

SERVERLESS IOT DATA PROCESSING

Problem Definition:

The project aims to transform a home into a smart living space using IBM Cloud Functions for IoT data processing. The goal is to collect data from various smart devices, process it in real-time, and automate routines for energy efficiency and home security. This involves designing the smart home setup, implementing data collection and processing, and leveraging IBM Cloud for storage and analysis.

Introduction:

Completely automated smart homes are on the way to becoming a well-established reality. The ever increasing number of smart objects in the smart home environment requires the definition of standardized and flexible protocols for state information exchange, besides optimal strategies for processing large number of commands. New technologies such as serverless computing and ad hoc communication protocols can be leveraged to manage a large fleet of smart objects, while also ensuring good accessibility and intuitive user interfaces.

Serverless computing is a cloud computing model in which the cloud provider manages the infrastructure and automatically allocates resources as needed. This means that businesses can focus on building their applications and processing their data without worrying about managing and scaling their infrastructure.

Design thinking:

Data integration:

Integrate the smart devices in your home with sensors to ensure safety and for home automation. There is a list of 8 sensors to make our home automated and

are fire/CO detection, Leak detection, motion sensor, Video doorbell, Smart thermostat and smart garage door.

Data collection:

Devices integrated to sensors track the performance of the devices connected to IOT are recorded.

Real-time processing:

The real-time data collected by the sensors are transmitted to the cloud database platform like aws, IBM Cloud functions etc., It is to implement real-time processing.

Automation:

Develop routines for auto detection of glowing of lights, motion detection, usage of electrical appliances and fire detection to security, energy efficiency and home security.

Storage and Analysis:

The data collected from the sensors are transmitted to the IBM Cloud object Storage database and further use the data stored for reducing energy consumption , improving security and protecting home from other security issues.

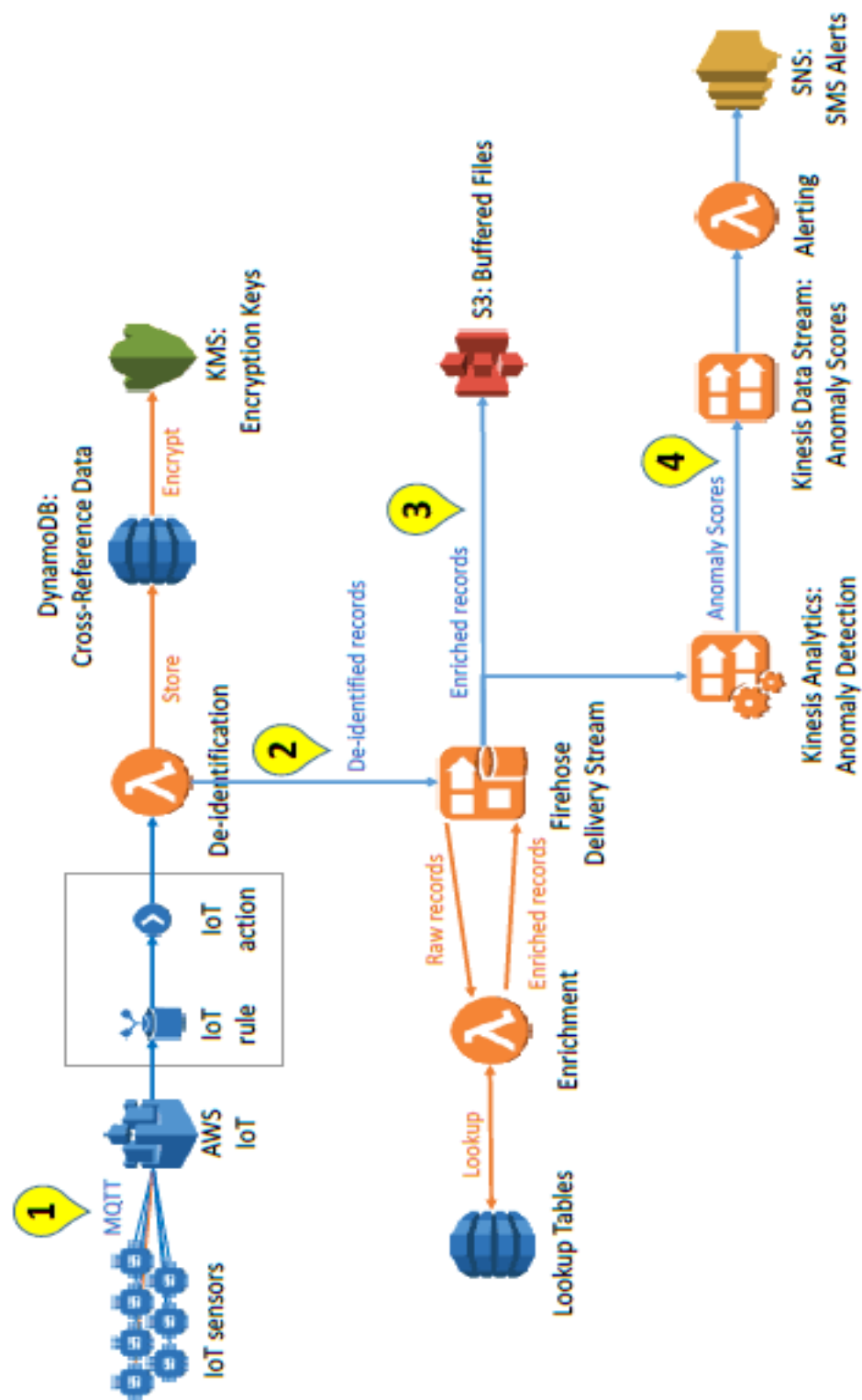


Fig: Serverless Data Processing.

Working:

- The working of this design would be like home appliances like AC, refrigerator, fan, lights and others are provided with inbuilt sensors which helps for automation.
- The sensor receives the data and keeps track of the data data received from the home appliances .
- The data received are used to generate routines for automation. The generated routines automatically detects movement of people in house, glowing of lights, and also for home security.
- The data received are send to cloud databases and instructions are sent to the sensors of the smart devices based on the movements accordingly.
- It is for increasing the performance of the automation.

Conclusion:

A generalized and flexible framework for smart object applications in a smart home environment was proposed. The framework consists of smart objects receiving messages from the cloud through a dedicated message-exchange protocol and interactive vocal interfaces, with serverless functions deployed on the cloud to monitor and control the objects. A practical use case based on this framework.