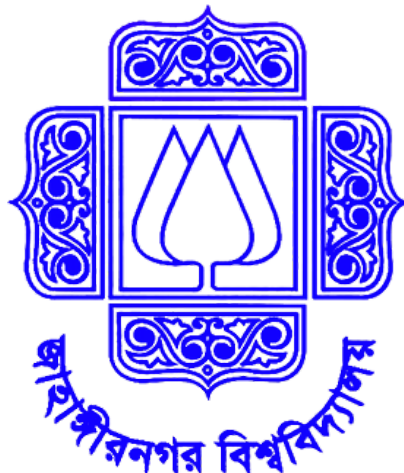Department of Computer Science and Engineering
Jahangirnagar University
Savar, Dhaka

Laboratory Report

CSE-402: Computer Networks Laboratory

Submitted by

Md. Ashick Areafin
Exam roll: 160054
Class roll:2130
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Submitted to

Dr. Imdadul Islam
Professor
Department of Computer Science and Engineering
Jahangirnagar University

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.
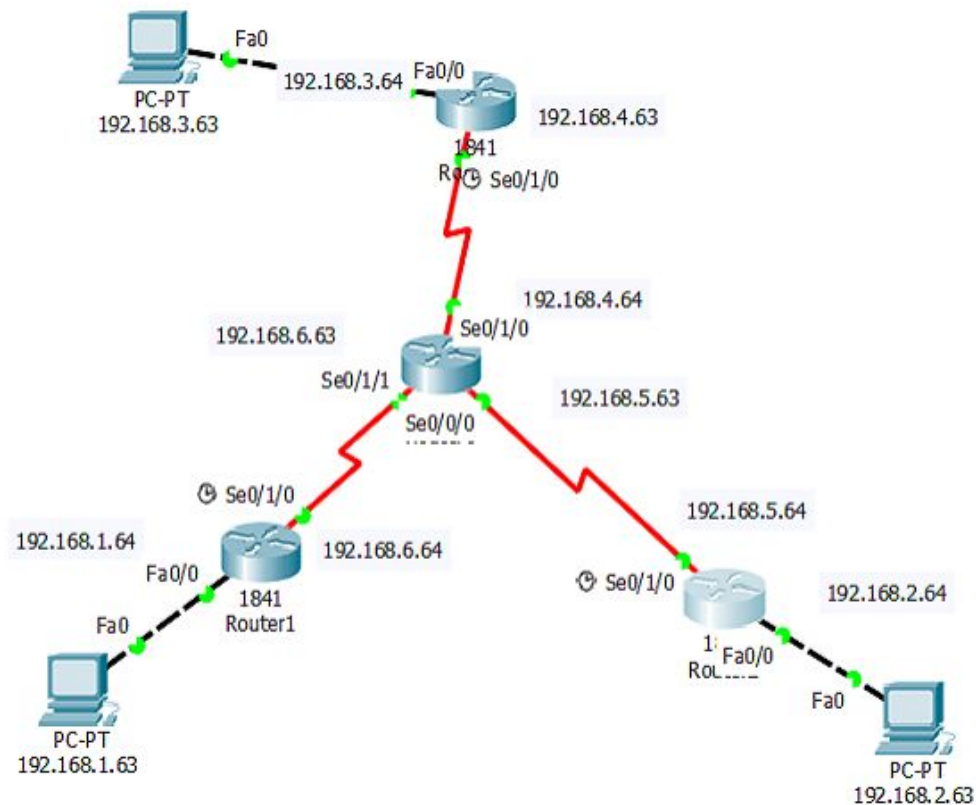
Figure 1 : Four Router and Three PC

Router 0 Configuration through CLC :

 --- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]: no
Press RETURN to get started!
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int se0/1/0
Router(config-if)#ip add 192.168.4.64 255.255.255.0
Router(config-if)#no shut
Router(config)#exit
Router(config)#int se0/1/1
Router(config-if)#ip add 192.168.6.63 255.255.255.0
Router(config-if)#no shut
Router(config-if)#exit

Router(config)#int se0/0/0
Router(config-if)#ip add 192.168.5.63 255.255.255.0
Router(config-if)#no shut
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
exit
Router(config)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state
to up
Router(config)#exit
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)#
%SYS-5-CONFIG_I: Configured from console by console
00:25:32: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.6.64 on Serial0/1/1 from
LOADING to FULL, Loading Done
00:25:34: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.5.64 on Serial0/0/0 from
LOADING to FULL, Loading Done
00:25:35: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.4.63 on Serial0/1/0 from
LOADING to FULL, Loading Done

Router 1 Configuration through CLC :
      --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no
Press RETURN to get started!
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 192.168.1.64 255.255.255.0

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 192.168.6.64 255.255.255.0
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 192.168.6.0 0.0.0.255 area 0
Router(config-router)#
Router con0 is now available
Press RETURN to get started.
%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
00:27:21: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.6.63 on Serial0/1/0 from LOADING to FULL, Loading Done

Router 2 Configuration through CLC :
    --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no
Press RETURN to get started!
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 192.168.2.64 255.255.255.0
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 192.168.5.64 255.255.255.0
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 192.168.5.0 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
Router con0 is now available
Press RETURN to get started.
00:27:06: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.6.63 on Serial0/1/0 from LOADING to FULL, Loading Done

Router 3 Configuration through CLC :
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]: no
Press RETURN to get started!
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 192.168.3.64 255.255.255.0
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 192.168.4.63 255.255.255.0
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 192.168.4.0 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

00:27:53: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.6.63 on Serial0/1/0 from LOADING to FULL, Loading Done
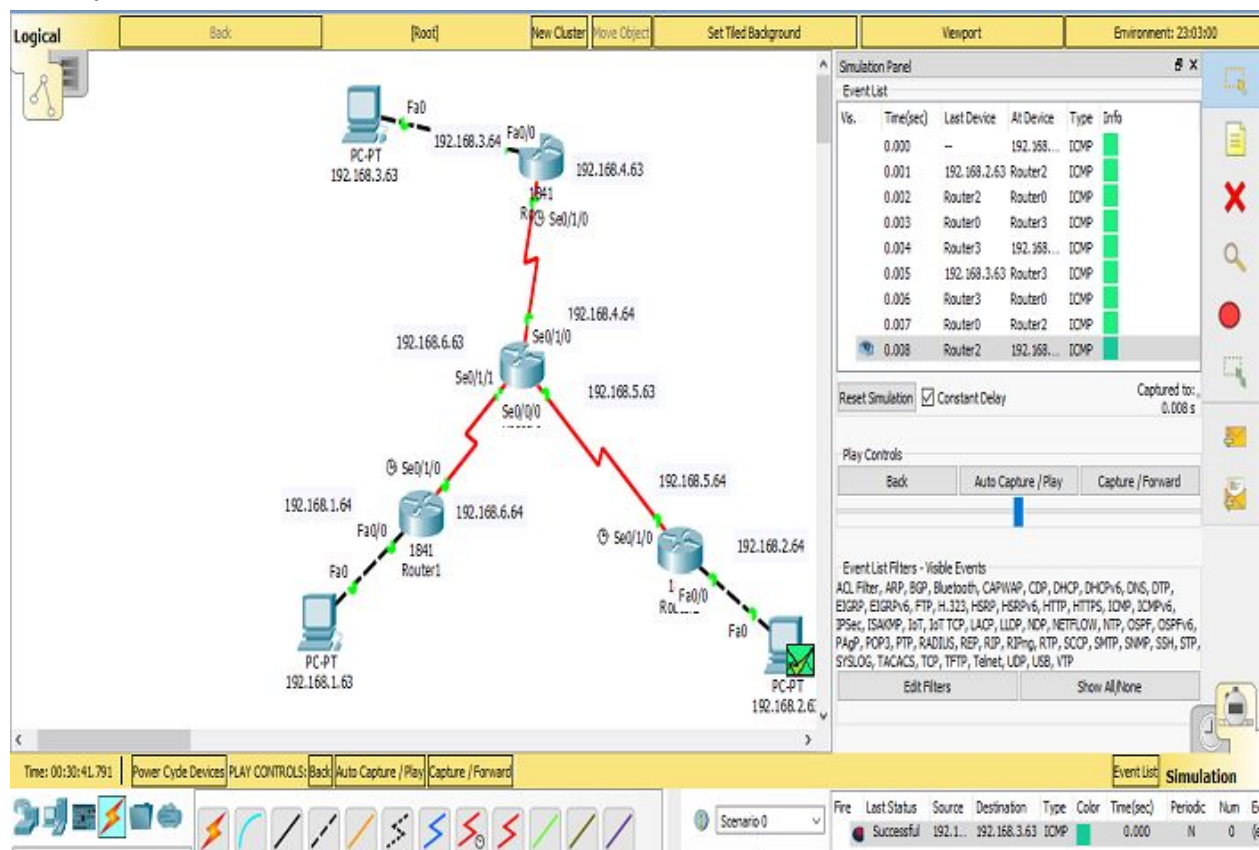
Verify the circuit:

Figure 2: Result