



# 360Degree Action Camera with cloud connectivity



Company needed to build complete software stack from embedded Linux to mobile app to cloud to support a highly-functional 360Degree action camera product based on Ambarella SOC.

**Project Size:** 12 members

**Project Duration:** Ongoing

**Technology Used:** AWS, iOS, Android, RTSP, Wowza, Google Cloud Storage, Google Container Engine

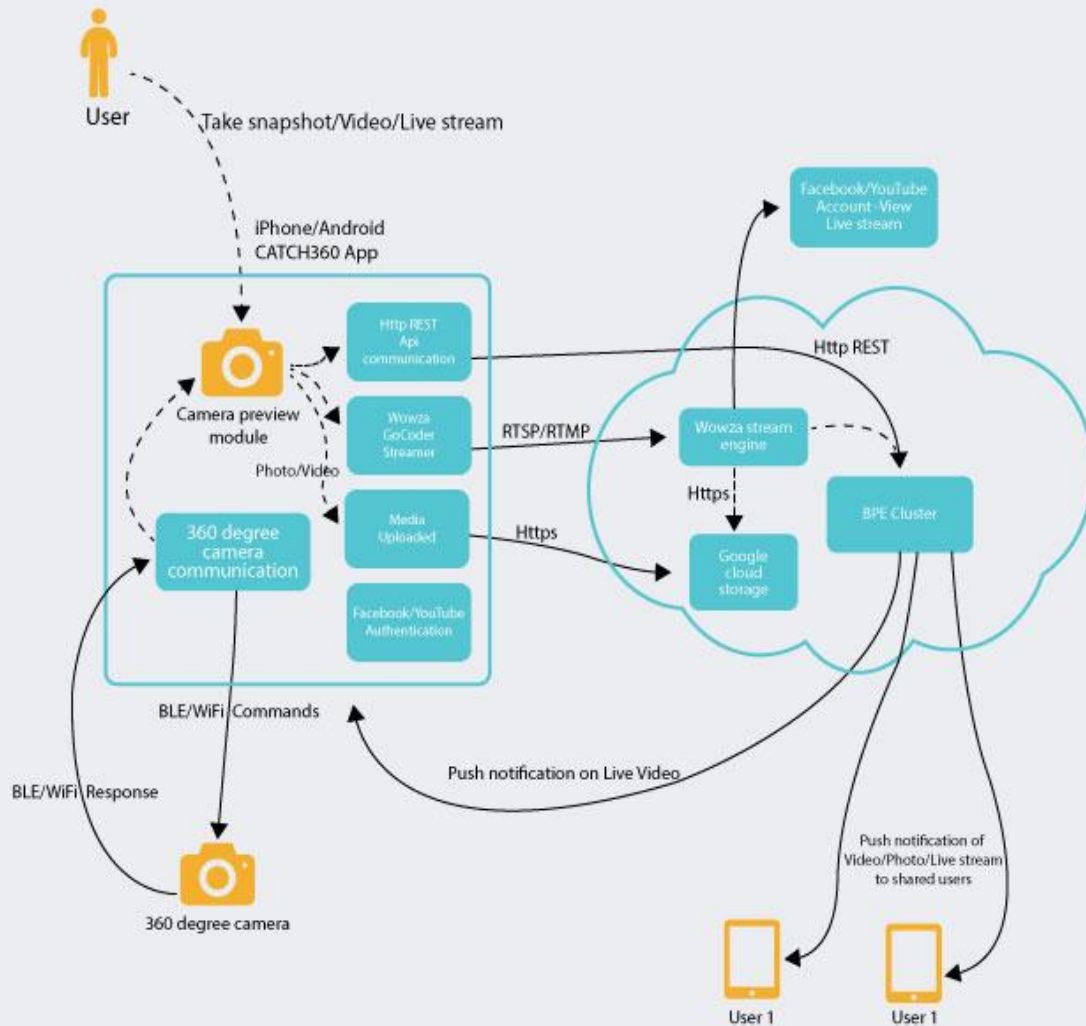
## Challenge

- 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

## Outcome

- 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
- 360Degree Camera management/configurations using BLE/WiFi
- Released three stable iOS and Android versions to the customer and currently going thru limited pilot testing

# Data Flow Diagram



## Tools / Technology Used

### MobApp

- ❖ MVC architecture
- ❖ goCoder SDK for video streaming
- ❖ FB , YouTube Live Stream
- ❖ BLE/WiFi – Camera Configuration and Management
- ❖ 360Degree Player Integration
- ❖ Push Notification – GCM/APN
- ❖ Retrofit-API Calls
- ❖ Picasso-Image loading
- ❖ Volley- Image/Videos Download Management

### Testing

Appium, Owasp.

WHAT DID GADGEON DO?	PLATFORMS/ TECHNOLOGIES USED
1) Architecture for complete system including WiFi/ BLE/ LTE based 360Degree camera, Video Streaming Cloud platform, Social API platform and Mobile App	Requirements Gathering & Analysis, Uses cases, Architecture development, identification of functional components.
2) Firmware for 360Degree camera, REST API implementation to control the camera and retrieve captured media over WiFi, BLE and LTE interfaces.	libmicrohttpd, C , Buildroot, shell scripting
3) 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)	<ul style="list-style-type: none"> <li>a) 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.</li> <li>b) Social media sharing using YouTube, Facebook API's .</li> <li>c) iOS app developed in Swift using Xcode and native Android app using Android studio. Followed the recommended design patterns from Apple and Google.</li> </ul>
4) Cloud based server implementation to enable social interaction, media sharing and live streaming	<ul style="list-style-type: none"> <li>a) 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 plugin for authentication and access control, SMS notifications using Twilio server, push notifications via GCM and APN Service, eMail using SMTP server.</li> <li>b) Google cloud platform for hosting the cloud server: Google Container Engine for auto scalable deployment, Google Compute Engine and Google Cloud storage.</li> </ul>
5) Integration of all sub-systems to create the 360Degree Action camera solution with assured scalability	Jenkins, Robot framework, Appium, Selenium, Python





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