Network Project Documentation

Project Title:

Enterprise Network Design and Implementation Using Huawei Datacom Technologies

1) Project Overview

Description:

This project aims to redesign and implement a secure, segmented, and scalable network infrastructure for a Real Estate company. The new design includes restructuring existing VLANs, improving traffic isolation, and supporting different business departments such as Sales, IT, Management, Branches, and the Data Center.

Objective:

- Improve network performance and security
- Apply proper VLAN segmentation
- Support new company structure after transitioning from banking to real estate
- Establish a scalable network for future expansion (branches, new departments)

Scope:

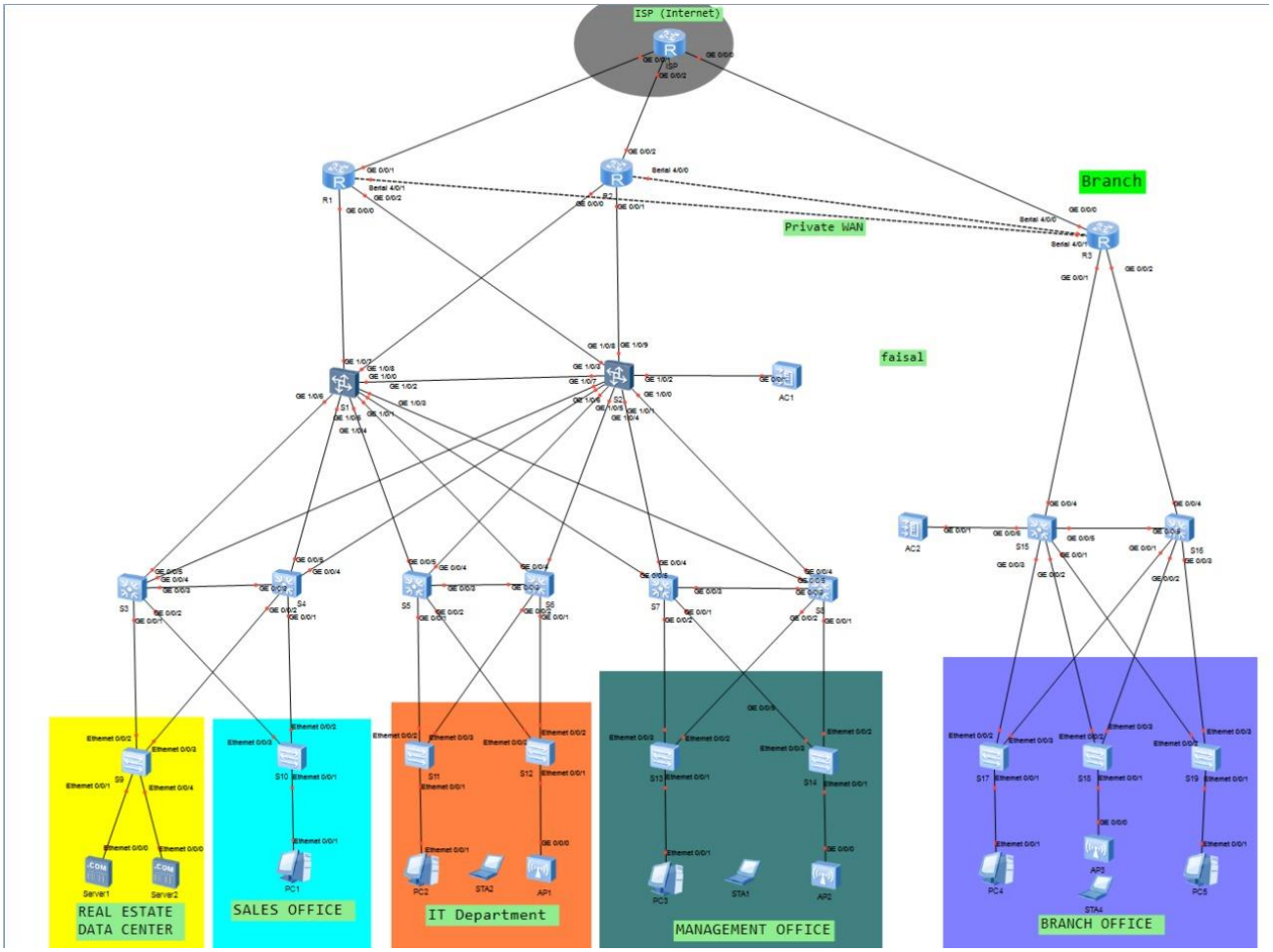
In-Scope:

- VLAN redesign
- IP addressing plan
- switch and router configuration
- Inter-VLAN routing
- DHCP planning
- Network testing

Out-of-Scope:

- Wireless network design
- WAN/MPLS provider configuration
- Server installation/maintenance

2) Network Planning & Design



3)Network Requirements

- centralized Data Center) requires a redesigned network to meet the new organizational structure and ensure smooth operations. The network requirements are as follows:
- Support the operational needs of all departments, including Sales, Management, Branch Office, and the Real Estate Data Center.
- Use a simple and scalable network topology to simplify operation and maintenance (O&M).
- Provide wired access for employees inside departments and optional wireless access for guests or branch users.

- Ensure clear traffic separation between departments through VLAN segmentation (VLAN 10, 20, 30, 100, 120).
- Implement basic network traffic management to ensure stable connectivity and prevent broadcast issues.
- Ensure network security by applying ACLs, enabling SSH, and restricting access to the Real Estate Data Center VLAN.

Functional Requirements

- Each department must operate in a separate VLAN
- Inter-VLAN communication must be controlled by ACL
- Centralized Data Center VLAN for servers
- IP addressing must support growth

Software Requirements

- Switch OS/IOS
- Network monitoring tool (optional)

Security Requirements

- Port security on access switches
- ACL between departments
- Restrict access to Data Center VLAN

4)VLAN Design

Based on the Real Estate company structure, the network is divided into multiple VLANs to separate traffic, improve security, and optimize performance

VLAN ID	Department
100	Real Estate Data Center
10	Sales Office
20	IT Department
30	Management Office
120	Branch Office

VLAN Design Notes

- VLAN 100 – Real Estate Data Center
  Dedicated for servers, storage, and core systems.
- VLAN 10 – Sales Office
  Used by employees in the sales department.
- VLAN 20 – IT Department
  Administrative VLAN for IT staff and network management.
- VLAN 30 – Management Office
  For executives and management-level staff.
- VLAN 120 – Branch Office
  Used for the remote or external branch office.

5) IP Address Planning

Main site

Core/Gateway: Redundant Core Switches S1 and S2 using VLANIF

DHCP Server: AC1 (in Data Center).

Area / Department	VLAN ID	Subnet Address	Default Gateway IPs (VLANIF)	Devices in this VLAN
Data Center	100	10.50.100.0/24	Virtual IP: 10.50.100.1	Access Switch: S9 Servers: Server1, Server2
Sales department	10	10.50.10.0/24	Virtual IP: 10.50.10.1	Access Switch: S10 PC: PC1
IT department	20	10.50.20.0/24	Virtual IP: 10.50.20.1	Access Switches: S11, S12 PC: PC2 &
management department	30	10.50.30.0/24	Virtual IP: 10.50.30.1	Access Switches: S13, S14 PC: PC3 &

Branch site:

Area / Department	VLAN ID	Subnet Address	Default Gateway IPs (VLANIF)	Devices in this VLAN
Marketing department	120	10.50.132.0/24	Virtual IP: 10.50.132.1	Access Switches: S17, S18, S19 PCs: PC4, PC

Address Assignment Rules

- Core switch gateway uses .1
- Fixed IPs for servers/printers
- DHCP for end users
- Static IPs for networking devices

6)Routing Design

- Inter-VLAN routing implemented on the Core switch
- Static routes used due to small network size
- Default route points to ISP router
- ACLs applied to control sensitive traffic

7)Deployment & Implementation

- Install and cable all devices
- Configure VLANs and IP addressing
- Apply access & trunk ports
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- Configure inter-VLAN routing
- Test connectivity
- Apply DHCP and management IPs

8) Testing & Verification Connectivity

- Ping default gateway for each VLAN
- Verify inter-VLAN routing
- Verify restricted access to Data Center VLAN

9) Network O&M Plan

- Regular backup of device configs
- Log monitoring

- Environmental checks
- Firmware upgrades

10)Future Optimization

- Add wireless infrastructure
- Add redundancy (HSRP/VRRP)
- Implement centralized management system
- Enhance QoS for VoIP/Vide