



Laboratorio 2

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1 Dentro de red: Cálculo de subredes

1. Red 0: En nuestro caso, el dígito verificador del primer integrante es 1, por lo que la cantidad de subredes es $2 * (1 + 1) = 4$. Para poder realizar 4 subredes se necesitan por lo menos 2 bits extra, por lo que la máscara de las subredes está definida como $10.0.0.0/10 \Rightarrow 255.192.0.0$. El valor 192 se obtiene al calcular $1100\ 0000$ que corresponde a $128 + 64 = 192$. Una vez obteniendo la nueva máscara se elige la subred con el nombre más grande, esta subred se genera cuando los 2 bits extra de la máscara son 1, por lo que la ip de esta subred resulta ser $10.192.0.0$ con el 192 obtenido al calcular $1100\ 0000$. Una vez obtenida la ip de la subred, se le asigna la ip más grande posible al router, la cuál es $10.255.255.254$ dado que la subred va desde $10.192.0.0$ al $10.255.255.255$, pero esta última es para broadcast. Al pc1 se le asigna $10.192.0.1$ y al pc0 $10.192.0.2$ con una máscara de $255.192.0.0$.
2. Red 1: En nuestro caso, el último dígito del primer integrante es 7, por lo que la cantidad de subredes es 7. Para poder realizar 7 subredes, se necesitan a lo menos 3 bits extra, por lo que la máscara de las subredes está definida como $172.16.0.0/19 \Rightarrow 255.255.224.0$. El valor 224 se obtiene al calcular el binario $1110\ 000$, que corresponde a $128 + 64 + 32 = 224$. Una vez obtenida la nueva máscara se elige la tercera subred con el nombre más pequeño, en este caso esa subred ocurre cuando los tres bits toman el valor de 010 , que traducido a la subred corresponde a $172.16.64.0$, siendo 64 el valor del binario $0100\ 0000$. Una vez obtenida la ip de la subred, se le asigna la ip más grande posible al router, la cual es $172.16.95.254$ dado que la subred va desde $172.16.64.0$ al $172.16.95.255$, pero esta última es para broadcast. Al pc4 se le asigna $172.16.64.2$ y al pc5 con $172.16.64.1$, con una máscara de $255.255.224.0$.
3. Red 2: En nuestro caso, en el ítem 1 teníamos 4 subredes generados con 2 bits. La tercera menor subred ocurre cuando esos 2 bits toman el valor

de 10, o en su defecto 10000000 \Rightarrow 128. El dígito verificador del segundo miembro es 3, por lo que se necesitan por lo menos 2 bits para representar 3 subredes. Al añadir estos 2 bits a la máscara se obtiene 255.240.0.0. El valor 240 se obtiene al calcular el binario 1111 0000. Una vez obtenida la máscara, sabemos que la segunda red con el nombre más pequeño ocurre cuando los bits toman el valor de 01, por lo que la ip de la subred es 10.144.0.0 siendo 144 el valor obtenido al calcular 1001 0000, que corresponde a $128 + 16 = 144$. Una vez obtenida la ip de la subred, se le asigna la ip más grande posible al router, la cual es 10.159.255.254 dado que la subred va desde 10.144.0.0 al 10.159.255.255, pero esta última es para broadcast. Al servidor se le asigna la ip 10.144.0.1, y la máscara es de 255.240.0.0

4. Red 3: En nuestro caso, la cantidad de bits extra para definir subredes es $2/2 + 1 = 2$, por lo que se puede definir a lo más 4 subredes. La segunda red con el nombre más grande es cuando los dos bits toman el valor de 10, obteniendo una ip de subred 192.168.0.128 con una máscara de 255.255.255.192. El valor 128 de la ip se obtiene al calcular la segunda subred con nombre más grande, la cual es 1000 0000, por otro lado el 192 de la máscara se obtiene al añadir los 2 bits nuevos a ella, obteniendo 1100 0000 que corresponde a $128 + 64 = 192$. Una vez obtenida la ip de la subred, se le asigna la ip más grande posible al router, la cual es 192.168.0.190 dado que la subred va desde 192.168.0.128 al 192.168.0.191, pero esta última es para broadcast. Al pc3 192.168.0.129 y al pc2 192.168.0.130 con una máscara de 255.255.255.192.

2 Preguntas

1. Para comprobar la conexión exitosa entre todos los dispositivos se envió por cada dispositivo un mensaje simple PDU a todos los demás como se muestra en las siguientes imágenes:

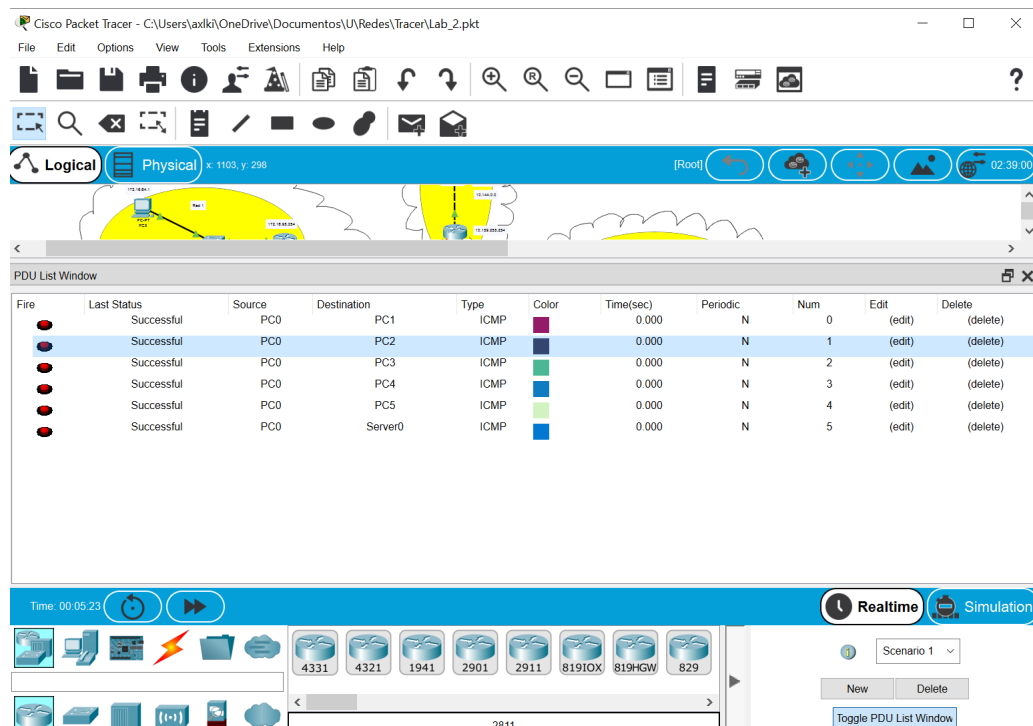
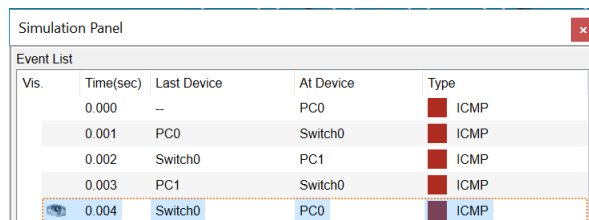


Figure 1: PC0 al resto

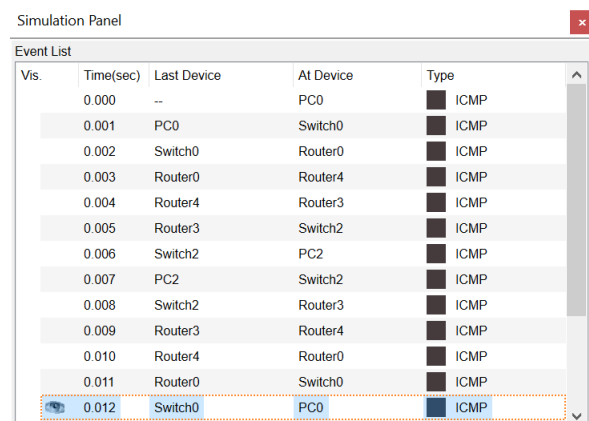
El cual tuvo los siguientes recorridos para cada dispositivo:



The image shows a 'Simulation Panel' window with a title bar and a close button. Inside, there is an 'Event List' table. The table has five columns: 'Vis.', 'Time(sec)', 'Last Device', 'At Device', and 'Type'. The first four rows show a sequence of ICMP events: 0.000 from PC0, 0.001 from PC0 to Switch0, 0.002 from Switch0 to PC1, and 0.003 from PC1 to Switch0. The fifth row, at 0.004, shows an ICMP event from Switch0 to PC0, which is highlighted with a dashed orange border and a blue icon in the 'Vis.' column.

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC0	ICMP
	0.001	PC0	Switch0	ICMP
	0.002	Switch0	PC1	ICMP
	0.003	PC1	Switch0	ICMP
	0.004	Switch0	PC0	ICMP

Figure 2: PC0 a PC1



The image shows a 'Simulation Panel' window with a title bar and a close button. Inside, there is an 'Event List' table. The table has five columns: 'Vis.', 'Time(sec)', 'Last Device', 'At Device', and 'Type'. The table lists 12 rows of ICMP events. The path starts at PC0 (0.000), goes to Switch0 (0.001), then Router0 (0.002), Router4 (0.003), Router3 (0.004), Switch2 (0.005), PC2 (0.006), and back to Switch2 (0.007). It then continues through Router3 (0.008), Router4 (0.009), Router0 (0.010), and Switch0 (0.011). The final row, at 0.012, shows an ICMP event from Switch0 to PC0, which is highlighted with a dashed orange border and a blue icon in the 'Vis.' column.

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC0	ICMP
	0.001	PC0	Switch0	ICMP
	0.002	Switch0	Router0	ICMP
	0.003	Router0	Router4	ICMP
	0.004	Router4	Router3	ICMP
	0.005	Router3	Switch2	ICMP
	0.006	Switch2	PC2	ICMP
	0.007	PC2	Switch2	ICMP
	0.008	Switch2	Router3	ICMP
	0.009	Router3	Router4	ICMP
	0.010	Router4	Router0	ICMP
	0.011	Router0	Switch0	ICMP
	0.012	Switch0	PC0	ICMP

Figure 3: PC0 a PC2

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC0	ICMP
	0.001	PC0	Switch0	ICMP
	0.002	Switch0	Router0	ICMP
	0.003	Router0	Router4	ICMP
	0.004	Router4	Router3	ICMP
	0.005	Router3	Switch2	ICMP
	0.006	Switch2	PC3	ICMP
	0.007	PC3	Switch2	ICMP
	0.008	Switch2	Router3	ICMP
	0.009	Router3	Router4	ICMP
	0.010	Router4	Router0	ICMP
	0.011	Router0	Switch0	ICMP
	0.012	Switch0	PC0	ICMP
Reset Simulation <input checked="" type="checkbox"/> Constant Delay Captured to: 0.012 s				

Figure 4: PC0 a PC3

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC0	ICMP
	0.001	PC0	Switch0	ICMP
	0.002	Switch0	Router0	ICMP
	0.003	Router0	Router1	ICMP
	0.004	Router1	Switch1	ICMP
	0.005	Switch1	PC4	ICMP
	0.006	PC4	Switch1	ICMP
	0.007	Switch1	Router1	ICMP
	0.008	Router1	Router0	ICMP
	0.009	Router0	Switch0	ICMP
	0.010	Switch0	PC0	ICMP
Reset Simulation <input checked="" type="checkbox"/> Constant Delay Captured to: 0.010 s				

Figure 5: PC0 a PC4

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC0	ICMP
	0.001	PC0	Switch0	ICMP
	0.002	Switch0	Router0	ICMP
	0.003	Router0	Router1	ICMP
	0.004	Router1	Switch1	ICMP
	0.005	Switch1	PC5	ICMP
	0.006	PC5	Switch1	ICMP
	0.007	Switch1	Router1	ICMP
	0.008	Router1	Router0	ICMP
	0.009	Router0	Switch0	ICMP
	0.010	Switch0	PC0	ICMP

Reset Simulation ☒ Constant Delay Captured to: 0.010 s

Figure 6: PC0 a PC5

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC0	ICMP
	0.001	PC0	Switch0	ICMP
	0.002	Switch0	Router0	ICMP
	0.003	Router0	Router4	ICMP
	0.004	Router4	Router2	ICMP
	0.005	Router2	Server0	ICMP
	0.006	Server0	Router2	ICMP
	0.007	Router2	Router4	ICMP
	0.008	Router4	Router0	ICMP
	0.009	Router0	Switch0	ICMP
	0.010	Switch0	PC0	ICMP

Reset Simulation ☒ Constant Delay Captured to: 0.010 s

Figure 7: PC0 a S0

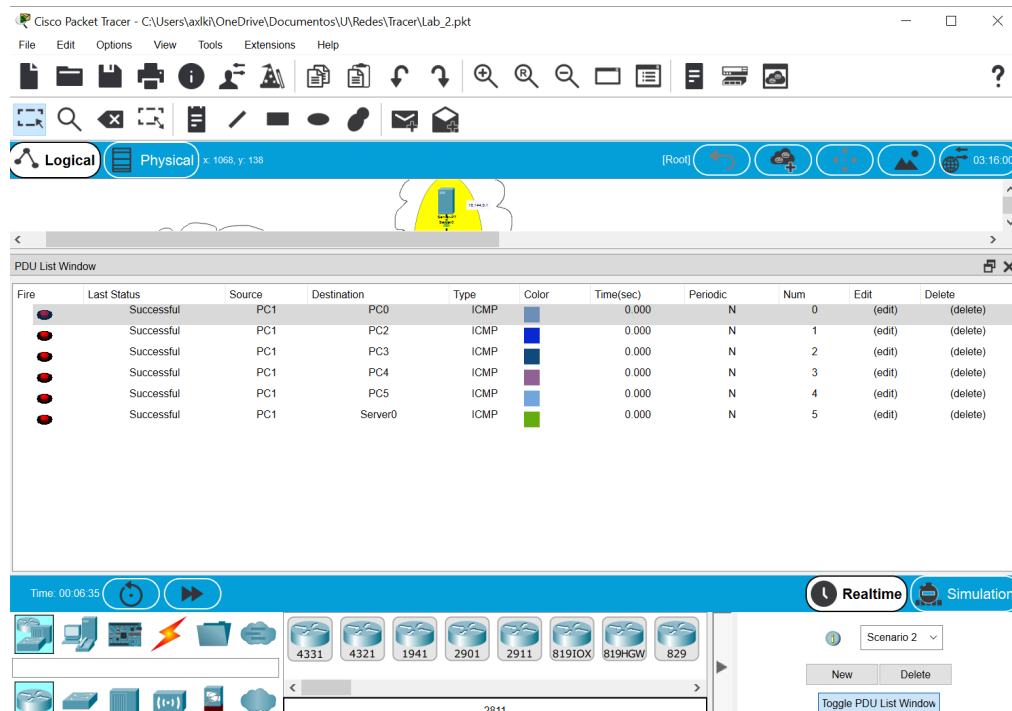


Figure 8: PC1 al resto

Luego para PC1 se repitió el proceso como se ve en la imagen anterior, el cual tuvo los siguientes recorridos para cada dispositivo:

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC1	ICMP
	0.001	PC1	Switch0	ICMP
	0.002	Switch0	PC0	ICMP
	0.003	PC0	Switch0	ICMP
	0.004	Switch0	PC1	ICMP

Reset Simulation ☒ Constant Delay
 Captured to: 0.004 s

Figure 9: PC1 a PC0

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC1	ICMP
	0.001	PC1	Switch0	ICMP
	0.002	Switch0	Router0	ICMP
	0.003	Router0	Router4	ICMP
	0.004	Router4	Router3	ICMP
	0.005	Router3	Switch2	ICMP
	0.006	Switch2	PC2	ICMP
	0.007	PC2	Switch2	ICMP
	0.008	Switch2	Router3	ICMP
	0.009	Router3	Router4	ICMP
	0.010	Router4	Router0	ICMP
	0.011	Router0	Switch0	ICMP
	0.012	Switch0	PC1	ICMP

Reset Simulation ☒ Constant Delay
 Captured to: 0.012 s

Figure 10: PC1 a PC2

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC1	ICMP
	0.001	PC1	Switch0	ICMP
	0.002	Switch0	Router0	ICMP
	0.003	Router0	Router4	ICMP
	0.004	Router4	Router3	ICMP
	0.005	Router3	Switch2	ICMP
	0.006	Switch2	PC3	ICMP
	0.007	PC3	Switch2	ICMP
	0.008	Switch2	Router3	ICMP
	0.009	Router3	Router4	ICMP
	0.010	Router4	Router0	ICMP
	0.011	Router0	Switch0	ICMP
	0.012	Switch0	PC1	ICMP

Reset Simulation ☒ Constant Delay Captured to: 0.012 s

Figure 11: PC1 a PC3

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC1	ICMP
	0.001	PC1	Switch0	ICMP
	0.002	Switch0	Router0	ICMP
	0.003	Router0	Router1	ICMP
	0.004	Router1	Switch1	ICMP
	0.005	Switch1	PC4	ICMP
	0.006	PC4	Switch1	ICMP
	0.007	Switch1	Router1	ICMP
	0.008	Router1	Router0	ICMP
	0.009	Router0	Switch0	ICMP
	0.010	Switch0	PC1	ICMP

Reset Simulation ☒ Constant Delay Captured to: 0.010 s

Figure 12: PC1 a PC4

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC1	ICMP
	0.001	PC1	Switch0	ICMP
	0.002	Switch0	Router0	ICMP
	0.003	Router0	Router1	ICMP
	0.004	Router1	Switch1	ICMP
	0.005	Switch1	PC5	ICMP
	0.006	PC5	Switch1	ICMP
	0.007	Switch1	Router1	ICMP
	0.008	Router1	Router0	ICMP
	0.009	Router0	Switch0	ICMP
	0.010	Switch0	PC1	ICMP

Reset Simulation ☒ Constant Delay Captured to: 0.010 s

Figure 13: PC1 a PC5

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC1	ICMP
	0.001	PC1	Switch0	ICMP
	0.002	Switch0	Router0	ICMP
	0.003	Router0	Router4	ICMP
	0.004	Router4	Router2	ICMP
	0.005	Router2	Server0	ICMP
	0.006	Server0	Router2	ICMP
	0.007	Router2	Router4	ICMP
	0.008	Router4	Router0	ICMP
	0.009	Router0	Switch0	ICMP
	0.010	Switch0	PC1	ICMP

Reset Simulation ☒ Constant Delay Captured to: 0.010 s

Figure 14: PC1 a S0

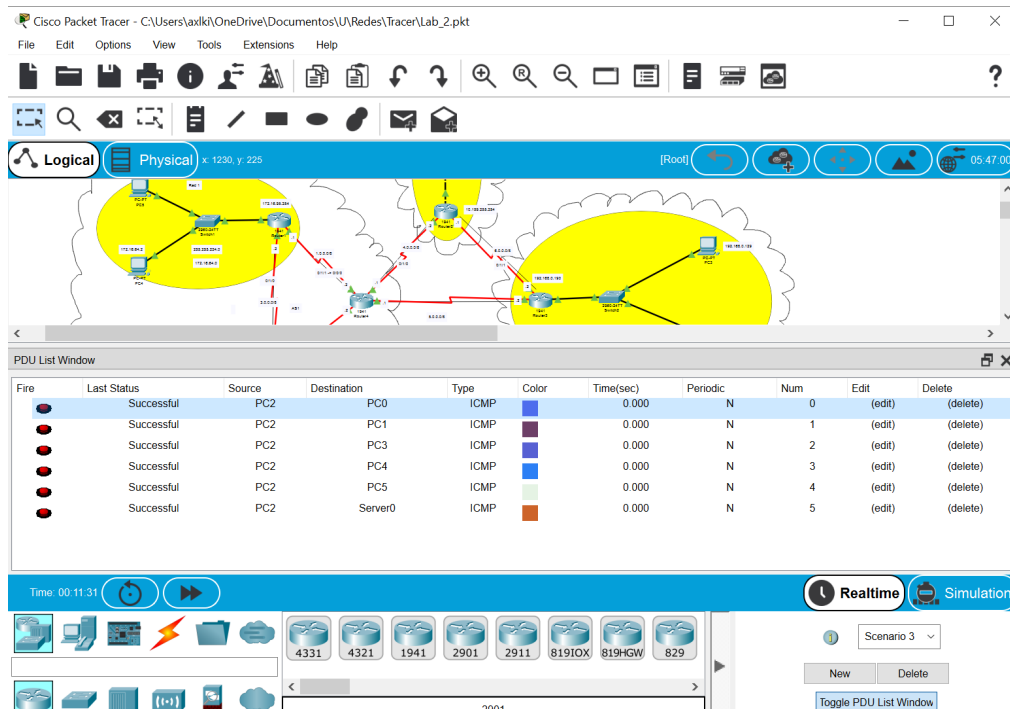


Figure 15: PC2 al resto

Luego para PC2 se repitió el proceso como se ve en la imagen anterior, el cual tuvo los siguientes recorridos para cada dispositivo:

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC2	ICMP
	0.001	PC2	Switch2	ICMP
	0.002	Switch2	Router3	ICMP
	0.003	Router3	Router4	ICMP
	0.004	Router4	Router0	ICMP
	0.005	Router0	Switch0	ICMP
	0.006	Switch0	PC0	ICMP
	0.007	PC0	Switch0	ICMP
	0.008	Switch0	Router0	ICMP
	0.009	Router0	Router4	ICMP
	0.010	Router4	Router3	ICMP
	0.011	Router3	Switch2	ICMP
	0.012	Switch2	PC2	ICMP

Figure 16: PC2 a PC0

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC2	ICMP
	0.001	PC2	Switch2	ICMP
	0.002	Switch2	Router3	ICMP
	0.003	Router3	Router4	ICMP
	0.004	Router4	Router0	ICMP
	0.005	Router0	Switch0	ICMP
	0.006	Switch0	PC1	ICMP
	0.007	PC1	Switch0	ICMP
	0.008	Switch0	Router0	ICMP
	0.009	Router0	Router4	ICMP
	0.010	Router4	Router3	ICMP
	0.011	Router3	Switch2	ICMP
	0.012	Switch2	PC2	ICMP

Figure 17: PC2 a PC1

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC2	ICMP
	0.001	PC2	Switch2	ICMP
	0.002	Switch2	PC3	ICMP
	0.003	PC3	Switch2	ICMP
	0.004	Switch2	PC2	ICMP

Figure 18: PC2 a PC3

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC2	ICMP
	0.001	PC2	Switch2	ICMP
	0.002	Switch2	Router3	ICMP
	0.003	Router3	Router4	ICMP
	0.004	Router4	Router1	ICMP
	0.005	Router1	Switch1	ICMP
	0.006	Switch1	PC4	ICMP
	0.007	PC4	Switch1	ICMP
	0.008	Switch1	Router1	ICMP
	0.009	Router1	Router4	ICMP
	0.010	Router4	Router3	ICMP
	0.011	Router3	Switch2	ICMP
	0.012	Switch2	PC2	ICMP

Figure 19: PC2 a PC4

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC2	ICMP
	0.001	PC2	Switch2	ICMP
	0.002	Switch2	Router3	ICMP
	0.003	Router3	Router4	ICMP
	0.004	Router4	Router1	ICMP
	0.005	Router1	Switch1	ICMP
	0.006	Switch1	PC5	ICMP
	0.007	PC5	Switch1	ICMP
	0.008	Switch1	Router1	ICMP
	0.009	Router1	Router4	ICMP
	0.010	Router4	Router3	ICMP
	0.011	Router3	Switch2	ICMP
	0.012	Switch2	PC2	ICMP

Figure 20: PC2 a PC5

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC2	ICMP
	0.001	PC2	Switch2	ICMP
	0.002	Switch2	Router3	ICMP
	0.003	Router3	Router2	ICMP
	0.004	Router2	Server0	ICMP
	0.005	Server0	Router2	ICMP
	0.006	Router2	Router3	ICMP
	0.007	Router3	Switch2	ICMP
	0.008	Switch2	PC2	ICMP

Figure 21: PC2 a S0

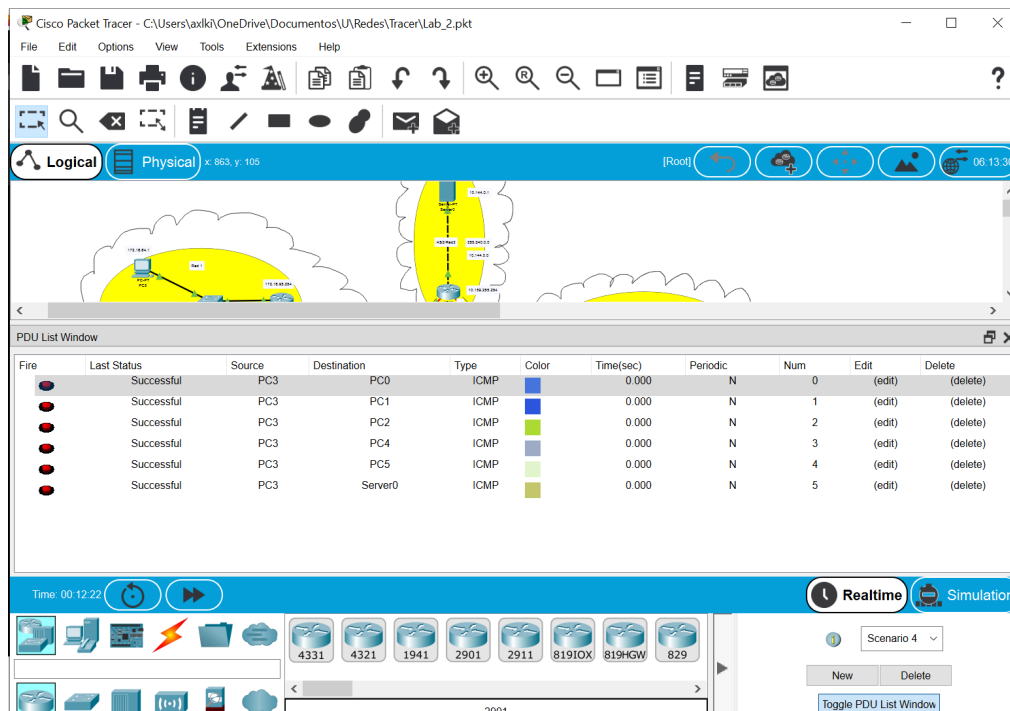


Figure 22: PC3 al resto

Luego para PC3 se repitió el proceso como se ve en la imagen anterior, el cual tuvo los siguientes recorridos para cada dispositivo:

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC3	ICMP
	0.001	PC3	Switch2	ICMP
	0.002	Switch2	Router3	ICMP
	0.003	Router3	Router4	ICMP
	0.004	Router4	Router0	ICMP
	0.005	Router0	Switch0	ICMP
	0.006	Switch0	PC0	ICMP
	0.007	PC0	Switch0	ICMP
	0.008	Switch0	Router0	ICMP
	0.009	Router0	Router4	ICMP
	0.010	Router4	Router3	ICMP
	0.011	Router3	Switch2	ICMP
	0.012	Switch2	PC3	ICMP

Figure 23: PC3 a PC0

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC3	ICMP
	0.001	PC3	Switch2	ICMP
	0.002	Switch2	Router3	ICMP
	0.003	Router3	Router4	ICMP
	0.004	Router4	Router0	ICMP
	0.005	Router0	Switch0	ICMP
	0.006	Switch0	PC1	ICMP
	0.007	PC1	Switch0	ICMP
	0.008	Switch0	Router0	ICMP
	0.009	Router0	Router4	ICMP
	0.010	Router4	Router3	ICMP
	0.011	Router3	Switch2	ICMP
	0.012	Switch2	PC3	ICMP

Figure 24: PC3 a PC1

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC3	ICMP
	0.001	PC3	Switch2	ICMP
	0.002	Switch2	PC2	ICMP
	0.003	PC2	Switch2	ICMP
	0.004	Switch2	PC3	ICMP

Figure 25: PC3 a PC2

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC3	ICMP
	0.001	PC3	Switch2	ICMP
	0.002	Switch2	Router3	ICMP
	0.003	Router3	Router4	ICMP
	0.004	Router4	Router1	ICMP
	0.005	Router1	Switch1	ICMP
	0.006	Switch1	PC4	ICMP
	0.007	PC4	Switch1	ICMP
	0.008	Switch1	Router1	ICMP
	0.009	Router1	Router4	ICMP
	0.010	Router4	Router3	ICMP
	0.011	Router3	Switch2	ICMP
	0.012	Switch2	PC3	ICMP

Figure 26: PC3 a PC4

Simulation Panel x

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC3	ICMP
	0.001	PC3	Switch2	ICMP
	0.002	Switch2	Router3	ICMP
	0.003	Router3	Router4	ICMP
	0.004	Router4	Router1	ICMP
	0.005	Router1	Switch1	ICMP
	0.006	Switch1	PC5	ICMP
	0.007	PC5	Switch1	ICMP
	0.008	Switch1	Router1	ICMP
	0.009	Router1	Router4	ICMP
	0.010	Router4	Router3	ICMP
	0.011	Router3	Switch2	ICMP
	0.012	Switch2	PC3	ICMP

Figure 27: PC3 a PC5

Simulation Panel x

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC3	ICMP
	0.001	PC3	Switch2	ICMP
	0.002	Switch2	Router3	ICMP
	0.003	Router3	Router2	ICMP
	0.004	Router2	Server0	ICMP
	0.005	Server0	Router2	ICMP
	0.006	Router2	Router3	ICMP
	0.007	Router3	Switch2	ICMP
	0.008	Switch2	PC3	ICMP

Figure 28: PC3 a S0

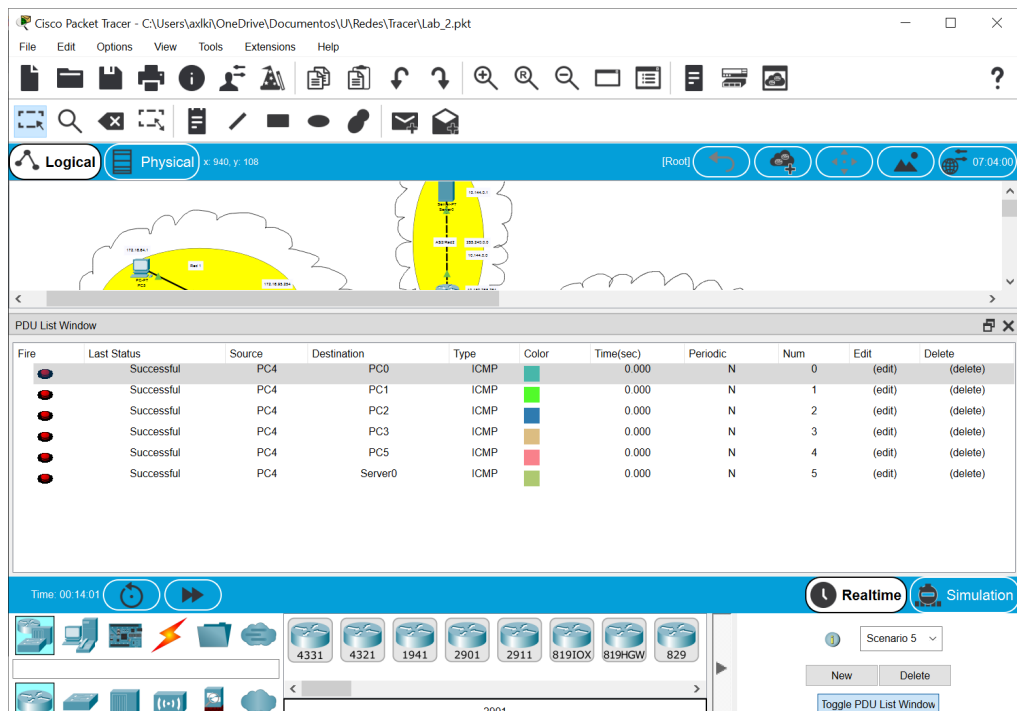


Figure 29: PC4 al resto

Luego para PC4 se repitió el proceso como se ve en la imagen anterior, el cual tuvo los siguientes recorridos para cada dispositivo:

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router0	ICMP
	0.004	Router0	Switch0	ICMP
	0.005	Switch0	PC0	ICMP
	0.006	PC0	Switch0	ICMP
	0.007	Switch0	Router0	ICMP
	0.008	Router0	Router1	ICMP
	0.009	Router1	Switch1	ICMP
	0.010	Switch1	PC4	ICMP

Figure 30: PC4 a PC0

Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router0	ICMP
	0.004	Router0	Switch0	ICMP
	0.005	Switch0	PC1	ICMP
	0.006	PC1	Switch0	ICMP
	0.007	Switch0	Router0	ICMP
	0.008	Router0	Router1	ICMP
	0.009	Router1	Switch1	ICMP
	0.010	Switch1	PC4	ICMP

Figure 31: PC4 a PC1

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router4	ICMP
	0.004	Router4	Router3	ICMP
	0.005	Router3	Switch2	ICMP
	0.006	Switch2	PC2	ICMP
	0.007	PC2	Switch2	ICMP
	0.008	Switch2	Router3	ICMP
	0.009	Router3	Router4	ICMP
	0.010	Router4	Router1	ICMP
	0.011	Router1	Switch1	ICMP
	0.012	Switch1	PC4	ICMP

Figure 32: PC4 a PC2

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router4	ICMP
	0.004	Router4	Router3	ICMP
	0.005	Router3	Switch2	ICMP
	0.006	Switch2	PC3	ICMP
	0.007	PC3	Switch2	ICMP
	0.008	Switch2	Router3	ICMP
	0.009	Router3	Router4	ICMP
	0.010	Router4	Router1	ICMP
	0.011	Router1	Switch1	ICMP
	0.012	Switch1	PC4	ICMP

Figure 33: PC4 a PC3

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	PC5	ICMP
	0.003	PC5	Switch1	ICMP
	0.004	Switch1	PC4	ICMP

Figure 34: PC4 a PC5

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router4	ICMP
	0.004	Router4	Router2	ICMP
	0.005	Router2	Server0	ICMP
	0.006	Server0	Router2	ICMP
	0.007	Router2	Router4	ICMP
	0.008	Router4	Router1	ICMP
	0.009	Router1	Switch1	ICMP
	0.010	Switch1	PC4	ICMP

Figure 35: PC4 a S0

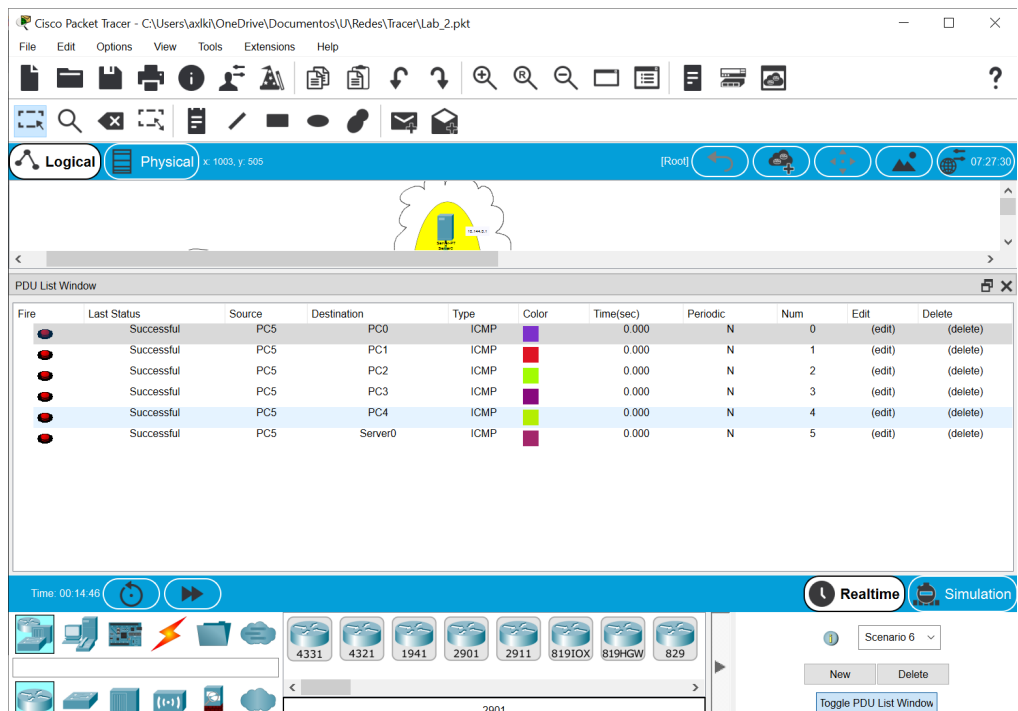


Figure 36: PC5 al resto

Luego para PC5 se repitió el proceso como se ve en la imagen anterior, el cual tuvo los siguientes recorridos para cada dispositivo:

Simulation Panel x

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	—	PC5	ICMP
	0.001	PC5	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router0	ICMP
	0.004	Router0	Switch0	ICMP
	0.005	Switch0	PC0	ICMP
	0.006	PC0	Switch0	ICMP
	0.007	Switch0	Router0	ICMP
	0.008	Router0	Router1	ICMP
	0.009	Router1	Switch1	ICMP
	0.010	Switch1	PC5	ICMP

Figure 37: PC5 a PC0

Simulation Panel x

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	—	PC5	ICMP
	0.001	PC5	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router0	ICMP
	0.004	Router0	Switch0	ICMP
	0.005	Switch0	PC1	ICMP
	0.006	PC1	Switch0	ICMP
	0.007	Switch0	Router0	ICMP
	0.008	Router0	Router1	ICMP
	0.009	Router1	Switch1	ICMP
	0.010	Switch1	PC5	ICMP

Figure 38: PC5 a PC1

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC5	ICMP
	0.001	PC5	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router4	ICMP
	0.004	Router4	Router3	ICMP
	0.005	Router3	Switch2	ICMP
	0.006	Switch2	PC2	ICMP
	0.007	PC2	Switch2	ICMP
	0.008	Switch2	Router3	ICMP
	0.009	Router3	Router4	ICMP
	0.010	Router4	Router1	ICMP
	0.011	Router1	Switch1	ICMP
	0.012	Switch1	PC5	ICMP

Figure 39: PC5 a PC2

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC5	ICMP
	0.001	PC5	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router4	ICMP
	0.004	Router4	Router3	ICMP
	0.005	Router3	Switch2	ICMP
	0.006	Switch2	PC3	ICMP
	0.007	PC3	Switch2	ICMP
	0.008	Switch2	Router3	ICMP
	0.009	Router3	Router4	ICMP
	0.010	Router4	Router1	ICMP
	0.011	Router1	Switch1	ICMP
	0.012	Switch1	PC5	ICMP

Figure 40: PC5 a PC3

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC5	ICMP
	0.001	PC5	Switch1	ICMP
	0.002	Switch1	PC4	ICMP
	0.003	PC4	Switch1	ICMP
	0.004	Switch1	PC5	ICMP

Figure 41: PC5 a PC4

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC5	ICMP
	0.001	PC5	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router4	ICMP
	0.004	Router4	Router2	ICMP
	0.005	Router2	Server0	ICMP
	0.006	Server0	Router2	ICMP
	0.007	Router2	Router4	ICMP
	0.008	Router4	Router1	ICMP
	0.009	Router1	Switch1	ICMP
	0.010	Switch1	PC5	ICMP

Figure 42: PC5 a S0

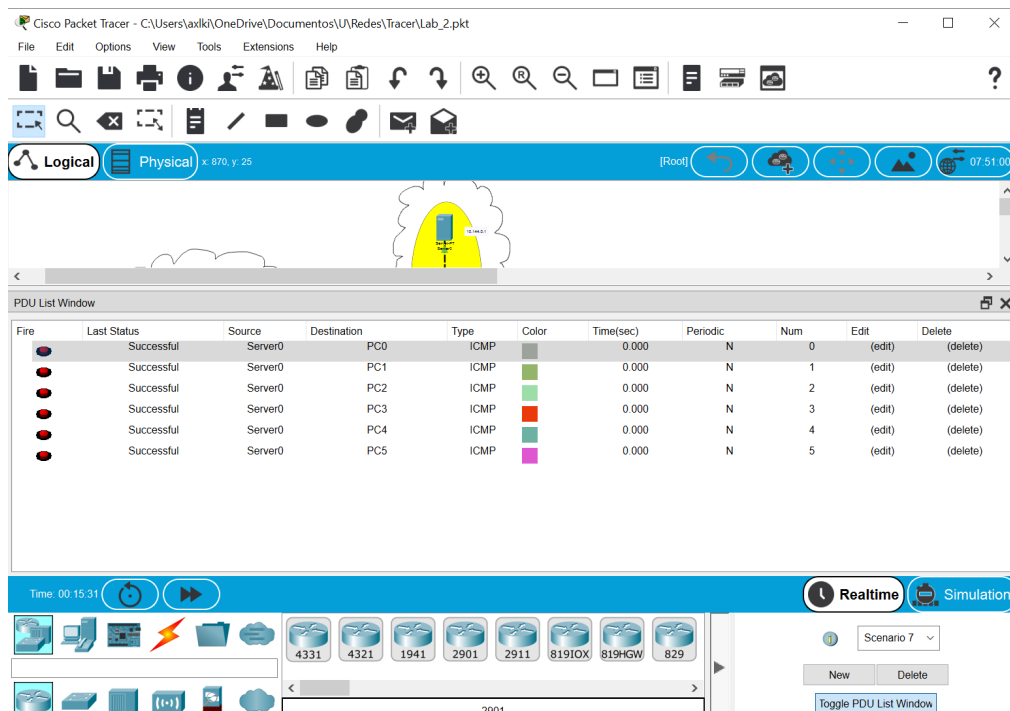


Figure 43: S0 al resto

Luego para S0 se repitió el proceso como se ve en la imagen anterior, el cual tuvo los siguientes recorridos para cada dispositivo:

Simulation Panel x

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	Server0	ICMP
	0.001	Server0	Router2	ICMP
	0.002	Router2	Router4	ICMP
	0.003	Router4	Router0	ICMP
	0.004	Router0	Switch0	ICMP
	0.005	Switch0	PC0	ICMP
	0.006	PC0	Switch0	ICMP
	0.007	Switch0	Router0	ICMP
	0.008	Router0	Router4	ICMP
	0.009	Router4	Router2	ICMP
	0.010	Router2	Server0	ICMP

Figure 44: S0 a PC0

Simulation Panel x

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	Server0	ICMP
	0.001	Server0	Router2	ICMP
	0.002	Router2	Router4	ICMP
	0.003	Router4	Router0	ICMP
	0.004	Router0	Switch0	ICMP
	0.005	Switch0	PC1	ICMP
	0.006	PC1	Switch0	ICMP
	0.007	Switch0	Router0	ICMP
	0.008	Router0	Router4	ICMP
	0.009	Router4	Router2	ICMP
	0.010	Router2	Server0	ICMP

Figure 45: S0 a PC1

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	Server0	ICMP
	0.001	Server0	Router2	ICMP
	0.002	Router2	Router3	ICMP
	0.003	Router3	Switch2	ICMP
	0.004	Switch2	PC2	ICMP
	0.005	PC2	Switch2	ICMP
	0.006	Switch2	Router3	ICMP
	0.007	Router3	Router2	ICMP
	0.008	Router2	Server0	ICMP

Figure 46: S0 a PC2

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	Server0	ICMP
	0.001	Server0	Router2	ICMP
	0.002	Router2	Router3	ICMP
	0.003	Router3	Switch2	ICMP
	0.004	Switch2	PC3	ICMP
	0.005	PC3	Switch2	ICMP
	0.006	Switch2	Router3	ICMP
	0.007	Router3	Router2	ICMP
	0.008	Router2	Server0	ICMP

Figure 47: S0 a PC3

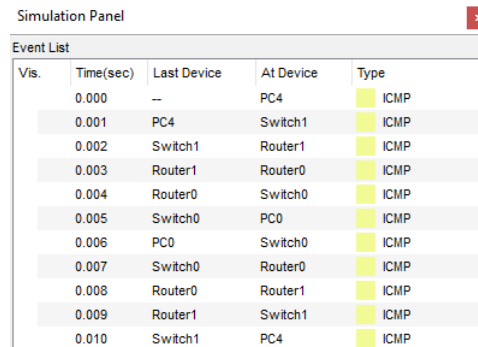
Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	Server0	ICMP
	0.001	Server0	Router2	ICMP
	0.002	Router2	Router4	ICMP
	0.003	Router4	Router1	ICMP
	0.004	Router1	Switch1	ICMP
	0.005	Switch1	PC4	ICMP
	0.006	PC4	Switch1	ICMP
	0.007	Switch1	Router1	ICMP
	0.008	Router1	Router4	ICMP
	0.009	Router4	Router2	ICMP
	0.010	Router2	Server0	ICMP

Figure 48: S0 a PC4

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	Server0	ICMP
	0.001	Server0	Router2	ICMP
	0.002	Router2	Router4	ICMP
	0.003	Router4	Router1	ICMP
	0.004	Router1	Switch1	ICMP
	0.005	Switch1	PC5	ICMP
	0.006	PC5	Switch1	ICMP
	0.007	Switch1	Router1	ICMP
	0.008	Router1	Router4	ICMP
	0.009	Router4	Router2	ICMP
	0.010	Router2	Server0	ICMP

Figure 49: S0 a PC5

2. Para esta pregunta usaremos el PC4, del cual se muestran las rutas tomadas por los mensajes enviados a PC0 y PC1 respectivamente



The image shows a 'Simulation Panel' window with a title bar and a close button. Inside, there is an 'Event List' table. The table has five columns: 'Vis.', 'Time(sec)', 'Last Device', 'At Device', and 'Type'. It contains 11 rows of data representing network events. The events show a sequence of hops from PC4 to PC0, passing through Switch1, Router1, Router0, and Switch0. Each event is marked as 'ICMP' and has a yellow square icon in the 'Type' column.

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router0	ICMP
	0.004	Router0	Switch0	ICMP
	0.005	Switch0	PC0	ICMP
	0.006	PC0	Switch0	ICMP
	0.007	Switch0	Router0	ICMP
	0.008	Router0	Router1	ICMP
	0.009	Router1	Switch1	ICMP
	0.010	Switch1	PC4	ICMP

Figure 50: PC4 a PC0

Simulation Panel				
Event List				
Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router0	ICMP
	0.004	Router0	Switch0	ICMP
	0.005	Switch0	PC1	ICMP
	0.006	PC1	Switch0	ICMP
	0.007	Switch0	Router0	ICMP
	0.008	Router0	Router1	ICMP
	0.009	Router1	Switch1	ICMP
	0.010	Switch1	PC4	ICMP

Figure 51: PC4 a PC1

La ruta para PC0 sería:

$$PC4 \rightarrow Switch1 \rightarrow Router1 \rightarrow Router0 \rightarrow Switch0 \rightarrow PC0$$

Y viceversa para volver de PC0 a PC4.

Para PC1 sigue exactamente la misma ruta, esto se debe a que los links están con el ancho de banda por defecto, por lo que todos los links poseen la misma velocidad y no hay preferencia entre uno u otro, siendo esto el causante de que el algoritmo simplemente escoja la ruta que posea la menor cantidad de links.

- Al eliminar el link entre Router0 y Router1 se envía nuevamente un mensaje entre PC4 y PC0, el cual sigue la siguiente ruta:

$PC4 \rightarrow Switch1 \rightarrow Router1 \rightarrow Router4 \rightarrow Router0 \rightarrow Switch0 \rightarrow PC0$

Y viceversa para volver de PC0 a PC4.

Simulation Panel ✕

Event List















Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	 ICMP
	0.001	PC4	Switch1	 ICMP
	0.002	Switch1	Router1	 ICMP
	0.003	Router1	Router4	 ICMP
	0.004	Router4	Router0	 ICMP
	0.005	Router0	Switch0	 ICMP
	0.006	Switch0	PC0	 ICMP
	0.007	PC0	Switch0	 ICMP
	0.008	Switch0	Router0	 ICMP
	0.009	Router0	Router4	 ICMP
	0.010	Router4	Router1	 ICMP
	0.011	Router1	Switch1	 ICMP
	0.012	Switch1	PC4	 ICMP

Figure 52: PC4 a PC0

Y luego se envía nuevamente un mensaje entre PC4 y PC1, el cual sigue la siguiente ruta:

PC4 → Switch1 → Router1 → Router4 → Router0 → Switch0 → PC1

Y viceversa para volver de PC1 a PC4.

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.003	Router1	Router4	ICMP
	0.004	Router4	Router0	ICMP
	0.005	Router0	Switch0	ICMP
	0.006	Switch0	PC1	ICMP
	0.007	PC1	Switch0	ICMP
	0.008	Switch0	Router0	ICMP
	0.009	Router0	Router4	ICMP
	0.010	Router4	Router1	ICMP
	0.011	Router1	Switch1	ICMP
	0.012	Switch1	PC4	ICMP

Figure 53: PC4 a PC0

Como se puede ver, ambos mensajes logran llegar con éxito, esto se debe a que cuando se realizó la configuración OSPF, se permitió que el router4 redireccionara tanto al router1 como al router0, por lo que el algoritmo identifica de que hay un camino alternativo que logra conectar la red 0 con la red 1, permitiendo así que el mensaje llegue incluso cuando la conexión entre el router0 y router1 fue eliminada.

- Al reparar la conexión entre Router0 y Router1, se configuró con un ancho de banda de 100 kbps. Al enviar el mensaje desde PC4 a PC0 tomó la siguiente ruta:

PC4 → Switch1 → Router1 → Router4 → Router0 → Switch0 → PC0

Y de vuelta:

PC0 → Switch0 → Router0 → Router1 → Router4 → Switch1 → PC4

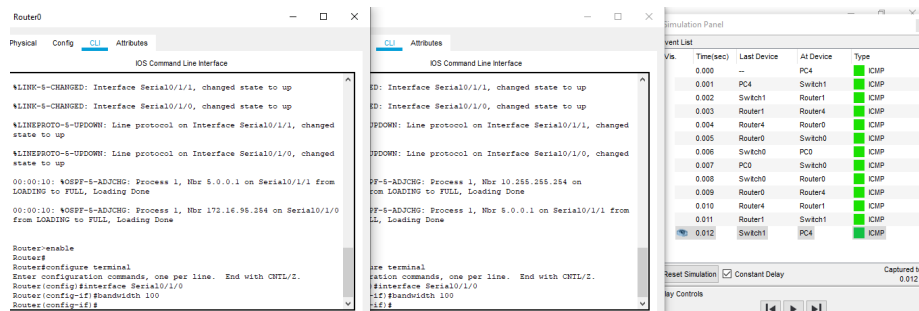


Figure 54: PC4 a PC0 con link de 100 kbps

Al enviar el mensaje desde PC4 a PC1 tomó la siguiente ruta

$PC4 \rightarrow Switch1 \rightarrow Router1 \rightarrow Router4 \rightarrow Router0 \rightarrow Switch0 \rightarrow PC1$

Y de vuelta:

$PC1 \rightarrow Switch0 \rightarrow Router0 \rightarrow Router4 \rightarrow Router1 \rightarrow Switch1 \rightarrow PC4$

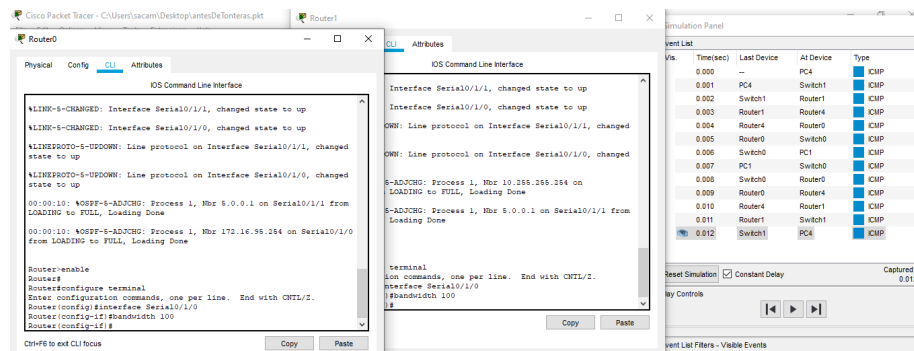


Figure 55: PC4 a PC1 con link de 100 kbps

Para ambos casos se esperaba que tanto el camino de ida como el de vuelta fuese evitando la conexión entre el router0 y el router1, dado que poseía una velocidad mucho más baja que la del camino alternativo. Durante la ida y vuelta efectivamente evitó la conexión entre Router0 y Router1. Esto se puede explicar dado que la conexión nueva es mucho más lenta, por lo que opta por tomar ese camino alternativo que sería pasar por Router4.

Luego, estableciendo una velocidad de 4000 kbps para la conexión entre Router0 y Router1 se mandó un mensaje desde PC4 a PC0, el cual siguió la siguiente ruta:

PC4 → Switch1 → Router1 → Router0 → Switch0 → PC0

Y de vuelta:

PC0 → Switch0 → Router0 → Router1 → Switch1 → PC4

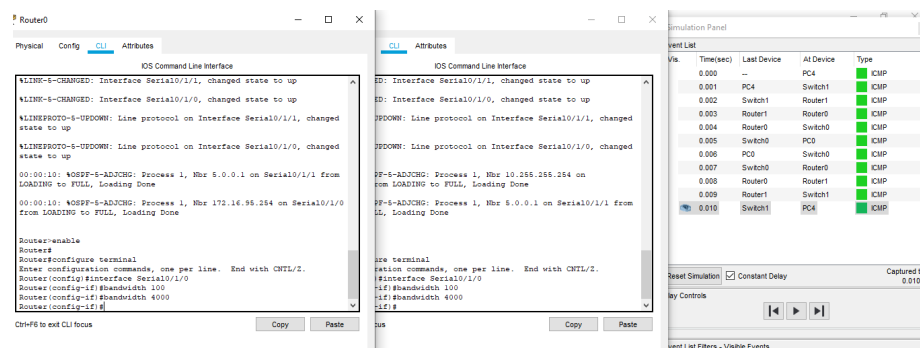


Figure 56: PC4 a PC0 con link de 100 kbps

Al enviar el mensaje desde PC4 a PC1 tomó la siguiente ruta

$PC4 \rightarrow Switch1 \rightarrow Router1 \rightarrow Router0 \rightarrow Switch0 \rightarrow PC1$

Y de vuelta:

$PC1 \rightarrow Switch0 \rightarrow Router0 \rightarrow Router1 \rightarrow Switch1 \rightarrow PC4$

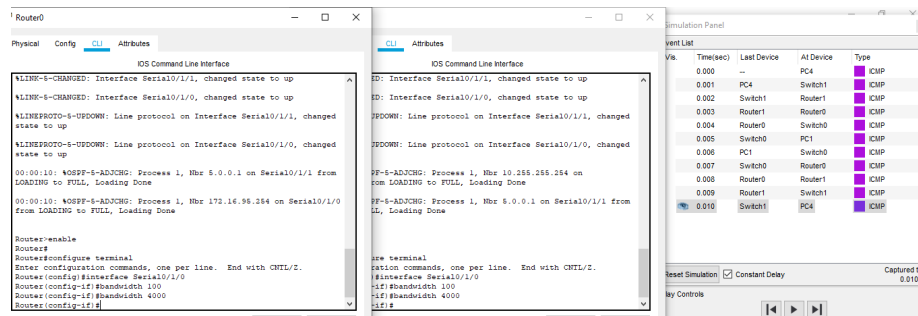
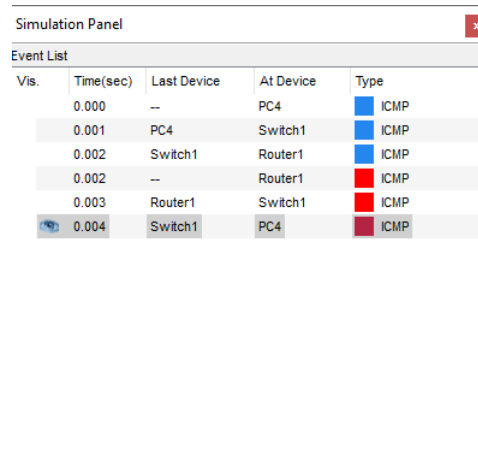


Figure 57: PC4 a PC1 con link de 100 kbps

Antes del envío de los mensajes esperábamos de que se siguiera la antigua ruta (que pasara por la conexión entre Router0 y Router1), ya que además de ahorrarse un link esta ruta era más rápida, y efectivamente eso ocurrió para PC0 y PC1 tanto de ida como de vuelta.

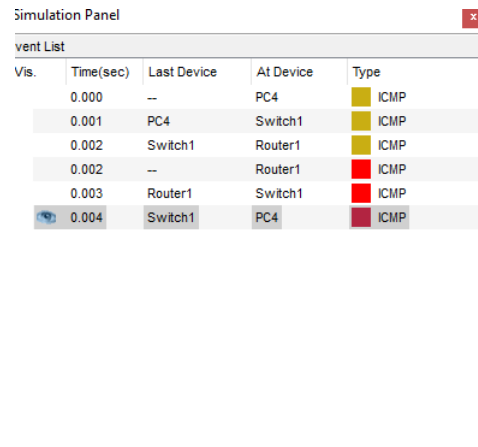
5. Tras cortar la conexión entre Router4 y Router3, se mandó un mensaje desde PC4 a PC2 y a PC3, lo cual resultó en lo que se muestra en las imágenes:



Simulation Panel

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.002	--	Router1	ICMP
	0.003	Router1	Switch1	ICMP
	0.004	Switch1	PC4	ICMP

Figure 58: PC4 a PC2



Simulation Panel

Vis.	Time(sec)	Last Device	At Device	Type
	0.000	--	PC4	ICMP
	0.001	PC4	Switch1	ICMP
	0.002	Switch1	Router1	ICMP
	0.002	--	Router1	ICMP
	0.003	Router1	Switch1	ICMP
	0.004	Switch1	PC4	ICMP

Figure 59: PC4 a PC3

En ambos casos pensamos de que el mensaje simplemente tomaría la ruta por Router2 y luego a Router3, sin embargo el mensaje no logró llegar con éxito. Esto se debe a que BGP define inicialmente la ruta más corta, la cual era pasar directamente hacia el Router3, pero al eliminar la conexión el Router4 pierde esta información y no logra redireccionar el mensaje hacia su destino.

Luego, se reparó la conexión entre Router3 y Router4 asignándole una velocidad de 100 kbps. Se mandó un mensaje desde PC4 a PC2 y a PC3, lo cual resultó en lo que se muestra en las imágenes:

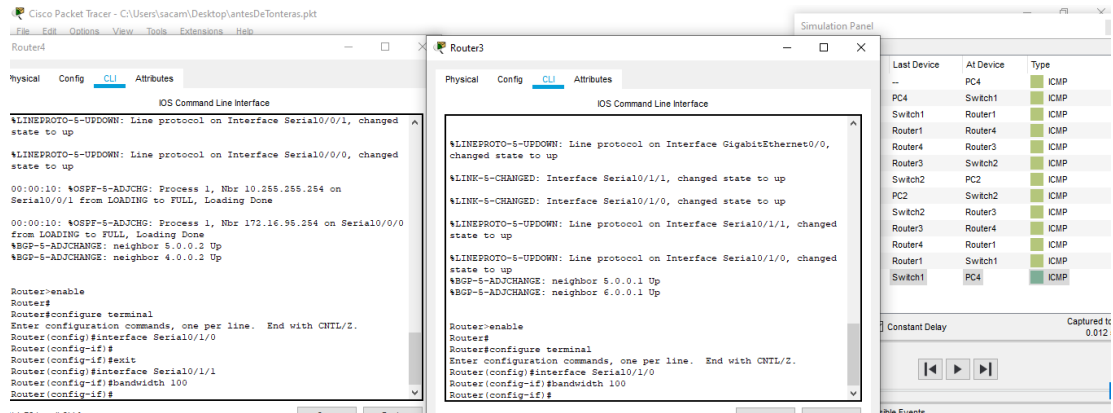


Figure 60: PC4 a PC2 con link de 100 kbps

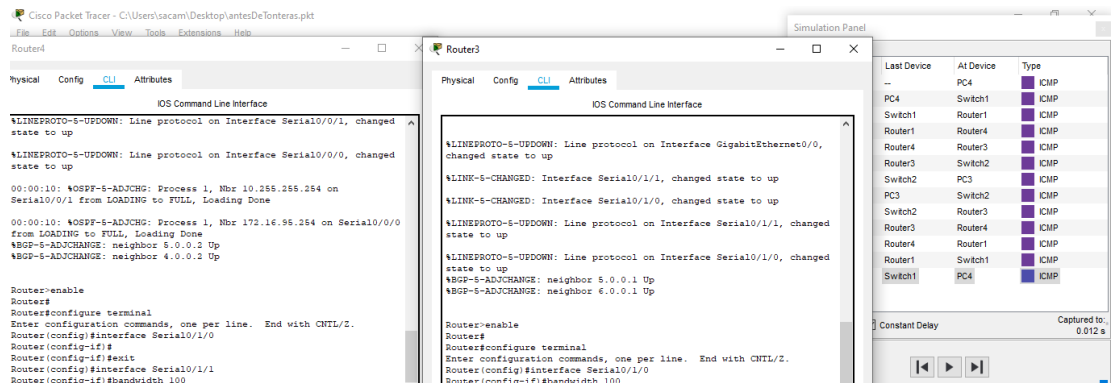


Figure 61: PC4 a PC3 con link de 100 kbps

En ambos casos pensábamos de que el mensaje seguiría una ruta que evitara la conexión entre Router4 y Router3, ya que es más lenta. Sin embargo, el mensaje siguió la ruta directa. Esto se debe al mismo caso con el link roto, ya que BGP tenía esa ruta guardada como la más rápida, y no se actualizó cuando se redujo el ancho de banda.

Finalmente, se estableció una velocidad de 4000 kbps para la conexión entre Router4 y Router3. Se mandó un mensaje desde PC4 a PC2 y a PC3, lo cual resultó en lo que se muestra en las imágenes:

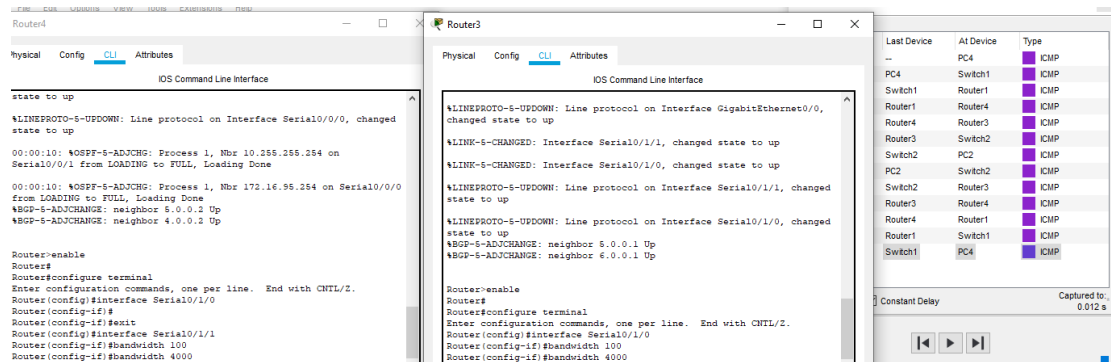


Figure 62: PC4 a PC2 con link de 4000 kbps

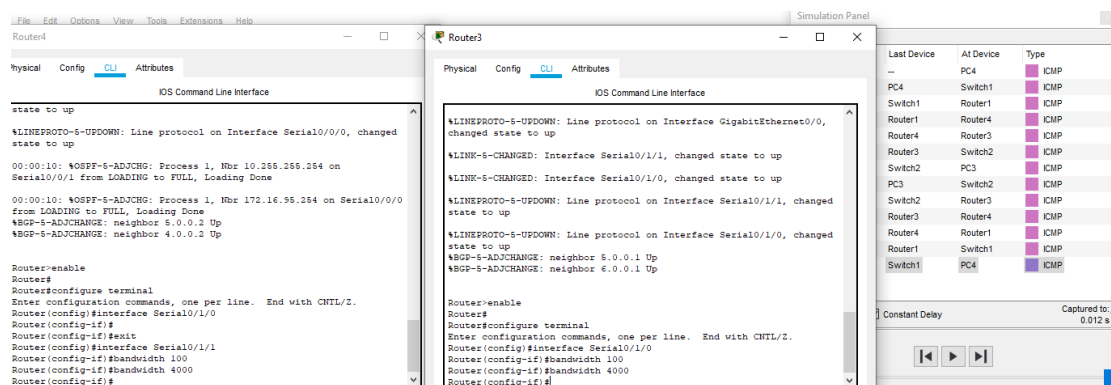


Figure 63: PC4 a PC3 con link de 4000 kbps

En ambos casos pensábamos de que el mensaje pasaría por la conexión directa entre Router4 y Router3, y efectivamente lo hizo. Sin embargo, la razón debe ser por la misma que los 2 experimentos anteriores (sin conexión y con conexión de 100 kbps) en la que BGP simplemente utiliza la ruta que tenía guardada originalmente y que no depende del nuevo ancho de banda asignado.

Finalmente, se procede a adjuntar las tablas de ruta de cada uno de los routers:

```

Router0
Physical Config CLI Attributes
IOS Command Line Interface
Router(config)#interface Serial0/1/0
Router(config-if)#bandwidth 100
Router(config-if)#bandwidth 4000
Router(config-if)#bandwidth 1544
Router(config-if)#exit
Router(config)#exit
Router#show ip route ospf
% Ambiguous command: "show ip route ospf"
Router#show ip route ospf
O    1.0.0.0 [110/128] via 2.0.0.2, 00:01:15, Serial0/1/1
      [110/128] via 3.0.0.2, 00:01:15, Serial0/1/0
O E2 4.0.0.0 [110/20] via 2.0.0.2, 00:08:43, Serial0/1/1
O E2 5.0.0.0 [110/20] via 2.0.0.2, 00:08:43, Serial0/1/1
O E2 6.0.0.0 [110/20] via 2.0.0.2, 00:07:58, Serial0/1/1
      10.0.0.0/8 is variably subnetted, 3 subnets, 3 masks
O E2  10.144.0.0 [110/20] via 2.0.0.2, 00:07:58, Serial0/1/1
      172.16.0.0/19 is subnetted, 1 subnets
O    172.16.64.0 [110/65] via 3.0.0.2, 00:01:15, Serial0/1/0
      192.168.0.0/26 is subnetted, 1 subnets
O E2  192.168.0.128 [110/20] via 2.0.0.2, 00:07:58, Serial0/1/1

Router#show ip route bgp

Router#

```

Figure 64: Tabla de rutas router 0

```

Router1
Physical Config CLI Attributes
IOS Command Line Interface
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial0/1/0
Router(config-if)#bandwidth 100
Router(config-if)#bandwidth 4000
Router(config-if)#bandwidth 1544
Router(config-if)#exit
Router(config)#exit
Router#show ip route ospf
O    2.0.0.0 [110/128] via 1.0.0.2, 00:01:15, Serial0/1/1
      [110/128] via 3.0.0.1, 00:01:15, Serial0/1/0
O E2 4.0.0.0 [110/20] via 1.0.0.2, 00:08:43, Serial0/1/1
O E2 5.0.0.0 [110/20] via 1.0.0.2, 00:08:43, Serial0/1/1
O E2 6.0.0.0 [110/20] via 1.0.0.2, 00:07:58, Serial0/1/1
      10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2  10.144.0.0 [110/20] via 1.0.0.2, 00:07:58, Serial0/1/1
      10.192.0.0 [110/65] via 3.0.0.1, 00:01:15, Serial0/1/0
      192.168.0.0/26 is subnetted, 1 subnets
O E2  192.168.0.128 [110/20] via 1.0.0.2, 00:07:58, Serial0/1/1

Router#show ip route bgp

Router#

```

Figure 65: Tabla de rutas router 1

Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

```
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed
state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed
state to up
%BGP-5-ADJCHANGE: neighbor 6.0.0.2 Up
%BGP-5-ADJCHANGE: neighbor 4.0.0.1 Up

Router>enable
Router#show ip route ospf
Router#show ip route bgp
B 1.0.0.0/8 [20/20] via 4.0.0.1, 00:00:00
B 2.0.0.0/8 [20/20] via 4.0.0.1, 00:00:00
B 3.0.0.0/8 [20/1064] via 4.0.0.1, 00:00:00
B 5.0.0.0/8 [20/0] via 4.0.0.1, 00:00:00
B 10.192.0.0/10 [20/65] via 4.0.0.1, 00:00:00
B 172.16.64.0 [20/65] via 4.0.0.1, 00:00:00
B 192.168.0.128 [20/0] via 6.0.0.2, 00:00:00

Router#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Figure 66: Tabla de rutas router 2

Router3

Physical Config **CLI** Attributes

IOS Command Line Interface

```
%BGP-5-ADJCHANGE: neighbor 5.0.0.1 Up
%BGP-5-ADJCHANGE: neighbor 6.0.0.1 Up

Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial0/1/0
Router(config-if)#bandwidth 100
Router(config-if)#bandwidth 4000
Router(config-if)#bandwidth 1544
Router(config-if)#exit
Router(config)#exit
Router#show ip route ospf
Router#show ip route bgp
B 1.0.0.0/8 [20/20] via 5.0.0.1, 00:00:00
B 2.0.0.0/8 [20/20] via 5.0.0.1, 00:00:00
B 3.0.0.0/8 [20/1064] via 5.0.0.1, 00:00:00
B 4.0.0.0/8 [20/0] via 5.0.0.1, 00:00:00
B 10.144.0.0/12 [20/0] via 6.0.0.1, 00:00:00
B 10.192.0.0/10 [20/65] via 5.0.0.1, 00:00:00
B 172.16.64.0 [20/65] via 5.0.0.1, 00:00:00

Router#
```

Ctrl+F6 to exit CLI focus

Copy Paste

Figure 67: Tabla de rutas router 3

```
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface Serial0/1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/1
Router(config-if)#bandwidth 100
Router(config-if)#bandwidth 4000
Router(config-if)#bandwidth 1544
Router(config-if)#exit
Router(config)#exit
Router#show ip route ospf
  10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O   10.192.0.0 [110/65] via 2.0.0.1, 00:08:48, Serial0/0/1
   172.16.0.0/19 is subnetted, 1 subnets
O   172.16.64.0 [110/65] via 1.0.0.1, 00:08:38, Serial0/0/0

Router#show ip route bgp
B    3.0.0.0/8 [20/1064] via 1.0.0.1, 00:00:00
B    6.0.0.0/8 [20/0] via 5.0.0.2, 00:00:00
B   10.144.0.0/12 [20/0] via 4.0.0.2, 00:00:00
B   192.168.0.128 [20/0] via 5.0.0.2, 00:00:00

Router#
```

Figure 68: Tabla de rutas router 4