AWS re:Invent

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BOA305

Creating an immersive gaming experience with IoT and ML

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Agenda

- AI/ML IoT demo architecture
- Minecraft and Roblox gaming platform
- Minecraft mod and demos
- Roblox and demos
- Lessons learned and takeaways

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What is this talk about?

- **Educate**: teaching code to anyone, including kids and teenagers
- **Inspire**: using AI/ML/IoT to improve users' experience
- **Research**: integrating AWS services, new technologies, and gaming platforms
- **Replicate**: sharing open-source hardware projects, source code, and tutorials

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AI/IoT demo components

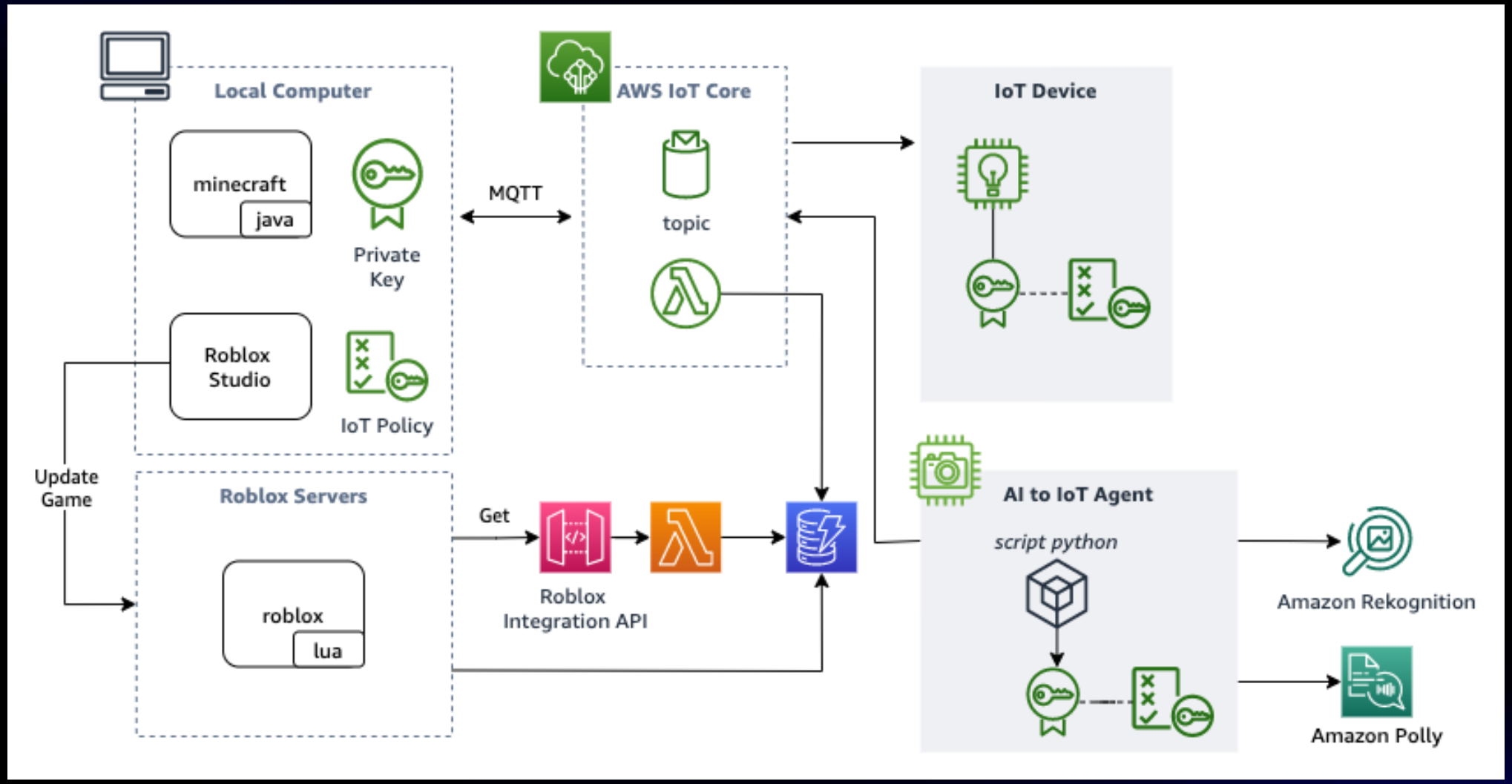
- **Gaming computer**
  - Mods/code for Minecraft and Roblox
  - AWS SDK for Java & Roblox Studio

- **IoT devices**
  - Any IoT devices or home appliance with sensors and actuators

- **AI/IoT Camera**
  - Python script + camera on any computer or any single-board computer (e.g. rasp-pi)

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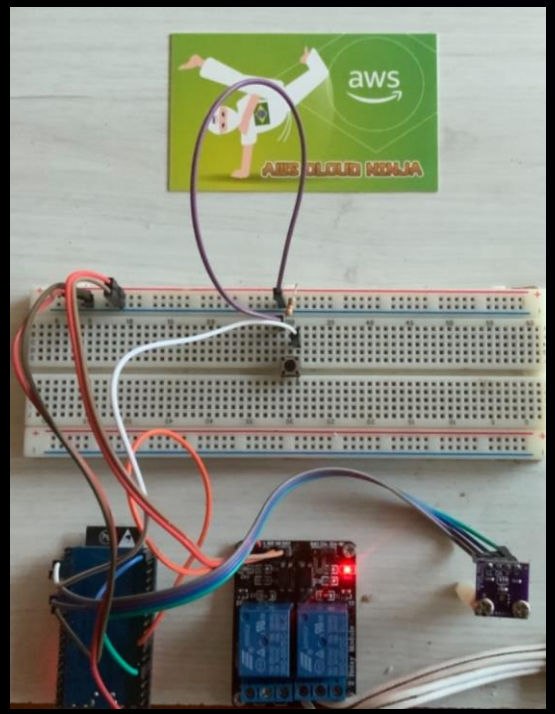
AI/IoT demo architecture overview

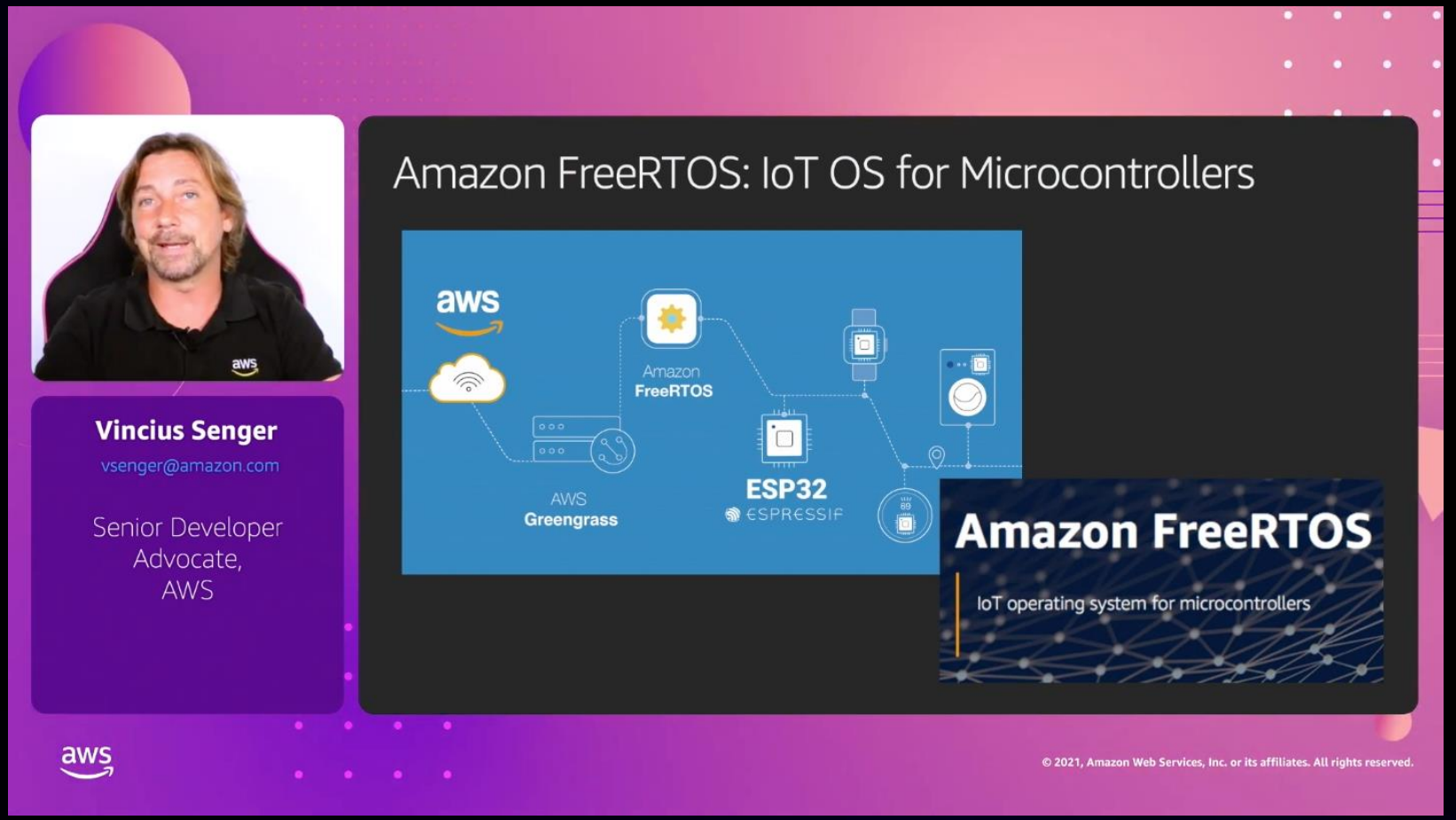


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IoT device

ESP32 with relay, temperature, and humidity sensors





https://aws.amazon.com/developer/learning/lets-build-iot/

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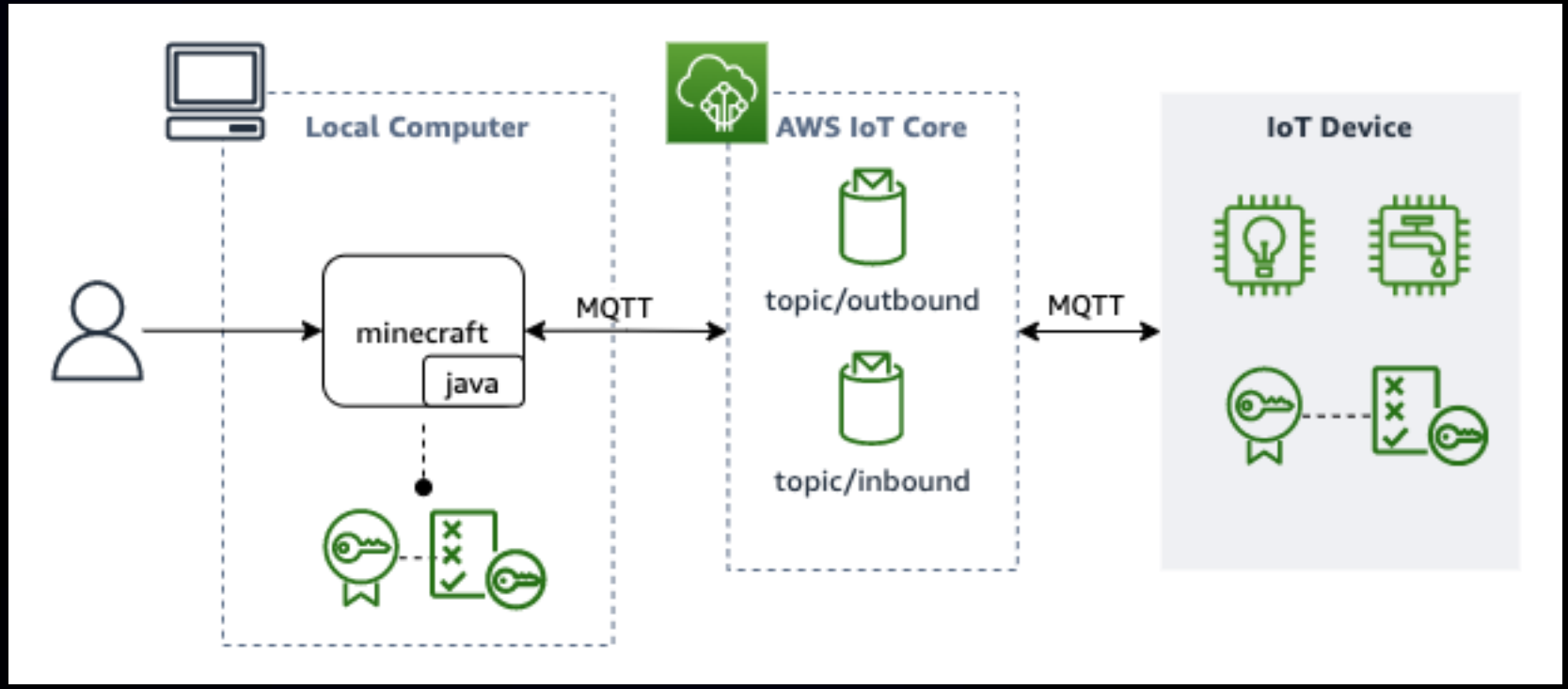
Minecraft

Break block mod & rain mod

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Minecraft: break block mod and rain mod

- Minecraft 1.16.5
- JDK 1.16
  - Amazon Corretto
- AWS IoT Core
- IoT device



https://github.com/vsenger/Playground4AWS

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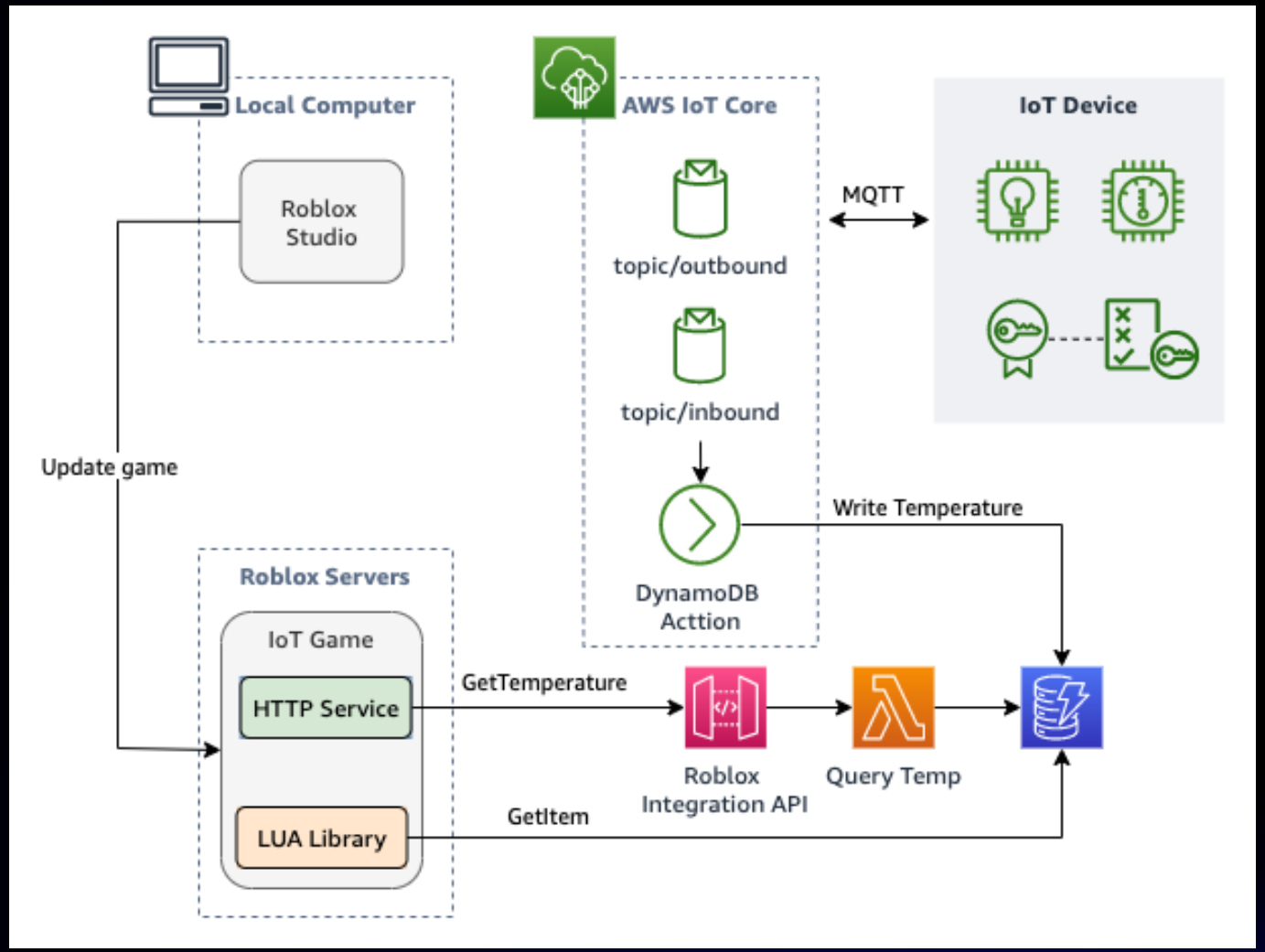
Roblox

Helmet mod & IoT dashboard

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Roblox: IoT dashboard

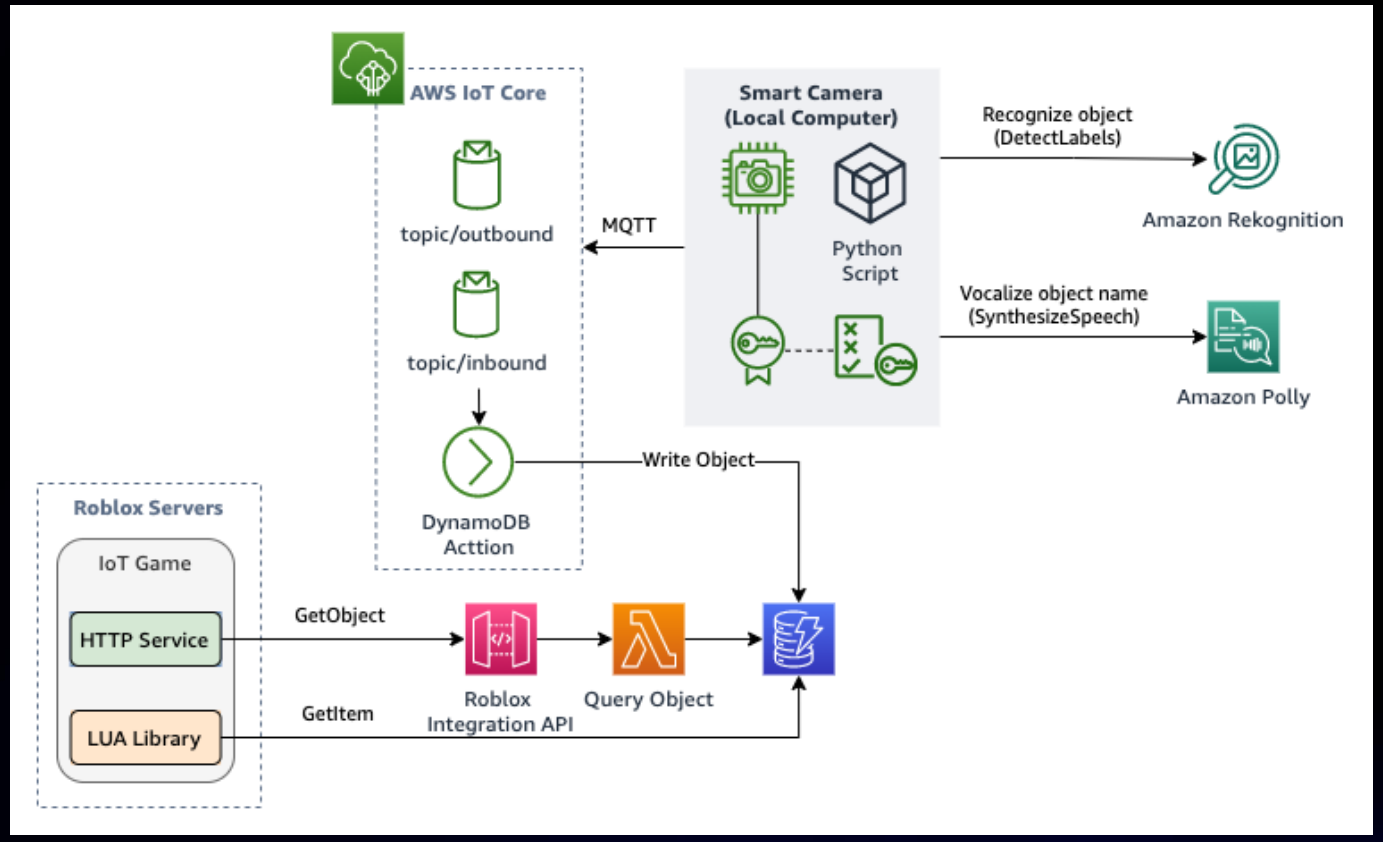
- AWS IoT Core
- Amazon DynamoDB
- IoT device
- Amazon API Gateway + AWS Lambda



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Roblox: Helmet mod (smart camera)

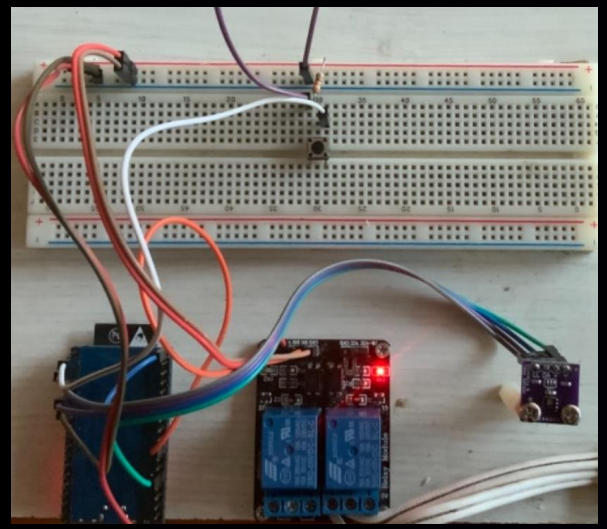
- Python script using Boto3
- AWS IoT Core
- Amazon Rekognition
- Amazon Polly
- Device (e.g., raspberry pi)



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IoT devices

- Easier to assemble
- Includes temperature and humidity sensors, and relays
- Based on common spare parts



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- More sensors and features
- Secure element
- Reference architecture for production



github.com/vsenger/playground4iot

aws

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AWS IoT EduKit

- Reference hardware kit for use with AWS IoT EduKit

- ESP32-D0WDQ6-V3
  - supports 2.4GHz WiFi
  - Bluetooth 4.2, BLE
  - 16M Flash
  - 8M PSRAM
  - Built-in ATECC608 Trust&GO hardware encryption chip



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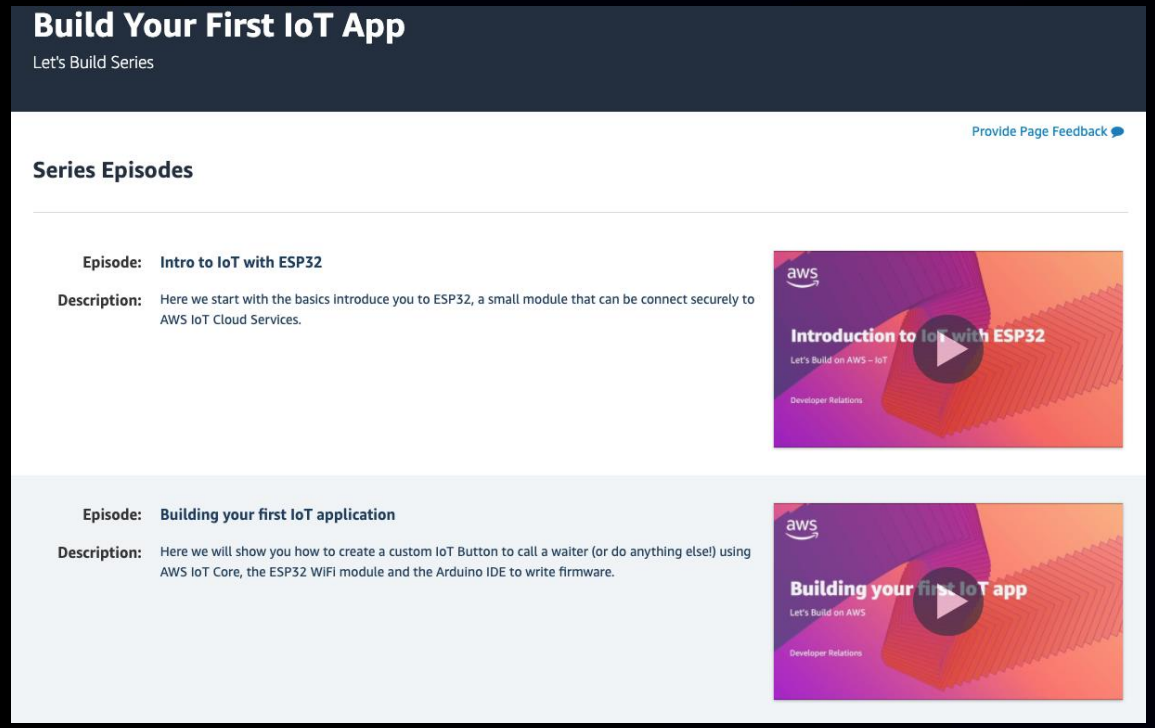
Lessons learned and takeaways

- Leverage AWS SDK for IoT (Java) in Minecraft
- Hard time to integrate Minecraft Forge 1.17 with AWS SDK
- No library to integrate Roblox with AWS
- Different ways to integrate with Roblox
- No secure way to store credentials on gaming environment
- Leverage code and hardware projects presented

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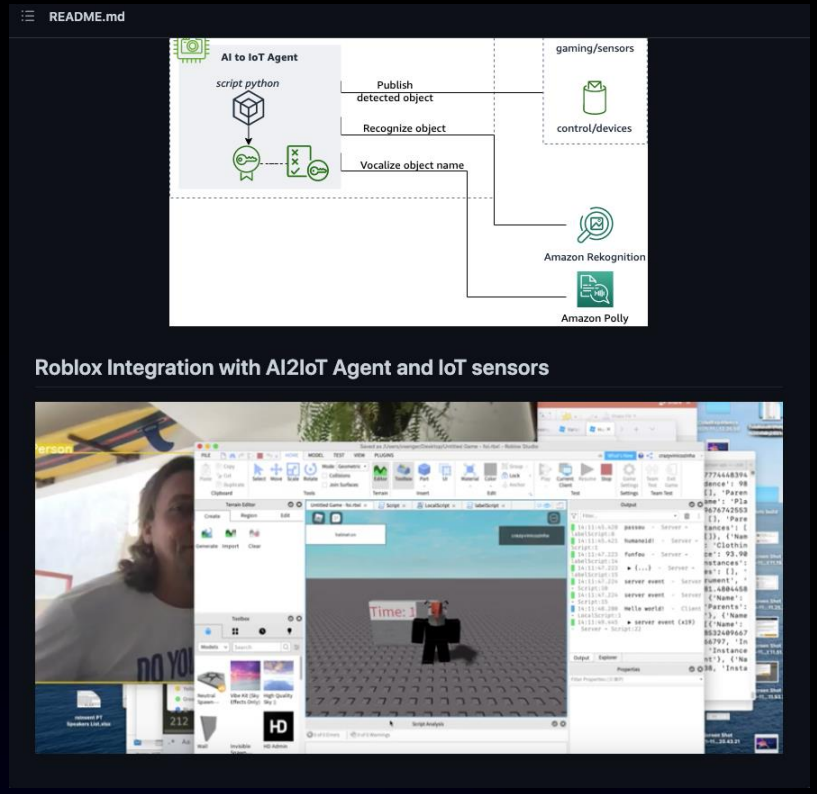
Go build, learn, and have fun!

Build your own hardware!



aws.amazon.com/developer/learning/lets-build-iot/

Build your own game!



github.com/vsenger/Playground4AWS

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Thank you!

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