

Sri Lanka Institute of Information Technology



IT1040 - Fundamentals of Computing
Year 1, Semester 1- 2025

NETWORK DESIGN GROUP PROJECT PART 1 & PART 2

Group WD.01.33

IT Number	Name
IT25101519	Kavindi W.L.P.R
IT25102478	Wimalagunaratne A. T
IT25101862	Saraf. M.T.M
IT25102887	Ranasinghe L.G.S.S
IT25100756	Prabhashwara P.L.D.N

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1. Overview:

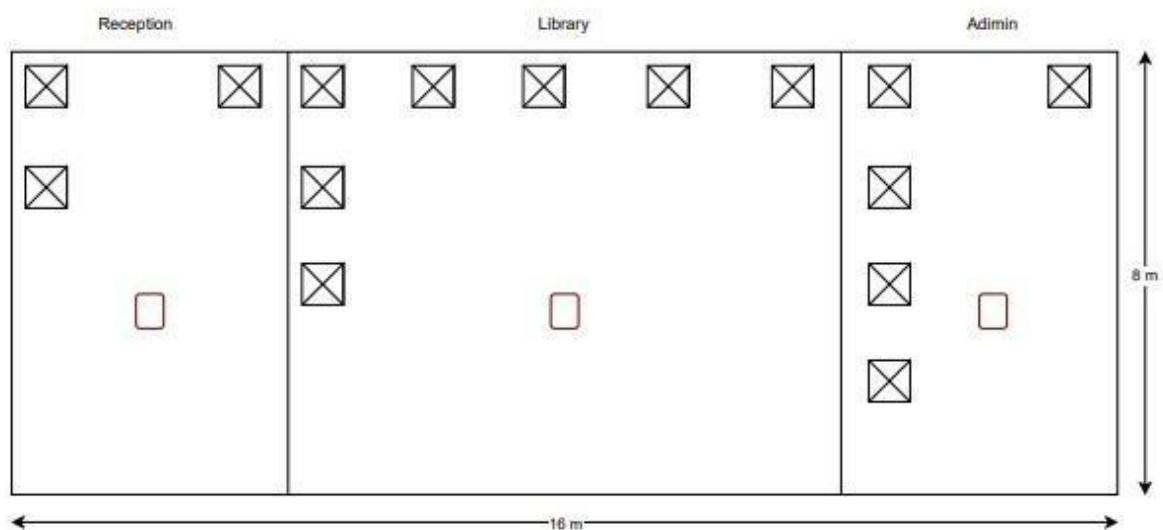
This report outlines the network data outlet plan for a 3-floor academic building. The goal is to provide sufficient wired network connectivity for PCs, staff devices, labs, and essential IT equipment while optimizing the number of outlets. A reduction in outlets is proposed to save costs and simplify the network design without affecting functionality, relying on Wi-Fi for student devices.

Proposed Outlets		
Floor	(Reduced)	Reason
Ground	18	Library: 5 (Library printer 1)Laptop 1; Reception 1 (Reception printer 1)Laptop 1, Admin 3(Admin printer 1)Laptop 1, 3 Access Point
First Floor	33	Lab A 11(Lab A printer 1)Laptop1 , Lab B 11(Lab B printer 1)Laptop 1 , Classrooms 3 (lecturer PCs only) Laptop 1, 3 Access Point.
Second Floor	17	Staff 5(Staff printer 1)Laptop 1, IT Room 3(Laptop 1), Server Room 4, Equipment Rack, 2 Access Point.
Total	68	

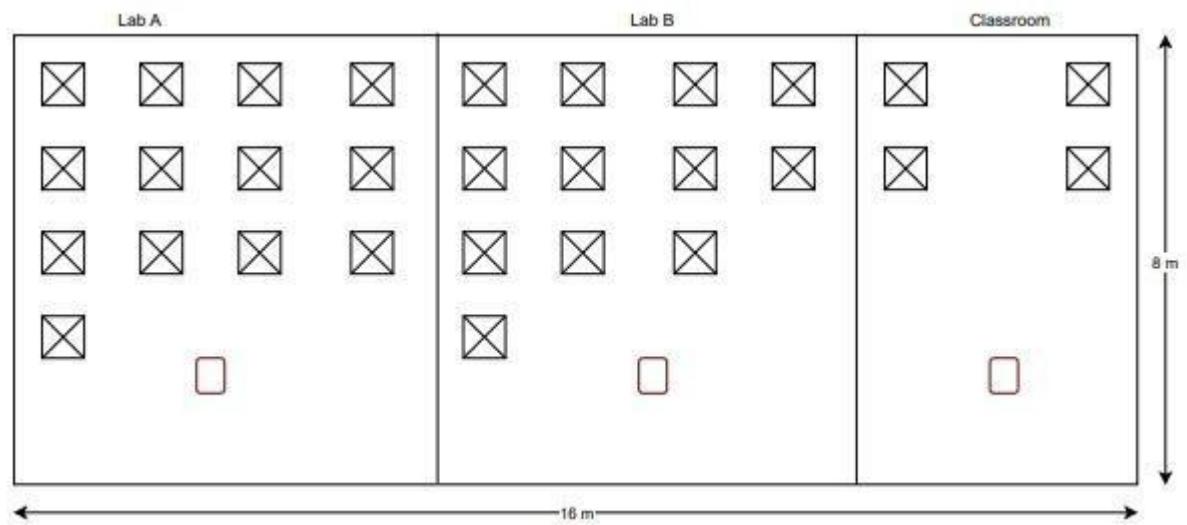
2. Requirement Analysis

a) Floor Plan

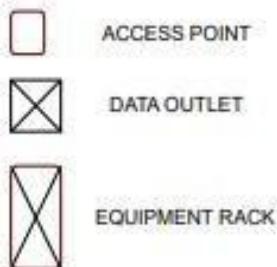
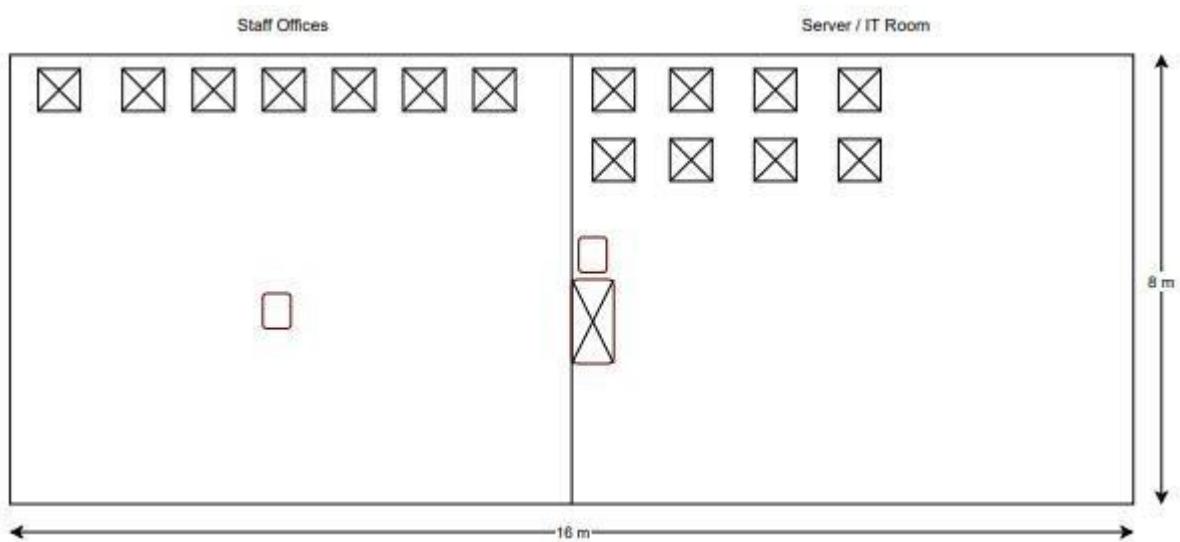
GROUND FLOOR



FIRST FLOOR



SECOND FLOOR



b) Wired Connectivity

Ground Floor (18 outlets)

1. Library: 5 outlets for student and library PCs, Laptop 1 (personal use)
2. Reception: 1 outlet for front desk computers, Laptop 1 (personal use)
3. Administration Offices: 3 outlets for staff computers, Laptop 1 (personal use)
4. Central Printer: Connected via Admin, Reception outlets and Library.

First Floor (33 outlets)

1. Lab A: 11 outlets for lab PCs and printer, Laptop 1 (personal use)
2. Lab B: 11 outlets for lab PCs and printer, Laptop 1 (personal use)
3. Classrooms: 3 outlets for lecturer PCs, Laptop 1 (personal use)

Second Floor (17 outlets)

1. Staff Offices: 5 outlets for staff PCs and printer, Laptop 1 (personal use)
2. IT Room: 3 outlets for IT workstations and devices, Laptop 1 (personal use)
3. Server Room: 4 outlets for servers and networking equipment.

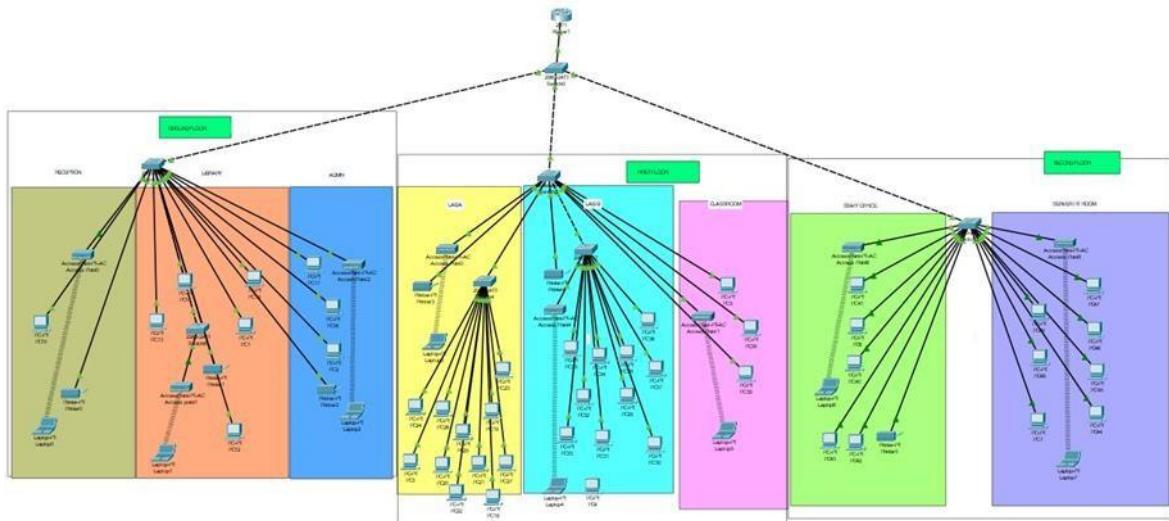
c) Wireless Connectivity

- Ground Floor - Access points: 3 (Library, Reception and Administration office)
- First Floor - Wi-Fi AP: 3 Aps (Lab A, Lab B, Classrooms)
- Second Floor - Wi-Fi AP: 2 Aps (Staff office and Server and IT room)

d) Internet Connectivity

Option	Technology	Speed	Subscription (Level)	Monthly Cost (LKR)	Suitability
FTTH (SLT)	Optical Fiber	1000 Mbps	Unlimited	LKR 39,900	✓ Best for main connection
4G LTE	Wireless	Up to 10 Mbps	Unlimited	LKR 7,090	✓ Good for backup
ADSL	Copper	5 Mbps	Unlimited	LKR 5,790	X Outdated, not suitable

3. Logical Network Design

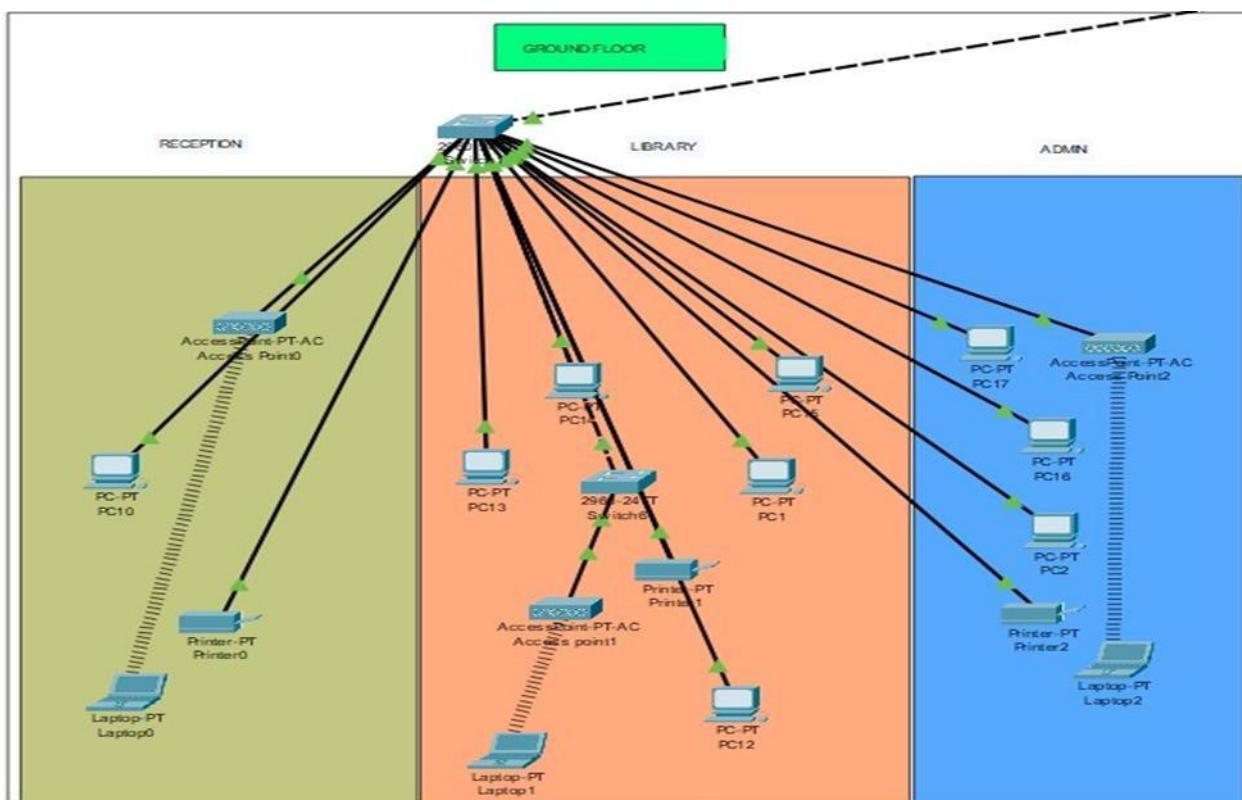


Overview of the network

Ground Floor

The Ground floor currently contains,

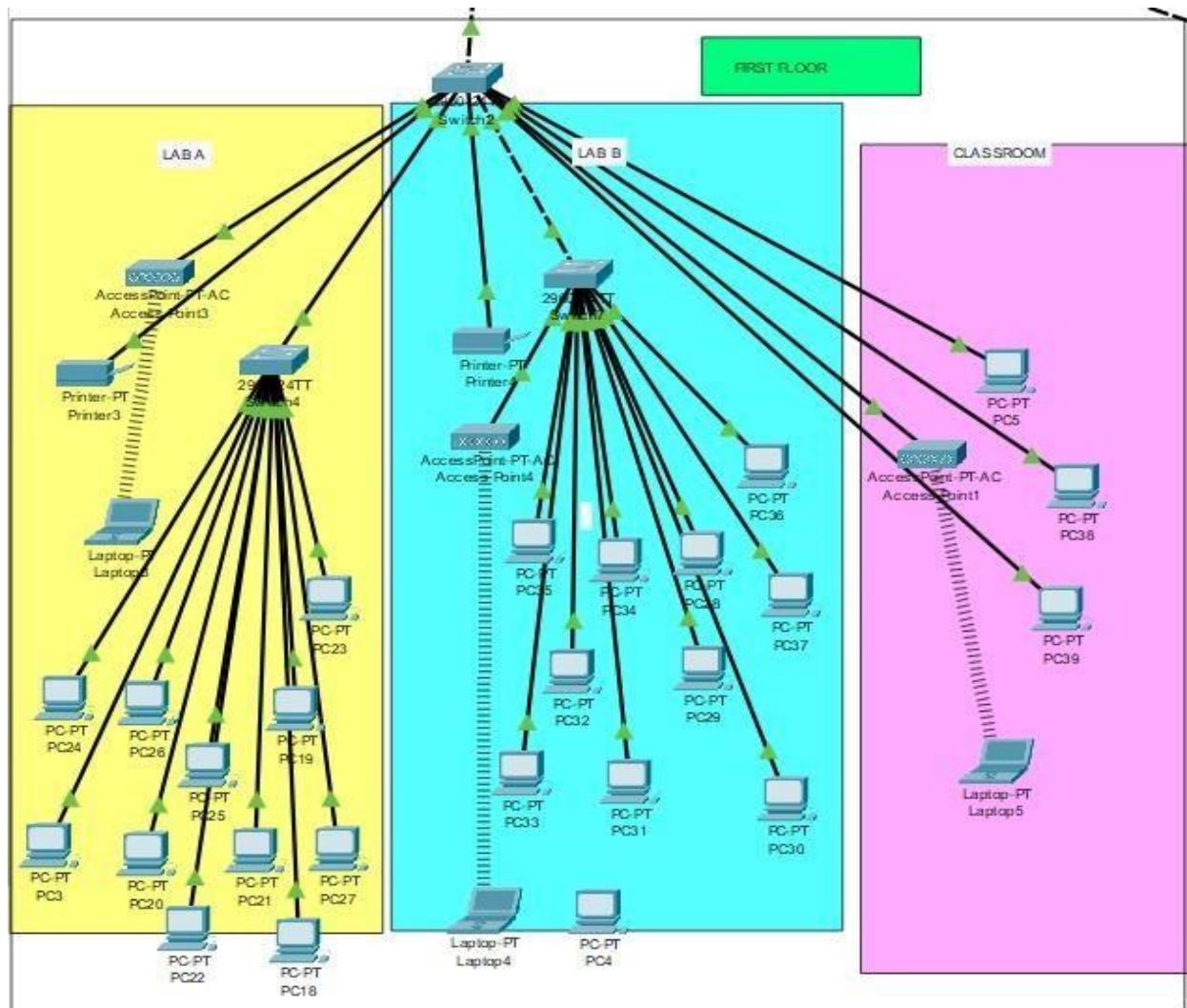
1. Library
2. Reception
3. Administration Office



First Floor

The first floor currently contains,

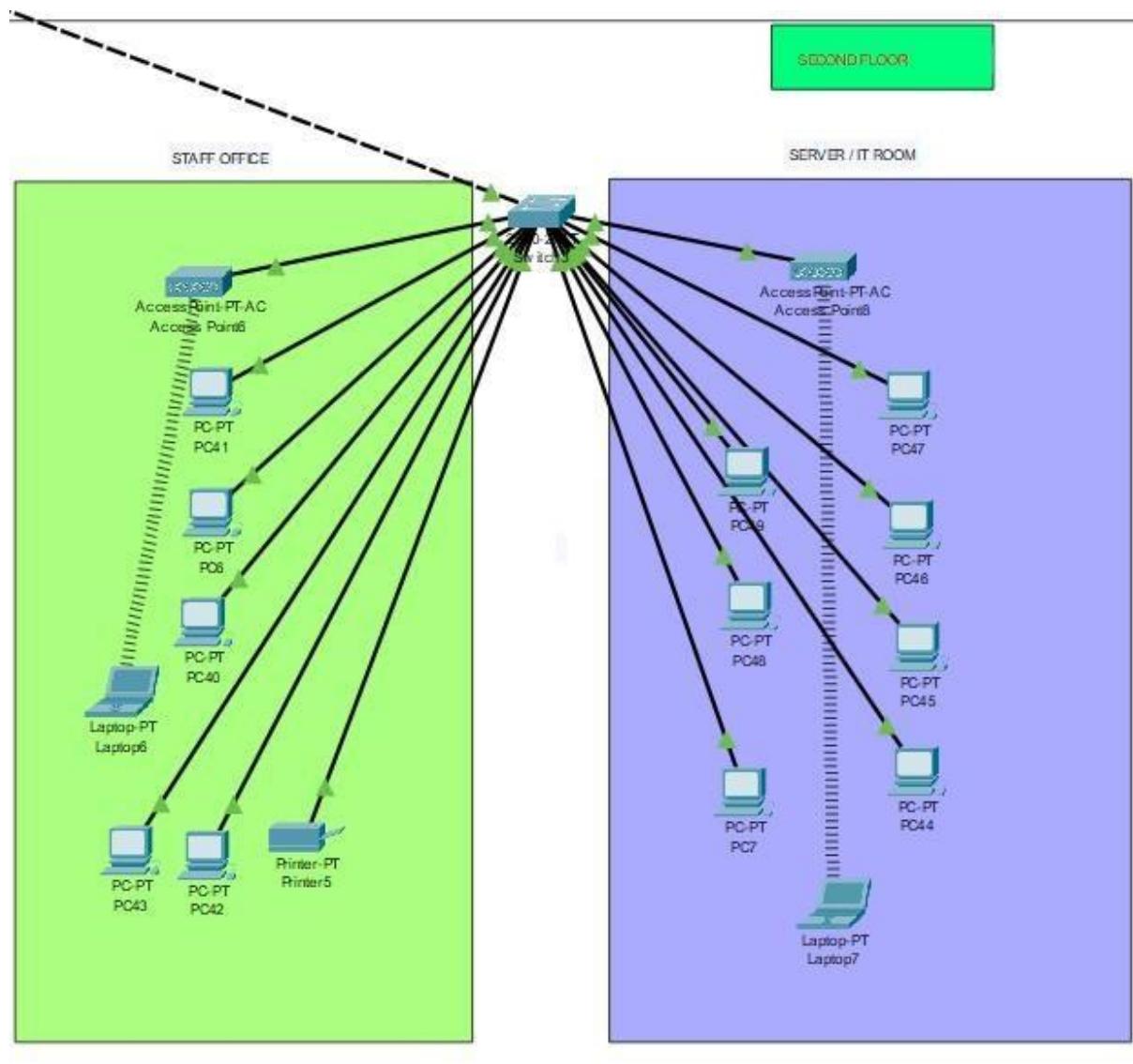
1. Lab A
2. Lab B
3. Classroom



Second Floor

The second floor currently contains,

1. Staff Office
2. IT Room
3. Server Room



Logical Network Connectivity

The following table shows the logical connectivity of the academic building network, including link relationships and their respective speeds. PCs and printers are connected to access (room) switches at 100 Mbps, while uplinks, APs, and servers are connected at 1 Gbps to ensure high performance and to match the ISP subscription bandwidth.

Link	Speed
Reception PCs → Room Switch	100 Mbps
Admin/Library PCs → Room Switch	100 Mbps
Lab A PCs → Room Switch	100 Mbps
Lab B PCs → Room Switch	100 Mbps
Classrooms Lecturer PCs → Room Switch	100 Mbps
APs (all floors) → Room Switch	1 Gbps
Room Switches (each floor) → Main/Core Switch	1 Gbps
Main/Core Switch → Router	1 Gbps
Main/Core Switch → Server	1 Gbps
Router → ISP (FTTH 1 Gbps)	1 Gbps