

CS 342: Networks Lab

(September - November 2020)

Assignment – 2: Network Protocol Analysis Using Wireshark

Submission Deadline: 27th September 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 in 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: (Total Marks 20)

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. Mention and explain the observed values for at least 5 fields of the packets of each layer. Example: Source or destination IP address, port number, Ethernet address, protocol number, etc. **(1+4 =5 marks)**
2. Mention the important functionalities of the application as many as you can discover. (*Two example functionalities for each application is given in Table 1*). Explain which protocols are being used by which functionalities of the application. Give reason why those protocols are used for the functionalities. **(1+5 =6 marks)**
3. For any two functionalities of the application (mentioned in question 2), show the sequence of messages (attach screenshot) exchanged to achieve those functionalities. Explain those message sequences. Check whether there are any handshaking sequences in the messages, and briefly explain the reason. **(1+3+1 =5 marks)**
4. 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. **(0.5*6 =3 marks)**
5. Check whether the content is being sent/fetched by the application to/from the same or different destination(s)/source(s) during the three different times of the day used in question 4. If multiple destinations /sources exist, list out their IP addresses, and explain the reason behind this. **(1 marks)**

Method of submission:

- **Submit a soft copy of the report in PDF format only, together with your collected traces in a zip file on Moodle. The name of the zip file should be like “Your_Rollno.zip” (example: “180101002.zip”).**
- **Files submitted without proper naming format will not be evaluated.**
- **If your trace file size is so large that you are not able to upload the file on Moodle, in that case you are advised to provide the OneDrive/Google Drive 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

App ID	App Name	Roll Number	Name
1	Microsoft Team (Desktop App) video conference Two example functionalities: a) Join meeting b) Post message Note: You can capture packet during online class	150101011	ASHUTOSH KUMAR
		160101053	RAHUL KUMAR
		180101001	AARTI MEENA
		180101002	ABHAY PRATAP GANGWAR
		180101003	ABHISHEK KUMAR
		180101004	ADITYA RAJESH PATIL
		180101005	ALAY CHIRAG SHAH
		180101006	AMAN KUMAR SINGH
		180101007	ANIRAJ KUMAR
		180101008	ANJALI GODARA
		180101009	ANNAPURNE KRISHNA MANIK
		180101010	ANSHUL MITTAL
		180101011	ANSHUMAN KUMAR SINGH
		180101012	ARYAN CHAUHAN
		180101013	B VENKATESH
		180101014	BEDADA AJAY KUMAR
180101015	BHASKER GOEL		
180101016	BHAVISHAYA SAMRIYA		
2	Online video game (Desktop App) Two example functionalities: a) Start b) Pause/End	180101017	Chinmai Anandh Chappa
		180101018	DARSHIT NAGAR
		180101019	DEVANSHI GUPTA
		180101020	DHAWAL BADI
		180101021	DRISHTI CHOUHAN
		180101022	DRISTIRON SAIKIA
		180101023	FALAK CHHIKARA
		180101024	GADIPALLY PAVAN PREETHAM REDDY
		180101025	GALI JAYA PRAKASH REDDY
		180101026	GOLI AANANDA VARDHAN
		180101027	HARSH GUPTA
		180101028	HARSH MOTWANI
		180101029	Harshal Sharma
		180101030	HARSHITA GUPTA
		180101031	HIMANSHU
		180101032	JAGANA VINEETH
		180101033	KARTIKAY GOEL
		180101034	KARTIKEYA SAXENA
3	WhatsApp (Desktop App) group activities Two example functionalities: a) Share image b) Post message	180101035	KHANDESH SAI LOKESH
		180101036	KOMATIREDDY SAI VIKYATH REDDY
		180101037	ANKET SANJAY KOTKAR
		180101038	KRISHNA PRAVIN PANDE
		180101039	Manish Chandolia
		180101040	MANSHARAM NIGWAL

		180101041	Manshi Sharma
		180101042	Mohan Kumar
		180101043	MOHIT JAIN
		180101044	MUKKANTI VENKATA SAKETH
		180101045	MUNINDRA NAIK
		180101046	Sandeep
		180101047	NARESH BHARASAGAR
		180101048	NIHARIKA BHAMER
		180101049	NIKUNJ HEDA
		180101050	NISHANK SIDDHARTH
		180101051	NISHCHAY MANWANI
		180101052	NISHTHA SHARMA
4 Outlook client (Desktop App) Two example functionalities: a) Send mail b) Refresh Inbox		180101053	NIYATI CHAUDHARY
		180101054	PAIDIMARRI MANOJ
		180101055	PARAM ARYAN SINGH
		180101056	PARTH DHANANJAY BAKARE
		180101057	POOJA GAJENDRA BHAGAT
		180101058	PRANAV GUPTA
		180101059	PREETI KUMARI KOTIYA
		180101060	Rahul Choudhary
		180101061	RAHUL KUMAR
		180101062	RAHUL MALA
		180101063	RAKSHIT RAJENDRA PATHADE
		180101064	RATHOD SAINATH
		180101065	RISHIKESH SONGRA
		180101066	RITIK MANDLOI
		180101067	RITWIK GANGULY
		180101068	SAI SUMANTH MADICHERLA
		180101069	SANKET KISAN PANDHARE
		180101070	SARASWATULA PHANI SAI PRANAV
5 GitHub client (Desktop App) Two example functionalities: a) Clone a repository b) Submit a file		180101071	Satyendra Dhaka
		180101072	SAURABH BARANWAL
		180101073	SHIVAM BAGHEL
		180101074	SHIVAM KUMAR AGRAWAL
		180101075	SHIVANGI KUMAR
		180101076	SHIVANSH MISHRA
		180101077	SHIVRAJ AHIRWAR
		180101078	SIDDHARTHA JAIN
		180101079	Tanneeru Jaswanth
		180101080	TARUN UBA
		180101081	TEJAS PRASHANT KHAIRNAR
		180101082	TUSHAR JAIN
		180101083	UJWAL KUMAR
		180101084	V ANIRUDH
		180101085	VADIGE PRANEETH CHANDRA
		180101086	VAIBHAV KUMAR SINGH
		180101087	VARHADE AMEY ANANT
		180101088	VATSHAL NILESHKUMAR PATEL
		180101089	VISHESH KUMAR JYANI

<p>6 Skype (Desktop App) video conference</p> <p>Two example functionalities:</p> <p>a) Initiate call</p> <p>b) Terminate call</p>	180101090	YOGESH KUMAR
	180101091	MILIND B PRABHU
	180101092	TANVISH
	180101093	PULKIT CHANGOIWALA
	180101094	KOUSIK RAJESH
	180101095	VEDIKA JITENDRA KULKARNI
	180101096	KUSHAL SANGWAN
	180101097	SAMAY VARSHNEY
	180101098	DODDAVULA LIKHITHKUMAR REDDY
	180123001	ADITI BIHADE
	180123002	AKSHAT GUPTA
	180123003	ANISH KUMAR
	180123004	ANMOL CHOUDHARY
	180123005	ANSH RAJIV BHATT
	180123006	ASHISH KUMAR BARNAWAL
	180123007	AYAZ ANIS
	<p>7 OneDrive (Desktop App)</p> <p>Two example functionalities:</p> <p>a) Create a folder</p> <p>b) Download/Upload file</p>	180123008
180123009		BINEETA ORAM
180123010		DAMAYANTI R SAMBHE
180123011		DHOOLAM SAICHANDAN
180123012		DRIGESH ANURAGI
180123013		GURRAM JOSEPH SPOURGEON
180123014		HARSH VARDHAN SINGH YADAV
180123015		HARSH YADAV
180123016		HIMANSHU YADAV
180123017		J.NEERAJA
180123018		JAY CHHAJED
180123019		JAY VIKAS SABALE
180123020		KARTIKEYA KUMAR GUPTA
180123021		KARTIKEYA SINGH
180123022		KASHAN HASAN
180123023		KAUSHAL CHHALANI
180123024		KRITIKA RAJ
180123025	KUSHAL JHANWAR	
180123026	MANAV CHIRANIA	
<p>8 YouTube live video</p> <p>Two example functionalities:</p> <p>a) Start watching</p> <p>b) Pause/Go live</p> <p>Note: You can capture online IITG live convocation program on 22nd Sept 2020 from Youtube.</p>	180123028	MRIDUL GARG
	180123029	NAMAN GOYAL
	180123030	NILESH KUMAR MEENA
	180123031	PANKAJ KUMAR
	180123032	PRAGATI RAMESH MAHAMUNE
	180123033	PRATHAPANI SRAVYA
	180123034	PRIYA GULATI
	180123035	RAHUL KRISHNA
	180123036	RASHI MOHTA
	180123037	RATHOD VIJAY MAHENDRA
	180123038	RAUNAK TIWARI
	180123039	ROHAN MODI
	180123040	SAMIKSHA SACHDEVA

		180123041	SATYADEV BADIREDI
		180123042	SHASHANK GOYAL
		180123043	SHASHANK RAJESH THOOL
		180123044	SHIVAM KUMAAR ARYA
		180123045	SHREYANK SNEHAL
9 FortiClient VPN (Desktop App) Two example functionalities: a) Establish connection b) ssh remote machine		180123046	Shubham Gandhi
		180123047	SIDHARTH BANKUPALLE
		180123048	SUBHAM KUMAR
		180123049	Sudhanshu Bhatia
		180123050	TANMAY JAIN
		180123051	TRINAYAN DAS
		180123052	VAARSHIK REDDY C
		180123053	VISHISHT PRIYADARSHI
		180123054	VIVEK KUMAR
		180123055	YASHWANTH K
		180123057	MOHAMMAD HUMAM KHAN
		180123058	SOURAV GOEL
		180123059	AADI GUPTA
		180123060	JATIN DHINGRA
		180123061	TEJUS SINGLA
		180123062	A B SATYAPRAKASH
		180123063	UDANDARAO SAI SANDEEP
		180123064	KARAN GUPTA
		180123065	EKLAVYA JAIN
		160123034	SAGAR MEWAR