



Static Routing User Guide

Version 23.8.1.2, 06 November 2023

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

©Copyright 2023 RtBrick, Inc. All rights reserved. The information contained herein is subject to change without notice. The trademarks, logos and service marks ("Marks") displayed in this documentation are the property of RtBrick in the United States and other countries. Use of the Marks are subject to RtBrick's Term of Use Policy, available at <https://www.rtbrick.com/privacy>. Use of marks belonging to other parties is for informational purposes only.

Table of Contents

1. Introduction	3
1.1. Supported Platforms	3
2. Configuring Static Routes	4
2.1. Configuration Hierarchy	4
2.2. Configuration Syntax and Commands	4
2.2.1. Static Route Configuration	4
2.2.2. Nexthop Profile Configuration	5
2.2.3. Conditional Profile Configuration	6
2.2.4. Static Multicast Route Configuration	7
3. Operational Commands	9
3.1. Show Commands	9
3.1.1. Static Routes Created by staticd	9
3.1.2. Static Routes in the Routing Table	9

1. Introduction

Static routing allows a network administrator to configure routes manually. Using the RtBrick CLI, you can configure static IPv4, IPv6, MPLS, and multicast routes.

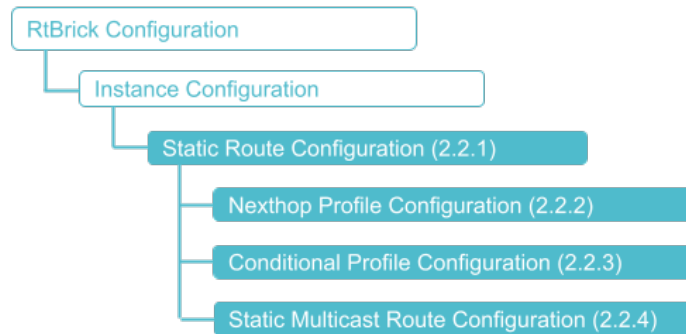
1.1. Supported Platforms

Not all features are necessarily supported on each hardware platform. Refer to the Platform Guide for the features and the sub-features that are or are not supported by each platform.

2. Configuring Static Routes

2.1. Configuration Hierarchy

The diagram illustrates the static routes configuration hierarchy.



2.2. Configuration Syntax and Commands

The following sections describe the static route configuration syntax and commands. In RBFS, next hops of static routes are configured separately, and referenced by the actual routes.

2.2.1. Static Route Configuration

This section describes how to configure the static route itself.

Syntax

set instance <instance-name> **static route** <attribute> <value>

Attribute	Description
<instance-name>	Name of the routing instance
<afi> <prefix label> (true false)	Supported AFIs are ipv4, ipv6, and mpls. In case of IPv4 or IPv6, configure the prefix. In case of MPLS, configure the incoming label and BOS flag.
<safi>	Supported SAFIs are unicast, labeled-unicast, and multicast.
<nexthop-profile>	Name of the nexthop profile

Example: Static Route Configuration

```

{
  "rtbrick-config:route": {
    "ipv4": [
      {
        "prefix4": "198.51.100.15/24",
        "safi": "unicast",
        "nexthop-profile": "nexthop1",
        "preference": 20
      }
    ],
    "ipv6": [
      {
        "prefix6": "2001:db8:0:117::/32",
        "safi": "unicast",
        "nexthop-profile": "nexthop2"
      }
    ],
    "mpls": [
      {
        "in-label": 8888,
        "in-bos": "true",
        "safi": "unicast",
        "nexthop-profile": "nexthop1"
      }
    ]
  }
}

```

2.2.2. Nexthop Profile Configuration

You can group various nexthop parameters with a nexthop profile name and instance, and associate this nexthop profile with multiple routes.

Syntax

set instance <instance-name> **static nexthop-profile** <name> <attribute> <value>

Attribute	Description
<instance-name>	Name of the routing instance
nexthop-profile <name>	Nexthop profile name
exit-interface <exit-interface>	Exit interface name
lookup-afi (ipv4 ipv6 mpls)	Lookup routing table address family where the nexthop will be resolved.
lookup-instance <lookup-instance>	Lookup routing table instance where the nexthop will be resolved.

Attribute	Description
lookup-safi (labeled-unicast multicast unicast)	Lookup routing table subsequent address family where the nexthop will be resolved.
nexthop <address>	IPv4/IPv6 nexthop address
out-bos (true false)	Label BOS
out-label <out-label>	Label to be pushed

Example: Nexthop Profile Configuration

```
{
  "rtbrick-config:static": {
    "nexthop-profile": [
      {
        "name": "nexthop1",
        "nexthop": "198.51.100.145",
        "out-label": 4444
      },
      {
        "name": "nexthop3",
        "exit-interface": "ifp-0/0/4/4"
      }
    ]
  }
}
```



- If you do not provide lookup-instance, lookup-afi and lookup-safi values, default values will be used to install the route.
- The exit interface attribute is mandatory for link-local nexthop.

2.2.3. Conditional Profile Configuration

By using the conditional static route feature, you can make specific routes conditional. These conditional routes are installed only if the specified condition is satisfied.

You can group various conditional parameters such as match-instance, match-afi, match-safi, compare-operation, compare-type, and compare-value with a conditional profile name, and associate this conditional profile with multiple routes.

Syntax:

```
set instance <instance-name> static conditional-profile <name> <attribute> <value>
```

Attribute	Description
conditional <name>	Conditional profile name
compare-operation greater-then	Conditional routing compare operation
compare-type route-count	Conditional routing compare type
compare-value <compare-value>	Conditional routing condition value
match-instance <instance-name>	Routing instance where the condition will be checked.
match-afi (ipv4 ipv6 mpls)	Routing tables address family (AFI) for which the condition will be checked.
match-safi (labeled-unicast multicast unicast)	Routing table subsequent address family (SAFI) for which the condition will be checked.

Example: Conditional Profile Configuration

```
{
  "rtbrick-config:conditional-profile": [
    {
      "name": "c2",
      "match-instance": "default",
      "match-afi": "ipv4",
      "match-safi": "unicast",
      "compare-type": "route-count",
      "compare-operation": "greater-than",
      "compare-value": 20
    }
  ]
}
```

2.2.4. Static Multicast Route Configuration

Syntax:

set instance <instance-name> **static route multicast4** <attribute> <value>

Attribute	Description
<instance-name>	Name of the routing instance
<source>	IPv4 multicast source address
<group>	IPv4 multicast group address

Example: Static Multicast Route Configuration


```
{
  "rtbrick-config:static": {
    "route": {
      "multicast4": [
        {
          "source": "198.51.100.15/24",
          "group": "198.51.100.35/24",
          "nexthop-profile": "nexthop3"
        }
      ]
    }
  }
}
```

3. Operational Commands

3.1. Show Commands

3.1.1. Static Routes Created by staticd

These commands show static routes as created by the static route daemon (staticd).

Syntax:

show static route <options>

Attribute	Description
<afi>	Supported AFIs are ipv4, ipv6, and mpls.
<safi>	Supported SAFIs are unicast, labeled-unicast, and multicast.
instance <name>	Static routes for an instance

Example: List static routes for all instances

```

supervisor@dev1: cfg> show static route
Instance: default, AFI: ipv4, SAFI: unicast
Prefix/Label      Pref  Next Hop      Interface
198.51.100.100/24  2     198.51.100.22 -
Instance: default, AFI: ipv6, SAFI: unicast
Prefix/Label      Pref  Next Hop      Interface
2001:db8:0:334::/32  2     2001:db8:0:99:: -

```

3.1.2. Static Routes in the Routing Table

These commands show the static routes included in the final routing table.

Syntax:

show route <options> **source static** <options>

Attribute	Description
<afi>	Supported AFIs are ipv4, ipv6, and mpls.
<safi>	Supported SAFIs are unicast, labeled-unicast, and multicast.
detail	Detailed route information
instance <name>	Routing table information for a specific instance

Attribute	Description
label <value>	Destination label
mpls	Address family
prefix <value>	Destination prefix
source	Source of the routing information

Example 1: List static routes information

```

supervisor@dev1: cfg> show route ipv4 source static
Instance: default, AFI: ipv4, SAFI: unicast
Prefix/Label          Source          Pref    Next Hop
Interface
198.51.100.100/24    static          2       198.51.100.22
ifl-0/0/1/4
supervisor@dev1: cfg>
    
```

Example 2: List detailed static routes information

```

supervisor@dev1: cfg> show route ipv4 source static detail
Instance: default, AFI: ipv4, SAFI: unicast
198.51.100.100/24
  Source: static, Preference: 2
  Next Hop: 198.51.100.22
  Covering prefix: 198.51.100.22/24
  Next Hop type: direct, Next Hop action: None
  Resolved in: default-ipv4-unicast
  Egress interface: ifl-0/0/1/4, NextHop MAC: 7a:00:81:64:04:04
    
```

Example 3: List MPLS route information

```

supervisor@rtbrick: cfg> show route mpls
Instance: default, AFI: mpls, SAFI: unicast
Prefix/Label  Source  Pref  Next Hop  Interface
20010         bgp     170   2001:db8:0:110::  ifl-0/0/17/1001
20011         bgp     170   2001:db8:0:110::  ifl-0/0/17/1001
20012         bgp     170   2001:db8:0:110::  ifl-0/0/17/1001
20013         bgp     170   2001:db8:0:110::  ifl-0/0/17/1001
20014         bgp     170   2001:db8:0:110::  ifl-0/0/17/1001
20015         bgp     170   2001:db8:0:110::  ifl-0/0/17/1001
20016         bgp     170   2001:db8:0:110::  ifl-0/0/17/1001
20017         bgp     170   2001:db8:0:110::  ifl-0/0/17/1001
20018         bgp     170   2001:db8:0:110::  ifl-0/0/17/1001
    
```