SIT226 Cloud Automation Technologies

Pass Task 5.1P

Types of Storage

Background

Most applications require storage of some kind, either directly for storing files or as a backing store for other storage applications, e.g., databases. The applications of storage vary widely and will vary depending on the volume of data to be stored, how often the data will be stored/modified/retrieved, how reliable the data needs to be (or potentially just temporary), and so on. Consider the storage needs of an online shopping site versus a video streaming site for example. To satisfy such diverse needs, Kubernetes defines a number of different classes of storage. Although each provides the ability to store files, they do vary in their features. In this week, we consider the different classes of storage that are provided and how they relate to application requirements.

Instructions

At the time of writing, Kubernetes supports 19 different storage classes, such as AWS EBS, GCE PD, etc, identified in the [official documentation] (https://kubernetes.io/docs/concepts/storage/storage-classes/). These storage types are not all equivalent, each having its own advantages and disadvantages for different applications. Go through these storage classes and understand their different use cases, capabilities, features, etc. While reading different storage classes, do extra research on what these storage classes do.

Complete the Task

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

Prepare a document according to the following requirements:

1. Reflect on the content for this week. In ½-¾ page, identify the most important lessons/topics this week relevant to your future studies/career and explain why they are the most important. Note: Do not present/explain topics, you are explaining why the things you learned are important!
2. Provide one or more screenshots for each activity, demonstrating that you have completed the lab session this week and briefly explain what is shown in each screenshot (one or two short sentences each).
3. In ¼-½ page, give an example storage class that provides temporary local storage, briefly discuss the features of this type of storage, and explain what applications would use it for.
4. In ¼-½ page, give an example storage class that provides block storage, briefly discuss the features of this type of storage, and explain what applications would use it for.

Submit Your Task

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

Taking it Further (Optional)

In this task, we have examined different storage classes and how they might be used by applications. There are a number of additional areas where you might consider developing your knowledge further:

- There are other storage class types that we haven't addressed here, e.g., network shares. Take time to investigate these different storage classes and try to learn why the different types are provided and how they might be used by applications.
- Some storage class types are equivalent but are from different providers, e.g., object storage from AWS, Google Cloud, Microsoft Azure, and also, through private cloud services (Ceph/Gluster). It's important to understand why these alternatives exist and what may be common and different between the alternatives.
- One of the issues we have to deal with in cloud computing is protecting data. An important aspect of this is protecting "data at rest", i.e., data that is stored on a disk /on a filesystem. Take the time to investigate what is meant by the term data at rest, what the problems and challenges are in achieving this, and what techniques and technologies are used.
- Different storage types have different levels of availability. This can be seen clearly when reviewing public cloud storage services. If you consider Amazon S3 storage for example (object storage), there are many availability levels: Standard, Intelligent, Infrequent Access, Glacier, and Glacier Deep Archive. Understanding the differences between these storage types, their accessibility, and pricing, is important if you are going to work in this field.
- Several cloud native services, e.g., Dropbox, Netflix, etc., make heavy use of storage provided by the public cloud. These are significant and highly successful/profitable services, and it's useful to understand how these services have developed over time and how they make use of these storage services.

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.