# Redundancy and Replication

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## Grokking the System Design Interview

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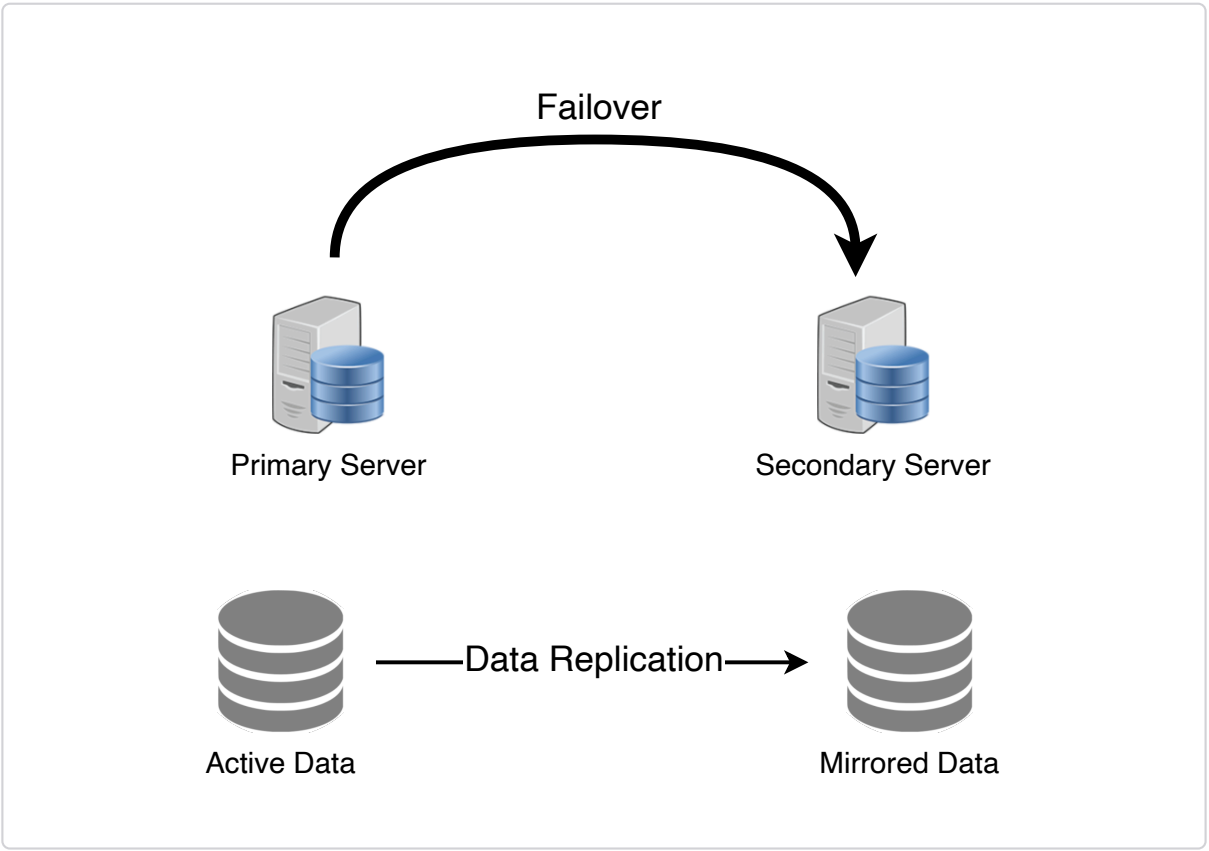
Redundancy (https://en.wikipedia.org/wiki/Redundancy_(engineering)) is the duplication of critical components or functions of a system with the intention of increasing the reliability of the system, usually in the form of a backup or fail-safe, or to improve actual system performance. For example, if there is only one copy of a file stored on a single server, then losing that server means losing the file. Since losing data is seldom a good thing, we can create duplicate or redundant copies of the file to solve this problem.

Redundancy plays a key role in removing the single points of failure in the system and provides backups if needed in a crisis. For example, if we have two instances of a service running in production and one fails, the system can failover to the other one.




Replication (https://en.wikipedia.org/wiki/Replication_(computing)) means sharing information to ensure consistency between redundant resources, such as software or hardware components, to improve reliability, fault-tolerance (https://en.wikipedia.org/wiki/Fault_tolerance), or accessibility.

Replication is widely used in many database management systems (DBMS), usually with a primary-replica relationship between the original and the copies. The primary server gets all the updates, which then ripple through to the replica servers. Each replica outputs a message stating that it has received the update successfully, thus allowing the sending of subsequent updates.

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