

# **ASSIGNMENT – 1**

## **EC 4060 – COMPUTER AND DATA NETWORK**

**ATPUTHARAVI.R**

**2020/E/015**

**GROUP – B11**

**SEMESTER – 4**

**17 MAY 2023**

The details of the subnet, devices included and IP addressing

VLAN name	VLAN	Neede d size	Allocat ed size	IP address range	Ma sk	Subnet mask
Computer lab 1 (I)	1	60	62	10.20.0.0- 10.20.0.63	26	255.255.255.192
Computer lab 2 (I)	1	60	62	10.20.0.64 - 10.20.0.127	26	255.255.255.192
Computer lab 1 (D)	6	50	62	10.20.0.128 - 10.20.0.191	26	255.255.255.192
Computer lab 2 (D)	6	50	62	10.20.0.192 - 10.20.0.255	26	255.255.255.192
Computer vision & machine learning lab	7	50	62	10.20.1.0 - 10.20.1.63	26	255.255.255.192
Digital learning & media center	4	30	30	10.20.1.64 - 10.20.1.95	27	255.255.255.224
14 staff rooms	7	14	14	10.20.1.96 - 10.20.1.111	28	255.255.255.240
Microprocessor lab	8	12	14	10.20.1.112 - 10.20.1.127	28	255.255.255.240
Network engineering lab	8	10	14	10.20.1.128 - 10.20.1.143	28	255.255.255.240
4 lecture halls	9	8	14	10.20.1.144 - 10.20.1.159	28	255.255.255.240
Staff office	2	5	6	10.20.1.160 – 10.20.1.167	29	255.255.255.248
4 technical officers room	9	4	6	10.20.1.168 - 10.20.1.175	29	255.255.255.248
Printers (I)	5	3	6	10.20.1.176 - 10.20.1.183	29	255.255.255.248
Wifi (I)	5	2	2	10.20.1.184 – 10.20.1.187	30	255.255.255.252
Department meeting room	10	2	2	10.20.1.188 - 10.20.1.191	30	255.255.255.252
Department office	10	2	2	10.20.1.192 - 10.20.1.195	30	255.255.255.252
Meeting room	2	2	2	10.20.1.196 - 10.20.1.199	30	255.255.255.252
2 technical officers room	4	2	2	10.20.1.200 - 10.20.1.203	30	255.255.255.252
Director office	3	2	2	10.20.1.204 - 10.20.1.207	30	255.255.255.252
Printer (D)	11	1	2	10.20.1.208 – 10.20.1.211	30	255.255.255.252
Wifi (D)	11	1	2	10.20.1.212 – 10.20.1.215	30	255.255.255.252

Network manager room	3	1	2	10.20.1.216 - 10.20.1.219	30	255.255.255.252
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## **CONFIGURING SWITCH**

```
Switch>enable
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname Block1
Block1(config)#line console 0
Block1(config-line)#password 2020E015
Block1(config-line)#exit
Block1(config)#exit
Block1#
%SYS-5-CONFIG_I: Configured from console by console
Block1#exit
```

## **CONFIGURING MULTILAYER SWITCH 0**

```
Switch>enable
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#vlan 1
Switch(config-vlan)#name Block1
Default VLAN 1 may not have its name changed.
Switch(config-vlan)#vlan 2
Switch(config-vlan)#name Block2
Switch(config-vlan)#vlan 3
Switch(config-vlan)#name Block3
Switch(config-vlan)#vlan 4
Switch(config-vlan)#name Block4
Switch(config-vlan)#vlan 5
Switch(config-vlan)#name Block5
Switch(config-vlan)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console
```

Multilayer Switch0

Physical **Config** CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**ROUTING**

- Static
- RIP

**SWITCHING**

- VLAN Database

**INTERFACE**

- FastEthernet0/1**
- FastEthernet0/2
- FastEthernet0/3
- FastEthernet0/4
- FastEthernet0/5
- FastEthernet0/6

**FastEthernet0/1**

Port Status ☒ **On**

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

Trunk ☐ VLAN 1-1005

Tx Ring Limit 10

Equivalent IOS Commands

```
MAIN_SWITCH_1(config)#interface FastEthernet0/2
MAIN_SWITCH_1(config-if)#
MAIN_SWITCH_1(config-if)#exit
MAIN_SWITCH_1(config)#interface FastEthernet0/1
MAIN_SWITCH_1(config-if)#
```

Multilayer Switch0

Physical **Config** CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**ROUTING**

- Static
- RIP

**SWITCHING**

- VLAN Database

**INTERFACE**

- FastEthernet0/1
- FastEthernet0/2**
- FastEthernet0/3
- FastEthernet0/4
- FastEthernet0/5
- FastEthernet0/6

**FastEthernet0/2**

Port Status ☒ **On**

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

Trunk ☐ VLAN 1

Tx Ring Limit 10

Equivalent IOS Commands

```
changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2,
changed state to up
```

Multilayer Switch0

Physical **Config** CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**ROUTING**

- Static
- RIP

**SWITCHING**

- VLAN Database

**INTERFACE**

- FastEthernet0/1
- FastEthernet0/2
- FastEthernet0/3**
- FastEthernet0/4
- FastEthernet0/5
- FastEthernet0/6

**FastEthernet0/3**

Port Status ☒ **On**

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ **Auto**

Duplex ☐ Half Duplex ☒ Full Duplex ☒ **Auto**

Trunk ☐ **Access** VLAN 1

Tx Ring Limit 10

Equivalent IOS Commands

```
changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3,
changed state to up
```

Multilayer Switch0

Physical **Config** CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**ROUTING**

- Static
- RIP

**SWITCHING**

- VLAN Database

**INTERFACE**

- FastEthernet0/1
- FastEthernet0/2
- FastEthernet0/3
- FastEthernet0/4**
- FastEthernet0/5
- FastEthernet0/6

**FastEthernet0/4**

Port Status ☒ **On**

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ **Auto**

Duplex ☐ Half Duplex ☒ Full Duplex ☒ **Auto**

Trunk ☐ **Access** VLAN 1

Tx Ring Limit 10

Equivalent IOS Commands

```
changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4,
changed state to up
```

Multilayer Switch0

Physical **Config** CLI Attributes

**GLOBAL**  
 Settings  
 Algorithm Settings  
**ROUTING**  
 Static  
 RIP  
**SWITCHING**  
 VLAN Database  
**INTERFACE**  
 FastEthernet0/1  
 FastEthernet0/2  
 FastEthernet0/3  
 FastEthernet0/4  
**FastEthernet0/5**  
 FastEthernet0/6

**FastEthernet0/5**  
 Port Status ☒ On  
 Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto  
 Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto  
 Trunk ☐ ☒ VLAN 1  
 Tx Ring Limit 10

Equivalent IOS Commands

```

changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/5,
changed state to up
  
```

Multilayer Switch0

Physical **Config** CLI Attributes

Static  
 RIP  
**SWITCHING**  
**VLAN Database**  
**INTERFACE**  
 FastEthernet0/1  
 FastEthernet0/2  
 FastEthernet0/3  
 FastEthernet0/4  
 FastEthernet0/5  
 FastEthernet0/6  
 FastEthernet0/7  
 FastEthernet0/8  
 FastEthernet0/9  
 FastEthernet0/10

**VLAN Configuration**  
 VLAN Number   
 VLAN Name   
 Add Remove  

VLAN No	VLAN Name
1	default
2	Block2
3	Block3
4	Block4
5	Block5
6	Block6

Equivalent IOS Commands

```

documentation for configuring VTP/VLAN in config mode.

MAIN_SWITCH_1(vlan)#
%SYS-5-CONFIG_I: Configured from console by console
  
```

```
Switch#
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface FastEthernet0/1
Switch(config-if)#
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

Switch(config-if)#exit
Switch(config)#interface FastEthernet0/2
Switch(config-if)#
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

Switch(config-if)#exit
Switch(config)#interface FastEthernet0/3
Switch(config-if)#
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

Switch(config-if)#exit
Switch(config)#interface FastEthernet0/4
Switch(config-if)#
Switch(config-if)#switchport trunk encapsulation dot1q
Switch(config-if)#switchport mode trunk

Switch(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up
```

By using show vlan can identify the created vlans

```
Switch#show vlan
```

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 Fa0/23, Fa0/24, Gig0/1, Gig0/2
2	Block2	active	
3	Block3	active	
4	Block4	active	
5	Block5	active	
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

VLAN	Type	SAID	MTU	Parent	RingNo	BridgeNo	Stp	BrdgMode	Trans1	Trans2
1	enet	100001	1500	-	-	-	-	-	0	0
2	enet	100002	1500	-	-	-	-	-	0	0
3	enet	100003	1500	-	-	-	-	-	0	0

```
--More-- |
```

## CONFIGURATION OF MULTILAYER SWITCH 1

```
Switch>enable
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#vlan 6
Switch(config-vlan)#name Block6
Switch(config-vlan)#vlan 7
Switch(config-vlan)#name Block7
Switch(config-vlan)#vlan 8
Switch(config-vlan)#name Block8
Switch(config-vlan)#vlan 9
Switch(config-vlan)#name Block9
Switch(config-vlan)#vlan 10
Switch(config-vlan)#name Block10
Switch(config-vlan)#vlan 11
Switch(config-vlan)#name block11
Switch(config-vlan)#end
Switch#
%SYS-5-CONFIG_I: Configured from console by console
```



Switch#show vlan

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 Gig0/1, Gig0/2
6 Block6	active	
7 Block7	active	
8 Block8	active	
9 Block9	active	
10 Block10	active	
11 block11	active	
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	
VLAN Type SAID MTU Parent RingNo BridgeNo Stp BrdgMode Trans1 Trans2		
--More--		

## **CONFIGURING ROUTER**

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname MAIN_ROUTER
MAIN_ROUTER(config)#line console 0
MAIN_ROUTER(config-line)#password 2020E015
MAIN_ROUTER(config-line)#login
MAIN_ROUTER(config-line)#exit
MAIN_ROUTER(config)#line vty 0 4
MAIN_ROUTER(config-line)#password 2020E015
MAIN_ROUTER(config-line)#login
MAIN_ROUTER(config-line)#exit
MAIN_ROUTER(config)#enable secret 2020E015
MAIN_ROUTER(config)#banner motd "No unauthorized entry!"
MAIN_ROUTER(config)#exit
MAIN_ROUTER#
%SYS-5-CONFIG_I: Configured from console by console
```

```
MAIN_ROUTER#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
MAIN_ROUTER(config)#interface GigabitEthernet0/0
MAIN_ROUTER(config-if)#ip address
% Incomplete command.
MAIN_ROUTER(config-if)#ip address
% Incomplete command.
MAIN_ROUTER(config-if)#
MAIN_ROUTER(config-if)#exit
MAIN_ROUTER(config)#interface GigabitEthernet0/1
MAIN_ROUTER(config-if)#ip address 10.20.0.1 255.255.255.192
MAIN_ROUTER(config-if)#ip address 10.20.0.1 255.255.255.192
MAIN_ROUTER(config-if)#ip address 10.20.0.1 255.255.255.192
MAIN_ROUTER(config-if)#
MAIN_ROUTER(config-if)#exit
MAIN_ROUTER(config)#interface GigabitEthernet0/0
MAIN_ROUTER(config-if)#no ip address
MAIN_ROUTER(config-if)#ip address 10.20.1.219 255.255.255.192
MAIN_ROUTER(config-if)#no ip address
MAIN_ROUTER(config-if)#ip address 10.20.1.217 255.255.255.192
MAIN_ROUTER(config-if)#ip address 10.20.1.217 255.255.255.252
MAIN_ROUTER(config-if)#
MAIN_ROUTER(config-if)#exit
MAIN_ROUTER(config)#interface GigabitEthernet0/2
MAIN_ROUTER(config-if)#ip address 10.20.0.250 255.255.255.252
MAIN_ROUTER(config-if)#ip address 10.20.0.250 255.255.255.192
MAIN_ROUTER(config-if)#
```

## IP CONFIGURING OF PC

PC0

Physical **Config** Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Bluetooth

Global Settings

Display Name PC0

Interfaces FastEthernet0

Gateway/DNS IPv4

☐ DHCP

☒ Static

Gateway 10.20.0.0

DNS Server

Gateway/DNS IPv6

☐ DHCP

☐ Auto Config

☒ Static

IPv6 Gateway

IPv6 DNS Server

PC0

Physical **Config** Desktop Programming Attributes

**GLOBAL**

Settings

Algorithm Settings

**INTERFACE**

FastEthernet0

Bluetooth

FastEthernet0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0003.E442.A524

IP Configuration

☐ DHCP

☒ Static

IP Address 10.20.0.3

Subnet Mask 255.255.255.128

IPv6 Configuration

☐ DHCP

☐ Auto Config

☒ Static

IPv6 Address /

Link Local Address: FE80::203:E4FF:FE42:A524

PC0

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IP Address 10.20.0.3

Subnet Mask 255.255.255.128

Default Gateway 10.20.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address /

Link Local Address FE80::203:E4FF:FE42:A524

IPv6 Gateway

IPv6 DNS Server

802.1X

☐ Use 802.1X Security

Authentication MD5

PC0

Physical Config Desktop Programming Attributes

Command Prompt X

```
Packet Tracer PC Command Line 1.0
C:\>ping 10.20.0.0

Pinging 10.20.0.0 with 32 bytes of data:

Request timed out.
Reply from 10.20.0.1: bytes=32 time<1ms TTL=255
Reply from 10.20.0.1: bytes=32 time<1ms TTL=255
Reply from 10.20.0.1: bytes=32 time=1ms TTL=255

Ping statistics for 10.20.0.0:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

PC0

Physical Config Desktop Programming Attributes

Command Prompt X

```
Request timed out.
Reply from 10.20.0.1: bytes=32 time<1ms TTL=255
Reply from 10.20.0.1: bytes=32 time<1ms TTL=255
Reply from 10.20.0.1: bytes=32 time=1ms TTL=255

Ping statistics for 10.20.0.0:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ipconfig

FastEthernet0 Connection:(default port)

    Link-local IPv6 Address . . . . . : FE80::203:E4FF:FE42:A524
    IP Address. . . . . : 10.20.0.3
    Subnet Mask . . . . . : 255.255.255.128
    Default Gateway . . . . . : 10.20.0.0

Bluetooth Connection:

    Link-local IPv6 Address . . . . . : ::
    IP Address. . . . . : 0.0.0.0
    Subnet Mask . . . . . : 0.0.0.0
    Default Gateway . . . . . : 0.0.0.0

C:\>
```

CONFIGURING WIRELESS ROUTER

Wireless Router1

PhysicalConfigGUIAttributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

Internet

LAN

Wireless 2.4G

Wireless 5G(1)

Wireless 5G(2)

Wireless Guest 2.4G

Wireless Guest 5G(1)

Wireless Guest 5G(2)

LAN Settings

IP Configuration

IP Address10.20.1.184

Subnet Mask255.255.255.0

Wireless Router1

PhysicalConfigGUIAttributes

GLOBAL

Settings

Algorithm Settings

INTERFACE

Internet

LAN

Wireless 2.4G

Wireless 5G(1)

Wireless 5G(2)

Wireless Guest 2.4G

Wireless Guest 5G(1)

Wireless Guest 5G(2)

Wireless 5G(1) Settings

SSIDDefault

5 GHz ChannelAuto

Authentication

☐ Disabled

☒ WEP

☐ WPA-PSK

☐ WPA

☐ WPA2-PSK

☐ WPA2

WEP Key1901202246

PSK Pass Phrase

RADIUS Server Settings

IP Address

Shared Secret

Encryption Type40/64-Bits (10 Hex digits)

## IP CONFIGURING OF PRINTERS

Printer0

Physical **Config** Attributes

**GLOBAL**

Settings

**INTERFACE**

FastEthernet0

Global Settings

Display Name

Gateway/DNS IPv4

☐ DHCP

☒ Static

Gateway

DNS Server

Gateway/DNS IPv6

☐ DHCP

☐ Auto Config

☒ Static

IPv6 Gateway

IPv6 DNS Server

Printer0

Physical **Config** Attributes

**GLOBAL**

Settings

**INTERFACE**

FastEthernet0

FastEthernet0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address

IP Configuration

☐ DHCP

☒ Static

IP Address

Subnet Mask

IPv6 Configuration

☐ DHCP

☐ Auto Config

☒ Static

IPv6 Address

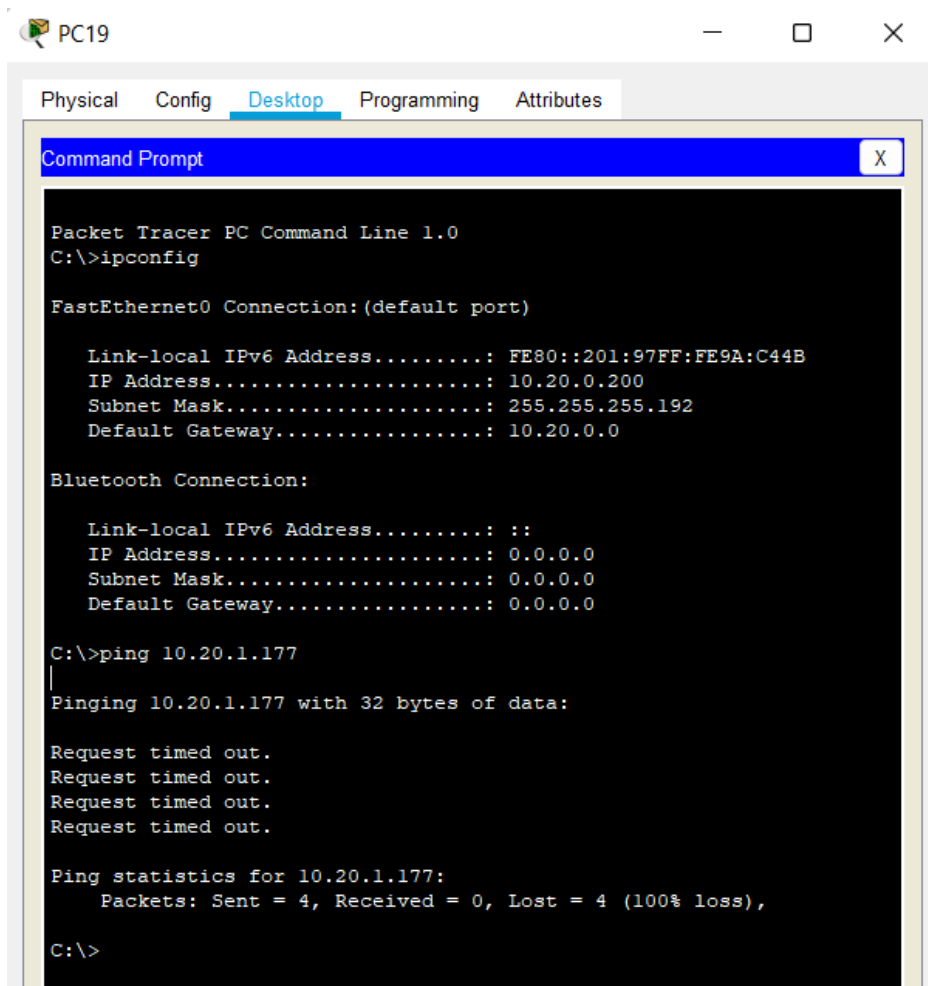
Link Local Address:

Restrict access of printers available at the IT Center block

```
Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip access-list extended Printer
Switch(config-ext-nacl)#permit ip host 10.20.0.0 host 10.20.0.63
Switch(config-ext-nacl)#permit ip host 10.20.0.0 host 10.20.0.127
Switch(config-ext-nacl)#permit ip host 10.20.0.0 host 10.20.1.199
Switch(config-ext-nacl)#permit ip host 10.20.0.0 host 10.20.1.219
Switch(config-ext-nacl)#permit ip host 10.20.0.0 host 10.20.1.203
Switch(config-ext-nacl)#permit ip host 10.20.0.0 host 10.20.1.187
Switch(config-ext-nacl)#deny ip any any
Switch(config-ext-nacl)#
```

---

Can't be access by other than IT Center block staff

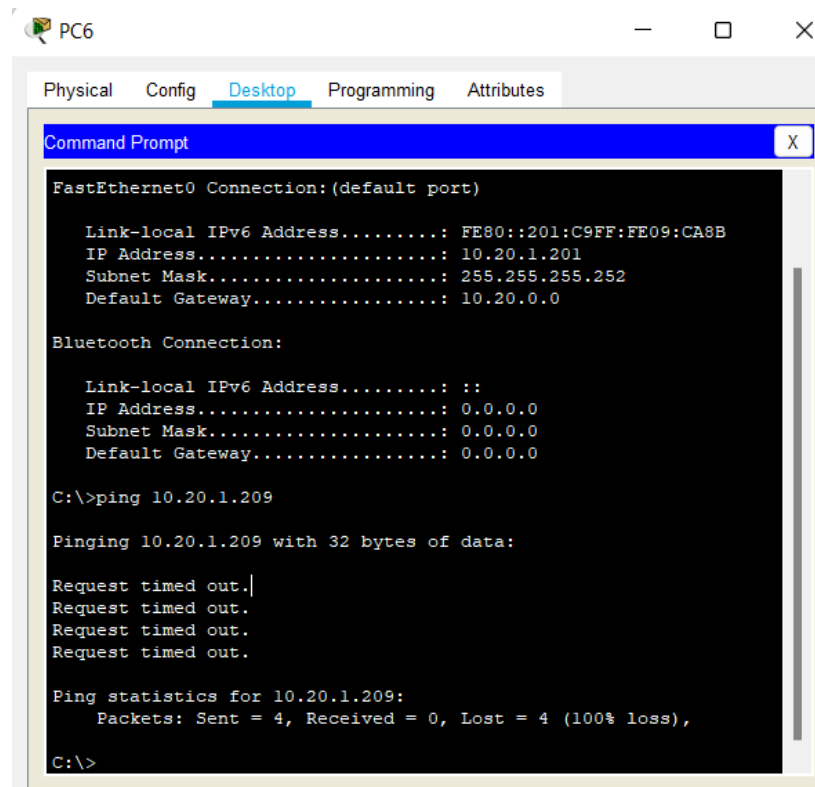




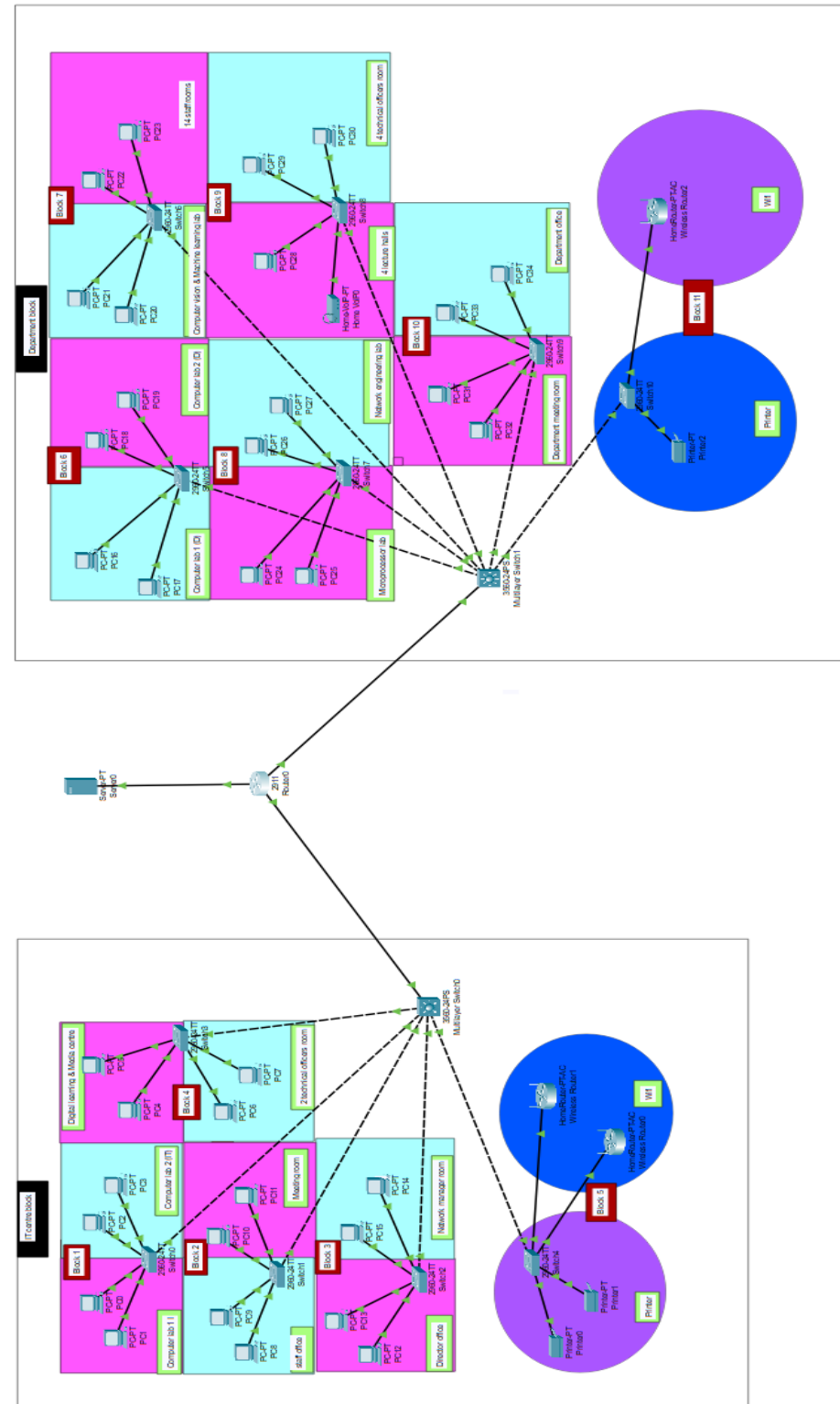
Restrict access of printers available at the department block

```
Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#ip access-list extended Printer
Switch(config-ext-nacl)#permit ip host 10.20.0.192 host
10.20.0.255
Switch(config-ext-nacl)#permit ip host 10.20.0.192 host
10.20.1.111
Switch(config-ext-nacl)#permit ip host 10.20.0.192 host
10.20.1.143
Switch(config-ext-nacl)#permit ip host 10.20.0.192 host
10.20.1.175
Switch(config-ext-nacl)#permit ip host 10.20.0.192 host
10.20.1.195
Switch(config-ext-nacl)#permit ip host 10.20.0.192 host
10.20.1.215
Switch(config-ext-nacl)#deny ip any any
Switch(config-ext-nacl)#exit
```

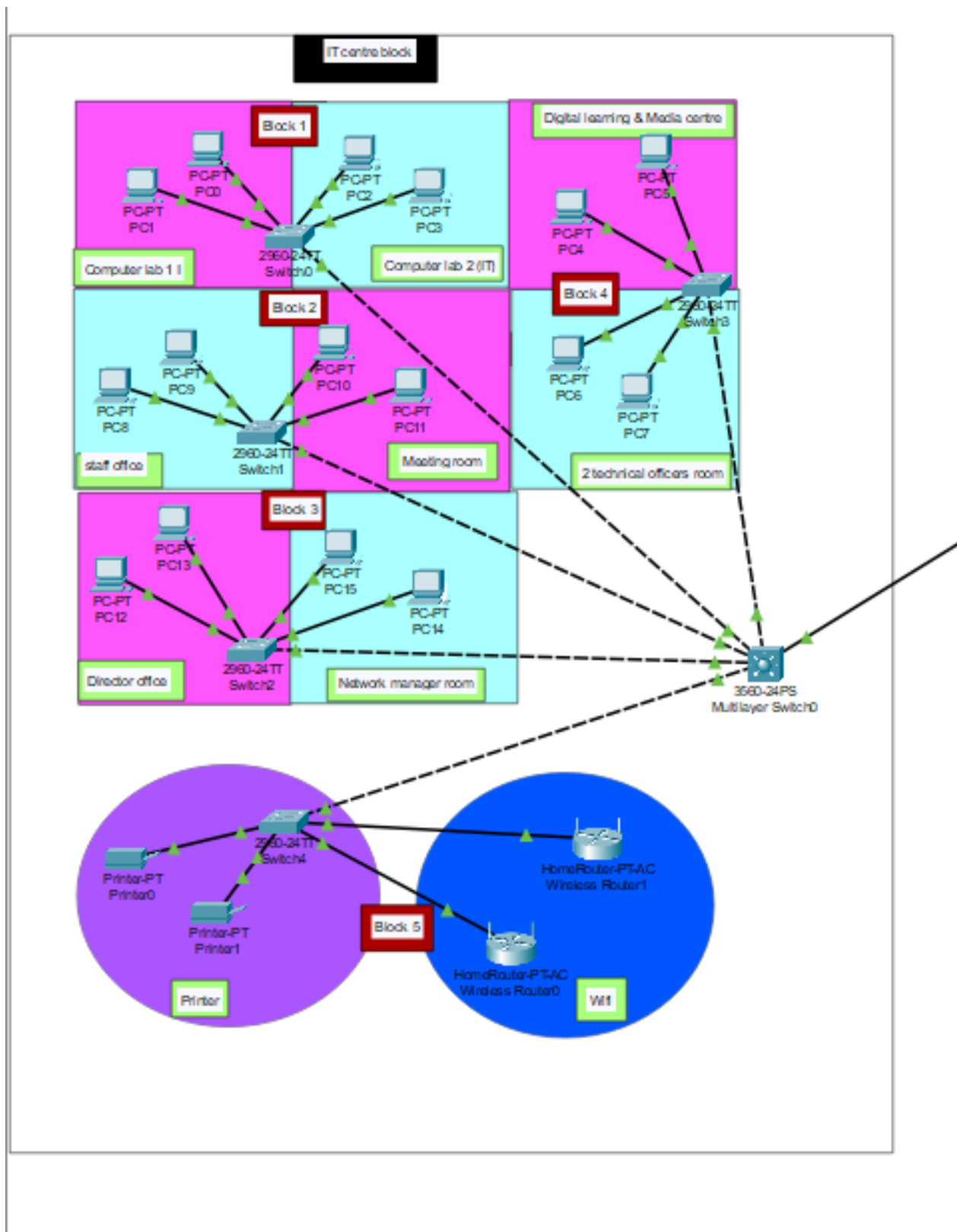
Can't be accessed by other than department block staffs



## NETWORK DIAGRAM OF WHOLE SYSTEM



## IT CENTRE BLOCK DIAGRAM



## DEPARTMENT BLOCK DIAGRAM

