

## Application Layer Protocols (HTTP,SMTP/POP)

### Examination Lab

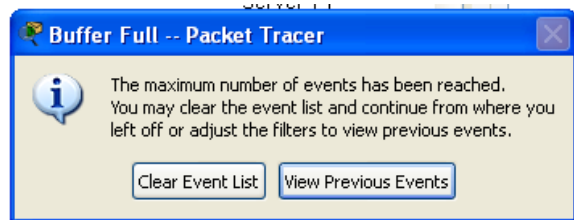
#### Objectives:

Capture traffic and observe the PDUS for HTTP, SMTP, POP.

#### **Task 1: Observe HTTP traffic exchange between a client and server.**

##### **Step 1 – Run the simulation and capture the traffic.**

- Enter **Simulation** mode.
- 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.
- Two packets appear in the **Event List**, a DNS request needed to resolve the URL to the IP address of the web server and an ARP request needed to resolve the IP address of the server to its hardware MAC address.
- 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 HTTP traffic.

	Last Device	At Device	Type
1.	PC1	Switch 0	HTTP
2..	Local Web Server	Switch 1	HTTP

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

(sec)	Last Device	At Device	Type	Info
--		PC1	DNS	
--		PC1	ARP	
PC1		Switch0	ARP	
Switch0		PC0	ARP	
Switch0		Switch1	ARP	

- 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.

- Examine the PDU information for the remaining events in the exchange.

**For packet 1::**

What kind of HTTP packet is packet no. 1?

It's an HTTP request packet for packet no.1.

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Click onto "Inbound PDU details" tab. Scroll down at the end, what do you see?

I see the TCP information, and HTTP request, "HTTP Data:Accept-Language: en-us  
Accept: \*/\*"

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**For packet 2:**

Click onto "Inbound PDU details" tab. Scroll down at the end, what do you see? What kind of HTTP packet is this?

This is a response protocol where the header specifies that the connection will be terminated after sending the response, which has a content length of 151 bytes.

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**Task 2: Observe email traffic exchange between a client and email server using SMTP and POP3.**

**Step 1 – Run the simulation and capture the traffic.**

- On the Event List window click "Reset Simulation" button. All previous packets will disappear.
- At the bottom of the Event List window, there is a filter which filters the protocols that we want to see. Click Edit filters. Another window appears showing different protocols, unclick HTTP and click SMTP and POP3.



- Click a space anywhere outside the popup window, then it will disappear.
- Your Event List Filter should be as shown below:

Event List Filters

Visible Events: ARP, DNS, POP3, SMTP

- Now click on the PC1. Close the web browser window. Open the **Email** from the **Desktop**. A mail browser window will open. Click “compose”, another window appears.

Compose Mail

To: sakib@bracu.ac.bd

Subject: Hello

- Fill the window as shown and press send.
- Minimize the client window .
- Click the **Auto Capture / Play** button to run the simulation and capture events.
- Sit tight and observe the packets flowing through the network.
- This interaction is between the sender client and its email server.

## Step 2 – Examine the following captured traffic.

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

	Last Device	At Device	Type
3.	PC1	Switch 0	DNS
4.	PC1	Switch 0	SMTP
5.	Bracu Email Server	Switch 1	SMTP

- Find the following packets given in the table above in the **Event List**, and click on the colored square in the **Info** column.
- Examine the PDU information.

### **For packet 4::**

What is the purpose of this DNS packet?

The DNS packet's function is to translate human-readable domain names into machine-readable IP addresses, as machines cannot interpret natural languages like humans do.

### **For packet 5& 6::**

Explain why SMTP packet was sent to the email server and the server replied with an SMTP packet?

The server responded with an SMTP packet containing a status code, such as 250 for success or 421 for service unavailability. The receiver then sends a reply indicating the status of the sent packet, whether it was successfully received, encountered authorization issues, or faced other delivery challenges.

### Step 3 – Run the simulation and capture the traffic for POP.

- On the Event List window click “Reset Simulation” button. All previous packets will disappear.
- Now click on the PC0. Open the **Email** from the **Desktop**. A mail browser window will open. Click “**receive**”, minimize the window.
- Click the **Auto Capture / Play** button to run the simulation and capture events.
- Sit tight and observe the packets flowing through the network.
- This interaction is between the sender client and its email server.

### Step 2 – Examine the following captured traffic.

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

	Last Device	At Device	Type
6.	PC1	Switch 0	DNS
7.	PC1	Switch 0	POP3
8.	Bracu Email Server	Switch 1	POP3

- Find the following packets given in the table above in the **Event List**, and click on the colored square in the **Info** column.
- Examine the PDU information.

#### For packet 6::

What is the purpose of this DNS packet?

The purpose of this DNS packet is to retrieve the IP address of the BRACU email server since machines cannot interpret domain names like, bracu.ac.bd directly. DNS translates this into a numerical format that computers can understand and use for communication.

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#### For packet 7&8::

Explain why POP packet was sent to the email server and the server replied with a POP packet?

The server responded with a POP packet containing the status code +OK, indicating a successful operation. Without this response, the sender would have no confirmation that their packet was successfully received.

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