

INSTITUTE OF COMPUTER TECHNOLOGY  
B. TECH COMPUTER SCIENCE AND ENGINEERING

*Subject: Computer Networks[CN]*

Name : Archita Gahoi

Enrollment\_No. : 23162171002

SEM : 5

Class : A

Batch : 52 (CS)

**Practical 4**

**Aim:** To implement access control list (ACL) in network of an organization containing different departments.

**Scenario:**

There is an organization of the University having 3 different departments University, ICT and DCS. IPv4 addressing scheme is used for assigning the IP address to the device as shown in Table1. Each department has multiple employees, which have specific rights to communicate within the network.

The details of the rights are as mentioned below:

Access Rights:

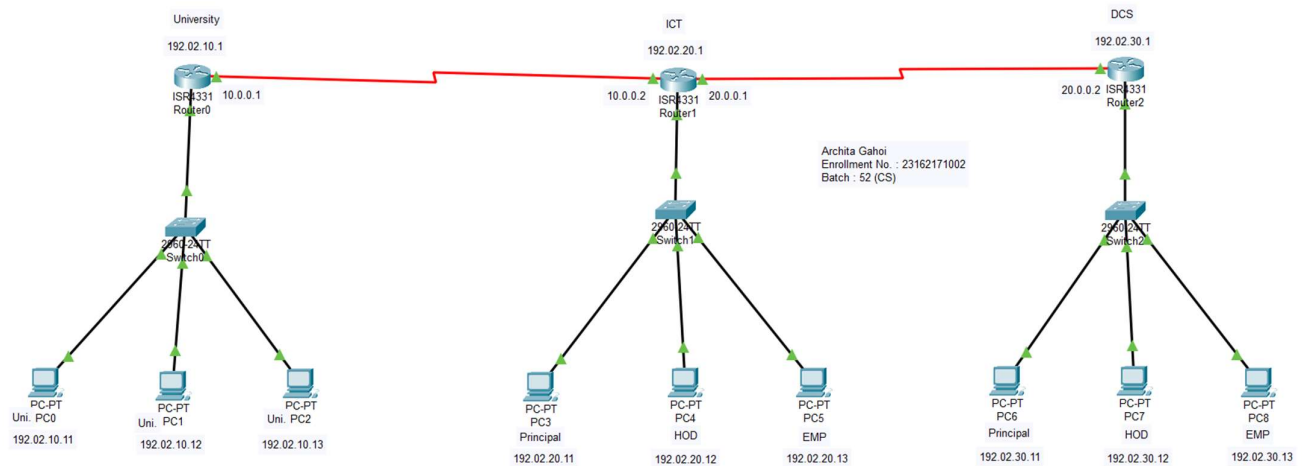
- University can contact all employees.
- Only Principal can contact University office.
- All Principals should contact each other
- All head of departments can contact each other

Configure Access Control List (ACL) at each router according to the specified access rights.

## Procedure:

- 1) Create network as given below
- 2) Configure IP address (All Devices, Routers)
- 3) Configure dynamic routing table (RIP in routers)
- 4) Configure ACL on Router0
- 5) Configure ACL on Router1
- 6) Configure ACL on Router2

⇒ Main Circuit



## Configurations:

### IP Address:

⇒ Routers

### Router 0

The screenshot shows the 'Router0' configuration window with the 'Config' tab selected. The left sidebar shows a tree view with 'GLOBAL' expanded, containing 'Settings', 'Algorithm Settings', 'ROUTING', 'Static', 'RIP', 'SWITCHING', 'VLAN Database', and 'INTERFACE'. The 'RIP Routing' configuration is displayed in the main area. It includes a 'Network' section with a table of network addresses: 10.0.0.0 and 192.2.10.0. Below this is a 'Remove' button. The 'Equivalent IOS Commands' section shows the following commands:

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#
```

The bottom of the window shows a Windows taskbar with various application icons and a system clock indicating 15:22 on 08-09-2025.

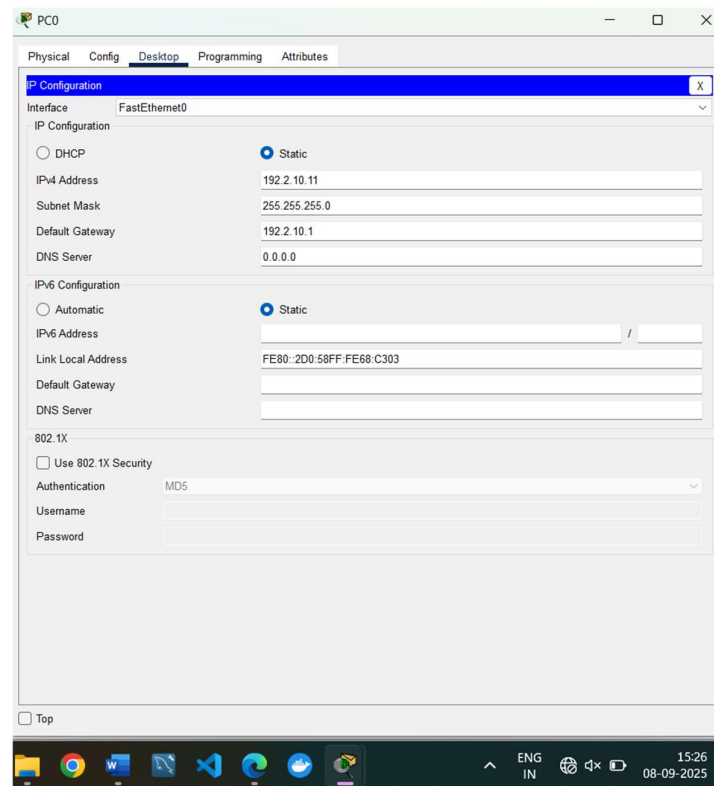
The screenshot shows the 'Router0' configuration window with the 'Config' tab selected. The left sidebar shows a tree view with 'GLOBAL' expanded, containing 'Settings', 'Algorithm Settings', 'ROUTING', 'Static', 'RIP', 'SWITCHING', 'VLAN Database', and 'INTERFACE'. The 'GigabitEthernet0/0/0' interface configuration is displayed in the main area. It includes fields for 'Port Status' (On), 'Bandwidth' (100 Mbps), 'Duplex' (Full Duplex), 'MAC Address' (00E0.F789.B801), 'IP Configuration' (IPv4 Address: 192.2.10.1, Subnet Mask: 255.255.255.0), and 'Tx Ring Limit' (10). The 'Equivalent IOS Commands' section shows the following commands:

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
```

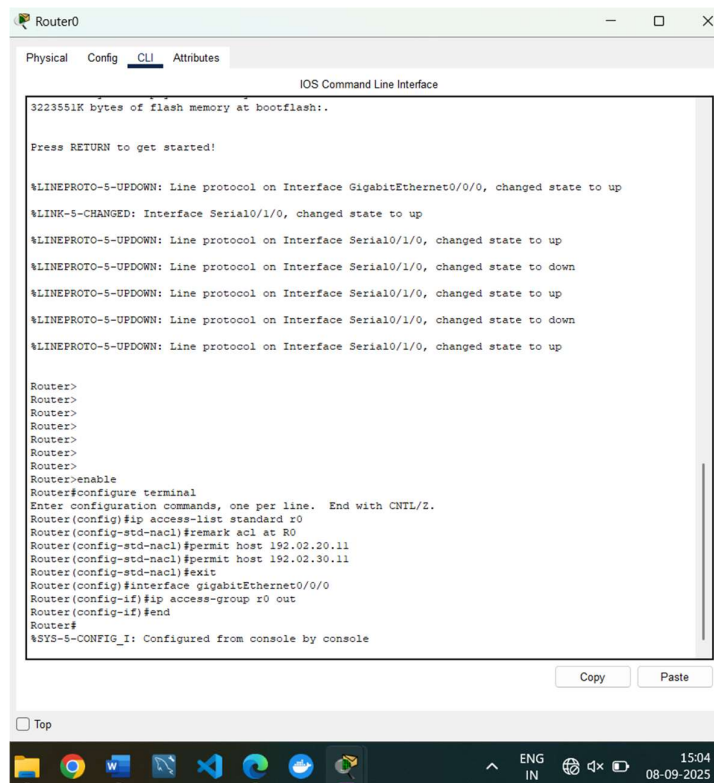
The bottom of the window shows a Windows taskbar with various application icons and a system clock indicating 15:20 on 08-09-2025.

⇒ PCS

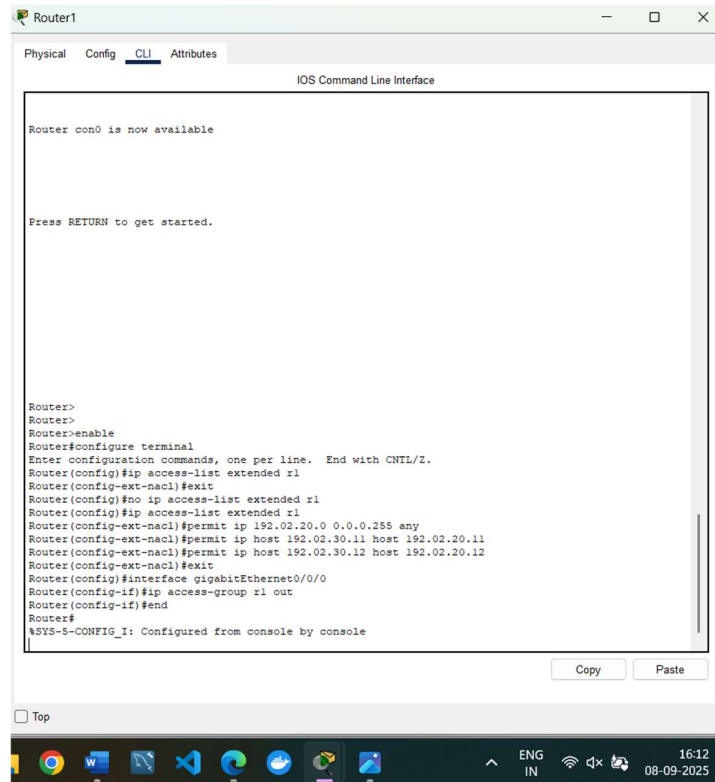
PC0



⇒ ACL on Router0



## ⇒ ACL on Router1



The screenshot shows the CLI window for Router1. The window has tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, showing the IOS Command Line Interface. The text in the window is as follows:

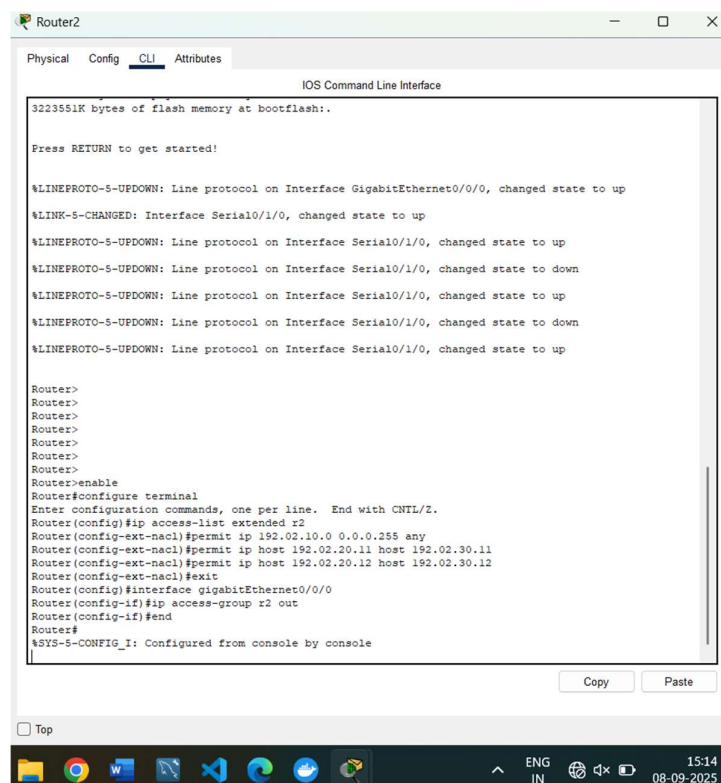
```
Router con0 is now available

Press RETURN to get started.

Router>
Router>
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip access-list extended r1
Router(config-ext-nacl)#exit
Router(config)#no ip access-list extended r1
Router(config)#ip access-list extended r1
Router(config-ext-nacl)#permit ip 192.02.20.0 0.0.0.255 any
Router(config-ext-nacl)#permit ip host 192.02.30.11 host 192.02.20.11
Router(config-ext-nacl)#permit ip host 192.02.30.12 host 192.02.20.12
Router(config-ext-nacl)#exit
Router(config)#interface gigabitEthernet0/0/0
Router(config-if)#ip access-group r1 out
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

At the bottom of the window, there are 'Copy' and 'Paste' buttons. The taskbar at the bottom shows various application icons and the system clock indicating 16:12 on 08-09-2025.

## ⇒ ACL on Router2



The screenshot shows the CLI window for Router2. The window has tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, showing the IOS Command Line Interface. The text in the window is as follows:

```
3223551K bytes of flash memory at bootflash:.

Press RETURN to get started!

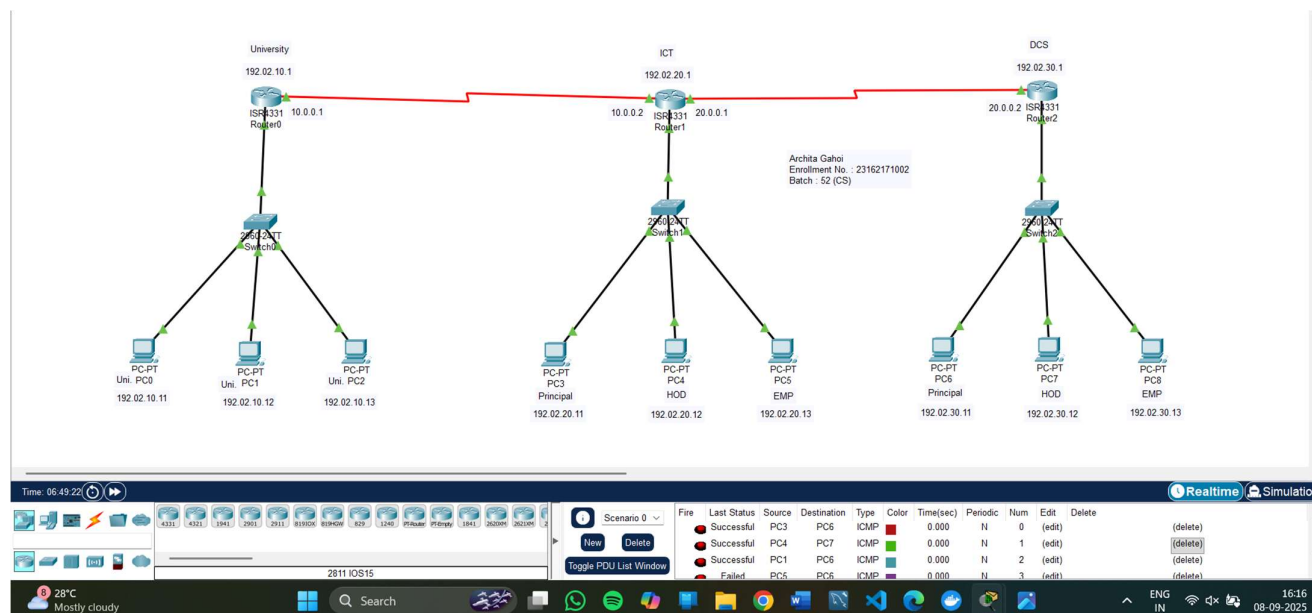
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up

Router>
Router>
Router>
Router>
Router>
Router>
Router>
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip access-list extended r2
Router(config-ext-nacl)#permit ip 192.02.10.0 0.0.0.255 any
Router(config-ext-nacl)#permit ip host 192.02.20.11 host 192.02.30.11
Router(config-ext-nacl)#permit ip host 192.02.20.12 host 192.02.30.12
Router(config-ext-nacl)#exit
Router(config)#interface gigabitEthernet0/0/0
Router(config-if)#ip access-group r2 out
Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

At the bottom of the window, there are 'Copy' and 'Paste' buttons. The taskbar at the bottom shows various application icons and the system clock indicating 15:14 on 08-09-2025.

## PCs packet transfer

- : from principal to principal
- : from HOD to HOD
- : from Uni to principal
- : from EMP to principal



## Conclusion:

In this practical, ACLs were successfully implemented on the routers to control communication between University, ICT, and DCS departments as per the given access rights. This ensured secure and authorized communication within the organization's network while restricting unauthorized access.