AWS
re:Invent
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IOT309-R

Build smart camera applications using Amazon Kinesis Video Streams WebRTC

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Agenda

Amazon Kinesis Video Streams service overview

Key use cases and architectures

Hands-on workshop

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What customers are building

Kinesis Video Streams enables millions of camera-enabled IoT devices to securely stream media to the AWS Cloud for storage, media playback, and ML-based analytics processing. Additionally, KVS offers managed WebRTC capabilities that enable interactive, real-time audio and video communication between web browsers, mobile applications, and connected devices.

Connected home

- Video doorbells
- Baby monitors
- Outdoor cameras

Industrial

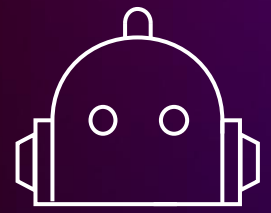
- Safety management
- Predictive maintenance models
- Quality assurance

Public sector

- Traffic management with 24/7 video
- Public safety

Automotive

- Sentinel mode for vehicle monitoring
- Telematics
- Video dash cameras



Robotics

- Remote control

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Customer challenges

Scalability and security

Connected home

High reliability, low-latency live viewing

Video playback and storage

Integrations with AI/ML models like Amazon Rekognition for people, pet & package detection

Industrial

Media Ingestions into CV and AI/ML models

Reliable 24/7 streaming

Imaging extraction for CV analytics

Public sector

Highly reliable video with multiple viewers

Imaging extraction for CV analytics

Automotive

Integrate with edge and cloud hybrid models to collect data while driving and analyze locally stored data when stopped

Robotics

Live streaming video and metadata and 300 ms latency to remote control products

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Amazon Kinesis Video Streams service overview

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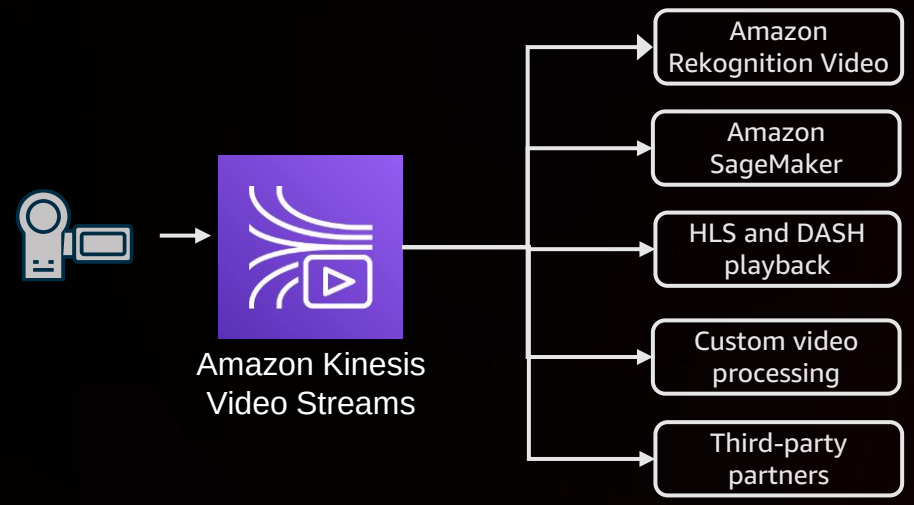
Two streaming methods

Streams

Secure data ingestion from millions of camera devices

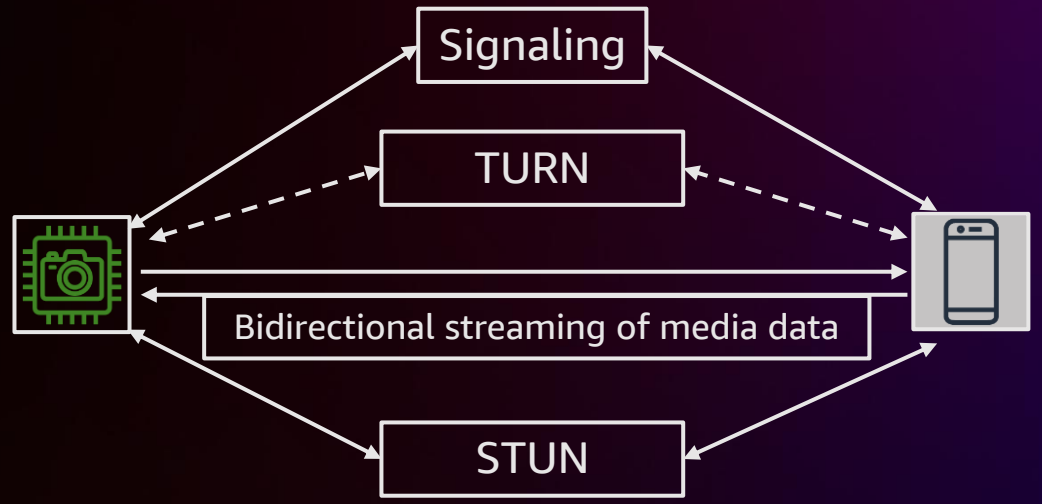
- Ingest media, store, consume and playback time-indexed media data
- Integration with AI/ML services



WebRTC

Low-latency and two-way media streaming with WebRTC

- Managed signaling, STUN, and TURN servers



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"Streams" and "WebRTC" are used for convenience in this presentation

Choosing the right streaming method

	Streams	WebRTC
Cloud media storage Analysis with AI/ML services	Yes	No
Bidirectional streaming	No	Yes
Typical latency for live playback	3-5 seconds	Less than 1 second
Number of simultaneous playback sessions	Up to about 100 sessions	Up to 10 sessions
SDK for camera devices	Producer SDK	WebRTC SDK

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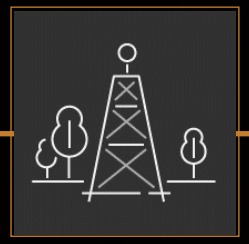
WebRTC technology overview

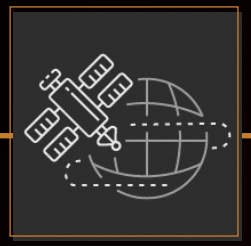
WebRTC is not “just” a media streaming protocol. It is an open standard for real-time communication with technology specifications for:

Signaling



Exchange connection metadata

Connectivity



Establish peer-to-peer connectivity

Media delivery

Low-latency exchange media and arbitrary data

Encryption

End-to-end encryption

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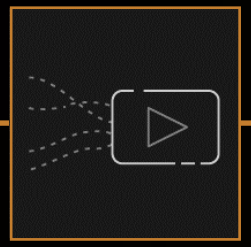
Kinesis Video Streams with WebRTC

WebRTC

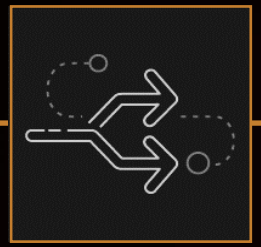
Stream live media with ultra-low latency and enable two-way interactivity for millions of camera devices

Low-latency live media streaming



Peer-to-peer audio and video live streaming with sub-1 second latency for playback

Real-time, two-way interactivity

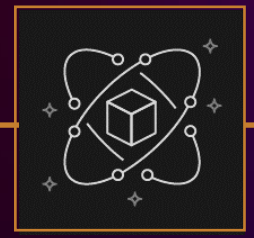


Exchange audio, video, and data between devices, mobile, and web apps for real-time, two-way interactivity

Standards compliant

Compliant with web and mobile platforms for easy plugin free playback

Fully managed



Fully managed WebRTC signaling, TURN, and STUN services with easy to use SDKs

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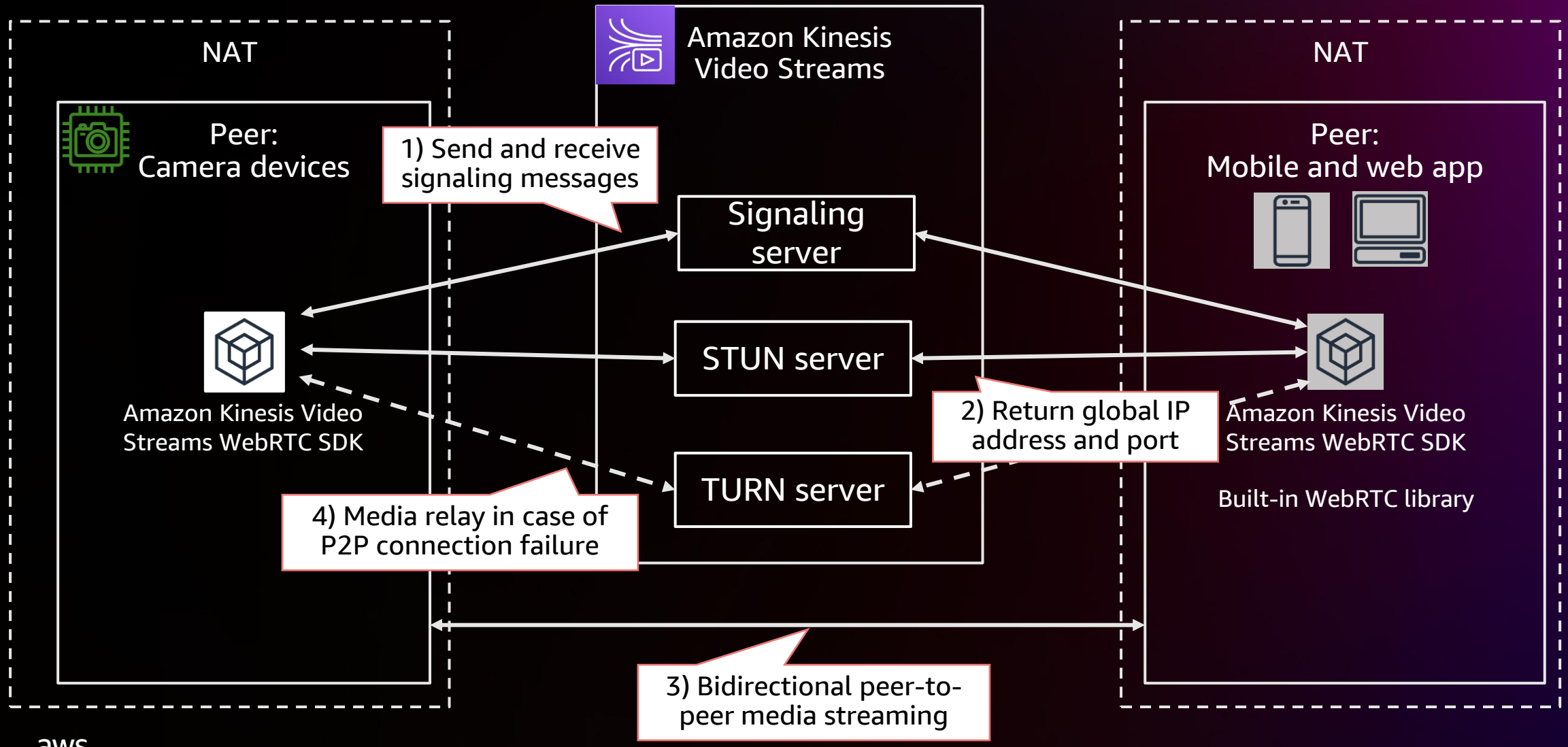
WebRTC connection flow



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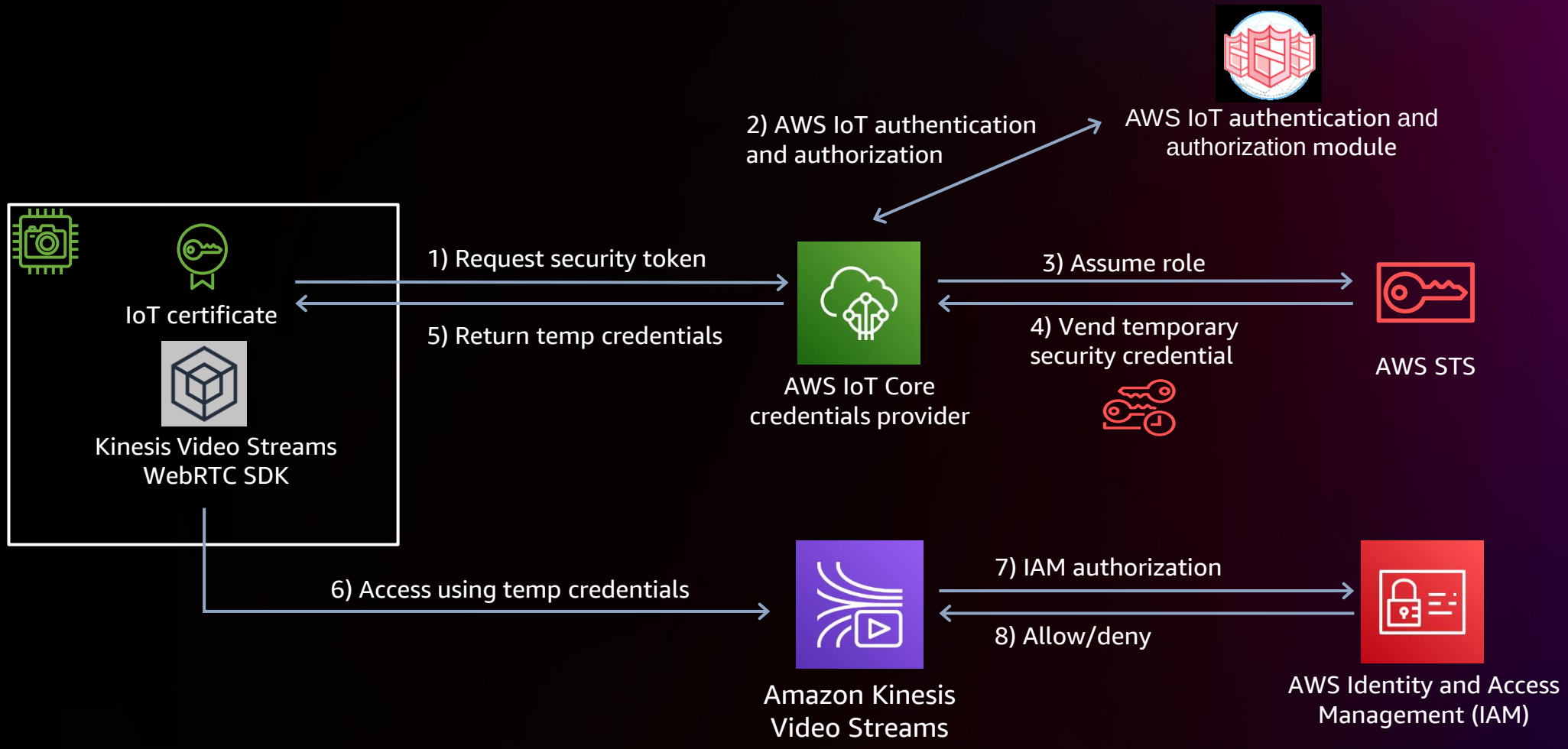
How to authenticate camera devices

WebRTC



https://docs.aws.amazon.com/iot/latest/developerguide/authorizing-direct-aws.html

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Key use cases and architectures

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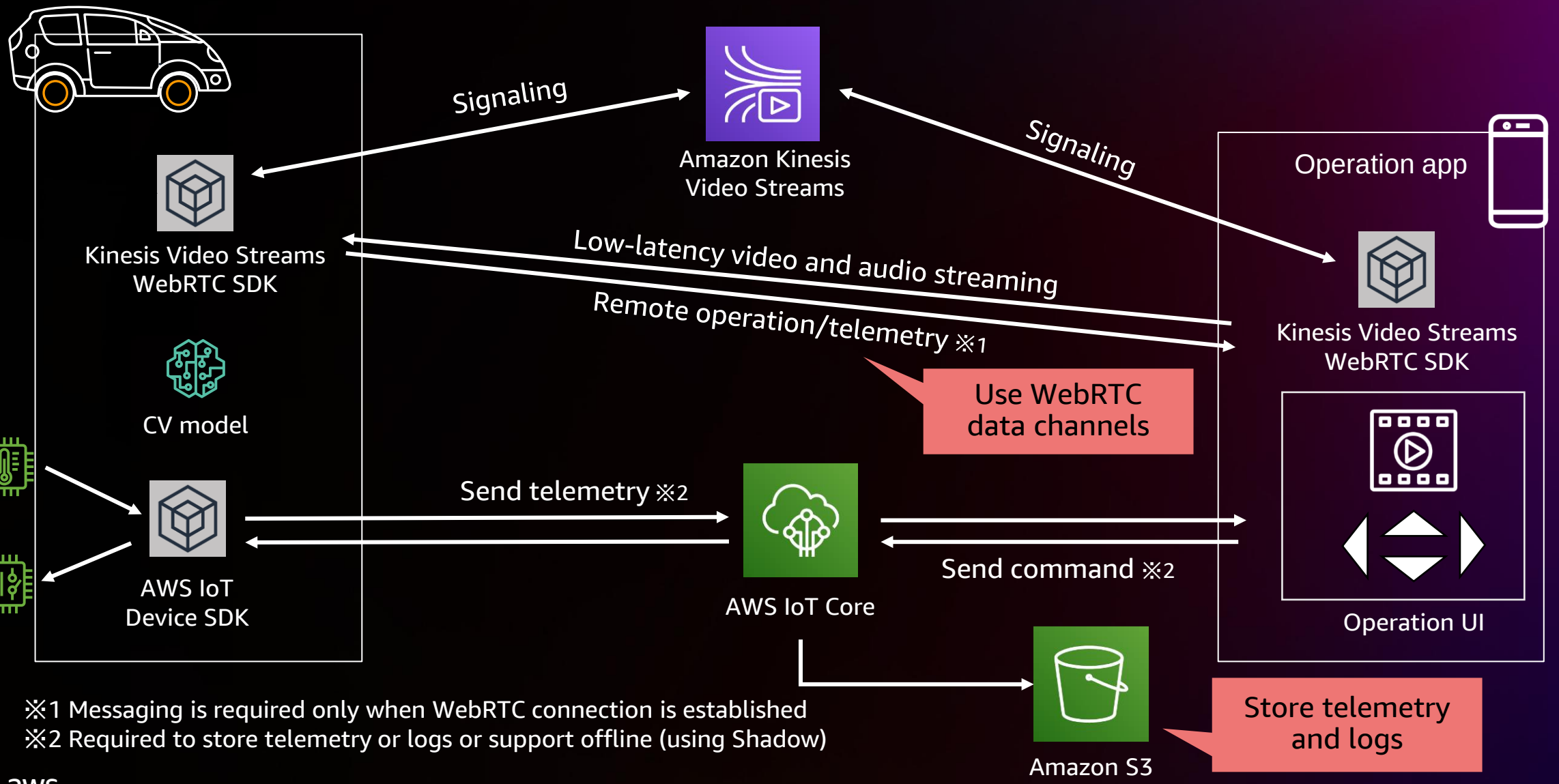
Automotive and robotics

WebRTC



※1 Messaging is required only when WebRTC connection is established
※2 Required to store telemetry or logs or support offline (using Shadow)

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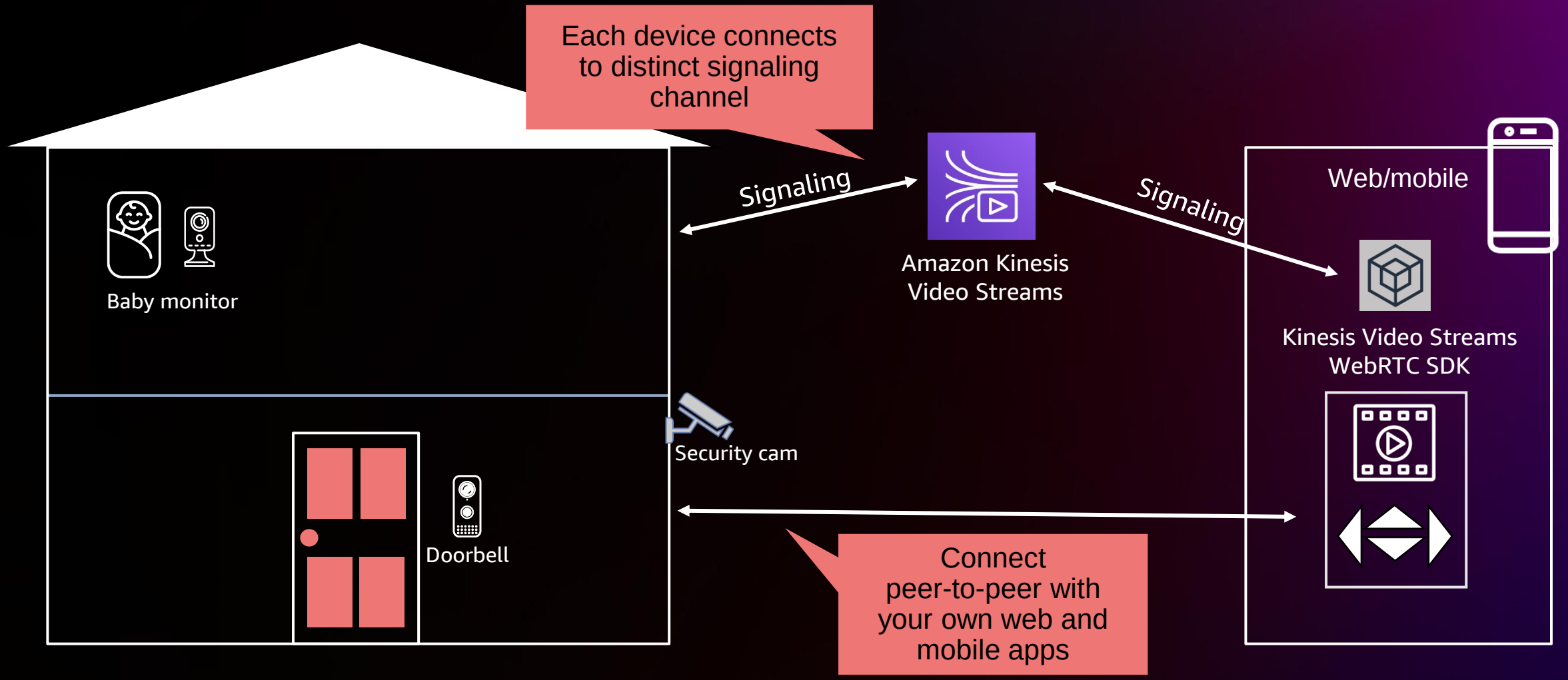
Smart home

WebRTC



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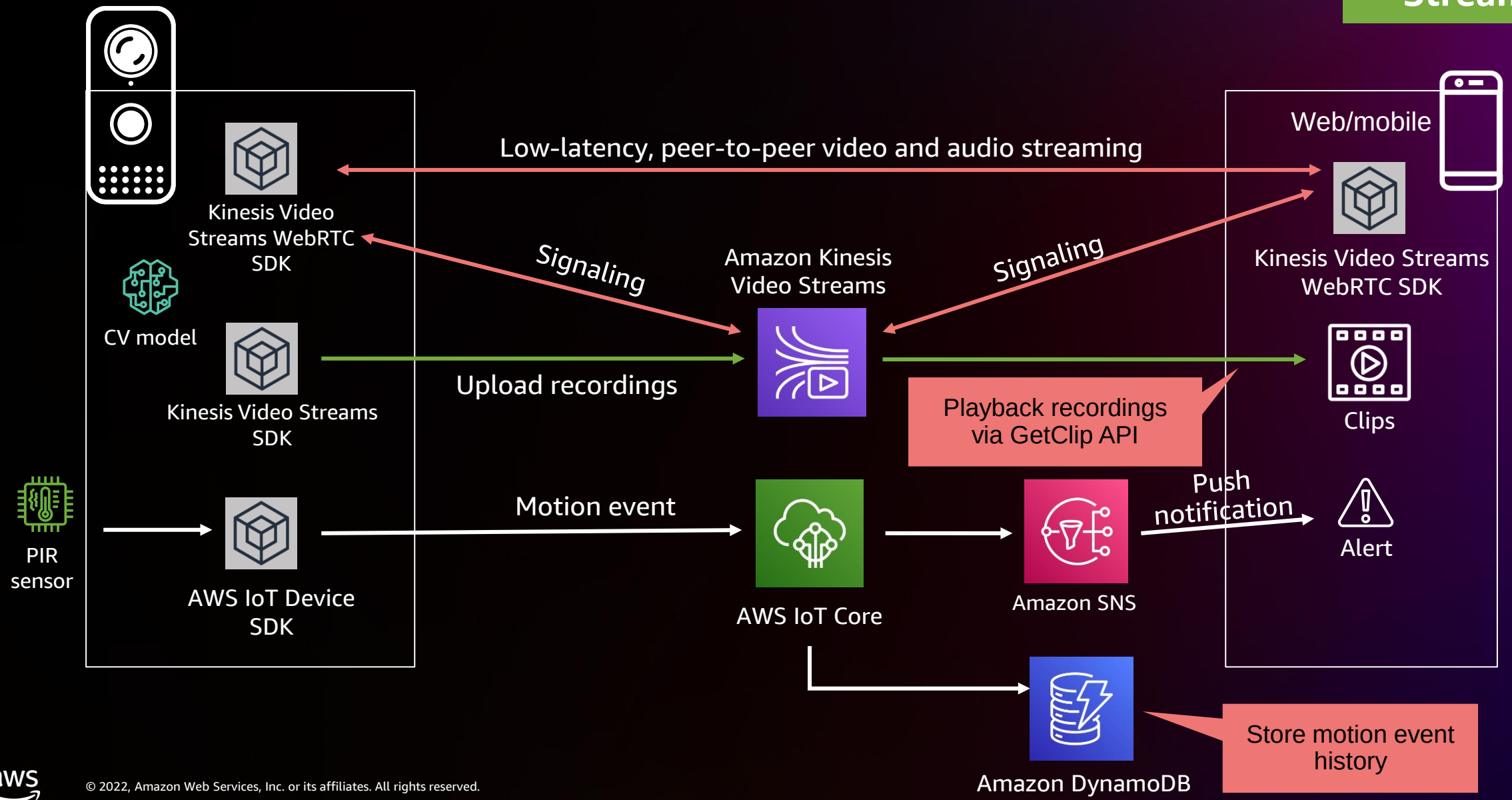
Smart home

WebRTC

Streams



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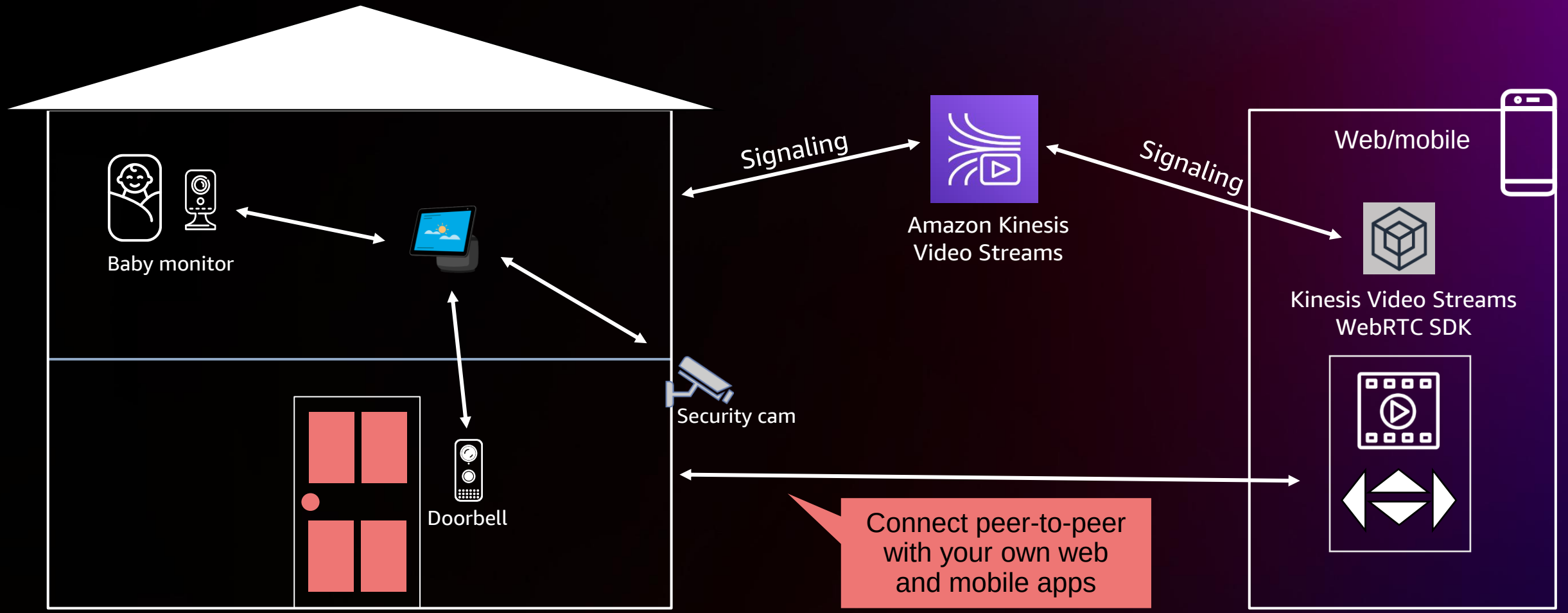
Connect to Echo Show

WebRTC



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Workshop

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Getting started with this workshop

- As a participant, you will have access to an AWS account with any optional pre-provisioned infrastructure and IAM policies needed to complete this workshop
- The AWS account will only be available for the duration of this workshop – you will lose access to the account thereafter
- The optional pre-provisioned infrastructure will be deployed to a specific AWS Region; check your workshop content to determine whether other Regions will be used
- Be sure to review the terms and conditions of the event – do not upload any personal or confidential information in the account

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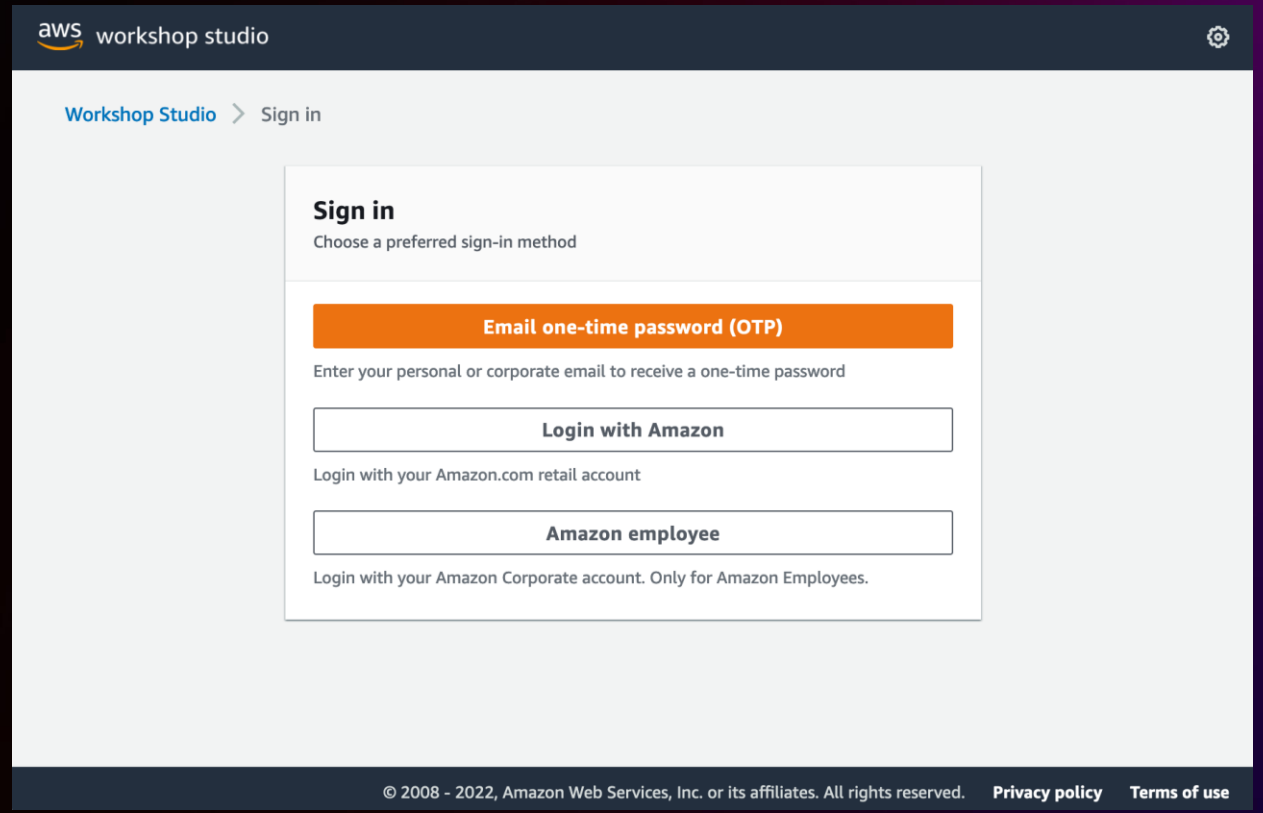
Step 1: Sign in via your preferred method

https://catalog.workshops.aws/join



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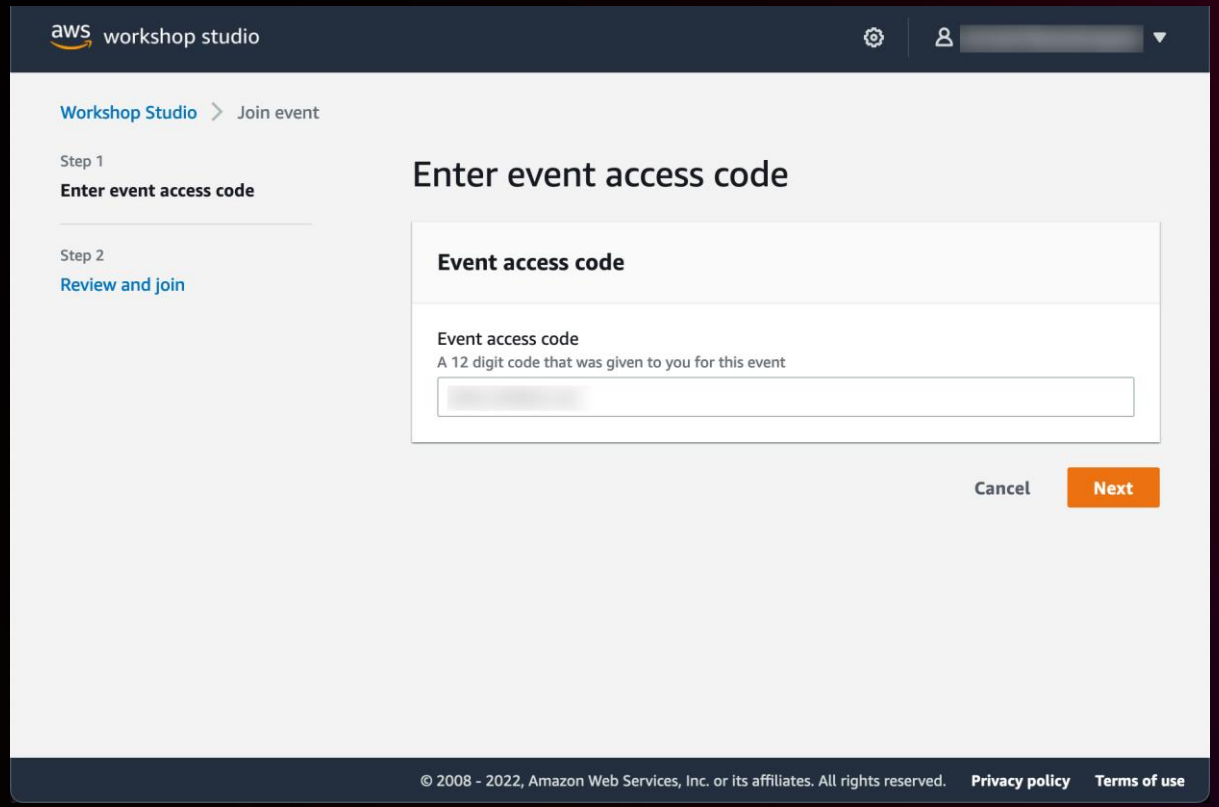
Step 2: Enter event access code

7293-07ee19-9f



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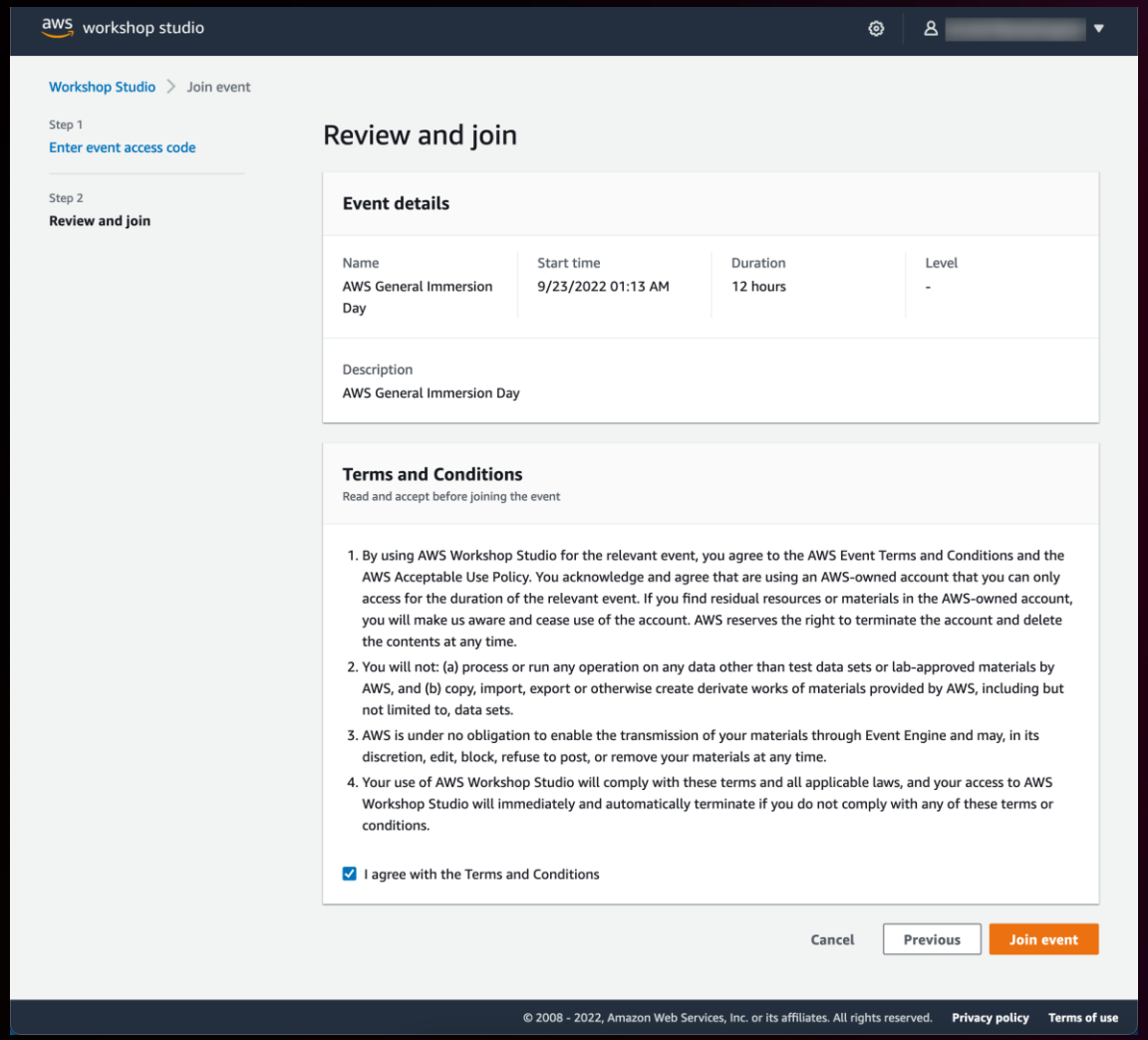
Step 3: Review terms and join event



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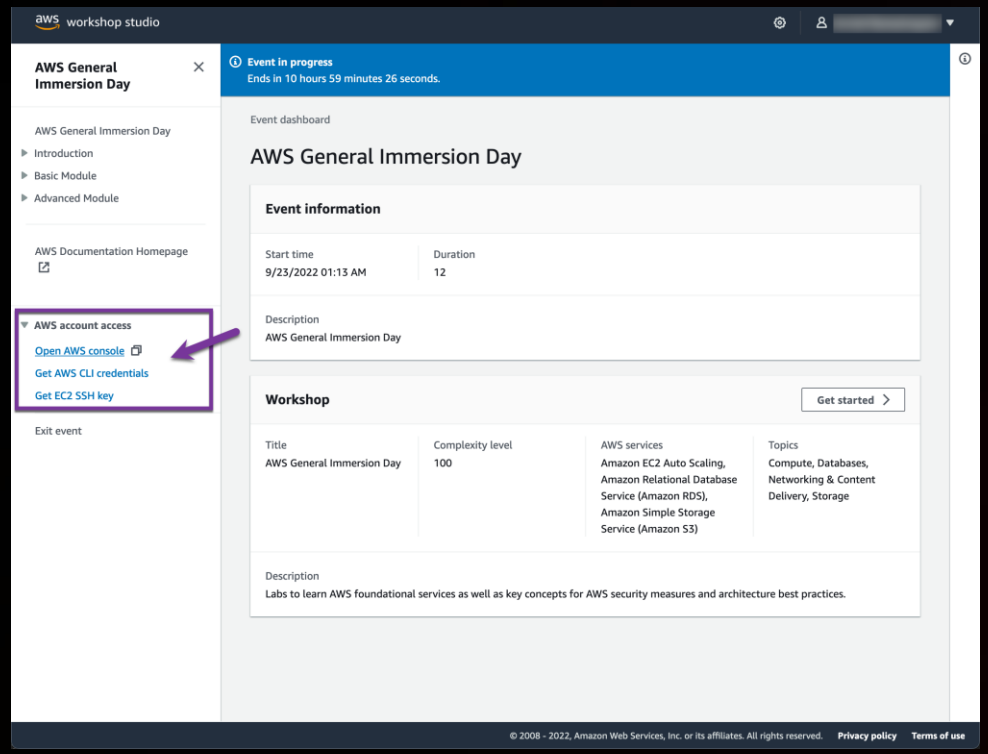
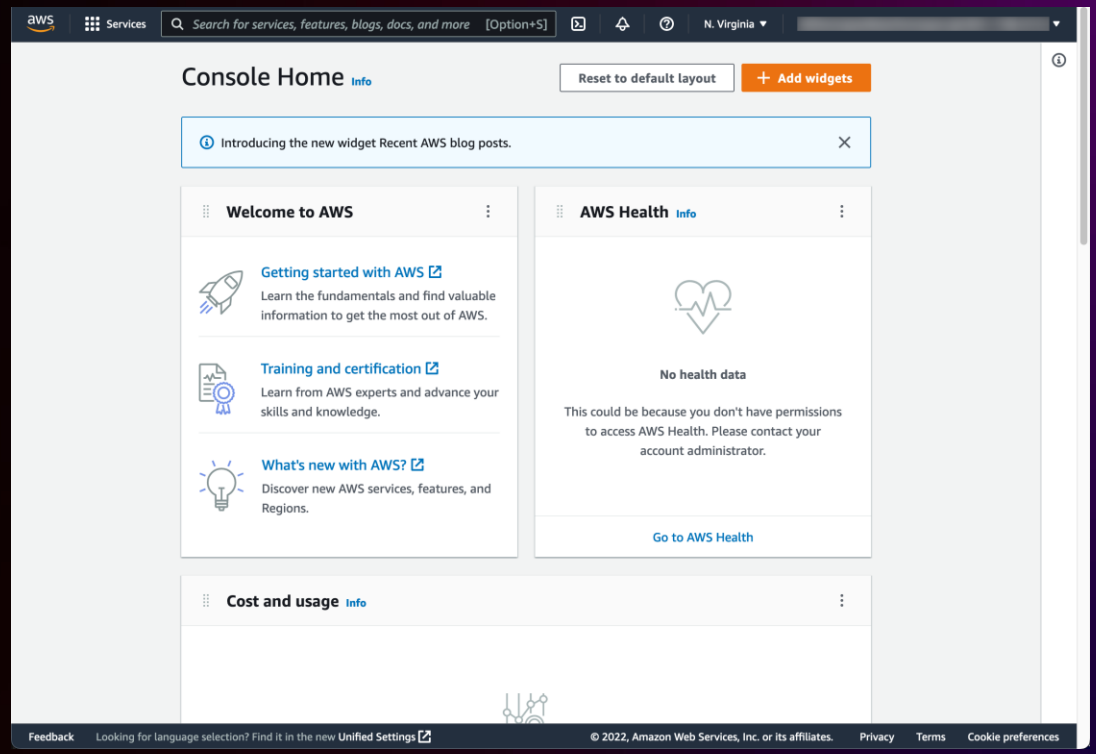
Step 4: Access AWS account

Access the AWS Management Console or generate AWS CLI credentials as needed





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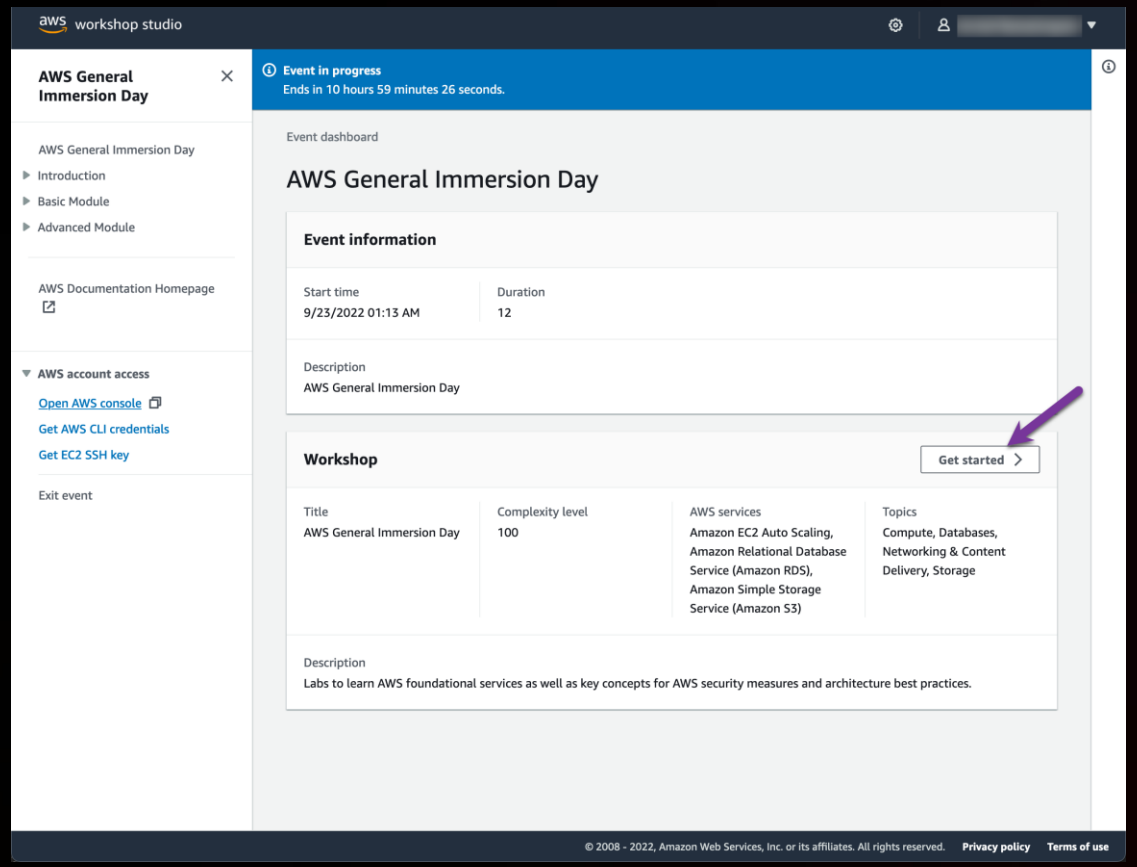
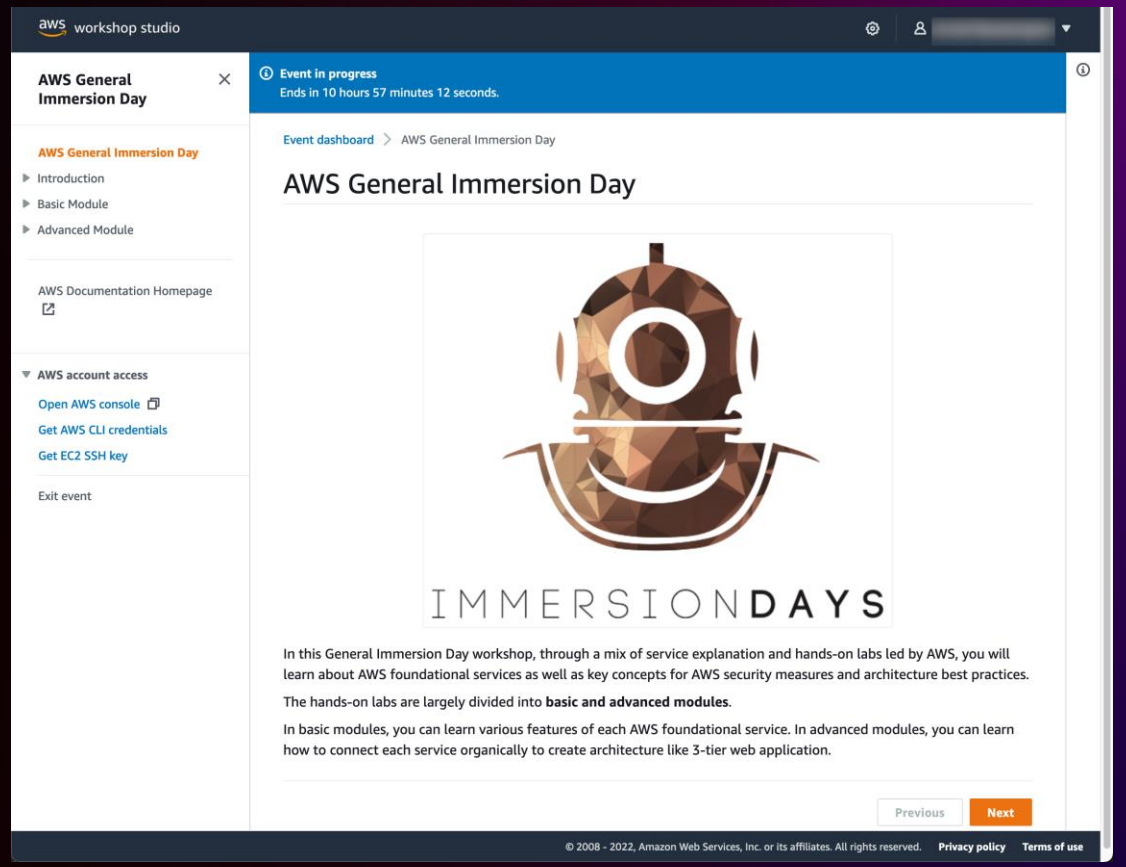
Step 5: Get started with the workshop





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Thank you!

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