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Task 10

Project documentation

**Network 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.

**Network 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.

**Core 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.

**Access Control**

* **VLAN Membership**: Assigned based on department.
* **Port Security**: Configured on switches to prevent unauthorized devices.
* **Access Lists**: Implemented on the router for network traffic filtering.

**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!