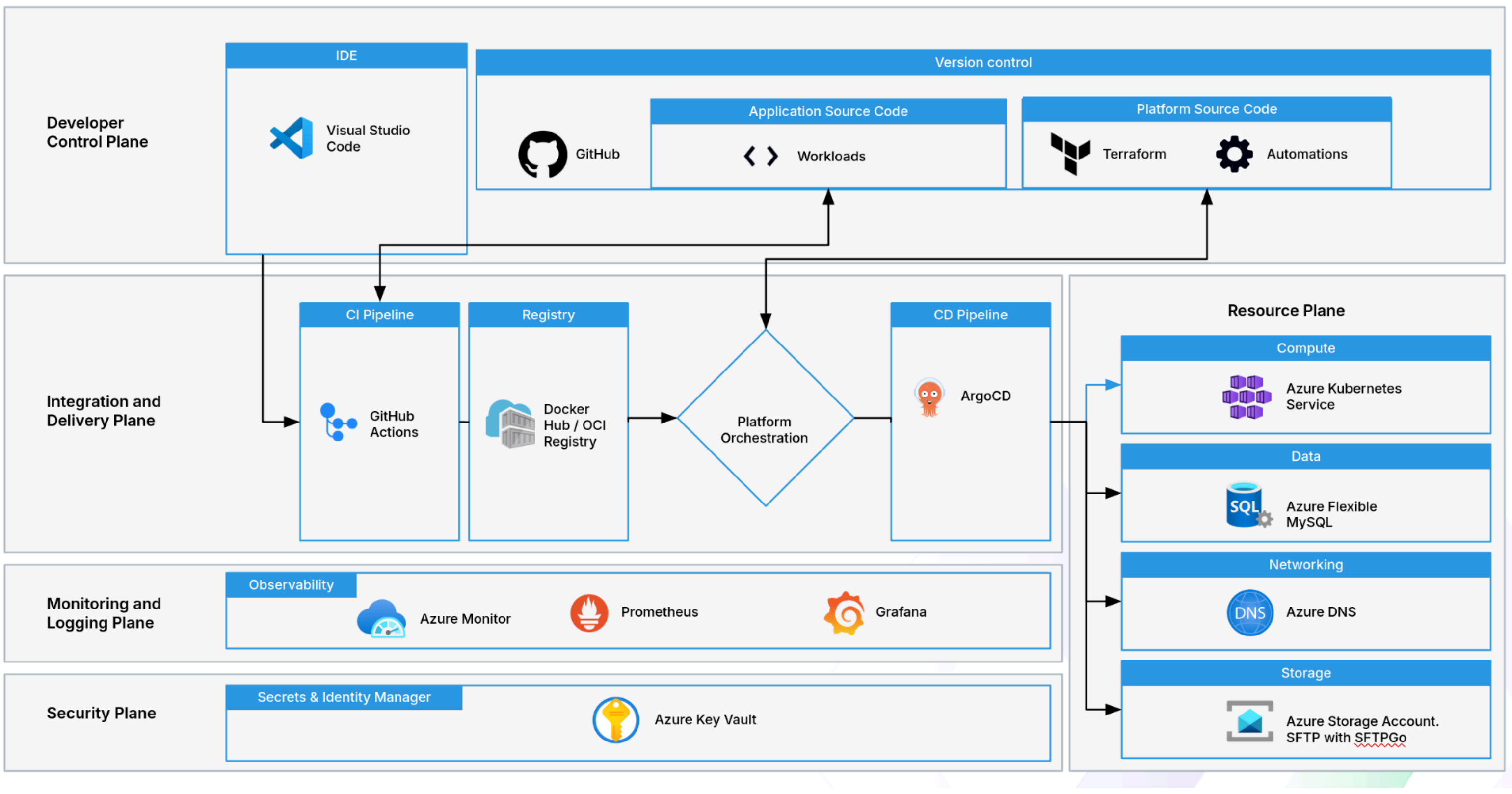


Given the interesting projects to choose from, I took the liberty trying to tackle all of them. As it's not a trivial task to come up with a robust cloud architecture. The above diagram encapsulates a good to go to production (after testing of course ;-)). With composing all resources in a dedicated resource group in Azure, where all cloud resources like AKS cluster, VNet, Subnets for AKS and Flexible Mysql Server instances, ArgoCD GitOPS workflows.

I tried to automate all pieces, but couldn't finish up the workload pipelines, but created all the code looking at Azure's best practices and well architected frameworks.Given the intriguing project options available, I ventured to undertake the challenge of addressing each one. It is not a straightforward endeavor to devise a robust cloud architecture. The diagram above encapsulates a viable approach to production readiness (following thorough testing, of course). This approach involves organizing all resources within a dedicated resource group in Azure, encompassing cloud resources such as AKS clusters, Virtual Networks (VNets), Subnets for AKS and Flexible MySQL Server instances, and ArgoCD GitOps workflows.

While I endeavored to automate all components, I was unable to complete the workload pipelines. However, I created all the code while adhering to Azure's best practices and well-architected frameworks.

Project A:

- Service to return POD IP and Version, from inside a container with Python Flask
- Created helm chart as well as pushing it to docker hub OCI registry along with container.

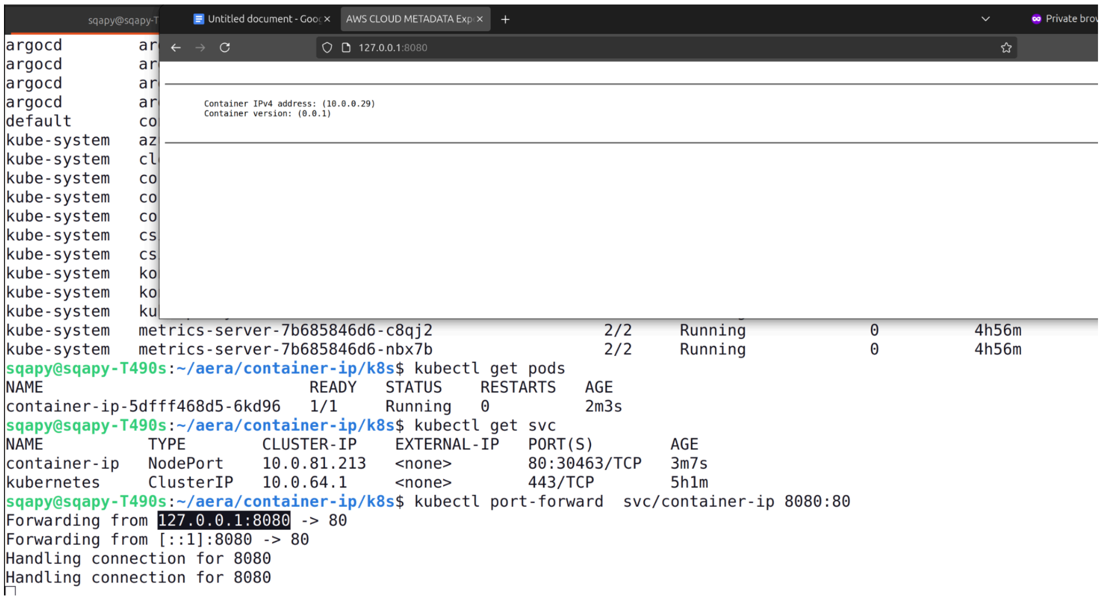
https://hub.docker.com/repository/docker/sqapy/container-ip/general
*** TODO: CI/CD workflows with github actions

How to use:
Installation can be done from a repository or directly pulling from DockerHub OCI registry

- Set your kube-context to your desired test cluster
- Go to following location: https://github.com/sqe/azure-terraform-aks/tree/main/container-ip/helm-chart/
- Execute: ***helm install container-ip "container-ip"***

Observe similar outcome:

```
sqapy@sqapy-T490s:~/aera/container-ip/k8s$ helm install container-ip "container-ip"
NAME: container-ip
LAST DEPLOYED: Fri Sep 13 07:39:13 2024
NAMESPACE: default
STATUS: deployed
REVISION: 1
NOTES:
1. Get the application URL by running these commands:
  http://chart-example.local/
sqapy@sqapy-T490s:~/aera/container-ip/k8s$ kubectl get pods -A
NAMESPACE     NAME                                         READY   STATUS              RESTARTS   AGE
argocd        argocd-application-controller-57c654bb67-cxxrg   1/1     Running             0          4h49m
argocd        argocd-dex-server-7b557cf649-dkmzn               1/1     Running             0          4h49m
argocd        argocd-server-f8965847d-gzr57                    1/1     Running             0          4h49m
default       container-ip-5dfff468d5-6kd96                    0/1     ContainerCreating   0          23s
kube-system   csi-azuredisk-node-tcvn9                         3/3     Running             0          4h57m
kube-system   csi-azurefile-node-d4s6r                         3/3     Running             0          4h57m
kube-system   konnectivity-agent-869d8bd998-sc5j9              1/1     Running             0          4h22m
```



```
Container IPv4 address: (10.0.0.29)
Container version: (0.0.1)
```

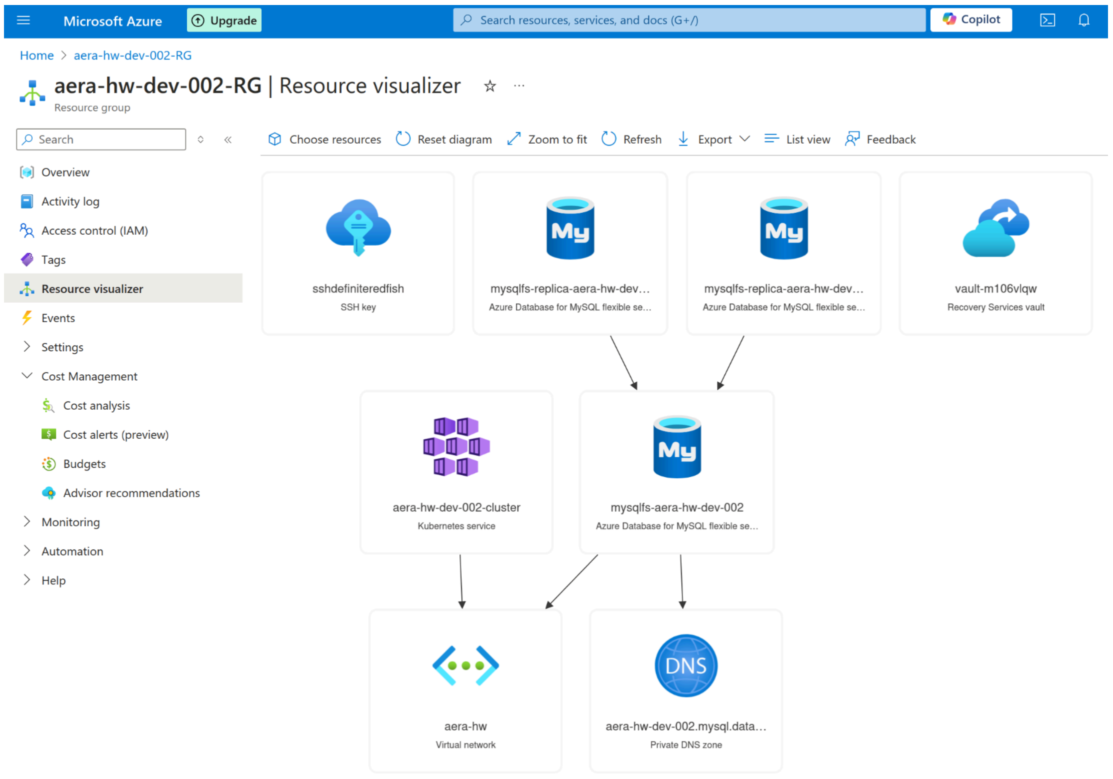
```
argocd        ar
argocd        ar
argocd        ar
argocd        ar
default       co
kube-system   az
kube-system   cl
kube-system   co
kube-system   co
kube-system   co
kube-system   cs
kube-system   cs
kube-system   ko
kube-system   ko
kube-system   ku
kube-system   metrics-server-7b685846d6-c8qj2                2/2     Running            0             4h56m
kube-system   metrics-server-7b685846d6-nbx7b                2/2     Running            0             4h56m
sqapy@sqapy-T490s:~/aera/container-ip/k8s$ kubectl get pods
NAME                            READY   STATUS    RESTARTS   AGE
container-ip-5dfff468d5-6kd96   1/1     Running   0          2m3s
sqapy@sqapy-T490s:~/aera/container-ip/k8s$ kubectl get svc
NAME           TYPE        CLUSTER-IP    EXTERNAL-IP   PORT(S)        AGE
container-ip   NodePort    10.0.81.213   <none>        80:30463/TCP   3m7s
kubernetes     ClusterIP   10.0.64.1     <none>        443/TCP        5h1m
sqapy@sqapy-T490s:~/aera/container-ip/k8s$ kubectl port-forward  svc/container-ip 8080:80
Forwarding from 127.0.0.1:8080 -> 80
Forwarding from [::1]:8080 -> 80
Handling connection for 8080
Handling connection for 8080
```

Project B:.

MySQL Flexible Server with replicas on the same location as primary, and reader replicas in more regions, configured via list named locations in terraform.tfvars

- Infrastructure provisioning:
  - *Export your Azure Service Principal credentials on shell*
  - ***terraform apply -var-file=terraform.tfvars***
  - https://github.com/sqe/azure-terraform-aks/tree/main/infra/environments/aera-hw-dev-001
  - Environment composition consist of VNet, Subnets, Storage, Permissions, AKS, ArgoCD, Helm bootstrap, Flexible Mysql Server
- Once infrastructure is provisioned the resource group map looks like as following:

***TODO: fix github actions for infra provisioning, the issue is setting up a Service Principal authentication which needs to be resolved
https://github.com/sqe/azure-terraform-aks/actions/runs/10851039164/workflow



Project C:

Containerized SFTP server using Azure BlobStore

- Created POD, PersistentVolumeClaim, Persistent Volume with blob.csi.azure.com driver
- https://github.com/sqe/azure-terraform-aks/tree/main/sftp

***TODO: Deploy SFTPgo container in AKS https://sftpgo.com/