

# **NETWORK SIMULATION**

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## **PROJECT REPORT**

### **18CSS202J- COMPUTER COMMUNICATIONS & NETWORKING LABORATORY**

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# COMPUTER COMMUNICATIONS & NETWORKING

## 18CSS202J

### Mini Project Requirements

#### Introduction

We designed this **network configuration for the network of three companies**, given some constraints. The main role was to **subnet the IP addresses** correctly.

It's an interesting problem demonstrating the concepts of **Classless IP Subnetting** and using **RIPv2 Protocol**.

#### Constraints

We decide to **simulate the topology on Cisco Packet Tracer** in order to optimally design the network considering the number of devices (switches, routers etc.) used to maximize the profit margins of your company. However, you must simulate the topology strictly following rules and regulations described below:

- 1-** Use Straight Through wires, Cross Over cables or Serial DCE wires where necessary and applicable.
- 2-** Use Generic Router and Generic PCs for your design
- 3-** Use Generic Switches such that you attach **only 3 of the 4** available **Ethernet Interfaces** for a single switch, however, you can attach as many switches considering optimal design.
- 4-** We have to assign IPs to the PCs using **Static IP allocation**.
- 5-** Although we have to use GUI of the router to configure its interfaces but we must use CLI of the router to configure the **RIPv2 Protocol** for **Classless Subnet Addressing**.

# Problem Statement

Suppose that you are the CEO of a start-up which deals with network configuration for various companies. After 100 days of struggle, we have finally received your first assignment to configure the network for three different companies in such a way that all the PCs in each company must be able to communicate with each other as well as with all the PCs of any other company.

The companies are named as **CMP X, CMP Y and CMP Z**.

- **CMP X** has **5 Rooms** with **1 PC** in each room.
- **CMP Y** has **3 Rooms** with **3 PCs** in each room.
- **CMP Z** has **2 Rooms** with **4 PCs** in each room.

The IP regulating company has assigned the following IP network addresses to each of the company:

- **CMP X: 144.186.96.0/19**
- **CMP Y: 50.152.0.0/15**
- **CMP Z: 210.98.169.64/26**

As part of the agreement, all three companies have asked us to bear the expense of all the switches and routers used to interconnect all the computers in a merged network for three companies and further instructed us that **all the PCs in a single room must be on the same sub network and all the rooms of a single company must be on a different sub-network which will be assigned after sub-netting the assigned *network address* only for the relevant company** (no outside network or the network of other company will be accepted) e.g., each room for CMP X will be assigned a different sub-network after sub-netting the address of 144.186.96.0/19 only and not any other network address. The companies have further informed us that companies plan to extend the number of their PCs in each room in the future.

We, to be economical, decide to install old switches (**Generic Switches** in Cisco Packet Tracer) with only **three Ethernet ports working out of four** and routers (**Generic Routers** in Cisco Packet Tracer) to configure the network for three companies in such a way that you use as much less routers and switches as possible.

# Configuration Diagram

