

# Template:Networking rutos manual routing

The information in this page is updated in accordance with firmware version .

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## Contents

- [1 Summary](#)
- [2 Static Routes](#)
  - [2.1 Static IPv4 Routes](#)
  - [2.2 Static IPv6 Routes](#)
- [3 Policy Based Routing](#)
  - [3.1 Routing Tables](#)
  - [3.2 Routing Rules For IPv4](#)

## Summary

The **Routing** page is used to set up static routes, routing tables and rules.

This manual page provides an overview of the Routing windows in {{{name}}} devices.

If you're having trouble finding this page or some of the parameters described here on your device's WebUI, you should **turn on "Advanced WebUI" mode**. You can do that by clicking the "Advanced" button, located at the top of the WebUI.

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## Static Routes

**Routes** ensure that network traffic finds its path to a specified host or network, both in local and remote network scenarios. Static routes are simply fixed routing entries in the routing table(s).

This section provides the possibility to configure custom static routes.

### Static IPv4 Routes

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The **Static IPv4 Routes** section displays a list of user defined static IPv4 routes and provides the possibility to add and configure new ones. The list is empty by default.

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To add a new route and begin editing, simply click the 'Add' button. Refer to the table below for

information on static route configuration fields.



Field	Value	Description
Interface	network interface; default: <b>lan</b>	Network interface of the target network.
Target*	ip4; default: <b>none</b>	Destination network address.
IPv4-Netmask*	netmask; default: <b>none</b>	A netmask is used to divide an IP address into sub-networks (subnets). Combined together, the 'Netmask' and 'Target' values define the exact destination network or IP address to which this route applies.
IPv4-Gateway	ip4; default: <b>none</b>	A gateway can be any machine in a network that is capable of serving as an access point to another network. Traffic that matches this route will be directed over the IP address specified in this field.
Metric	integer [0..255]; default: <b>none</b>	The metric value acts as a measurement of priority. If a packet about to be routed matches two or more rules, the one with the lower metric is applied.
MTU	integer [64..9000]; default: <b>1500</b>	Sets the maximum transmission unit (MTU) size. It is the largest size of a protocol data unit (PDU) that can be transmitted in a single network layer transaction.
Route Type	unicast   local   broadcast   multicast   unreachable   prohibit   blackhole   anycast   -- custom -- ; default: <b>unicast</b>	Selects route type. Each type specifies a different behavior for the route: <ul style="list-style-type: none"><li>• <b>unicast</b> - most common type of route, simply describes a path to a destination.</li><li>• <b>local</b> - routes of this type are added to the 'local' routing table and used only for locally hosted IPs.</li><li>• <b>broadcast</b> - routes of this type are added to the 'local' routing table and used by link layer devices that support the broadcast address principle.</li><li>• <b>multicast</b> - used for distribution of multicast traffic.</li><li>• <b>unreachable</b> - sends an ICMP "unreachable" response to the source address when a request for a routing decision returns a "destination with an unreachable route type" message.</li><li>• <b>prohibit</b> - used to prohibit traffic to specified host or network. When a destination is prohibited, the kernel sends a 'Network is unreachable' response the source address.</li><li>• <b>blackhole</b> - packets that match this type of route are discarded without any response.</li><li>• <b>anycast</b> - provides a possibility to route incoming requests to multiple different network locations.</li><li>• <b>-- custom --</b> - does not use any of the predefined route types.</li></ul>

**\*Additional notes on 'Target' & 'Netmask' fields:**

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You can define a rule that applies to a single IP like this:

- **Target:** some IP

- **Netmask:** 255.255.255.255

Furthermore, you can create target/netmask combinations that apply to a range of IPs. Refer to the table below for examples.

Target	Netmask	Network range
192.168.2.0	255.255.255.240	192.168.2.0 - 192.168.2.15
192.168.2.240	255.255.255.240	192.168.2.240 - 192.168.2.255
192.168.2.161	255.255.255.0	192.168.2.0 - 192.168.2.255
192.168.0.0	255.255.0.0	192.168.0.0 - 192.168.255.255
192.168.2.161	255.255.255.255	192.168.2.161

## Static IPv6 Routes

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The **Static IPv6 Routes** section displays a list of user defined static IPv6 routes and provides the possibility to add and configure new ones. The list is empty by default.



To add a new route and begin editing, simply click the 'Add' button. Refer to the table below for information on static route configuration fields.



Field	Value	Description
Interface	network interface; default: <b>lan</b>	Network interface of the target network.
Target	ip6; default: <b>none</b>	Destination network address.
IPv6-Gateway	ip6; default: <b>none</b>	A gateway can be any machine in a network that is capable of serving as an access point to another network. Traffic that matches this route will be directed over the IP address specified in this field.
Metric	integer [0..255]; default: <b>none</b>	The metric value acts as a measurement of priority. If a packet about to be routed matches two or more rules, the one with the lower metric is applied.
MTU	integer [64..9000]; default: <b>1500</b>	Sets the maximum transmission unit (MTU) size. It is the largest size of a protocol data unit (PDU) that can be transmitted in a single network layer transaction.

Route Type      unicast | local | broadcast  
                  | multicast | unreachable |  
                  prohibit | blackhole |  
                  anycast | -- custom -- ;  
                  default: **unicast**

Selects route type. Each type specifies a different behavior for the route:

- **unicast** - most common type of route, simply describes a path to a destination.
- **local** - routes of this type are added to the 'local' routing table and used only for locally hosted IPs.
- **broadcast** - routes of this type are added to the 'local' routing table and used by link layer devices that support the broadcast address principle.
- **multicast** - used for distribution of multicast traffic.
- **unreachable** - sends an ICMP "unreachable" response to the source address when a request for a routing decision returns a "destination with an unreachable route type" message.
- **prohibit** - used to prohibit traffic to specified host or network. When a destination is prohibited, the kernel sends a 'Network is unreachable' response the source address.
- **blackhole** - packets that match this type of route are discarded without any response.
- **anycast** - provides a possibility to route incoming requests to multiple different network locations.
- **-- custom --** - does not use any of the predefined route types.

## Policy Based Routing

The **Policy Based Routing** section is used to configure policy-based routing infrastructures, which are usually used in more complex or specific networking scenarios.

### Routing Tables

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**Routing Tables** store network routes. Tables are checked before every routing decision until a matching route is found. Having multiple tables allows the user to set up a policy routing infrastructure. Policy-based routing is a technique where routing decisions are based on policies (rule) set by the user.

The 'Routing Tables' section displays user created routing tables. By default, the list is empty.



To create a new table, look to the 'Add New Routing Table' section below. Enter an ID for the new table in the range of [1..252], enter a custom name and click the 'Add' button. The new table should appear in the 'Routing Tables' list. Click the 'Edit' button next to it to begin editing.



Refer to the table below for information on configuration fields for routing tables.



Field	Value	Description
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Name of Table	string; default: <b>none</b>	A custom name for the table. A table can be invoked by the both its ID or name.
ID of Table	integer [1..252]; default: <b>none</b>	Unique numerical identifier for the table. A table can be invoked by the both its ID or name.

## Routing Rules For IPv4

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**Routing Rules** provide a way to route certain packets with exceptions, i.e., in accordance to a rule. 'Routing Rules For IPv4' displays user defined routing rules. It is empty by default. To create a new rule, click the 'Add' button and begin editing by clicking the 'Edit' button located to the right of the newly created rule.



Refer to table below for information on each configuration field.



Field	Value	Description
Priority	integer [0..65535]; default: <b>none</b>	Controls the order of IP rules. Rules with a lower priority value will be checked first.
Incoming interface	network interface   Any; default: <b>Any</b>	Logical interface name for incoming traffic. Select 'Any' to make the rule apply to all network interfaces.
Outgoing interface	network interface   None; default: <b>None</b>	Logical interface name for incoming traffic. Select 'None' to ignore outgoing interface.
Source subnet	netmask; default: <b>none</b>	Source subnet to match the rule.
Destination subnet	netmask; default: <b>none</b>	Destination subnet to match the rule.
TOS Value to Match	integer [0..255]; default: <b>none</b>	The type of service (ToS) value to match in IP headers.
Firewall Mark	integer [0..255]   hex [0x00..0xFF]; default: <b>none</b>	Specifies the fwmark and optionally its mask to match. For example, 0xFF to match mark 255 or 0x0/0x1 to match any even mark value.
Invert matches	off   on; default: <b>off</b>	If enabled, the meaning of the match options (Firewall Mark, TOS Value, Source and Destination subnets) is inverted.
Matched Traffic Action	<a href="#">Lookup Table</a>   <a href="#">Jump to rule</a>   <a href="#">Routing Action</a> ; default: <b>Lookup Table</b>	When network traffic matches this rule, the device will take an action specified in this field: <ul style="list-style-type: none"> <li>• <b>Lookup Table</b> - routes traffic in accordance with the specified routing table.</li> <li>• <b>Jump to rule</b> - specifies another routing rule to follow.</li> <li>• <b>Routing Action</b> - executes one of four predefined routing actions.</li> </ul>
<b>Lookup Table</b>	routing table; default: <b>none</b>	Specifies a table for routing traffic that matches this rule. This field is visible only when 'Matched Traffic Action' is set to <i>Lookup Table</i> .

<b>Jump to rule</b>	rule priority number; default: <b>none</b>	Specifies a another rule to follow for traffic that matches this rule. This field is visible only when 'Matched Traffic Action' is set to <i>Jump to rule</i> .
<b>Routing Action</b>	Prohibit   Unreachable   Blackhole   Throw; default: <b>Prohibit</b>	When traffic matches this rule, the action specified in this field will be executed. This field is visible only when 'Matched Traffic Action' is set to <i>Routing Action</i> .

[[Category:{{name}}] Network section]