

CENG 491
Project Proposal Report

Secure Video Streaming Proxy Server

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Portakal Technologies

Team Prime'

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2) Motivation & Purpose

Video streaming occupies a significant part of everyday internet traffic and number of streaming sources is increasing exponentially. For instance, video surveillance of city traffic is a common practice, however, much larger scaled projects such as border surveillance of countries are being given serious consideration. Therefore, this scope change brings new problems to video streaming subject.

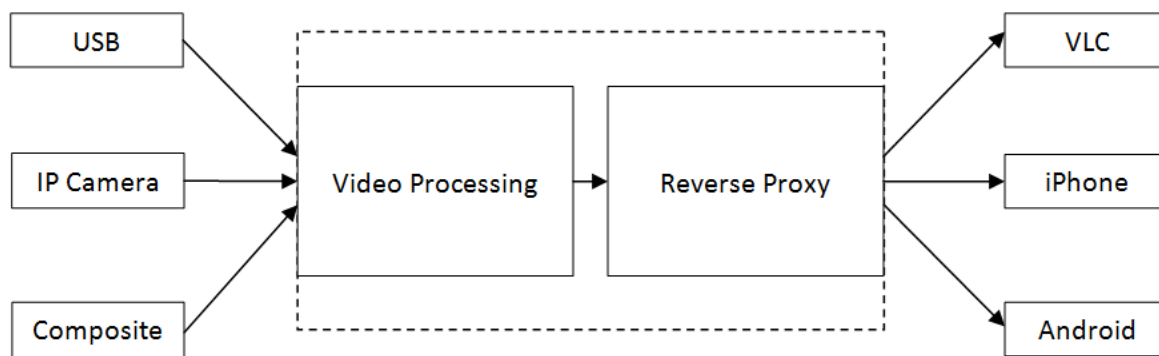
The most troublesome of these problems are considered to be scalability. In spite of the high rated development of hardware technology, ever growing number of streaming sources pose a threat of overwhelming the existing software that is driving the infrastructure. Therefore, new techniques should be developed in order to handle the problem appropriately.

Another issue that has come up due to altering use of area of these systems is security. Military and governmental projects require much more trustworthy environments due to their nature. Therefore, similar to scalability issue, current software is not able to satisfy the upcoming needs.

In this project, we will work on developing solutions to these issues stated above.

3) Project Description

The system that is going to be used in the project consists of three main parts.



a) Receiving the Streaming Media

Streaming data is gathered from various video sources into a single node. The purpose of this procedure is establishing the connection between sources and users not directly but through the node.

b) Video Processing and Secure Streaming Unit

This unit is the main part of the project that we will be developing. After gathering the data from sources, this unit processes videos to prepare them for delivery to the users. In this part, we will mostly use C and C++ languages since most of the relevant libraries are written in C. Some python or bash script codes may be included as well. Processing the data means preparing the video for streaming with appropriate codecs for the destination.

After processing the video, next issue is to deliver it to the user securely. At this point, we will use some kind of reverse proxy in a server, most probably apache. By secure delivery, we mean to reject connections from unauthorized users and prevent data from leaking out.

Another issue for delivering data is the scalability. Our system should be capable of adjusting itself so that it can handle the much greater number of requests than usual from the users. For this job, we will develop a concurrent streaming algorithm which we do not know yet.

c) Delivering Secure Data

At this part, the processed data is sent to the users by the secure connections that were established. Receiving device might be a VLC client, android or iPhone. Data will be adjusted according to receiver device in the processing unit.

4) Market Research & Literature Survey

As far as we have researched market, many companies and organizations are requesting surveillance and monitoring systems. For instance, Istanbul Metropolitan Municipality is developing such a system for the whole city. Nowadays, MOBESE cameras are becoming widespread in Istanbul. Currently the number of cameras is in reasonable amount. However, the number is expected to increase drastically. Thus, it is crucial to have a scalable and secure stream to prevent unauthorized modifications.

Also, there are few iPhone applications for surveillance purposes. iRa Pro and Mobile Cam Viewer are from the most expensive iPhone applications.

Actually there is no exact equivalent of this project currently in the market. It is expected to have greater demand in the next decade.

5) References

- Top 10 Most Expensive iPhone Apps,

<http://www.topintheworld.com/2010/top-10-most-expensive-iphone-apps.html>

- İstanbul Emniyet Müdürlüğü,

<http://mobese.iem.gov.tr/>