**DEPI Graduation Project**

**Advanced OSPF-Based Multi-Site Enterprise Network**

**Project Timeline**

**\*Week 1: Project Planning and Research\***

- Review project requirements and objectives.

- Conduct research on relevant technologies and configurations.

- Develop a project plan, including key milestones and deadlines.

\***Week 2: Network Design\***

- Create detailed network diagrams, including logical and physical topologies.

- Design security features such as ACLs, 802.1X.

**\*Week 3: Implementation\***

- Begin configuring devices in Packet Tracer according to the network design.

- Implement routing protocols and verify network connectivity.

- Configure Layer 2 features, including VLANs and EtherChannel.

- Apply security settings, including ACLs, DHCP Snooping, and port security.

- Test the network configuration at each step to ensure it meets project requirements.

**\*Week 4: Testing, Troubleshooting, and Documentation\***

- Troubleshoot any issues that arise, ensuring the network operates as intended.

- Finalize project documentation, including network diagrams, configuration details, and test results.

- Prepare and submit the final project report, along with a demonstration or presentation as required.

**#### Network Overview**

The enterprise network consists of five sites: Headquarters (HQ), Branch A, Branch B, and a Remote Office. The network will be interconnected using OSPF with multiple areas, leveraging advanced OSPF features like summarization. Additional configurations include VLANs, inter-VLAN routing, EtherChannel, ACLs, NAT.

**#### Network Topology**

**1. \*Headquarters (HQ):**

- \*Devices: 2 Routers, 3 Layer 3 Switches

- \*VLANs:

- VLAN 10 (Management)

- VLAN 20 (Sales)

- VLAN 30 (IT)

- VLAN 40 (Finance)

- VLAN 50 (Guest)

- Inter-VLAN Routing: Using Layer 3 Switches

- EtherChannel: Configured between Layer 3 Switches and routers for redundancy

- OSPF (area0) Features: Route summarization, passive interfaces and changing reference Bandwidth.

**2. Branch A:**

- Devices: 1 Router, 2 Layer 2 Switches

-One network With Dynamic ARP Inspection configuration.

- NAT: PAT for internet access

**3. Branch B:**

- Devices: 1 Router, 1 Layer 2 Switch

- VLANs:

- VLAN 120 (Engineering)

- VLAN 130 (HR)

- Inter-VLAN Routing: Router-on-a-Stick

- NAT: Static NAT for specific hosts needing external access

**4. Remote Office:**

- Devices: 1 Router, 1 Layer 2 Switch

- OSPF Area: Area 2

- AAA for secure device management.

- VLANs:

- VLAN 140 (Remote Users)

- VLAN 150 (Remote IT)

- port security is required (use variety of port security options)

**#### IP Addressing Plan**

- Headquarters:

- VLAN 10: 172.16.10.0/24

- VLAN 20: 172.16.20.0/24

- VLAN 30: 172.16.30.0/24

- VLAN 40: 172.16.40.0/24

- VLAN 50: 172.16.50.0/24

- \*Branch A:

-192.168.100.0/24

-192.168.110.0/24

- \*Branch B:

- VLAN 120: 192.168.120.0/24

- VLAN 130: 192.168.130.0/24

- \*Remote Office:

- VLAN 140: 192.168.140.0/24

- VLAN 150: 192.168.150.0/24

- \*OSPF Areas:

- HQ: Area 0 (Backbone)

- Branch A: Area 1

- Branch B: Area 1

- Remote Office: Area 2

**\*Note to Students:**

**Please assume any missing data as needed to complete the project. The IP address ranges provided in this document are examples and can be adjusted as per your design requirements.**

**Testing and Verification:**

* Verify successful communication through OSPF routing.
* Test internet connectivity for all devices with internet access configured.
* Verify limited access based on security configurations.

**Documentation:**

* Create a network diagram in Packet Tracer that accurately reflects your designed topology.
* Document the IP addressing scheme used for each network segment.
* Describe the VLAN configuration and any implemented security measures.

**Project Submission:**

Submit your Packet Tracer project file along with your network diagram and documentation to your instructor for evaluation.