RBFS Resource Monitoring (Resmon)

Version 20.5.1-rc0, 25 May 2020

Registered Address	Support	Sales
26, Kingston Terrace, Princeton, New Jersey 08540, United States		
		+91 80 4850 5445
http://www.rtbrick.com	support@rtbrick.com	sales@rtbrick.com

Table of Contents

1. Introduction

An optic transceiver sends and receives data between devices using fiber optic medium. The optics modules available in a network may not be available to Brick Data Store (BDS). The BDS might not be able to access the optics information directly on the network, and hence it relies on i2c tools to interact with optics modules.

The RBFS optics support functionality provides a mechanism to represent optics modules in BDS, and it comes with the following features.

- Supports the following optics modules:
    - SFP, SFP+, QSFP, QSFP+, QSFP28 (DAC are not supported)
- Provides a mechanism to discover and monitor optics modules
- Provides CLIs to write to optics modules
- Provides show commands to visualize optics inventory and status of each module
- Logs the status of the optics module

The RBFS implementation supports pluggable optics modules on whitebox switches only.

This document describes how you can integrate and monitor the optics modules into the resource monitoring daemon (*resmond*) on RBFS. This functionality leverages the Open Optics Monitoring (OOM) tool from OCP for reading from or writing to optics modules from different vendors.

The RBFS optics integration is decoupled into two components: resmond-agent and resmond.

- **resmond-agent**: This daemon runs inside a container, which is responsible for interacting with optics modules.
- **resmond**: This daemon is responsible for managing optics in BDS.

This resmond daemon performs the following tasks:

- Optics inventory accounting: Identifying the following details of a discovered optics module.
    - Port
    - Type
    - Vendor
    - Serial Number

- Part Number
- Read the following optics data from a module:
  - RX/TX alarming (loss of light and loss of signal)
  - RX/TX power status
  - Voltage and BIAS status
  - Temperature
- Write the optics data to an optics module
- Enabling high power class on QSFP28
- Shutdown lasers (QSFP28, SFP+ and SFP)

1.1. Supported Hardware

- Edgecore AS5916-XKS

1.2. Guidelines and Limitations

- The current RBFS optics integration does not support the following functionalities:
  - Interrupt-based optics notification
  - Alarms

2. Components of RBFS Optics Integration

The RBFS optics integration is decoupled into two components: resmond-agent and resmond.

2.1. Resmond-agent

The resmond-agent is a daemon, which interacts with an optics module through an OCP-based OOM package. The resmond-agent exposes REST APIs so that the external applications can interact with optical modules.
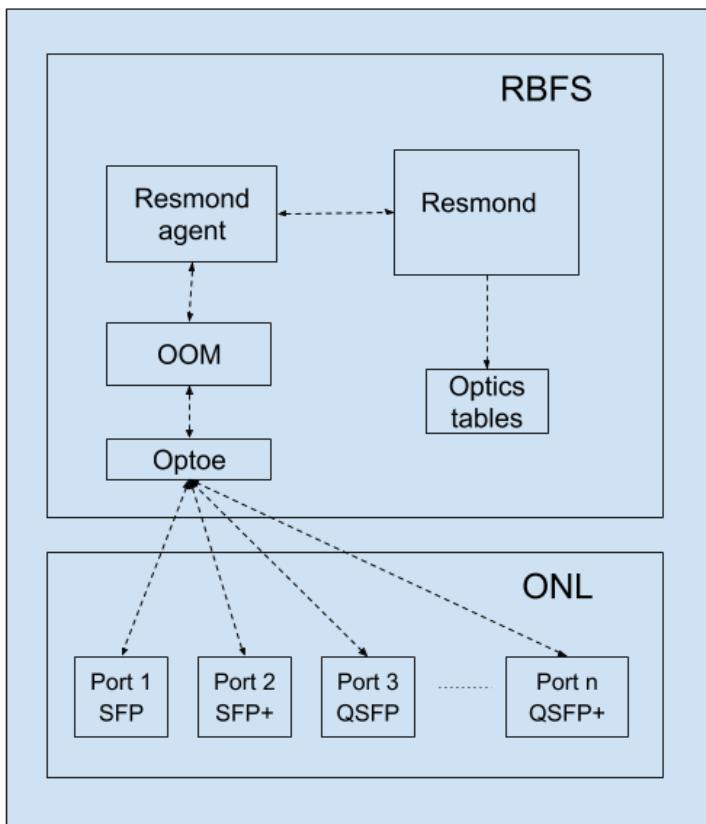
Figure 1. RBFS Optical Integration

The resmond-agent performs the following functions:

- Reads (Electrically Erasable Programmable Read-Only Memory) EEPROM data from the optics modules at specified intervals, and creates resmond optics BDS objects.

- Writes values to specified fields of optics module. The supported fields are:

  - TX_DISABLE: This field can be True or False

  - HIGH_POWER_CLASS_ENABLE: This field can be True or False

- Provides following URIs:

- /resmond-agent/optics/get: It collects optics module information available from all available ports

- /resmond-agent/optics/set: It sets value to the specified field of an optics module

2.2. Resmond

The resmond is a BD running inside the RtBrick container, which manages every optics module discovered by the resmond-agent. It polls hardware at specified interval to discover available optics modules.

2.2.1. Reading from optics

The resmond creates and maintains an inventory table and optics module table named *global.loc_0.resource.optics.inventory* and *global.loc_0.resource.optics.module* to keep information of each optics module. Objects corresponding to these tables are added by the resmond-agent.

The following optics modules are supported:

- SFP

- SFP+

- QSFP

- QSFP+

- QSFP28

Writing to optics

The resmond receives configuration related to the write operation. It sends REST query to resmond-agent (/resmond-agent/optics/set URI) to perform write operation to optics. The resmond receives set operation status code from the resmond-agent.

The following operations are supported:

- Enabling or disabling high-power class on the QSFP28 optics module

- Enabling or disabling lasers on optics module

2.2.2. Resmond Logging

The resmond can log the following events:

- Module temperature high alarm

- Module temperature high warning

- Module temperature low alarm
- Module temperature low warning
- Module voltage high alarm
- Module voltage high warning
- Module voltage low alarm
- Module voltage low warning
- Module lane power high alarm
- Module lane power high warning
- Module lane power low alarm
- Module lane power low warning
- Module lane bias high alarm
- Module lane bias high warning
- Module lane bias low alarm
- Module lane bias low warning

3. Configuration Commands

3.1. Interface Level Commands

- resmon monitoring poll-interval
- high-power-class-enable
- tx-disable

3.1.1. resmon monitoring poll-interval

This command sets the poll-interval for the resmond to discover optics.

Command mode

```
[resmon monitoring]
```

Syntax

```
set poll-interval <poll_interval>
```

Command arguments

<poll_interval>	Specifies the interval (in milliseconds) at which optics should be polled. The interval can range from 1000 to 4294967295 milliseconds. The default interval is 5000.

Example

```
edit resmon monitoring
set poll-interval 15000
```

3.1.2. high-power-class-enable

This command enables or disables the high-power class of an optics module on a specific interface.

Command mode

```
[resmon optics interface <interface_name>]
```

Syntax

> **set high-power-class-enable** <false | true>

Command arguments

<true | false>	false - Disables high power class for optical module
	true - Enables high power class for optical module

Example

```
edit resmon optics interface ifp-0/0/0
set high-power-class-enable true
```

3.1.3. tx-disable

This command allows you to enable or disable lasers for an optical module.

Command mode

```
[resmon optics interface <interface_name>]
```

Syntax

> **set tx-disable** <false | true>

Command arguments

<true | false>	false - Enables lasers for optical module
	true - Disables lasers for optical module

Example

```
root@rtbrick:confd> edit resmon optics interface ifp-0/0/54

[ resmon optics interface ifp-0/0/54 ]
root@rtbrick:confd> set tx-disable false
```

4. Show Commands

- show optics all
- show optics

4.1. show optics all

This command displays all optics inventory information.

Syntax

```
show optics all
```

Example

```
ubuntu@rtbrick:~$ rtb resmond show optics all
+-----------+---------+--------+----------------------+------------+------------------+---------------+-----------------+-----------+
| Port      | Lane Id | Type   | Connector Type       | Vendor     | Part Number      | Serial Number | Power Class     | Power Mode|
+-----------+---------+--------+----------------------+------------+------------------+---------------+-----------------+-----------+
| ifp-0/0/1 | 0       | SFP    | Copper Pigtail       | FiberStore | SFP-10G-DAC      | F1712078552-1 | N/A             | N/A       |
| ifp-0/0/2 | 0       | SFP    | Copper Pigtail       | FiberStore | SFP-10G-DAC      | F1712078553-2 | N/A             | N/A       |
| ifp-0/0/3 | 0       | SFP    | Copper Pigtail       | FiberStore | SFP-10G-DAC      | F1712078543-1 | N/A             | N/A       |
| ifp-0/0/4 | 0       | SFP    | Copper Pigtail       | FiberStore | SFP-10G-DAC      | F1712078555-1 | N/A             | N/A       |
| ifp-0/0/10| 0       | SFP    | Copper Pigtail       | FS         | QSFP-4SFP10G-DAC | G1805050592-1 | N/A             | N/A       |
| ifp-0/0/11| 0       | SFP    | Copper Pigtail       | FS         | QSFP-4SFP10G-DAC | G1805050592-3 | N/A             | N/A       |
| ifp-0/0/12| 0       | SFP    | Copper Pigtail       | FS         | QSFP-4SFP10G-DAC | G1805050592-4 | N/A             | N/A       |
| ifp-0/0/13| 0       | SFP    | Copper Pigtail       | FS         | QSFP-4SFP10G-DAC | G1805050592-2 | N/A             | N/A       |
| ifp-0/0/20| 0       | SFP    | Unknown or unspecified| FS        | SFP-GB-GE-T      | G1809118355   | N/A             | N/A       |
| ifp-0/0/49| 1       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034263-2 | Class 1 (1.5W)  | Low       |
| ifp-0/0/49| 2       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034263-2 | Class 1 (1.5W)  | Low       |
| ifp-0/0/49| 3       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034263-2 | Class 1 (1.5W)  | Low       |
| ifp-0/0/49| 4       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034263-2 | Class 1 (1.5W)  | Low       |
| ifp-0/0/50| 1       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034278-1 | Class 1 (1.5W)  | Low       |
| ifp-0/0/50| 2       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034278-1 | Class 1 (1.5W)  | Low       |
| ifp-0/0/50| 3       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034278-1 | Class 1 (1.5W)  | Low       |
| ifp-0/0/50| 4       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034278-1 | Class 1 (1.5W)  | Low       |
| ifp-0/0/51| 1       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034261-2 | Class 1 (1.5W)  | Low       |
| ifp-0/0/51| 2       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034261-2 | Class 1 (1.5W)  | Low       |
| ifp-0/0/51| 3       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034261-2 | Class 1 (1.5W)  | Low       |
| ifp-0/0/51| 4       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034261-2 | Class 1 (1.5W)  | Low       |
| ifp-0/0/52| 1       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034268-1 | Class 1 (1.5W)  | Low       |
| ifp-0/0/52| 2       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034268-1 | Class 1 (1.5W)  | Low       |
| ifp-0/0/52| 3       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034268-1 | Class 1 (1.5W)  | Low       |
| ifp-0/0/52| 4       | QSFP28 | No Seperable connector| Fiberstore | Q28-PC01        | F1800034268-1 | Class 1 (1.5W)  | Low       |
| ifp-0/0/53| 1       | QSFP28 | Lucent Connector     | LambdaGain | LL1C31A2A        | L1297I0005    | Class 4 (3.5W)  | High      |
| ifp-0/0/53| 2       | QSFP28 | Lucent Connector     | LambdaGain | LL1C31A2A        | L1297I0005    | Class 4 (3.5W)  | High      |
| ifp-0/0/53| 3       | QSFP28 | Lucent Connector     | LambdaGain | LL1C31A2A        | L1297I0005    | Class 4 (3.5W)  | High      |
| ifp-0/0/53| 4       | QSFP28 | Lucent Connector     | LambdaGain | LL1C31A2A        | L1297I0005    | Class 4 (3.5W)  | High      |
| ifp-0/0/54| 1       | QSFP28 | Lucent Connector     | LambdaGain | LL1S31B0A        | L069780077    | Class 4 (3.5W)  | High      |
| ifp-0/0/54| 2       | QSFP28 | Lucent Connector     | LambdaGain | LL1S31B0A        | L069780077    | Class 4 (3.5W)  | High      |
| ifp-0/0/54| 3       | QSFP28 | Lucent Connector     | LambdaGain | LL1S31B0A        | L069780077    | Class 4 (3.5W)  | High      |
| ifp-0/0/54| 4       | QSFP28 | Lucent Connector     | LambdaGain | LL1S31B0A        | L069780077    | Class 4 (3.5W)  | High      |
+-----------+---------+--------+----------------------+------------+------------------+---------------+-----------------+-----------+
```

4.2. show optics

This command displays all optics information of a module in the specified port.

Syntax

```
show optics <port name>
```

Command arguments

<port name >	Name of the physical interface, for example, ifp-0/0/0

Example

```
ubuntu@rtbrick:~$ rtb resmond show optics ifp-0/0/54
Physical Interface: ifp-0/0/54
  Lane Id                                        : 1
  Laser bias current                             : 44.590000 mA
  Laser tx power                                 : 1.829100 mW / 2.6224 dBm
  Laser rx power                                 : 1.401400 mW / 1.4656 dBm
  Module temperature                             : 38.132812 degree celsius
  Module voltage                                 : 3.287300 V
  TX disable                                     : false
  High power class enable                        : true
  Laser TX loss of signal                        : false
  Laser TX loss of lock                          : false
  Laser RX loss of signal                        : false
  Laser RX loss of lock                          : false
  Laser bias current high alarm                  : false
  Laser bias current high warning                : false
  Laser bias current low alarm                   : false
  Laser bias current low warning                 : false
  Module voltage high alarm                      : false
  Module voltage high warning                    : false
  Module voltage low alarm                       : false
  Module voltage low warning                     : false
  Module temperature high alarm                  : false
  Module temperature high warning                : false
  Module temperature low alarm                   : false
  Module temperature low warning                 : false
  Laser tx power high alarm                      : false
  Laser tx power high warning                    : false
  Laser tx power low alarm                       : false
  Laser tx power low warning                     : false
  Laser rx power high alarm                      : false
  Laser rx power high warning                    : false
  Laser rx power low alarm                        : false
  Laser rx power low warning                     : false
  Laser bias current high alarm threshold        : 90.000000 mA
  Laser bias current high warning threshold      : 80.000000 mA
  Laser bias current low alarm threshold         : 5.000000 mA
  Laser bias current low warning threshold       : 10.000000 mA
  Module voltage high alarm threshold            : 3.600000 V
  Module voltage high warning threshold          : 3.470000 V
  Module voltage low alarm threshold             : 3.080000 V
  Module voltage low warning threshold           : 3.100000 V
  Module temperature high alarm threshold        : 75.000000 degree celsius
  Module temperature high warning threshold      : 70.000000 degree celsius
  Module temperature low alarm threshold         : -5.000000 degree celsius
  Module temperature low warning threshold       : 0.000000 degree celsius
  Laser tx power high alarm threshold            : 2.818400 mW / 4.5000 dBm
  Laser tx power high warning threshold          : 2.511900 mW / 4.0000 dBm
  Laser tx power low alarm threshold             : 0.354800 mW / -4.5002 dBm
  Laser tx power low warning threshold           : 0.398100 mW / -4.0001 dBm
  Laser rx power high alarm threshold            : 2.818400 mW / 4.5000 dBm
  Laser rx power high warning threshold          : 2.511900 mW / 4.0000 dBm
  Laser rx power low alarm threshold             : 0.069200 mW / -11.5989 dBm
  Laser rx power low warning threshold           : 0.087100 mW / -10.5998 dBm
```