CSE 421 **ID:** 20301121

Transport Layer Protocols (TCP) Examination Lab

Objectives:

Capture traffic and observe the PDUS for TCP when a HTTP request is made.
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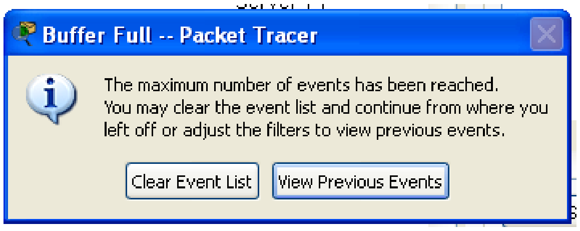
Task 1: Observe TCP traffic exchange between a client and server.

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.


Buffer Full -- Packet Tracer

The maximum number of events has been reached. You may clear the event list and continue from where you left off or adjust the filters to view previous events.

- 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?

It is to establish connection by seeing the SYN flag. The sequence no. is 0 and the

acknowledge no is also 0. it means is requesting the server side.

B. What control flags are visible?

SYN flag

C. What are the sequence and acknowledgement numbers?

Sequence number 0 and acknowledge number 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?

it indicates that the local web server acknowledge the request for TCP connection

B. What control flags are visible?

The ACK and the SYN flags are visible.

C. Why is the acknowledgement number “ 1”?

1 it means the local web server has acknowledge the request for TCP

connection made by PC1

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 flag is visible because PC1 has acknowledged the TCP packet

sent by the server and PSH (Push) flag is visible as PC1 wants the server to send.

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?

For termination

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

A. What control flags are visible?

ACK and FIN.

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.

The sequence number is 104 because previous one is 103 and

acknowledge number is 254 because it expects the next packet to be 254.

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?

Acknowledgeing the request for closure of the TCP connection by PC1.

What control flags are visible?

ACK and FIN.

Why the sequence number is 254?

It is the last segment sent by the local web server because there is no more data.