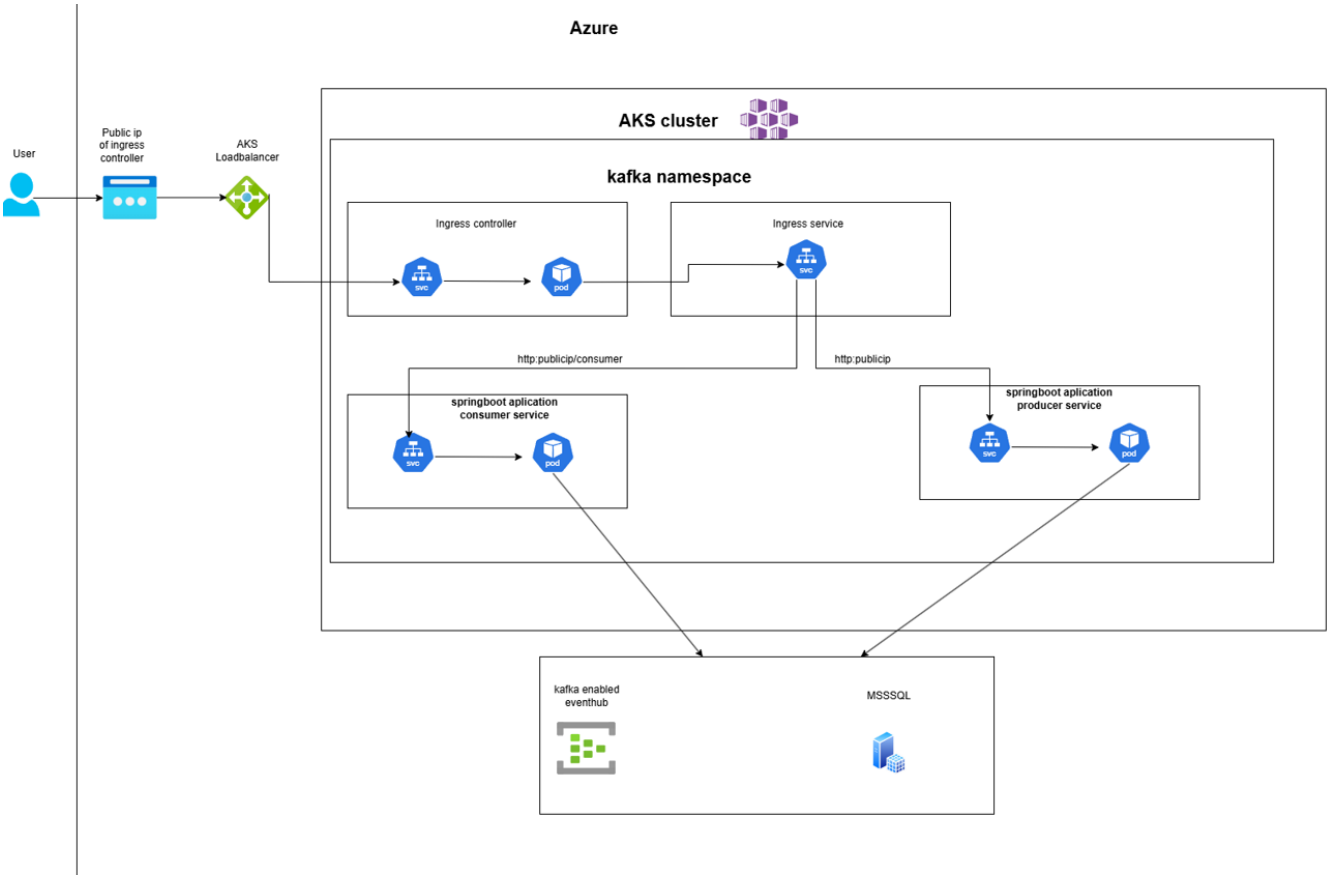
Hello , welcome to my small demo of using terraform to deploy 2 applications to AKS cluster that use EventHub(Kafka enabled) for message streaming. A lot can be improved security and scalability wise. Most of them although not implemented for the simplicity of the demo, will be well described in the following pages.

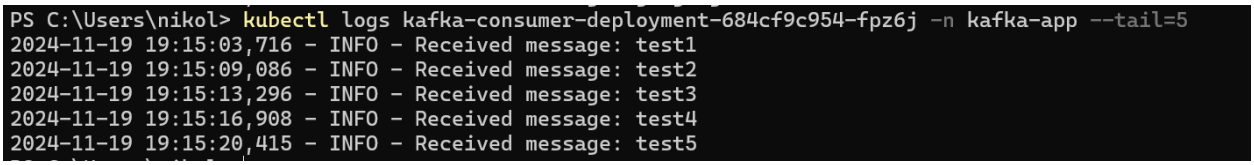
Architecture



How it works

A producer pod is exposing a UI by accessing the public IP of controller where someone can write messages that will be sent to Kafka

Then the consumer is connecting to EventHub to a topic and it will output the messages to the logs



How to run it

change the subscription field with your subscription ID on the field bellow in main.tf

```
provider "azurerm" {
  features {
    resource_group {
      prevent_deletion_if_contains_resources = false
    }
  }
  subscription_id = <your-subscription-id>
}
```

and you are all set. You can do terraform apply

The deployment is currently using 2 custom public images (written in python) but can be any kind of application, that exposes a 8080 port

The images currently used are bellow:

docker pull nikose/demoazurehubwithpython:producer.1.3

docker pull nikose/demoazurehubwithpython:consumer.2.1

Security improvements

The current system lacks in many ways in terms of security. Some of the improvements that should be done are:

- EventHub should be accessible only from private network, same applies to AKS cluster
- AKS should have RBAC authentication
- Network policies implementation
- Enable TLS/SSL encryption
- Enable Microsoft Defender for Containers
- Secure container access to resources
- Dedicated – Isolated servers for the infrastructure

Scalability and Availability improvements

Some of the improvements that should be done are:

For EventHub:

- Adjustment of throughput units considering also Auto-inflate feature
- Utilization of processing units
- Adjust number of partitions based on the application needs
- Configuration of Geo-disaster recovery and Geo-replication
- Capture the data if they are needed more than the specified retention days

For AKS:

- Usage of autoscaling features for pods and nodes
- Utilization of regional scalability