UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING
UTM Johor Bahru

SEMESTER 1/20242025

SECR1213-07 NETWORK COMMUNICATIONS PROJECT :

PHASE 5

GROUP : Darksystem

LECTURER: Dr. Nurfazrina binti Mohd Zamry

NAME	MATRIC NO
IZZAT FAKHRULLAH BIN KARIM	A23CS0089
MOHAMMAD IRFAN DANIAL BIN KEFLI	A23CS0113
THAYAALLAN NAIDU A/L GANESAN	A23CS0281

Table of Content

1.0 Get the Network Address from your lecturer.

Group/Section	Network Address
1	192.16.0.0/8
2	192.17.0.0/8
3	192.18.0.0/8
4	192.19.0.0/8
5	192.20.0.0/8
6	192.21.0.0/8
7	192.22.0.0/8
8	192.23.0.0/8
9	192.24.0.0/8
10	192.25.0.0/8

Figure 1.1

Figure 1.1 shows the list of network addresses of each group. The network address of our group is 192.21.0.0/16. We assume that our subnet mask is /16 or 255.255.0.0 to ensure that our range of address usage does not influence other group subnets.

Network Address details:

IP address (decimal)	192.21.0.0
IP address (binary)	11000000 00010101 00000000 00000000
Subnet Mask(decimal)	255.255.0.0
Subnet Mask(binary)	11111111 11111111 00000000 00000000

We divided the subnet mask into two parts which are a 16-bit network portion and a 16-bit host portion. By applying the AND operation between the IP address and the subnet mask, we determined the network address to be 192.21.0.0 and the broadcast address to be 192.21.255.255. The valid address range for devices within the building is from 192.21.0.1 to 192.21.255.254.

Network Address	192.21.0.0
Broadcast Address	192.21.255.255
Range of usable address	192.21.0.1 - 192.21.255.254

2.0 Divide it in the best possible way for your network.

2.1 Network distribution for different work area

To meet the network requirements for our building, we decided to allocate separate subnets for different work areas, as outlined in Task 4. In order to create 8 subnets, we borrowed 3 bits from the host portion of the IP address, as this allows for 2^3 = 8 subnets. This adjustment ensures that each work area is allocated its own subnet

Subnet	Network portion	Subnet bits	Host portion	Address	IP address
0	11000000 00010101	000	00000 00000000	Network Address	192.21.0.0
			11111 111111111	Broadcast Address	192.21.31.255
1	11000000 00010101	001	00000 00000000	Network Address	192.21.32.0
			11111 111111111	Broadcast Address	192.21.63.255
2	11000000 00010101	010	00000 00000000	Network Address	192.21.64.0
			11111 111111111	Broadcast Address	192.21.95.255
3	11000000 00010101	011	00000 00000000	Network Address	192.21.96.0
			11111 111111111	Broadcast Address	192.21.127.255
4	11000000 00010101	100	00000 00000000	Network Address	192.21.128.0
			11111 111111111	Broadcast Address	192.21.159.255
5	11000000 00010101	101	00000 00000000	Network Address	192.21.160.0
			11111 111111111	Broadcast Address	192.21.191.255
6	11000000 00010101	110	00000 00000000	Network Address	192.21.192.0
			11111 111111111	Broadcast Address	192.21.223.255
7	11000000 00010101	111	00000 00000000	Network Address	192.21.224.0
			11111 111111111	Broadcast Address	192.21.255.255

Distribution of subnet for different work area:

Subnet	**Work Area**	**Network Address**	**Broadcast Address**	**Range of usable address**	**Subnet Mask Address**
0	Library & IT support room	192.21.0.0	192.21.31.255	192.21.0.1 - 192.21.31.254	/27 255.255.255.224
1	Technical rooms	192.21.32.0	192.21.63.255	192.21.32.1 - 192.21.63.254	/27 255.255.255.224
2	Video Conferencing Room	192.21.64.0	192.21.95.255	192.21.64.1 - 192.21.95.254	/27 255.255.255.224
3	Cisco Lab	192.21.96.0	192.21.127.255	192.21.96.1 - 192.21.127.254	/27 255.255.255.224
4	Student lounge	192.21.128.0	192.21.159.255	192.21.128.1 - 192.21.159.254	/27 255.255.255.224
5	General Labs and server rooms	192.21.160.0	192.21.191.255	192.21.160.1 - 192.21.191.254	/27 255.255.255.224
6	Embedded Lab and server room	192.21.192.0	192.21.223.255	192.21.192.1 - 192.21.223.254	/27 255.255.255.224
7	Hybrid Classroom	192.21.224.0	192.21.255.255	192.21.224.1 - 192.21.255.254	/27 255.255.255.224

2.2 Network Distribution for workstation in different work area

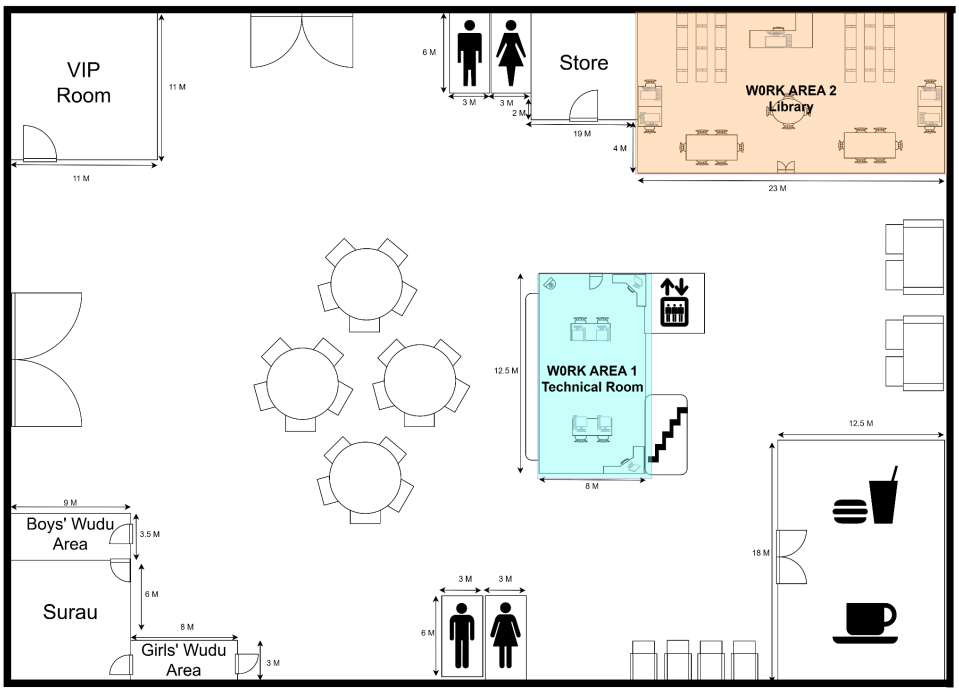

Figure 2.2.1 shows work area on the ground floor

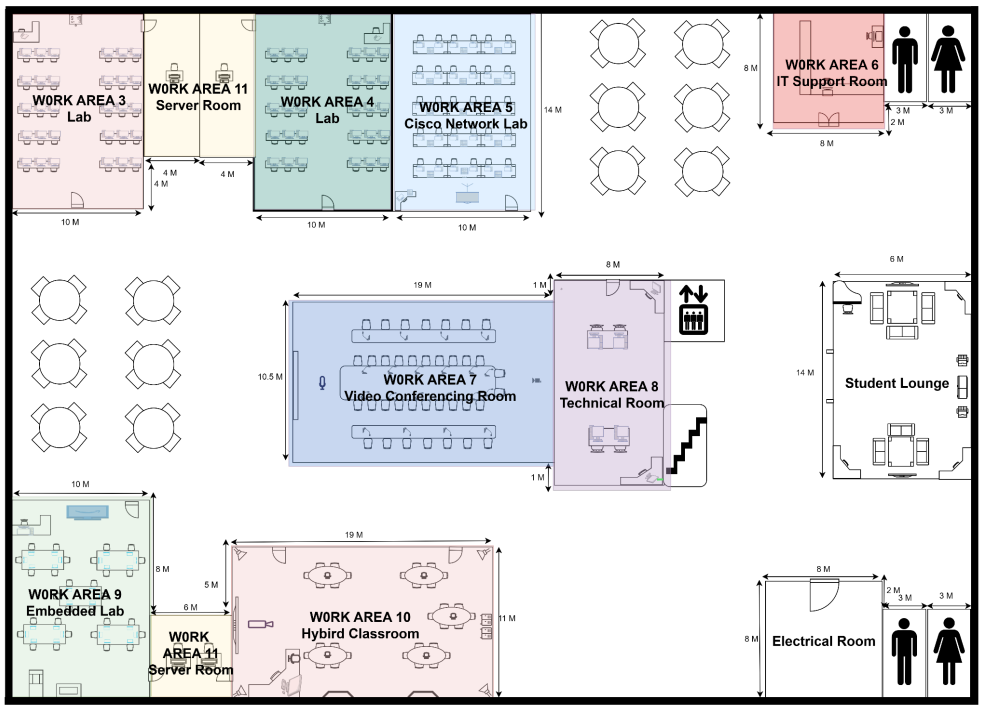

Figure 2.2.2 shows work area on the first floor

2.2.1 Work Area 3 & 11 (General Lab and Server Room)

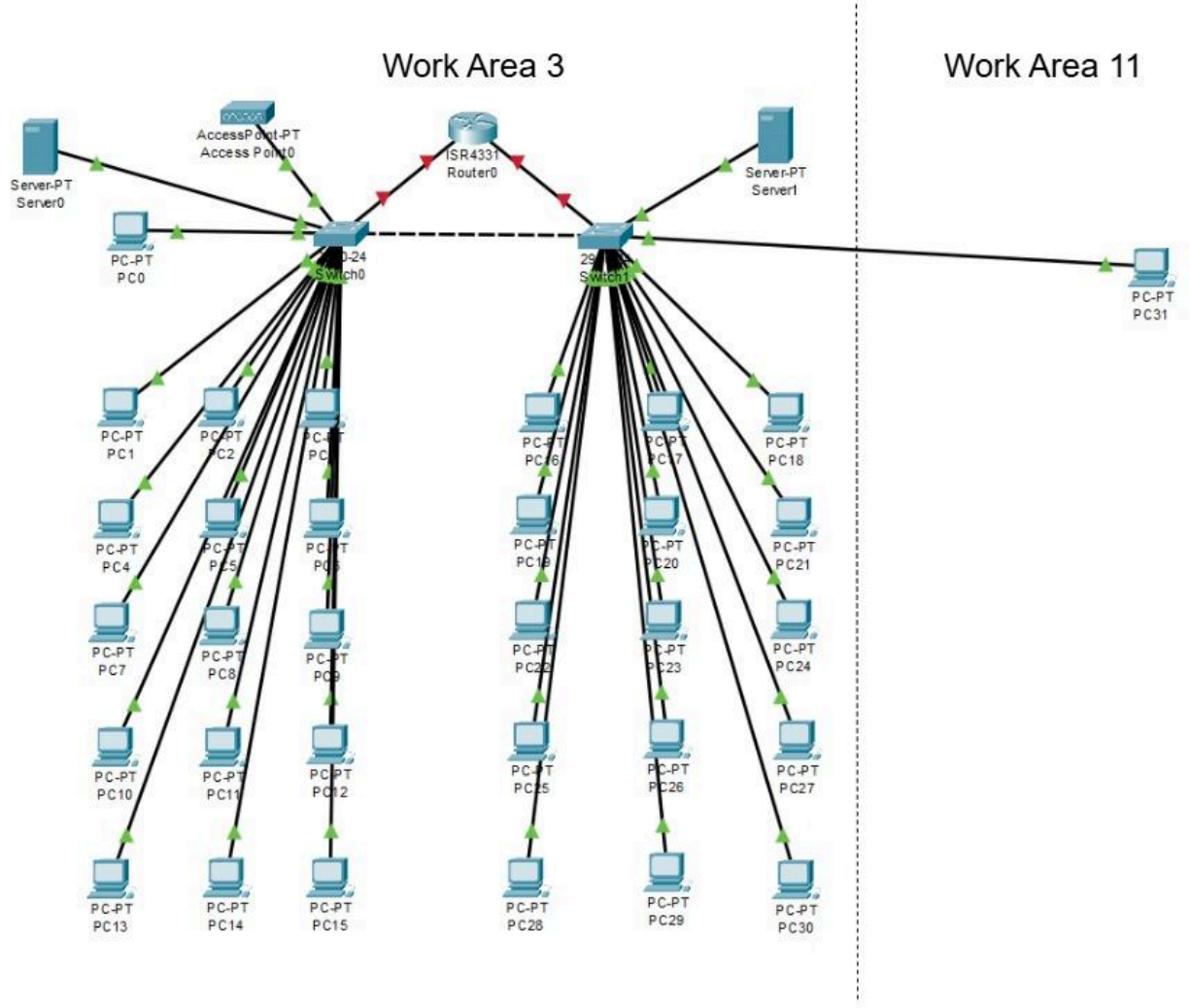

Figure 2.2.1.1: Network connection of Work Area 3 & 11

Equipment	IP Range
Router 0	192.21.160.1
Switch 0	192.21.160.2
Switch 1	192.21.160.3
Server 0	192.21.160.4
Server 1	192.21.160.5
Access Point 0	192.21.160.6
PC0-PC31	192.21.160.7-192.21.160.37

2.2.2 Work Area 4 & 11 (General Lab and Server Room)

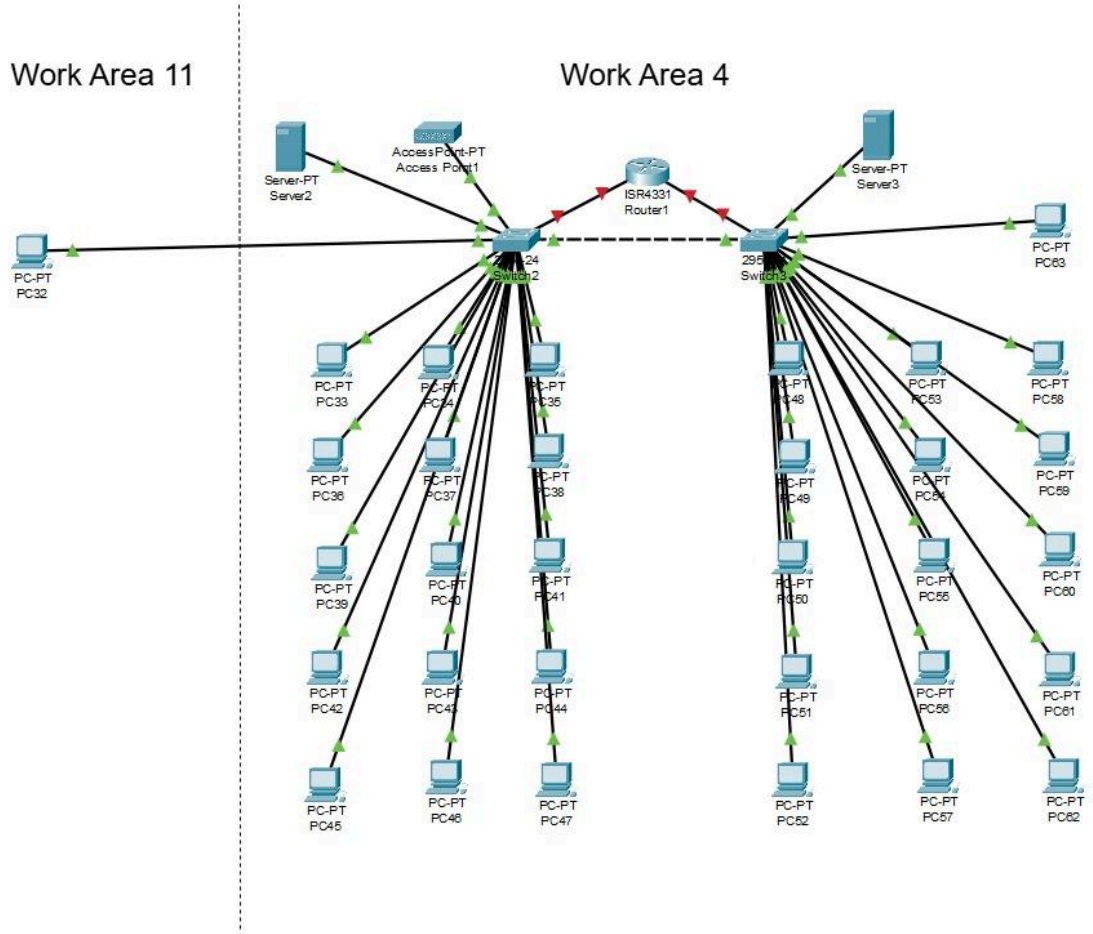

Figure 2.2.2.1: Network connection of Work Area 4 & 11

Equipment	IP Range
Router 1	192.21.160.38
Switch 2	192.21.160.39
Switch 3	192.21.160.40
Server 2	192.21.160.41
Server 3	192.21.160.42
Access Point 1	192.21.160.43
PC32-PC63	192.21.160.44-192.21.160.74

2.2.3 Work Area 5 (Cisco Lab)

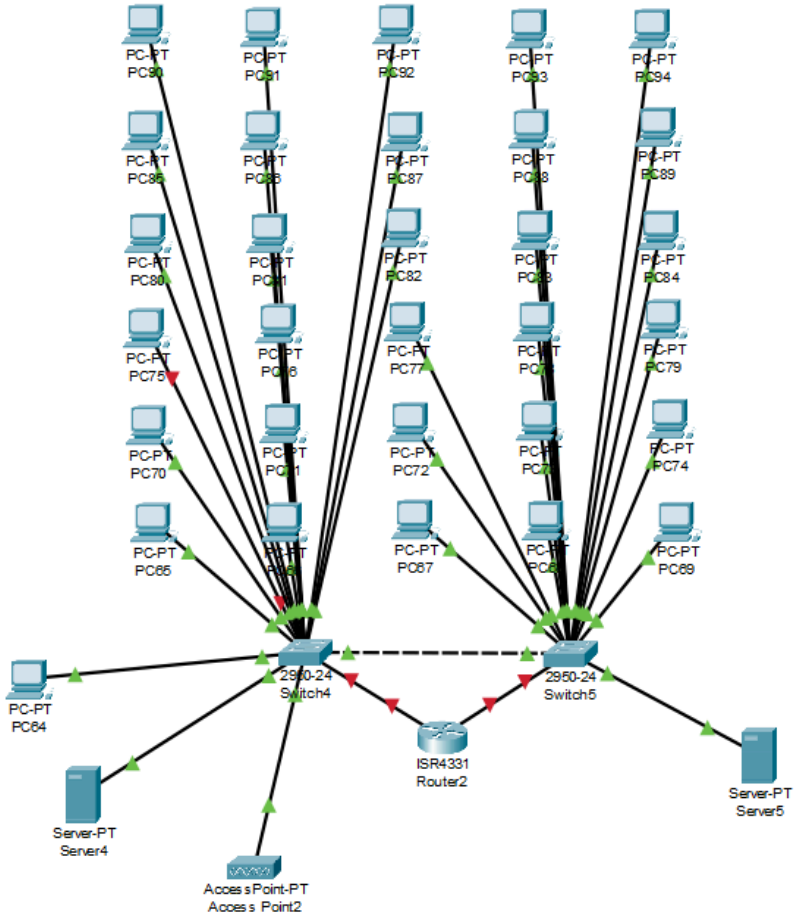

Figure 2.2.3.1: Network connection of Work Area 5

Equipment	IP Range
Router 2	192.21.96.1
Switch 4	192.21.96.2
Switch 5	192.21.96.3
Server 4	192.21.96.4
Server 5	192.21.96.5
Access Point 2	192.21.96.6
PC64-PC94	192.21.96.7 - 192.21.96.37

2.2.4 Work Area 9, 11 & 10 (Embedded Lab, Server Room, Hybrid Classroom)

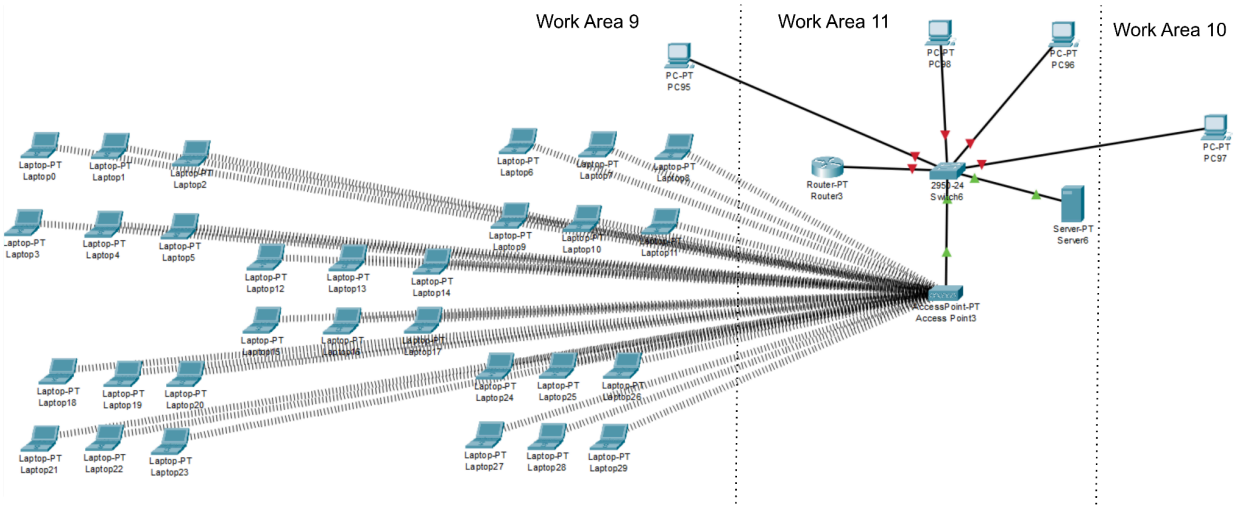

Figure 2.2.4.1: Network connection of Work Area 9, 11 & 10

Equipment	IP Range
Router 3	192.21.192.1
Server 6	192.21.192.2
Switch 6	192.21.192.3
Access Point 3	192.21.192.4
PC95-96 & PC98	192.21.192.5 - 192.21.192.7
Laptop0 - Laptop29	192.21.192.8 - 192.21.192.37
PC97	192.21.224.1

2.2.5 Work Area 1,2,6,8 (Technical Room (Ground), Library, IT Support Room, Technical Room (First Floor)

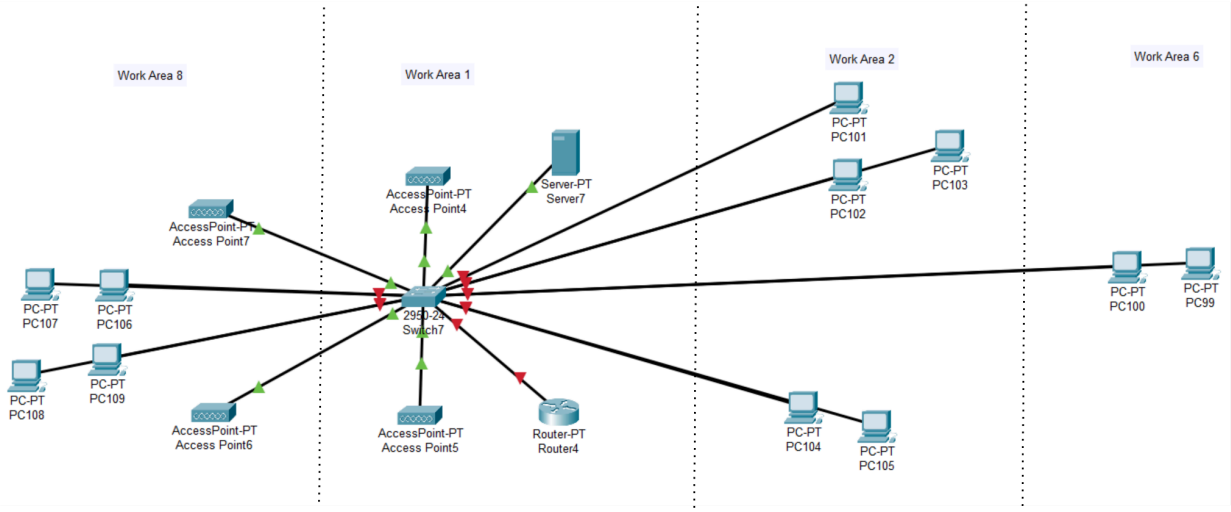

Figure 2.2.4.1: Network connection of Work Area 1, 2, 6, 8

Equipment	IP Range
Router 4	192.21.32.1
Server 7	192.21.32.2
Switch 7	192.21.32.3
Access Point 4	192.21.32.4
Access Point 5	192.21.32.5
Access Point 6	192.21.32.6
Access Point 7	192.21.32.7
PC99-PC105	192.21.0.1 -192.21.0.7
PC106-PC109	192.21.32.8 - 192.21.32.11

3.0 Minute Meeting

Date/Time		**8 JAN 2025 9.00 pm**	
Location		**Online (Google Meet)**	
Agenda		**1. Understand the details about task 5.** **2. Discuss the way to divide the subnet.** **3. Complete task 5 together.**	
Meeting Host		**Thayaallan Naidu A/L Ganesan**	
Attendance			
Name		**Time**	**Reason For Absence**
THAYAALLAN NAIDU A/L GANESAN		**2100**	**-**
MOHAMMAD IRFAN DANIAL BIN KEFLI		**2100**	**-**
IZZAT FAKHRULLAH BIN KARIM		**2100**	**-**
Minutes			
No.	**Item Discussed**	**Details**	**Person-In-Charge**

1	**Discussion for task 5**	**Izzat shared the information about task 5 and its rubric.**	**Izzat**
		All members read and investigate the task carefully.	
		Solved the problem raised by group members together through discussion.	
2	**Suggestion for subnetwork division**	**All members suggest their prefer subnetwork division**	**All members**
		All members discuss and decide the one that best suits our design.	
3	**IP Addressing Scheme Overview**	**All members examine how IP addresses are currently assigned to each work area.**	**All members**
4	**Proceed to the parts of Task 5**	**All members work on google docs together to complete task 5.** **-At the same time, if any of the group members question and identify any issues or problems then we find ways to encounter problems together.**	**All members**

5	**Meeting Ended**	**At 0200, the meeting ended after all the discussion and work was done.**	**All members**