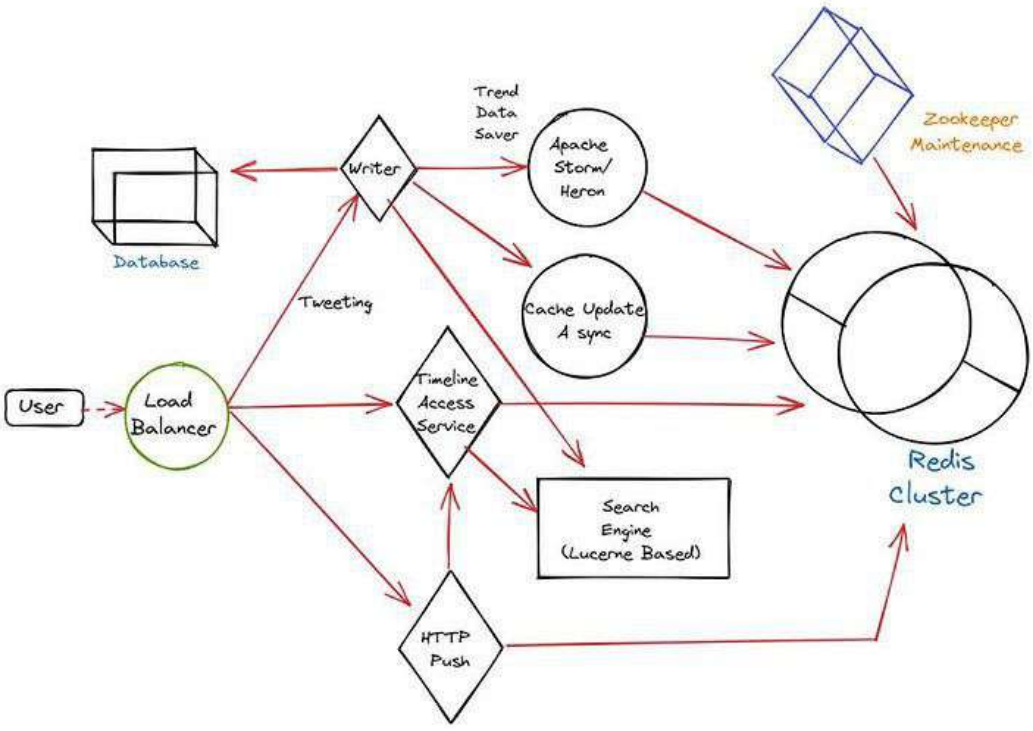
BOSSCODER ACADEMY

SYSTEM DESIGN

Basic to Advanced



IN JUST 60 DAYS

Questions

1. What does OSI stand for, and what is the OSI Model used for in networking?
2. List the primary functions of all the seven layers of the OSI Model.
3. Which layer of the OSI Model is responsible for routing and logical addressing?
4. Provide an example of a protocol or technology associated with each layer of the OSI Model.
5. Explain the concept of encapsulation in the context of the OSI Model.
6. How does the TCP/IP Protocol Stack compare to the OSI Model in terms of layers?
7. Which protocols operate at the Transport Layer of the TCP/IP stack?
8. Explain the differences between TCP (Transmission Control Protocol) and UDP (User Datagram Protocol)

4. What are the main advantages and challenges of vertical scaling?
5. Provide examples of applications or systems where horizontal scaling is a better fit.
6. Provide examples of applications or systems where vertical scaling is a better fit.
7. Is it possible to combine horizontal and vertical scaling strategies in a single system? Why or why not?

DAY 10-12

IP Address Routing

📝 Topics to cover

- IP Addresses
- Subnetting
- Routing

🗂️ Resource

- What is an IP Address? | Definition from TechTarget
- What is IP Routing? - GeeksforGeeks
- Introduction To Subnetting - GeeksforGeeks

DAY 6-9

Basics of Networking

📝 Topics to cover

- OSI Model
- TCP/IP Protocol Stack

🗂️ Resource

- Layers of OSI Model - GeeksforGeeks
- OSI Model Explained | OSI Animation | Open System Interconnection Model | OSI 7 layers | TechTerms
- TCP/IP Model - GeeksforGeeks
- TCP IP Model Explained | TCP IP Model Animation | TCP IP Protocol Suite | TCP IP Layers | TechTerms

DAY 4-6

System Design Basics - Reliability and Availability

📝 Topics to cover

- Reliability
- Mean Time Between Failures (MTBF)
- Redundancy
- MTTR (Mean Time To Repair)
- High Availability Architecture
- Service Level Agreements (SLA)

🗂️ Resource

- System Reliability & Availability Calculations – BMC Software | Blogs

Questions

1. What does "reliability" mean in the context of system design, and why is it essential?
2. Define the terms MTBF (Mean Time Between Failures) and MTTR (Mean Time To Repair). How are they related to system reliability?
3. Explain the concept of redundancy. How does redundancy contribute to improved system reliability?
4. Define "availability" in system design. Why is high availability important?
5. Explain the concept of planned downtime and unplanned downtime. How do they impact system availability?
6. Why is monitoring important for maintaining system availability?

DAY 2-3

System Design Basics - Scalability

📝 Topics to cover

- Horizontal Scaling
- Vertical Scaling

📁 Resource

- System Design - Horizontal and Vertical Scaling - GeeksforGeeks

❓ Questions

1. Explain the main differences between horizontal and vertical scaling
2. Explain the terms "scaling out" and "scaling up" in the context of horizontal and vertical scaling
3. What are the main advantages and challenges of horizontal scaling?

DAY 1

What exactly is System Design?

📝 Topics to cover

- What is System Design and why is it important?
- Key components of a system: Clients, Servers, Databases, Caching, Load Balancing, Proxies.
- Horizontal vs. Vertical Scaling.

📁 Resource

- System design primer: Learn the basics of system design

❓ Questions

1. Explain why system design is crucial in software development.
2. What is the difference between horizontal and vertical scaling
3. Name three key components of a typical system architecture.