

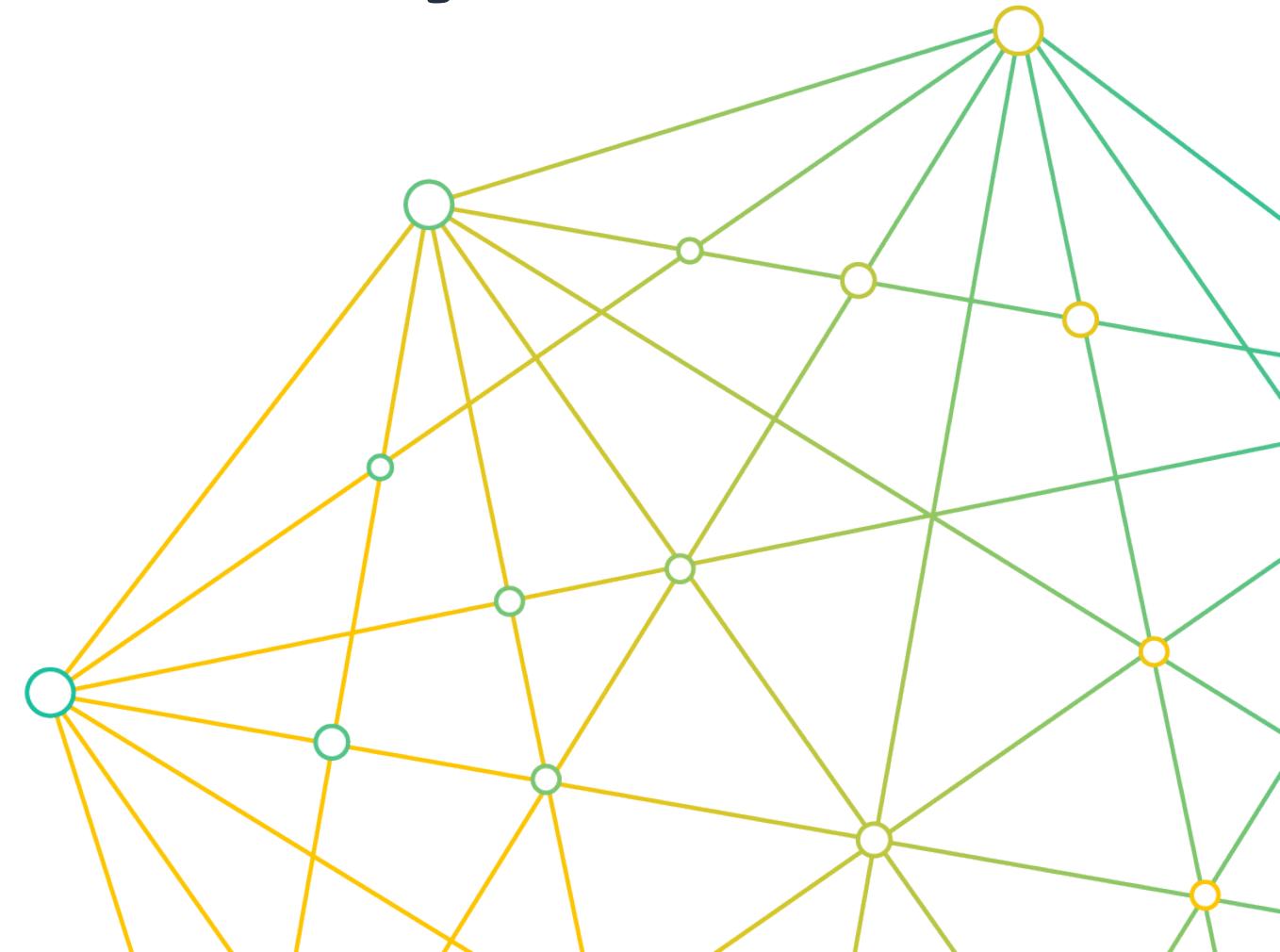
DevSecOps with IoT - Is it a myth ?

Neel Mitra

WW Specialist Solutions Architect, IoT

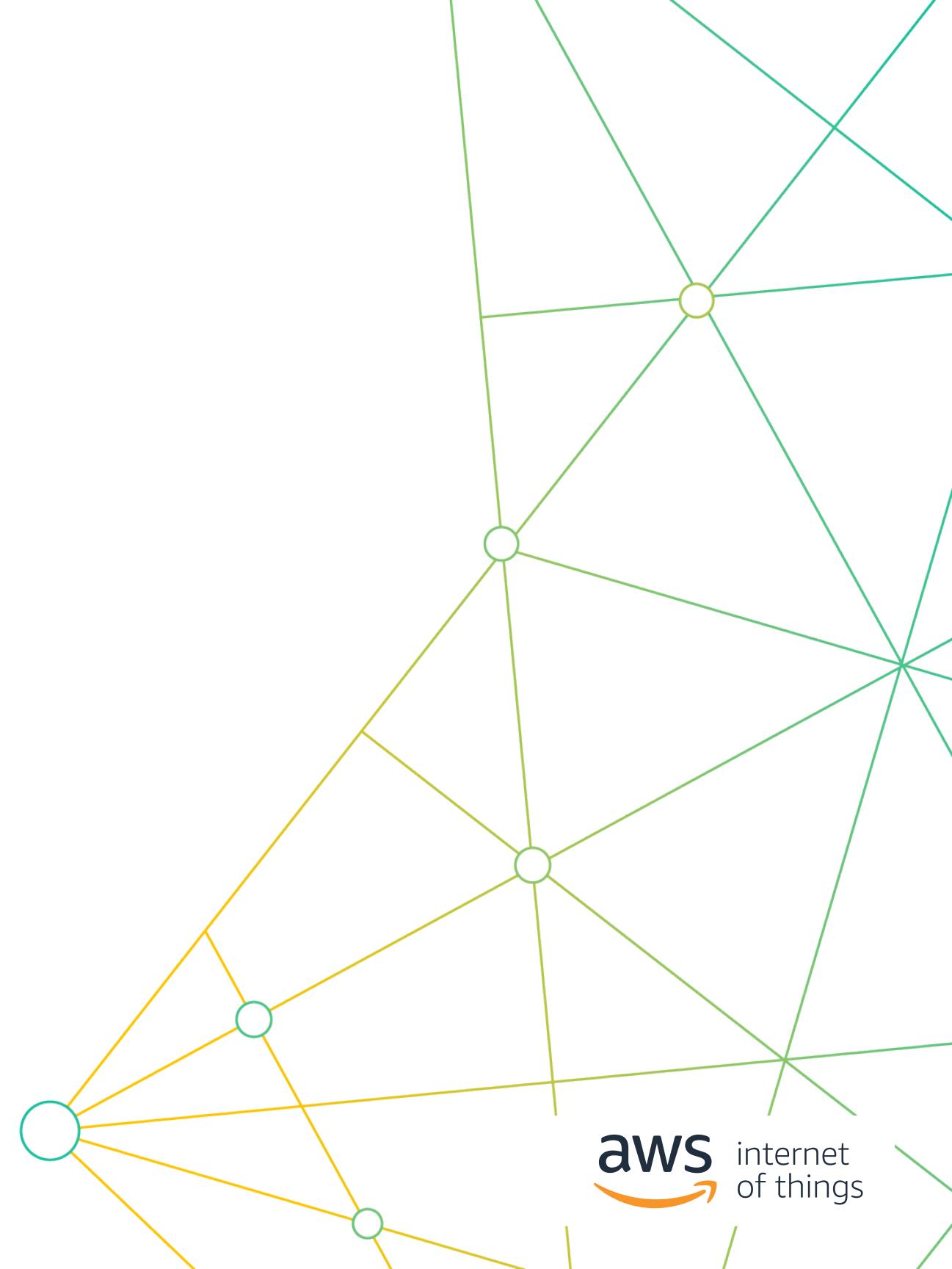
AWS

<https://www.linkedin.com/in/neelmitra/>



What you will learn

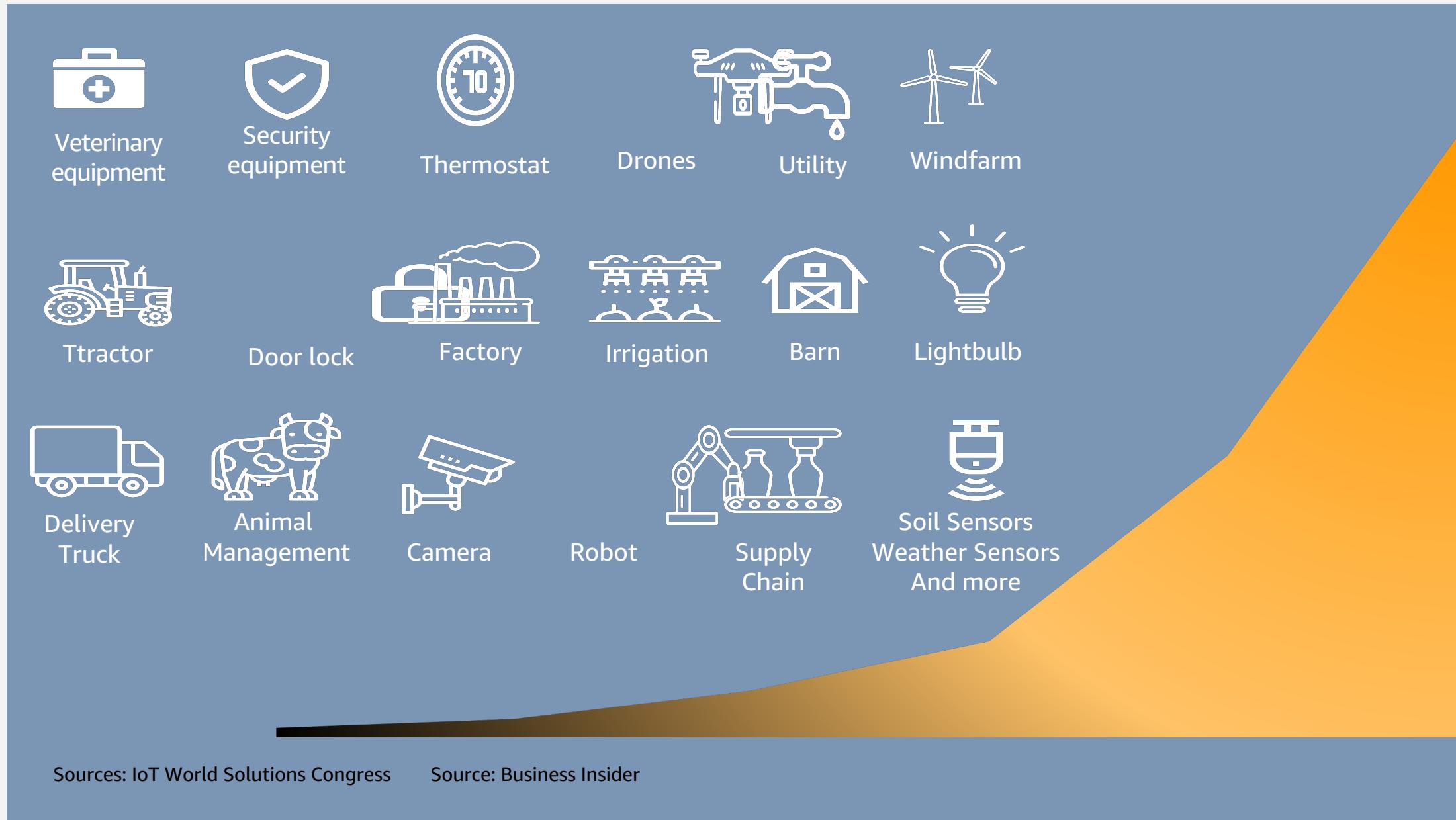
- Insecurity Of Things
- IoT Edge Computing Overview
 - Developing on the Edge
 - Securing the Edge
 - Operating the Edge
- Demo
- Getting Started with AWS IoT



Insecurity of Things



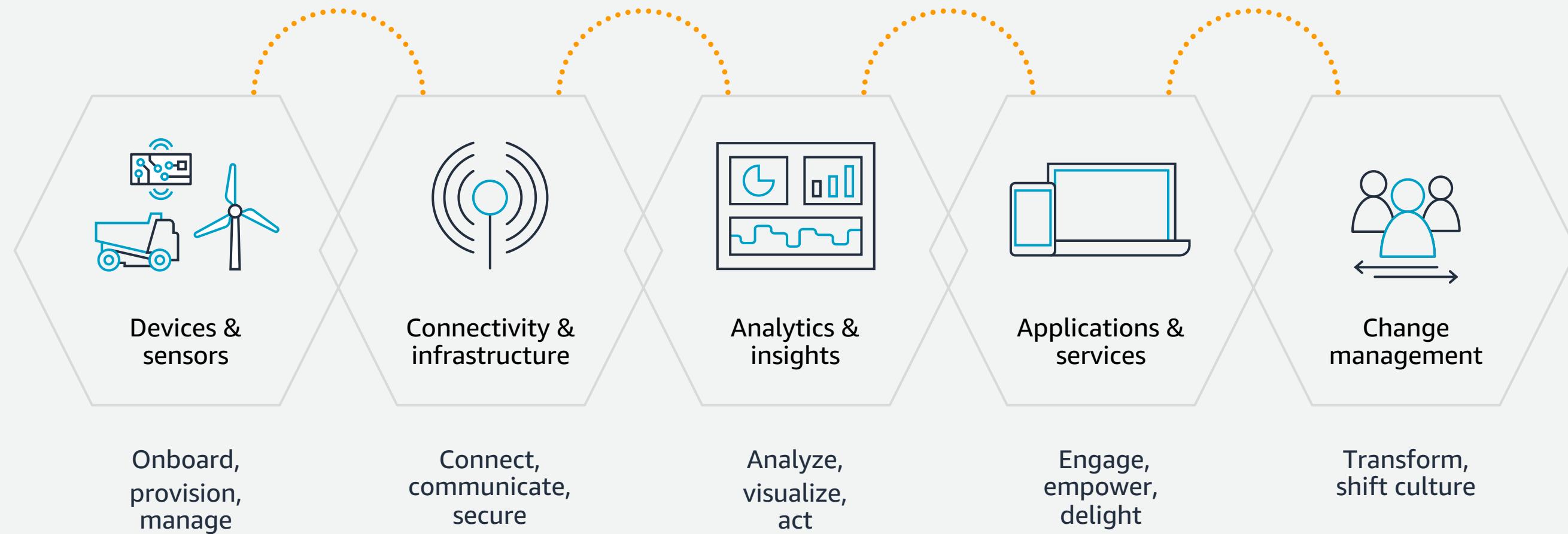
The source of data is increasing—coming from billions of edge devices



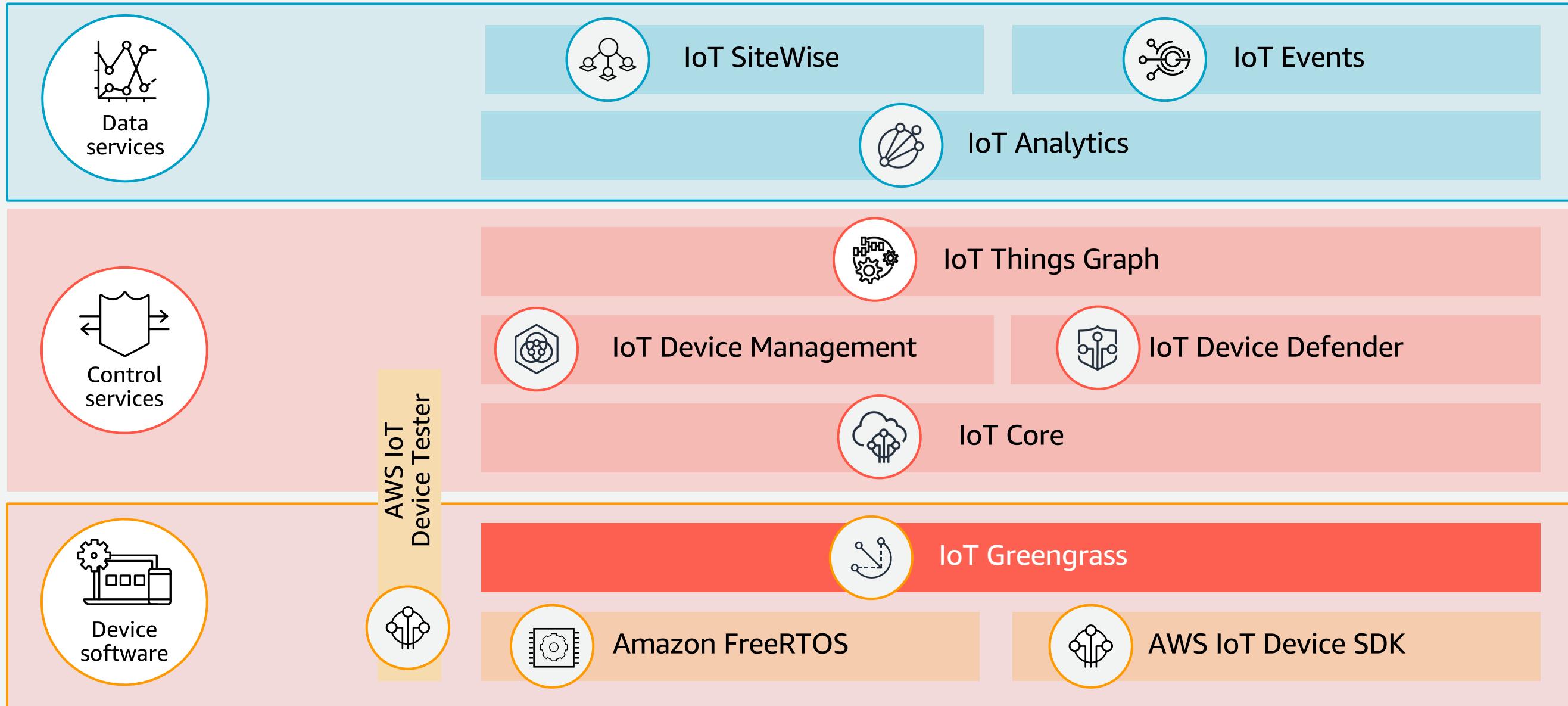
IoT abuse scenarios



IoT solutions are complex & multidimensional



AWS IoT Architecture



AWS IoT customers solve problems in all sectors

VIZIO

PENTAIR

PHILIPS

amazon alexa

iRobot

YANMAR



PROGLOVE

rachio

COMCAST

Fender®

VANTAGE POWER

hudl

iDevices

VESTEL



Valmet

British Gas

rotimatic

verizon

CAMP CHEF
THE WAY TO COOK OUTDOORS

KRONES

ecofit™

CTE
CentraTechSystems

CAF

key for business

SKF

Spireon
Guiding Business Intelligence

coway

solar now

Yonomi

enel

StanleyBlack&Decker

Georgia-Pacific

Haier

Symantec

rachio

ANALOG DEVICES

NASA

modjoul

DB

Trimble

BAYER

ThermoFisher
SCIENTIFIC

LG

Woodside

Cradlewise®

EMS
Driving Fuel IQ

SIEMENS

teralytic

ABInBev

electronic
caregiver

KEMPII

Panasonic

Amway

aws
internet
of things

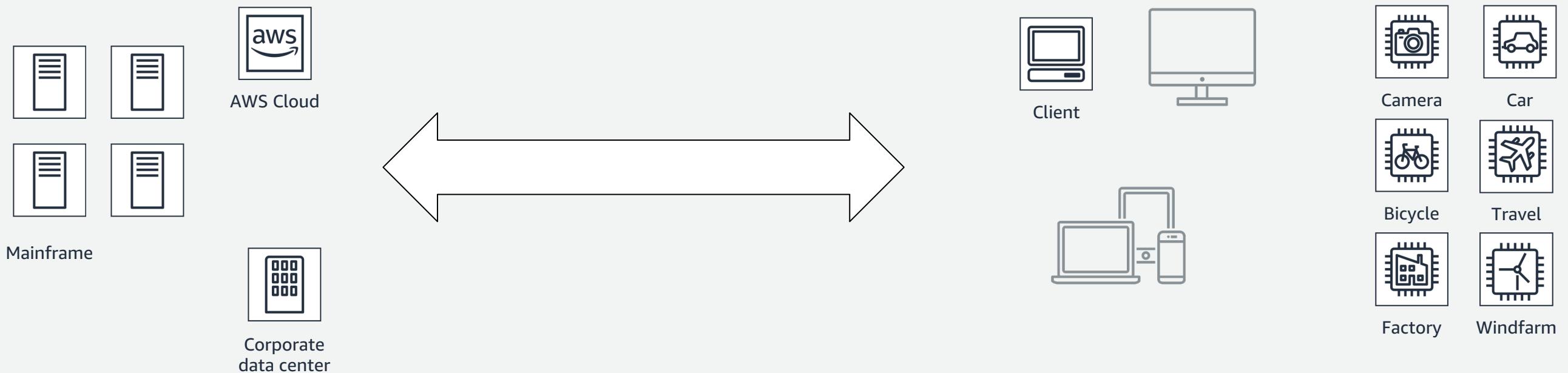
Edge Computing Overview



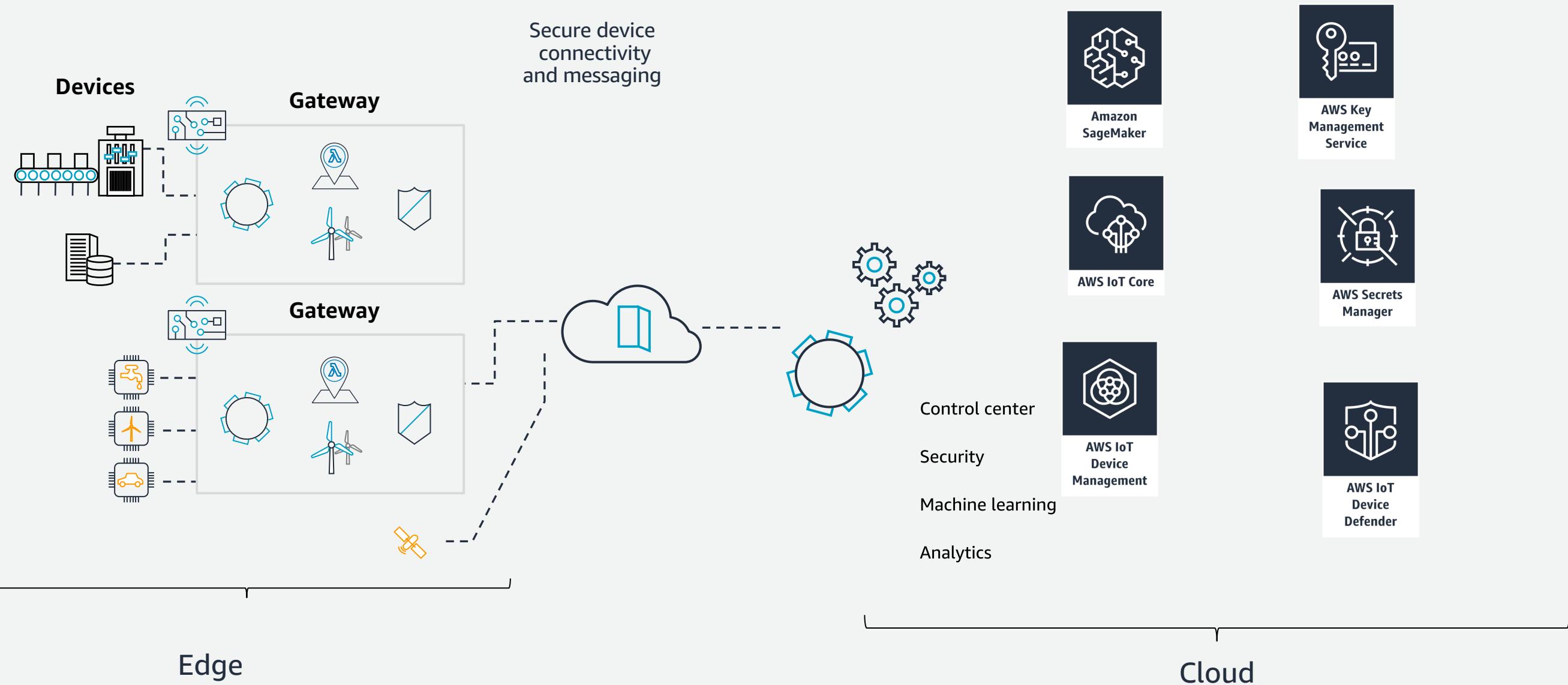
Edge: Is this new?

"A decentralized system is closer to people whom it serves, and responsive to needs ..." – P. Berman, Decentralized Again, Datamation, 1970

"Whether to centralize decisions, locations, and functions is long-standing debate driven by organizations" – J.L. King, Centralized versus Decentralized Computing, 1983



AWS Cloud to edge



Developing on the Edge

" Invention requires two things: the ability to try a lot of experiments, and not having to live with the collateral damage of failed experiments "



Andy Jassy
CEO, Amazon Web Services





AWS IoT Greengrass

Extend AWS Cloud to the edge



Local messages and triggers

Local message broker

Local actions

Lambda functions

Data and state sync

Local device shadows

Security

AWS-grade security

Local resource access

Lambdas interact with peripherals

Machine learning inference

Local execution of ML models

Connectors

Easy integrations with AWS services, protocol adaptors, and other SaaS providers

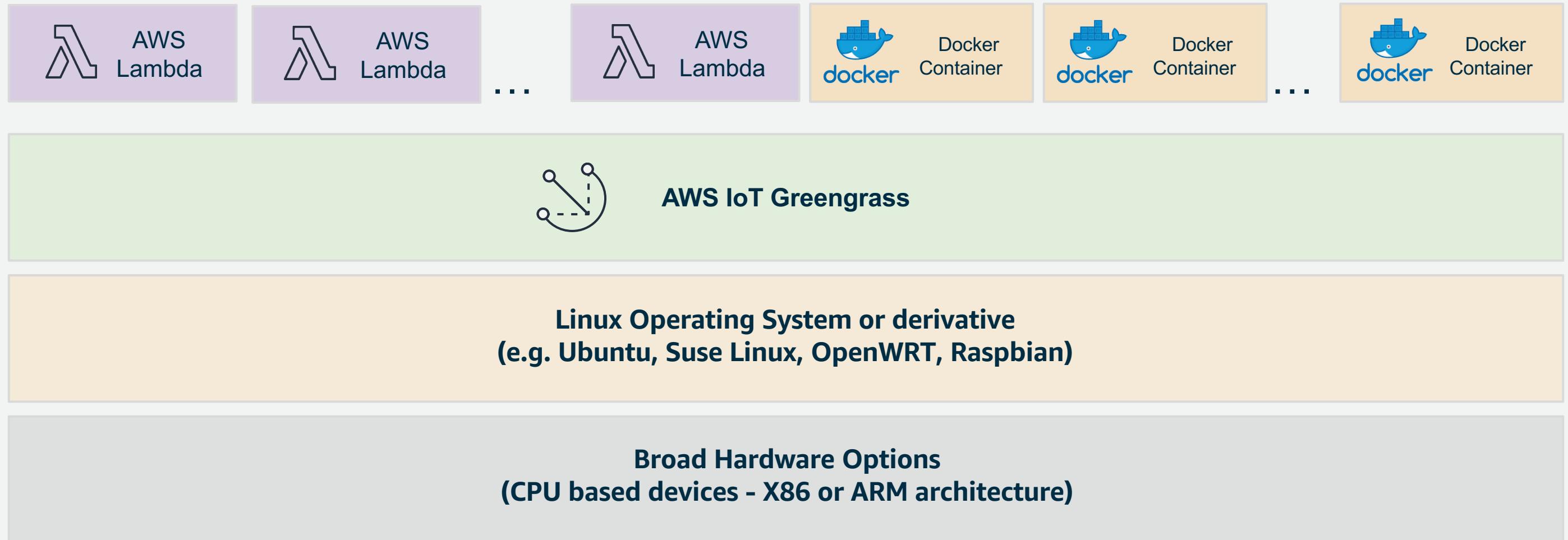
Over-the-air updates

Easily update AWS Greengrass core

Secure credential store

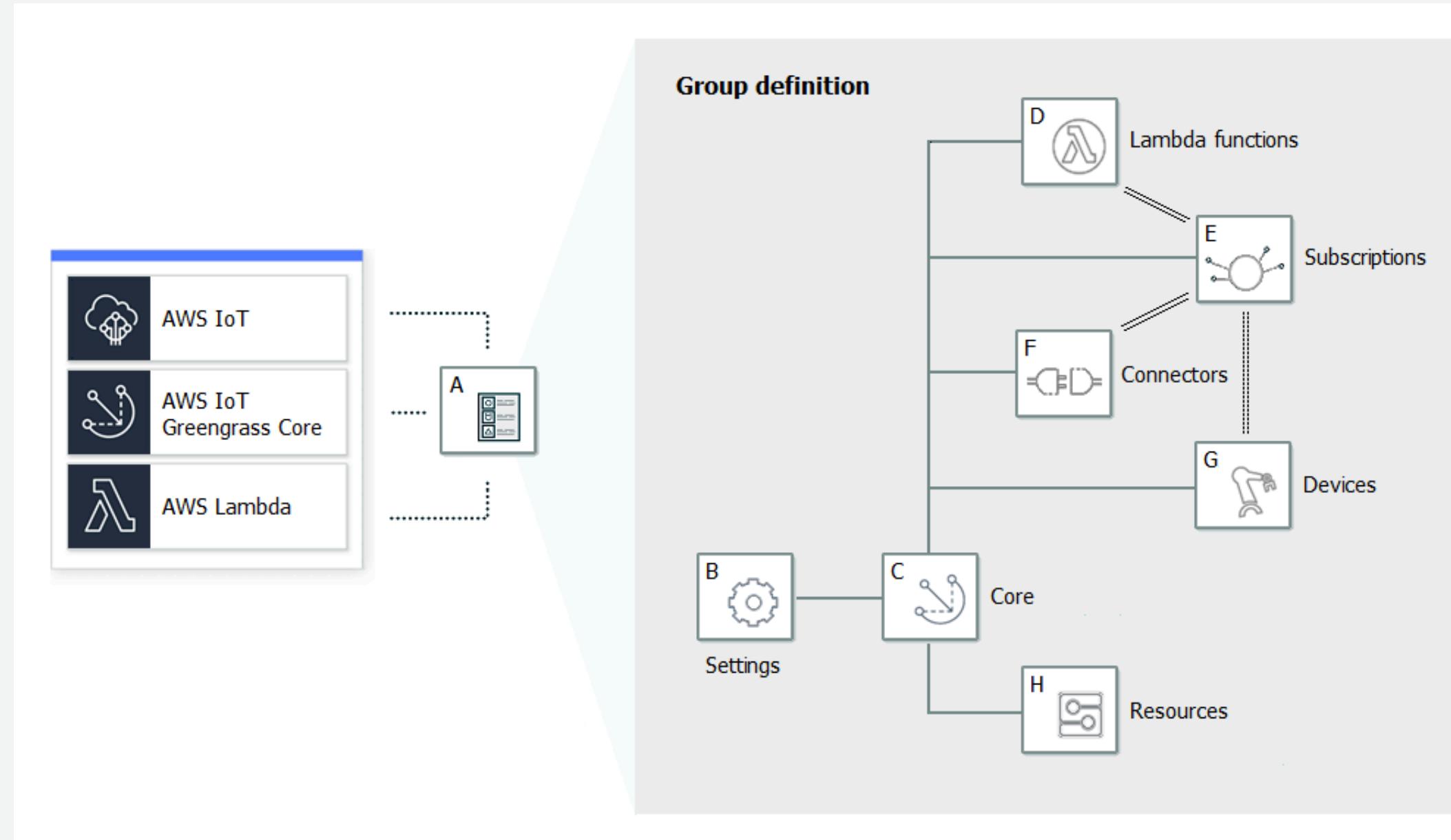
AWS Secrets Manager functionality at edge

AWS IoT Greengrass runs virtually anywhere

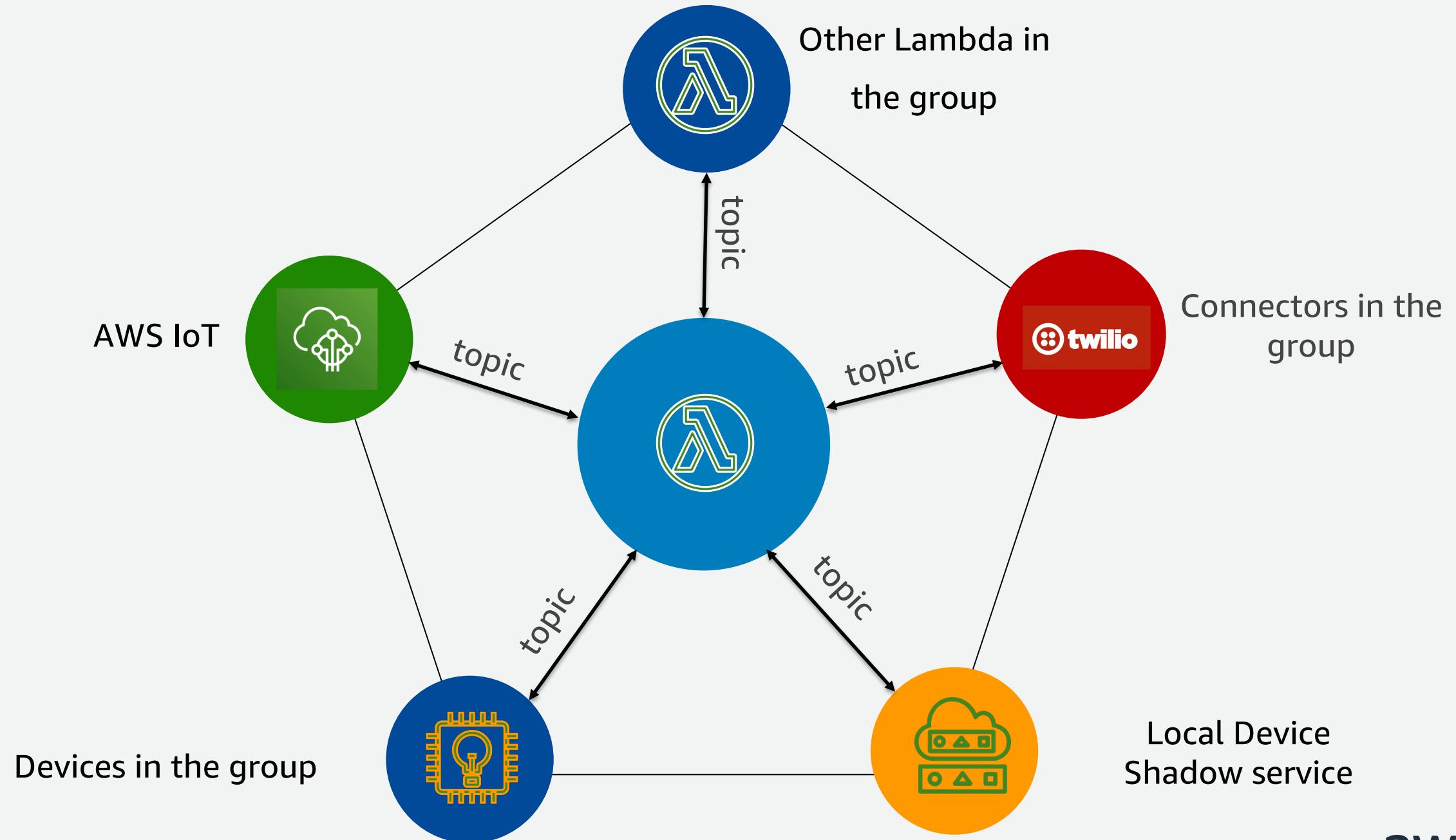


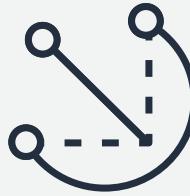
Device
software

AWS IoT Greengrass components



Configuring Lambda for AWS IoT Greengrass — publish-subscribe





Use AWS IoT Greengrass Containers to lift and shift legacy apps to the Edge



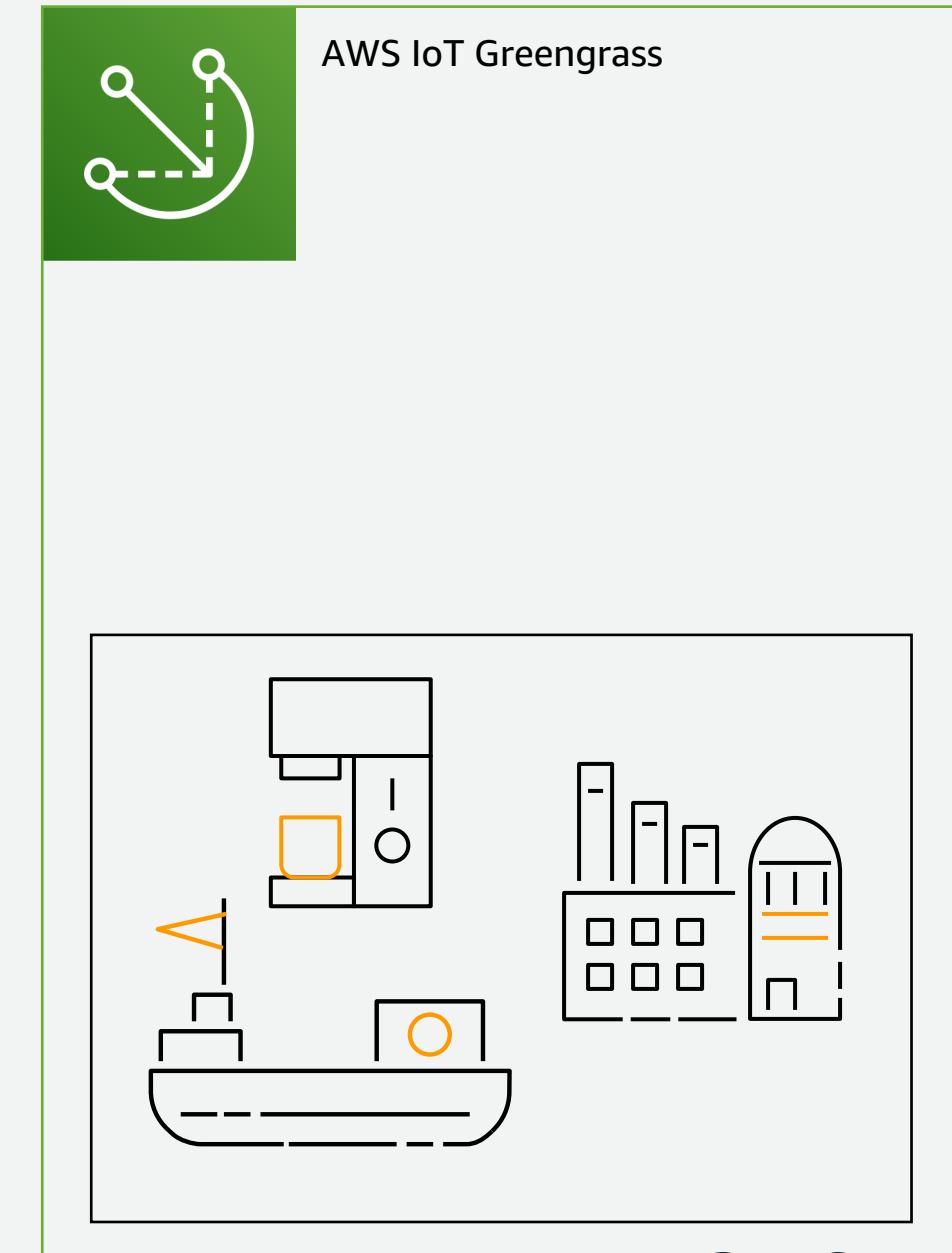
Container Image



Device software

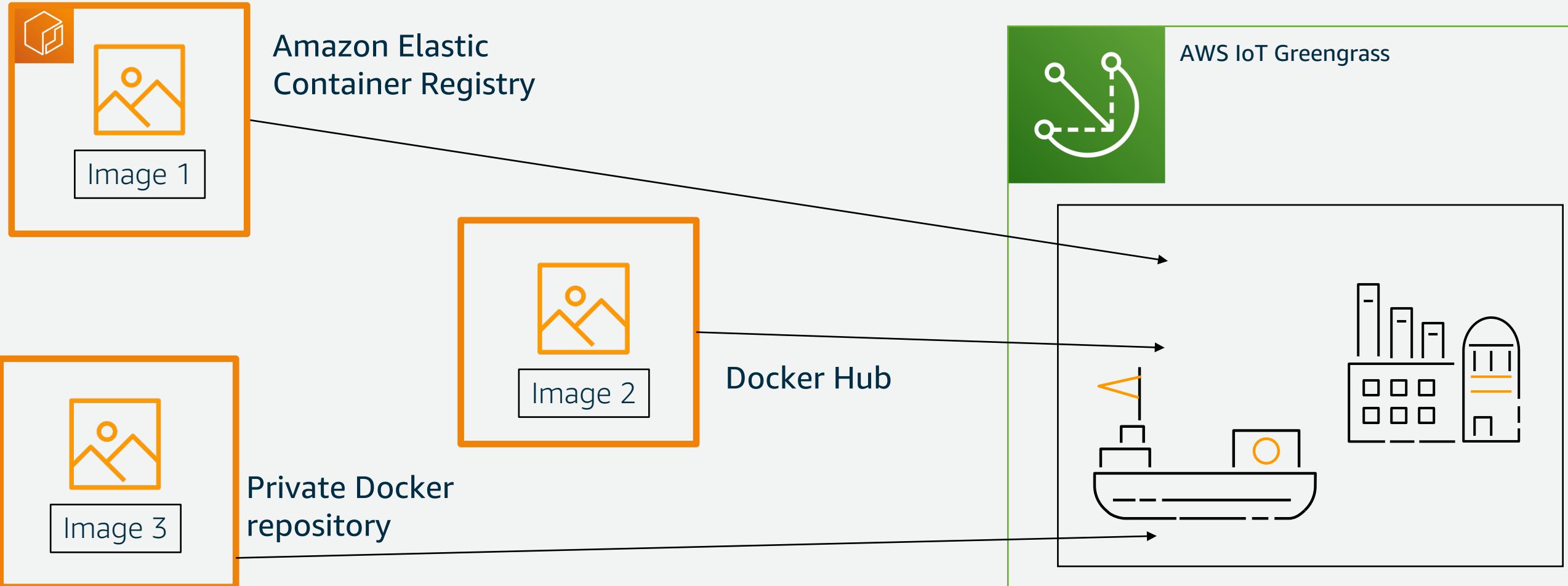


Existing Application





Pull images from multiple sources



Device
software

Growing the AWS IoT Edge Partner Community

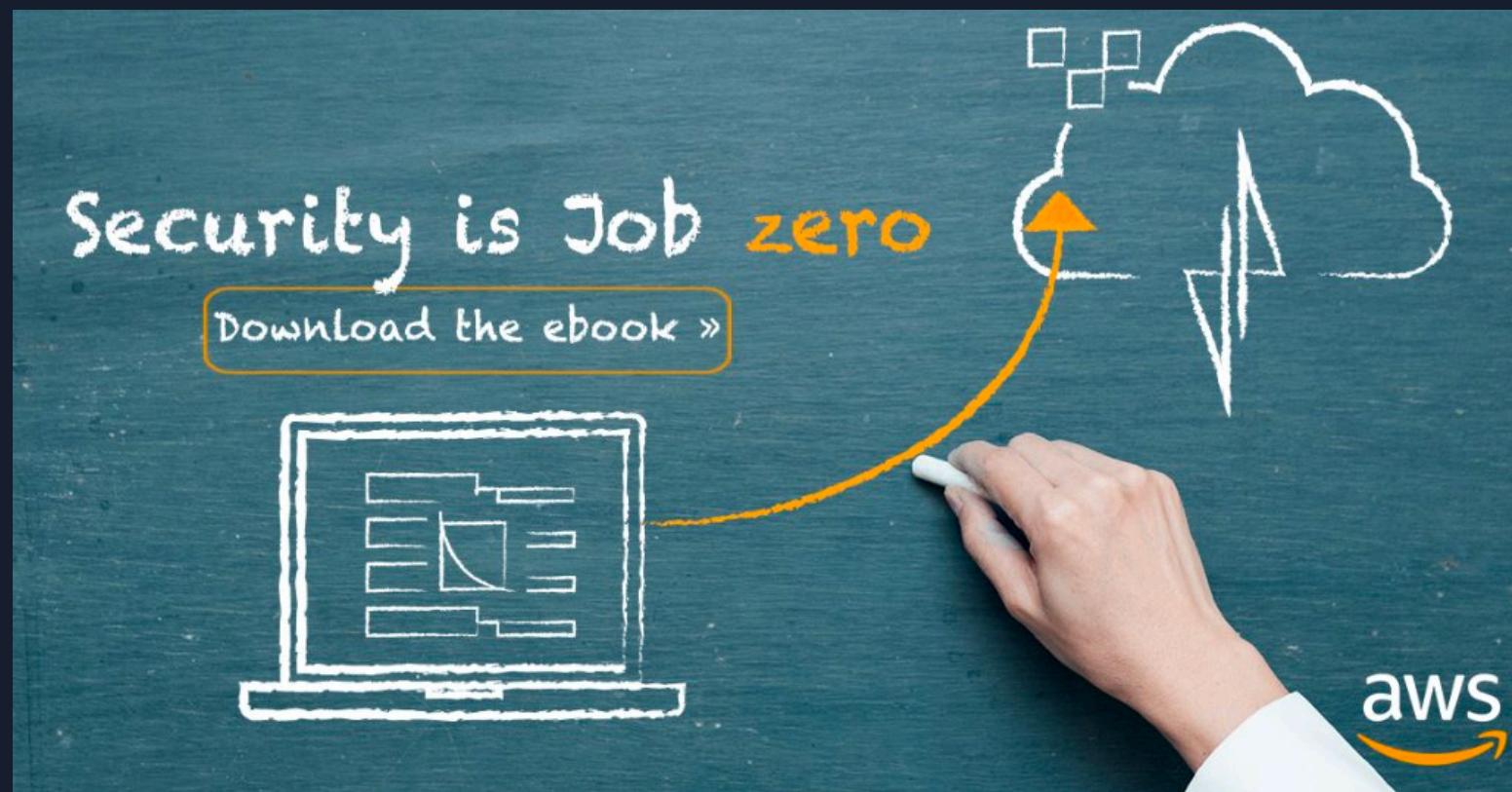


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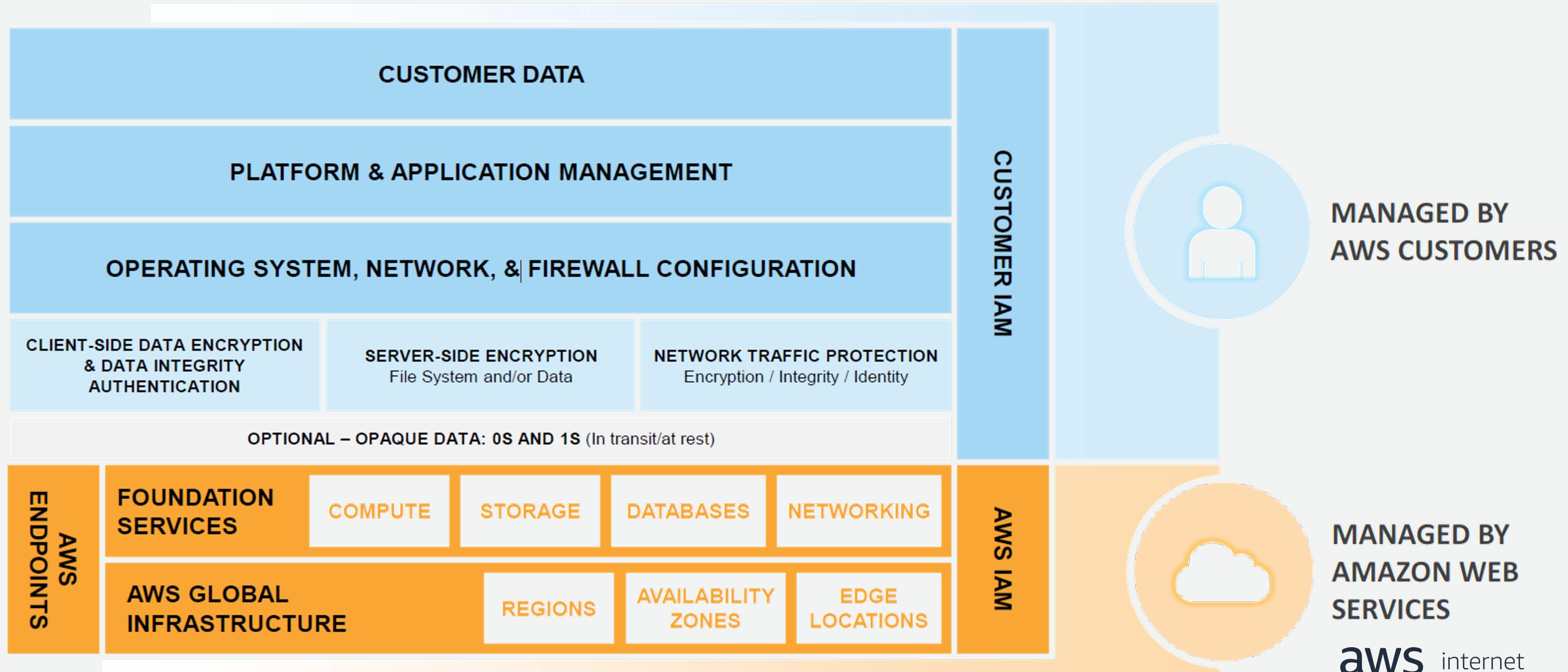


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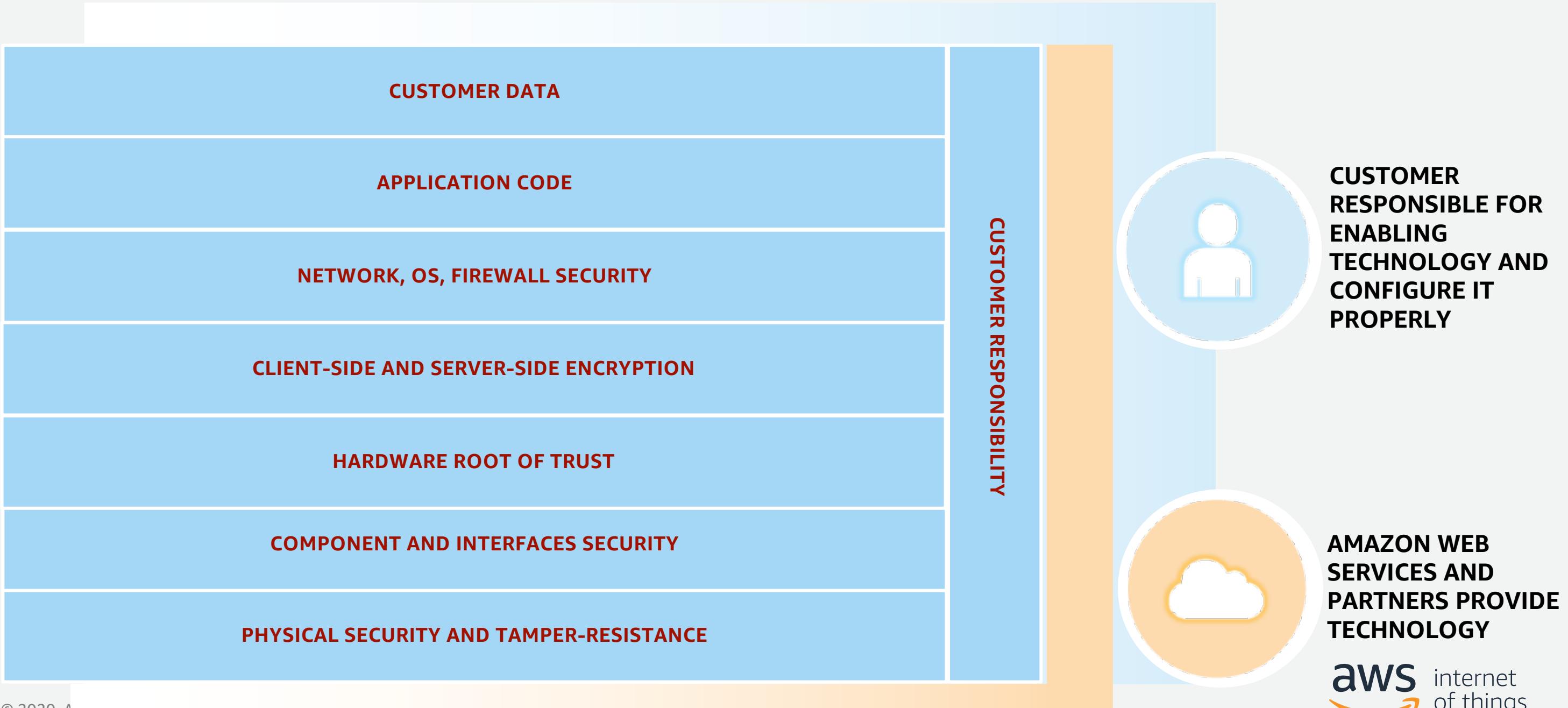
Securing the Edge



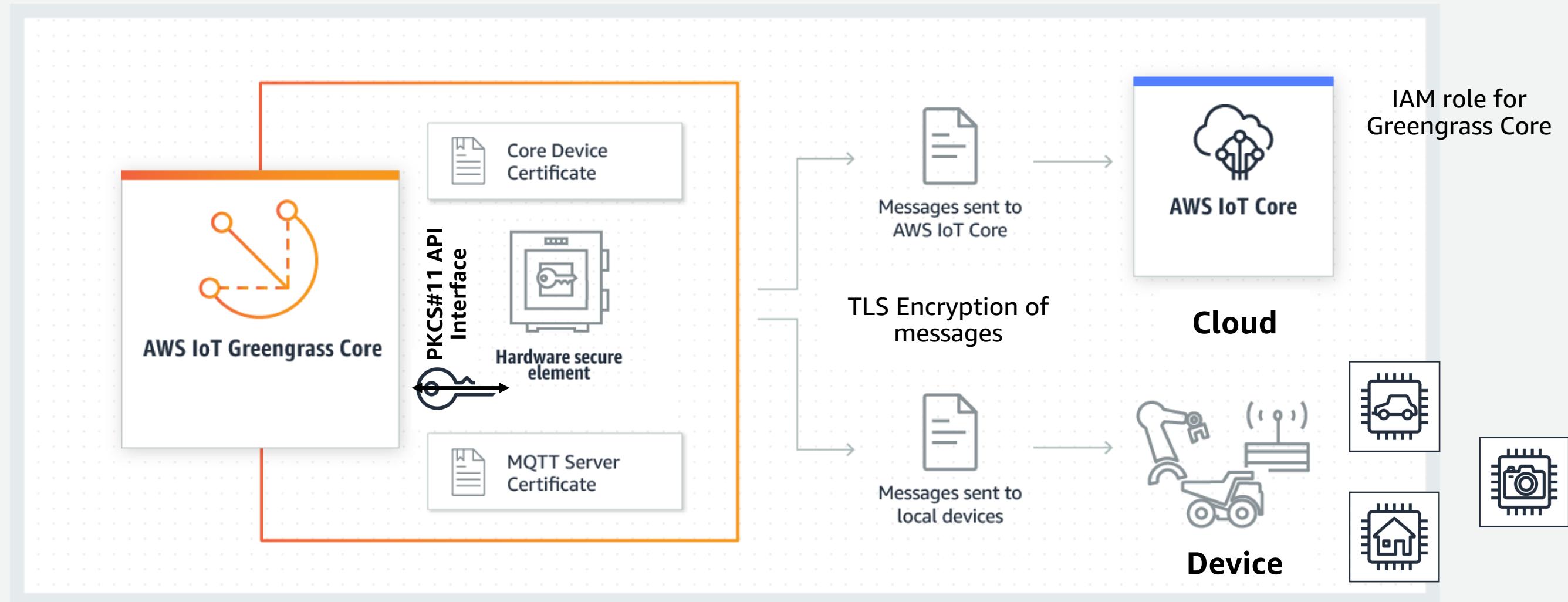
Shared Responsibility Model



Customer responsible for 100% of device security



AWS IoT Greengrass Hardware Security Integration



Authorize AWS IoT Greengrass service role

/greengrass/[servicerole](#)



Greengrass	Full access
IoT	Limited: Read, Write
Lambda	Limited: Read

Authorize AWS IoT Greengrass to access resources from AWS services on your behalf, such as retrieving AWS Lambda functions and managing AWS IoT shadows.

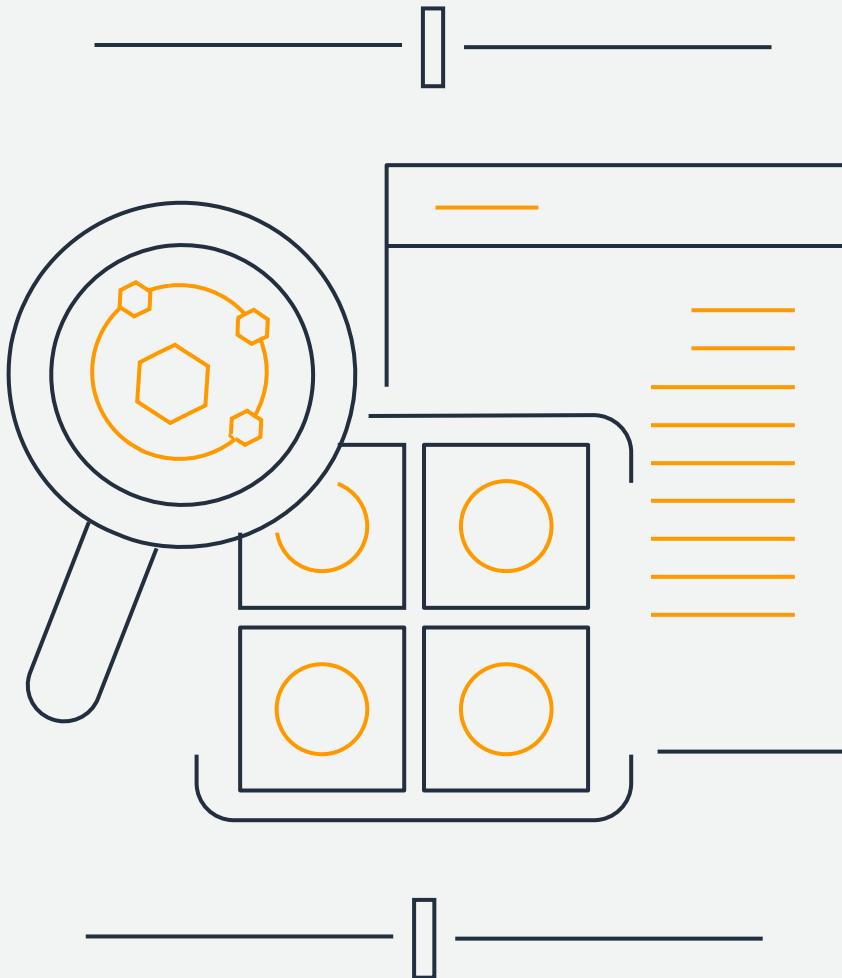
AWS IoT Greengrass Secrets Manager

Deploy secrets to edge devices

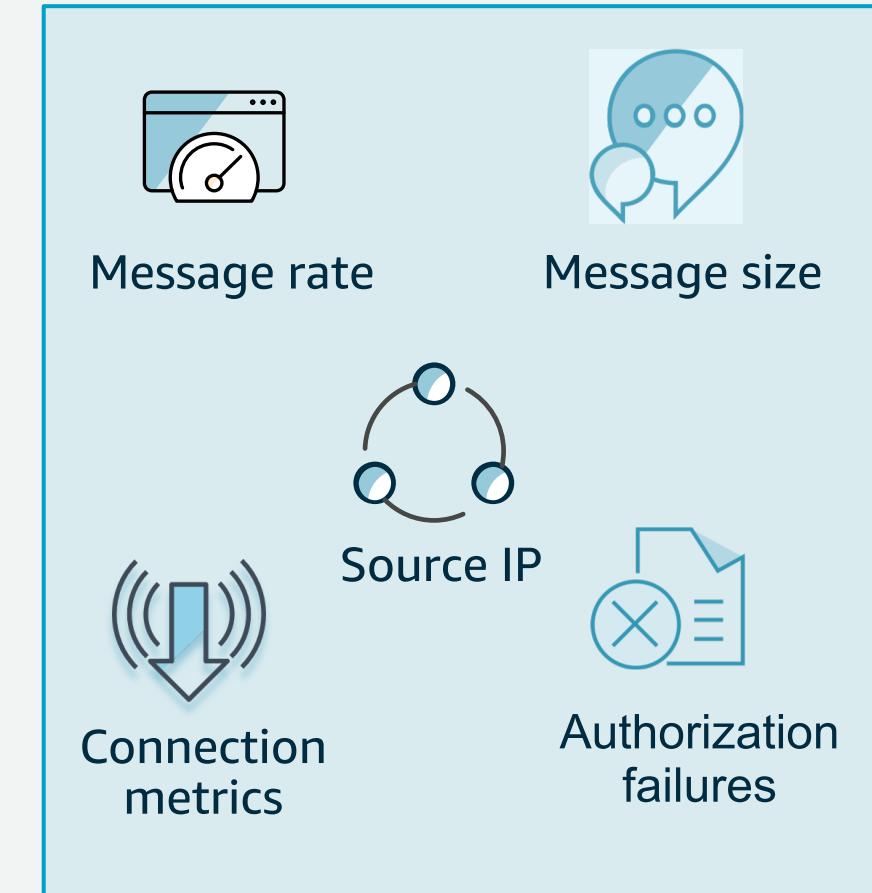
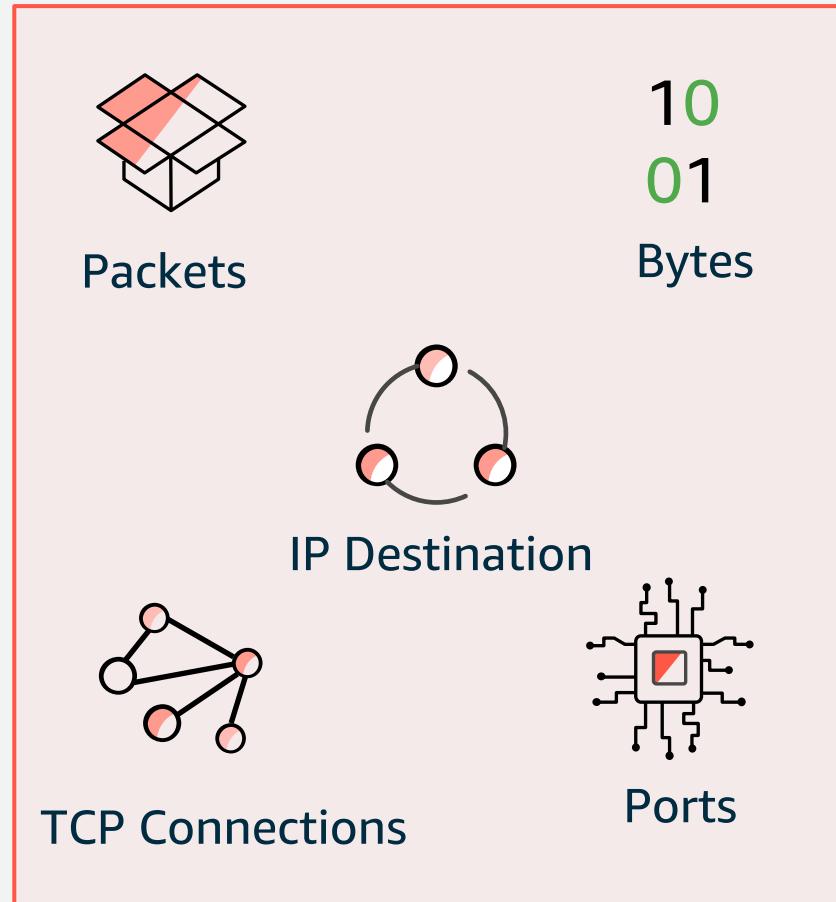
Store, access, rotate, and manage secrets—credentials, keys, endpoints, and configurations

Securely manage secrets in the cloud and deploy locally on edge devices

Manage secrets on devices through AWS Secrets Manager in the cloud



Secure with IoT Device Defender



Device-side metrics



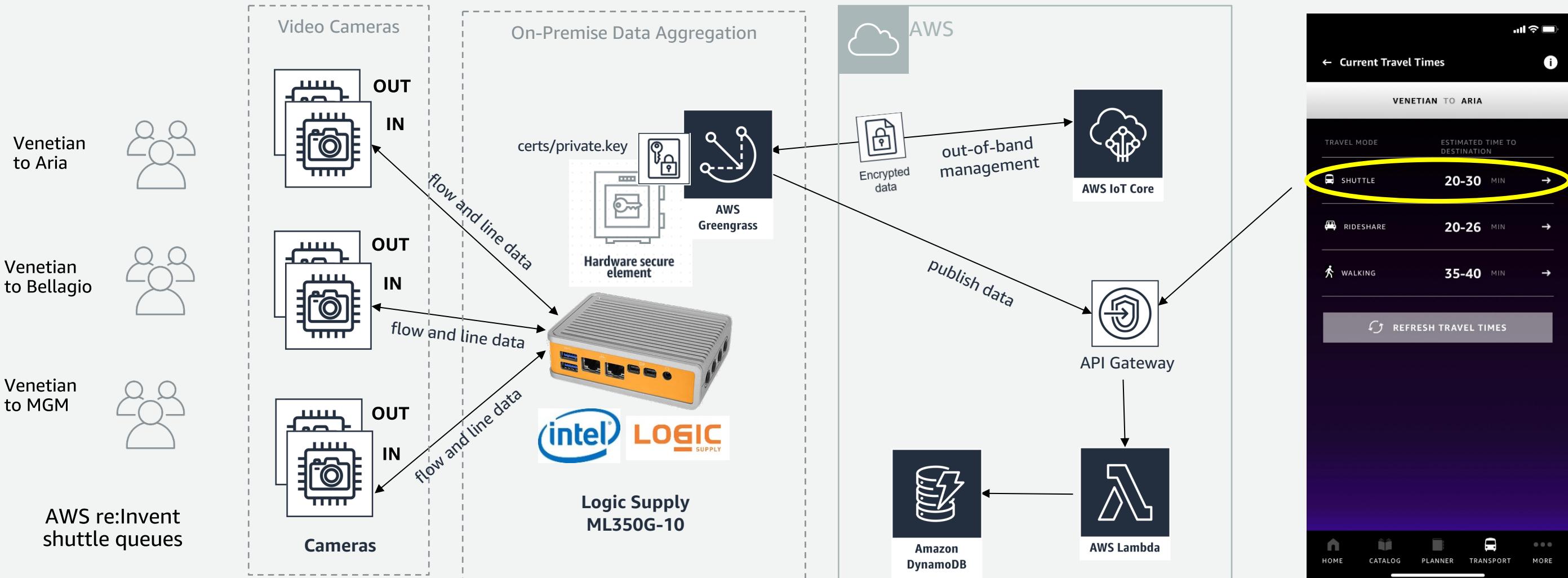
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Security
profile

Cloud-side metrics



AWS IoT Greengrass @ re:Invent



AWS re:Invent
2018 Official
Mobile App



Operating the Edge



Everything fails, all the time.

— Werner Vogels —

AZ QUOTES

STOQUSA



Monitor your fleet

Events

Registry

Lifecycle

Custom

Cloudwatch

Logs

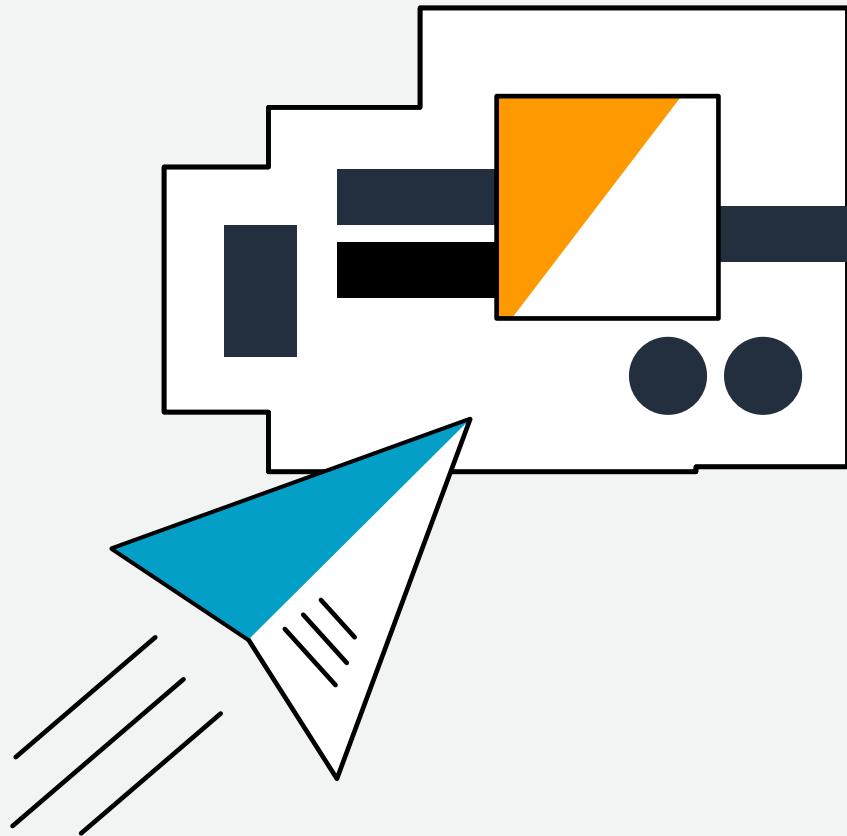
Metrics

CloudTrail

API Logs

Over the Air Updates to keep secure

- Remotely update an AWS IoT Greengrass core device with the latest Greengrass software, security updates, bug fixes, and new features
- Enable bulk updates of many AWS IoT Greengrass core devices at once



AWS IoT Greengrass Connectors

- **What are connectors?**

- Connectivity to AWS services, industrial protocols, local- and cloud-based applications
- Code-free configuration and installation
- 12 connectors currently available

- **Why use connectors?**

- Take away the complexity of calling AWS services or your own systems at edge. Leverage the existing IAM roles and features of GG connectors.
- Store API keys and passwords (for example, Splunk API Key) in local secrets, and leverage in the connectors.
- Less coding = more security!

More connectors to come in Future!



Amazon Kinesis
Data Firehose



Amazon Simple
Notification
Service



AWS IoT
Device Defender



Amazon
CloudWatch



Modbus RTU
Protocol
Adapter



Raspberry Pi
GPIO



IOT analytics



ML Inference



Serial Stream



Seeing is Believing

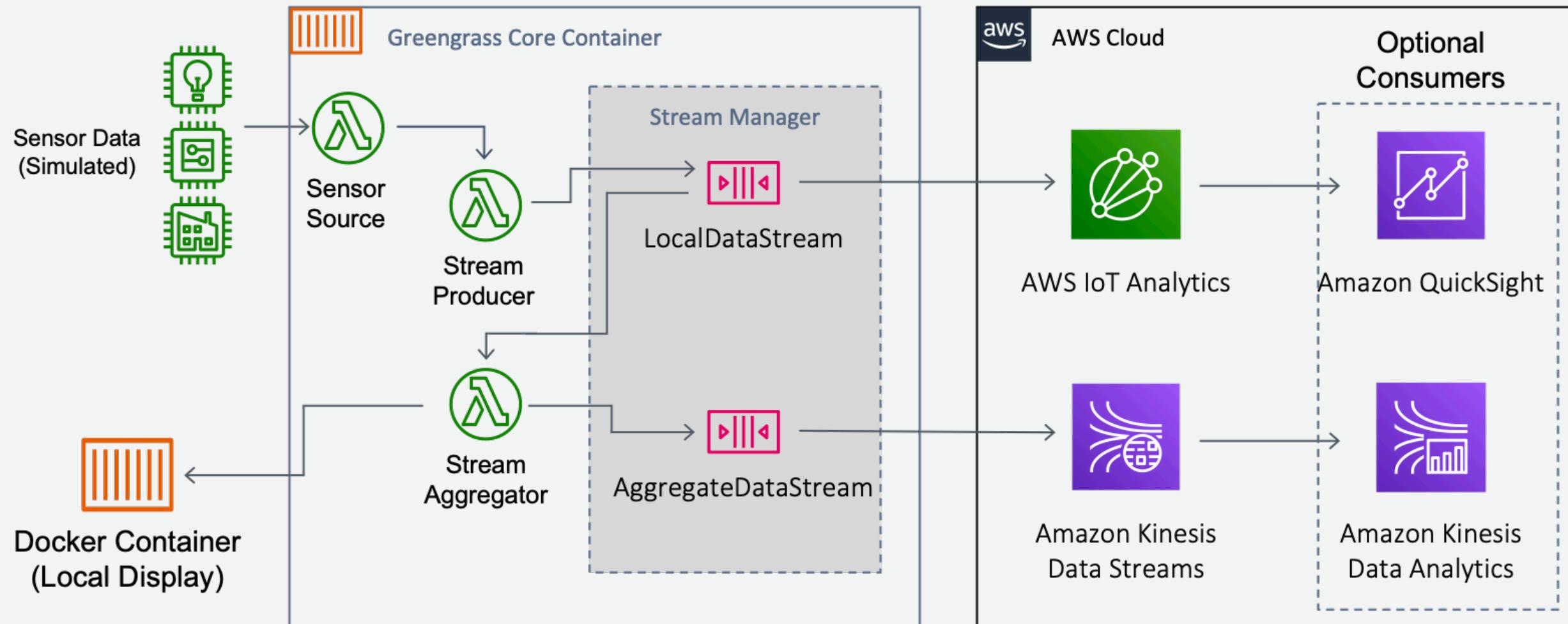
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aws internet
of things

Demo - Edge to Cloud Architecture

<https://github.com/awslabs/aws-iot-greengrass-accelerators>



DevSecOps for IoT – It's not a myth

How to Start with IoT ?

<https://aws.amazon.com/iot/>

Hands-on learning

AWS Partner Device Catalog
Discover qualified hardware that works with AWS services to help build and deliver successful IoT solutions.

Filter by:

- AWS Services
- FreeRTOS
- AWS IoT Core
- AWS IoT Greengrass**
- Amazon Kinesis
- Video Streams

Device Type

- Asset Tracker
- Camera
- Cellular Modem
- Development Kit
- Edge Server
- Gateway / Router
- Industrial PC (IPC)
- Programmable Automation Controller (PAC)
- Programmable Logic Controller (PLC)
- Reference Design
- RF Module
- SIM
- Sensor
- SIM / COM
- Starter Kit
- Other

Industry

- Application
- Region
- Hardware Architecture
- Silicon Vendor
- Operating System
- Connectivity
- Industrial Connectivity
- Programming Language
- I/O Interfaces

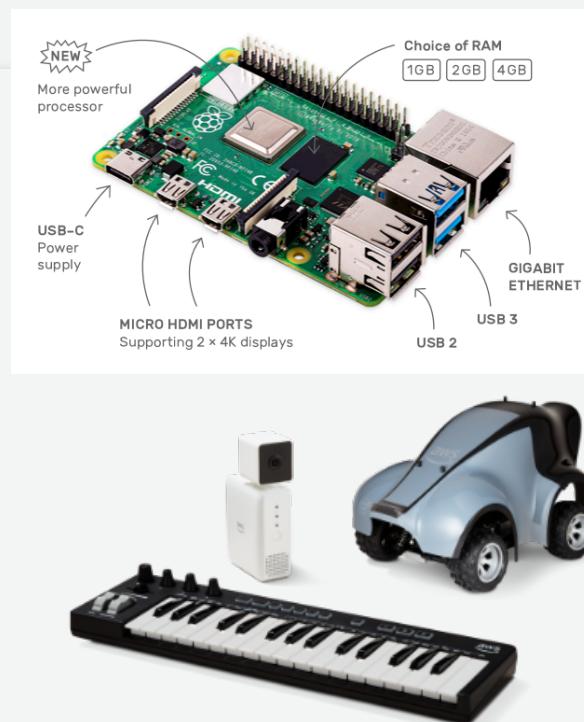
Clear all

Search for qualified devices

1-15 of 30 results

Category	Product	Status
XILINX	Xilinx Zynq UltraScale+ MPSoC ZCU104 Evaluation Kit	AWS IoT Greengrass Qualified
NVIDIA	Nvidia Jetson TX2 Developer Kit	AWS IoT Greengrass Qualified
MICROCHIP TECHNOLOGY	ATSAMASD27-SOM1-EK1 Prototyping and Evaluation Kit	AWS IoT Greengrass Qualified
NVIDIA	Nvidia Jetson™ Nano Developer Kit	AWS IoT Greengrass Qualified
XILINX	Ultra96 Development Kit by Avnet	Bringing the Power of Modern AI to Millions of Devices
MICROCHIP TECHNOLOGY	ATECC608a CryptoAuthentication	The ATECC608a secure element from Microchip is a JILL "High" rated secure key storage device qualified for AWS...

Shop now



AWS IoT
Greengrass

AWS IoT
Core

AWS IoT
Analytics

FreeRTOS

Training

aws training and certification Learning Library Certification Support Partner Training

Build your future in the AWS Cloud.

The only set of training programs and offerings built by the experts at AWS.

CREATE ACCOUNT

aws training and certification Learning Library Certification Support Partner Training

VIDEO Introduction to AWS IoT

FUNDAMENTAL 10 MINUTES ENGLISH

ABOUT This course is an introduction to AWS IoT, or Internet of Things. In this course, you will learn how the AWS IoT communication architecture works, and the components that make up AWS IoT. We will discuss how AWS IoT works with other AWS services. A case study of AWS IoT will also be provided.

Related Training

- AWS IoT Foundation Series

FREE COURSE SIGN IN >

LANGUAGES AVAILABLE

This training is also available in other languages. Click the links below to register for this training in your preferred language.

- Simplified Chinese
- Japanese
- Korean
- Traditional Chinese

search for training

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Thank You

