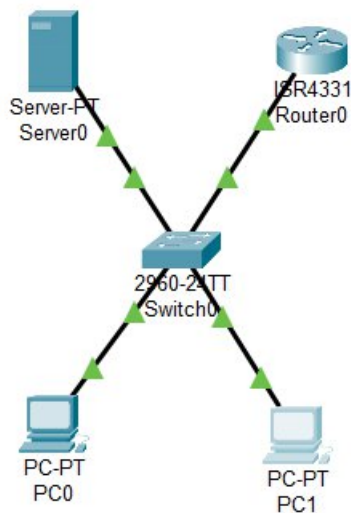


Department of Computer Engineering
TE Computer-B (2025-26 Sem I)
Computer Networks and Security
CNS Simulation Assignment 2: TELNET and SSH

1. Network Topology Setup

- i. Create the Network
 - Open Cisco Packet Tracer
 - Add devices: 1 Router, 1 Server - Acts as DHCP Server, 2 PCs - Rename to PC0 and PC1, 1 Switch
- ii. Connect Devices
 - Connect PC0, PC1, and Server to Switch using Copper Straight-Through cables
 - Connect Switch to Router's GigabitEthernet 0/0 using Copper Straight-Through cable



2. IP Address Configuration using DHCP

- i. Configure Router Interface
 - Allocate ip 192.168.47.1 to router and set it's subnet mask to 255.255.255.0
- ii. Configure DHCP Server
 - Server Configuration: IP Address: 192.168.47.2, Default Gateway: 192.168.47.1
 - DHCP Pool: Default Gateway: 192.168.47.1, DNS Server: 192.168.47.2, Start IP: 192.168.47.1, Subnet Mask: 255.255.255.0
- iii. Configure PCs for DHCP
 - PC0 → Config Tab → FastEthernet → Select DHCP

- PC1 → Config Tab → FastEthernet → Select DHCP

Server0

Physical Config **Services** Desktop Programming Attributes

SERVICES

- HTTP
- DHCP**
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP
- IoT
- VM Management
- Radius EAP

DHCP

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: server

Default Gateway: 192.168.25.1

DNS Server: 192.168.25.2

Start IP Address: 192 168 47 0

Subnet Mask: 255 255 255 0

Maximum Number of Users: 256

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

Add Save Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
server	192.168.25.1	192.168.25.2	192.168.47.0	255.255.255.0	256	0.0.0.0	0.0.0.0

PC0

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address: 192.168.47.3

Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0

DNS Server: 192.168.25.2

PC1

Physical Config **Desktop** Programming Attributes

IP Configuration

Interface: FastEthernet0

IP Configuration

☒ DHCP ☐ Static

IPv4 Address: 192.168.47.4

Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0

DNS Server: 192.168.25.2

3. Router Configuration for Remote Access

i. Basic Router Configuration

- Router> enable
- Router# configure terminal
- Router(config)# hostname HQ
- HQ(config)# interface gigabitethernet 0/0
- HQ(config-if)# ip address 192.168.X.1 255.255.255.0
- HQ(config-if)# no shutdown
- HQ(config-if)# exit

ii. SSH Configuration

- HQ(config)# ip domain-name cns-assignment.com
- HQ(config)# crypto key generate rsa
- (Choose 1024 bits modulus)
- HQ(config)# ip ssh version 2
- HQ(config)# ip ssh time-out 60
- HQ(config)# ip ssh authentication-retries 2

iii. User and Line Configuration

- HQ(config)# username admin secret admin123
- HQ(config)# enable secret class123
- HQ(config)# line vty 0 4
- HQ(config-line)# login local

- HQ(config-line)# transport input telnet ssh
- HQ(config-line)# exit
- HQ(config)# exit
- HQ# write memory

 Router0

```

Physical  Config  CLI  Attributes
IOS Command Line Interface

HQ>enable
Password:
Password:
HQ#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
HQ(config)#ip domain-name cns-assignment.com
HQ(config)#crypto key generate rsa
% You already have RSA keys defined named HQ.cns-assignment.com .
% Do you really want to replace them? [yes/no]: yes
The name for the keys will be: HQ.cns-assignment.com
Choose the size of the key modulus in the range of 360 to 4096 for your
General Purpose Keys. Choosing a key modulus greater than 512 may take
a few minutes.

How many bits in the modulus [512]: 1024
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]

HQ(config)#ip ssh version 2
*Mar 1 0:11:10.325: %SSH-5-ENABLED: SSH 2 has been enabled
HQ(config)#ip ssh time-out 60
HQ(config)#ip ssh authentication-retries 2
^
% Invalid input detected at '^' marker.

HQ(config)#ip ssh authentication-retries 2
HQ(config)#username admin secret admin123
HQ(config)#line vty 0 4
HQ(config-line)#login local
HQ(config-line)#transport input ssh
HQ(config-line)#transport local telnet
^
% Invalid input detected at '^' marker.

HQ(config-line)#transport input telnet
HQ(config-line)#exec-timeout 5 0
HQ(config-line)#exit
HQ(config)#enable secret class123
HQ(config)#exit
HQ#
%SYS-5-CONFIG_I: Configured from console by console
write memory
Building configuration...

```

4. Access Remote Device – Telnet

i. Access Telnet from PC1

- Go to PC1 → Desktop Tab → Command Prompt
- Enter telnet 192.168.47.1
- Use Username: admin
- Enter Password: admin123
- HQ> enable
- Password: class123

5. Access Remote Device – SSH

i. PC0 → Desktop Tab → Command Prompt

- C:\> ssh -l admin 192.168.47.1
- Password: admin123
- HQ> enable

- Password: class123

```

PC1
Physical Config Desktop Programming Attributes
Command Prompt
C:\>telnet 192.168.47.1
Trying 192.168.47.1 ...Open

User Access Verification

Username: admin
Password:
HQ>enable
Password:
HQ#
HQ#
  
```

```

PC0
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ssh -l admin 192.168.47.1

Password:

HQ>enable
Password:
HQ#
HQ#
  
```

```

PC1
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 192.168.47.1

Pinging 192.168.47.1 with 32 bytes of data:

Reply from 192.168.47.1: bytes=32 time=19ms TTL=255
Reply from 192.168.47.1: bytes=32 time<1ms TTL=255
Reply from 192.168.47.1: bytes=32 time<1ms TTL=255
Reply from 192.168.47.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.47.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 19ms, Average = 4ms

C:\>
  
```

```

PC0
Physical Config Desktop Programming Attributes
Command Prompt
C:\>
C:\>ping 192.168.47.1

Pinging 192.168.47.1 with 32 bytes of data:

Reply from 192.168.47.1: bytes=32 time<1ms TTL=255
Reply from 192.168.47.1: bytes=32 time<1ms TTL=255
Reply from 192.168.47.1: bytes=32 time<1ms TTL=255
Reply from 192.168.47.1: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.47.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

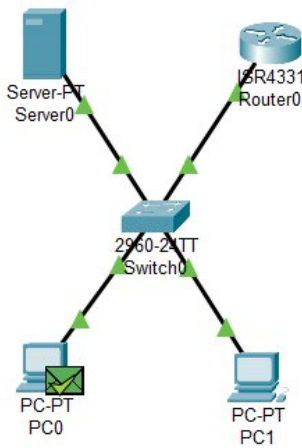
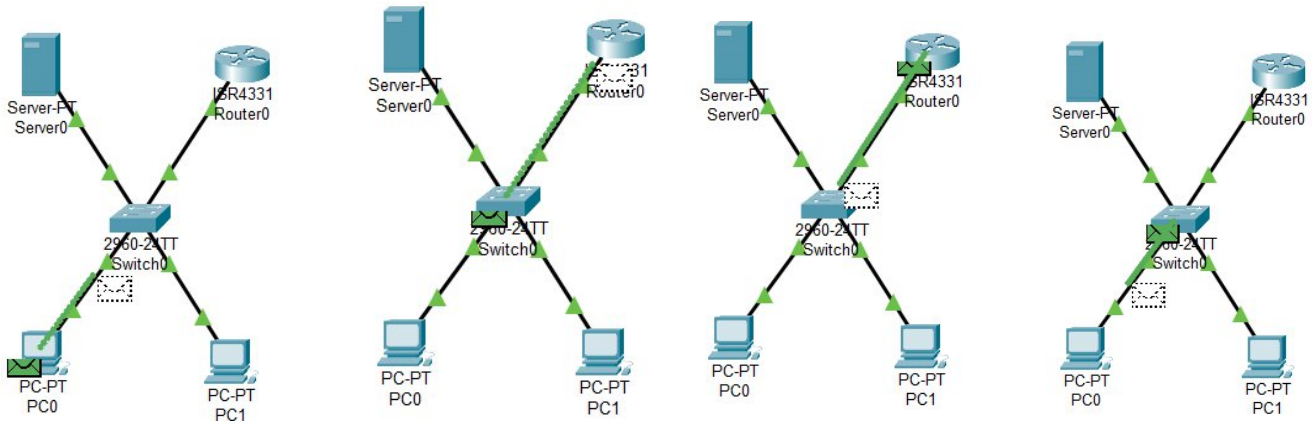
C:\>
  
```

6. Real Mode and Event Simulation

i. Real Mode

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	Router0	ICMP		0.000	N	0	(edit)	(delete)
	Successful	PC1	Router0	ICMP		0.000	N	1	(edit)	(delete)
	Successful	Router0	PC0	ICMP		0.000	N	2	(edit)	(delete)
	Successful	Router0	PC1	ICMP		0.000	N	3	(edit)	(delete)

ii. Event Simulation



Simulation Panel		
Event List		
Vis.	Time(sec)	Last Device
	0.000	--
	0.002	PC0
	0.004	Switch0
	0.006	Router0
	0.008	Switch0
	1.999	--

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC0	Router0	ICMP		0.000	N	0	(edit)	(delete)