AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

AIM303

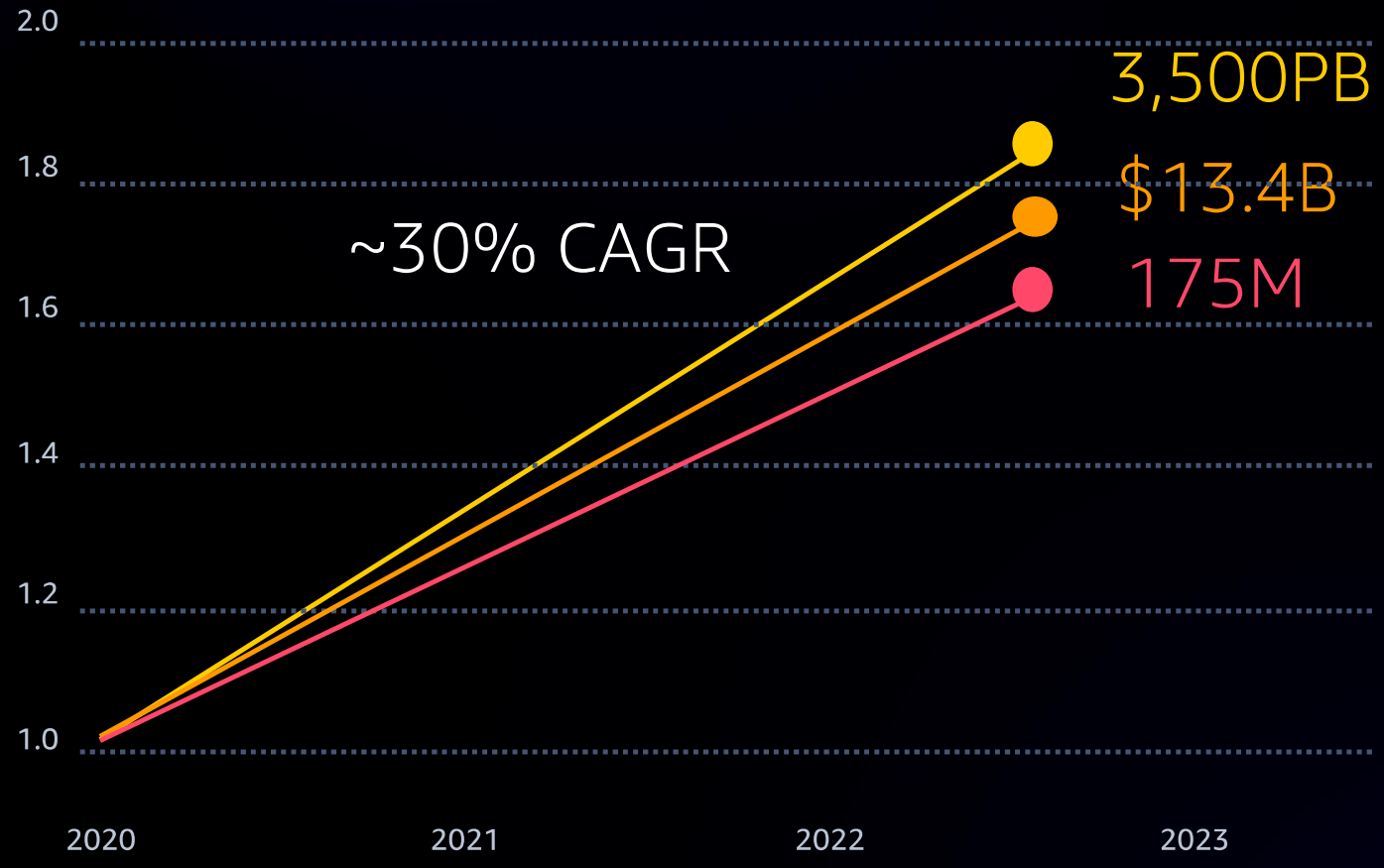
Improve your operations with computer vision at the edge

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AWS

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Senior Solutions Architect
AWS

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Visual data from IP cameras is doubling every 2.5 years



3,500PB Daily data from IP cameras

$13.4B Video analytics market

175M Enterprise IP cameras

However, **98%** of recorded footage is **never analyzed**

Source: Market Research Future: Global Surveillance Storage Market, and Global Market Insights: IP Camera Market Report

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Computer vision (CV) enables new capabilities across industries



Gather

retail analytics, such as heat mapping for store layout optimization and queue length monitoring



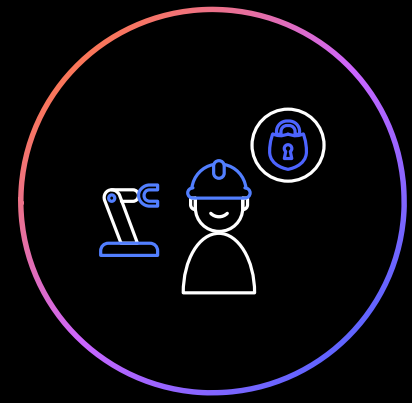
Monitor

order accuracy or vehicle traffic at quick-service restaurants



Improve

performance and productivity of industrial processes, such as supply chain operations or manufacturing quality inspection



Enhance

worker safety in the warehouse, in the office, and on the factory floor

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Customers need computer vision at the edge



Low latency for real-time insights



Bandwidth constraints limit what video is sent to the cloud

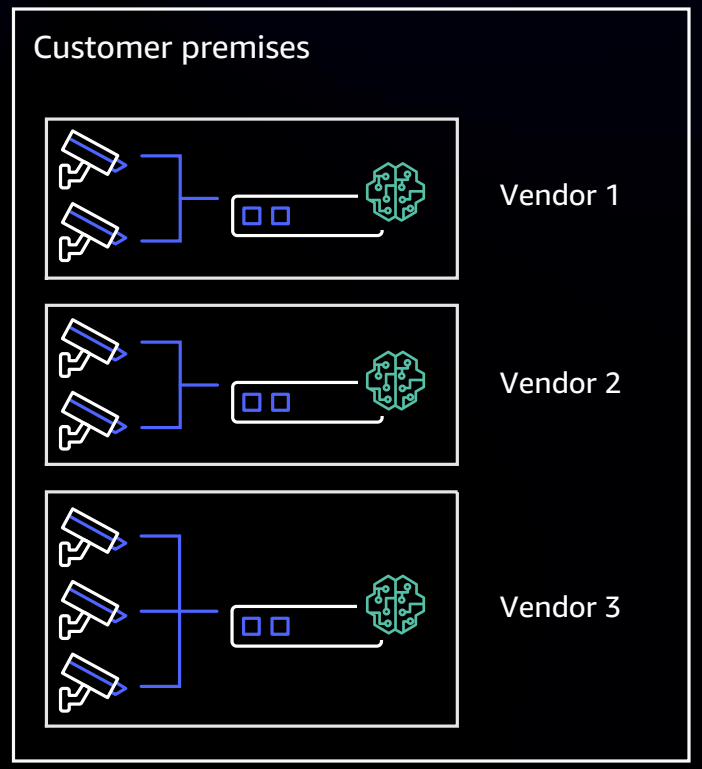


On-premises data processing requirements

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Edge computer vision solutions are hard

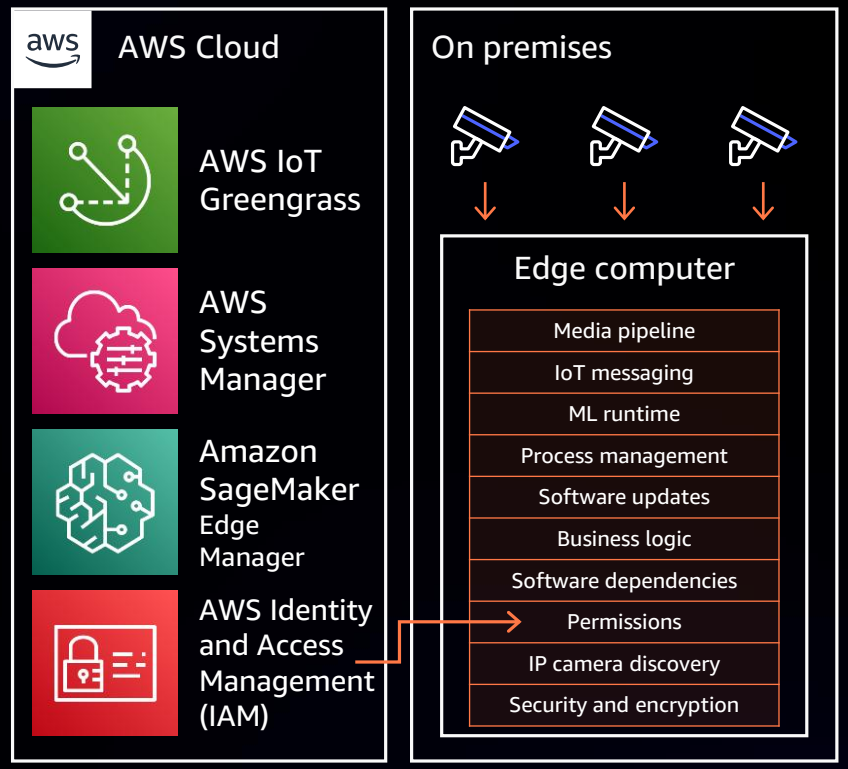
Standalone solutions



✓ **Easy to deploy**

✕ **Closed and proprietary**

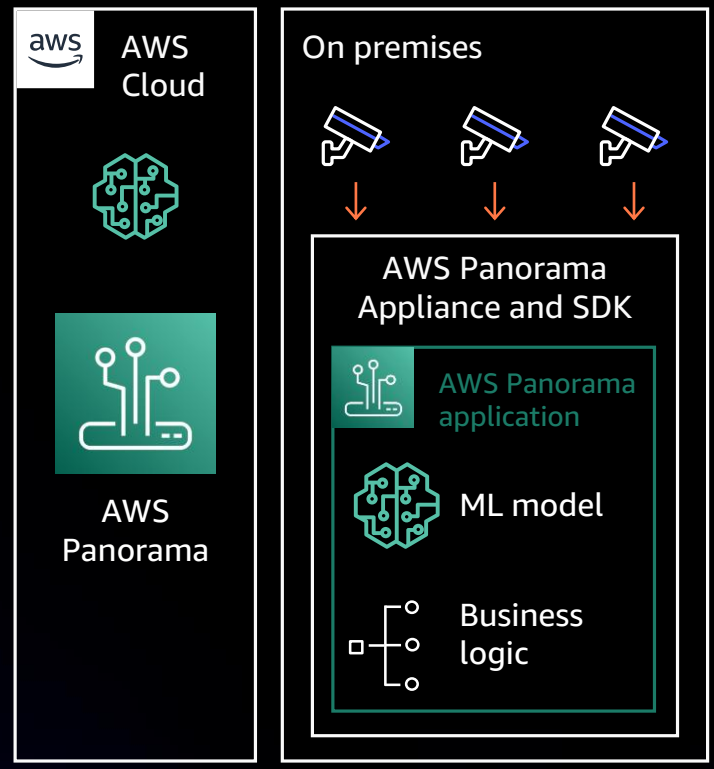
Unmanaged/DIY



✓ **Open and flexible**

✕ **Difficult to build and scale**

AWS Panorama



✓ **Open and flexible**

✓ **Easier to build and scale**

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What is AWS Panorama?

AWS Cloud

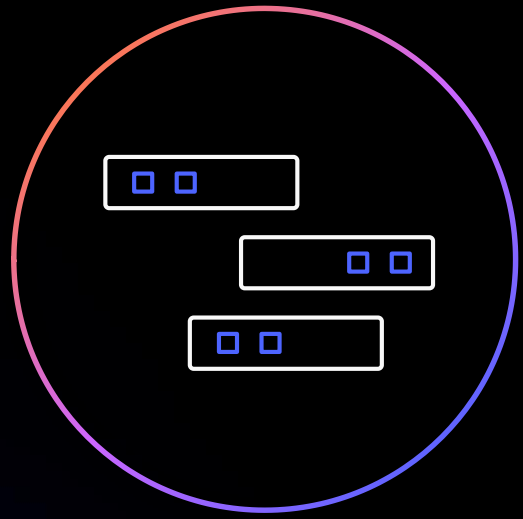
AWS Panorama console and service APIs



Cloud-based console and service APIs that enable fleet management of CV apps, AWS Panorama appliances, and camera streams

Customer site

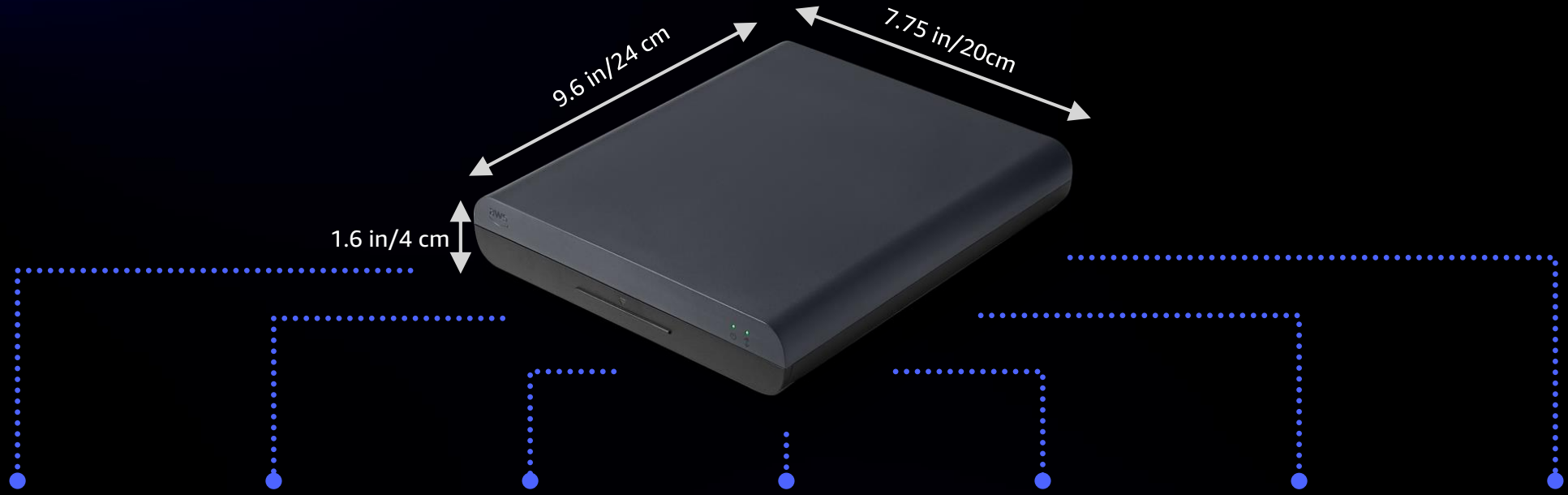
AWS Panorama Appliance and SDK



App SDK manages video stream ingestion, application deployment, and inferencing on edge appliance optimized for CV workloads

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AWS Panorama Appliance



Set up in minutes

Connects to existing IP cameras

Runs custom models or production-ready CV apps at the edge

IP62-rated ruggedized device

NVIDIA Xavier AGX GPU

Multiple camera streams in parallel

Multiple models per stream

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How does AWS Panorama work?

AWS Cloud

1

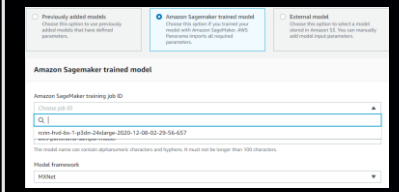
- Build on Amazon SageMaker
- Bring your own model
- Buy pre-built 3P model/app



2

- Import model
- Build app/business logic
- Provision devices
- Manage camera streams
- Deploy CV app

AWS Panorama console and service APIs



Customer site

3

- Connect appliance to LAN
- Connect to cameras and ingest video feeds
- Run CV apps against camera feeds
- Publish inference results (local/AWS)

AWS Panorama Appliance and SDK





Network switch



IP cameras

AWS Cloud

4



Route AWS Panorama application results to AWS services such as Amazon S3 or Amazon CloudWatch

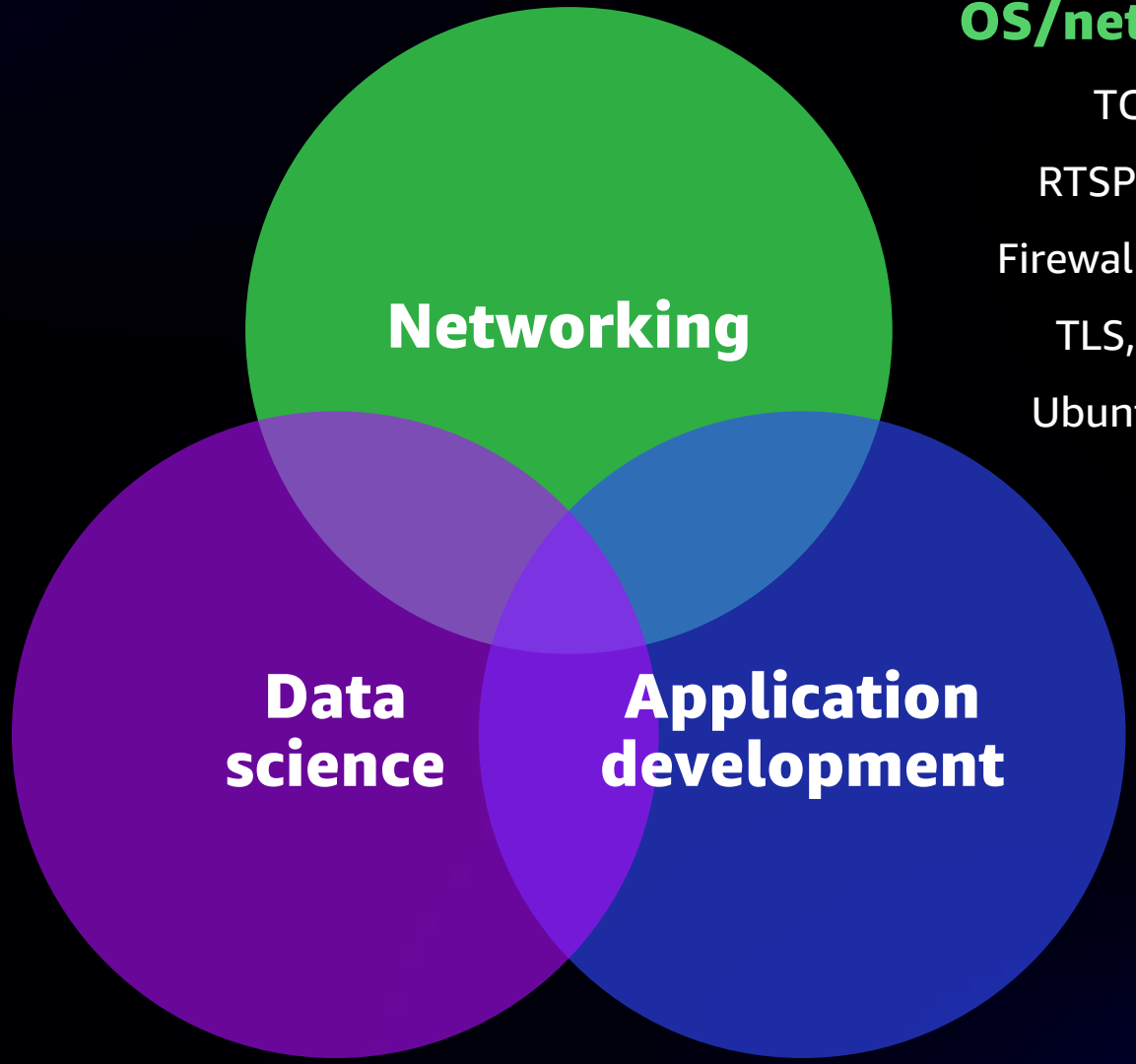
4



Integrate AWS Panorama application results with on-premises line of business applications for analytics and/or automation

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Skills required to deploy AWS Panorama



OS/networking

TCP/IP

RTSP, ONVIF

Firewalls, proxies

TLS, MQTT

Ubuntu Linux

CV model development

PyTorch, TensorFlow, MXNet, Darknet

Object detection, segmentation

Data labeling

Performance tuning

Application builders

Containers

Web application

Business rules

Analytics

aws

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3 sources for ML models on AWS Panorama

Build

Custom models

Train custom models anywhere with support for major ML frameworks and neural network architectures

Buy

ISV models and apps

Retail analytics

Yard management

Restaurant operations

Smart cities

Try

AWS Panorama sample GitHub





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AWS Panorama customers

Retail analytics

PHILLIPS 66

PARKLAND

Yard management

PORT of vancouver

amazon freight

Process inspection

Tyson

Fender®

Airport operations

CVG

Traffic analysis

SIEMENS

Worker safety

bp

aws

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Phillips 66 transforming retail operations with computer vision

Phillips 66 (P66) is a Fortune 100, multinational energy company headquartered in Houston, TX. In the United States, P66 markets gasoline, diesel, and aviation fuel through approximately 7,540 independently owned outlets in 48 states. The sites feature the Phillips 66, Conoco, or 76 brands.



Solution overview

- In-store heat maps
- Vehicle dwell time analysis at fuel dispenser (forecourt)
- Customer wait time analysis
- Forecourt → backcourt conversion rate

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Container tracking at the Port of Vancouver

PORT of vancouver

Port of Vancouver is leveraging AWS Panorama to deploy cameras that will allow for comprehensive tracking of container movement across the entire site

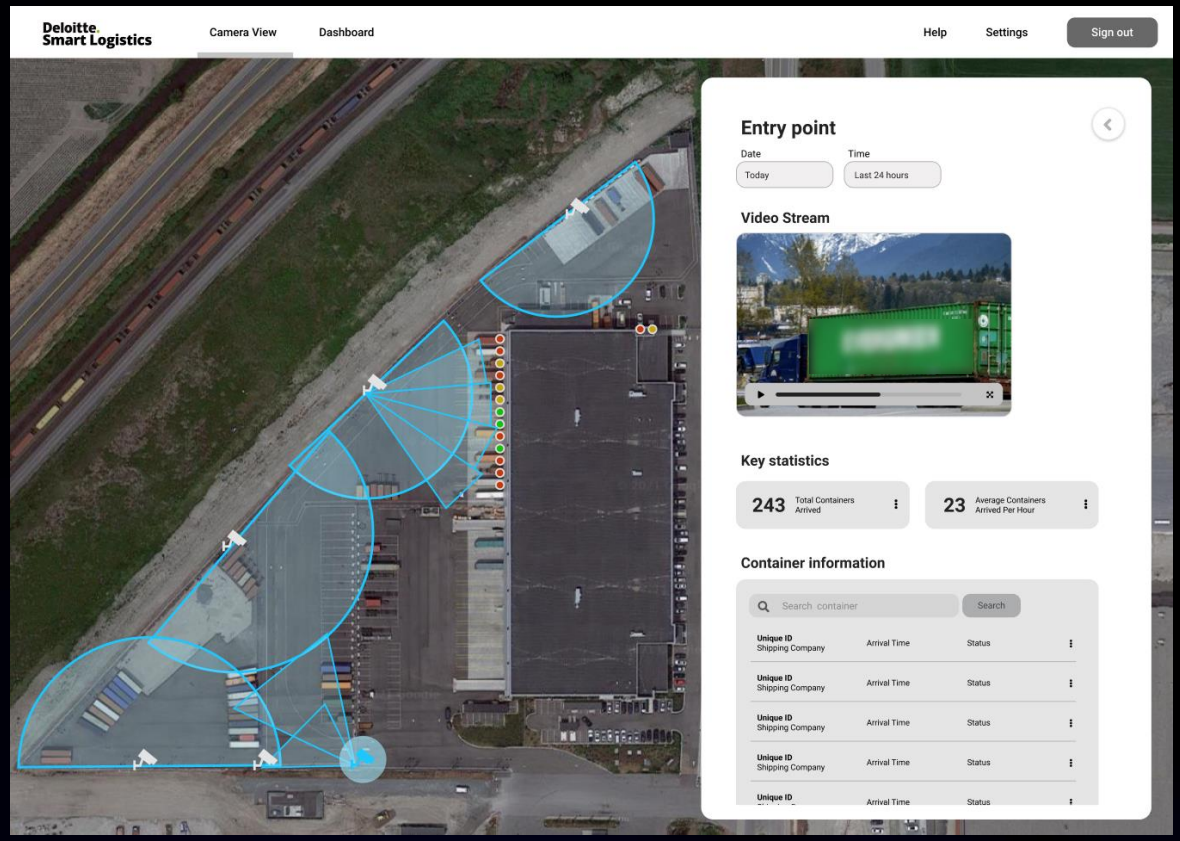
Platform will use visual cues to indicate how long containers have been at specific sites

- Lead ISV/SI – Deloitte
- Cameras – Axis Communications
- Installation/security integrator – Convergint Technologies

Deloitte.

AXIS COMMUNICATIONS

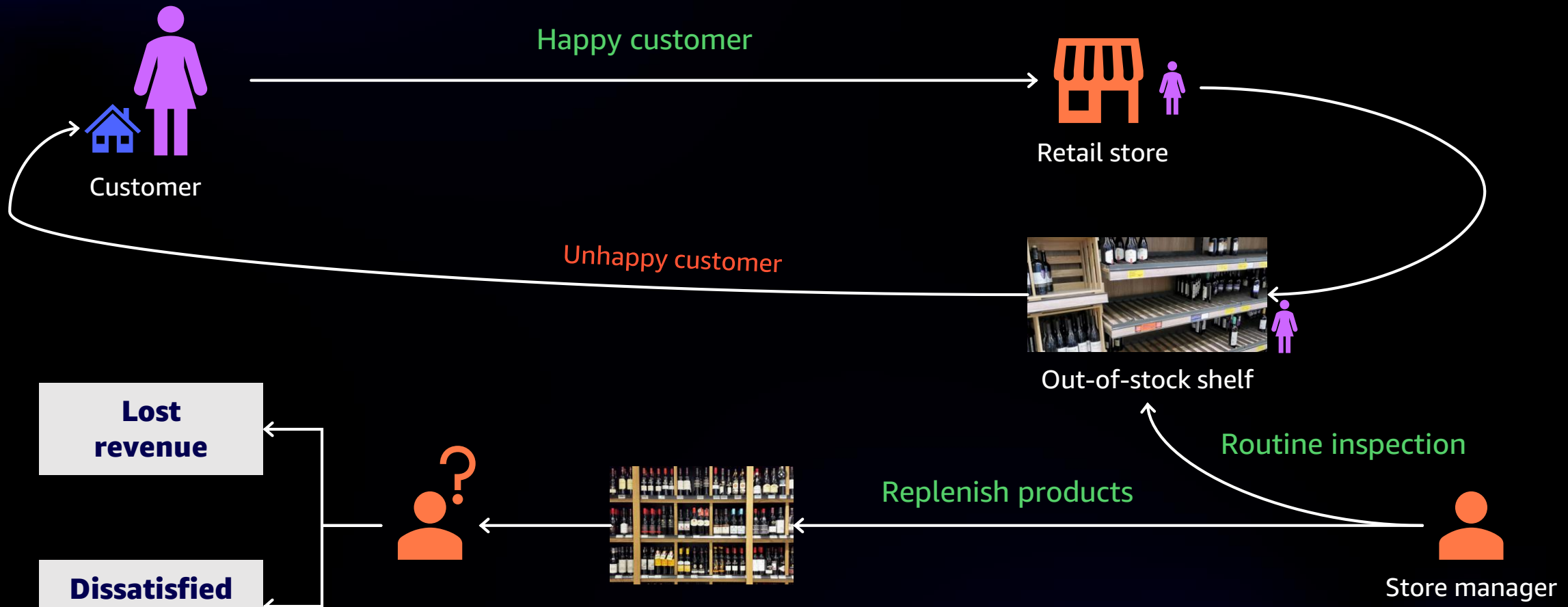
convergint



aws

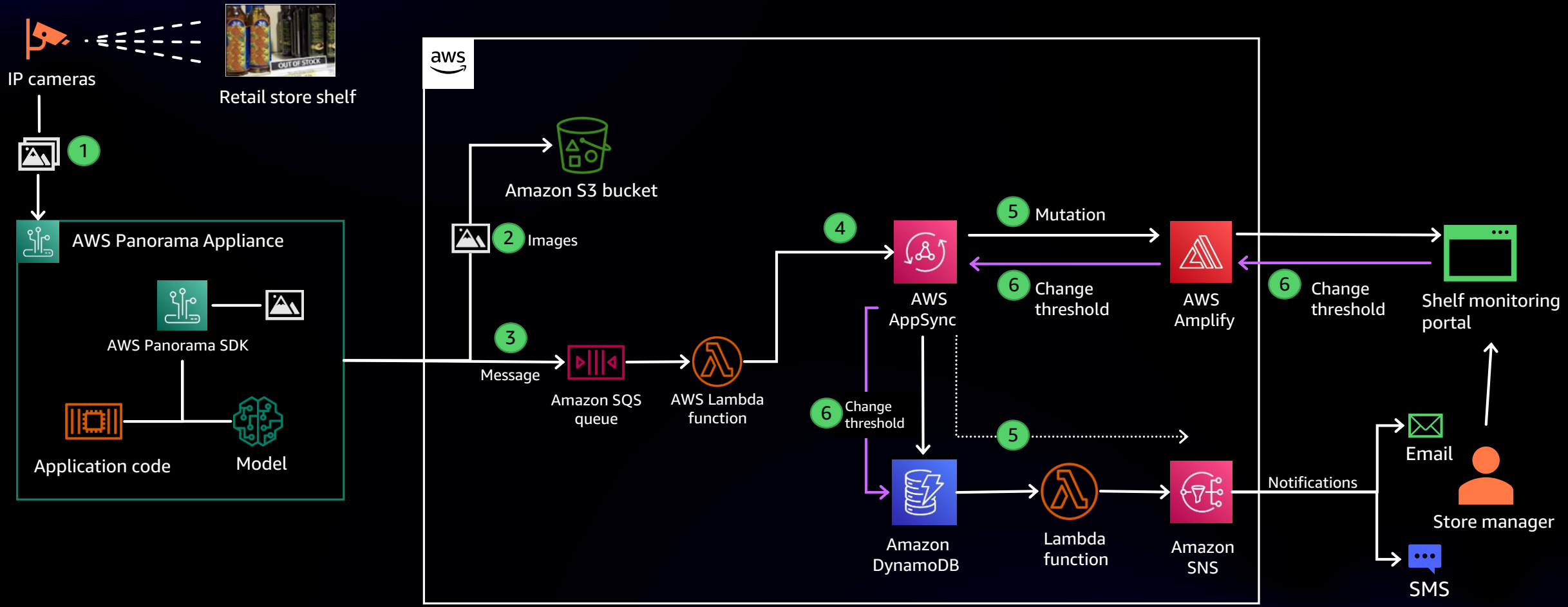
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Use case: Out-of-stock item in retail store



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Shelf monitor architecture



https://aws.amazon.com/blogs/machine-learning/build-a-shelf-monitoring-application-using-aws-panorama/

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Additional resources

AWS Panorama webpage (https://aws.amazon.com/panorama/) – Overview of the AWS Panorama service

AWS Panorama resources (https://aws.amazon.com/panorama/resources/) – Documentation, blogs, videos

AWS Panorama Partners (https://aws.amazon.com/panorama/partners/)

AWS Panorama FAQ (https://aws.amazon.com/panorama/faqs/)

AWS Panorama customers (https://aws.amazon.com/panorama/customers/) – Some customers and use cases

AWS Panorama features (https://aws.amazon.com/panorama/features/) – Overview of product features

AWS Panorama pricing (https://aws.amazon.com/panorama/pricing/) – Details of AWS Panorama pricing

Learn more at aws.amazon.com/panorama

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Thank you!

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Appendix

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