Forwarding Configuration Guide

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1. Introduction to Forwarding

FWDD interface commands fall into four major areas:

- Physical interface commands
- Logical interface commands
- MTU size command
- Routing table (IPv4, IPv6, VRF, MPLS) commands

2. Interface Commands

2.1. Display All Physical Interfaces

Command to display the status and MAC addresses of all physical interfaces

rtb ifmd show interface physical

physical	Show physical interface

Example

```
ubuntu@spine1:~$ rtb ifmd show interface physical
+-------------------+------------+------------+------------+-------------------
+-------------------------------------------------+
 Interface            Admin Status Link Status  Oper Status  MAC Address          UpTime
+-------------------+------------+------------+------------+-------------------
+-------------------------------------------------+
ifp-0/0/52            up          up          up b8:6a:97:a5:92:34 Tue Jun 30 11:29:48
GMT +0000 2020
ifp-0/0/53            up          up          up b8:6a:97:a5:92:35 Tue Jun 30 11:29:48
GMT +0000 2020
lo-0/0/0              up          up          up b8:6a:97:a5:92:3d Tue Jun 30 11:29:47
GMT +0000 2020
lo-0/0/1 up up up b8:6a:97:a5:92:3e Tue Jun 30 11:29:47 GMT +0000 2020
```

2.2. Display All Logical Interfaces

Command to display the status and other information about all logical interfaces.

rtb ifmd show interface logical

logical	Show logical interface

Example

```
ubuntu@spine1:~$ rtb ifmd show interface logical
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 Interface            Admin Status Link Status  Oper Status  Outer Vlan Inner Vlan MAC
Address          Instance
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
ifl-0/0/52/1         up           up           up
b8:6a:97:a5:92:34    default
 ifl-0/0/53/2        up           up           up
b8:6a:97:a5:92:35    default
 lo-0/0/0/1           up           up           up
b8:6a:97:a5:92:3d    default
 lo-0/0/1/1           up           up           up
b8:6a:97:a5:92:3e    default
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
```

2.3. Create a Logical Interface on an Instance

The following command creates an interface on the default instance.

rtb confd set interface physical <physical interface> **logical unit** <logical-unit-id>

<physical interface>	Physical interface name
<logical-unit>	Logical unit ID

Example

```
ubuntu@s1:~$ rtb confd set interface physical lo-0/0/0 logical unit 1
ubuntu@s1:~$
ubuntu@s1:~$ rtb ifmd show interface logical
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 Interface            Admin Status Link Status  Oper Status  Outer Vlan Inner Vlan MAC
Address          Instance
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 lo-0/0/0/1           up           up           up
7a:2d:63:d1:00:01    default
 lo-0/0/0/4           up           up           up
7a:2d:63:d1:00:01    default
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
```

The following command creates an interface on the specified instance.

rtb confd set interface physical <physical interface> **logical unit** <logical-unit-id> **instance** <instance Name>

<physical interface>	Physical interface name
<logical-unit>	Logical unit ID
<instance name>	Instance name

Example

```
ubuntu@s1:~$ rtb confd set interface physical lo-0/0/0 logical unit 2 instance red
ubuntu@s1:~$ rtb ifmd show interface logical
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 Interface            Admin Status Link Status  Oper Status  Outer Vlan Inner Vlan MAC
Address          Instance
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
ifl-0/0/52/1        up           up           up
b8:6a:97:a5:92:34    default
 ifl-0/0/53/2        up           up           up
b8:6a:97:a5:92:35    default
 lo-0/0/0/1           up           up           up
b8:6a:97:a5:92:3d    default
 lo-0/0/0/2           up           up           up
b8:6a:97:a5:92:3d    red
 lo-0/0/1/1           up           up           up
b8:6a:97:a5:92:3e    default
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
```

2.4. Delete a Logical Interface

Command to delete logical interface in instance (a show command will verify deletion)

rtb confd delete interface physical <physical interface> **logical unit** <logical-unit-id>

<physical interface>	Physical interface name
<logical-unit>	Logical unit ID

Example

```
ubuntu@spine1:~$ rtb confd delete interface physical lo-0/0/0 logical unit 2
ubuntu@spine1:~$ rtb ifmd show interface logical
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 Interface            Admin Status Link Status  Oper Status  Outer Vlan Inner Vlan MAC
Address          Instance
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
ifl-0/0/52/1        up           up           up
b8:6a:97:a5:92:34    default
 ifl-0/0/53/2        up           up           up
b8:6a:97:a5:92:35    default
 lo-0/0/0/1           up           up           up
b8:6a:97:a5:92:3d    default
 lo-0/0/1/1           up           up           up
b8:6a:97:a5:92:3e    default
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
```

2.5. Show Logical Interface Details

Command to display the status and other information about a logical interface.

This command does not display the counter information for a logical interface. Also, the **rtb ifmd show interface logical counters** command has been removed in release 20.6.1-rc0.

rtb ifmd show interface logical <ifl-name>

Example

```
ubuntu@rtbrick:~$ rtb ifmd show interface logical ifl-0/0/52/1
Logical Interface Name   ifl-0/0/52/1
  Interface Index        106497
  Physical Interface Name ifp-0/0/52
  Logical Unit Id        1
  Admin Status           up
  Link Status            up
  Oper Status            up
  Ifl Type               Logical Sub interface
  MAC                    b8:6a:97:a5:92:34
  Instance               default
Address-family:
  IPv4:
    Status    up
  IPv6:
    Status    up
  MPLS
    Status    up

+--------------------+------------
+------------------------------------------------+
 IPv4                primary flag IPv6
+--------------------+------------
+------------------------------------------------+
 10.1.1.1/24         true
                     true         10::1/64
                     true         fe80::ba6a:97ff:fea5:9234/128
ubuntu@rtbrick:~$
```

2.6. Show Interface Addresses

Command to display the IPv4 and IPv6 addresses used on interfaces

rtb ifmd show interface address

address	Interface address

Example

```
ubuntu@rtbrick:~$ rtb ifmd show interface address
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 Interface            Instance             IPv4                 Primary  IPv6
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 ifl-0/0/52/1        default              10.1.1.1/24          true
 ifl-0/0/52/1        default                                   true     10::1/64
 ifl-0/0/52/1        default                                   true
fe80::ba6a:97ff:fea5:9234/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 ifl-0/0/53/2       default                                   true
fe80::ba6a:97ff:fea5:9235/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 lo-0/0/0/1           default              192.1.0.3/32         true
 lo-0/0/0/1           default                                   true     192:1::3/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 lo-0/0/1/1           default             192.1.1.3/32         true
 lo-0/0/1/1           default                                   true     192:1:1::3/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
```

2.7. Assign Logical Interface IPv4 Address

Command to assign an IPv4 address to a logical interface on the default instance and verify that the assignment is correct

rtb confd set interface physical <physical interface> **logical unit** <logical-unit-id> **address ipv4** <ipv4-address>

<physical interface>	Physical interface to act on
<logical unit>	Logical Unit ID
<ipv4-address>	IPv4 address to assign

Example

```
ubuntu@spine1:~$ rtb confd set interface physical lo-0/0/0 logical unit 1 address ipv4
192.1.0.3/32
ubuntu@spine1:~$ rtb ifmd show interface address
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 Interface            Instance             IPv4                 Primary  IPv6
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 ifl-0/0/52/1        default              10.1.1.1/24          true
 ifl-0/0/52/1        default                                   true     10::1/64
 ifl-0/0/52/1        default                                   true
fe80::ba6a:97ff:fea5:9234/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 ifl-0/0/53/2       default                                   true
fe80::ba6a:97ff:fea5:9235/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 lo-0/0/0/1           default              192.1.0.3/32         true
 lo-0/0/0/1           default                                   true     192:1::3/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 lo-0/0/1/1           default             192.1.1.3/32         true
 lo-0/0/1/1           default                                   true     192:1:1::3/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
```

2.8. Assign Logical Interface IPv6 Address

Command to assign an IPv6 address (as primary) to a logical interface on the default instance and verify that the assignment is correct

rtb confd set interface physical <physical interface> **logical unit** <logical-unit-id> **address ipv6** <ipv6-address>

<physical interface>	Physical interface to act on
<logical unit>	Logical Unit ID
<ipv6-address>	IPv6 address to assign

Example

```
ubuntu@spine1:~$ rtb confd set interface physical lo-0/0/0 logical unit 1 address ipv6
192:1::3/128
ubuntu@rtbrick:~$ rtb ifmd show interface address
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 Interface            Instance             IPv4                 Primary  IPv6
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 ifl-0/0/52/1        default              10.1.1.1/24          true
 ifl-0/0/52/1        default                                   true     10::1/64
 ifl-0/0/52/1        default                                   true
fe80::ba6a:97ff:fea5:9234/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 ifl-0/0/53/2       default                                   true
fe80::ba6a:97ff:fea5:9235/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 lo-0/0/0/1           default              192.1.0.3/32         true
 lo-0/0/0/1           default                                   true     192:1::3/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 lo-0/0/1/1           default             192.1.1.3/32         true
 lo-0/0/1/1           default                                   true     192:1:1::3/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
```

2.9. Delete Logical Interface IPv4 Address

Command to delete the IPv4 address of a logical interface (without deleting the logical interface itself)

rtb confd delete interface physical <physical interface> **logical unit** <logical-unit-id> **address ipv4** <ipv4-address>

<physical interface>	Physical interface to act on
<logical unit>	Logical Unit ID
<ipv4-address>	IPv4 address

Example

```
ubuntu@s1:~$ rtb confd set interface physical lo-0/0/0 logical unit 4 address ipv4
4.4.4.4/32
ubuntu@s1:~$
ubuntu@s1:~$ rtb ifmd show interface address
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 Interface            Instance             IPv4                 Primary  IPv6
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 lo-0/0/0/4           default              4.4.4.4/32           true
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
ubuntu@s1:~$
ubuntu@s1:~$ rtb confd delete interface physical lo-0/0/0 logical unit 4 address ipv4
4.4.4.4/32
ubuntu@s1:~$
ubuntu@s1:~$ rtb ifmd show interface address
ubuntu@s1:~$
ubuntu@s1:~$
```

2.10. Delete Logical Interface IPv6 Address

Command to delete the IPv6 address of a logical interface (without deleting the logical interface itself)

rtb confd delete interface physical <physical interface> **logical unit** <logical-unit-id> **address ipv6** <ipv6-address>

<physical interface>	Physical interface to act on
<logical unit>	Logical Unit ID
<ipv6-address>	IPv6 address

Example

```
ubuntu@s1:~$ rtb confd set interface physical lo-0/0/0 logical unit 4 address ipv6
4::4/128
ubuntu@s1:~$
ubuntu@s1:~$ rtb ifmd show interface address
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 Interface            Instance             IPv4                 Primary  IPv6
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
 lo-0/0/0/4           default                                   true     4::4/128
+--------------------+--------------------+--------------------+--------
+-------------------------------------------------+
ubuntu@s1:~$
ubuntu@s1:~$ rtb confd delete interface physical lo-0/0/0 logical unit 4 address ipv6
4::4/128
ubuntu@s1:~$
ubuntu@s1:~$ rtb ifmd show interface address
ubuntu@s1:~$
ubuntu@s1:~$
```

2.11. Disable (Shut Down) a Logical Interface

Command to disable (shut down) a logical interface on the default instance

rtb confd set interface physical <physical interface> **logical unit** <logical-unit-id> **disable**

<physical interface>	Physical interface name
<logical-unit-id>	Logical unit ID

Example

```
ubuntu@spine1:~$ rtb confd set interface physical ifp-0/0/52 logical unit 1 disable
ubuntu@spine1:~$ rtb ifmd show interface logical
ifl-0/0/52/1        up           up           up
b8:6a:97:a5:92:34    default
 ifl-0/0/53/2        up           up           up
b8:6a:97:a5:92:35    default
 lo-0/0/0/1           up           up           up
b8:6a:97:a5:92:3d    default
 lo-0/0/1/1           up           up           up
b8:6a:97:a5:92:3e    default
```

2.12. Enable a Logical Interface

Command to enable a logical interface that was previously shut down (essentially, delete the disable sent to the interface)

rtb confd delete interface physical <physical interface> **logical unit** <logical-unit-id> **disable**

<physical interface>	Physical interface name
<logical-unit-id>	Logical Unit ID

Example

```
ubuntu@spine1:~$ rtb confd delete interface physical ifp-0/0/52 logical unit 1 disable
ubuntu@spine1:~$ rtb ifmd show interface logical
ifl-0/0/52/1        up           up           up
b8:6a:97:a5:92:34    default
 ifl-0/0/53/2        up           up           up
b8:6a:97:a5:92:35    default
 lo-0/0/0/1           up           up           up
b8:6a:97:a5:92:3d    default
 lo-0/0/1/1           up           up           up
b8:6a:97:a5:92:3e    default
```

2.13. Disable IPv4 on a Logical Interface

Command to disable IPv4 on a logical interface on the default instance

rtb confd set interface physical <physical interface> **logical unit** <logical-unit-id> **ipv4-disable**

<physical interface>	Physical interface name
<logical-unit-id>	Logical Unit ID

Example

```
ubuntu@spine1:~$ rtb confd set interface physical ifp-0/0/52 logical unit 1 ipv4-disable
ubuntu@rtbrick:~$ rtb ifmd show interface logical ifl-0/0/52/1
Logical Interface Name   ifl-0/0/52/1
  Interface Index        106497
  Physical Interface Name ifp-0/0/52
  Logical Unit Id        1
  Admin Status           up
  Link Status            up
  Oper Status            up
  Ifl Type               Logical Sub interface
  MAC                    b8:6a:97:a5:92:34
  Instance               default
Address-family:
  IPv4:
    Status    down
  IPv6:
    Status    up
  MPLS
    Status    up

+--------------------+------------+-------------------------------------------------+
 IPv4                primary flag IPv6
+--------------------+------------+-------------------------------------------------+
                     true         10::1/64
                     true         fe80::ba6a:97ff:fea5:9234/128
ubuntu@rtbrick:~$
```

2.14. Disable IPv6 on a Logical Interface

Command to disable IPv6 on a logical interface on the default instance

rtb confd set interface physical <physical interface> **logical unit** <logical-unit-id **ipv6-disable**

<physical interface>	Physical interface name
<logical-unit-id>	Logical Unit ID

Example

```
ubuntu@spine1:~$ rtb confd set interface physical ifp-0/0/52 logical unit 1 ipv6-disable
ubuntu@spine1:~$ rtb ifmd show interface logical lo-0/0/1/100
Logical Interface Name   lo-0/0/1/100
  Interface Index        2053
  Physical Interface Name lo-0/0/1
  Logical Unit Id        100
  Admin Status           up
  Link Status            up
  Oper Status            up
  Ifl Type               Loopback interface
  MAC                    7a:0e:dd:00:00:01
  Instance               default
Address-family:
  IPv4:
    Status    up
  IPv6:
    Status    down
  MPLS
    Status    up

+--------------------+------------+--------------------------------------------------+
 IPv4                primary flag IPv6
+--------------------+------------+--------------------------------------------------+
 10.0.0.1/32         true
```

2.15. Enable IPv4 on a Logical Interface

Command to enable IPv4 on a logical interface that was previously shut down (essentially, delete the disable sent to the interface)

rtb confd delete interface physical <physical interface> **logical unit** <logical-unit-id> **ipv4-disable**

<physical interface>	Physical interface name
<logical-unit-id>	Logical Unit ID

Example

```
ubuntu@spine1:~$ rtb confd delete interface physical ifp-0/0/52  logical unit 1 ipv4-
disable
ubuntu@rtbrick:~$ rtb ifmd show interface logical ifl-0/0/52/1
Logical Interface Name   ifl-0/0/52/1
  Interface Index        106497
  Physical Interface Name ifp-0/0/52
  Logical Unit Id        1
  Admin Status           up
  Link Status            up
  Oper Status            up
  Ifl Type               Logical Sub interface
  MAC                    b8:6a:97:a5:92:34
  Instance               default
Address-family:
  IPv4:
    Status    up
  IPv6:
    Status    up
  MPLS
    Status    up

+--------------------+------------+--------------------------------------------------+
 IPv4                primary flag IPv6
+--------------------+------------+--------------------------------------------------+
 10.1.1.1/24         true
                     true         10::1/64
                     true         fe80::ba6a:97ff:fea5:9234/128
ubuntu@rtbrick:~$
```

2.16. Enable IPv6 on a Logical Interface

Command to enable IPv6 on a logical interface that was previously shut down (essentially, delete the disable sent to the interface)

rtb confd delete interface physical <physical interface> **logical unit** <logical-unit-id> **ipv6-disable**

<physical interface>	Physical interface name
<logical-unit-id>	Logical Unit ID

Example

```
ubuntu@spine1:~$ rtb confd delete interface physical ifp-0/0/52 logical unit 1 ipv6-
disable
ubuntu@rtbrick:~$ rtb ifmd show interface logical ifl-0/0/52/1
Logical Interface Name   ifl-0/0/52/1
  Interface Index        106497
  Physical Interface Name ifp-0/0/52
  Logical Unit Id        1
  Admin Status           up
  Link Status            up
  Oper Status            up
  Ifl Type               Logical Sub interface
  MAC                    b8:6a:97:a5:92:34
  Instance               default
Address-family:
  IPv4:
    Status    up
  IPv6:
    Status    up
  MPLS
    Status    up

+--------------------+------------+--------------------------------------------------+
 IPv4                primary flag IPv6
+--------------------+------------+--------------------------------------------------+
 10.1.1.1/24         true
                     true         10::1/64
                     true         fe80::ba6a:97ff:fea5:9234/128
ubuntu@rtbrick:~$
```

2.17. Set IPv4 or IPv6 MTU Size

Command to assign an IPv4 or IPv6 MTU size to a logical interface

rtb confd set interface physical <physical interface> **logical unit** <logical-unit-id> <ipv4-mtu> | <ipv6-mtu> <mtu-size>

<physical interface>	Physical interface name
<logical-unit-id>	Logical Unit ID
<ipv4-mtu>	Set MTU for IPv4
<ipv6-mtu>	Set MTU for IPv6
<mtu-size>	Set the size of the MTU (range: TBD)

Example

```
ubuntu@rtbrick:~$ rtb ifmd show interface logical ifl-0/0/52/1
Logical Interface Name   ifl-0/0/52/1
  Interface Index        106497
  Physical Interface Name ifp-0/0/52
  Logical Unit Id        1
  Admin Status           up
  Link Status            up
  Oper Status            up
  Ifl Type               Logical Sub interface
  MAC                    b8:6a:97:a5:92:34
  Instance               default
Address-family:
  IPv4:
    Status    up
  IPv6:
    Status    up
  MPLS
    Status    up

+--------------------+------------+--------------------------------------------------+
 IPv4                 primary flag IPv6
+--------------------+------------+--------------------------------------------------+
 10.1.1.1/24          true
                      true         10::1/64
                      true         fe80::ba6a:97ff:fea5:9234/128
ubuntu@rtbrick:~$
```

2.18. Display the IPv4 Unicast Routing Table

Command to display the prefix, source, preference, and next-hop for IPv4 unicast routes for the default instance

rtb fibd show ipv4 route unicast

unicast	Routing table to display

Example

```
ubuntu@rtbrick:~$ rtb ribd show ipv4 route unicast
Source codes: L local, D direct, S static, BGP-LO bgp-local-origin, BGP-L bgp-local,
              A-ND arp-nd,
+--------------------+------+----+--------------------------------------------------
+--------------------+
 Prefix               Source Pref Next-Hop
Egress Interface
+--------------------+------+----+--------------------------------------------------
+--------------------+
 192.1.0.3/32         D         0 192.1.0.3                                          lo-
0/0/0/1
 10.1.1.0/24          D         0 10.1.1.0
ifl-0/0/52/1
 10.1.1.1/32          D         0 10.1.1.1
ifl-0/0/52/1
ubuntu@rtbrick:~$
```

2.19. Display the IPv4 Unicast Routing Table Detail

Command to display the details of IPv4 unicast routing table

rtb fibd show ipv4 route unicast detail

unicast	Routing table to display
detail	Displays detailed information for the IPv4 unicast routing table

Example

```
ubuntu@rtbrick:~$ rtb ribd show ipv4 route unicast detail
192.1.0.3/32
  Source: direct, Preference: 0
  Adjacency-Hash:871ec262d4b87532579366c07780e7fadffafef6252d81ad
    NextHop: 192.1.0.3
     -Hash: 97e1465fbe57a30bf6dab75482aec2a634860bb79dfac8b0
      NextHop Type: glean, NextHop Action: trap to cpu
      Destination:default-ipv4-unicast
      Resolved in:default-ipv4-unicast
      Egress-Interface: lo-0/0/0/1

10.1.1.0/24
  Source: direct, Preference: 0
  Adjacency-Hash:bb165ee5ce2aa4623da0eeed6e7e277b7b9631af15397db9
    NextHop: 10.1.1.0
     -Hash: b4eae577a21ad6bc79da64a550468677f73d54dede18ef97
      NextHop Type: glean, NextHop Action: trap to cpu
      Destination:default-ipv4-unicast
      Resolved in:default-ipv4-unicast
      Egress-Interface: ifl-0/0/52/1

10.1.1.1/32
  Source: direct, Preference: 0
  Adjacency-Hash:a1b22f673e9a09c71985d3ce408df8ec83d8dcdcb851e107
    NextHop: 10.1.1.1
     -Hash: 662b7f344c055428fbeb845029d385fc03c8019ff37ae751
      NextHop Type: local, NextHop Action: trap to cpu
      Destination:default-ipv4-unicast
      Resolved in:default-ipv4-unicast
      Egress-Interface: ifl-0/0/52/1

ubuntu@rtbrick:~$
```

2.20. Display the IPv6 Unicast Routing Table

Command to display the prefix, source, preference, and next-hop for IPv6 unicast routes for the default instance

rtb fibd show ipv6 route unicast

unicast	Routing table to display
detail	Displays detailed information for the IPv4 unicast routing table

Example

```
ubuntu@rtbrick:~$ rtb ribd show ipv6 route unicast
Source codes: L local, D direct, S static, BGP-LO bgp-local-origin, BGP-L bgp-local,
              A-ND arp-nd,
+---------------------------------------+------+----
+-------------------------------------------------+--------------------+
 Prefix                                  Source Pref Next-Hop
Egress Interface
+---------------------------------------+------+----
+-------------------------------------------------+--------------------+
 192:1::3/128                            D         0 192:1::3
lo-0/0/0/1
 192:1::2/128                            BGP-LO   20 fe80::7821:f0ff:fe00:1
ifl-0/0/2/23
 192:1::4/128                            BGP-LO   20 fe80::7821:f0ff:fe00:1
ifl-0/0/2/23
ubuntu@rtbrick:~$
```

2.21. Display the IPv4 Unicast Routing Table for a VRF Instance

Command to display the prefix, source, preference, and next-hop for IPv4 unicast routes for the subscriber instance

rtb fibd show ipv4 route unicast instance <instance-name>

<instance-name>	Name of the instance (for example, subscriber)

Example

```
ubuntu@spine1:~$ rtb fibd show ipv4 route unicast instance subscriber
Source codes: L local, D direct, S static, BGP-LO bgp-local-origin, BGP-L bgp-local,
              A-ND arp-nd,
+--------------------+------+----+-------------------------------------------------
+--------------------+
 Prefix               Source Pref Next-Hop
Egress Interface
+--------------------+------+----+-------------------------------------------------
+--------------------+
 192.1.4.3/32         D         0 192.1.4.3                                        lo-
0/0/4/1
 192.1.4.2/32         BGP-LO  200 192:1::2
ifl-0/0/2/23
 0.0.0.0/0            BGP-LO  200 192:1::2
ifl-0/0/2/23
ubuntu@spine1:~$
```

2.22. Display the Details of IPv4 Unicast Routing Table for a VRF Instance

Command to display the details of IPv4 unicast routing table for a VRF instance

rtb fibd show ipv4 route unicast instance <instance-name> **detail**

<instance-name>	Name of the instance (for example, subscriber)
<detail>	Provides the details of the IPv4 Unicast Routing Table for a VRF Instance

Example

```
ubuntu@rtbrick:~$ rtb ribd show ipv4 route unicast instance subscriber detail
192.1.4.3/32
  Source: direct, Preference: 0
  Extended Community:   Adjacency-Hash:4d55f6833ff4f42029cf6565046206fb5b0b87387d5a5ed3
    NextHop: 192.1.4.3
     -Hash: 9605d0527baaf653e67dd47f93c94057efa0e00c8a0f6ce1
      NextHop Type: glean, NextHop Action: trap to cpu
      Destination:ip2vrf-ipv4-unicast
      Resolved in:ip2vrf-ipv4-unicast
      Egress-Interface: lo-0/0/4/1
      MPLS-Label:
192.1.4.2/32
  Source: bgp, Preference: 200
  Extended Community: target:192.1.4.0:11
  Adjacency-Hash:b6b3394b9e0d8f3c05cf382fcca74158c8b31899f2157638
    NextHop: 192:1::2
     -Hash: ca0fdea4799c248d7f868092fa9315305857f44b08fd07ca
      Covering prefix: 192:1::2/128
      NextHop Type: mpls ingress, NextHop Action: mpls label push
      Destination:ip2vrf-ipv4-unicast
      Resolved in:default-ipv6-labeled-unicast
      Egress-Interface: ifl-0/0/2/23, NextHop MAC: 7a:21:f0:00:00:01
      Created: Tue Jun 30 12:53:36 GMT +0000 2020
      MPLS-Label: label:20020,bos:1

0.0.0.0/0
  Source: bgp, Preference: 200
  Extended Community: target:192.1.4.0:11
  Adjacency-Hash:b6b3394b9e0d8f3c05cf382fcca74158c8b31899f2157638
    NextHop: 192:1::2
     -Hash: ca0fdea4799c248d7f868092fa9315305857f44b08fd07ca
      Covering prefix: 192:1::2/128
      NextHop Type: mpls ingress, NextHop Action: mpls label push
      Destination:ip2vrf-ipv4-unicast
      Resolved in:default-ipv6-labeled-unicast
      Egress-Interface: ifl-0/0/2/23, NextHop MAC: 7a:21:f0:00:00:01
      Created: Tue Jun 30 12:53:36 GMT +0000 2020
      MPLS-Label: label:20020,bos:1

ubuntu@rtbrick:~$
```

2.23. Display the IPv6 Unicast Routing Table for a VRF Instance

Command to display the prefix, source, preference, and next-hop for IPv6 unicast routes for the subscriber instance.

rtb fibd show ipv6 route unicast instance <instance-name>

<instance-name>	Name of the instance (for example, subscriber)

Example

```
ubuntu@rtbrick:~$ rtb fibd show ipv6 route unicast instance subscriber
Source codes: L local, D direct, S static, BGP-LO bgp-local-origin, BGP-L bgp-local,
              A-ND arp-nd,
+---------------------------------------+------+----
+-------------------------------------------------+--------------------+
 Prefix                                  Source Pref Next-Hop
Egress Interface
+---------------------------------------+------+----
+-------------------------------------------------+--------------------+
 192:1:4::3/128                          D         0 192:1:4::3
lo-0/0/4/1
 192:1:4::1/128                          BGP-LO  200 192:1::1
ifl-0/0/52/13
 ::/0                                    BGP-LO  200 192:1::1
ifl-0/0/52/13
 192:1:4::4/128                          BGP-LO  200 192:1::1
ifl-0/0/52/13
 192:1:4::2/128                          BGP-LO  200 192:1::2
ifl-0/0/2/23
ubuntu@rtbrick:~$
```

2.24. Display the IPv6 Labeled-Unicast Routing Table for the VRF Instance

Command to display the prefix, source, preference, and next-hop for IPv6 labeled-unicast routes for the subscriber instance

rtb fibd show ipv6 route labeled-unicast instance <instance-name>

<instance-name>	Name of the instance (for example, subscriber)

Example

```
ubuntu@rtbrick:~$ rtb fibd show ipv6 route labeled-unicast instance subscriber
Source codes: L local, D direct, S static, BGP-LO bgp-local-origin, BGP-L bgp-local,
              A-ND arp-nd,
+---------------------------------------+------+----
+---------------------------------------+--------------------+
 Prefix                                  Source Pref Next-Hop
Egress Interface
+---------------------------------------+------+----
+---------------------------------------+--------------------+
 192:1::3/128                            D         0 192:1::3
lo-0/0/0/0
 192:1::1/128                            BGP-LO  200 fe80::82a2:35ff:feef:2806
ifl-0/0/26/0
ubuntu@rtbrick:~$
```

2.25. Display the MPLS Routing Table

Command to display the label, source, and next-hop for MPLS routes for the default instance

rtb fibd show mpls route

Example

```
ubuntu@rtbrick:~$ rtb fibd show mpls route unicast
Source codes: L local, D direct, S static, BGP-LO bgp-local-origin, BGP-L bgp-local,
              A-ND arp-nd,
+--------------------+------+----+---------------------------------------
+--------------------+
 Label                Source Pref Next-Hop                                  Egress
Interface
+--------------------+------+----+---------------------------------------
+--------------------+

 label:1001           BGP     170 192:1::1                                  ifl-0/0/26/0
 label:2001           BGP     170 fe80::82a2:35ff:feef:2806                 ifl-0/0/26/0
 label:20017,bos:1    BGP     170 192:1::1                                  ifl-0/0/26/0
 label:20018,bos:1    BGP     170 192:1::1                                  ifl-0/0/26/0
 label:20019,bos:1    BGP     170 192:1::1                                  ifl-0/0/26/0
 label:20020,bos:1    BGP     170 fe80::82a2:35ff:feef:2806                 ifl-0/0/26/0
 label:20021,bos:1    BGP     170 fe80::82a2:35ff:feef:2806                 ifl-0/0/26/0
 label:20022,bos:1    BGP     170 fe80::82a2:35ff:feef:2806                 ifl-0/0/26/0
 label:20023,bos:1    BGP     170 fe80::82a2:35ff:feef:2806                 ifl-0/0/26/0
 label:20016,bos:1    BGP     170 192:1::1                                  ifl-0/0/26/0
 label:20008,bos:1    BGP     170 NA
ubuntu@rtbrick:~$
```

2.26. Ping an IPv4 Address That is Part of a VRF Instance

Command to ping the IPv4 address used in the subscriber instance

rtb fibd ping <ipv4-address> **instance** <instance-name>

<ipv4-address>	IPv4 address to ping
<instance-name>	Name of instance to act on (for example, subscriber)

Example

```
ubuntu@spine1:~$ rtb fibd ping 10.1.1.2 instance subscriber
116 bytes from 10.1.1.2: icmp_seq=1 ttl=64 time=27.7584 ms
116 bytes from 10.1.1.2: icmp_seq=2 ttl=64 time=28.0524 ms
116 bytes from 10.1.1.2: icmp_seq=3 ttl=64 time=20.0368 ms
116 bytes from 10.1.1.2: icmp_seq=4 ttl=64 time=28.0195 ms
116 bytes from 10.1.1.2: icmp_seq=5 ttl=64 time=32.0229 ms

Statistics: 5 sent, 5 received, 0% packet loss
```

2.27. Ping an IPv6 Address That is Part of a VRF Instance

Command to ping the IPv6 address used in the subscriber instance

rtb fibd ping6 <ipv6-address> **instance** <instance-name>

<ipv6-address>	IPv6 address to ping
<instance-name>	Name of instance to act on (for example, subscriber)

Example

```
ubuntu@spine1:~$ rtb fibd ping6 10:1:1::1 instance subscriber
76 bytes from 10:1:1::1: icmp_seq=1 ttl=63 time=27.7891 ms
76 bytes from 10:1:1::1: icmp_seq=2 ttl=63 time=31.7864 ms
76 bytes from 10:1:1::1: icmp_seq=3 ttl=63 time=31.7316 ms
76 bytes from 10:1:1::1: icmp_seq=4 ttl=63 time=15.7478 ms
76 bytes from 10:1:1::1: icmp_seq=5 ttl=63 time=15.8116 ms

Statistics: 5 sent, 5 received, 0% packet loss
```

2.28. Extended Community Support for Static and Interface Routes

After you configure the route and protocol policy, it is recommended to keep them generic using communities so that the future configurations or routes automatically get the desired processing.

Currently there are two items that cannot be "tagged" with a community but need to be operated by policy:

- static routes
- interfaces (interface routes)

The static routes provide a configuration option to add community/extended community.

For the interfaces, a community tag would be inherited to the interface routes (IPv4, IPv6 etc.) which is used by the policy while matching a community.

2.28.1. Community setting for static routes

```
rtb confd set static l3 route ipv4 unicast 10.1.1.1/32 next-hop ipv4 unicast
4.4.4.5 community <community_value1>
rtb confd set static l3 route ipv4 unicast 10.1.1.1/32 next-hop ipv4 unicast
4.4.4.5 community <community_value2>

rtb confd set static l3 route ipv4 unicast 10.1.1.1/32 next-hop ipv4 unicast
4.4.4.5 ext-community <ext_community1>
rtb confd set static l3 route ipv4 unicast 10.1.1.1/32 next-hop ipv4 unicast
4.4.4.5 ext-community <ext_community2>
```

2.28.2. Community setting for interface routes

```
rtb confd set interface physical memif-4/4/4 logical unit 4 address ipv4
4.4.4.4/24 community <community_value1>
rtb confd set interface physical memif-4/4/4 logical unit 4 address ipv4
4.4.4.4/24 community <community_value2>

rtb confd set interface physical memif-4/4/4 logical unit 4 address ipv4
4.4.4.4/24 ext-community <ext_community1>
rtb confd set interface physical memif-4/4/4 logical unit 4 address ipv4
4.4.4.4/24 ext-community <ext_community2>

rtb confd set interface physical memif-4/4/4 logical unit 4 address ipv4
4.4.4.4/24 label <label_value>
```

2.29. Configuring Port Mirroring

Port Mirroring is a method of monitoring network traffic. When you enable port mirroring, the switch sends a copy of all network packets seen on one port to another port, where the packet can be analyzed.

Guidelines and Limitations

- You can configure up to 15 mirror profiles.
- The same mirror resources are used for LI and Port Mirroring

- You can configure a CPU port as destination physical interface port; but if heavy traffic is mirrored, it may impact system performance.
- If you want to mirror traffic to CPU, enable the control plane security features. For more refer, see the *Control Plane Security Guide*.
- Since this is a debugging tool, the save and reload functionality is not supported.
- If physical interface/logical interface goes down, mirror configuration will not be deleted automatically. You need to delete the mirror configuration explicitly.

2.29.1. Mirroring one physical interface traffic to another physical interface

You can mirror one physical interface traffic to another physical interface by entering the following command:

rtb confd set forwarding-options mirror <mirror_name> **destination ifp-name** <destination-interface-name> <direction> **source ifp-name** <source-ifp-name>

<mirror_name>	Name for mirror configuration
<destination-interface-name>	Port to where you need to mirror traffic
<direction>	Direction in which you want to mirror traffic (supported values ingress and egress)
<source-ifp-name>	Specifies the port from which you mirror the traffic

Example

```
rtb confd set forwarding-options mirror mirror1 destination ifp-name ifp-
0/0/50 ingress source ifp-name ifp-0/0/52
```

Example: Mirror Traffic to CPU

```
rtb confd set forwarding-options mirror mirror1 destination ifp-name cpu-
0/0/200 ingress source ifp-name ifp-0/0/52
```

2.29.2. Capturing Mirror Traffic

After you configure mirroring to CPU by using the commands above, you can use the **capture** command to capture the mirror traffic.

rtb fibd show capture ifp <ifp-name> direction <dir>

Example

```
rtb fibd show capture ifp ifp-0/0/52 direction in
```

2.29.3. Mirroring one logical interface traffic to another physical interface

Inbound mirroring is defined per In-Port, or per In-Port x VLAN. Configurations for six distinct VLAN tags, for any other VLAN tag, and for packets without VLAN tags are supported. The ingress mirroring can be sampled by specifying a probability that a matching packet will be mirrored.

Outbound mirroring is defined per Out-Port, or per Out-Port x VLAN tag. Configurations for seven distinct VLAN tags are supported.

Prerequisites

- Before creating logical interface mirroring, the source logical interface should exist.
- The logical interface should not be deleted during mirroring.

You can mirror one logical interface traffic to another physical interface by entering the following command:

rtb confd set forwarding-options mirror <mirror_name> **destination ifp-name** <destination-interface-name> <direction> **source ifl-name** <source-ifl-name>

<mirror_name>	Name for mirror configuration
<destination-interface-name>	Port to where you need to mirror traffic
<direction>	Direction in which you want to mirror traffic (supported values ingress and egress)
<source-ifl-name>	Specifies the logical interface from which you are mirroring traffic

Example

```
rtb confd set forwarding-options mirror mirror1 destination ifp-name ifp-
0/0/50 ingress source ifl-name ifl-0/0/52/4
```

2.29.4. Deleting Port Mirroring Configuration

You can delete the port mirroring configuration by entering the following

command.

rtb confd delete forwarding-options mirror [arg-required] <mirror_name>

Example

```
rtb confd delete forwarding-options mirror mirror1
```

2.30. Configuring Static MPLS Route

2.30.1. Adding a Static MPLS Route

To add a static MPLS route, enter the following command:

rtb confd set static l3 mpls label <instance_afi> <instance_safi> <in_label> **next-hop** <lookup_afi> <lookup_safi> <nexthop>

<instance_afi>	routing instance of the address family identifier
<instance_safi>	<routing instance of the subsequent address family identifier
<in_label>	MPLS label
<lookup_afi>	Lookup address family identifier
<lookup_safi>	Lookup subsequent address family identifier
<nexthop>	The next hop to which the packet is to be forwarded.

Example

```
rtb confd set static l3 mpls label mpls unicast 100 bos next-hop ipv4 unicast
10.10.10.1
```

2.30.2. Deleting a Static MPLS Route

To delete a static MPLS route, enter the following command:

rtb confd delete static l3 mpls label <instance_afi> <instance_safi> <in_label> **next-hop** <lookup_afi> <lookup_safi> <nexthop>

<instance_afi>	routing instance of the address family identifier
<instance_safi>	<routing instance of the subsequent address family identifier
<in_label>	MPLS label
<lookup_afi>	Lookup address family identifier

<lookup_safi>	Lookup subsequent address family identifier
<nexthop>	the next hop to which the packet is to be forwarded.

Example

```
rtb confd delete static l3 mpls label mpls unicast 100 bos next-hop ipv4
unicast 10.10.10.1
```

2.31. Host Path Capturing Tool

The sections below explain the various options available in the host path capturing tool to troubleshoot host path issues.

2.31.1. Shared Memory Interface

There is no bds packet tables in fibd, rather there is a pseudo network interface of the form shm-0/0/<trap-id>, where the trap-id identifies the protocol (BGP, ISIS, PPPoE, L2TP, RADIUS). You can use the VPP internal command **show rtb-shm** to know the mapping of protocol to trap-id. This command captures the packet exchanges between fibd and other protocol daemons.

Example

```
rtb fibd vpp show rtb-shm
rtb fibd show capture shm shm-0/0/1 direction both
```

2.31.2. Logical Interface

In most cases, when you want to troubleshoot, the packets are exchanged with other routers that are connected over a sub interface. The logical interface-level capturing enables this functionality.

Example

```
rtb fibd show capture ifl memif-0/1/6/16 direction both
```

2.31.3. Physical Interface

This is original physical interface-based capture that is supported. It is the entry point to all packets transmitting to the software. If you want to know if packets are transmitting to software or not you can use this command.

Example

```
rtb fibd show capture ifp memif-0/1/6 direction both
```

2.31.4. Filtering by Protocol

In most cases, while using the logical interface and physical interface, you may want to select a packet belonging to a specific protocol. In that case, you can use the protocol knob available in all the commands to achieve this functionality.

Example

```
rtb fibd show capture ifl memif-0/1/6/16 direction both protocol bgp
rtb fibd show capture ifp memif-0/1/6 direction both protocol bgp
```

2.31.5. Raw Option Capture tool

The raw option capture tool can decode the packet as well as dump the packet in raw format. The **raw** option is useful if you want to examine packets in hex to check for malformed packets, etc.

Example

```
rtb fibd show capture ifl memif-0/1/6/16 direction both raw
rtb fibd show capture ifp memif-0/1/6 direction both raw
```

2.31.6. PCAP file format

While debugging a setup with real traffic, displaying the packets on console makes debugging tedious. You can use the **pcap** option to save the packets in the PCAP file and later run tcpdump/wireshark from any Linux system.

Example

```
rtb fibd start capture ifp memif-0/1/6 direction both file test.pcap
rtb fibd stop capture ifp memif-0/1/6 direction both file test.pcap
```

3. Statistics Commands

3.1. Clearing Statistics

By clearing the L2X statistics and interface physical counters, you can reset all of the previous packet statistics and counters.

3.1.1. Clearing Interface Physical Counters

To clear the interface physical counters, enter the following command:

rtb fibd clear bcm interface physical counters

3.1.2. Clearing Physical Counters of a Specific Interface

To clear the physical counters of a specific interface, enter the following command:

rtb fibd clear bcm interface physical counters <ifp-name>

3.1.3. Clearing Logical Interface Statistics

To clear the statistics of logical interface, enter the following command:

rtb fibd clear bcm lif statistics

3.1.4. Clearing PPPoE Counters

To clear the PPPoE counters, enter the following command:

rtb fibd clear bcm pppoe counters

3.1.5. Clearing the PPPoE Counters of a Specific Subscriber

To clear the PPPoE counters of a specific subscriber, enter the following command:

rtb fibd clear bcm pppoe counters subscriber_id <subscriber-id>

3.2. Statistics Show Commands

3.2.1. Viewing ACL Statistics

To view the ACL statistics, enter the following command:

rtb fibd show bcm acl statistics

Example

```
ubuntu@rtbrick:~$ rtb fibd show bcm acl statistics
------------------------------------------------------------------------------
--------------
Rule-Name                                 lldp.ifp-0/0/1.trap.rule
------------------------------------------------------------------------------
--------------
  ACL-Type                                l2
  ACL_Stat_id                             3489660941
  Counter_id                              13
  Counter_engine                          10
  Packet_statistics                       15
  Bytes_statistics                        1305
  Packet_statistics_core1                 0
  Bytes_statistics_core1                  0
------------------------------------------------------------------------------
--------------
Rule-Name                                 lldp.ifp-0/0/2.trap.rule
------------------------------------------------------------------------------
--------------
  ACL-Type                                l2
  ACL_Stat_id                             3489660942
  Counter_id                              14
  Counter_engine                          10
  Packet_statistics                       132
  Bytes_statistics                        11484
  Packet_statistics_core1                 0
  Bytes_statistics_core1                  0
ubuntu@rtbrick:~$
```

3.2.2. Viewing ACL Statistics for a Specific Rule

To view the ACL statistics for specific rule, enter the following command:

rtb fibd show bcm acl statistics rule-name <rule-name>

Example

```
ubuntu@rtbrick:~$ rtb fibd show bcm acl statistics rule-name lldp.ifp-
0/0/1.trap.rule
------------------------------------------------------------------------------
--------------
Rule-Name                                lldp.ifp-0/0/1.trap.rule
------------------------------------------------------------------------------
--------------
  ACL-Type                               l2
  ACL_Stat_id                            3489660941
  Counter_id                             13
  Counter_engine                         10
  Packet_statistics                      18
  Bytes_statistics                       1566
  Packet_statistics_core1                0
  Bytes_statistics_core1                 0
ubuntu@rtbrick:~$
```

3.2.3. Viewing Interface Physical Counters

To view the interface physical counters, enter the following command:

rtb fibd show bcm interface physical counters

Example

```
ubuntu@rtbrick:~$ rtb fibd show bcm interface physical counters
------------------------------------------------------------------------------
--------------
Physical Inteface Name                          ifp-0/0/1
------------------------------------------------------------------------------
--------------
  Asic port                                     1
  Port Mapping Core                             0
  InOctets                                      8496
  InUcastPkts                                   0
  InNonUcastPkts                                104
  InErrors                                      0
  InUnknownProtos                               0
  OutOctets                                     7500
  OutUcastPkts                                  0
  OutNonUcastPkts                               75
  OutErrors                                     0
  EtherStatsDropEvents                          0
  EtherStatsMulticastPkts                       157
  EtherStatsBroadcastPkts                       22
  EtherStatsUndersizePkts                       0
  EtherStatsFragments                           0
  EtherStatsOversizePkts                        0
  EtherStatsOctets                              15996
  EtherStatsPkts                                179
  EtherStatsCollisions                          0
  EtherStatsTXNoErrors                          75
  EtherStatsRXNoErrors                          104
  ifInMulticastPkts                             82
  IfOutBroadcastPkts                            0
  IfOutMulticastPkts                            75
  IfOutBroadcastPkts                            0
  BcmReceivedUndersizePkts                      0
  BcmTransmittedUndersizePkts                   0
  BcmQmxDot1dBasePortDelayExceededDiscards      0
  BcmQmxDot1dBasePortMtuExceededDiscards        0
  BcmQmxDot1dTpPortInFrames                     104
  BcmQmxDot1dTpPortOutFrames                    75
  BcmQmxEtherStatsPkts64Octets                  22
  BcmQmxEtherStatsPkts128to255Octets            0
  BcmQmxEtherStatsPkts256to511Octets            0
  BcmQmxEtherStatsPkts512to1023Octets           0
```

3.2.4. Viewing Interface Physical Counters for Specific Interface

To view the interface physical counters for a specific interface, enter the following command:

rtb fibd show bcm interface physical counters <ifp-name>

Example

```
ubuntu@rtbrick:~$ rtb fibd show bcm interface physical counters ifp-0/0/1
--------------------------------------------------------------------------------
--------------
Physical Inteface Name                          ifp-0/0/1
--------------------------------------------------------------------------------
--------------
  Asic port                                     1
  Port Mapping Core                             0
  InOctets                                      8670
  InUcastPkts                                   0
  InNonUcastPkts                                106
  InErrors                                      0
  InUnknownProtos                               0
  OutOctets                                     7800
  OutUcastPkts                                  0
  OutNonUcastPkts                               78
  OutErrors                                     0
  EtherStatsDropEvents                          0
  EtherStatsMulticastPkts                       162
  EtherStatsBroadcastPkts                       22
  EtherStatsUndersizePkts                       0
  EtherStatsFragments                           0
  EtherStatsOversizePkts                        0
  EtherStatsOctets                              16470
  EtherStatsPkts                                184
  EtherStatsCollisions                          0
  EtherStatsTXNoErrors                          78
  EtherStatsRXNoErrors                          106
  ifInMulticastPkts                             84
  IfOutBroadcastPkts                            0
  IfOutMulticastPkts                            78
  IfOutBroadcastPkts                            0
  BcmReceivedUndersizePkts                      0
  BcmTransmittedUndersizePkts                   0
  BcmQmxDot1dBasePortDelayExceededDiscards      0
  BcmQmxDot1dBasePortMtuExceededDiscards        0
  BcmQmxDot1dTpPortInFrames                     106
  BcmQmxDot1dTpPortOutFrames                    78
  BcmQmxEtherStatsPkts64Octets                  22
  BcmQmxEtherStatsPkts128to255Octets            0
  BcmQmxEtherStatsPkts256to511Octets            0
  BcmQmxEtherStatsPkts512to1023Octets           0
  BcmQmxEtherStatsPkts1024to1518Octets          0
  BcmQmxEtherRxOversizePkts                     0
  BcmQmxEtherTxOversizePkts                     0
  BcmQmxEtherStatsJabbers                       0
  BcmQmxEtherStatsCRCAlignErrors                0
  BcmQmxDot3StatsFCSErrors                      0
  BcmQmxDot3StatsSingleCollisionFrames          0
  BcmQmxDot3StatsMultipleCollisionFrames        0
  BcmQmxDot3StatsSQETTestErrors                 0
  BcmQmxDot3StatsDeferredTransmissions          0
  BcmQmxDot3StatsLateCollisions                 0
  BcmQmxDot3StatsExcessiveCollisions            0
  BcmQmxDot3StatsInternalMacTransmitErrors      0
  BcmQmxDot3StatsCarrierSenseErrors             0
  BcmQmxDot3StatsFrameTooLongs                  0
  BcmQmxDot3StatsInternalMacReceiveErrors       0
```

```
  BcmQmxDot3StatsSymbolErrors                  0
  BcmQmxDot3ControlInUnknownOpcodes            0
  BcmQmxDot3InPauseFrames                      0
  BcmQmxDot3OutPauseFrames                     0
  BcmQmxIfHCInOctets                           8670
  BcmQmxIfHCInUcastPkts                        0
  BcmQmxIfHCInMulticastPkts                    84
  BcmQmxIfHCInBroadcastPkts                    22
  BcmQmxIfHCOutOctets                          7800
  BcmQmxIfHCOutUcastPkts                       0
  BcmQmxIfHCOutMulticastPkts                   78
BcmQmxIfHCOutBroadcastPckts                  0
  BcmQmxIeee8021PfcRequests                    0
  BcmQmxIeee8021PfcIndications                 0
  BcmQmxBcmEtherStatsPkts1519to1522Octets      0
  BcmQmxBcmEtherStatsPkts1522to2047Octets      0
  BcmQmxBcmReceivedPkts64Octets                22
  BcmQmxBcmReceivedPkts65to127Octets           84
  BcmQmxBcmReceivedPkts128to255Octets          0
  BcmQmxBcmReceivedPkts256to511Octets          0
  BcmQmxBcmReceivedPkts512to1023Octets         0
  BcmQmxBcmReceivedPkts1024to1518Octets        0
  BcmQmxBcmReceivedPkts1519to2047Octets        0
  BcmQmxBcmTransmittedPkts64Octets             0
  BcmQmxBcmTransmittedPkts65to127Octets        78
  BcmQmxBcmTransmittedPkts128to255Octets       0
  BcmQmxBcmTransmittedPkts256to511Octets       0
  bcmQmxBcmTransmittedPkts512to1023Octets      0
  BcmQmxBcmTransmittedPkts1024to1518Octets     0
  BcmQmxBcmTransmittedPkts1519to2047Octets     0
  BcmQmxBcmTransmittedPkts2048to4095Octets     0
  BcmQmxBcmTransmittedPkts4095to9216Octets     0
ubuntu@rtbrick:~$
```

3.2.5. Viewing the Logical Interface Statistics

To view the statistics of logical interfaces, enter the following command:

rtb fibd show bcm lif statistics

Example

```
ubuntu@rtbrick:~$ rtb fibd show bcm lif statistics
------------------------------------------------------------------------------
--------------
Logical Inteface Name                     ifl-0/0/2/23
------------------------------------------------------------------------------
--------------
  Physical Interface Name                 ifp-0/0/2
  Port Mapping Core                       0
  Vlan Port Id                            1149251619
  In Forward Packets                      392
  In Forward Bytes                        37539
  In Drop Packets                         0
  In Drop Bytes                           0
  Out forward Packets                     0
  Out forward Bytes                       0
  Out Drop Packets                        0
  Out Drop Bytes                          0
------------------------------------------------------------------------------
--------------
Logical Inteface Name                     ifl-0/0/3/1
------------------------------------------------------------------------------
--------------
  Physical Interface Name                 ifp-0/0/3
  Port Mapping Core                       0
  Vlan Port Id                            1149251621
  In Forward Packets                      26
  In Forward Bytes                        2262
  In Drop Packets                         0
  In Drop Bytes                           0
  Out forward Packets                     0
  Out forward Bytes                       0
  Out Drop Packets                        0
  Out Drop Bytes                          0
```

3.2.6. Viewing the Statistics of a Specific Logical Interface

To view the statistics of a specific logical interface, enter the following command:

rtb fibd show bcm lif statistics logical_interface <ifl-name>

Example

```
ubuntu@rtbrick:~$ rtb fibd show bcm lif statistics logical_interface ifl-
0/0/2/23
------------------------------------------------------------------------------
--------------
Logical Inteface Name                     ifl-0/0/2/23
------------------------------------------------------------------------------
--------------
  Physical Interface Name                 ifp-0/0/2
  Port Mapping Core                       0
  Vlan Port Id                            1149251619
  In Forward Packets                      419
  In Forward Bytes                        39911
  In Drop Packets                         0
  In Drop Bytes                           0
  Out forward Packets                     0
  Out forward Bytes                       0
  Out Drop Packets                        0
  Out Drop Bytes                          0
ubuntu@rtbrick:~$
```

3.2.7. Viewing the PPPoE Counters

To view the PPPoE counters, enter the following command:

rtb fibd show bcm pppoe counters

Example

```
ubuntu@rtbrick:~$ rtb fibd show bcm pppoe counters
------------------------------------------------------------------------------
--------------
Subscriber-Id 72339069014638601
------------------------------------------------------------------------------
--------------
PPP SessionId 8
Local Mac b8:6a:97:a5:92:03
Subscriber_mac 00:0c:29:40:93:ab
Rx_Accepted_pkts 4
Rx_Accepted_bytes 288
Rx_Dropped_pkts 0
Rx_Dropped_bytes 0
Tx_Accepted_pkts 0
Tx_Accepted_bytes 0
Tx_Dropped_pkts 0
Tx_Dropped_bytes 0
ubuntu@rtbrick:~$ rtb fibd show bcm pppoe counters subscriber_id
72339069014638601
------------------------------------------------------------------------------
--------------
Subscriber-Id 72339069014638601
------------------------------------------------------------------------------
--------------
PPP SessionId 8
Local Mac b8:6a:97:a5:92:03
Subscriber_mac 00:0c:29:40:93:ab
Rx_Accepted_pkts 4
Rx_Accepted_bytes 288
Rx_Dropped_pkts 0
Rx_Dropped_bytes 0
Tx_Accepted_pkts 0
Tx_Accepted_bytes 0
Tx_Dropped_pkts 0
Tx_Dropped_bytes 0
ubuntu@rtbrick:~$
```

3.2.8. Viewing the PPPoE Counters of a Specific Subscriber

To view the PPPoE counters of a specific subscriber, enter the following command:

rtb fibd show bcm pppoe counters subscriber_id <subsriber-id>

Example

```
ubuntu@rtbrick:~$ rtb fibd show bcm pppoe counters subscriber_id
72339069014638610
--------------------------------------------------------------------------------
--------------
Subscriber-Id 72339069014638610
--------------------------------------------------------------------------------
--------------
PPP SessionId 17
Local Mac b8:6a:97:a5:92:0a
Subscriber_mac 00:0c:29:40:93:ab
Rx_Accepted_pkts 57
Rx_Accepted_bytes 4974
Rx_Dropped_pkts 10
Rx_Dropped_bytes 1220
Tx_Accepted_pkts 25
Tx_Accepted_bytes 3100
Tx_Dropped_pkts 0
Tx_Dropped_bytes 0
ubuntu@rtbrick:~$
ubuntu@rtbrick:~$
```