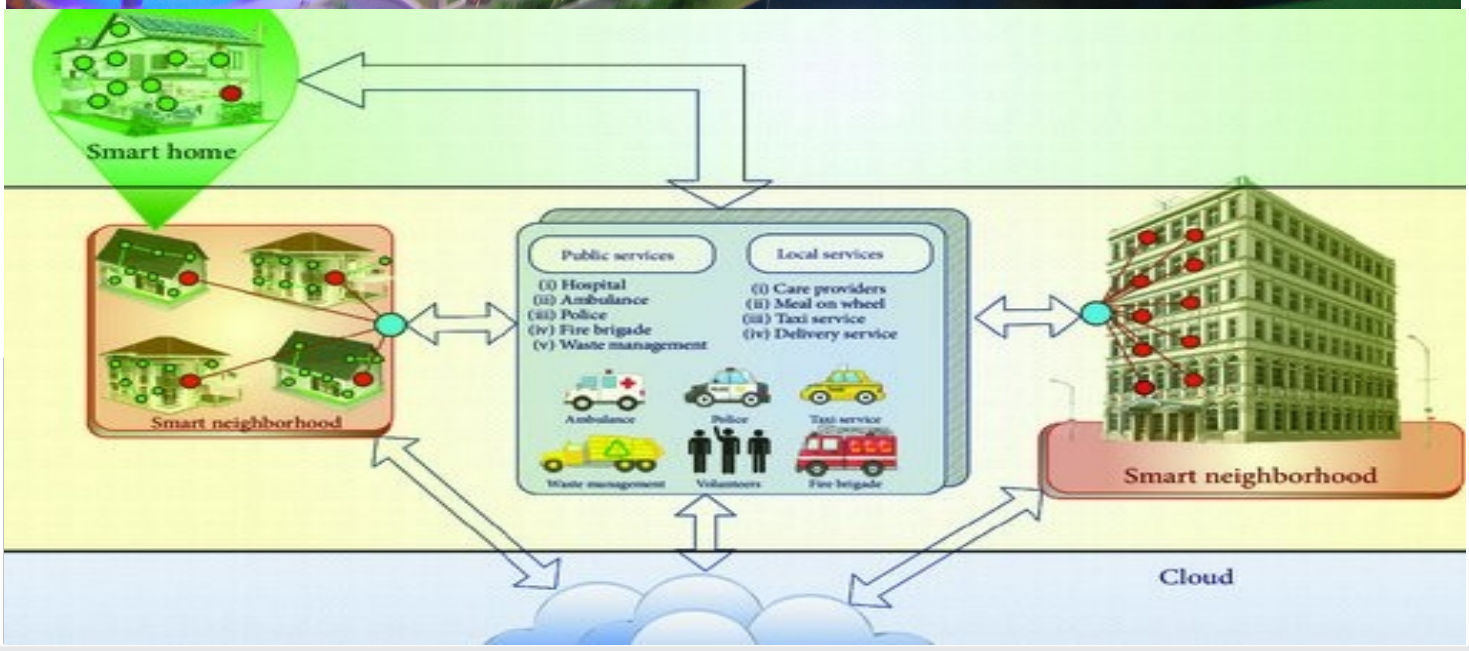
Energy Management for Smart cities using LoRa Technology



Energy Management For Smart Cities

Background

With Technology becoming an integral part of our lives, our energy requirement is ever-increasing, making it absolutely necessary to monitor its consumption. Smart Cities all over the world are employing measurable, sustainable, efficient, technological, clean practices for optimal usage and management of resources without compromising on the standard of living nor on the security of the people. Energy is one such resource the conservation of which is increasingly gathering momentum due to its depleting nature.

Challenges

Like the adage “You cannot manage what you do not measure” the biggest challenge in managing energy efficiently is to have access to precise measurement data of the consumption. Accessing and monitoring this data can present two aspects of the difficulty associated with this. The inaccessibility of the energy meters and their data is one aspect and the other is having this data available in a centralised format for monitoring and making changes.

This problem can get compounded in the case of smart cities with population increase and huge infrastructures and varying power needs.

Solution

In the era of the smart and the convergence of technologies, we at CASCADEMIC extended and evolved our decades of embedded expertise from SCADA to the growing IoT space.

The Energy Management System from CASCADEMIC is one such IoT solution which aids in optimal management of Energy resources in a Smart City efficiently and intelligently.

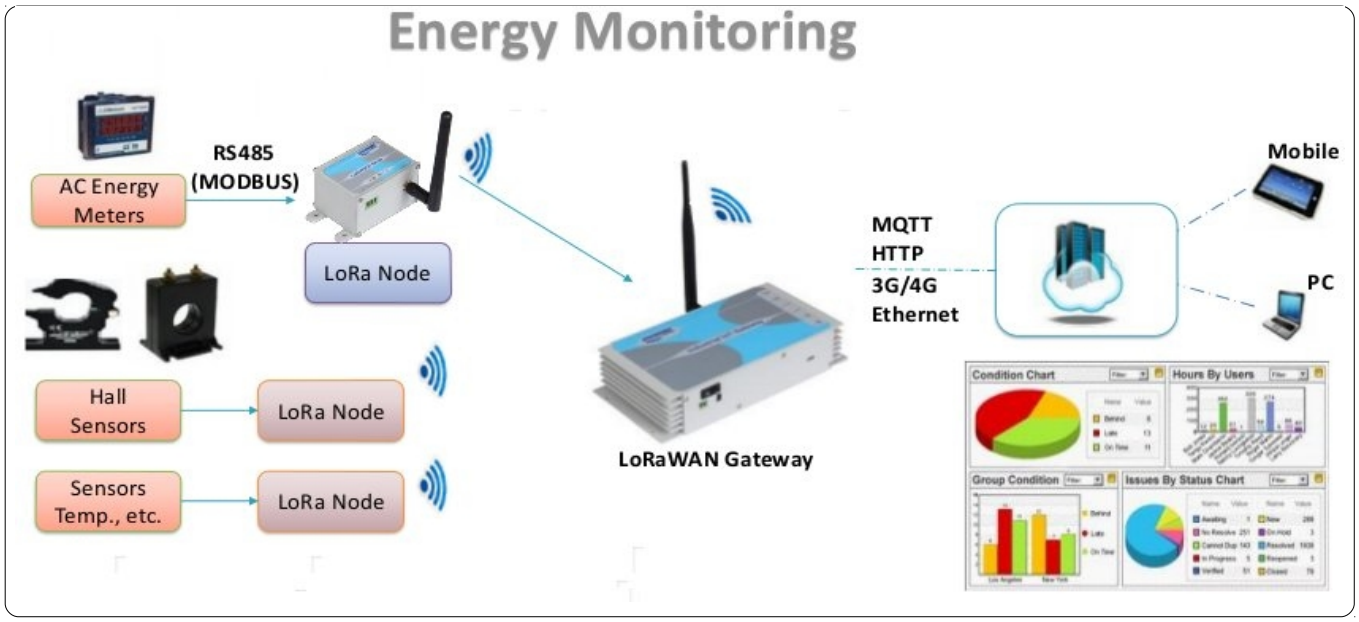
It helps to monitor Energy consumtion in Remote Infrastructures, Industrial Plants, Educational Institutions, Malls, Apartment complexes, etc. Solar Power Monitoring, Automatic Facilities Control (Fans, ACs, etc), Intelligent Lighting are some of the use cases of the energy monitoring solution.

It effectively addresses the challenges faced in energy management through noninvasive, retrofit solution to existing energymeters through its MODBUS interface, and the data collected is made accessible over the cloud for monitoring and control.

This is done by setting up a LoRa Network using the LoRaWAN IoT gateway and LoRa Nodes. With the advantages of the LoRa technology being long range and low power this makes for a cost-effective solution where a central gateway can collect data from many node devices spread over a large area. The LoRa Nodes interface with energy meters through Modbus RTU to collect energy consumption data and send it to the gateway using LoRa. In case Modbus interface is not available, external sensors which are retrofit. CASCADEMIC's LoRaWAN Gateway is a data concentrator and sends the collected data to the cloud over 3G, 4G, LTE for realtime monitoring, also available to cloud applications for automated billing and analysis.

Features

- MODBUS Interface to existing Energy Meters
- Communication to Server/Cloud through multiple wired and wireless methods
- Ultra low-power consumption
- Non-invasive retrofit solution
- Embedded SIM support



Value Proposition

The solution delivers business value through:

- RUtility based power billing
- Corrective measures on load
- Management of Energy Resources
- Battery Health Monitoring
- Realtime Billing Reports on Energy Consumption
- Remote management, Configuration
- Higher Resource Utilization with continuous monitoring