CSE 421 **ID:** 19201128

Transport Layer Protocols (TCP) Examination Lab

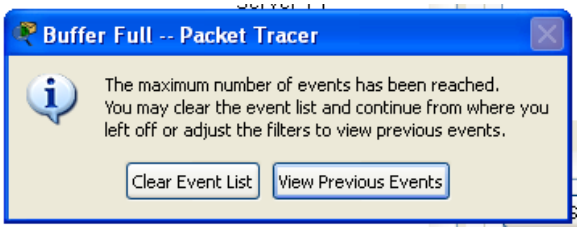
Objectives:

Capture traffic and observe the PDUS for TCP when a HTTP request is made.
.

Task 1: Observe TCP traffic exchange between a client and server.

Step 1 – Run the simulation and capture the traffic.

- Enter **Simulation** mode.
- Check that your Event List Filters shows only **HTTP** and **TCP**.
- Click on the PC1. Open the **Web Browser** from the **Desktop**.
- Enter **www.bracu.ac.bd** into the browser. Clicking on **Go** will initiate a web server request. Minimize the Web Client configuration window.
- A TCP packet appears in the **Event List**, as we will only focus on TCP the DNS and ARP packets are not shown.
- Click the **Auto Capture / Play** button to run the simulation and capture events.
- Sit tight and observe the packets flowing through the network.



- When the above message appears Click “View Previous Events".
- Click on PC1. The web browser displays a web page appears.

Step 2 – Examine the following captured traffic.

Our objective in this lab is only to observe TCP traffic.

	Last Device	At Device	Type
1.	PC1	Switch 0	TCP
2.	Local Web Server	Switch 1	TCP
3.	PC1	Switch 0	HTTP
4.	Local Web Server	Switch 1	HTTP
5.	PC1 (after HTTP response)	Switch 0	TCP
6.	Local Web Server	Switch 1	TCP
7.	PC1	Switch 0	TCP

- As before find the following packets given in the table above in the **Event List**, and click on the colored square in the **Info** column.

- When you click on the Info square for a packet in the event list the **PDU Information** window opens. If you click on these layers, the algorithm used by the device (in this case, the PC) is displayed. View what is going on at each layer.

For packet 1::

Click onto “Inbound PDU details” tab. Scroll down and observe the TCP header.

A. What is this TCP segment created by PC1 for? How do you know what is it for?

The TCP segment created by PC1 is for to make TCP connection with the local web server. We know it by sequence number and Acknowledgement numbers.

B. What control flags are visible?

The Sync control flag is visible.

C. What are the sequence and acknowledgement numbers?

Sequence number is 0 and Acknowledgement number is 0.

For packet 2:

Click onto “Inbound PDU details” tab. Scroll down and observe the TCP header.

A. Why is this TCP segment created by the Local Web Server?

This TCP segment created by the Local Web Server for the Acknowledgment purpose.

B. What control flags are visible?

Sync flag and Acknowledgement flag is visible.

C. Why is the acknowledgement number “ 1”?

Since the web server provides Acknowledgement of request PC1 so, that is the reason of Acknowledgement 1.

For packet 3:

This HTTP PDU is actually the third packet of the “Three Way Handshake” process, along with the HTTP request.

A. Explain why control flags **ACK(Acknowledgement)** and **PSH (Push)** are visible in the TCP header?

ACK ensures PC1 received the packet and connection with the local server is confirmed.

PSH ensures that local web server pushes HTTP request to the Application layer.

For packet 5:

After PC1 receives the HTTP response from the Local Web Server, it again sends a TCP packet to the Local Web server why?

The reason is to terminate the connection with local web server.

Click onto “Inbound PDU details” tab. Scroll down and observe the TCP header.

A. What control flags are visible?

FIN flag and ACK flag.

B. Why the sequence number is 104 and acknowledge number 254? Note this packet is created after PC1 receives the HTTP response from the server.

Sequence number is 104 because 104th packet is being sent Acknowledgement number is 254 because the packet that is suppose to be sent is 254th packet.

For packet 6:

Click onto “Inbound PDU details” tab. Scroll down and observe the TCP header.

What is this packet sent from the webserver to PC1 for?

The packet sent from the webserver to PC1 to terminate TCP connection.

What control flags are visible?

FIN flag and ACK flag are visible.

Why the sequence number is 254?

The sequence number is 254 because the packet that is suppose to be sent is 254th packet.