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AMZ-201: Sidewalk & AWS IoT

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aws internet of things

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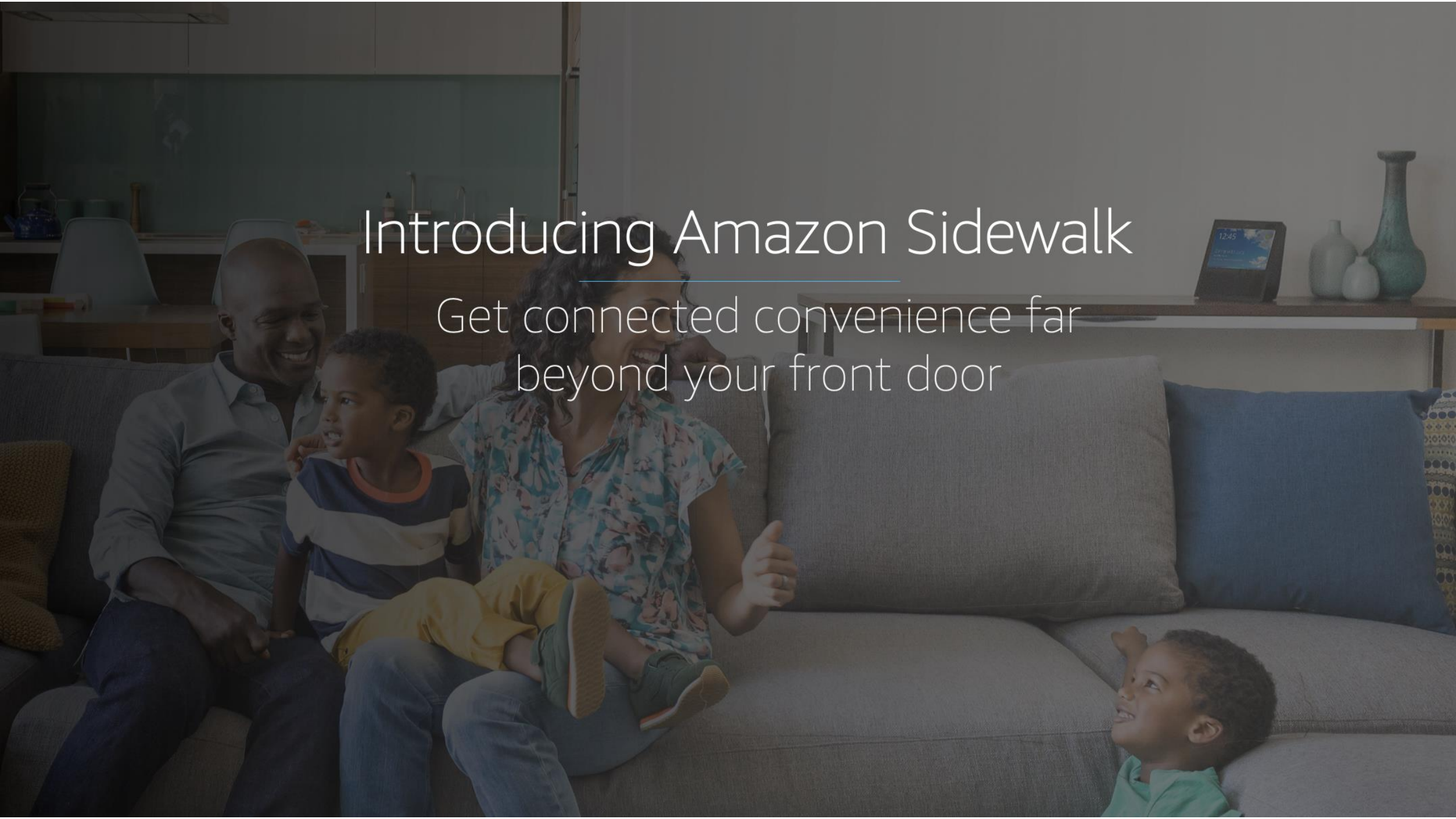
Introducing Amazon Sidewalk
Get connected convenience far
beyond your front door

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

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

Community and Home Applications

If you knew **the state of every thing** and could **reason on top of that data…**

what **problems** would you solve?

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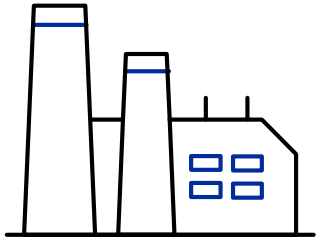
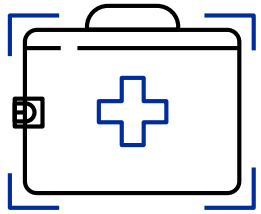
AWS IoT customers solve problems in all sectors

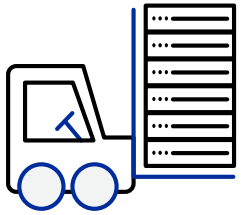
What customers are doing with AWS IoT



Improve the performance and productivity of industrial processes

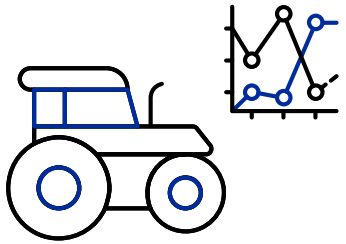


Remotely monitor patient health & wellness applications

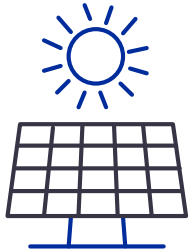


Track inventory levels and manage warehouse operations

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

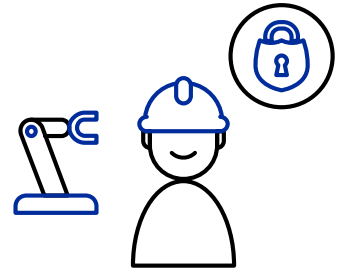


Grow healthier crops with greater efficiencies



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

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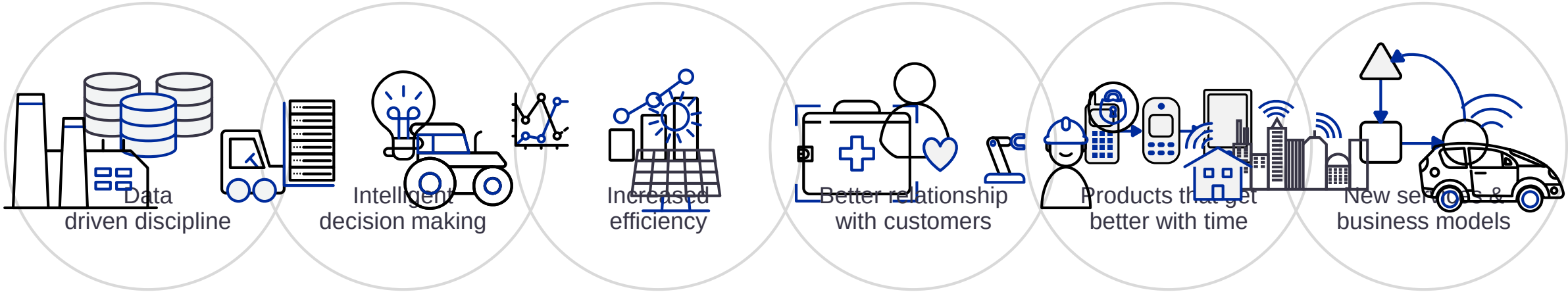
What customers are doing with AWS IoT



Operational efficiency

IoT data decreases OpEx

Revenue growth

IoT data drives business growth

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

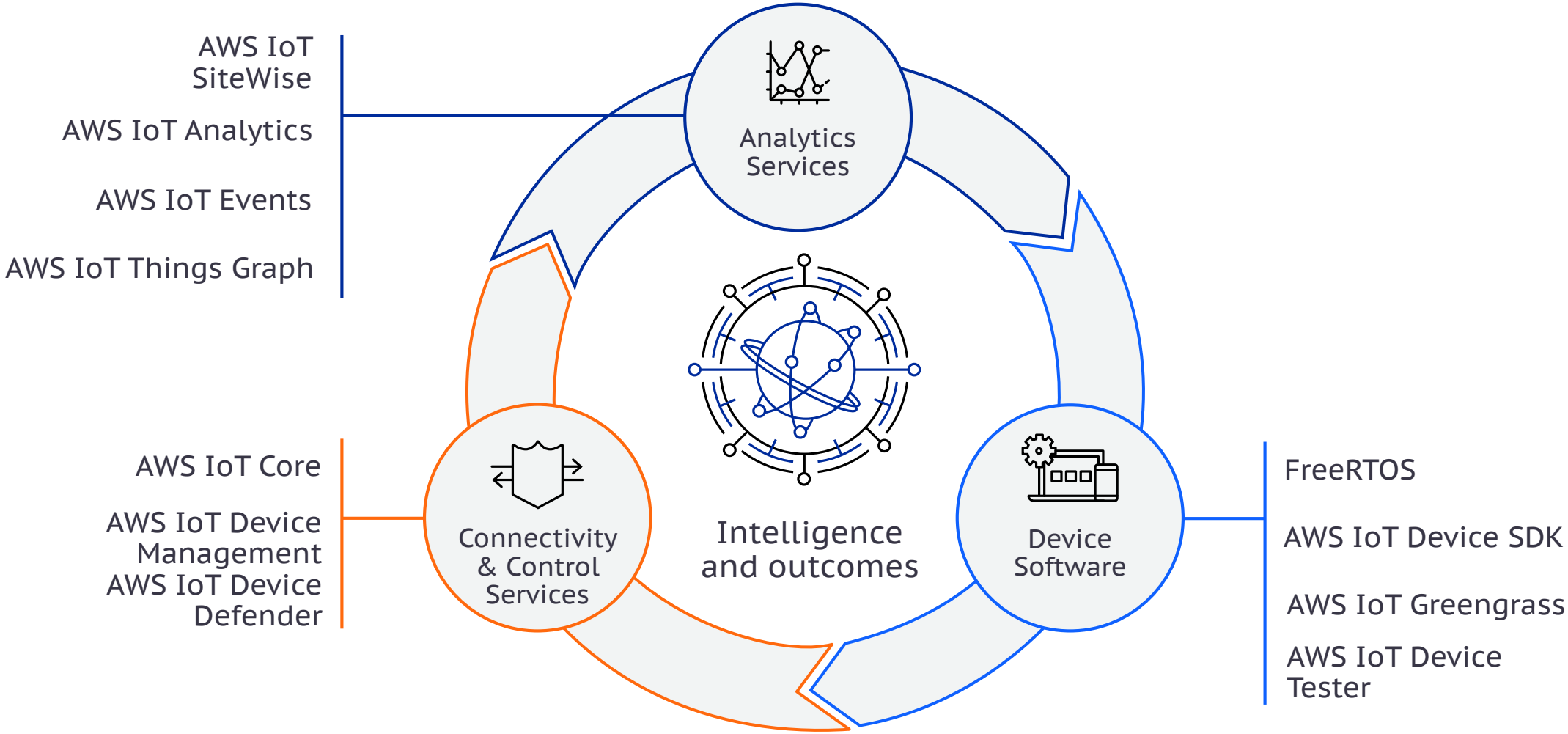
AWS IoT architecture

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

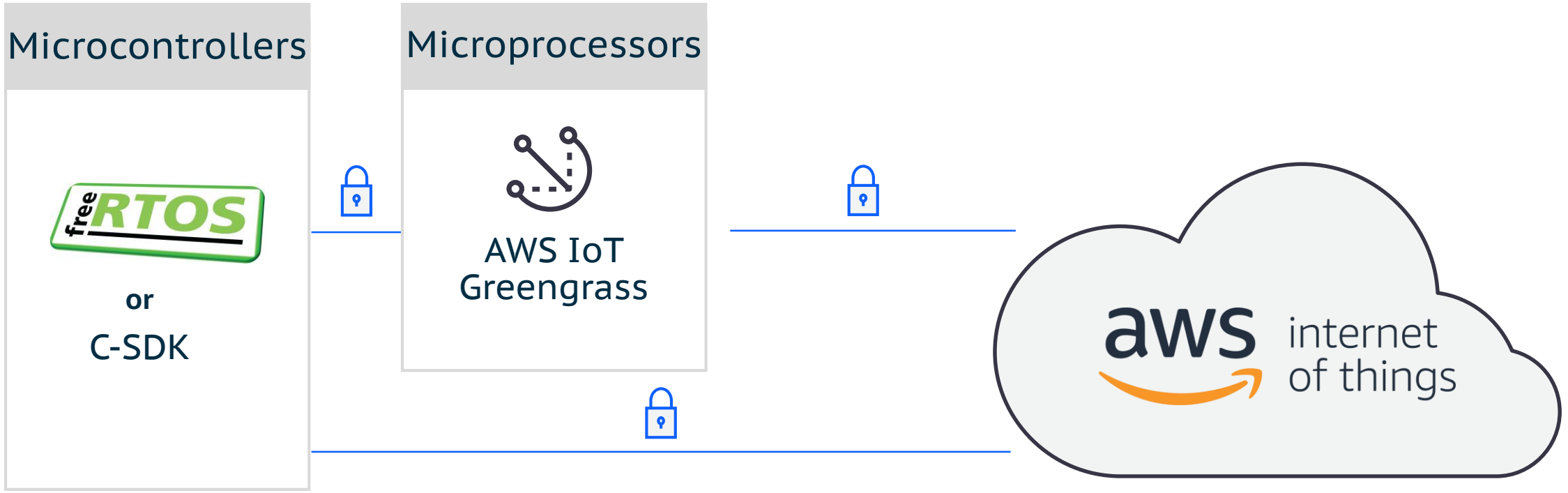
How can I control, manage, and secure my devices at scale?

How can I build devices that operate at the edge?

IoT virtuous cycle

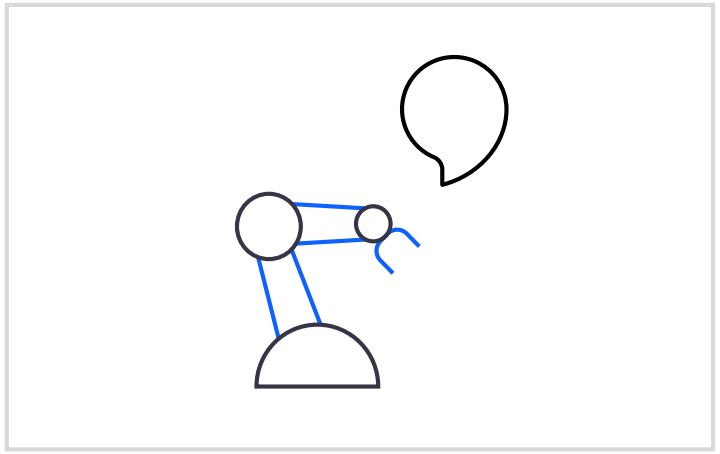


Easily build devices that works with AWS IoT

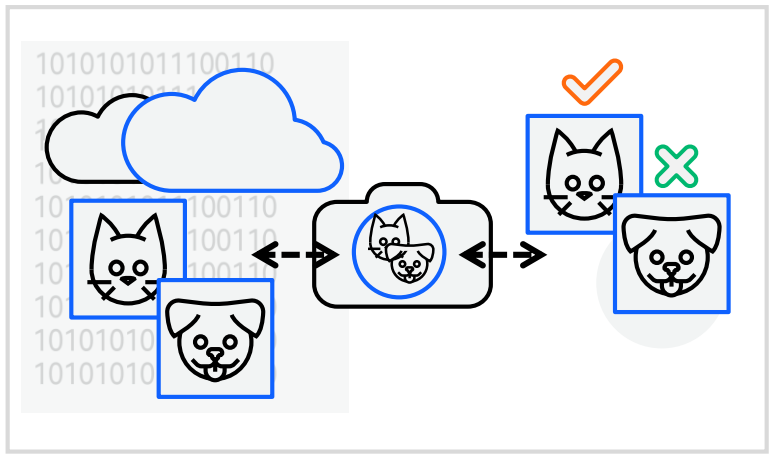


Device
software

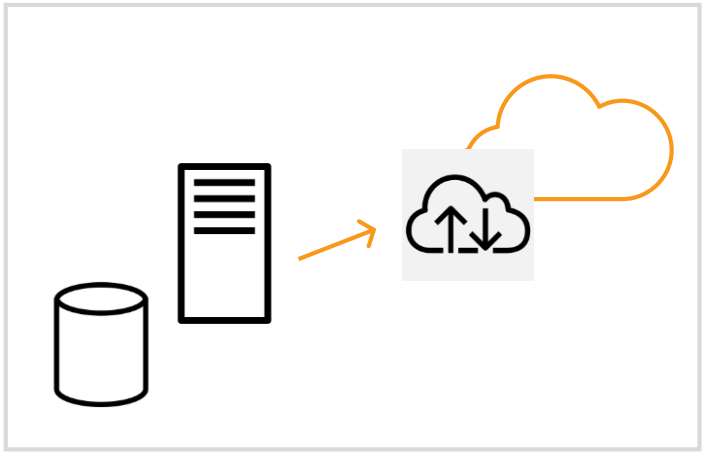
AWS IoT Greengrass solves common use cases to help you securely build, deploy, and manage your device software



Remote Fleet Management

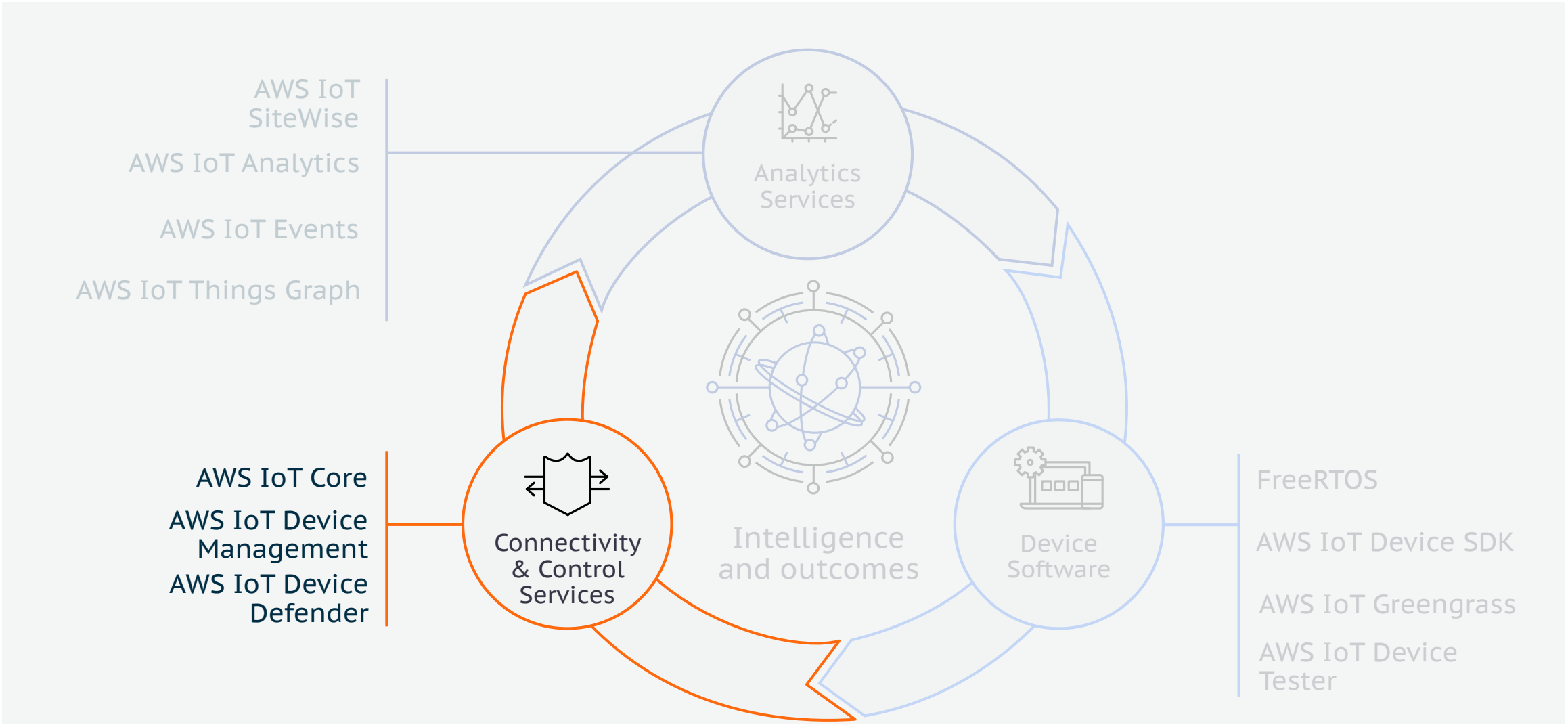


Machine Learning Inference

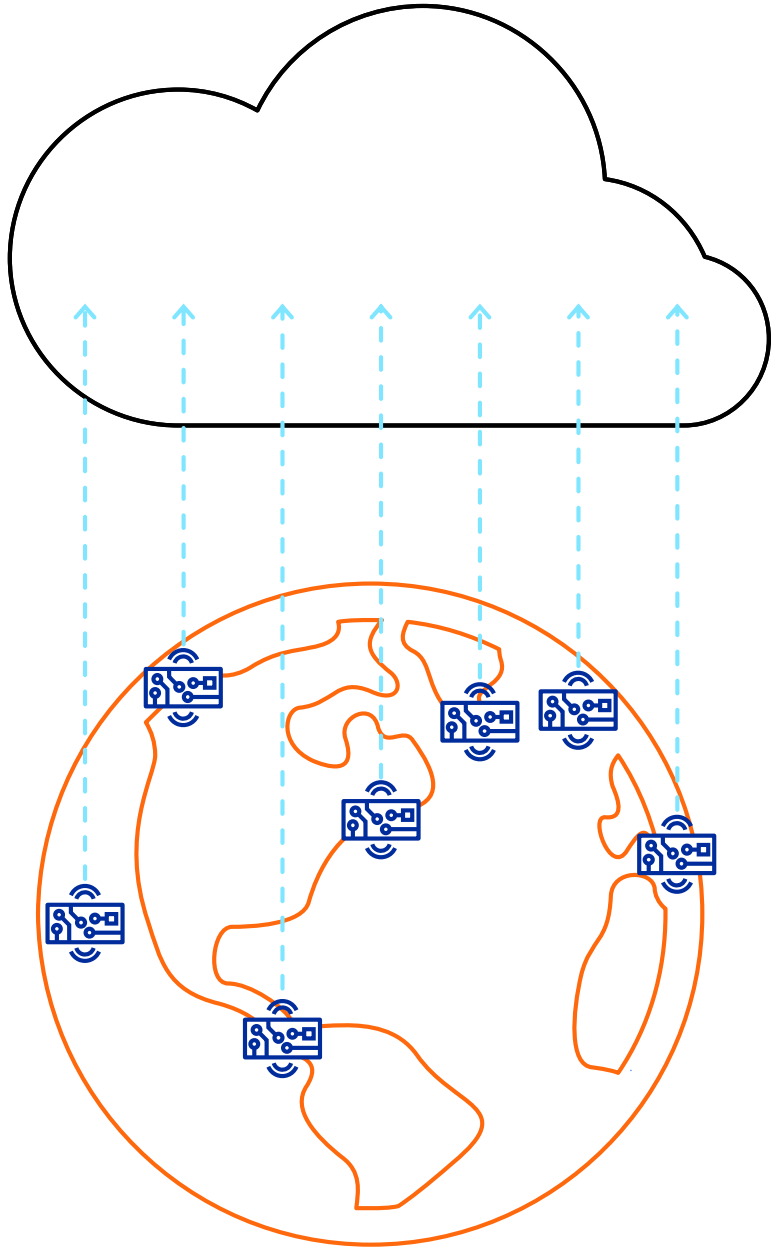


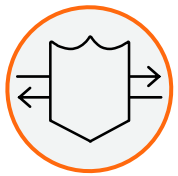
Extract, Aggregate, Filter, Send Data

IoT virtuous cycle



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

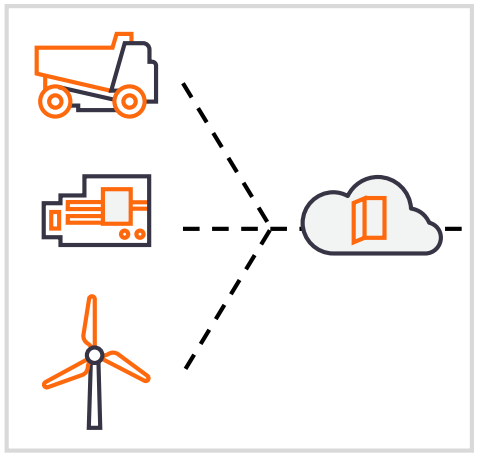




Connectivity
& Control
Services

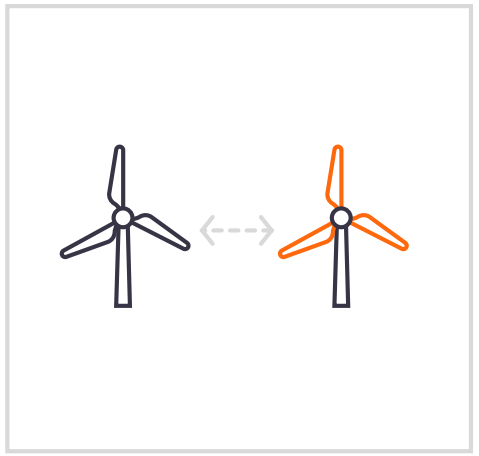
AWS IoT Core

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

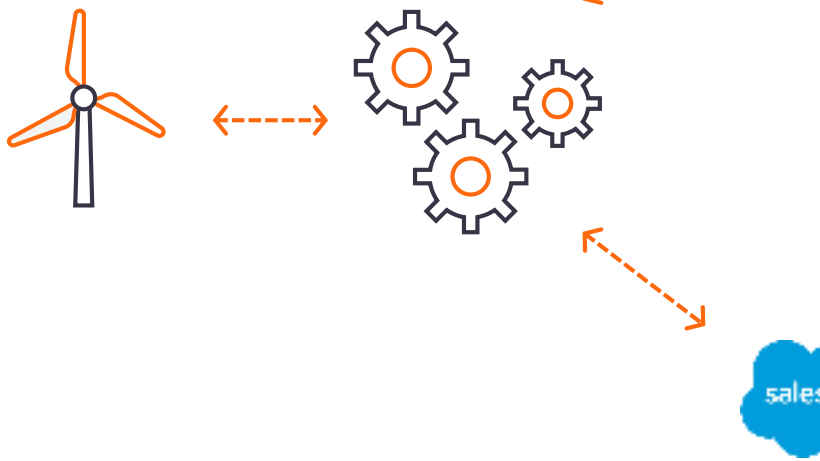
Ingest large amounts of data at a low cost, pre-process it, and make it available to 20+ services for analytics, reporting, & visualization

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.



Analytics
Kinesis
Elasticsearch Services
IoT Analytics
Apache Kafka

Database
Timestream
DynamoDB

Manage
CloudWatch

Compute
Lambda

Application Integration
SNS
SQS
Step Functions
HTTP Action

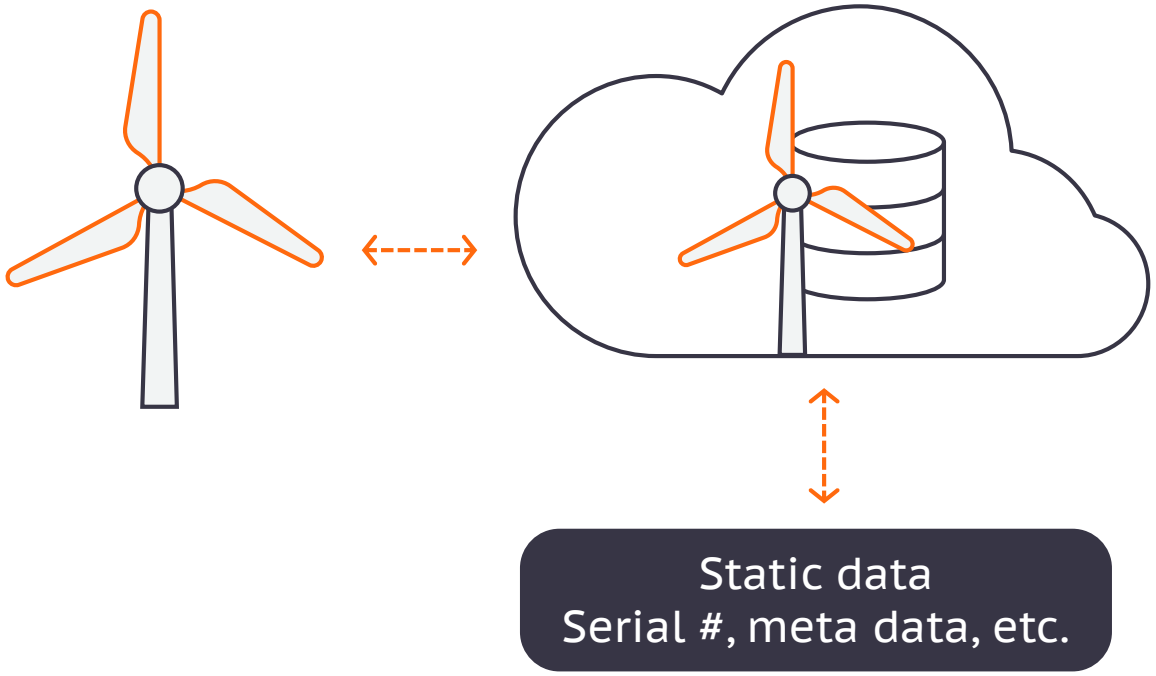
Registry

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

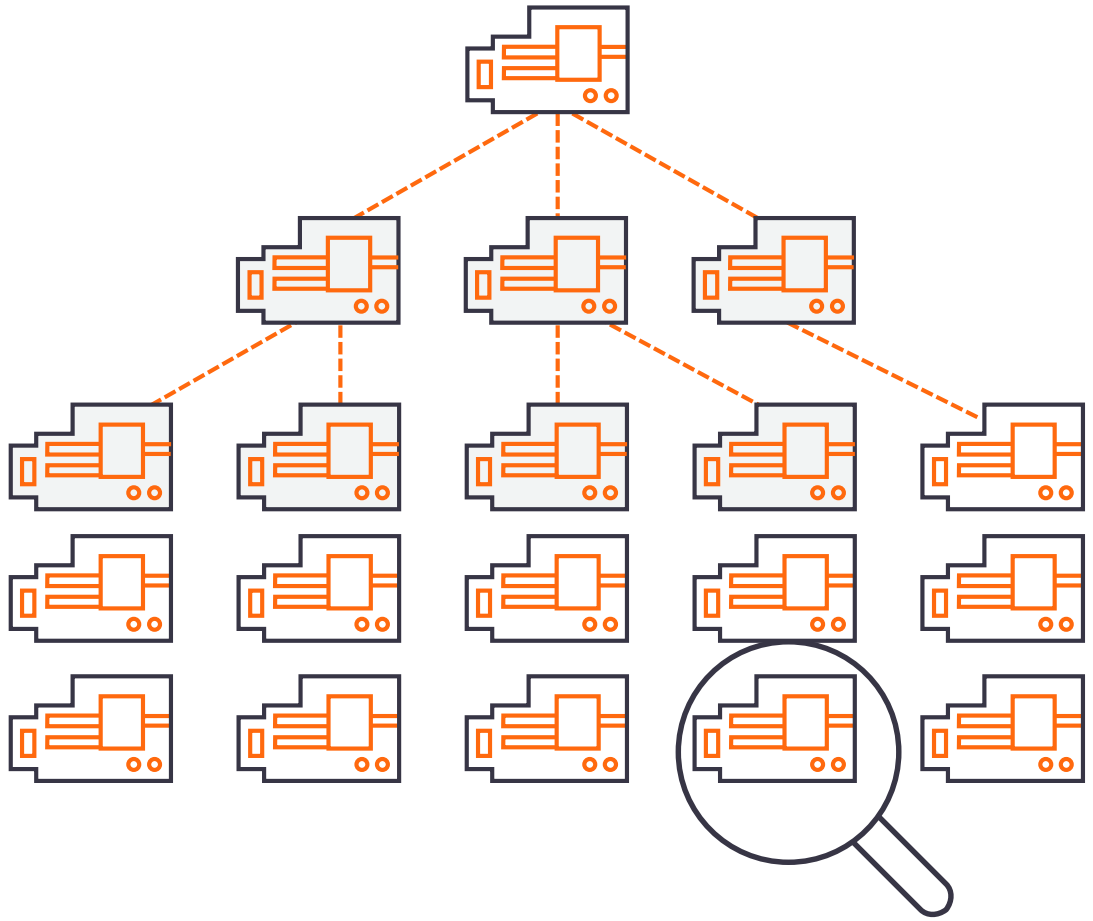
Find devices within the fleet based on any combination of device attributes

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



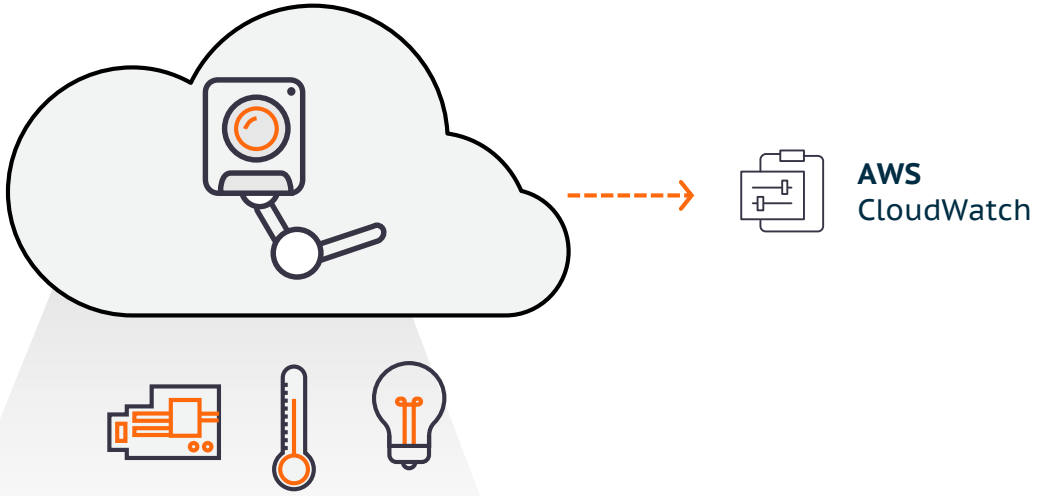
Fine-Grained Device Logging & Monitoring

Collect device logs to identify and remediate problems

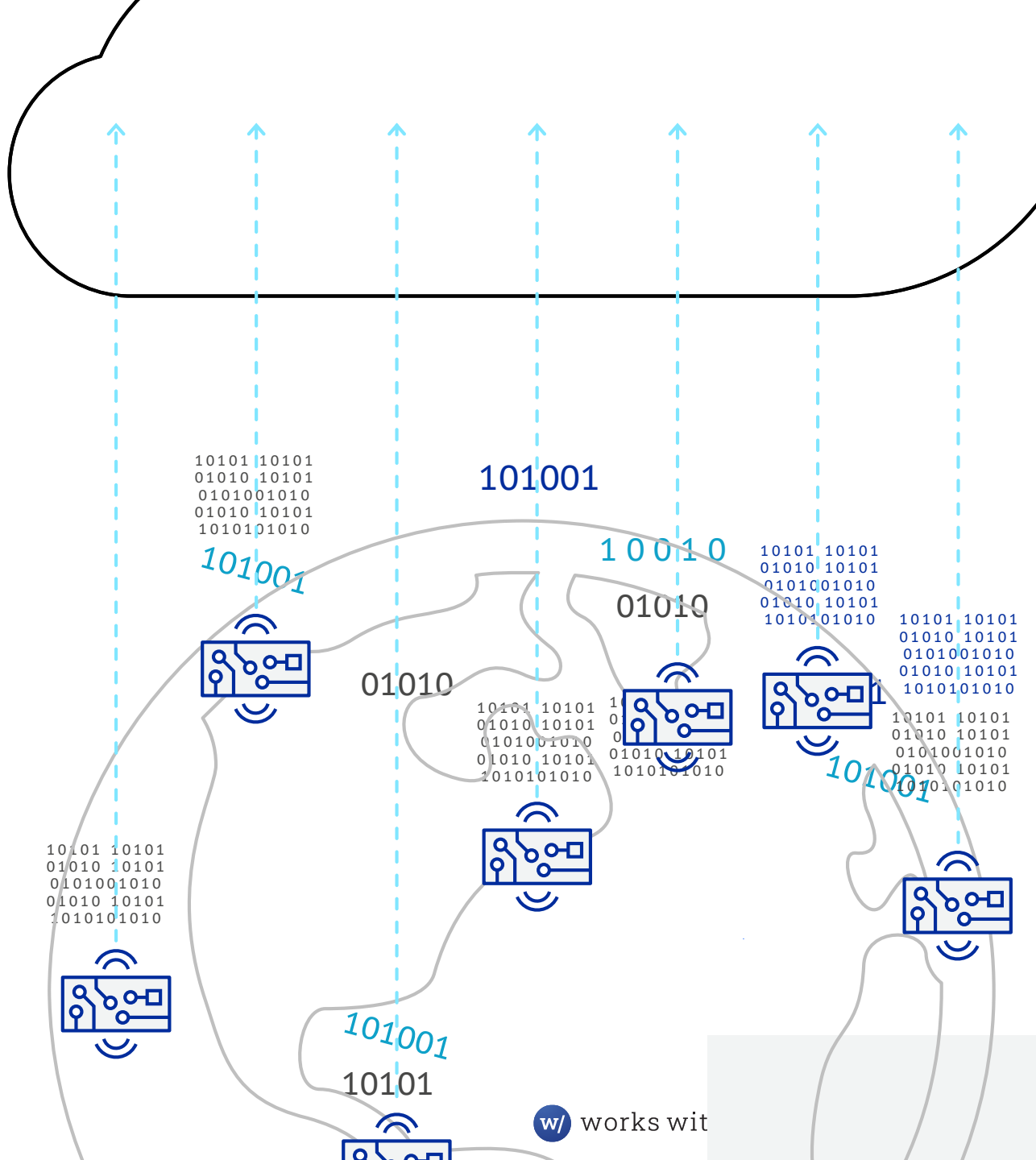
Configure the logging level on a per device basis or on a group of devices

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

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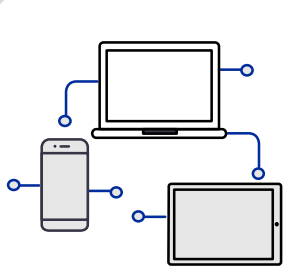
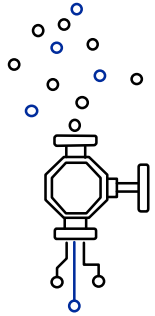
AWS IoT Analytics

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



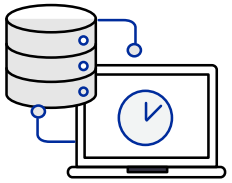
Collect

Collect only the data you want to store & analyze



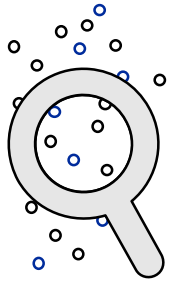
Process

Convert raw data to meaningful information



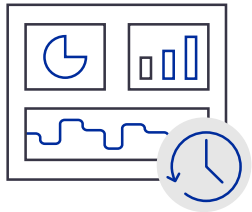
Store

Store device data in time-series data store for analysis



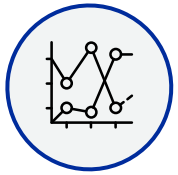
Analyze

Get deeper insight into the health & performance of assets



Visualize

Quickly visualize your IoT data sets



Analytics Services

Collect

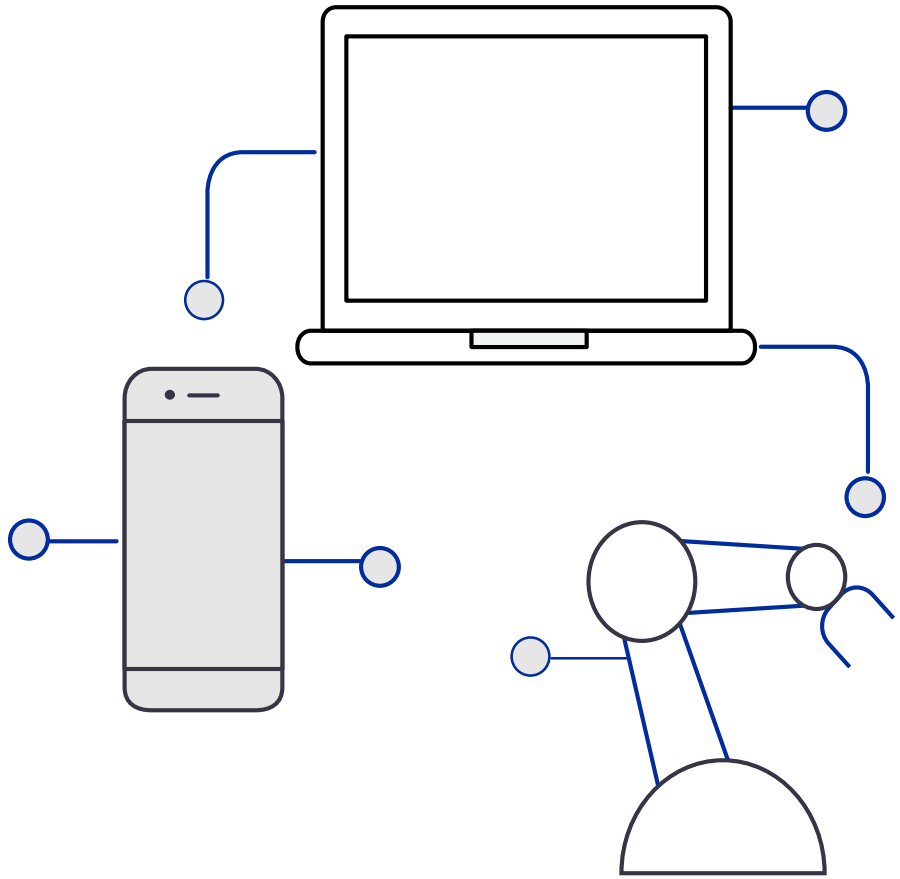
Collect equipment data you want to store and analyze

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

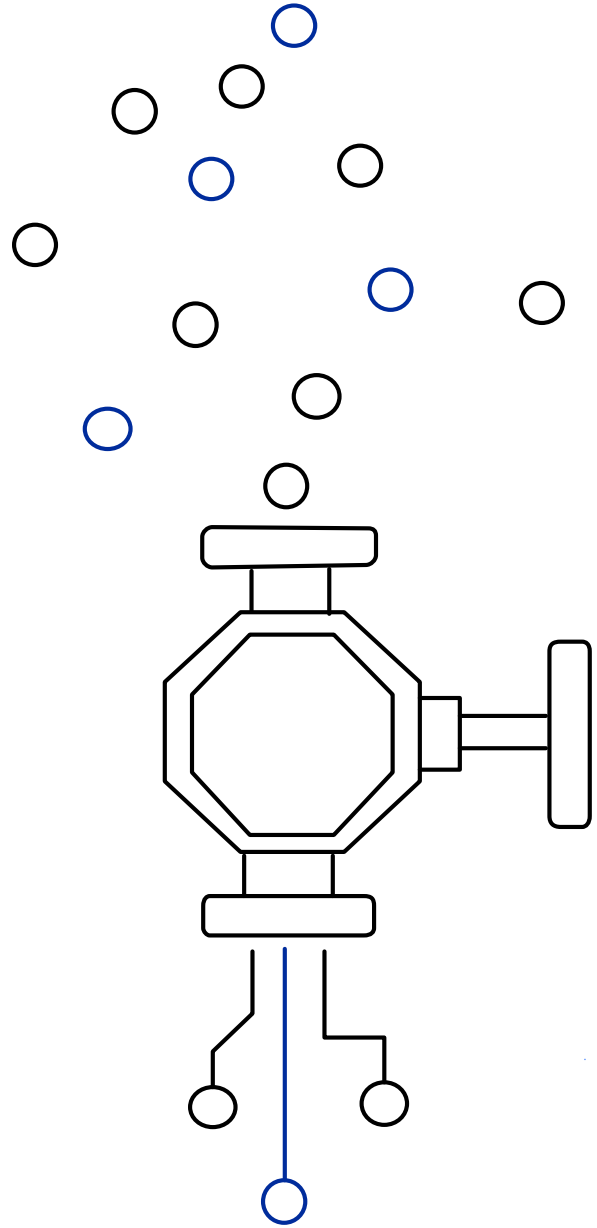
Conditionally purge messages to remove outliers and erroneous/irrelevant data

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

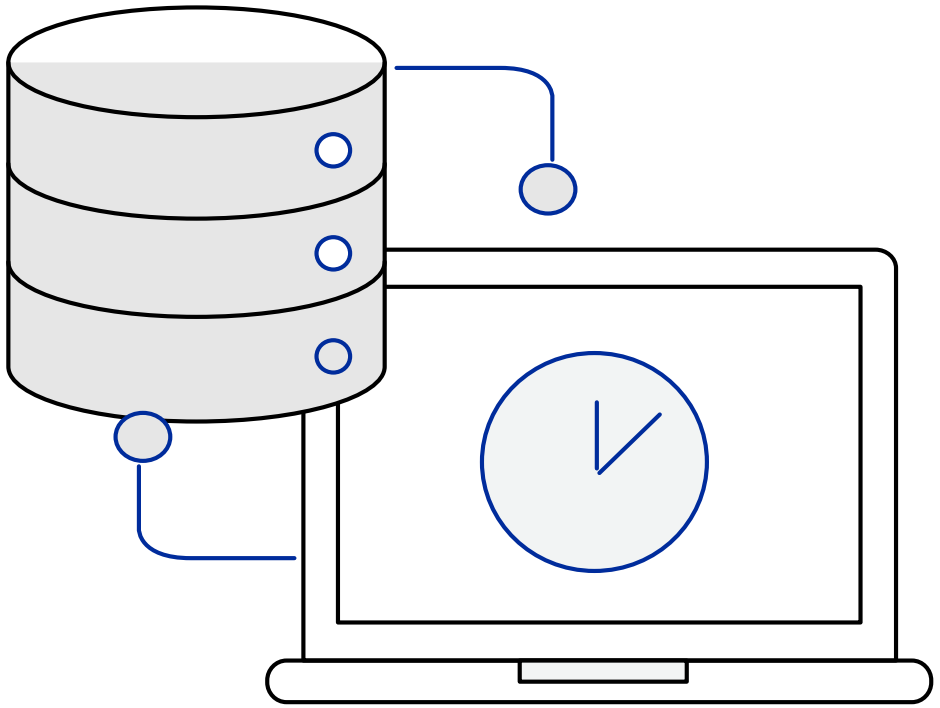
Store device data in time-series optimized data store

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

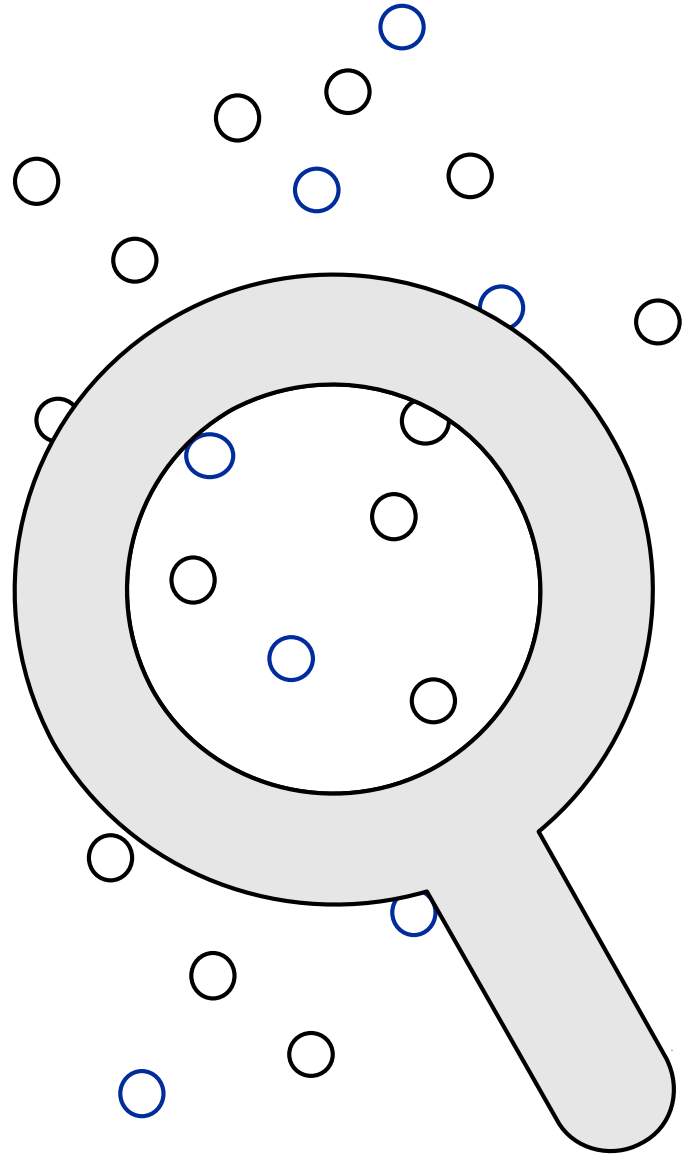
Schedule your queries to run at a 1-minute granularity

Process late data and re-compute results

Execute custom analysis or Jupyter notebooks through scheduled compute

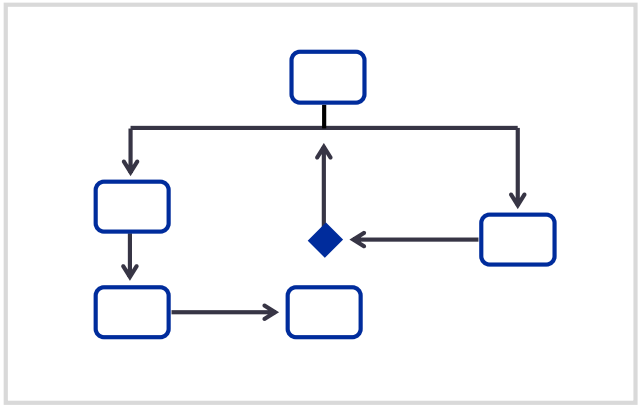
Visualize results in Amazon QuickSight dashboards

Perform stateful analysis on your data

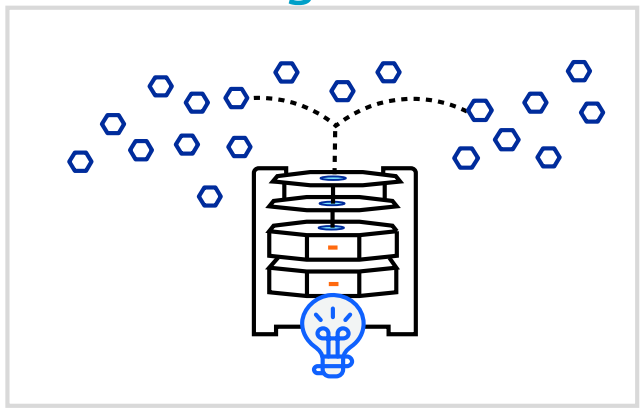


AWS IoT Events

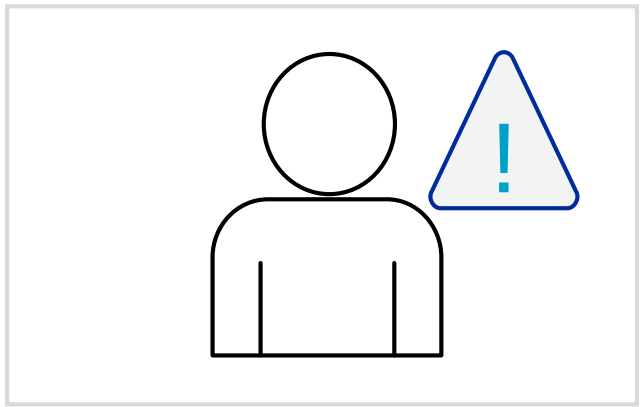
AWS IoT Events is a managed service that continuously monitors data from your equipment to identify their state, detect changes and trigger the appropriate responses when changes occur



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



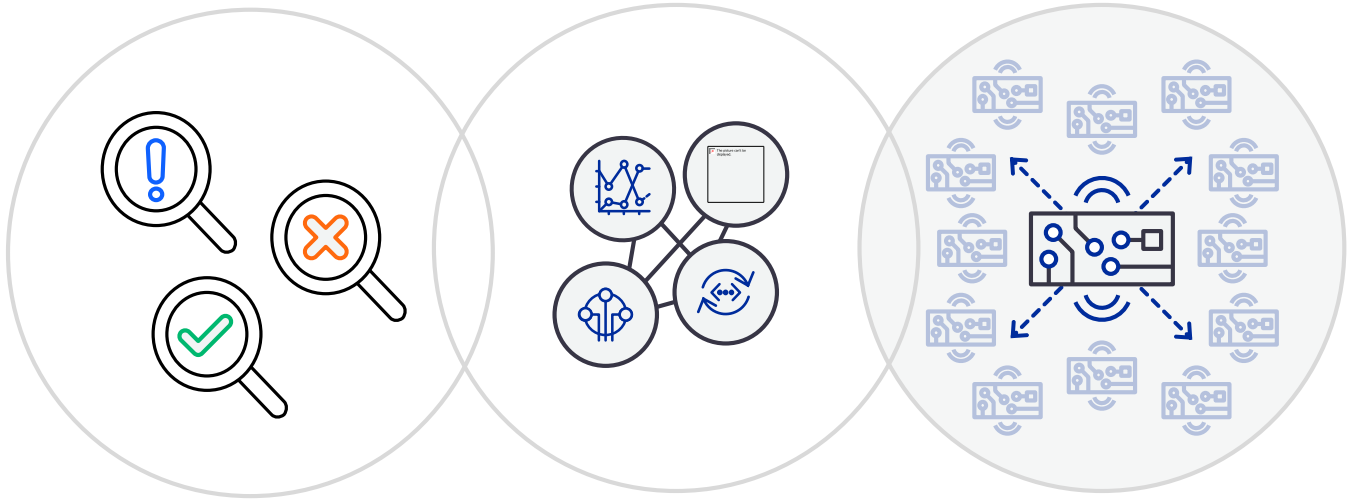
Detect events from data across thousands of sensors and other sources



Trigger responses to optimize operations

Analytics Services

AWS IoT Events



Event Detector Models and Alarms

Reduce the cost of device maintenance

Trigger actions to other AWS services

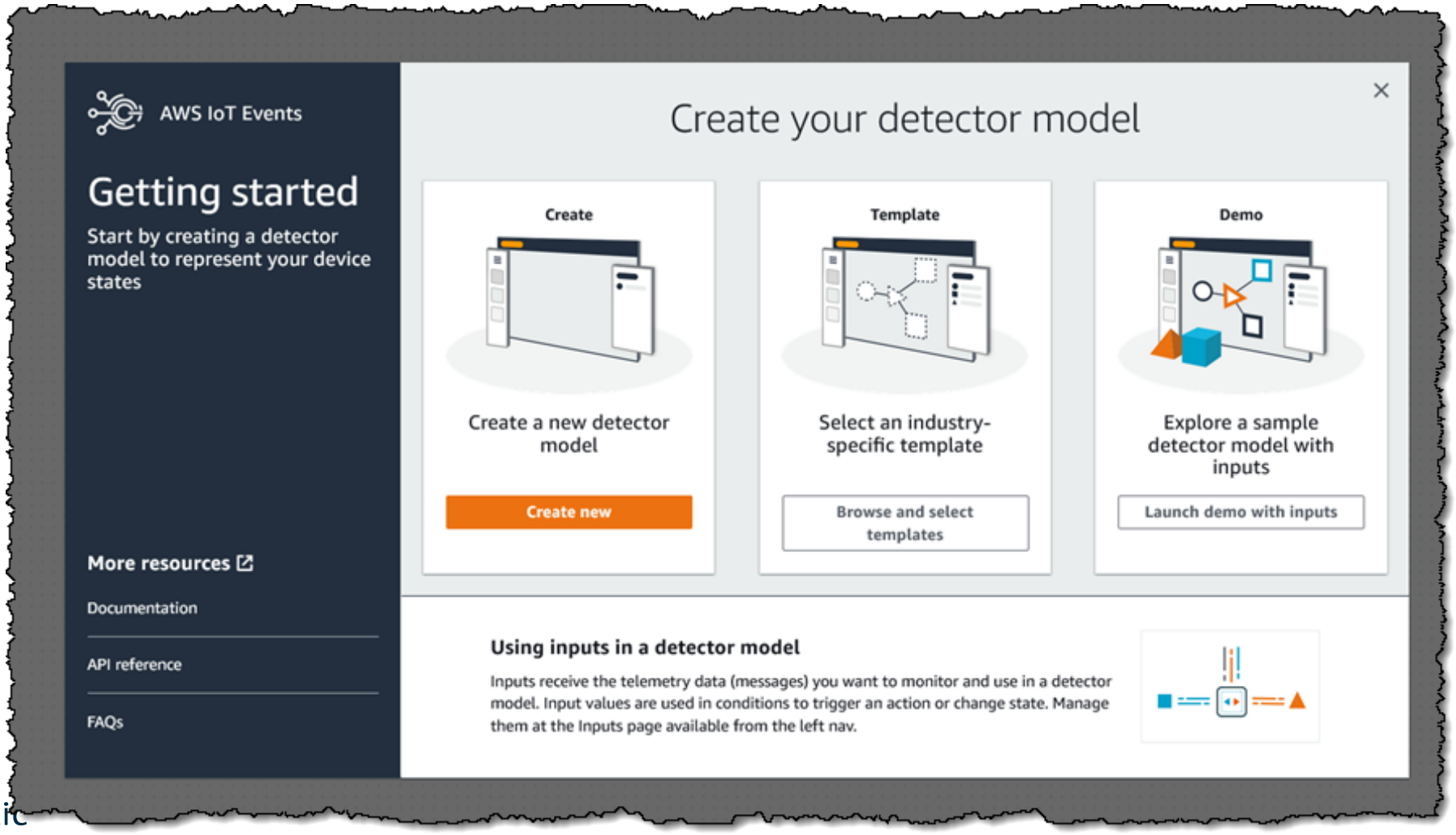
Uncover new insights and trigger actions

Auto-scale for your entire fleet

Easily automate operations

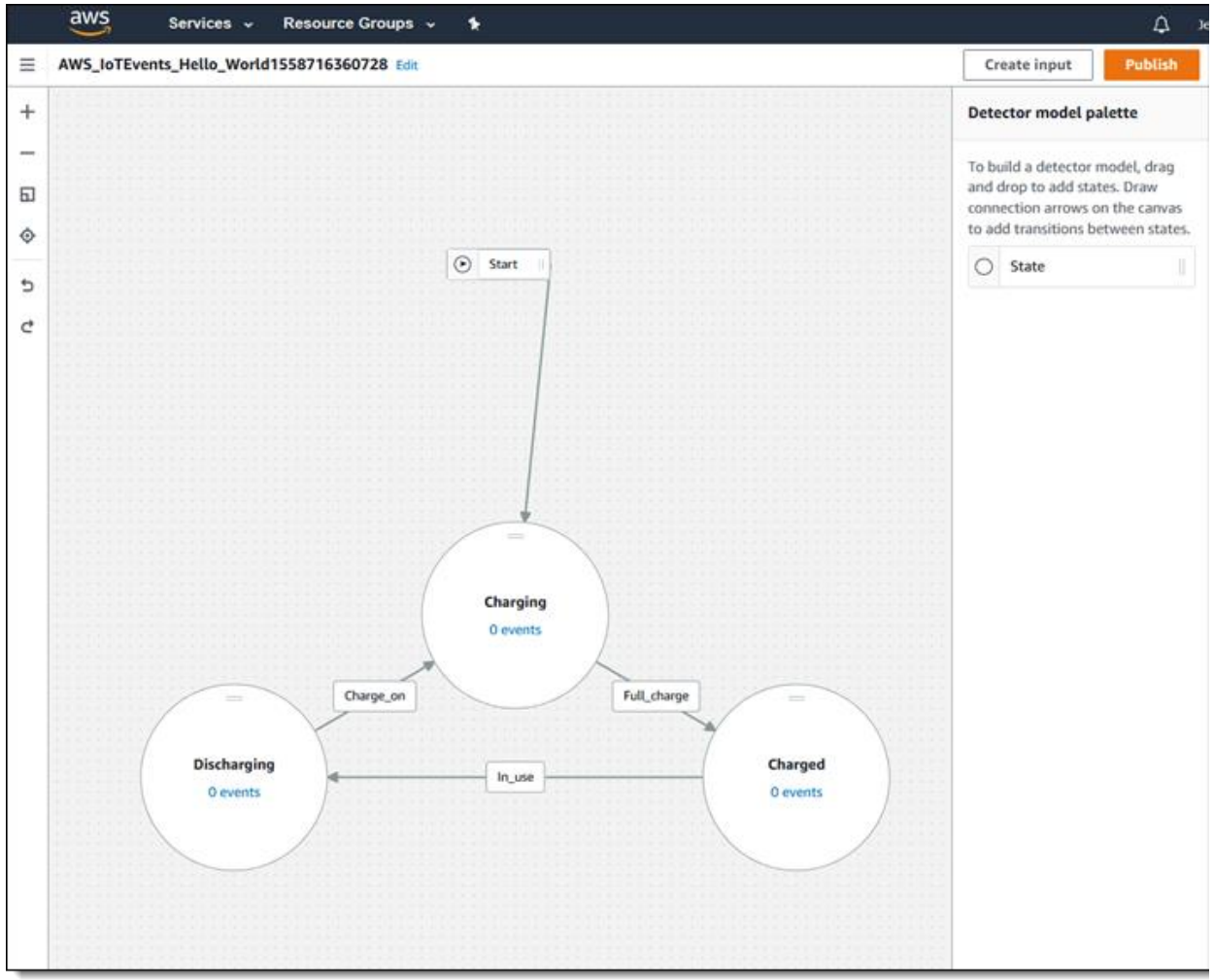
Analytics Services

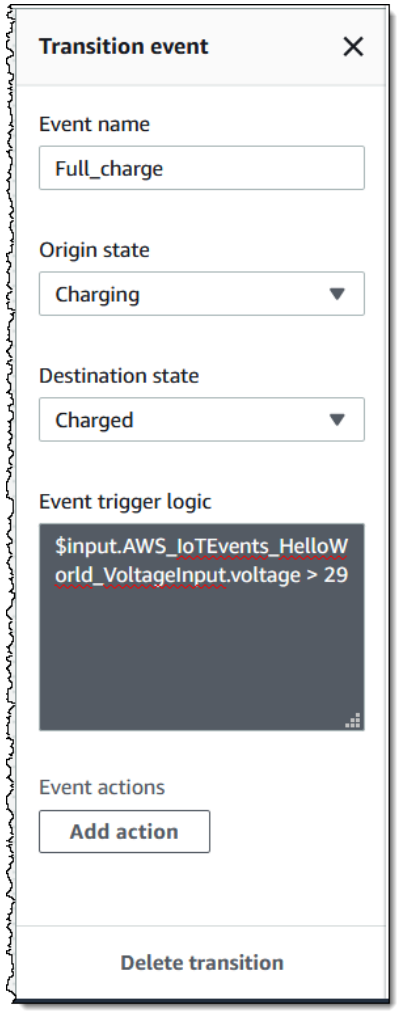
AWS IoT Events



Analytics Services

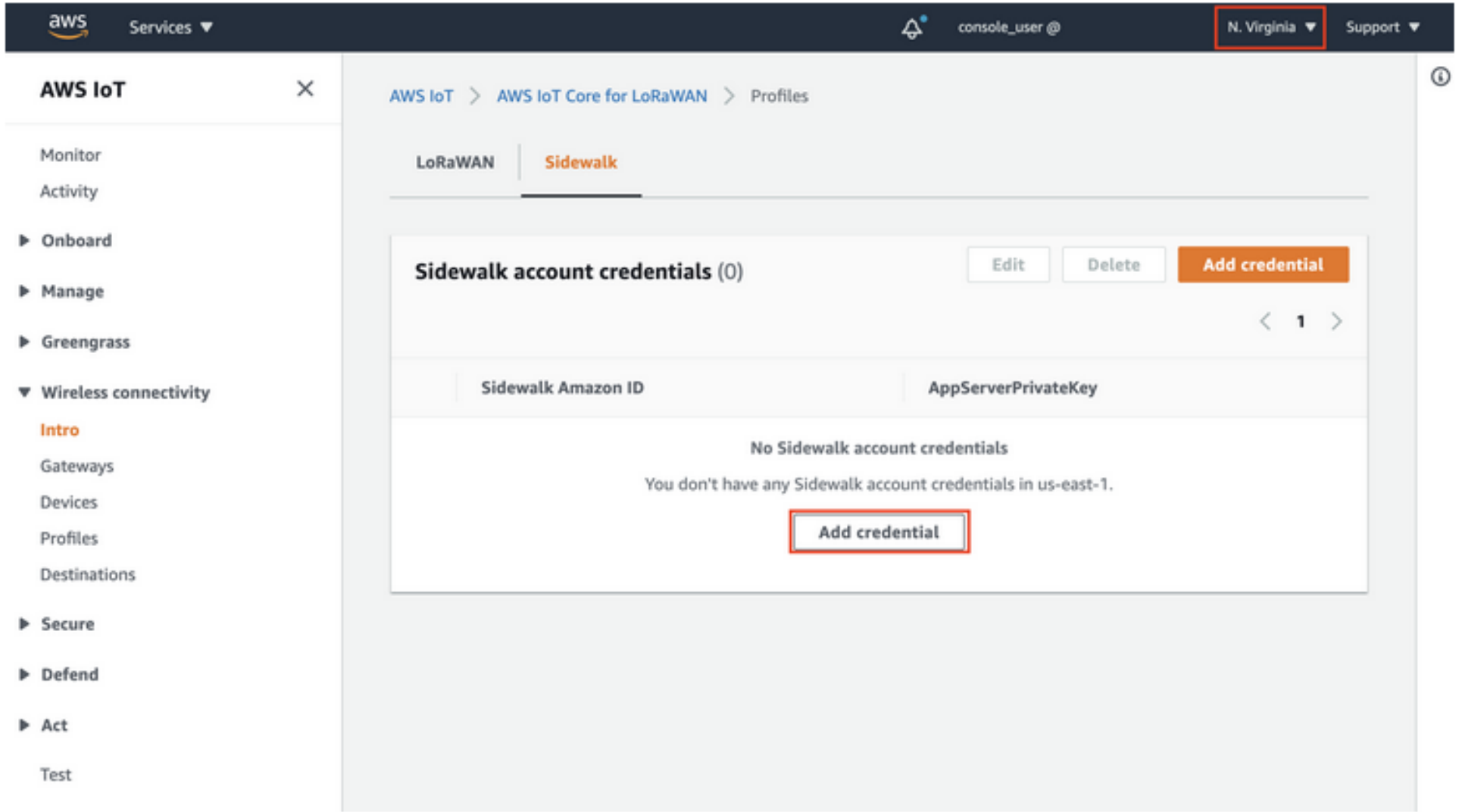
AWS IoT Events



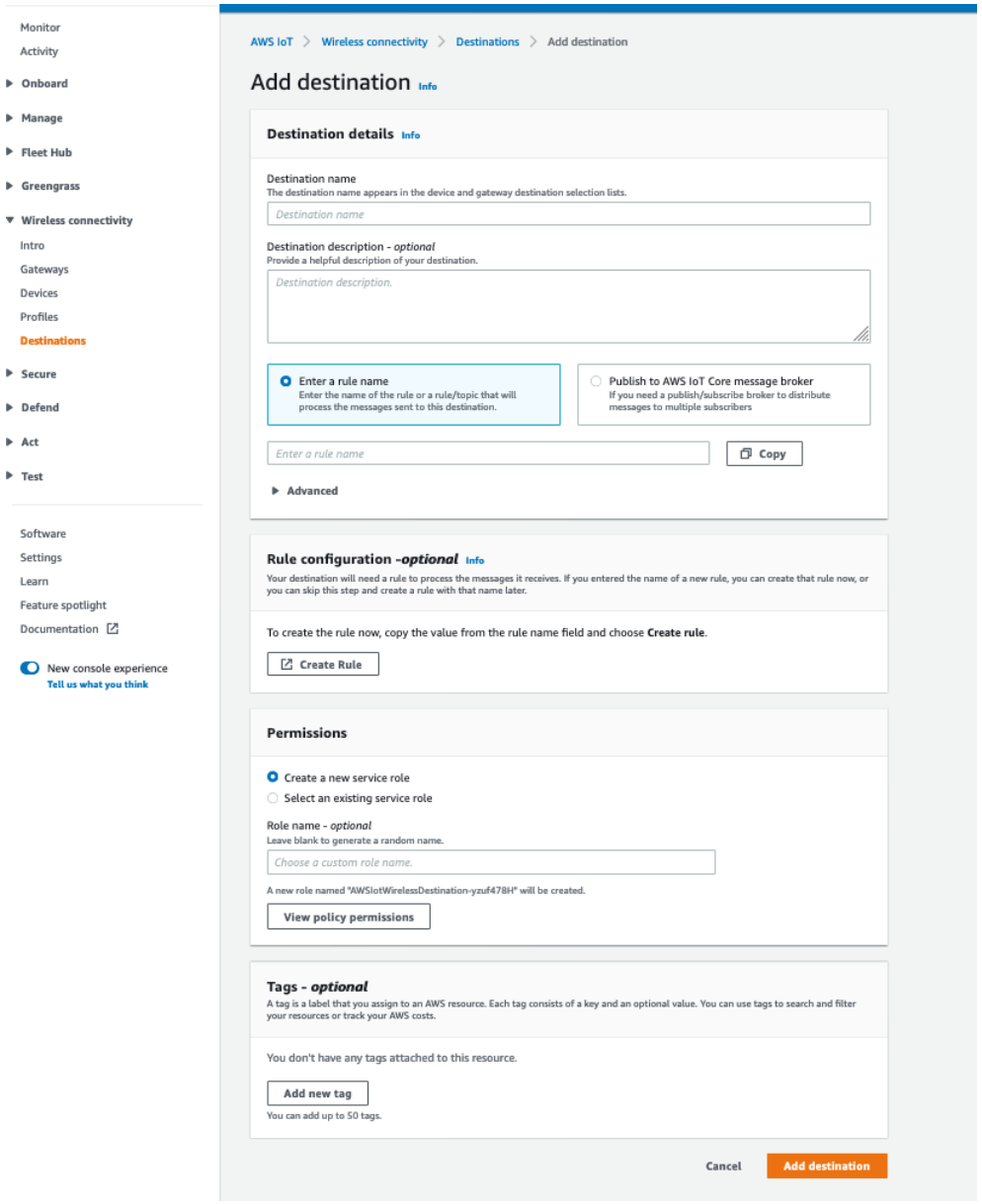


Analytics Services

AWS IoT Core



AWS IoT Core



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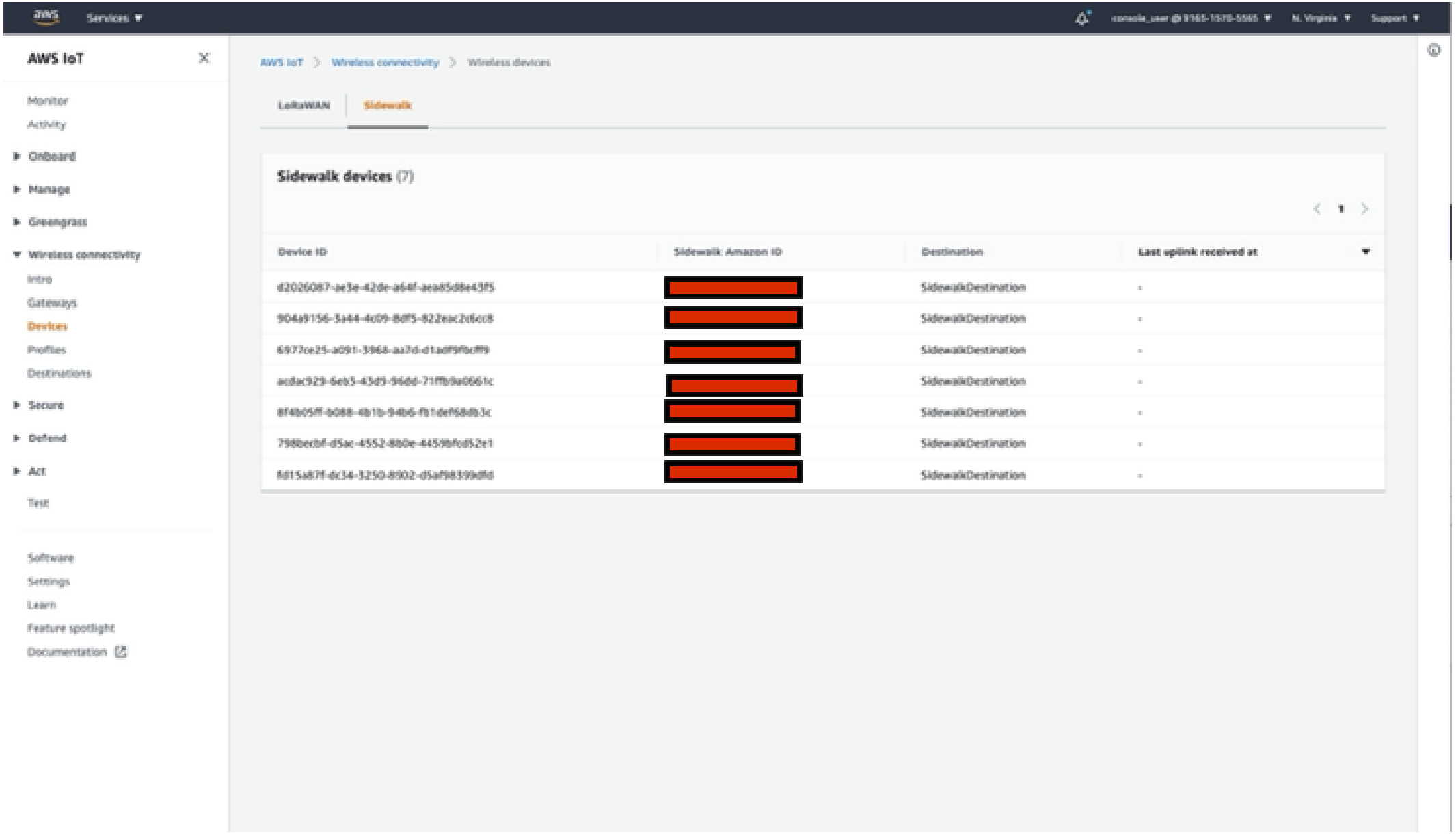
AWS IoT Core



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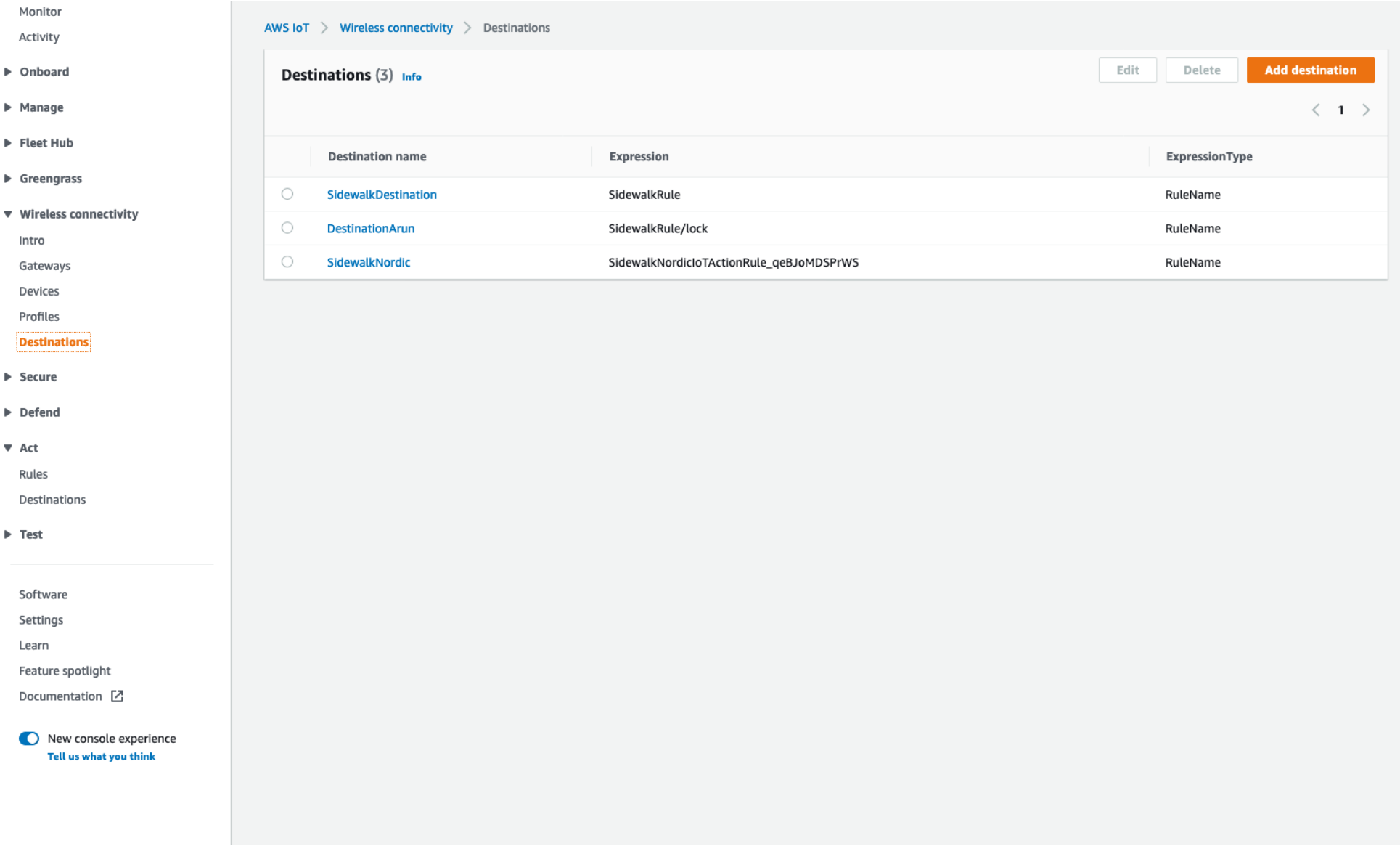
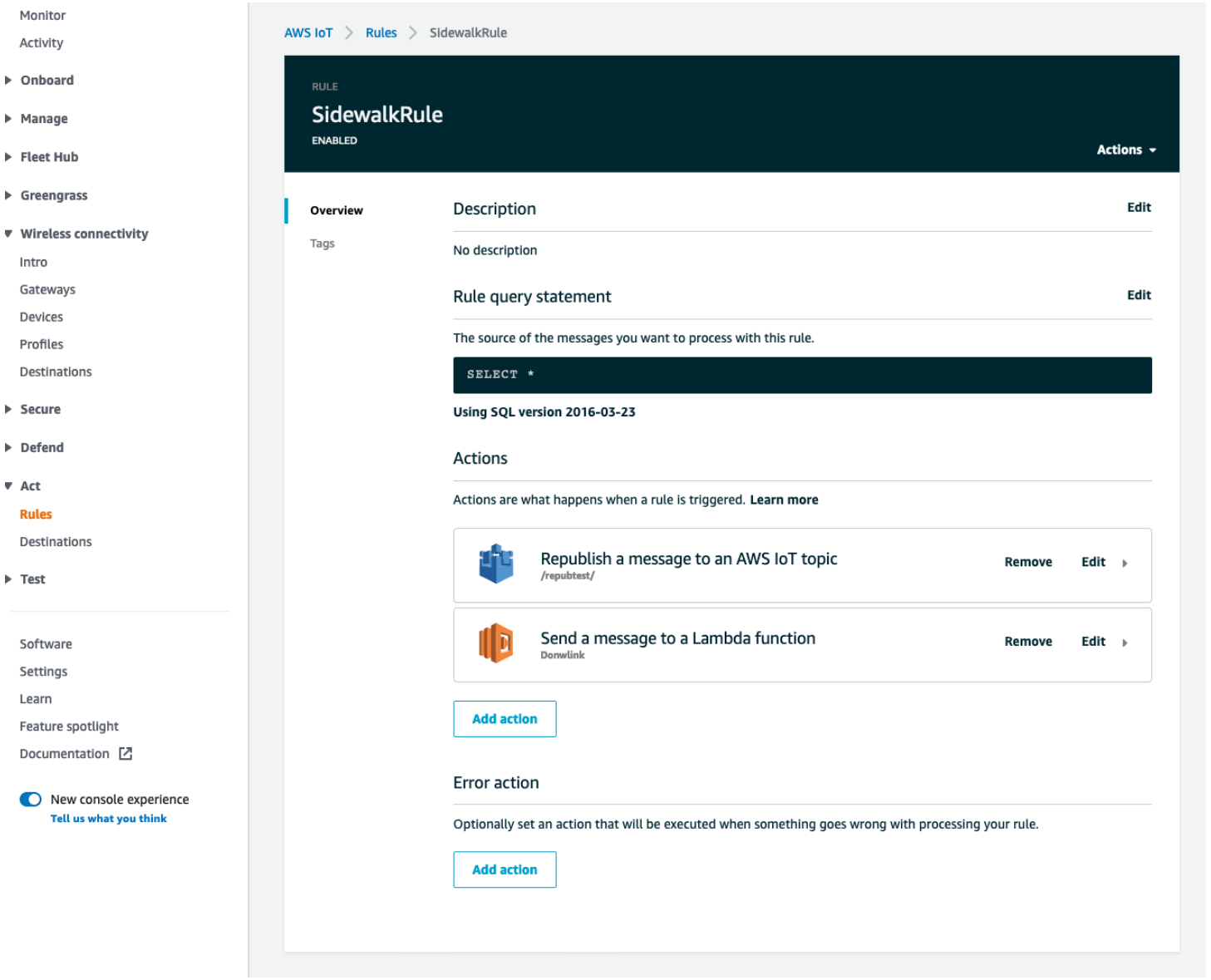


AWS IoT Core



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

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