

# **Computer Networks Lab**

Course Code: CSEL-3110



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## **How to Configure Same VLAN in Different Layer 2 Cisco Switches and Trunk Configuraion.**

Let's see how to configure VLAN in different Switches and we gonna check how it communicates with same VLAN on different Switches using Packet Tracer.

If a network has less number of host, that only needs single switch for the network. What if the network has larger number of host or Users. Host in a Same VLAN can communicate with each other if we configure host in same VLAN. Is it possible for the host to communicate from one switch to the host from other switch if the two host are in same VLAN.

Yes, VLAN can be extended to other switches in a network. we can make them communicate with each other by connecting that two switches with cross cable and we have to configure that link as a Trunk.

### **Trunk and Access Links**

#### **Trunk Link**

Trunk Links are the port that connects Switches and Routers.

Trunk Links are used to carry multiple VLAN frames across Switches in a network.

It makes VLANs to communicate with host in Same VLAN present in other switches.

Trunk Links can be configured between Switches and Routers with Cross cable as a Point to Point link.

It can be 100Mbps, 1gbps links.

Trunk links are the part of multiple VLAN's, So it uses ID created by frame tagging method.

Only Fastethernet ports can be trunk links.

#### **Access Link**

Access links are the ports that connects end devices to Switches.

Access Link referred as native VLAN of the port.

Access Links are unaware of VLAN Information, Switches strips VLAN information before it sends out through access link.

Hosts connected to access link doesn't know about the VLAN ID.

This links are belongs to only one VLAN.

## Frame Tagging

By using this we can create a VLANs that can be forwarded across switches in a network. VLAN ID will be added once the frames reaches the switch. End devices unaware of VLAN in a network.

End devices creates and sends data without any VLAN information, Only switch adds VLAN information by frame tagging and it sends to switches in network.

Once that frame reaches the switch, it first job is to identify VLAN ID

If theres is a same VLAN that sender belongs to, the switch will send out through only that port. If same VLAN not present then, Switch will drop the frames.

## Frame Tagging Methods

There are two types of frame tagging methods

Inter Switch Link-ISL

IEEE802.1q

Inter Switch Links is proprietary to Cisco switches.

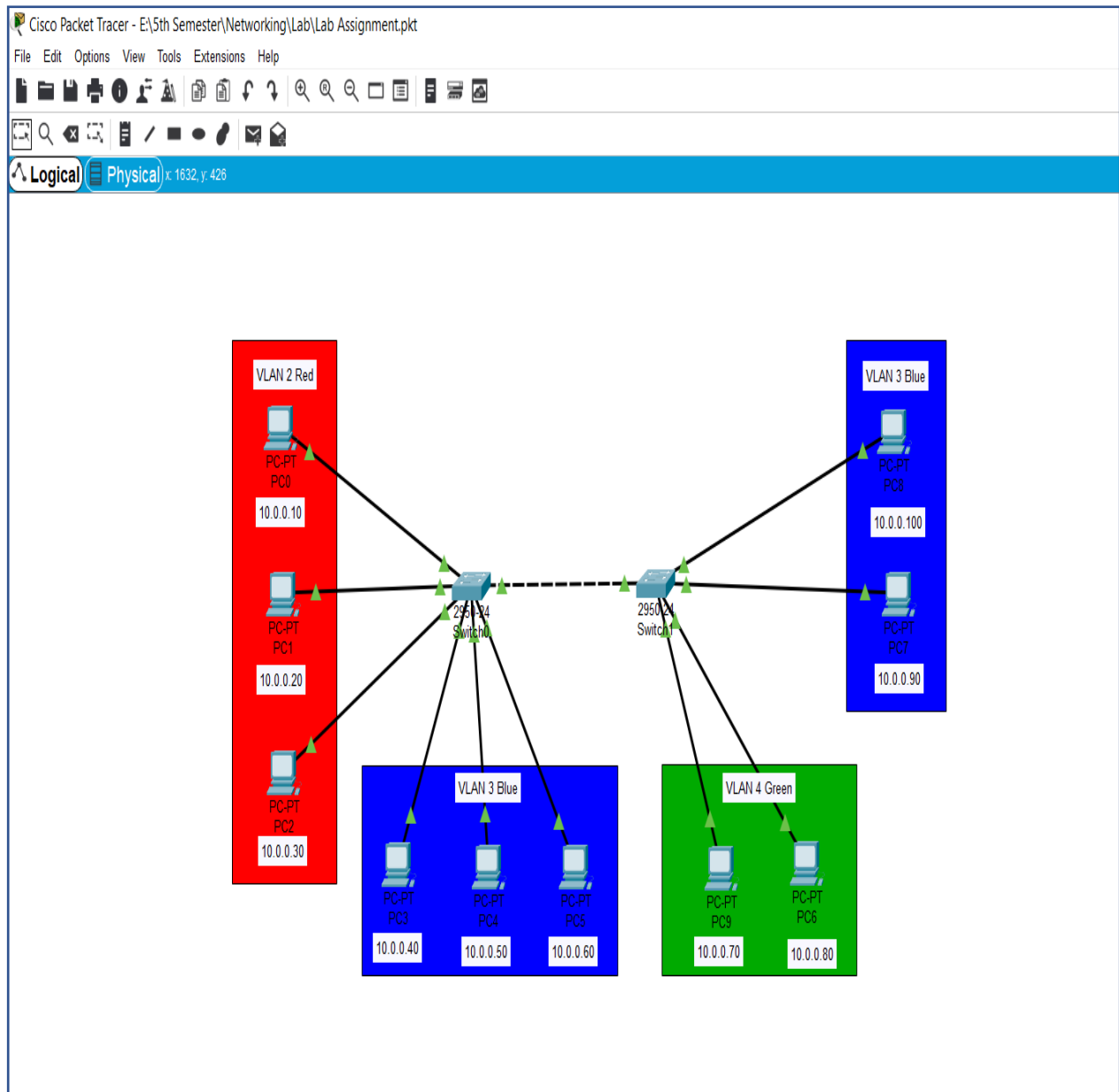
ISL is used for fastEthernet links and Gigabit Ethernet links only.

We cannot use this in different vendor switches, we can only use in cisco switches.

ISL is performed with ASIC(Application Specific Integrated Circuits)

Efficient between cisco switch to switch, Router to Switch.

**Step 1:** Create a topology with two switches and connect PC's like in a below topology



In above topology in left switch there are two VLAN configured one is VLAN 2 name Red, another one is VLAN 3 name Blue. In Right switch configured with VLAN 4 name Green and VLAN 3 name Blue.

**Step 2:** Configure switch with VLAN and assign IP address to all host with IP address..

For

PC0 IP is 10.0.0.10

PC1 IP is 10.0.0.20

PC2 IP is 10.0.0.30

PC3 IP is 10.0.0.40

PC4 IP is 10.0.0.50

PC5 IP is 10.0.0.60

PC6 IP is 10.0.0.80

PC7 IP is 10.0.0.90

PC8 IP is 10.0.0.100

PC9 IP is 10.0.0.70

## **Left Switch Configuration**

```
Switch>  
Switch>en  
Switch#configure terminal
```

```
Switch(config)#vlan 2  
Switch(config-vlan)#name red  
Switch(config-vlan)#exit
```

```
Switch(config)#vlan 3  
Switch(config-vlan)#name blue  
Switch(config-vlan)#exit
```

```
Switch(config)#interface range fastethernet0/1-3  
Switch(config-if-range)#switchport mode access  
Switch(config-if-range)#switchport access vlan 2  
Switch(config-if-range)#exit
```

```
Switch(config)#  
Switch(config)#interface range fastethernet0/4-6  
Switch(config-if-range)#switchport mode access
```

```
Switch(config-if-range)#switchport access vlan 3
Switch(config-if-range)#exit
Switch(config)#exit
```

```
Switch#
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#interface fastethernet0/23
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
```

## **Right Switch Configuration**

```
Switch>
Switch>en
Switch#configure terminal
```

```
Switch(config)#vlan 3
Switch(config-vlan)#name blue
Switch(config-vlan)#exit
```

```
Switch(config)#vlan 4
Switch(config-vlan)#name green
Switch(config-vlan)#exit
```

```
Switch(config)#interface range fastethernet0/1-2
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 3
Switch(config-if-range)#exit
```

```
Switch(config)#interface range fastethernet0/3-4
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 3
Switch(config-if-range)#exit
```

```
Switch#
Switch#%SPANTREE-2-RECV_PVID_ERR: Received 802.1Q BPDU on non trunk
FastEthernet0/23 VLAN1.
```

%SPANTREE-2-BLOCK\_PVID\_LOCAL: Blocking FastEthernet0/23 on VLAN0001.  
Inconsistent port type.

Switch#

Switch#config t

Enter configuration commands, one per line. End with CNTL/Z.

Switch(config)#

Switch(config)#interface fastethernet0/23

Switch(config-if)#switchport mode trunk

Switch(config-if)#exit

## After Configuration

### In Left Switch

The screenshot shows a network switch CLI interface with the following content:

```
Switch0
Physical Config CLI Attributes
IOS Command Line Interface

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/5, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/23, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/6, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up

Switch>en
Switch#show brief
^
% Invalid input detected at '^' marker.

Switch#show vlan brief

VLAN Name                Status    Ports
-----
1    default                active    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
                                           Fa0/24
2    Red                    active    Fa0/1, Fa0/2, Fa0/3
3    Blue                   active    Fa0/4, Fa0/5, Fa0/6
1002 fddi-default          active
1003 token-ring-default   active
1004 fddinet-default      active
1005 trnet-default        active
Switch#
```

Ctrl+F6 to exit CLI focus

Copy Paste

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## In Right Switch

Switch1

Physical

Config

CLI

Attributes

IOS Command Line Interface

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/23, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/23, changed state to up
%LINK-5-CHANGED: Interface FastEthernet0/9, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to up
%LINK-3-UPDOWN: Interface FastEthernet0/9, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/9, changed state to down

Switch>en
Switch#show vlan brief
```

VLAN	Name	Status	Ports
1	default	active	Fa0/5, Fa0/6, Fa0/7, Fa0/8 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, Fa0/24
3	Blue	active	Fa0/3, Fa0/4
4	Green	active	Fa0/1, Fa0/2, Fa0/9
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

```
Switch#
```

Ctrl+F6 to exit CLI focus

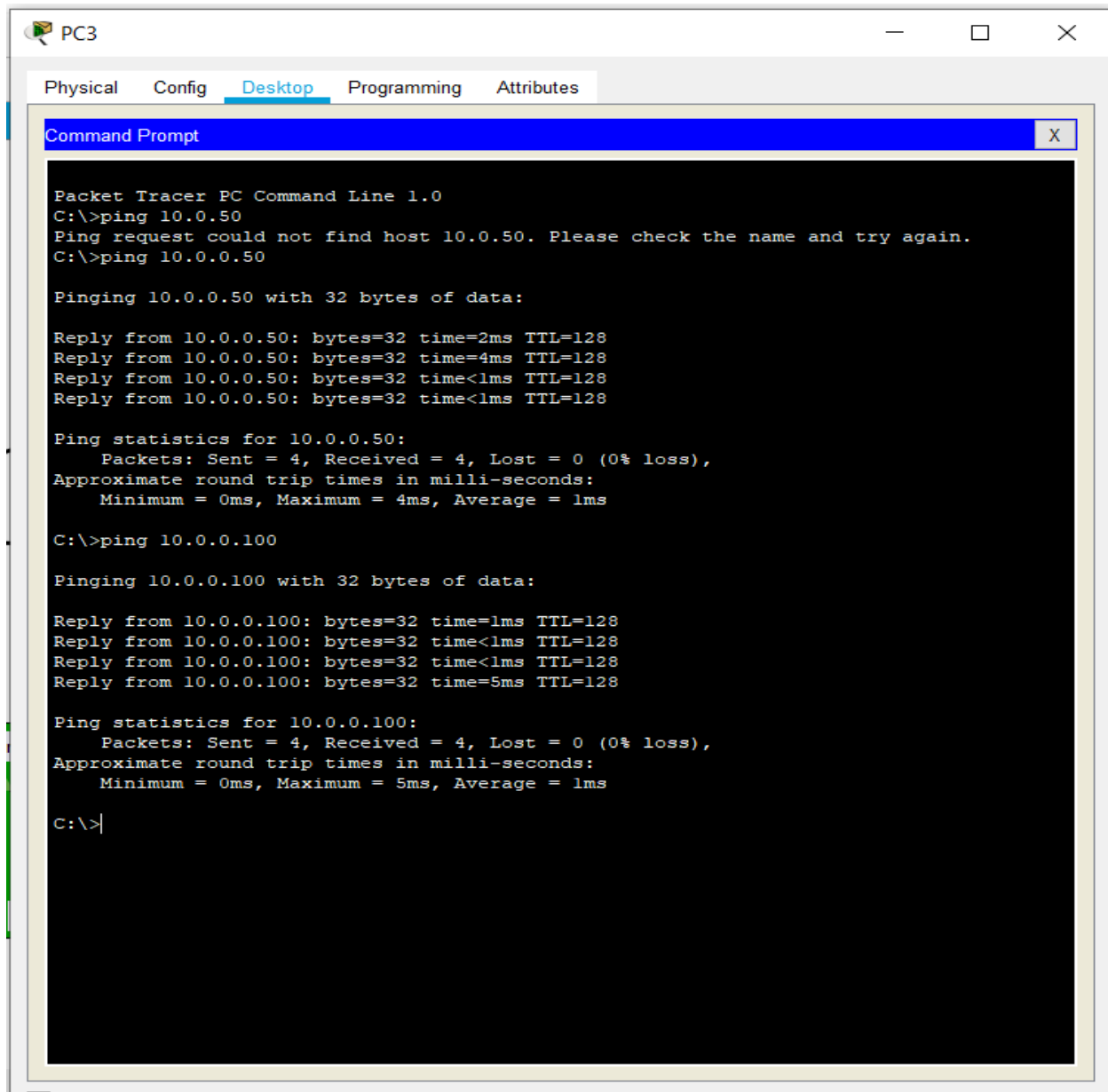
Copy

Paste

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When I try to ping from same VLAN



The screenshot shows a Packet Tracer PC window for PC3. The 'Desktop' tab is selected, displaying a Command Prompt. The prompt shows the following sequence of commands and outputs:

```
Packet Tracer PC Command Line 1.0
C:\>ping 10.0.50
Ping request could not find host 10.0.50. Please check the name and try again.
C:\>ping 10.0.0.50

Pinging 10.0.0.50 with 32 bytes of data:

Reply from 10.0.0.50: bytes=32 time=2ms TTL=128
Reply from 10.0.0.50: bytes=32 time=4ms TTL=128
Reply from 10.0.0.50: bytes=32 time<1ms TTL=128
Reply from 10.0.0.50: bytes=32 time<1ms TTL=128

Ping statistics for 10.0.0.50:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 4ms, Average = 1ms

C:\>ping 10.0.0.100

Pinging 10.0.0.100 with 32 bytes of data:

Reply from 10.0.0.100: bytes=32 time=1ms TTL=128
Reply from 10.0.0.100: bytes=32 time<1ms TTL=128
Reply from 10.0.0.100: bytes=32 time<1ms TTL=128
Reply from 10.0.0.100: bytes=32 time=5ms TTL=128

Ping statistics for 10.0.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 5ms, Average = 1ms

C:\>|
```

## Ping from different VLAN

