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Summary of cloudnative
Kari Systä, 02.11.2021

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What it means to be Cloud Native approach — the CNCF way

https://medium.com/developingnodes/what-it-means-to-be-cloud-native-approach-the-cncf-way-9e8ab99d4923

1. Containerization

- **Docker container** image is a lightweight, standalone, executable package of software that includes everything needed to run an application.

2. CI/CD

3. Orchestration

- **Kubernetes** is the market-leading orchestration solution.

4. Observability & Analysis

- Monitoring, logging, and tracing

5. Service MESH

6. Networking and Policy

- Flexibility with authorization, admission control and data filtering

7. Distributed Database

- When you need more resiliency and scalability than you can get from a single database

8. Messaging

9. Container registry and runtimes

10. Sofware distribution

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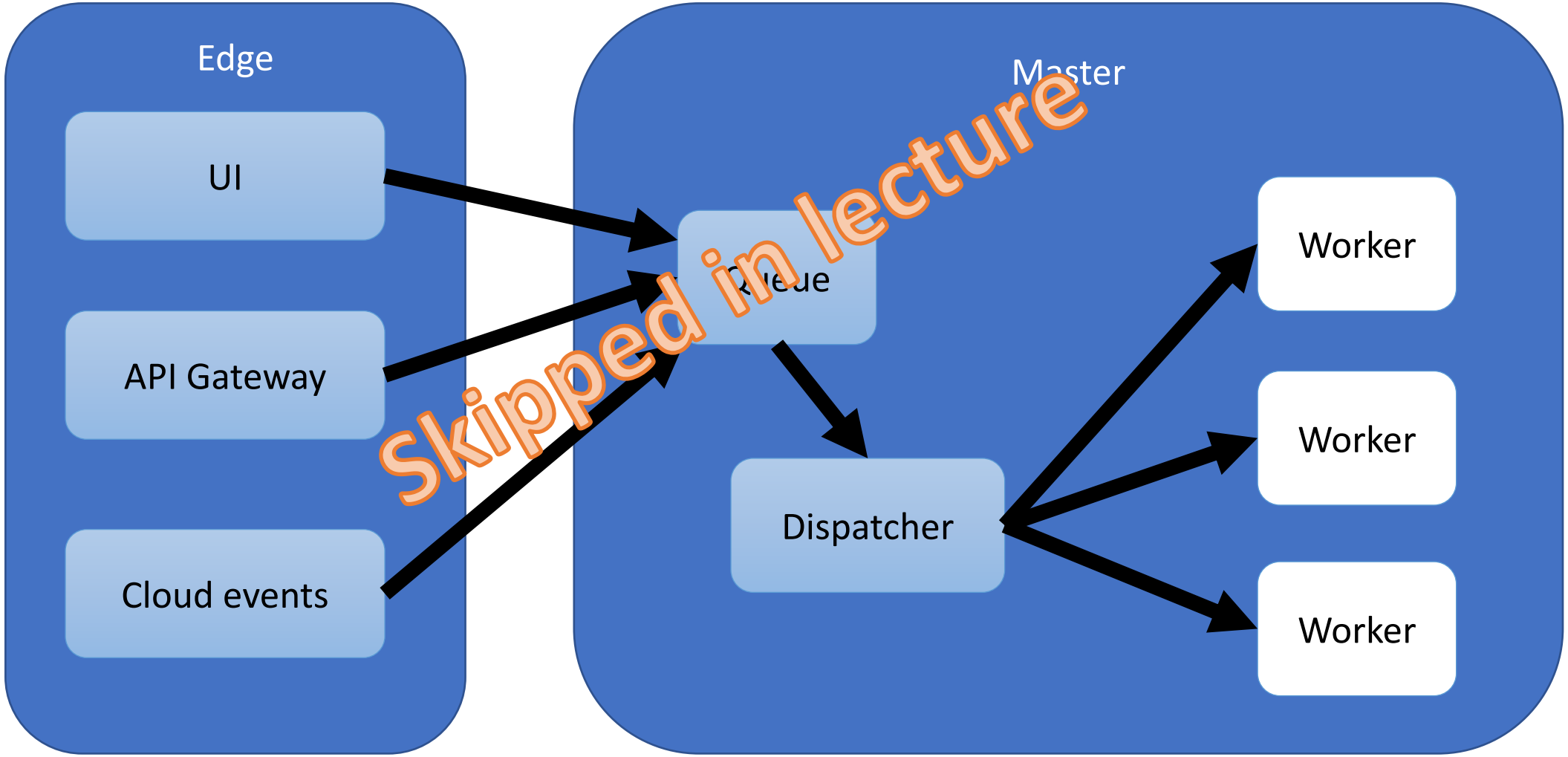
Serverless

Baldini et al: Serverless Computing: Current Trends and Open Problems



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Microservices vs. Serverless/FaaS
(They are different – do not call serveless microservices)

- Microservice
  - Small services running in their own process and communicating with lightweight services
  - Can be stateful

- Serverless / FaaS
  - Short term execution triggered by a request, then closes down
  - For stateless computing

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Some comparison

	Microservice	Serverless / FaaS
Bug hunting	Easier (but not easy)	Difficult
Infrastructure code	May be complex	Minimal or even non-existent
Scaling	Need to be implemented	Automatic
Performance	Good	Possible cold-start issues
Running cost	May include cost of idle time	Pay only per use

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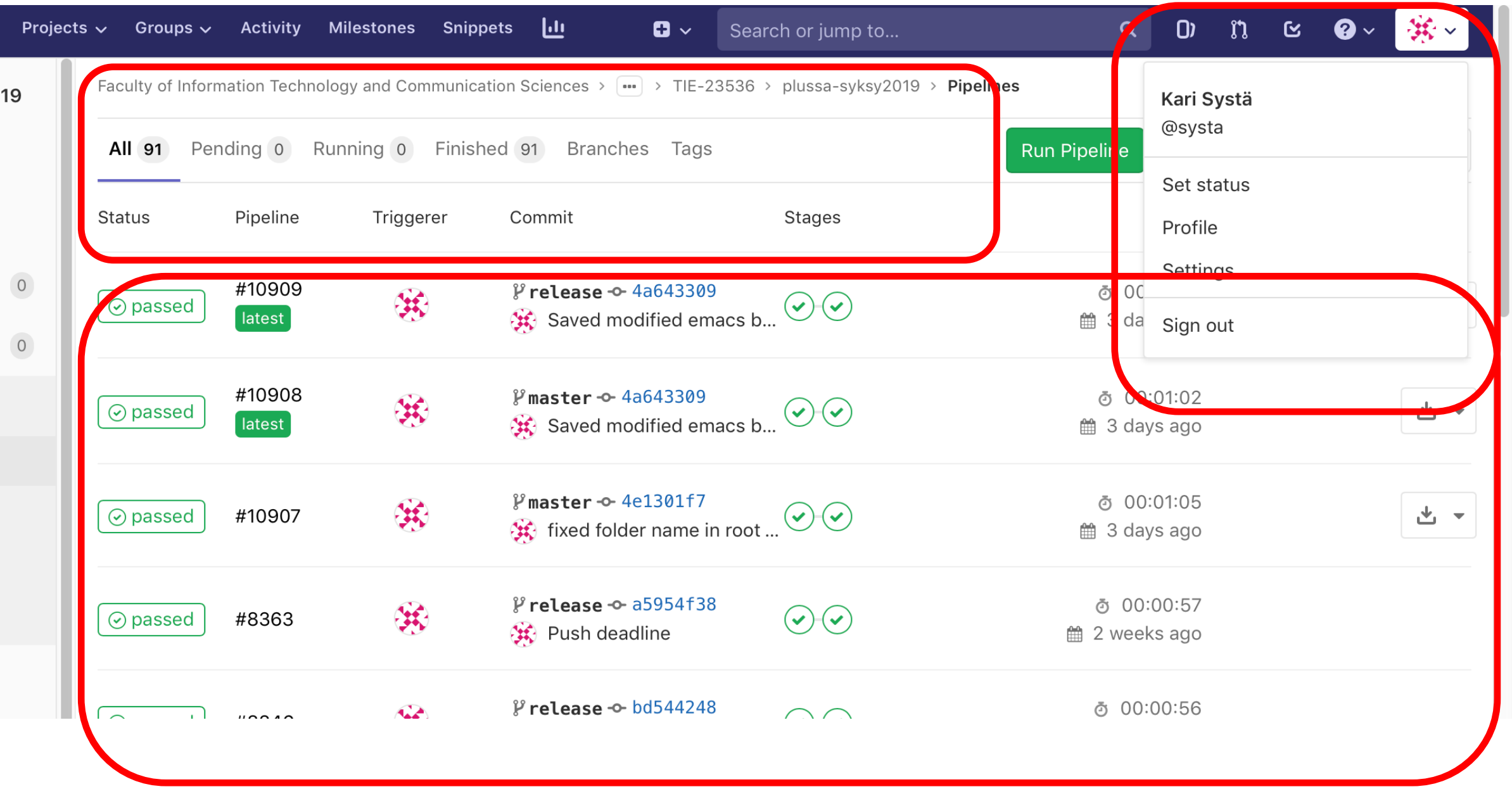
Microfront-ends



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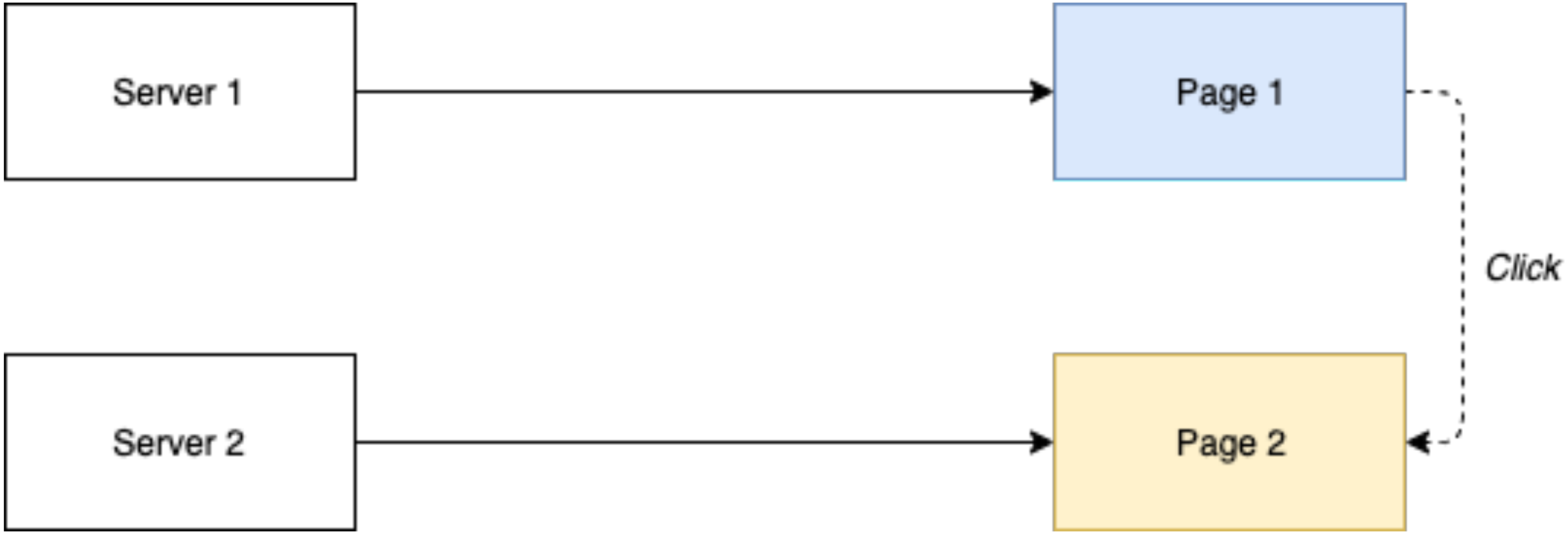
Alternative architectures

(from https://morioh.com/p/ee1b48c9de16)

1. Web Approach



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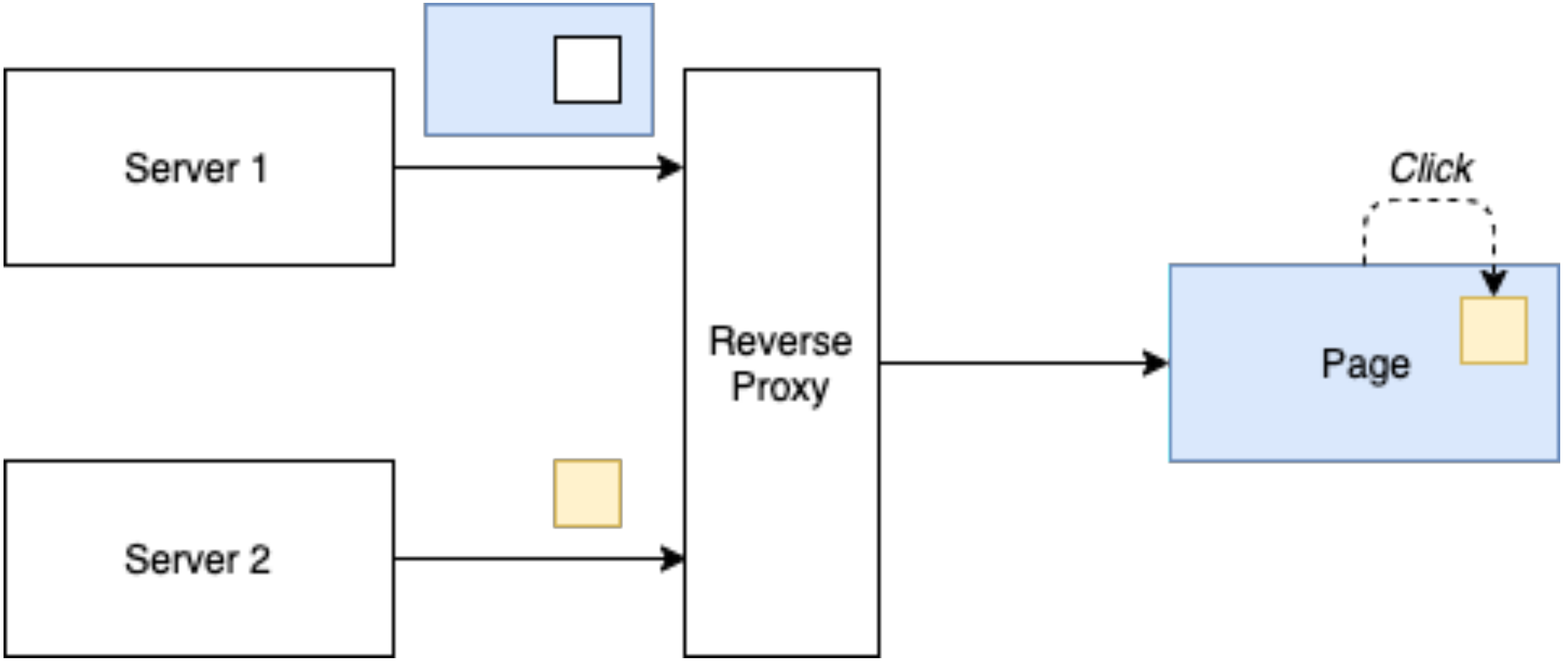
2. Server-side composition



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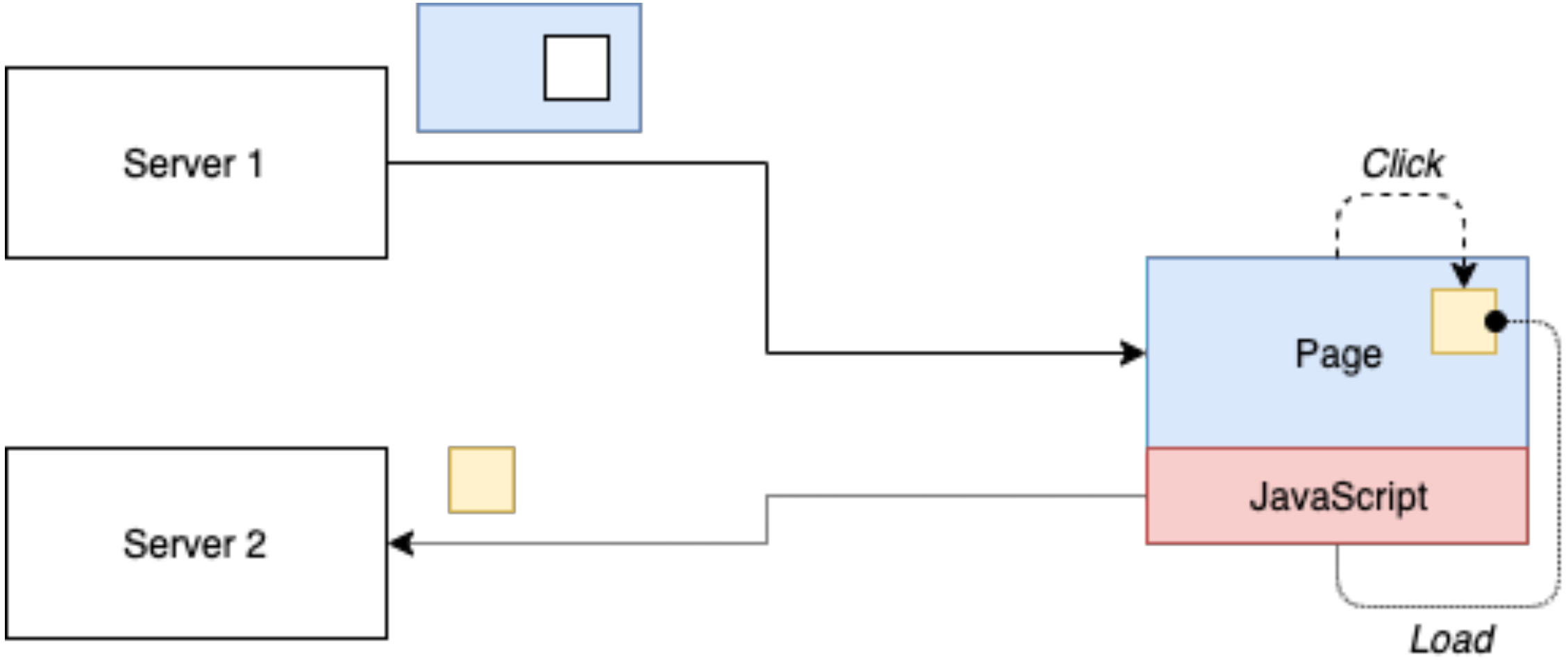
3. Client-side composition



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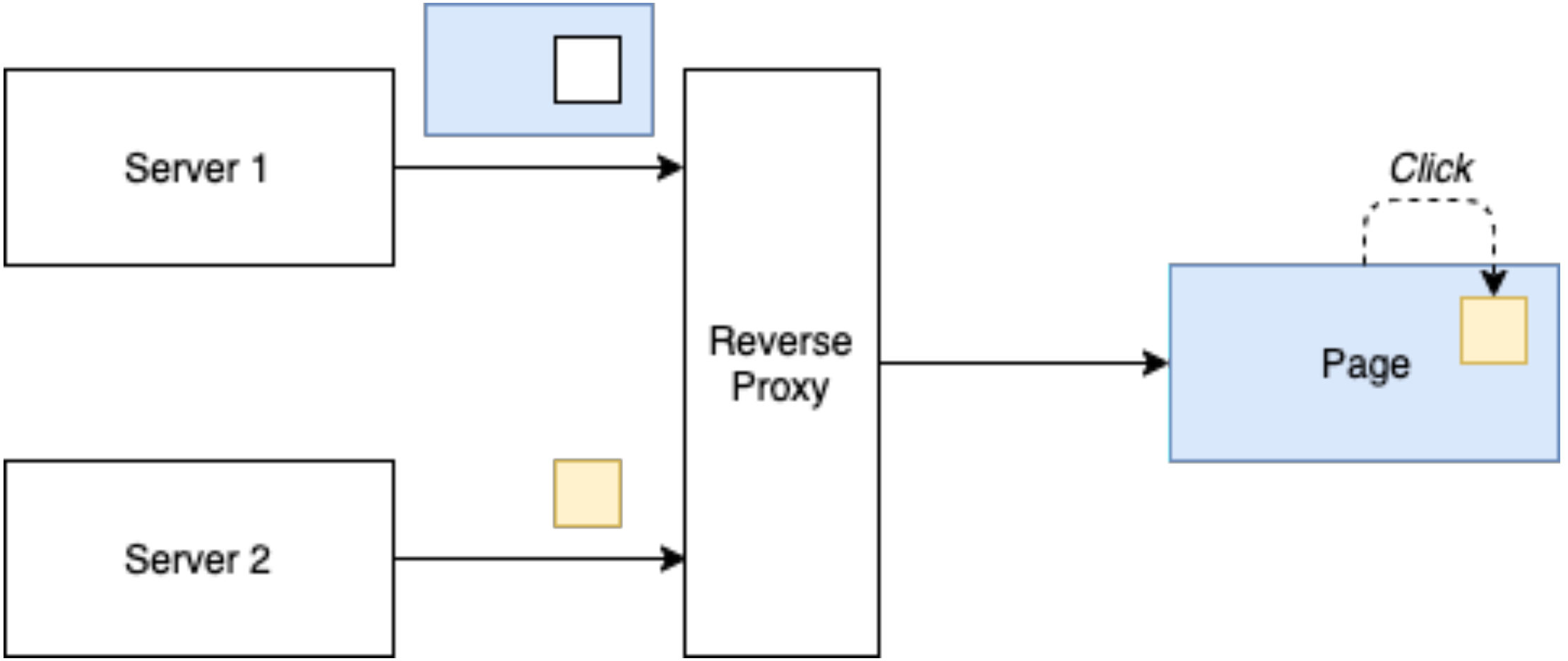
4. Client-side rendering



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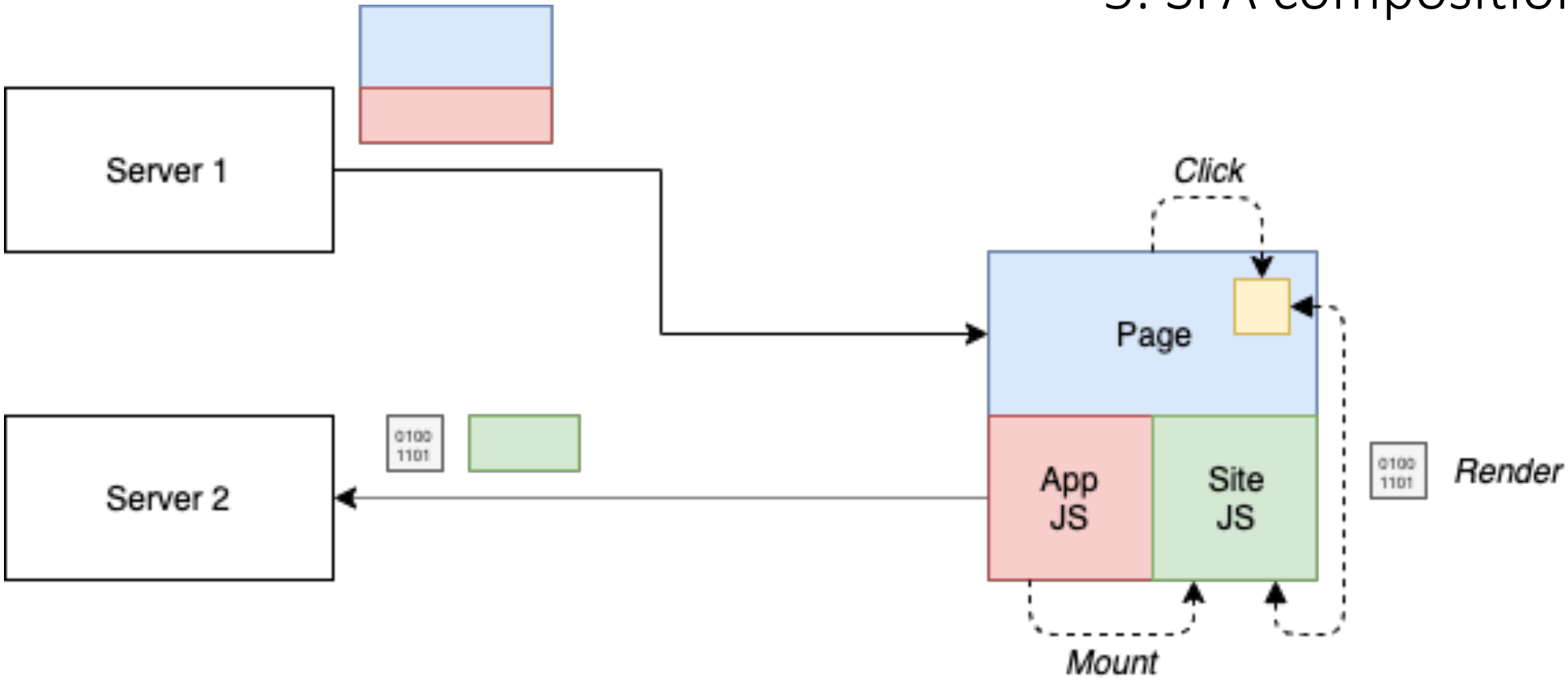
5. SPA composition



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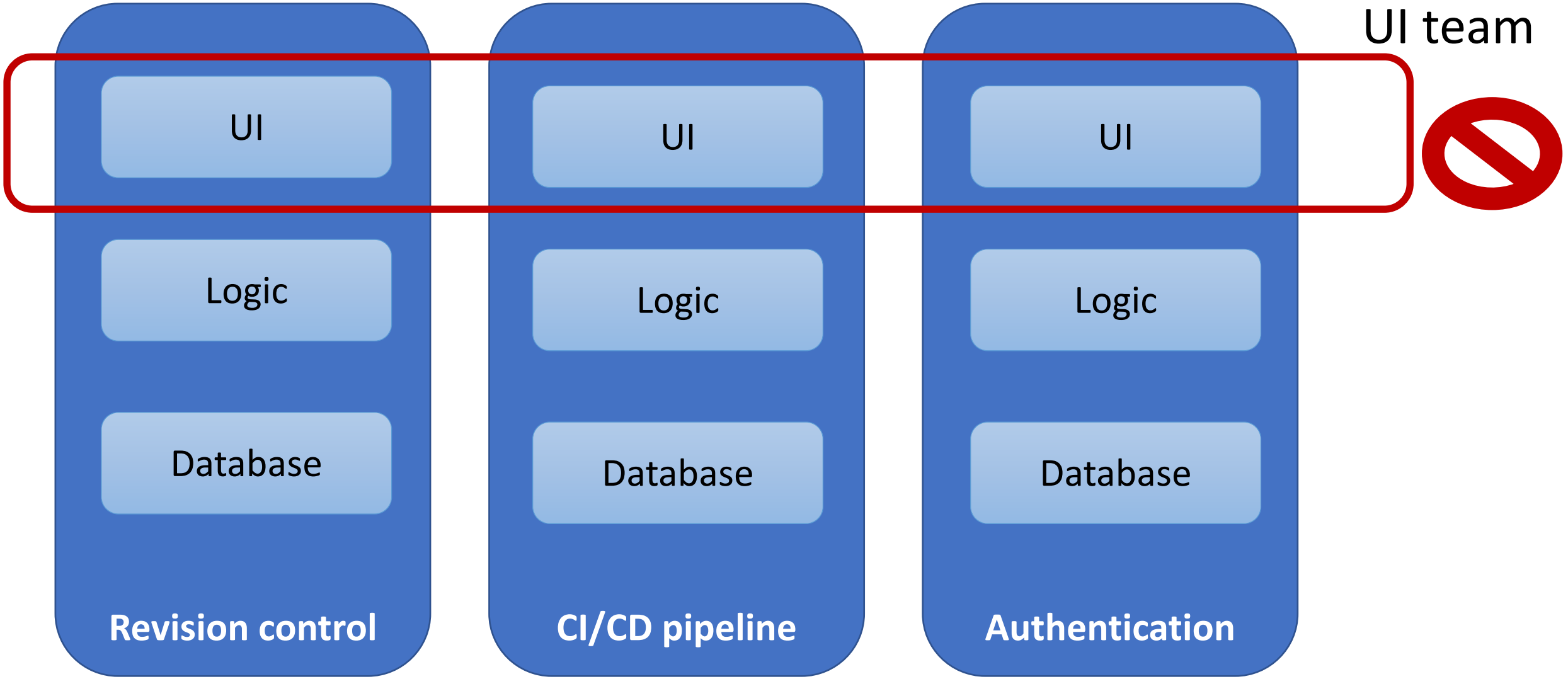
Organization and process issues



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Stateful vs stateless computation

- If a service has an internal state it is difficult to
  - Scale it
  - Move it to other server or other hosting system

  => Stateless Services are subject to cloud-specific optimizations
- The internal state my be
  - volatile or
  - non-volatile
  - ... in memory, file local to container,

- Serverless / FaaS

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7R's of cloud Micration

Replace
with imilar or improved but SaaS

Reuse
in the new SaaS version

Refactor
towards cloud-native architecture

Replatform
by using cloud services

Rehost
to a VM

Retain

Retire

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Reminder

https://thenewstack.io/10-key-attributes-of-cloud-native-applications/

- **Packaged as lightweight containers**
- **Developed with best-of-breed languages and frameworks**
- **Designed as loosely coupled microservices**
- **Centered around APIs for interaction and collaboration**
- **Architected with a clean separation of stateless and stateful services**
- **Isolated from server and operating system dependencies**
- **Deployed on self-service, elastic, cloud infrastructure**
- **Managed through agile DevOps processes**
- **Automated capabilities**
- **Defined, policy-driven resource allocation**

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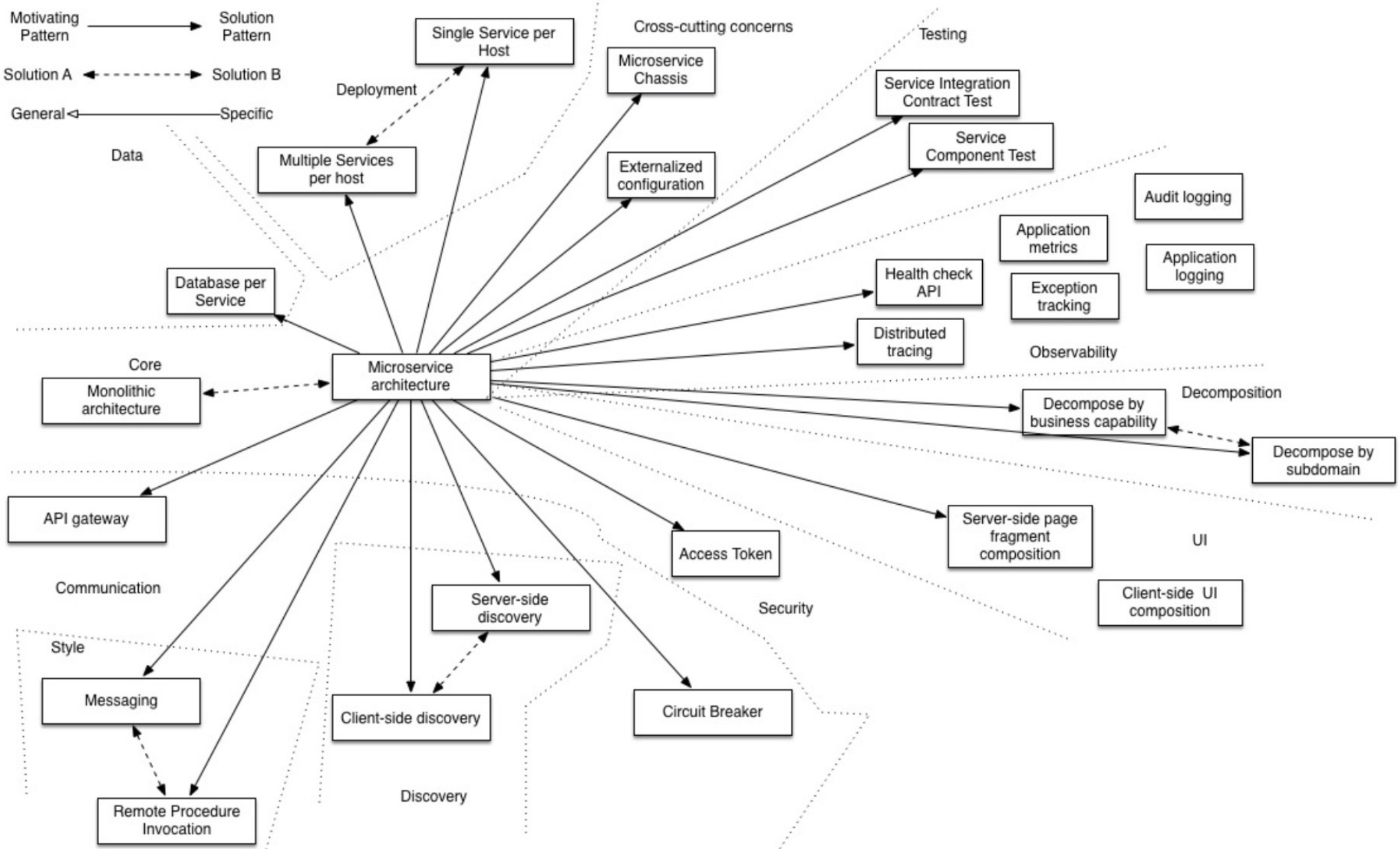
https://microservices.io/patterns/microservices.html



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Nice video about microservices

- Netflix story (Mastering Chaos - A Netflix Guide to Microservices) <https://www.youtube.com/watch?v=CZ3wIuvmHeM>