Redundancy and Replication

Redundancy 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.

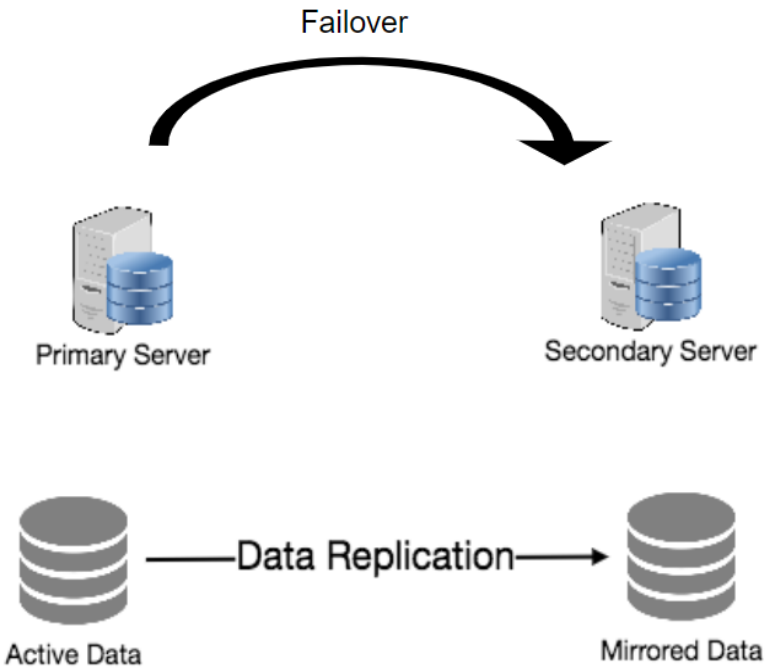

figure 1: Redundancy and Replication in practice

Replication means **sharing information to ensure consistency** between redundant resources, such as software or hardware components, to improve reliability, fault-tolerance, or accessibility.

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