CCNA Cheat Sheet

ROUTER MODES

- **Router>:** User mode = Limited to basic monitoring commands
- **Router#:** Privileged mode (exec-level mode) = Provides access to all other router commands
- **Router(config)#:** global configuration mode = Commands that affect the entire system
- **Router(config-if)#:** interface mode = Commands that affect interfaces
- **Router(config-subif)#:** subinterface mode = Commands that affect subinterfaces
- **Router(config-line)#:** line mode = Commands that affect in lines modes (console, vty, aux...)
- **Router(config-router)#:** router configuration mode

GENERAL COMMANDS

- General commands

Router# configure terminal	Enter configure mode **Router(config)#**
Router# write	To write configuration
Router(config)# do write	To write configuration in config mode

- Changing Host names

Router (config) # hostname <name>	For routers
Switch (config) # hostname <name>	For Switches

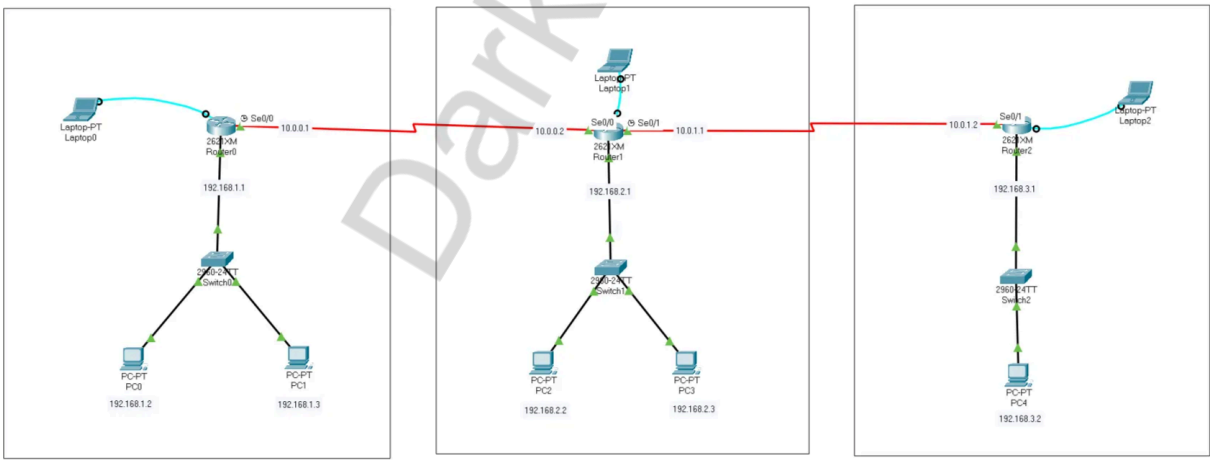
- Configuring Passwords

(Config)# enable password {password}	Set Passwords for Privileged mode
(Config)# enable secret {password}	Password will be encrypted

- Display / Show Commands

Router# show version	Display RAM , NVRAM , Flash , IOS , etc.
Router# show running-config	Display running configs
Router# show startup-config	Display Startup configs
Router# show ip interface brief	Display overview of all interfaces
Router# show ip route	Displays all routes attached to router
Router# show ip route static	Displays all static routes of router
Router# show access-lists	Displays all access lists
Router# show access-lists {name/number}	Displays only denoted ACL
Router# show ip eigrp neighbours	Displays all EIGRP configured neighbour routers
Router# show ip route eigrp	Displays EIGRP-learned routes
Router# show ip ospf neighbours	Displays all OSPF configured neighbour routers
Router# show ip route ospf	Displays OSPF-learned routes
Router# show ip nat tr	Displays NAT table translation

ROUTING PROTOCOLS



Static Routing

1. Configure interfaces of all routers (Fast Ethernets , Serial Ports) & internal networks.
2. Use ip route with the **next Network's Id and Serial Port Number** to add static Routing.

3. For router 0 :
    a. **Router(config)#** ip route 192.168.2.0 255.255.255.0 10.0.0.2
    b. **Router(config)#** ip route 192.168.3.0 255.255.255.0 10.0.0.2
4. For router 1 :
    a. **Router(config)#** ip route 192.168.1.0 255.255.255.0 10.0.0.1
    b. **Router(config)#** ip route 192.168.3.0 255.255.255.0 10.0.1.2
5. For router 2:
    a. **Router(config)#** ip route 192.168.1.0 255.255.255.0 10.0.1.1
    b. **Router(config)#** ip route 192.168.2.0 255.255.255.0 10.0.1.1

RIP V1 & V2 Routing

1. Configure interfaces of all routers (Fast Ethernets , Serial Ports) & internal networks.
2. Use **router rip** to add RIP Routing in your network
3. For router 0:
    a. **Router(config)#** router rip
    b. **Router(config-router)#** network 192.168.1.0
    c. **Router(config-router)#** network 10.0.0.0
    d. **Router(config-router)#** no auto-summary
4. For router 1:
    a. **Router(config)#** router rip
    b. **Router(config-router)#** network 192.168.2.0
    c. **Router(config-router)#** network 10.0.0.0
    d. **Router(config-router)#** network 10.0.1.0
    e. **Router(config-router)#** no auto-summary
5. For router 2:
    a. **Router(config)#** router rip
    b. **Router(config-router)#** network 192.168.3.0

c. **Router(config-router)#** network 10.0.1.0

d. **Router(config-router)#** no auto-summary

6. For **RIP V2 :**

a. **Router(config)#** router rip

b. **Router(config-router)#** version 2

c. <!—Other commands same for all routers—!>

EIGRP Routing

1. Configure interfaces of all routers (Fast Ethernets , Serial Ports) & internal networks.
2. Use **router eigrp <ASN>** to add eigrp Routing in your network

a. For the **SAME ASN**

i. For router 0:

1. **Router(config)#** router eigrp 100
2. **Router(config-router)#** network 192.168.1.0 0.0.0.255
3. **Router(config-router)#** network 10.0.0.0 0.0.0.3
4. **Router(config-router)#** no auto-summary

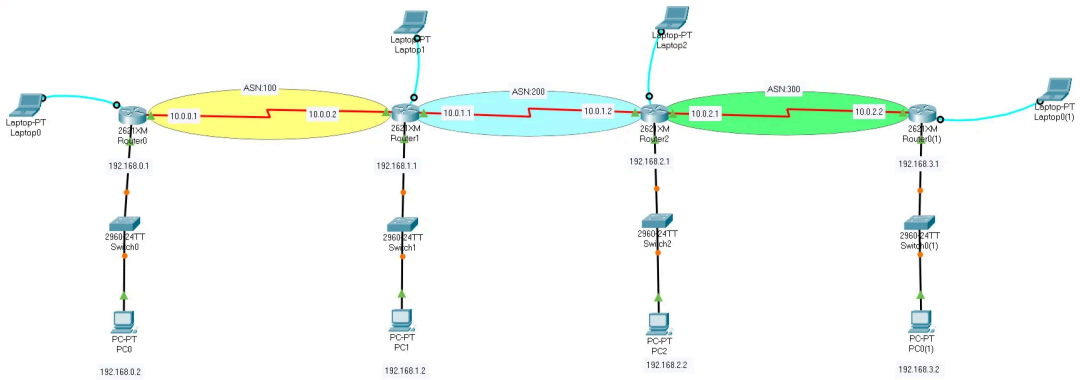
ii. For router 1:

1. **Router(config)#** router eigrp 100
2. **Router(config-router)#** network 192.168.2.0 0.0.0.255
3. **Router(config-router)#** network 10.0.0.0 0.0.0.3
4. **Router(config-router)#** network 10.0.1.0 0.0.0.3
5. **Router(config-router)#** no auto-summary

iii. For router 2:

1. **Router(config)#** router eigrp 100
2. **Router(config-router)#** network 192.168.3.0 0.0.0.255
3. **Router(config-router)#** network 10.0.1.0 0.0.0.3
4. **Router(config-router)#** no auto-summary

b. For the **Different ASN (100,200,300)**



1. For router 0:
    a. **Router(config)#** router eigrp 100
    b. **Router(config-router)#** network 192.168.1.0 0.0.0.255
    c. **Router(config-router)#** network 10.0.0.0 0.0.0.3
2. For router 1:
    a. **Router(config)#** router eigrp 100
    b. **Router(config-router)#** network 192.168.2.0 0.0.0.255
    c. **Router(config-router)#** network 10.0.0.0 0.0.0.3
    d. **Router(config-router)#** exit
    e. **Router(config)#** router eigrp 200
    f. **Router(config-router)#** network 10.0.1.0 0.0.0.3
3. For router 2:
    a. **Router(config)#** router eigrp 200
    b. **Router(config-router)#** network 192.168.3.0 0.0.0.255
    c. **Router(config-router)#** network 10.0.1.0 0.0.0.3
    d. **Router(config-router)#** exit
    e. **Router(config)#** router eigrp 300
    f. **Router(config-router)#** network 10.0.2.0 0.0.0.3
4. For router 3:

a. **Router(config)#** router eigrp 300
b. **Router(config-router)#** network 192.168.4.0 0.0.0.255
c. **Router(config-router)#** network 10.0.2.0 0.0.0.3

5. **REDISTRIBUTION IS NEEDED IN DIFFERENT ASN**
6. For router 1:
    a. **Router(config)#** router eigrp 100
    b. **Router(config-router)#** redistribute eigrp 200
    c. **Router(config-router)#** exit
    d. **Router(config)#** router eigrp 200
    e. **Router(config-router)#** redistribute eigrp 100
7. For router 2:
    a. **Router(config)#** router eigrp 200
    b. **Router(config-router)#** redistribute eigrp 300
    c. **Router(config-router)#** exit
    d. **Router(config)#** router eigrp 300
    e. **Router(config-router)#** redistribute eigrp 200

OSPF Routing

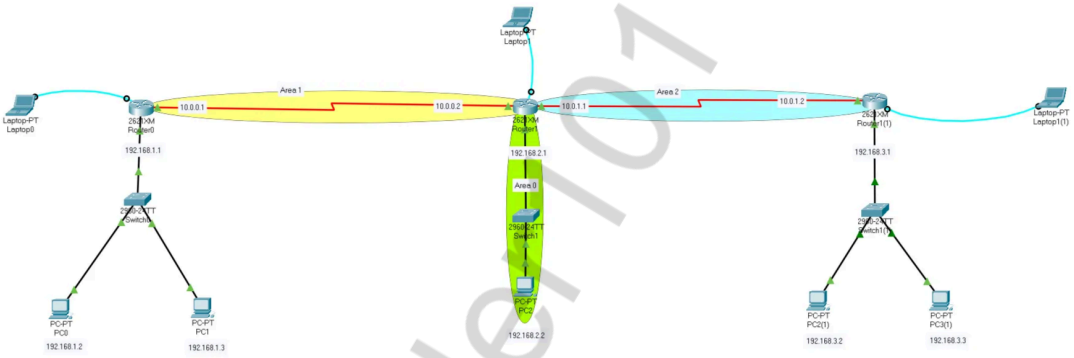
1. Configure interfaces of all routers (Fast Ethernets , Serial Ports) & internal networks.
2. Use **router ospf <ASN>** to add ospf Routing in your network
    a. For the **SAME Area**
        i. For router 0:
            1. **Router(config)#** router ospf 1
            2. **Router(config-router)#** network 192.168.1.0 0.0.0.255 area 0
            3. **Router(config-router)#** network 10.0.0.0 0.0.0.3 area 0
        ii. For router 1:
            1. **Router(config)#** router ospf 1

2. **Router(config-router)#** network 192.168.2.0 0.0.0.255 area 0
3. **Router(config-router)#** network 10.0.0.0 0.0.0.3 area 0
4. **Router(config-router)#** network 10.0.1.0 0.0.0.3 area 0

iii. For router 2:

1. **Router(config)#** router ospf 1
2. **Router(config-router)#** network 192.168.3.0 0.0.0.255 area 0
3. **Router(config-router)#** network 10.0.1.0 0.0.0.3 area 0

b. For the **DIFFERENT Area**

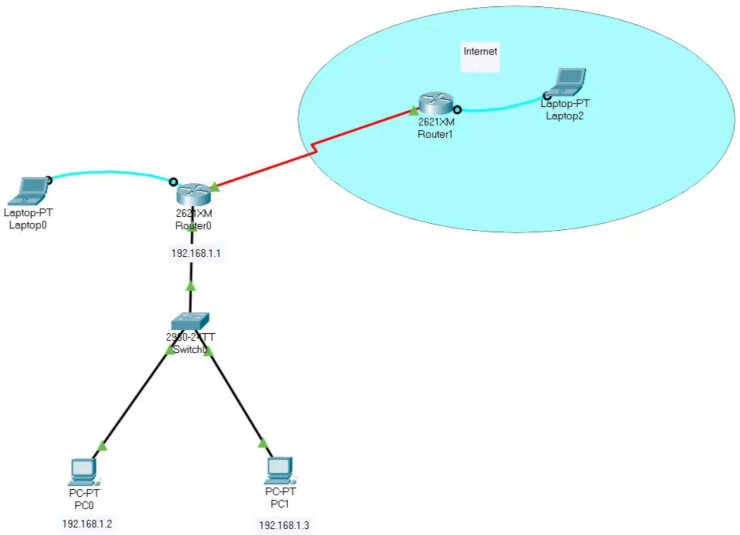


1. For router 0:
    a. **Router(config)#** router ospf 1
    b. **Router(config-router)#** network 192.168.1.0 0.0.0.255 area 1
    c. **Router(config-router)#** network 10.0.0.0 0.0.0.3 area 1
2. For router 1:
    a. **Router(config)#** router ospf 1
    b. **Router(config-router)#** network 192.168.2.0 0.0.0.255 area 0
    c. **Router(config-router)#** network 10.0.0.0 0.0.0.3 area 1
    d. **Router(config-router)#** network 10.0.1.0 0.0.0.3 area 2
3. For router 2:
    a. **Router(config)#** router ospf 1
    b. **Router(config-router)#** network 192.168.3.0 0.0.0.255 area 2
    c. **Router(config-router)#** network 10.0.1.0 0.0.0.3 area 2

BGP Routing

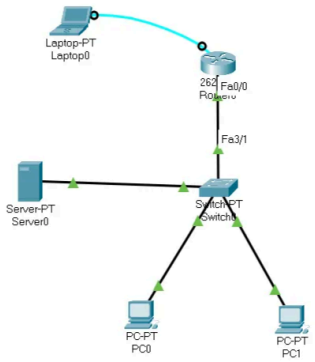
1. Configure interfaces of all routers (Fast Ethernets , Serial Ports) & internal networks.
2. Use **router bgp <ASN>** to add ospf Routing in your network
    a. For the **DIFFERENT Area**
        i. For router 0:
            1. **Router(config)#** router bgp 100
            2. **Router(config-router)#** network 192.168.1.0 mask 255.255.255.0
            3. **Router(config-router)#** network 10.0.0.0 mask 255.0.0.0
            4. **Router(config-router)#** neighbour 10.0.0.2 remote-as 200
        ii. For router 1:
            1. **Router(config)#** router bgp 200
            2. **Router(config-router)#** network 192.168.2.0 mask 255.0.0.0
            3. **Router(config-router)#** network 10.0.0.0 mask 255.0.0.0
            4. **Router(config-router)#** network 10.0.1.0 mask 255.0.0.0
            5. **Router(config-router)#** neighbour 10.0.0.1 remote-as 100
            6. **Router(config-router)#** neighbour 10.0.1.2 remote-as 300
        iii. For router 2:
            1. **Router(config)#** router bgp 300
            2. **Router(config-router)#** network 192.168.3.0 mask 255.255.255.0
            3. **Router(config-router)#** network 10.0.1.0 mask 255.0.0.0
            4. **Router(config-router)#** neighbour 10.0.1.1 remote-as 200

Default Router / Routing



1. Configure internal networks.
2. Configure interface of internet facing router and router on the internet. (Fast Ethernets , Serial Ports)
3. configure **DEFAULT STATIC ROUTE** on both router. (internet facing and router on the internet).
    a. For Router 0:
        i. **Router(config)#** ip route 0.0.0.0 0.0.0.0 s0/0
    b. For Router 1:
        i. **Router(config)#** ip route 0.0.0.0 0.0.0.0 s0/0
4. create loopbacks on router on the internet to check connectivity.
    a. For Router 1:
        i. **Router(config)#** int loopback 0
        ii. **Router(config-if)#** ip add 1.1.1.1 255.255.255.255
        iii. **Router(config)#** int loopback 1
        iv. **Router(config-if)#** ip add 2.2.2.2 255.255.255.255

NETWORK SERVICES



DHCP Setup

1. Drag and drop a **generic server** & Configure internal networks. (Fast Ethernets , Serial Ports)
2. Click on the **server** → Go to the **Config** tab → Change the **Server Name** to `DHCP-Server`
3. For Router 0:
   a. **Router(config)#** interface Fastethernet0/0
   b. **Router(config-if)#** ip address 192.168.1.1 255.255.255.0
   c. **Router(config-if)#** no shut-down
4. For Server :
   a. Click on the **server** → Go to the **Desktop** tab → **IP configuration tab**
   b. IPV4 : 192.168.1.100 , Subnet Mask : 255.255.255.0
   c. Default Gateway : 192.168.1.1 , DNS Server : 8.8.8.8
5. For Pc0 , Pc1 :
   a. Click on the **Pc0 , Pc1** → Go to the **Desktop** tab → **IP configuration tab**
   b. Turn on **DHCP**

NTP Server

1. Drag and drop a **generic server** & Configure internal networks. (Fast Ethernets , Serial Ports)
2. Click on the **server** → Go to the **Config** tab → Change the **Server Name** to `NTP-Server`

3. For Router 0:
    a. **Router(config)#** interface Fastethernet0/0
    b. **Router(config-if)#** ip address 192.168.1.1 255.255.255.0
    c. **Router(config-if)#** no shut-down
4. For Server :
    a. Click on the **server** → Go to the **Desktop** tab → **IP configuration tab**
    b. IPV4 : 192.168.1.100 , Subnet Mask : 255.255.255.0
    c. Default Gateway : 192.168.1.1
5. Click on the **server** → Go to the **Services** tab → **NTP [Add key (123) & password (abc)]**
6. For Router 0:
    a. **Router(config)#** ntp authentication-key 123 md5 abc
    b. **Router(config)#** ntp server 192.168.1.100
    c. **Router#** show clock

TFTP Server

1. Drag and drop a **generic server** & Configure internal networks. (Fast Ethernets , Serial Ports)
2. Click on the **server** → Go to the **Config** tab → Change the **Server Name** to `TFTP-Server`
3. For Router 0:
    a. **Router(config)#** interface Fastethernet0/0
    b. **Router(config-if)#** ip address 192.168.1.1 255.255.255.0
    c. **Router(config-if)#** no shut-down
4. For Server :
    a. Click on the **server** → Go to the **Desktop** tab → **IP configuration tab**
    b. IPV4 : 192.168.1.100 , Subnet Mask : 255.255.255.0
    c. Default Gateway : 192.168.1.1
5. Click on the **server** → Go to the **Services** tab → **TFTP**

6. For Router 0 (**Uploading file** to the server) :
    a. **Router#** copy startup-config tftp:
    b. **Address or name of remote host [ ]?** 192.168.1.100
    c. **Destination filename [Router-confg]?** startup
7. For Router 0 (**Downloading file** from the server) :
    a. **Router#** copy tftp: startup-config(Enter)
    b. **Address or name of remote host [ ]?** 192.168.1.100
    c. **Source filename []?** startup
    d. **Destination filename [startup-config]? [**enter**]**

SYSLOG Server

1. Drag and drop a **generic server** & Configure internal networks. (Fast Ethernets , Serial Ports)
2. Click on the **server** → Go to the **Config** tab → Change the **Server Name** to `Syslog-Server`

Password Reset

1. Configure internal networks. (Fast Ethernets , Serial Ports)
2. Set Password on router :
    a. **Router(config)#** enable secret Test321
3. Using laptop terminal get into **ROMMON MODE**.
    a. switch off router
    b. switch on router & at the same time on laptop terminal Press **CRTL + SHIFT + C**
    c. you will see **rommon 1 >**
4. On Laptop Terminal
    a. **rommon 1 >** confreg 0x2142
    b. **rommon 2 >** reset
5. After the router reloads, enter privileged EXEC mode:
    a. **Would you like to enter the initial configuration dialog? [yes/no]** → No

b. **Router>** enable

c. **Router#** configure terminal

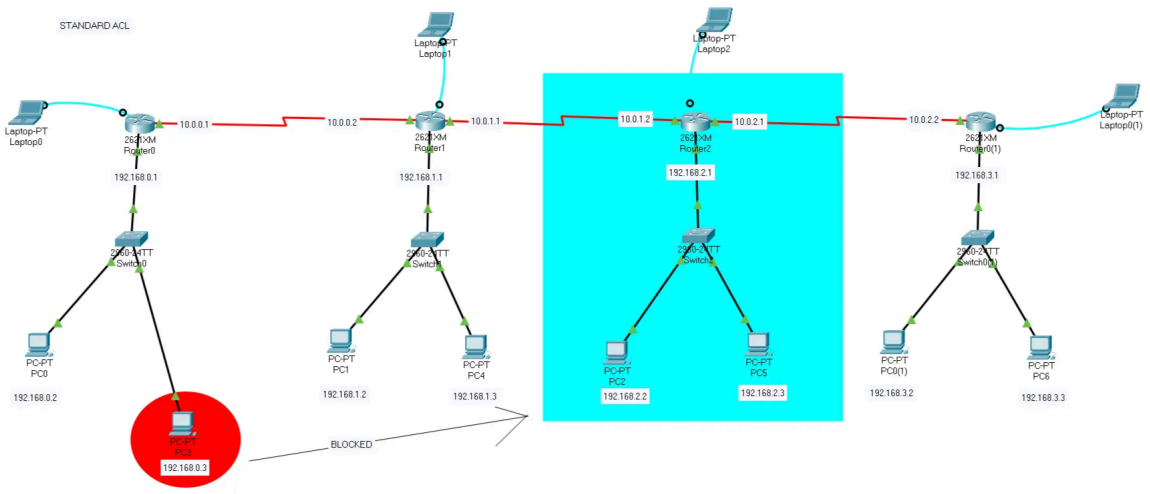
6. Change the password:
   a. **Router(config)#** enable secret Test456
7. Restore the original configuration register:
   a. **Router(config)#** config-register 0x2102
   b. **Router(config)#** exit
8. Save the configuration and reload the router:
   a. **Router#** copy running-config startup-config
   b. **Router#** reload
9. To test New password
   a. **Router>** enable
   b. **Password:** {New password}

ACCESS CONTROL LIST

- Access -list : [1 - 99 :- Standard ACL] , [100 - 199 : - Extended ACL]
- Operators : eq (equal to) , neq (not equal to) , lt (less than) , gt (greater than)

Standard ACL

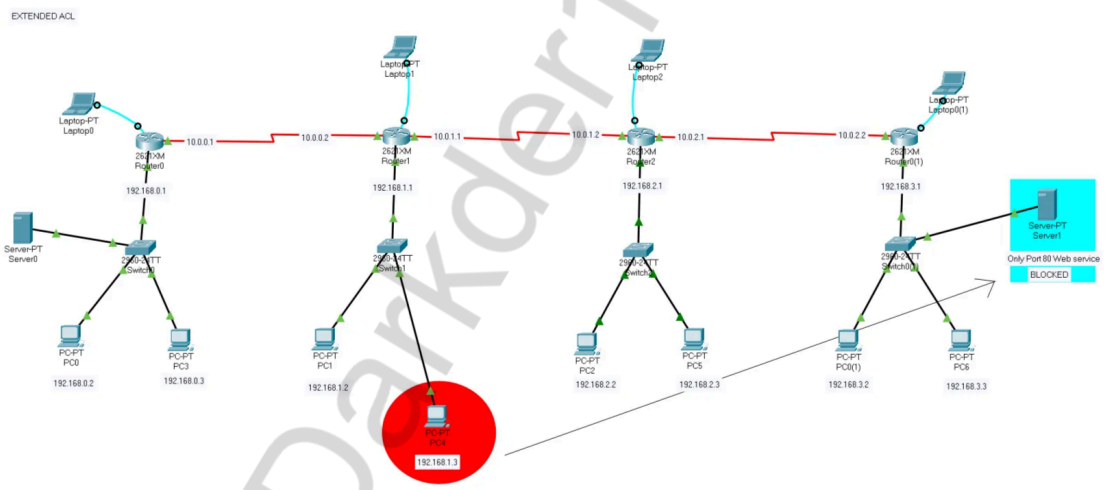
- Standard ACL is always configured on Destination Router.



1. Configure internal networks. (Fast Ethernets , Serial Ports).
2. Configure Routing Protocol
3. Define the access rule to block a specific host (**192.168.0.3**) from reaching a network (**192.168.2.0**).
4. Apply the ACL on the **Destination** router:
    a. **Router(config)#** access-list 1 deny 192.168.0.3
    b. **Router(config)#** access-list 1 permit any
    c. **Router(config)#** interface fastethernet0/0
    d. **Router(config)#** ip access-group 1 out

Extended ACL

- Extended ACL is always configured on Closet to source Router.

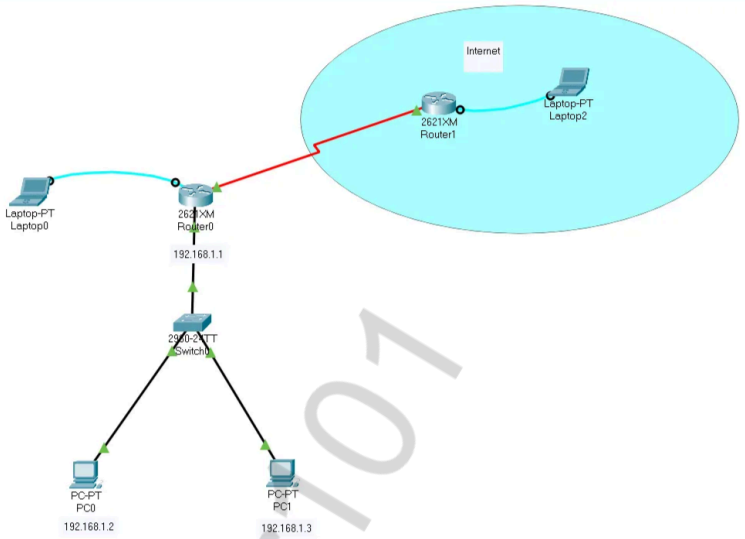


1. Configure internal networks. (Fast Ethernets , Serial Ports).
2. Configure Routing Protocol
3. Define the access rule to block a specific host (**192.168.1.3**) from reaching a specific network Service (**192.168.3.100**) **HTTP WEB SERVER**
4. Apply the ACL on the **Closet Source** router:
    a. **Router(config)#** access-list 101 deny tcp 192.168.1.3 0.0.0.0 192.168.3.100 0.0.0.0 eq 80
    b. **Router(config)#** access-list 101 permit ip any any
    c. **Router(config)#** interface fastethernet0/0

d. **Router(config)#** ip access-group 101 in

NAT

- NAT table contains table of mapping of private ip & public ip



Static NAT

1. Configure internal networks. (Fast Ethernets , Serial Ports).
2. Configure **Default Routing Protocol**
3. For Router 0:
   a. **Router(config)#** ip nat inside source static 192.168.1.2 1.1.1.2
   b. **Router(config)#** ip nat inside source static 192.168.1.3 1.1.1.3
   c. **Router(config)#** interface fastethernet0/0
   d. **Router(config-if)#** ip nat inside
   e. **Router(config-if)#** exit
   f. **Router(config)#** interface serial0/0
   g. **Router(config-if)#** ip nat outside

Dynamic NAT

1. Configure internal networks. (Fast Ethernets , Serial Ports).
2. Configure **Default Routing Protocol**

3. For Router 0:
    a. Configure Static ACL
        i. **Router(config)#** access-list 1 permit any
    b. Configure NAT Pool
        i. **Router(config)#** ip nat pool cisco 1.1.1.1 1.1.1.3 netmask 255.255.255.0
    c. Bind ACL and NAT Pool
        i. **Router(config)#** ip nat inside source list 1 pool cisco
    d. Apply NAT
        i. **Router(config)#** interface fastethernet0/0
        ii. **Router(config-if)#** ip nat inside
        iii. **Router(config-if)#** exit
        iv. **Router(config)#** interface serial0/0
        v. **Router(config-if)#** ip nat outside