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Date: 5/12/25

Day: _____

CL-3001 - CNET LAB:-

Final VLSM Tree & Calculations:-

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(I) VLSM Calculations:-

- Base Network: 89.180.0.0 /14
- Total Available IPs : $2^{(32-14)} = 2^{18} = 262,144$ IPs
- Range: 89.180.0.0 to 89.183.255.255.

1) Network A:-

- Hosts Required: 43,741
- Need N where $2^N - 2 \geq 43,741$
- $2^{16} = 65,536$
- CIDR = $32 - 16 = /16$
- Allocation: 89.180.0.0 /16
- Next Available IP: 89.181.0.0

2) Network E:-

- Hosts Required: 16,084
- $2^{15} = 32,768$
- CIDR = $32 - 15 = /17$
- Allocation: 89.181.0.0 /17
- Next Available IP: 89.181.128.0

3) Network B:-

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- Hosts Required: 11,904
- Need $2^{14} = 16,384$
- CIDR = $32 - 14 = /18$
- Allocation: 89.181.128.0/18
- Next Available IP: 89.181.192.0

4) Network L:-

- Hosts Required: 11,724
- Need $2^{14} = 16,384$
- CIDR = $32 - 14 = /18$
- Allocation: 89.181.192.0/18
- This completes the 89.181.x.x block
- Next Available IP: 89.182.0.0

5) Network M:-

- Hosts Required: 8,603
- $2^{14} = 16,384$
- CIDR = $32 - 14 = /18$
- Allocation: 89.182.0.0/18
- Next Available IP: 89.182.64.0

6) Network C:-

- Hosts Required: 6,921
- Need $2^{13} = 8,192$
- CIDR = $32 - 13 = /19$
- Allocation: 89.182.64.0/19
- Next Available IP: 89.182.96.0

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7) Network D:-

- Hosts Required: 3,797
- Need $2^{12} = 4,096$
- CIDR = $32 - 12 = /20$
- Allocation: 89.182.96.0/20
- Next Available IP: 89.182.112.0

8) Network N:-

- Hosts Required: 1,603
- Need $2^{11} = 2,048$
- CIDR = $32 - 11 = /21$
- Allocation: 89.182.112.0/21
- Next Available IP: 89.182.120.0

9) Network H:-

- Hosts Required: 1,071
- Need $2^{11} = 2,048$
- CIDR = $32 - 11 = /21$
- Allocation: 89.182.120.0/21
- Next Available IP: 89.182.128.0

10) Network J:-

- Hosts Required: 575
- Need $2^{10} = 1,024$
- CIDR = $32 - 10 = /22$
- Allocation: 89.182.128.0/22
- Next Available IP: 89.182.132.0

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- Allocations:-

- Link 1 : 89.183.255.0 /30

- Link 2 : 89.183.255.4 /30

..... (sequential allocation)

(II) Table 1 - Main Network Allocation:- (89.180.0.0/14)

Network	Hosts	CIDR	Subnet Mask	Network Address	Gateway IP	Broadcast Address
A	43,741	/16	255.255.0.0	89.180.0.0	89.180.0.1	89.180.255.255
E	16,084	/17	255.255.128.0	89.181.0.0	89.181.0.1	89.181.127.255
B	11,904	/18	255.255.192.0	89.181.128.0	89.181.128.1	89.181.191.255
L	11,724	/18	255.255.192.0	89.181.192.0	89.181.192.1	89.181.255.255
M	8,603	/18	255.255.192.0	89.182.0.0	89.182.0.1	89.181.63.255
C	6,921	/19	255.255.224.0	89.182.64.0	89.182.64.1	89.182.95.255
D	3,797	/20	255.255.240.0	89.182.96.0	89.182.96.1	89.182.111.255
N	1,603	/21	255.255.248.0	89.182.112.0	89.182.112.1	89.182.119.255
H	1,071	/21	255.255.248.0	89.182.120.0	89.182.120.1	89.182.127.255
J	575	/22	255.255.252.0	89.182.128.0	89.182.128.1	89.182.131.255
I	501	/23	255.255.254.0	89.182.132.0	89.182.132.1	89.182.133.255
F	343	/23	255.255.254.0	89.182.134.0	89.182.134.1	89.182.135.255

(III) Table 2 - Private Network (NAT):- (192.168.0.0/19)

Network	Hosts	CIDR	Subnet Mask	Network Address	Gateway IP	Broadcast Address
G	4,412	/19	255.255.224.0	192.168.0.0	192.168.0.1	192.168.31.255

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(IV) Table 3 - Vacant Subnets :- (89.182.136.0)

Device	Router	Network Address	Subnet Mask	Gateway IP
Web Server	R5	89.182.140.0	255.255.255.0	89.182.140.1
Server 4	R13	89.182.141.0	255.255.255.0	89.182.141.1
DHCP-2	R14	89.182.142.0	255.255.255.0	89.182.142.1
Data Server	R18	89.182.143.0	255.255.255.0	89.182.143.1
TFTP Server	R11	89.182.144.0	255.255.255.0	89.182.144.1
DHCP-1	R25	89.182.145.0	255.255.255.0	89.182.145.1
Server 0	R0	89.182.146.0	255.255.255.0	89.182.146.1
Server 1	R3	89.182.147.0	255.255.255.0	89.182.147.1
Laptop 13	R20	89.182.150.0	255.255.255.0	89.182.150.1
Laptop 11	R22	89.182.151.0	255.255.255.0	89.182.151.1
Switch 8	R22	89.182.152.0	255.255.255.0	89.182.152.1
Laptop 4	R8	89.182.153.0	255.255.255.0	89.182.153.1
Laptop 6	R12	89.182.154.0	255.255.255.0	89.182.154.1
Laptop 14	R24	89.182.155.0	255.255.255.0	89.182.155.1
Switch 9	R26	89.182.156.0	255.255.255.0	89.182.156.1
Switch 12	R26	89.182.157.0	255.255.255.0	89.182.157.1

(V) Table 4 - Silent Networks :-

Link Name	Connection	Network Address	1 st IP	2 nd IP
Link 1	R0 - R2	89.183.255.0	.1	.2
Link 2	R0 - R1	89.183.255.4	.5	.6
Link 3	R2 - R3	89.183.255.8	.9	.10
Link 4	R2 - R4	89.183.255.12	.13	.14
Link 5	R2 - R5	89.183.255.16	.17	.18
Link 6	R3 - R5	89.183.255.20	.21	.22
...
Link 30	R26 - R27	89.183.255.116	.117	.118

(VI) Final VLSM Tree:-

89.180.0.0/14 (Public IP Base)

