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Database Replication
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* Definition: "Multiple instances of a database (where data is synchronized between them)."

* Advantages: (1) The services are up even when one of the database goes down.
              (2) Less or no chance of data loss.
              (3) Helps reduce latency.

* Replication Lag: Time taken to update data from primary database to secondary database(s)
                   (to maintain data consistency throughout the databases).

* Types of database replication ->
  (1) Synchronous Replication - (1.1) Steps: Step 1:: Write / Update data to the primary database.
                                            Step 2:: Wait for the secondary database(s) for data replication.
                                            Step 3:: Send back acknowledgement.
                                (1.2) Data consistency is prioritized (over availability).

  (2) Asynchronous Replication - (2.1) Steps: Step 1:: Write / Update data to the primary database.
                                             Step 2:: Send signal to secondary database(s) for data replication. Do not wait.
                                             Step 3:: Send back acknowledgement.
                                 (2.2) Availability is prioritized (over data consistency).

  (3) Semi-synchronous Replication - (3.1) Steps: Step 1:: Write / Update data to the primary database.
                                                 Step 2:: Send signal to secondary database(s) for data replication
                                                          and wait till at least one database is updated.
                                                 Step 3:: Send back acknowledgement.

* Master-Slave Replication: (1) If the master ( / primary) database goes down then, one of the slave (/ secondary) databases
                                is temporarily assigned as master database until the master database is back to service.
                            (2) Whether the master database is back or not is checked by a heartbeat mechanism.

* Master-Master Replication: (1) Two or more databases configured as master databases.
                             (2) Each master database can accept write operations.
                             (3) Changes made to any one of the master database will reflect in other master databases
                                 and are subsequently propagated to all slave databases.

For more info, visit: https://www.geeksforgeeks.org/system-design/database-replication-and-their-types-in-system-design/
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