Microservice DevOps Architecture & Infrastructure

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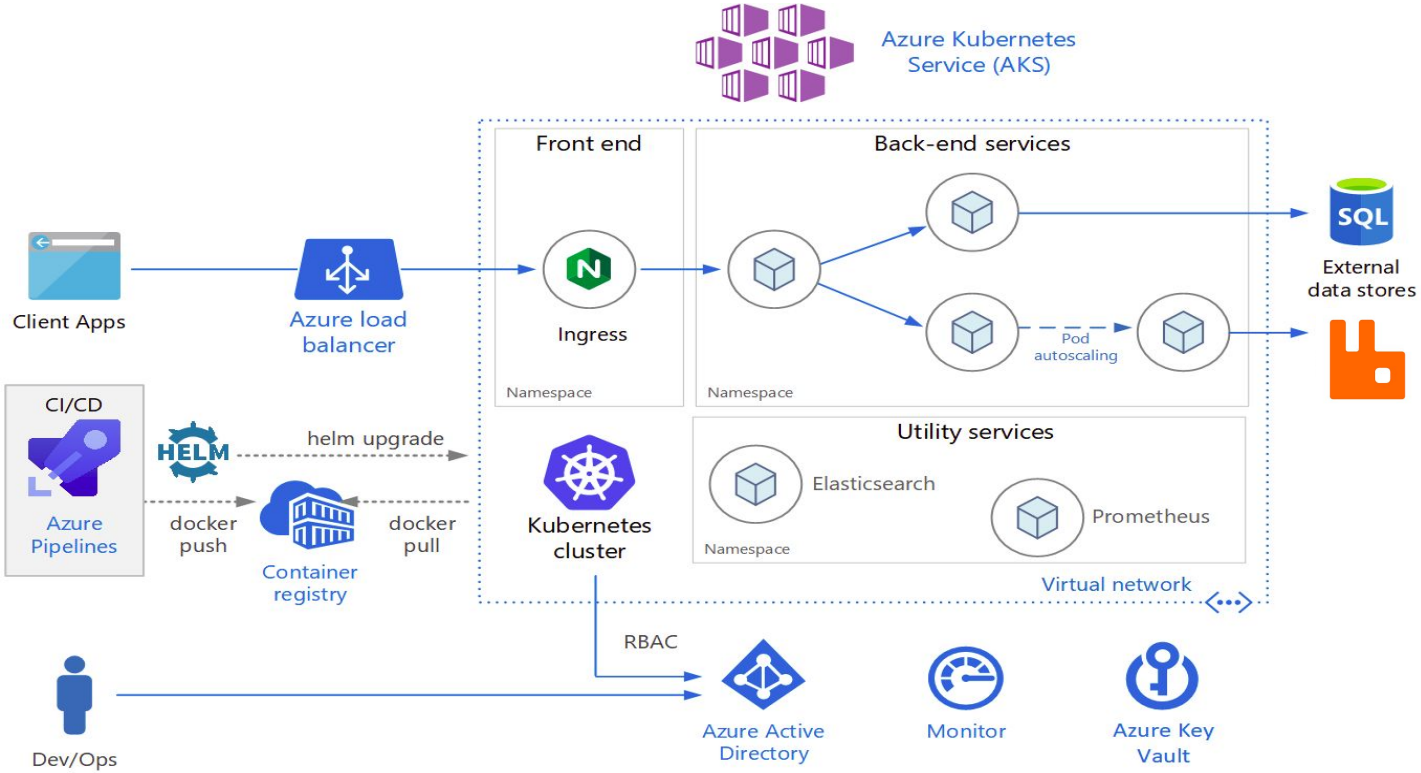
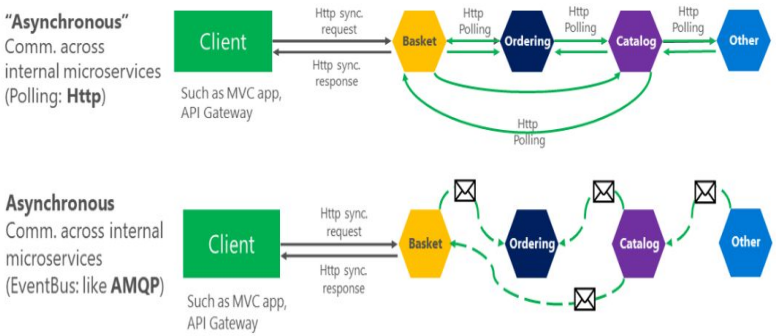
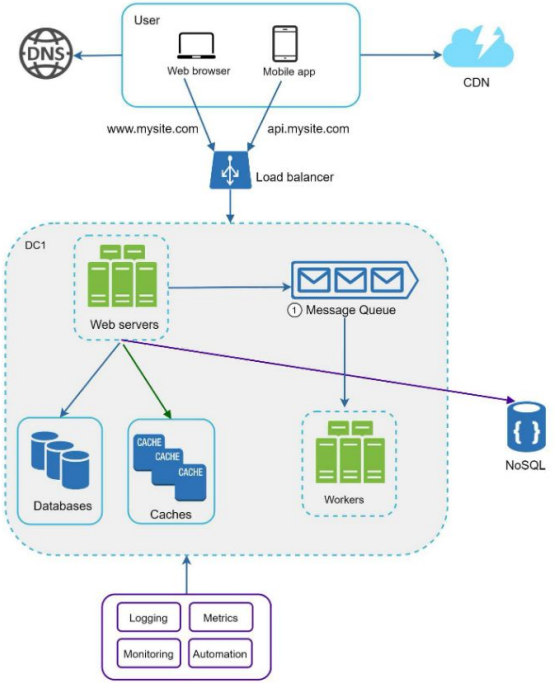
Microservice Cloud Infrastructure on Azure for Ecommerce



Microservice Architecture & Communication



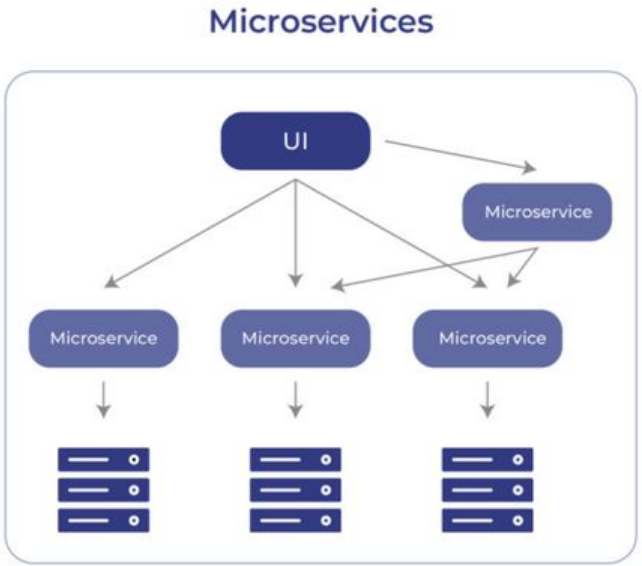


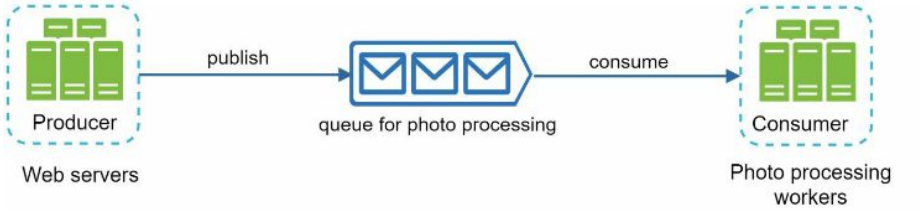
Event Driven Microservice Architecture

Microservices and event-driven computing have recently gained popularity. Modern microservices designs are

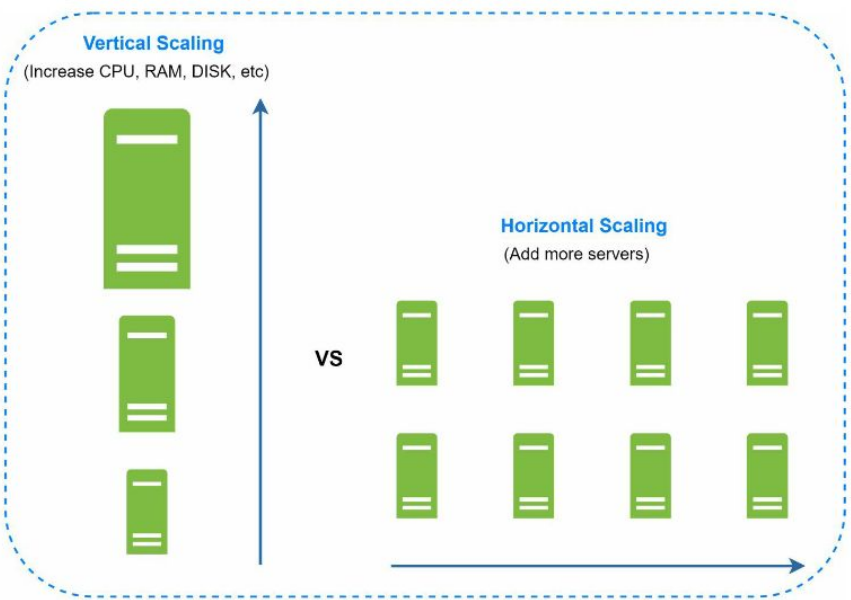
- Decentralized
- Loosely Coupled/ Connected
- Reactive and Event driven
- Asynchronous
- Lightweight
- Highly Scalable
- Highly Available
- Fault Tolerant

Event Driven Microservice Architecture





Horizontal & Vertical Auto Scaling for High Availability



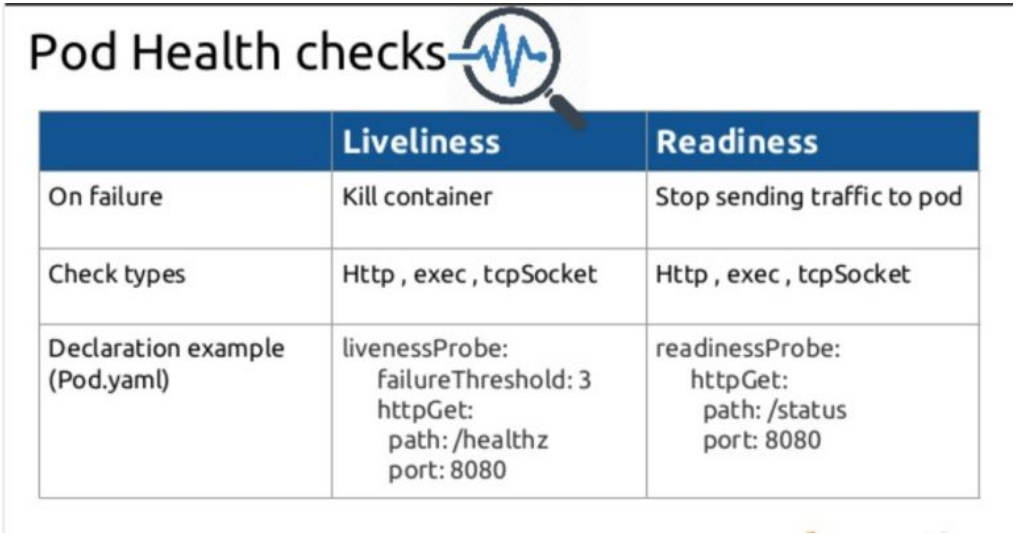
Horizontal & Vertical Scaling in Kubernetes

```yaml
apiVersion: autoscaling/v2
kind: HorizontalPodAutoscaler
metadata:
  name: web-servers
spec:
  scaleTargetRef:
    apiVersion: apps/v1
    kind: Deployment
    name: web-servers
  minReplicas: 1
  maxReplicas: 3
  metrics:
  - type: Resource
    resource:
      name: cpu
      target:
        type: Utilization
        averageUtilization: 80
  - type: Resource
    resource:
      name: memory
      target:
        type: AverageValue
        averageValue: 30Mi
```

```yaml
apiVersion: autoscaling.k8s.io/v1beta2
kind: VerticalPodAutoscaler
metadata:
  name: nginx-vpa
spec:
  targetRef:
    apiVersion: "apps/v1"
    kind: Deployment
    name: nginx
```

Fault Tolerant

- Readiness Probe
- Liveness Probe

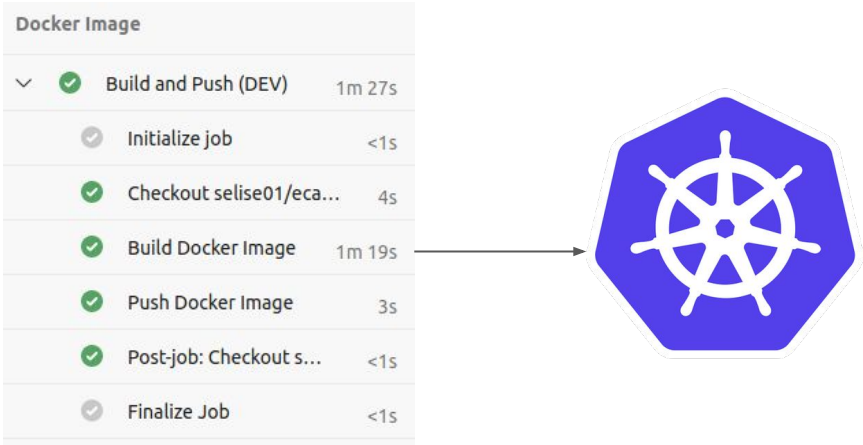


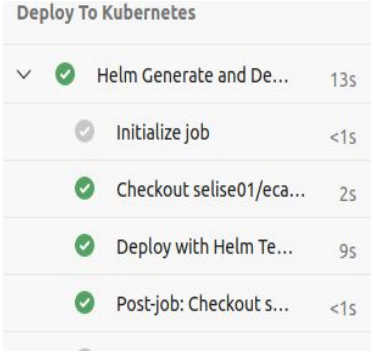
Microservice Routing

Path Based Routing

- Identity: microservices.clodageskill.com/api/identity/v1/token
- Storage: microservices.cloudageskill.com/api/storage/v1/storageservice
- Notification: microservices.cloudageskill.com/api/notification/notifierservice
- Mailservice: microservices.cloudageskill.com/api/mailservice/mailservice
- GraphQl : microservices.cloudageskill.com/api/graphql/gqlservice

Microservice Automated Deployment with CI/CD





Security

- Encrypt all communications (using https or transport layer security).
- Authenticate all access requests.
- Do not hard code certificates, passwords or any form of secrets within the code.
- Use DevSecOps tools designed for microservice architecture environments to scan code as it is developed.
- Define the APIs and strictly make sure all communications comply.
- Use Managed Load Balancer to protect microservices from cyber attacks

Challenges

- Operational complexity is likely to increase
- New skill sets will be required by your development teams and your operational teams (including security)
- You will need to have a microservice-friendly infrastructure in place to support your new continuous delivery workflows.
- Latency will necessarily be introduced by the need to traverse the network in order to execute a complete workflow.
- Hard to follow the best practices