Cisco Network Administrator Project

OSPF and EIGRP

**Project Overview**

This project focuses on the creation of two distinct networks using Open Shortest Path First (OSPF) and Enhanced Interior Gateway Routing Protocol (EIGRP). OSPF, a link-state protocol, and EIGRP, a distance-vector protocol, have unique characteristics that make them suitable for different network scenarios. The objective of this project is to design and implement these networks while enabling effective communication between them through route redistribution. Route redistribution allows the exchange of routing information between OSPF and EIGRP, ensuring seamless data flow across both environments.

The project explores key practical challenges, including managing routing loops, applying route filtering, and ensuring optimal path selection. By focusing on the configuration, verification, troubleshooting, and final documentation of OSPF and EIGRP, the project highlights the considerations of running multiple routing protocols within an enterprise network.

**Team members**

* Noura Hamdy
* Esraa Sayed
* Menna Allah Hany
* Mohamed Salah
* Mohamed Hamdy
* Omar Ahmed

**Weeks Plan**

**Week 1: OSPF Configuration**

**Task: Configure OSPF with router IDs and area configurations. Verify using commands like show ip ospf, show ip route, etc.**

**Key Steps:**

* Assign router IDs (manually if needed).
* Define OSPF areas (backbone area, other areas).
* Configure OSPF on interfaces and set network types.
* Verify adjacency formation and proper route propagation.
* Use commands like show ip ospf neighbor for verification.
* Deliverable: OSPF configuration files, a verification report detailing key outputs from the OSPF setup.

**Week 2: EIGRP Configuration**

**Task: Configure EIGRP, focusing on metrics (bandwidth, delay, etc.) and ensuring the routes propagate.**

**Key Steps:**

* Enable EIGRP on routers and configure Autonomous System (AS) numbers.
* Set up EIGRP interfaces and configure metrics (use bandwidth, delay commands).
* Use show ip eigrp neighbors and show ip eigrp topology to verify EIGRP performance.
* Make sure to account for route summarization and metric calculation.
* Deliverable: EIGRP configuration files and verification report.

**Week 3: Troubleshooting Routing Protocols**

**Task: Diagnose and fix issues between OSPF and EIGRP using show and debug commands.**

**Common Troubleshooting Steps:**

* Identify any routing loops, split horizon, or metric misconfigurations.
* Ensure proper route redistribution is set up with route filtering to avoid loops.
* Debug OSPF/EIGRP adjacencies if routers are not communicating properly.
* Use ACLs, prefix lists, or route-maps for fine-tuning route filtering.
* Deliverable: A report detailing any issues encountered and their resolution, along with updated configuration files.

**Week 4: Documentation and Presentation**

**Task: Compile everything into a final report and prepare a presentation.**

**Key Contents:**

* Network diagrams showing the OSPF and EIGRP topologies.
* Configuration files from both protocols, annotated with comments.
* A summary of troubleshooting steps and the outcomes.
* The route redistribution process between OSPF and EIGRP and how issues like routing loops were addressed.
* Deliverable: Final report and a presentation summarizing the network setup and lessons learned.

**Members Task**

* **Network Design and Planning (Mohamed Salah)**
* **OSPF Configuration (Mohamed Hamdy)**
* **OSPF Virtual link (Omar Ahmed)**
* **EIGRP Configuration (Menna Allah Hany)**
* **Route Redistribution Configuration (Esraa Sayed)**
* **Troubleshooting Specialist (Noura Hamdy)**

**Project Visual View**

