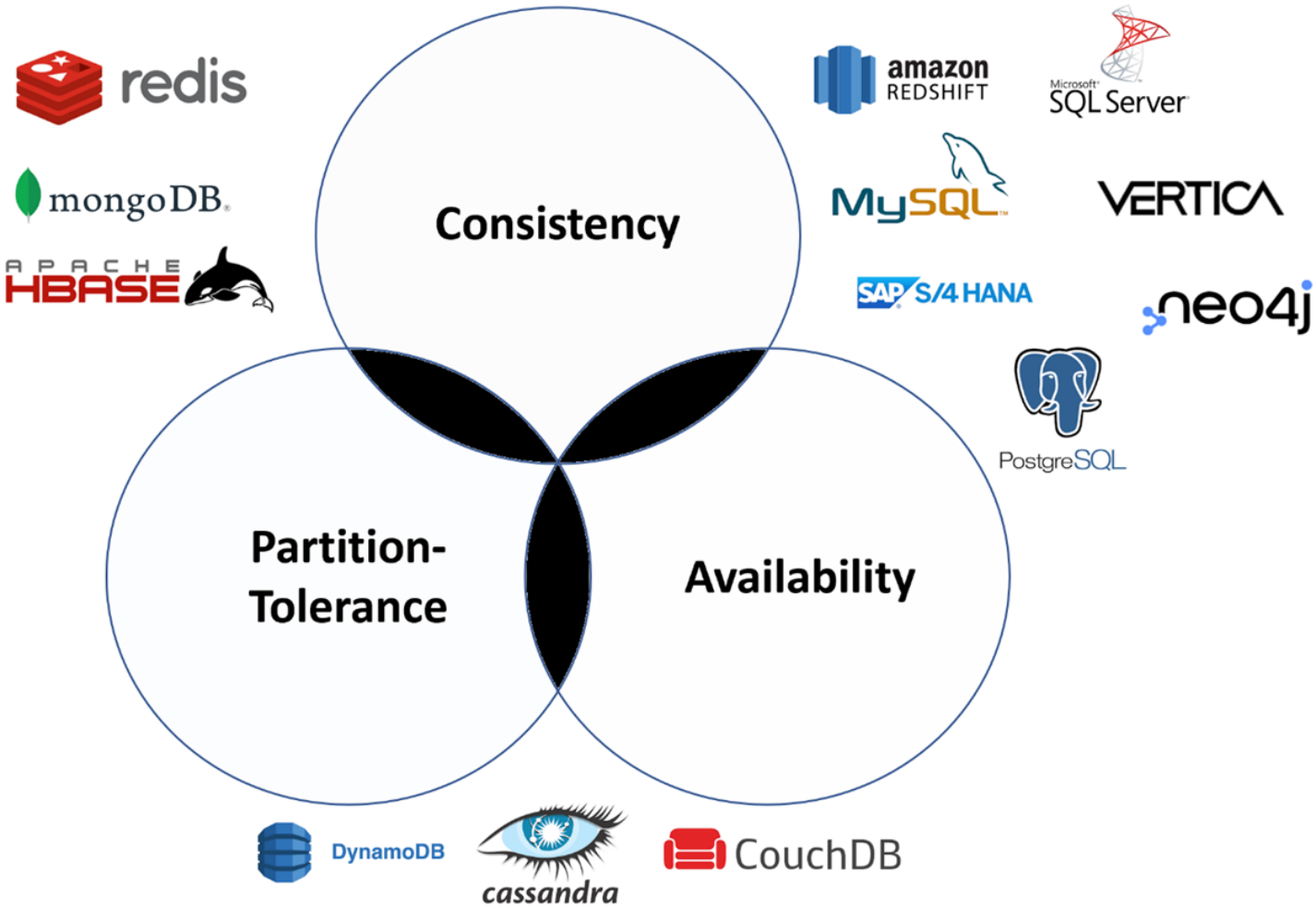
CAP Theorem Follow-up

CAP Review

- Consistency
  Every read receives the most recent write or an error.
- Availability
  Every request receives a (non-error) response, without the guarantee that it contains the most recent write.
- Partition tolerance
  The system continues to operate despite an arbitrary number of messages being dropped (or delayed) by the network between nodes.


redis
mongoDB.
APACHE HBASE
amazon REDSHIFT
Microsoft SQL Server
MySQL
VERTICA
SAP S/4 HANA
neo4j
PostgreSQL
Consistency
Partition-Tolerance
Availability
DynamoDB
cassandra
CouchDB

Eventual Consistency

Eventual Consistency is a guarantee that when an update is made in a distributed database, that **update will eventually be reflected in all nodes** that store the data, resulting in the same response every time the data is queried.

Consistency refers to a database query returning the same data each time the same request is made. **Strong consistency** means the latest data is returned, but, due to internal consistency methods, it may result in higher latency or delay. With eventual consistency, results are less consistent early on, but they are provided much faster with low latency. Early results of eventual consistency data queries may not have the most recent updates because it takes time for updates to reach replicas across a database cluster.

A key benefit of an eventually consistent database is that it supports the high availability model of NoSQL. Eventually consistent databases **prioritize availability over strong consistency**. Eventual consistency in microservices can support an always-available API that must be responsive, even if the query results may occasionally be missing the latest commit.

Example

Message timeline for a social app like Facebook or Twitter

When you post a status message on Facebook, or tweet a message via Twitter, it might not be immediately visible to your friends or followers. But eventually, they'll be able to see the status updates/ tweets

References

https://en.wikipedia.org/wiki/CAP_theorem
https://www.scylladb.com/glossary/eventual-consistency/
https://www.acodersjourney.com/eventual-consistency/