

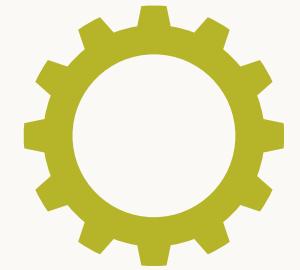
- 
- Position Applied: Backend Engineer
 - Technology: Node.js, SQLite, MQTT



Presented by Muhammad Adib Majdi

GREENHOUSE BACKEND SYSTEM (IOT SIMULATION)

**Backend Engineer Technical
Assignment**



PROBLEM STATEMENT

Masalah yang ingin diselesaikan

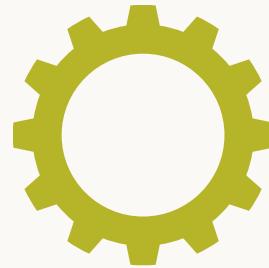
- Sensor greenhouse mengirim data secara real-time
- Device perlu menerima perintah secara asynchronous
- Sistem harus mudah dimonitor statusnya

Tantangan utama

- Validasi data
- Event-based communication
- Integrasi backend dengan MQTT

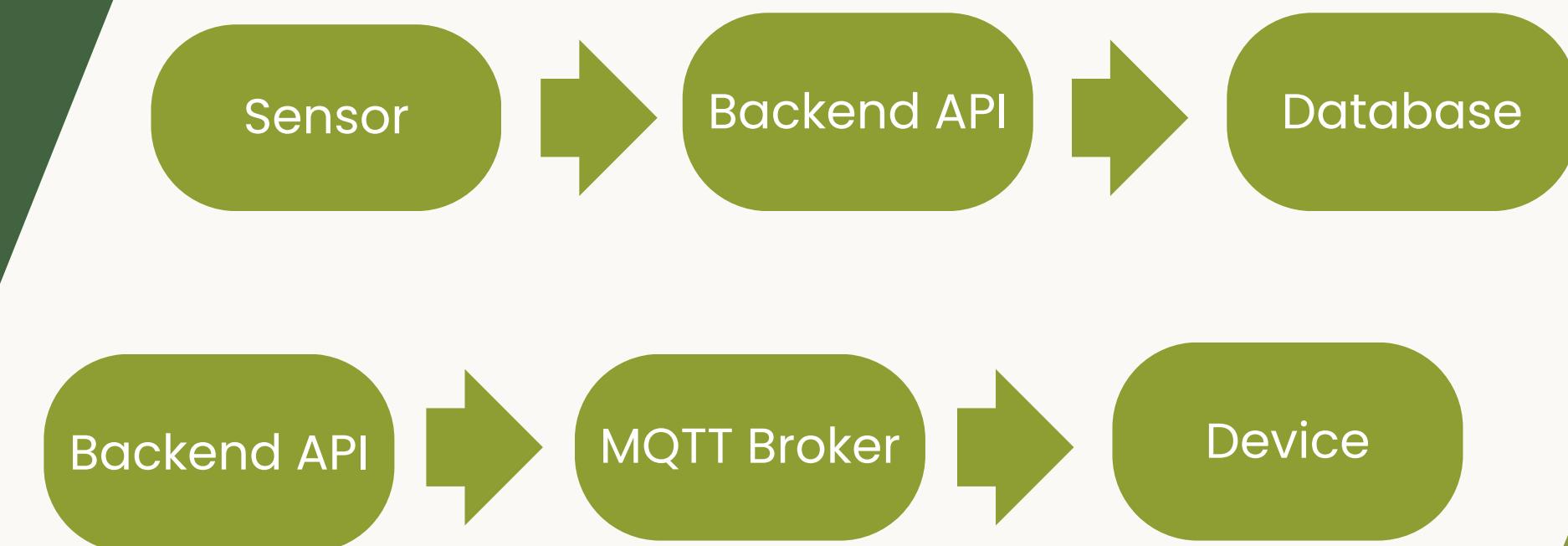


SYSTEM ARCHITECTURE



Komponen Utama

- API Server (Express)
- Database (SQLite)
- Message Broker (Mosquitto)



API DESIGN



Endpoint utama

- POST /sensor-data
- POST /device-control
- GET /status

Contoh validasi

- Payload sensor divalidasi sebelum disimpan
- Command device dibatasi hanya ON / OFF

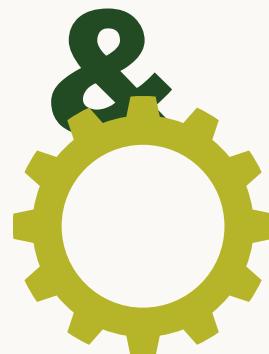


An aerial photograph showing a vast, sprawling tea plantation. The fields are arranged in numerous terraced rows that follow the contours of rolling hills. A dirt road cuts through the plantation, with a few small vehicles and people visible. The tea leaves are a vibrant green.

Kenapa MQTT

- Lightweight
- Event-driven
- Cocok untuk IoT

MQTT INTEGRATION REAL-TIME BEHAVIOR



LIMITATIONS & CONCLUSION



Current Limitations

- Tidak ada authentication
- Tidak ada retry mechanism MQTT
- Masih single-instance backend

Conclusion

- Sistem memenuhi requirement dasar
- Mudah dikembangkan ke skala lebih besar

Ready to contribute to your company

