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CIS 4360 Microservices Architecture

MSA case study one pager

Snapchat’s Service Mesh from Monolith to Multi-cloud microservices

Over the years, Snap’s backend was built on Google App Engine, a monolithic sandbox environment to build applications. As Snap engineer scaled the application, they found it notoriously difficult to scale due to its monolithic features. Especially during peak periods in blast radius, engineers wanted to create an architecture that can limit outages in peak periods. So, engineer proposed a new service-oriented architecture that is powered by individual independent backend services that are universally self-contained known as microservices. When making a microservices there are many things to consider such as “network topology, authentication, cloud resource provisioning, deployment, logs, metrics, traffic routing, rate limiting, and staging vs. production environments.” Ultimately, Snap decided on an open-source project, Envoy to build their proxy. Envoy will be backbone of all communication API for each container to create something called a Service Mesh. This allows each container to communicate with TLS and publish metric on all inbound and outbound traffic. Inside the service mesh, we have a switchboard that allows manage service dependencies, consumer, and shift traffic. Snap decided to use a switchboard so they don’t have to expose the whole Envoy API since it can be easier to manage with smaller bits and pieces. Switchboard can also manage other things such as provisioning, deployment, and manage k8 clusters. On the network side, snap want to minimize their service exposure to the internet hence it will increase security problems. So, they decided on a design that have a shared, internal, regional network for their microservices and services within those regions communicate without going to the internet. There is no direct external traffic source exposed besides the gateway. There is a main API gateway for all request from Snapchat client it will be connected to all the services envoy and get filter authentications also Envoy will route to the appropriate Service Mesh. As in today, Snap has 7 service mesh on AWS and Google cloud while handling 10 million queries per second along with 300+ productions. Lastly, we will show the architecture design of Snap’s microservice in a high level below.

Diagram

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