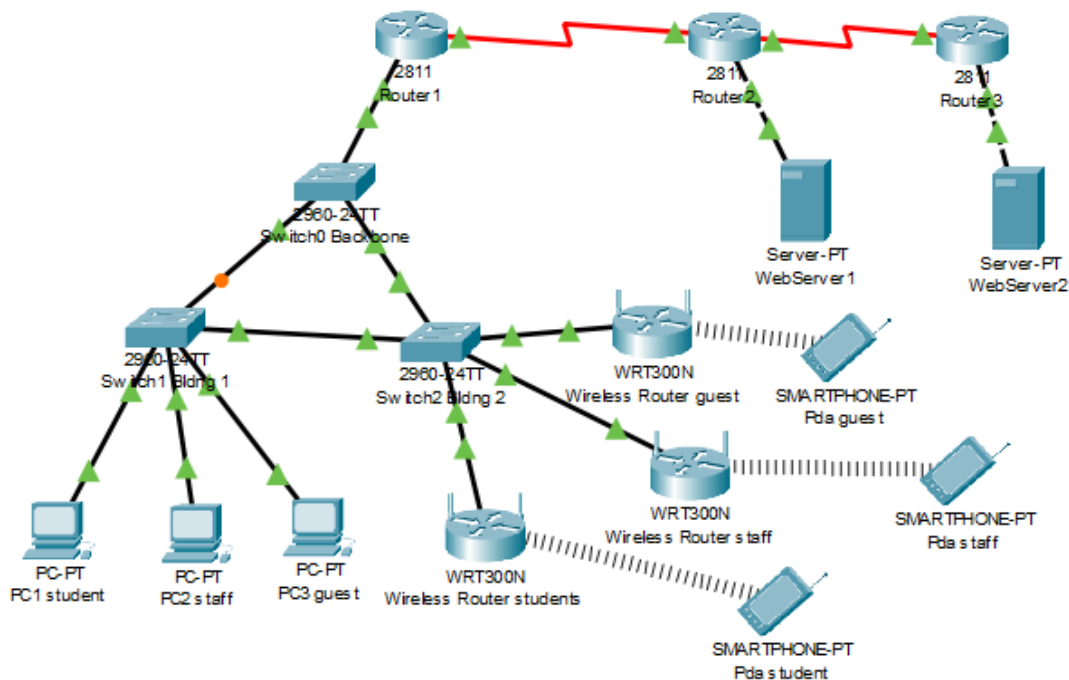


Learning Objectives

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

- Configure VLANs using switch port membership.
- Configure VTP
- Configure dynamic routing (using OSPF)
- Test and verify full connectivity.

Topology Diagram



TASK 1: Create and cable the network referring to topology above.

Topology is available.

TASK 2: Design IP address plan

The network address 172.30.0.0/16 is given. IP address plan for the network illustrated in Figure1 above is done for you using VLSM. The following criteria was used:

- VLAN 10 (students) is having 250 users
- VLAN 20 (staff) is having 60 users
- VLAN 30 (guests) is having 58 users
- WAN1 is having 2 users
- WAN2 has 2 users

VLAN 10 (STUDENTS)

Subnet address	First usable address	Last usable address	Subnet mask
172.30.0.0	172.30.0.1	172.30.0.254	255.255.255.0

VLAN 20 (STAFF)

Subnet address	First usable address	Last usable address	Subnet mask
172.30.1.0	172.30.1.1	172.30.1.62	255.255.255.192

VLAN 30 (GUEST)

Subnet address	First usable address	Last usable address	Subnet mask
172.30.1.64	172.30.1.65	172.30.1.126	255.255.255.192

WAN1

Subnet address	First usable address	Second usable address	Subnet mask
172.30.1.128	172.30.1.129	172.30.1.130	255.255.255.252

WAN2

Subnet address	First usable address	Second usable address	Subnet mask
172.30.1.132	172.30.1.133	172.30.1.134	255.255.255.252

DEVICE	INTERFACE	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
Router1	Fa0/0.10	172.30.0.1	255.255.255.0	N/A
	Fa0/0.20	172.30.1.1	255.255.255.192	N/A
	S0/0/0	172.30.1.129	255.255.255.252	N/A
Router 2	Fa0/0	200.50.5.1	255.255.255.224	N/A
	S0/0/0	172.30.1.130	255.255.255.252	N/A
	S0/0/1	172.30.1.133	255.255.255.252	N/A
Router 3	Fa0/0	120.100.10.1	255.255.255.224	N/A
	S0/0/1	172.30.1.134	255.255.255.252	N/A
Wireless Router student	NIC	172.30.0.254	255.255.255.0	N/A
Wireless Router staff	NIC	172.30.1.62	255.255.255.192	N/A
Wireless Router guest	NIC	172.30.1.126	255.255.255.192	N/A
PC1 (student)	NIC	172.30.0.2	255.255.255.0	172.30.0.1
PC2 (staff)	NIC	172.30.1.2	255.255.255.192	172.30.1.1
PC3 (guest)	NIC	172.30.1.66	255.255.255.192	172.30.1.65
PDA (student)	NIC	172.30.0.3	255.255.255.0	172.30.0.1
PDA (staff)	NIC	172.30.1.3	255.255.255.192	172.30.1.1
PDA (guest)	NIC	172.30.1.67	255.255.255.192	172.30.1.65
Web Server1	NIC	200.50.5.2	255.255.255.224	200.50.5.1
WebServer2	NIC	120.100.10.2	255.255.255.224	120.100.10.1

TASK 3: Configure a Web Server using the address table above.

To be completed in the lab.

TASK 4: Configure wireless security

On the Wireless Router student, set **WEP** security to **aaaaaa1111**.

On the Wireless Router staff, set **WEP** security to **aaaaaa2222**.

On the Wireless Router guest, set **WEP** security to **aaaaaa3333**.

On the PDA student, set **WEP** security to **aaaaaa1111**.

On the PDA staff, set **WEP** security to **aaaaaa2222**.

On the PDA guest, set **WEP** security to **aaaaaa3333**.

TASK 5: Configure VTP on all switches.

On Backbone switch, set the VTP **mode** to Server, set the **domain** to cob, and set the **password** to cob311t.

On Building 1 switch, set the VTP **mode** to Client, set the **domain** to cob, and set the **password** to cob311t.

On Building 2 switch, set the VTP **mode** to Client, set the **domain** to cob, and set the **password** to cob311t.

TASK 6: Create VLANs to separate students, staff and guests on Backbone switch.

Create VLANs 10, 20, 30, and 99. Name them students, staff, guest, and management respectively.

Note that VLANs must only be created on **Backbone switch**.

TASK 7: Assign ports to VLANs that you created on all switches.

Students VLAN 10 will use ports FastEthernet0/1 to FastEthernet0/5. Make sure that you set the ports to access mode.

Staff VLAN 20 will use ports FastEthernet0/6 to FastEthernet0/10. Make sure that you set the ports to access mode.

Guests VLAN 30 will use ports FastEthernet0/11 to FastEthernet0/15. Make sure that you set the ports to access mode.

Management VLAN 99 will use ports FastEthernet0/16 to FastEthernet0/20. Make sure that you set the ports to trunk mode.

Note that the same assignment of ports to VLANs must be done on all switches.

TASK 8: Connecting VLANs together

Configure the interfaces of router1 as follows:

Make sure that interface Fa0/0 is enabled.

N.B: Use the IP address table for reference.

Subinterface Fa0/0.10 must be assigned **vlan10_first_usable_address + subnet mask**

Subinterface Fa0/0.20 must be assigned **vlan20_first_usable_address + subnet mask**

TASK 9: Assign IP addresses manually on all end devices

All end devices must be configured according to IP addresses filled in the IP address table.

TASK10: Verify connectivity

Only the pings between VLANs 10 and 20 must be successful. Pings to VLAN 30 and the Web servers will fail. E.g., from PC1(student) you must ping PC2(staff). If the ping fails, you must troubleshoot.

TASK11: Configure router interfaces on router1 and router2

On router1, configure interface S0/0/0 with correct IP address.

On router2, configure interface S0/0/0 with correct IP address.

On router2, configure interface S0/0/1 with correct IP address.

On router2, configure interface Fa0/0 with IP address – 200.50.5.1 mask 255.255.255.224.

On router3, configure interface S0/0/1 with correct IP address.

On router3, configure interface Fa0/0 with IP address – 120.100.10.1 mask 255.255.255.224.

TASK12: Configure dynamic routing (Open Shortest Path First)

You must use OSPF only to configure dynamic routing as follows:

Use process id of 1.

Use the area of 0.

TASK13: Verify full connectivity from VLANs to the Web server

At this stage, all devices from the VLAN 10 and 20 must successfully ping all the Web servers. Pings from VLAN 30 to web servers will fail.