

# IMPROVE THE QUALITY OF VIDEO CONFERENCING USING JVM TOOLS

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**Abstract—** Video conferencing is now certainly growing very rapidly. It saves significant amount of money in terms of both travel and time. During the last decade availability of the equipment at the reasonable cost make it affordable to a much wider group of users. It is now widely used in the fields of education, collaborative work between researchers and business communities, telemedicine and in many other fields. On the other hand recent terrorist activities have forced many organizations and government agencies to re-examine their existing security policies and mechanisms. The government agencies must now carefully safeguard their sensitive data transmission.

**This paper presents to improve the clarity of sound and visibility of image using java tools and mathematical protocols.**

**Index Terms—** JVM Tools, Image Visibility, Video conferencing, Protocols

## INTRODUCTION

A major factor to be taken into consideration is that an object-oriented language approach would be more suited for this paper, as this will allow different components to be represented independently. Additionally, as this paper's graphical user interface, Java provides an extensive API for graphical development. Furthermore Borland Java has a number of developing environments that allow users to exploit graphical development. Also with the adaptation of a waterfall model software engineering approach, an object oriented approach will allow the author to refer back to any stage of development and amend or alter framework design and also the implementation. An object-oriented approach will make it easier for the author to add delete and modify components at any stage. The two contenders for the choice of programming languages to be used are C# and Java: C# is a fairly new object-oriented language from

Microsoft that is based around the .NET Framework. As an object-oriented language, C# supports inheritance, polymorphism, class and custom attributes. In addition C# prevents programs from accessing objects inappropriately and supports garbage collection and memory management. Visual studio.NET is a complete set of development tools available for application building that is available to me if I was to choose C#

Java is a portable and a high level language which compiles to byte code. Java also supports inheritance, polymorphism, class and custom attributes as well as preventing programs from accessing objects inappropriately along with its own garbage collection. Java is also a platform providing a virtual machine upon which programs can run with the API provided. To develop applications in Java, there are a number of options available ranging from Borland J Builder (high end of the market) to Helios Text pad (a text editor with code highlighting and auto syntactic). JDK (Java Development Kit) can be easily accessible from java.sun.com. More over Java supports media application. Choose to use the java programming language to implement the paper because past experiences using the language lead to the belief that it was adequate for the job. In addition, with a major aim of the Framework, being platform independent and portable, java provides an ideal solution to meet this aim.

## Server Side Application

The objective is to develop the video conferencing system with security features incorporated in it as part of the LAN based security surveillance system being developed at IIT Kanpur. The system includes a centralized server and distributed clients. The development is comprised of two parts, namely, server side application and client side application. Following features are proposed to be incorporated in the server side application

- Initialization and authentication of security Nodes: Server should take care of authentication of any user before he joins the conference and provide user required information for initialization.

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- User management: Server is responsible for forming various user groups, deciding the policy for joining the group, assigning the various levels of permission to the user.
- Selection and configuration of communication protocol between nodes: Server is responsible for smooth communication between all users. Server will decide what is the communication protocol to be used, how to manage the various connection, how to forward the data from one user to another user.

## Current Problem

This software is coded in Java. It is mainly LAN video conferencing software. To capture live videos by using some capture devices like webcam. User can select destination points which can be a single destination (Unicast) or more (Multicast). The live captured video data will be presented at the destination points with a very small delay. Real-Time Transport Protocol (RTP) for the live conferencing purpose. For monitoring purpose RTP is augmented with RTCP (Real-Time Transport Control Protocol). Here underlying transport layer protocol is UDP. Capture the video stream using the webcam and the audio stream using the microphone. Encode the tracks of the streams to an RTP compatible format. For video track using JPEG, H.263 or MPEG compression algorithms and get a RTP compatible form. For audio track to use PCM, MPEG\_AUDIO or GSM. Using an API, JMF (Java Media Framework) released by Sun for multimedia programming in Java.

## Protocol Issue

Designing a network protocol to support streaming media raises many issues. Datagram protocols, such as the User Datagram Protocol (UDP), send the media stream as a series of small packets, called datagram's. This is simple and efficient; however, packets are liable to be lost or corrupted in transit. Depending on the protocol and the extent of the loss, the client may be able to recover the data with error correction techniques, may interpolate over the missing data, or may suffer a dropout. The Real-time Transport Protocol (RTP), the Real Time Streaming Protocol (RTSP) and the Real Time Control Protocol (RTCP) were specifically designed to stream media over the network. They are all built on top of UDP. Reliable protocols, such as the Transmission Control Protocol (TCP), guarantee correct delivery of each bit in the media stream. However, they accomplish this with a system of timeouts and retries, which makes them more complex to implement. It also means that when there is data loss on the network, the media stream stalls while the protocol handlers detect the loss and retransmit the

missing data. Clients can minimize the effect of this by buffering data for display.

## Proposed Technique

In proposed technique the various points about the implementation and the importance of this research. The key aspect of the paper can be broken into parts to understand the working of the research. The key aspects of the research are:

- Data Format
- Manager
- Capture Media Data.
- Process Media Data
- Transmitting RTP Data with Session Manager
- Receiving and Presenting RTP Media Streams
- Multicast Session

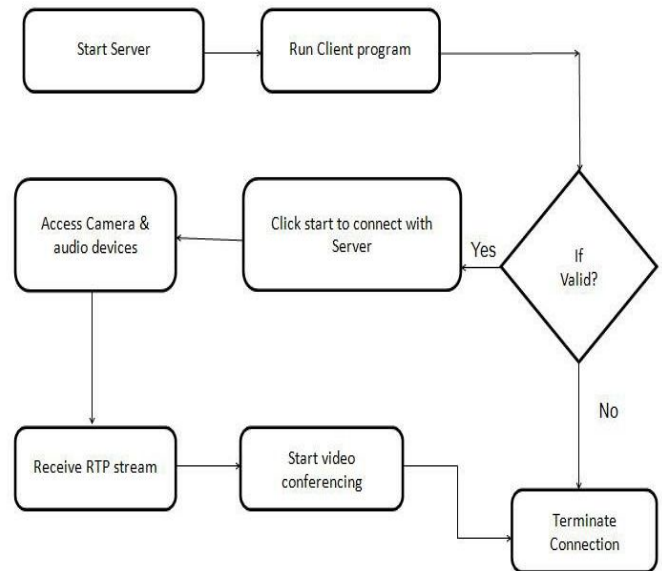


Figure 1.0 Control Processing of Video Conferencing

## Algorithm:

### Code for the Connection Client Program to Connect to a Server Program

```
import java.net.*;

import java.io.*;

class connectionClient{

public static void main(String[ ] args){
try{

InetAddress acceptorHost =
InetAddress.getByName(args[0]);

int serverPortNum = Integer.parseInt(args[1]);
```

```
Socket clientSocket = new Socket(acceptorHost,  
serverPortNum);  
  
BufferedReader br = new BufferedReader(new  
InputStreamReader(clientSocket.getInputStream( )));  
  
System.out.println(br.readLine( ));  
  
clientSocket.close();  
}  
catch(Exception e){  
  
e.printStackTrace( );  
}  
}  
}
```

---

### Conclusion

Optional function is to convey minimal session control information, for participant identification to be displayed in the user interface. This is most likely to be useful in loosely controlled sessions where participants enter and leave without membership control or parameter negotiation. RTCP serves as a convenient channel to reach all the participants, but it is not necessarily expected to support all the control communication requirements of an application. A higher-level session control protocol, which is beyond the scope of this document, may be needed.

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