



**GadgEon**

Engineering Smartness

**360 DEGREE ACTION CAMERA WITH CLOUD  
CONNECTIVITY**



## 360 Degree Action Camera with Cloud connectivity



Company needed to build complete software stack from embedded Linux to mobile app to cloud that supports a highly-functional 360 Degree Action camera product based on Ambarella SOC. Custom solution need to enhance the limited video and image functionality in chipset.

### Results / Outcomes

- Conducted feasibility study with RTSP, RTMP and HLS based 360Degree Video player and Video streaming SDK and selected the suitable combination to meet the use cases and power optimization.
- Highly scalable video streaming cloud application using Wowza video stream engine and Google Cloud Storage for media storage.
- Google Container Engine for auto scalable deployment
- Live video streaming to Facebook, YouTube, 360MobApp using Wowza stream engine
- 360 Degree Camera remote management/configurations using Websocket
- Released three stable iOS and Android versions to the customer and currently going thru limited pilot testing



## The Solution

### Challenges:

- Custom solution to enhance the Limited video and image functionality in chipset.
- Highly scalable Video Streaming with most appropriate protocol (RTSP/RTMP/HLS) and 360Degree Video Player to meet the use case.
- Handling multiple radios (BLE, WiFi, LTE) for remote management and streaming with power optimization

### The Solution:

Architecture for complete system including WiFi/ BLE/ LTE based 360Degree camera, Video Streaming Cloud platform, Social API platform and Mobile App

Firmware for 360Degree camera, REST API implementation to control the camera and retrieve captured media over Wi-Fi, BLE and LTE interfaces, using libmicrohttpd, C , Buildroot, shell scripting

Mobile App design and development for interacting with camera (both 360Degree camera and phone's inbuilt), Social interaction via cloud- both iOS & Android – native and Social media Sharing (Live Stream – from 360Degree camera using inbuilt LTE interface or using MobApp as a gateway; from phone's inbuilt camera and MobApp as a gateway)

- MVC architecture, notification handling using GCM for Android and APN for iOS, BLE/ WiFi interactions with 360Degree camera, API interface with node.js Server, Google Cloud Storage and Wowza stream server.
- Social media sharing using YouTube, Facebook API's .
- iOS app developed in Swift using Xcode and native Android app using Android studio. Followed the recommended design patterns from Apple and Google.



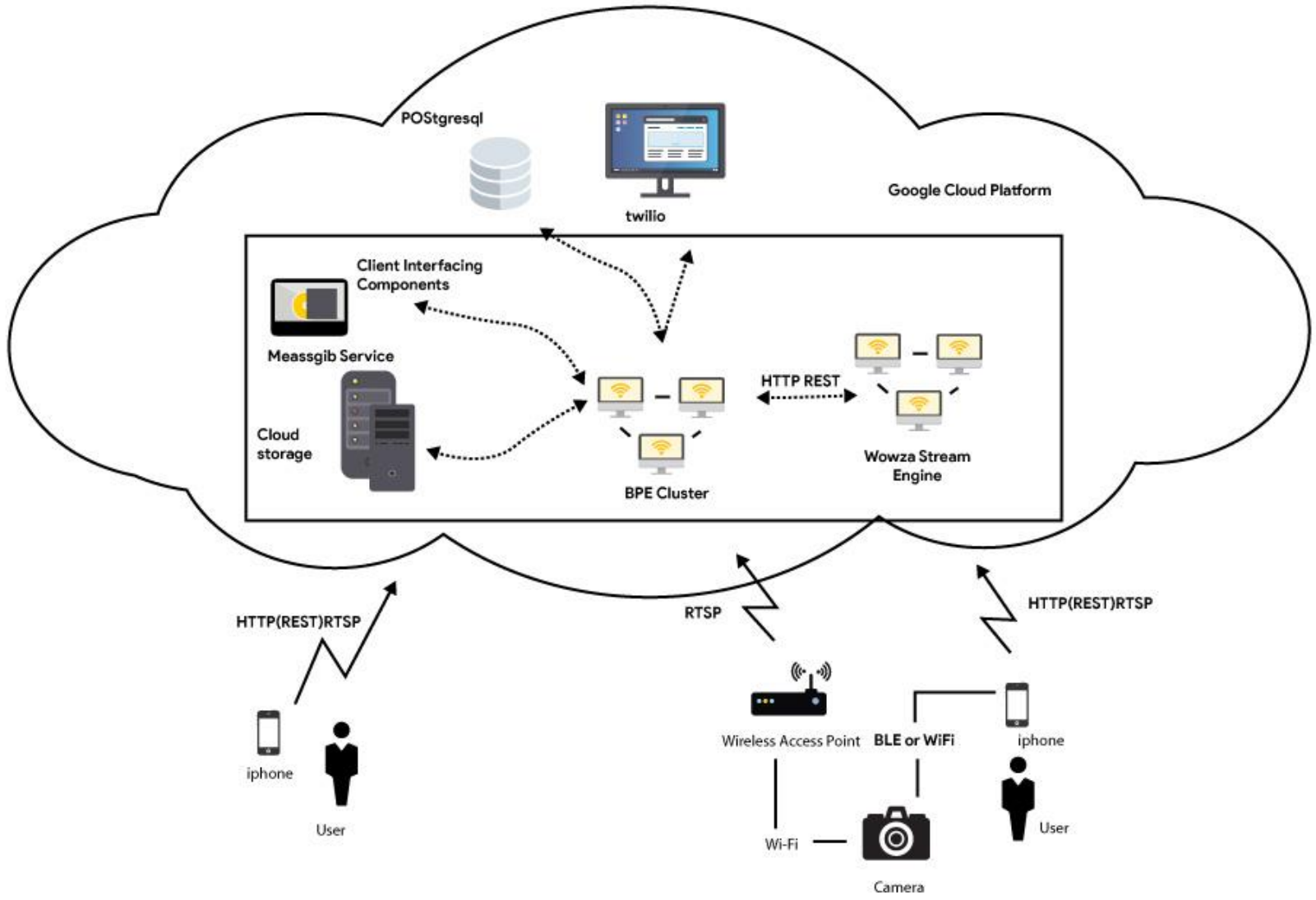
## The Solution

Cloud based server implementation to enable remote management of the camera , social interaction, media sharing and live streaming

- Express – node.js based web app framework, REST API server, Clustered Postgresql backend database, Google Cloud Storage for Media storage and sharing, Wowza stream server for live streaming and wowza Java plug in for authentication and access control, SMS notifications using Twilio server, push notifications via GCM and APN Service, eMail using SMTP server.
- Google cloud platform for hosting the cloud server: Google Container Engine for auto scalable deployment, Google Compute Engine and Google Cloud storage.
- Highly scalable Websocket server based on ws.js for remote device management. Redis Cache server is used for performance as well as for Websocket server clustering.



# The Solution – Data Flow Diagram



# THANK YOU



For More Details, Let's Connect



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