Design Manual

**Main Components**

1. Database
2. Authentication
3. Cloud Storage
4. Cloud Hosting
5. Mobile Application
6. Web application
7. Control Unit
8. Mailbox

Database

Main technology used: Firebase Realtime Database

Collections & Sub collection:

* Nodes
  + nodeID(serialNum)
    - init: Boolean
    - nodeId: String

This collection maintains by the system administrator. When a new device is eligible for register, system admin add a separate collection with init field value ‘false’. When the device initialized the init field set to ‘ture’ and push a random nodeId. This nodeId used as the access point for other sub collections.

* initNodes
  + nodeID
    - adminID: String
    - users
      * user0: String

This collection maintains all the registered device information like adminID, users. Separate sub collection can be access using nodeID.

* events
  + nodeID
    - eventID
      * data: String
      * description: String
      * imageURL: String
      * name: String
      * rating: int
      * userType: String
* users
  + usersID
    - admin:Boolean
    - email: String
    - fName: String
    - imgUrl: String
    - lName: String
    - nodeId: String

Users collection holds details about users, token provide by the Firebase auth is used as the

* messages
  + nodeID
    - event: String
    - from: String
    - to: String
    - msgType: String
    - msgUrl: String
    - time: String

Authentication & Authorization

Technology Stack: Firebase Auth

Solution has several authentication and authorization steps

1. Device Authentication
2. User Authentication

Device Authentication

The Collection Node, that maintains init details of the Nodes. If the node is initialized database push a deviceID into the collection. That ID take as the access token for backend. In the initialize stage there is a System admin must add separate collection with the serial number for a device. Then user can register their device using register time.

User Authentication

When user make a request on with the email and password, Firebase auth send a access token for the system. That token is used to access database and user can resolve the relevant deviceID using that access token.