# 25+ Google Systems Design Interview Questions for Software Developers

Google is one of the most valuable companies in the world and offers a broad spectrum of consumer- and business-centric services. Its phenomenal culture makes it one of the best companies to work for software engineers and developers. As part of its technical interview process, Google conducts a systems design round to evaluate the engineering design skills of applicants. This round mostly happens during the on-site interview, along with the coding and behavioral rounds.

To ace Google's system design interview requires a good understanding of design fundamentals and the ability to build and work with scalable systems.

This article focuses on acquainting you with Google's technical interview process and what sort of systems design interview questions to expect.

Here's what we will cover in this article:

- What is a system design interview?
- Google system design interview process
- Google system design interview questions
- Tips to prepare for and crack system design interview

## What Is a Systems Design Interview?

Systems design interviews is an important part of tech interviews at FAANG and tier-1 tech companies. In these interviews, companies evaluate your ability to create scalable systems with low latency, capable of reaching millions of users.

These interviews typically consist of many open-ended interview questions, where you essentially have to discuss the technicalities behind complex, scalable systems. Knowing and applying concepts related to relational databases, sharding techniques, and network protocols is also crucial to ace this round.

# Google Systems Design Interview Process

The systems design interview round happens after the technical phone screen interview. You won't be asked any design questions during your phone screen interview, as the initial phone screen mainly focuses on coding questions around data structures and algorithms.

The design interview happens much later in the interview process, during the on-site or in-person interview. After passing the phone screen round, you're invited to Google's campus for on-site technical and behavioral interviews.

***To understand more about Google's interview process,*** *click here.*

# Topics to Prepare for Systems Design Interview

The systems design interview rounds aim at testing how you break down a large problem and tackle different parts of it. So while your tech skills are important, your critical thinking is also at display during these rounds. Narrowing down the topics to prepare for such an interview is not easy.

However, based on our experience of training over 9,000 software engineers, the following are some of the key broad categories that you should consider while preparing for a systems design interview:

- Basics of systems design
- Basics of networking
- Scaling distributed applications
- Replication
- Sharding techniques
- Measuring the performance of scalable systems
- Cache
- Storage and retrieval
- MapReduce and distributed file systems
- Systems design case studies
- Basics of API design

# Google Systems Design Interview Questions

Practicing a good number of systems design questions is vital to acing the design round at Google.

Here are a couple of sample System Design interview questions and the approach you should take to solve them:

**Question: Design a video streaming service.**

Designing a global video streaming service like Youtube or Netflix is a commonly asked design interview question. While designing a video streaming service, your ideal solution should:

- Allow the user to view, search and upload videos.
- Allow users to add comments on videos in real time.
- Count and show the number of views, upvotes, and downvotes on individual videos.
- Be able to store and transmit petabytes of information.
- Scale well and allow many users to share and watch videos at the same time.
- Discuss OC, backend, and client design components.

**Question: Design a chat application.**

Designing a messaging system like Whatsapp is also a popular design question. While solving this question, your ideal solution should:

- Support one-on-one chatting between users.
- Support group-chats.
- Offer delivered and read receipts.
- Consider offering last seen.
- Handle what happens in the case of no internet connection.
- Support push notifications.
- Support media like documents and images, even sound recordings, and videos if possible.
- Provide end-to-end encryption.
- Offer customization of privacy settings.

To help you with your interview prep further, here are some types of Google system design interview questions you can expect:

1. How would you design a warehouse system for Google.com?
2. How would you design Google.com so it can handle 10x more traffic than today?
3. How would you design Google.com's database (customers, orders, products, etc.)?
4. Design a counters system for online services.
5. Design a game of chess.
6. Design a parking garage.
7. Design an email sender that can send 100,000,000 emails. You have five machines. How could you do it efficiently?
8. Design a URL shortening service.
9. Design an online bookstore.
10. Design a global file storage or a sharing service.
11. Design an API rate limiter.
12. Design a proximity server.
13. Design a type-ahead service.
14. How do you design a vending machine in Java?
15. How do you design a traffic control system?
16. How to design a limit order book for trading systems?
17. How do you design an elevator system?
18. How would you go about designing an e-commerce website?
19. How would you go about designing an e-commerce website using microservices? How will you handle transactions?
20. Create an autocomplete feature like word suggestions on search engines. How will you scale it to millions of users?
21. Design a website like Pastebin.
22. How would you design Google's Web Crawler?
23. How would you design a global ride-hailing service?
24. Design an online ticket booking system.
25. Design a parking lot system.

# Tips to Prepare for and Crack the Google Systems Design Interview

Systems design interview questions asked in Google's technical interview can be tricky and challenging. With diligent practice, you can give yourself a good chance at dealing with questions recruiters throw at you and acing the round.

Below are some important tips to ace Google's systems design interview:

- **Give yourself adequate time to prepare and practice:** Giving yourself sufficient time is the most important thing. Ideally, you'll have to prepare for the system design interview and the coding interview simultaneously. While the coding interview prep can take up most of your time, give yourself at least three weeks to prepare for the systems design round.
- **Leverage your experience:** Systems design questions are usually based on real-world systems that are functional and scalable. Having experience in building engineering systems is a big plus point, as a lot of questions can be navigated by leveraging your experience. If you don't have hands-on design experience, look up resources that will acquaint you with the ways of design.
- **Read books:** Read up popular design books such as *"Designing Data-Intensive Applications" by Martin Kleppmann* and *"Patterns of Enterprise Application Architecture" by Martin Fowler* to get a fair idea of complex, scalable systems and what is expected of you during design interviews.
- **Brush up on core design concepts:** Brush up on core design concepts including abstraction, caching, load balancing, proxies, concurrency, database, network, and more. Also, learn how to employ these concepts while building scalable systems. That way, you'll know exactly how to navigate a design problem in the interview.
- **Practice mock interviews:** Mock interviews are a brilliant way to polish your interviewing skills. The idea, however, is to practice with accomplished professionals, preferably hiring managers and technical leads from FAANG companies. Interview Kickstart offers mock interviews with actual hiring managers from Google. To learn more, register for our free webinar.

## Tips to Keep in Mind During Your Systems Design Interview

No matter how well-prepared you are, you can falter on the day of the interview. Below are some things that will help you make a good impression during your google systems design interview:

1. **Understand the problem before solving it:** Understanding the problem is key to getting the solution right. Before you go about solving the problem, clarify your doubts with the hiring manager. Ask the right questions to form a thorough understanding of what is required. Ask questions pertaining to scale, scalability, and latency.

2. **Think out loud:** Thinking out your solution aloud will give the interviewer a window into your thoughts. Also, stay in constant conversation while you go about designing your system.
3. **Approach the problem from different angles:** If you're a frontend developer, begin by recognizing the use case. If you're a database engineer, start by creating the database and how you're going to enter the entities.

# Ready to Nail Your Next Tech Interview?

Whether you're a Coding Engineer gunning for Software Developer or Software Engineer roles, a Tech Lead, or you're targeting management positions at top companies, IK offers courses specifically designed for your needs to help you with your technical interview preparation!

Nailing tech interviews at the biggest firms is the best way to give your career a great boost. If you're unsure about how to prepare, register for Interview Kickstart's FREE webinar and find out how we can help you take your career to the next level.