

GIVED DATA ABOUT TWO BLOCKS

IT CENTER BLOCK

Data points :164

PLACE	NO OF PC /PRINTER
DIRECTOR OFFICE	2
NETWORK MANGER ROOM	1
TECHNICAL OFFICERS ROOM(2)	2
MEETING ROOM	2
LOBBY (WI-FI)	1
COM.LAB 01	60
COM.LAB	60
Digital learning	31
Printing room	2

DEPARTMENT BLOCK

Data points : 203

PLACE	NO OF PC /PRINTER
Lecture halls (4)	8
Staff rooms	1
Technical officers room	4
Meeting room	2
COM.LAB 1	50
COM.LAB 2	50
Network engineering lab	12
Computer vision and machine learning lab	12
Department office	3

- IP allocation done by considering IT CENTER BLOCK and DEPARTMENT BLOCK as a whole.
- If we allocate it separately then it will be a waste of IP address allocation.

- **To restrict the address of staff room and department office, it should be consider as separate VLANs.**
- **For the access of printers in IT centres accessed only by IT centre staffs.**
- **Passwords set for each node to restrict the access from others than administrators.**

Vlan name	Vlan No	Needed Size	All Occupied Size
Director office + Net.manager.+ Tech.officer room+ Staff office + Printing unit	1	12	14
Meeting room + lobby Com. Lab 01 (IT centre) + Com. Lab 02 (IT centre)	2	123	126
Digital learning unit + Lecture halls	3	31+8 =39	62
Staff room	5	14	14
Technical officer room	6	4	6
Com lab 01 (department block) Com lab 01 (department block)	7	100	126
Network engineering lab + Computer vision and ML lab	8	12+12 =24	30
Department office	9	3	6

MEETING ROOM (and so)123	10.10.0.1 – 10.10.0.127
COM LAB (1,2) 100	10.10.0.141- 10.10.0.255
DIGITAL LEARNING AND SO... 39	10.10.1.76– 10.10.1.140
NETWORK EN. AND COM VISION LAB 24	10.10.1.43 – 10.10.1.75
STAFF ROOM 14	10.10.1.26- 10.10.1.42
DIRECTOR OFFC' 12	10.10.1.9-10.10.1.25
TECH OFFICER ROOM 4	10.10.1.5-10.10.1.8
DEPARTMNT OFF. 3	10.10.1.1- 10.10.1.4

Vlan name	Vlan No	Needed Size	Alloted Size	Network address	Mask	Subnet mask	Assignabl e range	Broadc as T	
Meeting room + lobby Com. Lab 01 (IT centre) + Com. Lab 02 (IT centre)	1	123	126	10.10.0.0	25	255.255.255.128	10.10.0.1 – 10.10.0.126	10.10.0.127	
Com lab 01 (department block) Com lab 02 (department block)	2	100	126	10.10.0.127	25	255.255.255.128	10.10.0.128-10.10.0.254	10.10.0.255	
Digital learning unit + Lecture halls	3	31+8=39	62	10.10.1.0	26	255.255.255.192	10.10.1.1-10.10.1.62	10.10.1.63	
Network engineering lab + Computer vision and ML lab + Tech.officer(department)	4	12+12+4=28	30	10.10.1.64	27	255.255.255.24	10.10.1.65 - 10.10.1.95	10.10.1.96	
Staff room	5	14	14	10.10.1.97	28	255.255.255.240	10.10.1.98 - 10.10.1.112	10.10.1.113	
Staff office	6	5	6	10.10.1.114	29	255.255.255.248	10.10.1.115-10.10.1.119	10.10.1.120	
Technical officer room	7	4	6	10.10.1.121	29	255.255.255.248	10.10.1.122-10.10.1.128	10.10.1.129	
Department office	8	3	6	10.10.1.130	29	255.255.255.248	10.10.1.131-10.10.1.137	10.10.1.138	
Printing unit	9	2	6	10.10.1.139	29	255.255.255.248	10.10.1.140-10.10.1.146	10.10.1.147	
Director office(IT) +Net.manager room(IT) + meeting room(Department)	10	5	6	10.10.1.148	29	255.255.255.248	10.10.1.149-10.10.1.155	10.10.1.156	

Assigning IP address and sub net masks

1)IT CENTER

DIRECTOR OFFICE

The screenshot shows the configuration page for the FastEthernet0 interface. The left sidebar has a tree view with 'GLOBAL' (Settings, Algorithm Settings) and 'INTERFACE' (FastEthernet0, Bluetooth). The 'FastEthernet0' interface is selected. The main panel shows the following settings:

- Port Status: ☒ On
- Bandwidth: ☒ 100 Mbps, ☐ 10 Mbps, ☒ Auto
- Duplex: ☐ Half Duplex, ☒ Full Duplex, ☒ Auto
- MAC Address: 0003.E43E.6084
- IP Configuration: ☐ DHCP, ☒ Static
 - IPv4 Address: 10.10.1.155
 - Subnet Mask: 255.255.255.248
- IPv6 Configuration: ☐ Automatic, ☒ Static
 - IPv6 Address: (empty field)
 - Link Local Address: FE80::203:E4FF:FE3E:6084

At the bottom left, there is a 'Top' button.

This screenshot is similar to the one above, showing the configuration for the FastEthernet0 interface. The settings are identical except for the IPv4 Address, which is now 10.10.1.153.

- Port Status: ☒ On
- Bandwidth: ☒ 100 Mbps, ☐ 10 Mbps, ☒ Auto
- Duplex: ☐ Half Duplex, ☒ Full Duplex, ☒ Auto
- MAC Address: 0003.E43E.6084
- IP Configuration: ☐ DHCP, ☒ Static
 - IPv4 Address: 10.10.1.153
 - Subnet Mask: 255.255.255.248
- IPv6 Configuration: ☐ Automatic, ☒ Static
 - IPv6 Address: (empty field)
 - Link Local Address: FE80::203:E4FF:FE3E:6084

At the bottom left, there is a 'Top' button.

CONFIGURING ROUTERS

ROUTER 01

Fast ethernet 0/0

Press RETURN to get started.

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 10.10.1.150 255.0.0.0
Router(config-if)#ip address 10.10.1.150 255.255.255.248
Router(config-if)#ip address 10.10.1.150 255.255.255.248
Router(config-if)#
```

Fast Ethernet 0/1

```
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#no ip address
Router(config-if)#no ip address
Router(config-if)#ip address 10.10.1.156 255.255.255.248
Router(config-if)#ip address 10.10.1.156 255.255.255.248
Router(config-if)#ip address 10.10.1.156 255.255.255.248
Router(config-if)#
```

Fast Ethernet 0/4

```
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface FastEthernet4/0
Router(config-if)#ip address 10.10.1.122 255.255.255.248
Router(config-if)#ip address 10.10.1.122 255.255.255.248
Router(config-if)#ip address 10.10.1.122 255.255.255.248
Router(config-if)#
```

Physical Config CLI Attributes

GLOBAL	FastEthernet4/0	
Settings	<div>Port Status <input checked="" type="checkbox"/> On</div> <div>MAC Address 0002.4A98.7E1D</div>	
Algorithm Settings		
ROUTING		
Static		
RIP		
INTERFACE		
FastEthernet0/0		
FastEthernet1/0		
Serial2/0		
Serial3/0		
FastEthernet4/0	<div>IP Configuration</div> <div>IPv4 Address 10.10.1.122</div> <div>Subnet Mask 255.255.255.248</div>	
FastEthernet5/0		
FastEthernet6/0		
FastEthernet7/0		
FastEthernet8/0	<div>Tx Ring Limit 10</div>	

Fast Ethernet 0/5

```
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet5/0
Router(config-if)#ip address 10.10.1.115 255.255.255.248
Router(config-if)#ip address 10.10.1.115 255.255.255.248
Router(config-if)#
```

IP Configuration	
IPv4 Address	10.10.1.115
Subnet Mask	255.255.255.248
Tx Ring Limit	
	10

Router3

```
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 10.10.1.1 255.0.0.0
Router(config-if)#ip address 10.10.1.1 255.255.255.192
Router(config-if)#ip address 10.10.1.1 255.255.255.192
Router(config-if)#
```



```

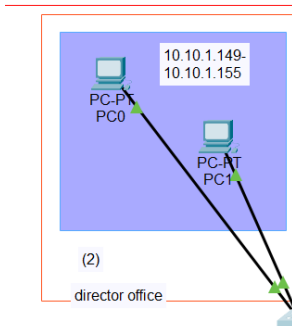
Router(config)#interface FastEthernet1/0
Router(config-if)#ip address 10.10.1.149 255.255.255.192
Router(config-if)#ip address 10.10.1.149 255.255.255.192
Router(config-if)#ip address 10.10.1.149 255.255.255.248
Router(config-if)#

```

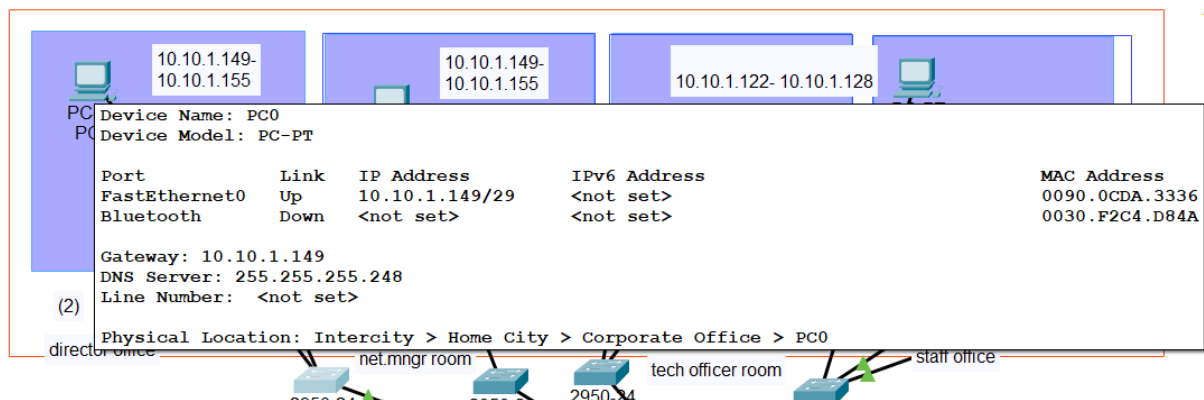
IP ADDRESS ALOCATIONS PER BUILDING

IT CENTER

1)Director officie



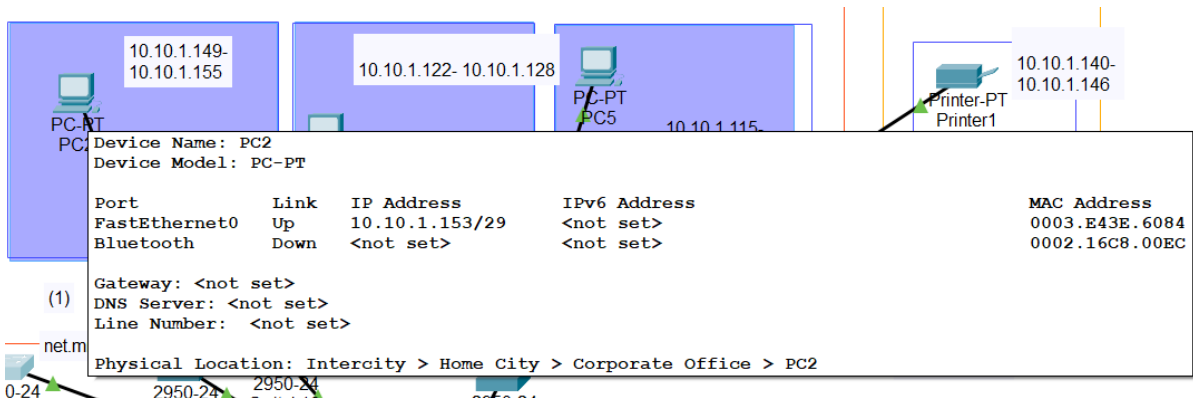
Ex: IP address for PC 0 in IT centre



2)Network manger room

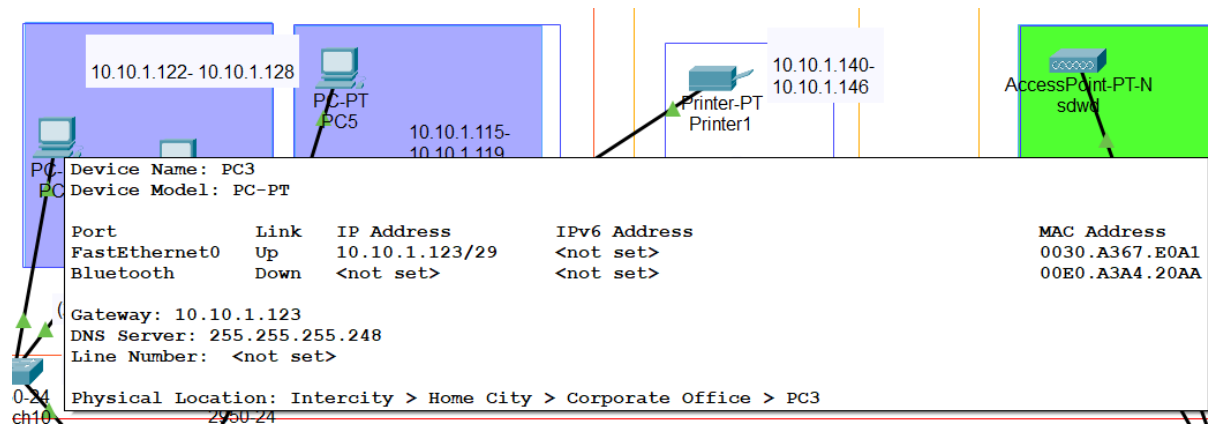
IP address range : 10.10.1.122 - 10.10.1.128

eX: PC 02 in NET.mananger room

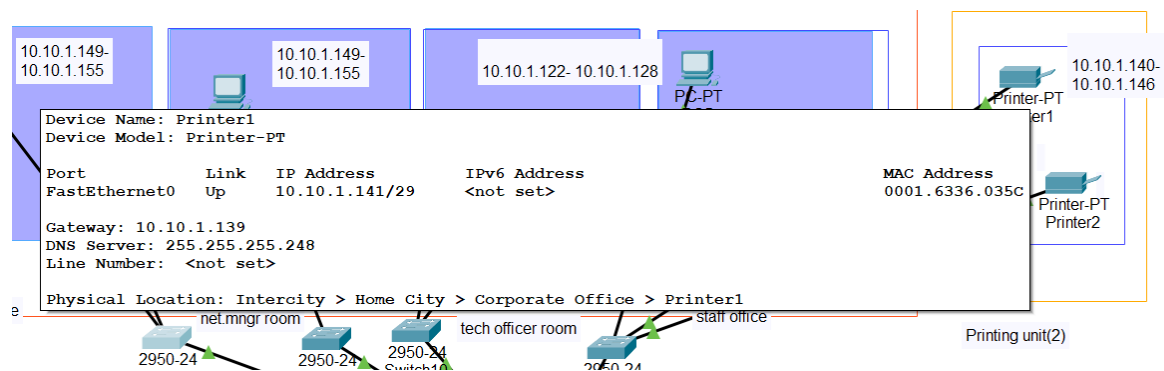


Similarly

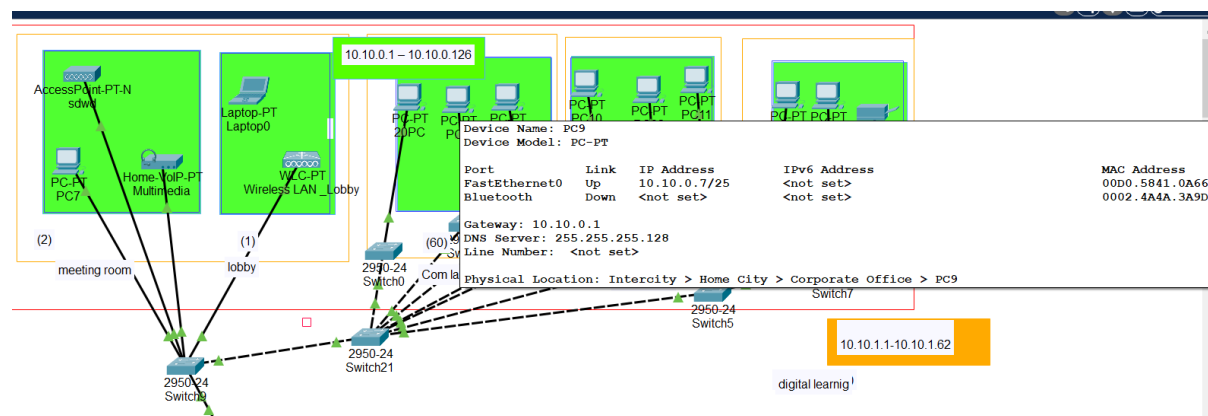
PC 3



Printer in printing unit



PC 9 in Com Lab 01



VLANs and allowed access

<u>VLAN</u> <u>no</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
<u>1</u>											
<u>2</u>											
<u>3</u>											
<u>4</u>											
<u>5</u>											
<u>6</u>											
<u>7</u>											
<u>8</u>											
<u>9</u>											
<u>10</u>											

Configuring switch

For switch 02

```
Switch>en
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 10
^
% Invalid input detected at '^' marker.

Switch(config-if-range)#switchport access vlan 10
% Access VLAN does not exist. Creating vlan 10
Switch(config-if-range)#do wr
Building configuration...
[OK]
Switch(config-if-range)#
```

For switch 01

```
Switch>en
Switch#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 10
% Access VLAN does not exist. Creating vlan 10
Switch(config-if-range)#do wr
Building configuration...
[OK]
Switch(config-if-range)#
```

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For switch 09

```

Switch>en
Switch#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#switchport mode access
      ^
% Invalid input detected at '^' marker.

Switch(config)#switchport mode access
      ^
% Invalid input detected at '^' marker.

Switch(config)#switchport mode access
      ^
% Invalid input detected at '^' marker.

Switch(config)#int range fa0/1-14
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport mode access vlan 1
      ^
% Invalid input detected at '^' marker.

Switch(config-if-range)#switchport mode access vlan 1
      ^
% Invalid input detected at '^' marker.

Switch(config-if-range)#switchport access vlan 1
Switch(config-if-range)#do wr
Building configuration...
[OK]

```

Switch 11

```

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 3
% Access VLAN does not exist. Creating vlan 3
Switch(config-if-range)#do wr
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered
on FastEthernet0/6 (3), with Switch FastEthernet0/3 (1).

Building configuration...
[OK]

```

For switch 12

```

Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#switchport mode access
      ^
% Invalid input detected at '^' marker.

Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 5
% Access VLAN does not exist. Creating vlan 5
Switch(config-if-range)#do wr
Building configuration...
[OK]

```

Switch 22

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 8
% Access VLAN does not exist. Creating vlan 8
Switch(config-if-range)#do wr
Building configuration...
[OK]
Switch(config-if-range)#ex
Switch(config)#
```

Switch 14

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 10
% Access VLAN does not exist. Creating vlan 10
Switch(config-if-range)#do wr
Building configuration...
[OK]
Switch(config-if-range)#ex
Switch(config)#
```

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Switch 15

```
Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 2
% Access VLAN does not exist. Creating vlan 2
Switch(config-if-range)#do wr
Building configuration...
[OK]
Switch(config-if-range)#ex
Switch(config)#
```

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Switch 12

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 5
% Access VLAN does not exist. Creating vlan 5
Switch(config-if-range)#do wr
Building configuration...
[OK]
Switch(config-if-range)#ex
Switch(config)#
```

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Switch 17

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 7
Switch(config-if-range)#do wr
Building configuration...
[OK]
Switch(config-if-range)#ex
Switch(config)#
```

Computer
and ML lat

Switch 16

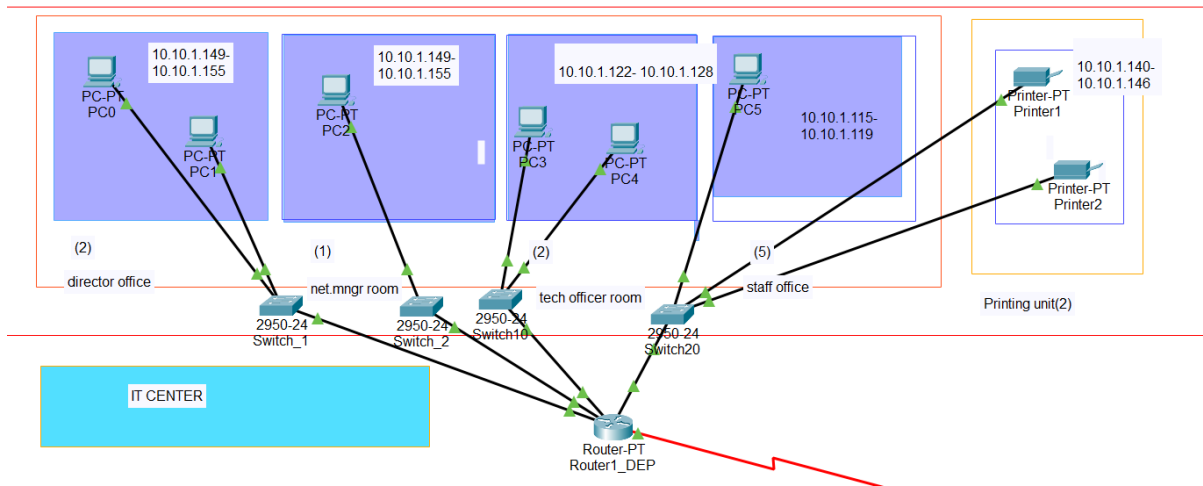
```
Switchn#
%SYS-5-CONFIG_I: Configured from console by console

Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#int range fa0/1-24
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 4
```

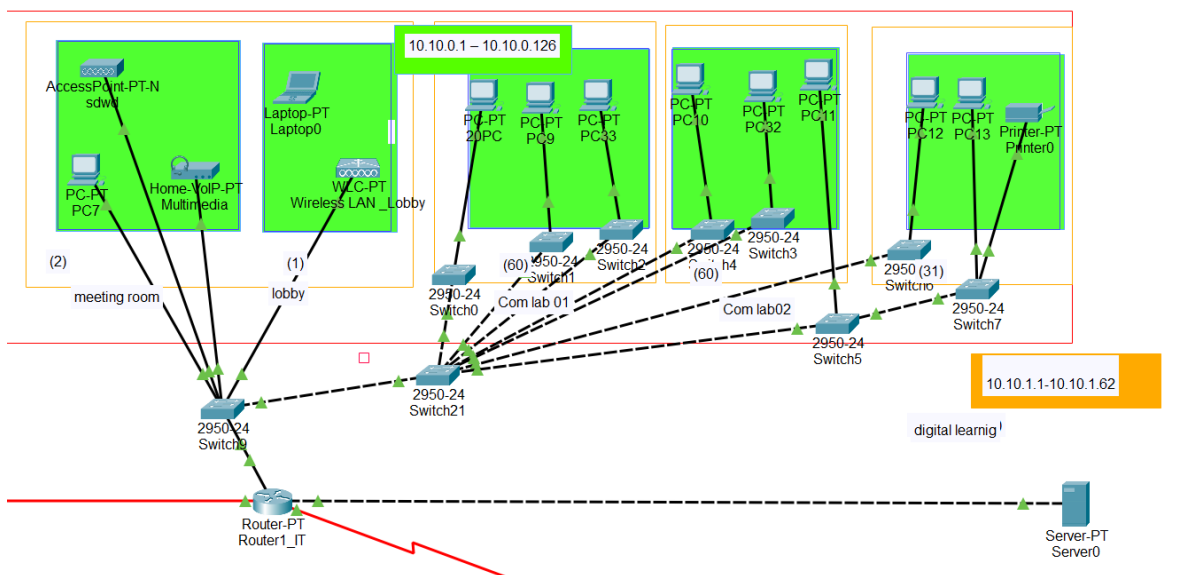
COMPLETE NETWORK DIAGRAM

1)IT CENTRE

1. Ground floor

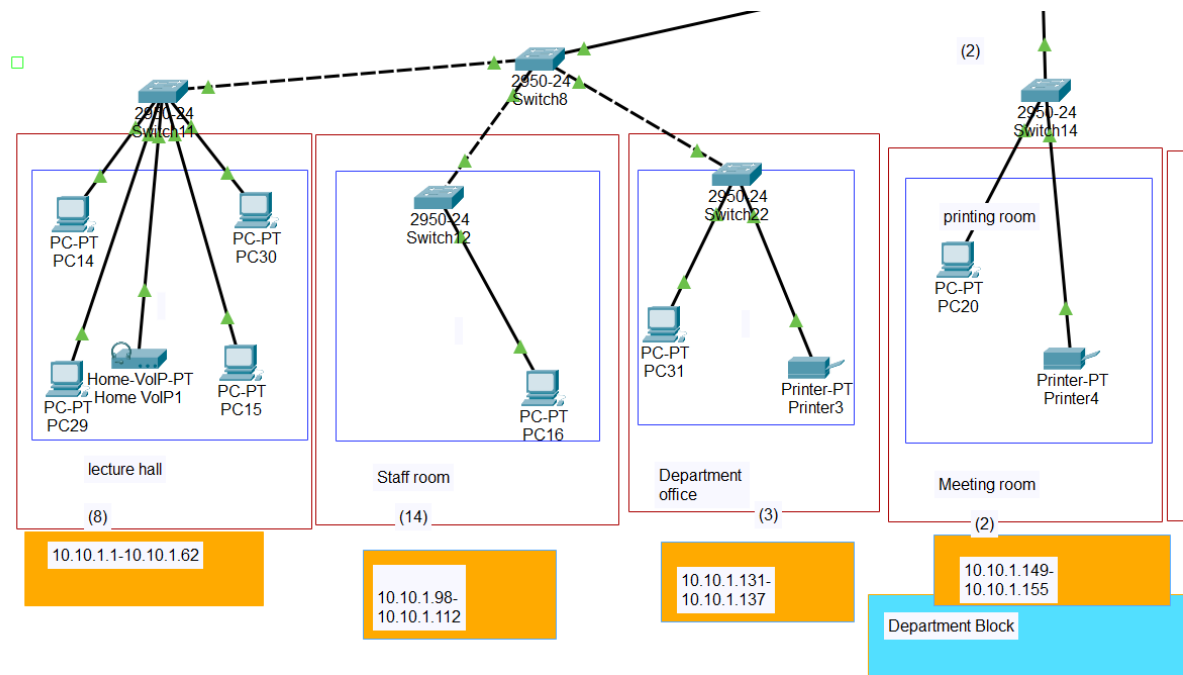


2. First floor

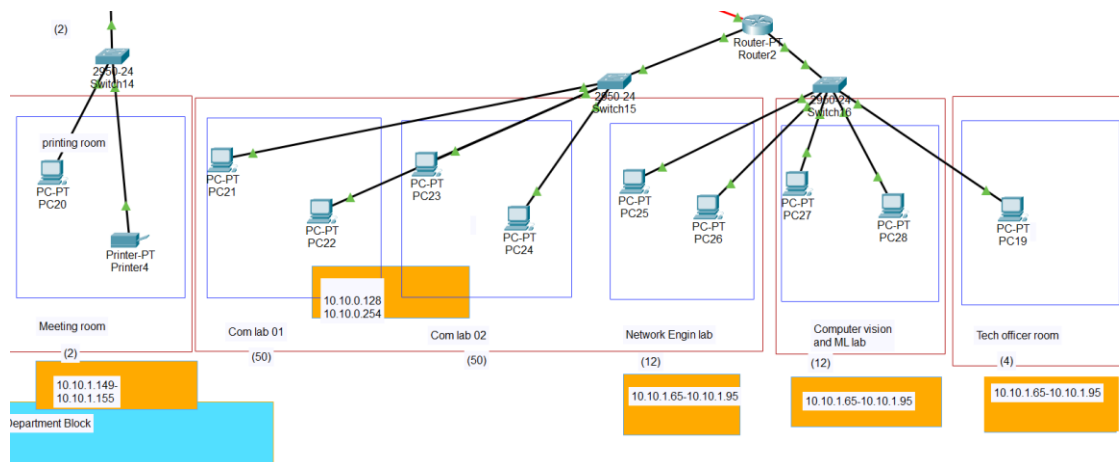


DEPARTMENT BLOCK

1. Ground floor



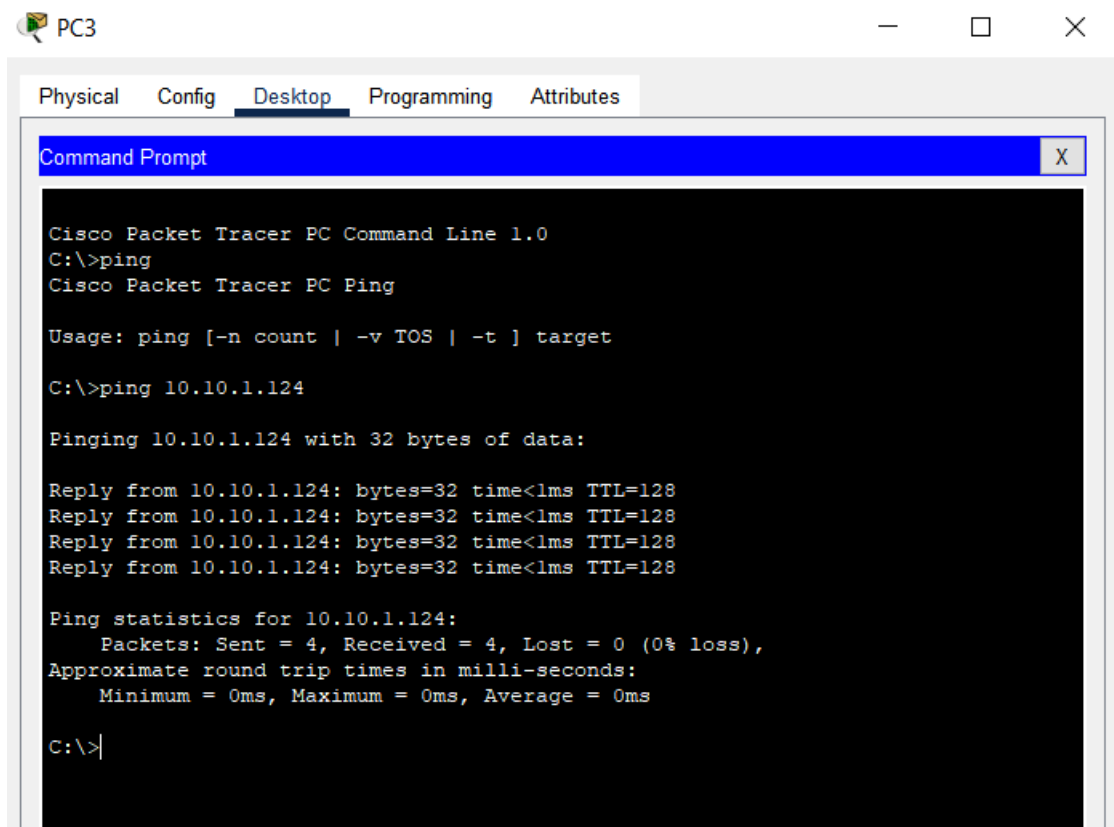
2. First floor



Router Configuration


```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa 0/0
Router(config-if)#no sh
Router(config-if)#int fa 0/0
Router(config-if)#no sh
Router(config-if)#do w
Building configuration...
[OK]
Router(config-if)#do wr
Building configuration...
[OK]
Router(config-if)#
```

Configuration of PC



```
C:\>ipconfig

FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address.....: FE80::230:A3FF:FE67:E0A1
    IPv6 Address.....: ::
    IPv4 Address.....: 10.10.1.123
    Subnet Mask.....: 255.255.255.248
    Default Gateway.....: ::
                        10.10.1.123

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address.....: ::
    IPv6 Address.....: ::
    IPv4 Address.....: 0.0.0.0
    Subnet Mask.....: 0.0.0.0
    Default Gateway.....: ::
                        0.0.0.0

C:\>
```

Configuration of Printers

Printer1

Physical **Config** Attributes

GLOBAL

Settings

INTERFACE

FastEthernet0

Global Settings

Display Name

Gateway/DNS IPv4

☐ DHCP

☒ Static

Default Gateway

DNS Server

Gateway/DNS IPv6

☐ Automatic

☒ Static

Default Gateway

DNS Server

Printer1

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

IPv4 Address

Subnet Mask

IPv6 Configuration

☐ Automatic

☒ Static

IPv6 Address

Link Local Address:

DENYINIG PRINTERS ROOM

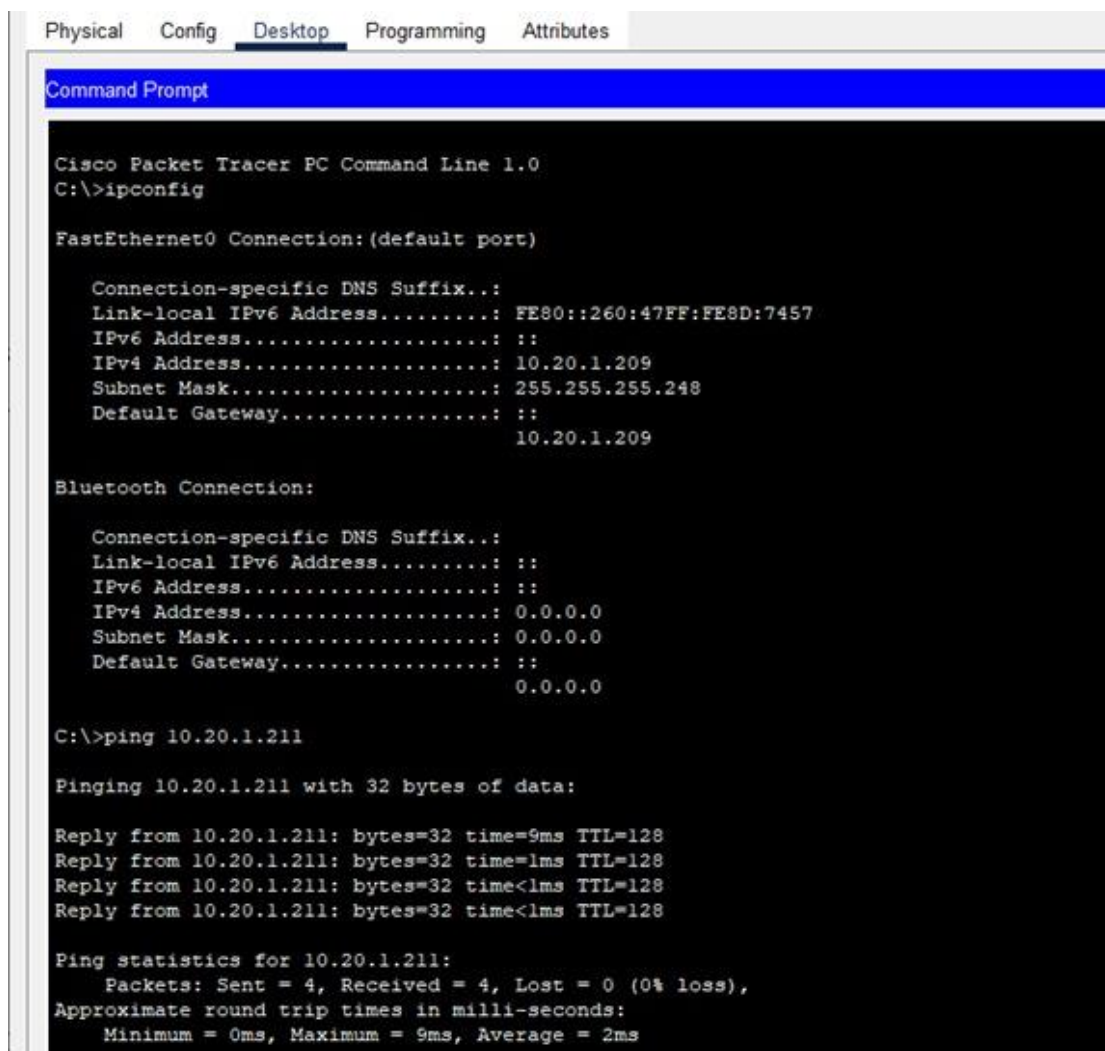
```

Switch>enable
Switch#conf 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 10.10.1.149 host
10.10.1.155
Switch(config-ext-nacl)#permit ip host 10.10.1.122 host
10.10.1.128
Switch(config-ext-nacl)#deny ip any any
Switch(config-ext-nacl)#
  
```

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Ping from a PC in Staff room to a printer in printing room



```
Physical  Config  Desktop  Programming  Attributes
Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address.....: FE80::260:47FF:FE8D:7457
    IPv6 Address.....: ::
    IPv4 Address.....: 10.20.1.209
    Subnet Mask.....: 255.255.255.248
    Default Gateway.....: ::
                        10.20.1.209

Bluetooth Connection:

    Connection-specific DNS Suffix...:
    Link-local IPv6 Address.....: ::
    IPv6 Address.....: ::
    IPv4 Address.....: 0.0.0.0
    Subnet Mask.....: 0.0.0.0
    Default Gateway.....: ::
                        0.0.0.0

C:\>ping 10.20.1.211

Pinging 10.20.1.211 with 32 bytes of data:

Reply from 10.20.1.211: bytes=32 time=9ms TTL=128
Reply from 10.20.1.211: bytes=32 time=1ms TTL=128
Reply from 10.20.1.211: bytes=32 time<1ms TTL=128
Reply from 10.20.1.211: bytes=32 time<1ms TTL=128

Ping statistics for 10.20.1.211:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 9ms, Average = 2ms
```