

Continuous Assignment 02

LNBTI – Main Building

Network Infrastructure

Proposal

Group Name:

Group E

Group Members:

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This proposal outlines required upgrades to design and implement a robust network infrastructure that meets the LNBTI main building's requirement.

Question 01: Equipment List

Floor	Room	Current Equipment	Updated Equipment
Basement	Counselling Room	PC 1	PC 1, Wi-Fi Access Point 1
	Lecture Room 07	PC 1, Projector 1	PC 1, Projector 1, Switch 1,
	Lecture Room 06	PC 1, Projector 1	PC 1, Projector 1, Switch 1,
	Lecture Room 05	PC 1, Projector 1	PC 1, Projector 1, Switch 1,
			Wi-Fi Access Point 1
Ground Floor	Reception	PC 1	PC 1, Wi-Fi Access Point 1
	Administration	PC 1	PC 1, Wi-Fi Access Point 1
	Admission Room (Marketing Staff)	PC 2	PC 5, Wi-Fi Access Point 1, Switch 1
	Registrar Office	PC 1, Printer 1	PC 1, Printer 1
	Examination Room	PC 2	PC 2, Wi-Fi Access Point 1, Printer 2
	Academics Staff Room	PC 8	PC 27, Wi-Fi Access Point 1, Printer 1
	Student Affairs	PC 1	PC 1, Printer 1
1st Floor	Cafeteria	None	Wi-Fi Access Point 2
2nd Floor	Boardroom	PC 1, Projector 1	PC 1, Projector 1
	Lecture Room 02	PC 1, Projector 1	PC 1, Projector 1, Switch 1
	Server Room	PC 2, Wi-Fi Router 2, Switch 5	PC 2, Wi-Fi Router 2, Switch 5, Backup Router 1, Server
			Wi-Fi Access Point 1
3rd Floor	Library	PC 3	PC 8, Wi-Fi Access Point 1, Printer 1
	Research Lab	PC 1, Projector 1, Switch 1	PC 1, Projector 1, Switch 1, Printer 1
	Computer Lab	PC 16	PC 30, Switch 2, Projector 1,
			Wi-Fi Access Point 1

Total Equipment List;

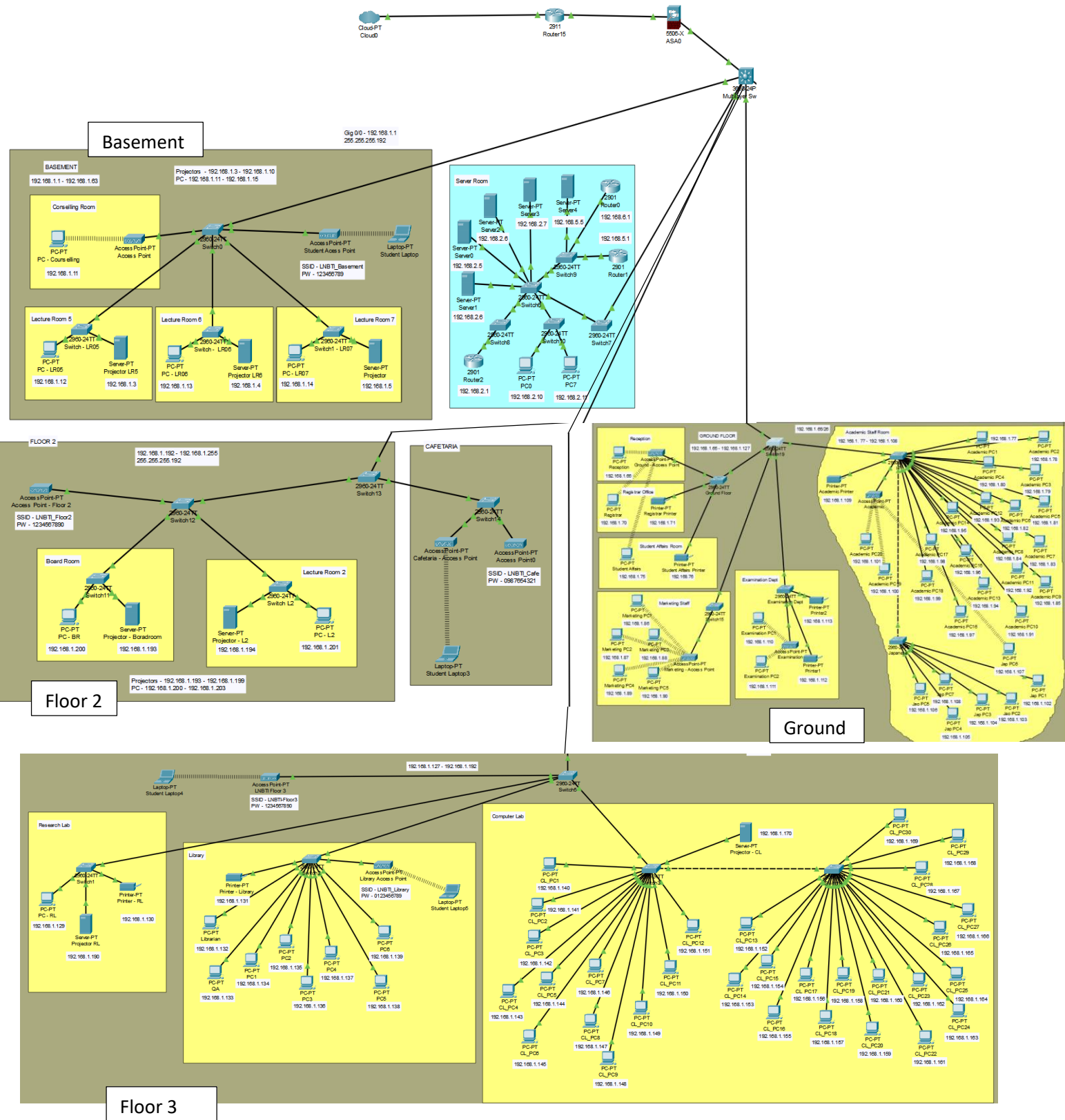
- PCs – 84
- Projectors - 7
- Printers - 7
- Routers – 4
- Switches – 25
- Access Point – 11
- Server – 5

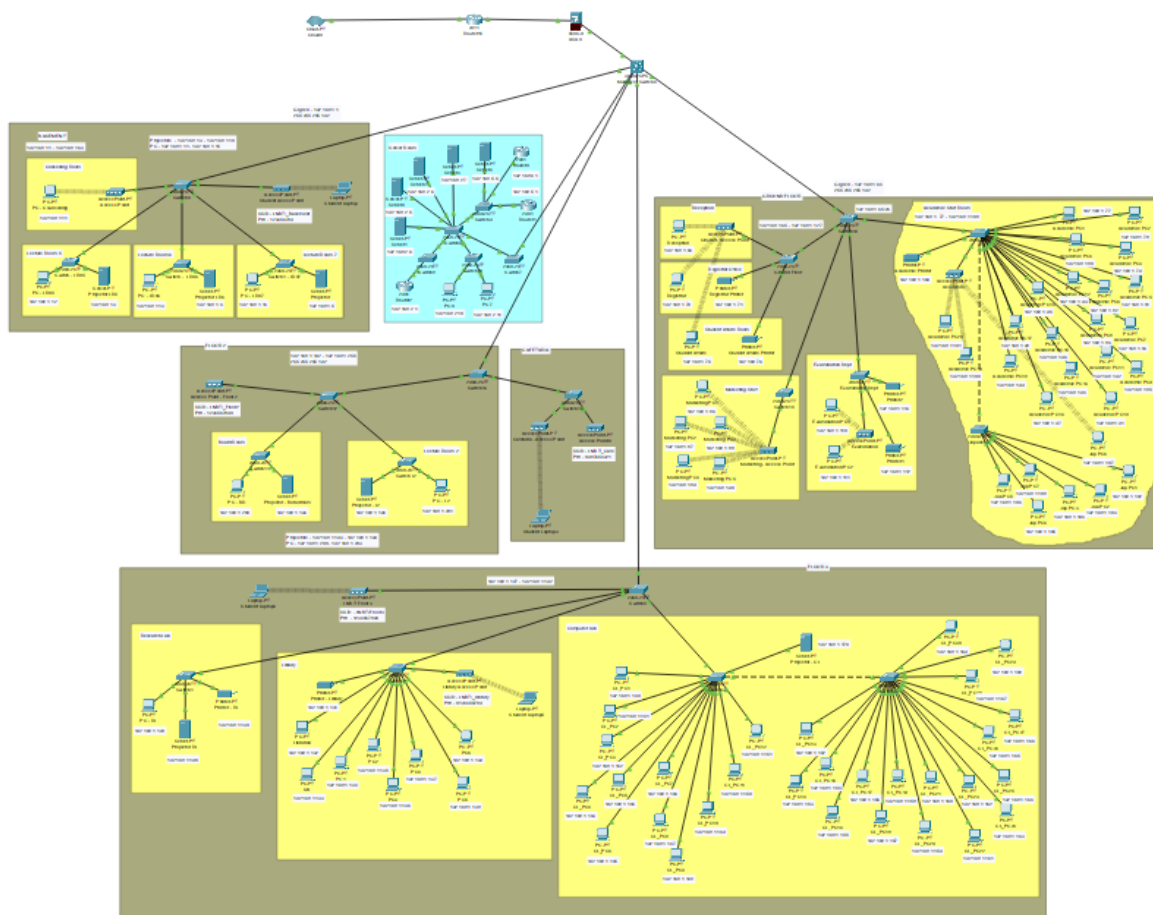
Question 02: Cost Estimation

Cost Estimation Table

Item	Quantity	Unit Cost (LKR)	Total Cost (LKR)
PCs	84	149,990	12 516 000
Projectors	7	60,000	420 000
Printer (Inject Printer)	1	75,000	75 000
	6	41,000	246 000
Routers	4	12 500	50 000
Network Switches (24-port)	25	38,000	950 000
Servers	5	177 000	885 000
Wi-Fi Access Points	11	9750	107 250
Cabling and Accessories	-	-	350 000
Multilayer Switch	1	50 000	50 000
Installation Charges	-	-	200 000
Training Sessions	-	-	100 000
Total Cost	-	-	15 949 250.00

Network Diagram





Whole diagram

IP Addressing and Subnetting

Network IP Range: 192.168.1.0/26

- The IP range 192.168.1.0/26 will provide 62 usable IP addresses per subnet, adequate for addressing devices in each segment of the university.

Floor	NIP	GIP	BIP	IP Range	Subnet Mask
Basement	192.168.1.0	192.168.1.1	192.168.1.63	192.168.1.0 - 192.168.1.63	255.255.255.192
Ground Floor	192.168.1.64	192.168.1.65	192.168.1.127	192.168.1.64 - 192.168.1.127	255.255.255.192
1st Floor	Cafeteria				
2nd Floor	192.168.1.192	192.168.1.193	192.168.1.255	192.168.1.192 - 192.168.1.255	255.255.255.192
3rd Floor	192.168.1.128	192.168.1.129	192.168.1.191	192.168.1.128 - 192.168.1.191	255.255.255.192
Server Room	192.168.2.0	192.168.2.0	192.168.2.31	192.168.2.0 - 192.168.2.31	255.255.255.224

Implementing New Network

Implementation Step:

- Install and set up every piece of network hardware.
- Configure network services and servers.
- Install backup plans and security precautions.
- To guarantee network performance and dependability, do extensive testing.

Security and Scalability

- At the perimeter, a firewall will be placed to filter both incoming and outgoing traffic. It should block all types of potential external threats or unauthorized access from outside the network.
- Firewall Best Practices:
 - Enable logging for all allowed/blocked traffic for auditing.
 - Update firewall rules periodically to meet evolving requirements.
 - Use Access Control Lists (ACLs) to define user-specific policies.

Staff Training

- Weekly training sessions for two months.
- Set clear and realistic deadlines and rollout methods.
- Use training incentives for employees to use new software.

Training Materials and Resources:

- Pick the right format for training.
- Documentation on network configuration and management.
- Access to online training courses.

Maintenance

- Hardware and software installation/ Configuration.
- Monitoring and improving network performance.
- Quarterly security audits.
- Troubleshooting Network problems.
- Ensuring compliance with company policies.
- Ensuring compliance with legal regulation.
- Securing the network against all kind of threats.
- Dedicated IT support helpline.
- Email support

Backup Plans

1. Data Backups:
 - Perform daily incremental backups and weekly full backups of all critical data.
 - Store backups in:
 - On-site storage (e.g., Network Attached Storage or Backup Servers).
 - Cloud backups for redundancy.
2. Configuration Backups:
 - Save copies of network device configurations (firewalls, routers, and switches) after any major change.
 - Automate configuration backups to a central repository.
3. Scalability Planning:
 - Hardware Scalability: Use modular switches and routers to add ports and capacity when needed.
 - Virtualization: Utilize virtual servers for easy expansion of server capabilities.
 - Cloud Solutions: Leverage cloud-based services for dynamic scalability of storage and computing power.
4. Disaster Recovery:
 - Set up a disaster recovery site (on-site or cloud) with synchronized backups.
 - Perform regular disaster recovery drills to ensure readiness.

The updated network design ensures robust connectivity, security, and scalability for the LNBTI Main Building. The proposed changes address existing gaps, enhance functionality, and future-proof the infrastructure.

References

Prices of required devices;

1. <https://abansit.lk/products?brands=hp>
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