

# Secure video transmission using open mpi information technology essay

[Technology](#), [Information Technology](#)



## **Abstract**

**Digital transmission increases day by day. In multimedia technology transmitting digital data must be secure, private and fast. This paper introduced efficient and secure real time transmission by using parallel and distributed approach for fast transmission of data which is used in conferences , video on demand etc. This papers aims to make video encryption feasible for real time application without using any extra dedicated at receiver side, for feasibility this paper introduce some new technique which is Open MPI and Open MP.**

**Keywords: - open MPI, Open MP, TAPI protocol, AES encryption, HEX string.**

## **1. Introduction**

Advances in digital content transmission have increased now a day. In multimedia technology the important issues are Security and privacy. The given project proposes an efficient and fast video transmission technique and secure video encryption algorithm. The project aims to make real time video transmission using parallel and distributed approach. Video conferencing is most popular application of video transmission for better conferencing transmission must be fast and secure. Use of Video conferencing as a communication tool to communicate with several individuals or groups in real time across different locations Conducting a conference between two or more clients at different sites by using computer networks to transmit audio and video data. Each client has a video camera, microphone, and speakers mounted on their computer. As the

two client speak to one another, their voices are carried over the network and delivered to the other's speakers, and whatever images appear in front of the video camera appear in a window on the other participant's monitor. Our aim is to send video and audio to client parallelly without keeping any client ideal, for such parallel and distributed approach this paper introduce new technique which transmit video with high quality, secure and fast in speed, this new introduced techniques are Open MPI and Open MP. The detail about Open MPI and Open MP will see below.

## **2. Methodology**

Before we start with Open MPI and Open MP, it is important to know why we need parallel processing. A sequential code will execute in a thread which is executed on a single processing unit. Thus, if a computer has two processors or more, only a single processor will be used for execution, thus wasting the other processing power. Rather than letting the other processor sit idle, we can use it to speed up our algorithm. The new methods of parallel processing are

Use MPI: MPI (Message Passing Interface) is a standardized API typically used for parallel and/or distributed computing. The Open MPI Project is an open source MPI-2 implementation that is developed and maintained by a consortium of academic, research, and industry partners. Open MPI is therefore able to combine the expertise, technologies, and resources from all across the High Performance Computing community in order to build the best MPI library available. Open MPI offers advantages for system and software vendors, application developers and computer science researchers. Features of Open MPI include: Thread safety Dynamic process spawning N/W

and process fault toleranceRun-time instrumentationHigh performance on all platformsPortable and maintainableUse Open MP: Open MP is an implementation of multithreading, a method of parallelizing whereby a master thread (a series of instructions executed consecutively) forks a specified number of slave threads and a task is divided among them. The threads then run concurrently, with the runtime environment allocating threads to different processors. Understanding the Fork-and-Join ModelOpenMP uses the fork-and-join parallelism model. In fork-and-join, parallel threads are created and branched out from a master thread to execute an operation and will only remain until the operation has finished, then all the threads are destroyed, thus leaving only one master thread. The process of splitting and joining of threads including synchronization for end result are handled by OpenMP.

## **TAPI**

As telephony and call control become more common in the desktop computer, a general telephony interface is needed to enable applications to access all the telephony options available on any computer. The media or data on a call must also be available to applications in a standard manner. TAPI 3.0 provides simple and generic methods for making connections between two or more computers and accessing any media streams involved in that connection. It abstracts call-control functionality to allow different, and seemingly incompatible, communication protocols to expose a common interface to applications. IP telephony is poised for explosive growth, as organizations begin a historic shift from expensive and inflexible circuit-

switched public telephone networks to intelligent, flexible, and inexpensive IP networks. Microsoft, in anticipation of this trend, has created a robust computer telephony infrastructure, TAPI. Now in its third major version, TAPI is suitable for quick and easy development of IP telephony applications.

## Video Encryption

Basically there two types of encryption1. Public key cryptography2. Private Key cryptographyPublic key cryptography is not applicable for secure real time video conferencing because its operation requires an amount of time which is not suitable for video conferencing. There are various private key encryption algorithmsNaïve algorithm: - It encrypts each and every byte of whole video stream. Which give more security level but it is not an applicable solution if size of data is large. Selective algorithm :- video divided into 3 frames I P and B. this algorithm encrypting all headers and I (initial) frames, encrypting all I frames and all I blocks in P and B frames, and finally encrypting all frames as in Naive algorithm . ZIG-ZAG algorithm: - It encrypts the algorithm before compressing them. It used random permutation if the permutation list is known; the algorithm will not be secure. AES algorithm: - Advance Encryption Standers the AES algorithm is symmetric key cryptosystem that processes 128-bit data blocks using cipher keys with lengths of 128, 192, or 256 bits. It is more scalable and can handle different key sizes and data block sizes, however they are not included in the standard. Also the basic blocks of AES operation are shown in figure.

## Implementation

Fig (a) shows actual real time video snapshot on sender's computer. Fig (b) shows video snapshot on receiver's computer without applying any technique fig (c) shows video snapshot on receiver's computer after applying Open MPI and Open MP.

- Whenever sender send video to the receiver's video mainly divided into frames (120 frames/sec) computer is an digital electronic devices with use of binary encoder that frames converted into binary format i. e. 0100011000100 this is a 13 bit binary number it take too much time for transmission Open MPI and Open MP convert that binary bit to hex string i. e. 0100 0110 0010 it is only 3 bit string now it is easy to transfer and require very less time as compare to 13 bit. There are many receiver's who send request to the sender MPI\_Comm\_accept establishes communication with a receiver. It is collective over the calling communicator. It returns an intercommunicator that allows communication with the receiver, after the receiver has connected with the MPI\_Comm\_accept function using the MPI\_Comm\_connect function. Many programs will be written with the master-slave model, where one process (such as the rank-zero process) will play a supervisory role, and the other processes will serve as compute nodes. In this framework, MPI\_Comm\_size and MPI\_Comm\_rank are useful for determining the roles of the various processes of a communicator. When connection establish through server's channel Open MP provide multi thread, that multi thread work parallel in manner so instead of sending video one by

one Open MP sends it in parallel which give fast transmission at receiver's side decoder decodes HEX string to binary and then binary bit to frames continuous motion frames is nothing but a video. 4. ConclusionThe paper has discussed and introduced the new technique i. e. Open MPI and Open MP for parallel and distributed approach, by considering video conferencing as an application the Protocol TAPI and various Encryption methods available for real time video transmission. This paper shows the experimental result by taking video snapshot this new technique gives fast video transmission and secure from hackers by applying AES encryption algorithm.