

廈門大學



信息学院软件工程系

《计算机网络》实验报告

题 目 实验五 CISCO IOS 路由器基本配置

班 级 软件工程 2018 级 1 班

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1 实验目的

- 1、理解路由协议的分类。
- 2、掌握路由器的基本配置以及静态路由、动态路由和交换机端口 VLAN 的配置方法。

2 实验环境

Windows 10, Router eSIM v1.0, CCNA Network Visualizer 6.0

3 实验结果

- 1、使用 Router eSIM v1.0 模拟器来模拟路由器的基本配置

```
Router>enable
Router#config t
Enter configuration commands, one per line.  End with END.
Router(config)#hostname lab_A
lab_A(config)#banner motd #
Enter TEXT message.  End with the character '#'.
Accounting Department
You have entered a secured system
Authorized access only' #
lab_A(config)#ip host lab_A 192.5.5.1 205.7.5.1 201.100.11.1
lab_A(config)#ip host lab_B 219.17.100.1 199.6.13.1 201.100.11.2
lab_A(config)#ip host lab_c 223.8.151.1 204.204.7.1 199.6.13.2
lab_A(config)#ip host lab_D 210.93.105.1 204.204.7.2
lab_A(config)#ip host lab_E 210.93.105.2
lab_A(config)#ip host lab_C 223.8.151.1 204.204.7.1 201.100.11.2
lab_A(config)#int eth 0
lab_A(config-if)#ip address 192.5.5.1 255.255.255.0
lab_A(config-if)#int eth 1
lab_A(config-if)#ip address 205.7.5.1 255.255.255.0
lab_A(config-if)#int serial 0
lab_A(config-if)#ip address 201.100.11.1 255.255.255.0

lab_A#config t
Enter configuration commands, one per line.  End with END.
lab_A(config)#interface serial 0
lab_A(config-if)#clock rate 56000
```

```
lab_A#show interface serial 0
Serial0 is administratively down, line protocol is down
  Internet address is 201.100.11.1/24
  Hardware is HD64570
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, loopback not set
  Keepalive set (10 sec)
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0 (size/max/drops); Total output drops: 0
  Queueing strategy: weighted fair
  Output queue: 0/1000/64/0 (size/max total/threshold/drops)
    Conversations 0/0/256 (active/max active/max total)
    Reserved Conversations 0/0 (allocated/max allocated)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer
  Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 packets output, 0 bytes, 0 underruns
  0 output errors, 0 collisions, 1 interface resets
  0 output buffer failures, 0 output buffers swapped out
```

2、静态路由配置

(1) 对整个界面进行布局



(2) 对 Router A 进行配置:

```
Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z
Router(config)#hostname RouterA
RouterA(config)#int f0/0
RouterA(config-if)#ip address 192.5.5.1 255.255.255.0
RouterA(config-if)#no shutdown
10:07:35 %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
10:07:35 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

RouterA(config-if)#int f0/1
RouterA(config-if)#ip address 205.7.5.1 255.255.255.0
RouterA(config-if)#no shutdown
10:08:13 %LINK-3-UPDOWN: Interface FastEthernet0/1, changed state to up
10:08:13 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

RouterA(config-if)#int s0/0
RouterA(config-if)#ip address 201.100.11.1 255.255.255.0
RouterA(config-if)#clock rate 56000
%Error: This command applies only to DCE interfaces
RouterA(config-if)#no shutdown
10:09:19 %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
10:09:19 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up

RouterA(config-if)#exit
RouterA(config)#exit
RouterA#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, 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, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
       U - per-user static route, o - ODR, P - periodic downloaded static route
       T - traffic engineered route

Gateway of last resort is not set
C    201.100.11.0/24 is directly connected, Serial0/0
C    205.7.5.0/24 is directly connected, FastEthernet0/1
C    192.5.5.0/24 is directly connected, FastEthernet0/0
RouterA#
```

(3) 对 Router B 进行配置:

```

Router>enable
Router#config t
Enter configuration commands, one per line. End with CNTL/Z
Router(config)#hostname RouterB
RouterB(config)#int f0/0
RouterB(config-if)#ip address 199.6.13.1 255.255.255.0
RouterB(config-if)#no shutdown
11:57:38 %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
11:57:38 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

RouterB(config-if)#int s0/0
RouterB(config-if)#ip address 201.100.11.2 255.255.255.0
RouterB(config-if)#no shutdown
11:58:44 %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
11:58:44 %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up

RouterB(config-if)#exit
RouterB(config)#exit
RouterB#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, 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, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
       U - per-user static route, o - ODR, P - periodic downloaded static route
       T - traffic engineered route

Gateway of last resort is not set
C      201.100.11.0/24 is directly connected, Serial0/0
C      199.6.13.0/24 is directly connected, FastEthernet0/0
RouterB#

```

(4) 在 Router A 上，通过 ping 命令测试到路由器 Router B 的直连网络地址 199.6.13.1 是否连通：

```

RouterA>ping 199.6.13.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 199.6.13.1, timeout is 2 seconds:
.....
Success rate is 0 percent (0/5), round-trip min/avg/max = 0/0/0 ms
RouterA>

```

(5) 配置静态路由

```

RouterA>enable
RouterA#config t
Enter configuration commands, one per line. End with CNTL/Z
RouterA(config)#ip route 199.6.13.1 255.255.255.0 201.100.11.2
RouterA(config)#exit
RouterA#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, 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, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, * - candidate default
       U - per-user static route, o - ODR, P - periodic downloaded static route
       T - traffic engineered route

Gateway of last resort is not set
C      192.5.5.0/24 is directly connected, FastEthernet0/0
C      205.7.5.0/24 is directly connected, FastEthernet0/1
S      199.6.13.1 [1/0] via 201.100.11.2
C      201.100.11.0/24 is directly connected, Serial0/0

```

(6) 检验连通性

```

RouterA#ping 199.6.13.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 199.6.13.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/4 ms

```

3、动态路由 RIP 协议的配置

```

RouterA(config)#router rip

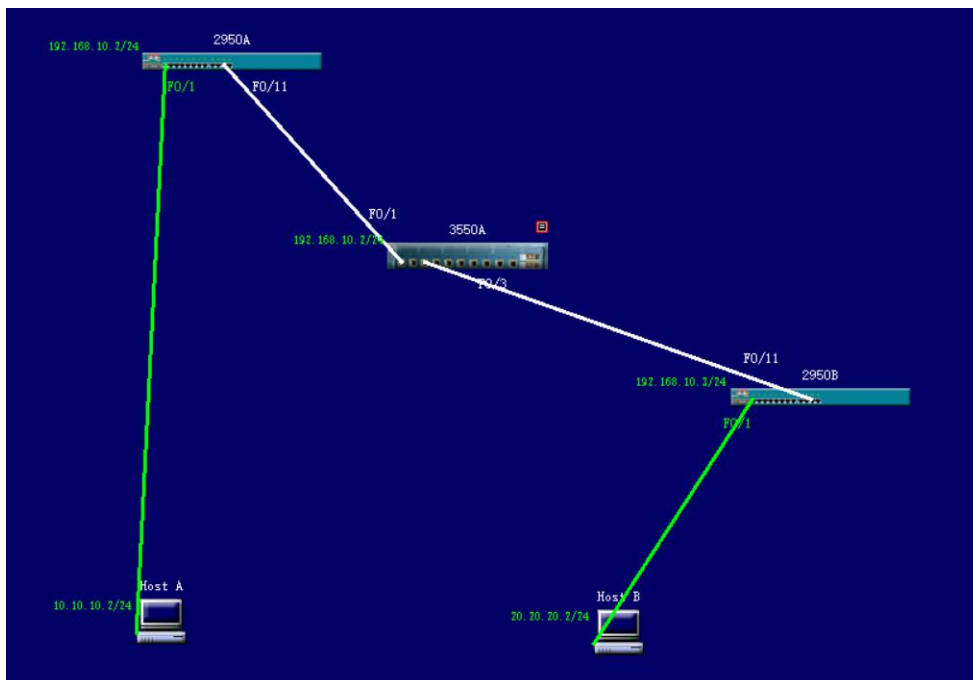
RouterA(config-router)#network 199.6.13.1

```

```
RouterA#show ip protocols
Routing Protocol is "rip"
  Sending updates every 30 seconds, next due in 12 seconds
  Invalid after 180 seconds, hold down 180, flushed after 240
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Redistributing: rip
  Default version control: send version 1, receive any version
    Interface          Send  Recv  Triggered RIP  Key-chain
    Serial0/0           1     1 2
    FastEthernet0/1     1     1 2
    FastEthernet0/0     1     1 2
  Automatic network summarization is in effect
  Maximum path: 4
  Routing for networks:
    199.6.13.0
  Routing information sources:
    Gateway            Distance      Last Update
  Distance: <default is 120>
```

4、VLAN 的配置

示例一：



(1) 设置 VTP 域


```
switch>en
switch#config t
Enter configuration commands, one per line. End with CNTL/Z
switch(config)#hostname 3550A
3550A(config)#vtp domain Cisco
      ^
% Invalid input detected at '^' marker.
3550A(config)#vtp domain Cisco
Changing VTP domain name from NULL to Cisco
3550A(config)#exit
3550A#show vtp status
VTP Version                : 2
Configuration Revision     : 1
Maximum VLANs supported locally : 64
Number of existing VLANs   : 5
VTP Operating Mode         : Server
VTP Domain Name            : Cisco
VTP Pruning Mode           : Disabled
VTP V2 Mode                : Disabled
VTP Traps Generation       : Disabled
MD5 digest                 : 0x70 0x01 0xF2 0x72 0x97 0xA1 0x35 0xEB
Configuration last modified by: 0.0.0.0 at 11-29-93 20:39:24
Local updater ID is 0.0.0.0 on interface V11 (lowest numbered VLAN interface found)
3550A#
```

```
switch>en
switch#conf t
Enter configuration commands, one per line. End with CNTL/Z
switch(config)#hostname 2950A
2950A(config)#vtp domain Cisco
Changing VTP domain name from NULL to Cisco
2950A(config)#vtp mode ?
    client      Set the device to client mode.
    server      Set the device to server mode.
    transparent Set the device to transparent mode.

2950A(config)#vtp mode client
Setting device to VTP CLIENT mode.
2950A(config)#exit
2950A#show vtp status
VTP Version                : 2
Configuration Revision     : 0
Maximum VLANs supported locally : 64
Number of existing VLANs   : 4
VTP Operating Mode         : Client
VTP Domain Name            : Cisco
VTP Pruning Mode           : Disabled
VTP V2 Mode                : Disabled
VTP Traps Generation       : Disabled
MD5 digest                 : 0x70 0x01 0xF2 0x72 0x97 0xA1 0x35 0xEB
Configuration last modified by: 0.0.0.0 at 11-29-93 20:39:24
Local updater ID is 0.0.0.0 on interface V11 (lowest numbered VLAN interface found)
```



```

switch>en
switch#conf t
Enter configuration commands, one per line.  End with CNTL/Z
switch(config)#hostname 2950B
2950B(config)#vtp domain Cisco
Changing VTP domain name from NULL to Cisco
2950B(config)#vtp mode client
Setting device to VTP CLIENT mode.
2950B(config)#exit

```

(2) 设置 Trunk

```

3550A>en
3550A#config t
Enter configuration commands, one per line.  End with CNTL/Z
3550A(config)#interface fa0/1
3550A(config-if)#switchport trunk encapsulation ?
    dot1q      Interface uses only 802.1q trunking encapsulation when trunking
    isl         Interface uses only ISL trunking encapsulation when trunking
    negotiate   Device will negotiate trunking encapsulation with peer on
                interface
3550A(config-if)#switchport trunk encapsulation dot1q
                ^
% Invalid input detected at '^' marker.
3550A(config-if)#switchport mode trunk
13:09:32: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state
to down
13:09:32: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
3550A(config-if)#switchport mode trunk
3550A(config-if)#interface fa0/3
3550A(config-if)#switch trunk encapsulation dot1q
13:10:20: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state
to down
13:10:20: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up
3550A(config-if)#switchport mode trunk

```

```

2950A>en
2950A#config t
Enter configuration commands, one per line.  End with CNTL/Z
2950A(config)#interface fa0/11
2950A(config-if)#switchport mode trunk

```

```

2950B>en
2950B#config t
Enter configuration commands, one per line.  End with CNTL/Z
2950B(config)#interface fa0/11
2950B(config-if)#switchport mode trunk

```

(3) 创建 VLAN

```

3550A>en
3550A#config t
Enter configuration commands, one per line.  End with CNTL/Z
3550A(config)#vlan 10
3550A(config-vlan)#vlan 20
3550A(config-vlan)#exit
3550A(config)#exit
3550A#show vlan

```

VLAN Name	Status	Ports
1 default	active	Fa0/2, Fa0/3, Fa0/4, Fa0/5 Fa0/6, Fa0/7, Fa0/8, Fa0/9 Fa0/10
10 VLAN0010	active	
20 VLAN0020	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
10	enet	100010	1500	-	-	-	-	-	0	0
20	enet	100020	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0

```

--More--
3550A#

```

(4) 分配交换机端口加入 VLAN

```

2950A>en
2950A#config t
Enter configuration commands, one per line.  End with CNTL/Z
2950A(config)#interface fa0/2
2950A(config-if)#switchport access vlan 10
2950A#

2950B>en
2950B#config t
Enter configuration commands, one per line.  End with CNTL/Z
2950B(config)#interface fa0/2
2950B(config-if)#switchport access vlan 20
2950B#

```

(5) 配置第三层交换机

```
3550A>en
3550A#config t
Enter configuration commands, one per line. End with CNTL/Z
3550A(config)#int vlan 10
3550A(config-if)#ip address 10.10.10.1 255.255.255.0
3550A(config-if)#int vlan 20
3550A(config-if)#ip address 20.20.20.1 255.255.255.0
3550A(config-if)#no shut
3550A(config-if)#exit
3550A(config)#ip routing
3550A(config)#int vlan 1
3550A(config-if)#ip address 192.168.10.1 255.255.255.0
3550A(config-if)#no shut
```

```
2950A>en
2950A#config t
Enter configuration commands, one per line. End with CNTL/Z
2950A(config)#int vlan 1
2950A(config-if)#ip address 192.168.10.2 255.255.255.0
2950A(config-if)#no shutdown
```

```
2950B>en
2950B#config t
Enter configuration commands, one per line. End with CNTL/Z
2950B(config)#int vlan 1
2950B(config-if)#ip address 192.168.10.3 255.255.255.0
2950B(config-if)#no shutdown
```

(6) 配置主机并进行测试

Configure Host A	Configure Host B
Host Name: <input type="text" value="Host A"/>	Host Name: <input type="text" value="Host B"/>
<input type="radio"/> Obtain an IP address automatically	<input type="radio"/> Obtain an IP address automatically
<input checked="" type="radio"/> Use the following IP address:	<input checked="" type="radio"/> Use the following IP address:
IP Address <input type="text" value="10"/> <input type="text" value="10"/> <input type="text" value="10"/> <input type="text" value="2"/>	IP Address <input type="text" value="20"/> <input type="text" value="20"/> <input type="text" value="20"/> <input type="text" value="2"/>
Subnet <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="0"/>	Subnet <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="0"/>
Default Gateway <input type="text" value="10"/> <input type="text" value="10"/> <input type="text" value="10"/> <input type="text" value="1"/>	Default Gateway <input type="text" value="20"/> <input type="text" value="20"/> <input type="text" value="20"/> <input type="text" value="1"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	<input type="button" value="OK"/> <input type="button" value="Cancel"/>

```

3550A>en
3550A#ping 192.168.10.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/4 ms
3550A#ping 192.168.10.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.10.3, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/4 ms
-----
C:\>ping 20.20.20.2

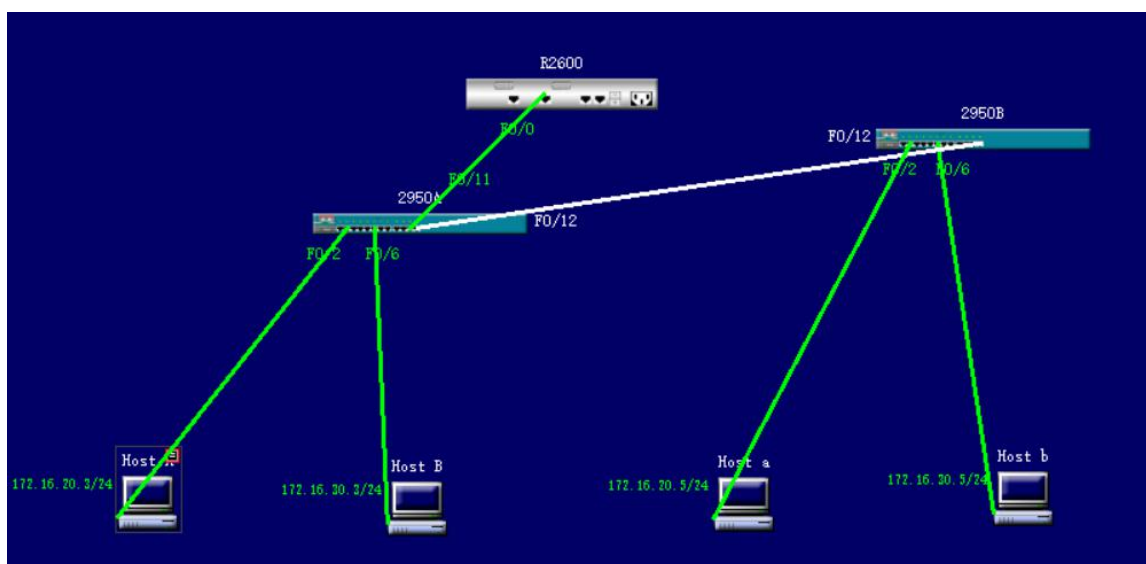
Pinging 20.20.20.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping Statistics for 20.20.20.2:
    Packets Sent = 4, Received = 0, Lost = 4 (100% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

```

示例二：



(1) 配置 VTP

```
switch>en
switch#config t
Enter configuration commands, one per line. End with CNTL/Z
switch(config)#hostname 2950A
2950A(config)#vtp domain Test
Changing VTP domain name from NULL to Test
2950A(config)#vtp mode ?
    client      Set the device to client mode.
    server      Set the device to server mode.
    transparent Set the device to transparent mode.

2950A(config)#vtp mode server
Device mode already VTP SERVER.
2950A(config)#exit
2950A#show vtp status
VTP Version                : 2
Configuration Revision      : 1
Maximum VLANs supported locally : 64
Number of existing VLANs    : 5
VTP Operating Mode          : Server
VTP Domain Name             : Test
VTP Pruning Mode            : Disabled
VTP V2 Mode                 : Disabled
VTP Traps Generation        : Disabled
MD5 digest                  : 0x70 0x01 0xF2 0x72 0x97 0xA1 0x35 0xEB
Configuration last modified by: 0.0.0.0 at 11-29-93 20:39:24
Local updater ID is 0.0.0.0 on interface V11 (lowest numbered VLAN interface found)
~~~~~
```

(2) 启动 Trunk

```
2950A>en
2950A#config t
Enter configuration commands, one per line. End with CNTL/Z
2950A(config)#interface fa0/12
2950A(config-if)#switchport mode ?
    access      Set trunking mode to ACCESS unconditionally
    dynamic     Set trunking mode to dynamically negotiate access or trunk mode
    trunk       Set trunking mode to TRUNK unconditionally

2950A(config-if)#switchport mode trunk
2950A(config-if)#interface fa0/11
2950A(config-if)#switchport mode trunk
2950A(config-if)#exit
2950A(config)#_
```



```
switch>en
switch#config t
Enter configuration commands, one per line.  End with CNTL/Z
switch(config)#hostname 2950B
2950B(config)#interface fa0/12
2950B(config-if)#switchport mode trunk
2950B(config-if)#exit
2950B(config)#_
```

(3) 创建 VLAN

```
2950A>en
2950A#vlan database
2950A(vlan)#vlan 2 name vlan2
VLAN 2 added:
    Name: vlan2
2950A(vlan)#vlan 3 name vlan3
VLAN 3 added:
    Name: vlan3
2950A(vlan)#exit
APPLY completed.
Exiting....
2950A#
```

(4) 分配端口到 VLAN


```

2950A>en
2950A#vlan database
2950A(vlan)#vlan 2 name vlan2
VLAN 2 added:
    Name: vlan2
2950A(vlan)#vlan 3 name vlan3
VLAN 3 added:
    Name: vlan3
2950A(vlan)#exit
APPLY completed.
Exiting....
2950A#config t
Enter configuration commands, one per line.  End with CNTL/Z
2950A(config)#interface f0/2
2950A(config-if)#switchport access vlan 2
2950A(config-if)#switchport mode access
2950A(config-if)#interface f0/6
2950A(config-if)#switchport access vlan 3
2950A(config-if)#switchport mode access
2950A(config-if)#exit
2950A(config)#show vlan
      ^
% Invalid input detected at '^' marker.
2950A(config)#exit
2950A#show vlan

```

VLAN Name	Status	Ports
1 default	active	Fa0/1, Fa0/3, Fa0/4, Fa0/5 Fa0/7, Fa0/8, Fa0/9, Fa0/10 Fa0/11, Fa0/12
2 vlan2	active	Fa0/2
3 vlan3	active	Fa0/6
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
2	enet	100002	1500	-	-	-	-	-	0	0
3	enet	100003	1500	-	-	-	-	-	0	0
1002	fddi	101002	1500	-	-	-	-	-	0	0
1003	tr	101003	1500	-	-	-	-	-	0	0
1004	fdnet	101004	1500	-	-	-	ieee	-	0	0
1005	trnet	101005	1500	-	-	-	ibm	-	0	0

--More--

```
2950B>en
2950B#config t
Enter configuration commands, one per line.  End with CNTL/Z
2950B(config)#vtp domain Test
Changing VTP domain name from NULL to Test
2950B(config)#vtp mode client
Setting device to VTP CLIENT mode.
2950B(config)#interface f0/2
2950B(config-if)#switchport access vlan 2
2950B(config-if)#switchport mode access
      ^
% Invalid input detected at '^' marker.
2950B(config-if)#switch mode access
2950B(config-if)#interface f0/6
2950B(config-if)#switchport access vlan 3
2950B(config-if)#switchport mode access
2950B(config-if)#exit
2950B(config)#
```

(5) 配置 VLAN 之间的路由

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z
Router(config)#hostname R2600
R2600(config)#interface f0/0
R2600(config-if)#no ip address
R2600(config-if)#no shutdown
04:24:24 %LINK-3-UPDOWN: Interface FastEthernet0/0, changed state to up
04:24:24 %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

R2600(config-if)#interface f0/0.1
R2600(config-subif)#encapsulation dot1q 1
R2600(config-subif)#ip address 172.16.10.1 255.255.255.0
R2600(config-subif)#interface f0/0.2
R2600(config-subif)#encapsulation dot1q 2
R2600(config-subif)#ip address 172.16.20.1 255.255.255.0
R2600(config-subif)#interface f0/0.3
R2600(config-subif)#encapsulation dot1q 3
R2600(config-subif)#ip address 172.16.30.1 255.255.255.0
R2600(config-subif)#exit
R2600(config)#
```

(6) 配置主机验证连通性

```
C:\>ping 172.16.20.1

Pinging 172.16.20.1 with 32 bytes of data:

Reply from 172.16.20.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.20.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.20.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.20.1 :bytes=32 time=22ms TTL=254

Ping Statistics for 172.16.20.1:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 22ms, Maximum = 23ms, Average = 22ms
```

```
C:\>ping 172.16.30.1

Pinging 172.16.30.1 with 32 bytes of data:

Reply from 172.16.30.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.1 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.1 :bytes=32 time=22ms TTL=254

Ping Statistics for 172.16.30.1:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 22ms, Maximum = 23ms, Average = 22ms
```

```
C:\>ping 172.16.30.3

Pinging 172.16.30.3 with 32 bytes of data:

Reply from 172.16.30.3 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.3 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.3 :bytes=32 time=22ms TTL=254
Reply from 172.16.30.3 :bytes=32 time=22ms TTL=254

Ping Statistics for 172.16.30.3:
    Packets Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 22ms, Maximum = 23ms, Average = 22ms
```

4 实验总结

通过这次实验，对路由协议的分类以及 IP 地址的分配有了更深的了解，掌握了路由器的基本配置以及静态路由、动态路由和交换机端口 VLAN 的配置方法，通过对所学知识加以应用，让所学的知识印象深刻。