

Assessment Details and Submission Guidelines	
Trimester	T1 2019
Unit Code	MN504
Unit Title	Networked Application Management
Assessment Type	Group Assignment
Assessment Title	Network Analysis using Wireshark
Purpose of the assessment (with ULO Mapping)	<p>This assignment is designed to develop deeper analytical understanding of different distributed network conditions. At the completion of this assessment students should be able to:</p> <ul style="list-style-type: none"> d. Analyse performance and deployment issues for networked applications; e. Compare appropriate industry tools and techniques to manage networked applications;
Weight	20%
Total Marks	60
Word limit	2000
Due Date	31/05/2019 05:00 PM (Week 11 Friday)
Submission Guidelines	<ul style="list-style-type: none"> • All work must be submitted on Moodle by the due date along with a title Page. • The assignment must be in MS Word format, 1.5 spacing, 11-pt Calibri (Body) font and 2.54 cm margins on all four sides of your page with appropriate section headings. • Reference sources must be cited in the text of the report, and listed appropriately at the end in a reference list using IEEE referencing style.
Extension	<ul style="list-style-type: none"> • If an extension of time to submit work is required, a Special Consideration Application must be submitted directly on AMS. You must submit this application three working days prior to the due date of the assignment. Further information is available at: http://www.mit.edu.au/about-mit/institute-publications/policies-procedures-and-guidelines/specialconsiderationdeferment
Academic Misconduct	<ul style="list-style-type: none"> • Academic Misconduct is a serious offence. Depending on the seriousness of the case, penalties can vary from a written warning or zero marks to exclusion from the course or rescinding the degree. Students should make themselves familiar with the full policy and procedure available at: http://www.mit.edu.au/about-mit/institute-publications/policies-procedures-and-guidelines/Plagiarism-Academic-Misconduct-Policy-Procedure For further information, please refer to the Academic Integrity Section in your Unit Description.

Assignment Description

The aim of the assignment is to develop an analytical understanding of performance and management of different types of networked applications. The assignment will provide an opportunity to understand network performance and management issues of networked applications using state of the art tools. These exercises provide an opportunity to demonstrate analytical ability of evaluating distributed systems performance, Quality of Service and service management.

Overview and General Instructions of Assignment

Students need to form a group of two in their own lab class and inform tutor about their group during Week 8 Lab. Each group will need to capture packets on **two networks**, at their **home network** and at **MIT network** while accessing the following websites. One website is of a news channel and the other one is a website for live streaming. The students are required to capture packets of multiple images from the news channel website and capture packets from the live stream website while streaming for 10 minutes once at MIT in a group and then on their home network individually. So at the end, there will be **four trace files**, two for each website, two captured on MIT network and two on students' home networks. The websites to access are:

<http://www.lightfm.com.au>
<http://iview.abc.net.au>

The complete report must be submitted on Moodle within due date. The report has following four main parts:

Part 1:

The first part of the report should be about general statistics of all four captures using Wireshark that must include:

1. Start time of capture
2. Total number of captured packets for each protocol
3. Total Number of lost packets
4. IP addresses of the client and server

Part 2:

The second part of the report must include screen shots of packet capture, screenshots of different statistics from Wireshark and complete analysis of those screenshots for both websites for all two networks. **Only screenshots of the graphs or other statistics will not get any marks as those must be analysed in detail to discuss the quality of service for a particular application.** The students are required to analyse the network performance for the assigned websites considering following aspects:

1. Throughput
2. Round Trip Time
3. Packet Loss

While collecting statistics please make sure, you are looking at the right flow as your Wireshark file may have packets from other applications and flows as well. Figure 1 on next page shows the throughput graph generated by Wireshark and source and destination addresses are clearly shown. You need to collect statistics for flows which are from server to client.

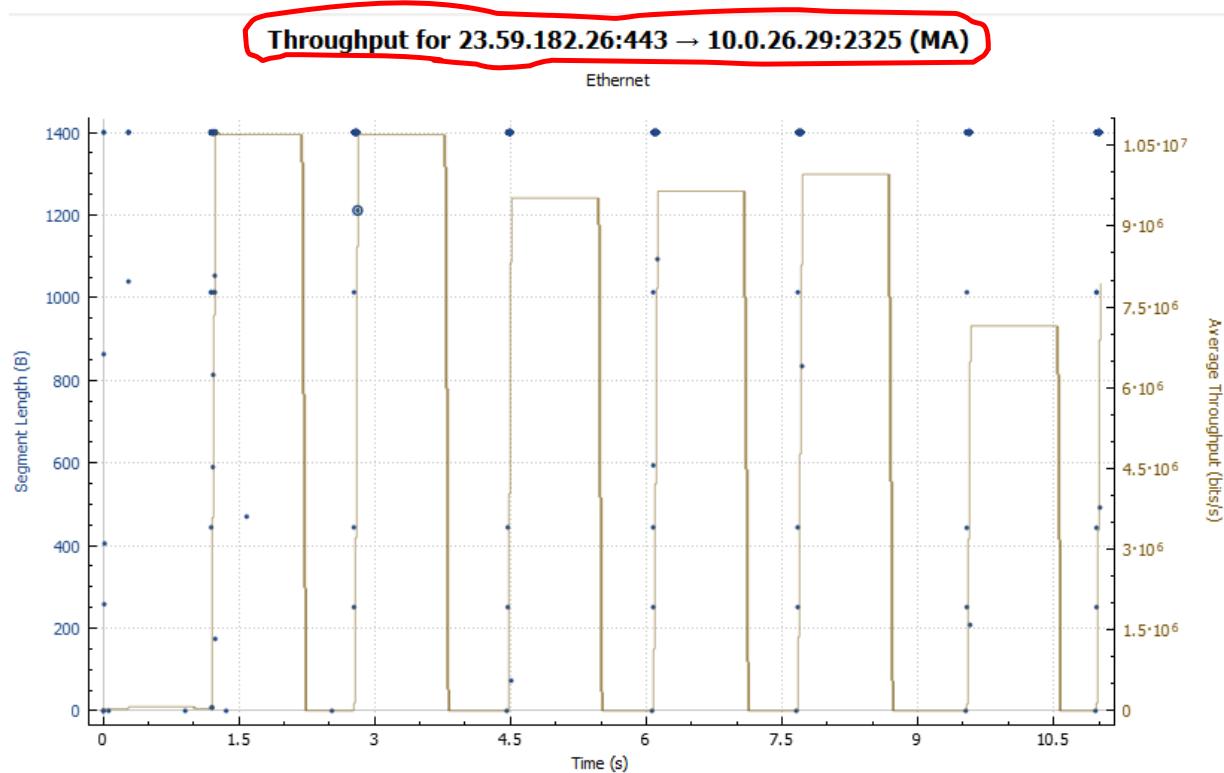


Figure 1: Throughput Graph showing source and destination IP addresses

To see the Packet loss you need to enter the following filter in Wireshark:

`tcp.analysis.lost_Segment`

Part 3:

The third part of the report is about comparing the collected Wireshark statistics of the two different networked applications on two different networks. The throughput graphs and TCP retransmission statistics for web page transfer and live streaming (provided in part 2) need to be compared with each other and for all two networks. The differences of the performance to be identified and reasons must be provided for such differences.

Part 4:

Students need to download, install, use and compare another free network performance measurement tool from the Internet on their home computer. One possible option is Microsoft Message Analyser from <https://www.microsoft.com/en-au/download/details.aspx?id=44226>. The tool should be used to analyse the network traffic captured while accessing one of the news websites mentioned in Table 1. The chosen tool should be compared with Wireshark on the basis of following criteria:

1. Ease of access and use: how easy it is to download, install and start using (any changes to be made to the system etc.) as compared to Wireshark
2. GUI: Compare at least four GUI features of the chosen tool with Wireshark

3. Visualisation of traffic: After capturing packets by the chosen tool the effectiveness of the visualisation of the network traffic should be compared with Wireshark.
4. Statistics generation: At least one statistics like throughput, RTT etc. needs to be generated by the chosen tool and to be compared with the same generated by Wireshark.

The comparison must include screenshots for both tools (your chosen tool and Wireshark) to judge the validity of the comparison.

Marking criteria:

Section to be included in the report	Description of the section	Marks
Introduction	Outline of the assignment Overall structure of the report	4
General Statistics	For each capture following should be discussed: <ol style="list-style-type: none"> 1. Time of capture 2. Total number of captured packets 3. IP addresses of client and server 	9
Network Performance	Screenshots and analysis of the following: <ol style="list-style-type: none"> 1. Throughput 2. Round Trip Time 3. Packet Loss 	$5 \times 3 = 15$
Comparison 1	Comparison of the throughput and TCP retransmissions of both applications on two networks and discussion of the reasons for the difference.	$5 \times 3 = 15$
Comparison 2	Comparison of the chosen tool with Wireshark in terms of: <ol style="list-style-type: none"> 1. Ease of access and use 2. GUI 3. Visualisation of traffic 4. Statistics generation The screenshots for both tools should be provided	$3 \times 4 = 12$
Conclusion	Complete summary of the report specially the comparison.	3
Reference style	Follow IEEE reference style.	2
	Total	60

Marking Rubric for Assignment #2: Total Marks 60

Grade Mark	HD > 80%	DI 70-79%	CR 60-69%	P 50-59%	Fail < 50%
	Excellent	Very Good	Good	Satisfactory	Unsatisfactory
Introduction /4	Clear and concise outline is provided, report structure is described properly	Clear outline is provided, report structure is described.	Some outline is provided, report structure is somewhat discussed	Some outline is provided.,	This is no relevance to the assignment topic.
General Statistics /9	All required aspects are discussed exceptionally well	All required aspects are discussed	Some aspects are discussed	Very few aspects are discussed	Not related
Network Performance /15	All required matters are analysed in detail and exceptionally well, All screen shots are clear and complete	Most of the required matters are analysed in detail , All screen shots are clear and complete	Some required matters are analysed in detail and , Some screen shots are clear and complete	Few of the required matters are analysed	Not related or/and incomplete
Comparison 1 /15	In detail comparison is provided and justification is given exceptionally well	Some comparison is provided and justification given	Some comparison is provided and incomplete justification is there	Comparison and justification is incomplete	Not related and/or incomplete
Comparison 2 /12	In detail comparison is provided and justification is given exceptionally well	Some comparison is provided and justification given	Some comparison is provided and incomplete justification is there	Comparison and justification is incomplete	Not related and/or incomplete
Conclusion /3	Logic is clear and easy to follow with strong arguments	Consistency logical and convincing	Mostly consistent logical and convincing	Adequate cohesion and conviction	Argument is confused and disjointed
Reference style /2	Clear styles with excellent source of references.	Clear referencing style	Generally good referencing style	Sometimes clear referencing style	Lacks consistency with many errors