CHAT Application

Using AWS websocket API and Lambda functions

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INTRODUCTION

Real time chat application that makes use of lambda functions powered by websocket api

OBJECTIVE

The aim of this application is to allow users to send public messages as well as private messages to specific users in the chat room. A websocket gateway API is setup for the client side. A lambda function is used to handle the events occurring on the client side. The frontend is built using React.

LITERATURE SURVEY

S.No	Paper Title	Summary	Methodology	Limitations
1.	Android chatting application based on wifi technology Year: 2016 Publisher : IJESRT	Android chatting application based on WI-FI technology allows users to communicates with each other through WIFI,simply turning on Wi-fi option from mobile phone instead of using internet data connectivity. Thus it saves the costs where users are can send and receive messages within WI-FI range.	The Methodology used behind the android chatting application Based on WI-FI Technology is A2P. A2P is a type of SMS sent from a subscriber to an application or sent from an application to a subscriber. It is commonly used by financial institutions, airlines, hotel booking sites, social networks, and other organizations sending SMS from their systems to their customers. According to research in 2013, A2P traffic is growing faster than P2P messaging traffic.	One of the major limitation of ANdroid Chatting Application Based on WI-Fi Technology is that There is no external connection. Within WI-FI range users can transfers large amount of data as well as download the data.

S.No	Paper Title	Summary	Methodology	Limitations
2.	I. Karabey and G. Akman, "A cryptographic approach for secure client - server chat application using public key infrastructure (PKI)," 2016 11th International Conference for Internet Technology and Secured Transactions (ICITST), 2016, pp. 442-446, doi: 10.1109/ICITST.2016.7856750.	Encryption and identity authentication have been added to a simple chat application to let clients talk to each other instantly over a secure channel. A simple chat application has led clients to talk to each other safely by implementing a lot of methods which are important for network security and security concepts	NIST made a call for an Advanced Encryption Standard (AES) in 1997. AES symmetric algorithm proposed by Rijndal was selected after the assessment and this algorithm uses block size of 128 bit and key length of 128, 192 or 256 bit.	A trusted third party, which signs users' public key with its secret key to authenticate the identity of sender and receiver while exchanging data over the internet is needed for the setup.

S.No	Paper Title	Summary	Methodology	Limitations
3.	Online Chatting Application Year : 2020 Publisher: IJREISS	Online Chatting Application provides the feature of authorization allows the user to use their account anywhere anytime with the use of any mobiles phone. User needs to send chat request before sending any messages to any user. When user accept their request then only they send the messages otherwise not. User has to login their application with their email id and password as there is no need of OTP.	Firebase Cloud Messaging (FCM) is a service that encourages informing between mobile applications and server applications. It's based on Google Play Services that supports cross-stage (iOS, Android and Web). It is a free assistance that permits sending lightweight messages from the server to the devices at whatever point there is new information available. This spares a great deal of client's battery by abstaining from requesting to the server for new messages.	The limitations of Online Chatting Application are that these features can't be accessed at this point of time: 1. Voice informing. 2. Gathering calling 3. Live spilling 4. Messages auto erase after a given time. 5. Customized message tunes.

S.No	Paper Title	Summary	Methodology	Limitations
4.	A Chat Application in Lift Year: 2010 Publisher: IEEE Internet Computing	The application provides a single chat server that takes chat messages and redistributes the messages out to all listeners.	Implementation uses a single HTTP connection to poll for changes to an arbitrary number of components on the page. Each component has a version number. The long poll includes the version number and the component's globally unique identifier (GUID). On the server side, a listener is attached to all the GUIDs listed in the long-poll requests. If any component has a higher version number, or the version number increases during the long-poll period, the listener sends the deltas	If a second request comes into the same URL during a long poll, the long poll is terminated to avoid connection starvation.

S.No	Paper Title	Summary	Methodology	Limitations
5	Group chatting Application Year: 2016 Publisher: Ashutosh Kumar and Atul Singh	This paper shows the importance of chat application in day today life and its impact in technological world. This project is to develop a chat system based on Java multi threading and network concept. The application allows people to transfer messages both in private and public way .It also enables the feature of sharing resources like files, images, videos,etc	Once they joined the chat they are responsible for IP and port. When a user A wants to communicate to user B, B will act as a server and authenticate client A. As authentication is one-way, this opens up an opportunity for attackers to masquerade as user B. To cater some of these problems, they came out with some principle ideas in our proposed application.	This project lacks in developing a chat service Web app with high quality user interface like some features such as: 1. Voice Message 2. Video Message 3. Audio Call 4. Video Call 5. Group Call

OVERVIEW

This project is centered around the use of AWS Websocket API. A client can send messages to a service, and services can independently send messages to clients. This is done via websocket routes.

OVERVIEW

STRENGTHS

Serverless therefore easier to manage

WEAKNESSES

Stability as there is no server

OPPORTUNITIES

Shorter response time and scalability

THREATS

Security issues, access/authorization control

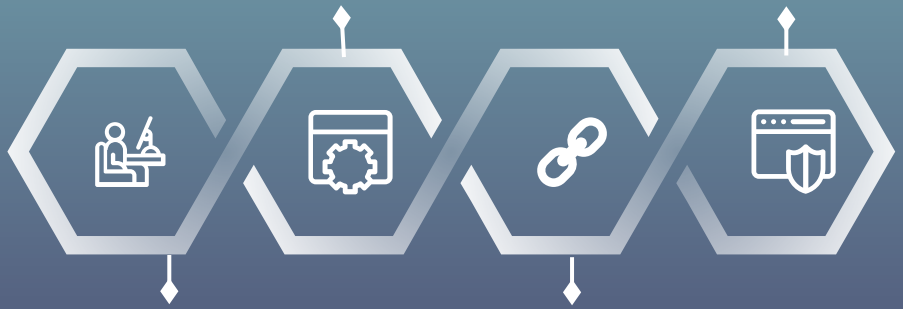
ARCHITECTURE

API GATEWAY

An API Gateway with routes to cater to incoming client requests.

RESPONSE

Response is sent to client securely (states and hooks)



CLIENT

The client sends a message request to the server (socket).

CONNECTION URL

Websocket URL on AWS to establish a serverless connection

MODULES

ROUTES

Predefined and custom

BACKEND

Lambda functions
(javascript)

CHAT UI/UX

Frontend using react, typescript

ROUTES

PREDEFINED

- Connect: triggered when client connects to API
- Disconnect: triggered when connection is closed
- Default: triggered when no matching route is found

CUSTOM

- setName: allows user to choose a username
- sendPublic: allows users to send public messages
- sendPrivate: allows to users to send private messages

BACKEND

LAMBDA FUNCTION

Chat API handler used as integration type for all listed routes. The lambda function calls event handlers and extracts the connection ID.

PRODUCTION STAGE

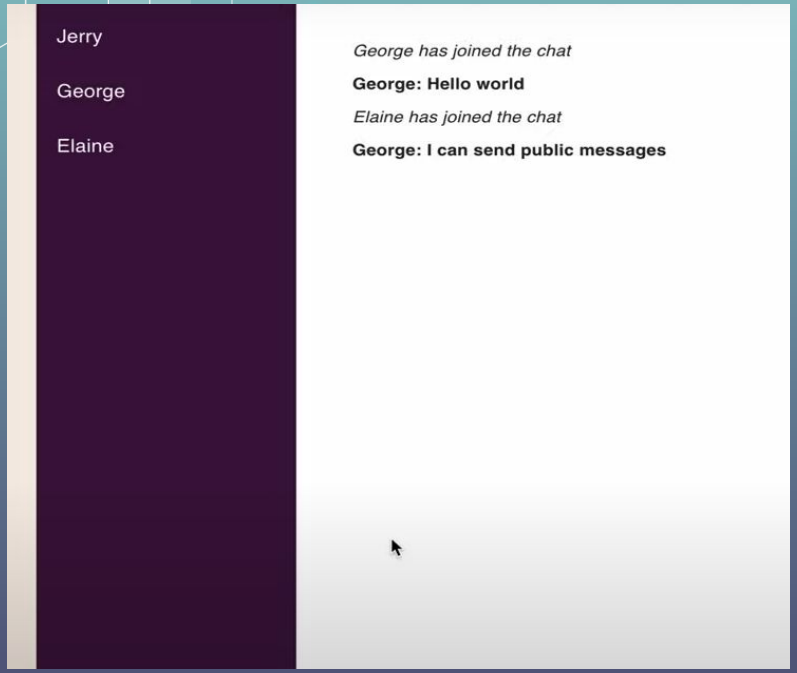
- Websocket URL: used to connect client to websocket
- Connection URL: The URL is used when we want to send request to client

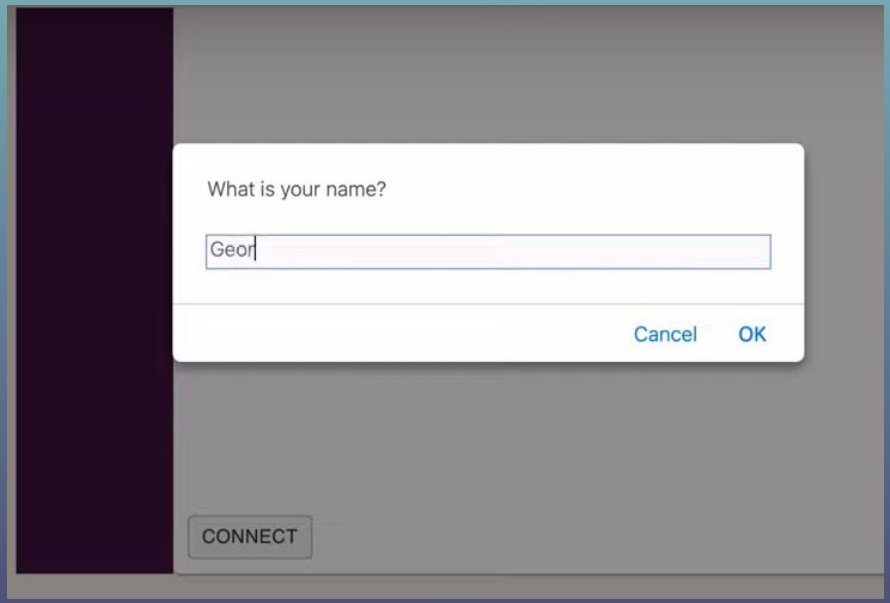
FRONTEND

The Chat Client UI is built using ReactJS (states and hooks)

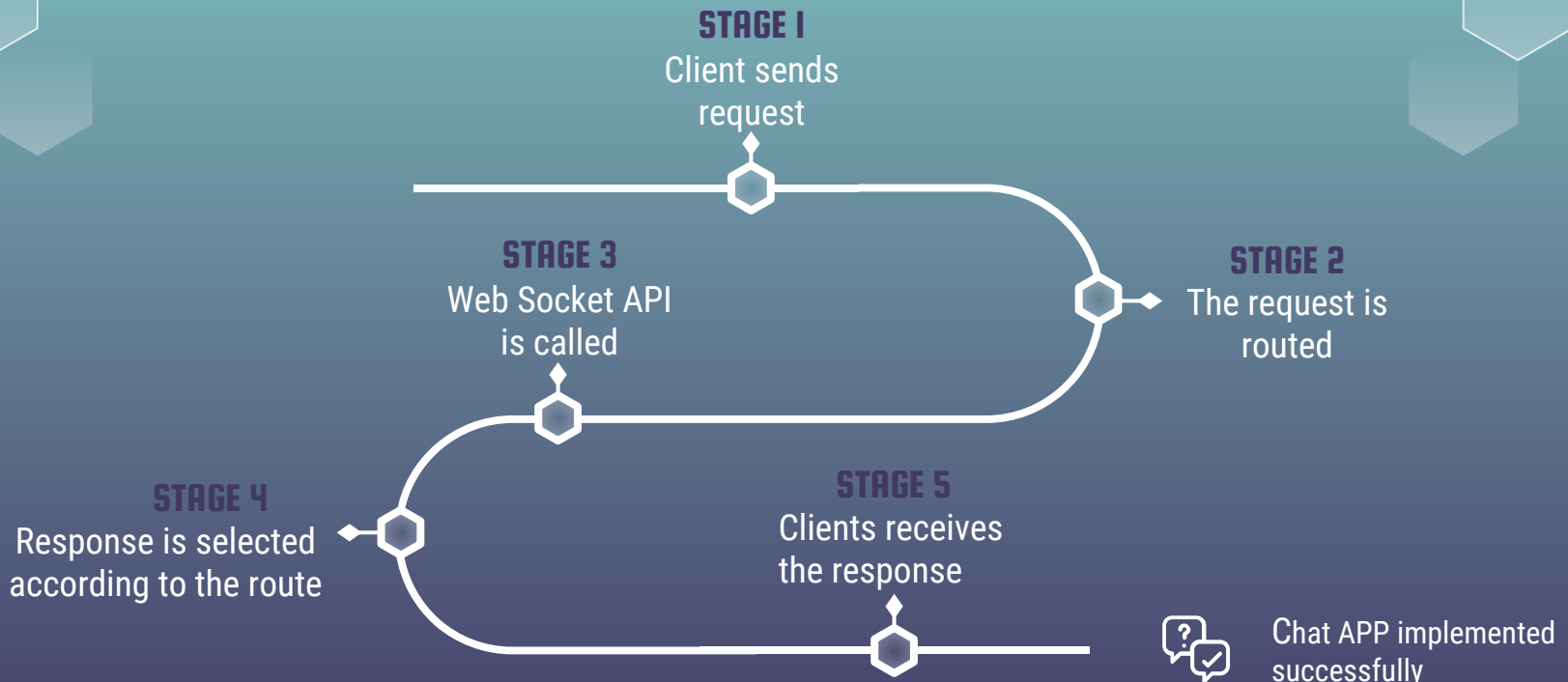
A simplistic design is made using Javascript/typescript to enable ease of access

OUTPUT


Jerry
George
Elaine
George has joined the chat
George: Hello world
Elaine has joined the chat
George: I can send public messages


What is your name?
Geor
Cancel
OK
CONNECT

RESULTS AND DISCUSSIONS



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THANK YOU