

Kingdom of Saudi Arabia

Ministry of Education

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College of Science and Humanities

Computer Science department



جامعة الإمام عبد الرحمن بن فيصل
IMAM ABDULRAHMAN BIN FAISAL UNIVERSITY

“IT Infrastructure Management

Course Project

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PROJECT IDEA:

Our project is about:

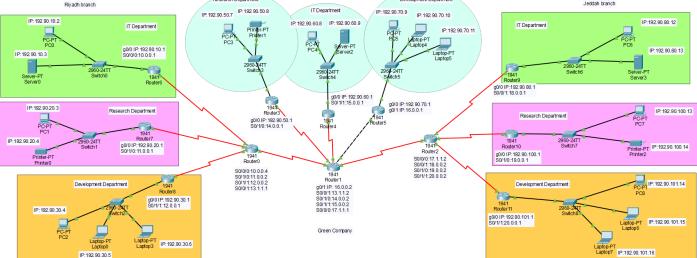
Grow Green company is a firm that creates and develops eco-friendly products and services. Grow Green has three branches in different cities with main three departments Research and development department, and the IT department. All these departments work together to produce green and sustainable surroundings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



USED PROTOCOL

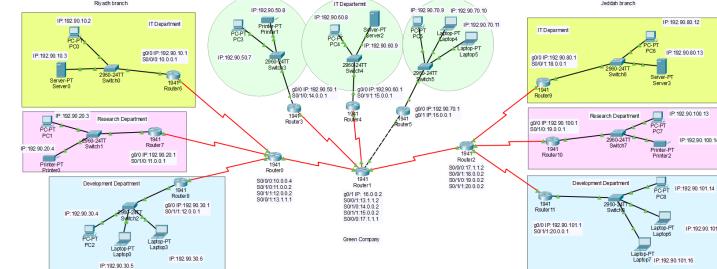
RIP

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.

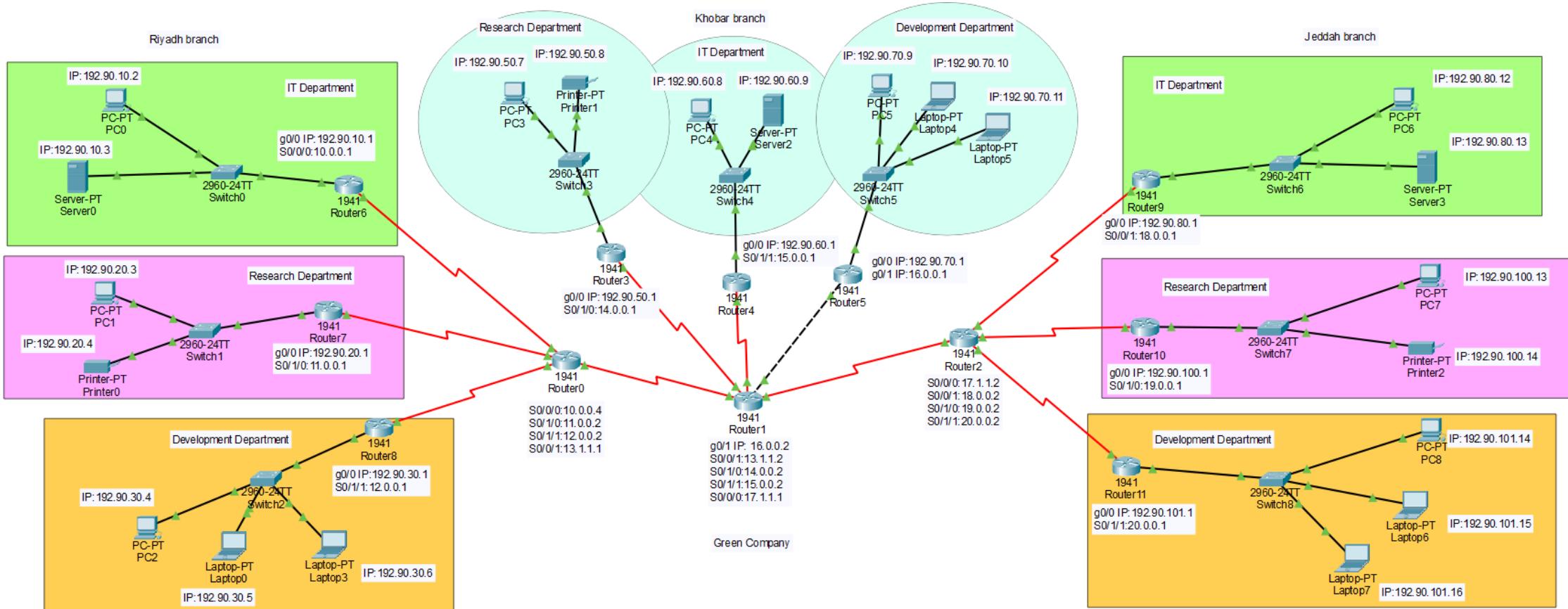


OSPF

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.

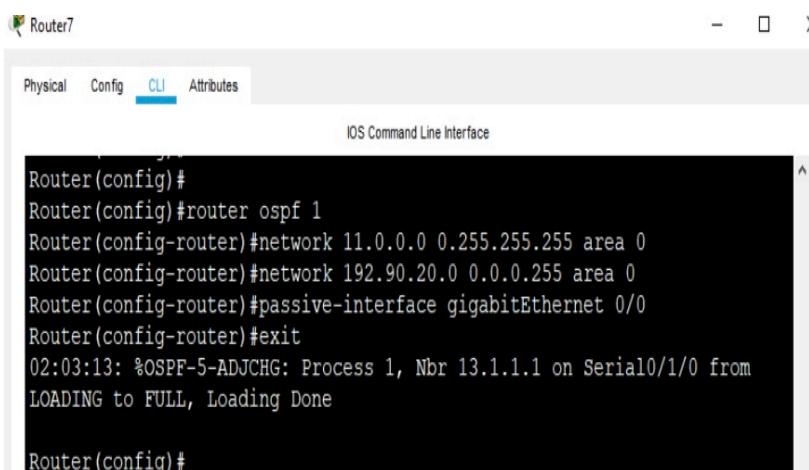


NETWORK TOPOLOGY



PROTOCOLS CONFIGURATION

RIP



Router7

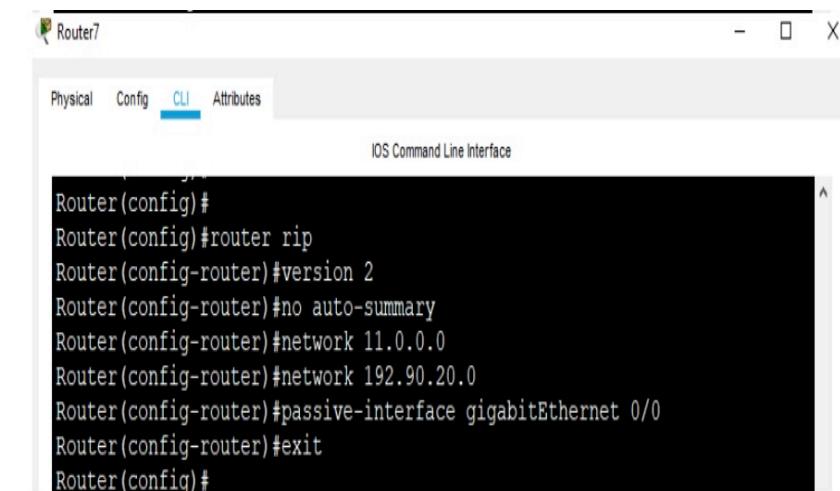
Physical Config **CLI** Attributes

IOS Command Line Interface

```
Router(config)#  
Router(config)#router ospf 1  
Router(config-router)#network 11.0.0.0 0.255.255.255 area 0  
Router(config-router)#network 192.90.20.0 0.0.0.255 area 0  
Router(config-router)#passive-interface gigabitEthernet 0/0  
Router(config-router)#exit  
02:03:13: %OSPF-5-ADJCHG: Process 1, Nbr 13.1.1.1 on Serial0/1/0 from  
LOADING to FULL, Loading Done  
  
Router(config)#

```

OSPF



Router7

Physical Config **CLI** Attributes

IOS Command Line Interface

```
Router(config)#  
Router(config)#router rip  
Router(config-router)#version 2  
Router(config-router)#no auto-summary  
Router(config-router)#network 11.0.0.0  
Router(config-router)#network 192.90.20.0  
Router(config-router)#passive-interface gigabitEthernet 0/0  
Router(config-router)#exit  
Router(config)#

```

PROTOCOLS PING

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

```
PC0
Physical Config Desktop Programming Attributes
Command Prompt X
Packet Tracer PC Command Line 1.0
C:\>ping 192.90.100.13

Pinging 192.90.100.13 with 32 bytes of data:

Request timed out.
Reply from 192.90.100.13: bytes=32 time=10ms TTL=123
Reply from 192.90.100.13: bytes=32 time=14ms TTL=123
Reply from 192.90.100.13: bytes=32 time=12ms TTL=123

Ping statistics for 192.90.100.13:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 14ms, Average = 12ms

C:\>ping 192.90.100.13

Pinging 192.90.100.13 with 32 bytes of data:

Reply from 192.90.100.13: bytes=32 time=4ms TTL=123
Reply from 192.90.100.13: bytes=32 time=28ms TTL=123
Reply from 192.90.100.13: bytes=32 time=14ms TTL=123
Reply from 192.90.100.13: bytes=32 time=13ms TTL=123

Ping statistics for 192.90.100.13:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 28ms, Average = 14ms

C:\>
```

Ping:

(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

```
PC0
Physical Config Desktop Programming Attributes
Command Prompt X
Packet Tracer PC Command Line 1.0
C:\>ping 192.90.100.13

Pinging 192.90.100.13 with 32 bytes of data:

Request timed out.
Reply from 192.90.100.13: bytes=32 time=16ms TTL=123
Reply from 192.90.100.13: bytes=32 time=4ms TTL=123
Reply from 192.90.100.13: bytes=32 time=16ms TTL=123

Ping statistics for 192.90.100.13:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 16ms, Average = 12ms

C:\>ping 192.90.100.13

Pinging 192.90.100.13 with 32 bytes of data:

Reply from 192.90.100.13: bytes=32 time=5ms TTL=123
Reply from 192.90.100.13: bytes=32 time=19ms TTL=123
Reply from 192.90.100.13: bytes=32 time=12ms TTL=123
Reply from 192.90.100.13: bytes=32 time=12ms TTL=123

Ping statistics for 192.90.100.13:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 5ms, Maximum = 19ms, Average = 12ms

C:\>
```

- **Results and Preformance**
- Discuss the performance of each protocol in terms of the metrics that mentioned in methodology section.

Metrics	RIP	OSPF
Concept	Stands for Routing Information Protocol.	Stands for Open Shortest Path First.
Algorithm	Works on Bellman-Ford algorithm (Distance Vector protocol)	Works on Dijkstar algorithm (link-state protocol)
How the protocol works	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	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: $(\text{packet data send} - \text{packet data receive}) / \text{packet data send} * 100\%$ To calculate the cost is done by the formula: $\text{Cost} = 108 / \text{bandwidth kbps}$

Results

- We found that OSPF protocol is better in term network for the large area, and the RIP protocol which is an old routing protocol and preferred to be used in small area .

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.





In the end

- **Thank you for listening**

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