Department of Computer Science and Engineering
Jahangirnagar University
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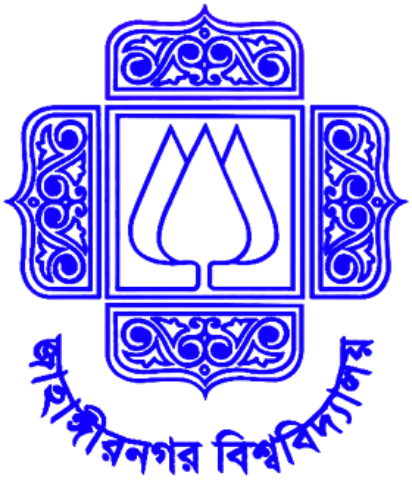

Laboratory Report

CSE-402: Computer Networks Laboratory

Submitted by

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Exam roll: 160050
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Submitted to

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Experiment No: 07

Experiment Name: Implementation of OSPF (Open Shortest Path First) Algorithm

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Objectives:

This Experiment explains how to configure OSPF Routing protocol step by step with practical example in packet tracer. Learn OSPF configuration commands, OSPF show commands, OSPF network configuration (Process ID, Network ID, Wildcard mask and Area number) and OSPF routing in detail.For demonstration we will use packet tracer network simulator software.

Introduction:

This module describes how to configure Open Shortest Path First (OSPF). OSPF is an Interior Gateway Protocol (IGP) developed by the OSPF working group of the Internet Engineering Task Force (IETF). OSPF was designed expressly for IP networks and it supports IP subnetting and tagging of externally derived routing information. OSPF also allows packet authentication and uses IP multicast when sending and receiving packets. The OSPF MIB defines an IP routing protocol that provides management information related to OSPF and is supported by Cisco routers.

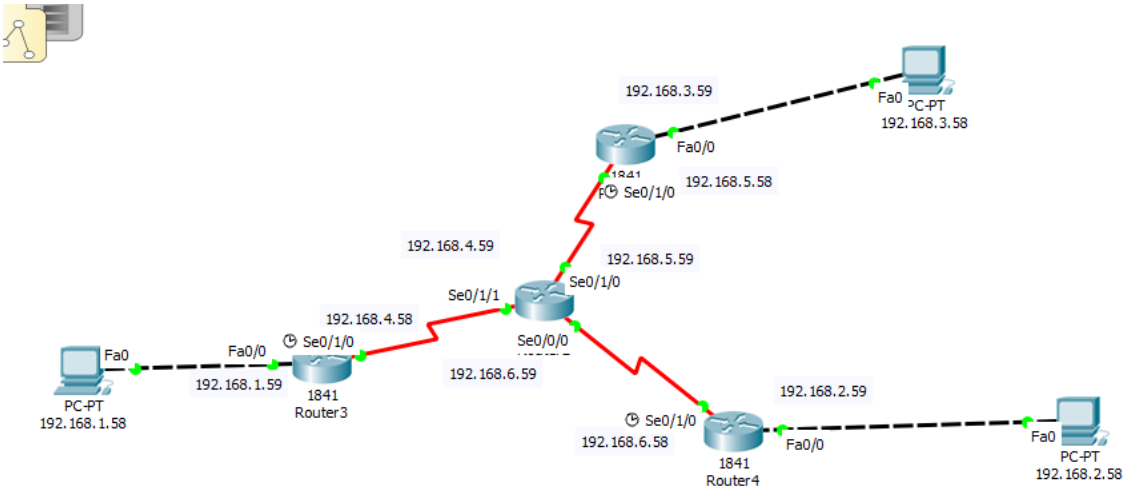

Figure 1 : Four Router and Three PC

Router 0 Configuration through CLC :

Router>en

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip add 192.168.1.59 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#int se0/1/0
Router(config-if)#ip add 192.168.4.58 255.255.255.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.168.1.0 0.0.0.255 area 0
Router(config-router)#network 192.168.4.0 0.0.0.255 area 0
Router(config-router)#
%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 1 Configuration through CLC :

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.

```
Router(config)#int fa0/0
Router(config-if)#ip add 192.168.3.59 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#int se0/1/0
Router(config-if)#ip add 192.168.5.58 255.255.255.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.168.3.0 0.0.0.255 area 0
Router(config-router)#network 192.168.5.0 0.0.0.255 area 0
Router(config-router)#
%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

00:21:53: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.6.59 on Serial0/1/0 from LOADING to FULL,
Loading Done
```

Router 2 Configuration through CLC :

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip add 192.168.2.59 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#int se0/1/0
Router(config-if)#ip add 192.168.6.58 255.255.255.0
Router(config-if)#clock rate 64000
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.168.2.0 0.0.0.255 area 0
Router(config-router)#network 192.168.6.0 0.0.0.255 area 0
Router(config-router)#
%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
```

00:21:58: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.6.59 on Serial0/1/0 from LOADING to FULL, Loading Done

Router 3 Configuration through CLC :

```
Router>en
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int se0/1/1
Router(config-if)#ip add 192.168.4.59 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/1, changed state to up

Router(config-if)#exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed state to up

Router(config)#int se0/1/0
Router(config-if)#ip add 192.168.5.59 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

Router(config-if)#exit
Router(config)#int se0/0/0
Router(config-if)#ip add 192.168.6.59 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Router(config-if)#exit
Router(config)#exit
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

Router#
%SYS-5-CONFIG_I: Configured from console by console
```

Router#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.168.4.0 0.0.0.255 area 0
Router(config-router)#network 192.168.5.0 0.0.0.255 area 0
Router(config-router)#network 192.168.6.0 0.0.0.255 area 0
Router(config-router)#
00:04:27: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.6.58 on Serial0/0/0 from LOADING to FULL, Loading Done

Verify the circuit:

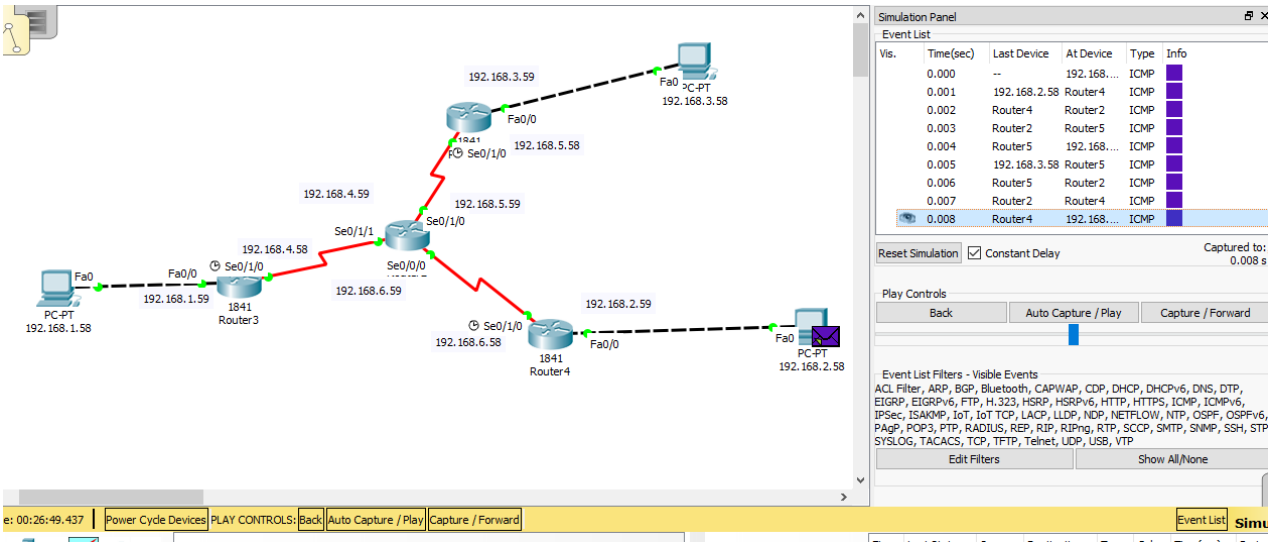

Figure 2: Result