1. A logo of a globe with a graduation cap

   AI-generated content may be incorrect.**Project Planning & Management**
   * **Project Proposal**

**Overview:** This project aims to design and configure a network infrastructure using Cisco devices. The goal is to implement internal and external networks using Cisco routers and switches. The project involves configuring 10 routers, 2 switches, and integrating multiple routing protocols (OSPF, EIGRP, BGP) for inter-router communication. The primary objective is to set up a network that uses multiple routing protocols and secure configurations.

**Objectives:**

* Design a network using Cisco routers and switches (10 routers, 2 switches).
* Configure and implement OSPF, EIGRP, and BGP to establish communication between routers.
* Implement secure network practices such as password encryption and configuration security.
* Ensure communication between routers using different protocols via BGP.

**Scope:**

* Installation and configuration of network devices using Cisco Packet Tracer or GNS3.
* Configuration of routers with OSPF and EIGRP protocols.
* Integration of BGP for inter-protocol communication.
* Final report and presentation to demonstrate the project's outcome.
* **Project Plan**

**Timeline:**

A diagram of a network

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**Resource Allocation**:

* **Tools**: GNS3.
* **Hardware/Software Requirements**: 10 Cisco routers, 2 switches, and a computer with the ability to run simulation tools.
* **Task Assignment & Roles**

1. **Saif ElDeen Samir (Network Architect)**
   * **Week 1**: Design the network topology, ensure the installation of internal and external networks (10 routers, 2 switches).
   * **Week 4**: Design and oversee the configuration of BGP for inter-protocol communication.
   * **Collaborates**: Works with other members to ensure the network design flows smoothly.
   * **Deliverables**: Network design document, BGP configuration overview.
2. **Ibrahim Zayed (Router Configuration Specialist)**
   * **Week 2**: Configure OSPF on the first 5 routers (3 areas: stubby, totally stubby, backbone).
   * **Week 3**: Configure EIGRP on the remaining 5 routers.
   * **Deliverables**: OSPF configuration, EIGRP configuration, router configuration scripts.
3. **Abdelrahman Sobhy (Security & Configuration Lead)**
   * **Week 2** and **Week 3**: Configure secure settings such as password encryption, enabling VTY access passwords, and ensuring secure communication between routers.
   * **Collaborates**: Works with all members to ensure security is integrated into configurations.
   * **Deliverables**: Configurations for enabling secret and VTY passwords, password encryption, secure access policies.
4. **Hanna Mostafa (Protocol Integration Specialist)**
   * **Week 4**: Configure BGP and ensure inter-protocol communication (OSPF/EIGRP) using ISP.
   * **Collaborates**: Works with the Network Architect to ensure BGP is properly configured and integrated with existing protocols.
   * **Deliverables**: BGP configuration, troubleshooting report, integration plan for OSPF/EIGRP communication via BGP.
5. **Salma Amin (Testing & Documentation Lead)**
   * **Throughout the Project**: Perform testing and validation on each configuration (OSPF, EIGRP, BGP).
   * **Final Week**: Work on the final **project report** and **presentation**. Document each stage of the project, including designs, configurations, and testing results.
   * **Collaborates**: Works with all members to test configurations and ensure the network is functioning correctly.
   * **Deliverables**: Testing reports, final project report, presentation slides.

* **Risk Assessment & Mitigation Plan**

| **Risk** | **Mitigation** |
| --- | --- |
| Configuration errors leading to downtime | Frequent testing and validation after each configuration. |
| Incompatibility between protocols (OSPF, EIGRP) | Use a detailed configuration guide to ensure compatibility. |
| Network misconfigurations in ISP section | Run simulations first, document every configuration change. |
| Time overruns in configuration setup | Keep buffer times in the schedule for troubleshooting. |

* **KPIs**
* **Response Time**: Time for each router to respond to a ping request.
* **System Uptime**: Percentage of time the network operates without failure.
* **User Adoption Rate**: Number of successful configurations implemented by each team member.

**2. Literature Review**

* **Feedback & Evaluation – Lecturer’s Assessment of the Project**

Seek feedback throughout the project phases, especially after configuring each protocol (OSPF, EIGRP, BGP). This feedback will guide adjustments to the configuration or design as needed.

* **Suggested Improvements – Areas Where the Project Can Be Enhanced**
* Explore more advanced network security configurations (e.g., ACLs or VPNs).
* Implement Quality of Service (QoS) policies for traffic management.
* Utilize more complex routing protocols (e.g., OSPF with Route Summarization or EIGRP with route redistribution).
* **Final Grading Criteria**
* **Documentation (40%)**: Detailed configuration, design, and testing report.
* **Implementation (30%)**: Successful configuration of OSPF, EIGRP, and BGP.
* **Testing (20%)**: Proper testing and verification of network connectivity.
* **Presentation (10%)**: Clear and concise final presentation.

**3. Requirements Gathering**

* **Stakeholder Analysis – Identifying Key Stakeholders and Their Needs**
* **Internal Team**: Needs to collaborate on configurations and testing.
* **Lecturer**: Requires progress reports, final report, and clear presentation.
* **End Users**: Require secure and reliable network communication between protocols.
* **User Stories & Use Cases – Scenarios Illustrating How Users Interact with the System**
* **User Story 1**: As a network administrator, I need to configure OSPF on routers to ensure efficient routing.
* **User Story 2**: As a network engineer, I need to integrate BGP between two different routing protocols to ensure inter-network communication.
* **Functional Requirements**
* OSPF configuration for 3 areas (stubby, totally stubby, and backbone).
* EIGRP configuration with Autonomous System 1.
* BGP configuration to allow communication between OSPF and EIGRP.
* Secure configuration practices (password encryption, VTY, and enable secret).
* **Non-functional Requirements**
* **Performance**: Ensure routing protocols handle high volumes of traffic.
* **Security**: Encrypt passwords and secure VTY access.
* **Reliability**: Ensure routers and switches remain operational 99.9% of the time.

**4. System Analysis & Design**

* **Problem Statement & Objectives**

The problem being solved is how to configure multiple routing protocols across a network with different requirements (OSPF, EIGRP, and BGP). The goal is to enable secure, reliable, and efficient communication between devices.

* **Use Case Diagram & Descriptions**

Create use cases for configuring and managing each protocol (OSPF, EIGRP, BGP) and interactions between routers and switches.

* **Software Architecture**

Use **Hybrid Architecture** (Combining OSPF, EIGRP, and BGP), where routers connect with different routing protocols using BGP for inter-protocol communication.

* **Deployment System & Integration**

**Technology Stack**

* **Router Configuration**: Cisco devices (configured with OSPF, EIGRP, BGP).
* **Tools**: Cisco Packet Tracer, GNS3.
* **Security**: Password encryption, access control lists (ACLs), and secure management.

**Deployment Diagram**

Show how routers are distributed across different subnets and where BGP acts as an intermediary for protocol communication.

* **Additional Deliverables**

**Testing & Validation**

* **Unit Tests**: Check individual configurations for OSPF, EIGRP, BGP.
* **Integration Tests**: Ensure all routers communicate effectively between the two protocols.
* **User Acceptance Testing**: Test end-to-end communication after protocol configuration.

**Deployment Strategy**

The network will be deployed using Cisco Packet Tracer or GNS3 for simulation, with potential future deployment on actual hardware.