



Policy Configuration Guide

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1. Overview

Routing Policies are the rules that allow you to control and modify the default behaviour of the routing protocols such as BGP and IS-IS.

A routing policy consists of different “ordinals”. These ordinals includes “match” and “action” (with control) parts. The matched traffic with “match” field is behaved according to the “action” field. For more information, see the [Building Blocks of Policy Configuration](#) section.

To use a routing policy, firstly you need to generate it. After this, you can use this policy by enforcing them to the routes.

1.1. Supported Hardware

Routing Policy is supported on the following platforms:

- Broadcom’s Qumran Switch
- VPP based software forwarding platform

1.2. Guidelines

- The policy list names and policy names can contain alphanumeric characters and an underscore character. They must not include special characters like hyphen. For example, **BGP-EXPORT** is not supported, whereas **BGP_EXPORT** is supported. A valid name cannot start with a number but it can contain numbers and underscore () in the string. The length of the names should not exceed 64 characters.

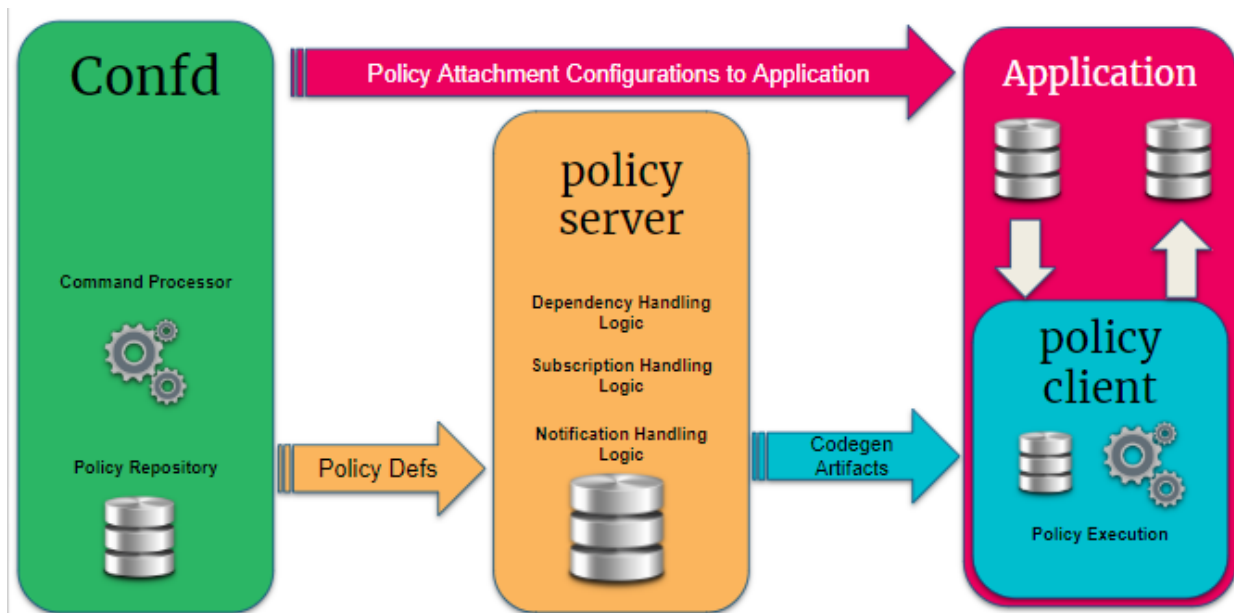
1.3. Limitations

- Configuring the raw hardware package filters through a generic representation model is not supported
- The following features are unavailable in the current policy implementation:
 - Conditional policies, that is, filtering based on conditions (that is, if a route is present in table x, then permit or deny)
 - Filtering based on Layer 2 constructs like MAC and ARP
 - Access Control Lists on generic criteria
 - Integration of subscriber policy-based routing
 - Policy Main is not supported in this release

1.4. Policy Components

In RtBrick Full Stack, the policy is divided into 4 sub-components:

- Policy Repository
- Command Processing Module
- Policy Server, the policy generation and relationship management component
- Policy Client, the policy enforcement component



1.4.1. Policy Repository

The policy repository contains all the tables that are related to policy and associated list of compare criteria

1.4.2. Command Processing Module

The command processing module is part of the [Configuration daemon \(confD\)](#), and that handles user interaction with the policy module. This is the back-end of the Command Line Interface (CLI) and JSON configuration that support the policy configurations.

This module maps the user-entered configuration into the back-end policy object, which is used by the execution engine (after verification) that ensures that the policy can be correctly executed. In the future implementation of policy, this will be extended to include dynamic criteria for permit and deny actions that is based on routes present in a specific table. This module relays the user intent and relays it via [Publish Subscribe bus \(PubSub bus\)](#) to policy server.

1.4.3. Policy Server

The Policy Server is a server component that manages all the policy rules in the various policy tables and also code generation of the policies.

The following are the functionalities of the policy server:

- Parses the objects in the policy tables, and it is an execution engine that generates the code to build the policy rules for evaluation, the relationship between various objects, and relays the intent to the evaluation engine.
- Maintains relationships between various policy constructs such as policy statements, rules, terms and lists.
- Tracks the attachment points so that when policies are modified, the appropriate clients are notified with the relevant new policies.
- Flattens the various relationships and generates a notification table that the clients subscribe to obtain notification based on specific interest groups.
- Uses the dependency table relationships to generate jobs to trigger code generation for various policy components.
- On code generation the policy server updates a notification table that maintains the mapping between the policy server has a notification table that maintains the mapping of the policy objects for which code is generated and the client interest groups. The notification table is a single point for the dissemination of information so that it can generate notifications for clients depending on their subscriptions for policy of interest.
- Policy server notification is generated towards the policy clients. A notification is received from the notification table with metadata information that notifies the client if this is a new version of the policy or the first version of the policy. The client uses this information to enforce the policy evaluation and to decide on the version of the policy rule to be used.

1.4.4. Policy Client

Policy client is a shared library component that a client daemon like BGP, ISIS, OSPF etc links to. This is the component that performs policy enforcement. It performs the following tasks:

- Links with client daemons like BGP, ISIS, OSPF.
- Contains a listener that gets notifications on the availability of a new policy rule that is generated by the policy server.
- Evaluates the compiled rule and if there are any listeners/ interests, then notifies the components within the client daemon.
- Evaluates any policy configurations on the client daemon and invokes policy processing in response.

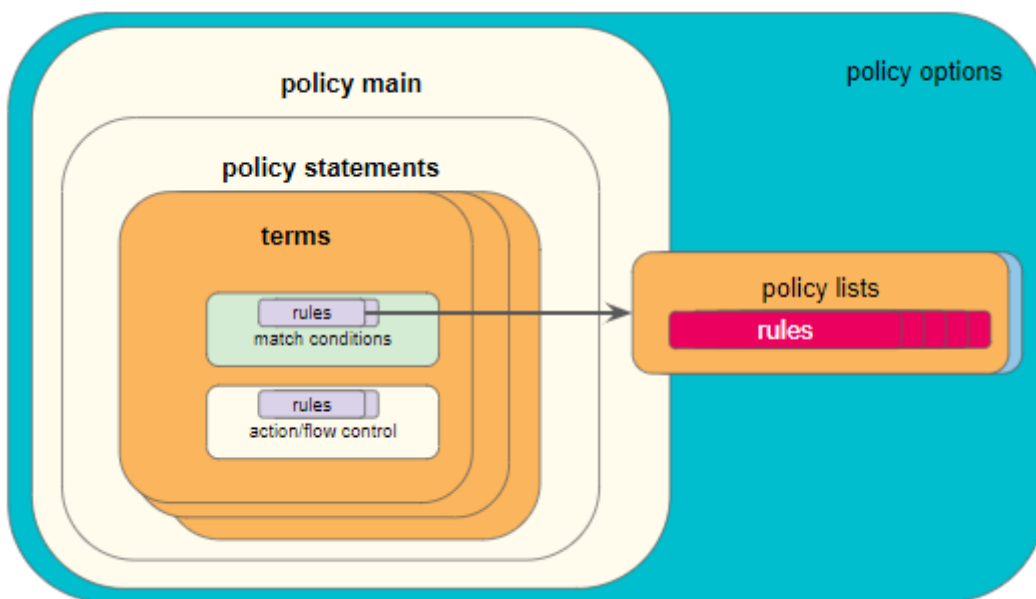
1.5. Support List Types

Following types of lists are supported:

- ipv4-prefix
- ipv4-address
- ipv6-prefix
- ipv6-address
- route-distinguisher
- community
- extended-community
- large-community
- as-path
- source
- sub-source
- cluster-list
- mpls-label
- mac-address

1.6. Building Blocks of Policy Configuration

The figure below shows the basic building blocks of the policy module. A policy is defined by a policy statement. A policy statement is a compound block of policy definition that consists of one or more policy terms.



A policy term is the smallest block to relay user policy intent and consists of rules for match and action blocks. Match blocks can either define single independent elements like As-path, IP Prefix, IP addresses, Community, ext-community etc. or a list of these elements maintained in a different table.

Policy	Policy configuration mode
Policy Statement	Composed of one or more terms exercised in the order defined
Policy Ordinal	Ordinals are executed in ascending order.
Match	Match criteria to define either a single or list of independent elements. This is an optional block in a policy term
Action	Action criteria to either perform an action or define flow control, that is, go to next term , accept , deny etc. This is an optional block in policy term with a default action deny
Policy Lists	Aggregation or list of items of various types that are used in various policy comparison blocks
Rules	Index inside a policy term that defines the ordering of match and/or action criteria

1.6.1. Statement

A policy statement name is a globally unique string that is used to identify the policy and also used by the application for attachment points.

1.6.2. Ordinal

- An ordinal must be unique number within the scope of a statement which determines the order of the term execution within a policy statement.
- If no ordinal exist or configured, and if the policy is used, then all routes/BDS objects will be denied.
- Match must be associated to the match-condition, that is, **and/or**.

1.6.3. Match

- The outcome of a match block is **deny** by default.
- One or more matching rules make a match block; each matched routes/BDS objects are permitted by default.
- If a rule uses list match and if any one of the list entry matches to the attribute value, then the route is considered to be matched.
- If a list is defined and it is empty, then the route.bds object will be denied.
- Order of matching is based on the rule numbers.

- If match-type is **or**, then any one rule match will consider the route/BDS object as matched and permitted, otherwise it is denied.
- If match-type is **and**, then all rules match will consider the route/bds object as matched and permitted otherwise its denied.
- If match block results in a successful match, then corresponding action block is executed (resulting route/BDS object to be permitted).
- If match block results in a unsuccessful or there is no match, then corresponding action block is not executed instead next term is executed. If there are no more terms, then the policy execution will result in **deny** (resulting route/BDS object to be denied).

1.6.4. Actions in Policy

Action	Description
action goto-next-term	If next term exists, then next term is executed and the policy result is decided based on execution result.
action return-deny	Stops policy execution and returns result as deny (resulting route/BDS object to be denied)
action return-permit	Stop policy execution and return result as permit (resulting route/BDS object to be permitted)
operation delete-attribute	Deletes the attribute from the route/BDS object, that is, clearing all the info for that specific attribute in the object
operation <operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type

1.7. Policy Match Options, Compare Types, and Operations

Policy Match Options	Operation Types Supported	Compare Types Supported
route ipv4-prefix	overwrite	regex-match exact longer or-longer prefix-length-exact prefix-length-greater prefix-length-greater-or-exact

Policy Match Options	Operation Types Supported	Compare Types Supported
route ipv6-prefix	overwrite	regex-match exact longer or-longer prefix-length-exact prefix-length-greater prefix-length-greater-or-exact
route distinguisher	overwrite	regex-match exact
route community	append prepend overwrite	regex-match exact exists
route extended-community	append prepend overwrite	regex-match exact exists
route large-community	append prepend overwrite	regex-match exact exists
route as-path	append prepend overwrite	regex-match exact exists
route cluster-list	append prepend overwrite	regex-match exact exists
route source	overwrite	regex-match exact
route sub-source	overwrite	regex-match exact
route originator-identifier	overwrite	regex-match exact
route peer-router-id	overwrite	regex-match exact
route ipv4-nexthop	overwrite	regex-match exact
route ipv6-nexthop	overwrite	regex-match exact
route label	overwrite	regex-match exact

Policy Match Options	Operation Types Supported	Compare Types Supported
route peer-ipv4	overwrite	regex-match exact
route peer-ipv6	overwrite	regex-match exact

1.7.1. Policy Compare Types

Policy Compare Types	Description
regex-match	<p>An attribute can be matched using a standard Linux egrep regular expression.</p> <p>Example: "label": "label-op:push,label:206,bos:1"</p> <p>In this example, the label is a 64bit number, which has label value, bos, and operation encoding.</p> <p>A regex is used to match the string which is displayed in the table dump, that is, label-op:push,label:206,bos:1 not the 64bit value.</p> <p>The same is applicable to an array type attribute. A regex can be written to the string which is visible in the table dump output.</p>
exact	Value configured in the command must be same as application attribute value
exists	This is applicable only for array type attribute; an exist match is the one where value configured in the command must exist in the application attribute value which is an array.
lesser	The application attribute value must be lesser than the value configured in the command
lesser-or-exact	The application attribute value must be lesser than or exact value configured in the command
greater	The application attribute value must be greater than the value configured in the command
greater-or-exact	The application attribute value must be greater than or exact value configured in the command

Policy Compare Types	Description
greater-longer	The route shares the same most-significant bits (described by prefix-length), and prefix-length is greater than the route's prefix length
greater-or-longer	The route shares the same most-significant bits (described by prefix-length), and prefix-length is equal to or greater than the route's prefix length.
longer	The route address shares the same most-significant bits as the match prefix (destination-prefix or source-prefix). The number of significant bits is described by the prefix-length component of the match prefix.
or-longer	The route address shares the same most-significant bits as the match prefix (destination-prefix or the source-prefix). The number of significant bits is described by the prefix-length component of the match prefix.
prefix-length-exact	The application attribute value whose prefix length must be lesser than or exact value configured in the command
prefix-length-greater	The application attribute value whose prefix length must be greater than or exact value configured in the command

1.7.2. Policy Operation Types

Policy Operation Types	Description
Add	The application attribute value will be added with the value configured in the command
Subtract	The application attribute value will be subtracted with the value configured in the command. If the result of the subtraction results in a number less than 0, the value "0" is used.
Multiply	The application attribute value will be multiplied with the value configured in the command
Divide	The application attribute value will be divided with the value configured in the command
Overwrite	The application attribute value will be overwritten with the value configured in the command

1.8. Structure of Policy Statements

1.8.1. Syntax and Structure

The following example shows the syntax and structure of the policy statements.

```

supervisor@ixr_rtd: cfg> set policy
  <cr>
  list                Policy list configuration
  statement           Policy statement configuration
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 description "My
policy"
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match-condition or
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1
  match-type         type                value                value-type
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1
match-type
  exact              Match type
  exists             Match type
  greater            Match type
  greater-or-exact   Match type
  less               Match type
  less-or-exact      Match type
  longer             Match type
  or-longer          Match type
  prefix-length-exact Match type
  prefix-length-greater Match type
  prefix-length-greater-or-exact Match type
  regex-match        Match type
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1
match-type exact
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1 type
mcast-route-ipv4-group      Application type multicast route ipv4 group
mcast-route-ipv4-source     Application type multicast route ipv4 source
route-as-path                Application type route as path
route-cluster-list           Application type route cluster list
route-community               Application type route community
route-distinguisher          Application type route distinguisher
route-extended-community     Application type route extended community
route-igp-metric             Application type route igp metric
route-ipv4-nexthop           Application type route ipv4 nexthop
route-ipv4-prefix            Application type route ipv4 prefix
route-ipv6-nexthop           Application type route ipv6 nexthop
route-ipv6-prefix            Application type route ipv6 prefix
route-label                  Application type route label
route-large-community        Application type route large community
route-local-preference       Application type route local preference
route-med                    Application type route med
route-origin                 Application type route origin
route-originator-identifier  Application type route originator identifier
route-peer-ipv4              Application type route peer's ipv4 address
route-peer-ipv6              Application type route peer's ipv6 address
route-peer-router-id        Application type route peer's router
identifier
  route-preference           Application type route preference
  route-receive-path-identifier Application type route receive path
  identifier

```

```

route-send-path-identifier      Application type route send path identifier
route-source                    Application type route source
route-sub-source                Application type route sub source
<type>                          Application type
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1 type
route-as-path
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1
match-type                      type                      value                      value-type
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1 value
l1                              Application type value
<value>                          Application type value
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1 value
10
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1
value-type
complete                        Value type
list-name                        Value type
supervisor@ixr_rtd: cfg> set policy
<cr>
list                            Policy list configuration
statement                        Policy statement configuration
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1
action                            description                match                        match-
condition
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 description "My
policy"
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match-condition or
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1
match-type                      type                      value                      value-type
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1
match-type
exact                            Match type
exists                          Match type
greater                          Match type
greater-or-exact                Match type
less                             Match type
less-or-exact                  Match type
longer                          Match type
or-longer                       Match type
prefix-length-exact             Match type
prefix-length-greater           Match type
prefix-length-greater-or-exact  Match type
regex-match                     Match type
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1
match-type exact
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1 type
mcast-route-ipv4-group          Application type multicast route ipv4 group
mcast-route-ipv4-source          Application type multicast route ipv4 source
route-as-path                    Application type route as path
route-cluster-list               Application type route cluster list
route-community                  Application type route community
route-distinguisher              Application type route distinguisher
route-extended-community         Application type route extended community
route-igp-metric                 Application type route igp metric
route-ipv4-nexthop               Application type route ipv4 nexthop
route-ipv4-prefix                Application type route ipv4 prefix
route-ipv6-nexthop               Application type route ipv6 nexthop
route-ipv6-prefix                Application type route ipv6 prefix

```



```

route-label                Application type route label
route-large-community      Application type route large community
route-local-preference    Application type route local preference
route-med                  Application type route med
route-origin               Application type route origin
route-originator-identifier Application type route originator identifier
route-peer-ipv4            Application type route peer's ipv4 address
route-peer-ipv6           Application type route peer's ipv6 address
route-peer-router-id      Application type route peer's router
identifier
route-preference          Application type route preference
route-receive-path-identifier Application type route receive path
identifier
route-send-path-identifier Application type route send path identifier
route-source              Application type route source
route-sub-source          Application type route sub source
<type>                    Application type
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1 type
route-as-path
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1
match-type                type                value                value-type
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1 value
<value>                    Application type value
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1 value
10
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1
value-type
complete                    Value type
list-name                    Value type
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 match rule 1
value-type complete
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 action rule 1
operation                type                value
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 action rule 1
operation
add                        Operation type
append                     Operation type
delete-attribute           Operation type
divide                     Operation type
goto-next-ordinal         Operation type
multiply                   Operation type
overwrite                  Operation type
prepend                    Operation type
return-deny                Operation type
return-permit              Operation type
subtract                   Operation type
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 action rule 1
operation prepend
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 action rule 1
<cr>
operation                Operation type
type                    Application type
value                    Application type value
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 action rule 1 type
mcast-route-ipv4-group    Application type multicast route ipv4 group
mcast-route-ipv4-source   Application type multicast route ipv4 source
route-as-path             Application type route as path
route-cluster-list        Application type route cluster list

```

```

route-community           Application type route community
route-distinguisher      Application type route distinguisher
route-extended-community Application type route extended community
route-igp-metric         Application type route igp metric
route-ipv4-nexthop       Application type route ipv4 nexthop
route-ipv4-prefix        Application type route ipv4 prefix
route-ipv6-nexthop       Application type route ipv6 nexthop
route-ipv6-prefix        Application type route ipv6 prefix
route-label              Application type route label
route-large-community    Application type route large community
route-local-preference   Application type route local preference
route-med                Application type route med
route-origin             Application type route origin
route-originator-identifier Application type route originator identifier
route-peer-ipv4          Application type route peer's ipv4 address
route-peer-ipv6          Application type route peer's ipv6 address
route-peer-router-id    Application type route peer's router
identifier
route-preference         Application type route preference
route-receive-path-identifier Application type route receive path
identifier
route-send-path-identifier Application type route send path identifier
route-source             Application type route source
route-sub-source         Application type route sub source
<type>                   Application type
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 action rule 1 type
route-community
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 action rule 1
value
<value>
supervisor@ixr_rtd: cfg> set policy statement s1 ordinal 1 action rule 1
value 100:100
supervisor@ixr_rtd: cfg>
List-:
supervisor@ixr_rtd: cfg> set policy list
l1                        List name
<name>                   List name
supervisor@ixr_rtd: cfg> set policy list l1
as-path                  Policy list type
cluster-list             Policy list type
community                Policy list type
extended-community       Policy list type
ipv4-address             Policy list type
ipv4-prefix              Policy list type
ipv6-address             Policy list type
ipv6-prefix              Policy list type
large-community          Policy list type
mac-address              Policy list type
mpls-label               Policy list type
route-distinguisher     Policy list type
source                   Policy list type
sub-source               Policy list type
<type>                   List type
supervisor@ixr_rtd: cfg> set policy list l1 as-path ordinal
<ordinal>                 Ordinal number
supervisor@ixr_rtd: cfg> set policy list l1 as-path ordinal 1
<ordinal>
supervisor@ixr_rtd: cfg> set policy list l1 as-path ordinal 1 value

```

```
<value> List type value
supervisor@ixr_rtd: cfg> set policy list 11 as-path ordinal 1 value 10
```

1.8.2. Sample Configuration for Policy

```

set policy list l1 ipv4-prefix
set policy list l1 ipv4-prefix ordinal 1
set policy list l1 ipv4-prefix ordinal 1 value 200.0.0.1/32
set policy list l1 ipv4-prefix ordinal 2
set policy list l1 ipv4-prefix ordinal 2 value 200.0.0.3/32
set policy list l1 ipv4-prefix ordinal 3
set policy list l1 ipv4-prefix ordinal 3 value 200.0.0.5/32
set policy list l1 ipv4-prefix ordinal 4
set policy list l1 ipv4-prefix ordinal 4 value 200.0.0.7/32
set policy list l1 ipv4-prefix ordinal 5
set policy list l1 ipv4-prefix ordinal 5 value 200.0.0.9/32
set policy statement p1
set policy statement p1 ordinal 1
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 3
set policy statement p1 ordinal 1 match rule 3 type route-ipv4-prefix
set policy statement p1 ordinal 1 match rule 3 value-type complete
set policy statement p1 ordinal 1 match rule 3 match-type regex-match
set policy statement p1 ordinal 1 match rule 3 value "[0-9]{1,3}.[0-9]{1,3}.[0-9]{1,3}.(15)/[0-9]{1,2}"
set policy statement p1 ordinal 1 action rule 1
set policy statement p1 ordinal 1 action rule 1 type route-local-preference
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 123
set policy statement p1 ordinal 1 action rule 3
set policy statement p1 ordinal 1 action rule 3 operation goto-next-ordinal
set policy statement p1 ordinal 2
set policy statement p1 ordinal 2 match-condition or
set policy statement p1 ordinal 2 match rule 1
set policy statement p1 ordinal 2 match rule 1 type route-ipv4-prefix
set policy statement p1 ordinal 2 match rule 1 value-type list-name
set policy statement p1 ordinal 2 match rule 1 match-type exact
set policy statement p1 ordinal 2 match rule 1 value l1
set policy statement p1 ordinal 2 action rule 1
set policy statement p1 ordinal 2 action rule 1 type route-med
set policy statement p1 ordinal 2 action rule 1 operation overwrite
set policy statement p1 ordinal 2 action rule 1 value 321
set policy statement p1 ordinal 3
set policy statement p1 ordinal 3 match-condition or
set policy statement p1 ordinal 3 match rule 3
set policy statement p1 ordinal 3 match rule 3 type route-ipv4-prefix
set policy statement p1 ordinal 3 match rule 3 value-type complete
set policy statement p1 ordinal 3 match rule 3 match-type regex-match
set policy statement p1 ordinal 3 match rule 3 value "[0-9]{1,3}.[0-9]{1,3}.(16)/[0-9]{1,2}"
set policy statement p1 ordinal 3 action rule 4
set policy statement p1 ordinal 3 action rule 4 type route-local-preference
set policy statement p1 ordinal 3 action rule 4 operation delete-attribute
set policy statement p1 ordinal 3 action rule 5
set policy statement p1 ordinal 3 action rule 5 operation return-deny

```

1.9. Tables and Subscriptions

The table below shows the various tables and their sharing across various policy

components.

Confid	global.policy.list.config global.policy.list.entry.config global.policy.match.rules.config global.policy.statement.config global.policy.ordinal.config global.policy.mapping.list global.policy.mapping.rules	Policy Statement is composed of one or more policy terms. Each term has a match action criteria. In the match and action criteria either a single element or a list of elements are compared and actions are taken. The actions include accept, deny, flow-control etc.
policy.server	global.policy.dependency global.<bds_name>.policy.subscription global.<bds_name>.policy.notification	Policy Server subscribes to all the tables from confd and creates tables that track policy-entry and dependency and notifies clients after code generation.
policy.client	global.<bds_name>.policy.shared.object.cache global.<bds_name>.policy.subscription global.<bds_name>.policy.context	Subscribes to code generation notifications, application context and maintains cache of subscribed .so

1.10. Using Policy with BGP

RtBrick supports attaching a BGP routing policy at two levels:

- Peer group address-family level
- Instance address-family level

In each case, you can apply the policy as an import or export policy and filter. As expected, import filters determine which routing updates are accepted and export filters determine which routes are advertised to other peers.

For more information, see the *RBFS BGP Configuration Guide*.

1.11. Using the Policy Test Feature

You can use the policy test feature to test a policy before attaching it to a BGP peer group or an instance.

Perform the following tasks:

1. Identify the table that you want to input to the policy.
2. Run the 'test policy' command on the table that you identified in step-1.

```
supervisor@leaf1: op> test policy run bgp.appd.1
  policy-name          Policy name
supervisor@leaf1: op> test policy run bgp.appd.1 policy-name s2 table
  bds.default.job.table
  bds_cmd_lib.default.job.table
  default.bgp.1.fib-local.ipv4.labeled-unicast
  default.bgp.1.fib-local.ipv4.multicast
  <....>
supervisor@leaf1: op> test policy run bgp.appd.1 policy-name s2 table
  global.policy.bgp.appd.1.s
  global.policy.bgp.appd.1.shared.object.cache
  global.policy.bgp.appd.1.statistics
  global.policy.bgp.appd.1.subscription
supervisor@leaf1: op> test policy run bgp.appd.1 policy-name s2 table
  global.policy.bgp.appd.1.shared.object.cache
supervisor@leaf1: op> test policy
  clear                Clear a policy test result
  run                  Test a policy
supervisor@leaf1: op> test policy clear bgp.appd.1 policy-name
  <policy-name>
supervisor@leaf1: op> test policy clear bgp.appd.1 policy-name s2 table
  global.policy.bgp.appd.1.shared.object.cache
```

1.11.1. Clearing the Result Tables

You can clear the result tables using the 'test policy clear' command:

```
supervisor@leaf1: op> test policy clear bgp.appd.1 policy-name s2 table
  global.policy.bgp.appd.1.shared.object.cache
```

2. Policy Configuration Commands

This section presents a list of commands used for configuring policies. For information about the match options, compare operations and types, refer to [Policy Match Options, Compare Types, and Operations](#).

2.1. Policy list rules configuration

2.1.1. ordinal value

Use this command to execute in an order

Syntax

```
set policy list <name> <type> ordinal <ordinal> value <value>
```

Command arguments

<name>	List name
<type>	Policy list type
<ordinal>	it gives order of execution of rules
<value>	Mention proper value

Example

```
set policy list l1 ipv4-prefix ordinal 1 value 200.0.0.1/32
set policy list l1 ipv4-prefix ordinal 2 value 200.0.0.3/32
set policy list l1 ipv4-prefix ordinal 3 value 200.0.0.5/32
set policy list l1 ipv4-prefix ordinal 4 value 200.0.0.7/32
set policy list l1 ipv4-prefix ordinal 5 value 200.0.0.9/32
```

To delete the operation that you performed, enter the following command:

```
delete ordinal <ordinal>
```

Command arguments

<ordinal>	it gives order of deleting the executed rules
-----------	---

Example

```
delete policy list l1 ipv4-prefix ordinal 1
delete policy list l1 ipv4-prefix ordinal 2
delete policy list l1 ipv4-prefix ordinal 3
delete policy list l1 ipv4-prefix ordinal 4
delete policy list l1 ipv4-prefix ordinal 5
```

2.2. Policy rules match list options

2.2.1. ipv4-prefix match-list

Use this command to set the rule to match for ipv4 prefix list

Syntax

set rule <rule> **route ipv4-prefix match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-ipv4-prefix
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.2. ipv6-prefix match-list

Use this command to set the rule to match for ipv6 prefix list

Syntax

set rule <rule> **route ipv6-prefix match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
--------	---

<list-name>	name of the list of prefix which is going to be used for setting up the policy
-------------	--

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-ipv6-prefix
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.3. distinguisher match-list

Use this command to set the rule to match for distinguisher list

Syntax

set rule <rule> **route distinguisher match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-distinguisher
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.4. community match-list

Use this command to set the rule to match for community list

Syntax

set rule <rule> **route community match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-community
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.5. extended-community match-list

Use this command to set the rule to match for extended-community list

Syntax

set rule <rule> **route extended-community match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-extended-community
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.6. large-community match-list

Use this command to set the rule to match for large-community list

Syntax

set rule <rule> **route large-community match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-large-community
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.7. as-path match-list

Use this command to set the rule to match for as-path list

Syntax

set rule <rule> route as-path match-list-name <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-as-path
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
exit
```

2.2.8. cluster-list match-list

Use this command to set the rule to match for cluster-list

Syntax

set rule <rule> route cluster-list match-list-name <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-cluster-list
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.9. source match-list

Use this command to set the rule to match for source list

Syntax

set rule <rule> **route source match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-source
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.10. sub-source match-list

Use this command to set the rule to match for sub-source list

Syntax

set rule <rule> **route sub-source match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-sub-source
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.11. originator-identifier match-list

Use this command to set the rule to match for originator-identifier list

Syntax

set rule <rule> route originator-identifier match-list-name <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-riginator-
identifier
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.12. peer-router-id match-list

Use this command to set the rule to match for peer_router-id list

Syntax

set rule <rule> **route peer-router-id match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-peer-router-id
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.13. ipv4-nexthop match-list

Use this command to set the rule to match for ipv4-nexthop list

Syntax

set rule <rule> **route ipv4-nexthop match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-ipv4-nexthop
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.14. ipv6-nexthop match-list

Use this command to set the rule to match for ipv6-nexthop list

Syntax

set rule <rule> **route ipv6-nexthop match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-ipv6-nexthop
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.15. label match-list

Use this command to set the rule to match for label list

Syntax

set rule <rule> **route label match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-label
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.16. peer-ipv4 match-list

Use this command to set the rule to match for peer-ipv4 list

Syntax

set rule <rule> **route peer-ipv4 match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-peer-ipv4
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.2.17. peer-ipv6 match-list

Use this command to set the rule to match for peer-ipv6 list

Syntax

set rule <rule> **route peer-ipv6 match-list-name** <list-name>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<list-name>	name of the list of prefix or attributes which is going to be used for setting up the policy

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-peer-ipv6
set policy statement p1 ordinal 1 match rule 1 value-type list-name
set policy statement p1 ordinal 1 match rule 1 value l1
```

2.3. Policy rules delete for match

2.3.1. delete rule

Use this command to delete the rule set for policy statement

Syntax

delete rule <rule>

Command arguments

<rule>	Specifies the rule that you want to delete
--------	--

Example

```
delete policy statement p1 ordinal 1 match rule 1
```

2.4. Policy rules match rules options

2.4.1. ipv4-prefix match-type

Use this command to setup a rule to match-value type for route ipv4-prefix

Syntax

set rule <rule> **route ipv4-prefix match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid IPv4 address, for example 2.2.2.4/24

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type prefix-length-exact
set policy statement p1 ordinal 1 match rule 1 type route-ipv4-prefix
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 2.2.2.4/24
```

2.4.2. ipv6-prefix match-type

Use this command to setup a rule to match-value type for route ipv6-prefix

Syntax

set rule <rule> **route ipv6-prefix match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid IPv6 address, for example 2001:db8:3c4d:15::/64

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-ipv6-prefix match
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 2001:db8:3c4d:15::/64
```

2.4.3. distinguisher match-type

Use this command to setup a rule to match-value type for route distinguisher

Syntax

set rule <rule> **route distinguisher match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route distinguisher value, for example 192.168.1.1:65002

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-distinguisher
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 192.168.1.1:65002
```

2.4.4. community match-type

Use this command to setup a rule to match-value type for route community

Syntax

set rule <rule> **route community match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route community value, for example 7018:5000

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-community
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 7018:5000
```

2.4.5. extended-community match-type

Use this command to setup a rule to match-value type for route extended-community

Syntax

set rule <rule> **route extended-community match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route extended-community value, for example 192.168.0.0:5000

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-extended-community
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 192.168.0.0:5000
```

2.4.6. large-community match-type

Use this command to setup a rule to match-value type for route larger-community

Syntax

set rule <rule> **route large-community match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route large-community value, for example 2914:65400:5000

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-large-community
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 2914:65400:5000
```

2.4.7. as-path match-type

Use this command to setup a rule to match-value type for route as-path

Syntax

set rule <rule> **route as-path match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route as-path value, for example 65001

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-as-path
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 65001
```

2.4.8. cluster-list match-type

Use this command to setup a rule to match-value type for route cluster-list

Syntax

set rule <rule> **route cluster-list match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid IPv4 address, for example 10.10.10.2

Example

```

set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-cluster-list
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 192.168.1.5

```

2.4.9. origin match-type

Use this command to setup a rule to match-value type for route origin

Syntax

set rule <rule> **route origin match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route origin value, for example IGP, EGP etc

Example

```

set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-origin
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value IGP

```

2.4.10. med match-type

Use this command to setup a rule to match-value type for route MED

Syntax

set rule <rule> **route med match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
--------	---

<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route med value, for example 100,200 etc

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-med
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 100
```

2.4.11. local-preference match-type

Use this command to setup a rule to match-value type for local-preference route

Syntax

set rule <rule> **route local-preference match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route local-preference value, for example 100, 200 etc

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-local-preference
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 100
```

2.4.12. preference match-type

Use this command to setup a rule to match-value type for preference route

Syntax

set rule <rule> **route preference match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route preference value, for example 2, 100, 200 etc

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-preference
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 100
```

2.4.13. source match-type

Use this command to setup a rule to match-value type for source route

Syntax

set rule <rule> **route source match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route source value, for example BGP

Example


```

set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-source
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value bgp

```

2.4.14. sub-source match-type

Use this command to setup a rule to match-value type for sub-source route

Syntax

set rule <rule> **route sub-source match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route sub-source value, for example 100

Example

```

set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-sub-source
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 200

```

2.4.15. originator-identifier match-type

Use this command to setup a rule to match-value type for originator-identifier route

Syntax

set rule <rule> **route originator-identifier match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
--------	---

<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid IPv4 address, for example 20.20.20.4

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-originator-id
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 192.168.1.7
```

2.4.16. peer-router-id match-type

Use this command to setup a rule to match-value type for peer-router-id

Syntax

set rule <rule> **route peer-router-id match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid IPv4 address, for example 20.20.20.4

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-peer-router-id
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 5.1.168.192
```

2.4.17. ipv4-nextthop match-type

Use this command to setup a rule to match-value type for ipv4-nextthop route

Syntax

set rule <rule> **route ipv4-nexthop match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid IPv4 address, for example 20.20.20.4

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-ipv4-nexthop
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 129.121.76.192
```

2.4.18. ipv6-nexthop match-type

Use this command to setup a rule to match-value type for ipv6-nexthop route

Syntax

set rule <rule> **route ipv6-nexthop match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid IPv6 address, for example 17f0:949f:6a53:898f:8369:beb9:cd89:5ced

Example

```

set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-ipv6-nexthop
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value
17f0:949f:6a53:898f:8369:beb9:cd89:5ced

```

2.4.19. receive-path-identifier match-type

Use this command to setup a rule to match-value type for receive-path-identifier route

Syntax

```
set rule <rule> route receive-path-identifier match <match-type> value
<attribute-value>
```

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route receive-path-identifier value, for example 1885178186

Example

```

set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-receive-path-id
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 1885178186

```

2.4.20. send-path-identifier match-type

Use this command to setup a rule to match-value type for send-path-identifier route

Syntax

```
set rule <rule> route send-path-identifier match <match-type> value
<attribute-value>
```

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route send-path-identifier value, for example 1885178186

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-send-path-id
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 1885178186
```

2.4.21. label match-type

Use this command to setup a rule to match-value type for label route

Syntax

set rule <rule> **route label match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid mpls-lable, for example label-op:push,label:20001,bos-op:compare,bos:1

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-label
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value label-
op:push,label:20001,bos-op:compare,bos:1
```

2.4.22. igp-metric match-type

Use this command to setup a rule to match-value type for igp-metric route

Syntax

set rule <rule> **route igp-metric match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid route igp-metric value, for example 1885178186

Example

```
set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-igp-metric
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 1885178186
```

2.4.23. peer-ipv4 match-type

Use this command to setup a rule to match-value type for peer-ipv4 route

Syntax

set rule <rule> **route peer-ipv4 match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid IPv4 address, for example 129.121.76.192

Example

```

set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-peer-ipv4
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value 129.121.76.192

```

2.4.24. peer-ipv6 match-type

Use this command to setup a rule to match-value type for peer ipv6-route

Syntax

set rule <rule> **route peer-ipv6 match** <match-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<match-type>	is condition of "and/or" ('and' means set of rules to be satisfied & 'or' means any one rule is satisfied policy should get applied)
<attribute-value>	Specify a valid IPv6 address, for example 17f0:949f:6a53:898f:8369:beb9:cd89:5ced

Example

```

set policy statement p1 ordinal 1 match-condition or
set policy statement p1 ordinal 1 match rule 1 match-type exact
set policy statement p1 ordinal 1 match rule 1 type route-peer-ipv6
set policy statement p1 ordinal 1 match rule 1 value-type complete
set policy statement p1 ordinal 1 match rule 1 value
17f0:949f:6a53:898f:8369:beb9:cd89:5ced

```

2.5. Policy rules action-rules options

2.5.1. ipv4-prefix operation

Use this command to perform the operation on configured ipv4-prefix rule

Syntax

set rule <rule> **route ipv4-prefix operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid IPv4 address, for example 20.20.20.3/24

Example

```
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 type route-ipv4-prefix
set policy statement p1 ordinal 1 action rule 1 value 1.1.1.1/24
```

2.5.2. ipv6-prefix operation

Use this command to perform the operation on configured ipv6-prefix rule

Syntax

set rule <rule> **route ipv6-prefix operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid IPv6 address, for example 2001:db8:3c4d:15::/64

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-ipv6-prefix
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 2001:db8:3c4d:15::/64
```

2.5.3. distinguisher operation

Use this command to perform the operation on configured distinguisher rule

Syntax

set rule <rule> **route distinguisher operation** <operation-type> **value** <attribute-

value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-distinguisher
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 192.168.1.4:65002
```

2.5.4. community operation

Use this command to perform the operation on configured community rule

Syntax

set rule <rule> **route community operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route community value, for example 7018:5000

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-community
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 7018:5000
```

2.5.5. extended-community operation

Use this command to perform the operation on configured extended-community

rule

Syntax

set rule <rule> **route extended-community operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route extended-community value, for example 192.168.0.0:5000

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-extended-community
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 192.168.0.0:5000
```

2.5.6. large-community operation

Use this command to perform the operation on configured large-community rule

Syntax

set rule <rule> **route large-community operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route large-community value, for example 2914:65400:5000

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-large-community
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 2914:65400:5000
```

2.5.7. as-path operation

Use this command to perform the operation on configured as-path rule

Syntax

set rule <rule> **route as-path operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route as-path value, for example 65001

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-as-path
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 65002
```

2.5.8. cluster-list operation

Use this command to perform the operation on configured cluster-list rule

Syntax

set rule <rule> **route cluster-list operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid IPv4 address, for example 52.10.100.250

Example

```
edit policy-options
edit policy-statement p1
edit term t1 ordinal 1
edit match-conditions match-type or
edit rules
set rule 1 route cluster-list operation overwrite value 52.10.100.250
exit
exit
exit
exit
exit
```

2.5.9. origin operation

Use this command to perform the operation on configured origin rule

Syntax

set rule <rule> **route origin operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route origin value, for example IGP, EGP etc

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-origin
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 123
```

2.5.10. med operation

Use this command to perform the operation on configured MED rule

Syntax

set rule <rule> **route med operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route med value, for example 100,200 etc

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-med-operation
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 123
```

2.5.11. local-preference operation

Use this command to perform the operation on configured local-preference rule

Syntax

set rule <rule> **route local-preference operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route local-preference value, for example 100, 200 etc

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-local-preference
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 123
```

2.5.12. preference operation

Use this command to perform the operation on configured preference rule

Syntax

set rule <rule> **route preference operation** <operation-type> **value** <attribute-

value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route preference value, for example 2, 100, 200 etc

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-preference
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 123
```

2.5.13. source operation

Use this command to perform the operation on configured source rule

Syntax

set rule <rule> **route source operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route source value, for example BGP

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-source
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value bgp
```

2.5.14. sub-source operation

Use this command to perform the operation on configured sub-source rule

Syntax

set rule <rule> **route sub-source operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route sub-source value, for example 100

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-sub-source
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 303243
```

2.5.15. originator-identifier operation

Use this command to perform the operation on configured originator-identifier rule

Syntax

set rule <rule> **route originator-identifier operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid IPv4 address, for example 129.121.76.192

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-originator-
identifier
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 192.168.2.8
```

2.5.16. peer-router-id operation

Use this command to perform the operation on configured peer-router-id rule

Syntax

set rule <rule> **route peer-router-id operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid IPv4 address, for example 129.121.76.192

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-peer-router-id
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 5.1.168.192
```

2.5.17. ipv4-nextthop operation

Use this command to perform the operation on configured ipv4-nextthop rule

Syntax

set rule <rule> **route ipv4-nextthop operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid IPv4 address, for example 129.121.76.192

Example


```
set policy statement p1 ordinal 1 action rule 1 type route-ipv4-nexthop
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 10.10.10.2
```

2.5.18. ipv6-nexthop operation

Use this command to perform the operation on configured ipv6-nexthop rule

Syntax

set rule <rule> **route ipv6-nexthop operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid IPv6 address, for example 17f0:949f:6a53:898f:8369:beb9:cd89:5ced

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-ipv4-nexthop
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value
17f0:949f:6a53:898f:8369:beb9:cd89:5ced
```

2.5.19. receive-path-identifier operation

Use this command to perform the operation on configured receive-path-id rule

Syntax

set rule <rule> **route receive-path-identifier operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type

<attribute-value>	Specify a valid route receive-path-identifier value, for example 1885178186
-------------------	---

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-receive-path-
identifier
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 1885178186
```

2.5.20. send-path-identifier operation

Use this command to perform the operation on configured send-path-id rule

Syntax

set rule <rule> **route send-path-identifier operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route send-path-identifier value, for example 1885178186

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-send-path-
identifier
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 1885178186
```

2.5.21. label operation

Use this command to perform the operation on configured label rule

Syntax

set rule <rule> **route label operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid mpls-label, for example label-op:push,label:20001,bosop:compare,bos:1

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-label operation
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value label-op
```

2.5.22. igp-metric operation

Use this command to perform the operation on configured igp-metric rule

Syntax

set rule <rule> **route igp-metric operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid route igp-metric value, for example 1885178186

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-igp-metric
operation
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 12323
```

2.5.23. peer-ipv4 operation

Use this command to perform the operation on configured peer-ipv4 rule

Syntax

set rule <rule> **route peer-ipv4 operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid IPv4 address, for example 129.121.76.192

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-peer-ipv4
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value 26.0.1.1
```

2.5.24. peer-ipv6 operation

Use this command to perform the operation on configured peer-ipv6 rule

Syntax

set rule <rule> **route peer-ipv6 operation** <operation-type> **value** <attribute-value>

Command arguments

<rule>	rule which are going to set either for match or action for policy
<operation-type>	An operation is performed on that attribute in the route/BDS object based on the operation-type
<attribute-value>	Specify a valid IPv6 address, for example 17f0:949f:6a53:898f:8369:beb9:cd89:5ced

Example

```
set policy statement p1 ordinal 1 action rule 1 type route-peer-ipv6
set policy statement p1 ordinal 1 action rule 1 operation overwrite
set policy statement p1 ordinal 1 action rule 1 value
17f0:949f:6a53:898f:8369:beb9:cd89:5ced
```