CSE421-LAB

Computer Networks

LAB Project - TOPIC 4

Valorant: A Sentinel’s Eagle Eye

Section: 02

Group: 34

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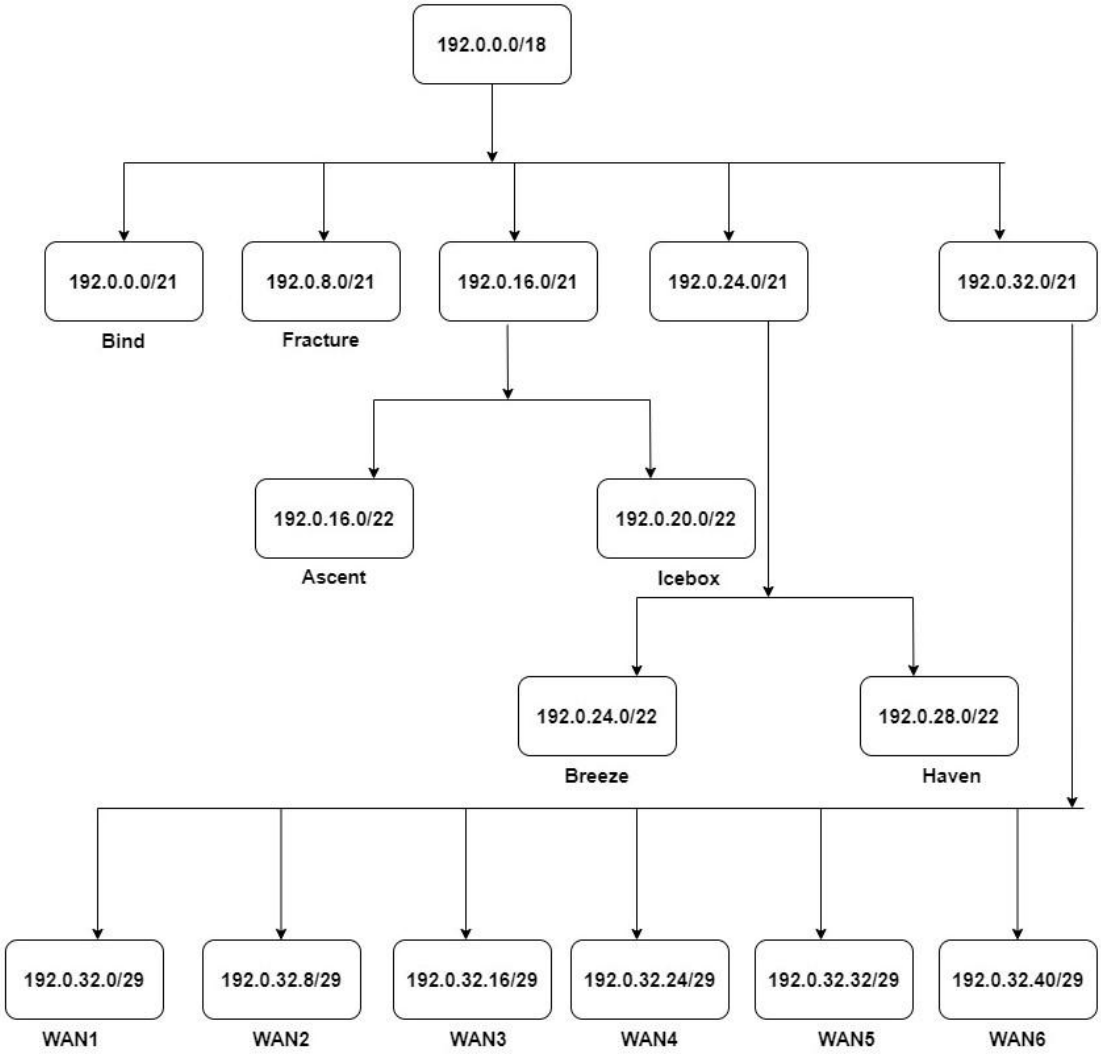
Assumptions:

- Network Address 192.0.0.0/18.
- We have set a floating route in the Fracture to Bind connection.
- As Bind and Ascent are the most important cities we have used dynamic routing in these two maps. The rest of other cities are routed through standard static routing.
- We have doubled the number of IP addresses as we are asked to use only the odd IP addresses.
- From the table we have tried to find the shortest path with the help of the Dijkstra algorithm assuming Haven is the source.

VLSM Details

Router Name	Host Size	Assigned IP	Double Assigned IP(can’t use even IP)	IP block size	Host Bit	Network bit
Bind (A)	**780**	**782**	**1564**	**2048**	**11**	**21**
Fracture(B)	**674**	**676**	**1352**	**2048**	**11**	**21**
Ascent(C)	**484**	**486**	**972**	**1024**	**10**	**22**
Icebox(D)	**441**	**443**	**886**	**1024**	**10**	**22**
Breeze(E)	**359**	**361**	**722**	**1024**	**10**	**22**
Haven(F)	**293**	**295**	**590**	**1024**	**10**	**22**
WAN1(G)	**2**	**4**	**8**	**8**	**3**	**29**
WAN2(H)	**2**	**4**	**8**	**8**	**3**	**29**
WAN3(I)	**2**	**4**	**8**	**8**	**3**	**29**
WAN4(J)	**2**	**4**	**8**	**8**	**3**	**29**
WAN5(K)	**2**	**4**	**8**	**8**	**3**	**29**
WAN6(L)	**2**	**4**	**8**	**8**	**3**	**29**

VLSM TREE


192.0.0.0/18
192.0.0.0/21
Bind
192.0.8.0/21
Fracture
192.0.16.0/21
192.0.24.0/21
192.0.32.0/21
192.0.16.0/22
Ascent
192.0.20.0/22
Icebox
192.0.24.0/22
Breeze
192.0.28.0/22
Haven
192.0.32.0/29
WAN1
192.0.32.8/29
WAN2
192.0.32.16/29
WAN3
192.0.32.24/29
WAN4
192.0.32.32/29
WAN5
192.0.32.40/29
WAN6

ADDRESSING TABLE:

Network Address: 192.0.0.0/18

Device	Interface	IP Address	Subnet Mask	Default gateway
BIND	s0/0	192.0.32.1/29	255.255.255.248	N/A
	s1/0	192.0.32.41/29	255.255.255.248	N/A
	f2/0	192.0.0.1/21	255.255.248.0	N/A
Haven	s0/0	192.0.32.9/29	255.255.255.248	N/A
	s1/0	192.0.32.3/29	255.255.255.248	N/A
	f2/0	192.0.28.1/22	255.255.252.0	N/A
Fracture	s0/0	192.0.32.17/29	255.255.255.248	N/A
	s1/0	192.0.32.11/29	255.255.255.248	N/A
	s2/0	192.0.32.25/29	255.255.255.248	N/A
	f3/0	192.0.8.1/21	255.255.248.0	N/A
Ascent	s1/0	192.0.32.19/29	255.255.255.248	N/A
	f0/0	192.0.16.1/22	255.255.252.0	N/A
Breeze	s0/0	192.0.32.27/29	255.255.255.248	N/A
	s1/0	192.0.32.33/29	255.255.255.248	N/A
	f2/0	192.0.24.1/22	255.255.252.0	N/A
IceBox	s0/0	192.0.32.35/29	255.255.255.248	N/A
	s1/0	192.0.32.43/29	255.255.255.248	N/A
	f2/0	192.0.20.1/22	255.255.252.0	N/A
PC0	N/A	192.0.0.3/21	255.255.248.0	192.0.0.1/21
PC1	N/A	192.0.0.5/21	255.255.248.0	192.0.0.1/21
PC2	N/A	DHCP Assigned	DHCP Assigned	DHCP Assigned

Laptop0	**N/A**	**DHCP Assigned**	**DHCP Assigned**	**DHCP Assigned**
PC3	**N/A**	**DHCP Assigned**	**DHCP Assigned**	**DHCP Assigned**
Laptop1	**N/A**	**DHCP Assigned**	**DHCP Assigned**	**DHCP Assigned**
PC4	**N/A**	**192.0.16.3/22**	**255.255.252.0**	**192.0.16.1/22**
PC6	**N/A**	**192.0.16.5/22**	**255.255.252.0**	**192.0.16.1/22**
PC7	**N/A**	**DHCP Assigned**	**DHCP Assigned**	**DHCP Assigned**
PC8	**N/A**	**DHCP Assigned**	**DHCP Assigned**	**DHCP Assigned**
PC9	**N/A**	**DHCP Assigned**	**DHCP Assigned**	**DHCP Assigned**
PC10	**N/A**	**DHCP Assigned**	**DHCP Assigned**	**DHCP Assigned**
DNS Server (BIND)	**N/A**	**192.0.0.7/21**	**255.255.248.0**	**192.0.0.1/21**
Email Server (BIND)	**N/A**	**192.0.0.9/21**	**255.255.248.0**	**192.0.0.1/21**
Web Server (BIND)	**N/A**	**192.0.0.11/21**	**255.255.248.0**	**192.0.0.1/21**
Email Server2(ascent)	**N/A**	**192.0.16.7/22**	**255.255.252.0**	**192.0.16.1/22**
DHCP server1(icebox)	**N/A**	**192.0.20.3/22**	**255.255.252.0**	**192.0.20.1/22**
DHCP server2(breeze)	**N/A**	**192.0.24.3/22**	**255.255.252.0**	**192.0.24.1/22**
DHCP server3(Fracture)	**N/A**	**192.0.8.3/21**	**255.255.248.0**	**192.0.8.1/21**
DHCP server4(Haven)	**N/A**	**192.0.28.3/22**	**255.255.252.0**	**192.0.28.1/22**

Commands

Bind:

```
enable
conf t
hostname Bind
int f2/0
ip address 192.0.0.1 255.255.248.0
no shut
exit
int s0/0
ip address 192.0.32.1 255.255.255.248
no shut
exit
int s1/0
ip address 192.0.32.41 255.255.255.248
no shut
exit
exit
copy run start
```

Routing==========

```
en
conf t
ip route 0.0.0.0 0.0.0.0 192.0.32.3
router rip
version 2
no auto-summary
network 192.0.0.0
network 192.0.32.0
network 192.0.32.40
default-information originate
passive-interface f2/0
exit
end
copy run start
```

Haven:

```
enable
conf t
hostname Haven
int f2/0
ip address 192.0.28.1 255.255.252.0
no shut
exit
int s0/0
ip address 192.0.32.9 255.255.255.248
no shut
exit
int s1/0
ip address 192.0.32.3 255.255.255.248
no shut
exit
exit
copy run start
```

Routing==========

```
en
conf t
ip route 192.0.0.0 255.255.248.0 192.0.32.1
ip route 192.0.8.0 255.255.248.0 192.0.32.11
ip route 192.0.24.0 255.255.252.0 192.0.32.11
ip route 192.0.16.0 255.255.252.0 192.0.32.11
ip route 192.0.20.0 255.255.252.0 192.0.32.1
exit
```

Fracture:

enable
conf t
hostname Fracture
int f3/0
ip address 192.0.8.1 255.255.248.0
no shut
exit
int s0/0
ip address 192.0.32.17 255.255.255.248
no shut
exit
int s1/0
ip address 192.0.32.11 255.255.255.248
no shut
exit
int s2/0
ip address 192.0.32.25 255.255.255.248
no shut
exit
exit
copy run start

Routing==========

en
conf t
ip route 192.0.24.0 255.255.252.0 192.0.32.27
ip route 192.0.16.0 255.255.252.0 192.0.32.19
ip route 192.0.28.0 255.255.252.0 192.0.32.9
ip route 192.0.0.0 255.255.248.0 192.0.32.9
ip route 192.0.0.0 255.255.248.0 s2/0 5
ip route 192.0.20.0 255.255.252.0 192.0.32.27
exit

Icebox:

```
enable
conf t
hostname Icebox
int f2/0
ip address 192.0.20.1 255.255.252.0
no shut
exit
int s0/0
ip address 192.0.32.35 255.255.255.248
no shut
exit
int s1/0
ip address 192.0.32.43 255.255.255.248
no shut
exit
exit
copy run start
```

Routing==========

```
en
conf t
ip route 192.0.0.0 255.255.248.0 192.0.32.41
ip route 192.0.8.0 255.255.248.0 192.0.32.33
ip route 192.0.24.0 255.255.252.0 192.0.32.33
ip route 192.0.16.0 255.255.252.0 192.0.32.33
ip route 192.0.28.0 255.255.252.0 192.0.32.41
exit
```

Ascent:

```
enable
conf t
hostname Ascent
int f0/0
ip address 192.0.16.1 255.255.252.0
no shut
exit
int s1/0
ip address 192.0.32.19 255.255.255.248
no shut
exit
copy run start

Routing=======================================

en
conf t
ip route 0.0.0.0 0.0.0.0 192.0.32.17
router rip
version 2
no auto-summary
network 192.0.16.0
network 192.0.32.16
default-information originate
passive-interface f0/0
exit
end
copy run start
```

Breeze:

enable
conf t
hostname Breeze
interface Serial0/0
ip address 192.0.32.27 255.255.255.248
no shut
exit
interface Serial1/0
ip address 192.0.32.33 255.255.255.248
no shut
exit
interface FastEthernet2/0
ip address 192.0.24.1 255.255.252.0
no shut
exit
exit
copy run start

Routing==========

en
conf t
ip route 192.0.0.0 255.255.248.0 192.0.32.35
ip route 192.0.8.0 255.255.248.0 192.0.32.25
ip route 192.0.16.0 255.255.252.0 192.0.32.25
ip route 192.0.20.0 255.255.252.0 192.0.32.35
ip route 192.0.28.0 255.255.252.0 192.0.32.25
Exit

Dijkstra Algorithm

	Bind	Ascent	Fracture	Breeze	Icebox	Haven
Haven	317_{Haven}	820_{Haven}	184_{Haven}	940_{haven}	682_{Haven}	0_{Haven}
Fracture	317_{Haven}	$286_{Fracture}$	184_{Haven}	$618_{Fracture}$	682_{Haven}	
Ascent	317_{Haven}	$286_{Fracture}$		$618_{Fracture}$	650_{Haven}	
Bind	317_{Haven}			$618_{Fracture}$	414_{Bind}	
Icebox				$618_{Fracture}$	414_{Bind}	
Breeze				$618_{Fracture}$		

Shortest paths: (Heaven as the Root)

Heaven → Heaven =0

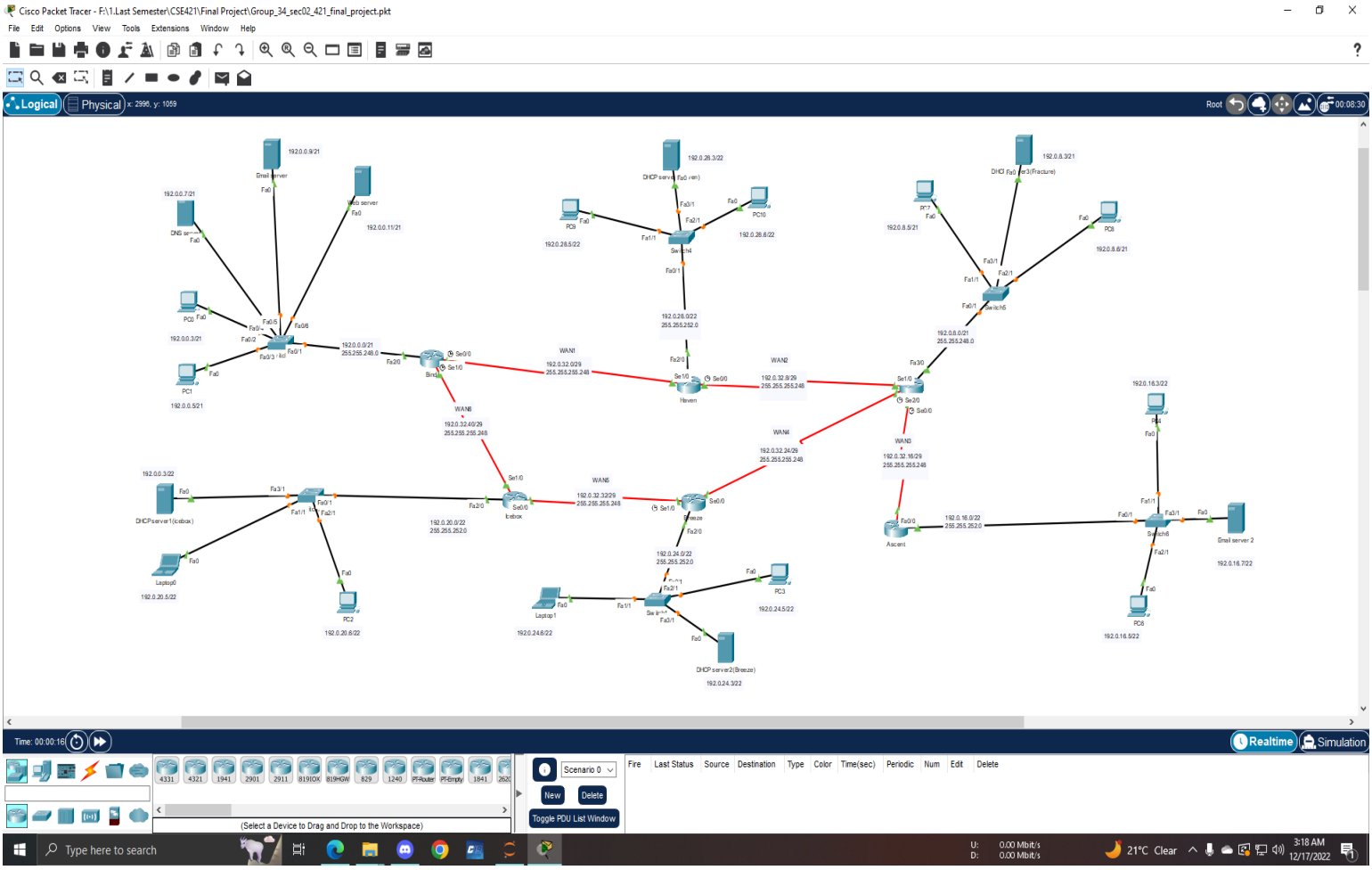
Heaven → Bind =317

Heaven → Fracture=184

Heaven → Fracture→Ascent =286

Heaven → Fracture→Breeze =618

Heaven → Bind → Icebox= 414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File Edit Options View Tools Extensions Window Help
Logical Physical
Root
Email server
Web server
DNS server
DHCP server(Fa0 / ren)
DHCP server3(Fracture)
PC0
PC1
PC2
PC3
PC4
PC5
PC6
PC7
PC8
PC9
PC10
Switch4
Switch5
Switch6
Bimta
Haven
Breeze
Ascent
Icebox
Laptop0
Laptop1
DHCPserver1(Icebox)
DHCPserver2(Breeze)
Email server 2
WAN1
WAN2
WAN3
WAN4
WAN5
WAN6
Time: 00:00:16
Realtime
Simulation
Scenario 0
New
Delete
Toggle PDU List Window
Fire
Last Status
Source
Destination
Type
Color
Time(sec)
Periodic
Num
Edit
Delete
(Select a Device to Drag and Drop to the Workspace)
Type here to search
21°C Clear
3:18 AM
12/17/2022