Project Requirements
For
IoT Based Application Platform

Internals Of Application Server

Submitted By : Group 6 Team 4

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Introduction

Platform initializer: This module will mount and initialize all the services available on our platform by loading all the modules on EC2(AWS) instance along with their config files and executables.

Action Manager: This Module is responsible for performing actions such as EMAIL, SMS, control action and callback functions based on the input provided by the runtime server and forwarding it to the intended users or control unit.

Monitoring and Fault: The Monitoring Service and Fault Tolerance Module is responsible to continuously check the status of other runnable modules in the Platform such as Deployer, Scheduler, Action Manager, Sensor Manager etc.

Intended use: -

- Platform Initializer will initialize the Modules necessary for the platform in sequence and run the scripts to automate the loading of files and process so that our platform is fully functional to with every module interacting with each other in required sequence.
- The Action Manager keeps track of the Message queue to consume the output generated by the acting server and outputs it to the intended users or control unit in real time so that the user has all the necessary information.

Assumptions and Dependencies: -

- Platform Initializer must have access to the path of config files, executables and address and authentication file of EC2 instances.

- The Action Manager must be able to interact with Scheduler and Deployer for input and Sensor manager and user devices for performing actions.
- The Action Manager's API must be accessible to application developers to use the functionality of the module.

Features and Requirements:

Functional Requirements -

- **Authentication and Authorization:** Platform Admin will mount the platform modules into the server instances by using instance's private key. Action Manager will register an email id and phone number for notification purpose.
- **Load Balancing:** Platform modules will be initialized on different servers, based on the distribution of load on servers.
- **Platform service's Fault tolerance:** Platform services will be monitored and if any service goes down, it will be reinitialized to avoid any fault in system.
- **Control Action:** Control actions will be taken based on the output of algorithm on different sensors.

Non-Functional Requirements -

- **Robustness –** The Deployer should not entirely crash when one / many of the worker nodes goes offline. Instead, it should choose one of the running nodes and must deploy the applications there.
- **Security –** Authorization will prevent the users who do not have access rights to see or modify the application. Only authorized users will be able to send the requests to the platform.
- **Ease of Accessibility –** The web GUI will provide access to the platform through the internet. The Rich Interactive Web GUI will allow users to

access the platform more effectively which immensely helps users to see logs and send stop requests for the algorithms.

Systems:

Platform Initializer-

Functional Overview: This module is responsible for loading all the modules of platform from local machine to EC2 instances and also perform authentication using private key present in .pem file. It will then initialize all the platform services in the required order.

Block Diagram:

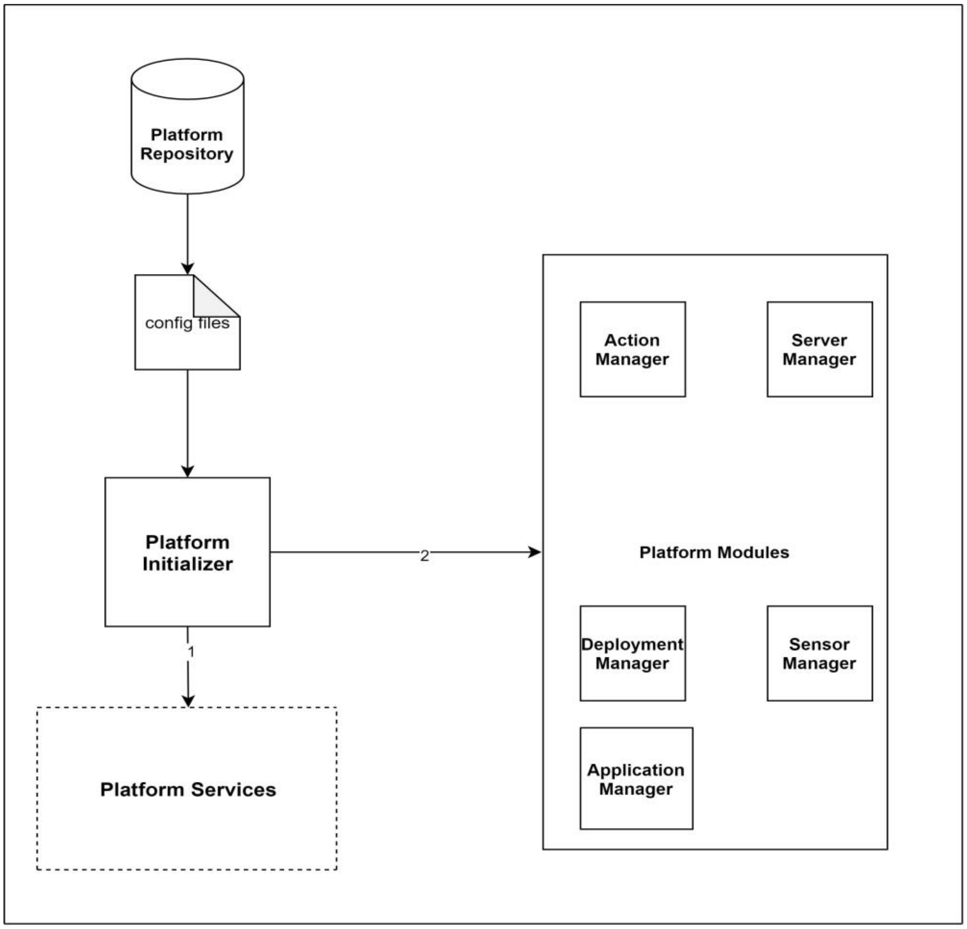
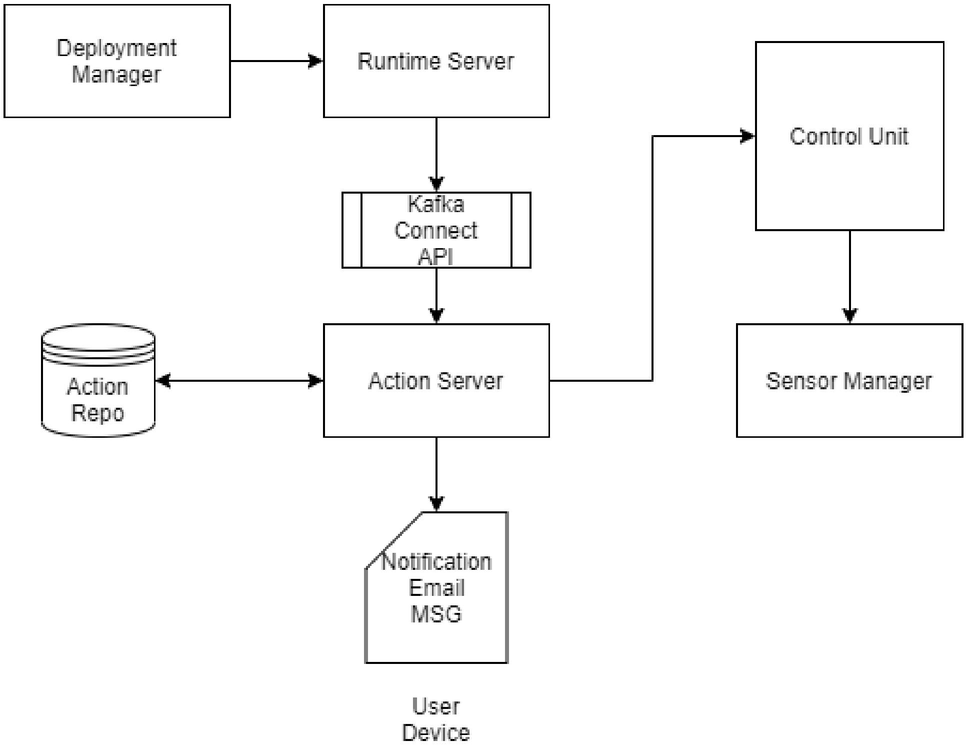


Fig 1. Platform Initializer

Action Manager-

Functional Overview: This module is responsible for sending notifications (email, SMS) and taking control action on sensors.

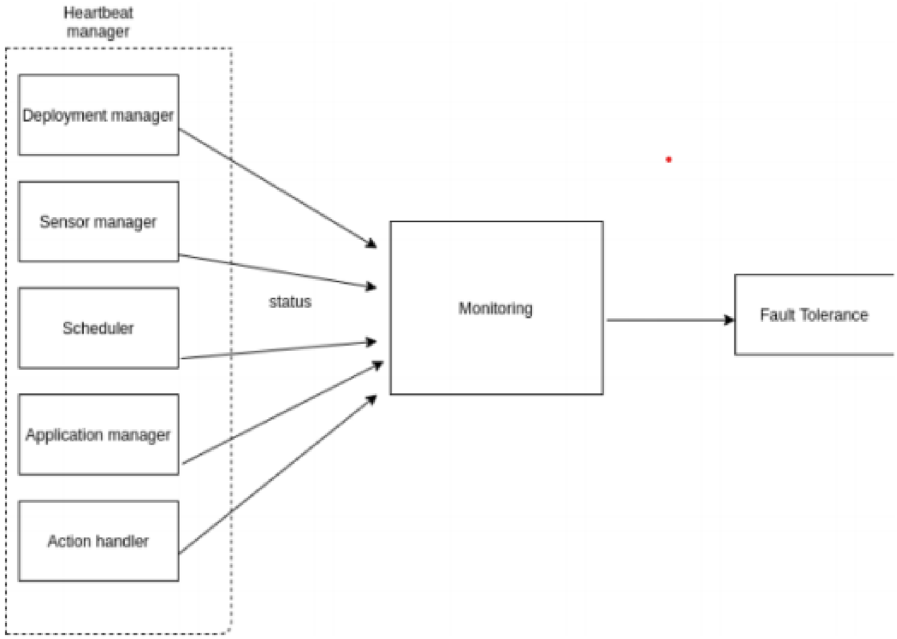
Block Diagram:



Monitoring and Fault Tolerance-

Functional Overview: This module continuously checks if all the platform services are up and working or not. If not, it will re-run that service to avoid any fault in platform.

Block Diagram:


Heartbeat manager
Deployment manager
Sensor manager
Scheduler
Application manager
Action handler
status
Monitoring
Fault Tolerance