

# CCNA Practice Labs

I studied this course with [eng.Hussain Almalki](#).

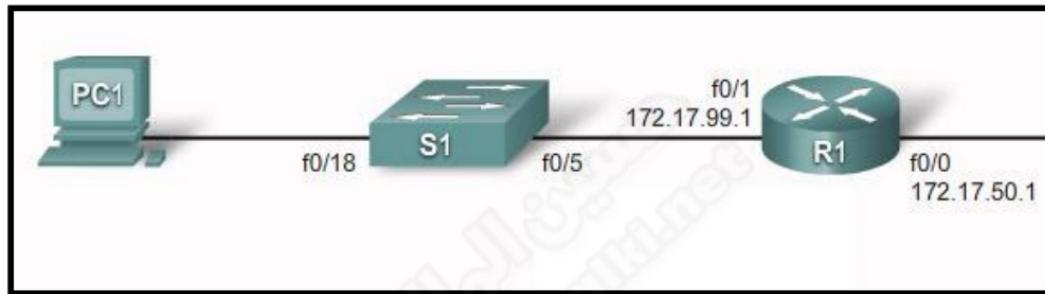
Here are a few tips to get you started:

- In this document you will see small description, capture and link for every lab.
- In labs you can see the structure and used commands.

▼ Switch Commands [[The Lab](#)]

▼ Topic Summary:

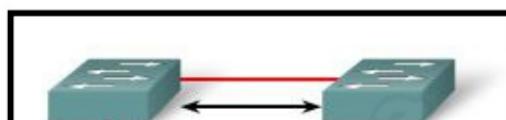
## Config IP

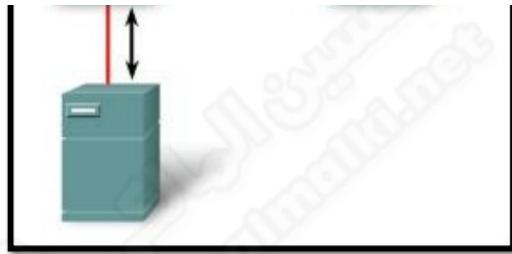


```

S1#config t
S1(config)#int vlan 1
S1(config-if)#ip address 172.17.99.11 255.255.0.0
S1(config-if)#no shutdown
S1(config-if)#exit
S1(config)#ip default-gateway 172.17.99.1
  
```

## Config Duplex & Speed





```
S1#config t
S1(config)#int f 0/1
S1(config-if)#duplex auto
S1(config-if)#speed auto
S1(config-if)#no shutdown
```

## MAC Address Table

- Switches use MAC address tables .
- S#show mac-address-table
- Content addressable memory (CAM) or CAM table.

Mac Address Table			
Vlan	Mac Address	Type	Ports
All	0100.0ccc.cccc	STATIC	CPU
All	0100.0ccc.ddd	STATIC	CPU
All	0180.c200.0000	STATIC	CPU
All	0180.c200.0001	STATIC	CPU
All	0180.c200.0002	STATIC	CPU
All	0180.c200.0003	STATIC	CPU

# Show Commands

**S1#show flash:**

Displays current operating configuration.

**S1#show interfaces f0/1**

Displays interface status and configuration for a single or all interfaces available on the switch.

**S1#reload**

Restart the switch.

**S1#erase start**

clear the contents of your startup configuration

## Configure Console Access

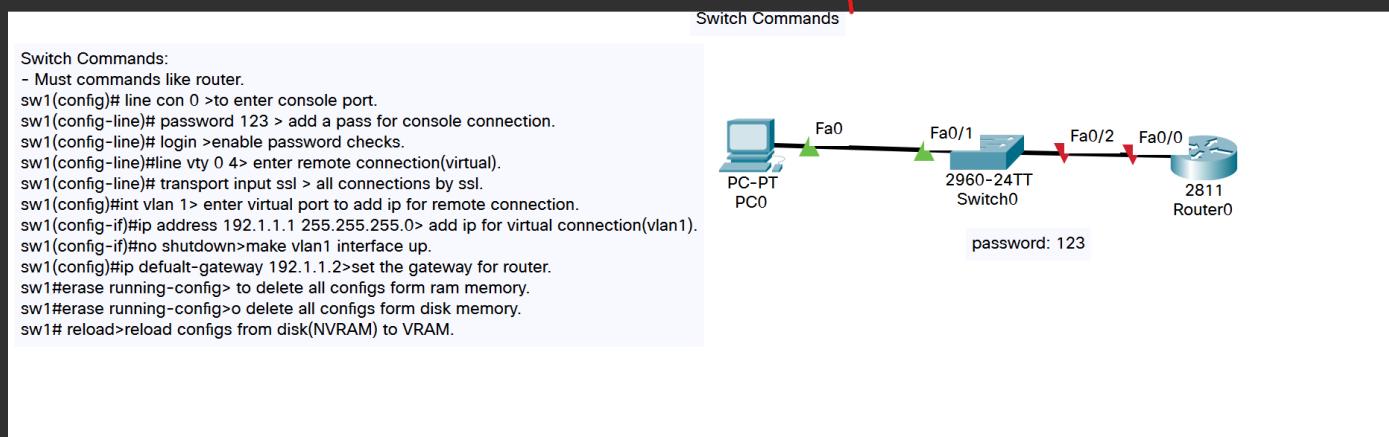
```
S1#config t
```

```
S1(config)#line con 0
```

```
S1(config-line)#password cisco
```

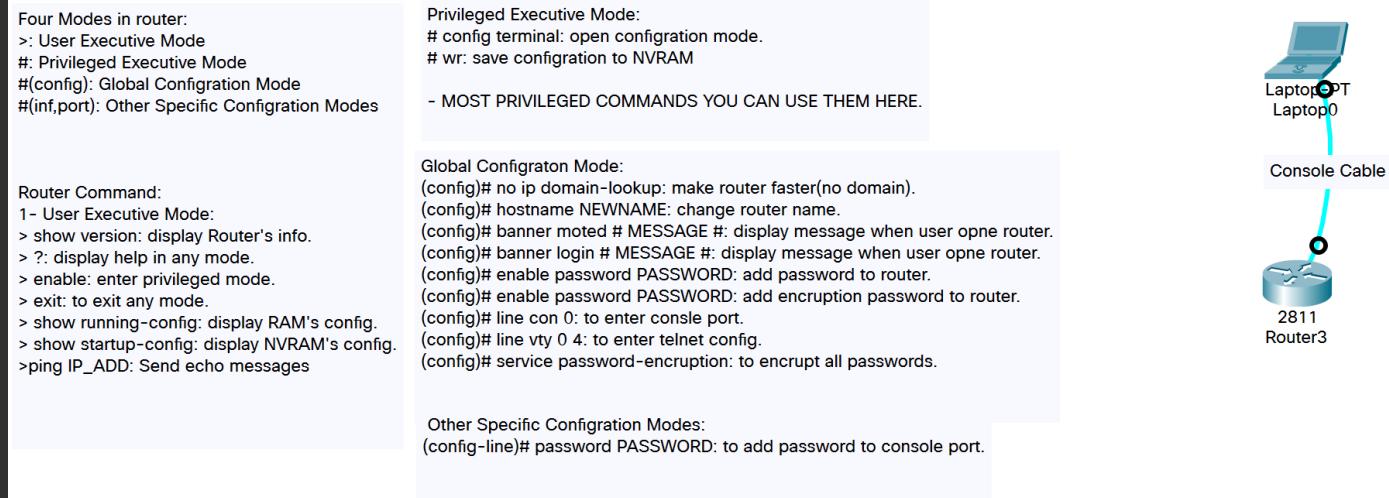
```
S1(config-line)#login
```

## Photo From Lab



## ▼ Router Commands [The Lab]

## Photo From Lab



## ▼ Dynamic Host Configuration Protocol(DHCP).pkt [The Lab]

## ▼ Topic Summary:

DHCP

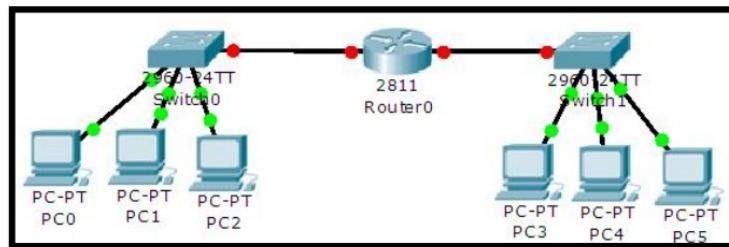
- Dynamic Host Configuration Protocol.
- DHCP is a protocol that assigns unique IP addresses to devices.

**DHCP environments require:**

- DHCP server:
  - Range or "pool" of available IP addresses.
  - The correct subnet masks.
  - Default gateway.
  
- DHCP client software:  
can automatically retrieve these settings from DHCP servers as needed.

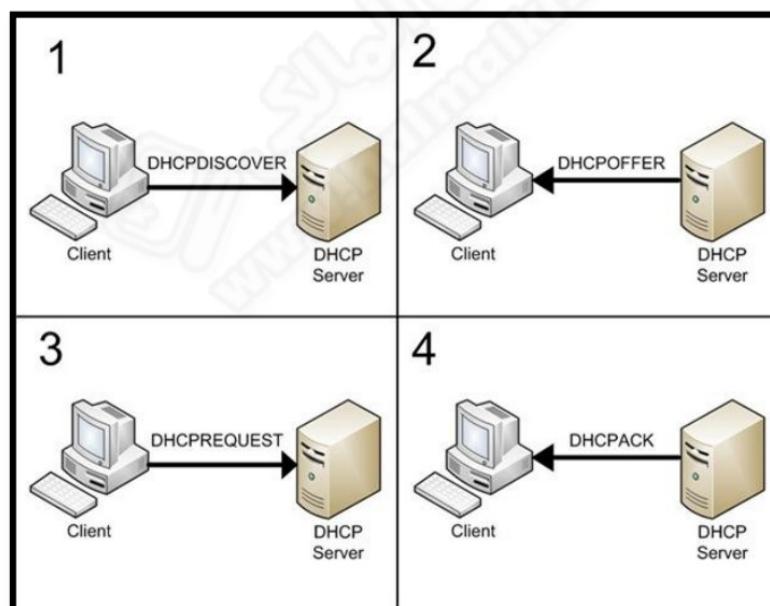
**DHCP advantages:**

- There is no need to manually configure each client with an IP address.
- Address duplication is eliminated.

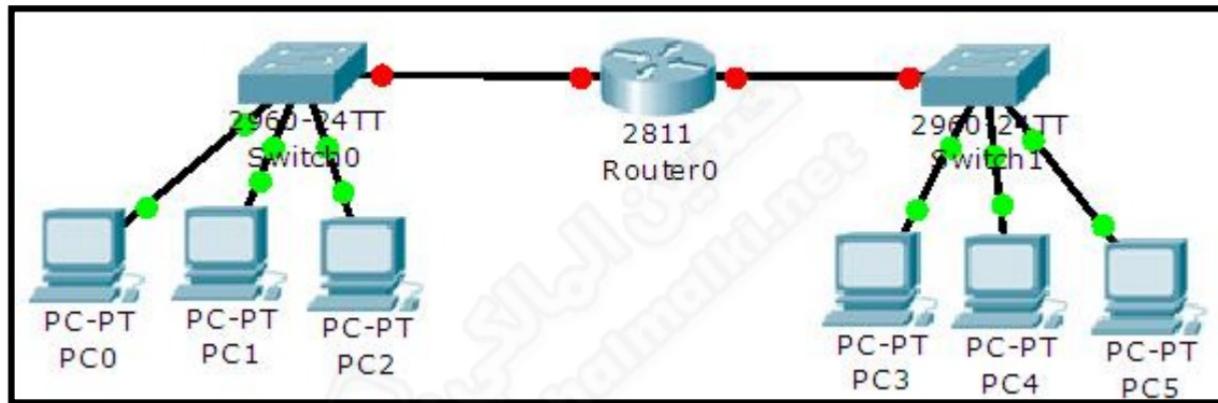


## DHCP operations

- 1- Clients sends the **DHCP Discovery** request to the server.
- 2- Server responds to the client with the **DHCP Offer** packet.
- 3- Clients responds to the server with **DHCP Request**.
- 4- Server confirm IP address assignment via **DHCP ACK** packet.



## DHCP configurations

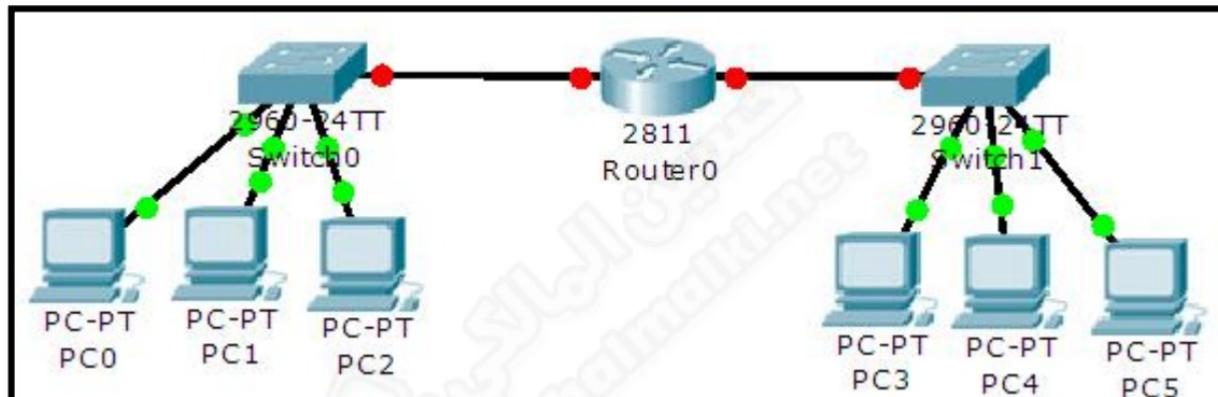


192.1.1.0

192.1.2.0

```
Router(config)#int f0/0
Router(config-if)#ip address 192.1.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config)#int f0/1
Router(config-if)#ip address 192.1.2.1 255.255.255.0
Router(config-if)#no shutdown
```

## DHCP configurations



192.1.1.0

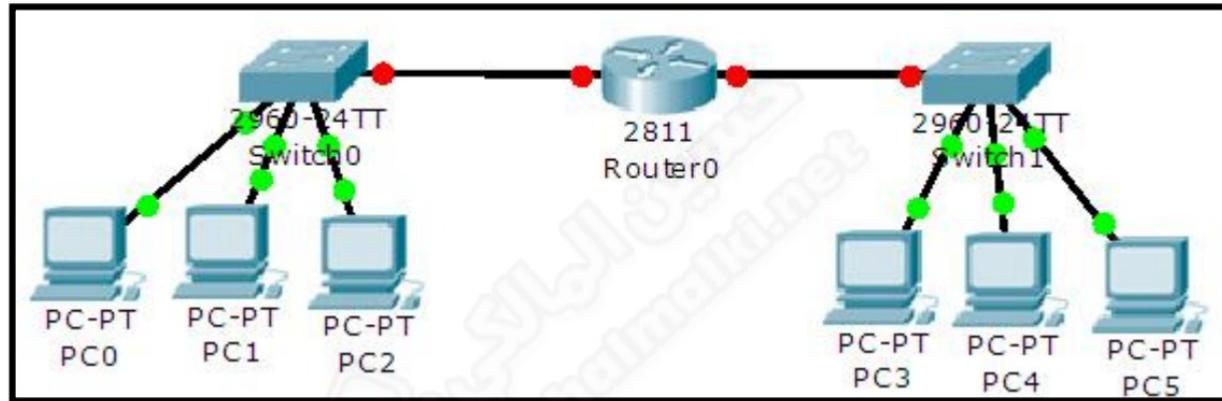
192.1.2.0

```

Router(config)#ip dhcp pool hussain1
Router(dhcp-config)#network 192.1.1.0 255.255.255.0
Router(dhcp-config)#default-router 192.1.1.1
Router(dhcp-config)#dns-server 192.1.1.3
Router(dhcp-config)#lease 9

```

## DHCP configurations



192.1.1.0

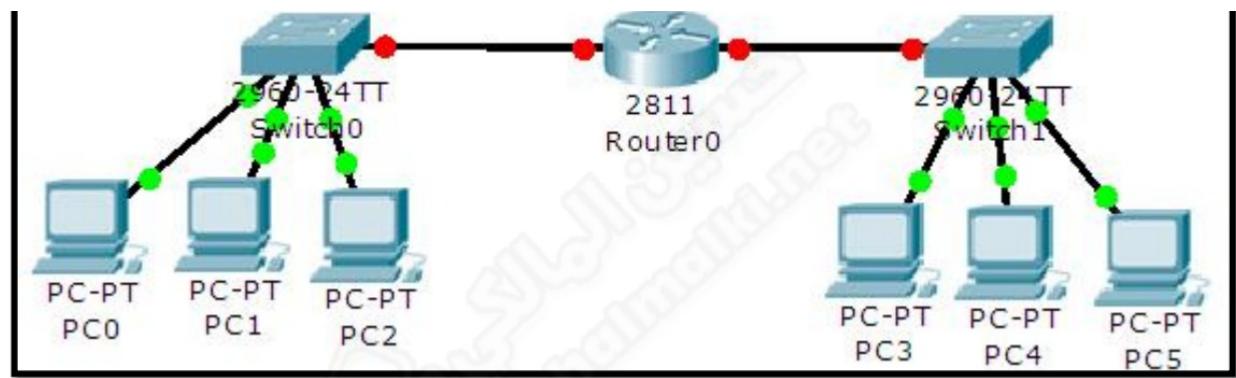
192.1.2.0

```

Router(config)# ip dhcp pool hussain2
Router(dhcp-config)#network 192.1.2.0 255.255.255.0
Router(dhcp-config)# default-router 192.1.2.1
Router(dhcp-config)# lease 9
Router(dhcp-config)# exit
Router(config)# ip dhcp excluded-address 192.1.1.1 192.1.1.5
Router(config)# ip dhcp excluded-address 192.1.2.1

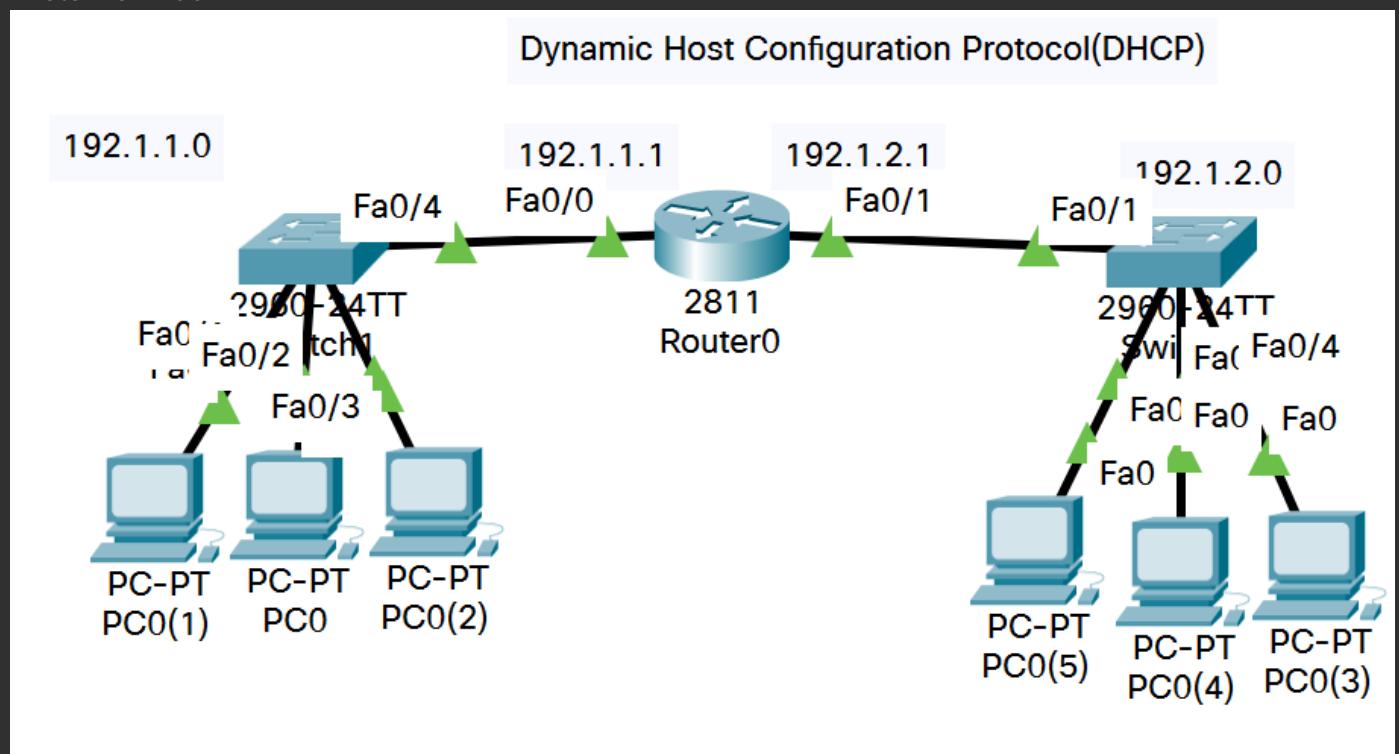
```

## DHCP configurations



```
Router#show ip dhcp binding
IP address Client-ID/ Lease expiration Type
Hardware address
192.1.1.6 0010.11DD.A321 -- Automatic
192.1.1.7 0009.7C72.B0C3 -- Automatic
192.1.1.8 00E0.A3CA.576C -- Automatic
192.1.2.2 0007.ECC3.0A1E -- Automatic
192.1.2.3 0005.5EB0.86B1 -- Automatic
192.1.2.4 0004.9A17.65C0 -- Automatic
```

## Photo From Lab



# Static and Dynamic Routes

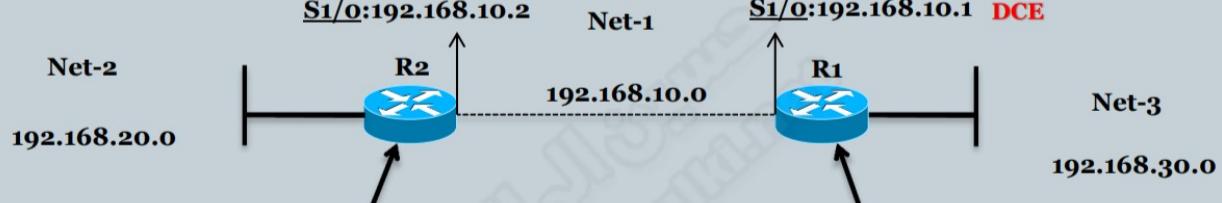
- **Static Route**

Uses a route that a network administrator enters into the router manually

- **Dynamic Route**

Uses a route that a network routing protocol adjusts automatically for topology or traffic changes

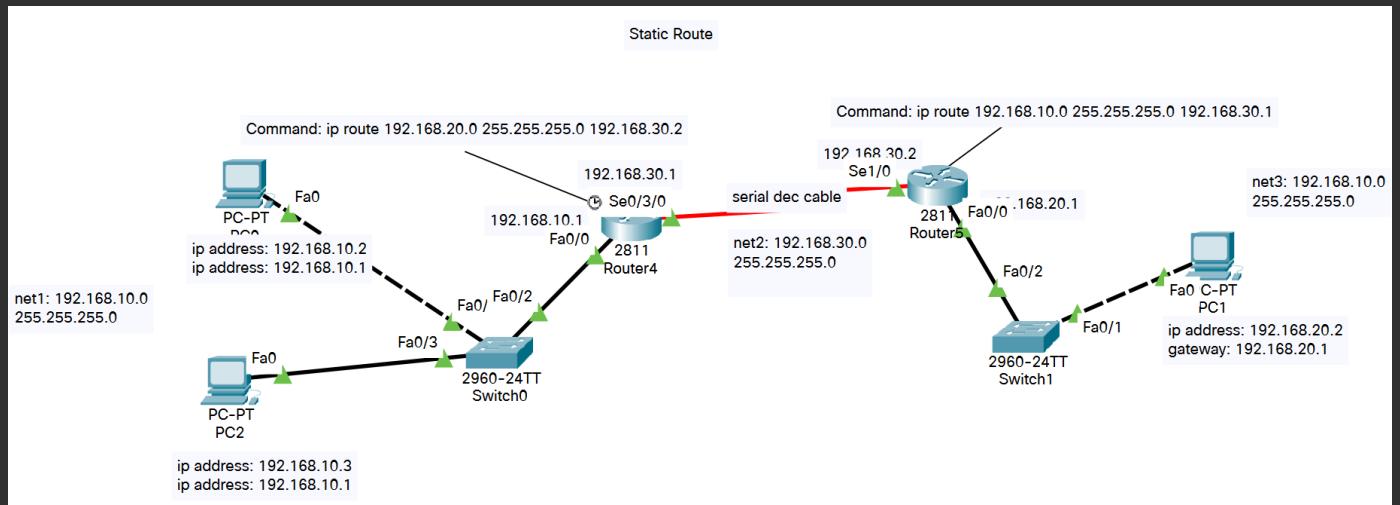
## Static route



ip route 192.168.30.0 255.255.255.0 192.168.10.1

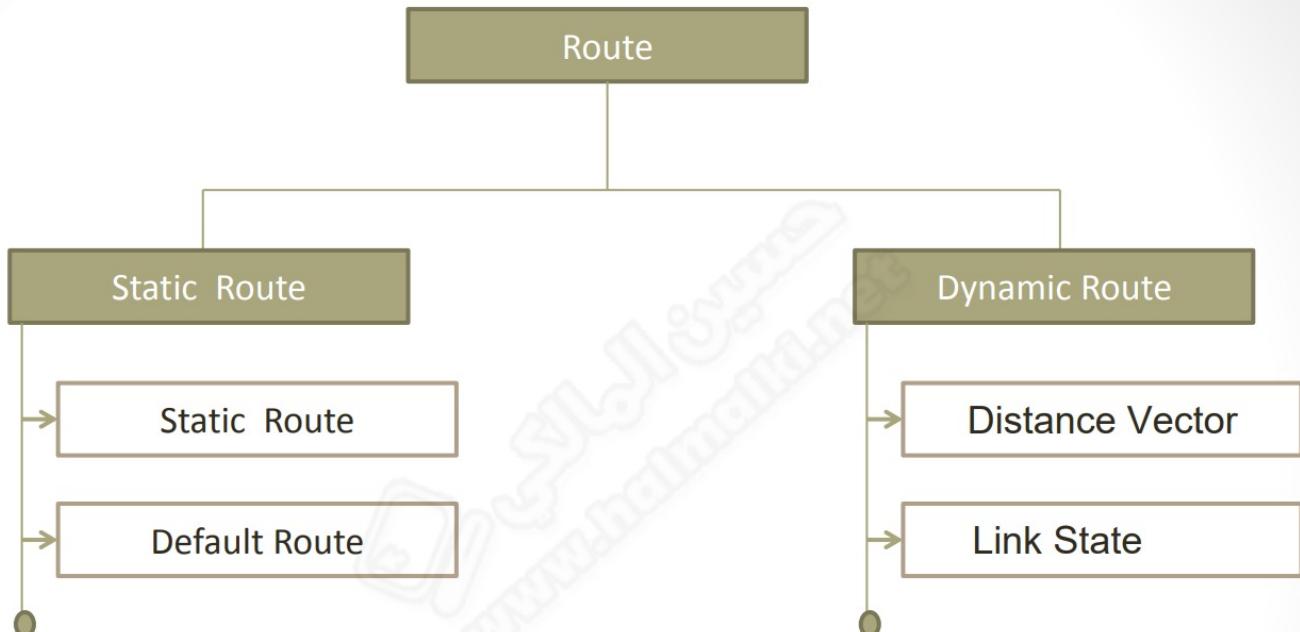
ip route 192.168.20.0 255.255.255.0 192.168.10.2

## Photo From Lab



## ▼ Routing(RIP Protocol) [The Lab]

## ▼ Topic Summary:



## RIP

- Routing Information Protocol .
- Dynamic.
- Distance vector .
- RIP calculates the best route based on hop count.
- Administrative distance 120.

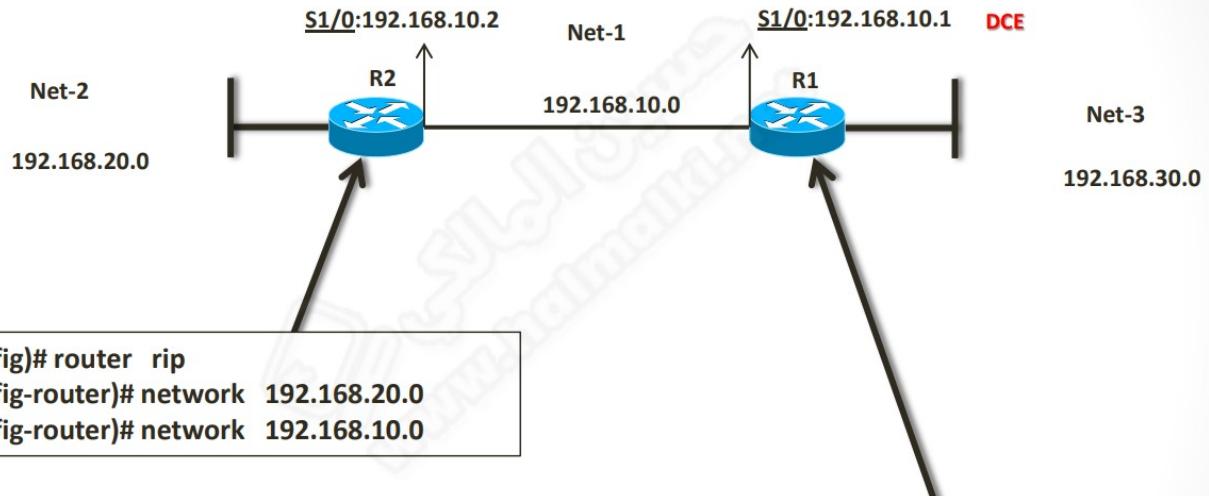
- Hop count 16.
  - The path with the shortest hop count maybe the slowest .
  - Classful Routing Only

## RIP Timers

TIMER	DEFAULT	CONTROLS
Update	30 sec.	update advertisements
Hold-Down	90 sec.	Period a route is withdrawn from the table to prevent a routing loop.
Timeout	180 sec.	stay 'live' in the routing table.
Flush	240 sec.	How long to wait to delete a route after it has timed out.

## Broadcast update

### Apply RIP



```
router(config)# router rip
router(config-router)# network 192.168.20.0
router(config-router)# network 192.168.10.0
```

```
router(config)# router rip
router(config-router)# network 192.168.30.0
router(config-router)# network 192.168.10.0
```

### IP protocols

**R2#show ip protocols**

**Routing Protocol is "rip"**

Sending updates every 30 seconds, next due in 10 seconds

Invalid after 180 seconds, hold down 180, flushed after 240

Invoked after 100 seconds, hold down 100, flushed after 240

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Redistributing: rip

Default version control: send version 1, receive any version

Interface Send Recv Triggered RIP Key-chain

**FastEthernet0/0** 1 2 1

**Serial1/0** 1 2 1

Automatic network summarization is in effect

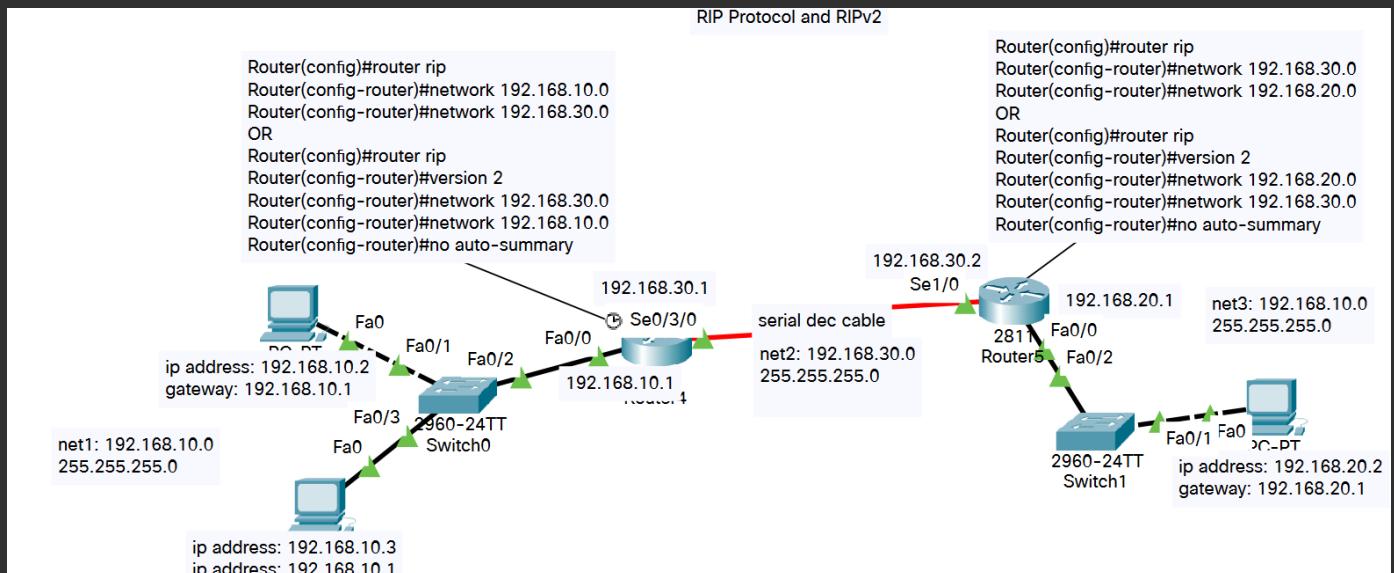
Maximum path: 4

### Routing for Networks:

**192.168.10.0**

**192.168.30.0**

### Photo From Lab



### ▼ IPv6 Routing(RIP) [The Lab]

### ▼ Topic Summary:

# IPv6 Routing Protocols

## IPv6 ROUTING TYPES

- Static
- RIPng
- OSPFv3
- EIGRP for IPv6

# IPv6 Routing Protocols

## IPv6 ROUTING TYPES

- Static

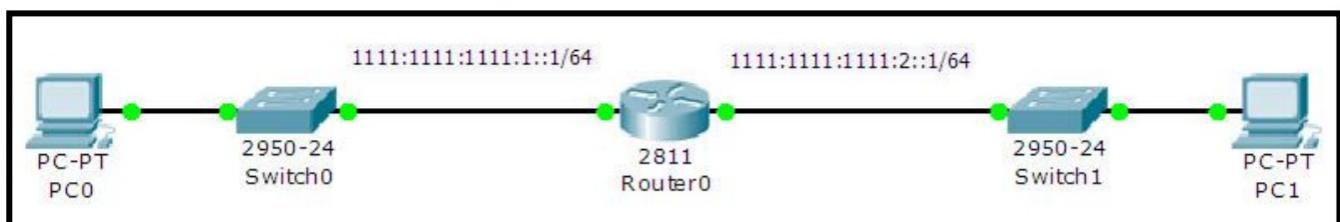
```
Router(config)#ipv6 unicast-routing
```

```
Router(config)#int f0/0
```

```
Router(config-if)#ipv6 enable
```

```
Router(config-if)#ipv6 address 1111:1111:1111:1::1/64
```

```
Router(config-if)#no shut
```



# IPv6 Routing Protocols

## IPv6 ROUTING TYPES

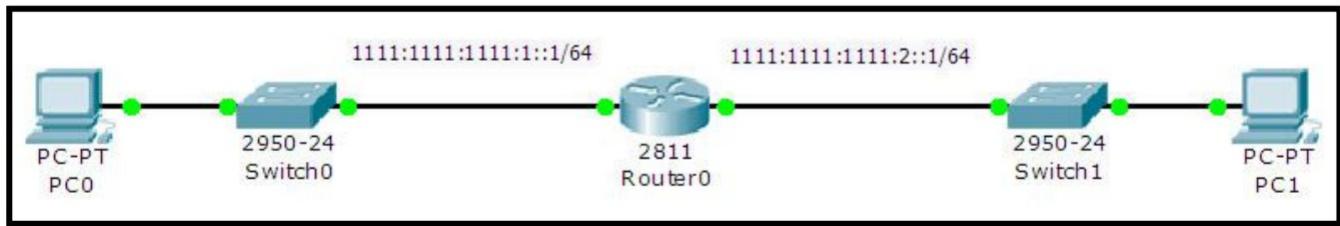
- Static

```
Router(config-if)#int f0/1
```

```

Router(config-if)#ipv6 enable
Router(config-if)#ipv6 address 1111:1111:1111:2::1/64
Router(config-if)#no shut

```



## IPv6 Routing Protocols

### IPv6 ROUTING TYPES

- Static

```

Router(config)#ipv6 route 1111:1111:1111:1::/64 f0/0
Router(config)#ipv6 route 1111:1111:1111:2::/64 f0/1

```

Router#sh ipv6 route

Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP

C 1111:1111:1111:1::/64 [0/0]	via ::, FastEthernet0/0
L 1111:1111:1111:1::1/128 [0/0]	via ::, FastEthernet0/0
C 1111:1111:1111:2::/64 [0/0]	via ::, FastEthernet0/1
L 1111:1111:1111:2::1/128 [0/0]	via ::, FastEthernet0/1
L FF00::/8 [0/0]	via ::, Null0

## IPv6 Routing Protocols

## IPv6 ROUTING TYPES

- RIPng

```
Router(config)# ipv6 unicast-routing
```

```
Router(config)# interface Fa 0/0
```

```
Router(config-if)# ipv6 enable
```

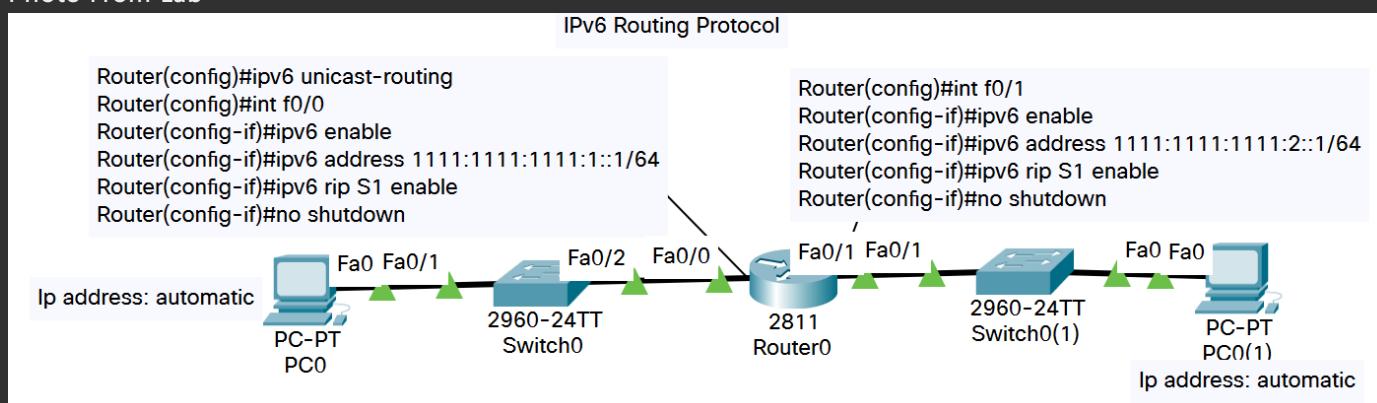
```
Router(config-if)# ipv6 address 1111:1111:1111:1::1/64
```

```
Router(config-if)# ipv6 rip S1 enable
```

```
Router(config-if)# no shutdown
```



Photo From Lab



▼ Routing(EIGRP Protocol) [The Lab]

▼ Topic Summary:

## EIGRP

- Enhanced Interior Gateway Routing Protocol.
- Dynamic.
- Distance vector.
- Invented by Cisco.
- Fast convergence.

- **Supports VLSM – summarization.**
- **Administrative distance 90.**
- **Bandwidth, delay, Reliability and load as metric.**
- **Autonomous system.**

## EIGRP Components

**Neighbor Discover/Recovery**

- learn about other routers that are directly connected to them.
- Finding when a router (neighbor) goes down by sending hello packets.

**Reliable Transport**

- use TCP when it is necessary to guarantee that a neighbor received a communication.

**DUAL finite state machine**

- Determines routing tables.
- Diffusing Update Algorithm (routing calculations are shared among multiple routers).
- Only sends routing updates to directly connected routes.
- Only sends an update if a topology change (only to neighbor).

**Protocol-dependent modules**

- Handle network layer.
- Handel IP or IPX separate tables for each layer 3 protocol.

## EIGRP Tables

**Neighbor table** lists adjacent routers

**Topology table** contain Feasible Successor

**Routing table** contain Successor

**Successor**

**Feasible Successor**

▪ **Successor – Current Route**

➢ A successor is a route selected as the primary route to use to reach a destination.

➢ Successors are the entries kept in the routing table.

▪ **Feasible Successor - A backup route**

➢ A feasible successor is a backup route.

➢ These routes are selected at the same time the successors are identified, but they are kept in the topology table.

➢ Multiple feasible successors for a destination can be retained in the topology table.

## EIGRP Tables

### Neighbor table

Next hop	Interface
Router A	F0/0
Router B	F1/1

List all directly connected

### Topology table

Network	FD	AD	EIGRP nei
192.168.1.0/24	2000	1000	Router A(F0/0)
192.168.1.0/24	2500	1500	Router B(F1/1)

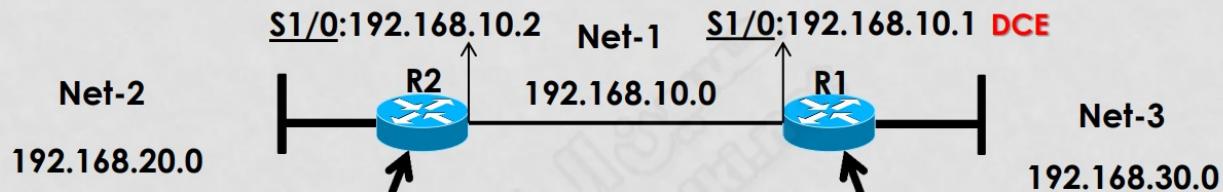
List all routes learnt from each neighbor

### Routing table

Network	FD	Outbound interface	Next hop EIGRP nei
192.168.1.0/24	2000	F0/0	Router A

List best route from topology table

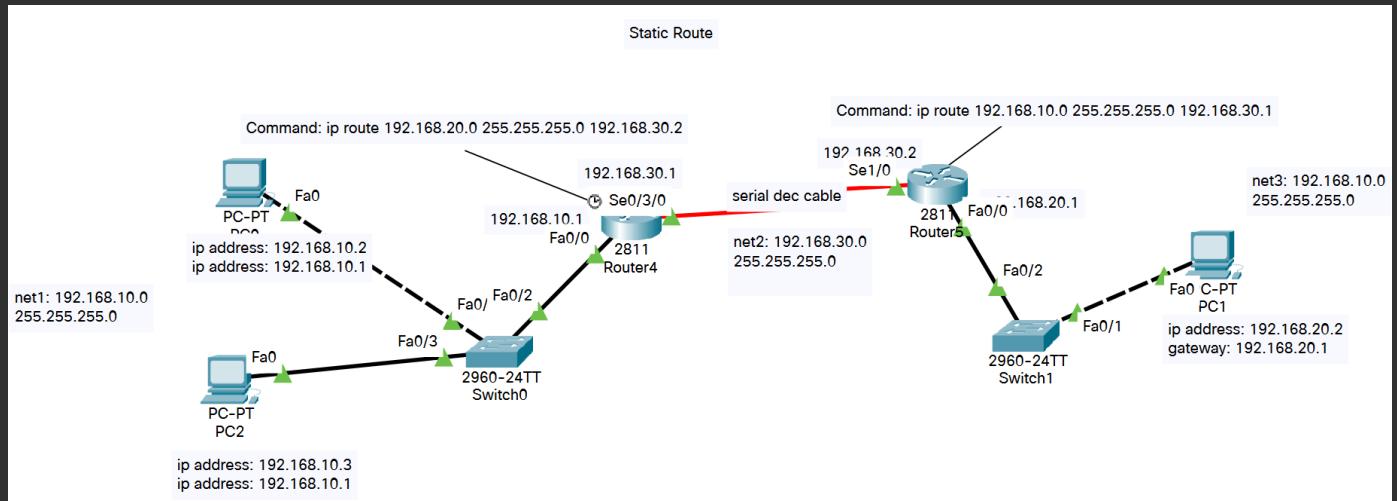
## EIGRP commands



```
RouterA(config)#router eigrp 100
RouterA(config-router)#network 192.168.10.0
RouterA(config-router)#network 192.168.20.0
RouterA(config-router)#no auto-summary
```

```
RouterB(config)#router eigrp 100
RouterB(config-router)#network 192.168.10.0
RouterB(config-router)#network 192.168.30.0
RouterB(config-router)#no auto-summary
```

### Photo From Lab



### ▼ Routing(OSPF Protocol) [The Lab]

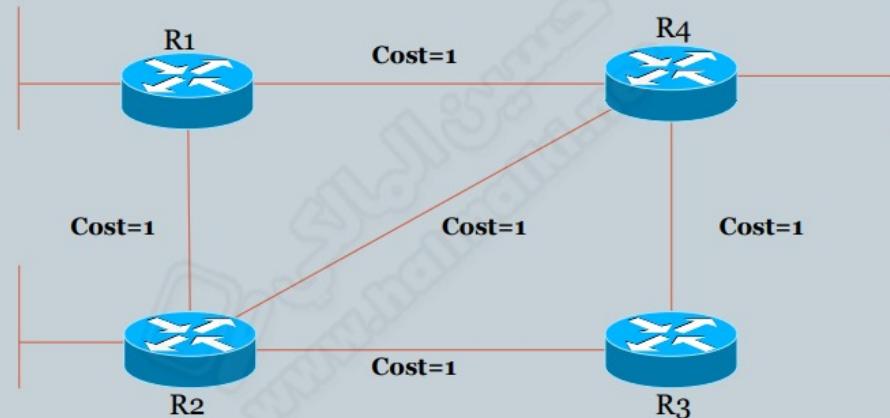
### ▼ Topic Summary:

## OSPF

- **Open Shortest Path First .**
- **Dynamic.**

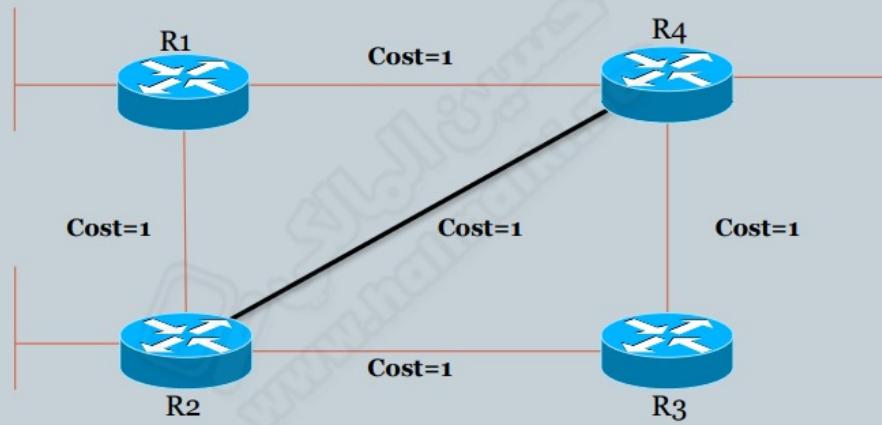
- **Link-state.**
- **Use classless IP.**
- **hierachal structure.**
- **Supports VLSM – summarization.**
- **Administrative distance 110.**
- **finding the lowest **cost** paths to a destination.**

## OSPF routing



R2 -> R4

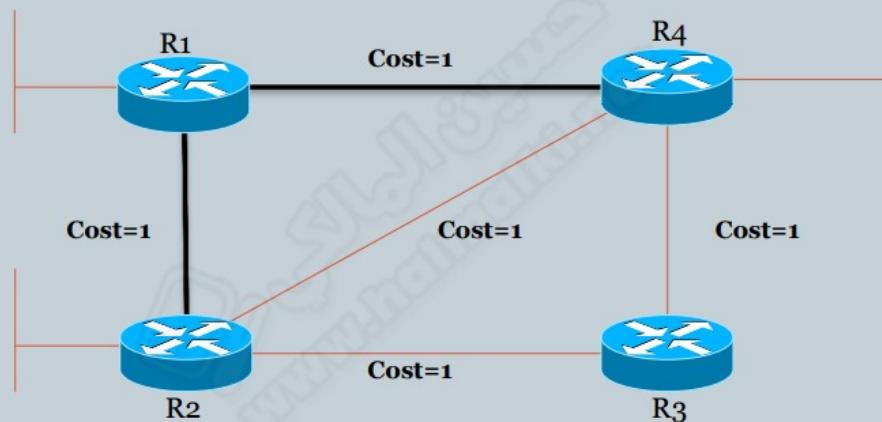
## OSPF routing



R2 -> R4

- R2 – R4 (1)

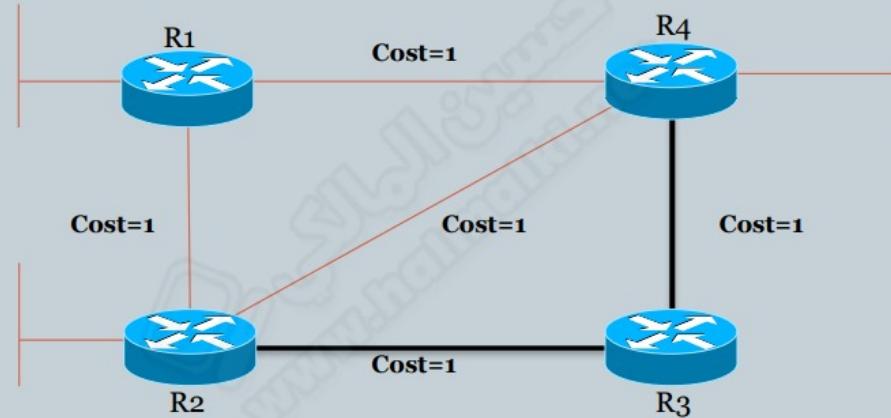
## OSPF routing



R2 -> R4

- R2 – R4 (1)
- R2- R1 –R4 (1+1)

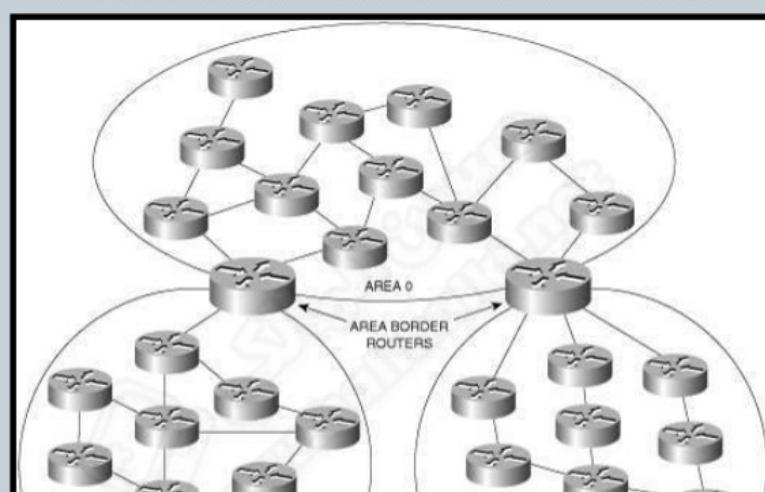
## OSPF routing

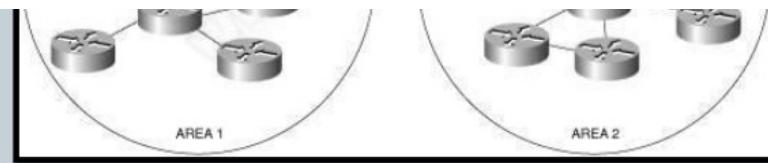


R2 -> R4

- R2 – R4 (1)
- R2- R1 –R4 (1+1)
- R2- R3 –R4 (1+1)

## OSPF Terminology



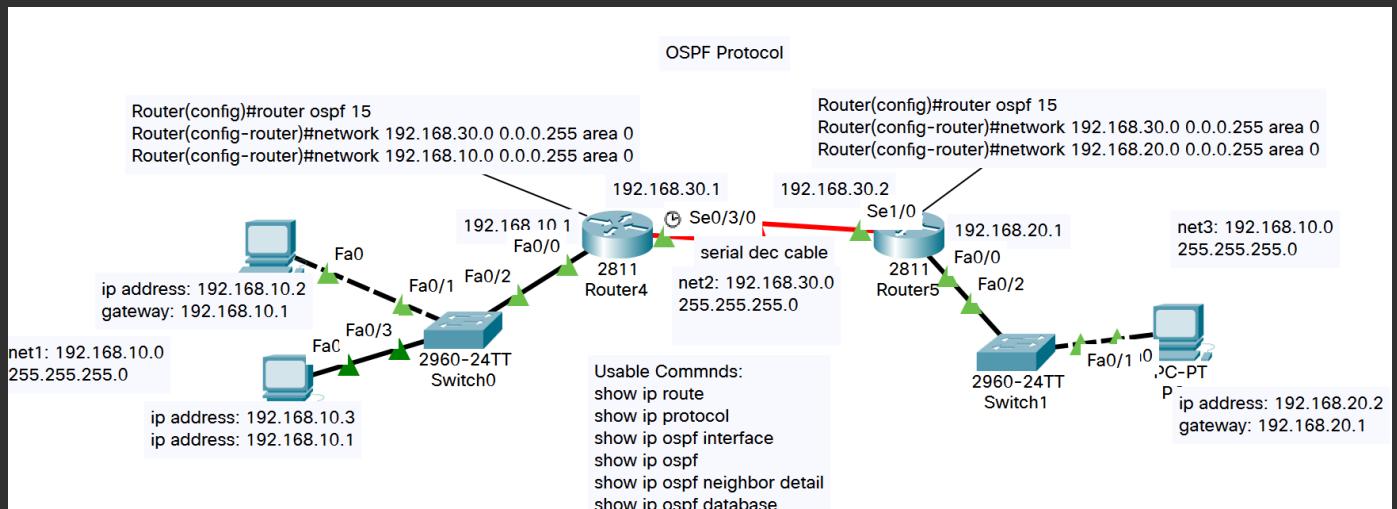


- **Area 0 - backbone.**
- **Area border routers (ABR).**
- **Autonomous System Boundary Router (ASBR).**

## OSPF Terminology

Term	Explain
Link	an interface on a router

### Photo From Lab

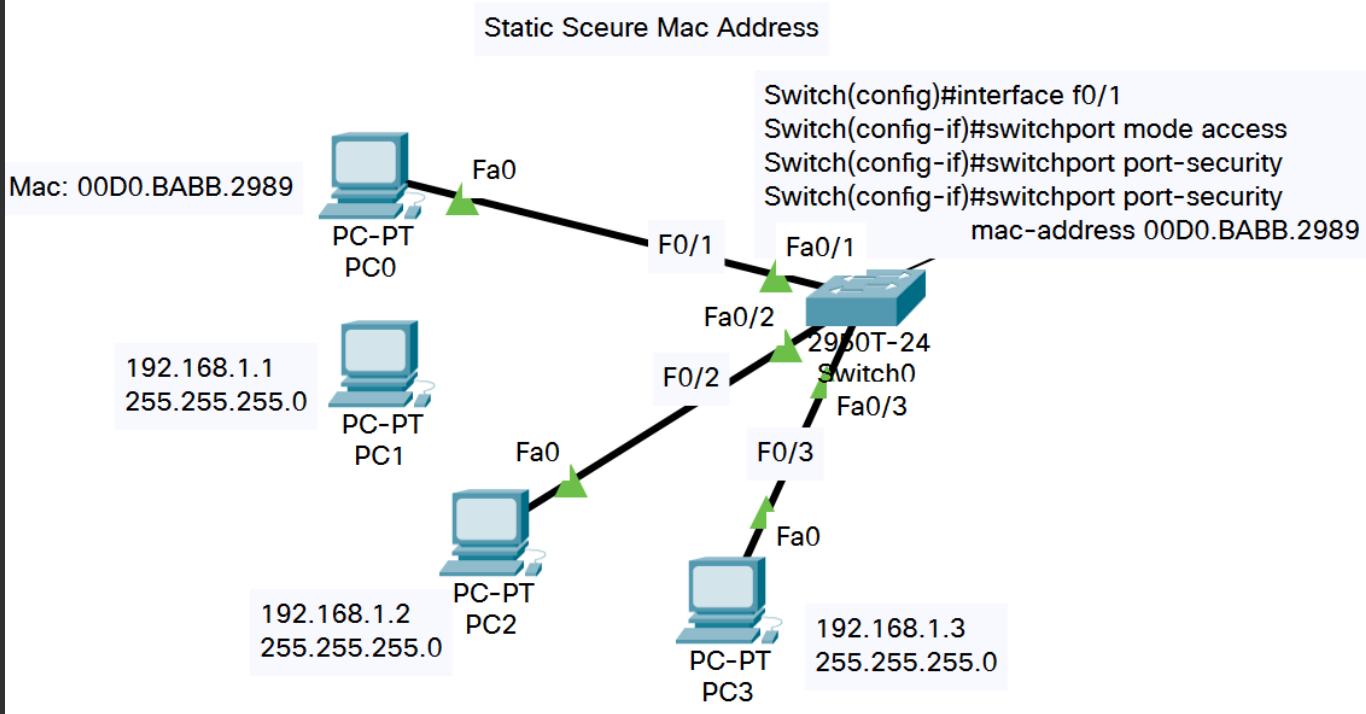


▼ Secure Switch From Mac Flooding(Static) [The Lab]

▼ Topic Summary:

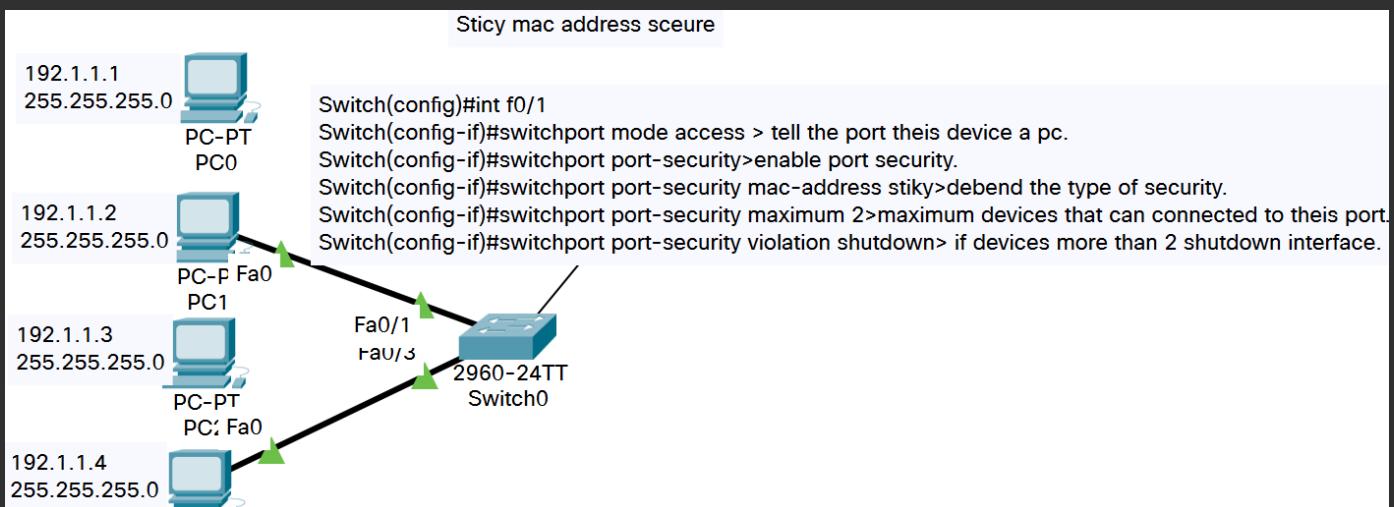


### Photo From Lab



▼ Secure Switch From Mac Flooding(Sticky) [The Lab]

Photo From Lab

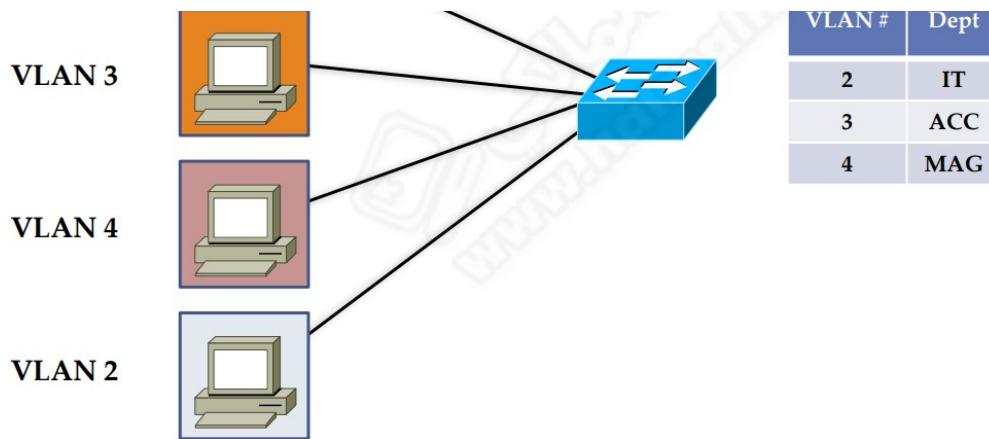


▼ VLAN-1 [The Lab]

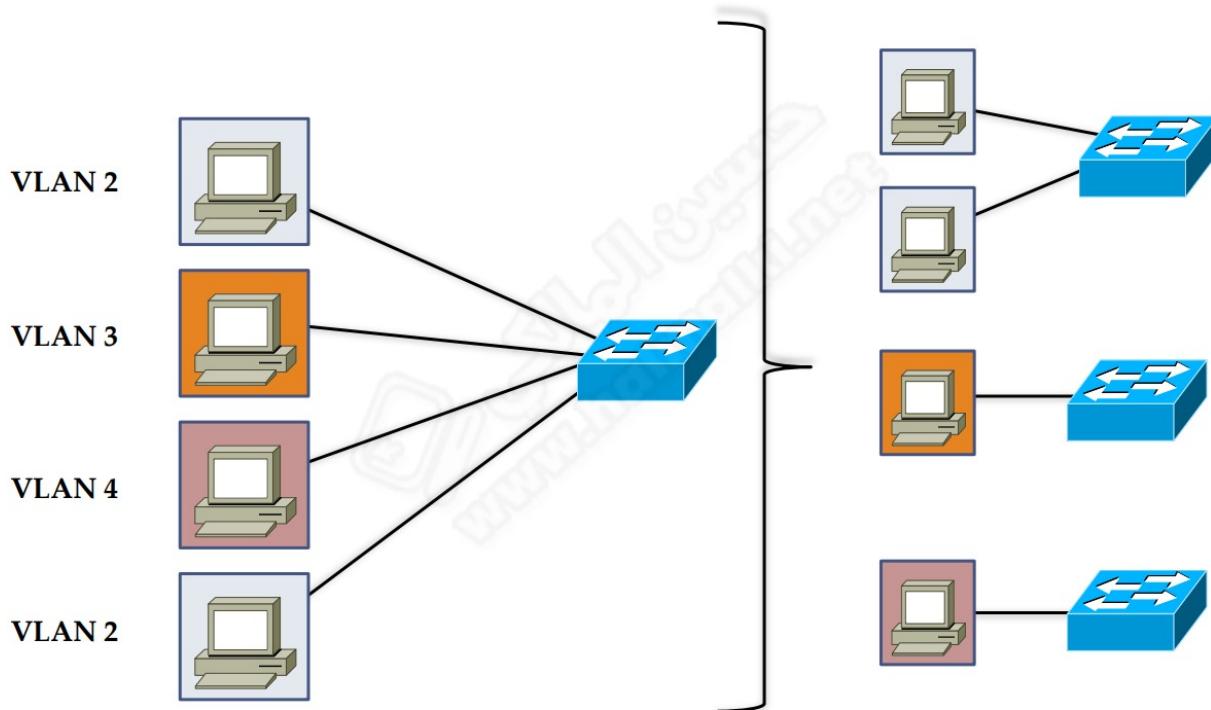
▼ Topic Summary:

VLAN

VLAN 2

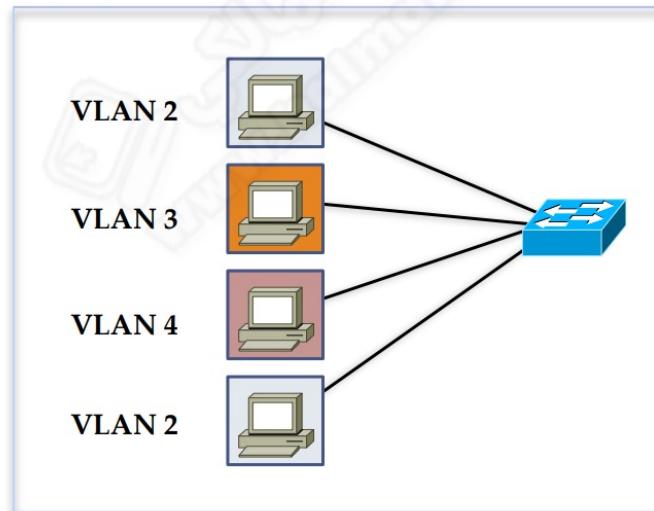


## VLAN



## Benefits of VLAN

- Increased performance.
- Improved manageability.
- Physical topology independence.
- Increased security options.



## VLAN ID Ranges

### Normal Range VLANs

- VLAN ID between 1 and 1005.
- IDs 1002 through 1005 are reserved for Token Ring and FDDI VLANs.
- IDs 1 and 1002 to 1005 are automatically created and **cannot** be removed.
- Configurations are stored within a VLAN database called **vlan.dat**.
- The **vlan.dat** file is located in the **flash** memory of the switch.

# VLAN ID Ranges

## Extended Range VLANs

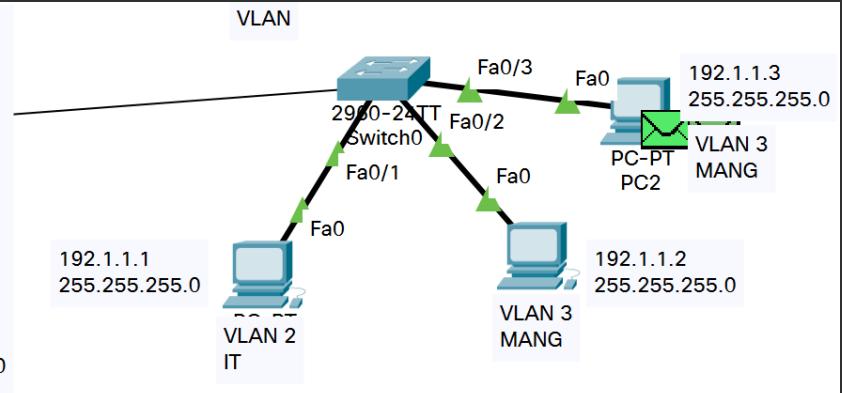
- Global enterprises could need extended range VLAN IDs.
- VLAN ID between 1006 and 4094.
- Support fewer VLAN features than normal range VLANs.
- Are saved in the running configuration file.

### Photo From Lab

```

Switch(config)#vlan 2
Switch(config-vlan)#name IT
Switch(config)#vlan 3
Switch(config-vlan)#name MANG
Switch(config)#interface f0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 2
Switch(config)#interface f0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 3
Switch(config)#vlan 50
Switch(config-vlan)#name control
Switch(config)#interface vlan 50
Switch(config-if)#ip address 192.1.1.100 255.255.255.0
Switch(config-if)#no shutdown

```



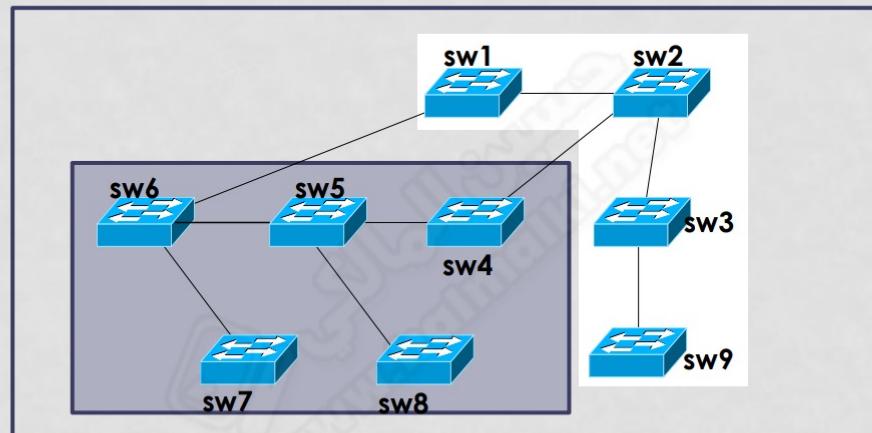
### ▼ VTP-Protocol [The Lab]

### ▼ Topic Summary:

## VLAN TRUNKING PROTOCOL

## VTP

## VTP



Allows a network manager to configure a switch so that it will propagate VLAN configurations to other switches in the network.

## VTP COMPONENTS

```

VTP Version : 2
Configuration Revision : 4
Maximum VLANs supported locally : 255
Number of existing VLANs : 7
VTP Operating Mode : Server
VTP Domain Name :
VTP Pruning Mode : Disabled
VTP V2 Mode : Disabled
VTP Traps Generation : Disabled
MD5 digest : 0x97 0x56 0x64 0x34 0xB4 0x66 0xFF 0x72

```

**Configuration last modified by 192.1.100.1 at 3-1-93 00:04:02**

**Local updater ID is 192.1.100.1 on interface VI1 (lowest numbered VLAN interface found)**

## VTP COMPONENTS

**SW1#show vtp status**

<b>VTP Version</b>	: 2
--------------------	-----

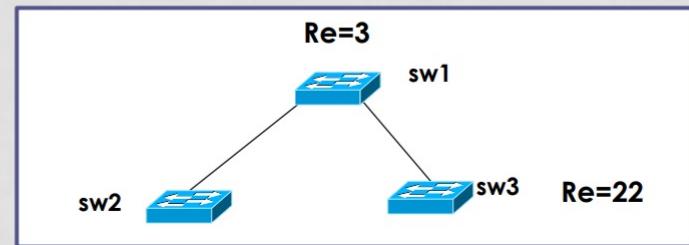
- Versions, 1, 2, and 3.
- Only one VTP version is allowed in a VTP domain.
- The default is VTP version 1.
- A Cisco 2960 switch supports VTP version 2 , but it is disabled.

# VTP COMPONENTS

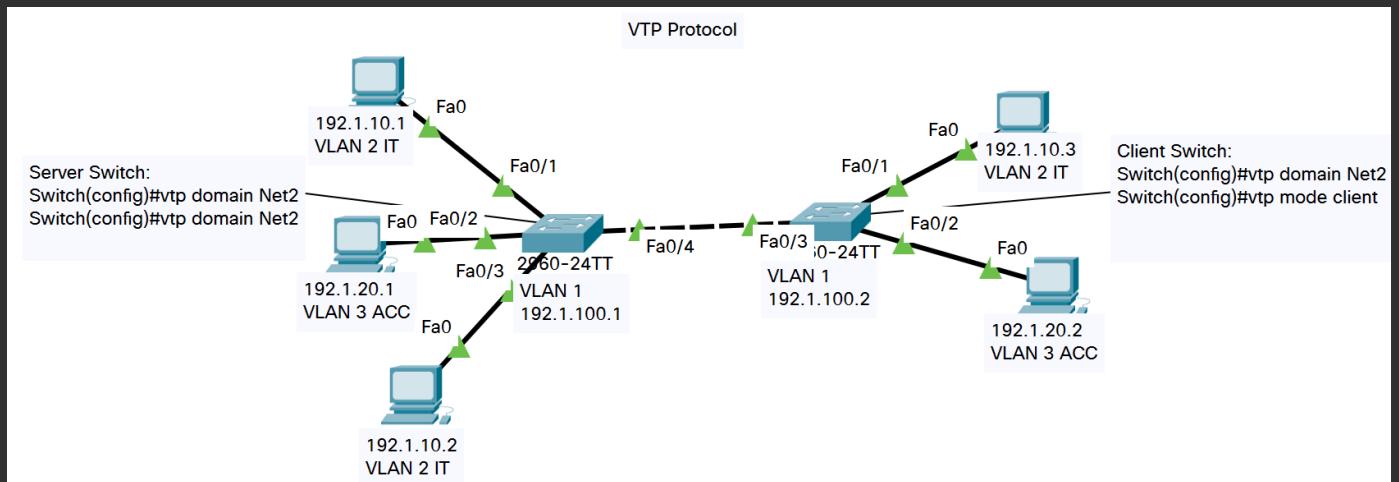
**SW1#show vtp status**

**Configuration Revision : 4**

- The default configuration number for a switch is zero.
- Each time a VLAN is added or removed, the configuration revision number is incremented.
- Each VTP device tracks the VTP configuration revision number that is assigned to it.
- Determines whether the information received from another is more recent than the version stored on the switch.



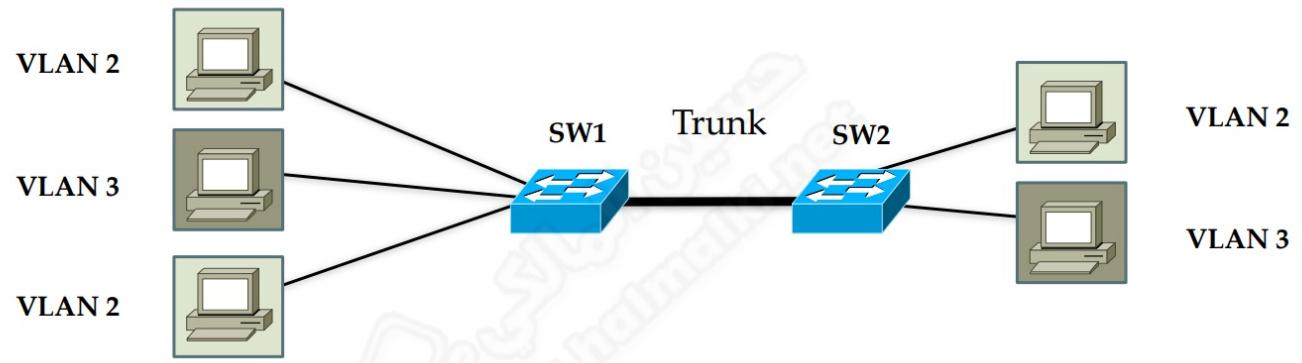
## Photo From Lab



▼ VLAN-2(With Trunk) [The Lab]

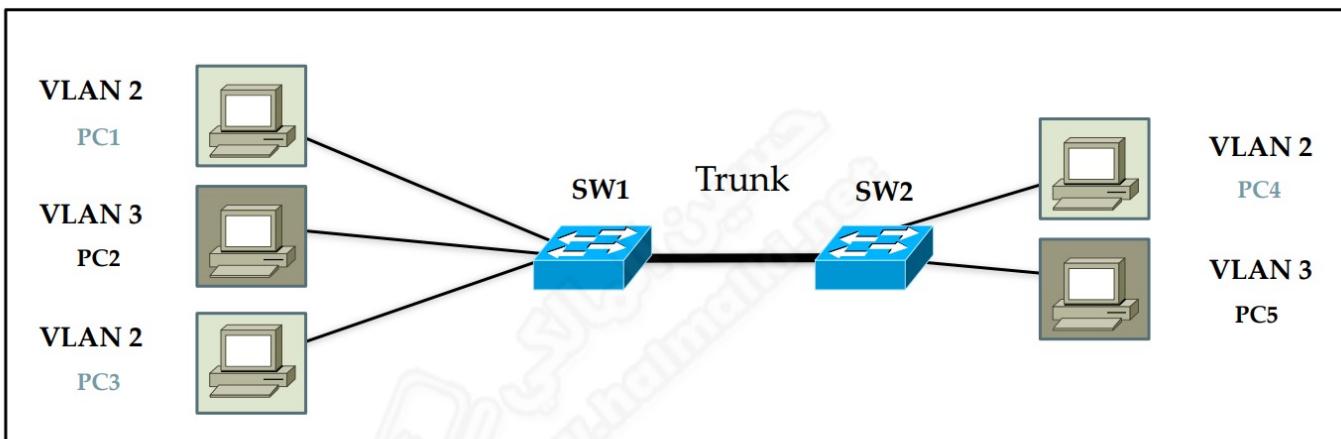
▼ Topic Summary:

# VLAN



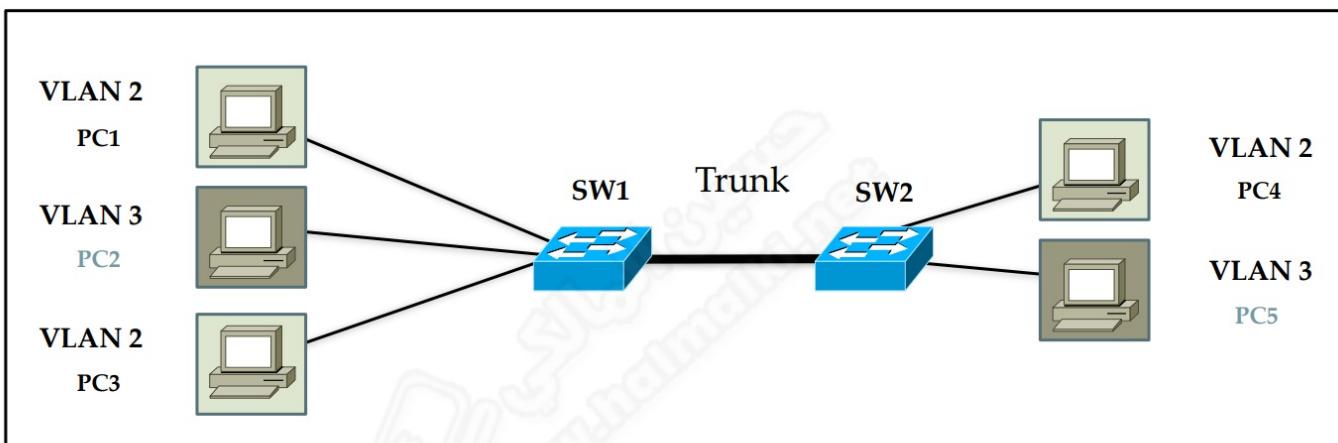
VLAN #	IP	Dept
2	192.1.10.0	IT
3	192.1.20.0	ACC

## IP Addresses



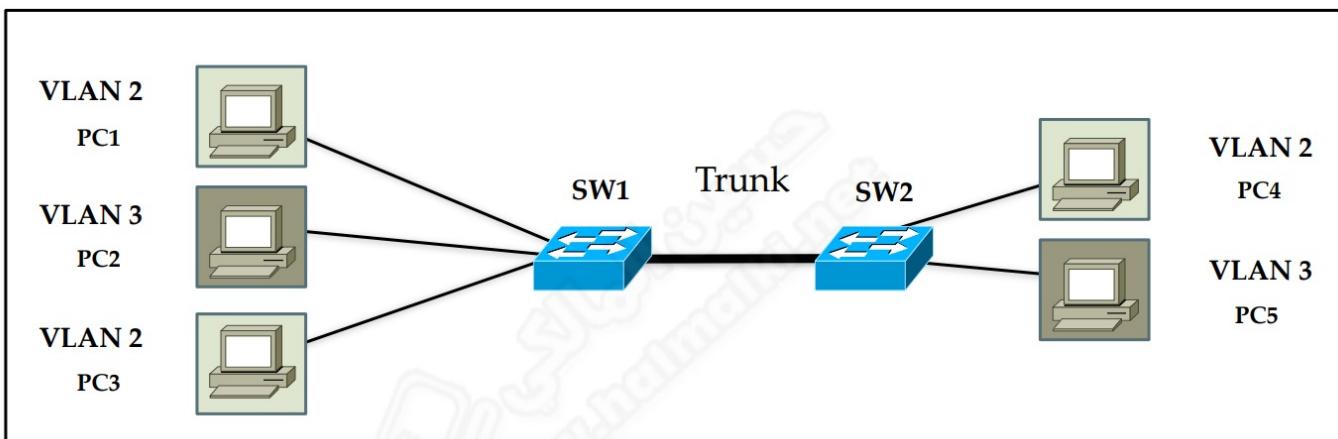
PC	IP	Subnet mask
1	192.1.10.2	255.255.255.0
3	192.1.10.3	255.255.255.0
4	192.1.10.4	255.255.255.0

# IP Addresses



PC	IP	Subnet mask
2	192.1.20.2	255.255.255.0
5	192.1.20.3	255.255.255.0

# Create VLAN



```
SW1#config t
```

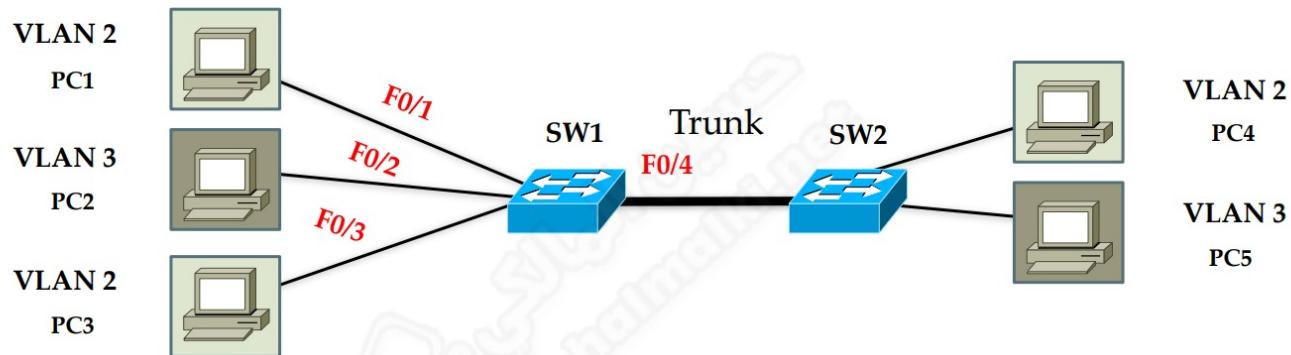
```
SW1(config)#vlan 2
```

```
SW1(config-vlan)#name IT
```

```
SW1(config-vlan)#vlan 3
```

SW1(config-vlan)#name ACC

# Assign Ports



```

SW1(config)#int f0/1
SW1(config-if)#switchport mode access
SW1(config-if)#switchport access vlan 2
SW1(config-if)#no shutdown
SW1(config-if)#int f0/2

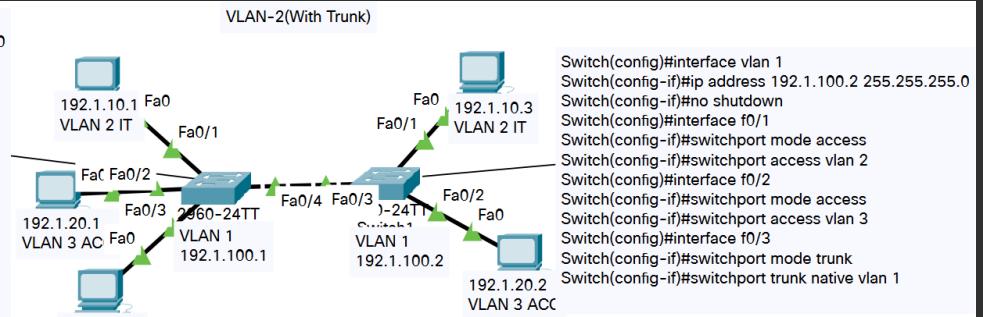
```

## Photo From Lab

```

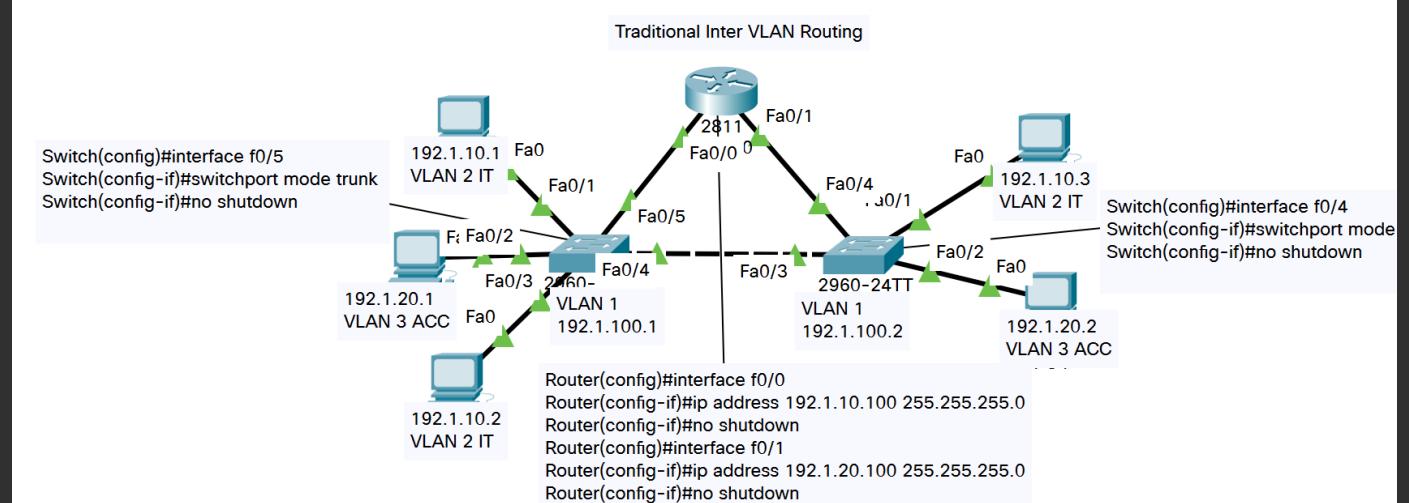
Switch(config)#interface vlan 1
Switch(config-if)#ip address 192.1.100.1 255.255.255.0
Switch(config-if)#no shutdown
Switch(config)#vlan 2
Switch(config-vlan)#name IT
Switch(config)#vlan 3
Switch(config-vlan)#name ACC
Switch(config)#interface f0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 2
Switch(config)#interface f0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 3
Switch(config)#interface f0/3
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 2
Switch(config)#interface f0/4
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk native vlan 1

```



- ▼ Traditional Inter VLAN Routing [The Lab]
- ▼ Topic Summary:  


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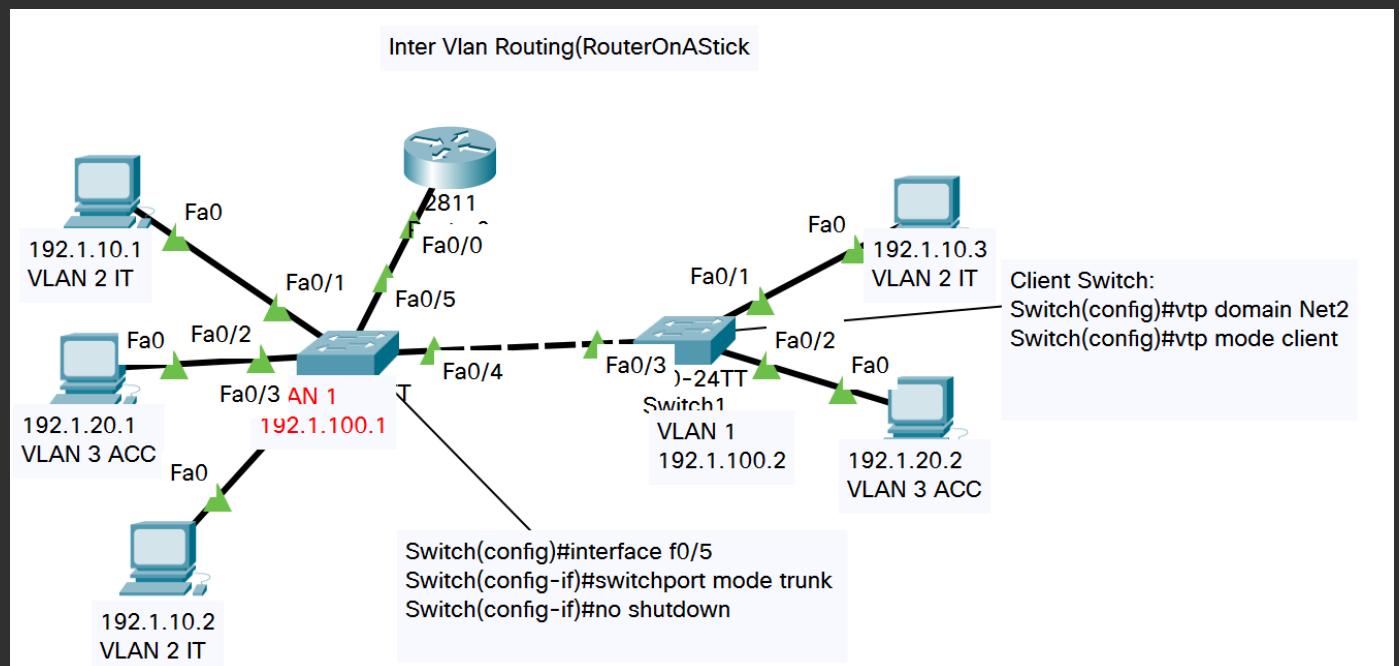


▼ Inter VIAN Routing(RouterOnAStick) [The Lab]

▼ Topic Summary:

- 

Photo From Lab



▼ Access Control List(Standard).pkt [The Lab]

▼ Topic Summary

## Standard ACL

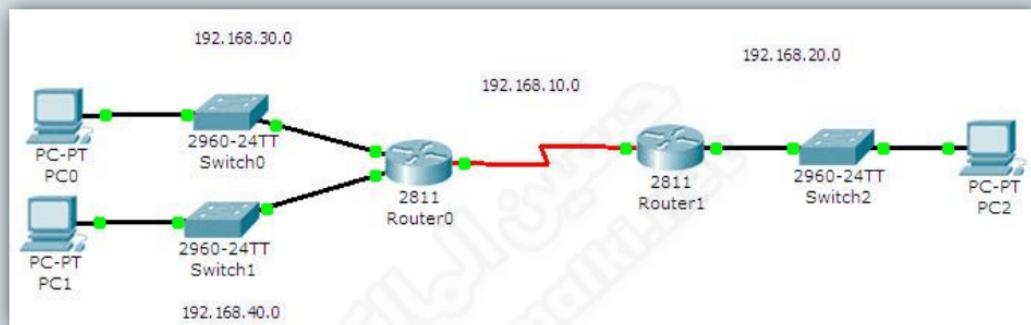




```

interface FastEthernet0/0
ip address 192.168.30.1 255.255.255.0
!
interface FastEthernet0/1
ip address 192.168.40.1 255.255.255.0
!
interface Serial1/0
ip address 192.168.10.1 255.255.255.0
clock rate 64000
!
router rip
network 192.168.10.0
network 192.168.30.0
network 192.168.40.0
!
```

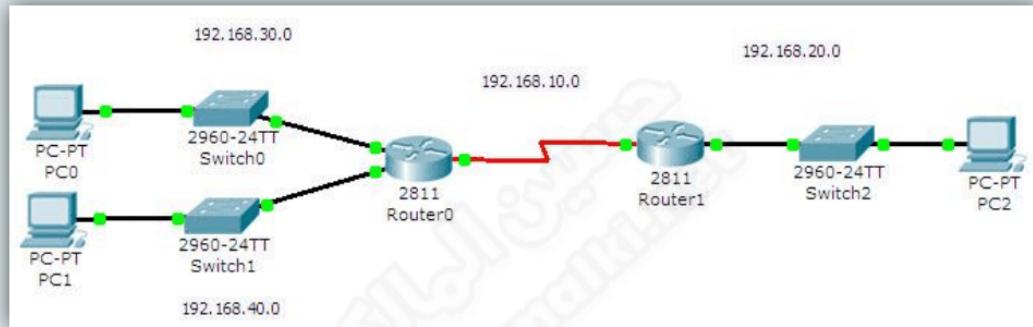
## Standard ACL



```

interface FastEthernet0/0
ip address 192.168.20.1 255.255.255.0
!
interface Serial1/0
ip address 192.168.10.2 255.255.255.0
!
router rip
network 192.168.10.0
network 192.168.20.0
!
```

## Standard ACL



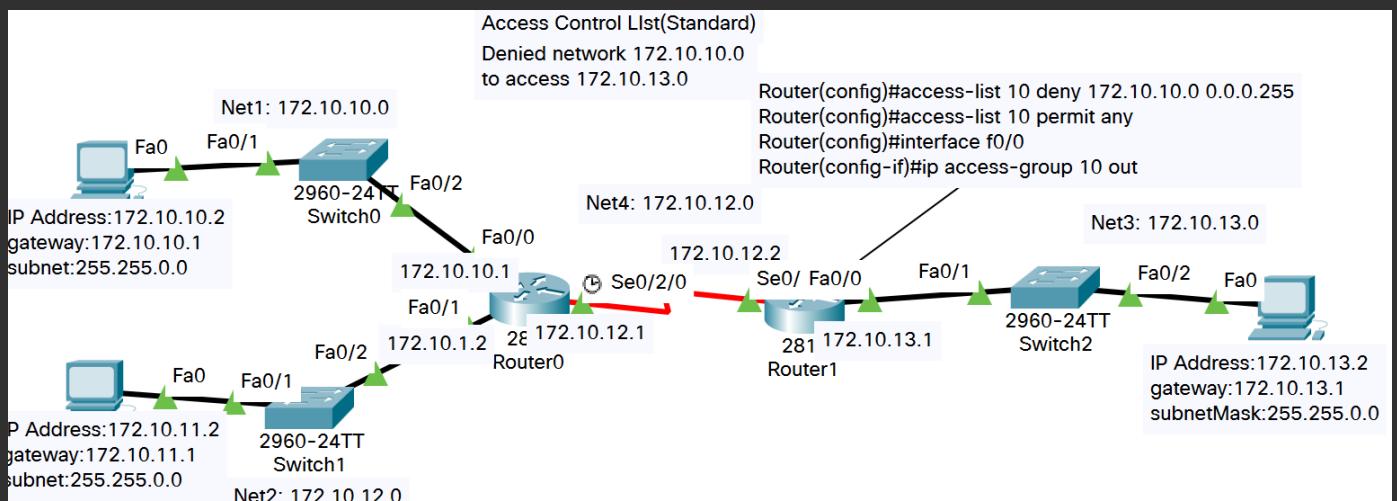
**Deny network 192.168.30.0 - 192.168.20.0**

```

Router1(config)#access-list 10 deny 192.168.30.0 0.0.0.255
Router1(config)#access-list 10 permit any
Router1(config)#int fo/o
Router1(config-if)#ip access-group 10 out

```

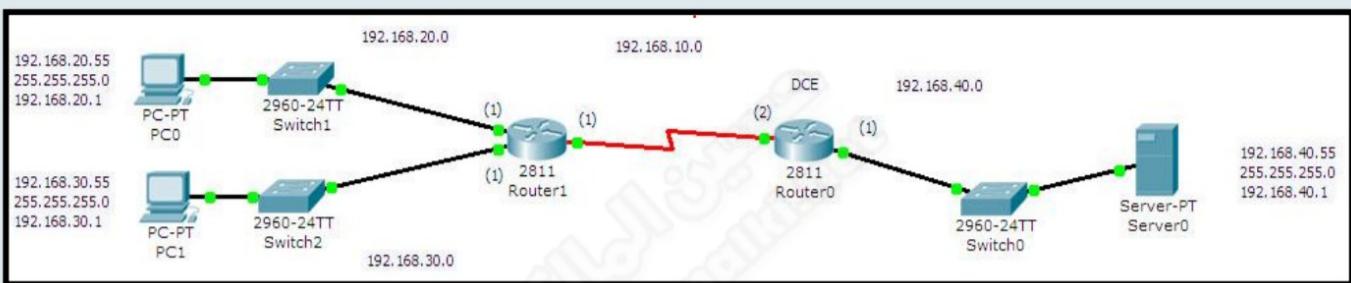
### Photo From Lab



▼ Access Control List(Extend) [The Lab]

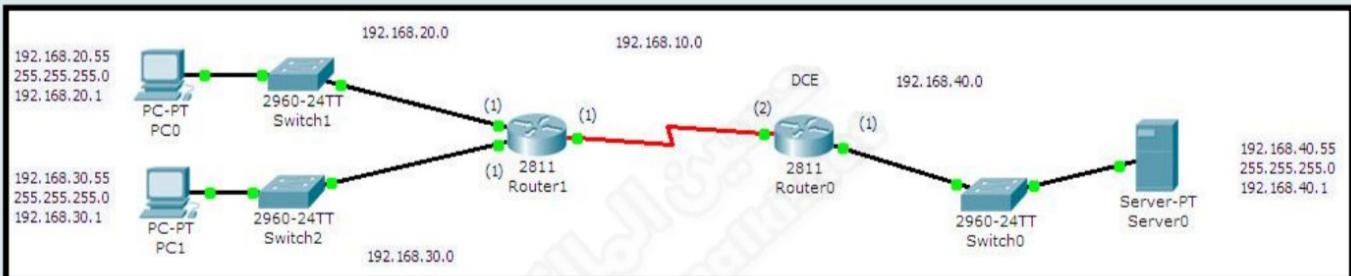
▼ Topic Summary:

## Extended ACL

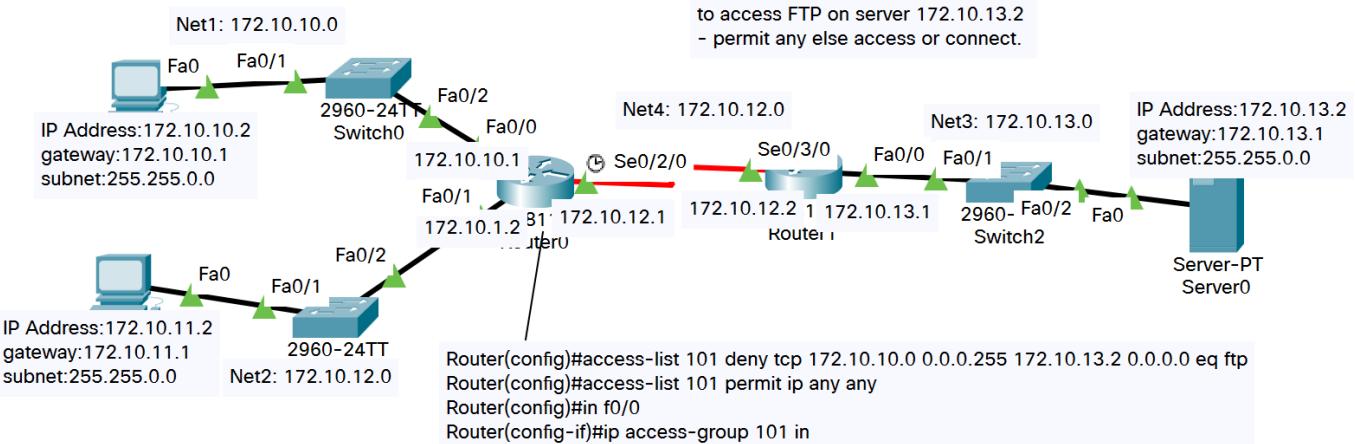


```
deny 192.168.20.0 to access FTP on server 192.168.40.55
permit any else service or connect
```

## Extended ACL



```
R1(config)#access-list 101 deny tcp 192.168.20.0 0.0.0.255 192.168.40.55 0.0.0.0 eq ftp
R1(config)#access-list 101 permit ip any any
R1(config)#int f0/0
R1(config-if)#ip access-group 101 in
```

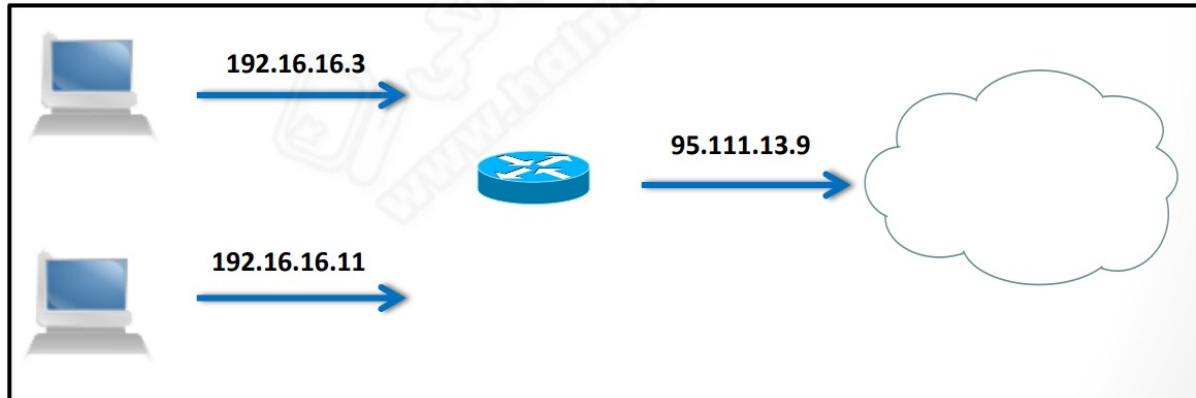


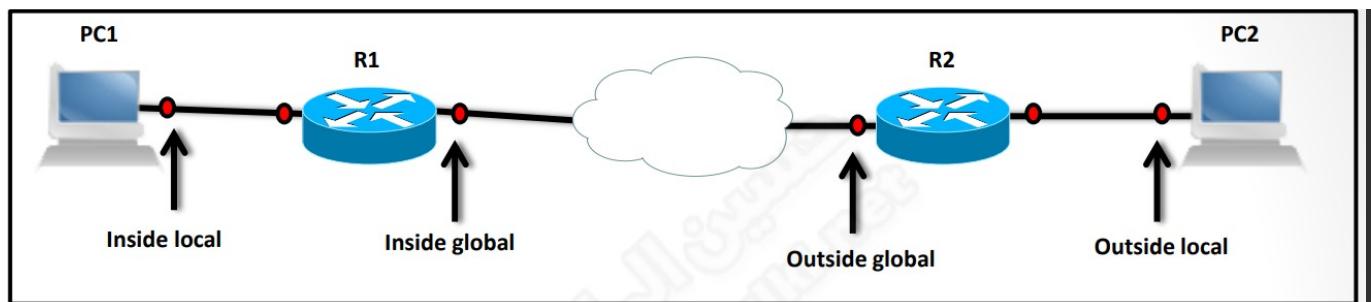
▼ Static NAT [[The Lab](#)]

▼ Topic Summary:

## NETWORK ADDRESS TRANSLATION (NAT)

- ❑ Translate private IP addresses which are used inside the company into public (global) IP addresses.
- ❑ NAT is primarily used to conserve global IP addresses because it allows that many IP-enabled devices use a few public IP addresses.



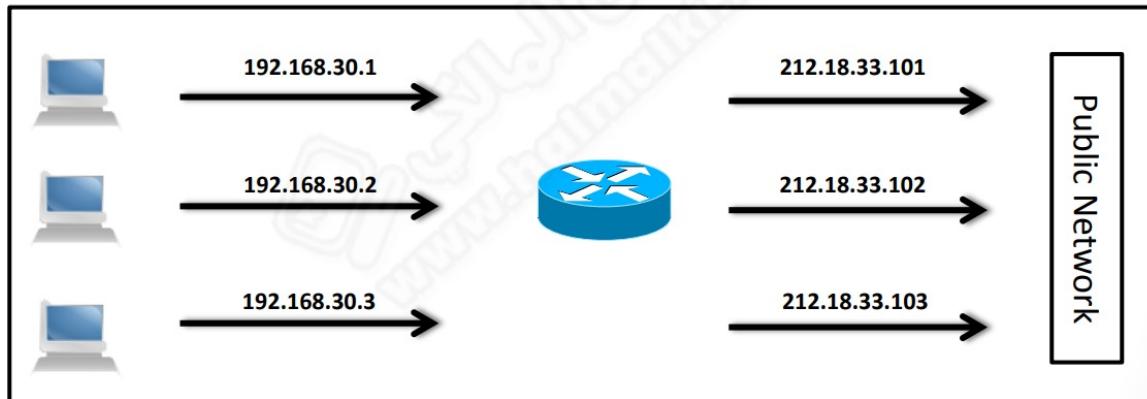


Type	Desc
<b>Inside local</b>	This is the source address before the NAT translation, assigned to a host on a private network, from a private address range.
<b>Inside global</b>	Source address after translation. This is the address the destination sees. This is the public IP address assigned by the ISP.
<b>Outside local</b>	Destination private address. This is known to the hosts on their private network.
<b>Outside global</b>	Destination address known by the source. This is a public IP address.

### NAT types

#### ❖ Static NAT

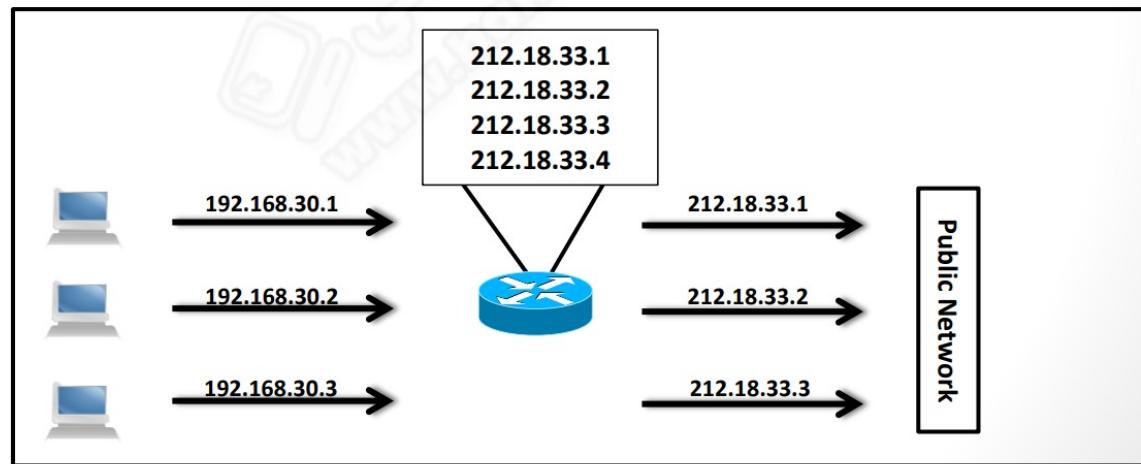
- Translate IP addresses in one-to-one.
- Need one public Internet address for every host in the network.



## NAT types

### ❖ Dynamic NAT

- Have a "pool" of public addresses.
- Translate into the same number of host addresses.
- Need one public Internet address for every host in the network.
- Unlike static NAT with dynamic NAT the translation doesn't really take place until one is needed.



## NAT types

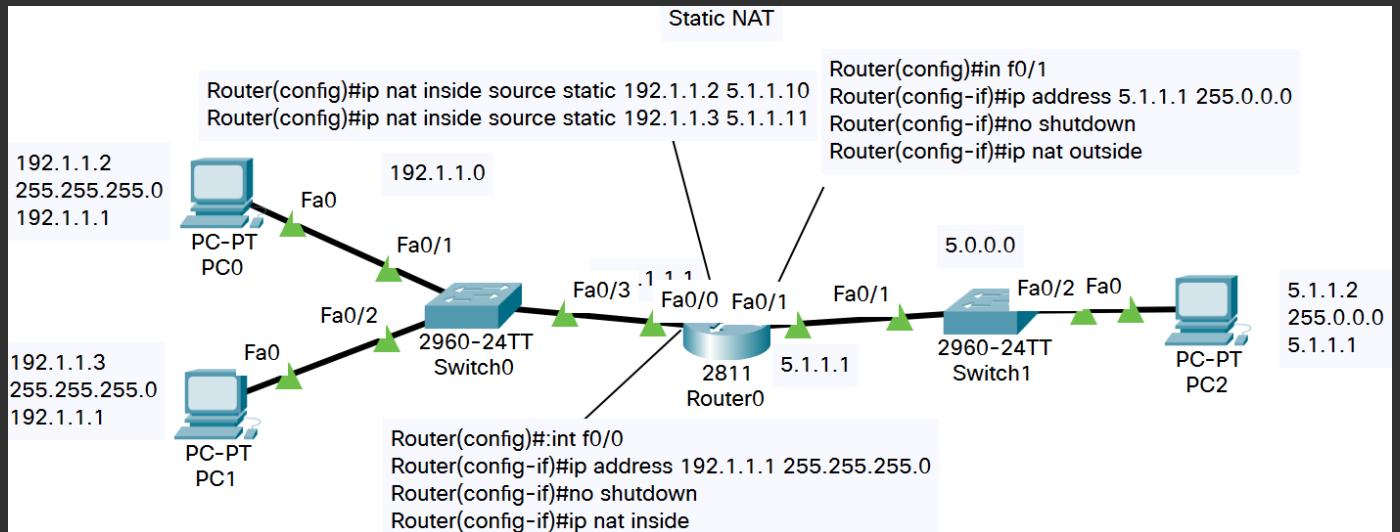
### ❖ NAT Overload (PAT - Port Address Translation)

- Most useful type of NAT available.
- Map multiple private IP addresses to single public IP address .
- Router uses port numbers to identify which host's address is translated
- Could have 65000 hosts on a single public IP address.





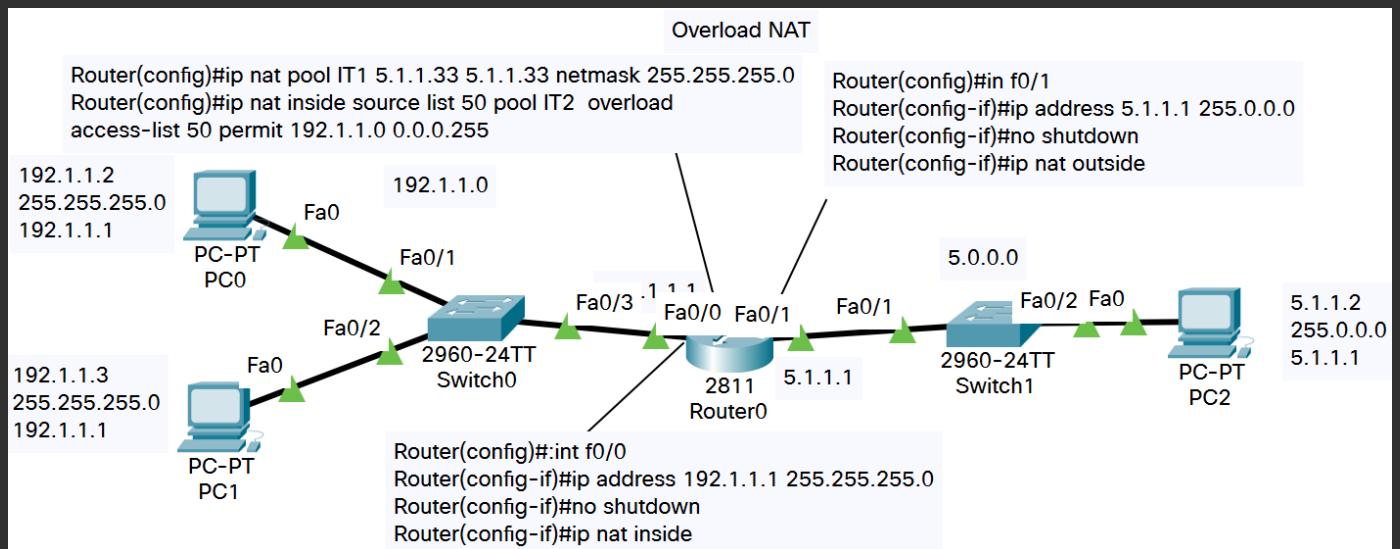
## Photo From Lab



## ▼ Overload NAT [The Lab]

▼

## Photo From Lab



## ▼ Recover Router's Password [The Lab]

## ▼ Topic Summary:

# Managing Cisco Internetwork

# Configuration Register

```
Router#show version
```

Processor board ID JAD05190MTZ (4292891495)

M860 processor: part number 0, mask 49

2 FastEthernet/IEEE 802.3 interface(s)

239K bytes of NVRAM.

62720K bytes of processor board System flash (Read/Write)

**Configuration register is 0x2102**

- ❖ Routers use a 16-bit software configuration register.
- ❖ written into nonvolatile random access memory (NVRAM).
- ❖ factory default value for Cisco router is 0x2102.

```
Router(config)# config-register 0x 2100
```

# Configuration Registers

Bit Number	15 14 13 12	11 10 9 8	7 6 5 4	3 2 1 0
------------	-------------	-----------	---------	---------

Config Register #	2	1	0	2
Binary	0 0 1 0	0 0 0 1	0 0 0 0	0 0 1 0

- 0x means the digits that follow are in hexadecimal.
- The lowest four bits form the boot field. The order in which the switch/router looks for system bootstrap information.

## Configuration Registers

Bit Number	15 14 13 12	11 10 9 8	7 6 5 4	3 2 1 0
Config Register #	2	1	0	2
Binary	0 0 1 0	0 0 0 1	0 0 0 0	0 0 1 0

- Boot filed:
  - If boot field is set to 1 you will boot from an IOS image stored in ROM.
  - If boot field is set to 0, you must boot the operating system manually .

Bit Number	15 14 13 12	11 10 9 8	7 6 5 4	3 2 1 0
Config Register #	2	1	0	2
Binary	0 0 1 0	0 0 0 1	0 0 0 0	0 0 1 0



Boot Filed	Meaning	Use
00	ROM monitor	Rommon>
01	Boot image from ROM	Router(boot)>
02-F	Specifies a default boot file name	

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## Configuration Meanings

Bit Number	15 14 13 12	11 10 9 8	7 6 5 4	3 2 1 0
Config Register #	2	1	0	2
Binary	0 0 1 0	0 0 0 1	0 0 0 0	0 0 1 0

Bit	Hex	Desc
0-3	0x0000-0x000F	Boot field
6	0x0040	Ignore NVRAM
7	0x0080	OEM bit enable
8	0x101	Break disable
10	0x0400	IP broadcast with all zeros
5,11-12	0x0800-0x1000	Console line speed
13	0x2000	Boot default ROM if network boot fails
14	0x4000	IP broadcast do not have net numbers
15	0x8000	Enable diagnostic messages and ignore NVRAM

# Configuration Register

- To force the system into the ROM monitor or boot ROM.
- To control broadcast addresses.
- To load operating software from Flash memory.
- To recover a lost password.

Photo From Lab

## Recover Router's Password

Steps to reset router's password:

- step1: reboot the router and press Ctrl+Break.
  - step2: write (confreg 0x2142).
  - step3: write(reset).
  - step4: write(copy startup-config running-config).
  - step5: enter config mode and change password.
  - step6: change register-config(config-register 0x2192).
- Last step: reload the router.



▼ Backup Router's Configurations [The Lab]

▼ Topic Summary:

# Managing Cisco Internetwork

## 2

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### FTP & TFTP



- Trivial file transfer protocol (TFTP) .
- File transfer protocol (FTP).

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# Backing up & Restoring

## ❖ Verify Flash Memory

➤ Router#show flash

System flash directory:

File	Length	Name/status
1	8121000	c2500-js-1.112-18.bin

➤ [8121064 bytes used, 8656152 available, 16777216 total].

## Backup IOS

### ❑ Ensure you have good connectivity to the TFTP host

Router#ping 1.1.1.1

### ❑ Copy the IOS from the Run to TFTP

Router#copy run tftp

### ❑ Copy the IOS from the TFTP host to Run

Router#copy tftp run

## Restoring the Configuration

### ❖ Erasing the Configuration

```
Router#erase startup-config
```

```
Router#reload
```

## Using Cisco Discovery Protocol (CDP)

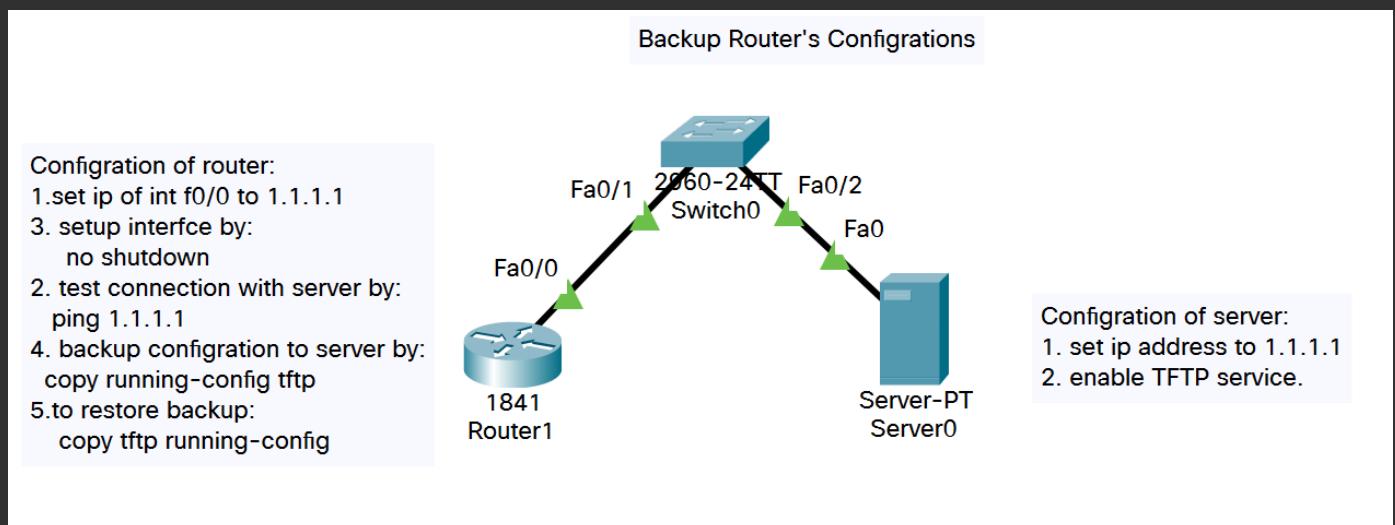
- A Cisco proprietary protocol
  - Designed to collect information about directly attached & remote devices
    - Hardware information
    - Protocol information
  - Useful in troubleshooting & documenting the network

## Getting CDP Timers

Timer	Desc
CDP Timer	How often CDP packets are transmitted to all active interfaces
CDP Holdtime	The amount of time that the device will hold packets received from neighbor devices

Default Values

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▼ Cisco Discovery Protocol(CDP) [The Lab]

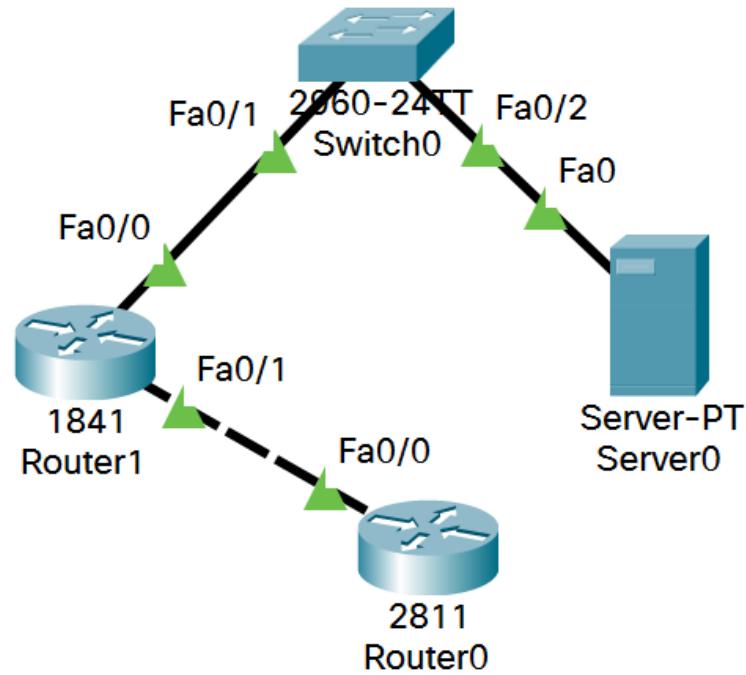
▼ Topic Summary:

### Photo From Lab

## CISCO Discover Protocol(CDP)

Steps:

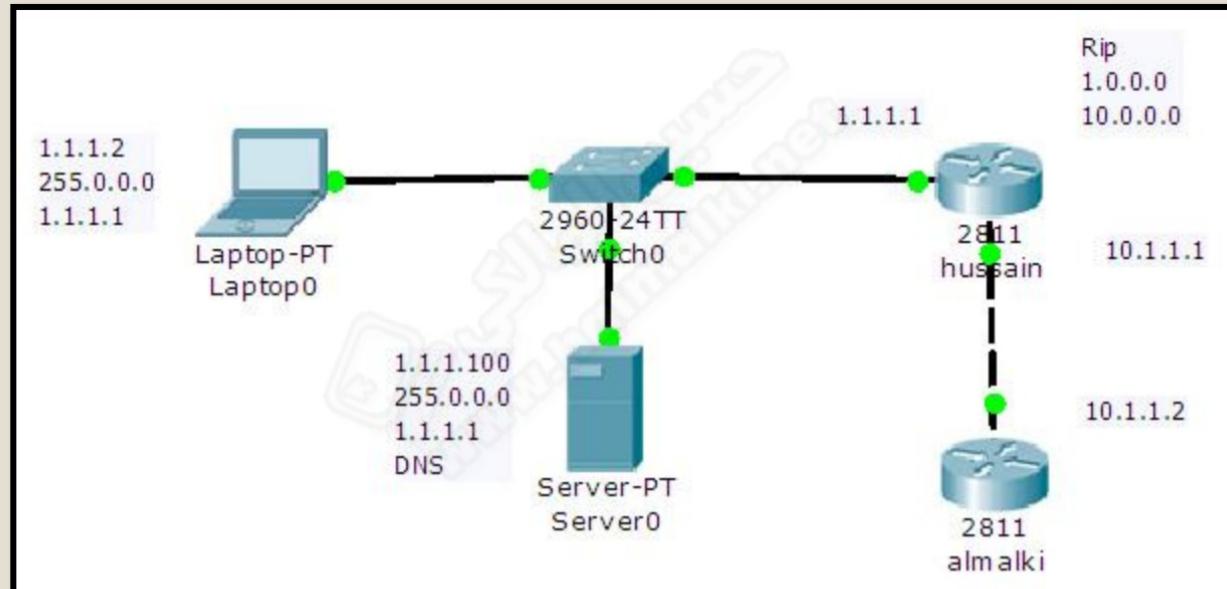
1. configure all interfaces
2. show all neighbors by:  
show cdp neibghoors
2. show all interfaces by:  
show cdp interfaces



▼ Telnet&DNS [The Lab]

▼ Topic Summary:

## Using Telnet



# Using Telnet

- A virtual terminal protocol
  - Part of the TCP/IP suite
  - Allows connections to remote devices
    - Gather information.
    - Run programs.

## ➤ Setting VTY passwords:

```
Router#config t
Router(config)#line vty 0 4
Router(config-line)#login
Router(config-line)#password cisco
```

```
RouterA#telnet 1.1.1.1
Trying 1.1.1.1 ... Open
User Access Verification
Password:
```

## ➤ Setting router passwords:

```
Router#config t
Router(config)#enable password 321
Router>enable
% No password set
Router>
```

# Telnet Commands

## ❖ Telnetting into Multiple Devices

Ctrl+Shift+6 (release) X

```
Router#telnet 1.1.1.1
Trying 1.1.1.1 ... open
User Access Verification
```

Password:

```
RouterB>Ctrl+Shift+6
Router#
```

## ❖ Checking Telnet Connections

Router#sh sessions

Conn	Host	Address	Byte	Idle	Conn	Name
1	10.2.2.2	10.2.2.2	0	0	10.2.2.2	
*	2 10.1.1.2	10.1.1.2	0	0	10.1.1.2	

## Telnet Commands

### ❖ Checking Telnet Users

Router#sh users

Line	User	Host(s)	Idle	Location
*	0 con 0	10.1.1.2	00:00:01	
		10.2.2.2	00:01:06	

### ❖ Closing Telnet Sessions

Router#show sessions

Conn	Host	Address	Byte	Idle	Conn	Name
2	10.2.2.2	10.2.2.2	0	0	10.2.2.2	

Router#disconnect 2

## Telnet Commands

### ❖ Disconnect by user

Router#sh users

Line	User	Host(s)	Idle	Location
*	0 con 0	idle	00:00:00	
	vty 194	idle	00:00:21	10.2.2.1

Router#clear line 194

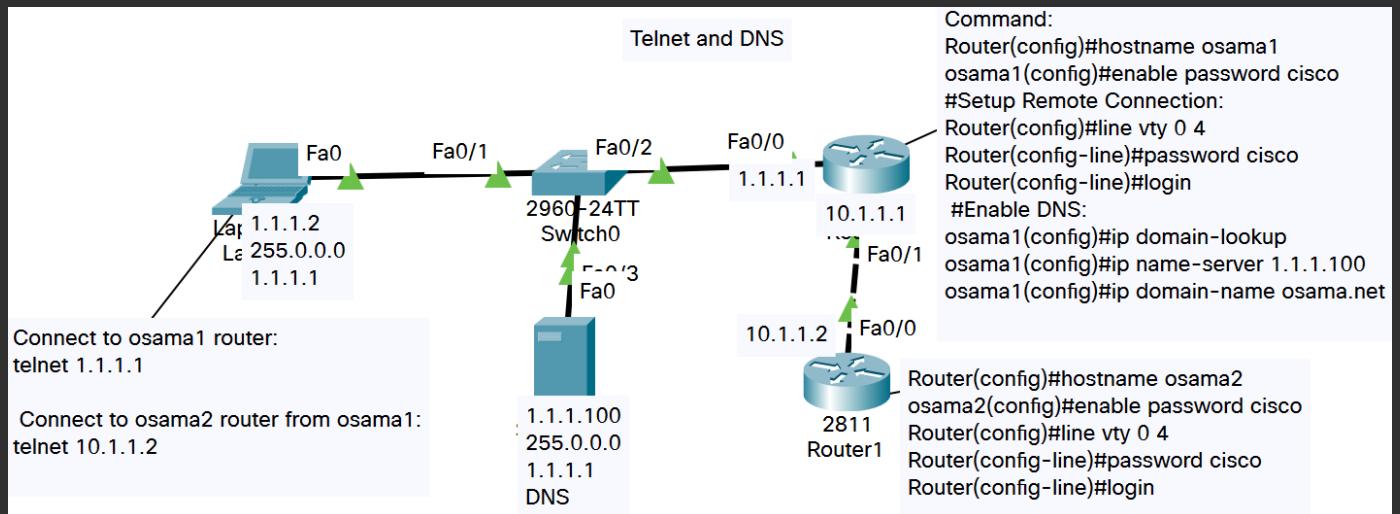
## Resolving Hostnames

- ❖ To use a hostname rather than an IP address.
- ❖ Must be able to translate the hostname to an IP address.
  - Build a host table on each router.
  - Build a Domain Name System (DNS) server.

## Building a Host Table

- ❖ Provides name resolution only on the router on which it

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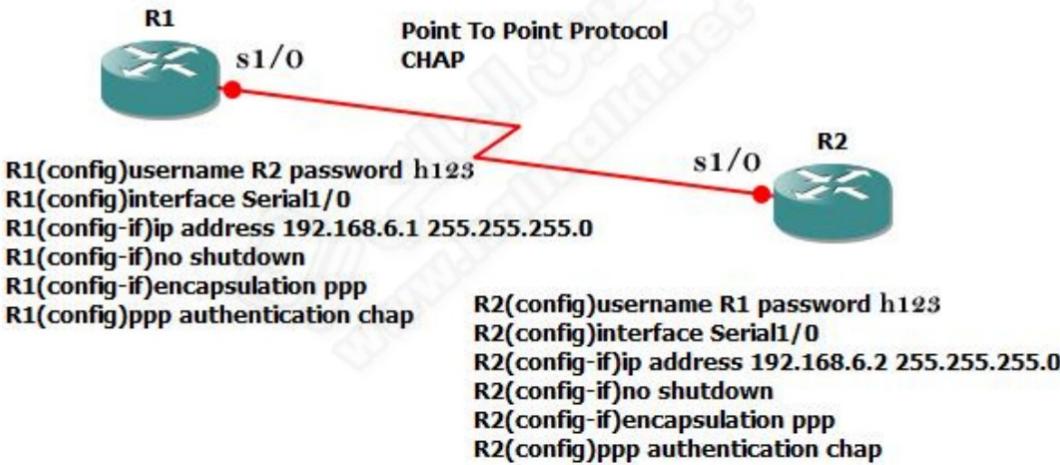


- ▼ point-to-point Protocol(WAN-Protocol) [\[The Lab\]](#)
- ▼ Topic Summary:

## PPP Configuration Commands

```
R#config t
R(config)#int s0/0
R(config-if)#encapsulation ppp
R(config-if)#compress stac
R(config-if)#ppp authentication pap chap
```

# PPP Configuration Commands



## Verifying PPP

```

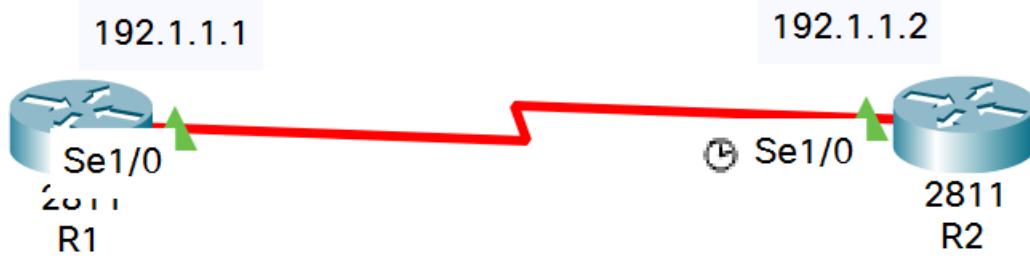
R2#show interface serial 0/0/0
Serial0/0/0 is up, line protocol is up
  Hardware is GT96K Serial
  MTU 1500 bytes, BW 128 Kbit, DLY 20000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation PPP, LCP Open
  Open: CDP/CP, loopback not set
  Keepalive set (10 sec)

```

- debug ppp
- undebug all

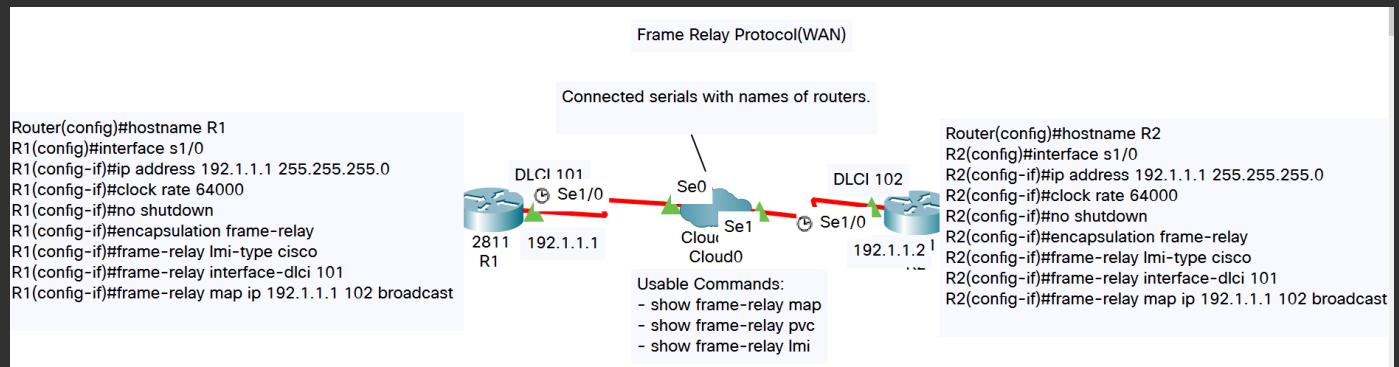
## Photo From Lab

### Point to Point(WAN)



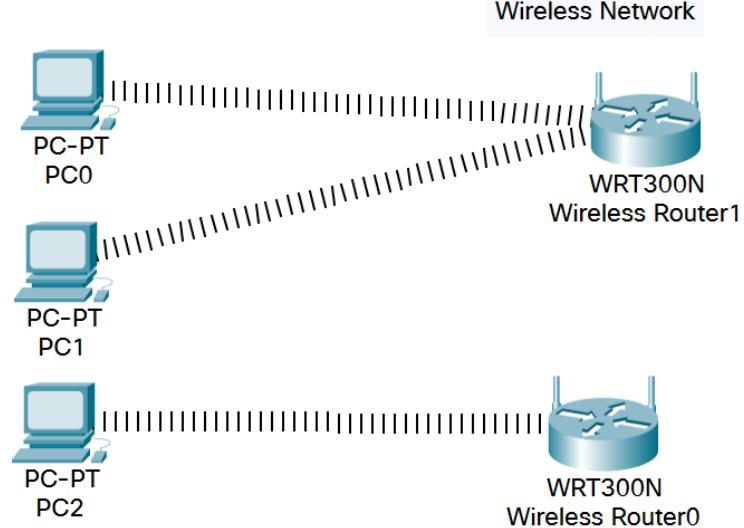
## ▼ Frame Relay Protocol(WAN) [The Lab]

### Photo From Lab



## ▼ Wireless Network [The Lab]

### Photo From Lab



Steps:

- 1.add a wireless cards to PCs.
- 2.change names of routers
- 3.
4. change channels of routers and test the speed