GeeksforGeeks

System Design Live

DETAILED COURSE SYLLABUS

CONTENTS

LECTURE 01

- WHAT EXACTLY IS A SYSTEM DESIGN INTERVIEW?
- EXPECTATIONS FROM INTERVIEWEE
  - Breadth Vs Depth
  - Should you know everything about everything?
- TYPES OF JOBS TO TARGET FROM THE MARKET
- SYSTEM DESIGN PROCESS
  (MOTIVATING EXAMPLE: DESIGN UBER.)
  - Common Mistakes
  - Chaotic Approach
  - Systematic Approach
- DESIGN PROBLEM FOCUSSED ON REQUIREMENT ANALYSIS AND DATAMODELLING

LECTURE 02

- GENERIC COMPONENTS DESIGN DIAGRAM OF A LARGE-SCALE SYSTEM
- TRADE-OFFS IN A LARGE-SCALE SYSTEM (MOTIVATING EXAMPLE: DESIGN TWITTER.)
  - Performance Vs Scalability
  - Latency Vs Throughput
  - Availability Vs Consistency (CAP Theorem)
- DESIGN PROBLEM FOCUSED ON REQUIREMENT ANALYSIS AND DATA MODELLING

LECTURE 03

- LOAD BALANCERS
  - Why?
  - Algorithms
  - Benefits

CONTENTS

- **SSL TERMINATION AND SSL PASSTHROUGH**
- **REVERSE PROXY**
  - When to use?
  - Benefits
- **DESIGN PROBLEM-FOCUSED USING REVERSE PROXY AND LB**

LECTURE 04

- **WEB SOCKETS**
  - Why Web sockets?
  - Establishing a web socket connection
- **MONOLITHS AND MICROSERVICES**
  - Understanding the misconceptions.
  - What are they?
  - When to use what?
  - Advantages of one over the other.
- **FACEBOOK MESSENGER DESIGN USING WEB SOCKETS**

LECTURE 05

- **O AUTH 2.0**
  - What is it?
  - Understanding with an example.
- **JWT TOKENS**
  - What is it?
  - Demo
- **DESIGN PROBLEM FOCUSED ON WRITING MICROSERVICES**

CONTENTS

LECTURE 06

- **CDN**
  - What is it?
  - Why and when?
- **CACHING**
  - Why caching?
  - Implementation types.
  - When to use which implementation.
  - Eviction policies
  - Redis Intro
- **DESIGN PROBLEM FOCUSED ON USING CDNS**

LECTURE 07

- **DESIGN PROBLEM FOCUSED ON USING CDNS**
  - Why?
  - Features
- **DNS**
- **HTTPS WORKING**
  - HTTPS vs HTTP
- **ZOOKEEPER**
- **DESIGN PROBLEMS FOCUSED ON ZOOKEEPERS.**

LECTURE 08

- **DISTRIBUTING DATA IN A LARGE-SCALE SYSTEM**
- **LINEAR HASHING**
  - What is it?
  - Why?
  - Issues?
  - Solution?

CONTENTS

- **CONSISTENT HASHING**
  - What is it?
  - How it is better than linear hashing
- **DESIGN PROBLEM BASED ON CONSISTENT HASHING.**

LECTURE 09

- **HOW TO HANDLE MASSIVE DATA?**
  - What are the issues if the data set is huge?
- **INDEXING**
  - Primary
  - Secondary
  - Multilevel
- **DATA PARTITIONING**
  - Vertical partitioning
  - Horizontal partitioning
- **SHARDING**
  - What is data sharding?
  - Sharding Techniques
- **REPLICATION AND MIRRORING**
- **DESIGN PROBLEM BASED ON DATA MODELING.**

LECTURE 10

- **PUSH VS PULL MECHANISM.**
  - What are they?
  - When to choose what?
- **TIPS ON SYSTEM DESIGN**
  - How to present end-to-end design during interviews?
  - Some direct tips from top companies.

CONTENTS

- APPLYING END-TO-END LEARNING ON DESIGNING A SYSTEM.
- EVENT DRIVEN DESIGN OF A PROBLEM.

LECTURE 11

- ATTACKS ON A SERVICE
  - Understanding attacking using DDOS as an example
  - DDOS working.
  - How to identify an attack
  - How to mitigate
- ENCRYPTION MECHANISM
  - Symmetric
  - Asymmetric
  - Hashing
  - Digital Signature

LECTURE 12

- API DESIGNS
  - Tips on designing APIs.
- REVISITING DATABASES
  - SQL vs No SQL
  - Scalability of SQL vs NoSQL
  - ACID properties
  - BASE
- APPLYING END-TO-END LEARNING ON DESIGNING A SYSTEM.