IoT Modelling Environment

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Agenda

1. Aim of the Project
2. Utilized Technologies
3. IoT Modelling Tool
4. Roadmap

1. Aim of the Project

- The project has as goal building a platform, where users can have their own devices with components.
- The users may monitor in real time the values’ changes in the sensors attached to their devices.

2. Used Technologies

1. Database
2. Backend
3. Frontend

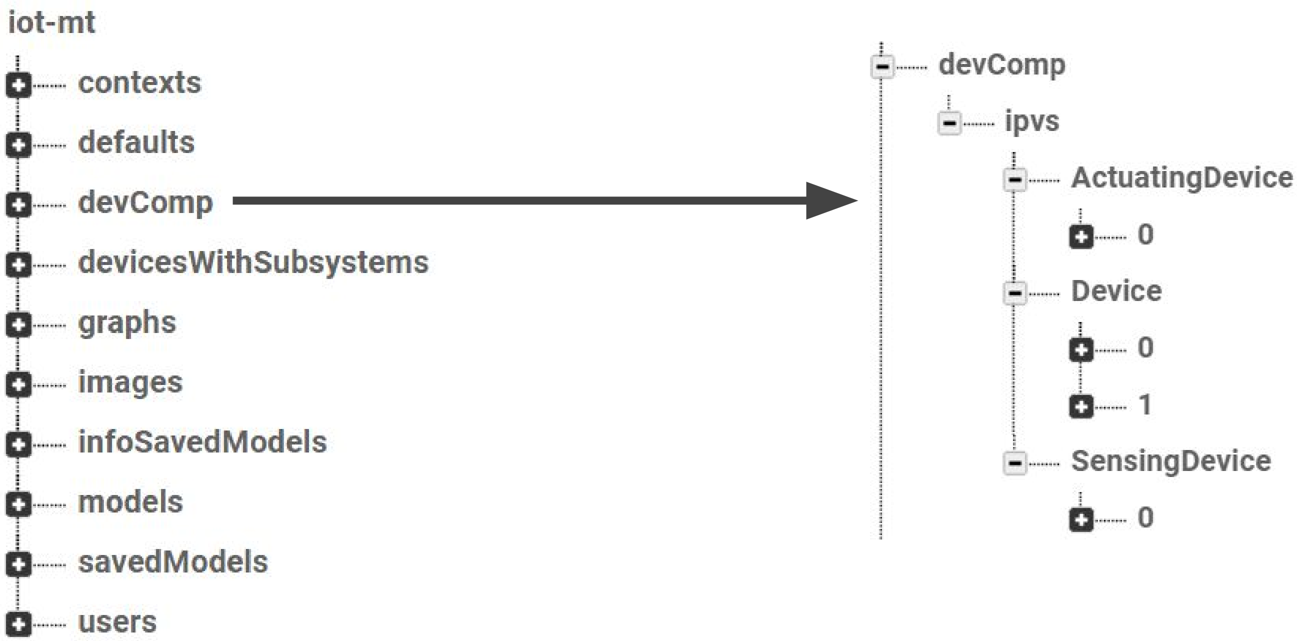
2.1. Database

Firebase (Google)

The Firebase Real Time Database is a cloud-hosted NoSQL database that lets data being synchronized and stored between its users in real time.

- Json-based
- Document-store

2.1.1. Firebase Stored Format

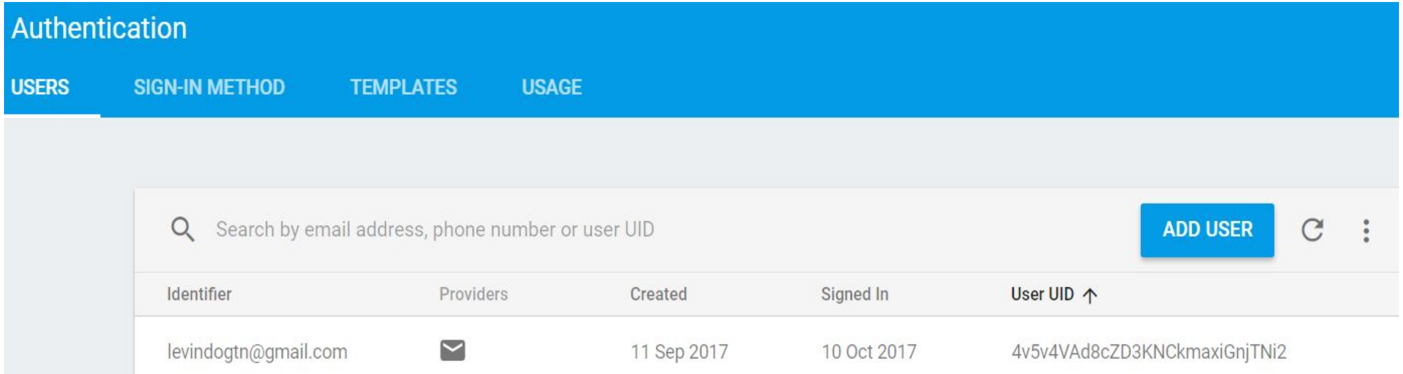


- iot-mt
  - contexts
  - defaults
  - devComp
  - devicesWithSubsystems
  - graphs
  - images
  - infoSavedModels
  - models
  - savedModels
  - users

- devComp
  - ipvs
    - ActuatingDevice
      - 0
    - Device
      - 0
      - 1
    - SensingDevice
      - 0

2.1.2. Firebase Authentication

Firebase Authentication provides backend services, easy-to-use SDKs, and ready-made UI libraries to authenticate users to the created platform.



Identifier	Providers	Created	Signed In	User UID ↑
levindogtn@gmail.com	✉	11 Sep 2017	10 Oct 2017	4v5v4VAd8cZD3KNCkmaxiGnjTNi2

```
{
  "rules": {
    ".read": "true",
    ".write": "true"
  }
}
```

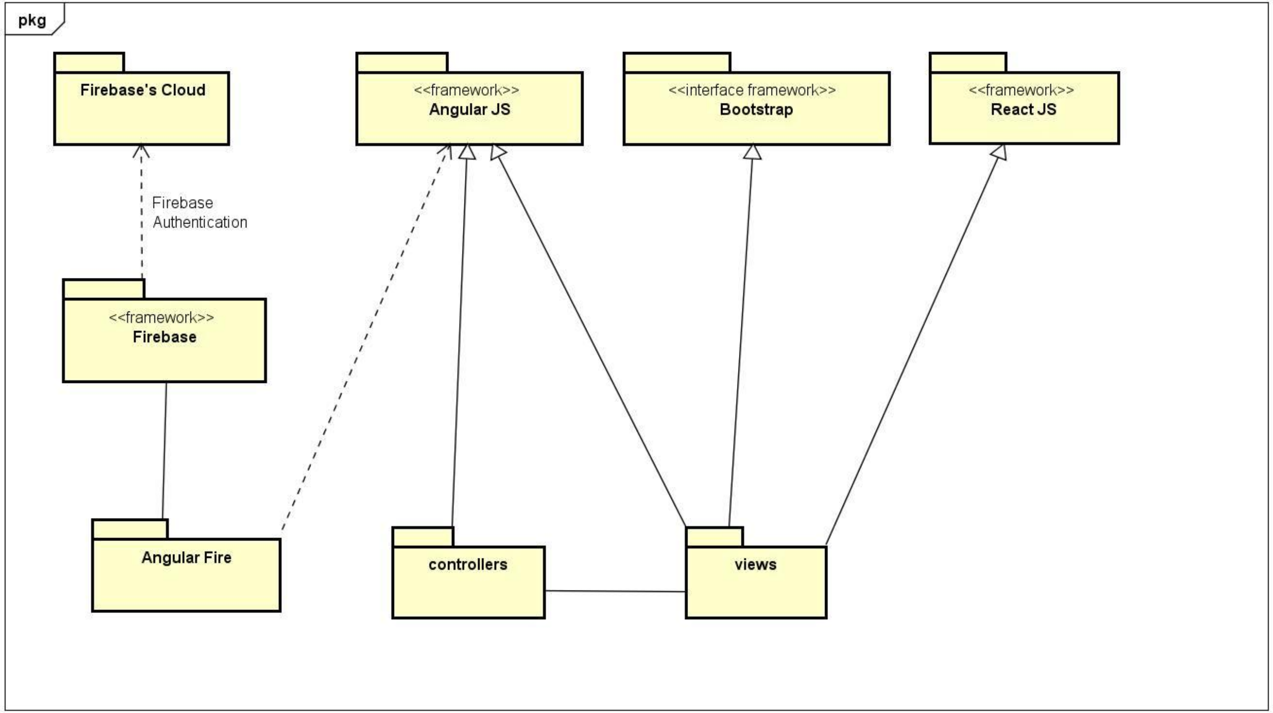
2.2. Backend

The backend is developed **Javascript**, **Angular JS** (v1.6.6) and **AngularFire** (v2.3.0).

2.3. Frontend

The frontend of the application is developed using **HTML** (v5), **CSS** (v3), **Bootstrap** (v3.3.7) and **React JS** (v15.5.4).

2.4. Relation among the used technologies

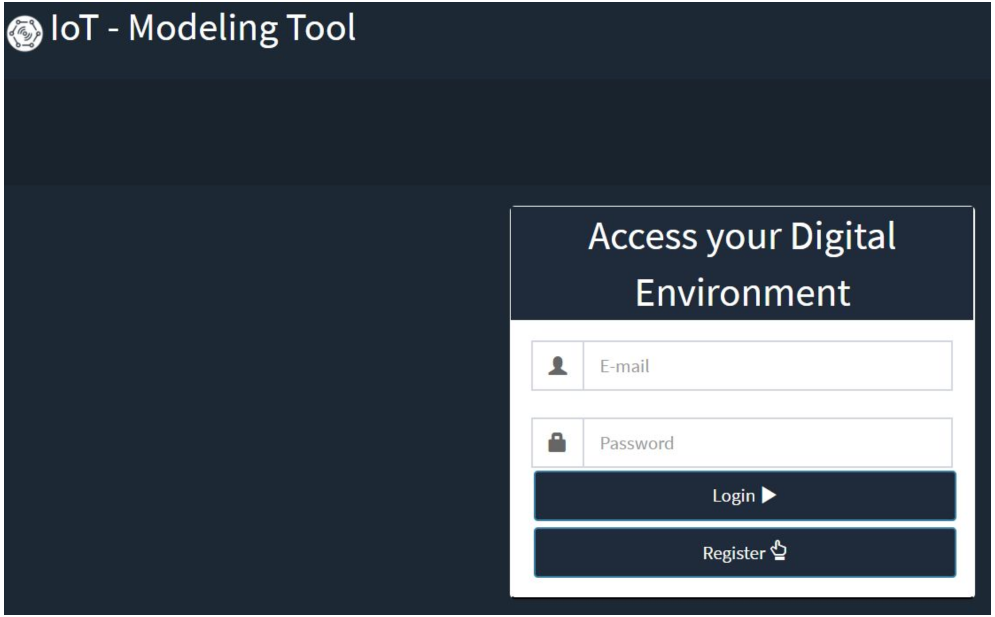


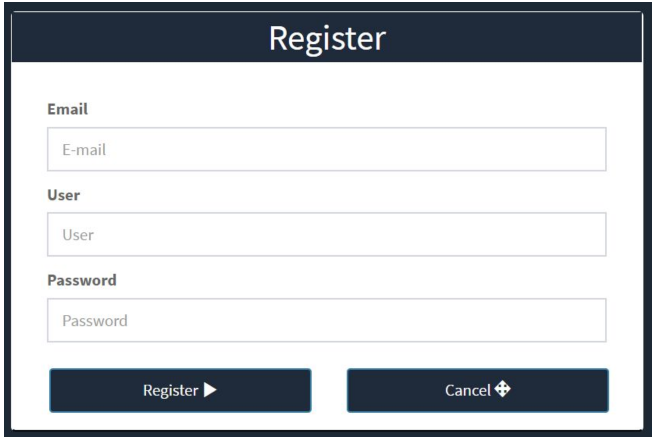
3. IoT Modelling Tool

Iot Modelling Tool is a platform, which allows users to have their own devices and components modeled in order to represent a physical environment.

3.1 Registration and Login

The user may register and login onto the platform.



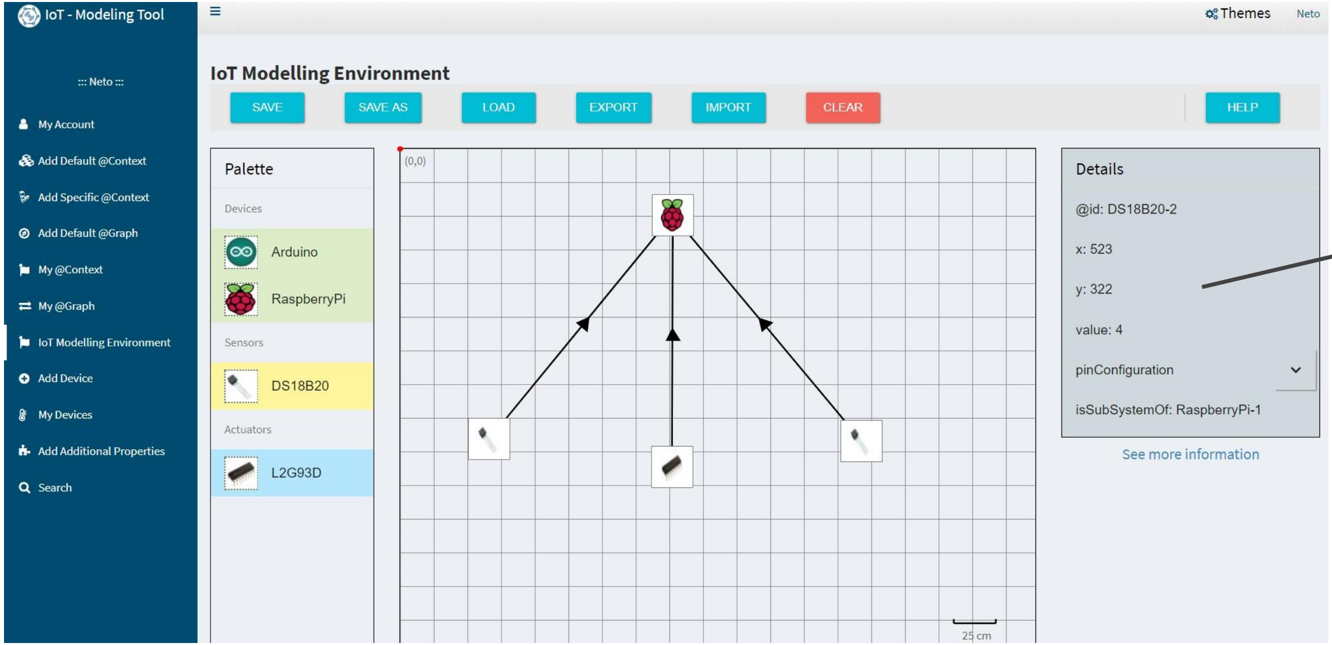


3.2 Platform's Functionalities

The users can, on the platform:

- Manage their accounts
- Add and manage the IoT Lite Elements (@Context and @Graph)
- Access the IoT Modelling Environment
- Add a device or a component (sensor or actuator)
- Add additional properties in their devices/components
- View detail information about their modeled hardware devices and components
- Search for components and devices

3.3 IoT Modelling Environment



IoT Modelling Environment

Details

@id: DS18B20-2

x: 523

y: 322

value: 4

pinConfiguration

isSubSystemOf: RaspberryPi-1

Information synchronized with the database

3.3.1 Navigation Bar

The navigation bar contains synchronized functionalities with the real-time database, as well as importing and exporting models using the file system.

1. Synchronized with Firebase
   1.1. Save
   1.2. Save As
   1.3. Load
2. Independent from Firebase
   2.1. Export
   2.2. Import
   2.3. Clear

3.3.2 Palette Container

The palette contains the currently stored smart devices and components on the database.

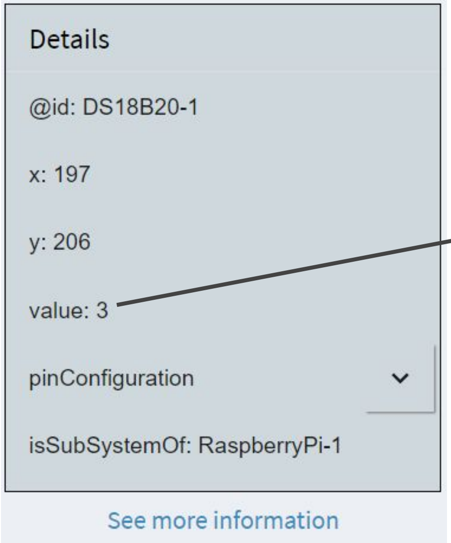
It’s divided in 3 labels

1. Devices
2. Sensors
3. Actuators

Each smart device/component has an id and an icon.

3.3.3 Information List

The information list contains information about the device/component, that is selected on at the moment.



Details

@id: DS18B20-1

x: 197

y: 206

value: 3

pinConfiguration

isSubSystemOf: RaspberryPi-1

See more information

The property **value** just shows up for sensing devices.

4. Roadmap

1. Separate user and admin view
2. Integration with hardware for getting information from a physical environment