

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

Engineering Smartness

# SCHOOL EMERGENCY/CRISIS MANAGEMENT SOLUTION

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Version 01

# Emergency / Crisis Management System



Our Customer Wanted a reliable communication system so that events leading to emergencies can be monitored and responded at schools, or buildings

## Solution Description

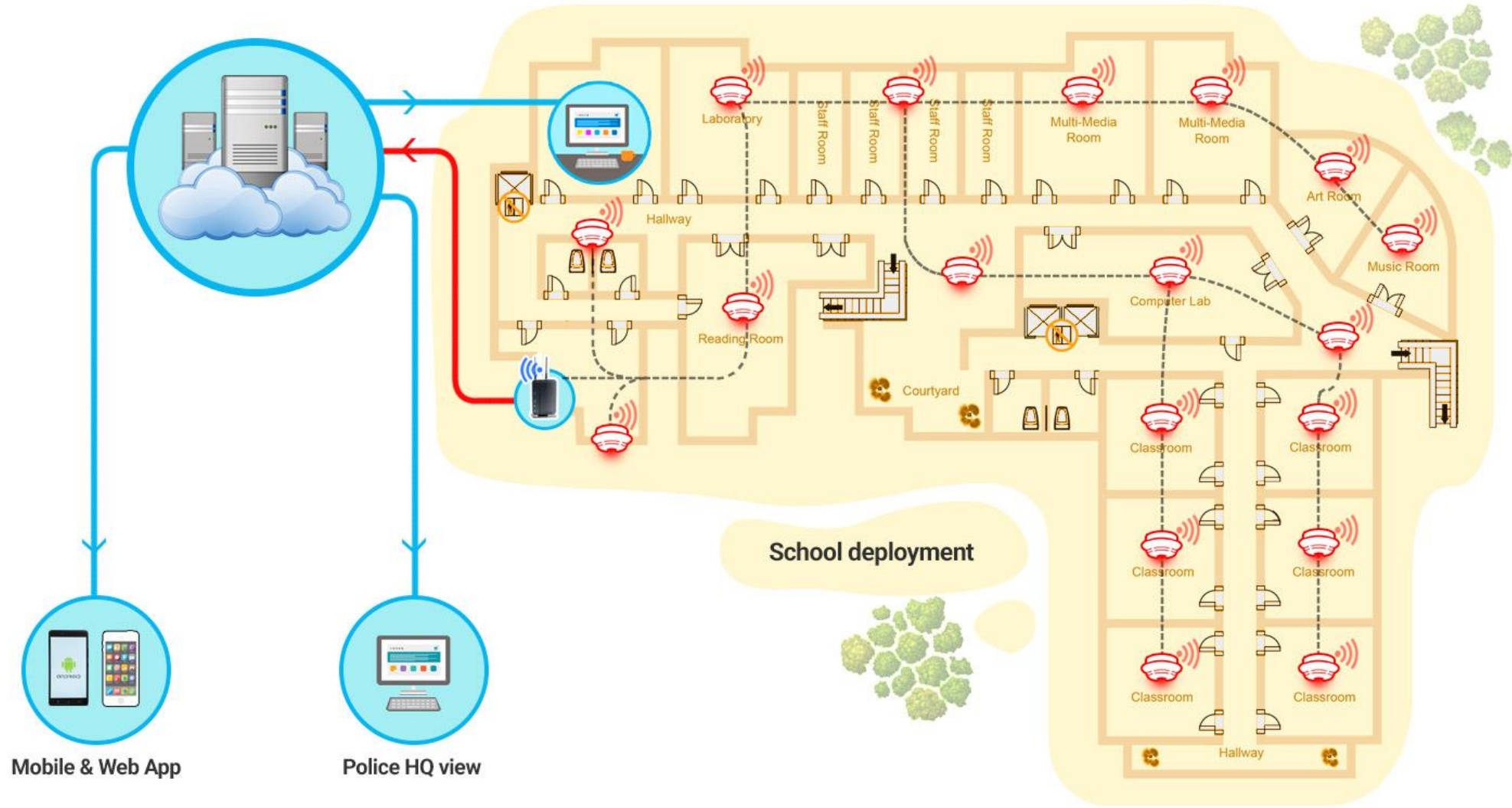
- Instant communication of events across the building with several hundreds classroom using multiple communication technologies.
- A ZigBee based large mesh network propagates events to hubs located throughout the facility to give audio and visual alerts.
- Mobile apps help staff members to receive instant updates on the situation and has walkie talkie type voice communication facility.
- System can be customized to generate different audio and visual alerts based on the requirement of the school. System can integrate with intercom or other existing facilities in schools.
- Desktop apps to view the alerts in real time and aggregated view for police headquarters.

## Outcome and Benefits Delivered

- A complete IoT Solution was designed, developed, and tested that delivered the following high level business benefits:
  - Instant communication of events throughout the buildings using multiple communication technologies.
  - Mobile apps helped the staff members to receive instant updates on the situation and has walkie talkie type voice communication facility.
  - Provided accurate location of the person in the floor plan of the school for emergency responders to reach the event location.
  - Customizable system that generate different audio and visual alerts
- Provides accurate location of the person in the floor plan of the school for emergency responders to reach the event location.



# System Overview



ZigBee mesh Hubs deployed throughout school for coverage and location identification





# System Description

The alert management system consist of various components to achieve the desired benefits

## Cloud application

- Customized the cloud application to manage provisioning of multiple Gateways and associated Hubs and badges.
- The application coordinates the communication between Gateways, mobile apps, desktop apps and web applications.
- MQTT protocol is used as communication protocol between cloud and gateways.
- REST API and Web sockets are used to interact with cloud and client applications.
- Web application supports various functions like administer schools, alert classifications, user management, firmware upgrade etc. Also supports viewing the current status and statistics of the systems. Web UI can used for viewing, generation, escalation and closing of alerts.
- When an event is generated from the users badge/app, the floor view provides the exact location of the event in a school floor plan, so that emergency responders can locate the person quickly.
- The features like walkie talkie and integration with schools existing alert management system will help to take quick action during alert events.

## Desktop app

- The windows application is a client application which runs on a Windows desktop.
- The application is used for getting notifications during alerts. User can view the alert details from the notification received. It is a C# application using WPF framework.
- The Mac OS desktop application has the similar functionalities of windows application. It is developed using cross platform electron.js and angular frameworks.





# System Description

## Gateway

- Customized Gadgeon's DelEdge Gateway, which manages hub Zigbee mesh network on one side and communicates with cloud application over MQTT on the other side.
- Cc2538 based dongle is used for ZigBee functionality.

## Hub

- Microcontroller based ZigBee hubs form a large mesh network throughout the school to propagate the alerts.
- The Hub provides audio and visual alerts to students and staff.
- Hub has BLE interface for receiving alert initiated from badges used by staff members.

## iOS & Android mobile apps

- Alerts staff members on new events as they happen.
- Staff members can also generate alerts, escalate and close alerts.
- Walkie-talkie based emergency communication from mobile and web, between responder and crisis management team.

# THANK YOU



For More Details, Let's Connect



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