IPIP Tunnel Interfaces

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General Information

Summary

The IPIP tunneling implementation on the MikroTik RouterOS is RFC 2003 compliant. IPIP tunnel is a simple protocol that encapsulates IP packets in IP to make a tunnel between two routers. The IPIP tunnel interface appears as an interface under the interface list. Many routers, including Cisco and Linux based, support this protocol. This protocol makes multiple network schemes possible.

IP tunneling protocol adds the following possibilities to a network setups:

• to tunnel Intranets over the Internet
• to use it instead of source routing

Quick Setup Guide

To make an IPIP tunnel between 2 MikroTik routers with IP addresses **10.5.8.104** and **10.1.0.172**, using IPIP tunnel addresses 10.0.0.1 and 10.0.0.2, follow the next steps.

• Configuration on router with IP address **10.5.8.104**:
  1. Add an IPIP interface (by default, its name will be **ipip1**):

      [admin@MikroTik] interface ipip> add local-address=10.5.8.104 \ remote-address=10.1.0.172 disabled=no

      2. Add an IP address to created **ipip1** interface:

      [admin@MikroTik] ip address> add address=10.0.0.1/24 interface=ipip1

• Configuration on router with IP address **10.1.0.172**:
1. Add an IPIP interface (by default, its name will be ipip1):

```
[admin@MikroTik] interface ipip> add local-address=10.1.0.172 \ 
remote-address=10.0.0.104 disabled=no
```

2. Add an IP address to created ipip1 interface:

```
[admin@MikroTik] ip address> add address=10.0.0.2/24 interface=ipip1
```

**Specifications**

Packages required: *system*
License required: *level1 (limited to 1 tunnel), level3 (200 tunnels), level5 (unlimited)*
Home menu level: `/interface ipip`
Standards and Technologies: *IPIP (RFC 2003)*
Hardware usage: *Not significant*

**Additional Documents**

- RFC1853
- RFC2003
- RFC1241

**IPIP Setup**

Home menu level: `/interface ipip`

**Description**

An IPIP interface should be configured on two routers that have the possibility for an IP level connection and are *RFC 2003* compliant. The IPIP tunnel may run over any connection that transports IP. Each IPIP tunnel interface can connect with one remote router that has a corresponding interface configured. An unlimited number of IPIP tunnels may be added to the router. There may only be one tunnel between a pair of IP addresses, so if you need various different tunnels between same hosts, use more than one IP address. For more details on IPIP tunnels, see *RFC 2003*.

**Property Description**

- **local-address (IP address)** - local address on router which sends IPIP traffic to the remote host
- **mtu (integer; default: 1480)** - Maximum Transmission Unit. Should be set to 1480 bytes to avoid fragmentation of packets. May be set to 1500 bytes if mtu path discovery is not working properly on links
- **name (name; default: ipipN)** - interface name for reference
- **remote-address (IP address)** - the IP address of the remote host of the IPIP tunnel - may be any RFC 2003 compliant router

**Notes**
Use `/ip address add` command to assign an IP address to the IPIP interface.

There is no authentication or 'state' for this interface. The bandwidth usage of the interface may be monitored with the `monitor` feature from the `interface` menu.

MikroTik RouterOS IPIP implementation has been tested with Cisco 1005. The sample of the Cisco 1005 configuration is given below:

```plaintext
interface Tunnel0
  ip address 10.3.0.1 255.255.255.0
  tunnel source 10.0.0.171
  tunnel destination 10.0.0.204
  tunnel mode ipip
```

## Application Examples

### Description

Suppose we want to add an IPIP tunnel between routers **R1** and **R2**:

![IPIP Tunnel Diagram]

At first, we need to configure IPIP interfaces and then add **IP addresses** to them.

The configuration for router **R1** is as follows:

```plaintext
[admin@MikroTik] interface ipip> add
  local-address: 10.0.0.1
  remote-address: 22.63.11.6
[admin@MikroTik] interface ipip> print
  Flags: X - disabled, R - running, D - dynamic
  # NAME           MTU LOCAL-ADDRESS  REMOTE-ADDRESS
  0 X  ipip1 1480 10.0.0.1  22.63.11.6
[admin@MikroTik] interface ipip> enable 0
[admin@MikroTik] interface ipip> /ip address add address 1.1.1.1/24 interface=ipip1
```

The configuration of the **R2** is shown below:
[admin@MikroTik] interface ipip> add local-address=22.63.11.6 remote-address=10.0.0.1
[admin@MikroTik] interface ipip> print
Flags: X - disabled, R - running, D - dynamic
#   NAME     MTU     LOCAL-ADDRESS   REMOTE-ADDRESS
 0   X   ipip1     1480     22.63.11.6     10.0.0.1
[admin@MikroTik] interface ipip> enable 0
[admin@MikroTik] interface ipip> /ip address add address 1.1.1.2/24 interface=ipip1

Now both routers can ping each other:

[admin@MikroTik] interface ipip> /ping 1.1.1.2
1.1.1.2 64 byte ping: ttl=64 time=24 ms
1.1.1.2 64 byte ping: ttl=64 time=19 ms
1.1.1.2 64 byte ping: ttl=64 time=20 ms
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max = 19/21.0/24 ms
[admin@MikroTik] interface ipip>