

3.3.12 Packet Tracer – VLAN Configuration (Instructions Answer)

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3.3.12 Packet Tracer – VLAN Configuration (Instructor Version)



Addressing Table

Device	Interface	IP Address	Subnet Mask	VLAN
PC1	NIC	172.17.10.21	255.255.255.0	10
PC2	NIC	172.17.20.22	255.255.255.0	20
PC3	NIC	172.17.30.23	255.255.255.0	30
PC4	NIC	172.17.10.24	255.255.255.0	10
PC5	NIC	172.17.20.25	255.255.255.0	20
PC6	NIC	172.17.30.26	255.255.255.0	30

Objectives

- Part 1: Verify the Default VLAN Configuration
- Part 2: Configure VLANs
- Part 3: Assign VLANs to Ports

Background

VLANs are helpful in the administration of logical groups, allowing members of a group to be easily moved, changed, or added. This activity focuses on creating and naming VLANs, and assigning access ports to specific VLANs.

Part 1: View the Default VLAN Configuration

Step 1: Display the current VLANs.

On S1, issue the command that displays all VLANs configured. By default, all interfaces are assigned to VLAN 1.

```
S1#show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

S1#

Step 2: Verify connectivity between PCs on the same network.

Notice that each PC can ping the other PC that shares the same subnet.

- PC1 can ping PC4
- PC2 can ping PC5
- PC3 can ping PC6

Pings to hosts on other networks fail.

What benefits can VLANs provide to the network?

The primary benefits of using VLANs are as follows: security, cost reduction, higher performance, broadcast storm mitigation, improved IT staff efficiency, and simpler project and application management.

Part 2: Configure VLANs

Step 1: Create and name VLANs on S1.

a. Create the following VLANs. Names are case-sensitive and must match the requirement exactly:

- VLAN 10: Faculty/Staff

```
S1(config)# vlan 10
S1(config-vlan)# name Faculty/Staff
```

b. Create the remaining VLANs.

- VLAN 20: Students
- VLAN 30: Guest(Default)
- VLAN 99: Management&Native
- VLAN 150: VOICE

```
S1(config-vlan)#vlan 20
S1(config-vlan)#name Students
S1(config-vlan)#vlan 30
S1(config-vlan)#name Guest(Default)
S1(config-vlan)#vlan 99
S1(config-vlan)#name Management&Native
S1(config-vlan)#vlan 150
S1(config-vlan)#name VOICE
```

Step 2: Verify the VLAN configuration.

Which command will only display the VLAN name, status, and associated ports on a switch?

```
S1#show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/6, Fa0/7, Fa0/8 Fa0/9, Fa0/10, Fa0/11, Fa0/12 Fa0/13, Fa0/14, Fa0/15, Fa0/16 Fa0/17, Fa0/18, Fa0/19, Fa0/20 Fa0/21, Fa0/22, Fa0/23, Fa0/24 Gig0/1, Gig0/2
10	Faculty/Staff	active	
20	Students	active	
30	Guest(Default)	active	
99	Management&Native	active	
150	VOICE	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

Step 3: Create the VLANs on S2 and S3.

Use the same commands from Step 1 to create and name the same VLANs on S2 and S3.

S2

```
S2(config)#vlan 10
S2(config-vlan)#name Faculty/Staff
S2(config-vlan)#vlan 20
S2(config-vlan)#name Students
S2(config-vlan)#vlan 30
S2(config-vlan)#name Guest(Default)
S2(config-vlan)#vlan 99
S2(config-vlan)#name Management&Native
S2(config-vlan)#vlan 150
S2(config-vlan)#name VOICE
```

S3

```
S3(config)#vlan 10
S3(config-vlan)#name Faculty/Staff
S3(config-vlan)#vlan 20
S3(config-vlan)#name Students
S3(config-vlan)#vlan 30
S3(config-vlan)#name Guest(Default)
S3(config-vlan)#vlan 99
S3(config-vlan)#name Management&Native
S3(config-vlan)#vlan 150
S3(config-vlan)#name VOICE
```

Step 4: Verify the VLAN configuration.

```
show vlan brief
```

Part 3: Assign VLANs to Ports

Step 1: Assign VLANs to the active ports on S2.

a. Configure the interfaces as access ports and assign the VLANs as follows:

- VLAN 10: FastEthernet 0/11

```
S2(config)# interface f0/11
S2(config-if)# switchport mode access
S2(config-if)# switchport access vlan 10
```

b. Assign the remaining ports to the appropriate VLAN.

- VLAN 20: FastEthernet 0/18
- VLAN 30: FastEthernet 0/6

```
S2(config-if)#interface f0/18
S2(config-if)#switchport mode access
S2(config-if)#switchport access vlan 20
```

```
S2(config-if)#interface f0/6
S2(config-if)#switchport mode access
S2(config-if)#switchport access vlan 30
S2(config-if)#
```

Step 2: Assign VLANs to the active ports on S3.

S3 uses the same VLAN access port assignments as S2. Configure the interfaces as access ports and assign the VLANs as follows:

- VLAN 10: FastEthernet 0/11
- VLAN 20: FastEthernet 0/18
- VLAN 30: FastEthernet 0/6

```
S3(config)#interface f0/11
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 10
```

```
S3(config-if)#interface f0/18
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 20
```

```
S3(config-if)#interface f0/6
S3(config-if)#switchport mode access
S3(config-if)#switchport access vlan 30
```

Step 3: Assign the VOICE VLAN to FastEthernet 0/11 on S3.

As shown in the topology, the S3 FastEthernet 0/11 interface connects to a Cisco IP Phone and PC4. The IP phone contains an integrated three-port 10/100 switch. One port on the phone is labeled Switch and connects to Fo/4. Another port on the phone is labeled PC and

connects to PC4. The IP phone also has an internal port that connects to the IP phone functions.

The S3 Fo/11 interface must be configured to support user traffic to PC4 using VLAN 10 and voice traffic to the IP phone using VLAN 150. The interface must also enable QoS and trust the Class of Service (CoS) values assigned by the IP phone. IP voice traffic requires a minimum amount of throughput to support acceptable voice communication quality. This command helps the switchport to provide this minimum amount of throughput.

```
S3(config)# interface f0/11
S3(config-if)# mls qos trust cos
S3(config-if)# switchport voice vlan 150
```

Step 4: Verify loss of connectivity.

Previously, PCs that shared the same network could ping each other successfully.

Study the output of from the following command on S2 and answer the following questions based on your knowledge of communication between VLANs. Pay close attention to the Gigo/1 port assignment.

```
S2# show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4 Fa0/5, Fa0/7, Fa0/8, Fa0/9 Fa0/10, Fa0/12, Fa0/13, Fa0/14 Fa0/15, Fa0/16, Fa0/17, Fa0/19 Fa0/20, Fa0/21, Fa0/22, Fa0/23 Fa0/24, Gig0/1, Gig0/2
10	Faculty/Staff	active	Fa0/11
20	Students	active	Fa0/18
30	Guest(Default)	active	Fa0/6
99	Management&Native	active	
150	VOICE	active	

Try pinging between PC1 and PC4.

Although the access ports are assigned to the appropriate VLANs, were the pings successful? Explain.

No, the pings failed because the ports between the switches are in VLAN 1 and PC1 and PC4 are in VLAN 10.

What could be done to resolve this issue?

Configure the ports between the switches as trunk ports.

Answer Scripts

Switch S1

```
vlan 10
  name Faculty/Staff
vlan 20
  name Students
vlan 30
  name Guest(Default)
vlan 99
  name Management&Native
vlan 150
  name VOICE
```

Switch S2

```
vlan 10
  name Faculty/Staff
vlan 20
  name Students
vlan 30
  name Guest(Default)
vlan 99
  name Management&Native
vlan 150
  name VOICE
interface fa0/11
  switchport mode access
  switchport access vlan 10
interface fa0/18
  switchport mode access
  switchport access vlan 20
interface fa0/6
  switchport mode access
  switchport access vlan 30
```

Switch S3

```
vlan 10
  name Faculty/Staff
vlan 20
  name Students
vlan 30
  name Guest(Default)
vlan 99
  name Management&Native
vlan 150
  name VOICE
interface fa0/11
  switchport mode access
  switchport access vlan 10
  mls qos trust cos
  switchport voice vlan 150
interface fa0/18
  switchport mode access
  switchport access vlan 20
interface fa0/6
  switchport mode access
  switchport access vlan 30
```

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