North South University

Department of Electrical & Computer Engineering (ECE)

Project Report
Group-06

CSE 438L

Data Communications and Networking Lab

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Introduction:

This project is about to build a simulated network system in Cisco Packet Tracer for a company named "Johnson & Johnson". And the company has 5 departments such as Production, Research & Development, Finance, Sales & Marketing, Human Resources. As a company needs to communicate every department to another, there must be a network topology model for this purpose .Use here 3 Routing protocol which are RIP, EIGRP and OSPF.

Subnetting Procedure:

Our given IP address for this project was – 192.214.29.0/19

If we take 3 bits . Then our network subnet number will be 8 (23 = 8). As our required system has 5 departments so we need to take 5 networks ID.

Subnet addr	First host	Last host	Subnet mask	Broadcast
192.214.0.0	192.214.0.1	192.214.31.254	255.255.224.0	192.214.31.255
192.214.32.0	192.214.32.1	192.214.63.254	255.255.224.0	192.214.63.255
192.214.64.0	192.214.64.1	192.214.95.254	255.255.224.0	192.214.95.255
192.214.96.0	192.214.96.1	192.214.127.254	255.255.224.0	192.214.127.255
192.214.128.0	192.214.128.1	192.214.159.254	255.255.224.0	192.214.159.255

As the company have 5 departments. So, we use network1 to network5 to configure the whole system.

Network Name	Network ID	Subnet Mask	Allocated Department
Network1	192.214.0.0	255.255.255.0	Finance
Network2	192.214.32.0	255.255.255.0	Production
Network3	192.214.64.0	255.255.255.0	Sales & Marketing network
Network4	192.214.96.0	255.255.255.0	Research & Development
Network5	192.214.128.0	255.255.255.0	Human Resources

For connection of two router we use IP address as our own choice. We use class A IP address.

Network ID	Subnet Mask	Allocated Router
10.0.0.0	255.0.0.0	Router 0 – Router 1
20.0.0.0	255.0.0.0	Router 1 – Router 2

Modules and Routing Protocols:

Modules:

Modules are a piece of hardware containing several device interfaces. Here, we use HWIC-2T module which is a 2-port serial WAN interface for serial connection of Router. Router has to be powered off in order to add or remove modules.

Again, for establishing this network, we need to configure the entire device according to their assigned IP with every Router respectively. Without configuration one device couldn't identify another device and can't perform their work.

Routing Protocol:

Routing protocols are used to distribute (Send/Receive) routing information between routing devices.

As routing protocol, EIGRP, OSPF and RIP are used here.

At Router 2 we use RIP and EIGRP. RIP use for Router 2 and Human Resource. For Finance and Production we use EIGRP routing protocol.

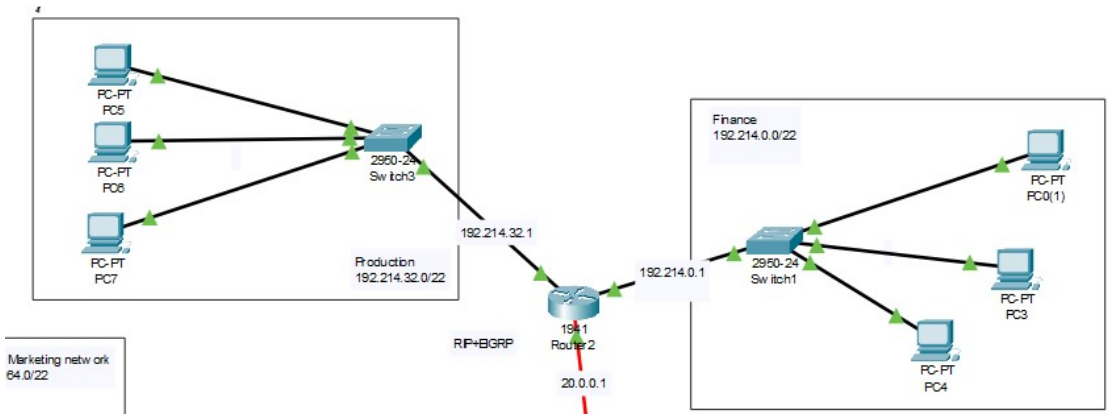


Fig- RIP and EIGRP routing

EIGRP acts as an internal gateway protocol. When communicating with neighbors, EIGRP will first send out information to its neighbors using the address.

At Router 0 we use OSPF routing protocol. OSPF use for Research & Development and Sales & Marketing network .

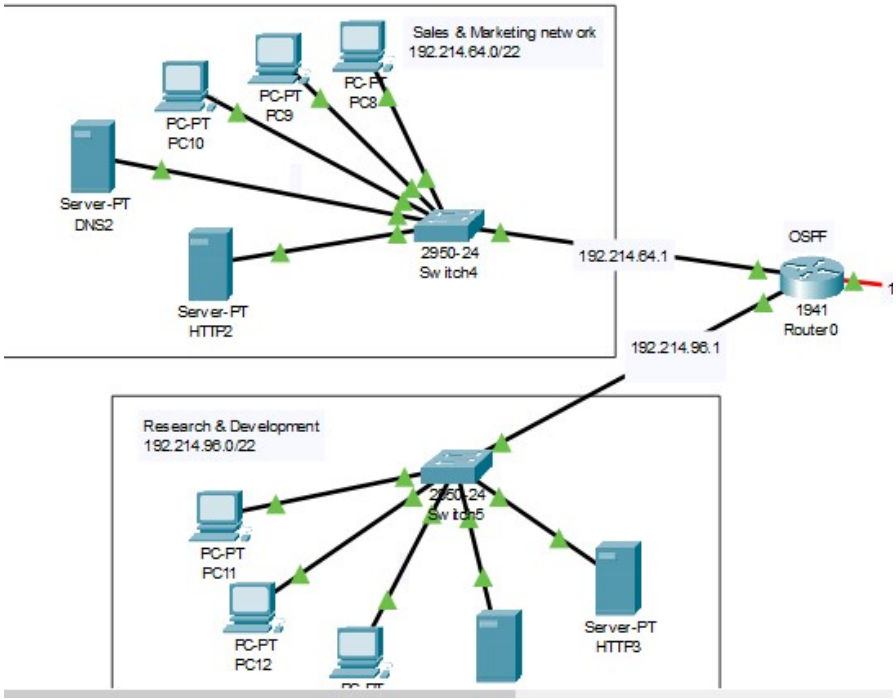


Fig- OSPF routing

At Router1 we use both OSPF and EIGRP routing protocol for Router 1 and 2 and Human Resource network.

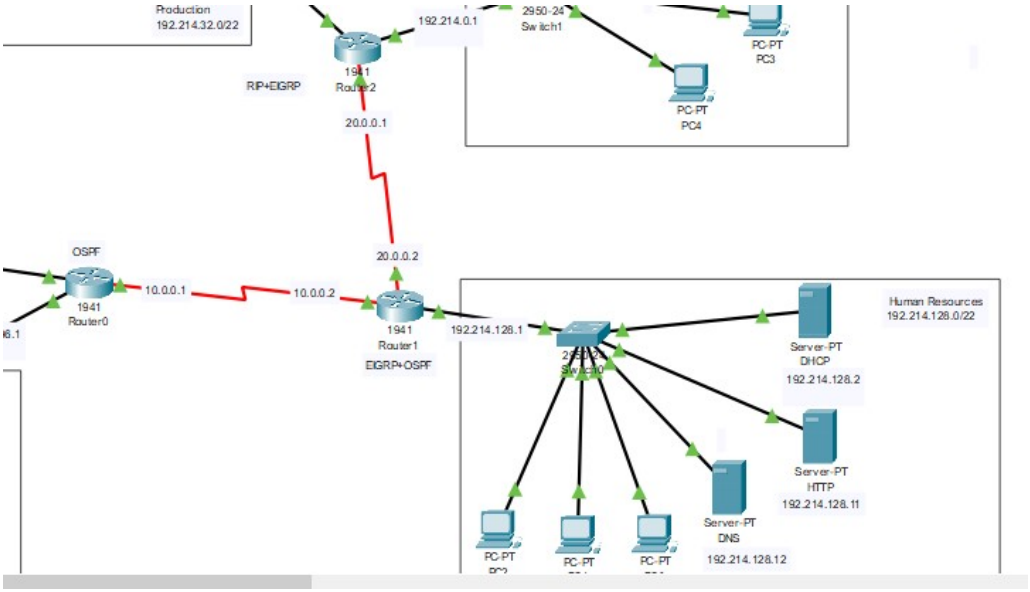


Fig- OSPF and EIGRP routing

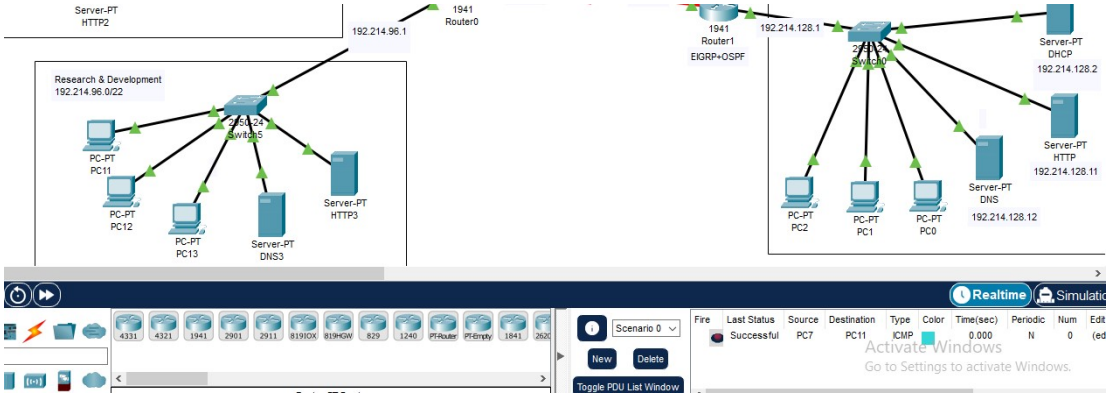
Command for DHCP server connection in every department. The IP helper command is generally used to configure a DHCP Relay agent on a layer interface on a Cisco.

Results and Discussion

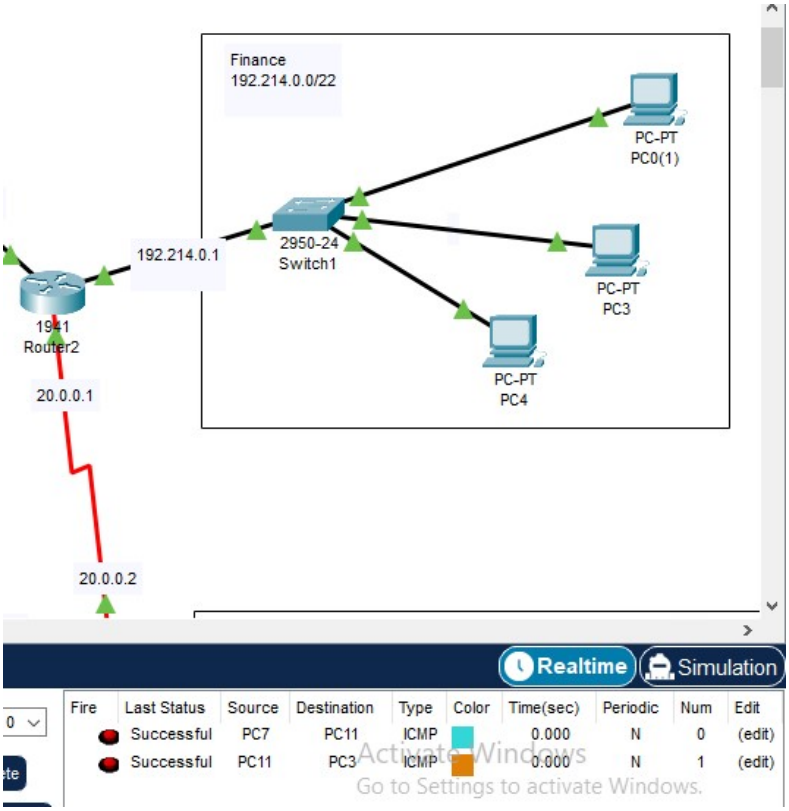
After setting up all the things, now here is the result of our required system:

Message Transfer:

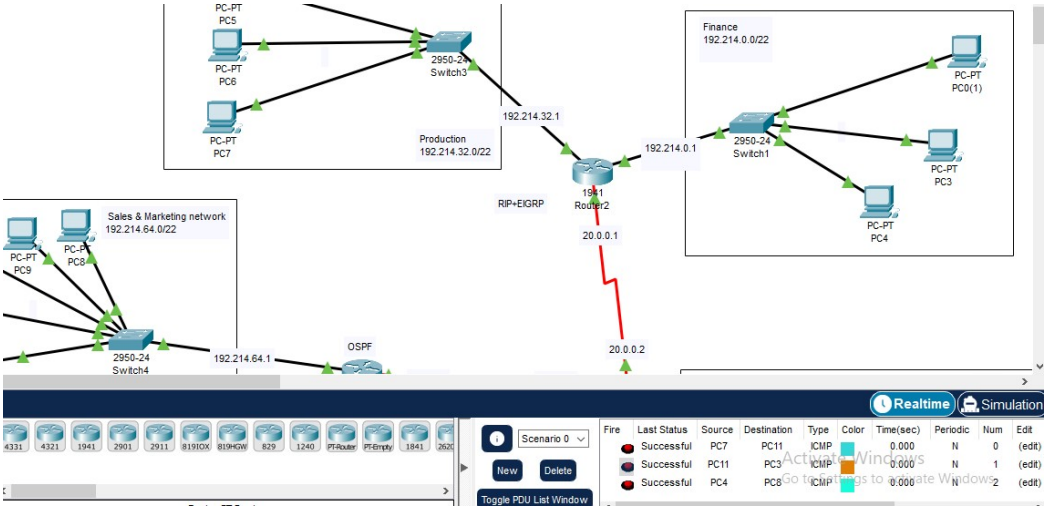
Production to Research & Development network:



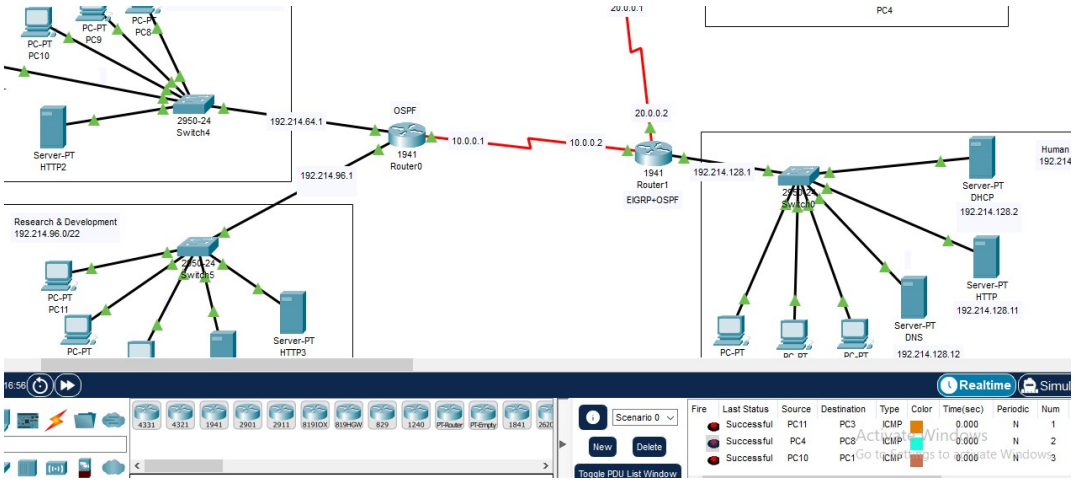
Research & Development to Finance network:



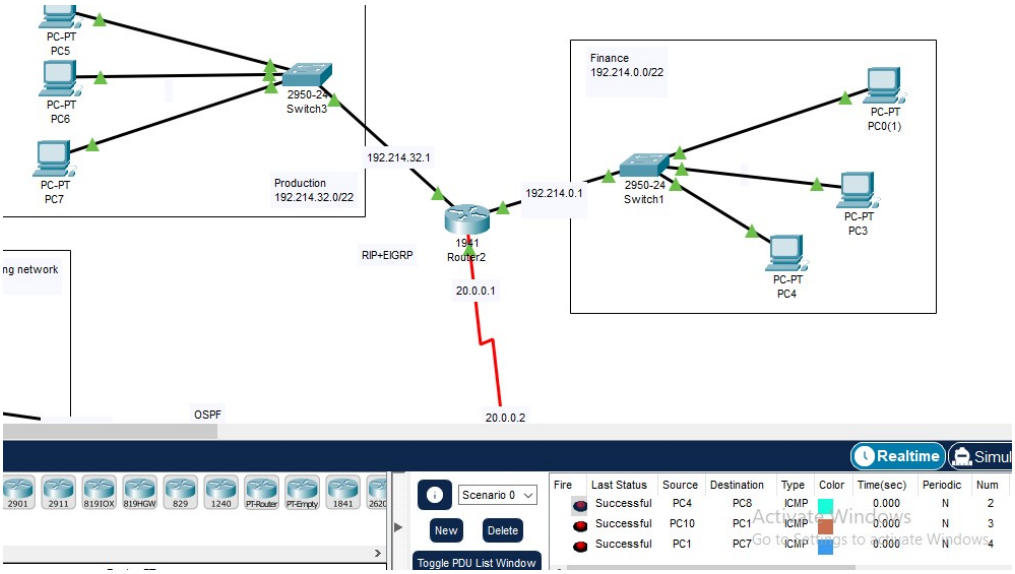
Finance to Sales & marketing network:



Sales & marketing to Human Resources network:



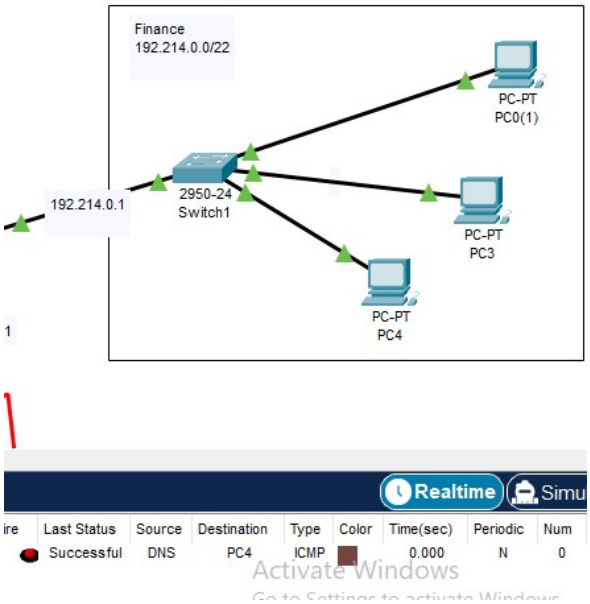
Human Resources to Production network:



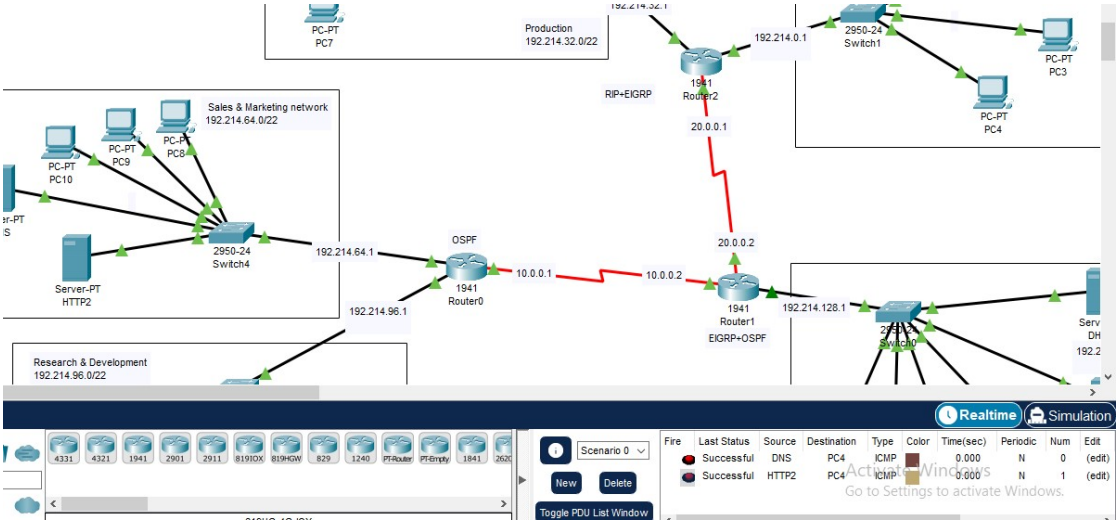
DNS & HTTP Result:

Here we use DNS and HTTP server for two rooms which are Research & Development and Sales & Marketing network**.**

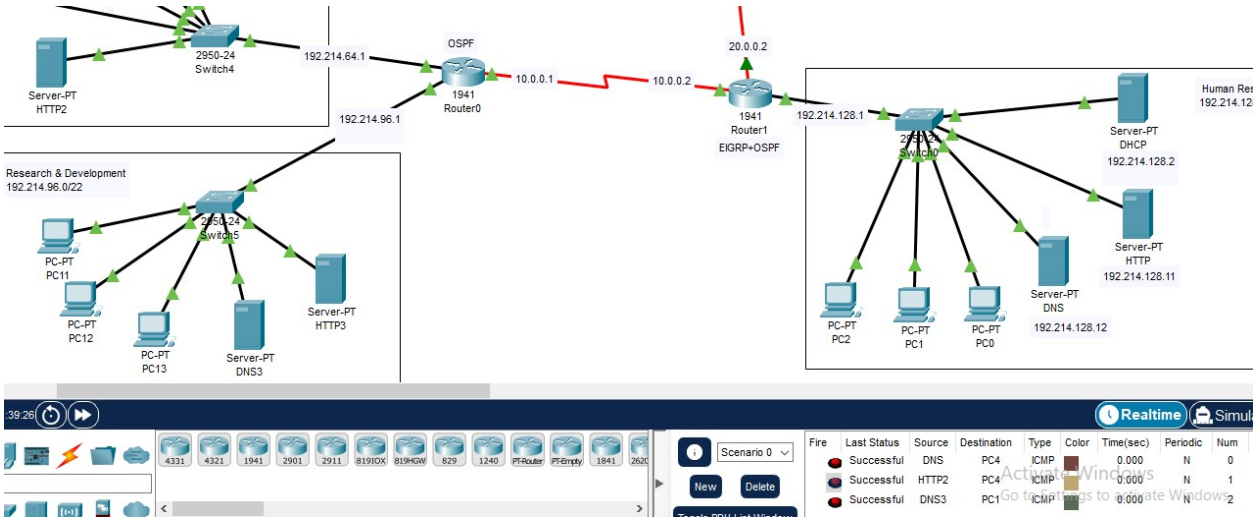
Sales & Marketing DNS to Finance network:



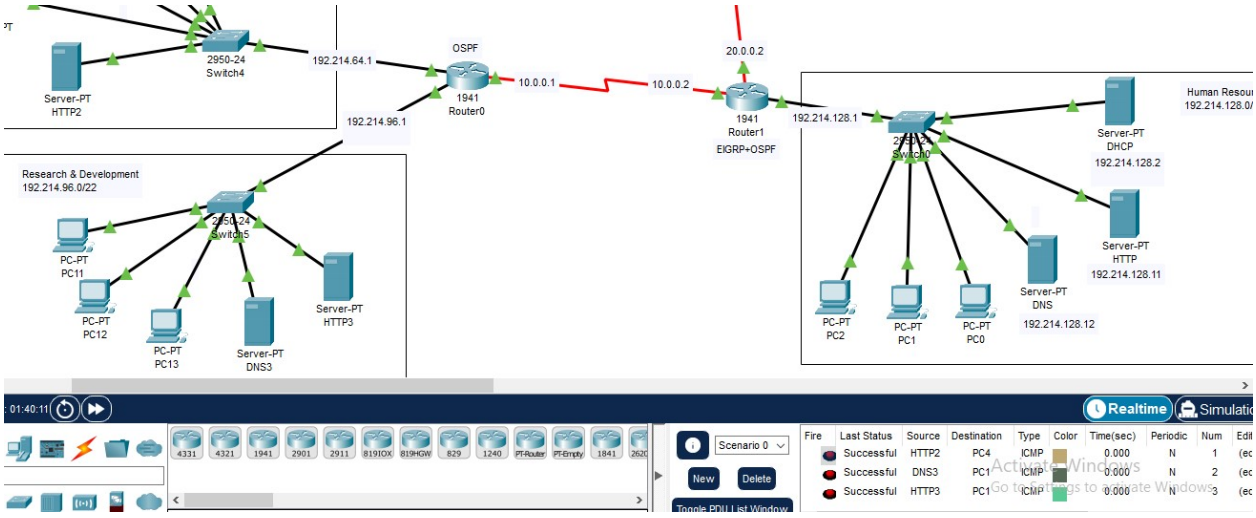
Sales & Marketing HTTP to Finance network:



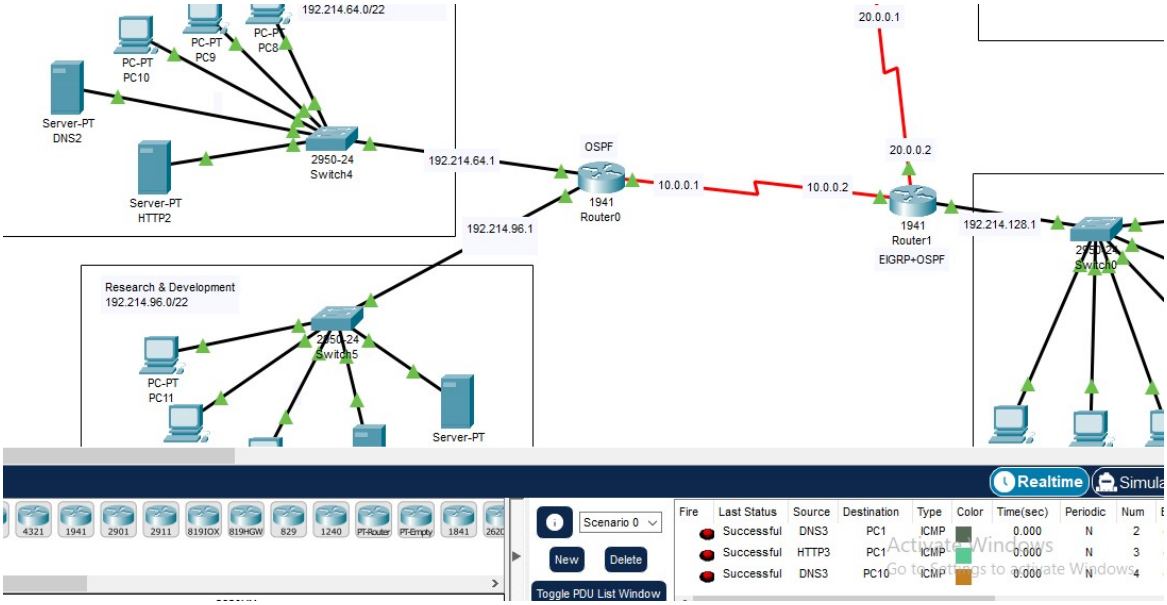
Research & Development DNS to Human Resources network:



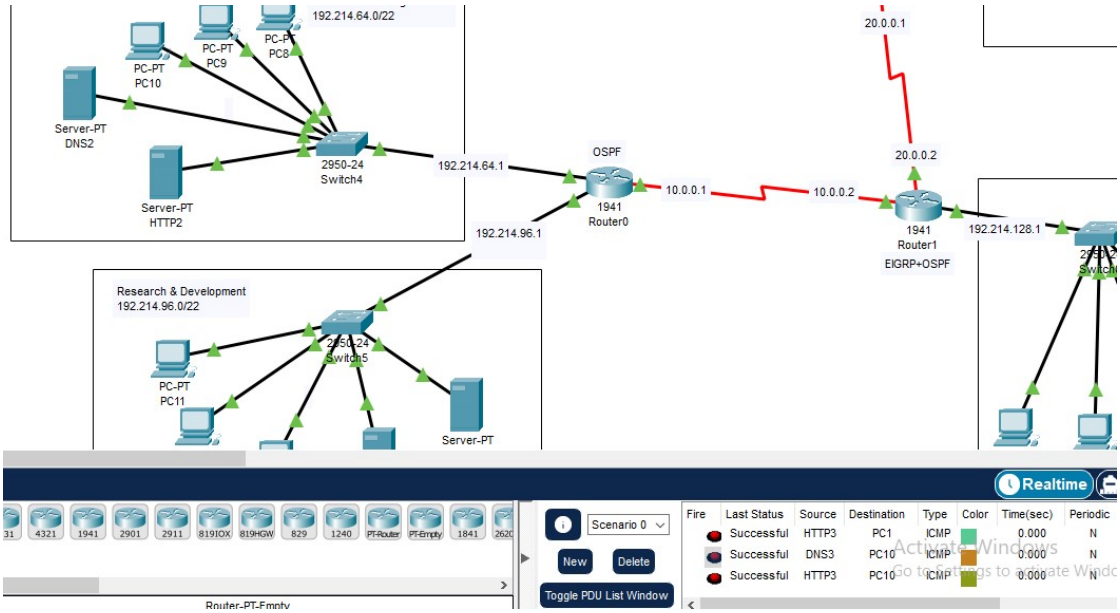
Research & Development HTTP to Human Resources network :



Research & Development DNS to Sales & Marketing network:

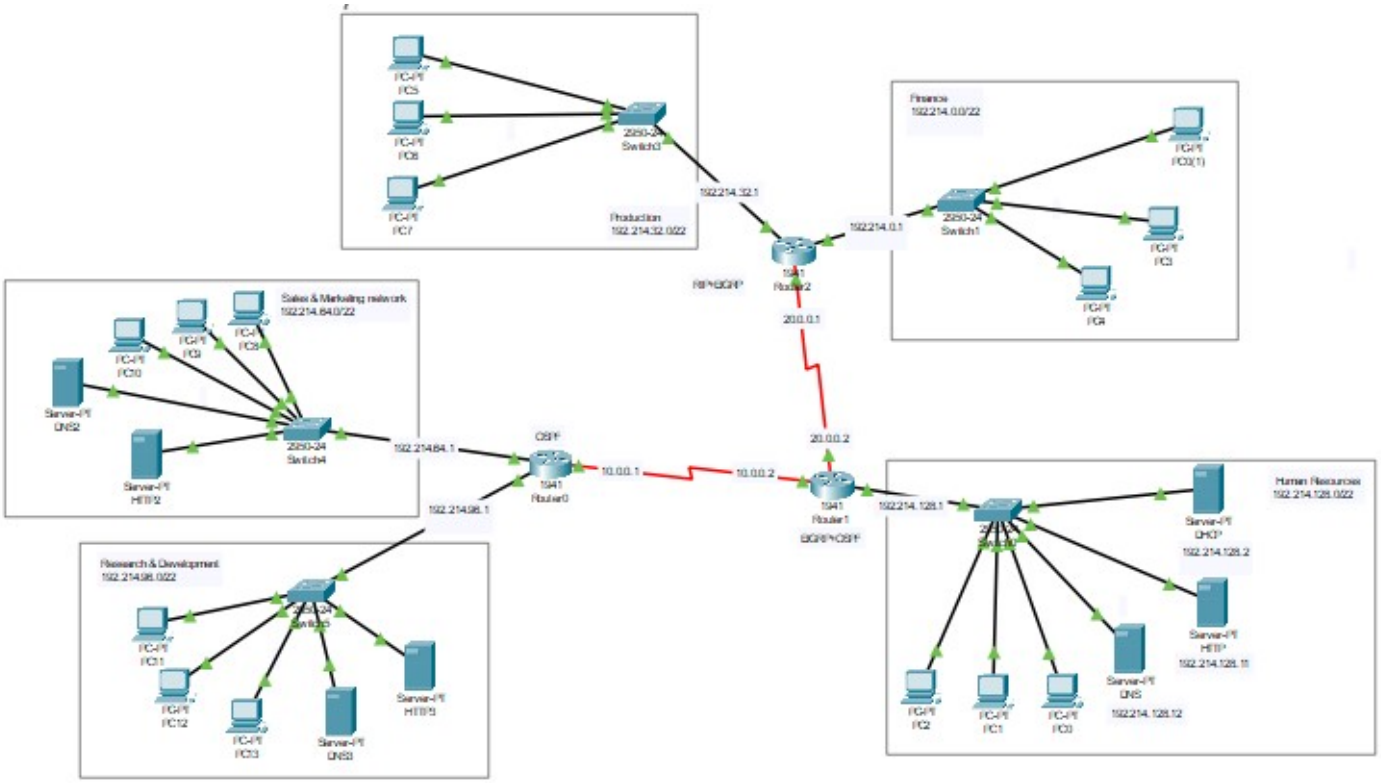


Research & Development HTTP to Sales & Marketing network:



Final Simulation:

In simulation mode we see that the network is running perfectly and the packets are being transferred to each device and routers successfully. We have completed all the tasks as mentioned in instruction.



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