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ANALYZING TRANSPORT LAYER PROTOCOLS USING WIRESHARK

Date :- 27-10-2022

Aim :- To analyze Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) using wireshark.

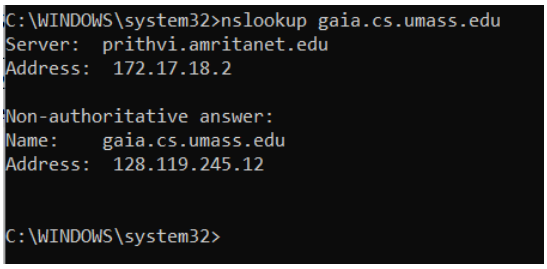
Tools Required :- Windows OS , CMD with Administrator privilege , Wireshark.

Procedure :-

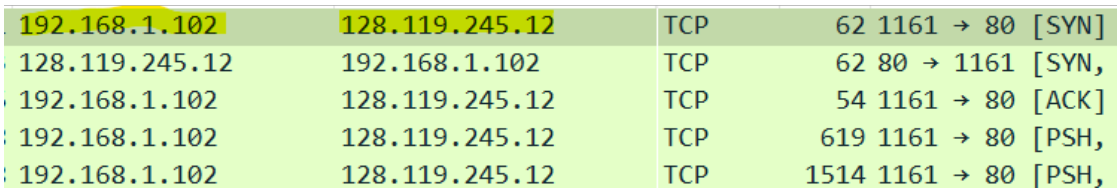
Opening “tcp” pcap file in wireshark.

a. What is the IP address and TCP port number used by the client computer (source) that is transferring the file to gaia.cs.umass.edu?

IP address of gaia.cs.umass.edu



Source and Destination addresses:



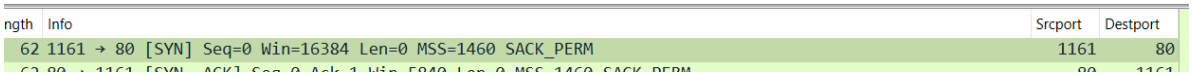
b. What is the IP address of gaia.cs.umass.edu? On what port number is it sending and receiving TCP segments for this connection?

IP address : 128.119.245.12

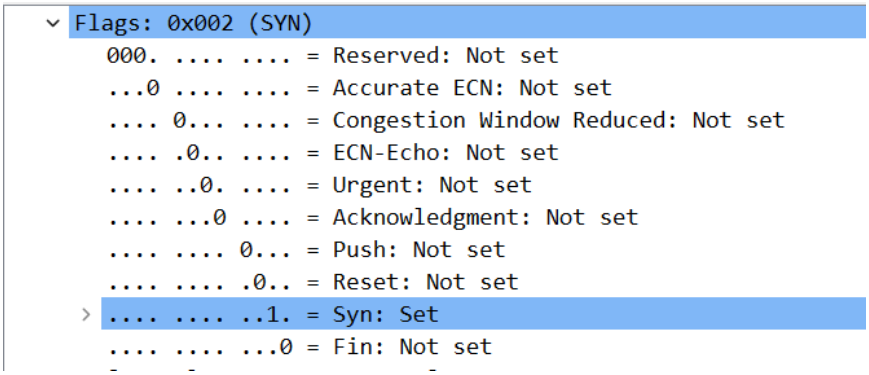
1161	80
80	1161
1161	80
1161	80
1161	80

c. What is the sequence number of the TCP SYN segment that is used to initiate the TCP connection between the client computer and gaia.cs.umass.edu? What is it in the segment that identifies the segment as a SYN segment?

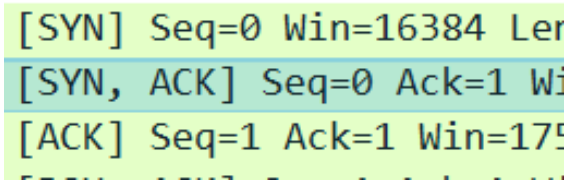
Sequence Number : 0



SYN Segment



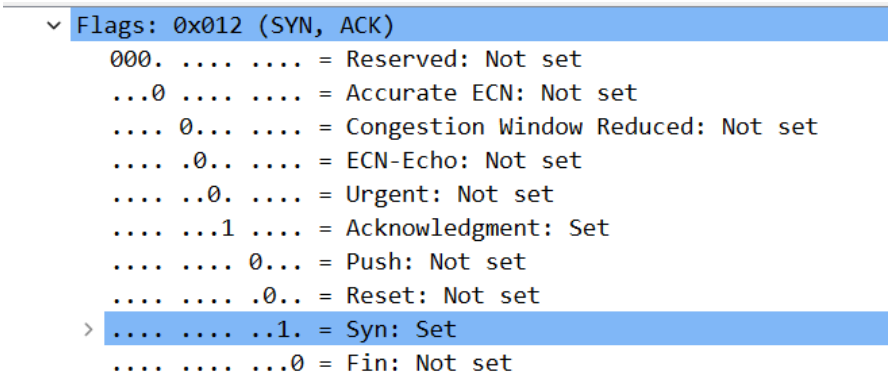
d. What is the sequence number of the SYNACK segment sent by gaia.cs.umass.edu to the client computer in reply to the SYN? What is the value of the Acknowledgement field in the SYNACK segment? How did gaia.cs.umass.edu determine that value?



Sequence Number of SYNACK : 0
Acknowledgement of SYNACK : 1

gaia.cs.umass.edu determined the ACK value by incrementing 1 to the sequence value as a part of TCP communication .

What is it in the segment that identifies the segment as a SYNACK segment?



e. What is the sequence number of the TCP segment containing the HTTP POST command? Note that in order to find the POST command, you'll need to dig into the packet content field at the bottom of the Wireshark window, looking for a segment with a "POST" within its DATA field.

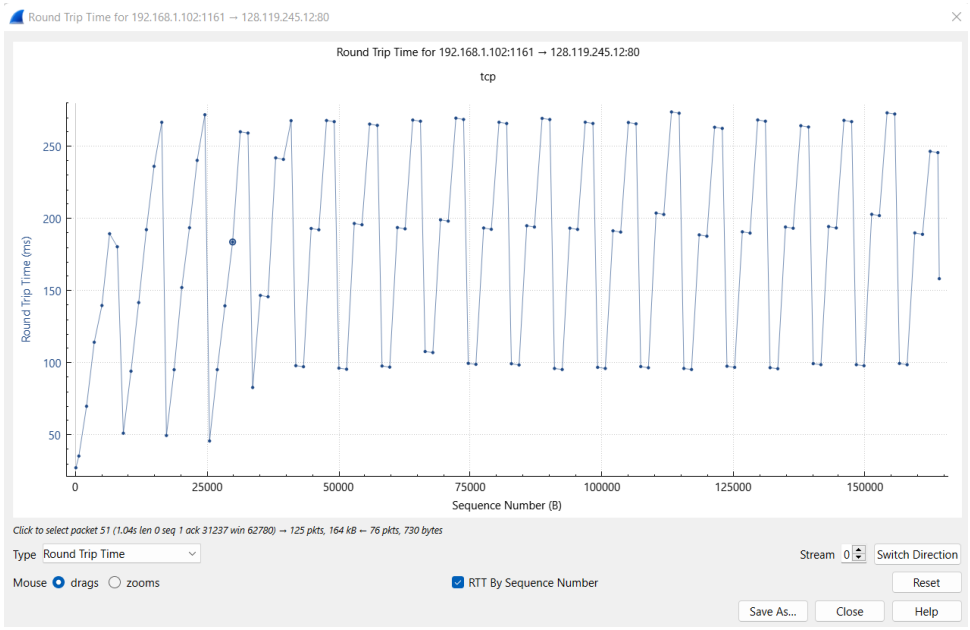
Sequence No of TCP containing HTTP POST command : 1

```
TCP        619 1161 → 80 [PSH, ACK] Seq=1 Ack=1 Win=17520 Len=565 [TCP segment of a reassembled PDU]
```

Wireshark · Packet 4 · tcp

```
> Frame 4: 619 bytes on wire (4952 bits), 619 bytes captured (4952 bits)
> Ethernet II, Src: Actionte_8a:70:1a (00:20:e0:8a:70:1a), Dst: LinksysG_da:af:73 (00:06:25:da:af:73
> Internet Protocol Version 4, Src: 192.168.1.102, Dst: 128.119.245.12
v Transmission Control Protocol, Src Port: 1161, Dst Port: 80, Seq: 1, Ack: 1, Len: 565
    Source Port: 1161
    Destination Port: 80
    [Stream index: 0]
    [Conversation completeness: Incomplete, DATA (15)]
    [TCP Segment Len: 565]
    Sequence Number: 1    (relative sequence number)
    Sequence Number (raw): 232129013
    [Next Sequence Number: 566    (relative sequence number)]
```

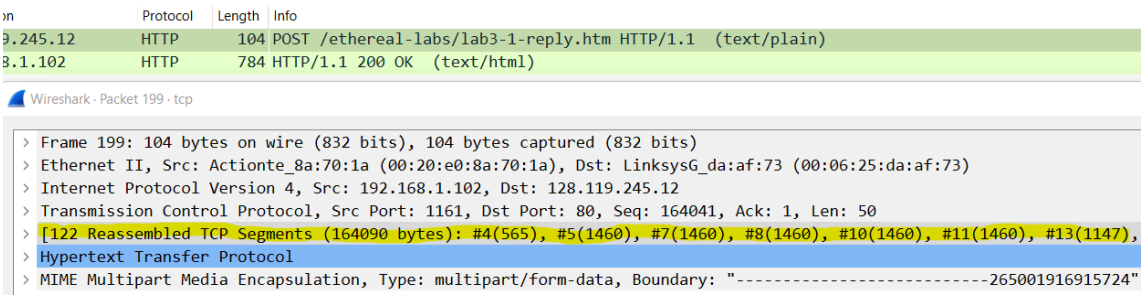
f. Plot the RTT graph using Wireshark.



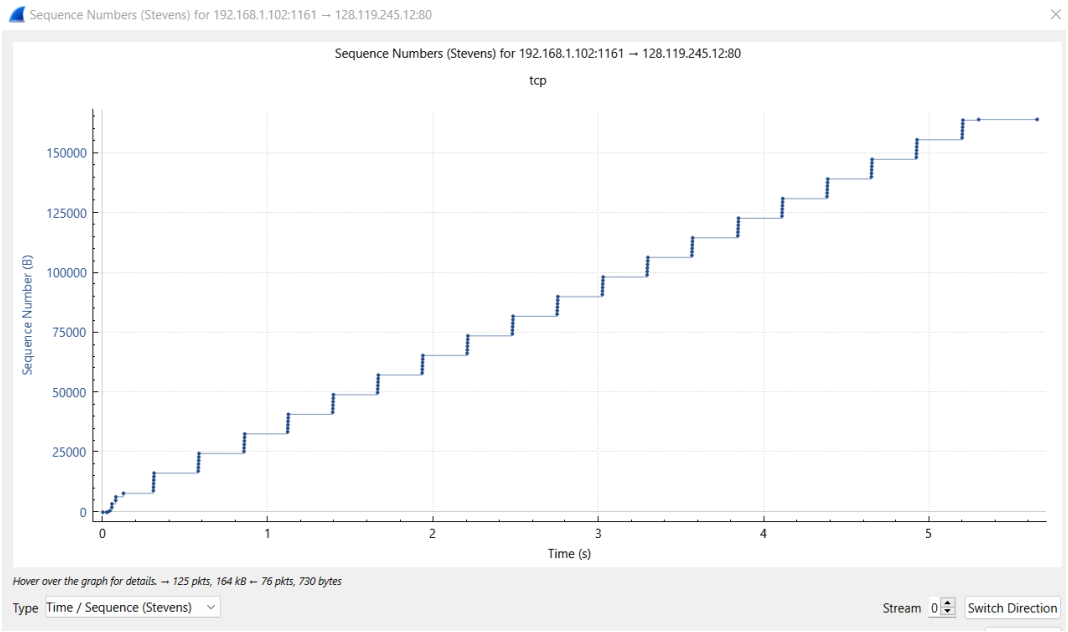
g.What is the length of each of the first six TCP segments (HTTP POST)?

Length of first six TCP segments :

565 , 1460 , 1460 , 1460 , 1460 , 1460

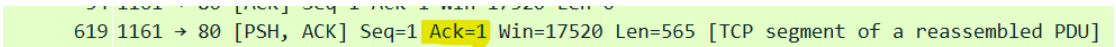


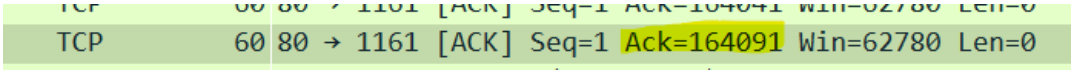
h. Are there any retransmitted segments in the trace file? What did you check for (in the trace) in order to answer this question?

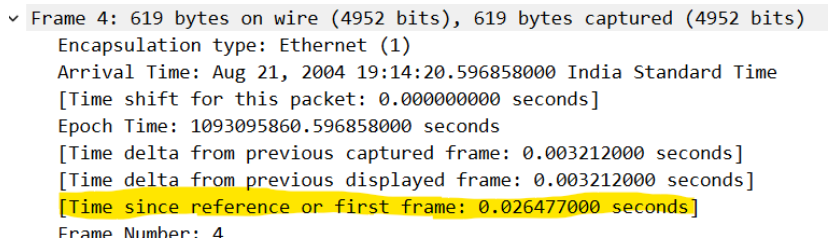


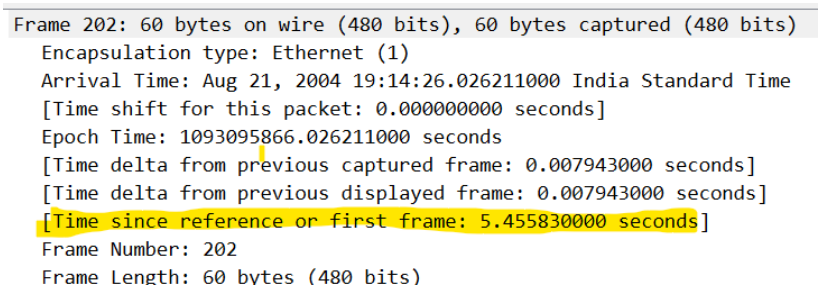
i. What is the throughput (bytes transferred per unit time) for the TCP connection? Explain how you calculated this value.

Throughput = Total amount of Data transferred / Total time taken





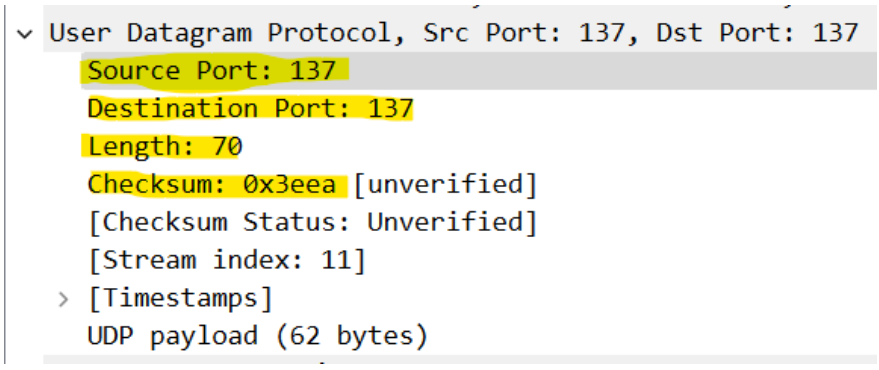




164090 / 5.429353 = 30,222.754 bytes per second
30.222 kilobytes/second

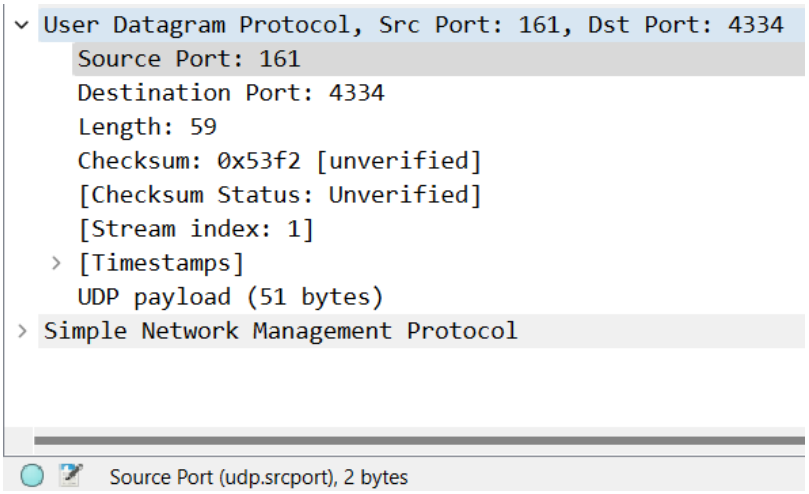
Opening the “udp” pcap file.

j. Select one UDP packet from your trace. From this packet, determine how many fields the are in the UDP header. Name these fields.



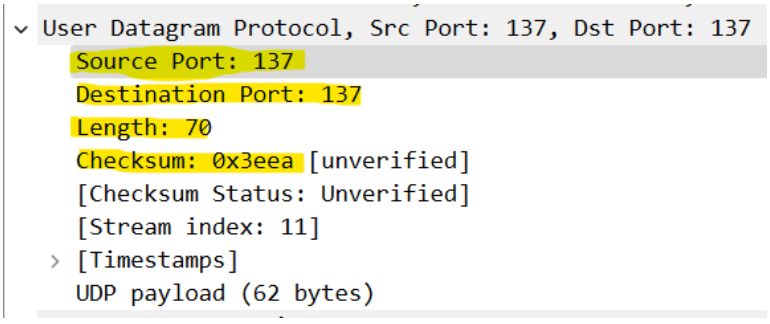
Source Port , Destination Port , Length , Chechksum

k. By consulting the displayed information in Wireshark's packet content field for this packet, determine the length (in bytes) of each of the UDP header fields.



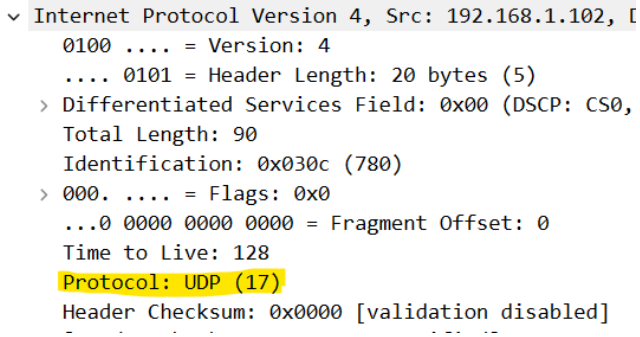
Source Port : 2 Bytes
Destination Port : 2 Bytes
Length : 2 Bytes
Checksum : 2 Bytes

l. The value in the Length field is the length of what? Verify your claim with your captured UDP packet.



Length : 70
UDP payload + Header length = Length
62 + 8 = 70

m. What is the protocol number for UDP? Give your answer in both hexadecimal and decimal notation.



Protocol No for UDP is : 17
Hexadecimal Notation : 11

n. Examine a pair of UDP packets in which your host sends the first UDP packet and the second UDP packet is a reply to this first UDP packet. (Hint: for a second packet to be sent in response to a first packet, the sender of the first packet should be the destination of the second packet). Describe the relationship between the port numbers in the two packets.

Destination	Protocol	Length	Info	Srcport	Destport
192.168.1.104	SNMP	92	get-request 1.3.6.1.4.1.11.2.3.9.4.2.1.2.2.2.1.0	4334	161
192.168.1.102	SNMP	93	get-response 1.3.6.1.4.1.11.2.3.9.4.2.1.2.2.2.1.0	161	4334

Sourceport : 4334
Destination port : 161

Result :- Analyzing TCP and UDP protocols using wireshark is successfully done.