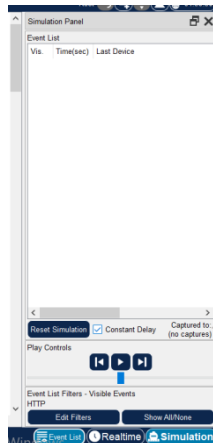
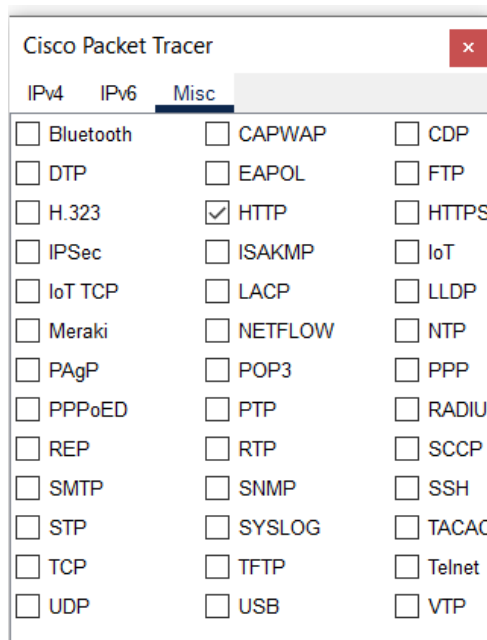


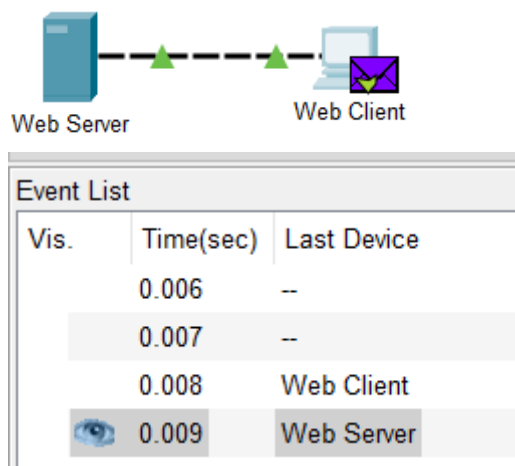
1. Click the **Simulation** mode icon to switch from **Realtime** mode to **Simulation** mode.



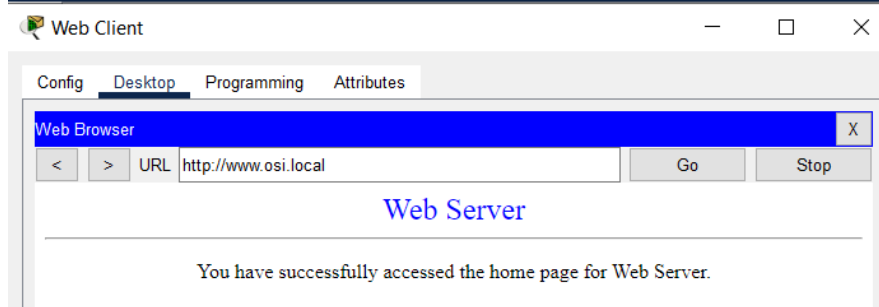
2. Select **HTTP** from the **Event List Filters**.



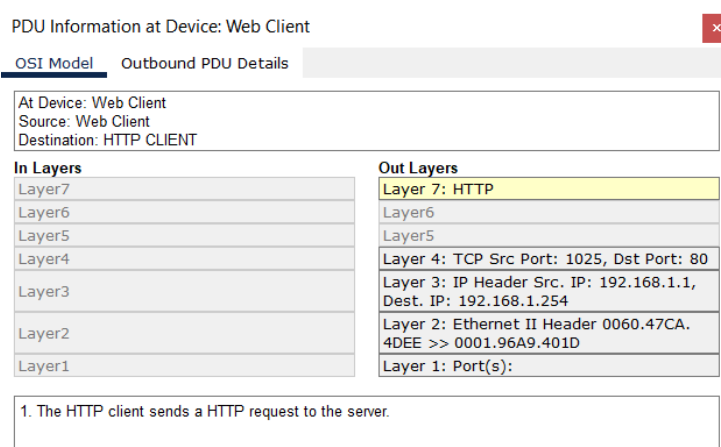
3. Click **Web Client** in the far left pane.
Click the **Desktop** tab and click the **Web Browser** icon to open it.
In the URL field, enter www.osi.local and click **Go**.
Click **Capture/Forward** four times. There should be four events in the Event List.



4. Look at the Web Client web browser page. Did anything change?



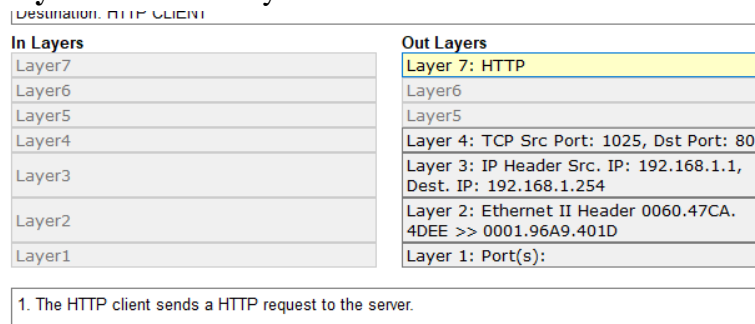
5. Click the first colored square box under the **Event List** -> **Type** column. It may be necessary to expand the **Simulation Panel** or use the scrollbar directly below the **Event List**.



6. Ensure that the **OSI Model** tab is selected.

Under the **Out Layers** column, click **Layer 7**.

What information is listed in the numbered steps directly below the **In Layers** and **Out Layers** boxes for Layer 7?



7. What is the **Dst Port** value for **Layer 4** under the **Out Layers** column?

Layer 4: TCP Src Port: 1025, Dst Port: 80

8. What is the **Dest. IP** value for **Layer 3** under the **Out Layers** column?

Layer 3: IP Header Src. IP: 192.168.1.1,
Dest. IP: 192.168.1.254

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

Layer 2: Ethernet II Header 0060.47CA.
4DEE >> 0001.96A9.401D

10. Click 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 **OSI Model** tab? With which layer is it associated?

SRC IP and DST IP at Layer 3

IP																															
0				4				8				16				20				24				28				32			
VER:4				IHL:5				DSCP:0x00								TL:122															
ID:0x0004																FLAGS: 0x2				FRAG OFFSET:0x000											
TTL:128								PRO:0x06								CHKSUM															
SRC IP:192.168.1.1																															
DST IP:192.168.1.254																															
DATA (VARIABLE LENGTH)																															

11. 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? *SRC PORT and DEST PORT at Layer 4*
12. What is the Host listed under the HTTP section of the PDU Details? What layer would this information be associated with under the OSI Model tab? *www.osi.local , Layer 7*
13. Click the next colored square box under the **Event List** -> **Type** column. Only Layer 1 is active (not grayed out). The device is moving the frame from the buffer and placing it on to the network.

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	Layer7
Layer6	Layer6
Layer5	Layer5
Layer4	Layer4
Layer3	Layer3
Layer2	Layer2
Layer1	Layer 1: Port(s): FastEthernet0

1. The device takes out this frame from the buffer and sends it.
2. FastEthernet0 sends out the frame.

- Comparing the information displayed in the **In Layers** column with that of the **Out Layers** column, what are the major differences? *The Src and Dst Ports, Src and Dst IPs and MAC addresses have been swapped.*
- Click the **Inbound and Outbound PDU Details** tabs. Review the PDU details.

PDU Information at Receiver: Web Client

OSI Model Outbound PDU Details

PDU Formats

The diagram illustrates the structure of an Ethernet II PDU. It is divided into two main sections: the first 14 bytes (0 to 14) and the remaining bytes (14 to 24+). The first section contains the PREAMBLE (101010...10), SF D (1 byte), DEST ADDR (0001.96A9.401D, 6 bytes), SRC ADDR (0060.47CA.4DEE, 6 bytes), TYPE (x0800, 2 bytes), and DATA (VARIABLE LENGTH, 15 bytes). The second section contains the FCS (0x00000000, 4 bytes). The second section is further divided into VER (4), IHL (5), DSCP (0x00, 1), TL (122, 2), ID (0x0004, 2), FLAGS (0x2, 1), FRAG OFFSET (0x000, 2), TTL (128, 2), PRO (0x06, 1), CHKSUM (2), SRC IP (192.168.1.1, 4), DST IP (192.168.1.254, 4), and DATA (VARIABLE LENGTH, 15 bytes).

16. Click the last colored square box under the **Info** column.

How many tabs are displayed with this event? Explain: **just 2, one for the OSI Model and one for Inbound PDU Details** because this is the receiving device.

PDU Information at Device: Web Client

OSI Model Inbound PDU Details

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

In Layers	Out Layers
Layer 7: HTTP	Layer7
Layer6	Layer6
Layer5	Layer5
Layer 4: TCP Src Port: 80, Dst Port: 1026	Layer4
Layer 3: IP Header Src. IP: 192.168.1.254, Dest. IP: 192.168.1.1	Layer3
Layer 2: Ethernet II Header 0001.96A9.401D >> 0060.47CA.4DEE	Layer2
Layer 1: Port FastEthernet0	Layer1

1. FastEthernet0 receives the frame.

17. Close any open PDU information windows. In the Event Filters > Visible Events section, click Show All/None. What additional Event Types are displayed?

Depending on whether any communication has occurred prior to starting the original simulation, there should now be entries for ARP, DNS, TCP and HTTP. It is possible that the Arp entries may not show, depending on what a student may have done prior to going to simulation mode. If the activity is started from scratch all of those will be listed.

18. Click the first DNS event in the **Type** column. Explore the **OSI Model** and **PDU Detail** tabs and note the encapsulation process. As you look at the **OSI Model** tab with **Layer 7** highlighted, a description of what is occurring is listed directly below the **In Layers** and **Out Layers**.

PDU Information at Device: Web Client

OSI Model Outbound PDU Details

At Device: Web Client
Source: Web Client
Destination: 192.168.1.254

In Layers	Out Layers
Layer7	Layer 7: DNS
Layer6	Layer6
Layer5	Layer5
Layer4	Layer 4: UDP Src Port: 1025, Dst Port: 53
Layer3	Layer 3: IP Header Src. IP: 192.168.1.1, Dest. IP: 192.168.1.254
Layer2	Layer 2:
Layer1	Layer1

1. The DNS client sends an A DNS query to the DNS server.

19. Click the **Outbound PDU Details** tab.

OSI Model Outbound PDU Details

PDU Formats

IP

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 Bits

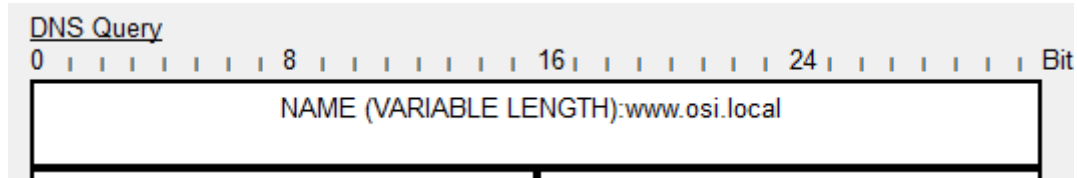
VER:4	IHL:5	DSCP:0x00	TL:57
ID:0x0001		FLAGS:0x0	FRAG OFFSET:0x000
TTL:128	PRO:0x11	CHKSUM	
SRC IP:192.168.1.1			
DST IP:192.168.1.254			
DATA (VARIABLE LENGTH)			

UDP

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 Bits

SOURCE PORT:1025		DESTINATION PORT:53	
LENGTH:0x0025		CHECKSUM:0	
DATA (VARIABLE LENGTH)			

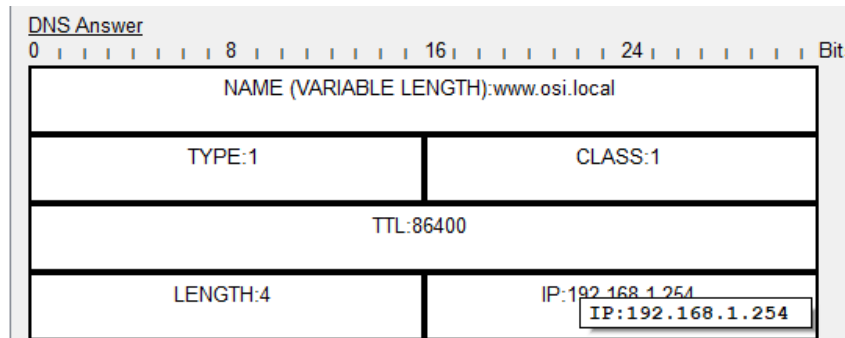
20. What information is listed in the **MANE** field in the DNS QUERY section?



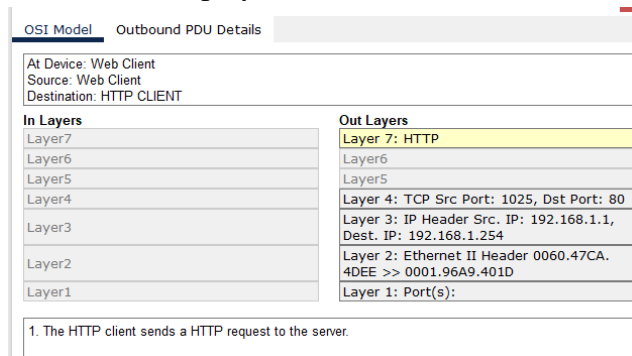
21. Click the last DNS **Info** colored square box in the event list.

At which device was the PDU captured? What is the value listed next to **ADDRESS** in the DNS ANSWER section of the **Inbound PDU Details**?

At device Web Client

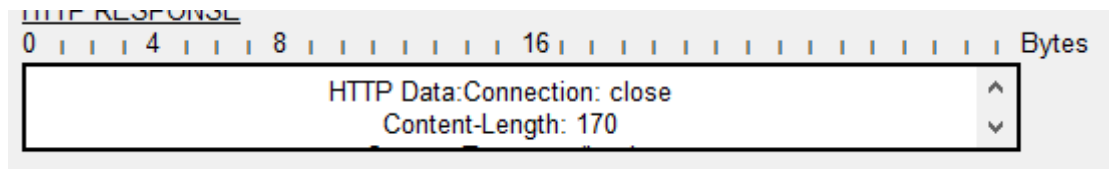


22. Find the first **HTTP** event in the list and click the colored square box of the **TCP** event immediately following this event. Highlight **Layer 4** in the **OSI Model** tab. In the numbered list directly below the **In Layers** and **Out Layers**, what is the information displayed under items 4 and 5?



23. Click the last TCP event. Highlight Layer 4 in the **OSI Model** tab. Examine the steps listed directly below **In Layers** and **Out Layers**. What is the purpose of this event, based on the information provided in the last item in the list (should be item 4)?

Connection close.



24. 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?

The first HTTP PDU being requested by the Web Client shows port 80 under the Layer 4 DST port.

25. What port is the Web Server listening on for a DNS request?

The first DNS PDU being requested by the Web Client shows a Layer 4 destination of a port 53.