

CS 349: Networks Lab

(January-May 2020)

Assignment – 2: Network Protocol Analysis Using Wireshark

Submission Deadline: 11:55 pm on Monday, 3rd February 2020 (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), 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. Mention and explain the observed values for at least 5 fields of the protocols mentioned in question 1. Example: Source or destination IP address and port number, Ethernet address, protocol number, etc.
3. Explain all relevant protocols used by the application to achieve the important functionalities of the application (varies with application). Give reason for using those protocols. For example, important functionalities for video streaming are 'download', 'play', 'pause', etc.
4. Mention at least two functionalities (mentioned in question 3) of the application and show the sequence of messages exchanged by the application to achieve those functionalities. Check whether there are any handshaking sequences in the application. Briefly explain the handshaking message sequence, if any.
5. Calculate the following statistics from your traces while performing experiments at three different times (morning, afternoon, night) of the day: a) Throughput, b) RTT, c) Packet size, d) Number of packets lost, e) Number of UDP & TCP packets, f) Number of responses received with respect to one request sent. Report the observed values in your answer, preferably using tables.
6. Check whether the content is being sent by the application from the same source during the three different times of the day used in question 5. If multiple sources exist, list out their IP addresses, 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: Application Allocation to Students

Sl. No.	Application Name/Type	Roll Number of Student	Name of Student
1	Dailymotion Activity: Uploading and Downloading videos	150123034	ROHIT KUMAR
		160101011	AKHIL CHANDRA PANCHUMARTHI
		160101017	AUTONU KRO
		170101001	AAYUSH PATNI
		170101002	ABHISHEK JAISWAL
		170101003	ADITYA VARDHAN GARA
		170101004	AJINKYA SHIVASHANKAR SHIVASHANKAR
		170101005	AMAN MISHRA
		170101006	AMAN RAJ
		170101007	ANIKET RAJPUT
		170101008	ANNANYA PRATAP SINGH CHAUHAN
		170101009	ANUBHAV TYAGI
		170101011	ARANYA ARYAMAN
2	Vimeo Activity: Uploading and Downloading videos	170101012	ARPIT GUPTA
		170101013	ARYAN AGRAWAL
		170101014	AVIRAL GUPTA
		170101015	AVNEET SINGH CHANNA
		170101016	BANDAGONDA SHRI RAAM REDDY
		170101017	CH ROHITH RAVI PRABHU TEJA
		170101018	CHALUMURU BHAVANI DATT
		170101019	CHIRAG GUPTA
		170101020	DEEPAK GAMI
		170101021	DEVAISHI TIWARI
		170101022	DEVANSH GUPTA
		170101023	FUGARE ASHISH DILEEP
		170101024	GEDDAM IKYA VENUS
		170101025	HANSRAJ PATEL
3	Hotstar video streaming	170101026	HARDIK KATYAL
		170101027	KADAM KIRAN ZATINGRAO
		170101028	KANCHUGANTLA RHYTHM
		170101029	KAPIL JANGID
		170101030	KARTIK GUPTA
		170101031	KEERTI HARPAVAT
		170101032	KETHAVATH NAVEEN
		170101033	LUCKY
		170101034	MAKHARIA AAYUSH
		170101035	MANAN GUPTA
		170101036	MANI MANNAMPALLI
		170101037	MAYANK CHANDRA
		170101038	MAYANK WADHWANI
4	Dropbox Activity: Uploading and Downloading large files	170101039	NAGULAPALLI KASI VENKATA SAI KIRAN
		170101040	NAKKA SRIHARSHA
		170101041	NAVEEN KUMAR GUPTA
		170101042	NAYANJYOTI DEURY
		170101043	PARTHA PRATIM MALAKAR
		170101044	PARVINDAR SINGH
		170101045	Piyush Gupta
		170101046	PRABHAT KUMAR
		170101047	PRANAY GARG
		170101048	PRANSHU SRIVAS
		170101049	Priyanshu Singh
		170101050	PULIKONDA ROOP SAI RAKESH GUPTA
		170101051	RAJANALA HARSHAVARDHAN REDDY
		170101052	RASHI SINGH

5	Live Sports Streaming	170101053	RAVI SHANKAR
		170101054	RISHI PATHAK
		170101055	ROHAN NIGAM
		170101056	ROUNAK PARIHAR
		170101057	RUTVIK GHUGHAL
		170101058	RYTHUM SINGLA
		170101059	Sachin Giri
		170101060	SANCHIT
		170101061	SAYAK DUTTA
		170101062	SAYALKUMAR SUBHASH HAJARE
		170101063	SHIVAM BANSAL
		170101064	SHUBHAM KUMAR
		170101065	SHYAM SUNDAR RAV
6	NPTEL/Coursera video lectures	170101066	SOUMIK PAUL
		170101067	SOURABH JANGID
		170101068	SUNNY KUMAR
		170101070	THAHIR MAHMOOD POOVADA
		170101071	THEEGALA RAKESH REDDY
		170101072	TIKARAM MEENA
		170101073	TUSHAR RAJENDRA BHUTADA
		170101074	UMANG
		170101075	UTKARSH JAIN
		170101076	VAKUL GUPTA
		170101077	VEMURI SAHITHYA
		170101078	VINEET MALIK
		170101079	VINIT KUMAR
		170101080	VIVEK KUMAR
7	Online games	170101081	UDBHAV CHUGH
		170101082	LAVISH GULATI
		170101083	UTKARSH SANTOSH MISHRA
		170101084	MAYANK BARANWAL
		170101085	Sparsh Sinha
		170101086	SHIVANG DALAL
		170101087	SIDDHARTH AGARWAL
		170101088	SHASHANK SHARMA
		170123001	AAYUSH BANSAL
		170123002	ABHINAV ANAND
		170123003	ABHINAV R
		170123004	ADITYA RAJ
		170123005	ANKIT KUMAR KANOJIYA
8	Peer-to-peer networking Note: Use any remote desktop application, like TeamViewer.	170123006	ANKIT TRIPATHI
		170123007	ANKUR PRAMOD INGALE
		170123008	ARAV GARG
		170123010	ARYAN RAJ
		170123011	ASHISH AGARWAL
		170123012	AYUSH DALIA
		170123013	BAGAL SATEJ BABANRAO
		170123014	BARISH BHAGAT
		170123015	BOJJA SAI PREETHAM
		170123016	CHINDAM SUJANA MAITHILI
		170123017	DEV PRIYA GOEL
		170123018	GARVIT MEHTA
		170123019	GARVIT SARJARE
		170123020	harit gupta

9	Google Hangout	170123021	HEMANT YADAV
		170123022	JAYANT PATIDAR
		170123023	KEDAR NATH
		170123024	KESHETTI SAI KUMAR
		170123025	KOMMINENI NIKHIL
		170123026	KONDRU SURAJ
		170123027	KOTTA PREM SUJAN
		170123028	KRISHNA PRIYATAM D
		170123029	KUSHAGRA MAHAJAN
		170123031	MALISSETTI KIRAN KARTHEEK
		170123032	MANNE HEMA PRIYA
		170123033	MAYANK SAHARAN
		170123034	MIHIR YADAV
		170123035	MOGILLAPALLI NIKHIL
10	DC++ Activity: Uploading and Downloading large files	170123036	MOHIT DHAKA
		170123037	MOHIT KUMAR MEENA
		170123038	MRIGANKA BASU ROY CHOWDHURY
		170123039	NAKKA LAHARI
		170123040	PARV SOOD
		170123041	RUPAM SAHU
		170123042	S SAI VAMSHI
		170123043	SAHILPREET SINGH THIND
		170123044	SAKSHI SHARMA
		170123045	SAURABH KUMAR
		170123046	SHALINI KUMARI
		170123048	SIDDHANT SINHA
		170123050	SUMEDH RAVI JOURAS
11	Twitch (live streaming video platform)	170123051	TANVI OHRI
		170123052	TANYA CHAUHAN
		170123053	TEJASVEE PANWAR
		170123054	TUMARADA ADITYA
		170123056	PRATHIK.S.NAYAK
		170123057	KARTIK SETHI
		170123058	ARUN KUMAR
		170123059	SHRUTI DINESH AGARWAL
		170123060	TRIKAY NALAMADA
		170123061	MAHFOOZUR RAHMAN KHAN
		170123062	DIVYANSH MANGAL
		170123063	JOEL RAJA SINGH
		170123064	AGNIV BANDYOPADHYAY