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Computer Networks Mini-Project Work

Proposal - Network Design

Design and Realize a Company/ISP/University Network

Design and realize a computer network for a **university** or a **company** or an **organization** or an **ISP** with minimum following requirements.

- **IP address block**: At least /22 address block or even larger.
- **Networks**: Minimum 9 networks having different sizes at least six different sizes (without counting the point to point connections between routers). From given networks there should be at least 3 VLANS extended via at least three switches.
- **Routers**: At least 9 with three routers without LAN connectivity.
- **Routing**: Use OSPF for your internal routing. Forward all Internet traffic towards your upstream service provider. Similarly forward network packets to your network from ISP without dynamic routing. There should be at least three areas including backbone area for OSPF configuration. Always prefer the good practices.
- **Servers**:
  - At least two or more DNS servers for caching and own web resolution in different LANs. At least 2 Web servers on different subnets.
  - There should be an additional level of DNS server(s) to resolve web addresses into IP. This DNS server should be in your upstream service provider's network.
  - Each LAN can be equipped with a DHCP server for IP assignments, Default gateway & DNS server information.
- The network topology should have multiple paths at least in two networks.

Note: You can also propose to realize a real network of any organization in Packet-tracer, such as Pulchowk Campus, or any other organization/company.

Prepare a proposal with the following and submit it within the specified deadline.

1. Network topology showing followings:
   - Routers, switches, PCs & Servers
   - Link with your service provider
   - Network ID of each network (LAN as well as Point-to-point links)
   - Location of web and DNS servers with description
   - Location of DHCP server (if any)

2. Description containing followings:
   - Pool of IP addresses
   - Number of subnets with their sizes - a table showing IP address ranges and network ID of each subnet
   - IP address of each server
   - Any additional specifications as per requirements

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July 2024