

Assignment on solving Subnetting Problem

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SMUCT

Problem Statement: Suppose you are working an ISP company as a network engineer. You have been given an IP address block of 172.17.0.0/20. You must provide for the following subnet arrangement for the company:

- (a) 1st subnet, CSE Department LAN, up to 112 hosts
- (b) 2nd subnet, EEE Department LAN, up to 210 hosts
- (c) 3rd subnet, ETE Department LAN, up to 64 hosts
- (d) Point to point link between CSE and ETE,
- (e) Point to point link between CSE and EEE,
- (f) Point to point to point link between EEE and ETE.

Fill up the following table, configure the exhibit and test the connectivity of the following cases:

- (i) Ping from PC0 to PC5 (ii) PC1 to PC3 and (iii) PC2 to PC5

Subnet Name	Needed Size	Allocated Size	Network Address	Mask	Assignable Range	Broadcast Address
CSE						
EEE						
ETE						
CSE-ETE						
CSE-EEE						
EEE-ETE						

Solution of the problem: 172.17.0.0 / 20

Step 1: Sort (Descending order) the number of subnets according to their requirement

1st -- subnet, EEE Department LAN => 210 + 2 = 212 - (2⁸) /24 4th -- Point to point link between CSE and ETE => 2 + 2 = 4 - (2²) /30
2nd -- subnet, CSE Department LAN => 112 + 2 = 114 - (2⁷) /25 5th -- Point to point link between CSE and EEE => 2 + 2 = 4 - (2²) /30
3rd -- subnet, ETE Department LAN => 64 + 2 = 66 - (2⁷) /25 6th -- Point to point link between EEE and ETE => 2 + 2 = 4 - (2²) /30

Step 2: Step 3: 212 <= 2^N

128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1	128	64	32	16	8	4	2	1		
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Network EEE	172.17.0.0 / 24
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1 st Host of EEE	172.17.0.1 / 24
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	Last Host of EEE	172.17.0.254 / 24
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	Broadcast EEE	172.17.0.255 / 24
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	Network CSE	172.17.1.0 / 25
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1 st Host of CSE	172.17.1.1 / 25
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	0	Last Host of CSE	172.17.1.126 / 25
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	Broadcast CSE	172.17.1.127 / 25
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	Network ETE	172.17.1.128 / 25
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	1 st Host of ETE	172.17.1.129 / 25
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	0	Last Host of ETE	172.17.1.254 / 25
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	Broadcast ETE	172.17.1.255 / 25
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	Network CSE-ETE	172.17.2.0 / 30
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1 st Host of CSE-ETE	172.17.2.1 / 30
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	Last Host of CSE-ETE	172.17.2.2 / 30
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	Broadcast CSE-ETE	172.17.2.3 / 30
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	Network CSE-EEE	172.17.2.4 / 30
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1 st Host of CSE-EEE	172.17.2.5 / 30
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	Last Host of CSE-EEE	172.17.2.6 / 30
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	Broadcast CSE-EEE	172.17.2.7 / 30
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	Network EEE-ETE	172.17.2.8 / 30
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1 st Host of EEE-ETE	172.17.2.9 / 30
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	Last Host of EEE-ETE	172.17.2.10 / 30
1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	1	Broadcast EEE-ETE	172.17.2.11 / 30

Subnet Name	Needed Size	Allocated Size	Network Address	Mask	Assignable Range	Broadcast Address
EEE	210	254	172.17.0.0 / 24	255.255.255.0	172.17.0.1 - 172.17.0.254	172.17.0.255
CSE	112	126	172.17.1.0 / 25	255.255.255.128	172.17.1.1 - 172.17.1.126	172.17.1.127
ETE	64	126	172.17.1.128 / 25	255.255.255.128	172.17.1.129 - 172.17.1.254	172.17.1.255
CSE-ETE	2	2	172.17.2.0 / 30	255.255.255.252	172.17.2.1 - 172.17.2.2	172.17.2.3
CSE-EEE	2	2	172.17.2.4 / 30	255.255.255.252	172.17.2.5 - 172.17.2.6	172.17.2.7
EEE-ETE	2	2	172.17.2.8 / 30	255.255.255.252	172.17.2.9 - 172.17.2.10	172.17.2.11

