

# VIT-AP UNIVERSITY, ANDHRA PRADESH

## CSE3003 – Computer Networks - Lab Sheet: 4

**Academic year:** 2023-2024

**Semester:** Fall

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**Branch/ Class:** B.Tech

**Date:** 16/02/24

**School:** SCOPE

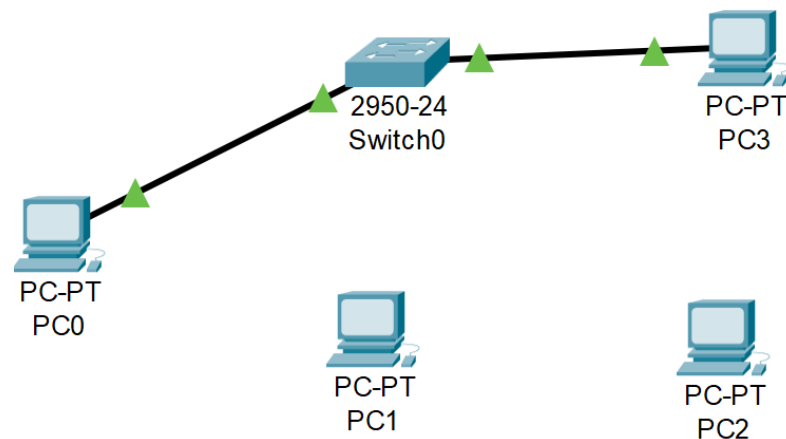
**Reg. no.:**22BCE7224

### LAB 4

#### 1. Port Security: Port-Security Configuration to prevent MAC flooding attack

Procedure:

1. Build the network topology: PC1 connects to fa0/1 and PC2 to fa0/2 of the switch



#### Addressing Table:

Device	Interface	IP Address	Subnet Mask
PC0	NIC	192.168.1.1	255.255.255.0
PC1	NIC	192.168.1.2	255.255.255.0
PC2	NIC	192.168.1.3	255.255.255.0
PC3	NIC	192.168.1.4	255.255.255.0

2. Now configure switch port security on switch interfaces.  
We'll configure port security interfaces on fa0/1 and fa0/2.  
To do this, we'll:
  - Configure the port as an **access port**
  - Enable **port security**
  - Define which **MAC addresses** are allowed to send frames through this interface.

**Objective:**

Configure switch should connect only two devices and verify port security using:

**Case 1:**

- Default MAC address to learn is 2
- Default violation mode is shut down.
- Expected output:

```
Switch#sh por
Switch#sh port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
          (Count)          (Count)          (Count)
-----
Fa0/1      2                2                1      Shutdown
```

**Case 2:**

- Default MAC address to learn is 2
- Change violation mode to protect mode.
- Expected output:

```
Switch#
Switch#show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
          (Count)          (Count)          (Count)
-----
Fa0/1      2                2                0      Protect
```

**Note:**

**Use the following comments to get your outputs for each case**

```
Switch# Show port-security
Switch# sh mac-address-table
Switch# sh ip int brief
```

+

Cisco Packet Tracer - C:\Users\jhy\Cisco Packet Tracer 8.2\1\save\228CE7224\LAB4.Q1.pkt

File Edit Options View Tools Extensions Window Help

Logical Physical x 1250, y 758

Time: 00:11:56

Scenario 0

31°C Haze

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Switch0

Physical Config CLI Attributes

IOS Command Line Interface

!SYN-5-CONFIG-I: Configured from console by console

Switch0#show port-security

Secure Port	MacSecureAddr (Count)	CurrentAddr (Count)	SecurityViolation (Count)	Security Action
Fa0/1	2	1	0	Shutdown
Fa0/2	2	1	0	Protect

Switch0#sh mac-address-table

Mac Address Table

Vlan	Mac Address	Type	Ports
1	0007.e0fa.997d	STATIC	Fa0/1
1	0050.0f3c.6c38	STATIC	Fa0/2

Switch0#sh ip int brief

Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/1	unassigned	YES	manual	up	up
FastEthernet0/2	unassigned	YES	manual	up	up
FastEthernet0/3	unassigned	YES	manual	down	down
FastEthernet0/4	unassigned	YES	manual	down	down
FastEthernet0/5	unassigned	YES	manual	down	down
FastEthernet0/6	unassigned	YES	manual	down	down
FastEthernet0/7	unassigned	YES	manual	down	down
FastEthernet0/8	unassigned	YES	manual	down	down
FastEthernet0/9	unassigned	YES	manual	down	down
FastEthernet0/10	unassigned	YES	manual	down	down
FastEthernet0/11	unassigned	YES	manual	down	down
FastEthernet0/12	unassigned	YES	manual	down	down
FastEthernet0/13	unassigned	YES	manual	down	down
FastEthernet0/14	unassigned	YES	manual	down	down
FastEthernet0/15	unassigned	YES	manual	down	down
FastEthernet0/16	unassigned	YES	manual	down	down
FastEthernet0/17	unassigned	YES	manual	down	down
FastEthernet0/18	unassigned	YES	manual	down	down
FastEthernet0/19	unassigned	YES	manual	down	down
FastEthernet0/20	unassigned	YES	manual	down	down
FastEthernet0/21	unassigned	YES	manual	down	down

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Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete

Successful PC0 PC3 ICMP 0.000 N 0 (edit) (delete)

Switch0

Physical Config CLI Attributes

IOS Command Line Interface

```

%SYS-S-CONFIG_I: Configured from console by console

Switch#Show port-security
Secure Port MaxSecureAddr CurrentAddr SecurityViolation Security Action
          (Count)          (Count)          (Count)
-----
Fa0/1      2              1              0      Shutdown
Fa0/2      2              1              0      Protect

Switch#sh mac-address-table
Mac Address Table
-----
Vlan    Mac Address      Type      Ports
-----
1       0007.ec5a.597d    STATIC    Fa0/1
1       0050.0f3c.6c38    STATIC    Fa0/2

Switch#sh ip int brief
Interface      IP-Address      OK? Method Status      Protocol
FastEthernet0/1 unassigned      YES manual up          up
FastEthernet0/2 unassigned      YES manual up          up
FastEthernet0/3 unassigned      YES manual down        down
FastEthernet0/4 unassigned      YES manual down        down
FastEthernet0/5 unassigned      YES manual down        down
FastEthernet0/6 unassigned      YES manual down        down
FastEthernet0/7 unassigned      YES manual down        down
FastEthernet0/8 unassigned      YES manual down        down
FastEthernet0/9 unassigned      YES manual down        down
FastEthernet0/10 unassigned      YES manual down        down
FastEthernet0/11 unassigned      YES manual down        down
FastEthernet0/12 unassigned      YES manual down        down
FastEthernet0/13 unassigned      YES manual down        down
FastEthernet0/14 unassigned      YES manual down        down
FastEthernet0/15 unassigned      YES manual down        down
FastEthernet0/16 unassigned      YES manual down        down
FastEthernet0/17 unassigned      YES manual down        down
FastEthernet0/18 unassigned      YES manual down        down
FastEthernet0/19 unassigned      YES manual down        down
FastEthernet0/20 unassigned      YES manual down        down
FastEthernet0/21 unassigned      YES manual down        down
--More--

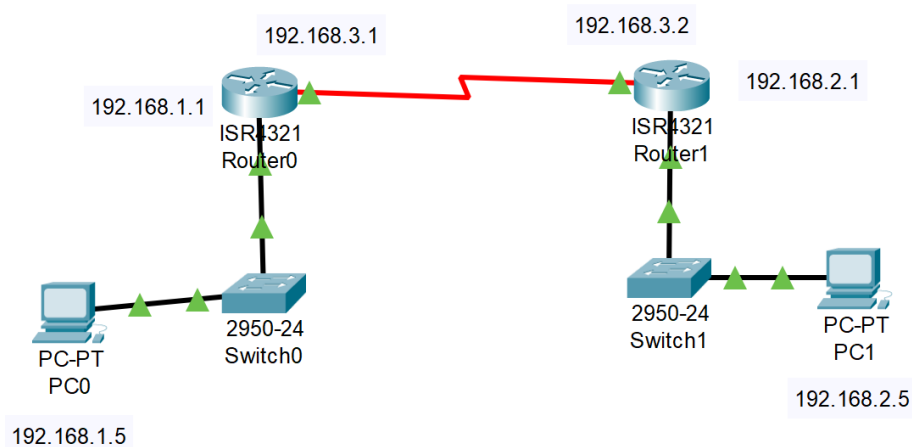
```

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## 2. HDLC (High-level Data Link Control) and PPP (Point to Point Protocol):

1. Desing the network given below:



Addressing Table:

Device	Interface	IP Address	Subnet Mask
PC1	NIC	192.168.1.5	255.255.255.0
PC2	NIC	192.168.2.5	255.255.255.0
Router1 Fast Ethernet 0/1	NIC	192.168.1.1	255.255.255.0
Router1 Serial 0/0	NIC	192.168.3.1	255.255.255.0
Router2 Fast Ethernet 0/1	NIC	192.168.2.1	255.255.255.0
Router2 Serial 0/0	NIC	192.168.3.2	255.255.255.0

## Objectives:

### Case 1:

1. Design a WAN with 2 Routers
2. Configure the Routers
3. Apply HDLC (PAP and CHAP) authentication on it.
4. Verify Connection.

### Case 2:

1. Design a WAN with 2 Routers
2. Configure the Routers
3. Apply PPP (PAP and CHAP) authentication on it.
4. Verify Connection.

## Router Configuration:

Router> enable

Router# configure terminal

Router(config)# interface gigabitethernet 0/1

Router(config-if)# ip address 192.168.1.2 255.255.255.0

Router(config)# ip route 192.168.1.0 255.255.0.0 192.168.2.2

Router(config-if)# no shutdown

Router#show interfaces serial 0/0/0

Router#configure terminal

Router(config)#interface serial 0/0/0

Router(config-if)#encapsulation ppp

Router(config)#exit

Router#show interfaces serial 0/0/0

Router#configure terminal

Router(config)#interface serial 0/0/0

Router(config-if)#encapsulation hdlc

Router(config-if)#shutdown

Router(config-if)#no shutdown

Router(config-if)#exit

Router(config)#exit

Router#show interfaces serial 0/0/0

Router>enable

```
Router#configure terminal
Router(config)#hostname R1
R1(config)#username R2 password vinita
R1(config)#interface serial 0/0/0
R1(config-if)#encapsulation ppp
R1(config-if)#ppp authentication chap
R1(config-if)#exit
R1(config)#
```

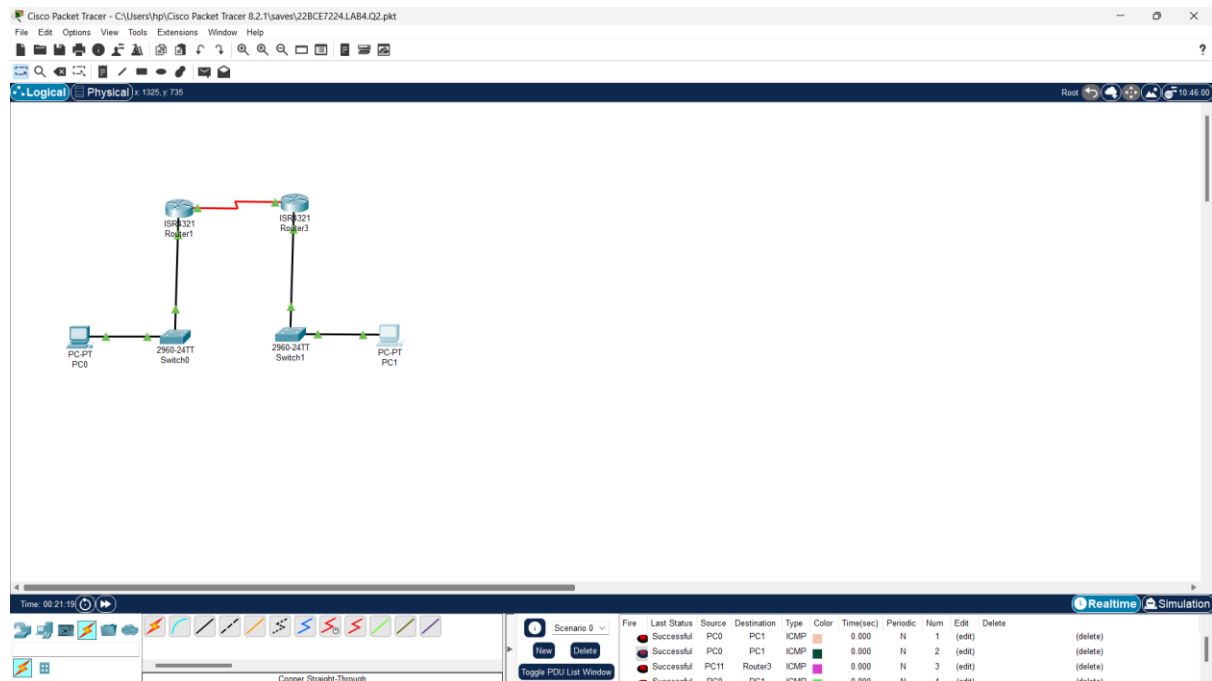
```
Router>enable
Router#configure terminal
Router(config)#hostname R2
R2(config)#username R1 password vinita
R2(config)#interface serial 0/0/0
R2(config-if)#encapsulation ppp
R2(config-if)#ppp authentication chap
R2(config-if)#exit
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,
changed state to up
R2(config)#
```

## References:

<https://www.packettracernetwork.com/labs/lab11-hdlc.html>

<https://www.packettracernetwork.com/labs/lab12-ppp.html>

## 1.HDLC



## 2.PPP

Cisco Packet Tracer

File Edit Options View Tools Extensions Window Help

Logical Physical x 1573 y 408

Time 00:27:16

Router0 Router2

PC PT PC0 2950-24 Switch0 PC PT PC1 2950-24 Switch1

Serial DCE

Scenario 0

Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
Successful	PC0	PC1	ICMP	0.000	N	0	(edit)	(delete)		
Successful	PC1	Router2	ICMP	0.000	N	1	(edit)	(delete)		
Successful	PC11	Router2	ICMP	0.000	N	2	(edit)	(delete)		
Successful	PC0	PC1	ICMP	0.000	N	3	(edit)	(delete)		

Router2

Physical Config CLI Attributes

IOS Command Line Interface

```
R2(config-if)#encapsulation ppp
R2(config-if)#shutdown
R2(config-if)#no shutdown

R2(config-if)#
%LINE-5-CHANGED: Interface Serial0/1/0, changed state to up
%
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
exit

% Invalid input detected at '' marker.

R2(config-if)#exit
R2(config)#exit
R2#
%XP-5-COMP10_1: Configured from console by console
show interface serial 0/1/0
Serial0/1/0 is up, line protocol is up (connected)
Hardware is HD44570
Internet address is 192.168.3.2/24
MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set, keepalive set (10 sec)
LCP Open
Open: LCP, CDCEP
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1500/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 1155 Kbits/sec
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
0 packets input, 0 bytes, 0 no buffer
Received 0 broadcasts, 0 runs, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
--More--
```

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Simulation