-Project Title: Enterprise Network Design and Implementation Using Huawei Datacom Technologies.

-Course: Huawei Network Administrator.

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Executive Summary:

-This project focuses on designing and implementing a secure and scalable enterprise network. The design includes VLAN segmentation, inter-VLAN routing, DHCP services, and basic security measures. The topology was built and tested using (Ensp) and full connectivity was achieved between all departments.

Introduction:

-The goal of this project is to design a network for a “Real state Data center” with multiple departments (Sales Office, IT Department, Management Office and Branch Office). The network must support secure communication, VLAN segmentation, Ip Addressing and ospf for basic Connectivity.

Requirements:

-Functional Requirements:

* VLANs

*STP

*Inter-VLAN Routing

*PPP and PPPoE

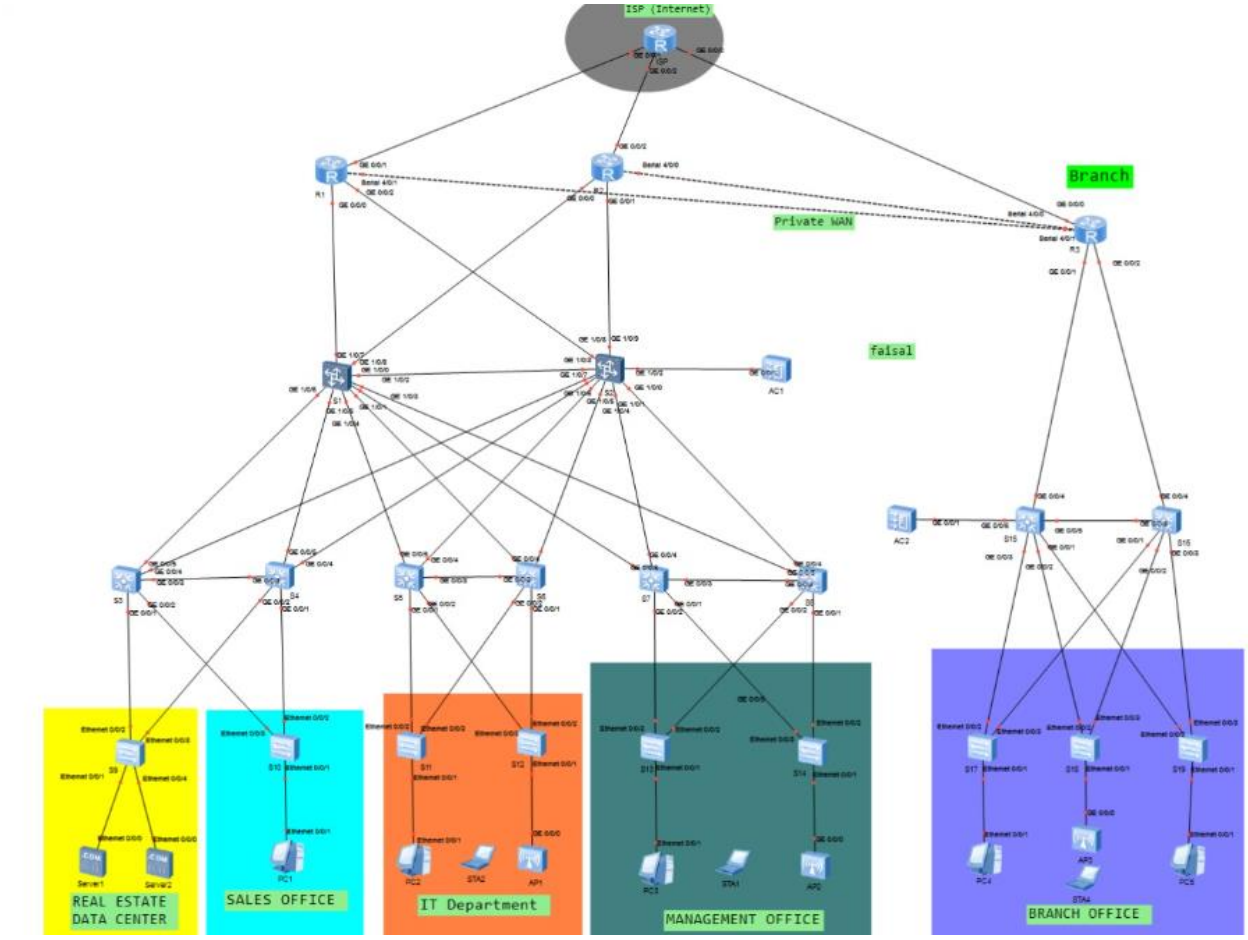
*NAT

*AAA

*Ip Addressing

*DHCP and DNS

-Network Topology:



-Scheme:

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

DHCP Server: AC1 (in Data Center)

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

Branch Site:

Core/Gateway: Redundant Core Switches S15 and S16 using VLANIF

DHCP Server: AC2

Area / Department	VLAN ID	Subnet Address	Default Gateway IPs (VLANIF)	Devices in this VLAN

Marketing department (Purple)	120	10.50.132.0/24	Virtual IP: 10.50.132.1	Access Switches: S17, S18, S19 PCs: PC4, PC5

Infrastructure Links:

All links use a /30 subnet mask (255.255.255.252).

ROUTER NUM	R1	R2	R3	ISP
ID	1.1.1.1	2.2.2.2	3.3.3.3	4.4.4.4

Device 1	Interface 1	IP Address 1	Device 2	Interface 2	IP Address 2
ISP	G0/0/1	10.50.254.9	R1	G0/0/1	10.50.254.10
ISP	G0/0/2	10.50.254.13	R2	G0/0/2	10.50.254.14
ISP	G0/0/0	10.50.254.17	R3	G0/0/0	10.50.254.18
R1	G0/0/1	10.50.254.21	R2	G0/0/1	10.50.254.22
R2	S4/0/1	10.50.254.2	R3	S4/0/1	10.50.254.1
R3	S4/0/0	10.50.254.6	R3	S4/0/0	10.50.254.5

VLANIF	Device 1	Ip address 1	Device2	Interface 2	Ip address 2
VLAN 130	Sw1	10.50.254.37	R1	0/0/0	10.50.254.38
VLAN 140	Sw2	10.50.254.41	R2	0/0/0	10.50.254.42
VLAN 150	Sw2	10.50.254.45	AC1	-------	10.50.254.46
VLAN160	Sw15	10.50.254.49	AC2	-------	10.50.254.50
VLAN 170	Sw15	10.50.254.53	R3	1/0/0	10.50.254.54
VLAN 170	Sw16	10.50.254.53	R3	1/0/1	10.50.254.54

Testing & Verification:

-ping tests Successfully.

-`show vlan` verified correct VLAN mapping.

Conclusion:

-The project successfully delivered a functioning enterprise network with VLANs, inter-VLAN routing and secure access. Future improvements include redundancy, wireless network integration, and firewall appliances.