Description:

This project aims to **Build**, implement and **construct** a structured network communication system among the 4 main campuses of Bahria University:

1. Bahria University Islamabad (E-8 Campus)
2. Bahria University Islamabad (H-11 Campus)
3. Bahria University Lahore Campus
4. Bahria University Karachi Campus

Each campus has **7** designated laboratories, **each equipped with 14 PCs**:

i. Communication Lab
ii. Computing Lab
iii. Electrical Machines Lab
iv. Electronics Lab
v. FYP Hardware Lab
vi. Embedded Systems Lab
vii. Control Systems Lab

The objective is to allow only inter-campus communication between the **same type of labs** while restricting access to other labs. Additionally, a **Rector's Computer** will have administrative access to communicate with all labs across all campuses.

Project Objective:

1. Design a structured and secure **network topology** connecting multiple campuses.
2. Implement **VLANs** to segment and restrict communication between different labs.
3. Configure **Access Control Lists (ACLs)** to enforce secure access policies.
4. Utilize **OSPF / RIP routing**.
5. Establish a **centralized Rector's Computer** for administrative communication across all campuses.
6. Develop **campus-specific HTML websites** with restricted access.
7. Simulate and test the network to verify proper segmentation, routing, and security implementations.
8. Apply troubleshooting skills to resolve networking issues related to ACLs, VLANs, and routing protocols.

Outcomes:

- A fully functional network design demonstrating secure inter-campus communication.
- Proper ACL rules preventing unauthorized communication.
- Optimized routing and lab segmentation using VLANs and OSPF.
- A structured web system where each campus can only access its designated website.

The activity is mapped to the following CLO's and your performance in this project will play an important role in their attainment.

CLO	LEVEL	PLO	Outcome
I	P3	PLO2	Build detailed configurations of a Router and a Switch.
II	P4	PLO2	Simulate and build different routing protocols like RIP, EIGRP, OSPF, NAT, ACL etc.
III	A2	PLO10	Present and interpret the concepts of computer communication and networks through oral and written communication.

Deliverables:

Please follow the following dates and instructions for deliverables.

1. Proposal to be submitted in the 10th week of the semester. The project proposal should include Table of contents, Objective, Background, Project description, Components Description and Circuit Diagrams.
2. Simulation design and results to be evaluated in the 12th week of the semester.
3. Software implementation and results to be evaluated in the 14th week of the semester.
4. The project report should include Objectives, Background, Abstract, Components Description, Network Diagram, Working, Simulation Results and Conclusion. **(_on LaTeX_)**
5. A Brief **Presentation** will be taken by the instructor on the Evaluation Day of the Project.
6. All students are advised to follow the dates given in the Deliverables and told by the instructor both verbally and in writing.

Instructions for Proposal:

1. Ensure all deadlines are met.
2. Prepare the document in Microsoft Word.
3. Set the paper size to A4 in the Layout section.
4. Use **"Arial"** as the font style, with a font size of **"12"**. Align the entire document in the **"Justify"** format.
5. Format all headings to be bold and underlined.
6. The first page should be an introductory page, listing your names, enrollment numbers, teacher's name, subject, and any other relevant details.
7. Submit both the proposal and the final report in hard and soft form.
8. A group should consist of only two members.
9. Ensure the report does not exceed 10% similarity in plagiarism and AI content.