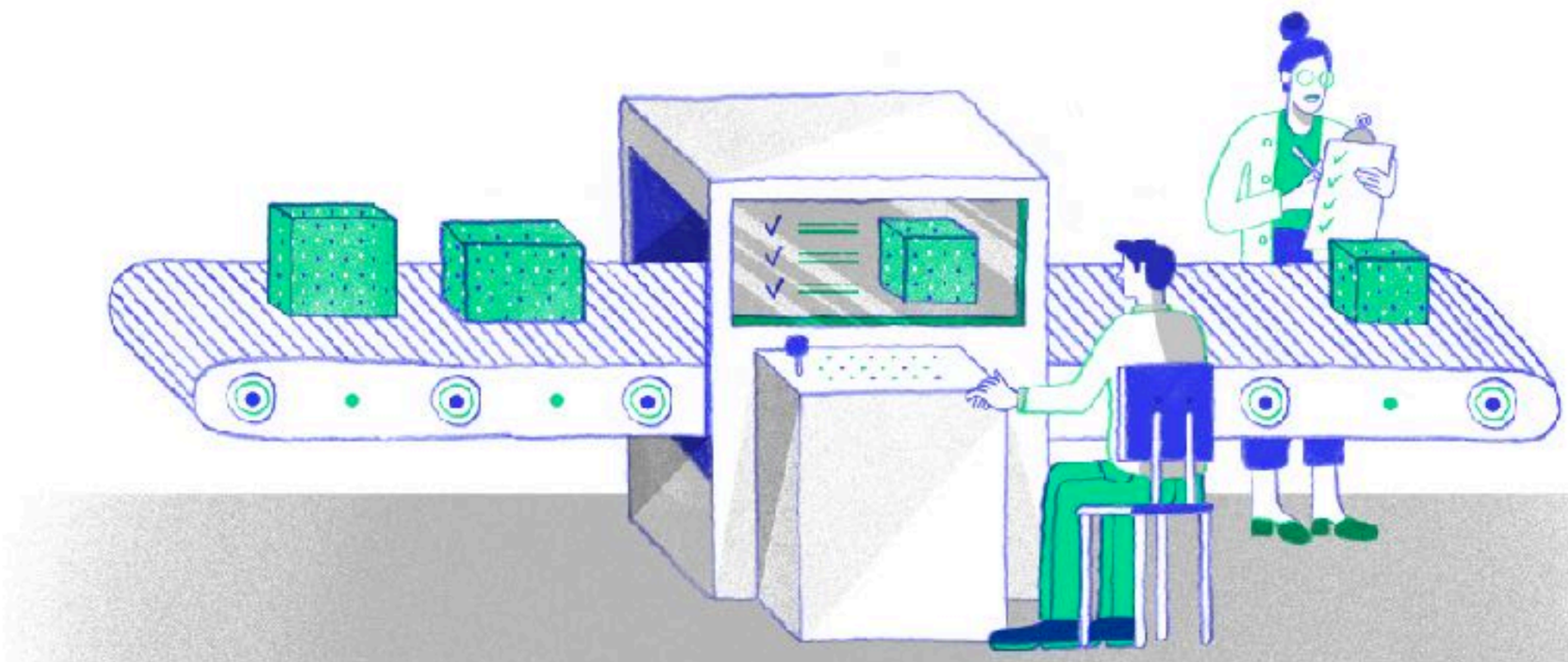
Olist Architecture

From monotith to microservices



Osvaldo

- Programador amador desde 1986, profissional desde 1989 e pythonista desde 2000
- Criador e ex-moderador da da python-brasil@yahoo (atual python-brasil@googlegroups)
- Criador da primeira versão do www.python.org.br
- Sócio fundador e ex-presidente da Associação Python Brasil
- Autor do (antigo) livro Python e Django
- Atualmente na Olist
- osvaldo@olist.com e @osantana (ou @osantanabr)

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O que nós fazemos?

Merchants

Online | Offline

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Submarino

AMERICANAS.COM

mercado livre

extra

CASAS BAHIA

Walmart

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Previous System

Monolithic

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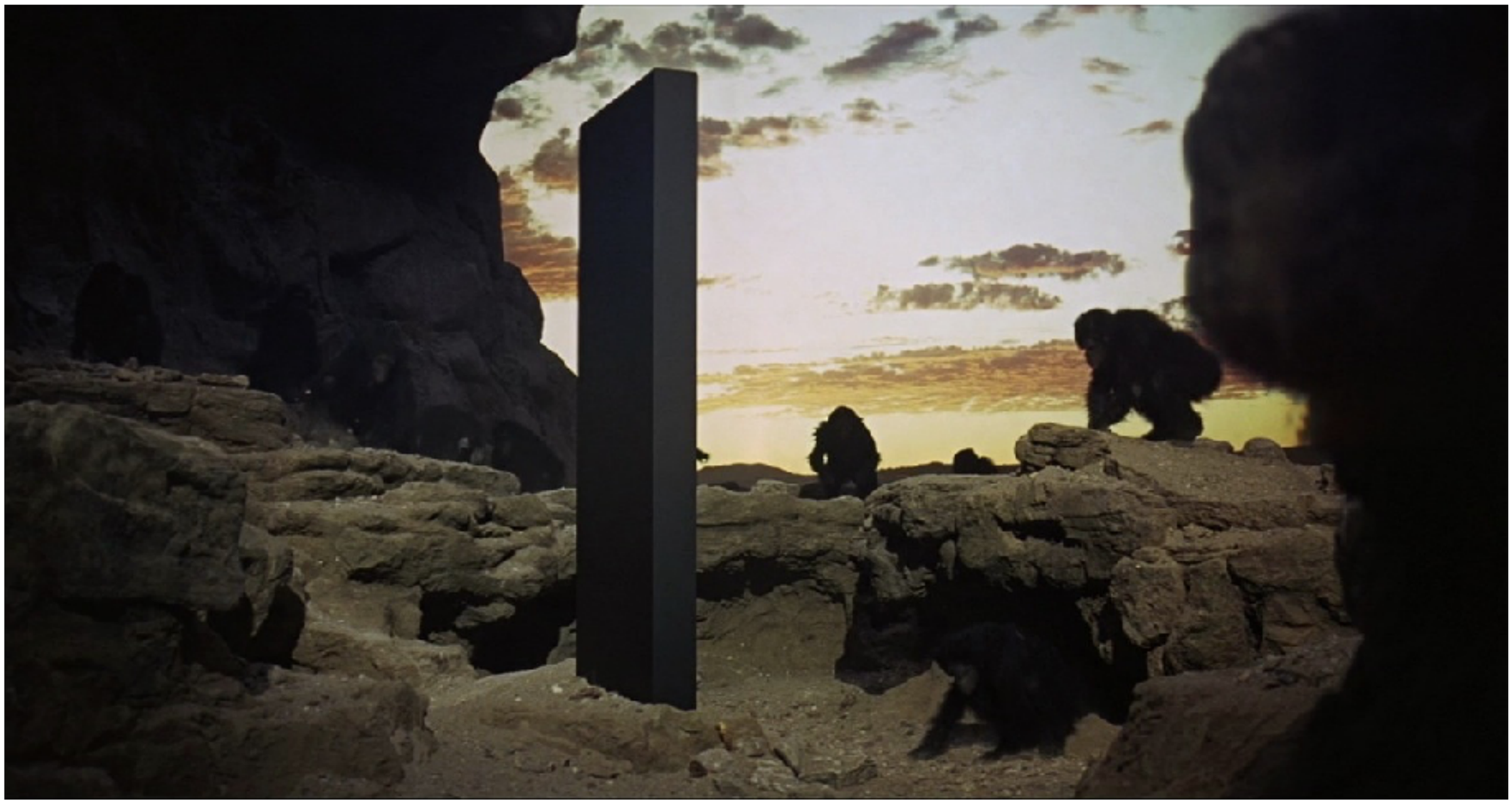

Monolithic

No Scalability

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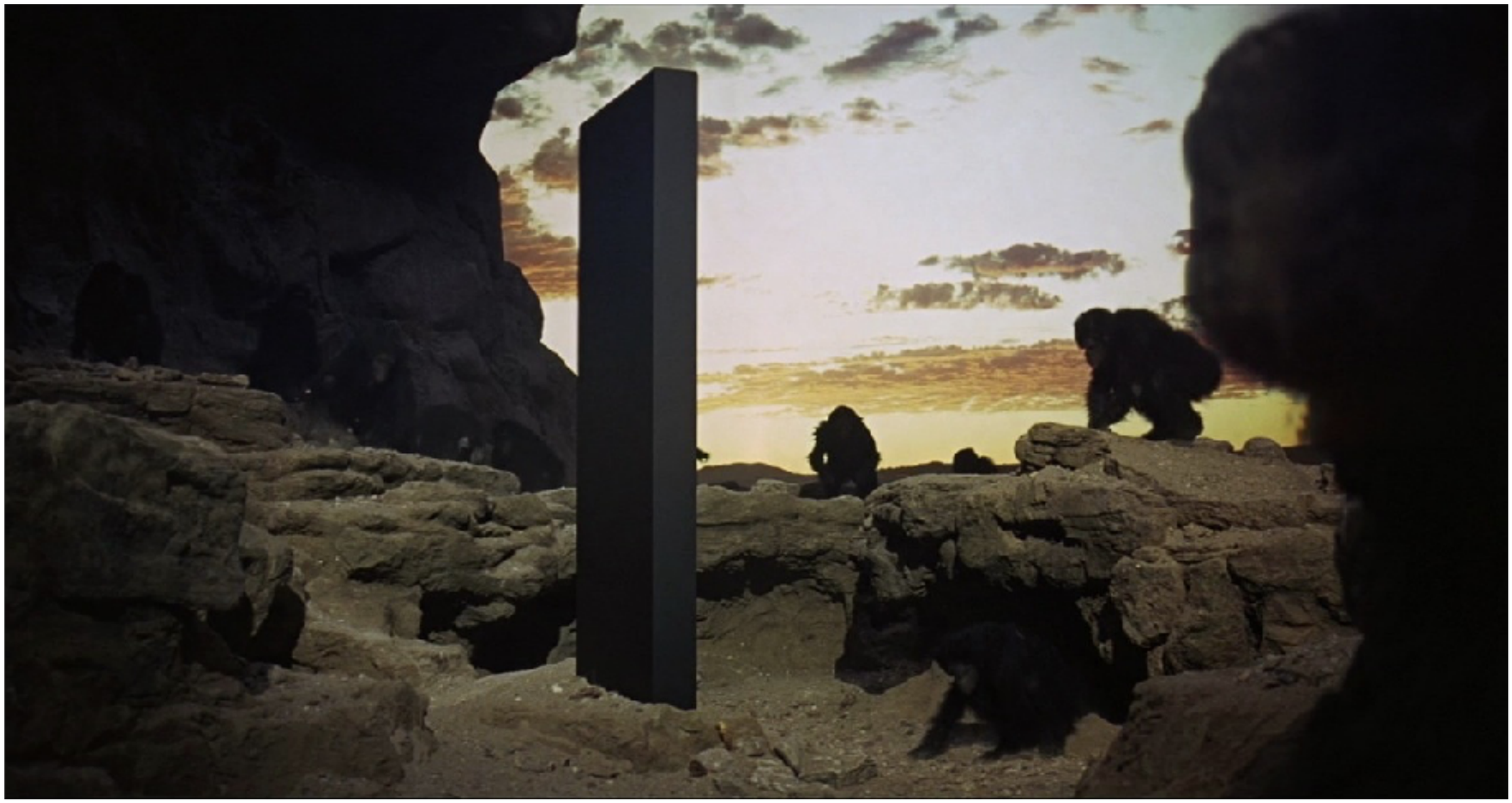

Monolithic

No Reliability

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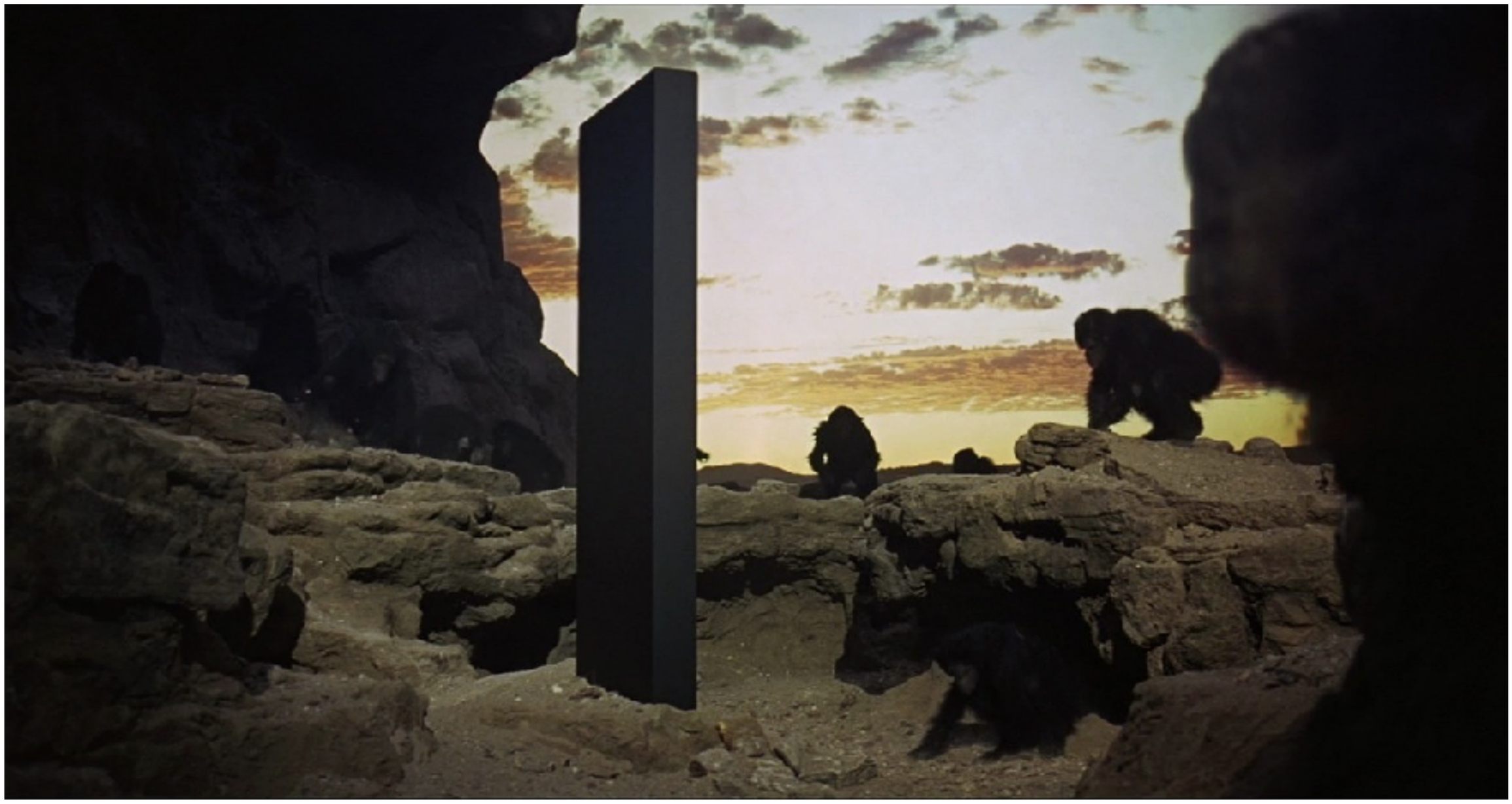

Monolithic

No Safety

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Monolithic

Complex

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New Platform

Let's write a new version...

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Requirements

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Requirements

Simplicity

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Requirements

Scalability

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Requirements

Resilience

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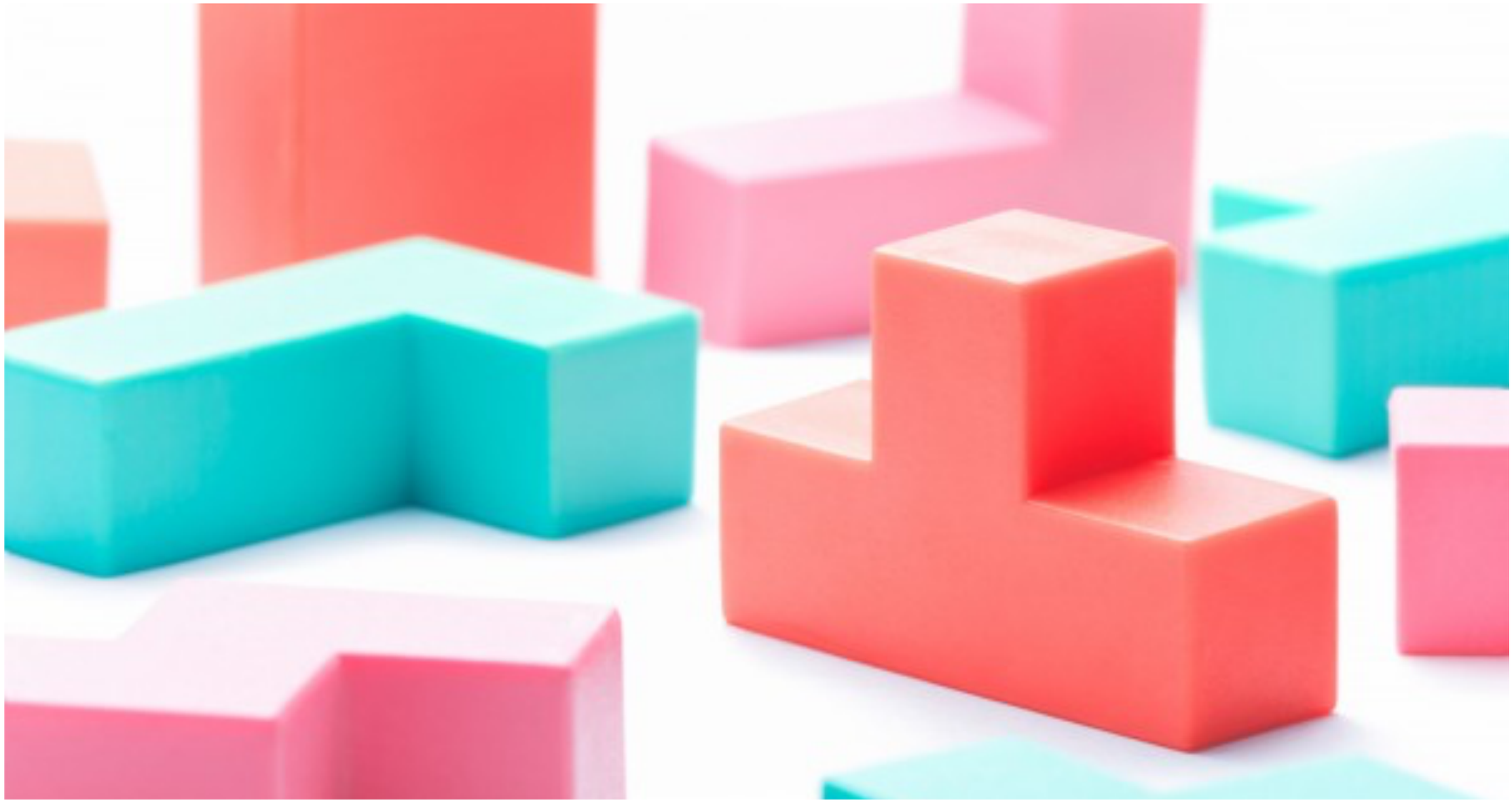

Requirements

Modularity

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Requirements

Safety

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Premisse

- No matter if a **system** is internal or external, it eventually...
- ... goes **offline**...
- ... **crashes**...
- ... or **change their behaviour without notice**.

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New Architecture

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Microsservices

... or SOA

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Microservices

Implementation Models

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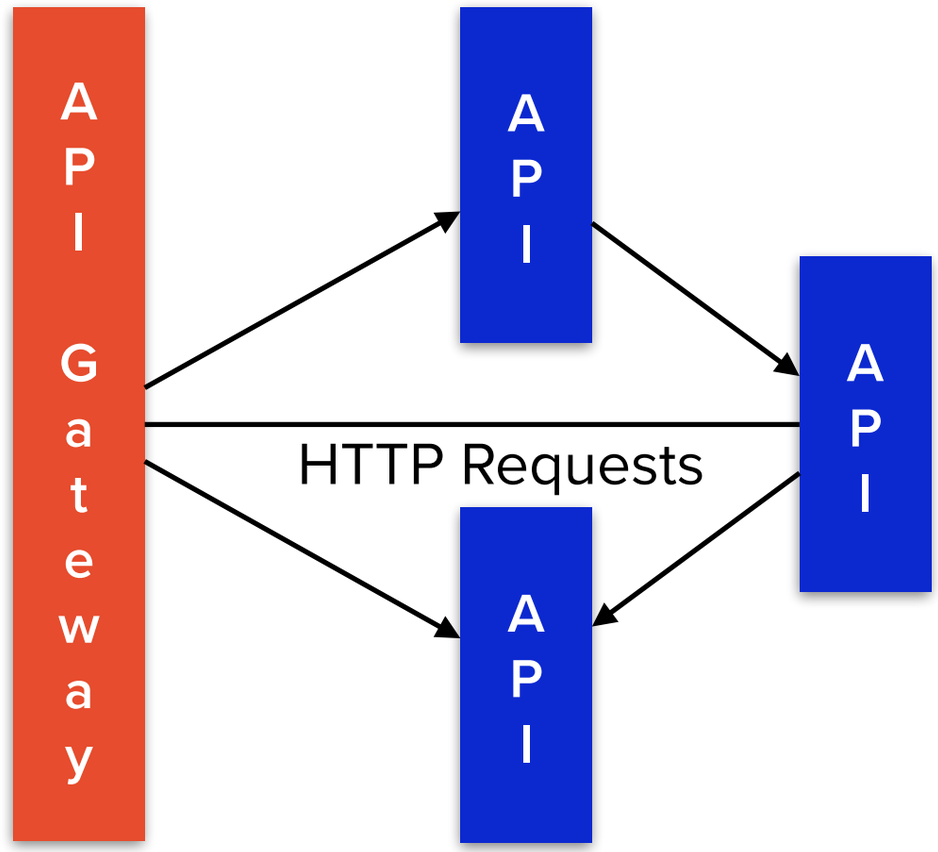
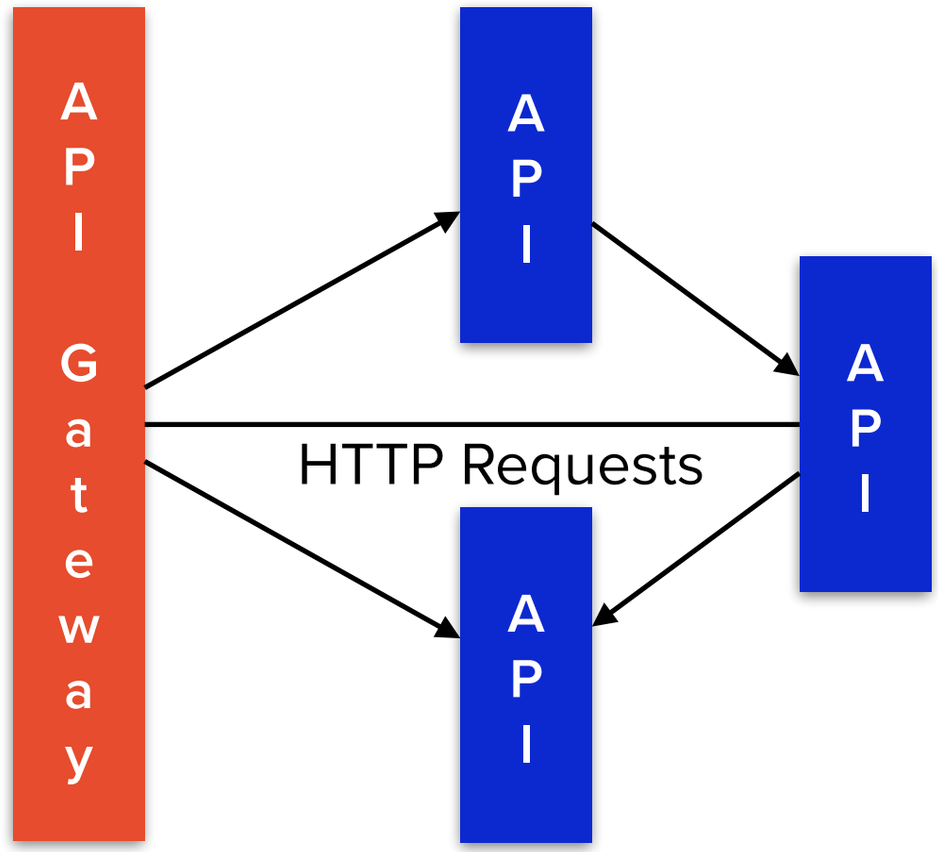
Communication via API



Communication via API

- RESTful communication between services
- Synchronous Service Calls
- Strict dependency between services



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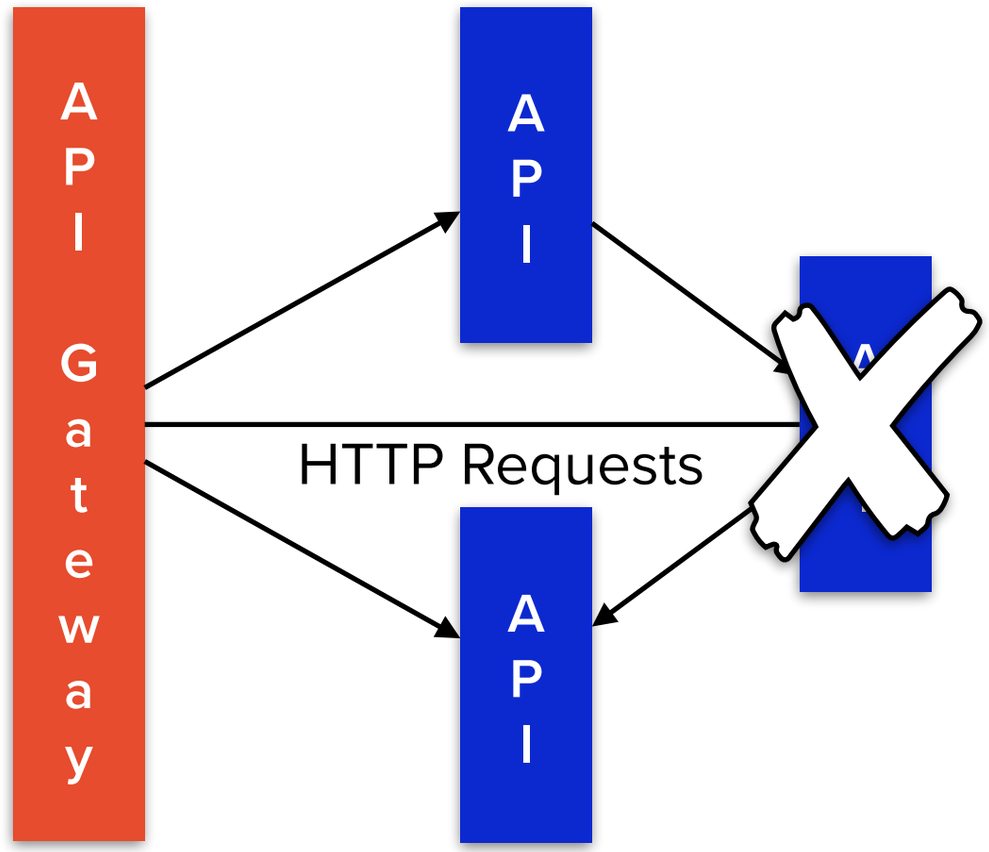

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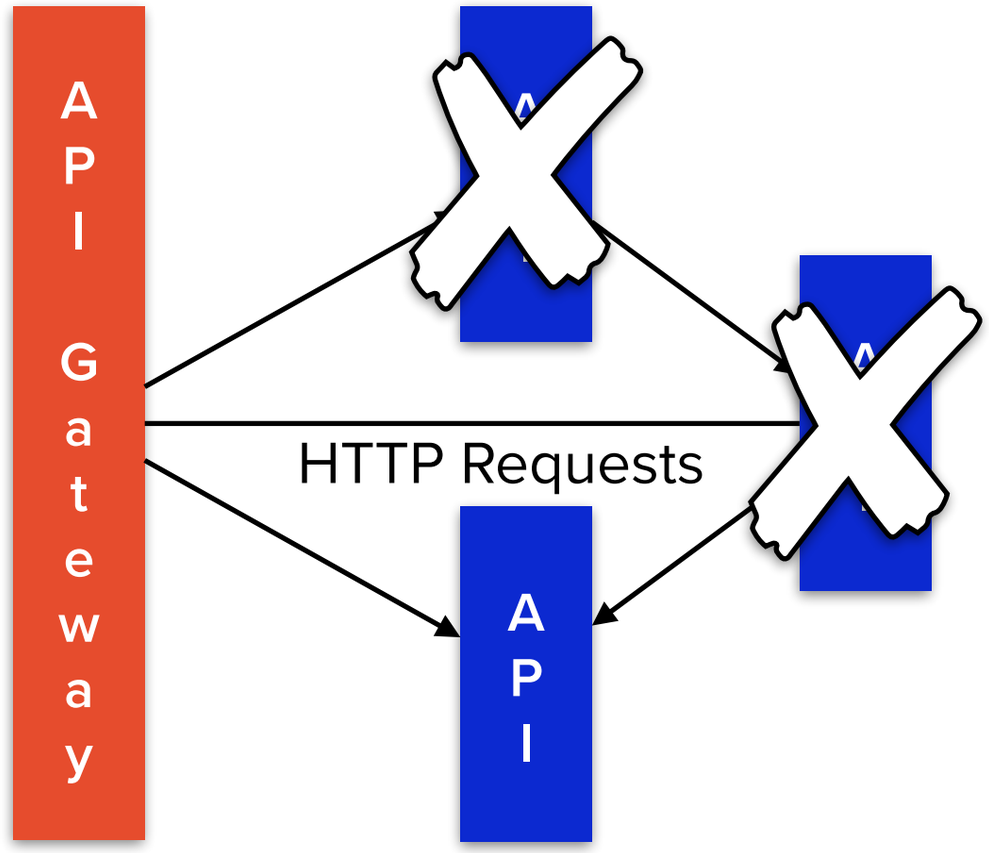

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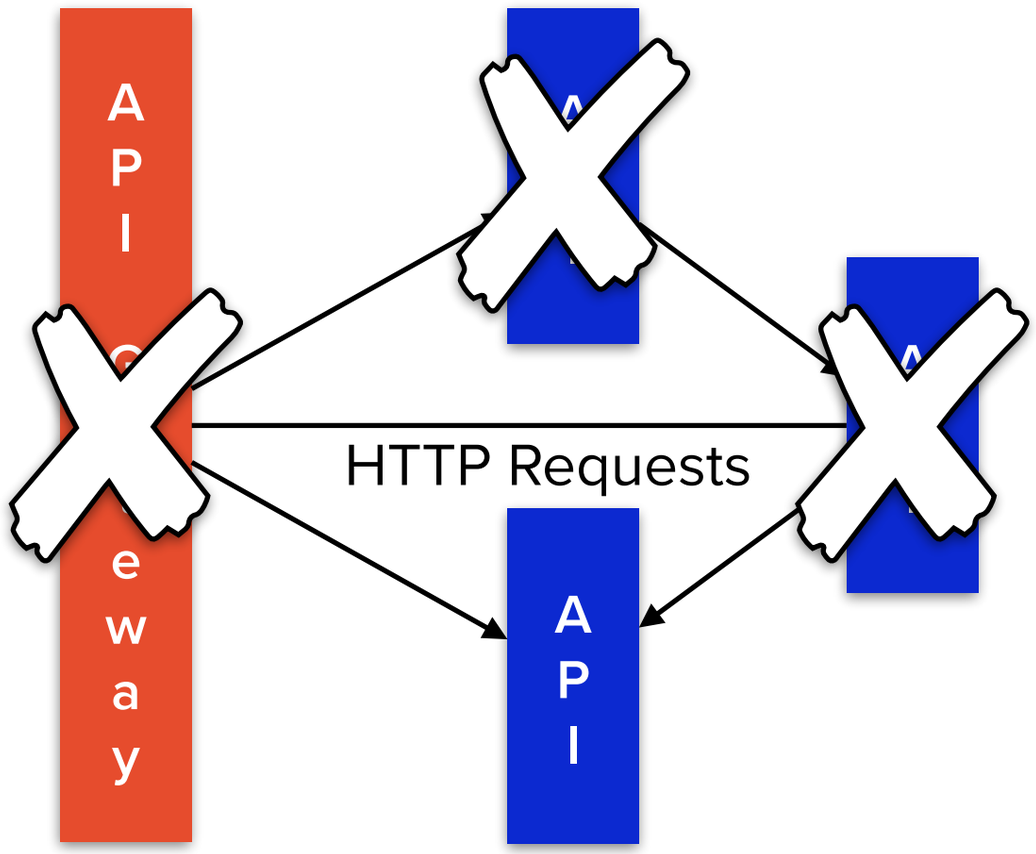
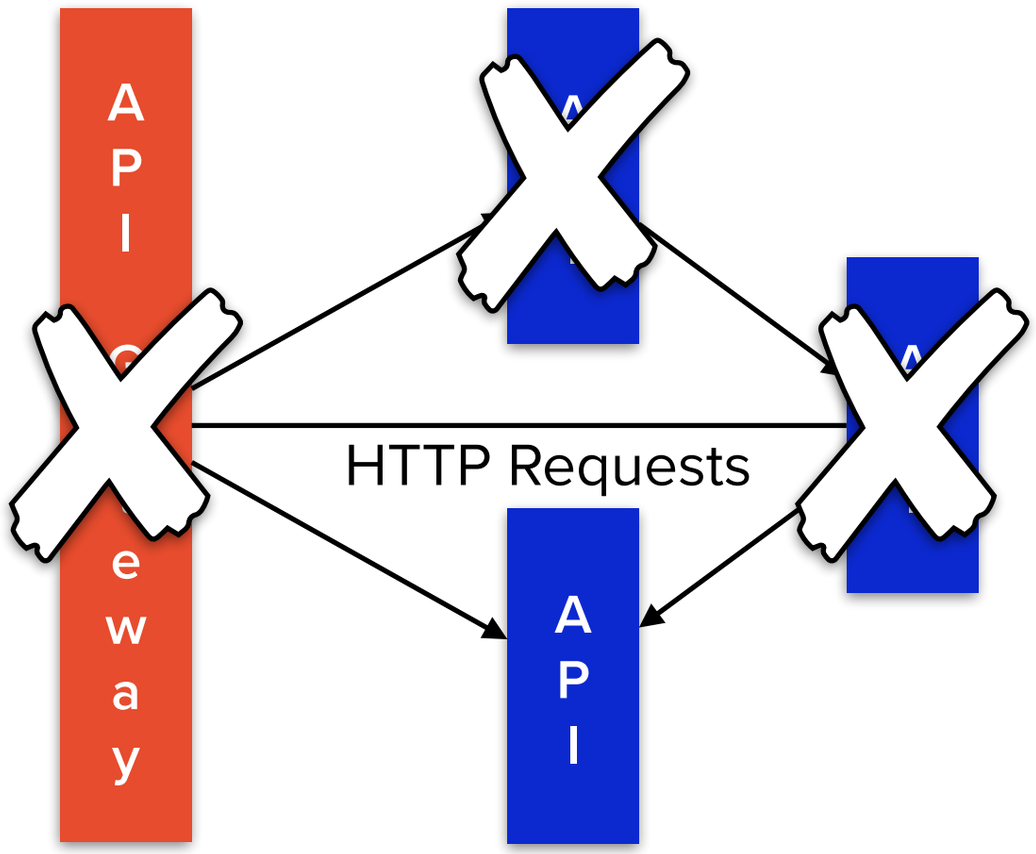
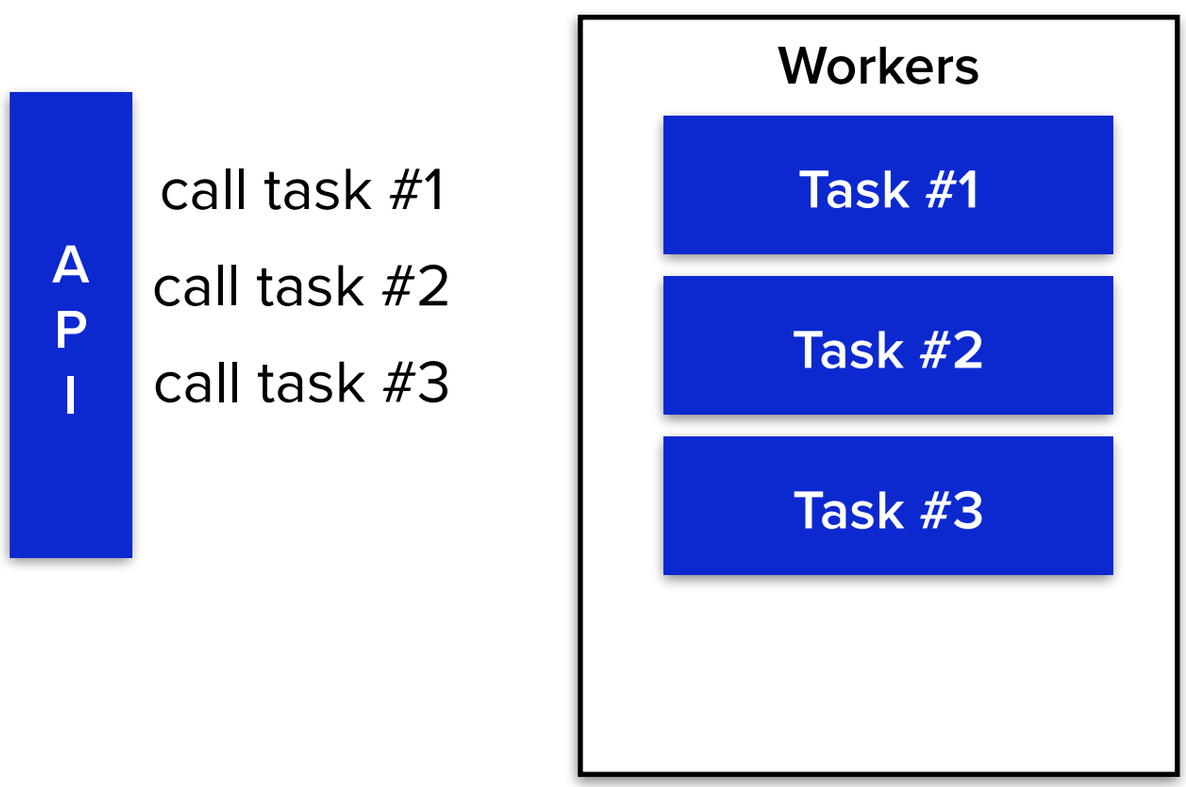


Communication via API

- RESTful communication between services
- Synchronous Service Calls
- Strict dependency between services
- No resilience
- No safety* (eg. data loss on request failures)

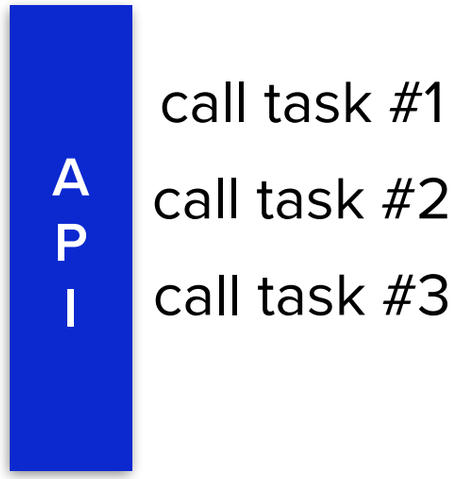


Async Task Execution



Async Task Execution

- Asynchronous Procedure Calls
- Queue based task execution
- Client must knows about their dependents (I've to change API every time I need to add a new task)



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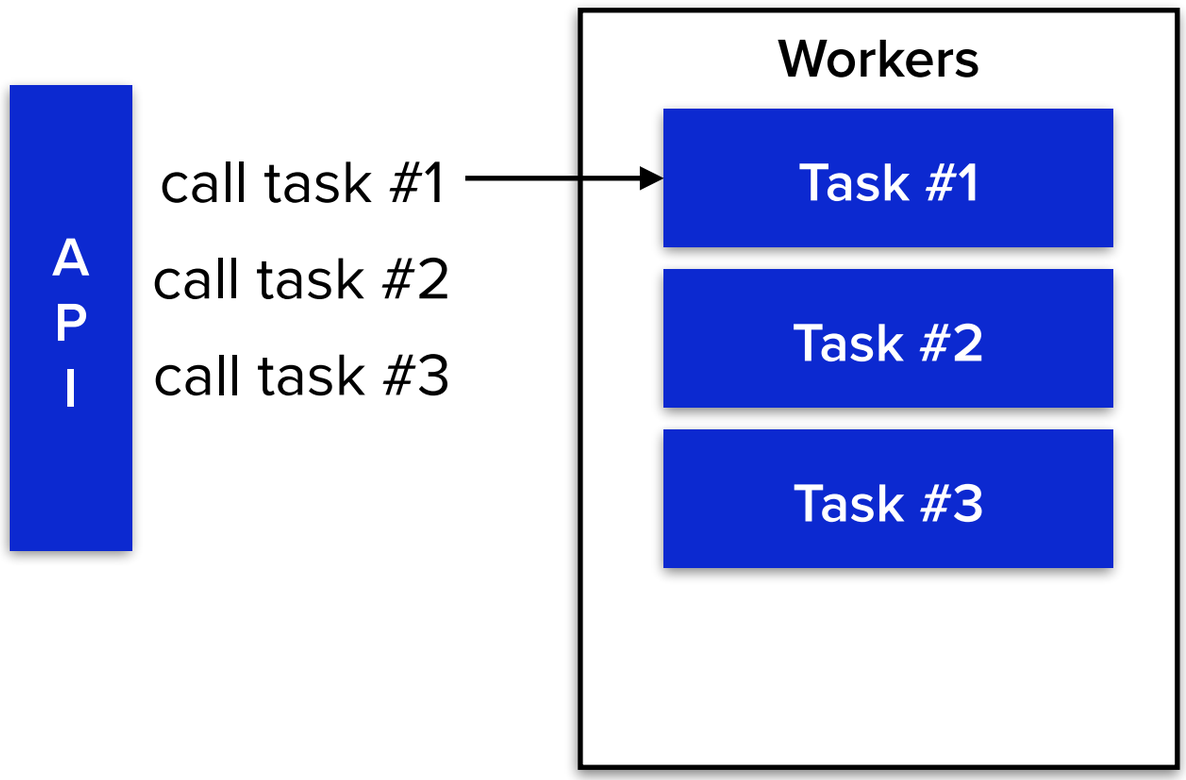

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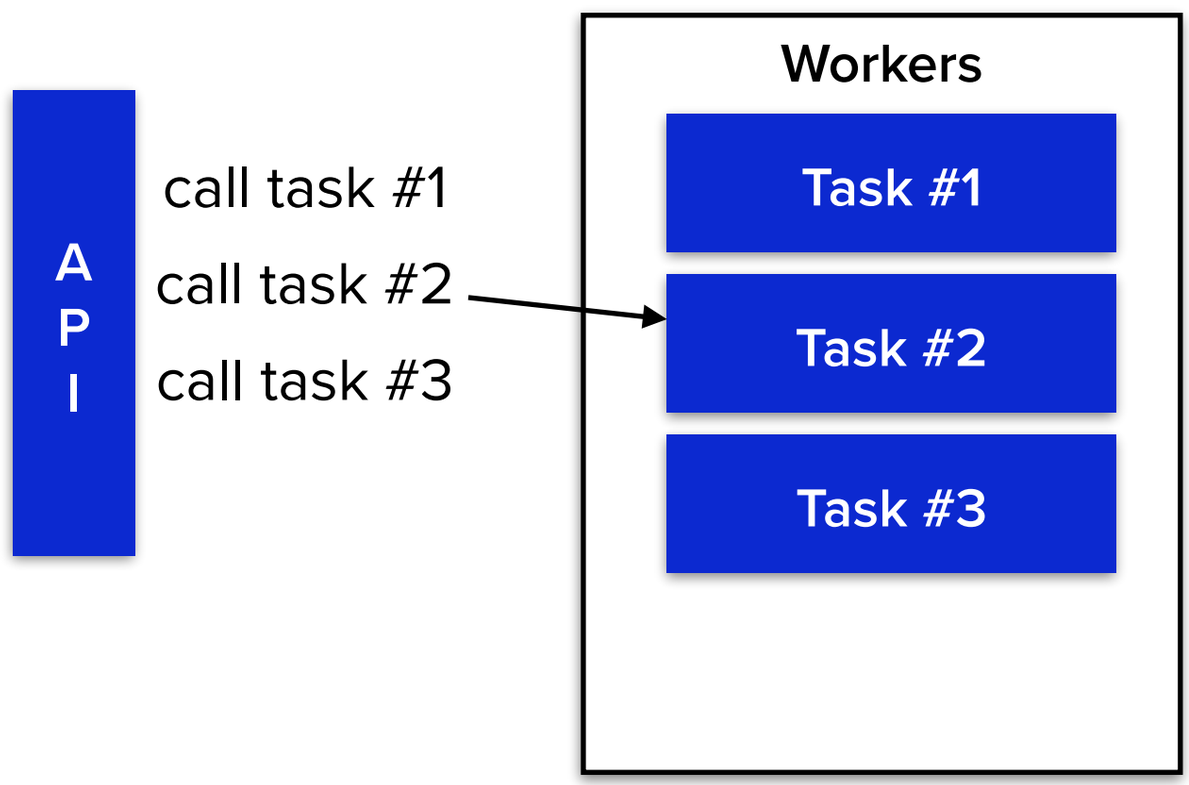

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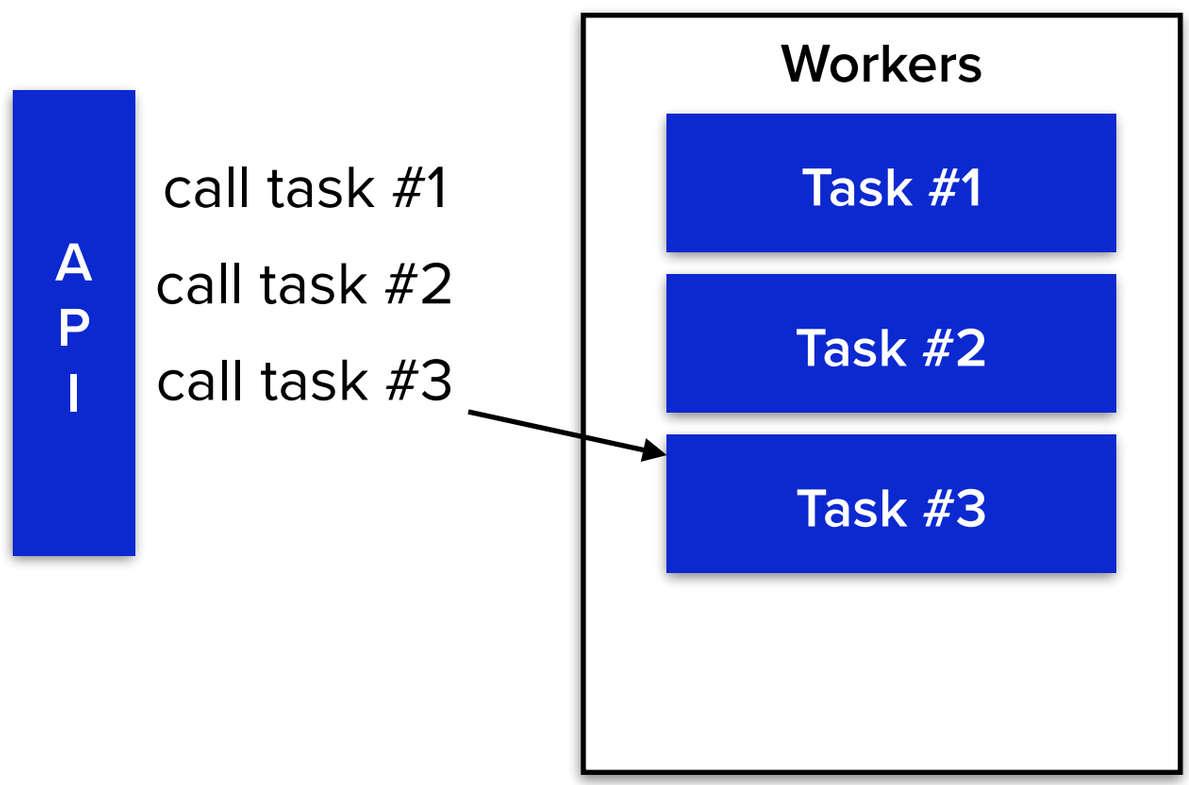

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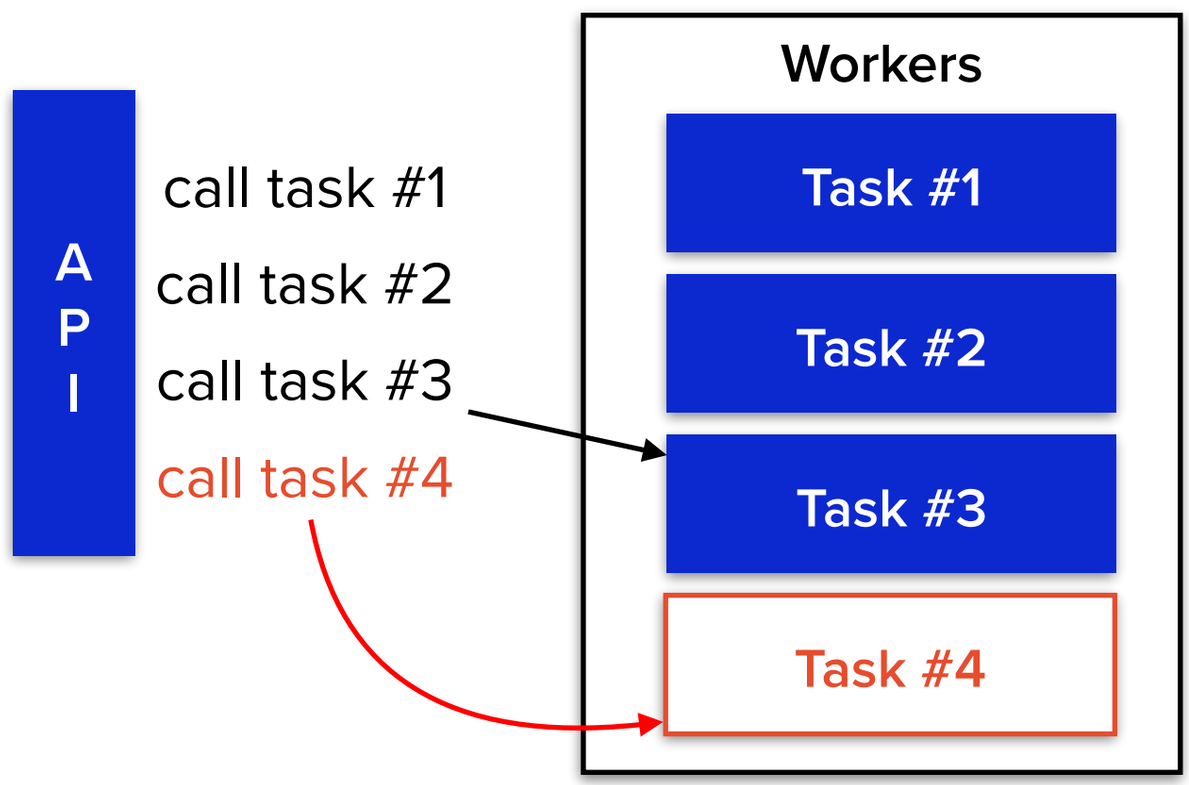
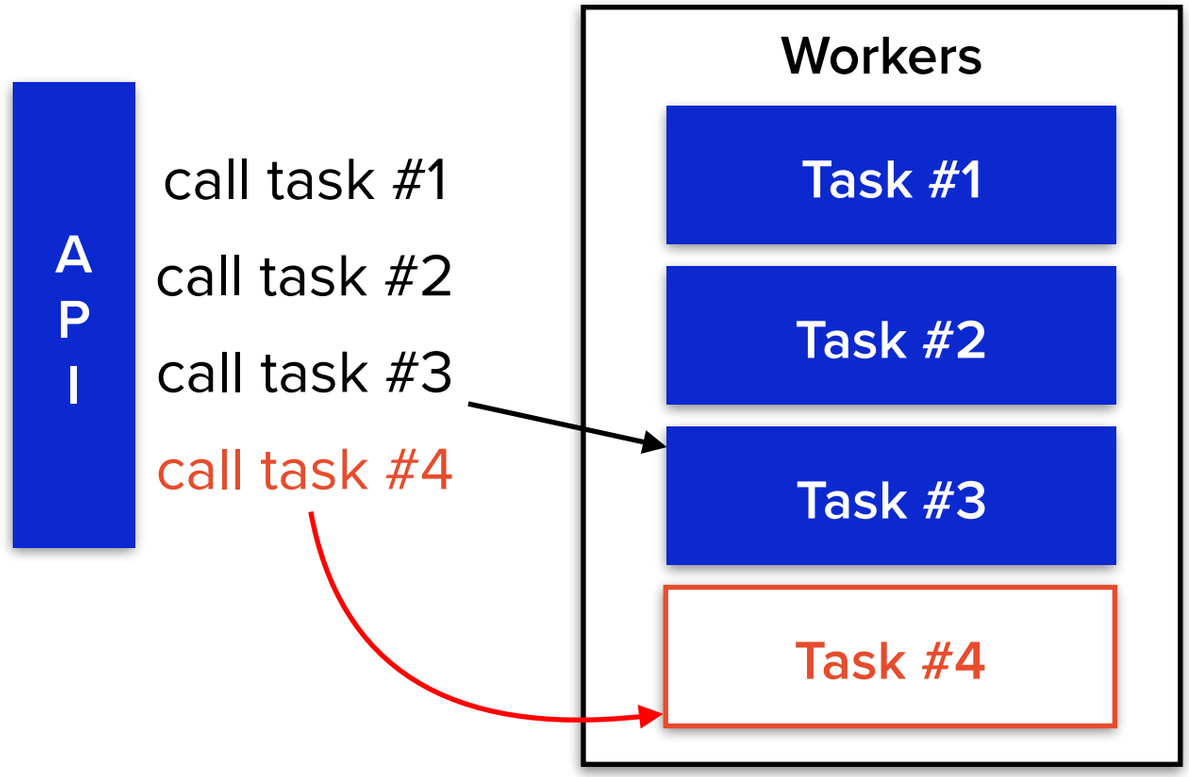
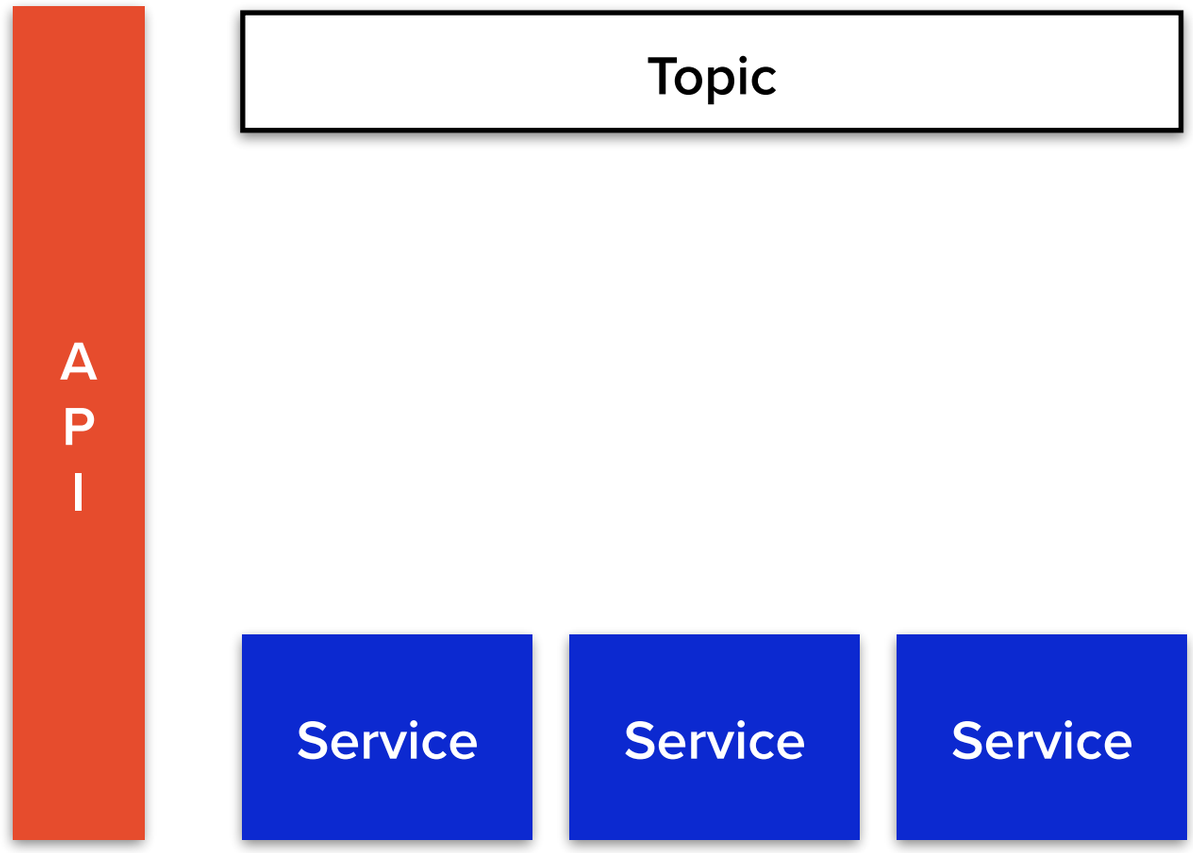


Async Task Execution

- Asynchronous Procedure Calls
- Queue based task execution
- Client must knows about their dependents (I've to change API every time I need to add a new task)
- No decoupling ➡ No modularity
- No safety* (eg. data loss on deployment failures)

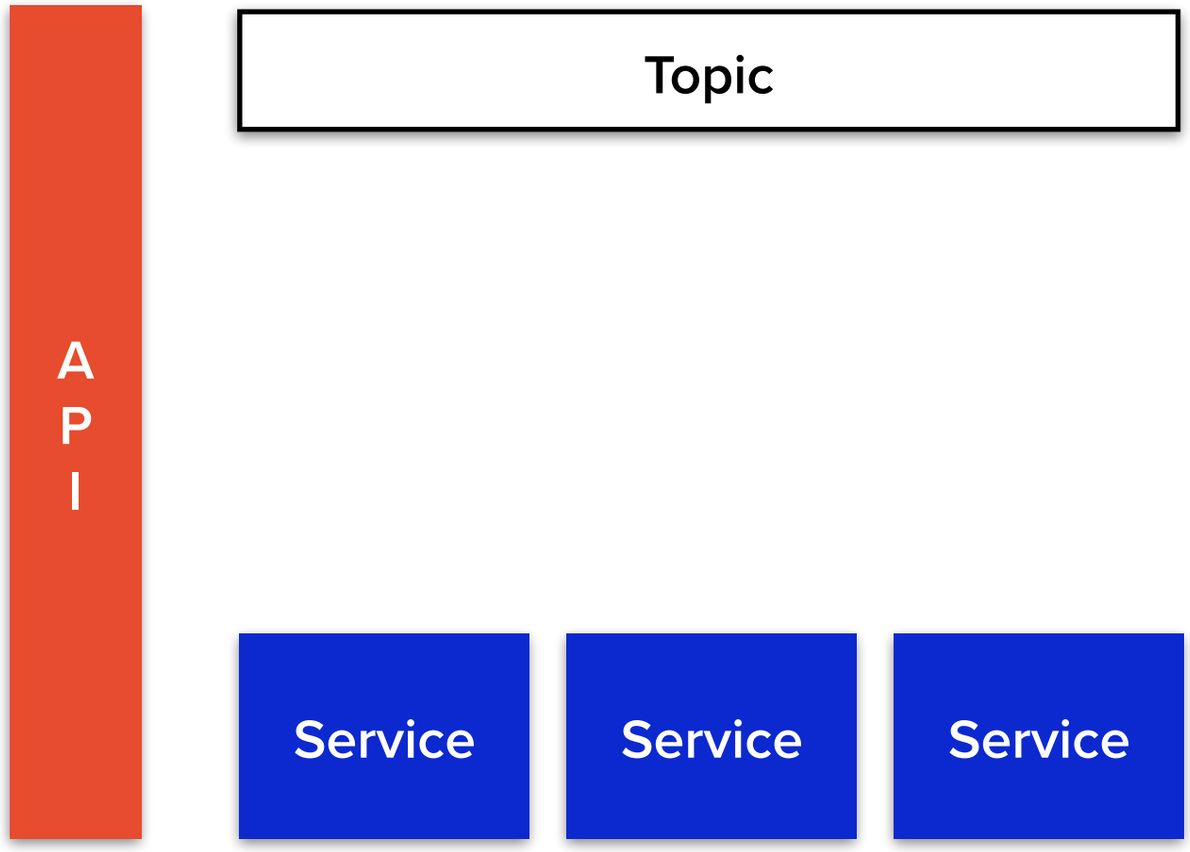


Message Event Triggering



Message Event Triggering

- Action Event triggering
- Queue based message event handling
- Event as messages



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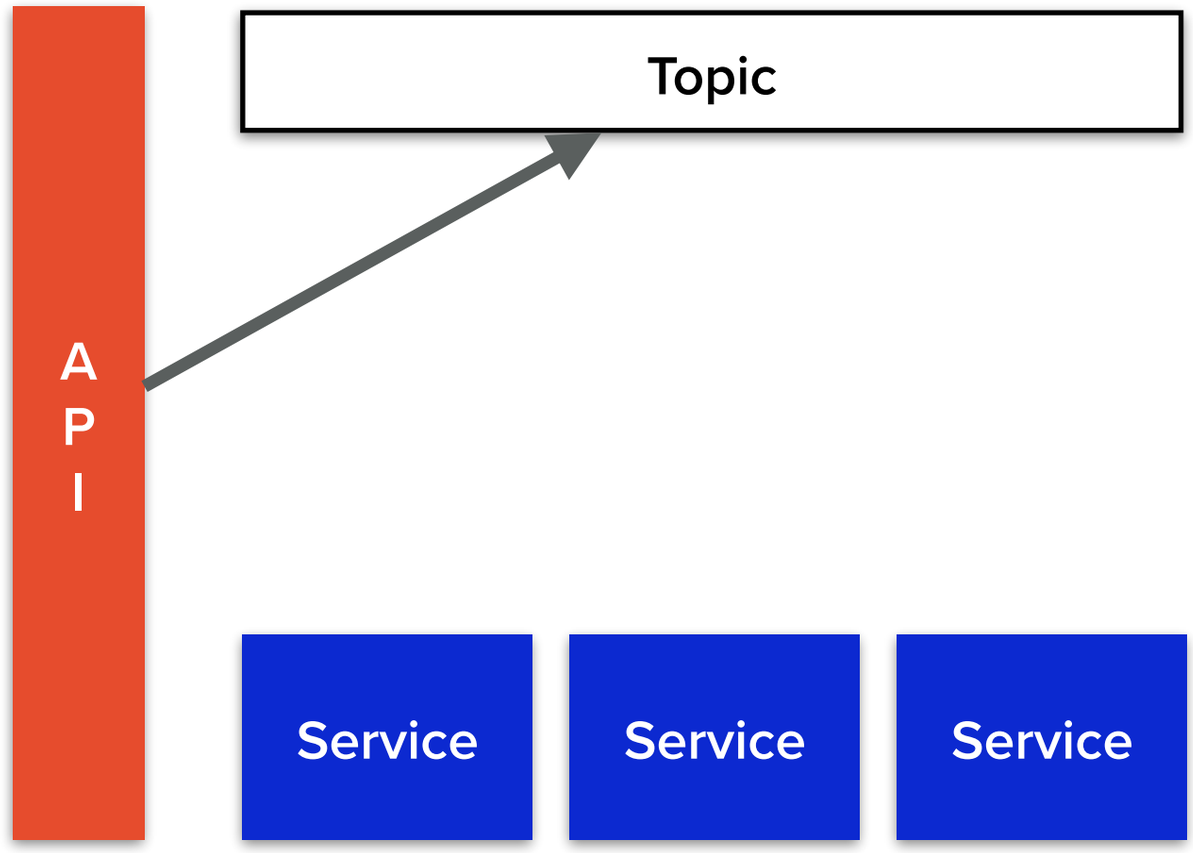

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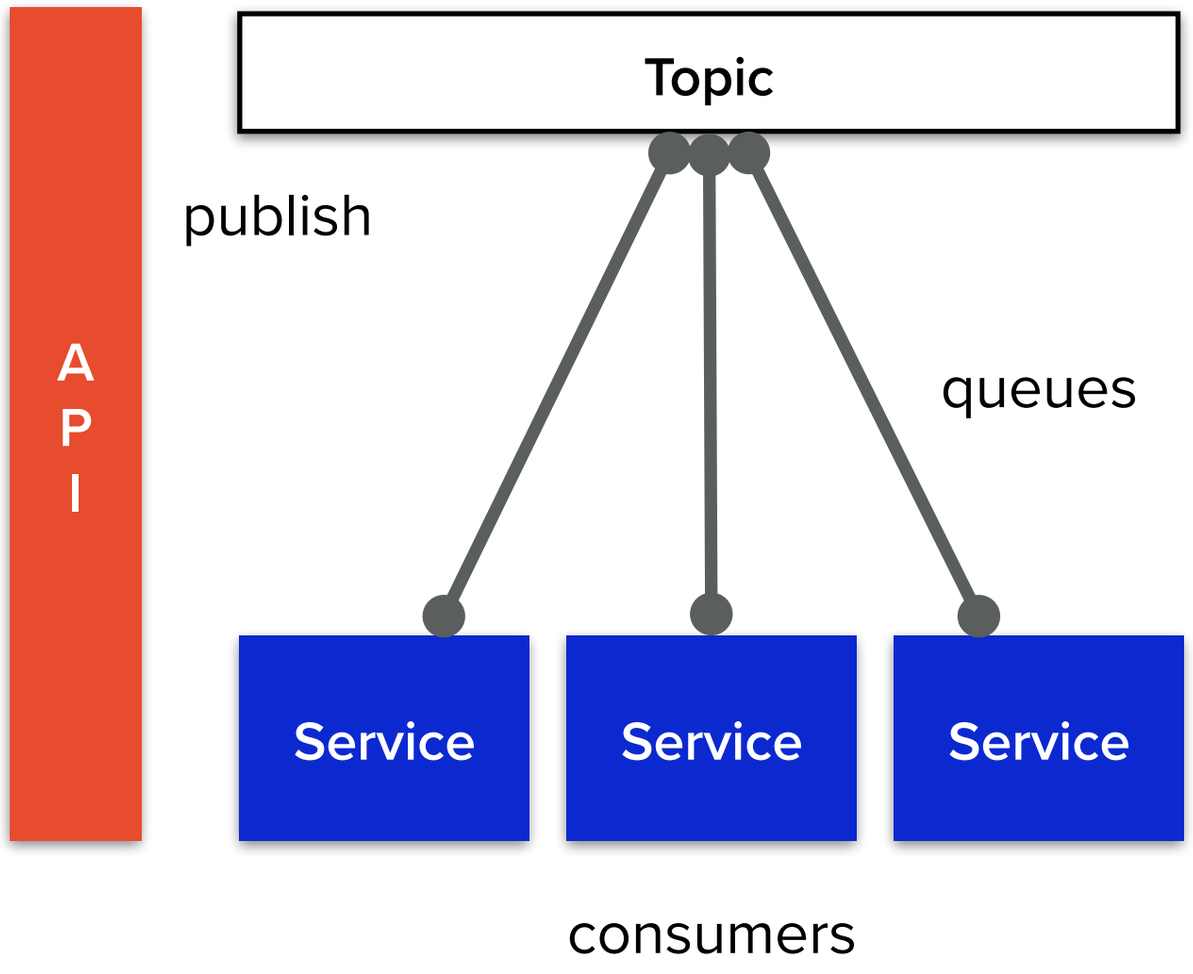
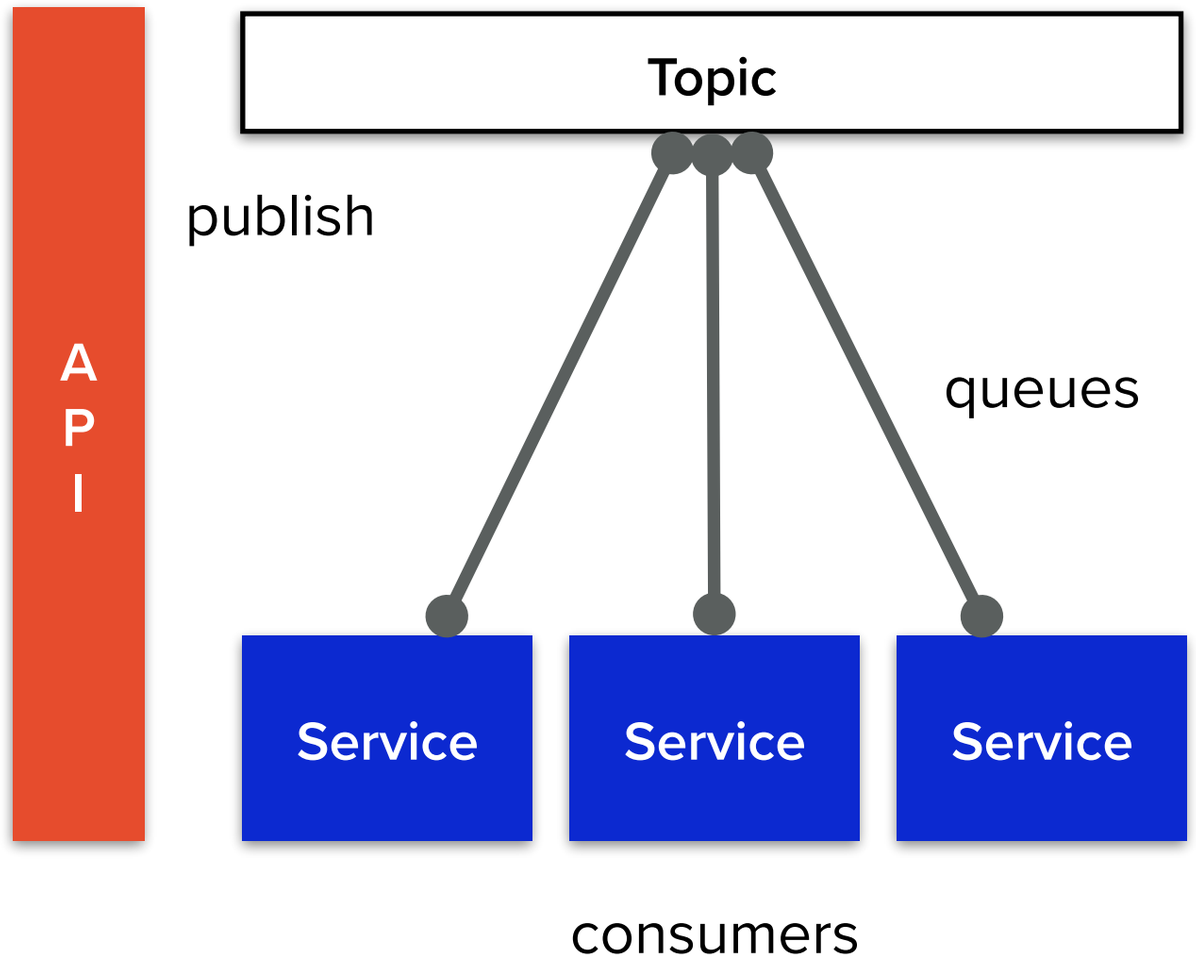


Message Event Triggering

- Action Event triggering
- Queue based message event handling
- Event as messages
- That's it!



Microservices

Building Blocks

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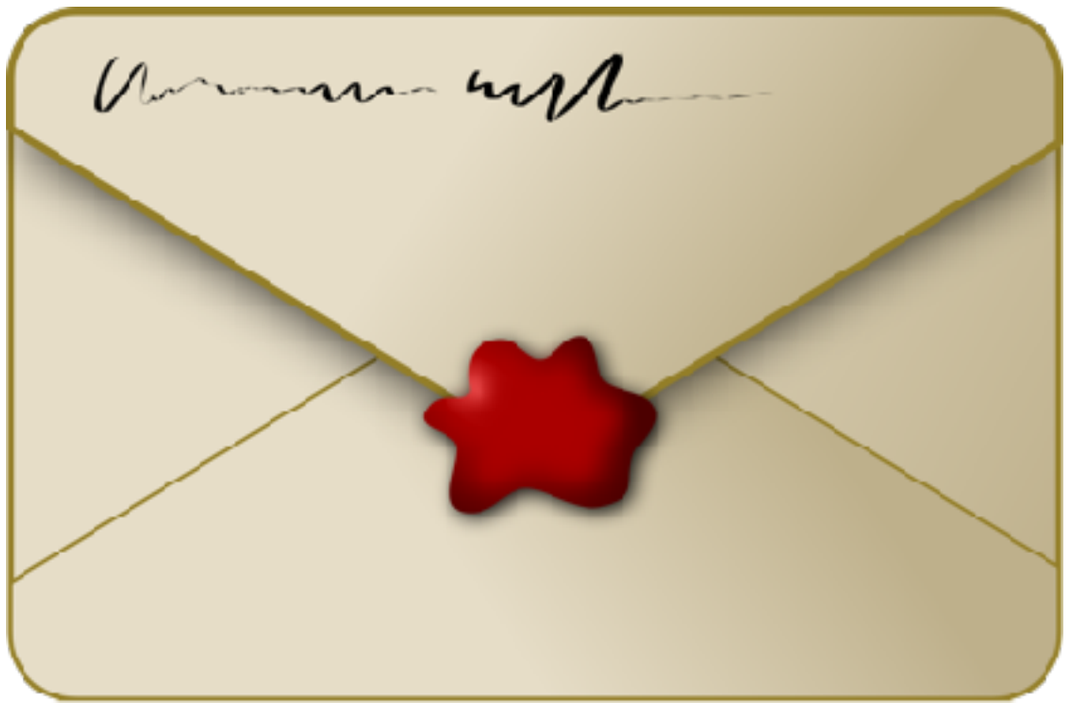
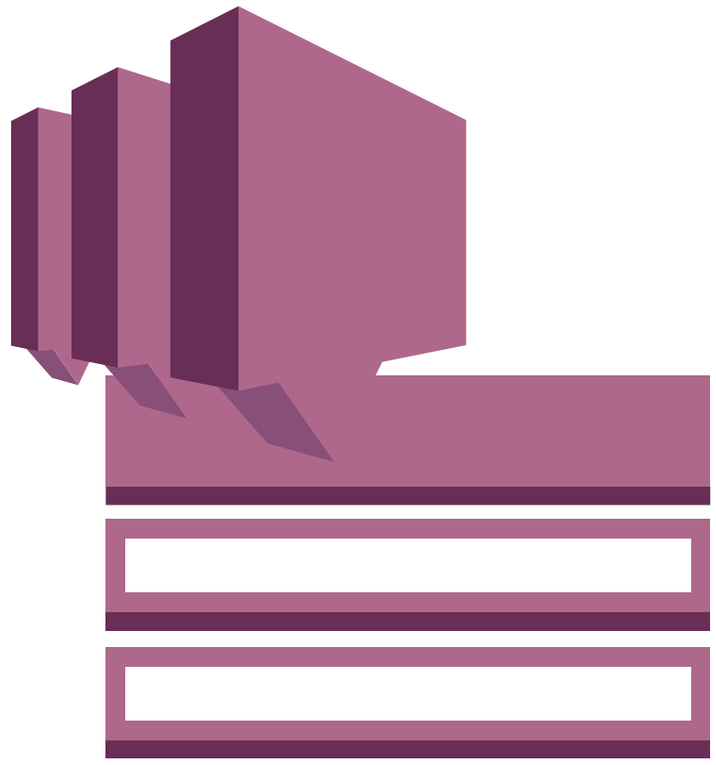
Messages

- Also known as Resource in REST context
- Follow a contract (schema)
- Can be wrapped with metadata (eg. SNS/SQS metadata)



Topics (global)

- Publisher in PubSub Pattern
- Global topics for message publication
- Topics belong to the system (or architecture) and not to a (micro)service
- AWS SNS



Service Queues

- Subscribers in PubSub Pattern
- Queues subscribe topics
- One queue belong exclusively to one (micro)service
- AWS SQS
  - SQS can be used as a SNS subscriber

Microservices

Patterns

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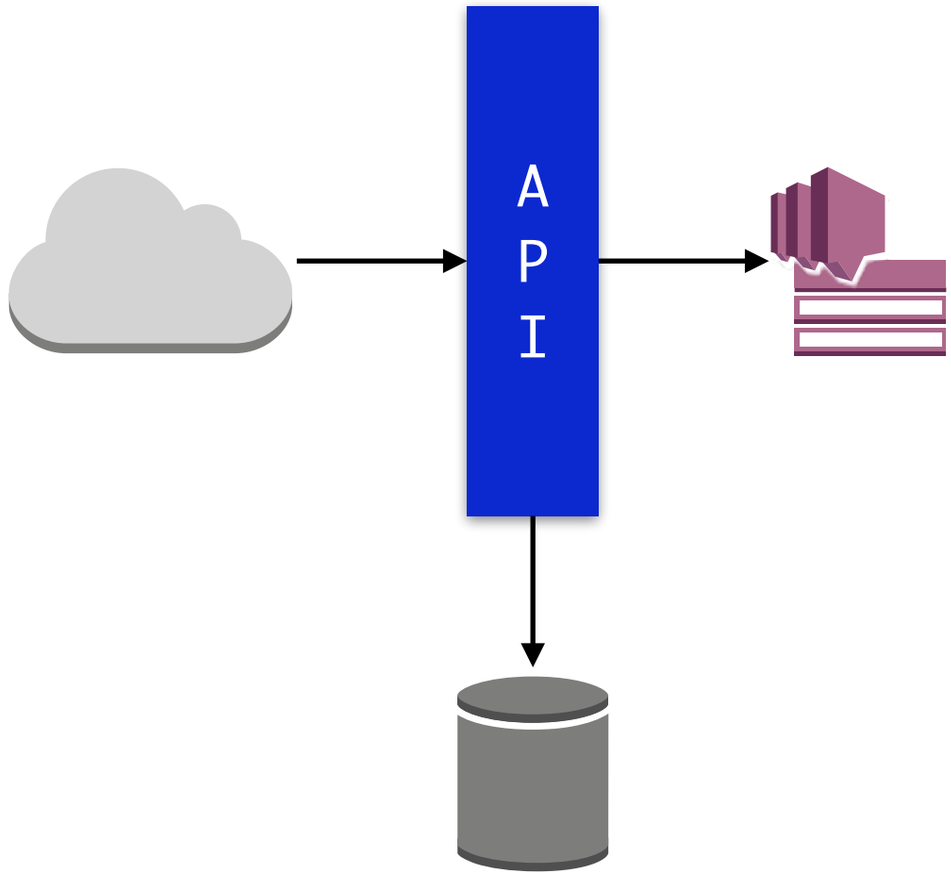
API

- Data Entry Point
- Data Validation
  - Workflow Management (eg. status/state machine)
- Data Persistence
- Event Triggering
- Idempotency handling (eg. discard duplicated requests returning a HTTP 304 Not Modified)
- Python, Django, DRF



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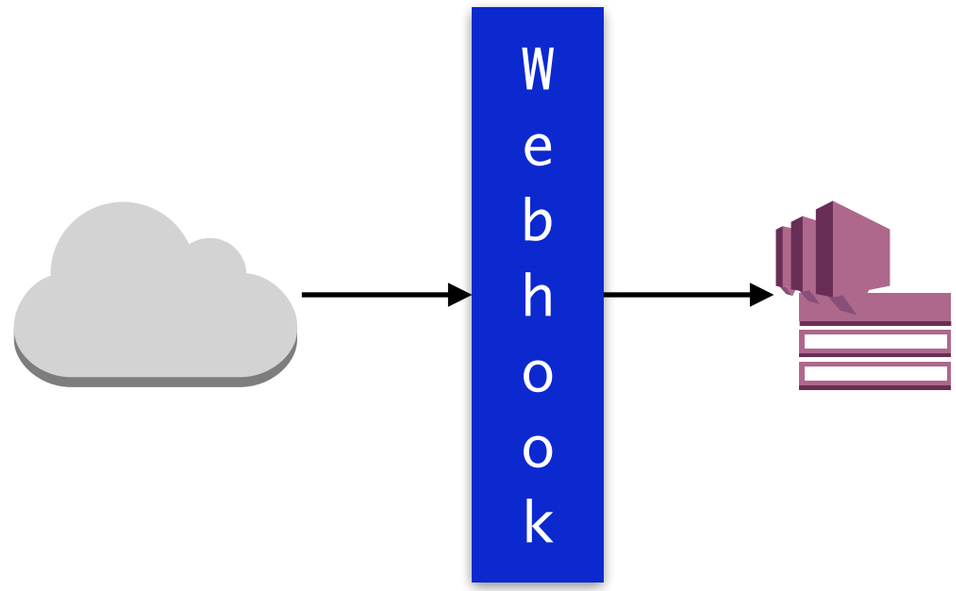
API (webhook)

- Data Entry Point
- No Data Persistence
- Proxy HTTP ➡ SNS
- Event Triggering
- Python, Django, DRF



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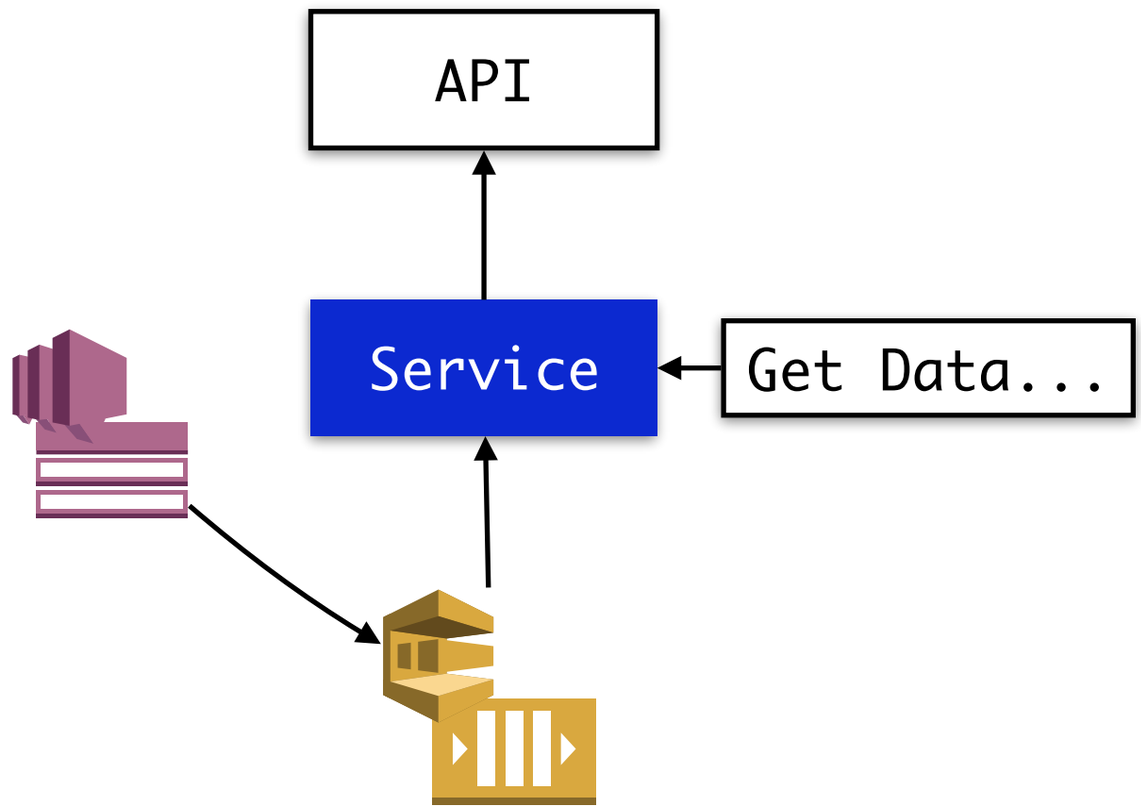
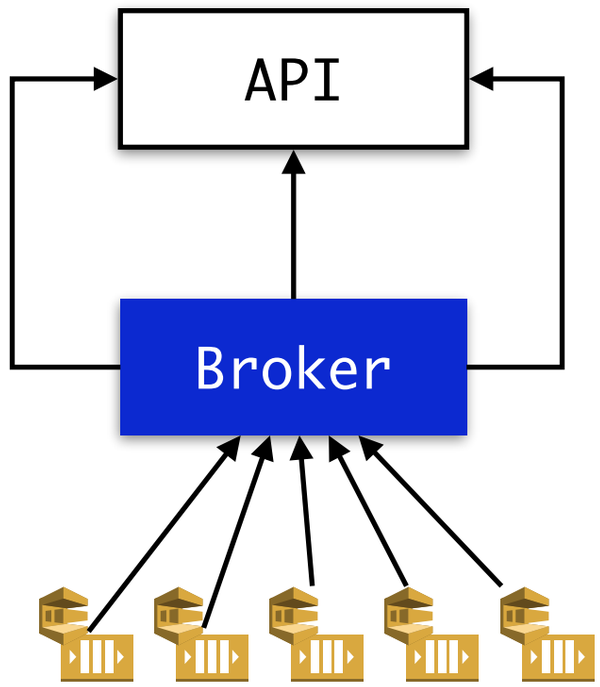
Service (consumer)

- Event Handling / Message Processing
- Business Logic
- Python, Loafer



Service (broker)

- Event Handling / Message Processing
- Business Logic
- Python, Loafer



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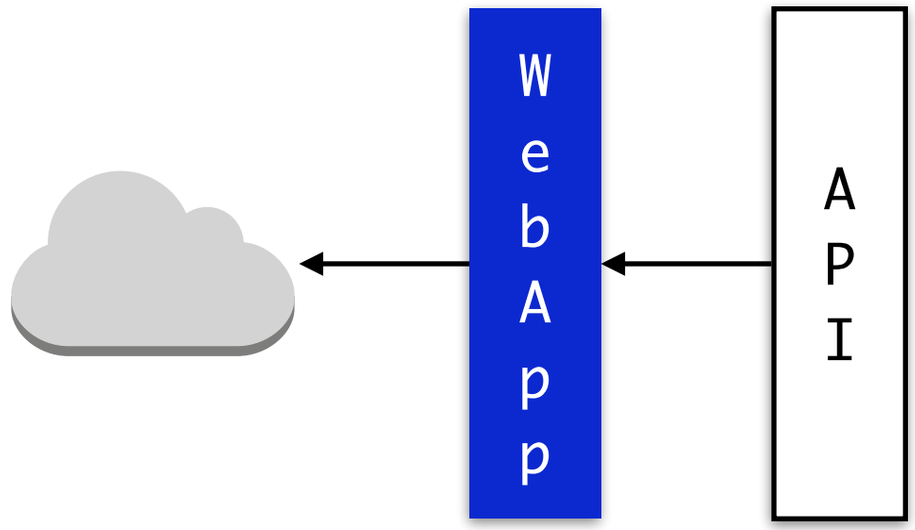
Service (job)

- Scheduled Job
- No Persistence
- Event Triggering
- Python 3

Client

- Web or Mobile Applications
- No Persistence (or basic persistence)
- Web presentation of APIs' resources
- Python 3, Django



Libraries

- **Common Libraries** — common utilities for APIs and Services (eg. event triggering/topic publishing)

- **Client Libraries** — libraries to connect our APIs

- **Open Source Libraries** — useful libraries for community (eg. correios)

Tools

- **Data Migrator** — tool that connects in all databases and provides a small framework for data migration. It uses Kenneth Reiz's records library. It was initially used to migrate data from the old version of our application.

- **Toolbelt** — tool that provide basic management commands to interact with our APIs, partner APIs and to make ease to manage SQS queues or trigger some events in SNS Topics.

Working Sample

Webapp

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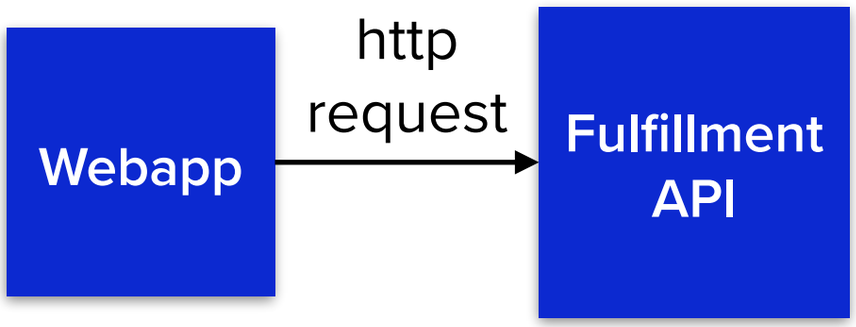
Working Sample



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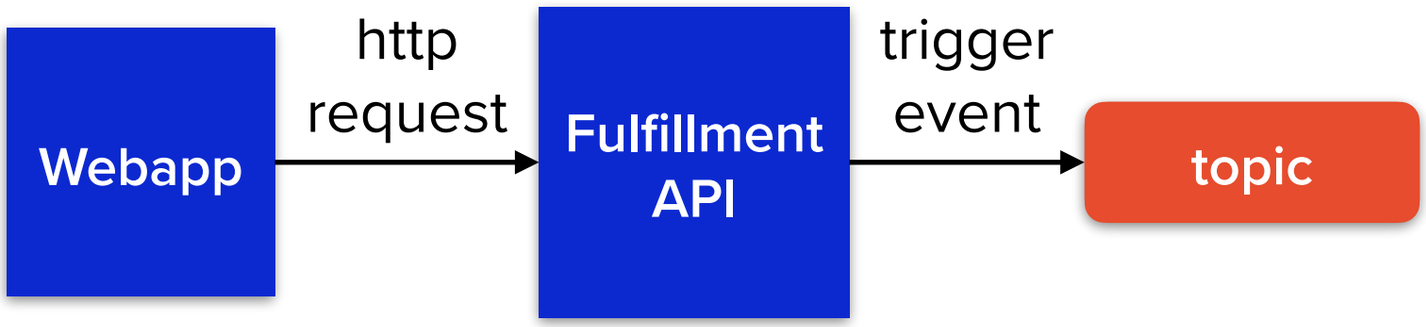

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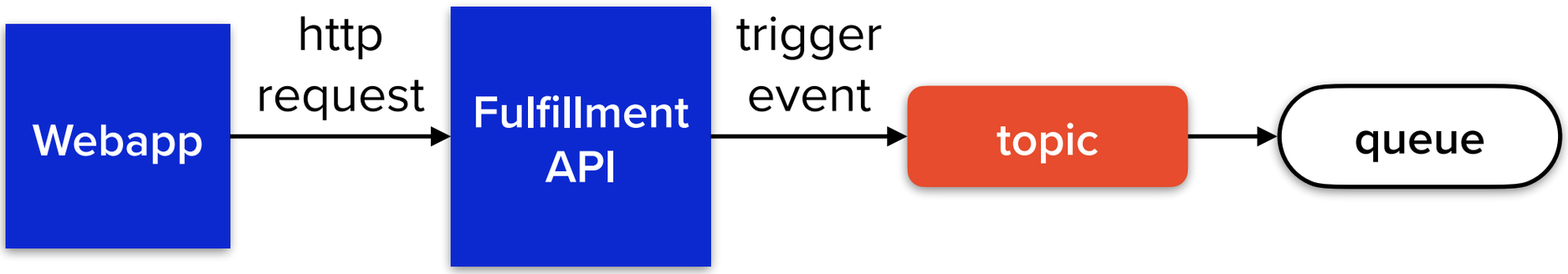

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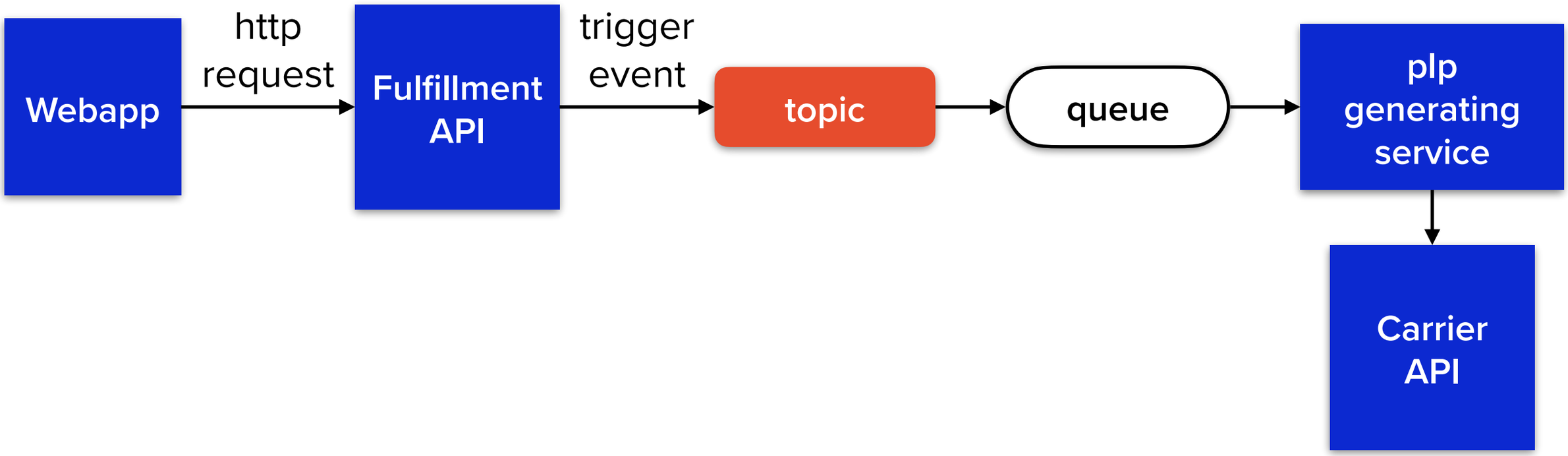

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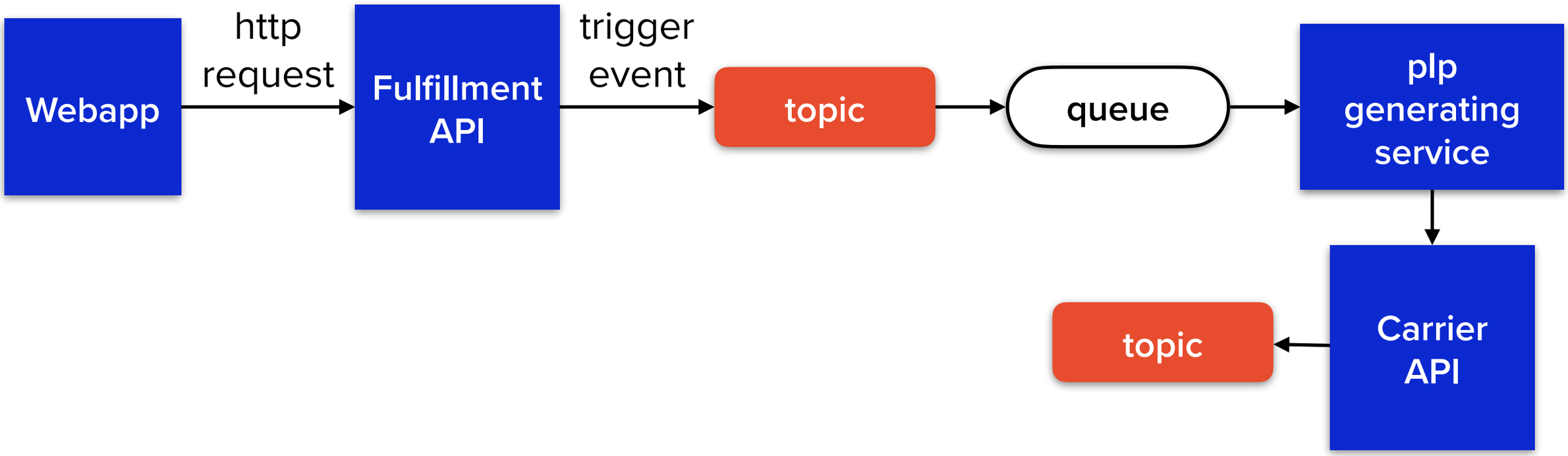

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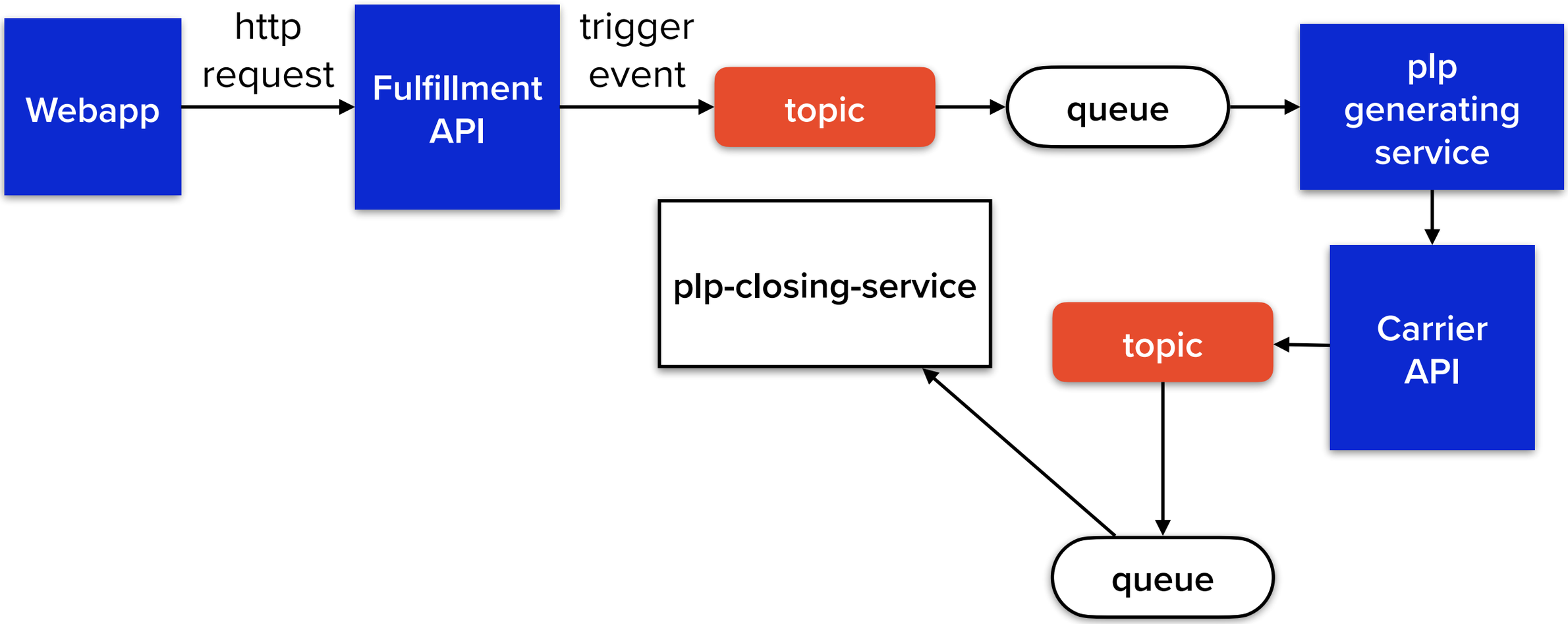

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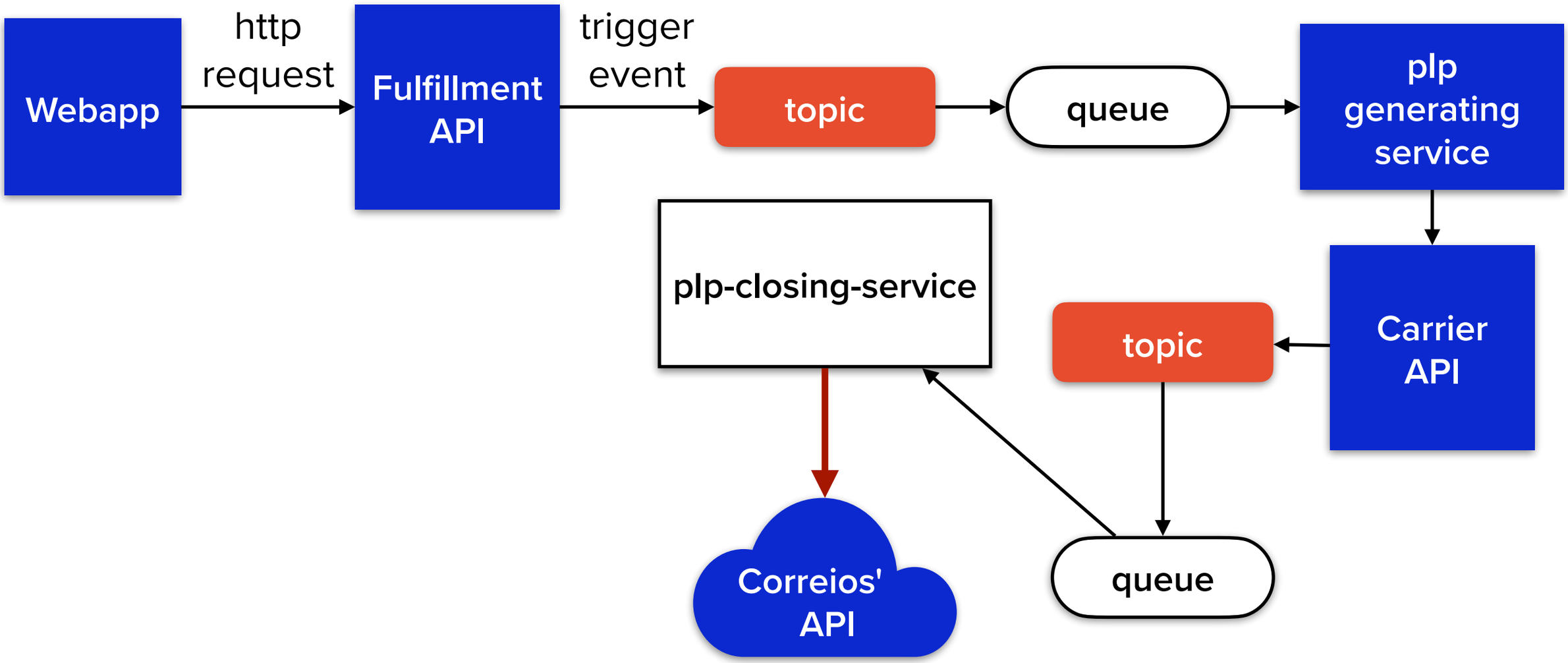

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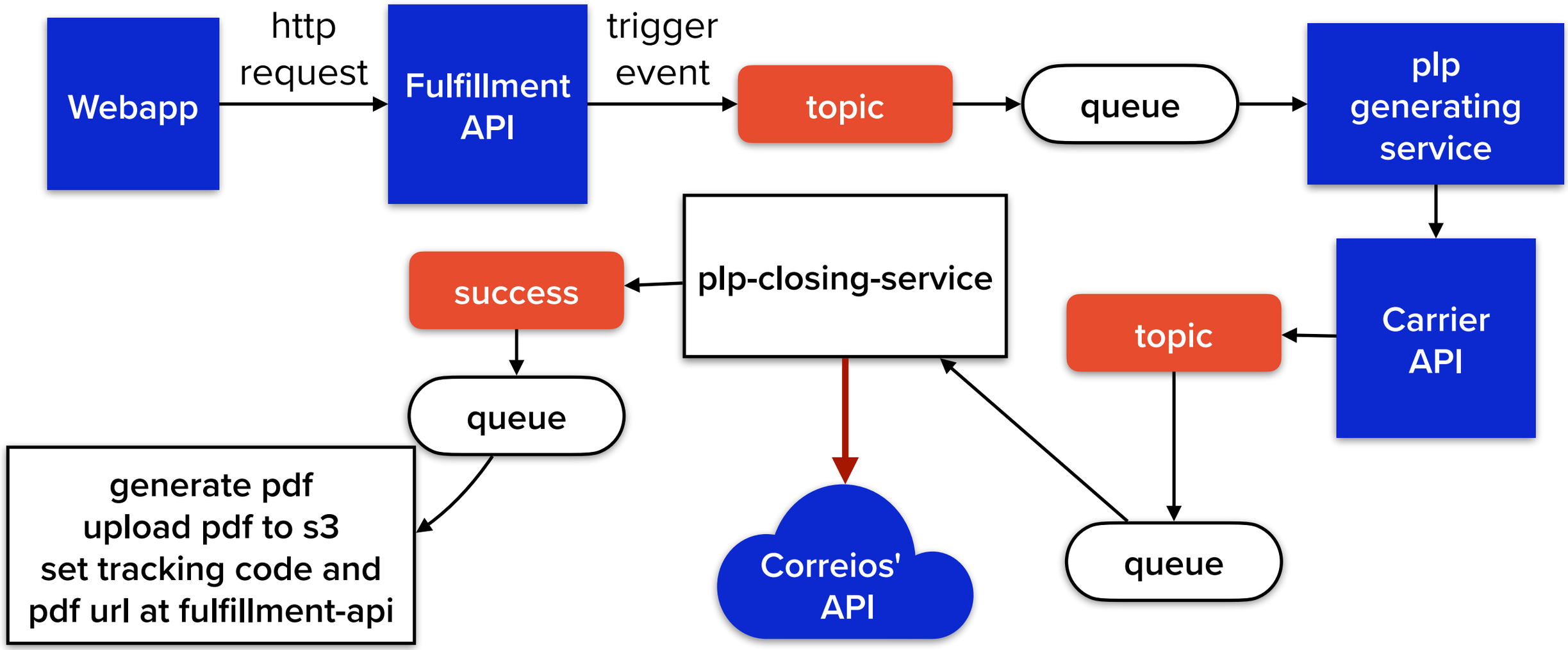

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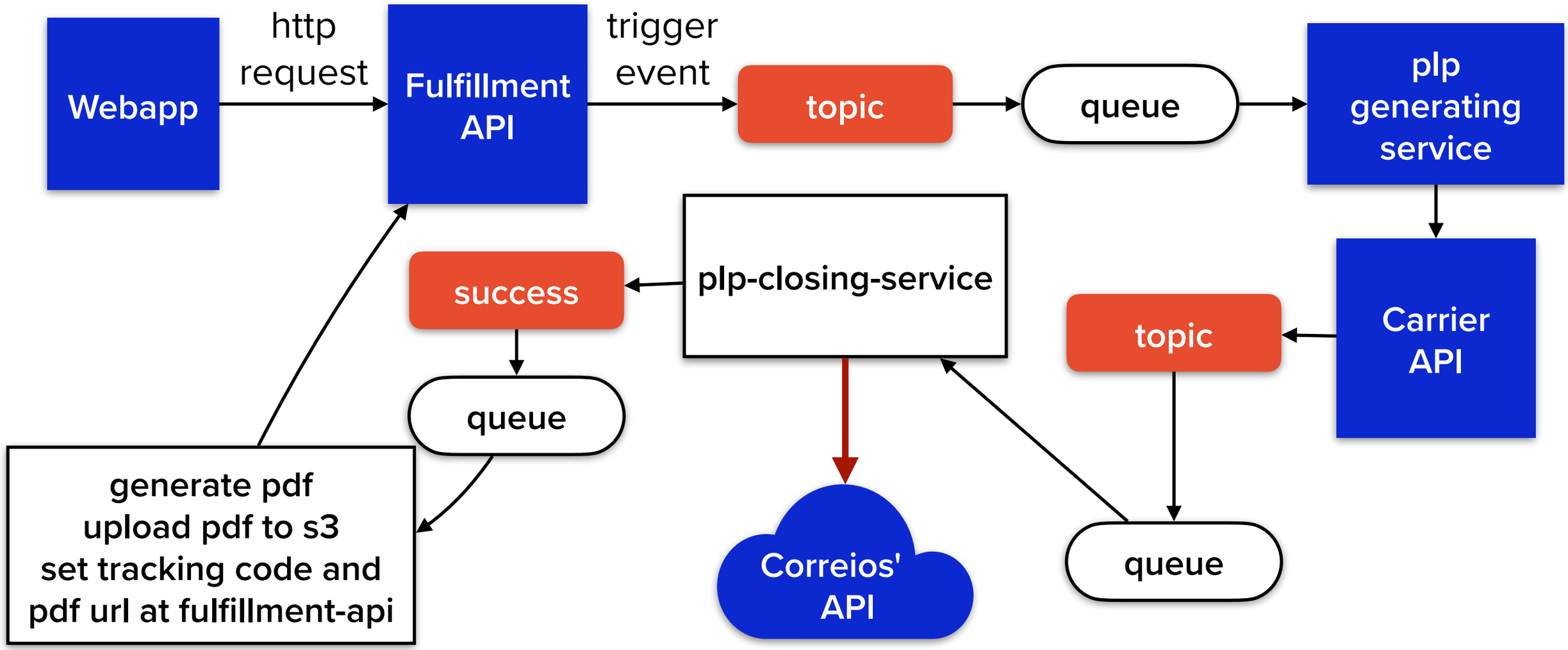

Microservices

Deployment

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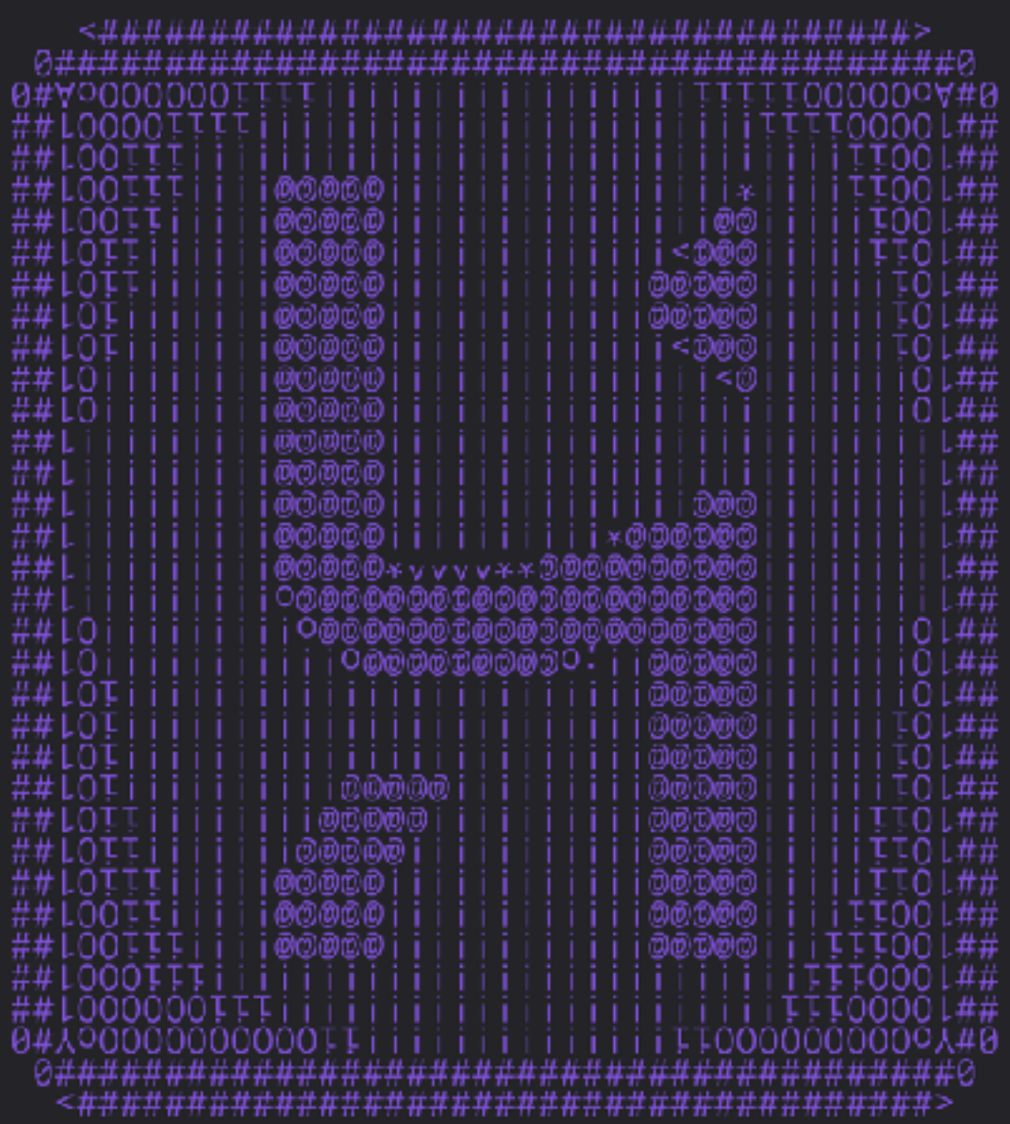

amazon
web services

- Hosted on Heroku PaaS (our secret weapon!)
    - Easy deployment, configuration management, log handling, etc
- Heroku PostgreSQL Database
    - Easy deployment, easy configuration and setup, easy backup, replica and foreign data wrappers
- Other services and tools
    - Logentries, Sentry and New Relic

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Microservices

Challenges

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- It's hard to make evolution of message/resource contracts between services

- All sequential process must be splitted over multiple (small) services

- Denormalization of data can easily lead to problems of data consistency if we do not take certain precautions

- Information needed for one API must be replicated through services and stored locally

- Data migration or refactoring in several services requires the development of an specific application

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Development

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Development

Remote Team

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Development Tools

- Github - code management
- CircleCI - continuous integration
- vim / PyCharm / SublimeText / etc - development

Communication Tools

- JIRA - project management
- Confluence - documentation
- Google Apps - Mail, Calendar, Docs
- Slack - chat and monitoring integrations
- Mumble - voice conference
- tmux, ngrok, vim (and mumble) - pair programming

Perguntas?

Estamos contratando!

https://olist.com/trabalhe-conosco/