CN Lab Report – Week 7

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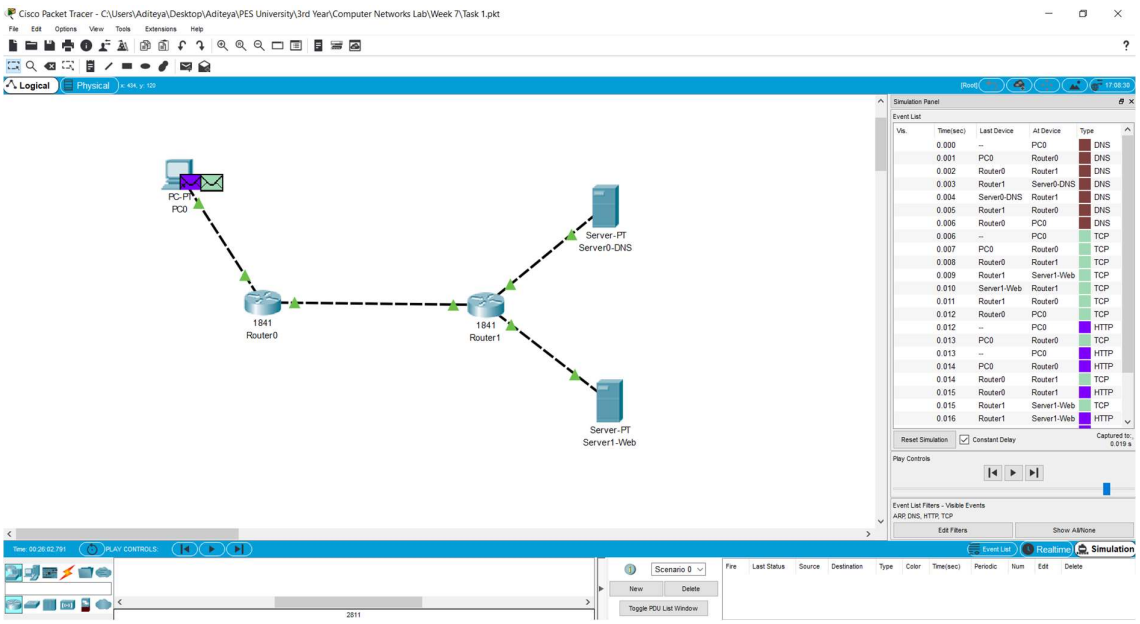
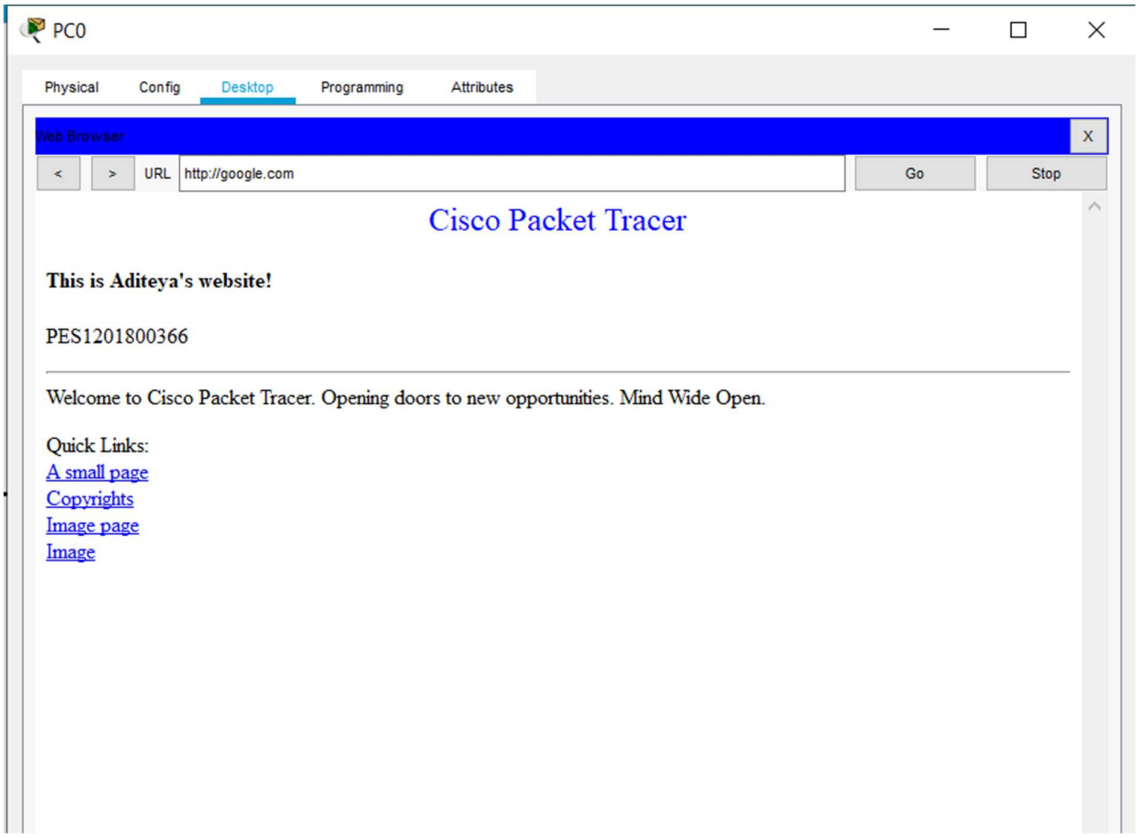
1. Task 1

1.1 Configuring Topology

- The network devices are organised in the required topology shown.
- IP Addresses have been assigned to each interface being used on the routers and end systems.
- The routing tables are then configured manually by adding the required routing information.
- The two servers in the topology correspond to a DNS Server that serves DNS queries from the PC and a web server that serves webpages stored on it. The server is appropriately configured as well.
- An HTTP request is made from the PC for the page `index.html` in the domain `google.com`.



HTTP Request with DNS Service



Response Received after HTTP Request

1.2 Configuring Network and Routing Tables

1.2.1 End Systems

End System	Interface Name	IP Address	Subnet Mask	Gateway	DNS Server
PC0	FastEthernet0	10.10.1.1	255.255.255.0	10.0.0.3	192.168.1.2
Server0-DNS	FastEthernet0	192.168.1.2	255.255.255.0	192.168.1.1	
Server1-Web	FastEthernet0	192.168.2.2	255.255.255.0	192.168.2.1	

1.2.2 Routers

Router	Interface Name	IP Address	Subnet Mask
Router0	FastEthernet0/0	10.10.1.2	255.255.255.0
Router0	FastEthernet0/1	10.10.2.1	255.255.255.0
Router1	FastEthernet0/0	10.10.2.2	255.255.255.0
Router1	FastEthernet0/1	192.168.1.1	255.255.255.0
Router1	Ethernet0/0/0	192.168.2.1	255.255.255.0

1.2.3 Routing Table

Router	Destination Network	Next Hop
Router0	192.168.1.0	10.10.2.2
Router0	192.168.2.0	10.10.2.2
Router1	10.10.1.0	10.10.2.1

1.3 Observations

The simulation's first run takes about 0.32 seconds to complete, while the second run takes just 0.19 seconds. This difference is due to caching being performed, where the DNS Resource Record is cached and stored after the first run for the domain `google.com`. On the second run, the necessary DNS lookup is performed from the cache instead of the DNS server.