



AMZ-201: Sidewalk & AWS IoT



Jake G. Wood
Business Development
Engineer



Arun Viswanathan
IoT Solutions Architect



Presenters

Arun Viswanathan

IoT Solutions Architect
Amazon





Introducing Amazon Sidewalk

Get connected convenience far
beyond your front door

Introducing Sidewalk

Sidewalk helps your devices work better at home and around the community

- Secure and private connection, developer owns application
- Long-range and availability
- Lower hardware development and product costs



Amazon Confidential

How Sidewalk Helps Customers



The Innovation Behind Sidewalk

- Neighbors “share the sugar,” contributing to a small pool of bandwidth
- Leverages existing multi-radio products with long-range 900MHz (LoRa, FSK), and shorter range BLE.
- Maximum bandwidth used is 80kb/s or 500MB/mo/user

Sidewalk is built for customer control, privacy, and security

Amazon Confidential



works with

 SILICON LABS

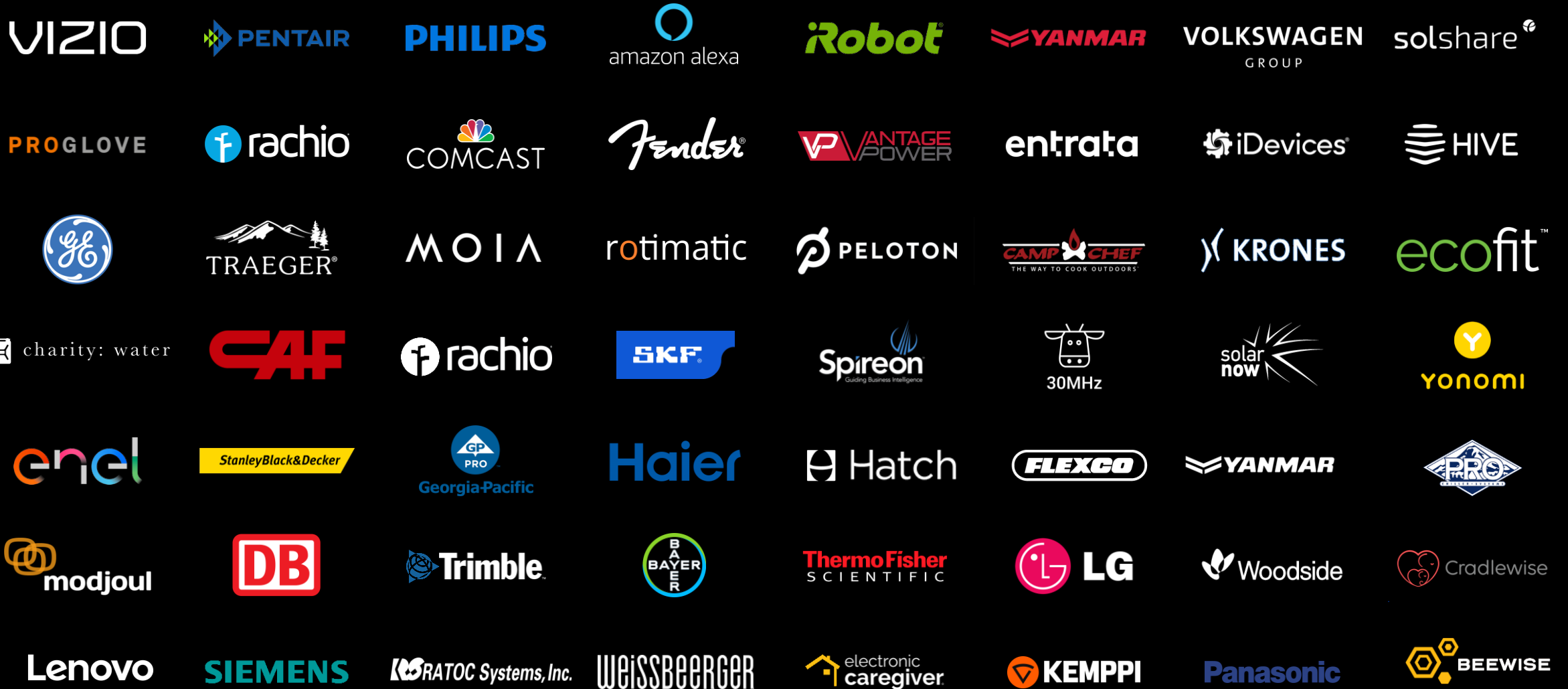
Community and Home Applications



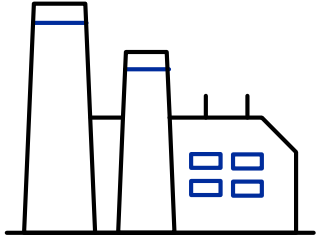
Amazon Confidential

If you knew the state of every thing and
could reason on top of that data...
what problems would you solve?

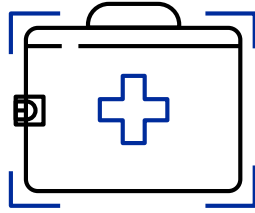
AWS IoT customers solve problems in all sectors



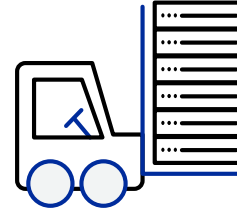
What customers are doing with AWS IoT



Improve the performance and productivity of industrial processes



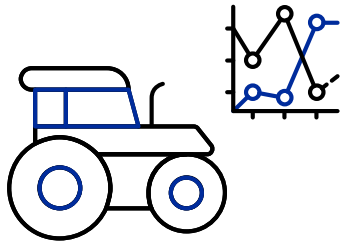
Remotely monitor patient health & wellness applications



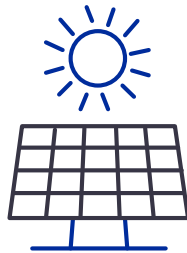
Track inventory levels and manage warehouse operations



Build smarter products & user experiences in homes, buildings, and cities



Grow healthier crops with greater efficiencies



Manage energy resources more efficiently



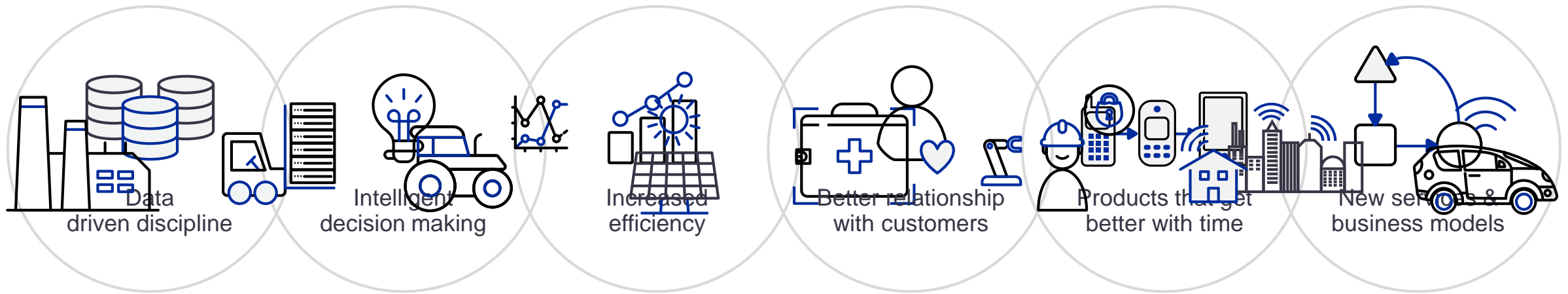
Transform transportation with connected and autonomous vehicles



Enhance safety in the home, the office, and the factory floor

Nobody just buys IoT technology...
they seek business outcomes

What customers are doing with AWS IoT



Operational efficiency
IoT data decreases OpEx

Revenue growth
IoT data drives business growth

What are the fundamentals of **AWS** IoT?

AWS IoT architecture



How can I make sense of my IoT data and take appropriate actions?

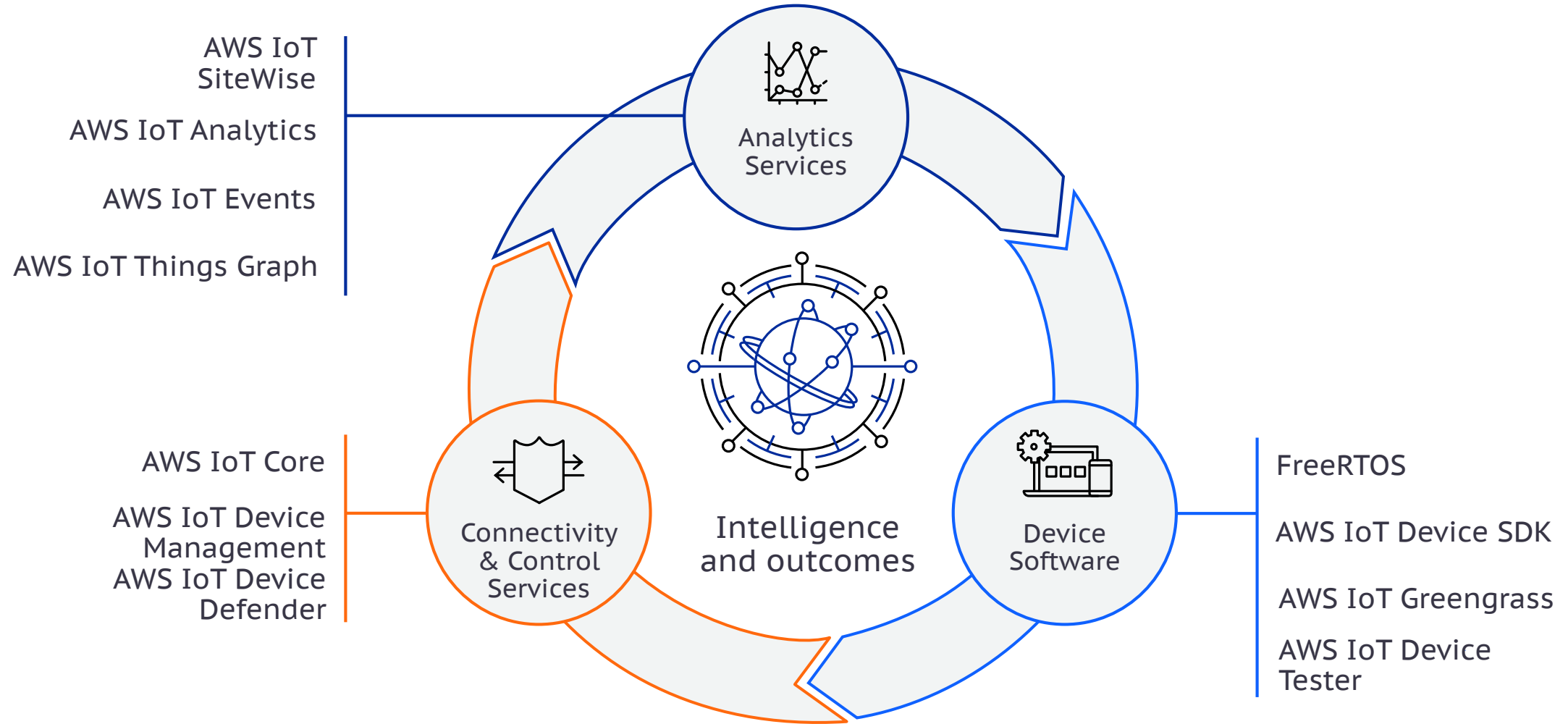


How can I control, manage, and secure my devices at scale?

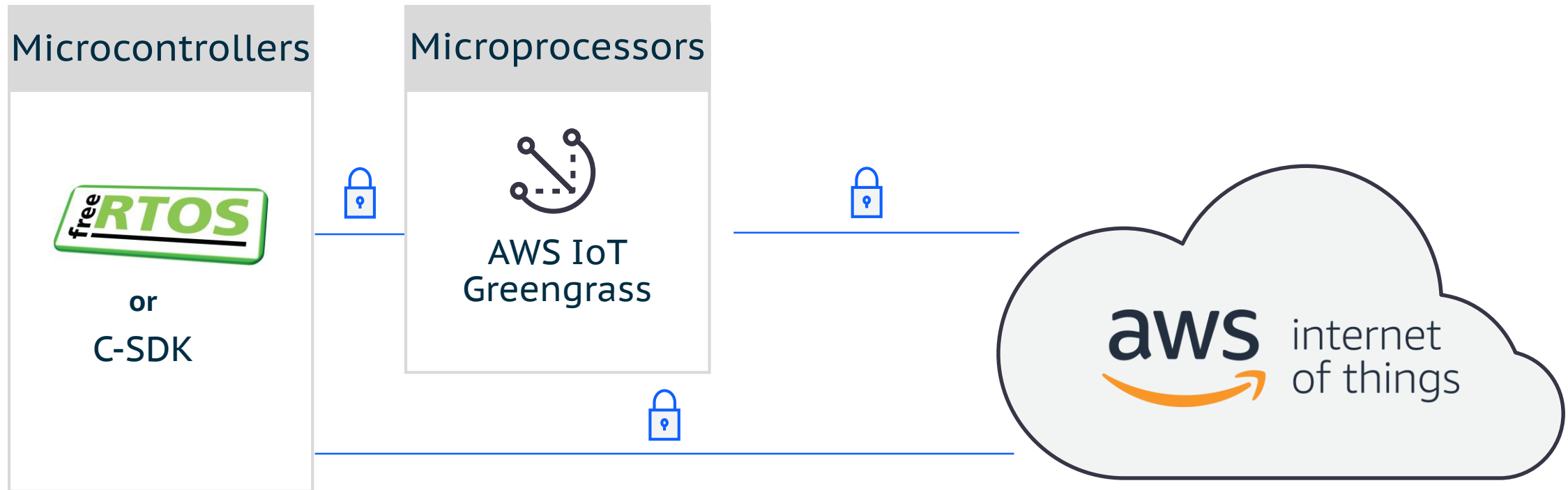


How can I build devices that operate at the edge?

IoT virtuous cycle

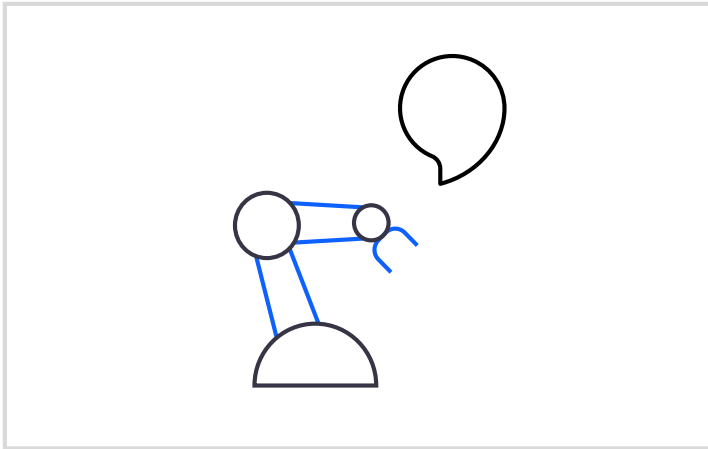


Easily build devices that works with AWS IoT

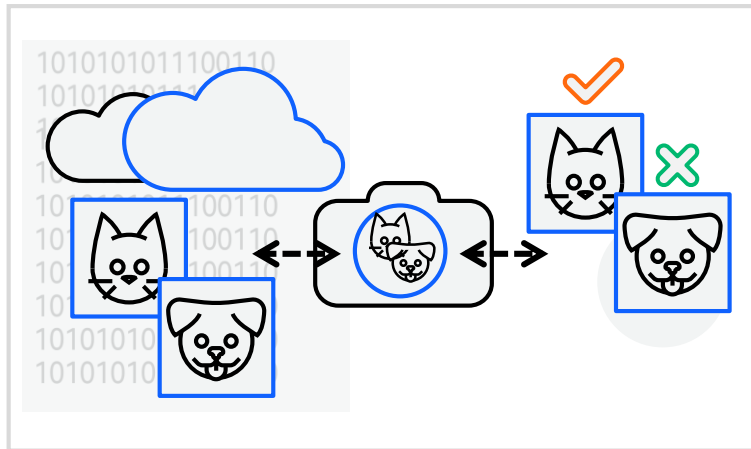


Device
software

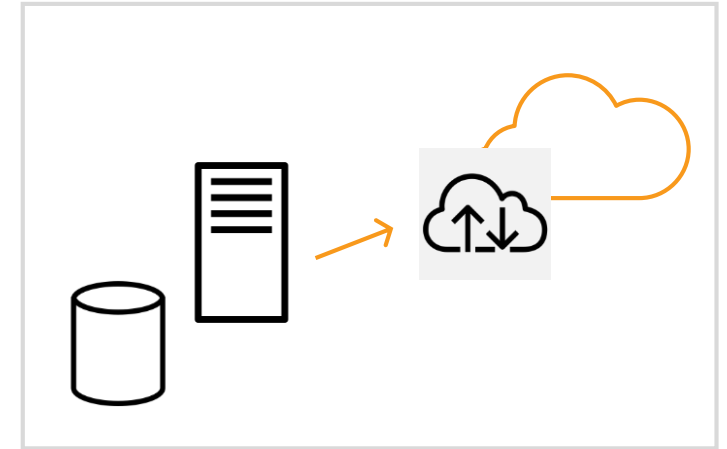
AWS IoT Greengrass solves common use cases to help you securely build, deploy, and manage your device software



Remote Fleet
Management

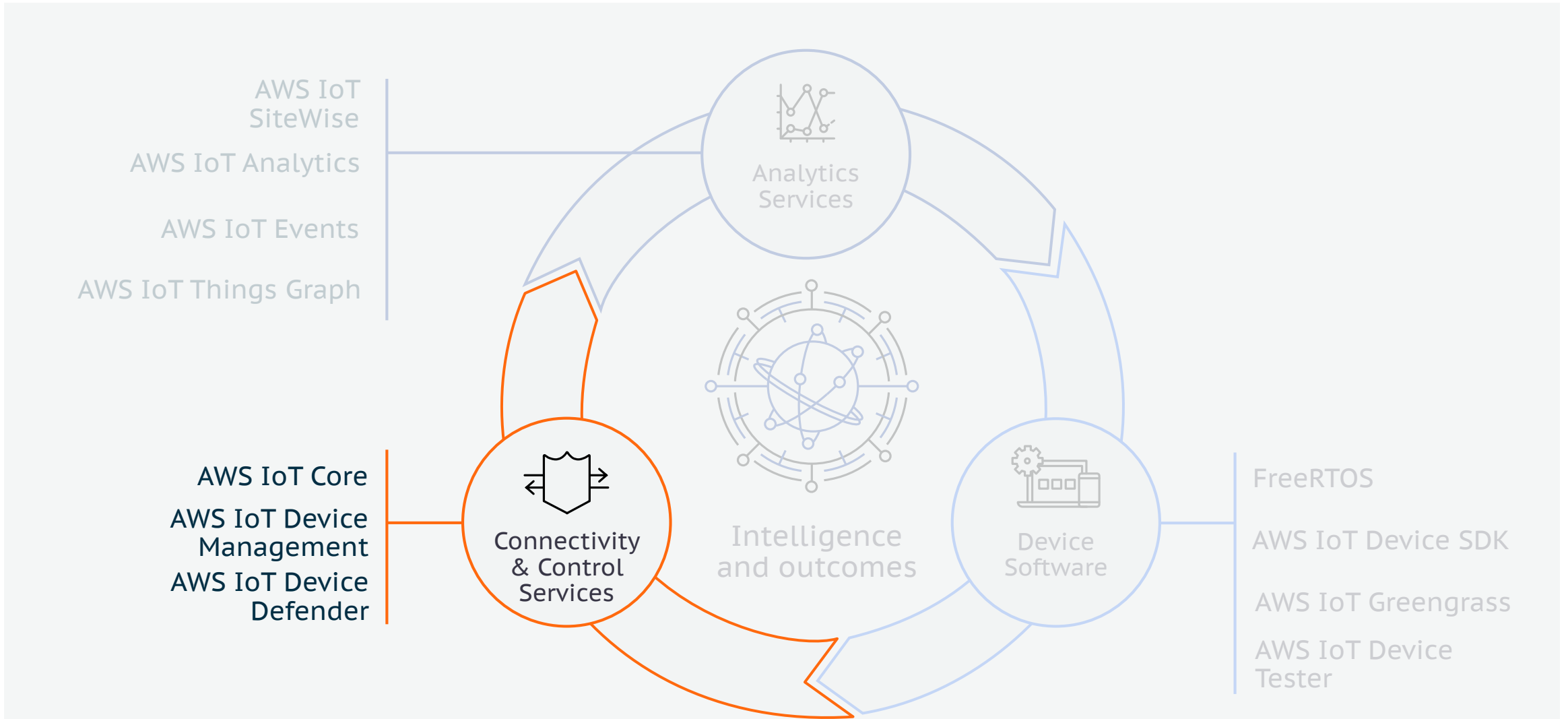


Machine Learning
Inference

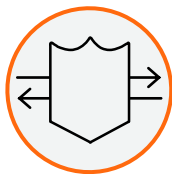


Extract, Aggregate,
Filter, Send Data

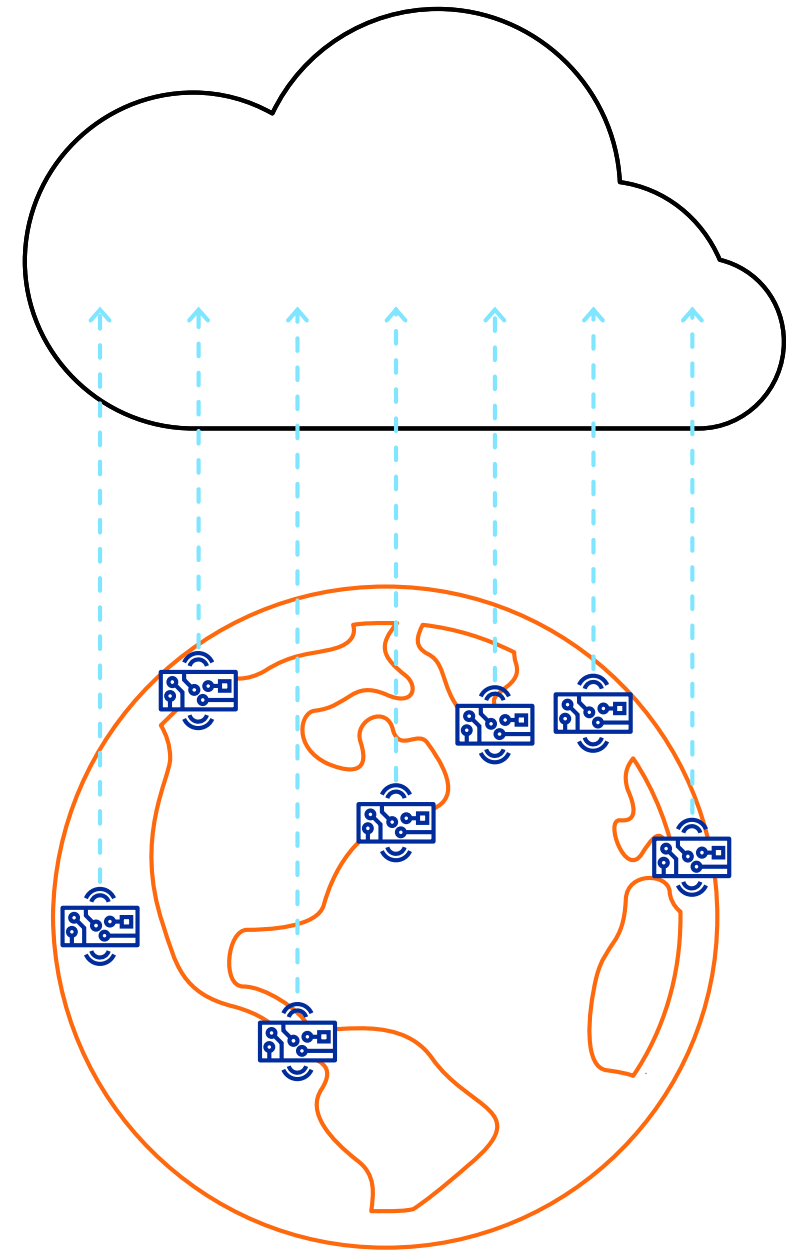
IoT virtuous cycle



How can I connect my data securely, and handle the data they generate at scale?



Connectivity
& Control
Services



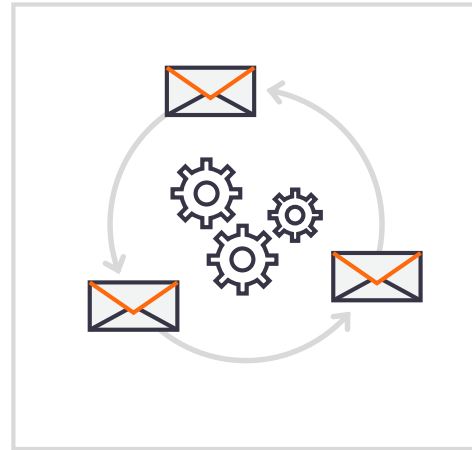


AWS IoT Core

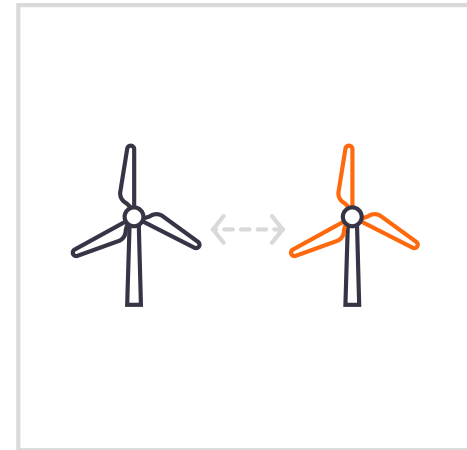
AWS IoT Core allows you to securely connect any number of devices to the cloud and to other devices without requiring you to provision or manage servers



To securely connect devices to the AWS cloud & other devices at scale



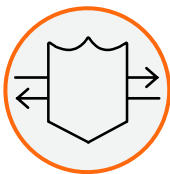
To route, process, and act upon data from connected devices



To enable applications to interact with devices even when they are offline



To fully integrate with other AWS services to reason on top of the data
(Analytics, Databases, AI, etc.)



Connectivity
& Control
Services

Rules Engine

Ingest large amounts of data at a low cost, pre-process it, and make it available to 20+ services for analytics, reporting, & visualization

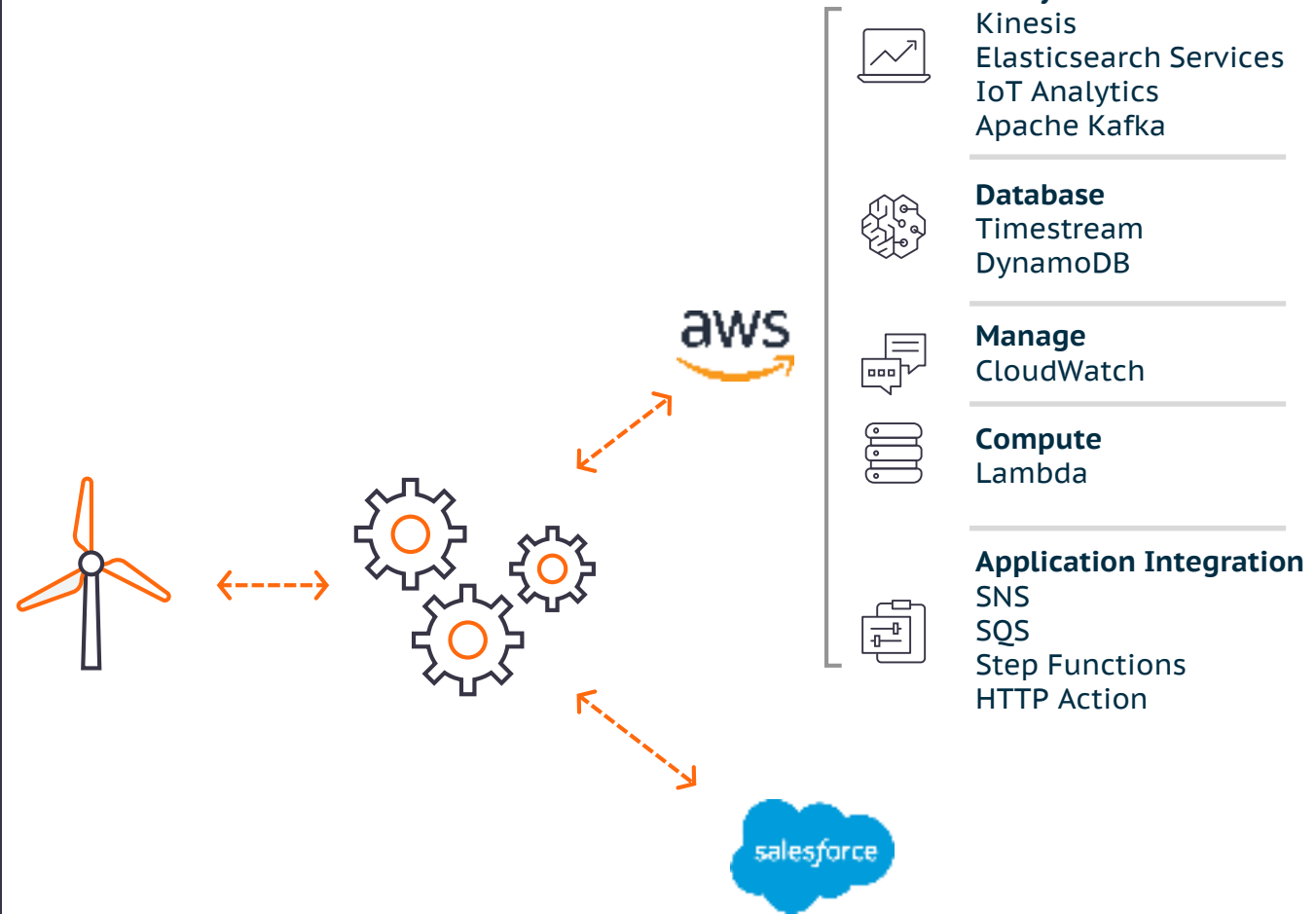
Transform—built in functions for math, string manipulation, dates, etc.

Filter—use the WHERE clause to capture only the data you want

Enrich—bring in context from the Device Shadow and Amazon Machine Learning or from external sources via inline AWS Lambda execution and DynamoDB lookups

Route—send your data to over 20 AWS services and third-party services like Salesforce, etc.

© 2021, Amazon Web Services, Inc. or its Affiliates.



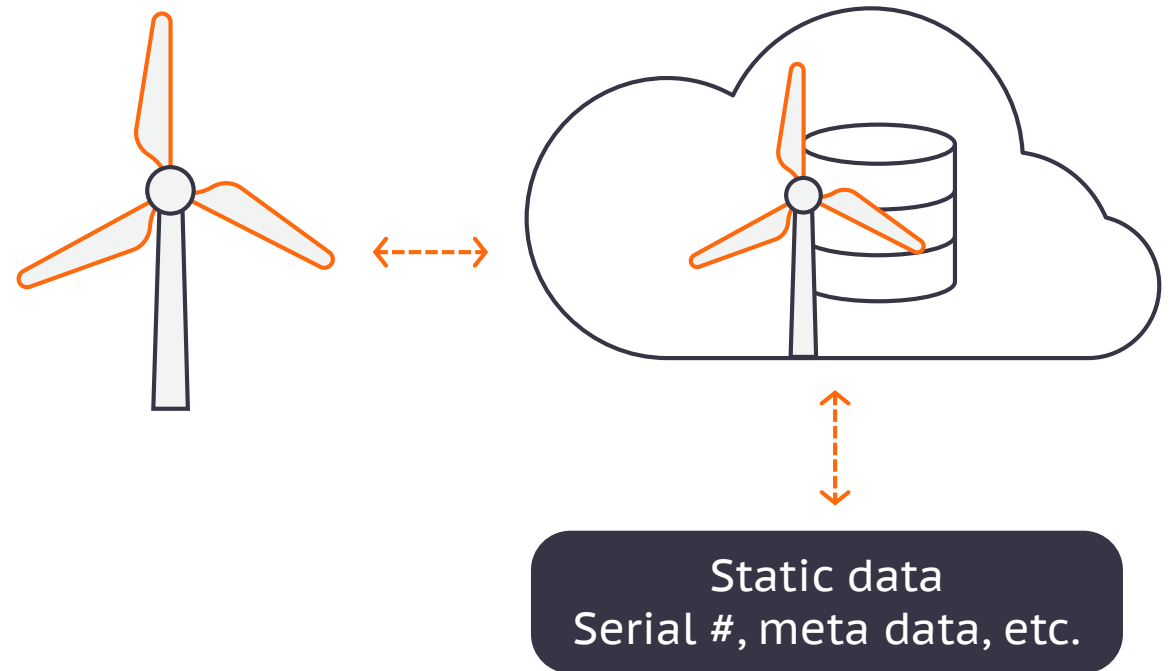
Registry

Define and catalog device
for easy use by AWS services

Simple searches (e.g., which
devices were made in 2019?)

Defining *ThingTypes* (e.g., a Honda
and a Toyota are of the *ThingType*
Car) to enable standardization of
attributes and policies across
devices

Defining *Groups* (e.g., sensors in
a car) to enable simpler
management (running jobs, setting
policies, etc.)



Fleet Index & Search

Understand the health and status of your device fleet

Find devices within the fleet based on any combination of device attributes

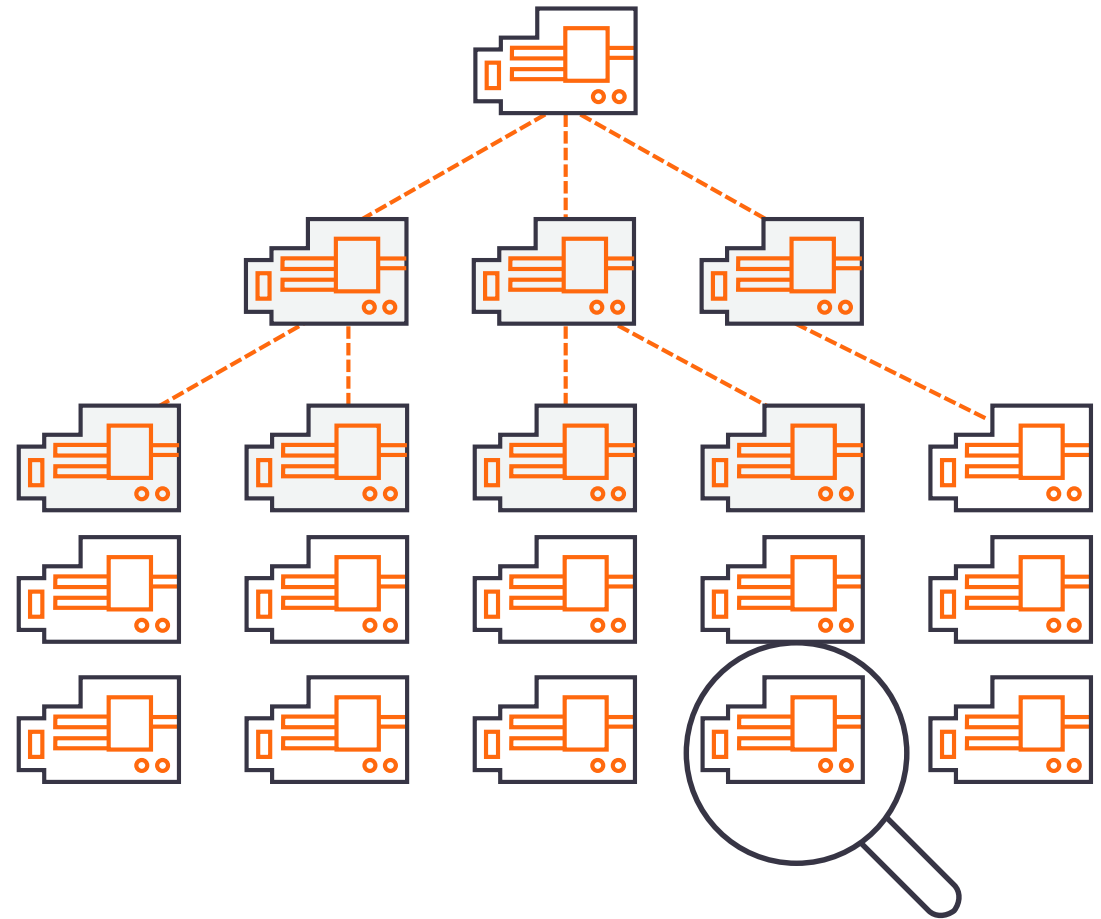
Example: “Find all devices manufactured after 2013 with firmware version 1.2 that are currently connected”

Automate your device organization with dynamically updating groups of devices based upon queries

Example: “Group all hardware version 1.1 lightbulbs that are in New York”

Easy to use—one-click activation via console

© 2021, Amazon Web Services, Inc. or its Affiliates.



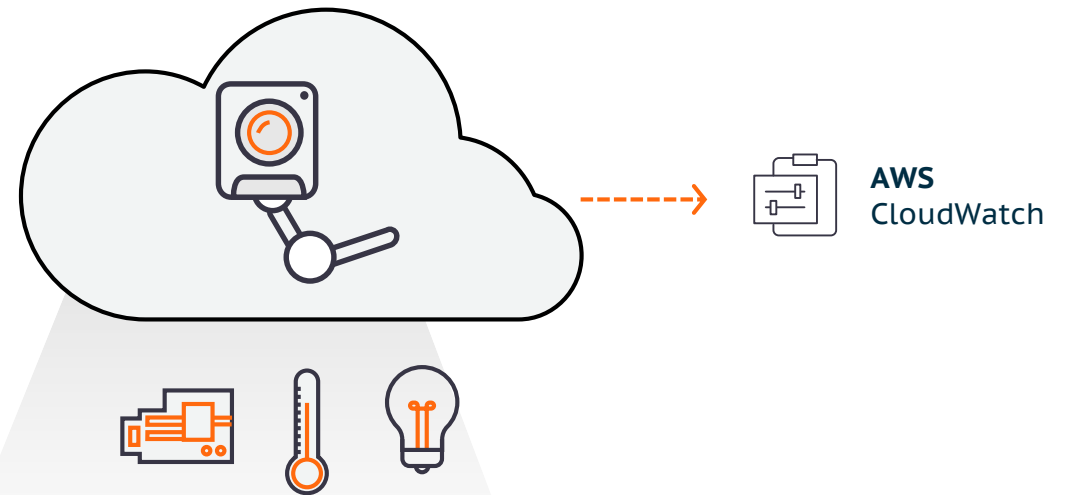
Fine-Grained Device Logging & Monitoring

Collect device logs to identify and remediate problems

Configure the logging level on a per device basis or on a group of devices

To troubleshoot an issue, you can selectively increase diagnostic levels across a subset of devices that are malfunctioning

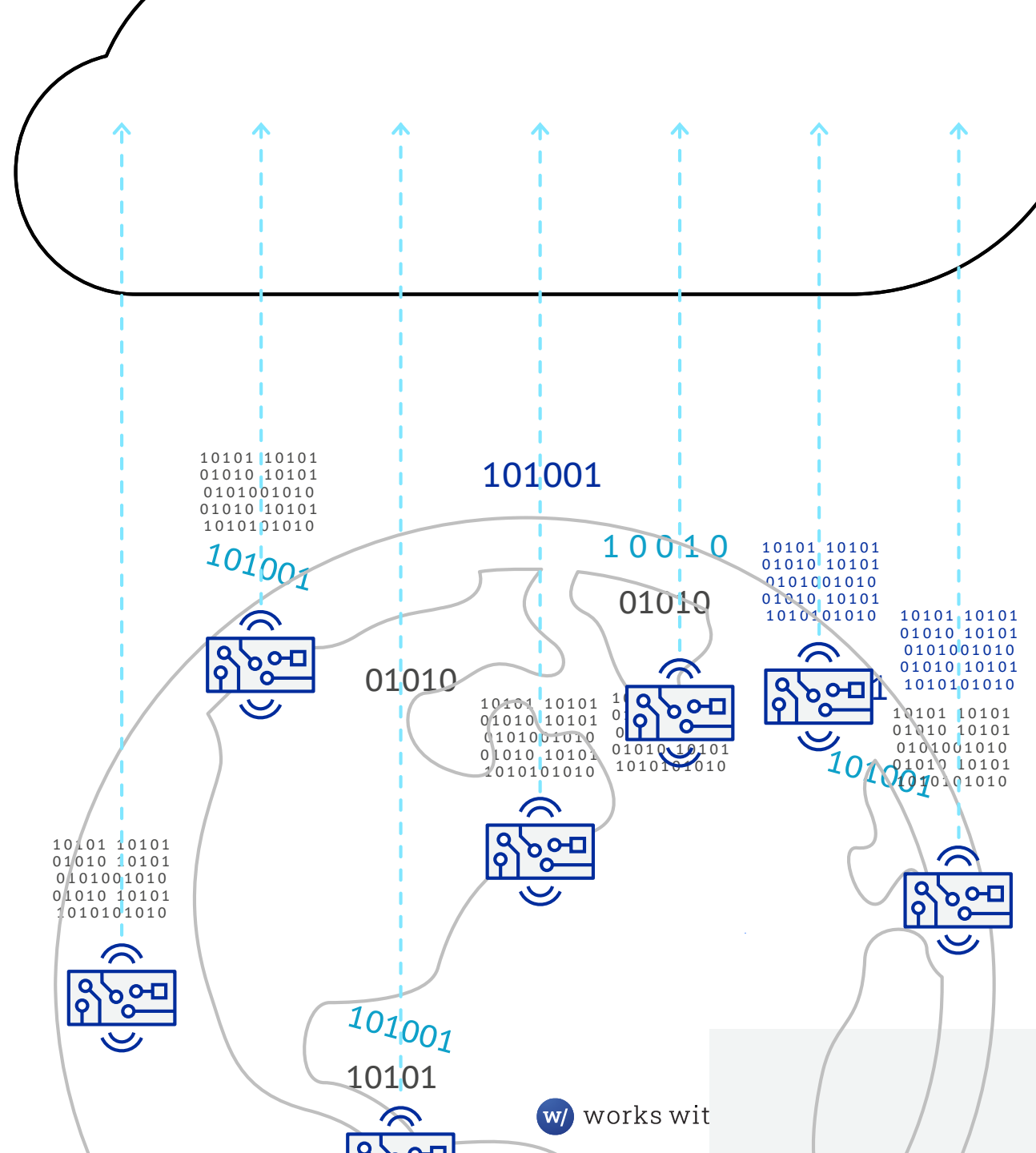
Use AWS CloudWatch to configure alarms and search for your logs



How do I reason on top of IoT data?



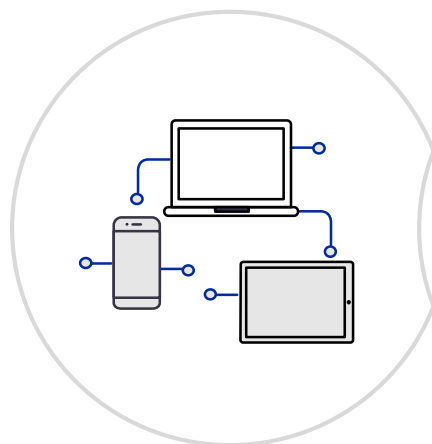
Analytics
Services





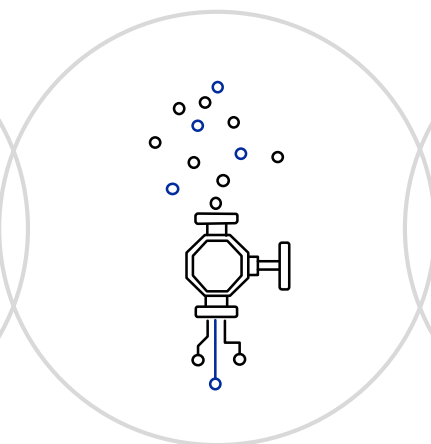
AWS IoT Analytics

AWS IoT Analytics is a service that processes, enriches, stores, analyzes, and visualizes IoT data for manufacturers and enterprises.



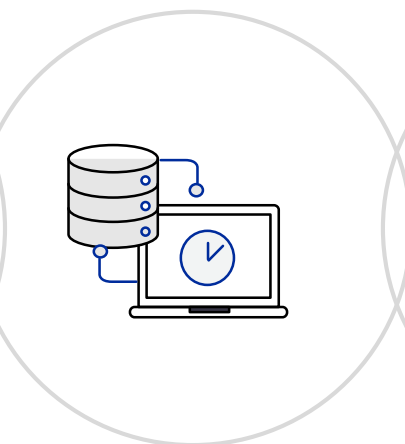
Collect

Collect only the data you want to store & analyze



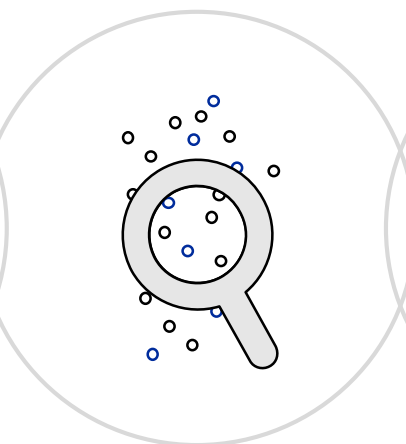
Process

Convert raw data to meaningful information



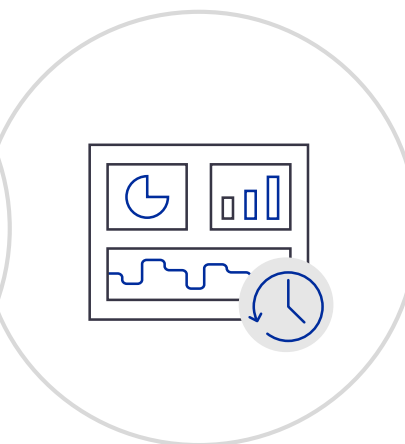
Store

Store device data in time-series data store for analysis



Analyze

Get deeper insight into the health & performance of assets



Visualize

Quickly visualize your IoT data sets



Analytics
Services



works with

 SILICON LABS

Collect

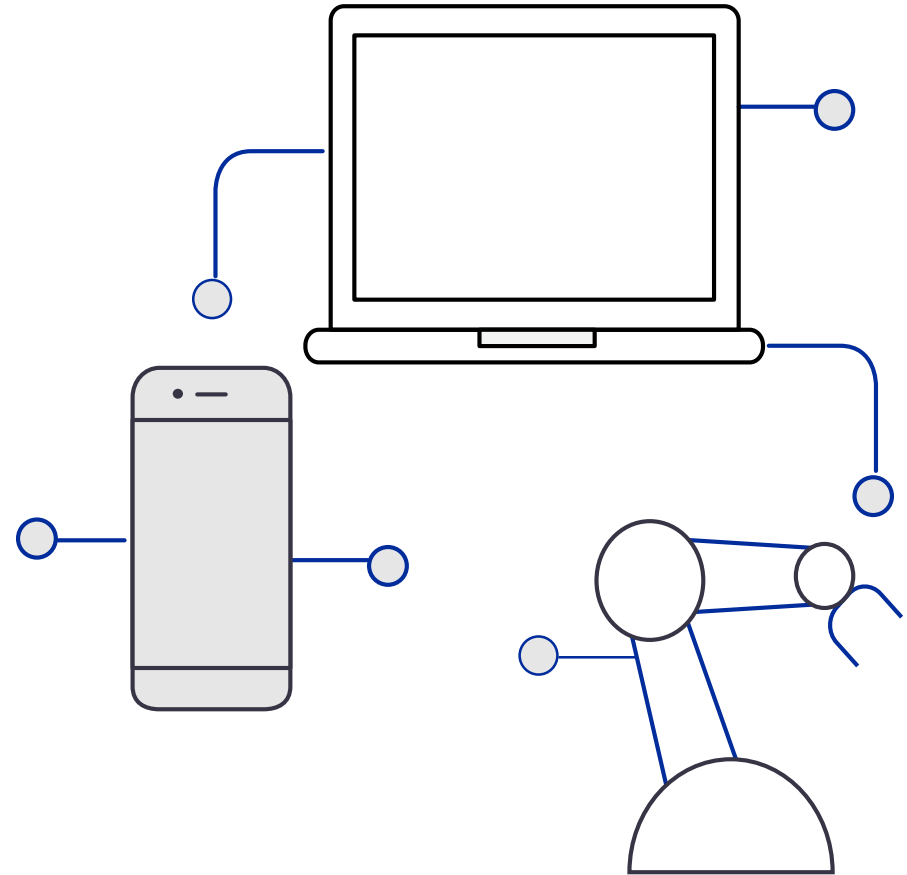
Collect equipment data you want to store and analyze

Ingest data from AWS IoT Core, Amazon S3, Amazon Kinesis, or through PUT APIs

Ingest data in binary or JSON format

Auto-scales based on ingest – no upfront provisioning needed

Single-step setup of channels and pipelines



Process

Convert raw data to
meaningful information

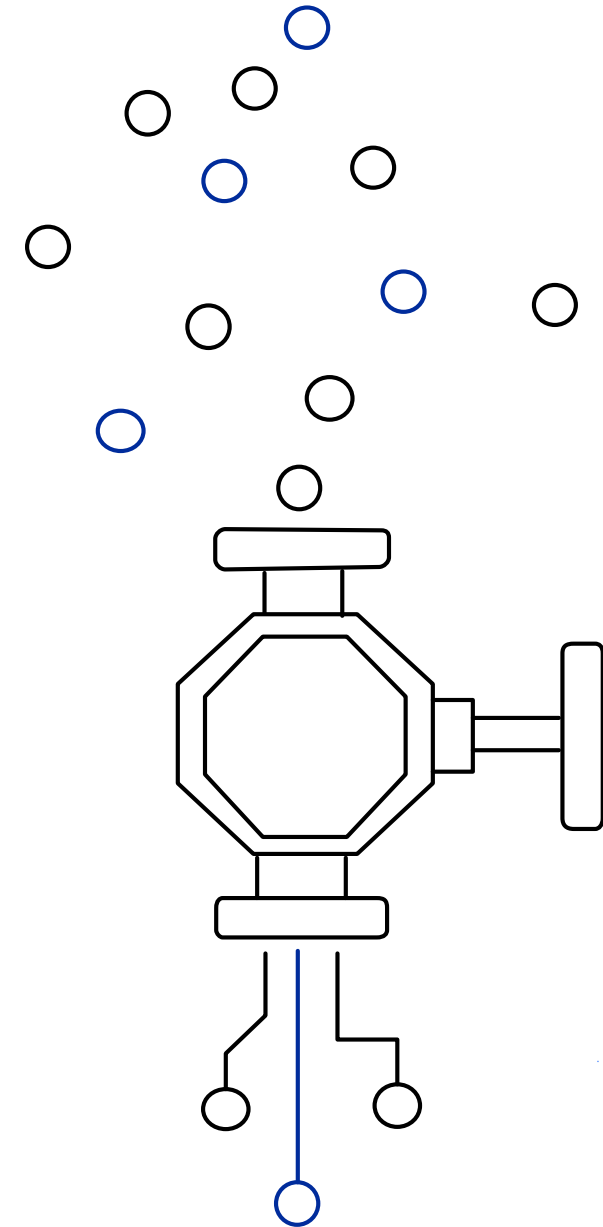
Conditionally purge messages to
remove outliers and
erroneous/irrelevant data

Transform messages using
mathematical or conditional logic

Enrich data with external data sources
such as weather forecast information

Reprocess raw data to create a new
pipeline, make changes, or process
data in a different way

Advanced error handling and
response



Store

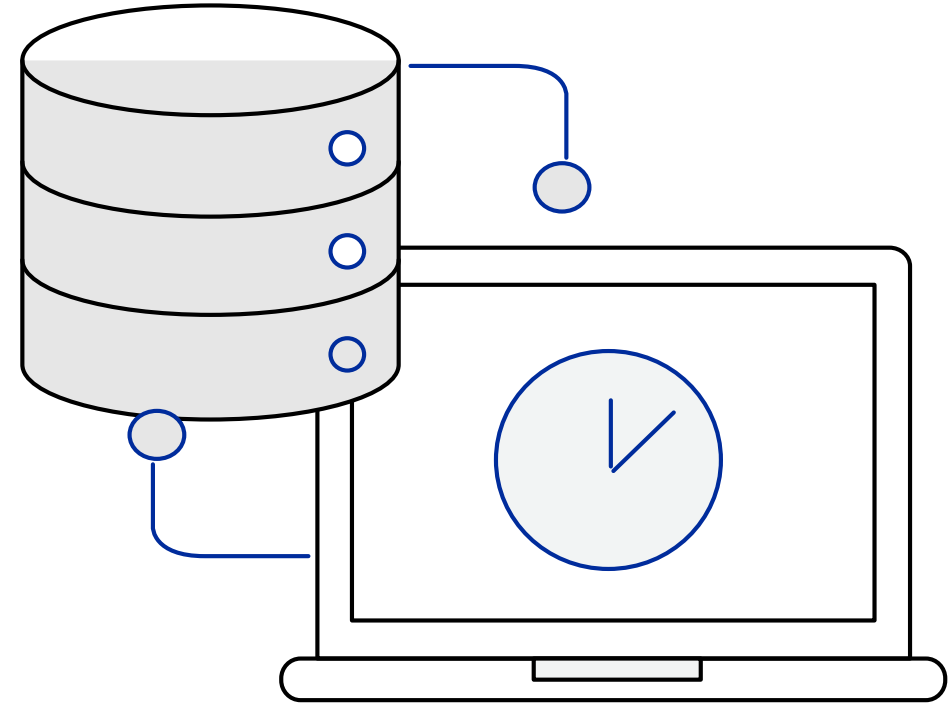
Store device data in time-series optimized data store

Partitioned by time - supports faster query response on time series data

Bring your own S3 bucket

Manageable data retention policies

Supported data storage formats – Parquet and JSON



Analyze

Get deeper insight into the health & performance of assets

Query Data Stores using standard SQL with Query Data set

Schedule your queries to run at a 1-minute granularity

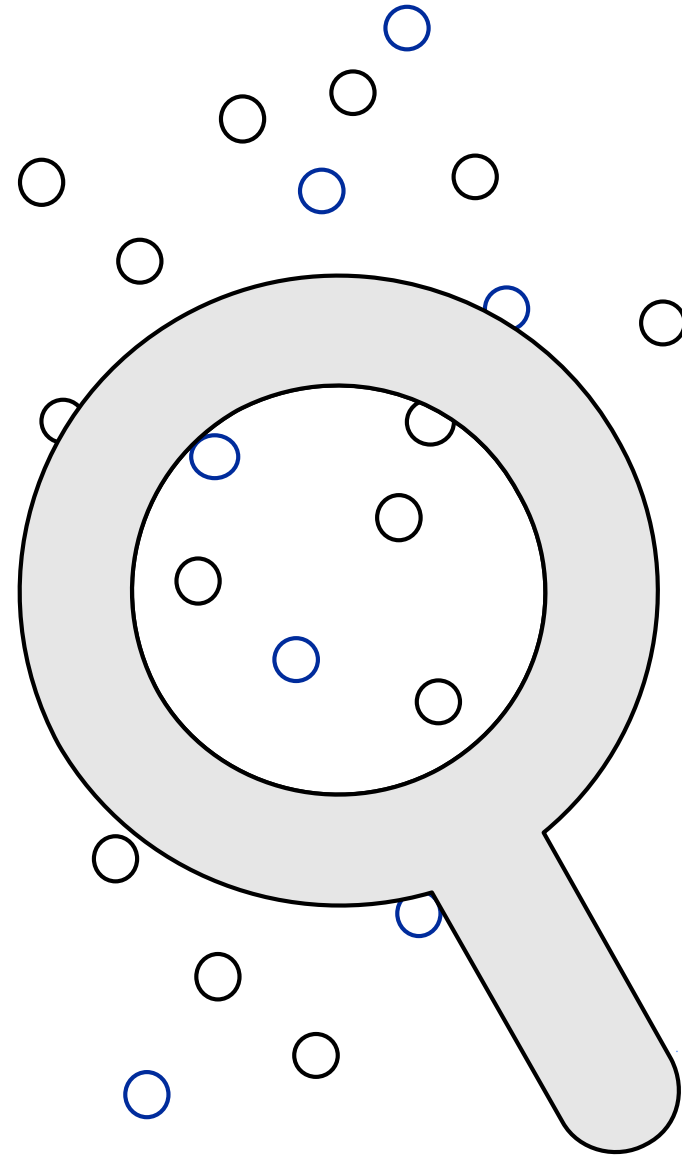
Process late data and re-compute results

Execute custom analysis or Jupyter notebooks through scheduled compute

Visualize results in Amazon QuickSight dashboards

Perform stateful analysis on your data

© 2024 Amazon Web Services, Inc. or its Affiliates.



works with

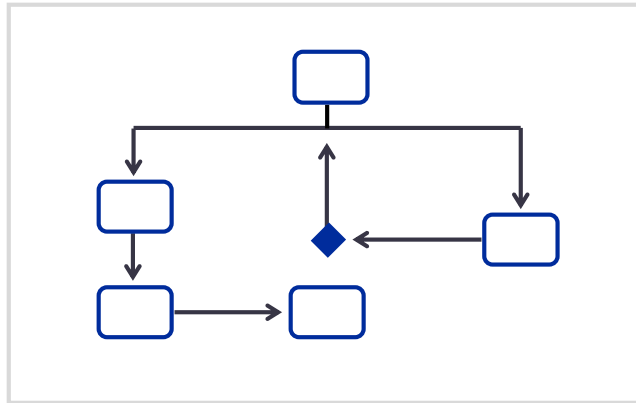


SILICON LABS

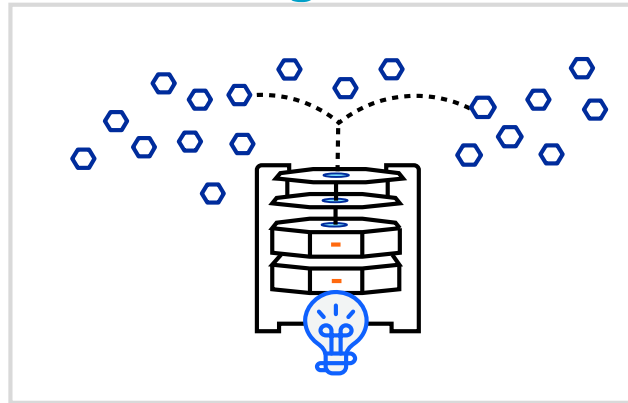


AWS IoT Events

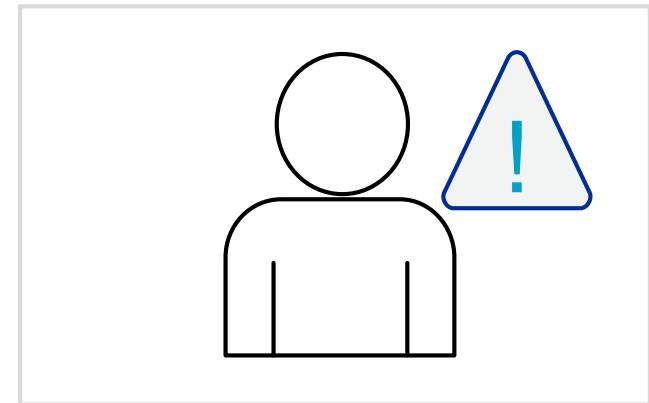
AWS IoT Events is a managed service that continuously monitors data from your equipment to identify their state, detect changes and trigger the appropriate responses when changes occur



Build simple logic to evaluate incoming telemetry data to detect stateful changes in equipment or a process



Detect events from data across thousands of sensors and other sources



Trigger responses to optimize operations



Analytics
Services

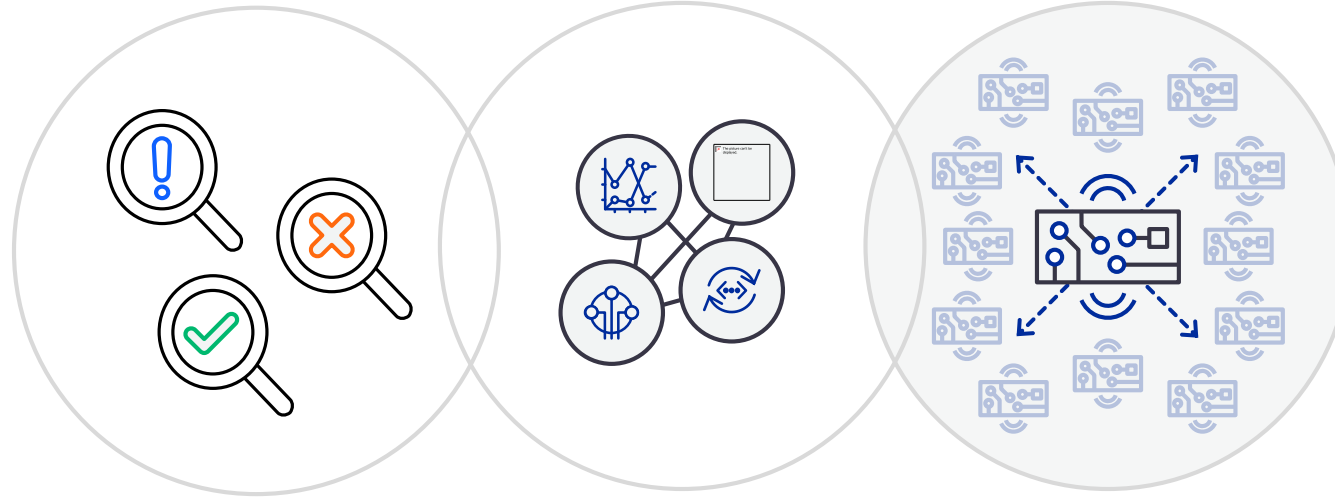


works with

SILICON LABS



AWS IoT Events



Event Detector Models and Alarms

Reduce the cost of device maintenance

Trigger actions to other AWS services

Uncover new insights and trigger actions

Auto-scale for your entire fleet


Easily automate operations



Analytics
Services



AWS IoT Events

 AWS IoT Events

Getting started

Start by creating a detector model to represent your device states


[Documentation](#)

[API reference](#)

[FAQs](#)

Create your detector model


Create



Create a new detector model

[Create new](#)


Template



Select an industry-specific template

[Browse and select templates](#)

Demo




Explore a sample detector model with inputs

[Launch demo with inputs](#)

Using inputs in a detector model

Inputs receive the telemetry data (messages) you want to monitor and use in a detector model. Input values are used in conditions to trigger an action or change state. Manage them at the Inputs page available from the left nav.

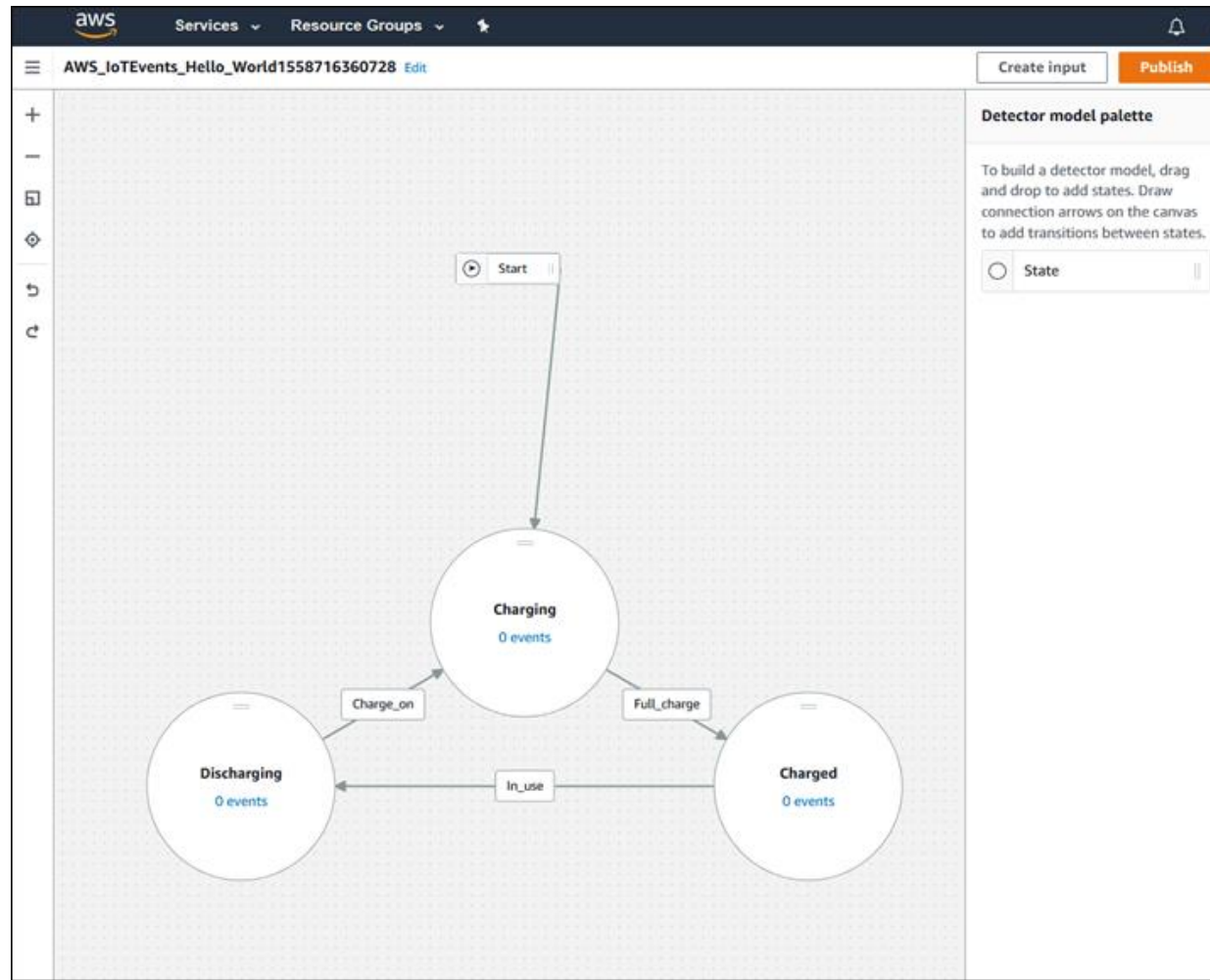




Analytics
Services



AWS IoT Events



Transition event [X]

Event name
Full_charge

Origin state
Charging ▼

Destination state
Charged ▼

Event trigger logic

```
$input.AWS_IoTEvents_HelloWorld_VoltageInput.voltage > 29
```

Event actions
[Add action]

[Delete transition]



Analytics
Services



works with



SILICON LABS

AWS IoT Core

The screenshot shows the AWS IoT Core console interface. The top navigation bar includes the AWS logo, a 'Services' dropdown, a notification bell, the user 'console_user @', the region 'N. Virginia' (highlighted with a red box), and a 'Support' dropdown. The left sidebar lists various AWS IoT services, with 'Wireless connectivity' expanded to show 'Intro' (highlighted in orange), 'Gateways', 'Devices', 'Profiles', and 'Destinations'. The main content area shows the breadcrumb 'AWS IoT > AWS IoT Core for LoRaWAN > Profiles'. Below this, there are tabs for 'LoRaWAN' and 'Sidewalk' (selected). The 'Sidewalk account credentials (0)' section contains 'Edit', 'Delete', and 'Add credential' buttons. A pagination control shows '< 1 >'. Below this is a table with headers 'Sidewalk Amazon ID' and 'AppServerPrivateKey'. A message states 'No Sidewalk account credentials' and 'You don't have any Sidewalk account credentials in us-east-1.', with an 'Add credential' button (highlighted with a red box) below it.

AWS IoT Core

Monitor

Activity

► Onboard

► Manage

► Fleet Hub

► Greengrass

▼ Wireless connectivity

Intro

Gateways

Devices

Profiles

Destinations

► Secure

► Defend

► Act

► Test

Software

Settings

Learn

Feature spotlight

Documentation

New console experience

Tell us what you think

AWS IoT > Wireless connectivity > Destinations > Add destination

Add destination

Destination details

Destination name

The destination name appears in the device and gateway destination selection lists.

Destination name

Destination description - optional

Provide a helpful description of your destination.

Destination description.

Enter a rule name

Enter the name of the rule or a rule/topic that will process the messages sent to this destination.

Enter a rule name

Copy

Publish to AWS IoT Core message broker

If you need a publish/subscribe broker to distribute messages to multiple subscribers

Advanced

Rule configuration - optional

Your destination will need a rule to process the messages it receives. If you entered the name of a new rule, you can create that rule now, or you can skip this step and create a rule with that name later.

To create the rule now, copy the value from the rule name field and choose Create rule.

Create Rule

Permissions

Create a new service role

Select an existing service role

Role name - optional

Leave blank to generate a random name.

Choose a custom role name.

A new role named "AWSIoTWirelessDestination-yzuf478H" will be created.

View policy permissions

Tags - optional

A tag is a label that you assign to an AWS resource. Each tag consists of a key and an optional value. You can use tags to search and filter your resources or track your AWS costs.

You don't have any tags attached to this resource.

Add new tag


You can add up to 50 tags.

Cancel

Add destination

w/

works with

 SILICON LABS

AWS IoT Core

AWS IoT

Monitor

Activity

Onboard

Manage

Greengrass

Wireless connectivity

Intro

Gateways

Devices

Profiles

Destinations

Secure

Defend

Act

Test

Software

Settings

Learn

Feature spotlight

Documentation

AWS IoT > Wireless connectivity > Wireless devices

LoRaWAN | Sidewalk

Sidewalk devices (7)

Device ID	Sidewalk Amazon ID	Destination	Last uplink received at
d2026087-ae3e-42de-a64f-aea85d8e43f5		SidewalkDestination	-
904e9156-3a64-4c09-b0f5-822eac2e6cc8		SidewalkDestination	-
6977ce25-ad91-3968-aa7d-d1ad9fbcff9		SidewalkDestination	-
acda929-6eb3-43d9-96dd-71f9ba0661c		SidewalkDestination	-
8f4b05ff-b088-4b1b-94b6-fb1de968db3c		SidewalkDestination	-
798bcebf-d5ac-4552-8b0e-44596fcd52e1		SidewalkDestination	-
8d15a87f-dc34-3250-8902-d5af98399d9d		SidewalkDestination	-

AWS IoT Core

- Monitor

Activity

▶ Onboard

▶ Manage

▶ Fleet Hub

▶ Greengrass

▼ Wireless connectivity

Intro

Gateways

Devices

Profiles

Destinations

▶ Secure

▶ Defend

▼ Act

Rules

Destinations

▶ Test
- Software

Settings

Learn

Feature spotlight

Documentation

New console experience

Tell us what you think

AWS IoT

>

Wireless connectivity

>

Destinations

Destinations (3)

Info

Edit

Delete

Add destination



<

1

>

	Destination name	Expression	ExpressionType
<input type="radio"/>	SidewalkDestination	SidewalkRule	RuleName
<input type="radio"/>	DestinationArun	SidewalkRule/lock	RuleName
<input type="radio"/>	SidewalkNordic	SidewalkNordicIoTActionRule_qeBJoMDSPrWS	RuleName

AWS IoT Core

- Monitor
- Activity
- ▶ Onboard
- ▶ Manage
- ▶ Fleet Hub
- ▶ Greengrass
- ▼ Wireless connectivity
- Intro
- Gateways
- Devices
- Profiles
- Destinations
- ▶ Secure
- ▶ Defend
- ▼ Act
- Rules
- Destinations
- ▶ Test
- Software
- Settings
- Learn
- Feature spotlight
- Documentation 
-  New console experience
- Tell us what you think

AWS IoT > Rules > SidewalkRule

RULE

SidewalkRule

ENABLED

Actions ▾

Overview

Description

Tags

No description

Rule query statement


The source of the messages you want to process with this rule.

SELECT *

Using SQL version 2016-03-23


Actions

Actions are what happens when a rule is triggered. [Learn more](#)

 Republish a message to an AWS IoT topic

/repubtest/

Remove Edit ▶

 Send a message to a Lambda function

Downlink

Remove Edit ▶

Add action

Error action

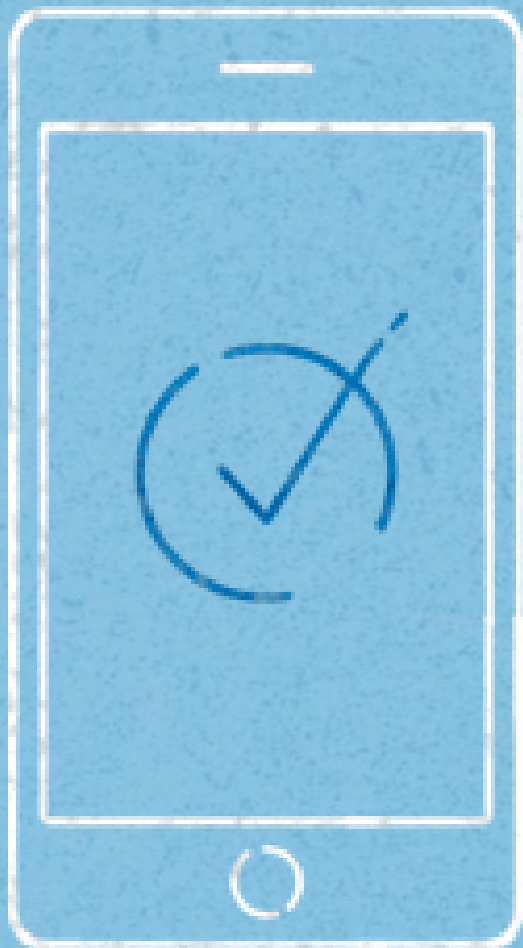
Optionally set an action that will be executed when something goes wrong with processing your rule.

Add action

Getting started on Sidewalk and AWS IoT Core

- Get an Amazon Developer Account
- Get an AWS Account
- Sample code here: <https://github.com/aws-samples/amazon-sidewalk>

Around the Block Again



We are building the network to do things right for our customers and neighborhoods

Looking forward to device, application developers, and silicon vendors delivering rich experiences



works with

BY SILICON LABS

VIRTUAL CONFERENCE

