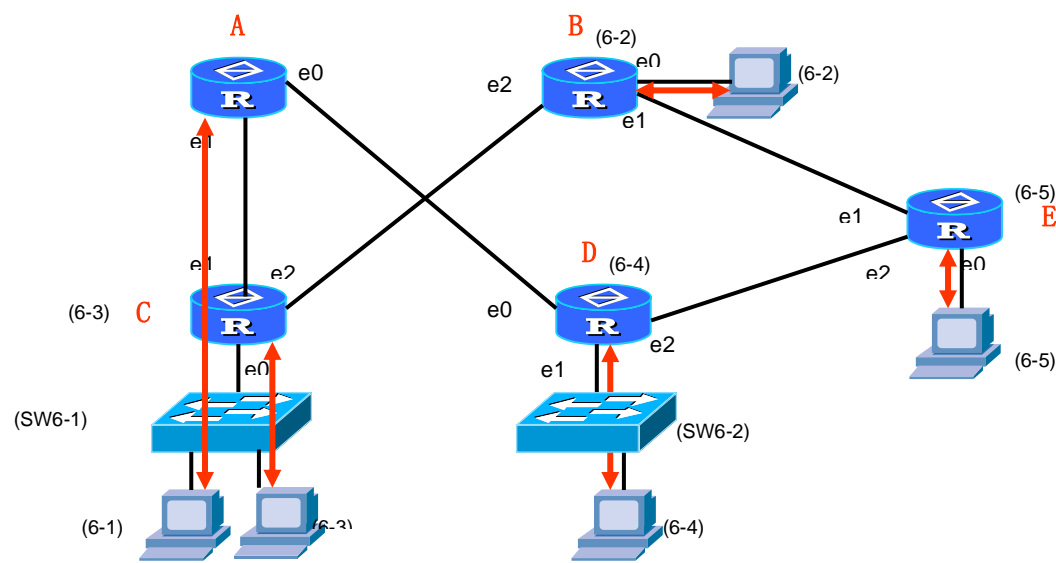


# 实验报告   RIP 路由实验

*Hollow Man*

## 一、实验小组拓扑



## 二、实验准备

分析拓扑图之后，为了避免造成 IP 地址的浪费，我们选择了 C 类网络。

### 1、路由器网络地址方案设计

	E0	E1	E2
A	219.246.2.1/24	219.246.1.1/24	
B	219.246.9.1/24	219.246.8.2/24	219.246.4.2/24
C	219.246.3.1/24	219.246.1.2/24	219.246.4.1/24
D	219.246.2.2/24	219.246.5.1/24	219.246.6.1/24
E	219.246.7.1/24	219.246.8.1/24	219.246.6.2/24

2、PC 机设置方案

主机序号	IP 地址	网关
6-1	219.246.3.2/24	219.246.3.1/24
6-2	219.246.9.2/24	219.246.9.1/24
6-3	219.246.3.3/24	219.246.3.1/24
6-4	219.246.5.2/24	219.246.5.1/24
6-5	219.246.7.2/24	219.246.7.1/24

三、实验内容

1.为各个主机设置 IP 地址和网关

基础配置

命令行

组播

UDP发包工具

串口

主机名:

1

MAC 地址:

54-89-98-88-04-1C

IPv4 配置

☒ 静态

☐ DHCP

☐ 自动获取 DNS 服务器地址

IP 地址:

219 . 246 . 3 . 2

DNS1:

0 . 0 . 0 . 0

子网掩码:

255 . 255 . 255 . 0

DNS2:

0 . 0 . 0 . 0

网关:

219 . 246 . 3 . 1

IPv6 配置

☒ 静态

☐ DHCPv6

IPv6 地址:

::

前缀长度:

128

IPv6 网关:

::

应用

主机 6-1



Figure 6-2 shows a network configuration window with the following settings:

- Host Name:** (Empty text box)
- MAC Address:** 54-89-98-C1-24-66
- IPv4 Configuration:**
  - ☒ Static (Selected)
  - ☐ DHCP
  - ☐ Automatically obtain DNS server address
  - IP Address:** 219 . 246 . 9 . 2
  - Subnet Mask:** 255 . 255 . 255 . 0
  - Gateway:** 219 . 246 . 9 . 1
  - DNS1:** 0 . 0 . 0 . 0
  - DNS2:** 0 . 0 . 0 . 0
- IPv6 Configuration:**
  - ☒ Static (Selected)
  - ☐ DHCPv6
  - IPv6 Address:** ::
  - Prefix Length:** 128
  - IPv6 Gateway:** ::
- Buttons:** 应用 (Apply)

6-2



Figure 6-3 shows a network configuration window with the following settings:

- Host Name:** (Empty text box)
- MAC Address:** 54-89-98-0B-1E-73
- IPv4 Configuration:**
  - ☒ Static (Selected)
  - ☐ DHCP
  - ☐ Automatically obtain DNS server address
  - IP Address:** 219 . 246 . 3 . 3
  - Subnet Mask:** 255 . 255 . 255 . 0
  - Gateway:** 219 . 246 . 3 . 1
  - DNS1:** 0 . 0 . 0 . 0
  - DNS2:** 0 . 0 . 0 . 0
- IPv6 Configuration:**
  - ☒ Static (Selected)
  - ☐ DHCPv6
  - IPv6 Address:** ::
  - Prefix Length:** 128
  - IPv6 Gateway:** ::
- Buttons:** 应用 (Apply)

6-3

4

基础配置

命令行

组播

UDP发包工具

串口

主机名:

MAC 地址:

54-89-98-5E-21-CF

IPv4 配置

静态

DHCP

自动获取 DNS 服务器地址

IP 地址:

219 . 246 . 5 . 2

DNS1:

0 . 0 . 0 . 0

子网掩码:

255 . 255 . 255 . 0

DNS2:

0 . 0 . 0 . 0

网关:

219 . 246 . 5 . 1

IPv6 配置

静态

DHCPv6

IPv6 地址:

::

前缀长度:

128

IPv6 网关:

::

应用

6-4

5

基础配置

命令行

组播

UDP发包工具

串口

主机名:

MAC 地址:

54-89-98-19-1A-AD

IPv4 配置

静态

DHCP

自动获取 DNS 服务器地址

IP 地址:

219 . 246 . 7 . 2

DNS1:

0 . 0 . 0 . 0

子网掩码:

255 . 255 . 255 . 0

DNS2:

0 . 0 . 0 . 0

网关:

219 . 246 . 7 . 1

IPv6 配置

静态

DHCPv6

IPv6 地址:

::

前缀长度:

128

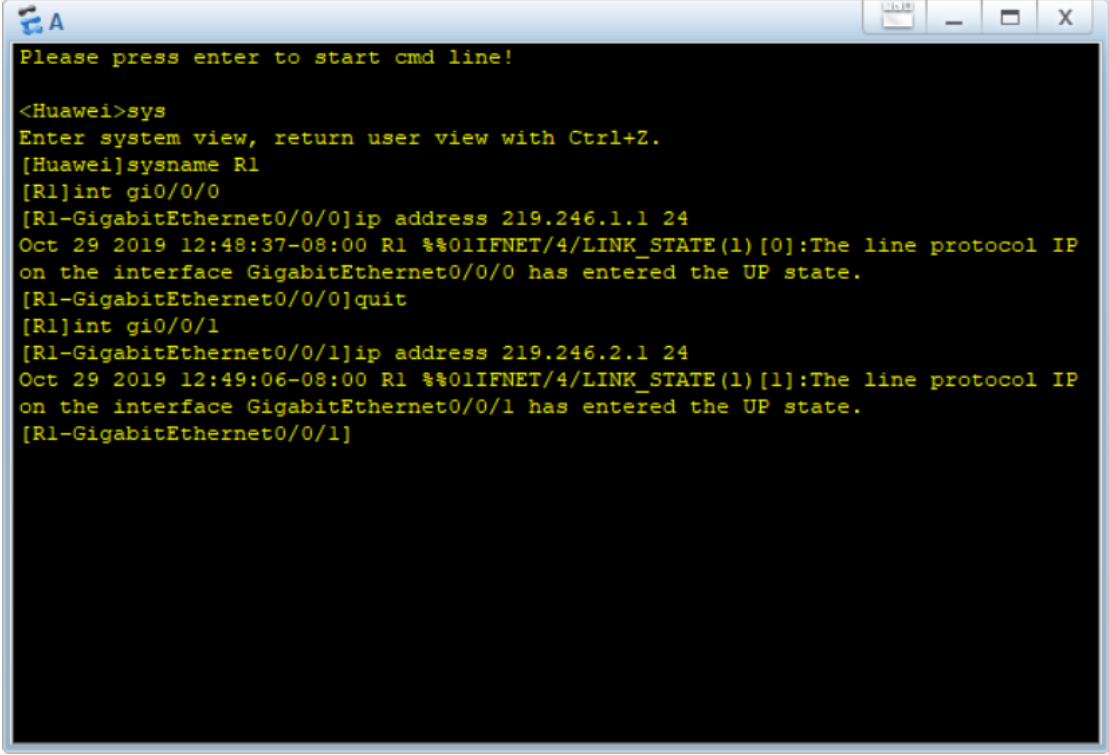
IPv6 网关:

::

应用

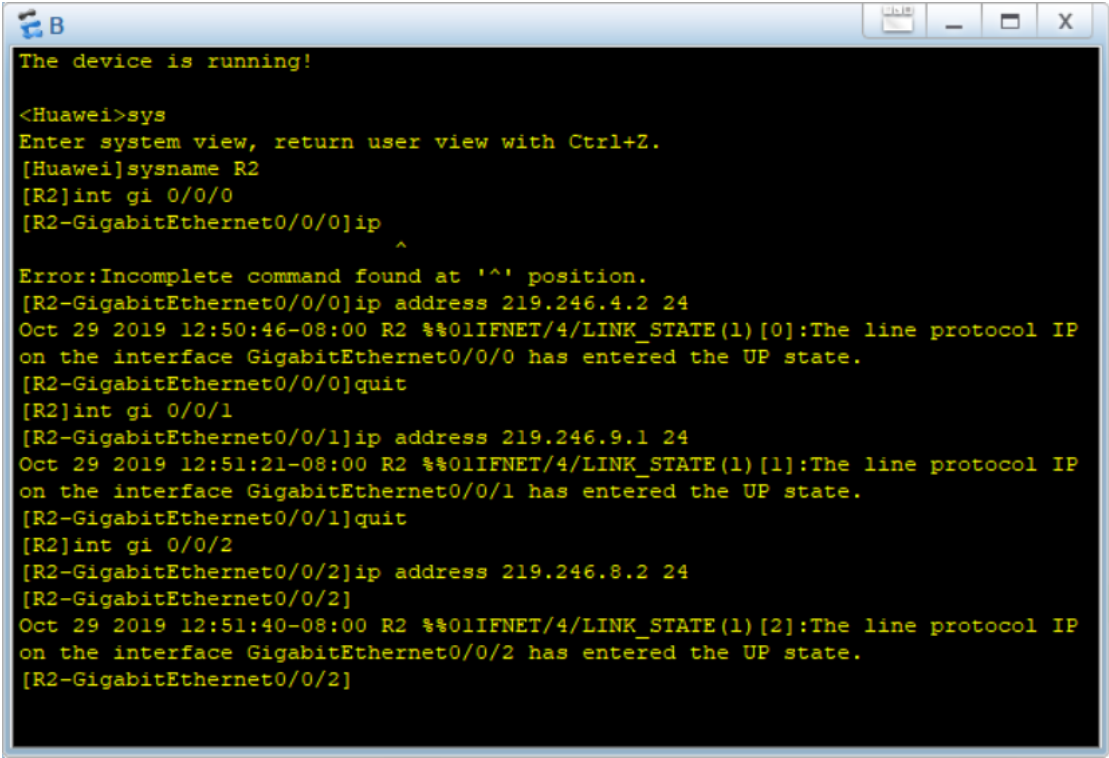
6-5

## 2.为路由器配置 ip 地址

A screenshot of a terminal window titled 'A' showing the configuration of Router R1. The prompt is '<Huawei>'. The user enters 'sys' to enter system view. The prompt changes to '[Huawei]'. The user enters 'sysname R1' to set the router name. The prompt changes to '[R1]'. The user enters 'int gi0/0/0' to enter interface view. The prompt changes to '[R1-GigabitEthernet0/0/0]'. The user enters 'ip address 219.246.1.1 24'. The system returns a message: 'Oct 29 2019 12:48:37-08:00 R1 %01IFNET/4/LINK\_STATE(1)[0]:The line protocol IP on the interface GigabitEthernet0/0/0 has entered the UP state.' The user enters 'quit' to return to router view. The prompt changes to '[R1]'. The user enters 'int gi0/0/1'. The prompt changes to '[R1-GigabitEthernet0/0/1]'. The user enters 'ip address 219.246.2.1 24'. The system returns a message: 'Oct 29 2019 12:49:06-08:00 R1 %01IFNET/4/LINK\_STATE(1)[1]:The line protocol IP on the interface GigabitEthernet0/0/1 has entered the UP state.' The user enters 'quit' to return to router view. The prompt changes to '[R1-GigabitEthernet0/0/1]'.

```
<Huawei>sys
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname R1
[R1]int gi0/0/0
[R1-GigabitEthernet0/0/0]ip address 219.246.1.1 24
Oct 29 2019 12:48:37-08:00 R1 %01IFNET/4/LINK_STATE(1)[0]:The line protocol IP
on the interface GigabitEthernet0/0/0 has entered the UP state.
[R1-GigabitEthernet0/0/0]quit
[R1]int gi0/0/1
[R1-GigabitEthernet0/0/1]ip address 219.246.2.1 24
Oct 29 2019 12:49:06-08:00 R1 %01IFNET/4/LINK_STATE(1)[1]:The line protocol IP
on the interface GigabitEthernet0/0/1 has entered the UP state.
[R1-GigabitEthernet0/0/1]
```

路由器 R1

A screenshot of a terminal window titled 'B' showing the configuration of Router R2. The prompt is '<Huawei>'. The user enters 'sys' to enter system view. The prompt changes to '[Huawei]'. The user enters 'sysname R2' to set the router name. The prompt changes to '[R2]'. The user enters 'int gi 0/0/0'. The prompt changes to '[R2-GigabitEthernet0/0/0]'. The user enters 'ip ^'. The system returns an error: 'Error:Incomplete command found at '^' position.' The user enters 'ip address 219.246.4.2 24'. The system returns a message: 'Oct 29 2019 12:50:46-08:00 R2 %01IFNET/4/LINK\_STATE(1)[0]:The line protocol IP on the interface GigabitEthernet0/0/0 has entered the UP state.' The user enters 'quit' to return to router view. The prompt changes to '[R2]'. The user enters 'int gi 0/0/1'. The prompt changes to '[R2-GigabitEthernet0/0/1]'. The user enters 'ip address 219.246.9.1 24'. The system returns a message: 'Oct 29 2019 12:51:21-08:00 R2 %01IFNET/4/LINK\_STATE(1)[1]:The line protocol IP on the interface GigabitEthernet0/0/1 has entered the UP state.' The user enters 'quit' to return to router view. The prompt changes to '[R2]'. The user enters 'int gi 0/0/2'. The prompt changes to '[R2-GigabitEthernet0/0/2]'. The user enters 'ip address 219.246.8.2 24'. The system returns a message: 'Oct 29 2019 12:51:40-08:00 R2 %01IFNET/4/LINK\_STATE(1)[2]:The line protocol IP on the interface GigabitEthernet0/0/2 has entered the UP state.' The user enters 'quit' to return to router view. The prompt changes to '[R2-GigabitEthernet0/0/2]'.

```
The device is running!

<Huawei>sys
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname R2
[R2]int gi 0/0/0
[R2-GigabitEthernet0/0/0]ip ^
Error:Incomplete command found at '^' position.
[R2-GigabitEthernet0/0/0]ip address 219.246.4.2 24
Oct 29 2019 12:50:46-08:00 R2 %01IFNET/4/LINK_STATE(1)[0]:The line protocol IP
on the interface GigabitEthernet0/0/0 has entered the UP state.
[R2-GigabitEthernet0/0/0]quit
[R2]int gi 0/0/1
[R2-GigabitEthernet0/0/1]ip address 219.246.9.1 24
Oct 29 2019 12:51:21-08:00 R2 %01IFNET/4/LINK_STATE(1)[1]:The line protocol IP
on the interface GigabitEthernet0/0/1 has entered the UP state.
[R2-GigabitEthernet0/0/1]quit
[R2]int gi 0/0/2
[R2-GigabitEthernet0/0/2]ip address 219.246.8.2 24
[R2-GigabitEthernet0/0/2]
Oct 29 2019 12:51:40-08:00 R2 %01IFNET/4/LINK_STATE(1)[2]:The line protocol IP
on the interface GigabitEthernet0/0/2 has entered the UP state.
[R2-GigabitEthernet0/0/2]
```

路由器 R2

```
The device is running!

<Huawei>sys
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname R3
[R3]int gi 0/0/0
[R3-GigabitEthernet0/0/0]ip address 219.246.1.2 24
Oct 29 2019 12:53:26-08:00 R3 %%01IFNET/4/LINK_STATE(1)[0]:The line protocol IP
on the interface GigabitEthernet0/0/0 has entered the UP state.
[R3-GigabitEthernet0/0/0]quit
[R3]int gi 0/0/1
[R3-GigabitEthernet0/0/1]ip address 219.246.4.1 24
Oct 29 2019 12:53:58-08:00 R3 %%01IFNET/4/LINK_STATE(1)[1]:The line protocol IP
on the interface GigabitEthernet0/0/1 has entered the UP state.
[R3-GigabitEthernet0/0/1]quit
[R3]int gi 0/0/2
[R3-GigabitEthernet0/0/2]ip address 219.246.3.1 24
[R3-GigabitEthernet0/0/2]
Oct 29 2019 12:54:24-08:00 R3 %%01IFNET/4/LINK_STATE(1)[2]:The line protocol IP
on the interface GigabitEthernet0/0/2 has entered the UP state.
[R3-GigabitEthernet0/0/2]
```

路由器 R3

```
The device is running!

<Huawei>sys
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname
^
Error:Incomplete command found at '^' position.
[Huawei]sysname R4
[R4]int gi 0/0/0
[R4-GigabitEthernet0/0/0]ip address 219.246.2.2 24
Oct 29 2019 12:55:44-08:00 R4 %%01IFNET/4/LINK_STATE(1)[0]:The line protocol IP
on the interface GigabitEthernet0/0/0 has entered the UP state.
[R4-GigabitEthernet0/0/0]quit
[R4]int gi 0/0/1
[R4-GigabitEthernet0/0/1]ip address 219.246.6.1 24
[R4-GigabitEthernet0/0/1]
Oct 29 2019 12:56:27-08:00 R4 %%01IFNET/4/LINK_STATE(1)[1]:The line protocol IP
on the interface GigabitEthernet0/0/1 has entered the UP state.
[R4-GigabitEthernet0/0/1]quit
[R4]int gi 0/0/2
[R4-GigabitEthernet0/0/2]ip address 219.246.5.1 24
[R4-GigabitEthernet0/0/2]
Oct 29 2019 12:57:00-08:00 R4 %%01IFNET/4/LINK_STATE(1)[2]:The line protocol IP
on the interface GigabitEthernet0/0/2 has entered the UP state.
[R4-GigabitEthernet0/0/2]
```

路由器 R4

```
The device is running!

<Huawei>sys
Enter system view, return user view with Ctrl+Z.
[Huawei]sysname R5
[R5]int gi 0/0/0
[R5-GigabitEthernet0/0/0]ip address 219.246.8.1 24
Oct 29 2019 12:58:19-08:00 R5 %%01IFNET/4/LINK_STATE(1)[0]:The line protocol IP
on the interface GigabitEthernet0/0/0 has entered the UP state.
[R5-GigabitEthernet0/0/0]quit
[R5]int gi 0/0/1
[R5-GigabitEthernet0/0/1]ip address 219.246.6.2 24
Oct 29 2019 12:58:55-08:00 R5 %%01IFNET/4/LINK_STATE(1)[1]:The line protocol IP
on the interface GigabitEthernet0/0/1 has entered the UP state.
[R5-GigabitEthernet0/0/1]quit
[R5]int gi 0/0/2
[R5-GigabitEthernet0/0/2]ip address 219.246.7.1 24
Oct 29 2019 12:59:18-08:00 R5 %%01IFNET/4/LINK_STATE(1)[2]:The line protocol IP
on the interface GigabitEthernet0/0/2 has entered the UP state.
[R5-GigabitEthernet0/0/2]
```

路由器 R5

### 3.配置 rip1

```
<R1>sys
Enter system view, return user view with Ctrl+Z.
[R1]rip
[R1-rip-1]network 219.246.2.0
[R1-rip-1]network 219.246.1.0
[R1-rip-1]quit
[R1]
```

路由器 R1

```
<R2>sys
Enter system view, return user view with Ctrl+Z.
[R2]rip
[R2-rip-1]network 219.246.9.0
[R2-rip-1]network 219.246.8.0
[R2-rip-1]network 219.246.4.0
[R2-rip-1]quit
[R2]
```

路由器 R2

```
<R3>SYS
Enter system view, return user view with Ctrl+Z.
[R3]RIP
[R3-rip-1]NETWORK 219.246.3.0
[R3-rip-1]NETWORK 219.246.1.0
[R3-rip-1]NETWORK 219.246.4.0
[R3-rip-1]QUIT
[R3]
```

路由器 R3

```
<R4>sys
Enter system view, return user view with Ctrl+Z.
[R4]rip
[R4-rip-1]network 219.246.2.0
[R4-rip-1]network 219.246.5.0
[R4-rip-1]network 219.246.6.0
[R4-rip-1]quit
[R4]
```

路由器 R4

```
<R5>sys
Enter system view, return user view with Ctrl+Z.
[R5]rip
[R5-rip-1]network 219.246.7.0
[R5-rip-1]network 219.246.8.0
[R5-rip-1]network 219.246.6.0
[R5-rip-1]quit
[R5]
```

路由器 R5

#### 4. 查看路由表信息



```
<R1>sys
Enter system view, return user view with Ctrl+Z.
[R1]display ip ro
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
Destinations : 17      Routes : 18

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
219.246.1.0/24       Direct  0    0        D  219.246.1.1       GigabitEthernet
0/0/0
219.246.1.1/32       Direct  0    0        D  127.0.0.1         GigabitEthernet
0/0/0
219.246.1.255/32     Direct  0    0        D  127.0.0.1         GigabitEthernet
0/0/0
219.246.2.0/24       Direct  0    0        D  219.246.2.1       GigabitEthernet
0/0/1
219.246.2.1/32       Direct  0    0        D  127.0.0.1         GigabitEthernet
0/0/1
219.246.2.255/32     Direct  0    0        D  127.0.0.1         GigabitEthernet
0/0/1
219.246.3.0/24       RIP     100  1        D  219.246.1.2       GigabitEthernet
0/0/0
219.246.4.0/24       RIP     100  1        D  219.246.1.2       GigabitEthernet
0/0/0
219.246.5.0/24       RIP     100  1        D  219.246.2.2       GigabitEthernet
0/0/1
219.246.6.0/24       RIP     100  1        D  219.246.2.2       GigabitEthernet
0/0/1
219.246.7.0/24       RIP     100  2        D  219.246.2.2       GigabitEthernet
0/0/1
219.246.8.0/24       RIP     100  2        D  219.246.1.2       GigabitEthernet
0/0/0
                RIP     100  2        D  219.246.2.2       GigabitEthernet
0/0/1
219.246.9.0/24       RIP     100  2        D  219.246.1.2       GigabitEthernet
0/0/0
255.255.255.255/32   Direct  0    0        D  127.0.0.1         InLoopBack0
```

路由器 R1

```
<R2>
<R2>display ip ro
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
Destinations : 19      Routes : 20

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
219.246.1.0/24      RIP      100  1        D  219.246.4.1      GigabitEthernet
0/0/0
219.246.2.0/24      RIP      100  2        D  219.246.4.1      GigabitEthernet
0/0/0
0/0/2               RIP      100  2        D  219.246.8.1      GigabitEthernet
219.246.3.0/24      RIP      100  1        D  219.246.4.1      GigabitEthernet
0/0/0
219.246.4.0/24      Direct   0    0        D  219.246.4.2      GigabitEthernet
0/0/0
219.246.4.2/32      Direct   0    0        D  127.0.0.1        GigabitEthernet
0/0/0
219.246.4.255/32    Direct   0    0        D  127.0.0.1        GigabitEthernet
0/0/0
219.246.5.0/24      RIP      100  2        D  219.246.8.1      GigabitEthernet
0/0/2
219.246.6.0/24      RIP      100  1        D  219.246.8.1      GigabitEthernet
0/0/2
219.246.7.0/24      RIP      100  1        D  219.246.8.1      GigabitEthernet
0/0/2
219.246.8.0/24      Direct   0    0        D  219.246.8.2      GigabitEthernet
0/0/2
219.246.8.2/32      Direct   0    0        D  127.0.0.1        GigabitEthernet
0/0/2
219.246.8.255/32    Direct   0    0        D  127.0.0.1        GigabitEthernet
0/0/2
219.246.9.0/24      Direct   0    0        D  219.246.9.1      GigabitEthernet
0/0/1
219.246.9.1/32      Direct   0    0        D  127.0.0.1        GigabitEthernet
0/0/1
219.246.9.255/32    Direct   0    0        D  127.0.0.1        GigabitEthernet
0/0/1
255.255.255.255/32  Direct   0    0        D  127.0.0.1        InLoopBack0
```

路由器 R2

```
Error: Ambiguous command found at '^' position.
<R3> display ip ro
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
Destinations : 19      Routes : 20

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
219.246.1.0/24       Direct  0    0       D  219.246.1.2       GigabitEthernet
0/0/0
219.246.1.2/32       Direct  0    0       D  127.0.0.1         GigabitEthernet
0/0/0
219.246.1.255/32     Direct  0    0       D  127.0.0.1         GigabitEthernet
0/0/0
219.246.2.0/24       RIP     100  1       D  219.246.1.1       GigabitEthernet
0/0/0
219.246.3.0/24       Direct  0    0       D  219.246.3.1       GigabitEthernet
0/0/2
219.246.3.1/32       Direct  0    0       D  127.0.0.1         GigabitEthernet
0/0/2
219.246.3.255/32     Direct  0    0       D  127.0.0.1         GigabitEthernet
0/0/2
219.246.4.0/24       Direct  0    0       D  219.246.4.1       GigabitEthernet
0/0/1
219.246.4.1/32       Direct  0    0       D  127.0.0.1         GigabitEthernet
0/0/1
219.246.4.255/32     Direct  0    0       D  127.0.0.1         GigabitEthernet
0/0/1
219.246.5.0/24       RIP     100  2       D  219.246.1.1       GigabitEthernet
0/0/0
219.246.6.0/24       RIP     100  2       D  219.246.1.1       GigabitEthernet
0/0/0
                RIP     100  2       D  219.246.4.2       GigabitEthernet
0/0/1
219.246.7.0/24       RIP     100  2       D  219.246.4.2       GigabitEthernet
0/0/1
219.246.8.0/24       RIP     100  1       D  219.246.4.2       GigabitEthernet
0/0/1
219.246.9.0/24       RIP     100  1       D  219.246.4.2       GigabitEthernet
0/0/1
255.255.255.255/32   Direct  0    0       D  127.0.0.1         InLoopBack0

<R3>
```

路由器 R3

```
<R4>display ip ro
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
Destinations : 19      Routes : 20

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
219.246.1.0/24      RIP      100  1        D  219.246.2.1     GigabitEthernet
0/0/0
219.246.2.0/24      Direct   0    0        D  219.246.2.2     GigabitEthernet
0/0/0
219.246.2.2/32      Direct   0    0        D  127.0.0.1       GigabitEthernet
0/0/0
219.246.2.255/32    Direct   0    0        D  127.0.0.1       GigabitEthernet
0/0/0
219.246.3.0/24      RIP      100  2        D  219.246.2.1     GigabitEthernet
0/0/0
219.246.4.0/24      RIP      100  2        D  219.246.2.1     GigabitEthernet
0/0/0
                RIP      100  2        D  219.246.6.2     GigabitEthernet
0/0/1
219.246.5.0/24      Direct   0    0        D  219.246.5.1     GigabitEthernet
0/0/2
219.246.5.1/32      Direct   0    0        D  127.0.0.1       GigabitEthernet
0/0/2
219.246.5.255/32    Direct   0    0        D  127.0.0.1       GigabitEthernet
0/0/2
219.246.6.0/24      Direct   0    0        D  219.246.6.1     GigabitEthernet
0/0/1
219.246.6.1/32      Direct   0    0        D  127.0.0.1       GigabitEthernet
0/0/1
219.246.6.255/32    Direct   0    0        D  127.0.0.1       GigabitEthernet
0/0/1
219.246.7.0/24      RIP      100  1        D  219.246.6.2     GigabitEthernet
0/0/1
219.246.8.0/24      RIP      100  1        D  219.246.6.2     GigabitEthernet
0/0/1
219.246.9.0/24      RIP      100  2        D  219.246.6.2     GigabitEthernet
0/0/1
255.255.255.255/32  Direct   0    0        D  127.0.0.1       InLoopBack0
```

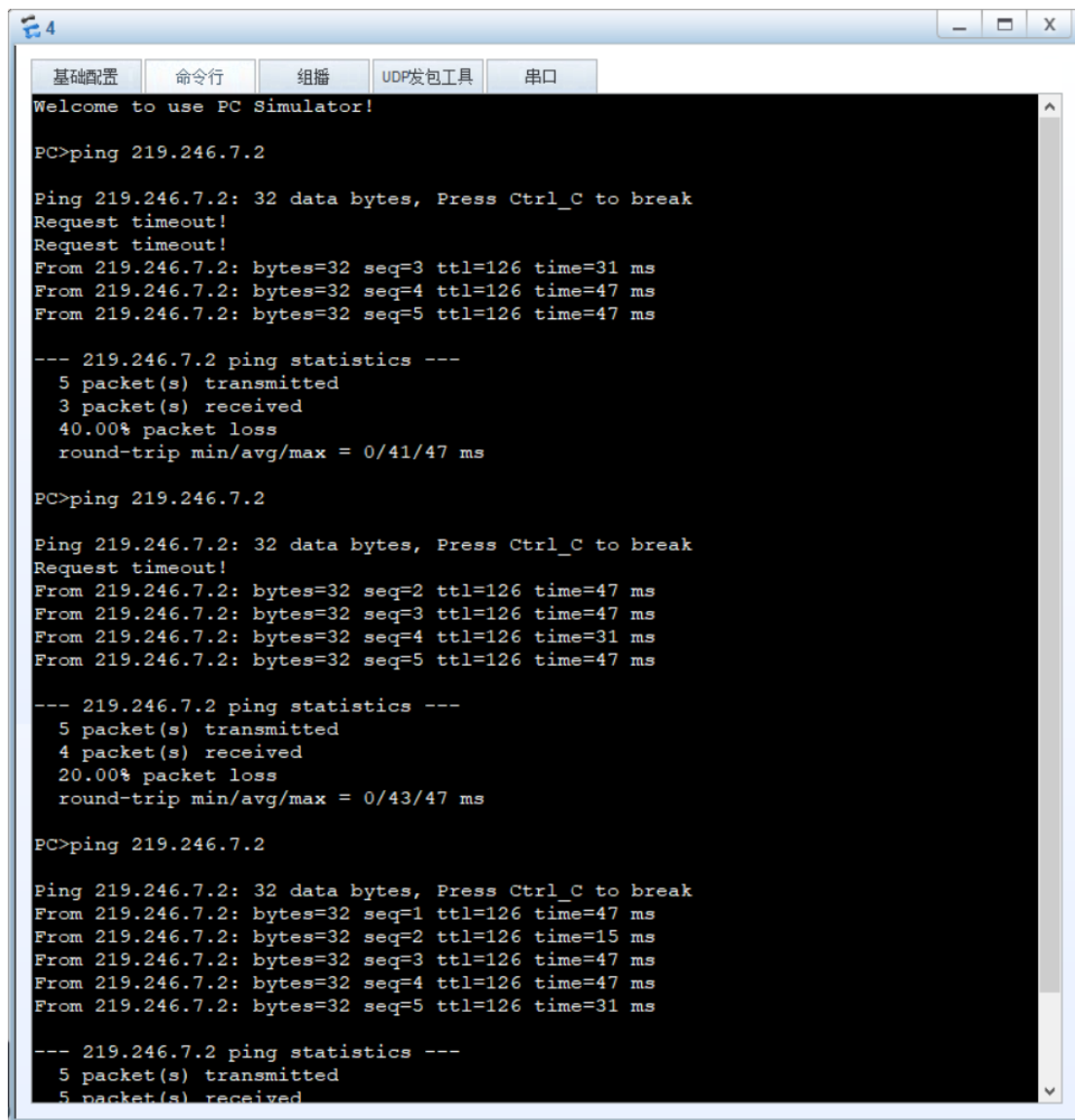
路由器 R4

```
<R5>display ip ro
Route Flags: R - relay, D - download to fib
-----
Routing Tables: Public
Destinations : 19      Routes : 20

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
219.246.1.0/24      RIP      100  2        D  219.246.8.2       GigabitEthernet
0/0/0
0/0/1              RIP      100  2        D  219.246.6.1       GigabitEthernet
219.246.2.0/24      RIP      100  1        D  219.246.6.1       GigabitEthernet
0/0/1
219.246.3.0/24      RIP      100  2        D  219.246.8.2       GigabitEthernet
0/0/0
219.246.4.0/24      RIP      100  1        D  219.246.8.2       GigabitEthernet
0/0/0
219.246.5.0/24      RIP      100  1        D  219.246.6.1       GigabitEthernet
0/0/1
219.246.6.0/24      Direct   0    0        D  219.246.6.2       GigabitEthernet
0/0/1
219.246.6.2/32      Direct   0    0        D  127.0.0.1         GigabitEthernet
0/0/1
219.246.6.255/32    Direct   0    0        D  127.0.0.1         GigabitEthernet
0/0/1
219.246.7.0/24      Direct   0    0        D  219.246.7.1       GigabitEthernet
0/0/2
219.246.7.1/32      Direct   0    0        D  127.0.0.1         GigabitEthernet
0/0/2
219.246.7.255/32    Direct   0    0        D  127.0.0.1         GigabitEthernet
0/0/2
219.246.8.0/24      Direct   0    0        D  219.246.8.1       GigabitEthernet
0/0/0
219.246.8.1/32      Direct   0    0        D  127.0.0.1         GigabitEthernet
0/0/0
219.246.8.255/32    Direct   0    0        D  127.0.0.1         GigabitEthernet
0/0/0
219.246.9.0/24      RIP      100  1        D  219.246.8.2       GigabitEthernet
0/0/0
255.255.255.255/32  Direct   0    0        D  127.0.0.1         InLoopBack0
```

路由器 R5

## 5. 测试连通性



```
PC4
基础配置 命令行 组播 UDP发包工具 串口
Welcome to use PC Simulator!

PC>ping 219.246.7.2

Ping 219.246.7.2: 32 data bytes, Press Ctrl_C to break
Request timeout!
Request timeout!
From 219.246.7.2: bytes=32 seq=3 ttl=126 time=31 ms
From 219.246.7.2: bytes=32 seq=4 ttl=126 time=47 ms
From 219.246.7.2: bytes=32 seq=5 ttl=126 time=47 ms

--- 219.246.7.2 ping statistics ---
 5 packet(s) transmitted
 3 packet(s) received
40.00% packet loss
round-trip min/avg/max = 0/41/47 ms

PC>ping 219.246.7.2

Ping 219.246.7.2: 32 data bytes, Press Ctrl_C to break
Request timeout!
From 219.246.7.2: bytes=32 seq=2 ttl=126 time=47 ms
From 219.246.7.2: bytes=32 seq=3 ttl=126 time=47 ms
From 219.246.7.2: bytes=32 seq=4 ttl=126 time=31 ms
From 219.246.7.2: bytes=32 seq=5 ttl=126 time=47 ms

--- 219.246.7.2 ping statistics ---
 5 packet(s) transmitted
 4 packet(s) received
20.00% packet loss
round-trip min/avg/max = 0/43/47 ms

PC>ping 219.246.7.2

Ping 219.246.7.2: 32 data bytes, Press Ctrl_C to break
From 219.246.7.2: bytes=32 seq=1 ttl=126 time=47 ms
From 219.246.7.2: bytes=32 seq=2 ttl=126 time=15 ms
From 219.246.7.2: bytes=32 seq=3 ttl=126 time=47 ms
From 219.246.7.2: bytes=32 seq=4 ttl=126 time=47 ms
From 219.246.7.2: bytes=32 seq=5 ttl=126 time=31 ms

--- 219.246.7.2 ping statistics ---
 5 packet(s) transmitted
 5 packet(s) received
```

不同网络下主机之间 ping（开始时会有包超时）

```
[R1]
<R1>ping 219.246.5.1
  PING 219.246.5.1: 56 data bytes, press CTRL_C to break
    Reply from 219.246.5.1: bytes=56 Sequence=1 ttl=255 time=50 ms
    Reply from 219.246.5.1: bytes=56 Sequence=2 ttl=255 time=40 ms
    Reply from 219.246.5.1: bytes=56 Sequence=3 ttl=255 time=20 ms
    Reply from 219.246.5.1: bytes=56 Sequence=4 ttl=255 time=20 ms
    Reply from 219.246.5.1: bytes=56 Sequence=5 ttl=255 time=20 ms

--- 219.246.5.1 ping statistics ---
 5 packet(s) transmitted
 5 packet(s) received
 0.00% packet loss
round-trip min/avg/max = 20/30/50 ms

<R1>
```

路由器到路由器 ping

```
PC>ping 219.246.3.1

Ping 219.246.3.1: 32 data bytes, Press Ctrl_C to break
From 219.246.3.1: bytes=32 seq=1 ttl=255 time=63 ms
From 219.246.3.1: bytes=32 seq=2 ttl=255 time=46 ms
From 219.246.3.1: bytes=32 seq=3 ttl=255 time=32 ms
From 219.246.3.1: bytes=32 seq=4 ttl=255 time=47 ms
From 219.246.3.1: bytes=32 seq=5 ttl=255 time=31 ms

--- 219.246.3.1 ping statistics ---
 5 packet(s) transmitted
 5 packet(s) received
 0.00% packet loss
 round-trip min/avg/max = 31/43/63 ms

PC>
```

同一网络下主机之间 ping

```
PC>tracert 219.246.3.1

tracert to 219.246.3.1, 8 hops max
(ICMP), press Ctrl+C to stop
 1  219.246.5.1    32 ms  47 ms  31 ms
 2  219.246.2.1    47 ms  47 ms  46 ms
 3  219.246.3.1    63 ms  62 ms  63 ms

PC>
```

主机与路由器之间 tracert

```
The device is running!

<R1>
<R1>save all
  The current configuration will be written to the device.
  Are you sure to continue? (y/n)[n]:y
  It will take several minutes to save configuration file, please wait.....
  Configuration file had been saved successfully
  Note: The configuration file will take effect after being activated
<R1>
<R1>tracert 219.246.2.2

  traceroute to 219.246.2.2(219.246.2.2), max hops: 30 ,packet length: 40,press
  CTRL_C to break

  1 219.246.2.2 60 ms 20 ms 20 ms
<R1>tracert 219.246.1.2

  traceroute to 219.246.1.2(219.246.1.2), max hops: 30 ,packet length: 40,press
  CTRL_C to break

  1 219.246.1.2 60 ms 30 ms 20 ms
<R1>
```

路由器之间 tracert

```
PC>

PC Simulator has not been started!

Welcome to use PC Simulator!

PC>tracert 219.246.3.2

traceroute to 219.246.3.2, 8 hops max
(ICMP), press Ctrl+C to stop
 1 219.246.5.1 32 ms 46 ms 47 ms
 2 219.246.2.1 63 ms 47 ms 15 ms
 3 219.246.1.2 78 ms 32 ms 62 ms
 4 *219.246.3.2 94 ms 78 ms

PC>
```

主机之间 tracert

## 四、实验总结

实验结果：经过老师的指导和小组成员的讨论，rip1 协议的网络连通任务基本完成，通过网段，路由器，主机的 ip 配置，这几台主机和路由器能够相互 ping



通。

实验中遇到的问题：知道了 C 类网络的选择是为了避免浪费。除此之外，还了解到了不同路由器的接口不同，在选择路由器的时候要按照需求进行挑选。GE 接口(Gigabit Ethernet)是千兆以太网接口。

心得体会：本次实验让我们了解到了处于同一网段的主机可以相互连通，在不同网段的主机需要通过路由器去相互连通，除此之外，我们也了解到了 rip1 协议的原理。

Rip1 优缺点：rip1 作为距离矢量路由协议，简单易行，但是有很多限制。RIPv1 不支持无类 IP 和 VLSM(Variable length subnet mask, 变长子网掩码)；安全性差；接受来自任何设备的路由更新；带宽消耗大。