System design interviews: a framework senior engineers use

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A system design interview asks you to design something open-ended in under an hour. The interviewer is watching how you think, not whether you reach a particular diagram. A repeatable framework keeps you calm and on track.

TL;DR The short version

- A system design interview tests how you think, not whether you reach a particular diagram.
- Follow a repeatable framework: clarify requirements and scale, state assumptions, define the interface, then design and discuss trade-offs.
- Avoid starting with a complex diagram or adding components without a reason, and practise by designing systems you use, out loud.

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The framework

1. **Clarify.** Ask what the system must do, for whom and at what scale. State your assumptions.
2. **Define the interface.** Sketch the main operations and the data they use.
3. **Draw the simple version.** One box, one database. Make it work first.
4. **Find the bottleneck.** Where does it break as load grows? Data size, writes, hot keys, latency?
5. **Evolve the design.** Add caching, partitioning, queues or replication, each in answer to a named problem.
6. **Discuss trade-offs and failures.** What does each choice cost, and what happens when a part fails?

What interviewers look for

- Questions before answers.
- Reasoning about trade-offs, not name-dropping technologies.
- Awareness of failure, cost and operations.
- Clear communication and willingness to change course.

Common mistakes

- Starting with a complex diagram.
- Adding components with no stated reason.
- Ignoring data consistency and failure.

- Not checking the design against the requirements at the end.

Practise

Design systems you already use, out loud, with a friend. Write down what you would change after the first user and after the thousandth. See architecture decisions are expensive to undo.

> Related credential: Certified Technical Practitioner. Explore the exam facts and syllabus.

Sources and further reading

1. IICTP. TPBOK, Architecture & Systems Design. iictp.org/standards/tpbok.

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