Divide the Network 162.18.0.0/16 to support 2000 hosts in each subnet. Configure following four VLANs (every VLAN must have at least two PCs connected) for accessing the specified ports:

1. Subnet‐1 VLAN20 fa0/2‐6

2. Subnet‐2 VLAN30 fa0/7‐12

3. Subnet‐3 VLAN40 fa0/13‐19

4. Subnet‐4 VLAN50 fa0/20‐24

Subnetting:

162.18.0.0/16

Default Network Bits (DN) = 16

Default host bits (DH) = 16

Default Subnet Mask = 255.255.0.0

Required number of hosts/subnet = 2000 minimum

Step-1:

0 1 2 3 4 5 6 7 8 9 10 11

1 2 4 8 16 32 64 128 256 512 1024 2048

12 13 14 15

4096 8192 16384 32768

Required Number of Host bits in one subnet = 11

Step-2: Total number of host bits converted to network bits

Converted network bits (N) = DH – H = 16 – 11 = 5

Step-3: Total number network bits/subnet

TN = DN + N =16 + 5 = 21 CIDR = /21

Step-4: Calculate the subnet mask

11111111 11111111 11111000 00000000

255 255 248 0

255.255.248.0

Step-5: Total number of subnets = 2N = 25 = 32

Step-6: Total number of hosts/subnet = 2H = 211 = 2048

Step-7: Range of subnets

Compare the Default subnet mask with calculated subnet mask at step-4

DSM 255 . 255 . 0 . 0

CSM 255 . 255 . 248 . 0

256 - 248 = 8

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Subnet | N/W Id | Start IP | End IP | B/C Id |
| 1 | 162.18.0.0 | 162.18.0.1 | 162.18.7.254 | 162.18.7.255 |
| 2 | 162.18.8.0 |  |  | 162.18.15.255 |
| 3 | 162.18.16.0 |  |  |  |
| 4 | 162.18.24.0 |  |  |  |
| 5 | 162.18.32.0 |  |  |  |