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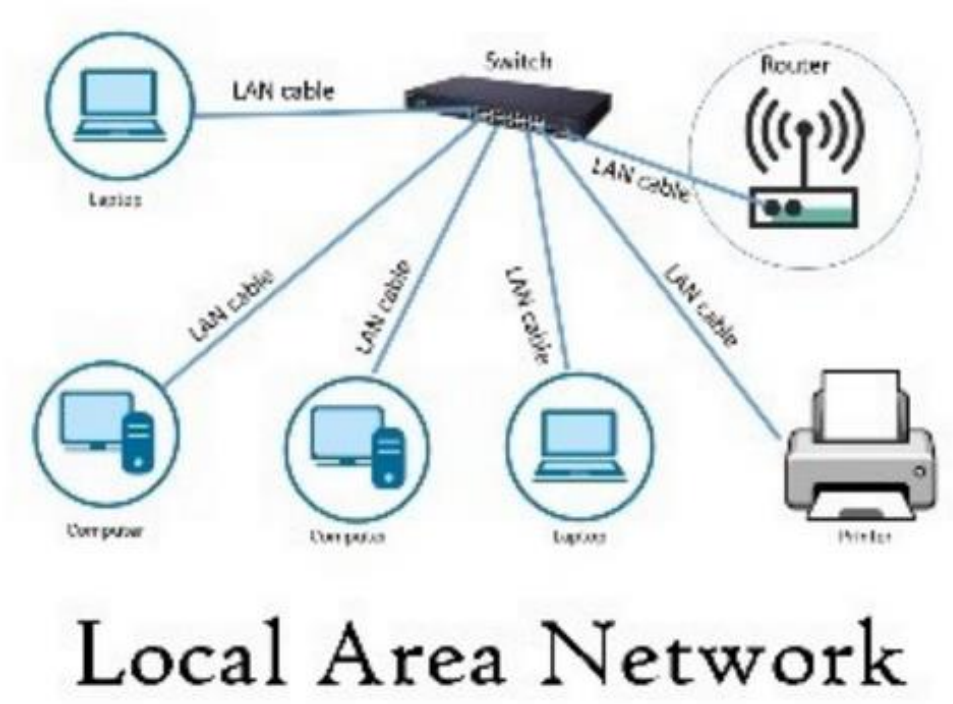
DCCN/CN lab 4
SE –Fall 2024

Introduction to VLAN's

What is LAN?

LAN is a group of devices like PCs, laptops, printers, servers, switches, wireless access Points, and routers. These devices are connected to share resources or for communication.



Local Area Network

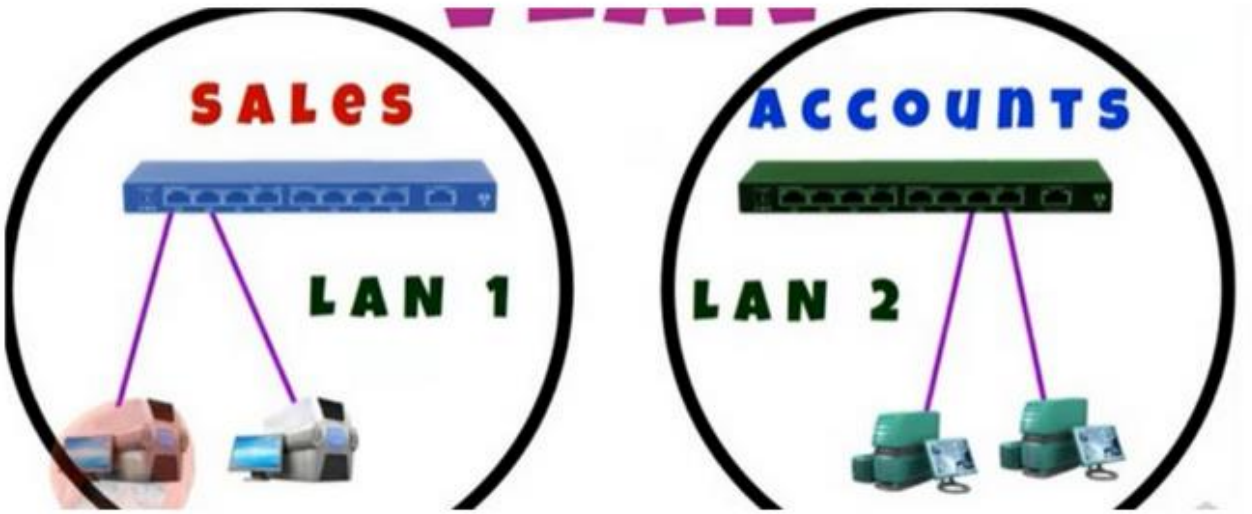
All devices are in the single broadcast domain. If any device from the LAN network sends any broadcast message it will received by all other devices in the same LAN.

VLAN'S (Virtual LANs)

VLANs mean LANs do not exist physically but have a logical grouping structure. A virtual LAN (VLAN) is a logical overlay network that groups a subset of devices that share a physical LAN, isolating the traffic for each group.

A virtual LAN (VLAN) is a logical overlay network that groups a subset of devices that share a physical LAN, isolating the traffic for each group.

VLAN is a virtual group of nodes with the same requirements, share resources, and are in a single broadcast domain. Whether the devices are physically in the same place or not.



By connecting 2 LANS with a single switch we can make a VLAN and their broadcast domain will remain separate. LAN is divided into sub-LANs and with different broadcast domains.

Data from one network does not move to the other side network or LAN which provides security. Devices from different LANs or networks use the same switch or infrastructure and wires etc.

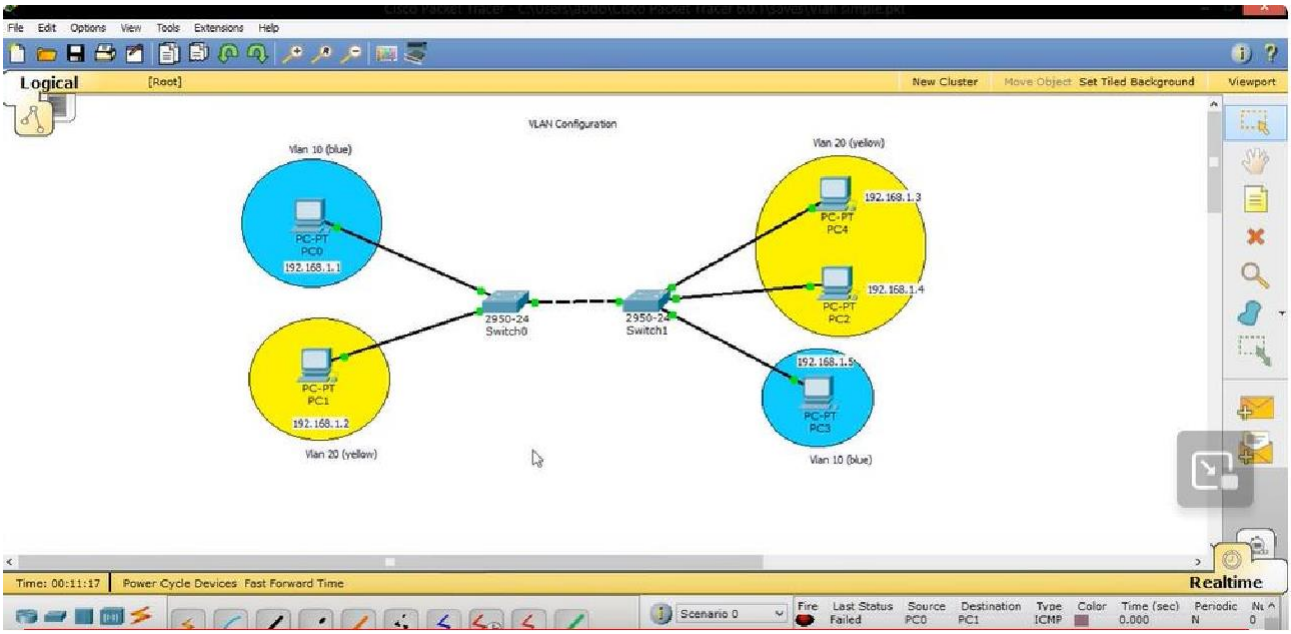
WHY VLANs?

- Reduce security risks (because of small broadcasts very limited devices get the copy of broadcast, multicast frames).

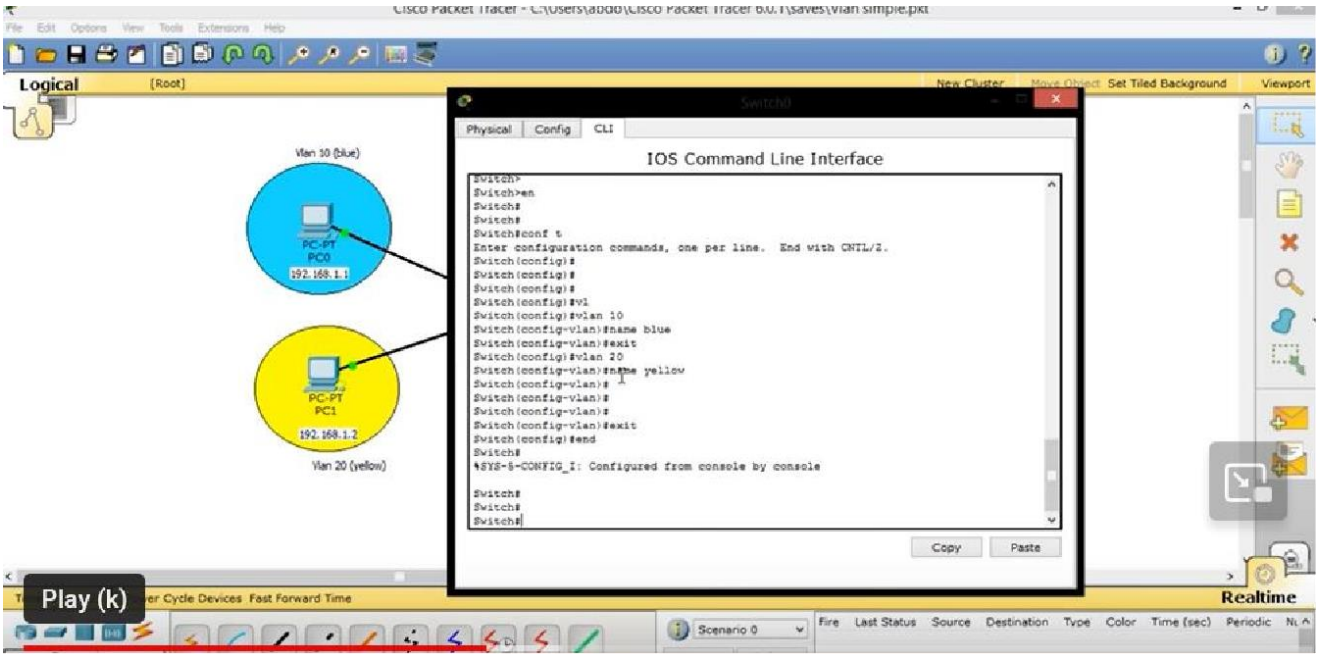
- Improve Performance (Broadcast traffic is reduced due to small broadcast domain, which increases the performance of the network)

- Troubleshooting (Because of small groups of networks in VLANs problem problem-finding and troubleshooting becomes easy).

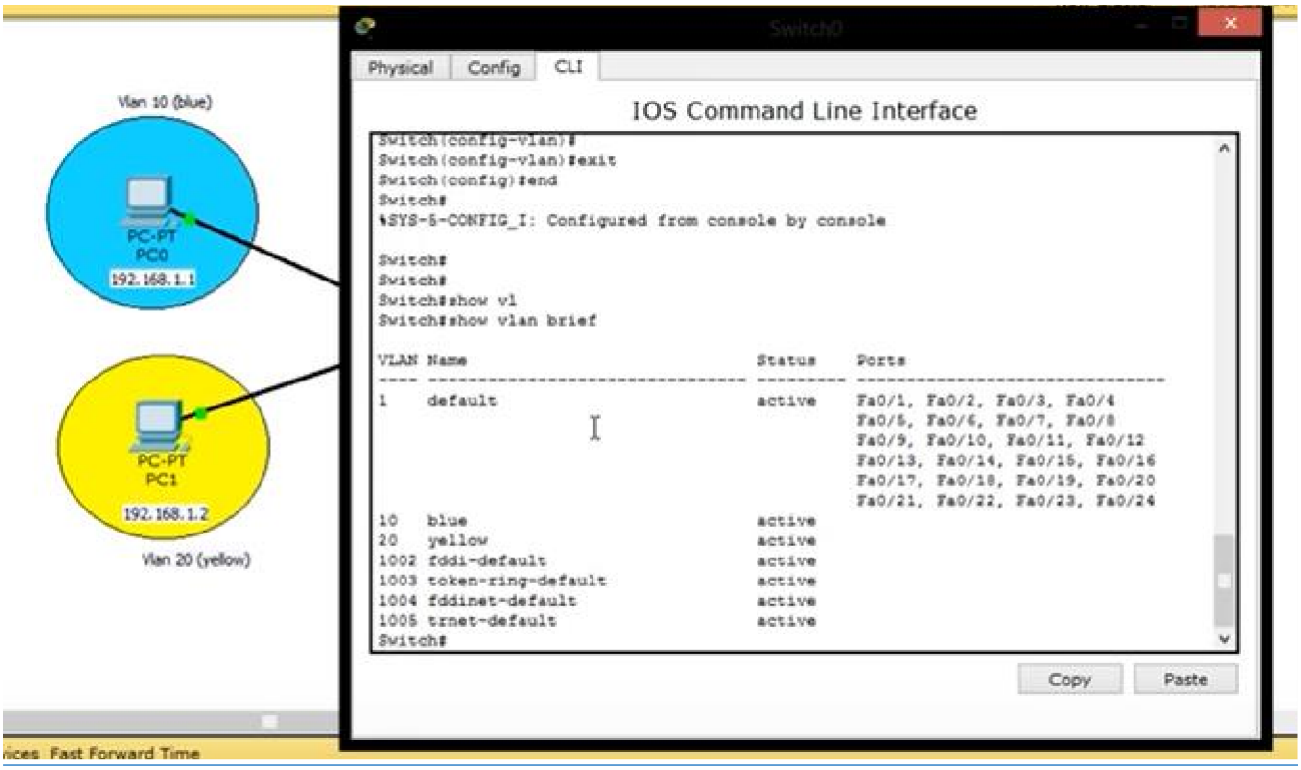
For creating VLANs step1



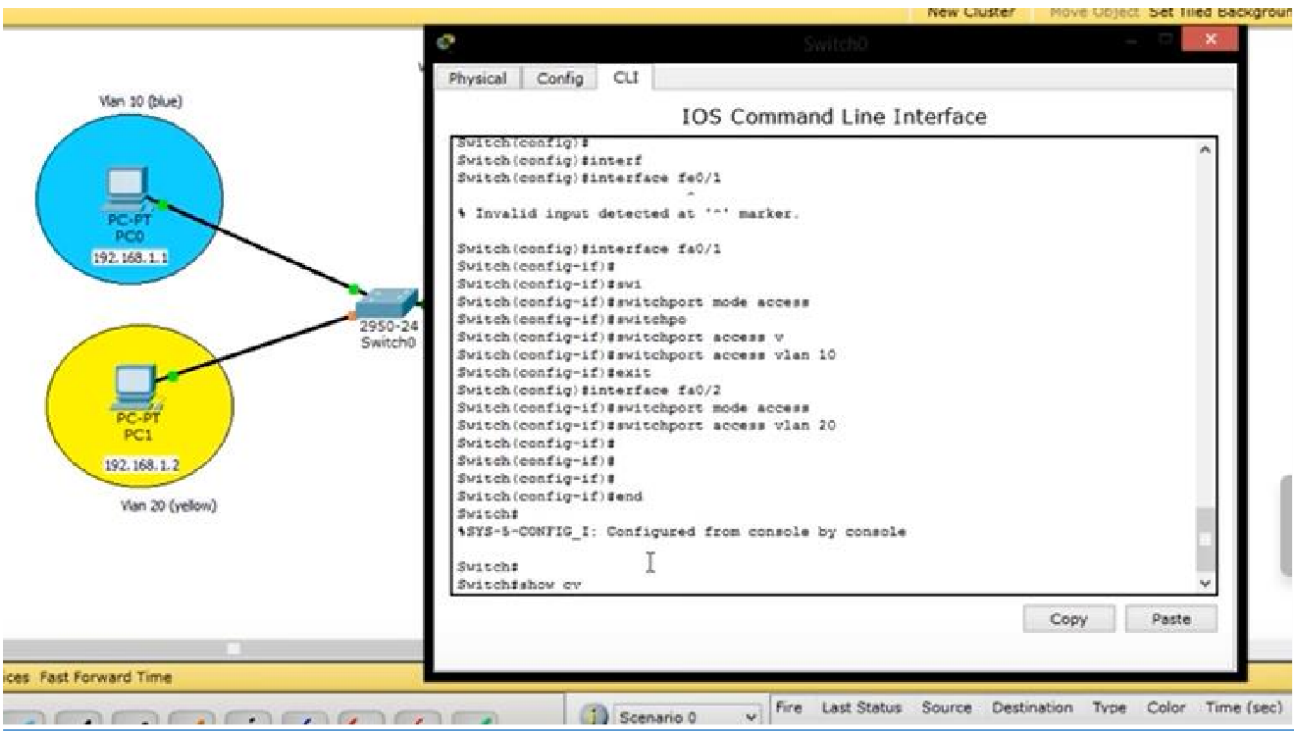
Step2



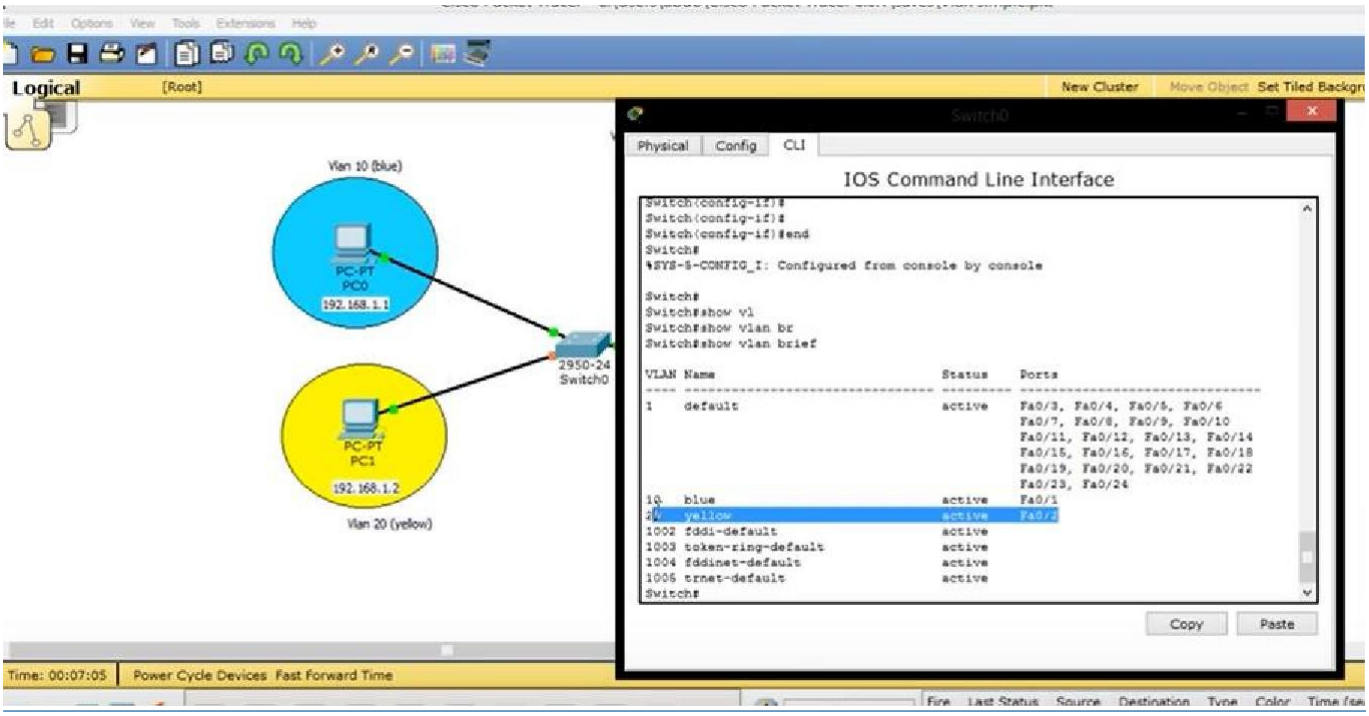
Step 3


Vlan 10 (blue)
PC-PT
PC0
192.168.1.1
PC-PT
PC1
192.168.1.2
Vlan 20 (yellow)
Switch0
Physical
Config
CLI
IOS Command Line Interface
Switch(config-vlan)#
Switch(config-vlan)#exit
Switch(config)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console
Switch#
Switch#
Switch#show vl
Switch#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
10 blue active
20 yellow active
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active
Switch#
Copy
Paste
ices Fast Forward Time

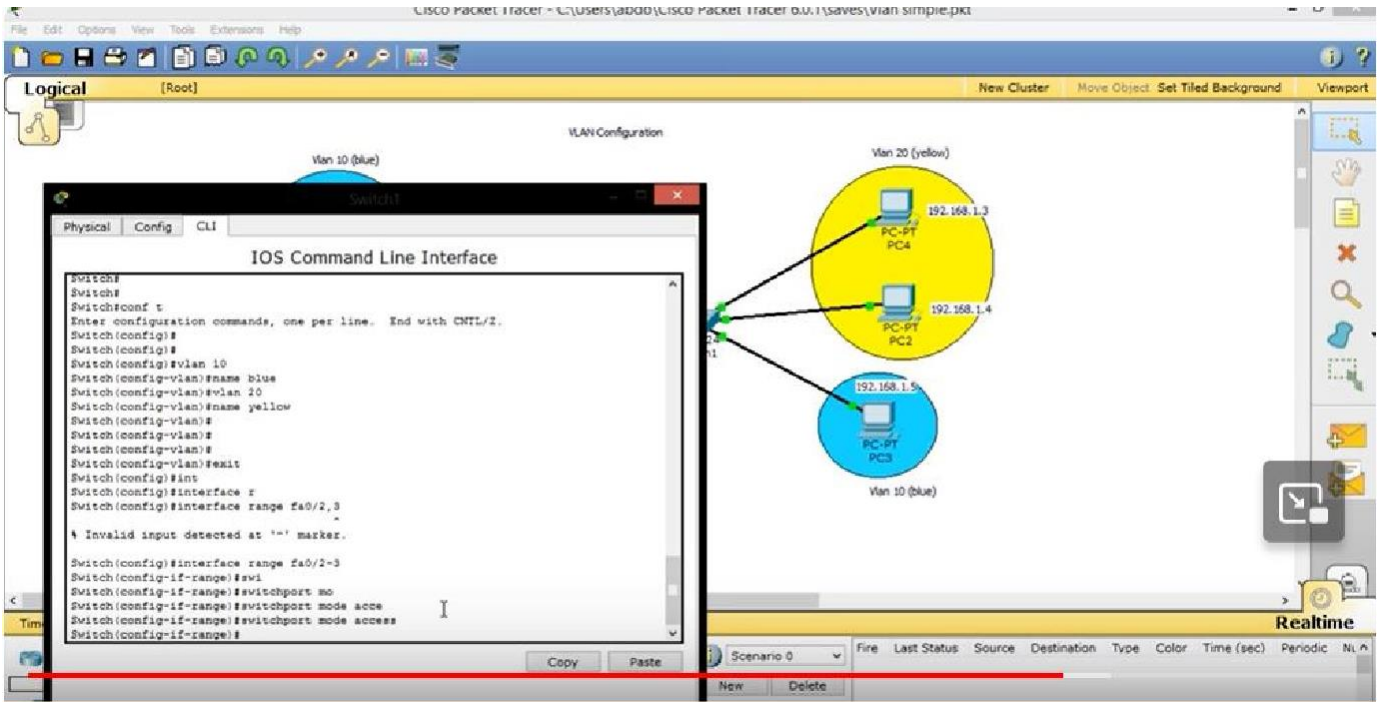
Step 4


Vlan 10 (blue)
PC-PT
PC0
192.168.1.1
2950-24
Switch0
PC-PT
PC1
192.168.1.2
Vlan 20 (yellow)
Switch0
Physical
Config
CLI
IOS Command Line Interface
Switch(config)#
Switch(config)#interf
Switch(config)#interface fe0/1
% Invalid input detected at '^' marker.
Switch(config)#interface fa0/1
Switch(config-if)#
Switch(config-if)#swi
Switch(config-if)#switchport mode access
Switch(config-if)#switchpo
Switch(config-if)#switchport access v
Switch(config-if)#switchport access vlan 10
Switch(config-if)#exit
Switch(config)#interface fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console
Switch#
Switch#show cv
Copy
Paste
ces Fast Forward Time
Scenario 0
Fire
Last Status
Source
Destination
Type
Color
Time (sec)

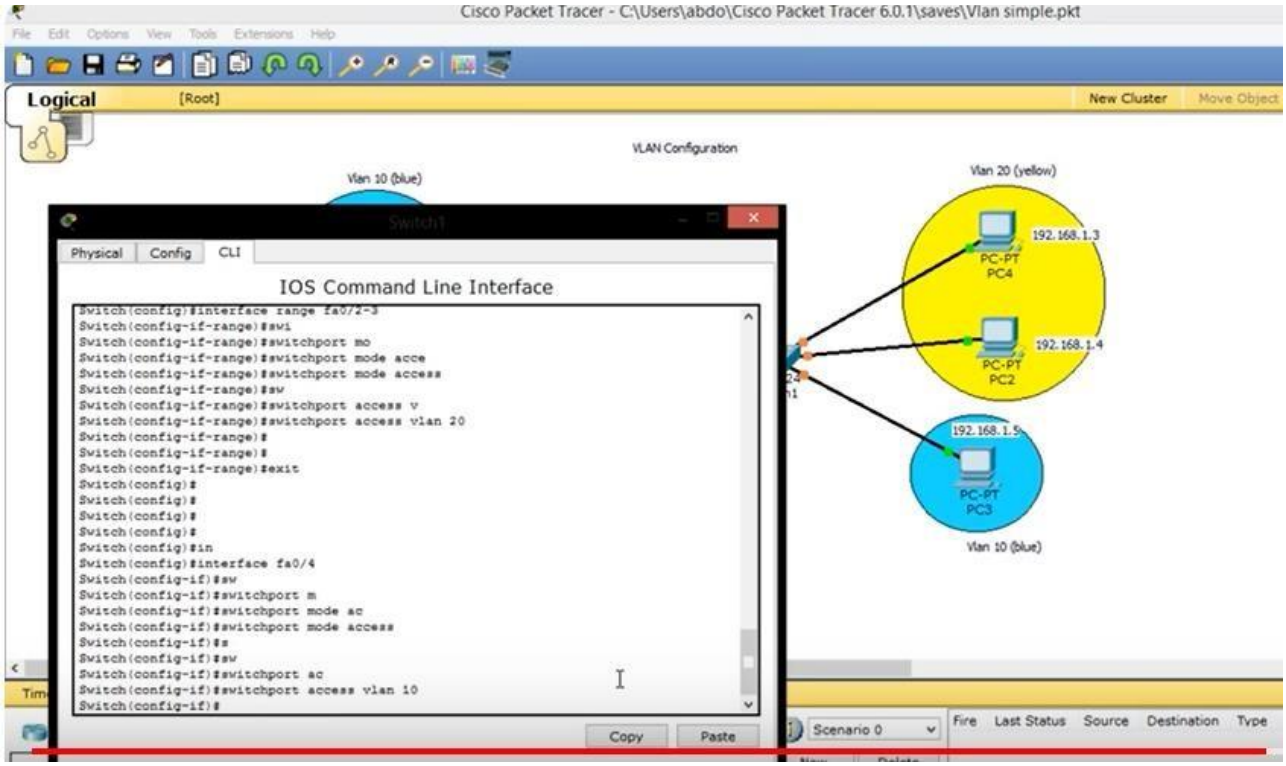
Step 5


Logical
[Root]
New Cluster
Move Object
Set Tiled Backgr
Vlan 10 (blue)
PC-PT
PC0
192.168.1.1
2950-24
Switch0
PC-PT
PC1
192.168.1.2
Vlan 20 (yellow)
Switch0
Physical
Config
CLI
IOS Command Line Interface
Switch(config-if)#
Switch(config-if)#
Switch(config-if)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console
Switch#
Switch#show vl
Switch#show vlan br
Switch#show vlan brief
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 blue active Fa0/1
20 yellow active Fa0/2
1002 fddi-default active
1003 token-ring-default active
1004 fddinet-default active
1005 trnet-default active
Switch#
Copy
Paste
Time: 00:07:05
Power Cycle Devices
Fast Forward Time

Step 6


Logical
[Root]
New Cluster
Move Object
Set Tiled Background
Viewport
VLAN Configuration
Vlan 10 (blue)
Vlan 20 (yellow)
192.168.1.3
PC-PT
PC4
192.168.1.4
PC-PT
PC2
192.168.1.5
PC-PT
PC3
Vlan 10 (blue)
Switch1
Physical
Config
CLI
IOS Command Line Interface
Switch#
Switch#
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#
Switch(config)#vlan 10
Switch(config-vlan)#name blue
Switch(config-vlan)#vlan 20
Switch(config-vlan)#name yellow
Switch(config-vlan)#
Switch(config-vlan)#
Switch(config-vlan)#
Switch(config-vlan)#exit
Switch(config)#int
Switch(config)#interface r
Switch(config)#interface range fa0/2,3
^
% Invalid input detected at '^' marker.
Switch(config)#interface range fa0/2-3
Switch(config-if-range)#swi
Switch(config-if-range)#switchport mo
Switch(config-if-range)#switchport mode acce
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#
Copy
Paste
Realtime
Scenario 0
New
Delete
Fire
Last Status
Source
Destination
Type
Color
Time (sec)
Periodic

Step 7



Some useful commands

1. The command for removing VLAN (no VLAN (number)
2. To check VLAN configuration (Show VLAN Brief)
3. To confirm the allowed VLANs on the trunk (show interface trunk)
4. To specify which VLANs can send traffic on the trunk. (switchport trunk allowed vlan 10,20,30)

Lab activity:

Create three different VLANs using a single switch and 3 nodes in each broadcast domain.
i-e vlan10, vlan20 and vlan30
Configure the above scenario using the command line interface. (No GUI)