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Extraordinary

Deliver uninterrupted, high-quality entertainment services
Build an effective monitoring framework to ensure high
performance of microservices-based streaming services

Credits

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DSP's complex video-on-demand (VoD) ecosystem

DSP's complex VoD ecosystem

More and more DSPs are moving towards **microservices** for their video-on-demand (VoD) services to handle huge number of requests with minimum response time and to maintain high availability (in the order of 5 9's). Here are some of the key reasons for this transition.

- ▶ More than a billion requests per day and more than a million events per second (at peak)
- ▶ Thousands of different types of devices to support
- ▶ Millions of lines of java scripts, 100s of daily UI scripts
- ▶ Thousands of long running tests per day

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Complexity of microservices-based applications

DSPs are opting for microservices to reap its benefits. However, monitoring microservices are very challenging.

A single application (several microservices) runs on multiple hosts in a very dynamic environment and needs to interact with multiple other systems that are also dynamic in nature.

Implementing the right tool chain is critical in effective performance monitoring of microservices based applications. This insight focuses on building a robust tool chain to monitor microservices based VoD application.

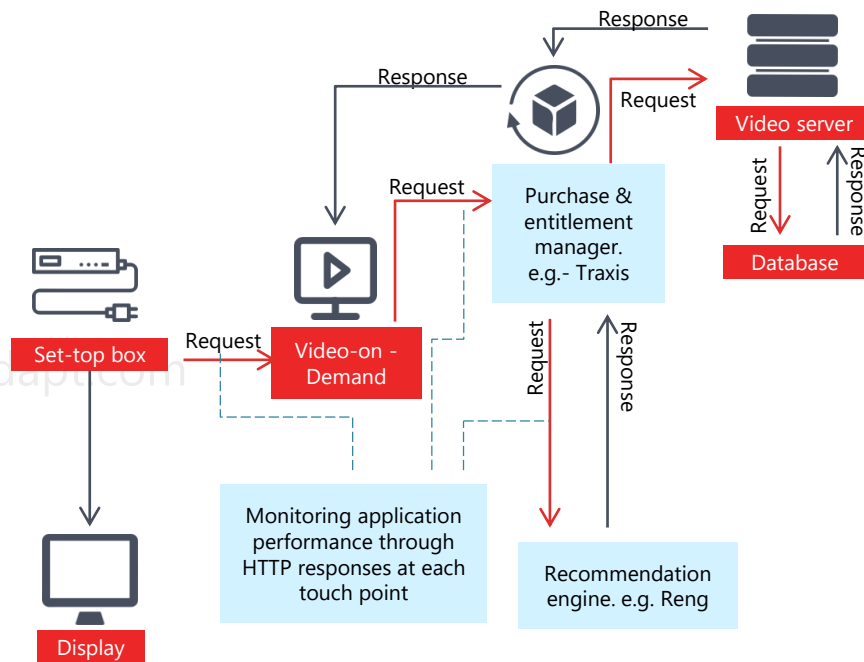
Video-on-Demand (VoD) application monitoring - Overview

Key areas to monitor

In order to ensure that the application functionality is delivered, the following aspects need to be monitored.

- ▶ Time taken from request till response
- ▶ Time lapse at each touch point
- ▶ Success/failure rate of requests at each touch points
- ▶ Success/failure rate of requests by category/genre/content
- ▶ Busy/free time by requests/category/genre
- ▶ Trending requests by user/content/category/genre

Microservices based VoD application architecture

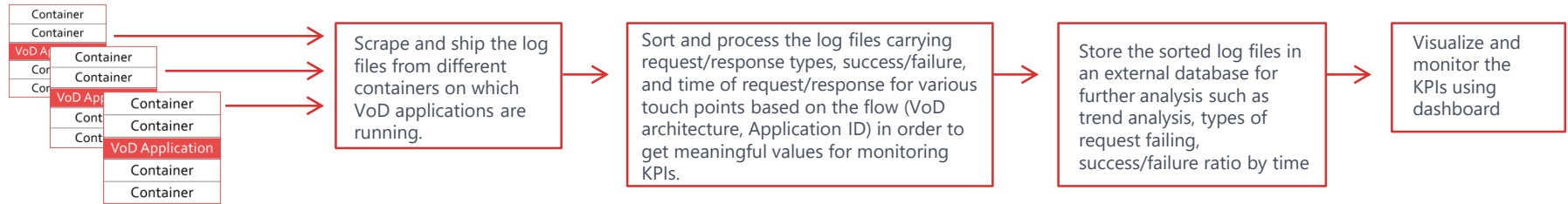


As VoD application is running on microservices which are spread across multiple hosts, it can not be monitored through a single tool. One needs to build a tool-chain to monitor application performance effectively.

Monitoring the VoD application: Types of tools required to monitor key VoD KPIs

Activities involved in VoD application monitoring

VoD application has distributed touch points and requires a set of activities to capture KPIs like success/failure rate, time lapse etc.



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Tools required to support monitoring activities efficiently



Log scrapper

To scrape microservices log files containing request/response type, timestamp etc. from different hosts.



Log shipper

To collate the application logs collected by the scrapers from individual containers and ship to an external storage system.



Log aggregator

To consolidate and sort microservices' logs that come from multiple containers under one application in order to analyze performance metrics. Aggregator helps to identify touch-points where requests/responses are getting stuck or failing.



Message Queuer

To help in alleviating back pressure of host level disk space while large amount of data is being written to the database or while network issues and DB unavailability scenarios.



Database/storage

An external centralized storage system for better accessibility of processed log files for root cause analysis, trend analysis etc.



Performance monitoring dashboard

Rule-based dashboard view to show performance KPIs' report from processed log files and send notifications in case of exceptions.

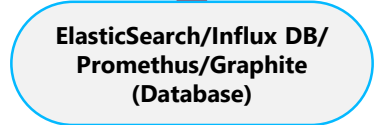
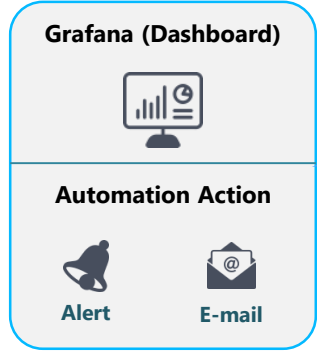
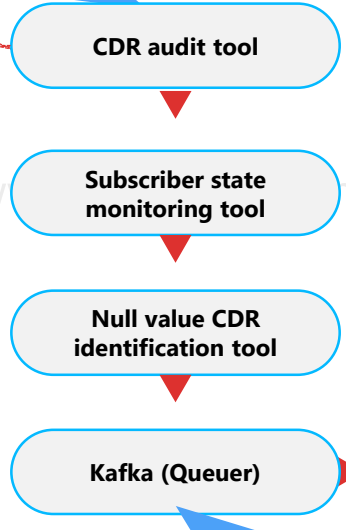
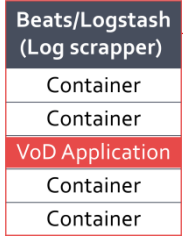
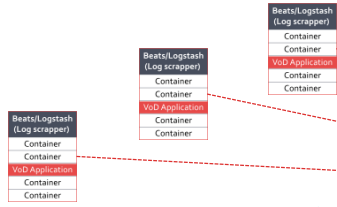
Recommended toolchain for efficient monitoring of VoD application

Identifying and stitching together right tools into one unified stack and making it work is the key to successful microservices monitoring

Fluentd is suitable for monitoring at edge level. However, for VoD application monitoring, Flume is recommended as it works better when log files need to be queued, aggregated, processed and stored in an external storage.

Beats is a lightweight agent used for frequent scrapping of logs. However for VoD application monitoring, Logstash is recommended as it provides various plug-ins to transform the log data that helps to monitor VoD applications effectively

Storm is a distributed real-time computation system. However, for VoD application monitoring, Spark is recommended as it is fast and general-purpose engine for large-scale data processing applications



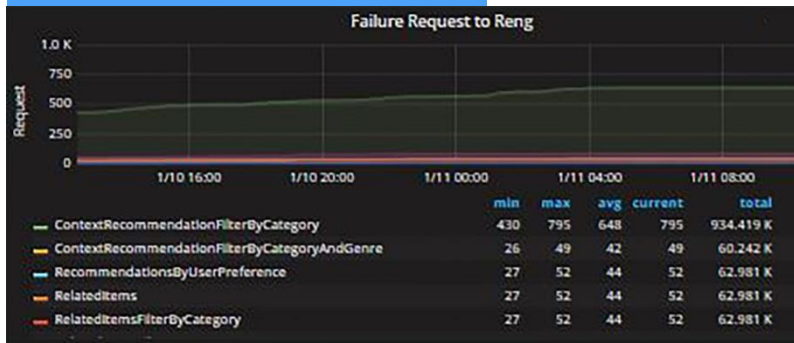
Queues large number of VoD log files to avoid unnecessary pressure on database

Automated scripts to send notifications/alerts and actions

To categorize information and save in a presentable manner

Once the tool chain is in place, leverage Grafana for visualization of key KPIs

Success/Failure rate

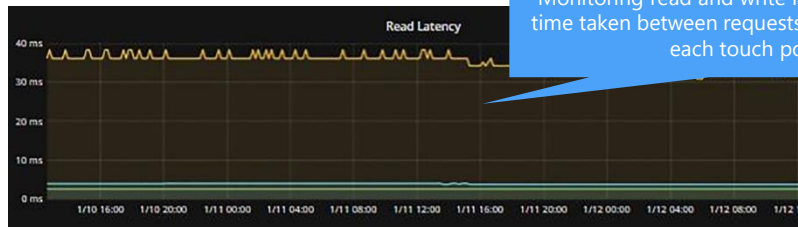
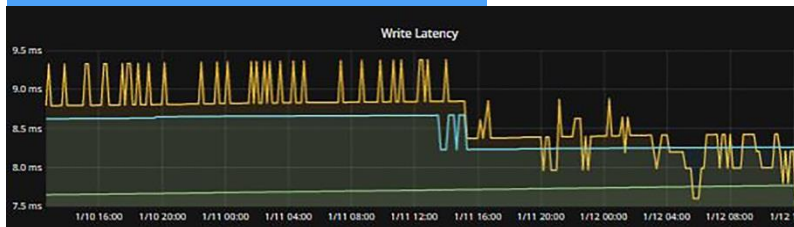


Once the log files are shipped to a centralized location, aggregator (Spark) sorts the data using custom python scripts and processes it. E.g.- To monitor failure requests (4xx responses), aggregator consolidates log files based on their Pod IDs linked with the VoD application. This helps in displaying the consolidated results on dashboard

e.g. Monitoring application performance through HTTP responses at each touch point:

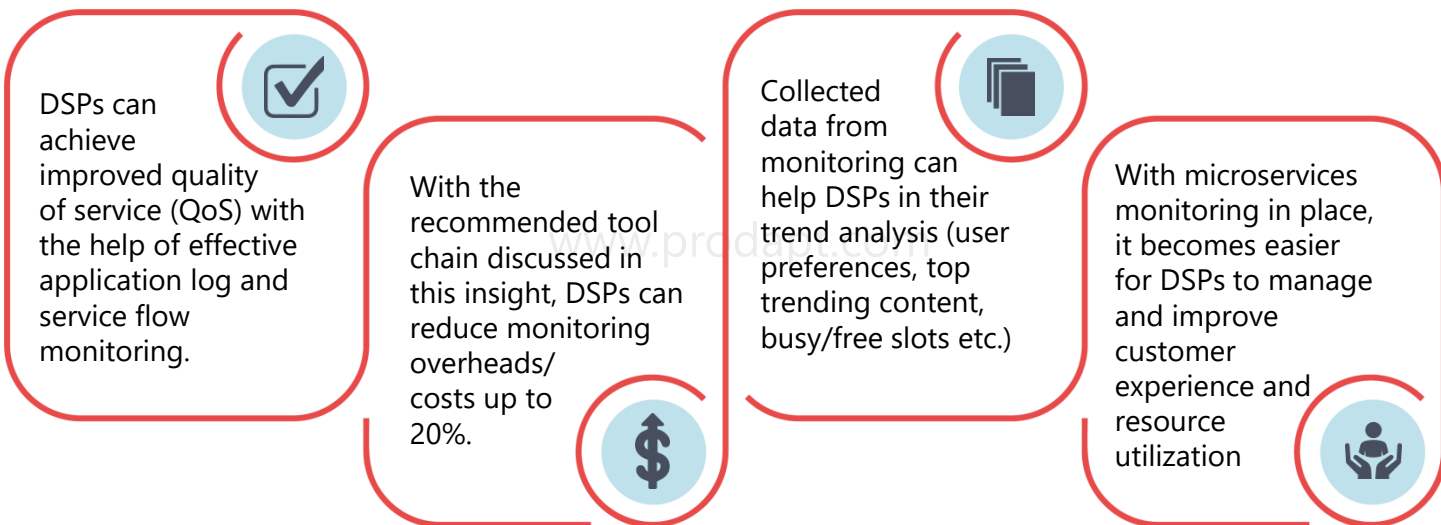
Port	HTTP Response Status code	Message	Comments
80	200	Ok	The details for the UI screens have been responded successfully
80	200	Bad Request	Invalid value of type on request

Read/write latency



Monitoring read and write latency to analyze time taken between requests and responses at each touch point

Key takeaways





THANKS!

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THANK YOU!

