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6. Project Overview:

The Network Security Project is a simulation of an Hotel management Network which consist of different devices used in everyday execution of an Hotel. The simulation is to be carried out on Cisco Packet tracer.

The Devices included in the Project are Router, Switches, AP, Computer, Laptop, Printer, IP phone, Smartphones and Server of different kinds.

The Project consist of different departments which will eventually cause different set of configuration as listed below:

1. Network Topology: Design a network topology with multiple departments (e.g., Reception, IT, Security) using switches and routers.
2. VLAN Configuration: Segment the network into different VLANs for each department.
3. Inter-VLAN Routing: Configure inter-VLAN routing to allow communication between VLANs while applying security controls.
4. ACL Implementation: Apply ACLs on routers to control traffic flow between VLANs, allowing only authorized traffic.
5. Port Security: Implement port security on switches to prevent unauthorized devices from connecting to the network.
6. VPN Setup: Configure a site-to-site VPN to securely connect a remote branch office to the corporate network.
7. Testing: Simulate attacks like unauthorized access attempts and test the network's response to these threats.
8. Project Resources:

 The hotel has three floors; in the first floor there three departments (Reception, store and Logistics), in the second floor there are three departments (Finance, HR and Sales/Marketing), while the third floor hosts the IT and Admin. Therefore, the following are part of the considerations during the design and implementation;

* There should be three routers connecting each floor (all placed in the server room in IT department).
* All routers should be connected to each other using serial DCE cable.
* The network between the routers should be 10.10.10.0/30,10.10.10.4/30 and 10.10.10.8/30.
* Each floor is expected to have one switch (placed in the respective floor).
* Each floor is expected to have WIFI networks connected to laptops and phones.
* Each department is expected to have a printer.
* Each department is expected to be in different VLAN with the following details;  
  **1st Floor;**  
  - Reception- VLAN 80, Network of 192.168.8.0/24  
  - Store- VLAN 70, Network of 192.168.7.0/24  
  - Logistics- VLAN 60, Network of 192.168.6.0/24  
  **2nd Floor;**  
  - Finance- VLAN 50, Network of 192.168.5.0/24  
  - HR- VLAN 40, Network of 192.168.4.0/24  
  - Sales- VLAN 30, Network of 192.168.3.0/24  
  **3rd Floor;**  
  - Admin- VLAN 20, Network of 192.168.2.0/24  
  - IT- VLAN 10, Network of 192.168.1.0/24

* Use OSPF as the routing protocol to advertise routes.
* All devices in the network are expected to obtain IP address dynamically with their respective router configured as the DHCP server.
* All the devices in the network are expected to communicate with each other.
* Configure SSH in all the routers for remote login.
* In IT department, add PC called Test-PC to port fa0/1 and use it to test remote login.
* Configure port security to IT-dept switch to allow only Test-PC to access port fa0/1 (use sticky method to obtain mac-address with violation mode of shutdown.)

1. Project Diagram:

1. Diagram Explanation:
2. Configuration Of Devices:

**Router Floor 1:**

Interface gig0/0

No shutdown

Interface se0/3/0

No shutdown

Interface se0/3/1

No shutdown

Int se0/3/0

Ip address 10.10.10.5 255.255.255.252

Int se0/3/1

Ip address 10.10.10.1 255.255.255.252

Int gig0/0.80

Encapsulation dotiq 80

Ip address 192.168.8.1 255.255.255.0

Int gig0/0.70

Encapsulation dotiq 70

Ip address 192.168.7.1 255.255.255.0

Int gig0/0.60

Encapsulation dotiq 60

Ip address 192.168.6.1 255.255.255.0

Service dhcp

ip dhcp pool reception

network 192.168.8.0 255.255.255.0

default-router 192.168.8.1

dns-server 192.168.8.1

ip dhcp pool store

network 192.168.7.0 255.255.255.0

default-router 192.168.7.1

dns-server 192.168.7.1

ip dhcp pool logistics

network 192.168.6.0 255.255.255.0

default-router 192.168.6.1

dns-server 192.168.6.1

router ospf 10

network 10.10.10.0 255.255.255.252 area 0

network 10.10.10.4 255.255.255.252 area 0

network 192.168.8.0 255.255.255.0 area 0

network 192.168.7.0 255.255.255.0 area 0

network 192.168.6.0 255.255.255.0 area 0

hostname F1-Router

ip domain-name zulali

username ali password ali

crypto key generate rsa

1024

Line vty 0 15

Login local

Transport input ssh

**Router Floor 2:**

Interface gig0/0

No shutdown

Interface se0/3/0

No shutdown

Interface se0/3/1

No shutdown

Int se0/3/0

Ip address 10.10.10.2 255.255.255.252

Int se0/3/1

Ip address 10.10.10.9 255.255.255.252

Int gig0/0.50

Encapsulation dotiq 50

Ip address 192.168.5.1 255.255.255.0

Int gig0/0.40

Encapsulation dotiq 40

Ip address 192.168.4.1 255.255.255.0

Int gig0/0.30

Encapsulation dotiq 30

Ip address 192.168.3.1 255.255.255.0

Service dhcp

ip dhcp pool finance

network 192.168.5.0 255.255.255.0

default-router 192.168.5.1

dns-server 192.168.5.1

ip dhcp pool HR

network 192.168.4.0 255.255.255.0

default-router 192.168.4.1

dns-server 192.168.4.1

ip dhcp pool salesmarket

network 192.168.3.0 255.255.255.0

default-router 192.168.3.1

dns-server 192.168.3.1

router ospf 10

network 10.10.10.0 255.255.255.252 area 0

network 10.10.10.8 255.255.255.252 area 0

network 192.168.5.0 255.255.255.0 area 0

network 192.168.4.0 255.255.255.0 area 0

network 192.168.3.0 255.255.255.0 area 0

hostname F2-Router

ip domain-name zulali

username ali password ali

crypto key generate rsa

1024

Line vty 0 15

Login local

Transport input ssh

**Router Floor 3:**

Interface gig0/0

No shutdown

Interface se0/3/0

No shutdown

Interface se0/3/1

No shutdown

Int se0/3/0

Ip address 10.10.10.6 255.255.255.252

Int se0/3/1

Ip address 10.10.10.10 255.255.255.252

Int gig0/0.20

Encapsulation dotiq 20

Ip address 192.168.2.1 255.255.255.0

Int gig0/0.10

Encapsulation dotiq 10

Ip address 192.168.1.1 255.255.255.0

Service dhcp

ip dhcp pool IT

network 192.168.1.0 255.255.255.0

default-router 192.168.1.1

dns-server 192.168.1.1

ip dhcp pool admin

network 192.168.2.0 255.255.255.0

default-router 192.168.2.1

dns-server 192.168.2.1

router ospf 10

network 10.10.10.8 255.255.255.252 area 0

network 10.10.10.4 255.255.255.252 area 0

network 192.168.1.0 255.255.255.0 area 0

network 192.168.2.0 255.255.255.0 area 0

hostname F3-Router

ip domain-name zulali

username ali password ali

crypto key generate rsa

1024

Line vty 0 15

Login local

Transport input ssh

**Switch Floor 1:**

Interface fa0/2-3

Switchport mode access

Switchport access vlan 80

Interface fa0/4-5

Switchport mode access

Switchport access vlan 70

Interface fa0/6-8

Switchport mode access

Switchport access vlan 60

Interface fa0/1

Switchport mode trunk

**Switch Floor 1:**

Interface fa0/2-3

Switchport mode access

Switchport access vlan 80

Interface fa0/4-5

Switchport mode access

Switchport access vlan 70

Interface fa0/6-8

Switchport mode access

Switchport access vlan 60

Interface fa0/1

Switchport mode trunk

**Switch Floor 2:**

Interface fa0/2-3

Switchport mode access

Switchport access vlan 50

Interface fa0/4-5

Switchport mode access

Switchport access vlan 40

Interface fa0/6-8

Switchport mode access

Switchport access vlan 30

Interface fa0/1

Switchport mode trunk

**Switch Floor 3:**

Interface fa0/2-3

Switchport mode access

Switchport access vlan 10

Interface fa0/4-6

Switchport mode access

Switchport access vlan 20

Interface fa0/1

Switchport mode trunk

**AP Floor 1:**

Ssid: Floor 1

WPA key : Floor@123

Connected to laptop

**AP Floor 2:**

Ssid: Floor 2

WPA key : Floor@123

Connected to smartphone

**AP Floor 3:**

Ssid: Floor 3

WPA key : Floor@123

Connected to Tablet