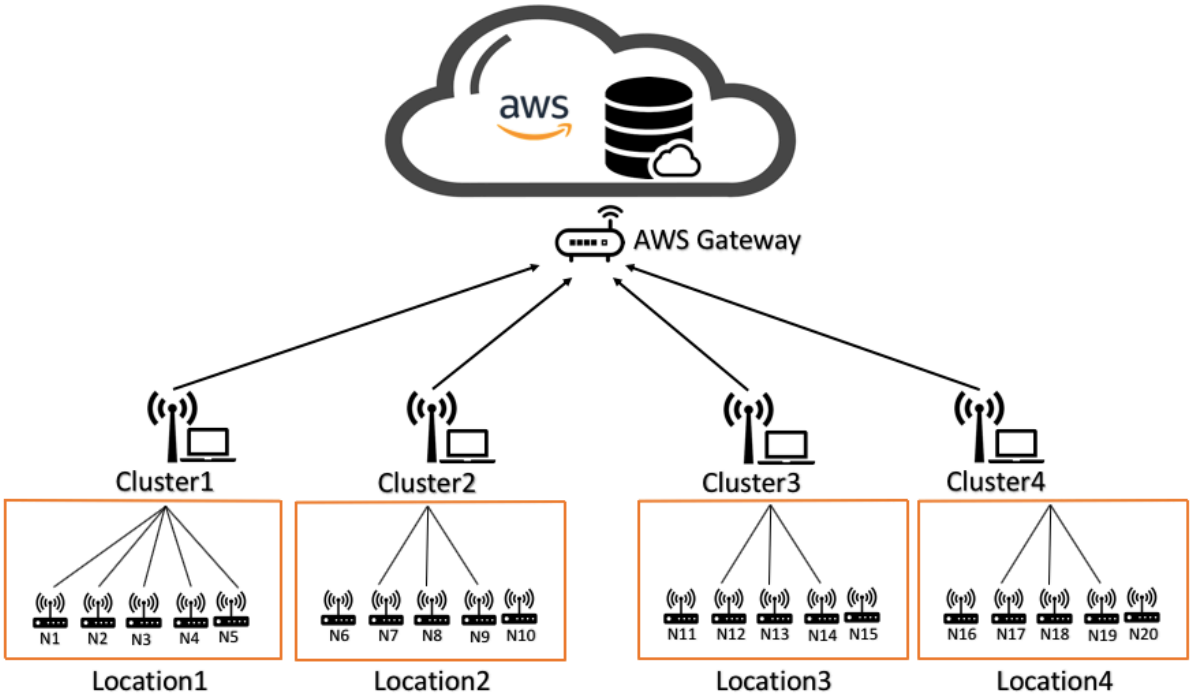
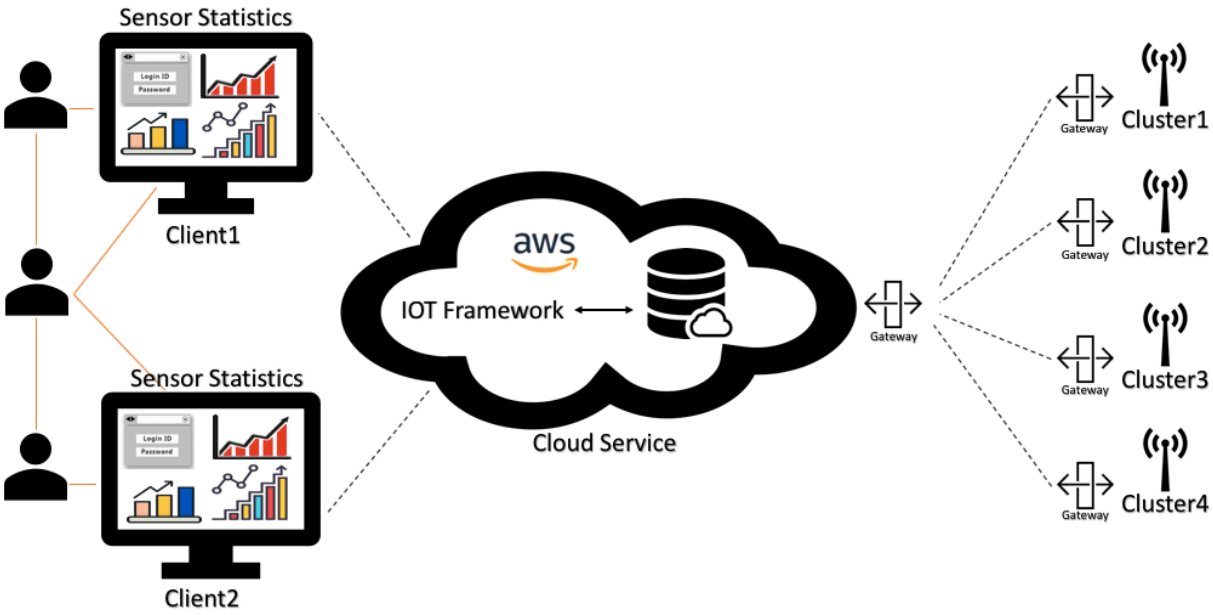
System Infrastructure and Architecture

Sensor Cloud System Infrastructure:



The above architecture shows the outline of our infrastructure to be used. Several sensors constitute towards the forming of one Smart Node from N1-N12. The above shown nodes does not have any communication mechanism with each other. All the Smart Nodes send the sensor data to the cluster. There are 4 cluster which take care of the underlying 12 smart nodes.

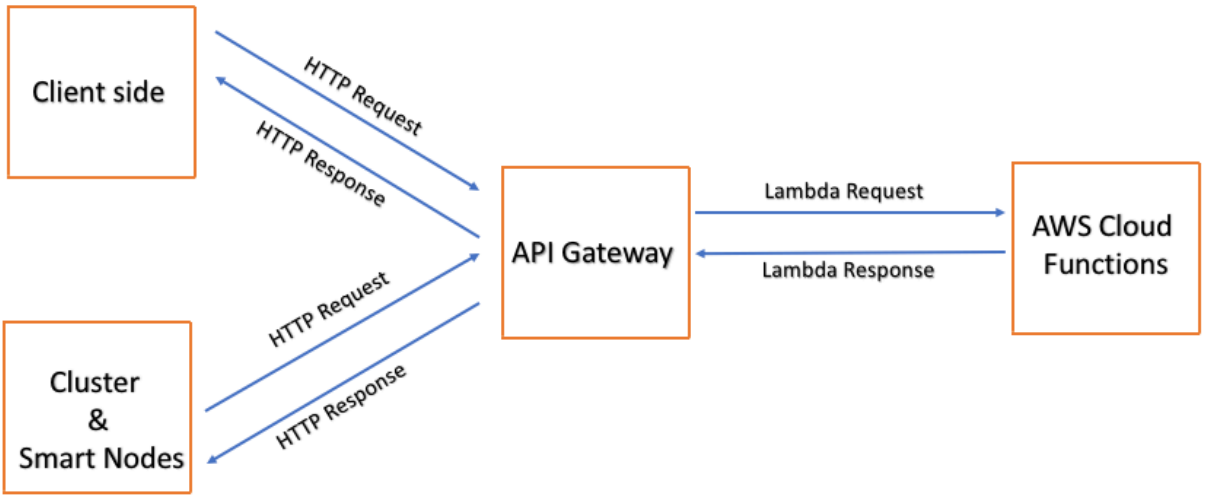
Cluster acts as an interface to transfer/transmit its underlying sensor's data to the cloud database. The data from the cluster is sent to the cloud service provider as IP Packets through the ISP. These IP Packets are then received by the Gateway router of the cloud provider and the sensor data is taken out from the packets and then stored in the Database.
Deployment-Oriented System Infrastructure:



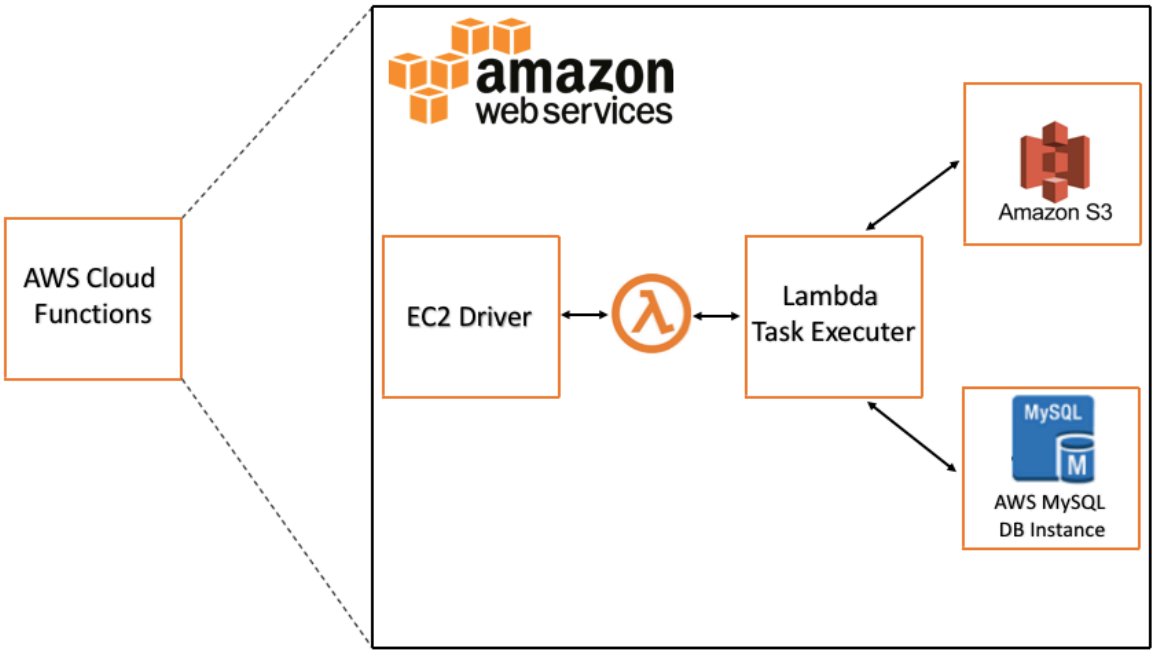
The data from the sensors will be sent to the cloud provider's database. Then the data is organized in a framework (web page). The statistics, performance and availability of the sensors and its data can be viewed in an organized manner through a webpage. The organized information will be helpful to the Clients, maintenance people and the infrastructure manager. The smart node can be configured by the maintenance people after viewing and fetching the visual report of the sensors. Configuration of the sensors by the authoritative staffs is possible as the status of each cluster, smart nodes and its sensors are clearly visible.

The data can be easily accessed by throwing the API request to the Cloud Provider Database. According to the response received the data is manipulated and plotted/marked. The UI design of the IOT framework allows us to communicate with the cloud service using the ISP. Request packets are sent, and the response packets are received as it is a HTTP request and response (API request/response).

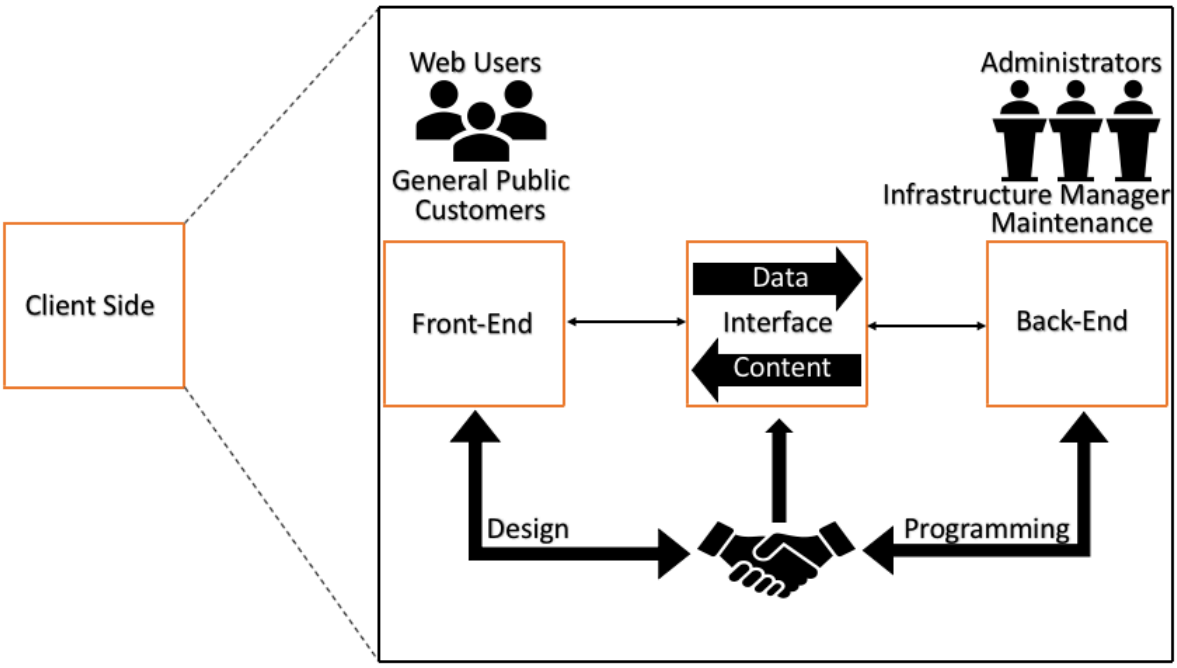
System-Oriented Component Functional View:



The above diagram shows the functional overview of our project. The client side consists of Web Users and Administrators. Administrators are the one who have complete control over the infrastructure. All the events generated by the client side and the data from the cluster side are sent as an HTTP PUT/GET request to the API Gateway. The API gateway then forwards the request for processing. The below diagram shows the insight of AWS cloud functions.



AWS Cloud Functions consists of an EC2 driver (Compute driver), the request is then forwarded to the Lambda Task executer which process the requested query. The response is then collected sent back to the same channel and sent as the HTTP response to the client side. The insight of the client side is shown below in a detailed view.



The client side consists of a front end which deals with the GUI part. The GUI part is event driven which is the front-end. All the events are processes by the back-end part. Both the parts are collaborated together to form the client-side GUI and event handling architecture. The front-end part is entirely for the Web users looking for information. The information deliverable process is the backend which will be controlled by the Administrators. Updating of node information and maintenance work will be handled by the backend.