**Design and configure dynamic routing protocols (RIP and OSPF) for an organization (hospital) using Cisco Packet Tracer.**

*“IT Infrastructure Management Course Project*

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1. **Introduction**

**What is a Network?(1)**

A network consists of two or more computers that are linked in order to share resources (such as printers and CDs), exchange files, or allow electronic communications. The computers on a network may be linked through cables, telephone lines, radio waves, satellites, or infrared light beams.

Two very common types of networks include:

1. Local Area Network (LAN)
2. Wide Area Network (WAN)

**What is a network protocol?(2)**

In networking, a protocol is a set of rules for formatting and processing data. Network protocols are like a common language for computers. The computers within a network may use vastly different software and hardware; however, the use of protocols enables them to communicate with each other regardless.

**Which protocols run on the network layer?(3)**

As described above, IP is a network layer protocol responsible for routing. But it is not the only network layer protocol.

[**IPsec:**](https://www.cloudflare.com/learning/network-layer/what-is-ipsec/) Internet Protocol Security (IPsec) sets up encrypted, authenticated IP connections over a [virtual private network (VPN)](https://www.cloudflare.com/learning/access-management/what-is-a-vpn/). Technically IPsec is not a protocol, but rather a collection of protocols that includes the Encapsulating Security Protocol (ESP), Authentication Header (AH), and Security Associations (SA).

[**ICMP:**](https://www.cloudflare.com/learning/ddos/glossary/internet-control-message-protocol-icmp/) The Internet Control Message Protocol (ICMP) reports errors and provides status updates. For example, if a router is unable to deliver a packet, it will send an ICMP message back to the packet's source.

**IGMP:** The Internet Group Management Protocol (IGMP) sets up one-to-many network connections. IGMP helps set up multicasting, meaning multiple computers can receive data packets directed at one [IP address](https://www.cloudflare.com/learning/dns/glossary/what-is-my-ip-address/).

Some of the most important protocols to know are:

**TCP:** As described above, TCP is a transport layer protocol that ensures reliable data delivery. TCP is meant to be used with IP, and the two protocols are often referenced together as TCP/IP.

**HTTP:** The [Hypertext Transfer Protocol (HTTP)](https://www.cloudflare.com/learning/ddos/glossary/hypertext-transfer-protocol-http/) is the foundation of the World Wide Web, the Internet that most users interact with. It is used for transferring data between devices. HTTP belongs to the [application layer (layer 7)](https://www.cloudflare.com/learning/ddos/what-is-layer-7/), because it puts data into a format that applications (e.g. a browser) can use directly, without further interpretation. The lower layers of the OSI model are handled by a computer's operating system, not applications.

**HTTPS:** The problem with HTTP is that it is not [encrypted](https://www.cloudflare.com/learning/ssl/what-is-encryption/) — any attacker who intercepts an HTTP message can read it. [HTTPS](https://www.cloudflare.com/learning/ssl/what-is-https/) (HTTP Secure) corrects this by encrypting HTTP messages.

**TLS/SSL:** [Transport Layer Security (TLS)](https://www.cloudflare.com/learning/ssl/transport-layer-security-tls/) is the protocol HTTPS uses for encryption. TLS used to be called [Secure Sockets Layer (SSL)](https://www.cloudflare.com/learning/ssl/what-is-ssl/).

**UDP:** The [User Datagram Protocol (UDP)](https://www.cloudflare.com/learning/ddos/glossary/user-datagram-protocol-udp/) is a faster but less reliable alternative to TCP at the transport layer. It is often used in services like video streaming and gaming, where fast data delivery is paramount.

Dynamic routing uses multiple algorithms and protocols. The most popular are **Routing Information Protocol (RIP) and Open Shortest Path First (OSPF)**. Dynamic routing protocols allow routers to share information about the network with other routers to allow them to select the best path to reach a destination.

**RIP**

Routing Information Protocol version 2 (RIPv2) is an old routing protocol. RIPv2 suffers from scalability issues due to a relatively low maximum hop count of 15 routing devices. Compared to more modern dynamic routing protocols, RIPv2’s methods for selecting optimal routes and the substantial convergence time it takes to recalculate paths renders it nearly obsolete.

**OSPF:**

The algorithm used by OSPF to determine best routes relies on the link-state database and allows OSPF to update its routes faster than RIP when a network change is encountered. OSPF uses areas to segment the network, which helps it decrease the general size of the link-state database and consequently speeds up network convergence when changes in the network are experienced.

**Our project is about:**

**Grow Green company is a firm that creates and develops eco-friendly products and services. Grow Green has three branches in different cities with main three departments Research and development department, and the IT department. All these departments work together to produce green and sustainable surroundings by using the (OSPF , RIP) protocols.**

**2-Methodology(4)**

Using Packet Tracer, a network topology was created, Cisco Packet Tracer as the name suggests, is a tool built by Cisco. This tool provides a network simulation to practice simple and complex networks ,allows users to create network

topologies and imitate modern computer networks

the protocols that will be compared using these four matrics(concept-algorithm-how the protocol works-preformance)

**3-Proposed model**

* Network Topology of the proposed model
* (OSPF Topology)

Diagram, schematic

Description automatically generated

* (RIP Topology)

Diagram

Description automatically generated

* Addressing table

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Default gateway | Subnet mask | IP | interface | Device |
| N/A | 255.255.255.252 | 10.0.0.4 | S0/0/0 | Router0 |
| N/A | 255.255.255.252 | 11.0.0.2 | S0/1/0 |  |
| N/A | 255.255.255.252 | 12.0.0.2 | S0/1/1 |  |
| N/A | 255.255.255.252 | 13.1.1.1 | S0/0/1 |  |
| N/A | 255.255.255.252 | 17.1.1.1 | S0/0/0 | Router1 |
| N/A | 255.255.255.252 | 14.0.0.2 | S0/1/0 |  |
| N/A | 255.255.255.252 | 15.0.0.2 | S0/1/1 |  |
| N/A | 255.255.255.252 | 13.1.1.2 | S0/0/1 |  |
| N/A | 255.0.0.0 | 16.0.0.2 | G0/1 |  |
| N/A | 255.255.255.252 | 17.1.1.2 | S0/0/0 | Router2 |
| N/A | 255.255.255.252 | 19.0.0.2 | S0/1/0 |  |
| N/A | 255.255.255.252 | 20.0.0.2 | S0/1/1 |  |
| N/A | 255.255.255.252 | 18.0.0.2 | S0/0/1 |  |
| Riyadh branch | | | | |
| N/A | 255.255.255.252 | 10.0.0.1 | S0/0/0 | Router6 |
| N/A | 255.255.255.0 | 192.90.10.1 | G0/0 |  |
| N/A | 255.255.255.252 | 11.0.0.1 | S0/1/0 | Router7 |
| N/A | 255.255.255.0 | 192.90.20.1 | G0/0 |  |
| N/A | 255.255.255.252 | 12.0.0.1 | S0/1/1 | Router8 |
| N/A | 255.255.255.0 | 192.90.30.1 | G0/0 |  |
| 192.90.10.1 | 255.255.255.0 | 192.90.10.2 | NIC | PC0 |
| 192.90.10.1 | 255.255.255.0 | 192.90.10.3 | NIC | Server0 |
| 192.90.20.1 | 255.255.255.0 | 192.90.20.3 | NIC | PC1 |
| 192.90.20.1 | 255.255.255.0 | 192.90.20.4 | NIC | Printer0 |
| 192.90.30.1 | 255.255.255.0 | 192.90.30.4 | NIC | PC2 |
| 192.90.30.1 | 255.255.255.0 | 192.90.30.5 | NIC | Laptop0 |
| 192.90.30.1 | 255.255.255.0 | 192.90.30.6 | NIC | Laptop3 |
| Khobar branch | | | | |
| N/A | 255.255.255.252 | 14.0.0.1 | S0/1/0 | Router3 |
| N/A | 255.255.255.0 | 192.90.50.1 | G0/0 |  |
| N/A | 255.255.255.252 | 15.0.0.1 | S0/1/1 | Router4 |
| N/A | 255.255.255.0 | 192.90.60.1 | G0/0 |  |
| N/A | 255.0.0.0 | 16.0.0.1 | G0/1 | Router5 |
| N/A | 255.255.255.0 | 192.90.70.1 | G0/0 |  |
| 192.90.60.1 | 255.255.255.0 | 192.90.60.8 | NIC | PC4 |
| 192.90.60.1 | 255.255.255.0 | 192.90.60.9 | NIC | Server2 |
| 192.90.50.1 | 255.255.255.0 | 192.90.50.7 | NIC | PC3 |
| 192.90.50.1 | 255.255.255.0 | 192.90.50.8 | NIC | Printer1 |
| 192.90.70.1 | 255.255.255.0 | 192.90.70.9 | NIC | PC5 |
| 192.90.70.1 | 255.255.255.0 | 192.90.70.10 | NIC | Laptop4 |
| 192.90.70.1 | 255.255.255.0 | 192.90.70.11 | NIC | Laptop5 |
| Jeddah branch | | | | |
| N/A | 255.255.255.252 | 18.0.0.1 | S0/0/1 | Router9 |
| N/A | 255.255.255.0 | 192.90.80.1 | G0/0 |  |
| N/A | 255.255.255.252 | 19.0.0.1 | S0/1/0 | Router10 |
| N/A | 255.255.255.0 | 192.90.100.1 | G0/0 |  |
| N/A | 255.255.255.252 | 20.0.0.1 | S0/1/1 | Router11 |
| N/A | 255.255.255.0 | 192.90.101.1 | G0/0 |  |
| 192.90.80.1 | 255.255.255.0 | 192.90.80.12 | NIC | PC6 |
| 192.90.80.1 | 255.255.255.0 | 192.90.80.13 | NIC | Server3 |
| 192.90.100.1 | 255.255.255.0 | 192.90.100.13 | NIC | PC7 |
| 192.90.100.1 | 255.255.255.0 | 192.90.100.14 | NIC | Printer2 |
| 192.90.101.1 | 255.255.255.0 | 192.90.101.14 | NIC | PC8 |
| 192.90.101.1 | 255.255.255.0 | 192.90.101.15 | NIC | Laptop6 |
| 192.90.101.1 | 255.255.255.0 | 192.90.101.16 | NIC | Laptop7 |

* Devices configurations.

Graphical user interface, text, application, email

Description automatically generatedGraphical user interface, text, application, email

Description automatically generated

Graphical user interface, application

Description automatically generatedGraphical user interface, application

Description automatically generated

Routers Configurations:

Router0

Router>enable

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (config)#int s0/0/0

Router (config-if) #ip address 10.0.0.4 255.0.0.0

Router (config-if) #no shutdown

Router (config-if)#

LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Router (config-if)#

LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

Router (config-if)# int s0/1/0

Router (config-if) #ip address 11.0.0.2 255.0.0.0

Router (config-if) #no shutdown

Router (config-if)#

%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 (config-if) #int s0/1/1

Router (config-if) #ip address 12.0.0.2 255.0.0.0

Router (config-if) #no shutdown

Router (config-if)#

LINK-5-CHANGED: Interface Serial0/1/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed state to up

Router (config-if)#int s0/0/1

Router (config-if) #ip address 13.1.1.1 255.0.0.0

Router (config-if)#no shutdown

LINK-5-CHANGED: Interface Serial0/0/1, changed state to down

Router1

Router>enable

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (config) #int s0/0/1

Router (config-if)# ip address 13.1.1.2 255.0.0.0

Router (config-if)#no shutdown

Router (config-if)#

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up

Router (config-if) #int g0/1

Router (config-if) #ip address 16.0.0.2 255.0.0.0

Router (config-if) #no shutdown

Router (config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router (config-if) #int s0/1/0

Router (config-if) #ip address 14.0.0.2 255.0.0.0

Router (config-if) #no shutdown

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down

Router (config-if)#

Router (config-if) #int s0/1/1

Router (config-if) #ip address 15.0.0.2 255.0.0.0

Router (config-if)#no shutdown

LINK-5-CHANGED: Interface Serial0/1/1, changed state to down

Router (config-if)#

Router (config-if) #int s0/0/0

Router (config-if) #ip address 17.1.1.1 255.0.0.0

Router (config-if) #no shutdown

LINK-5-CHANGED: Interface Serial0/0/0, changed state to down

Router (config-if)#

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

Router2

Router>enable

Router #conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (Config)#1 S0/0/0

Router (config-if) #ip address 17.1.1.2 255.0.0.0

Router (config-if)#no shutdown

Router (config-if)#

LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

Router (config)# int s0/0/1

Router (config-if)# ip address 18.0.0.2 255.0.0.0

Router (config-if) #no shutdown

Router (config-if)#

LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

Router (config-if) #

Router (config-if) #int s0/1/0

Router (config-if) #ip address 19.0.0.2 255.0.0.0

Router (config-if) #no shutdown

Router (config-if)#

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 (config-if) #int s0/1/1

Router (config-if) #ip address 20.0.0.2 255.0.0.0

Router (config-if)#no shutdown

Router3

Router>enable

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (config)#int g0/0

Router (config-if) #ip address 192.90.50.1 255.255.255.0

Router (config-if)#no shutdown

Router (config-if)#

LINK-5-CHANGED: Interface Gigabit Ethernet0/0, changed state to up

LINEPROTO-5-UPDOWN: Line protocol on Interface Gigabit Ethernet0/0, changed state to up

Router (config-if)#int s0/1/0

Router (config-if) #ip address 14.0.0.1 255.0.0.0

Router (config-if)#no shutdown

Router (config-if)#

LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

LINE PROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up

Router4

Router>enable

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (config) #int g0/0

Router (config-if) #ip address 192.90.60.1 255.255.255.0

Router (config-if) #no shutdown

Router (config-if)#

LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

\* LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router (config-if)# int s0/1/1

Router (config-if) #ip address 15.0.0.1 255.0.0.0

Router (config-if) #no shutdown

Router (config-if)#

LINK-5-CHANGED: Interface Serial0/1/1, changed state to up

Router5

Router>enable

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (config) #int g0/0

Router (config-if) #ip address 192.90.70.1 255.255.255.0

Router (config-if)#no shutdown

Router (config-if) #

LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

LINE PROTO-5-UPDOWN: Line protocol on Interface Gigabit Ethernet0/0, changed state to up

Router (config-if) #int g0/1

Router (config-if) #ip address 16.0.0.1 255.0.0.0

Router (config-if) #no shutdown

Router (config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router6

Router>enable

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (config)# int g0/0

Router (config-if) #ip address 192.90.10.1 255.255.255.0

Router (config-if) #no shutdown

Router (config-if)#

LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

LINE PROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router (config-if) #int s0/0/0

Router (config-if) #ip address 10.0.0.1 255.0.0.0 Router (config-if) #no shutdown

LINK-5-CHANGED: Interface Serial0/0/0, changed state to down

Router7

Router>enable

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (config) #int s0/1/0

Router (config-if) # ip address 11.0.0.1 255.0.0.0

Router (config-if) #no shutdown

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

LINE PROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up

Router (config-if)# int g0/0

Router (config-if) #ip address 192.90.20.1 255.255.255.0

Router (config-if)#no shutdown

Router (config-if) #

LINK-5-CHANGED: Interface Gigabit Ethernet0/0, changed state to up

LINE PROTO-5-UPDOWN: Line protocol on Interface Gigabit Ethernet0/0, changed state to up

Router8

Router>enable

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (config)#int g0/0

Router (config-if) #ip address 192.90.30.1 255.255.255.0

Router (config-if) #no shutdown

Router (config-if)#

LINK-5-CHANGED: Interface Gigabit Ethernet0/0, changed state to up

LINE PROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router (config-if)#int s0/1/1

Router (config-if) #ip address 12.0.0.1 255.0.0.0

Router (config-if)#no shutdown

LINK-5-CHANGED: Interface Serial0/1/1, changed state to down

Router9

Router>enable

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (config) #int g0/0

Router (config-if) #ip address 192.90.80.1 255.255.255.0

Router (config-if) #no shutdown

Router (config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

LINE PROTO-5-UPDOWN: Line protocol on Interface Gigabit Ethernet0/0, changed state to up

Router (config-if)# int s0/0/1

Router (config-if) #ip address 18.0.0.1 255.0.0.0

Router (config-if) #no shutdown

LINK-5-CHANGED: Interface Serial0/0/1, changed state to down

Router10

Router>enable

Router #conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (config) #int g0/0

Router (config-if)# ip address 192.90.100.1 255.255.255.0

Router (config-if) #no shutdown

Router (config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

LINE PROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router (config-if)#int s0/1/0

Router (config-if)# ip address 19.0.0.1 255.0.0.0

Router (config-if) #no shutdown

LINK-5-CHANGED: Interface Serial0/1/0, changed state to down

Router11

Router>enable

Router#conf t

Enter configuration commands, one per line. End with CNTL/Z.

Router (config)#int g0/0

Router (config-if)# ip address 192.90.101.1 255.255.255.0

Router (config-if)#no shutdown

Router (config-if)#

LINK-5-CHANGED: Interface Gigabit Ethernet0/0, changed state to up

LINE PROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router (config-if)#int s0/1/1

Router (config-if)# ip address 20.0.0.1 255.0.0.0

Router (config-if)#no shutdown

LINK-5-CHANGED: Interface Serial0/1/1, changed state to down

* Protocols configurations.

(OSPF)

Router6

router ospf 1

network 10.0.0.0 0.255.255.255 area 0

network 192.90.10.0 0.0.0.255 area 0

passive-interface gigabitEthernet 0/0

exit

Router7

router ospf 1

network 11.0.0.0 0.255.255.255 area 0

network 192.90.20.0 0.0.0.255 area 0

passive-interface gigabitEthernet 0/0

exit

Router8

router ospf 1

network 12.0.0.0 0.255.255.255 area 0

network 192.90.30.0 0.0.0.255 area 0

passive-interface gigabitEthernet 0/0

exit

Router0

router ospf 1

network 10.0.0.0 0.255.255.255 area 0

network 11.0.0.0 0.255.255.255 area 0

network 12.0.0.0 0.255.255.255 area 0

network 13.0.0.0 0.255.255.255 area 0

exit

Router1

router ospf 1

network 13.0.0.0 0.255.255.255 area 0

network 14.0.0.0 0.255.255.255 area 0

network 15.0.0.0 0.255.255.255 area 0

network 16.0.0.0 0.255.255.255 area 0

network 17.0.0.0 0.255.255.255 area 0

exit

Router2

router ospf 1

network 17.0.0.0 0.255.255.255 area 0

network 18.0.0.0 0.255.255.255 area 0

network 19.0.0.0 0.255.255.255 area 0

network 20.0.0.0 0.255.255.255 area 0

exit

Router3

router ospf 1

network 14.0.0.0 0.255.255.255 area 0

network 192.90.50.0 0.0.0.255 area 0

passive-interface gigabitEthernet 0/0

exit

Router4

router ospf 1

network 15.0.0.0 0.255.255.255 area 0

network 192.90.60.0 0.0.0.255 area 0

passive-interface gigabitEthernet 0/0

exit

Router5

router ospf 1

network 16.0.0.0 0.255.255.255 area 0

network 192.90.70.0 0.0.0.255 area 0

passive-interface gigabitEthernet 0/0

exit

Router9

router ospf 1

network 18.0.0.0 0.255.255.255 area 0

network 192.90.80.0 0.0.0.255 area 0

passive-interface gigabitEthernet 0/0

exit

Router10

router ospf 1

network 19.0.0.0 0.255.255.255 area 0

network 192.90.100.0 0.0.0.255 area 0

passive-interface gigabitEthernet 0/0

exit

Router11

router ospf 1

network 20.0.0.0 0.255.255.255 area 0

network 192.90.101.0 0.0.0.255 area 0

passive-interface gigabitEthernet 0/0

exit

(RIP)

Router6

router rip

version 2

no auto-summary

network 10.0.0.0

network 192.90.10.0

passive-interface gigabitEthernet 0/0

exit

Router7

router rip

version 2

no auto-summary

network 11.0.0.0

network 192.90.20.0

passive-interface gigabitEthernet 0/0

exit

Router8

router rip

version 2

no auto-summary

network 12.0.0.0

network 192.90.30.0

passive-interface gigabitEthernet 0/0

exit

Router0

router rip

version 2

no auto-summary

network 10.0.0.0

network 11.0.0.0

network 12.0.0.0

network 13.0.0.0

exit

Router1

router rip

version 2

no auto-summary

network 13.0.0.0

network 14.0.0.0

network 15.0.0.0

network 16.0.0.0

network 17.0.0.0

exit

Router3

router rip

version 2

no auto-summary

network 14.0.0.0

network 192.90.50.0

passive-interface gigabitEthernet 0/0

exit

Router4

router rip

version 2

no auto-summary

network 15.0.0.0

network 192.90.60.0

passive-interface gigabitEthernet 0/0

exit

Router5

router rip

version 2

no auto-summary

network 16.0.0.0

network 192.90.70.0

passive-interface gigabitEthernet 0/0

exit

Router2

router rip

version 2

no auto-summary

network 17.0.0.0

network 18.0.0.0

network 19.0.0.0

network 20.0.0.0

exit

Router9

router rip

version 2

no auto-summary

network 18.0.0.0

network 192.90.80.0

passive-interface gigabitEthernet 0/0

exit

Router10

router rip

version 2

no auto-summary

network 19.0.0.0

network 192.90.100.0

passive-interface gigabitEthernet 0/0

exit

Router11

router rip

version 2

no auto-summary

network 20.0.0.0

network 192.90.101.0

passive-interface gigabitEthernet 0/0

exit

Ping:

(OSPF) – ping from PC0 in (Riyadh branch-IT Department) network 192.90.10.0 to PC7 in (Jeddah branch - Research Department) network 192.90.100.0

Text

Description automatically generated

(OSPF) – ping from PC1 in (Riyadh branch- Research Department) network 192.90.20.0 to PC5 in (Khobar branch - Development Department) network 192.90.70.0

Graphical user interface, text

Description automatically generated

(RIP) – ping from PC0 in (Riyadh branch-IT Department) network 192.90.10.0 to PC7 in (Jeddah branch - Research Department) network 192.90.100.0

Graphical user interface, text

Description automatically generated

(RIP) – ping from PC1 in (Riyadh branch- Research Department) network 192.90.20.0 to PC5 in (Khobar branch - Development Department) network 192.90.70.0

Graphical user interface, text

Description automatically generated

1. **Results and Discussion**

* Discuss the performance of each protocol in terms of the metrics that mentioned in methodology section.

|  |  |  |
| --- | --- | --- |
| Metrics | RIP | OSPF |
| **Concept(5)** | Stands for Routing Information Protocol. | Stands for Open Shortest Path First. |
| **Algorithm (6)** | Works on Bellman-Ford algorithm (Distance Vector protocol) | Works on Dijkstar algorithm (link-state protocol) |
| **How the protocol works(5)** | determines the transmission path based on the distance or hops count. | determines the shortest path by analyzing many factors such as speed, cost, and path congestion. |
| **protocols performance(7)(5)** | RIP protocol is ideal for small networks that are simple and non-hierarchical because The hop counts of RIP are limited to 15 hops. also, it's slow and simple. | OSPF's routing performance testing is very good, after sending messages several times, OSPF routing has packet loss with an average of 2.09%(1). And it's faster than RIP protocol.  The percentage of packet loss is:  (packet data send – packet data receive) / packet data send \* 100%  To calculate the cost is done by the formula:  Cost = 108 / bandwidth kbps |

1. **Conclusion**

In conclusion, the main goal of our project is to represent a network That service the nature . we connected all the branches to each other, and they are able to send to each other, by using, OSFP and RIP protocols and WLAN concepts.

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