

四川大學

《计算机网络》实验报告（6）



OSPF 配置和 BGP 配置

专 业 软件工程

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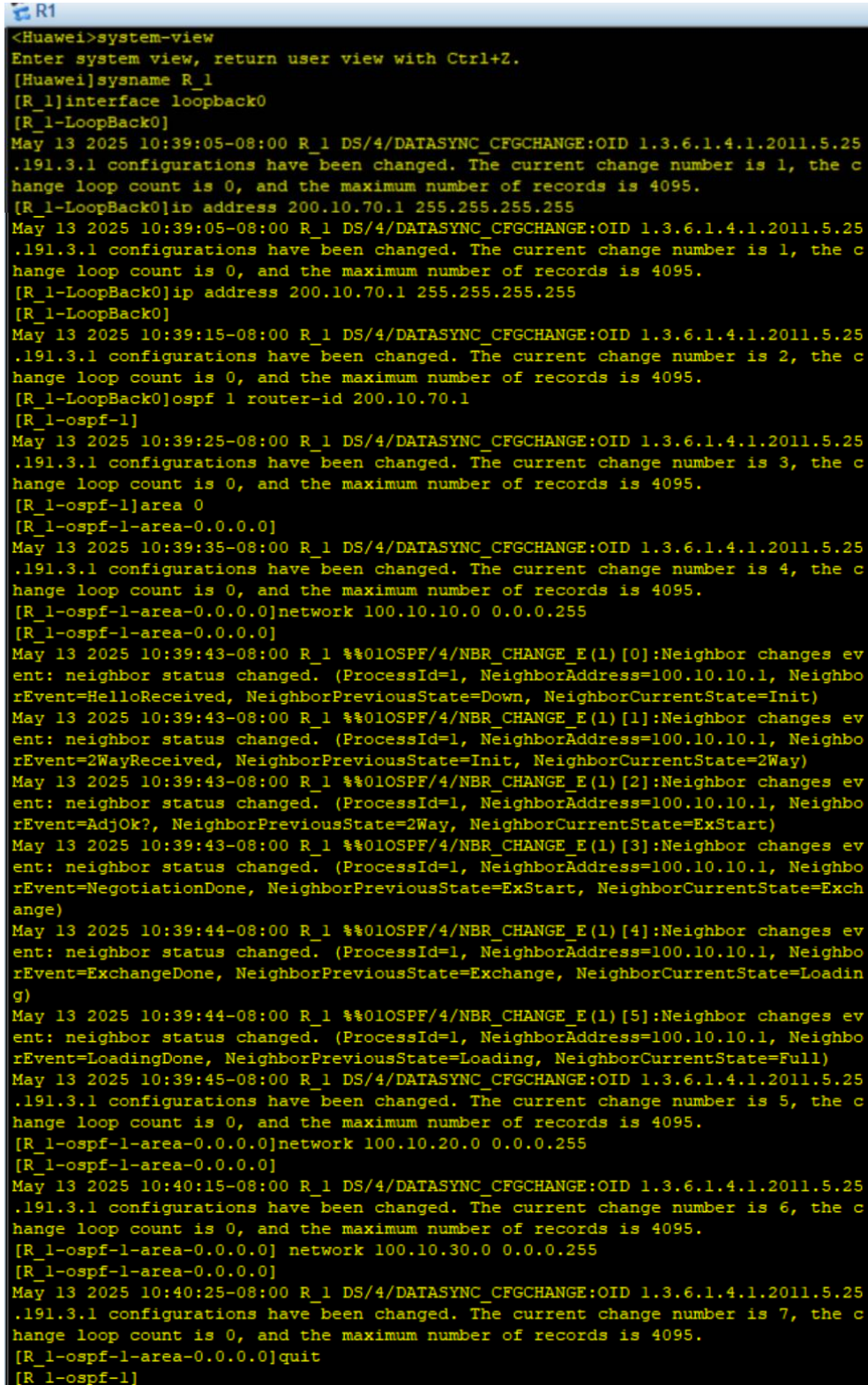
指导老师 程艳红

成绩分数

二零二五年五月十七日

OSPF 配置和 BGP 配置

1. 截取 AR1 的 OSPF 配置作为第一题



```
<Huawei>system-view
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname R_1
[R_1]interface loopback0
[R_1-LoopBack0]
May 13 2025 10:39:05-08:00 R_1 DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.5.25
.191.3.1 configurations have been changed. The current change number is 1, the c
hange loop count is 0, and the maximum number of records is 4095.
[R_1-LoopBack0]ip address 200.10.70.1 255.255.255.255
May 13 2025 10:39:05-08:00 R_1 DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.5.25
.191.3.1 configurations have been changed. The current change number is 1, the c
hange loop count is 0, and the maximum number of records is 4095.
[R_1-LoopBack0]ip address 200.10.70.1 255.255.255.255
[R_1-LoopBack0]
May 13 2025 10:39:15-08:00 R_1 DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.5.25
.191.3.1 configurations have been changed. The current change number is 2, the c
hange loop count is 0, and the maximum number of records is 4095.
[R_1-LoopBack0]ospf 1 router-id 200.10.70.1
[R_1-ospf-1]
May 13 2025 10:39:25-08:00 R_1 DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.5.25
.191.3.1 configurations have been changed. The current change number is 3, the c
hange loop count is 0, and the maximum number of records is 4095.
[R_1-ospf-1]area 0
[R_1-ospf-1-area-0.0.0.0]
May 13 2025 10:39:35-08:00 R_1 DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.5.25
.191.3.1 configurations have been changed. The current change number is 4, the c
hange loop count is 0, and the maximum number of records is 4095.
[R_1-ospf-1-area-0.0.0.0]network 100.10.10.0 0.0.0.255
[R_1-ospf-1-area-0.0.0.0]
May 13 2025 10:39:43-08:00 R_1 %%01OSPF/4/NBR_CHANGE_E(1)[0]:Neighbor changes ev
ent: neighbor status changed. (ProcessId=1, NeighborAddress=100.10.10.1, Neighbo
rEvent=HelloReceived, NeighborPreviousState=Down, NeighborCurrentState=Init)
May 13 2025 10:39:43-08:00 R_1 %%01OSPF/4/NBR_CHANGE_E(1)[1]:Neighbor changes ev
ent: neighbor status changed. (ProcessId=1, NeighborAddress=100.10.10.1, Neighbo
rEvent=2WayReceived, NeighborPreviousState=Init, NeighborCurrentState=2Way)
May 13 2025 10:39:43-08:00 R_1 %%01OSPF/4/NBR_CHANGE_E(1)[2]:Neighbor changes ev
ent: neighbor status changed. (ProcessId=1, NeighborAddress=100.10.10.1, Neighbo
rEvent=AdjOk?, NeighborPreviousState=2Way, NeighborCurrentState=ExStart)
May 13 2025 10:39:43-08:00 R_1 %%01OSPF/4/NBR_CHANGE_E(1)[3]:Neighbor changes ev
ent: neighbor status changed. (ProcessId=1, NeighborAddress=100.10.10.1, Neighbo
rEvent=NegotiationDone, NeighborPreviousState=ExStart, NeighborCurrentState=Exch
ange)
May 13 2025 10:39:44-08:00 R_1 %%01OSPF/4/NBR_CHANGE_E(1)[4]:Neighbor changes ev
ent: neighbor status changed. (ProcessId=1, NeighborAddress=100.10.10.1, Neighbo
rEvent=ExchangeDone, NeighborPreviousState=Exchange, NeighborCurrentState=Loadin
g)
May 13 2025 10:39:44-08:00 R_1 %%01OSPF/4/NBR_CHANGE_E(1)[5]:Neighbor changes ev
ent: neighbor status changed. (ProcessId=1, NeighborAddress=100.10.10.1, Neighbo
rEvent=LoadingDone, NeighborPreviousState>Loading, NeighborCurrentState=Full)
May 13 2025 10:39:45-08:00 R_1 DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.5.25
.191.3.1 configurations have been changed. The current change number is 5, the c
hange loop count is 0, and the maximum number of records is 4095.
[R_1-ospf-1-area-0.0.0.0]network 100.10.20.0 0.0.0.255
[R_1-ospf-1-area-0.0.0.0]
May 13 2025 10:40:15-08:00 R_1 DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.5.25
.191.3.1 configurations have been changed. The current change number is 6, the c
hange loop count is 0, and the maximum number of records is 4095.
[R_1-ospf-1-area-0.0.0.0] network 100.10.30.0 0.0.0.255
[R_1-ospf-1-area-0.0.0.0]
May 13 2025 10:40:25-08:00 R_1 DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.5.25
.191.3.1 configurations have been changed. The current change number is 7, the c
hange loop count is 0, and the maximum number of records is 4095.
[R_1-ospf-1-area-0.0.0.0]quit
[R_1-ospf-1]
```

图 1 AR1 的 OSPF 配置

2. 截取交换机 1OSFP 建立情况作为第二题

```
LSW1
May 13 2025 10:39:43-08:00 Switch1 %%01OSPF/4/NBR_CHANGE_E(1)[3]:Neighbor change
s event: neighbor status changed. (ProcessId=1, NeighborAddress=100.10.10.2, Ne
ighborEvent=ExchangeDone, NeighborPreviousState=Exchange, NeighborCurrentState=
Loading)
May 13 2025 10:39:43-08:00 Switch1 %%01OSPF/4/NBR_CHANGE_E(1)[4]:Neighbor change
s event: neighbor status changed. (ProcessId=1, NeighborAddress=100.10.10.2, Ne
ighborEvent>LoadingDone, NeighborPreviousState>Loading, NeighborCurrentState=Full
)
[Switch1-ospf-1]quit
[Switch1]display ospf peer

      OSPF Process 1 with Router ID 200.10.10.1
        Neighbors

Area 0.0.0.0 interface 100.10.10.1(Vlanif100)'s neighbors
Router ID: 200.10.70.1      Address: 100.10.10.2
  State: Full Mode:Nbr is Master Priority: 1
  DR: 100.10.10.1 BDR: 100.10.10.2 MTU: 0
  Dead timer due in 40 sec
  Retrans timer interval: 5
  Neighbor is up for 00:02:37
  Authentication Sequence: [ 0 ]
```

图 2 交换机 1 的 OSFP 建立情况

3. 截取交换机 1 的路由情况作为第三题

```
LSW1
Area 0.0.0.0 interface 100.10.10.1(Vlanif100)'s neighbors
Router ID: 200.10.70.1      Address: 100.10.10.2
  State: Full Mode:Nbr is Master Priority: 1
  DR: 100.10.10.1 BDR: 100.10.10.2 MTU: 0
  Dead timer due in 40 sec
  Retrans timer interval: 5
  Neighbor is up for 00:02:37
  Authentication Sequence: [ 0 ]

[Switch1]display ospf routing

      OSPF Process 1 with Router ID 200.10.10.1
        Routing Tables

Routing for Network
Destination      Cost  Type      NextHop      AdvRouter      Area
100.10.10.0/24   1     Transit   100.10.10.1   200.10.10.1    0.0.0.0
100.10.20.0/24   2     Stub      100.10.10.2   200.10.70.1    0.0.0.0
100.10.30.0/24   2     Stub      100.10.10.2   200.10.70.1    0.0.0.0

Total Nets: 3
Intra Area: 3 Inter Area: 0 ASE: 0 NSSA: 0

[Switch1]display ip routing
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
  Destinations : 10      Routes : 11

Destination/Mask  Proto  Pre  Cost  Flags NextHop  Interface
-----
10.10.10.0/24     Direct  0    0      D  10.10.10.1  Vlanif10
10.10.10.1/32     Direct  0    0      D  127.0.0.1   Vlanif10
100.10.10.0/24     Direct  0    0      D  100.10.10.1 Vlanif100
100.10.10.1/32     Direct  0    0      D  127.0.0.1   Vlanif100
100.10.20.0/24     OSPF    10    2      D  100.10.10.2 Vlanif100
100.10.30.0/24     OSPF    10    2      D  100.10.10.2 Vlanif100
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
200.10.10.1/32     Direct  0    0      D  127.0.0.1   LoopBack0
200.10.70.0/24     Static  60    0      RD  100.10.10.2 Vlanif100
                  Static  60    0      RD  100.10.10.0 Vlanif100

[Switch1]
```

图 3 交换机 1 的路由情况

4. 截取 PC1 能 ping 通 PC2、PC3 作为第四题

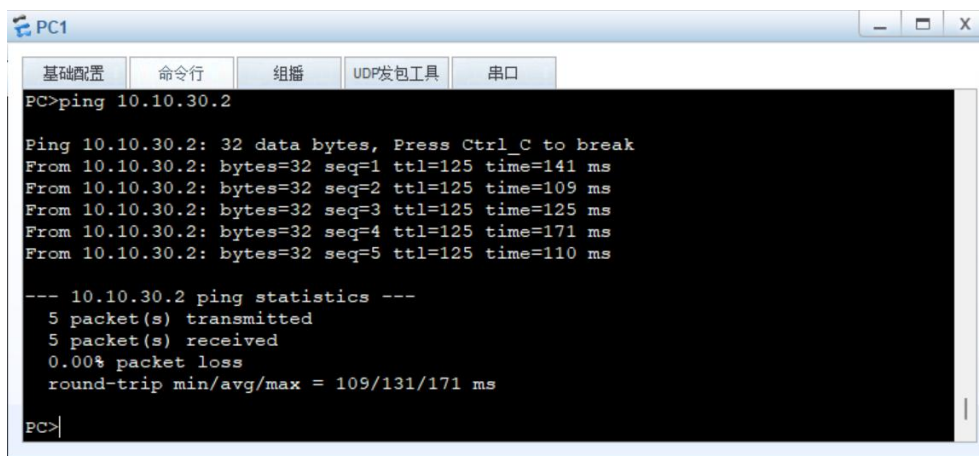
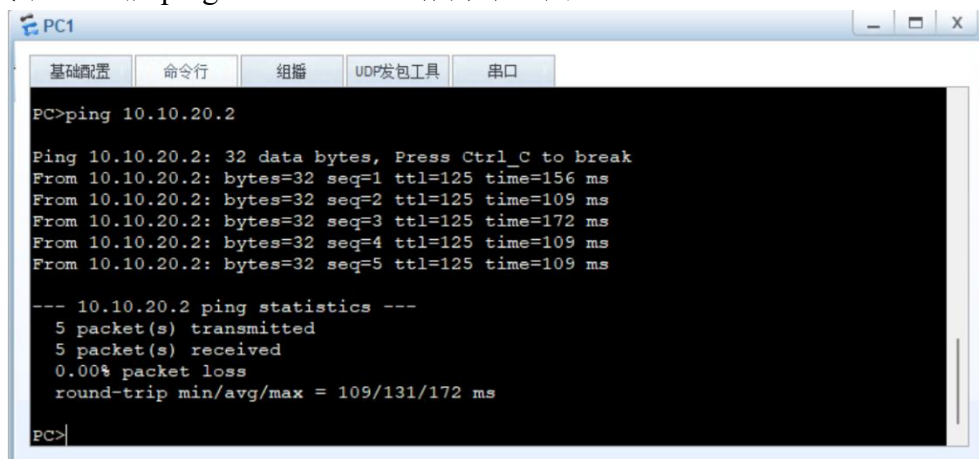


图 4 PC1 的 ping 命令

5. 截取网络拓扑结构作为第五题

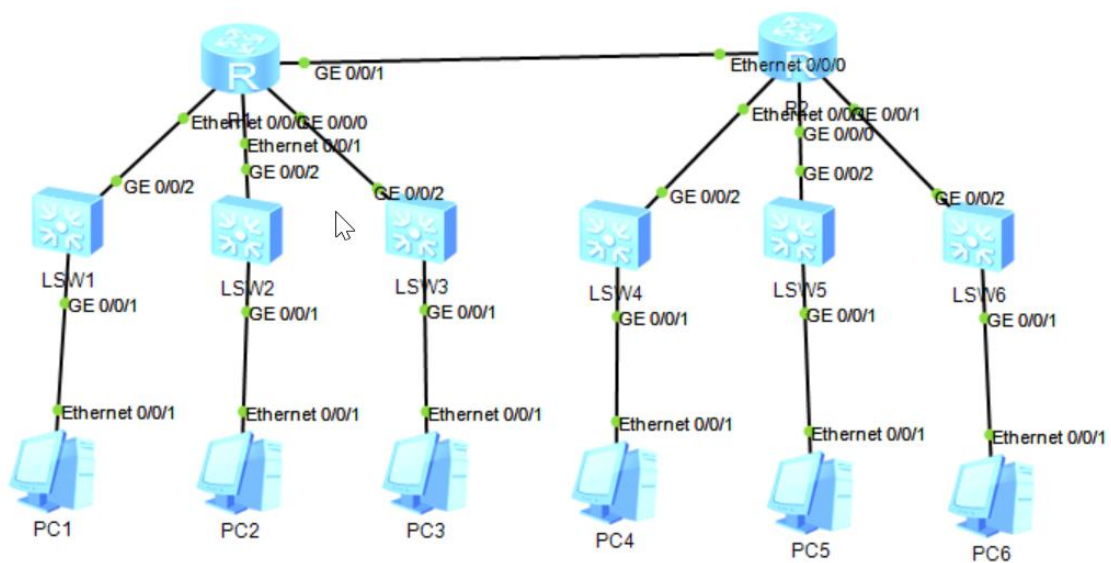


图 5 网络拓扑结构

6. 截取 AR1 和 AR2 的路由情况作为第六题

```
<R1>system-view
Enter system view, return user view with Ctrl+Z.
[R1]display ip routing-table
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
Destinations : 20      Routes : 20

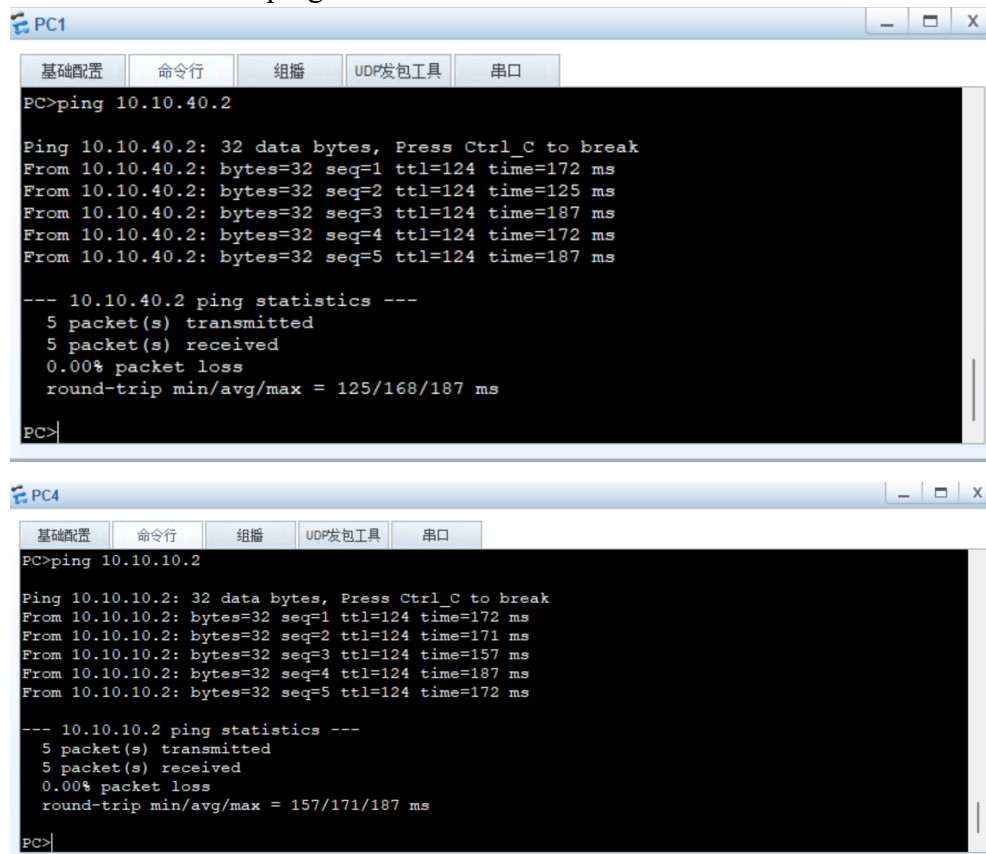
Destination/Mask    Proto  Pre  Cost    Flags NextHop        Interface
-----
10.10.10.0/24      Static 60   0        RD 100.10.10.1    Ethernet0/0/0
10.10.20.0/24      Static 60   0        RD 100.10.20.1    Ethernet0/0/1
10.10.30.0/24      Static 60   0        RD 100.10.30.1    GigabitEthernet
0/0/0
10.10.40.0/24      Static 60   0        RD 150.10.70.2    GigabitEthernet
0/0/1
100.10.10.0/24     Direct 0     0        D 100.10.10.2    Ethernet0/0/0
100.10.10.2/32     Direct 0     0        D 127.0.0.1     Ethernet0/0/0
100.10.20.0/24     Direct 0     0        D 100.10.20.2    Ethernet0/0/1
100.10.20.2/32     Direct 0     0        D 127.0.0.1     Ethernet0/0/1
100.10.30.0/24     Direct 0     0        D 100.10.30.2    GigabitEthernet
0/0/0
100.10.30.2/32     Direct 0     0        D 127.0.0.1     GigabitEthernet
0/0/0
100.10.40.0/24     EBGP   255   0        D 150.10.70.2    GigabitEthernet
0/0/1
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
150.10.70.0/24     Direct 0     0        D 150.10.70.1    GigabitEthernet
0/0/1
150.10.70.1/32     Direct 0     0        D 127.0.0.1     GigabitEthernet
0/0/1
200.10.10.1/32     O_ASE  150   1        D 100.10.10.1    Ethernet0/0/0
200.10.20.1/32     O_ASE  150   1        D 100.10.20.1    Ethernet0/0/1
200.10.30.1/32     O_ASE  150   1        D 100.10.30.1    GigabitEthernet
0/0/0
200.10.70.0/24     EBGP   255   0        D 150.10.70.2    GigabitEthernet
0/0/1
200.10.70.1/32     Direct 0     0        D 127.0.0.1     LoopBack0
[R1]

<Huawei>system-view
Enter system view, return user view with Ctrl+Z.
[Huawei]display ip routing-table
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
Destinations : 17      Routes : 17

Destination/Mask    Proto  Pre  Cost    Flags NextHop        Interface
-----
10.10.10.0/24      Static 60   0        RD 150.10.70.1    GigabitEthernet
0/0/0
10.10.40.0/24      Static 60   0        RD 100.10.40.1    Ethernet0/0/0
100.10.10.0/24     EBGP   255   0        D 150.10.70.1    GigabitEthernet
0/0/0
100.10.20.0/24     EBGP   255   0        D 150.10.70.1    GigabitEthernet
0/0/0
100.10.30.0/24     EBGP   255   0        D 150.10.70.1    GigabitEthernet
0/0/0
100.10.40.0/24     Direct 0     0        D 100.10.40.2    Ethernet0/0/0
100.10.40.2/32     Direct 0     0        D 127.0.0.1     Ethernet0/0/0
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
150.10.70.0/24     Direct 0     0        D 150.10.70.2    GigabitEthernet
0/0/0
150.10.70.2/32     Direct 0     0        D 127.0.0.1     GigabitEthernet
0/0/0
200.10.10.1/32     EBGP   255   1        D 150.10.70.1    GigabitEthernet
0/0/0
200.10.20.1/32     EBGP   255   1        D 150.10.70.1    GigabitEthernet
0/0/0
200.10.30.1/32     EBGP   255   1        D 150.10.70.1    GigabitEthernet
0/0/0
200.10.70.0/24     Direct 0     0        D 200.10.70.2    LoopBack0
200.10.70.1/32     EBGP   255   0        D 150.10.70.1    GigabitEthernet
0/0/0
200.10.70.2/32     Direct 0     0        D 127.0.0.1     LoopBack0
[Huawei]
```

图 6-2 AR1 和 AR2 的路由情况

7. 截取 PC1 和 PC4 的 ping 通情况作为第七题



The image contains two screenshots of a network simulation interface. The top screenshot shows the command window for PC1, where the command 'ping 10.10.40.2' has been executed. The output displays five successful ping requests with 32 bytes each, showing TTL values of 124 and round-trip times ranging from 125 ms to 187 ms. The statistics section indicates 5 packets transmitted, 5 received, and 0.00% packet loss. The bottom screenshot shows the command window for PC4, where the command 'ping 10.10.10.2' has been executed. The output displays five successful ping requests with 32 bytes each, showing TTL values of 124 and round-trip times ranging from 157 ms to 187 ms. The statistics section indicates 5 packets transmitted, 5 received, and 0.00% packet loss.

```
PC1
基础配置 命令行 组播 UDP发包工具 串口
PC>ping 10.10.40.2

Ping 10.10.40.2: 32 data bytes, Press Ctrl_C to break
From 10.10.40.2: bytes=32 seq=1 ttl=124 time=172 ms
From 10.10.40.2: bytes=32 seq=2 ttl=124 time=125 ms
From 10.10.40.2: bytes=32 seq=3 ttl=124 time=187 ms
From 10.10.40.2: bytes=32 seq=4 ttl=124 time=172 ms
From 10.10.40.2: bytes=32 seq=5 ttl=124 time=187 ms

--- 10.10.40.2 ping statistics ---
 5 packet(s) transmitted
 5 packet(s) received
 0.00% packet loss
 round-trip min/avg/max = 125/168/187 ms
PC>

PC4
基础配置 命令行 组播 UDP发包工具 串口
PC>ping 10.10.10.2

Ping 10.10.10.2: 32 data bytes, Press Ctrl_C to break
From 10.10.10.2: bytes=32 seq=1 ttl=124 time=172 ms
From 10.10.10.2: bytes=32 seq=2 ttl=124 time=171 ms
From 10.10.10.2: bytes=32 seq=3 ttl=124 time=157 ms
From 10.10.10.2: bytes=32 seq=4 ttl=124 time=187 ms
From 10.10.10.2: bytes=32 seq=5 ttl=124 time=172 ms

--- 10.10.10.2 ping statistics ---
 5 packet(s) transmitted
 5 packet(s) received
 0.00% packet loss
 round-trip min/avg/max = 157/171/187 ms
PC>
```

图 7 PC1 和 PC4 的 ping 命令

实验到此完成。