**IP Addressing and Address Division**

Student Version



Huawei Technologies Co., Ltd.

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| Huawei Technologies Co., Ltd. | |
| Address: | Huawei Industrial Base  Bantian, Longgang  Shenzhen 518129  People's Republic of China |
| Website: | <https://e.huawei.com/> |

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# IP Addressing and Address Division

## Background

IP addresses are fundamental for networks. IP address planning is crucial to network construction, and the continuity, scalability, structuring, and service correlation of IP addresses must be considered.

An enterprise department has two service teams: Group1 and Group2. Group1 has one employee and Group2 has three employees now, and will not exceed 5 and 12, respectively, in the future. The address segment 192.168.1.192/27 has been allocated to the department. Please plan IP addresses for the two service teams and allocate IP addresses to existing employees.

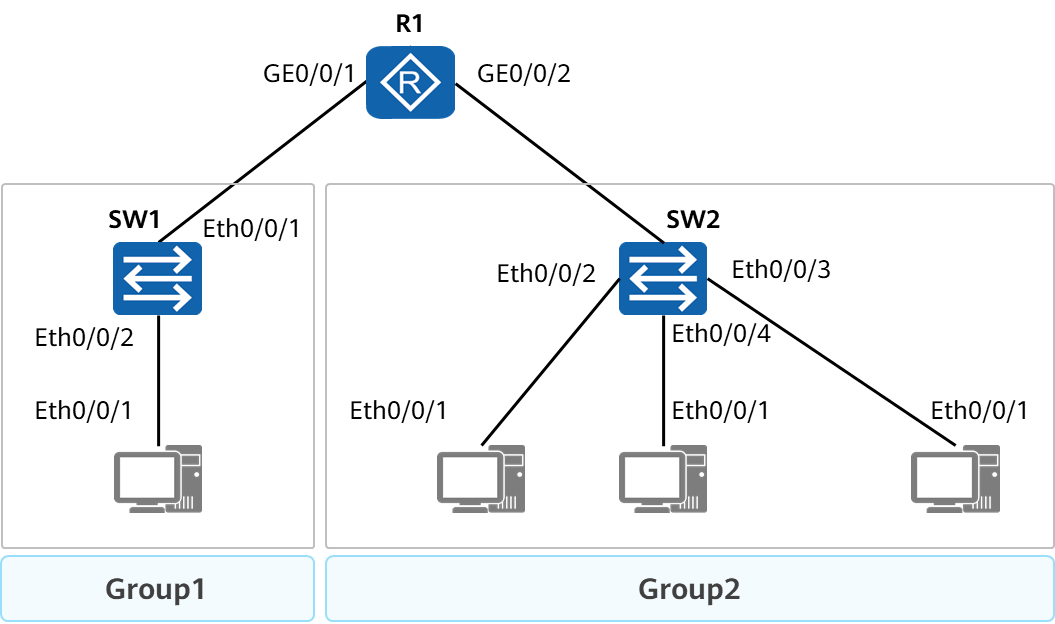
## Objectives

Upon completion of this exercise, you will be able to:

* Master the method of configuring IP addresses.
* Master the method of allocating IP addresses.

## Topology

Lab Topology



The IP address segment 192.168.1.192/27 allocated to the department has 30 available IP addresses.

* Group1 will have a maximum of five employees. A total of six IP addresses are required because one gateway address is required. Therefore, the IP address segment 192.168.1.192/29 can be planned for the team.
* Group2 wil have a maximum of 12 employees. A total of 13 IP addresses are required because one gateway address is required. To prevent conflicts with the IP address segment of Group1, the IP address segment 192.168.1.208/28 can be planned for the team.

## Implementation

### Roadmap

1. Configure the gateway IP addresses.
2. Configure the PC IP addresses.

### Procedure

Configure the gateway IP address.

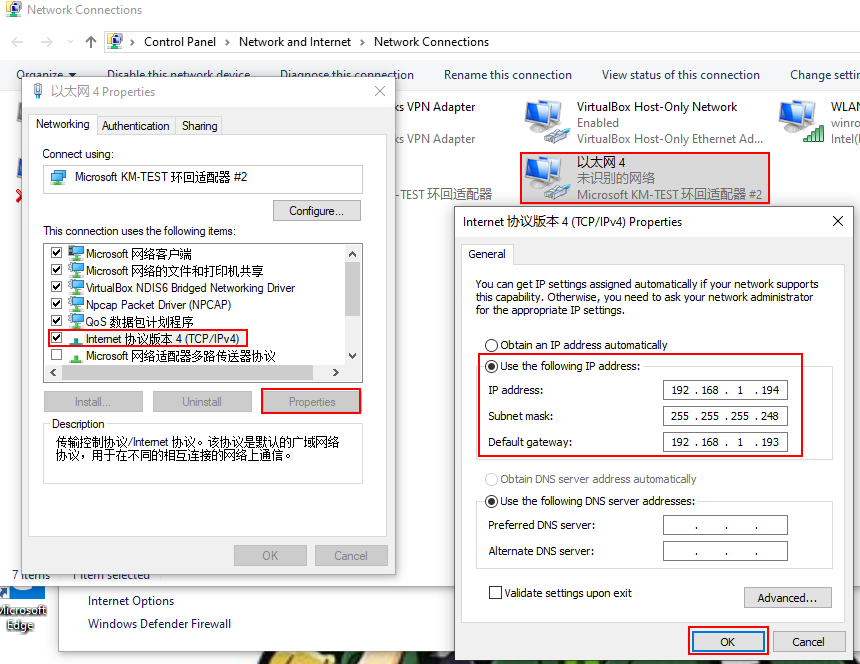
Log in to the router (gateway) through the console port or other methods, enter the system view, and change the device name to R1.

Enter the interface view of GE0/0/1 and configure an IP address for the interface. (The IP address can be any host address on the network segment 192.168.1.192/29.)

Configure an IP address for GE0/0/2 in the same way as you configure an IP address for GE0/0/1. (The IP address of GE0/0/2 can be set to any host address on the network segment 192.168.1.208/28.)

Configure an IP address for PC1 in Group1.

Configure the IP address of PC1.Open **Control Panel**, choose **Network and Sharing Center** > **Change Adapter Settings**, right-click the network adapter whose IP address needs to be changed, and choose **Properties** from the shortcut menu. In the displayed dialog box, find **Internet Protocol Version (TCP/IPv4)**, click **Properties**, and configure the IP address.



Configure the IP addresses of the PCs in Group2. The method is the same as that of configuring the IP address of PC1 in Group1.

----End

## Verification

Check the IP address of the router (gateway).

[R1]display ip interface brief

\*down: administratively down

!down: FIB overload down

^down: standby

(l): loopback

(s): spoofing

(d): Dampening Suppressed

The number of interface that is UP in Physical is 3

The number of interface that is DOWN in Physical is 8

The number of interface that is UP in Protocol is 3

The number of interface that is DOWN in Protocol is 8

Interface IP Address/Mask Physical Protocol

Ethernet0/0/0 unassigned down down

Ethernet0/0/1 unassigned down down

GigabitEthernet0/0/0 unassigned down down

GigabitEthernet0/0/1 192.168.1.193/29 up up

GigabitEthernet0/0/2 192.168.1.209/28 up up

GigabitEthernet0/0/3 unassigned down down

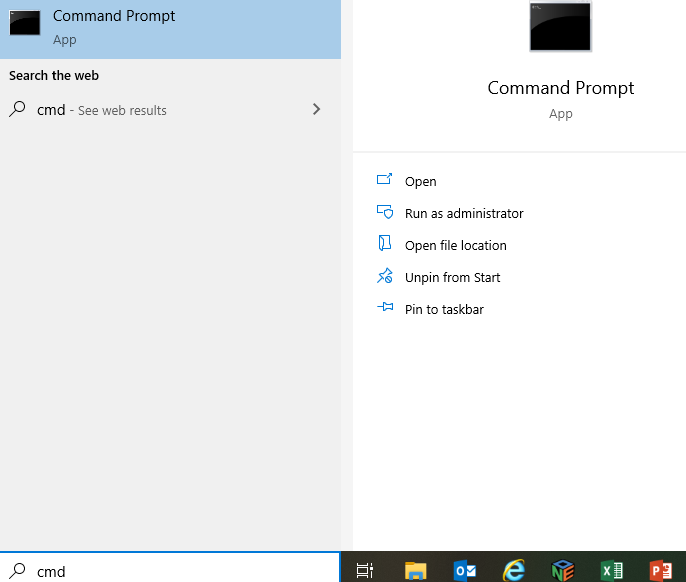
NULL0 unassigned up up(s)

Serial0/0/0 unassigned down down

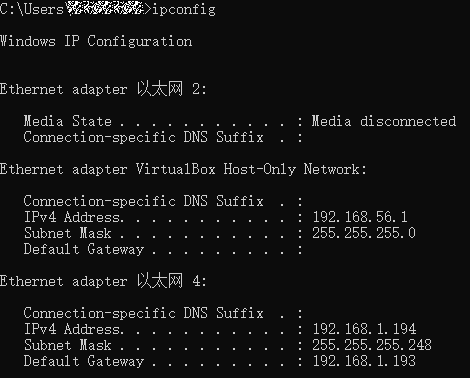
Serial0/0/1 unassigned down down

Serial0/0/2 unassigned down down

Serial0/0/3 unassigned down down



Check the IP address of the PC. Choose **Start** > **Run**, enter **cmd**, and press **Enter** to open the CLI. Run the **ipconfig** command.



Ping the IP address of PC2 from PC1.

[C:\~]$ping 192.168.1.210

Ping 192.168.1.210: 32 data bytes, Press Ctrl\_C to break

From 192.168.1.194: Destination host unreachable

From 192.168.1.194: Destination host unreachable

From 192.168.1.194: Destination host unreachable

From 192.168.1.194: Destination host unreachable

From 192.168.1.194: Destination host unreachable

--- 192.168.1.193 ping statistics ---

5 packet(s) transmitted

0 packet(s) received

100.00% packet loss

PC1 and PC2 are on different network segments, and no routing protocol is configured. Therefore, PC1 fails to ping PC2.

Ping the IP address of PC3 from PC2.

[C:\~]$ping 192.168.1.211

Ping 192.168.1.211: 32 data bytes, Press Ctrl\_C to break

From 192.168.1.211: bytes=32 seq=1 ttl=255 time=31 ms

From 192.168.1.211: bytes=32 seq=2 ttl=255 time=16 ms

From 192.168.1.211: bytes=32 seq=3 ttl=255 time<1 ms

From 192.168.1.211: bytes=32 seq=4 ttl=255 time<1 ms

From 192.168.1.211: bytes=32 seq=5 ttl=255 time=32 ms

--- 192.168.1.194 ping statistics ---

5 packet(s) transmitted

5 packet(s) received

0.00% packet loss

round-trip min/avg/max = 0/15/32 ms

PC2 and PC3 are on the same network segment. Therefore, PC2 can ping PC3.