CSC 466 Project Proposal
Comparing the Performance of Various Video Streaming Technology

1. Introduction

With the rapid growing need of multimedia entertainment, multimedia services become increasingly popular, especially live video streaming applications that allows general users to broadcast their content to massive viewers. Twitch, a live video streaming platform, has some amazing numbers. There are over 100 million monthly unique users and a total of 241 billion minutes of gaming content has been live-streamed [1].

2. Problem and Literature Review

However, many multimedia applications, such as YouTube and Twitch, involve different video streaming technology therefore provide various performance in terms of video quality, live streaming latency, and service scalability. For example, Xinyan Zhang, et al. proposed a data-driven overlay network (DONet) for live media streaming, which had an industrial implementation called CoolStreaming released on 2004 [2]. The underlying technology is similar to that of BitTorrent where every DONet nodes periodically exchange data availability information, and retrieve unavailable data from partners, or supplies available data to partners. Twitch, as another example, is known to use Crowdsourced Interactive Live Streaming methodology, which has a number of distinguishable features [3]. First, Twitch-like services do not provide the sources of live streaming by themselves. Rather, they serve as a platform that bridges sources and viewers, thereby greatly expanding the content and user bases. On the other hand, the sources are no longer professional content producers and providers, and often have limited computation and network resources. Second, Twitch-like services also promote viewers' involvement with live content broadcasters. In conclusion, the broadcast delay for PC users at 2400 Kb/s bitrates is about 12 secs.

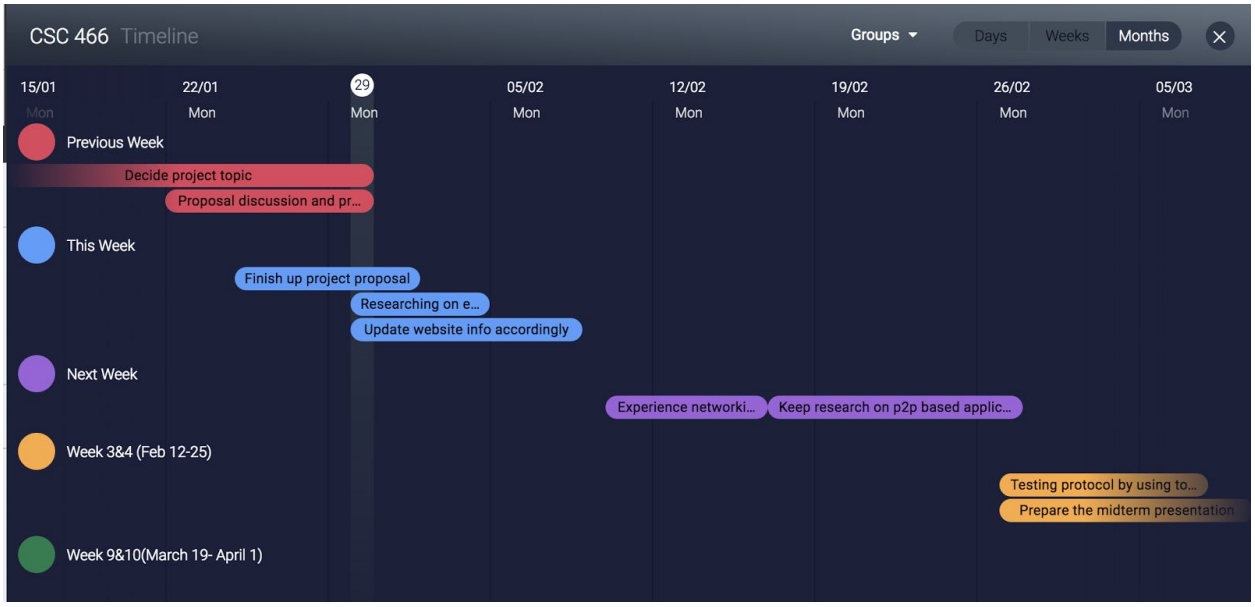
3. Objectives and Methodology

To evaluate the delivered video quality and compare the live streaming latency, this study will deploy several video streaming applications under different networking environment by controlling parameters such as packet drop rate, user downlink/uplink bandwidth, etc. This could be done on the client side using assistent tools like tc command in linux and link conditioner on Mac. On the server end, we could measure the server I/O bandwidth and the number of viewers at the same time by deploying media applications on PlanetLab [4] .

We believe that peer-to-peer based video streaming technology is better than HTTP based and Proxy-assisted based technology. By comparing various types of video streaming applications, we hope to reach the conclusion by evaluating the service performance under different networking environment. Our study aims to provide a clear comparison between different video streaming technology and a reliable guideline for new initiated media projects.

4. Time management

A full Gantt Chart can be found here: https://popepicteam.monday.com/boards/74156888



5. Website Url

A website is maintained to record project milestones: https://popepicteam.wordpress.com/

6. References

1. Smith, C. (2017, November 14). 46 Amazing Twitch Stats and Facts. Retrieved January 30, 2018, from https://expandedramblings.com/index.php/twitch-stats/
2. Zhang, X., Lin, J., Li, B., T., & Yum, P. (n.d.). Coolstreaming/DONet: a data-driven overlay network for peer-to-peer live media streaming. *Proceedings IEEE 24th Annual Joint Conference of the IEEE Computer and Communications Societies*.doi:10.1109/infcom.2005.1498486
3. Zhang, C., & Liu, J. (2015). On crowdsourced interactive live streaming. *Proceedings of the 25th ACM Workshop on Network and Operating Systems Support for Digital Audio and Video - NOSSDAV 15*. doi:10.1145/2736084.2736091
4. PlanetLab | An open platform for developing, deploying, and accessing planetary-scale services. (n.d.). Retrieved January 30, 2018, from https://www.planet-lab.org/