# Lab – Dynamic Routing Protocols

## Lab Objectives:

- Understand dynamic routing protocols.
- Implement RIP protocol.
- Implement OSPF protocol.
- Verify the connection between remote networks.

### Dynamic Routing

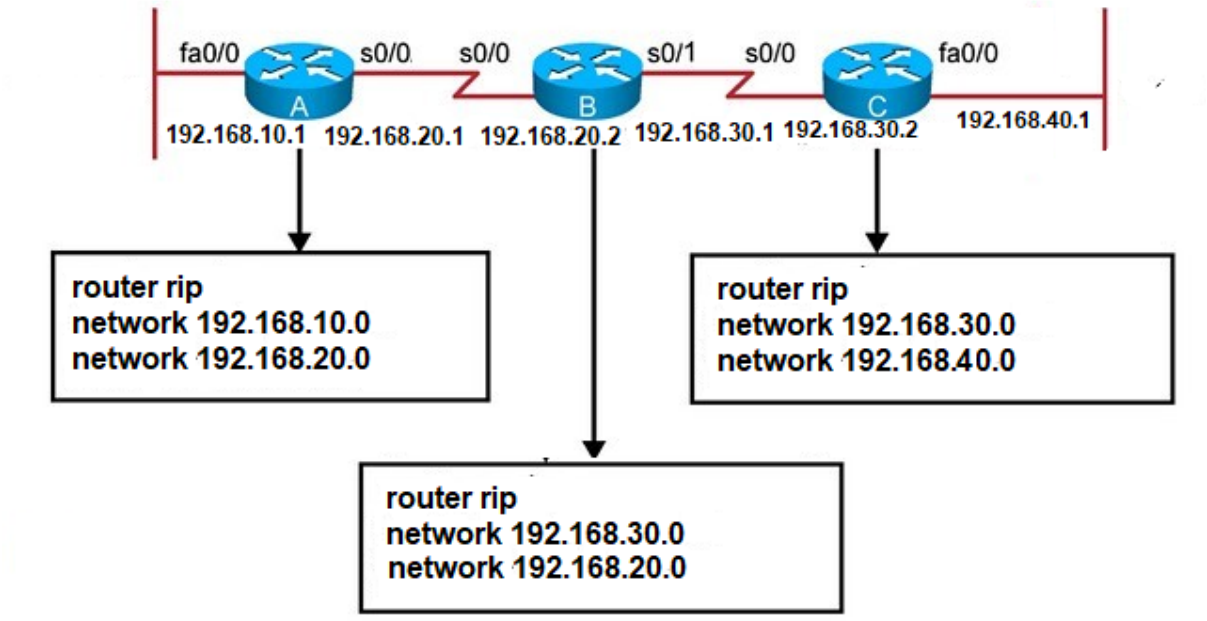
Dynamic routing is a networking technique that provides optimal data routing. Unlike static routing, dynamic routing enables routers to select paths according to real-time logical network layout changes. In dynamic routing, the routing protocol operating on the router is responsible for the creation, maintenance and updating of the dynamic routing table. In static routing, all these jobs are manually done by the system administrator.

Dynamic routing uses multiple algorithms and protocols. The most popular are Routing Information Protocol (RIP) and Open Shortest Path First (OSPF).

### RIP Configuration

**Router(config)#** router rip

**Router(config-router) #** network_address

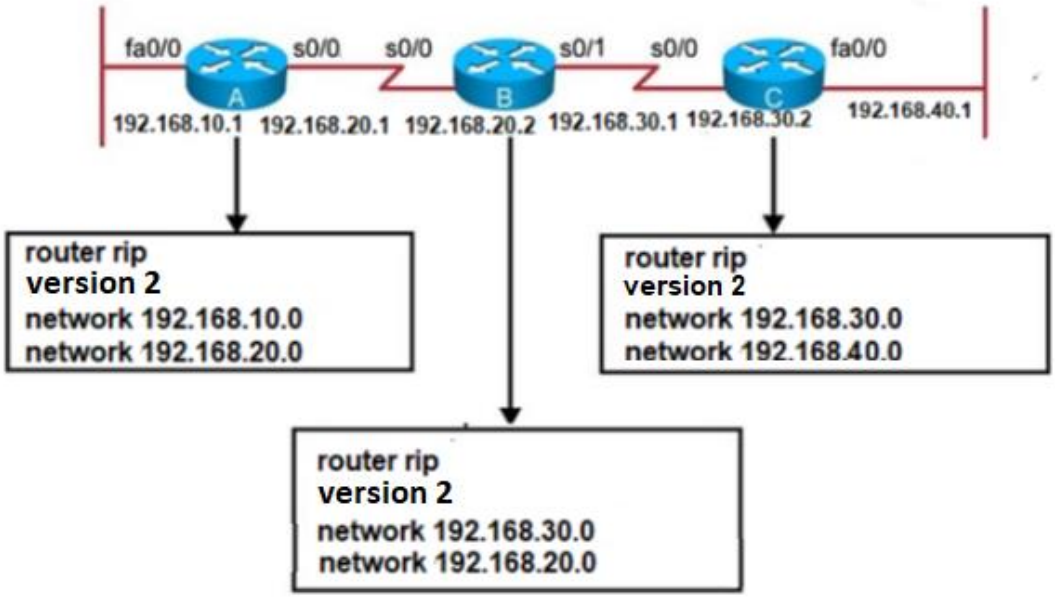


## RIP V2 Configuration

**Router(config)#** router rip

**Router(config-router) #** version 2

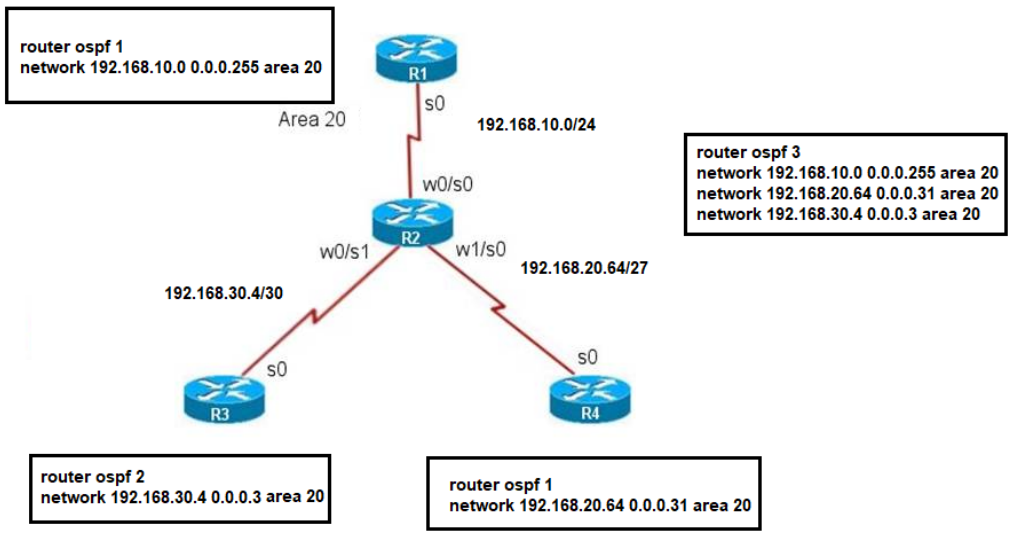
**Router(config-router) #** network_address




## OSPF Configuration

Router(config)# **router ospf** *process-id*

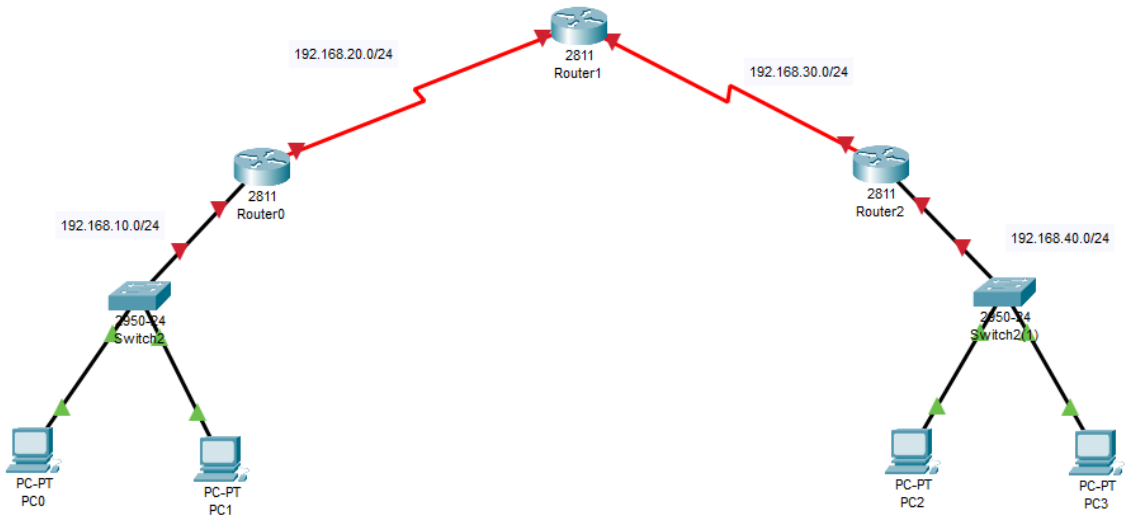
Router(config-router) # **network** *ip-address wildcard-mask* **area** *area-id*



## Task 1: RIP configuration

Using the provided topology, perform the following tasks:

- Create the network on the Packet tracer.
- Add the IP addresses to routers and PCs according to the provided topology.
- Configure dynamic routing using RIP version 2 on each router and show the routing table.
- Verify the connectivity between remote networks.




## Task 2: OSPF configuration

Use the same topology of the previous Task, replace RIP protocol with OSFP and verify the connectivity between various networks.

## Task 3: Network Design with OSFP

An e-commerce centre, responsible for managing a high volume of online orders, is undergoing a substantial expansion. The current facility is no longer sufficient to meet the growing demands. In response, the decision has been made to relocate the centre to a larger premises. The building for the new facility has been identified, but it lacks any pre-existing network infrastructure. Before the relocation can take place, a new and robust network service must be designed and implemented to support the centre's operations in the expanded space.

The new building is expected to have three floors with two departments on each floor as follows:

- **First Floor**- (Marketing - 80 users, Sales – 30 users)
- **Second Floor**- (Finance -100 users, HR - 12 users).
- **Third Floor**- (IT- 30 users, Legal – 5 users)

You have been selected to design and configure their network. The requirements of the network design include:

- Use Cisco Packet Tracer to design and implement the network solution.
- Provided a base network of 172.16.1.0/16, carry out VLSM subnetting to allocate the correct number of IP addresses to each department.

**Note**: This example was used in Week 10, you can reuse the VLSM subnetting, however, you may need to create two more subnets with/30 as You are expected to use three routers to connect between three floors.

- Configure OSPF to route between different networks/subnets.
- Test and Verifying Network Communication, ensure everything configured is working as expected.