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8. Lease

Let's learn about lease and its usage.

> ### We'll cover the following   ⌃
>
> - Background
> - Definition
> - Solution
> - Examples

Background#

In distributed systems, a lot of times clients need specified rights to certain resources. For example, a client might need exclusive rights to update the contents of a file. One way to fulfill this requirement is through distributed locking. A client first gets an exclusive (or write) lock associated with the file and then proceeds with updating the file. One problem with locking is that the lock is granted until the locking client explicitly releases it. If the client fails to release the lock due to any reason, e.g., process crash, deadlock, or a software bug, the resource will be locked indefinitely. This leads to resource unavailability until the system is reset. Is there an alternate solution?

Definition#

Use time-bound leases to grant clients rights on resources.

Solution#

A lease is like a lock, but it works even when the client goes away. The client asks for a lease for a limited period of time, after which the lease expires. If the client wants to extend the lease, it can renew the lease before it expires.

Examples#

Chubby clients maintain a time-bound session lease with the leader. During this time interval, the leader guarantees to not terminate the session unilaterally.

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