First-Call-meet free and open-source video conferencing application

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Abstract - *Numerous associations are as of now using conferencing applications to relate students and educators, as well as to give online classes. Progresses like Google Meet and Zoom have become crucial for informational foundations to pass on web-based courses amidst the current pandemic.*

WebRTC (Web Real-Time Communication) is a Best-in-class open innovation that makes constant correspondence capacities in sound, video, and information transmission conceivable continuously correspondence through internet browsers utilizing JavaScript APIs (Application Programming Connection points) without modules. we have proposed an electronic shared continuous correspondence framework utilizing the web browser along with the Socket.io that empowers clients to speak with high velocity information transmission over the correspondence channel utilizing WebRTC innovation, HTML5 and use Node.js server address.

First-Call-Meet Web App is a video conferencing application that allow industries for e-learning and training.

***Key Words*: *Web Real-Time Communication [WebRTC]*, HTML5, Socket.io, Node.js, JavaScript API, First-Call-meet, e-learning.**

1.INTRODUCTION

WebRTC is a project that was started by google. It is collection of open sources Framework and libraries. It maintains ongoing communication between various web browsers and applications. It uses simple application programming interfaces (APIs). Socket.IO is a library that enables real-time, bidirectional, and event-based communication between the browser and the server. Our project First-Call-meet is developed using this technology with user friendly UI. It is fast and secure video conferencing application which allow 400+ user to connect in a single room at a same time. our system is developed using both WebRTC and Socket.io.

2. Problem:

Through there were few applications which were used by many institutions for video conferencing such as Google-meet, zoom, MS Team, etc. but there are some problems in this system that they require good internet connection, and some are hard to use because of their UI.

3. Technology Used

Different technology is used to develop video conference application some used technology in our project are: WebRTC, Socket.io, Node.js

3.1 WebRTC

It is an open-source technology that provide web application and sites to capture and stream audio and video as well as exchange data between browser without any intermediatory. It contains Objects like RTCPeerConnection, RTCDataChannel, MediaStream. Its architecture is shown in figure 1.

- RTCPeerConnection: It is used to connect the user and add audio/video Stream by using onAddStream event. It uses protocols like JSEP, SRTP to establish connection and make audio/video stream transfer securely over a network.
- MediaStream: It make a request for media stream and then add it to RTCPeerConnection, it uses signalling server to establish connection for communication.
- RTCDataChannel: It is used to send data along with media stream to the peer connected to that server.

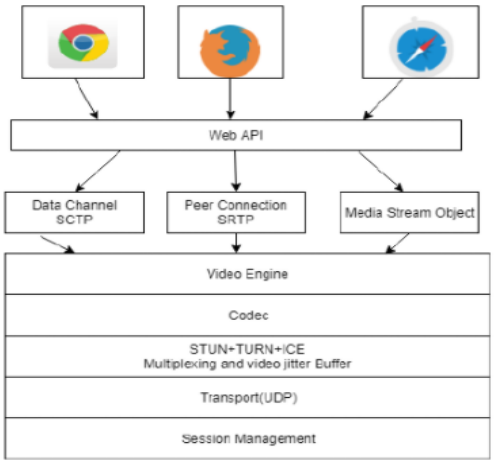


Fig 1. WebRTC Architecture

3.2 Socket.io

Socket.IO gives the capacity to carry out ongoing investigation, paired streaming, texting, and report coordinated effort. Socket.io architecture is shown in fig 2.

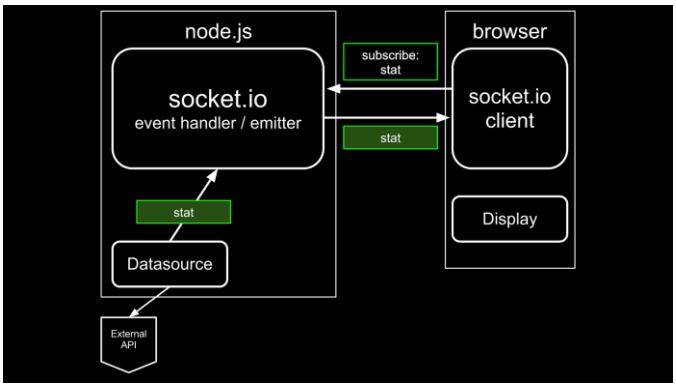


Fig 2. Socket.io architecture

3.3 Node.js

Node.js is an open-source, cross-platform, back-end JavaScript runtime environment that runs on the V8 engine and executes JavaScript code outside a web browser. Node.js lets developers use JavaScript to write command line tools and for server-side scripting—running scripts server-side to produce dynamic web page

4. Practical Utility

1.Online Teaching

2.Business Administration

3.Video Interview

4.Working from Home

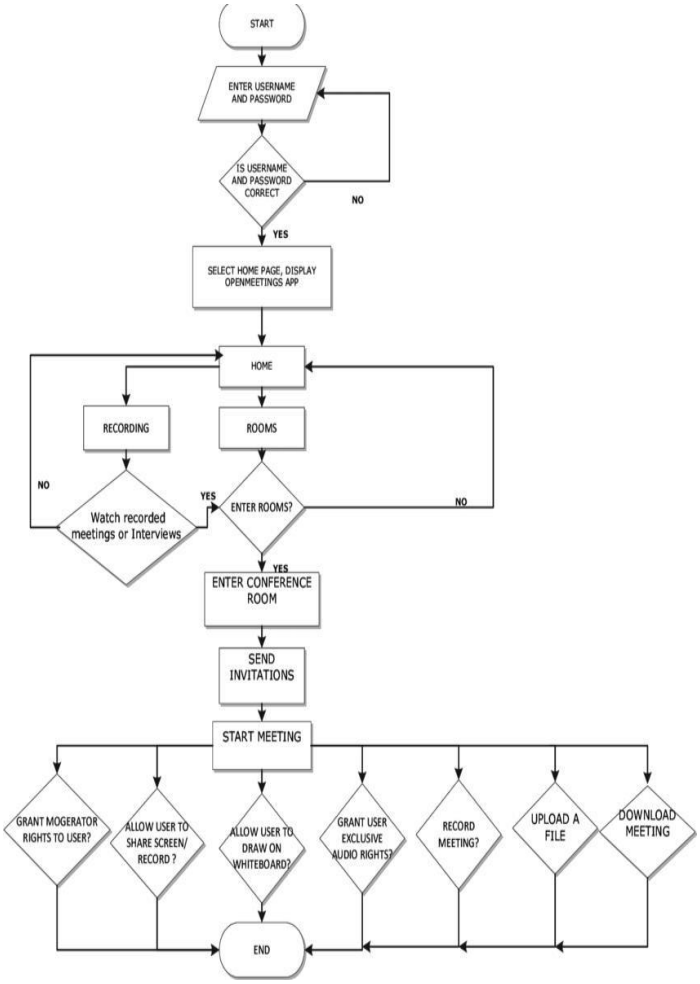
5.Distance Diagnostics

6.Legal Environment

7.Saves Time and Money.

8.No Traveling Required

5. Methodology Flow Chart



6. Previous Work on this technology

Multiple systems are developed on this technology some of them are Google-Meet, Zoom, MS Team, Skype and many more

6.1 Google Meet

Google meet previously known as Google Hangout a video conferencing application that was developed by google. During pandemic the use of google meet rapidly increased. It allows multiple users to join over a network and to meeting and it allow used for e-learning.

6.2 Zoom

Zoom Video Communications, Inc commonly known as to Zoom. It provides video/audio conferencing system to the institutions. It is an American company which also rapidly grow during covid pandemic.

6.3 MS Team

MS Team is developed by Microsoft this application is based on video/audio conferencing it contains more features as compared to other it was launched on March 14, 2017. This also rapidly grow during pandemic.

6.4 Skype

Skype is a proprietary telecommunications application that is run by Skype Technologies, a Microsoft business, and is best known for VoIP-based videotelephony, videoconferencing, and voice calls. It also includes capabilities such as instant messaging, file transfer, debit-based calls to landlines and mobile phones, and more. In the spring of 2003, an early alpha version was built and tested, and the first public beta version was released on August 29, 2003.

7. CONCLUSIONS

First-Call-Meet developed with both WebRTC and Socket.io to improve audio/video streaming over a network with feature like Video/audio call, Whiteboard, Chat, Participants List, Hand raise, Document Sharing. It has user friendly UI that allow the user to use this application without any problem. It allows 400+ user connect at same time at same server/room.

Fig 3. Showing Create and Join room using Code

Fig 4. Showing room

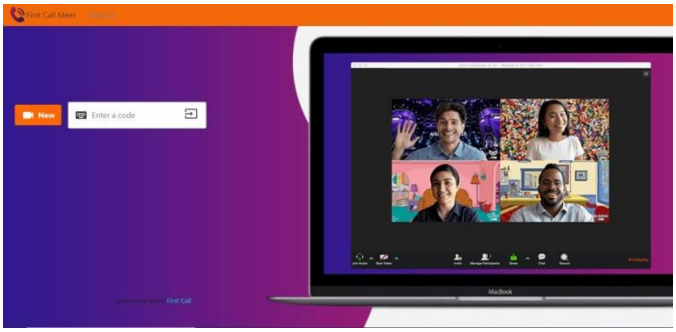


Fig 3. Create/Join room

Fig 4. Room

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