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Smart Calculation using Edge Computing

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Article History	Abstract
	Number of things are getting connected to Internet so Necessity of data on Edge in Real-time and without latency, With Edge computing system we can perform Efficient Data processing has large amount of data and it reduces internet bandwidth. Edge computing is a new computing pattern in which fundamental compute and storage Resources are placed at Internet, Nearer to Mobile devices, Sensors and Internet of things (IOT) this will increase Latency. Definition of Edge computing as a Mesh Network of Micro-data centers that process or store critical temporarily and push all received data to central data or cloud storage, in a footprint of less than 100sqft with Edge computing abilities, System can perform Structured Data as large amount of data can be processed at or nearer the source. Edge computing allows Smart application and devices to respond to data which is been created. This is useful for Self-driving Cars and many more benefits for Business. Edge computing reduces volume of data that must be moved, traffic and the distance that data must travel it provides very low Latency and transmitted cost and the other use of Edge computing is clou Gaming where some aspects of game will run in cloud.

1. Introduction

Edge computing is described as open IT Architecture   that allows system to compute nearer or source information rather than relaying the information on cloud. Edge computing allows Real-time data processing without Latency. Definition of Edge computing as a Mesh Network of Micro-data centers that process or store critical temporarily and push all received data to central data or cloud storage, In a footprint of less than 100sqft with Edge computing abilities, System can perform Structured Data as large amount of data can be processed at or nearer the source. Edge computing allows Smart application and devices to respond to data which is been created. This is useful for Self-driving Cars and many more benefits for Business. Edge computing reduces volume of data that must be moved, traffic and the distance that data must travel it provides very low Latency and transmitted cost and the other use of Edge computing is cloud Gaming where some aspects of game will run in cloud [1-10].

PROBLEM DEFINITION

Build an Edge computing software which performs Interface for multiple drivers to get data as input and get High performance low footprint database to store data from sensors by raw data cleansing and shows the out by Aggregation Calculations on data by implementing Threshold based Alarms and Alerts.

2. Materials And Methods

The process of building software takes place in a few specified steps.

1. Base Framework

2. Microsoft Azure IOT Client SDK

3. Input Interface

4. Push Data to Cloud

5. Buffer data in case of connectivity issues

6. Aggregation calculation

7. Threshold based alarms

Base Framework

The Base framework enhances with all the requirements required for building the software and gives the outlier of the process.Such as IOT devices and Sensors.

Microsoft Azure IOT Client SDK

The Microsoft Azure IOT Client SDK contains inbuilt code which manages the mesh connection by devices towards the Edge computing and enables more reliable and secure toward the software.

Input Interface

The Modbus device which generates inputs of sensors randomly according to the calculation.

Push data to Cloud

This process of pushing data is done by Edge

Computing which acts as medium between the

Sensors and Microsoft Azure IOT cloud platform

Buffer data

In case of any connectivity issues like power-off the data transmission to cloud will be rejected and not considered through the process data cleansing.

1. Aggregation calculation

The Aggregation calculation is mainly implemented by developing the machine learning Algorithm which is trained based on the train and test dataset.The dataset includes the history of the bill generated and amount of the source been used in previous months and predicts the monthly usage of electricity and water bill which include the expected bills of both.By doing so the bill generated can be concluded as valid or invalid based on the previous record and further actions like buzzing alarms is embodied.

2. Threshold based alarms

The software includes with Alarms where if the usage of electricity and water is higher than the Setup point there will be beep sound which indicates the usage exceeded than the set-up one.

I. PROPOSED SYSTEM

- Raspberry PI hardware .

- Linux Ubuntu operating System.

- Python/.NET core based code.

- Microsoft Azure Cloud components and SDK.

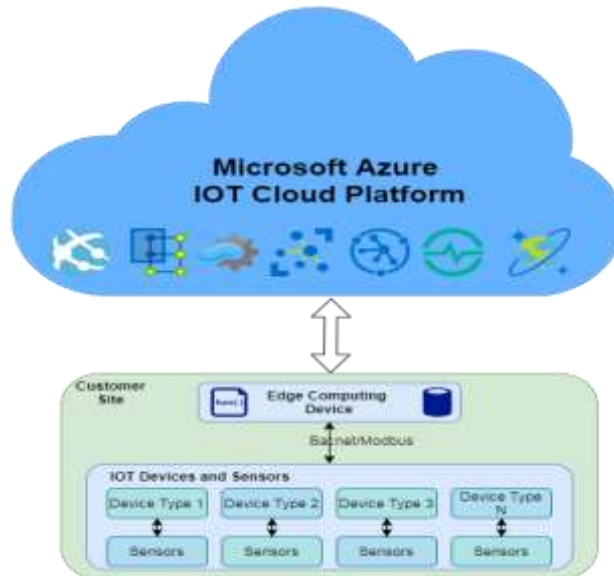- Sensor data from Modbus devices as input.

Fig 1. IoT Cloud Platform

II. APPLICATIONS

1. Edge computing adds security and privacy risk along

with the latency in time-critical actions.

2. Edge intelligence is an evolving technology to

solve the challenges of traditional IoT cloud architecture.

3. Edge intelligence moves the analytics within the periphery

of the home network to sustain the volume and velocity

of the data without compromising the privacy and

security of the data collected.

VII. EXPECTED OUTPUT

1. Aggregation calculation
2. Buffered storage with acknowledgement.
3. ML Algorithm for outlier detection.
4. Alerts/Alarms based on threshold.

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