

VMeet - A Voice and Video over IP solution

Objective

The growth of IP networks promises a richer multimedia world, delivering next generation voice communication over a cost effective, service oriented, high bandwidth covered networks. VMeet is an attempt to make use of the advances in technology to bring industries competent features for cheaper communication. With this in mind, we have taken initiative in developing a product, for Voice Over IP framework. Our vision is to enable new integrated applications, such as multimedia conferencing, unified messaging, file sharing, and white boarding.

System Overview

H.323 Based Voice Over IP Frame Work: H.323 standard is a cornerstone technology for the transmission of real time audio/video, and data communication over packet based networks. H.323 can be applied in a variety of mechanisms. Audio only (IP telephony), audio and video (video telephony), video and data. H.323 can be applied to multipoint multimedia communication. H.323 provides myriad services and therefore can be applied in a variety of areas, consumer, business and entertainment areas.

Components

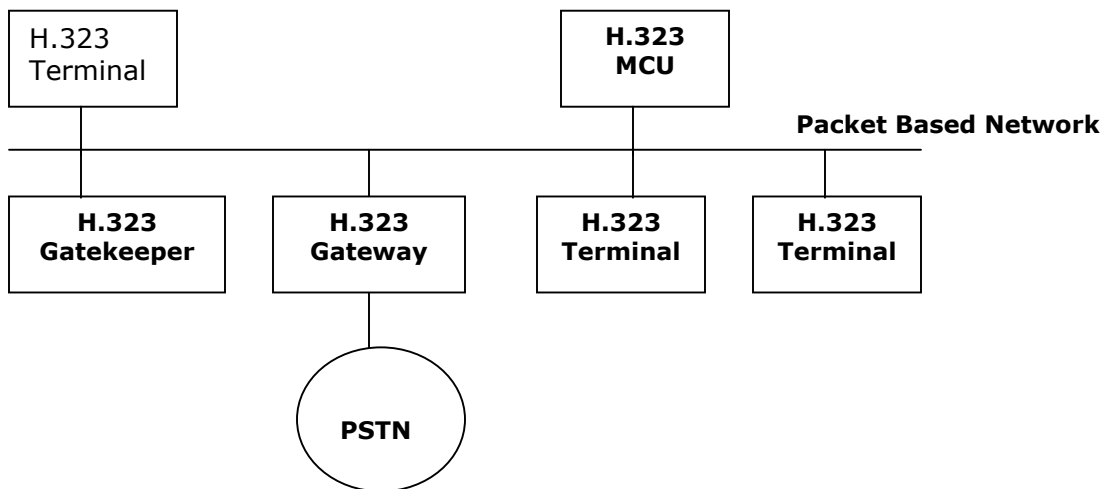
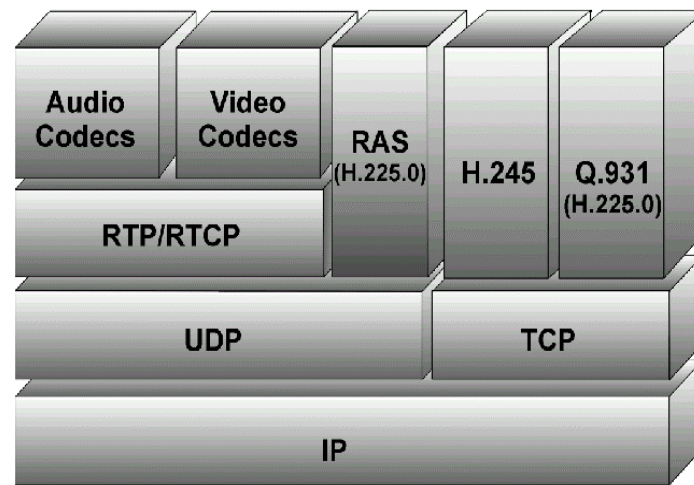


Fig 1. H.323 Framework

H.323 standard specifies four kinds of components, which when networked together provide the point-to-point, or point to multipoint multimedia communication services.

1. Terminals
2. Gateways
3. Gatekeeper
4. Multipoint Control Unit.

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H.323 protocol Framework

Terminal: Used for real time bi-directional multimedia communications, an H.323 terminal can be either be a personal computer (PC) or stand-alone devices, running an H.323 multimedia applications. It supports audio& video communication.

Gateways: A gateway connects two dissimilar networks. An H.323 gateway provides connectivity between an H.323 network and a non H.323 network. For example a gateway can connect and provide communication between an H.323 terminal and public switched telephone network.

Gatekeeper: A gatekeeper can be considered as the brain of H.323 network. It is the focal point of all calls within the H323 network. Gatekeeper can provide important services such as addressing, authorization, and authentication of terminals and gateways, bandwidth management, accounting, billing, and charging.

Multipoint Control Units (MCU): MCU provides support for conferences of three or more H.323 terminals. All terminals participating in the conference establishes a connection with the MCU. The MCU manages conferences resources, negotiates between terminals, for the purpose of determining the audio or video/ decoder (CODEC) to use, and may handle the media stream.

We have the following protocol components

H.323 Protocol Framework Implementation: H.323 Recommendation describes terminals and other entities that provide multimedia communications services over Packet Based Networks (PBN) which may not provide a guaranteed Quality of Service. This Recommendation describes the components of an H.323 system. This includes Terminals, Gateways, Gatekeepers, Multipoint Controllers, Multipoint Processors, and Multipoint Control Units. Control messages and procedures within this Recommendation define how these components communicate. Our present implementation contains H.323 terminal implementation to work in Windows.

RTP and RTCP protocol stack: RTP is the real time protocol designed to meet the real time requirements of the different multimedia services. The control part of the protocol is defined in Real Time Control protocol (RTCP), which controls the transmission characteristics of the senders. This protocol module is developed for Windows and supports IPV6 and multicasting.

H.245 Signaling Protocol Implementation: H.245 Recommendation specifies syntax and semantics of terminal information messages as well as procedures to use them for in-band negotiation at the start of or during communication. The messages cover receiving and transmitting capabilities as well as mode preference from the receiving end, logical channel signaling, and Control & Indication. This module is in C and is portable and interoperable.

H.225 Signaling Protocol Implementation: H.225 Recommendation covers the technical requirements for narrow-band visual telephone services, in those situations where the transmission path includes one or more packet-based networks, each of which is configured and managed to provide a non-guaranteed Quality of Service (QOS) which is not equivalent to that of N-ISDN such that additional protection or recovery mechanisms beyond those mandated by Recommendation H.320 need be provided in the terminals. Our implementation covers ITU-T H.225 Call signaling protocols and media stream packetization for packet - based multimedia communication systems. This module is implemented in C in Windows platform and portable and interoperable.

RAS Signaling Stack Implementation: This signaling channel is with respect to the H.225 specification. This signaling channel is used for signaling between terminal and gatekeeper.

Our Future Implementation Plans

We plan to complete the Voice Over IP framework implementation with the following features.

- Voice conferencing.
- One-to-one multimedia (audio, video) meeting.
- White boarding
- High Quality of Service
- Scalability up to 500 PC's.
- Management Systems for monitoring and control.
- Management system complies with Simple Network Management Protocol (SNMP)
- Call Forwarding, Call Waiting, Voice Mail, Multiple channel holding.
- A conferencing system with provision for conference reservation and automatic dialing.
- Components are interoperable with other third party vendors.
- Highly sophisticated and user friendly GUI's.

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Conclusion

Interest and demand for VOIP is growing as it matures as technology. Greatest impact will be in international voice, enterprises voice, and value added applications