OAM Support

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1. Introduction to OAM

Operations, Administration and Management (OAM) are the processes, activities, tools, and standards involved with performing operational, administrative, and management tasks. RBFS provides the following OAM features that enable you troubleshoot RtBrick software:

- IP ping
- IP traceroute
- IP ping on an MPLS transport
- IP traceroute on an MPLS transport

MPLS ping and traceroute will be supported in the later releases

2. Using OAM Commands

2.1. Guidelines

- Execute the OAM commands in the **operation** mode of cli.

```
admin@rtbrick:~$ cli
admin@rtbrick: cfg> switch-mode operation
Activating syntax mode : op [operation]
admin@rtbrick: op>
```

2.2. IP Ping

The IP ping utility is used to check the reachability of an IP address.

2.2.1. IP ping in default instance

The **ping** command allows you to ping to a destination to see if a networked device is reachable.

Syntax

```
ping <destination-ip> [source-interface <interface>] count <count> interval
<interval> size <size> source-ip <source-ip> ttl <ttl> tos <tos>
```

Command Parameters

destination-ip	ipv4 destination address
interface	source interface
count	count of the ping packet (default 5)
interval	interval between the packets (default 1 sec)
size	size of the ping packet (default 60)
source-ip	IPv4 source address
ttl	Time-to-live to be used in the packet
tos	Type of Service (TOS) to be used in the packet

> Parameters are optional, but the order has to be maintained as given in the syntax. For example, count cannot be specified after interval.

Example

```
admin@rtbrick: op> ping 30.1.1.1
68 bytes from 30.1.1.1: icmp_seq=1 ttl=64 time=11.8707 ms
68 bytes from 30.1.1.1: icmp_seq=2 ttl=64 time=1.9824 ms
68 bytes from 30.1.1.1: icmp_seq=3 ttl=64 time=5.0726 ms
68 bytes from 30.1.1.1: icmp_seq=4 ttl=64 time=5.6529 ms
68 bytes from 30.1.1.1: icmp_seq=5 ttl=64 time=10.6588 ms
Statistics: 5 sent, 5 received, 0% packet loss
```

2.2.2. IP ping in specific instance and afi/safi

This command allows you to ping to a destination in a particular VRF.

Syntax

```
ping <destination-ip> [instance <instance-name> afi <afi> safi<safi>]
[source-interface <interface>] count <count> interval <interval> size <size>
source-ip <source-ip> ttl <ttl> tos <tos>
```

Command Parameters

destination-ip	ipv4 destination address
instance-name	instance on which ping has to be executed
afi	IPv4 Address Family Identifier (AFI)
safi	Subsequent address family identifier (SAFI)
interface	source interface
count	count of the ping packet (default 5)
interval	interval between the packets (default 1 sec)
size	size of the ping packet (default 60)
source-ip	IPv4 source address
ttl	Time-to-live to be used in the packet
tos	Type of Service (TOS) to be used in the packet

> The afi/safi attributes are optional; if not specified, afi would be ipv4 and safi would be unicast.

Example

```
admin@rtbrick: op> ping 30.10.1.2 instance ip2vrf afi ipv4 safi labeled-
unicast
68 bytes from 30.10.1.2: icmp_seq=1 ttl=64 time=18.1306 ms
68 bytes from 30.10.1.2: icmp_seq=2 ttl=64 time=32.1058 ms
68 bytes from 30.10.1.2: icmp_seq=3 ttl=64 time=19.8205 ms
68 bytes from 30.10.1.2: icmp_seq=4 ttl=64 time=20.0144 ms
68 bytes from 30.10.1.2: icmp_seq=5 ttl=64 time=32.0085 ms
Statistics: 5 sent, 5 received, 0% packet loss
```

2.3. IPv6 Ping

The IPv6 ping utility is used to check the reachability of an IPv6 address.

2.3.1. IPv6 ping in default instance

The **ping** command allows you to ping to an IPv6 destination to see if a networked device is reachable.

Syntax

```
ping <destination-ipv6> [source-interface <interface>] count <count> interval
<interval> size <size> source-ip <source-ipv6> ttl <ttl> tos <tos>
```

Command Parameters

destination-ipv6	ipv6 destination address
interface	source interface
count	count of the ping packet (default 5)
interval	interval between the packets (default 1 sec)
size	size of the ping packet (default 60)
source-ipv6	IPv6 source address
ttl	Time-to-live to be used in the packet
tos	Type of Service (TOS) to be used in the packet

Example

```
admin@rtbrick: op> ping fec0::2556:0:1
68 bytes from fec0::2556:0:1: icmp_seq=1 ttl=64 time=.0503 ms
68 bytes from fec0::2556:0:1: icmp_seq=2 ttl=64 time=.0321 ms
68 bytes from fec0::2556:0:1: icmp_seq=3 ttl=64 time=.0314 ms
68 bytes from fec0::2556:0:1: icmp_seq=4 ttl=64 time=.0325 ms
68 bytes from fec0::2556:0:1: icmp_seq=5 ttl=64 time=.0354 ms
Statistics: 5 sent, 5 received, 0% packet loss
```

2.3.2. IPv6 ping in specific instance and afi/safi

This command allows you to ping to an IPv6 destination in a particular VRF.

Syntax

```
ping <destination-ipv6> [instance <instance-name> afi<afi> safi<safi>]
[source-interface <interface>] count <count> interval <interval> size <size>
source-ip <source-ipv6> ttl <ttl> tos <tos>
```

Command Parameters

destination-ipv6	ipv6 destination address
instance-name	instance on which ping has to be executed
afi	IPv4 Address Family Identifier (AFI)
safi	Subsequent address family identifier (SAFI)
interface	source interface
count	count of the ping packet (default 5)
interval	interval between the packets (default 1 sec)
size	size of the ping packet (default 60)
source-ipv6	IPv6 source address
ttl	Time-to-live to be used in the packet
tos	Type of Service (TOS) to be used in the packet

ℹ️ The afi/safi attributes are optional; if not specified, afi would be ipv6 and safi would be unicast.

Example

```
admin@rtbrick: op> ping fec0::2556:0:1 instance abc afi ipv6 safi labeled-
unicast
68 bytes from fec0::2556:0:1: icmp_seq=1 ttl=64 time=.0503 ms
68 bytes from fec0::2556:0:1: icmp_seq=2 ttl=64 time=.0321 ms
68 bytes from fec0::2556:0:1: icmp_seq=3 ttl=64 time=.0314 ms
68 bytes from fec0::2556:0:1: icmp_seq=4 ttl=64 time=.0325 ms
68 bytes from fec0::2556:0:1: icmp_seq=5 ttl=64 time=.0354 ms
Statistics: 5 sent, 5 received, 0% packet loss
```

2.4. IP traceroute

2.4.1. IP traceroute in default instance

This command allows you to traceroute to a particular IP destination.

Syntax

```
traceroute <destination-ip> [source-interface <interface>] repeat <repeat>
interval <interval> size <pktsize> source-ip <source-ip> maxhop <maxhop>
```

destination-ip	ipv4 destination address
interface	source interface
repeat	no of packets for each hop (default 3)
interval	interval between the packets (default 1 sec)
pktsize	size of the traceroute packet (default 60)
source-ip	source IP address
maxhop	max number of hops before the TTL expires (default 30)

> ℹ️ Parameters are optional, but order has to be maintained as given in the syntax. For example, interval cannot be specified after size.

Example

```
admin@rtbrick: op> traceroute 30.10.1.2
traceroute to 30.10.1.2, 30 hops max, 60 byte packets
1    20.10.1.2    39.401 ms        19.919 ms        20.074 ms
2    30.10.1.2    55.544 ms        36.765 ms        45.989 ms
```

2.4.2. IP traceroute in specific instance and afi/safi

This command allows you to traceroute to a particular IP destination in a specific VRF.

Syntax

```
traceroute <destination-ip> [instance <instance-name> afi <afi> safi<safi>]
[source-interface <interface>] repeat <repeat> interval <interval> size
<pktsize> source-ip <source-ip> maxhop <maxhop>
```

destination-ip	ipv4 destination address
instance-name	instance on which traceroute has to be executed
afi	IPv4 Address Family Identifier (AFI)
safi	Subsequent address family identifier (SAFI)
interface	source interface
repeat	no of packets for each hop (default 3)
interval	interval between the packets (default 1 sec)
pktsize	size of the traceroute packet (default 60)
source-ip	source IP address
maxhop	max number of hops before the TTL expires (default 30)

> ℹ️ The afi/safi attributes are optional; if not specified, afi would be ipv4 and safi would be unicast.

Example

```
admin@rtbrick: op> traceroute 30.10.1.2 instance abc afi ipv4 safi labeled-
unicast
traceroute to 30.10.1.2, 30 hops max, 60 byte packets
1    20.10.1.2    39.401 ms       19.919 ms       20.074 ms
2    30.10.1.2    55.544 ms       36.765 ms       45.989 ms
```

2.5. IPv6 traceroute

2.5.1. IPv6 traceroute in default instance

This command allows you to traceroute to a particular IP destination.

Syntax

```
traceroute <destination-ipv6> [source-interface <interface>] repeat <repeat>
interval <interval> size <pktsize> source-ip <source-ipv6> maxhop <maxhop>
```

destination-ipv6	ipv6 destination address
interface	source interface
repeat	no of packets for each hop (default 3)
interval	interval between the packets (default 1 sec)
pktsize	size of the traceroute packet (default 60)
source-ip	IPv6 source address
maxhop	max number of hops before the TTL expires (default 30)

Example

```
admin@rtbrick: op> traceroute fec0::3556:0:1
traceroute to fec0::3556:0:1 30 hops max, 60 byte packets
1 fec0::2556:1:1 21.247 ms 20.232 ms 20.052 ms
2 fec0::3556:0:1 50.124 ms 59.822 ms 40.032 ms
```

2.5.2. IPv6 traceroute in specific instance and afi/safi

This command allows you to traceroute to a particular IPv6 destination in a specific VRF.

Syntax

```
traceroute <destination-ipv6> [instance <instance-name> afi<afi> safi<safi>]
[source-interface <interface>] repeat <repeat> interval <interval> size
<pktsize> source-ip <source-ipv6> maxhop <maxhop>
```

destination-ipv6	ipv6 destination address
instance-name	instance on which traceroute has to be executed
afi	IPv4 Address Family Identifier (AFI)
safi	Subsequent address family identifier (SAFI)
interface	source interface
repeat	no of packets for each hop (default 3)
interval	interval between the packets (default 1 sec)
pktsize	size of the traceroute packet (default 60)

source-ip	IPv6 source address
maxhop	max number of hops before the TTL expires (default 30)

> ℹ️ The afi/safi attributes are optional; if not specified, afi would be ipv6 and safi would be unicast.

Example

```
admin@rtbrick: op> traceroute fec0::3556:0:1 instance abc afi ipv4 safi
labeled-unicast
traceroute to fec0::3556:0:1 30 hops max, 60 byte packets
1 fec0::2556:1:1 21.247 ms 20.232 ms 20.052 ms
2 fec0::3556:0:1 50.124 ms 59.822 ms 40.032 ms
```