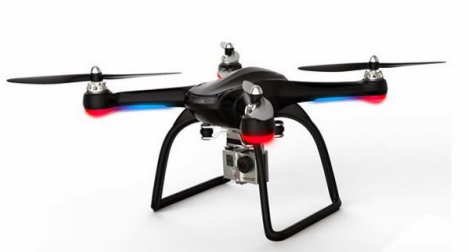
Remote Drone Control Project

Scenarios

- Air Traffic Control
  - Remote monitor drone’s status
  - Remote control the drone
- Flight Route Automation
  - ML on Edge
- Flight Video Logs
  - Remote video streaming and recording



Control drone and retrieve data/video

Install edge modules

Azure Container Registry

Azure DevOps

Machine Learning

Drone Control App (drone SDK, IoT Edge and IoT Device SDK)

Azure IoT Hub

Query Device Twins for the drone information

Remote Monitoring Dashboard

Datawarehouse

1. Exchange drone status.
2. Managed edge modules installed on the gateway app.

Drone related data (battery level, location, altitude.....)

Device Twins

Live video streaming ingest

Real-time monitoring

Analyze Video

Archive video

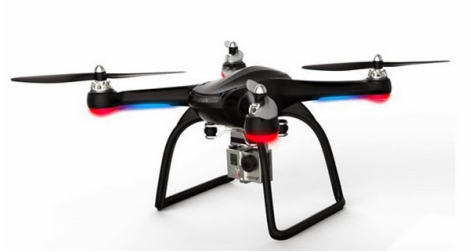
Azure Media Services

Azure Storage

Remote monitoring and control drones

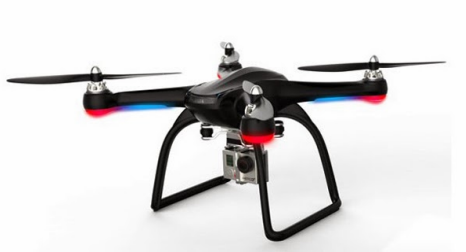
Common Drone Control App

- Using drone vender's SDK
  - Collect data from drone
  - Send command to drone
  - Video streaming
- Connect to drone via WIFI
  - UDP protocol
  - Long distance radio frequency
  - 5G
- Azure IoT Device SDK
- Azure IoT Edge



Control drone and retrieve data/video

Drone Control App (drone SDK, IoT Edge and IoT Device SDK)



1. Send Takeoff command to drone

Drone Control App

2. Update value of the Reported Proerty “**ReportedCommand**” to “**Takeoff**”.

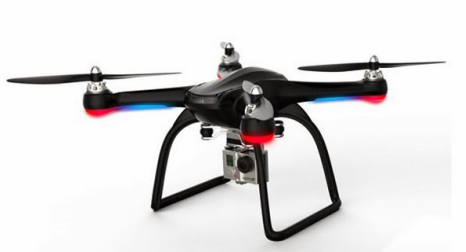
Azure IoT Hub

3. Query the status of drone

Rakuten Dashboard App

Device Twins

```
"reported": {
            "ReportedCommand": "Takeoff“
}
```



3. Send Land command to drone

Drone Control App

2. Retrieve the new value of desired properties

Azure IoT Hub

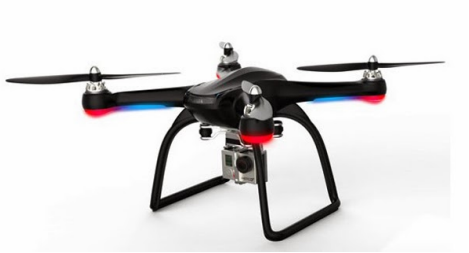
1. Set the value of Desired Property “**Command**” to “**Land**”.

Rakuten Dashboard App

Device Twins

“desired": {
"Command": “Land“
}

Architecture -- TBC



WiFi (UDP)

Drone Control App (Raspberry Pi)

MQTT

Azure IoT Hub

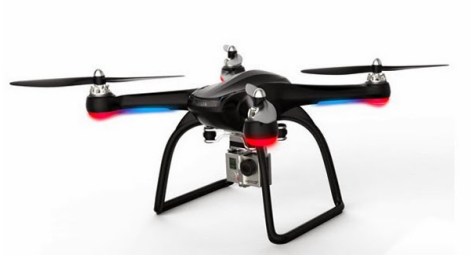
Https

Rakuten Dashboard App

Device Twins

ML on Edge
(Drone App)

ML on Edge



Drone Control App (drone SDK, IoT Edge and IoT Device SDK)

Install edge modules

Azure Container Registry

Azure DevOps

Machine Learning Module

Azure IoT Hub

1. Exchange drone status.
2. Managed edge modules installed on the app.

Set Edge Modules for drones

Remote Dashboard

SQL

Remote video streaming and recording

Realtime video streaming