**Bahria University, Lahore Campus**

Department of Computer Sciences

Lab Journal 08

**(Spring 2022)**

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| --- | --- | --- |
| Course: | **Data Communication and Networking Lab** | Date: |
| Course Code: | CEL - 222 | Max Marks: 10 |
| Faculty’s Name: |  | M Lab Engineer: |

Name: ALI HASSAN Enroll No: 03-135211-005

Objective(s) :

To understand and implement OSPF routing protocol.

## Lab Tasks :

**Task 1: Explain the protocol of OSPF.**

An Interior Gateway Protocol (IGP) for the Internet, the OSPF (Open Shortest Path First) protocol is one of a family of IP Routing protocols that is used to disseminate IP routing information throughout a single Autonomous System (AS) on an IP network. A link-state routing protocol is the OSPF protocol.

**Task 2: Configure the topology below. Assign IP addresses to routers interfaces and PCs.**

Diagram

Description automatically generated

**Task 3: Implement OSPF on the given topology.**

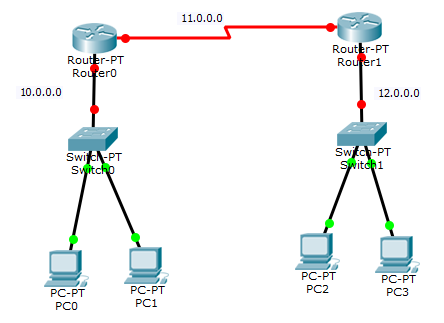
Graphical user interface, text, application

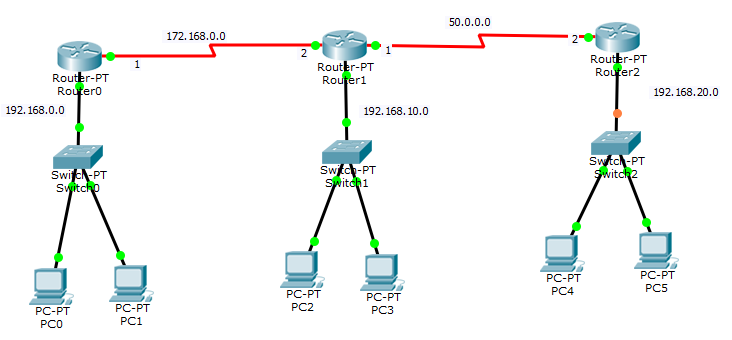
Description automatically generated

**Task 4: Implement OSPF on the network topology.**

**Graphical user interface

Description automatically generated**





**Lab Grading Sheet :**

|  |  |  |  |
| --- | --- | --- | --- |
| **Task** | **Max Marks** | **Obtained Marks** | **Comments(*if any*)** |
| 1. | 2.5 |  |  |
| 2. | 2.5 |  |  |
| 3. | 2.5 |  |  |
| 4. | 2.5 |  |  |
| **Total** | **10** |  | **Signature** |

# Note : Attempt all tasks and get them checked by your Lab. Instructor

# Lab 08: Implementation of OSPF

**Objective(s):**

In this lab, students will configure OSPF routing protocol.

**Tool(s) used:**

CISCO packet tracer

## Open Shortest Path First (OSPF) Basics

Open Shortest Path First (OSPF) is an open standard link state routing protocol that’s been implemented by a wide variety of network vendors, including Cisco. And it’s open standard characteristic that’s the key to OSPF’s flexibility and popularity.

OSPF works by using the Dijkstra Algorithm to initially construct a shortest path tree and follows that by populating the routing table with the resulting best paths. It is quickly convergent. Another two great advantages OSPF offers are that it supports multiple, equal cost routes to the same destination, also supports both IP and IPv6 routed protocols. OSPF’s best features are:

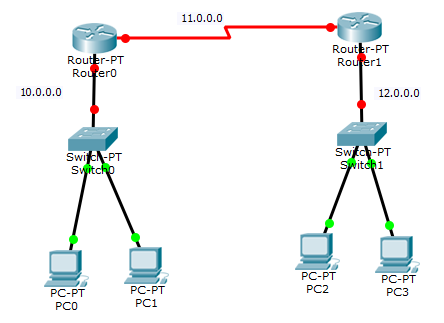
* Allows the creation of areas and autonomous systems.
* Minimizing routing update traffic.
* Is highly flexible, versatile and scalable.

Using OSPF:

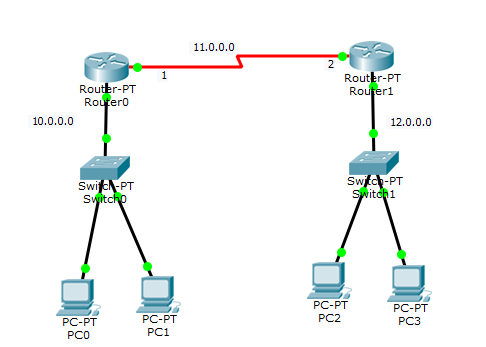
* Decrease routing overhead
* To speed up convergence
* To confine network instability to single areas of network.

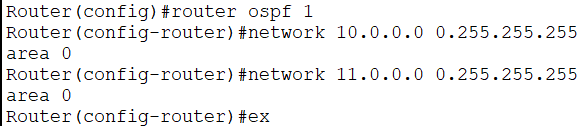
**OSPF application on Packet Tracer**

**Task 1:** Apply OSPF(open shortest path first) protocol on packet tracer. Let us take the following simple topology.

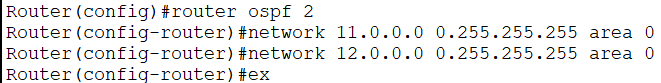


**Task 2:** Apply the OSPF on it. But before that, as usual, let us assign IP addresses and change the state of interfaces.

Now, as we can see, interfaces are up but the communication is not enabled because we have not applied the protocol yet.

 On router 1.Implement   


After applying protocol successfully , the traffic is flowing . Couple of things worth discussing Provide area id and process id on OSPF protocol. Provide wildcard mask on OSPF.



OSPF implemented. Now ping the networks and with *‘show ip route’* to check whether OSPF is implemented.

