FAST NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCE

COMPUTER NETWORKS PROJECT

UNIVERSITY NETWORK ARCHITECTURE

Group Members:

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1 Introduction

This report presents a rough sketch of the computer networks project. The project focuses on designing network infrastructures for the University campuses, along with a cloud network to support essential services.

2 Highway Campus Network

2.1 Network Infrastructure

- To ensure smooth operation and effective management of the network, a Core Switch serves as the backbone, facilitating inter-VLAN routing and connecting to routers for external connectivity.
- Access Switches are strategically placed to link end devices within each building or area, promoting seamless communication.

2.2 Network Logic

In this network architecture, VLANs are utilized to delineate specific areas or buildings on the Highway campus. This segmentation allows for efficient traffic management and ensures that resources are allocated appropriately. Inter-VLAN routing enables communication between various departments and facilities while maintaining the necessary level of network security. Additionally, a DHCP server dynamically assigns IP addresses to devices within each VLAN, streamlining network administration and ensuring optimal resource allocation.

3 Main Campus Network (Secondary Campus)

3.1 Network Infrastructure

- Similar to the Highway campus, the Main Campus Network is equipped with a Core Switch responsible for inter-VLAN routing and connecting to routers for external connectivity.
- Access Switches are deployed to facilitate communication among end devices within each department and lab.

3.2 Network Logic

VLAN segmentation is implemented to isolate departments and labs, thereby enhancing network management and security. Inter-VLAN routing enables communication between different departments and labs while maintaining isolation where necessary. Additionally, a DHCP server ensures dynamic IP address allocation for devices within each VLAN, simplifying network administration and resource allocation.

4 Cloud Network

4.1 Network Infrastructure

- An External Router connects the campus network to the internet and cloud services, facilitating access to external resources and services.

4.2 Network Logic

The External Router establishes connectivity between the campus networks and external cloud-based services, enabling seamless access to essential resources.

5 Tools Used

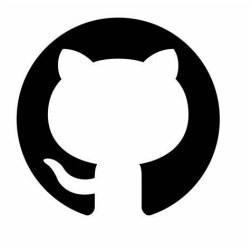
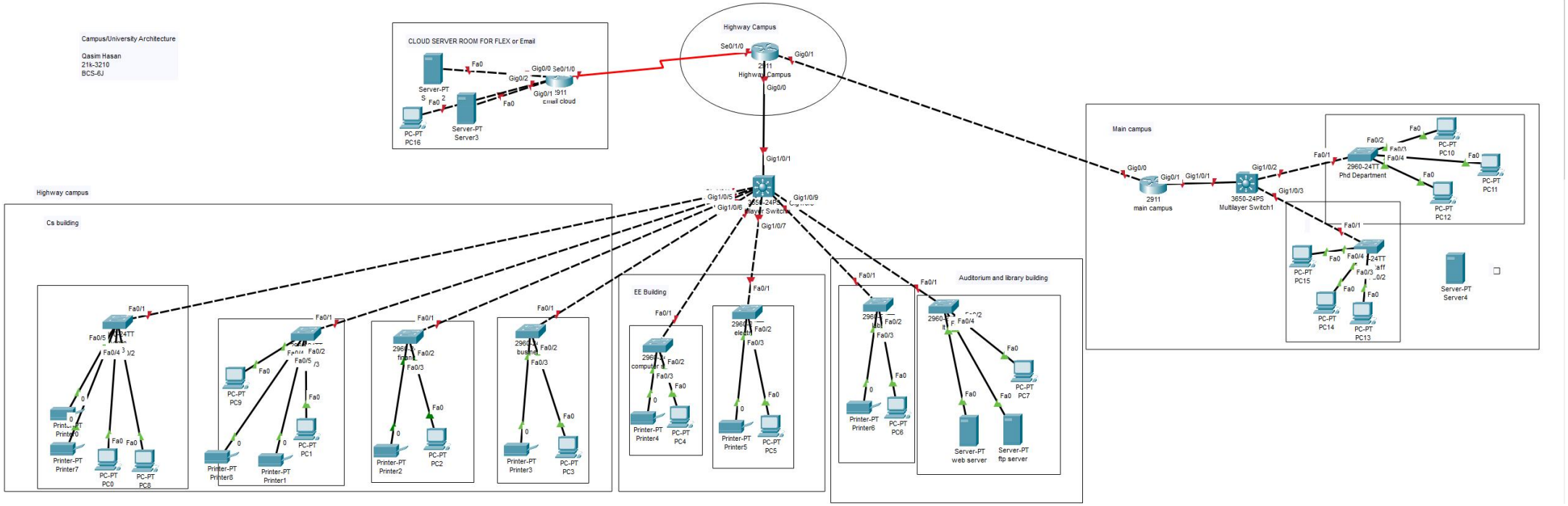


Figure 1: GitHub - Version control and collaboration platform

Figure 2: Cisco Packet Tracer - Network simulation and visualization tool

6 Conclusion

In conclusion, this report has outlined the preliminary design of computer networks for the Fast National University's campuses and cloud services. Further refinement and detailed planning are required to implement the proposed network infrastructures effectively.


Campus/University Architecture
Qasim Hasan
21k-3210
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CLOUD SERVER ROOM FOR FLEX or Email
Server-PT
Server3
PC-PT
PC16
Highway Campus
2911
Highway Campus
Main campus
2911
main campus
3650-24PS
Multilayer Switch1
2960-24TT
Phd Department
PC-PT
PC10
PC-PT
PC11
PC-PT
PC12
PC-PT
PC15
PC-PT
PC14
PC-PT
PC13
Server-PT
Server4
Highway campus
Cs building
PC-PT
PC9
PC-PT
PC1
PC-PT
PC0
PC-PT
PC8
Printer-PT
Printer7
Printer-PT
Printer8
Printer-PT
Printer1
Printer-PT
Printer2
PC-PT
PC2
Printer-PT
Printer3
PC-PT
PC3
EE Building
Printer-PT
Printer4
PC-PT
PC4
Printer-PT
Printer5
PC-PT
PC5
Auditorium and library building
Printer-PT
Printer6
PC-PT
PC6
Server-PT
web server
Server-PT
ftp server
PC-PT
PC7