#ASLI ENGINEERING

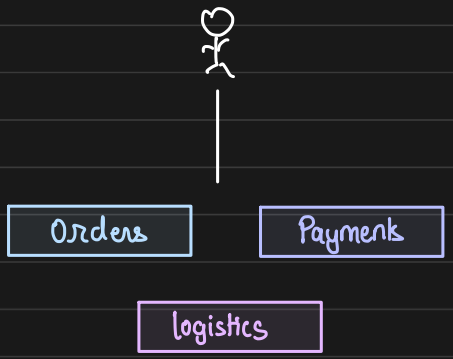
API Composition Pattern In Microservices

SWIPE

BY

ARPIT BHAYANI

API Composition Pattern in Microservices

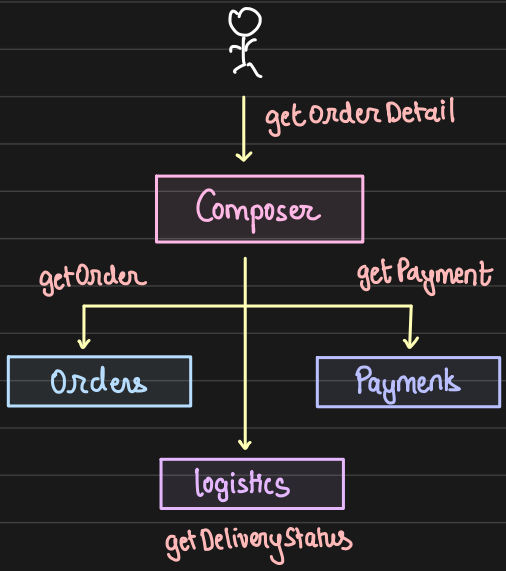


Say we have 3 services, Orders, Payments, and logistics. A user wants to fetch order detail, how would we get the required data?

Classic problem: Querying Microservices

To query microservices, a common pattern in use is **API Composition**

In the API composition pattern, we have a "composer" that

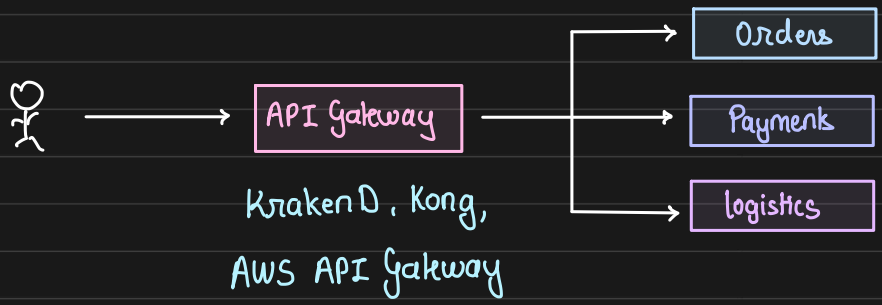


- takes the user query
- identifies the services to talk to
- gets the responses from them
- combines the result
- returns the response

So, how do we implement it?

Do we need to write Composer from scratch? No!

API Gateway is a classic example of a "composer"
So, we put an API Gateway in front of our microservices and configure the rules.



The calls to the individual microservices can happen

- Sequentially → Takes longer time to compute
- Parallel → Requires more machine resources

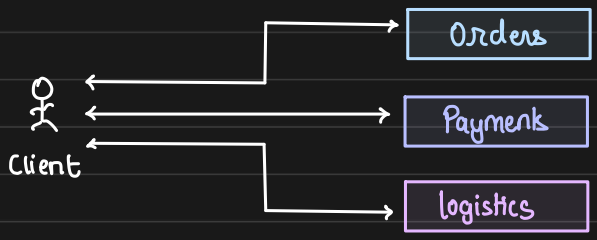
The implementation of the Consumer depends on

- programming lang
- usecase at hand

Improving end user experience

The impact of API composition is not just limited to microservices it has huge role to play in giving a great UX

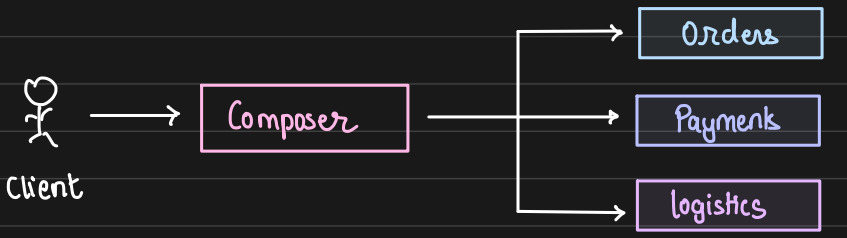
Imagine this,



- More round trips
- High latency
- Data merge / collate logic at client

Hence, to make experience better, we should compose at server

+ Better use of user's data

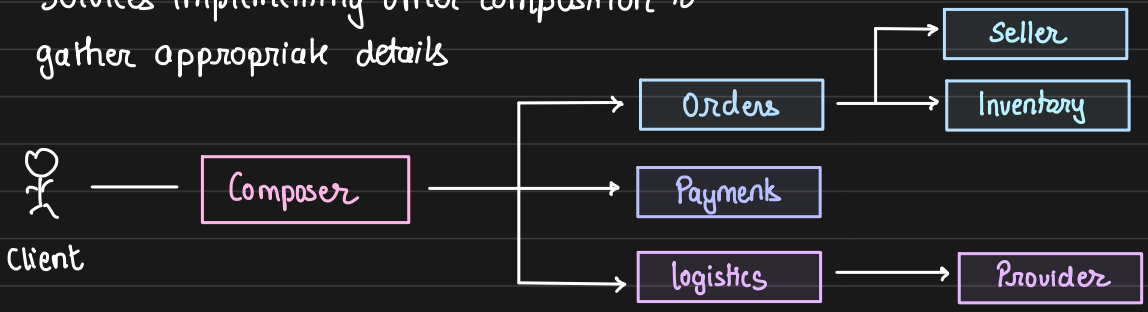


- One round trip
- logic at server
- Client can be dumb
- low latency

End user thus gets pretty solid experience with just one data round trip.

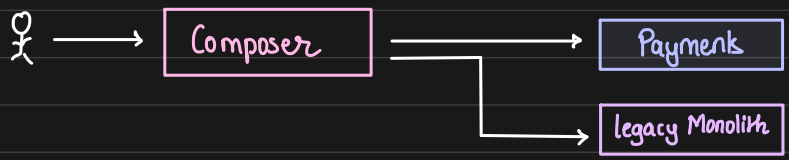
Branch Composition

Branch composition is Multi-level API composition
Services implementing other composition to gather appropriate details



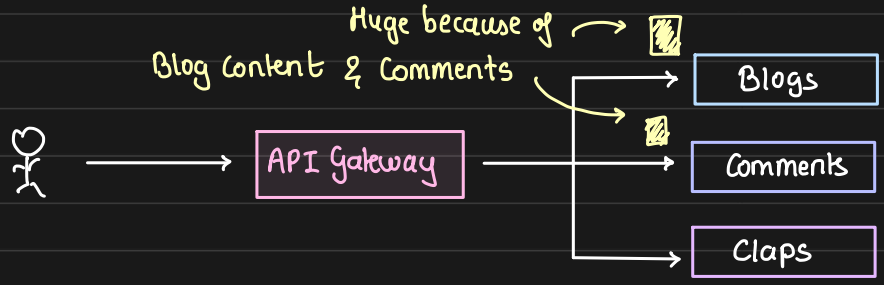
Advantages of API Composition

- Simple to implement
- User has a single point to interact
- Hides the implementation detail and complexities (First line of defence)
- Security and Limiting can be implemented at composer
- Can cover "bad" design decisions and wrap them with a new interface
- Hides legacy system and we can replace it gradually



Disadvantages of API Composition

- What if we fetch large data from microservices
  - ↳ Joining them on API Gateway would be inefficient



- Overall availability is challenged when the number of services composer interacts with increases
- Having transactional data consistency is very difficult
  - eg: All or none across services .... Distributed Transaction
- composer needs to be managed and maintained
- composer may become a bottleneck