

Introduction to

Service Mesh

with Istio

Agenda

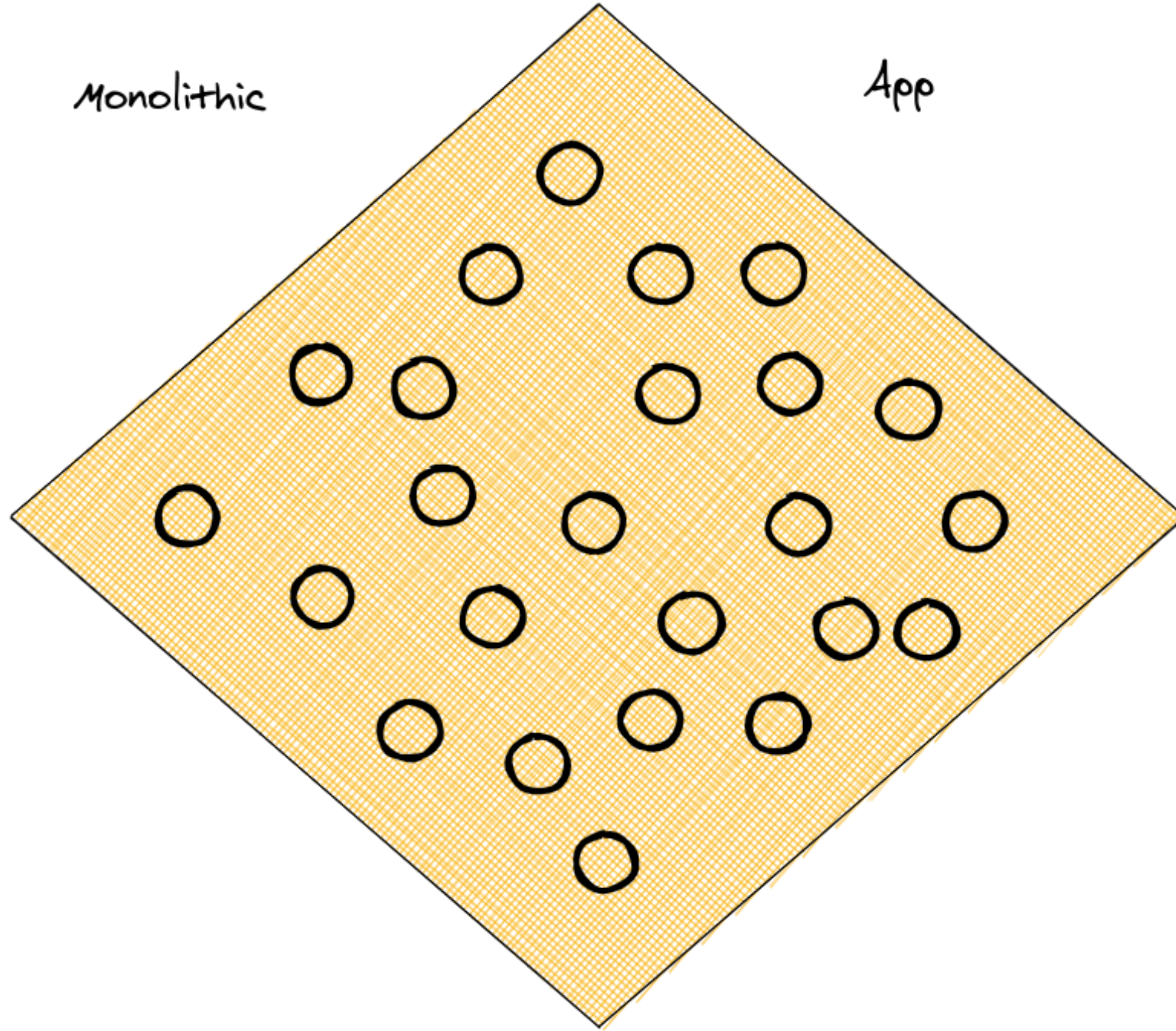
- Do you need a service mesh?
- Istio Architecture
- Installation
- Observability
- Traffic Management
- Service Resiliency
- Fault Injection
- Security

Do you need a service mesh?



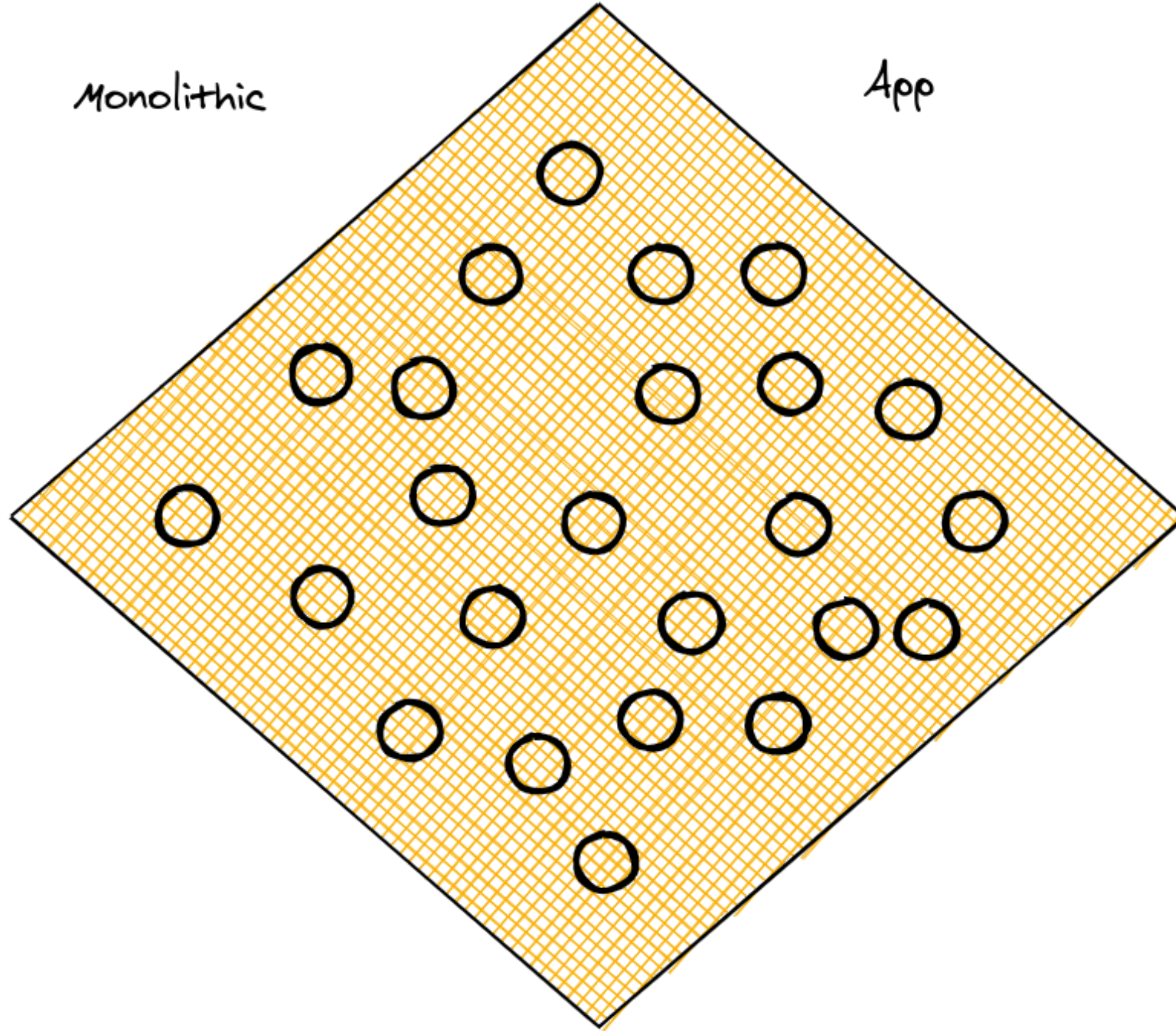
Monolithic

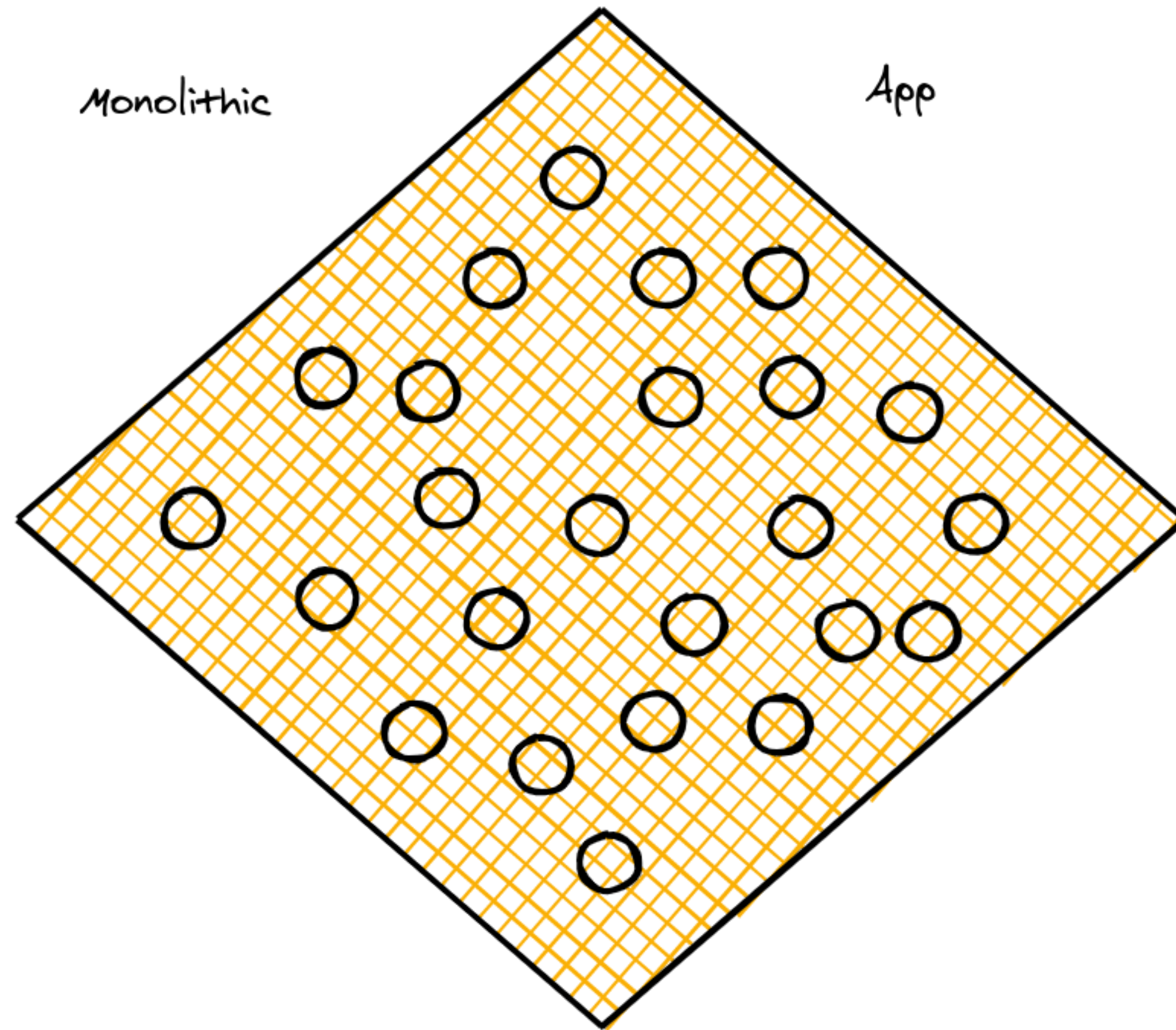
App

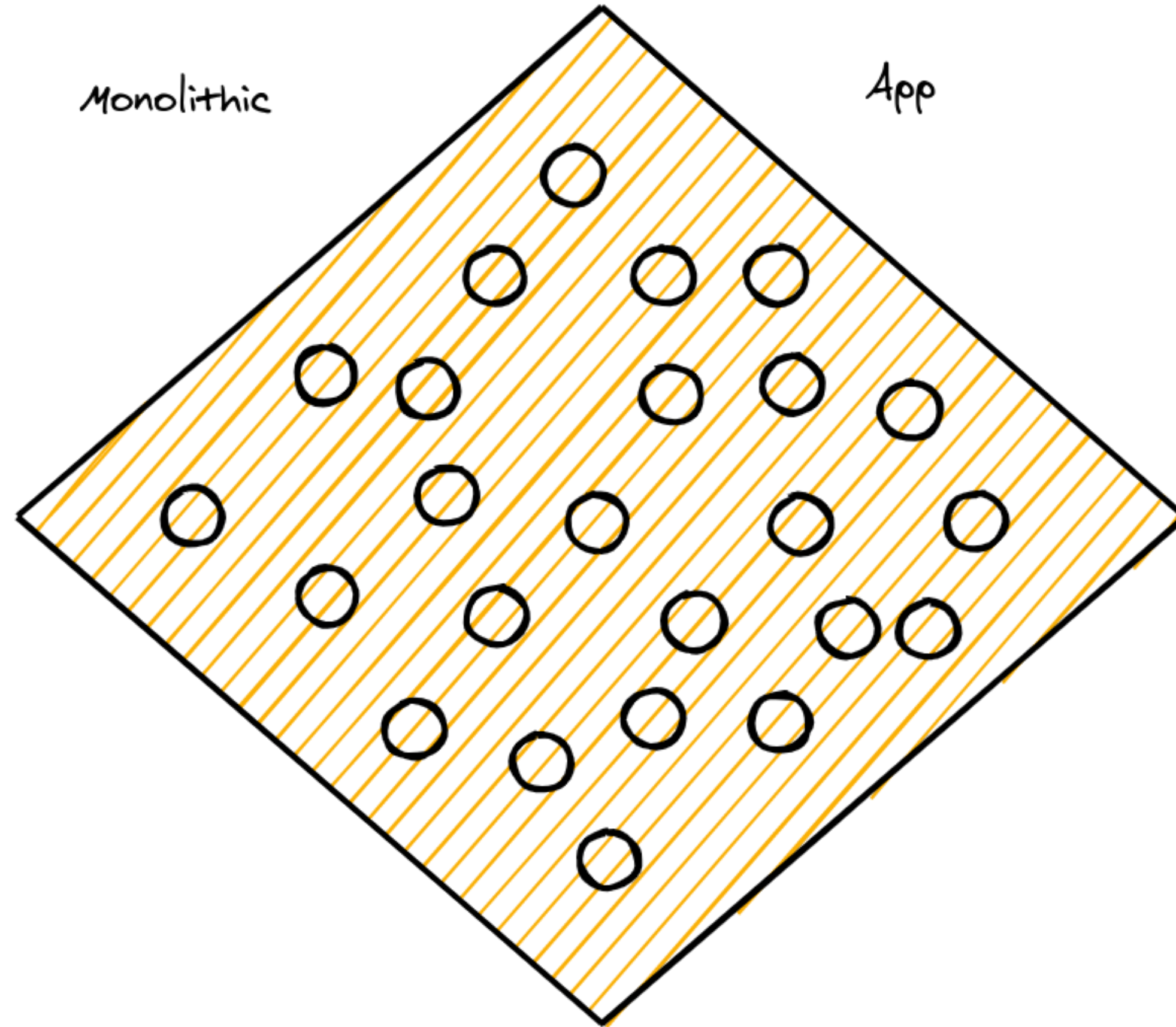


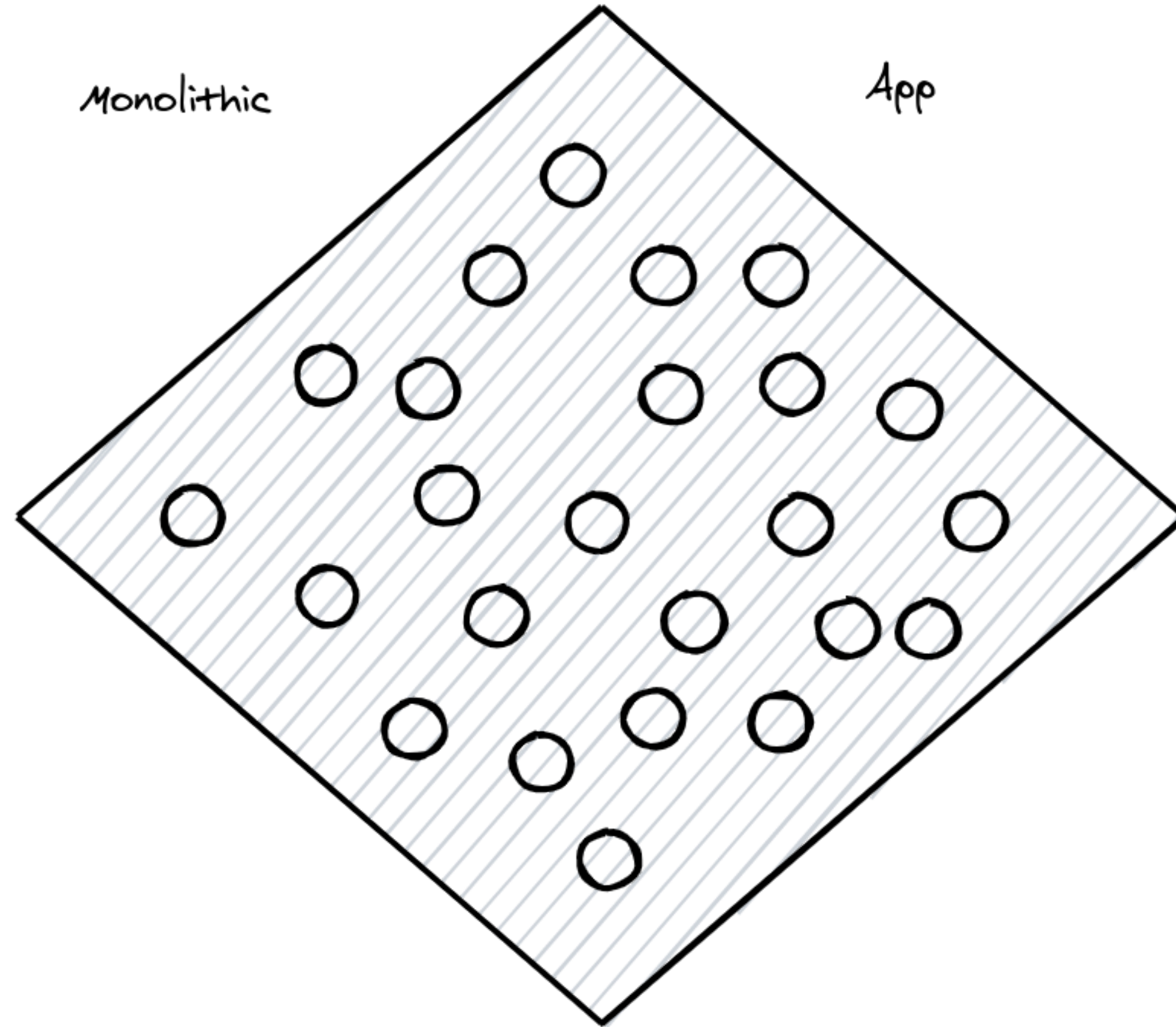
Monolithic

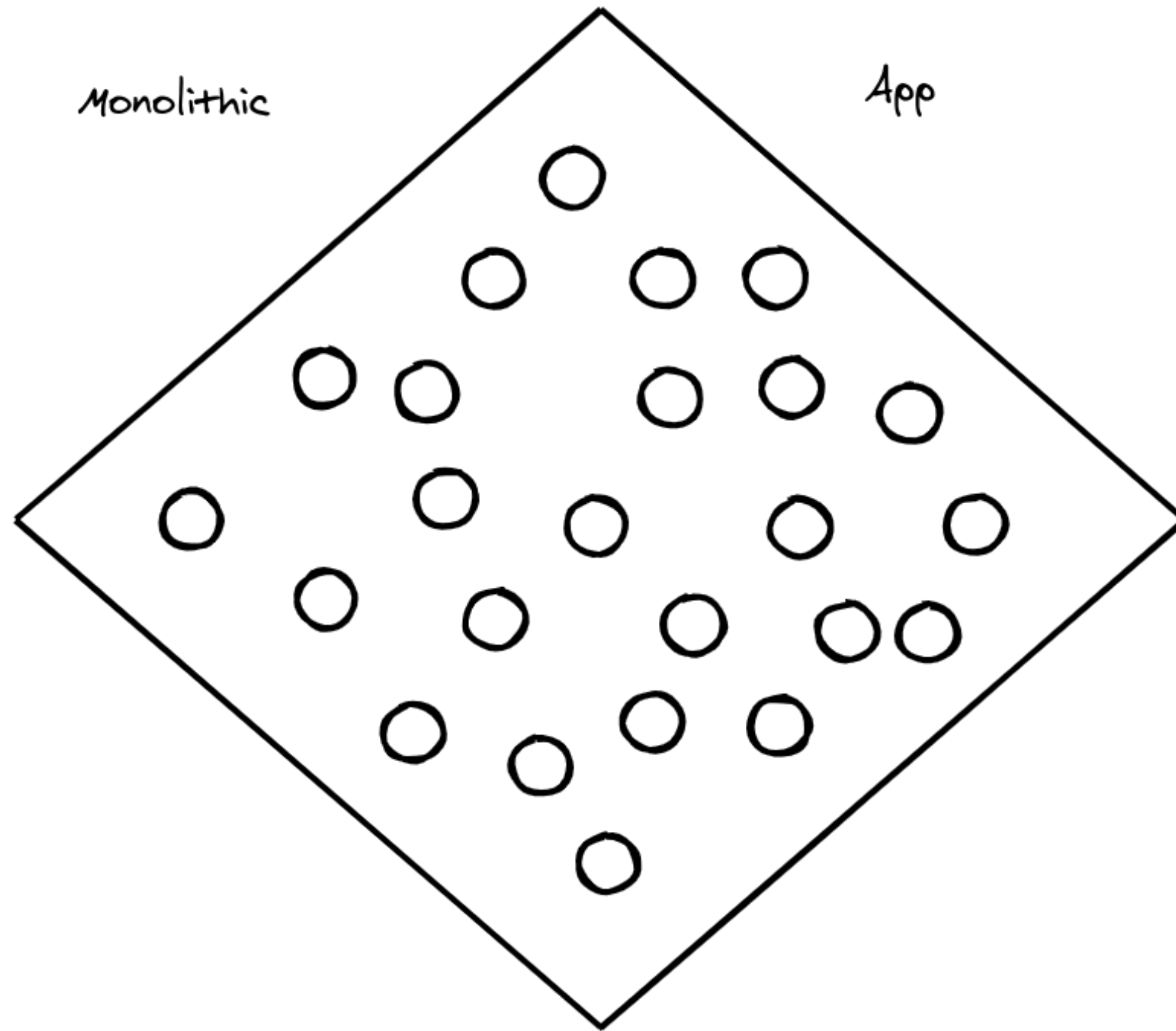
App

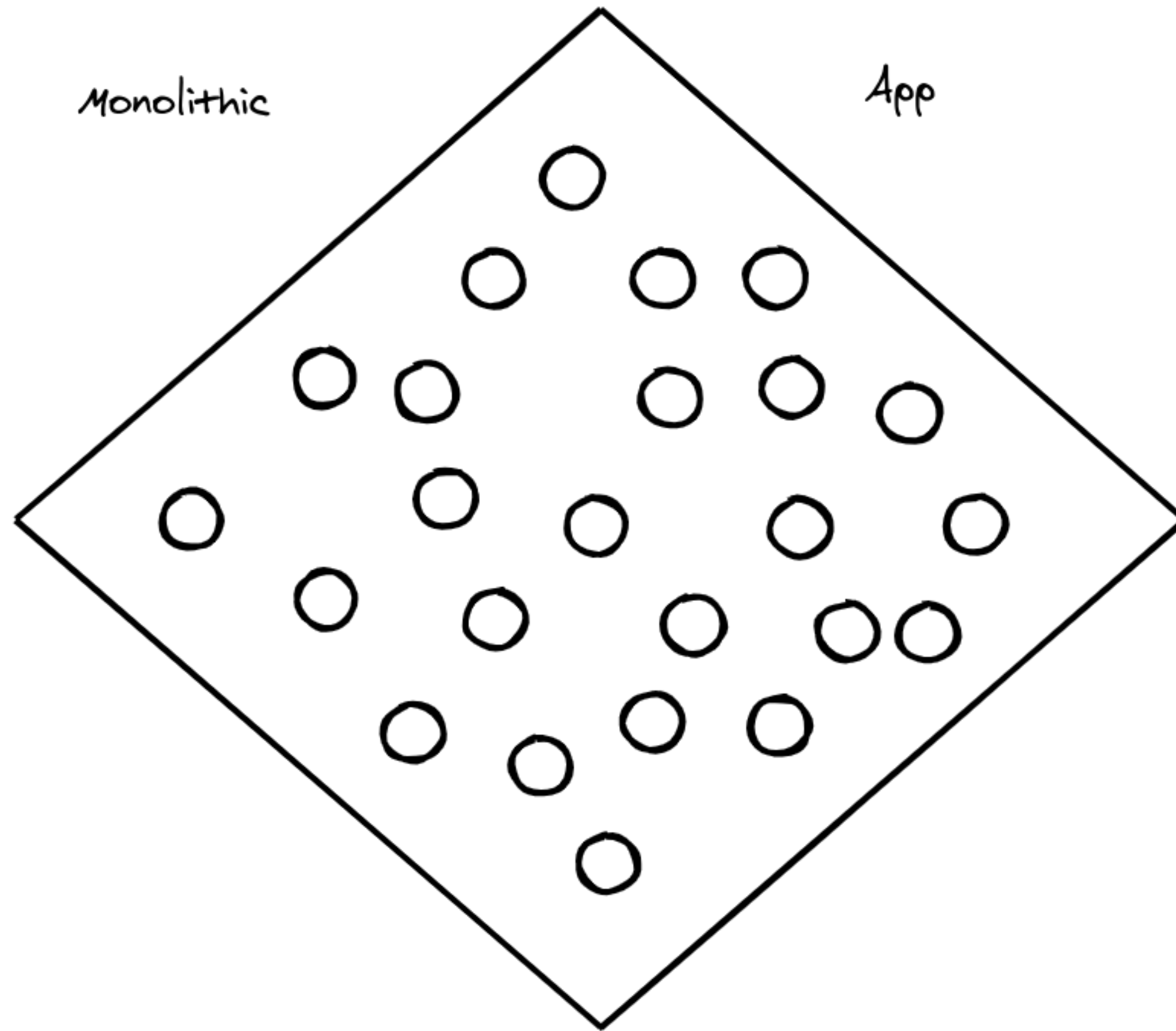


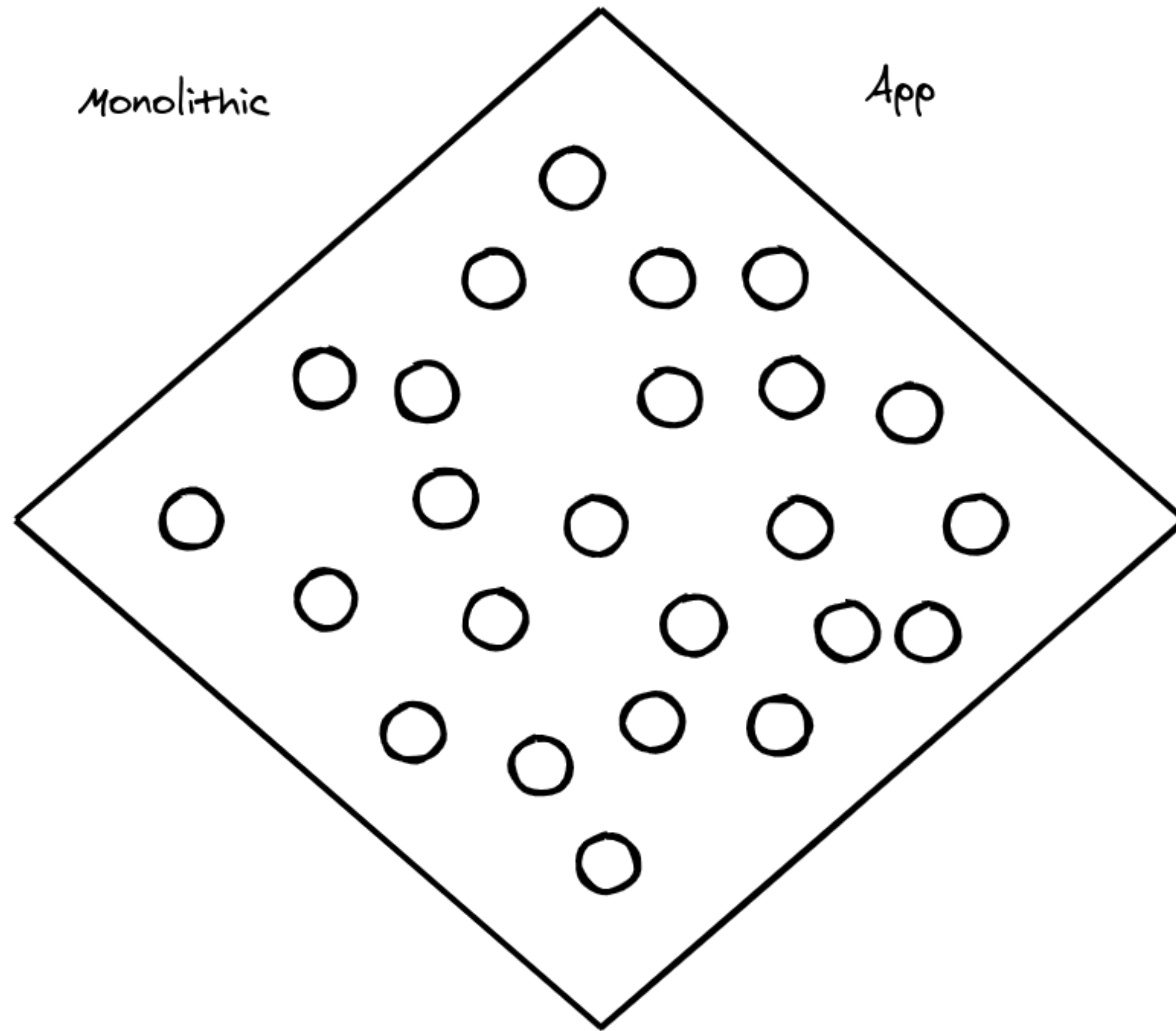


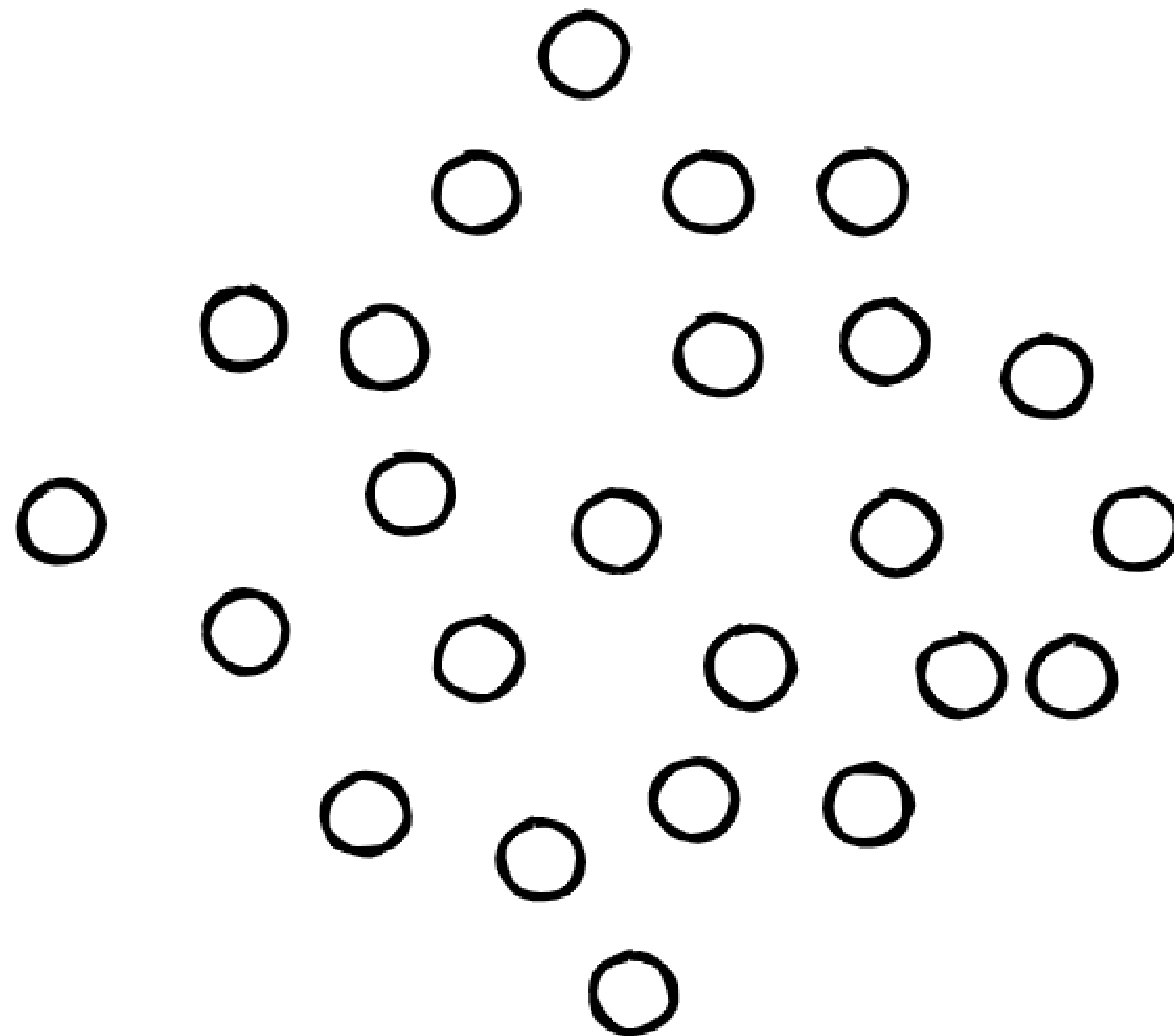


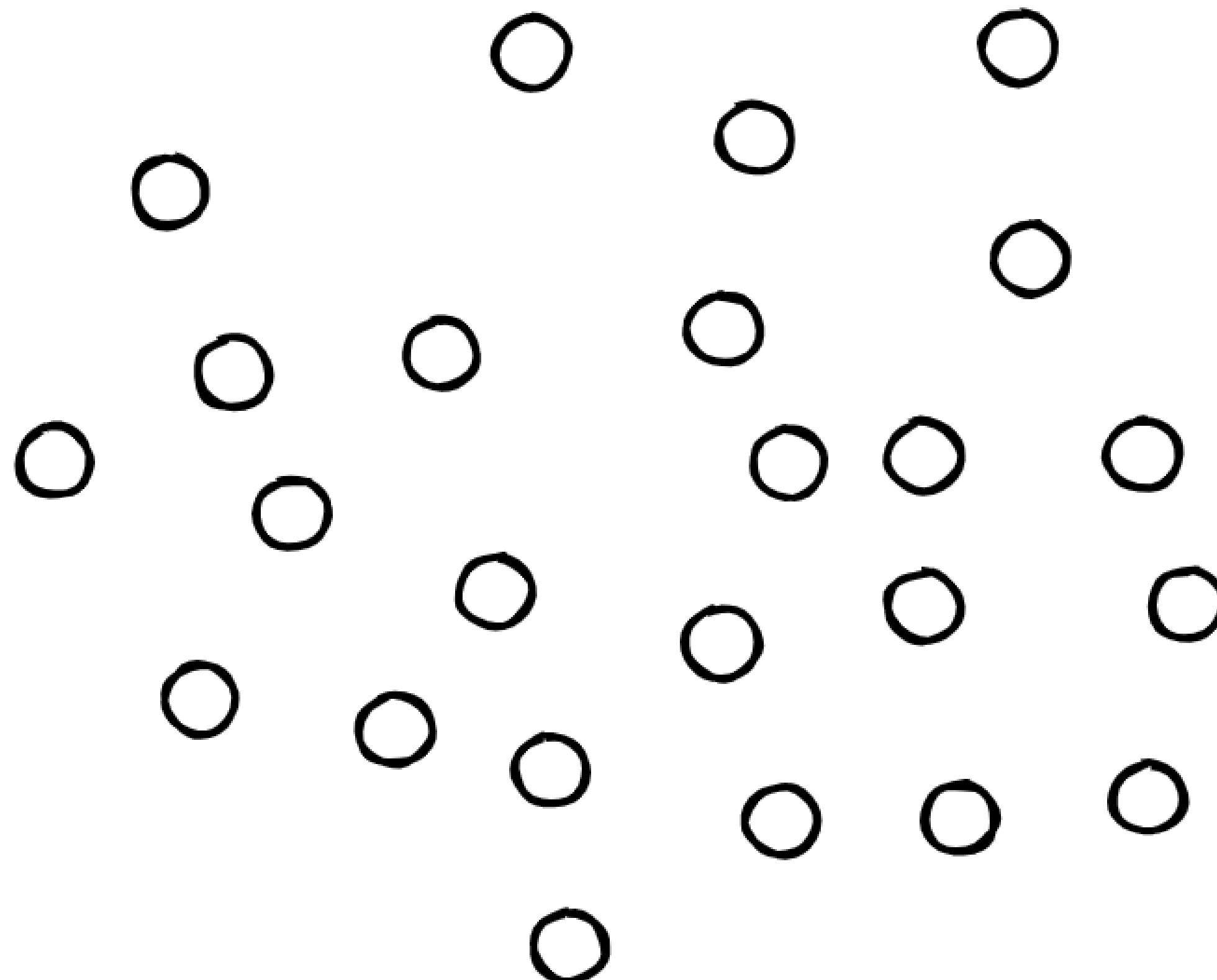




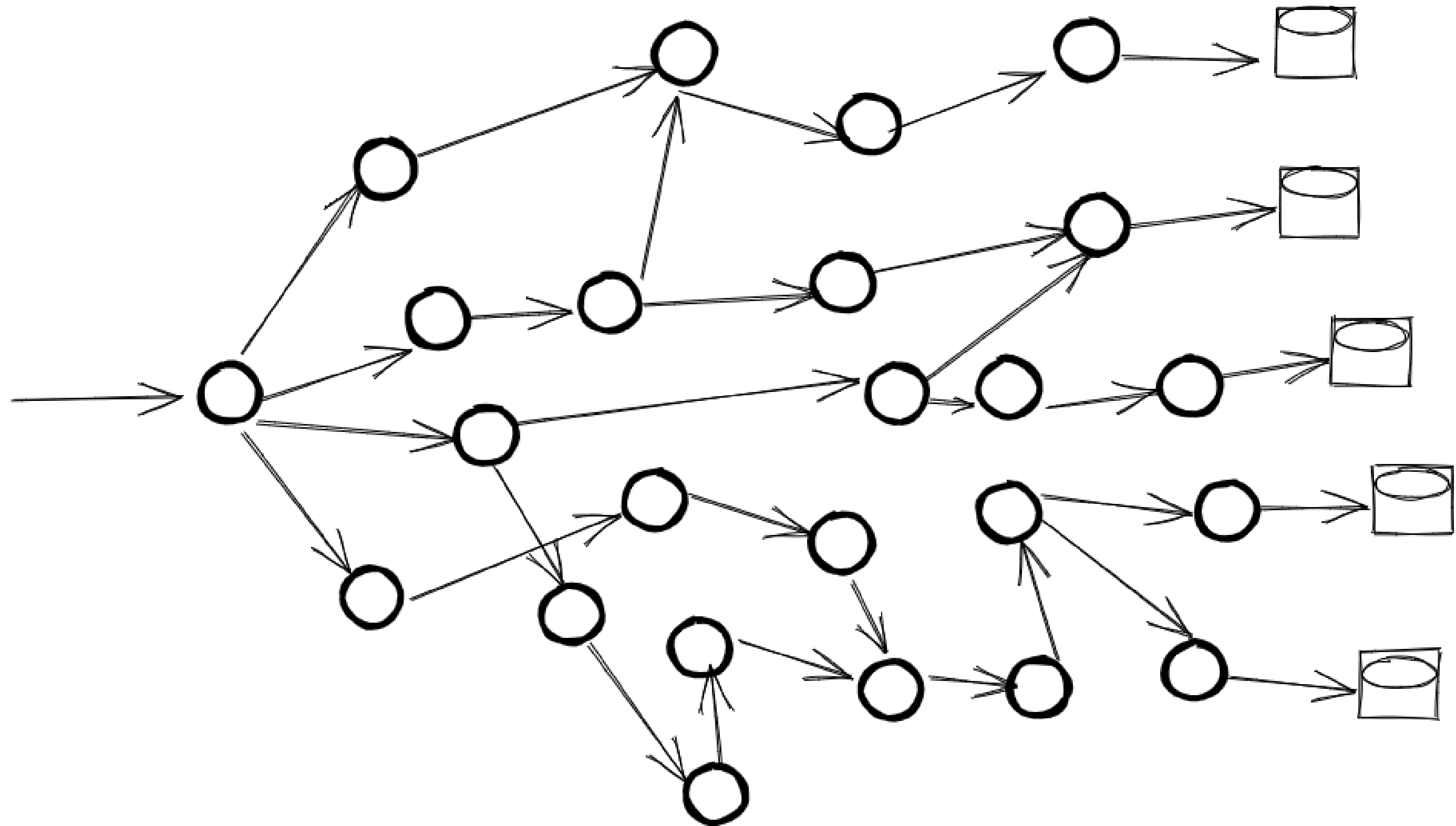




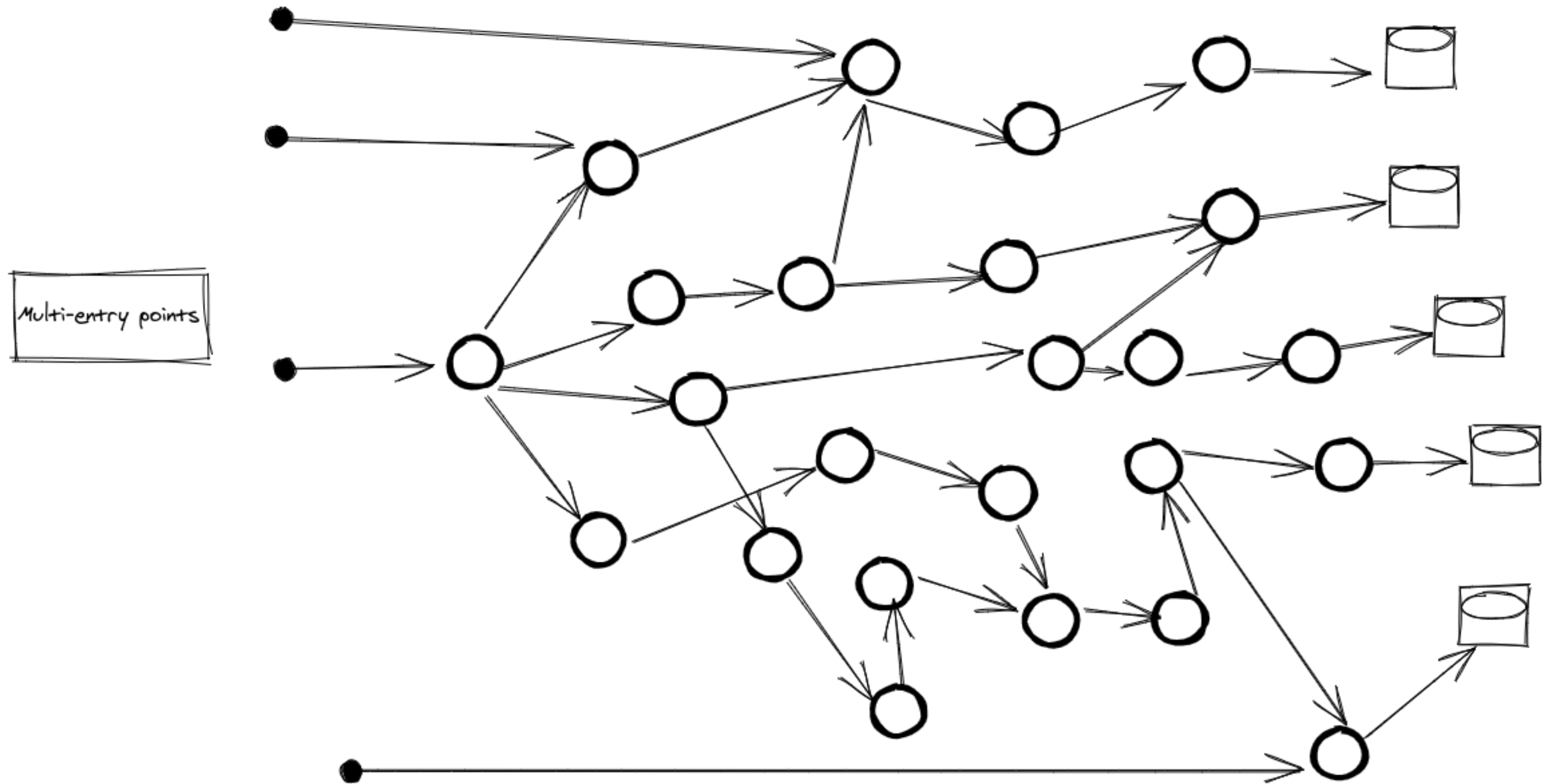




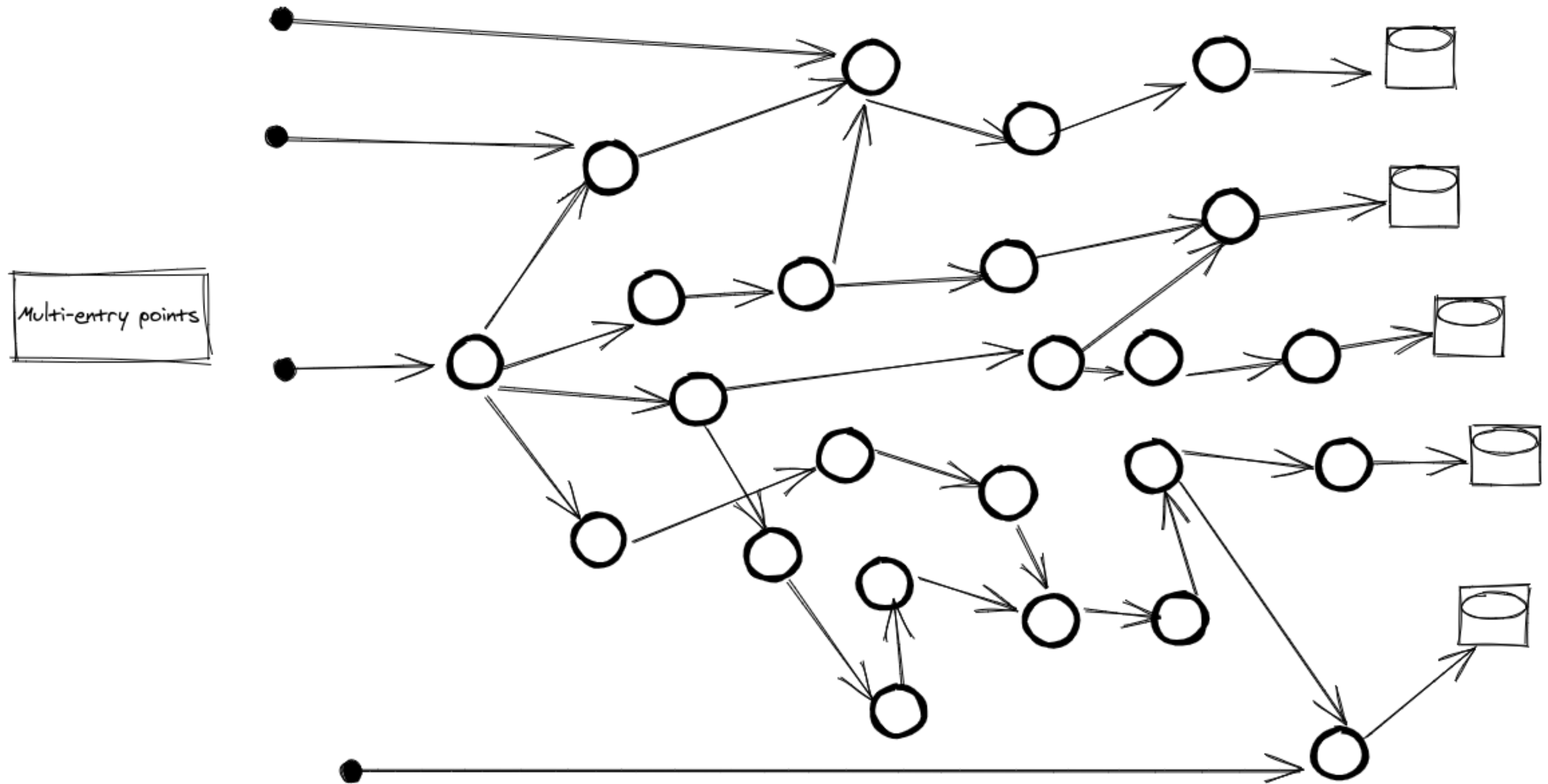
Microservices



Microservices



Microservices

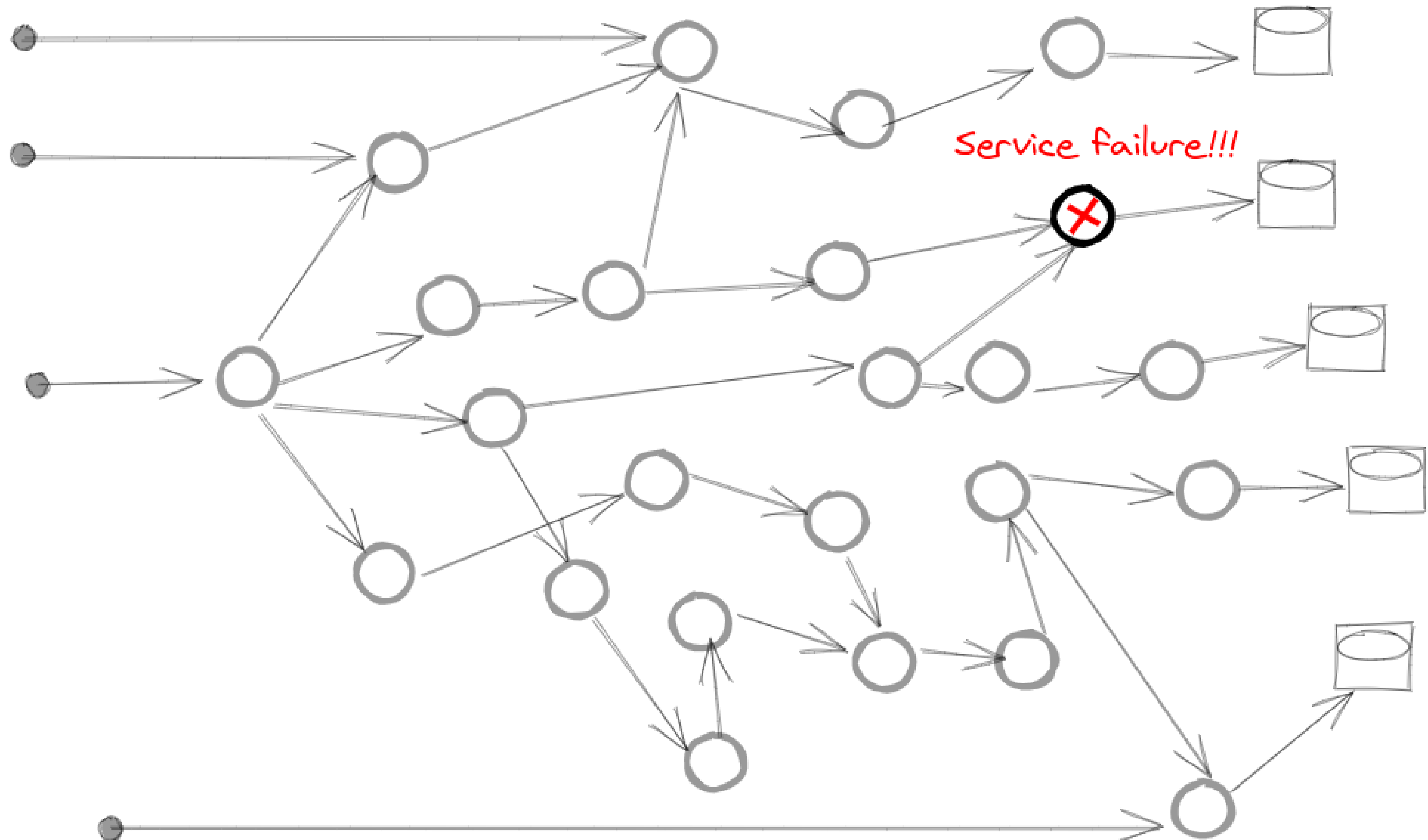


Fallacies of Distributed Computing

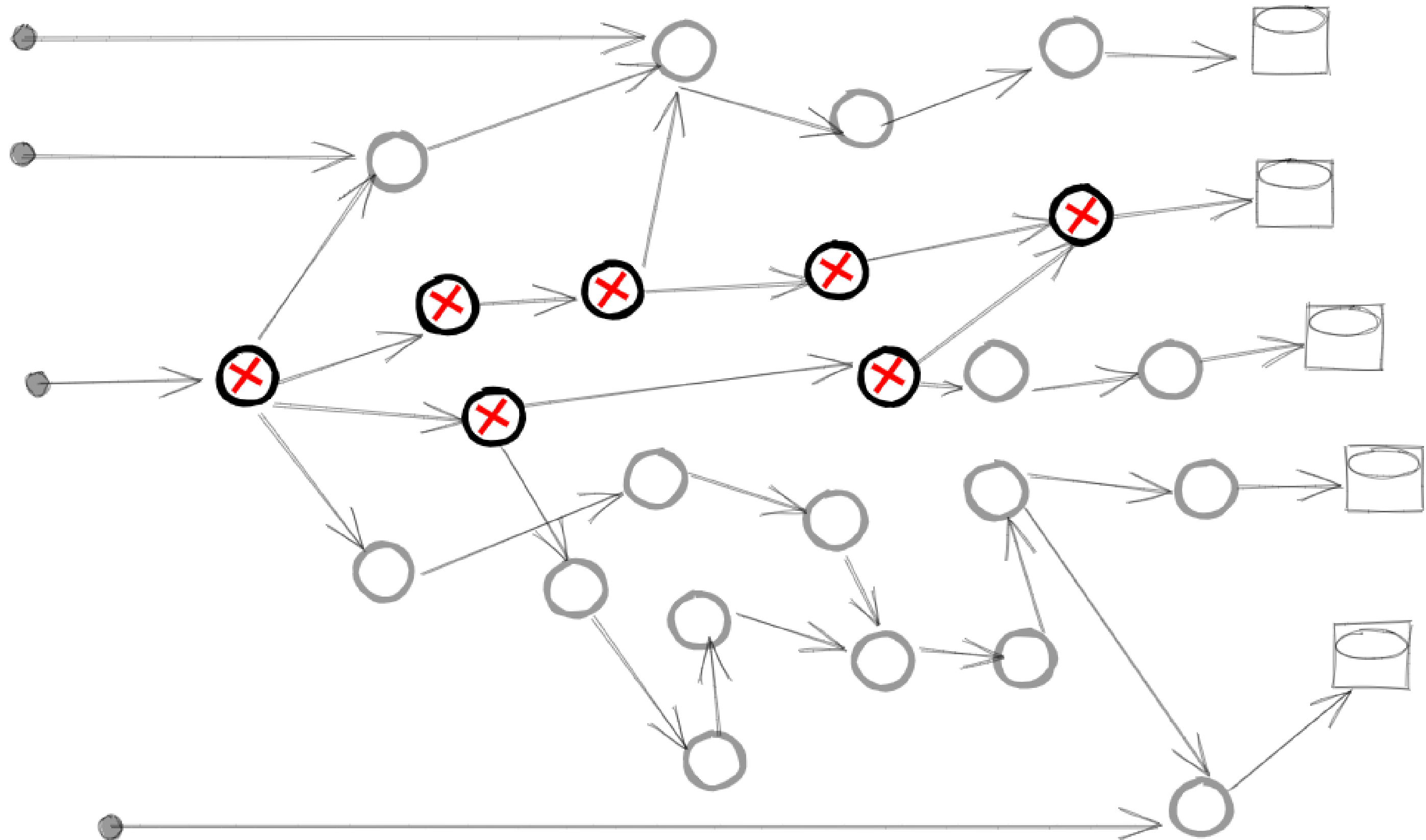
- The Network is Reliable
- Latency is zero
- Bandwidth is infinite
- Topology does not change
- There is one administrator
- Transport cost is zero
- The network is homogeneous



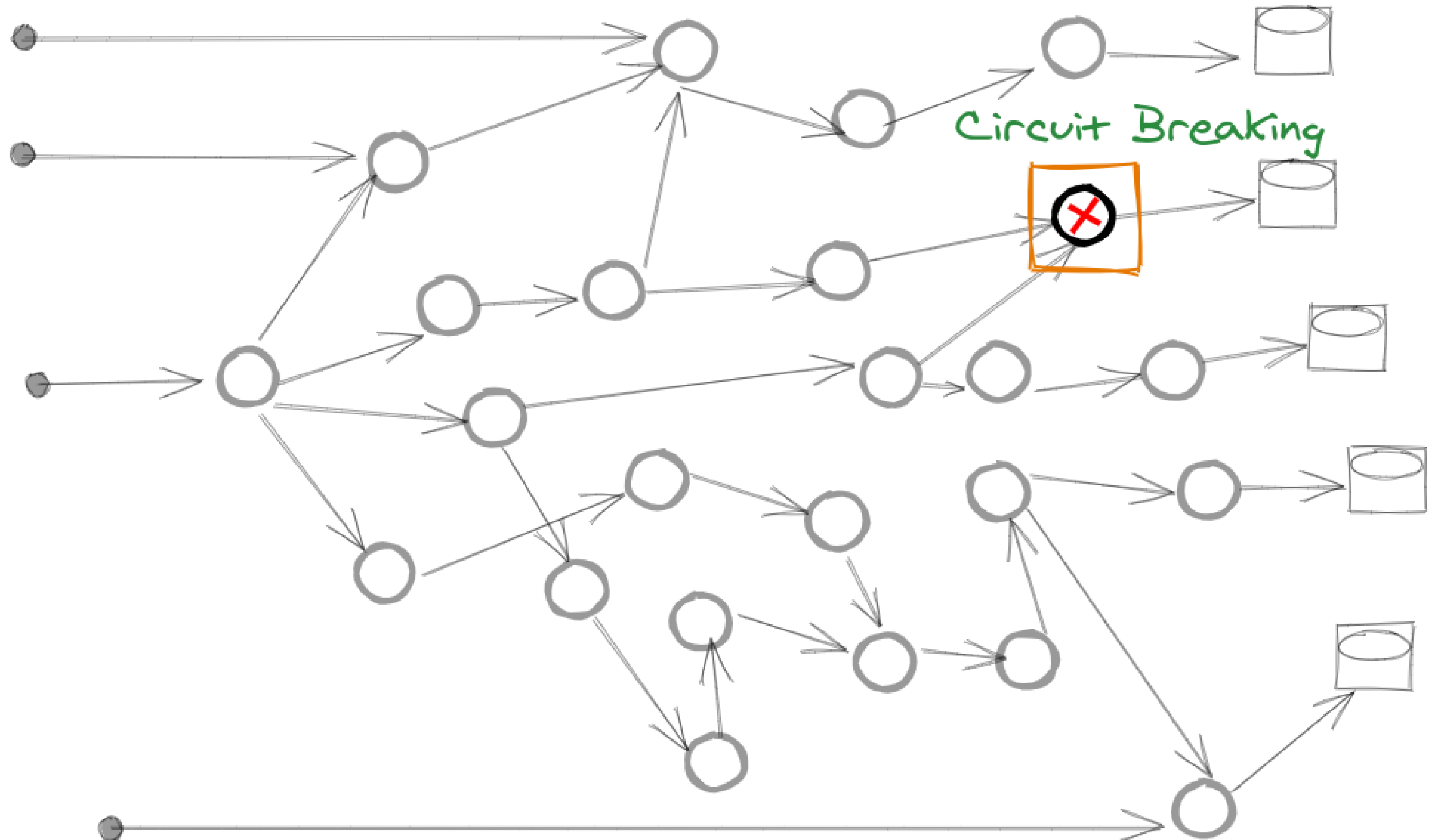
Microservices



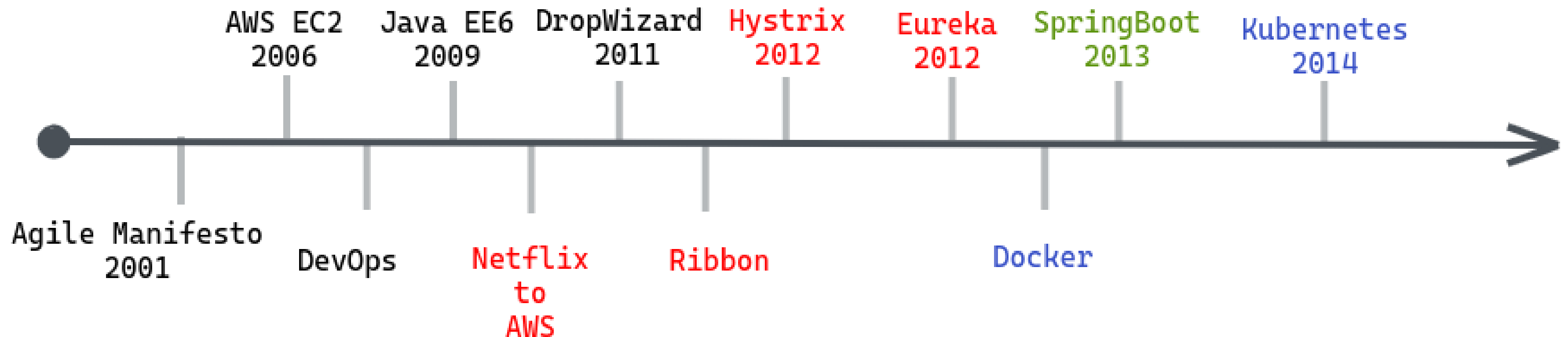
Microservices



Microservices



History of Microservices

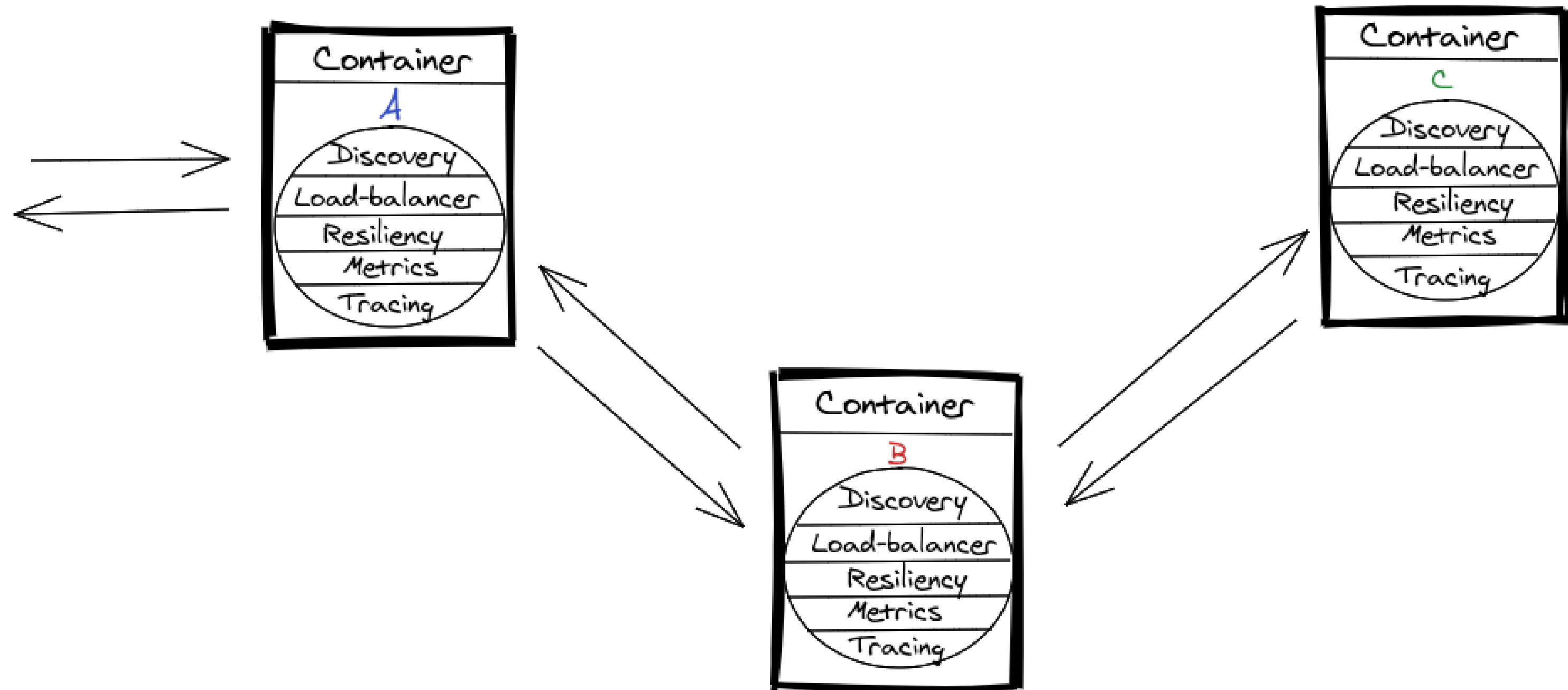




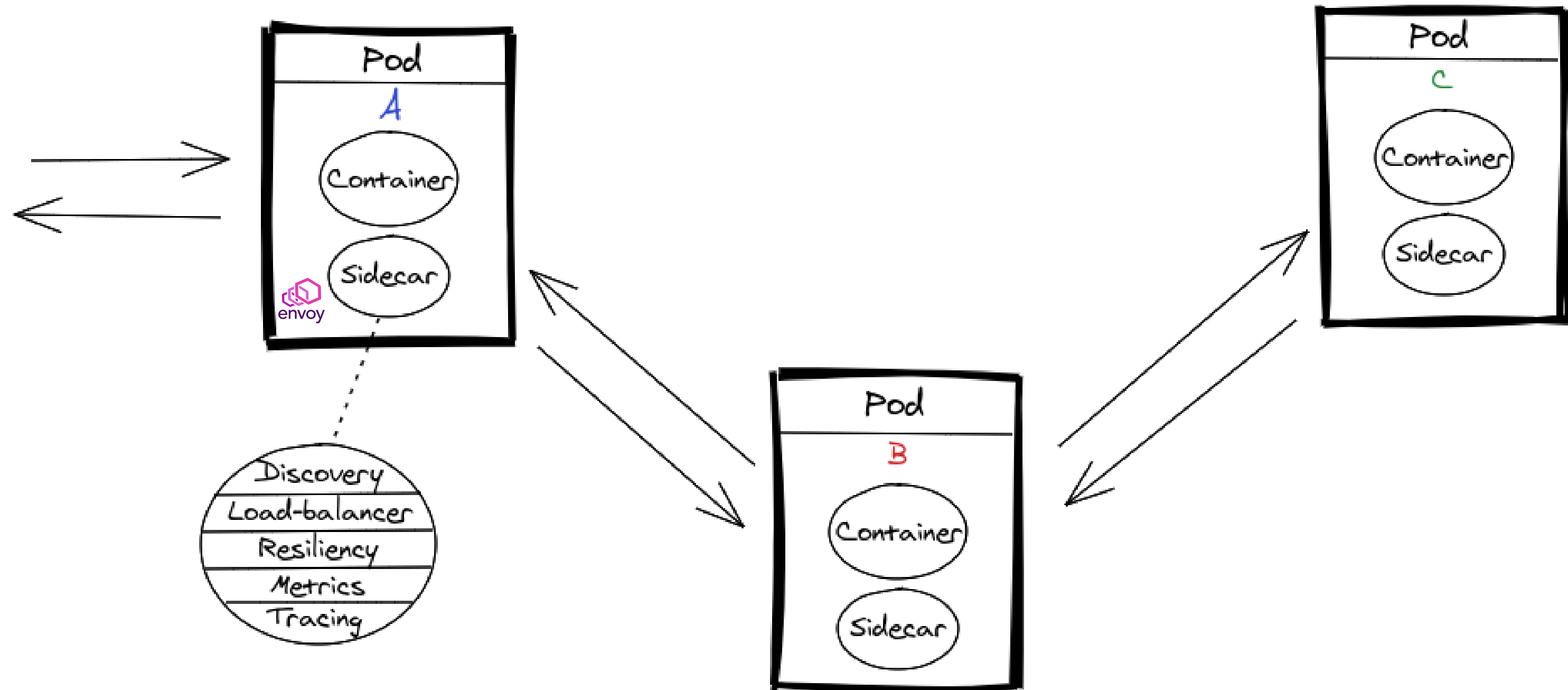
Istio



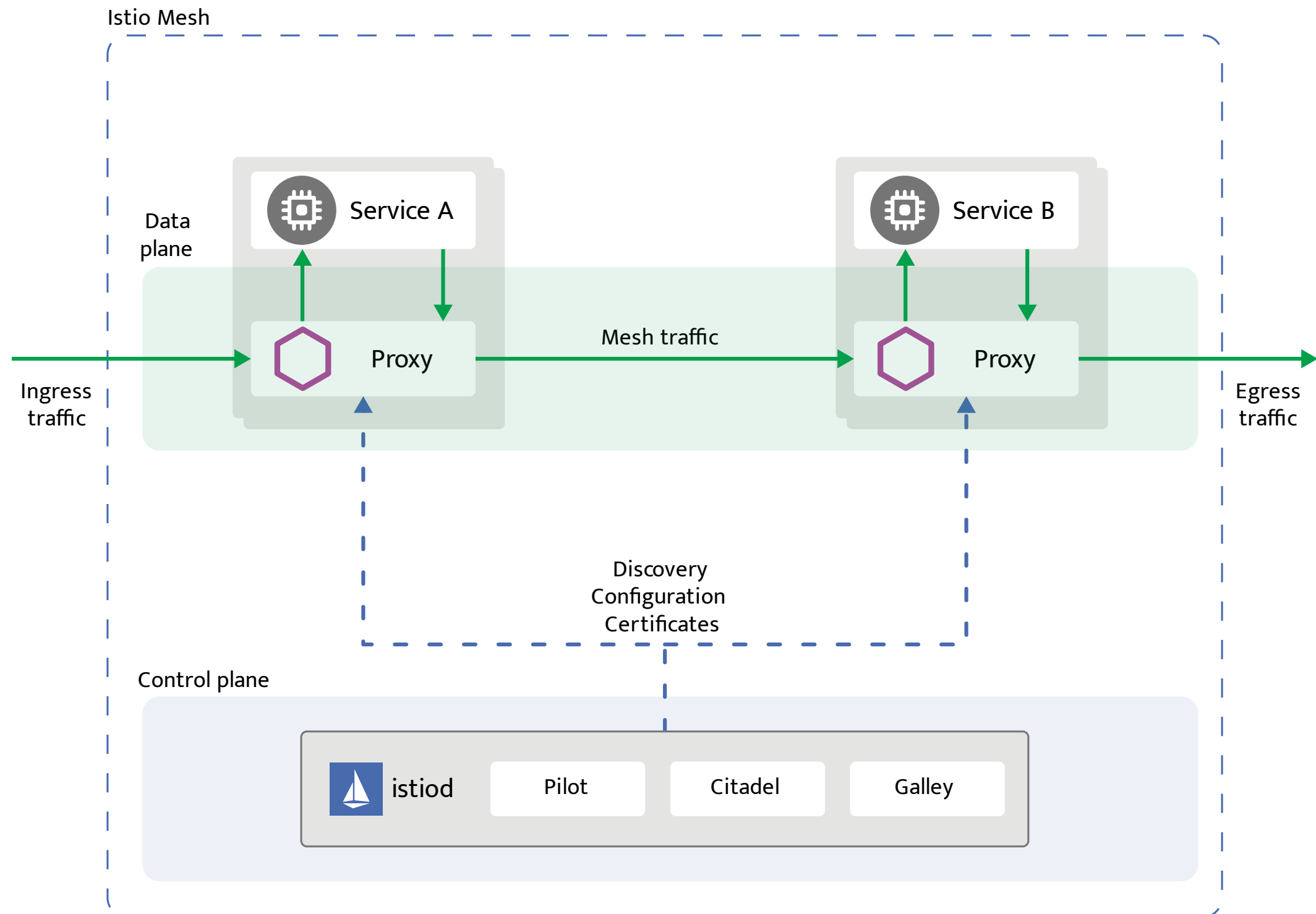
Before Istio



After Istio



Architecture



Core Features

- Code Independent
- Observability
- Routing and Load-Balancing
- Fault Injection, Timeouts, Retries
- Resilience: Circuit Breaking
- Security: Encryption and Authorization

Setup Lab

- Download the Ebook: [Introducing Istio Service Mesh for Microservices](#)
- Clone the repository: <https://github.com/ahmedgabers/istio-intro>
- Install Tools: [kubectl](#), [Minikube](#), [stern](#), [Git](#), [kubectx](#) and [kubens](#)
- Start minikube:

```
minikube start --memory=4096 --cpus=2 --driver=virtualbox -p istio
```

- Install Istio
- Deploy Sample Application

Main Istio Resources (API Objects based on CRDs)

- VirtualService
- DestinationRule
- ServiceEntry
- Gateway
- Policy
- ServiceRole
- ServiceRoleBinding

Observability

Metrics

Tracing

Logs

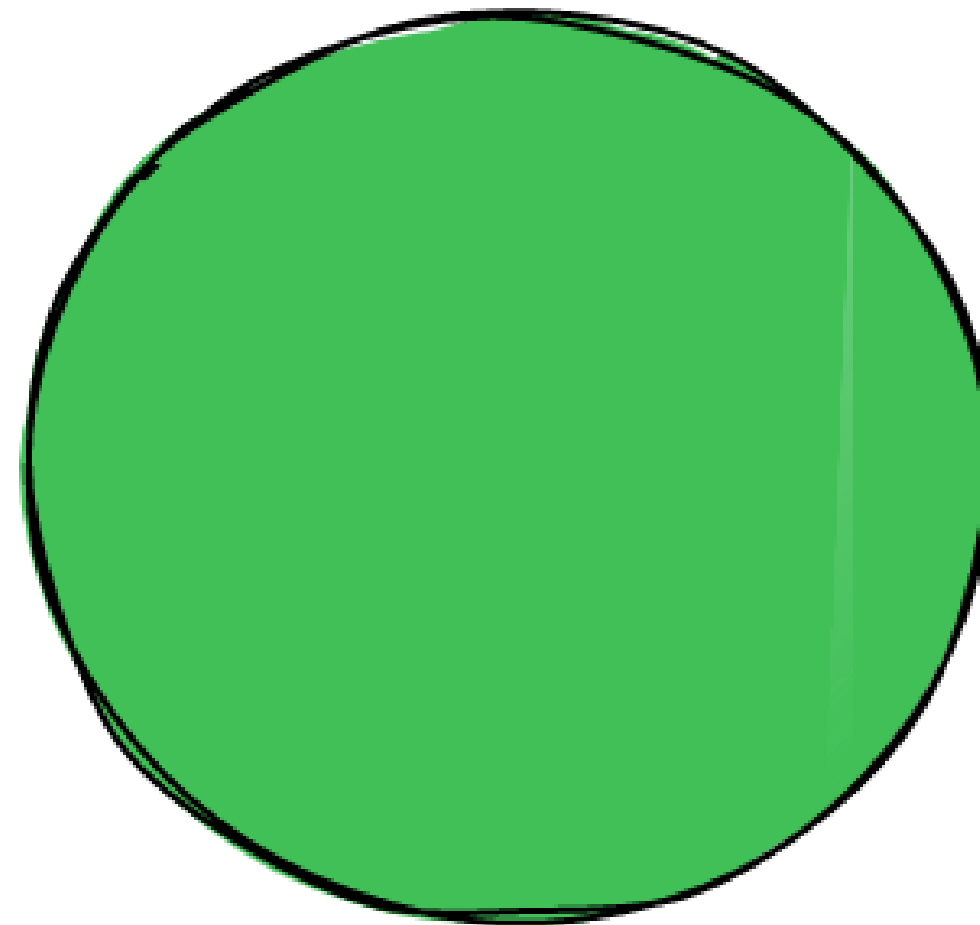
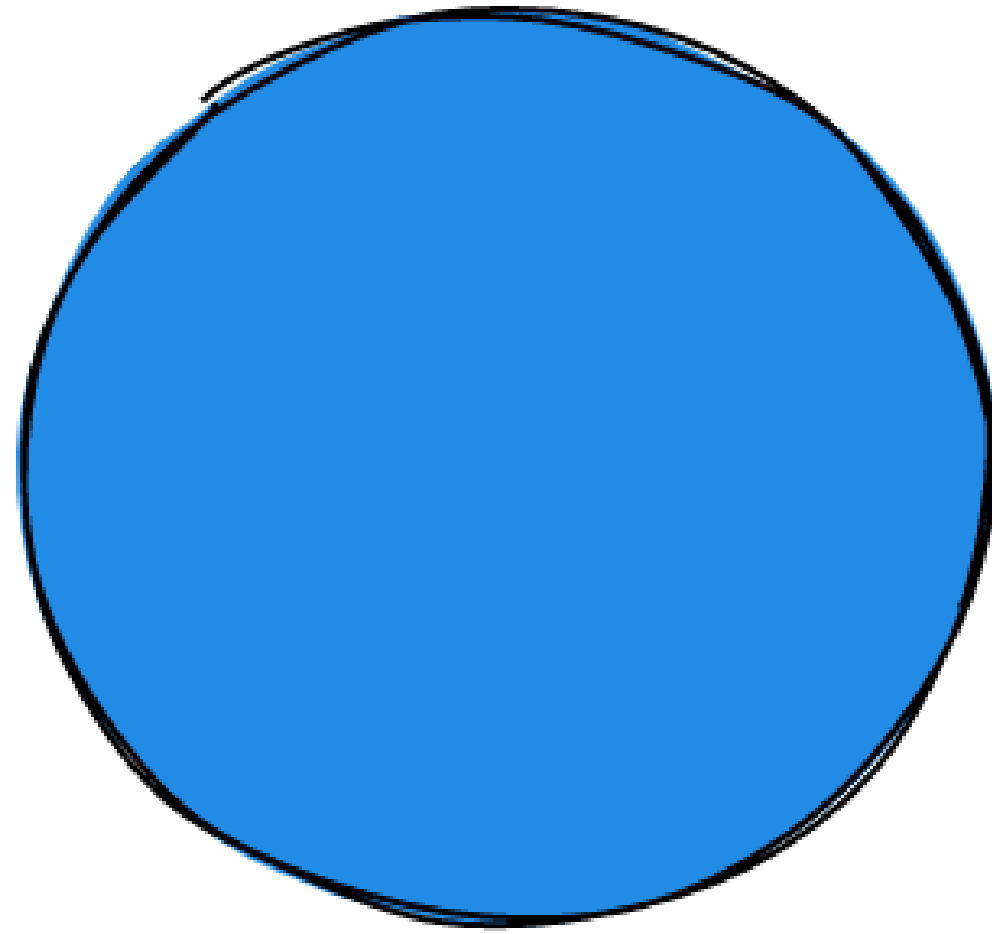
Traffic Management

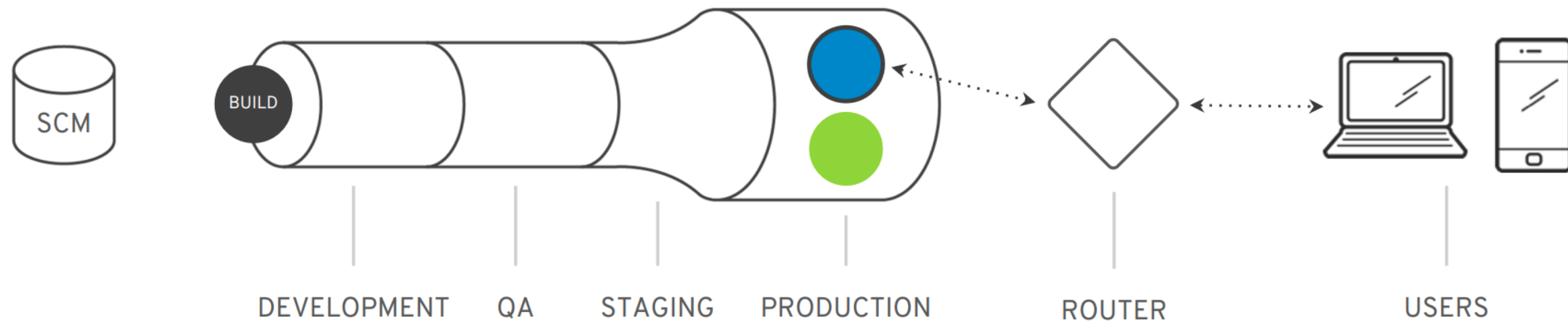
Traffic Control

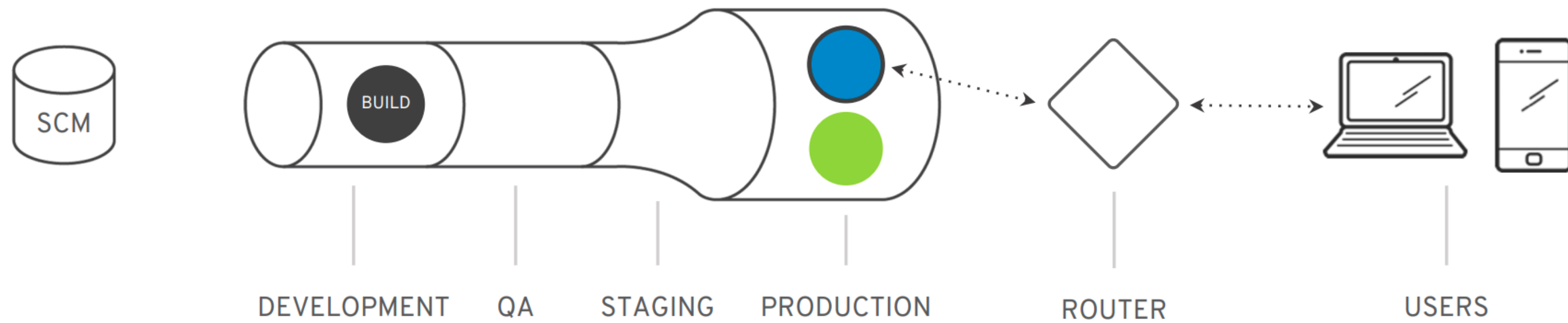
- Blue/Green Deployments
- Percentages based Canary

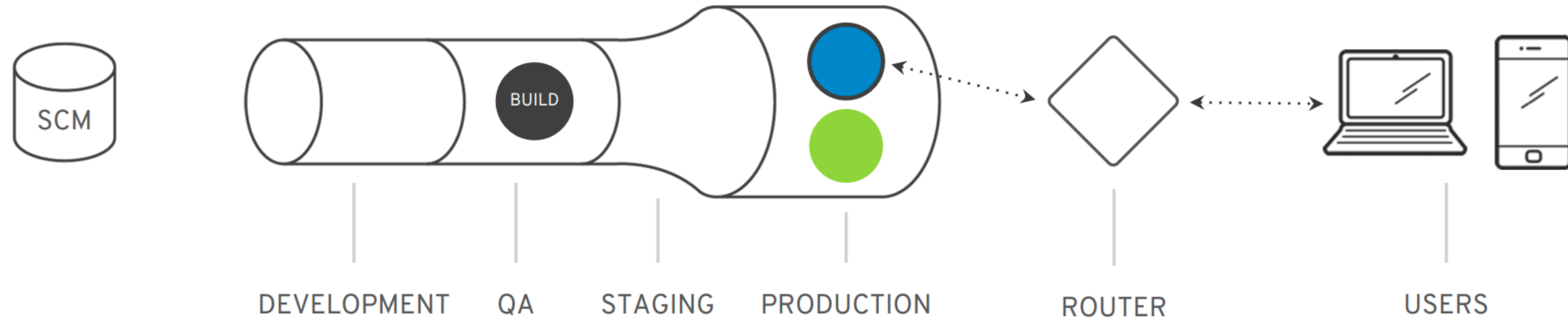


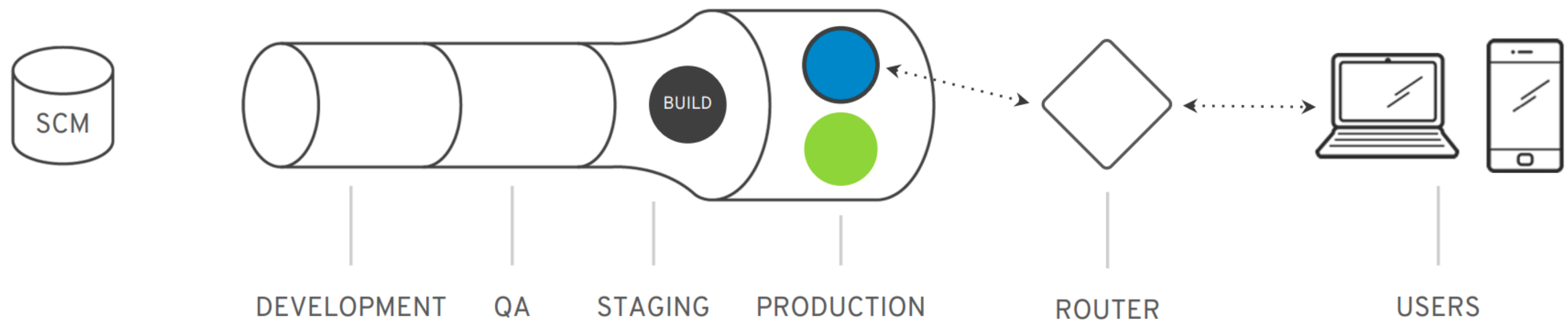
Blue/Green
Deployment

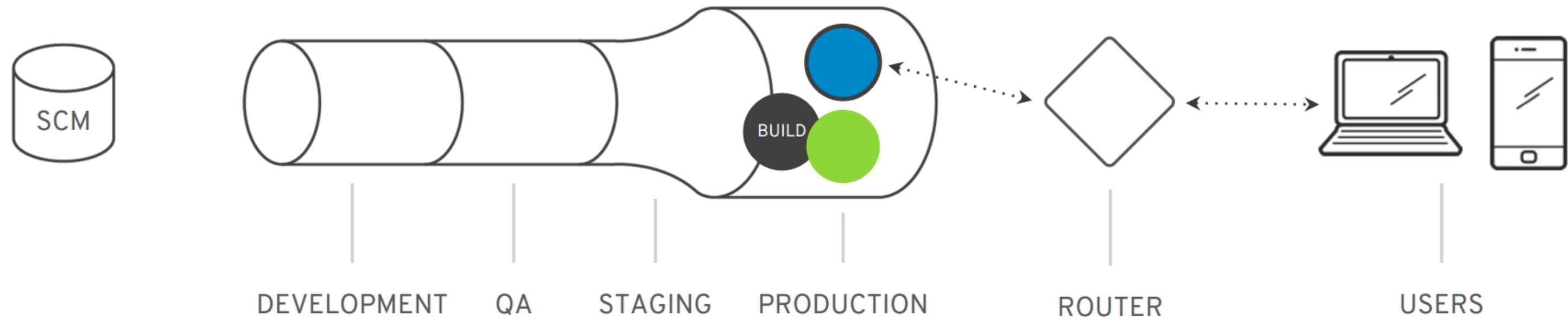


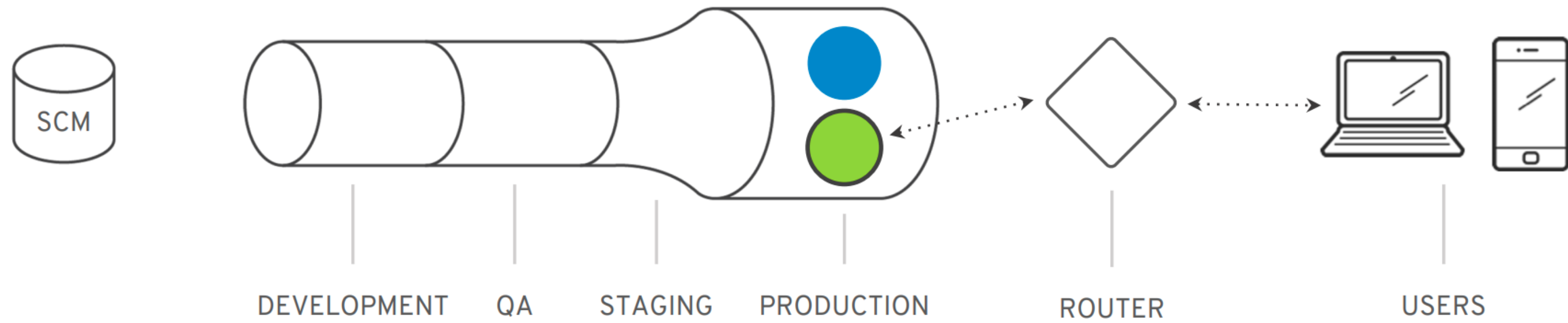


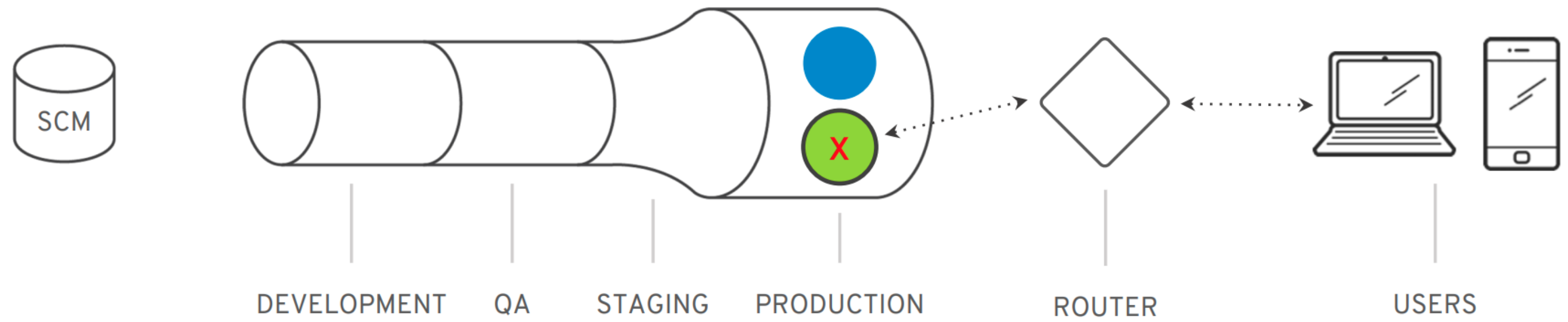


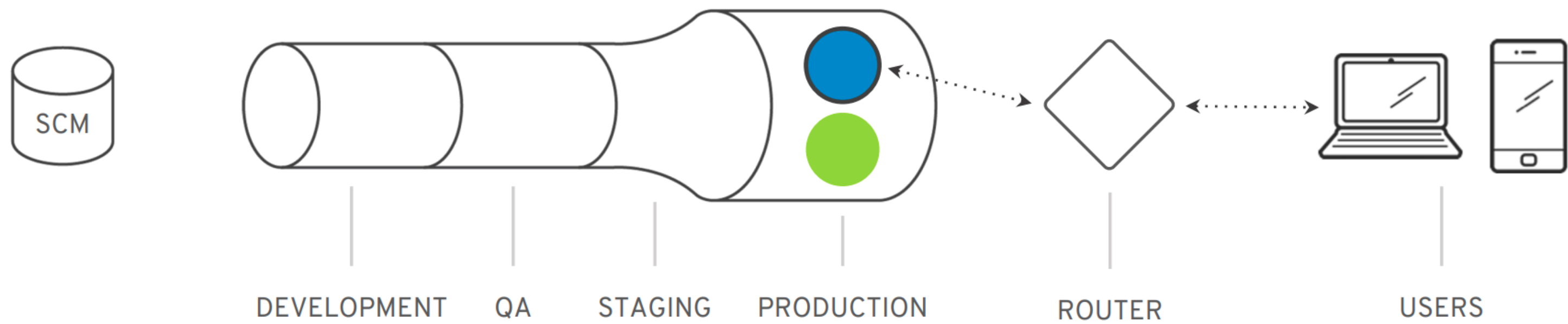






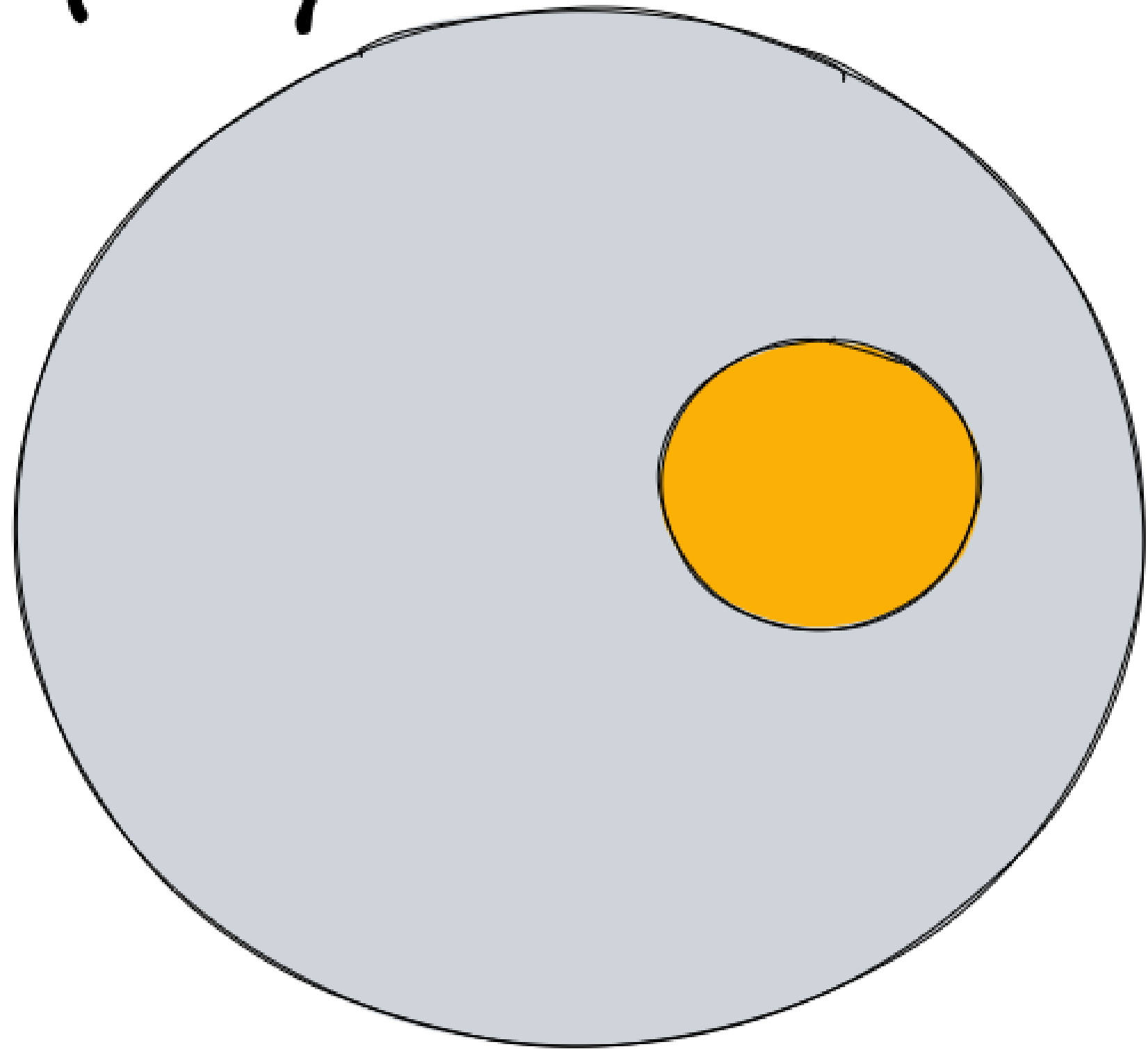




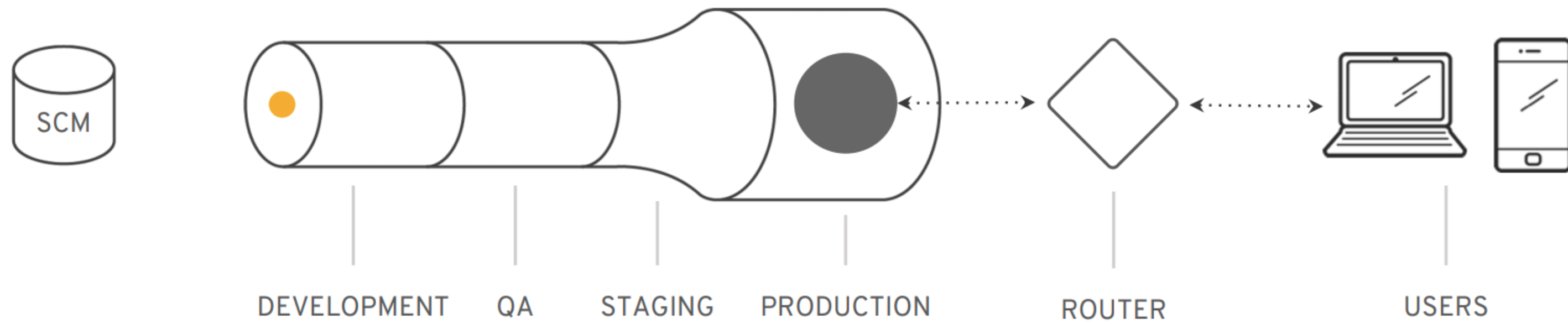


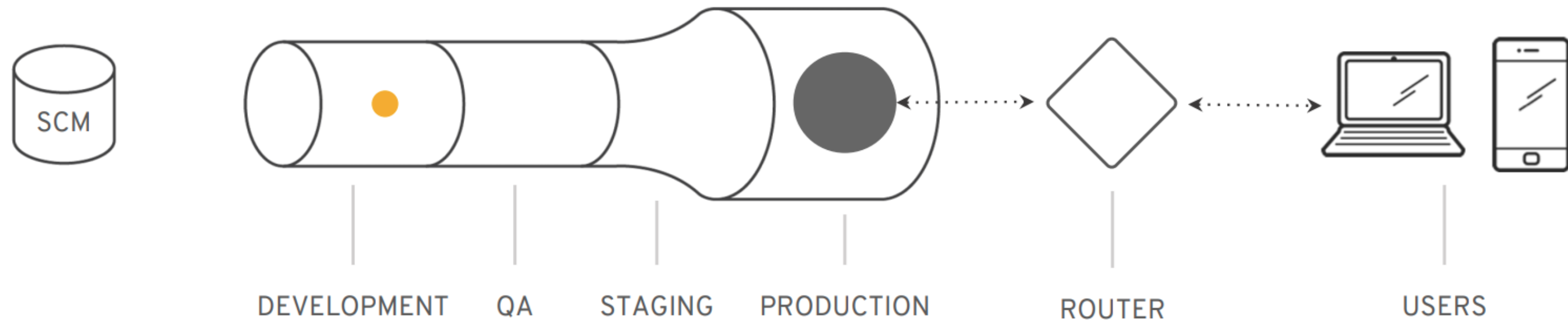


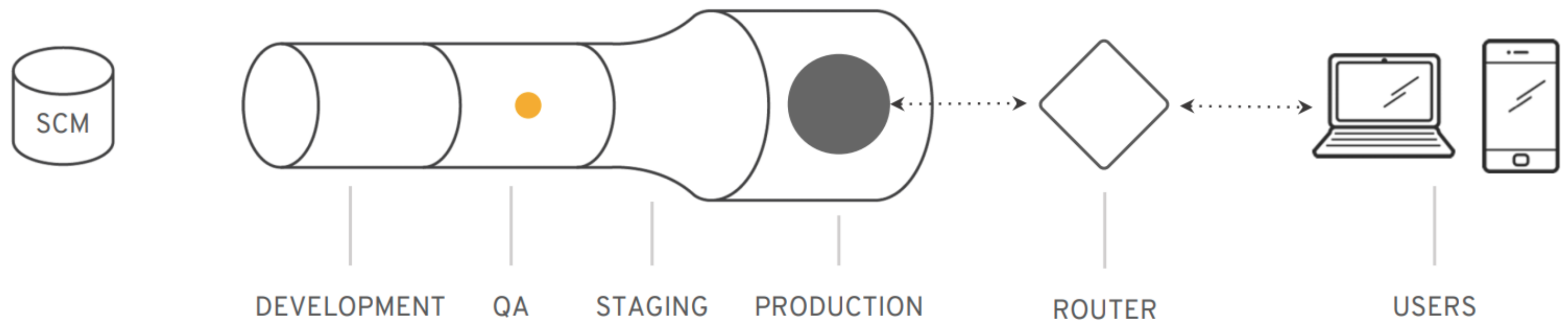
Canary Deployment

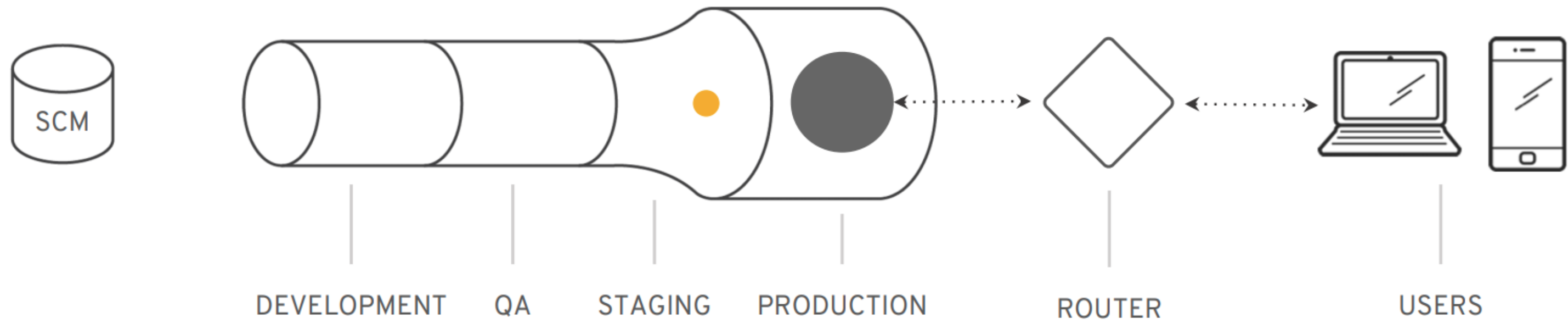


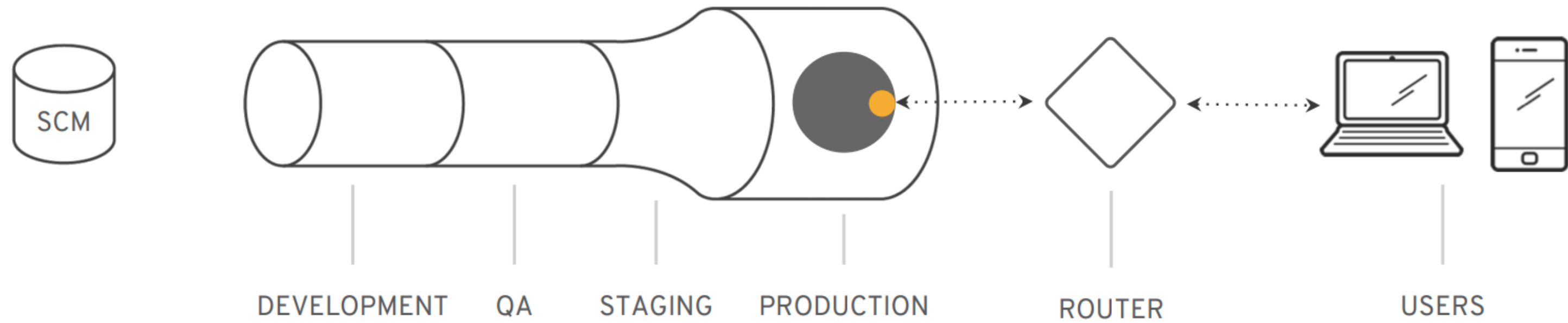


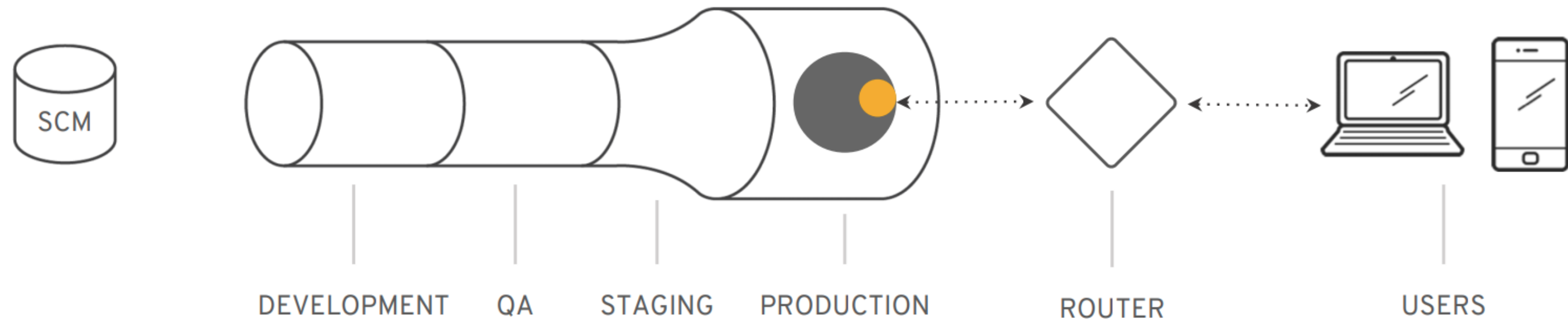


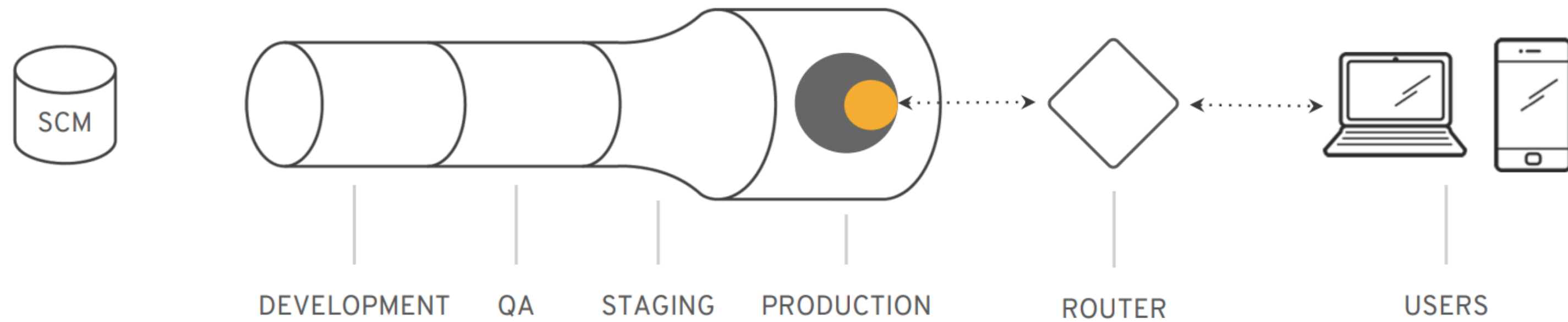


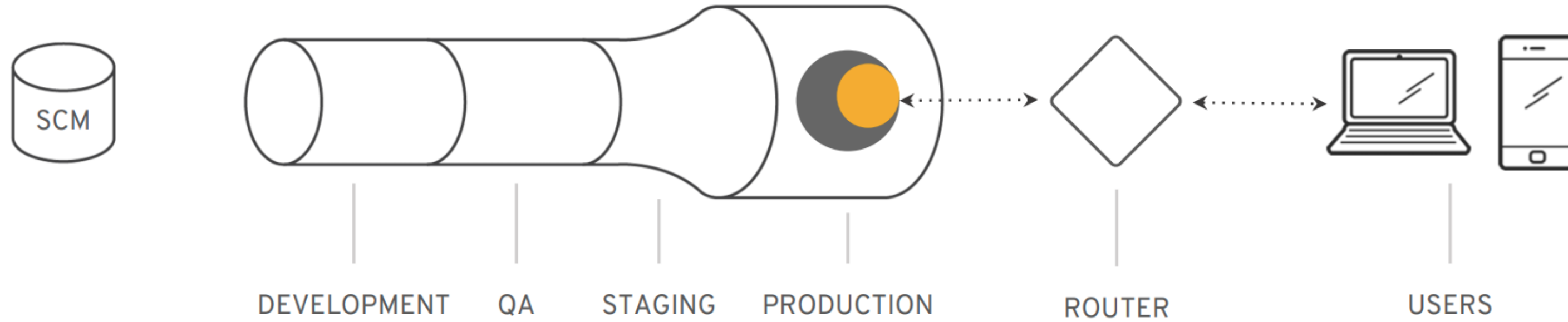


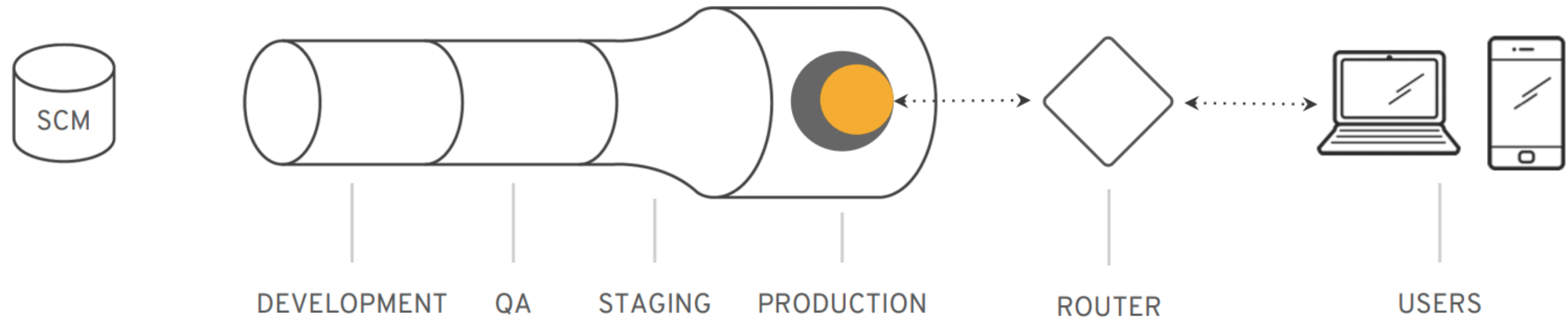


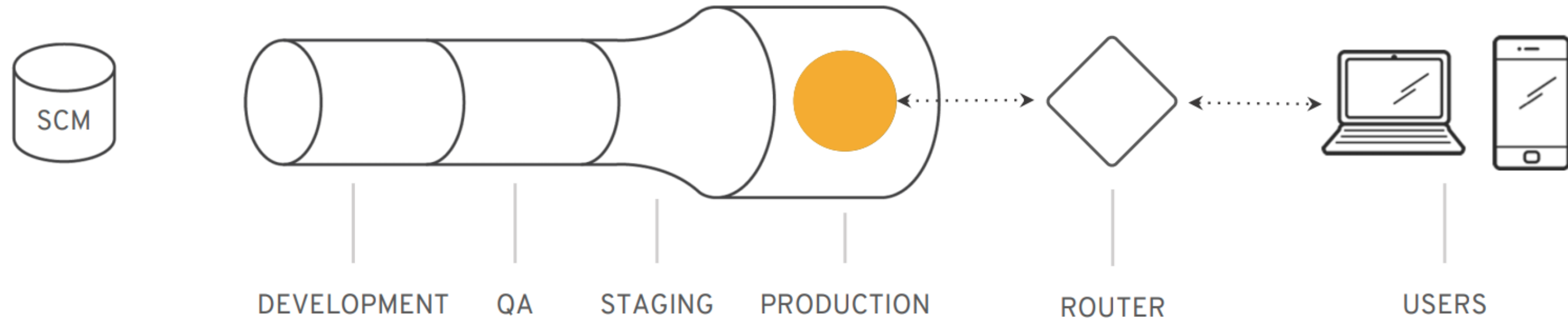














Traffic-Control Lab

Service Resiliency

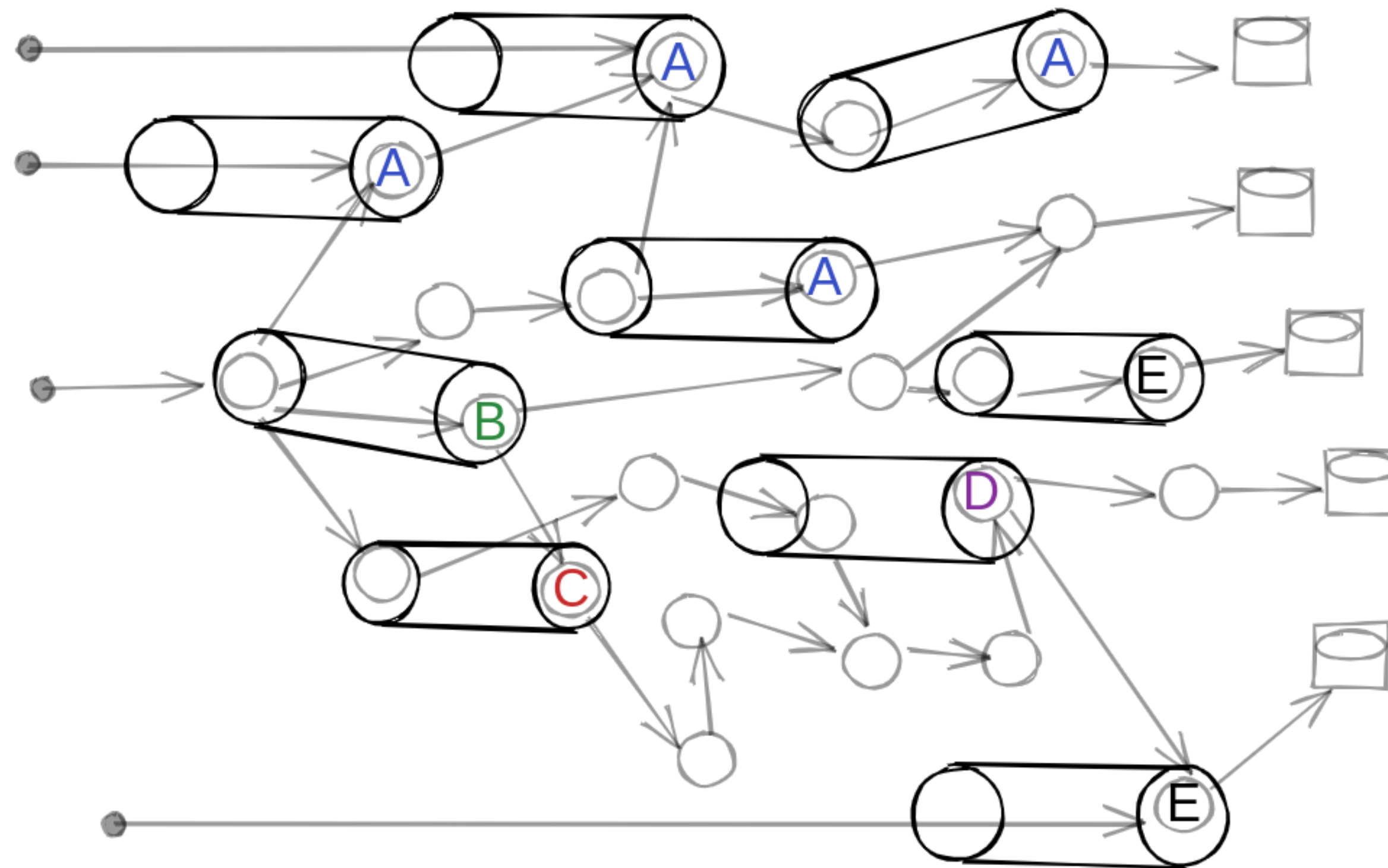
Service Resiliency

- Retry
- Timeouts
- Circuit Breaking

Service-Resiliency Lab

Security





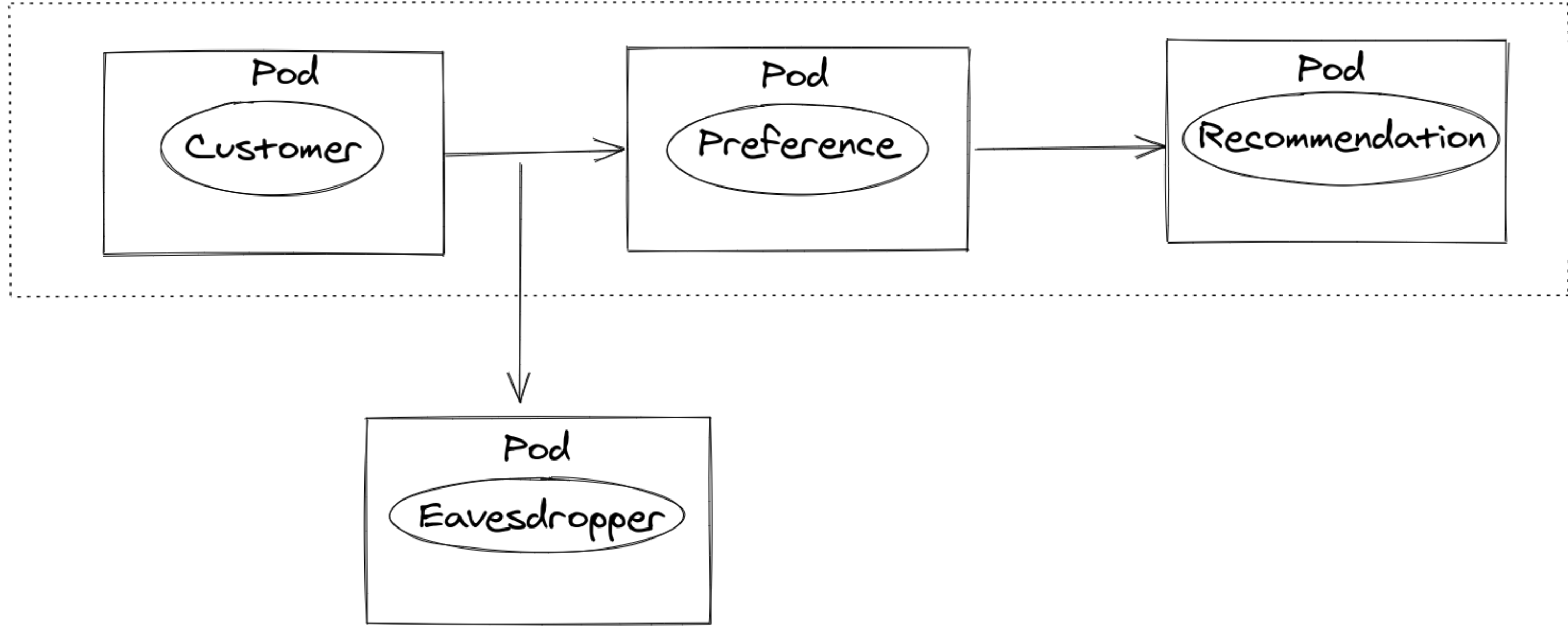
Team A

Team B

Team C

Team D

Team E



Istio Security Capabilities

- Egress Blocking
- mTLS - Encryption
- Access Control
- JSON Web Token (JWT) Authentication
- Role-based Access Control (RBAC) Authorization

Security Lab

Resources

- Read [Istio: Up and Running](#)
- Read [The Enterprise Path to Service Mesh Architectures](#)
- Read [Istio docs](#)

Thank you!

questions?

