



Namal University Mianwali

Computer Networks Laboratory Manual #3

Lab title: HTTP and DNS Servers in LAN Networks

Course Title	Computer Networks	Course Number	CS – 270
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1. Introduction:

In the previous lab we have configured networked devices, i.e., hub, switch and wireless access point in Local Area Networks (LAN)). In this lab you will configure HTTP and DNS server in the LAN network via a switch. It is to be considered that you learnt the theoretical concepts of HTTP and DNS servers in the lecture in details, so you will implement the message/packet transfer in LAN networks through HTTP and DNS.

Recall, network supports exchange of messages which are referred to as services e.g. sharing a file, exchange of email, browsing web pages, voice or video chats etc. Since the format and presentation of each service is different (consider email and file transfer) therefore handling the message exchange is different.

It is but logical, to develop a set of rules which distinguish each type of service, as well as the manner the messages are exchanged. These rules are called protocols. In this lab, we shall cover one such protocol which enables us to view the web page.

Web page is written in HTML (a markup language), which can be parsed by an application called web browser presenting the page the way we want to see it. However, if the same page is to be accessed over the network, HTTP (hypertext transport protocol) is used by the server and client to effectively exchange messages carrying HTML.

2. Objective:

In this lab the students shall learn how to setup a HTTP server on which a webpage is available for viewing, and access it using a client browser on a host. In addition, domain name service is also touched to highlight web page address resolution.

- i. The students can understand how a message representing HTML is transferred from any of the hosts (a server to a client) in a LAN.
- ii. They can understand the working of HTTP and DNS in a LAN networks.
- iii. Since it is a simulated environment, IP configurations needed by any server are highlighted in this lab. Actual configuration of a web server shall be covered elsewhere.
- iv. Troubleshoot web server access issues because of unavailable DNS.

3. Software/Tool:

The simulation is carried out in Cisco's Packet Tracer, whereas notes are taken in a word processor such as LibreOffice or MS office.

Packet Tracer v8.0+ should have been installed in the previous Lab activity, if not done, please ask for Lab Engineer for assistance.

4. How to attempt this Lab Activity:

This laboratory session and subsequent sessions are divided in to activities with associated tasks. Each task requires its own setup, configuration and learned observations. You are to attempt the lab activities to best your knowledge, seeking guidance where hurdles arise.

Every task, needs to be performed within the Lab Time, and demonstrate the understanding to Lab Engineer/Demonstrator; to get grade points

Without further ado, lets dive into the lab activities.

5. Activities

Activity A:

Configure the web server to display webpages.

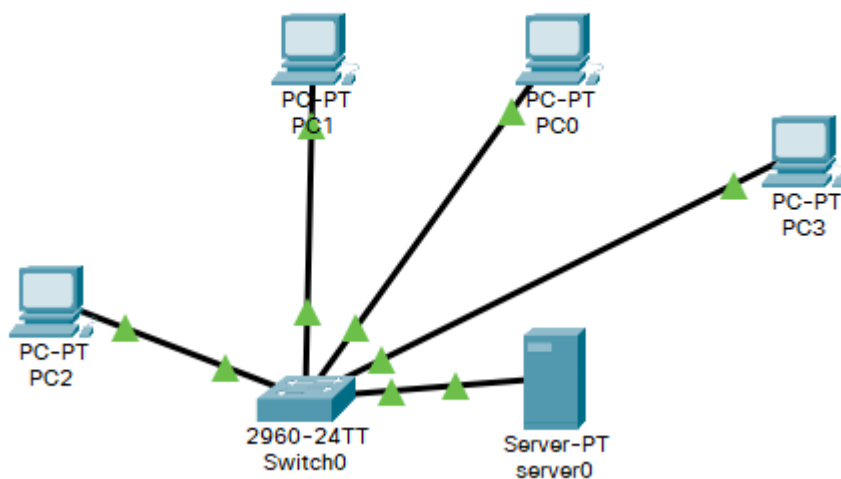
- (1) Build a logical topology of 4 hosts (PCs) and one server connected via a switch.
- (2) Assign each host the IP address according to the Table

Label	IP Address
PC0	192.168.1.1
PC1	192.168.1.2
PC2	192.168.1.3
PC3	192.168.1.4
Server0	192.168.1.101

- (3) Test your logical connection between each host using the ping command.

Observation: Take screen shot of your final network and paste it here.

Four PCs and sever are connected via a switch. We assign them IP addresses. So, we can build connectivity between them.



- (4) Write down the output of ping between PC0 and Server 0. Also verify logical

Observation:

PC0 is connected to serrver0 with a switch. By ping command find the connection. Ping command

tells us the link lies between PC0 and server0. Ping command tells us about the connectivity between pc or servers. Here ping command show connectivity lies between PC0 and Server0.

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Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.101

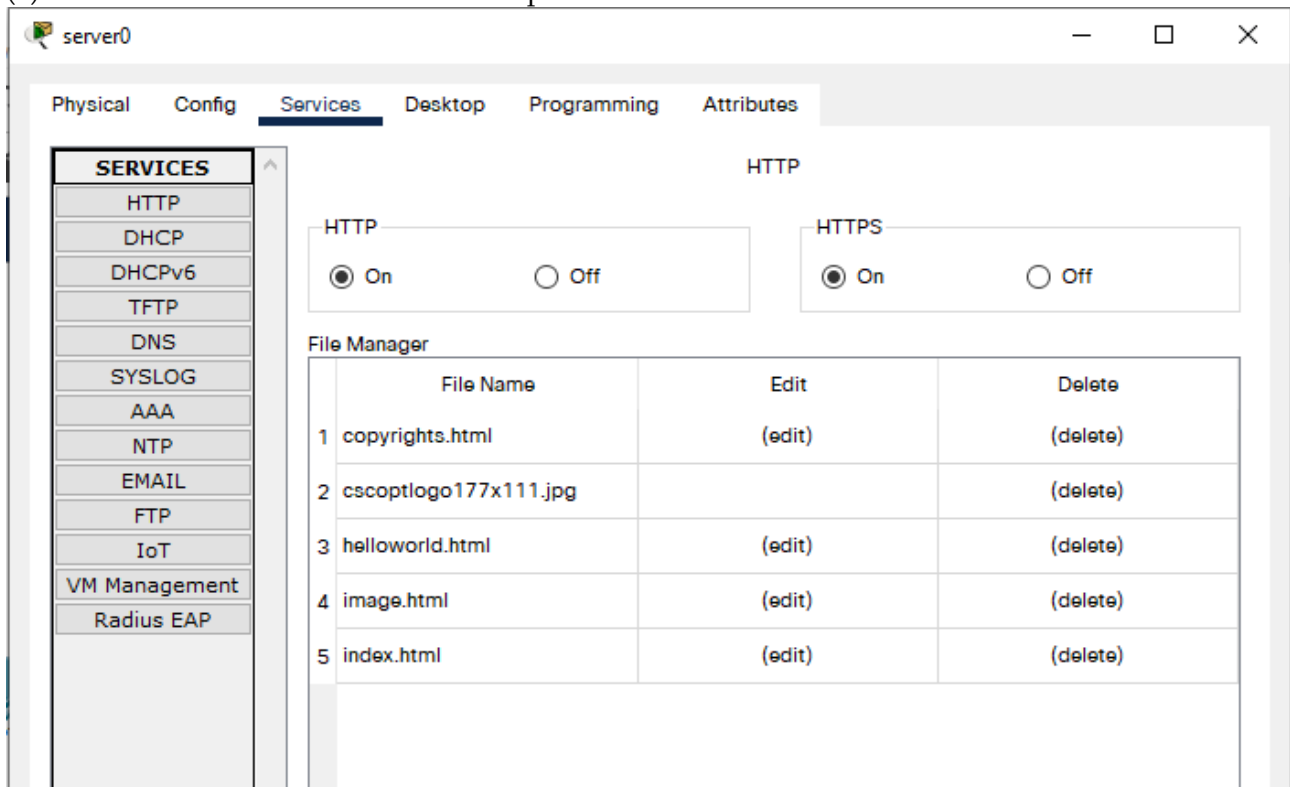
Pinging 192.168.1.101 with 32 bytes of data:

Reply from 192.168.1.101: bytes=32 time=2ms TTL=128
Reply from 192.168.1.101: bytes=32 time<1ms TTL=128
Reply from 192.168.1.101: bytes=32 time<1ms TTL=128
Reply from 192.168.1.101: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.101:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms

```

- (5) Disable all services in Server0 except HTTP.

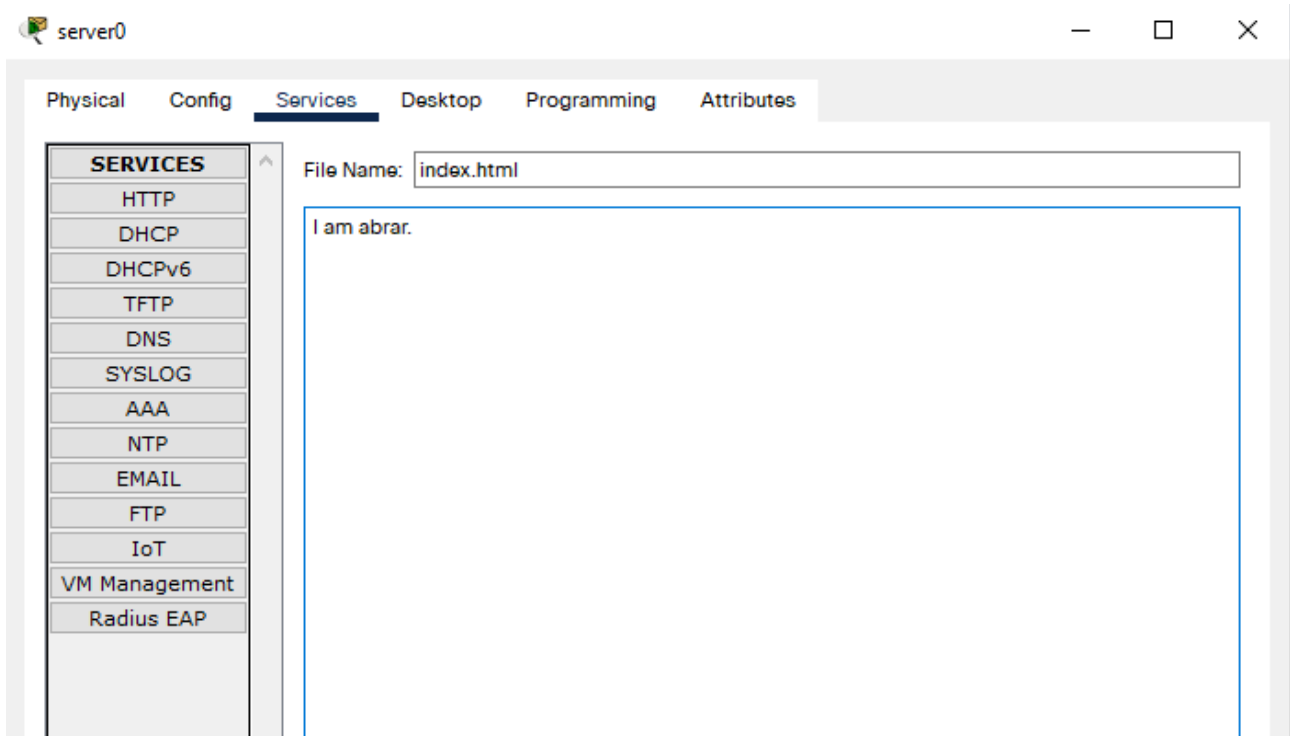


- (6) Write down or copy paste the text in “index.html” file in the HTTP server.

Observation:

I turn off all services except HTTP(Hypertext transfer protocol). Edit the index.html and write “I am abrar”.

Attach the working process image below

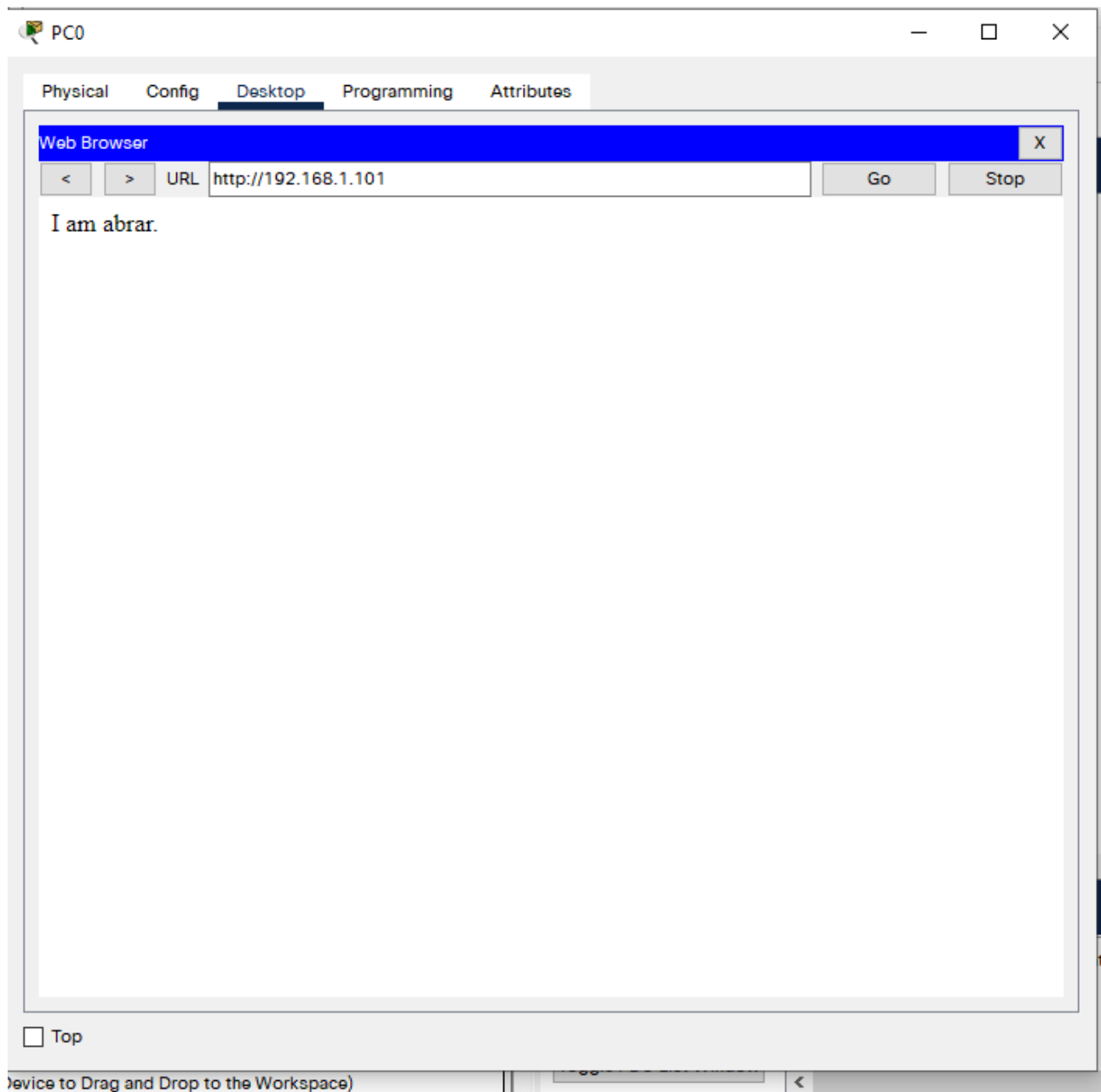


(7) On PC0, using the web browser (find it in desktop tab), access the webpage on Server0, using the IP address assigned in. Copy paste the displayed web page using “printscreen” command in the space below.

Observation:

I access the webpage from server0. To access the webpage, I type IP address of server to access page from server.

Attach the working image below

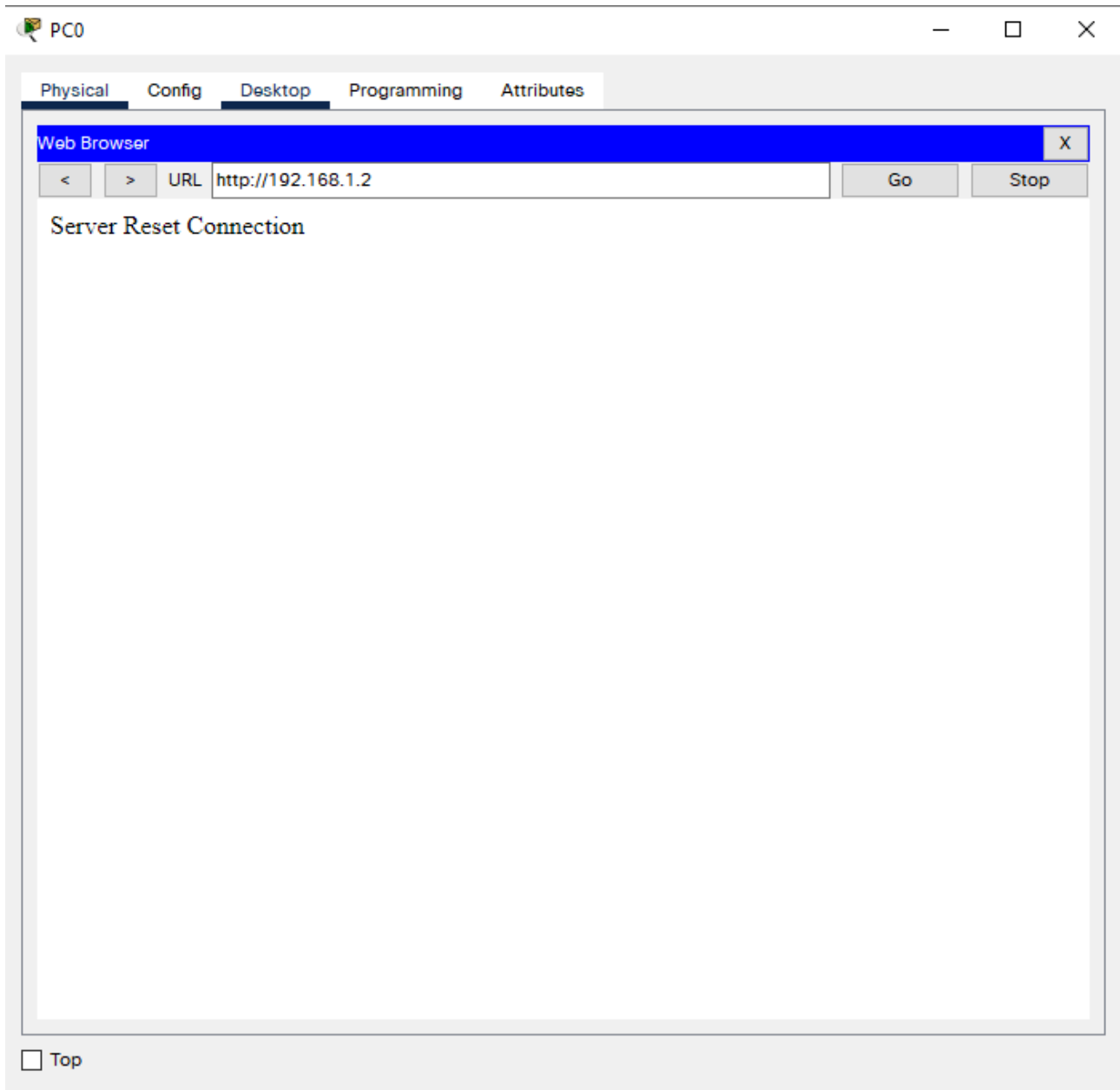


- (8) In the web browser use the IP address 192.168.1.2 and record the observation.

Observations and Reasons:

The IP address, I type in the search bar, is not linked to any server. Therefore, we come to respond, server reset.

Attach the response screenshot below



- (9) Activate Simulation Mode and make sure that in event list you just checked the “arp”, “http” event only when the web page is accessed. Observe which PDUs go first amongst the two.

Observation and Reason:

When we type the server’s IP address on the web browser of PC0, the message goes toward the switch and sends it to the server. Because the switch knows the given IP address is the address of the server. The server verifies from which PC the request comes. After verifying the PC by IP address, the server sends the required message to the PC

Simulation Panel

Event List

Vis.	Time(sec)	Last Device	At Device
	450.689	--	PC0
	450.690	--	PC0
	450.691	PC0	Switch0
	450.692	Switch0	HTTP
	450.693	HTTP	Switch0
	450.694	Switch0	PC0
	450.696	--	PC0
	450.697	--	PC0
	450.698	PC0	Switch0
	450.699	Switch0	HTTP
	450.700	HTTP	Switch0
Visible	450.701	Switch0	PC0

Reset Simulation ☒ Constant Delay Captured to: 600.846 s

Play Controls

Event List Filters - Visible Events
ARP, HTTP

Edit Filters Show All/None

- (10) Try accessing the same webpage by stating www.cisco.com in the browser.
Observation and Reason:

We cannot access the same page as with the www.cisco.com link. Our web page only searches able with IP addresses, because our server only provides HTTP service. In HTTP, we can search web page by IP address, not with name.

- (11) Activity ends here.

Activity B:

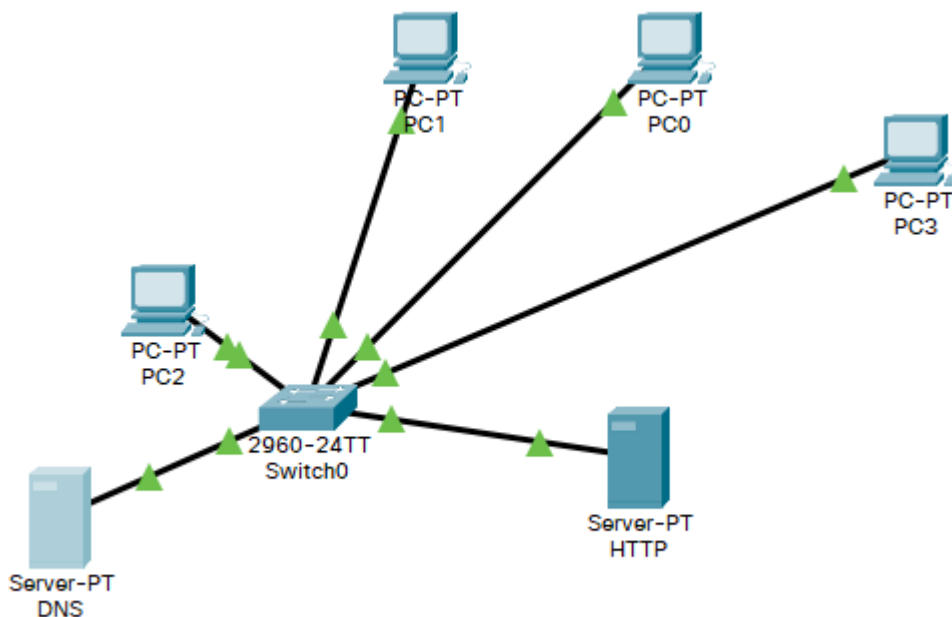
Resolving Domain name services on the network. If we want to state "www.cisco.com" in the web browser, the host should be able to access the same webpage. In order to accomplish it, follow the steps below.

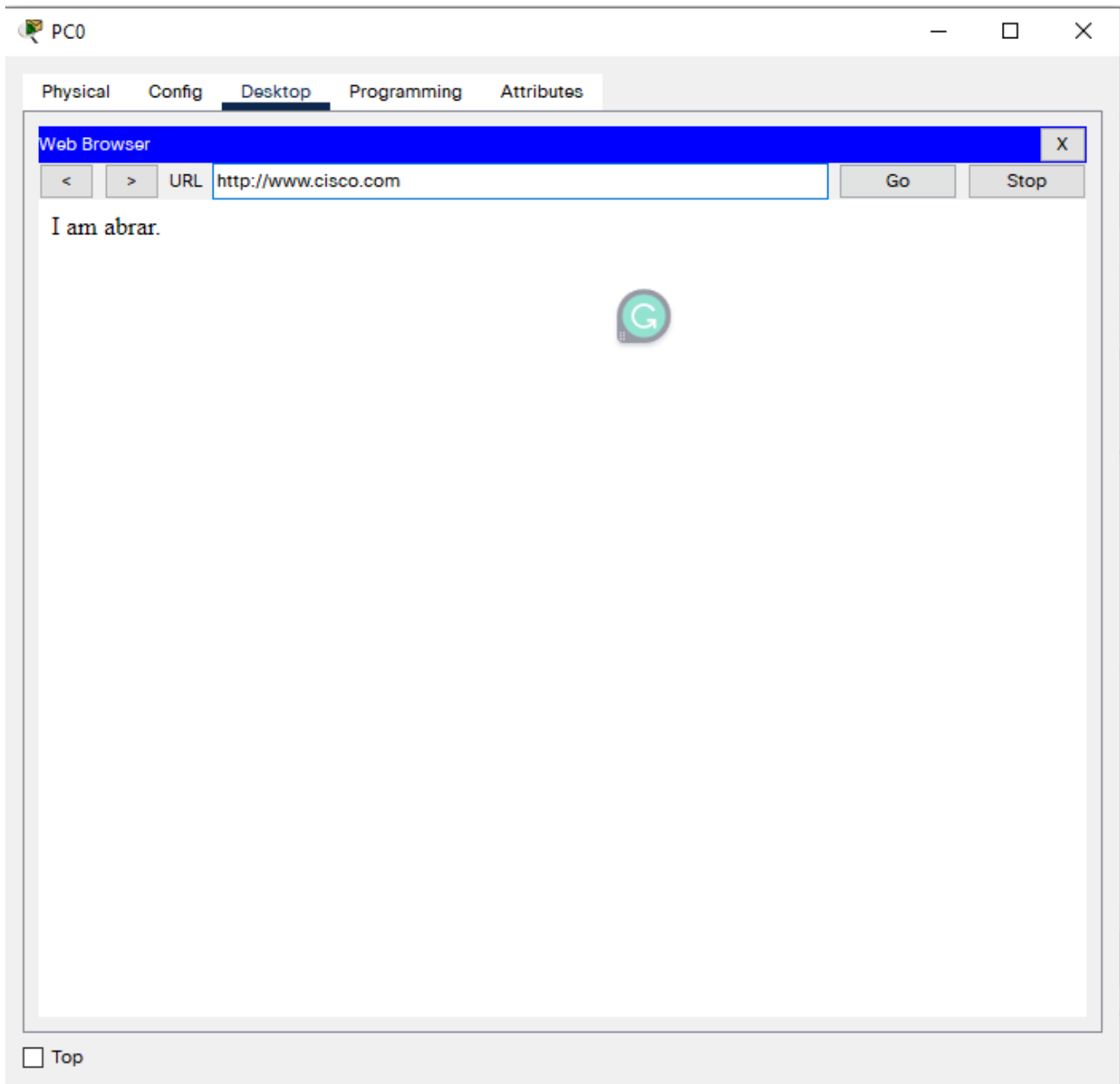
- (1) Add another server in the same topology. Name or label it as DNS-server.
- (2) Assign IP address to its interface as 192.168.1.102.
- (3) For the PC0 to PC3 to use this DNS server, they need to know the IP address of DNS server. Add DNS IP address in the Global Config of each host.
- (4) For the DNS to resolve the name of the webpage it should have a record to know which IP address is associated with the webpage name (URL). In the DNS service configuration, add a record by assigning "www.cisco.com" associated IP address 192.168.1.101.
- (5) Now using a web browser at Host PC0, try to access the webpage by typing www.cisco.com. Note down your observations.
- (6) Explain DNS's role in the above example.
- (7) Now try "ping www.cisco.com" in the command prompt of PC0. Note down the observations and give reasons why is it working now.

Observation and Reason:

In the HTTP server, we only search web pages by IP address. But DNS help us in searching web page by name of the web we assign to it. DNA makes things easy for us so we can search by name, otherwise remembering numbers is very difficult.

By ping www.cisco.com , I found connection lies between the PC0 and server.





```
Packet Tracer PC Command Line 1.0
C:\>ping www.cisco.com

Pinging 192.168.1.101 with 32 bytes of data:

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Ping statistics for 192.168.1.101:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
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```

(8) Activity ends here.