HY435 - Lab 3
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1. Routing Tables:

1.1. PCs:

PC 1:

Address	Gateway	Interface
0.0.0.0/0	147.52.20.149	eth0
192.168.4.0	0.0.0.0	vlan1000

PC2:

Address	Gateway	Interface
0.0.0.0.0/0	192.168.8.1	eth0
192.168.8.0/24	0.0.0.0	eth0
192.168.4.0	0.0.0.0	vlan1000

PC3:

Address	Gateway	Interface
0.0.0.0.0/0	192.168.9.1	eth0
192.168.9.0/24	0.0.0.0	eth0
192.168.4.0/24	0.0.0.0	vlan1000

1.2. Routers

R2:
Kernel IP routing table

Destination	Gateway	Genmask	Flags	MSS	Window	irtt	Iface
0.0.0.0	10.0.0.1	0.0.0.0	UG	0	0	0	eth2
10.0.0.0	0.0.0.0	255.255.255.0	U	0	0	0	eth2
147.52.17.0	10.0.0.1	255.255.255.0	UG	0	0	0	eth2
147.52.20.128	10.0.0.1	255.255.255.128	UG	0	0	0	eth2
147.52.20.144	0.0.0.0	255.255.255.240	U	0	0	0	eth4
192.168.0.0	192.168.21.1	255.255.252.0	UG	0	0	0	eth3
192.168.4.0	0.0.0.0	255.255.255.0	U	0	0	0	eth0.1000
192.168.8.0	192.168.21.1	255.255.255.0	UG	0	0	0	eth3
192.168.9.0	192.168.21.1	255.255.255.0	UG	0	0	0	eth3
192.168.20.0	192.168.21.1	255.255.255.252	UG	0	0	0	eth3
192.168.21.0	0.0.0.0	255.255.255.252	U	0	0	0	eth3
192.168.22.0	0.0.0.0	255.255.255.252	U	0	0	0	eth1

R3:
Kernel IP routing table

Destination	Gateway	Genmask	Flags	MSS	Window	irtt	Iface
0.0.0.0	192.168.21.2	0.0.0.0	UG	0	0	0	eth2
10.0.0.0	192.168.21.2	255.255.255.0	UG	0	0	0	eth2
147.52.17.0	192.168.21.2	255.255.255.0	UG	0	0	0	eth2
147.52.20.128	192.168.21.2	255.255.255.128	UG	0	0	0	eth2
147.52.20.144	192.168.21.2	255.255.255.240	UG	0	0	0	eth2
192.168.0.0	192.168.20.2	255.255.252.0	UG	0	0	0	eth3
192.168.4.0	0.0.0.0	255.255.255.0	U	0	0	0	eth0.1000
192.168.8.0	192.168.20.2	255.255.255.0	UG	0	0	0	eth3
192.168.9.0	192.168.20.2	255.255.255.0	UG	0	0	0	eth3
192.168.20.0	0.0.0.0	255.255.255.252	U	0	0	0	eth3
192.168.21.0	0.0.0.0	255.255.255.252	U	0	0	0	eth2
192.168.22.0	192.168.21.2	255.255.255.252	UG	0	0	0	eth2

R4:
Kernel IP routing table

Destination	Gateway	Genmask	Flags	MSS	Window	irtt	Iface
0.0.0.0	192.168.0.3	0.0.0.0	UG	0	0	0	eth3
10.0.0.0	192.168.0.3	255.255.255.0	UG	0	0	0	eth3
147.52.17.0	192.168.0.3	255.255.255.0	UG	0	0	0	eth3
147.52.20.128	192.168.0.3	255.255.255.128	UG	0	0	0	eth3
147.52.20.144	192.168.0.3	255.255.255.240	UG	0	0	0	eth3
192.168.0.0	0.0.0.0	255.255.252.0	U	0	0	0	eth3
192.168.4.0	0.0.0.0	255.255.255.0	U	0	0	0	eth0.1000
192.168.8.0	0.0.0.0	255.255.255.0	U	0	0	0	eth4
192.168.9.0	192.168.0.2	255.255.255.0	UG	0	0	0	eth3
192.168.20.0	192.168.0.3	255.255.255.252	UG	0	0	0	eth3
192.168.21.0	192.168.0.3	255.255.255.252	UG	0	0	0	eth3
192.168.22.0	192.168.0.3	255.255.255.252	UG	0	0	0	eth3

R5:
Kernel IP routing table

Destination	Gateway	Genmask	Flags	MSS	Window	irtt	Iface
0.0.0.0	192.168.20.1	0.0.0.0	UG	0	0	0	eth2
10.0.0.0	192.168.20.1	255.255.255.0	UG	0	0	0	eth2
147.52.17.0	192.168.20.1	255.255.255.0	UG	0	0	0	eth2
147.52.20.128	192.168.20.1	255.255.255.128	UG	0	0	0	eth2
147.52.20.144	192.168.20.1	255.255.255.240	UG	0	0	0	eth2
192.168.0.0	0.0.0.0	255.255.252.0	U	0	0	0	switch0
192.168.4.0	0.0.0.0	255.255.255.0	U	0	0	0	eth0.1000
192.168.8.0	192.168.0.1	255.255.255.0	UG	0	0	0	switch0
192.168.9.0	192.168.0.2	255.255.255.0	UG	0	0	0	switch0
192.168.20.0	0.0.0.0	255.255.255.252	U	0	0	0	eth2
192.168.21.0	192.168.20.1	255.255.255.252	UG	0	0	0	eth2
192.168.22.0	0.0.0.0	255.255.255.252	U	0	0	0	eth1

R6:
Kernel IP routing table

Destination	Gateway	Genmask	Flags	MSS	Window	irtt	Iface
0.0.0.0	192.168.0.3	0.0.0.0	UG	0	0	0	eth3
10.0.0.0	192.168.0.3	255.255.255.0	UG	0	0	0	eth3
147.52.17.0	192.168.0.3	255.255.255.0	UG	0	0	0	eth3
147.52.20.128	192.168.0.3	255.255.255.128	UG	0	0	0	eth3
147.52.20.144	192.168.0.3	255.255.255.240	UG	0	0	0	eth3
192.168.0.0	0.0.0.0	255.255.252.0	U	0	0	0	eth3
192.168.4.0	0.0.0.0	255.255.255.0	U	0	0	0	eth0.1000
192.168.8.0	192.168.0.1	255.255.255.0	UG	0	0	0	eth3
192.168.9.0	0.0.0.0	255.255.255.0	U	0	0	0	eth4
192.168.20.0	192.168.0.3	255.255.255.252	UG	0	0	0	eth3
192.168.21.0	192.168.0.3	255.255.255.252	UG	0	0	0	eth3
192.168.22.0	192.168.0.3	255.255.255.252	UG	0	0	0	eth3

2. Traceroutes

PC2 -> PC3:
traceroute to 192.168.9.2 (192.168.9.2), 30 hops max, 60 byte packets
 1 192.168.8.1 (192.168.8.1) 0.351 ms 0.340 ms 0.326 ms
 2 192.168.0.2 (192.168.0.2) 0.531 ms 0.522 ms 0.507 ms
 3 192.168.9.2 (192.168.9.2) 0.646 ms 0.773 ms *

PC3 -> PC2:
traceroute to 192.168.8.2 (192.168.8.2), 30 hops max, 60 byte packets
 1 192.168.9.1 (192.168.9.1) 0.297 ms 0.291 ms 0.274 ms
 2 192.168.0.1 (192.168.0.1) 0.562 ms 0.553 ms 0.538 ms
 3 192.168.8.2 (192.168.8.2) 0.606 ms 0.595 ms 0.565 ms

PC2 -> PC1:
traceroute to 147.52.20.150 (147.52.20.150), 30 hops max, 60 byte packets
 1 192.168.8.1 (192.168.8.1) 0.289 ms 0.260 ms 0.255 ms
 2 192.168.0.3 (192.168.0.3) 0.540 ms 0.533 ms 0.517 ms
 3 192.168.20.1 (192.168.20.1) 0.628 ms 0.611 ms 0.738 ms
 4 192.168.21.2 (192.168.21.2) 0.884 ms 0.714 ms 0.699 ms
 5 147.52.20.150 (147.52.20.150) 0.843 ms 1.050 ms 0.816 ms

PC3 -> PC1
traceroute to 147.52.20.150 (147.52.20.150), 30 hops max, 60 byte packets
 1 192.168.9.1 (192.168.9.1) 0.272 ms 0.264 ms 0.252 ms
 2 192.168.0.3 (192.168.0.3) 0.483 ms 0.475 ms 0.459 ms
 3 192.168.20.1 (192.168.20.1) 0.448 ms 0.569 ms 0.557 ms
 4 192.168.21.2 (192.168.21.2) 0.854 ms 0.657 ms 0.641 ms
 5 147.52.20.150 (147.52.20.150) 0.910 ms 0.893 ms 0.885 ms

PC1 -> 147.52.17.85 (R1:eth4)
traceroute to 147.52.17.85 (147.52.17.85), 30 hops max, 60 byte packets
 1 147.52.20.149 (147.52.20.149) 0.374 ms 0.362 ms 0.449 ms
 2 147.52.17.85 (147.52.17.85) 0.440 ms 0.426 ms 0.409 ms

PC1->8.8.8.8:
team07@comm1:~> sudo traceroute 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
 1 147.52.20.149 (147.52.20.149) 0.301 ms 0.268 ms 0.268 ms
 2 10.0.0.1 (10.0.0.1) 1.049 ms 0.726 ms 1.439 ms
 3 evros-gw.ucnet.uoc.gr (147.52.17.1) 10.992 ms 10.980 ms 10.948 ms
 4 147.52.2.209 (147.52.2.209) 2.702 ms 2.691 ms 2.566 ms
 5 10.78.140.1 (10.78.140.1) 2.555 ms 3.402 ms 3.391 ms
 6 * * *
 7 62.217.101.120 (62.217.101.120) 8.713 ms 42.973 ms 42.950 ms
 8 grnet-ias-geant-gw.mx2.ath.gr.geant.net (83.97.88.69) 8.384 ms 7.941 ms 8.025 ms
 9 ae2.mx1.mil2.it.geant.net (62.40.98.150) 32.060 ms 31.877 ms 32.027 ms
10 72.14.203.32 (72.14.203.32) 32.373 ms 33.750 ms 33.728 ms
11 108.170.245.65 (108.170.245.65) 34.290 ms 74.125.245.241 (74.125.245.241) 33.487 ms
74.125.245.225 (74.125.245.225) 32.817 ms
12 108.170.232.181 (108.170.232.181) 36.508 ms 142.250.212.243 (142.250.212.243) 33.715
ms 142.251.235.173 (142.251.235.173) 31.345 ms
13 dns.google (8.8.8.8) 31.392 ms 31.809 ms 31.645 ms

PC2->R1:eth4:
traceroute to 147.52.17.85 (147.52.17.85), 30 hops max, 60 byte packets
 1 192.168.8.1 (192.168.8.1) 0.285 ms 0.275 ms 0.267 ms
 2 192.168.0.3 (192.168.0.3) 0.494 ms 0.489 ms 0.471 ms
 3 192.168.20.1 (192.168.20.1) 0.576 ms 0.554 ms 0.544 ms
 4 192.168.21.2 (192.168.21.2) 0.672 ms 0.660 ms 0.647 ms
 5 147.52.17.85 (147.52.17.85) 0.938 ms 0.926 ms 0.917 ms

PC3 -> 147.52.17.85
traceroute to 147.52.17.85 (147.52.17.85), 30 hops max, 60 byte packets
 1 192.168.9.1 (192.168.9.1) 0.302 ms 0.268 ms 0.270 ms
 2 192.168.0.3 (192.168.0.3) 0.449 ms 0.440 ms 0.424 ms
 3 192.168.20.1 (192.168.20.1) 0.640 ms 0.627 ms 0.703 ms
 4 192.168.21.2 (192.168.21.2) 0.797 ms 0.678 ms 0.772 ms
 5 147.52.17.85 (147.52.17.85) 0.987 ms 1.102 ms 1.086 ms

3. Backup Link

We used the same back up link as Lab 3 and added its networrk (192.168.22.0/30) to the
backbone area (0.0.0.0). We used cost value of 5 in the backup link, and the default value of 1 in
the main route

The affected routes are tracerouted below (having R3 disconnected):

PC2->PC1:

traceroute to 147.52.20.150 (147.52.20.150), 30 hops max, 60 byte packets
 1 192.168.8.1 (192.168.8.1) 0.298 ms 0.265 ms 0.264 ms
 2 192.168.0.3 (192.168.0.3) 0.523 ms 0.500 ms 0.490 ms
 3 192.168.22.1 (192.168.22.1) 0.621 ms 0.600 ms 0.702 ms
 4 147.52.20.150 (147.52.20.150) 0.693 ms 0.798 ms 0.663 ms

PC3->PC1:

traceroute to 147.52.20.150 (147.52.20.150), 30 hops max, 60 byte packets
 1 192.168.9.1 (192.168.9.1) 0.297 ms 0.284 ms 0.264 ms
 2 192.168.0.3 (192.168.0.3) 0.380 ms 0.377 ms 0.347 ms
 3 192.168.22.1 (192.168.22.1) 0.634 ms 0.614 ms 0.576 ms
 4 147.52.20.150 (147.52.20.150) 0.675 ms 0.663 ms 0.647 ms

PC2->R1:eth4:

traceroute to 147.52.17.85 (147.52.17.85), 30 hops max, 60 byte packets
 1 192.168.8.1 (192.168.8.1) 0.271 ms 0.240 ms 0.240 ms
 2 192.168.0.3 (192.168.0.3) 0.374 ms 0.365 ms 0.354 ms
 3 192.168.22.1 (192.168.22.1) 0.731 ms 0.708 ms 0.683 ms
 4 147.52.17.85 (147.52.17.85) 2.142 ms 1.135 ms 1.470 ms

PC3->R1:eth4:

traceroute to 147.52.20.150 (147.52.20.150), 30 hops max, 60 byte packets
 1 192.168.9.1 (192.168.9.1) 0.297 ms 0.284 ms 0.264 ms
 2 192.168.0.3 (192.168.0.3) 0.380 ms 0.377 ms 0.347 ms
 3 192.168.22.1 (192.168.22.1) 0.634 ms 0.614 ms 0.576 ms
 4 147.52.20.150 (147.52.20.150) 0.675 ms 0.663 ms 0.647 ms