Cloud deployment

research document

for

HeardIT

Author: Mihail Vasilev

Date: 10-04-2024

Contents

[1. Introduction 3](#_Toc151037828)

[2. Main question 3](#_Toc151037829)

[3. Sub-questions 3](#_Toc151037830)

[4. Conclusion 5](#_Toc151037831)

1. Introduction

The purpose of this document is to outline the research process taken during the cloud deployment process of the HeardIT application. The research is split into the following sections *– Main research question*, where the main question is defined, *Sub-questions*, where the sub-question derived from the main questions are defined and answered and *Conclusion*, where the answers to the sub-questions are combined in order to answer the main question. The final section is the *References* section where the sources of the information used during the research are presented.

This research takes into account a lot of different aspects of the cloud development sphere. This document reflects my current level of application deployment. During the duration of the semester new parts will be added, updated and expanded upon.

1. Main question

In this section the main question will be established. In order to complete the research, the main question needs to have a concrete answer. For this reason, it is important to define the main question well. The main question will also allow us to create the sub-questions that will help us answer the main question.

The main research question is:

*What technologies and methods are most suitable for deploying HeardIT?*

Answering this question will allow us to determine the best architecture design for the HeardIT application. In the next section I will establish the sub-questions that were derived from the main question and I will formulate an answer to each of them.

1. Sub-questions
2. What cloud providers are suitable for the HeardIT application?

There are many cloud providers that can be suitable for a web-application like the one I am working on. For this reason, the choice will be influenced by the specific requirements for technologies and scalability that have been established beforehand (*check User Requirements – HeardIT.docx)* and also the budget.

One of the aspects that I wanted to touch upon during the development of HeardIT was the usage of a professional cloud service provider since this would allow me to gain real experience working with a popular and widely used platform. Additional functionalities, which I might have not known that I would need could also come in handy once I actually started using the cloud services and a provider with a well-established community support and documentation would make my work process easier and would create less risks and dependencies.

After considering both my technical and non-technical requirements, I came to the conclusion that most suitable cloud provider would be one of the big three: *Amazon Web Services (AWS)*, *Microsoft Azure* or *Google Cloud Platform (GCP)*. In the table I have summarized the most important factors that influenced my choice between the three main cloud providers.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Cloud provider | Compute and Containerization | Database and Storage | Networking and Security | Monitoring and cost management |
| Amazon Web Services (AWS) | Comprehensive range of computing options suitable for various workload types: EC2 for virtual servers, ECS for container management and Lambda for serverless computing | Amazon RDS, DynamoDB, Aurora, Amazon S3, EBS and Glacier | Robust networking features and security options for building secure and scalable applications: Amazon VPC for network isolation, AWS Direct Connect | Various pricing models and tools for cost estimation and optimization.  Amazon CloudWatch for monitoring and logging. |
| Microsoft Azure | Virtual Machines, Azure Kubernetes Services (AKS), Azure Functions | Azure SQL Database, Cosmos DB, Azure Blob Storage | Azure virtual network, ExpressRoute and advanced networking features | Azure Monitor and Azure Log Analytics |
| Google Cloud Platform | Compute Engine, Google Kubernetes Engine (GKE) and Cloud Functions | Cloud SQL, Cloud Spanner and Cloud Storage | Cloud Virtual Network and Cloud Interconnect | Stackdivre Monitoring and Stackdriver Logging.  Different pricing models depending on usage. |

Each of these cloud service providers brings a lot to the table and allows their users to have a reliable, easy to use and relatively affordable cloud platform where they can deploy their applications. AWS is by far the most widely used cloud provider, followed by Azure and GCP as state in Slingerland (2023). Choosing any of them would be a great option for my project since all provide a lot of features and capabilities and have great communities and documentation.

In the end it came down to personal preference and the budget constraints. My budget for this project is minimal I want to make the most of any free package that cloud providers could offer. Microsoft Azure was a great option since I could use my university account to have a free package of 100$ credits to use. However, Google Cloud Platform offered a 90 days and 300$ credits for their free package. Additionally, they provide a service which allows the user to set-up their application in such a way that when it is not being actively used, credits are not deducted. Also, they provide convenient deployment capabilities directly from GitHub Actions which greatly reduced the effort put into creating the CICD pipelines for HeardIT.

For this reason, my final choice as the cloud provider that I am going to use for the HeardIT application is Google Cloud Platform (GCP).

Methods used: Literature study

1. How to automate the deployment process?

Methods used: Brainstorm, Prototyping, Expert interview, System test

1. How to set-up the CICD pipeline for the front and back end repositories?

Also explain how the CICD pipeline works!!!

Methods used: Literature study, Document analysis, Expert interview

Methods used:

Methods used:

1. Conclusion

To conclude this research, I am going to deploy the HeardIT application using \_\_\_\_\_\_\_\_\_.

**References:**

* Slingerland, C. (2023, December 15). 11 Top Cloud Service Providers Globally In 2024. CloudZero. <https://www.cloudzero.com/blog/cloud-service-providers/>
* Chand, M. (n.d.). Top 10 cloud service providers (2023). <https://www.c-sharpcorner.com/article/top-10-cloud-service-providers/>