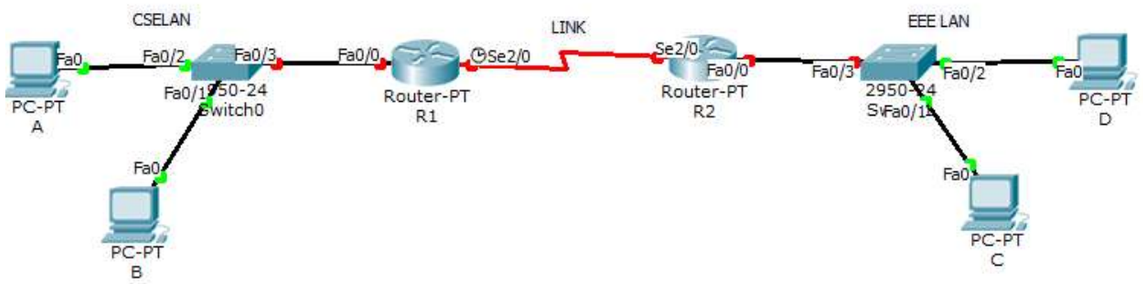
Subnet Intensive Lab

Task 1) Subnetting

You are given an address block of $172.12.0.0/16$ containing $2^{16} = 65536$ ip addresses. Create subnets for the following requirements:

Department	Required IP addresses
CSE	4000
EEE	1000
ME	900
CHEM	800
MATH	500
LINK1	2
LINK2	2
LINK3	2

Task 2) Device configuration



a. Create the above network in Packet tracer.

b. Assign IP addresses to different hosts according to following table:

Host Name	IP to be assigned
A	1st usable IP of CSE Network
B	2nd usable IP of CSE Network
R1 Fa0/0	Last usable IP of CSE Network
C	1st usable IP of EEE Network
D	2nd usable IP of EEE Network
R2 Fa0/0	Last usable IP of EEE Network
R1 Se2/0	1st usable IP of LINK1
R2 Se2/0	2nd usable IP of LINK1

c. Configure IP address, sub-net mask, and default gateway of all PCs.

d. Configure IP address and sub-net mask of all ports of both routers. Enable all interfaces.

e. Configure hostname, secret password, telnet password, console password, and banner of both routers. Use any password of your choice. Remember the password!

f. Configure clock rate of **Se 2/0 interface of R1** issuing the following command in interface configuration mode:

```
R1(config-if) # clock rate 9600
```

g. Configure routing with the help of your instructor!

h. Ping from A to C, A to D, B to C, B to D. All pings should work!

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Solution of Problem 2

Given block = 172.12.0.0/16

Department	Required IP addresses	Minimum IP	Host bit
CSE	4000	4096	12
EEE	1000	1024	10
ME	900	1024	10
CHEM	800	1024	10
MATH	500	512	9
LINK1	2	4	2
LINK2	2	4	2
LINK3	2	4	2

We now write down the given address block in X notation:

```
172.12.0.0/16
=172.12.XXXX XXXX.XXXX XXXX (X's are host bits)
```

Now, we generate the different subnets for each department as follows.

```
172.12.XXXX XXXX.XXXX XXXX
172.12.0000 XXXX.XXXX XXXX (CSE)
172.12.0001 00XX.XXXX XXXX (EEE)
172.12.0001 01XX.XXXX XXXX (ME)
172.12.0001 10XX.XXXX XXXX (CHEM)
172.12.0001 110X.XXXX XXXX (MATH)
172.12.0001 1110.0000 00XX (LINK1)
172.12.0001 1110.0000 01XX (LINK2)
172.12.0001 1110.0000 10XX (LINK3)
```

The following table shows the details for other subnets:

Dept.	Network Addr. (All 0 in host bit)	Broadcast Addr. (All 1 in host bit)	First Host Addr. (Network+1)	Last Host Addr. (Broadcast-1)
CSE	172.12.0.0	172.12.15.255	172.12.0.1	172.12.15.254
EEE	172.12.16.0	172.12.19.255	172.12.16.1	172.12.19.254
ME	172.12.20.0	172.12.23.255	172.12.20.1	172.12.23.254
CHEM	172.12.24.0	172.12.27.255	172.12.24.1	172.12.27.254
MATH	172.12.28.0	172.12.29.255	172.12.28.1	172.12.29.254
LINK1	172.12.30.0	172.12.30.3	172.12.30.1	172.12.30.2
LINK2	172.12.30.4	172.12.30.7	172.12.30.5	172.12.30.6
LINK3	172.12.30.8	172.12.30.11	172.12.30.9	172.12.30.10