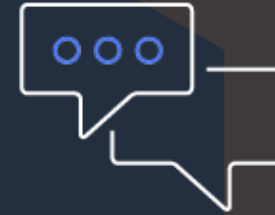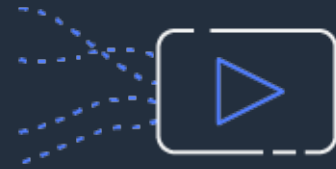# Amazon Interactive Video Service

Quality of Experience Monitoring Dashboard

Purpose
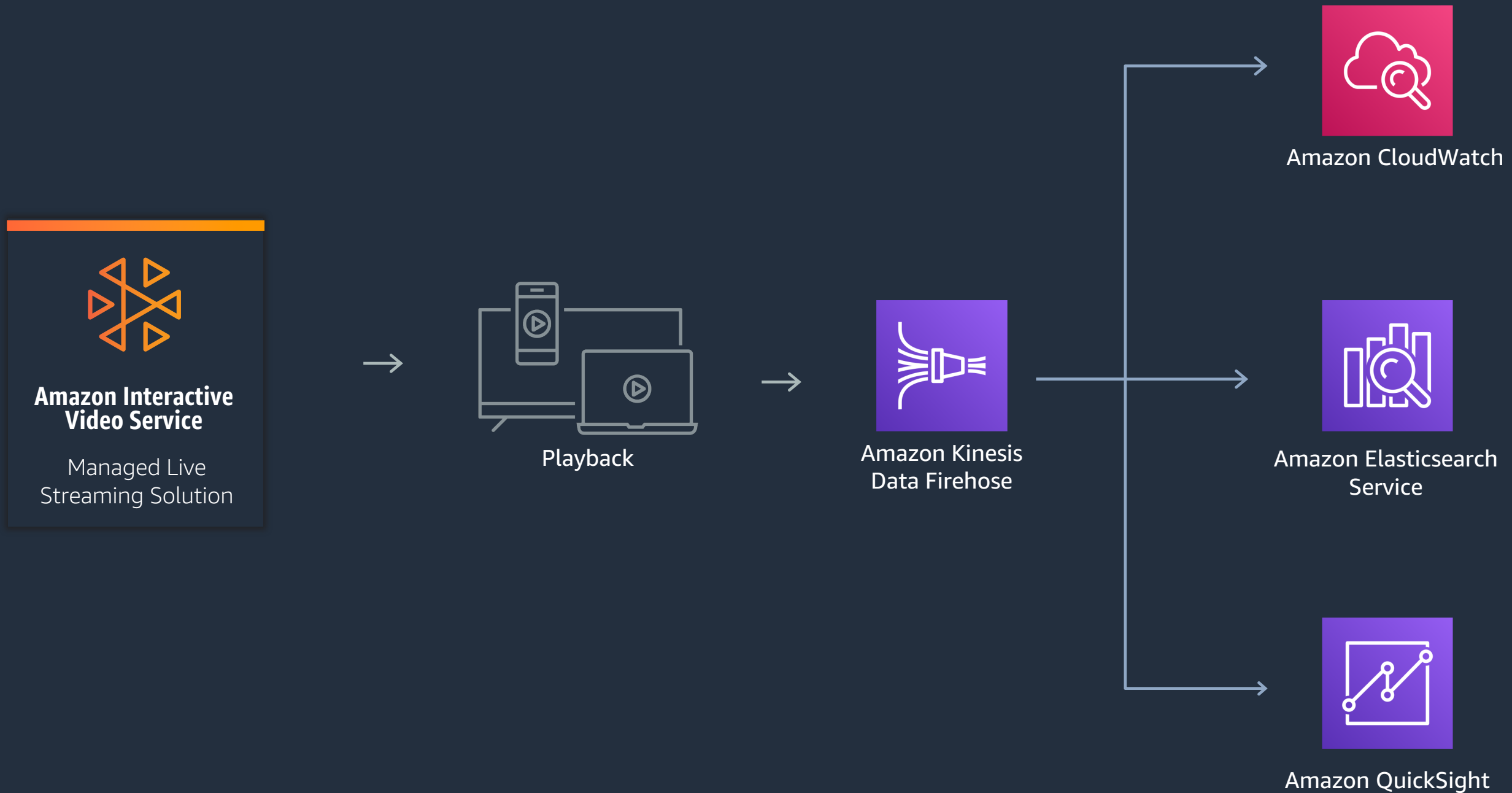
Monitor
quality of service

- Capture metrics on delivery performance and viewing experience
- Build dashboards and alerts for operations teams to proactively understand customer experience
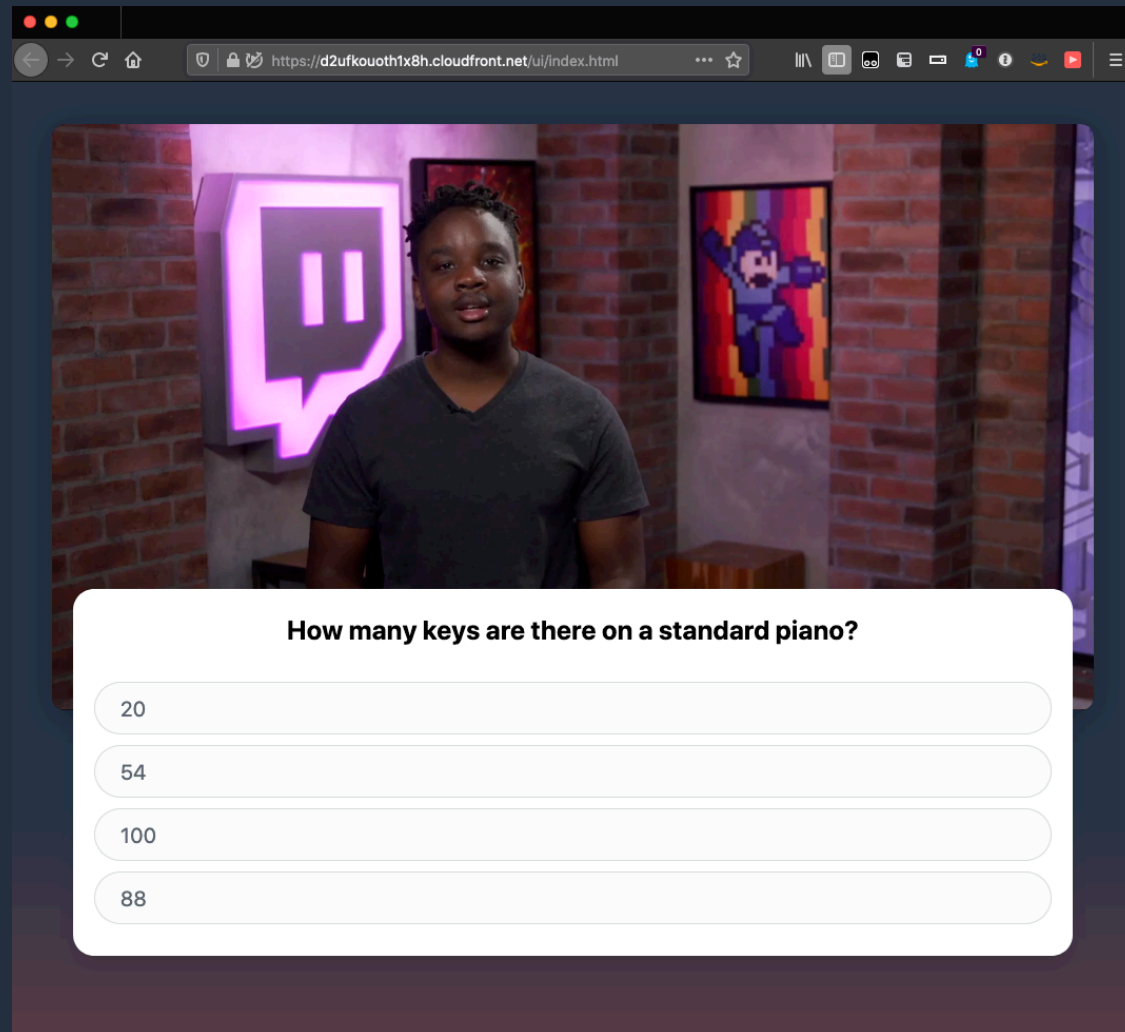
Measure
quality of experience

- Monitor and measure interactions
- Understand consumption behavior and user interactions

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Solution Components

Amazon Interactive Video Service — Managed Live Streaming Solution → Playback → Amazon Kinesis Data Firehose → Amazon CloudWatch / Amazon Elasticsearch Service / Amazon QuickSight

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Client Architecture

```
{
    "metric_type":"PLAYBACK_SUMMARY",
    "client_platform":"web",
    "channel_watched":"xhP3ExfcX80N",
    "is_live":true,
    "error_count":0,
    "playing_time_ms":60030,
    "buffering_time_ms":0,
    "rendition_name":"720p",
    "rendition_height":720,
    "startup_latency_ms":0,
    "live_latency_ms":2
}
```
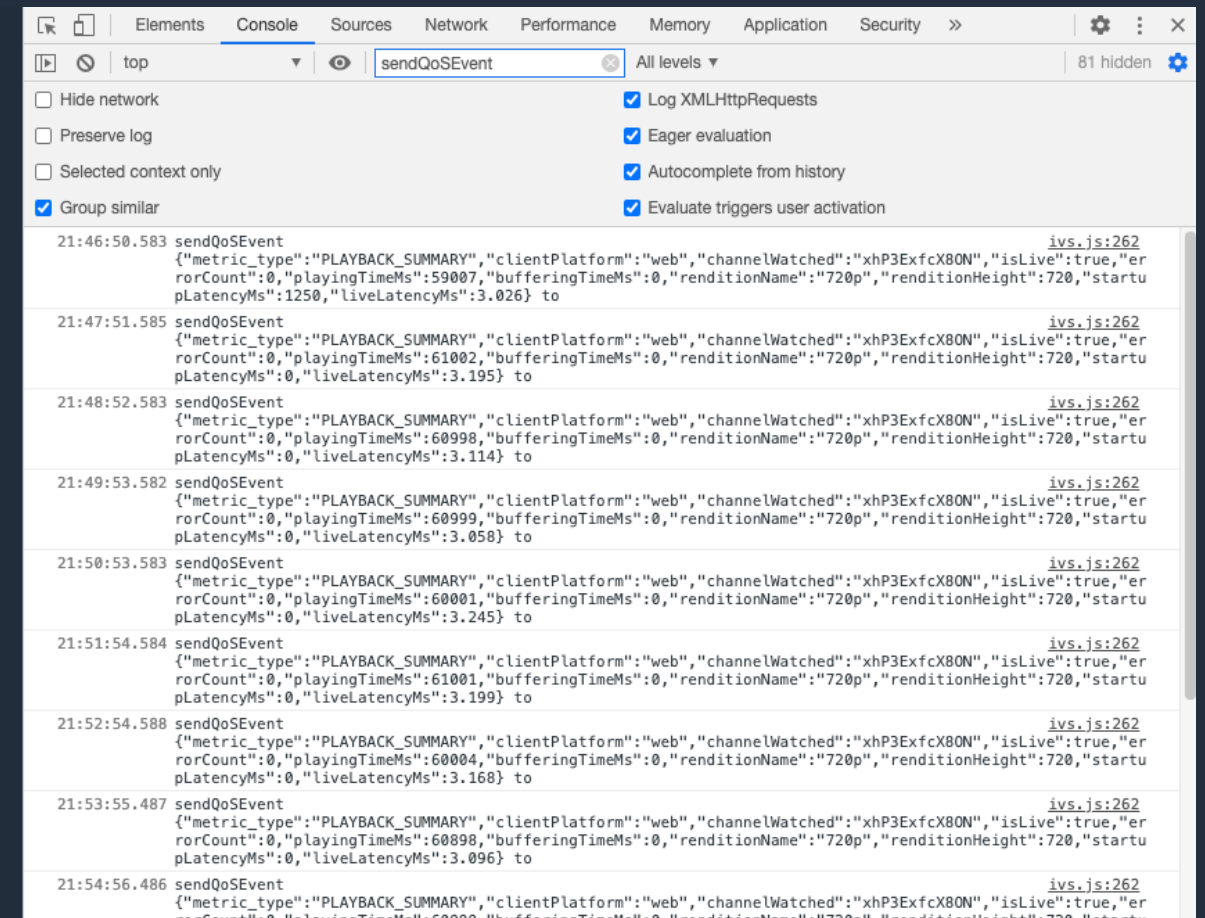
Sample JS Player

To get started: please read the web/IVSplayer/README.md

The sample player by default plays an IVS test channel, generating one QoS event each minute (configurable, tradeoff between latency and cost)

JSON Schema

Metrics of user activity (concurrent viewers, etc.) and QoS (buffering, latency, etc.)

Field Name	Data Type	Note
		// event type (QoS, timed metadata feedback, etc.)
metric_type	string	"PLAYBACK_SUMMARY" for QoS event
		// client platform and content
client_platform	string	e.g., "web", "android", "ios"
channel_watched	string	the string after ".channel." in the playback URL, e.g., "xhP3ExfcX8ON" for the test channel
is_live	boolean	
		// playback summary
error_count	integer	
playing_time_ms	integer	the duration (in ms) of the player SDK staying in the "PLAYING" state
buffering_time_ms	integer	the duration (in ms) of the player SDK staying in the "BUFFERING" state
rendition_name	string	e.g., "Source", "720p60", "720p", "480p", "240p", "160p" (snapshot taken right before the event is sent)
rendition_height	integer	(snapshot taken right before the event is sent)
startup_latency_ms	integer	latency in ms from load() being called to state becoming PLAYING. Value is only valid in the very first event of playing a channel, and is set to 0 in following events, i.e., the 2nd/3rd/... minute of the playback session
live_latency_ms	integer	latency in ms based on "getLiveLatency()" covering the latency from ingest to playback (i.e., not include the latency of broadcast tool), live only. set to -1, if VOD

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Implementation

Check section 3.1.3 of
web/IVSplayer/README.md

Search "QoS event" in
web/IVSplayer/js/ivs.js

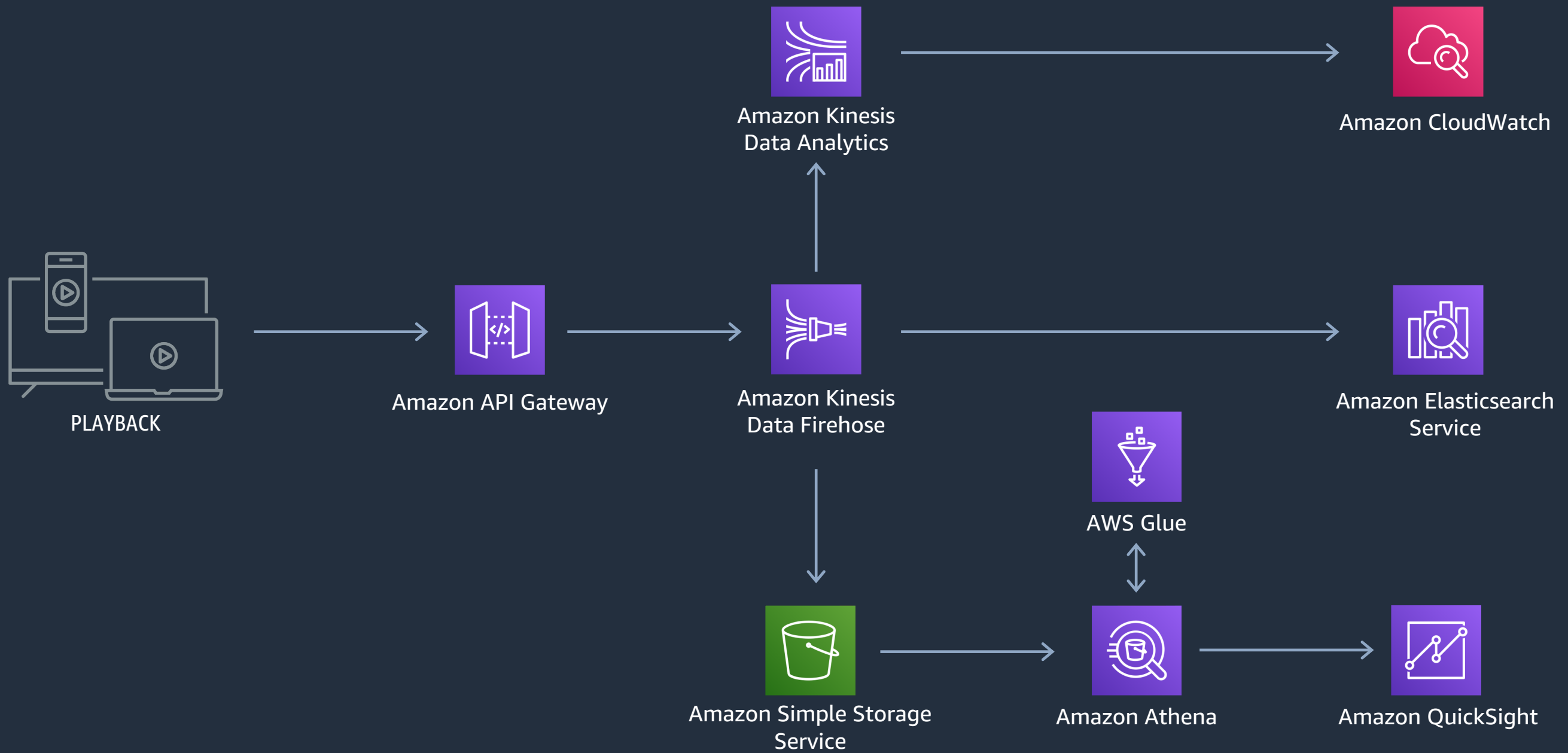Most logic is in the transition
of player state
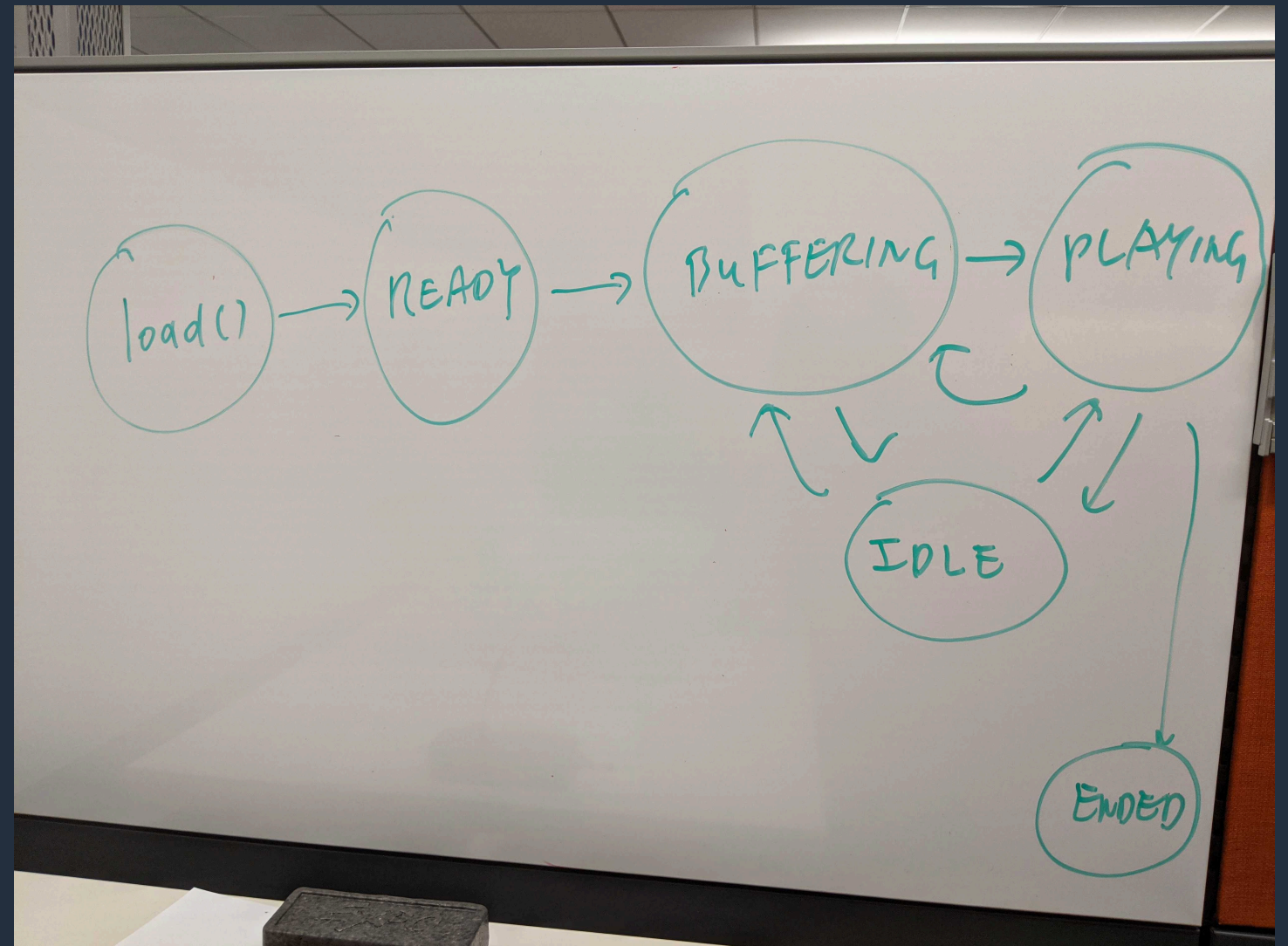
Verification

Multiple test cases with simulated network conditions (use Chrome Developer Tool to throttle network)

Test Case	Which QoS Event	Expected startupLatencyMs	playingTimeMs	bufferingTimeMs	renditionHeight	LiveLatencyMs	errorCount
#1	1st	~2s	~58s	~0s	720	~3s	~0
	Following	0s	~60s	~0s	720	~3s	~0
#2	1st	~2s	~58s	~0s	720	~3s	~0
	2nd	0s	~60s	~0s	720	~3s	~0
	3rd	0s	>55s	<5s	360	<6s	~0
	4th	0s	~60s	~0s	360	<6s	~0
#3	1st	~5s	~55s	~0s	360	<5s	~0
	2nd	0s	~60s	~0s	360	<5s	~0
	3rd	0s	~60s	~0s	720	<5s	~0
	4th	0s	~60s	~0s	720	<5s	~0

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Backend Architecture: Analytics

PLAYBACK

Amazon API Gateway

Amazon Kinesis Data Firehose

Amazon Kinesis Data Analytics

Amazon CloudWatch

Amazon Elasticsearch Service

AWS Glue

Amazon Simple Storage Service

Amazon Athena

Amazon QuickSight

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Dashboard Options

CloudWatch	ElasticSearch	QuickSight
Near real time	Near real time	Long term
Operational metrics-notifications	More flexibility Developer comfort	Business reporting

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Dashboards – metrics on popularity
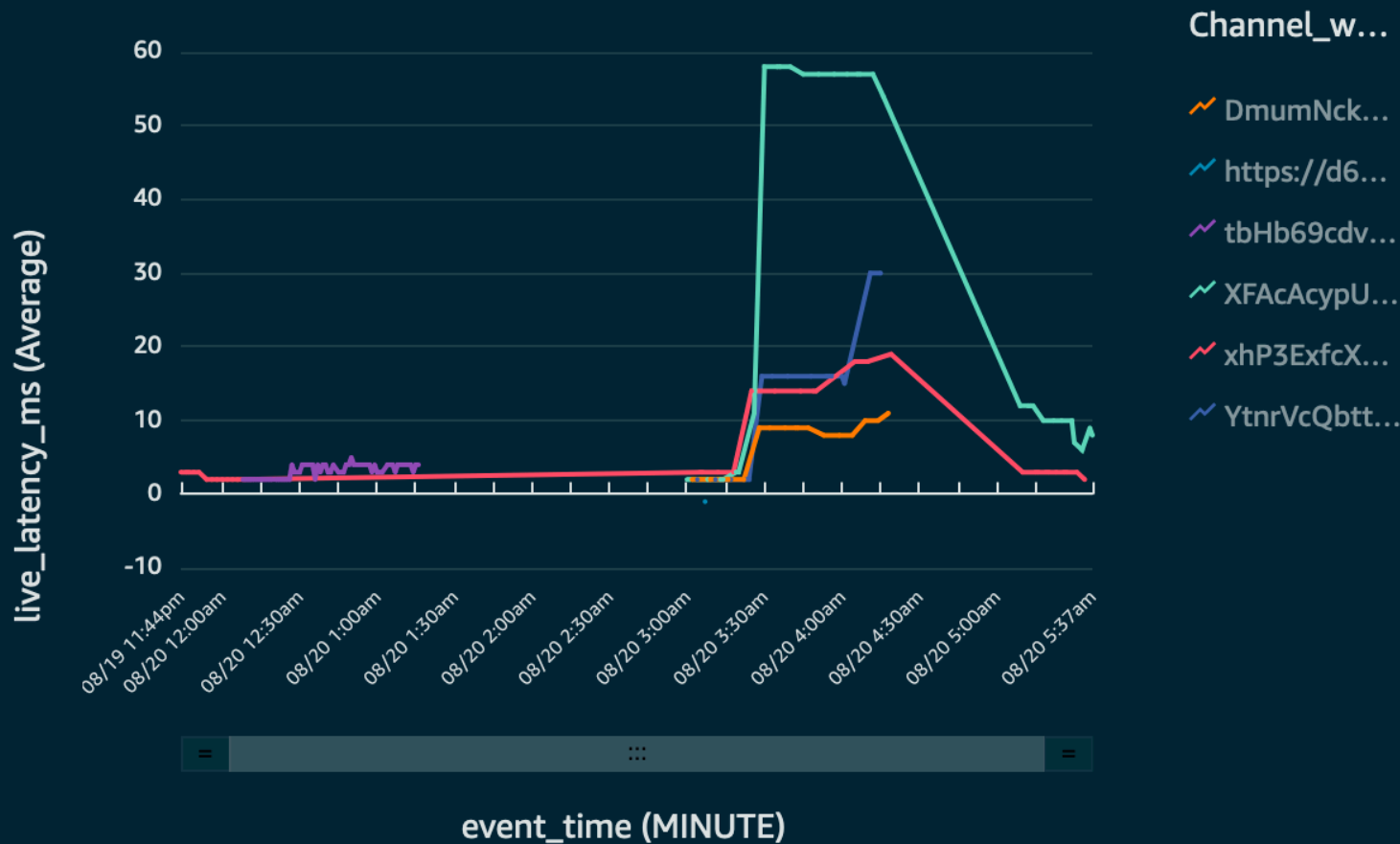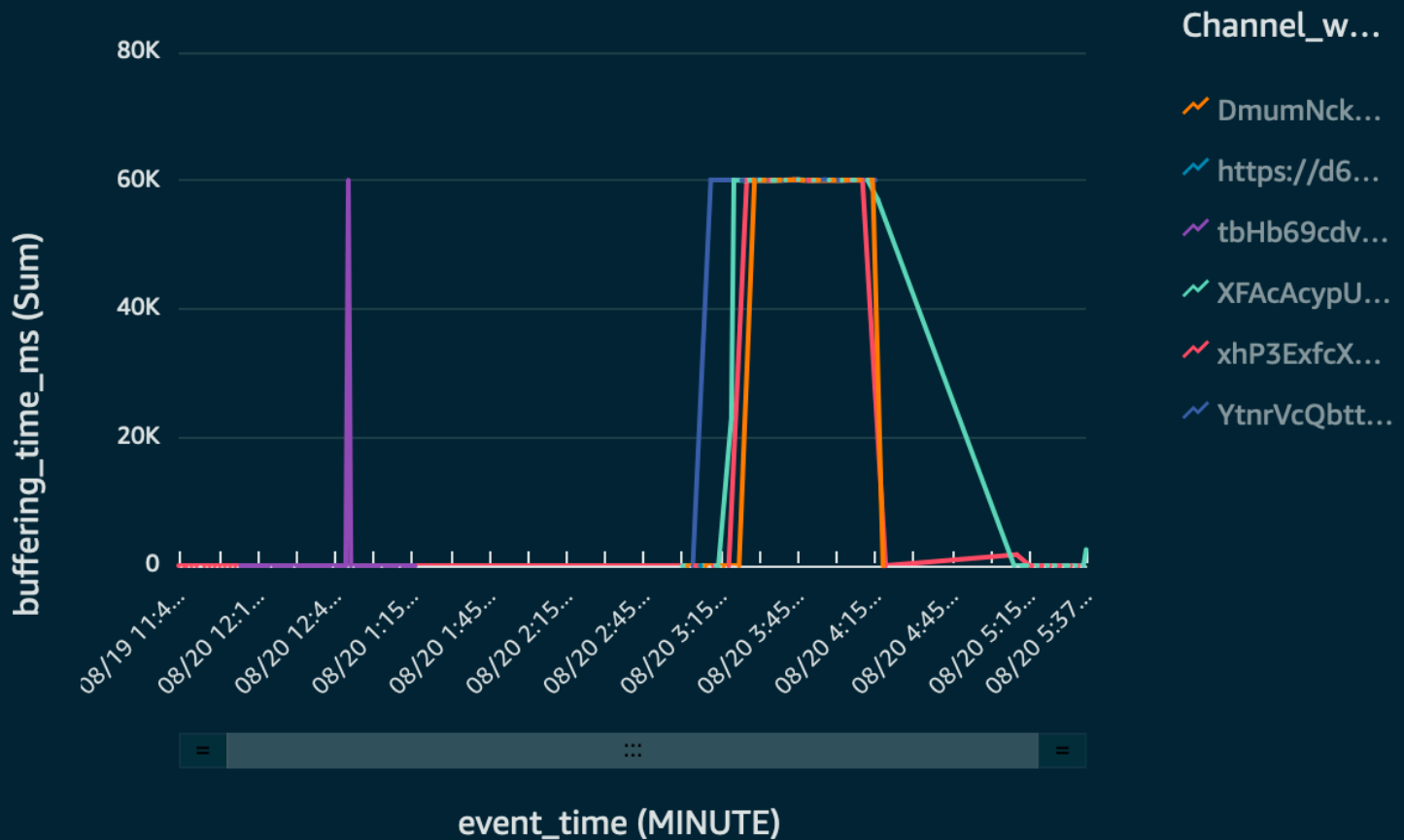

Popular Channels

YtnrVcQbttF0

DmumNckWFTqz

XFAcAcypUxQm

162

tbHb69cdvlbk

xhP3ExfcX8ON

Channel_w...

- tbHb69cdv...
- xhP3ExfcX...
- XFAcAcypU...
- DmumNck...
- YtnrVcQbtt...
- https://d6...

Group By: channel_watched
Size: client_platform (Count)

Popular platforms

161

web

Client_platf...

- web

Group By: client_platform

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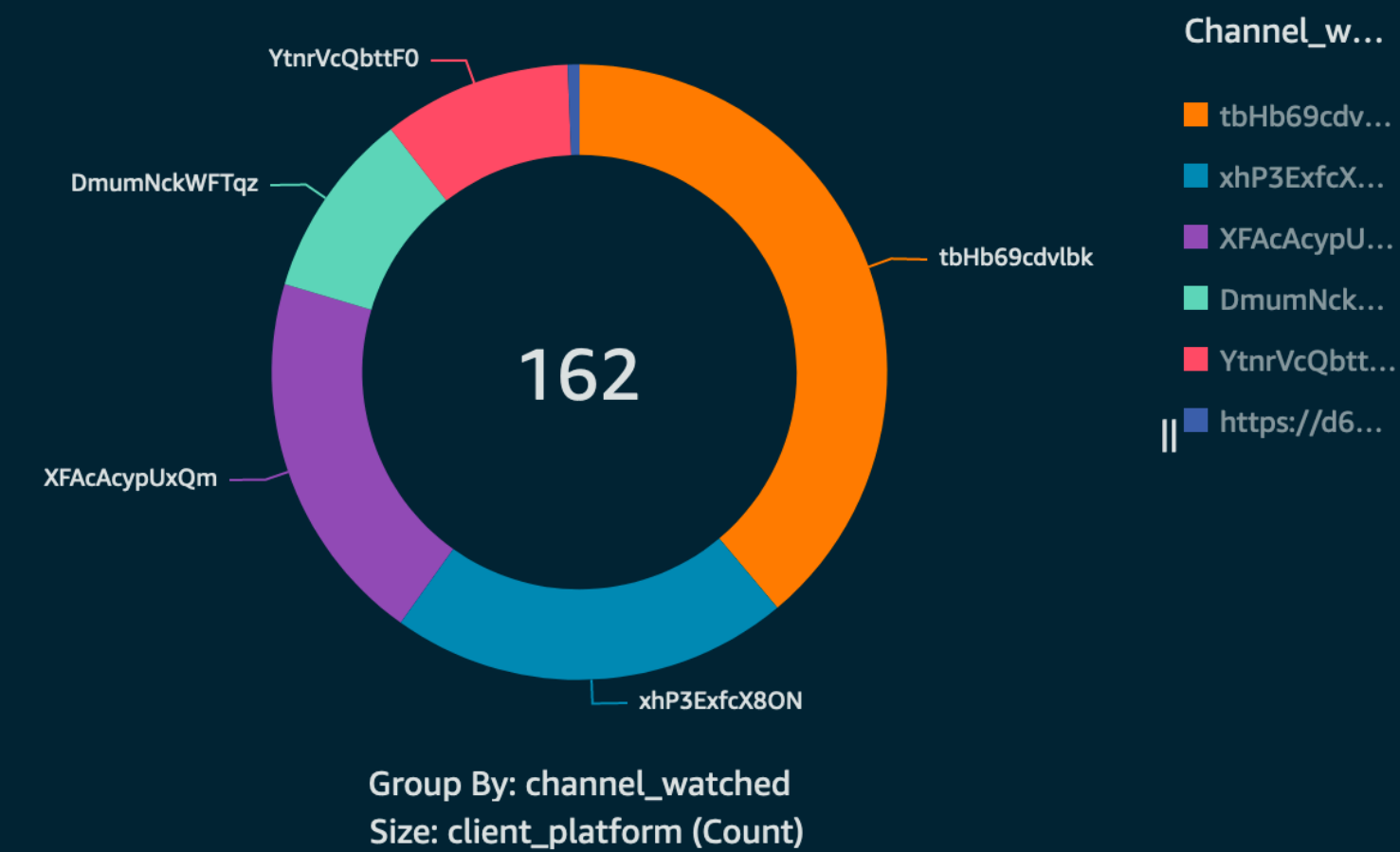
Dashboards – metrics on experience

Dashboards – metrics on experience

Average Startup latency(ms) by Channel

Errors by Channel over time
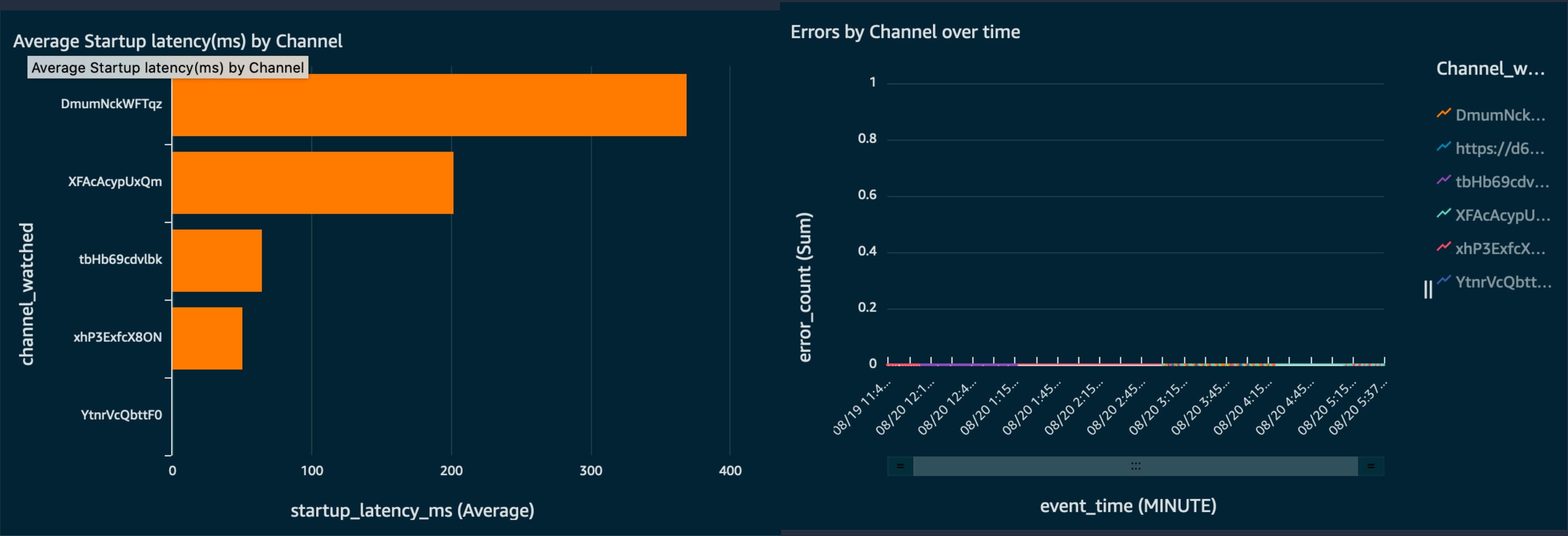
Beyond QoS/E – building interactions

Survey/Quiz/Polls/Reactions

Backend Systems

Amazon Interactive Video Service
Managed Live Streaming Solution

Aggregated metrics

Timed metadata

Amazon Kinesis Data Analytics

Amazon CloudWatch

PLAYBACK

Amazon API Gateway

Amazon Kinesis Data Firehose

Amazon Elasticsearch Service

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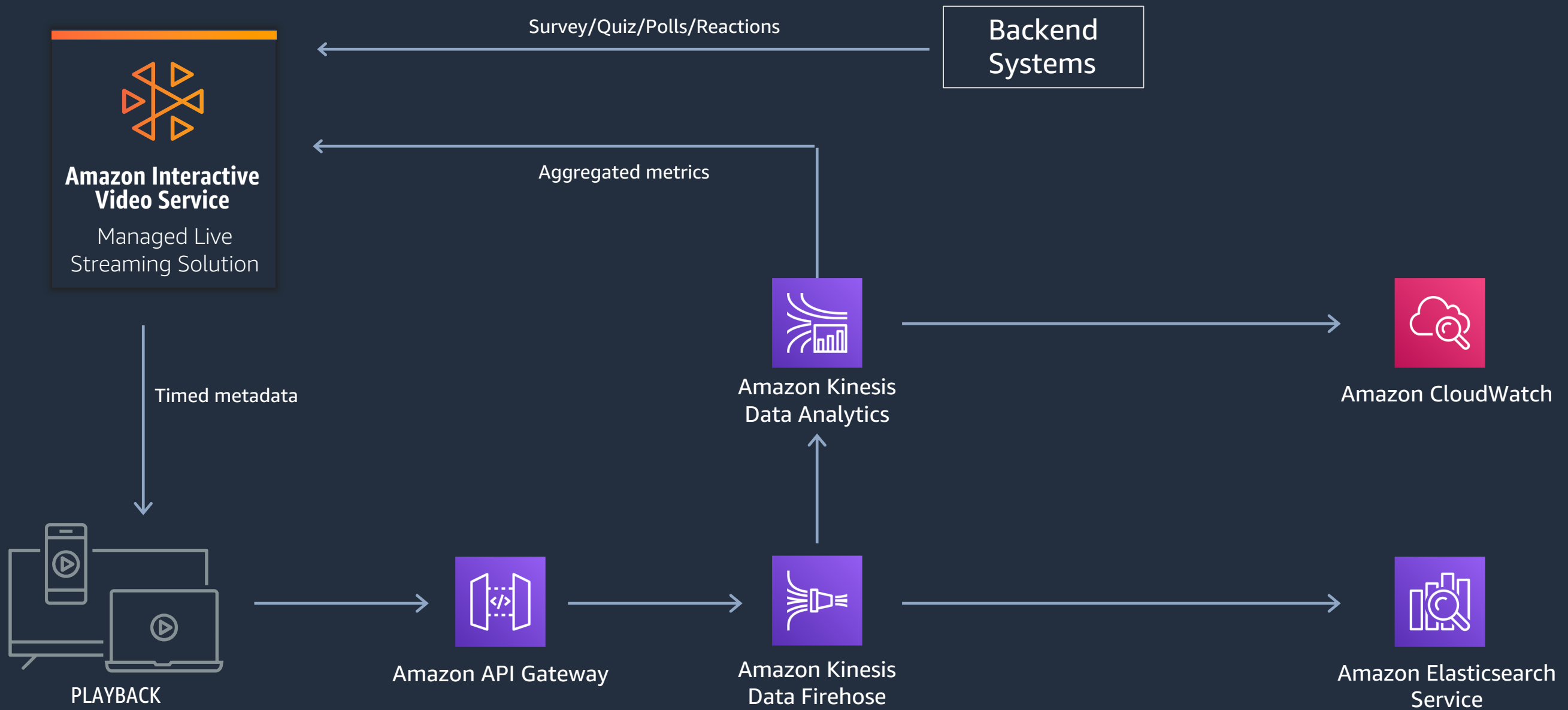
Cost Estimates

Components	Costs	Cost variability by traffic
Ingests	$218.40 per Million Hours	High
Kinesis Analytics Processing	$84.20 per Month (1 KPU)	Stepwise
CloudWatch Dashboards	$4.50 per Month	Consistent
ElasticSearch Dashboards	$232.50 per Month (2x m4.large w/ 100GB storage)	Stepwise
QuickSight Dashboards	$12/user/month + S3 Data scan charges	Usage based

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Next Steps

https://github.com/aws-samples/amazon-ivs-qos-dashboard-timed-metadata-sample

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