SIT226 Cloud Automation Technologies

Credit Task 2.2C

Microservice Architectures

Background

Microservice architectures are a relatively new concept in the development of network services although, like most technologies, they can also be observed as an evolution of existing techniques dating back to the early 2000s. Microservice architectures divide the functionality of an application into many small services, each of which can be replicated and/or scaled separately from the other components of an application. In this task, we examine how microservice architectures have been applied in a major web application.

Get Prepared

Begin by taking the time to review the microservice architecture and ensure that you properly understand what a microservice is. Next, conduct research into major web applications that have adopted microservices and learn what you can about why they have done so and what they have achieved.
Note: Be careful to select an application that uses a microservice architecture, examples of which may be found for social media, audio/video streaming, major shopping sites, and so on. Public cloud services such as those provided by Azure/AWS/Google Cloud are not example applications.

Complete the Task
Page Limit: 1 page of text formatted reasonably, e.g., 2cm margins, 11 or 12 point font, appropriate headings/spacing, etc.

Select **one web application** and prepare a document according to the following requirements:

1. Provide a general overview of the web application, describing the functionality it exposes to the public (approximately 0.25 page).
2. Select two of the microservices that form part of your selected application. Explain what functionality that microservice provides to the application (approximately 0.25 page each).
3. Discuss the benefits and challenges introduced to your selected web application by introducing the microservice architecture (approximately 0.25 page).

   Hint: Any relevant issues can be addressed here but some common issues might relate to the complexity of the application, the continued development, reliability and scalability of the running application, and the structure of the supporting workforce.

Submit Your Task

Prepare your submission using the word processor of your choice and submit a PDF to OnTrack.

Taking it Further (Optional)

Microservices are widely accepted as an important architecture for large complex network services, particularly web applications. Our exploration of microservices is restricted to understanding their significance and what they are used for, but also to understand the challenge they represent as an application that we need to support operationally. Many careers in information technology will both encounter and work with applications implemented using a microservice architecture, including web/ software development, cybersecurity and networking. Take the time to understand microservice architectures and how they work, the following points may suggest useful areas to investigate:

- Take the time to study and fully comprehend how microservice architectures work and how you might apply them in the development of a web application. The website microservices.io provides a great starting point to explore the many details of microservices applications, but also includes links to presentations and books that will help you get up to speed with microservices.
- In learning about microservice architectures you'll quickly identify that there are a number of components that are commonly used. Take the time to explore some of these and understand the functionality that they provide, e.g., RESTful APIs, containerisation systems, service registration and discovery systems, message queue systems, log collectors and analysers, databases, and so on.
- Explore how microservices would be dealt with in the industry context. For this you could examine how microservices relate to the other business processes and IT practices that would be involved, such as:
    - Cybersecurity and microservices – what are the unique cybersecurity issues raised by the use of microservices? How are traditional security mechanisms, such as authentication and authorisation implemented in microservice architecture applications? What techniques are used to secure microservice architecture applications? How are microservices addressed by other common security practices, such as penetration testing or forensics analysis?
    - Software development and microservices – one of the key advantages identified for microservices is the ability to use smaller autonomous teams working in parallel. How does this aid the agile development model? What new challenges are introduced by using microservices given the significantly increased complexity? How do key software development processes change to handle the microservice architecture, e.g., testing. One of the biggest issues is when should a web application be developed/re-developed using microservices?

Citations and Referencing

When completing any work it is necessary to acknowledge the work of others that you have relied upon. For written assessment, we achieve this through the use of citations and references. Failing to correctly identify the work of others is known as plagiarism and is considered an issue of Academic Integrity.

If your submission to this task has involved the work of others, you must include citations and references where appropriate. Deakin provides a website that explains how to use citations and references, and includes explanations of various referencing styles:

https://www.deakin.edu.au/students/studying/study-support/referencing

You may select any style for your citations/references, however, you must be consistent in applying that style in this task (you can use other styles in other tasks if you wish).

Note that any bibliography/list of references is not included in page limits.