Department of Computer Science and Engineering

Course Title: Computer Networks Lab

Course Code: CSE 320

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Submitted by: _____

Name: Ayman Hasib

Reg. No.: 18201065

Section: B1

Submitted to: _____

Name: Dr. A S M Touhidul Hasan

Designation: Assistant Professor

Network Components:

- End Device: PC = 6, Laptop = 6, Server = 12 (DNS = 4, DHCP = 12)
- Network Device: Router = 6, Switch = 12
- Wire: Copper Straight Through, Fiber

Network Design:

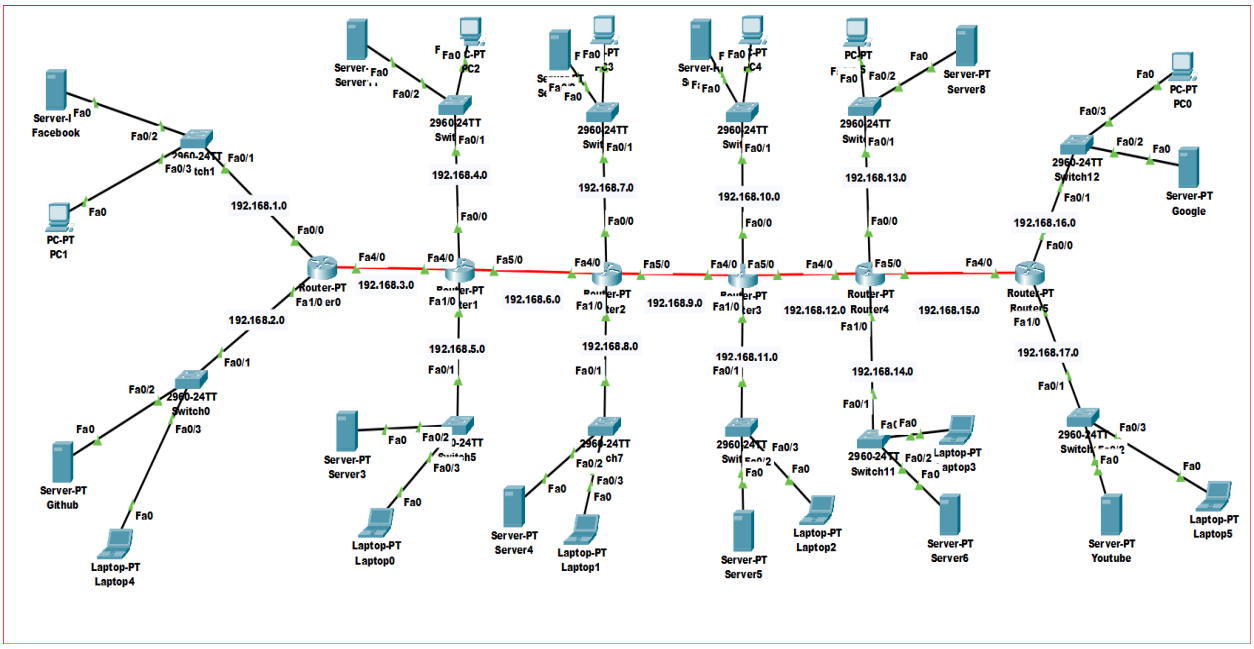

Figure: 01

Connecting all the Routers with **Fiber cables** and End devices which are PC, Laptop, Servers will be connected with **Copper Straight Through cables**.

Network Addressing Table

SL No.	Network Name	Host Requirements	Network Address	Subnet Mask	First Host	Last Host	Broadcast Address
1	Zone-1	254	192.168.1.0	255.255.255.0	192.168.1.1	192.168.1.254	192.168.1.255
2	Zone-2	254	192.168.2.0	255.255.255.0	192.168.2.1	192.168.2.254	192.168.2. 255
3	R0-R1	2	192.168.3.0	255.255.255.0	192.168.3.1	192.168.3.254	192.168.3. 255
4	Zone-3	254	192.168.4.0	255.255.255.0	192.168.4.1	192.168.4.254	192.168.4. 255
5	Zone-4	254	192.168.5.0	255.255.255.0	192.168.5.1	192.168.5.254	192.168.5. 255
6	R1-R2	2	192.168.6.0	255.255.255.0	192.168.6.1	192.168.6.254	192.168.6. 255
7	Zone-5	254	192.168.7.0	255.255.255.0	192.168.7.1	192.168.7.254	192.168.7.255
8	Zone-6	254	192.168.8.0	255.255.255.0	192.168.8.1	192.168.8.254	192.168.8.255
8	R2-R3	2	192.168.9.0	255.255.255.0	192.168.9.1	192.168.9.254	192.168.9.255
10	Zone-7	254	192.168.10.0	255.255.255.0	192.168.10.1	192.168.10.254	192.168.10.255
11	Zone-8	254	192.168.11.0	255.255.255.0	192.168.11.1	192.168.11.254	192.168.11.255
12	R3-R4	2	192.168.12.0	255.255.255.0	192.168.12.1	192.168.12.254	192.168.12.255
13	Zone-9	254	192.168.13.0	255.255.255.0	192.168.13.1	192.168.13.254	192.168.13.255
14	Zone-10	254	192.168.14.0	255.255.255.0	192.168.14.1	192.168.14.254	192.168.14.255
15	R4-R5	2	192.168.15.0	255.255.255.0	192.168.15.1	192.168.15.254	192.168.15.255
16	Zone-11	254	192.168.16.0	255.255.255.0	192.168.16.1	192.168.16.254	192.168.16.255
17	Zone-12	254	192.168.17.0	255.255.255.0	192.168.17.1	192.168.17.254	192.168.17.255

Table: 01

Router Configuration:

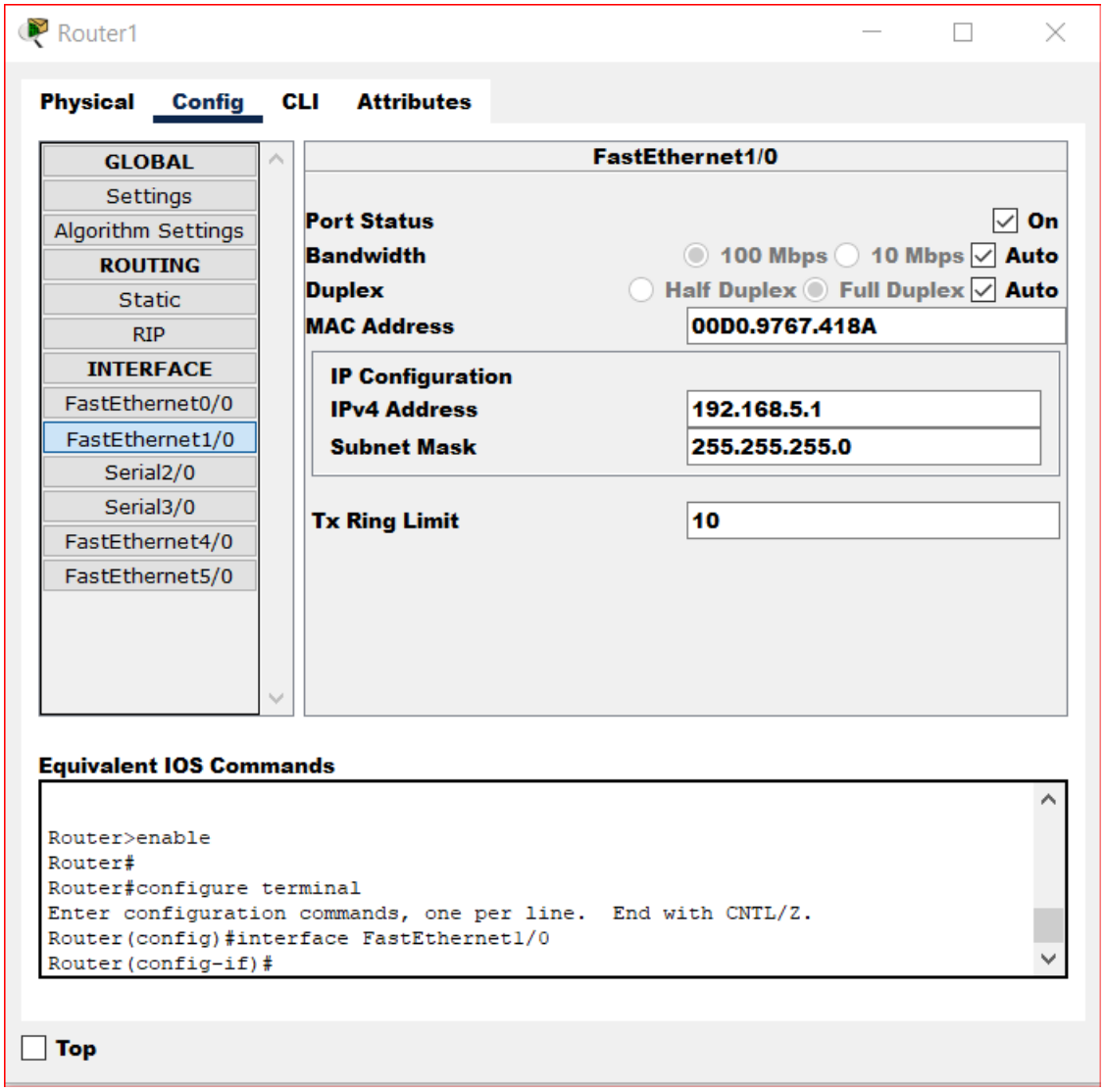

Figure: 02

Here, press the router and go to the **config** tab then for each FastEthernet port **Turn ON** the port status and set the IP address for IPv4, also set the Subnet Mask for each port and each router. The IP address for each port will be the **First Host ID** or **Second Host ID** depends on need of each network connected to the dedicated port.

Connection Router to another networks:

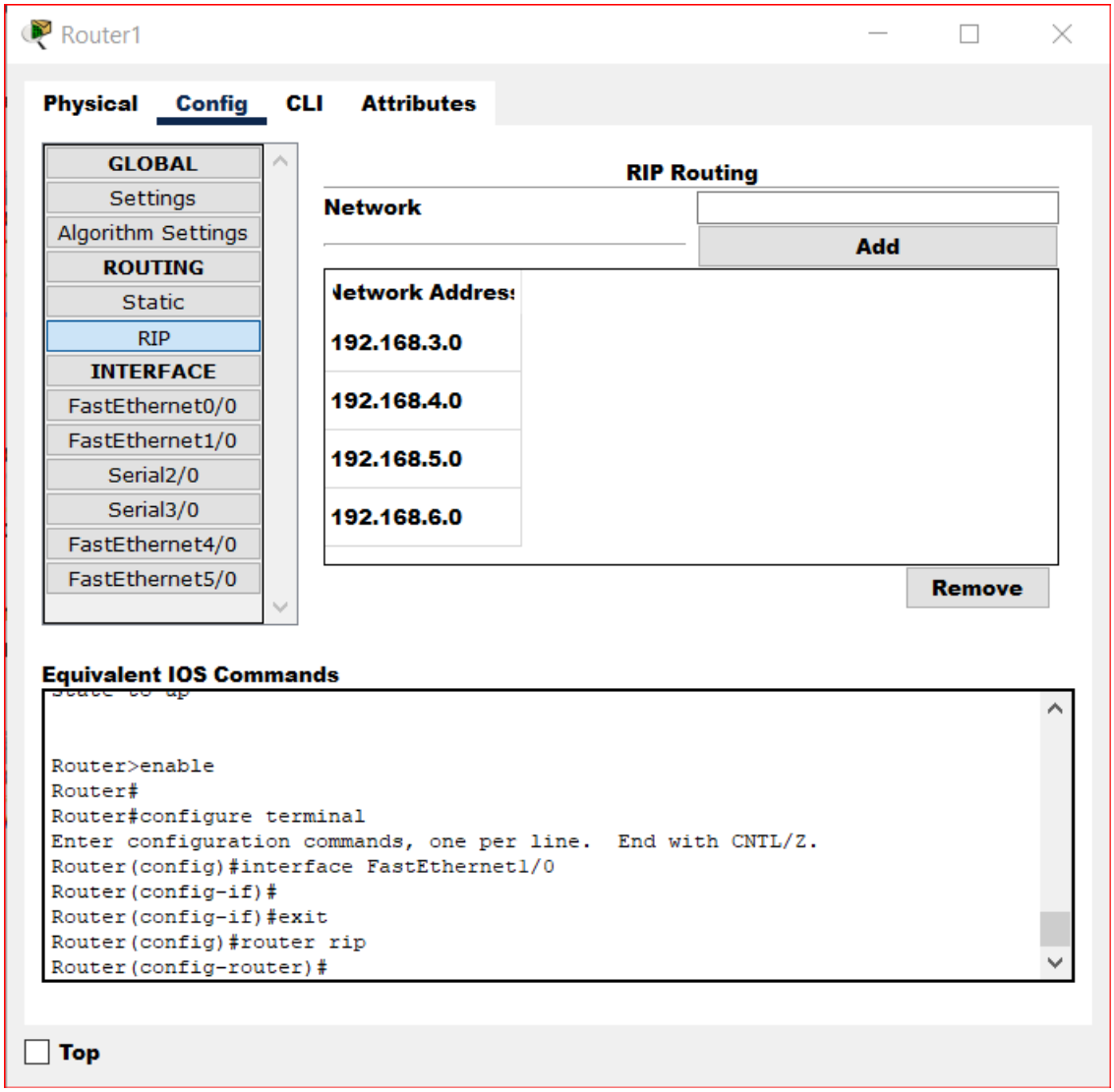

Figure: 03

Select the router and go to the config tab, then select the **RIP** section. Here we have to provide the IP address of other possible networks which are directly connected to this router and press the add button.

Configuring the DHCP & DNS Servers:

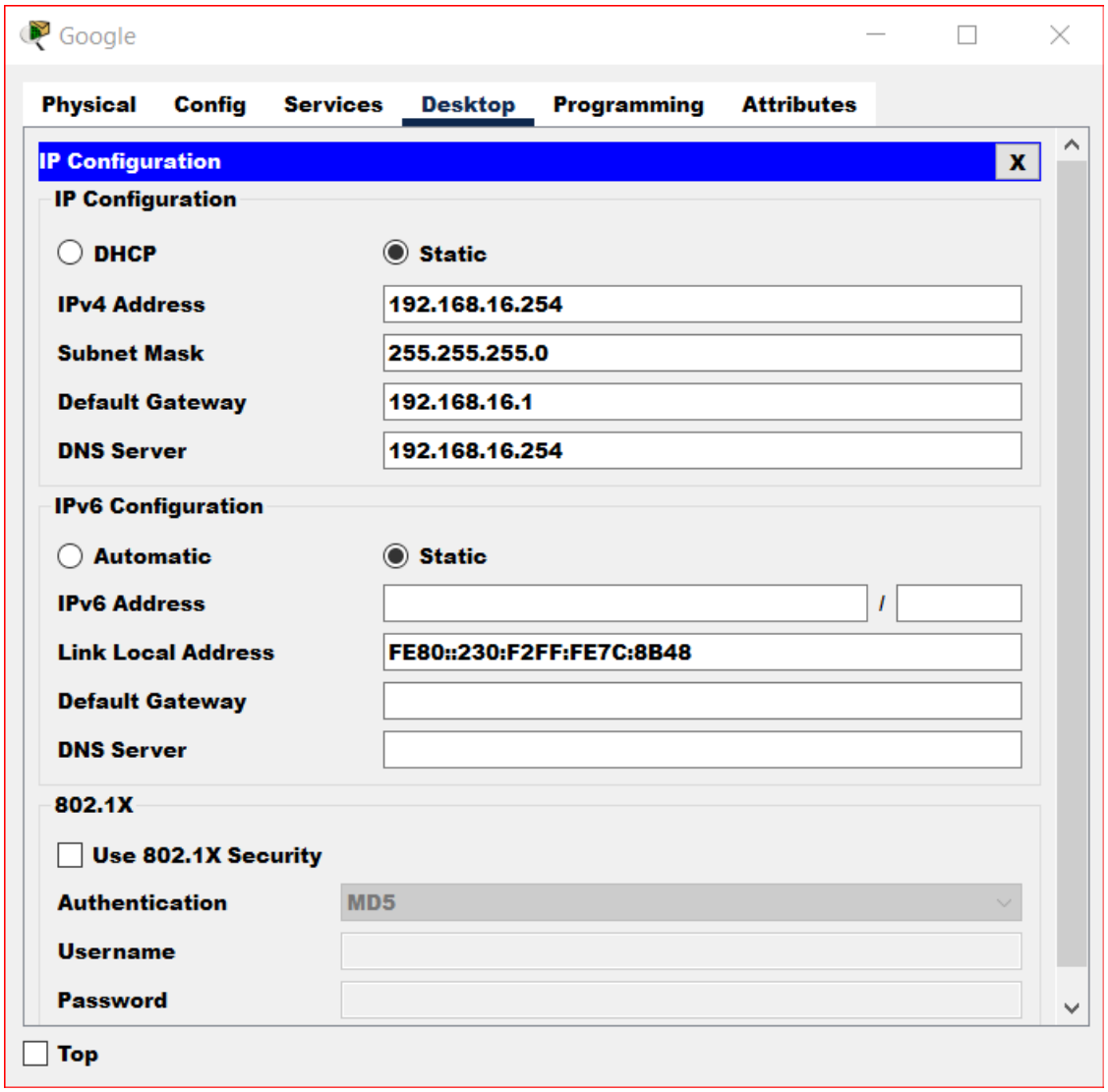

Figure: 04

In server **Google** select the Desktop and open IP configuration. Here we have to select the **static** mode. Then give IPv4 address which will be the **Last Host ID** of that network. Provide subnet mask default gateway and give its own IP address as **DNS Server** to convert this server to DNS server alongside DHCP server.

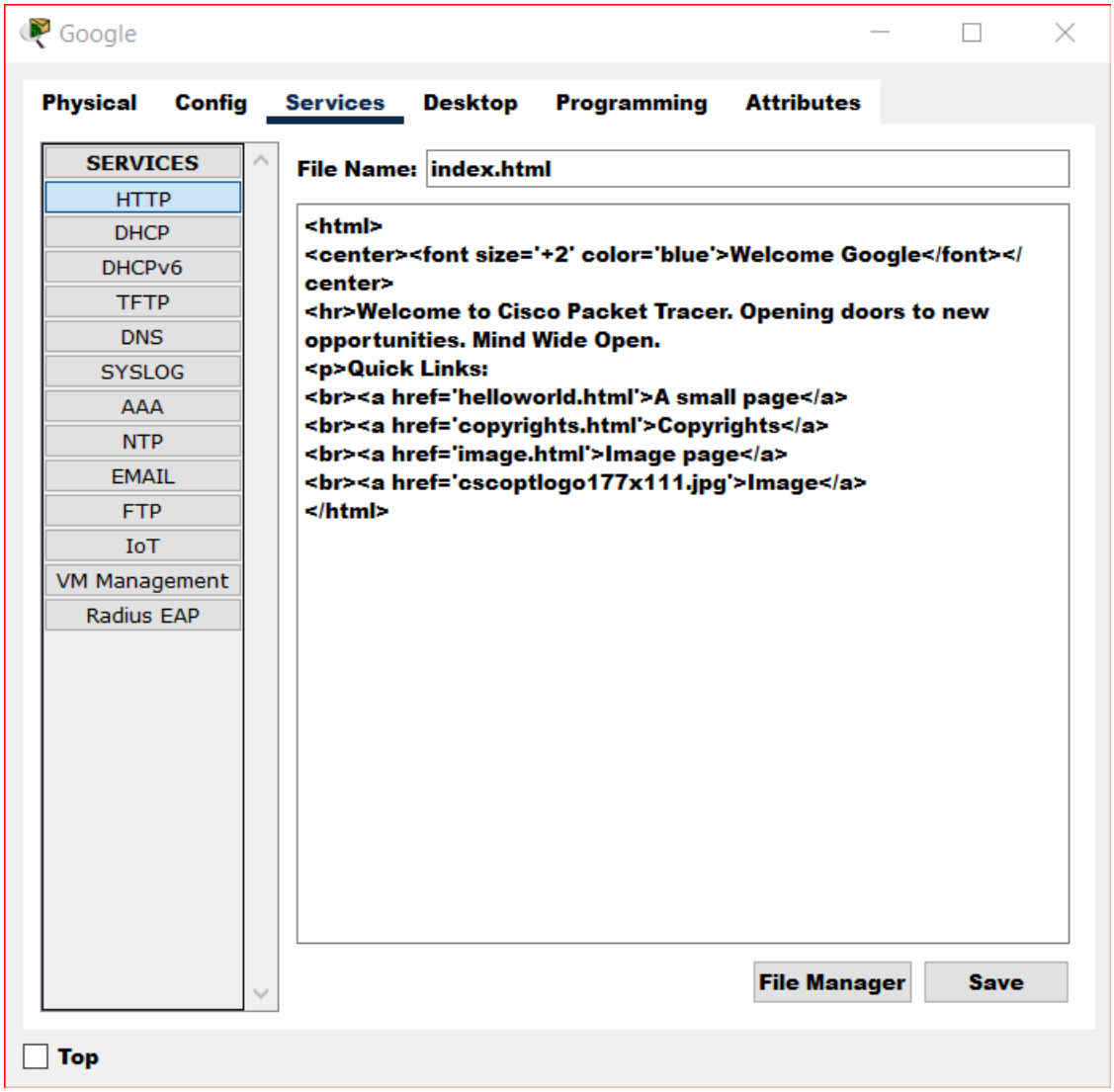

Figure: 05

In the Services tab we select the HTTP section edit the index.html. Here renames the title to Welcome Google. And we have to follow this step for other DNS servers and rename them as their corresponding name.

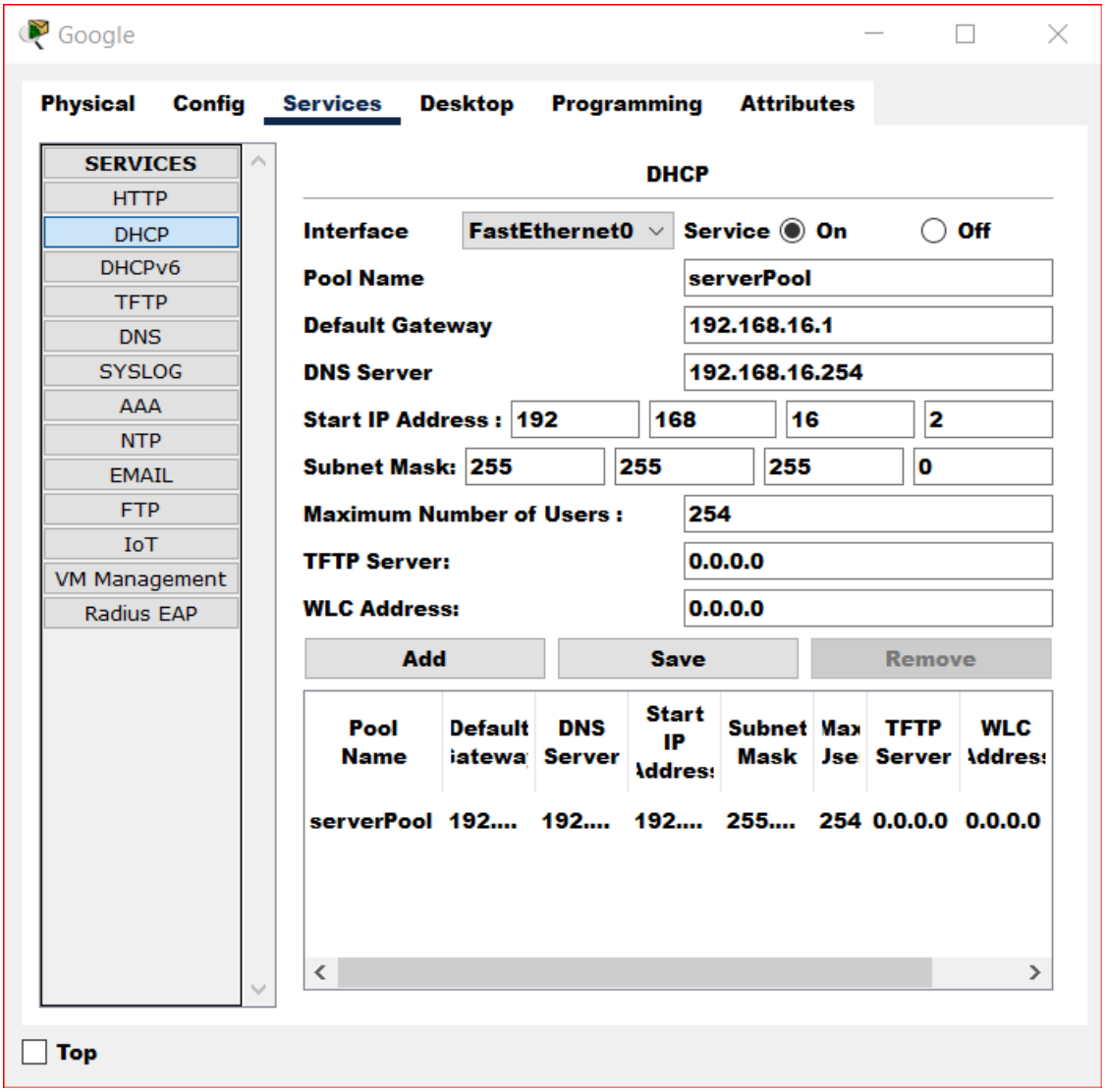

Figure: 06

Then in the Services tab select the **DHCP** section **Turn ON** the Service option. After that give the default gateway of the network here, **192.168.16.1**. Also add the DNS server to its IP address, here **192.168.16.254**. Reserve the first two IP address and start the host Ip address from **192.168.16.2**
Then press the save button.

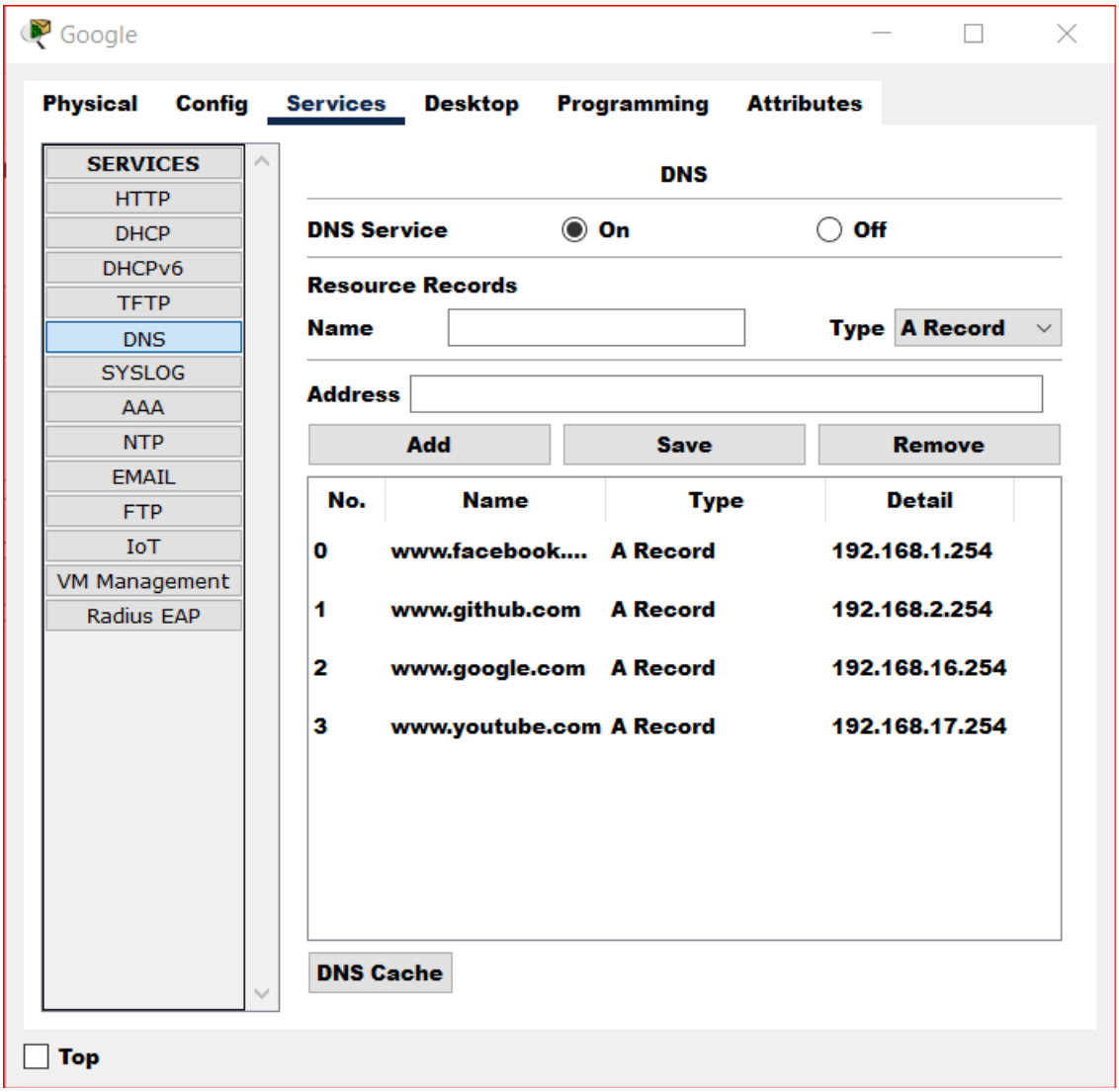

Figure: 07

In the DNS section Turn ON the DNS Service, give the **URL name** and the **IP address** for the specific network and press the save button for saving the information in the DNS server.

Here we have added 4 web services to this DNS server.

- URL 1: www.facebook.com
  IP address 1: 192.168.1.254
- URL 2: www.github.com
  IP address 2: 192.168.2.254
- URL 3: www.google.com
  IP address 3: 192.168.16.254
- URL 4: www.youtube.com
  IP address 4: 192.168.17.254

Configuration of the PC & Laptop:

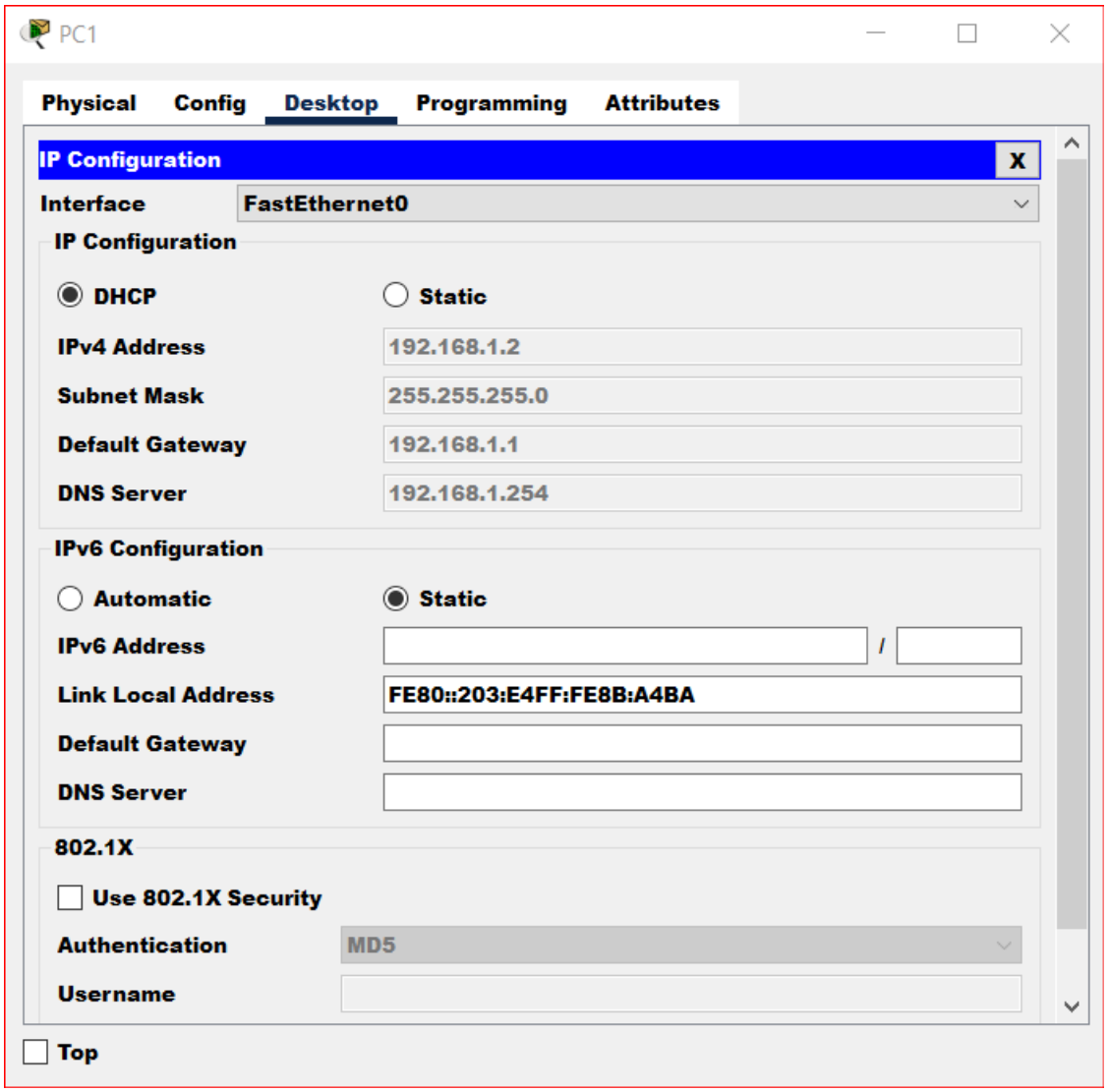

Figure: 08

Select the PC and go to the Desktop tab, then select the IP Configuration. Here, we have to select the DHCP mode. So that the device will get all its information needed from the DHCP server which is connected with it.

Testing of Networks:

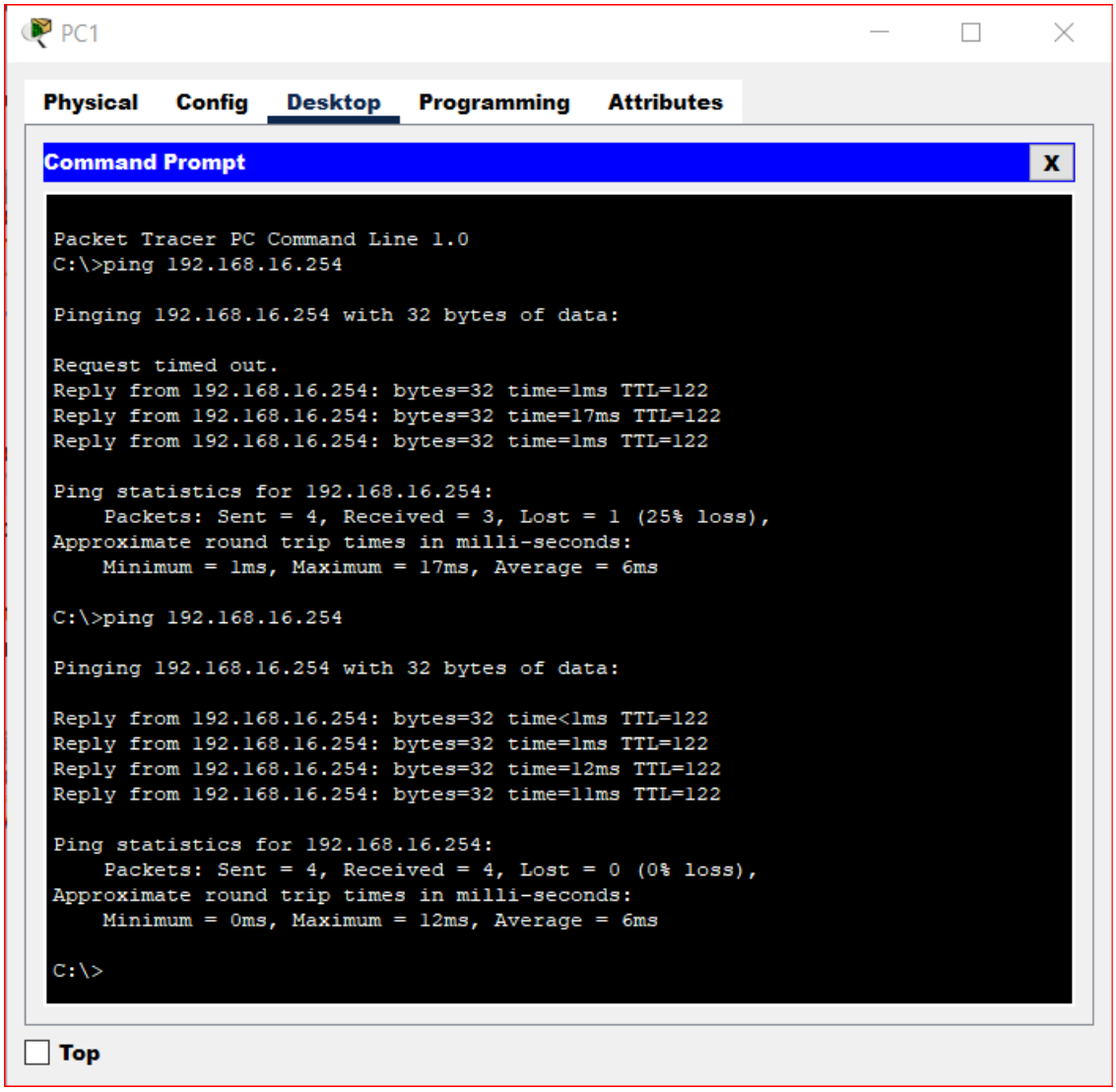

Figure: 09

For testing the network, first we have to select a PC and open the Command Prompt from the desktop tab. Then **ping** to a particular **IP address** here, 192.168.16.254
We can see that-

Sent = 4 packets

Received = 4 packets

Lost = 0 packets

So, all the packet transmitted and received successfully and the network established.

Browsing from the PC:

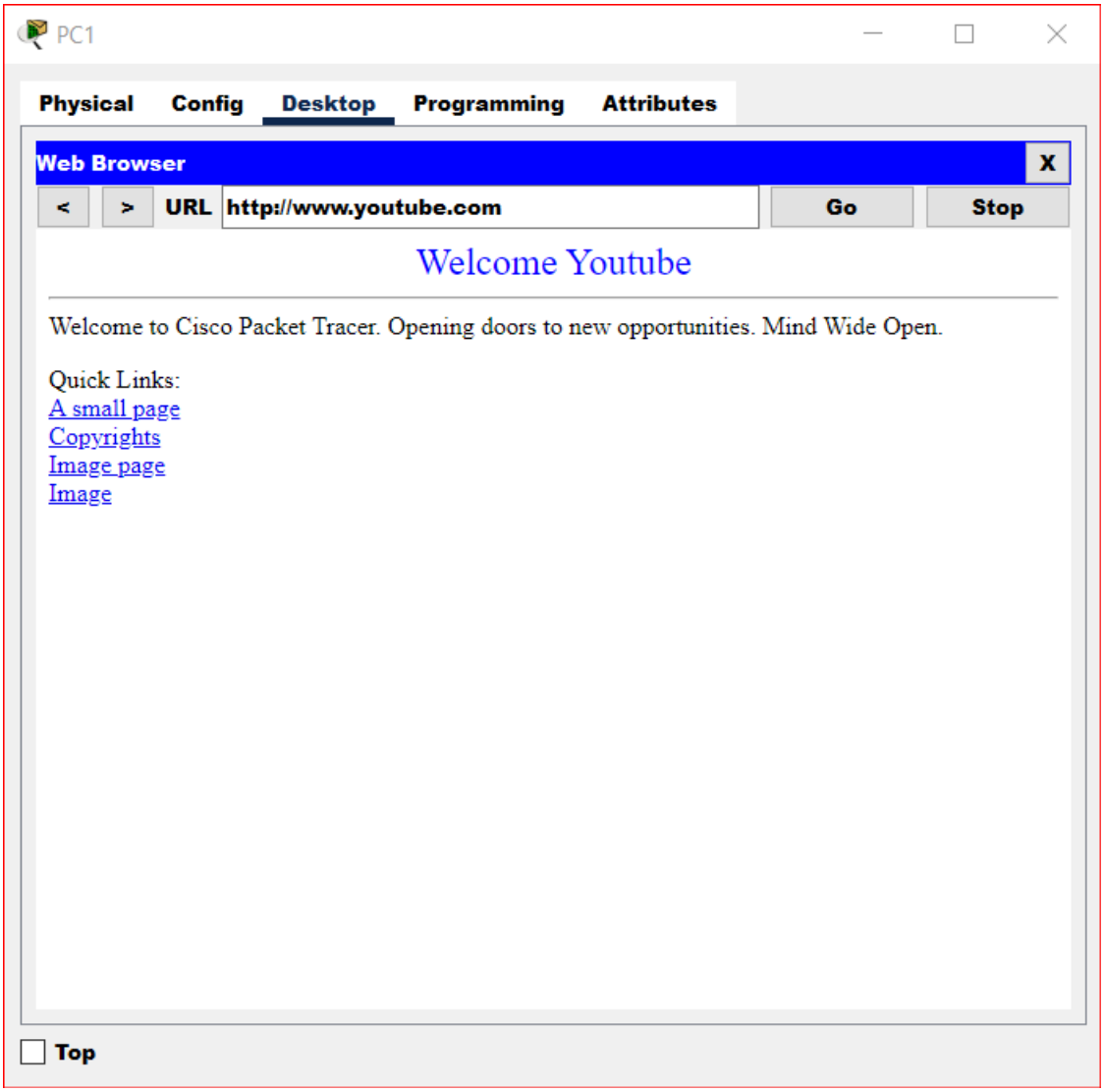

Figure: 10

From a particular PC or Laptop we can also browse. First select desktop then open Web Browser press the **URL** which was set in the **DNS server**. Then we can see the interface of that website.
Here,

Web URL: http://www.youtube.com

Associated IP with this URL: 162.168.17.254