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, MAC addresses, and bandwidth 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
+--------------------+------------+------------+------------+--------------------
+---------------------------------------------------+
 lo-1/2/1             up           up           up           7a:d8:e6:69:00:02    Wed
Mar 18 11:03:05 GMT +0000 2020
 lo-2/2/1             up           up           up           7a:d8:e6:69:00:03    Wed
Mar 18 11:03:05 GMT +0000 2020
 memif-1/2/1          up           up           up           7a:d8:e6:69:00:01    Wed
Mar 18 11:03:15 GMT +0000 2020
```

2.2. Display All Logical Interfaces

Command to display the status, MTU size, 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
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 lo-1/2/1/1           up           up           up
7a:d8:e6:69:00:02    default
 lo-2/2/1/2           up           up           up
7a:d8:e6:69:00:03    default
 memif-1/2/1/1        up           up           up
7a:d8:e6:69:00:01    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
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 lo-0/0/0/1           up           up           up
7a:2d:63:d1:00:01    default
 lo-0/0/0/2           up           up           up
7a:2d:63:d1:00:01    red
 lo-0/0/0/4           up           up           up
7a:2d:63:d1:00:01    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-1/2/1 logical unit 1
ubuntu@spine1:~$ rtb ifmd show interface logical
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 Interface            Admin Status Link Status  Oper Status  Outer Vlan Inner Vlan MAC
Address          Instance
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 lo-2/2/1/2           up           up           up
7a:d8:e6:69:00:03    default
 memif-1/2/1/1        up           up           up
7a:d8:e6:69:00:01    default
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
```

2.5. Show Interface Addresses

Command to display the IPv4 and IPv6 addresses used on interfaces

rtb ifmd show interface address

address	Interface address

Example

```
ubuntu@spine1:~$ rtb ifmd show interface address
+--------------------+--------------------+--------------------+--------
+---------------------------------------------------+
 Interface            Instance             IPv4                 Primary  IPv6
+--------------------+--------------------+--------------------+--------
+---------------------------------------------------+
 lo-1/2/1/1           default              1.1.1.1/32           true
+--------------------+--------------------+--------------------+--------
+---------------------------------------------------+
 lo-2/2/1/2           default              4.4.4.4/32           true
+--------------------+--------------------+--------------------+--------
+---------------------------------------------------+
 memif-1/2/1/1        default              10.1.1.1/24          true
 memif-1/2/1/1        default                                   true
fe80::78d8:e6ff:fe69:1/128
+--------------------+--------------------+--------------------+--------
+---------------------------------------------------+
```

2.6. 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-1/2/1 logical unit 1 address ipv4
1.1.1.1/32
ubuntu@spine1:~$ rtb ifmd show interface address
+--------------------+--------------------+--------------------+--------
+--------------------------------------------------+
 Interface            Instance             IPv4                 Primary  IPv6
+--------------------+--------------------+--------------------+--------
+--------------------------------------------------+
 lo-1/2/1/1           default              1.1.1.1/32           true
+--------------------+--------------------+--------------------+--------
+--------------------------------------------------+
 lo-2/2/1/2           default              4.4.4.4/32           true
+--------------------+--------------------+--------------------+--------
+--------------------------------------------------+
 memif-1/2/1/1        default              10.1.1.1/24          true
 memif-1/2/1/1        default                                   true
fe80::78d8:e6ff:fe69:1/128
+--------------------+--------------------+--------------------+--------
+--------------------------------------------------+
```

2.7. 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-1/2/1 logical unit 1 address ipv6
10:1:1::1/128
ubuntu@spine1:~$ rtb ifmd show interface address
+--------------------+--------------------+--------------------+--------
+---------------------------------------------------+
 Interface            Instance             IPv4                 Primary  IPv6
+--------------------+--------------------+--------------------+--------
+---------------------------------------------------+
 lo-1/2/1/1           default              1.1.1.1/32           true
 lo-1/2/1/1           default                                   true     10:1:1::1/128
+--------------------+--------------------+--------------------+--------
+---------------------------------------------------+
 lo-2/2/1/2           default              4.4.4.4/32           true
+--------------------+--------------------+--------------------+--------
+---------------------------------------------------+
 memif-1/2/1/1        default              10.1.1.1/24          true
 memif-1/2/1/1        default                                   true
fe80::78d8:e6ff:fe69:1/128
+--------------------+--------------------+--------------------+--------
+---------------------------------------------------+
```

2.8. 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>	IPv6 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:~$
```

2.9. 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:~$
```

2.10. 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 lo-1/2/1 logical unit 1 disable
ubuntu@spine1:~$ rtb ifmd show interface logical
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 Interface            Admin Status Link Status  Oper Status  Outer Vlan Inner Vlan MAC
Address          Instance
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 lo-1/2/1/1           up           up           down
7a:d8:e6:69:00:02    default
 lo-2/2/1/2           up           up           up
7a:d8:e6:69:00:03    default
 memif-1/2/1/1        up           up           up
7a:d8:e6:69:00:01    default
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
```

2.11. 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 lo-1/2/1 logical unit 1 disable
ubuntu@spine1:~$ rtb ifmd show interface logical
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 Interface            Admin Status Link Status  Oper Status  Outer Vlan Inner Vlan MAC
Address          Instance
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
 lo-1/2/1/1           up           up           up
7a:d8:e6:69:00:02    default
 lo-2/2/1/2           up           up           up
7a:d8:e6:69:00:03    default
 memif-1/2/1/1        up           up           up
7a:d8:e6:69:00:01    default
+--------------------+------------+------------+------------+----------+----------
+--------------------+---------------+
```

2.12. 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 lo-1/2/1 logical unit 1 ipv4-disable
ubuntu@spine1:~$ rtb ifmd show interface logical lo-1/2/1/1
Logical Interface Name   lo-1/2/1/1
  Interface Index        2597
  Physical Interface Name lo-1/2/1
  Logical Unit Id        1
  Admin Status           up
  Link Status            up
  Oper Status            up
  Ifl Type               Loopback interface
  MAC                    7a:d8:e6:69:00:02
  Instance               default
Address-family:
  IPv4:
    Status    Down
  IPv6:
    Status    up
  MPLS
    Status    up

 Counter               Count
 drops                :403
 ip6                  :403
 tx bytes             :69916
 tx packets           :806
+--------------------+------------+-------------------------------------------------+
 IPv4                 primary flag IPv6
+--------------------+------------+-------------------------------------------------+
 1.1.1.1/32           true
                      true         10:1:1::1/128
```

2.13. 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 lo-1/2/1 logical unit 1 ipv6-disable
ubuntu@spine1:~$ rtb ifmd show interface logical lo-1/2/1/1
Logical Interface Name   lo-1/2/1/1
  Interface Index        2597
  Physical Interface Name lo-1/2/1
  Logical Unit Id        1
  Admin Status           up
  Link Status            up
  Oper Status            up
  Ifl Type               Loopback interface
  MAC                    7a:d8:e6:69:00:02
  Instance               default
Address-family:
  IPv4:
    Status    up
  IPv6:
    Status    Down
  MPLS
    Status    up

 Counter               Count
 drops                :403
 ip6                  :403
 tx bytes             :69916
 tx packets           :806
+--------------------+------------+-------------------------------------------------+
 IPv4                 primary flag IPv6
+--------------------+------------+-------------------------------------------------+
 1.1.1.1/32           true
                      true         10:1:1::1/128
```

2.14. 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 lo-1/2/1 logical unit 1 ipv4-
disable
ubuntu@spine1:~$ rtb ifmd show interface logical lo-1/2/1/1
Logical Interface Name   lo-1/2/1/1
  Interface Index        2597
  Physical Interface Name lo-1/2/1
  Logical Unit Id        1
  Admin Status           up
  Link Status            up
  Oper Status            up
  Ifl Type               Loopback interface
  MAC                    7a:d8:e6:69:00:02
  Instance               default
Address-family:
  IPv4:
    Status    up
  IPv6:
    Status    up
  MPLS
    Status    up

 Counter              Count
 drops               :403
 ip6                 :403
 tx bytes            :69916
 tx packets          :806
+--------------------+------------+-------------------------------------------------+
 IPv4                primary flag IPv6
+--------------------+------------+-------------------------------------------------+
 1.1.1.1/32          true
                     true         10:1:1::1/128
```

2.15. 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 lo-1/2/1 logical unit 1 ipv6-
disable
ubuntu@spine1:~$ rtb ifmd show interface logical lo-1/2/1/1
Logical Interface Name   lo-1/2/1/1
  Interface Index        2597
  Physical Interface Name lo-1/2/1
  Logical Unit Id        1
  Admin Status           up
  Link Status            up
  Oper Status            up
  Ifl Type               Loopback interface
  MAC                    7a:d8:e6:69:00:02
  Instance               default
Address-family:
  IPv4:
    Status    up
  IPv6:
    Status    up
  MPLS
    Status    up

 Counter              Count
 drops               :403
 ip6                 :403
 tx bytes            :69916
 tx packets          :806
+--------------------+------------+-------------------------------------------------+
 IPv4                primary flag IPv6
+--------------------+------------+-------------------------------------------------+
 1.1.1.1/32          true
                     true         10:1:1::1/128
```

2.16. 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	ipv6-mtu>
Set MTU for IPv4 or IPv6	<mtu-size>

Example

```
ubuntu@spine1:~$ rtb confd set interface physical lo-1/2/1 logical unit 1 ipv4-mtu 299
ubuntu@spine1:~$ rtb ifmd show interface logical lo-1/2/1/1
Logical Interface Name   lo-1/2/1/1
  Interface Index        2597
  Physical Interface Name lo-1/2/1
  Logical Unit Id        1
  Admin Status           up
  Link Status            up
  Oper Status            up
  Ifl Type               Loopback interface
  MAC                    7a:70:97:a8:00:02
  Instance               default
Address-family:
  IPv4:
    Status    up
    ipv4_mtu  299
  IPv6:
    Status    up
  MPLS
    Status    up

 Counter              Count
 drops               :86
 ip6                 :86
 tx bytes            :14880
 tx packets          :172
+--------------------+------------+--------------------------------------------------+
 IPv4                primary flag IPv6
+--------------------+------------+--------------------------------------------------+
 1.1.1.1/32          true
```

2.17. 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@spine1:~$ rtb fibd 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
+--------------------+------+----+---------------------------------------
+--------------------+
 10.1.1.1/32          D         0 10.1.1.1                                 memif-1/2/1/1
 10.1.1.2/32          A-ND      6 10.1.1.2                                 memif-1/2/1/1
 10.1.1.0/24          D         0 10.1.1.0                                 memif-1/2/1/1
 1.1.1.1/32           D         0 1.1.1.1                                  lo-1/2/1/1
 4.4.4.4/32           D         0 4.4.4.4                                  lo-2/2/1/2
 0.0.0.0/0            BGP-LO   20 2.2.2.2                                 memif-1/2/1/1
 3.3.3.3/32           S         2 10.1.1.2                                 memif-1/2/1/1
 2.2.2.2/32           S         2 10.1.1.2                                 memif-1/2/1/1
 3.3.3.33/32          BGP-LO   20 2.2.2.2                                 memif-1/2/1/1
```

2.18. 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

Example

```
ubuntu@s1:~$ rtb fibd show ipv4 route unicast detail
192.1.0.1/32
Source: direct, Preference: 0
Adjacency-Hash:59c0b341d1d8bd991c8beb7dc5711aa63c2a52339e8b8a04
NextHop: 192.1.0.1
-Hash: 05d99c0a905c17df95ceefa88714f0efb04a91a435c5cf93
NextHop Type: local, NextHop Action: trap to cpu
Destination:default-ipv4-unicast
Resolved in:default-ipv4-unicast
Egress-Interface: lo-0/0/0/1
Created: Fri Mar 20 07:07:55 GMT +0000 2020
```

2.19. 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

Example

```
ubuntu@spine1:~$ rtb fibd 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
+----------------------------------------+------+----
+----------------------------------------+--------------------+
 ::/0                                    BGP-LO   20 2.2.2.2
memif-1/2/1/1
 10:1:1::1/128                           D         0 10:1:1::1
lo-1/2/1/1
 10:1:1::2/128                           ISIS     15
```

2.20. 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
+--------------------+------+----+----------------------------------------
+--------------------+
 10.1.1.1/32          D         0 10.1.1.1                                 memif-1/2/1/1
 10.1.1.0/24          D         0 10.1.1.0                                 memif-1/2/1/1
 1.1.1.1/32           D         0 1.1.1.1                                  lo-1/2/1/1
 2.2.2.2/32           ISIS     15 10.1.1.2                                 memif-1/2/1/1
 10.1.1.2/32          A-ND      6 10.1.1.2                                 memif-1/2/1/1
```

2.21. 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 Pv4 Unicast Routing Table for a VRF Instance

Example

```
ubuntu@s1:~$ rtb fibd show ipv4 route unicast instance mgmt-vrf detail
192.1.1.1/32
Source: direct, Preference: 0
Adjacency-Hash:2740c7e4365dcbc9cdc6b29b3a6bf7197f5fa22a432935c1
NextHop: 192.1.1.1
-Hash: 57ae1d8ab84a56ca17895e1b42963af7c830c11d7b4c9061
NextHop Type: local, NextHop Action: trap to cpu
Destination:mgmt-vrf-ipv4-unicast
Resolved in:mgmt-vrf-ipv4-unicast
Egress-Interface: lo-0/0/1/1
Created: Fri Mar 20 03:30:14 GMT +0000 2020
```

2.22. 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@spine2:~$ 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
+----------------------------------------+------+----
+----------------------------------------+--------------------+
 10:1::/128                              A-ND      6 10:1::
memif-2/1/1/1
 10:1::1:1/128                           ISIS     15 fe80::7830:dbff:fe52:1
memif-2/1/1/1
```

2.23. Display the IPv6 Labeled-Unicast Routing Table for the mgmt 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, mgmt)

Example

```
ubuntu@rtbrick:~$ rtb fibd show ipv6 route labeled-unicast instance default
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:~$
```

2.24. Display the IPv4 Unicast Routing Table for the mgmt Instance

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

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

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

Example

```
ubuntu@spine1:~$ rtb fibd show ipv4 route unicast instance mgmt
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
+--------------------+------+----+---------------------------------------
+--------------------+
 10.1.1.1/32          D         0 10.1.1.1                                memif-1/2/1/1
 10.1.1.0/24          D         0 10.1.1.0                                memif-1/2/1/1
 1.1.1.1/32           D         0 1.1.1.1                                 lo-1/2/1/1
 2.2.2.2/32           ISIS     15 10.1.1.2                                memif-1/2/1/1
 10.1.1.2/32          A-ND      6 10.1.1.2                                memif-1/2/1/1
```

2.25. Display the IPv6 Unicast Routing Table for the mgmt Instance

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

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

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

Example

```
ubuntu@spine2:~$ rtb fibd show ipv6 route unicast instance mgmt
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
+---------------------------------------+------+----
+---------------------------------------+--------------------+
 10:1::/128                              A-ND      6 10:1::
memif-2/1/1/1
 10:1::1:1/128                           ISIS     15 fe80::7830:dbff:fe52:1
memif-2/1/1/1
```

2.26. 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:~$
```

2.27. Ping an IPv4 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>	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
```

2.28. 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>	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
```