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**SECR2013-10 NETWORK COMMUNICATIONS**

**TASK 5: IP ADDRESSING SCHEME**

**GROUP 7 – SUNFLOWER**

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***(a) IP Addresses given by the lecturer***

1. 120.10.0.0

* Class A
* N.H.H.H
* Huge network

1. 132.10.0.0

* Class B
* N.N.H.H
* Small network

1. 221.1.11.0

* Class C
* N.N.N.H
* Reasonable small server

Total workstations in lab = (15x3) + 20 = 65

Total routers = 3

Total switches = 9

Total servers in server room = 5

Total multi-terabyte storage server = 4

**IP Address 1: 120.10.0.0**

|  |  |
| --- | --- |
| Step | Calculation |
| 1 | 120.0000 0000.0000 0000.0000 0000 |
| 2 | 2^n - 2 >= 65  2^7 - 2 >= 65  126 >= 65 |
| 3 | 120.0000 0000.0000 0000.0000 0000 (⇠right to left) |
| 4 | 120.1111 1111.1111 1111.1111 1111  8 + 8 + 8 = 24 |
| 5 | 120.255.255.0/24 (Last subnet) |
| 6 | 120.0.0.0/24 (First subnet)  120.0.1.0/24 (Second subnet)  120.0.2.0/24 (Third subnet)  120.0.3.0/24 (Fourth subnet)  .  .  .  120.255.255.0/24 (Last subnet) |

**IP Address 2: 132.10.0.0**

|  |  |
| --- | --- |
| Step | Calculation |
| 1 | 132.10.0000 0000.0000 0000 |
| 2 | 2^n - 2 >= 65  2^7 - 2 >= 65  126 >= 65  n = 7 |
| 3 | 132.100.0000 0000.0000 0000 (⇠right to left) |
| 4 | 132.100.1111 1111.0000 0000  8 + 8 + 8 = 24 |
| 5 | 132.10.255.0/24 (Last subnet) |
| 6 | 132.10.0.0/24 (First subnet)  132.10.1.0/24 (Second subnet)  132.10.2.0/24 (Third subnet)  132.10.3.0/24 (Fourth subnet)  .  .  .  132.10.255.0/24 (Last subnet) |

**IP Address 3: 221.1.11.0**

|  |  |
| --- | --- |
| Step | Calculation |
| 1 | 221.1.11.0000 0000 |
| 2 | 2^n - 2 >= 65  2^7 - 2 >= 65  126 >= 65  n = 7 |
| 3 | 221.1.11.0000 0000 (⇠right to left) |
| 4 | 221.1.11.0/24 |
| 5 | 221.1.11.0/24 |

***(b) Divide it in the best possible way for your network – all the different labs and rooms***

Generally, we choose **IP Address 2: 132.10.0.0**, which is a class B IP address with a total of 65,536 addresses. From the total, two of IP addresses are initially for network address and broadcast address. Both network and broadcast addresses are 132.10.0.0/24 and 132.10.255.0/24.

On the first floor, we have Network Lab and General Purpose Lab. In Network Lab, we have 15 workstations, 1 switch and 1 multi-terabyte storage server For that, we assigned an IP address from 132.10.1.0/24 to 132.10.18.0/24. Next, for General Purpose Lab, also with 15 workstations, 1 switch and 1 multi-terabyte storage server. We assigned an IP address from 132.10.19.0/24 to 132.10.35.0/24.

Meanwhile, on the second floor, we have a Computer Security Lab, IOT Lab and also a server room. In Computer Security Lab, with 15 workstations, 1 switch and 1 multi-terabyte storage server. So we are assigning IP addresses from 132.10.36.0/24 to 132.10.53.0/24. In IOT Lab that contains 15 workstations, 1 switch and 1 multi-terabyte storage server, we also assigned IP addresses from 132.10.54.0/24 to 132.10.71.0/24. For the server room, we assigned 4 IP addresses in the room from 132.10.72.0/24 to 132.10.76.0/24. For the main router on the building, we assigned it with 132.10.77.0/24.

We have remaining 178 IP addresses to be used on other devices after setting up the network in the whole building has been done. In conclusion, we think this total of remaining IP addresses is enough for the building.