Microsoft

Real-time monitoring and observable systems for Media

November 2022

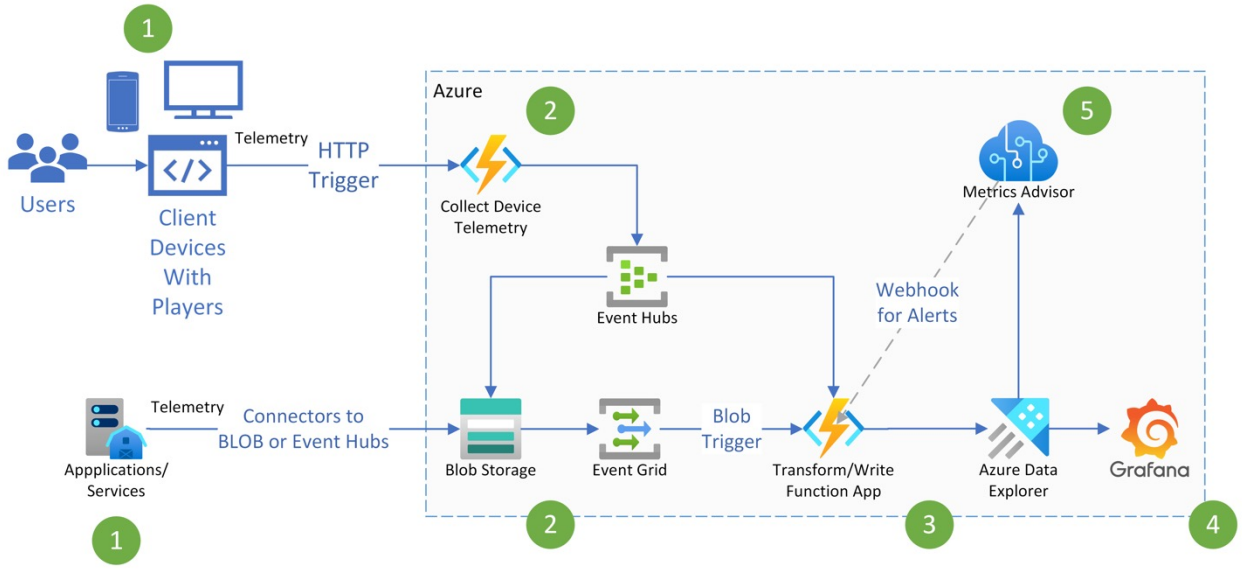
Use case: Real-time monitoring of Quality-of-Experience (QoE) and Quality-of-Service (QoS) metrics on Azure

Challenge

Data is collected from disparate systems and third-party providers. How can we synthesize and derive intelligence from this data in near real-time and at scale.

Solution

A scalable and fault-tolerant architecture on Azure using Azure Applied AI allows you to monitor, establish a baseline, and trigger alerts in near real-time if there is an issue with steady-state system.



Benefits

Azure managed services make it easier to auto scale horizontally and make management of services a breeze.

High-level Flow for Anomaly Detection

1

End user
Watches video

2

Video Player
Web browser, mobile, TV

3

Connectors
Collect telemetry from various end devices

4

Data Stores
Store raw telemetry data and enrich with other datasets

5

Anomaly Detection
Metrics Advisor and Azure Cognitive Services

6

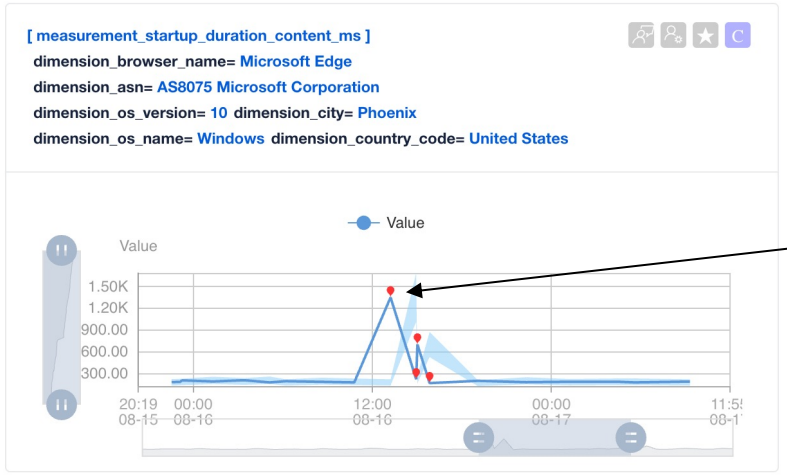
Reporting & Alerts
Microsoft Teams notifications, Grafana, Emails

Use case: Focus on common streaming problems

Scenario

"4 horsemen of the streaming apocalypse" as a measure of bad Quality of Experience (QoE) from a user perspective.

- slow start
- low quality
- stall/buffering
- player errors



On August 16 around 12 AM, in Phoenix, AZ, USA, users watching a video on Edge browser starting to experience a slow start.

Dimensions

- **`Slow Start`** – The time for playback to begin after start is initiated on a user device
- **`Low Quality`** – measured network throughput and a ratio of current playback quality vs. highest possible playback quality
- **`Stalls/Buffering`** – frequency of stalls and the duration of time spent in buffer
- **`Player Errors`** – frequency and types of player errors

Use case: Misuse of Assets/Discovery of New Markets

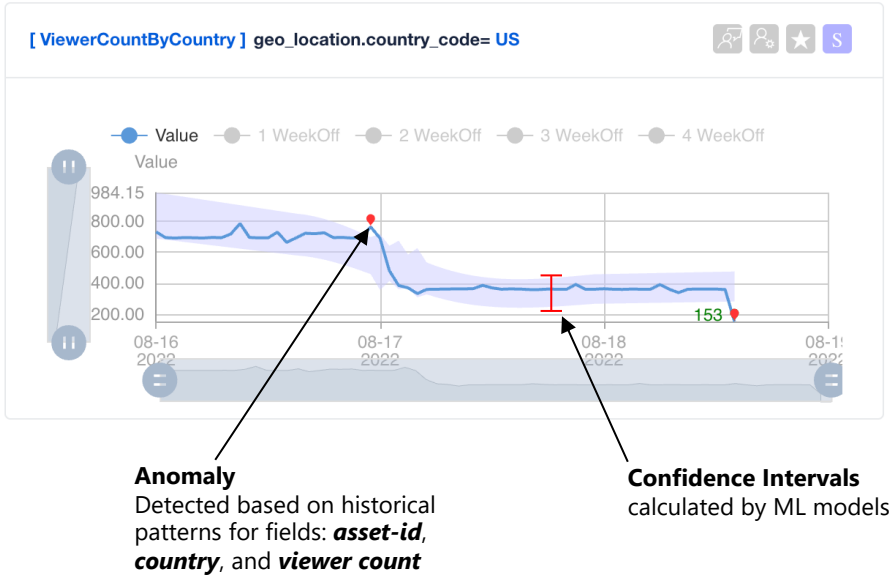
Scenario
Movie premieres/screens in Region-A but we see viewers in Region-B

Scenario
Bug in code or a permissions issues enables viewers to view VOD in a country where the asset is banned. Examples:

- "Screening" application where assets should only be available to a small set of "preview" viewers and not widely released to public
- Propaganda films
- Films that are banned in some countries
- Regulatory requirements

Dimensions

- **`cmcd.cid`** – asset unique identifier
- **`country_code`** - Country

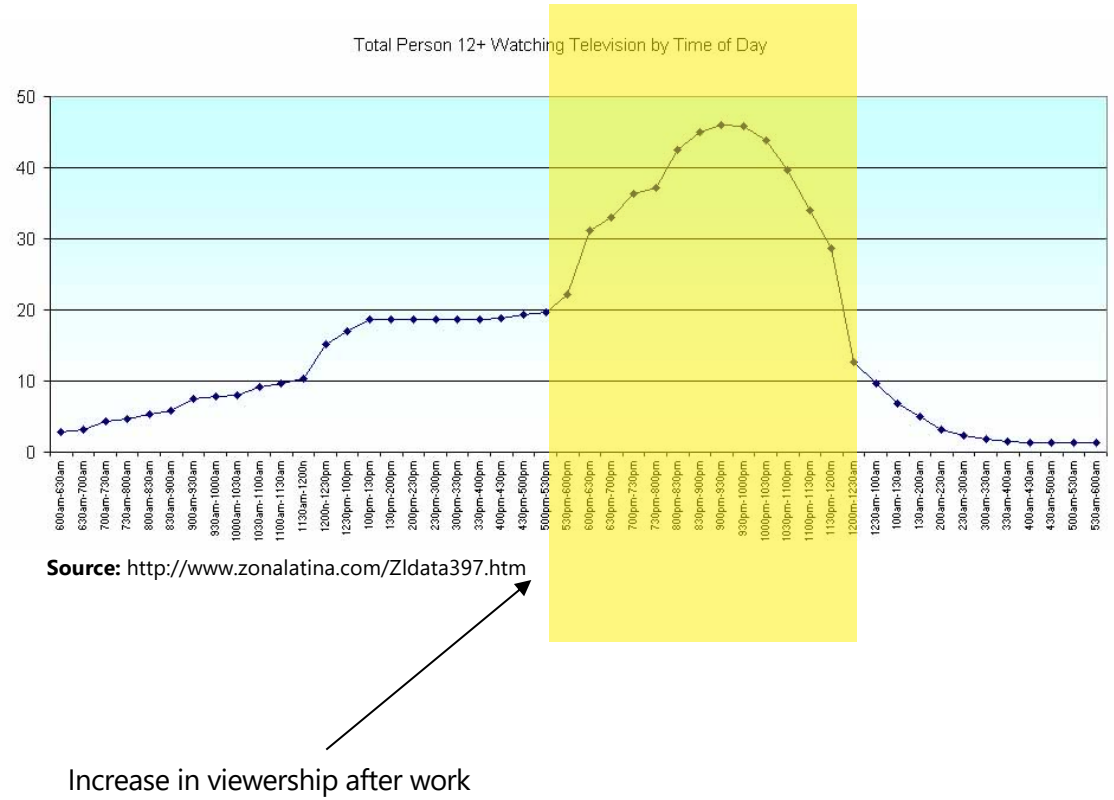


Use case: Misuse of Assets/Discovery of New Markets

Question #1
If a movie premiers in US to 10k viewers and 2 people watch in Australia, is that a *false-positive*?

Question #2
Can we define a way to detect misuse or popularity without having to code in thresholds?

Question #3
We notice an uptick in viewers between 5 PM through 12 PM every weekday. Can we capture this insight?



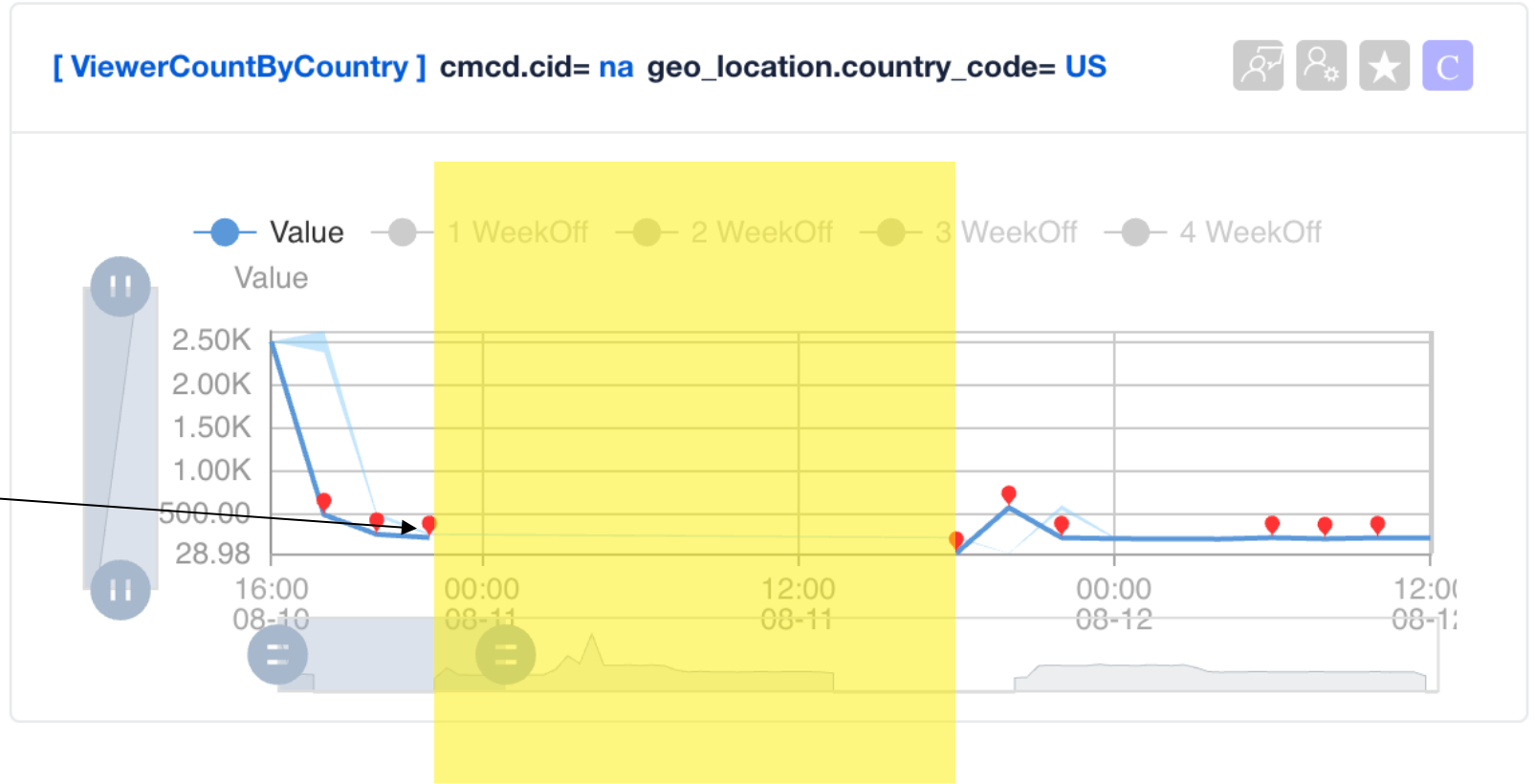
Source: http://www.zonalatina.com/Zldata397.htm

Increase in viewership after work

Use case: Outage/Sudden loss in viewership

Scenario:

Data center or CDN/Point-of-presense (PoP) experiences an outage



Metrics Advisor is unable to see new data and based on historical inference triggers an alert.

Use case: QoE characteristics based on region

Scenario
A user in a developing country with 3g cellular data has a higher *Time To First Frame (TTFF)* compared to another user in a developed nation with high-speed WiFi internet

Dimensions

- **`cmcd.cid`** – asset unique identifier
- **`startup_duration/ttff`** – Average time of media request to the rendering of the first frame of video.
- **`country_code`** - Country