SYST8111 – Server Virtualization

**Title:** Private Cloud Platforms

Swathi Anil

Virtualization and Cloud Computing, Conestoga College Waterloo

Course Code: 1523

Course Instructor: Andre Gignac

Assignment Due Date: Jan 24 2024

**Part A - Vendor Identification**

**1.** **Here are the profiles of five vendors specializing in cloud computing.**

In my investigation, I have discovered multiple suppliers offering infrastructure services and private cloud platforms. Here are a few noteworthy examples:

1. **Amazon Web Services (AWS)**

AWS, plays a pivotal role in the field of cloud computing, its an online platform that provides cost-effective and scalable computing solutions to ISVs, application providers and vendors. Some of the on-demand operations provided by AWS includes content delivery, compute power, database storage and various other features which helps corporate to grow easily. It has the capability to work on different configurations based on users needs. AWS is known for its cost- effective service as it does not require a long-term commitment for anything which the consumer needs. It offers hybrid computing, management of centralized sectors and quick installation or removal of the application in any geographical locations.

1. **Google Cloud Platform (GCP)**

Google Cloud Platform (GCP) is a widely used cloud computing platform nowadays. GCP leverages cloud computing services offered by Google to assist customers in their digital transactions. Some of the services offered by GCP includes big data processing, compute, Machine learning and AI and Network. GCP's global infrastructure, allows businesses to quickly deploy scalable applications as it has with data centers in different regions. GCP provides freedom for the users to build, test, and deploy their applications on distributed and scalable infrastructure. It also provides its users to utilize the service’s capabilities in data management, security, analytics, and artificial intelligence (AI). The Google’s API helps in speech detection and language translation which is one of the most preferred choices among customers.

1. **Microsoft Azure**

Microsoft Azure is the second largest cloud service provider. Some of the services offered by Microsoft Azure includes Machine Learning +AI, Internet of things, Databases, Security, DevOps and many more. Microsoft’s previous products and services offered by them in the cloud makes it the most intelligent and attractive cloud choice. Microsoft Azure offers advanced security solutions and services such as, Azure active directory, Security Center, Key vault, VPN gateway, Application gateway, and so on. Azure offers global availability by providing more data centers around the world. It utilizes virtualization to differentiate the coupling between CPU and the operating system, this is done with the help of an abstraction layer commonly known as hypervisor. This Hypervisor has the unique ability to emulate all the functionalities of the physical machine such as server and hardware into a virtual machine. There are multiple virtual machines available, and each one can be used to run numerous operating systems.

1. **IBM Cloud Services**

The services offered by IBM cloud are Software as a service (SaaS) platform as a service (PaaS) and infrastructure as a service (IaaS) via private, public and hybrid cloud models. With the help of internet, the IBM cloud organizations can access and deploy its resources such as compute power and storage networking. IBM cloud fulfils the requirements of the customers and ensures customer satisfaction with its amazing speed and agility of the cloud. IBM Cloud provides solution that enables higher level of security, compliance and management, with proven architecture methods and patterns. IBM Cloud provides support for multicloud and hybrid cloud which makes it easy to work with different vendors. IBM Cloud computing services also helps home appliance manufacturer, medical supply businesses and retailers.

1. **Alibaba Cloud**

Alibaba Cloud is a leading cloud provider in China and in Asia Pacific, its part of Alibaba group. In Alibaba Cloud the cloud services are available on a pay-as-you go basis. It also includes services such as data storage, elastic compute, big data processing, relational database and content delivery network. Alibaba cloud was launched in 2009. Alibaba incorporates object storage service (OSS) which provides enterprises to store any type of unstructured data. Alibaba cloud provides cloud computing services such as IaaS, PaaS, DBaaS and SaaS. Along with other providers, Alibaba cloud also offers various cloud infrastructure and applications development services. Alibaba Cloud provides a wide range of AI-based services and products, including natural language processing, machine learning and computer vision, which enables customers to automate processes and build intelligent applications.

**2.** **Here are the five infrastructure services corresponding to each vendor for building private cloud architecture.**

1. **Amazon Web Services**
   1. **The Amazon Elastic Compute Cloud (Amazon EC2)** is a web service that provides secure, scalable computing capacity in cloud. It permits organizations to configure and access virtual compute capacity in the cloud.
   2. **AWS Lambda** is a serverless and event-driven compute service that allows to run code without managing servers. It enables to run code for any type of application with minimum or zero administration. It also enables the flexibility to pay for what is been used.
   3. **Amazon VPC** is the network environment in the cloud. Amazon VPC allows to create a private network within AWS cloud which uses most of the constructs and concepts of an on-premises network. Amazon VPC is an AWS foundational service which is integrated with numerous other AWS services.
   4. **Amazon S3 (Amazon Simple Storage Service)** is object storage which consist of simple web service interface to retrieve and store any amount of data from anywhere on the web.Amazon S3 is used as a primary storage for cloud-native application as a means for backup and disaster recovery.
   5. **Amazon Glacier is a durable, secure and extremely low-cost storage service used for long-term backup and data archiving. It is an ideal solution for data archiving as it take several hours to retrieve the data stored in them.**
   6. **Amazon Relational Database Service (Amazon RDS)** enables to setting up, operate and scale a relational database easily in cloud. It manages time consuming database administration task which in turn provides cost effective and resizable capacity.
2. **Google Cloud Platform**
   1. **The Google Compute Engine** is used as a provision for the virtual machines to deploy the applications with the help of required rom, ram and security groups.
   2. **Cloud Storage** enable to store large amounts of data , which is required to be highly available.
   3. **Cloud SQL** it offers services like PostgreSQL, MySQL and SQL Server. It also helps in managing relational database with automated backup and scaling.
   4. **Virtual Private Cloud (VPC)** it enables to create and manage isolated virtual networks for google cloud platform resources.
   5. **Cloud Load Balancing:** This is considered as an important service of google cloud which helps to distribute cloud among multiple replicas of the application.
3. **Microsoft Azure:**
   1. **Compute**. It includes cloud services for building apps and APIs. It includes Virtual machines and functions for serverless computing.
   2. **Storage** includes Queue, blob, and Disk Storage as well as provides Backup and recovery.
   3. **Azure CDN** This service is used to deliver content to users.  The [CDN service](https://www.simplilearn.com/content-delivery-network-article)  enables the users to access the data as soon as possible with the help of a network of servers placed strategically around the globe.
   4. **Express Route** This service helps to connect on premise network to Microsoft cloud or any other services that is needed by the consumer with the help of a private connection.
   5. **Virtual Network** This service allows to have any of the Azure services communicate with one another privately and securely.
4. **IBM Cloud Services:**
   1. **IBM Cloud Code Engine** enables serverless containers hosting platform as a service.
   2. **IBM Cloud Database** enables to store, query and analyze structured database.
   3. **IBM Security Advisor** ensure to secure the cloud resources and simplify regulatory compliances.
   4. **IBM Load balancer** ensures traffic flow management for cloud applications.
   5. **IBM Cloud Direct Link** helps to establish Physical or virtual private connections to IBM Cloud.
5. **Alibaba Cloud**
   1. **Elastic Compute Service:** This cloud computing service provides scalable and on-demand computing resources. It enables users to launch virtual machines on demand and pay as they use.
   2. **Simple Application Server:** This is a completely managed, PaaS that enables easy deploy, run and scale web APIs, applications and microservices.
   3. **Apsara Stack:** Alibaba cloud offers a hybrid cloud solution which aims to encourage organizations to seamlessly integrate their on-premises IT infrastructure with its cloud platform.
   4. **Server Load Balancer (SLB):** This is a service that distributes the incoming network traffic across multiple servers. It also ensures to handles traffic effectively.
   5. **Auto Scaling:** This service of Alibaba Cloud automatically adjusts the number of virtual machines in an application based on the current demand.

**2.** **Here are few identified purpose associated with each infrastructure service.**

1. **Amazon Web Services**
   1. **Amazon E2C** enables to use ones or hundreds of server instance simultaneously. It provides complete, secure solutions for computing applications. Amazon EC2 provides reliable, secure, high-performance and cost-effective compute infrastructure so as to meet the needs of the businesses on demand.
   2. **Amazon Lambda** The main purpose of this service is that it lets developers to run code for any type of application with zero administration. It also ensures auto scaling of the code with high availability. It lets developers the flexibility to pay for compute time they consumed.
   3. **Virtual Private cloud (Amazon VCP) Amazon** VPC is responsible for the network environment in the cloud. It lets to create a private network within the AWS cloud that uses most of the same constructs and concepts as an on-premises network.
   4. **Amazon S3** The main purpose is to provide infinite amount of storage and its delivery with 99.99999% durability. It facilitates the store and retrieval of any amount of data from the web with the help of a simple web service of object storage.
   5. **Amazon Glacier The** main purpose of Amazon Glacier is that it provides faster access to the archive data. They take several hours to retrieve stored data. This is a low cost storage service which is ideal for data archiving and long-term backup.
   6. **Amazon RDS** The main purpose of this service is that it makes it easy to setup, operate and scale an relational database in cloud. It manages time consuming administrative task while providing resizable and cost-effective capacity which helps the users to focus on their application and business .
2. **Google cloud platform**
   1. **Google Compute Engine** The main purpose of this service is to provide the required computing resources such as RAM, ROM, and security groups, that allow the users to provision virtual machines to deploy and run the application.
   2. **Cloud storage** The main purpose is to store huge amounts of data which is required to be highly available.
   3. **Cloud SQL** The main purpose of this service is that it provides services like SQL Server, MySQL and PostgreSQL.
   4. **Virtual Private Cloud** the main purpose is to deploy the application in the private network which can be achieved by google cloud.
   5. **Cloud Load Balancing** the main purpose of this is to distribute the cloud across the multiple replicas of the applications.
3. **Microsoft AZURE**
   1. **Compute Service:** There are several uses of this service for instance it enables to create Virtual Machine in Windows, Linux or any other operating system within fraction of seconds. It is also possible to create scalable applications within the cloud. Once the application is deployed rest everything is taken care by Azure.
   2. **Blob Storage** The purpose of this service is to store massive amount of unstructured data. The data can be text and binary data.
   3. **Azure CDN The** primary objective of this service is to deliver data to the users as soon as possible and the users can access these data from any part of the glob.
   4. **Express Route** The main purpose of this service is that it enables to establish a private connection between on-premises network to the Microsoft cloud or any other services that is on need.
   5. **Virtual Network**

**References**

Kozier, B., Erb, G., Berman, A., Snyder, S. J., Buck, M., Yiu, L., & Stamler, L. L. (2014). *Fundamentals of canadian nursing: Concepts, process, and practice*. Pearson Canada. (Delete this before you start your references. This example is just to set up the hanging indent feature.)

References are set up in a hanging indent paragraph format. If you enter your reference information following this paragraph and then delete these words, your paragraph will be formatted correctly. You can use the “enter” key to start a new paragraph, and then type your information.