Why API Gateway

Enable teams to secure, scale, and ship their (micro)services, so your ops teams don’t have to.

Agenda

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- Monolith VS Microservices
- API Gateway
- Ambassador

Monolith VS Microservices

Let’s imagine you are building a large, complex application, e.g. an online store

Monolith VS Microservices

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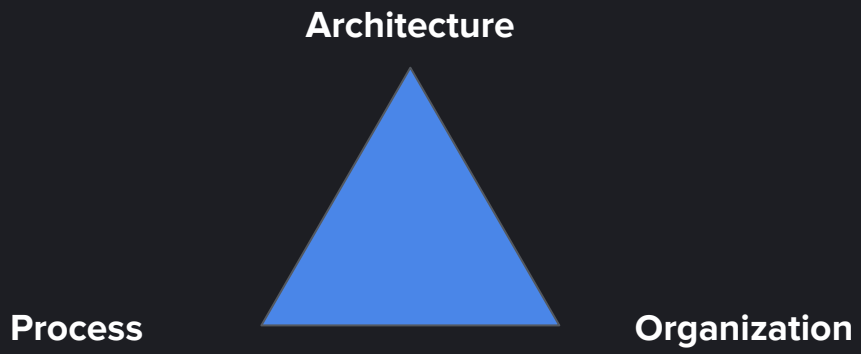
Successful Software Development



Monolith VS Microservices

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Successful Software Development

Small, Autonomous teams

Monolith VS Microservices

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Successful Software Development

Process

Agile,
Continuous
Delivery

Organization

Small,
Autonomous
teams

Successful Software Development

Architecture?

The Monolithic Architecture

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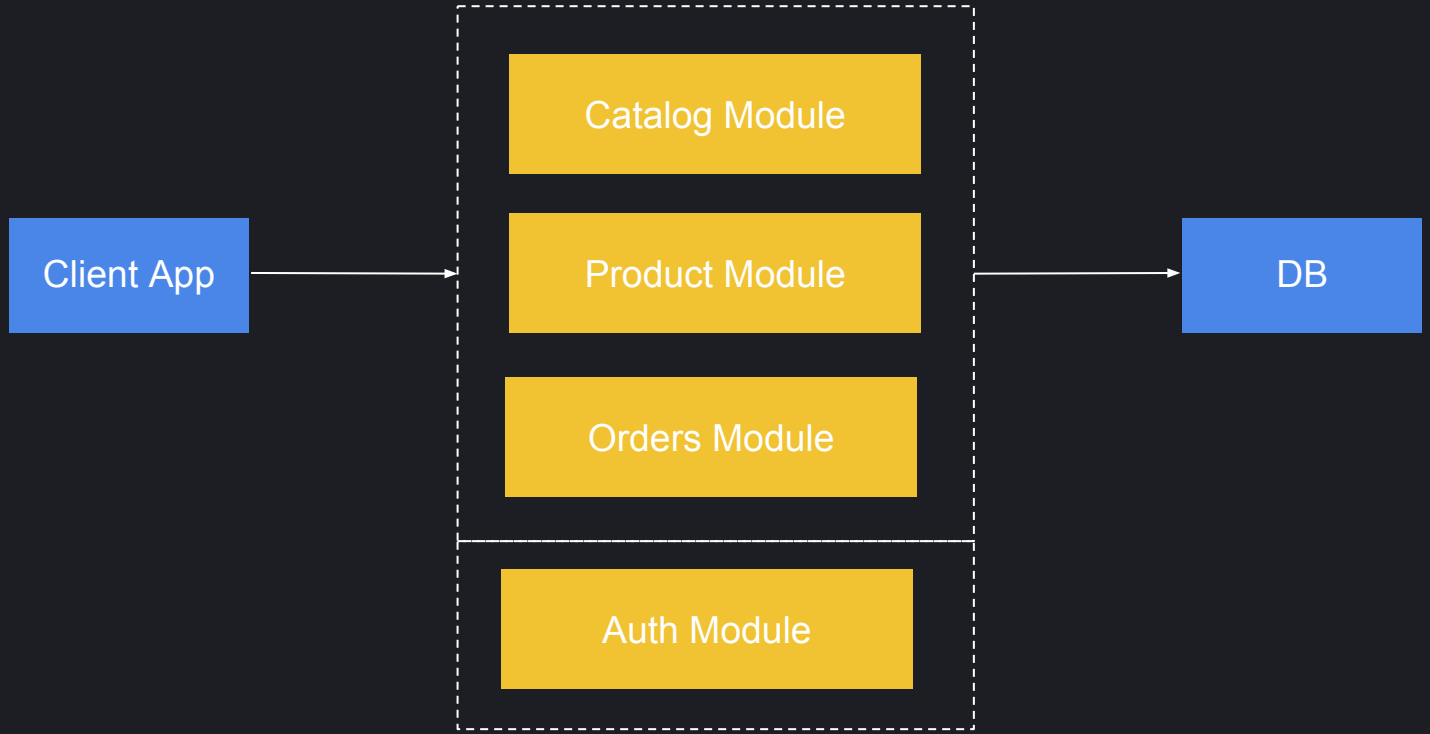

The Monolithic Architecture

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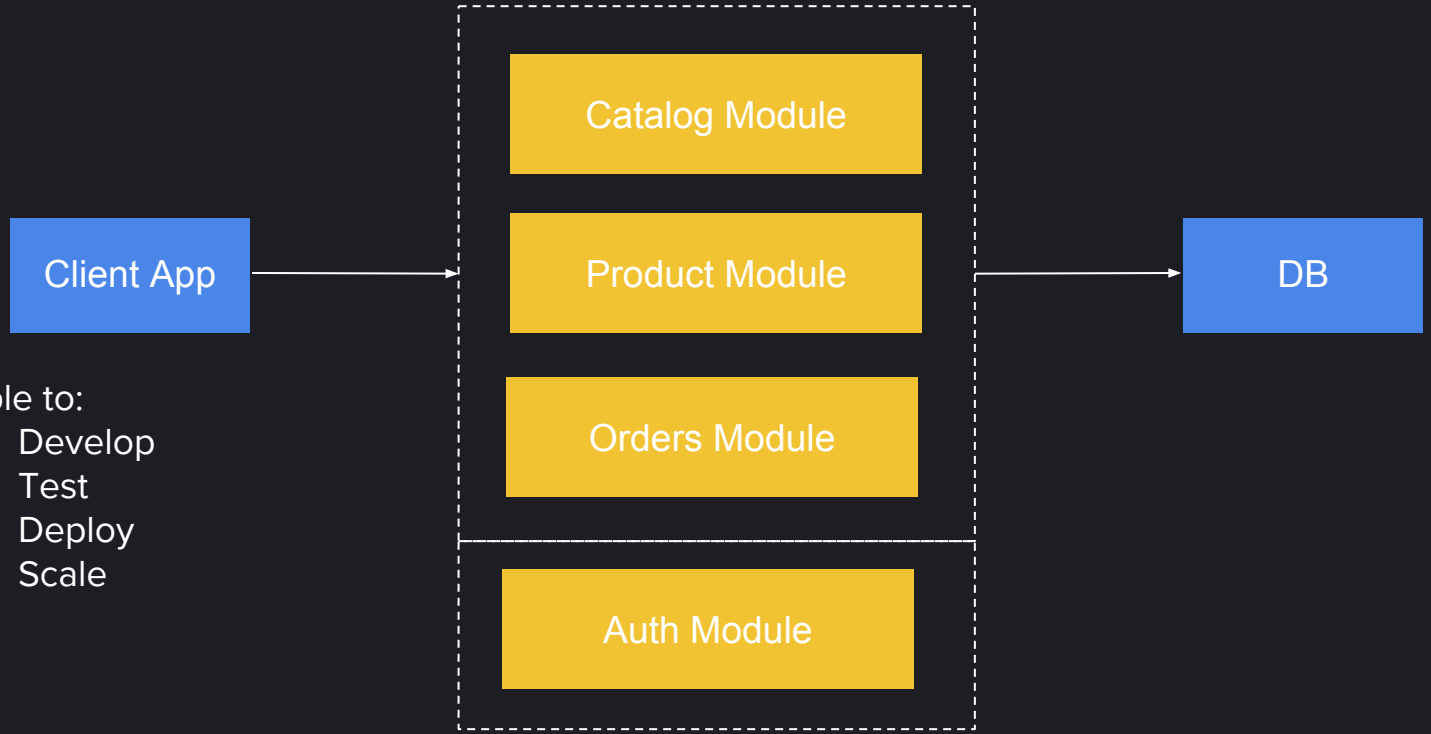

Simple to:

- Develop
- Test
- Deploy
- Scale

The Monolithic Architecture

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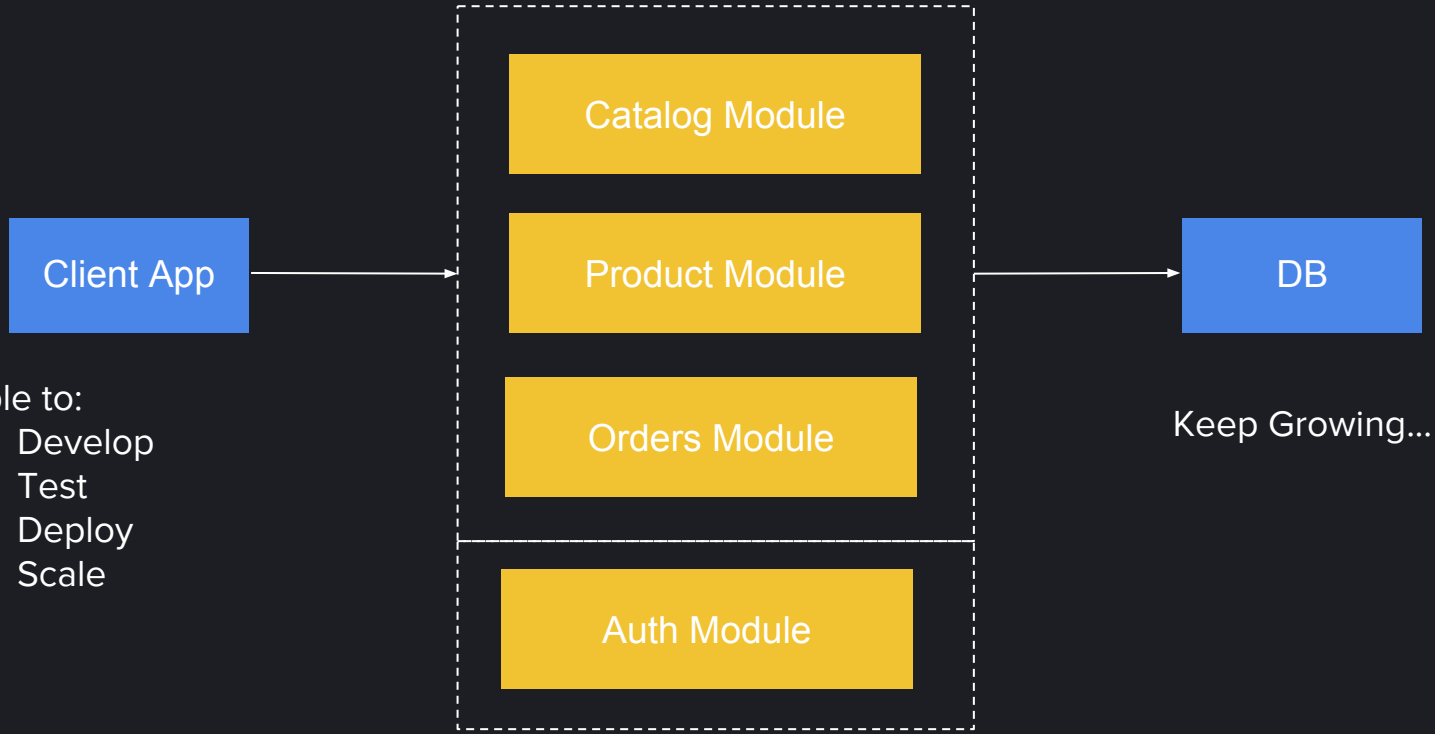

Simple to:

- Develop
- Test
- Deploy
- Scale

Keep Growing...

The Monolithic Architecture

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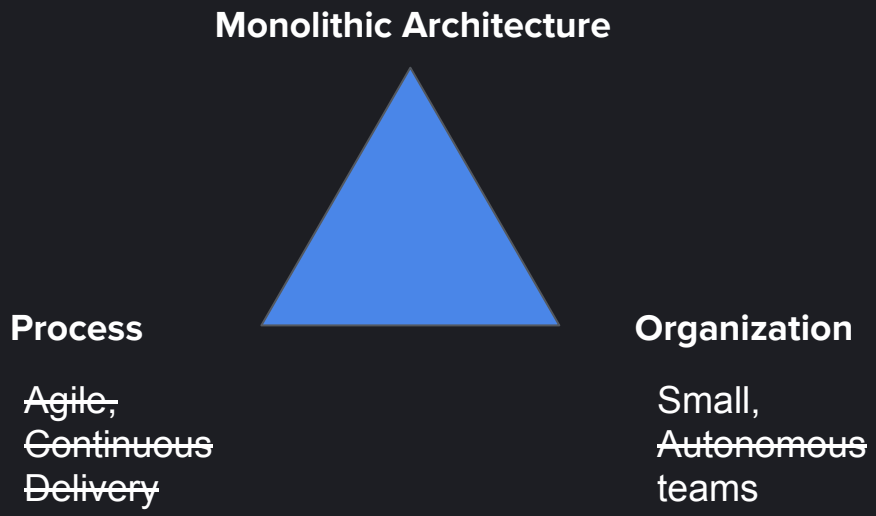
Painful Software Development



The Monolithic Architecture

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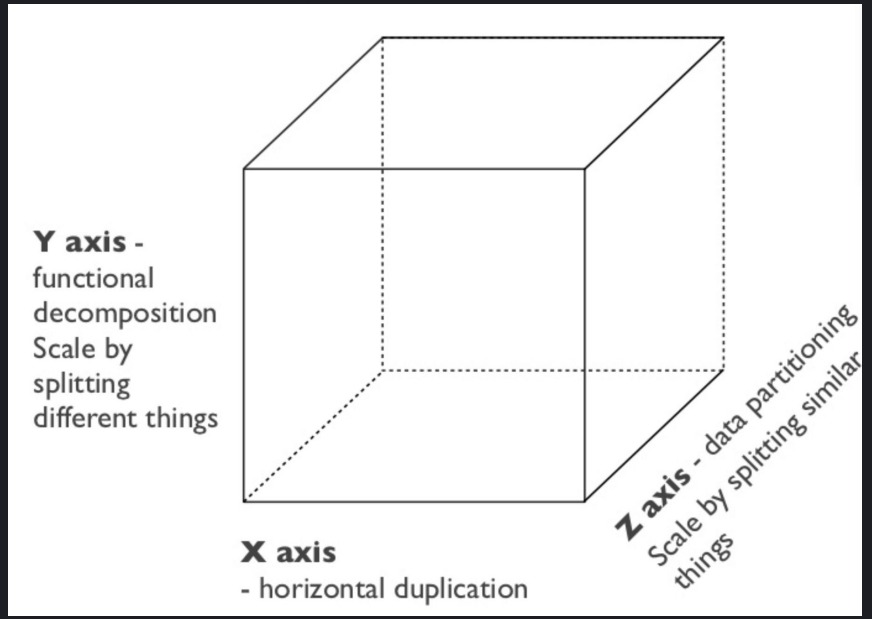
- Functional Decomposition
- Microservices
- Hybrid approach
- Dev VS Ops VS Clients



The Microservices Architecture

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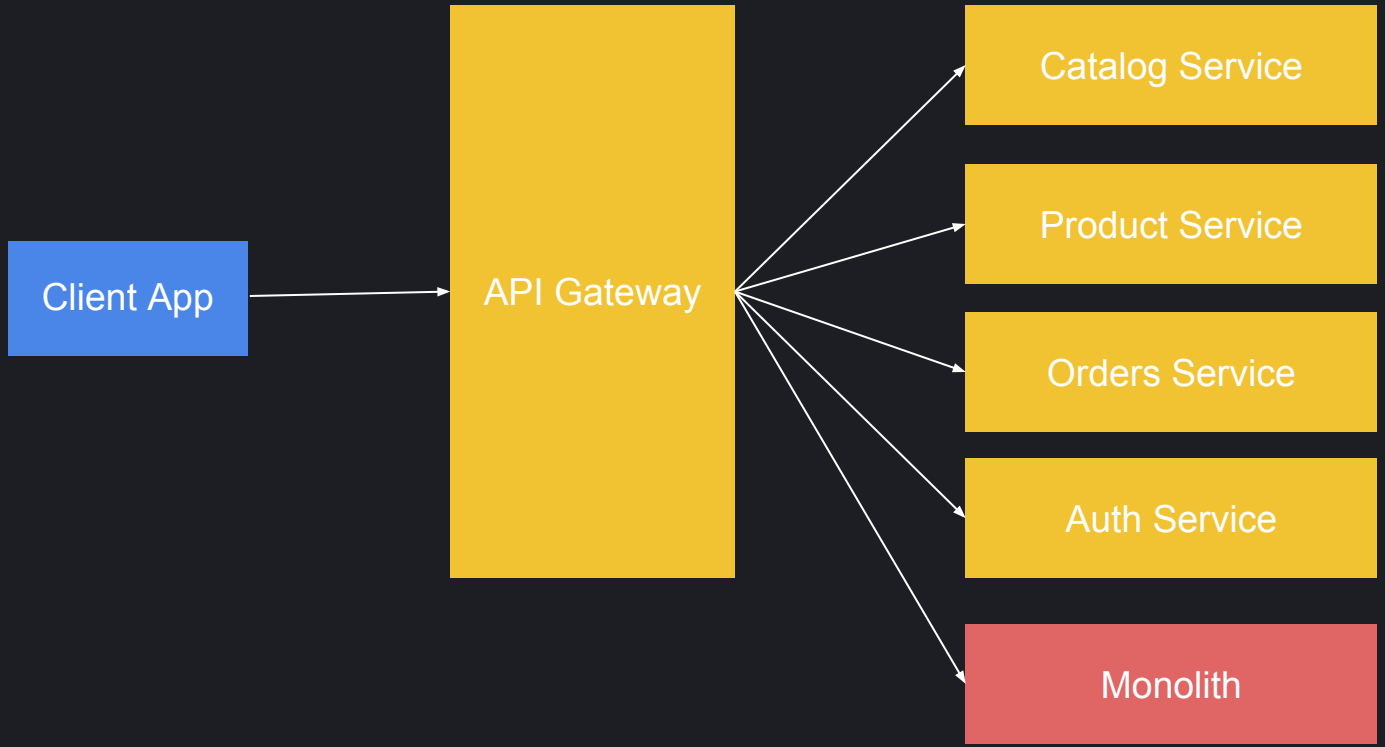

The Microservices Architecture

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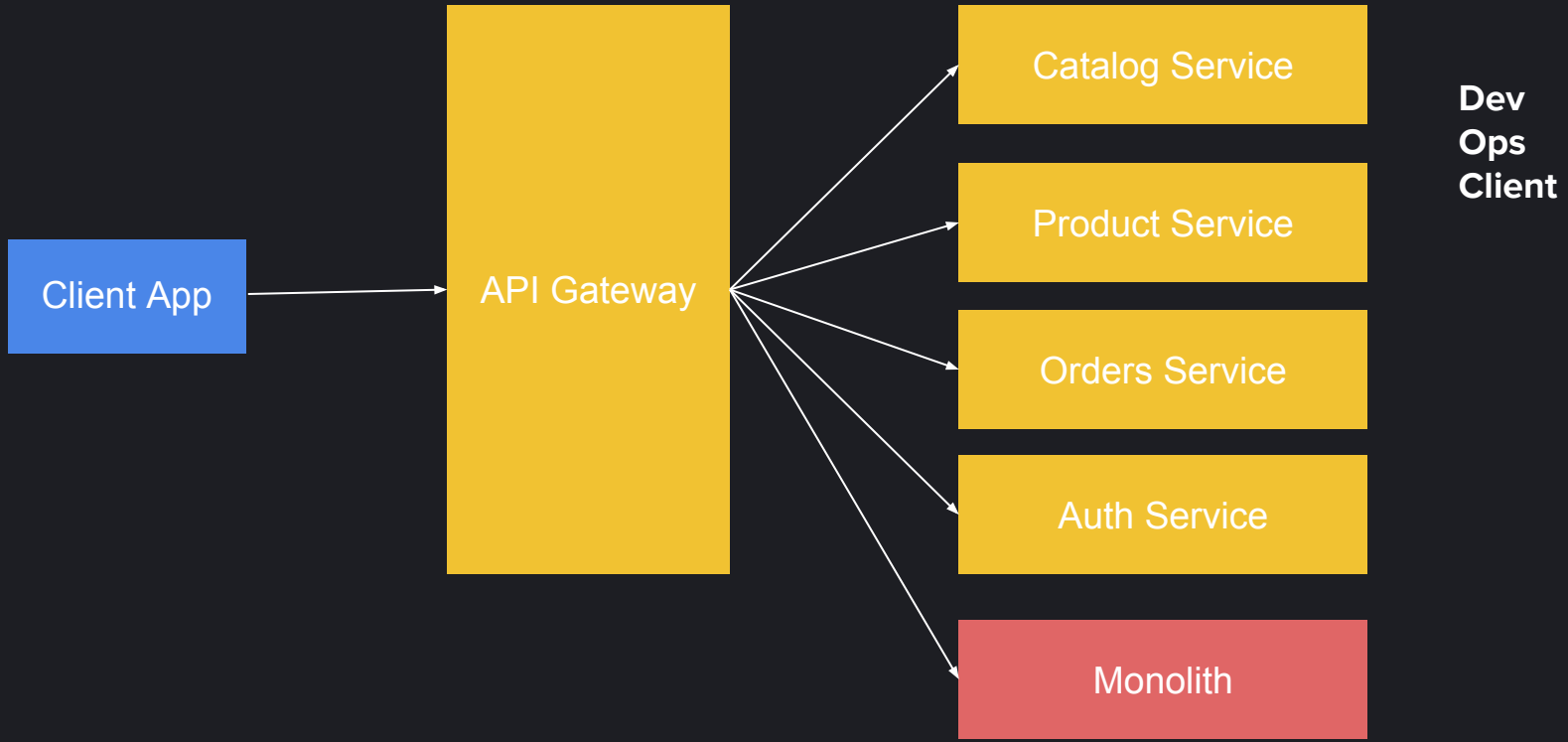

Dev
Ops
Client

API Gateway

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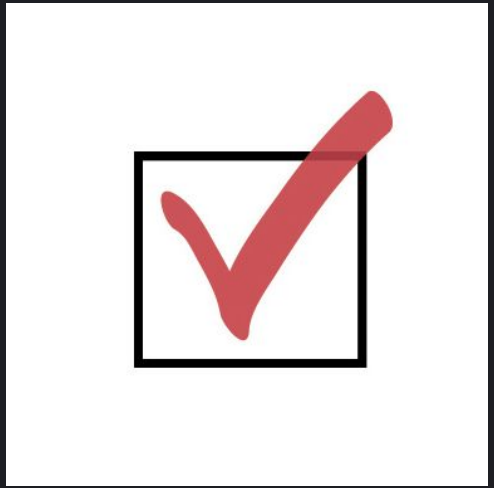
Criteria:

- Authentication
- Authorization
- Logging
- Monitoring
- Scaling
- Caching
- Rate Limiting
- Works for Devs
- Works for Ops



API Gateway

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	Ambassador	Traefik	OpenResty(NGINX)	Cloud Vendor Impl	CA API Gateway	Kong
Use Case	Microservices	Microservices	Monolith/Microservices	Expose backend services	Enterprise API management	Enterprise API management
Learning Curve	Simple	Simple	Moderate	Moderate	High	Moderate
Cost	Open Source	Open Source	Open Source	$	$$	$$
Config Language	YAML (Kubernetes annotations	TOML	nginx.conf	YAML or JSON	Text files	REST API, text files, nginx.conf
Authentication	Yes	Basic auth	Yes	Yes*	Yes	Yes
Governance mode	Decentralised, self-service	Decentralised, self-service	Decentralised	Decentralised	Centralized	Configurable
Kubernetes	Official YAML	Official YAML	Moderate	moderate	N/A	Moderate

Ambassador API Gateway

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- Kubernetes Native
- Powered by Envoy Proxy
- External auth service support
- External rate limiting support
- Fast
- HTTP/2, gRPC, WebSockets
- Works with Istio
- L7 metrics
- Distributed Tracing

Ambassador API Gateway - installation

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```yaml
---
apiVersion: v1
kind: Service
metadata:
  labels:
    service: ambassador-admin
  name: ambassador-admin
spec:
  type: NodePort
  ports:
  - name: ambassador-admin
    port: 8877
    targetPort: 8877
  selector:
    service: ambassador
---
apiVersion: extensions/v1beta1
kind: Deployment
metadata:
  name: ambassador
spec:
  replicas: 3
  template:
    metadata:
      annotations:
        sidecar.istio.io/inject: "false"
      labels:
        service: ambassador
    spec:
      containers:
      - name: ambassador
        image: quay.io/datawire/ambassador:0.40.2
        resources:
          limits:
            cpu: 1
            memory: 400Mi
          requests:
            cpu: 200m
            memory: 100Mi
        env:
        - name: AMBASSADOR_NAMESPACE
          valueFrom:
            fieldRef:
              fieldPath: metadata.namespace
        ports:
        - name: http
          containerPort: 80
        - name: https
          containerPort: 443
        - name: admin
          containerPort: 8877
        livenessProbe:
          httpGet:
            path: /ambassador/v0/check_alive
            port: 8877
          initialDelaySeconds: 30
          periodSeconds: 3
        readinessProbe:
          httpGet:
            path: /ambassador/v0/check_ready
            port: 8877
          initialDelaySeconds: 30
          periodSeconds: 3
      restartPolicy: Always
```

Ambassador API Gateway - route definition

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```yaml
---
apiVersion: v1
kind: Service
metadata:
  name: qotm
  annotations:
    getambassador.io/config: |
      ---
      apiVersion: ambassador/v0
      kind:  Mapping
      name:  qotm_mapping
      prefix: /qotm/
      service: qotm
spec:
  selector:
    app: qotm
  ports:
  - port: 80
    name: http-qotm
    targetPort: http-api
---
apiVersion: extensions/v1beta1
kind: Deployment
metadata:
  name: qotm
spec:
  replicas: 1
  strategy:
    type: RollingUpdate
  template:
    metadata:
      labels:
        app: qotm
    spec:
      containers:
      - name: qotm
        image: datawire/qotm:1.1
        ports:
        - name: http-api
          containerPort: 5000
        resources:
          limits:
            cpu: "0.1"
            memory: 100Mi
```

Questions?

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“Organizations which design systems ... are constrained to produce designs which are copies of the communication structures of these organizations.”