th: Deep Dive into System Design Interview

Basic Building Blocks for Modern System Design

Module Overview

In this module, we'll learn about the building blocks of modern systems, each component of which is a completely scalable application itself. These building blocks are the foundation for designing scalable applications. Each building block serves a unique purpose and has its own importance in scalable applications.

Module Objectives

Learn about the role of Domain Name System (DNS) in system design.

Learn about the role of databases in system design.

Learn the importance of load balancers.

Learn the importance of distributed messaging queues.

Start Learning

72 Lessons

66 Quizzes

3 Playgrounds

36 Code Snippets

434 Illustrations

Module 3

Contents (Module 4)

Module 5

1. Introduction to Building Blocks

- Introduction to Building Blocks for Modern System Design

2. Domain Name System

- Introduction to Domain Name System (DNS)
- How the Domain Name System Works

3. Load balancers

- Introduction to Load Balancers
- Global and Local Load Balancing

4. Cache

- Caching

5. Databases

- Introduction to Databases
- Types of Databases
- Data Replication
- Data Partitioning
- Trade-offs in Databases

6. Key-value Store

- System Design: The Key-value Store
- Design of a Key-value Store
- Ensure Scalability and Replication
- Versioning Data and Achieving Configurability
- Enable Fault Tolerance and Failure Detection

7. Content Delivery Network (CDN)

- System Design: The Content Delivery Network (CDN)
- Introduction to a CDN
- Design of a CDN
- In-depth Investigation of CDN: Part 1
- In-depth Investigation of CDN: Part 2
- Evaluation of CDN's Design
-

Quiz on CDN's Design

8. Sequencer

- System Design: Sequencer
- Design of a Unique ID Generator
- Unique IDs with Causality

9. Distributed Monitoring

- System Design: Distributed Monitoring
- Introduction to Distributed Monitoring
- Prerequisites of a Monitoring System

10. Distributed Cache

- System Design: The Distributed Cache
- Background of Distributed Cache
- High-level Design of a Distributed Cache
- Detailed Design of a Distributed Cache
- Evaluation of a Distributed Cache's Design
- Memcached versus Redis

11. Distributed Messaging Queue

- System Design: The Distributed Messaging Queue
- Requirements of a Distributed Messaging Queue's Design
- Considerations of a Distributed Messaging Queue's Design
- Design of a Distributed Messaging Queue: Part 1
- Design of a Distributed Messaging Queue: Part 2
- Evaluation of a Distributed Messaging Queue's Design
- Quiz on the Distributed Messaging Queue's Design

12. Pub-sub

- System Design: The Pub-sub Abstraction
- Introduction to Pub-sub
- Design of a Pub-sub System

13. Rate Limiter

- System Design: The Rate Limiter
- Requirements of a Rate Limiter's Design
- Design of a Rate Limiter
- Rate Limiter Algorithms
- Quiz on the Rate Limiter's Design

14. Blob Store

- System Design: A Blob Store

- Requirements of a Blob Store's Design
- Design of a Blob Store
- Design Considerations of a Blob Store
- Evaluation of a Blob Store's Design
- Quiz on the Blob Store's Design

15. Distributed Search

- System Design: The Distributed Search
- Requirements of a Distributed Search System's Design
- Indexing in a Distributed Search
- Design of a Distributed Search
- Scaling Search and Indexing
- Evaluation of a Distributed Search's Design

16. Distributed Task Scheduler

- System Design: The Distributed Task Scheduler
- Requirements of a Distributed Task Scheduler's Design
- Design of a Distributed Task Scheduler
- Design Considerations of a Distributed Task Scheduler
- Evaluation of a Distributed Task Scheduler's Design

17. Sharded Counters

System Design: The Sharded Counters

- High-level Design of Sharded Counters
- Detailed Design of Sharded Counters
- Quiz on the Sharded Counters' Design

18. Conclusion

- Final Remarks

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