



# RBMS Configuration Store

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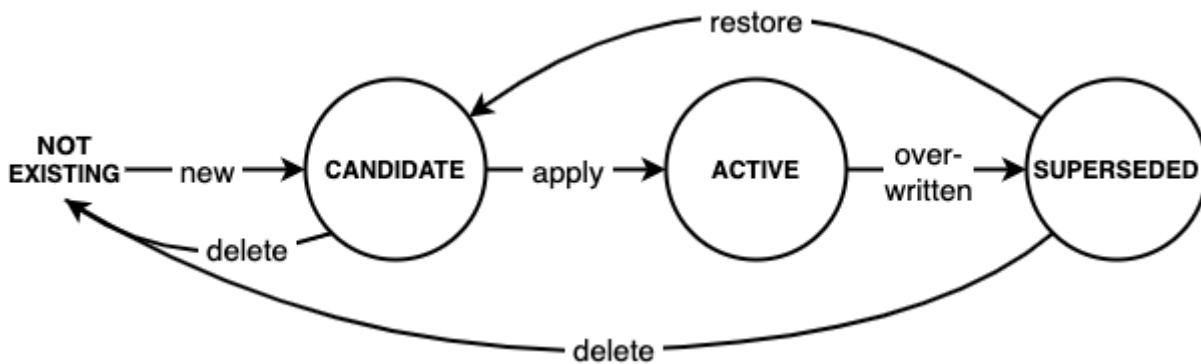
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# 1. RBMS Configuration Store

The RBMS resource inventory includes a configuration store to maintain switch configurations. The configuration store can store an arbitrary number of configurations per switch and provides a history of up to 50 revisions for each configuration.

RBFS stores the active configuration in RBMS after every configuration change.

The figure below shows the configuration lifecycle.



A new configuration is considered a *candidate* configuration. A candidate configuration turns into the *active* configuration when being applied to the switch. The previously activate configuration is marked as *superseded* at the same time. A superseded configuration can be restored by creating a new candidate configuration from it and applying the candidate configuration again. Candidate and superseded configurations can be removed from the configuration store. The active configuration cannot be deleted.

RBMS provides means to create or upload new configurations and apply them to the switch. In addition, RBMS UI allows inspecting configuration changes in the configuration history.

## 1.1. Creating a new candidate configuration

### 1.1.1. Uploading a candidate configuration

The simplest way to add a new candidate configuration is to upload a new configuration to the configuration store.

To upload a new candidate configuration

1. Click the **Inventory** tab.
2. Click **Elements** in the left navigation pane. The element list appears.

# Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration Logout

Inventory -

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

Administration +

### Elements

Overview of all registered elements.

**Filter**

 Filter

3. Click the element name for which you want to upload a new configuration.
4. Click **Configuration** in the left navigation pane. The configurations list appears.

# Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration Logout

Inventory +

- Pod +
- accessleaf l1.pod1.blr
  - Element -
  - Element Settings
  - CTRLD
  - Configuration**
  - Environments

### Element Configurations

List of all existing element configurations

**Filter**

 Filter

**No configurations found.**

No configurations for the selected element found.

5. Click **Add configuration**. The New Configuration page appears.

# Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration [Logout](#)

Inventory +

Element Configurations > New Configuration

## New Configuration

Create a new configuration for element l1.pod1.blr .

blr

Pod +

accessleaf l1.pod1.blr

Element -

- Element Settings
- CTRLD
- Configuration**
- Environments
- Location
- Dashboards
- Metrics

**New Configuration**  
Creates a new candidate configuration for an existing configuration or add a new configuration.

Drop your configuration file onto the dashed region or select the configuration file in the file dialog.

[Select configuration file](#)

- Drop a configuration file onto the dashed area or click **Select configuration file** to open the file dialog to select a file.
- Review the configuration in the preview.

# Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration

Logout

**Inventory** +

blr

**Pod** +

accessleaf l1.pod1.blr

**Element** -

- Element Settings
- CTRLD
- Configuration**
- Environments
- Location
- Dashboards
- Metrics
- Images
- Services
- Physical Interfaces
- Logical Interfaces
- Modules
- DNS
- Tools
- Actions

**Administration** +

Element Configurations > New Configuration

## New Configuration

Create a new configuration for element l1.pod1.blr .

### New Configuration

Creates a new candidate configuration for an existing configuration or add a new configuration.

```
{
  "running-configuration": {
    "system:rtbrick": {
      "system-time-type": "GMT",
      "load-last-config": "True",
      "snapshot-logd": "False",
      "host-name:rtbrick": {
        "element-name": "l1.pod1.blr",
        "pod-name": "blr"
      }
    },
    "ctrlld": [
      {
        "ipv4-address": "10.0.3.1",
        "port": 19091
      }
    ]
  },
  "log": [
    {
      "bd_module_logmap:all bds all": {
        "level": "none"
      },
      "bd_module_logmap:all pubsub all": {
        "level": "none"
      }
    }
  ],
  "time-series": [
    {
      "metric:basic-temperature:all:cpu:all": {

```

Dismiss

### Configuration Name

running-config.json

Descriptive configuration name

### Content Type

JSON

The MIME-Type of the application

### Comment

Comment on the applied configuration changes

Cancel

Save configuration

8. In **Configuration Name**, enter the switch configuration name. By default the configuration name is taken from the file name.
9. Check whether the selected **Content Type** is correct.
10. Optionally comment the configuration.
11. Click **Save configuration** to add the candidate configuration.

# Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration Logout

Inventory + **Element Configurations**  
List of all existing element configurations

blr  
Pod +

accessleaf I1.pod1.blr

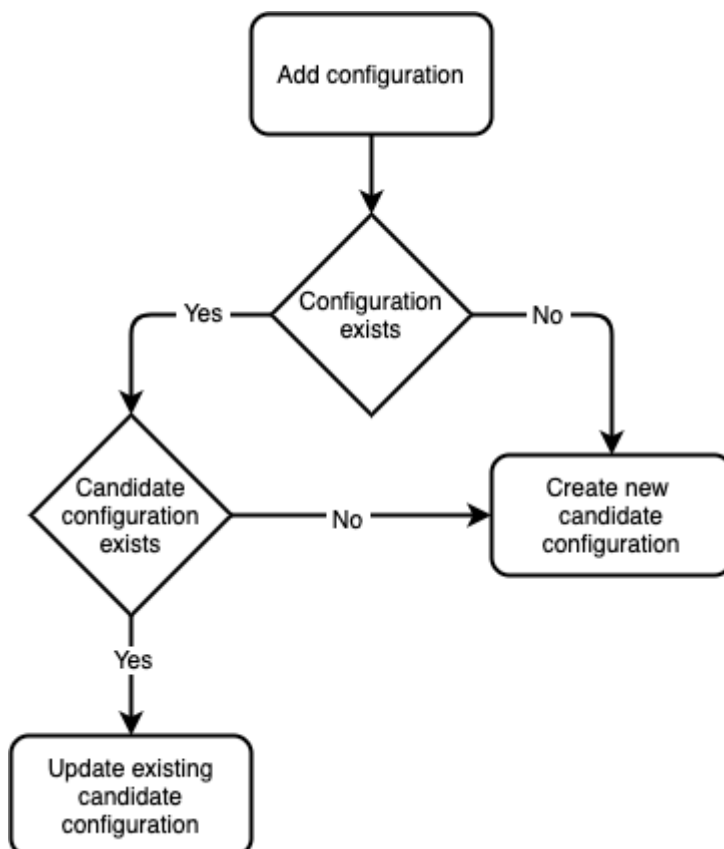
Filter  
Filter configurations by their name. Filter

Config	State	Creator	Date Modified	Comment
running-config	CANDIDATE	martin	23-JUN-2020 22:27:30.262	<span>Download</span>

Add configuration

Element -  
 Element Settings  
 CTRLD  
**Configuration**  
 Environments

RBMS either creates a new candidate configuration or updates an existing candidate configuration if a candidate configuration for the specified configuration name exists. The complete flow is illustrated below:



## 1.1.2. Generating a candidate configuration

RBMS includes a template engine to generate switch configurations. The configuration templates are designed based on your conventions for building a fabric and then added to the template engine. The templates need to be registered in RBMS to make them eligible for execution. RBMS passes the following

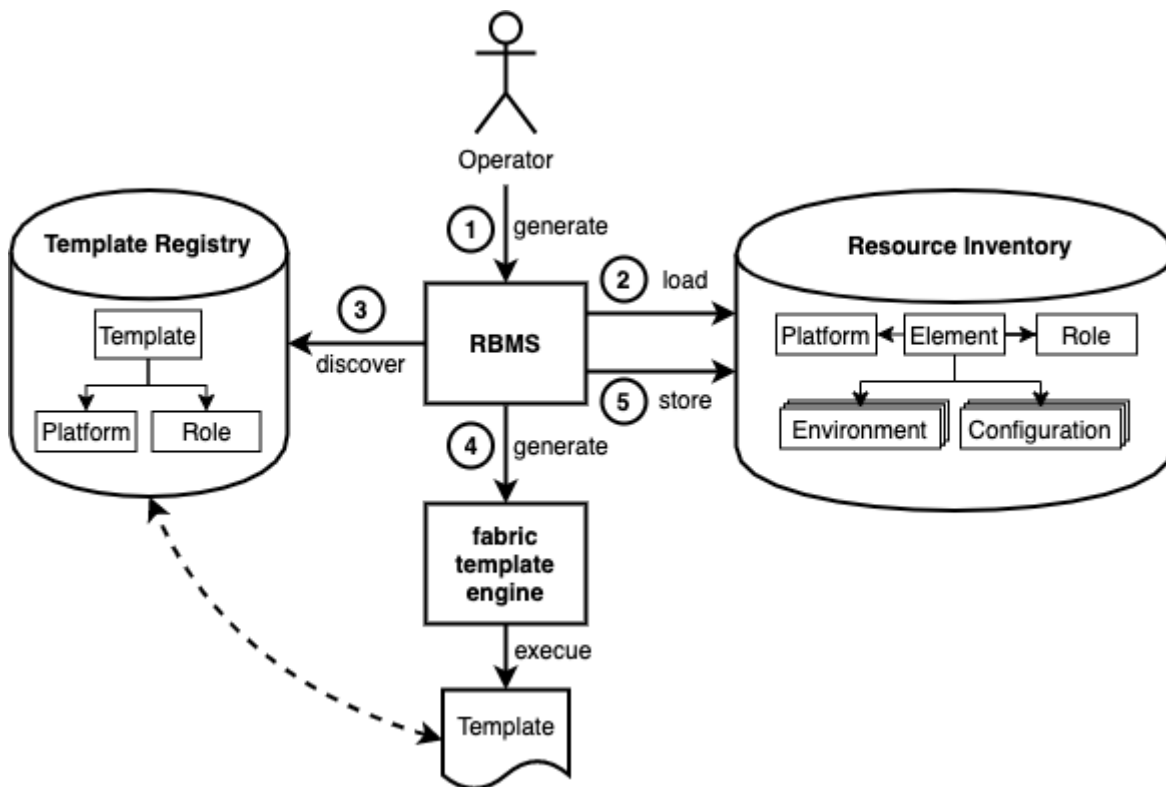


information to the template engine:

- the general element settings
- the software image to be installed on the switch and
- all registered environments

RBMS can store an arbitrary set of *environments* per element. An environment is a JSON object containing parameters processed in the template. The structure and number of environments is defined by the template author.

The figure below shows the configuration generation flow:



1. The operator triggers the switch configuration generation in RBMS.
2. RBMS loads the element settings, environments and image information from the resource inventory.
3. RBMS discovers the templates eligible for the selected switch.
4. RBMS invokes the template engine for each discovered template.
5. RBMS stores the generated configuration as candidate configuration in the configuration store.

### 1.1.2.1. Template registration

The template registration maintains the list of templates available in the template engine.

Say you have three different templates:

- `ztp.gojson` generates the ZTP configuration snippet for a switch.
- `leaf-running-configuration.gojson` generates the running-configuration of a leaf switch.
- `spine-running-configuraton.gojson` generates the running-configuration of a spine switch.

All templates need to be registered in RBMS to get executed when the switch configuration is generated.

To register a new template

1. Click the **Inventory** tab.
2. Click **+** to expand the **Administration** menu.
3. Click **Templates** in the left navigation pane. The template list appears. ZTP and spine templates are already registered.

## Inventory

Manage network elements



Images Inventory Metrics Jobs Logs Administration Logout

Inventory +

Administration -

- Platforms
- Roles
- Dashboards & Panels
- Templates

### Templates

Manage configuration templates.

Templates  Filter

Filter templates by their name

Template	Description
<a href="#">spine-running-configuration</a>	Spine running configuration template
<a href="#">ztp</a>	ZTP service configuration template.

Add template

4. Click **Add template** to register the leaf template.

# Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration

Logout

- Inventory +
- Administration -
- Platforms
- Roles
- Dashboards & Panels
- Templates**

Templates > New template

## New Template

Register a new template

### General Settings

#### Template Name

leaf-running-configuration

The name of the template

#### Configuration Name

running-configuration

The name of the generated configuration

#### Description

Leaf running configuration template

An optional template description

### Binding

#### Element Roles

- accessleaf**
- borderleaf
- spine
- integrationtest

Restrict this template to the selected element roles.

#### Platforms

- EC5916-54XK
- EC5916-54XKS
- Wedge-100BF-32X
- Wedge-100BF-65X

Restrict this template to the selected platforms.

Cancel **Add template**

5. In **Template Name**, enter *leaf-running-configuration*.



The template name in RBMS matches the template folder name in the template engine. See the [template engine guide](#) for more details.

6. In **Configuration Name**, enter *running-configuration* since the template generates the *running-configuration* for a switch.

7. In **Element Roles**, select *accessleaf* to bind the template to accessleaf switches.

8. In **Description**, optionally describe the template and the generated configuration.

9. Click **Save template**. The template list appears. The new template is listed.

## Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration [Logout](#)

Inventory + **Templates**  
Manage configuration templates.

Administration -  
Platforms  
Roles  
Dashboards & Panels  
**Templates**

Templates  
Filter templates by their name

Filter

Template	Description
<a href="#">leaf-running-configuration</a>	Leaf running configuration template
<a href="#">spine-running-configuration</a>	Spine running configuration template
<a href="#">ztp</a>	ZTP service configuration template.

[Add template](#)

## 1.1.2.2. Environment management

### 1.1.2.2.1. Adding a new environment

To add a new environment

1. Click **Environments** in the left navigation pane. The list of environment appears.

## Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration [Logout](#)

Inventory + **Element Environments**  
List of environments declared for this element.

blr  
Pod +

accessleaf l1.pod1.blr  
Element -  
Element Settings  
CTRLD  
Configuration

**No environments found.**  
No environments have been registered for this element.

[Add environment](#)

2. Click **Add environment**. The New Environment view appears.

# Inventory

Manage network elements



Manage software images

Images Inventory Metrics Jobs Logs Administration Logout

Inventory +

Element Environments > New environment

## New Environment

Create new environment for element l1.pod1.bir

Environment

**Environment Name**  
bgb-peering  
The environment name is unique per element

**Category**  
RBFS  
Optional environment category.

**Type**  
  
Optional environment type.

**Description**  
BGP Instances  
Optional environment description.

powered by ace

```
1 {
```

3. In **Environment Name** enter the name of this environment.

4. In **Category** enter *RBFS*.



Only RBFS environments are processed by the template engine.

5. In **Type** enter an optional type or schema information of the environment.

6. In **Description** enter an optional environment description.

7. Enter the environment variables in the displayed JSON editor or click **Upload new environment** to upload a JSON file.

8. Click **Add environment** to add a new environment.

### 1.1.2.2.2. Editing an environment

To update an existing environment

1. Click **Environments** in the left navigation pane. The list of environment appears.

2. Click the name of the environment you want to edit.
3. Apply the modifications to the environment.
4. Click **Save environment** to save the environment.

### 1.1.2.2.3. Removing an environment

To remove an environment

1. Click **Environments** in the left navigation pane. The list of environment appears.
2. Click the name of the environment you want to remove.
3. Click **Remove environment**. A confirmation dialog is displayed.
4. Click **Confirm** to remove the environment.

### 1.1.2.3. Configuration generation

To generate a configuration

1. Click **Actions** in the left navigation pane.

## Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration Logout

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**Inventory** +

blr

**Pod** +

accessleaf I1.pod1.blr

**Element** -

- Element Settings
- CTRLD
- Configuration
- Environments
- Location
- Dashboards
- Metrics
- Images
- Services
- Physical Interfaces
- Logical Interfaces

Pods > blr > Elements > I1.pod1.blr > CTRLD

### Actions for element I1.pod1.blr

Execute management actions on I1.pod1.blr

**Ping**

Test whether CTRLD switch management API is reachable. Ping

**Configuration**

Generate switch configuration and provision the ZTP service. Generate configurations

**ACCEPTED** Scheduled job to generate the element configuration.

**ZTP**

Copy configurations to ZTP server. Provision ZTP

**Running Configuration Update**

Merge candidate running configuration into the current running configuration. Daemons that receive a configuration change might be restarted. Apply running-configuration

**Software Upgrade**

Run Zero-Touch Provisioning (ZTP) to upgrade the switch. Upgrade

2. Click **Generate configurations**. RBMS schedules a configuration generation job. The job contains a task for each configuration and invokes the template engine to create the configuration.

# Jobs

Manage the metrics sampled from network devices



Images Inventory Metrics **Jobs** Logs Administration

Logout

Job List

Jobs > Job Tasks

## Job Tasks

I1.pod1.blr

Job Info

Settings

**Tasks**

Flow

### Job Summary

General job settings and job process in terms of percentage of completed tasks

Job Application	ZTP
Job Type	generate-config
Job Name	I1.pod1.blr
Job Owner	martin
Job State	<b>COMPLETED</b>
Started at	23-JUN-2020 10:27:30.105

### Job Tasks

Review the job tasks and their respective state.

Task List

Task Type	Task Name	Element	State	Last modified
generate-config	<a href="#">running-configuration</a>	<a href="#">accessleaf I1.pod1.blr</a>	<b>COMPLETED</b>	23-JUN-2020 10:27:30.275
generate-config	<a href="#">ZTP</a>	<a href="#">accessleaf I1.pod1.blr</a>	<b>COMPLETED</b>	23-JUN-2020 10:27:30.351

Remove



The generated configurations are stored as new candidate configurations.

To review the generated configuration

1. Click **Configuration** in the left navigation pane. The configuration list shows new candidate configurations.

# Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration Logout

Inventory +

blr

Pod +

accessleaf l1.pod1.blr

Element -

- Element Settings
- CTRLD
- Configuration**
- Environments
- Location
- Dashboards

## Element Configurations

List of all existing element configurations

**Filter**

 Filter

Filter configurations by their name.

Config	State	Creator	Date Modified	Comment
running-config	CANDIDATE	martin	23-JUN-2020 10:27:30.262	<span>Download</span>
ZTP	CANDIDATE	martin	23-JUN-2020 10:27:30.338	<span>Download</span>

Add configuration

- Click the timestamp of the generated configuration to show the configuration content. Click the configuration name to display the configuration history.

## 1.2. Review configuration history

To review configuration changes in the configuration history

- Click the **Inventory** tab. The list of pods appears.
- Click **Element** in the left navigation pane. The element list appears.
- In **Filter** enter the name of the switch and click **Filter**. The list of matching elements appears.

# Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration Logout

Inventory -

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

Administration +

## Elements

Overview of all registered elements.

**Filter**

 Filter

Select the property to filter elements for. [Show advanced filtering options](#)

Pod	Element	Alias	Adm.-State	Tags
blr	l1.pod1.blr		ACTIVE	BLR RBMS lab

1 element(s) found.

- Click the element name for which you want to inspect configuration changes.



The element settings appears.

5. Click **Configurations**. The list of configurations appears.

The screenshot shows the 'Inventory' page with the 'Configurations' tab selected. The main content area displays a table of configurations. The table has columns for Config, State, Creator, Date Modified, and Comment. Two configurations are listed: 'CTRLD' and 'running-configuration', both in an 'ACTIVE' state. A 'Filter' input field and a 'Filter' button are present above the table. A sidebar on the left shows navigation options like 'Element Settings', 'CTRLD', 'Configuration', 'Environments', and 'Location'. A 'Logout' button is in the top right corner.

Config	State	Creator	Date Modified	Comment
CTRLD	ACTIVE	karthik	24-JUN-2020 06:51:28.609	RBMS upgrade
running-configuration	ACTIVE	karthik	24-JUN-2020 07:37:17.079	Commit Immediate

6. Click the configuration name. The configuration history appears.

The screenshot shows the 'Inventory' page with the 'running-configuration' configuration selected. The main content area displays the 'Element Configuration History' for this configuration. It features a 'Revisions' table with columns for Compare, State, Author, Last Modified, and Comment. Five revisions are listed, with the first one being 'ACTIVE' and the others 'SUPERSEDED'. A 'Compare' button is visible at the top left of the table. The sidebar and 'Logout' button are also present.

Compare	State	Author	Last Modified	Comment
<input checked="" type="radio"/>	ACTIVE	karthik	24-JUN-2020 07:37:17.079	Commit Immediate
<input type="radio"/>	SUPERSEDED	karthik	24-JUN-2020 07:35:23.307	Commit Immediate
<input type="radio"/>	SUPERSEDED	karthik	24-JUN-2020 07:34:45.516	Commit Immediate
<input type="radio"/>	SUPERSEDED	karthik	24-JUN-2020 07:33:03.198	Commit via Rest
<input type="radio"/>	SUPERSEDED	karthik	24-JUN-2020 07:21:31.216	Commit via Rest

7. Select the two configurations you want to compare and click the **Compare** button. The diff viewer appears.

# Inventory

Manage network elements



Images **Inventory** Metrics Jobs Logs Administration

Logout

Inventory +

Element Configurations > running-configuration > Element Configuration Revisions Comparator

## I1.pod1.blr running-configuration diff

Compare running-configuration changes between 24-JUN-2020 07:37:17.079 and 24-JUN-2020 07:34:45.516

blr

Pod +

accessleaf I1.pod1.blr

Element -

- Element Settings
- CTRLD
- Configuration**
- Environments
- Location
- Dashboards
- Images
- Services
- Physical Interfaces
- Logical Interfaces

24-JUN-2020 07:37:17.079

```
{
  "running-configuration": {
    "system:rtbrick": {
      "system-time-type": "GMT",
      "load-last-config": "True",
      "snapshot-logd": "False",
      "host-name:rtbrick": {
        "element-name": "I1.pod1.blr",
        "pod-name": "blr"
      }
    },
    "ctrlld": [
      {
        "ipv4-address": "10.0.3.1",
        "port": 19091
      }
    ]
  },
  "log": [
    {
      "bd_module_loggroup:all bds all": {
        "level": "None"
      },
      "bd_module_loggroup:all pubsub all": {
        "level": "None"
      }
    }
  ],
  "time-series": [
    {
      "metric:chassis_fan_speed_rpm": {
        "metric-bds-type": "object-metric",
        "prometheus-type": "naive"
      }
    }
  ]
}
```

24-JUN-2020 07:34:45.516

```
{
  "running-configuration": {
    "system:rtbrick": {
      "system-time-type": "GMT",
      "load-last-config": "True",
      "snapshot-logd": "False",
      "host-name:rtbrick": {
        "element-name": "I1.pod1.blr",
        "pod-name": "blr"
      }
    },
    "ctrlld": [
      {
        "ipv4-address": "10.0.3.1",
        "port": 19091
      }
    ]
  },
  "log": [
    {
      "bd_module_loggroup:all bds all": {
        "level": "None"
      },
      "bd_module_loggroup:all pubsub all": {
        "level": "None"
      }
    }
  ],
  "time-series": [
    {
      "metric:chassis_fan_speed_rpm": {
        "metric-bds-type": "object-metric",
        "prometheus-type": "naive"
      }
    }
  ]
}
```

The diff viewer shows both configurations and the diff if you scroll down.

```
{
  "physical:ifp-0/0/52": {
    "speed": "40G"
    "auto_negotiation": true
  }
}
```