

DCCN PROJECT

Scenario

You have to design and implement networking infrastructure for SZABIST Karachi campus. In Karachi there are multiple departments functioning in seven different buildings. Based on the following description, draw up a detailed diagram to illustrate the SZABIST's networking infrastructure. In the diagram, include the internal network with the connecting devices. Requirement for each building have been mentioned and should be implemented accordingly. Clearly label all the elements of the diagram.

100 Campus Building:

- There are seven labs in 100 building with following number of devices:
 - CS Lab have 58 PCs, 2 Printer and 1 ftp server.
 - Lab-3 have 38 PCs, 2 Printer and 1 ftp server.
 - Lab-4 have 35 PCs and 2 Printer.
 - Lab-5 have 35 PCs, 2 Printer and 1ftp server.
 - Lab-6 have 35 PCs only
 - Smart Lab have 40 PCs and 1 Printer.
 - Gaming Lab have 9 PCs and 2 Printer.
- There are 20 classrooms in 100-building, each class room has one PC.
- There are around 25 PCs and 4 printers belong to faculty.
- There are 5 PCs and three printers belong to Academic department.
- There are four PCs belong to ADMINISTRATION department.
- There are ten PCs and two printers belongs to IT department.

99 Campus Building:

- There are 18 classrooms in 99-building, each class room has one PC.
- There are around 32 PCs belong to faculty and 6 printers.
- There are six PCs and two printers belong to Academic department.
- There are four PCs and one printers belongs to IT department.
- There are 12 PCs and 4 printers belong to EXAMINATION department.
- There are two PCs belong to ADMINISTRATION department.
- There are four servers in data center, one for web server, one for ZABDESK, one for email and one for CMS.
- EDGE router is located at 99-Campus Building.

154 Campus Building:

- There are 8 classrooms in 154-building, each class room has one PC.
- There are around 18 PCs and two printers belong to faculty.
- There are one PC and one printers belong to Academic department.
- There are two PCs belong to ADMINISTRATION department.
- There are 15 PCs and one printer belongs to Mechatronics Labs.

153 Campus Building:

- There are 6 classrooms in 153-building, each class room has one PC.
- There are 8 PCs and three printers belong to Admission department.
- There are one PC and one printers belong to Academic department.

79 Campus Building:

- There are 8 PCs in Library of 79-building.
- There are seven PCs and two printers belong to HR department.
- There are four PCs and one printers belongs to Procurement department.
- There are seven PCs and two printer belongs to ADMINISTRATION department.
- There are five PCs and two printers belongs to Finance department.
- There are three PCs and one printers belongs to EDC department.

Media villa and Research villa:

- There are 3 classrooms and each class room has one PC.
- There are 8 PCs and three printers belong to Faculty.
- There are one PC and one printers belong to Academic department.

General Guidelines

- Use VLSM to subnet IP pools (please take care minimum wastage of IPs)
- Use IP pool xx.xx.xx.xx/24. Replace xx with your roll number. you have four IP pools as project group have four members. If you need more IPs then use private IP pools. e.g. 192.168.1.0/24.
- Make VLANs for better network management or **where necessary**.
- Implement Inter-VLAN routing **where necessary**.
- Assign IP addresses to each PCs should be through DHCP in SZABIST Karachi Campus.
- If you have designed switched network, Configure DHCP server on your EDGE router, otherwise you have to configure DHCP server on 154-Campus's router.
- Statically assign IP addresses to the SERVER and the printers in SZABIST Karachi.
- Port security must be enable for each Servers and for the LAB devices in SZABIST Karachi campus. Use any type of port security.

- NAT should be enable on your edge router to connect SZABIST's network with the internet. Use 11.11.11.0/30 as public IP pool between EDGE and ISP routers.
- No other department can access Faculty's Printers (Implement it using ACL).
- Only Faculty and Labs PCs can access ZABDESK (Implement it using ACL).
- If you need to implement dynamic routing, use single area OSPF for routing.
- Every PC, Server and Printer in all branches should be reachable to each other, Except any restriction mentioned above
- Remote management of Routers through any device.
- Switches must be accessible remotely from anywhere in SZABIST
- Switches and routers must be password protected (console, Telnet and privileged mode)
- Topology properly labeled. Necessary information like Subnets, Vlans, Network IP, port numbers, device IP and devices name (hostname) must be properly visible and configured.

Note:

- **If network topology is getting huge and facing difficulty, you can reduce the number of devices by 70 percent but subnet the IP pool according to the actual requirement.**

- Project submission will be done through google class room.
- Project submission deadline 21st May 2023.
- Please note no further extension will be granted.
- Project viva will be conducted on 22nd May 2023 to 23rd May 2023