

CONFIGURATION OF DNS SERVER USING DHCP IP ADDRESS AND WEB SERVER

INTRODUCTION :

In this assignment we are configuring a DNS using multiple routers and a HTTP (web server) server. Here we assign DHCP IP address. Each router has minimum one switch also under each switch has more than one node (pc, laptop, printer, etc.).

❖ DNS (DOMAIN NAME SYSTEM) :

The Domain Name System(DNS) is a hierarchical and decentralized naming system for computers, services, or other resources connected to the internet or a private network. It associates various information with domain names assigned to each of the participating entities.

❖ HOW DNS WORKS :

The process of DNS resolution involves converting a hostname (such as www.medicare.com) into a computer friendly IP address (such as 192.168.40.10) . An IP address is given to each device on the internet, and that address is necessary to find the appropriate internet device – like a street address is used to find a particular home. When a user wants to load a webpage, a translation must occur between what a user types into their web browser (www.medicare.com) and the machine – friendly address necessary to locate the www.medicare.com webpage.

Here we assign DHCP IP address...

❖ DHCP IP ADDRESS : (DYNAMIC HOST CONFIGURATION PROTOCOL)

A DHCP server dynamically assigns an IP address and other network configuration parameters to each device on a network so they can communicate with other IP networks. DHCP is an enhancement of an older protocol called BOOTP. DHCP is an important part of the DDI solution (DNS - DHCP – IPAM). It relies on the standard protocol known as Dynamic Host Configuration Protocol or DHCP to respond to broadcast queries by clients.

REQUIRMENTS :

- I. TWO 2811 ROUTER.

- II. FIVE 2950-24 SWITCH.
- III. FOUR SERVERS.
- IV. FIVE PCs.
- V. FOUR LAPTOPS.
- VI. TWO PRINTERS.

➤ **2811 ROUTER :** The Cisco 2811 router is a multiple – chip standalone cryptographic module. The router has a processing speed of 350MHz. Depending on configuration, either the internal NetGX chip or the IOS software is used for cryptographic operations. The cryptographic boundary of the module is the device's case.

It has –

- One enhanced network module slot.
- Two integrated 10/100 Fast Ethernet ports.
- etc.

Hare in this practical we add two serial port (WIC – 1T) in this router.

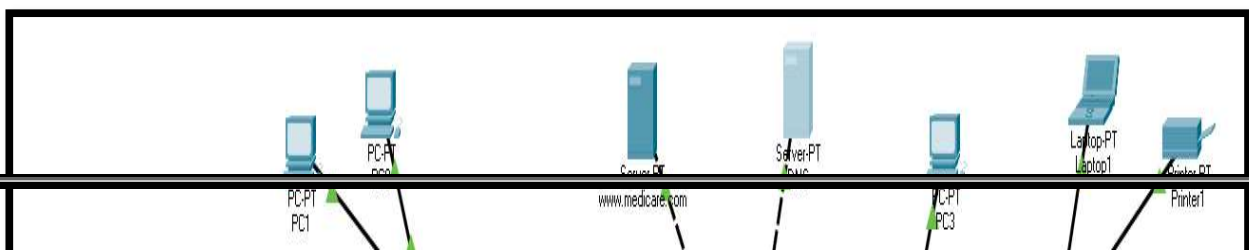
➤ **2950 - 24 SWITCH :** The Cisco Catalyst 2950 Series, are standalone, fixed-configuration, managed 10/100 Mbps switches providing basic workgroup connectivity for small to midsize networks.

It has –

- 24 10/100 Mbps fast Ethernet ports(first 4 are up link and remaining are down link).

➤ **SERVER :** A server is a device that serves information to other device. These devices , called clients, can connect to a server through either a local area network or a wide area network, such as the internet.

NETWORK DIAGRAM :



DNS server using DHCP IP address

Here in this diagram two 2811 router are used, and each router connected with a switch(2950-24) via Copper Straight cable. Each switch connected three nodes via Copper Straight cable. Two routers are connected each other via serial DCE cable. In router-1 two servers are connected via copper cross-over cable, one is DNS server and another one is HTTP web server. All IP address are generated DHCP configuration through two (DHCP and DHCP-2) servers.

The servers host web pages. A web server is responsible for making the World Wide Web(WWW) possible. Each website has one or more web servers. There clients are computers with a web browser.

CONFIGARATION OF NETWORKS :

UNDER SWITCH - 0 :

NAME OF THE NODE	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY	DNS SERVER
PC-0	192.168.10.3	255.255.255.0	192.168.10.1	192.168.30.10
PC-1	192.168.10.4	255.255.255.0	192.168.10.1	192.168.30.10
DHCP SERVER	192.168.10.10	255.255.255.0	192.168.10.1	192.168.30.10

Here Switch-0 and Switch-3 are connected through copper cross-over cable.

UNDER SWITCH - 3 :

NAME OF THE NODE	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY	DNS SERVER
LAPTOP-0	192.168.10.7	255.255.255.0	192.168.10.1	192.168.30.10
PC-2	192.168.10.5	255.255.255.0	192.168.10.1	192.168.30.10
PRINTER-0	192.168.10.6	255.255.255.0	192.168.10.1	192.168.30.10

UNDER SWITCH - 2 :

NAME OF THE NODE	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY	DNS SERVER
PC-3	192.168.20.4	255.255.255.0	192.168.20.1	192.168.30.10
DHCP SERVER-2	192.168.20.10	255.255.255.0	192.168.20.1	192.168.30.10

Here Switch-2 connected on Switch-4 and Switch-5 through copper cross-over cable.

UNDER SWITCH - 4 :

NAME OF THE NODE	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY	DNS SERVER
LAPTOP-1	192.168.20.5	255.255.255.0	192.168.20.1	192.168.30.10
Printer-1	192.168.20.7	255.255.255.0	192.168.20.1	192.168.30.10
Pc-4	192.168.20.9	255.255.255.0	192.168.20.1	192.168.30.10

UNDER SWITCH - 5 :

NAME OF THE NODE	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY	DNS SERVER
LAPTOP-3	192.168.20.6	255.255.255.0	192.168.20.1	192.168.30.10
Pc-5	192.168.20.3	255.255.255.0	192.168.20.1	192.168.30.10
LAPTOP-4	192.168.20.8	255.255.255.0	192.168.20.1	192.168.30.10

ROUTER - 0 :

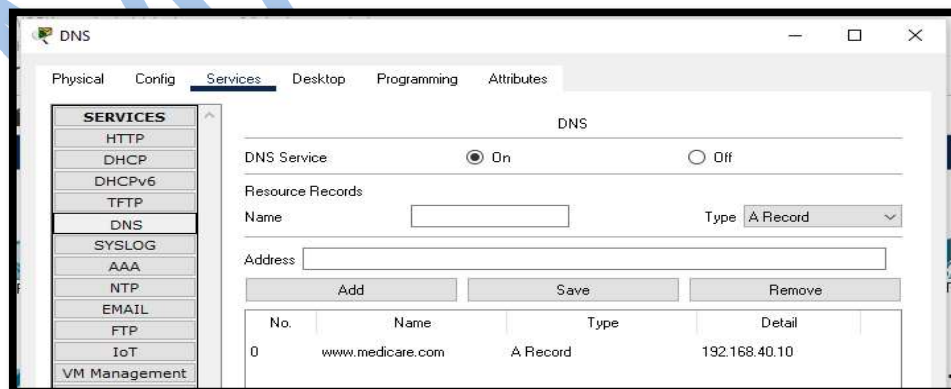
NAME OF THE PORT	IP ADDRESS	SUBNET MASK
FAST ETHERNET 0/0	192.168.10.1	255.255.255.0
SERIAL 0/0/0	10.0.0.1	255.255.255.0

ROUTER - 1 :

Here in this router (router-1) we connect one DNS server and one web(HTTPS) server. These two servers are connected in router-1 through copper cross-over cable. Also it connect one switch through copper straight cable.

DNS SERVER CONFIGURATION :

SERVER NAME	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY
DNS SERVER	192.168.30.10	255.255.255.0	192.168.20.1

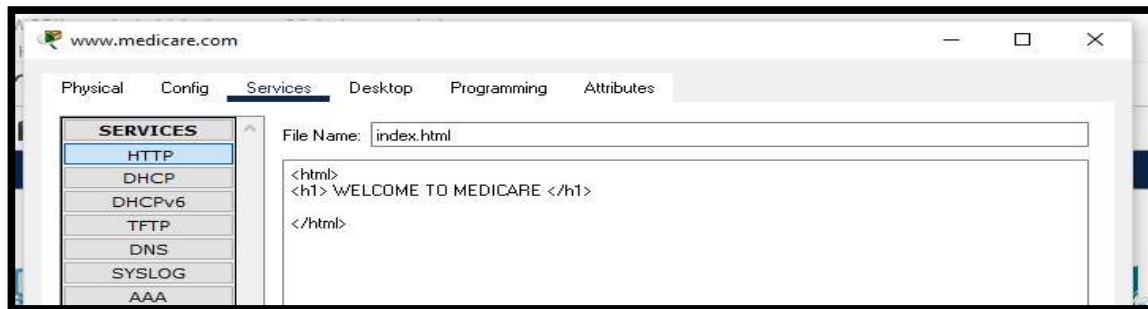


DNS SERVER

Here add a hostname www.medicare.com , address is 192.168.20.10. Then ON the DNS service.

WEB SERVER CONFIGURATION :

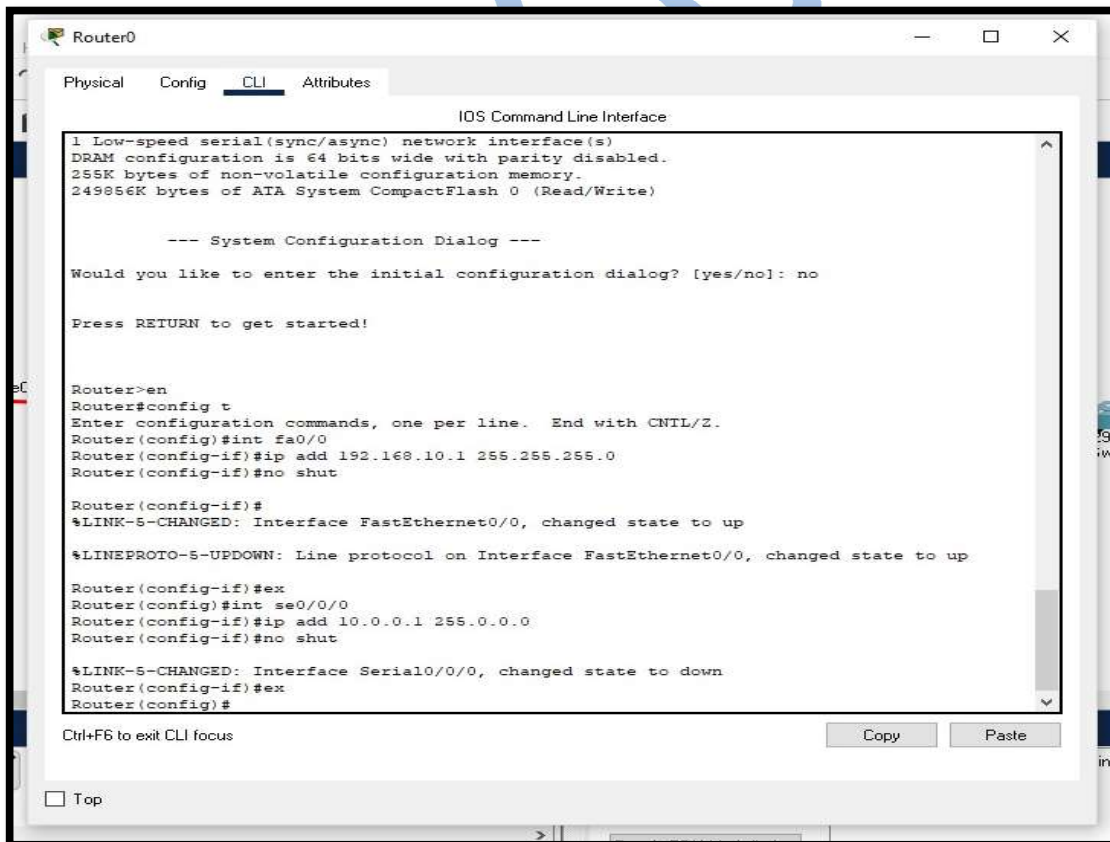
DOMAIN NAME	IP ADDRESS	SUBNET MASK	DEFAULT GATEWAY	DNS SERVER
www.medicare.com	192.168.40.10	255.255.255.0	192.168.20.1	192.168.30.10

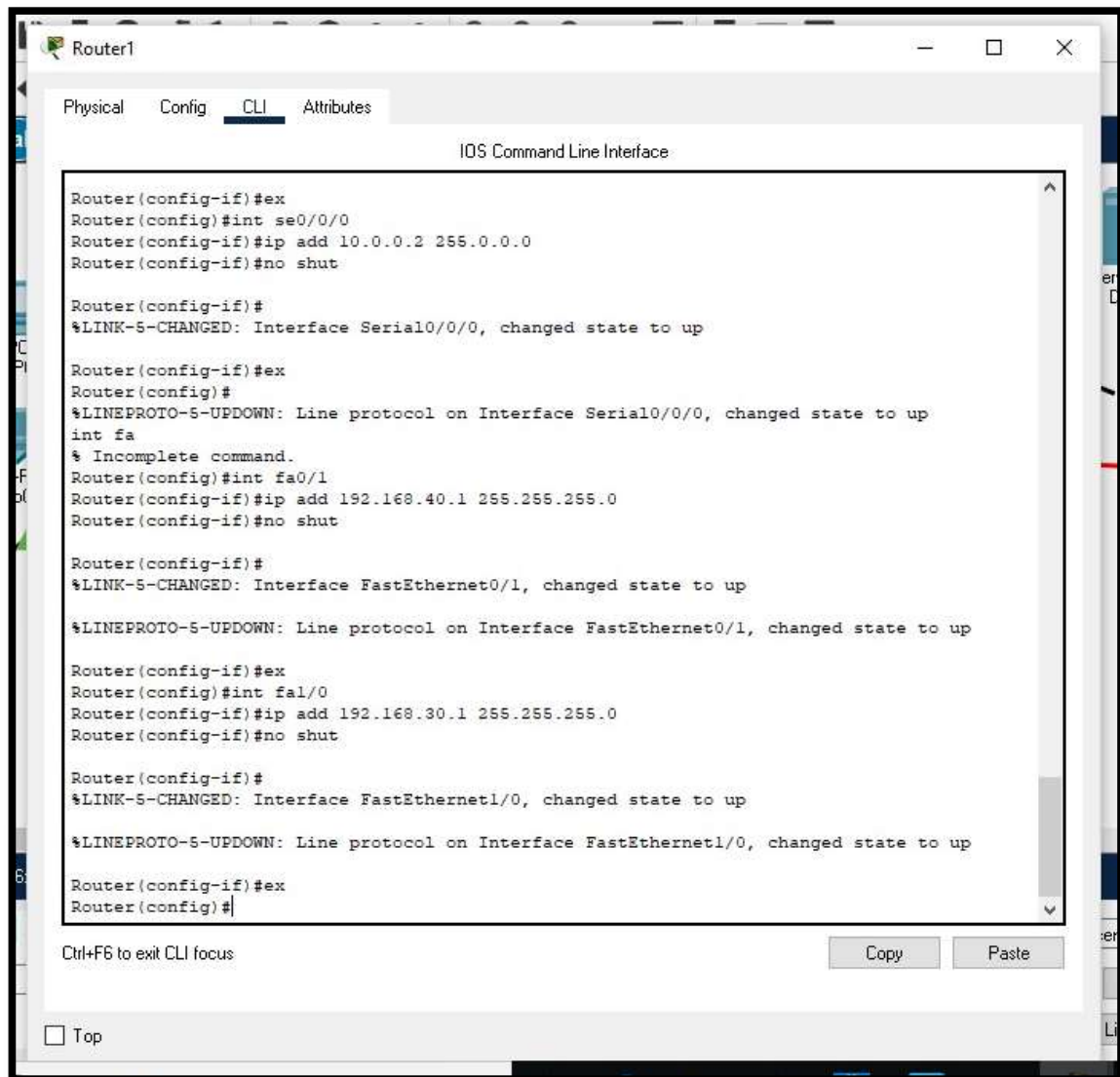


HTTP SERVICES AND HOMEPAGE HTML CODE

ROUTER CONFIGURATION :

ROUTER - 0:





ROUTE CONFIGARATION :

ROUTER - 0 RIP :

The screenshot displays the configuration window for Router0, specifically the 'Config' tab. The left sidebar shows a tree view with categories: GLOBAL (Settings, Algorithm Settings), ROUTING (Static, RIP, SWITCHING), and INTERFACE (VLAN Database, FastEthernet0/0, FastEthernet0/1, Serial0/0/0). The 'RIP' option under ROUTING is selected. The main area is titled 'RIP Routing' and contains a 'Network' section with a table of network addresses. The table has two rows: '10.0.0.0' and '192.168.10.0'. An 'Add' button is located to the right of the table, and a 'Remove' button is at the bottom right. Below the table, there is a section for 'Equivalent IOS Commands' which lists the following commands:

```
Router(config)#int se0/0/0
Router(config-if)#ip add 10.0.0.1 255.0.0.0
Router(config-if)#no shut

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

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

Router(config)#router rip
Router(config-router)#network 192.168.10.0
Router(config-router)#network 10.0.0.0
Router(config-router)#
```

At the bottom left of the window, there is a checkbox labeled 'Top'.

ROUTER - 1 RIP :

The screenshot shows the configuration interface for a router named 'Router1'. The 'Config' tab is active, and the 'RIP' option is selected under the 'ROUTING' section in the left sidebar. The main area displays the 'RIP Routing' configuration, including a table of network addresses and a list of equivalent IOS commands.

Physical **Config** CLI Attributes

GLOBAL

- Settings
- Algorithm Settings

ROUTING

- Static
- RIP**

SWITCHING

- VLAN Database

INTERFACE

- FastEthernet0/0
- FastEthernet0/1
- Serial0/0/0
- FastEthernet1/0

RIP Routing

Network

Network Address
10.0.0.0
192.168.10.0
192.168.20.0
192.168.30.0
192.168.40.0

Equivalent IOS Commands

```
Router(config-if)#  
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up  
  
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up  
  
Router(config-if)#ex  
Router(config)#  
Router(config)#router rip  
Router(config-router)#network 10.0.0.0  
Router(config-router)#network 192.168.20.0  
Router(config-router)#network 192.168.30.0  
Router(config-router)#network 192.168.40.0  
Router(config-router)#network 192.168.10.0  
Router(config-router)#
```

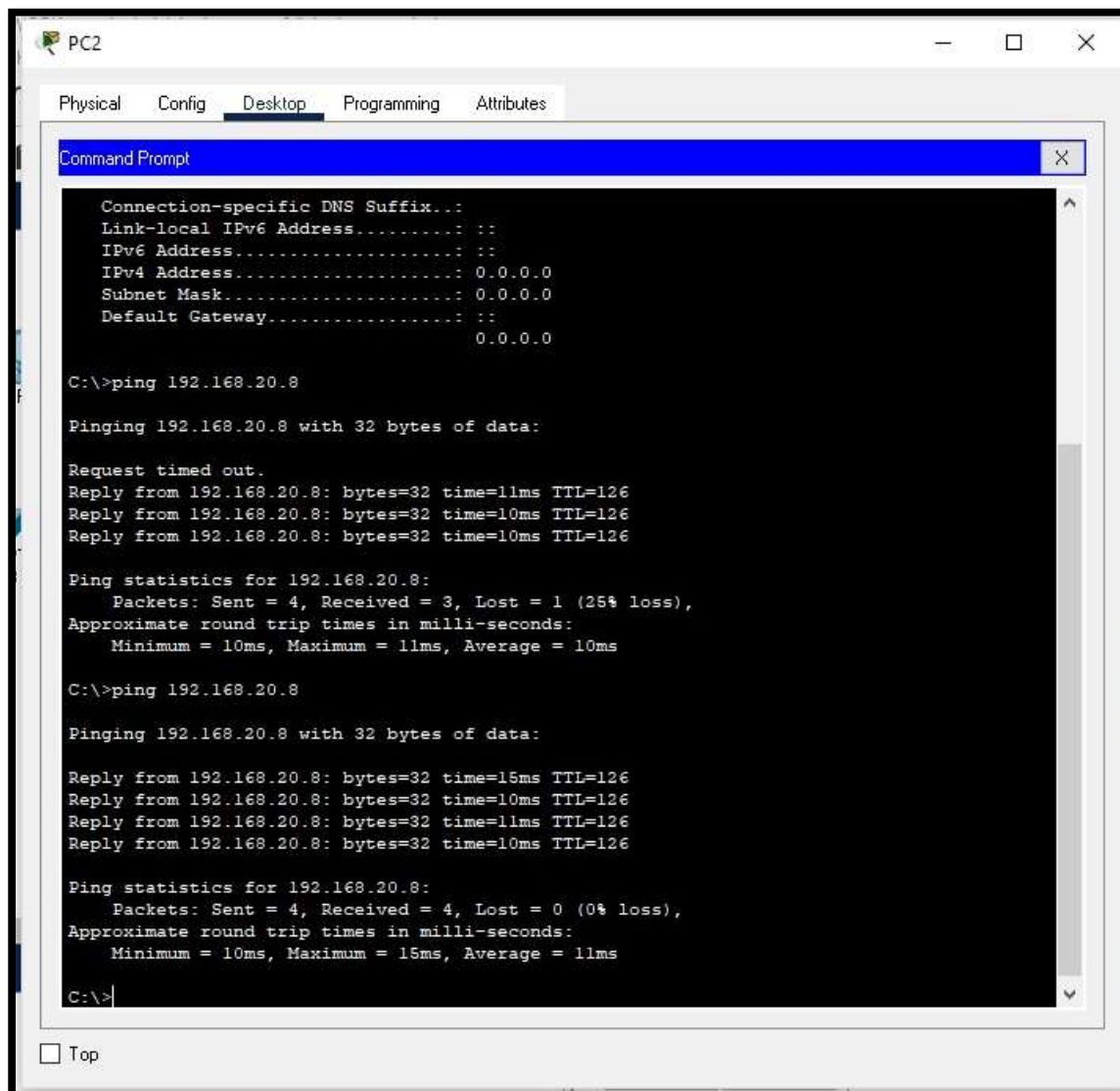
☐ Top

OUTPUT :

❖ PINGING THE NETWORK :

SENDER :- 192.168.10.3

RECIEVER :- 192.168.20.8



The screenshot shows a PC2 desktop environment with a window titled 'PC2'. Inside the window, there are tabs for 'Physical', 'Config', 'Desktop', 'Programming', and 'Attributes'. The 'Desktop' tab is active, displaying a 'Command Prompt' window. The Command Prompt shows the following output:

```
Connection-specific DNS Suffix...:
Link-local IPv6 Address . . . . .: ::
IPv6 Address . . . . .: ::
IPv4 Address . . . . .: 0.0.0.0
Subnet Mask . . . . .: 0.0.0.0
Default Gateway . . . . .: ::
                                0.0.0.0

C:\>ping 192.168.20.8

Pinging 192.168.20.8 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.8: bytes=32 time=11ms TTL=126
Reply from 192.168.20.8: bytes=32 time=10ms TTL=126
Reply from 192.168.20.8: bytes=32 time=10ms TTL=126

Ping statistics for 192.168.20.8:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 11ms, Average = 10ms

C:\>ping 192.168.20.8

Pinging 192.168.20.8 with 32 bytes of data:

Reply from 192.168.20.8: bytes=32 time=15ms TTL=126
Reply from 192.168.20.8: bytes=32 time=10ms TTL=126
Reply from 192.168.20.8: bytes=32 time=11ms TTL=126
Reply from 192.168.20.8: bytes=32 time=10ms TTL=126

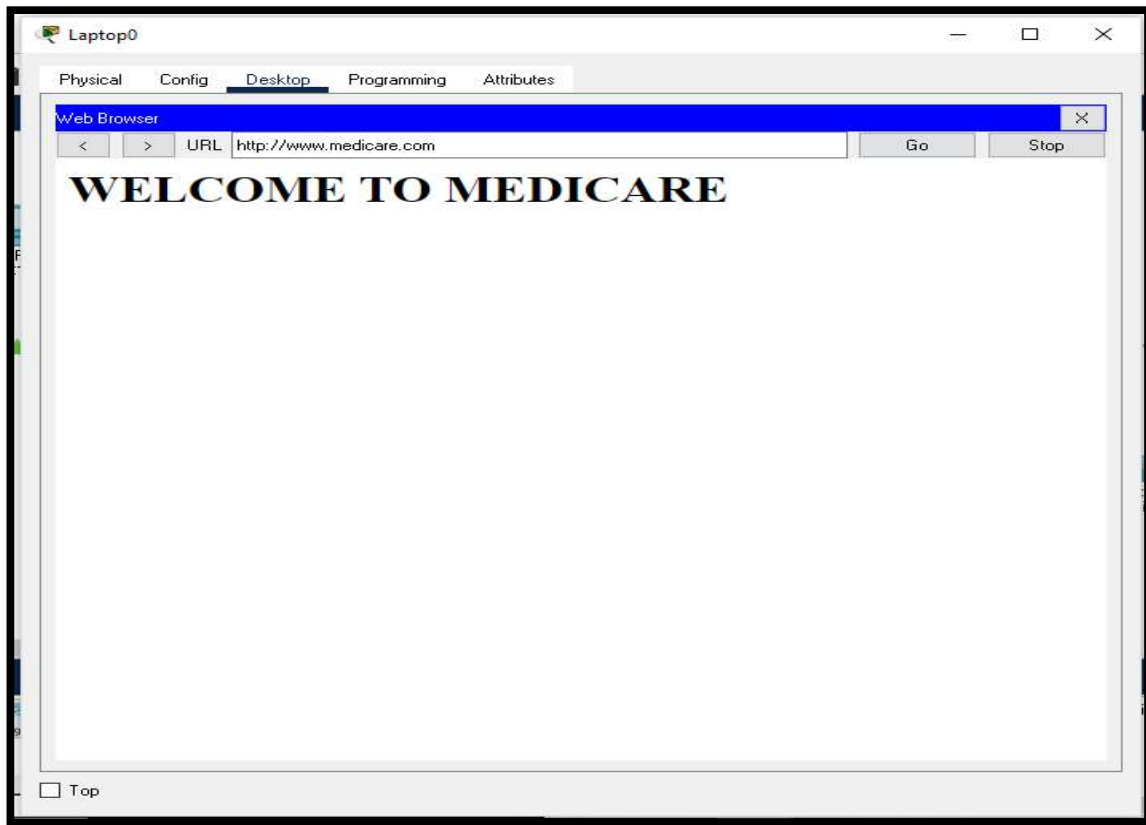
Ping statistics for 192.168.20.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 10ms, Maximum = 15ms, Average = 11ms

C:\>
```

At the bottom of the Command Prompt window, there is a checkbox labeled 'Top' which is currently unchecked.

Here first time one packet was lost, but again ping then all packets was sending correctly.

❖ WEB SERVER ACCESS THROUGH DNS SERVER :



WEB SEARCH

Here, In this picture(web search picture)

- ✓ Go to a node (laptop, pc), here I go laptop-0 .
- ✓ Tap Desktop option.
- ✓ Then go to web browser option and tap this option.
- ✓ Type the www.medicare.com in search bar and then tap Go button.
- ✓ Then show this output.

❖ SIMULATION RESULT:

The screenshot displays a network simulation interface. At the top, a status bar shows '[Root]' and a clock icon, followed by navigation icons and the time '22:32:30'. The main window is divided into several sections:

- Simulation Panel:** Contains an 'Event List' table, a 'Reset Simulation' button, a 'Constant Delay' checkbox (checked), and a 'Captured to: 0.010 s' label.
- Play Controls:** Includes buttons for previous, play, and next, with a blue progress bar below them.
- Event List Filters - Visible Events:** A list of supported protocols including ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPsec, ISAKMP, IoT, IoT, TCP, LACP, LLDP, Meraki, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoE, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, and VTP. Below this list are 'Edit Filters' and 'Show All/None' buttons.
- Bottom Panel:** Features three tabs: 'Event List' (selected), 'Realtime', and 'Simulation'. Below the tabs is a table with columns: Fire, Last Status, Source, Destination, Type, Color, Time(sec), Periodic, Num, Edit, and Delete.

The 'Event List' table in the Simulation Panel shows the following data:

Vis.	Time(sec)	Last Device	At Device
	0.007	Switch3	Router1
	0.008	Router1	Router0
	0.009	Router0	Switch2
	0.010	Switch2	PC5

The bottom table shows a single event:

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC5	Laptop1	ICMP		0.000	N	0	(edit)	(delete)

REFERENCES :

- YOUTUBE
- GOOGLE

CONCLUSION :

- DNS is play essential rolls in today's Internet and in many private networks around the world.
- A hostname only there for human use and the IP address is what matters to the machines attached to a network.
- There are several types of DNS servers but they all do serve the same purpose which is mapping hostnames to IP addresses.