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| November 2021 (16 pt) |
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| *Submitted in partial fulfillment of the requirements  for the degree of ‘insert name of course here’ (14 pt)* |



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**Abstract**

Video provides a powerful way to help you prove your point. When you click Online Video, you can paste in the embed code for the video you want to add. You can also type a keyword to search online for the video that best fits your document. To make your document look professionally produced, Word provides header, footer, cover page, and text box designs that complement each other. For example, you can add a matching cover page, header, and sidebar. Click Insert and then choose the elements you want from the different galleries. Themes and styles also help keep your document coordinated. When you click Design and choose a new Theme, the pictures, charts, and SmartArt graphics change to match your new theme. When you apply styles, your headings change to match the new theme. Save time in Word with new buttons that show up where you need them. To change the way a picture fits in your document, click it and a button for layout options appears next to it. When you work on a table, click where you want to add a row or a column, and then click the plus sign. Reading is easier, too, in the new Reading view. You can collapse parts of the document and focus on the text you want. If you need to stop reading before you reach the end, Word remembers where you left off - even on another device.

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# List of Abbreviations

GPS ………………………………………………………………………….………. Global Positioning System

# 1. Introduction

Video content is expected to make up 82% of all internet traffic by 2022. People are not only watching more videos online, they are also watching them in higher qualities, thus utilising more bandwidth. Live streaming has the capability to generate large amounts of traffic since it is replacing traditional broadcast viewing. It is expected to become the fastest growing area of internet video due to the emergence of live video streaming offerings on multiple platforms such as YouTube, Twitter and Facebook. From the current 5% of internet video traffic generated by live video, it is predicted that it will reach 17% by 2022. [11] [45]

Today's live streaming applications generally utilise adaptive streaming techniques due to their advantages over single bitrate streaming. HTTP adaptive streaming has become the standard for delivering video to various types of devices Video content is provided with different quality levels where each quality has a corresponding bitrate. In addition, the video content is split into multiple segments which typically have a duration of a few seconds. This streaming technique provides many benefits over delivering a video at a single bitrate since the bitrate can be changed during the streaming session by the client in response to changes in available bandwidth. In addition, HTTP-based delivery provides an effortless streaming service by avoiding firewall and NAT traversal issues. It also provides the client with the ability to choose an initial rate of content depending on its bandwidth without the necessity of a negotiation with the streaming server. (60) [26] Examples of Tables and Figures:

Table 1. Table Type Styles

| Table Head | Table Column Head | | |
| --- | --- | --- | --- |
| Table column subhead | Subhead | Subhead |
| copy | More table copy |  |  |

Figure 1. Example of a figure caption.

1.1 Sub-heading

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Example equation:

(1.1) (format chapter\_number.equation\_number\_in\_chapter)

Numbered list example:

1. Social media use would be associated with lower mood.
2. Active participation in social media would be associated with higher mood than passive participation.
3. Perceived meaningfulness of online activity would mediate the relationship between online activity and mood.

Bulleted list example:

* Identified xx items for improvement in existing systems
* Improved system by increasing xx, reducing yy, optimizing zz items
* Hired x engineers
* Improved availability by x%
* Reduced latency by xx%

Examples of internal citations, such as figure, table, chapter, section:

Figure 2. Example of a figure caption (Clipart 2022).

Table 2. Sectioned data (Research Statistics 2019)

| 206 | 305 | 530 |
| --- | --- | --- |
| 233.59 | 0.96 | 616 |

Jackson *et al*. (2013, p. 157) argue that the results of this method are ‘frequently messy’.

Lemma example:

**Lemma 1.** *Let a be …….*

Theorem example:

**Theorem 1.** Given ….

Proof: Since ….

Code listing example:

**Listing 1** Example code (use Lucida Console)

# include <…..>

int main()

{

….

return 0;

}

Algorithm example:

|  |
| --- |
| **Algorithm 1** Title of Algorithm |
| 1: inputs and outputs  2: **for** i: 1 …. k **do**  3: ……  … |
|  |

# References (use IEEE style [5] or Harvard style [6])

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# Appendices

# Justification for using OMNeT++

A.1 Network simulators

Network simulators are available in abundance however the list can be narrowed down by focusing on the peer-to-peer support a simulator provides. Implementing a P2P overlay directly on a realistic network is not a feasible option since scalability is a vital challenge for P2P. Researchers and organisations need to analyse, test and evaluate the implementation of P2P networks through experiments. Several simulators have been designed to simulate P2P networks before being used for real applications. [61]

Throughout the years, it has been observed that simulation is the most practical method for research regarding P2P. Network simulators offer various utilization possibilities such as [61]:

* Use of the simulator's readily available features to implement a P2P network.
* Extending or changing the modules of current simulators depending on the
* application requirements.