COMPUTER NETWORKS LABORATORY

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5 'A'

WEEK – 7- Using Cisco packet tracer to understand the life of packet in internet.

Date: 28/10/2020

Create the following topology in packet tracer.

```
          /---DNS
A – R1—R2
          \--- Web Server
```

Open the browser in A and access the webserver using sitename (not using IP Address). Traverse each packet (in simulation mode) and answer the following for each packet Src IP, Dstn IP, Src Mac, Dstn MAC, pkt type (e.g. DNS, ARP, HTTP, TCP)

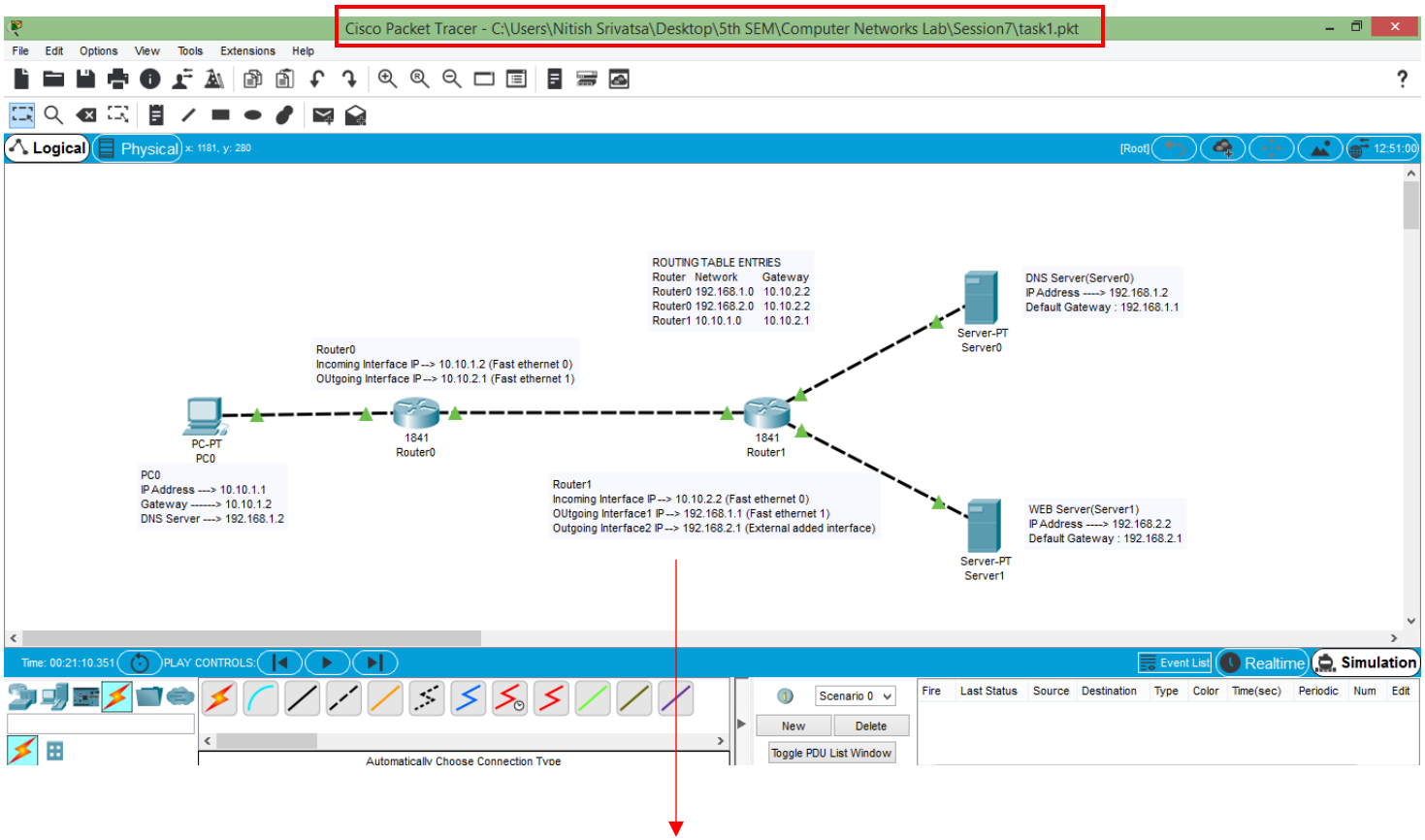
Observation: Does the number of packets traversed in the network change with second invocation of web request.

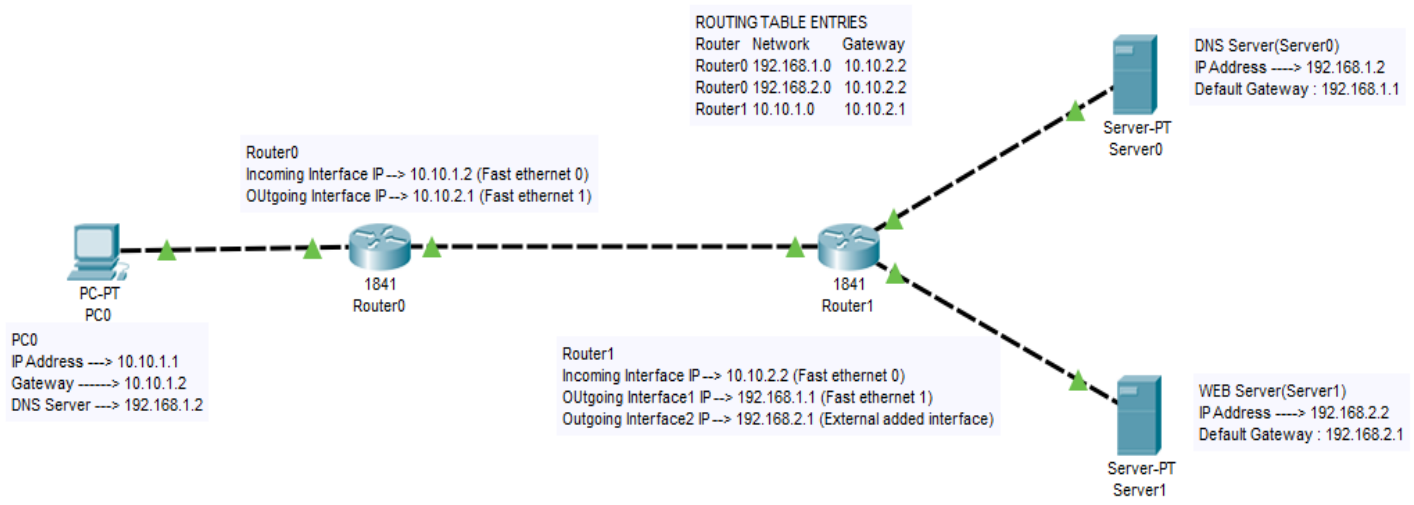
Experiment : Understanding the life of packet in internet.

Components Used : PC-Devices, DNS server, Web Server, Routers (everything on cisco packet tracer)

STEPS OF EXECUTION:

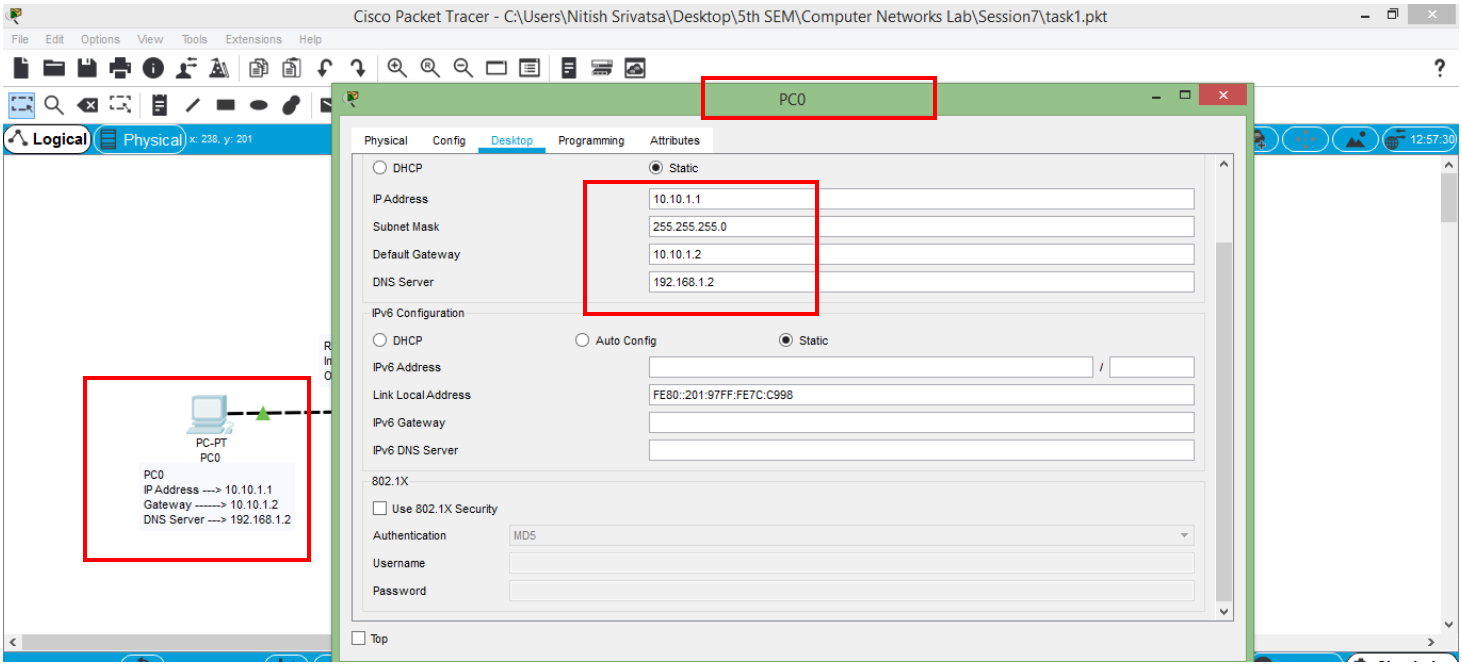
Step-1) The topology was constructed and configured using the given details.



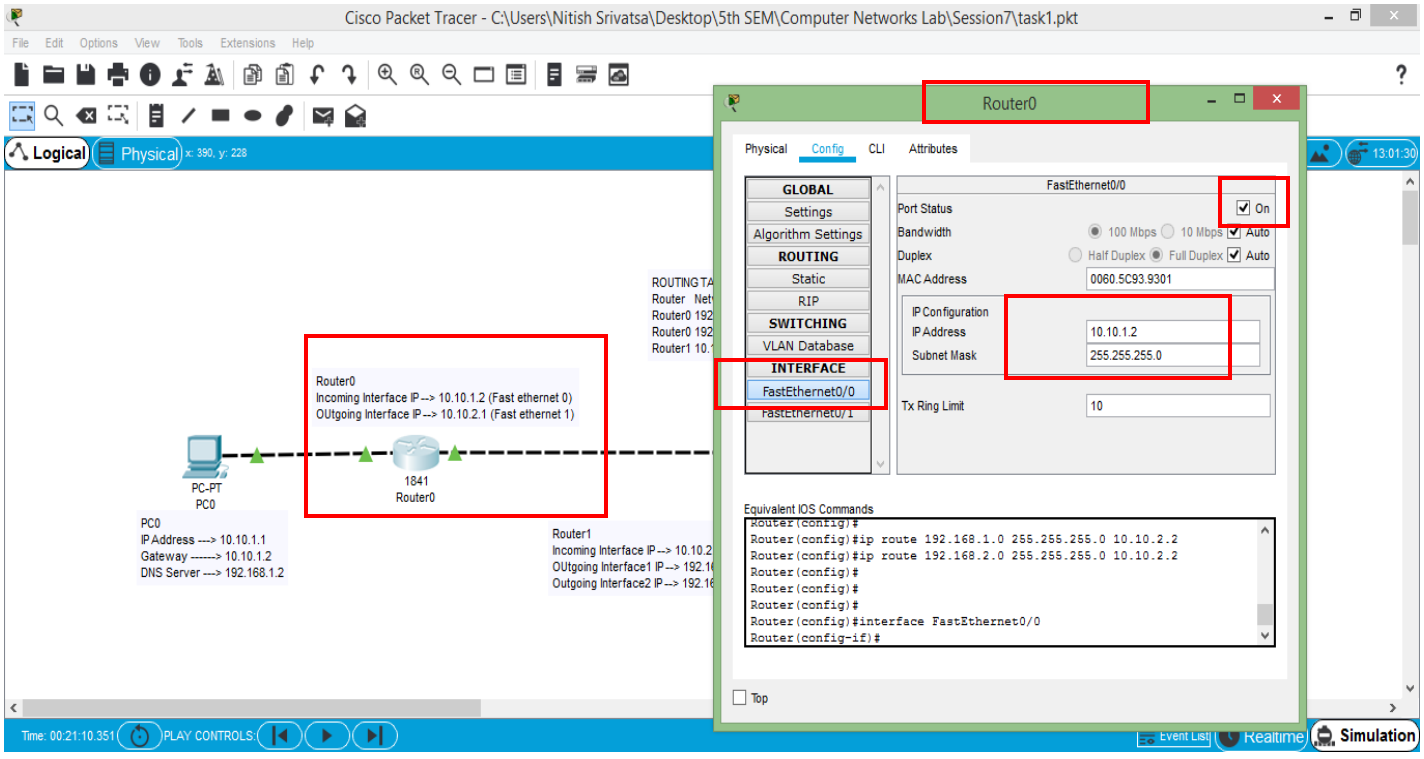


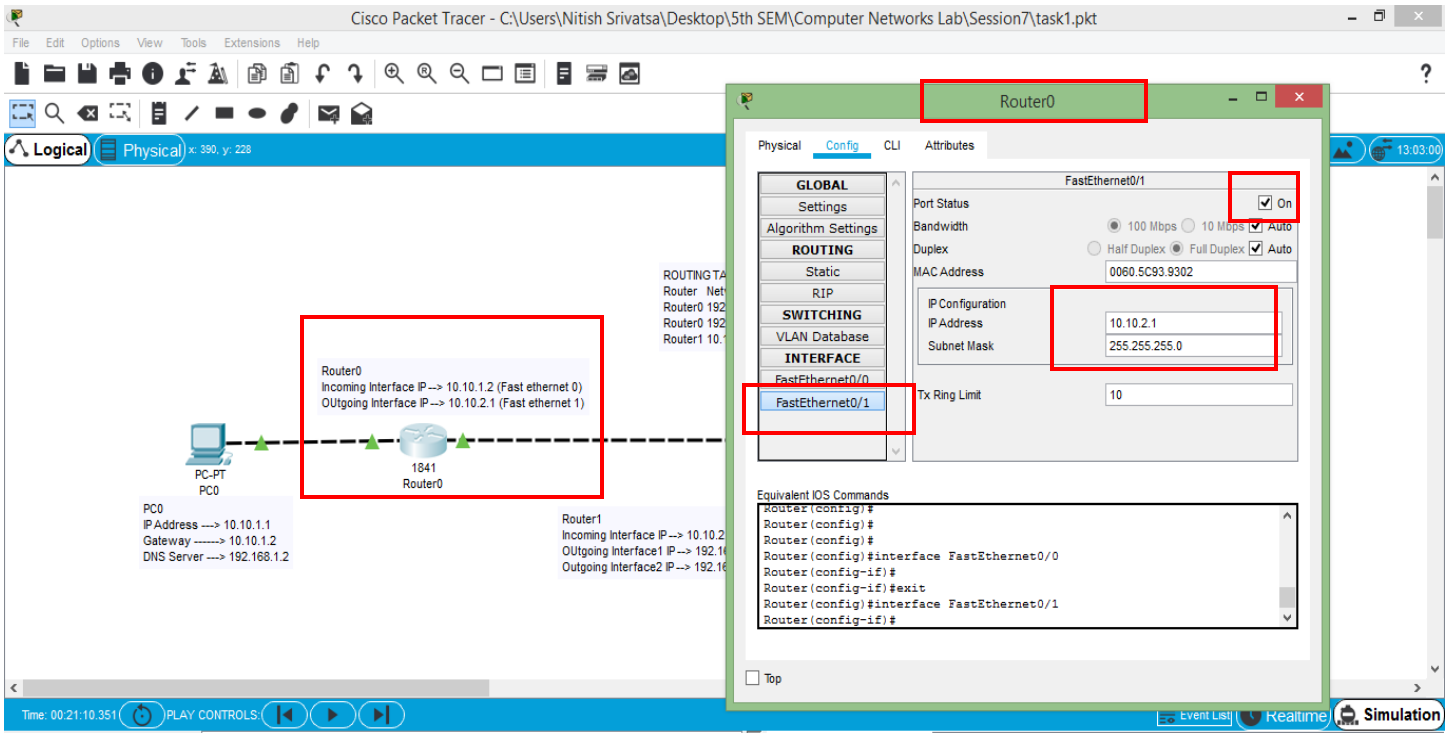
All the configurations made to the PCs, routers and the servers are named in boxes next to each of them.
Procedure of how configurations were made are shown for one PC, one router and one Server . Similar procedure are followed for all the other PCs, routers and Servers.

CONFIGURATION PROCEDURE FOR A PC:-

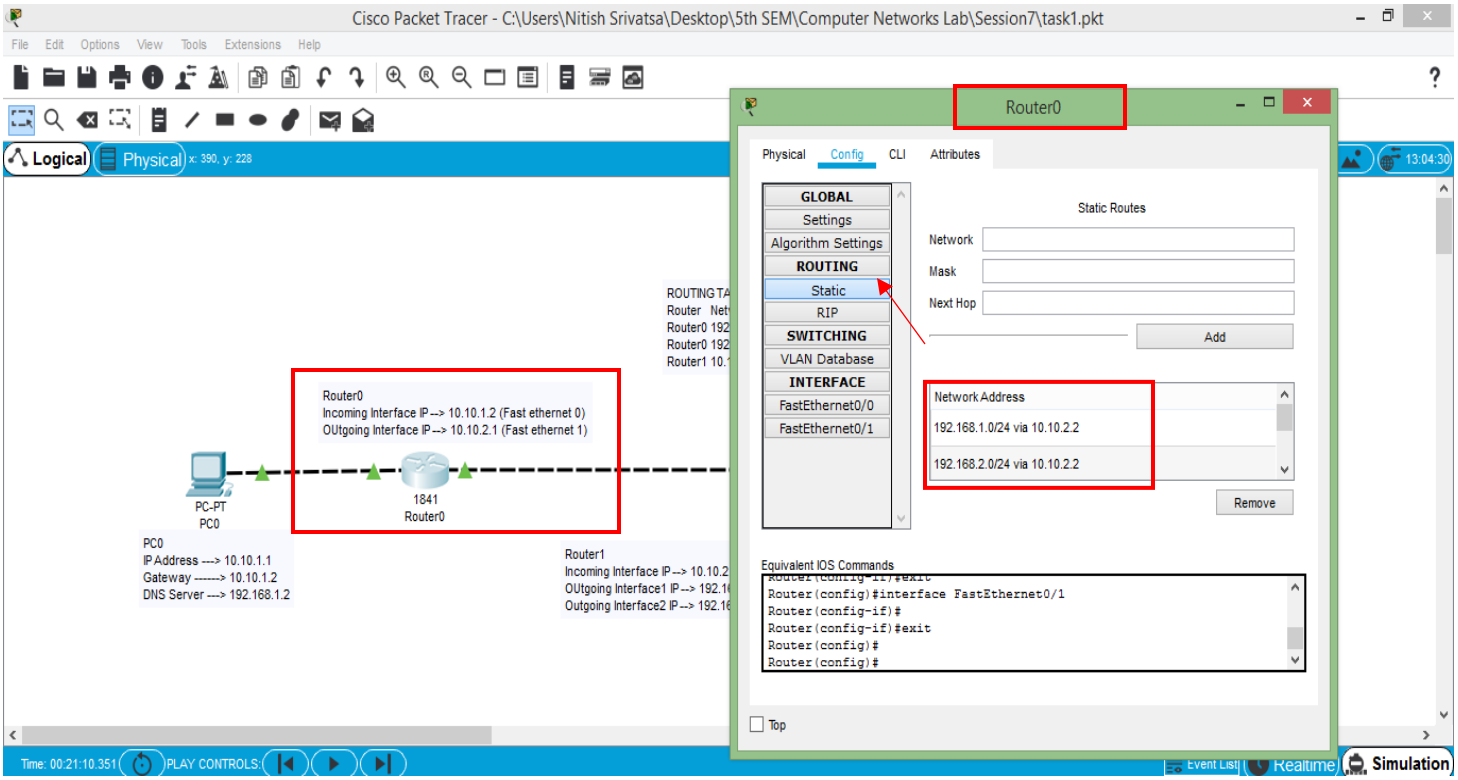


CONFIGURATION PROCEDURE FOR A ROUTER:-

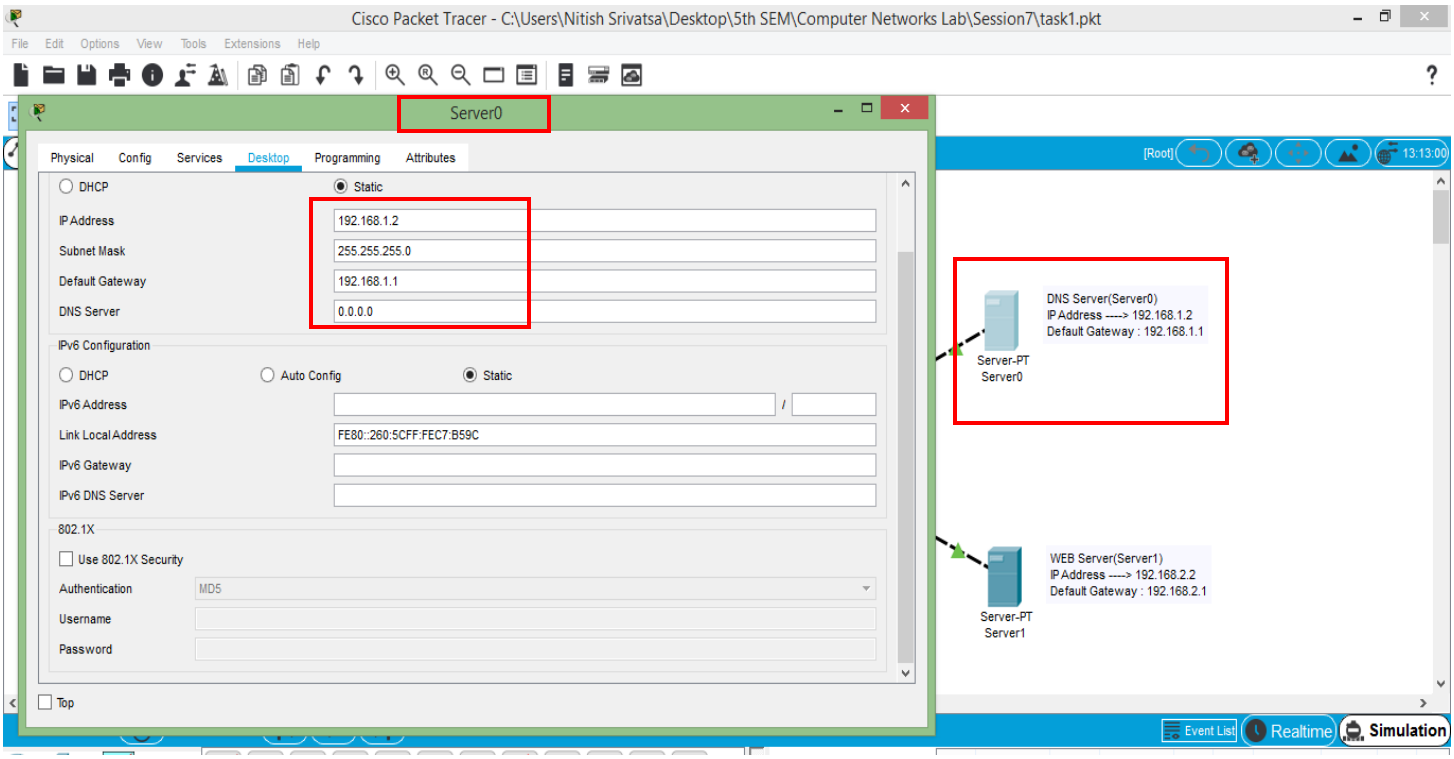




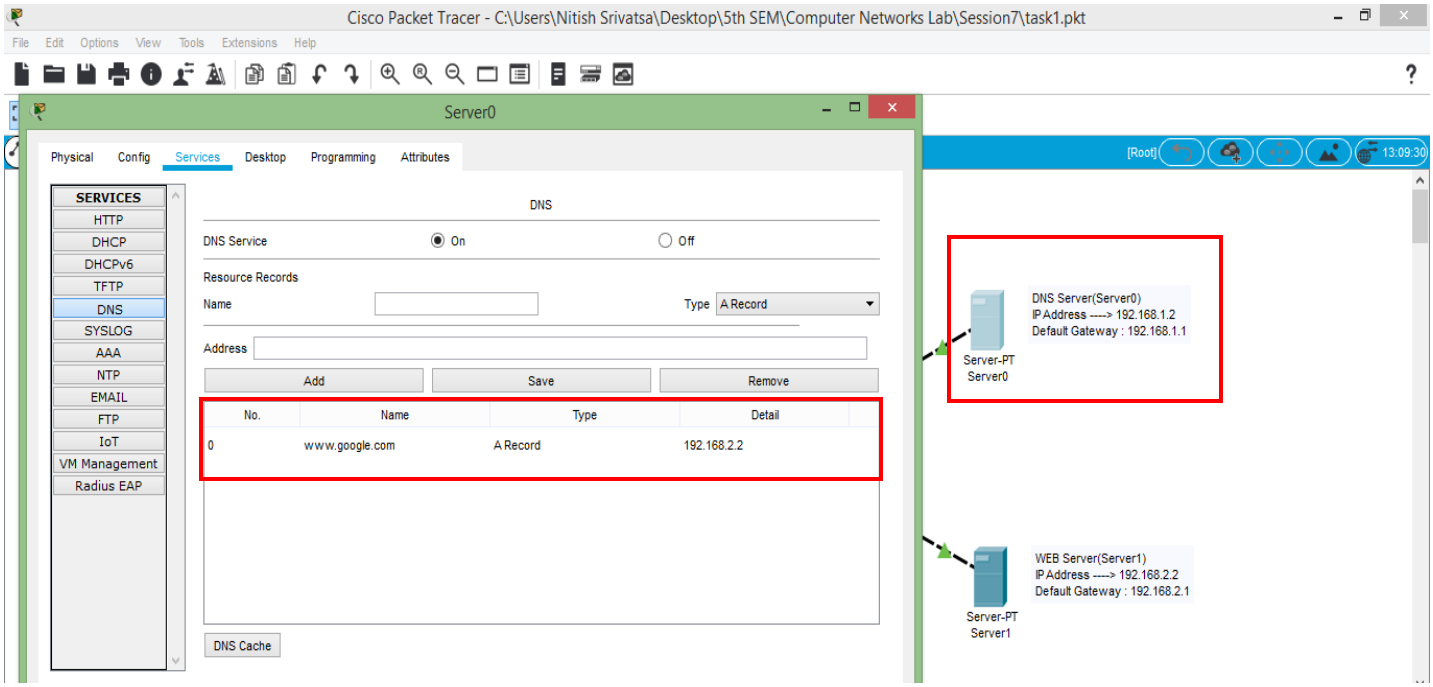
ROUTING TABLE ENTRY FOR THE ROUTER0:-



CONFIGURATION PROCEDURE FOR SERVER0 (DNS Server):-

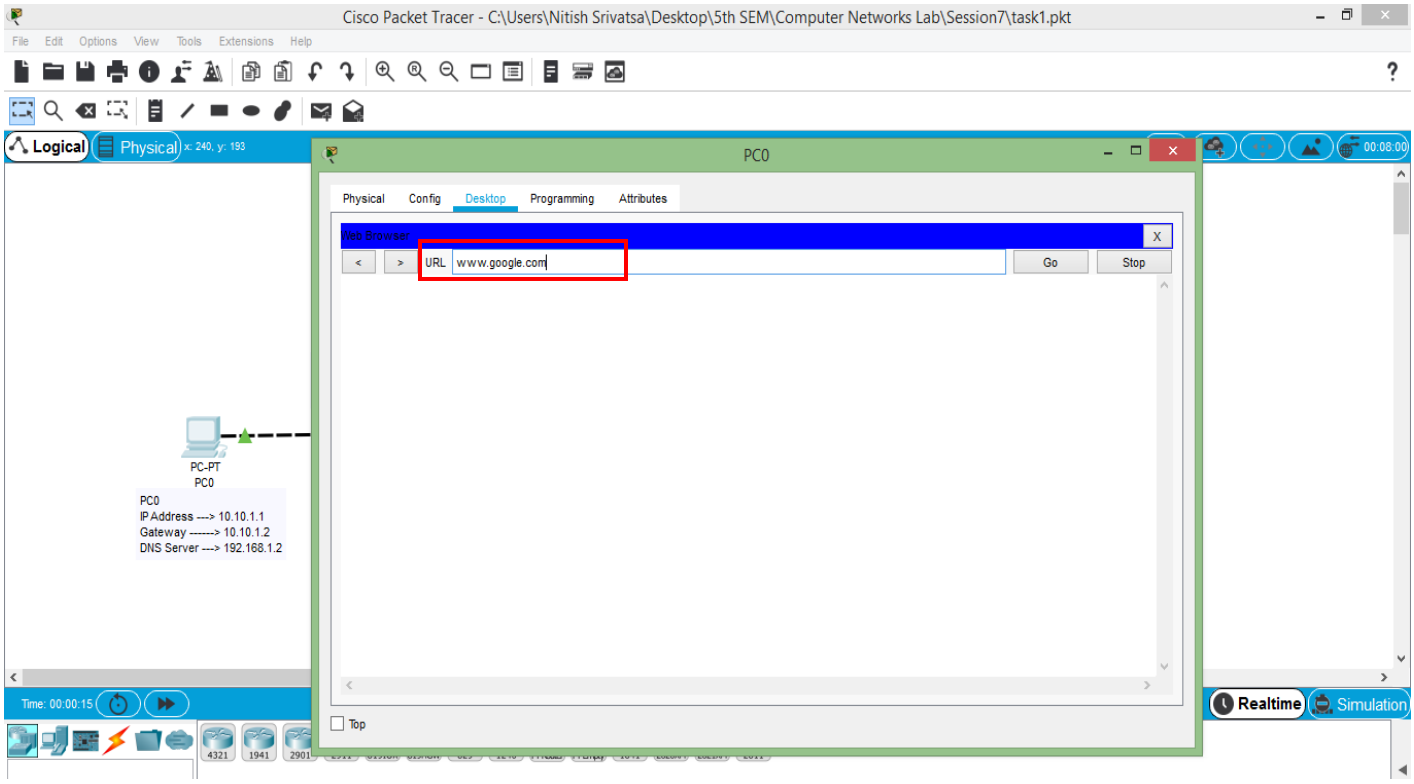


While configuring the DNS server (with the above information), a type-A record was also added:
Record-type: Type-A
Name: google.com (NAME OF THE DOMAIN)
Address: IP address of web-server i.e. 192.168.2.2 (DOMAIN'S IP Address)



While configuring the Web Server (with the above information), the HTML page in the HTTP config information is checked and we can add information over there to see the output over there.

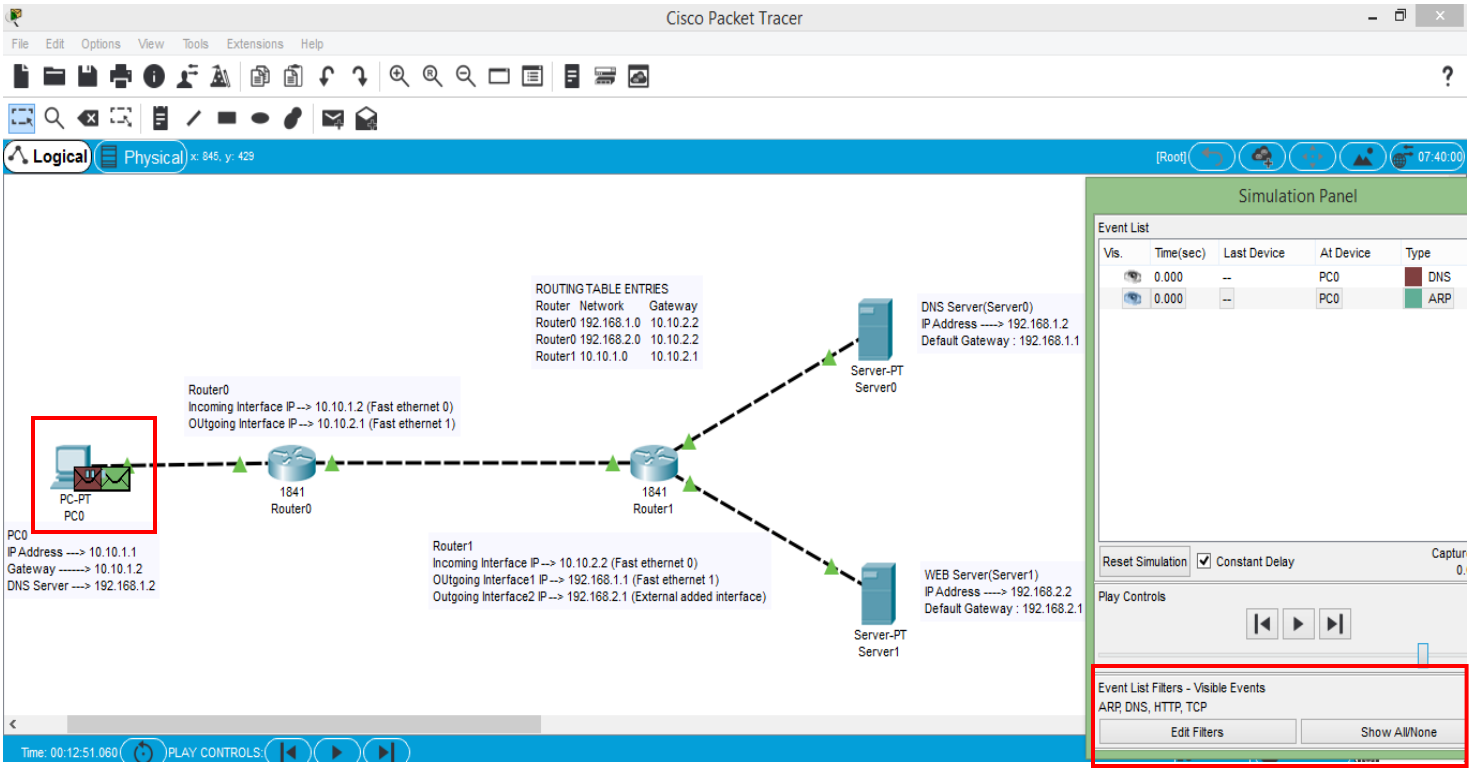
Step-2) As the topology is created and all the devices are configured, we open the PC's Web Broswer on the cisco packet tracer and type the name of the domain to be looked for as "google.com".



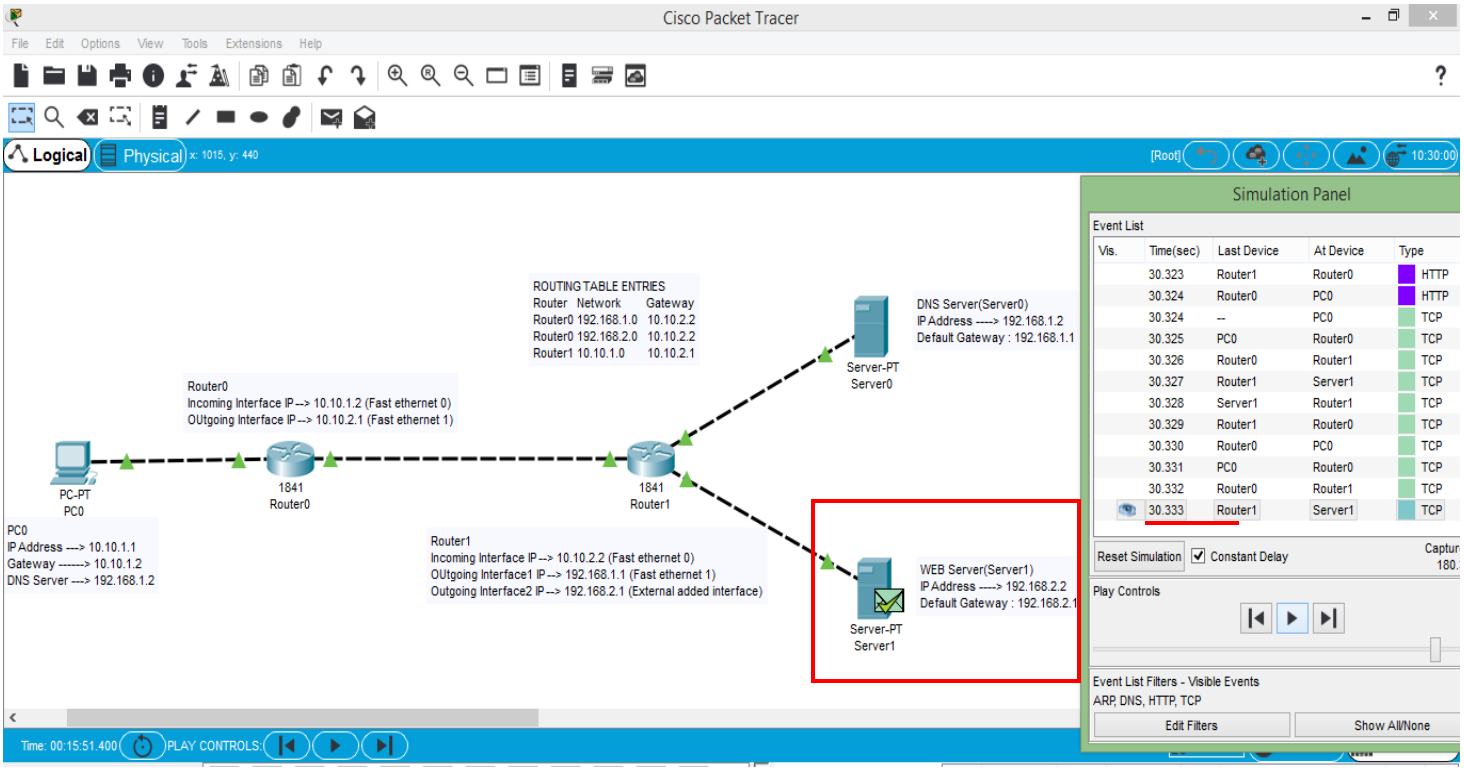
Step-3) Now we open the packet tracer in the SIMULATION MODE and apply the filters on it for capturing only the following protocols :

a. Transmission Control Protocol
b. Address Resolution Protocol
c. Domain Name Service
d. Hyper Text Transfer Protocol

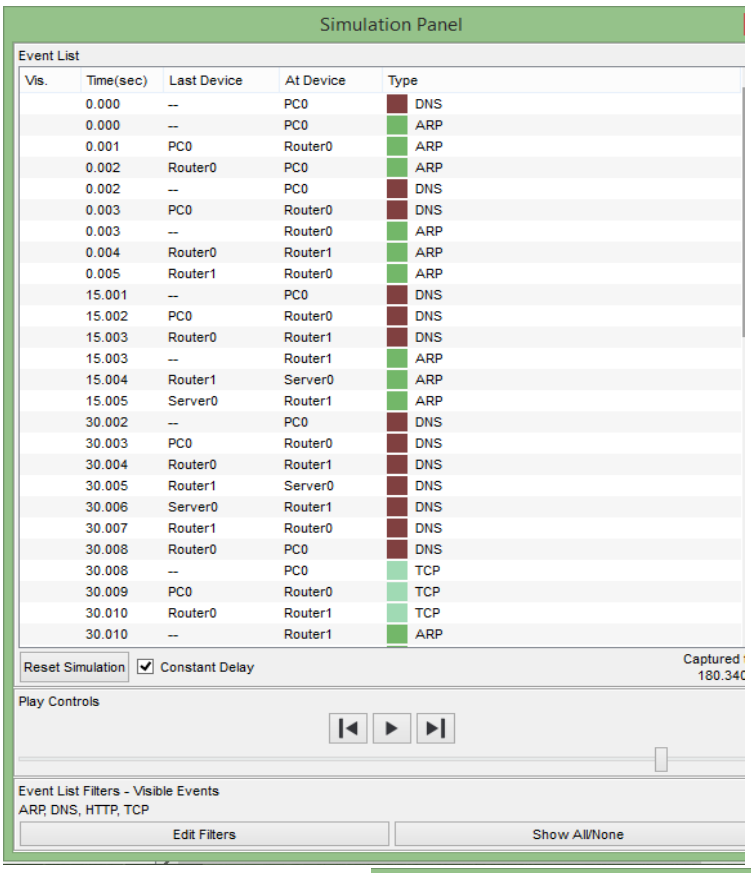
Simulation ready to begin:

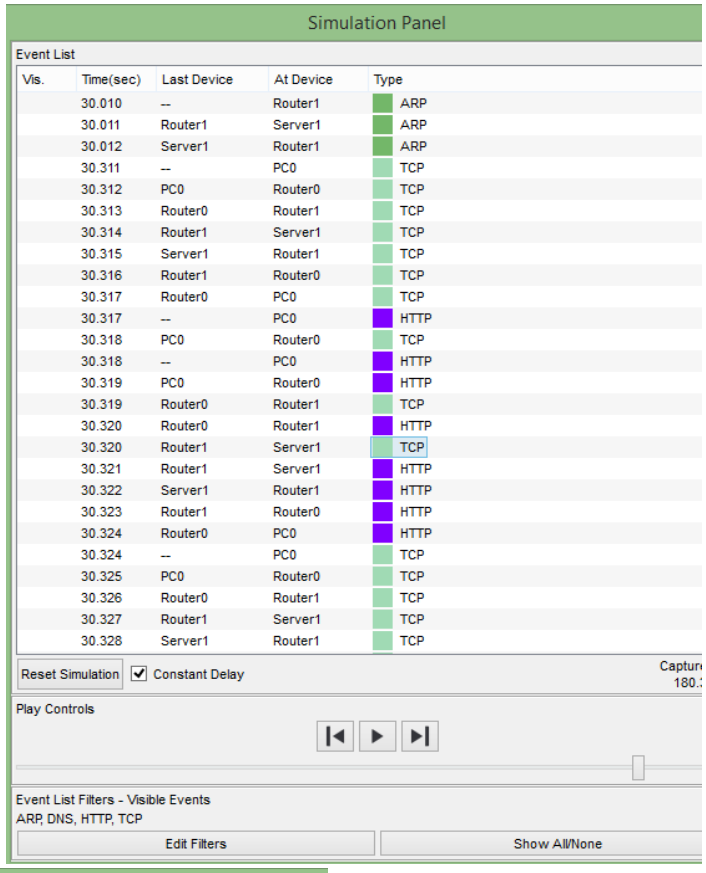


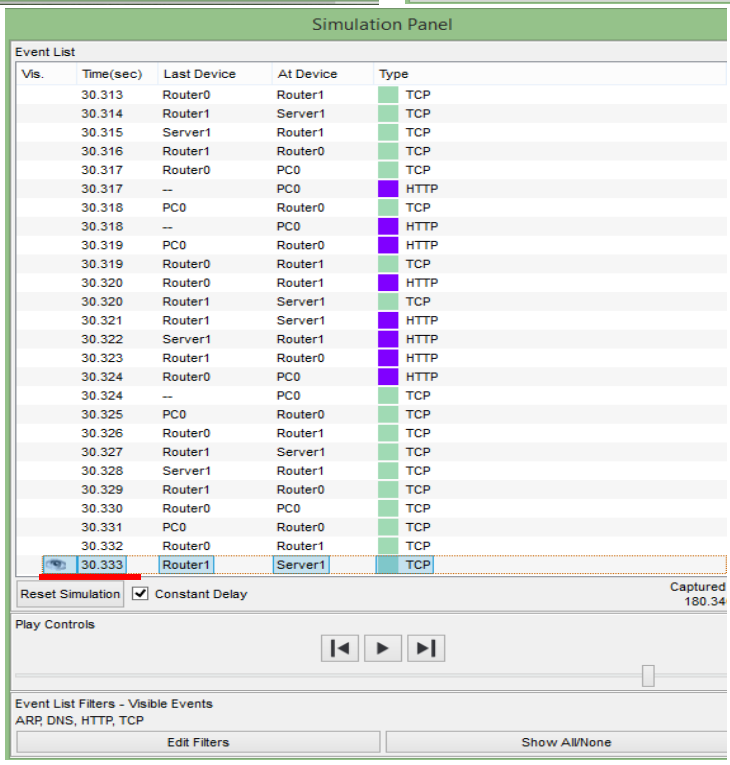
The First time Request:- (Screenshot shows completed execution)

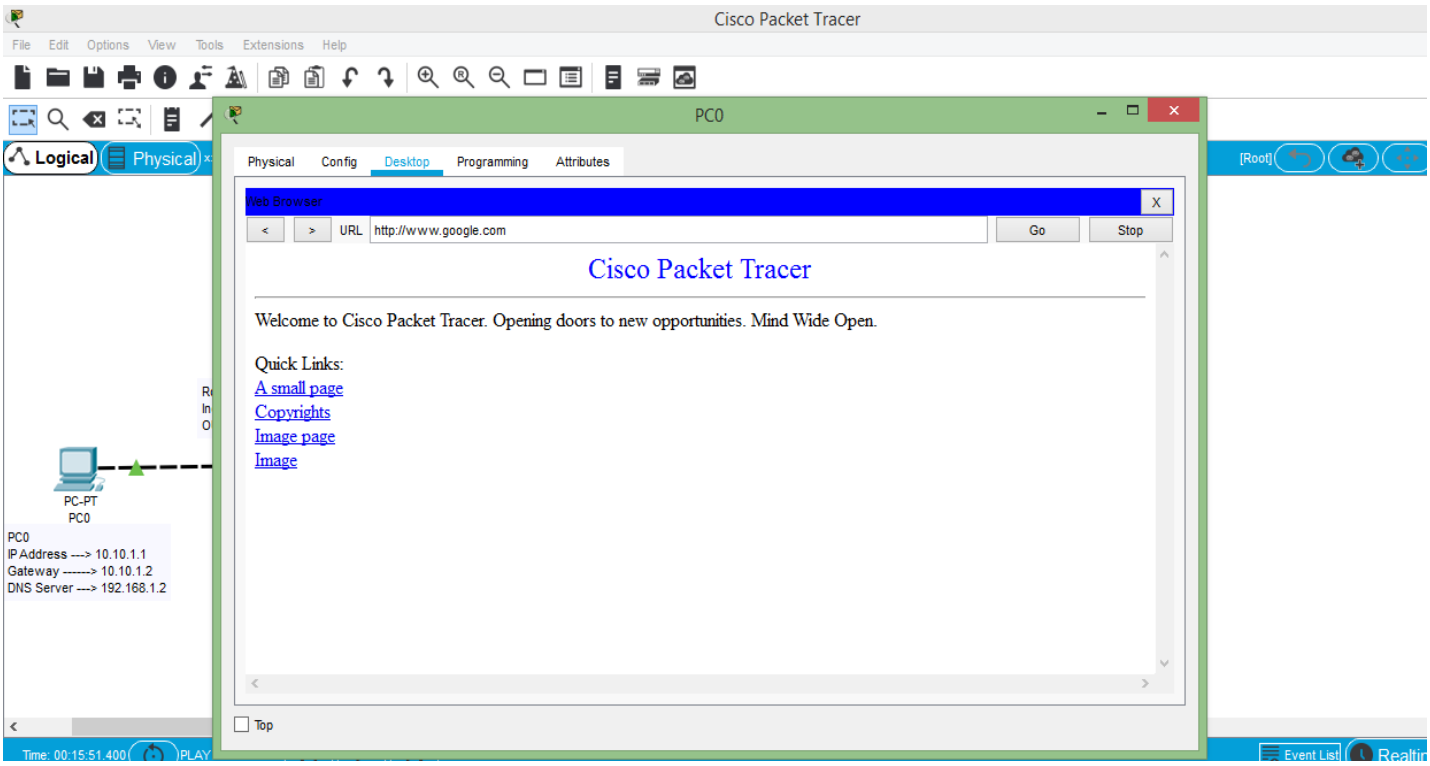


ENLARGED AND COMPLETE SIMULATION PANEL SCREENSHOT DURING THE FIRST REQUEST:-



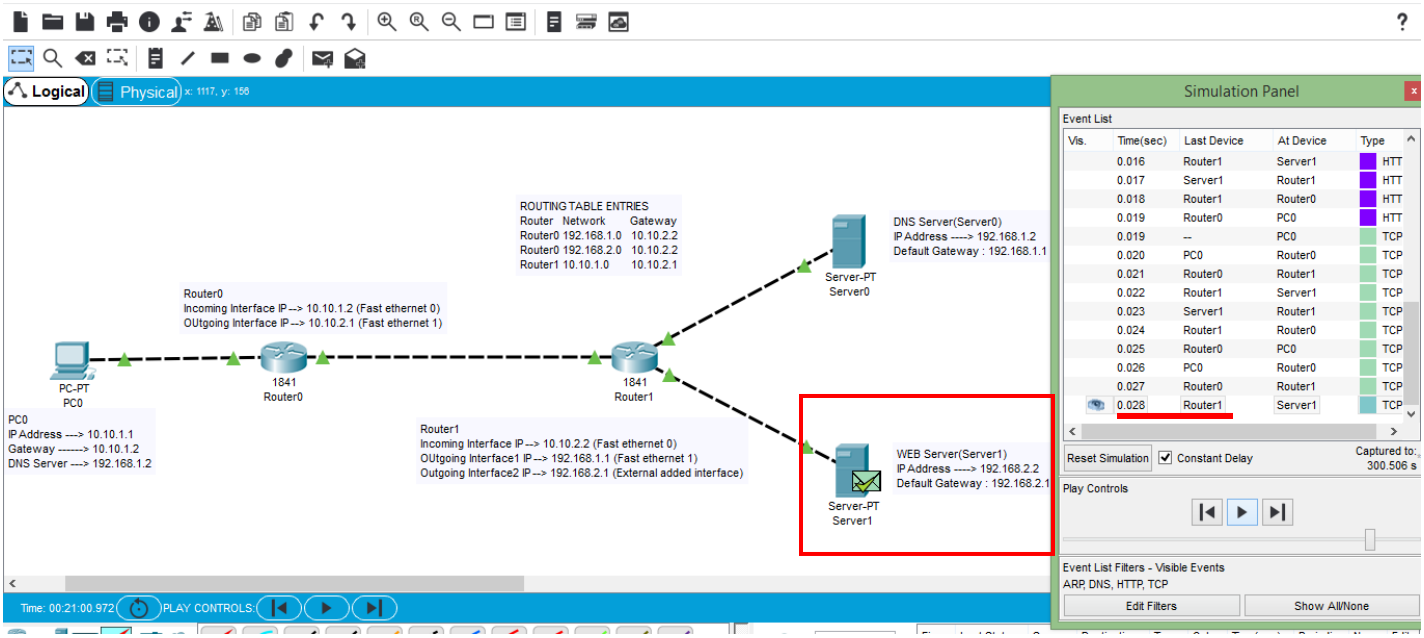




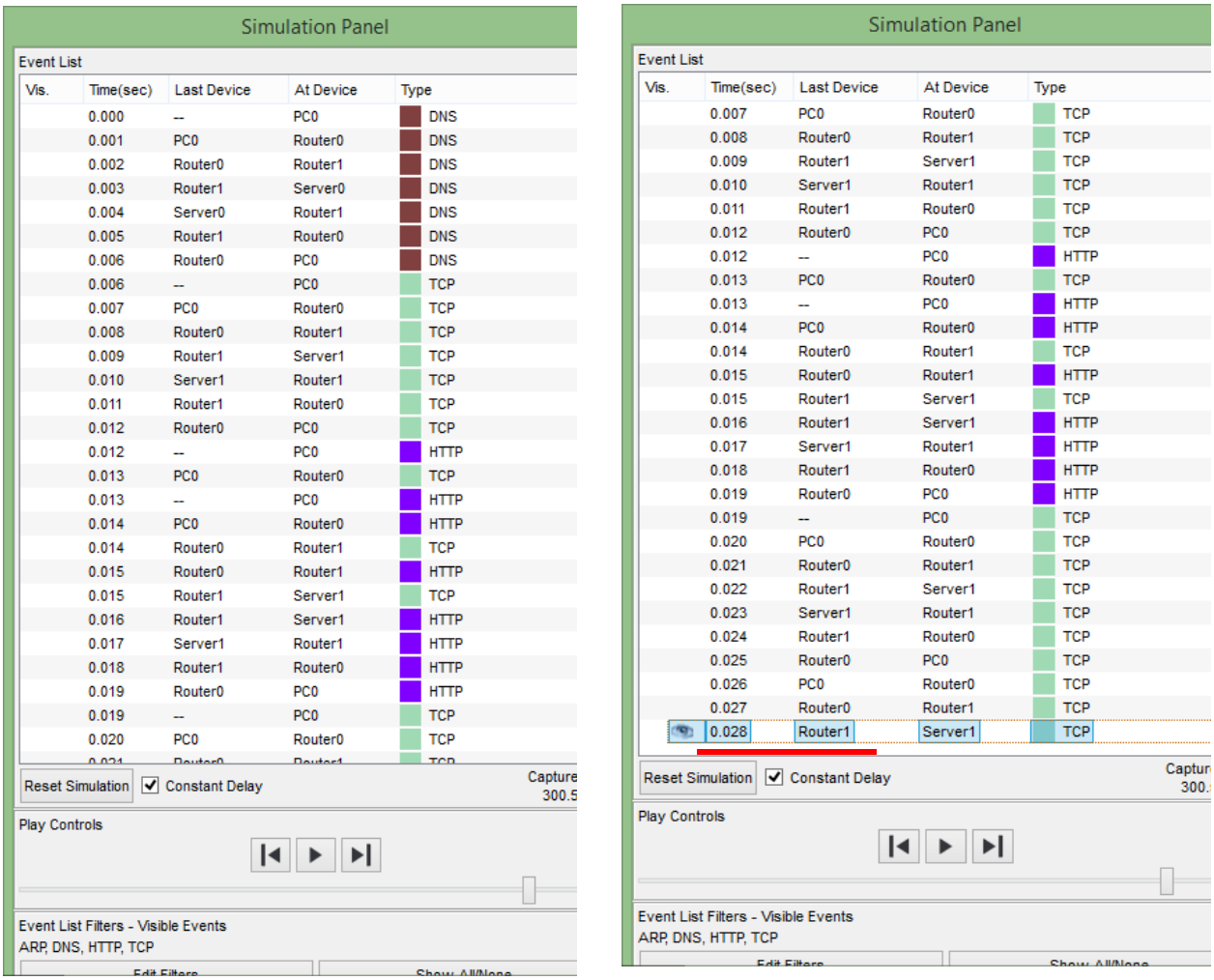


On complete simulation, the above contents are displayed in the Web Browser tab of PC0 where the request was given.
For the first time request, the time taken to fetch the page is: **<u>30.33sec</u>** (underlined in the screenshot).

The Second time Request:- (Screenshot shows completed execution)



ENLARGED AND COMPLETE SIMULATION PANEL SCREENSHOT DURING THE SECOND REQUEST:-



On complete simulation, the same contents are displayed in the Web Browser tab of PC0 where the request for the page was made.

But during the second time request , the time taken to fetch the request is: **0.028sec** (underlined in the screenshot)

The reason for such a difference in time in the 2 requests(First request 30.33sec and second request 0.028sec) being that DNS upon the first request of the web-server from the client cached the DNS-name and the IP address in its local DNS

cache and on the subsequent request again doesn't need to search for the web-server again.
The ARP packets flowing were only seen in the first DNS request and not in the subsequent request as because of the DNS cache. All other packets i.e. TCP, HTTP and DNS were seen in both the web-server requests.

OBSERVATIONS:-
The color coding was observed in the simulation mode :
ARP : Dark green
HTTP : Purple
DNS : Brown
TCP : Green