Addressing & VLSM Tree

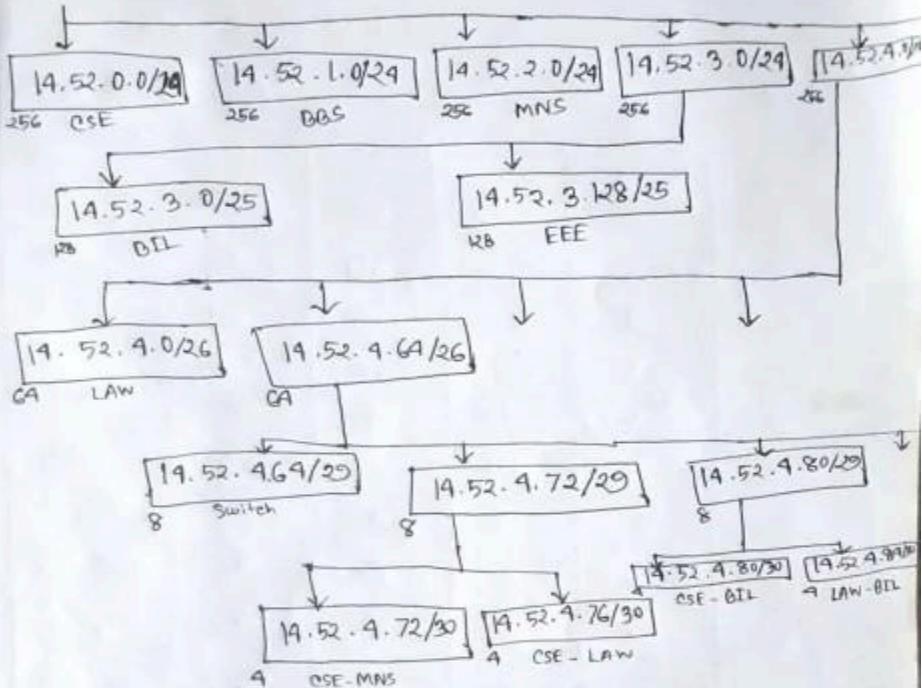1 ID – 21201452

Base network 14.52.0.0/16

2 VLSM Tree:

Department	Host	+2	IP	H.bit	N.bit
CSE	250	252	256	8	24
BBS	170	172	256	8	24
MNS	150	152	256	8	24
BIL	120	122	128	7	25
EEE	100	102	128	7	25
LAW	50	52	64	6	26
Switch	3	5	8	3	29
CSE-MNS	2	4	4	2	30
CSE-LAW	2	4	4	2	30
CSE-BIL	2	4	4	2	30
LAW-BIL	2	4	4	2	30

14.52.0.0/16

14.52.0.0/24
256 CSE

14.52.1.0/24
256 BBS

14.52.2.0/24
256 MNS

14.52.3.0/24
256

14.52.4.3/?
256

14.52.3.0/25
RB BIL

14.52.3.128/25
RB EEE

14.52.4.0/26
CA LAW

14.52.4.64/26
CA

14.52.4.64/29
8 Switch

14.52.4.72/29
8

14.52.4.80/29
8

14.52.4.80/30
CSE - BIL

14.52.4.??/??
4 LAW - BIL

14.52.4.72/30
4 CSE - MNS

14.52.4.76/30
4 CSE - LAW

CSE = 14.52.0.0/24
BBS = 14.52.1.0/24
MNS = 14.52.2.0/24
BIL = 14.52.3.0/25
EEE = 14.52.3.128/25
LAW = 14.52.4.0/26
Switch - 14.52.4.64/29

CSE - MNS - 14.52.4.72/30
CSE - LAW - 14.52.4.76/30
CSE - BIL - 14.52.4.80/30
LAW - BIL - 14.52.4.84/30

IP Address Table

Device	Interface	IP Address	Subnet Mask	Default Gateway
CSE Router	Gig0/0	14.52.4.66	255.255.255.248	N/A
	Gig0/2	14.52.0.1	255.255.255.0	N/A
	Se0/0/0	14.52.4.73	255.255.255.252	N/A
	Se0/1/0	14.52.4.81	255.255.255.252	N/A
	Se0/0/1	14.52.4.77	255.255.255.252	N/A
MNS Router	Gig0/1	14.52.2.1	255.255.255.0	N/A
	Se0/0/0	14.52.4.74	255.255.255.252	N/A
BBS Router	Gig0/0	14.52.4.67	255.255.255.248	N/A
	Gig0/2	14.52.1.1	255.255.255.0	N/A
EEE Router	Gig0/0	14.52.4.68	255.255.255.248	N/A
	Gig0/2	14.52.3.129	255.255.255.128	N/A
BIL Router	Gig0/0	14.52.3.1	255.255.255.128	N/A
	Se0/0/0	14.52.4.85	255.255.255.252	N/A
	Se0/0/1	14.52.4.82	255.255.255.252	N/A
LAW Router	Gig0/0	14.52.4.1	255.255.255.192	N/A
	Se0/0/0	14.52.4.86	255.255.255.252	N/A

	Se0/0/1	14.52.4.78	255.255.255.252	N/A
PC0	Fa0	14.52.3.136	255.255.255.128	14.52.3.129
PC1	Fa0	14.52.3.134	255.255.255.128	14.52.3.129
PC2	Fa0	14.52.1.2	255.255.255.0	14.52.1.1
PC3	Fa0	14.52.1.3	255.255.255.0	14.52.1.1
PC4	Fa0	14.52.0.5	255.255.255.0	14.52.0.1
PC5	Fa0	14.52.0.6	255.255.255.0	14.52.0.1
PC6	Fa0	DHCP	255.255.255.128	14.52.3.1
PC7	Fa0	DHCP	255.255.255.128	14.52.3.1
PC8	Fa0	DHCP	255.255.255.192	14.52.4.1
PC9	Fa0	DHCP	255.255.255.192	14.52.4.1
PC10	Fa0	DHCP	255.255.255.0	14.52.2.1
PC11	Fa0	DHCP	255.255.255.0	14.52.2.1
Printer 0	0	14.52.3.132	255.255.255.128	14.52.3.129
Printer 1	0	14.52.1.4	255.255.255.0	14.52.1.1
Printer 2	0	14.52.0.7	255.255.255.0	14.52.0.1
Printer 3	0	14.52.3.4	255.255.255.128	14.52.3.1

Printer 4	0	14.52.4.3	255.255.255.192	14.52.4.1
Printer 5	0	14.52.2.13	255.255.255.0	14.52.2.1
Email Server 0	Fa0	14.52.0.2	255.255.255.0	14.52.0.1
Email Server 1	Fa0	14.52.1.5	255.255.255.0	14.52.1.1
Email Server 2	Fa0	14.52.3.130	255.255.255.128	14.52.3.129
Email Server 3	Fa0	14.52.3.3	255.255.255.128	14.52.3.1
Email Server 4	Fa0	14.52.4.2	255.255.255.192	14.52.4.1
Email Server 5	Fa0	14.52.2.2	255.255.255.0	14.52.2.1
DHCP Server 1	Fa0	14.52.4.4	255.255.255.128	14.52.4.1
DHCP Server 2	Fa0	14.52.3.2	255.255.255.128	14.52.3.1
CSE Web Server	Fa0	14.52.0.3	255.255.255.0	14.52.0.1
MNS Web Server	Fa0	14.52.2.3	255.255.255.0	14.52.2.1
DNS Server	Fa0	14.52.0.4	255.255.255.0	14.52.0.1

Configuration Commands

Router Configuration

cse router

Router> enable
Router# configure terminal
Router(config)# interface GigabitEthernet0/2
Router(config-if)# ip address 14.52.0.1 255.255.255.0
Router(config-if)# no shutdown
Router(config-if)# exit

Router(config)# interface Serial0/0/0
Router(config-if)# ip address 14.52.4.73 255.255.255.252
Router(config-if)# no shutdown
Router(config-if)# exit

Router(config)# interface Serial0/0/1
Router(config-if)# ip address 14.52.4.77 255.255.255.252
Router(config-if)# no shutdown
Router(config-if)# exit

Router(config)# interface Serial0/1/0
Router(config-if)# ip address 14.52.4.81 255.255.255.252
Router(config-if)# no shutdown

Router(config)# interface GigabitEthernet0/0
Router(config-if)# ip address 14.52.4.66,255.255.255.248
Router(config-if)# no shutdown

bil router

Router> enable
Router# configure terminal
Router(config)# interface GigabitEthernet0/0
Router(config-if)# ip address 14.52.3.1 255.255.255.128
Router(config-if)# no shutdown
Router(config-if)# exit

Router(config)# interface Serial0/0/1
Router(config-if)# ip address 14.52.4.82 255.255.255.252
Router(config-if)# no shutdown
Router(config-if)# exit

Router(config)# interface Serial0/0/0
Router(config-if)# ip address 14.52.4.85 255.255.255.252
Router(config-if)# no shutdown

law router

Router> enable
Router# configure terminal
Router(config)# interface GigabitEthernet0/0
Router(config-if)# ip address 14.52.4.1 255.255.255.192
Router(config-if)# no shutdown
Router(config-if)# exit

Router(config)# interface Serial0/0/1
Router(config-if)# ip address 14.52.4.78 255.255.255.252
Router(config-if)# no shutdown
Router(config-if)# exit

Router(config)# interface Serial0/0/0
Router(config-if)# ip address 14.52.4.86 255.255.255.252
Router(config-if)# no shutdown

mns router

Router> enable
Router# configure terminal
Router(config)# interface GigabitEthernet0/1
Router(config-if)# ip address 14.52.2.1 255.255.255.0
Router(config-if)# ip helper-address 14.52.0.4
Router(config-if)# no shutdown

```
Router(config-if)# exit

Router(config)# interface Serial0/0/0
Router(config-if)# ip address 14.52.4.74 255.255.255.252
Router(config-if)# no shutdown
```

eee router

```
Router> enable
Router# configure terminal
Router(config)# interface GigabitEthernet0/2
Router(config-if)# ip address 14.52.3.129 255.255.255.128
Router(config-if)# no shutdown
Router(config-if)# exit

Router(config)# interface GigabitEthernet0/0
Router(config-if)# ip address 14.52.4.68,255.255.255.248
Router(config-if)# no shutdown
```

bbs router

```
Router> enable
Router# configure terminal
Router(config)# interface GigabitEthernet0/2
Router(config-if)# ip address 14.52.1.1 255.255.255.0
Router(config-if)# no shutdown

Router(config)# interface GigabitEthernet0/0
Router(config-if)# ip address 14.52.4.67,255.255.255.248
Router(config-if)# no shutdown
```

central switch

```
Router> enable
Router# configure terminal
Switch(config)# interface vlan 1
Switch(config-if)# ip address 14.52.4.65 255.255.255.248
Switch(config-if)# no shutdown
```

DHCP Configuration

```
en
conf t

ip dhcp excluded-address 14.52.0.1 14.52.0.20
ip dhcp excluded-address 14.52.1.1 14.52.1.10
ip dhcp excluded-address 14.52.2.1 14.52.2.10
ip dhcp excluded-address 14.52.3.129 14.52.3.140

ip dhcp pool CSE_POOL
network 14.52.0.0 255.255.255.0
default-router 14.52.0.1
dns-server 14.52.0.4
exit

ip dhcp pool BBS_POOL
network 14.52.1.0 255.255.255.0
default-router 14.52.1.1
dns-server 14.52.0.4
exit

ip dhcp pool MNS_POOL
network 14.52.2.0 255.255.255.0
default-router 14.52.2.1
dns-server 14.52.0.4
exit

ip dhcp pool EEE_POOL
network 14.52.3.128 255.255.255.128
default-router 14.52.3.129
dns-server 14.52.0.4
exit

en
conf t
int g0/1
ip helper-address 14.52.4.73
exit

en
```

```
conf t
int g0/2
ip helper-address 14.52.4.66
no shutdown
exit

en
conf t
int g0/2
ip helper-address 14.52.4.67
exit

en
conf t
ip dhcp excluded-address 14.52.4.1 14.52.4.10
ip dhcp pool LAW_POOL
network 14.52.4.0 255.255.255.192
default-router 14.52.4.1
dns-server 14.52.0.4
exit

en
conf t
ip dhcp excluded-address 14.52.3.1 14.52.3.10
ip dhcp pool BIL_POOL
network 14.52.3.0 255.255.255.128
default-router 14.52.3.1
dns-server 14.52.0.4
exit
```

Routing Configuration

```
en
conf t
router rip
version 2
no auto-summary
network 14.52.0.0
network 14.52.4.64
exit
```

```
en
conf t
router rip
version 2
no auto-summary
network 14.52.3.128
network 14.52.4.64
exit

en
conf t
router rip
version 2
no auto-summary
network 14.52.1.0
network 14.52.4.64
exit

en
conf t
ip route 0.0.0.0 0.0.0.0 14.52.4.73

en
conf t
ip route 14.52.2.0 255.255.255.0 14.52.4.74
ip route 14.52.4.0 255.255.255.192 14.52.4.78
ip route 14.52.3.0 255.255.255.128 14.52.4.82
exit

en
conf t
ip route 0.0.0.0 0.0.0.0 14.52.4.77
ip route 0.0.0.0 0.0.0.0 14.52.4.85 10
exit

en
conf t
ip route 0.0.0.0 0.0.0.0 14.52.4.81
ip route 0.0.0.0 0.0.0.0 14.52.4.86 10
exit

en
conf t
```

```
ip route 14.52.2.0 255.255.255.0 14.52.4.66
exit

en
conf t
ip route 14.52.2.0 255.255.255.0 14.52.4.66
exit

en
conf t
router rip
version 2
redistribute static
exit
```