Real Time Communication

Er. Simar Preet Singh[1], Er. Anjali Passi[2]

[1]Assistant Professor, [2]Research Scholar, Computer Science & Engineering Department, DAV University, Jalandhar, Punjab (INDIA)

Abstract-**The capabilities of real time communication are of its high speed, high bandwidth in real time application such as multimedia services and automation factory. It will help the user to exchange their information as multimedia, audio content in real time. Traditionally, real time communication is soft and hard real time communication. In this, VoIP is future of voice and video communication such as yahoo, Msn, Google talk and Skype. Several real time applications are used in corporation and business world. RTC is the new integrate communication medium based on W3C standards web RTC.**

***Keywords*- Communications, Real-Time, Transmission, Multimedia, VoIP, Messaging**

I. INTRODUCTION

The real time communication is the communication in which sender and receiver exchange their information and data over a channel without any delay. Generally Real time communication (RTC) is called "LIVE COMMUNICATION". It belongs to peer to peer communication[2].

RTC mode of transmission:

1. Half duplex: In half duplex, the communication is bidirectional but not at the same time. e.g walkie-talkie
2. Full duplex: In full duplex, the communication is bidirectional and simultaneously. e.g: internet telephone[1]
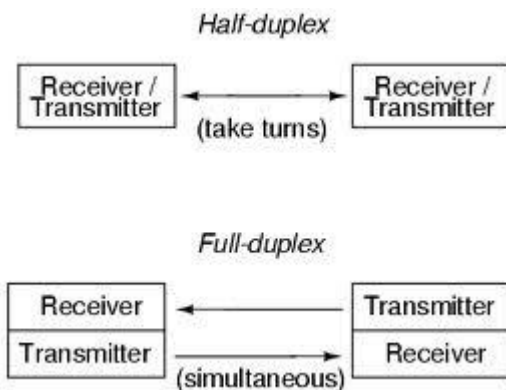

Figure1: Modes of Transmission

The real time communications are of hard and soft real time communication. Soft real time application in which it has capability to tolerate some amount of lost messages where as in hard real time application does not tolerate the loss of messages. In soft real time application require fewer services and allow the network to utilize maximum network. Soft real time communication do not provide absolute guarantee of its quality where as hard real time application provide the guarantee of its quality. Soft real time communication protocol supports both non real time and real time messages in same framework of time.

In internet environment, only soft real time communication is supported in a wide range. There are many hard real time applications such as industrial process control applications, automated manufacturing systems. In real time communication there is a direct path between the sender and the receiver although there are many several nodes in between but it goes from sender to receiver without any storage[8].

The real time communication provides a various components through which users communicate with each other's .This platform is used in many business, as well as in Microsoft products. Microsoft window supports the real time communication platform. With the availability of Microsoft window XP, it provides many features. There are various Microsoft applications, including Microsoft Office Communicator, MSN Messenger, and Windows Messenger to deal with user-to-user communications by using real-time voice and video, instant messaging, and other collaboration features[4].

II. CHARACTERISTICS OF REAL TIME COMMUNICATION:

- Timeliness
- Fast
- Low loss rate
- Low end to end delay
- Delivery of acknowledgement
- Peer to peer
- Cost effective

III. SOME APPLICATION OF REAL TIME COMMUNICATION (RTC)

- INSTANT MESSAGING
- INTERNET TELEPHONY AND VoIP
- LIVE VIDEO CONFERENCING
- TELECONFERENCE
- MULTIMEDIA MULTICAST
- INTERNET RELAY CHAT(IR)
- AMATEUR RADIO

Instant Messaging-It is growing widely all over the world. This type of communication is taking place between two or more people in a private room. An IM communication services provide extra feature as someone in your contact list is online; you can start a chat with that person privately. It became so popular, because in email the person has to wait for recipient reply but in IM, if a person in online mode then the message instantly drops on their screen [9].

In telephonic conversation there is no evidence of content of their communication but in IM communication both has the content of their communication.

Problem in IM-In IM the junk messages and advertisement pop up in the window than it is necessity to handle the messages immediately but in the case Email, these type of messages can be handle later on.

The second problem of IM is virus and Trojan worms can spread through IM channel in which the malicious program are spread when an IM user going to click the hyperlink or download it[3].

For the protection, the user has to choose safe chat room and update the antivirus regularly. So that system cannot be affected by malicious programs.

Internet Telephony And Voip-From the word of internet telephony it is cleared that the user can perform telephonic conversation with the help or use of internet. There is necessary requirement through which communication could be possible i.e Internet. Fixed internet should be available to both sides of users, so that the communication should be better and reliable. Internet telephony software provides free telephone false anywhere throughout the world. Computer to computer telephony includes cable modem, microphone attached to computer and sending their voice with the help of telephony software installed on both sides[5].

As in traditional telephone the quality of transmission is better than internet telephony due to its quality of service. Internet telephony has poor quality of voice transmission which is not clear as placing the regular phone calls.

Example: Many internet telephony applications are available such as pool talk, net meeting and viber.

VoIP is widely growing, it is internet based communication method where hardware and software work together and use internet to transmit telephone calls by sending voice data in packets using IP rather than any traditional way called PSTN (public switched telephone network)

Live Video Conferencing-Live video conference is a conference between two or more user at different site by using internet technology to transmit audio and video data. In this, each participant should have video camera, speaker and microphone connected on both site. And whatever images appear in front of video camera also appears in a window on the participant's screen[7].

From business point of view:

a) Cheaper
b) No travelling cost
c) Group work over geographical distant
d) face to face connection

It can be called as: PHONE CALL WITH PICTURE"
Example: SKYPE:

Skype is a free voice over ip service. It allows the user to communicate with peers by video using a webcam and voice using microphone and messaging on the internet. We can share our screen during the video conference and we can share files on the internet with the help of Skype. Skype reduces the charge of calling we can call to any one on Skype free of cost rather we call on landline or mobile phones[10].

Teleconference-A teleconference is a meeting of two or more participant using technologies. It is popular more because in simple it can perform communication only with two people. In teleconference, there is need of sharing speaker on both ends.

Multimedia Multicast-Multimedia server is used to gather information from various receivers located at geographical places. Multimedia information is form of radio and audio.

Internet Relay Chat(IR)-Internet relay chat is a chatting system that has some set of rules. It is client/server software. On web, certain sites such as Talk city help you to download an IRC client on PC. Talk City offers an IRC client applet. In this, you can start a chat group .On the type of network, reserved nickname is used only in that session. This registered nickname offer your personal profile picture ,your personal home link and pictures. the most common IRC networks are IRCnet (mostly European), EFnet (mostly North American), Undernet, and Dalnet.

Popular IRC clients include mIRC for Windows, IRCle for Mac OS, and irc2 (the original client) for UNIX-based operating systems.

*Amateur Radio-*Amateur radio is also known as harm radio. It is generally used by millions of people all around the world. The operator of amateur radio also called themselves "radio hams" or ham. Wireless amateur communication is done on bands extending from 1.8 MHz through several hundred gigahertzes. When the stage of emergency came, the ham radio provides communication it works when all the other system fails. It communicates on the world wide scale using low power transmitter. The frequency having wavelength shorter than 200 meter by useless for the purpose of radio communication, so they are restrictive to radio amateur to reach frequency[6].

IV. SECURING REAL TIME COMMUNICATION

- Require security at the variety of layers.
- Security need to live in the end to end because where the logic application resides there.
- Sensitive info is carried on the channels and it has to protect against malicious attack. Sufficient security must be provided at end user. The initial authentication shows result in session key communication it should be in session so that previous data cannot be stolen.
  - The data should protect against eavesdropping.
  - The prohibiting VOIP spanning (SPIT) incoming call can be blocked.
  - End point user identities should not revealed to any one special hacker or eaves dropper.
  - Real time communication should be guard of all types of attacks.

Security At Different Layers
- For session/call control we can use session initiation protocol (SIP) (RFC3261).
- For transporting the media the real time transport protocol (RIP) (RFC3261).
- For transmit control data for the RTP Stream RTP control protocol (RTCP) (RFC3550).

V. REQUIREMENTS

- Low end to end delay
- Low loss rate
- Quality of service
- Not imposing too much extra networks load since the data rates of voice traffic is low
- Availability of internet

VI. GOALS FOR REAL TIME COMMUNICATION

All methods of real time communication aim to provide real time message acknowledgement either with low or zero loss rate. The following properties of real time communication

1. In this ,it has low jitter
2. Low latency
3. High affective bandwidth utilization.
4. Low overhead in header bits per packet or cell
5. Low processing overhead per packet within the packet and at the end system

VII. IMPORTANCE OF REAL TIME COMMUNICATION

As our society is developing day by day and rapidly changing so there is need of sharing information and providing feedback too. For example Facebook, twitter. Most of expert provide us new real time communication for the convince of user and make more reliable this communication. For more realistic, real time communication is monitored such as video and voice communication and able us for extracting the valuable information [9].

VIII. CONCLUSION

The real time communication provides the platform to communicate with end users. RTC makes people closer with each other as it requires less cost and negligible time. The development of RTC in social sites makes it more interested .The new generation is used to communicate with one another and provide feedback too such as Facebook, twitter. Securing the RTC is the toughest job and in this security needs to live in end to end users. In this paper, there are some applications of Real time communication; its need and importance are discussed. Goal of real time communication aims to exchange information.

REFERENCES

[1] 3D Videocommunication: Algorithms, concepts and real-time systems in human centred communication edited by Oliver Schreer, Peter Kauff, Thomas Sikora

[2] Real-Time Systems: Theory and Practice Author name Rajib Mall Publisher: Pearson Education India

[3] Automatic Verification of Real-Time Communicating Systems by Constraint-Solving Wang Yi, Paul Pettersson, and Mats Daniels Department of Computer Systems, Uppsala University. Sweden.

[4] Real-Time Communication in Packet-Switched Networks Caglan M. Aras,1 James F. Kurose,2 Douglas S. Reeves3 and Henning Schulzrinne

[5]   A Real-Time Communication Architecture for Large-Scale Wireless Sensor Networks Chenyang Lu Brian M. Blum Tarek F. Abdelzaher John A. Stankovic Tian He Department of Computer Science University of Virginia Charlottesville, VA 22903

[6]   TU Wien Real time communication

[7]   Introduction to Real time communication and embedded system University of Glassglow

[8]   Ashok Agrawala Ardas Cilingiroglu,Sung Lee.Real Time Communication.University of Maryland Institute for Advanced Computer Studies

[9]   Internet chat quick tour:real time conversation &communication online by Donald Rose

[10] An architecture for real-time multimedia communication systems by Cosmos Nicolaou University of Cambridge. Computer Laboratory