思科校园网搭建

校园拓扑图

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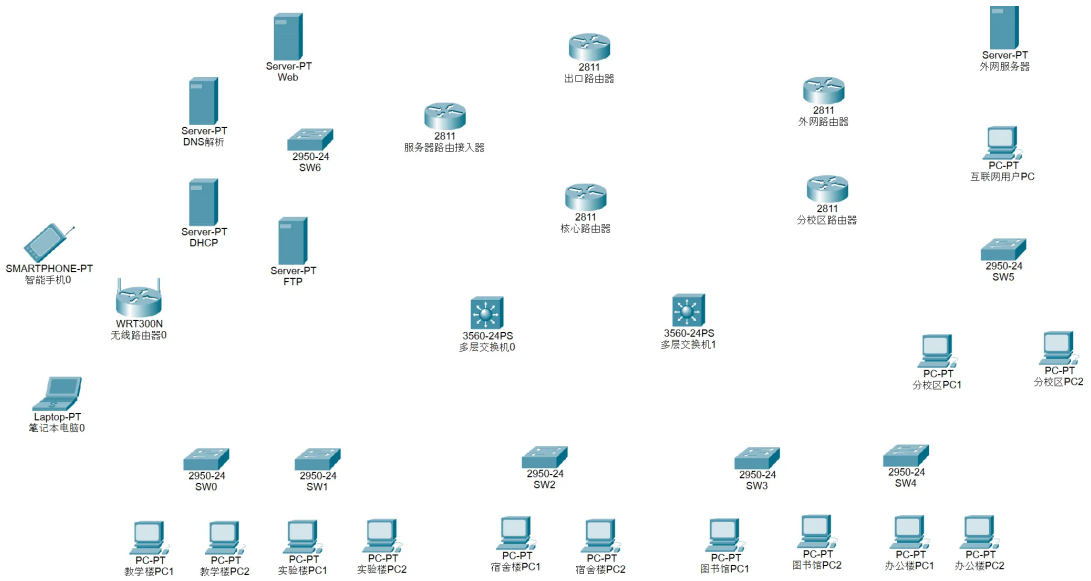
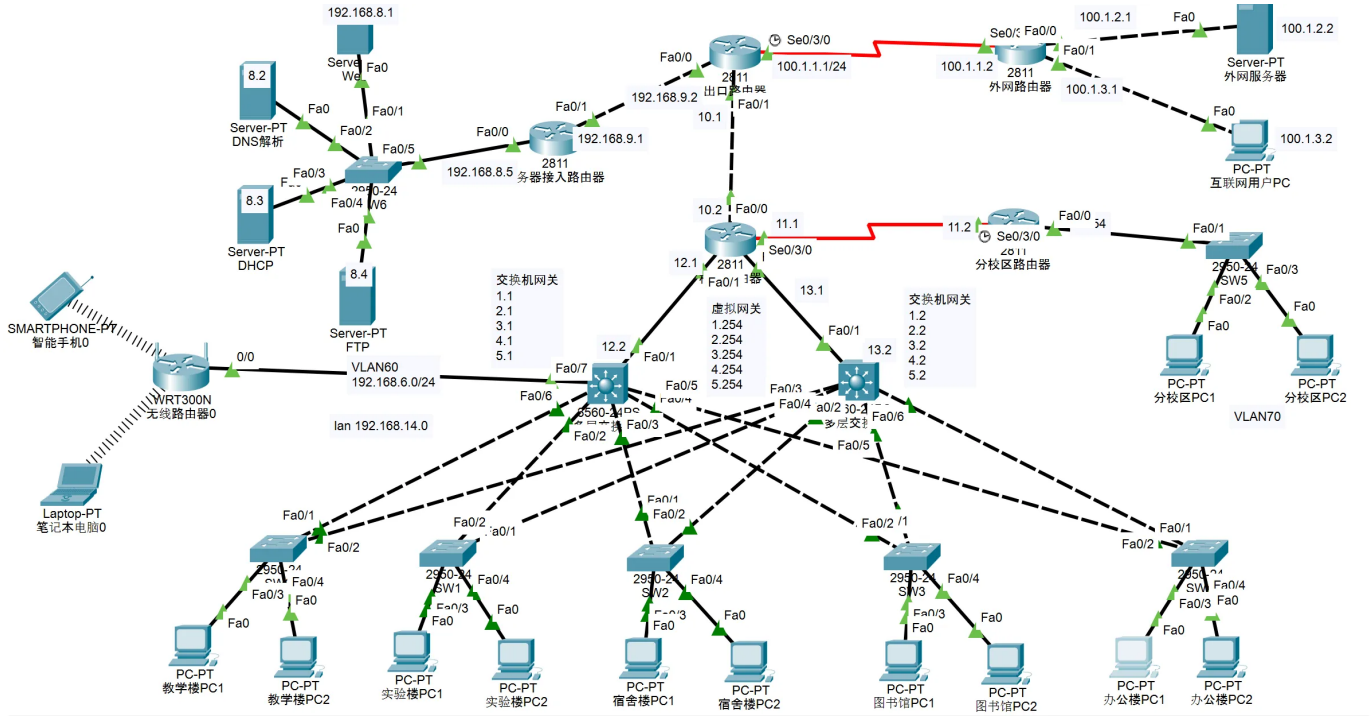
校园拓扑图



连线：

核心路由器加

NM-2FE2W接口



配置

服务器接入路由器（192.168.8.0/24 内网服务器区

```ArkTS
en
conf t
int f0/0
 ip address 192.168.8.5 255.255.255.0
 no shutdown
int f0/1
 ip address 192.168.9.1 255.255.255.0
 no shutdown
 ip helper-address 192.168.8.3
exit
router rip
 version 2
 no auto-summary
 network 192.168.8.0
 network 192.168.9.0

```

连接服务器区（DNS/DHCP/FTP）与出口路由器，启动 RIP V2，DHCP 通过 helper 转发

出口路由器（连接外网）

```ArkTS
en
conf t
int f0/0
 ip address 192.168.9.2 255.255.255.0
 no shutdown
int f0/1
 ip address 192.168.10.1 255.255.255.0
 no shutdown
int s0/3/0
 ip address 100.1.1.1 255.255.255.0
 clock rate 64000
 no shutdown
exit

# NAT 配置
int f0/0
 ip nat inside
int f0/1
 ip nat inside
int s0/3/0
 ip nat outside
exit

ip nat pool DZC 100.1.1.3 100.1.1.10 netmask 255.255.255.0
access-list 1 permit 192.168.0.0 0.0.255.255
ip nat inside source list 1 pool DZC overload

# 路由配置
router rip
 version 2
 no auto-summary
 network 192.168.9.0
 network 192.168.10.0
 default-information originate
exit
ip route 0.0.0.0 0.0.0.0 100.1.1.2

```

实现 NAT 出口（inside → outside），RIP 发布内网路由，默认路由指向外网路由器 100.1.1.2。

核心路由器

```ArkTS
en
conf t
int f0/0
 ip address 192.168.10.2 255.255.255.0
 no shutdown
int f0/1
 ip address 192.168.12.1 255.255.255.0
 ip helper-address 192.168.8.3
 no shutdown
int f1/0
 ip address 192.168.13.1 255.255.255.0
 ip helper-address 192.168.8.3
 no shutdown
int s0/3/0
 ip address 192.168.11.1 255.255.255.0
 ip helper-address 192.168.8.3
 no shutdown
exit

router rip
 version 2
 no auto-summary
 network 192.168.10.0
 network 192.168.11.0
 network 192.168.12.0
 network 192.168.13.0

```

核心层路由器，负责连接出口路由器、核心交换机、分校区，支持 DHCP 转发。

分校区接入路由器

```ArkTS
en
conf t
int f0/0
 ip address 192.168.7.254 255.255.255.0
 no shutdown
int s0/3/0
 ip address 192.168.11.2 255.255.255.0
 clock rate 64000
 no shutdown
exit

router rip
 version 2
 no auto-summary
 network 192.168.7.0
 network 192.168.11.0

```

分校区接入路由器，RIP 与核心路由互通。

核心交换机1（带 HSRP）

```
en
conf t
vlan 10
vlan 20
vlan 30
vlan 40
vlan 50
vlan 60
exit

int vlan 10
 ip address 192.168.1.1 255.255.255.0
 ip helper-address 192.168.8.3
 standby 10 ip 192.168.1.254
 standby 10 priority 101
 standby 10 preempt
 standby 10 track f0/1
int vlan 20
 ip address 192.168.2.1 255.255.255.0
 ip helper-address 192.168.8.3
 standby 20 ip 192.168.2.254
 standby 20 preempt
 standby 20 track f0/1
int vlan 30
 ip address 192.168.3.1 255.255.255.0
 ip helper-address 192.168.8.3
 standby 30 ip 192.168.3.254
int vlan 40
 ip address 192.168.4.1 255.255.255.0
 ip helper-address 192.168.8.3
 standby 40 ip 192.168.4.254
int vlan 50
 ip address 192.168.5.1 255.255.255.0
 ip helper-address 192.168.8.3
 standby 50 ip 192.168.5.254
int vlan 60
 ip address 192.168.6.254 255.255.255.0
 ip helper-address 192.168.8.3
exit

ip routing
int f0/1
 no switchport
 ip address 192.168.12.2 255.255.255.0
 no shutdown
```

```
int f0/2
 switchport trunk encapsulation dot1q
 switchport mode trunk
int f0/3
 switchport trunk encapsulation dot1q
 switchport mode trunk
int f0/4
 switchport trunk encapsulation dot1q
 switchport mode trunk
int f0/5
 switchport trunk encapsulation dot1q
 switchport mode trunk
int f0/6
 switchport trunk encapsulation dot1q
 switchport mode trunk
int f0/7
 switchport mode access
 switchport access vlan 60
exit

router rip
 version 2
 no auto-summary
 network 192.168.1.0
 network 192.168.2.0
 network 192.168.3.0
 network 192.168.4.0
 network 192.168.5.0
 network 192.168.6.0
 network 192.168.12.0
```

核心交换机 1，承担 VLAN 网关，支持 HSRP 虚拟网关冗余，RIP 通告 VLAN 网段

核心交换机2（带 HSRP）

```
en
conf t
vlan 10
vlan 20
vlan 30
vlan 40
vlan 50
exit

int vlan 10
 ip address 192.168.1.2 255.255.255.0
 ip helper-address 192.168.8.3
 standby 10 ip 192.168.1.254
int vlan 20
 ip address 192.168.2.2 255.255.255.0
 ip helper-address 192.168.8.3
 standby 20 ip 192.168.2.254
int vlan 30
 ip address 192.168.3.2 255.255.255.0
 ip helper-address 192.168.8.3
 standby 30 ip 192.168.3.254
 standby 30 priority 101
 standby 30 preempt
 standby 30 track f0/1
int vlan 40
 ip address 192.168.4.2 255.255.255.0
 ip helper-address 192.168.8.3
 standby 40 ip 192.168.4.254
 standby 40 priority 101
 standby 40 preempt
 standby 40 track f0/1
int vlan 50
 ip address 192.168.5.2 255.255.255.0
 ip helper-address 192.168.8.3
 standby 50 ip 192.168.5.254
 standby 50 priority 101
 standby 50 preempt
 standby 50 track f0/1
exit

ip routing
int f0/1
 no switchport
 ip address 192.168.13.2 255.255.255.0
 no shutdown
```

```
int f0/2
 switchport trunk encapsulation dot1q
 switchport mode trunk
int f0/3
 switchport trunk encapsulation dot1q
 switchport mode trunk
int f0/4
 switchport trunk encapsulation dot1q
 switchport mode trunk
int f0/5
 switchport trunk encapsulation dot1q
 switchport mode trunk
int f0/6
 switchport trunk encapsulation dot1q
 switchport mode trunk
exit

router rip
 version 2
 no auto-summary
 network 192.168.1.0
 network 192.168.2.0
 network 192.168.3.0
 network 192.168.4.0
 network 192.168.5.0
 network 192.168.13.0
```

核心交换机 2，作为 HSRP 备份/主设备，负责 VLAN 冗余与路由

外网路由器

ArkTS

```
en
conf t
int f0/0
 ip address 100.1.2.1 255.255.255.0
 no shutdown
int f0/1
 ip address 100.1.3.1 255.255.255.0
 no shutdown
int s0/3/0
 ip address 100.1.1.2 255.255.255.0
 no shutdown
```

与出口路由器相连，负责外网服务器、互联网用户 PC

i层交换机（i从1到5）

```ArkTS
en
conf t
vlan 20
vlan i0
exit
int f0/1
switch mode trunk
int f0/4
switch mode trunk
int f0/2
switch mode trunk
switch access vlan i0
int f0/3
switch access vlan i0
```

- VLAN 划分 + HSRP 冗余网关
- 核心交换机路由转发
- 出口 NAT（多用户共享公网 IP 段）
- RIP V2 动态路由互通
- DHCP 中继（helper-address）
- 分校区互联 + 外网访问

结果展示

```
C:\>ping 100.1.2.2

Pinging 100.1.2.2 with 32 bytes of
data:

Request timed out.
Request timed out.
Reply from 100.1.2.2: bytes=32
time=1ms TTL=124
Reply from 100.1.2.2: bytes=32
time=1ms TTL=124

Ping statistics for 100.1.2.2:
    Packets: Sent = 4, Received = 2,
Lost = 2 (50% loss),
Approximate round trip times in milli-
seconds:
```

ping 100.1.2.2成功