

Latency and consistency tradeoffs for data replication



ALEX XU

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21



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Understanding the **tradeoffs** is very important not only in system design interviews but also designing real-world systems. When we talk about data replication, there is a fundamental tradeoff between **latency** and **consistency**. It is illustrated by the diagram below.

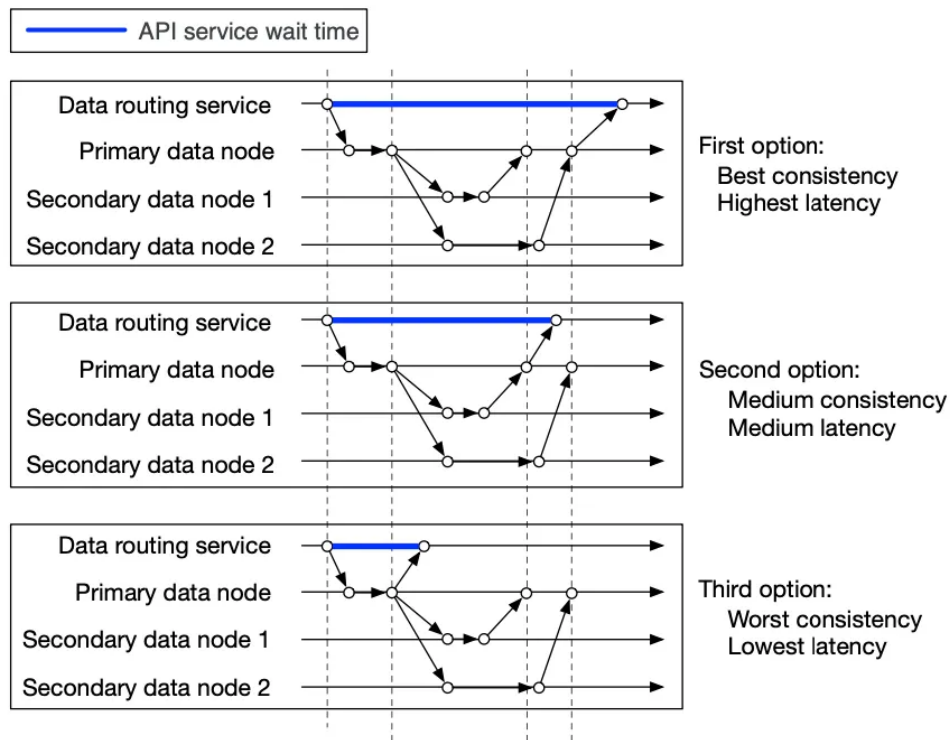


Figure 9.11: Trade-off between consistency and latency

1. Data is considered as successfully saved after all three nodes store the data. This approach has the best consistency but the highest latency.
2. Data is considered as successfully saved after the primary and one of the secondaries store the data. This approach has a medium consistency and medium latency.
3. Data is considered as successfully saved after the primary persists the data. This approach has the worst consistency but the lowest latency.

Both 2 and 3 are forms of eventual consistency.

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