

ASSIGNMENT 9

OSPF:

The Open Shortest Path First (OSPF) protocol is a link-state Interior Gateway Protocol (IGP) developed by the Internet Engineering Task Force (IETF).

WHY DO WE NEED OSPF:

Before the emergence of OSPF, the Routing Information Protocol (RIP) was the most widely used IGP.

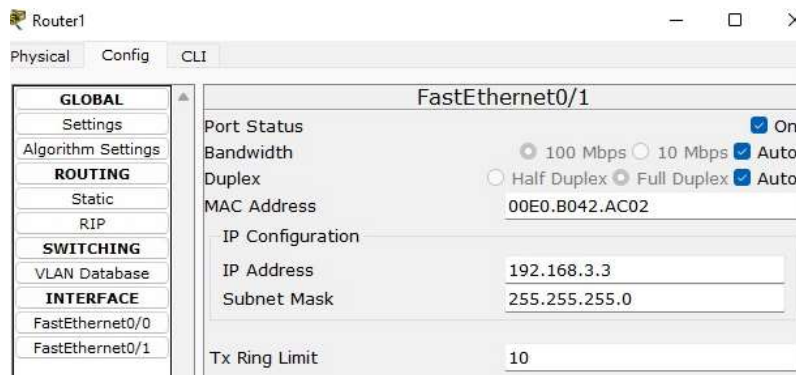
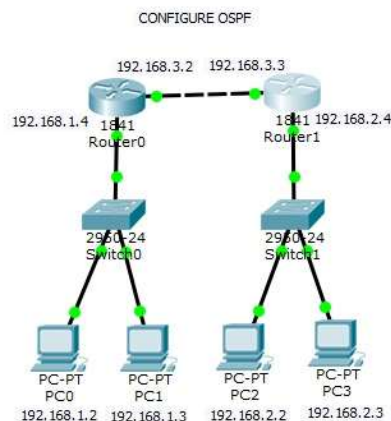
RIP is a distance-vector routing protocol which is gradually being replaced by OSPF, due to the former's slow convergence, tendency to form routing loops, and poor scalability.

OSPF is a link-state routing protocol featuring:

- Multicast packet transmission, reducing load on the routers that do not run OSPF
- Support for Classless Inter-Domain Routing (CIDR)
- Load balancing among equal-cost routes
- Packet authentication

With the preceding advantages, OSPF is widely accepted and used as an IGP.

1. Configure OSPF using 2 routers, 2 switches, 4 PCs



Router1

Physical Config CLI

GLOBAL
 Settings
 Algorithm Settings
ROUTING
 Static
 RIP
SWITCHING
 VLAN Database
INTERFACE
 FastEthernet0/0
 FastEthernet0/1

FastEthernet0/0

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00E0.B042.AC01

IP Configuration

IP Address 192.168.2.4

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Router0

Physical Config CLI

GLOBAL
 Settings
 Algorithm Settings
ROUTING
 Static
 RIP
SWITCHING
 VLAN Database
INTERFACE
 FastEthernet0/0
 FastEthernet0/1

FastEthernet0/1

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0002.169C.7102

IP Configuration

IP Address 192.168.3.2

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Router0

Physical Config CLI

GLOBAL
 Settings
 Algorithm Settings
ROUTING
 Static
 RIP
SWITCHING
 VLAN Database
INTERFACE
 FastEthernet0/0
 FastEthernet0/1

FastEthernet0/0

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0002.169C.7101

IP Configuration

IP Address 192.168.1.4

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Router1

Physical Config CLI

IOS Command Line Interface

```

Router>enable
Router#config terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 2
Router(config-router)#network 196 168.3.0 0.0.0.255 area 0
      ^
% Invalid input detected at '^' marker.

Router(config-router)#network 196.168.3.0 0.0.0.255 area 0
Router(config-router)#network 196.168.2.0 0.0.0.255 area 0
Router(config-router)#exit
Router(config)#
  
```

Router0

Physical Config CLI

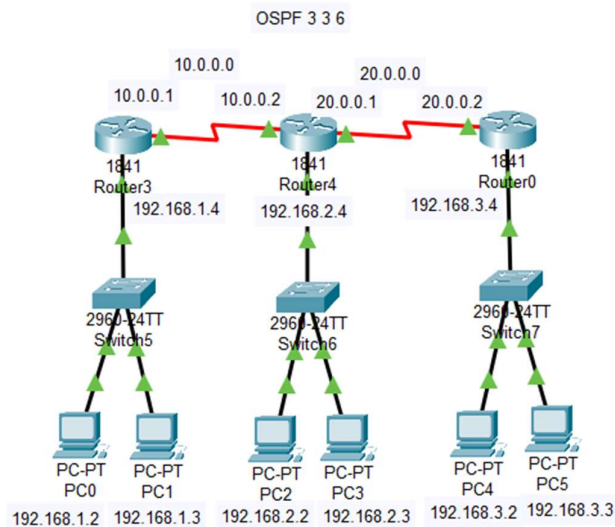
IOS Command Line Interface

```

Router>ENABLE
Router#CONFIG TERMINAL
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 196.168.1.0 0.0.0.255 area 0
Router(config-router)#network 196.168.3.0 0.0.0.255 area 0
Router(config-router)#exit
Router(config)#

```

2.Configure OSPF 3 routers,3 switches, 6Pcs



Router3

Physical Config CLI Attributes

IOS Command Line Interface

```

Router#ENABLE
Router#CONFIG TERMINAL
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ROUTER OSPF 3
Router(config-router)#NETWORK 10.0.0.0 0.255.255.255 AREA 0
Router(config-router)#NETWORK 192.168.1.0 0.0.0.255 AREA 0
Router(config-router)#EXIT

```

Router4

Physical Config CLI Attributes

IOS Command Line Interface

```
Router#ENABLE
Router#CONFIG TERMINAL
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ROUTER OSPF 2
Router(config-router)#NETWORK 10.0.0.0 0.255.255.255 AREA 0
Router(config-router)#
00:01:55: %OSPF-5-ADJCHG: Process 2, Nbr 192.168.1.4 on Serial0/0/0 from
LOADING to FULL, Loading Done

Router(config-router)#NETWORK 20.0.0.0 0.255.255.255 AREA 0
Router(config-router)#
00:02:12: %OSPF-5-ADJCHG: Process 2, Nbr 192.168.3.4 on Serial0/1/0 from
LOADING to FULL, Loading Done

Router(config-router)#NETWORK 192.168.2.0 0.0.0.255 AREA 0
Router(config-router)#
Router(config-router)#EXIT
```

Router0

Physical Config CLI Attributes

IOS Command Line Interface

```
Router#ENABLE
Router#CONFIG TERMINAL
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ROUTER OSPF 1
Router(config-router)#NETWORK 20.0.0.0 0.255.255.255 AREA 0
Router(config-router)#NETWORK 192.168.3.0 0.0.0.255 AREA 0
Router(config-router)#EXIT
```