AWS re:Invent

IOT213

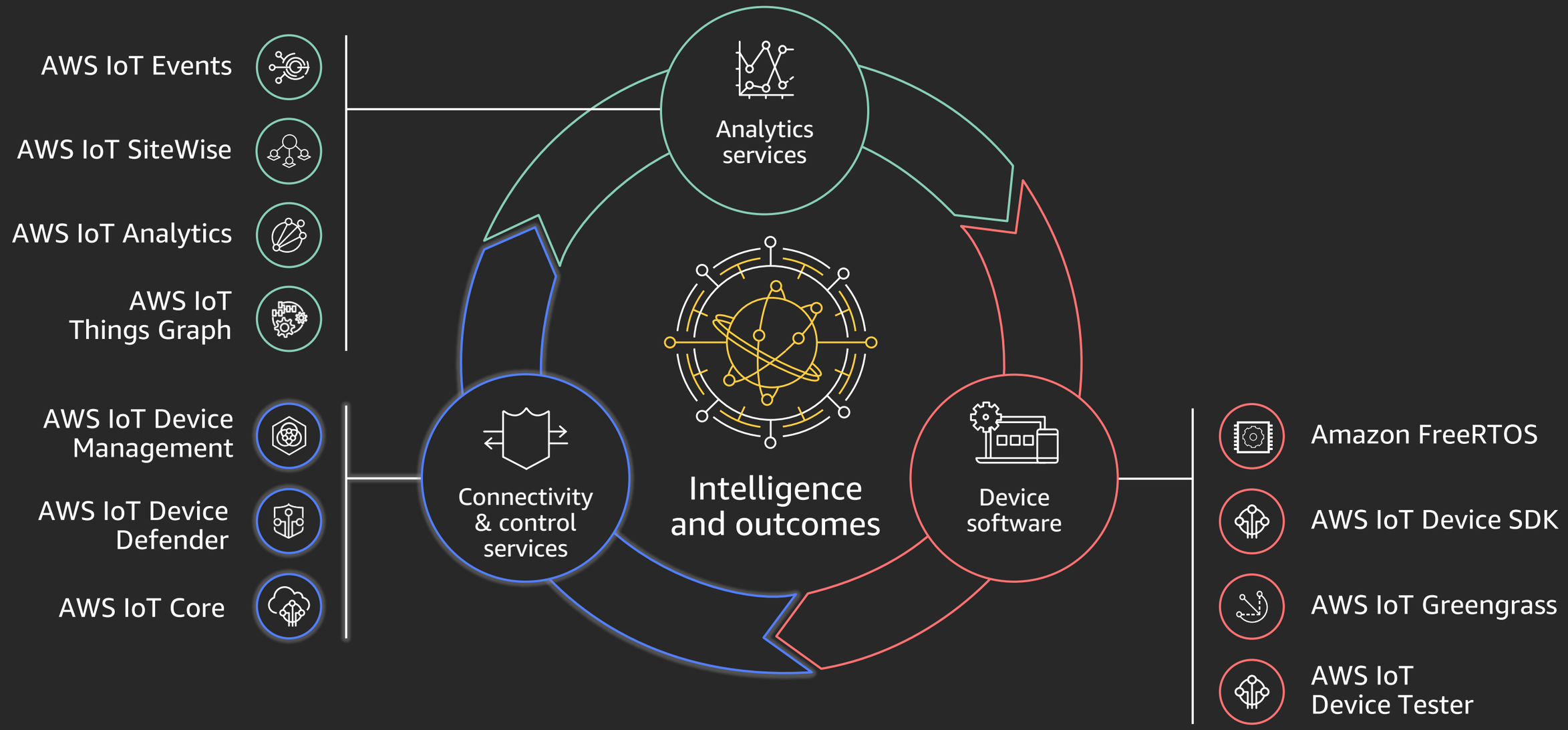
What's new with AWS IoT connectivity and control services?

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Senior Product Manager - Technical
Amazon Web Services

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AWS IoT virtuous cycle



AWS IoT Core

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AWS IoT Core components



Identity



Device gateway



Message broker



Rules engine



Thing shadow



Thing registry

2019 major features



Identity

- Fleet provisioning (beta)
- Multi-account certificate registration (beta)
- Custom authentication enhancements (beta)



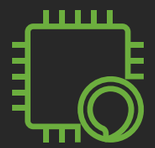
Device gateway

- Configurable endpoints (beta)
- Custom domains (beta)



Rules engine

- HTTP action



Alexa

- AWS IoT Core - MQTT for Alexa Voice

Fleet provisioning (beta)

Enables generic devices to get uniquely configured on devices' first connection to AWS IoT Core

Fleet provisioning automatically configures devices with



Unique digital identity



IoT policy



Thing registry (optional)

Fleet provisioning: How it works

Use case 1

"Trusted bootstrap identity"

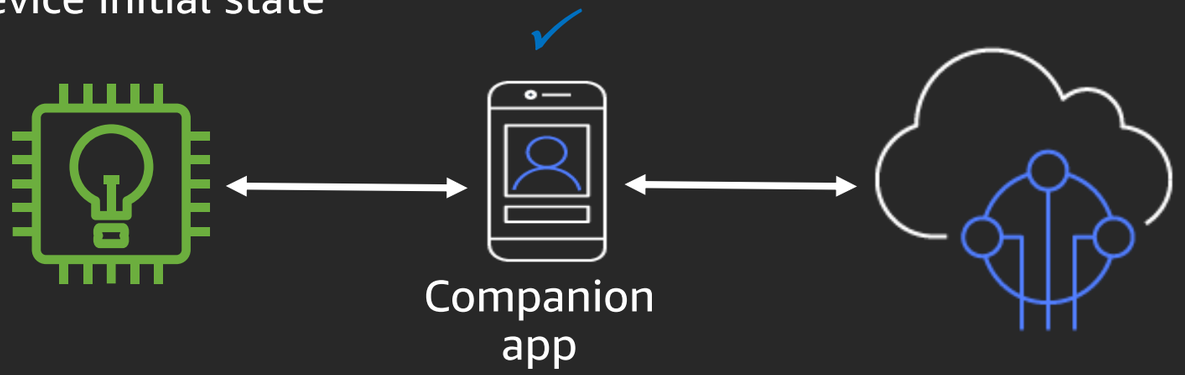
Device initial state



Use case 2

"Trusted user"

Device initial state



Device final state



Unique digital identity

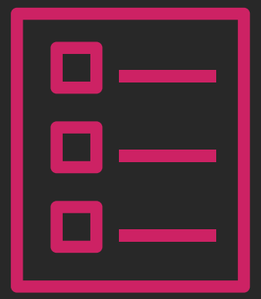


IoT policy



Thing registry (optional)

Fleet provisioning: Components



Provisioning template

Enables customers to define

Initial-trust criteria
Configurations required



“Updated” IoT Device SDK

Enables devices to get

Unique device configuration

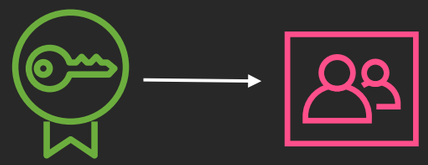
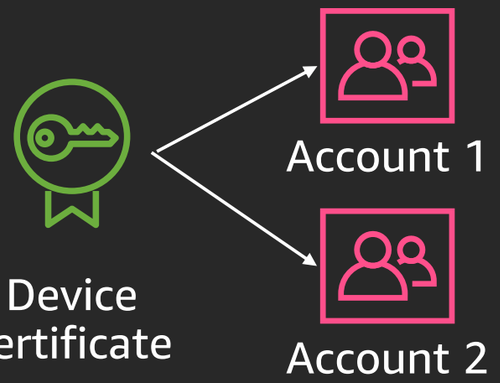


Mobile SDK

Enables companion apps to get

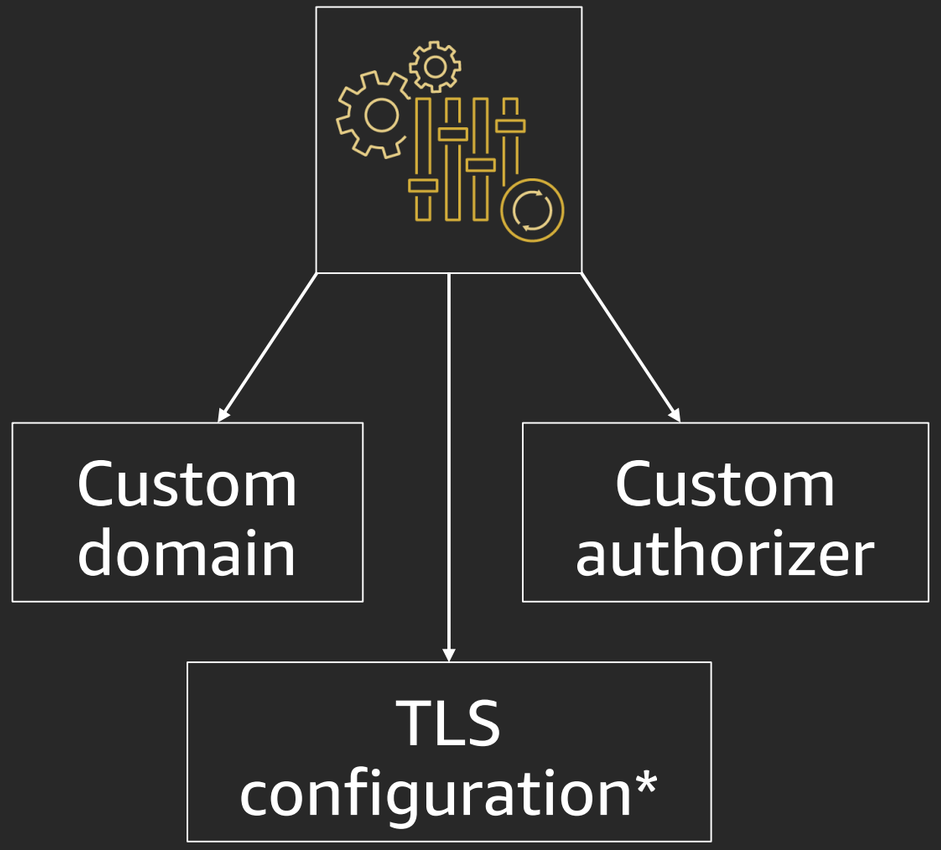
Unique device configuration

Multi-account registration (beta)

	AWS IoT Core today	With multi-account registration	
Enables device certificate registration without CA	 CA certificate Device certificate	 CA certificate Device certificate	Device connections routed based on the server name indication (SNI) Information passed by the devices
Enables a device certificate to be registered in multiple AWS IoT accounts	 Device certificate Account 1	 Device certificate Account 1 Account 2	

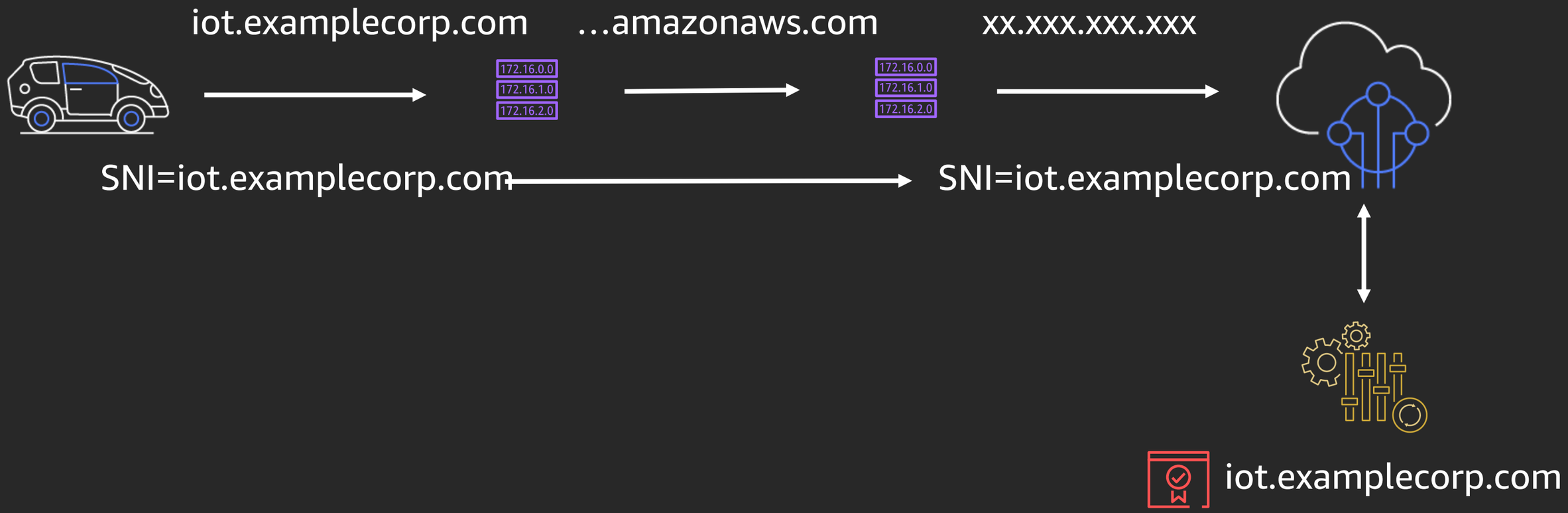
Configurable endpoints (beta)

abcd1234.iot.us-east-1.amazonaws.com



*Coming soon

Custom domains (beta)



Custom authentication enhancements (beta)







++

Protocols
- HTTP
- MQTT over WSS

Identity:
- Token passed HTTP header

New protocols
- MQTT

New identity options
- Token passed HTTP header or query string
- MQTT username/password

Custom authentication enhancements

```
{"token" :"a Token",
"signatureVerified": boolean, // Indicates whether the device gateway has validated the signature.
"protocols": ["tls", "http", "mqtt"], // Indicates which protocols to expect.
"protocolData": {
        "tls" : {
                "serverName": "serverName" // The SNI string.
        },
        "http": {
                 "headers": {
                         "#{name}": "#{value}"
                 },
                "queryString": "?#{name}=#{value}"
         },
        "mqtt": {
                 "username": "myUserName",
                "password": "myPassword", // base64 encoded.
                 "clientId": "myClientId"
         }
},
"connectionMetadata": {
   "id": UUID // The connection Id. You can use this for logging.
},
```

HTTP action

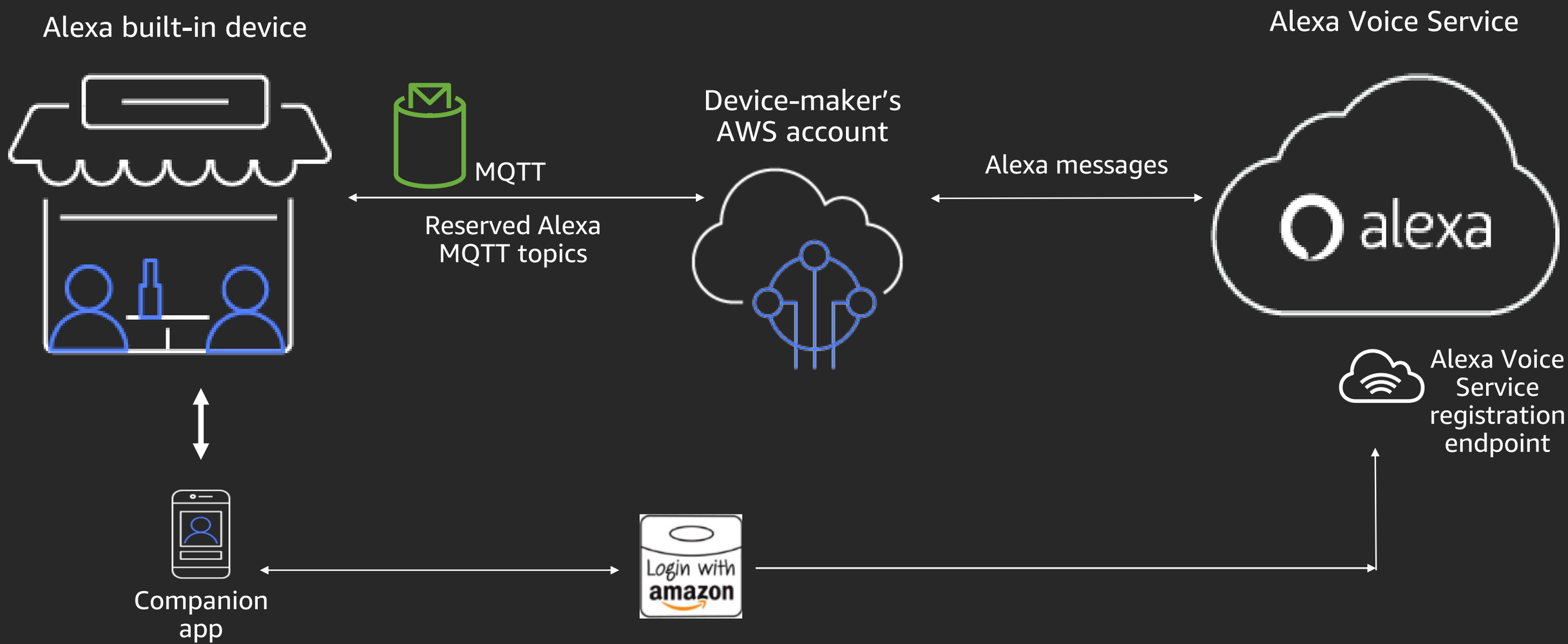


Alexa Voice Service Integration for AWS IoT Core





Alexa Voice Service Integration for AWS IoT Core



AWS IoT Core: Additional 2019 releases

Feature	Objective
Configurable rule limit	Allow customers to configure more than 1,000 IoT rules per account
ECC cipher suite on ATS endpoints	Support for Amazon root CA 3 ECC on ATS endpoints
AWS IoT Core price reduction	Price reductions in Singapore, Sydney, and Tokyo regions to bring into alignment with Seoul (20% premium to N. Virginia)
Rules engine republish action QoS 1	Allows customers to republish QoS 1 messages via republish action
Region expansion (8 new regions)	Launched in Stockholm, Bahrain, Paris, Sao Paulo, Hong Kong, San Francisco, Montreal, and Ningxia

Device management

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AWS IoT Device Management components



Bulk things provisioning



Fleet indexing & search



Jobs



Secure tunneling

AWS IoT Device Management enhancements

Understand



Organize

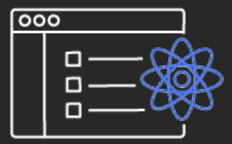


Take action



Manage your device fleet at scale

2019 major releases



Aggregation queries

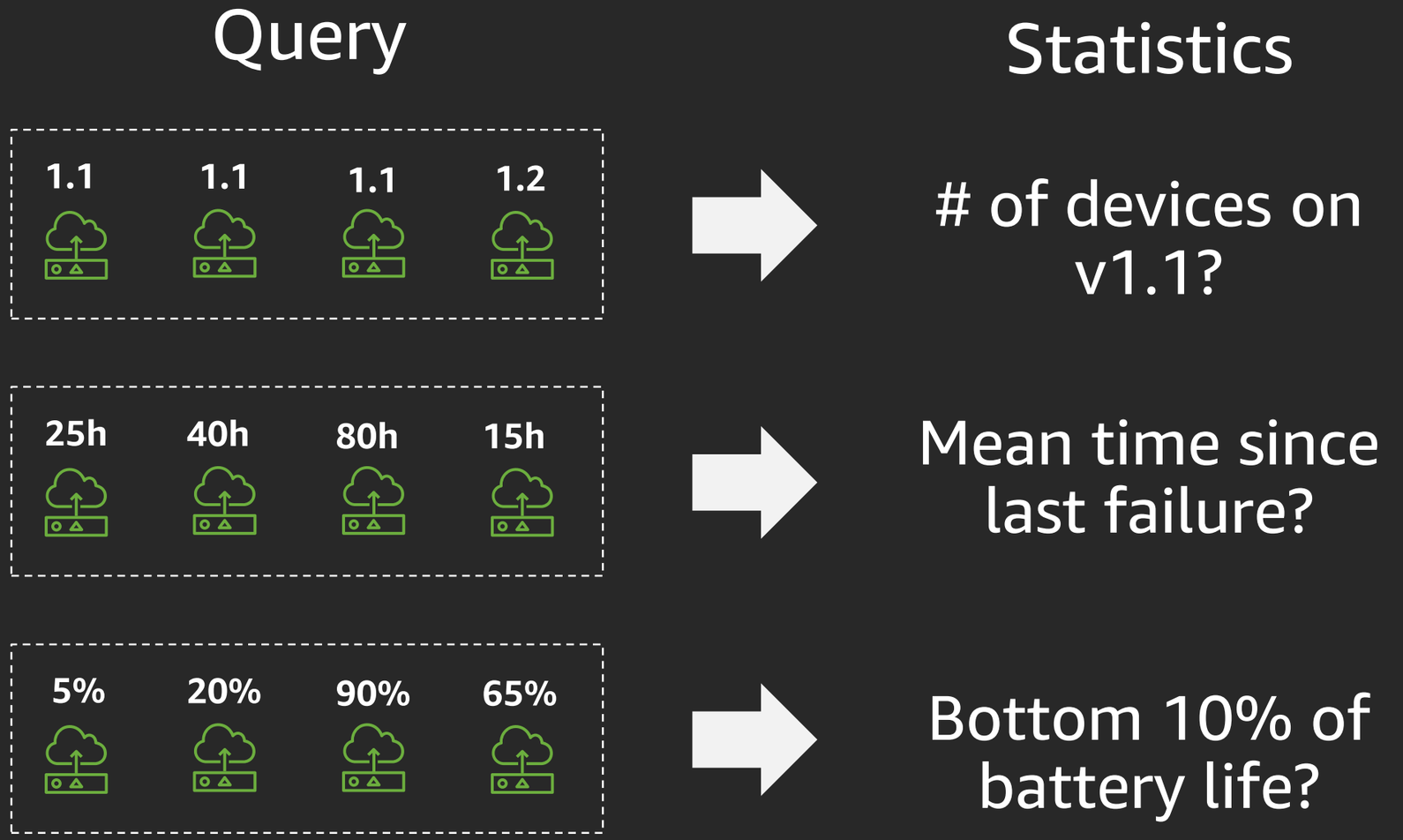


Secure tunneling

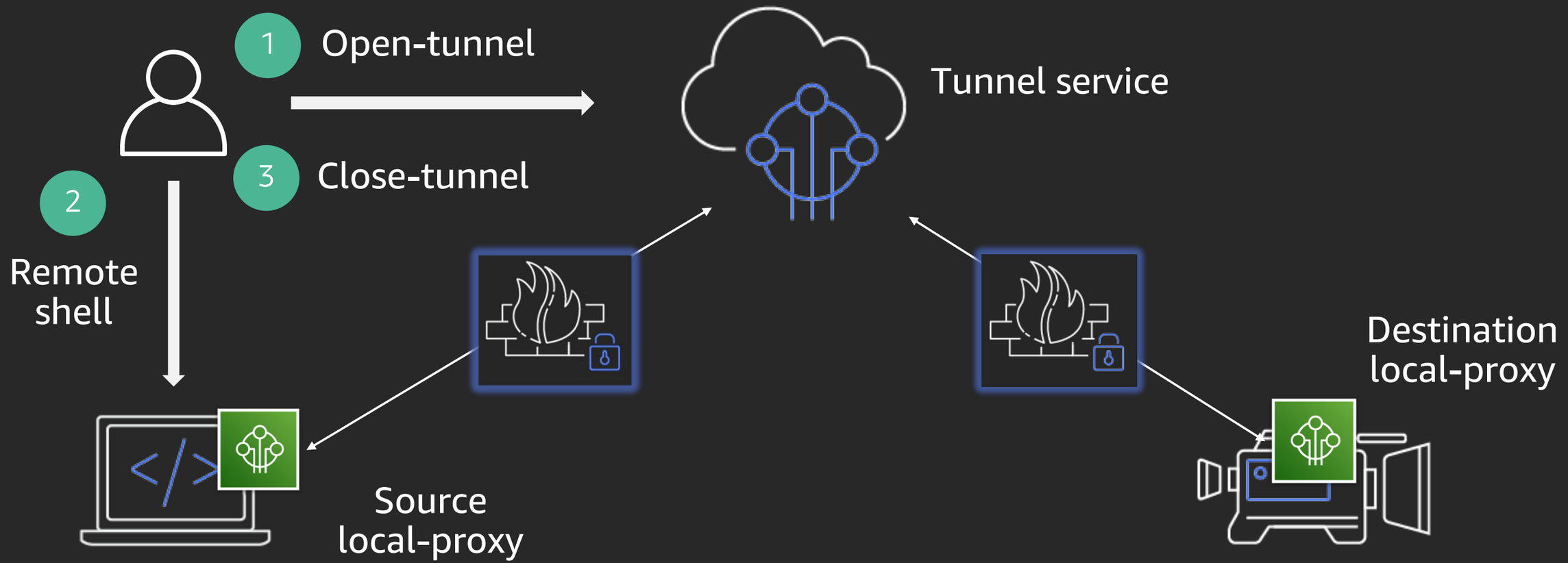


Added 8 new AWS Regions

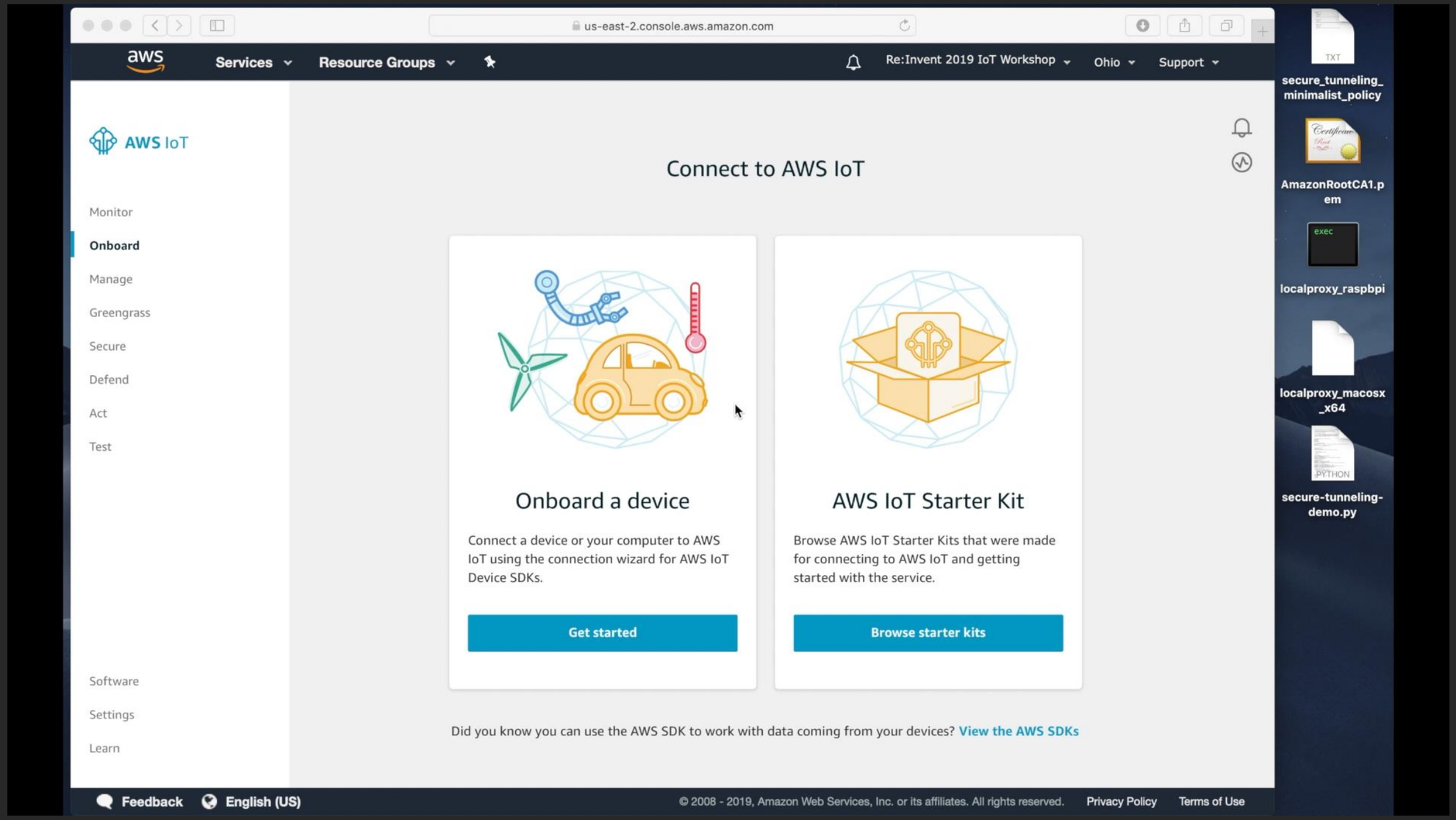
Aggregation queries



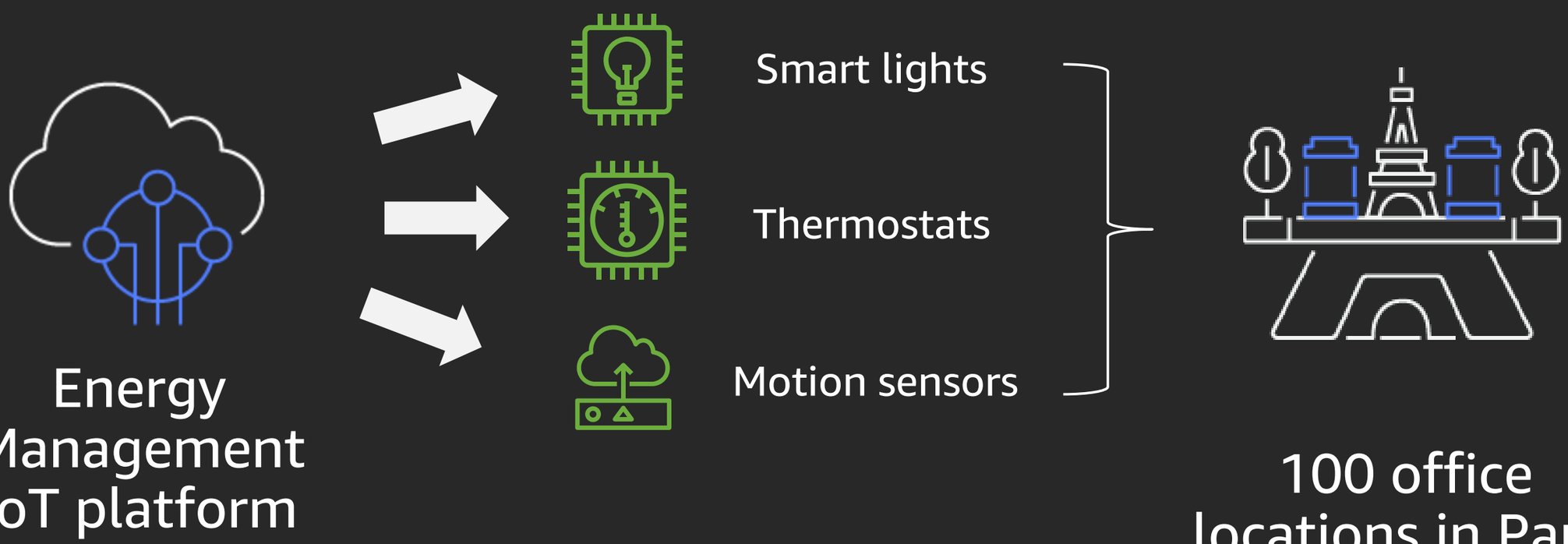
Secure tunneling



Secure tunneling demo

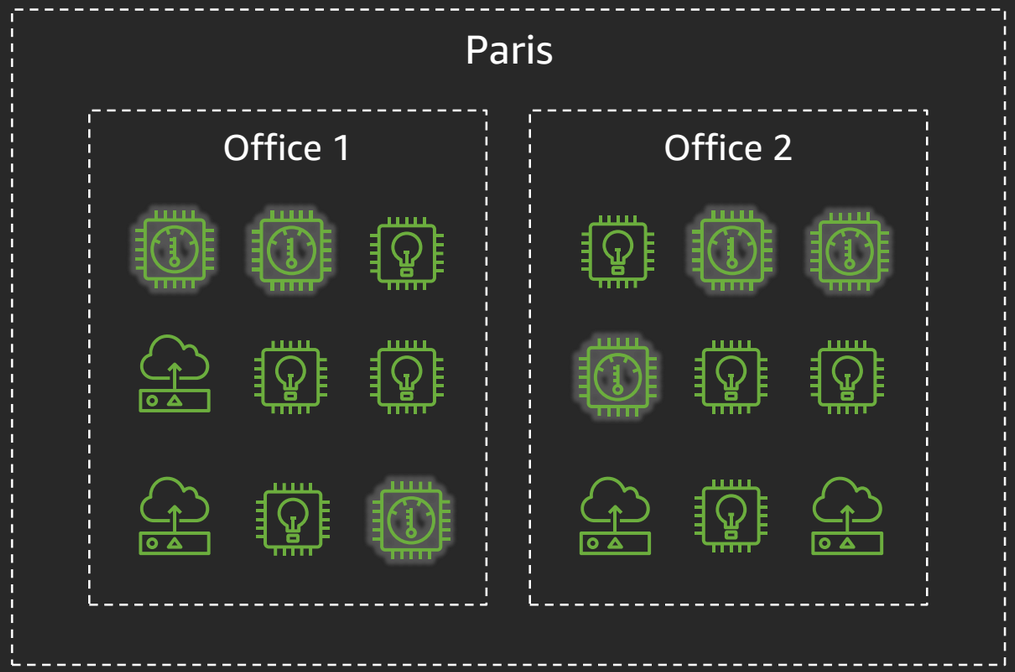


Example use case: Energy management



Understand: Fleet indexing & search

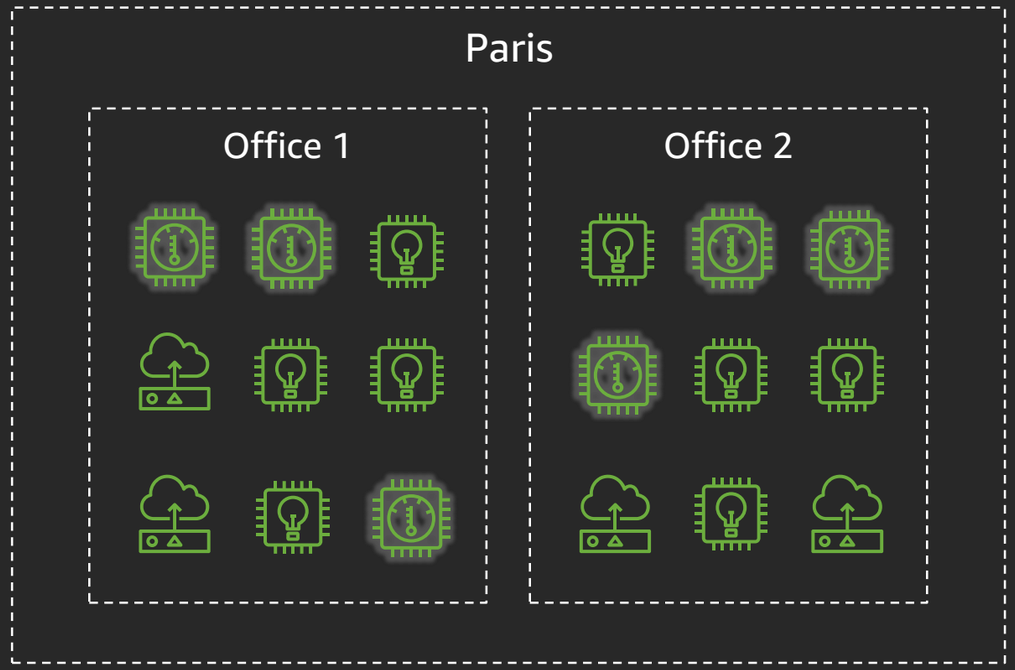
Using fleet indexing & search, I can find all thermostat devices located in Paris




```
attributes.type: Thermostat
AND attribute.location: Paris
AND connectivity.connected: true
```

Organize: Aggregation queries

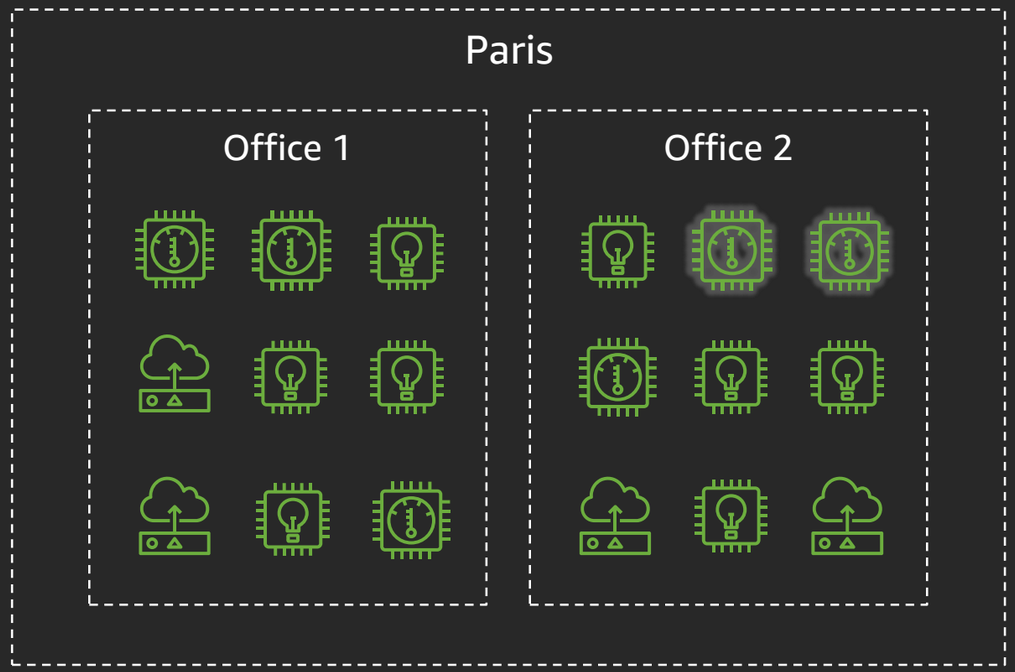
Using get-statistics, I can find the average temperature ranges for thermostats in Paris




```
aws iot get-statistics --index-name AWS_Things
--aggregation-field attribute.temperature
--query-string “attributes.type: Thermostat
AND attribute.location: Paris
AND connectivity.connected: true”
```

Organize: Aggregation queries

Using get-percentiles, I can find the thermostats with current temperatures in the 95th percentile

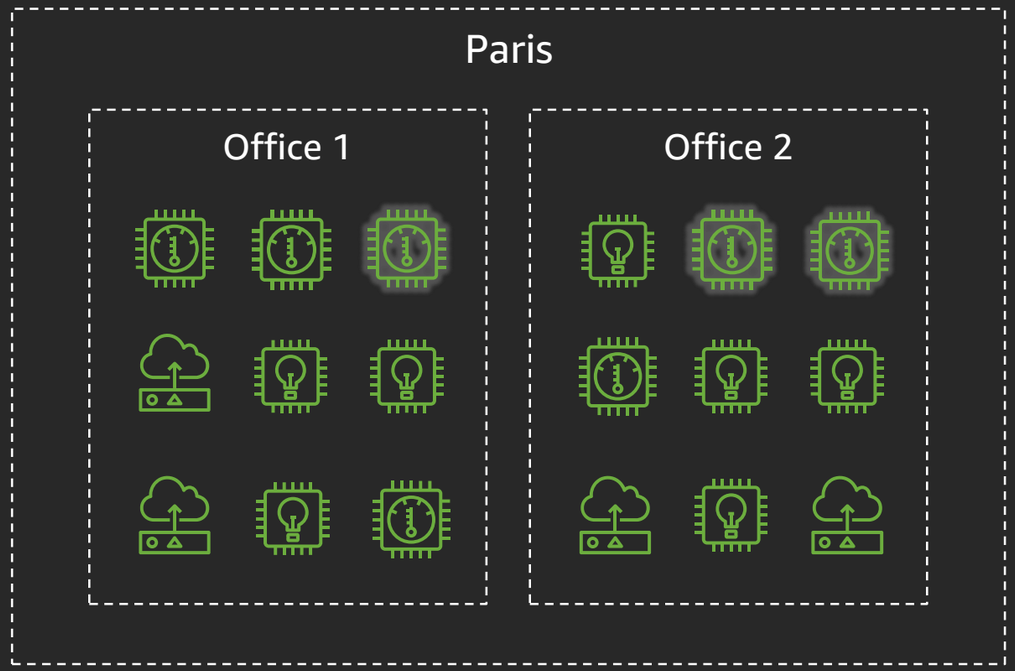



```
aws iot get-percentiles --index-name AWS_Things
--aggregation-field attribute.temperature
--query-string “attributes.type: Thermostat
AND attribute.location: Paris
AND connectivity.connected: true”
```

I find that my two thermostats in Office 2 are showing temperatures in the 95th percentile

Take action: Secure tunneling

Using secure tunneling, I can access one of my thermostats in each office to troubleshoot

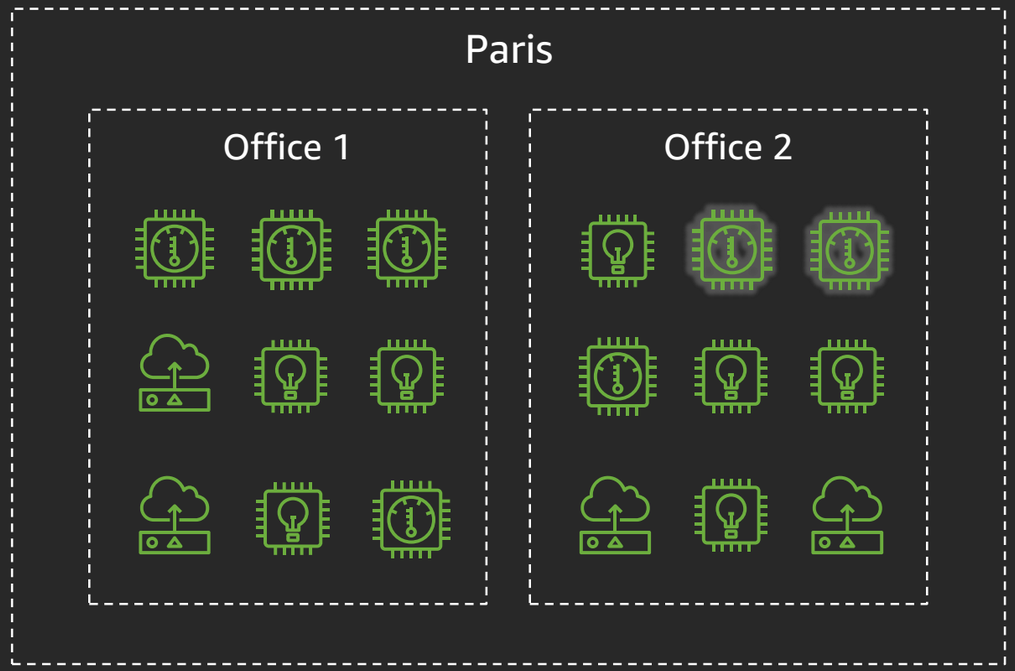



```
open-tunnel {
"tags": [
 {
 "key": ”owner",
 "value": ”aws-tunnel"
 }
 ],
 "timeoutConfig": {
 "maxLifetimeTimeoutMinutes": 60
 }
```

I find that my thermostats in Office 2 need updates from version 1.1 to version 1.2

Take action: Dynamic groups

Using dynamic groups and continuous jobs, thermostats get dynamically added to a group and updated from v1.1 to v1.2




```
attributes.type: Thermostat
AND attribute.configVer: 1.1
AND attribute.location: Paris
AND connectivity.connected: true
AND connectivity.timestamp > 1509283242
```

```
attributes.type: Thermostat
AND shadow.reported.configVer: 1.1
```

```
attributes.type: Thermostat
AND shadow.reported.configVer: 1.2
```



Continuous jobs

AWS IoT Device Defender

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AWS IoT Device Defender components

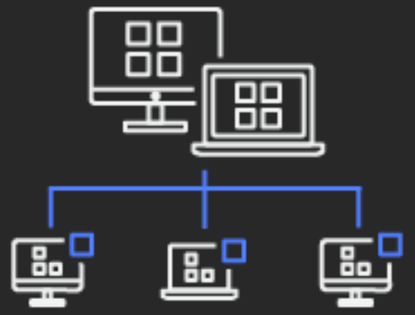


Detect

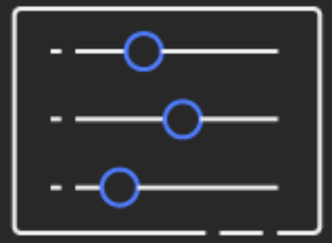


Audit

AWS IoT Device Defender workflow



Audit AWS IoT resource configuration



Monitor device behavior and identify anomalies



Alert using AWS IoT console, Amazon SNS, Amazon CloudWatch



Investigate and mitigate security issues

Audit



Expiring or revoked certificates



Overly permissive policies

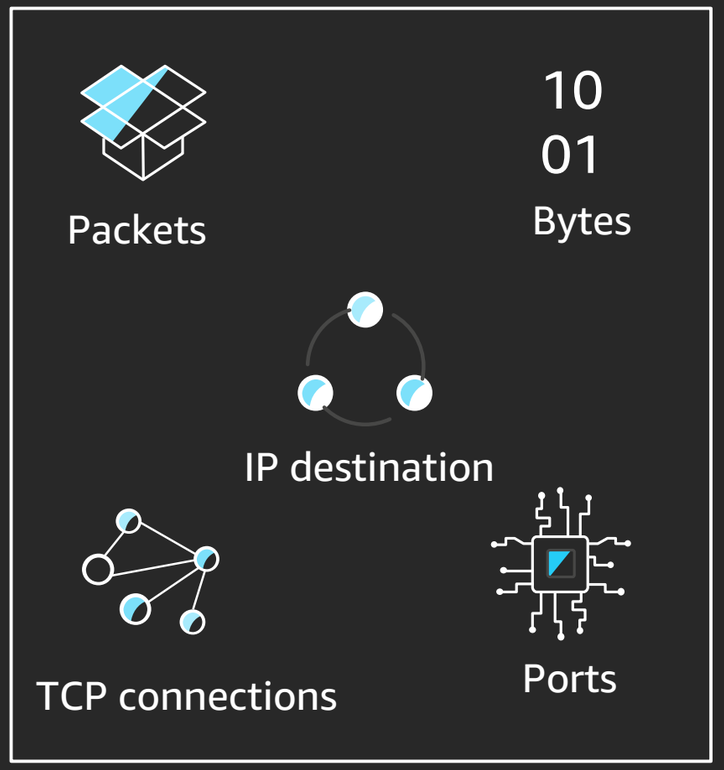


Device connections



Logs

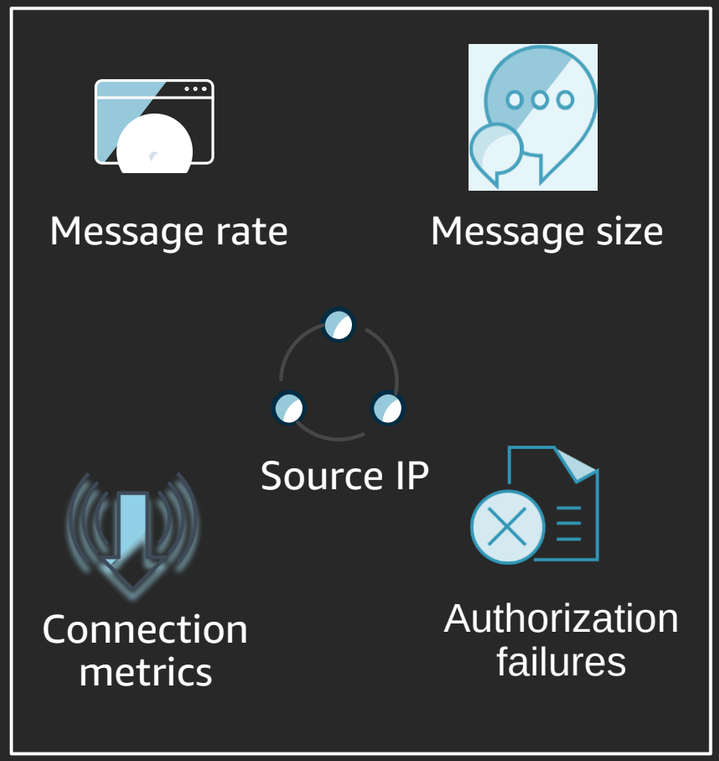
Detect



Device-side metrics



Security profile



Cloud-side metrics

Related breakouts

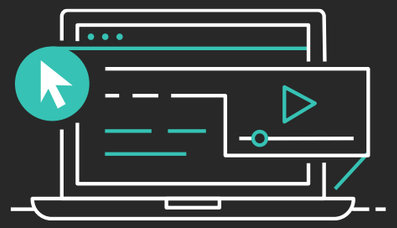
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