



## 《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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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 OSFP 配置作为第一题

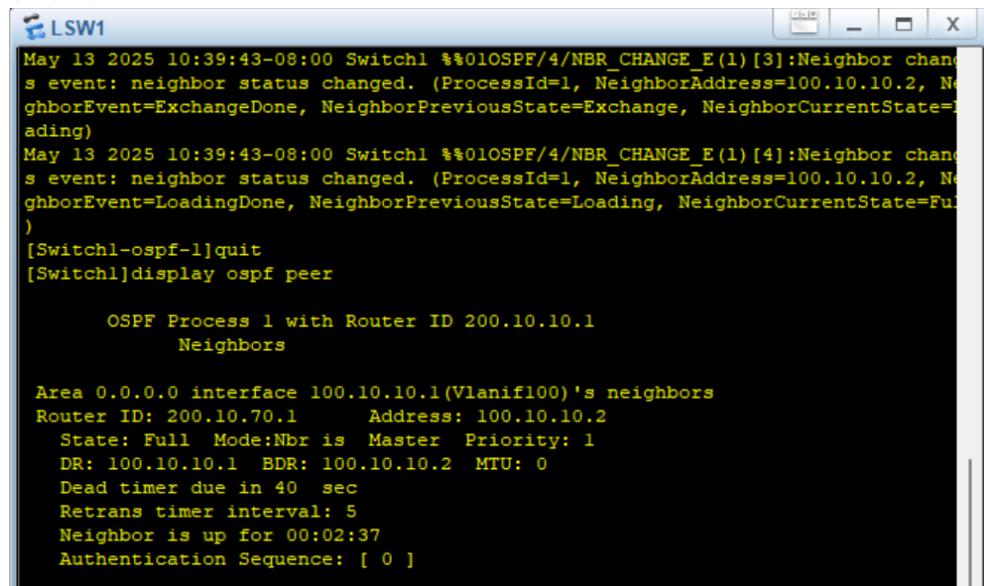
```

R1
<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 OSFP 配置

## 2. 截取交换机 1 OSPF 建立情况作为第二题



```

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

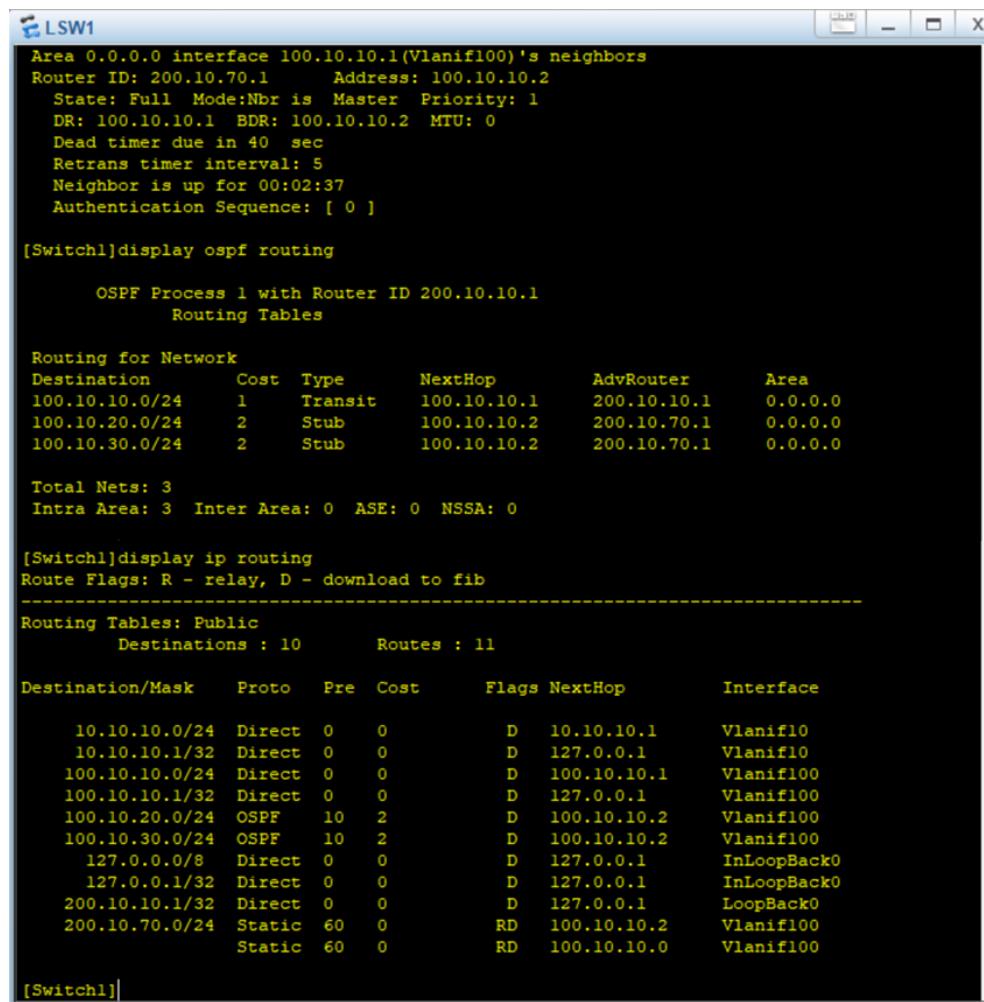
        OSPF Process 1 with Router ID 200.10.10.1
        Neighbors

        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 OSPF 建立情况

## 3. 截取交换机 1 的路由情况作为第三题



```

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

```

PC>ping 10.10.20.2
Ping 10.10.20.2: 32 data bytes, Press Ctrl_C to break
From 10.10.20.2: bytes=32 seq=1 ttl=125 time=156 ms
From 10.10.20.2: bytes=32 seq=2 ttl=125 time=109 ms
From 10.10.20.2: bytes=32 seq=3 ttl=125 time=172 ms
From 10.10.20.2: bytes=32 seq=4 ttl=125 time=109 ms
From 10.10.20.2: bytes=32 seq=5 ttl=125 time=109 ms

--- 10.10.20.2 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 109/131/172 ms

PC>

```

```

PC>ping 10.10.30.2
Ping 10.10.30.2: 32 data bytes, Press Ctrl_C to break
From 10.10.30.2: bytes=32 seq=1 ttl=125 time=141 ms
From 10.10.30.2: bytes=32 seq=2 ttl=125 time=109 ms
From 10.10.30.2: bytes=32 seq=3 ttl=125 time=125 ms
From 10.10.30.2: bytes=32 seq=4 ttl=125 time=171 ms
From 10.10.30.2: bytes=32 seq=5 ttl=125 time=110 ms

--- 10.10.30.2 ping statistics ---
5 packet(s) transmitted
5 packet(s) received
0.00% packet loss
round-trip min/avg/max = 109/131/171 ms

PC>

```

图 4 PC1 的 ping 命令

## 5. 截取网络拓扑结构作为第五题

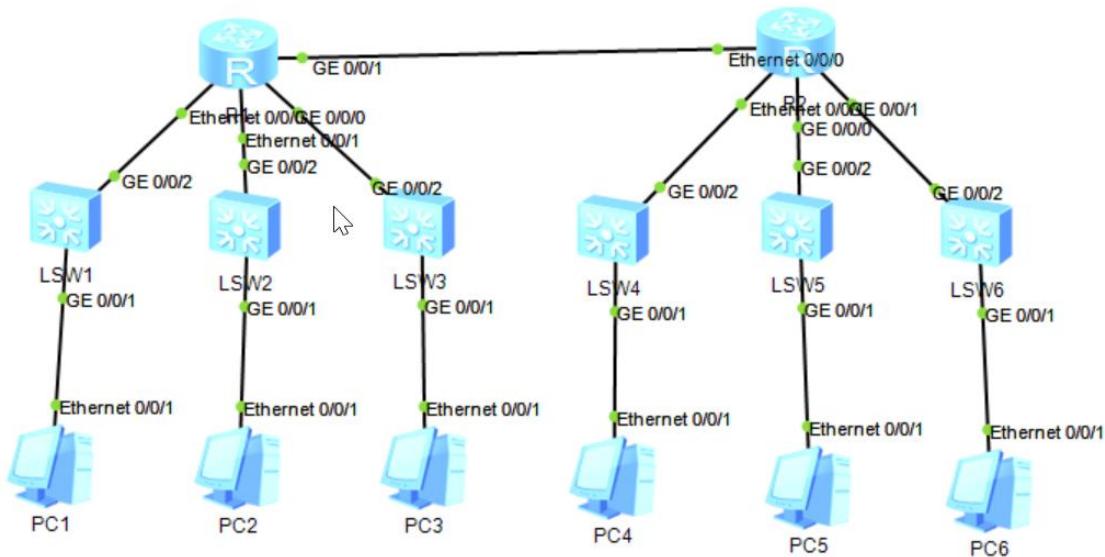


图 5 网络拓扑结构

## 6. 截取 AR1 和 AR2 的路由情况作为第六题

```

R1
<R_1>system-view
Enter system view, return user view with Ctrl+Z.
[R_1]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
[R_1]

R2
<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
0/0/0
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 figure consists of two side-by-side screenshots of a network monitoring application. Both windows have a title bar labeled 'PC1' and 'PC4' respectively. Below the title bar is a tab bar with five tabs: '基础配置', '命令行', '组播', 'UDP发包工具', and '串口'. The '命令行' tab is selected in both windows. The main area of each window displays the output of a ping command.

**PC1 Window Output:**

```
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 Window Output:**

```
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。