Experiment 3 router basic configuration and routing protocol

【Purpose】

(1) Be familiar with the interface and wiring method of the router, and understand the meaning of each indicator light;

(2) Understand the basic functions of gateways and routers;

(3) Understand the network information that needs to be configured to form an IP network;

【Experimental task】

Complete the basic settings of the router, and use the router to build a local area network, including:

(1) The startup of the router;

(2) The command mode setting of the router;

(3) Basic configuration of router ports.

【experiment equipment】

3-6 people in each group, 6 microcomputers with dual network cards in each group, WindowsXP starts normally;

2 routers in each group;

The LIMP laboratory comprehensive management platform started normally.

【Experimental content】

(First, pick up "Project 5" from the last experiment and finish it in this class)

Item 5 Communication between VLANs

five steps in this project 5 are consistent with project 4, we have recorded several different steps and their experimental results.

Step 6 Set up communication between Layer 3 switch VLANs

```
SwitchA>
SwitchA>enable
SwitchA#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
SwitchA(config)#interface vlan 1
SwitchA(config-VLAN 1)#*Nov 14 15:26:26: %LINEPROTO-5-UPDOWN: Line protocol on I
nterface VLAN 1, changed state to up.

SwitchA(config-VLAN 1)#ip address 192.168.1.254 255.255.255.0
SwitchA(config-VLAN 1)#no shutdown
SwitchA(config-VLAN 1)#exit
SwitchA(config)#interface vlan 10
SwitchA(config-VLAN 10)#*Nov 14 15:27:37: %LINEPROTO-5-UPDOWN: Line protocol on
Interface VLAN 10, changed state to up.

SwitchA(config-VLAN 10)#ip address 192.168.10.254 255.255.255.0
SwitchA(config-VLAN 10)#no shutdown
SwitchA(config-VLAN 10)#exit
SwitchA(config)#interface vlan 20
SwitchA(config-VLAN 20)#*Nov 14 15:28:29: %LINEPROTO-5-UPDOWN: Line protocol on
Interface VLAN 20, changed state to up.

SwitchA(config-VLAN 20)#ip address 192.168.20.254 255.255.255.0
SwitchA(config-VLAN 20)#no shutdown
```

Step 7 Configure the default gateway of S2328 as the SVI address of S3760 VLAN1

```
SwitchB>ENABLE
SwitchB#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
SwitchB(config)#ip default-gateway 192.168.1.254
SwitchB(config)#
```

Step 9 Verify that PC1 and PC3 can ping each other, and PC2 and PC3 can also ping each other.

Test Results:

```
C:\Documents and Settings\Administrator>ping 192.168.10.1

Pinging 192.168.10.1 with 32 bytes of data:

Reply from 192.168.10.1: bytes=32 time=3ms TTL=63
Reply from 192.168.10.1: bytes=32 time<1ms TTL=63
Reply from 192.168.10.1: bytes=32 time<1ms TTL=63
Reply from 192.168.10.1: bytes=32 time<1ms TTL=63

Ping statistics for 192.168.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 0ms

C:\Documents and Settings\Administrator>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time=1ms TTL=63
Reply from 192.168.10.2: bytes=32 time<1ms TTL=63
Reply from 192.168.10.2: bytes=32 time<1ms TTL=63
Reply from 192.168.10.2: bytes=32 time<1ms TTL=63
```

one. Basic router configuration

(1) Experiment preparation

(1) Design the topology of the experimental network according to the requirements.
(2) Collect the router configuration commands to be used.
(3) Design router configuration and detailed steps.
(4) Design the detailed steps of router configuration check.

(2) Experimental projects

Item 1 Log in to the configuration environment of the router

(1)--(4) Please refer to the configuration environment of the login switch.

(5) Log in to the router

Click the "Login" option in the router device list, log in to the router, press the "Enter" key, the router should display the information of IOS startup , and enter the general user mode (Figure 4.1).

All experiments

```
[Message : Hello, welcome to use LIMP Telnet Proxy.Prepare connecting to the dev
ice, please wait a moment....]

[Message : Connection is established.Device is RG-RSR20-1]

Ruijie>
```

If the router is logged in for the first time, it will enter the general user mode. If you are not logging in for the first time, you will directly enter the command mode when you logged out last time.

Item 2 Command mode setting of the router

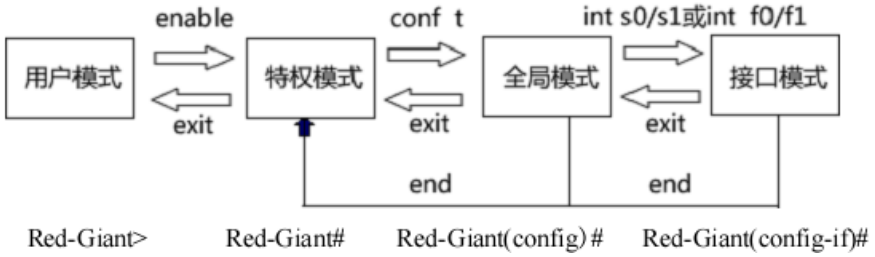
The configuration of the router needs to use the commands provided by the router IOS. There are more than ten modes of router configuration commands,

The parameters configured in different modes are different, and the executable command sets are also different. The following are the four most basic command modes of routers:

User mode, privileged mode, global configuration mode, interface

Configuration mode (interface configuration).

In different command modes, the operation prompt provided by the router IOS will change accordingly, please pay attention to observation and memorization.



(1) User mode

The first time you log in to the router, you will enter the general user mode. In the user mode, the user can only run a few commands, check the current status of the router, and cannot do any configuration. To configure the router, you must enter the privileged mode .

Without any configuration, the default prompt in user mode is: " > ".

Example 4.1 View the version information and hardware configuration information of the router

Router> **show version**

View the current IOS version information of the router , and the router displays information such as the currently running IOS version number, installed modules, the size of various stored data, and the production date.

```
Router>show version
System description      : Ruijie Router (RSR20-18) by Ruijie Networks Co., Ltd.
System start time       : 2020-08-21 8:12:58
System uptime           : 0:0:48:35
System hardware version : 1.01
System software version : RGOS 10.3(5b3), Release(105163)
System BOOT version     : 10.3.105163
Router>
```

(2) Privileged mode

In user mode , enter the command enable:

Router> **enable** // If a password is set , you need to enter the corresponding password ; if the password is correct , you will enter the privileged mode.

Router # // Privileged mode prompt

More commands can be run in privileged mode than in user mode. You can enter "?" in user mode and privileged mode to view the help information in the two modes.

Example 4.2 Router> **show interface!** View port information.

```
Router#show interface
========================= Serial 2/0 ======================
Index(dec):4 (hex):4
Serial 2/0 is UP  , line protocol is UP
Hardware is SIC-1HS HDLC CONTROLLER Serial
Interface address is: no ip address
  MTU 1500 bytes, BW 2000 Kbit
  Encapsulation protocol is HDLC, loopback not set
  Keepalive interval is 10 sec , set
  Carrier delay is 2 sec
  RXload is 1 ,Txload is 1
  Queueing strategy: FIFO
    Output queue 0/40, 0 drops;
    Input queue 0/75, 0 drops
    1 carrier transitions
    V35 DCE cable
    DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
  5 minutes input rate 17 bits/sec, 0 packets/sec
  5 minutes output rate 17 bits/sec, 0 packets/sec
    300 packets input, 6600 bytes, 0 no buffer, 0 dropped
    Received 300 broadcasts, 0 runts, 0 giants
    1 input errors, 0 CRC, 1 frame, 0 overrun, 0 abort
    300 packets output, 6600 bytes, 0 underruns , 0 dropped
    0 output errors, 0 collisions, 2 interface resets
========================= FastEthernet 0/0 ======================
 --More--
```

Example 4.3 View routing table information

Router> **show ip route**

View routing table information.

```
Router#show ip route

Codes:  C - connected, S - static, R - RIP, B - BGP
        O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 2
        i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2
        ia - IS-IS inter area, * - candidate default

Gateway of last resort is no set
```

Example 4.4 In privileged mode , view the content of the configuration file backed up in the router's NVRAM

Router # **show startup-config**

Example 4.5 In the privileged mode , view the information of the current configuration file of the router

Router # **show running-config**

```
Router#show startup-config
Router#show running-config

Building configuration...
Current configuration : 548 bytes

!
version RGOS 10.3(5b3), Release(105163)(Wed Dec 22 18:30:05 CST 2010 -ngcf67)
hostname Router
```

Description :

The difference between the configuration information in NVRAM and the current configuration information is that the current configuration information is a configuration file running in the router's random access memory (RAM), and will be lost when the router is reset ; while the configuration information in NVRAM is saved in In the router's non-volatile (NVRAM) memory , it will not be lost when the router is reset.

Most commands in privileged mode are used to test the network, backup configuration files, check the system, etc. , and cannot configure ports and network protocols.

(3) Global configuration mode

the config terminal command in the privileged mode to enter the global configuration mode :

Router # **config terminal**

The prompt changes to :

Router(config)#

In global configuration mode , you can set some basic parameters such as router name and user password.

```
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#
```

(4) interface configuration mode

Enter commands in the global configuration mode: From the global configuration mode, you can enter a variety of different configuration modes, and each mode can be used to configure a specific part or specific function of the IOS device. Common parts of these patterns are listed below.

Interface configuration mode: used to configure a network interface (F0, S0, etc.).

Line configuration mode: used to configure a real line or virtual line (console, AUX or VTY, etc.).

Routing configuration mode: used to configure the parameters of the routing protocol.

In the interface configuration mode, you can configure parameters such as encapsulation protocol, IP address, and working mode of the port. end of router

Port types mainly include: high-speed synchronous serial port (Serial), Ethernet port (Ethernet), Fast Ethernet port (FastEthernet) and Gigabit Ethernet port (GigaEthernet).

Enter the command in global configuration mode:

Router (config) # interface < port type > < port number >

That is, enter the interface configuration mode , the prompt is :

Router(config-if)#

Example 4.6 _

Router(config)# **interface** *F0/1*
Router(config-if)# // Enter the configuration state of port F1
Router(config-if)# ip address 192.168.1.2 255.255.255.0 ! Set the port IP address
Router(config-if)# no shutdown ! Activate port
Router (config-if)# exit ! Return to parent mode

In port configuration mode , you can configure parameters such as encapsulation protocol, IP address and working mode for the port. The port types of the router mainly include: high-speed synchronous serial port (Serial), Ethernet port (Ethernet) and Gigabit Ethernet port (GigaEthernet), etc.

```
Router(config-if-FastEthernet 0/1)#exit
Router(config)#interface f0/1
Router(config-if-FastEthernet 0/1)#
Router(config-if-FastEthernet 0/1)#ip address 192.168.1.2 255.255.255.0
Router(config-if-FastEthernet 0/1)#no shutdown
Router(config-if-FastEthernet 0/1)#exit
Router(config)#
```

Item 3 Basic Configuration of Router Ports

Routers generally have two interfaces, WAN and LAN . The types mainly include the widely used Ethernet interface, high-speed synchronous serial port (Serial) and the now rare ISDN interface . Some low-end routers are also equipped with telephone dial-up asynchronous serial ports. (Async) . During the configuration of the router, except for the Ethernet interface, other ports must encapsulate the link layer protocol adopted by them.

(1) Set the port IP address.

Enter the port to be configured in configuration mode, use the command:
RouterA> enable
RouterA# config terminal
Router(config)# **interface** *fa 0/0*
IP address of the port in port configuration mode , use the command
Router(config-if)# **ip address** *ip-address netmas*
ip-address is the IP address , netmask is the subnet mask

Example 4.7 Set the IP address of the Serial 0 port to "192.168.0.1", and the subnet mask to "255.255.255.0"

Router(config-if)# **ip address** *192.168.0.1 255.255.255.0*

configuring the interface IP address, you must remember to configure the corresponding subnet mask. Otherwise, the router will reject the set IP address.

```
Router>enable
Router#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface fa 0/0
Router(config-if-FastEthernet 0/0)#ip address 192.168.0.2 255.255.555.0
                                                                    ^
% Invalid input detected at '^' marker.

Router(config-if-FastEthernet 0/0)#ip address 192.168.0.2 255.255.255.0
Router(config-if-FastEthernet 0/0)#
```

(2) Activate and close the port.

In particular, note that **Cisco routers are turned off by default.** If you don't know this, the network will still be disconnected after configuring the data. Therefore, after configuring the port, you must immediately activate the port.

To activate a port in port configuration mode use the command :

Router(config-if)# **no shutdown**

```
Router(config-if-FastEthernet 0/0)#no shutdown
```

To close a port in port configuration mode use the command:

Router (config-if) # **shutdown**

```
Router(config-if-FastEthernet 0/0)#shutdown
```

(4) Describe the port.

For a relatively large network, there are many routes between the networks. It is inevitable to make mistakes by manually remembering the networks connected to each port of the router. Cisco routers provide a command to describe ports as follows:

Router(config-if)# **description** *string*

Example 4.8 _ _ The description of the Serial port is the export of "link-edu" to the education network :

Router(config-if) #**description** *link-edu*

```
Router(config)#interface fa 0/2
Router(config-if-FastEthernet 0/2)#description link-edu
```

Show shows the modification result

```
Description: link-edu
```

(5) Set the protocol of the data link layer used by the port.

When configuring synchronous, asynchronous serial ports, and ISDN ports , specify the protocol used by the link layer. Cisco routers and Ruijie routers use the HDLC protocol by default.

The command format for setting the port link layer protocol is as follows:

Router(config-if)# **encapsulation** {frame-relay | hdlc | ppp}

parameter:

frame-relay indicates that frame relay is used as the data link layer protocol;

HDLC means using HDLC as the link layer protocol;

PPP means using PPP as the data link layer protocol.

The encapsulation of the port protocol will not be carried out here temporarily. For specific examples, see Experiment 9.

Example 4.9 Configuration of router LAN port **F0** .

```
RouterA> enable
RouterA# config terminal
RouterA(config)# interface F 0/0 ! Enter the configuration state of LAN port F0
RouterA (config-if)# ip address 192.168.40.10 255.255.255.0 ! Set port IP address
RouterA(config-if)# no shutdown ! activate port
RouterA(config-if)# exit ! Return to superior mode
RouterA(config)#
```

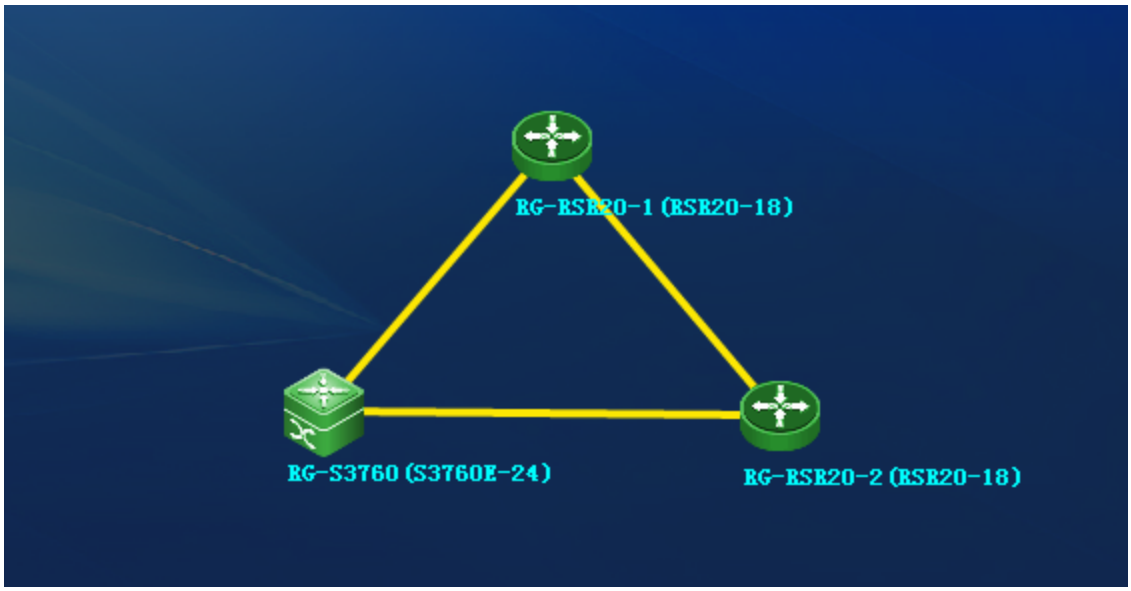
```
>enable
#config terminal
configuration commands, one per line.  End with CNTL/Z.
(config)#interface F 0/0
(config-if-FastEthernet 0/0)#ip address 192.168.40.10 255.255.255.0
(config-if-FastEthernet 0/0)#no shutdown
```

Project 4 group experiment exercises (required)

Connect the three routers through the serial port, and name the routers RA, RB, and R C respectively ; design the network address allocation scheme, and configure it to the corresponding interface correctly. Requirements: Adjacent routers can ping each other successfully.

Note: Use the Layer 3 switch S3760 as the router RA.

Topology design:



Layer 3 switch S3760 operation:

Because this experiment needs to use the three-layer switch S 3760 as the router RA, it is necessary to turn off the switching function when configuring the IP, that is, use the command no switch :

```
RA(config-FastEthernet 0/1)#no switch
RA(config-FastEthernet 0/1)#ip address 192.168.2.2 255.255.255.0
RA(config-FastEthernet 0/1)#no shutdown
RA(config-FastEthernet 0/1)#exit
```

```
RA(config-FastEthernet 0/2)#no switch
RA(config-FastEthernet 0/2)#ip address 192.168.1.1 255.255.255.0
RA(config-FastEthernet 0/2)#no shutdown
RA(config-FastEthernet 0/2)#exit
```

RB operation:

Set the 0/1 port ip address to 192.168.1.1/24

```
RB#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
RB(config)#interface fa 0/1
RB(config-if-FastEthernet 0/1)#ip address 192.168.1.1 255.255.255.0
RB(config-if-FastEthernet 0/1)#no shutdown
RB(config-if-FastEthernet 0/1)#end
RB#*Aug 21 09:57:41: %SYS-5-CONFIG_I: Configured from console by console
```

Set the 0/0 port ip address to 192.168.0.1/24

```
RB(config)#interface fa 0/0
RB(config-if-FastEthernet 0/0)#ip address 192.168.0.1 255.255.255.0
RB(config-if-FastEthernet 0/0)#no shutdown
RB(config-if-FastEthernet 0/0)#end
```

ping adjacent routes

```
RB>en
RB#ping 192.168.1.2
Sending 5, 100-byte ICMP Echoes to 192.168.1.2, timeout is 2 seconds:
  < press Ctrl+C to break >
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/10 ms
RB#ping 192.168.0.2
Sending 5, 100-byte ICMP Echoes to 192.168.0.2, timeout is 2 seconds:
  < press Ctrl+C to break >
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

RC operation:

Set the 0/0 port ip address to 192.168.0.2

```
Ruijie>
Ruijie>en
Ruijie#con
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#hostname RC
RC(config)#interface f0/0
RC(config-if-FastEthernet 0/0)#ip address 192.168.0.2 255.255.255.0
RC(config-if-FastEthernet 0/0)#no shutdown
RC(config-if-FastEthernet 0/0)#end
RC#*Aug 21 10:30:58: %SYS-5-CONFIG_I: Configured from console by console
end
```

Set the 0/2 port ip address to 192.168.2.2

```
RC#con
Enter configuration commands, one per line.  End with CNTL/Z.
RC(config)#interface f0/2
RC(config-if-FastEthernet 0/2)#ip address 192.168.2.2 255.255.255.0
RC(config-if-FastEthernet 0/2)#no shutdawn
                               ^
% Invalid input detected at '^' marker.

RC(config-if-FastEthernet 0/2)#no shutdown
RC(config-if-FastEthernet 0/2)#end
RC#*Aug 21 10:33:39: %SYS-5-CONFIG_I: Configured from console by console
```

Phase ping test:

```
RC#ping 192.168.2.1
Sending 5, 100-byte ICMP Echoes to 192.168.2.1, timeout is 2 seconds:
  < press Ctrl+C to break >
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

```
RC#ping 192.168.0.1
Sending 5, 100-byte ICMP Echoes to 192.168.0.1, timeout is 2 seconds:
  < press Ctrl+C to break >
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

two. Routing Protocol

【Purpose】

(1) Understand the principles of routing protocols;

(2) Familiar with the configuration of static routing and dynamic routing protocols;

(3) Learn more about the network information that needs to be configured to build an IP network.

【Experimental task】

Complete the setting of the static routing and dynamic routing of the router, and realize the communication between any two end systems in the experimental network.

【experiment equipment】

3-6 people in each group, 6 microcomputers with dual network cards in each group, WindowsXP starts normally;

Each group has 2 routers and 1 Layer 3 switch;

The LIMP laboratory comprehensive management platform started normally.

(1) Experiment preparation

Whether the selection and configuration of the routing protocol is reasonable will directly affect the performance of the network. Routing protocols are usually integrated in the router's operating system (IOS), and are divided into static routing and dynamic routing protocols. Dynamic routing protocols are further divided into two types: distance vector routing protocols (such as RIP) and link state routing protocols (such as OSPF).

(2) Experimental projects

Project 1 Configure static routing

A static route is a special route configured manually by an administrator. In the network structure is relatively simple, to a specific purpose

In a network where there is only one known path, you only need to configure static routing to make the router work properly.

The default route is also a static route, which is used only when no matching route item is found.

In the global configuration mode, add a static route according to the following

command format:

Router (config) # **ip route** < network number of destination network > < subnet mask > < next hop address >

For example, add a static route from PC1 to PC2 on Router1

Router(config)# ip route 192.168.3.0 255.255.255.0 192.168.2.2

For example, add a static route from PC2 to PC1 on Router2

Router(config)# ip route 192.168.1.0 255.255.255.0 192.168.2.1

In global configuration mode, add a default route:

Router (config) # **ip route 0.0.0.0 0.0.0.0** < next hop address >

For example, add a default route from PC1 to PC2 on Router1

Router(config)# ip route 0.0.0.0 0.0.0.0 192.168.2.2

For example, add a default route from PC2 to PC1 on Router2

Router(config)# ip route 0.0.0.0 0.0.0.0 192.168.2.1

If you want to cancel the original routing command, you can use the no command.

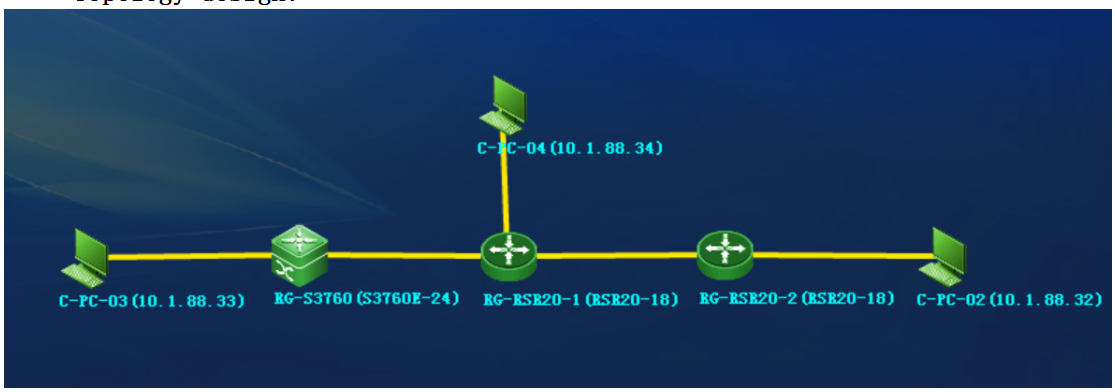
For example, cancel the static route from PC1 to PC2 on Router1

Router(config)# no ip route 192.168.3.0 255.255.255.0 192.168.2.2

Group lab exercises :

In the network structure shown in Figure 5.1, HDLC protocol is used for transmission on the serial ports of 2 routers and 1 Layer 3 switch. They are named from left to right: Router1, Router 2, and Router 3. Write out their static routing configuration commands respectively. It is required that the three PCs can ping each other successfully.

Topology design:



Configuration of Router1: (that is, the configuration of RG-S3760 needs to use the n o switch command)

```
Ruijie(config)#hostname Router1
Router1(config)#int fa 0/2
Router1(config-FastEthernet 0/2)#ip address 192.168.1.1 255.255.255.0
                                 ^
% Invalid input detected at '^' marker.

Router1(config-FastEthernet 0/2)#no switch
Router1(config-FastEthernet 0/2)#ip address 192.168.1.1 255.255.255.0
Router1(config-FastEthernet 0/2)#exit
Router1(config)#int fa 0/1
Router1(config-FastEthernet 0/1)#ip address 192.168.2.1 255.255.255.0
                                 ^
% Invalid input detected at '^' marker.

Router1(config-FastEthernet 0/1)#no switch
Router1(config-FastEthernet 0/1)#ip address 192.168.2.1 255.255.255.0
Router1(config-FastEthernet 0/1)#no shutdown
Router1(config-FastEthernet 0/1)#exit
Router1(config)#int fa 0/2
Router1(config-FastEthernet 0/2)#no shutdown
Router1(config-FastEthernet 0/2)#exit
Router1(config)#ip route 192.168.3.0 255.255.255.0 192.168.2.2
Router1(config)#ip route 192.168.4.0 255.255.255.0 192.168.2.2
Router1(config)#ip route 192.168.5.0 255.255.255.0 192.168.2.2
Router1(config)#end
Router1#*Dec 12 15:07:06: %SYS-5-CONFIG_I: Configured from console by console
```

Configuration of Router 2 : (that is, the configuration of RG- RSR20-1)

Set the 2-port route to 192.168.5.1/24

Set the route of port 1 to 192.168.2.2/24

Set the route of port 0 to 192.168.3.1/24

Set up routing table:

Destination address 192.168.1.0/24 Next hop address 192.168.2.1

Destination address 192.168.4.0/24 Next hop address 192.168.3.2

```
Ruijie>en
Ruijie#con
Enter configuration commands, one per line.  End with CNTL/Z.
Ruijie(config)#hostname Router2
Router2(config)#interface fa 0/2
Router2(config-if-FastEthernet 0/2)#ip address 192.168.5.1 255.255.255.0
Router2(config-if-FastEthernet 0/2)#no shutdown
Router2(config-if-FastEthernet 0/2)#exit
Router2(config)#int Fa 0/1
Router2(config-if-FastEthernet 0/1)#ip address 192.168.2.2 255.255.255.0
Router2(config-if-FastEthernet 0/1)#no shutdown
Router2(config-if-FastEthernet 0/1)#exit
Router2(config)#int fa 0/0
Router2(config-if-FastEthernet 0/0)#ip address 192.168.3.1 255.255.255.0
Router2(config-if-FastEthernet 0/0)#no shutdown
Router2(config-if-FastEthernet 0/0)#exit
Router2(config)#ip route 192.168.1.0 255.255.255.0 192.168.2.1
Router2(config)#ip route 192.168.4.0 255.255.255.0 192.168.3.2
Router2(config)#end
Router2#*Aug 21 10:46:43: %SYS-5-CONFIG_I: Configured from console by console
```

Configuration of Router3: (that is, the configuration of RG-RSR20-2)

Set the route of port 0 to 192.168.3.2/24

```
Router3#con
Enter configuration commands, one per line.  End with CNTL/Z.
Router3(config)#int fa 0/0
Router3(config-if-FastEthernet 0/0)#ip address 192.168.3.2 255.255.255.0
Router3(config-if-FastEthernet 0/0)#no shutdown
Router3(config-if-FastEthernet 0/0)#end
Router3#*Aug 21 11:48:08: %SYS-5-CONFIG_I: Configured from console by console
```

Set the 2-port route to 192.168.4.1/24

```
Router3(config)#int fa 0/2
Router3(config-if-FastEthernet 0/2)#ip address 192.168.4.1 255.255.255.0
Router3(config-if-FastEthernet 0/2)#no shutdown
Router3(config-if-FastEthernet 0/2)#end
```

Test verification: Tested on three PCs respectively.

C:\>ping 192.168.5.2 -t Ping pc4 from pc2 and pc3 respectively

```
C:\Documents and Settings\Administrator>ping 192.168.5.2

Pinging 192.168.5.2 with 32 bytes of data:

Reply from 192.168.5.2: bytes=32 time=1ms TTL=62
Reply from 192.168.5.2: bytes=32 time=1ms TTL=62
Reply from 192.168.5.2: bytes=32 time=1ms TTL=62
Reply from 192.168.5.2: bytes=32 time=1ms TTL=62

Ping statistics for 192.168.5.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

C:\>ping 192.168.1.2 -t ping pc3 from pc2 and pc4 respectively

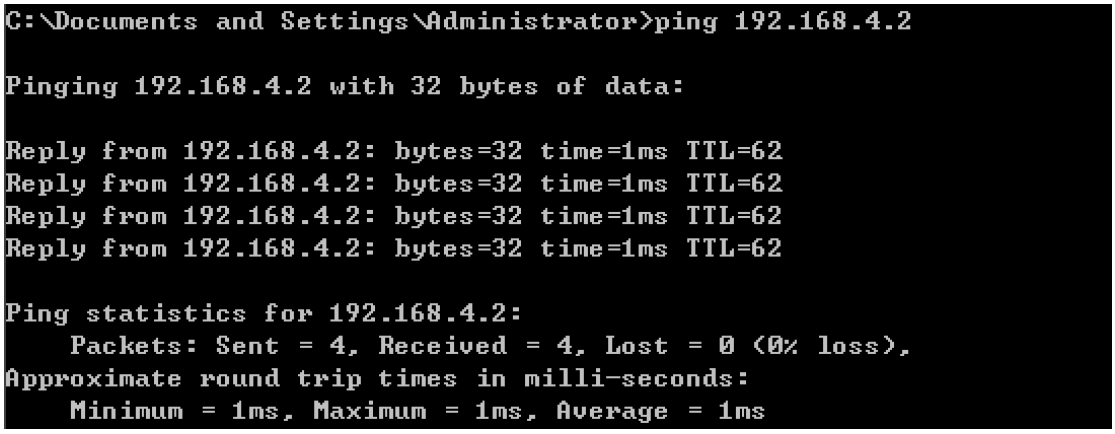
```
C:\Documents and Settings\Administrator>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=61
Reply from 192.168.1.2: bytes=32 time=1ms TTL=61
Reply from 192.168.1.2: bytes=32 time=1ms TTL=61
Reply from 192.168.1.2: bytes=32 time=1ms TTL=61

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

C:\>ping 192.168.4.2 -t ping pc2 from pc4 and pc3 respectively



From the screenshot of the experiment, it can be seen that PC1, PC2, and PC3 can ping each other.

Through the **Ping** command, you can know whether the routers can communicate with each other. The result shows that the configuration of the static routing protocol is successful.

【Summary and Discussion】

In this experiment, we designed the topology of the experimental network according to the experimental requirements, collected the router configuration commands to be used and

Design router configuration and detailed steps. After finishing the experiment, we have gained a lot. We are familiar with the interface and wiring method of the router, and we understand the meaning of each indicator light, the basic functions of the gateway and the router, and the network information that needs to be configured to form an IP network. , understand the principles of routing protocols, and be familiar with the configuration of static routing protocols.