

User Guide for Resource Configuration

Ericsson Dynamic Activation 1

USER GUIDE

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1 Introduction

This document is a guide to the Graphical User Interface (GUI) of Resource Configuration. Resource Configuration is delivered as part of Ericsson™ Dynamic Activation (EDA).

1.1 Purpose and Scope

The purpose of this document is to provide help information on how to perform configuration tasks using the Resource Configuration GUI.

This document covers all actions available in the Resource Configuration GUI. All features are shown in this User Guide, but depending on the authorities granted, only the granted GUI items and features are visible for a specific user.

1.2 Target Group

The target group for this document is users of the Resource Configuration GUI.

For more information about different target groups, see *Library Overview*, Reference [1].

1.3 Typographic Conventions

Typographic conventions are described in *Library Overview*, Reference [1].

1.4 Prerequisites

To perform the configuration tasks, the Resource Configuration GUI user must know which attributes need to be configured and their respective values.

For more information, refer to the following document:

- *Function Specification Resource Configuration*, Reference [2].

Note: Screen captures in this document are examples. Some features pictured in them are license or version dependant.





2 General

This section provides basic information about the Resource Configuration GUI.

Note: The supported web browsers are Chrome 58 and Firefox 52 or later versions.

2.1 Logging in

Use a web browser and direct it to the Resource Configuration web address. The address is

`https://<OAM_IP_address>:8383/scm.`

2.1.1 Logging in Using Internal Authentication

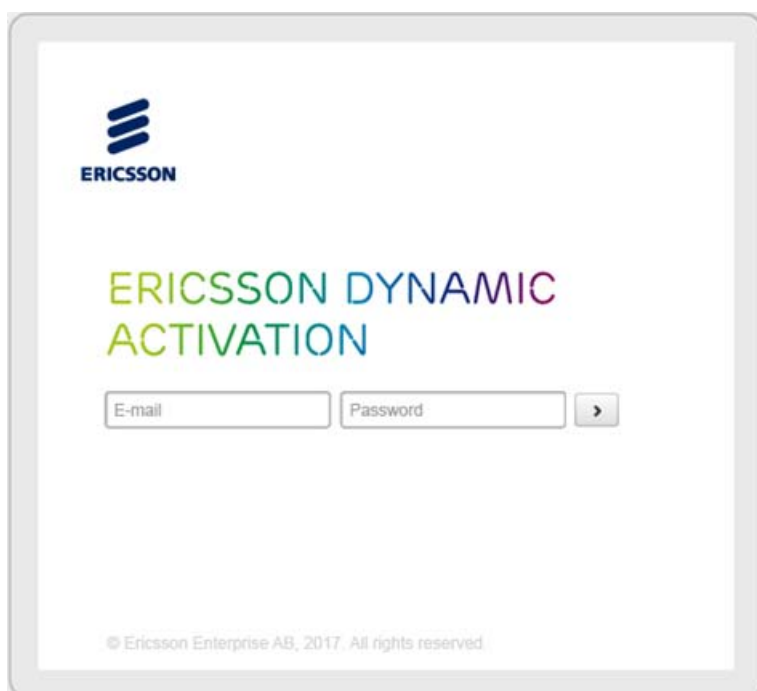


Figure 1 Resource Configuration Logon Window

For the first time launching after installation, use the default user `admin` and default password `admin` to log in.

Other users must be created by `System Administrator` before they can log in. For more information, refer to Section **User Management** in *User Guide for Resource Activation*, Reference [4].

- For other users, type the user email and password to log in. The initial password is provided by the `System Administrator`.



- It is mandatory to change the password after the first logon, and make changes regularly later on.
- After logging in, it is possible to change the user profile. For more information, refer to Section **User Profile** in *User Guide for Resource Activation*, Reference [4].
- Users will be locked if there are too many failed logon attempts. Contact the `System Administrator` to solve the problem.

2.1.2 Logging in Using External Authentication

When using external authentication, Dynamic Activation users are created in external OpenID connect provider before login. For more information, refer to the documents in related OpenID Connect Provider product.

During the OpenID authentication process, browser is redirected to the login page of external OpenID connect server.

- Type the user credential of external Dynamic Activation users to log in.
- After login, browser is redirected to the Resource Configuration GUI.

2.2 GUI Overview

The Resource Configuration GUI consists of the following areas, as shown in Figure 2. The content and functions in each of these areas are described in the following sections.

- Service Visualization, see Section 3 on page 7.
- Device Management, see Section 4 on page 13.
- Feature Models, see Section 5 on page 37.
- Vendor Templates, see Section 6 on page 43.
- Log Management, see Section 7 on page 73.



Resource Configuration

User Guide

13:36 (+02:00)

admin

RESOURCE CONFIGURATION

Dynamic Activation 1

Resource Configuration is a generic solution for managing wireline and enterprise services. It provides a uniform way to manage the mix of network technologies in both physical and virtualized networks. Network abstraction is provided with a model driven solution where the activation commands are determined by the models and simple configuration.

Service Visualization

The Service Visualization GUI makes it possible to visualize how the services depends on devices and features.

Launch Service Visualization

Device Management

The Device Repository keeps track of general device information, as well as current and previous device configurations. The Device Management GUI makes it possible to view and edit this information. It also makes it possible to reconcile discrepancies with actual device configuration.

Launch Device Repository

Feature Models

The Feature Model provides a vendor agnostic abstraction of configuration possible to setup in the devices. The Model Browser makes it possible to view the feature models as attribute lists, XML schemas or YANG models. It also makes it possible to import additional models and generate the interface models and definitions.

Launch Model Browser

Vendor Templates

The Vendor Templates are used to generate the down-stream commands towards the devices. The templates acts as a contract describing how to set up different features in a specific type of device. It is possible to create templates for several types of interfaces, like for example CLI and NETCONF.

Launch Template Management

Log Management

Log Management makes it possible to browse all the stored log information. It is possible to search for specific log items. For each incoming request, it is possible to view how the command is decomposed into several smaller commands and finally into the detailed interaction with the actual devices.

Launch Log Management

Figure 2 Areas in Resource Configuration GUI





3 Service Visualization

The **Service Visualization** GUI provides a visualized overview of a selected service instance. Through the overview, users can easily navigate to a particular device or feature to manage the configurations.

3.1 Service Visualization Overview


Figure 3, with belonging information, describes the **Service Visualization** GUI where the FTTH service is selected in the service list.




Service Visualization

Figure 3 Service Visualization GUI

1 To the left in the GUI, the services are listed.

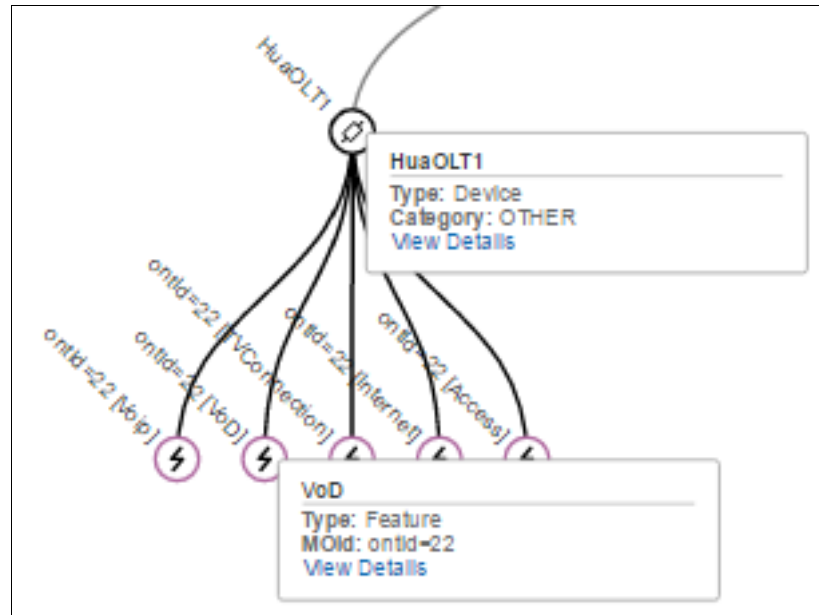
–  – No filter is used, and all services are listed.




–  – One or more filters are used, and services from certain criteria are listed.

2 Here the visualization for the selected service is shown.



Hover the mouse over the device or feature in the GUI. And click the link in the tooltip to go to corresponding configuration setting in area 5.



- 3 Click  to view the service visualization legend.
- 4 Shows the timeline of the resource configuration.
 - Use **Period** drop-down list together with  or  to select a specific time.
 - Each successful operation sent to the selected device is marked as green on the timeline.
- 5 Shows the feature configuration for the selected service.


Users can update or delete a feature for the service.

3.2 Filtering of Services

Besides searching a part of the service name in the search box, the **Service Visualization** GUI also supports using filters to find specific services easily.

3.2.1 Add a Filter

To add a filter:

1. Click  to open a slide-in panel with available filters.




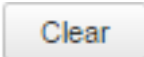

2. Select criteria among the available filters, and click .

Note: For **Device identifier** text box, the entire device name needs to be entered.

When filtering is done, all services that match selected criteria are listed as a search result.

3.2.2 Remove Filters

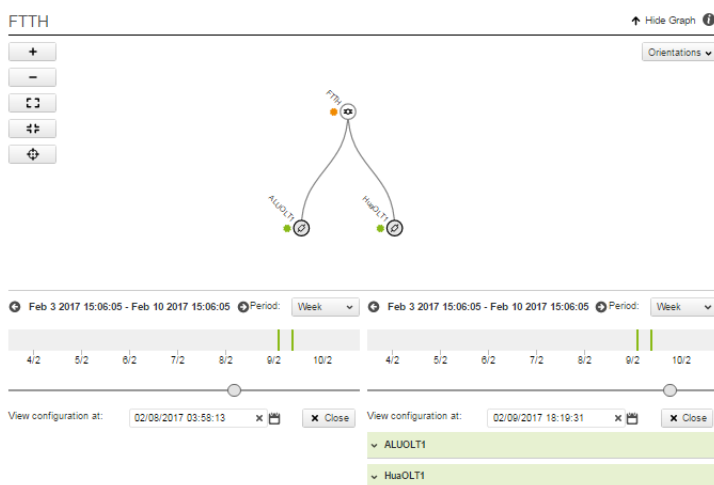
To remove filters:

1. Click  to open a slide-in panel with available filters.
2. Do one of the following:
 - Remove one filter – Use the **Backspace** key to clear the text box of a desired filter.
 - Remove all filters – Click .
3. Click  to apply changes.

3.3 Comparison of Resource Configurations

Do the following to compare resource configurations from different time points.

1. Select the service in the service list to the left.
2. Click **Compare**. This enters the comparison mode similar to the one below.





3. Specify the date and time of resource configurations to compare through the calendar or by sliding along the timeline.

The graphic is made relative to the later one of the two selected time-stamps. Color codes in the graphic are:

- Green – Added item.
- Orange – Modified item.
- Red – Removed item.

In the table, each row lists items corresponding to selected time-stamps. Color codes in the table are:

- Green – Unique item that does not exist in the other configuration.
- Orange – Item that is different from the other configuration.

4. Click **Close** to exit the comparison mode.

3.4 Restoring a Resource Configuration

To restore a service to a previous configuration, do the following:

1. Select the service to restore in the service list to the left.
2. Specify the time period to restore to, either in the calendar or by sliding along the timeline.
3. Click **Restore**.





4 Device Management

This section contains information about the available devices in the system. These devices are listed to the left in the GUI.

4.1 Management Tab

Figure 4, with belonging information, describes the GUI of **Device Repository, Management** tab. Here information about the selected device is available and can be updated.



Device Repository

Add device

Import devices

Export devices

1

Devices

Search

Q

gui_cisco_ios_device_cli

gui_juniper_junos_device_cli

gui_juniper_junos_device_cli_reconcil

gui_neg_juniper_junos_device_cli

sim_juniper_junos_device_cli

sim_juniper_junos_device_cli

Management

Configuration

Reconciliation

Candidate store

Edit device

Export device

1

Delete device

General Information

Identifier

Master

sim_juniper_junos_device_cli

Device category

CE

Admin state

ACTIVE

Type 1

Junos_Template_CLI

Type 2

Junos_Template_Policy_Get_Set_CLI

Type 3

Junos_Template_Policy_Create_Delete_CLI

Candidate store

Inactive

Feature instance lock

Inactive

Configuration validation

Inactive

Access point

SSH_CLI

Information

Address

136.225.39.22

Port

5000

Protocol

SSH_CLI

Credentials

Username

root

Password

.....

Credential 3

Name

enablePassword

Value

.....

Parameters

Parameter 1

Name

routerId

Value

1.1.1.1

Edit device

Export device

1

Delete device

Figure 4 Overview of Device Repository, Management Tab

Attributes in the Management Tab of Device Repository GUI are listed in Table 1–Table 2.



Table 1 General Information

Property	Description
Identifier	The unique identify of each device.
Device Category	Specifies what category the device belongs to.
Admin state	<p>Specifies the availability of the device. If set to ACTIVE, it is possible to provision the device. Otherwise the device cannot be provisioned.</p> <p>This parameter can be in OPERATION FAILED if an operation failed, for example a restore. Then the user has to set it back to ACTIVE manually once the problem has been resolved.</p>
Type	<p>Specifies which templates the device uses when generating the southbound commands to the device.</p> <p>A device can use multiple templates.</p>
Description	<p>Free text field where to enter additional information about the specific device.</p> <p>This parameter is invisible if the device has no additional information.</p>
Candidate store	<p>Specifies whether the Candidate store function is available (Active) or not (Inactive) for the specific device.</p> <p>When adding or editing a device:</p> <ul style="list-style-type: none"> • This parameter is invisible for devices whose categories are Proxy or Jump Server. • For other devices, there is a local switch for Candidate store. If this switch is activated, the configurations for the selected device are stored in Candidate store before sent out to the device. This local switch is only applicable if the global switch for Candidate store is deactivated. See Section 4.4 on page 25 for more information about Candidate store.



Feature Instance Lock	<p>Specifies whether the device is able to handle a configurable number of requests simultaneously. Those requests are identified by their unique combinations of DeviceID, MOType, and MOIds.</p> <p>When adding or editing a device, this parameter is invisible for devices whose categories are Proxy or Jump Server. For other devices, set the switch in this field as one of the following:</p> <ul style="list-style-type: none">• Inactive – (Default) The device can handle only 1 feature request at a time.• Active – The device can handle several requests simultaneously. The number is configurable in an appeared controller (value range: 2–100).
Configuration validation	<p>Specifies whether the Configuration validation function is available (Active) or not (Inactive) for the specific device, and what action to take if there is an inconsistency between the configuration in the device versus the same configuration in Resource Configuration.</p> <p>The only configuration that is checked is the one that applies for the model in the incoming request.</p> <p>When adding or editing a device, this parameter is invisible for devices whose categories are Proxy or Jump Server. For other devices, there is a switch for setting this validation check. If the switch is enabled, a check is made that the actual configuration on the device matches the configuration last provisioned to the device. It must also be specified what action to take if the configurations do not match.</p> <p>The following actions are available:</p> <ul style="list-style-type: none">- Display error: The user is notified with details of the discrepancies between the configurations, and the device is not provisioned.- Update device: The Resource Configuration updates the device with the stored device configuration, and then the device is provisioned with the new updated configuration.- Update repository: The Resource Configuration updates the device repository with the device configuration, and then the device is provisioned with the new updated configuration. <p>If the configurations match, the device is provisioned with the new or updated configuration.</p>



Table 2 Access Points

Property	Description
<p>Note: If the device is managed by an EMS, the access point must refer to the EMS, not the device. For more information, see Section 4.6.2 on page 30.</p> <p>A device can have multiple access points, but only one for each protocol. Click the protocol to expand or collapse the configurations of each access point.</p> <div> <div>Access point</div> <div> <div>SSH_CLI</div> </div> </div>	
Information	
Address	The address to the device according to format <code><IPv4_address/IPv6_address/FQDN/hostname></code> , for example <code>127.0.0.1</code> .
Port	A port number is required and the value range is 1–65535.
Protocol	The protocol to be used to access the device.
Credentials	
Note: This section is not available when editing or adding a Proxy device.	
Username	Specifies the username to use for communication with the device.
Password	Specifies the password to use for communication with the device.
Credential ⁽¹⁾ -Name	Optional Additional Credential can be added. For example, providing a default credential value. This credential can be defined in the template, by using the tag <code><deviceCredential></code> .
Credential ⁽¹⁾ -Value	<p>Specifies the value that belongs to the specified Credential - Name.</p> <p>Each available Credential - Name must have a Credential - Value specified to be able to save the device.</p>
Parameters	



Access via Jump Server	<p>This parameter is visible when the device is using a jump server or proxy.</p> <p>Specifies a jump server or proxy to use to be able to communicate with the device.</p> <p>When adding or editing a device, this parameter is visible if the access point uses the SSH_CLI protocol.</p> <p>For more information on jump server, see Section 4.6.1 on page 30.</p>
Access via Proxy Server	<p>This parameter is visible when the device is using a proxy server.</p> <p>Specifies a proxy to use to be able to communicate with the device.</p> <p>When adding or editing a device, this parameter is visible if the access point uses the HTTP or HTTPS protocol.</p>
Prompt	<p>This parameter is visible when the device category is Jump Server.</p> <p>Specifies a default prompt to indicates a successful logon to the jump server when performing service provisioning.</p>
Parameter _n ⁽¹⁾ -Name	<p>This parameter is visible if there is a parameter defined for the device.</p> <p>Specifies a parameter to set in the device. For example, providing a default parameter value.</p> <p>This parameter can be defined in the template, using the tag <code><deviceParameter></code>.</p>



Parameter ⁽¹⁾ -Value	<p>This parameter is visible if there is a parameter defined for the device.</p> <p>Specifies the actual value that is to be used for the parameter specified in Parameter - Name.</p> <p>If a parameter with the same name is specified in the northbound request, the parameter value specified in the Device Repository overrides the parameter value specified in the northbound request. It is only possible to override on parameters that are not MOIds.</p>
Additional Parameters	<p>Specifies what protocol to use for communication with the device.</p> <p>When adding or editing a device, Additional Parameters can be used to change default settings of the selected protocol if necessary.</p> <p>Use reset to change back to previous saved settings.</p> <div> <p>Additional Parameters ▾</p> <p>Response Timeout <input type="text" value="20000"/> reset</p> <p><i>Value</i> <input type="text"/></p> </div> <p>For parameter descriptions, see Section 4.1.1 on page 19.</p>

(1) $n = 1, 2, 3, \dots$

4.1.1 Protocol Additional Parameters

This section describes the additional parameters of connection protocols.

4.1.1.1 SSH_CLI Protocol Additional Parameters

Table 3 SSH_CLI Protocol Additional Parameters

Parameter	Description
Response Timeout	<p>Time in milliseconds to wait for a response after sending a request.</p> <p>Value range: 0-10²⁰</p> <p>Default value: 20000</p>



Parameter	Description
Key	The Private Key for SSH communication with SSH server. Public key is used to authenticate with external SSH server, and Public Key is created based on the Private Key. Private Keys must not be shared with the external SSH server.
Subsystem	Key for the term environment variable. If not set, <code>vt100</code> is used.
Version	The version of the data source.
Connection Timeout	Time in milliseconds to wait for a connection attempt to get contact before the attempt is aborted. Value range: 0-10 ²⁰ Default value: 60000
Authentication Timeout	Time in milliseconds to wait for a response after sending an authentication request. Value range: 0-10 ²⁰ Default value: 10000

4.1.1.2

SSH_NETCONF Protocol Additional Parameters

Table 4 SSH_NETCONF Protocol Additional Parameters

Parameter	Description
Key	The Private Key for SSH communication with SSH server. Public key is used to authenticate with external SSH server, and Public Key is created based on the Private Key. Private Keys must not be shared with the external SSH server.
Version	The version of the data source.
Response Timeout	Time in milliseconds to wait for a response after sending a request. Value range: 0-10 ²⁰ Default value: 180000
Connection Timeout	Time in milliseconds to wait for a connection attempt to get contact before the attempt is aborted. Value range: 0-10 ²⁰ Default value: 60000



4.1.1.3

Telnet Protocol Additional Parameters

Table 5 Telnet Protocol Additional Parameters

Parameter	Description
Login prompt	The displayed prompt to print during the logon procedure. Default value: login:
Password prompt	The displayed prompt to print during the logon procedure. Default value: password:
Response Timeout	Time in milliseconds to wait for a response after sending a request. Value range: 0-10 ²⁰ Default value: 10000
Connection Timeout	Time in milliseconds to wait for a connection attempt to get contact before the attempt is aborted. Value range: 0-10 ²⁰ Default value: 10000

4.1.1.4

SNMP Protocol Additional Parameters

Table 6 SNMP Protocol Additional Parameters

Parameter	Description
Security Name	Username to use when generating SNMP notifications.
Authentication Protocol	Authentication type to use. Value: MD5 or SHA
Authentication Password	Password that must be at least 8 characters in length.
Private Protocol	Privacy type to use Value: AES or DES
Private Password	Password that must be at least 8 characters in length
Context Name	A collection of management information accessible by an SNMP entity.



Parameter	Description
Response Timeout	Time in milliseconds to wait for a response after sending a request. Value range: 0-10 ²⁰ Default value: 50000
Retries	Number of times that connection is retried, if detected SSH busy failure. Value range: 0–10 Default value: 3

4.1.1.5 HTTP Protocol Additional Parameters

Table 7 HTTP Protocol Additional Parameters

Parameter	Description
Auth user name	The authentication username for logon procedure.
Auth password	The authentication password for logon procedure.
Response Timeout	Time in milliseconds to wait for a response after sending a request. Value range: 0-10 ²⁰ Default value: 0
Connection Timeout	Time in milliseconds to wait for a connection attempt to get contact before the attempt is aborted. Value range: 0-10 ²⁰ Default value: 0

4.2 Configuration Tab

Figure 5, with belonging information, describes the GUI of **Device Repository, Configuration** tab. Here information about the configuration of the selected device is available.



Resource Configuration / Device Repository

Device Repository



1

2

3

4

Figure 5 Overview of Device Repository, Configuration Tab

- 1 Here the time period for the timeline is selected.
- 2 Each successful configuration (create/set/delete) sent to the selected device is marked in green on the timeline.
- 3 Select a time to see a particular configuration on the device. User can use  or  to select the time.

Other available operations are as follows:

- Filter device configuration, see Section 4.12 on page 33.
- Compare with a previous configuration, see Section 4.14 on page 34.
- Add a device configuration, see Section 4.11 on page 33.
- Restore to a previous device configuration, see Section 4.15 on page 35.



- 4 Shows the actual configuration on the device at a selected time.
 - If a configuration belongs to a service, click the service link (for example, [FTTH serviceId=5555](#)) to update or delete a device configuration. For information, see Section 3.1 on page 7.
 - Use **Update** to edit a device configuration that does not belong to any services.
 - Use **Delete** to delete a device configuration that does not belong to any services.

Note: If the Candidate Store setting is activated, the updated configuration is stored in Candidate Store. For more information, see Section 4.4 on page 25.

If Candidate Store setting is inactivated, the device is immediately provisioned with the updated configuration.

4.3 Reconciliation Tab

This tab shows the difference between latest configuration in repository and the device configuration. The user can update the device with configuration from repository or conversely.

Features belonging to services are visualized but not reconciled. A warning text is shown for such features.

ALUOLT1

Management Configuration Reconciliation Candidate store

Repository

Update repository

Configuration at 2017-03-20 15:04:27

Voip	ontId=1	FTTH serviceId=5555
Internet	ontId=1	FTTH serviceId=5555
TVConnection	ontId=1	FTTH serviceId=5555
VoD	ontId=1	FTTH serviceId=5555
Access	ontId=1	FTTH serviceId=5555

Device

Update device Get device configuration

Configuration at 2017-03-20 15:04:27

Figure 6 Reconciliation Tab



Follow the instruction below to reconcile the configurations in repository and device:

1. Click **Get Device Configuration** and wait until the latest configuration is retrieved from device. This can take several minutes, depending on the amount of configuration to be fetched from device.
2. After configuration is retrieved, latest configuration from repository is displayed on the left side and device configuration on the right side. Color codes are:
 - Green – Unique item that does not exist in the other configuration.
 - Orange – Item that is different from the other configuration.
3. Click **Update Repository** or **Update Device** to reconcile the configurations. This can take several minutes.

The **Reconciliation** tab can also be used for device replacement. It is possible to retrieve the latest configuration from device repository, and update the device if an operator replaces it with a new device.

- If the newly added device has the same capabilities as the old device, follow instruction below to update configuration.
 - 1 Update the existing device with the credentials of the new device in the **Management** tab.
 - 2 Click **Get Device Configuration** to get the latest configuration from the new device.
 - 3 Click **Update Device** in the **Reconciliation** tab to update the device with the latest configuration in repository.
- If the newly added device has different capabilities from the old device, follow instructions below to update configuration. This assumes feature model is generic for both devices.
 - 1 Update the existing device with the credentials and the **Type** of the new device in the **Management** tab.
 - 2 Click **Get Device Configuration** to get the latest configuration from the new device.
 - 3 Click **Update Device** in the **Reconciliation** tab to update the device with the latest configuration in repository.

4.4 Candidate Store Tab

Note: This tab is only visible if the Candidate Store function is activated in one of the following ways:



- As a local setting for the selected device. This local setting is applicable for the selected device in the **Management** tab, see Section 4.1 on page 13.
- As a global setting applicable for all devices. This setting is set in the global settings menu accessed by clicking  on the top of the **Device repository** GUI. When active, this global setting overrides the local setting. When inactive, the local setting applies.


Figure 7, shows the GUI of **Device Repository, Candidate store** tab. This tab shows configuration with belonging commands that can be sent to the selected device.

Note: Get operations are not stored in **Candidate Store**.



The  in the list to the left indicates that there are configurations available in Candidate Store tab for the selected device.

To provision the device with the configuration, click **Commit**.

The exclamation mark icon () is displayed in the device list to the left if the configuration failed to be sent to the device when clicking **Commit**. Click the icon to find out more about what went wrong.

If clicking **Discard**, the configuration is removed from Candidate store and nothing is sent to the device.



Resource Configuration / Device Repository ▾

Device Repository

Add device

Import devices

Export devices



Devices



Search



5620_SAM_main_server

cand_store_device_cli

gui_cisco_ios_device_cli

gui_juniper_junos_device_cli

neg_no_port_device

neg_no_template_device

neg_wrong_ipaddress_device

neg_wrong_port_device

sim_cisco_ios_device_cli

sim_cisco_iosxe_device_cli

sim_device_snmp

sim_juniper_junos_device_cli



sim_juniper_junos_device_netconf

sim_juniper_junos_device_cli

Management

Configuration

Reconciliation

Candidate store

Commit

Discard

^ Create VRF

vrfName=customer

FTTH serviceId=5555

vrfName

customer

rd

100:1

^ rtImports

import

100:1

^ rtExports

export

100:1

vrfTarget

100:1

Commands:

```
set cli screen-width 1024
configure
edit routing-instances customer
set instance-type vrf
set route-distinguisher 100:1
set vrf-target target:100:1
set vrf-table-label
commit
top
exit
```

Figure 7 Overview of Device Repository, Candidate Store Tab



4.5 Filtering of Devices

Besides searching a part of the device name in the search box, the **Device Repository** GUI also supports using filters to find specific devices or group devices easily.



4.5.1 Add a Filter

To add a filter:

1. Click  to open a slide-in panel with available filters.
2. Select criteria among the available filters, and click .



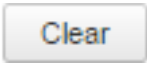

For information about the different attributes, see Section 4.1 on page 13.

Note: Searching by protocol, service type, or service Id can be time consuming.

When filtering is done, all devices that match selected criteria are listed as a search result.

4.5.2 Remove Filters

To remove filters:

1. Click  to open a slide-in panel with available filters.
2. Do one of the following:
 - Remove one filter – Click  or use the **Backspace** key to clear the text box of a desired filter.
 - Remove all filters – Click .
3. Click  to apply changes.

4.6 Adding a Device



Resource Configuration / Device Repository ▾ / Add Device

Add Device

Save

Cancel

Properties

Name	<input type="text" value="Master identifier"/>
Device Category	<input type="text" value="CE"/>
Types	<input type="text" value="IOS_XR_Template x IOS_Template x"/>
Administrative state	<input type="text" value="ACTIVE"/>
Description	<input type="text"/>

Management options

Candidate store	<input type="text" value="Inactive"/>
Feature instance lock	<input type="text" value="Inactive"/>
Configuration validation	<input type="text" value="Inactive"/>

Access Points

^ HTTPS

Information

Address	<input type="text"/>
Port	<input type="text"/>
Access via Proxy Server	<input type="text" value="Name of device to access"/>
<input type="text" value="Parameters"/> <input type="text" value="Additional Parameters"/>	

No proxy servers exist

Credentials

Username	<input type="text"/>
Password	<input type="text"/>
<input type="text" value="+ Add credential"/>	

SSH_CLI ▾

Save

Cancel

Figure 8 Add A Device

Follow the instruction below to add a device:

1. Click **Add device**.
2. Follow the GUI instruction to enter information about the device in the fields. For information about the different attributes, see Section 4.1 on page 13.

For jump server configuration, see Section 4.6.1 on page 30.

For devices that are integrated through an Element Management System (EMS), see Section 4.6.2 on page 30.

3. Click **Save**. Now the device is visible in the device list.

4.6.1 Add a Jump Server

A jump server can be used as a hop to route to a device in a secured network. Figure 9 shows an example.

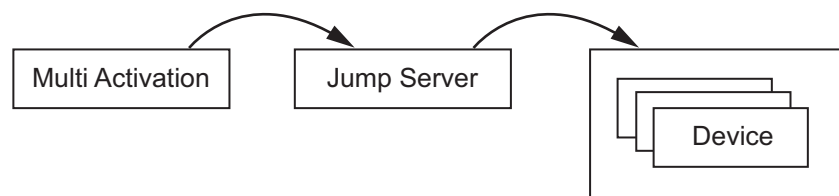


Figure 9 Jump Server Configuration

Consider the following when configuring a jump server:

- When adding a jump server device, the `Prompt` property must be specified, for example, as `#` or `\`. This character is used as a default prompt, which indicates a successful logon to the jump server when performing service provisioning.
- When multiple jump services are configured, it is important to ensure that there is no circular jump server configuration, as shown in Figure 10.

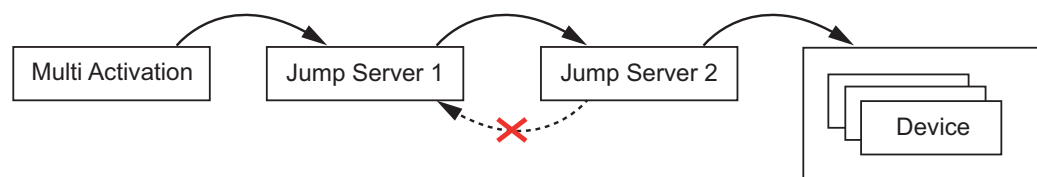


Figure 10 No Circular Jump Server Configuration

4.6.2 Integration of Devices through EMS

All managed devices must be defined as individual devices in Resource Configuration, even when they are integrated through an EMS, for the following good reasons:

- Avoid losing important Resource Configuration functionality.



- Make it possible to visualize the different devices separately in the Resource Configuration GUI.
- Secure that control of parallel updates happens on the right level.

When adding devices that are integrated through an EMS, set the access points of those devices as the EMS, instead of the physical devices. Figure 11 shows an example.

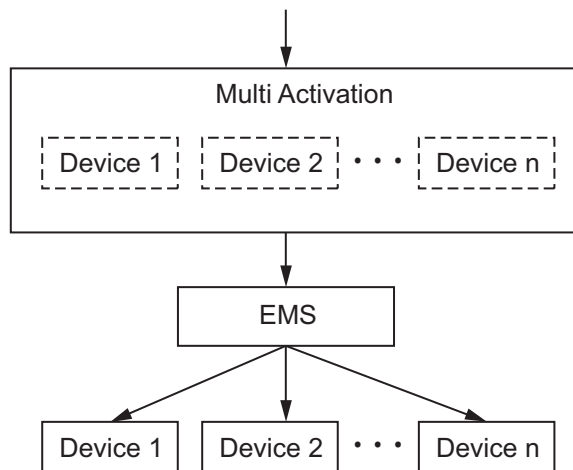


Figure 11 Integration of Devices Through EMS

4.7 Importing Device Information

Follow the instruction below to import device information:

1. Click **Import devices**.
2. Select a device Comma-Separated Value (CSV) or a JavaScript Object Notation (JSON) file.

Note: For now both formats can be used, while:

- The legacy `csv` format only supports one access point per device. This format is deprecated.
- The `json` format supports multiple access points.

3. Click **Import**. When the import is done, the imported devices are visible in the device list.

Note: If the device information exists, it is updated.

4.8 Editing Device Information

Follow the instruction below to edit a device:



1. Select the device to edit in the device list to the left. The device is now opened in the **Management** tab.
2. Click **Edit device**.
3. Make the desired changes in the device.
4. Click **Save**.

4.9 Exporting Device Information



The device information can be exported to a `.json` file.

For information about the different attributes that are exported, see Section 4.1 on page 13.

4.9.1 Activate Exporting Device Setting

Note: For security concerns, the setting of exporting device information is set to `Inactive` by default.

To activate the exporting device setting, do the following:

1. Click  on the top of **Device Repository** GUI to open the global settings slide-in panel.
2. Set the **Export device** setting to `Active`.
3. Click  to hide the slide-in panel.

4.9.2 Exporting a Device

To export a device information, do the following:

1. Ensure that the exporting device setting is activated.
2. Select a desired device from the devices list, and click **Export device** in the **Management** tab.

This generates a `.json` file which contains the selected device information.

3. Save the `.json` file to a local folder.

4.9.3 Exporting All Devices

To export all device information, do the following:

1. Ensure that the exporting device setting is activated.
2. Click **Export devices** above the device list.



This pops up the **Export devices** dialog.

3. Click **Generate new file** if necessary.

This generates an Excel `.json` file contains all the devices information.

4. Click **Download File** and save the `.json` file to a local folder.

4.10 Deleting a Device

Note: It is impossible to delete a device with configuration belonging to a service.

Follow the instruction below to delete a device:

1. Select the device to delete in the device list to the left. The device is now opened in the **Management** tab.
2. Click the **Delete device** link and confirm the delete of the device in the dialog that is displayed.
3. The deleted device is removed from the device list to the left.

4.11 Adding a Configuration to a Device

This section introduces how to add a configuration that is not associated with any service.

Do the following:

1. Select the device to add a configuration to in the list of devices to the left and open the **Configuration** tab.
2. Click **Add**.
3. Select a model in the pop-up window that is displayed and click **Select**.
4. Enter information about the attributes to use in the configuration and click **Add**.
5. If the Candidate Store setting is activated, the updated configuration is stored in Candidate Store. For more information, see Section 4.4 on page 25.

If Candidate Store setting is inactivated, the device is immediately provisioned with the updated configuration.

4.12 Filtering Configurations on a Device

Follow the instruction below to search for specific configurations:

1. Select the device to filter configuration on in the list of devices to the left and open the **Configuration** tab.



2. Click **Filter**.
3. In the device configuration filter form that is displayed, select one or more features to filter on.
4. Enter one or more MOIDs to filter on specific configurations, or leave the MOIDs blank to filter on all configurations of the same feature.

Note: All values for the MOId must be provided to be able to filter on it.

5. Click **Apply**.
6. To clear the filter, click **Clear** and **Apply** in the device configuration filter form.

4.13 Get Initial Configuration of a Device

If Resource Configuration has not provisioned configuration to a device, follow the procedure below to get initial configuration:

1. Select the device in the list of devices to the left and open the **Configuration** tab.
2. If Resource Configuration has not provisioned configuration to the device, the following is visible:

sim_juniper_junos_device_cli

Management Configuration Reconciliation Candidate store

Oct 12 2015 14:23 - Oct 19 2015 14:23 Period: Week

13/10 14/10 15/10 16/10 17/10 18/10 19/10

View configuration at: 2015-10-19 14:23:23 x

+ Add Restore Compare

No configuration data available

[Get initial device configuration](#)

3. To get initial device configuration, click the **Get initial device configuration** link. Now Resource Configuration fetches all configurations corresponding to the feature models available in model browser, and stores the configurations in Resource Configuration.

Note: This operation can take several minutes to finish.

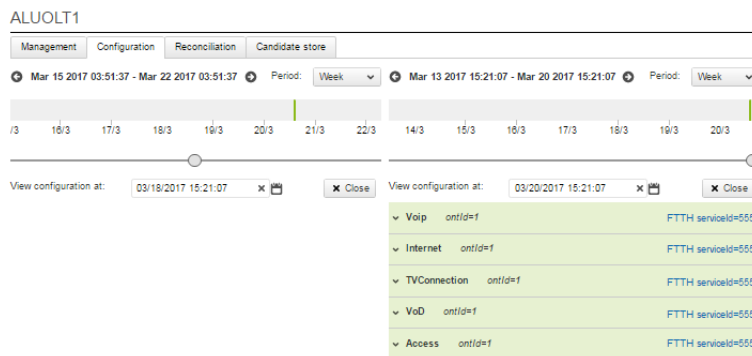
For information about feature models, see Section 5 on page 37.

4.14 Comparison of Device Configurations

Do the following to compare device configurations from different points in time.



1. Select the device in the list of devices to the left and open the **Configuration** tab.
2. Click **Compare. Configuration** tab enters device configuration comparison mode and content of the tab changes to screen similar to the one below:



3. Specify the date and time of device configurations to compare through calendar or by sliding along the timeline.

Each row lists items corresponding to selected time-stamps. Color codes are:

- Green – Unique item that does not exist in the other configuration.
- Orange – Item that is different from the other configuration.

4. To change device configuration that belongs to a service, click the link in the row, for example [FTTH serviceId=5555](#).
5. To quit device configuration comparison mode, click **Close**.

4.15 Restoring a Device Configuration

To restore a device to a previous configuration, do the following:

1. Select the device to restore in the list of devices to the left and open the **Configuration** tab.
2. Specify the time period to restore to, either in the calendar or by sliding along the timeline.
3. Click **Restore**.
4. If the Candidate Store setting is activated, the updated configuration is stored in Candidate Store. For more information, see Section 4.4 on page 25.


If Candidate Store setting is inactivated, the device is immediately provisioned with the updated configuration.



Note: The exclamation mark icon (❗) is displayed in the device list to the left if the restore of the configuration was not successful. Click the icon to find out more about what went wrong.

4.16 Loose Error Handling

All exposed CAI3G interfaces in Resource Configuration must support loose error handling, to support rollback from Designer Studio.

The Loose error handling setting can be activated or inactivated in the global settings menu accessed by clicking  on the top of the **Device repository** GUI.

If the Loose error handling setting is activated, all duplicate requests are returned with success response and no traffic is sent towards the device. All requests are logged in the log management GUI.

A scenario of Loose error handling is described as follows:

- When receiving either of the following requests, the Resource Configuration returns a success message without sending traffic down to the device:
 - A `Create` request to create a feature that exists.
 - A `Delete` request to delete a feature that does not exist.
- When receiving a `Get` request to get a feature that does not exist in the device, the Resource Configuration returns an empty message instead of an error.

5 Feature Models

This section contains information about the available feature models. The models contain the schemas to use for northbound CAI3G interface. For more information about feature models, refer to *Function Specification Resource Configuration*, Reference [2].

5.1 Feature Models Overview

Figure 12, with belonging information, describes the GUI of **Feature Models** where the LoopbackInterface model is selected in the model list.

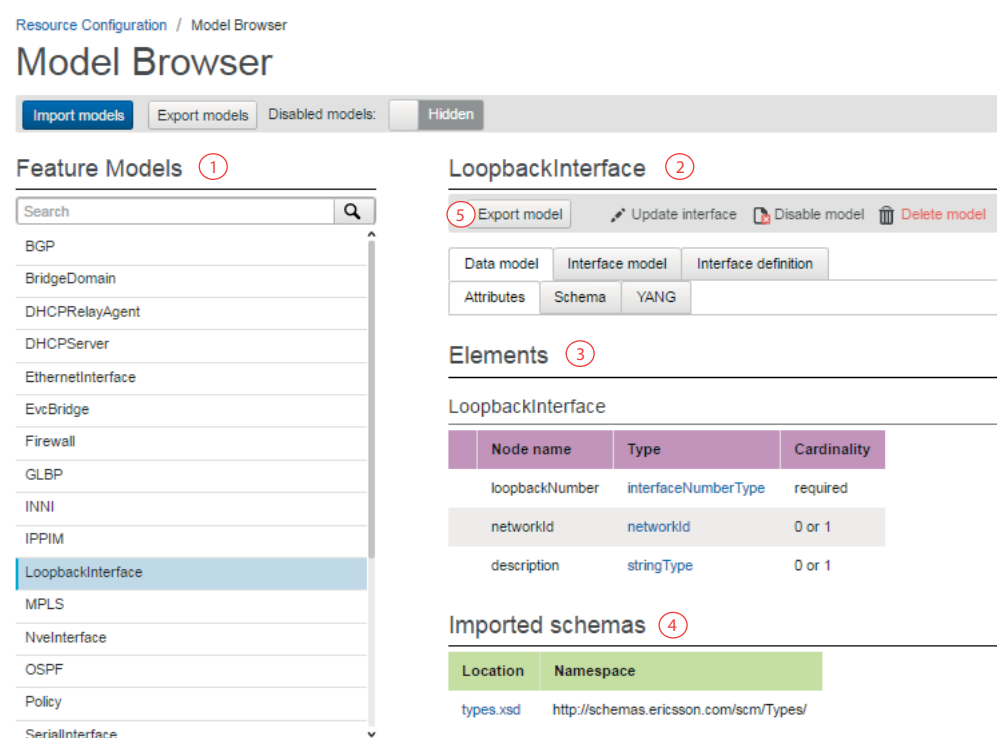


Figure 12 Overview of Feature Models GUI

- 1 To the left in the GUI, all the available models are listed. If no models are available, this list is empty. To add a model to the list, it has to be imported. For information about how to import models, see Section 5.2 on page 38.
- 2 The tabs show information about the selected model.

In the tab **Data model**:

- **Attributes**: shows a graphic view of the XML schema of the data model.



- **Schema:** shows the XML schema.
- **YANG:** shows the YANG file of the selected data model.

Note: Only available when the data model was imported from a YANG file.

In the tab **Interface model:**

- **Attributes:** shows the elements for the selected interface model.
- **Schema:** shows the XML schema of the selected interface model.

In the tab **Interface definition**, the WSDL file, and the WSDL URL for the interface definition is available.

Note: The **Interface model** and **Interface definition** tabs are empty if no interface is created for the selected model. For information about how to create an interface, see Section 5.7 on page 41.

- 3 In the **Elements** section, the available operations with belonging attributes are visible.
For more thorough information about the different attributes, refer to *Provisioning over CAI3G for Resource Configuration*, Reference [3].
- 4 In the **Imported schemas** section, schemas are listed from which attributes have been imported.
- 5 Export the current feature model to a local folder.

5.2 Importing Model

If the current model contains a dependency to another schema file (by using a schema import or include statement), it is important to first import this other schema file before trying to import the current model.

The typical example is when the model file depends on another schema file defining the data types. In this case, the data types have to be imported first and the model schema can be imported as a second step.

5.2.1 Import an XSD or YANG Model

To import a model by using an XML schema or YANG Model:

1. Click **Import models**.
2. Use **Choose File** to select an XSD or a YANG model file. Either use one of the files included in the delivery of Dynamic Activation, or create a file.
3. Enter a model name.



Note: The model name is case-sensitive and becomes the `MOName`.

4. Click **Import**. When the import is done, the model is visible in the model list.
5. Generate interface model by following the instruction in Section 5.7 on page 41.

5.2.2 Import Multiple Models by Using Zip File

When importing multiple modules, considering the following:

- Use a models zip file that was previously exported from a Resource Configuration. For more information, see Section 5.3 on page 39 for instructions.
- The zip file must be exported from and imported to the same release version of Resource Configuration.

To import one or multiple models by using such a zip file, do the following:

1. Click **Import models**.
2. Use **Choose File** to select the zip file.
3. Click **Import**. When the import is done, one or more models are visible in the model list.

5.3 Exporting Model

It is supported to export a chosen feature model, or export all feature models.

5.3.1 Exporting a Model

To export a feature model, do the following:

1. Select a desired feature model from the model list, and click **Export model** (area 5 in Figure 12).

This generates a `<model_name>.zip` file.

2. Save the `model_name.zip` file to a local folder.

5.3.2 Exporting All Models

To export all feature models, do the following:

1. Click **Export models** above the template list.

This pops up the **Export models** dialog.

2. Click **Generate new file** if necessary.



This generates a `models.zip` file.

3. Click **Download File** and save the `models.zip` file to a local folder.

5.4 Deleting Model

Follow the instruction below to delete a model:

1. Select the model to delete in the model list, and click the **Delete model** link.
2. A dialog is displayed, click **Find usage** to see on which devices the model is used.

Note: Ericsson recommends checking the model usage before deleting it. Because once it is deleted, the model cannot be used to perform any operations towards a device.

3. Click **Back** to go back to previous dialog.
4. If no concerns for the model usage result, click the **Delete** to delete the model.

Otherwise, click **Close**.



5.5 Disabling Model

When a model is disabled, it cannot be used for sending `create` or `set` commands.

To disable a model, do the following:

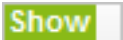
1. Select a desired model in the model list, and click the **Disable model** link.
2. A dialog is displayed, asking for verification to really disable the model. Click **Disable** to confirm.

Depending on the **Disabled models** setting, the disabled models are either:

- Not shown in the model list, if the setting is .
- Shown in the model list with a prefix “[Disabled]”, if the setting is .

5.6 Enabling Model

To enable a disabled model, do to following:

1. Ensure that the **Disable models** setting is set to .
2. Select a desired disabled model in the model list, and click the **Enable model** link.



3. A dialog is displayed, asking for verification to really enable the model. Click **Enable** to confirm.

The model is enabled and shown in the model list again, without a prefix “[Disabled]”.

5.7 Creating or Updating Feature Model Interface



To create or update an interface for a feature model, do the following:

1. Select a desired model in the model list.

This shows one of the following links on the right top of the GUI:

- **Create interface** – If no interface exists.
 - **Update interface** – If an interface exists.
2. Click **Create interface** or **Update interface** to open a configuration wizard.
 3. Follow the instruction in the wizard to configure the interface attributes.

Note:

- Zero or more attributes can be selected.
- Click  to update cardinality on the attributes.
- If needed, drag and move  to adjust the column widths in the wizard.

After finishing the wizard:

- **Interface model > Attribute** – Shows a graphic view of the xml schema of the feature model interface.
- **Interface model > Schema** – Shows the XML schema.
- **Interface definition** – Shows a generated WSDL file of the interface.





6 Vendor Templates

This section contains information about the available vendor templates, here referred to as “templates”. A template describes the contract of how to communicate with a certain type of device and maps a generic feature into a vendor-specific implementation. For more information about templates, refer to *Function Specification Resource Configuration, Reference* [2].

Two types of vendor templates are supported in Resource Configuration:

- XML Vendor Templates, see Section 6.1 on page 43
- YANG Vendor Templates, see Section 6.2 on page 59

Common operations in both XML and YANG templates GUIs are described in Section 6.3 on page 66.

6.1 XML Vendor Templates

The XML template describes the command sequence to setup a feature in a device and how to map the data from the northbound interface to the southbound commands.

Figure 13, with belonging information, describes the GUI of **Vendor Templates** for XML template.

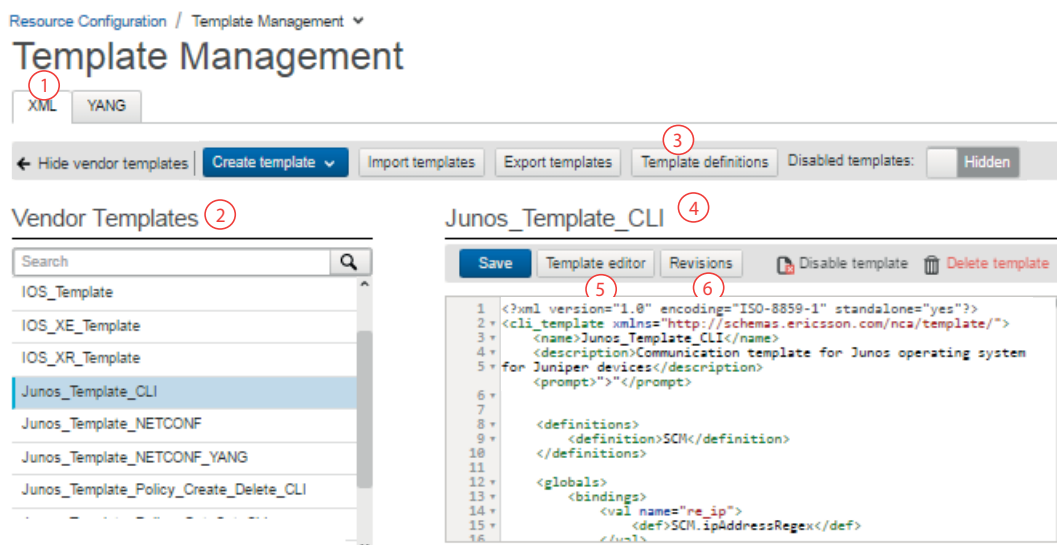


Figure 13 Overview of Vendor Templates

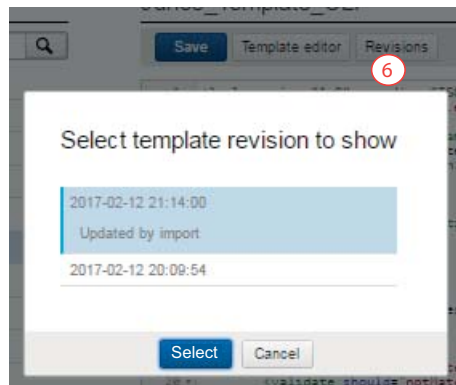


Figure 14 Overview of Vendor Templates

1. Choose **XML** template management GUIs.
2. To the left in the GUI, all enabled templates are listed. To view disabled templates, see Section 6.3.3 on page 69.

To add a template to the list, it has to be created or imported. For information on:
 - How to create a template, see Section 6.1.1 on page 44.
 - How to import a template, see Section 6.1.2 on page 45.
3. The **Template definitions** button is used to manage template definitions. For more information, see Section 6.1.6 on page 48.
4. Here the selected template is shown. By default, the latest revision of the template is shown, but also earlier revisions can be shown, see Section 6.3.5 on page 70.

The XML editor supports shortcut keys, see Section 6.1.5 on page 47.

5. For templates whose protocol type is CLI, the **Template editor** button is displayed to provide an alternative approach to edit template. For more information, see Section 6.1.7 on page 52.
6. Here all revisions of the selected template are listed.

Click **Revisions** to pop up this dialog.

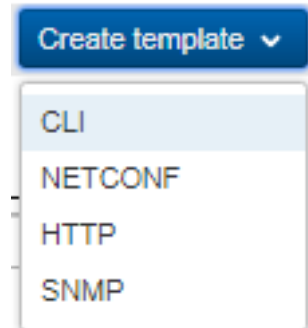
6.1.1 Creating XML Template

To create a template, do the following:

1. If the template uses a definition, ensure that the definition is created or imported first. For more information on:
 - Create definition, see Section 6.1.6.1 on page 49.
 - Import a definition from CLI, see Section 6.1.6.2 on page 49.



2. Click **Create template** and select a protocol type for the template.



3. A boilerplate for a template is shown in the template window. Make the desired changes of the template in the boilerplate.
4. Click **Save**.

A newly created template is activated after all nodes in the cluster are updated. It takes several minutes, depending on the template complexity.

6.1.2 Importing XML Template from CLI

This section describes how to import an XML template from CLI.

For information on how to import templates from GUI, see Section 6.3.1 on page 66.

Note: If the template exists, a new revision is created.

A newly imported template is activated after all nodes in the cluster are updated. It takes several minutes, depending on the template complexity.

1. If the template uses a definition, the definition must be created or imported first. For more information on:
 - How to create a definition, see Section 6.1.6.1 on page 49.
 - How to import a definition, see Section 6.1.6.2 on page 49.
2. Log in as an administrator and create directory `/tmp/template` on node-1.

```
$ sudo -u actadm mkdir -p /tmp/template
```

3. Copy the template XML files to the directory `/tmp/template`.

```
$ sudo -u actadm cp <template_XML_files> /tmp/template
```



The template is automatically imported, as `/tmp/template/` is a "hot-deploy" directory. The template files get the ending `.bad` if the import was not successful. If successful, the ending is `.processed`.

- When the import is done, the template is visible in the template list.

If it is not, the reason can be that the template is disabled owing to its old format. To solve the problem, see Section 6.1.3 on page 46.

6.1.3 Migrate XML Template

An XML template created before Dynamic Activation September release has an old format which needs to be migrated to a newer one.

Resource Configuration / Template Management ▾

Template Management

XML YANG

← Hide vendor templates

Create template ▾

Import templates

Export templates

Template

Vendor Templates

Search	Q
ALU_OLT	
Hua_OLT	
[Disabled] IOS_Template	
IOS_XE_Template	
IOS_XR_Template	
Junos_Template_CLI	
Junos_Template_Loopback_delete_failure_CLI	
Junos_Template_NETCONF	
Junos_Template_NETCONF_YANG	
Junos_Template_Policy_Create_Delete_CLI	

IOS_Template

Revisions

i This template needs migration

```
1 <?xml version="1.0" encoding="UTF-8" ?>
2 <template xmlns="http://schemas.xmlsoap.org/soap/envelope/">
3   <name>IOS_Template</name>
4   <description>Communication template</description>
5   <prompt>">"</prompt>
6
7   <definitions>
8     <definition>SCH</definition>
9   </definitions>
10
11   <globals>
12     <bindings>
13       <val name="re_ip" value="SCH.ipAddress" />
14     </bindings>
15   </globals>
16   <prompt>"#</prompt>
17   <validate should="not-validate" />
18 </globals>
19
20 <before>
```

Figure 15 Migrate XML Template

Templates with an old format are disabled by default. To migrate and enable them, do the following:

- Ensure that the **Disable template** is set to **Show**.



2. Select a desired template in the template list, click **Migrate now**, and then select a proper protocol type for the template.
3. Click **Enable template** and follow the GUI instruction to enable the template.

6.1.4 Editing XML Template

A template can be edited directly in the GUI, or by importing an updated template XML file.

To edit a template directly in the GUI, do the following:

1. Select the template to edit in the template list to the left.
2. Make the desired changes of the template in the template window.
3. Click **Save**.
4. If the logon page is displayed, which means the session expired when you were editing the template, do the following:
 - a. Log in the Resource Configuration again, and enter the **Vendor Templates** GUI.
 - b. Click **OK** in the appeared dialog to restore the lost modifications.

An edited template is activated after all nodes in the cluster are updated. It takes several minutes, depending on the template complexity.

For information on how to import an updated template XML file, see Section 6.1.2 on page 45, or Section 6.3.1 on page 66.

For information on how to edit template in **Template Editor** GUI, see Section 6.1.7 on page 52.

6.1.5 Using XML Editor or Viewer

Click in the XML editor or viewer and press **Ctrl + F** on the keyboard to enable search function, as shown in Figure 16.

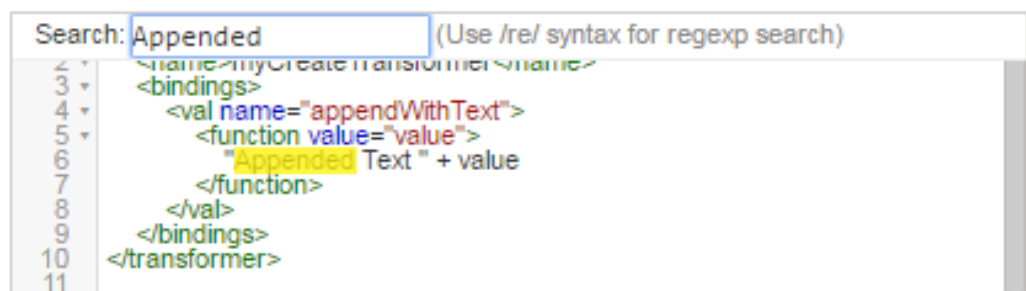


Figure 16 Search in XML Editor or Viewer

Other available shortcut keys are:

- **Ctrl + G** – Find next
- **Shift + Ctrl + G** – Find previous
- **Shift + Ctrl + F** – Replace
- **Shift + Ctrl + R** – Replace all

6.1.6 XML Template Definitions

This section contains information about the available template definitions, here referred to as “definitions”. A definition specifies reusable strings for reference against multiple templates. For more information about definitions, refer to *Function Specification Resource Configuration, Reference* [2]

Figure 17, with belonging information, describes the GUI of the **Template Definitions**.

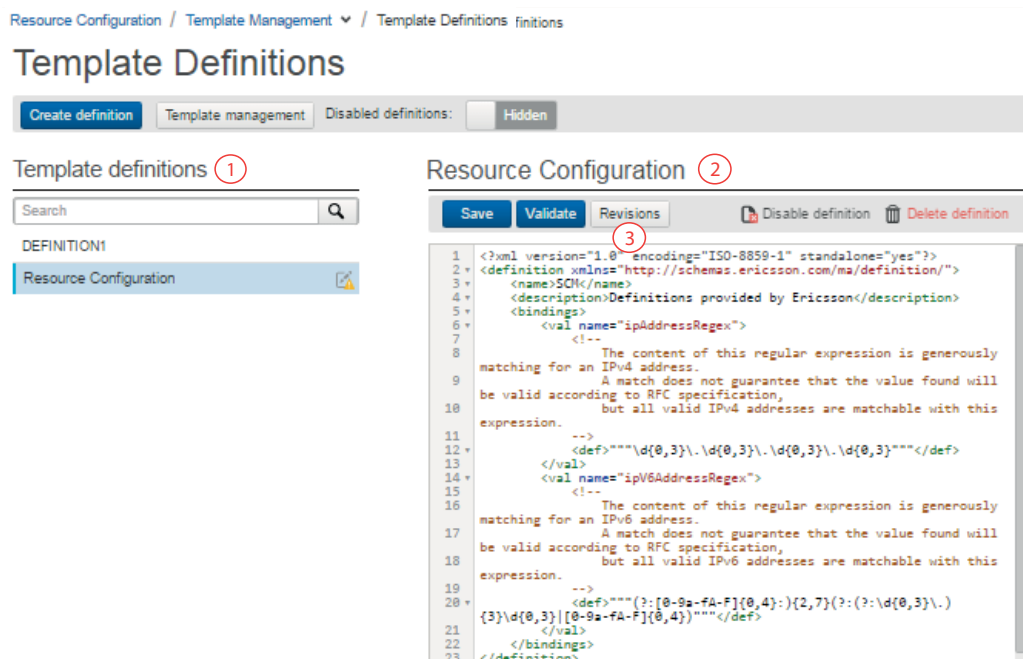


Figure 17 Overview of Template Definitions

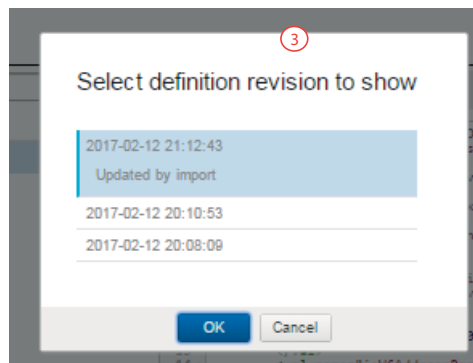



Figure 18 Overview of Template Definitions

1. To the left in the GUI, all enabled definitions are listed. To view disabled definitions, see Section 6.1.6.4 on page 50. The  in the list to the left indicates that the definition has been validated and needs to be saved to be used.

To add a definition to the list, it has to be imported or created. For more information on:

- How to create a definition, see Section 6.1.6.1 on page 49.
 - How to import a definition from CLI, see Section 6.1.6.2 on page 49.
 - A definition can be imported from GUI together with the corresponding XML template. For more information, see Section 6.3.1 on page 66.
2. Here the selected definition is shown. By default, the latest revision of the definition is shown, but also earlier revisions can be shown, see Section 6.1.6.6 on page 51.

The XML editor supports shortcut keys, see Section 6.1.5 on page 47.

3. Here all revisions of the selected definition are listed. Click **Revisions** to pop up this dialog.

6.1.6.1 Creating Definition

To create a definition, do the following:

1. Click **Create definition**.
2. A boilerplate for a definition is shown in the definition window. Make the desired changes to the boilerplate.
3. Click **Save**.

A newly created definition is activated after all nodes in the cluster are updated. It takes several minutes, depending on the definition complexity.



6.1.6.2 Importing Definition from CLI

This section describes how to import definitions from the CLI.

1. Log in as an administrator and create directory `/tmp/template` on node-1.

```
$ sudo -u actadm mkdir -p /tmp/template
```

2. Copy the definition XML files to the directory `/tmp/template`.

```
$ sudo -u actadm cp <definition_XML_files> /tmp/template
```

The definition is automatically imported, as `/tmp/template/` is a "hot-deploy" directory. The definition files get the ending `.bad` if the import was not successful. If successful, the ending is `.processed`.

3. When the import is done, the definition is visible in the Definition list.

6.1.6.3 Editing Definition

A definition can be edited directly in the GUI, or by importing an updated definition XML file from CLI or GUI. When importing from GUI, the corresponding template is imported with the definition together.

To edit a definition, do the following:

1. Select the definition to edit in the definition list on the left.
2. Make the desired changes to the definition in the editor.
3. Click **Validate**.
4. When the Definition has passed the validation, click **Save**.

If the logon page is displayed after clicking **Validate** or **Save**, which means the session expired, do the following:

5. Log in the Resource Configuration again, and enter the **Template Definitions** GUI.
6. Click **OK** in the appeared dialog to restore the lost modifications.

An edited definition is activated after all nodes in the cluster are updated. It takes several minutes, depending on the definition complexity.

6.1.6.4 Disabling Definition

When it is disabled, a definition cannot be used in templates any more. The definition is still kept in the system for traceability. This can help to understand why previous southbound commands were generated in a certain way. A definition cannot be disabled if it is referenced in any template.



To disable a definition, do the following:

1. Select a desired definition in the definition, and click the **Disable definition** link.
2. A dialog is displayed, click **Find usage** to see which templates that are using this definition.



Note: The definition cannot be disabled if it is used by any template.

3. Click **Back** to return to the previous dialog.
4. If no concerns for the definition usage result, enter a commit message, and click **Disable**.

Otherwise, click **Cancel**.


The definition is disabled immediately.

Depending on the **Disabled definitions** setting, the disabled definitions are either:

- Not shown in the definition list, if the setting is .
- Shown in the definition list with a prefix “[Disabled]”, if the setting is .

6.1.6.5 Enabling Definition

To enable a definition, do the following:

1. Ensure that the **Disabled definitions** setting is set to .
2. Select a desired definition in the definitions list, and click **Enable template** link.
3. A dialog is displayed. Enter a commit message, and click **Enable**.

An enabled definition is activated after all nodes in the cluster are updated. It takes several minutes, depending on the definition complexity.

6.1.6.6 Restoring Definition

To restore a previous version of a definition, do the following:

1. Select a desired definition in the definition list, and click **Revisions**.
2. In the appeared dialog, select a desire revision to restore, and click **Select**.

This shows a **Restore** button in the GUI.



3. Click **Restore** and confirm the restore of the definition in the dialog that is displayed.
4. Click **Save**.

A restored definition is activated after all nodes in the cluster are updated. It takes several minutes, depending on the definition complexity.

6.1.6.7 Deleting Definition

When a definition is deleted, it can no longer be used when generating southbound commands. A deleted definition cannot be restored. A definition cannot be deleted if it is referenced in any template.

1. Select a desired disabled definition from the definition list.
2. A dialog is displayed, click **Find usage** to whether the definition is used by any templates.

Note: A definition is used by one or more templates cannot be deleted.

3. Click **Back** to go back to previous dialog.
4. If no concerns for the definition usage result, click **Delete** to confirm the deletion.

Otherwise, click **Cancel**.

The definition is deleted immediately.

6.1.7 XML Template Editor

For templates whose protocol type is CLI, the **Template Editor** provides an alternative approach to edit template by using GUI elements rather than XML format.

The **Template Editor** consists of three main views:

- **Template View**, see Section 6.1.7.1 on page 53
- **Feature View**, see Section 6.1.7.2 on page 55
- **Command Editor**, see Section 6.1.7.3 on page 56



Note: Template modifications in the **Template Editor** are cached in the browser, which means that before clicking **Save Template**:

- No change takes effect.
- No notifications for template errors (if any).
- When the GUI is refreshed, or the session has timed out, all changes are lost.

Ericsson recommends clicking **Save Template** in several minutes to avoid losing configuration changes.

An edited template is activated after all nodes in the cluster are updated. It takes several minutes, depending on the template complexity.

For more information to understand the template construction process, refer to the following chapters in *Customer Adaptation Guide for Resource Configuration*, Reference [5].

- **Format of Vendor Template**
- **Template Functions and Primitives**

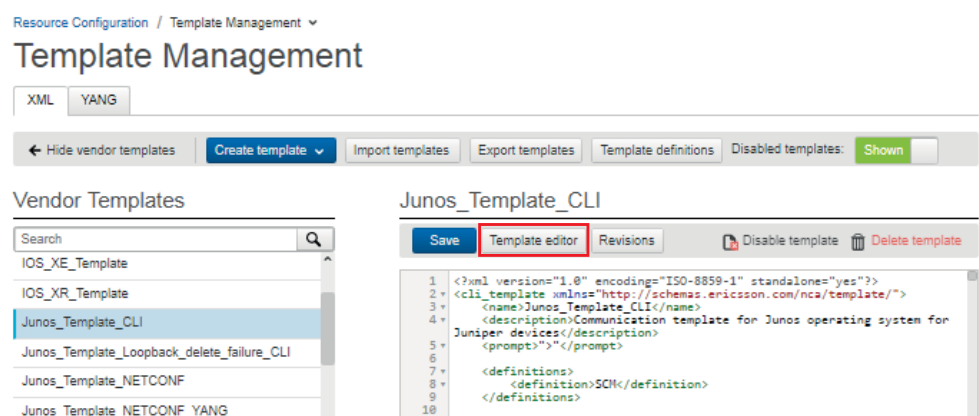
6.1.7.1 Template View

The **Template View** is the default GUI of the **Template Editor**.

6.1.7.1.1 Access Template View

To access the **Template View**:

1. In **Template Management**, select a template in the template list. The template must use CLI as its protocol type.
2. Click **Template editor**.



6.1.7.1.2 Available Operations

Figure 19, with belonging information, briefly describes the available operations in **Template View**.

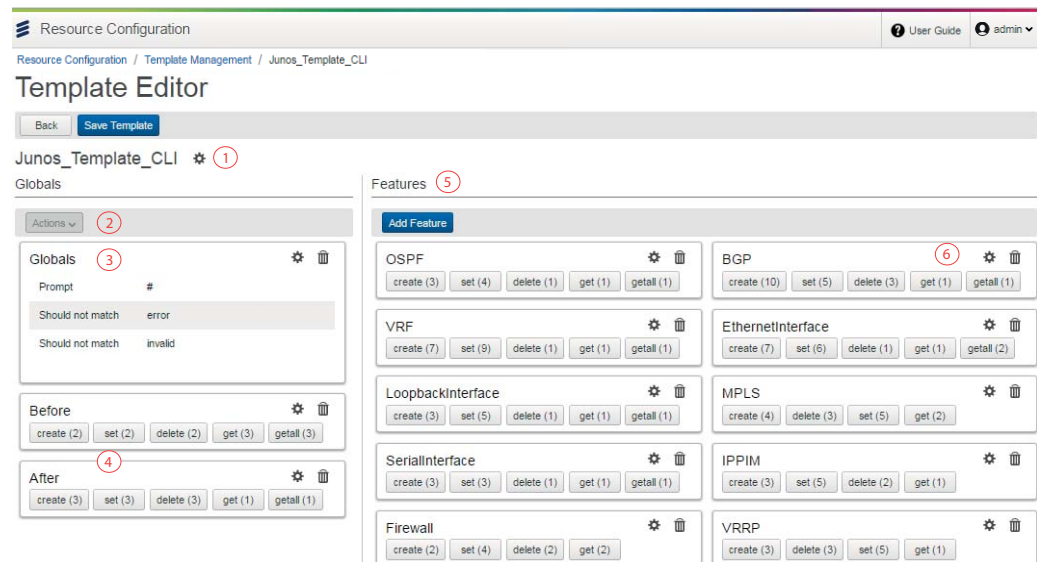


Figure 19 Template Editor – Template View

Available operations in the **Template View** are:

- 1 Click to set the template header value, such as description and prompt.




For more information, refer to chapter **Template Header** in *Customer Adaptation Guide for Resource Configuration*, Reference [5].

- 2 Choose from the **Actions** drop-down list, to add **Globals**, **Before**, and **After** widgets (area 3 and 4).

When all the available actions have been added, the **Actions** drop-down list is disabled.

- 3 Set the `globals` section of the template.
 - Click to set global prompts and assertions that are used throughout the template.
 - Click to delete the **Globals** section.
- 4 Set the `before` and `after` sections of the template.
 - Click or to a button (if any) to open the **Feature View**, see Section 6.1.7.2 on page 55.



- Click  to delete the **Before** or **After** section.
 - 5 Click **Add Feature** to select a feature from the **Model Catalog**, and add the feature to the template.
- The added feature is shown as a widget in the GUI.
- 6 Shows an example of feature widget. Users can:
 - Click  or to a button (if any) to open the **Feature View**, see Section 6.1.7.2 on page 55.
 - Click  to delete the feature.

6.1.7.2

Feature View

Figure 20, with belonging information, briefly describes the available operations in **Feature View**.

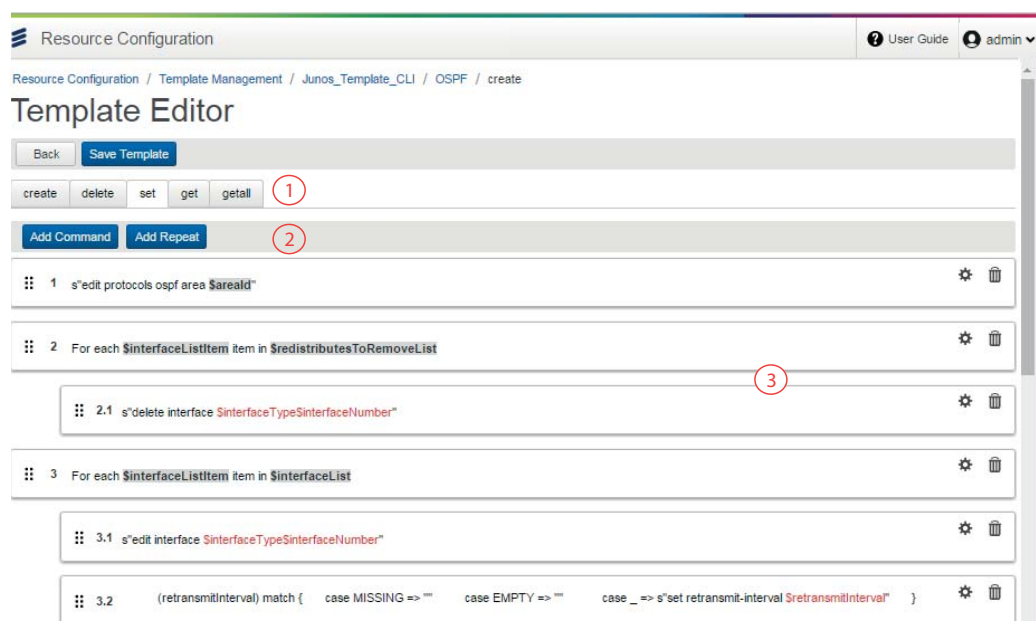


Figure 20 Template Editor – Feature View

Available operations in the **Feature View** are:

- 1 Click tabs to switch among operations of create, set, delete, get, and getall.
- 2 Click **Add Command** or **Add Repeat** to add items in 3.



Note: New items are always added at the end of the item list.





For more information on how to construct a `Repeat` item, refer to chapter **Repeat** in *Customer Adaptation Guide for Resource Configuration*, Reference [5].

3 Displays all command and repeat construct items.

- A resolved parameter is highlighted in gray (for example, `$areald`), while an unresolved one is highlighted in red (for example, `$interfaceType`).

Note: A parameter is considered as resolved if a binding with the same name exists in the template `globals` section, or in a feature operation.

For more information, refer to chapter **Bindings** in *Customer Adaptation Guide for Resource Configuration*, Reference [5].

- Drag and drop an item to change the sequence.
- Drag an item and drop it into a repeat item. This forms a “tree-like” structure.
- In a command item:
 - Click  to open the **Command Editor**, see Section 6.1.7.3 on page 56.
 - Click  to delete this command item.
- In a repeat construct item:
 - Click  to open the **Repeat Editor** dialog.
 - Click  to delete the repeat construct item.

Note: All children items of the repeat construct item are also deleted.

6.1.7.3 Command Editor

In **Command Editor**, users can add bindings, set prompt, and define validations for operations.

Note: In the current release, only CLI commands can be edited in **Command Editor**.

Figure 21 and Figure 22, with belonging information, briefly describe the available operations in **Command Editor**.

Command Editor

Request generation

```

s"edit routing-instances $vrfName"

```

1

MOids

+ vrfName

2

Attributes

+ rd
> rtImports
> rtExports
+ vrfTarget
> bgps
> interfaces

Validation

3

Prompt

Prompt

+ ✕

Validation

Should match

+

Ok

Cancel

Figure 21 Command Editor – Create, Set, and Delete

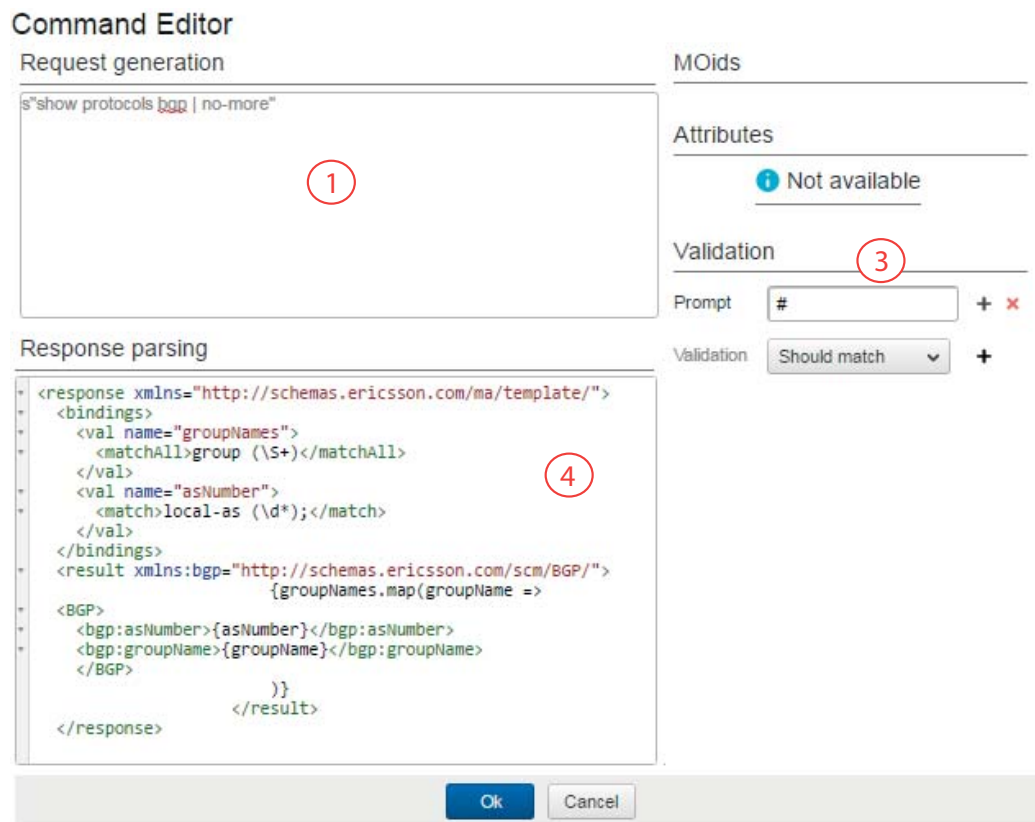


Figure 22 Command Editor – Get and Getall

Available operations in the **Command Editor** GUIs are:

- 1 Enter the request that is to be sent to devices.
 - Parameters having matches in area 2 are highlighted in gray, and corresponding bindings are created automatically in the operation section of the template.
 - Those parameters are considered as resolved ones.
 - Parameters highlighted in red are unresolved ones.
- 2 Lists available MOId and attribute parameters of the current feature. Drag a parameter and drop it in 1 to use it in the request command.
- 3 Configure the following settings:
 - Prompts that interpreter to wait for before executing the next command in the control console.
 - Validations that are used for evaluating the response to determine whether the request succeeds.
- 4 Enter the response parsing to convert a response to a result document.



For more information on how to parse a response, refer to chapter **CLI Commands** in *Customer Adaptation Guide for Resource Configuration*, Reference [5].

6.1.7.4 Known Limitations

In current release, editing a template by using the **Template Editor** GUI has the following known limitations:

- Only CLI commands can be edited in the **Command Editor**.

The commands of following types can be displayed in **Feature View**, but cannot be edited:

- NETCONF
- SNMP
- HTTP

- It is possible to reference template definition from template in **Template Editor**, but editing definition itself by using **Template Editor** is not supported.
- No direct interaction with bindings is supported.
- Runtime parameters are not supported.
- Repeat construct in **Feature View** supports selecting only one list for iteration.
- Response section in **Command Editor** can be edited by using XML only – no GUI component is available at current release.
- **Template Editor** displays error messages in same way as **Template Management** displays errors for template in XML format which might make error identification complicated.
- If the browser session expires before clicking **Save template**, all changes are lost after relogging in.

For an alternative solution to avoid above limitations, see Section 6.1.4 on page 47.

6.2 YANG Vendor Templates

The YANG templates provides a quicker way to integrate devices that provides a YANG/NETCONF interface. The solution uses a generic YANG engine to automatically generate the southbound NETCONF commands based on the constraints given by the device-specific YANG file. The YANG template is put

on top of this to map the device-specific YANG model to the normalized feature models in Resource Configuration.

Resource Configuration provides a GUI to simplify this mapping task. This GUI also adds the possibility to add parameter transformations.

Figure 23, with belonging information, describes the **Templates Management** GUI for YANG template.

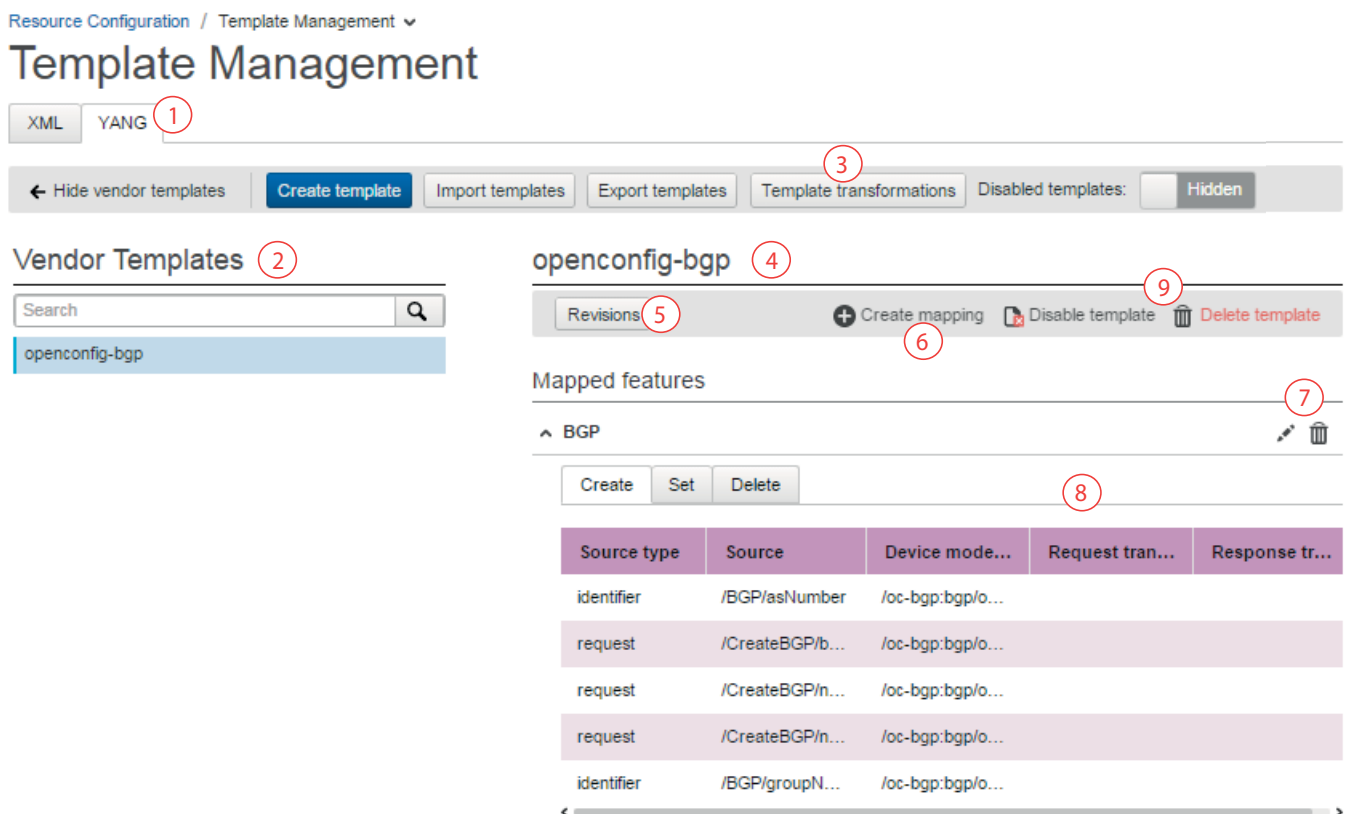


Figure 23 Overview of Vendor Templates

1. Choose **YANG** template management GUI.
2. To the left in the GUI, all enabled templates are listed. To view disabled templates, see Section 6.3.3 on page 69. To add a template to the list, it has to be created or imported. For information on:
 - How to create template, see Section 6.2.1 on page 61.
 - How to import templates, see Section 6.3.1 on page 66.
3. The **Template transformations** button is used to manage template transformations. For more information, see Section 6.2.4 on page 64.
4. Shows the selected template. By default, the latest revision of the template is shown, but also earlier revisions can be shown, see Section 6.3.5 on page 70.



5. Click **Revisions** to list all revisions of the selected template are listed.
6. Click **Create mapping** to add a feature and then configure mapping for a selected template. For more information, see Section 6.2.2 on page 62.
7. Update or delete a mapped feature for a selected template.
8. Displays the mapping information of a mapped feature.
 - **Source type** – Specify the type of the source.
 - **Source** – The XPath of the source parameters in the feature model. These parameters pass values to the mapped device parameters.
 - **Device model xpath** – The XPath of the device parameters in the YANG device model. These parameters which get values from the mapped source parameters.
 - **Request transformation** – (If any) Specify the method to be used for transforming a value before passing the value from a source parameter to the mapped device parameter.
 - **Response transformation** – To be supported in future.

6.2.1 Creating YANG Template

To create a YANG template:

1. Click **Create template**.
2. Select an interface model to use for the template.

Select models

Interface model*

Device models* 4 files

The interface models are managed in the **Feature Model** GUI. For information, see Section 5 on page 37.

3. Use **Choose Files** to select one or more YANG files that are used to define YANG devices.




Note: If a YANG device model has dependency to another YANG device model, the other files must be either selected together or imported earlier.

4. In the lower drop-down list, select one of those YANG device model files, on which to perform mapping with the chosen interface model.
5. Click **Select**.
6. A wizard is displayed to configure the mapping for the YANG template. For more information, see Section 6.2.2 on page 62.

After finishing the wizard, the template is shown in the template list.

6.2.2 Creating and Updating Mapping for YANG Template

To create or update a mapping on a template:

1. Select a desired template to create or update a mapping on in the template list to the left.
2. Do one of the following:
 - To create a mapping, click **Create mapping**, and select an interface model to use.
 - To update a mapping, click .
3. Follow the instruction in the wizard. Available operations are:
 - Click one row in the interface model and then click a desired row in the device model, to create a mapping between parameters of the selected Xpath in both models.

ethernet

1 Select MOKs

2 Select attributes for CREATE operation

3 Select attributes for SET operation

4 Select attributes for DELETE operation










Interface model




EthernetInterface

Xpath	Mapping
interfaceType	/if/interfaces/if-interface/ifa...
interfaceNumber	

Device model


ethernet > interfaces > interface

Xpath	Constraints	Mapping
name		
description		
type		
enabled		
link-up-down-trap-ena...		
>> ethernet		



Note: Ensure that constraints defined in the device YANG model are met, for example,  (key),  (mandatory), and  (when).

- Click  to delete a mapping.



- Click  to set the Source and Transformations.

Mapping settings

Source	Device configuration ▼	
Request transformation	myCreateTransformer ▼	
Method	appendWithText ▼	
Response transformation	Select transformation ▼	
<div> <div>OK</div> <div>Cancel</div> </div>		

Note: The following source types can be configured on a device that using the current YANG template. For more information, see Section 4 on page 13.

- Request
- Device configuration
- Device credential
- Device parameter

Available request transformations managed in **Template Transformation** GUI. See Section 6.2.4 on page 64.

The **Response transformation** is not supported in the current release.

After finishing the wizard, the created or updated mapping is shown in the list with mapped features.

6.2.3 Deleting Mapping for YANG Template

When a template is selected, use  to delete a desired feature from the template.

Note: If all mappings are deleted, the template disappears from the template list.

6.2.4 YANG Template Transformations

This section contains information about the template transformations, here referred to as “transformations”. A transformation can be used to transform a value before it is sent to a device or to transform the response value from a device.

Figure 24, with belonging information, describes the GUI of the **Template Transformations**.

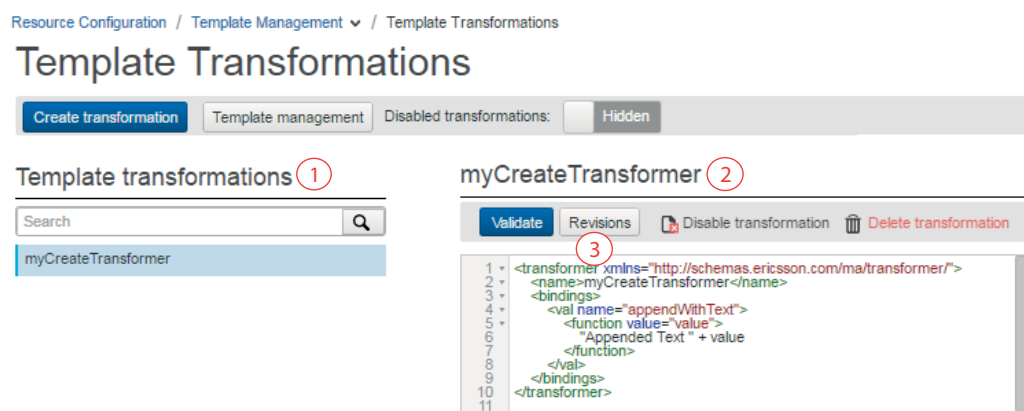


Figure 24 Overview of Template Transformations

1. To the left in the GUI, all enabled transformations are listed. To view disabled transformations, see Section 6.2.4.3 on page 65.

To add a transformation to the list, it has to be imported or created. For more information on:

- How to create a transformation, see Section 6.2.4.1 on page 64.
- How to import a transformation, see Section 6.3.1 on page 66.

2. Here the selected transformation is shown. By default, the latest revision of the transformation is shown, but also earlier revisions can be shown, see Section 6.2.4.5 on page 66.
3. Here all revisions of the selected transformation are listed. Click **Revisions** to pop up this dialog.

6.2.4.1 Creating Transformation

To create a transformation, do the following:

1. Click **Create transformation**.
2. A boilerplate for a transformation is shown in the editor. Make the desired changes to the boilerplate.



3. Click **Save**.

A newly created transformation is activated after all nodes in the cluster are updated. It takes several minutes, depending on the transformation complexity.

6.2.4.2 Editing Transformation

A transformation can be edited directly in the GUI.

To edit a transformation, do the following:

1. Select the transformation to edit in the transformation list on the left.
2. Make the desired changes to the transformation in the editor.
3. Click **Validate**.
4. When the transformation has passed the validation, click **Save**.

An edited transformation is activated after all nodes in the cluster are updated. It takes several minutes, depending on the transformation complexity.

6.2.4.3 Disabling Transformation


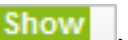
When a transformation is disabled, it cannot be used in templates any more. The transformation is still kept in the system for traceability. This can help to understand why previous southbound commands were generated in a certain way.

To disable a transformation, do the following:

1. Select a transformation to disable in the transformation list.
2. Click the **Disable transformation** link
3. Enter a commit message, and click **Disable**.

The transformation is disabled immediately.

Depending on the **Disabled transformation** setting, the disabled transformation is either:

- Not shown in the transformation list, if the setting is .
- Shown in the transformation list with a prefix “[Disabled]”, if the setting is .

6.2.4.4 Enabling Transformation

To enable a transformation, do the following:



1. Ensure that the **Disabled transformation** setting is set to **Show**.
2. Select a desired transformation in the transformation list, and click **Enable transformation** link.
3. Enter a commit message, and click **Enable**.

An enabled transformation is activated after all nodes in the cluster are updated. It takes several minutes, depending on the transformation complexity.

6.2.4.5 Restoring Transformation

To restore a previous version of a transformation, do the following:

1. Select a desired transformation in the transformation list, and click **Revisions**.
2. In the appeared dialog, select a desire revision to restore to, and click **Restore**.
3. Enter a commit message and click **Restore**.
4. Click **Save**.

A restored transformation is activated after all nodes in the cluster are updated. It takes several minutes, depending on the transformation complexity.

6.2.4.6 Deleting Transformation

When a transformation is deleted, it can no longer be used when generating southbound commands. A deleted transformation cannot be restored.

1. Select a desired disabled transformation from the transformation list, and click **Delete transformation**.
2. Click **Delete** to confirm the deletion.

The transformation is deleted immediately.

6.3 Common Operations for XML and YANG Templates

6.3.1 Importing Templates

It is supported to import one or more XML or YANG vendor templates from GUI, as shown in Figure 25.

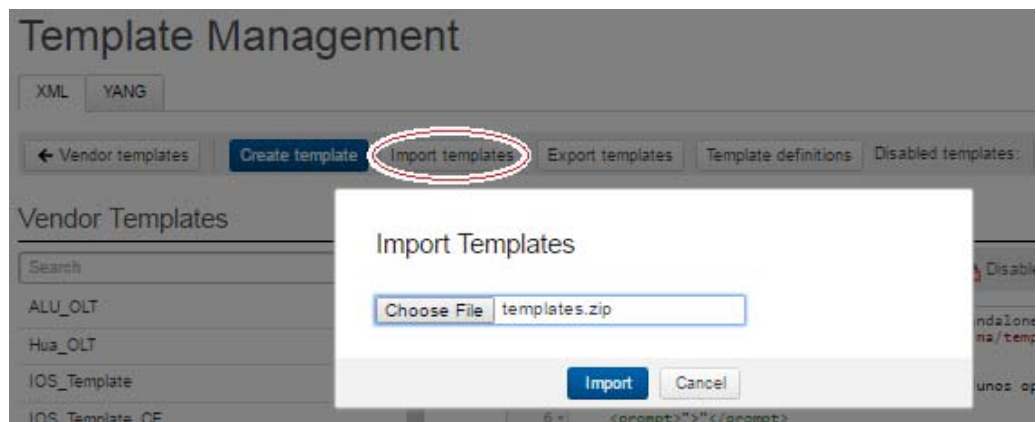


Figure 25 Import Templates From GUI

When importing a template, be aware of the following:

- Use the template `zip` file exported from Resource Configuration to import.
- XML template definitions and YANG template transformations included in the `zip` file is imported together with the corresponding XML or YANG templates.

Definition and transformation files cannot be imported without templates.

Note: If the template exists, a new revision is created.

A newly imported template is activated after all nodes in the cluster are updated. It takes several minutes, depending on the template complexity.

To import multiple templates from GUI, do the following:

1. Click **Import templates**.
2. Click **Choose file** to select a `zip`.

Note: Only a `zip` file that is exported from Resource Configuration can be used for importing. For instructions, see Section 6.3.2 on page 68.

3. Click **Import**.

When the import is done, the templates are visible in the template list.

If Figure 26 is displayed instead, the reason is that one or more templates are disabled owing to their old formats. To solve the problem, see Section 6.1.3 on page 46.

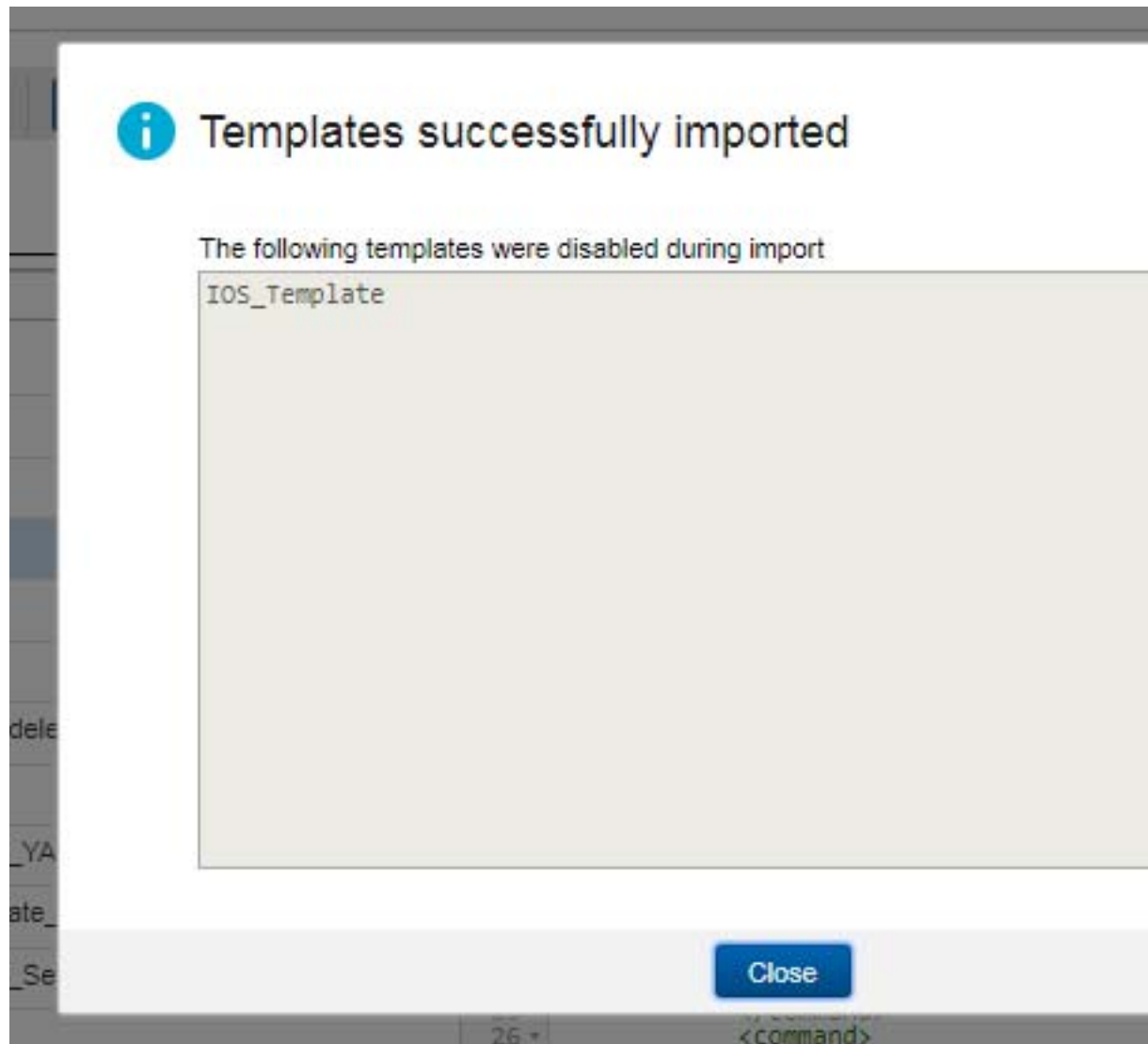


Figure 26 Imported Templates Are Disabled

6.3.2

Exporting Templates

It is supported to export a chosen vendor template, or export all templates, and the corresponding XML template definitions or YANG template transformations, as shown in Figure 27.

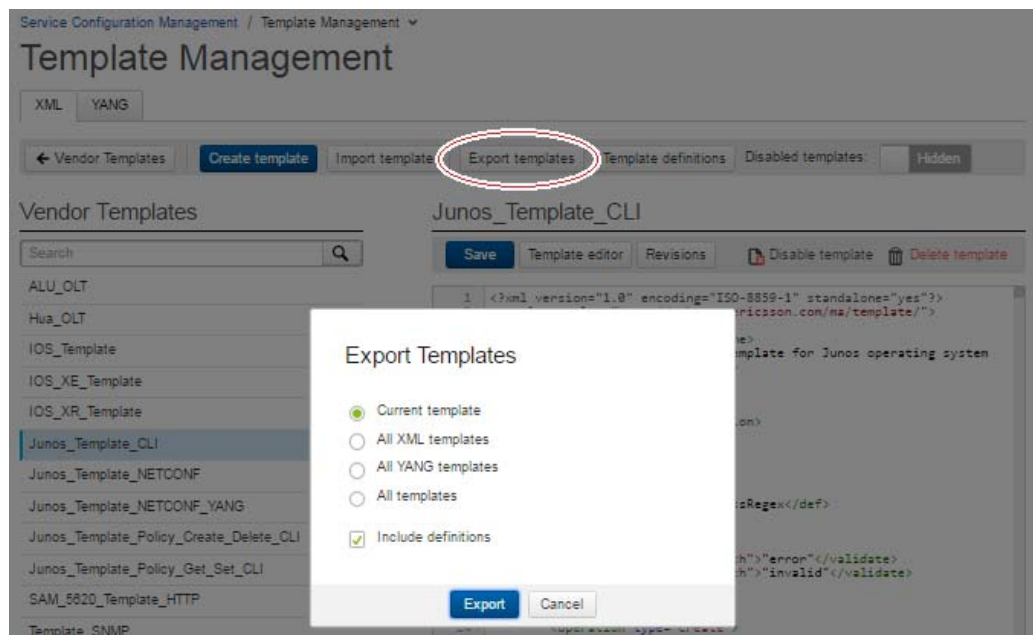


Figure 27 Export Templates

When exporting a template, be aware of the following:

- Select a template from the template list to enable exporting the **Current template**.

User can also choose whether to export the corresponding definition (for XML template) or transformation (for YANG template) at the same time.

- When choosing to export all XML or YANG, or all templates:
 - The corresponding XML template definitions or YANG template transformations are always exported together.
 - Disabled templates are not exported.
- Rename the exported file properly. The default filename is always `templates.zip`.

6.3.3 Disabling Template

When a template is disabled, it can no longer be used when generating southbound commands. The template is still kept in the system for traceability. This can help to understand why previous southbound commands were generated in a certain way.

To disable a template, do the following:

1. Select a desired template in the template list, and click the **Disable template** link.



2. A dialog is displayed, click **Find usage** to see which devices are using this template.



Note: Ericsson recommends checking the template usage before disabling it. Because once it is disabled, the template cannot be used to perform any operations towards a device.

3. Click **Back** to return to the previous dialog.
4. If no concerns for the template usage result, enter a commit message and click **Disable**.

Otherwise, click **Cancel**.

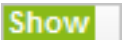
The template is disabled immediately.

Depending on the **Disabled templates** setting, the disabled templates are either:

- Not shown in the template list, if the setting is .
- Shown in the template list with a prefix “[Disabled]”, if the setting is .

6.3.4 Enabling Template

To enable a template, do the following:

1. Ensure that the **Disabled templates** setting is set to .
2. Select a desired template in the template list, and click **Enable template** link.
3. A dialog is displayed, enter a commit message and click **Enable**.

An enabled template is activated after all nodes in the cluster are updated. It takes several minutes, depending on the template complexity.

6.3.5 Restoring Template

To restore a previous version of a template, do the following:

1. Select a desired template in the template list, and click **Revisions**.
2. In the appeared dialog, select a desire revision to restore, and click **Select**.

This shows a **Restore** button in the GUI.

3. Click **Restore** and confirm the restore of the template in the dialog that is displayed.



A restored template is activated after all nodes in the cluster are updated. It takes several minutes, depending on the template complexity.

6.3.6 Deleting Template

When a template is deleted, it can no longer be used when generating southbound commands. A deleted template cannot be restored.

1. Select the template to delete in the template list on the left.
2. A dialog is displayed, click **Find usage** to see on which devices the template is used.

Note: Ericsson recommends checking the template usage before deleting it. Because once it is deleted, the template cannot be used to perform any operations towards a device.

3. Click **Back** to go back to previous dialog.
4. If no concerns for the template usage result, click the **Delete** to confirm the deletion.

Otherwise, click **Cancel**.

The template is deleted immediately.





7 Log Management

In **Log Management**, it is possible to retrieve processing log information. For information and descriptions of how to retrieve this information, refer to *User Guide for Resource Activation*, Reference [4].





Reference List

Ericsson Documents

- [1] *Library Overview*, 18/1553-CSH 109 628 Uen
- [2] *Function Specification Resource Configuration*, 19/155 17-CSH 109 628 Uen
- [3] *Provisioning over CAI3G for Resource Configuration*, 32/155 19-CSH 109 628 Uen
- [4] *User Guide for Resource Activation*, 1/1553-CSH 109 628 Uen
- [5] *Customer Adaptation Guide for Resource Configuration*, 14/1553-CSH 109 628 Uen