#ASLI ENGINEERING

Implementing Idempotence in Payments Service

SWIPE

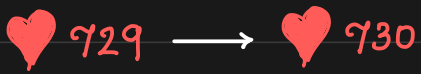
BY

ARPIT BHAYANI

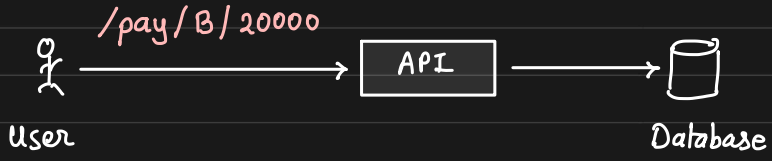
Idempotence in Payments Service

> execute same operation multiple times,
> result is same as if operation was applied just ONCE

No matter how many times user likes one post, the like count should just increase by 1



The situation becomes even more serious when $ is involved



Say A wants to transfer $ 20,000 to B and if due to any reason the API call is retried.

We would not want A to transfer twice the amount to B.

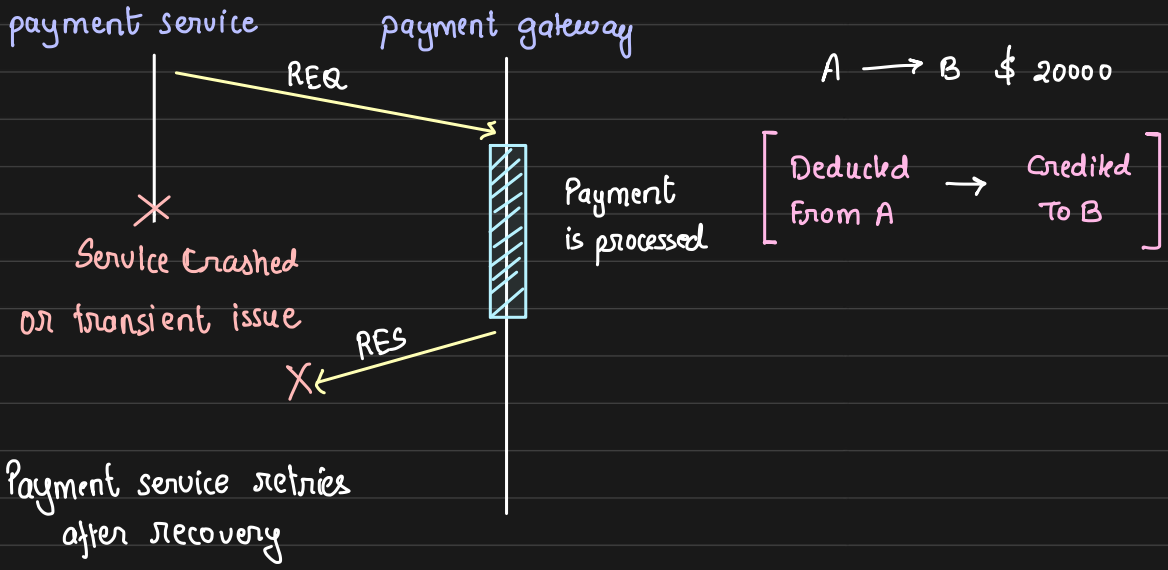
We need idempotence

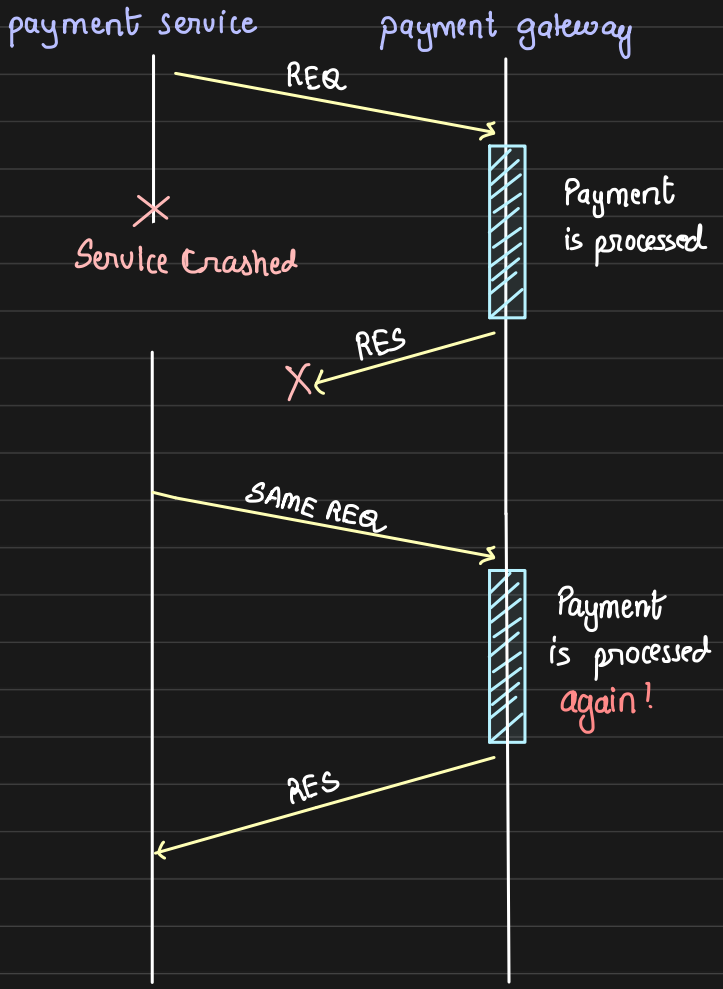
Other places where this is relevant

- user to not tweet the same tweet again
- not placing the same order twice on Amazon
- not sending the same message again

Why would the transaction repeat ?

You **retry** when something goes wrong ← user or service





A → B $ 20000

[Deducted From A → Credited To B]

But your service doesn't know hence it retries !!

Retry only when you are sure

let's see how can we implement idempolence!

Implementing Idempotence

Approach 1: You won't need idempotence if we Do not retry

Depending on your product / usecase
this might be the best thing

If operation failed, propagate the error
and show it to the end user

End user retries if
he/she wants to

let the user retry

Approach 2 : Check and update

Idea: Get the status of payment
& process only when not already processed

Implementation

create a unique payment_id ↗ Your API server can use this to get, check & update if needed

↓

and weave your API calls with it

Idempotent Flow

1. Payments service talks to Payment Gateway & generates a Payment ID
2. Payment service initiates the payment through this ID
   $A \rightarrow B$ $20,000
3. If payment service retries, it first checks the status of payment on ID
   if the status is COMPLETED
   then does not retry
   else retry through the same ID