

The logo for GadgEon, with 'Gadg' in blue and 'Eon' in orange.

Engineering Smartness

IOT ENABLED SMART FURNITURE

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Version 01





IOT enabled Smart Furniture



One of the largest furniture manufacturers in the United States developed Windows and Doors and other furniture embedded with sensor technology that can report own status and even control the shades and blinds. They were looking for a trusted partner to resolve issues with their gateway, cloud and mobile apps in terms of support as well as technical issues.

Solution Description

- Analysed the root cause for the RF range and isolated the problem to noise generated with one of the regulators in the system
- Updated the hardware design to fix the noise issue, replace obsolete parts and updated the BSP to support new hardware changes
- Developed the new cloud and mobile applications (iOS/Android) from scratch retaining existing features and migrated existing users to the new application
- Support for new features as required by customer

Outcome and Benefits Delivered

- Resolved the issue with noise sources on the bridge hardware improving range by 30%
- Developed the cloud and mobile apps with existing features and some additional features with guaranteed deployment support. All source code belongs to the customer.
- Reduced the overall recurring costs by 60% by removing license costs and reducing hosting costs to minimum



The Business Context and Challenges of the Customer

- One of the largest furniture manufacturers in the United States, developed an innovative IoT solution to enhance their business, especially for premium customers. They have developed Windows and Doors and other furniture embedded with sensor technology that can report own status and even control the shades and blinds.
- Solution was developed with sensor electronics and firmware inhouse, Gateway developed by one vendor and cloud/mobile apps licensed from another vendor. Gateway and Cloud/mobile vendors were not supporting minor feature updates and bug fixes. Gateway vendor was also unable to provide a solution for limited RF range on the gateway.
- Customer was looking for a trusted partner who can help them to resolve existing issues, avoid the recurring license fees, take control on the complete source code and add new features needed for the market.



The Solution / System Description

The solution consists of the following components

Sensors

Customer has developed several variants of the sensors which detects the status of door, window, garage door and shades/blinds etc. They are working on 433MHz RF and optimized for long battery life.

Bridge

Bridge in an embedded Linux gateway and communicates with sensors on one side and a cloud application on the other side. It also interfaces with home automation controllers.

Cloud Application

Cloud application coordinates the data transfer between the bridge and user's mobile app so that user will be able to control and monitor the sensors from anywhere in the world. Cloud pushes any alerts or notification to the user as and when the information is received from bridge. Application also provides the customer facility to view the statistics of their users and push firmware updates

Android and iOS apps

User interfaces to the system through the apps. Allows the user to receive notifications and view/control sensors and shades/blinds. They can setup rules to carry out specific actions at specific times or triggered by events.

System / Architecture Description

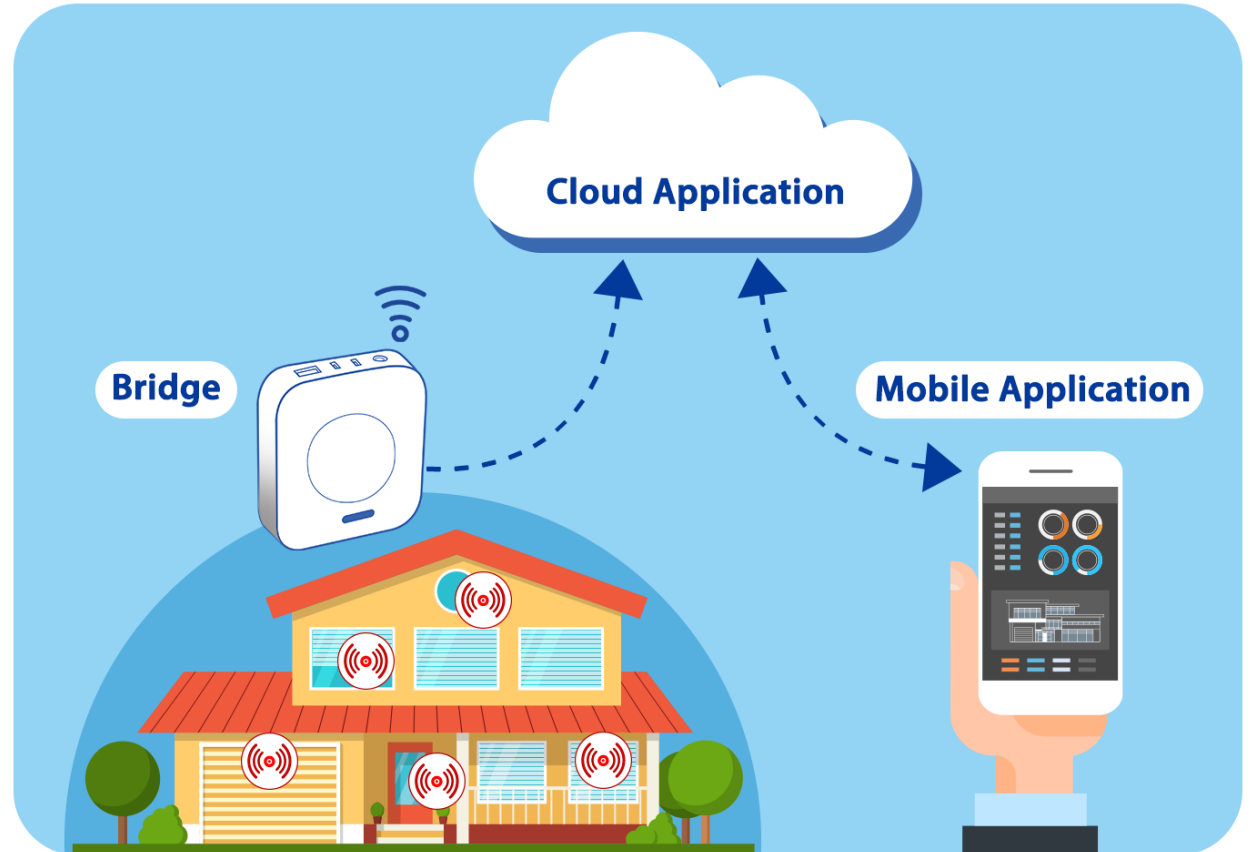
GATEWAY

Platform / Technologies

Yocto Linux, C/C++, Python, MySQL, MQTT

Implementation

- Fixed the hardware issue causing noise generation and loss of RF range
- Replaced obsolete components and updated the BSP
- Migrated the cloud interface from previous vendor to new cloud owned by client
- Retained all the existing source code
- Redesigned the application to minimize database writes
- Added major new features to support local rule engine, RF signal strength indication





The System Description

CLOUD

Platform /Technologies

React JS, C#, MS Azure, Mongo DB, MQTT, FCM

Implementation

- Developed the new cloud solution from scratch retaining existing features
- Migrated existing users to the new application
- Additional features such as support for multiple homes per user, multiple logins per user, UI pages for user statistics

Android and iOS Apps

Platform /Technologies

Java, Swift, FCM

Implementation

- Implemented the new applications from scratch as the previous app was licensed software
- Supports modified UI flows as per customers sales team feedback
- New features to support multiple homes per user, notifications based on rules, automated blind/shade control and scheduled tasks

THANK YOU



For More Details, Let's Connect



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