Audio Hosting Full Stack Application Documentation

Contents

1. API Interface

1.1. User / User Account

1.1.1. Authenticate User Login

http://ServerIP:5555/**user/authenticateLogin**		Method=POST	Content-Type = JSON	
	Field Names	**Data Type**	**Description**	**Example**
Input ((Body)	Username	String	Username of user. Unique to each user	"User_123"
	Password	String	Password of the user.	"1Password"

Return	loginAuthentication StatusObj	Object	authenticateStatus → true if successful login (Boolean)
			message → description of the status (string)
			jwt → json web token is issued if authentication was successful. (string)
			Payload in the jwt contains the following information.
			(1) username
			(2) userID
			(3) role
			(4) timestamp jwt was issued
			(5) timestamp jwt expires
				Response: {
				authenticateStatus: true,
				message: 'Successful Login',
				jwt: yJhbGciOiJIUzI1NiIs………
				}

	Status	Number	200 → Success, 500 → Error	

1.1.2. GetAllUsersList

http://ServerIP:5555/**user/getAllUsers**		Method=GET	Content-Type = JSON	Authorization-Header = JWT Token
	Field Names	**Data Type**	**Description**	**Example**
Input ((Body))	NIL	NIL	NIL	NIL

Return	usersList	Collection of Objects. Each object contains user information.	User Information Objects consists of
			(1) UserID → UUID
			(2) Username
			(3) Password
			(4) Role → Either "admin" or"user"
				Response: {
				userID: "234033-234…………"
				username: "Admin_User',
				password: "1Password"
				role: "Admin"
				}

	Status	Number	200 → Success, 500 → Error	

1.1.3. AddNewUser / SignUpNewUser

http://ServerIP:5555/**user/addUser**		Method=POST	Content-Type = JSON	Authorization-Header = JWT Token
http://ServerIP:5555/**user/signUpNewUser**		Method=POST	Content-Type = JSON	NO AUTHORIZATION HEADER
	Field Names	**Data Type**	**Description**	**Example**
Input (Body)	user	Object	User Object (1) UserID → UUID (2) Username (3) Password (4) Role → Either "admin" or"user"	{userID: "234033-234…………" username: "Admin_User', password: "1Password" role: "Admin"}
Return	StatusObj	Object	Status → status of add new user	pass or fail
	Status	Number	200 → Success, 500 → Error	

1.1.4. DeleteUser

http://ServerIP:5555**/user/deleteUser**			Method=DELETE	Content-Type = JSON	Authorization-Header = JWT Token
	Field Names	**Data Type**	**Description**		**Example**
Input (URL Param)	userID	String	String → UUID		'00000000-0000-0000-0000-000000000000'
Return	StatusObj	Object	Status → Status of deletion, statusMsg → Description		statusMsg = "At Least One Admin User is needed. Unable to delete" status: "fair"or "pass"
	Status	Number	200 → Success, 500 → Error		

1.1.5. UpdateUser

http://ServerIP:5555**/user/updateUser**			Method=PUT	Content-Type = JSON	Authorization-Header = JWT Token
	Field Names	**Data Type**	**Description**		**Example**
Input (URL Param)	userID	String	String → UUID		'00000000-0000-0000-0000-000000000000'
Input (Body)	user	Object	Object containing all user information (1) UserID → UUID (2) Username (3) Password (4) Role → Either "admin" or"user"		{userID: "234033-234…………" username: "Admin_User', password: "1Password" role: "Admin"}
Return	StatusObj	Object	Status → Status of deletion, statusMsg → Description		statusMsg = "At Least One Admin User is needed. Unable to delete" status: "fair"or "pass"
	Status	Number	200 → Success, 500 → Error		

1.1.6. GetCurrentUser

http://ServerIP:5555**/user/getCurrentUsername**			Method=GET	Content-Type = JSON	Authorization-Header = JWT Token
	Field Names	**Data Type**	**Description**		**Example**
Input	NIL	NIL	NIL		NIL
Return	username	Object	Contains one property username		{ username: "Admin_User"}
	Status	Number	200 → Success, 500 → Error		

1.2. Audio / Audio Upload API

1.2.1. GetUserAudioCollections

http://ServerIP:5555**/audio/getUserAudioCollections**			Method=GET	Content-Type = JSON	Authorization-Header = JWT Token
	Field Names	**Data Type**	**Description**		**Example**
Input	NIL	NIL	NIL		NIL
Return	collection	Collection of Objects. Each object contains user information.	User Information Objects consists of (1) filename → name of file (2) key → string info derived from upload time/date (3) audioCategory → string description of category		[{ audioCategory: "pop" audioDescription: "best of 2000s pop …" fileContent: "//uQZAAAAAAAA"

			(4) audioDescription → string description of song (5) username → username of user who uploaded file. (6) userID → user id of user who uploaded file. (7) base64 string representation of media file.	fileName: "Test_1OMB_MP3.mp3 key: "1682254380997-9" userID: "00000000-0000-00000….." username: "Super_Admin"}, {….}, ……..]
	Status	Number	200 → Success, 500 → Error	

1.2.2. DeleteAudioTrack

http://ServerIP:5555**/audio/deleteAudio**		Method=DELETE	Content-Type = JSON	Authorization-Header = JWT Token
	Field Names	**Data Type**	**Description**	**Example**
Input (URL Param)	key	String	key → unique string representation of audio file	"1682254380997-9"
Return	StatusObj	Object	Status → Status of deletion	status: "fair"or "pass"
	Status	Number	200 → Success, 500 → Error	

1.2.3. InitAudioUpload

http://ServerIP:5555**/audio/upload/init**		Method=POST	Content-Type = JSON	Authorization-Header = JWT Token
	Field Names	**Data Type**	**Description**	**Example**
Input (Headers)	X-Content-Length	Number	depicts the size of the file to be uploaded	
	X-Content-Name	String	depicts the name of the file	file_01.mp3
	X-Chunks-Quantity	Number	depicts the total slices/chucks the file will be boken into and sent	2
Return	fileId	String	Unique ID to represent the file to be uploaded by chunks.	"sdfss"
	Status	Number	200 → Success, 500 → Error	

1.2.4. UploadAudioChunks

http://ServerIP:5555**/audio/upload**		Method=POST	Content-Type = application/octet-stream	Authorization-Header = JWT Token
	Field Names	**Data Type**	**Description**	**Example**
Input (Headers)	Content-Length	Number	depicts the size of the chunk to be stream	
	Content-Length	Number	Size of file	
	X-Chunk-Id	String	Used to identify the file the chunk uploaded	file_01.mp3
	Content-Info	Object	Additional information of file uploaded, information to be saved in database together with file content.	username, userID, audioDescription, ..
Return	Size	Number	Size of chunk	
	Status	Number	200 → Success,	

1.3. <u>Middleware Definitions</u>

1.3.1. VerifyToken (uses jwt token in authorization request header)

Status	**Action**
No Token Found	Return 401 status and statusMsg: "Authorization Token not send in header. Please login first", status: "fail"
Token is not a valid JWT	Return 403 and statusMsg: "Unauthorized transaction"
Token is valid	extract the username, userID, role and pass it to next middleware.

1.3.2. ValidateAdminUserRole

Used to verify if user is admin, handle access control requirements associated with the api request.

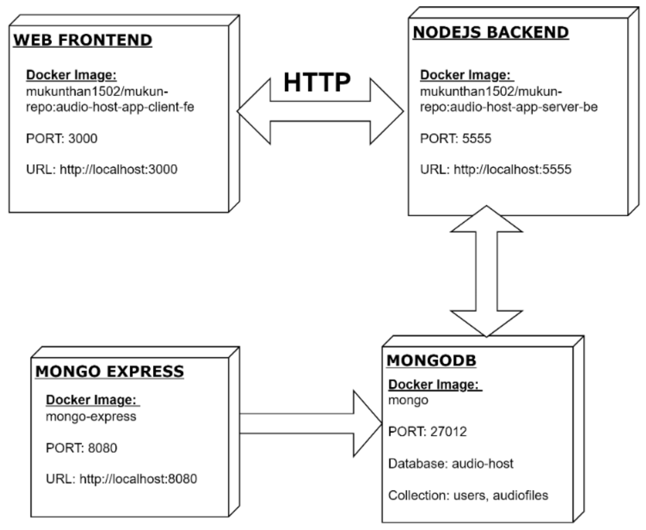
Status	Action
User Role is Admin	Call the next middleware
User Role is not Admin	Return 500 and StatusMsg: <username> current role has no access rights for current action. Current role: <role>. status: "fail"

1.3.3. CheckUsernameAlrExist

Status	Action
"username" is not unique	Return 409 and StatusMsg: <username> username is already taken. Try another username., status: "fail"
"username" is unique	Call the next middleware

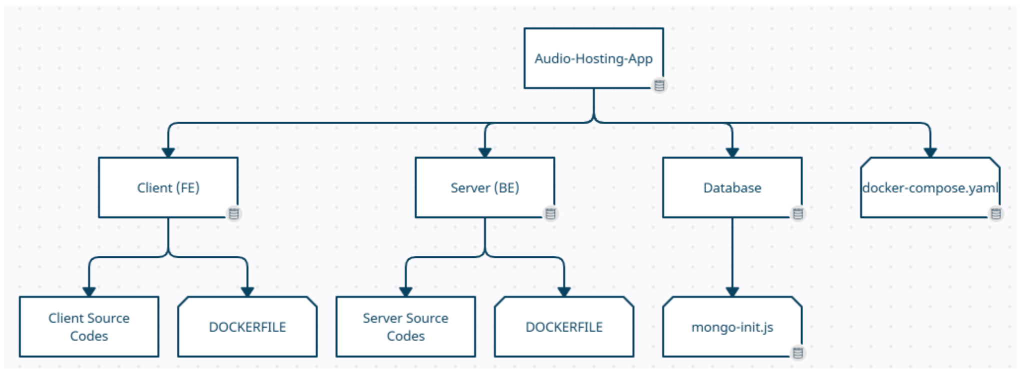
2. System Architecture

2.1. Overview


WEB FRONTEND
Docker Image:
mukunthan1502/mukun-repo:audio-host-app-client-fe
PORT: 3000
URL: http://localhost:3000
HTTP
NODEJS BACKEND
Docker Image:
mukunthan1502/mukun-repo:audio-host-app-server-be
PORT: 5555
URL: http://localhost:5555
MONGO EXPRESS
Docker Image:
mongo-express
PORT: 8080
URL: http://localhost:8080
MONGODB
Docker Image:
mongo
PORT: 27012
Database: audio-host
Collection: users, audiofiles

2.2. Application File Directory Overview

The 3 directories within Audio-Hosting-App folder contain codes and artifacts relating to the frontend, backend and database. The frontend and backend folders each contain a Dockerfile used to create their respective docker image. The mongo-init.js script resides in the Database folder. This script will initialize the mongo DB with some initial data when the mongo dB container is spawned and had no data initialize before.



2.3. Web Frontend Overview

The web frontend is developed using react framework. The frontend client runs on port 3000 and communicates with the backend service on port 5555 (configurable in docker-compose).

2.4. Nodejs Backend Overview

The backend runs on NodeJS and uses express framework. The server listens for incoming requests from clients (port 5555 – configurable), processes them, and responds with the appropriate data or actions. Express provides a set of middleware functions that can be used to handle requests and responses. Middleware functions are used to perform tasks such as request access control by examining json web token sent together with request header.

The backend services also interfaces with a mongo DB database for persistent storage on port 27017.

2.5. Mongo DB Overview

The database is used for persistent storage in our application. The database name used is “audio-host”. There are 2 collections present in the database. Communicates on port 27017. Uses latest official mongo docker image from docker hub.

Collection	Description
users	Collection of user details information. Each document consists of username, password, userID and role.
audiofiles	Collection of audio details information. Each document consists of filename, key, audioCategory, audioDescription, username, userID and fileContent.

Document definition for user collection		
Property	**Data Type**	**Example**
username	String	“userxx”
password	String	“1Password”
userID	String (UUID)	1234-2342…
role	String	“admin”or “user”

Document definition for audiofiles collection		
Property	**Data Type**	**Example**
filename	String	“song1.mp3”
key	String	“123-234324….”
audioCategory	String	“Rock”
audioDescription	String	“admin” or “user”
username	String	“userxx”
userID	String (UUID)	1234-2342…
fileContent	base64 string	“//uQZAAAAAAAA”

2.6. Mongo Express Overview

A web-based user interface (UI) tool for MongoDB that allows us to easily manage and interact with MongoDB database using port 8080. Uses latest official mongo-express docker image from docker hub.

3. Instruction to Start Application

1. Run docker-compose command on docker-compose.yaml file.
   1.1. In root folder, enter cmd and type "docker compose -f docker-compose.yaml up
   1.2. This will start up all 4 containers.

2. Once all containers are started up. Navigate to http://localhost:3000/login to navigate to application.
   2.1. If this is the first time initializing the database, then 2 default user entries will populate the database. Initial application login will use these initial user entries. The initial user entries are defined in ./Database/mongo-init.js. Current initial user entries are as follows.

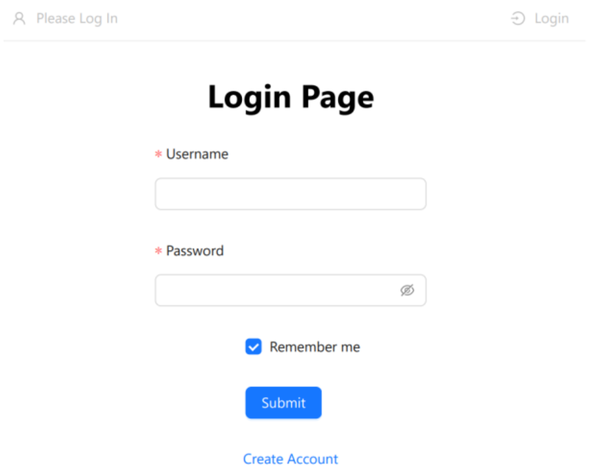
```
  {
        username: "Super_Admin",
        password: "1Password",
        userID: "00000000-0000-0000-0000-000000000000",
        role: "admin",
    },
    {
        username: "User",
        password: "1Password",
        userID: "8770db80-0d4b-4edc-bf84-4076d41259c6",
        role: "user",
    },
```

3. Navigate to http://localhost:8080 to navigate to the web interface of the mongo database. This interface allows for manual manipulation of the database. (add/remove. modify users, audio).
   3.1. Database used for this application is called "audio-host"
   3.2. Collection used are "users" and "audiofiles"
4. Backend service can be accessed using http://localhost:5555/ .

4. Application walkthrough

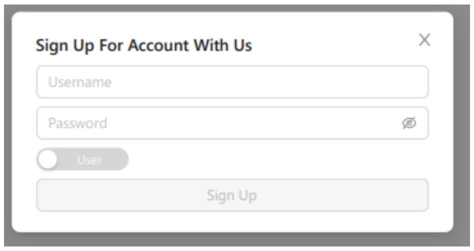
4.1. Login Page (http://localhost:3000/login)

4.1 Enter username and password to log into application.
4.2 No maximum attempts penalty



4.3 Click on “Create Account” to create a new Account.

4.3.1 Enter Username, password and click “Sign Up”.

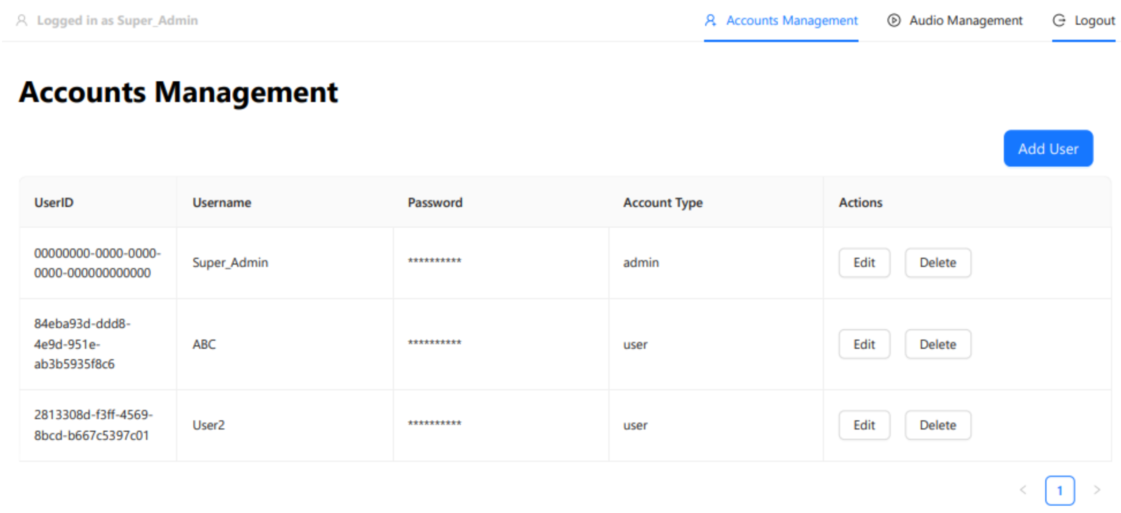


4.2. User Account Page (http://localhost:3000/account)

4.2.1 Upon successful login, the application will be re-directed to the accounts page.

4.2.2 Only admin users can add new users, edit and delete existing users.

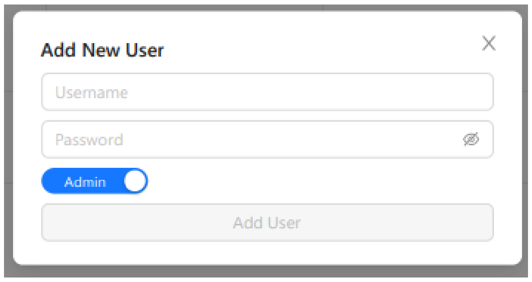
4.2.3 This page can also be accessed by clicking on Account Management on navigation bar.



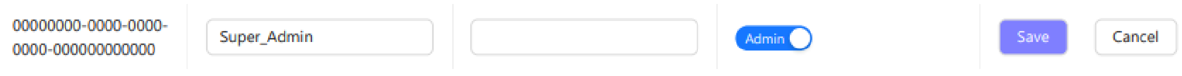
Accounts Management

UserID	Username	Password	Account Type	Actions
00000000-0000-0000-0000-000000000000	Super_Admin	**********	admin	Edit Delete
84eba93d-ddd8-4e9d-951e-ab3b5935f8c6	ABC	**********	user	Edit Delete
2813308d-f3ff-4569-8bcd-b667c5397c01	User2	**********	user	Edit Delete

4.2.4 Clicking On “Add User”.



4.2.5 View when click on edit.



00000000-0000-0000-0000-000000000000	Super_Admin		Admin	Save Cancel

4.2.6 Click on “Save” button to save changes, “Cancel” button to revert changes.

4.3. Audio Management Page (http://localhost:3000/audio)

4.3.1 Page displays all audio files uploaded by current user only.

4.3.2 Additional audio files can be uploaded with corresponding category and description.

4.3.2.1 "Click on Upload" to upload audio file.

4.3.2.2 "Add to Collection" to save file to audio collection.

4.3.3 Click on "Delete" to remove audio file from collection.

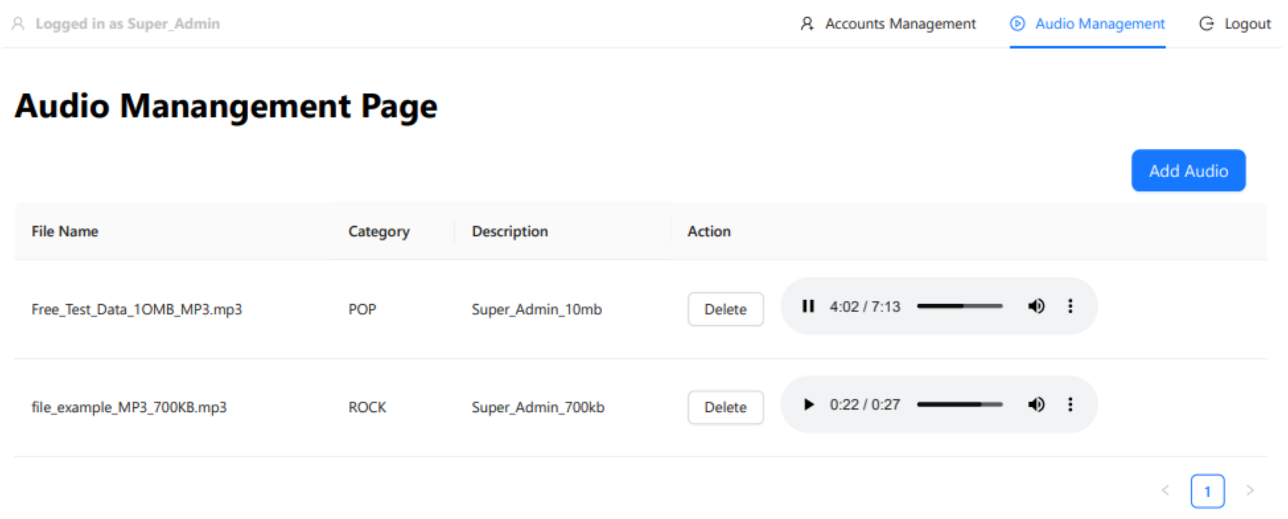
4.3.4 Media player on each row allows for

4.3.4.1 Playback and seeking of media.

4.3.4.2 Volume and playback speed adjustment.

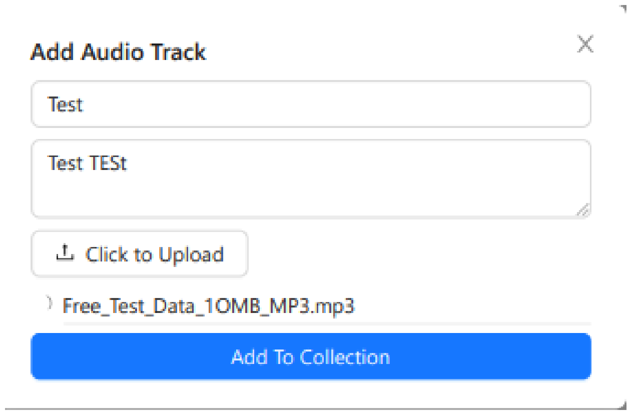
4.3.4.3 Downloading of audio file to local system.

4.3.5 This page can also be accessed by clicking on Audio Management on navigation bar.



File Name	Category	Description	Action
Free_Test_Data_1OMB_MP3.mp3	POP	Super_Admin_10mb	Delete 4:02 / 7:13
file_example_MP3_700KB.mp3	ROCK	Super_Admin_700kb	Delete 0:22 / 0:27

4.4 Clicking "Add Audio" will show this pop-put. Enter description, category and upload audio.



5. Source Codes and Project Artifacts

The source code and artifacts can be cloned from the following GitHub repo
https://github.com/mukunthan1502/Audio-Hosting-Application.git/

6. Docker Images

The docker images for the frontend and backend are hosted at Docker hub repository at the following repo mukunthan1502/mukun-repo. The mongo and mongo-express images are the latest official release on Docker hub.

- Client (FE) tag name: audio-host-app-client-fe
- Server (BE) tag name: audio-host-app-server-be