



**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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<b>Section</b>	<b>:1A</b>
<b>Semester</b>	<b>:Summer</b>
<b>Academic Year</b>	<b>:2021-2022</b>
<b>Date of Submission</b>	<b>:16.01.2023</b>
<b>Lab No</b>	<b>:02</b>

**Title:** Understanding the basics of OSI Model

**Objective:**

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

**Devices/ Software Used:** Cisco Packet Tracer

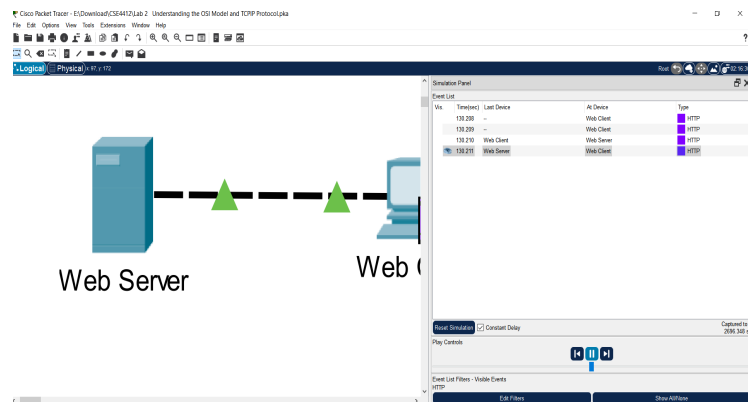
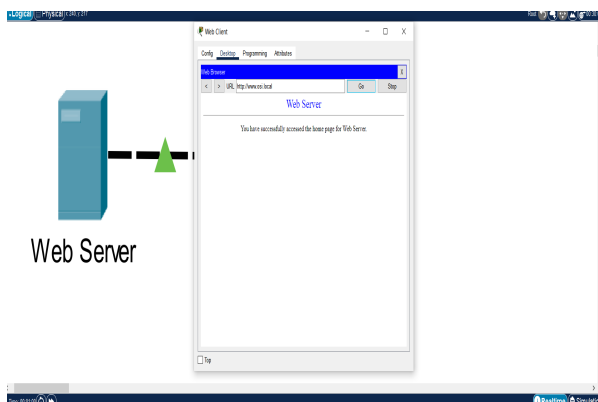
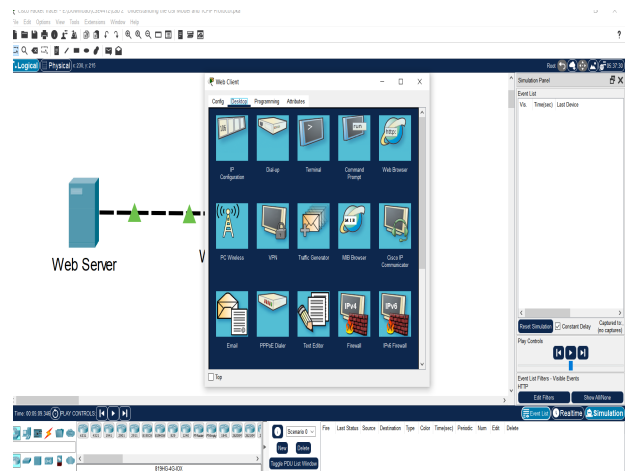
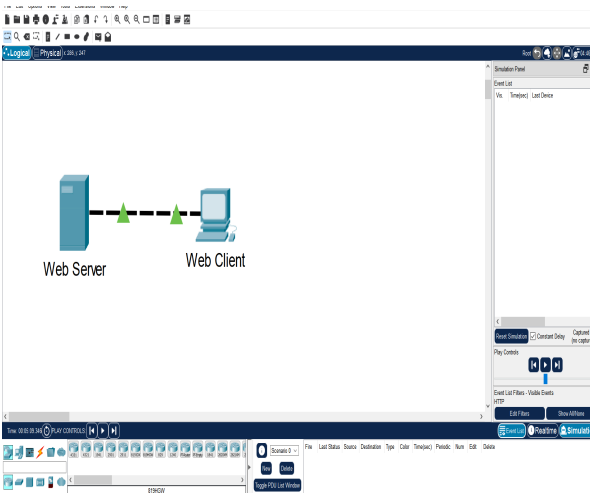
**Working Procedure:**

At first I opened the given .pka file using the Cisco Packet Tracer. There was a web server connected with a web client. Our task was to simulate them and see the transfer of information or signal between them.

To accomplish this task, I clicked on the web client and went to its desktop and from the desktop clicked on the web browser. In the URL box I entered the URL <http://www.osi.local>. Doing so I could see a success message.

After that I clicked on the simulation button and then clicked on the play button to see the real time transfer of packets.

## Diagram of the experiment:



### PDU Information at Device: Web Client

**OSI Model** | **Outbound PDU Details**

At Device: Web Client  
Source: Web Client  
Destination: HTTP CLIENT

In Layers	Out Layers
Layer7	Layer 7: HTTP
Layer6	Layer6
Layer5	Layer5
Layer4	Layer 4: TCP Src Port: 1026, Dst Port: 80
Layer3	Layer 3: IP Header Src. IP: 192.168.1.1, Dst. IP: 192.168.1.254
Layer2	Layer 2: Ethernet II Header 0060.47CA.4DEE >> 0001.96A9.401D
Layer1	Layer 1: Port(s):

1. The port FastEthernet0 is sending another frame at this time. The device buffers the frame to be sent later.

[Challenge Me](#) [<< Previous Layer](#) [Next Layer >>](#)

### PDU Information at Device: Web Client

#### OSI Model | Outbound PDU Details

At Device: Web Client  
Source: Web Client  
Destination: HTTP CLIENT

#### In Layers

Layer7
Layer6
Layer5
Layer4
Layer3
Layer2
Layer1

#### Out Layers

Layer 7: HTTP
Layer6
Layer5
Layer 4: TCP Src Port: 1026, Dst Port: 80
Layer 3: IP Header Src. IP: 192.168.1.1, Dst. IP: 192.168.1.254
Layer 2: Ethernet II Header 0060.47CA.4DEE >> 0001.96A9.401D
Layer 1: Port(s):

1. The next-hop IP address is a unicast. The ARP process looks it up in the ARP table.
2. The next-hop IP address is in the ARP table. The ARP process sets the frame's destination MAC address to the one found in the table.
3. The device encapsulates the PDU into an Ethernet frame.

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# PDU Information at Device: Web Client

OSI Model Outbound PDU Details

At Device: Web Client  
Source: Web Client  
Destination: HTTP CLIENT

## In Layers

Layer7  
Layer6  
Layer5  
Layer4  
Layer3  
Layer2  
Layer1

## Out Layers

Layer 7: HTTP  
Layer6  
Layer5  
Layer 4: TCP Src Port: 1026, Dst Port: 80  
Layer 3: IP Header Src. IP: 192.168.1.1, Dest. IP: 192.168.1.254  
Layer 2: Ethernet II Header 0060.47CA.4DEE >> 0001.96A9.401D  
Layer 1: Port(s):

1. The destination IP address is in the same subnet. The device sets the next-hop to destination.

Challenge Me

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Next Layer >>

# PDU Information at Device: Web Client

OSI Model Outbound PDU Details

At Device: Web Client  
Source: Web Client  
Destination: HTTP CLIENT

## In Layers

Layer7  
Layer6  
Layer5  
Layer4  
Layer3  
Layer2  
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## Out Layers

Layer 7: HTTP  
Layer6  
Layer5  
Layer 4: TCP Src Port: 1026, Dst Port: 80  
Layer 3: IP Header Src. IP: 192.168.1.1, Dest. IP: 192.168.1.254  
Layer 2: Ethernet II Header 0060.47CA.4DEE >> 0001.96A9.401D  
Layer 1: Port(s):

1. Sent segment information: the sequence number 1, the ACK number 1, and the data length 102.

Challenge Me

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Next Layer >>

# PDU Information at Device: Web Client

OSI Model Outbound PDU Details

At Device: Web Client  
Source: Web Client  
Destination: HTTP CLIENT

## In Layers

Layer7  
Layer6  
Layer5  
Layer4  
Layer3  
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## Out Layers

Layer 7: HTTP  
Layer6  
Layer5  
Layer 4: TCP Src Port: 1026, Dst Port: 80  
Layer 3: IP Header Src. IP: 192.168.1.1, Dest. IP: 192.168.1.254  
Layer 2: Ethernet II Header 0060.47CA.4DEE >> 0001.96A9.401D  
Layer 1: Port(s):

1. The HTTP client sends a HTTP request to the server.

Challenge Me

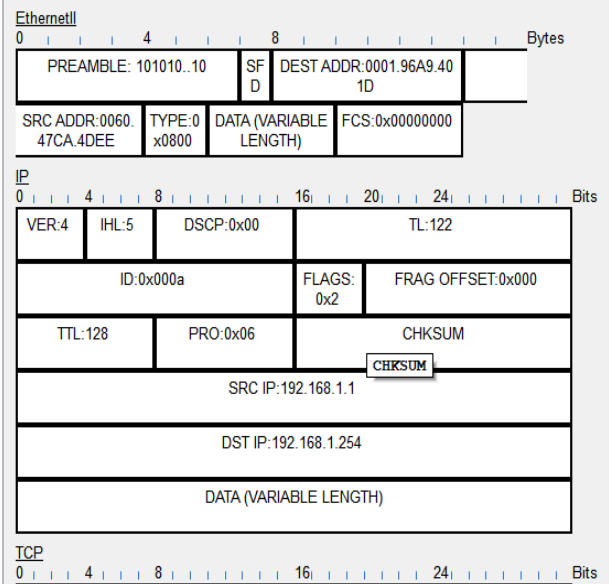
<< Previous Layer

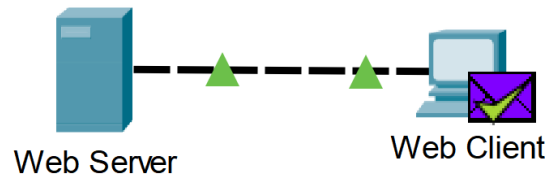
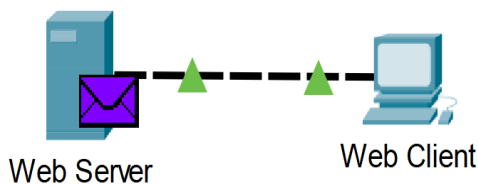
Next Layer >>

# PDU Information at Device: Web Client

OSI Model Outbound PDU Details

## PDU Formats





## Observation:

The OSI model stands for Open Systems Interconnect which is a conceptual framework that describes networking by a combination of seven layers which are - Application, Presentation, Session, Transport, Network, Data Link and Physical layer.

The Application layer is the layer that is the closest layer to the end user. It receives information directly from the user.

Presentation layer presents the data for the application or the network.

When two computers or other devices need to connect with one another, a session needs to be created. This is done at the Session layer. Functions at this layer involve setup and coordination for example how long a system should wait for a response.

The Transport Layer deals with the coordination of the data transfer between end systems and hosts.

Network layer is responsible for packet forwarding.

The Data Link Layer provides node-to-node data transfer, between two directly connected nodes.

At the bottom of the OSI model, we have the Physical layer, which represents the electrical and physical representation of the system.

As I simulated our project, I could see four event sets which reflected how packets are transferred between web client and server.

After clicking on each event set I could see the 7 layers of OSI model and its movement. In the Cisco packet manager, each of the layers can be observed as an in-layer and an out-layer.

During the simulation, I could see a purple envelope moving from the client to the server and back. It is due to the client requesting a packet from the server and in response the server returning an appropriate packet based on the request of the client.

### **Challenges:**

I did not face much of the difficulties in setting up the project because it was already set up by the instructor. Just following the instructions was enough. But I faced problems in understanding the layers of the OSI model as the theory part was not covered by me in advance. So I struggled in understanding that even at the time of report writing. I look forward to learning more about it.