

Redes de computadoras

Informe prelaboratorio

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1. Acercamiento utilizado

1.1. Aislamiento

Subnetting + encapsulación por medio de VLAN

1.2. Manejo de DHCP

Asignado como IP helper al router principal.

1.3. Manejo de DNS

Asignado al DHCP para propagar su configuración.

1.4. Switch 8 puertas

Usado para conectar la mayoría de la infraestructura de apoyo sobre la VLAN por defecto. El resto se conecta sobre la VLAN de equipos. Se prefiere GigabitEthernet para conectar dispositivos para no saturar la red.

1.5. Switch 24 puertas

Usado principalmente para conectar pcs de escritorio. Utiliza una GigabitEthernet para enlazar al router wireless en modo access, para así poder aislar su subred bajo la VLAN 3.

1.6. Manejo de Router Wireless

Asignado a una VLAN propia aislada del resto. El router inalámbrico por defecto NATea las conexiones. Tampoco pueden ver el servidor web (no hay requerimiento explicitado que los invitados pueden ver el servidor web, por tanto se obvió.)

1.7. Topología

Basada en MST (Minimum spanning tree) a modo de minimizar los hops entre dispositivos.

1.8. Equipos

DHCP,DNS,WEB1,WEB2,PRINTER bajo ip fija. Todo el resto mediante DHCP.

2. Diagramas y configuración de elementos en PacketTracer

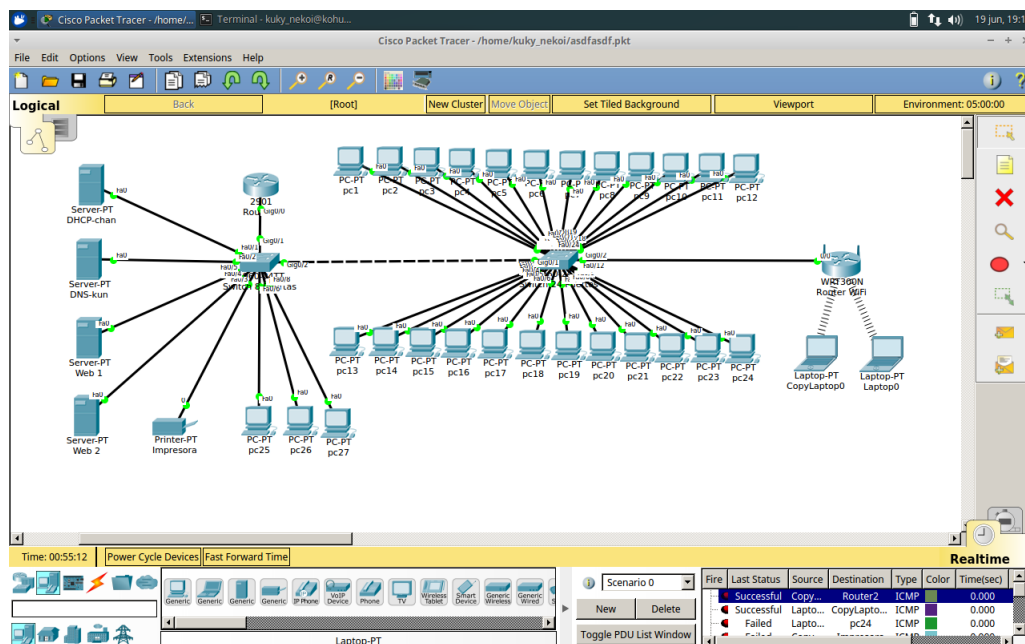


Figura 1: Diagrama de PacketTracer

Port Status Summary Table for Router2					
Port	Link	VLAN	IP Address	IPv6 Address	MAC Address
GigabitEthernet0/0	Up	--	192.168.1.1/26	<not set>	00E0.B003.AA01
GigabitEthernet0/0.2	Up	--	192.168.1.65/26	<not set>	00E0.B003.AA01
GigabitEthernet0/0.3	Up	--	192.168.1.129/26	<not set>	00E0.B003.AA01
GigabitEthernet0/1	Down	--	<not set>	<not set>	00E0.B003.AA02
Vlan1	Down	1	<not set>	<not set>	0090.0C46.CD1B

Hostname: Router

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Figura 2: Listado de puertos Router

Port Status Summary Table for Switch 8 Puertas					
Port	Link	VLAN	IP Address		MAC Address
FastEthernet0/1	Up	1	--		0090.0C8C.E101
FastEthernet0/2	Up	1	--		0090.0C8C.E102
FastEthernet0/3	Up	2	--		0090.0C8C.E103
FastEthernet0/4	Up	2	--		0090.0C8C.E104
FastEthernet0/5	Up	2	--		0090.0C8C.E105
FastEthernet0/6	Up	2	--		0090.0C8C.E106
FastEthernet0/7	Up	2	--		0090.0C8C.E107
FastEthernet0/8	Up	2	--		0090.0C8C.E108
FastEthernet0/9	Down	1	--		0090.0C8C.E109
FastEthernet0/10	Down	1	--		0090.0C8C.E10A
FastEthernet0/11	Down	1	--		0090.0C8C.E10B
FastEthernet0/12	Down	1	--		0090.0C8C.E10C
FastEthernet0/13	Down	1	--		0090.0C8C.E10D
FastEthernet0/14	Down	1	--		0090.0C8C.E10E
FastEthernet0/15	Down	1	--		0090.0C8C.E10F
FastEthernet0/16	Down	1	--		0090.0C8C.E110
FastEthernet0/17	Down	1	--		0090.0C8C.E111
FastEthernet0/18	Down	1	--		0090.0C8C.E112
FastEthernet0/19	Down	1	--		0090.0C8C.E113
FastEthernet0/20	Down	1	--		0090.0C8C.E114
FastEthernet0/21	Down	1	--		0090.0C8C.E115
FastEthernet0/22	Down	1	--		0090.0C8C.E116
FastEthernet0/23	Down	1	--		0090.0C8C.E117
FastEthernet0/24	Down	1	--		0090.0C8C.E118
GigabitEthernet0/1	Up	--	--		0090.0C8C.E119
GigabitEthernet0/2	Up	--	--		0090.0C8C.E11A
Vlan1	Up	1	192.168.1.1/26		0001.64EB.3401
Vlan2	Up	2	192.168.1.1/26		0001.64EB.3401
Vlan3	Up	3	192.168.1.1/26		0001.64EB.3402

Hostname: Switch

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Figura 3: Listado de puertos Switch 8 puertos

Port Status Summary Table for Switch 24 Puertas					
Port	Link	VLAN	IP Address		MAC Address
FastEthernet0/1	Up	2	--		0060.702A.A001
FastEthernet0/2	Up	2	--		0060.702A.A002
FastEthernet0/3	Up	2	--		0060.702A.A003
FastEthernet0/4	Up	2	--		0060.702A.A004
FastEthernet0/5	Up	2	--		0060.702A.A005
FastEthernet0/6	Up	2	--		0060.702A.A006
FastEthernet0/7	Up	2	--		0060.702A.A007
FastEthernet0/8	Up	2	--		0060.702A.A008
FastEthernet0/9	Up	2	--		0060.702A.A009
FastEthernet0/10	Up	2	--		0060.702A.A00A
FastEthernet0/11	Up	2	--		0060.702A.A00B
FastEthernet0/12	Up	2	--		0060.702A.A00C
FastEthernet0/13	Up	2	--		0060.702A.A00D
FastEthernet0/14	Up	2	--		0060.702A.A00E
FastEthernet0/15	Up	2	--		0060.702A.A00F
FastEthernet0/16	Up	2	--		0060.702A.A010
FastEthernet0/17	Up	2	--		0060.702A.A011
FastEthernet0/18	Up	2	--		0060.702A.A012
FastEthernet0/19	Up	2	--		0060.702A.A013
FastEthernet0/20	Up	2	--		0060.702A.A014
FastEthernet0/21	Up	2	--		0060.702A.A015
FastEthernet0/22	Up	2	--		0060.702A.A016
FastEthernet0/23	Up	2	--		0060.702A.A017
FastEthernet0/24	Up	2	--		0060.702A.A018
GigabitEthernet0/1	Up	--	--		0060.702A.A019
GigabitEthernet0/2	Up	3	--		0060.702A.A01A
Vlan1	Down	1	<not set>		0000.BD74.3CDA
Vlan2	Up	2	192.168.1.65/26		0000.BD74.3C01
Vlan3	Up	3	192.168.1.129/26		0000.BD74.3C02

Hostname: Switch

Physical Location: Intercity, Home City, Corporate Office, Main Wiring Closet

Figura 4: Listado de puertos Switch 24 puertos

Port Status Summary Table for Router WiFi			
Port	Link	IP Address	MAC Address
Internet	Up	192.168.1.130/26	0060.7033.C301
LAN	Up	192.168.0.1/24	00E0.A3CA.3211
Ethernet 1	Down	--	0060.7033.C302
Ethernet 2	Down	--	0060.7033.C303
Ethernet 3	Down	--	0060.7033.C304
Ethernet 4	Down	--	0060.7033.C305
Wireless	Up	--	0060.7033.C306
Physical Location: Intercity, Home City, Corporate Office			

Figura 5: Listado de puertas Router Wireless

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: serverPool

Default Gateway: 192.168.1.1

DNS Server: 192.168.1.3

Start IP Address: 192 168 1 0

Subnet Mask: 255 255 255 192

Maximum number of Users: 60

TFTP Server: 0.0.0.0

Add Save Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server
invitado	192.168.1.1	192.168.1.3	192.168.1.129	255.255.255.192	60	0.0.0.0
pcs	192.168.1.1	192.168.1.3	192.168.1.65	255.255.255.192	60	0.0.0.0
serverPool	192.168.1.1	192.168.1.3	192.168.1.0	255.255.255.192	60	0.0.0.0

Figura 6: Configuración DHCP

Impresora

Physical Config Attributes

FastEthernet0

Port Status: ☒ On ☐ Off

Bandwidth: ☒ 100 Mbps ☒ 10 Mbps ☒ Auto

Duplex: ☒ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address: 0004.9AA5.A6D4

IP Configuration

☐ DHCP ☒ Static

IP Address: 192.168.1.95

Subnet Mask: 255.255.255.192

IPv6 Configuration

☐ DHCP ☐ Auto Config ☒ Static

IPv6 Address:

Link Local Address: FE80::204:9AFF:FEA5:A6D4

Top

Figura 7: Configuración impresora

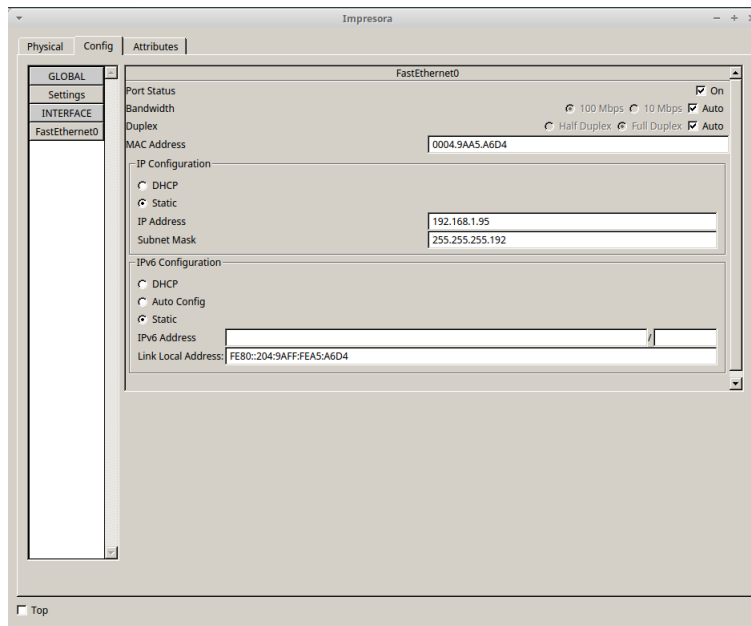


Figura 8: Configuración impresora

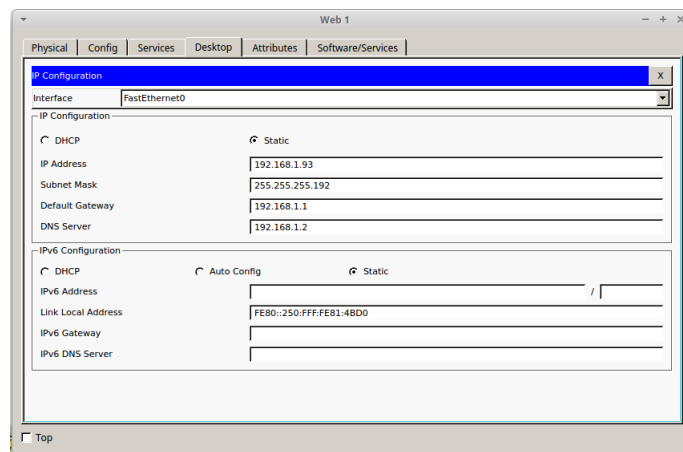


Figura 9: Configuración servidor web 1

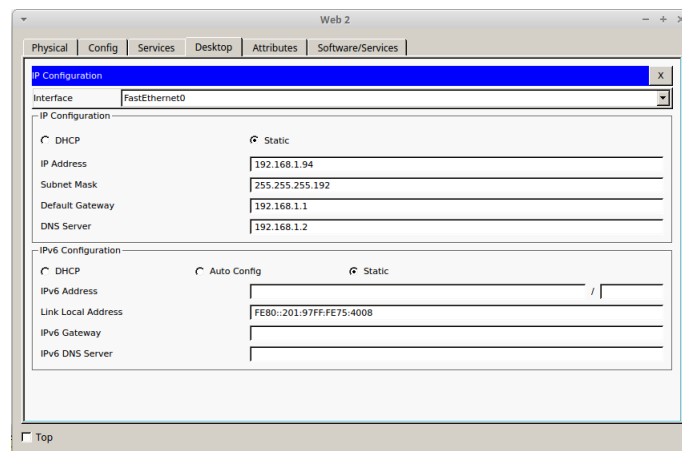


Figura 10: Configuración servidor web 2

3. Calculo de subredes

Cuadro 1: Tabla de cálculo de subredes

#	IP Subred	Máscara	Gateway	Broadcast	Rango	IPs disp.
0	192.168.1.0	/20	192.168.1.1	192.168.1.63	192.168.1.2 - 192.168.1.62	62
1	192.168.1.64	/20	192.168.1.65	192.168.1.127	192.168.1.66 - 192.168.1.126	62
2	192.168.1.128	/20	192.168.1.129	192.168.1.191	192.168.1.130 - 192.168.1.190	62
3	192.168.1.192	/20	192.168.1.193	192.168.1.255	192.168.1.194 - 192.168.1.254	62

4. Scripting

```
1 Router#enable
2 Router#configure terminal
3 Enter configuration commands, one per line. End with CNTL/Z.
4 Router(config)#interface gigabitEthernet 0/0
5 Router(config-if)#ip address 192.168.1.1 255.255.255.192
6 Router(config-if)#ip helper-address 192.168.1.2
7 Router(config-if)#no shutdown
8 Router(config-if)#exit
9 Router(config)#exit
10 Router>enable
11 Router#configure terminal
12 Enter configuration commands, one per line. End with CNTL/Z.
13 Router(config)#interface gigabitEthernet 0/0.2
14 Router(config-subif)#encapsulation dot1Q 2
15 Router(config-subif)#ip address 192.168.1.65 255.255.255.192
16 Router(config-subif)#ip helper-address 192.168.1.2
17 Router(config-subif)#exit
18 Router(config)#exit
19 Router#
20 Router#configure terminal
21 Enter configuration commands, one per line. End with CNTL/Z.
22 Router(config)#interface gigabitEthernet 0/0.3
23 Router(config-subif)#encapsulation dot1Q 3
24 Router(config-subif)#ip address 192.168.1.129 255.255.255.192
25 Router(config-subif)#ip helper-address 192.168.1.2
26 Router(config-subif)#exit
27 Router(config)#exit
```

Figura 11: Scripting para Router principal

```

1 Switch>enable
2 Switch#configure terminal
3 Switch(config)#vlan 1
4 Switch(config-vlan)#name admin
5 Switch(config-vlan)#exit
6 Switch(config)#vlan 2
7 Switch(config-vlan)#name pc
8 Switch(config-vlan)#exit
9 Switch(config)#vlan 3
10 Switch(config-vlan)#name invitado
11 Switch(config-vlan)#exit
12 Switch(config)#interface range fastEthernet 0/1-2
13 Switch(config-if-range)#switchport access vlan 1
14 Switch(config-if-range)#exit
15 Switch(config)#interface range fastEthernet 0/3-8
16 Switch(config-if-range)#switchport access vlan 2
17 Switch(config-if-range)#exit
18 Switch(config)#no shutdown
19 Switch(config)#interface range fastEthernet 0/6-8
20 Switch(config-if-range)#no shutdown
21 Switch(config-if-range)#exit
22 Switch(config)#interface range fastEthernet 0/1-5
23 Switch(config-if-range)#no shutdown
24 Switch(config-if-range)#exit
25 Switch(config)#interface vlan 1
26 Switch(config-if)#ip address 192.168.1.1 255.255.255.192
27 Switch(config-if)#no shutdown
28 Switch(config-if)#exit
29 Switch(config)#interface vlan 2
30 Switch(config-if)#ip address 192.168.1.1 255.255.255.192
31 Switch(config-if)#no shutdown
32 Switch(config-if)#exit
33 Switch(config)#interface vlan 3
34 Switch(config-if)#ip address 192.168.1.1 255.255.255.192
35 Switch(config-if)#no shutdown
36 Switch(config-if)#exit
37 Switch(config)#interface GigabitEthernet 0/1
38 Switch(config-if)#switchport mode trunk
39 Switch(config-if)#exit
40 Switch(config)#interface range GigabitEthernet 0/1-2
41 Switch(config-if)#switchport mode trunk
42 Switch(config-if)#exit
43 Switch(config)#exit
44 Switch#copy running-config startup-config
45 Destination filename [startup-config]?
46 Building configuration...
47 [OK]

```

Figura 12: Scripting para Switch 8 puertas


```
1 Switch>enable
2 Switch#configure terminal
3 Enter configuration commands, one per line. End with CNTL/Z.
4 Switch(config)#vlan 2
5 Switch(config-vlan)#name pc
6 Switch(config-vlan)#exit
7 Switch(config)#vlan 3
8 Switch(config-vlan)#name invitado
9 Switch(config-vlan)#exit
10 Switch(config)#interface range fastEthernet 0/1-24
11 Switch(config-if-range)#switchport access vlan 2
12 Switch(config-if-range)#no shutdown
13 Switch(config-if-range)#exit
14 Switch(config)#interface vlan 2
15 Switch(config-if)#ip address 192.168.1.65 255.255.255.192
16 Switch(config-if)#no shutdown
17 Switch(config-if)#exit
18 Switch(config)#interface vlan 3
19 Switch(config-if)#ip address 192.168.1.129 255.255.255.192
20 Switch(config-if)#no shutdown
21 Switch(config-if)#exit
22 Switch(config)#interface range GigabitEthernet 0/1-2
23 Switch(config-if-range)#switchport mode trunk
24 Switch(config-if-range)#exit
25 Switch(config)#interface GigabitEthernet 0/2
26 Switch(config-if)#switchport access vlan 3
27 Switch(config-if)#no shutdown
28 Switch(config-if)#exit
29 Switch(config)#exit
30 Switch#copy running-config startup-config
```

Figura 13: Scripting para Switch 8 puertas