[数据通信与网络]eNSP实验三、四

原创

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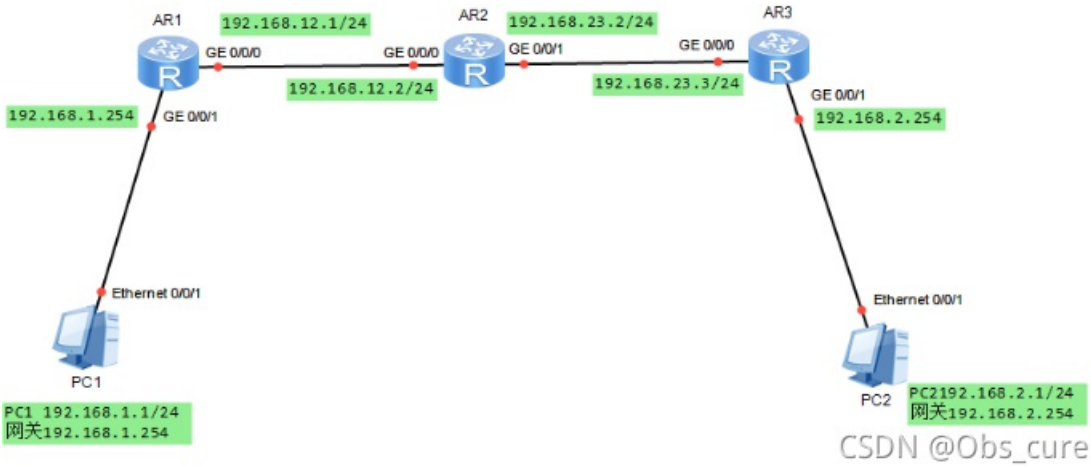
一、AR2220路由器静态路由实验

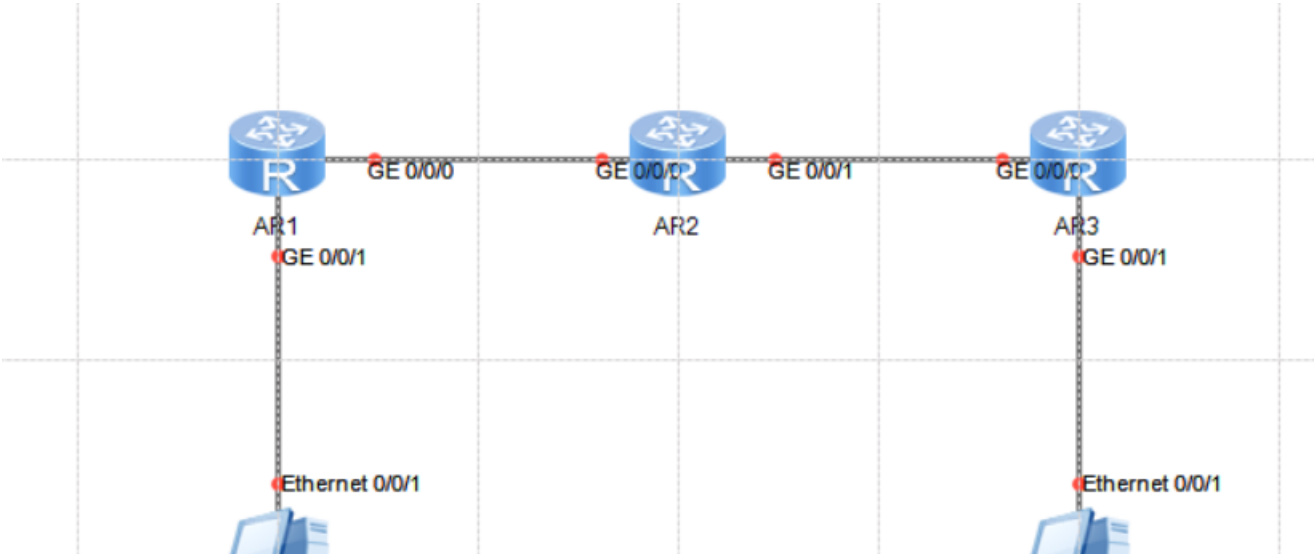
1.实验原理



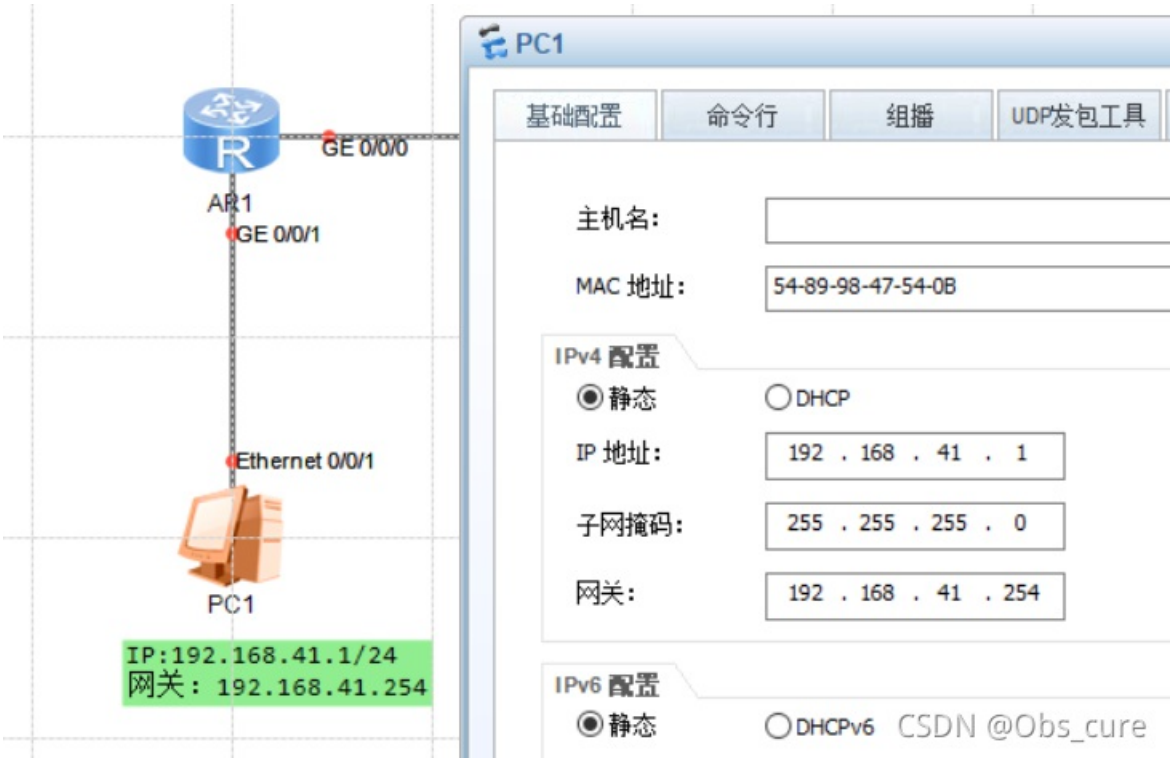
本次实验配置上图格式的网络拓扑，由2个主机和三个路由器组成。

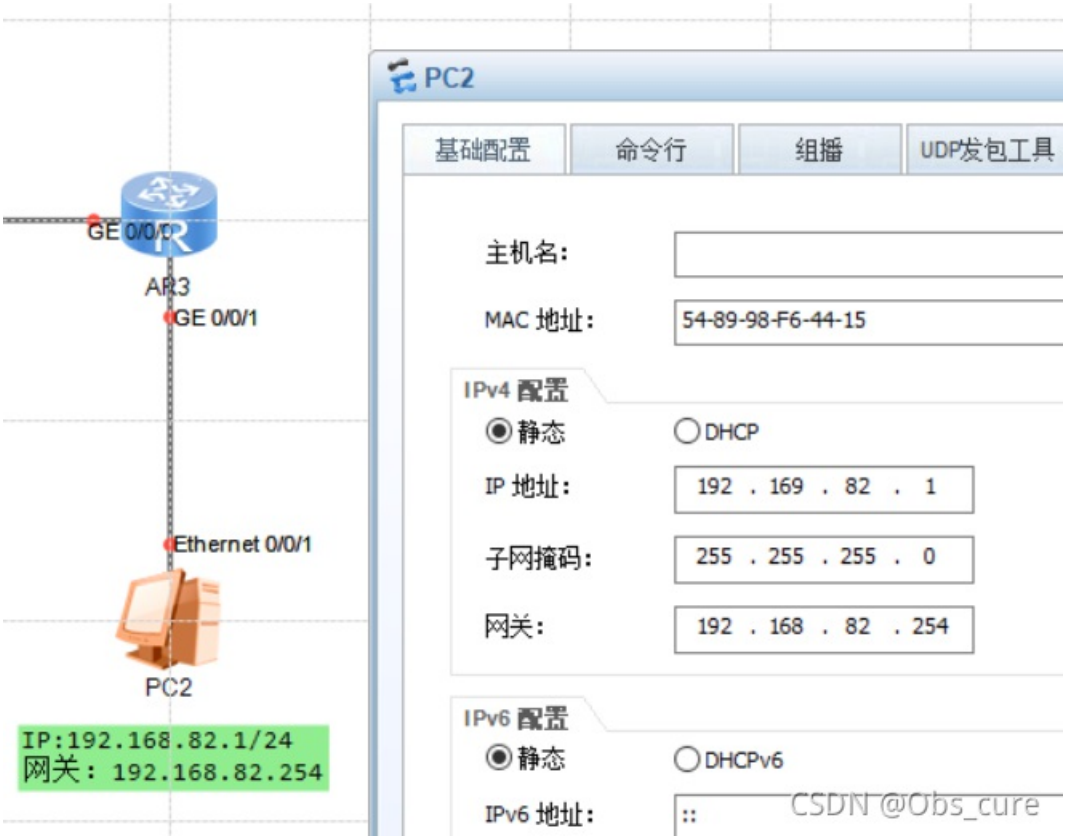
2.实验步骤

首先画出网络拓扑图



老师说要在每个设备上写注释，是一种良好的习惯~这里照着老师的流程配。

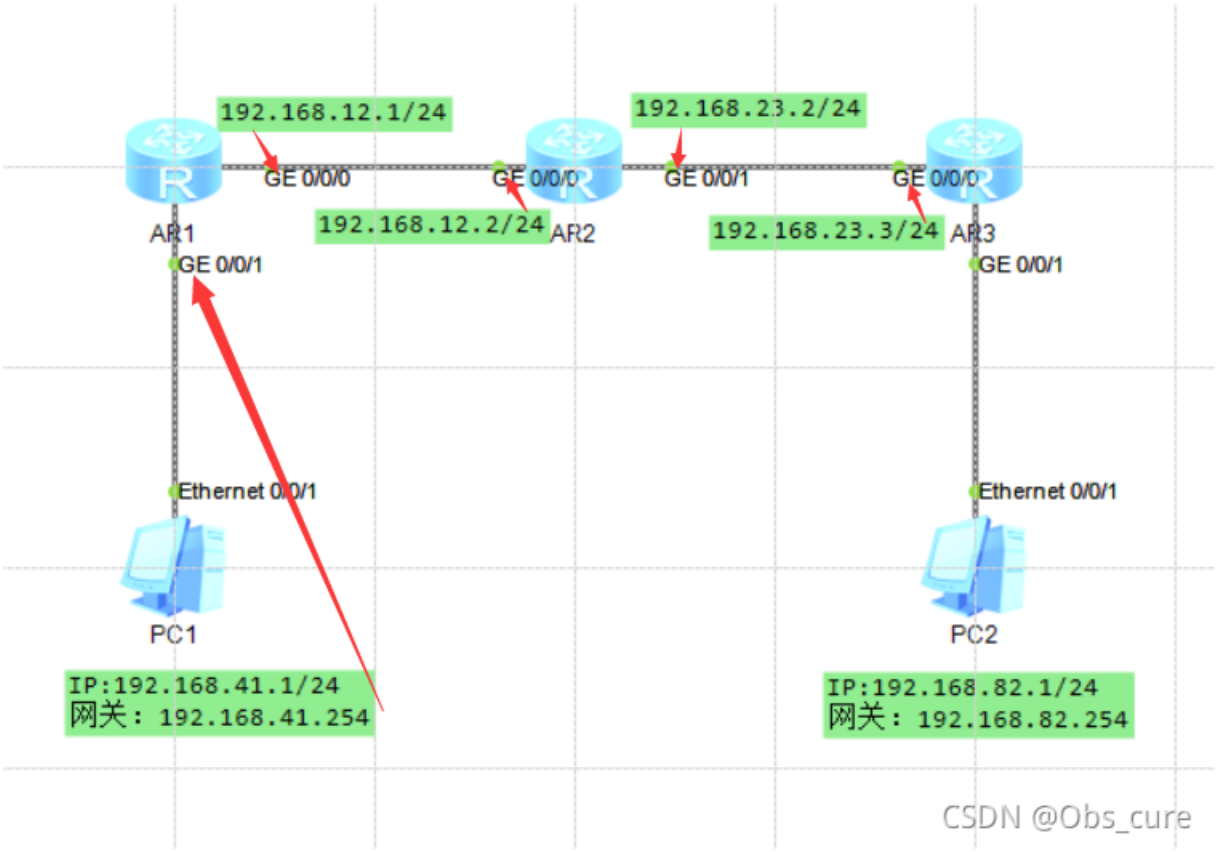




然后开机，配置三台路由器。首先配置路由器AR1，因为不明白老师要怎么改IP，这里直接用他默认的IP了。

```
system-view
sysname AR1
interface GigabitEthernet 0/0/0
ip address 192.168.12.1 24
interface GigabitEthernet 0/0/1
ip address 192.168.41.254 24
ip route-static 192.168.82.0 24 192.168.12.2
```

需要注意的是这里配置的路由信息和路由器的接口有关，配置之前注意看一眼接口。并且在这里面IP是相对于两个路由器的地址，每个接口的都有一个IP。
这个代码的前面都好理解，定义接口，最后一句是设置了静态路由，含义为：如果想找192.168.82.x的数据就从192.168.12.2的路由器里去寻找。（大概）



然后配置第二台路由器

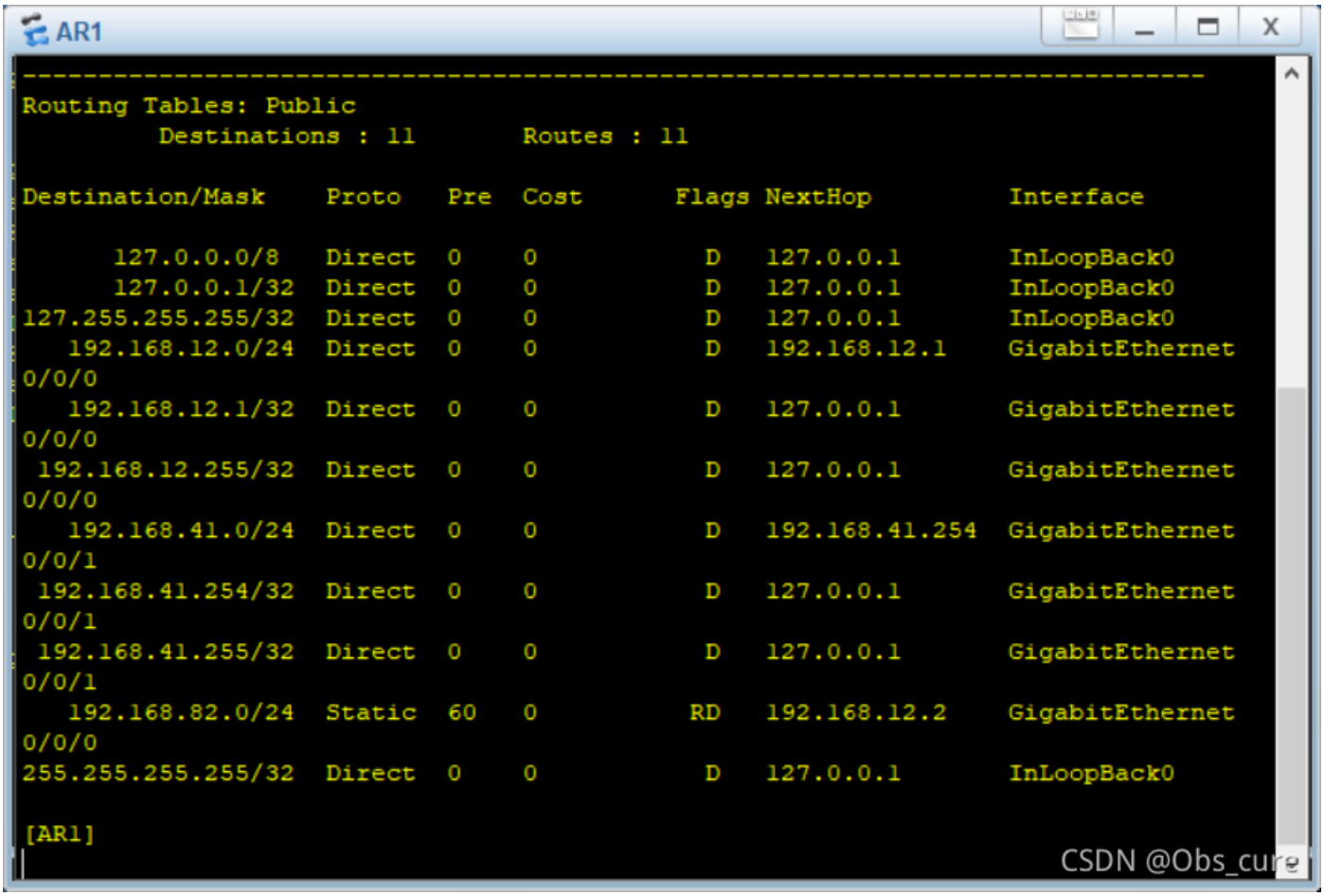
```
system-view
sysname AR2
interface GigabitEthernet 0/0/0
ip address 192.168.12.2 24
interface GigabitEthernet 0/0/1
ip address 192.168.23.2 24
ip route-static 192.168.41.0 24 192.168.12.1
ip route-static 192.168.82.0 24 192.168.23.3
```

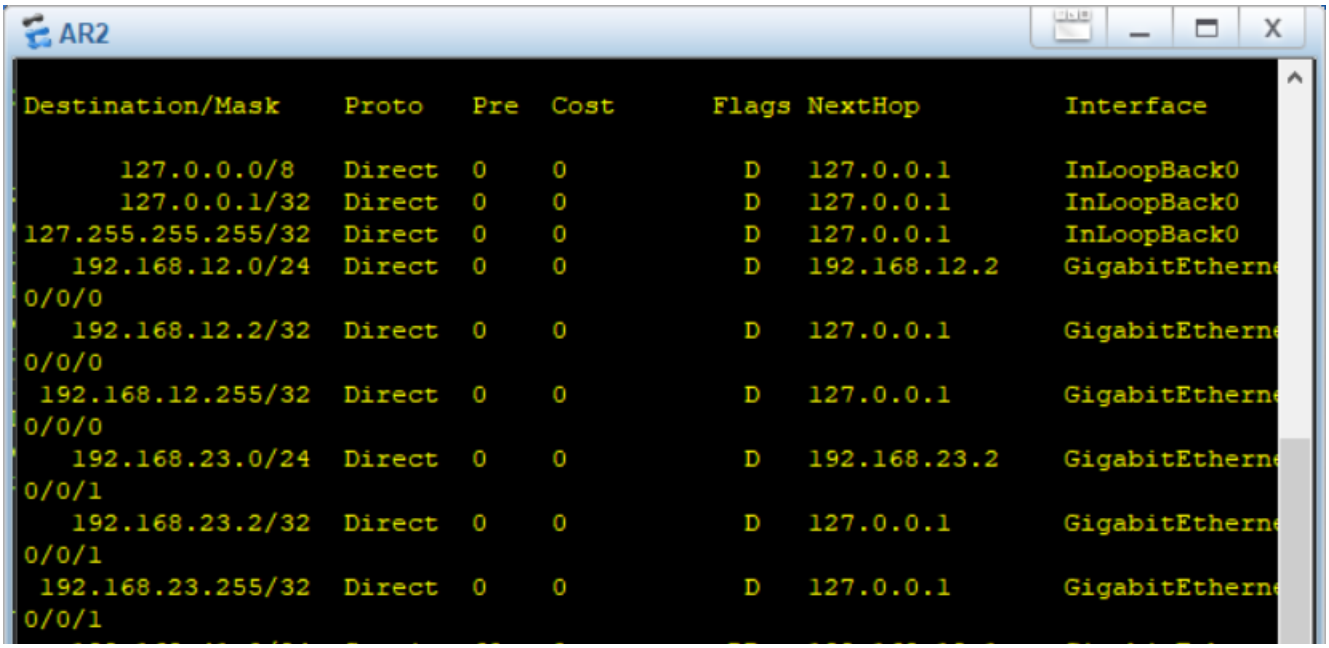
以及第三台路由器

```
system-view
sysname AR3
interface GigabitEthernet 0/0/0
ip address 192.168.23.3 24
interface GigabitEthernet 0/0/1
ip address 192.168.82.254 24
ip route-static 192.168.41.0 24 192.168.23.2
```

3.实验结果

三个路由器的路由表如下：





```
   192.168.41.0/24  Static  60    0           RD   192.168.12.1    GigabitEtherne
0/0/0
   192.168.82.0/24  Static  60    0           RD   192.168.23.3    GigabitEtherne
0/0/1
255.255.255.255/32  Direct  0     0            D   127.0.0.1       InLoopBack0

[AR2]
```


AR3

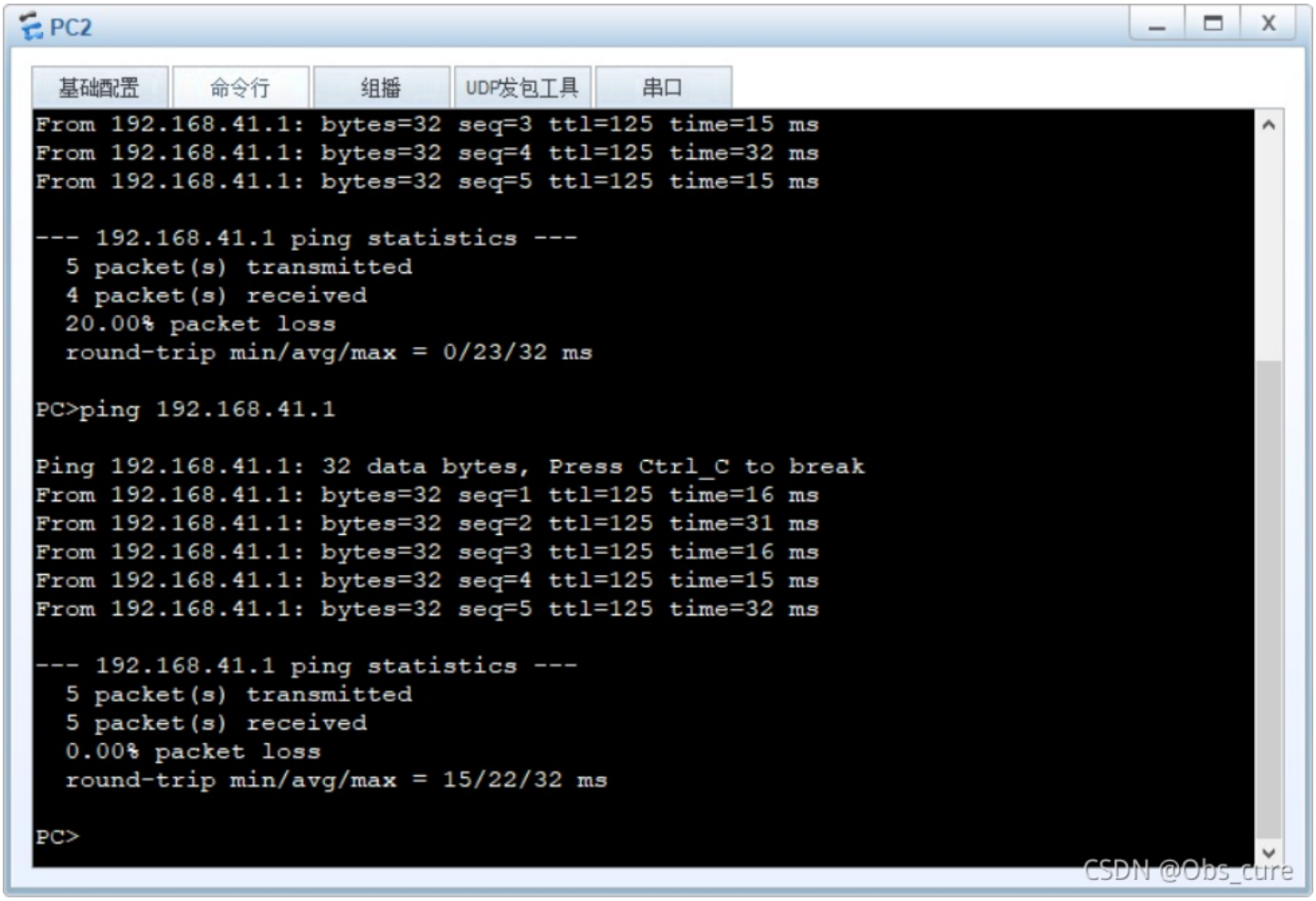
```
Routing Tables: Public
         Destinations : 11       Routes : 11

Destination/Mask    Proto   Pre  Cost      Flags NextHop         Interface

      127.0.0.0/8   Direct  0    0           D   127.0.0.1       InLoopBack0
      127.0.0.1/32  Direct  0    0           D   127.0.0.1       InLoopBack0
127.255.255.255/32  Direct  0    0           D   127.0.0.1       InLoopBack0
   192.168.23.0/24  Direct  0    0           D   192.168.23.3    GigabitEtherne
0/0/0
   192.168.23.3/32  Direct  0    0           D   127.0.0.1       GigabitEtherne
0/0/0
 192.168.23.255/32  Direct  0    0           D   127.0.0.1       GigabitEtherne
0/0/0
   192.168.41.0/24  Static  60   0           RD  192.168.23.2    GigabitEtherne
0/0/0
   192.168.82.0/24  Direct  0    0           D   192.168.82.254  GigabitEtherne
0/0/1
 192.168.82.254/32  Direct  0    0           D   127.0.0.1       GigabitEtherne
0/0/1
 192.168.82.255/32  Direct  0    0           D   127.0.0.1       GigabitEtherne
0/0/1
255.255.255.255/32  Direct  0    0           D   127.0.0.1       InLoopBack0

[AR3]
```

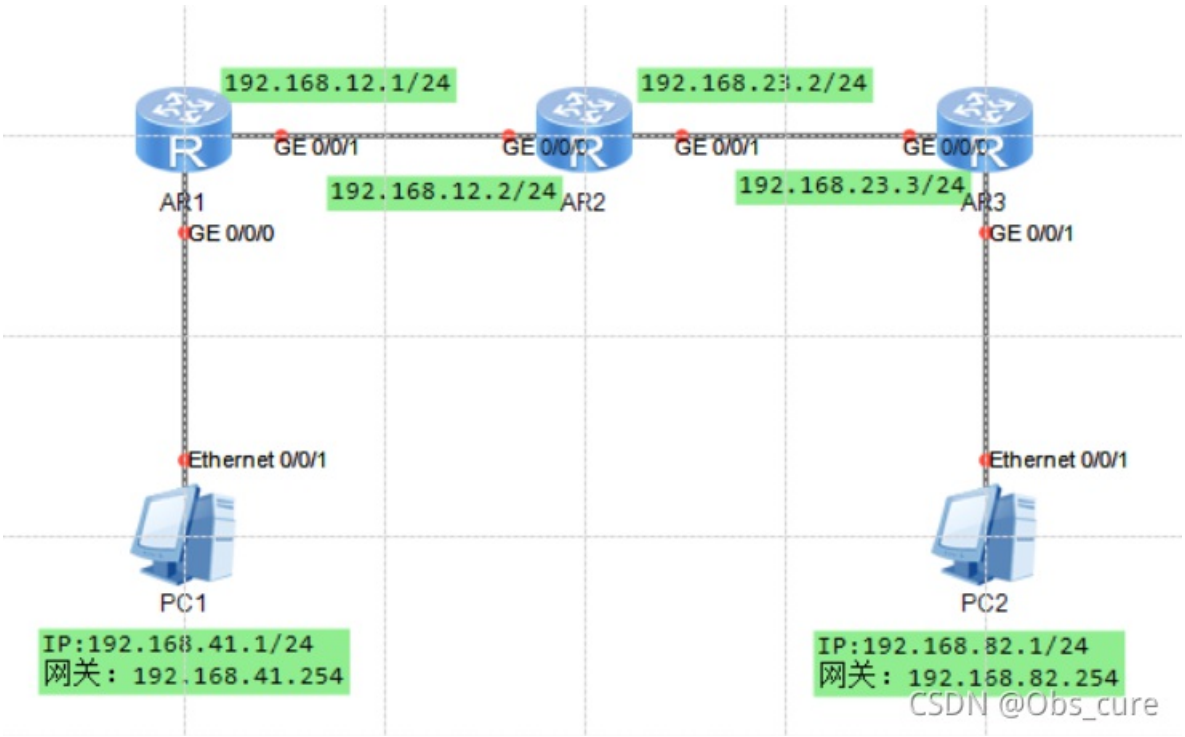

可以看到有static的信息，以及设置成功了。



可以PING通，实验成功。

二、AR2220路由器动态路由RIPv2实验

1.实验原理



拓扑图和上面的一样，不同的是路由器使用了RIP协议。通俗的理解就是，上个实验我们是手动配置的路由信息，而RIP协议下，每30s可以自动检索一遍路由信息。
RIP协议提出的年代是20世纪80年代，年代较为久远，因此有很多局限性。在后来的发展中出现了2.0版本，因此这次实验的命令协议都是RIPv2。但其网络路径不能超过15，不适合大型网络，以被OSPF协议淘汰。

2.实验步骤

首先配置IP，和上个实验一样，不再赘述，然后是配置三个路由器，这里我随手连的，和**老师连的不一样**，和**上个实验也不一样**！一定要注意：

```
system-view
sysname AR1
interface GigabitEthernet 0/0/0
ip address 192.168.41.254 24
interface GigabitEthernet 0/0/1
ip address 192.168.12.1 24
rip 1
version 2
network 192.168.12.0
network 192.168.41.0
```

然后是路由器2

```
system-view
sysname AR2
interface GigabitEthernet 0/0/0
ip address 192.168.12.2 24
interface GigabitEthernet 0/0/1
ip address 192.168.23.2 24
rip 1
version 2
network 192.168.12.0
network 192.168.23.0
```

然后是路由器3

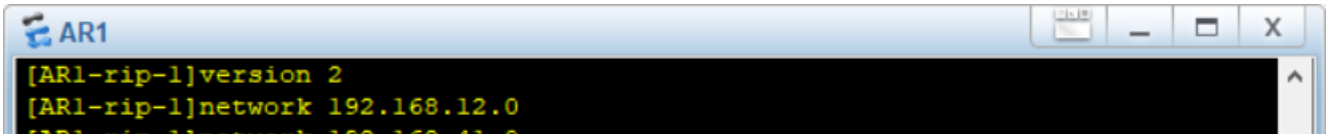
```
system-view
sysname AR3
interface GigabitEthernet 0/0/0
ip address 192.168.23.3 24
interface GigabitEthernet 0/0/1
ip address 192.168.82.254 24
rip 1
version 2
network 192.168.23.0
network 192.168.82.0
```

3.实验结果

直接查看RIP路由表，命令为：

```
display ip routing-table protocol rip
```

各个路由器的RIP表为：



```
[AR1-rip-1]network 192.168.41.0
[AR1-rip-1]
[AR1-rip-1]display ip routing-table protocol rip
Route Flags: R - relay, D - download to fib
------------------------------------------------------------------------------
Public routing table : RIP
         Destinations : 2        Routes : 2

RIP routing table status : <Active>
         Destinations : 2        Routes : 2

Destination/Mask    Proto   Pre  Cost      Flags NextHop         Interface

   192.168.23.0/24  RIP     100  1           D   192.168.12.2    GigabitEtherne
0/0/1
   192.168.82.0/24  RIP     100  2           D   192.168.12.2    GigabitEtherne
0/0/1

RIP routing table status : <Inactive>
         Destinations : 0        Routes : 0

[AR1-rip-1]
```


AR2

```
[AR2-rip-1]version 2
[AR2-rip-1]network 192.168.12.0
[AR2-rip-1]network 192.168.23.0
[AR2-rip-1]
[AR2-rip-1]display ip routing-table protocol rip
Route Flags: R - relay, D - download to fib
------------------------------------------------------------------------------
Public routing table : RIP
         Destinations : 2        Routes : 2

RIP routing table status : <Active>
         Destinations : 2        Routes : 2

Destination/Mask    Proto   Pre  Cost      Flags NextHop         Interface

   192.168.41.0/24  RIP     100  1           D   192.168.12.1    GigabitEtherne
0/0/0
   192.168.82.0/24  RIP     100  1           D   192.168.23.3    GigabitEtherne
0/0/1

RIP routing table status : <Inactive>
         Destinations : 0        Routes : 0

[AR2-rip-1]
```


AR3

```
[AR3-rip-1]network 192.168.23.0
[AR3-rip-1]
[AR3-rip-1]network 192.168.82.0
[AR3-rip-1]
[AR3-rip-1]display ip routing-table protocol rip
Route Flags: R - relay, D - download to fib
```

```
------------------------------------------------------------------------------
Public routing table : RIP
         Destinations : 2        Routes : 2

RIP routing table status : <Active>
         Destinations : 2        Routes : 2

Destination/Mask    Proto   Pre  Cost      Flags NextHop         Interface

   192.168.12.0/24  RIP     100  1           D   192.168.23.2    GigabitEtherne
0/0/0
   192.168.41.0/24  RIP     100  2           D   192.168.23.2    GigabitEtherne
0/0/0

RIP routing table status : <Inactive>
         Destinations : 0        Routes : 0

[AR3-rip-1]
```


PC1

基础配置 | 命令行 | 组播 | UDP发包工具 | 串口

```
Ping 192.168.82.1: 32 data bytes, Press Ctrl_C to break
Request timeout!
From 192.168.82.1: bytes=32 seq=2 ttl=125 time=32 ms

--- 192.168.82.1 ping statistics ---
  2 packet(s) transmitted
  1 packet(s) received
  50.00% packet loss
  round-trip min/avg/max = 0/32/32 ms

PC>ping 192.168.82.1

Ping 192.168.82.1: 32 data bytes, Press Ctrl_C to break
From 192.168.82.1: bytes=32 seq=1 ttl=125 time=16 ms
From 192.168.82.1: bytes=32 seq=2 ttl=125 time=31 ms
From 192.168.82.1: bytes=32 seq=3 ttl=125 time=31 ms
From 192.168.82.1: bytes=32 seq=4 ttl=125 time=16 ms
From 192.168.82.1: bytes=32 seq=5 ttl=125 time=16 ms

--- 192.168.82.1 ping statistics ---
  5 packet(s) transmitted
  5 packet(s) received
  0.00% packet loss
  round-trip min/avg/max = 16/22/31 ms

PC>
```


PING成功了。第一次PING的时候没PING通，可能是路由表没更新吧~所以有丢失还请重新PING一下吧！