CMPE281 – CLOUD TECHNOLOGIES

Team 20

Component design topic chosen : Infrastructure Manager

By: Name   :   Prashanth Rajaseakar
     SJSU-ID   :   011822460
     e-mail   :   prashanth.rajasekar@sjsu.eu

To: Professor :   Dr. Jerry Gao,
                       Department of Computer Engineering
   (jerry.gao@sjsu.edu)

Topics in our project:

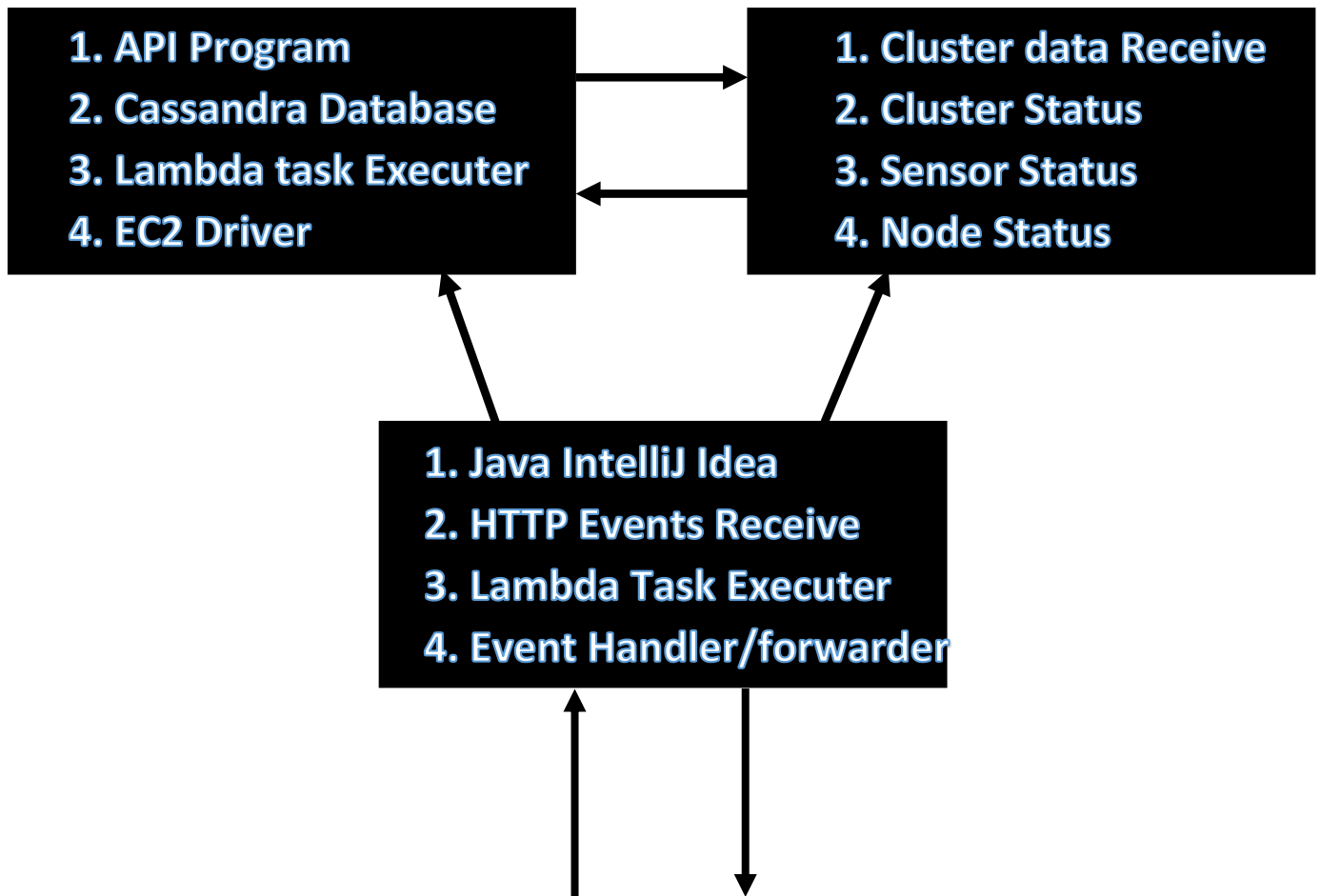| Topics	Responsible Person
Dashboard	Kaustubh Hassan Narasimhan
Infrastructure Manager	Prashanth Rajasekar
Sensor Station	Vishwas Mandarthy Adiga
Smart Street Data Manager	Madhu Prasanna Kallurya

Topics in the report.

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3 tiers
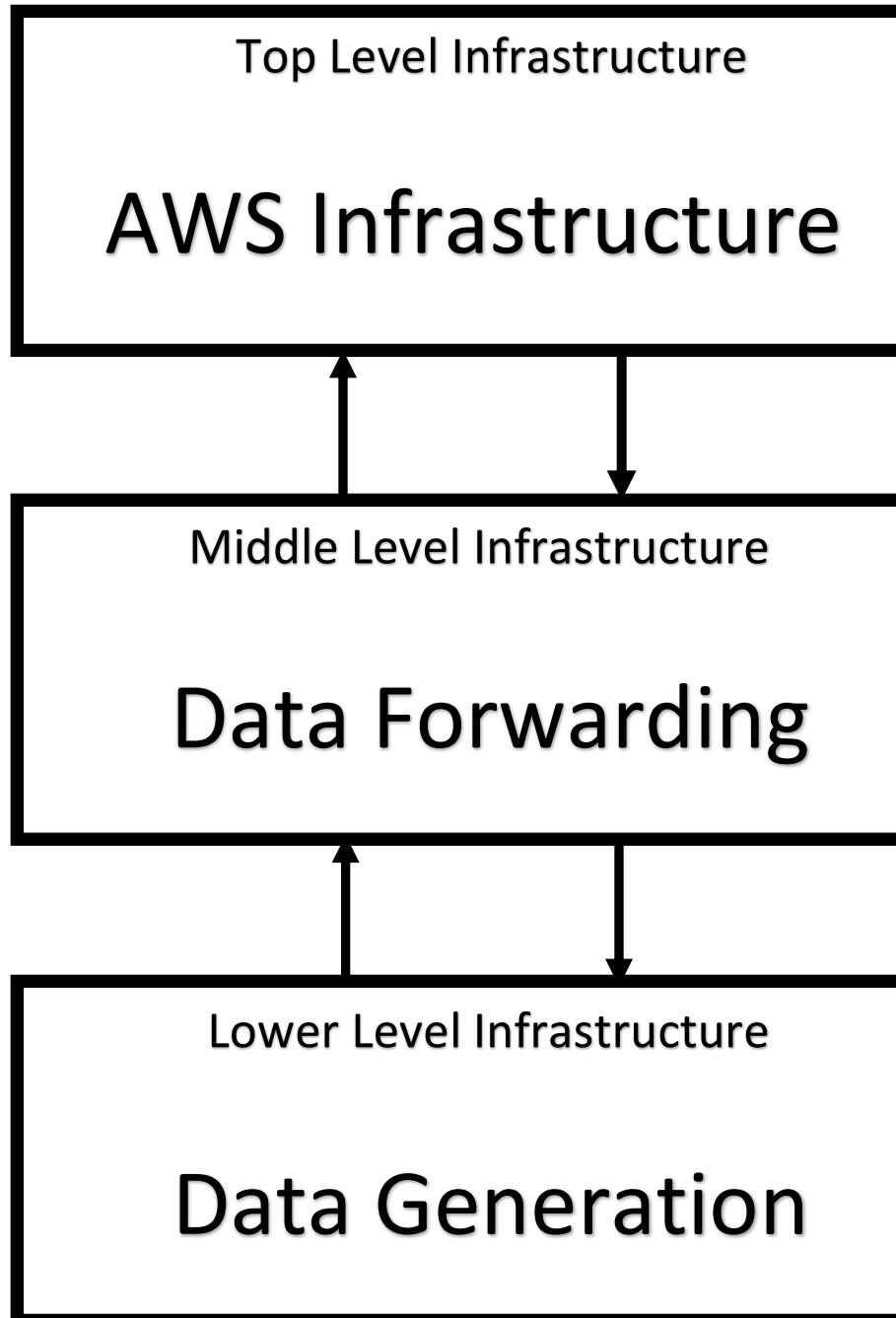
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┌────────────────────────────────────┐
│      Top Level Infrastructure      │
│                                    │
│       AWS Infrastructure           │
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│     Middle Level Infrastructure    │
│                                    │
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│     Lower Level Infrastructure     │
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└────────────────────────────────────┘
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Top Level Infrastructure

AWS Infrastructure

1. API Program
2. Cassandra Database
3. Lambda task Executer
4. EC2 Driver

1. Cluster data Receive
2. Cluster Status
3. Sensor Status
4. Node Status

1. Java IntelliJ Idea
2. HTTP Events Receive
3. Lambda Task Executer
4. Event Handler/forwarder

Middle Level Infrastructure

Data Forwarding

1. HTTP Event Sender
2. Cluster Data Receive
3. Node Data Receive
4. Sensor Data REcieve

Lower Level Infrastructure

Class based Logic Design for Lower level Infrastructure

Cluster ID
Cluster Name
Functions :
Login System();
View street map();
Cluster Control();
SetCluster Status();

Cluster Data

Node Data

Sensor Data

Node ID
Node Name
Functions :
NodeControl();
SetNode Status();

Sensor Status
Sensor ID
Sensor name
Functions:
Sensor Data();
SetSensorStatus();
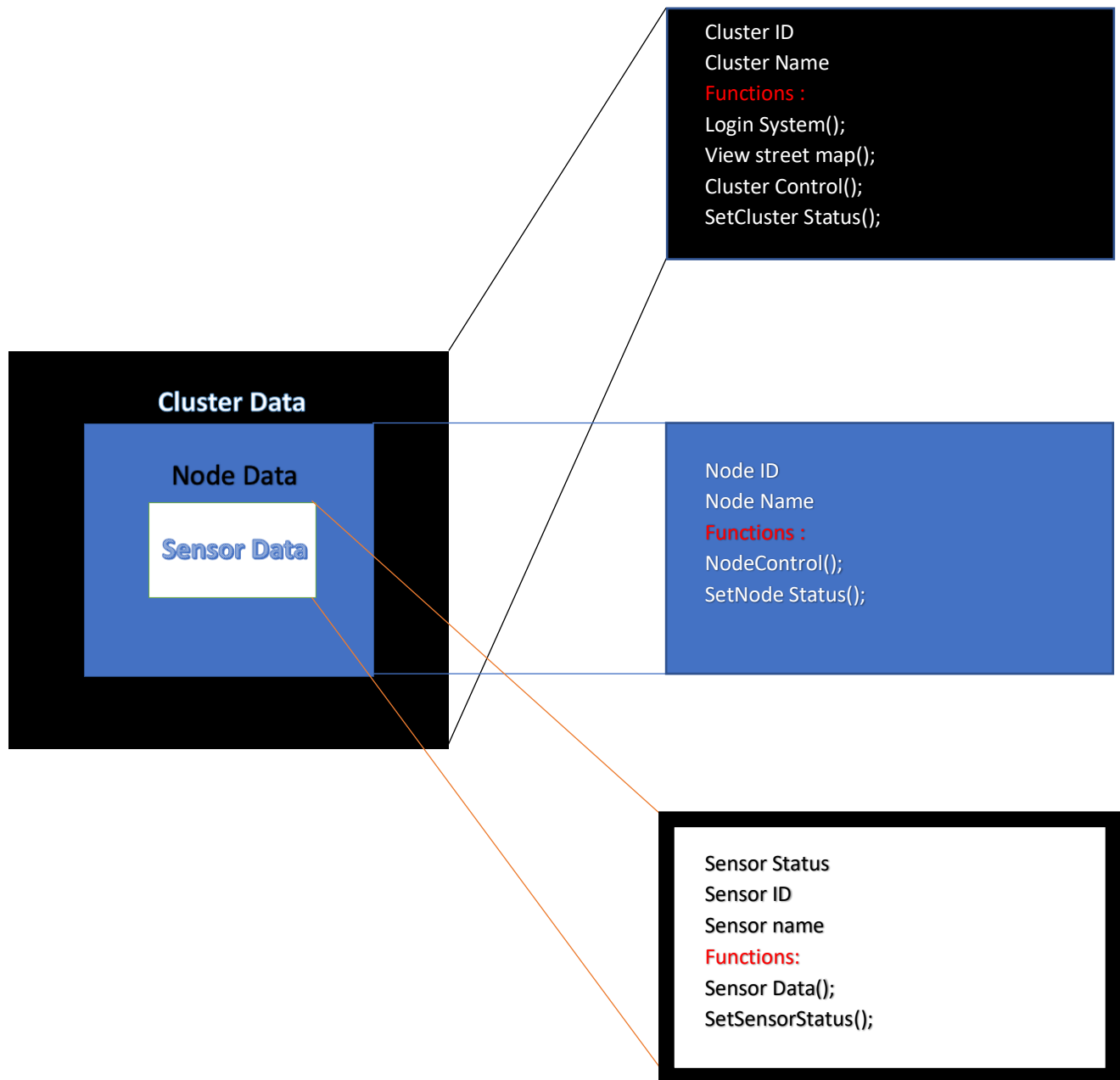
Use Case

Client only requests for the data and the method to visually see the data form in the dashboard.

Users/clients
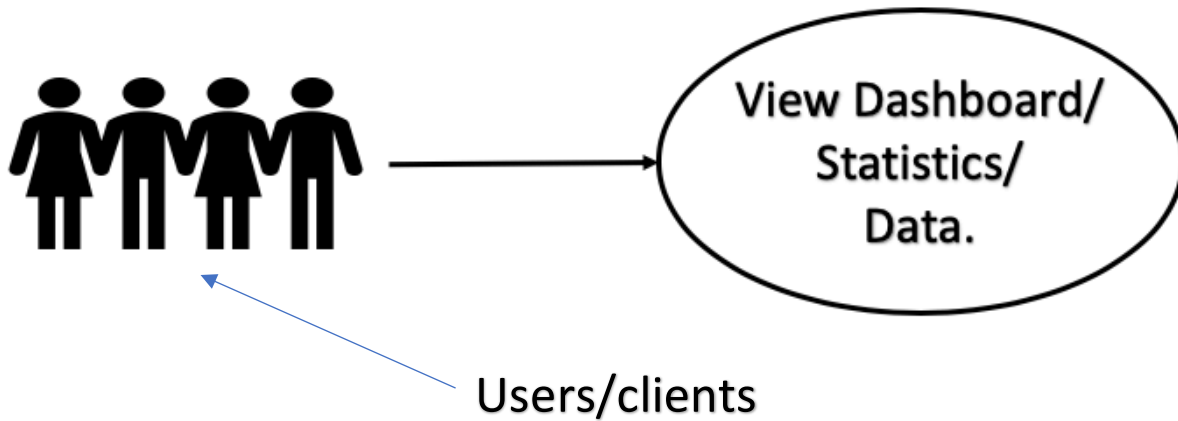
Infrastructure manager has the authority to add, delete and modify any type of changes required. Client is able to access the data because of using the infrastructure set by the infrastructure manager.

Infrastructure Manager

Add sensor

Delete sensor

Add Node

Delete Node

View Dashboard

Update Database
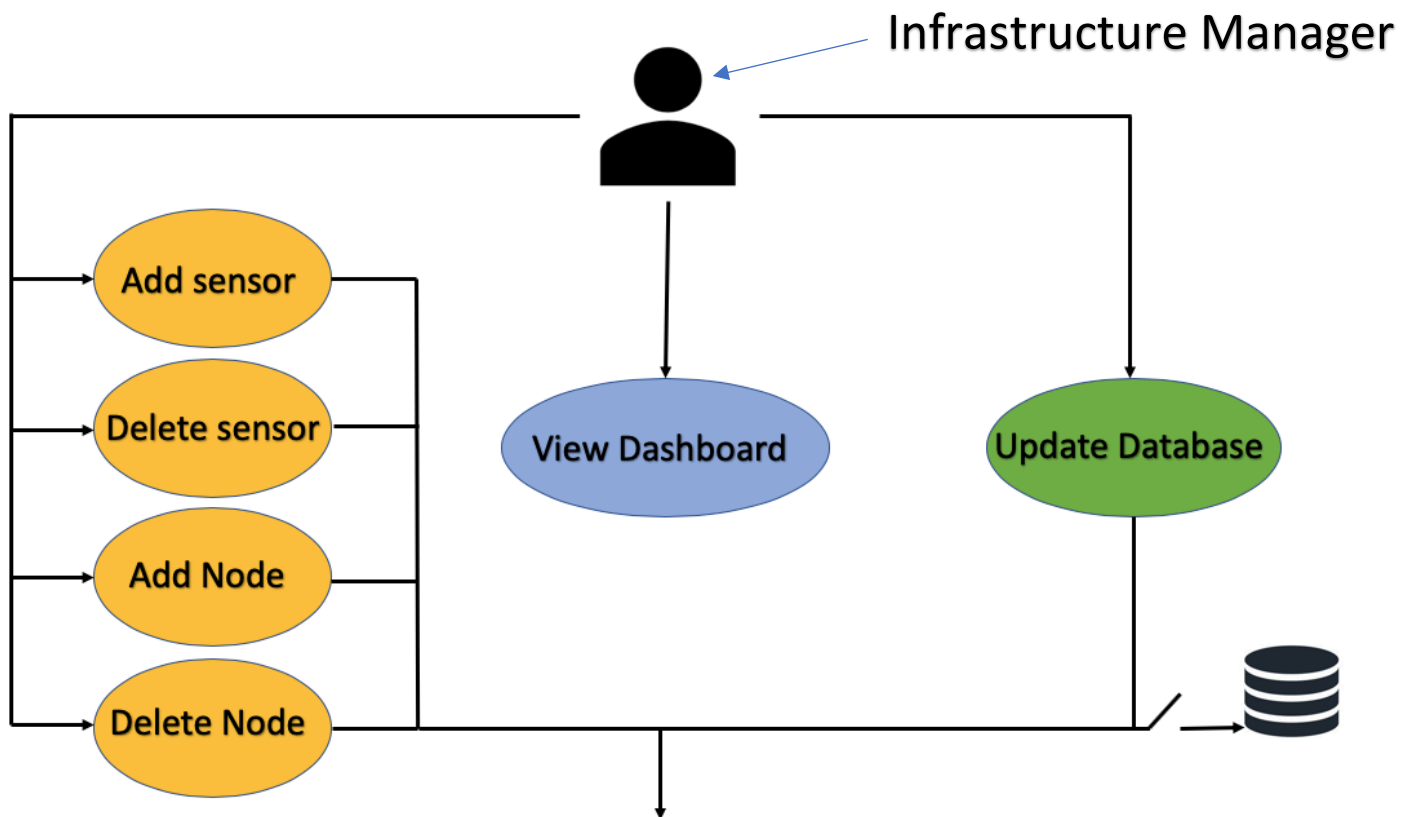
Respective command sent
to the Lower level infrastructure

Sequence Diagram

1. Between Clients and Cloud.

Client requests for the data from the cloud using the API gateway. The data can be the data from the sensor, or the statistics information. All the service charge billing will be deployed over the client as per the limit set by the infrastructure manager. Client can request many types of data.
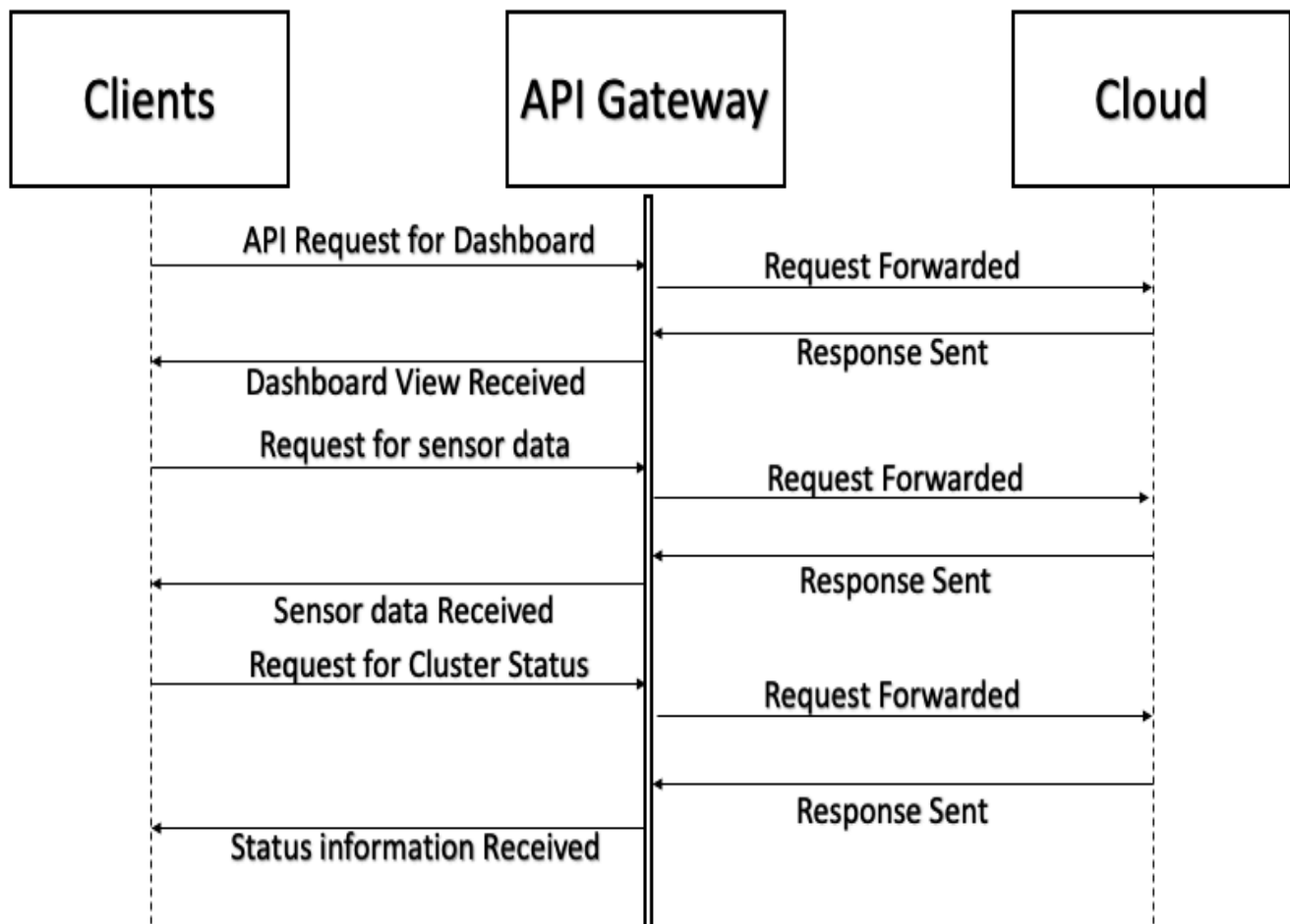
2. Between Infrastructure Manager and Cloud.

Even the infrastructure manager needs to talk to the cloud using the API gateway. API requests are parsed. And respective commands are executed as per the need. Adding, deleting the sensor can be done. Infrastructure knows everything about the cloud infrastructure as well the base level infrastructure. All the requests and response are handled by the API gateway.
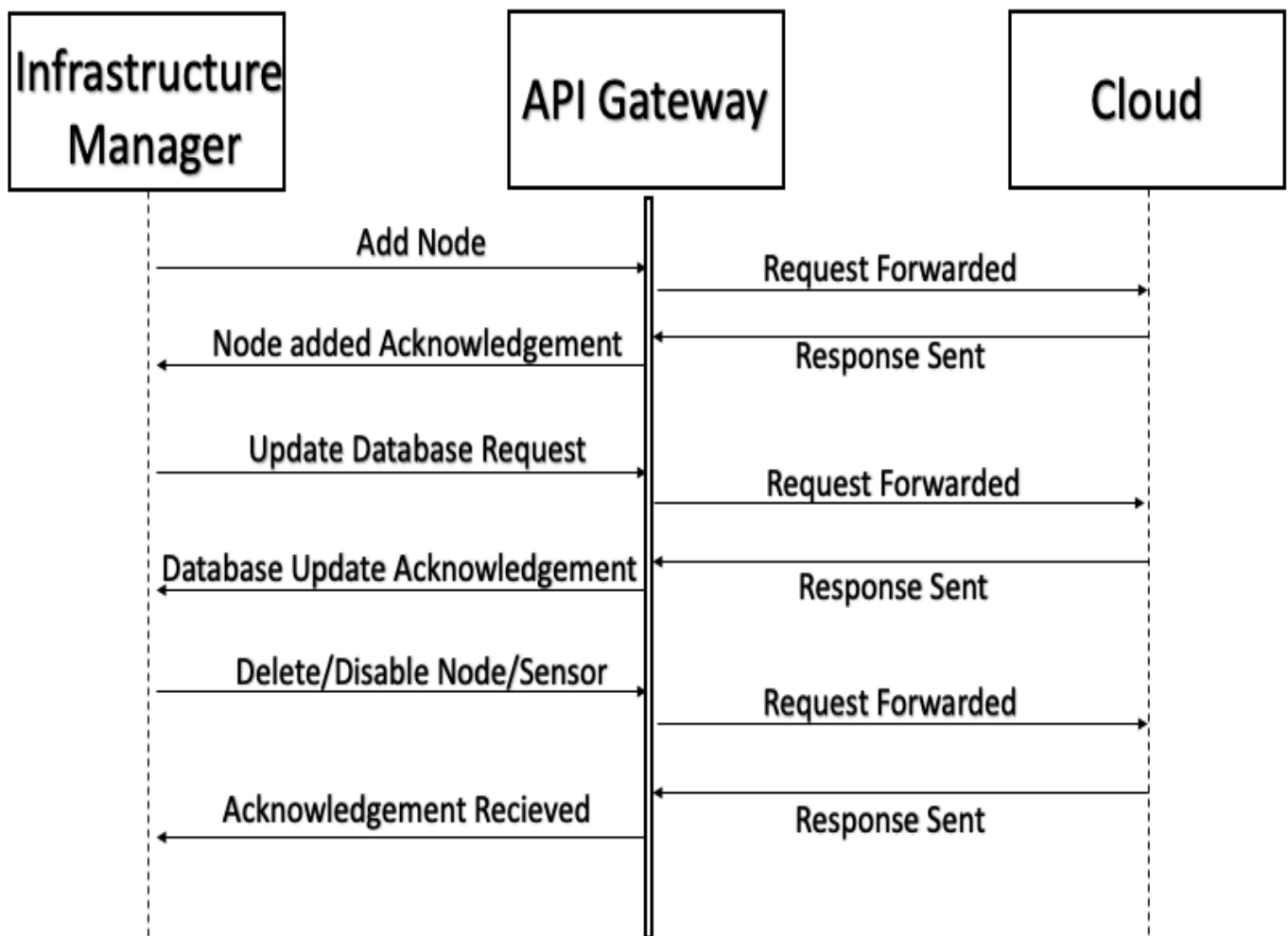
BD data file design is shown as below.

Node Data Storage Structure

ID	Sensor	Data	Status
Sensor_1	Light	10 units(boolean)	Active
Sensor_2	Motion	5 units (boolean)	Not Active
Sensor_3	Temperature	50 units(integer)	Active
Sensor_4	Rain	3 units(boolean)	Active
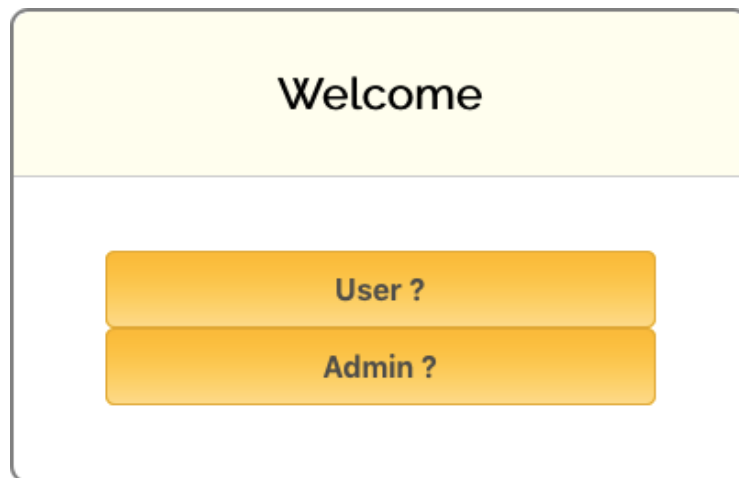
Cluster Data Storage Structure

Pool			
Cluster 1	Cluster 2	Cluster 3	Cluster 4

Cluster					
Node 1		Node 2		Node 3	
S1	S2	S1	S2	S1	S3
Light	Light	Light	Light	Light	Light
Temp	Temp	Temp	Temp	Temp	Temp
Motion	Motion	Motion	Motion	Motion	Motion
Rain	Rain	Rain	Rain	Rain	Rain
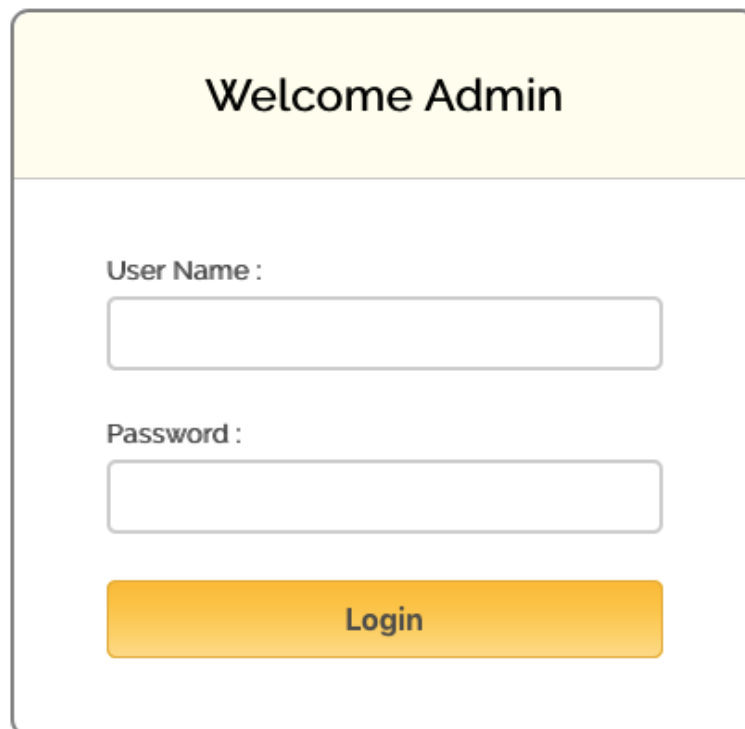
Component User Interface Design

1. Initial visual page

2. Entering as Admin asks for Username and Password. We can even enter as User.

3. Once logged, Dashboard is being visualized

Welcome to our Smart city project
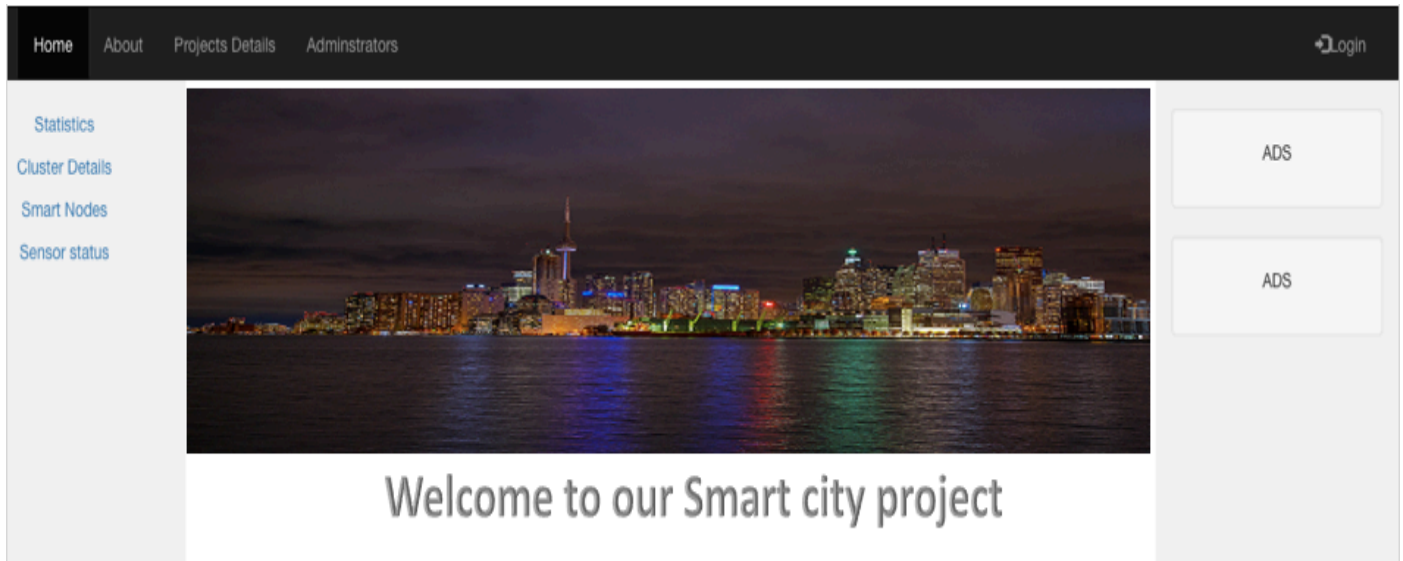
4. Once statistics icon is clicked. It will show the active sensor status and plotting the graph related to the data received by each sensor.
5. Once cluster details window is clicked. It will show all the active and non-active clusters under it. It even shows the details of number of nodes under it. And the data received under it.
6. Smart nodes tab shows the relevant information about each sensor status under it. Whether it is active or not. Whether data is being transmitted from the sensor or not.
7. Details of each sensor status can be seen under the sensor status tab. It shows the details as under which cluster and under which node the sensor is being located.