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FREE Live Webinar

How to add connectivity to
your IoT solution without
worrying about operations
– with AWS and EMnify

Speakers

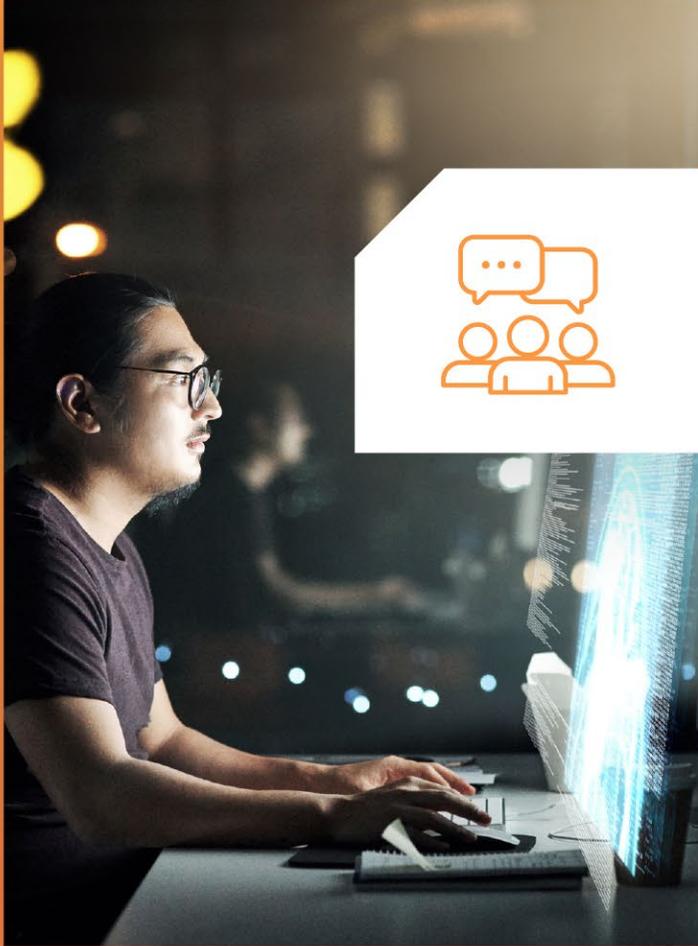


Philipp Dreimann
Solutions Architect at
Amazon Web Services



Christian Henke
Head of Product
EMnify





EMnify

IoT Webinars



GPS Tracking



Battery Technology



E-Scooters



Cloud Technology



Smart Modules



Smart Sensors



Industry



IoT Security



Smart Buildings

Cellular IoT Connectivity Anywhere In The World

(2G, 3G, 4G, LTE-M, NB-IoT, 5G)



180 countries

540 networks



IoT on AWS

without worrying about operations

Philipp Dreimann
Solutions Architect, AWS



AWS Global Infrastructure

24 geographical regions, 1 local region, 77 availability zones, 200+ POPs

Region & Number of Availability Zones (AZs)

GovCloud (US)

US-East (3), USWest (3)

US West

Oregon (4)

Northern California (3)

US East

N. Virginia (6), Ohio (3)

Canada

Central (3)

South America

São Paulo (3)

Africa

Cape Town (3)

Europe

Frankfurt (3), Paris (3),
Ireland (3), Stockholm (3),
London (3), Milan (3)

Middle East

Bahrain (3)

Asia Pacific

Singapore (3), Sydney (3),
Tokyo (4), Osaka-Local (1)*

Seoul (4), Mumbai (3),
Hong Kong (3)

China

Beijing (2), Ningxia (3)

Announced Regions

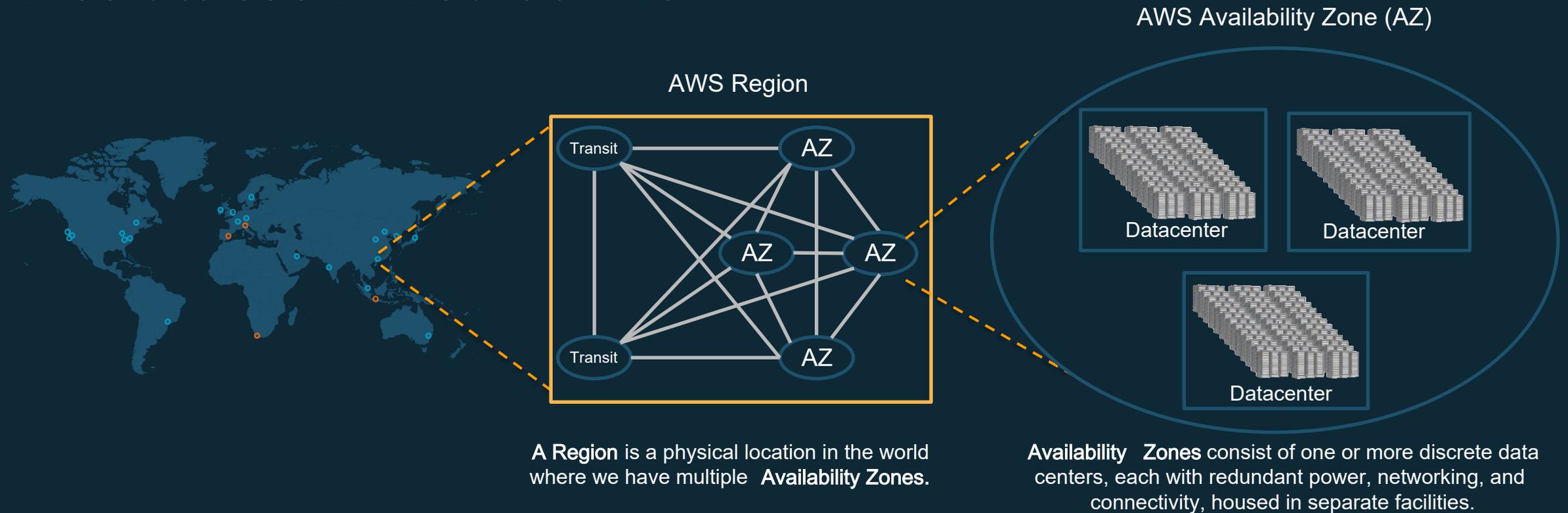
Three Regions and 9 AZs in Indonesia, Japan, and Spain

* Available to select AWS customers who request access. Customers wishing to use the Asia Pacific (Osaka) Local Region should speak with their sales representative.



AWS region design

AWS Regions are comprised of multiple Availability Zones (AZs) for **high availability**, **high scalability**, and high **fault tolerance**. Applications and data are replicated in real time and consistent in the different AZs.



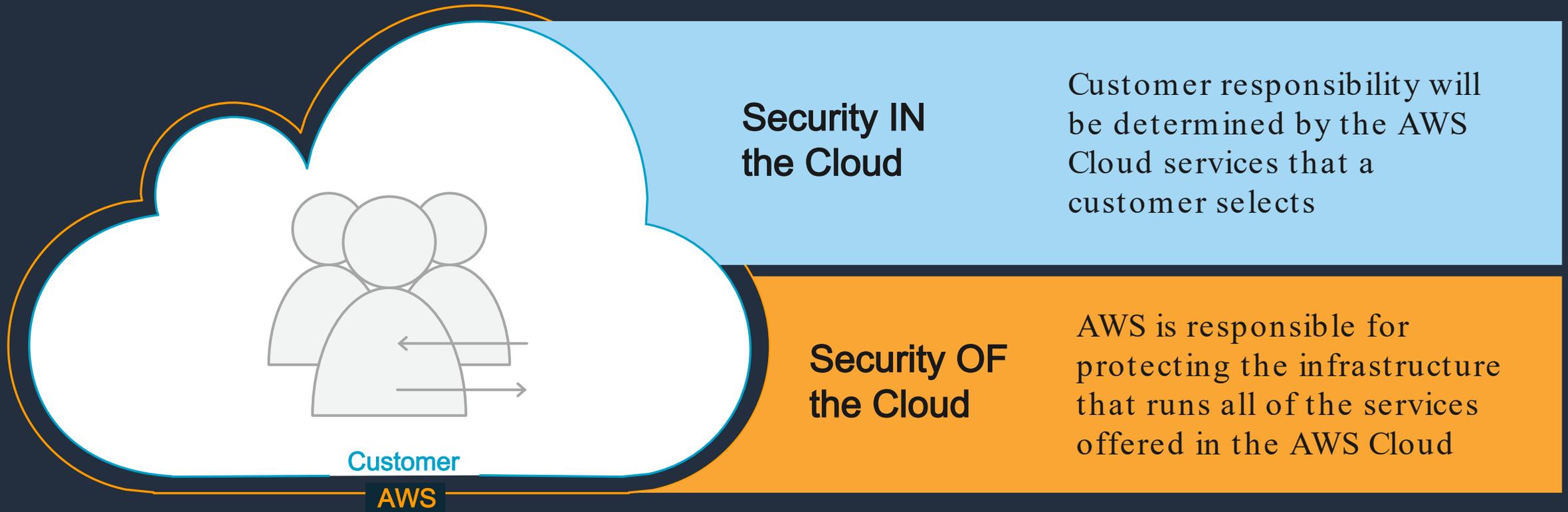
A **Region** is a physical location in the world where we have multiple **Availability Zones**.

Availability Zones consist of one or more discrete data centers, each with redundant power, networking, and connectivity, housed in separate facilities.

Breadth and Depth of Services

<p>ANALYTICS</p> <p>ANALYTICS DATA EXCHANGE DATA LAKE DATA PIPELINES DATA WAREHOUSE ELASTICSEARCH</p> <p>STREAMING ETL HADOOP/SPARK INTERACTIVE SQL QUERIES VISUALIZATIONS</p>	<p>COMPUTE</p> <p>COMPUTE AUTO SCALING BATCH JOBS EVENT-DRIVEN SERVERLESS COMPUTING</p> <p>CONTAINERS CONTAINER SERVICE MANAGED KUBERNETES STORE & RETRIEVE DOCKER IMAGES</p>	<p>END USER COMPUTING</p> <p>APP STREAMING DESKTOP COMPUTING</p> <p>MOBILE ACCESS STORAGE & COLLABORATION</p>	<p>MACHINE LEARNING</p> <p>ML FRAMEWORKS DEEP LEARNING AMIS & CONTAINERS HARDWARE ACCELERATION ML AT THE EDGE TENSORFLOW, PYTORCH, MXNET</p> <p>SAGEMAKER AUTOMATIC MODEL TUNING DATA LABELING HOSTED NOTEBOOKS ML MARKETPLACE MODEL HOSTING MODEL OPTIMIZATION MODEL TRAINING PRE-BUILT ALGORITHMS TOPIC MODELING DEEP LEARNING MODELS REINFORCEMENT LEARNING SPOT INSTANCES BATCH PREDICTIONS REAL-TIME PREDICTIONS</p>	<p>MEDIA SERVICES</p> <p>LIVE VIDEO TRANSPORT MEDIA STORAGE TRANSCODING VIDEO ORIGINATION & PACKAGING</p> <p>VIDEO PERSONALIZATION & MONETIZATION VIDEO PROCESSING & DELIVERY VIDEO STREAMING ANALYSIS</p>	<p>SATELLITE</p> <p>SATELLITE OPERATIONS</p>
<p>AR + VR</p> <p>AR/VR EXPERIENCES</p>	<p>INSTANCE TYPES MANAGED VIRTUAL PRIVATE SERVERS</p> <p>MANAGED REPOSITORY FOR SERVERLESS APPS</p> <p>RUN & MANAGE WEB APPS</p> <p>SERVERLESS COMPUTE</p> <p>VIRTUAL SERVERS</p>	<p>HYBRID ARCHITECTURE</p> <p>AWS SERVICES ON PREMISES DATA INTEGRATION INTEGRATED DEVICES & EDGE SYSTEMS INTEGRATED IDENTITY & ACCESS</p> <p>INTEGRATED NETWORKING INTEGRATED RESOURCE & DEPLOYMENT MANAGEMENT VMWARE CLOUD ON AWS</p>	<p>AI SERVICES CHATBOTS ENTITY EXTRACTION FACE ANALYTICS FACE SEARCH FORECASTING IMAGE LABELING NATURAL LANGUAGE PROCESSING PERSONALIZATION & RECOMMENDATION SENTIMENT ANALYSIS SPEECH TRANSCRIPTION TEXT & DATA EXTRACTION TEXT TO SPEECH TRANSLATION VIDEO & IMAGE ANALYSIS CONTENT MODERATION</p>	<p>MIGRATION & TRANSFER</p> <p>APPLICATION MIGRATION DATABASE MIGRATION EXABYTE-SCALE MIGRATION ONLINE DATA TRANSFER SCHEMA CONVERSION SERVER MIGRATION TRANSFER FOR SFTP</p>	<p>SECURITY, IDENTITY, & COMPLIANCE</p> <p>ACCESS CONTROL ASSESSMENT & REPORTING CONFIGURATION COMPLIANCE DATA PROTECTION DDOS PROTECTION IDENTITY MANAGEMENT KEY MANAGEMENT & STORAGE MONITORING & LOGGING RESOURCE MANAGEMENT THREAT DETECTION WEB APPLICATION FIREWALL</p>
<p>AWS COST MANAGEMENT</p> <p>ANALYZE AWS COSTS COST & USAGE BUDGETS COST & USAGE REPORTS RESERVED INSTANCES REPORTING</p>	<p>DATABASE</p> <p>REALTIONAL DATABASES HIGH-PERFORMANCE RELATIONAL DATABASE BUILT FOR THE CLOUD MANAGED MARIADB MANAGED MYSQL MANAGED ORACLE MANAGED POSTGRESQL MANAGED SQL SERVER</p> <p>PURPOSE-BUILT DATABASES DOCUMENT DATABASE GRAPH DATABASE IN-MEMORY CACHING KEY-VALUE STORE DATABASE LEDGER DATABASE TIME SERIES DATABASE</p>	<p>GAME TECH</p> <p>CROSS-PLATFORM 3D GAME ENGINE GAME SERVER HOSTING</p>	<p>INFRASTRUCTURE</p> <p>AVAILABILITY ZONES CUSTOM HARDWARE DATA CENTER INFRASTRUCTURE GLOBAL NETWORK BACKBONE POINTS OF PRESENCE POWER INFRASTRUCTURE REGIONS</p>	<p>MOBILE</p> <p>API GATEWAY DEVELOPMENT FRAMEWORK IDENTITY MOBILE ANALYTICS</p> <p>MOBILE APP TESTING SINGLE INTEGRATED CONSOLE SYNC TARGETED PUSH NOTIFICATIONS</p>	<p>STORAGE</p> <p>ARCHIVE STORAGE BACKUP & RESTORE BLOCK STORAGE DATA TRANSFER EDGE PROCESSING & COMPUTING FILE STORAGE HIGH-PERFORMANCE FILE SYSTEM HYBRID CLOUD STORAGE OBJECT STORAGE WINDOWS FILE SYSTEM</p>
<p>APPLICATION INTEGRATION</p> <p>EMAIL MESSAGE BROKER QUEUEING & NOTIFICATIONS</p> <p>SEARCH TRANSCODING WORKFLOW</p>	<p>DEVELOPER TOOLS</p> <p>ANALYZE & DEBUG APPLICATION LIFECYCLE MANAGEMENT AUTHORING BUILD & TEST CONTAINERS DEVOPS RESOURCE MANAGEMENT ONE-CLICK APP DEVELOPMENT PATCHING PIPELINE ORCHESTRATION RESOURCE TEMPLATES TRIGGERS</p>	<p>MANAGEMENT & GOVERNANCE</p> <p>ACTIVITY & API USAGE TRACKING CHATBOT CONFIGURATION TRACKING GOVERNANCE INVENTORY TRACKING LICENSE MANAGER MANAGE POLICIES MANAGE RESOURCES</p> <p>MONITORING PROVISIONING RESOURCE TEMPLATES SECURITY RECOMMENDATIONS SERVER MANAGEMENT SERVICE CATALOG SYSTEMS MANAGER</p>	<p>MANAGEMENT & GOVERNANCE</p> <p>ACTIVITY & API USAGE TRACKING CHATBOT CONFIGURATION TRACKING GOVERNANCE INVENTORY TRACKING LICENSE MANAGER MANAGE POLICIES MANAGE RESOURCES</p> <p>MONITORING PROVISIONING RESOURCE TEMPLATES SECURITY RECOMMENDATIONS SERVER MANAGEMENT SERVICE CATALOG SYSTEMS MANAGER</p>	<p>NETWORKING & CONTENT DELIVERY</p> <p>APPLICATION DELIVERY DEDICATED NETWORK CONNECTION DOMAIN NAME SYSTEM LOAD BALANCING MONITOR APIS MONITOR MICROSERVICES NETWORK TOPOLOGY NETWORKING HUB PRIVATE CONNECTION TO APPS SCALE VPC & ACCOUNT CONNECTIONS SERVICE DISCOVERY VIRTUAL PRIVATE CLOUD</p>	<p>STORAGE</p> <p>ARCHIVE STORAGE BACKUP & RESTORE BLOCK STORAGE DATA TRANSFER EDGE PROCESSING & COMPUTING FILE STORAGE HIGH-PERFORMANCE FILE SYSTEM HYBRID CLOUD STORAGE OBJECT STORAGE WINDOWS FILE SYSTEM</p>
<p>BUSINESS APPLICATIONS</p> <p>EMAIL & CALENDARING ONLINE MEETINGS SHARING & COLLABORATION</p> <p>UNIFIED COMMUNICATIONS VOICE-ENABLED WORKPLACE</p>	<p>DEVELOPER TOOLS</p> <p>ANALYZE & DEBUG APPLICATION LIFECYCLE MANAGEMENT AUTHORING BUILD & TEST CONTAINERS DEVOPS RESOURCE MANAGEMENT ONE-CLICK APP DEVELOPMENT PATCHING PIPELINE ORCHESTRATION RESOURCE TEMPLATES TRIGGERS</p>	<p>INTERNET OF THINGS (IOT)</p> <p>RULES ENGINE DEVICE ANALYTICS DEVICE GATEWAY DEVICE SDK DEVICE SHADOWS EVENT DETECTION & RESPONSE LOCAL COMPUTE LOCAL DATA COLLECTION MANAGEMENT & SECURITY MICROCONTROLLER OPERATING SYSTEM REGISTRY VISUAL APPLICATIONS DEVELOPMENT</p>	<p>MARKETPLACE</p> <p>ANALYTICS DATA PRODUCTS DATABASES DEVOPS IOT</p> <p>MACHINE LEARNING NETWORKING OPERATING SYSTEMS SECURITY STORAGE</p>	<p>ROBOTICS</p> <p>CLOUD ROBOTICS</p>	<p>CUSTOMER ENABLEMENT</p> <p>ACCOUNT MANAGEMENT DASHBOARD PERSONALIZATION ENTERPRISE SUPPORT EXPERTS MARKETPLACE OPTIMIZATION GUIDANCE PARTNER ECOSYSTEMS PROFESSIONAL SERVICES SECURITY & BILLING REPORTS SOLUTIONS MANAGEMENT TRAINING & CERTIFICATION</p>

Shared responsibility model



Inherit global security and compliance controls

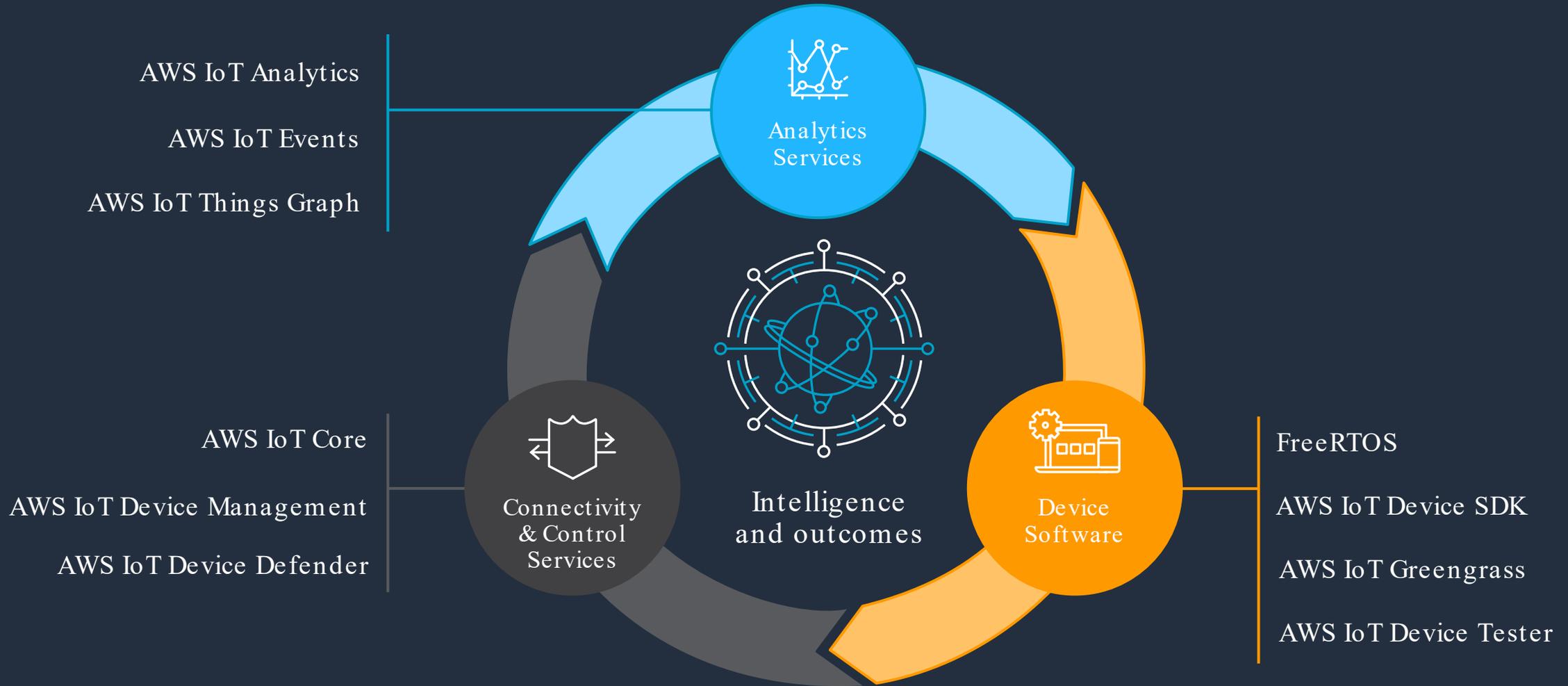


Now, really: IoT on AWS

AWS IoT customers solve problems in all sectors



Device to business value

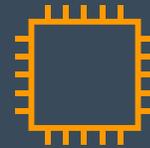


How to get started?

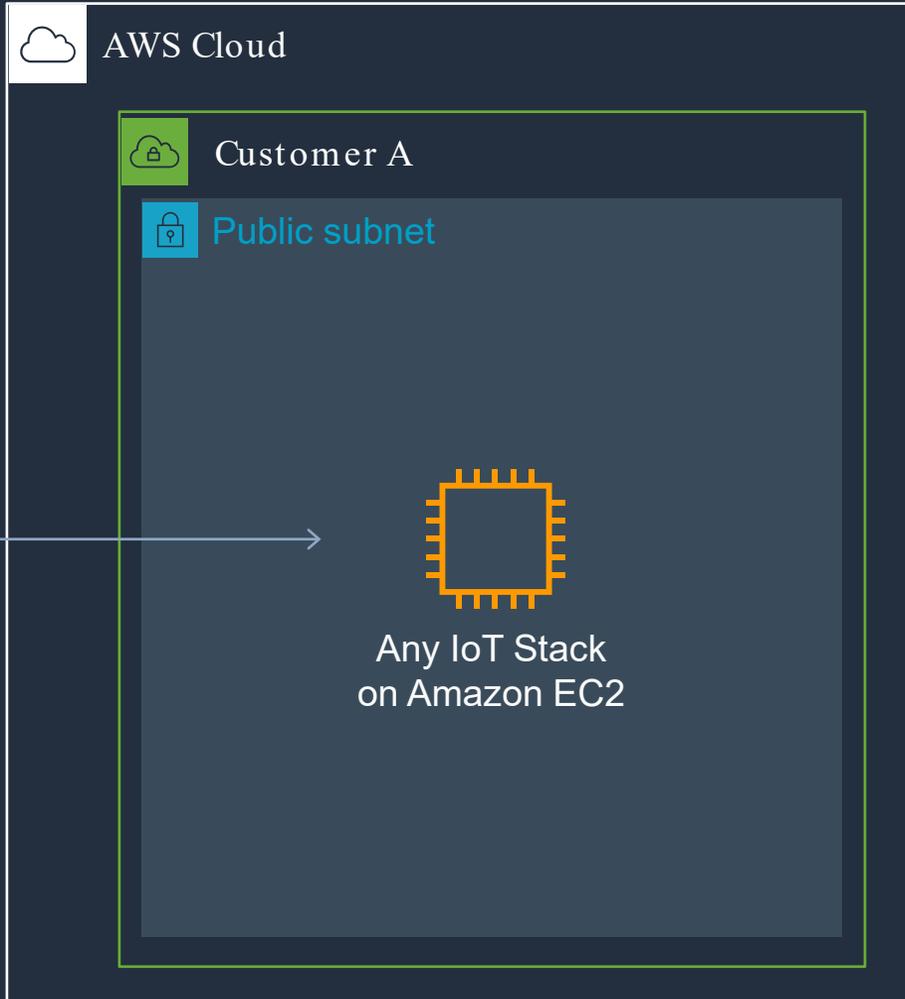
Any IoT Stack on AWS



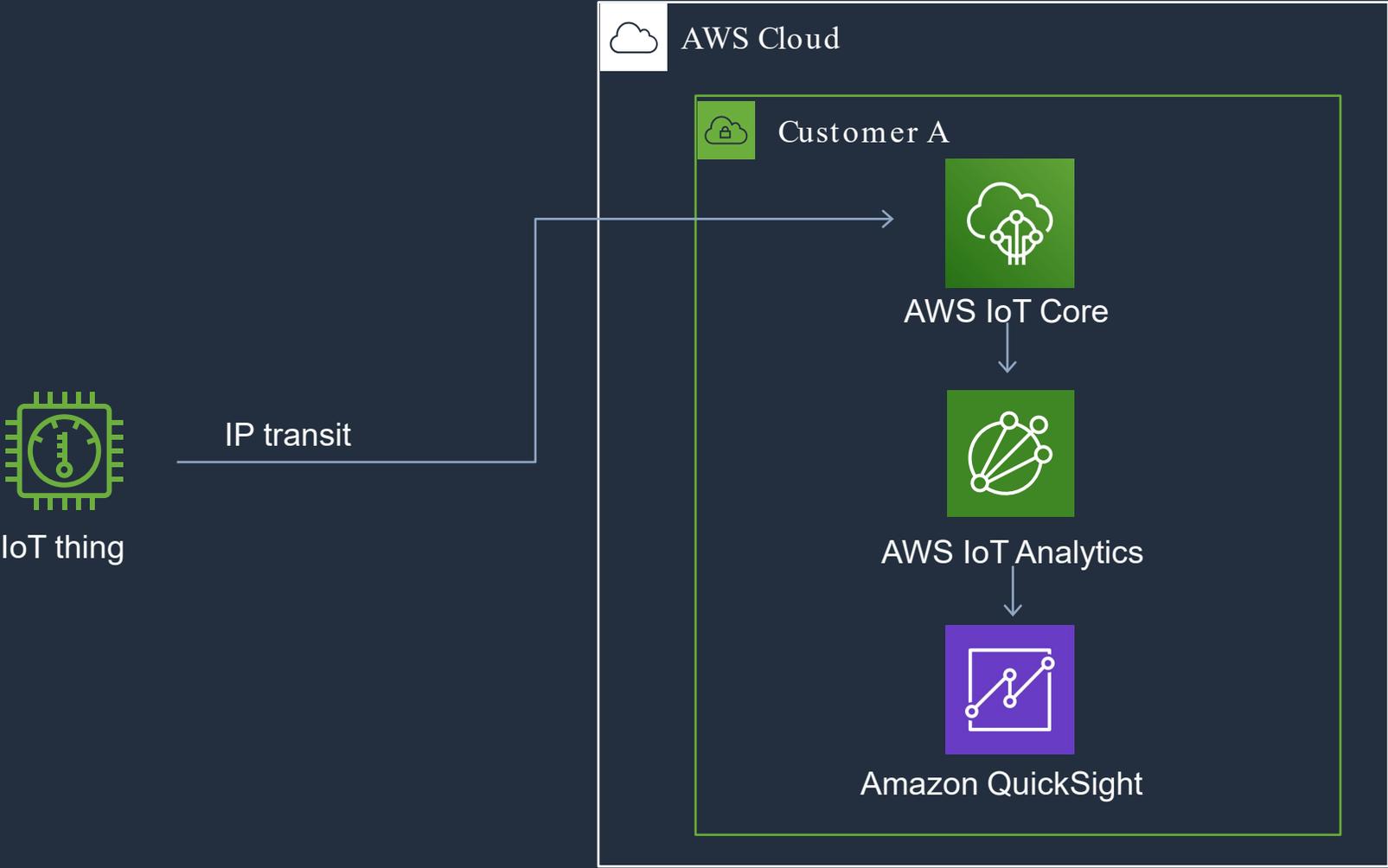
IP transit



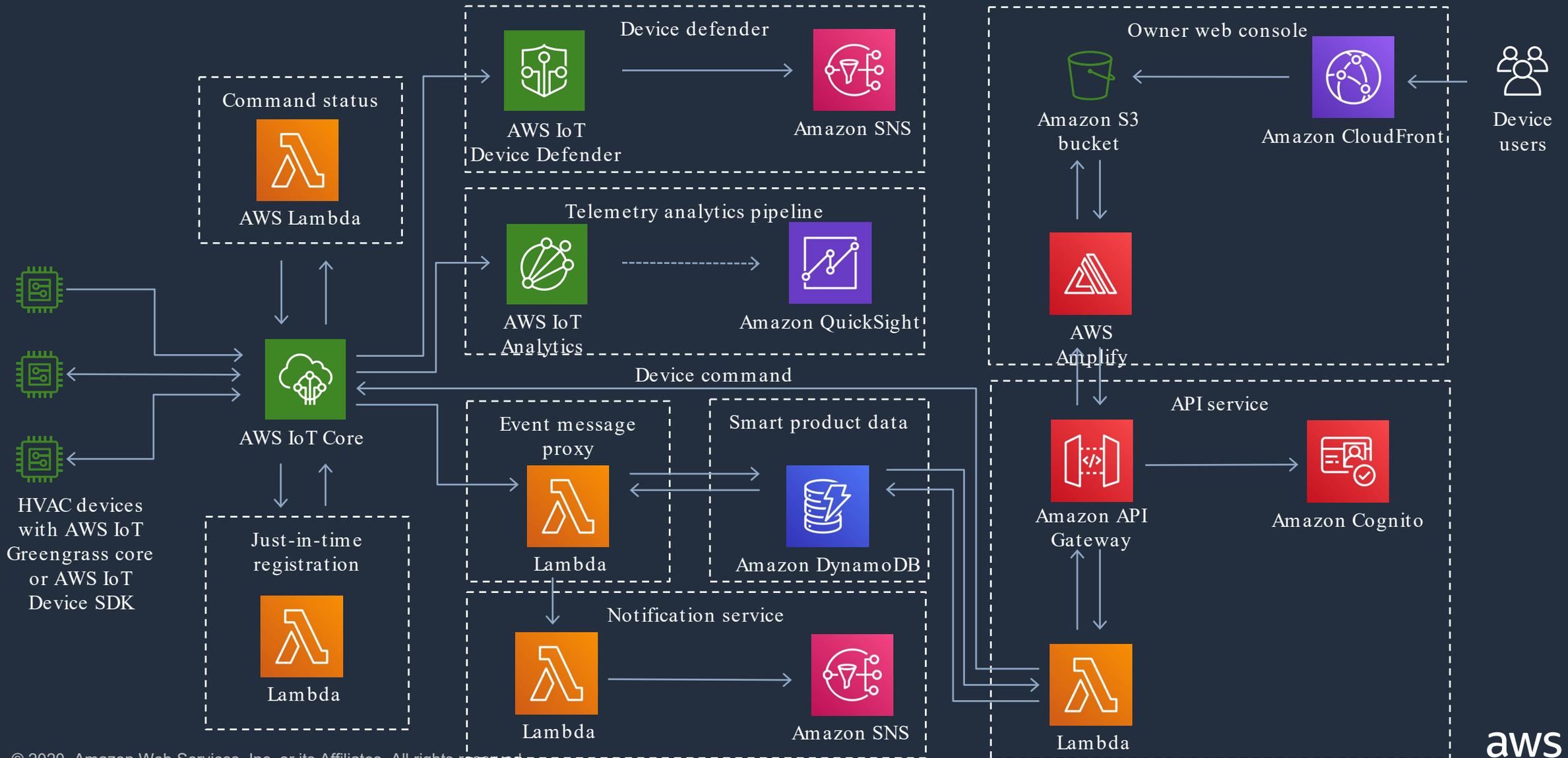
Any IoT Stack
on Amazon EC2



Usage of AWS IoT Core



How to start? Smart product solution



AWS and Cellular Connectivity for IoT

Distributed IoT Architecture

- Why required in IoT B2B?
 - data loss / latency
 - keep the customer data locally where the device is
 - battery / power saving
 - service uptime / redundancy
- Why AWS?
 - one contract – one infrastructure
 - redundancy, availability
 - scalable infrastructure
 - PAYG model
 - Specialized IoT services
 - device management, shadow and secure authentication (AWS IoT Core)
 - DNS load-balancing service (AWS Route 53) between the different geographical locations



With AWS IoT or EC2

Distributed Cellular IoT with AWS IoT Core and EMnify

Traditional Operators



Home-routing of roaming SIM data prevents distributed architecture

EMnify Connectivity

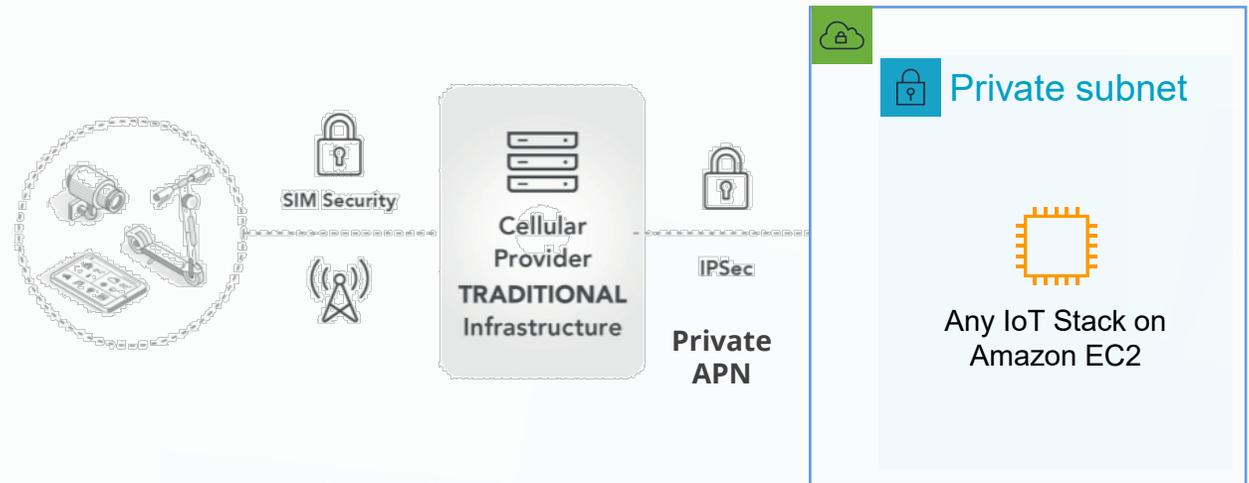


EMnify mobile core network is deployed in major AWS regions – keeping data local

**Works also
with AWS
EC2**

Secure Private Network for Cellular IoT

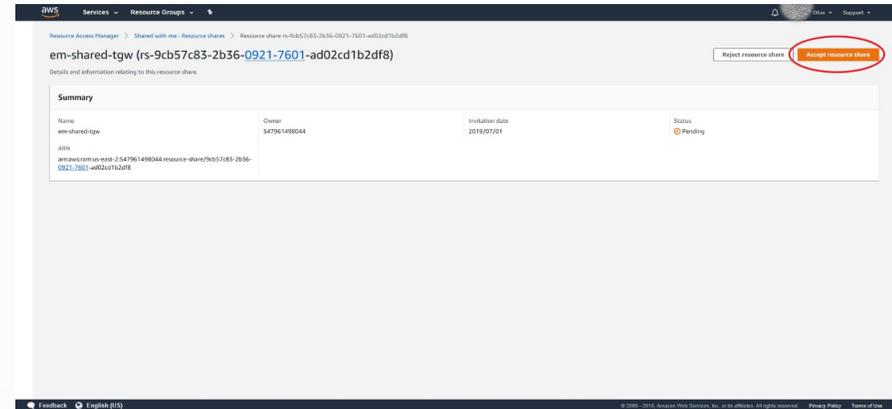
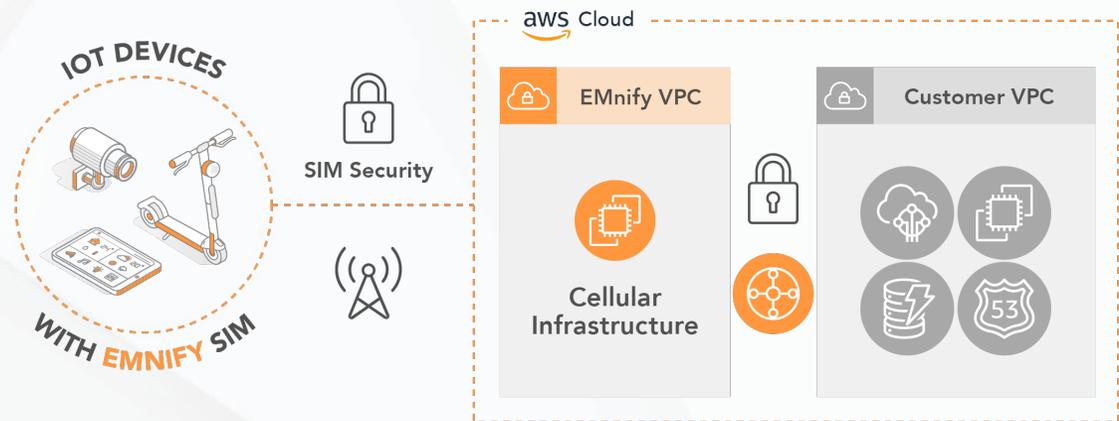
- Why required in IoT B2B?
 - remote access for support teams
 - additional security layer
 - circumvent carrier grade NAT
- Why AWS
 - high availability with managed service for VPN/IPsec or intra-cloud AWS TGW
 - support latest encryption standards
 - automated and standardized secure setup



Drawbacks:

- Setup and recurring costs (private APN, static IP, IPsec, Radius)
- complex IP config to setup redundant tunnels over public internet
- Time to deliver: 2-6 weeks

Simplifying Private Networks with EMnify and AWS



- EMnify secures data up to AWS
- Establishing private network with AWS Transit Gateway attachment (intra-cloud connect) via cross account role in minutes
- No need for private APN, IPsec

Operational Data, Alerts and Dashboards

- Why required in IoT B2B?

- support teams' primary tools
- solve issues before they appear
- display relevant data from all data sources for root cause triage

- Why AWS?

- streaming analytics and storage as a service
- scales with needs without pre-provisioning
- Integrates device and infrastructure data
- Or use own developed application on top of datastore (e.g. DynamoDB)



AWS IoT
Device Defender

Detect anomalies



Thing

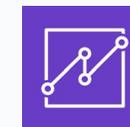


Amazon SNS

Send alerts



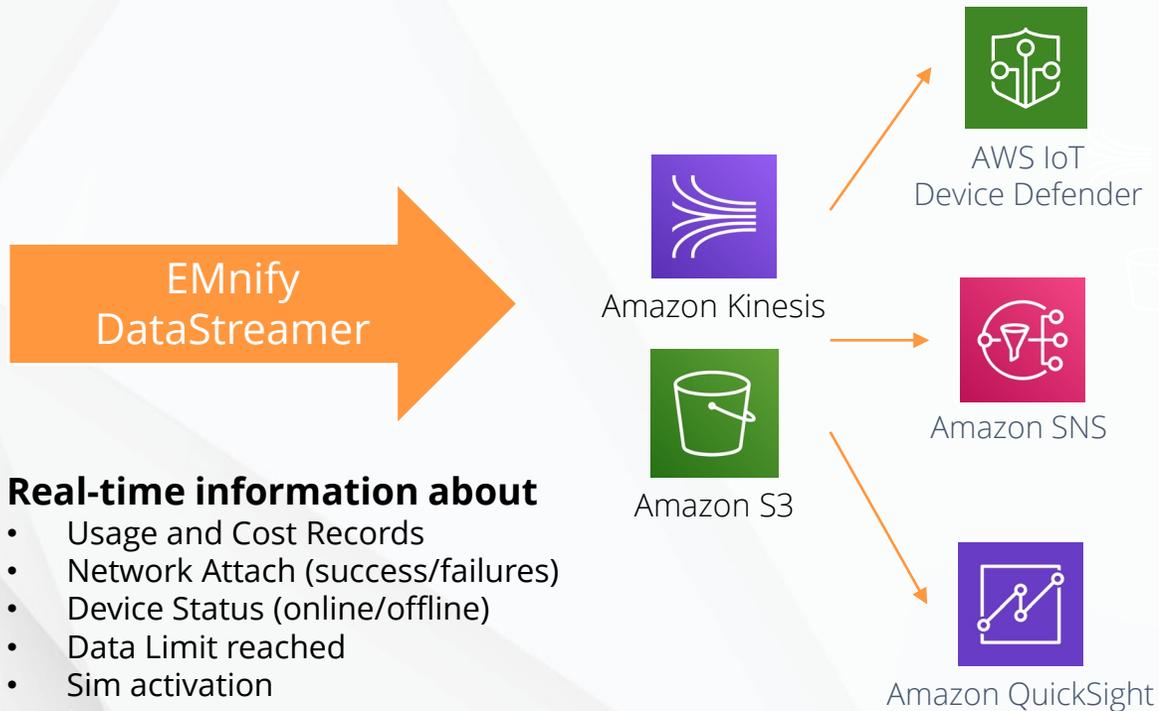
EC2 with
Cloudwatch



Amazon QuickSight

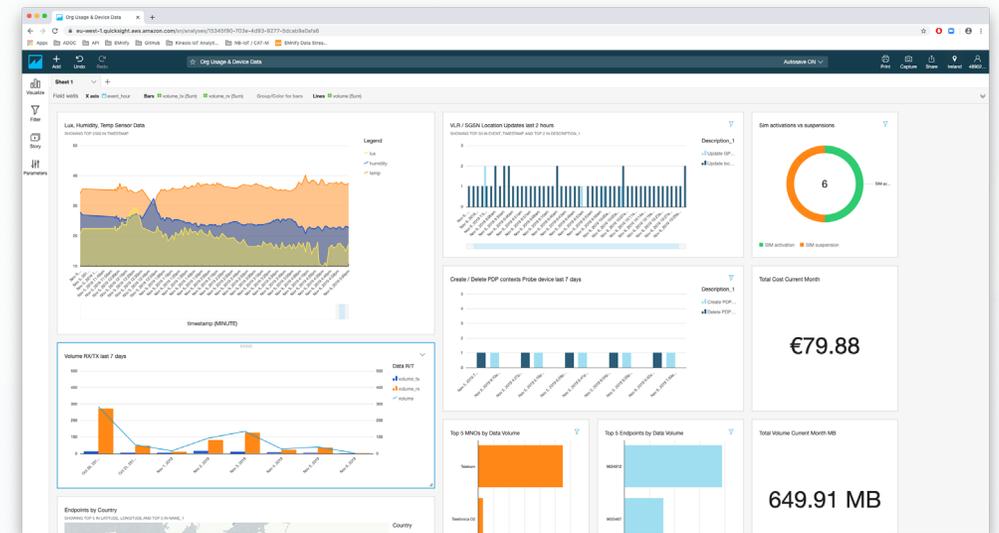
No-code
dashboards

Integrating Connectivity Data with EMnify and AWS



Real-time information about

- Usage and Cost Records
- Network Attach (success/failures)
- Device Status (online/offline)
- Data Limit reached
- Sim activation
- Location
- ...



Example AWS Quicksight Dashboard with Device and connectivity data

Summary

Customer requirements



EMnify

IoT solution that works everywhere

Reliable Distributed Infrastructure

Global Cellular Connectivity and multi-region mobile network

With efficient utilization of resources

Managed Services offloads development and operation

Automated Integration into AWS Cloud

Support teams that can see and solve customer issues

Services to operate, display, alert on the solution

Connectivity Metadata in AWS and remote device access

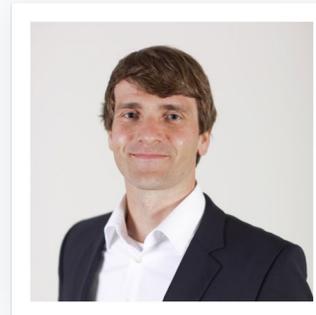
How to get started

- Getting Started with AWS
<https://amzn.to/3hZSkKj>
- Learn about AWS IoT
<https://aws.amazon.com/iot>
- Smart Product Solution
<https://amzn.to/2G7aaxq>



pdreiman@amazon.de

- EMnify Cellular IoT on AWS
<https://www.emnify.com/aws-service>
- Start testing for free
<https://cdn.emnify.net/#/signup>



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