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Assignment Submission IV

Simulating VLAN On Cisco Packet Tracer

VLAN stands for Virtual Local Area Network, is a broadcast domain which is logically partitioned and isolated on a computer network. This is usually done on the data link layer. Vlan is important as our network complexity and number of nodes increase and exceed the capacity of our network.

Why VLAN ?

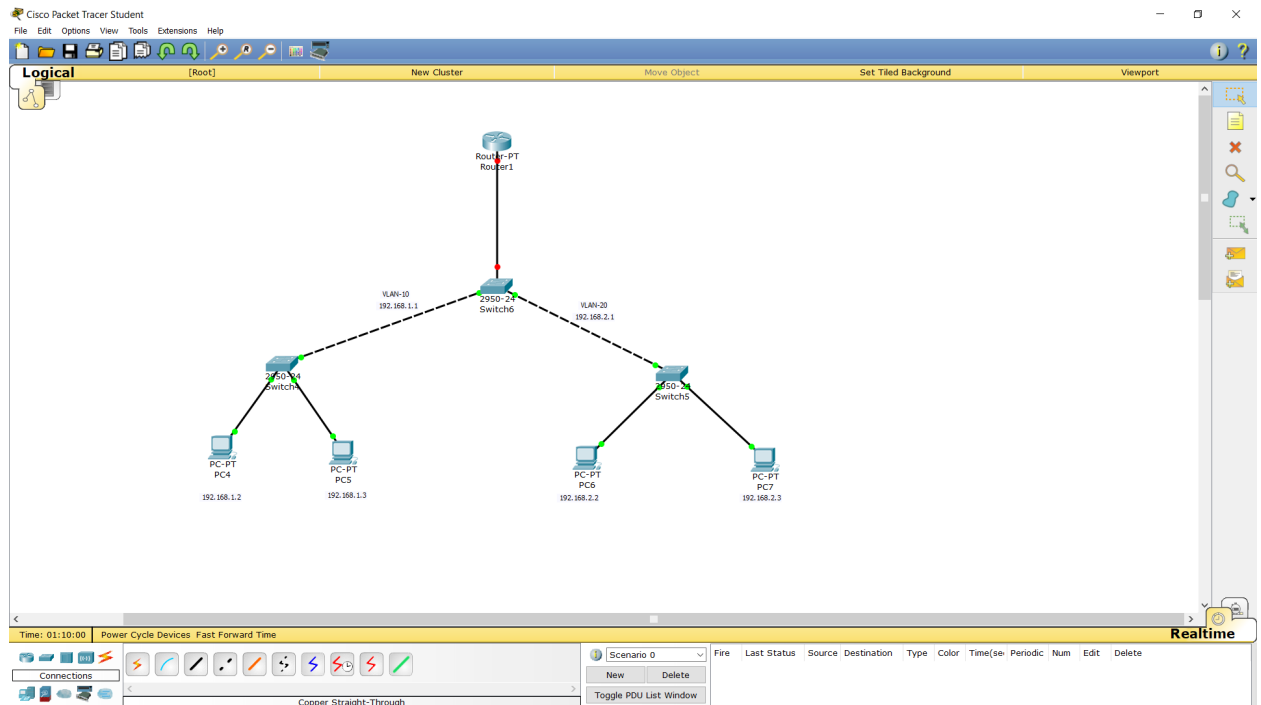
- VLAN is cost effective
- Offers more flexibility than non virtual solutions
- Decrease the amount of admin oversight

Commands to configure VLAN on Cisco Packet Tracer:

- Switch Configuration
 - **enable**
 - **configure terminal**
 - **vlan <any number>**
 - **name <any valid name for vlan>**
 - **show vlan**
 - **interface <interface> (fa0/0)**
 - **switchport mode access**
 - **switchport access vlan <vlan number>**
 - **show running-config**
 - **Interface <interface> switchport mode trunk**
- Router Configuration
 - **enable**
 - **configure terminal**
 - **int <interface>**
 - **no shutdown**
 - **int interface/0.10**
 - **encapsulation dot1q <vlan number>**
 - **ip address <IP address> <subnet mask>**

Steps to create a VLAN

- 1) Place the components on the workspace and connect them with the appropriate cables.



- 2) Check if the computers in the same network range work by pinging.

PC5 Command Prompt window showing a successful ping to 192.168.1.3. The output shows four successful replies with varying times and TTL values. The ping statistics indicate 0% loss.

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=11ms TTL=128
Reply from 192.168.1.3: bytes=32 time=7ms TTL=128
Reply from 192.168.1.3: bytes=32 time=0ms TTL=128
Reply from 192.168.1.3: bytes=32 time=5ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 5ms

PC>
```

PC4 Command Prompt window showing an invalid command followed by a successful ping to 192.168.1.2. The output shows four successful replies with varying times and TTL values. The ping statistics indicate 0% loss.

```
Packet Tracer PC Command Line 1.0
PC>ping ping 192.168.1.2
Invalid Command.

PC>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=4ms TTL=128
Reply from 192.168.1.2: bytes=32 time=0ms TTL=128
Reply from 192.168.1.2: bytes=32 time=6ms TTL=128
Reply from 192.168.1.2: bytes=32 time=11ms TTL=128

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 5ms

PC>
```

3) Configure the switch with the proper vlan settings

```
Switch>
Switch>
Switch>
Switch>
Switch>enable
Switch#config t
Enter configuration commands, one per line. End with CNTRL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name students
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name teachers
Switch(config-vlan)#exit
Switch(config)#int f0/1
Switch(config-if)#switchport access mode
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int f0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#exit
Switch(config)#
```

Switch6

Physical Config CLI

IOS Command Line Interface

```
Switch#show vlan
```

VLAN Name	Status	Ports
1 default	active	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
10 students	active	Fa0/1
20 teachers	active	Fa0/2
1002 fddi-default	act/unsup	
1003 token-ring-default	act/unsup	
1004 fddinet-default	act/unsup	
1005 trnet-default	act/unsup	

VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Transl

Trans2

Copy Paste

The screenshot shows a window titled "Switch6" from the Cisco Packet Tracer application. The window has three tabs at the top: "Physical", "Config", and "CLI". The "CLI" tab is currently selected. Below the tabs, the title "IOS Command Line Interface" is displayed. A large rectangular area contains the command-line interface text:

```
Switch#  
Switch#  
Switch#  
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Switch#  
Switch#  
Switch#  
Switch#  
Switch#  
Switch#  
Switch#  
Switch#  
Switch#  
Switch# config t  
Enter configuration commands, one per line. End with CNTL/Z.  
Switch(config)# int f0/3  
Switch(config-if)# switchport mode trunk  
Switch(config-if)# exit  
Switch(config) #
```

4) Configure the router, assign logical ports.



The screenshot shows a window titled "Router1" with tabs for "Physical", "Config", and "CLI". The "CLI" tab is active, displaying the "IOS Command Line Interface". The interface shows the Cisco IOS version 12.2(28) and the PT1000 hardware. It prompts for a system configuration dialog, which is skipped. The user enters the configuration mode and configures three subinterfaces on FastEthernet0/0: FastEthernet0/0.10 and FastEthernet0/0.20. Each subinterface is configured with a dot1q encapsulation and an IP address from the 192.168.1.1/24 network. The status of each configuration step is shown, indicating that the interfaces are up and the line protocols are down.

```
Router1
Physical Config CLI
IOS Command Line Interface

Cisco Internetwork Operating System Software
IOS (tm) PT1000 Software (PT1000-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang

PT 1001 (PTSC2005) processor (revision 0x200) with 60416K/5120K bytes of memory
.
Processor board ID PT0123 (0123)
PT2005 processor: part number 0, mask 01
Bridging software.
X.25 software, Version 3.0.0.
4 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
63488K bytes of ATA CompactFlash (Read/Write)

--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>en
Router#configure t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int f0/0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#int f0/0.10
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.10, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.10, changed state to up

Router(config-subif)#encapsulation dot1q 10
Router(config-subif)#ip address 192.168.1.1 255.255.255.0
Router(config-subif)#int f0/0.20
Router(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.20, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.20, changed state to up

Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip address 192.168.2.1 255.255.255.0
Router(config-subif)#
```

Copy Paste

5) Test the connection

```
PC4
Physical Config Desktop Custom Interface
Command Prompt
PC>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time=0ms TTL=255
Reply from 192.168.1.1: bytes=32 time=0ms TTL=255
Reply from 192.168.1.1: bytes=32 time=0ms TTL=255
Reply from 192.168.1.1: bytes=32 time=0ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.2: bytes=32 time=1ms TTL=127
Reply from 192.168.2.2: bytes=32 time=11ms TTL=127
Reply from 192.168.2.2: bytes=32 time=4ms TTL=127

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 5ms
```

```
PC4
Physical Config Desktop Custom Interface
Command Prompt
Request timed out.
Reply from 192.168.2.2: bytes=32 time=1ms TTL=127
Reply from 192.168.2.2: bytes=32 time=11ms TTL=127
Reply from 192.168.2.2: bytes=32 time=4ms TTL=127

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 11ms, Average = 5ms

PC>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.3: bytes=32 time=0ms TTL=127
Reply from 192.168.2.3: bytes=32 time=0ms TTL=127
Reply from 192.168.2.3: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

PC>
```

```
PC7
Physical Config Desktop Custom Interface
Command Prompt
Reply from 192.168.1.2: bytes=32 time=1ms TTL=127
Reply from 192.168.1.2: bytes=32 time=0ms TTL=127
Reply from 192.168.1.2: bytes=32 time=11ms TTL=127
Reply from 192.168.1.2: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 3ms

PC>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Request timed out.
Reply from 192.168.1.3: bytes=32 time=11ms TTL=127
Reply from 192.168.1.3: bytes=32 time=11ms TTL=127
Reply from 192.168.1.3: bytes=32 time=0ms TTL=127

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 7ms

PC>
```

```
PC5
Physical Config Desktop Custom Interface
Command Prompt
Reply from 192.168.1.3: bytes=32 time=11ms TTL=128
Reply from 192.168.1.3: bytes=32 time=7ms TTL=128
Reply from 192.168.1.3: bytes=32 time=0ms TTL=128
Reply from 192.168.1.3: bytes=32 time=5ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 5ms

PC>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:

Reply from 192.168.2.3: bytes=32 time=2ms TTL=127
Reply from 192.168.2.3: bytes=32 time=0ms TTL=127
Reply from 192.168.2.3: bytes=32 time=1ms TTL=127
Reply from 192.168.2.3: bytes=32 time=2ms TTL=127

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 1ms

PC>
```

- The packet(pkt) is attached here for reference if needed
<https://github.com/mikias21/NADC/tree/main/assignment4>