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Task 10

Project documentation

Project Documentation

Project Overview

The project involves the creation and management of a segmented network for an organization consisting of multiple buildings (A, B, C) and sub-campuses. The network is designed using Virtual Local Area Networks (VLANs) for improved security, management, and traffic optimization.

Server Design

The network is structured into multiple VLANs, each serving specific departments or areas. These VLANs are connected through switches and routers, with communication routed appropriately between the main and branch campuses.

Components

1. **Email Server**: Located at the main campus and configured at IP `20.0.0.2/30`.
2. **Branch Campus Network**: Connected via a router to the main campus.
3. **Main Campus Router**: Routes traffic between VLANs and subnets.
4. **Departments**: Divided into VLANs for separate administrative, technical, and operational areas.

VLAN Configuration

Each VLAN is assigned a unique IP subnet for logical segmentation:

VLAN ID	Name	Subnet	Building	Devices
10	Admin	192.168.1.0/24	Building A	PCs, Printers
20	HR	192.168.2.0/24	Building A	PCs, Printers
30	Finance	192.168.3.0/24	Building A	PCs, Printers
40	Business	192.168.4.0/24	Building B	PCs, Printers

50	E&C	192.168.5.0/24	Building B	PCs, Printers
60	A&B	192.168.6.0/24	Building B	PCs, Printers
70	Student Lab	192.168.7.0/24	Building C	PCs
80	IT Department	192.168.8.0/24	Building C	Web and FTP Servers

Inter-VLAN Routing

To facilitate communication between VLANs, a Layer 3 switch is configured to perform inter-VLAN routing:

- **Switch Interfaces**: Configured with sub-interfaces for each VLAN.
- **Router Interfaces**: Static routing or dynamic routing protocols (such as OSPF) can be configured as needed for campus communication.

Connection to Branch Campus

- The branch campus network is connected to the main campus via a router.
- **WAN Subnet**: 10.10.10.0/30.
- **Routing**: Static or dynamic routing ensures connectivity between main and branch campuses.

Server Configurations

1. **Email Server**: Provides email services to all VLANs.
2. **Web Server**: Hosts internal websites and services.
3. **FTP Server**: Facilitates file transfers between departments.

Future Enhancements

- Integration with a Network Management System (NMS) for real-time monitoring.
- Implementation of redundant links for failover and high availability.
- Deployment of advanced security measures, such as firewalls and intrusion detection systems.

If you require step-by-step CLI configuration commands, a more detailed implementation guide can be provided. Let me know!