

# CS 349: Networks Lab

(January-May 2019)

## Assignment – 2: Network Protocol Analysis Using Wireshark

**Submission Deadline: 11:55 pm on Friday, 15th February 2019 (hard deadline)**

Wireshark is a free and open-source packet sniffer and network protocol analyser tool. It helps to capture network packets and understand the structure of different networking protocols.

### Instructions:

- ⇒ Install Wireshark (download from [www.wireshark.org](http://www.wireshark.org)), and learn how to capture packets and filter the required content.
- ⇒ A specific application is assigned to each student (refer to **Table 1** below). Each student needs to perform various activities according to functionalities available in the assigned application and collect the traces for the application using Wireshark. Application-specific activities, if any, are mentioned in the table.
- ⇒ You should carry out your experiments across different network conditions including different time(s) of the day and locations (e.g., lab or hostel, etc.).
- ⇒ It is advisable to provide only trace-based description while answering the questions. While answering, provide snapshots of the traces in the report and highlight the content as and when required.
- ⇒ If something is missing/incorrect in a problem description, clearly mention the assumption with your answer.
- ⇒ Be precise with your answers; there is no credit for being unnecessarily verbose (may award you negative marks for the same). Unless specified otherwise, do not describe the tool or application or protocol in general.

### Questions:

1. List out all the protocols used by the application at different layers (only those which you can figure out from traces). Study and briefly describe their packet formats.
2. Highlight and explain the observed values for various fields of the protocols. Example: Source or destination IP address and port number, Ethernet address, protocol number, etc.
3. Explain the sequence of messages exchanged by the application for using the available functionalities in the application. For example: upload, download, play, pause, etc. Check whether there are any handshaking sequences in the application. Briefly explain the handshaking message sequence, if any.
4. Explain how the particular protocol(s) used by the application is relevant for functioning of the application.
5. Calculate the following statistics from your traces while performing experiments at different time of the day: Throughput, RTT, Packet size, Number of packets lost, Number of UDP & TCP packets, Number of responses received with respect to one request sent. Report the observed values in your answer, preferably using tables.
6. Check whether the whole content is being sent from same location/source. List out the IP addresses of content providers if multiple sources exist, and explain the reason behind this.

### Method of submission:

- **Submit a soft copy of the report, preferably in PDF format, together with your collected traces in a zip file on Moodle. The name of the zip file should be like “Your\_Rollno.zip” (example: “140101002.zip”).**
- **Files submitted without proper naming format will not be evaluated.**
- **If your trace file size is larger than 2 MB, (as you will not be able to upload the file on Moodle) you are advised to provide the OneDrive/Google Drive/Dropbox link of the traces in your report.**

### Note:

- **The deadline for submission must be strictly followed. Any submission done after the deadline will not be considered for evaluation.**
- **The report should not contain more than 6-7 pages.**
- **Plagiarism (copy cases) and other unfair means will be strictly punished by awarding NEGATIVE marks (equal to the maximum marks for the assignment).**

**Table 1: Assignment of applications to students (part 1 of 3)**

Sl. No.	Application Name/Type	Roll Number of Student	Name of Student
1	<b>Dailymotion</b> Activity: Uploading and Downloading videos	150101008	ANKIT VYAS
		160101008	ABHISHEK RANJAN
		160101020	BEDADHALA MANOJ REDDY
		160101031	HARSHIT GUPTA
		160101043	MOHIT SINGH
		160101055	RITIK AGRAWAL
		160101066	SHIVAM KUMAR
		160101078	WAKADE YUGANDHAR MORESHWAR
		160123001	AASHUTOSH AGRAWAL
		160123012	ISHAN AZAD
		160123024	NEELABH TIWARI
		160123039	SHREYA JAIN
		160123052	SAYANI KUNDU
2	<b>DC++</b> Activity: Uploading and Downloading large files	150101028	JIGNYASU RASESH CHASMAWALA
		160101009	ABHISHEK SURYAVANSHI
		160101021	BHADKE RAJAS JAGANNATH
		160101032	HARSHIT SHARMA
		160101044	MUKUL VERMA
		160101056	SACHIN CHOUHAN
		160101067	SHREYANSHI BHARADIA
		160101079	YAGYANSH BHATIA
		160123002	ABHISHEK DOGRA
		160123013	KAMANA VISHNU VARDHAN REDDY
		160123025	NEHA ORAON
		160123041	THIRTHALA UDAYASRI
		160123053	M SIVA VENKATA RANGA REDDY
3	<b>Dropbox</b> Activity: Uploading and Downloading large files	150101030	KRISHNA KUMAR
		160101010	ADITYA CHOUHAN
		160101022	BODDU HARI
		160101033	HARSHIT SRIVASTAVA
		160101045	MYNENI LAKSHMISAIDURGA
		160101057	SAHIB KHAN
		160101068	SHUBHENDU PATIDAR
		160101080	YASH RATHORE
		160123003	ANIMESH KUMAR
		160123014	KARTIKEY KANT
		160123027	NISHANT JAIN
		160123043	YASH KUMAR
		160123054	DEEPAK KUMAR GOUDA

**Table 1: Assignment of applications to students (part 2 of 3)**

Sl. No.	Application Name/Type	Roll Number of Student	Name of Student
4	<b>Google Hangout</b>	150123023	MD IMTIYAZ
		160101011	AKHIL CHANDRA PANCHUMARTHI
		160101023	CHANDRA PRAKASH MEENA
		160101034	HEMANT YADAV
		160101046	NAMIT KUMAR
		160101058	SAHIL GARHWAL
		160101069	SHUBHAM KUMAR KOUL
		160101081	DEBANGSHU BANERJEE
		160123004	ANKAM AMAN SAI
		160123015	KODALI NAGA SAI ANIRUDH
		160123028	PRANAV JANGIR
		160123044	YASH KOTHARI
		160123026	NIPENDRA SINGH
5	<b>Live Sports Streaming</b>	160101001	AADIL HODA
		160101012	ANSH SOOD
		160101024	DAMAN TEKCHANDANI
		160101035	INDERPREET SINGH CHERA
		160101047	NIKHIL KUMAR
		160101059	SAMYAK JAIN
		160101070	SHUBHANKER JAUHARI
		160101082	AMEYA DAIGAVANE
		160123005	ANURAG BARFA
		160123016	KSHITIJ NAYAR
		160123029	PRANAV SINGH MUKATI
		160123045	YERNENA SRINIVAS NAIDU
6	<b>NPTEL/Coursera video lectures</b>	160101002	AAYUSH SANJAY AGARWAL
		160101013	APURVA N SARAOGI
		160101025	DIVYAM AGARWAL
		160101036	JATIN GOYAL
		160101048	NITIN KEDIA
		160101060	SANCHIT JANGIR
		160101071	SIDDHARTH SHARMA
		160101083	SHUBHAM GOEL
		160123006	ASHISH RANJAN
		160123017	KULDEEP SHARMA
		160123030	RAHUL KUMAR GUPTA
		160123046	RAJAT PALIWAL
7	<b>Online games</b>	160101003	ABHAY KSHATRIYA
		160101014	ARPAN KONAR
		160101026	DIVYANSH SHARMA
		160101037	KAKUSTHAM ANURAG
		160101049	PANT ROHIT RAKESH
		160101061	SAURABH BAZARI
		160101072	SPARSH BANSAL
		160101084	NITESH JINDAL
		160123007	DIVYA KUMARI
		160123018	MARUPAKA SAI TEJA
		160123031	RAJAN SUKANTH
		160123047	AMDEKAR ATHARVA SHAILESH

**Table 1: Assignment of applications to students (part 3 of 3)**

Sl. No.	Application Name/Type	Roll Number of Student	Name of Student
8	<b>Peer-to-peer networking</b> Note: Use any remote desktop application, like TeamViewer.	160101004	ABHINAV HINGER
		160101015	ARPIT GUPTA
		160101027	DURGESH YADAV
		160101038	KANIKA AGARWAL
		160101050	PARANJAY BAGGA
		160101062	SAVINAY
		160101073	SUJOY GHOSH
		160101085	AKUL AGRAWAL
		160123008	ESWAR MODALA
		160123019	MD ZATIN MERAZ
		160123032	RAKSHIT TIWARI
		160123048	UDDESHYA MATHUR
9	<b>Hotstar video streaming</b>	160101005	ABHINAV MISHRA
		160101016	ASHVEEN BANSAL
		160101028	EKTA DHAN
		160101039	KAPIL GOYAL
		160101051	PHOOL CHANDRA
		160101063	SAVSANI KEVIN MUKESHBHAI
		160101075	VARUN KUMAR KEDIA
		160101086	SHAURYA GOMBER
		160123009	GARIKAPATI GANESH
		160123020	MITANSHU MITTAL
		160123035	SATYAM KUMAR
		160123049	HIMANSHU RAJ
10	<b>Vimeo</b> Activity: Uploading and Downloading videos	160101006	ABHISHEK BHARDWAJ
		160101018	AVINASH UCHCHAINIYA
		160101029	GUDALA AJAYRAM
		160101040	MALLALA BHARGAV
		160101052	POREDDY SAI KIRAN REDDY
		160101064	SEELAM PRADEEPA
		160101076	VIVEK RAJ
		160101087	ARCHIT JUGRAN
		160123010	HARSHIT SINGH
		160123021	MUSKAN AGARWAL
		160123036	SHASHWAT JOLLY
		160123050	NAVEEN MATHEW
11	<b>Twitch (live streaming video platform)</b>	160101007	ABHISHEK KUMAR KOTIYA
		160101019	BALABOLU TUSHARA LANGULYA
		160101030	HARSHIT AGRAWAL
		160101042	MITANSH JAIN
		160101054	RAVI VENKATA NAGA PAVAN KUMAR
		160101065	SHIMONA VERMA
		160101077	VYKUNTAM AKHIL
		160101088	RISHABH JAIN
		160123011	HIMANSHU RANJAN
		160123022	NALGONDA GNANESHWAR KUMAR
		160123038	SHREY JAIN
		160123051	SAURABH RAI

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