ASSIGNMENT ONE WRITEUP:

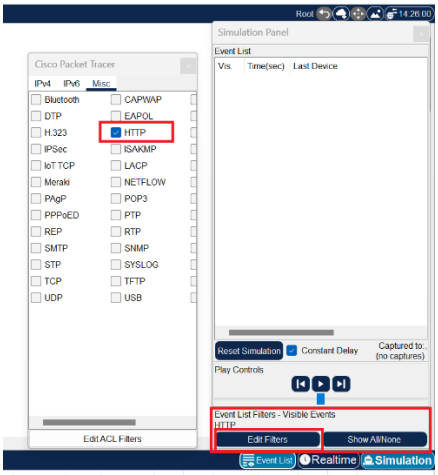
INVESTIGATE THE TCP/IP AND OSI MODELS IN ACTION

The TCP/IP and OSI models are two essential frameworks used to understand the structure and functionality of network communication protocols. These models provide valuable insights into how data flows through a network, the interactions between different layers, and the protocols involved. In this writeup, we will investigate the models in action.

PART ONE: Examine HTTP Web Traffic

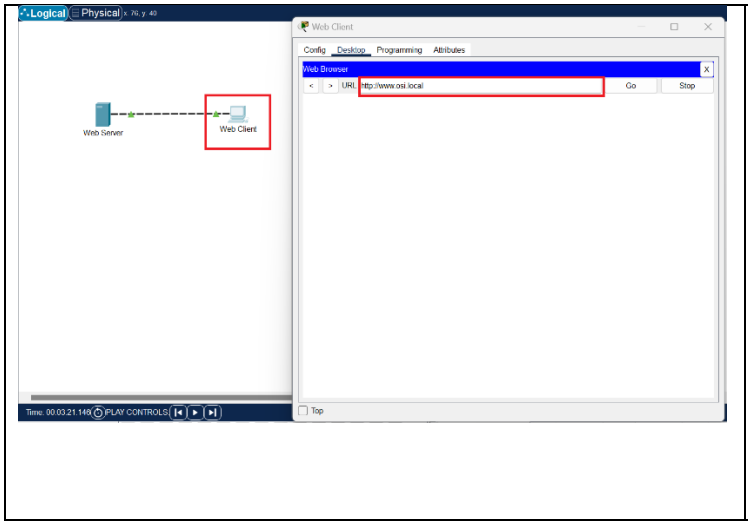
The following section is a step-by-step process of how to use packet tracer Simulation mode to generate web traffic and examine HTTP.

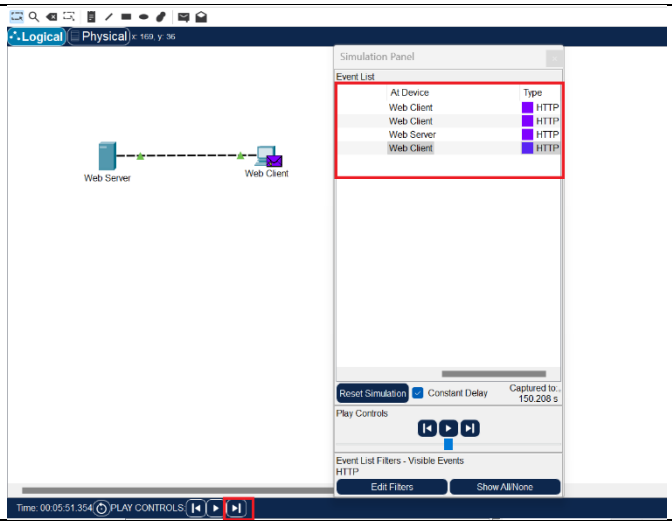
Step 1: Switch from realtime to Simulation mode



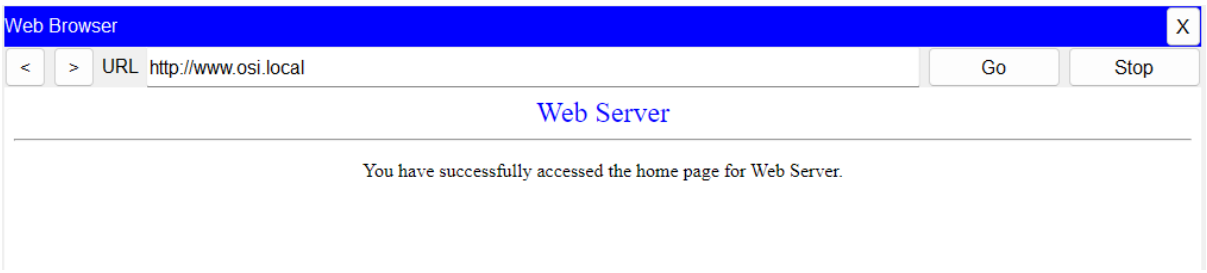
Step 2: Generate web (HTTP) traffic.

Click Web Client in the far left pane then click the Desktop tab and click the Web Browser icon to open it. In the URL field, enter www.osi.local and click Go.





Click Capture/Forward four times. There should be four events in the Event List. Question: Look at the Web Client web browser page. Did anything change? Yes, the browser displayed the homepage.



Click the first colored square box under the Event List > Type column.

On the OSI Model tab.

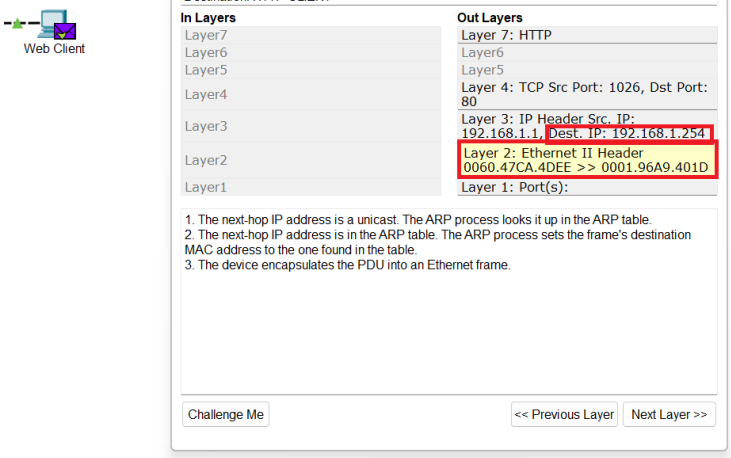
Questions:

What information is listed in the numbered steps directly below the In Layers and Out Layers boxes for Layer 7? The Http client sends HTTP request to the server.

What is the Dst Port value for Layer 4 under the Out Layers column? Port 80

What is the Dest. IP value for Layer 3 under the Out Layers column? Dst IP: 192.168.1.254

What information is displayed at Layer 2 under the Out Layers column?



On the **Outbound PDU Details** tab.

What is the common information listed under the **IP** section of **PDU Details** as compared to the information listed under the **OSI Model** tab? With which layer is it associated?

The Source IP (Scr IP) and destination IP (Dst IP) and it's associated in layer 3.

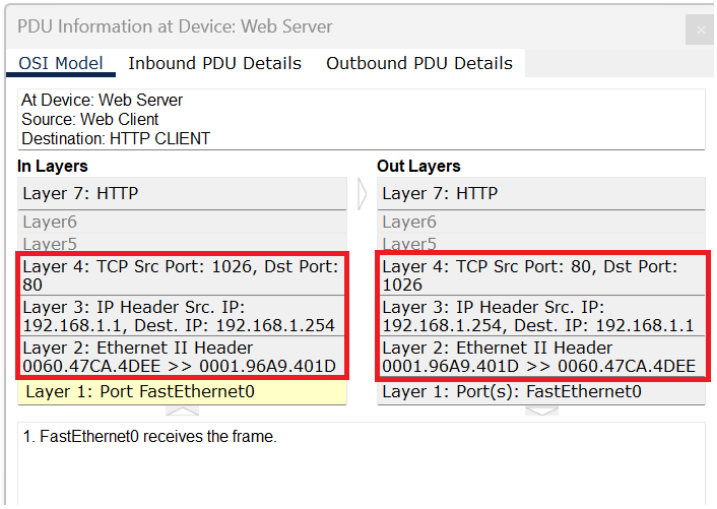
What is the common information listed under the **TCP** section of **PDU Details**, as compared to the information listed under the **OSI Model** tab, and with which layer is it associated?

The Source PORT (Scr PORT) and destination PORT (Dst PORT) and it's associated in layer 4.

What is the **Host** listed under the **HTTP** section of the **PDU Details**? Host: www.osi.local What layer would this information be associated with under the **OSI Model** tab? Layer 7

Comparing the information displayed in the **In Layers** column with that of the **Out Layers** column, what are the major differences?

The majors differences are in the layer 4, 3 ,2 where the TCP Scr and TCP dst Port, Scr IP address and Dst IP address, Mac address are interchanged in the In layer and Out Layer column as well the information in layer 1 and 7.



Click the **Inbound and Outbound PDU Details** tab. Review the PDU details.

Inbound: HTTP request

Outbound: HTTP response

PART TWO: Display Elements of the TCP/IP Protocol Suite

The following section is a step-by-step process on how to use the Packet Tracer Simulation mode to view and examine some of the other protocols comprising of TCP/IP suite.

Step 1: View Additional Events

In the Event List Filters > Visible Events section, click Show All/None.

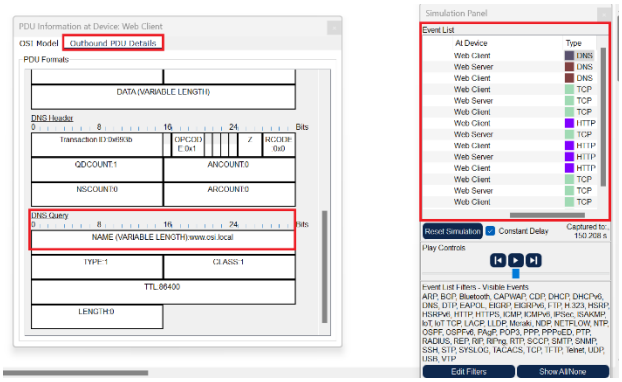
What additional Event Types are displayed? DNS and TCP

Click on the first DNS event in the Type column.

Click the Outbound PDU Details tab.

Question:

What information is listed in the NAME field: in the DNS QUERY section? www.osi.local

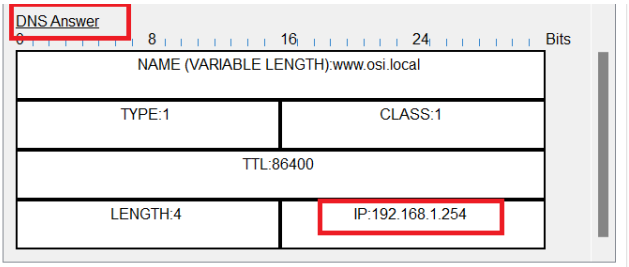


Click the last DNS Info colored square box in the event list.

Questions:

At which device was the PDU captured? Web Client

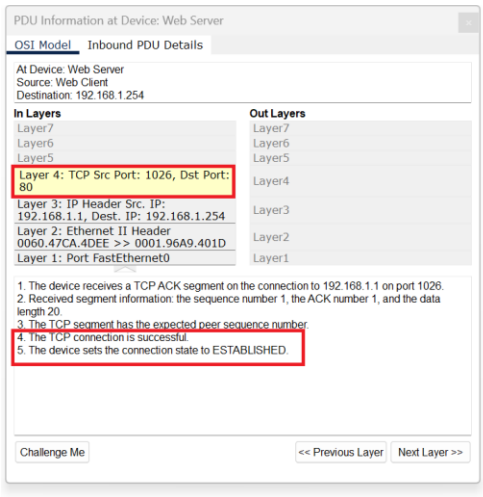
What is the value listed next to ADDRESS: in the DNS ANSWER section of the Inbound PDU Details? IP 192.168.1.254

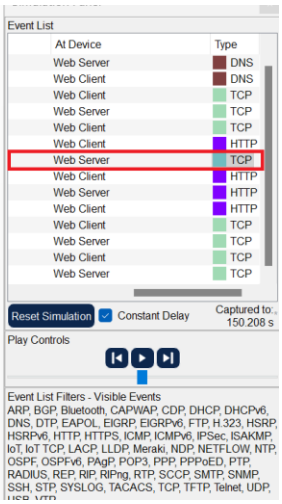


Find the first HTTP event in the list and click the colored square box of the TCP event immediately following this event. Highlight Layer 4 in the OSI Model tab.

Question:

In the numbered list directly below the In Layers and Out Layers, what is the information displayed under items 4 and 5? The TCP connection is successful, and the device sets the connection state to ESTABLISHED.





Click the last TCP event. Highlight Layer 4 in the OSI Model tab. Examine the steps listed directly below In Layers and Out Layers.

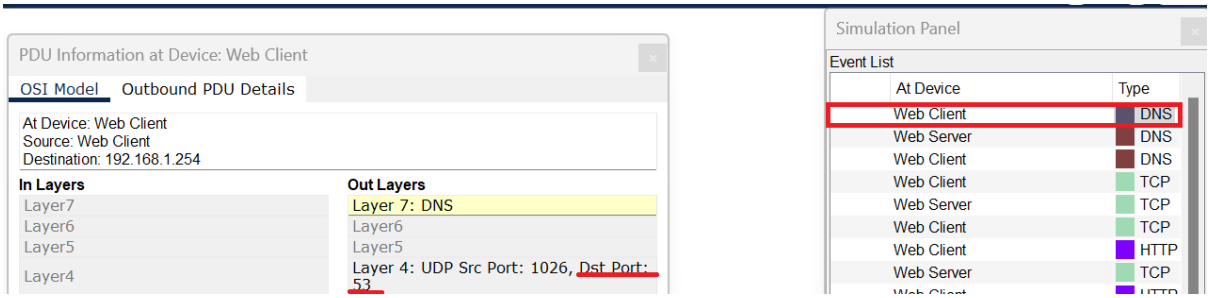
Question:

What is the purpose of this event, based on the information provided in the last item in the list (should be item 4)? Web server closed its connection hence the device sets the connection state to CLOSED.

Challenge Questions

Based on the information that was inspected during the Packet Tracer capture, what port number is the Web Server listening on for the web request? Port 80 (HTTP)

What port is the Web Server listening on for a DNS request? Port 53



In conclusion, Investigating the TCP/IP and OSI models in action provides a comprehensive understanding of how network communication occurs. In addition it provides knowledge on the protocols and ports that are at work and common in network communication.