Assignment 3

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1 Introduction

The major cloud providers are Amazon, Microsoft, Google, IBM, and Oracle [1]. Each cloud service provider is focused on a different niche of the market, with Amazon focused on infrastructure, Google on AI/ML and platform offerings, and Microsoft focused on prebuilt services. IBM and Oracle are more niche providers, focused on hybrid cloud deployments and database services respectively.

1.1 Amazon

Amazon is the largest cloud provider, beginning in 2006 with their landmark EC2 service allowing scalable cloud compute. AWS is primarily focused on IaaS offerings, allowing customers complete control of their deployment. AWS now offers the largest diversity of services, from compute on EC2 to storage on S3. AWS is the largest cloud provider with over 28 data centers deployed globally, each connected by completely private networking infrastructure. Amazon is the most cost-effective cloud provider, utilizing custom storage racks, custom hypervisor technology to deliver a competitive edge in cloud optimized services.

1.2 Google Cloud

Google Cloud Platform (GCP) delivers PaaS and SaaS, focusing on ease-of-use rather than complete flexibility. GCP's core strengths are in AI/ML services such as TensorFlow, big data analytics, and container orchestration such as Kubernetes. Google is focused on research and publications, with a dedicated research department focused on releasing research to further the field of cloud computing and AI/ML. Google offers PaaS development through its Google App Engine (AE), Container Engine (CntE), allowing developers to focus on writing code and deploying applications, rather than managing infrastructure. Google also offers multiple SaaS products such as Gmail, Google Docs, and Google Drive, with source development kits (SDKs) to enable easy integration and customization of these services.

1.3 Azure

Microsoft Azure is more focused on delivering services that integrate with their existing portfolio of products such as Office 365. Azure offers compute and storage, managed by the Fabric controller. The Fabric controller decides how to provision resources, where to deploy services, automating management of infrastructure.

1.4 IBM

IBM Cloud is focused on Hybrid cloud offerings and edge computing. IBM is focused on allowing customers to deploy in hybrid-cloud environments. IBM offers flexibility, container-based security, and the ability to work in a private-cloud environment.

IBM is focused on offering organizations hybrid cloud and private cloud services. IBM recently acquired the open-source provider Red Hat, and has integrated many highly secure offerings from Red Hat into its portfolio of cloud

offerings. IBM's focus on cloud security and custom deployment environments is highly attractive to large organizations with legacy deployment environments.

1.5 Oracle

Oracle is a minor cloud provider, and is built around database offering such as Oracle database, WebLogic, Exadata, and Exalogic. Oracle is highly focused on offering database services and middleware offerings.

References

[1] Dan C. Marinescu. Chapter 2 - the cloud ecosystem. In Dan C. Marinescu, editor, *Cloud Computing (Third Edition)*, pages 13–40. Morgan Kaufmann, third edition edition, 2023. ISBN 978-0-323-85277-7. doi: https://doi.org/10.1016/B978-0-32-385277-7.00009-9. URL `https://www.sciencedirect.com/science/article/pii/B9780323852777000099`.