

Administering RBMS

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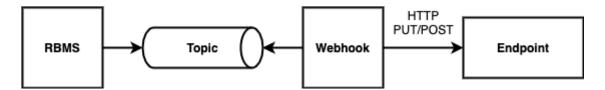
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1. Administration

1.1. Managing Webhooks

A webhooks is a registered HTTP endpoint that forwards notifications from RBMS to an external endpoint.



RBMS stores a *domain event* if a status in RBMS has changed. An event is only created when the transaction was comitted. An event is not fired when the transaction rolls back.

The events are grouped in different topics:

- element, the element topic contains all element-related messages
- image, the image topic contains all image-related messages

An event has a descriptive name that describes what state change is being reported. All events have a unique ID to identify different instances of the same event unambiguously.

For example, the *ElementRenamedEvent* informs about an element being renamed. The event is stored in the element topic.

A webhook subscribes a topic and calls the configured endpoint for all events that match the specified name filter. By default, the message send to the endpoint contains the JSON representation of the domain event. An optional template allows rewriting the event message.

The authentication can be done via HTTP Basic Authorization or bearer token. RBMS stores the provided credentials AES-protected in the database.



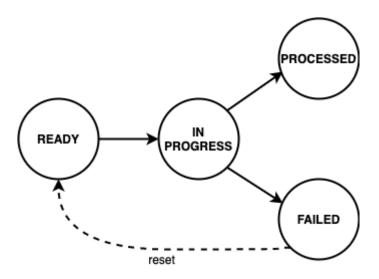
The AES secret and initialization vector (IV) can be specified in the master.secret and master.iv environment variables.

Unauthenticated endpoint calls are also supported.

A webhook invocation is considered *successful* if a HTTP success family status code is returned. For all other status codes the invocation is considered as failed.

A webhook can retry all failed messages. In addition, a webhook can be reset to a certain message to process this message and all subsequent messages again.

The complete message processing lifecycle is shown below:



New domain event messages are *READY* for being processed. The state changes to *IN PROGRESS* when the processing has begun and eventually to *PROCESSED* if the endpoint processed the message successfully and to *FAILED* otherwise respectively.

A webhook can be disabled to temporarily suspend the event processing. All events that occured while the webhook was disabled are processed when the webhook gets enabled again unless the event got dropped because the topic buffering capacity was exceeded.

1.1.1. Viewing Webhooks

To view the list of webhooks

- 1. Click the **Administration** tab.
- 2. Click **Webhooks** in the left navigation pane. The list of all webhooks appear.
- 3. Click the name of the webhook that you want to view.

1.1.2. Adding Webhooks

To add a webhook

- 1. Click the **Administration** tab.
- 2. Click **Webhooks** in the left navigation pane. The list of all webhooks appear.
- 3. Click **Add webhook**
- 4. Specify the general, subscription and authentication information about the webhook.
- 5. Click **Save webhook**.

1.1.3. Disabling a Webhook

To disable a webhook

- 1. Click the **Administration** tab.
- 2. Click **Webhooks** in the left navigation pane. The list of all webhooks appear.
- 3. Select the webhook to be disabled.
- 4. Click **Disable webhook**.

1.1.4. Enabling a Webhook

To enable a webhook

- 1. Click the **Administration** tab.
- 2. Click Webhooks in the left navigation pane. The list of all webhooks appear.
- 3. Select the webhook to be enabled.
- 4. Click Enable webhook.

1.1.5. Reset a Webhook

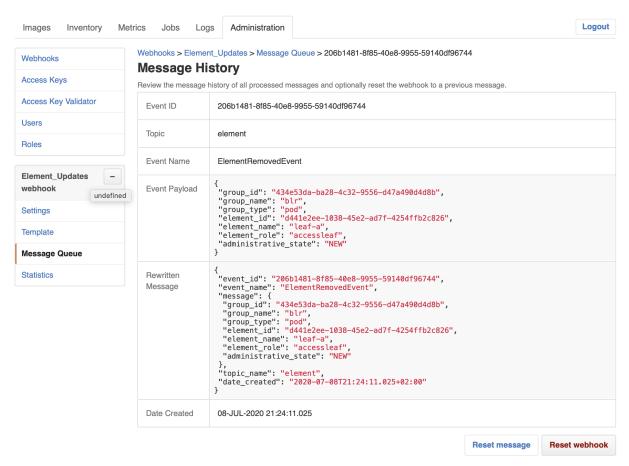
To reset a webhook

- 1. Click the **Administration** tab.
- 2. Click **Webhooks** in the left navigation pane. The list of all webhooks appear.
- 3. Select the webhook to be reset.
- 4. Click **Message Queue** in the left navigation pane. The list of the last 100 processed messages appear.
- 5. Enter the event ID in the **Filter** field and click **Filter**.
- 6. Open the displayed message.

Administration

Manage webhooks, access keys and user accounts



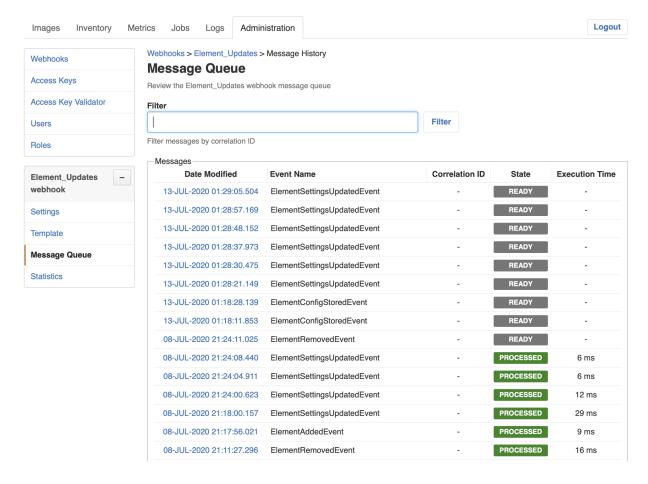


7. Click **Reset webhook** to process the message and all subsequent messages again. The message queue view appears.

Administration

Manage webhooks, access keys and user accounts



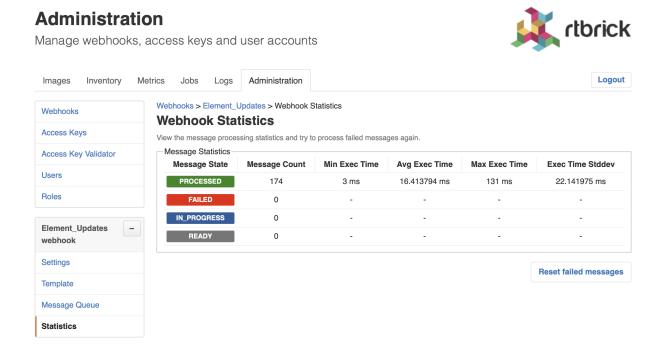


1.1.6. Viewing Webhook Statistics

The webhook statistics provides information about processing times and the message count grouped by the processing state.

To view the webhook statistics

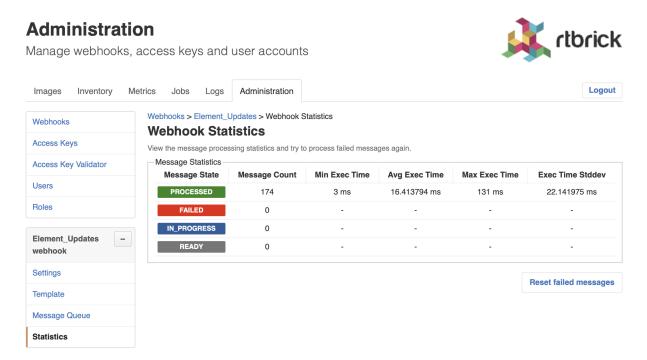
- 1. Click the **Administration** tab.
- 2. Click **Webhooks** in the left navigation pane. The list of all webhooks appear.
- 3. Select the webhook for which to retry the failed invocations.
- 4. Click **Statistics** in the left navigation pane. The webhook statistics appear.



1.1.7. Retrying Failed Webhook Invocations

To retry failed webhook invocations

- 1. Click the **Administration** tab.
- 2. Click **Webhooks** in the left navigation pane. The list of all webhooks appear.
- 3. Select the webhook for which to retry the failed invocations.
- 4. Click **Statistics** in the left navigation pane. The message statistics appear.



1. Click **Reset failed messages** to reset all failed messages to ready state.

1.2. Managing Users

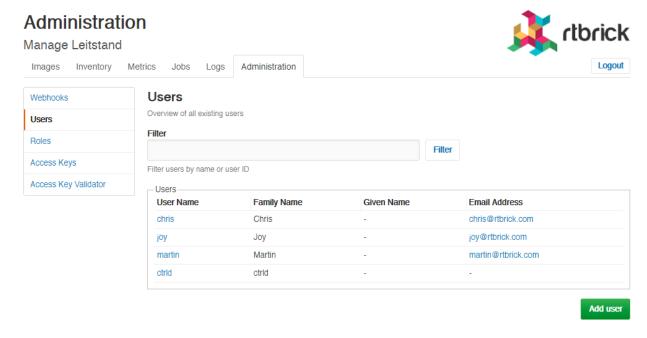


This section outlines how to manage users in the RBMS built-in user repository. If RBMS is connected to an authorization service the users are configured in the authorization service.

1.2.1. Viewing all existing users

To view all existing users

- 1. Click the **Administration** tab.
- 2. Click **Users** in the left navigation pane. The list of all existing users appear.



3. Click the name of the user whose details you want to view.

1.2.2. Adding users

You can add a new users to the user repository.

To add a user

- 1. Click the **Administration** tab.
- 2. Click **Users** in the left navigation pane. The list of all existing users appear.
- 3. On the **Users** page, click **Add user**.
- 4. Specify user details such as username, password, and access token.
- 5. Click Add user.

1.2.3. Removing users

To remove a user

- 1. Click the **Administration** tab.
- 2. Click **Users** in the left navigation pane. The list of all existing users appear.
- 3. Click the name of the user whom you want to remove.
- 4. On the **User Settings** page, click **Remove user**.

1.2.4. Resetting Password

To reset a user password

- 1. Click the **Administration** tab.
- 2. Click **Users** in the left navigation pane. The list of all existing users appear.
- 3. Click the name of the user whom you want to remove.
- 4. On the **User Settings** page, click **Reset password**. The **Reset Password** page appears.
- 5. Enter the new password.
- 6. Re-type the new password in order to detect accidental typos.
- 7. Click Reset Password.

1.3. Managing Roles



This section outlines how to manage roles in the RBMS built-in user repository. If RBMS is connected to an authorization service the roles are be configured in the authorization service. See Scopes for more information about the existing access scopes.

1.3.1. Viewing list of roles

To view the list of roles

- 1. Click the **Administration** tab.
- 2. Click **Roles** in the left navigation pane. The list of all existing users appear. image::admin_roles.png[]
- 2. Click the role that you want to view or modify.

1.4. Creating Roles

To create a role

- 1. Click the **Administration** tab.
- 2. Click **Roles** in the left navigation pane. The list of all existing users appear.
- 3. On the **Roles** page, click **Add role**.
- 4. Specify the details of the new role such as role name, Accessible Resource Scopes, and description.
- 5. Click **Add role**.

1.4.1. Removing roles

To remove a role

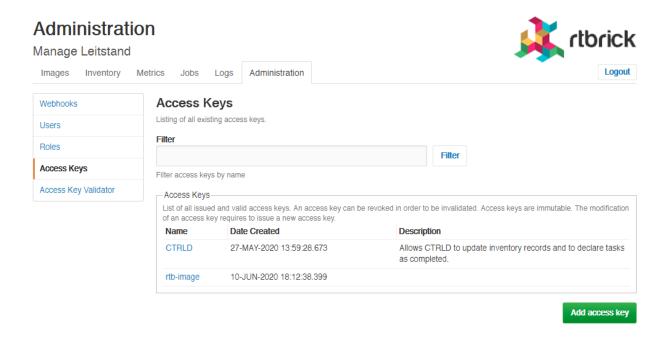
- 1. Click the **Administration** tab.
- 2. Click **Roles** in the left navigation pane. The list of all existing roles appear.
- 3. Click the role that you want to remove.
- 4. On the **Role** <rolename> page, click **Remove role**.

1.5. Managing Access Keys

1.5.1. Viewing list of access keys

To view the list of all existing access keys

- 1. Click the **Administration** tab.
- 2. Click **Access Keys** in the left navigation pane. The list of all existing access keys appear.

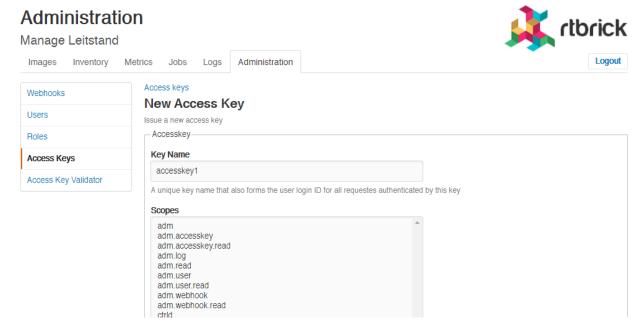


3. Click the name of the access key that you want to view or modify.

1.6. Creating Access Keys

To create an access key

- 1. Click the **Administration** tab.
- 2. Click **Access Keys** in the left navigation pane. The list of all existing access keys appear.
- 3. On the Access Keys page, click Add access key.



4. Specify the details of the new access key such as key name, scopes, and description.

5. Click Create access key.

1.6.1. Revoking an access key

To revoke an access key

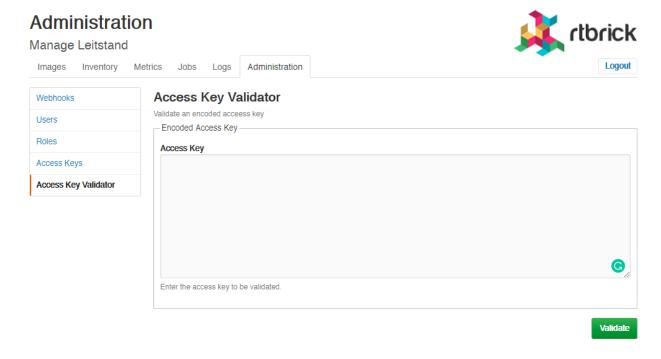
- 1. Click the **Administration** tab.
- 2. Click **Access Key** in the left navigation pane. The list of all existing access keys appear.
- 3. Click the access key that you want to revoke.
- 4. On the <access key name> accesskey page, click Revoke access key.

1.6.2. Validating an access key

The validating access key feature enables you to validate an encoded access key.

To validate an access key

- 1. Click the **Administration** tab.
- 2. Click **Access Key Validator** in the left navigation pane.

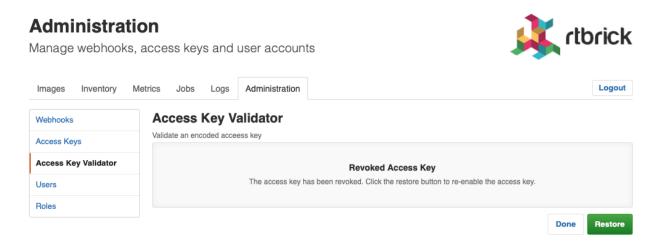


- 3. In the **Access Key** text box, enter the access key to be validated.
- 4. Click Validate.

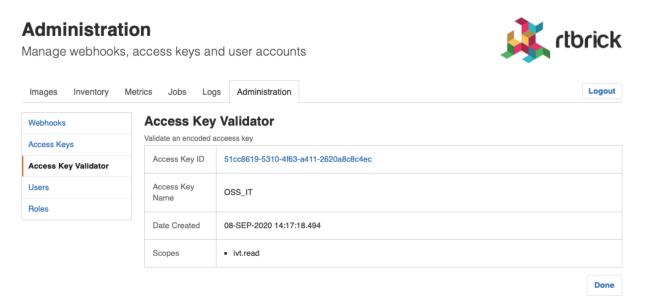
1.6.3. Restoring an revoked access key

To restore an accidentally revoked access key

- 1. Click the **Administration** tab.
- 2. Click the **Access Key Validator** in the left navigation pane.
- 3. Paste the access key to be restored in the text area.
- 4. Click Validate.



5. Clicke **Restore** to restore the revoked access key.



1.7. Scopes

Access to RBMS is granted through an access token. The access token is either issued by an OAuth2 compliant authorization service or by RBMS itself, depending on whether RBMS delegates to an authorization service or the RBMS built-in user repository is used.

The access token conveys the list of *scopes* the user is allowed to access. The table below lists all existing scopes:

Scope	Description

adm	Full access to the RBMS administration
	API and UI.
adm.read	Readonly access to the RBMS administration API and UI.
adm.accesskey	Full access to the RBMS access key administration API and UI.
adm.accesskey.read	Readonly access to the RBMS access key administration API and UI.
adm.user	Full access to the RBMS user management API and UI.
adm.user.read	Readonly access to te RBMS user management API and UI.
adm.webhook	Full access to the RBMS webhook management API and UI.
adm.webhook.read	Readonly access to the RBMS webhook management API and UI.
ctrld	Full access to all CTRLD actions that can be triggered from RBMS.
ctrld.reinstall	Permission to trigger CTRLD to run ZTP sequence for an software image upgrade again.
ctrld.settings	Permissions to update the CTRLD settings on the switch via RBMS.
ivt	Full access to the resource inventory.
ivt.read	Readonly access to the resource inventory.
ivt.element	Manage elements in the resource inventory.
ivt.element.settings	Manage element settings in the resource inventory.
ivt.element.config	Manage element configuration in the resource inventory.
ivt.element.dns	Manage element DNS records in the resource inventory.
ivt.element.module	Manage element hardware module information in the resource inventory.
ivt.group	Manage element groups in the resource inventory.

ivt.group.settings	Manage element group settings in the resource inventory.
ivt.image	Manage software images in the resource inventory.
ivt.rack	Manage racks in the resource inventory.
job	Full access to the RBMS job API and UI.
job.read	Readonly access to the RBMS job API and UI
job.task	Manage job tasks via RBMS Job API or UI.
tmy	Full access to the RBMS metric API and UI.
tmy.read	Readonly access to the RBMS metric API and UI.
tmy.metrics	Full access to manage RBMS metrics.
tmy.metrics.read	Readonly access to metrics.



Scopes are *cumulative* by convention. For example, the <u>ivt.elment</u> scope includes the <u>ivt.element.settings</u> scope.



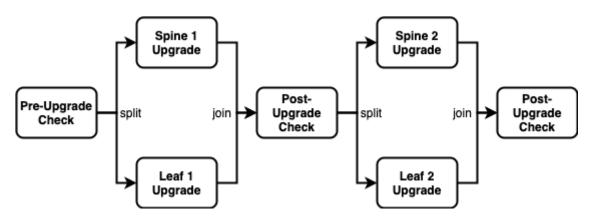
For UI access always grant the read scope in combination with a specific write scope to avoid trouble. For example, grant ivt.element.settings in combination with ivt.read. Otherwise a user might not be able to navigate to the view to apply the changes.

2. Managing Jobs

RBMS includes a job scheduler used by the network management applications to run management jobs. A job is a set of tasks that are executed in a specified order.

The task execution flow is defined by the application creating the job. Tasks can be executed sequentially or in parallel. Parallel execution flows can be joined to continue with a single flow. Technically speaking a job is described as *state engine*. Each task represents a node in the the state engine. The transition between tasks form the execution flow.

The figure below shows a simplified execution flow for a fabric upgrade.



The *Pre-Upgrade Check* task runs all checks to test whether the fabric can be upgraded. If the fabric passes all checks the execution flow is splitted to run the *Spine 1 Upgrade* and *Spine 2 Upgrade* in parallel. The *Post-Upgrade Check* waits for both upgrades to be completed before it runs the checks to test whether the upgrade was successful. If both switche upgrades were successful the job upgrades the two remaining switches in parallel. Finally another *Post-Uograde Check* is executed to check whether the upgrade was successful.

An application can program a job task to wait for an explicit confirmation. For example, an operator might want to inspect the state of a switch when a new image has been installed the very first time in the network. The upgrade application can program the *first* post-upgrade check to wait for confirmation before proceeding with the next upgrade.

The job module is a generic job viewer to inspect the state and progress of scheduled jobs. It also allows to confirm that a job can continue.

2.1. Viewing job list

To view the list of jobs

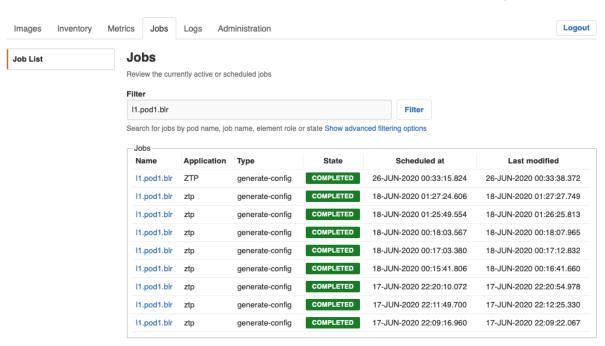
- 1. Click the **Jobs** tab. The list of currently active or scheduled jobs appear.
- 2. Optinally filter the job list by job name. The job name can be specied as prefix,

full name of regular expression.

Jobs

Manage jobs and tasks





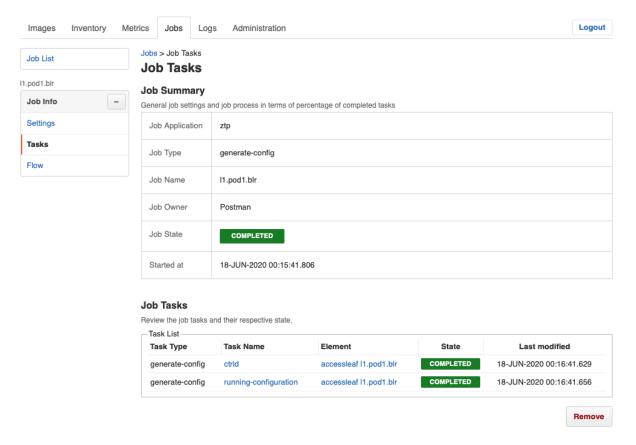
2.2. Viewing job task list

To view the list of job tasks

- 1. Click the **Jobs** tab. The list of currently active or scheduled jobs appear.
- 2. Click the name of the job that you want to view. The Job Tasks page appears.

Manage jobs and tasks





2.3. Viewing task flow

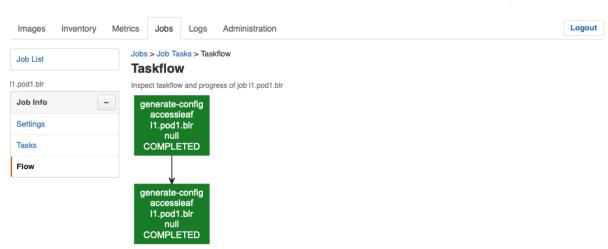
The task flow enables you to inspect taskflow and progress of the selected task.

To view the list of task flow

- 1. Click the **Jobs** tab. The list of currently active or scheduled jobs appear.
- 2. Click the name of the job that you want to view.
- 3. Click **Flow** in the left navigation pane. The **Taskflow** page appears.

Manage jobs and tasks





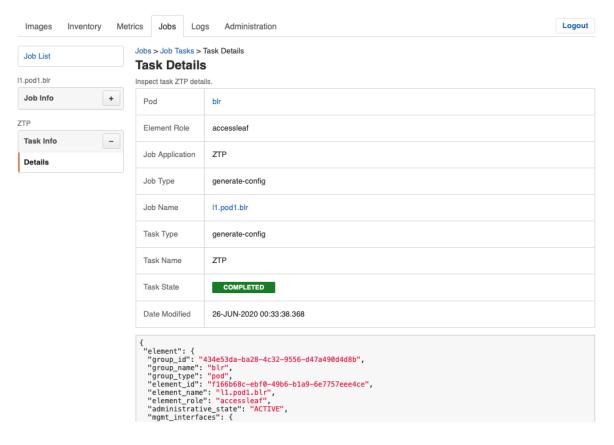
2.4. Viewing task details

To view the task details

- 1. Click the **Jobs** tab. The list of currently active or scheduled jobs appear.
- 2. Click the name of the job that you want to view. The **Job Tasks** page appears.
- 3. Click the name of the task that you want to view. The **Job Task** page appears.

Manage jobs and tasks

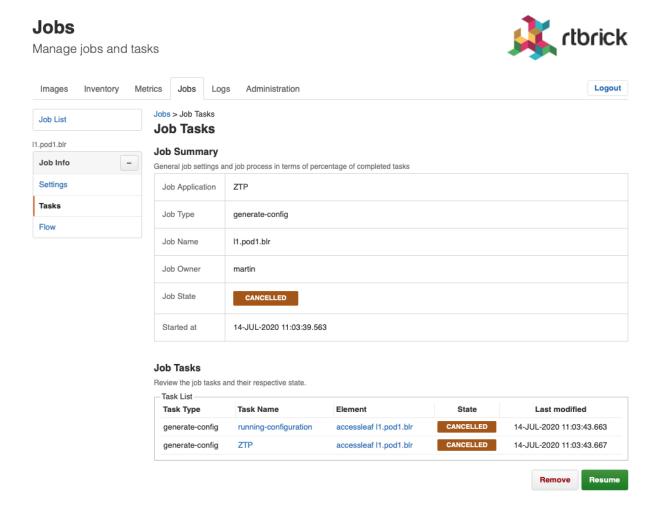




2.5. Canceling a Job

To cancel a job

- 1. Click the **Jobs** tab. The list of currently active or scheduled jobs appear.
- 2. Click the name of the job that you want to view.
- 3. Click **Tasks** in the left navigation pane. The **Job Tasks** page appears.
- 4. Click **Cancel job**. The job state changes to cancelled.



2.6. Removing a Job

To remove a completed, cancelled or failed job

- 1. Click the **Jobs** tab. The list of currently active or scheduled jobs appear.
- 2. Click the name of the job that you want to view.
- 3. Click **Tasks** in the left navigation pane. The **Job Tasks** page appears.
- 4. Click **Remove**. A confirmation dialog is displayed.
- 5. Click **Confirm** to remove the job.

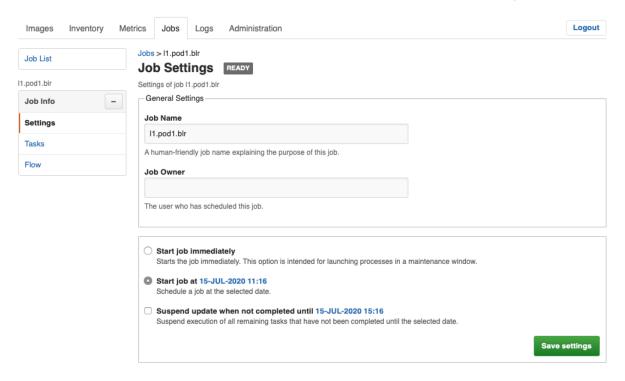
2.7. Configuring Job Settings

To configure the job settings

- 1. Click the **Jobs** tab. The list of currently active or scheduled jobs appear.
- 2. Click the name of the job that you want to configure.

Manage jobs and tasks





- 3. Make necessary configurations for the job.
- 4. Click **Save settings**.