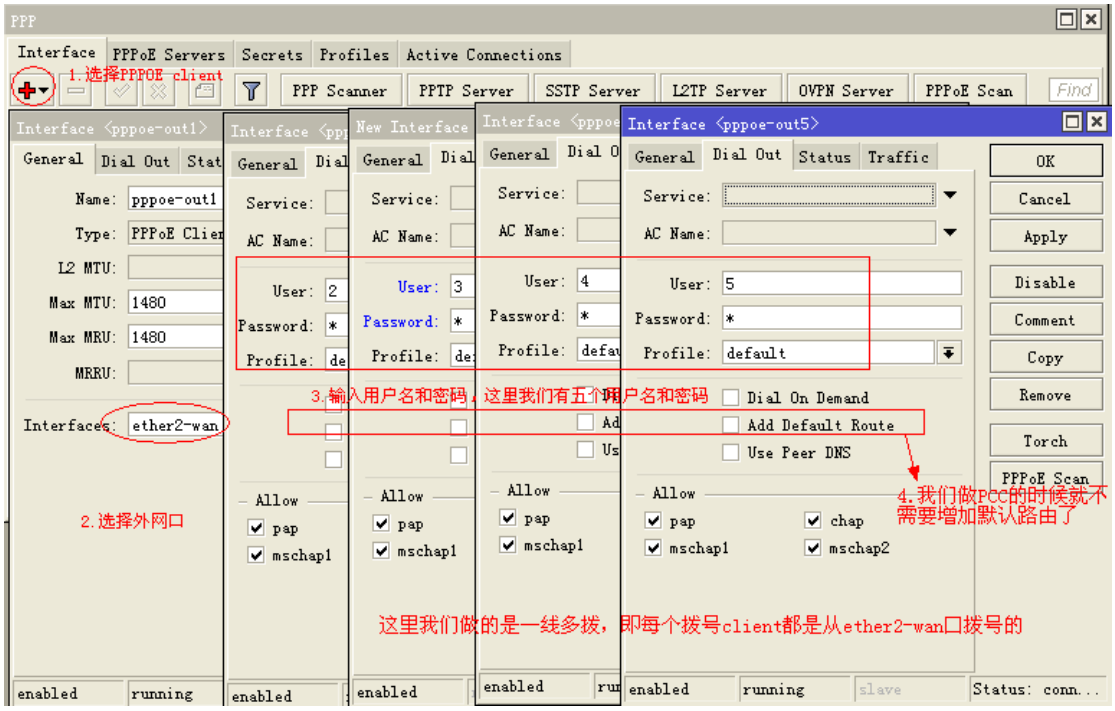
PCC 实验

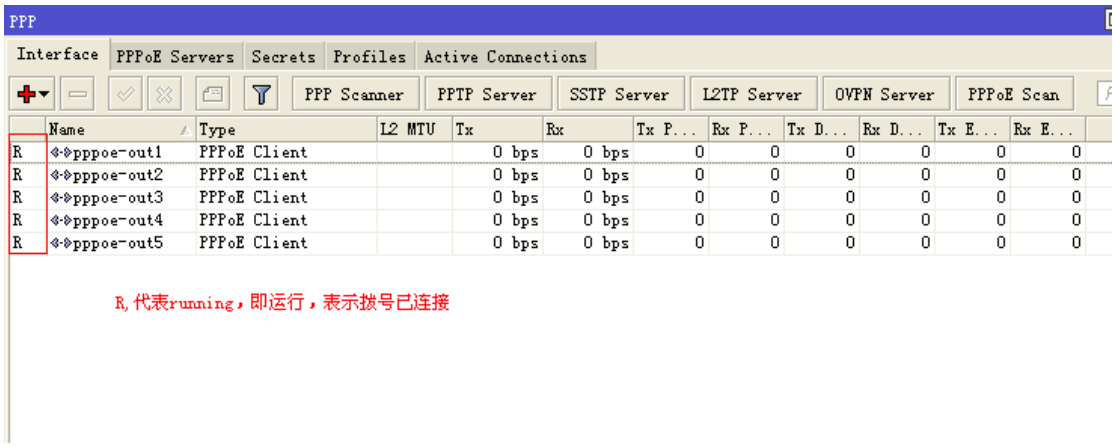
一、基本配置，使网络能够正常连通

1.pppoe 拨号：

拨通五个帐号

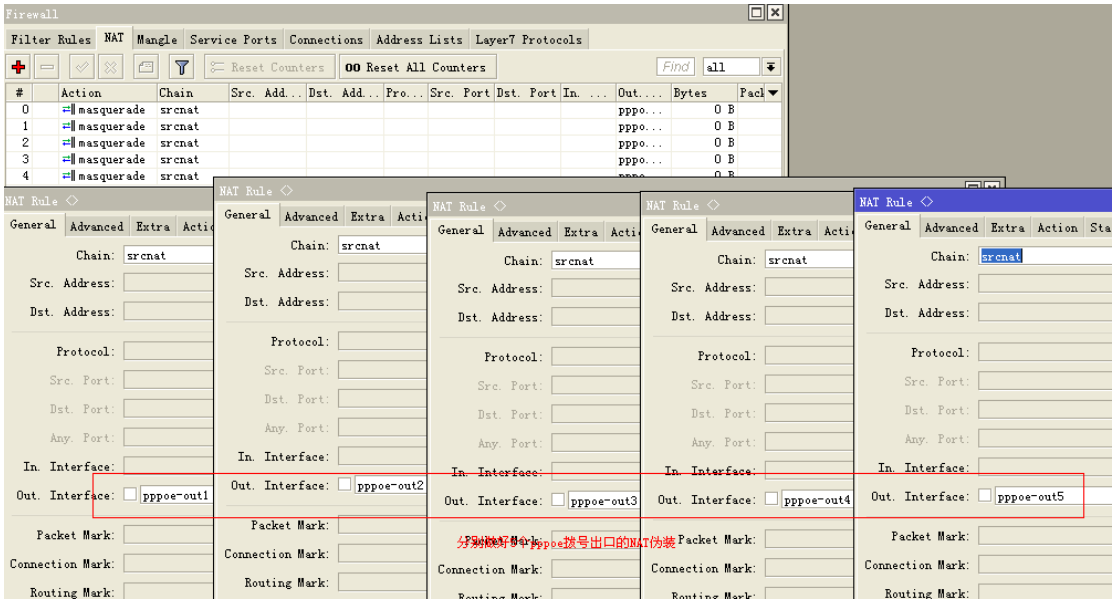


PPPOE client 的连接状态，已连接

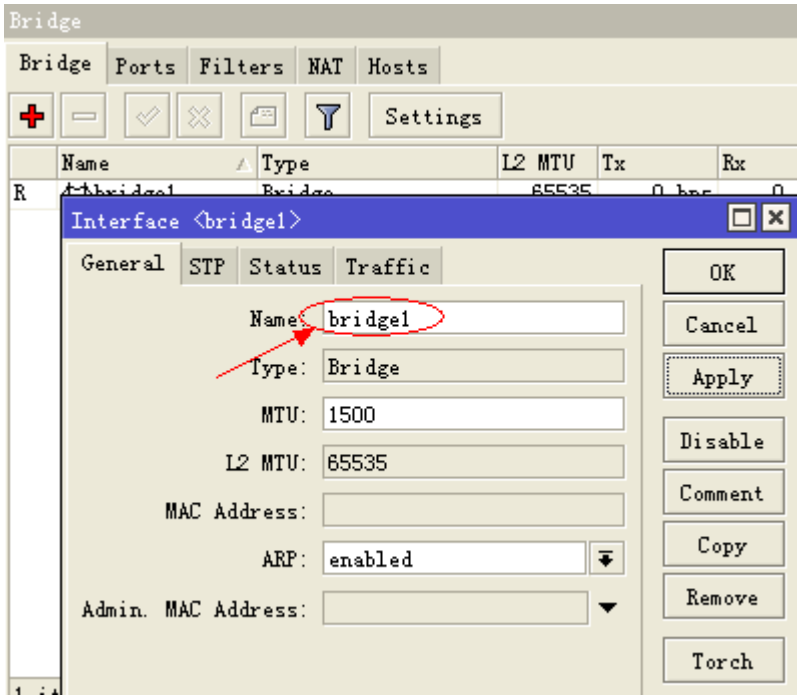


设备 NAT：

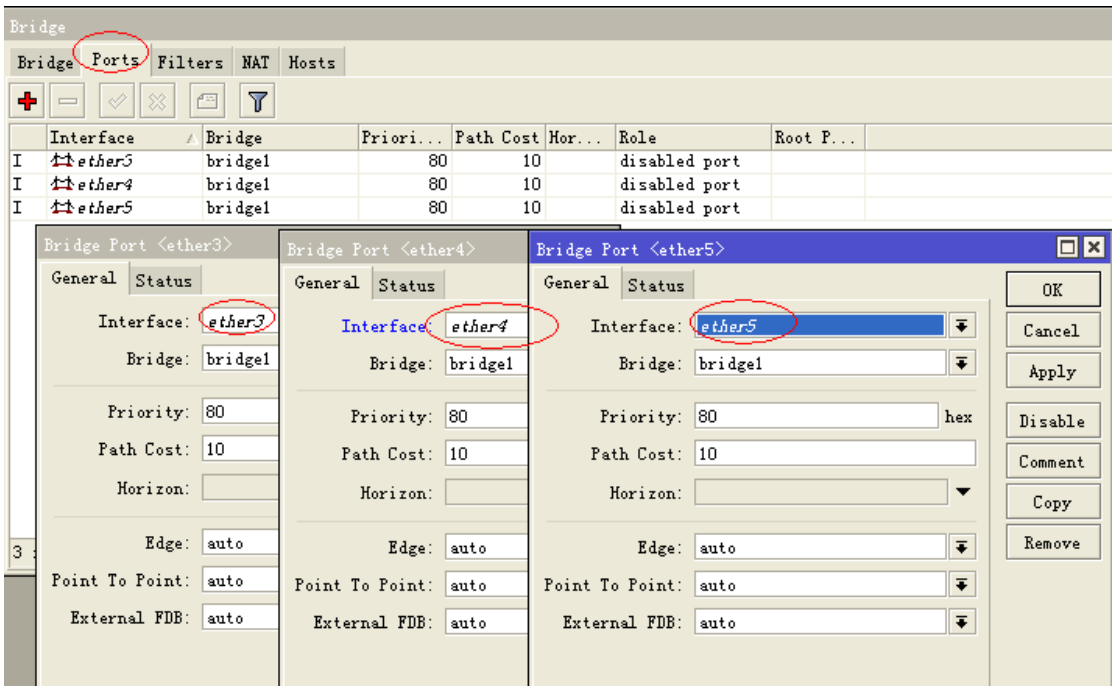
5 个接口出去都做 NAT



创建一个 bridge，把其他局域网口添加到 bridge 中。



添加其他局域网口到 bridge 中

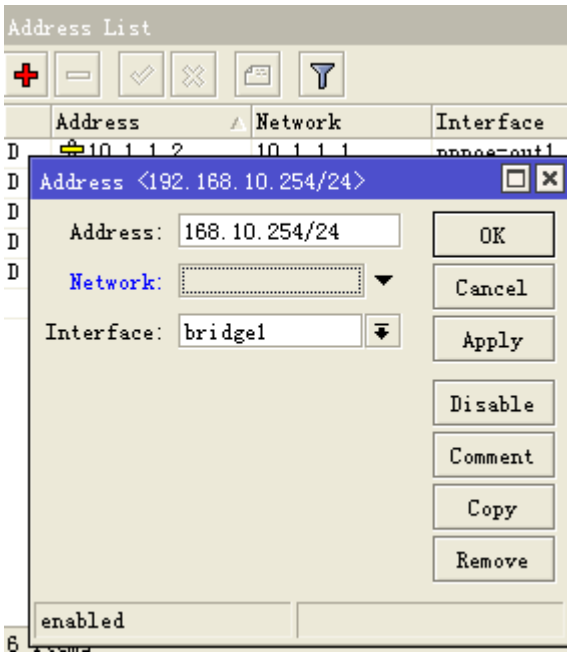


DHCP 服务器设置（局域网自动获取 IP 地址）

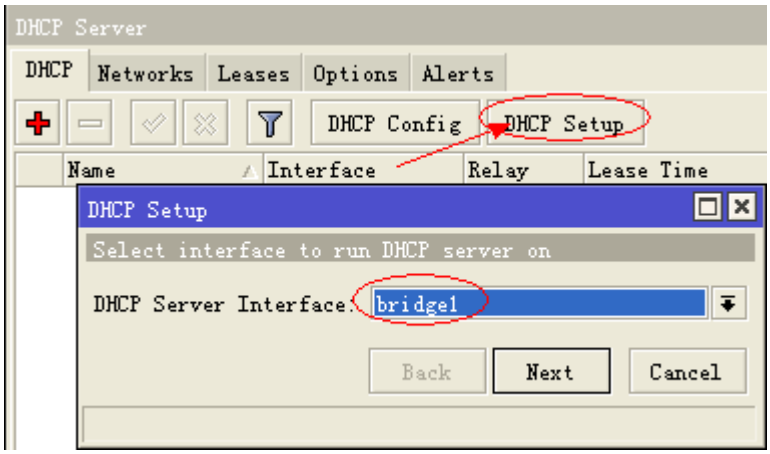
局域网的网段为 192.168.10.0/24

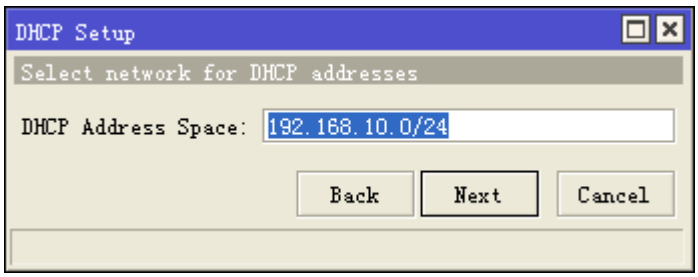
把 192.168.10.254 作为内网的网关

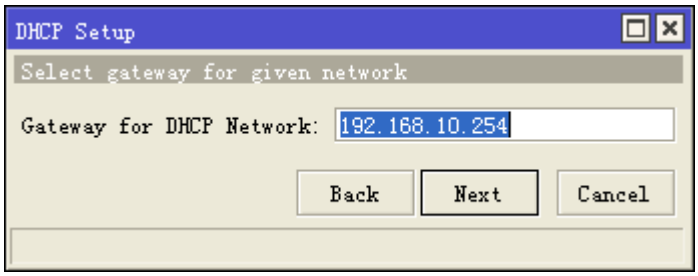
设置网关的地址，接口添加到 bridge1 上

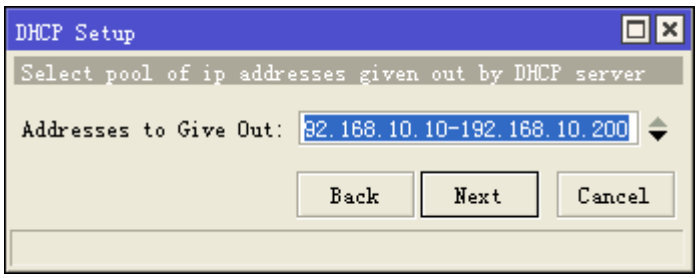


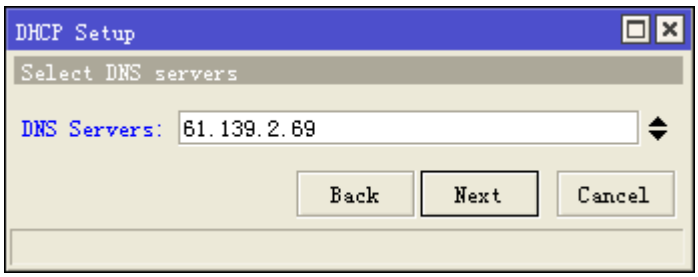
一般我们用 DHCP setup 来自动设置 DHCP server 这种设置比较简单快速

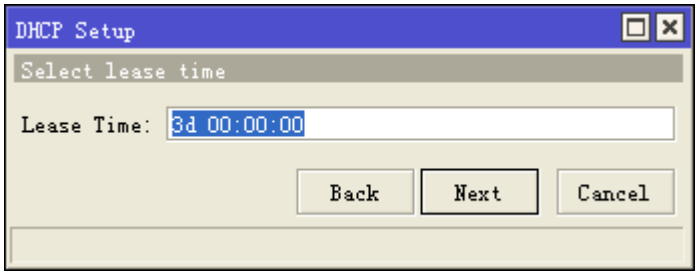

DHCP Server
DHCP
Networks
Leases
Options
Alerts
DHCP Config
DHCP Setup
Name
Interface
Relay
Lease Time
DHCP Setup
Select interface to run DHCP server on
DHCP Server Interface:
bridge1
Back
Next
Cancel


DHCP Setup
Select network for DHCP addresses
DHCP Address Space:
192.168.10.0/24
Back
Next
Cancel

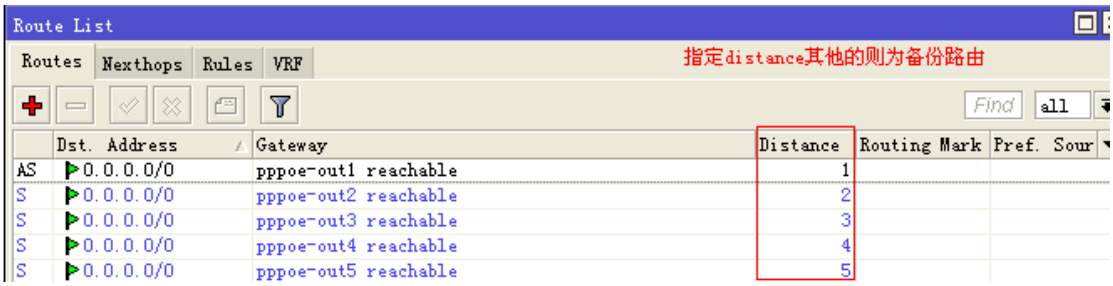

DHCP Setup
Select gateway for given network
Gateway for DHCP Network:
192.168.10.254
Back
Next
Cancel


DHCP Setup
Select pool of ip addresses given out by DHCP server
Addresses to Give Out:
192.168.10.10-192.168.10.200
Back
Next
Cancel


DHCP Setup
Select DNS servers
DNS Servers:
61.139.2.69
Back
Next
Cancel



路由配置：



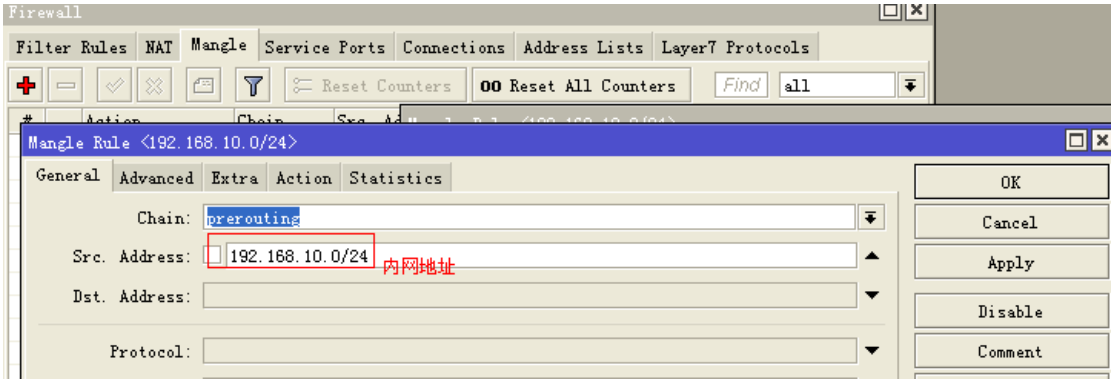
所有的基本配置都设置好了，局域网可以正常上网了，但是为了实现更好的网络环境，我们需要做更好的策略。这就需要使用 PCC 了，下面就看看 PCC 怎么做的吧。

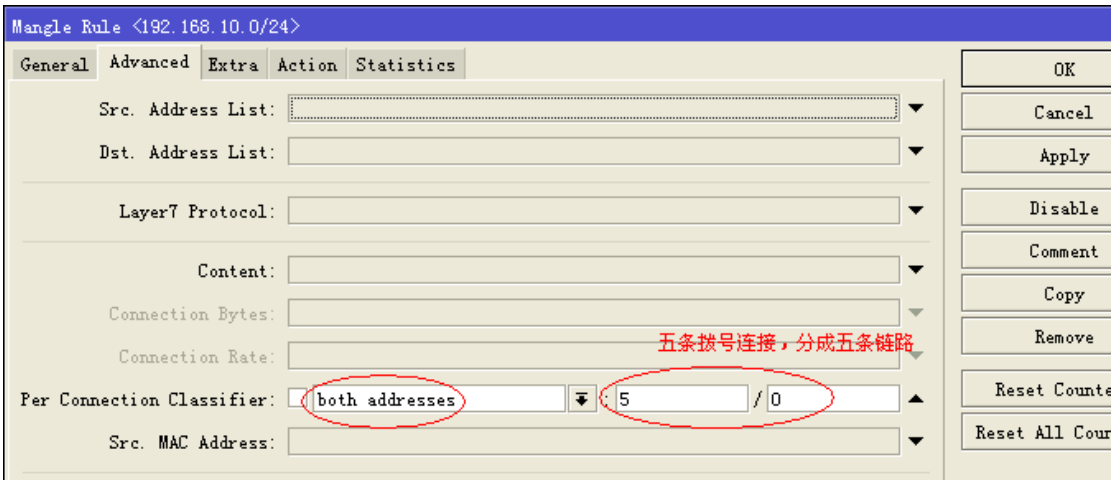
二、PCC 的配置

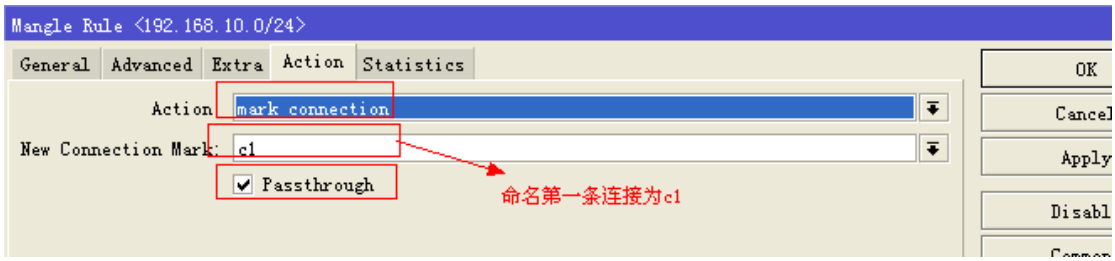
Mangle 标记

标记内网地址为 192.168.10.0 的五条线路的连接标记

标记第一条连接：







同理：

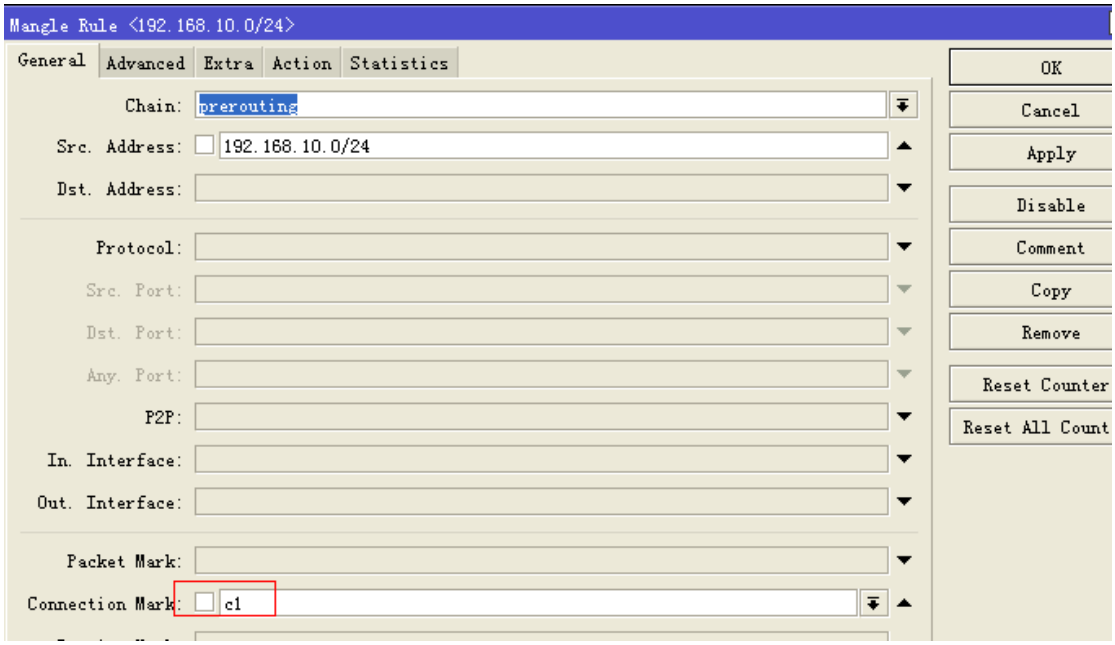
配置剩余的 4 调链路：

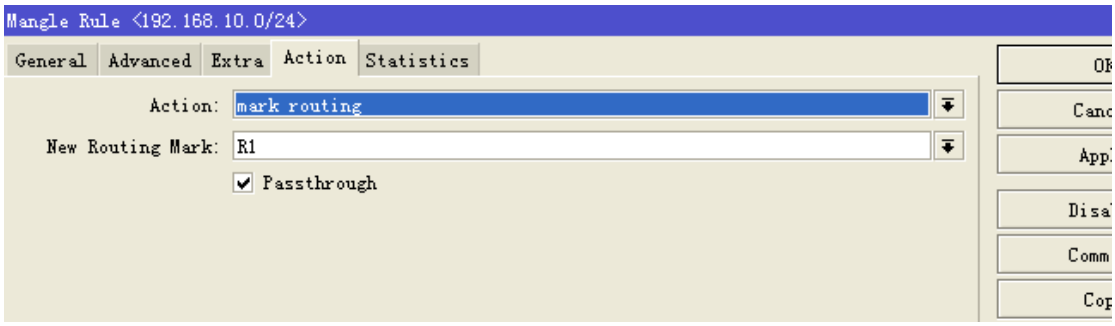
5/1,c2;　　5/2.c3;　　5/3,c4;　　5/4,c5.

从连接中提取路由标记：

从连接里提取路由标记

标记第一条连接 c1，命令为 R1





同理：

提出其他 4 调路由命名为 R2,R3,R4,R5.

标记连接，的命名配置方式为：

```
[admin@MikroTik] /ip firewall mangle> print
Flags: X - disabled, I - invalid, D - dynamic
 0    chain=prerouting action=mark-connection new-connection-mark=c1
      passthrough=yes src-address=192.168.10.0/24 dst-address-type=!local
      per-connection-classifier=both-addresses:5/0

 1    chain=prerouting action=mark-connection new-connection-mark=c2
      passthrough=yes src-address=192.168.10.0/24 dst-address-type=!local
      per-connection-classifier=both-addresses:5/1

 2    chain=prerouting action=mark-connection new-connection-mark=c3
      passthrough=yes src-address=192.168.10.0/24 dst-address-type=!local
      per-connection-classifier=both-addresses:5/2

 3    chain=prerouting action=mark-connection new-connection-mark=c4
      passthrough=yes src-address=192.168.10.0/24 dst-address-type=!local
      per-connection-classifier=both-addresses:5/3

 4    chain=prerouting action=mark-connection new-connection-mark=c5
      passthrough=yes src-address=192.168.10.0/24 dst-address-type=!local
      per-connection-classifier=both-addresses:5/4
```

提取路由的命令

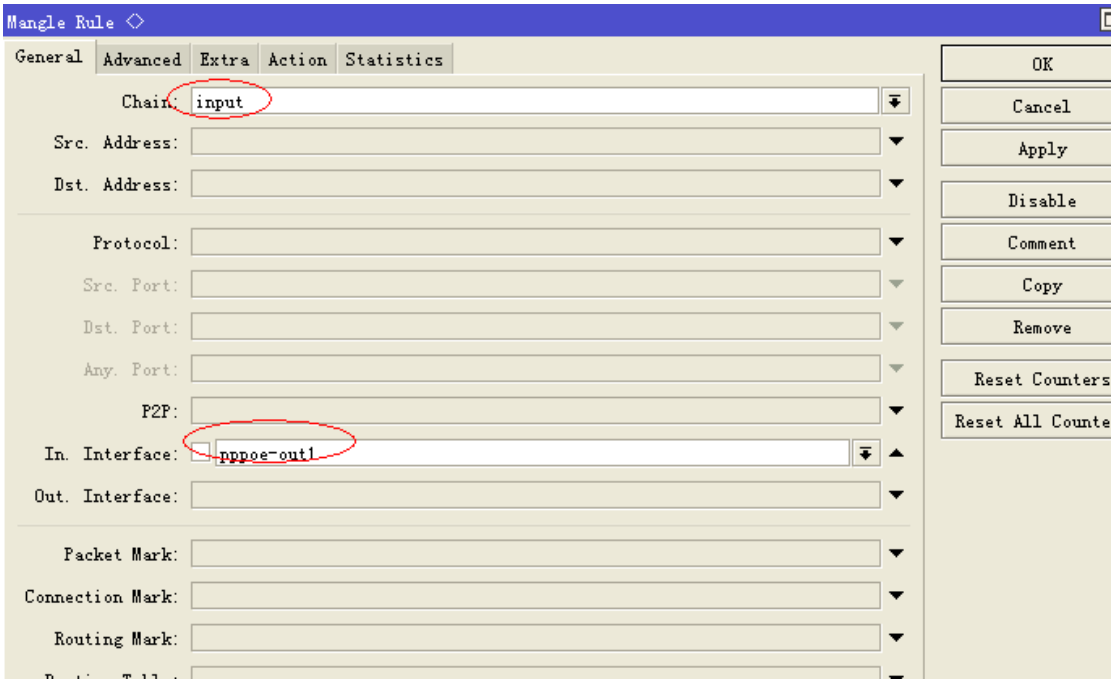
```
 5    chain=prerouting action=mark-routing new-routing-mark=R1 passthrough=yes
      src-address=192.168.10.0/24 connection-mark=c1

 6    chain=prerouting action=mark-routing new-routing-mark=R2 passthrough=yes
      src-address=192.168.10.0/24 connection-mark=c2

 7    chain=prerouting action=mark-routing new-routing-mark=R3 passthrough=yes
      src-address=192.168.10.0/24 connection-mark=c3
```

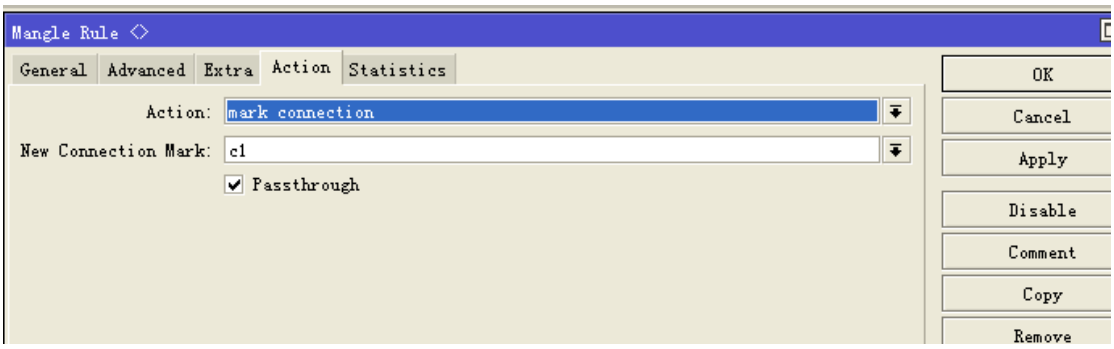
8 chain=prerouting action=mark-routing new-routing-mark=R4 passthrough=yes src-address=192.168.10.0/24 connection-mark=c4

9 chain=prerouting action=mark-routing new-routing-mark=R5 passthrough=yes src-address=192.168.10.0/24 connection-mark=c5

回程路由设置

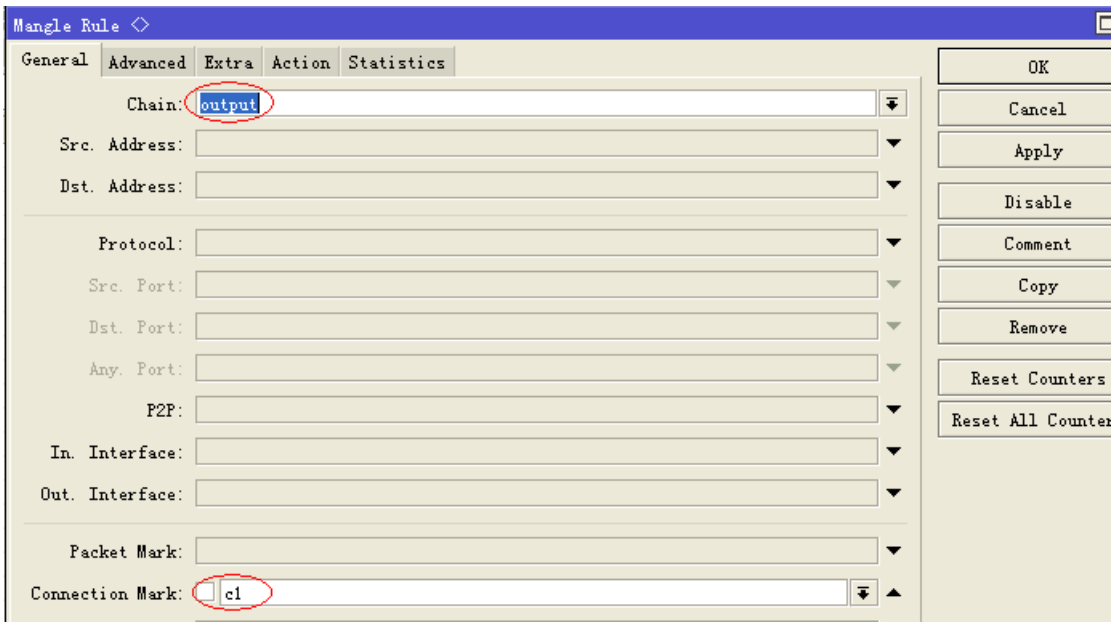
需要将从那个口进入就从相应的口回去，即保证每个外网口的数据能得到正确的路由

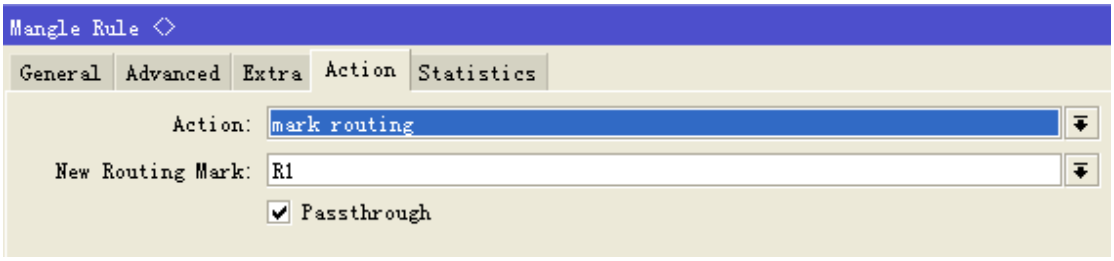




同理标记 c2,c3,c4,c5 的回程路由

提取回程路由





同理提取 c2,c3,c4,c5

命令方式：

10 chain=input action=mark-connection new-connection-mark=c1 passthrough=yes in-interface=pppoe-out1

11 chain=input action=mark-connection new-connection-mark=c2 passthrough=yes in-interface=pppoe-out2

12 chain=input action=mark-connection new-connection-mark=c3 passthrough=yes in-interface=pppoe-out3

13 chain=input action=mark-connection new-connection-mark=c4 passthrough=yes in-interface=pppoe-out4

14 chain=input action=mark-connection new-connection-mark=c5 passthrough=yes in-interface=pppoe-out5

15 chain=output action=mark-routing new-routing-mark=R1 passthrough=yes connection-mark=c1

16 chain=output action=mark-routing new-routing-mark=R2 passthrough=yes connection-mark=c2

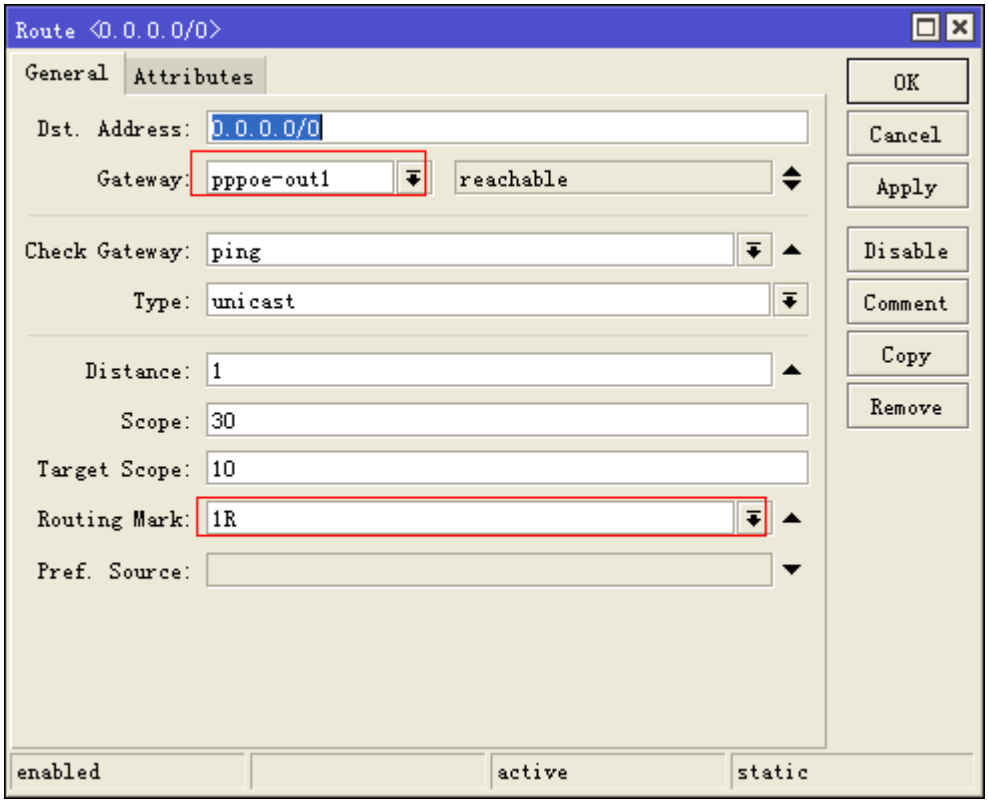
17 chain=output action=mark-routing new-routing-mark=R3 passthrough=yes connection-mark=c3

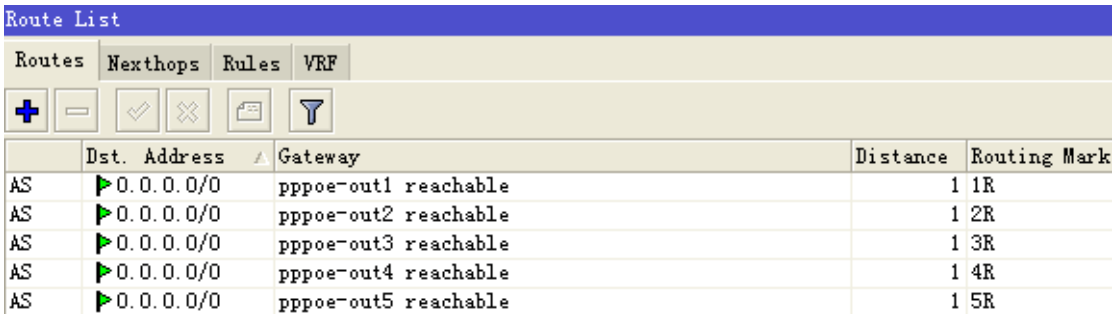
18 chain=output action=mark-routing new-routing-mark=R4 passthrough=yes connection-mark=c4

19 chain=output action=mark-routing new-routing-mark=R5 passthrough=yes connection-mark=c5

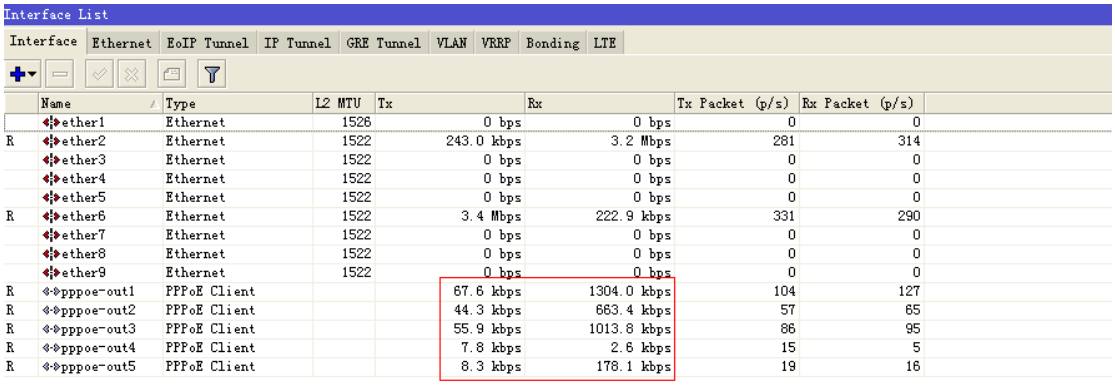
路由设置

添加五条默认路由，指定标记的路由





内网 PC 上开启迅雷下载资料，可以看到所有的拨号出口都有流量


Interface List
Interface
Ethernet
EoIP Tunnel
IP Tunnel
GRE Tunnel
VLAN
VRRP
Bonding
LTE
Name
Type
L2 MTU
Tx
Rx
Tx Packet (p/s)
Rx Packet (p/s)
ether1 Ethernet 1526 0 bps 0 bps 0 0
R ether2 Ethernet 1522 243.0 kbps 3.2 Mbps 281 314
ether3 Ethernet 1522 0 bps 0 bps 0 0
ether4 Ethernet 1522 0 bps 0 bps 0 0
ether5 Ethernet 1522 0 bps 0 bps 0 0
R ether6 Ethernet 1522 3.4 Mbps 222.9 kbps 331 290
ether7 Ethernet 1522 0 bps 0 bps 0 0
ether8 Ethernet 1522 0 bps 0 bps 0 0
ether9 Ethernet 1522 0 bps 0 bps 0 0
R pppoe-out1 PPPoE Client 67.6 kbps 1304.0 kbps 104 127
R pppoe-out2 PPPoE Client 44.3 kbps 663.4 kbps 57 65
R pppoe-out3 PPPoE Client 55.9 kbps 1013.8 kbps 86 95
R pppoe-out4 PPPoE Client 7.8 kbps 2.6 kbps 15 5
R pppoe-out5 PPPoE Client 8.3 kbps 178.1 kbps 19 16