CSE 421 ID: 19301151

Application Layer Protocols (HTTP.SMTP/POP) Examination Lab

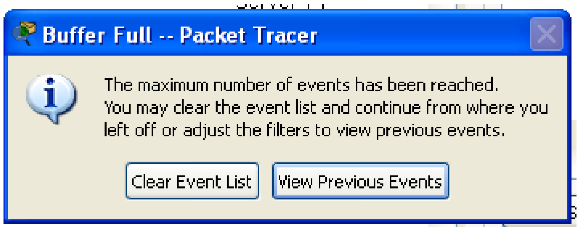
Objectives:

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.



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.

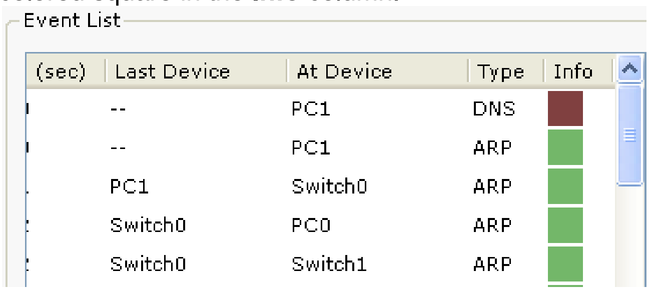
- When the above message appears Click “View Previous Events".
- Click on PC1. The web browser displays a web page appears.

Step 2 – Examine the following captured traffic.

Our objective in this lab is only to observe 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.



Event List

(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?

The packet no. 1 is HTTP REQUEST packet.

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

At the end of the Inbound PDU Details we see there is HTTP REQUEST tab which accept language is en-us.

For packet 2:

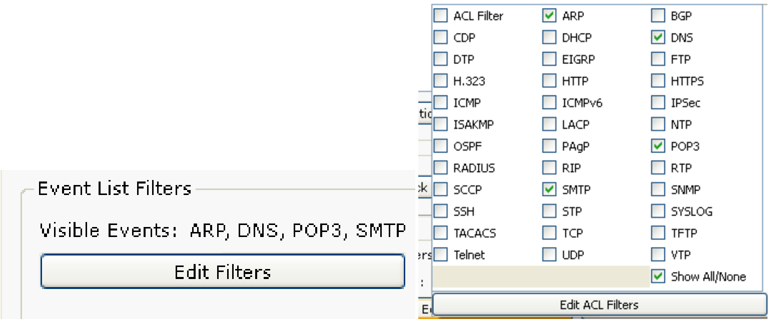
Click onto “Inbound PDU details” tab. Scroll down at the end, what do you see? What kind of HTTP packet is this?

At the end of the inbound PDU details of packet 2 we can there is portion for HTTP RESPONSE. From that we can say that this HTTP packet is actually a Response packet with a content-length 151 and data connection is close. i.e. it sends a data of length 151 to the client and close the http data connection for now.

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.

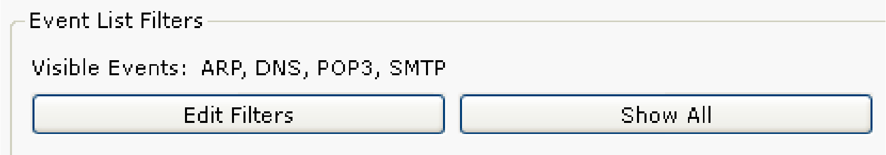


Event List Filters

Visible Events: ARP, DNS, POP3, SMTP

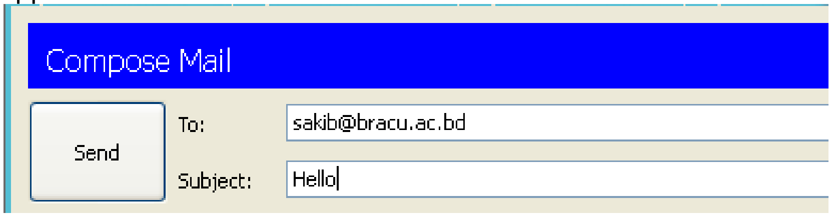
□ ACL Filter	☑ ARP	□ BGP
□ CDP	□ DHCP	☑ DNS
□ DTP	□ EIGRP	□ FTP
□ H.323	□ HTTP	□ HTTPS
□ ICMP	□ ICMPv6	□ IPSec
□ ISAKMP	□ LACP	□ NTP
□ OSPF	□ PAgP	☑ POP3
□ RADIUS	□ RIP	□ RTP
□ SCCP	☑ SMTP	□ SNMP
□ SSH	□ STP	□ SYSLOG
□ TACACS	□ TCP	□ TFTP
□ Telnet	□ UDP	□ VTP
		☑ Show All/None

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



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.



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?

DNS packet is used to resolve the domain name of the email's recipient. The purpose of the DNS packet is to obtain the IP address of the mail server responsible for handling incoming and outgoing email for that domain.

For packet 5& 6::

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

SMTP is the standard protocol for sending emails over the internet. When we send an email, SMTP packets are used to establish communication between the sender's email client and the recipient's email server. These packets are exchanged between the client and server to facilitate the transmission of the email.As we establishing a email communication with a server that's why SMTP packet was sent to the email serverand the server replied with an SMTP packet. Just like when we browse a page we send a HTTP request to the server and got a HTTP response in back from the server.

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?

DNS packet is used to resolve the domain name of the email's sender's sever. The purpose of the DNS packet is to obtain the IP address of the mail server responsible for handling incoming and outgoing email for that domain.

For packet 7&8::

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

When retrieving email messages from an email server, the POP protocol is mostly used. POP packets are sent between the email client (POP client) and the email server (POP server) to facilitate the retrieval of emails. The POP client initiates communication by sending POP packets, and the POP server responds with appropriate POP packets. Just like while sending the email we have used the SMTP packet and got a SMTP in response.

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