

四川大學

《计算机网络》实验报告（5）



DHCP 设置与静态路由实验

专 业 软件工程

姓 名 郭 政

学 号 2023141461076

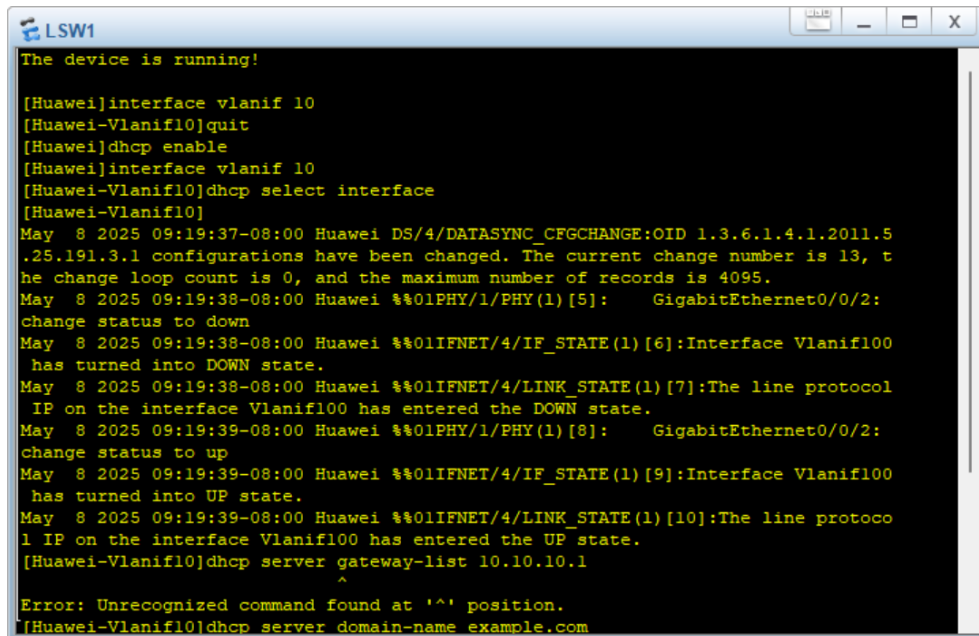
指导老师 程艳红

成绩分数

二零二五年五月十日

DHCP 设置与静态路由实验

1. 在路由器上配置 DHCP 的截图 1

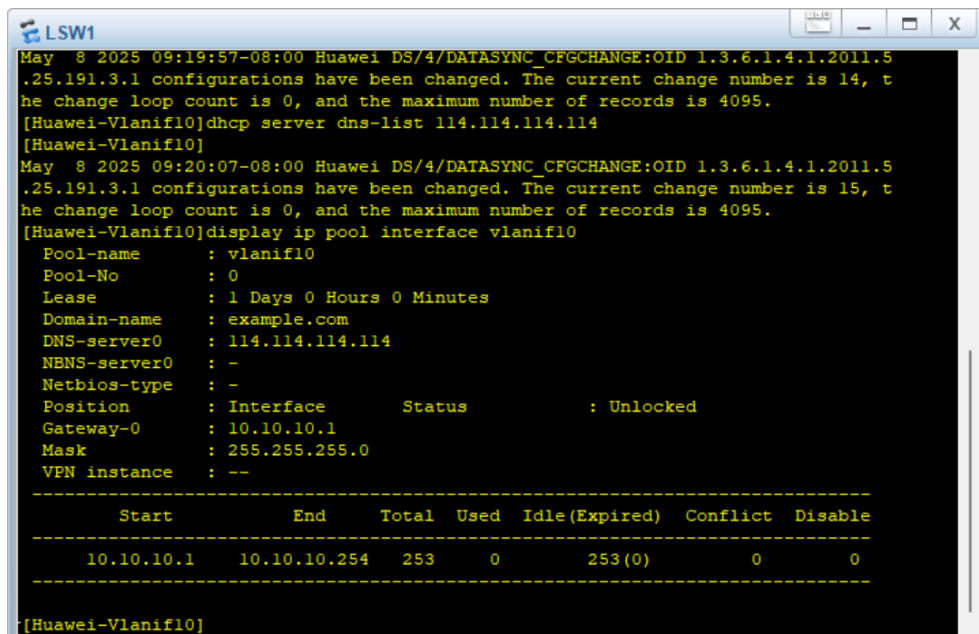


```
LSW1
The device is running!

[Huawei]interface vlanif 10
[Huawei-Vlanif10]quit
[Huawei]dhcp enable
[Huawei]interface vlanif 10
[Huawei-Vlanif10]dhcp select interface
[Huawei-Vlanif10]
May 8 2025 09:19:37-08:00 Huawei 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 13, t
he change loop count is 0, and the maximum number of records is 4095.
May 8 2025 09:19:38-08:00 Huawei %%01PHY/1/PHY(1) [5]: GigabitEthernet0/0/2:
change status to down
May 8 2025 09:19:38-08:00 Huawei %%01IFNET/4/IF_STATE(1) [6]:Interface Vlanif100
has turned into DOWN state.
May 8 2025 09:19:38-08:00 Huawei %%01IFNET/4/LINK_STATE(1) [7]:The line protocol
IP on the interface Vlanif100 has entered the DOWN state.
May 8 2025 09:19:39-08:00 Huawei %%01PHY/1/PHY(1) [8]: GigabitEthernet0/0/2:
change status to up
May 8 2025 09:19:39-08:00 Huawei %%01IFNET/4/IF_STATE(1) [9]:Interface Vlanif100
has turned into UP state.
May 8 2025 09:19:39-08:00 Huawei %%01IFNET/4/LINK_STATE(1) [10]:The line protoco
l IP on the interface Vlanif100 has entered the UP state.
[Huawei-Vlanif10]dhcp server gateway-list 10.10.10.1
^
Error: Unrecognized command found at '^' position.
[Huawei-Vlanif10]dhcp server domain-name example.com
```

图 1 路由器 1 配置 DHCP

2. 查看 DHCP 地址池信息的截图 2



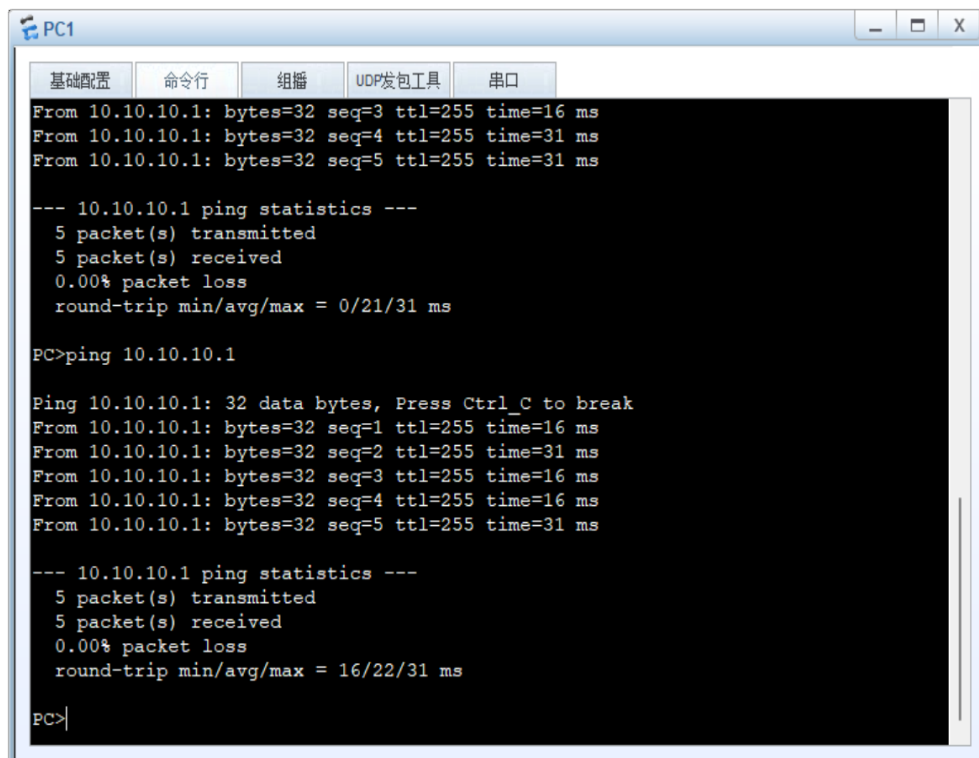
```
LSW1
May 8 2025 09:19:57-08:00 Huawei DS/4/DATASYNC_CFGCHANGE:OID 1.3.6.1.4.1.2011.5
.25.191.3.1 configurations have been changed. The current change number is 14, t
he change loop count is 0, and the maximum number of records is 4095.
[Huawei-Vlanif10]dhcp server dns-list 114.114.114.114
[Huawei-Vlanif10]
May 8 2025 09:20:07-08:00 Huawei 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 15, t
he change loop count is 0, and the maximum number of records is 4095.
[Huawei-Vlanif10]display ip pool interface vlanif10
Pool-name       : vlanif10
Pool-No        : 0
Lease           : 1 Days 0 Hours 0 Minutes
Domain-name     : example.com
DNS-server0    : 114.114.114.114
NBNS-server0   : -
Netbios-type   : -
Position        : Interface      Status      : Unlocked
Gateway-0      : 10.10.10.1
Mask           : 255.255.255.0
VPN instance    : --

-----
Start          End          Total Used Idle(Expired) Conflict Disable
-----
10.10.10.1     10.10.10.254 253    0    253(0)      0      0
-----

[Huawei-Vlanif10]
```

图 2 查看 DHCP 地址池信息

3. 交换机上配置好 DHCP 服务后在 PC1 上 ping 10.10.10.1 wireshark 抓包截图 3



```
PC1
基础配置  命令行  组播  UDF发包工具  串口

From 10.10.10.1: bytes=32 seq=3 ttl=255 time=16 ms
From 10.10.10.1: bytes=32 seq=4 ttl=255 time=31 ms
From 10.10.10.1: bytes=32 seq=5 ttl=255 time=31 ms

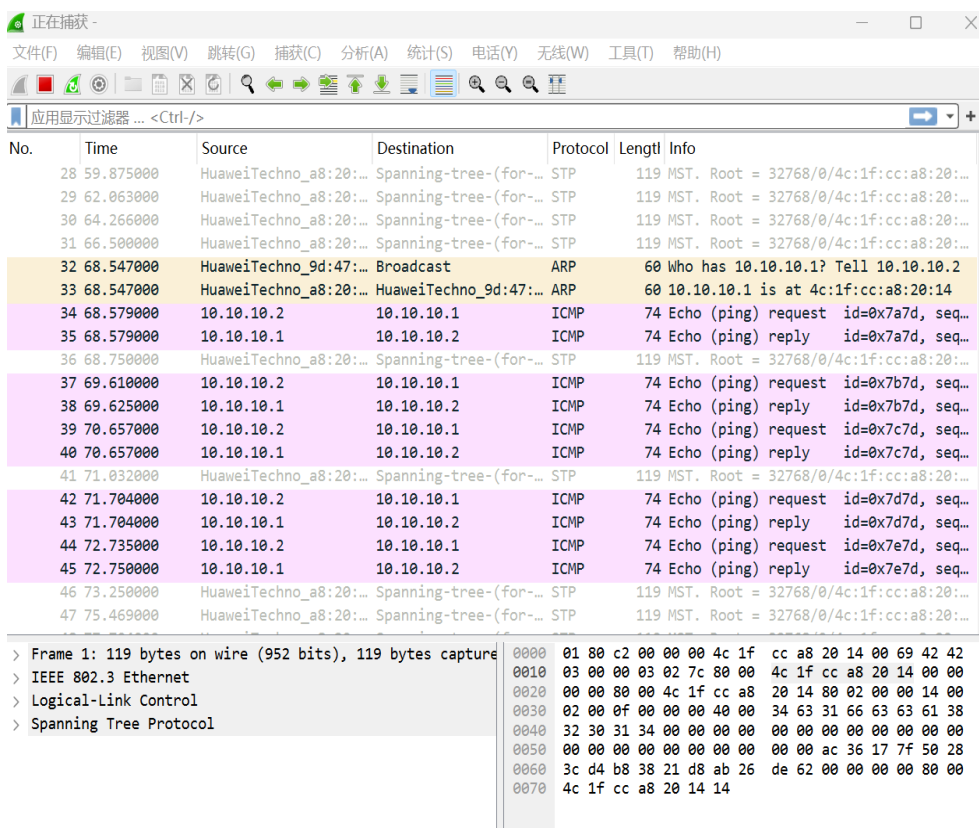
--- 10.10.10.1 ping statistics ---
 5 packet(s) transmitted
 5 packet(s) received
 0.00% packet loss
 round-trip min/avg/max = 0/21/31 ms

PC>ping 10.10.10.1

Ping 10.10.10.1: 32 data bytes, Press Ctrl_C to break
From 10.10.10.1: bytes=32 seq=1 ttl=255 time=16 ms
From 10.10.10.1: bytes=32 seq=2 ttl=255 time=31 ms
From 10.10.10.1: bytes=32 seq=3 ttl=255 time=16 ms
From 10.10.10.1: bytes=32 seq=4 ttl=255 time=16 ms
From 10.10.10.1: bytes=32 seq=5 ttl=255 time=31 ms

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

PC>|
```



No.	Time	Source	Destination	Protocol	Length	Info
28	59.875000	HuaweiTechno_a8:20:...	Spanning-tree-(for...	STP	119	MST. Root = 32768/0/4c:1f:cc:a8:20:...
29	62.063000	HuaweiTechno_a8:20:...	Spanning-tree-(for...	STP	119	MST. Root = 32768/0/4c:1f:cc:a8:20:...
30	64.266000	HuaweiTechno_a8:20:...	Spanning-tree-(for...	STP	119	MST. Root = 32768/0/4c:1f:cc:a8:20:...
31	66.500000	HuaweiTechno_a8:20:...	Spanning-tree-(for...	STP	119	MST. Root = 32768/0/4c:1f:cc:a8:20:...
32	68.547000	HuaweiTechno_9d:47:...	Broadcast	ARP	60	Who has 10.10.10.1? Tell 10.10.10.2
33	68.547000	HuaweiTechno_a8:20:...	HuaweiTechno_9d:47:...	ARP	60	10.10.10.1 is at 4c:1f:cc:a8:20:14
34	68.579000	10.10.10.2	10.10.10.1	ICMP	74	Echo (ping) request id=0x7a7d, seq...
35	68.579000	10.10.10.1	10.10.10.2	ICMP	74	Echo (ping) reply id=0x7a7d, seq...
36	68.750000	HuaweiTechno_a8:20:...	Spanning-tree-(for...	STP	119	MST. Root = 32768/0/4c:1f:cc:a8:20:...
37	69.610000	10.10.10.2	10.10.10.1	ICMP	74	Echo (ping) request id=0x7b7d, seq...
38	69.625000	10.10.10.1	10.10.10.2	ICMP	74	Echo (ping) reply id=0x7b7d, seq...
39	70.657000	10.10.10.2	10.10.10.1	ICMP	74	Echo (ping) request id=0x7c7d, seq...
40	70.657000	10.10.10.1	10.10.10.2	ICMP	74	Echo (ping) reply id=0x7c7d, seq...
41	71.032000	HuaweiTechno_a8:20:...	Spanning-tree-(for...	STP	119	MST. Root = 32768/0/4c:1f:cc:a8:20:...
42	71.704000	10.10.10.2	10.10.10.1	ICMP	74	Echo (ping) request id=0x7d7d, seq...
43	71.704000	10.10.10.1	10.10.10.2	ICMP	74	Echo (ping) reply id=0x7d7d, seq...
44	72.735000	10.10.10.2	10.10.10.1	ICMP	74	Echo (ping) request id=0x7e7d, seq...
45	72.750000	10.10.10.1	10.10.10.2	ICMP	74	Echo (ping) reply id=0x7e7d, seq...
46	73.250000	HuaweiTechno_a8:20:...	Spanning-tree-(for...	STP	119	MST. Root = 32768/0/4c:1f:cc:a8:20:...
47	75.469000	HuaweiTechno_a8:20:...	Spanning-tree-(for...	STP	119	MST. Root = 32768/0/4c:1f:cc:a8:20:...

> Frame 1: 119 bytes on wire (952 bits), 119 bytes captured
> IEEE 802.3 Ethernet
> Logical-Link Control
> Spanning Tree Protocol

0000 01 80 c2 00 00 00 4c 1f cc a8 20 14 00 69 42 42
0010 03 00 00 03 02 7c 80 00 4c 1f cc a8 20 14 00 00
0020 00 00 80 00 4c 1f cc a8 20 14 80 02 00 00 14 00
0030 02 00 0f 00 00 00 40 00 34 63 31 66 63 63 61 38
0040 32 30 31 34 00 00 00 00 00 00 00 00 00 00 00 00
0050 00 00 00 00 00 00 00 00 00 00 ac 36 17 7f 50 28
0060 3c d4 b8 38 21 d8 ab 26 de 62 00 00 00 00 80 00
0070 4c 1f cc a8 20 14 14

图 3 Ping 10.10.10.1 wireshark 抓包

4. 在 PC1 的设置里把静态路由改成 DHCP，然后在 PC1 的命令行里输入 ipconfig/renew 查看 PC 机上查看分配到的 IP 地址，网关地址，DNS 地址等



图 4 ipconfig/renew 指令查看信息

- 5.按照下图流程把 3 台交换机都配置好静态路由之后，在 R1 命令行里输入 display ip routing-table 命令显示路由表截图 5

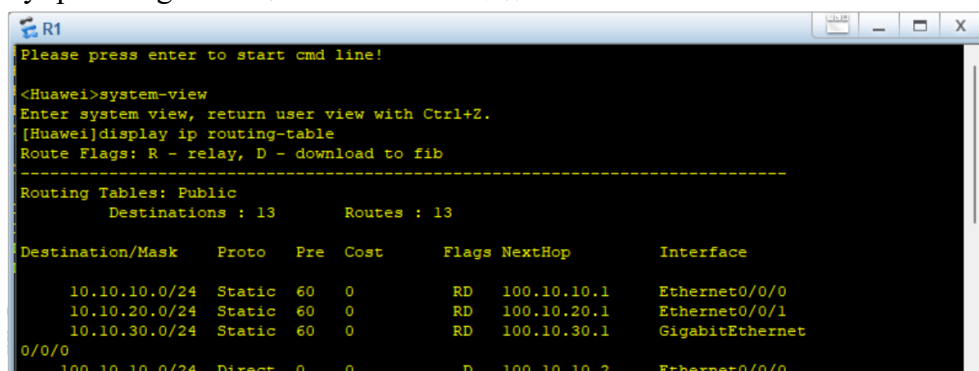


图 5 display ip routing-table 指令

6. PC1 ping 通 200.10.70.1 的截图 6

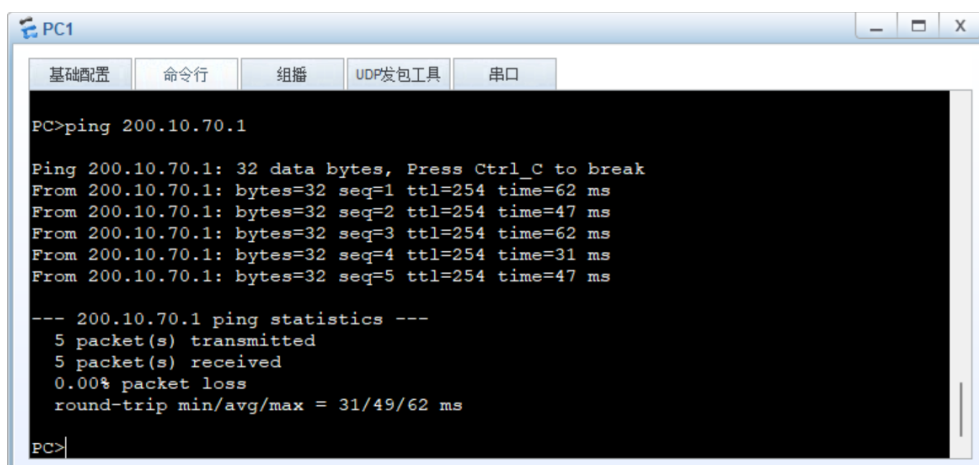


图 6 PC1 ping 200.10.70.1

7.文字解释 1 静态路由配置中下一条地址的作用。例如在本实验中，交换机配置的下一跳地址为何是 100.10.10.2 ？

（1）下一跳地址的作用：

静态路由配置中，“下一跳地址”是指数据包到达目的网络之前，所要到达的下一个路由设备的 IP 地址。它告诉当前设备，数据包应该转发给谁，以继续向目的地址前进。

（2）交换机配置的下一跳地址为何是 100.10.10.2？

本实验目标地址是 200.10.70.1，这个地址不在交换机本地的直连网段中，需要通过路由器转发数据包。交换机与路由器 AR1 之间通过 VLAN100 网络互联，交换机的接口地址是 100.10.10.1，而 AR1 的接口地址是 100.10.10.2。这两个地址处于同一网段内，是彼此的直连邻居。

交换机要将目的地址为 200.10.70.1 的数据包转发出去，就必须先把数据包送到与它相连的 AR1 路由器，即把数据包的下一跳设置为 100.10.10.2，由 AR1 继续根据其路由表决定下一步如何转发。

实验到此完成。