

## Network Design Proposal on Computer Networks and Security: Mini-Project

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This proposal consists of a network design effort that attempts to envisage the Network Topology and functioning of Pulchowk Campus, IoE. This proposal ventures on realizing the Campus Network as an Autonomous System with an effort to model the campus network architecture as much as possible.

The network is divided into 4 OSPF areas, with following divisions:

1. Area 0 (Purple color in the figure) : CIT ASBR, CIT Library Subnet consisting of a web-server for “pulchowk.com”. It also consists of two VLANs, namely, ICTC & DoECE Students and ICTC & DoECE Faculty. It also consists of a DNS Server.
2. Area 1 (Brown color in the figure): This OSPF area consists of Whitehouse and Architecture Subnets and also the Web Server for “ioe.com”.
3. Area 2 (Pink color in the figure): This area consists of a “Mechanical Department Router” (which further goes on to be divided into 2 VLANS, namely, Mechanical and Aerospace Department LANs. It also consists of “Civil Department Router” and “Applied Science Router” where the second DNS Server is also connected.
4. Area 3 (Green Color in the figure): This area consists of a Hostel zone which has a “Boys Hostel Router” which further creates 3 VLANs, dividing the network into Block A, Block B and Block C VLANs just like in real life. Furthermore, this area also consists of a Girls Hostel Router.

I have acquired the pool of IP Addresses from two networks:

- **24.24.24.0/21**, and
- **24.24.32.0/21**

The division of IP Addresses for each subnet using VLSM results into:

S.N	Department	No. of IPs Require d	Subnet Mask	Net-ID	Usable IP Range	Broadcast Address	No. of IP Addresses Required
1	ICTC	550	255.255.252.0	24.24.24.0	24.24.24.1 - 24.24.26.254	24.24.27.255	550
2	DoECE	300	255.255.254.0	24.24.28.0	24.24.28.1 -	24.24.29.255	300

					24.24.29.254		
3	Boys Hostel Block A	200	255.255.255.0	24.24.30.0	24.24.30.1 - 24.24.30.254	24.24.30.255	200
4	Boys Hostel Block B	200	255.255.255.0	24.24.31.0	24.24.31.1 - 24.24.31.254	24.24.31.255	200
5	Boys Hostel Block C	200	255.255.255.0	24.24.32.0	24.24.32.1 - 24.24.32.254	24.24.32.255	200
6	Girls Hostel	150	255.255.255.1 28	24.24.33.0	24.24.33.1 - 24.24.33.126	24.24.33.127	150
7	Civil Department	100	255.255.255.1 28	24.24.33.1 28	24.24.33.129 - 24.24.33.254	24.24.33.255	100
8	Whitehouse	80	255.255.255.1 28	24.24.34.0	24.24.34.1 - 24.24.34.126	24.24.34.127	80
9	Mechanical Department	70	255.255.255.1 28	24.24.34.1 28	24.24.34.129 - 24.24.34.254	24.24.34.255	70
10	Aerospace Department	70	255.255.255.1 28	24.24.35.0	24.24.35.1 - 24.24.35.126	24.24.35.127	70
11	Applied Science	60	255.255.255.1 92	24.24.35.1 28	24.24.35.129 - 24.24.35.190	24.24.35.191	60
12	Architecture Department	25	255.255.255.2 24	24.24.35.1 92	24.24.35.193 - 24.24.35.222	24.24.35.223	25
13	CITPC Library	10	255.255.255.2 40	24.24.35.2 24	24.24.35.225 - 24.24.35.238	24.24.35.239	10
14	CIT to ICTC & DoECE	2	255.255.255.2 52	24.24.35.2 40	24.24.35.241 - 24.24.35.242	24.24.35.243	2
15	CIT to Whitehouse	2	255.255.255.2 52	24.24.35.2 44	24.24.35.245 - 24.24.35.246	24.24.35.247	2
16	Whitehouse to Architecture	2	255.255.255.2 52	24.24.35.2 48	24.24.35.249 - 24.24.35.250	24.24.35.251	2
17	CIT to Mechanical	2	255.255.255.2 52	24.24.35.2 52	24.24.35.253 - 24.24.35.254	24.24.35.255	2
18	Mechanical to Civil	2	255.255.255.2 52	24.24.36.0	24.24.36.1 - 24.24.36.2	24.24.36.3	2

19	Civil to Applied Science	2	255.255.255.252	24.24.36.4	24.24.36.5 - 24.24.36.6	24.24.36.7	2
20	Mechanical to Applied Science	2	255.255.255.252	24.24.36.8	24.24.36.9 - 24.24.36.10	24.24.36.11	2
21	Applied Science to Boys Hostel	2	255.255.255.252	24.24.36.12	24.24.36.13 - 24.24.36.14	24.24.36.15	2
22	Boys Hostel to Girls Hostel	2	255.255.255.252	24.24.36.16	24.24.36.17 - 24.24.36.18	24.24.36.19	2
23	CIT to NT	2	255.255.255.252	24.24.36.20	24.24.36.21 - 24.24.36.22	24.24.36.23	2
24	Civil to Architecture	2	255.255.255.252	24.24.36.24	24.24.36.25 - 24.24.36.26	24.24.36.27	2

### IP Address of each Server:

Web Server for “pulchowk.com”	24.24.35.227
Web Server for “ioe.com”	24.24.34.126
DNS 1	24.24.29.254
DNS 2	24.24.35.190
Root DNS at ISP	20.20.20.6

### Network Topology:



