Questions to Help You Prep for An Embedded Engineer Interview in 2021

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I've worked for years as an embedded engineer and have conducted countless job interviews, like my co-author Maurice Kalinowski (https://www.linkedin.com/in/mauricekalinowski/). This post offers our expert advice for preparing for an embedded engineer interview and common questions in embedded interviews.

In this article:

How to prepare for embedded engineer interview in 2021

When preparing for an embedded engineer interview, think about the questions you'll be asked. You'll also want to prepare questions to ask about the company and culture. Research and learn about the company in advance.

Dale Bertrand, a former embedded engineer who is now President of Fire and Spark, says job applicants need to ask key questions about the company and position in their first phone screening interview with the company.

"What are they looking for? What would it take to be a success in this job? A question I always like to ask is: *What problem is this potion intended to solve?* If you can get those answers, then you can prepare," Bertrand explains. "You have to ask the right questions on that first call. I don't think you can go into the more in-depth interview blind. That's kind of suicide."

Read our guide to embedded engineering skills (/embedded-development-talk/essential-skills-for-embedded-systems-and-embedded-software-engineers?hsLang=en) to learn more about what these roles require.

Tips to help to do well at an embedded engineer interview

Experts say the most important thing applicants should do during an embedded engineer job interview is be honest. You should also be ready to think on your feet.

"It's best, to be honest about what you know and what you don't know. It is impossible for one engineer to know everything they need to know to build and test the entire system. It's just not possible to know everything," advises Bertrand. "If you don't have the experience, be honest about it and tell them you want to learn. That's attractive. What's not attractive is pretending you know when you don't."

Maurice Kalinowski, a former embedded engineer and current Product Director for Qt, says he likes to challenge embedded engineers in interviews with difficult questions and hypothetical scenarios. "But it's also very important to me to know that somebody is capable of saying: *I don't know*."

What are the typical embedded systems interview questions?

Companies conducting embedded engineer job interviews will ask a range of questions. Some inquiries will focus on an applicant's work views and engineering. Other queries are for assessing an applicant's knowledge of embedded systems.

Read our embedded job description article (/embedded-development-talk/embedded-engineers-roles-responsibilities-and-job-descriptions?hsLang=en) to learn more about requirements for embedded engineers.

General and "soft-skills" questions for embedded engineers

- Think about a time when you felt the solution you found for a problem in an embedded system was the right one. A colleague, also working on the issue, disagreed and suggested what you thought was an inferior solution? How did you resolve the dispute?
- Tell us about a difficult project that gives you pride. Tell us about the project and its challenges, and discuss the problems you encountered and how you resolved them.
- What are two character traits you try to show in your personal life and at work?
- If you were the interviewer, why would you choose yourself as the right candidate?
- For principal embedded engineer: Where is our industry (or component that the principal engineer works within) heading? Where will it be in five years?

Technical interview questions for embedded engineers

General questions:

- How would you equalize a high-speed interface?
- Explain how the I^2C interface works.
- How does a finite state machine work in an embedded system?
- Name one sorting algorithm.
- What is an atomic operation?
- How do you avoid memory fragmentation when targeting embedded devices?
- What are ways to reduce power consumption in an embedded system?
- What are the purpose and benefits of object-oriented programming?
- What are the four pillars of object-oriented programming?
- Tell me the difference between a process and a thread.
- What are common issues in handling interrupts?
- What is a semaphore? What are the different types?
- Can semaphores be used for interrupt context in Linux Kernel?
- How do you use the keyword "Volatile"?
- What does the keyword "const" mean?
- What is a watchdog timer?
- What is the difference between using an inline function and a macro?
- What are the properties of an object-oriented programming language?
- What is a memory leak?
- When and why would you use the keyword "static"?

Questions around C/C++:

- Why are C and C++ still popular and widely used in embedded systems?
- What are the benefits of using C/C++ vs. higher-level languages?
- How does one code an infinite loop in C?

Microcontroller inquiries:

- When might someone choose a microcontroller instead of a microprocessor when building an embedded system?
- How can you use a micro-controller to determine the frequency of a high-voltage level on a bus?
- Are the firmware and data embedded in microcontrollers safe from hacking, tampering, or downloading?

Real-Time operating systems questions:

- What are the important metrics of real-time software?
- Describe the advantages and disadvantages of using a real-time operating system on a mid-range microcontroller.

Quality assurance discussion:

- Why is it more difficult to test graphical user interfaces than container classes?
- What is the difference between static and dynamic analysis testing?

Specific coding exercises:

Write a program that tells us whether an integer is even or odd.
Write a function that will consider an array and return the number of odd numbers.

Puzzle questions for embedded engineers

- How might you weigh an airplane with no scales?
- If there are 70 legs in total and there are 26 animals involving chickens and horses, can you figure out how many are horses and how many are chickens—without using an equation?
- There are two light bulbs in a room and three switches outside the room. How do you determine which switches operate which bulbs?
- Why are sewer caps round?

Download a copy of all these embedded engineering interview questions.
(/hubfs/Embedded%20Talk/Materials/Sample%20Job%20Interview%20Questions%20for%20Embedded%20Engineers.docx)

How learning more about Qt's framework is beneficial for an embedded engineer interview

Whether you're new to embedded engineering or have been in the business for years, it's always useful to brush up on specific embedded frameworks before heading into an interview. Having this knowledge helps you come across well-informed, versatile, and that you have a willingness to learn.

Qt is a cross-platform embedded development framework widely used throughout the embedded systems industry. Knowing how Qt's tools work and streamline development can start an informative discussion during an embedded engineering interview.

Embedded engineers can learn more about Qt, an application development framework based on C++ (https://doc.qt.io/archives/qt-4.8/how-to-learn-qt.html) and get started with its cross-platform GUI library (https://www.qt.io/developers?hsLang=en). They can also view a wide range of free embedded development tutorials (https://www.qt.io/learnqt?hsLang=en#embedded) to help you learn the Qt ecosystem.