Unit 12 Seminar

Title: Microservices and Microkernels Debate

Read Biggs et al. (2018) and Bucchiarone et al. (2018) as examples of modern views and approaches to the Monolithic vs. Microservices/ Microkernel debate.

- Post your team's stance to the forum along with justifications.

- Read all the arguments for each position.

- Choose one team response that disagrees with your team's stance and post a message that refutes their argument.

- During this week's seminar session, all students will independently vote for which argument they believe was presented most persuasively.

Monolithic vs. Microservices/Microkernel Debate

As this topic was not discussed, I want to share my observations.

In my opinion, microservices architectures are a more suitable choice for modern applications compared to monolithic architectures. This is due to several advantages microservices offer, such as scalability, resilience, and agility.

According to the research conducted by Biggs et al. (2018), the type of operating system structure employed has a notable influence on security. Specifically, a microkernel-based system can prevent 96% of critical Linux exploits from reaching a necessary level and stop 29% of all exploits entirely. Unfortunately, the flawed monolithic OS design is the root cause of most security breaches. Hence, my choice

of microservices architecture is supported by Bucchiarone et al.'s (2018) article, particularly on:

Scalability: Microservices provide benefits in terms of service scalability, allowing each service to be developed and managed by a single team.

Resilience: Microservices simplify development and deployment, improving scalability and stability. They utilise Docker containerisation, CI/CD automation, Docker Swarm orchestration, and RabbitMQ message passing.

Agility: Microservices offer looser coupling, more straightforward deployment, and full ownership, regardless of the technology used. Centralised logging and monitoring provide a comprehensive system overview.

My comments for a different opinion:

One common argument against microservices is that they are more complex to develop and maintain than monolithic applications (Kanjilal, 2020). However, I believe that the benefits of microservices architectures outweigh this complexity. Microservices frameworks can help to simplify the development and deployment of microservices applications (Geeks, 2023). Additionally, the benefits of scalability, resilience, and agility can make microservices applications more accessible to manage in the long term.

References:

Bucchiarone, A., Dragoni, N., Dustdar, S., Larsen, S. T. & Mazzara, M. (2018). *Shibboleth Authentication Request*. [online] Available at: https://ieeexplore-ieee-org.uniessexlib.idm.oclc.org/document/8354415.

Biggs, S., Lee, D. & Heiser, G. (2018). The Jury Is In. *Proceedings of the 9th Asia-Pacific Workshop on Systems*. doi:https://doi.org/10.1145/3265723.3265733.

Kanjilal, J. (2020). *Pros and cons of monolithic vs. microservices architecture*. [online] Available at: https://www.techtarget.com/searchapparchitecture/tip/Pros-and-cons-of-monolithic-vs-microservices-architecture.

Geeks (2023). *10 Popular Microservices Frameworks*. [online] Java Code Geeks. Available at: https://www.javacodegeeks.com/2023/09/popular-10-microservices-frameworks.html [Accessed 29 Oct. 2023].