AWS IoT an overview

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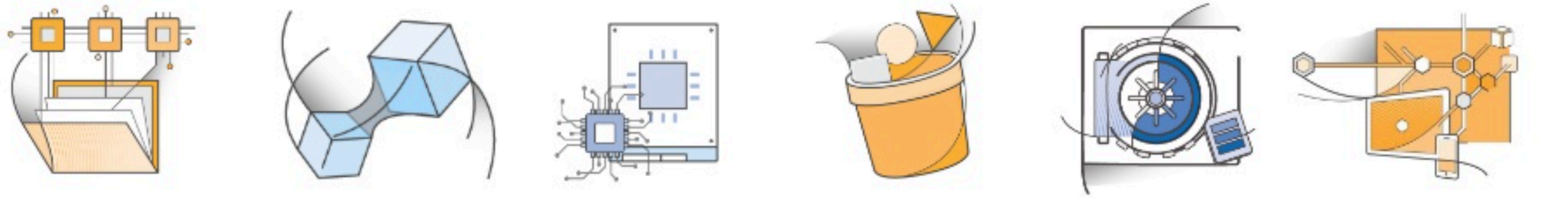
Foundation

- AWS Storage Service
- Lambda
- AWS IoT Services

AWS Storage Service



Amazon EFS

Amazon EBS

Amazon EC2 Instance storage

Amazon S3

Amazon Glacier

AWS Storage Gateway

File

Block

Object

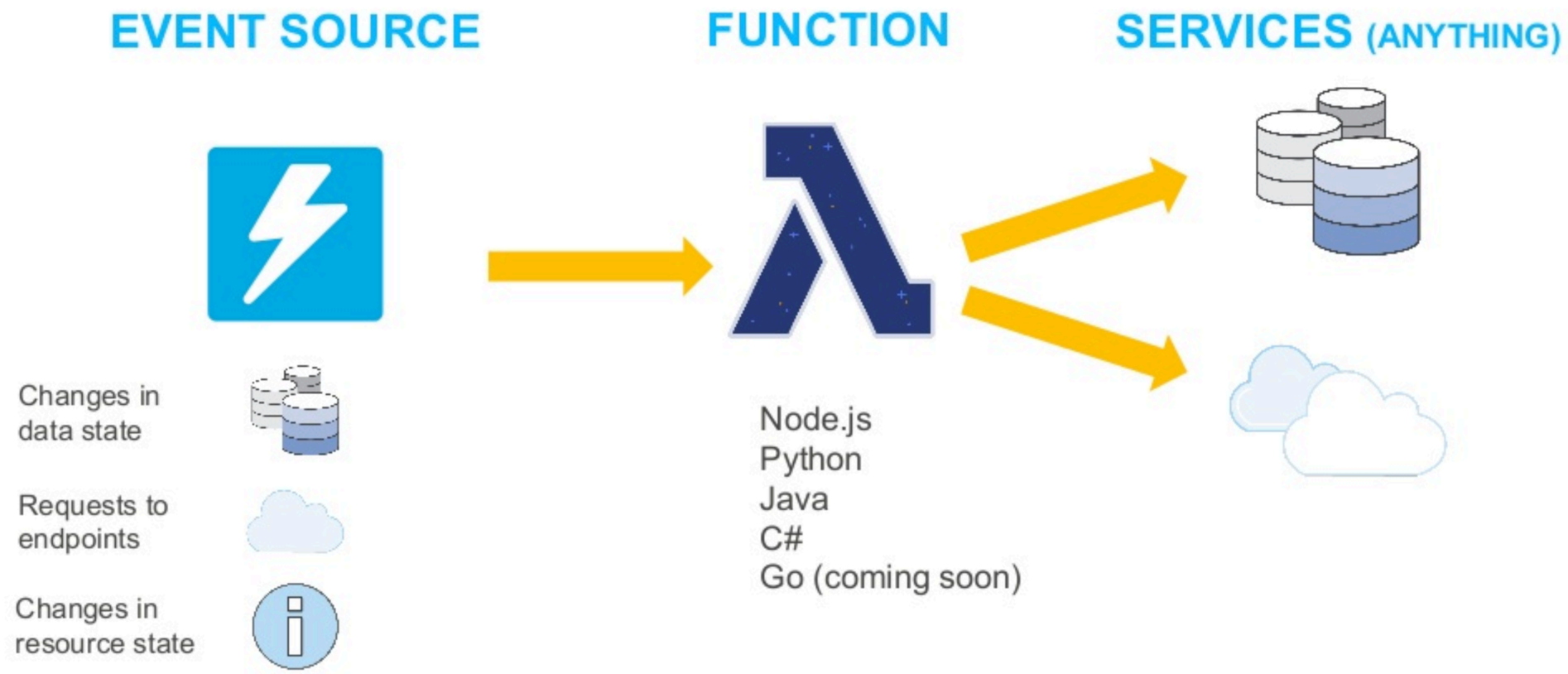
Hybrid integrated storage

RDS (Relational Database Service)

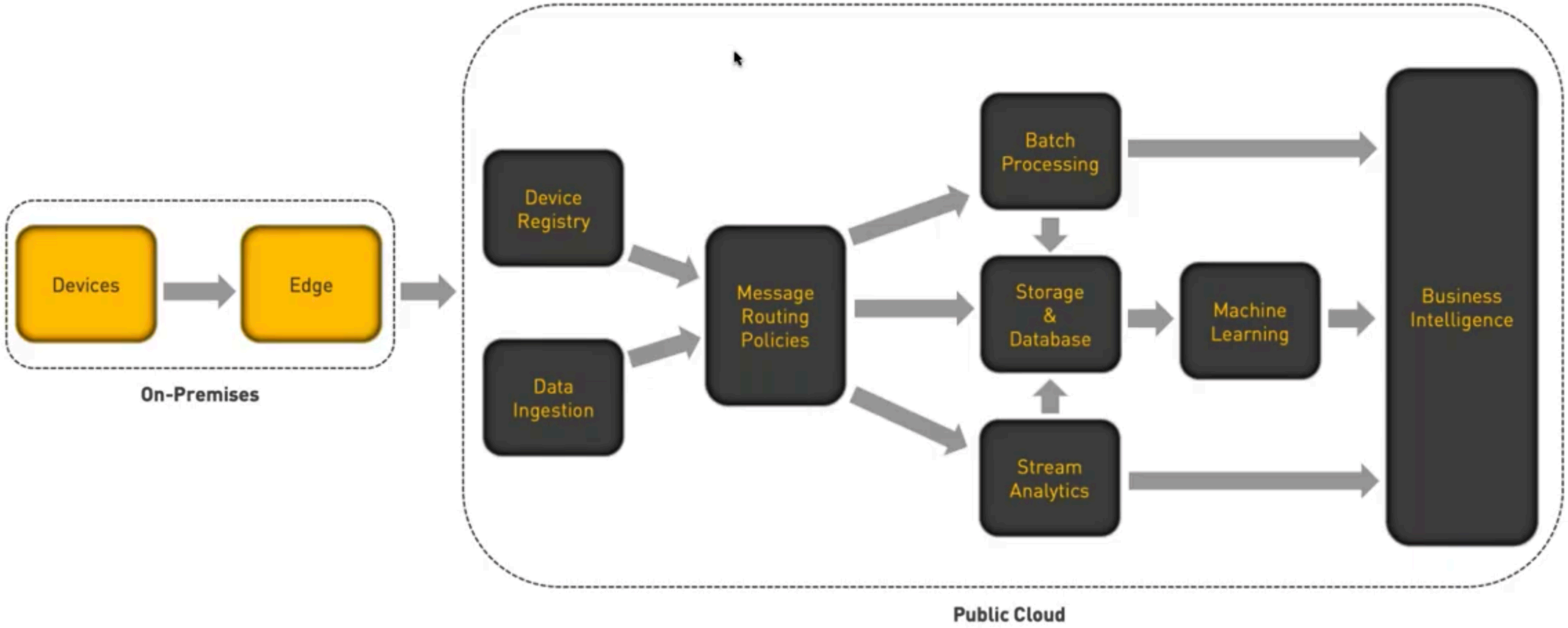
Lambda

- Provide function code to Lambda
- Lambda executes code on demand
- You don't know how or where code is executed
- No servers or VMS to manage
- Charged only for execution time

Serverless Application



Big Picture of IoT Platforms



AWS IoT Core

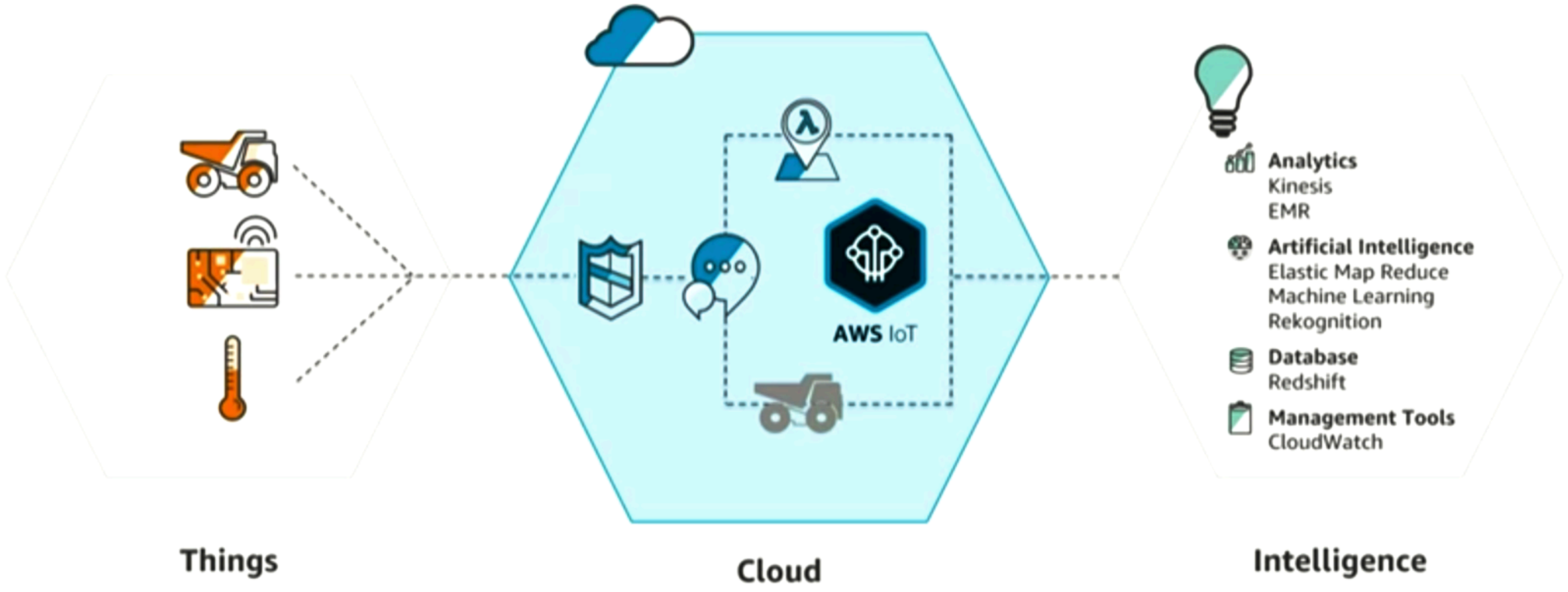
Three pillars of IoT

Things
Sense & Act

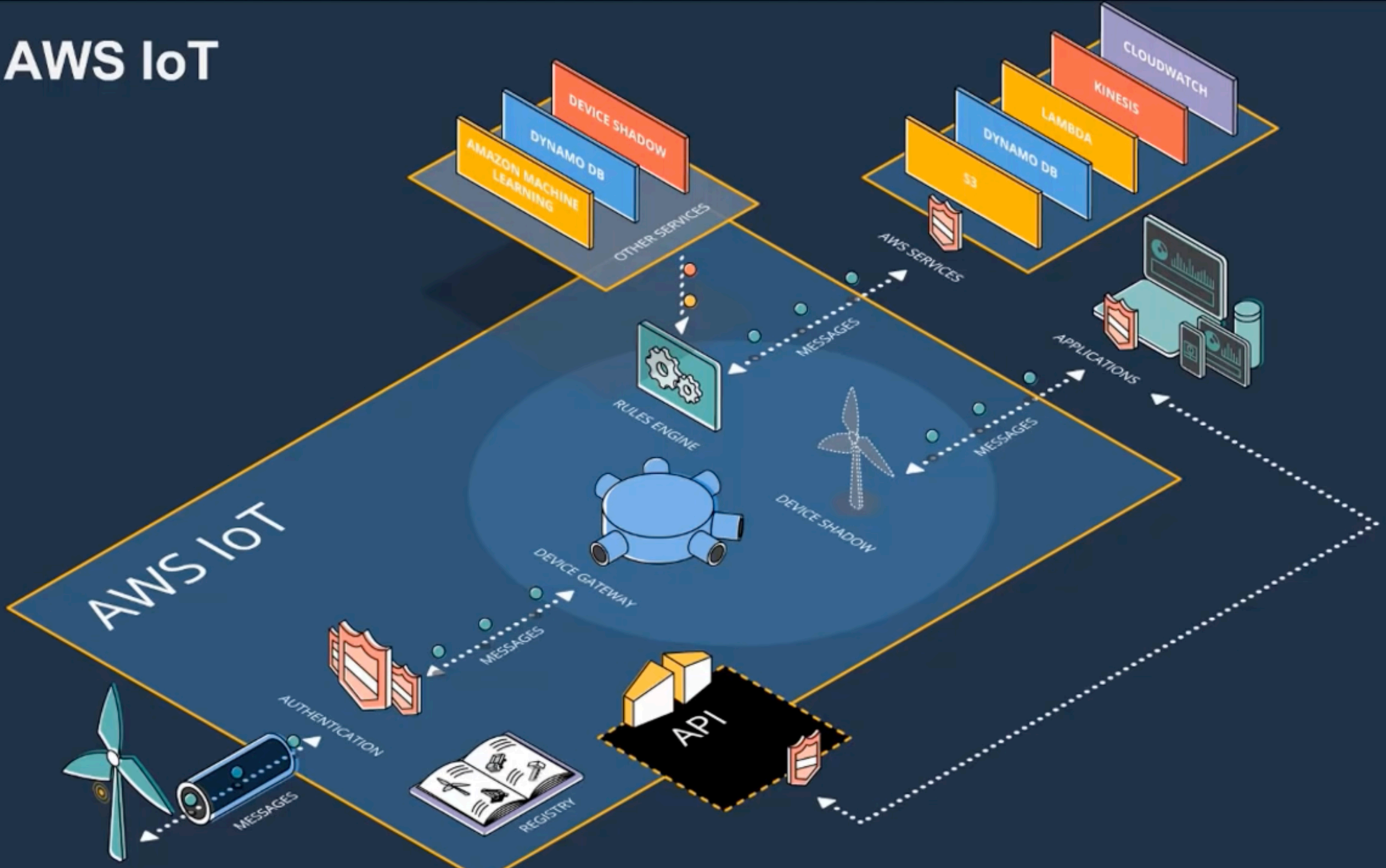
Cloud
Storage & Compute

Intelligence
Insights & Logic → Action

AWS IoT


AWS IoT
Analytics
Kinesis
EMR
Artificial Intelligence
Elastic Map Reduce
Machine Learning
Rekognition
Database
Redshift
Management Tools
CloudWatch
Things
Cloud
Intelligence

AWS IoT


DEVICE SHADOW
DYNAMO DB
AMAZON MACHINE LEARNING
OTHER SERVICES
CLOUDWATCH
KINESIS
LAMBDA
DYNAMO DB
S3
AWS SERVICES
APPLICATIONS
MESSAGES
RULES ENGINE
MESSAGES
DEVICE SHADOW
DEVICE GATEWAY
AWS IoT
MESSAGES
AUTHENTICATION
API
REGISTRY
MESSAGES

AWS IoT Services

Things
Sense & Act

Cloud
Storage & Compute

Edge based Software

Amazon FreeRTOS

AWS Greengrass

AWS IoT Core

AWS IoT Device Management

AWS IoT Device Defender

AWS IoT Analytics

AWS IoT 1-Click

AWS IoT Services

Edge based Software

Amazon FreeRTOS

AWS Greengrass

- Securely connect their assets
- Gather data
- Take intelligent actions locally, even when internet connectivity is down

AWS FreeRTOS

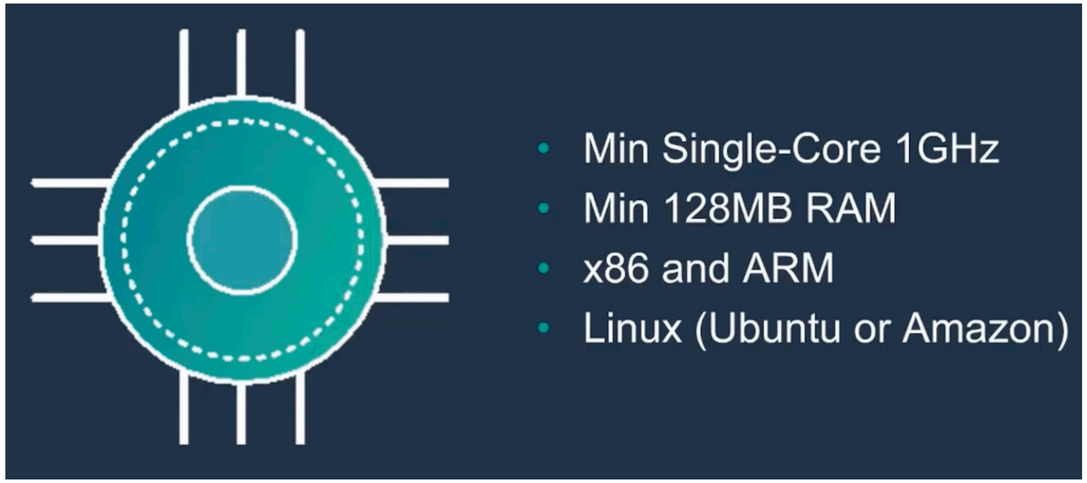
AWS FreeRTOS

AWS IoT Device SDK

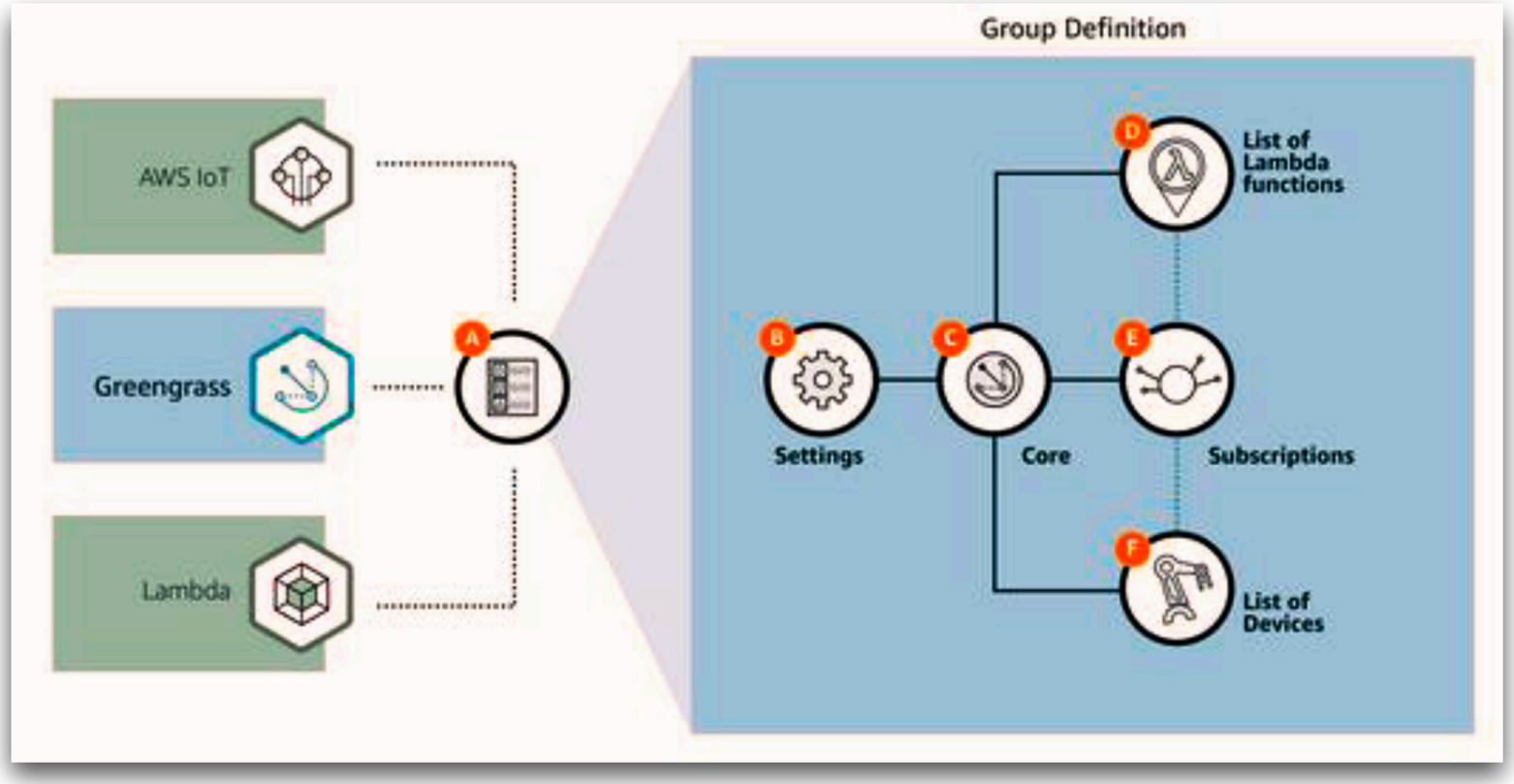
- AWS IoT Device SDKs
- AWS Mobile SDKs
- AWS IoT Device Client

AWS Greengrass - Edge computing

AWS Greengrass



AWS Greengrass



A: AWS Greengrass group definition
B: AWS Greengrass group settings
C: AWS Greengrass core
D: Lambda function definition.
E: Subscription definition (Routing rules)
F: Device definition

AWS IoT Services

- Quickly onboard their large and diverse fleets of devices
- Maintain fleet health
- Keep their fleets secure

Cloud based Services

AWS IoT Core

AWS IoT Device Management

AWS IoT Device Defender

AWS IoT Services

- Easily analyze their IoT data
- Integrates seamlessly with Amazon QuickSight for visualization and Amazon SageMaker for hosted machine learning

AWS IoT Core

Secure device connectivity & messaging

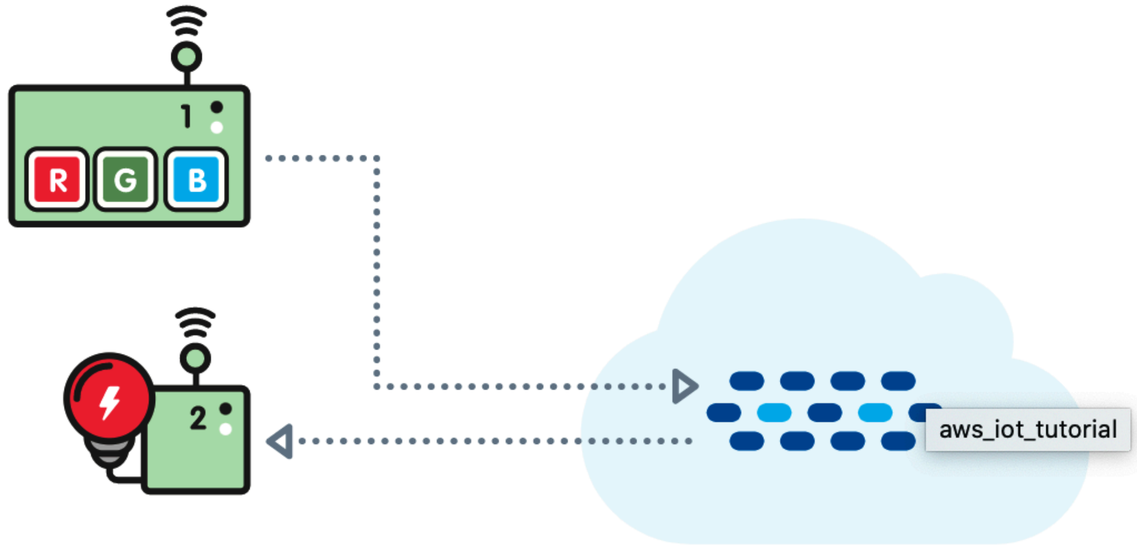
Securely connect

Route, process, and act on the data

Control & interact with devices

IoT Core

1. Device Gateway
2. Rules Engine
3. Rule actions
4. Device Shadows
5. Build solutions
6. Done



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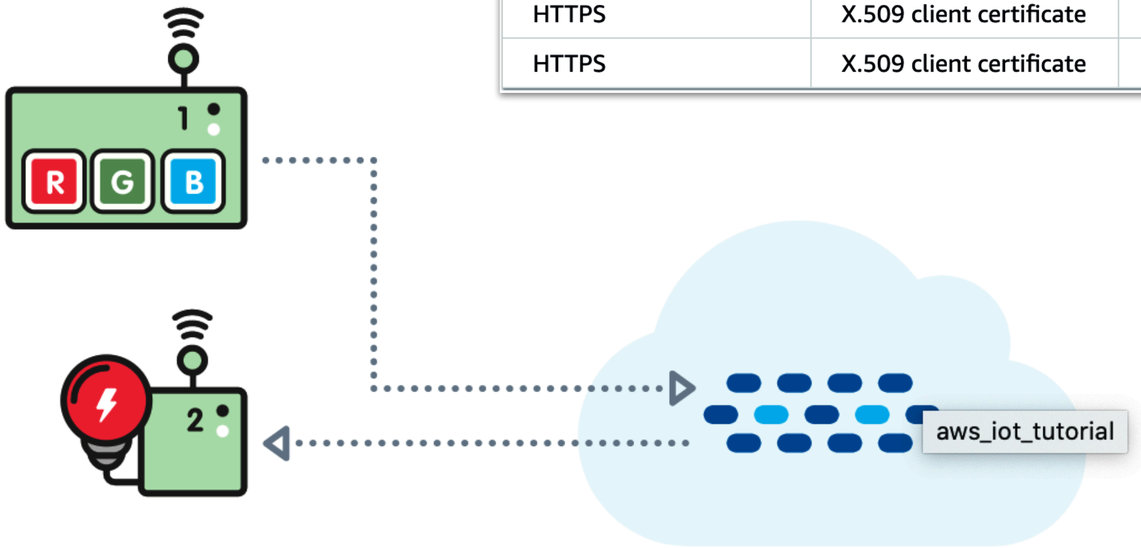

Protocols, authentication, and port mappings

Protocol	Authentication	Port	ALPN protocol name
MQTT over WebSocket	Signature Version 4	443	N/A
MQTT	X.509 client certificate	443†	`x-amzn-mqtt-ca`
MQTT	X.509 client certificate	8883	N/A
HTTPS	Signature Version 4	443	N/A
HTTPS	X.509 client certificate	443†	`x-amzn-http-ca`
HTTPS	X.509 client certificate	8443	N/A

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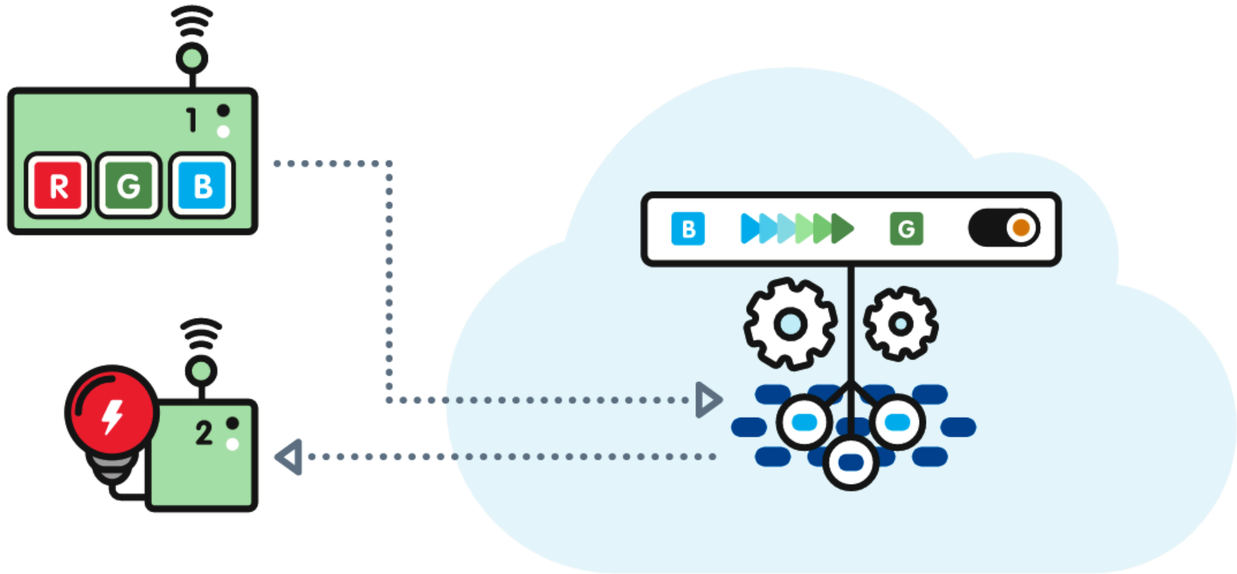

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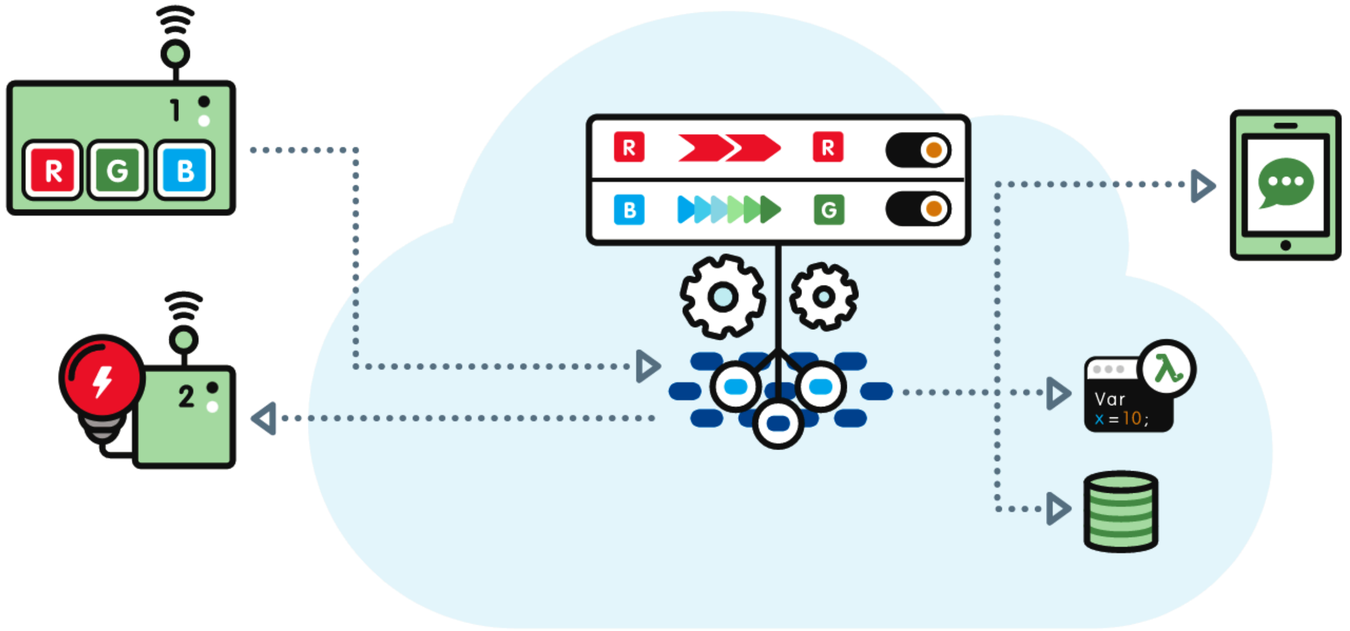

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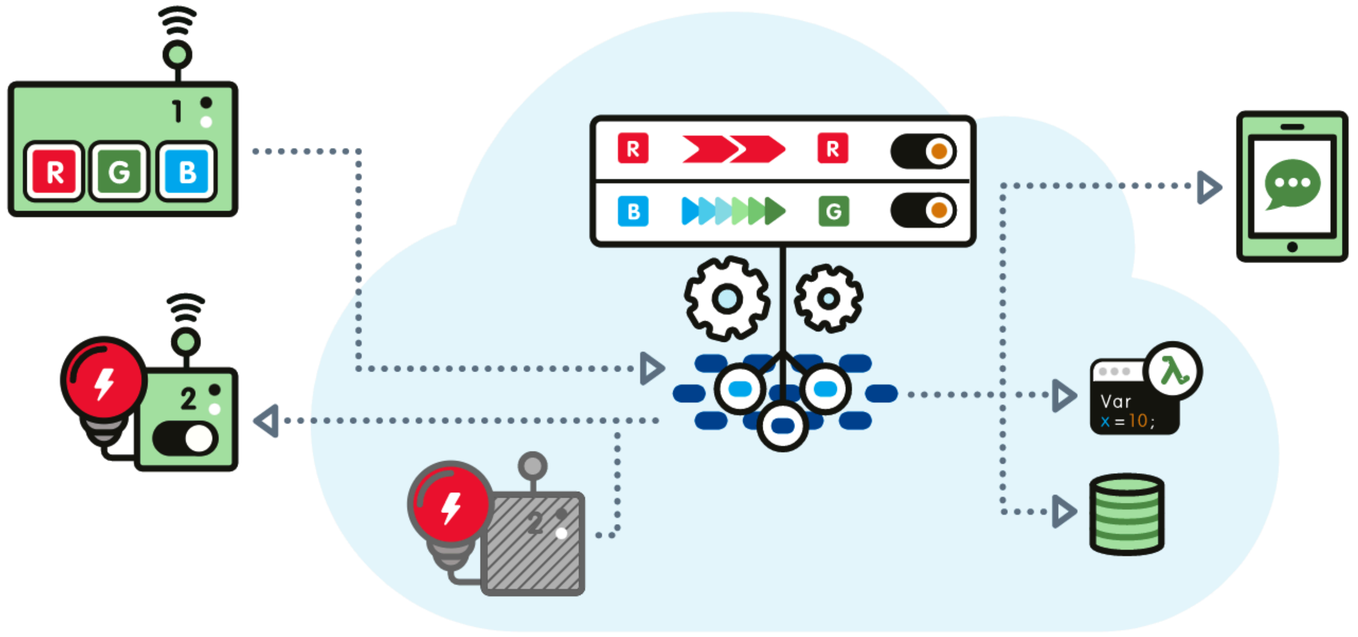

IoT Core

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2. Rules Engine
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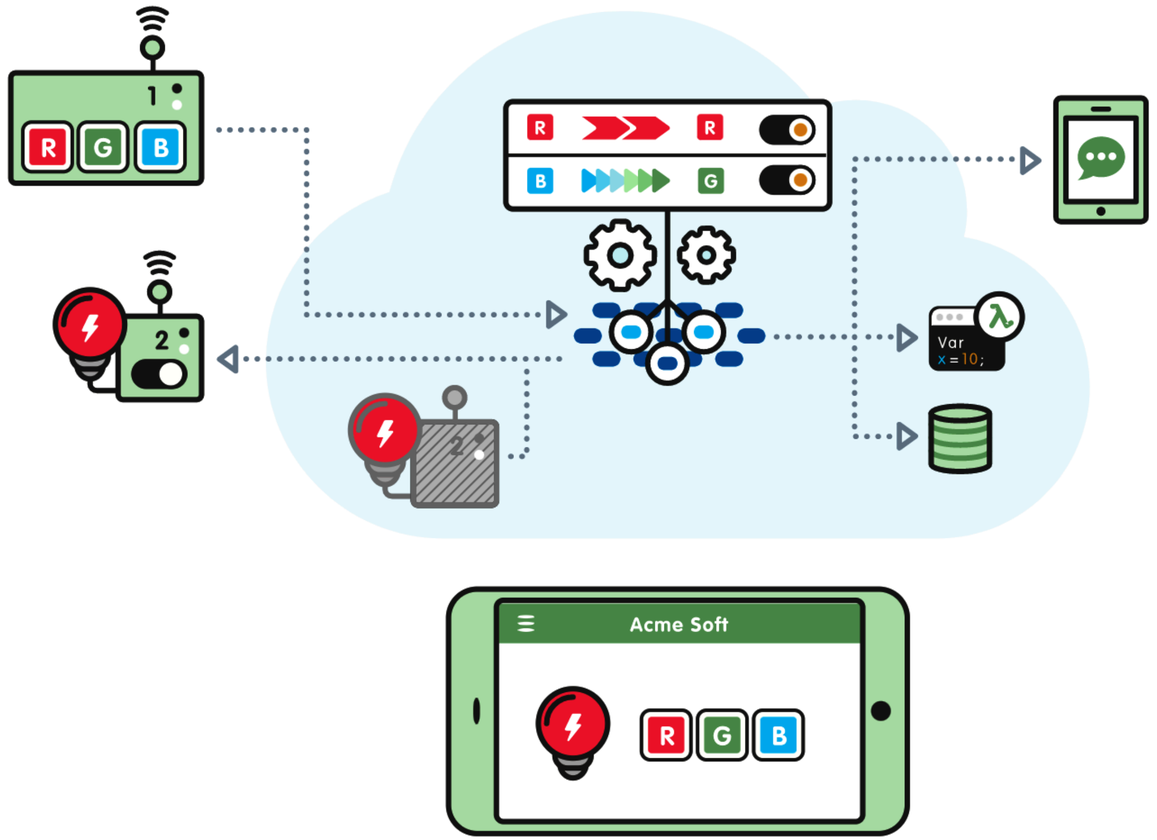
5. **Build solutions**
6. Done



AWS IoT Device Management

Device management to maintain fleet health

Batch fleet provisioning

Real-time fleet index & search

Fine grained device logging & monitoring

Over-the-air updates

AWS IoT Device Defender

Keep entire fleet of devices secure

Audit device configurations

Monitor device behavior

Identify anomalies

Generate alerts

Take corrective action

AWS IoT Analytics

Managed service to analyze IoT data

Run analytics on massive volumes of IoT data

Filter, transform, and enrich IoT data

Data stores

Easily analyze and visualize data

Sophisticated analytics and inference

AWS IoT 1-Click

One click creation of a trigger for an AWS Lambda function

Devices fully provisioned to connect to AWS IoT

Create actions using Lambda functions with 1-click

Extract reports in the 1-click mobile app

REAL-TIME FILE PROCESSING (An Example)

https://github.com/aws-samples/lambda-refarch-fileprocessing