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System Design

Interview Questions



*Seen in **ML Engineer** and **AI Engineer** interviews
at FAANGs, startups and consulting firms*



Core Concepts

1. **Scalability:** Understand horizontal vs. vertical scaling, and how to design scalable systems.
2. **Load Balancing:** Concepts behind tools like Nginx, HAProxy.
3. **Caching:** Mechanisms (e.g., Redis, Memcached) and strategies (LRU cache, write-through, write-back).
4. **Databases:** Differences between SQL (e.g., PostgreSQL, MySQL) and NoSQL (e.g., MongoDB, Cassandra). ACID vs. BASE properties.
5. **Consistency vs. Availability:** CAP theorem.
6. **Distributed Systems:** Challenges (e.g., network failures, partition tolerance) and patterns (e.g., leader election).
7. **Message Queues:** Usage and tools like RabbitMQ, Kafka.
8. **Microservices:** Benefits, challenges, and communication methods (e.g., REST, gRPC).
9. **API Design:** RESTful services, rate limiting, versioning.
10. **Replication & Sharding:** Strategies to distribute data.
11. **Failover and Recovery:** Strategies to handle system failures.
12. **Monitoring & Logging:** Tools and strategies for maintaining system health.