



Managing Device Inventory

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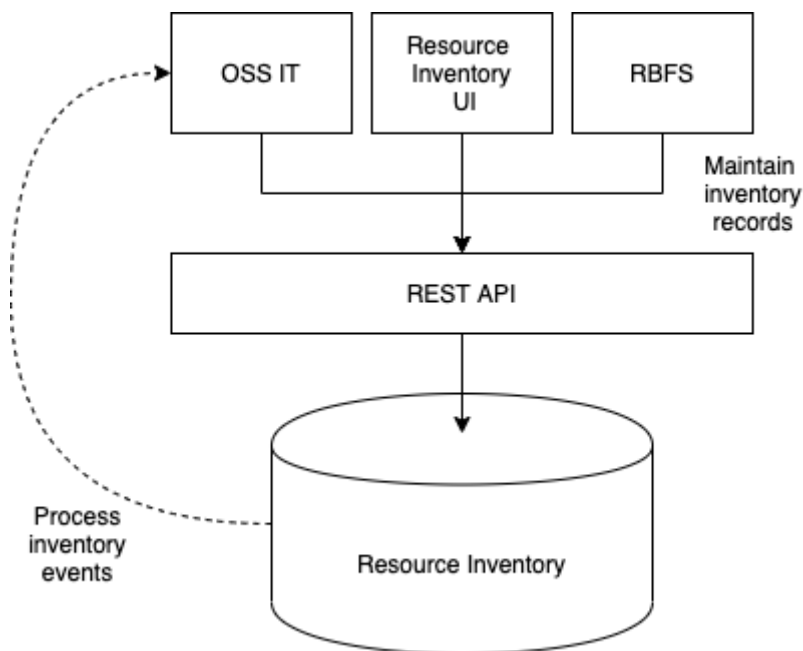
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1. Managing Inventory

1.1. Introduction

The resource inventory stores information about the elements installed in the network. The resource inventory provides a REST API to maintain the resource inventory records. In addition, the resource inventory contributes views to the RBMS UI. The resource inventory UI only uses the REST API to maintain the resource inventory records. Typically three consumers of the resource REST API exists as illustrated below:



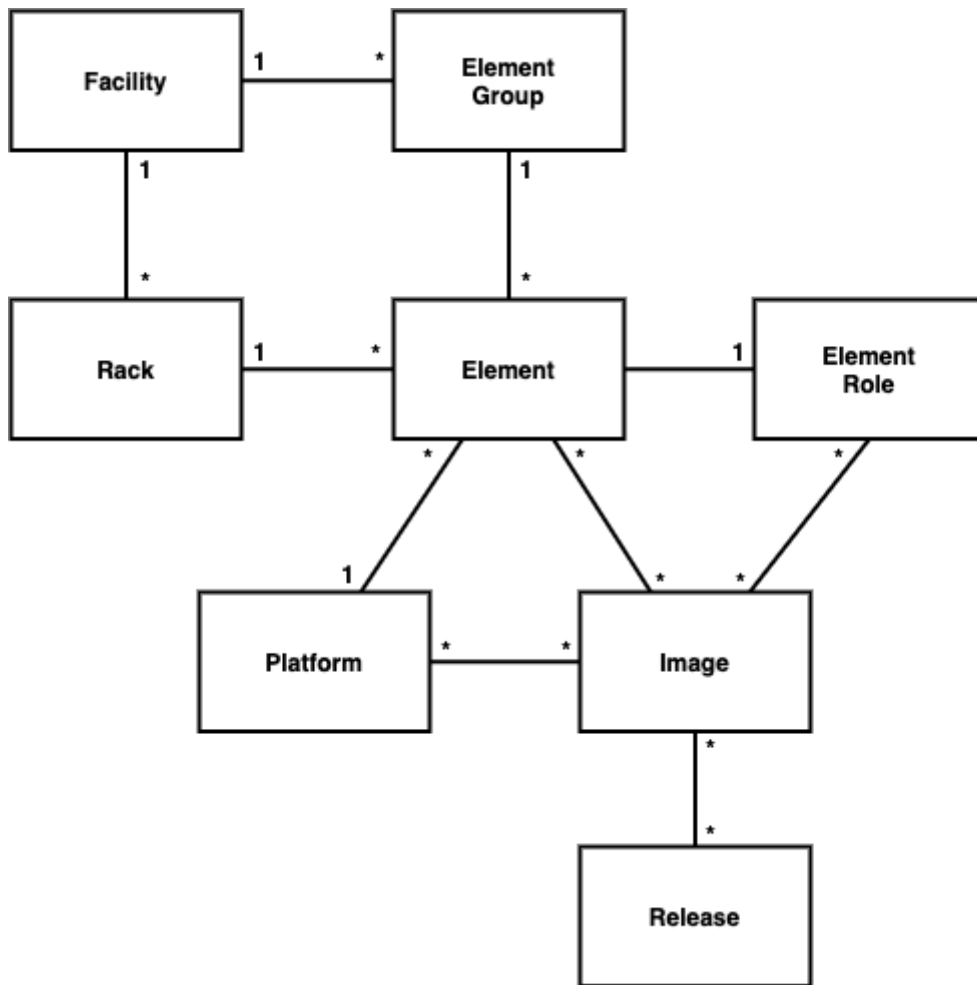
1. RBFS uses the resource inventory API to register itself in RBMS. RBFS reports the running services, physical interfaces, discovered neighbors, logical interfaces, hardware module information, information about the installed software image and the current configuration, including configuration changes, to RBMS.
2. The RBMS UI uses the resource inventory API to enable an operator to view and manage resource inventory records.
3. The OSS IT, or any other customer IT system can use the REST API to manage resource inventory records. It is also feasible to subscribe for events to get notified when a resource inventory record changes.

1.2. Data model

The resource inventory data is also the basis for the network management applications provided by RBMS. The data model is generalized allowing you to define additional roles to store custom elements, for example, to simplify automation of network management operations by storing the required data in

the same database.

The main entities of the resource inventory and their relationships are shown below:



1.2.1. Element, element role and platform

The element forms the cornerstone of the resource inventory. Every element has a certain role, like a spine or a leaf switch of a fabric for example. The element role describes the function of an element in the network.

The resource inventory stores the following information per element:

- General settings including the element role, element name, an optional element alias, the operational and administrative state, the serial number, the hardware platform, an optional asset ID and management interfaces like SSH or REST API access.
- List of physical interfaces and their operational state
- List of logical interfaces and their operational state
- Information about the installed software image

- Installed services including their current state
- Element hardware modules
- Element configurations including a configuration history
- Environments containing custom data used to generate the element configuration.

The platform provides information about the hardware platform vendor, model and chipset. This information is needed to discover the software images that can be installed on this element.

The element has one of the following administrative states:

Administrative State	Description
NEW	A new element that has not yet been installed or enabled in the network.
ACTIVE	An element that has been installed in the network and is supposed to be up and running.
RETIRED	An element that is about to being removed from the network.

The following operational states exist:

Operational State	Description
DOWN	The element is down.
UP	The element is up.
DETACHED	RBMS did not receive heartbeats from the element and declares it as detached from RBMS.
MAINTENANCE	The element is currently in maintenance.

1.2.2. Image

The image provides information about the images being eligible for deployment. RBMS supports prupose-build image that can be installed on certain element roles and platforms only. RBMS includes a image lifecycle management with the following states:

State	Description
NEW	A new image that is not yet eligible for deployment.

State	Description
CANDIDATE	A candidate image to become the next release. The image is eligible for deployment but not installed by default.
RELEASE	The image that get installed by default.
SUPERSEDED	A former release image that has been replaced by another release image.
REVOKED	An image that has been revoked and must not be installed any more. A revoked image retains in the intenvory for the sake of documentation.

1.2.3. Element Group

Each element belongs to an element group. Elements of the same element group form a logical unit inside the network. For example, a pod of an access network is modelled as element group.

1.2.4. Facility and racks

The facility describes a network facility including it’s physical location. Moreover the racks installed at a facility can be specified. This also includes the locations of elements in a rack.

1.3. Managing Pods

1.3.1. Filtering Pod list by Pod name

To filter Pod list by Pod name

1. Click the **Inventory** tab. The Pods page appears by default.
2. In the **Filter** text box, specify the filter criteria and then click **Filter**. The Pods that match the filter criteria appear.

Inventory

Manage network elements



Images Inventory Metrics Jobs Logs Administration

Logout

Inventory –

- Pods**
- Elements
- Interfaces
- Facilities
- Racks
- DNS Zones

Administration +

Pods

Overview of all registered pods.

Filter

Enter a filter expression... Filter

Filter elements by their name or alias.

Pods

Explore existing pods or [add a new pod](#).

Pod	Elements	Tags	Description
blr	4 active 4 in total	BLR lab	BLR lab environment
chris	1 active 4 in total		
karthik	1 active 1 in total	 	blr
pod1	6 active 6 in total	NBG lab	Pod1 in NBG lab
pod2	6 active 6 in total	NBG lab	Pod2 in NBG lab.

5 pod(s) found.

1.3.2. Creating Pods

To create a Pod

1. Click the **Inventory** tab. The list of Pods appears by default.
2. In the **Pods** page, click the **Add pod**.

Inventory

Manage network elements

Images Inventory Metrics Jobs Administration

Logout

Inventory –

- Pods**
- Elements
- Interfaces
- Facilities
- Racks
- DNS Zones

Administration +

Pods > New Pod

New Pod

Add a new pod

Settings

Pod Name

Pod12

The name of the pod

Description

Pod12 in NBG lab

A brief description of this pod

3. In the **Pod Name** field, specify the name of the Pod.

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4. In the **Description** field, specify a brief description for the Pod.
5. In the **Tags** field (optional), specify the tags that can be used to categorise the Pod.
6. Click **Add Pod**.

1.3.3. Modifying Pod settings

To modify the Pod settings

1. Click the **Inventory** tab. The list of Pods appear by default.
2. In the **Pods** group box, click the Pod that you want to modify. The **Pod Settings** page appears.

The screenshot shows the 'Pod Settings' page. On the left is a sidebar with a vertical list of options: 'Pod Settings' (highlighted in orange), 'Pod Location', 'Elements', 'Link State Graph', and 'Administration' with a plus sign. The main area contains several sections: 'Name' with a text input field containing 'pod1' and a label 'The name of the pod'; 'Facility Name' with a text input field and a 'Change facility' button, with a label 'The main facility where this pod is installed at'; 'Description' with a large text area containing 'Pod1 in NBG lab' and a label 'An optional description of the pod'; and 'Tags' with a row of buttons: 'NBG' (with a minus sign), 'lab' (with a minus sign), an empty input field (with a plus sign), and a label 'Optional tags to categorize the pod'. At the bottom right of the main area are two buttons: 'Remove pod' (grey) and 'Save settings' (green).

3. Make the necessary updates and click **Save settings**.

1.3.4. Removing Pods

To remove a Pod

1. Click the **Inventory** tab. The list of Pods appear.
2. In the **Pods** group box, click the Pod that you want to remove. The **Pod Settings** page appears.

Pod Settings

Pod Location

Elements

Link State Graph

Administration +

Name

The name of the pod

Facility Name

 Change facility

The main facility where this pod is installed at

Description

An optional description of the pod

Tags

+

Optional tags to categorize the pod

Remove pod
Save settings

1.3.5. Viewing Pod location

To view the facility where a Pod is installed

1. Click the **Inventory** tab. The list of Pods appear.
2. In the **Pods** group box, click the Pod whose facility you want to view.
3. Click **Pod location** in the left navigation pane. The **Pod Facility** page appears.

Inventory

Manage network elements



Images Inventory Metrics Jobs Logs Administration Logout

Inventory +

Pods > blr > Facility

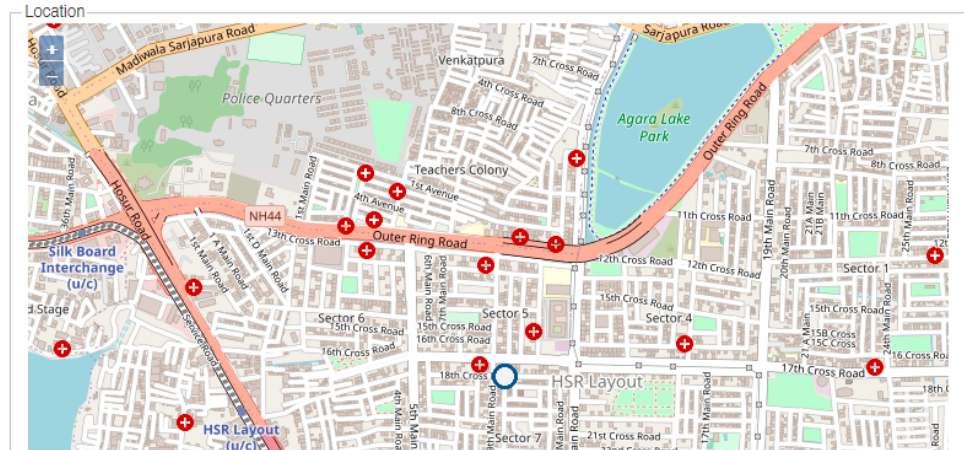
Pod Facility

blr

The facility where pod blr is installed at.

- Pod -
- Pod Settings
- Pod Location**
- Elements
- Link State Graph

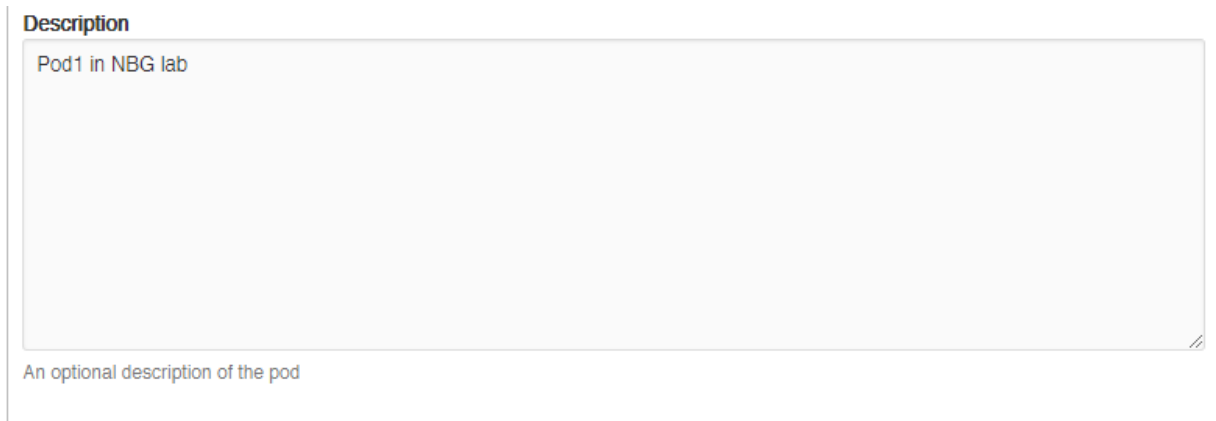
- Administration +



1.3.6. Describing Pod racks

To describe the Pod racks

1. Click the **Inventory** tab. The list of Pods appear.
2. In the **Pods** group box, click the Pod that you want to modify. The **Pod Settings** page appears.
3. Specify the description for Pod rack.



The screenshot shows a form titled "Description" with a text input field. The field contains the text "Pod1 in NBG lab". Below the field, there is a placeholder text: "An optional description of the pod".

1.3.7. Adding element to Pod

To add element to Pod

1. Click the **Inventory** tab. The list of Pods appear.
2. In the **Pods** group box, click the Pod that you want to modify. The **Pod Settings** page appears.
3. Click **Elements** from the left navigation pane. The **Elements** page appears.
4. Click **Add element**.

Inventory

Manage network elements



Images **Inventory** Metrics Jobs Administration

Logout

Inventory +

pod1

Pod -

- Pod Settings
- Pod Location
- Elements**
- Link State Graph

Administration +

Elements > New Element

New Element

Add a new element to pod1

Element Settings

Element Name

The unique name of the element

Element Alias

An optional unique element alias

Element Role

Access Leaf ↕

Select the role of the element

Hardware Platform

EC5916-54XK ↕

Select the hardware platform of the element

1.3.8. Listing elements of a Pod

To view the list of element in Pod

1. Click the **Inventory** tab. The list of Pods appear.
2. In the **Pods** group box, click the Pod that you want to modify. The **Pod Settings** page appears.
3. Click **Elements** from the left navigation pane. The **Elements** page appears and the list of elements in the selected Pod appear.

Inventory

Manage network elements



Images **Inventory** Metrics Jobs Administration

Logout

Inventory +

pod1

Pod -

- Pod Settings
- Pod Location
- Elements**
- Link State Graph

Administration +

Pods > Elements

Elements

Elements of pod pod1

Elements

Name	Alias	Adm.-State	Op.-State	Tags	Description
bl1.pod1.nbg2	bl1.pod1	ACTIVE	DETACHED	NBG lab pod1	Border leaf 1 in pod 1 in NBG lab.
bl2.pod1.nbg2	bl2.pod1	ACTIVE	DETACHED	NBG lab pod1	Border leaf 2 in pod 1 in NBG lab
l1.pod1.nbg2	l1.pod1	ACTIVE	DETACHED	NBG lab pod1	Access leaf 1 in pod 1 in NBG lab
l2.pod1.nbg2	l2.pod1	ACTIVE	DETACHED	NBG lab pod1	Access leaf 2 in pod1 in NBG lab.
s1.pod1.nbg2	s1.pod1	ACTIVE	DETACHED	NBG lab pod1	Spine 1 in pod 1 in NBG lab.
s2.pod1.nbg2	s2.pod1	ACTIVE	DETACHED	NBG lab pod1	Spine 2 in pod1 in NBG lab.

Add element

1.3.9. Viewing Link State Graph

To view the link state graph of Pod

1. Click the **Inventory** tab. The list of Pods appear.
2. In the **Pods** group box, click the Pod that you want to view. The **Pod Settings** page appears.
3. Click **Link State Graph** in the left navigation pane. The **Link State Graph** page appears.

The screenshot shows the 'Inventory' page for pod 'blr'. The left sidebar has 'Link State Graph' selected. The main area shows a 'Link State Graph' with a filter box and a diagram of four pods: l1.pod1.blr, s1.pod1.blr rtbrick, l2.pod1.blr, and s2.pod1.blr. A 'Details' button is located at the bottom right of the graph area.

4. On the **Link State Graph** page, select a network element to display link information.
5. Click **Details** to view the detailed information of network elements.

The screenshot shows the 'Inventory' page for pod 'blr' with detailed information for each pod. The pods are shown in a table format with status indicators: DETACHED for l1.pod1.blr, s1.pod1.blr rtbrick, and l2.pod1.blr, and DOWN for s2.pod1.blr. An 'Overview' button is located at the bottom right of the graph area.

l1.pod1.blr	s1.pod1.blr rtbrick	l2.pod1.blr	s2.pod1.blr
DETACHED	DETACHED	DETACHED	DOWN
Access Leaf	Access Leaf	Access Leaf	Access Leaf
EC5916-54XK	EC5916-54XK	EC5916-54XK	EC5916-54XK

1.3.10. Viewing Pod Topology

The topology view provides the following functionalities:

- Visualizes the Pod link-state graph
- Visualizes connected Pods
- Provides quick access to most relevant information
 - Alerts
 - Events
 - Established links

To view the Pod topology

1. Click the **Inventory** tab. The list of Pods appear.
2. In the **Pods** group box, click the Pod that you want to view. The **Pod Settings** page appears.
3. Click **Link State Graph** in the left navigation pane. The **Link State Graph** page appears.
4. Click the **view all pods** link that is displayed along the bottom of the page. The **Topology** page appears.

The screenshot shows the 'Inventory' page for pod 'blr'. The 'Link State Graph' section displays a diagram of four pods connected in a line. Each pod is represented by a table with the following structure:

DETACHED
Access Leaf
i1.pod1.blr
EC5916-54XK

--- (dashed red line) ---

DETACHED
Access Leaf
s1.pod1.blr rtbrick
EC5916-54XK

--- (dashed red line) ---

DETACHED
Access Leaf
i2.pod1.blr
EC5916-54XK

--- (dashed red line) ---

DOWN
Access Leaf
s2.pod1.blr
EC5916-54XK

At the bottom of the diagram, there is a text prompt: ".....Please pick a network element to display link informations or [view all pods](#) to navigate to a different pod....."

The **Topology** page displays the overview of the Pod topology in a graphical interface along with a table that shows the list of Pods deployed in the network.

1.4. Managing Elements

To view the list of all registered elements

1. Click the **Inventory** tab, and then click **Elements** in the left navigation pane. The list of registered elements appear.

The screenshot shows the 'Inventory' management interface. The 'Elements' tab is active, displaying an overview of all registered elements. A search bar labeled 'Expression' is present with a 'Filter' button. Below the search bar, a table lists the elements with the following data:

Pod	Element	Alias	Adm.-State	Tags	Description
blr	i1.pod1.blr		ACTIVE	BLR RBMS lab	
blr	i2.pod1.blr		ACTIVE	BLR lab	
blr	s1.pod1.blr		ACTIVE	BLR lab	
blr	s2.pod1.blr		ACTIVE	BLR lab	
chris	chris		NEW		
chris	cspine		ACTIVE		
chris	demo	demo	ACTIVE		

1.4.1. Assigning roles to elements

1. Click the **Inventory** tab, and then click **Elements** in the left navigation pane. The list of registered elements appear.
2. Click the name of the element that you want view.
3. In the **Element Role** box, select the role you want to use. The following roles are available:
 - **Access Leaf**- Access leaf fabric switch
 - **Border Leaf** - Border leaf fabric switch
 - **Spine** - Spine fabric switch

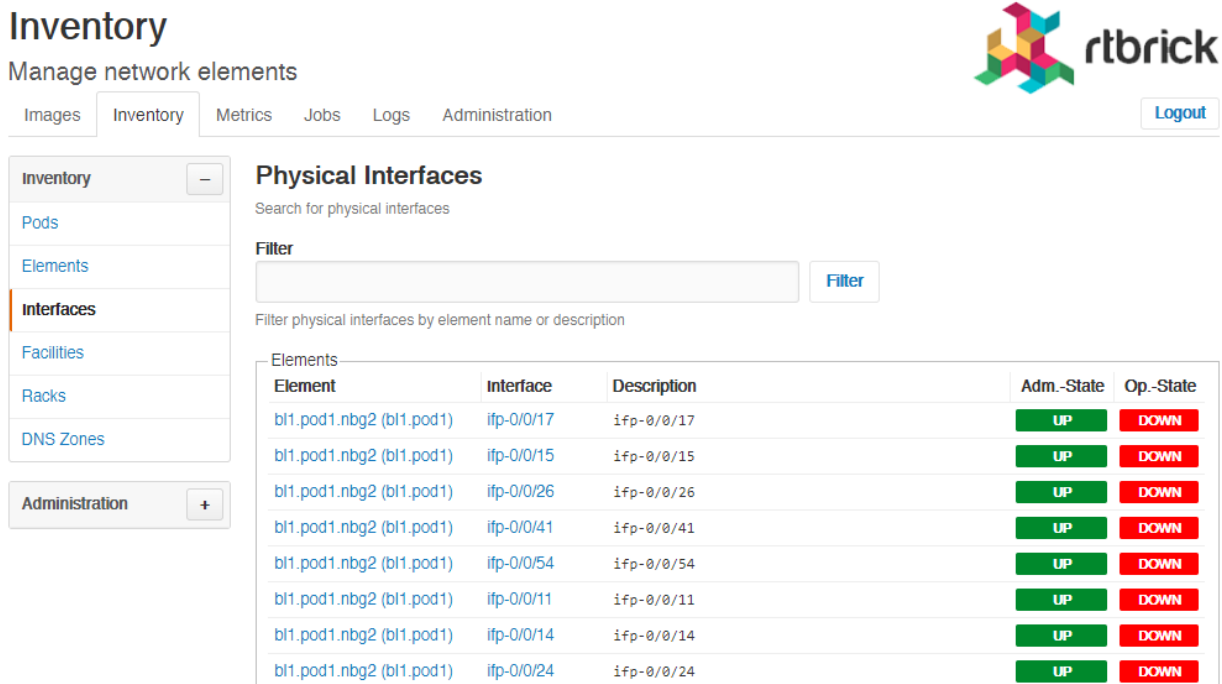
1.5. Viewing Physical Interfaces

The physical interface summary shows the information of a physical interface and its logical interfaces. The view might be augmented with telemetry data (for example, current interface utilization, log messages).

To view the list of physical interfaces

1. Click the **Inventory** tab.

- In the left navigation pane, click **Interfaces**. The **Physical Interfaces** page appears.



Inventory
Manage network elements

Images | **Inventory** | Metrics | Jobs | Logs | Administration

Logout

Physical Interfaces
Search for physical interfaces

Filter

Filter physical interfaces by element name or description

Elements

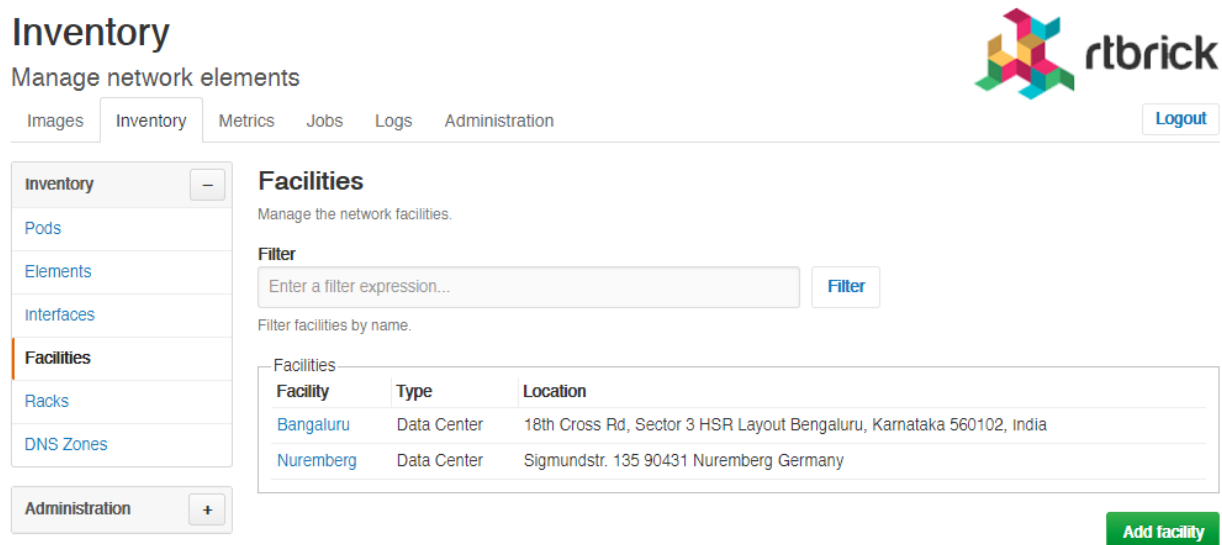
Element	Interface	Description	Adm.-State	Op.-State
bl1.pod1.nbg2 (bl1.pod1)	ifp-0/0/17	ifp-0/0/17	UP	DOWN
bl1.pod1.nbg2 (bl1.pod1)	ifp-0/0/15	ifp-0/0/15	UP	DOWN
bl1.pod1.nbg2 (bl1.pod1)	ifp-0/0/26	ifp-0/0/26	UP	DOWN
bl1.pod1.nbg2 (bl1.pod1)	ifp-0/0/41	ifp-0/0/41	UP	DOWN
bl1.pod1.nbg2 (bl1.pod1)	ifp-0/0/54	ifp-0/0/54	UP	DOWN
bl1.pod1.nbg2 (bl1.pod1)	ifp-0/0/11	ifp-0/0/11	UP	DOWN
bl1.pod1.nbg2 (bl1.pod1)	ifp-0/0/14	ifp-0/0/14	UP	DOWN
bl1.pod1.nbg2 (bl1.pod1)	ifp-0/0/24	ifp-0/0/24	UP	DOWN

1.6. Managing Facilities

1.7. Viewing list of facilities

To view the list of facilities

- Click the **Inventory** tab.
- In the left navigation pane, click **Facilities**. The list of available facilities appear.



Inventory
Manage network elements

Images | **Inventory** | Metrics | Jobs | Logs | Administration

Logout

Facilities
Manage the network facilities.

Filter

Enter a filter expression...

Filter facilities by name.

Facilities

Facility	Type	Location
Bangaluru	Data Center	18th Cross Rd, Sector 3 HSR Layout Bengaluru, Karnataka 560102, India
Nuremberg	Data Center	Sigmundstr. 135 90431 Nuremberg Germany

Add facility

1.7.1. Creating a Facility

To create a facility

1. Click the **Inventory** tab.
2. In the left navigation pane, click **Facilities**. The list of available facilities appear.
3. Click **Add facility**.
4. Specify the facility settings such as facility name, type, and description.
5. Click **Add facility**.

The screenshot shows the 'Inventory' management interface. The left sidebar has 'Facilities' selected. The main content area is titled 'New Facility' and contains a form with the following fields:

- Facility Name:** A text input field with a placeholder.
- Facility Type:** A dropdown menu currently set to 'Data Center'.
- Description:** A text area for entering details.

Navigation tabs at the top include 'Images', 'Inventory', 'Metrics', 'Jobs', 'Logs', and 'Administration'. A 'Logout' button is in the top right corner.

1.8. Managing Racks

To view the list of racks

1. Click the **Inventory** tab.
2. In the left navigation pane, click **Racks**. The list of available racks appear.

The screenshot shows the 'Inventory' management interface with 'Racks' selected in the left sidebar. The main content area displays a table of racks:

Rack	Facility	State	Description
nbg1	Nuremberg	UNKNOWN	Hetzner NBG

Below the table is a green 'Add rack' button. Above the table is a filter input field with a 'Filter' button. The interface also shows navigation tabs and a 'Logout' button.

1.8.1. Creating a Rack

To create a rack

1. Click the **Inventory** tab.
2. In the left navigation pane, click **Racks**. The list of available racks appear.
3. Click **Add rack**.

The screenshot shows the 'Inventory' management interface. The top navigation bar includes 'Images', 'Inventory' (selected), 'Metrics', 'Jobs', 'Logs', and 'Administration'. A 'Logout' button is in the top right. The left sidebar lists 'Inventory', 'Pods', 'Elements', 'Interfaces', 'Facilities', 'Racks' (selected), and 'DNS Zones'. Below the sidebar is an 'Administration' section with a '+' button. The main content area shows the breadcrumb 'Racks > New Rack' and the title 'New Rack'. Below the title is the instruction 'Describe new rack.' and a 'General Settings' section. This section contains three fields: 'Rack Name' with the value 'rack1', 'Administrative State' set to 'Active', and a 'Description' field.

4. Specify the rack settings such as rack name, administration state, description, rack dimensions, and other additional information.
5. Click **Add rack**.

1.9. Managing DNS Zones

To view the list of DNS zones

1. Click the **Inventory** tab.
2. In the left navigation pane, click **DNS Zones**. The list of available DNS Zones appear.

1.9.1. Creating a DNS Zone

To create a DNS zone

1. Click the **Inventory** tab.
2. In the left navigation pane, click **DNS Zones**. The list of available DNS zones appear.
3. Click **Add DNZ Zone**.

4. Specify the rack settings such as canonical DNS zone name and description.
5. Click **Add zone**.

1.10. Inventory Administration

To configure the inventory administration settings in the **Inventory** page, click the plus sign (+) next to **Administration**.

1.10.1. Managing element platforms

To list down the known hardware platforms

1. Click the **Inventory** tab.
2. click the plus sign (+) next to **Administration**.
3. Click **Platforms**. The list of hardware platforms appear.

1.10.1.1. Creating element platforms

To create a hardware platform

1. Click the **Inventory** tab.
2. click the plus sign (+) next to **Administration**.
3. Click **Platforms**. The list of hardware platforms appear.
4. Click **Add platform**.
5. Specify the settings and dimensions of the hardware platform.
6. Click **Save platform**.

1.10.1.2. Removing element platforms

To remove an element platform

1. Click the **Inventory** tab.
2. Click the plus sign (+) next to **Administration**, and then click **Platforms**. The list of hardware platforms appear.
3. Click the name of the element platform that you want delete. The **Platform Settings** page displays the settings of the element platform.
4. Click **Remove**.

1.10.2. Managing Element Roles

To list down the existing element roles

1. Click the **Inventory** tab.
2. click the plus sign (+) next to **Administration**.
3. Click **Roles**. The list of existing element roles appear.

1.10.2.1. Creating Element Roles

To create an element role

1. Click the **Inventory** tab.
2. click the plus sign (+) next to **Administration**. The list of existing element roles appear.
3. Click **Roles**. The list of existing element roles appear.
4. Click **Add role**
5. Specify the role settings.
6. Click **Save role**.

1.10.2.2. Removing Element Roles

To remove an element role

1. Click the **Inventory** tab.
2. click the plus sign (+) next to **Administration**. The list of existing element roles appear.
3. Click **Roles**. The list of existing element roles appear.
4. Click the name of the element role that you want delete. The next page displays the settings of the element role.
5. Click **Remove role**.

1.10.3. Managing Templates

To list down the existing templates

1. Click the **Inventory** tab.
2. click the plus sign (+) next to **Administration**.
3. Click **Templates**. The list of existing element templates appear.

1.10.3.1. Creating Templates

To create a template

1. Click the **Inventory** tab.

2. click the plus sign (+) next to **Administration**. The list of existing element templates appear.
3. Click **Add templates**
4. Specify the template settings such as template name and description.
5. Click **Save template**.

1.10.3.2. Removing Templates

To remove a template

1. Click the **Inventory** tab.
2. click the plus sign (+) next to **Administration**. The list of existing element templates appear.
3. Click **Templates**. The list of existing element templates appear.
4. Click the name of the template that you want delete. The next page displays the settings of the template.
5. Click **Remove template**.