What are the benefits of using a cloud platform?

Some benefits of using a cloud platform instead of self-hosting applications include greater elasticity. This means the application can easily scale up and down. When self-hosting scaling out is possible by increasing the servers, this means it's not as easy as when using a cloud platform. The initial costs of using a cloud platform are also less, because there is no need to invest in expensive servers and hardware. It also speeds up deployment, by enabling deployment anywhere in the world in a matter of minutes. It is also safer and more reliable. Cloud providers invest in security technologies to defend their platforms from threats and outages, providing stronger security than most organisations can implement for their own data centres. They are more reliable because distributed cloud platforms involve multiple servers and sites around the world for greater reliability and faster disaster recovery (*What Is a Cloud Platform?*, n.d.).

What cloud platforms are available?

There are multiple different cloud platforms available. The three most popular cloud providers are Amazon Web Services (AWS), Microsoft Azure and Google Cloud Platform (GCP).

There are multiple necessary components of the Concert Meetup application that need to be deployed. The front end for the application is a SPA React web app. This is the client interface that needs to be hosted. The backend of the Concert Meetup application is based on a microservices architecture; these microservices will be deployed as a kubernetes cluster. Each microservice also has its own database, to store the data that is necessary for each service. This means a total of 3 SQL databases. To save the images of the artists of the concert and profile pictures of users cloud object storage should be used. Doing this is possible with both Azure, AWS and GCP.

For this project Azure will be used for hosting, because students get 100$ in free credits and the backend is made in .NET and Azure is very compatible with .NET. There is also a lot of documentation available on the microsoft learn website.

What is Kubernetes?

Kubernetes takes care of scaling and failover for an application and provides deployment patterns. If traffic to a container is high, kubernetes can load balance and distribute the network traffic so that the deployment is stable. Kubernetes containers are self healing, this means it restarts containers that fail, replaces containers and kills containers that don't respond to health checks.

Kubernetes is a platform that manages container-based applications and their associated networking and storage components. A kubernetes cluster is divided into two components: a control plane which provides the core Kubernetes services and orchestration of application workloads, and nodes, which run the application workloads.