**Department of Computer Science and Engineering**
Faculty of Engineering, University of Moratuwa
**CS 2033 – Data Communication and Networking**
B. Sc. Engineering Semester 3

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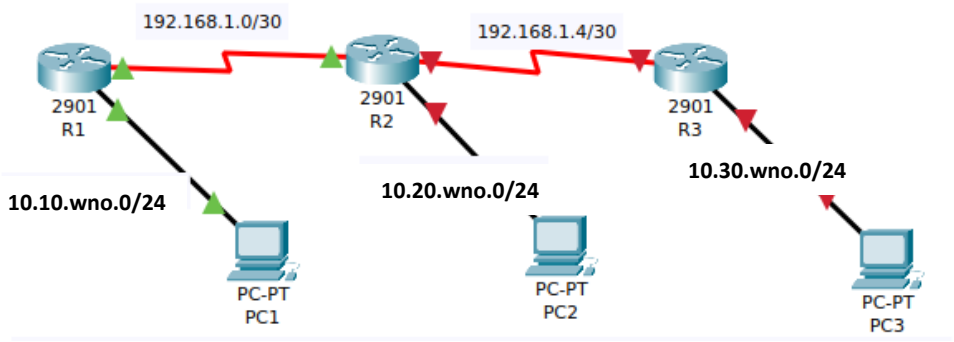
Index No **210518H** Group **3-B** Date **03.11.2023**

## Practical 3 : Basic Routing

Note: Each student should individually submit this lab sheet to moodle.




**wno = workstation number.**
**For example, for those who are working with the router at workstation 2 should use the network address 10.20.2.0/24**

1. Create the network as shown in the picture above.

   Since this network requires three routers, please divide the whole class into two groups where one group will be working on three workstations and other group will be working on the other three workstations.

2. List interfaces (of routers and PCs) and IP addresses that you are planning to assign:

| Device | Interface | IP address |
|---|---|---|
| **R1** | **Serial 0/0/0** | **192.168.1.1** |
| **R1** | **GigabitEthernet 0/1** | **10.10.1.1** |
| **R2** | **Serial 0/0/0** | **192.168.1.2** |
| **R2** | **Serial 0/0/1** | **192.168.1.5** |
| **R2** | **GigabitEthernet 0/0** | **10.20.1.1** |
| **R3** | **Serial 0/0/0** | **192.168.1.6** |
| **R3** | **GigabitEthernet 0/0** | **10.30.1.1** |
| **PC1** | **FastEthernet** | **10.10.1.2** |
| **PC2** | **FastEthernet** | **10.20.1.2** |
| **PC3** | **FastEthernet** | **10.30.1.2** |

3. View the initial configuration of R1, State the command you used:

**Show running-config**

4. Assign IP addresses according to the above table. State the commands you used to assign IP addresses to the interfaces of R2.

### For Interface between R2 and R1

**Enable**

**Config terminal**

**Interface serial0/0/0**

**Ip address 192.168.1.2 255.255.255.252**

**No shutdown r**

### For Interface between R2 and R3

**Enable**

**Config terminal**

**Interface serial0/0/1**

**Ip address 192.168.1.5 255.255.255.252**

**No shutdown r**

### For Interface between R2 and PC2

**Enable**

**Config terminal**

**Interface GigabitEthernet0/0**

**Ip address 10.20.1.1 255.255.255.0**

**No shutdown r**

5. Create IP Routes on R1, R2, and R3 to enable communications among PC1, PC2 and PC3. You can set static routes / default routes as necessary.

6. State the commands you used on R2 and R3 to set routes.

### For R2

**Ip route 10.30.1.0 255.255.255.0 192.168.1.6**

**Ip route 10.10.1.0 255.255.255.0 192.168.1.1**

### For R3

**Ip route 10.20.1.0 255.255.255.0 192.168.1.5**

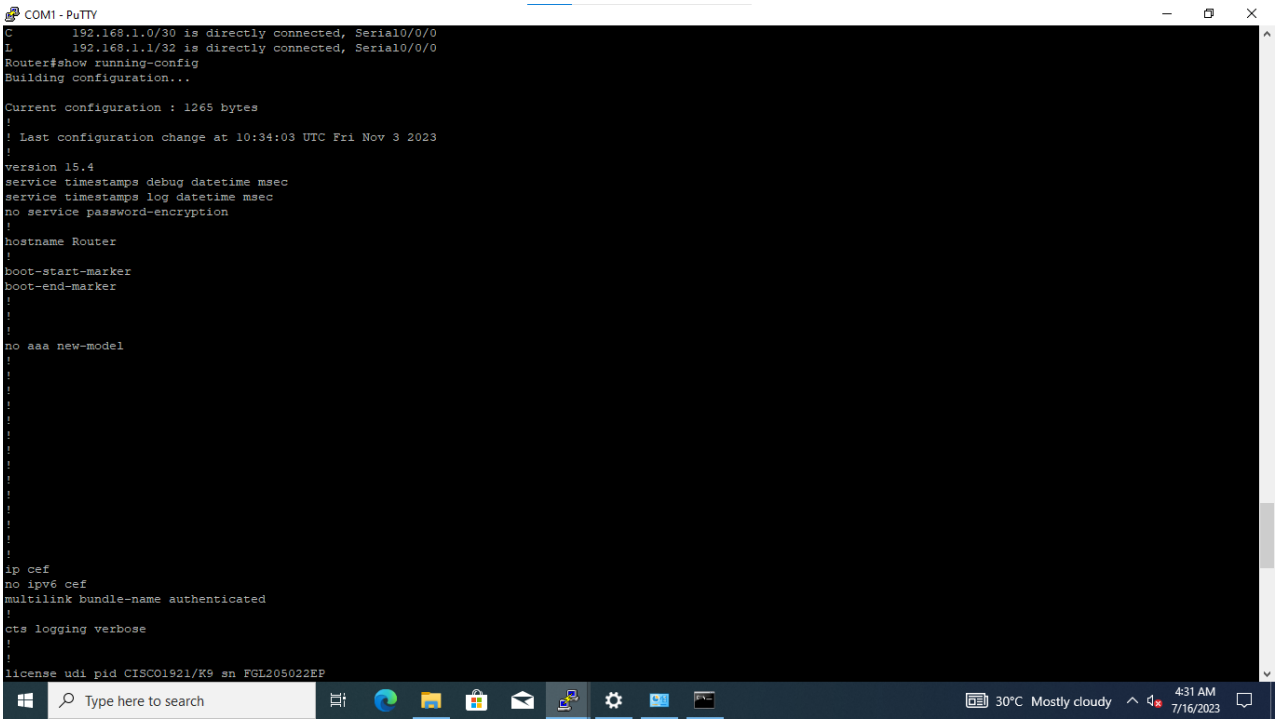
**Ip route 10.10.1.0 255.255.255.0 192.168.1.5**

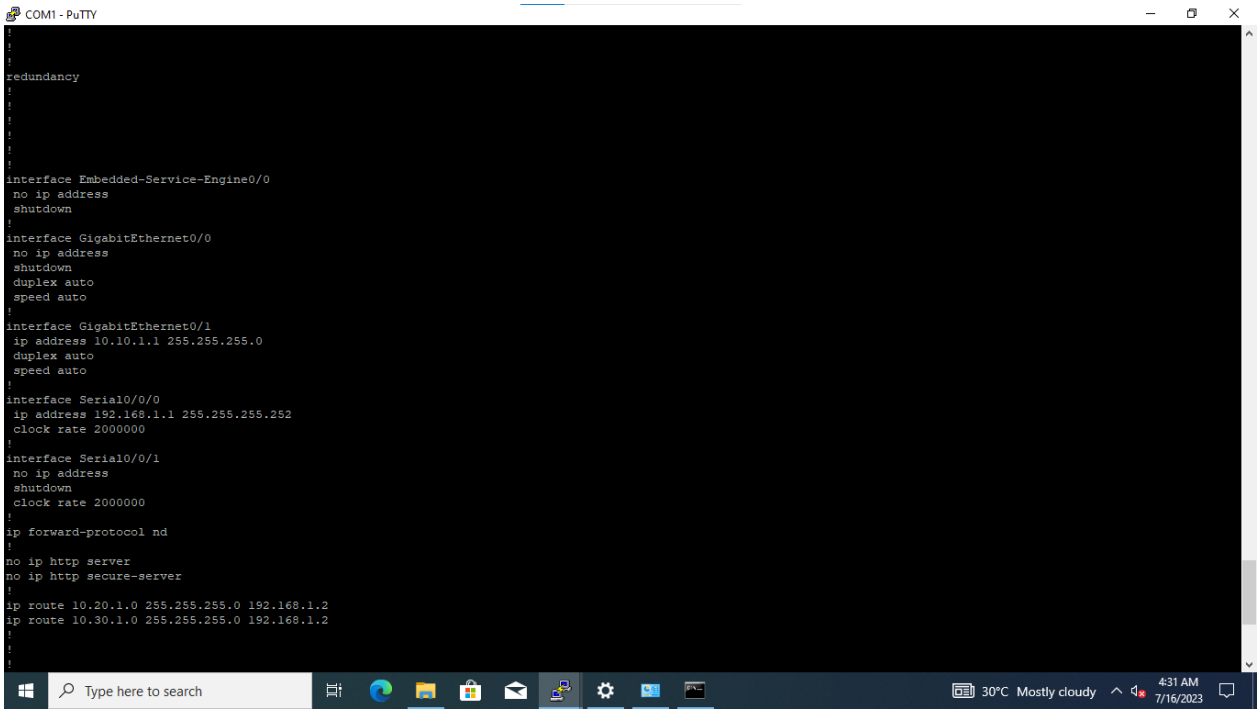
7. Ping from one PC to other two PCs (in the above diagram), observe and comment on the reachability.

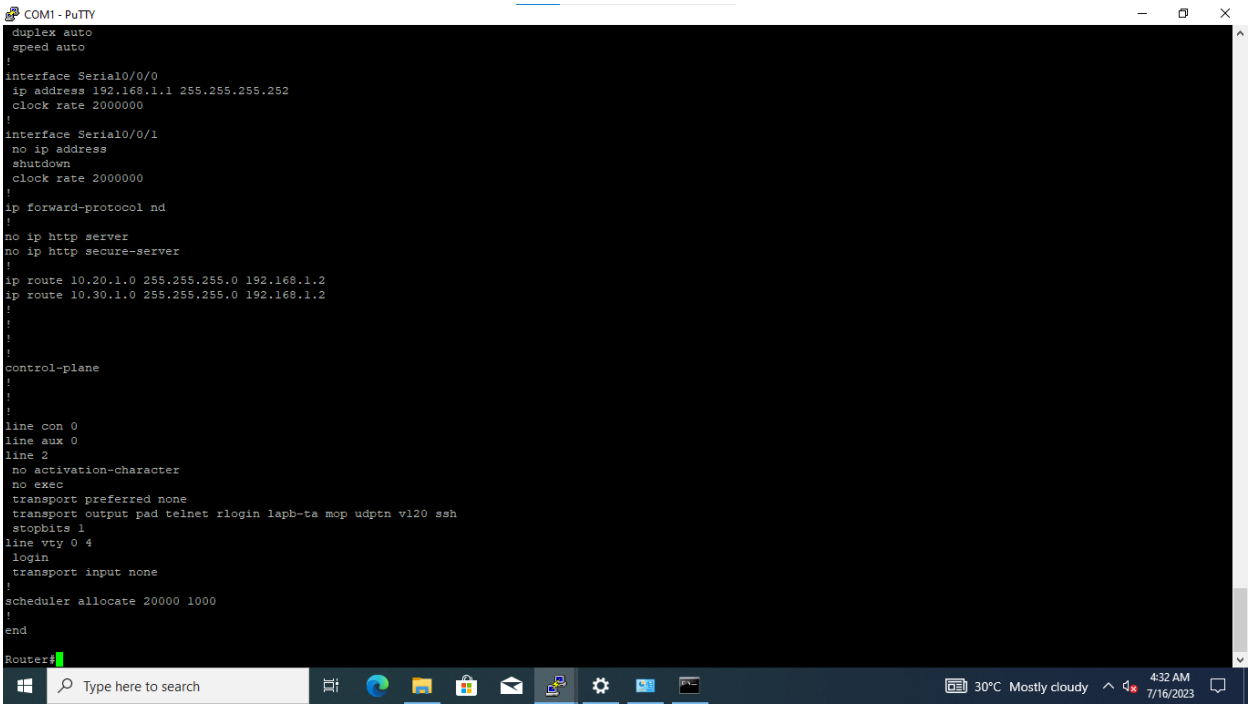
**Ping returns successfully. If the connection is not established in the froward direction it returns a host unreachable error. If the connection is not established in the backward direction it will keep loading as the signal is not returned. None of these happened which implies the ping was successful.**

8. Copy and paste a screenshot/photo of configuration of R1 and R2 here:

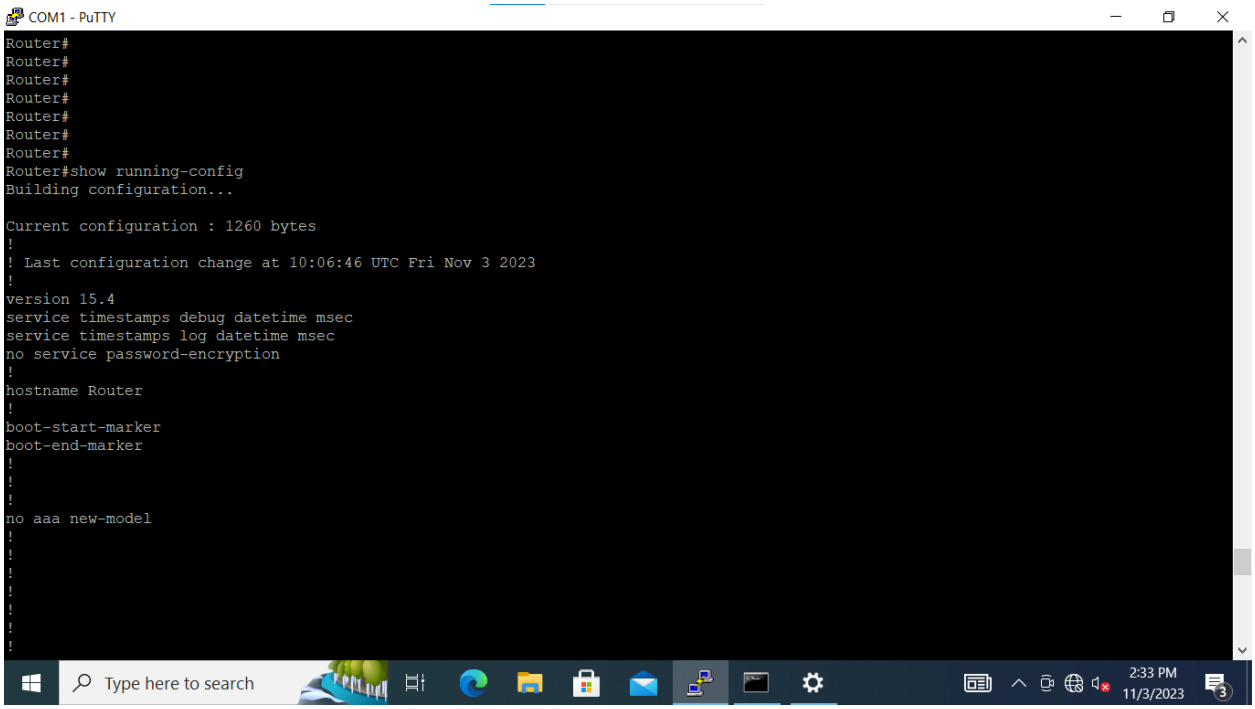
## Configuration for R1

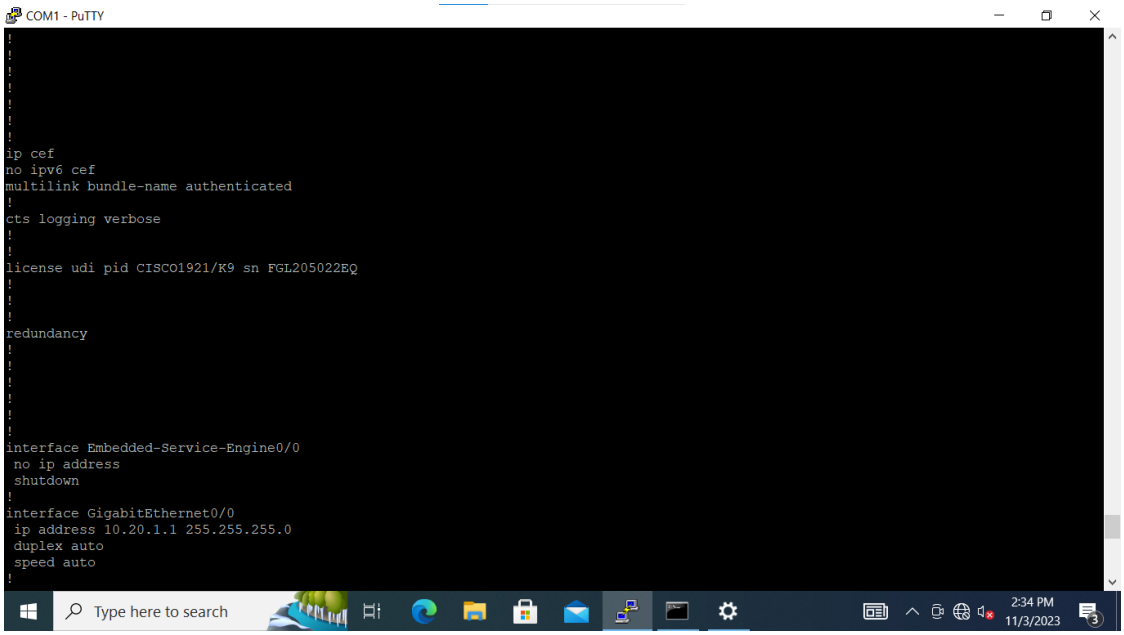


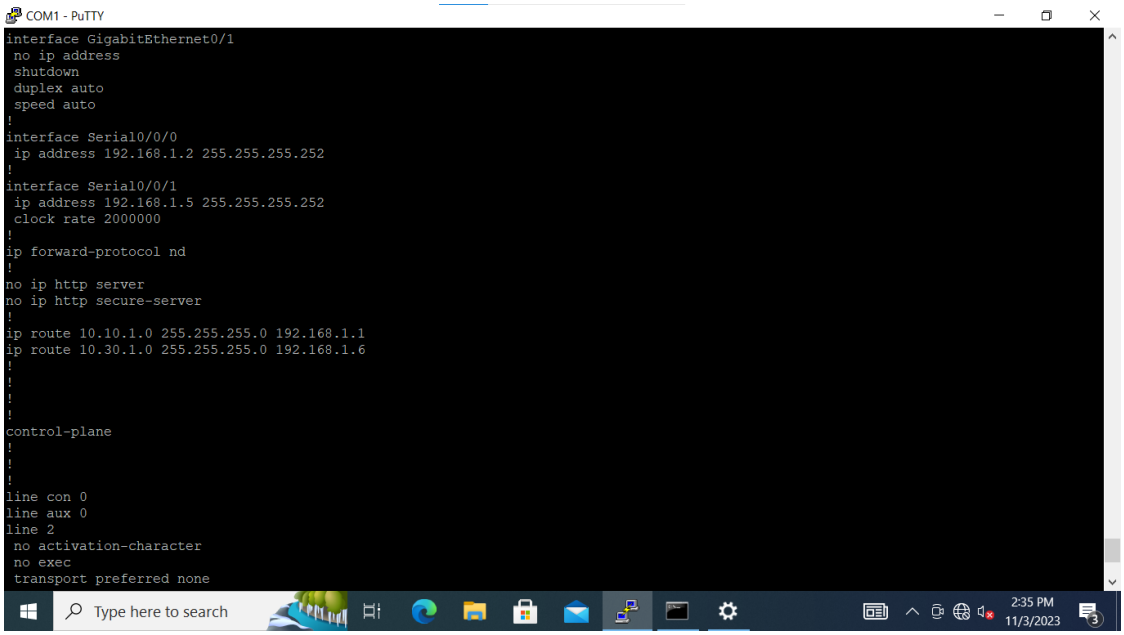



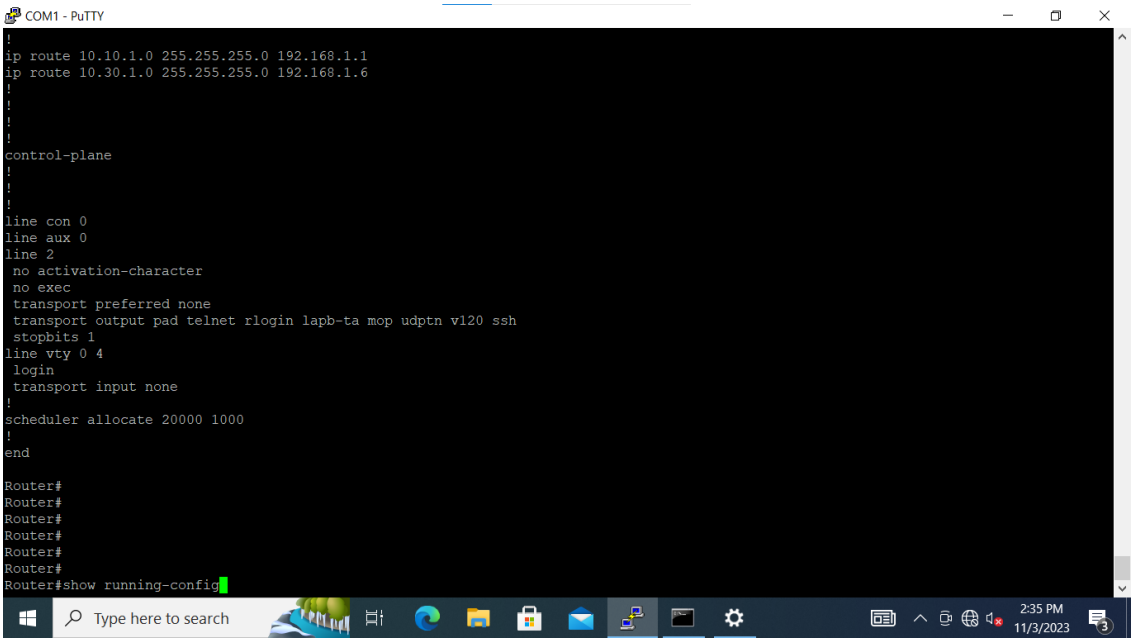



## Configuration for R2




COM1 - PuTTY
!
!
!
!
!
!
!
ip cef
no ipv6 cef
multilink bundle-name authenticated
!
cts logging verbose
!
!
license udi pid CISCO1921/K9 sn FGL205022EQ
!
!
!
redundancy
!
!
!
!
!
!
interface Embedded-Service-Engine0/0
 no ip address
 shutdown
!
interface GigabitEthernet0/0
 ip address 10.20.1.1 255.255.255.0
 duplex auto
 speed auto
!
Type here to search
2:34 PM
11/3/2023


COM1 - PuTTY
interface GigabitEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface Serial0/0/0
 ip address 192.168.1.2 255.255.255.252
!
interface Serial0/0/1
 ip address 192.168.1.5 255.255.255.252
 clock rate 2000000
!
ip forward-protocol nd
!
no ip http server
no ip http secure-server
!
ip route 10.10.1.0 255.255.255.0 192.168.1.1
ip route 10.30.1.0 255.255.255.0 192.168.1.6
!
!
!
!
control-plane
!
!
!
line con 0
line aux 0
line 2
 no activation-character
 no exec
 transport preferred none
Type here to search
2:35 PM
11/3/2023


COM1 - PuTTY
!
ip route 10.10.1.0 255.255.255.0 192.168.1.1
ip route 10.30.1.0 255.255.255.0 192.168.1.6
!
!
!
!
control-plane
!
!
!
line con 0
line aux 0
line 2
 no activation-character
 no exec
 transport preferred none
 transport output pad telnet rlogin lapb-ta mop udptn v120 ssh
 stopbits 1
line vty 0 4
 login
 transport input none
!
scheduler allocate 20000 1000
!
end
Router#
Router#
Router#
Router#
Router#
Router#
Router#show running-config
Type here to search
2:35 PM
11/3/2023