MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

(A Govt. Aided UGC Autonomous & NAAC Accredited Institute Affiliated to RGPV, Bhopal)

Report

on

Internship

An internship report submitted in partial fulfilment of the requirement of the degree of

BACHELOR OF TECHNOLOGY

in

COMPUTER SCIENCE AND ENGINEERING

Submitted By:

Deepanshu Sharma

0901CS181035

Internship – 160801

Faculty Mentor:

Prof. Mir Shahnawaz Ahmad

Submitted to:

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE

GWALIOR – 474005

MAY-JUNE 2022

MAY-JUNE 2022

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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CERTIFICATE

This is certified **Deepanshu Sharma (0901CS181035)** has submitted the internship report under the mentorship of **Prof. Mir Shahnawaz Ahmad**, in partial fulfillment of the requirement for the award of degree of Bachelor of Technology in **Computer Science and Engineering** from Madhav Institute of Technology and Science, Gwalior.

27/05/22

Prof. Mir Shahnawaz Ahmad

Faculty Mentor

Computer Science and Engineering

27/05/22

Dr. **Manish Dixit**

Professor and Head

Department of CSE

Dr. Manish Dixit
Professor & HOD
Department of CSE
M.I.T.S. Gwalior

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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DECLARATION

I hereby declare that the work being presented in this internship report, for the partial fulfilment of requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering at Madhav Institute of Technology & Science, Gwalior is an authenticated and original record of my work under the mentorship of Prof. Mir Shahnawaz Ahmad, Department of CSE.

I declare that I have not submitted the matter embodied in this report for the award of any degree or diploma anywhere else.

Date:

Place: Gwalior

Deepanshu Sharma

0901CS181035

IV Year,

Computer Science and Engineering

MADHAV INSTITUTE OF TECHNOLOGY & SCIENCE, GWALIOR

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ACKNOWLEDGEMENT

The full semester internship has proved to be pivotal to my career. I am thankful to my institute, **Madhav Institute of Technology and Science** to allow me to continue my disciplinary/interdisciplinary internship as a curriculum requirement, under the provisions of the Flexible Curriculum Scheme (based on the AICTE Model Curriculum 2018), approved by the Academic Council of the institute. I extend my gratitude to the Director of the institute, **Dr. R. K. Pandit** and Dean Academics, **Dr. Manjaree Pandit** for this.

I would sincerely like to thank my department, **Department of Computer Science and Engineering,** for allowing me to explore this internship. I humbly thank **Dr. Manish Dixit**, Professor and Head, Department of Computer Science and Engineering, for his continued support during the course of this engagement, which eased the process and formalities involved.

I am sincerely thankful to my faculty mentors. I am grateful to the guidance of **Prof. Mir Shahnawaz Ahmad**, Department of Computer Science and Engineering, for his continued support and guidance throughout the project. I am also very thankful to the faculty and staff of the department.

Deepanshu Sharma

0901CS181035

IV Year

Computer Science and Engineering

TABLE OF CONTENTS

1. Introduction

1.1 Company Profile:

Company name: Kloudspot Inc.

Blend physical and digital insights to deliver an enriched customer experience. Monetize your IT investments, drive engagement and deliver more personalized and enriched experiences to customers with Kloudspot. Serve up ‘spot on’ communications to customizable Wi-Fi portals and digital displays, including demographic-based advertisements and more.

Hybrid work experiences are much more than just combining physical location options with remote collaboration tools. It’s about creating new workspaces that are safe, engaging, and collaborative. Hybrid work designed with data, insights, and metrics delivers flexible spaces with real cost savings. Kloudspot hybrid work solutions bring the context you need to reframe your workspaces. Today and tomorrow.

The purpose of this company is to:

- To define the technical & operational feasibility.
- To ensure that there are no misunderstanding or omissions in functionality.
- To ensure that requirements of the proposed system are complete and clear.
- To provide a basis for the subsequent design, development and testing phases of entire application.

1.2 Objectives of Proposed Work:

Currently I am working as a SDE (Full stack) interns at kloudspot Inc. I have completed my full stack training conducted by external industry training experts. Various real time projects of the company has been assigned to us. Project assigned to me is a application name “kloud Meet” which is basically a video conferencing app similar to Zoom,Meet etc. I am working on this real time project and almost completed the basic applications of the project.

1.2 Purpose:

2. Technical Description

2.1 System Analysis & Requirements:

The selection of hardware is very important in the existence and proper working of any software. When selecting hardware, the size and requirements are also important.

- Processor – Intel CORE i5 8th Gen
- RAM – 8.0 GB
- Hard Disk Drive – 1 TB

2.2 Software Requirements:

- **WebRTC**
- **WebSockets**
- **Electron JS**
- **Mongo DB**
- **NodeJS & NPM**
- **Angular JS**
- **VS Code**
- **Amazon AWS**
- **Bitbucket**

2.3 Technology Used:

- **WebRTC**: WebRTC (Web Real-Time Communication) is a technology that enables Web applications and sites to capture and optionally stream audio and/or video media, as well as to exchange arbitrary data between browsers without requiring an intermediary. The set of standards that comprise WebRTC makes it possible to share data and perform teleconferencing peer-to-peer, without requiring that the user install plug-ins or any other third-party software.
- **WebSocket**: The WebSocket API is an advanced technology that makes it possible to open a two-way interactive communication session between the user's browser and a server. With this API, you can send messages to a server and receive event-driven responses without having to poll the server for a reply.

- **GIT**: Git is software for tracking changes in any set of files, usually used for coordinating work among programmers collaboratively developing source code during software development. Its goals include speed, data integrity, and support for distributed, non-linear workflows. For management of our projects, we are using bitbucket.

- **SpringBoot**: Spring Boot is an open source Java-based framework used to create a micro Service. It is developed by Pivotal Team and is used to build stand-alone and production ready spring applications.The main motive of using springboot is for the backend development, REST-API creation and Database Management.

- **MongoDB:** MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License.

- **HTML**- The HyperText Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser. It can be assisted by technologies such as Cascading Style Sheets and scripting languages such as JavaScript.

- **CSS** - Cascading Style Sheets is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

- **JavaScrip**t - JavaScript, often abbreviated JS, is a programming language that is one of the core technologies of the World Wide Web, alongside HTML and CSS. Over 97% of websites

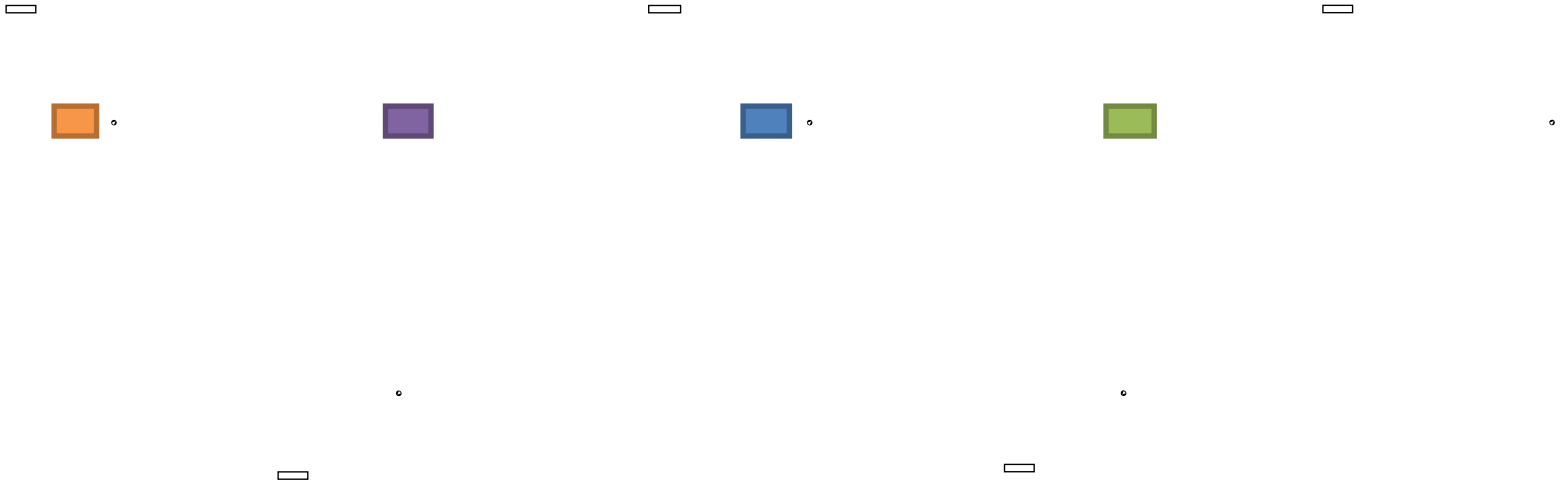
use JavaScript on the client side for web page behavior, often incorporating third-party libraries.

- **TypeScript**- TypeScript is a programming language developed and maintained by Microsoft. It is a strict syntactical superset of JavaScript and adds optional static typing to the language. TypeScript is designed for the development of large applications and transcompiles to JavaScript.

- **Angular JS** - AngularJS is **a structural framework for dynamic web apps**. With AngularJS, designers can use HTML as the template language and it allows for the extension of HTML's syntax to convey the application's components effortlessly. Angular makes much of the code you would otherwise have to write completely redundant.

- **RxJS**- RxJS is a library for reactive programming using Observables, to make it easier to compose asynchronous or callback-based code. This project is a rewrite of Reactive-Extensions/RxJS with better performance, better modularity, better debuggable call stacks, while staying mostly backwards compatible, with some breaking changes that reduce the API surface.
- **Electron-**Electron is a framework for building desktop applications using JavaScript, HTML, and CSS. By embeddingChromium and Node.js into its binary, Electron allows you to maintain one JavaScript codebase and create cross-platform apps that work on Windows, macOS, and Linux — no native development experience required.

3. Internship Timeline



4. Training

4.1 Self pace training:

Training (1 FEB 2022 – 7 MARCH 2022)

- I joined kloudspot as a intern on 1st feb 2022 remotely. From 1st feb our self pace training was started. We were assigned JAVA udemy courses which we have to complete it and submit the assignments.
- Along with that we were assigned video lectures of using Git and Linux.
- I successfully completed the JAVA Udemy course and submitted its all assignments and earned the certificate of completion from UDEMY.

4.2 Backend Training:

(7/March/2022 – 28/March/2022)

Topics Covered Were

- Maven, JDBC
- Spring boot – Spring IOC, Autowiring, Scope and reading from application. properties, Introduction to Spring Boot, Spring Core with boot, Spring MVC, Spring Rest-API, Integrating Rest-Api with mongoDB, Exception handling
- Spring Security using JWT
- MongoDB

4.3 Frontend Training:

(28/March/2022 – 12/April/2022)

- Learned HTML, CSS and JS

- Learned Typescript
- Learned AngularJS
- Learned Advanced JavaScript
- Learned RxJS

5. Project

5.1 Problem Statement & Requirements

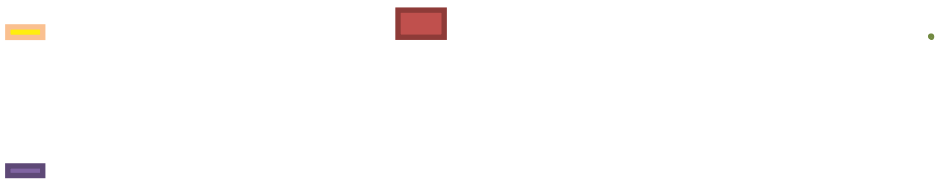
To develop video conferencing application which have the following applications in it:

- **Meetings:** HD video and audio collaboration.
- **ScreenShare:** Feature to let the screen be presented in the video call.
- **Group(both public & password enabled) & Private Meetings**
- **Chat support:** Feature of letting all the meeting attendee chat with each other

5.2 Development & Work Flow:

Authentication & Authorization:

Every web application is well protected with the facility of Authentication and Authorization. It simply means the registration of new user and login of already existing user to take all benefits of the application.



For achieving this we are using node.js in the backend which is fetching the data from database and ultimately creating an Authorization token as JWT token and sending it to the frontend.

The problem

Connecton	Data Transfer	Security
How the Peer's (Client) will be Identified.	● How the Different Type of Data Will be Transferred between the Peer's	How the Authentication and Authorization will be Implemented.

The Problem:

Three major issues we will face while building our application is first we need to find our peers on internet and then to make connections for transfering different kind of data like audio ,video and texts.and while doing the same we also have to authenticate the user and verfiy the authorization/access for particular event.

Challenges deep-dive

Challenge 1	Challenge 2	Challenge 3
Identification of Peer's	**Connecting Peer's**	**Streaming Data**
In an Application like Video Conferencing or Chatting application the first problem is to how to find other Peer or Peer' s over the Internet also with presence of NAT's.	After Identification how the Connection will be established between them and maintained.	After Establishing Connection, one need to Send the Data Streams over the Internet to other peer's.

THE SOLUTION:

- Here the concept of SDP protocol and signaling server comes into play.
- This SDP is a text based protocol used to define a contract between the clients containing the information such as Public IP, Codec , Port, Media Config , etc .
- This SDP will be send to server to pass to other Client's known as signaling server.
- Here for this there are a Number of solutions present but what we are using are:-

  One to One:

No connection UDP Protocol.

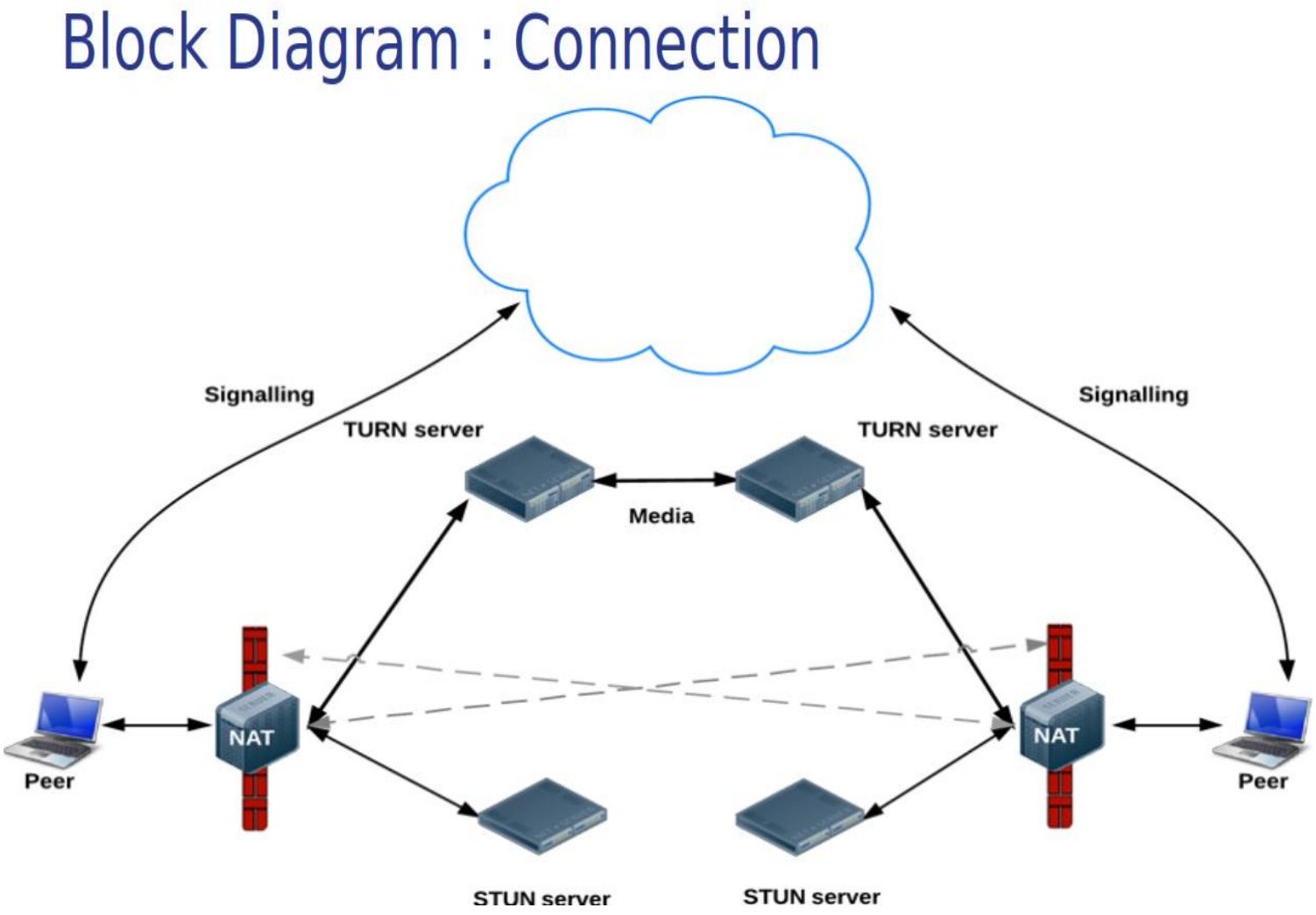
Multi User:

- A server based connection client create one connection between server and each user will
- connect to the same server with same two way communication protocol
- Peer to Peer:
- Both clients will be broadcasting their streams to the other clients via UDP Protocol.

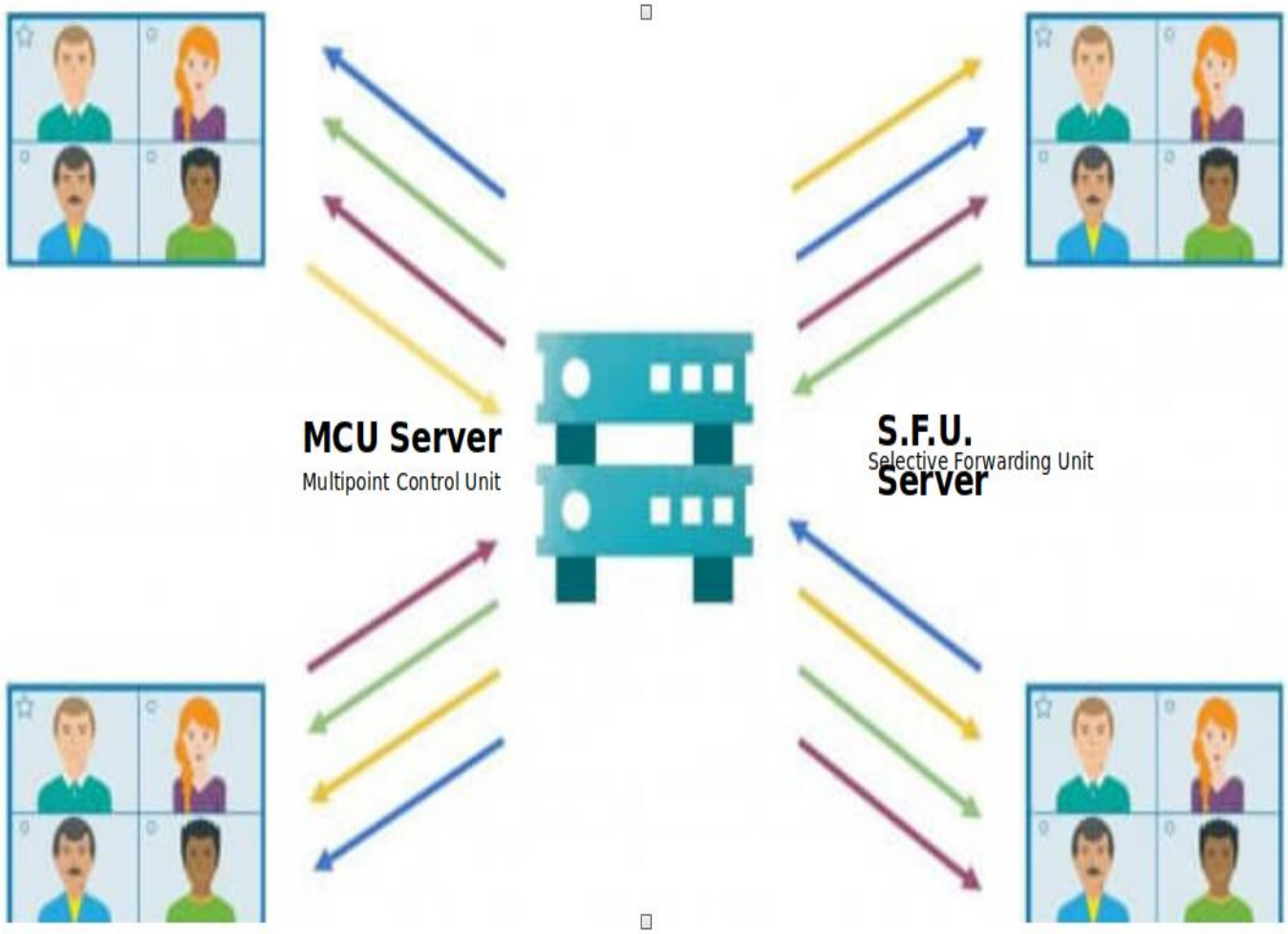
For Multiple user:

Each clients will Steam data to the Server (central) and this server will broadcast each stream to all other clients except the one sending it.

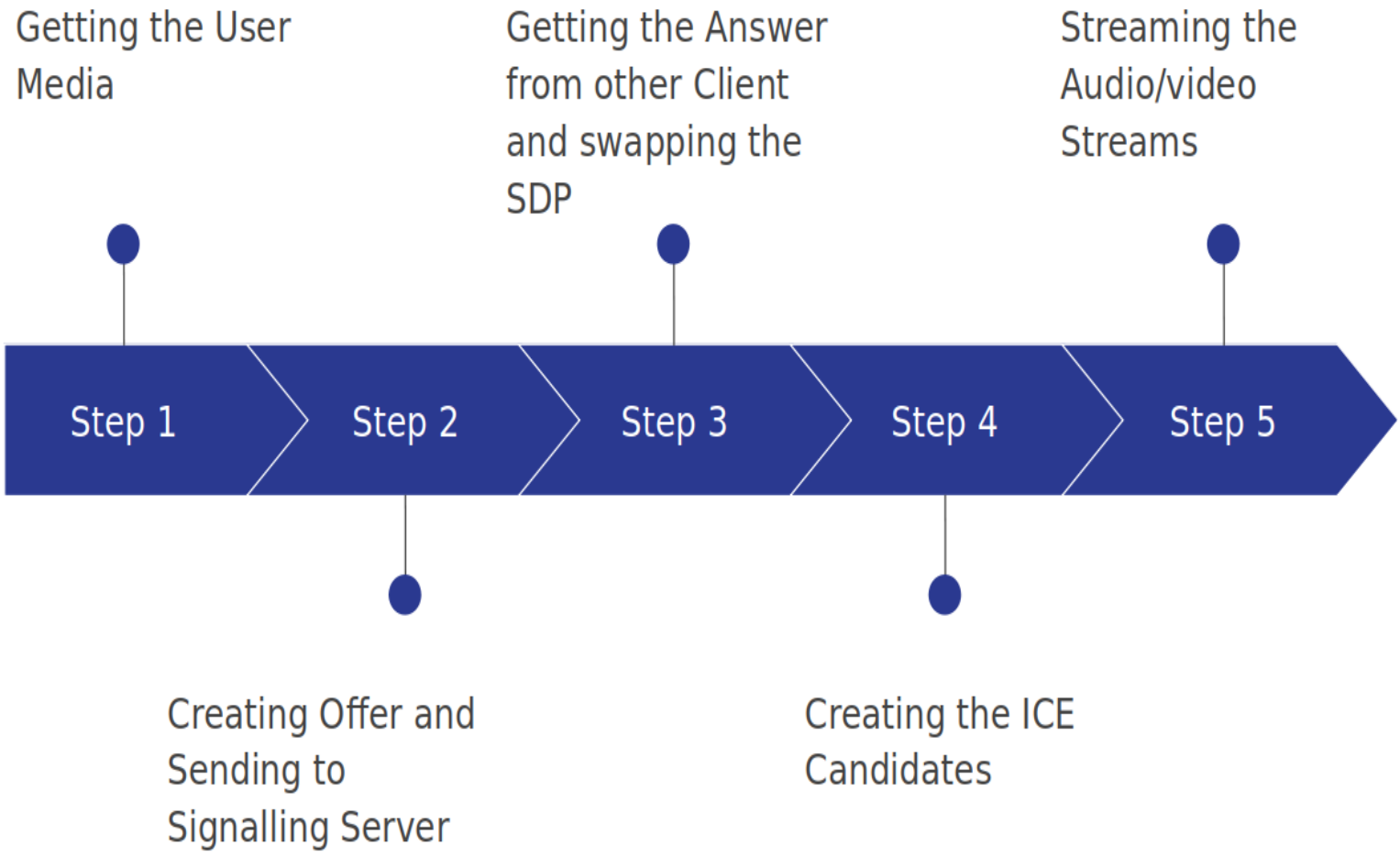
Block Diagram:



Block Diagram : Multiple User



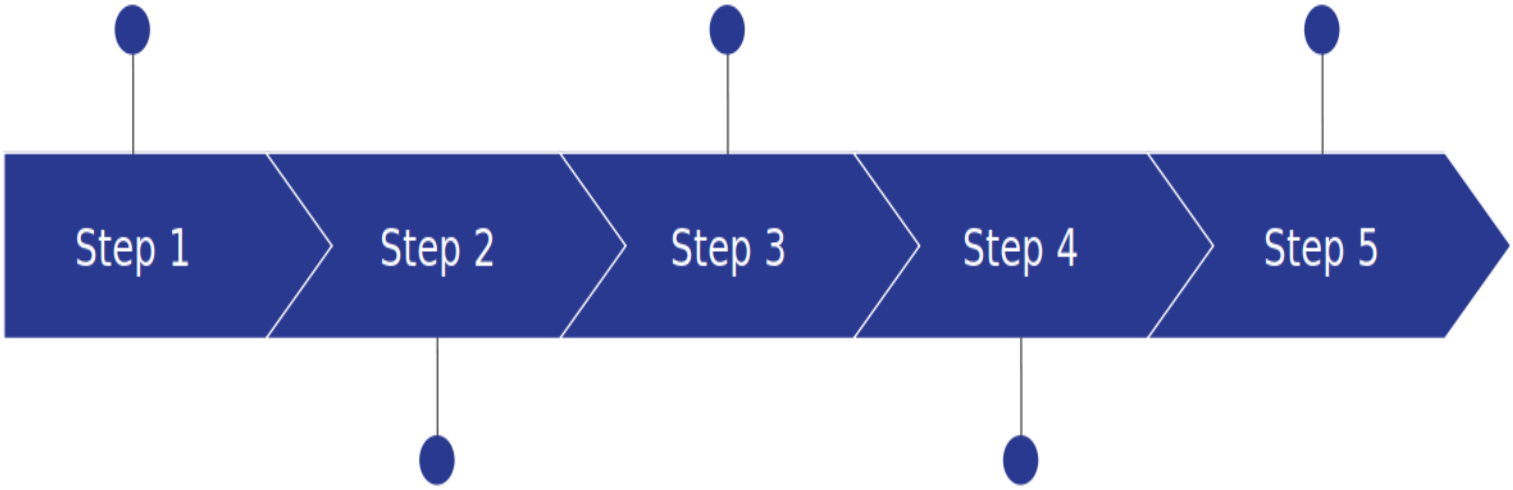
IMPLEMENTATION:



Getting the User Media.

Connecting to Other Clients.

Streaming the Audio/Video Streams to all the connections.



Connecting to Calling (MCU Server).

Converting the Streams into different stream Quality.

TECHNOLOGY IMPLEMENTATION:

- **WEBRTC:** For Audio and video data stream
- **WEB SOCKETS:** Connections and peer to peer Data stream.
- **NODE JS:** Authentication and Authorization and implementation of webRTC and web sockets on server side.
- **MONGODB:** For storing the credentials of users and storing the important details of the meetings/calls hosted like (SDP offer,start time,endtime and password etc).
- **ANGULAR JS:** required for making single page dynamic front end webpages.
- **ELECTRON JS:** At the end ,the main objective is to make desktop application which is platform independent and could be run on any Operating system ,here usability of electron js comes into play after all the backend and frontend part is done it would be used to make desktop application for the same.

6 Conclusion

I successfully completed my training and also worked on a real time company project. I was successfully able to learn full stack development and implement it. I was successfully able to complete the project on which our data was getting stored on the amazon aws cloud server. We were able to perform all the basic CRUD operations. And also we are on the path of synchronization of data. Finally, we hope this will go a long way in popularizing.

7 References & bibliography

- **https://stackoverflow.com/**
- **https://www.electronjs.org/**
- **https://www.geeksforgeeks.org/**
- **https://stackblitz.com/**
- **https://angularjs.org/**
- **https://nodejs.org/en/**
- **https://webrtc.org/**

Appendices

8 FPR REPORTS:

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	Deepanshu Sharma		Department	Engg.	
Industry/Organization	Kloudspot Inc.		Date/Duration	2nd Feb – 15th Feb, 22	
Criterion	**Poor**	**Average**	**Good**	**Very Good**	**Excellent**
Punctuality/Timely completion of assigned work					
Learning capacity/Knowledge up gradation					
Performance/Quality of work					
Behaviour/Discipline/Team work					
Sincerity/Hard work					
Comment on nature of work done/Area/Topic	He is going through JAVA training Performance has not yet assessed.				
OVERALL GRADE (Any one)	**POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT**				
Name of Industry Mentor	Nikhil Ram				
Signature of Industry Mentor					

Receiving Date		**Name of Faculty Mentor**		**Sign**	

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	DEEPANSHU SHARMA		Department	ENG.	
Industry/Organization	KLOUDSPOT INC		Date/Duration	16 Feb - 28 Feb, 2022	
Criterion	**Poor**	**Average**	**Good**	**Very Good**	**Excellent**
Punctuality/Timely completion of assigned work				✓	
Learning capacity/Knowledge up gradation					✓
Performance/Quality of work					✓
Behaviour/Discipline/Team work					✓
Sincerity/Hard work					✓
Comment on nature of work done/Area/Topic	HE HAS COMPLETED JAVA SCRIPT COURSE.				
OVERALL GRADE (Any one)	**POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT**				
Name of Industry Mentor	NIKHIL RAM				
Signature of Industry Mentor					

Receiving Date		**Name of Faculty Mentor**	ANJULA MEHTO	**Sign**	

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	Deepanshu Sharma		Department	ENGG.	
Industry/Organization	KLOUDSPOT INC.		Date/Duration	14 March 2022	
Criterion	**Poor**	**Average**	**Good**	**Very Good**	**Excellent**
Punctuality/Timely completion of assigned work				✓	
Learning capacity/Knowledge up gradation					✓
Performance/Quality of work					✓
Behaviour/Discipline/Team work				✓	
Sincerity/Hard work				✓	
Comment on nature of work done/Area/Topic	Quick learner				
OVERALL GRADE (Any one)	**POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT**				
Name of Industry Mentor	NIKHIL RAM				
Signature of Industry Mentor					

Receiving Date		**Name of Faculty Mentor**		**Sign**	

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	Deepanshu Sharma		Department	Engg	
Industry/Organization	KLOUDSPOT INC		Date/Duration	29 March 2022	
Criterion	**Poor**	**Average**	**Good**	**Very Good**	**Excellent**
Punctuality/Timely completion of assigned work			✓		
Learning capacity/Knowledge up gradation					✓
Performance/Quality of work					✓
Behaviour/Discipline/Team work			✓		
Sincerity/Hard work				✓	
Comment on nature of work done/Area/Topic	Spring Boot, HTML & CSS Mongodb				
OVERALL GRADE (Any one)	**POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT**				
Name of Industry Mentor	NIKHIL RAM				
Signature of Industry Mentor					

Receiving Date		**Name of Faculty Mentor**		**Sign**	

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	DEEPANSHU SHARMA		Department	ENGG.	
Industry/Organization	KLOUDSPOT		Date/Duration	1-APRIL → 13 APRIL	
Criterion	**Poor**	**Average**	**Good**	**Very Good**	**Excellent**
Punctuality/Timely completion of assigned work					✓
Learning capacity/Knowledge up gradation				✓	
Performance/Quality of work					✓
Behaviour/Discipline/Team work					✓
Sincerity/Hard work				✓	
Comment on nature of work done/Area/Topic	Angular : Directives, decorators, components etc				
OVERALL GRADE (Any one)	**POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT**				
Name of Industry Mentor	PRIYANSHI AGRAWAL				
Signature of Industry Mentor	Priyanshi				

Receiving Date		**Name of Faculty Mentor**		**Sign**	

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	Deepanshu Sharma		Department	CSE	
Industry/Organization	KLOUDSPOT. INC		Date/Duration	28/04/2022	
Criterion	**Poor**	**Average**	**Good**	**Very Good**	**Excellent**
Punctuality/Timely completion of assigned work					✓
Learning capacity/Knowledge up gradation				✓	
Performance/Quality of work					✓
Behaviour/Discipline/Team work					✓
Sincerity/Hard work					✓
Comment on nature of work done/Area/Topic	He's very much focused to work & is upgrading himself & completing the work assigned to him on time.				
OVERALL GRADE (Any one)	**POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT**				
Name of Industry Mentor	Priyanshi Agrawal.				
Signature of Industry Mentor	Agrawal 28/04/2022				

Receiving Date		**Name of Faculty Mentor**		**Sign**	

FORTNIGHTLY PROGRESS REPORT (FPR) FROM INDUSTRY MENTOR

Name of student	Deepanshu Sharma		Department	13/05/2022	
Industry/Organization			Date/Duration		
Criterion	**Poor**	**Average**	**Good**	**Very Good**	**Excellent**
Punctuality/Timely completion of assigned work				✓	
Learning capacity/Knowledge up gradation				✓	
Performance/Quality of work					✓
Behaviour/Discipline/Team work					✓
Sincerity/Hard work				✓	
Comment on nature of work done/Area/Topic	@ working on the Project assigned				
OVERALL GRADE (Any one)	**POOR/AVERAGE/GOOD/VERY GOOD/EXCELLENT**				
Name of Industry Mentor	Priyanshi Agrawal				
Signature of Industry Mentor	Agrawal 13/05/2022				

Receiving Date		**Name of Faculty Mentor**		**Sign**	

9. INTERNSHIP CERTIFICATE

kloudspot

: +91-8277-111444
: contact@kloudspot.com
: www.kloudspot.com

Date: May 20th 2022

CERTIFICATE OF INTERNSHIP

This is to certify that **Mr.Deepanshu Sharma**(ID: 0901CS181035, Madhav Institute of Technology & Science, Gwalior) is engaged as an intern in our organization from Feb, 1st 2022 to Jun, 30th 2022. Post completion of his internship, he will be joining us as Software Engineer, as per our offer letter.

During this period Deepanshu has met all expectations of the project and his conduct was found to be satisfactory.

We take this opportunity to thank and wish him well in future.

Sincerely,
For KSPOTFI SYSTEMS INDIA PRIVATE LIMITED,

KSPOTFI SYSTEMS INDIA PRIVATE LIMITED kloudspot BENGALURU

Deepak Kumar Singhal
Executive Director

KSPOTFI SYSTEMS INDIA PRIVATE LIMITED (A 100% subsidiary of Kloudspot Inc. USA)
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CIN: U72900KA2017FTC102518