Department of Computer Science and Engineering
Islamic University of Technology (IUT)
A subsidiary organ of OIC

Laboratory Report

CSE 4412: Data Communication and Networking Lab

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Section   : 1

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Lab No   : 2

Title: Understanding the basics of OSI Model

Objective:

1. Examine HTTP Web Traffic
2. Display Elements of the TCP/IP Protocol Suite

Theory:

OSI stands for Open Systems Interconnection. It's a conceptual framework for how applications communicate over a network. There are 7 layers within the model. These layers help users identify what is happening within a networking system. The 7 layers are (from top to bottom): Application, Presentation, Session, Transport, Network, Data link, Physical.

Devices/Software Used:

- Cisco Packet Tracer
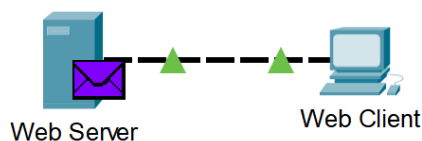- Virtual Web Server and Virtual Web Client

Working Procedure:

After opening the .pka file that was presented in the lab, an extra "PT Activity" window opens up. It had two objectives which were exactly same as this lab's objectives. It had two parts describing how to perform each task. Each step was followed from those two parts and the outcomes were observed.
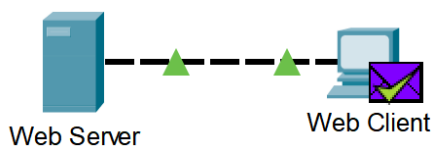
Diagram of the experiment:

Event List

Vis.	Time(sec)	Last Device	At Device	Type	
👁	0.000	--	Web Client	■	DNS
	0.001	Web Client	Web Server	■	DNS
	0.002	Web Server	Web Client	■	DNS
	0.002	--	Web Client	■	TCP
	0.003	Web Client	Web Server	■	TCP
	0.004	Web Server	Web Client	■	TCP
	0.004	--	Web Client	■	HTTP
	0.005	Web Client	Web Server	■	TCP
	0.005	--	Web Client	■	HTTP
	0.006	Web Client	Web Server	■	HTTP
	0.007	Web Server	Web Client	■	HTTP
	0.007	--	Web Client	■	TCP

Observation:

This simulation activity provides a foundation for understanding the TCP/IP protocol suite and the relationship to the OSI model. Simulation mode allowed us to view the data contents being sent across the network at each layer.

As data goes through the network, it is broken down into manageable smaller chunks and identified so that the chunks can be put back together whenever they arrive at their destination. Each component belongs to a certain layer of the TCP/IP and OSI models and is given a unique name (protocol data unit [PDU]). You can see every layer and its corresponding PDU in the Packet Tracer simulation mode. The user is guided through the process of requesting a web page from a web server using the client PC's built-in web browser application in the steps that followed in the "PT Activity" window.

After switching generating a web (HTTP) traffic the simulation panel will show all of the events that happened during its runtime. Then the contents of the each and every HTTP packet was explored.

The contents were divided into 2 or more tabs: OSI model, Outbound PDU details, Inbound PDU details. There were also arrows denoting the transfer of data from the server to the client or vise-versa. The windows/boxes contained In Layers, Out Layers or sometimes both.

In the second part of the experiment, we saw some additional protocols comprising of the TCP/IP suite. If the Address Resolution Protocol (ARP) is listed, it searches MAC addresses. DNS is responsible for converting a name (for example, www.osi.local) to an IP address. The additional TCP events are responsible for connecting, agreeing on communication parameters, and disconnecting the communications sessions between the devices.

Challenges:

OSI model is something that I wasn't familiar with before. Took me a bit of time to understand what this model is how its layers are connected.

Never used the Cisco Packet Tracer application before. Took me a bit of time to understand what the lab was about and how we're doing the tasks.

For the same reason as before, following all the steps was a bit challenging for me.