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Analyzing and Testing Packet Encryption of Video conferencing Application based onJava Media Framework

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***Abstract* - Analyze the solution Packet Encryption of Video conferencing is developed from JMF (Java Media Framework) in this case solution consists of Encrypting the UDP Packet that contain the Base64 Coded Frames Incorporated in RTP Packet the solution Proposed. These Cipher system based on Blowfish algorithm, the data formation of variable length Key block cipher and it suitable for application, the key work on complete cycle of both transmitter and receiver communication link with automatic file encryptor it is significantly faster than other encryption Algorithm, for secure real time communication and test implementation developed in different data networks (LAN WLAN Frame Relay).**

1. INTRODUCTION

Video conferencing system is growing exponentially some of these application involve the transfer of sensitive information such as credit card details. The Necessity to Protect Multimedia data distributed over Internet makes it necessary to encrypt the Audio and Video Flows transported on Internet. The Aim is to secureCommunication over Internet has extended to Live Video Stream in real time Communications. The Cipher Engine in the Code of our multimedia application as well as to choose an encryption algorithm fast enough to allow real time communication Real time Packet transmission should resolve the difficulties inherent in packet networks have the delay and loss of packets the unordered delivery the appearance of duplicated Packet.

2. REAL TIME TRANSPORT PROTOCOL

Real Time Protocol (RTP) is a protocol based on IP networks that provides end to end network delivery service for the transmission of the real time data. RTP is Network transport-protocol independently used over UDP. RTP enables you identify the type of data being transmitted and determines order of packet of data should be presented in dialog box. And resolve the Problem of synchronize media streams from different source. It ensures timely delivery quality of service that is augmented by the protocol RTCP (RTP Control Protocol). It Provides control and identification mechanism for RTP transmission and enables you to Monitor the quality of the data distribution in real time application with symmetric key encryption.

3. JAVA MEDIA FRAMEWORK

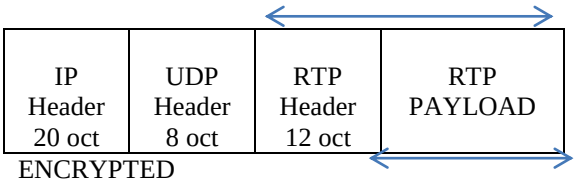
JMF is a versatile Application Programming Interface (API) for incorporating time based media into java application and its Portable and independent supporting hardware that Framework will change data with respect to time based media, such media data that can provide a variety of sources such as camera, microphones etc.

To send or receive a live streaming media broadcast or conduct a Video Conference over Internet or Intranet, to receive and transmit media streams in real time. JMF uses RTP for receiving and transmitting media streams across the network. JMF play various multimedia files using Java applet application and it support like AVI, MIDI, MPEG, QuickTime, and WAV) and streaming media play from the Internet, and capture audio and video with your microphone and video camera its process by time based media and change content type format for secure communication then it transmit audio and video in real time on the internet.

4. SOLUTIONPRESENTED

In the video conferencing with JMF solution to implement the secure base64 codec in RTP packet have a payload that corresponds to encrypted video frames using engine based on blowfish algorithm

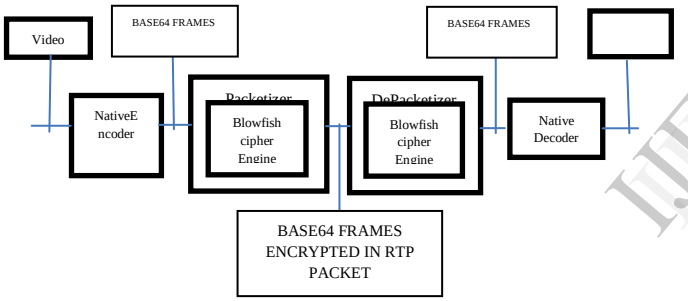
RTP PACKET



Encrypting in video conferencing application implemented with JMF

Video Conference Application Structure based on JMF.The secure communication for video conferencing application using JMF, it implies to encrypt the video/audio data that are transported by the network.it have encryption algorithm fast enough to guarantee the real time communications. And cipher engine present inside the JMF Architecture also have distribution of the session key among the system user, selecting blowfish algorithm as responsible for cipher engine.

Blowfish Algorithm is a symmetric block cipher of 64 bit block and uses a variable length key from 32 bits to 448 bits so that it has to make fast and reliable communication in real time is possible, cipher engine classes that are implement the base64 video Codec selected. In JMF Architecture denominated has two classes packetizer and depackerizer, the packetizer class is an implementation of the BasicCodec interface inside the architecture of classes and interfaces of JMF. This class encapsulates the base64 string data in RTP packet to be sent through the network. This class depacketizer is involved in the Receiver, this class receives RTP packet in a buffer and depacketizes them to obtain a complete frame in base64 string format. In these solution consists on encrypt the video data before it to be incorporation to the RTP packets.



4.1Secure BASE64 CODEC in JMF

The basic structure of our application is composed of the SecureCustomTrans class. This class from its method main that obtains the session key in secure way implementing a security protocol in the JMF Architecture JMF of the secure video BASE64 Codec thatimplemented in RegisterCustomPayload Methodand new codecs are presented again function starts method of the SecureCustomTrans classinvokes JMF APIto establish the RTP session.

4.2 Performance Study

The Performance of real time video transmission with BASE64 Code in the implementation was developed in JMF. The Analysis the transmission was carried out by evaluating the incorporation of blowfish cipher engine using with different Network technologies (LAN 10-100 Mbps, Frame Relay 2 Mbps and WLAN 11 Mbps).Finally the video conferencing performed in camera was studied. In JMF the Evaluation environment a fixed RTP packet size of 1024 Bytes. The Relative feature was carried out in Windows 200 operating with Pentium II Processor a4 450 MHZ with 512 Mbytes on the transmitter and a Pentium II processor at MHZ 256 Mbytes on the Video receiver. And packetzier to sequence packet for the frame relay to the receiverafter that reverse process for depacketzier.

4.3 Solution Presented in JMF

Cost of Frame transmission Protocol.

Different data Network have been evaluated LAN (Local Area Networks)10-100 Mbps, Frame Relay 2 Mbps and WLAN (Wireless Local Area Network) 11 Mbps. BASE64 Frames quality 0.2, 14 fps less than existing frames(frames per second) are reached in LAN at 10/100 Mbps or FR at 2 Mbps whilst only 12 fps are reached in in WLAN with BASE64 quality of 0,7,12 fps are reached in LAN at 10/100 Mbps or FR at 2Mbps whilst only 8 are reached in WLAN.

Relationship between the number of frames and the quality without Encryption

The set of tests carried out cover a range of base64 quality from 0.2 to 0.7, obtaining a clear conclusion from the reduction in the number of frames from a range of 4-12 fps with quality 0.2 to range 0f 11-8 fps when quality is increased. By increasing the quality the Base64 Encoder Algorithm is compressed to lesser extend and the BASE64 frames are larger.

Relationship between the number of frames, the quality and Bits per second without encryption

In direct association with the previous conclusion to point out the following at low quality, that are more small frames are transmitted due to the strong compression. So, less bandwidth is required, oscillating between approximately 450 Kbps (WLAN)-500 Kbps (LAN/FR) with quality 0.2 and almost 1250 (WLAN)-1450 Kbps (LAN/FR) with quality 0.7.

Cost of Real Time Encryption

Quality two 0.2 and 0.7 the quality 0.2 the average rate frame per second is around 12 frames per second in LAN/FR whilst in WLAN only 11 frames per second are reached. And the quality 0.7 the average rate of frame per second reached is around 7 frames per second in LAN/FR and WLAN only 6 frames per second are reached. From the analysis of the result, cost of encryption is deduce at low quality (0.2) is approximately 1-2 frame per second from 14 fps sent without encryption to 12 frames per second encrypted in LAN/FR. And from 12 frames per second sent without encryption to frames per second encrypted in WLAN. By increasing the quality to 0.7 the cost of using real time encryption is also increased, reaching a difference of 4 frames per second in LAN/FR from 11 frames per second sent without encryption to 7

frames per second encrypted and 2 frames per second in WLAN from 8 frames per second sent without encryption to 6 frames encrypted. JMF framework are secure than the existing video conferencing tool, the average of two frames per second less than the other tool, using JMF are portable flexible and reliable and it based on framework in java so the new codec and digital drives are automatically maintained so it gives safe and secure communication.

CONCLUSION

In this work have done real time video conferencing solutions using Blowfish cipher engine using JMF, To obtain flexibility base64 frames of video transmission,the content RTP packets to be encrypted for secure communication, with help java script it allows versatility in the video broadcast platform. Using the blowfish cipher engine the difference are more significant less frame per second compare to existing format, That produced in the transmission of base64encrypted video, the efficiency of base64 string format highly secure than the previous content.

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