AWS re:Invent

IOT208

What's new with AWS IoT analytics services?

Deepak Sury
Product Manager, AWS IoT
Amazon Web Services

Saras Kaul
Product Manager, AWS IoT
Amazon Web Services

AWS re:Invent

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

aws

AWS IoT architecture



How can I extract value from my IoT data?

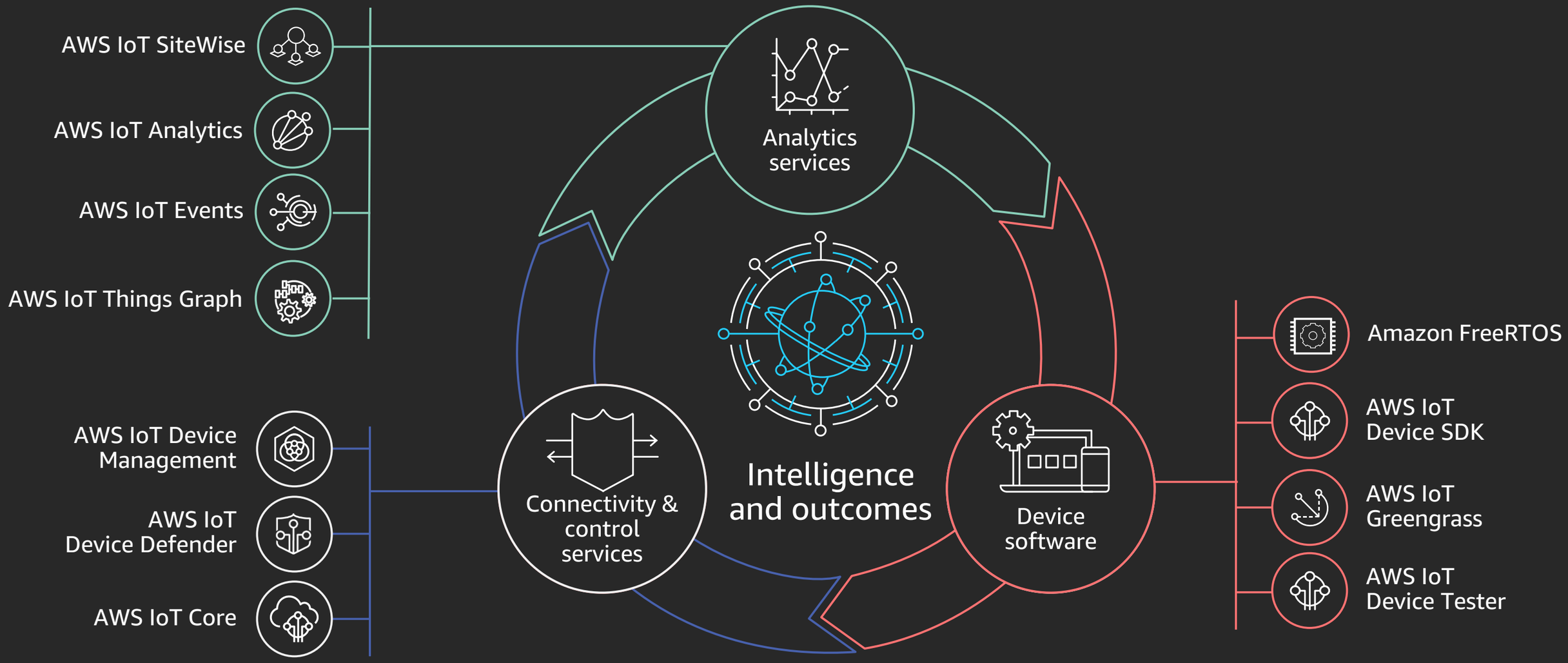


How can I connect, control, manage, and secure my devices?

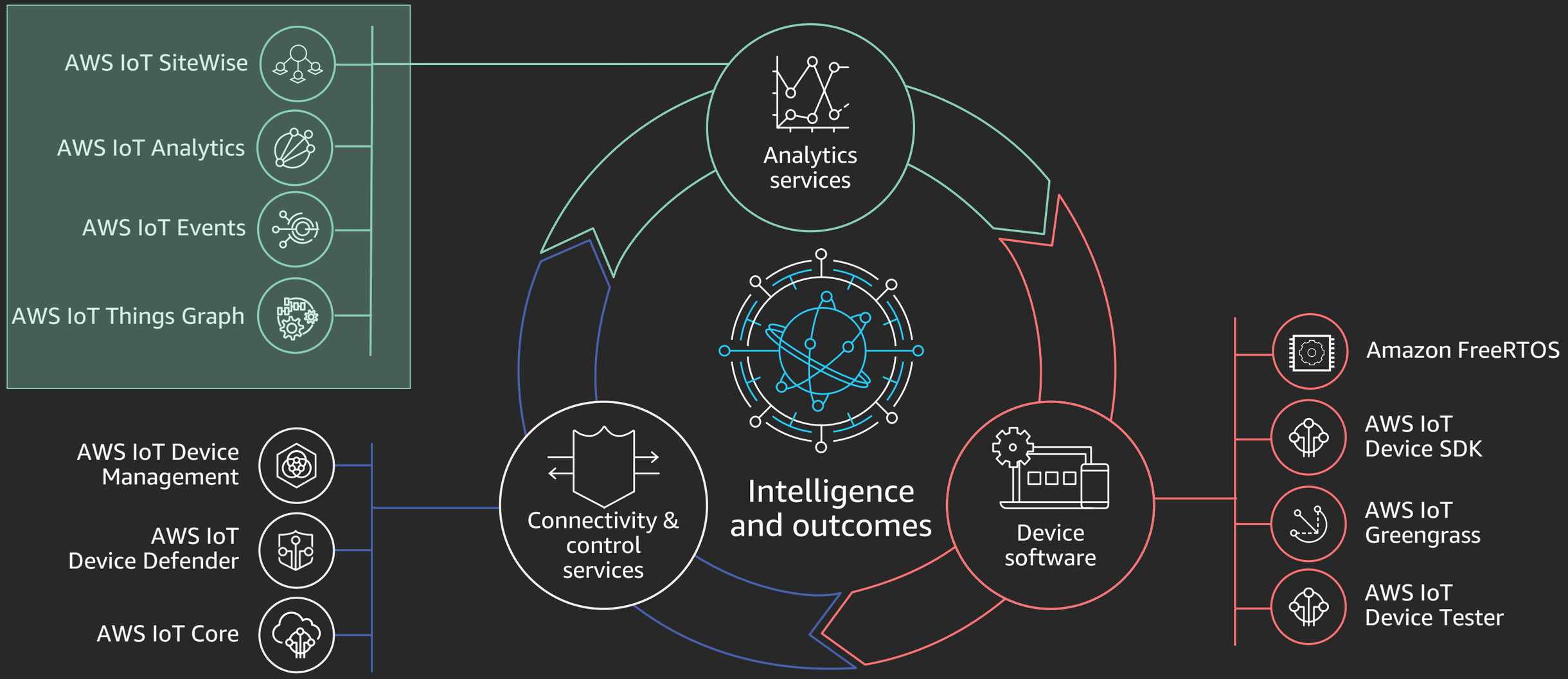


How can I build devices that work with AWS and operate at the edge?

IoT virtuous cycle



IoT virtuous cycle



Session map

Q1: Why IoT analytics services?

Q2: Who needs IoT analytics services?

Q3: What capabilities are needed for IoT analytics?

Q4: How do we address these requirements, and what’s new?

Session Map

Q1: Why IoT analytics services?

Q2: Who needs IoT analytics services?

Q3: What capabilities are needed for IoT analytics?

Q4: How do we address these requirements, and what’s new?

Why IoT analytics services?



Healthcare



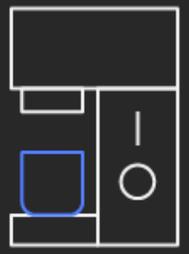
Agriculture



Connected Factory



Connected Vehicle



Smart Home



Smart City



Oil and Gas

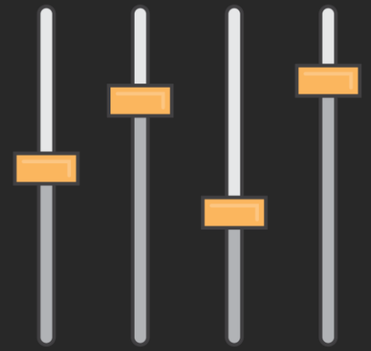


Logistics

Why IoT analytics services?



Lower costs



Increase efficiency



Better customer experience

Why IoT analytics services?



x N



Analysis at scale



Insights and actions

Why IoT analytics services?

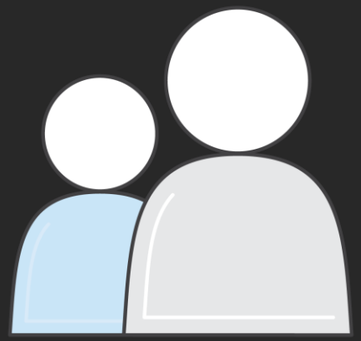






Automate
analysis & actions

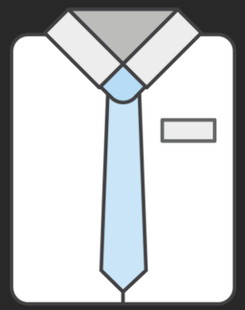
Who needs IoT analytics services?



Line of business developers



Operators



Data analysts

What capabilities are needed for IoT analytics?



Volume and
rate of data



Real-time data
& cold data

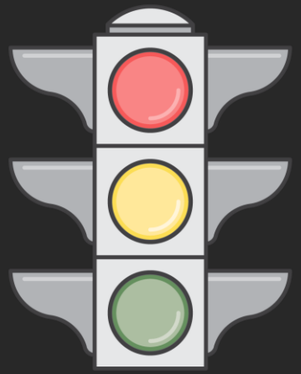


Context of
machines

What capabilities are needed for IoT analytics?



Collect machine data



Many protocols
MQTT, OPC-UA, Modbus, etc.

What capabilities are needed for IoT analytics?



Attach machine context to data
(before or after data is ingested)

What capabilities are needed for IoT analytics?



Calculate metrics

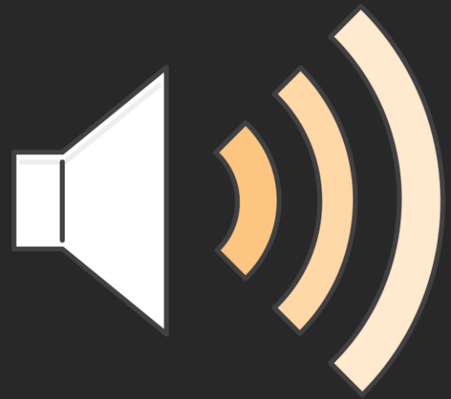


Observe

What capabilities are needed for IoT analytics?

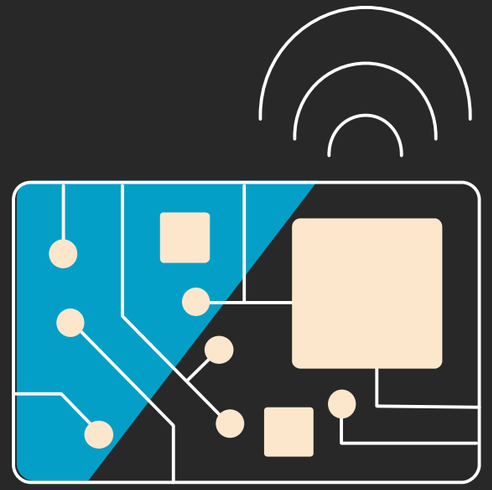


Root cause issues



Alarms

What capabilities are needed for IoT analytics?



At the edge

Session map

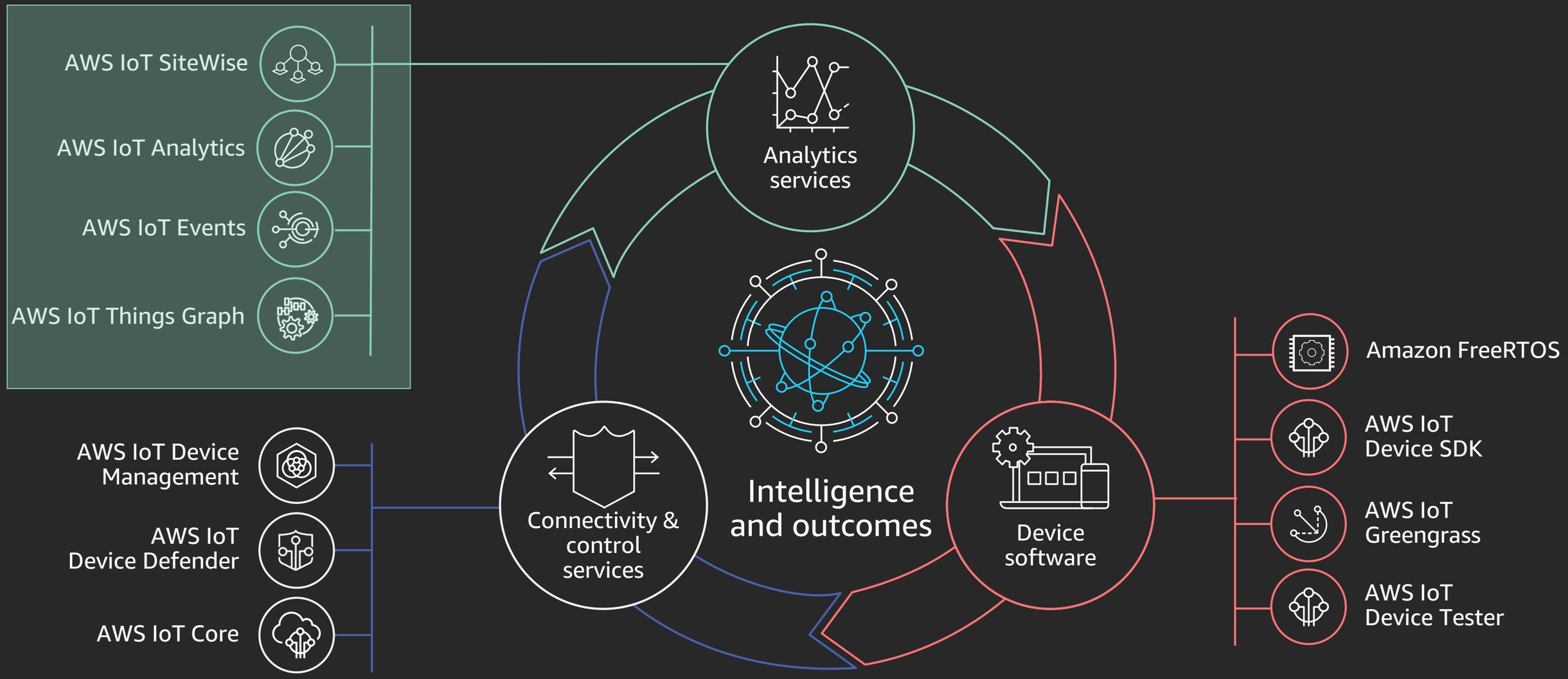
Q1: Why IoT analytics services?

Q2: Who needs IoT analytics services?

Q3: What capabilities are needed for IoT analytics?

Q4: How do we address these requirements, and what’s new?

IoT virtuous cycle



AWS IoT SiteWise

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Focus on making things (smartly)



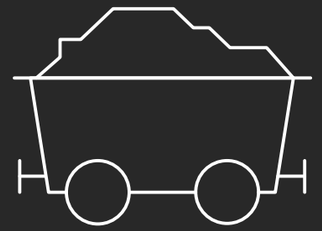
Connected Factory



Agriculture



Oil and Gas



Mining



Healthcare

AWS IoT SiteWise





Ingest data from equipment and historian databases, across all facilities using OPC-UA and MQTT protocols.



AWS IoT SiteWise

Collect, organize, store and visualize industrial data



Model

Collect on-premises equipment data and create virtual representations of facilities and physical assets.



Store

Store asset data in a time series database, query and stream structured IoT data to access asset information.



Monitor

Create fully managed web applications to visualize real time and historical equipment data, with no coding.



Predictive quality



Asset condition monitoring



Predictive maintenance

Consume asset data to create custom applications that optimize factory output quality, maximize asset utilization and identify equipment maintenance issues.

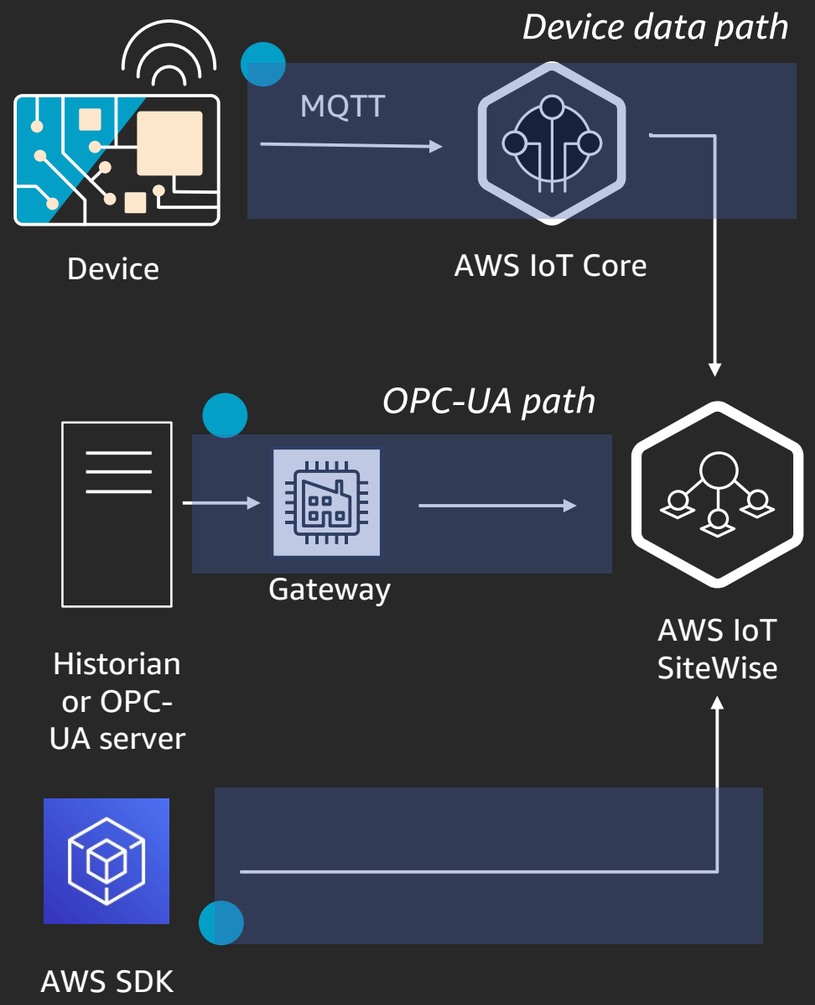
Ingest data

- Collect data from devices and historians across all sites

- Send data to AWS IoT SiteWise from AWS IoT Core and through PUT APIs *New!*

- Supports MQTT and OPC-UA protocols *New!*

- Remotely manage edge gateways



Model assets

Static descriptions

Raw data, time/quality/value

Translate measurements

Compute metrics

```
Model name: Machine
Property {
    Attribute { Name: string }
    Measurement{ Widget Output: INTEGER}
    Measurement { Temperature_in_C: FLOAT}
    Transform {
      Temperature_in_F: FLOAT;
      value = 9/5 * tempC + 32
      }
    Metric {
      Efficiency: FLOAT;
      value = Widget Output/Capacity
      window = 1 hour
      }
}
```

Add model hierarchy

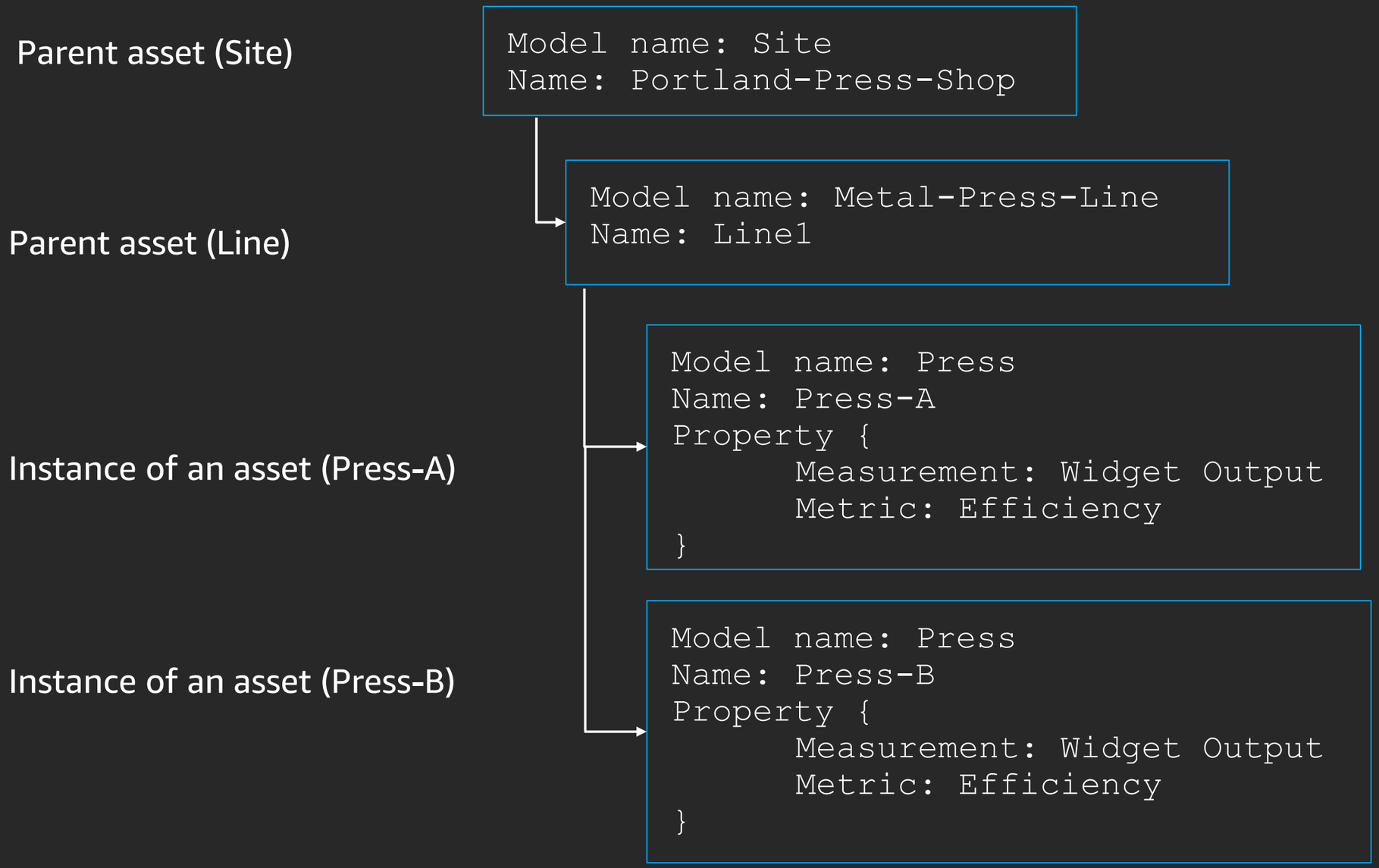
New!

```
Model name: Site
Name: string
```

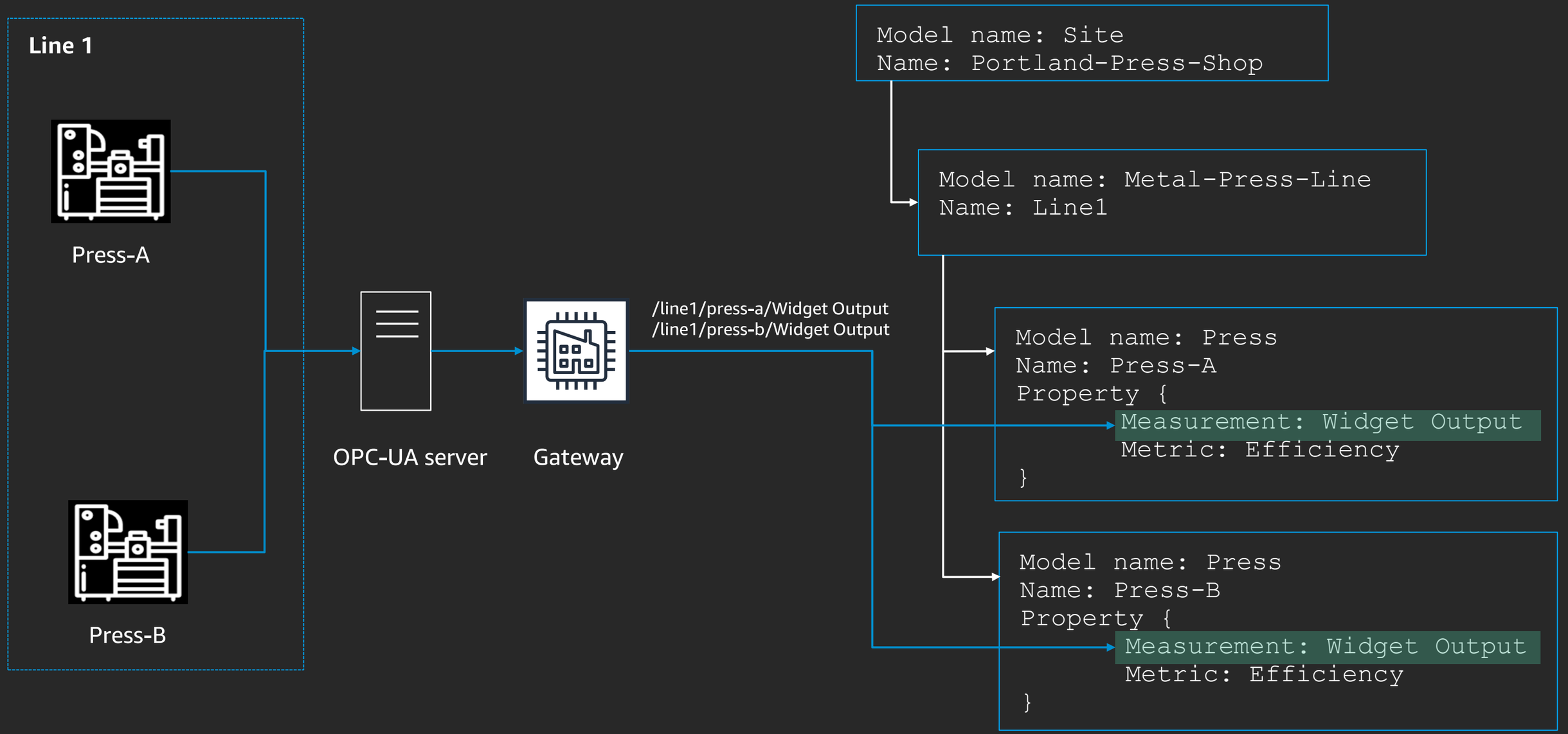
```
Model name: Metal-Press-Line
Name: string
```

```
Model name: Machine
Name: string
Property {
  Measurement: Widget Output
  Metric:
     Efficiency = Widget Output/Capacity
}
```

Create instances from model



Link measurements to assets



Store time-series data

- Scalable, performant, and managed time-series data store
- No capacity planning or provisioning needed
- Low latency access to equipment data and computed metrics

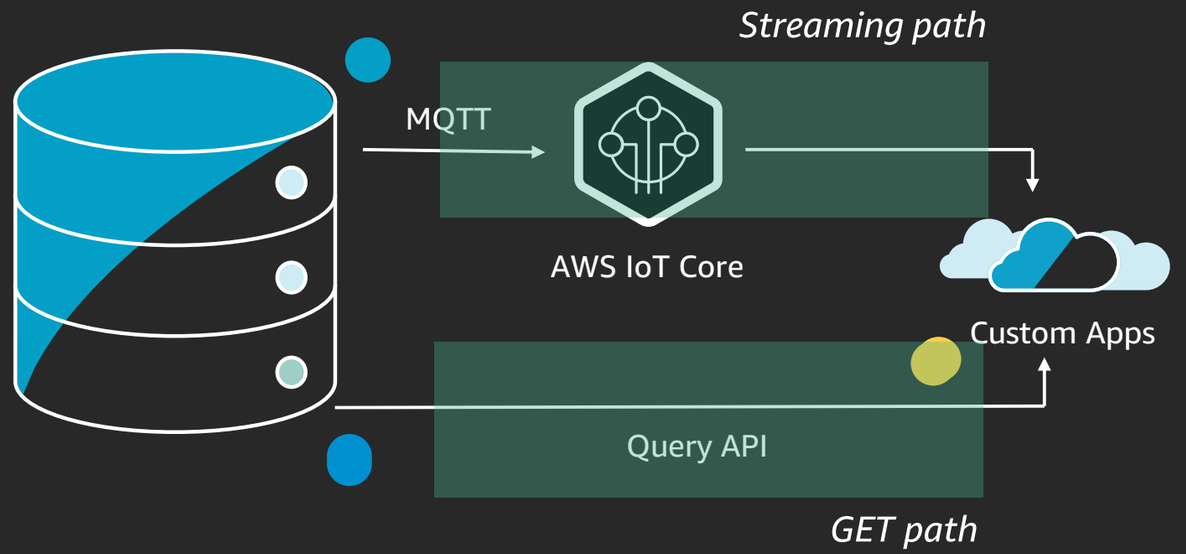


Retrieve data

New!

- Publish-subscribe interface streams updates to asset properties to an MQTT topic

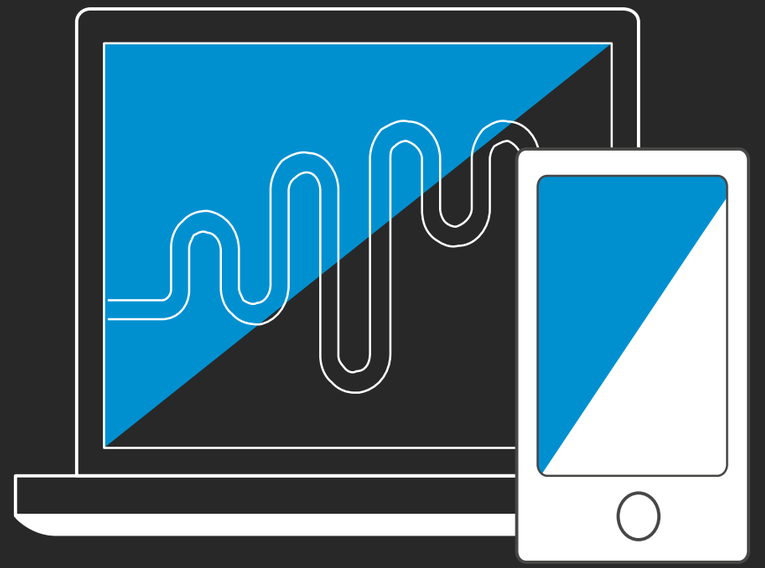
- GET APIs to query historical values of properties and metrics



AWS IoT SiteWise Monitor

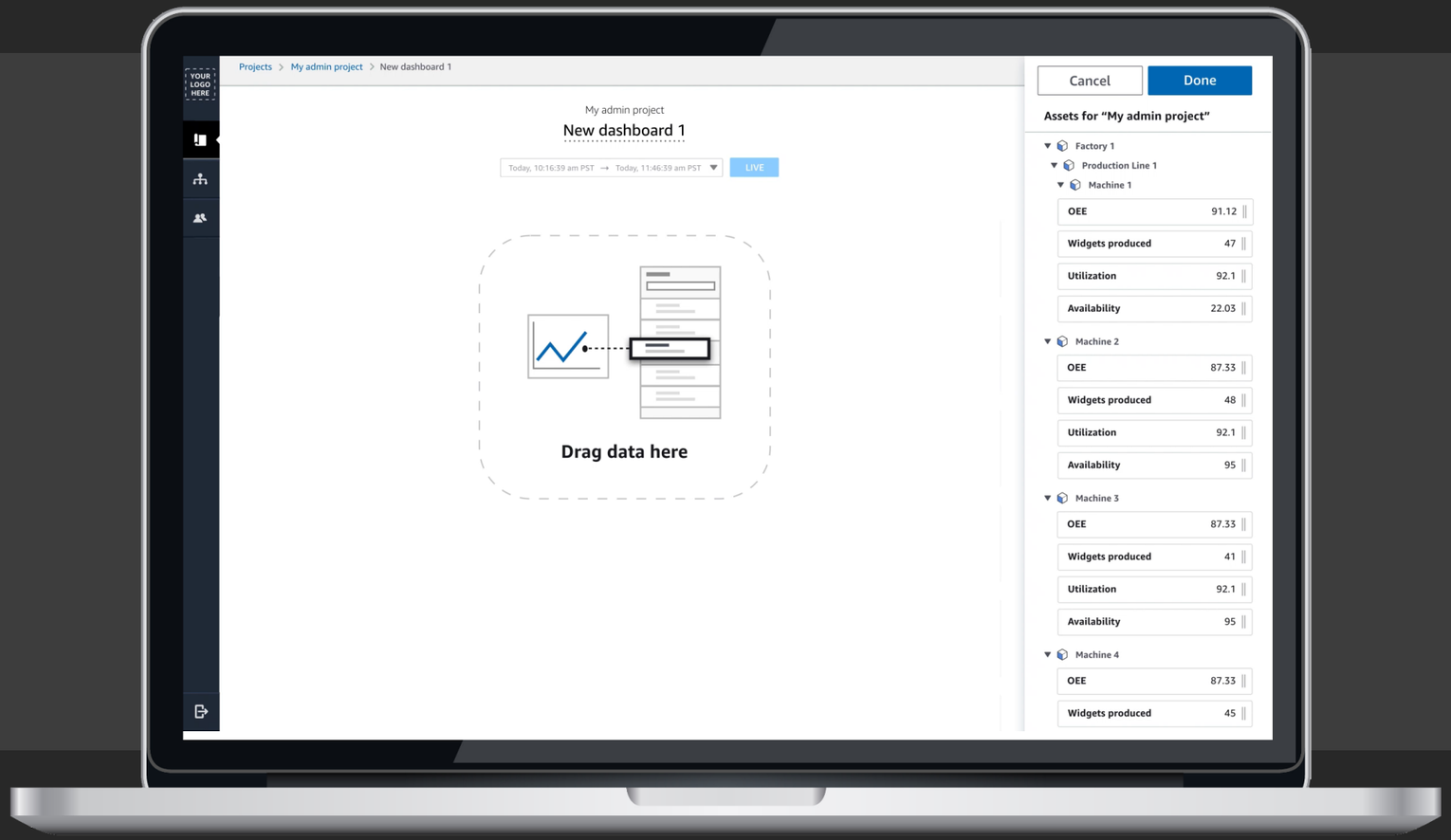
New!

- Managed web applications to visualize asset data
- Use AWS SSO for single sign-on with Active Directory or built-in credentials
- Discover assets and instantly visualize live and historical asset data through charts
- Create dashboards to organize and share asset data with other users



AWS IoT SiteWise Monitor

Create a fully managed web application for visualizing and interacting with operational data from devices and equipment connected to AWS IoT SiteWise



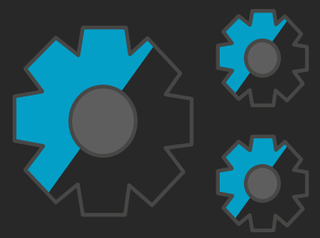
Updated pricing for AWS IoT SiteWise

Messaging



$1 per million messages

Data processing



$0.50 per million computations

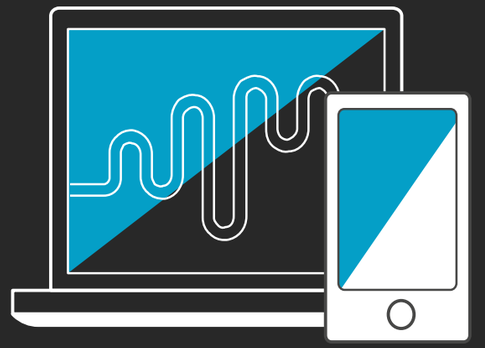
Storage



$0.01/GB-day

Warm storage

AWS IoT SiteWise Monitor



$10 per unique active user per month

Crop Science

Problem

18% of all food produced globally is lost in manufacturing. Bayer's Crop Science group is looking to reduce this wastage by building capabilities to monitor each phase of the process individually for wasteful equipment and product quality issues

Solution

AWS IoT SiteWise enables plant operators at Bayer’s crop processing sites to monitor equipment performance. By tracking Overall Equipment Efficiency (OEE) within each site, and allowing comparisons across sites, Bayer is able to identify abnormal wastage and tune equipment performance to reduce this wastage

Impact

Bayer is able to monitor and report on OEE across nine North American crop processing sites during the 2019 harvest season, and can easily identify under-performing equipment and processes



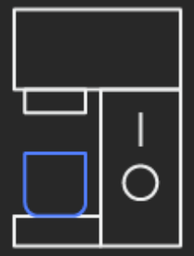
Launch your own demo

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

AWS IoT Analytics

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Focus on operating products (smartly)



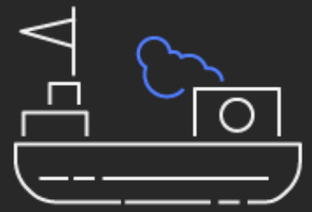
Smart Home



Smart City

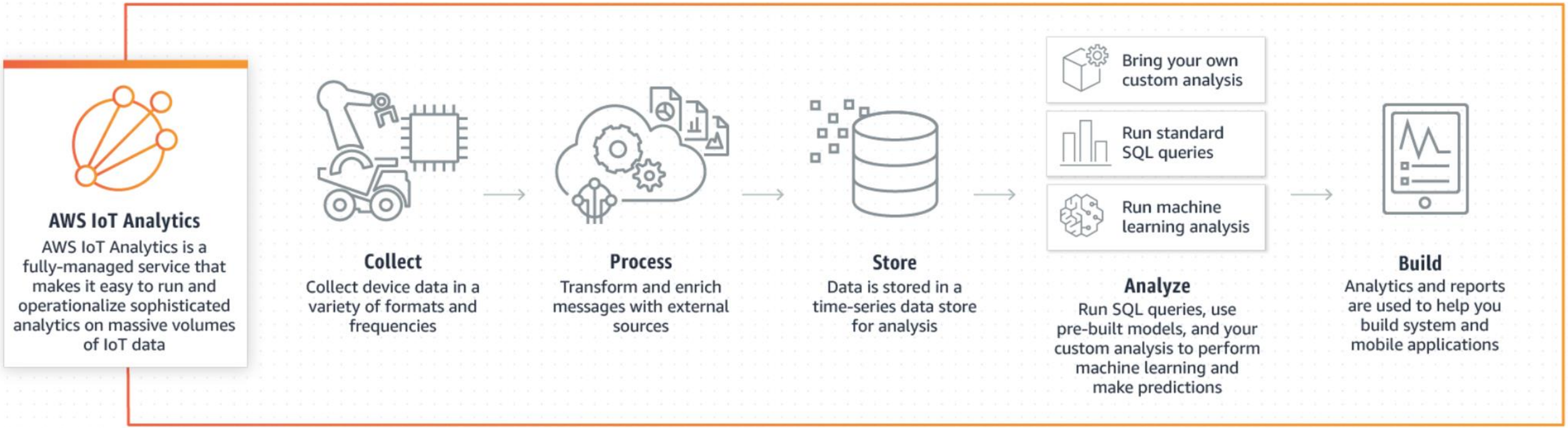


Connected Vehicle



Logistics

AWS IoT Analytics



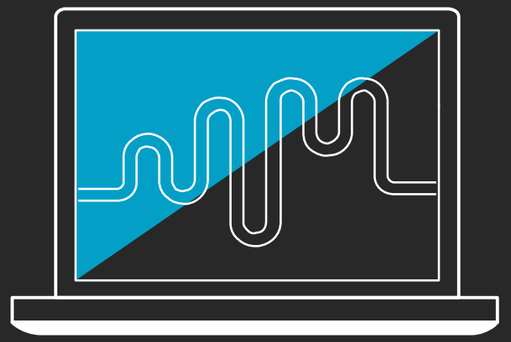
AWS IoT Analytics: What's new?



New!

Single-step AWS IoT Analytics pipeline setup

AWS IoT Analytics: What's new?



New!

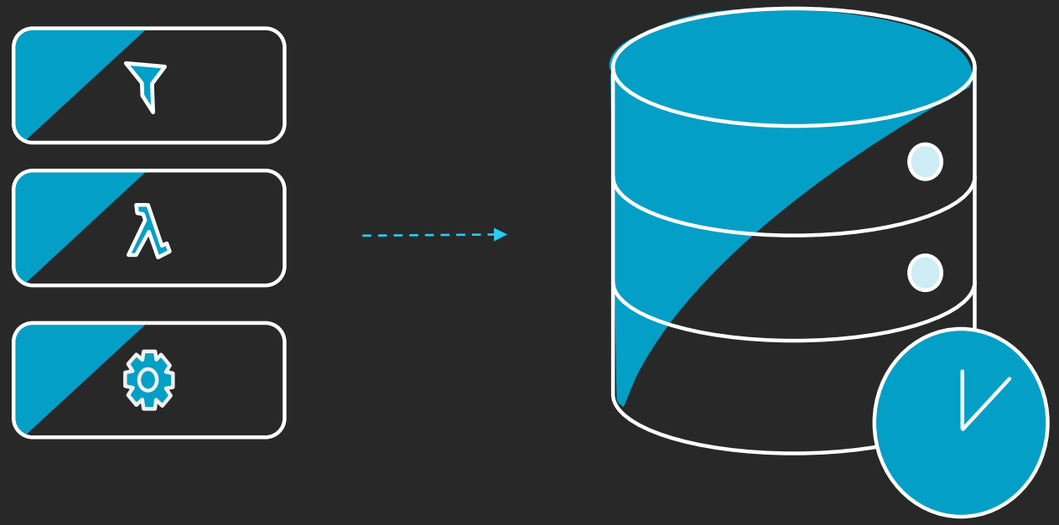
Monitor channel and pipeline activity



New!

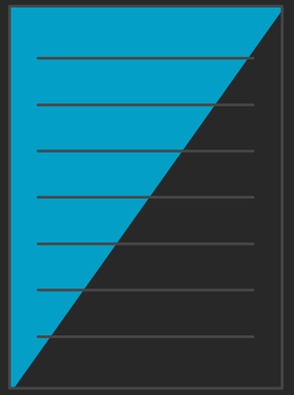
Interactive query editor in AWS Management Console

AWS IoT Analytics: What's new?



Customer Amazon S3 bucket for channel store, data sets *New!*

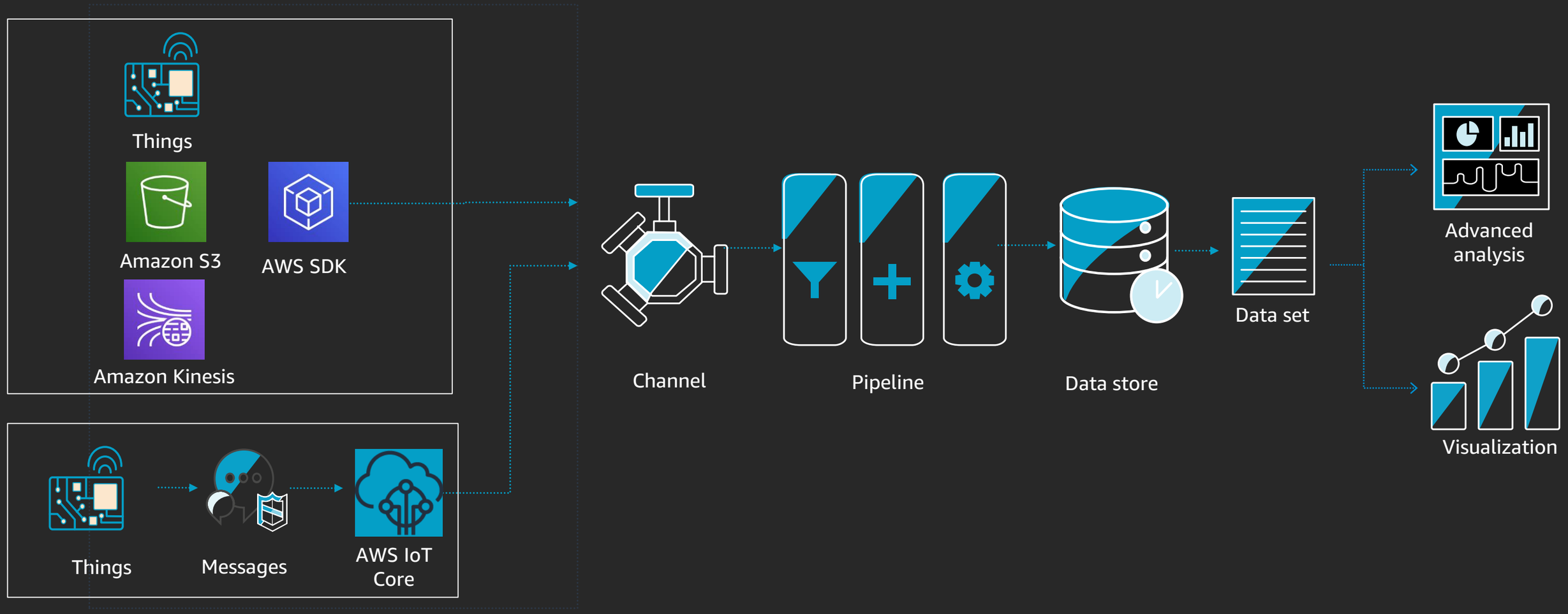
AWS IoT Analytics: What's new?



New!

Refresh data sets at
1-minute granularity

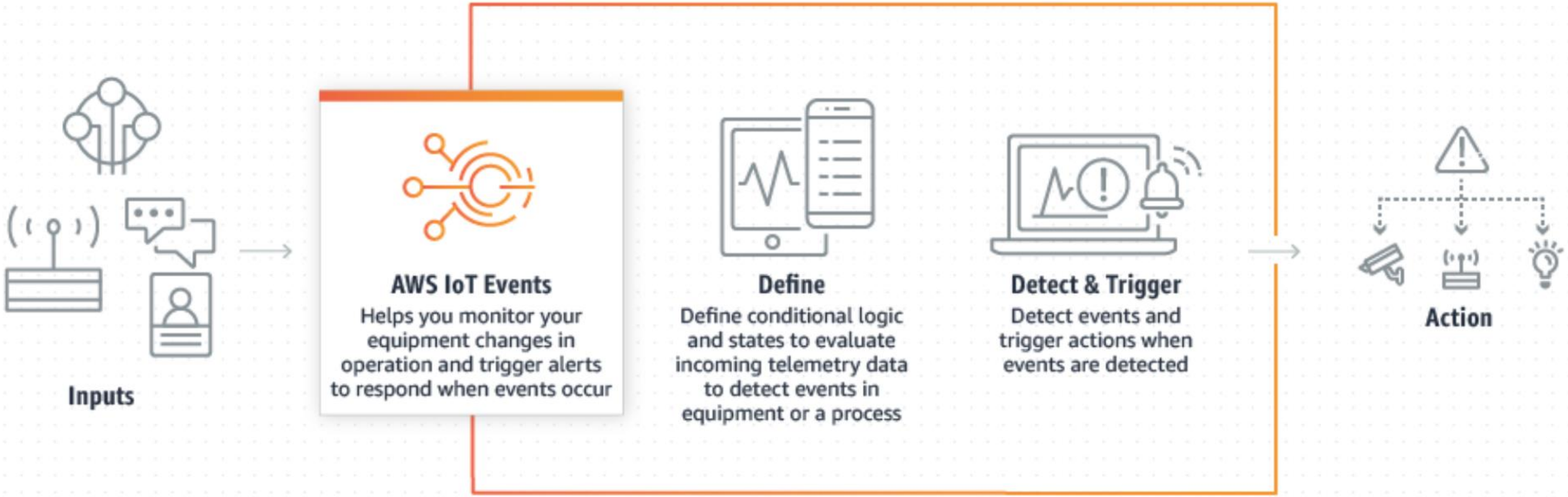
AWS IoT Analytics



AWS IoT Events

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

AWS IoT Events



AWS IoT Events: What's new?



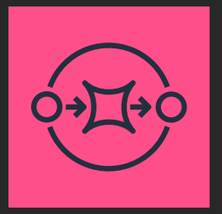
AWS Lambda



AWS IoT Events



Amazon Kinesis
Data Firehose



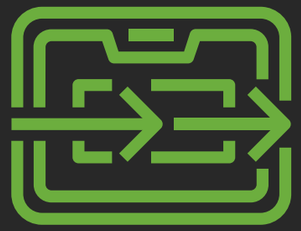
Amazon Simple
Queue Service

Integration with more action targets
from within AWS IoT Events

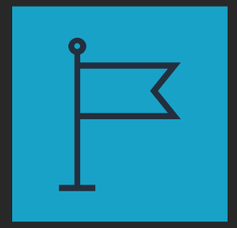
AWS IoT Events: What's new?



AWS CloudFormation



Export/Import
detector models



+6 AWS Regions

Try out AWS IoT Events

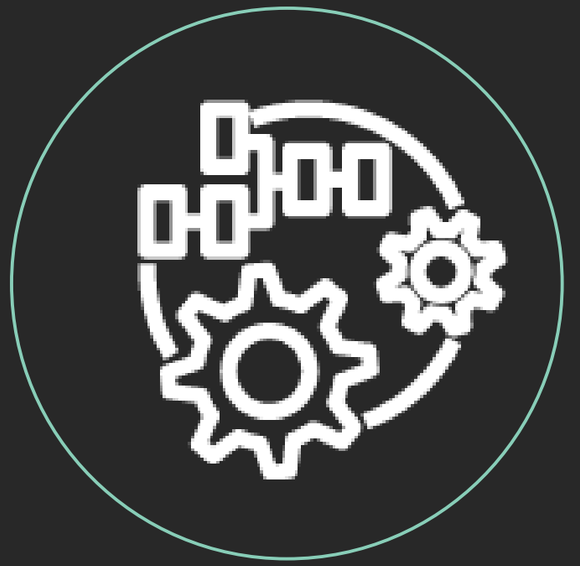
© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

AWS IoT Things Graph

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

AWS IoT Things Graph

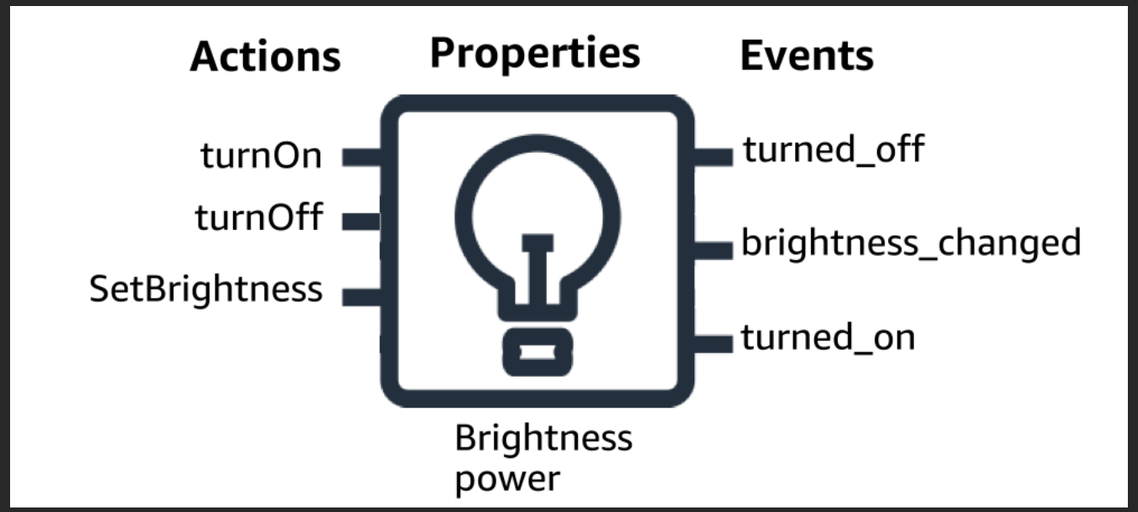
- Model device and service interfaces and behaviors
- Create application workflows connecting devices and web services
- Coordinate actions on devices and web services through models
- Build workflows visually and deploy to the cloud or edge



Model devices and services

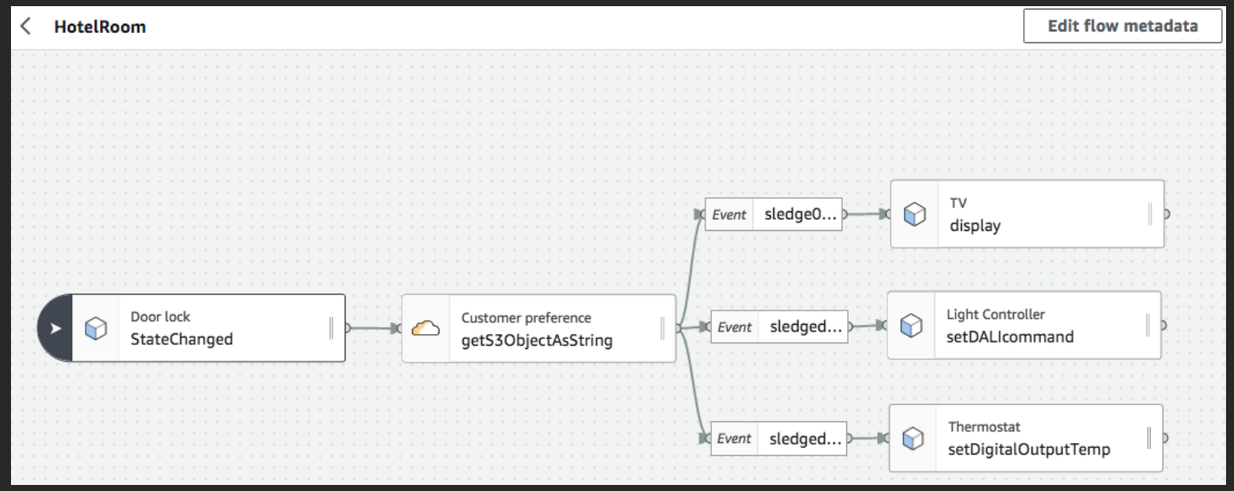
- Model devices to abstract low-level details such as communication protocols
- Define actions, properties, and events for a device model
- Use prebuilt models for common devices or build your own

Example: Lightbulb



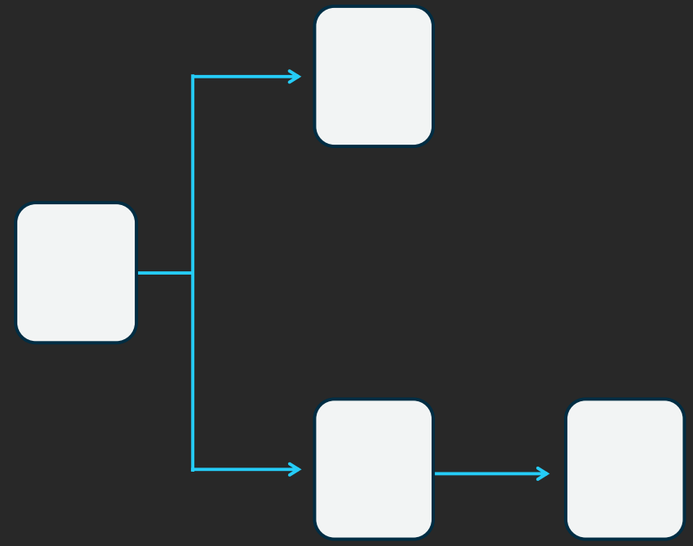
Visual design workflows

- Visually drag and drop models into the design canvas
- Connect models and create multistep workflows with minimal code
- Drag and drop models into the canvas; connect them with directed arrows
- Specify events, actions, and expressions for each model



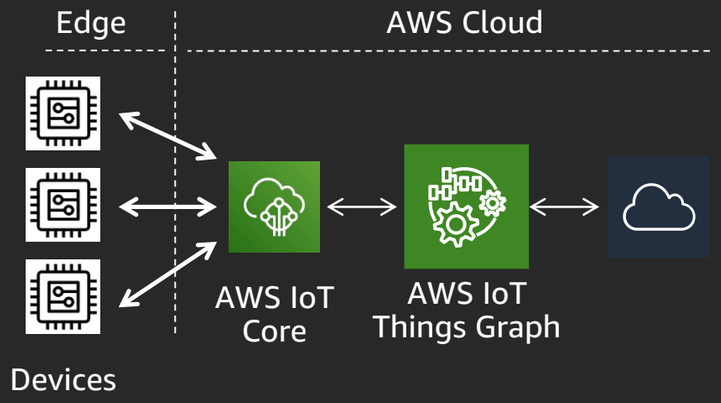
Create multistep workflows

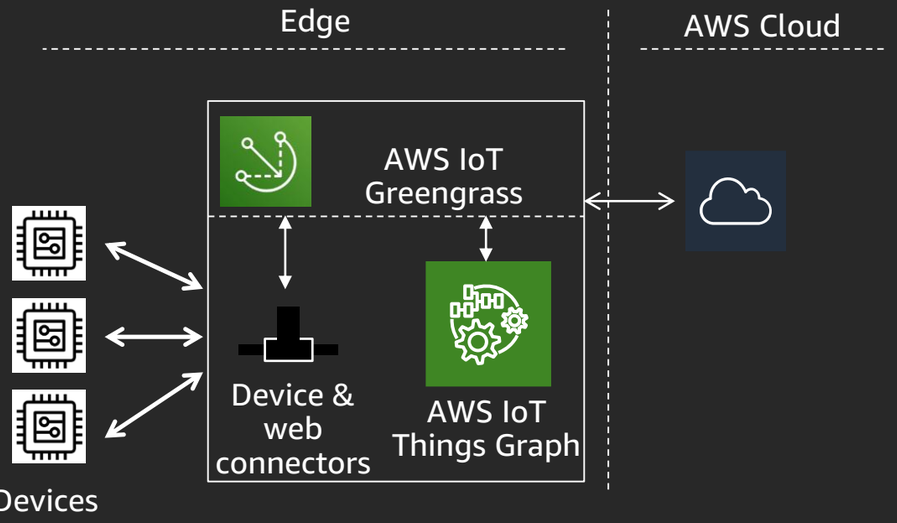
- Visually represent real-world systems
- Monitor interactions between devices
- Define branching conditions and logic
- Handle asynchronous interactions between devices



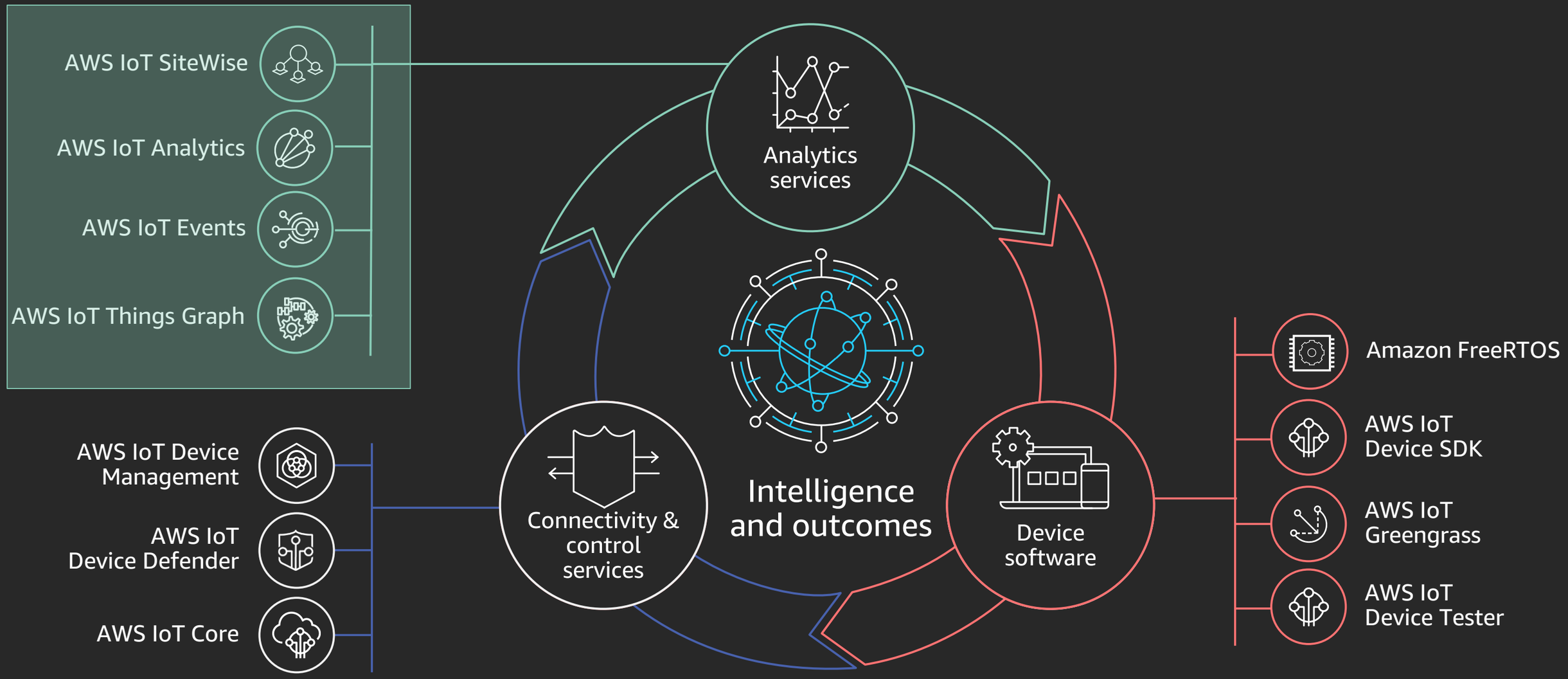
Deploy and run on the AWS Cloud or at the edge

- Deploy applications on the AWS Cloud or on AWS IoT Greengrass devices
- Monitor cloud workflows with Amazon CloudWatch
- Collect metrics on execution steps
- Set alarms to monitor application performance





IoT virtuous cycle

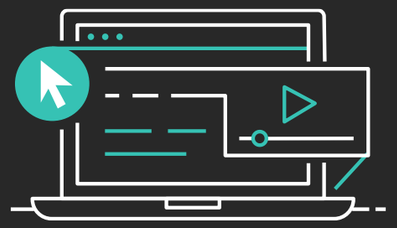


Learn IoT with AWS Training and Certification

Resources created by the experts at AWS to help you build IoT skills



Take the free digital curriculum, Internet of Things (IoT) Foundation Series, to build IoT skills and work through common scenarios



25+ additional free digital courses cover topics related to IoT, including:

- AWS IoT Core
- AWS IoT Greengrass
- AWS IoT Analytics
- AWS IoT Device Management
- AWS IoT Events

Visit the Learning Library at https://aws.training

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

aws training and certification

Related breakouts

IOT219-R Getting started with AWS IoT Events

IOT301-R Race to generate IoT connected wind energy

IOT314-R Driving operational performance across industrial facilities

IOT316-R Building an end-to-end, real-time IoT analytics pipeline

IOT323-R Moving industrial data to AWS using AWS IoT SiteWise

IOT332-R Bringing ambient intelligence to connected home products

MFG402 Asset condition monitoring with AWS industrial IoT services

Thank you!

AWS re:Invent

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

aws



Please complete the session survey in the mobile app.

© 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Reserve

AWS IoT SiteWise

- Ingest measurements from industrial equipment
- Link data to properties in asset models
- Create derived metrics computed in real time
- Visualize results, take actions



AWS IoT Events

- Detect changes across complex industrial systems
- Build event detector models to evaluate device data at scale
- In-order processing and message deduplication to ensure idempotent and consistent evaluation of state
- Trigger actions based on events and state changes



bai communications

Problem

BAI Communications designs, builds and operates communication networks for large city transit systems .To ensure good customer experience, they need to quickly identify and troubleshoot WiFi connectivity across 100s of access points in each city.

Solution

BAI Communications has installed a network of probes which simulate the user experience at each access point in the city and send the data to the AWS cloud. AWS IoT Events is used to identify the state of the network in real time using the WiFi environment metrics sent from each probe.

Impact

AWS IoT Events allows BAI Communications to create dashboards and enable technicians to identify network issues often before they affect the user experience.

