Leveraging Agile Microservices for Big Data

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ABSTRACT

Real-time data is generated in large streams on the IoT, thereby requiring highly available, scalable, and evolving systems. Microservices are well suited for the development of such Big Data Applications. Consequently, microservices along with Agile methodology can be used to implement dynamic Big Data systems efficiently.

CCS CONCEPTS

• Computer systems organization • Dependable and fault-tolerant systems and networks • Maintainability and maintenance

KEYWORDS

• Big Data • Micro-services • Agile-Methodology • Real-time

BACKGROUND

Monolithic architectures are traditionally large scale, complex, and tightly coupled. According to Hasselbring, [1] micro-services have solved these issues by providing loosely coupled architecture with features such as modularity, self-sustenance, scalability, and fault-tolerance.

Agile methodologies such as Scrum and Kanban define Software Development Lifecycle as the iterative and incremental development in short sprints with deliverables at the end of each sprint [2].

According to Ortiz *et al.,* the Internet and the Internet of Things generate large volumes of data termed as 'Big Data' [3]. Raw data streams need to be processed and stored in a structured format for further analysis. The services that support real-time big data streams need to be Highly Available (HA) and Scalable.

Prashanth *et al.* have suggested the use of real-time data streams and analysis of SMS data in a women safety mobile application [4]. Such a system can be developed using micro-services deployed on elastic docker containers. Deployment of containers is faster than Virtual Machines contributing to the real-time system.

1 Proactive Harassment Prevention System

Real-time predictive systems such as the MySafetiPin App [4] helps women against domestic abuse and other crimes. According to Hossain et al., existing applications for women safety rely on user input triggers [5]. However, proactively programmed triggers would be helpful in stressful situations where user input is not possible.

The proposed solution will utilize a smartphone application that works on adding emergency contacts to a friend circle. To enable proactive monitoring, the owner of the smartphone device must enable a safety mode. An agile microservices solution can rapidly scale compute at distinct edge locations in proximity to contacts in the friend circle. Programmed triggers in the application will use input sensors on the smartphone device such as the accelerometer, audio, and gyroscope to detect if the victim is in danger. For example, the accelerometer could be triggered by a running victim and the microservices will alert the nearby friend circle about imminent danger, and stream/record live audio and video.

The above solution alleviates the complexities in handling big data streams at edge locations by utilizing agile microservices. Moreover, a proactive approach can be more effective in preventing incidents against women.

ACKNOWLEDGMENTS

We acknowledge and thank Ruth G. Lennon, ACM-W LYIT Student Chapter, and LYIT for their support.

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