



UNIVERSIDAD TECNOLÓGICA DE PANAMÁ
CENTRO REGIONAL DE CHIRIQUÍ
LICENCIATURA EN CIBERSEGURIDAD



Laboratorio 8

Creación de VPN

Asignatura:

REDES DE COMPUTADORAS

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2S3111

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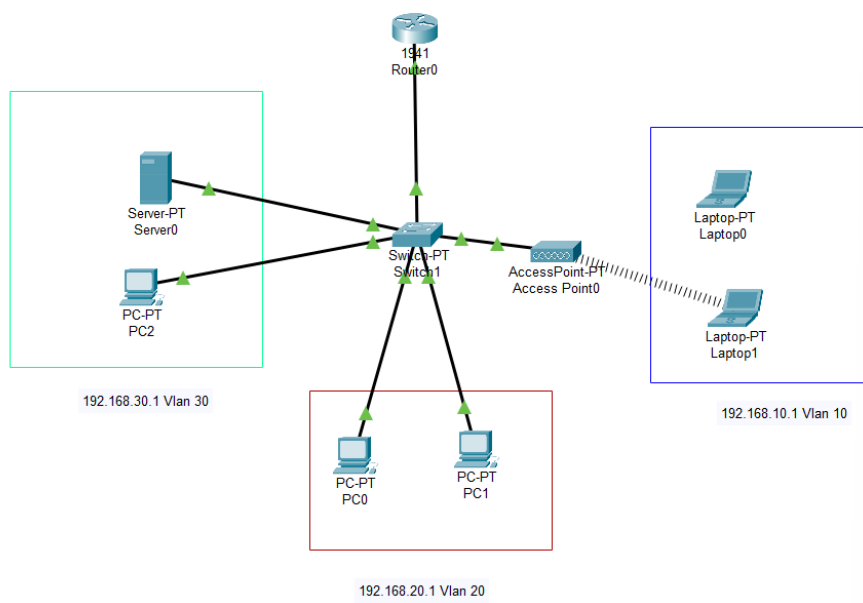
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PRIMER SEMESTRE

2025

Creación de VPN

Diseño y Configuración de una Red Doméstica con VLANs, DHCP y Extensor de Red



Diseñar y configurar una red doméstica segmentada mediante VLANs que simule una vivienda moderna con zona de invitados, red doméstica y red de dispositivos IoT, garantizando la distribución automática de direcciones IP por DHCP y la ampliación de cobertura mediante un extensor de red.

1.1. Equipos Utilizados

Dispositivo	Modelo	Función
Router	Cisco 1941	Enrutamiento y servidor DHCP
Switch	Cisco 2960 (12 puertos)	Distribución y segmentación VLAN
PCs	PC-PT	Red doméstica principal

Servidor	Server-PT	Control o almacenamiento IoT
IoT PC	PC-PT	Simulación de dispositivo inteligente
Access Point	Access Point-PT	Extensión Wi-Fi para invitados

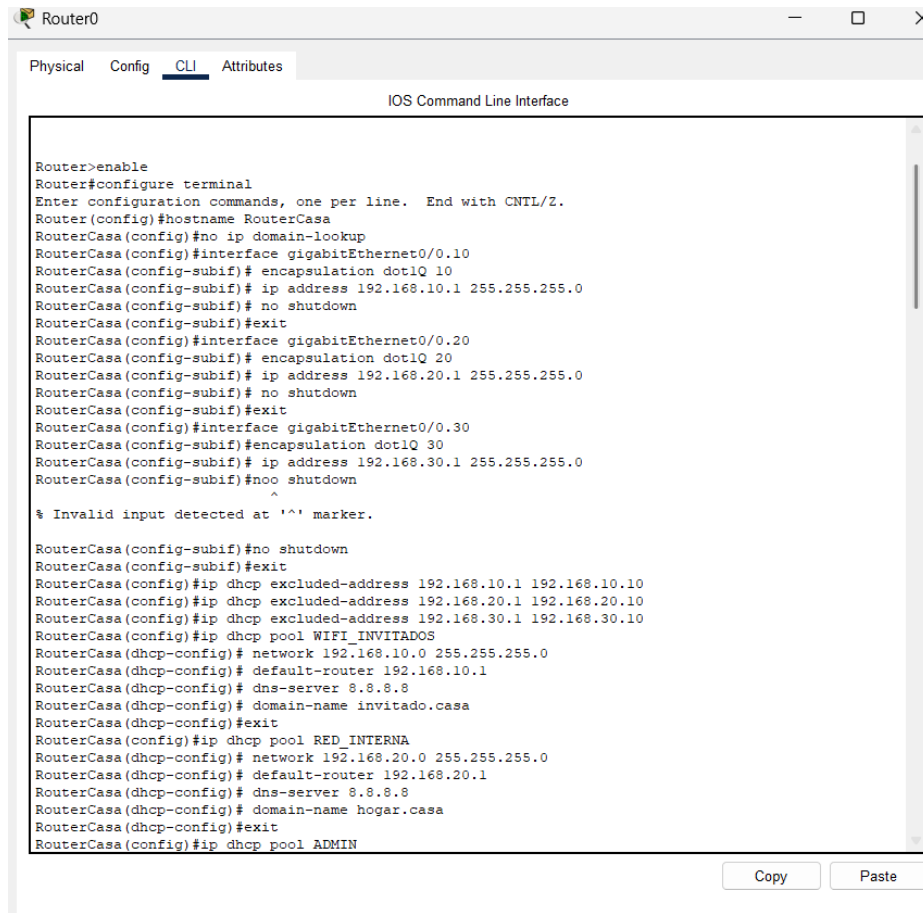
1.2. Estructura de la Red

VLAN	Nombre	Función	Red	Gateway
10	WIFI_INVITADOS	Red inalámbrica para visitantes	192.168.10.0/24	192.168.10.1
20	RED_INTERNA	Red doméstica principal	192.168.20.0/24	192.168.20.1
30	ADMIN	Red para servidor e IoT	192.168.30.0/24	192.168.30.1

1.3. Conexiones Físicas

Dispositivo 1	Puerto	Dispositivo 2	Puerto	VLAN
RouterCasa	G0/0	SwitchCasa	Fa0/1	Trunk (10,20,30)
PC 1	Fa0	SwitchCasa	Fa0/2	20
PC 2	Fa0	SwitchCasa	Fa0/3	20
Servidor	Fa0	SwitchCasa	Fa0/4	30
IoT PC	Fa0	SwitchCasa	Fa0/5	30
Access Point (Extensor)	Fa0	SwitchCasa	Fa0/10	10

1.4. Configuración Resumida del Router



The screenshot shows the CLI of Router0. The user has entered a series of commands to configure RouterCasa. The configuration includes setting the hostname, enabling the terminal, and configuring three GigabitEthernet interfaces (0/0.10, 0/0.20, and 0/0.30) with IP addresses and encapsulation. It also sets up two DHCP pools: 'WIFI_INVITADOS' and 'RED INTERNA', each with a network, default-router, and dns-server. Finally, it sets the domain-name to 'hogar.casa' and creates a pool named 'ADMIN'.

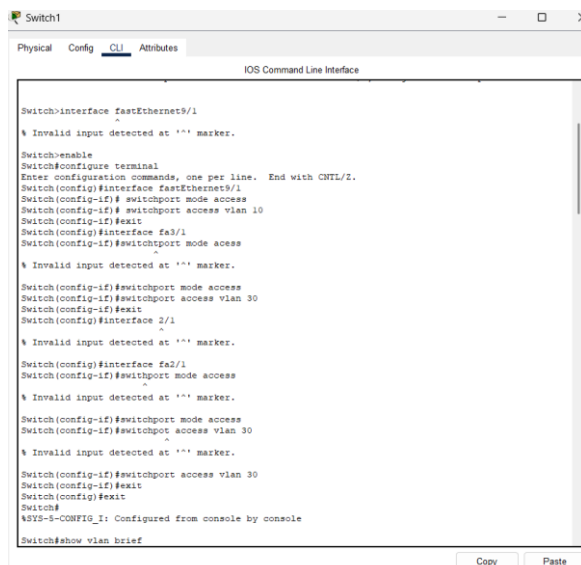
```

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname RouterCasa
RouterCasa(config)#no ip domain-lookup
RouterCasa(config)#interface gigabitEthernet0/0.10
RouterCasa(config-subif)# encapsulation dot1Q 10
RouterCasa(config-subif)# ip address 192.168.10.1 255.255.255.0
RouterCasa(config-subif)# no shutdown
RouterCasa(config-subif)#exit
RouterCasa(config)#interface gigabitEthernet0/0.20
RouterCasa(config-subif)# encapsulation dot1Q 20
RouterCasa(config-subif)# ip address 192.168.20.1 255.255.255.0
RouterCasa(config-subif)# no shutdown
RouterCasa(config-subif)#exit
RouterCasa(config)#interface gigabitEthernet0/0.30
RouterCasa(config-subif)#encapsulation dot1Q 30
RouterCasa(config-subif)# ip address 192.168.30.1 255.255.255.0
RouterCasa(config-subif)#noo shutdown
RouterCasa(config-subif)#
^
% Invalid input detected at '^' marker.

RouterCasa(config-subif)#no shutdown
RouterCasa(config-subif)#exit
RouterCasa(config)#ip dhcp excluded-address 192.168.10.1 192.168.10.10
RouterCasa(config)#ip dhcp excluded-address 192.168.20.1 192.168.20.10
RouterCasa(config)#ip dhcp excluded-address 192.168.30.1 192.168.30.10
RouterCasa(config)#ip dhcp pool WIFI_INVITADOS
RouterCasa(dhcp-config)# network 192.168.10.0 255.255.255.0
RouterCasa(dhcp-config)# default-router 192.168.10.1
RouterCasa(dhcp-config)# dns-server 8.8.8.8
RouterCasa(dhcp-config)# domain-name invitado.casa
RouterCasa(dhcp-config)#exit
RouterCasa(config)#ip dhcp pool RED INTERNA
RouterCasa(dhcp-config)# network 192.168.20.0 255.255.255.0
RouterCasa(dhcp-config)# default-router 192.168.20.1
RouterCasa(dhcp-config)# dns-server 8.8.8.8
RouterCasa(dhcp-config)# domain-name hogar.casa
RouterCasa(dhcp-config)#exit
RouterCasa(config)#ip dhcp pool ADMIN

```

1.5. Configuración del Switch



The screenshot shows the CLI of Switch1. The user has entered a series of commands to configure the switch. The configuration includes setting the hostname, enabling the terminal, and configuring three FastEthernet interfaces (9/1, 2/1, and 2/1) with IP addresses and encapsulation. It also sets up two DHCP pools: 'WIFI_INVITADOS' and 'RED INTERNA', each with a network, default-router, and dns-server. Finally, it sets the domain-name to 'hogar.casa' and creates a pool named 'ADMIN'.

```

Switch1>interface FastEthernet9/1
Switch1>
^
% Invalid input detected at '^' marker.

Switch1>enable
Switch1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch1(config)#interface FastEthernet9/1
Switch1(config-if)# switchport mode access
Switch1(config-if)# switchport access vlan 10
Switch1(config-if)#exit
Switch1(config)#interface fa3/1
Switch1(config-if)#switchport mode access
Switch1(config-if)#
^
% Invalid input detected at '^' marker.

Switch1(config-if)#switchport mode access
Switch1(config-if)#switchport access vlan 30
Switch1(config-if)#exit
Switch1(config)#interface 2/1
Switch1(config-if)#
^
% Invalid input detected at '^' marker.

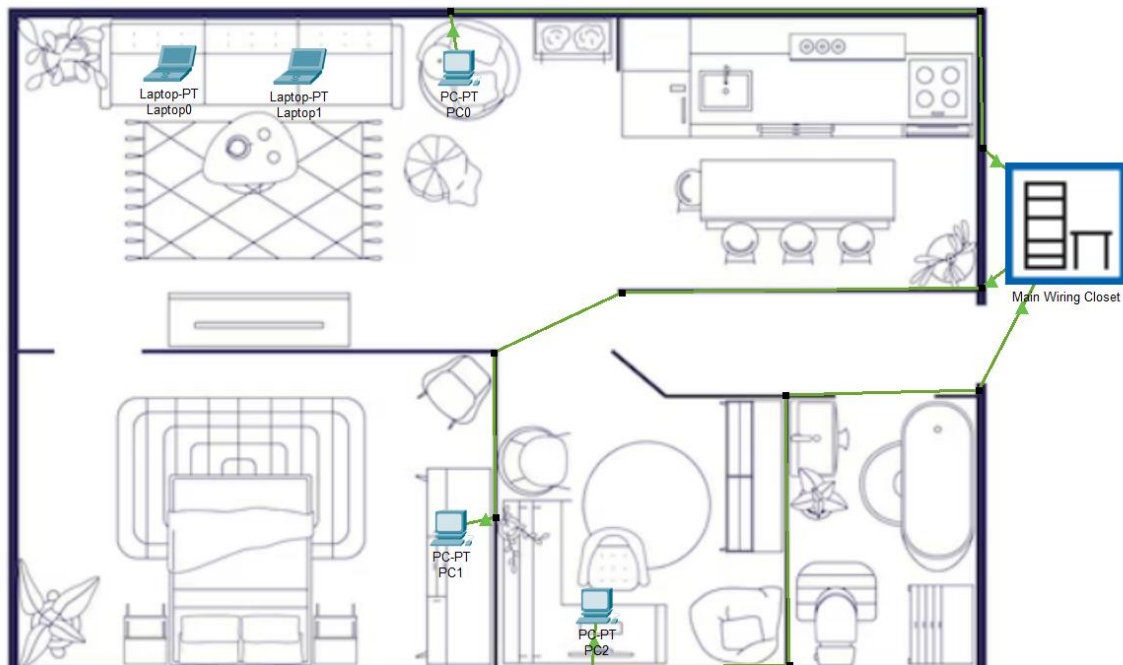
Switch1(config)#interface fa2/1
Switch1(config-if)#switchport mode access
Switch1(config-if)#
^
% Invalid input detected at '^' marker.

Switch1(config-if)#switchport mode access
Switch1(config-if)#switchport access vlan 30
Switch1(config-if)#
^
% Invalid input detected at '^' marker.

Switch1(config-if)#switchport access vlan 30
Switch1(config-if)#exit
Switch1(config)#exit
Switch1#
AUX-0-CONFIG_1: Configured from console by console
Switch1#show vlan brief

```

Sistema



1.6. Conclusión

La práctica logró establecer una red doméstica segmentada mediante VLANs funcionales. La VLAN de invitados quedó configurada de forma lógica, simulando una red Wi-Fi aislada con DHCP activo pero sin acceso directo a la red interna.



Lab8.pkt