

Service Name

Amazon Kinesis Video Streams

Service Overview

Amazon Kinesis Video Streams is a fully managed AWS service that enables secure streaming of live video and time-encoded data from connected devices to the AWS Cloud for analytics, machine learning, playback, and other processing. The service automatically provisions and scales infrastructure for ingesting streaming video data from millions of devices, then stores, encrypts, and indexes the data. It supports real-time consumption with its hot storage tier and extended retention with its warm storage tier, enabling both real-time and batch-oriented video analytics applications.

Key Use Cases

- **Smart Home Applications:** Streaming video from security cameras and IoT devices for real-time monitoring, motion detection, and automated alerts
- **Smart City Solutions:** Processing video feeds from traffic cameras, public safety systems, and urban infrastructure monitoring for analytics and decision-making
- **Industrial Automation:** Collecting video data from manufacturing equipment, drones, and sensors for quality control, predictive maintenance, and operational intelligence

Features

- **Secure Video Ingestion:** SDKs and APIs for streaming video data with encryption in transit using TLS and at rest using AWS KMS
- **WebRTC Support:** Low-latency two-way media streaming between web browsers, mobile applications, and connected devices
- **Video Playback:** Live and on-demand video playback via HTTP Live Streaming (HLS) and MPEG-DASH protocols
- **Amazon Rekognition Integration:** Built-in integration with Amazon Rekognition Video for face detection, object recognition, and content analysis
- **Tiered Storage:** Hot tier for immediate access and warm tier for cost-effective long-term retention with different pricing models
- **Automatic Indexing:** Time-based indexing of stored media using both producer timestamps and ingestion timestamps
- **Edge Recording:** Local recording capabilities with scheduled cloud streaming for IP cameras on customer premises

Value Proposition

Amazon Kinesis Video Streams eliminates the complexity of building and managing video streaming infrastructure by providing a fully managed, serverless solution that automatically scales from one to millions of video sources. It offers unique advantages including built-in integration with Amazon Rekognition for AI-powered video analysis, support for both real-time and batch processing workflows, and comprehensive security with encryption at rest and in transit. The service provides flexible storage tiers to optimize costs, supports diverse data types beyond video (audio, thermal, RADAR), and integrates seamlessly with the broader AWS ecosystem for comprehensive video analytics solutions.

Service Integration

Amazon Kinesis Video Streams integrates natively with Amazon Rekognition Video for face detection and object recognition, Amazon S3 as the underlying durable storage layer, and AWS Key Management Service (KMS) for encryption. It works with AWS Identity and Access Management (IAM) for access control, Amazon SNS for notifications, Amazon CloudWatch for monitoring and logging, and AWS CloudTrail for API usage tracking. The service also integrates with popular machine learning frameworks including Apache MXNet, TensorFlow, and OpenCV, enabling customers to build custom video analytics applications on Amazon EC2 instances.

Onboarding and Offboarding

Customers begin by setting up an AWS account and creating a Kinesis video stream through the AWS Management Console, CLI, or SDKs. They then configure producer devices using available SDKs for Java, C++, or Android to stream video data to the service:

- The process includes setting up proper IAM permissions, configuring stream properties like retention period and storage tier, and integrating with consuming applications
- AWS provides comprehensive documentation, sample applications, tutorials including Raspberry Pi examples, and a getting started guide to facilitate rapid onboarding and implementation

Getting Started Guide:

<https://docs.aws.amazon.com/kinesisvideostreams/latest/dg/getting-started.html>

Data Removal

Data removal involves deleting Kinesis video streams through the AWS Management Console, CLI, or DeleteStream API, which permanently removes all associated video data from both hot and warm storage tiers. Stream deletion is irreversible, so customers must ensure important video data is backed up before deletion. The service automatically handles cleanup of indexed metadata and associated resources when streams are deleted.

Backup/Restore and Disaster Recovery

Kinesis Video Streams provides inherent data durability through its underlying Amazon S3 storage with automatic encryption and indexing. The service supports configurable retention periods and offers warm tier storage for cost-effective long-term retention. Customers can implement additional backup strategies by integrating with other AWS services to copy video data to different regions or storage classes for disaster recovery purposes.

Backup Capabilities

The service does not integrate directly with AWS Backup but provides built-in durability through Amazon S3 storage with configurable retention periods. Customers can implement custom backup solutions by using APIs to retrieve video data and store it in additional locations or integrate with AWS services for cross-region replication.

Disaster Recovery

Kinesis Video Streams does not integrate directly with AWS Elastic Disaster Recovery but supports disaster recovery through its durable storage architecture and availability across multiple AWS regions. Customers can deploy streams in multiple regions and implement cross-region data replication strategies for comprehensive disaster recovery planning.

Recovery Objectives

The service supports low RTO through its highly available architecture across multiple Availability Zones and rapid stream recreation capabilities. For RPO objectives, configurable retention periods and durable storage ensure minimal data loss, while warm tier storage provides cost-effective long-term data retention for meeting extended recovery point requirements in disaster scenarios.

Service Constraints

Service Quotas: <https://docs.aws.amazon.com/kinesisvideostreams/latest/dg/limits.html>

FAQ: <https://aws.amazon.com/kinesis/video-streams/faqs/>

Technical Requirements

Service Documentation: <https://docs.aws.amazon.com/kinesisvideostreams/latest/dg/>

User Guide: <https://docs.aws.amazon.com/kinesisvideostreams/latest/dg/>

API Reference:

https://docs.aws.amazon.com/kinesisvideostreams/latest/dg/API_Reference.html

Pricing Overview

Please see the AWS UK G Cloud 15 Pricing Document accompanying this service in the Digital Marketplace.

Public Pricing: <https://aws.amazon.com/kinesis/video-streams/pricing/>

Cost Optimization

Kinesis Video Streams offers unique cost optimization through tiered storage with hot and warm tiers, where warm tier uses fragment-based billing instead of GB-based billing, providing significant savings for long-term retention. Customers can optimize costs by adjusting fragment duration, selecting appropriate retention periods, and choosing between storage tiers based on access patterns. The service also offers cost benefits for higher bitrate cameras in warm tier and provides flexible pricing based on actual data ingestion and consumption rather than provisioned capacity.

Savings Considerations

Primary cost savings come from the pay-as-you-use model with no upfront costs or infrastructure management overhead, elimination of the need to build and maintain streaming infrastructure, and automatic scaling that prevents over-provisioning. The warm storage tier provides up to 50% cost savings for long-term retention compared to hot tier, while integration with AWS services reduces development time and operational costs. Customers also save through reduced bandwidth costs with efficient streaming protocols and the ability to process video data without downloading entire files.