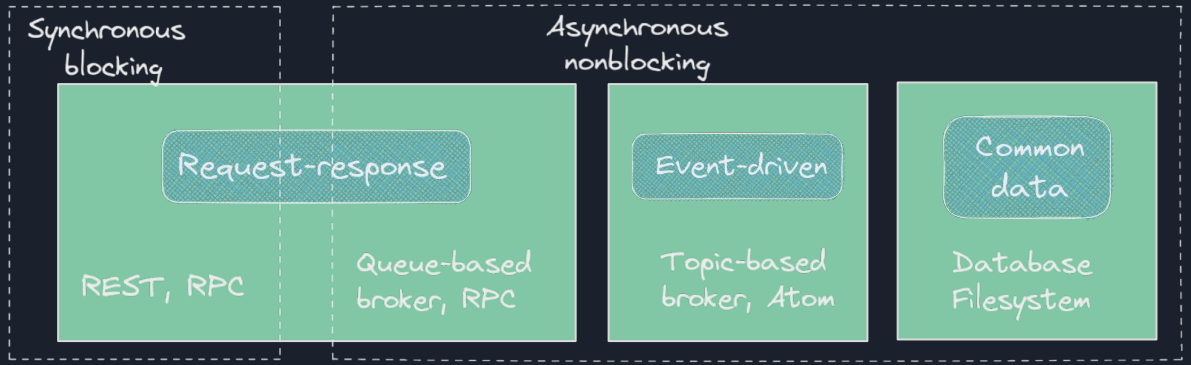
Introduction to

gRPC

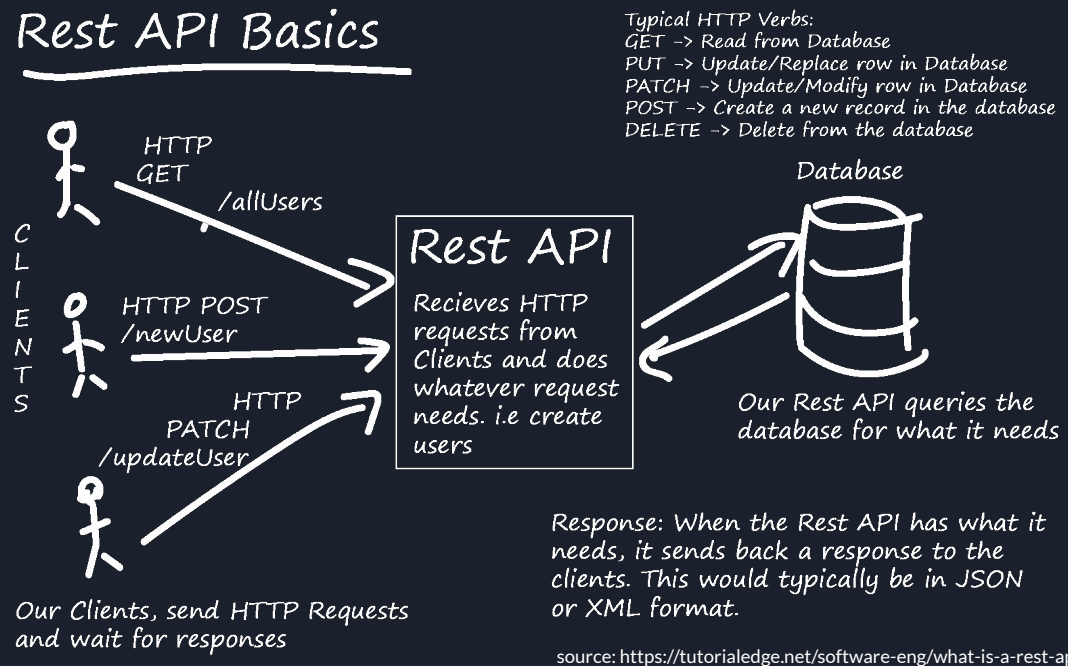
Motivation

Microservice Communication Styles



REST (Representational State Transfer)

Overview



source: https://tutorialedge.net/software-eng/what-is-a-rest-api/

REST (Representational State Transfer)

Design Principles

Based on Protocol **HTTP/1.1**

Payload mostly **JSON**

Code generation **Swagger**

API contract optional
- response format between an API and the client

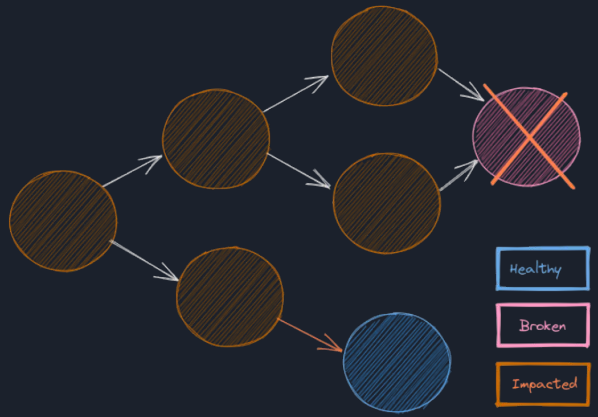
Synchronous communication between client and server

Advantages
- Simple to understand and implement
- Human readable payload
- Easy debuggable E.g. with curl or Postman
- Perfect fit for serverless (pay on execute)
- Ideal for public APIs

REST (Representational State Transfer)

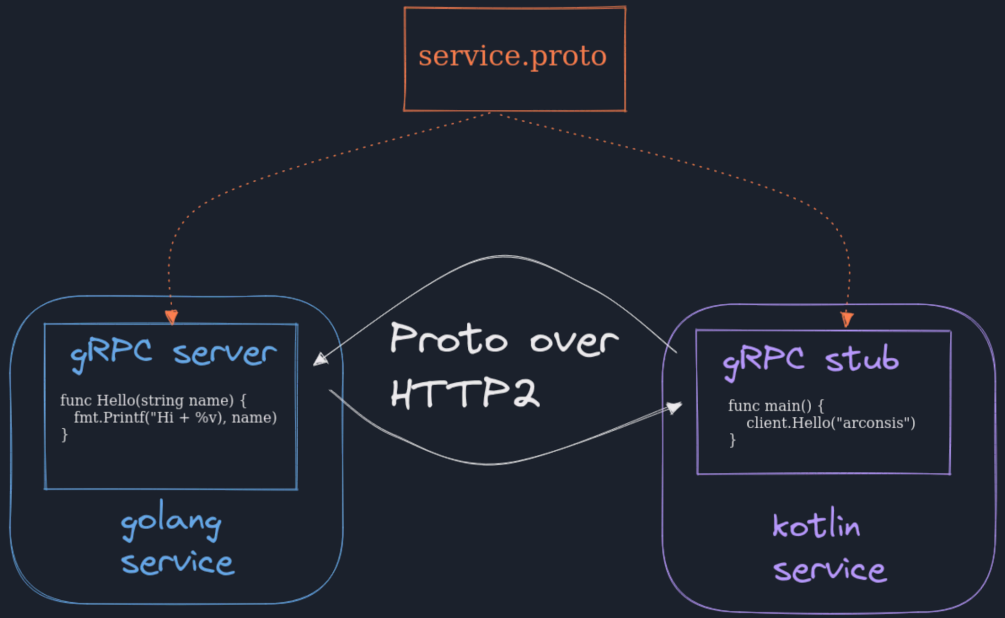
Disadvantages

- Payload can be a bottleneck in low latency or high throughput networks
- Does not support code generation for clients out of the box
- Unary & Synchronous by default



gRPC (**g**RPC **R**emote **P**rocedure **C**alls)

Overview



gRPC

Design Principles

“gRPC is a modern, open source remote procedure call (RPC) framework that can run anywhere. It enables client and server applications to communicate transparently, and makes it easier to build connected systems.”

Based on Protocol **HTTP/2.0**

Payload Agnostic but mostly **Protobuf**

Code generation **build-in**

API contract mandatory

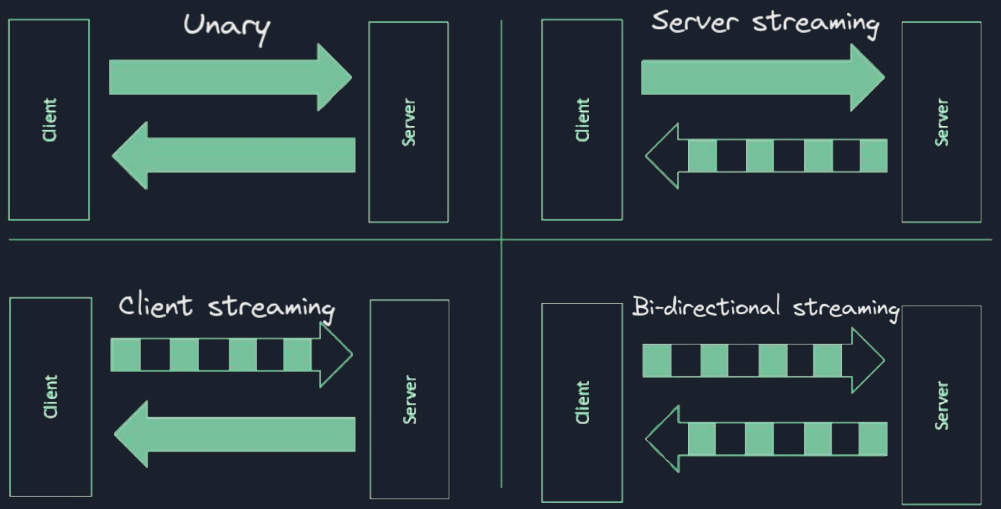
- Request and response format defined using Protocol Buffer

Blocking & Non-Blocking

- Support both asynchronous and synchronous processing of the sequence of messages exchanged by a client and server

gRPC

Streaming



gRPC

Advantages

- High performance due to compact message payload
- Streaming
- Code Generation
- Interoperability

Disadvantages

- Limited Browser Support
- Payload not human readable
- Harder to debug
- Steeper learning curve

Conclusion

When to use gRPC instead of REST?

- microservice-to-microservice communication
- When efficient communication is a goal (IoT)
- In multi-language environments
- Real-time communication services where you deal with streaming calls