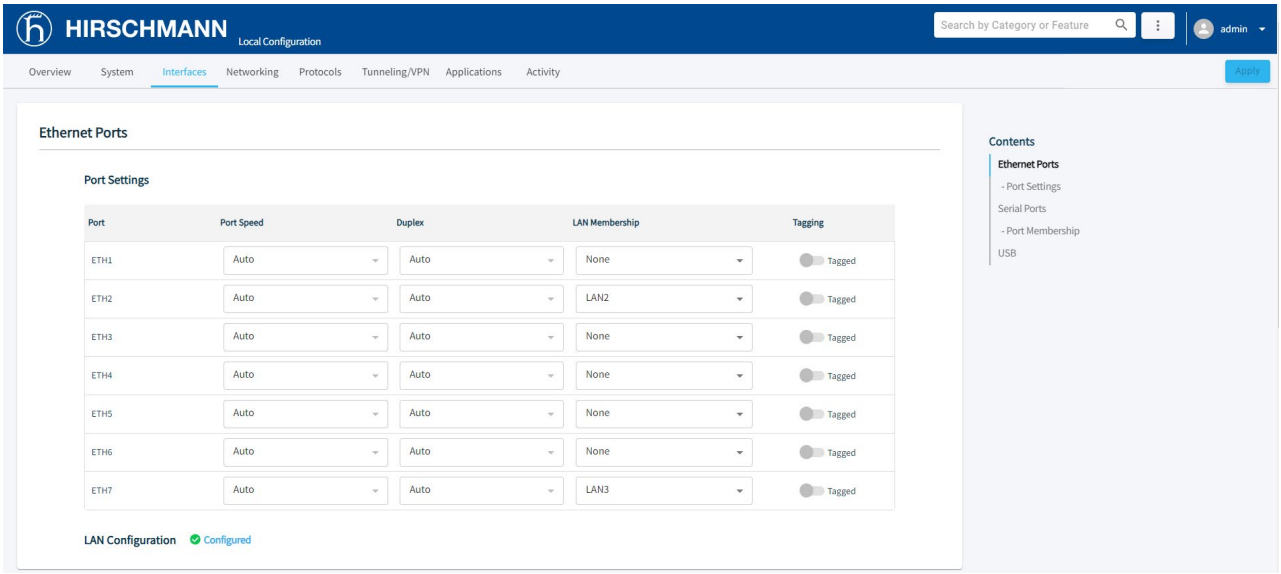
```
$template customFormat,"%TIMESTAMP% %HOSTNAME% [%syslogpriority-text%] %syslogtag% %msg:::sp-if-no-1st-sp%%msg:::drop-last-lf%
\n"
```

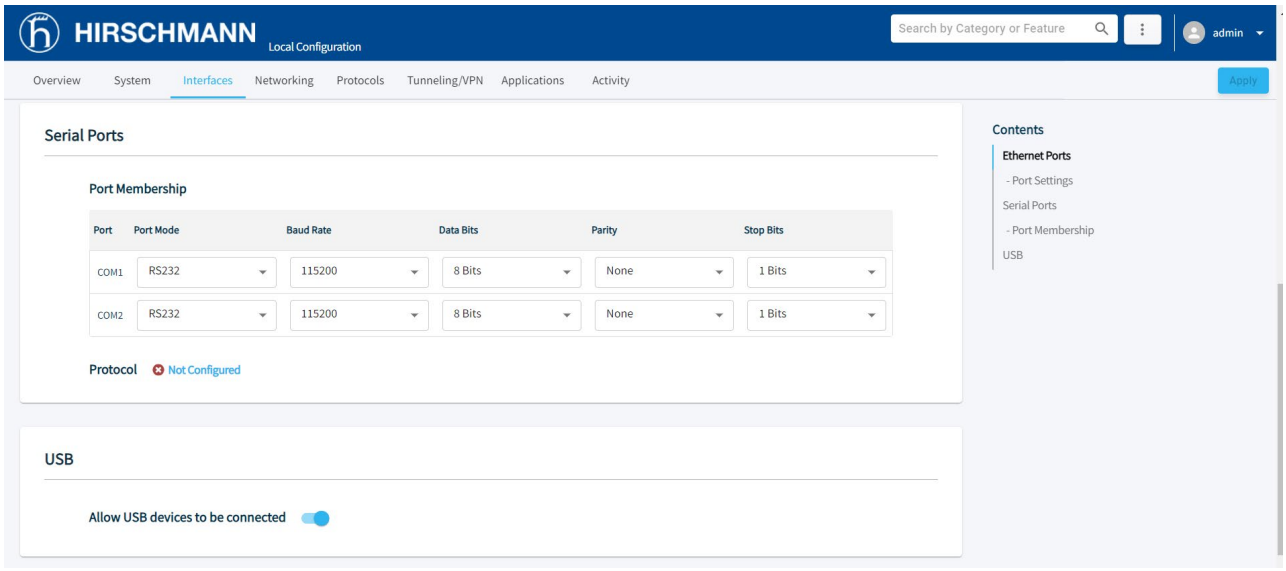
$template customeFormat, “%TIMESTAMP% %HOSTNAME% [%syslogpriority-text%] %syslogtag% %msg:::sp-if-no-1st-sp%%msg:::drop-last-lf% \n”

5.2 Interfaces Tab

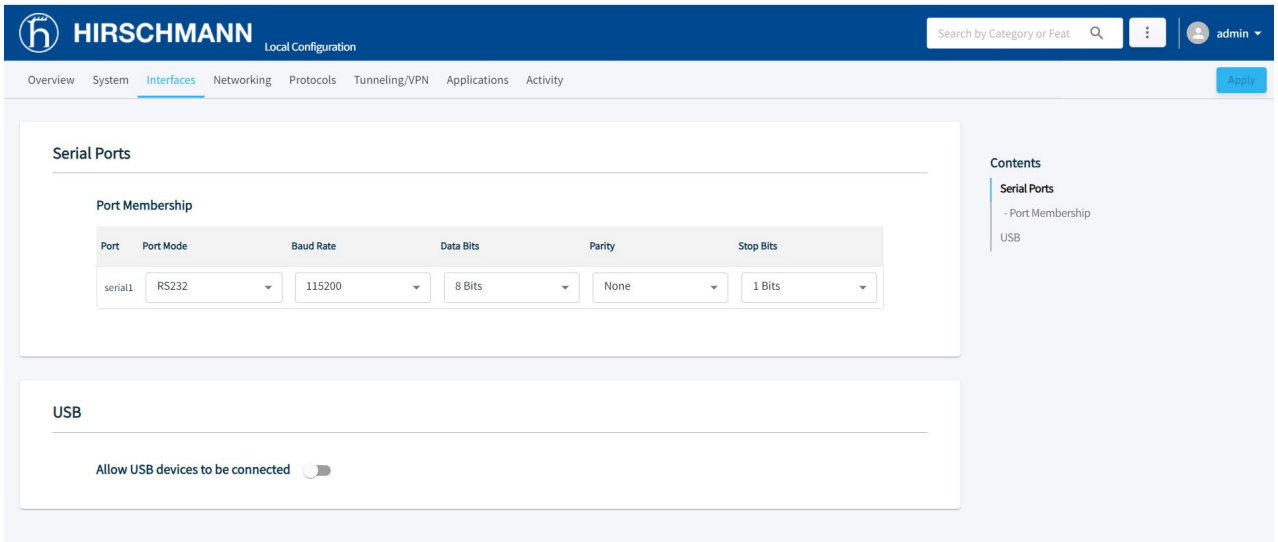
The *Interfaces* tab is used to configure the *Serial Ports* and *USB* on the OpEdge.

a. OpEdge-8D




HIRSCHMANN
Local Configuration
Search by Category or Feature
admin
Overview
System
Interfaces
Networking
Protocols
Tunneling/VPN
Applications
Activity
Apply
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 Feat
admin
Overview
System
Interfaces
Networking
Protocols
Tunneling/VPN
Applications
Activity
Apply
Serial Ports
Port Membership
Port
Port Mode
Baud Rate
Data Bits
Parity
Stop Bits
serial1
RS232
115200
8 Bits
None
1 Bits
USB
Allow USB devices to be connected
Contents
Serial Ports
- Port Membership
USB

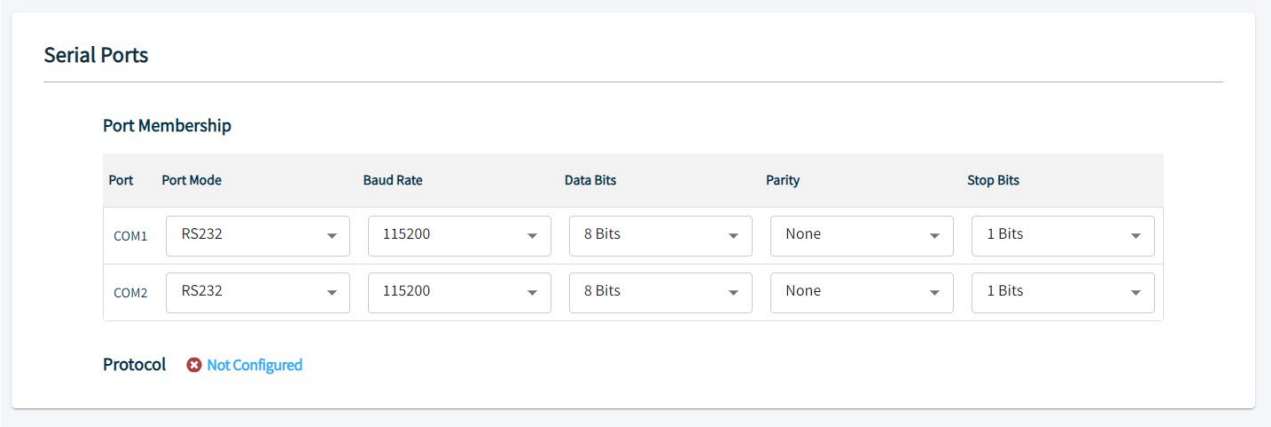
5.2.1 Serial Ports

The OpEdge-8D device has 2 and 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:

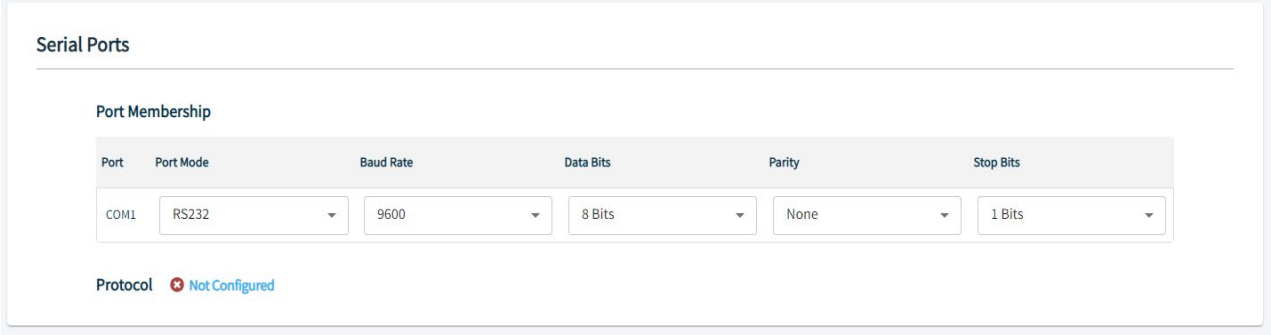
1 Click the *Interfaces* tab on the OpEdge configuration webpage.

2 Under *Port Membership*, provide the following details:

a. OpEdge-8D



b. OpEdge-4D



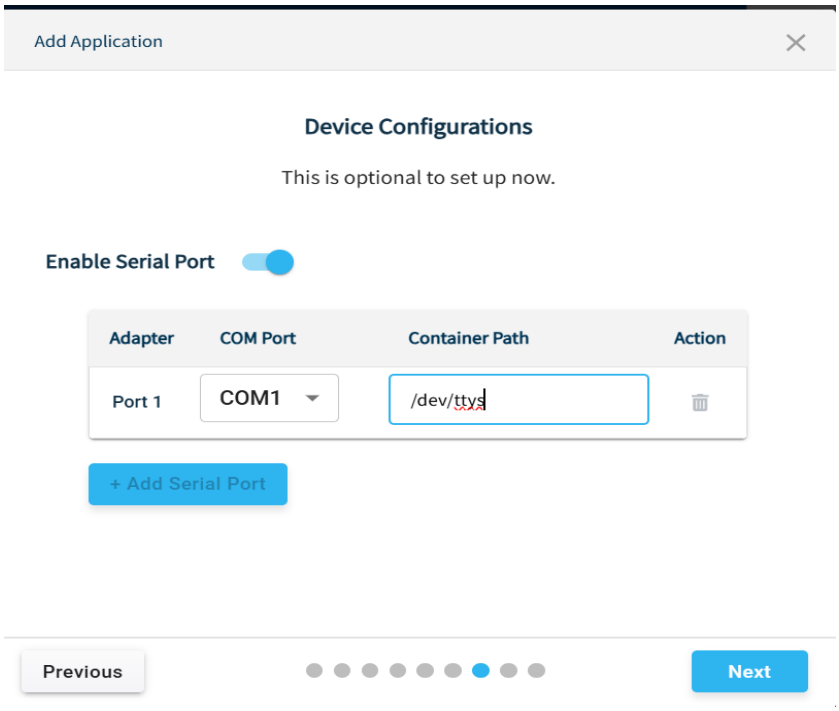
Parameter	Description
Port Mode	OpEdge provides one mode i.e. **RS232**
Baud Rate	Selects the speed at which data is transmitted between devices or over a communication channel. Measured in bits per second (bps).
Data Bits	Selects the size of the information chunk being sent or received.
Parity	Selects 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.

5.2.2 Serial Port with Containers (OpEdge-4D)

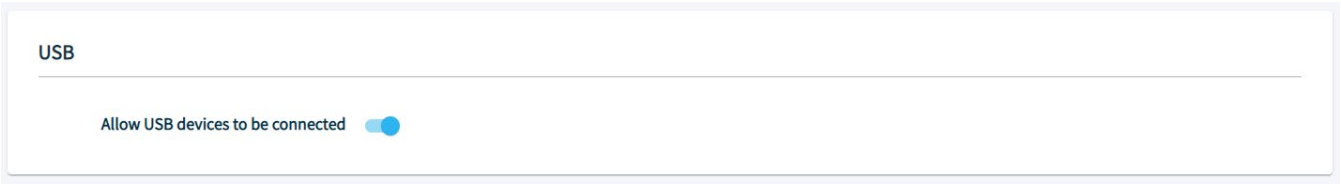
User can access a serial port from within a Docker container by utilizing a technique called "serial port forwarding". This involves forwarding the serial port connection from the host machine to the Docker container.

While creating a container, user needs to specify the serial port device and map it to the container.



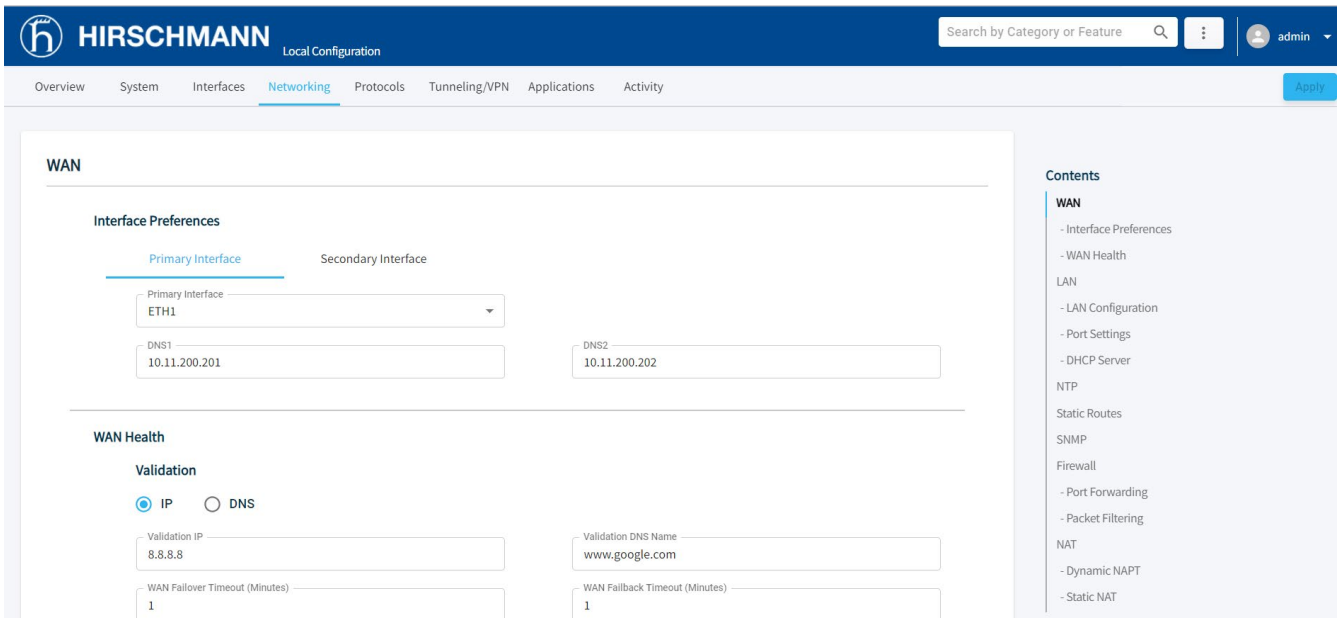
5.2.3 USB

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



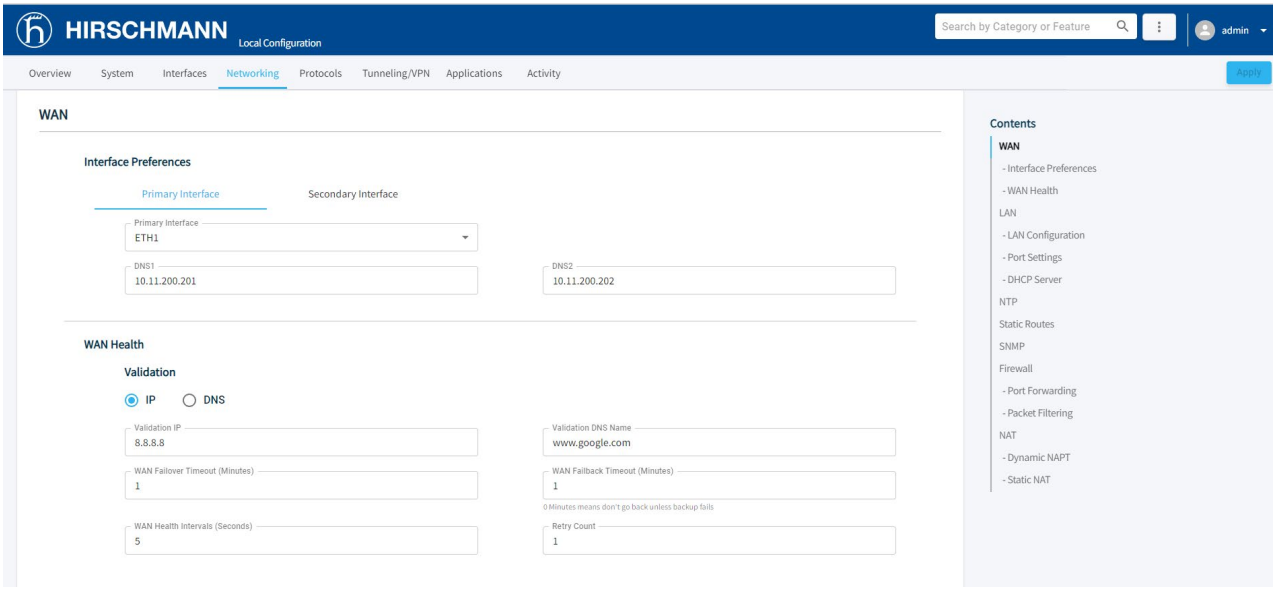
5.3 Networking Tab

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



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 1 of the 7 (4 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) **Note:** The ETH**x** port must be assigned to a specific LAN configuration. More information is detailed in the *LAN Configuration* section 5.3.2.
DNS1 and DNS2	DNS IP's assigned by the user.

5.3.1.2 WAN Health

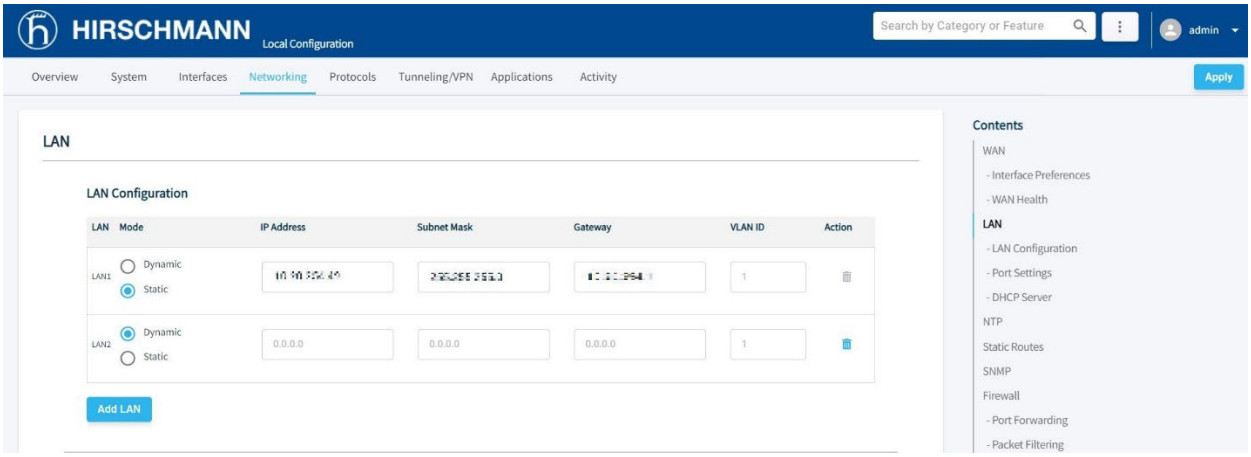
Parameter	Description
Validation IP	The system will ping the IP and confirm if the WAN network is operational.
Validation DNS Name	The system will ping the DNS and confirm if the WAN network is operational.
WAN Failover Timeout	The failed timeout, in minutes, after which primary network will be switched to secondary, or vice versa.
WAN Fallback Timeout	If the primary network failed 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 7 LAN ports for OpEdge-8D and a maximum of 4 LAN ports for OpEdge-4D.

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

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

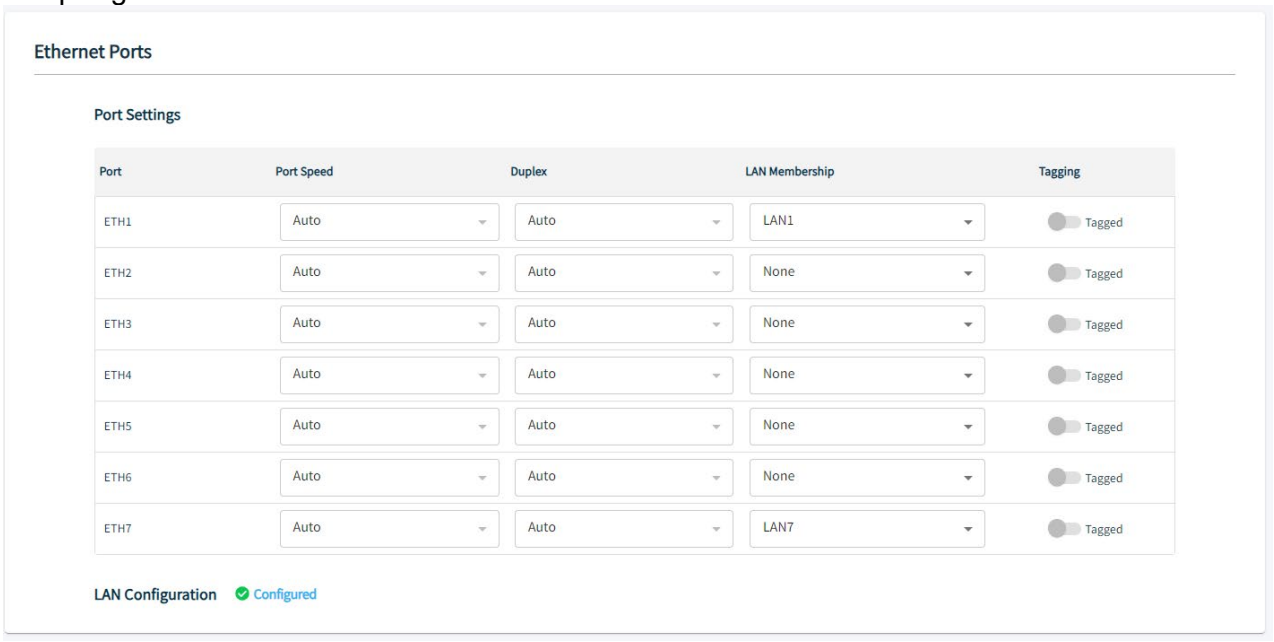
Parameter	Description
IP Address	Static IP Address for the port.
Subnet Mask	Subnet mask of the IP Address.
Gateway	Default IP Address of the OpEdge.
VLAN ID	VLAN identification number.

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

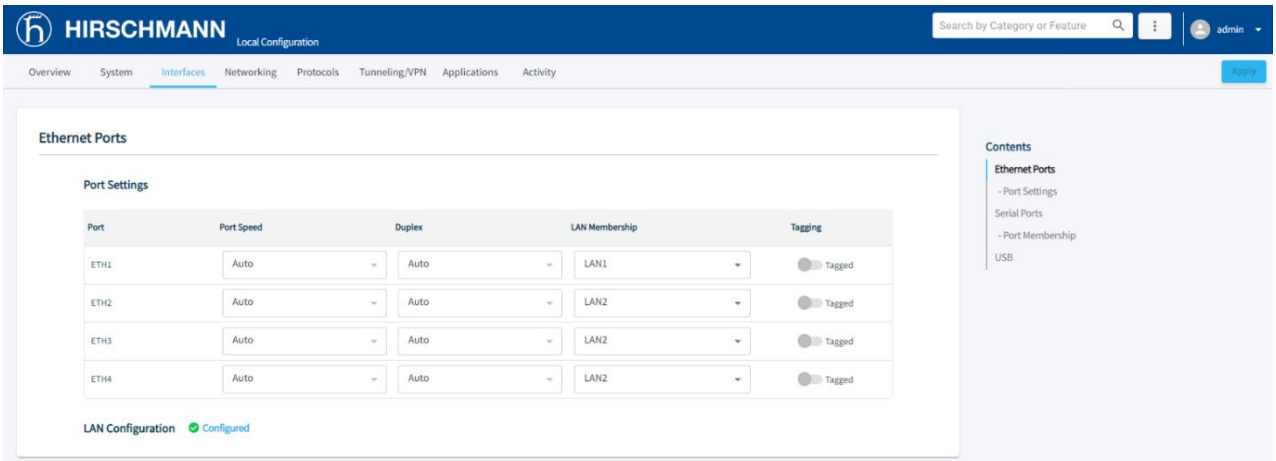
5 To assign a LAN Configuration to a specific OpEdge Ethernet port, click the *Interfaces* tab.

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



b. OpEdge-4D



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

5.3.2.1 Port Settings

The OpEdge configuration webpage allows configuring 7 Ethernet ports for OpEdge-8D and 4 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.

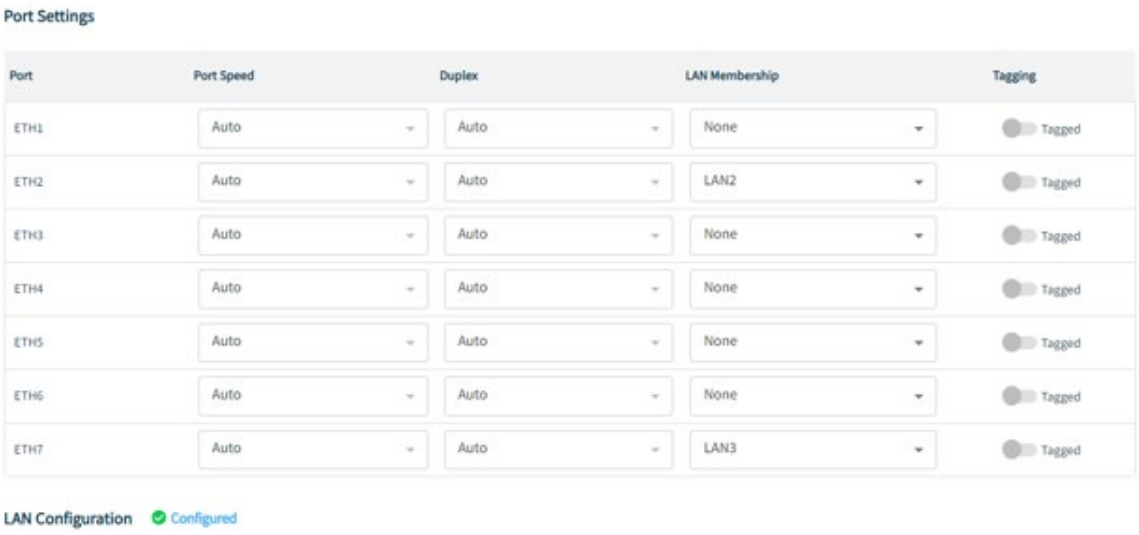
The configuration options for OpEdge Ethernet ports include speed, duplex mode, LAN membership, and tagging.

To configure an Ethernet port on OpEdge:

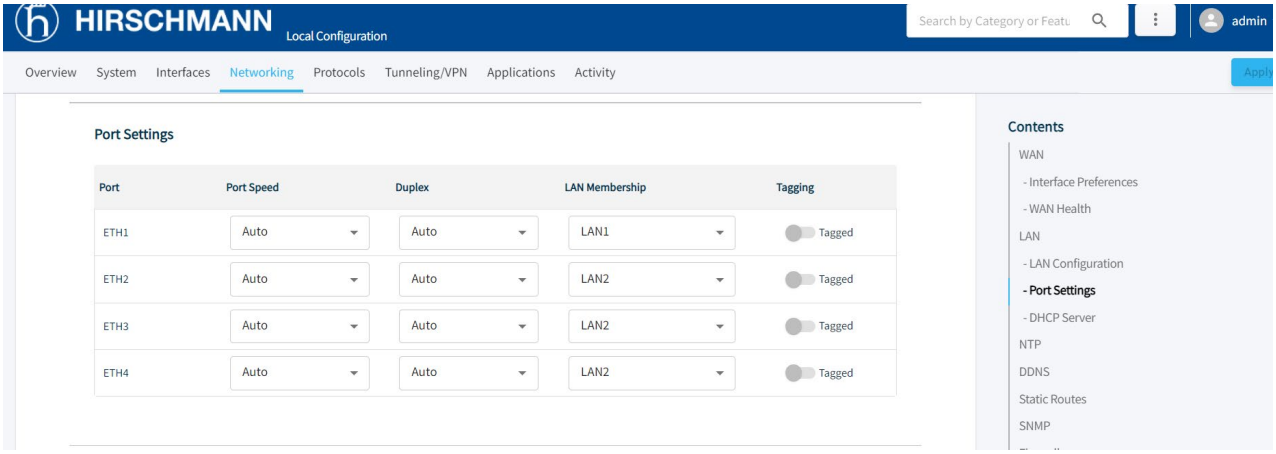
1 Click the *Interfaces* tab on the OpEdge configuration webpage.

2 Under *Port Settings*, provide the following details:

a. OpEdge-8D



b. OpEdge-4D



Note: Ethernet Ports section for OpEdge-4D has been mo

Parameter	Description
Port	OpEdge-8D: Ethernet port number: **ETH1** to **ETH7** OpEdge-4D: Ethernet port number: **ETH1** to **ETH4**
LAN Membership	LAN configuration to be assigned to the port. More information is detailed in the *LAN Configuration* in section 5.3.2.

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

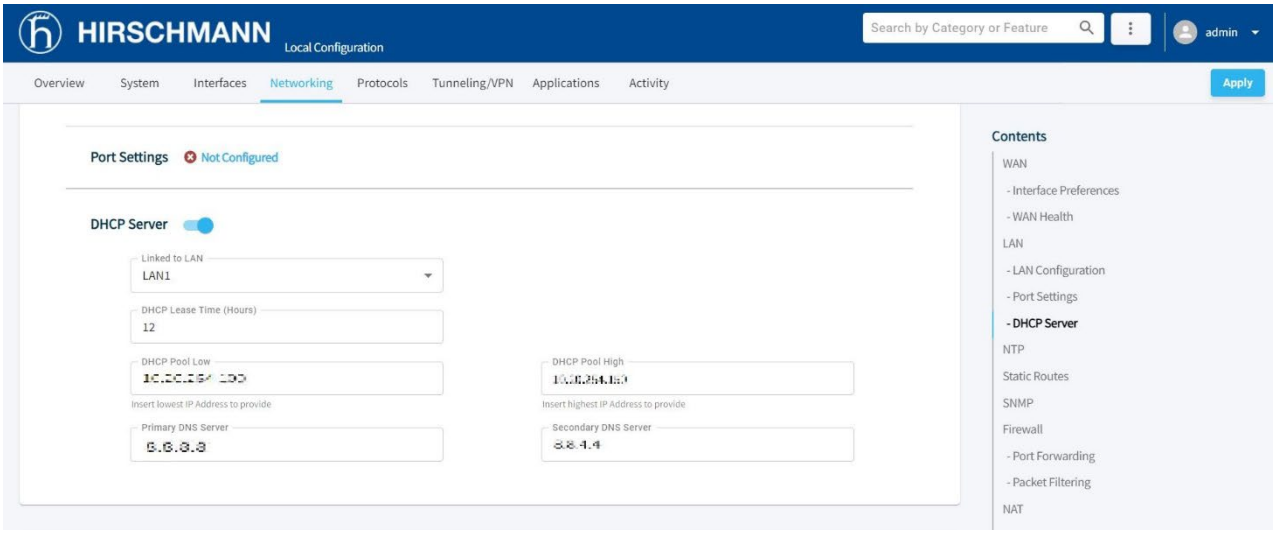
5.3.2.2 DHCP Server

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:

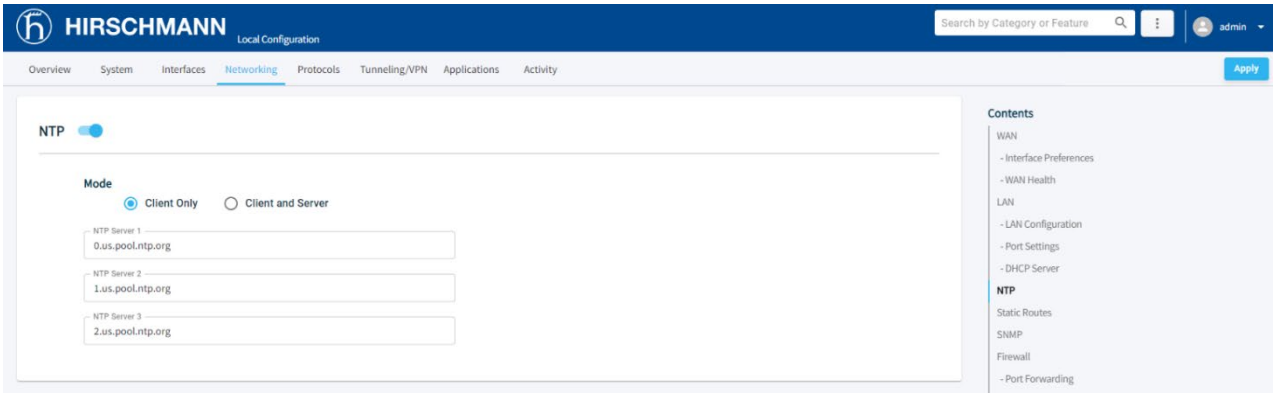
Parameter	Description
Linked to LAN	LAN port to be used to connect the end device to the network.
DHCP Lease Time	Lease period in hours (Range: 0 to 23)
DHCP Pool Low	Start of the range for the pool of IP addresses in the same subnet as the device.
DHCP Pool High	End of the range for the pool of IP addresses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

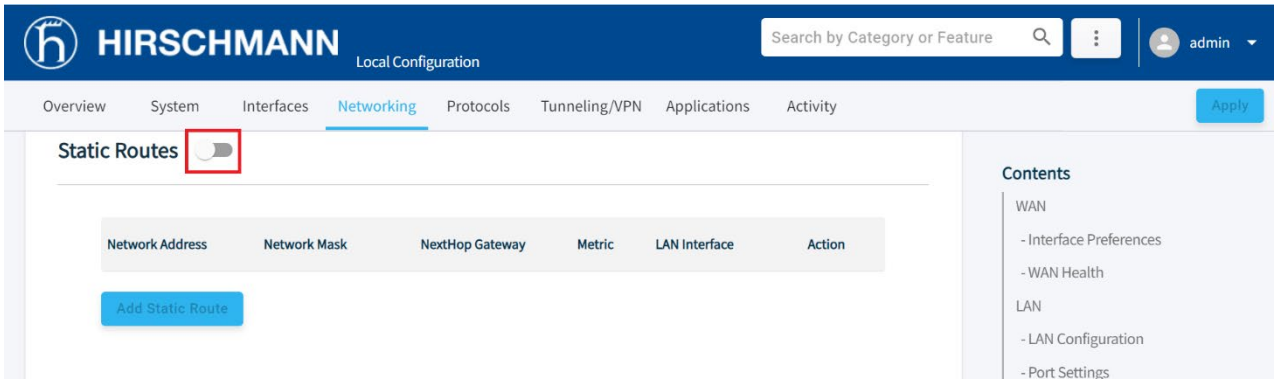


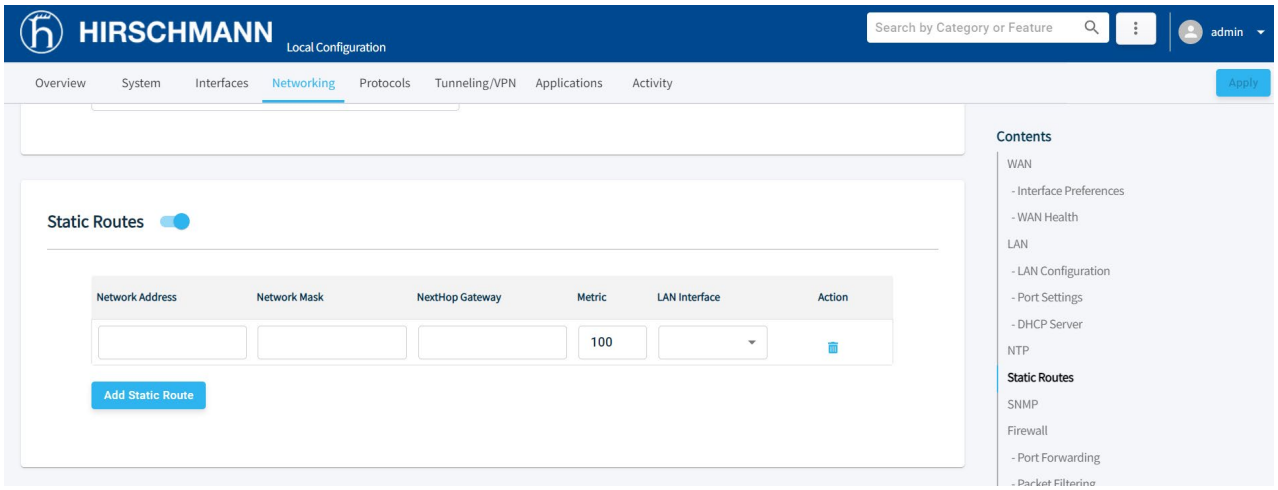
Parameter	Description
Mode	**Client Only** - NTP process will query NTP server and update OpEdge system time. **Client/Server** - NTP process will query NTP server and update OpEdge system time and resolve NTP requests from the LAN clients.
NTP Server 1, 2, 3	Server time updates for the OpEdge. Example: 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.





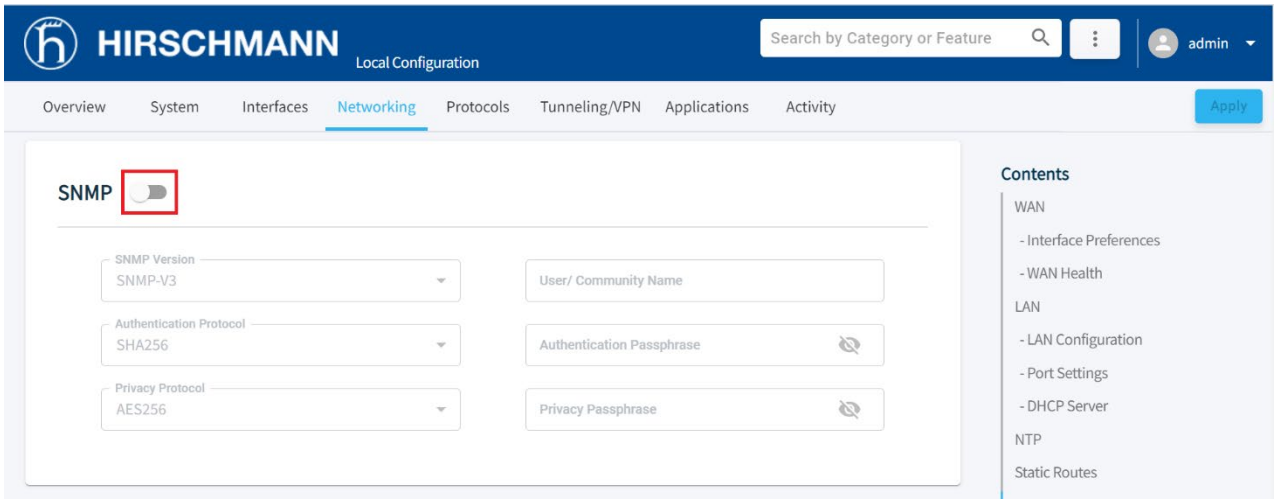
Parameter	Description
Network Address	IP Address of the network.
Network Mask	Subnet mask of the network.
NextHop Gateway	Nexthop gateway address.
Metric	Metric can be any positive 32 bit number. Default is **100**.
LAN Interface	Select from the available LAN interfaces where static route need to be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

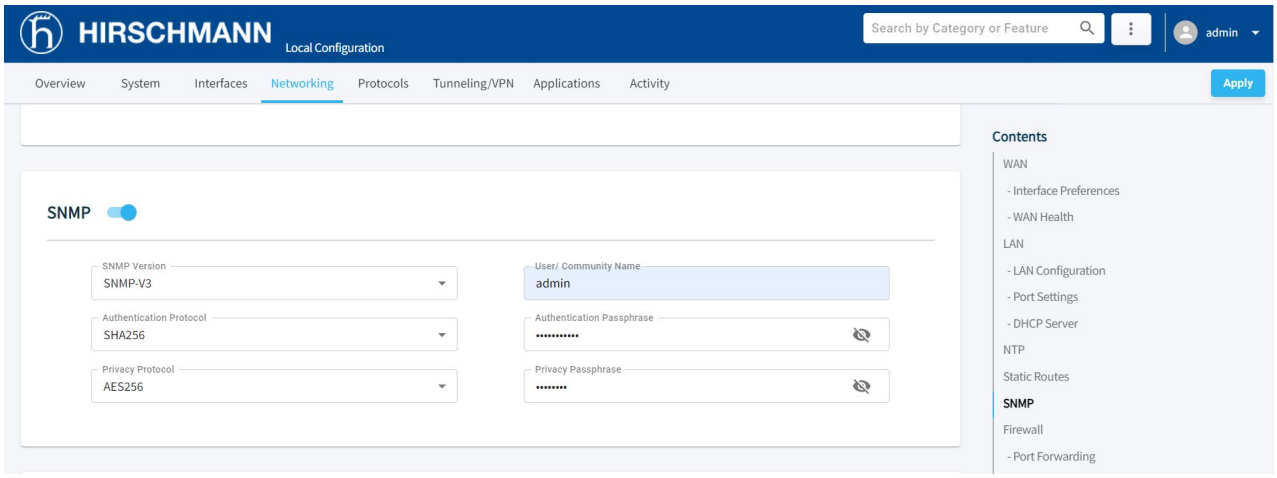
5.3.5 SNMP

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 LLDP

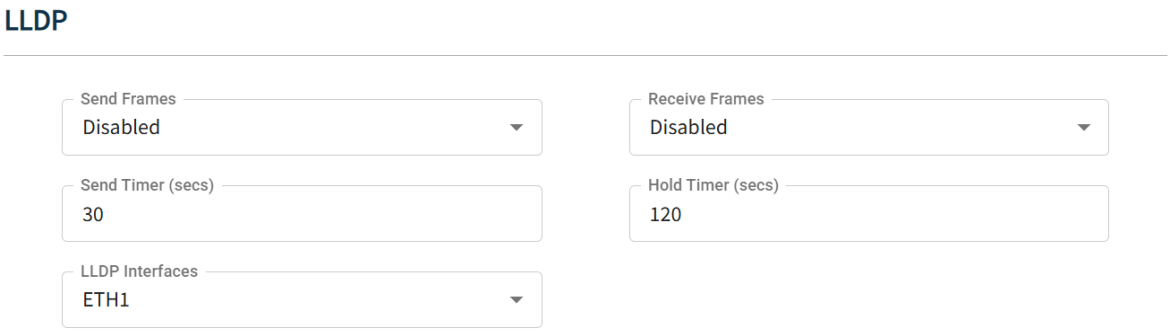
LLDP (Link Layer Discovery Protocol) is a vendor-neutral, layer 2 protocol used to discover and advertise information about neighboring network devices on a local area network (ETH).

LLDP while running on Edge Device, can be used to exchange information about its capabilities, identity, and other relevant details with other network devices. LLDP can provide interoperability with other devices from different vendors.

It can allow network administrators to obtain a better understanding of the devices connected to the network, facilitating network management tasks such as device tracking, inventory management, and troubleshooting.

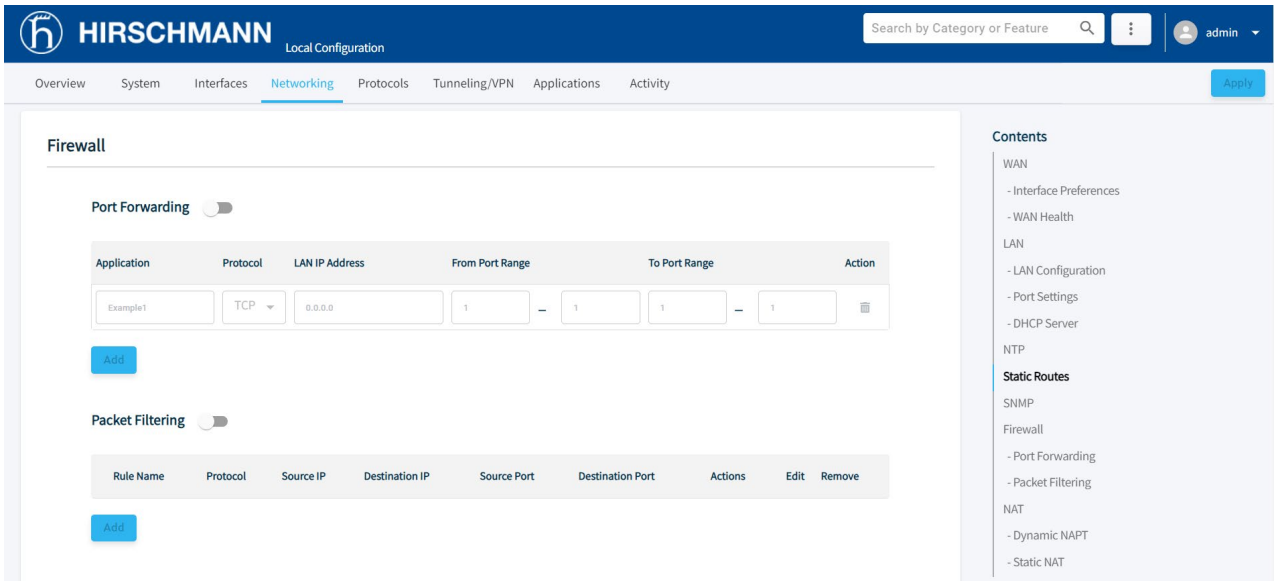
Notable LLDP Features:

- LLDP is Layer 2 discovery protocol. Does not use IP addresses, only use fixed multicast MAC Address 0180.C200.000E for addressing.
- LLDP is defined by Industry standard - IEEE 802.1AB
- LLDP is useful in multi-vendor IT environment, for examples when cisco, Juniper, Palo Alto firewalls etc are deployed
- LLDP messages (frames) are not forwarded by the devices, they can only be received and processed by the device.



5.3.7 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.

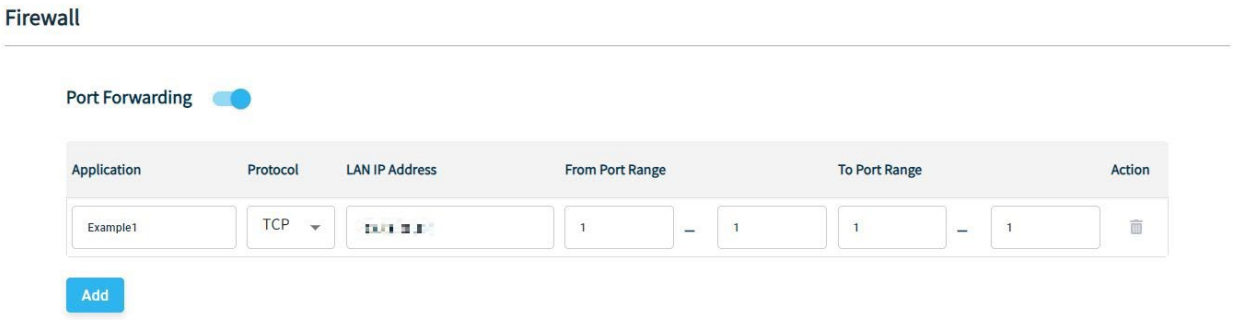


5.3.6.1 Port Forwarding

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.



3. Enter the following parameters:

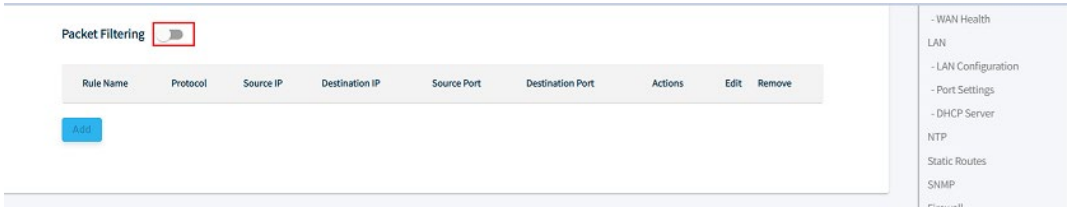
Parameter	Description
Application	Name of the mapping.
Protocol	Select the protocol for packet delivery: *TCP*, *UDP* or *Both*
LAN IP Address	IP address of the destination LAN device. **Note:** When configuring the end device, make sure: The IP Address of the end device must match the value entered in the *End Device Address* 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.

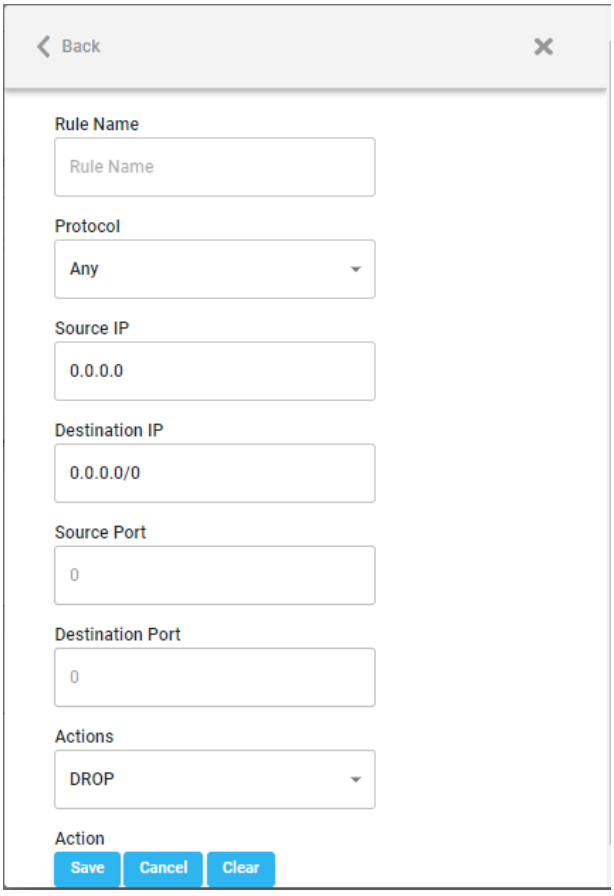
5.3.6.2 Packet Filtering

Packet Filtering provides 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:

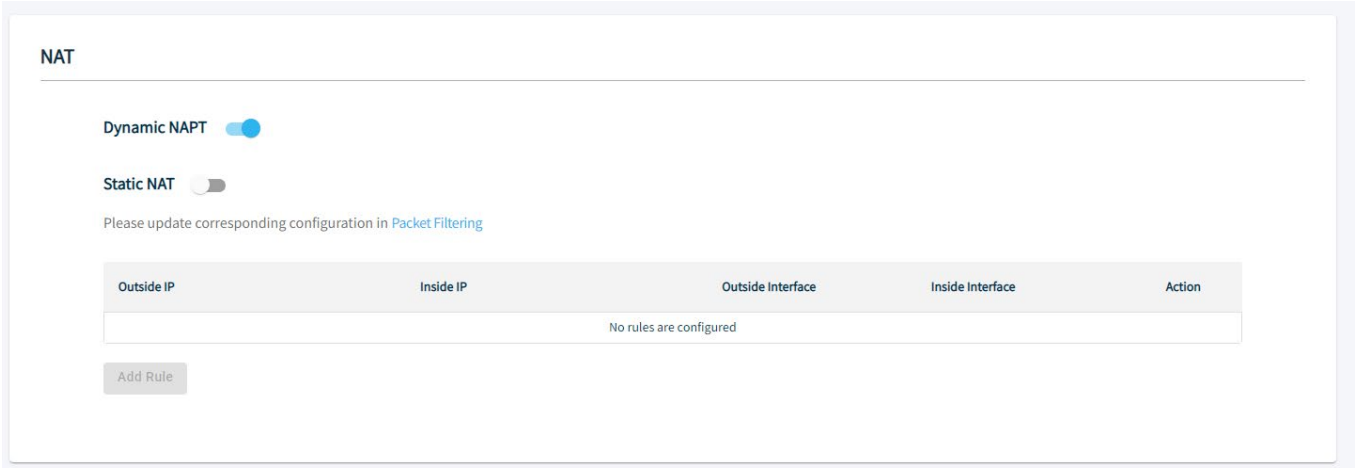
Parameter	Description
Rule Name	Name of rule. Allows up to 40 alphanumeric and special characters “_”, “-”
Protocol	Protocol used for packet filtering.
Source IP	IP of the source device.
Destination IP	IP address of destination device.
Source Port	Port used for source device.

Destination Port	Port used for destination device.
Actions	The action to **Accept** the packet for forwarding or **Drop** 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.

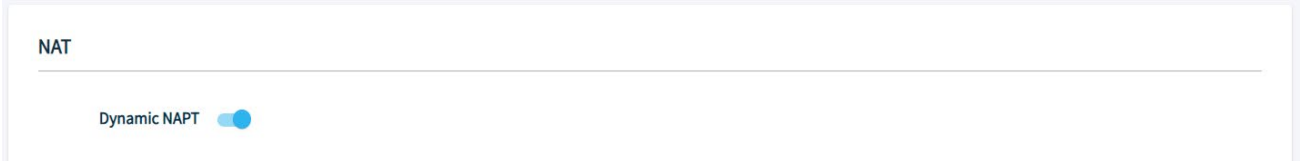
5.3.8 NAT

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



5.3.8.1 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.



5.3.8.2 Static NAT

Static Network Address Translation (NAT) is a 1-to-1 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.

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.

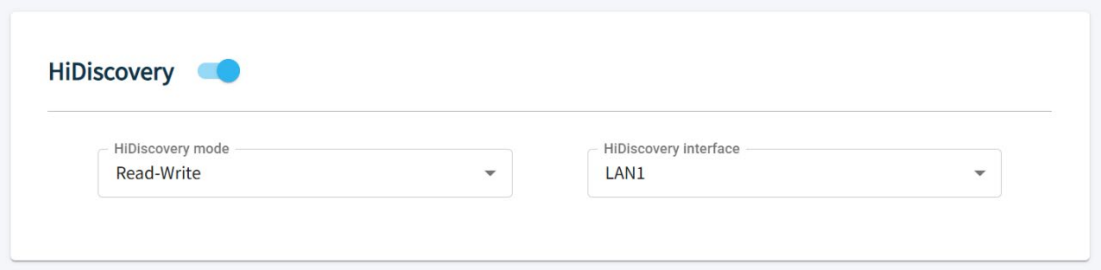
5.3.9 HiDiscovery

HiDiscovery is a discovery protocol developed for Hirschmann products. The protocol has 2 ends i.e. PC side application and device side application. It follows client server architecture. The PC side application acts as a client and device side application acts as a server.

More information on HiDiscovery features and configuration can be found in the User Manual "Network Management System Industrial HiVision". The manual is available for download here.

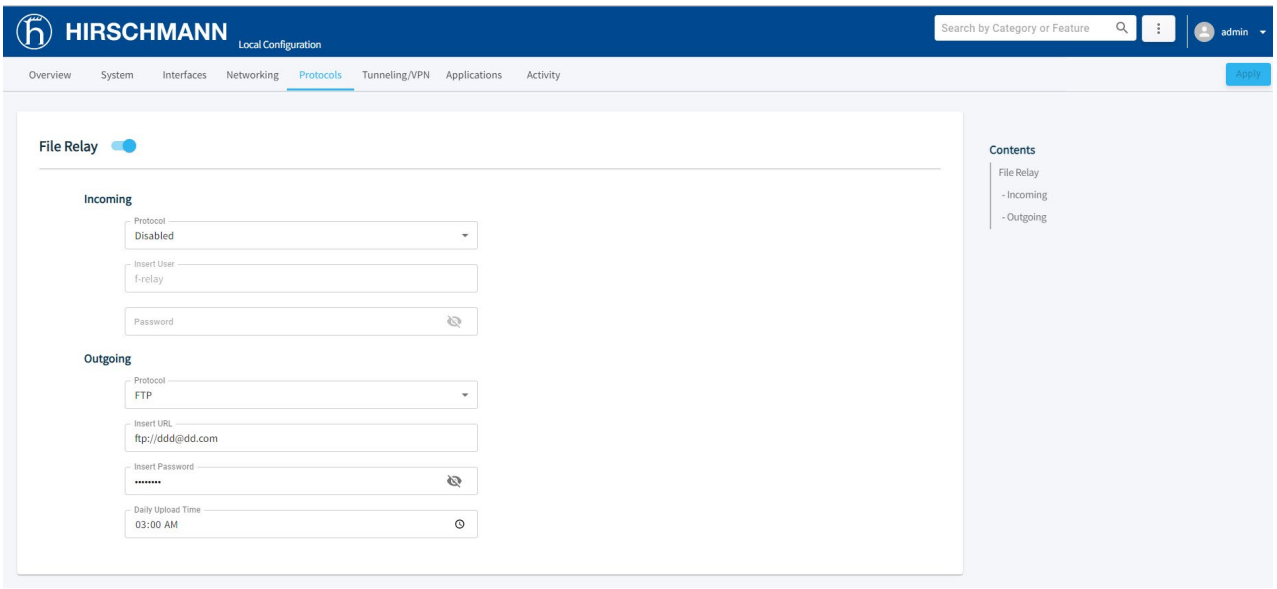
Key Features:

- Discovery and listing of all the supported devices present in the network
- Retrieval of latest configuration and operational parameters of an already discovered device listed by prior discovery operation
- Setting of basic device parameters of an already discovered device



5.4 Protocols Tab

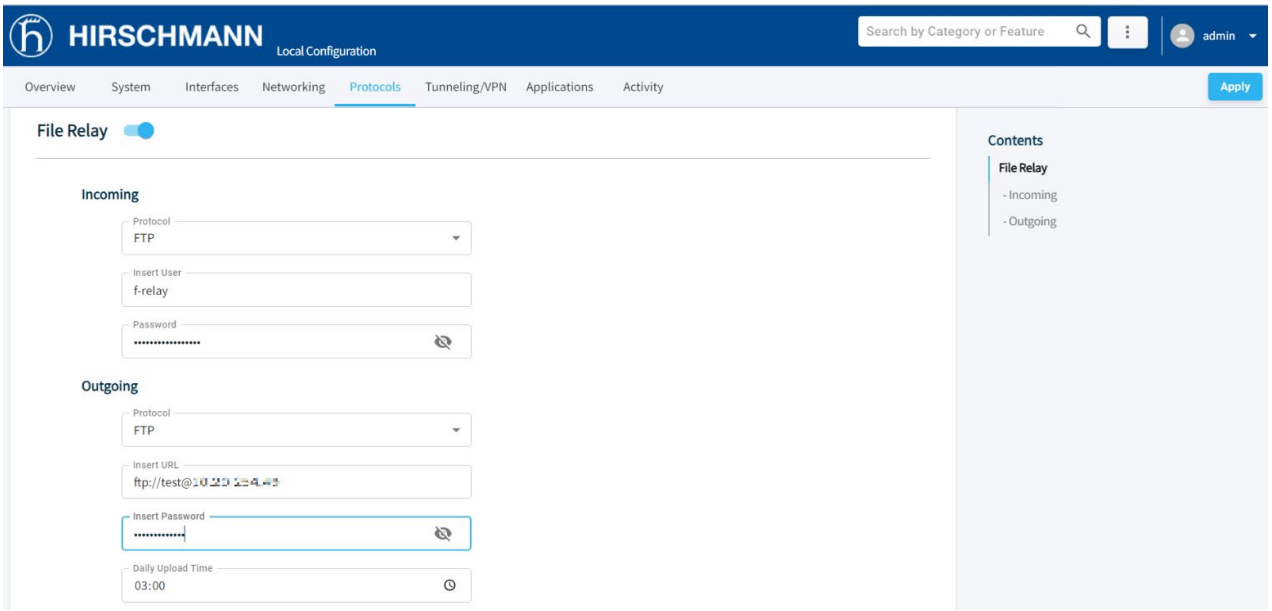
The *Protocols* tab is used to transfer files from the device to Belden Horizon.



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 2 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 a 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
Incoming	
Protocol	FTP (File Transfer Protocol) SFTP (Secure File Transfer Protocol)
User	The user name is for uploading files through FTP to the Internal storage. The default value is **f-relay**.
Password	Password for FTP access. The password must have at least 8 characters, contain at least 1 uppercase letter, 1 lowercase letter, and 1 special character.
Outgoing	
Protocol	Protocol of the server used as final destination for the File Relay. □ Supported protocols for upload are FTP/SFTP/Belden Horizon
URL	URL of the server used as final destination for the File Relay. • Supported protocols for upload are FTP/SFTP/Belden Horizon • For FTP the format is specified in the field: ftp://user@host/ • For SFTP the format is: sftp://user@host:port/
Password	Password used to upload to the remote server. You can view the configured value by pressing the "eye" button. • Password is used only for FTP
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. Public Key from SFTP Server should be exported as **OpenSSH** 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. The SSH-Key pair generation takes place the first time it is requested. Subsequent requests return the same public key. SSH keys will be removed upon gateway factory reset. • Used only for SFTP
Daily Upload Time	The upload time, shown in the Local UI is UTC – similar with the time on the *Overview* page. Default time value is 03:00.

3 Click **APPLY** when complete.

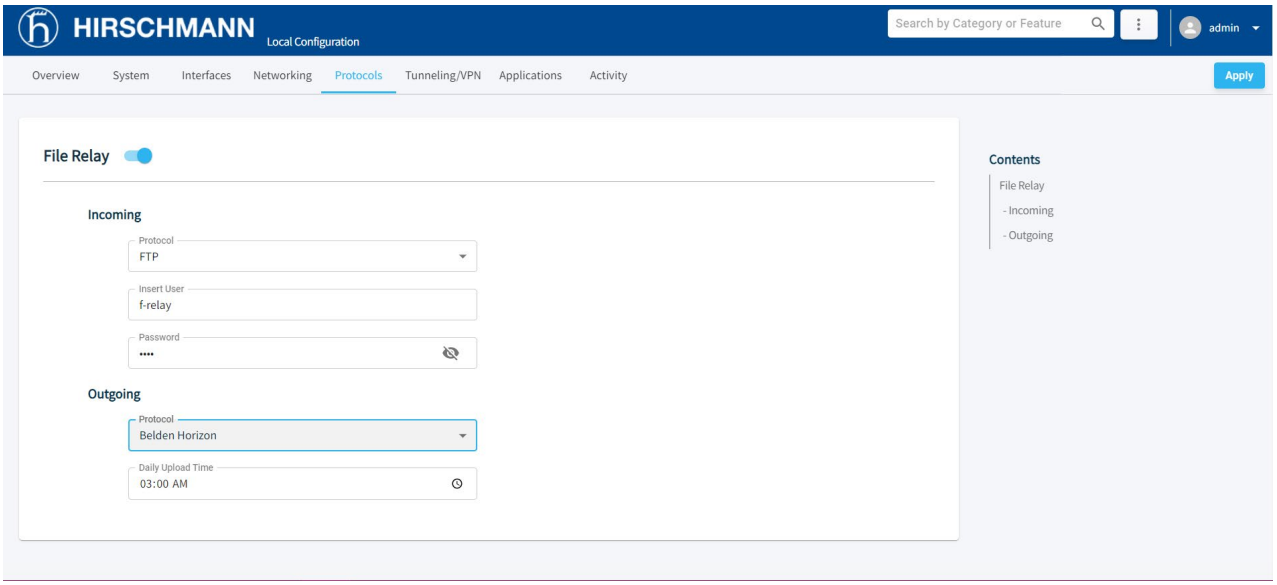
5.4.2 File Transfer to Belden Horizon

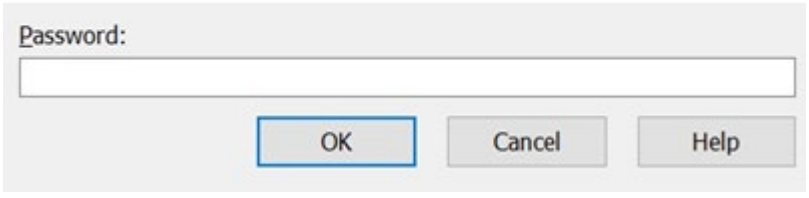
Users can transfer files from OpEdge to Belden Horizon. Below is the example for Belden Horizon file transfer.

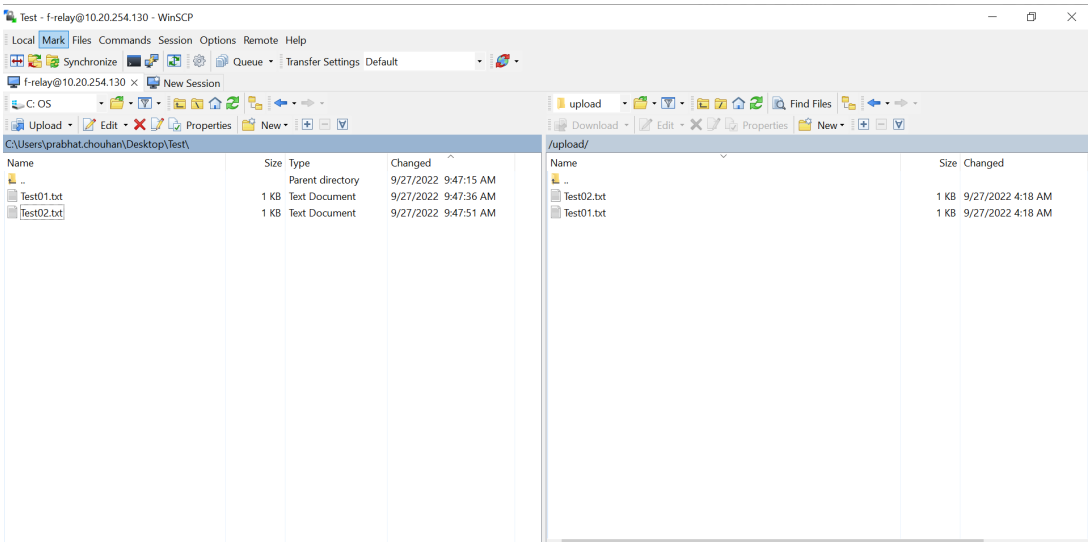
1 Generate the Activation key from the overview page and add gateway on Belden Horizon. Detailed steps are given in section 3.1 for activating gateway on Belden Horizon.

c. From the WinSCP Client, open a SFTP/FTP session to OpEdge and transfer 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.

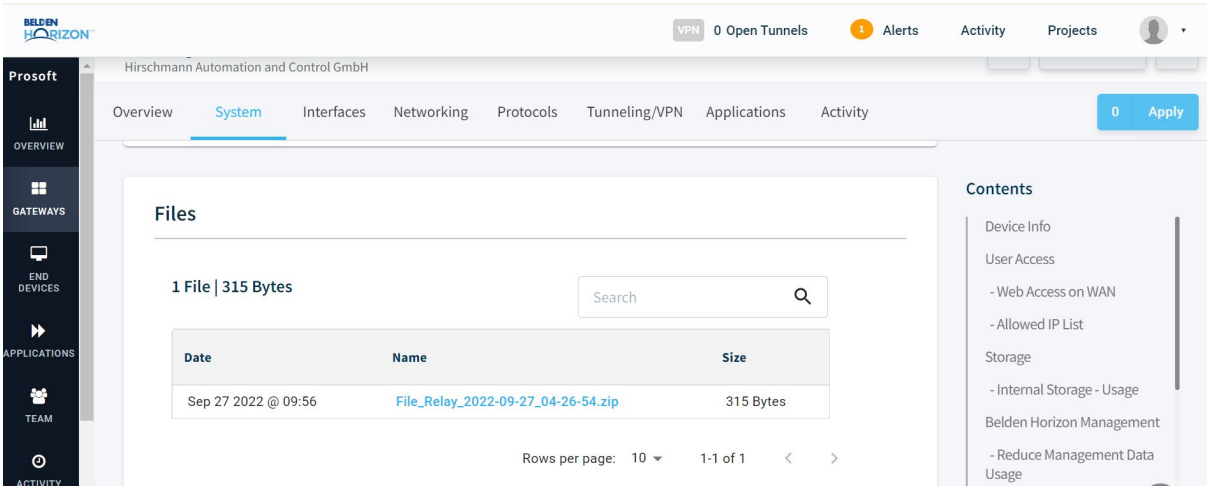


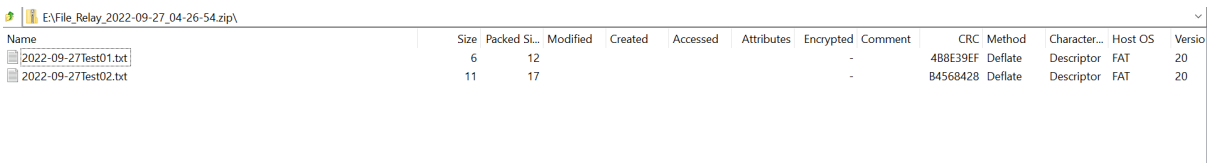




2 After uploading the files to /upload folder, the user can find the transferred file on Belden Horizon. It may take up to 10 minutes from the time given for the file transfer as the file transfer cycle is triggered once in 10 minutes.

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.

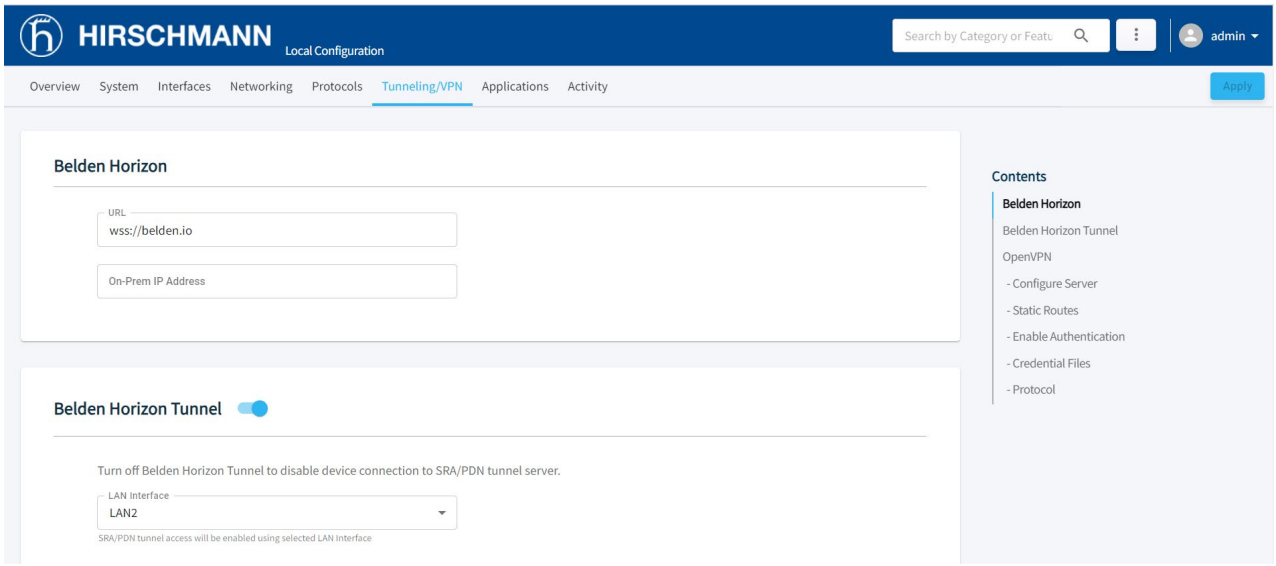




Note: Belden Horizon files can be transferred only once in 24 hours.

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 user to turn off Belden Horizon to block tunneling access from Belden Horizon users.

5.5.2 Belden Horizon On-Premises

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.

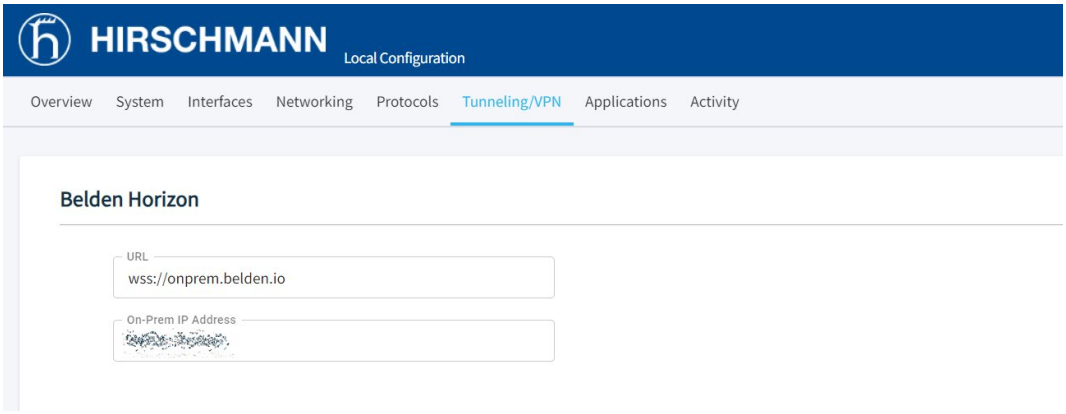
Enhanced connectivity has been introduced to link the Gateway with the Belden Horizon On-Premises server. User can configure his own local server to connect with OpEdge. The following functionalities are now available:

1. Activation and management of the Gateway.

2. Support for SRA and PDN tunnels.
3. Deployment of container applications.

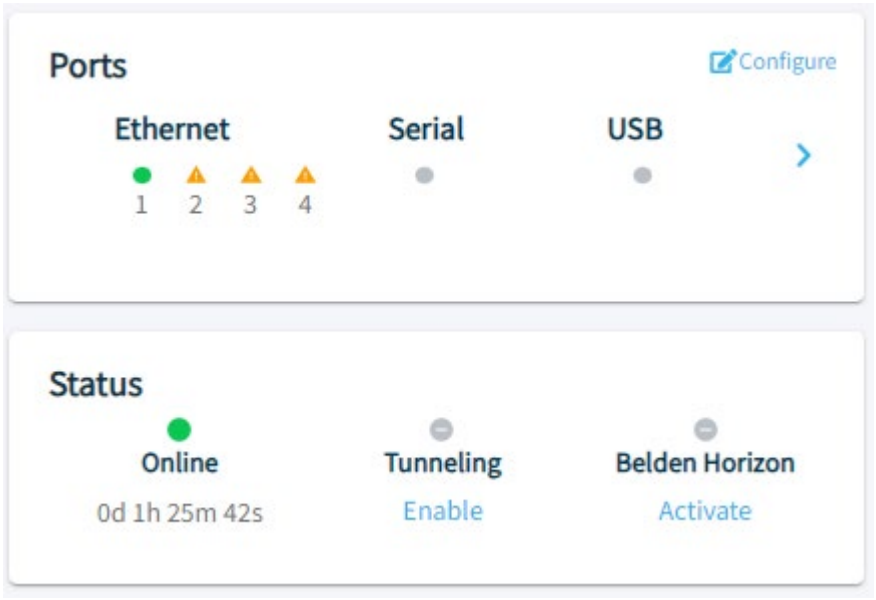
Perform below steps to activate the gateway to Belden Horizon On Premises:

1. Navigate to **Tunneling/VPN** tab.
2. Edit the URL field for Belden Horizon to “”**wss://onprem.belden.io**”.
3. Enter the On-Prem server IP in IP field.



NOTE: By default, the URL will be **wss://belden.io**

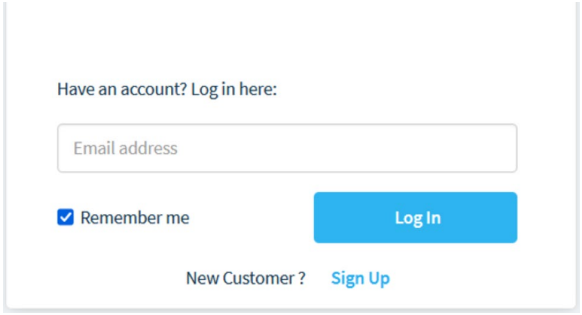
4. Go to Overview page and generate activation key by click on Activate.



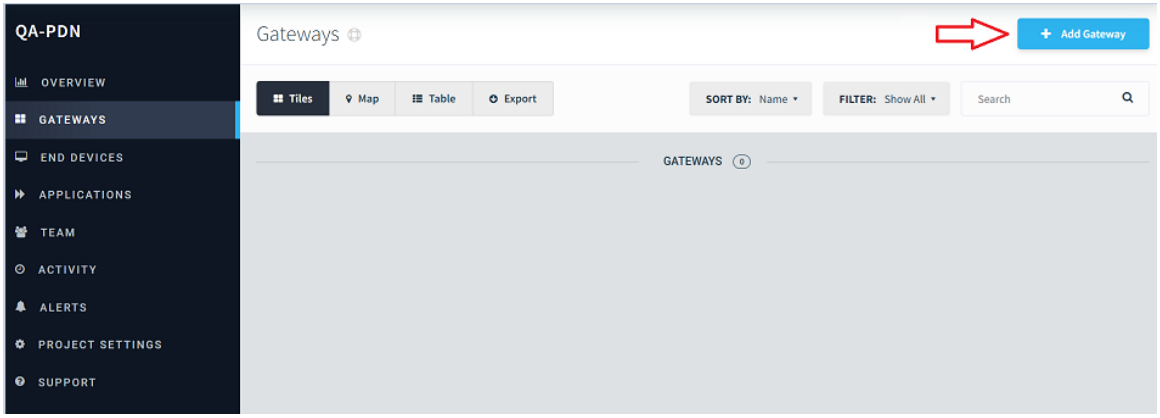
NOTE: If the OpEdge is already connected to a any Belden Horizon account, the link reads “Deactivate”.

NOTE: If the OpEdge is already connected to a any Belden Horizon account, the URL and IP field on Tunnel/VPN tab will be disabled for editing.

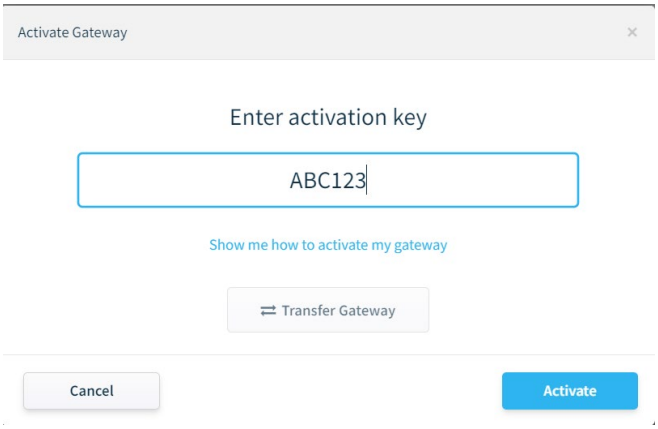
5. The OpEdge securely retrieves an alphanumeric activation key from Belden Horizon On Premises, that is only valid for 3 hours. Record this activation key.
6. Open a new tab in a web browser, enter www.onprem.belden.io in the address bar, and press **ENTER**.
7. On the Belden Horizon Login screen, enter 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.



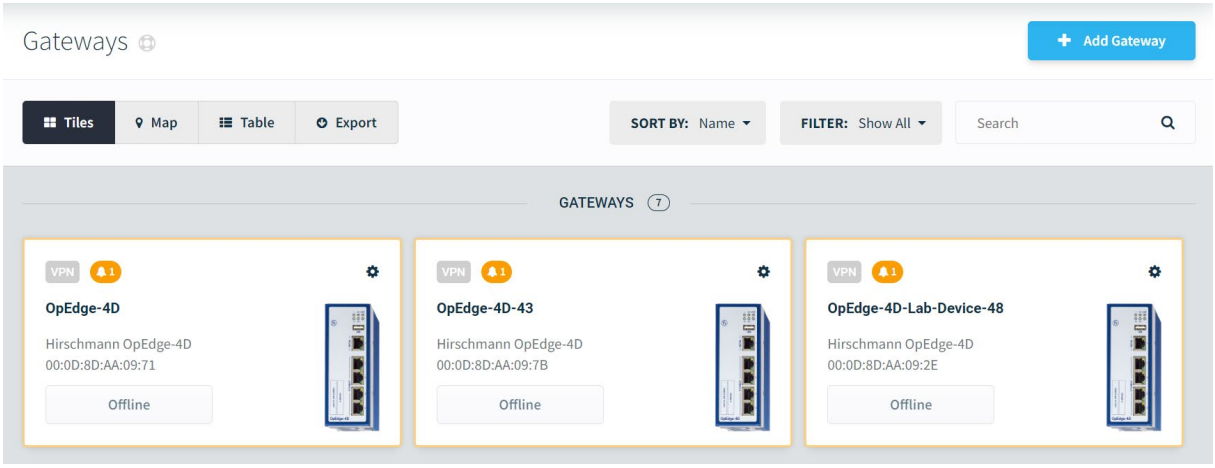
8. Once logged in, follow the prompts to create a project.
9. Click the Gateways tab, and then click **ADD GATEWAY**.



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

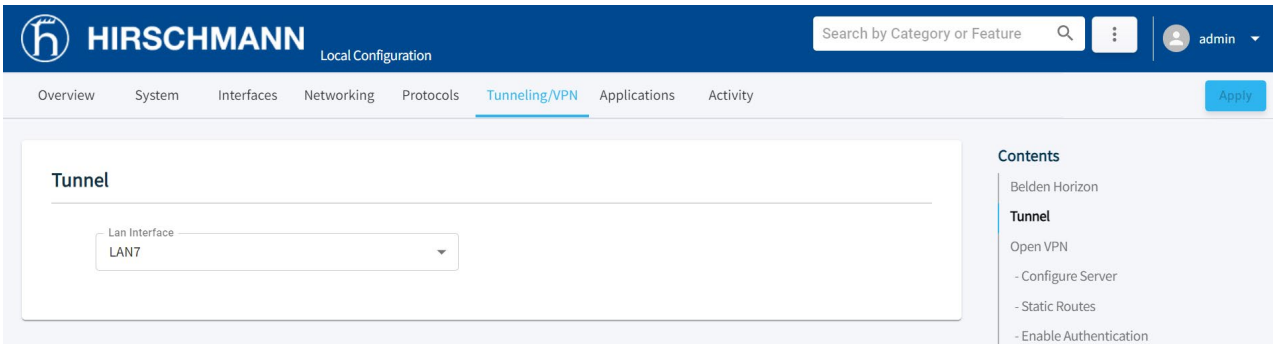


11. Upon successful activation, the OpEdge appears on the *Gateways* tab.



5.5.3 Tunnel

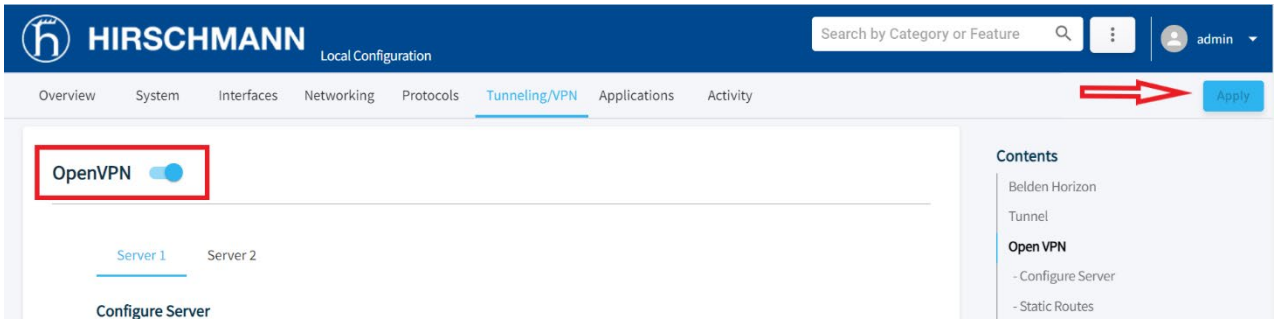
The Tunnel section provides a dropdown to select LAN interfaces to be members of SRA/PDN tunnel Hub. In the **LAN INTERFACE** dropdown list, the currently available LAN interfaces, which are not being used as WAN interfaces will be displayed.



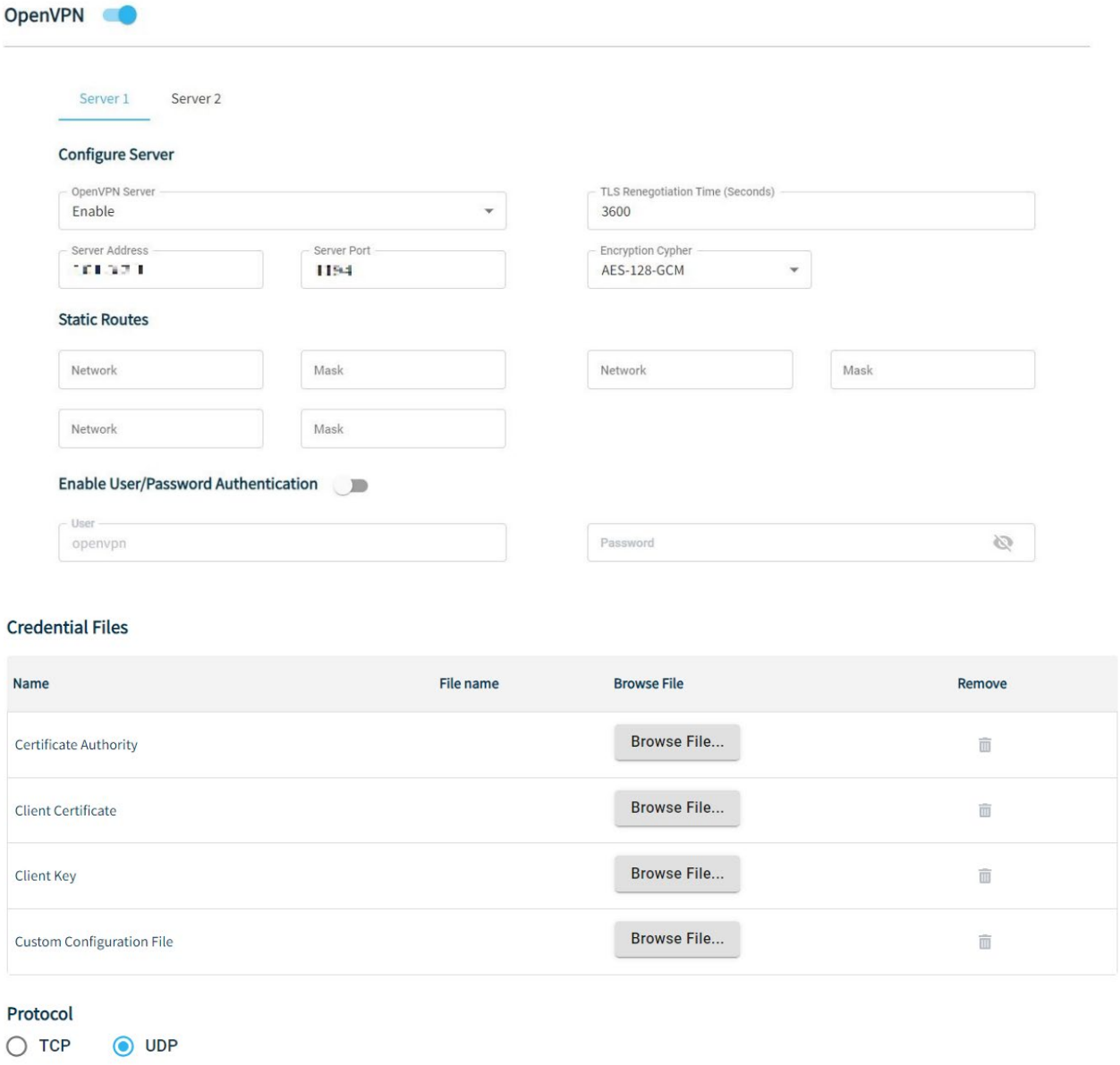
5.5.4 OpenVPN

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 user to turn on/off the feature after clicking on the apply button.



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



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: **3600**.
Server Address	IP address or hostname of the VPN server. This is the IP Address that you are creating the tunnel to. Default value: **3.216.155.83**
Server Port	Service port number on the VPN server. This is the port number for the OpenVPN. Port **1194** 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	Certificate Authority - VPN authentication that issues certificates for VPN, Secure Internal Communication (SIC), and users. Client Certificate - Issued by a certificate authority as proof of identity. Client Key - Password to the corresponding client certificate. Click the Choose File button to locate these files. **Note**: These Credential files are mandatory in order to enable OpenVPN. They can either be uploaded individually or have their content added inline, within the custom configuration file. If by mistake you uploaded them and also have them inline in the configuration file, the files uploaded individually will take precedence.
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

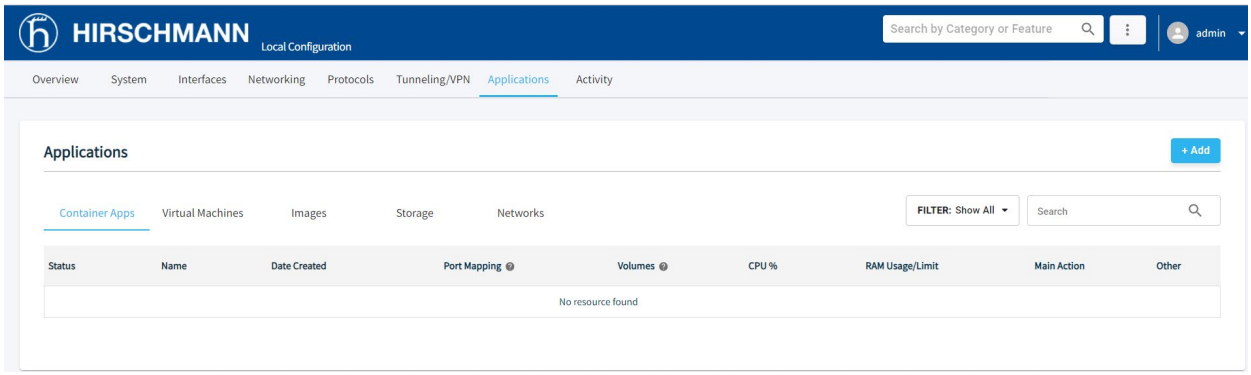
3 Click on **APPLY** button when complete.

5.6 Applications Tab

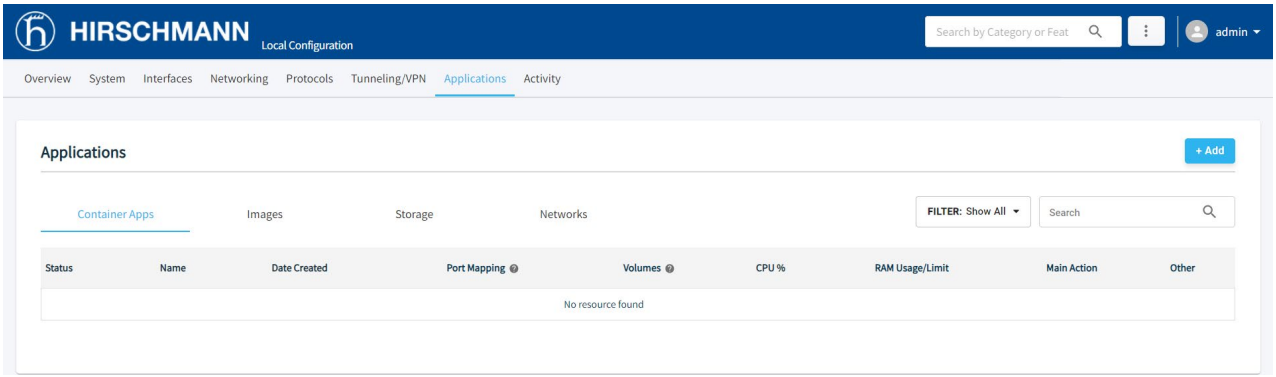
The *Applications* tab allows the user to perform actions on containers and virtual machines. For more information about the *Applications* tab and its features, please see the *Applications* chapter in section 6.

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

a. OpEdge-8D



b. OpEdge-4D:


HIRSCHMANN
Local Configuration
Search by Category or Feat
admin
Overview
System
Interfaces
Networking
Protocols
Tunneling/VPN
Applications
Activity
Applications
+ Add
Container Apps
Images
Storage
Networks
FILTER: Show All
Search
Status
Name
Date Created
Port Mapping
Volumes
CPU %
RAM Usage/Limit
Main Action
Other
No resource found

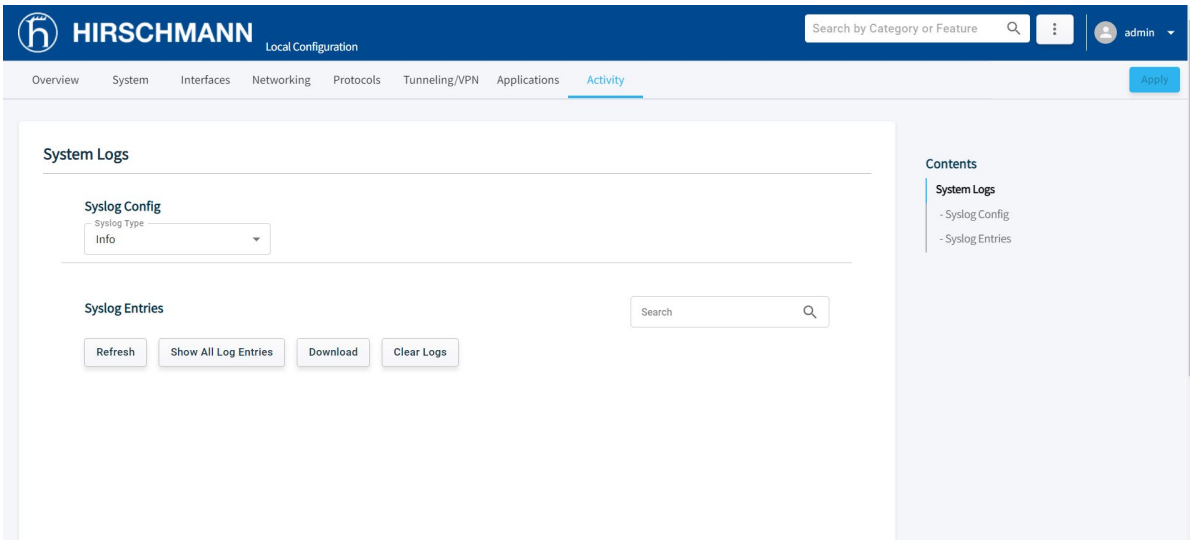
5.7 Activity Tab

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.

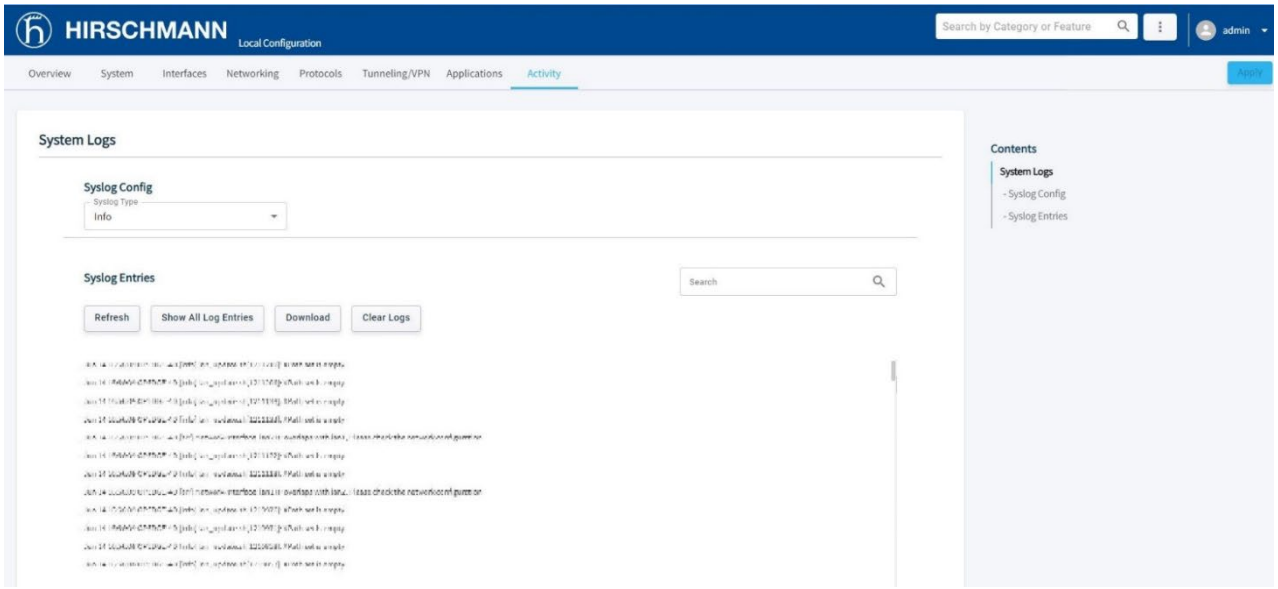
5.7.1.1 System Log Configuration



Parameter		Description
Syslog Config	Syslog Type	**WARNING** - Displays system messages and failures only. **INFO** - Displays all Warning messages, plus additional messages. **DEBUG** - 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:

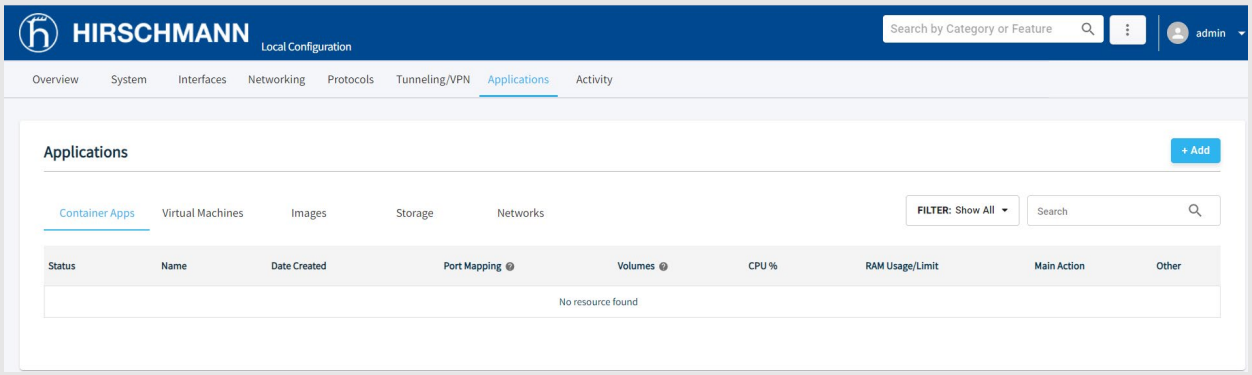


Parameter	Description
Refresh	Refreshes the log results.
Show All Log Entries	Refreshes and displays all log entries.
Download	Transfers the log file from the OpEdge to PC.
Clear Logs	Clears the recorded logs.
Search/Filter bar	Search/filter for a specific log.

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

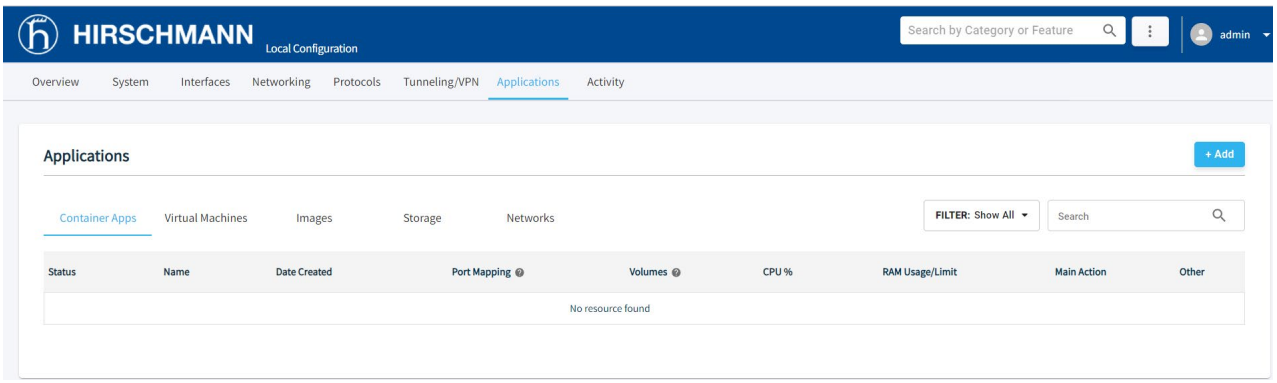
A container is a lightweight virtual computer system with its own CPU, memory, network interface, and storage, created on a physical hardware system (located off- or on-premises).

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.

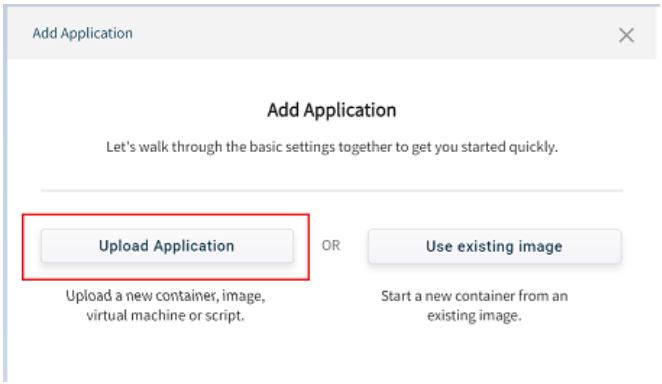


6.1.1 Creating a Container

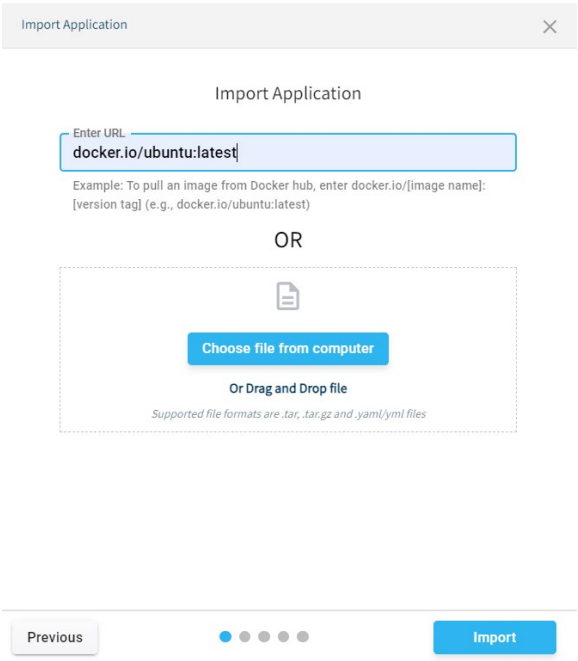
Perform the following steps to create a container:

1. Navigate to the *Container Apps* tab.
2. Click the + Add button to open the *Add Application* wizard.
3. There are 2 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.

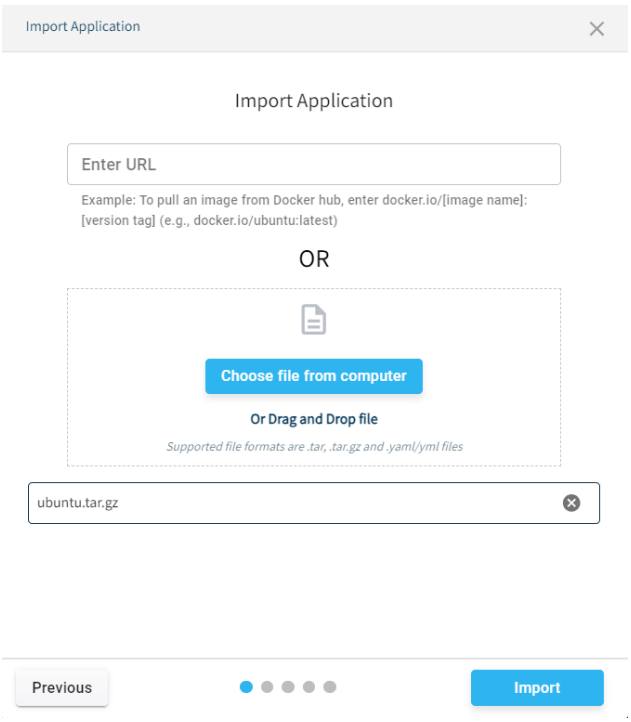
a) Upload Application option.



i. There are 2 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>**

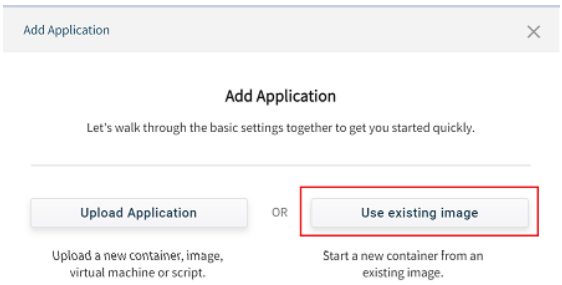


- In the *Import Application* window, click on **CHOOSE FILE FROM COMPUTER** and select the docker image from the local PC.

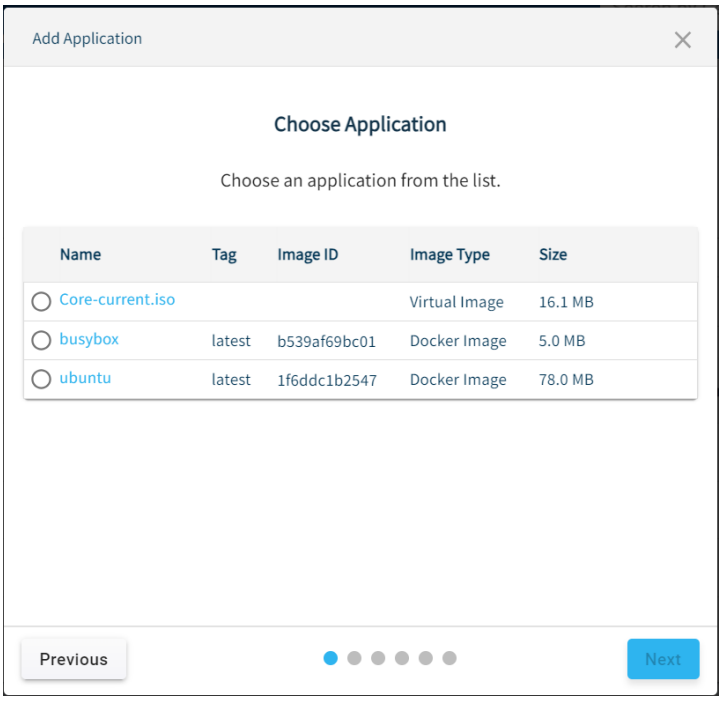


ii. Click **IMPORT** to add image.

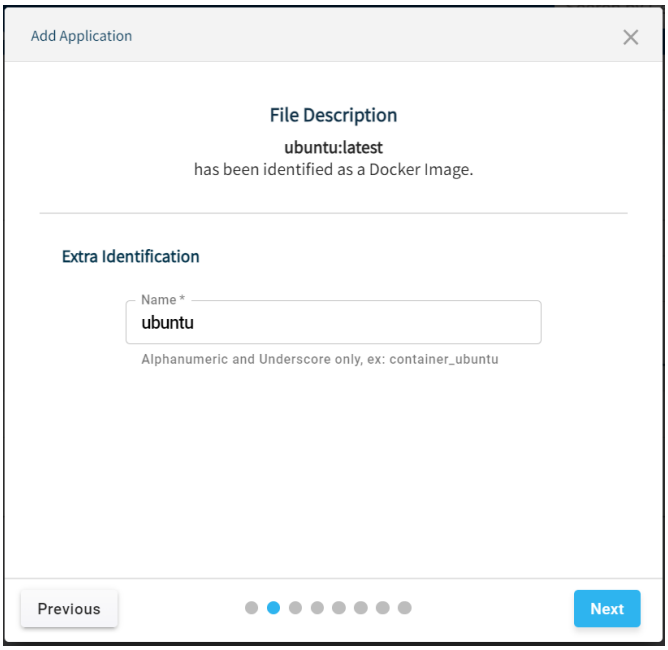
b) Use existing image option.



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
Core-current.iso
Virtual Image
16.1 MB
busybox
latest
b539af69bc01
Docker Image
5.0 MB
ubuntu
latest
1f6ddc1b2547
Docker Image
78.0 MB
Previous
Next

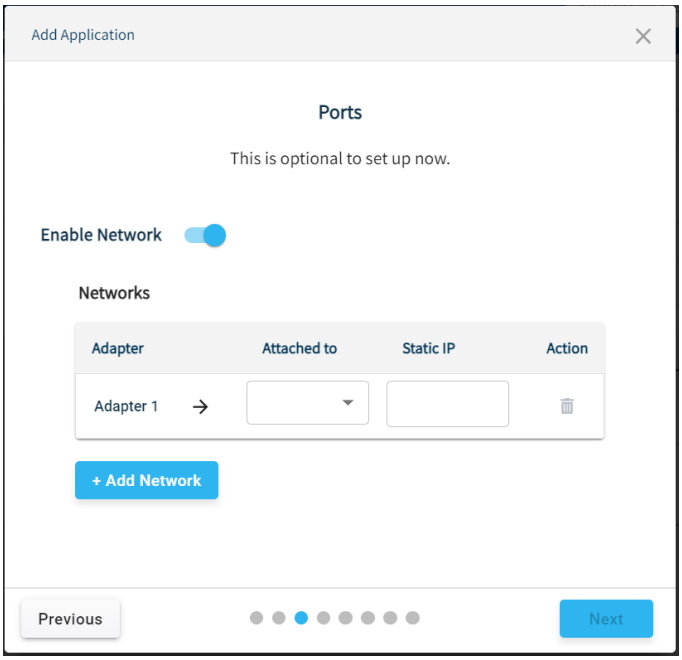
4 In the *Name* field, enter the name of the container.



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 Special character "_" is allowed for container name creation.

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



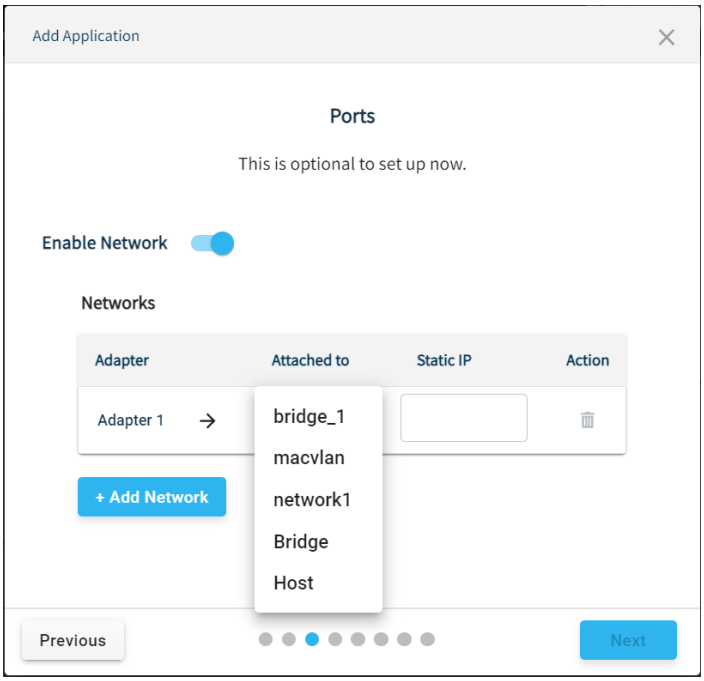
Note: The user can add a maximum of 4 network adapters.

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 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 creation of cutom network can be found under section 6.5 .



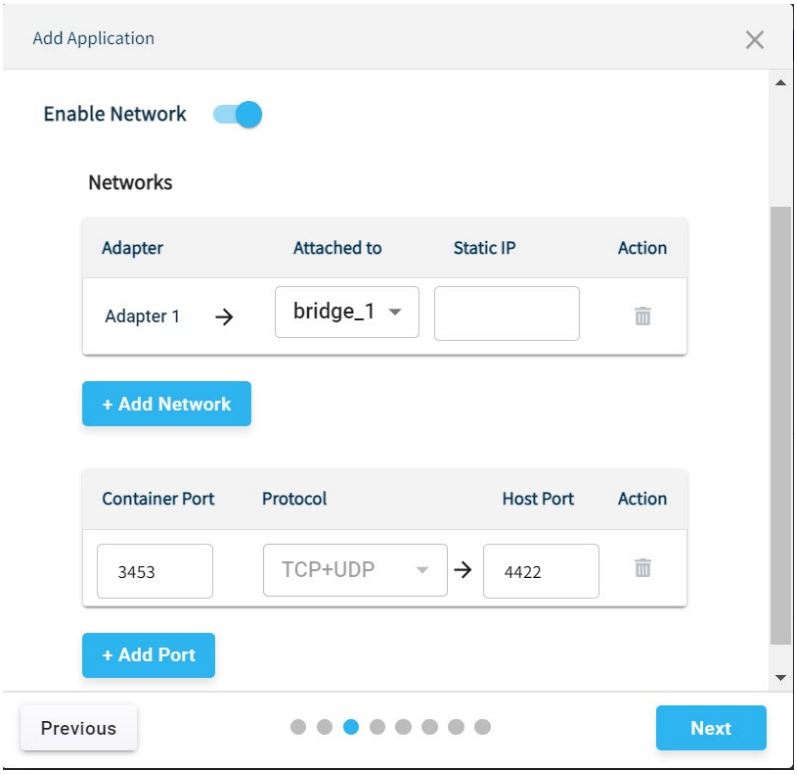
a) For networks of Bridge type, user need to configure the container and host ports.

i. In the *Container Port* box, enter the container port number.

ii. In the *Host Port* box, enter the host port number.

Note: The user can add a maximum of 4 Container and Host ports.

The user is not allowed to create a container without a Container port and Host port in **Bridge mode**; minimum 1 Docker and Host port is required to create a container with Bridge type network.



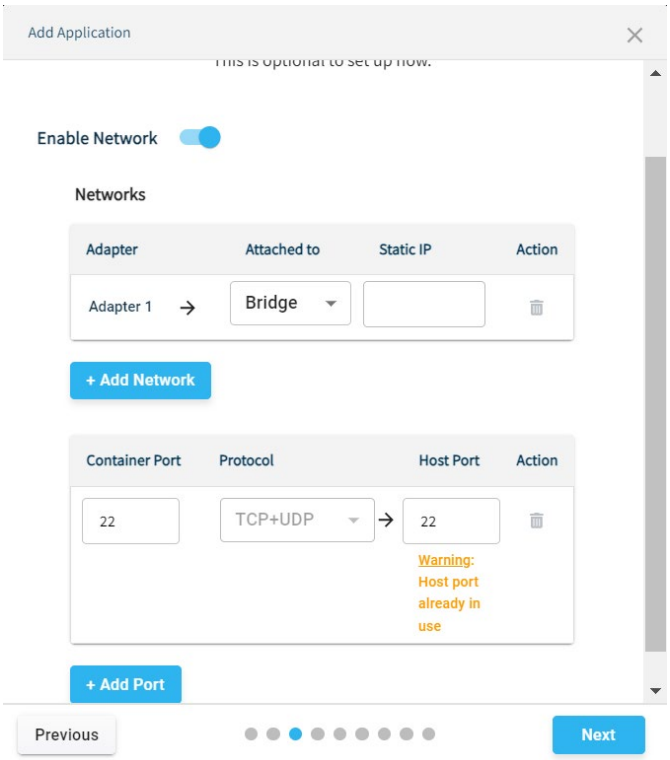
Note : A warning message will be displayed for Host Port if port entered is Reserved Port (Reserved for the system services).

User can still proceed for the container creation, container will be created if service is not using that port at that particular instant.

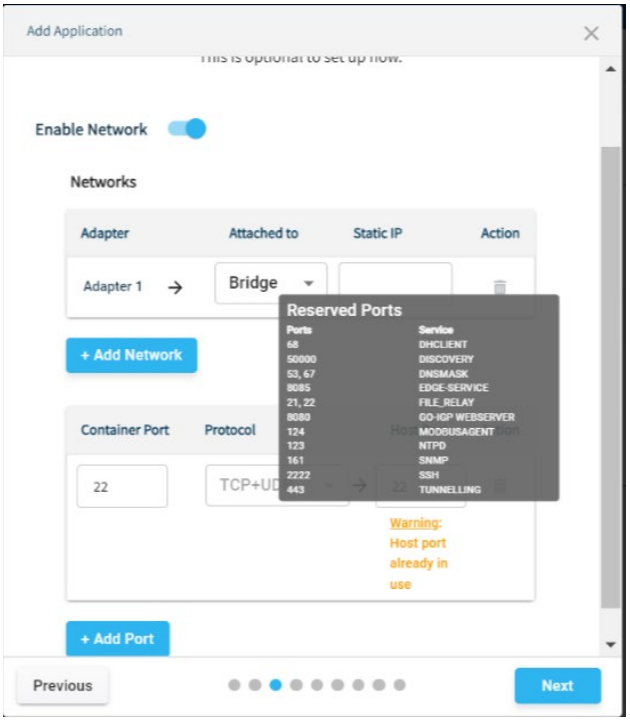
Below are the reserved ports for system services:

Ports	Service
53, 67	dnsmasq
68	dhclient
123	ntpd
8085	Edge.service
124	modbusagent

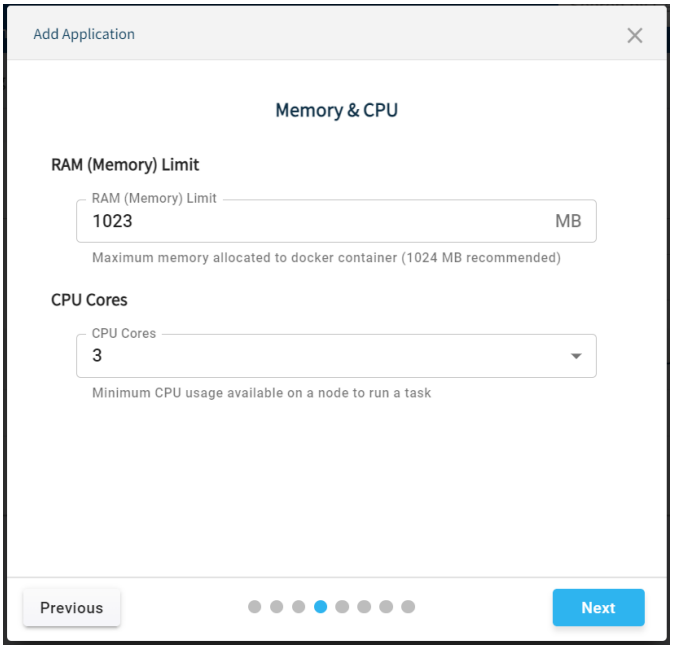
2222	sshd
50000	discovery
8080	go-igp webserver
21,22	file relay
443	tunnelling
161	SNMP



Hover over the warning message to see the list of all the reserved ports



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



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

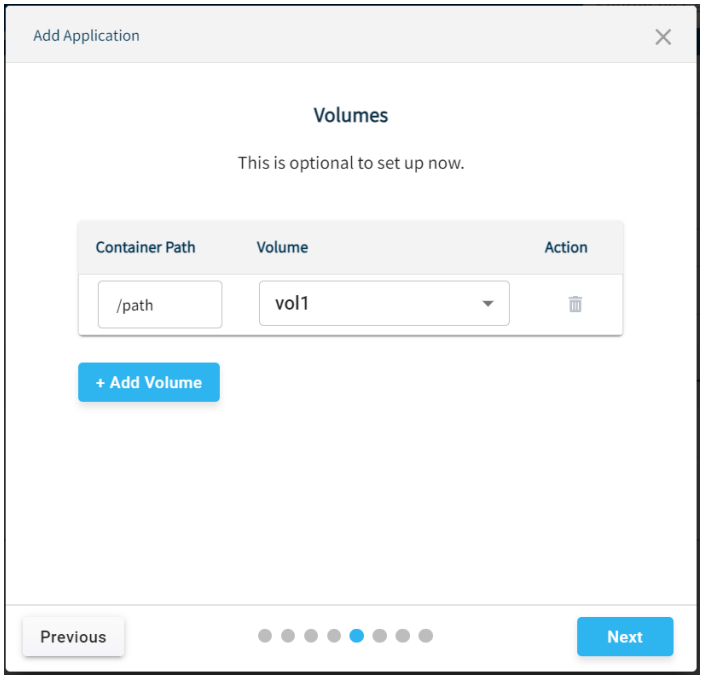
> **Note:** The minimum allowed memory value for creating containers is 4MB.

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

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

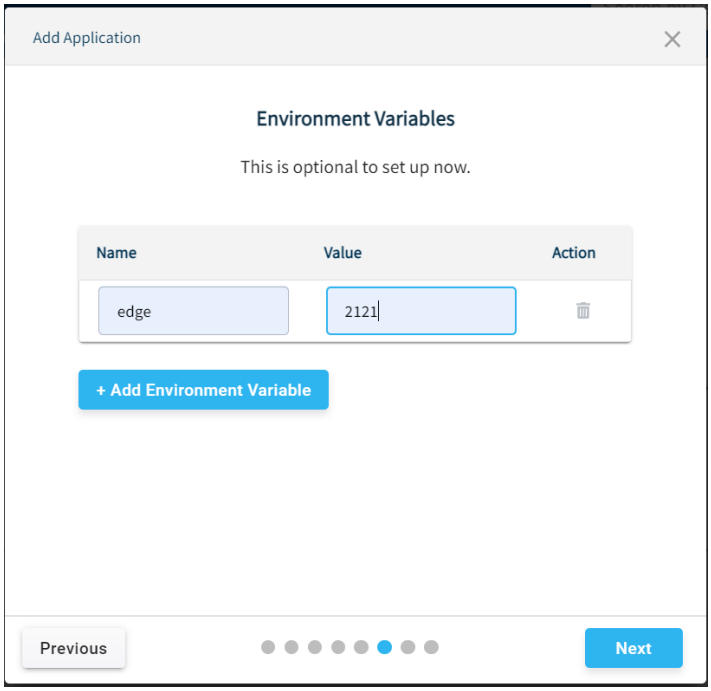
9 (Optional) In **Volumes** wizard, enter *Container Path* and select the *Volume* from an existing list to attach to the container.

> **Note:** Refer to section 6.2.1 to add a new volume when there is no volume available to attach to the container.



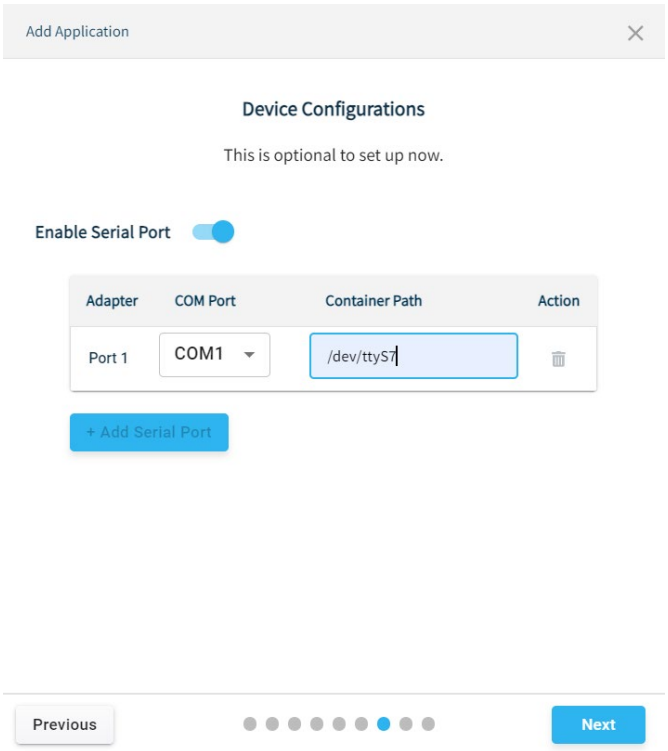
10 Click **NEXT** for **Environment Variables** wizard.

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



12 Click **NEXT** for **Device Configurations** wizard.

13 (Optional) In **Device Configurations** wizard, select the COM Port and enter the corresponding Container Path.

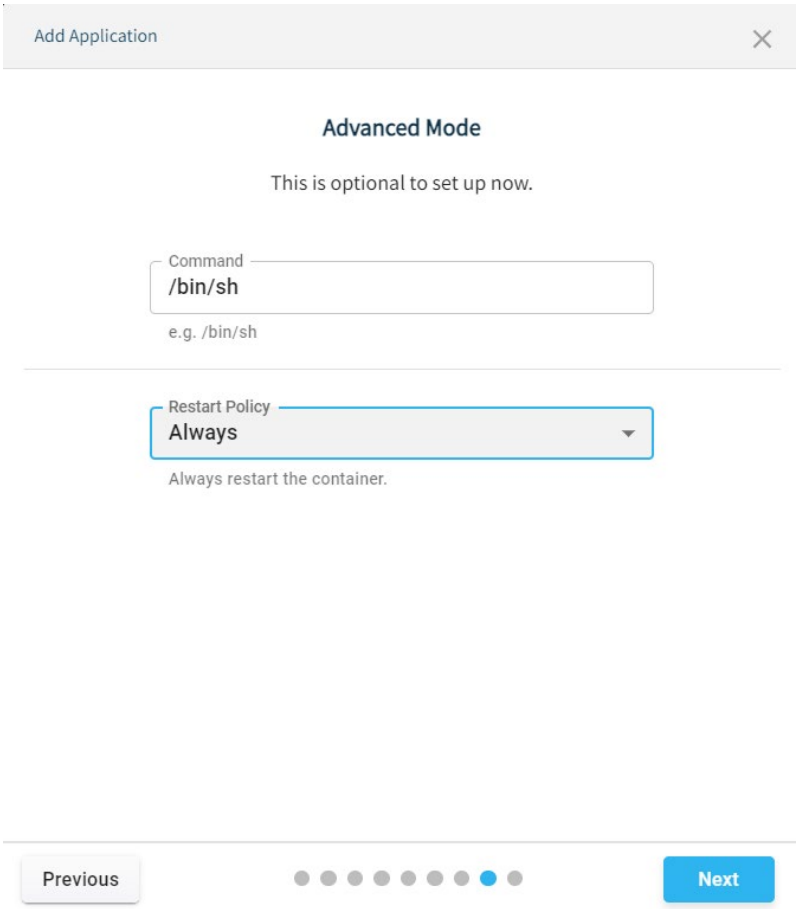


Note: For OpEdge-8D, 2 COM ports will be present COM1 and COM2.

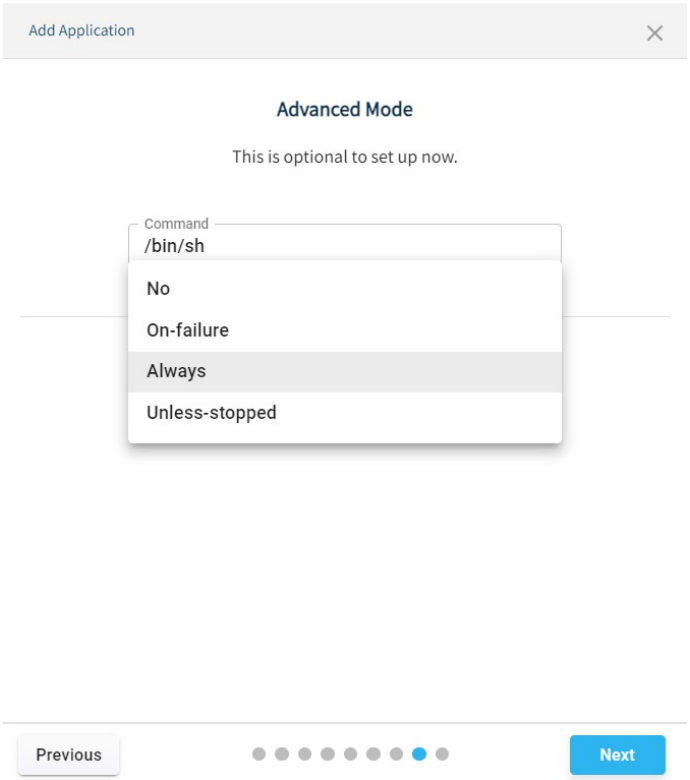
Note: If the COM port is busy, it will be shown as disabled and the same will be visible in the tooltip alongside the COM port name.

14 Click **NEXT** for **Advanced Mode** wizard.

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



16 Click on the dropdown for restart policy to select the restart policy for container.

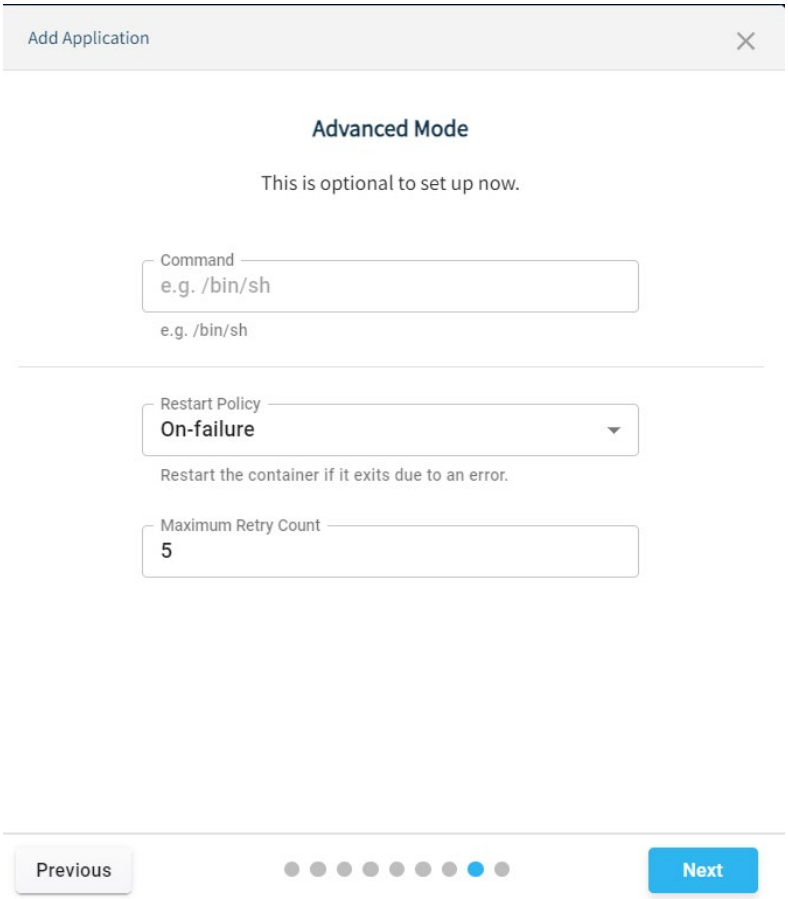


Below are the restart policy options for the user:

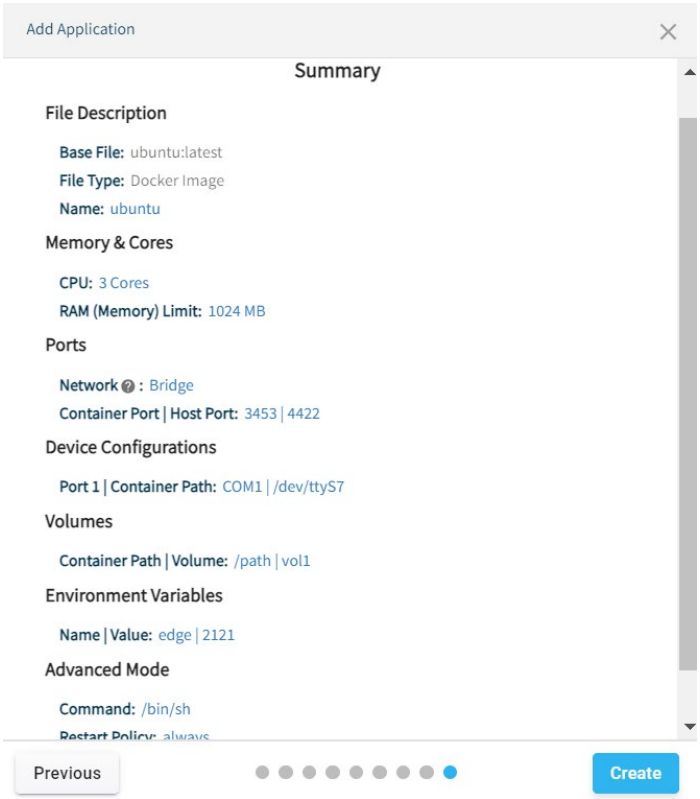
Parameter	Description
No	Do not automatically restart the container.
On-failure	Restart the container if it exits due to an error, which manifests as a non-zero exit code.
Always	Always restart the container if it stops. If it is manually stopped, it is restarted only when Docker daemon restarts or the container itself is manually restarted.
Unless-stopped	Similar to Always, except that when the container is stopped (manually or otherwise), it is not restarted even after Docker daemon restarts.

Note: For Restart policy as **On-Failure**, user can limit the number of retry count to restart the container by selecting Maximum Retry Count. Maximum Retry Count can be in between 1-5.

Note: By default, Restart policy will be **Always** for any container.



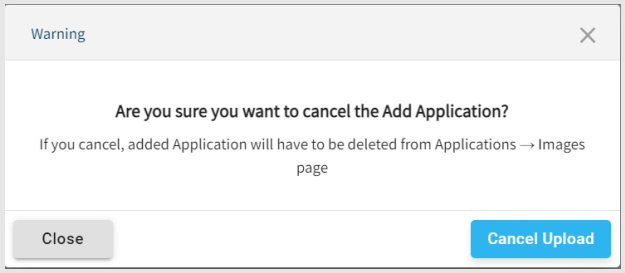
17 Click **NEXT** for **Summary** page.



18 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 popup at any step while creating a container, the following popup will display.

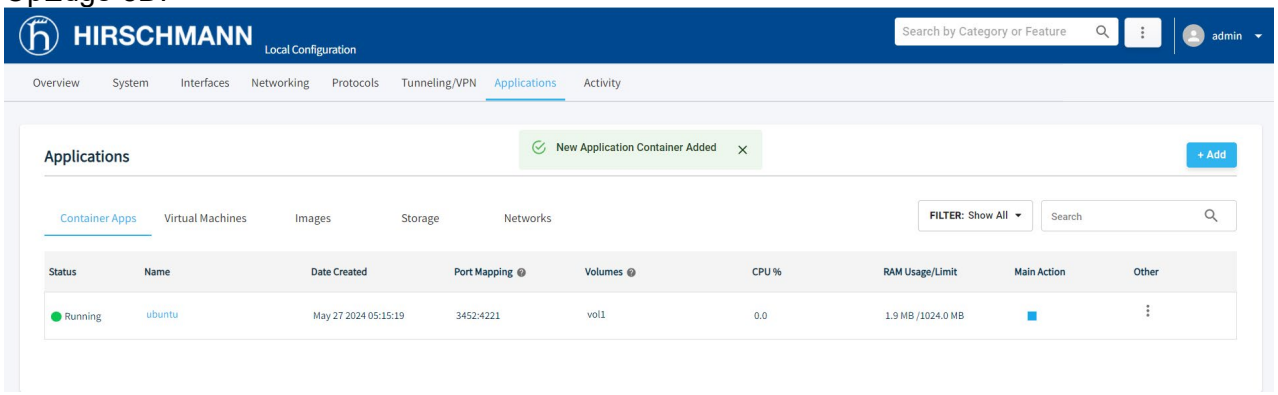


On clicking the "Cancel Upload" button, container creation will be stopped and Image will be added under the Images Tab and has to be manually deleted.

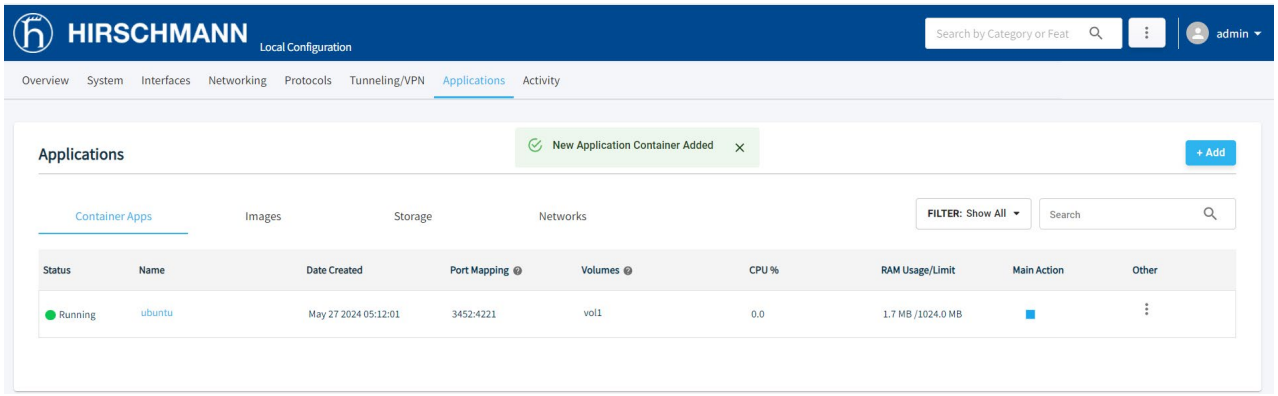
6.1.2 Container Status

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: • Running • Stopped • Paused
Name	Name of a container.
Date Created	Date of container creation
Port Mapping	This field describes the detail of the following ports: • Container *Port*: The Container port number. • Host *Port*: The Host port number.
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 *Saving a Container as an Image* section 6.1.2.1 for more details.

Edit container details	Edit the container. **Note:** 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.

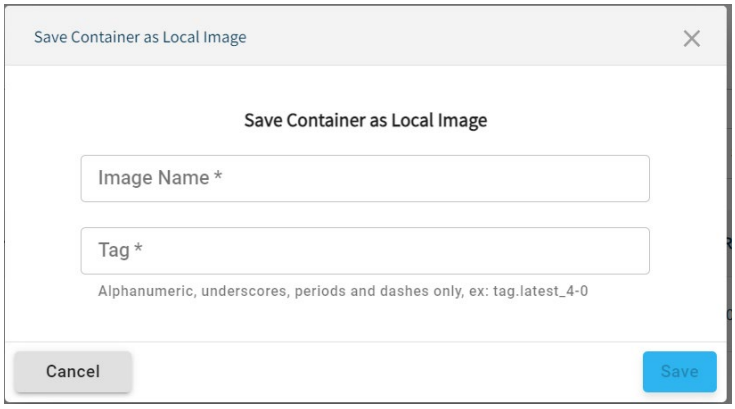
6.1.2.1 Saving a Container as an Image

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 few seconds while 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.

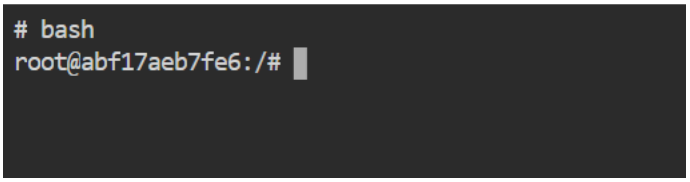
Note: The user is allowed to use "/" in the *Name* field. These images will not be downloaded directly to the local machine. To download to the local machine, browse to the *Images* tab and select *Download*.

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  button to open a prompt to run commands.



6.2 Docker Compose

Docker Compose is a feature used for defining and running multi-container Docker applications. It excels in orchestrating multi-container applications by defining containers, networks, and volumes in a single `configuration file` file. For instance, a web application can have a frontend container, a backend container, and a database container, all connected through a custom network for seamless communication. Additionally, Docker Compose can define volumes for persistent data storage, ensuring that database data persists across container restarts and updates, maintaining the application's state and data integrity.

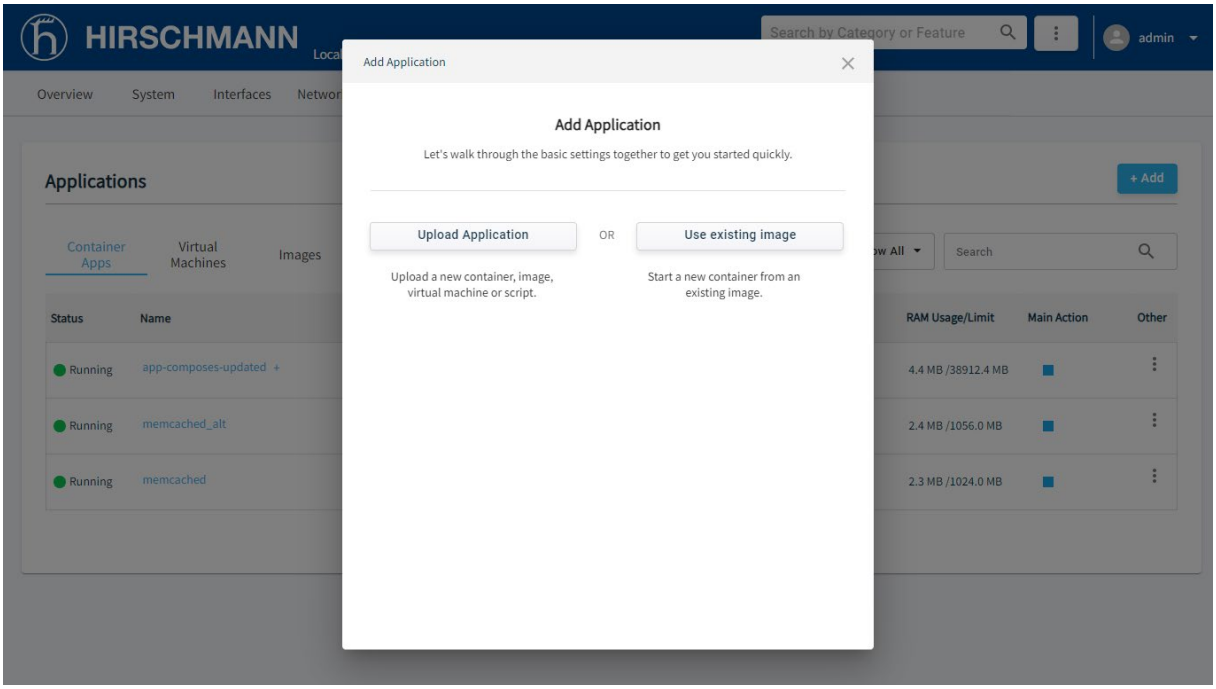
6.2.1 Creating a Container App

Perform the following steps to create a container app:

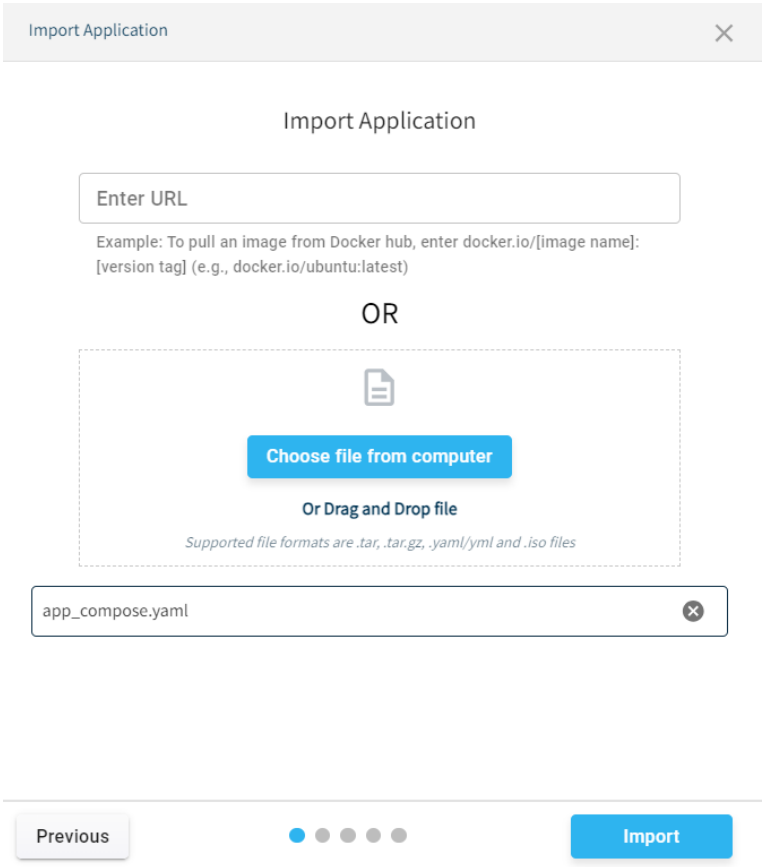
1 Navigate to the *Container Apps* tab.

2 Click the + Add button to open the *Add Application* wizard.

3 There are 2 options in the *Add Application* wizard, click on the 'Upload Application' option.



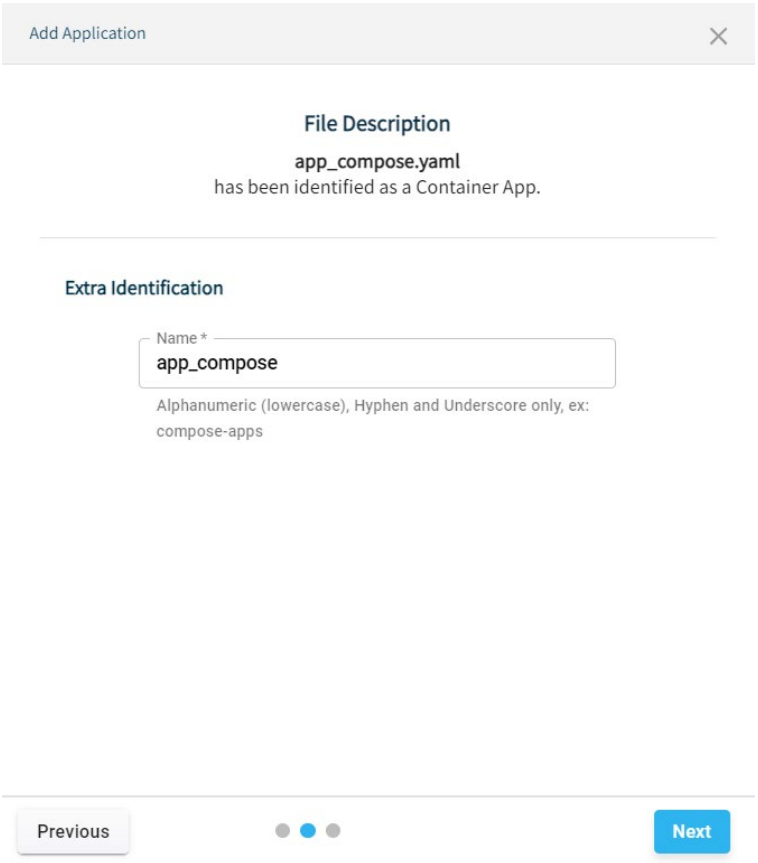
4 In the Import Application window, click on **CHOOSE FILE FROM COMPUTER** and select the YAML/YML file from the local PC.



5 Click **IMPORT** to upload the YAML/YML file.
Below is an example of YAML file for creating a container:

```yaml
---
version: '3.1'

volumes:
  data-busybox: {}

services:
  busybox-container:
    image: busybox

    command: ["sleep", "3600"]  # Example command, you can modify this as needed
    volumes:
      - data-busybox:/data
    restart: always
    networks:
      - ntw-internal_bridge_in




networks:
  ntw-internal_bridge_in:
    external: true
```

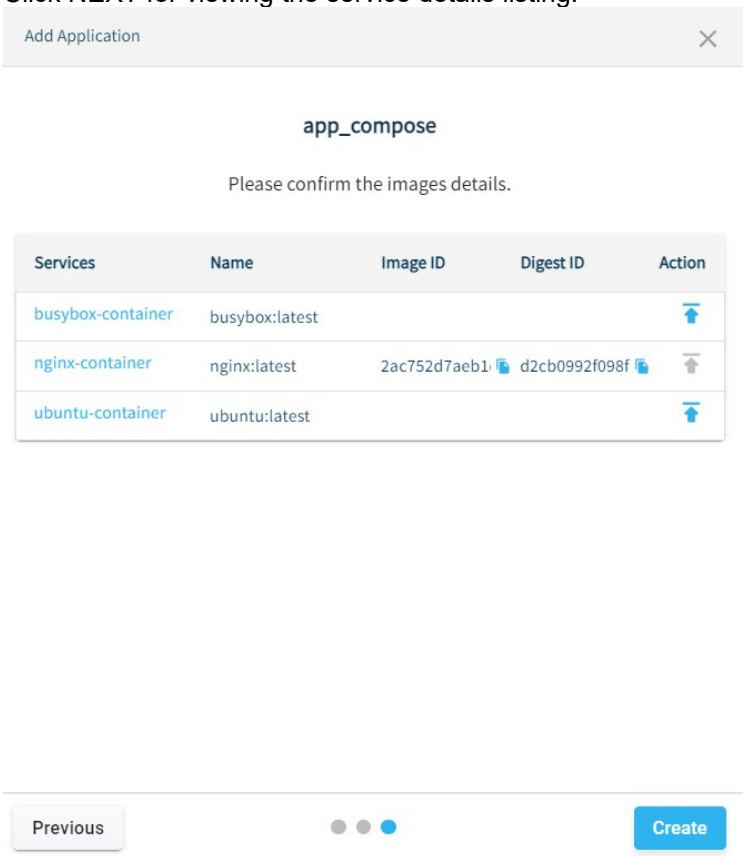
6 In the *Name* field, enter the name of the container app.



Note: The user can create a container app name with an alphanumeric character with a minimum length of 2 and a maximum length of 128.

The following characters are allowed:
a to z
0 to 9
Only Special character "_" and "-"are allowed for container name creation. Empty name string or whitespace is not allowed.

7 Click NEXT for viewing the service details listing.



Note: The action button is disabled if the corresponding image for a service is already present in the system. And if the action button is enabled the user can upload it.

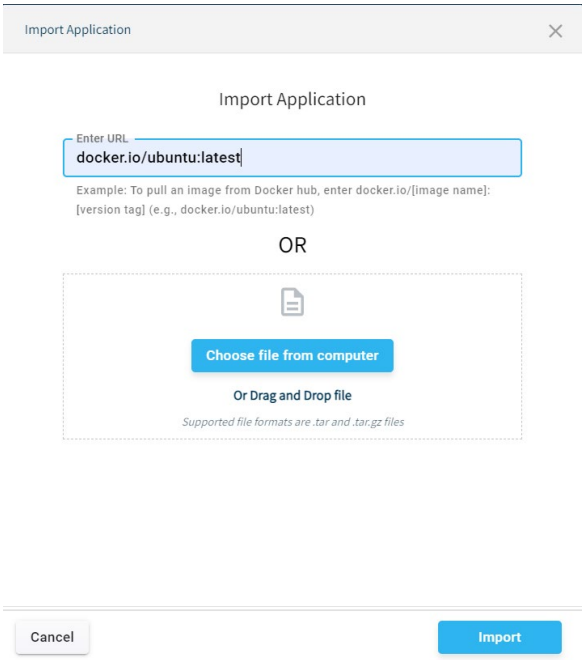
Note: The Image ID and Digest ID is displayed for only those services for which the image is present. Once the image is uploaded IDs will be visible.

8 Click on Action button to upload the image. Once clicked on Action button the IMPORT APPLICATION wizard opens.

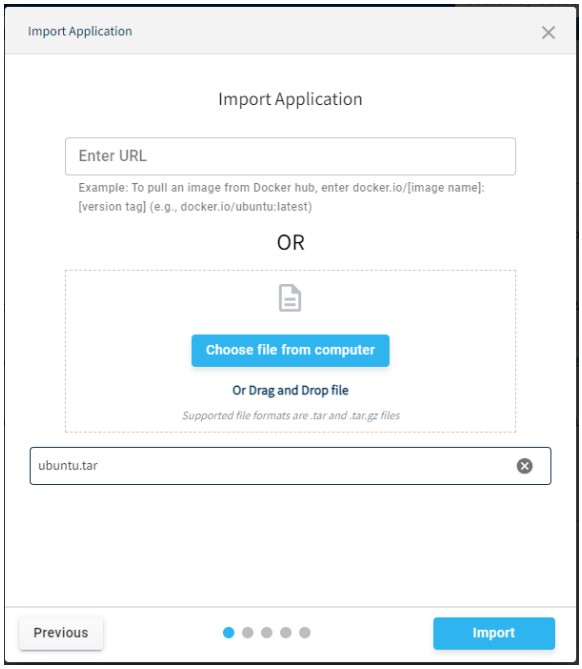
Note: If the user doesn't click on action button to upload any image from Docker Hub or local system, then the images will be automatically pulled from Docker hub when clicked on CREATE button.

9 The user can choose to upload images in 2 ways:

a. 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>**

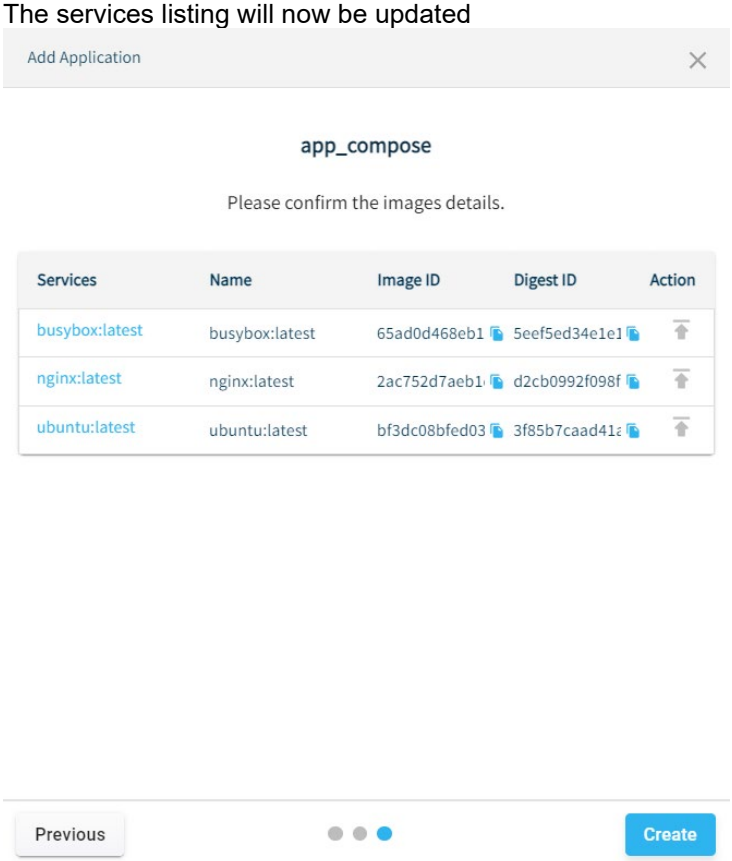


b. In the *Import Application* window, click on **CHOOSE FILE FROM COMPUTER** and select the Docker image from the local PC.



10 Click **IMPORT** to add image.

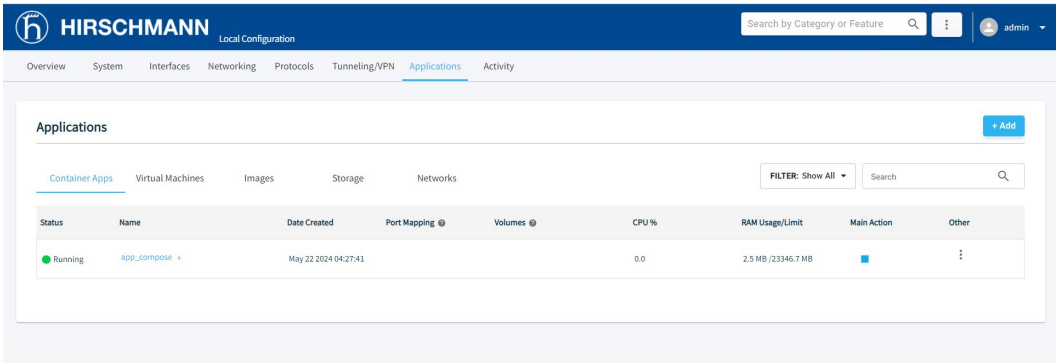
11 The services listing will now be updated



Note: User can copy the Image ID & Digest ID by clicking on the action next to ID value.

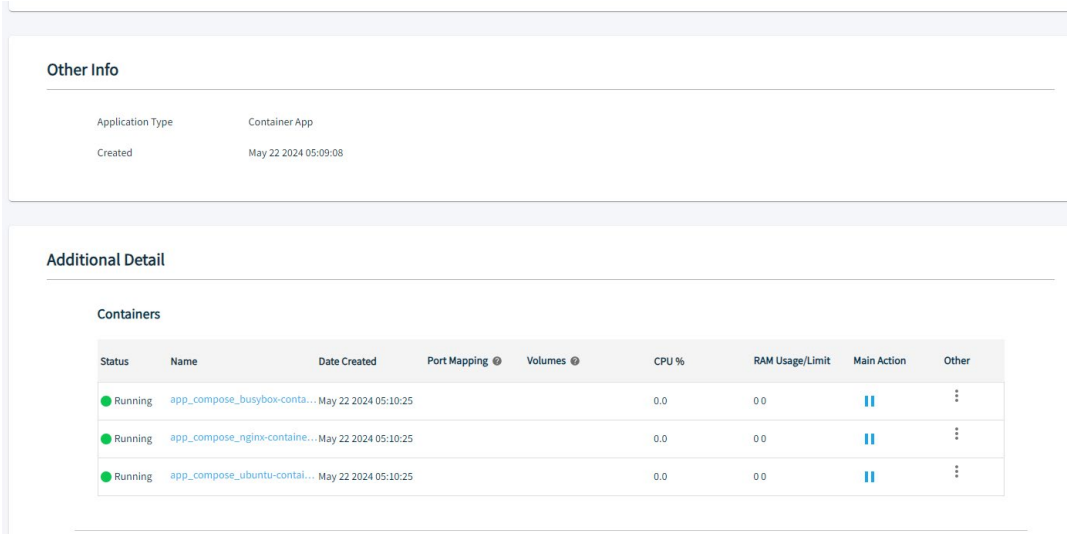
If user click on the action then respective button color will be lighten.

12 Click on CREATE button to create the Container App.



Note: If any container inside the compose app is paused/stopped then compose app status will be shown as **Degraded**.

13 Click on the app name to view the app details and perform operations on individual container.



6.3 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 2 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, 2 default volumes are created (1 default private and 1 default public). If a Docker image has any volumes included, then the same will be created and mapped with the container.

For volumes 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.

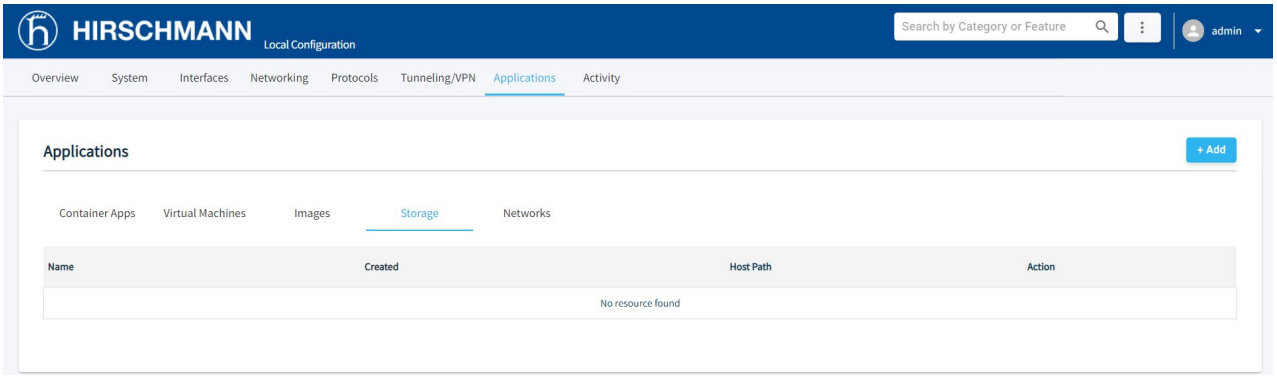
Common use cases for docker volumes:

- 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.

6.3.1 Adding a Volume

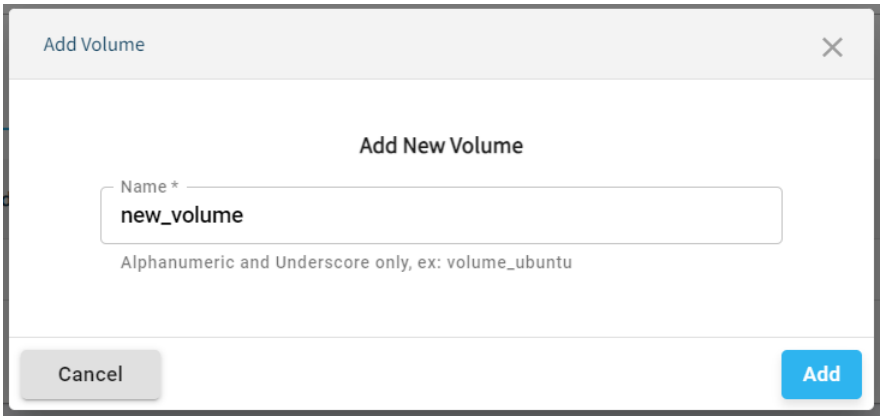
To add a volume:

1 Navigate to the *Storage* tab.

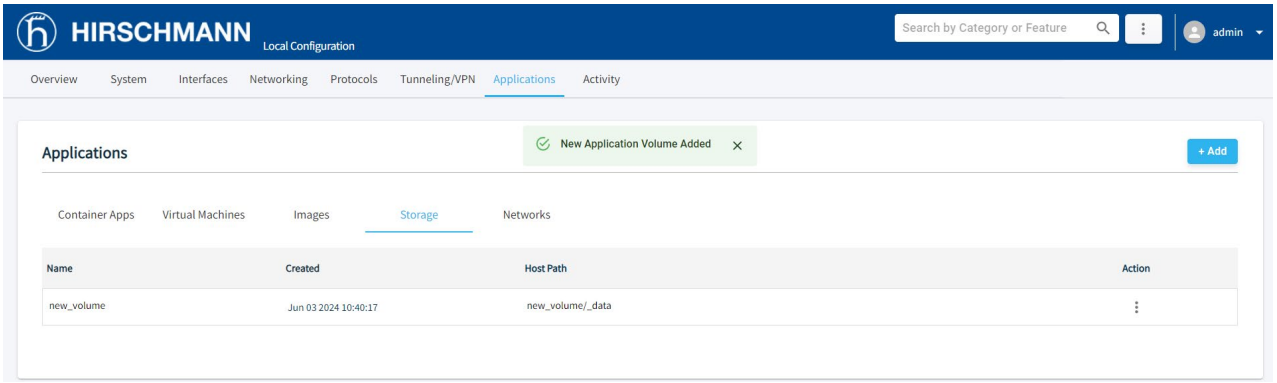


2 Click on + Add button.

3 Enter name of the volume in the *Name* field and click **ADD**.



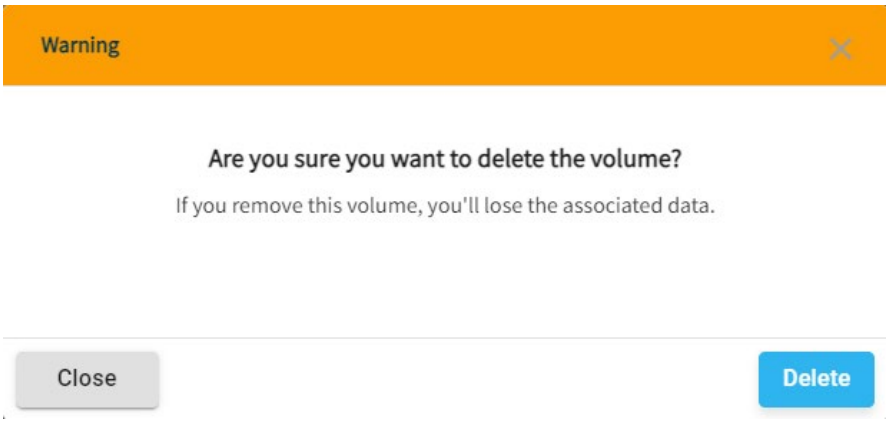
4 The list of *Volumes* is updated.



6.3.2 Deleting a Volume

To delete a volume:

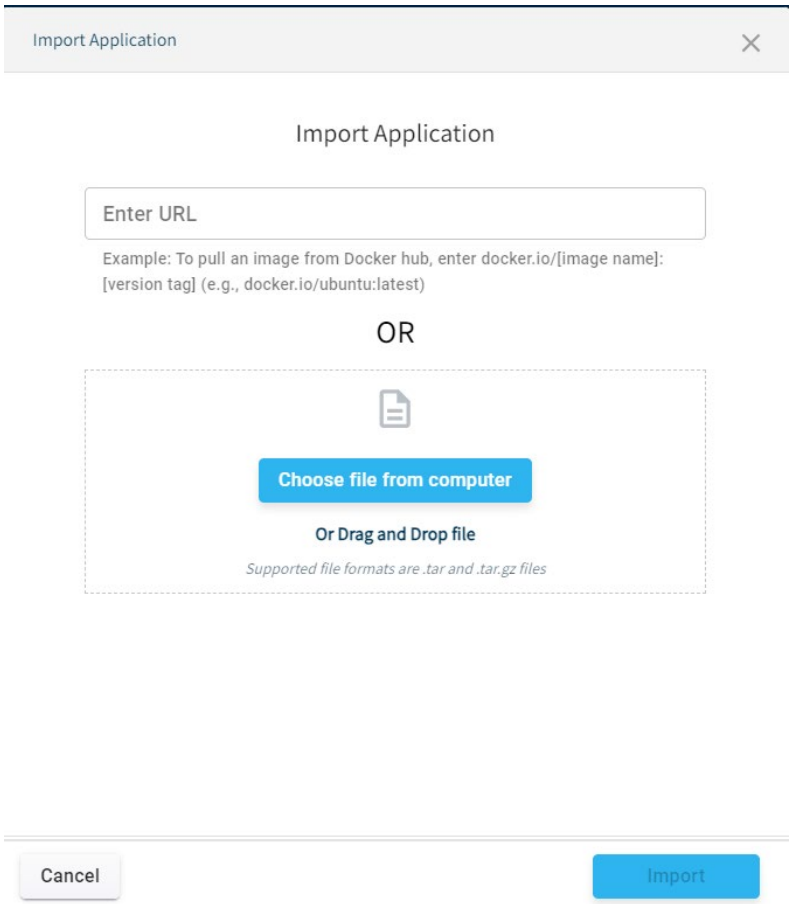
1. For the volume to be deleted, click on Actions button  .
2. Click on  button.
3. The user will be asked for the confirmation to delete.



4. Click **DELETE** to confirm.

6.4 Images

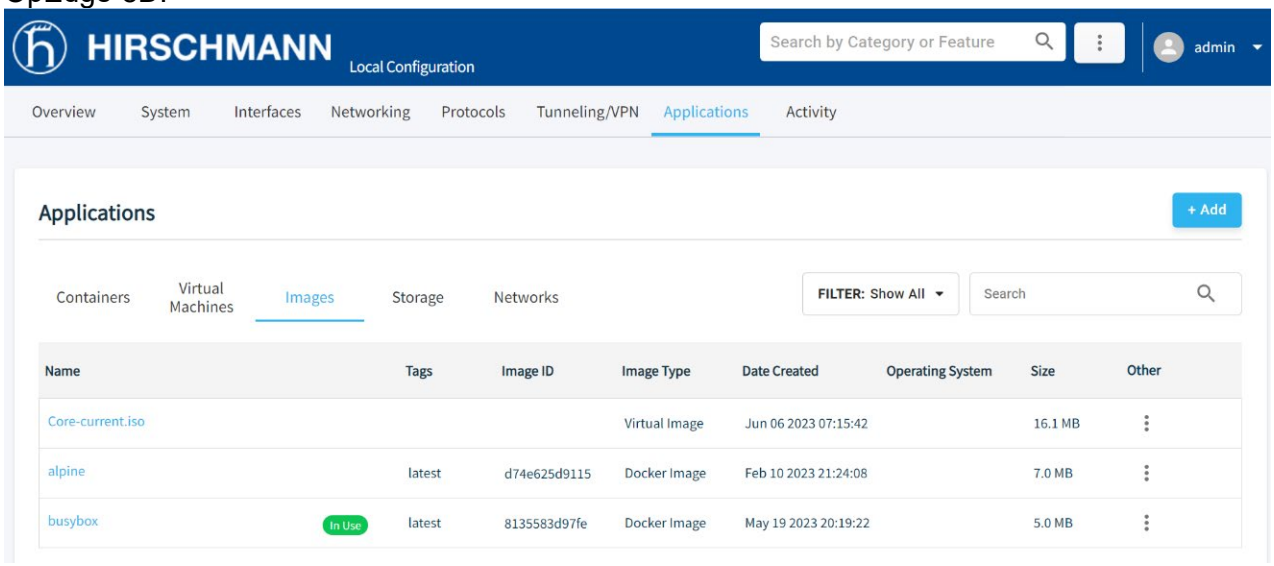
From Images section , user can pull a docker image from local PC by clicking on **+Add** Button.



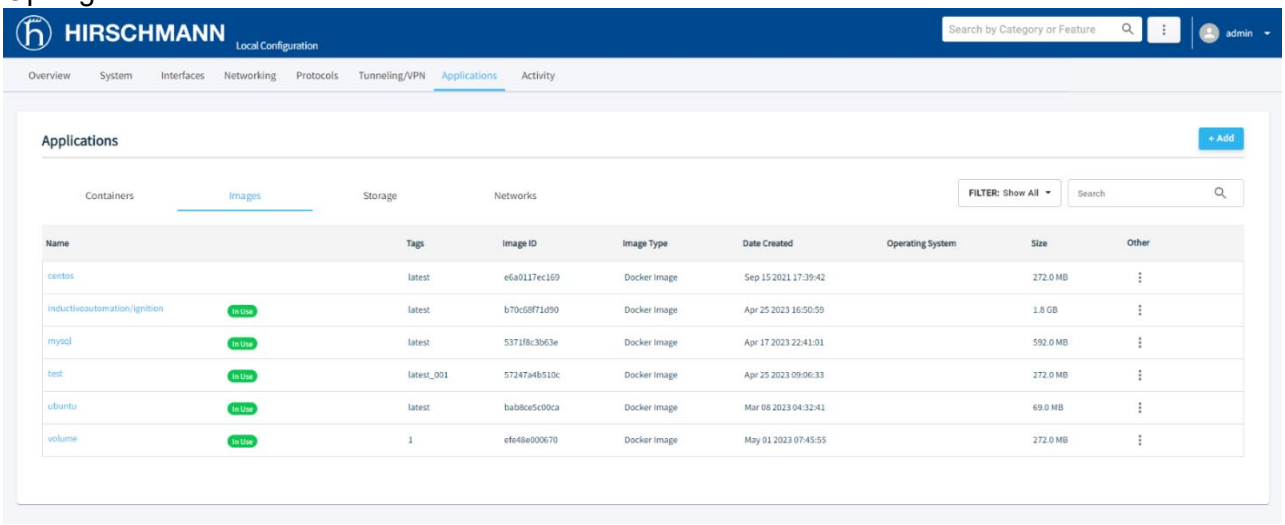
This page lists all Docker and Virtual Machine Images present on device.

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

OpEdge-8D:



OpEdge-4D:



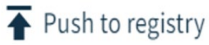
Parameter	Description
Name	The name of the Image.
Tags	The version/tag of the Image.
Image ID	The unique ID of each Image
Image Type	Image type: Docker **or** Virtual Machine.
Date Created	The date of Image upload on device.
Operating System	Operating system of the Image.
Size	The disk size in MB/GB of the virtual disk.
Other	**Action Button** / **Description** Push to registry — Push Image to registry. Enter the *URL*, *Username*, and *Password*. Download — Download Base Image. **Note:** The user can check the default download folder selected in the browser for the Base Image file downloaded. Delete — Deletes Base Image.

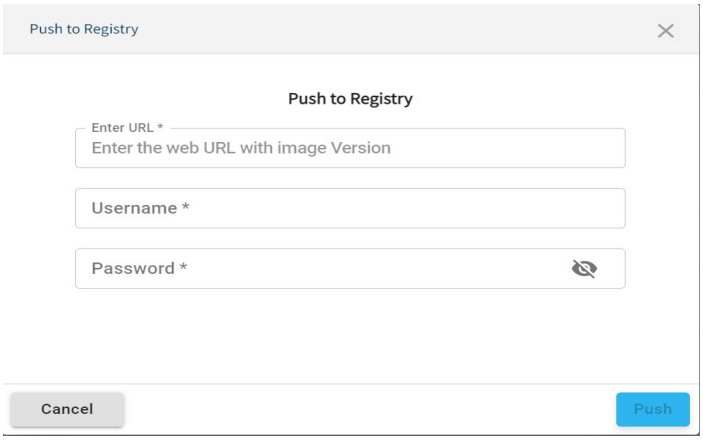
Note: Images being used for Container/Virtual Machine will show **In Use**.

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.

6.4.1 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  button.
3. Enter the *URL*, *Username*, and *Password* for the registry.



4. Click the  button to push the image.

6.5 Virtual Machines

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

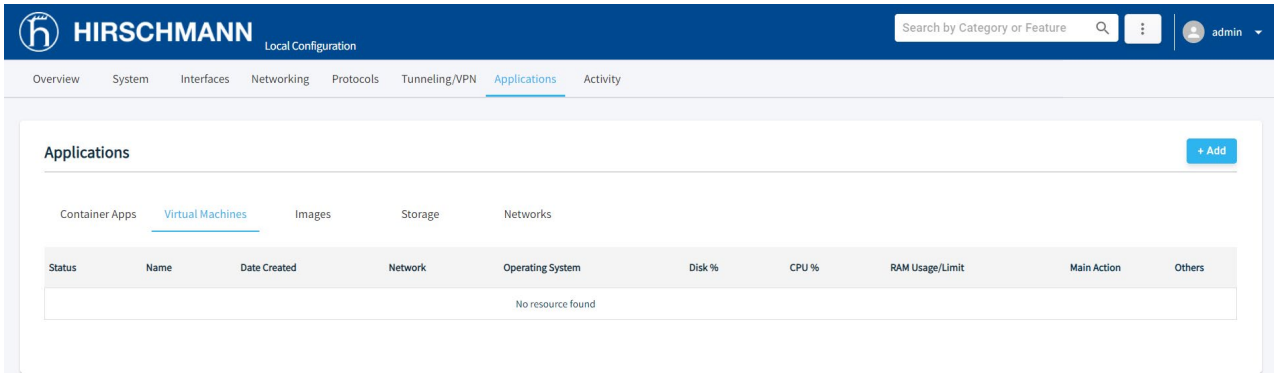
A virtual machine functions as a virtual computer system with its own CPU, memory, network interface, and storage, created on a physical hardware system (located off- or on-premises).

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:

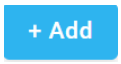
- Processor used in percentage
- Memory used in percentage
- Disk used in percentage

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.



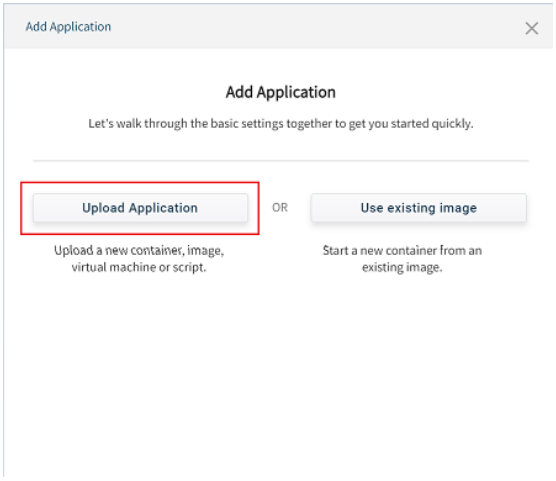
6.5.1 Creating a Virtual Machine

To create a guest virtual machine:

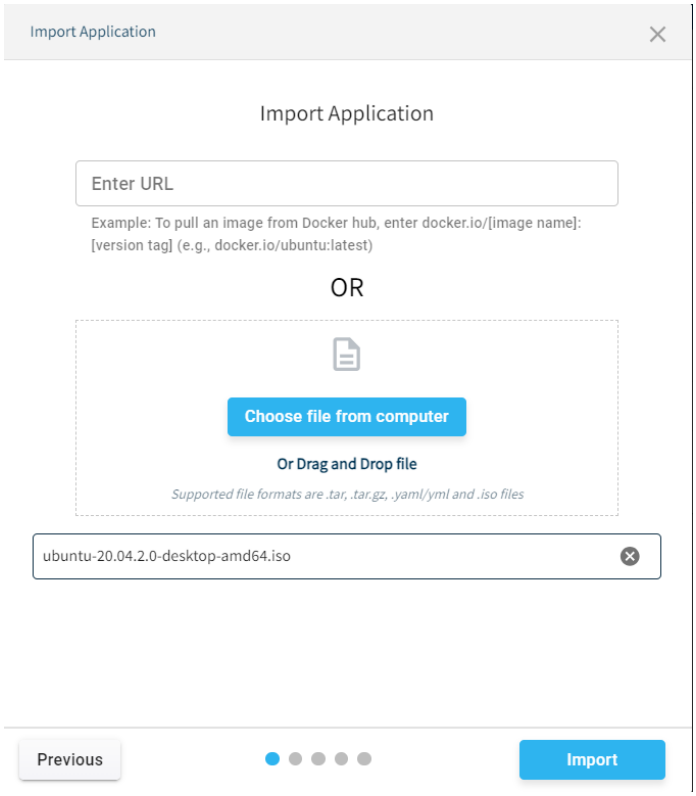
1. Go to the *Virtual Machines* tab.
2. Click 

to open the *Add Application* wizard.
3. Click **NEXT** to navigate through the wizard.
4. There are 2 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**.**

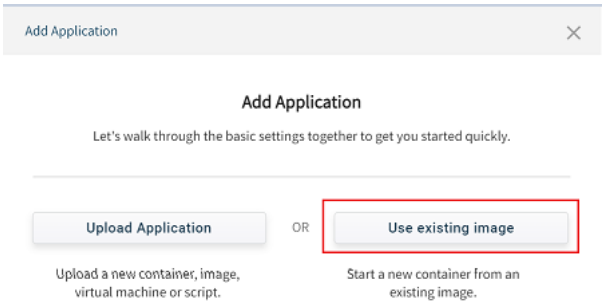


i. Upload the virtual machine image by selecting a virtual machine image from local PC by clicking **CHOOSE FILE FROM COMPUTER.**

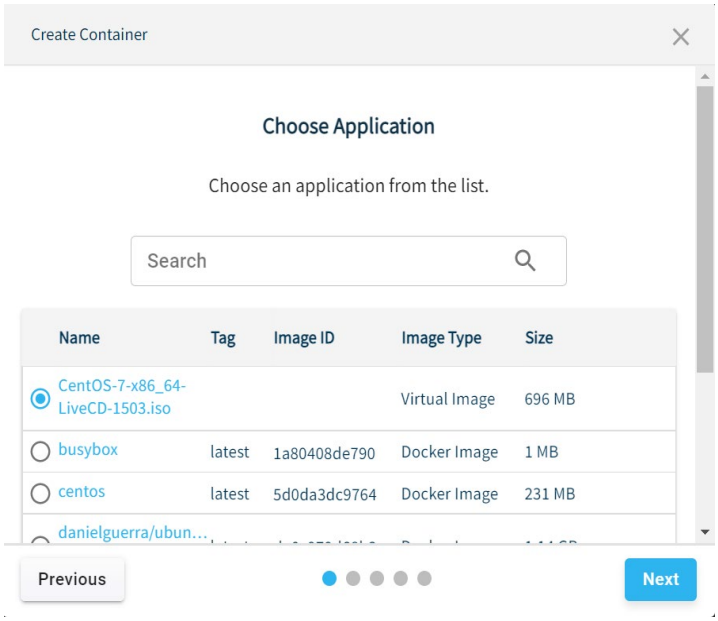


ii. Click **IMPORT** to add the image.

b) Use Existing Image option.

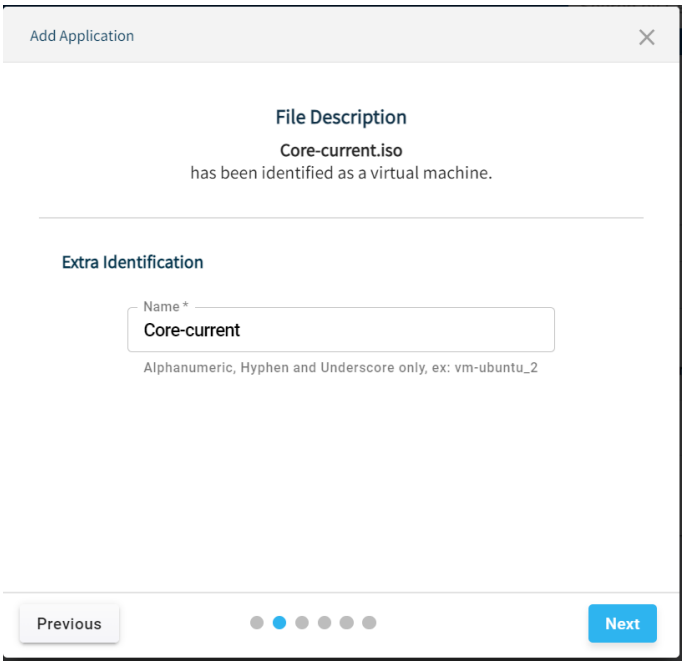


i. Select an .iso image from a list.



ii. Click **NEXT**.

5 Enter a name for the virtual machine.

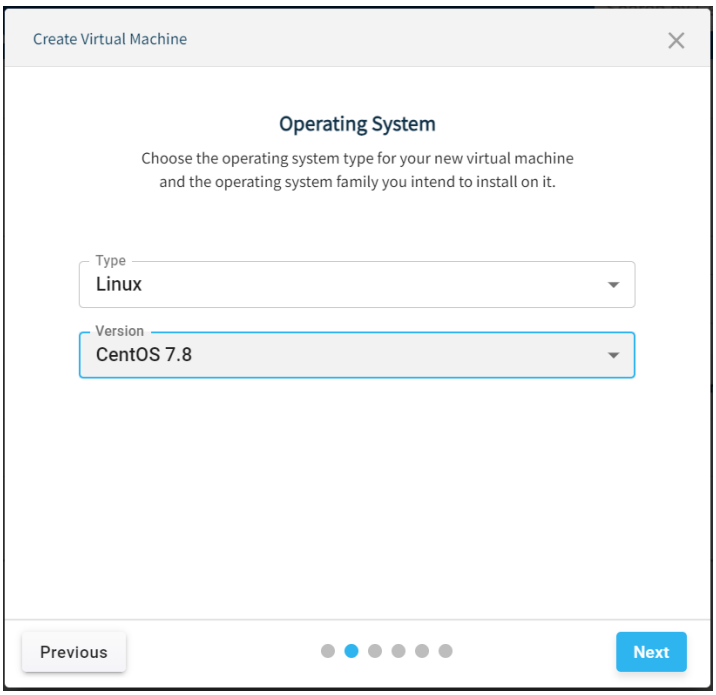


Note: The user can create a virtual machine name with an alphanumeric character with a minimum length of 1 and a maximum length of 30.

The following characters are allowed:
a to z
A to Z
0 to 9
Only 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.



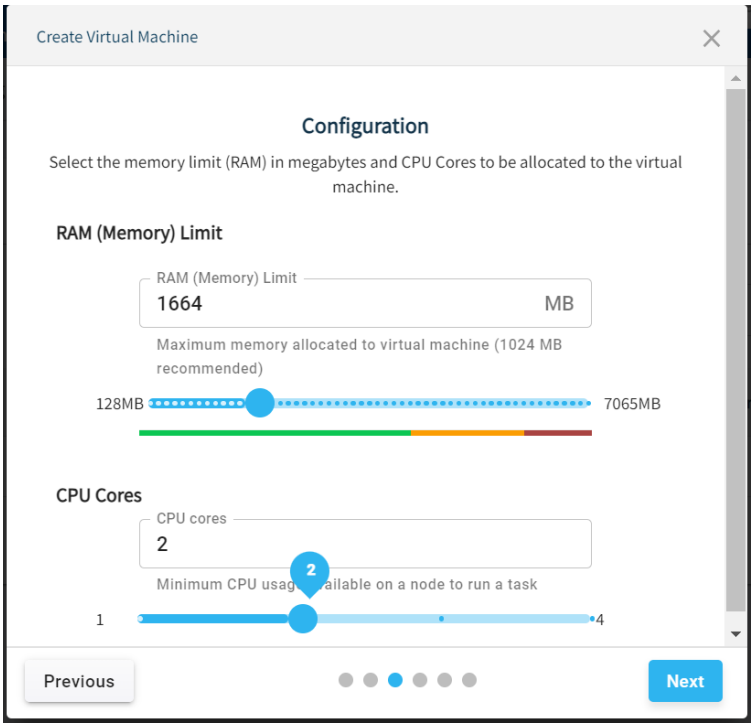
Parameter	Description
Type	The operating system of a virtual machine. User can select the respective operating system: Linux and Windows.
Version	Type or select the respective OS family. For example, Linux OS type user can select OS family as Ubuntu.

The current supported OS Types and Operating Systems:

Parameter	Description
Linux	CentOS 7.6 CentOS 7.7 CentOS 7.8 Ubuntu 16.04 Ubuntu 18.04
Windows	Microsoft Windows Server 2008 Microsoft Windows Server 2012

8 Click **NEXT**.

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

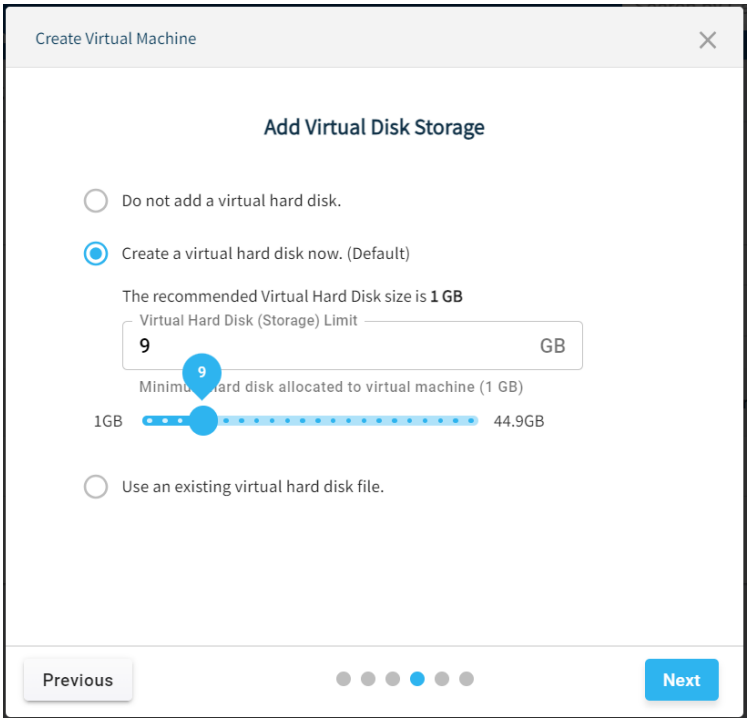


Parameter	Description
RAM (Memory) Limit	Select or provide memory for virtual machine.
CPU Cores	Select number of CPU Cores for the virtual machine.

10 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.

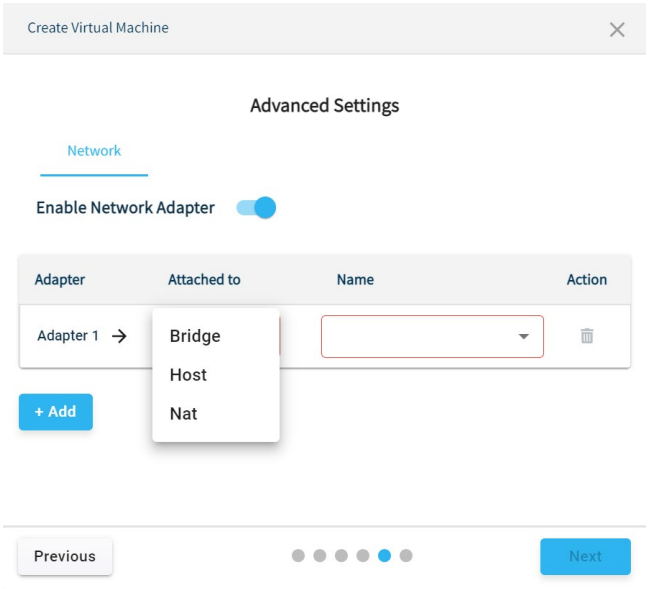


Note: The **CREATE A VIRTUAL HARD DISK NOW** option is the only available option in the current implementation.

12 Click **NEXT**.

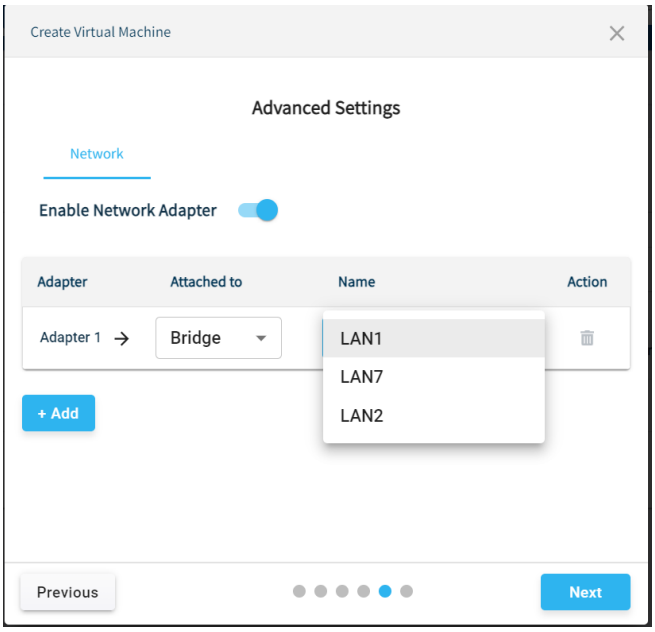
13 In the *Advanced Settings* wizard, toggle the **ENABLE NETWORK ADAPTOR** button and select a *Network Adapter* to attach with the virtual machine:

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



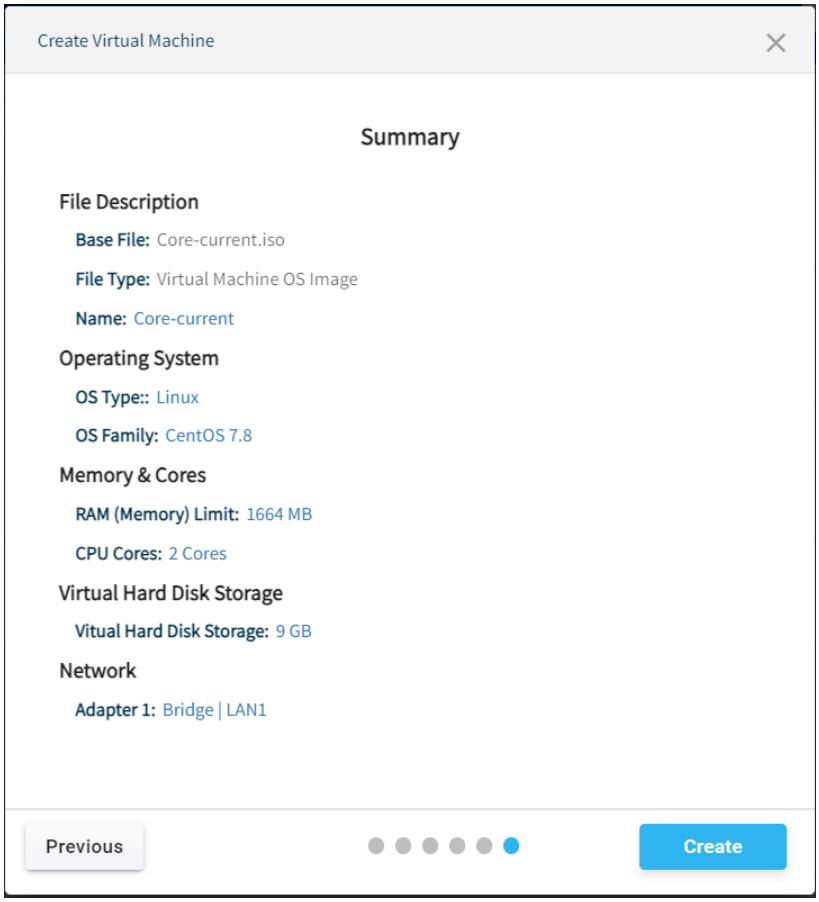
14 Select the **NAME** associated with the selected *Network Adapter*:

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

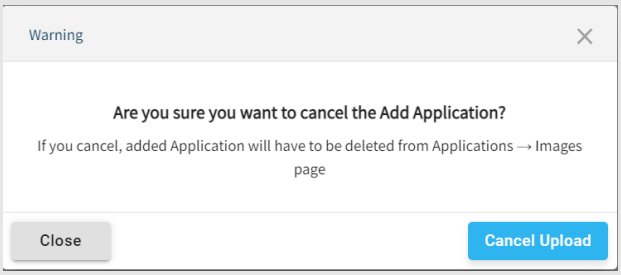


15 Click **NEXT**.

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

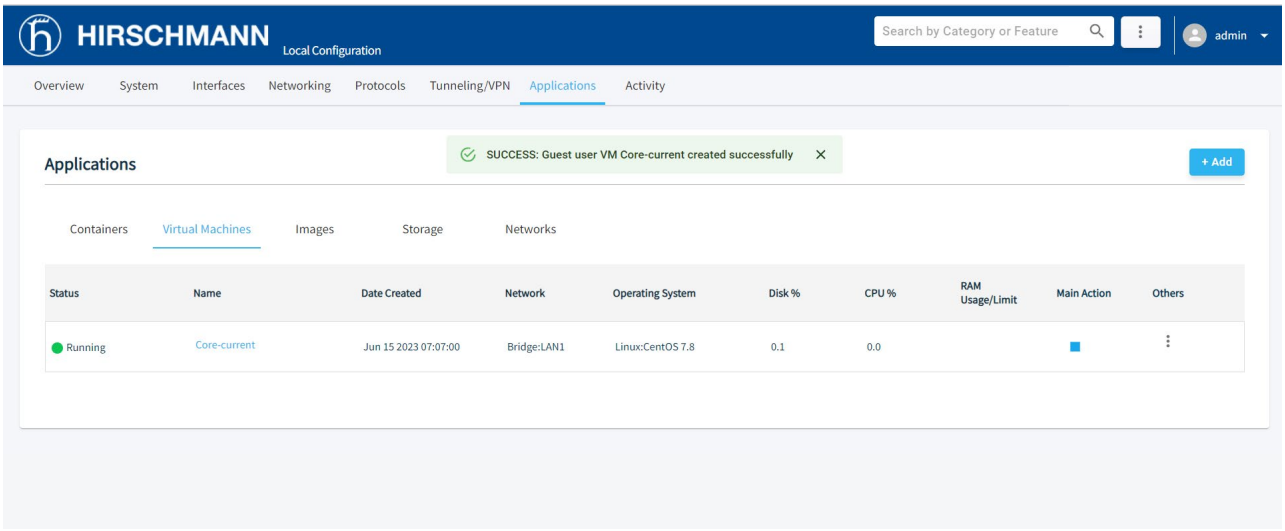


Note: If clicked at "X" button on top-right corner of popup at any step while creating a virtual machine, the following popup will display.



On clicking the "Cancel Upload" button, VM creation will be stopped and 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	**Status**	**Description**
	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 time of 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	**Action Button**	**Description**
	Start	Power On or resumes the virtual machine. **Note:** 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. The virtual machine is stopped. The state of the virtual machine is Powered-off after the shutdown is complete.
	Suspend	Suspend the virtual machine. 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.

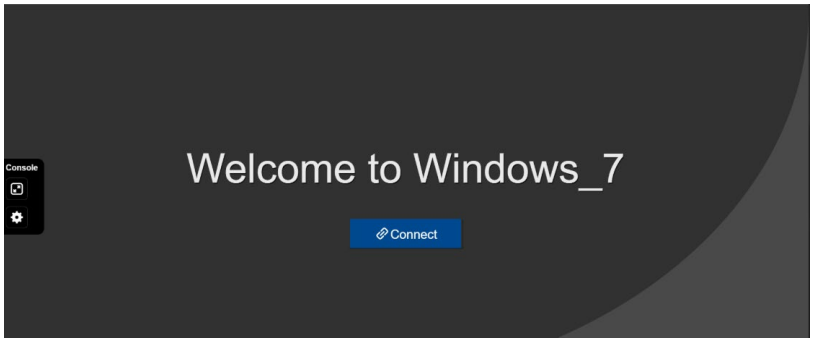
	Console	Console for virtual machine. The console is the remote control system of virtual machine, and enables the user to work and interact with the created virtual machines. Please see *Connecting to a Virtual Machine* in section 6.4.1.1 for more information.
	Edit	Edit the virtual machine.
	Delete	Delete the virtual machine.

6.5.1.1 Connecting to a Virtual Machine

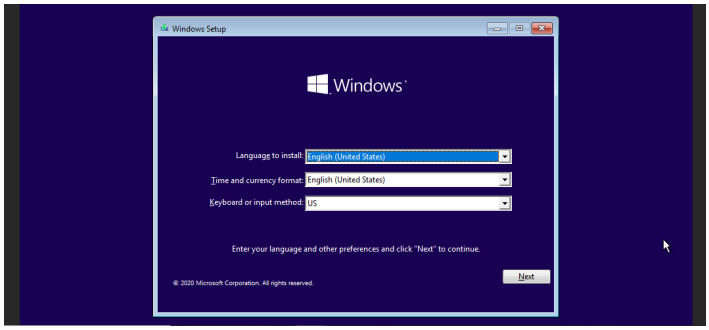
The user can connect to a virtual machine by using its console. The console is the remote control system of a virtual machine.

Note: For first time login to the virtual machine, the user must to 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.



6.5.1.2 Editing a Virtual Machine

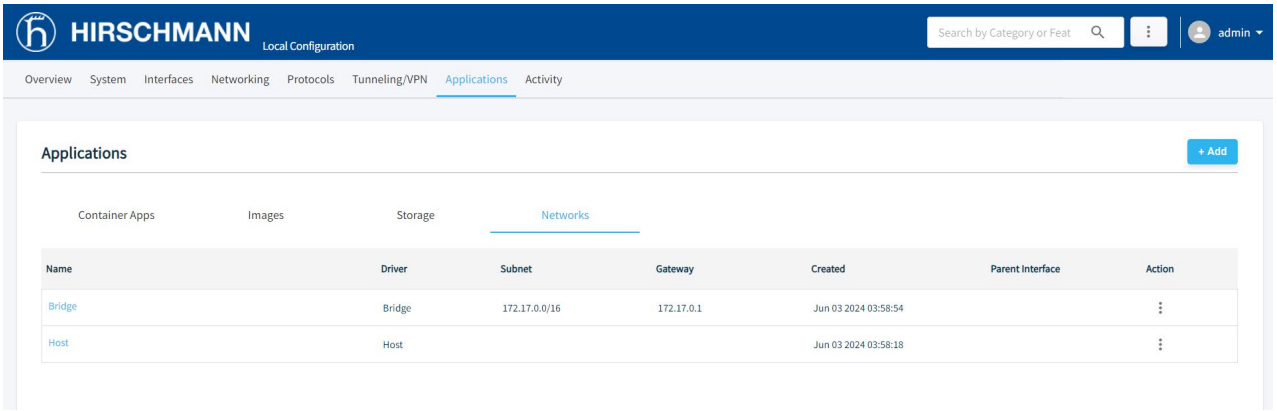
1. In the *Virtual Machines* tab, click on a container's Action button .
2. Click Edit to open the *Edit Virtual Machine* wizard.
3. Follow the steps in the wizard to edit the virtual machine.

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.

6.6 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 network between containers also known as Docker networks.

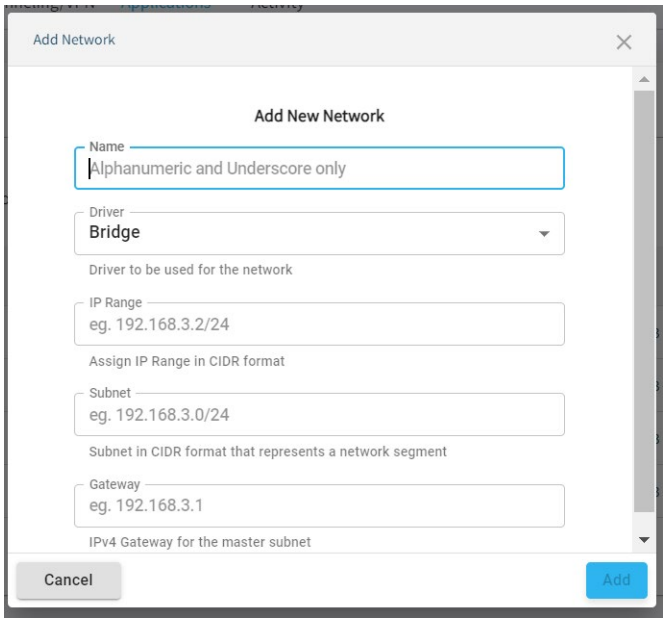
Docker network is a powerful feature that enables containers to communicate with each other and the outside world. It provides isolated and secure networking environments, allowing seamless connectivity and easy management of containerized application.



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

To create a network:

1. Go to the *Network* 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.



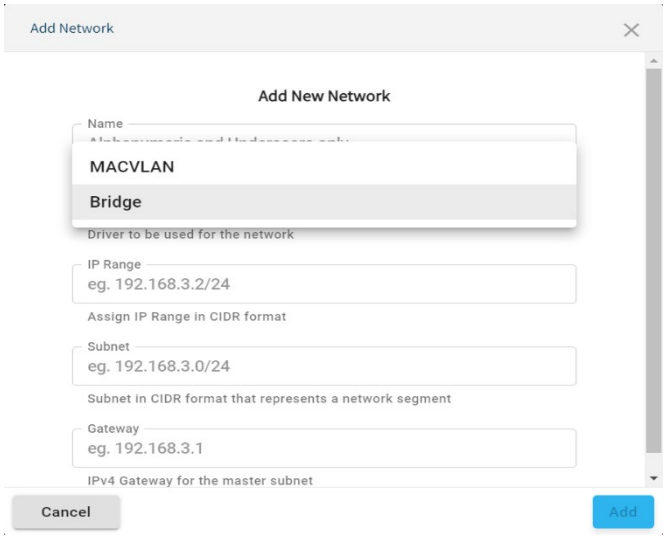
Note: The user can create a network name with an alphanumeric character with a minimum length of 2 and maximum length of 49.

The following characters are allowed:
a to z
A to Z

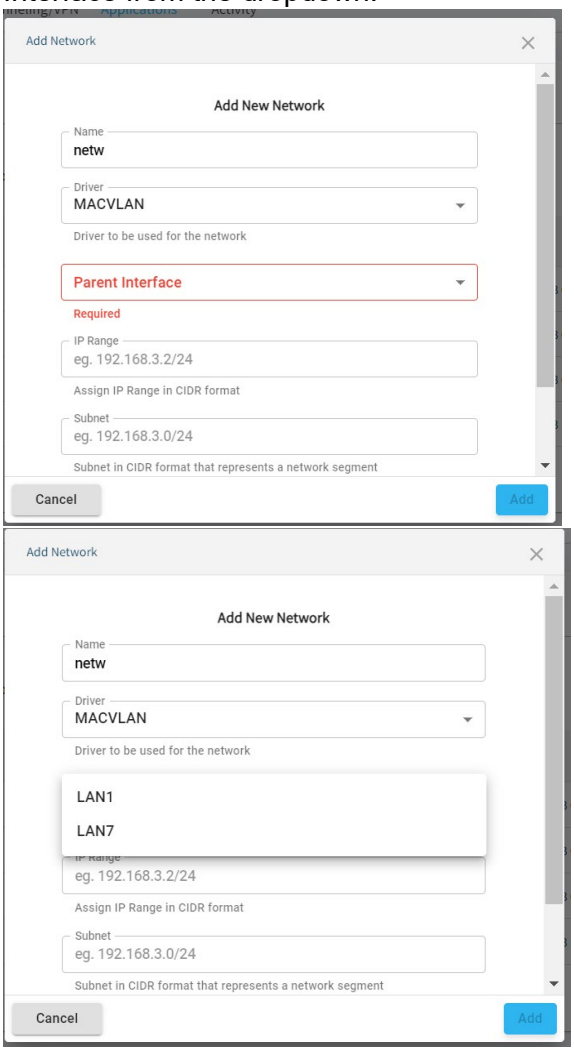
0 to 9

Only Special character "_" is allowed in network name creation.

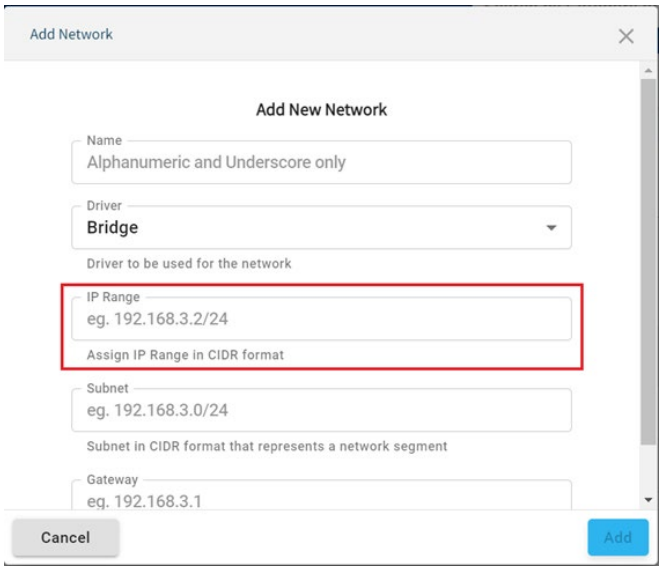
5. Choose driver for network from Dropdown menu.



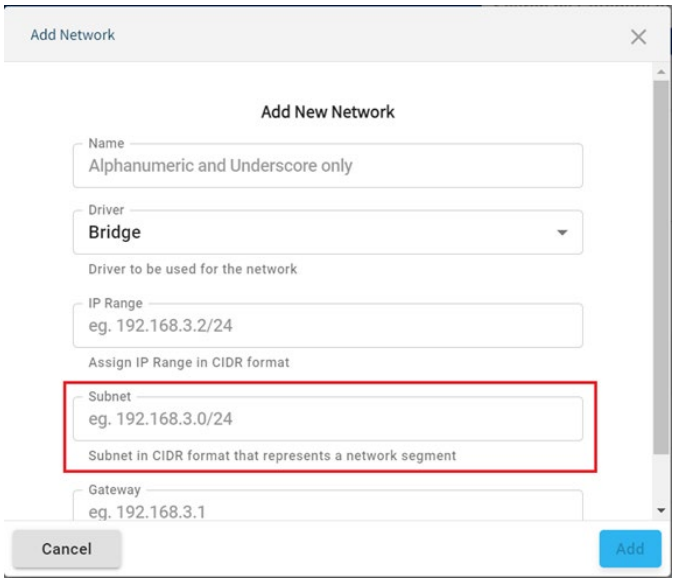
6. If chosen driver is “MACVLAN”, then ‘Parent Interface’ field is also required and select the Interface from the dropdown.



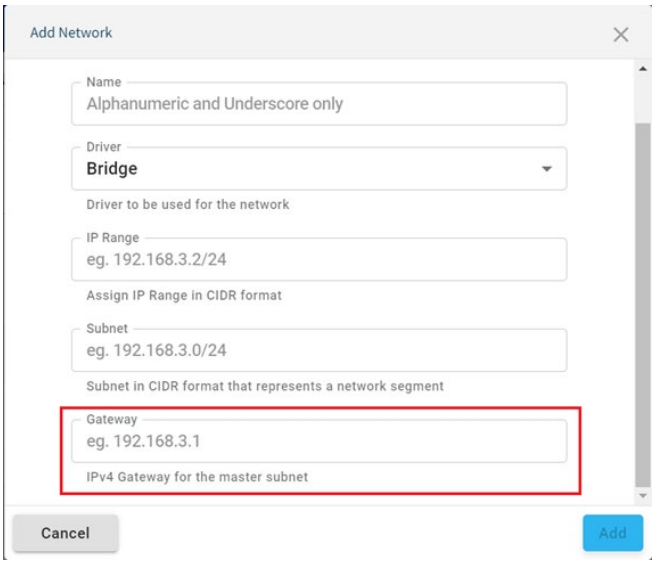
7. Assign IP range to the network in CIDR (Classless Inter Domain Routing) format.



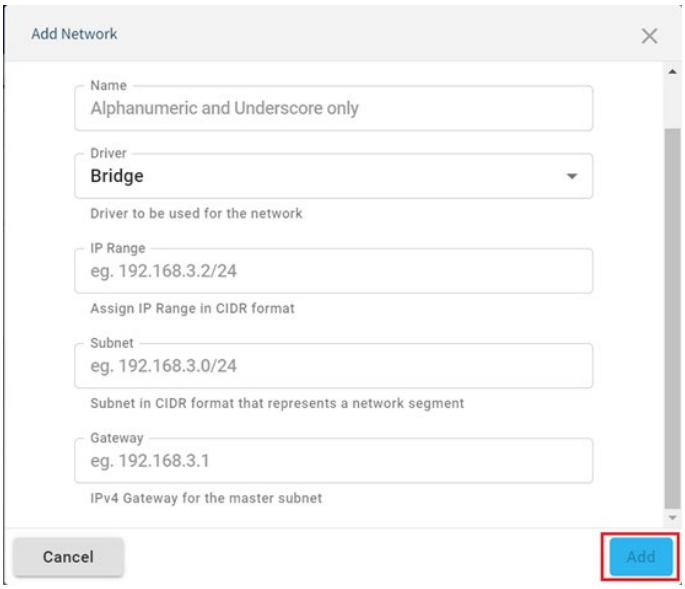
8. Assign IP range to the subnet in CIDR format.



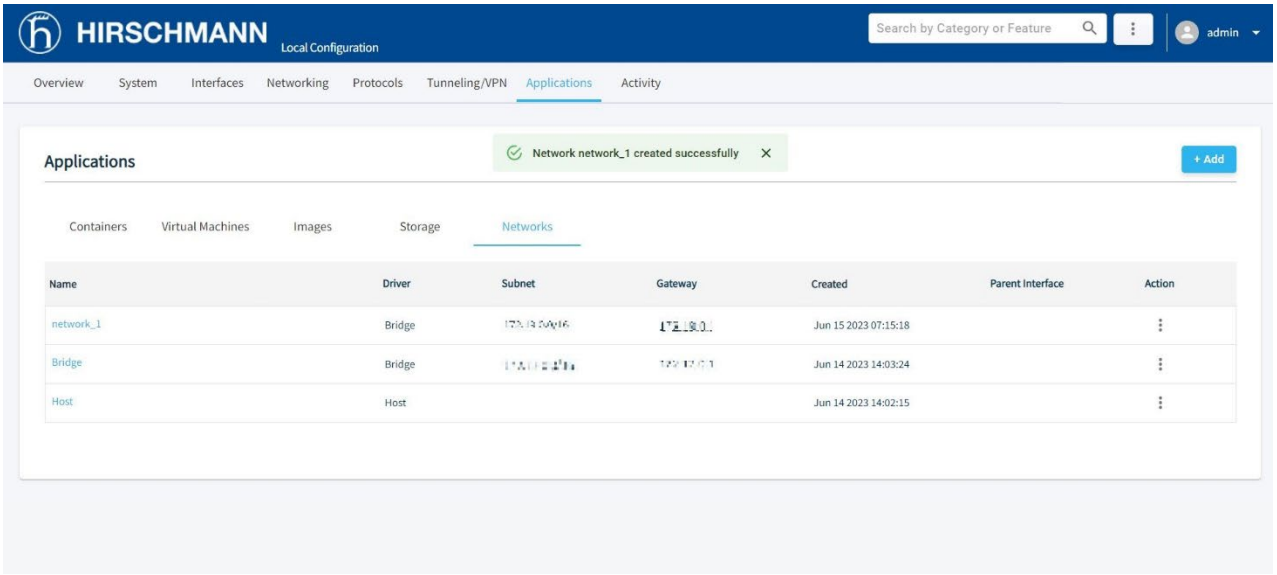
9. Specify IP address for the gateway to master subnet in IPv4 format.



10. Click on Add



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

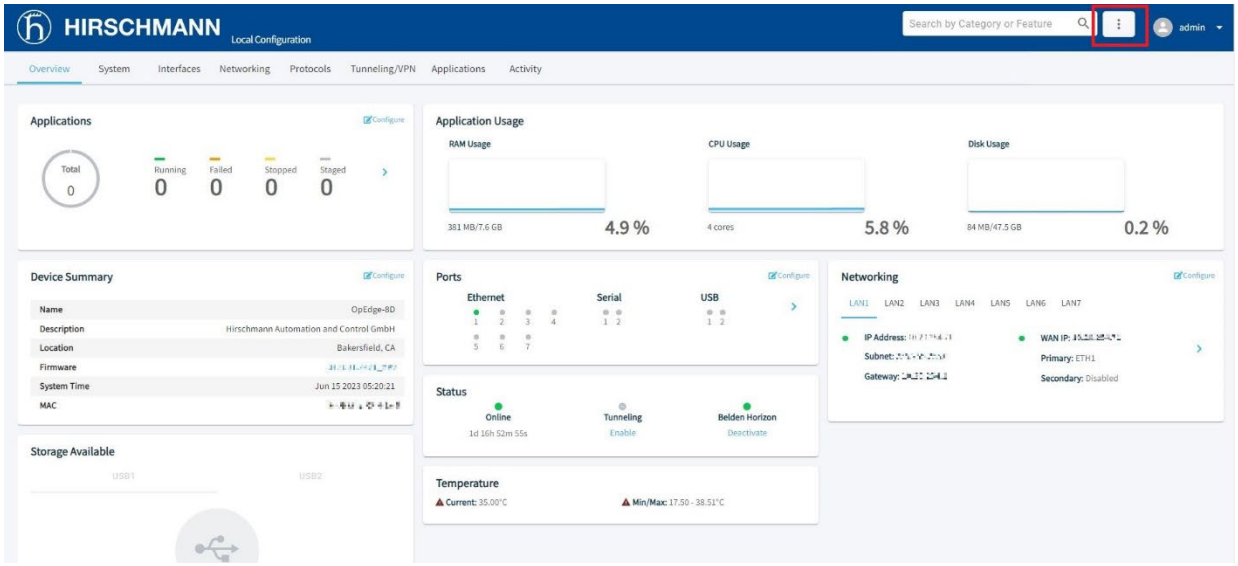
7 Diagnostics

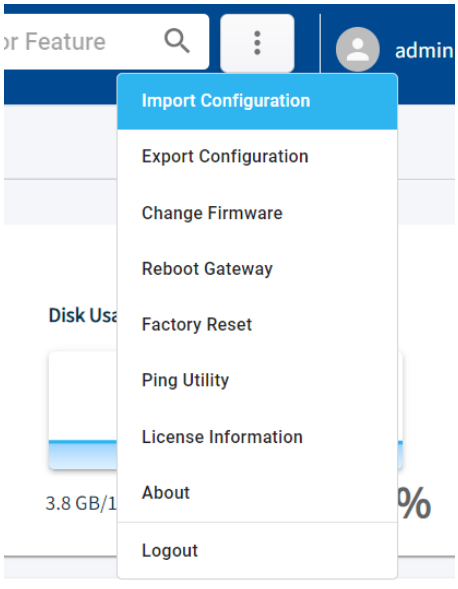
7.1 Factory Reset – Configuration Webpage

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.

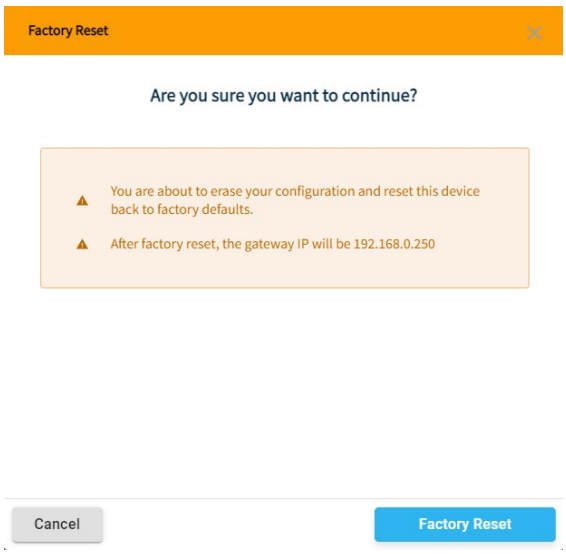
2 On the OpEdge webpage, click the **SETTINGS** button ⋮ in the top right corner of the page.



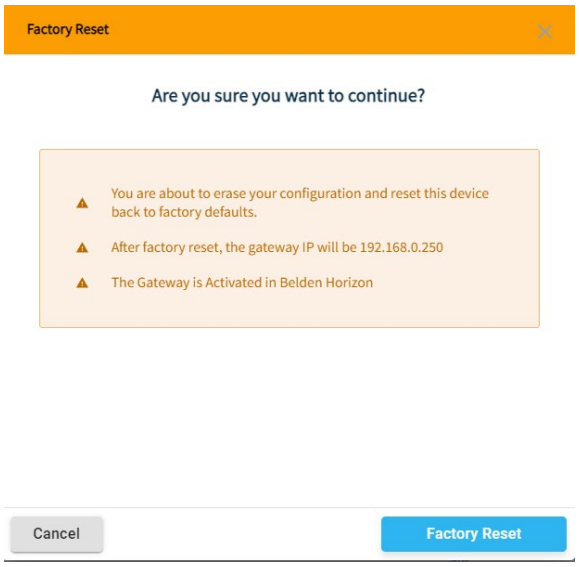


3 From the displayed drop-down list, select **FACTORY RESET**.

The *Factory Reset* pop-up is displayed.



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



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

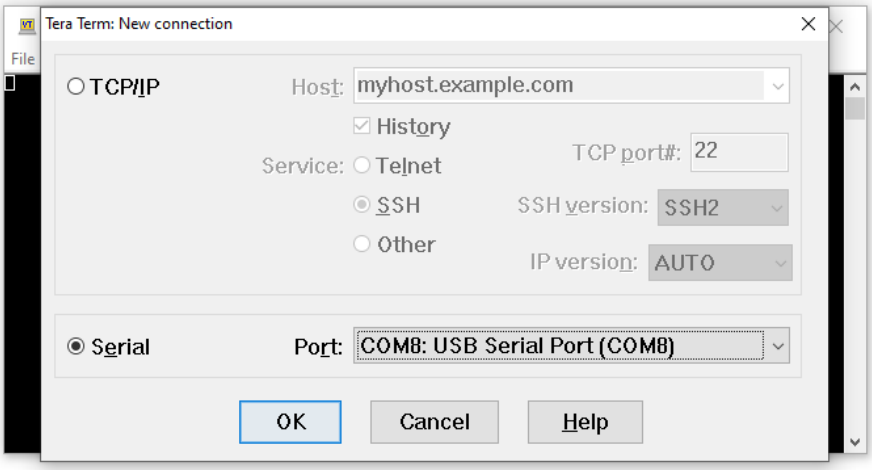
Once the factory reset procedure is completed, log in to the gateway using the default credentials (admin/password). After the initial login, the user is prompted to change the default password.

7.2 Factory Reset – Command Line Interface

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

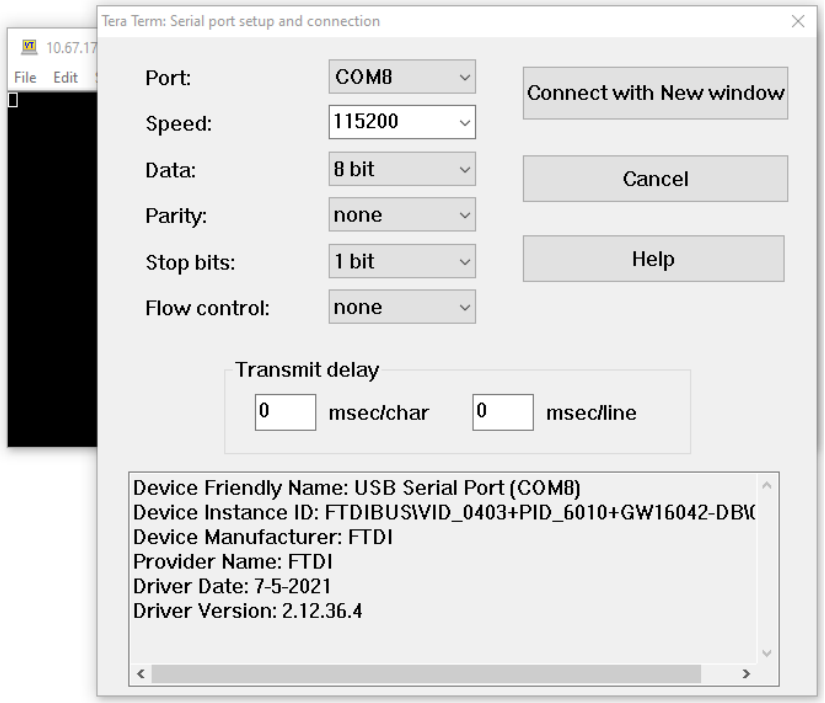
1 Connect to the console port of the OpEdge using a Terminal Emulator like Tera Term or Putty.

2 Select the COM Port on which the console shall be connected.



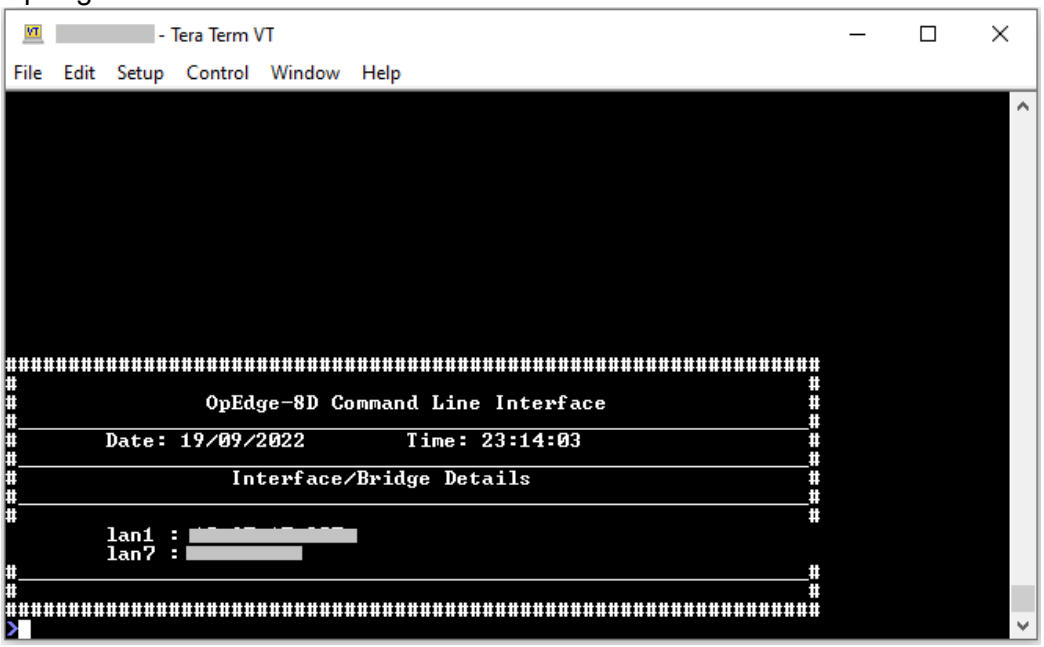
3 Set the below mentioned parameters for the Serial Ports:

a) Baud Rate/ Speed: 115200
b) Data: 8 bit
c) Parity: None
d) Stop Bits: 1 bit
e) Flow Control: None

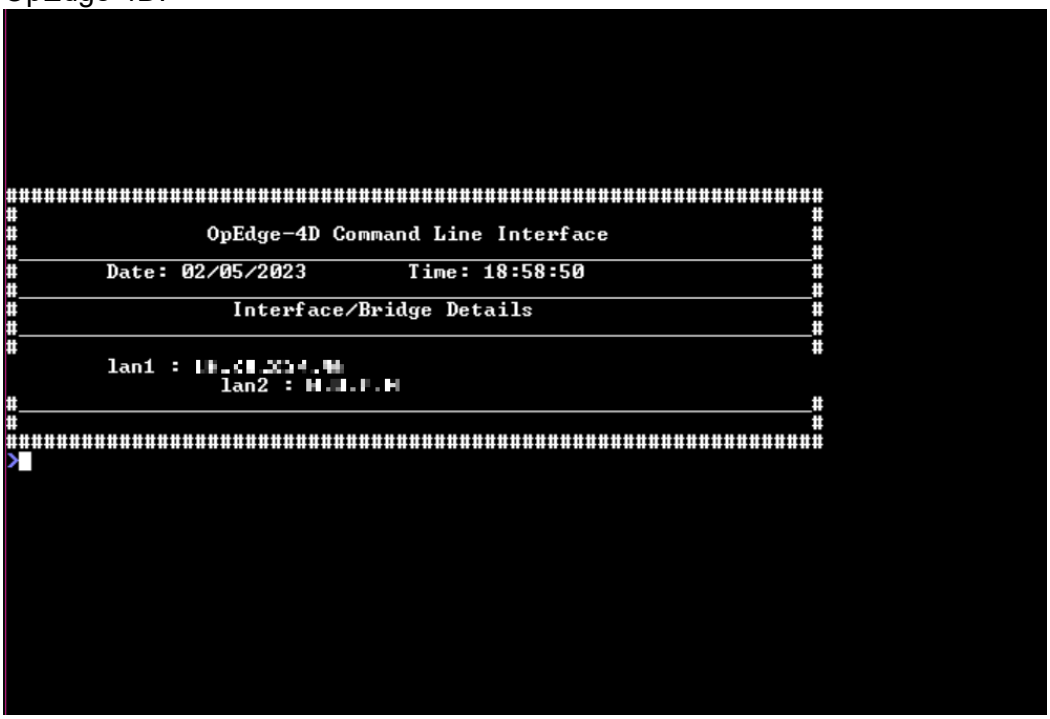


4 The command line interface will be available, on successful console connection to the OpEdge.

OpEdge-8D:



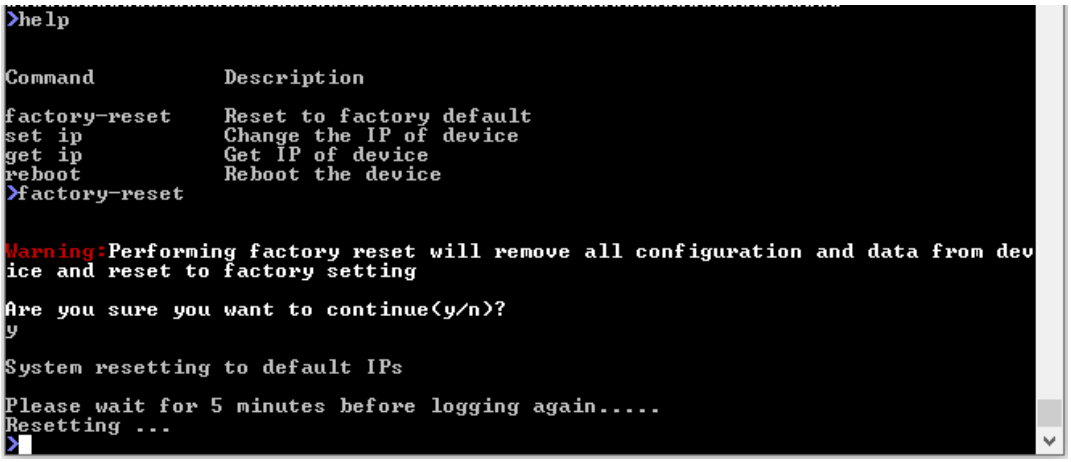
OpEdge-4D:



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

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

7 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.

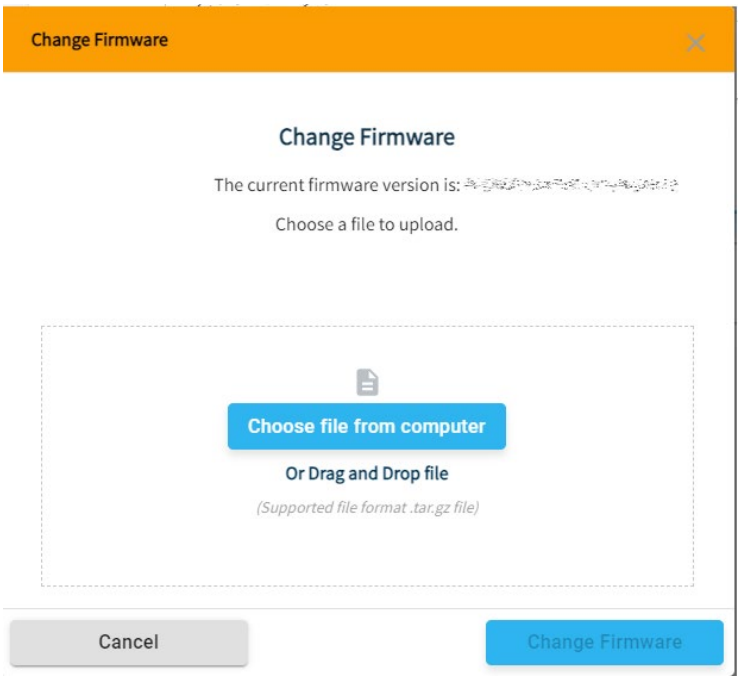


7.3 Updating Firmware

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

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 log 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 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” eventSource=” eventID=”1011”]	Structure data element with a non-IANA controlled SD-ID of type "examp“eSDID@3243”, which has 3 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: https://belden.com

C. Troubleshooting the OpEdge

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

   There are 7 Ethernet ports on the OpEdge-8D and 4 Ethernet ports on the OpEdge-4D. Any port can be configured as a WAN or LAN port. There can only be a maximum of 1 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 to 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 1 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.

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 https://www.belden.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.

Customer Innovation Center

The Customer Innovation Center is ahead of its competitors on three counts with its complete range of innovative services:

- Consulting incorporates comprehensive technical advice, from system evaluation through network planning to project planning.
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- Support ranges from the first installation through the standby service to maintenance concepts.

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