Hono™ service stack deployment to Azure

Experiences on utilizing tracing and monitoring of Eclipse Hono™ in Microsoft Azure

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INTRODUCTION

SMADYASP student group developed a solution of deploying *Eclipse Hono™* microservice stack, monitoring deployed services and tracing telemetry and event messages.

GOALS

The goal of this project was to ease the deployment of *Hono™*, and gather metrics and tracing data of the *Hono™* microservice stack. And to track the system load, cluster wellbeing, and the amount of requests handled by the system, and detect bottlenecks within the system.

SOLUTION

Terraform was used to create the needed infrastructure in *Microsoft Azure* and to deploy desired services in *Kubernetes* cluster (AKS) using *Helm* charts.

Hono™ microservices were deployed with provided Eclipse Helm charts which offer built-in support for *Jaeger*, *Grafana*, *Prometheus* and *MongoDB*. These services and *InfluxDB* were deployed on as separate charts.

Monitoring data is stored in *InfluxDB*. *Jaeger* is used for tracing *Hono™* messages. Separate *MongoDB* is used for *Hono™*'s device registry.

Services deployed
- ➔ Eclipse Hono™
- ➔ Prometheus monitoring
- ➔ Jaeger tracing
- ➔ MongoDB for device registry
- ➔ InfluxDB for storing monitoring data
- ➔ Grafana and set of dashboards

Technologies used for deployment
- ➔ Terraform
- ➔ Helm
- ➔ Kubernetes
- ➔ Microsoft Azure

BENEFITS

The developed Terraform deployment script enables swift creation of the infrastructure and deployment of the whole system. It encompasses all needed services for monitoring the cluster and tracing messages, giving insight into the services, and making fault detection, cluster scaling, and resource management more straightforward.
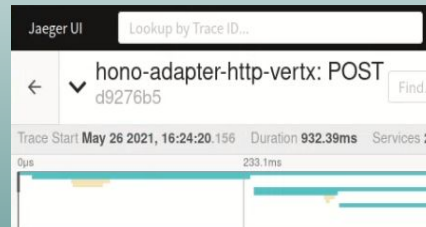
Based on this project, future research will be done during the summer and autumn in the Arctic 5G Test Network project. Coming research includes field tests using real cars and a 5G network.
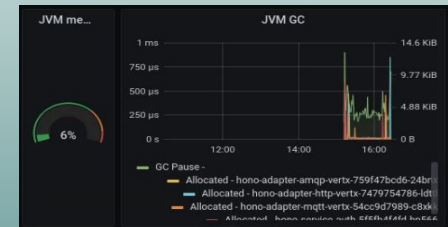
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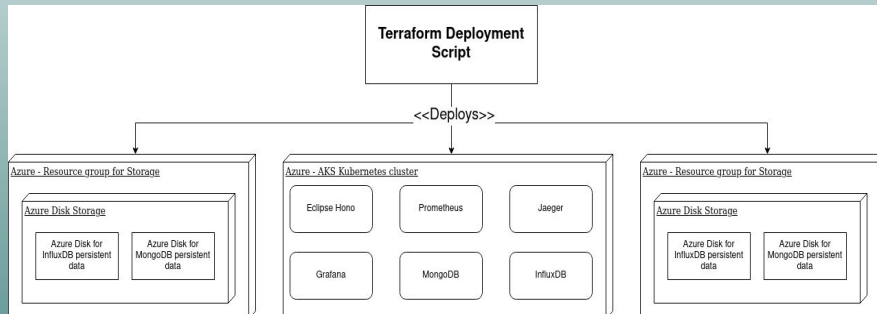
Simplified architectural presentation of deployment process

TRACING

Tracing HTTP event message send to Hono™ with Jaeger UI

Source: https://github.com/smaddis
Demo video: https://youtu.be/SF46X0i_hJU

MONITORING

Monitoring Hono™ with Prometheus and Grafana

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