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.
- \Rightarrow 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

Ann		Roll	
App ID	App Name	Number	Name
	Microsoft Team (Desktop App) video		
1	conference	150101011	ASHUTOSH KUMAR
	Two example functionalities:	160101053	RAHUL KUMAR
	a) Join meeting	180101001	AARTI MEENA
	b) Post message	180101002	ABHAY PRATAP GANGWAR
		180101003	ABHISHEK KUMAR
	Note: You can capture packet during online class	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)	180101017	Chinmai Anandh Chappa
	Two example functionalities:	180101018	DARSHIT NAGAR
	a) Start	180101019	DEVANSHI GUPTA
	b) Pause/End	180101020	DHAWAL BADI
		180101021	DRISHTI CHOUHAN
		180101022	DRISTIRON SAIKIA
		180101023	FALAK CHHIKARA
			GADIPALLY PAVAN PREETHAM
		180101024	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
_	MI . A /B I A	180101034	KARTIKEYA SAXENA
3	WhatsApp (Desktop App) group activities	180101035	KHANDESH SAI LOKESH
	Two example functionalities:	180101036	KOMATIREDDY SAI VIKYATH REDDY
	a) Share image	180101037	ANKET SANJAY KOTKAR
	b) Post message	180101038	KRISHNA PRAVIN PANDE
		180101039	Manish Chandolia
		180101040	MANSHARAM NIGWAL

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

6	Skype (Desktop App) video conference	180101090	YOGESH KUMAR
	Two example functionalities:	180101090	MILIND B PRABHU
	·	180101091	TANVISH
	a) Initiate call		
	b) Terminate call	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
		180123008	BHARGAB GAUTOM
7	OneDrive (Desktop App)	180123009	BINEETA ORAM
	Two example functionalities:	180123010	DAMAYANTI R SAMBHE
	a) Create a folder	180123011	DHOOLAM SAICHANDAN
	b) Download/Upload file	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
8	YouTube live video	180123028	MRIDUL GARG
	Two example functionalities:	180123029	NAMAN GOYAL
	a) Start watching	180123030	NILESH KUMAR MEENA
	b) Pause/Go live	180123031	PANKAJ KUMAR
		180123032	PRAGATI RAMESH MAHAMUNE
	Note:	180123033	PRATHAPANI SRAVYA
	You can capture online IITG live convocation	180123034	PRIYA GULATI
	program on 22nd Sept 2020 from Youtube.	180123035	RAHUL KRISHNA
		180123036	RASHI MOHTA
		180123037	RATHOD VIJAY MAHENDRA
		180123038	RAUNAK TIWARI
		180123039	ROHAN MODI
		180123040	SAMIKSHA SACHDEVA

		180123041	SATYADEV BADIREDDI
		180123042	SHASHANK GOYAL
		180123043	SHASHANK RAJESH THOOL
		180123044	SHIVAM KUMAAR ARYA
		180123045	SHREYANK SNEHAL
9	FortiClient VPN (Desktop App)	180123046	Shubham Gandhi
	Two example functionalities:	180123047	SIDHARTH BANKUPALLE
	a) Establish connection	180123048	SUBHAM KUMAR
	b) ssh remote machine	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