
AWSOME DAY
ONLINE CONFERENCE
9 JUNE 2022 | APAC

AWSOME DAY
ONLINE CONFERENCE

Innovation with AWS

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Amazon Web Services

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Internet of Things (IoT)

What is the Internet of Things (IoT)?

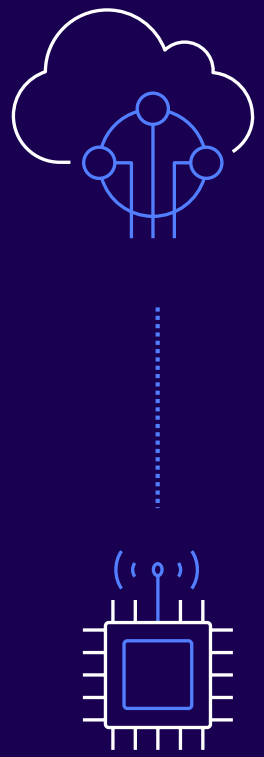
IoT is where a system of integrated devices, such as appliances, watches, or features in a car, can be connected to various applications

These connections enable data to be transferred to and from devices in a bidirectional communication flow over a network

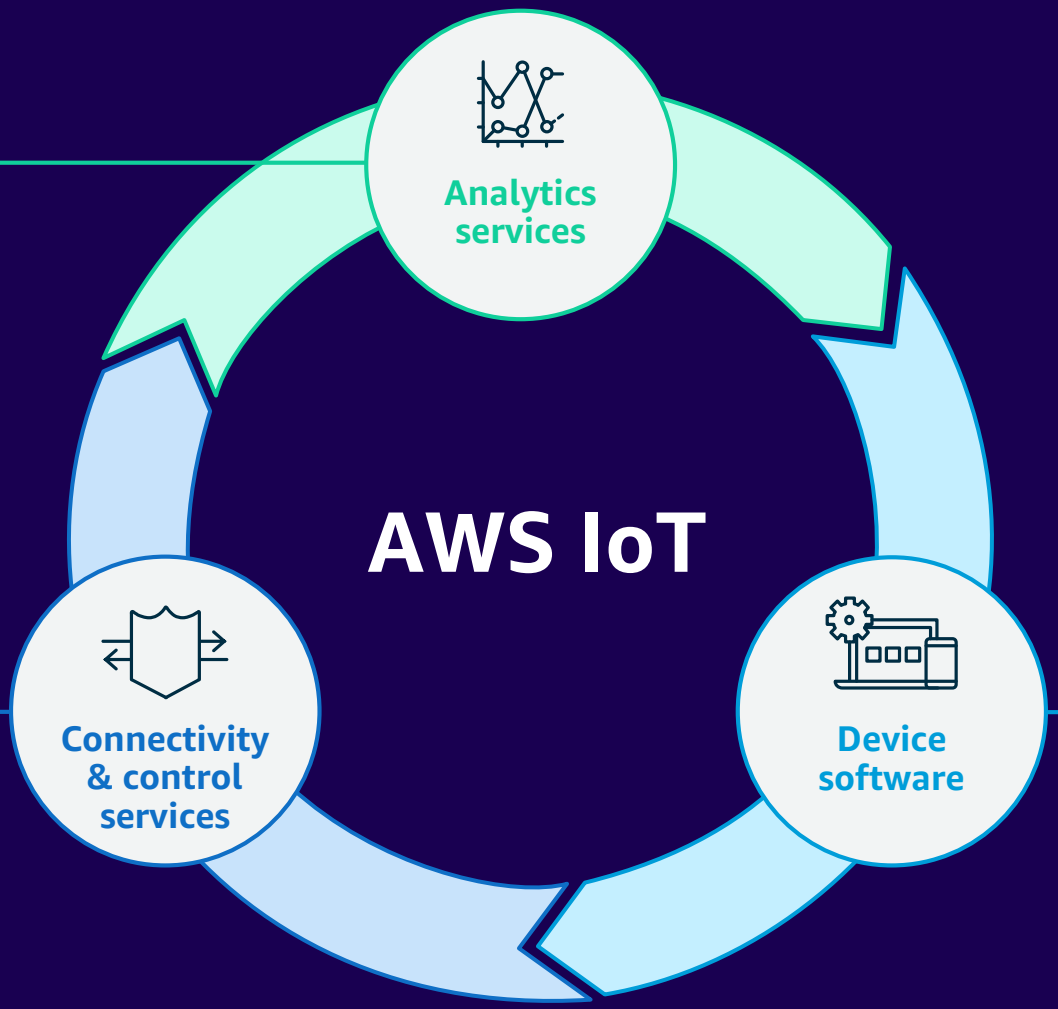
Challenges of managing “things”

The task of managing IoT devices poses a number of challenges

- Management and updates
  - Inconsistent or intermittent network connectivity
  - Devices are remote and may not be physically accessible
  - Large fleets of devices in production
- Analytics
  - Low compute power, low-spec on-device resources
  - Devices may emit large quantities of streaming data



AWS IoT services



AWS IoT SiteWise

AWS IoT Analytics

AWS IoT Events

AWS IoT Things Graph

AWS IoT Core

AWS IoT Device Management

AWS IoT Device Defender

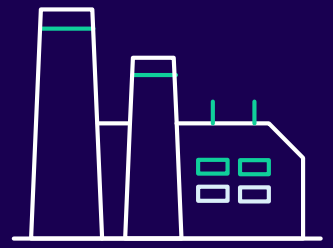
FreeRTOS

AWS IoT Device SDK

AWS IoT Greengrass

AWS IoT Device Tester

What customers are doing with AWS IoT

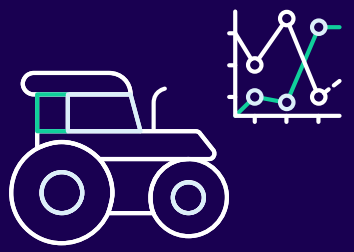


Improve the performance and productivity of industrial processes

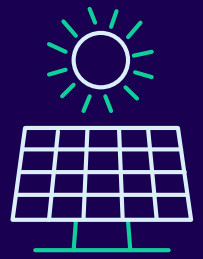
Remotely monitor patient health & wellness applications

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

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AWS IoT core: Rapid development

AWS IoT Core
Connect devices to the cloud

AWS Lambda
Run code in response to events

Amazon DynamoDB
Predictable & scalable NoSQL data store

Amazon Kinesis
Streaming analytics

Amazon API Gateway
Build, deploy, and manage APIs

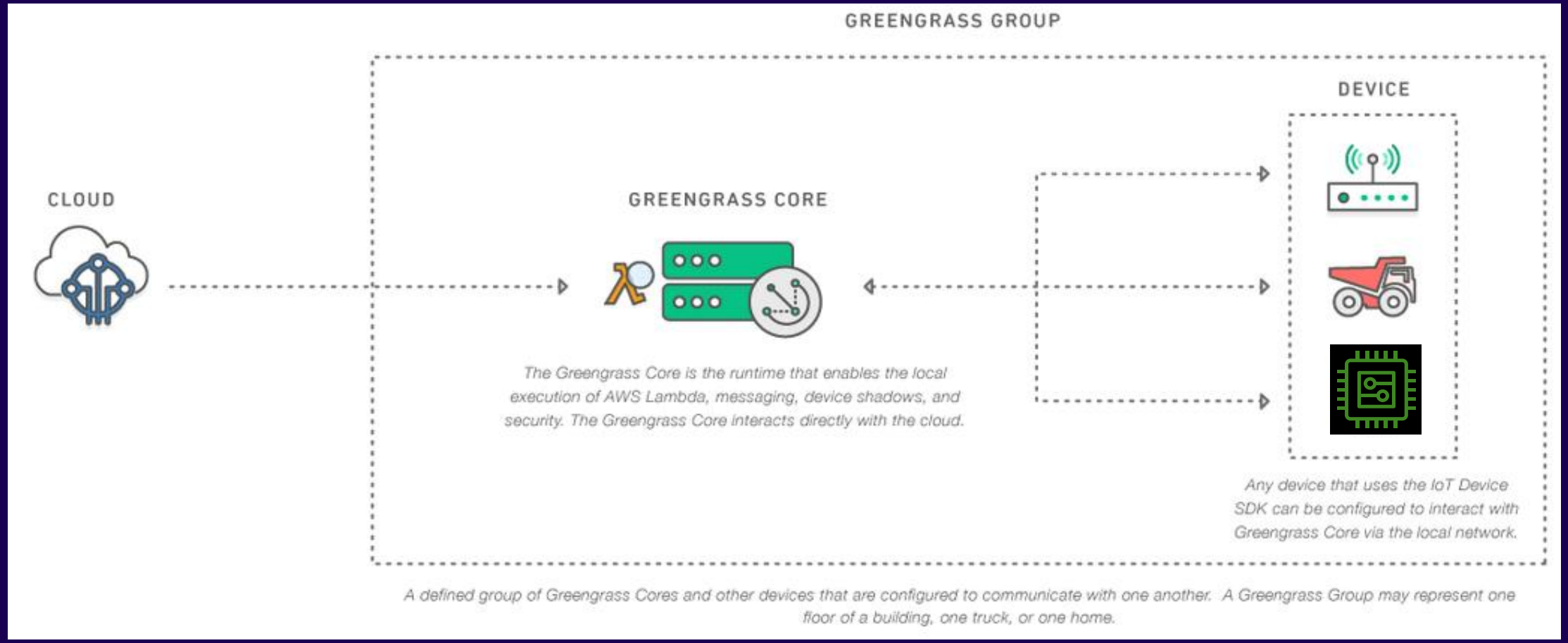
Amazon Redshift
Petabyte-scale data warehouse

Amazon SNS
Mobile push and notifications

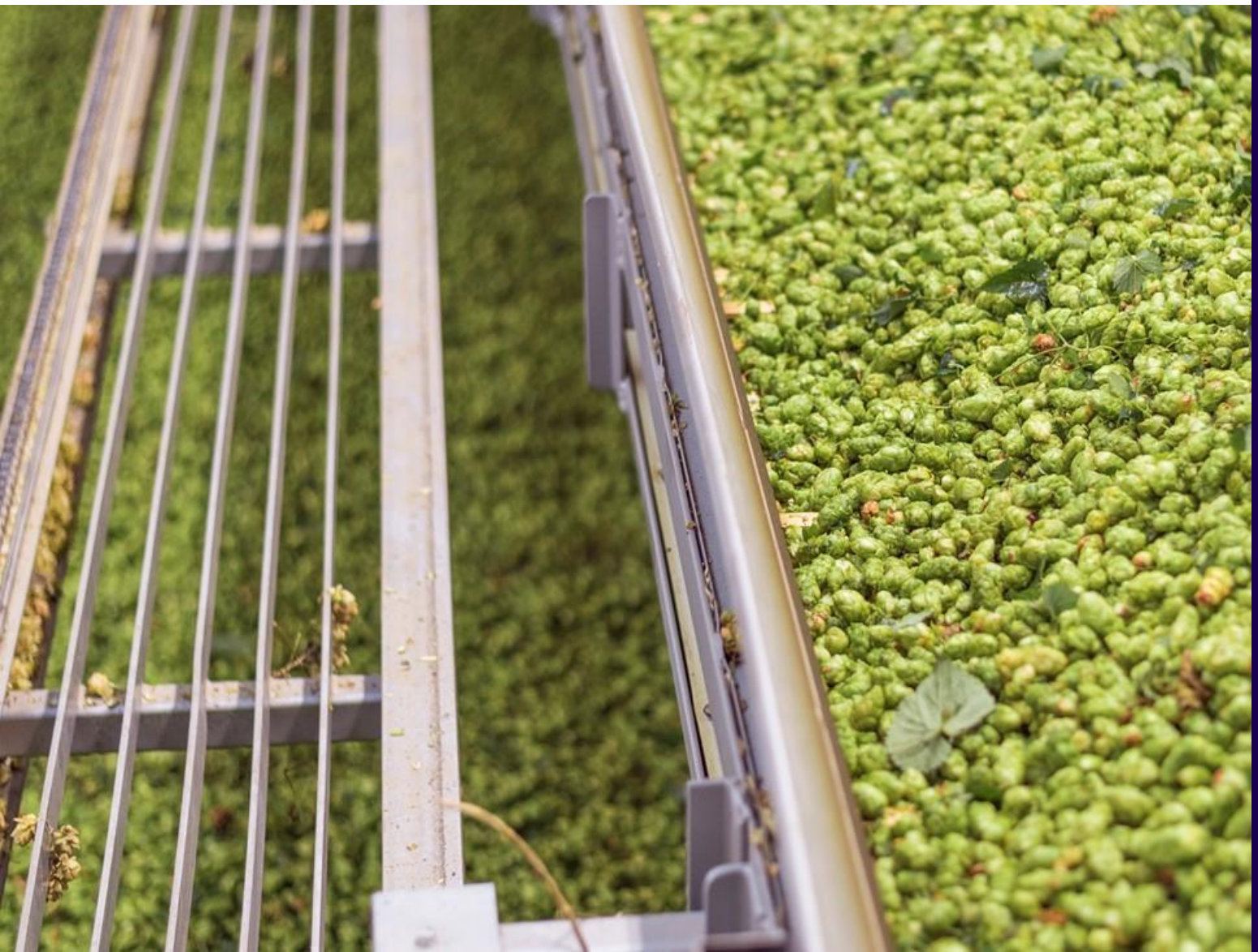
Amazon Cognito
User identity and data synchronization

. . .and more

AWS IoT Greengrass



Bayer CropScience



Problem

In the seed business, it's important to gain better and faster visibility into what's going on in fields during planting and harvest within breeding research and supply chain organizations.

Solution

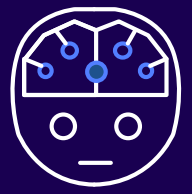
AWS IoT helps Bayer Crop Science manage the collection, processing, and analysis of seed-growing data. Data analysts use the new data collection platform to access data on their mobile devices via dashboards. The solution captures multiple terabytes of data from seed transportation, planting, and growing in the company's research fields across the globe.

Impact

Using AWS IoT, Bayer Crop Science can provide seed data to analysts in just a few minutes instead of a few days. This also helps farmers gain better visibility into field conditions and provides a robust edge processing and analytics framework.

Machine learning

What is machine learning?



Artificial intelligence (AI)

Any technique that enables computers to mimic human intelligence using logic, if-then statements, and machine learning (including deep learning)

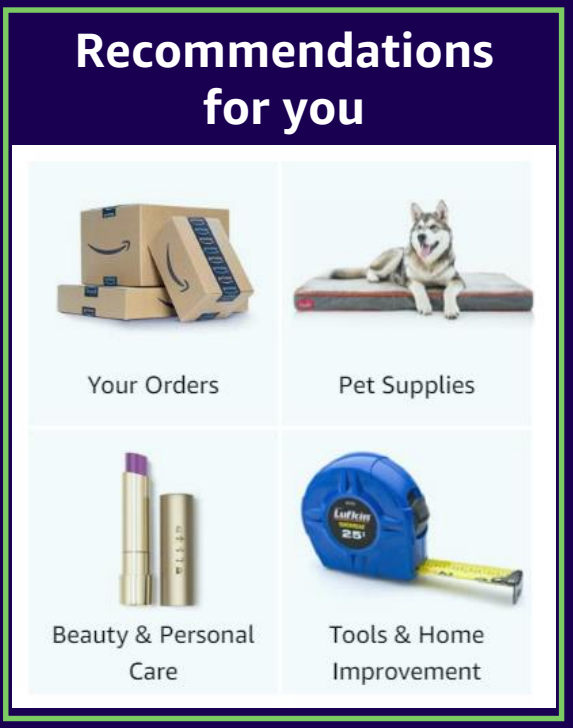
Machine learning (ML)

Subset of AI that uses machines to search for patterns in data to build logic models automatically

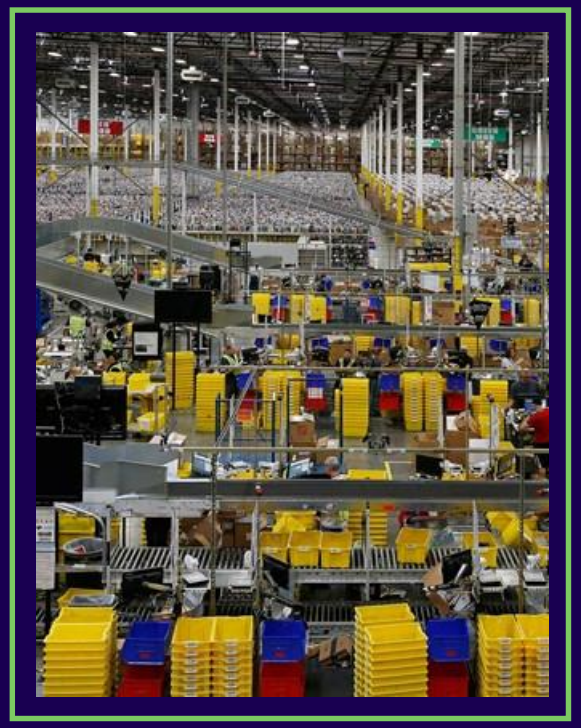
Deep learning

Subset of ML composed of deeply multi-layered neural networks that perform tasks like speech and image recognition

Amazon’s machine learning innovation



4,000 products per minute sold on Amazon.com



1.6 million packages every day

Billions of Alexa interactions each week

First Prime Air delivery on **Dec. 7, 2016**

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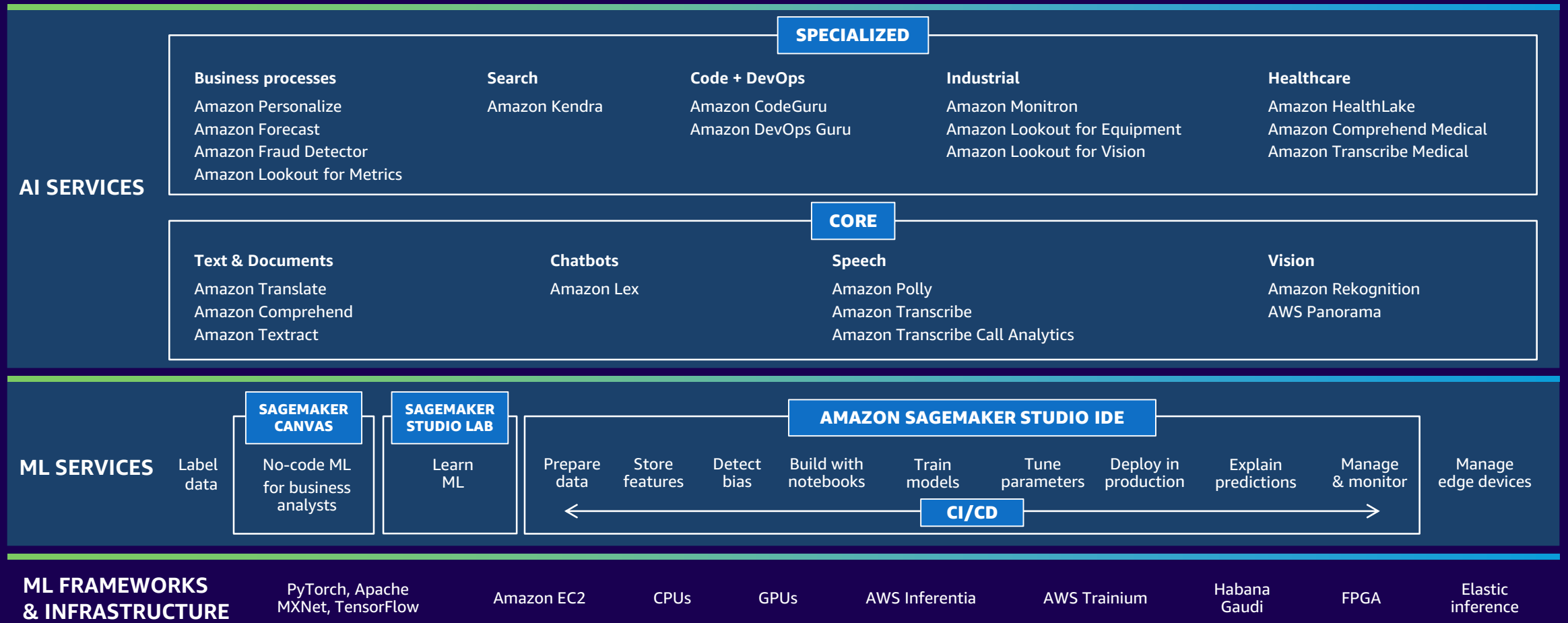
The AWS AI/ML stack

BROADEST AND MOST COMPLETE SET OF MACHINE LEARNING CAPABILITIES



Amazon SageMaker overview

Amazon SageMaker

Prepare →

- SageMaker Ground Truth
- SageMaker Data Wrangler
- SageMaker Processing
- SageMaker Feature Store
- SageMaker Clarify

Build →

- SageMaker Studio notebooks
- Built-in and bring-your-own algorithms
- Local mode
- SageMaker Autopilot
- SageMaker JumpStart

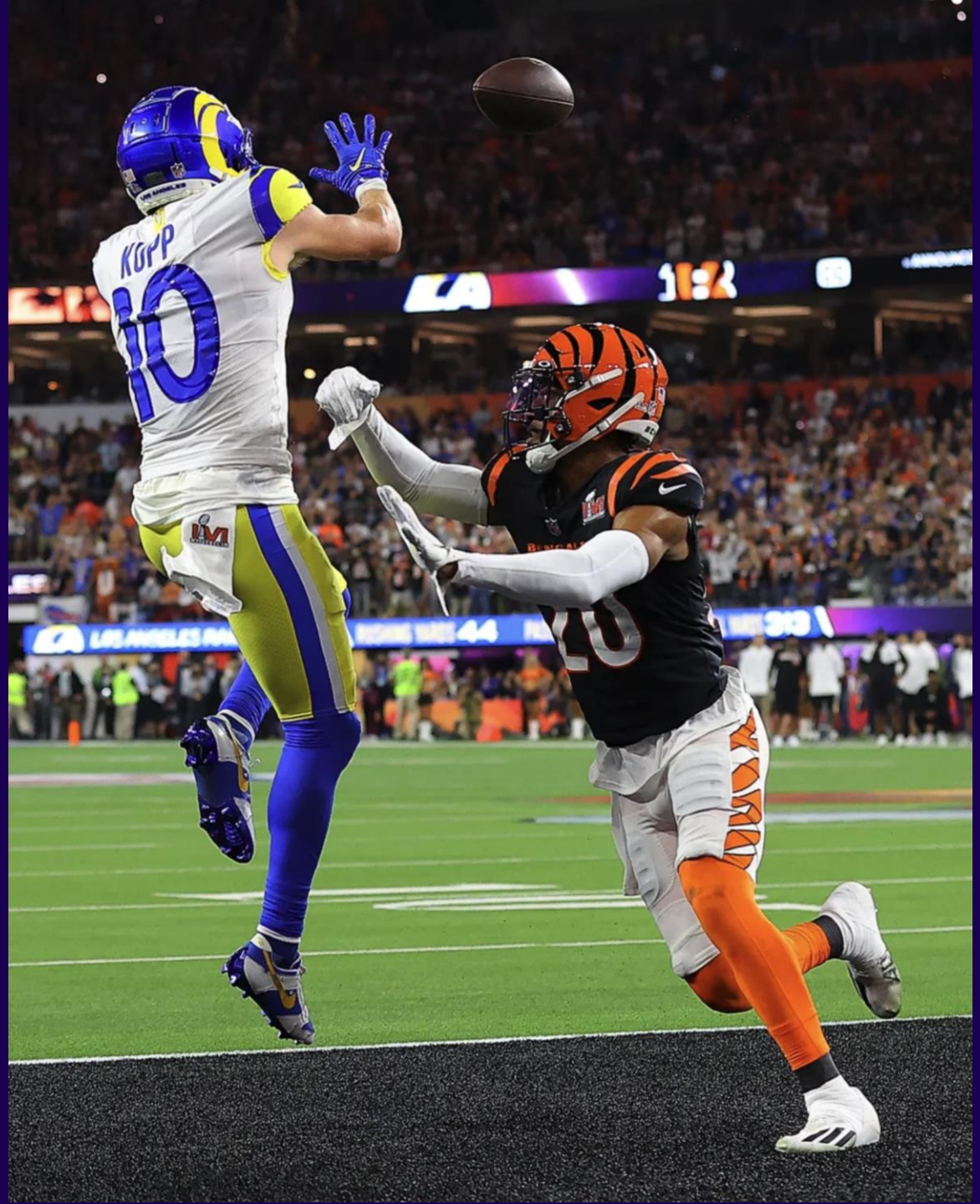
Train & tune →

- Managed training
- SageMaker Experiments
- Automatic model tuning
- Distributed training libraries
- SageMaker Debugger
- Managed spot training

Deploy & manage →

- Managed deployment
- Kubernetes & Kubeflow integration
- Multi-model endpoints
- SageMakerModel Monitor
- SageMaker Edge Manager
- SageMaker Pipelines

SageMaker Studio
Integrated development environment (IDE) for ML



PROBLEM

3+ terabytes of data, 1,500+ hours of play time per week

Needed a solution for real-time stats

Lean team, no data science expertise

SOLUTION: NEXT GEN STATS

Engaged with Amazon ML Solutions Lab

Live data streamed to AWS from RFID tags on players and in game ball

Data processed in 100+ steps in under 1 second

ML models built on Amazon SageMaker make predictions in real time

IMPACT

Launched 20+ stats quickly with limited data science team

Sports announcers get interesting data points to engage fans

Amazon Rekognition

Object and scene detection

Photo-sharing applications can power smart searches and quickly find events or images, such as weddings, hiking, or sunsets

Facial analysis

Retail businesses can understand the demographics and sentiment of in-store customers

Face comparison

Hotels and hospitality businesses can provide personalized service for guests

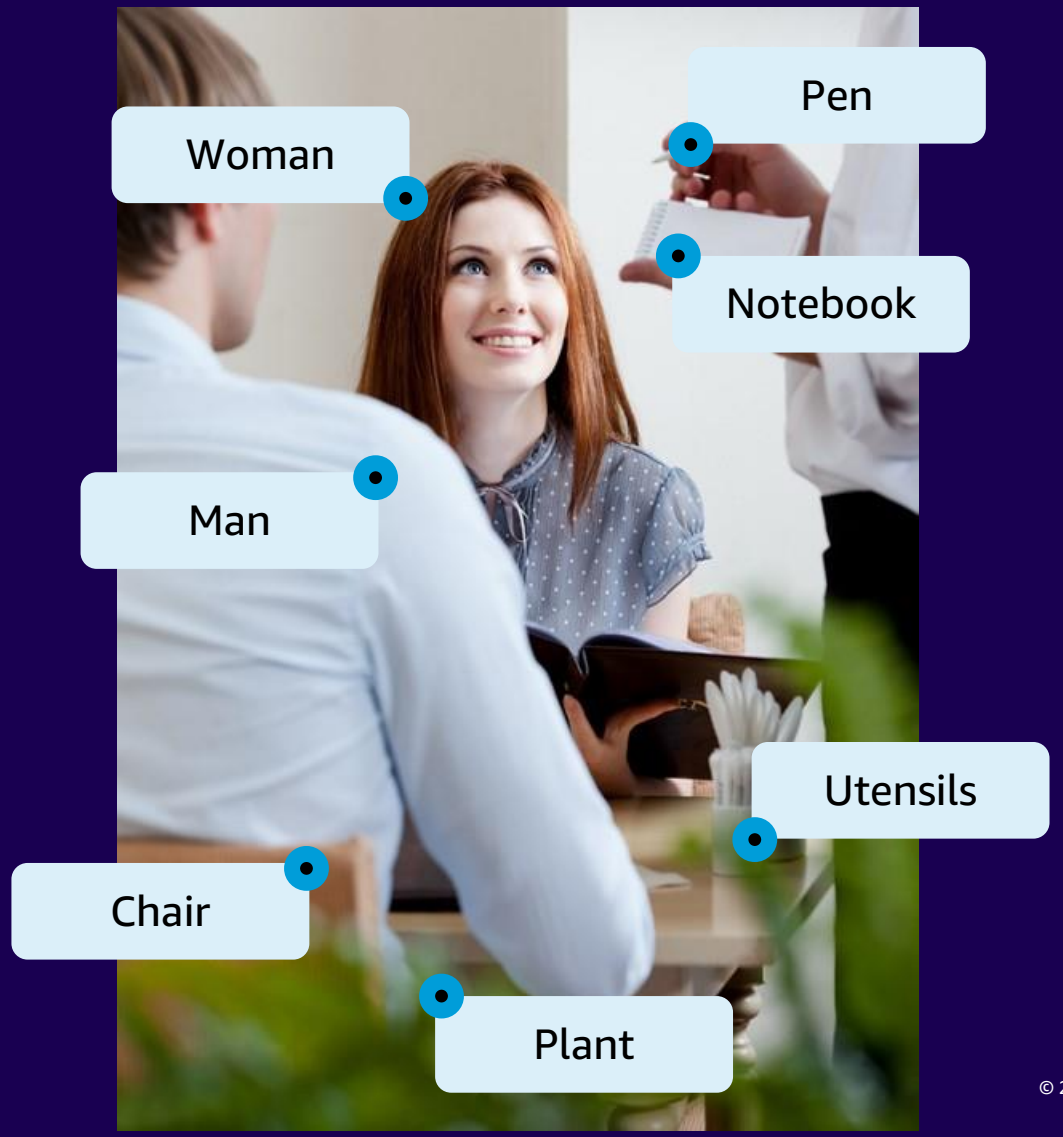
Facial recognition

Provide secondary authentication for existing applications

Object and scene detection

Identify objects and scenes, and provide confidence scores

Use object and scene detection to add features that search, filter, and curate large image libraries



DetectLabels

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Facial analysis

Analyze facial characteristics in multiple dimensions

DetectFaces

Demographic data
Age range: 29–45

Facial landmarks
EyeLeft, EyeRight, Nose, RightPupil, LeftPupil, MouthRight, LeftEyeBrowUp, Bounding Box. . .

Image quality
Brightness: 23.6%
Sharpness: 99.9%

Emotion expressed
Happy: 83.8%
Surprised: 0.65%

General attributes
Smile: True 23.6%
EyesOpen: True 99.8%
Beard: True 99.5%
Mustache: True 99.9%

Facial pose
Pitch: 1.446
Roll: 5.725

Blockchain

What is blockchain?

Blockchain makes it possible to build applications where multiple parties can execute transactions **without the need for a trusted, central authority**

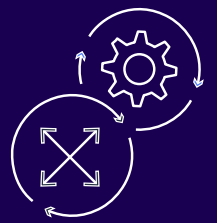
Today, building a scalable blockchain network with existing technologies is complex to set up and hard to manage

Each network member needs to

Manually provision hardware

Install software

Create & manage certificates for access control



Configure networking components

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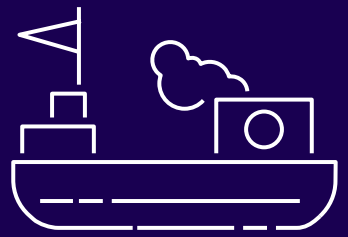
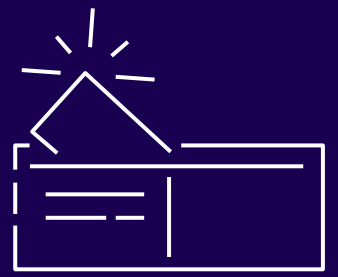
Example use cases

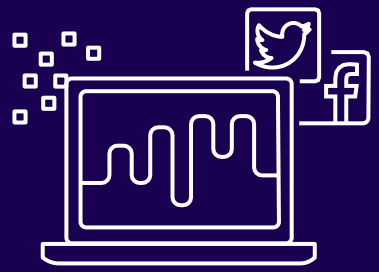


Shipping

Supply chain management



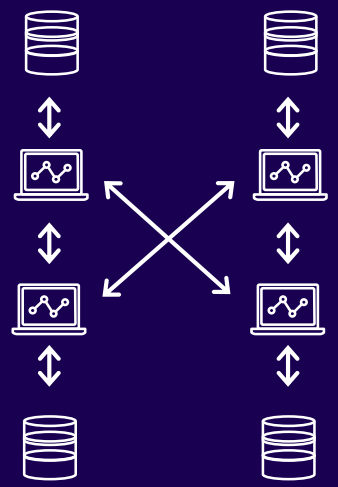
Finance and banking



Digital advertising

Blockchain qualities

Decentralized trust



Financial institutions
Peer-to-peer payments

Mortgage lenders
Process syndicated loans

Supply chain
Transact with suppliers and distributers

Retail
Streamline customer rewards

Benefits

Transparency

Immutability

Auditability

Permissionless

Permissioned

Consortium

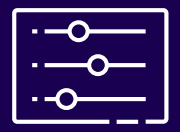
AWS blockchain services

Amazon Managed Blockchain

Fully managed service that makes it easy to create and manage scalable blockchain networks using popular open-source frameworks

- Hyperledger Fabric
- Ethereum

Amazon Managed Blockchain features



Fully managed

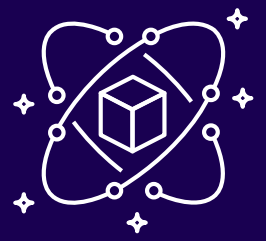
Create a blockchain network in minutes

Open-source variety

Support for two frameworks

Decentralized

Democratically govern the network

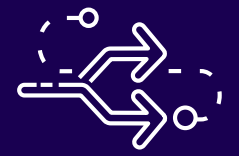


Reliable and scalable

Backed with Amazon QLDB technology

Low cost

Only pay for resources used



Integrated

Easily use with AWS services

Nestlé's chain of origin coffee cultivates supply chain transparency with Amazon Managed Blockchain

Challenge

Nestlé is the biggest procurer of coffee in the world, and it wanted to uncover transparency around its coffee bean supply chain beyond its brokers and buyers

Solution

Nestlé turned to Amazon Managed Blockchain to trace back through every step in its supply chain – from the farmer and grader to the roaster and packer

Benefits

- Nestlé can now grow one-on-one relationships with coffee farmers and roasting facilities
- Because the secure blockchain ledger is public, it provides greater accountability to everyone in the supply chain

"Whether it's how we ensure freshness, whether it's making sure that the packaging being used is better for the planet, **it means that the value is going back to the farmers and the partners we're working with**."

Armin Nehzat, Digital Technology Manager, Nestlé

Company: Nestlé
Country: Switzerland (CH)

Employees: 300,000+

Website: Nestle.com

About Nestlé

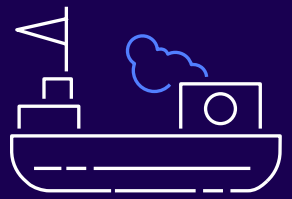
Nestlé is the world's largest food and beverage company. It is present in 190 countries around the world, and it has 308,000 employees. Nestlé is also the biggest procurer of coffee globally.

AWS Ground Station

Common satellite data cloud processing use cases

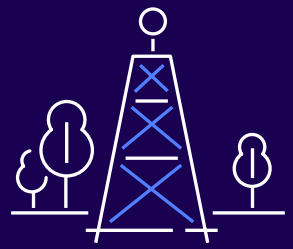
Weather forecasting and agriculture

Commercial fruit producers can monitor crop health and water levels to ensure efficient use of limited resources



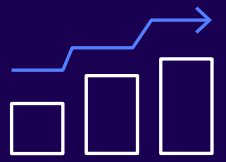
Global shipping and anti-piracy

Leverage registries of ship placement, destination, and tracking to confirm accuracy of ship positioning, as well as be notified of any deviations from normal operations



Earth observation and fire safety

Use low-latency access to high-resolution heat mapped images of the earth to inform frontline fire commanders on safest, lowest heat entry points to fight fires



Retail forecasting

4.8 million satellite images from 44 major US retailers confirms numbers of cars in parking lots and yields an informational advantage to forecasting accuracy

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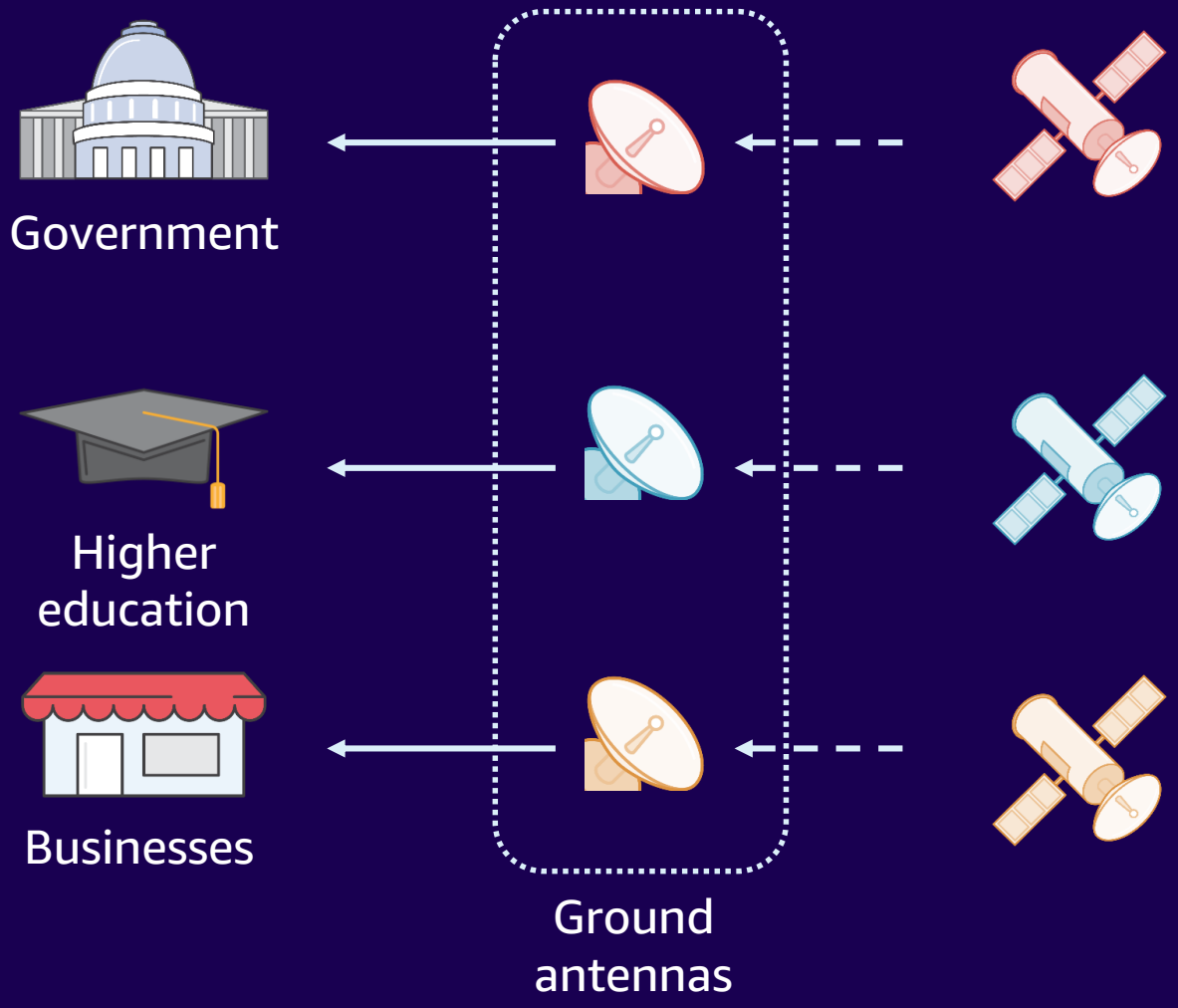
Industry challenges

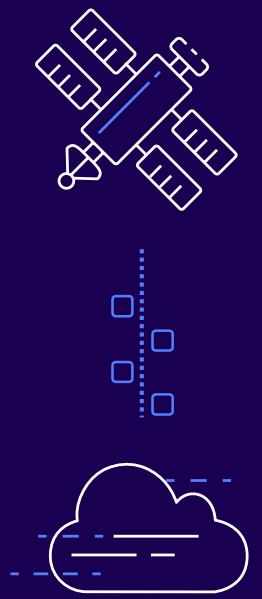


- Build, lease, or purchase unused bandwidth
- Are difficult to maintain
- Require high capital expenditure investment to scale
- Support opaque pricing
- Cause data access latency

AWS Ground Station: What is it?

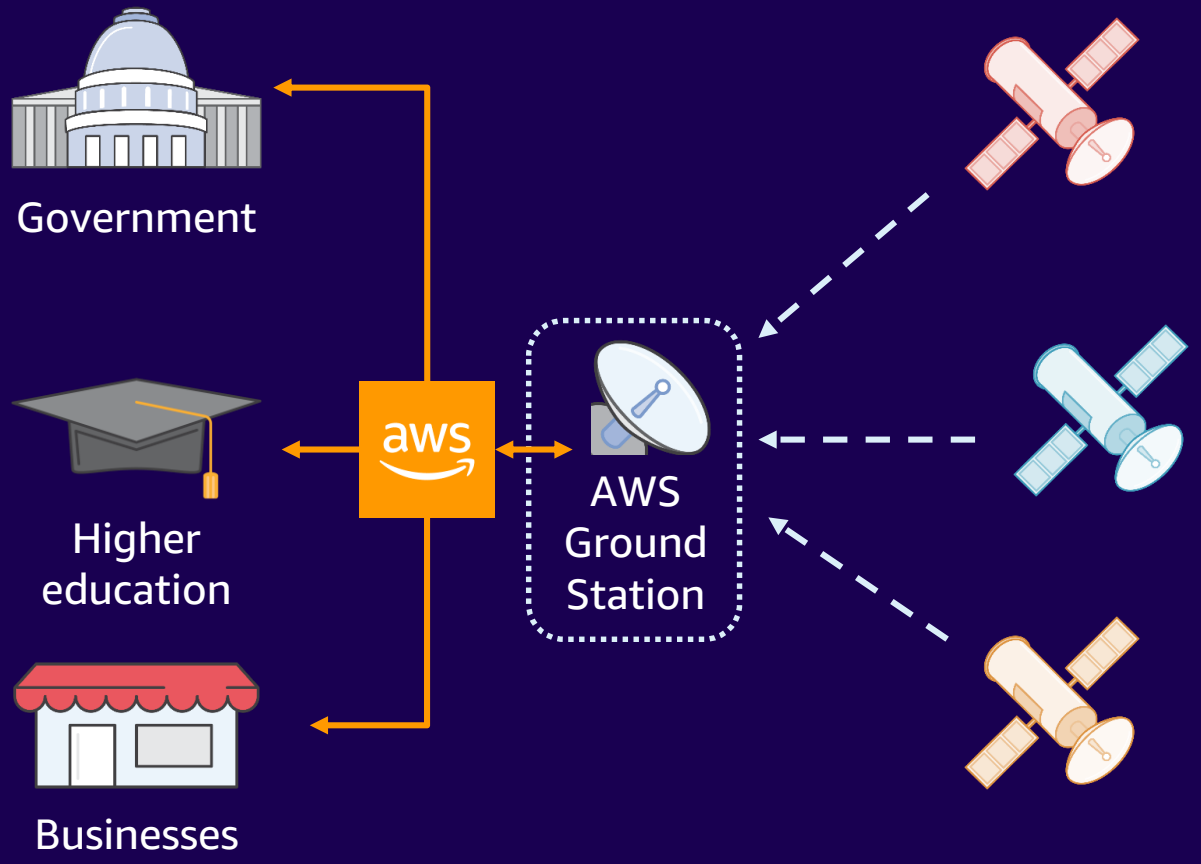
AWS Ground Station is a fully managed service that lets you control satellite communications, process data, and scale operations without having to worry about building or managing your own ground station infrastructure

These facilities provide communications between the ground and the satellites in space



- Low-latency global fiber network
- Direct access to AWS services
- Fully managed service (no infrastructure commitments)
- Pay-as-you-go pricing
- No licensing requirements
- Scale satellite communications on demand when your business needs it

What AWS Ground Station offers

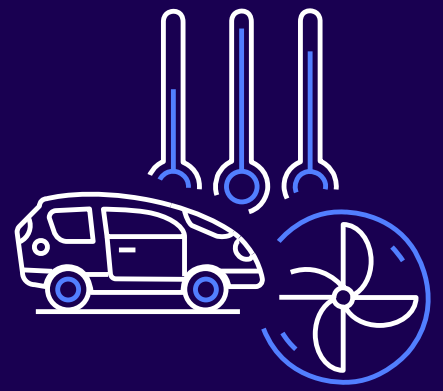


- Satellite ground support with no infrastructure commitments
- Pay-by-minute pricing
- Self-service scheduling
- Colocated ground stations and AWS data centers providing direct access to AWS resources and services
- Backhaul of base band data to customer Region of choice included in pricing
- Near-real-time data delivery

AWS Wavelength

Mobile edge computing: Characteristics

- **Massive number of devices** such as sensors, video cameras, and IoT devices generating large volumes of data
- Processing of data needs to happen **close to data generation**
- In real time with **very low latency**



Total global mobile traffic expected to reach 131 EB (exabytes) per month by 2024*

** Ericsson Mobility Report, June 2019*
https://www.ericsson.com/49d1d9/assets/local/mobility-report/documents/2019/ericsson-mobility-report-june-2019.pdf

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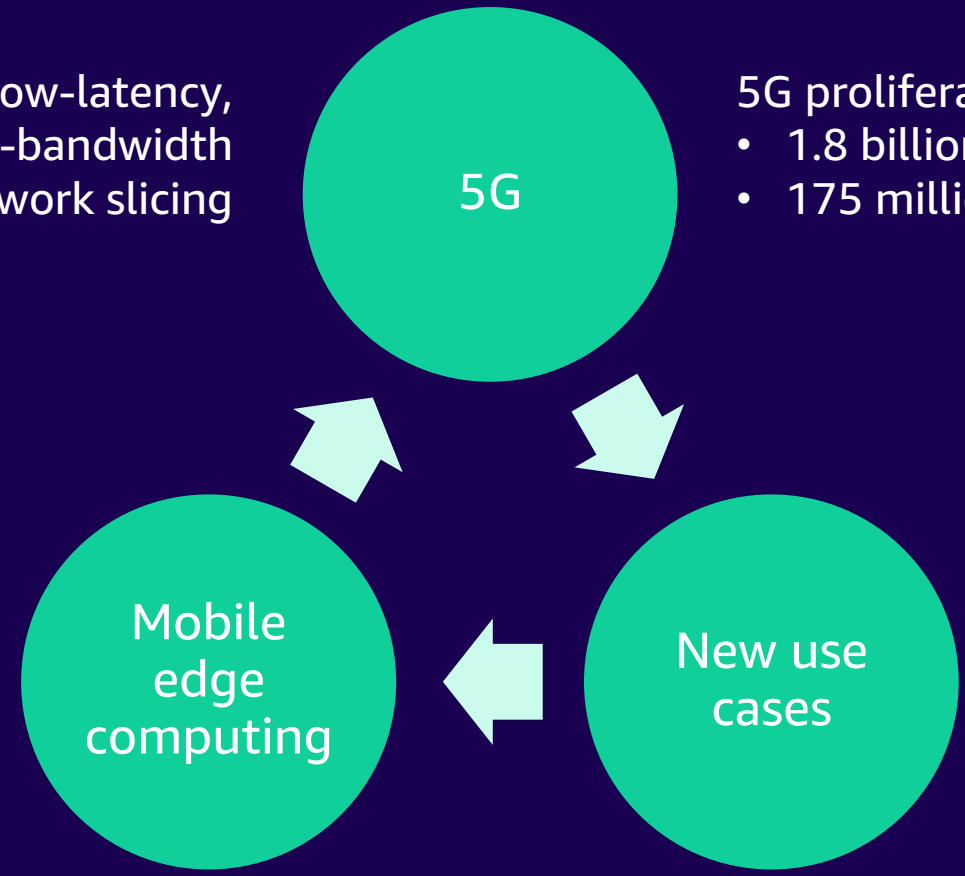
5G and mobile edge computing

MOBILE SERVICE DELIVERY MODEL THAT IS CONSUMER- AND BUSINESS-FOCUSED

Ultra-low-latency, high-bandwidth network slicing



5G proliferation forecast for the next 4 years
- 1.8 billion mobile subscribers
- 175 million business subscribers worldwide

Cloud gaming, video streaming, AR/VR, IoT, video recognition, C-V2X, etc.

Demand and new requirements such as low latency, local processing at MEC solution

AWS Wavelength

AWS Wavelength combines the high bandwidth and ultra-low latency of 5G networks with AWS compute and storage services to enable developers to innovate and build a whole new class of applications

- AWS infrastructure and services in CSP 5G networks
- Ultra-low latency, local data processing
- Scalable capacity in CSP data center managed and supported by AWS

AWS Wavelength: Built for the mobile edge

AWS SERVICES FROM INSIDE THE CSP MOBILE NETWORK

AWS compute and storage infrastructure embedded inside CSP mobile network

Single pane of management, across Wavelength Zone and AWS Regions

Access to services in the AWS Region

Develop applications once and deploy for use with 5G network globally

Failover from Wavelength Zone to AWS Region

AWS Wavelength use cases

Healthcare

AI/ML solution for processing and analyzing video, images, and data for real-time diagnosis

Connected vehicles (C-V2X)

Real-time monitoring of data from sensors for road safety, secure connectivity, in-car telematics, and autonomous driving

Smart factory

Accelerating the industrial edge with AI/ML, video recognition for software-defined manufacturing

LG uses AWS Wavelength for low-latency, high-throughput delivery of V2X data

"5G gives us that connectivity piece with high bandwidth and low latency, while **Wavelength is providing the necessary compute power at the edge to supplement the 5G technology**. So, it's about bringing security, privacy, connectivity, and compute together for the benefit of consumers and their safety."

Harsh Kupwade Patil,
Security Leader & Principal Research Engineer, LG Electronics

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We hope you found it interesting! A kind reminder to **complete the survey.**
Let us know what you thought of today's event and how we can improve the event experience for you in the future.


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