Non-functional requirements - Consistency

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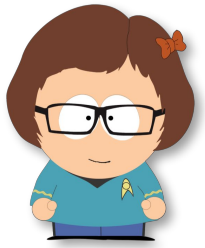
Do all these terms refer to the same notion of consistency?

Nope.



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ACID

C stands for consistency

refers to database transactions (database constraints are not violated when transaction is executed)

BASE

E stands for eventual consistency

tunable consistency

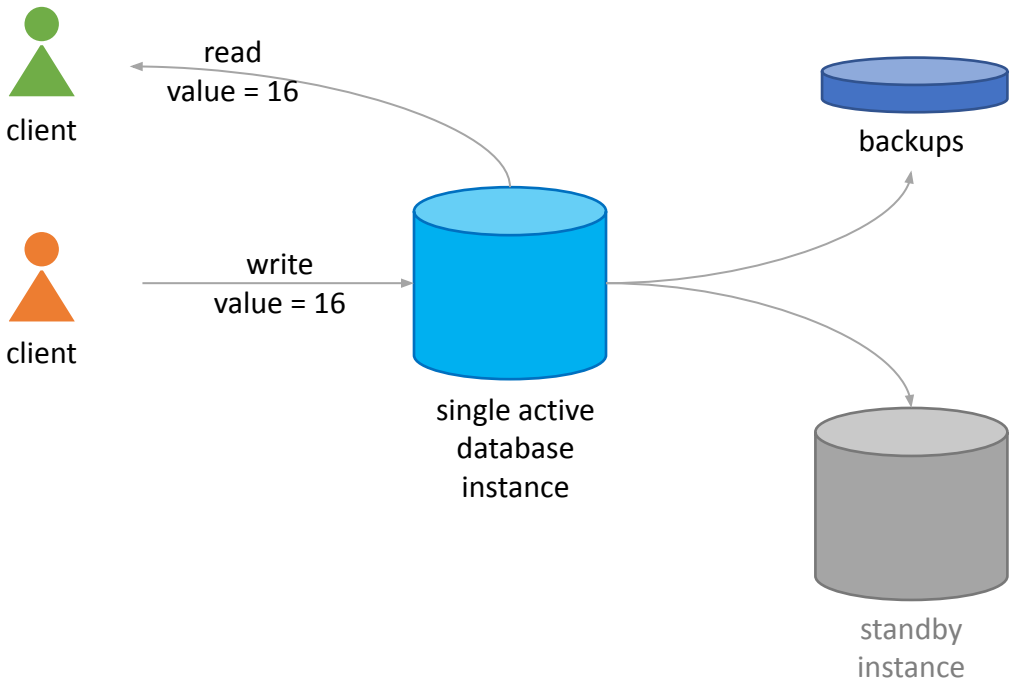
refers to data replication (whether a value is the same on all replicas and when the value becomes the same)

CAP

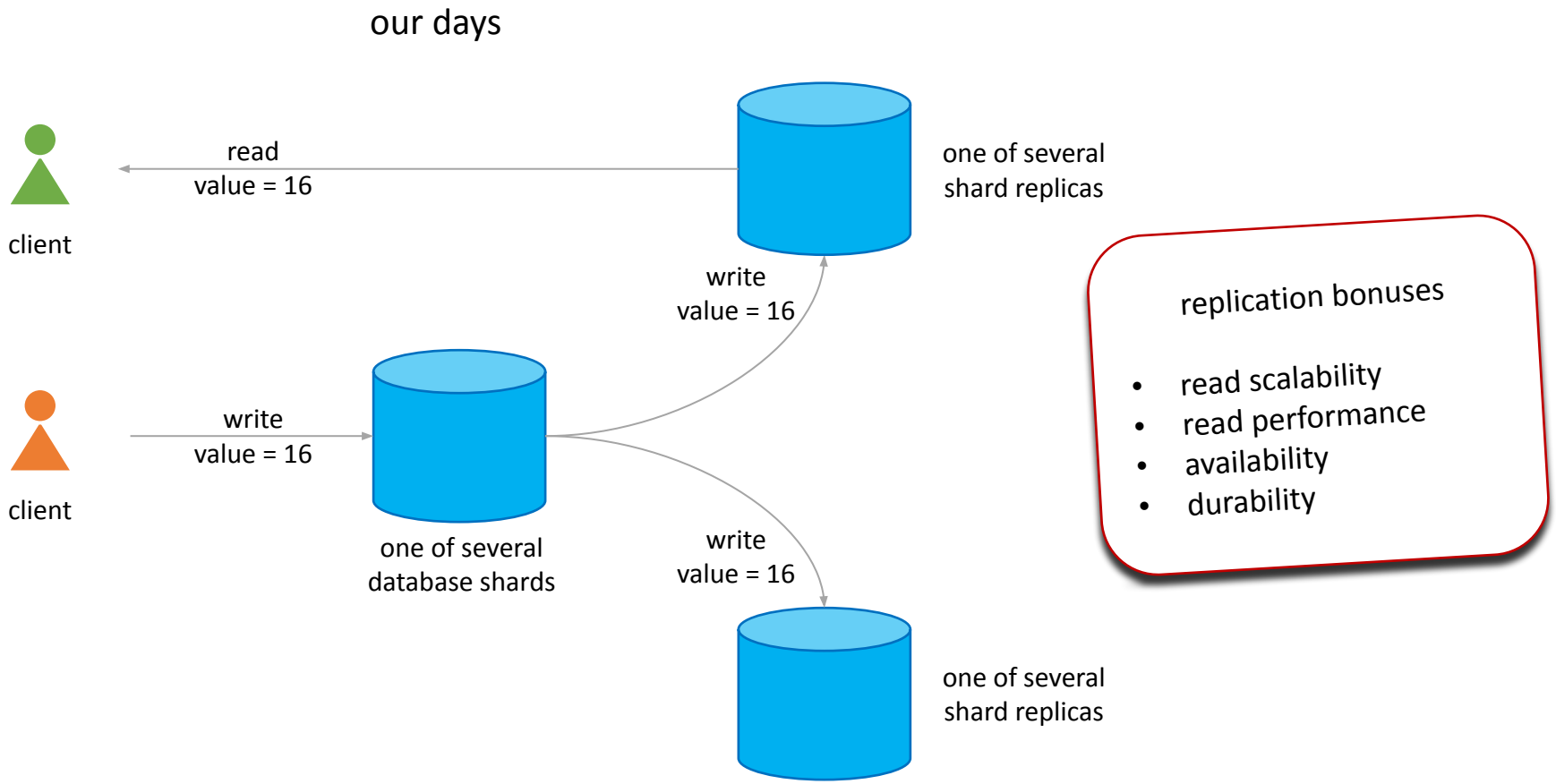
C stands for consistency

Non-functional requirements - Consistency

back in old days…



Non-functional requirements - Consistency



In the presence of multiple copies, we have two choices:

1. The system always returns a **single** (most recent) **value** to clients.

2. The system may return **several different values** (old and new) to clients.

Non-functional requirements - Consistency

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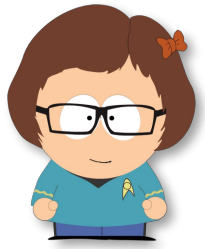
Let’s give a name to each consistency type.

Totally! And let’s define a set of rules for each type.



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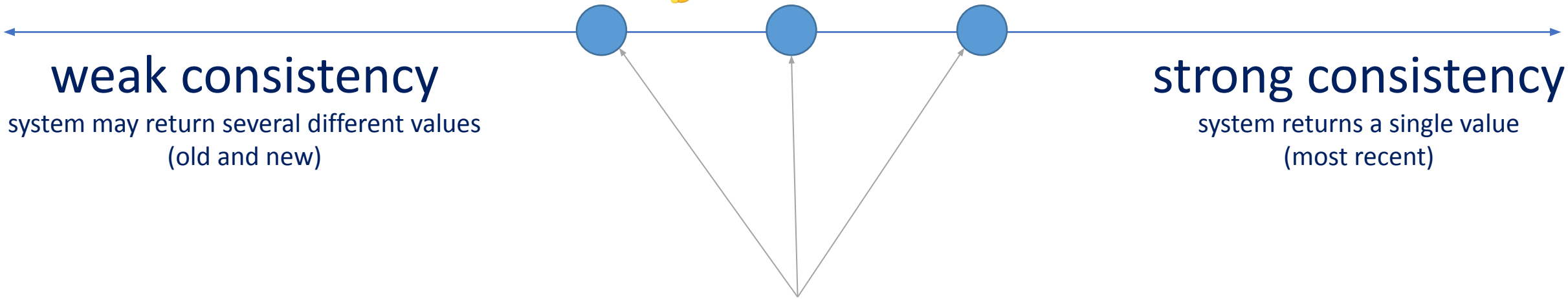
“medium” consistency? 🤔



weak consistency

system may return several different values (old and new)

strong consistency

system returns a single value (most recent)

consistency model

rules that define the order of updates in the system and when these updates become visible to users

Non-functional requirements - Consistency

if there are no additional updates made to the object, eventually all reads will return the latest written value of that object

after the update completes, all clients when they read data, get back the updated value

some facts about **eventual consistency**

- inconsistency window is typically small (sub-second)
- can be much faster than linearizability
- no need to sacrifice availability
- DNS is the most popular example

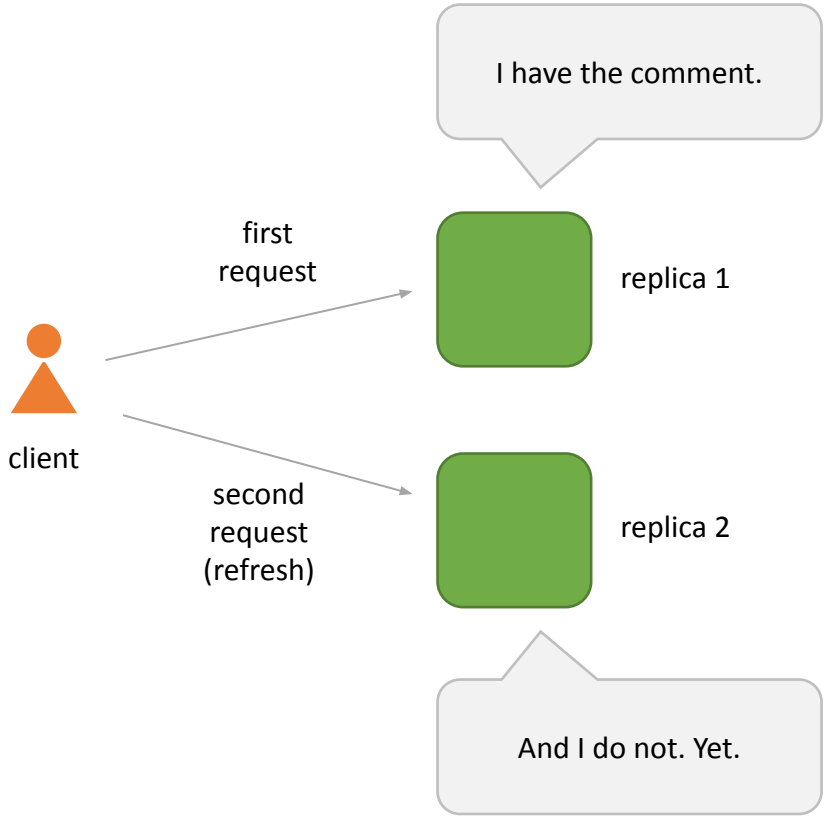
some facts about **linearizability**

- typical usage: banking, e-commerce, booking systems, distributed locks
- linearizability is slow
- C in CAP stands for linearizability

Non-functional requirements - Consistency

problem 1

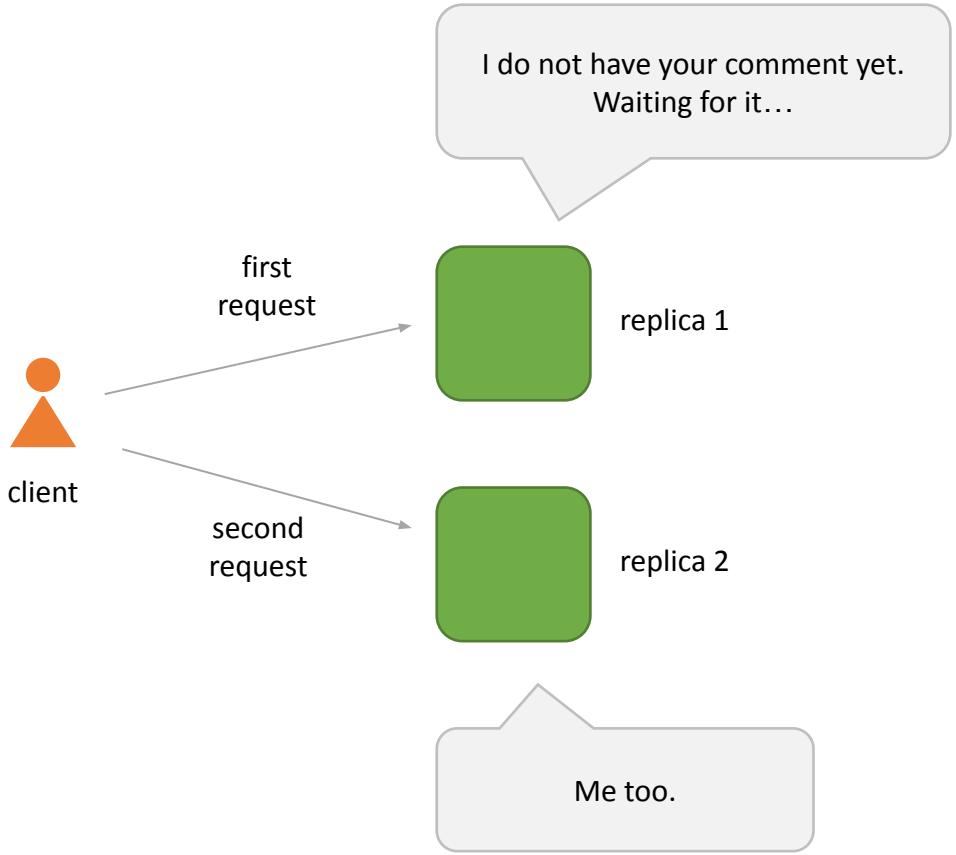
disappearing comments



Non-functional requirements - Consistency

problem 2

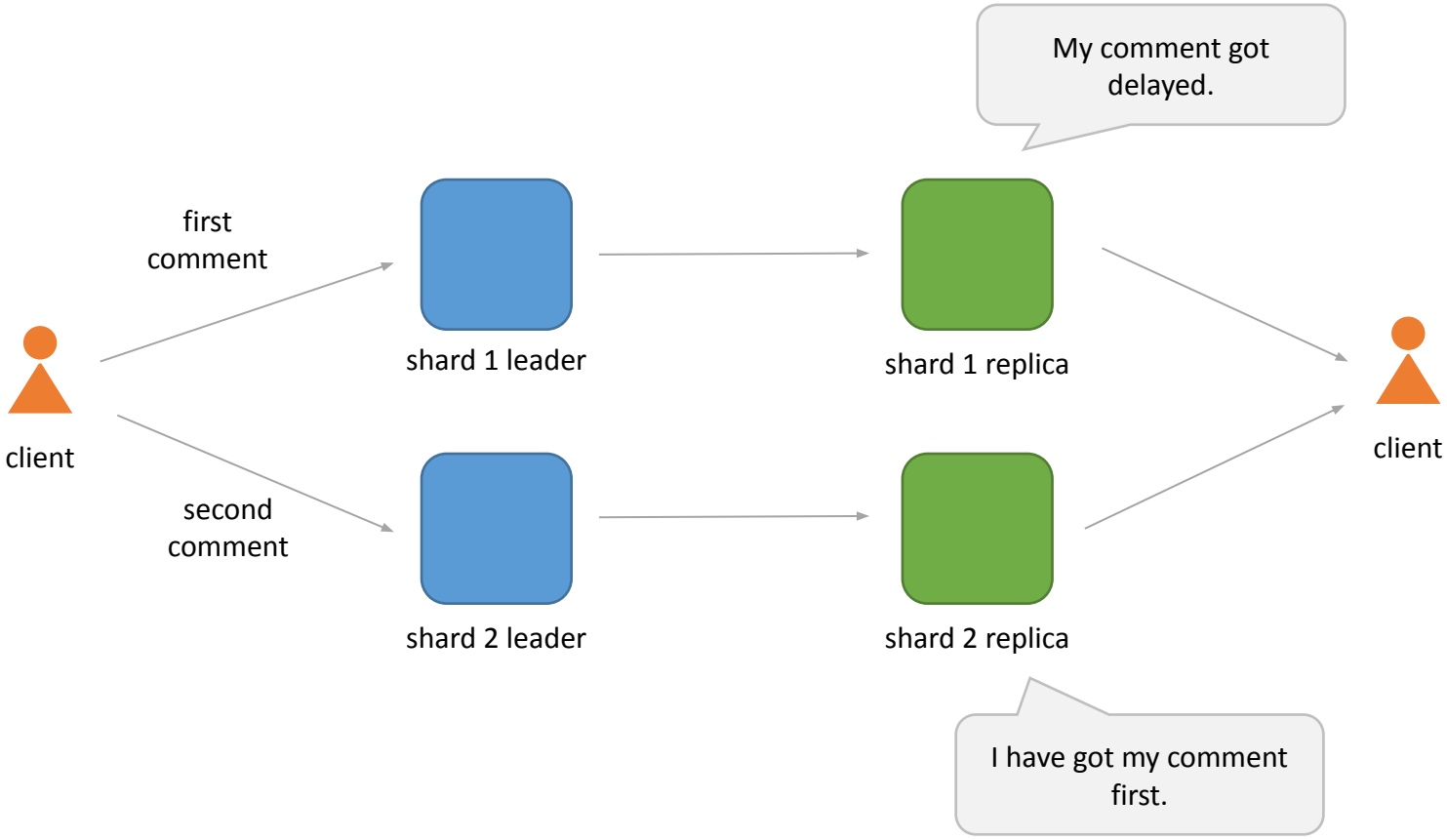
do not see my own comment



Non-functional requirements - Consistency

problem 3

out-of-order comments



Non-functional requirements - Consistency