OSPF

Router 01

```
Router(config)#router ospf 1
Router(config-router)#network 10.1.1.0 0.0.0.3 %
Incomplete command.
Router(config-router)#network 10.1.1.0 0.0.0.3 area
0
Router(config-router)#network 192.168.15.0
0.0.0.255 area 0
Router(config-router)#exit
```

Router 02

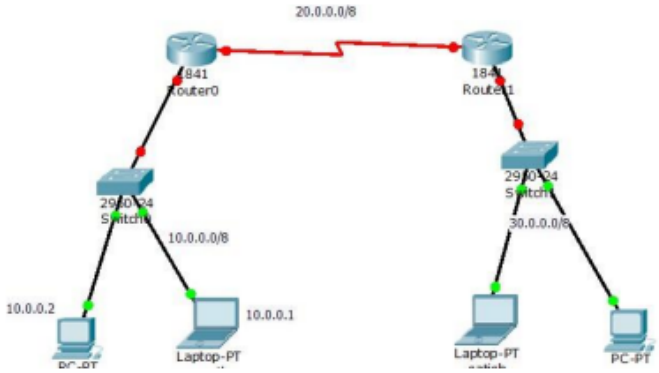
```
Router(config)#router ospf %
Incomplete command.
Router(config)#router ospf 1
Router(config-router)#network 10.1.1.0 0.0.0.3 area
0
Router(config-router)#network 10.2.2.0 0.0.0.3 area
0
Router(config-router)#
00:10:54: %OSPF-5-ADJCHG: Process 1, Nbr
192.168.15.1 on Serial0/0/0 from LOADING to
FULL, Loading Done

Router(config-router)#network 192.168.25.0
0.0.0.255 area 0
Router(config-router)#exit
```

Router 03

```
Router(config)#router ospf 1
Router(config-router)#network 10.2.2.0 0.0.0.3 area
0
Router(config-router)#network 192.168.35.0
0.0.0.255 area 0
Router(config-router)#exit
```

Basic EIGRP Configuration

Refer to the following topology. Using the 10.0.0.0/8 and 30.0.0.0/8 address space for LANs and the 20.0.0.0/8 address space for WANs:



By default, when using the network command and a classful network address such as 10.0.0.0, all interfaces on the router that belong to that classful network address will be enabled for EIGRP.

Following are the commands you will use to configure EIGRP on **Router0** and **Router1**:

Router0 (config)# router eigrp 1

Router0 (config-router)# network 20.0.0.0 255.0.0.0

Router0 (config-router)# network 10.0.0.0 255.0.0.0

Router1 (config)# router eigrp 1

Router1 (config-router)# network 20.0.0.0 255.0.0.0

Router1 (config-router)# network 30.0.0.0 255.0.0.0

Configuration on switch:

Creating VLANs

Switch(config)# vlan 2
(default VLAN is VLAN 1 , so don't need to create)

Switch(config)# int range fa0/2-4
Switch(config-if)# switchport mode access
Switch(config-if)# switchport access vlan 2
Switch(config-if)#exit

On switch0 we need to define the interface connected to the router as a **trunk link.** This will allow traffic from all VLANs to get to the router using that interface. (In our case it is fa0/1)

Switch(config)# int range fa0/1
Switch(config-if)# switchport mode trunk

Now, we will make sub-interface of fa0/0 as fa0/0.1 and fa0/0.2 and assign IP address as 10.0.0.1/8 and 20.0.0.1/8 respectively on router's logical ports.

Each subinterface is created using the interface interface_id.Subinterface_id in the global configuration mode. As shown below.

```
Router(config)#interface <interface_ID.Subinterface_ID>
```

NOTE: the "." Between the interface ID and the subinterface ID is a must. The subinterface ID is a logical number but ideally it should describe the VLAN ID.

Configuration on Router:

```
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fa0/0.1
Router(config-subif)#encapsulation dot1q 1
Router(config-subif)#ip address 10.0.0.1 255.0.0.0
Router(config-subif)#no shut
Router(config-subif)#exit
Router(config)#interface fa0/0.2
Router(config-subif)#encapsulation dot1q 2
Router(config-subif)#ip address 20.0.0.1 255.0.0.0
Router(config-subif)#exit
Router(config)#interface fa0/0
Router(config-if)#no shut
```

Use only FastEthernet 0/0 interface for both VLANs. We have created the Fa0/0.10 and Fa0/0.30 subinterfaces, specified the encapsulation type **dot1q** which is IEEE's 802.1Q, and the VLAN they belong to and we assigned an IP address. In this case, the physical interface, FastEthernet 0/0, does not need an IP address configuration, the only thing you must do is to use the **no shutdown** command so that the interfaces come up.

To display the information of fa0/0 interface after router configuration; use ***show interfaces*** command:

```
FastEthernet0/0.1 is up, line protocol is up (connected)
  Hardware is PQUICC_FEC, address is 00e0.8f2e.511e (bia 00e0.8f2e.511e)
  Internet address is 10.0.0.1/8
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID 1
  ARP type: ARPA, ARP Timeout 04:00:00,
  Last clearing of "show interface" counters never
FastEthernet0/0.2 is up, line protocol is up (connected)
  Hardware is PQUICC_FEC, address is 00e0.8f2e.511e (bia 00e0.8f2e.511e)
  Internet address is 20.0.0.1/8
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID 2
```

3. RIP ROUTING PROTOCOL CONFIGURATION COMMANDS

COMMAND	DESCRIPTION
Router(config)#router rip	Enable RIP routing protocol
Router(config-router)#network a.b.c.d	Add a.b.c.d network in RIP routing advertisement
Router(config-router)#no network a.b.c.d	Remove a.b.c.d network from RIP routing advertisement
Router(config-router)#version 1	Enable RIP routing protocol version one (default)
Router(config-router)#version 2	Enable RIP routing protocol version two
Router(config-router)#no auto-summary	By default RIPv2 automatically summarize networks in their default classful boundary. This command will turn it off.
Router(config-router)#passive-interface s0/0/0	RIP will not broadcast routing update from this interface
Router(config-router)#no ip split-horizon	Disable split horizon (Enable by default)
Router(config-router)#ip split-horizon	Enable spilt horizon
Router(config-router)#timers basic 30 90 180 270 360	Allow us to set RIP timer in seconds. 30 (routing update), 90 (invalid timer), 180 (Hold timer), 270 (Flush timer), 360 (sleep timer)
Router(config)#no router rip	Disable RIP routing protocol
Router#debug ip rip	Used for troubleshooting. Allow us to view all RIP related activity in real time.
Router#show ip rip database	Display RIP database including routes

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Router 0

```
LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up

LINK-5-CHANGED: Interface Serial0/1/0, changed state to down

LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to down

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

louter(config)#interface Serial0/1/0
louter(config-if)#ip address 50.0.0.1 255.0.0.0
louter(config-if)#
louter(config-if)#exit
louter(config)#interface FastEthernet0/1
louter(config-if)#ip address 10.0.0.1 255.0.0.0
louter(config-if)#
louter(config-if)#exit
louter(config)#interface FastEthernet0/0
louter(config-if)#no ip address
louter(config-if)#
louter(config-if)#exit
louter(config)#interface FastEthernet0/0
louter(config-if)#ip address 20.0.0.1 255.0.0.0
louter(config-if)#
louter(config-if)#exit
louter(config)#router rip
louter(config-router)#exit
louter(config)##access-list 1 deny host 40.0.0^Z
louter#
SYS-5-CONFIG_I: Configured from console by console

louter#en
louter#config t
Enter configuration commands, one per line.  End with CNTL/Z.
louter(config)#access-list 1 deny host 40.0.0.2
louter(config)#access-list 1 permit any
louter(config)#int f0/0
louter(config-if)#ip access-group 1 out
louter(config-if)#
```

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#network 20.0.0.0
Router(config-router)#network 50.0.0.0
Router(config-router)#wxit
                      ^
```

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to down

%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

Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#no ip address
Router(config-if)#ip address 50.0.0.2 255.0.0.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#ip address 40.0.0.1 255.0.0.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 30.0.0.1 255.0.0.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 30.0.0.0
Router(config-router)#network 40.0.0.0
Router(config-router)#network 50.0.0.0
Router(config-router)#exit
Router(config)#
```

Command Prompt X

```
Packet Tracer PC Command Line 1.0
PC>ping 40.0.0.0

Pinging 40.0.0.0 with 32 bytes of data:

Reply from 50.0.0.2: bytes=32 time=1ms TTL=254
Reply from 50.0.0.2: bytes=32 time=1ms TTL=254
Reply from 50.0.0.2: bytes=32 time=12ms TTL=254
Reply from 50.0.0.2: bytes=32 time=1ms TTL=254

Ping statistics for 40.0.0.0:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 12ms, Average = 3ms

PC>ping 40.0.0.2

Pinging 40.0.0.2 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 40.0.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>
```