



COLLEGE OF COMPUTER STUDIES
Information Technology Department

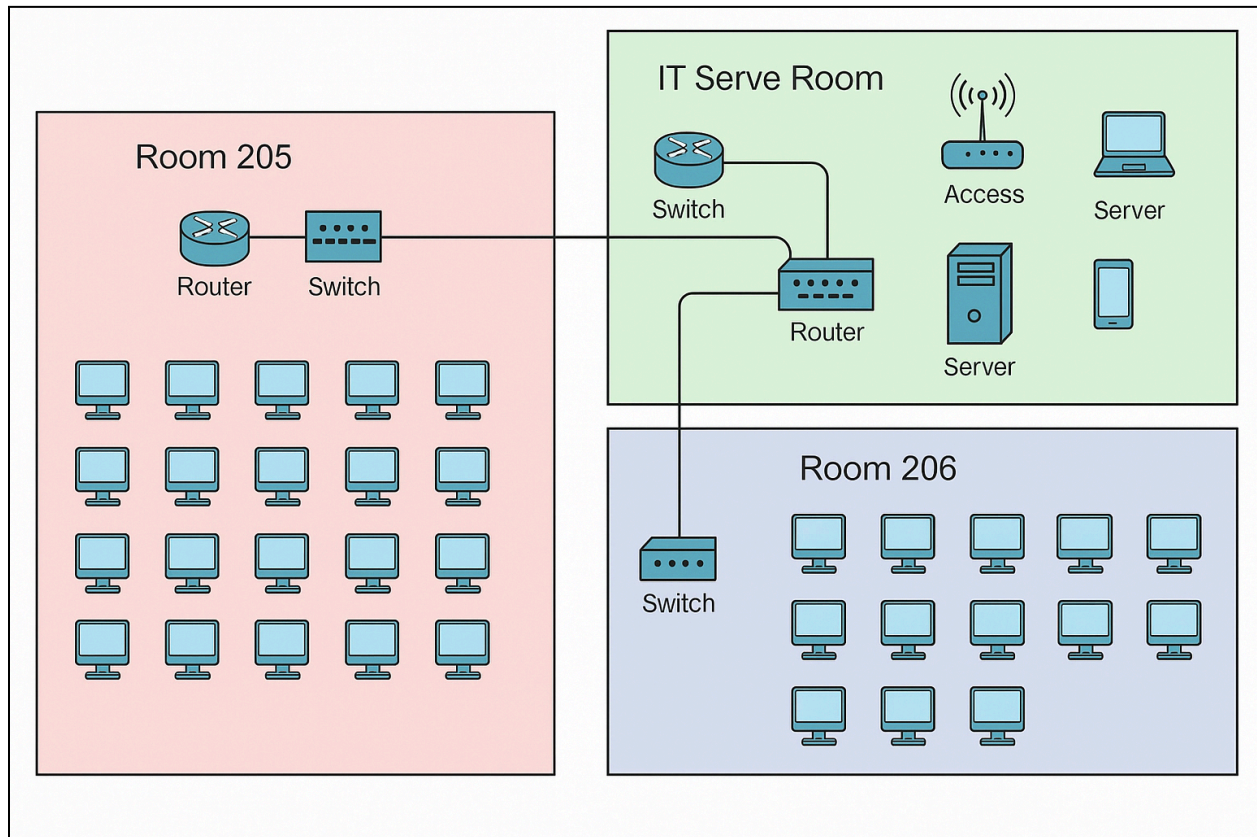
***Final Project Requirements in
CIT 307 Networking 2***

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Network Layout



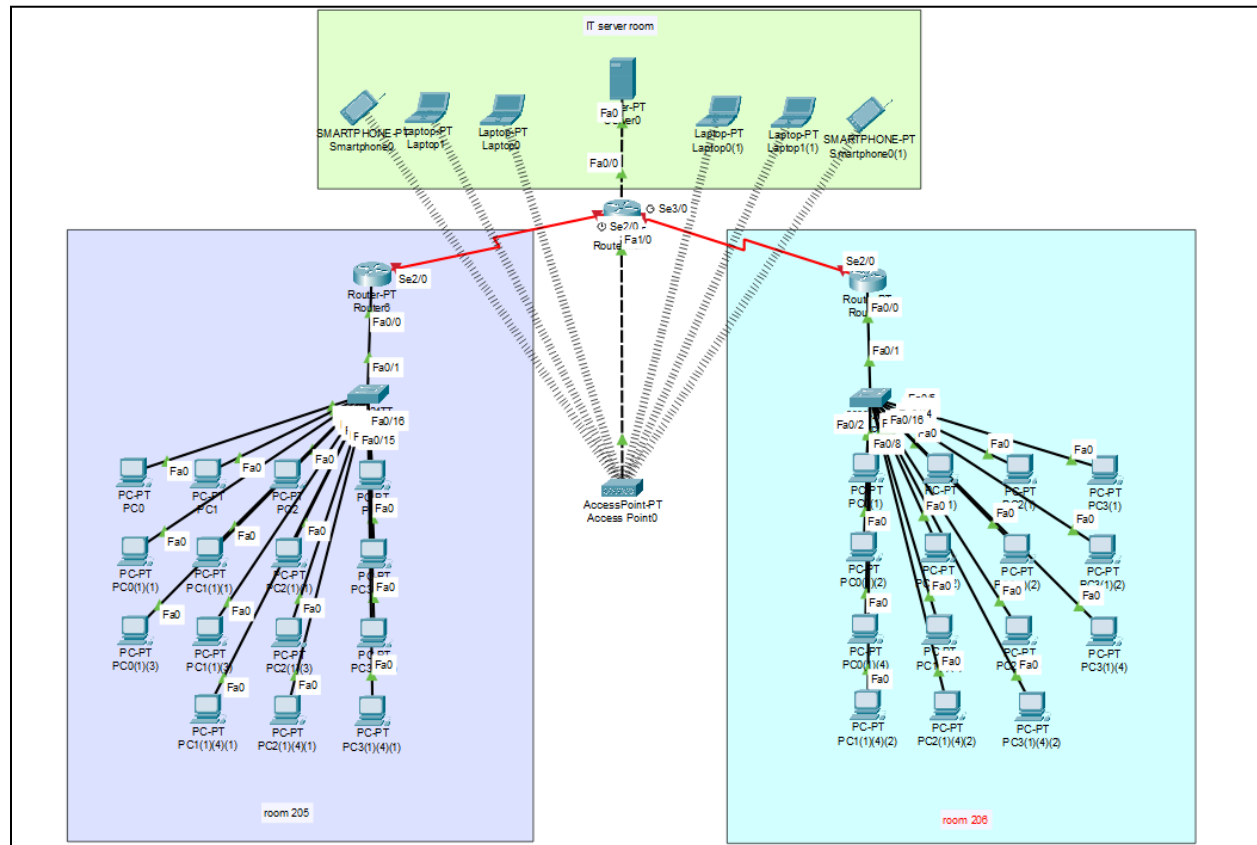
Physical Areas

- **Room 205:** This area, enclosed in the left light blue box, houses a collection of PCs connected to a single switch.
- **Room 206:** This area, enclosed in the right light blue box, similarly contains a group of PCs connected to another switch.
- **IT Server Room:** This area, indicated by the green box at the top, hosts servers, laptops, and smartphones, all connected to a central switch.

Network Devices

- **Routers:** Two routers are present, labeled "Router0" and "Router1". They facilitate communication between different network segments. Router0 has interfaces Serial0/0/0 and FastEthernet0/0, while Router1 has interfaces Serial0/0/1 and FastEthernet0/0.
- **Switches:** Three switches:
 - One switch in Room 205.
 - One switch in Room 206.
 - One central switch in the IT Server Room, labeled "Switch0".
- **Access Point:** A wireless access point, labeled "AccessPoint-PT AccessPoint0", is connected to the central switch in the IT Server Room, providing wireless connectivity.
- **End Devices:**
 - **PCs:** 15 PCs are located each in Room 205 and Room 206.
 - **Servers:** At least one server is present in the IT Server Room.
 - **Laptops:** 4 Laptops are connected wirelessly via the access point and wired to the central switch in the IT Server Room.
 - **Smartphones:** 2 Smartphones are also connected wirelessly via the access point in the IT Server Room.

Network Interconnections



● SECOND FLOOR



Subnetting Scheme

Subnetting divides bigger networks into smaller sub-networks, which helps in efficient IP addressing utilization, improving network management, better security, and reducing broadcast traffic.

Subnet Name	Network Address	Subnet Mask	IP Range	Broadcast Host	Usable Host
Room 205	192.168.20.0	/27	192.168.10.1 - 192.168.10.15	192.168.10.16	30
Room 206	192.168.30.0	/27	192.168.20.1 - 192.168.20.15	192.168.20.16	30
Server Room	192.168.10.0	/27	192.168.10.33 - 192.168.10.47	192.168.10.48	30
Access Points	192.168.10.1	/27	192.168.10.65- 192.168.10.80	192.168.10.81	30

Purpose of Subnetting in Each Subnet Name

- **Room 205 Subnet:** To logically group devices within the physical area of Room 205. This allows for localized network management and can improve security by isolating this segment from other parts of the network.
- **Room 206 Subnet:** Similar to Room 205, this subnet aims to organize and manage the devices within Room 206, providing logical separation and potential security benefits.
- **IT Server Room Subnet:** This subnet likely hosts critical network resources such as servers. Subnetting here enhances security by isolating these important devices and potentially allowing for specific access control policies. It also logically groups the wired and wireless devices within this area connected to the central switch.
- **Access Points Subnet:** This dedicated subnet is crucial for enabling routing between Room 205 and Room 206. It provides a network segment specifically for the routers to exchange routing information and forward traffic between the other subnets.

VLAN Configurations

Device Name	VLAN ID	IP Range	Switch Ports
Room 205	VLAN10	192.168.20.1– 192.168.20.30	Fa0/1 – Fa0/15 on Switch1
Room 206	VLAN20	192.168.30.1 – 192.168.30.30	Fa0/1 – Fa0/15 on Switch2
IT Server Room	VLAN30	192.168.10.34 – 192.168.10.62	Fa0/1 – Fa0/5 on Switch0

Assign and Document IP Addresses

Device Name	MAC Address	IP Address	Subnet Mask	Default Gateway
Room 205				
Teacher's PC	00:1A:2B:0A:2E:7D	192.168.10.1	/27	192.168.20.1
PC 1	00:1A:2B:C9:99:9F	192.168.10.2	/27	192.168.20.1
PC 2	00:1A:2B:A6:64:1F	192.168.10.3	/27	192.168.20.1
PC 3	00:1A:2B:0A:39:F1	192.168.10.4	/27	192.168.20.1
PC 4	00:1A:2B:26:51:C0	192.168.10.5	/27	192.168.20.1
PC 5	00:1A:2B:03:84:B4	192.168.10.6	/27	192.168.20.1
PC 6	00:1A:2B:9C:15:8B	192.168.10.7	/27	192.168.20.1
PC 7	00:1A:2B:AC:5F:06	192.168.10.8	/27	192.168.20.1
PC 8	00:1A:2B:90:49:5F	192.168.10.9	/27	192.168.20.1
PC 9	00:1A:2B:AC:86:BC	192.168.10.10	/27	192.168.20.1
PC 10	00:1A:2B:AE:02:F9	192.168.10.11	/27	192.168.20.1

PC 11	00:1A:2B:DF:A9:92	192.168.10.12	/27	192.168.20.1
PC 12	00:1A:2B:E8:B1:9D	192.168.10.13	/27	192.168.20.1
PC 13	00:1A:2B:79:E9:4E	192.168.10.14	/27	192.168.20.1
PC 14	00:1A:2B:23:2E:EE	192.168.10.15	/27	192.168.20.1

Device Name	MAC Address	IP Address	Subnet Mask	Default Gateway
Room 206				
Teacher's PC	00:1A:2B:5A:D7:C1	192.168.20.1	/27	192.168.30.1
PC 1	00:1A:2B:37:CD:BD	192.168.20.2	/27	192.168.30.1
PC 2	00:1A:2B:82:FD:5E	192.168.20.3	/27	192.168.30.1
PC 3	00:1A:2B:A5:6A:5F	192.168.20.4	/27	192.168.30.1
PC 4	00:1A:2B:23:ED:5C	192.168.20.5	/27	192.168.30.1
PC 5	00:1A:2B:4E:60:4A	192.168.20.6	/27	192.168.30.1
PC 6	00:1A:2B:88:CC:79	192.168.20.7	/27	192.168.30.1
PC 7	00:1A:2B:F1:80:F8	192.168.20.8	/27	192.168.30.1
PC 8	00:1A:2B:10:BE:94	192.168.20.9	/27	192.168.30.1
PC 9	00:1A:2B:EA:28:E2	192.168.20.10	/27	192.168.30.1
PC 10	00:1A:2B:0F:0D:19	192.168.20.11	/27	192.168.30.1

PC 11	00:1A:2B:32:49:FE	192.168.20.12	/27	192.168.30.1
PC 12	00:1A:2B:B8:E1:41	192.168.20.13	/27	192.168.30.1
PC 13	00:1A:2B:7A:3D:F8	192.168.20.14	/27	192.168.30.1
PC 14	00:1A:2B:F4:B7:9D	192.168.20.15	/27	192.168.30.1

Device Name	MAC Address	IP Address	Subnet Mask	Default Gateway
IT Server Room				
Laptop	00:1A:2B:10:AA:10	192.168.10.34	/27	192.168.10.33
Smartphone	00:1A:2B:10:AA:11	192.168.10.35	/27	192.168.10.33
PC 1	00:1A:2B:10:AA:12	192.168.10.36	/27	192.168.10.33
PC 2	00:1A:2B:10:AA:13	192.168.10.37	/27	192.168.10.33
PC 3	00:1A:2B:10:AA:14	192.168.10.38	/27	192.168.10.33

Device Name	MAC Address	IP Address	Subnet Mask	Default Gateway
Router Configuration				
R1	00:1A:2B:01:00:01	192.168.20.1 (Fa0/0) / 192.168.40.1 (S0/0/0)	255.255.255.224 / 255.255.255.252	N/A

R2	00:1A:2B:01:00:02	192.168.30.1(Fa0/0) / 192.168.40.2 (S0/0/1)	255.255.255.224 / 255.255.255.252	N/A
R3	00:1A:2B:01:00:03	192.168.10.33 (Fa0/0)	255.255.255.224 / 255.255.255.252	N/A

Firewall Configuration

VPN Implementation

Conclusion and Reflection

