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[How to create IP-IP tunnel between FreeBSD and Linux](#)

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Sometimes, I need to connect remote Unix servers with tunnels to provide some specific services or to get access to some internal networks. I was very surprised, when my friend, young system administrator, asked me about how to bring up IP-IP tunnel between different Unix operating systems (FreeBSD and Linux in his case) and said, that he can't find information about this configuration. As the result of my discovering, this HOWTO has been created.

Lets see to what we have and what we need to do.

We have 2 servers:

- **Server1:**
 - OS: Linux
 - Network Interface: eth0
 - IP: 100.100.100.100
- **Server2:**
 - OS: FreeBSD
 - Network Interface: fxp0
 - IP: 200.200.200.200

We need to get IPv4 over IPv4 tunnel with the following parameters between described servers:

- **Server1:** 10.0.0.1 / 255.255.255.252
- **Server2:** 10.0.0.2 / 255.255.255.252

To setup described configuration on Linux server we need to do following steps:

- Create ipip tunnel interface:

```
# ip tunnel add tun0 mode ipip \\  
> remote 200.200.200.200 local 100.100.100.100 dev eth0
```

- Set interface IP addresses:

```
# ifconfig tun0 10.0.0.1 netmask 255.255.255.252 \\  
> pointopoint 10.0.0.2
```

- Set interface MTU and bring interface up:

```
# ifconfig tun0 mtu 1500 up
```

Now we have following interface on the Linux server:

```
linux:~# ifconfig tun0  
tun77      Link encap:IPIP Tunnel  HWaddr  
            inet addr:10.0.0.1  P-t-P:10.0.0.2  Mask:255.255.255.252  
            UP POINTOPOINT RUNNING NOARP  MTU:1500  Metric:1  
            RX packets:6 errors:0 dropped:0 overruns:0 frame:0  
            TX packets:6 errors:0 dropped:0 overruns:0 carrier:0  
            collisions:0 txqueuelen:0  
            RX bytes:504 (504.0 b)  TX bytes:624 (624.0 b)
```

Now, we need to create tunnel point at the FreeBSD server:

- Create gif tunnel interface:

```
# # ifconfig gif0 create
```

- Set interface transport IP addresses:

```
# gifconfig gif0 inet 200.200.200.200 100.100.100.100
```

- Set interface IP addresses:

```
# ifconfig gif0 10.0.0.2 netmask 255.255.255.252 10.0.0.1
```

- Set interface MTU and bring interface up:

```
# ifconfig gif0 mtu 1500 up
```

The result at the FreeBSD side is following:

```
# ifconfig gif0  
gif0: flags=8051 mtu 1500  
        tunnel inet 200.200.200.200 --> 100.100.100.100  
        inet 10.0.0.2 --> 10.0.0.1 netmask 0xffffffff
```

To check the result we can use ping utility at linux side:

```
linux:~# ping -c 4 10.0.0.2  
PING 10.0.0.2 (10.0.0.2) 56(84) bytes of data.  
64 bytes from 10.0.0.2: icmp_seq=1 ttl=64 time=0.139 ms  
64 bytes from 10.0.0.2: icmp_seq=2 ttl=64 time=0.138 ms  
64 bytes from 10.0.0.2: icmp_seq=3 ttl=64 time=0.138 ms  
64 bytes from 10.0.0.2: icmp_seq=4 ttl=64 time=0.136 ms  
  
--- 172.17.0.1 ping statistics ---
```

```
4 packets transmitted, 4 received, 0% packet loss, time 2997ms
rtt min/avg/max/mdev = 0.136/0.137/0.139/0.014 ms
```

That is all! Now we have “direct” connection between our two servers and we are able to do some routing via this link.

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