Interview Guide for Infrastructure Software Engineer

Y Combinator

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# About this Guide

This guide is a tool for interviewers at Y Combinator to assess candidates for the Infrastructure Software Engineer role. It outlines the competencies required, provides a structured interview agenda, and includes a job description, case study, and candidate Q&A. The guide is designed to ensure a thorough evaluation of each candidate’s technical skills and alignment with Y Combinator’s values.

The competencies listed are based on the job description and the technical skills required for the role. They include both hard skills, such as experience with AWS and Docker, and soft skills, like problem-solving and communication. The guide also reflects Y Combinator’s values of integrity, respect, and accountability.

The interview process should be rigorous and fair. It should challenge candidates to demonstrate their expertise and problem-solving abilities. This guide will help interviewers identify the best candidate for the role, someone who can contribute to Y Combinator’s mission of supporting startups and applying mass production techniques to startup funding.

Use this guide as a framework for your interviews. It is flexible enough to allow for the unique flow of conversation with each candidate, yet structured enough to ensure all necessary areas are covered.

## Interview Agenda

The interview agenda is designed to provide a comprehensive assessment of the candidate’s qualifications for the Infrastructure Software Engineer role. It includes an introduction, a review of the candidate’s experience, a technical assessment, a discussion of the candidate’s approach to problem-solving, a review of the candidate’s alignment with Y Combinator’s values, and a closing section for any remaining questions and next steps.

## Competency Framework

The competency framework for the Infrastructure Software Engineer role at Y Combinator includes both technical and non-technical skills. The technical competencies are derived from the job description and focus on the candidate’s ability to manage and evolve infrastructure, debug a broad stack, and work with specific technologies. The non-technical competencies are based on Y Combinator’s values and include problem-solving, communication, and adaptability.

1. **Technical Proficiency in Ruby on Rails and AWS**: Deep understanding of Ruby on Rails and AWS services.
2. **Infrastructure Management**: Experience with Docker, ECS, and Terraform for infrastructure changes.
3. **Security and Performance Optimization**: Ability to secure applications and optimize performance.
4. **Problem-Solving and Debugging**: Strong analytical skills to debug complex issues.
5. **Communication and Collaboration**: Effective communication with product engineers and other team members.
6. **Adaptability and Learning**: Willingness to learn new technologies and adapt to changes.
7. **Alignment with Company Values**: Integrity, respect, and accountability in professional conduct.

# Job Description

**Y Combinator - Infrastructure Software Engineer**

Y Combinator is seeking an Infrastructure Software Engineer who will help manage and evolve the shared infrastructure that our software runs on. We have a team of approximately 15 Product Engineers who develop YC’s software products. Those products are developed in Ruby on Rails and run in AWS. Our team’s job is to provide a platform so our Product Engineers don’t have to think (as much) about infrastructure.

The ideal candidate will have experience debugging and developing a very broad stack. They’re comfortable talking about HTTP caching, AWS security groups, Rails monkey patching, n+1 queries in Active Record, CSRF protection, and React components.

Enjoy the many perks of working for a successful company – competitive salary and excellent benefits including fully-paid health care benefits and unlimited vacation – while working on a small, fast-moving and high-impact team.

In your first month, you might:

* Migrate a Rails application from Capistrano and EC2 to Docker and ECS
* Upgrade one of our applications to a newer version of Postgres or Rails
* Move more of our AWS infrastructure into Terraform
* Simplify our use of Webpack and Javascript for both developer productivity and faster deployments
* Create shared infrastructure to help manage email subscriptions and unsubscribes across 5 different product teams
* Triage and respond to bug bounty reports
* Work with outside security auditors to run a penetration test against our applications

**Key Responsibilities:**

* Provide a stable modern platform for our applications to be deployed to
* Keep our applications and data secure
* Improve our developer experience and tools so the YC Software Team can ship product updates quickly
* Help debug performance issues in our web applications
* Ship Ruby on Rails and TypeScript code that is shared among multiple YC applications

**Skills:**

* You know how to develop and debug MVC web applications. We use Ruby on Rails, Postgres, and React, but don’t worry if you haven’t used those specific technologies before
* You know how to deploy and run applications with AWS and Docker
* You use Terraform to make infrastructure changes

**Experience:**

* You have at least 5 years of experience developing and deploying web applications
* You are deeply familiar with the AWS platform specifically ECS, RDS, IAM, and CloudWatch

**Location:** YC is headquartered in the SF Bay Area with employees working from home or from our offices in San Francisco and Mountain View, CA. Candidates must live in the SF Bay Area or be willing to relocate.

**Compensation:** $130,000 to $270,000 + bonus (depending on skills and experience).

**Benefits:** Our full benefits package includes medical, vision, and dental plans, infertility benefit, STD/LTD, life insurance, commuter benefits, flexible spending account, health savings account, 401(k) + 4% matching, generous parental leave, paid holidays and flexible paid time off policy.

**Work Authorization:** This position does not support work authorization/visa sponsorship.

Y Combinator considers qualified applicants with criminal histories, consistent with applicable federal, state, and local law including San Francisco’s Fair Chance Ordinance. Y Combinator is committed to protecting the privacy of the personal information of job applicants and complying with the California Consumer Privacy Act. The privacy policy of Ashby, Inc., the hiring platform used by Y Combinator, governs the collection of such data.

# Competency 1. **Technical Proficiency in Ruby on Rails and AWS**

Candidates for the Infrastructure Software Engineer role must demonstrate a strong understanding of Ruby on Rails and familiarity with AWS services. This competency is critical as the job involves managing infrastructure for software developed in Ruby on Rails and running on AWS.

## Lead Question

**“Can you walk us through your experience with Ruby on Rails and AWS, particularly any challenges you’ve faced and how you overcame them?”** Listen for specific examples of work with Ruby on Rails and AWS. Probe for details about the candidate’s problem-solving approach. Ask about any significant contributions to projects involving these technologies.

*Look for evidence of in-depth knowledge and hands-on experience with Ruby on Rails and AWS. Assess the candidate’s ability to articulate complex technical concepts and past challenges.*

## Situational Scenario

**“Imagine you need to scale a Ruby on Rails application to handle a significant increase in traffic. What AWS services would you use, and how would you ensure the application remains stable and secure?”**

*Evaluate the candidate’s understanding of AWS services relevant to scaling and securing web applications. Look for a thoughtful approach to infrastructure management and security.*

## Diving Deeper

* “How do you manage database migrations in Ruby on Rails when dealing with large datasets?”
* “Describe a time when you had to troubleshoot a performance bottleneck in an AWS-hosted application. What tools did you use?”
* “What strategies do you employ for monitoring and logging in AWS to maintain application health?”

## Evaluation

| Rating 1 | Rating 2 | Rating 3 | Rating 4 | Rating 5 |
| --- | --- | --- | --- | --- |
| Limited knowledge of Ruby on Rails and AWS | Basic understanding but lacks depth | Competent with Ruby on Rails and AWS, some hands-on experience | Strong proficiency with Ruby on Rails and AWS, clear examples of problem-solving | Expert in Ruby on Rails and AWS, demonstrated leadership in complex projects |

# Competency 2. **Infrastructure Management**

The role requires experience in managing infrastructure using Docker, ECS, and Terraform. Candidates should be comfortable with containerization, orchestration, and infrastructure as code.

## Lead Question

**“Describe your process for implementing a significant infrastructure change using Docker, ECS, and Terraform. What considerations do you take into account?”** Look for a structured approach to infrastructure changes. Ask about any challenges faced and how they were resolved. Inquire about the impact of these changes on developer productivity and application deployment.

*Look for a clear understanding of containerization, orchestration, and infrastructure as code. Assess the candidate’s ability to plan and execute infrastructure changes with minimal disruption.*

## Situational Scenario

**“You are tasked with migrating a monolithic application to a microservices architecture using Docker and ECS. How would you approach this project, and what role would Terraform play in your strategy?”**

*Evaluate the candidate’s ability to break down a complex project into manageable steps. Look for knowledge of best practices in microservices architecture and the use of Terraform for infrastructure provisioning.*

## Diving Deeper

* “How do you ensure zero-downtime deployments when using Docker and ECS?”
* “Can you explain a time when you used Terraform to manage infrastructure? What were the benefits and drawbacks of this approach?”
* “Describe how you manage state in Terraform and ensure consistency across environments.”

## Evaluation

| Rating 1 | Rating 2 | Rating 3 | Rating 4 | Rating 5 |
| --- | --- | --- | --- | --- |
| Limited experience with Docker, ECS, or Terraform | Basic use of tools, but lacks comprehensive management experience | Competent in using Docker, ECS, and Terraform for standard tasks | Strong experience in infrastructure management, clear examples of successful projects | Expert in infrastructure management with Docker, ECS, and Terraform, innovative solutions to complex problems |

# Competency 3. **Security and Performance Optimization**

Candidates must be adept at securing applications and optimizing their performance. This includes understanding security best practices and performance tuning for web applications.

## Lead Question

**“What steps do you take to ensure the security and performance of web applications you manage?”** Listen for a comprehensive security strategy and performance optimization techniques. Probe for examples of past experiences where the candidate improved security or performance.

*Look for a proactive approach to security and performance. Assess the candidate’s ability to implement effective security measures and performance optimizations.*

## Situational Scenario

**“A web application you manage has been experiencing slow load times and has recently been the target of a security breach. How would you address these issues?”**

*Evaluate the candidate’s ability to diagnose and resolve security and performance issues. Look for a systematic approach to identifying root causes and implementing solutions.*

## Diving Deeper

* “How do you stay updated on the latest security vulnerabilities and patches?”
* “Describe a time when you optimized the performance of a high-traffic web application. What metrics did you focus on?”
* “What tools and practices do you use for continuous security monitoring?”

## Evaluation

| Rating 1 | Rating 2 | Rating 3 | Rating 4 | Rating 5 |
| --- | --- | --- | --- | --- |
| Limited understanding of security and performance optimization | Basic knowledge, but lacks practical experience | Competent in securing and optimizing web applications, some successful implementations | Strong track record of enhancing security and performance, innovative approaches | Expert in web application security and performance, recognized contributions to the field |

# Competency 4. **Problem-Solving and Debugging**

The role demands strong problem-solving skills and the ability to debug complex issues across a broad technology stack.

## Lead Question

**“Can you describe a complex problem you solved in your previous role, and how you approached debugging it?”** Look for a methodical approach to problem-solving. Ask about the tools and techniques used for debugging. Inquire about the outcome and any lessons learned.

*Look for analytical thinking and a systematic approach to problem-solving. Assess the candidate’s ability to use debugging tools effectively.*

## Situational Scenario

**“You notice an unusual spike in server errors during peak usage times. How would you go about identifying and resolving the issue?”**

*Evaluate the candidate’s ability to quickly identify and address performance issues. Look for a strategic approach to troubleshooting and resolving server errors.*

## Diving Deeper

* “What is your process for identifying and fixing n+1 query problems in an MVC application?”
* “How do you prioritize and manage bug fixes in a fast-paced development environment?”
* “Describe a time when you had to debug a complex issue that spanned multiple systems. What was your approach?”

## Evaluation

| Rating 1 | Rating 2 | Rating 3 | Rating 4 | Rating 5 |
| --- | --- | --- | --- | --- |
| Struggles with complex problem-solving and debugging | Can solve basic problems but is challenged by more complex issues | Competent problem-solver, able to debug a range of issues | Strong problem-solving skills, consistently resolves complex issues | Expert in problem-solving and debugging, innovative solutions to challenging problems |

# Competency 5. **Communication and Collaboration**

The role requires excellent communication skills and the ability to collaborate with product engineers and other team members.

## Lead Question

**“How do you ensure effective communication and collaboration when working with a team of product engineers and other stakeholders?”** Listen for examples of successful collaboration. Probe for communication strategies used in past projects. Ask about any challenges faced and how they were overcome.

*Look for clear communication skills and a collaborative mindset. Assess the candidate’s ability to work effectively in a team environment.*

## Situational Scenario

**“A product engineer is struggling to understand the deployment process for a new feature. How would you assist them, and what steps would you take to improve the overall developer experience?”**

*Evaluate the candidate’s ability to communicate technical concepts clearly and provide support to team members. Look for a focus on improving the developer experience.*

## Diving Deeper

* “Describe a situation where you had to explain a complex infrastructure issue to a non-technical stakeholder. How did you approach it?”
* “How do you handle disagreements or conflicts within a team?”
* “What tools and practices do you use to keep team members informed and involved in infrastructure-related decisions?”

## Evaluation

| Rating 1 | Rating 2 | Rating 3 | Rating 4 | Rating 5 |
| --- | --- | --- | --- | --- |
| Poor communication skills, struggles with collaboration | Basic communication skills, some collaboration challenges | Competent communicator, works well with a team | Strong communicator, actively fosters collaboration | Exceptional communication and collaboration skills, leader in team environments |

# Competency 6. **Adaptability and Learning**

The role requires a willingness to learn new technologies and adapt to changes in the tech landscape.

## Lead Question

**“Can you give an example of a time when you had to quickly learn a new technology or adapt to a significant change in your work environment? How did you manage it?”** Look for examples of adaptability and learning. Ask about the strategies used to learn new technologies. Inquire about the impact of adaptability on the candidate’s work.

*Look for a growth mindset and the ability to adapt to new situations. Assess the candidate’s willingness to learn and embrace change.*

## Situational Scenario

**“A new version of a core technology you use has been released with significant changes. How would you approach the transition, and what steps would you take to update your team’s knowledge?”**

*Evaluate the candidate’s approach to continuous learning and keeping up with technological advancements. Look for a proactive approach to knowledge sharing.*

## Diving Deeper

* “How do you stay current with the latest developments in web infrastructure and software engineering?”
* “Describe a time when you had to implement a technology that was outside of your comfort zone. What was the outcome?”
* “What resources do you rely on for professional development and learning?”

## Evaluation

| Rating 1 | Rating 2 | Rating 3 | Rating 4 | Rating 5 |
| --- | --- | --- | --- | --- |
| Resistant to change, struggles with new technologies | Slow to adapt, but willing to learn with guidance | Adapts to new technologies competently, seeks learning opportunities | Quickly adapts to change, proactive in learning new skills | Embraces change, recognized for mastering new technologies rapidly |

# Competency 7. **Alignment with Company Values**

Candidates must demonstrate alignment with Y Combinator’s values, which include integrity, respect, and accountability.

## Lead Question

**“Can you share an experience where you had to make a difficult decision that tested your integrity? What did you do, and what was the outcome?”** Listen for a story that shows the candidate’s ethical decision-making. Probe for the thought process and the impact of their decision.

*Look for examples that demonstrate the candidate’s commitment to ethical behavior. Assess their ability to act with integrity, even in challenging situations.*

## Situational Scenario

**“You discover a security flaw that could potentially expose sensitive data, but fixing it could delay a major product launch. How would you handle this situation?”**

*Evaluate the candidate’s prioritization of security and integrity over deadlines. Look for a responsible approach to handling sensitive issues.*

## Diving Deeper

* “How do you ensure that you treat your colleagues with respect, even under stressful conditions?”
* “Describe a time when you were held accountable for a project’s failure. How did you respond?”
* “What does accountability mean to you in a professional setting?”

## Evaluation

| Rating 1 | Rating 2 | Rating 3 | Rating 4 | Rating 5 |
| --- | --- | --- | --- | --- |
| Struggles with ethical decision-making, lacks accountability | Shows basic respect but has room for improvement in integrity and accountability | Generally acts with integrity and respect, accountable for actions | Consistently demonstrates high ethical standards, respectful and accountable | Exemplifies Y Combinator’s values, leads by example in integrity, respect, and accountability |

# Case Study

Y Combinator is facing a challenge with the deployment process of its new software product. The current deployment pipeline is not scalable and is causing delays in product updates. The candidate is tasked with designing a new deployment strategy that is efficient, secure, and minimizes downtime.

The candidate must consider the following constraints: a limited budget, the need to integrate with existing AWS infrastructure, and the requirement to ensure a smooth transition without disrupting the current operations. They should also consider the impact on the developer experience and the ability to quickly respond to market changes.

The candidate should address the following questions:

* What AWS services would you leverage to build the new deployment pipeline?
* How would you ensure the security of the deployment process?
* What measures would you take to minimize downtime during the transition?
* How would you improve the developer experience with the new pipeline?

A successful solution will demonstrate a clear understanding of AWS services, a focus on security and performance, and an emphasis on improving developer productivity. The solution should also show the candidate’s ability to work within budget constraints and align with Y Combinator’s values of efficiency and responsiveness.

The candidate’s solution will be evaluated based on its feasibility, scalability, security, and the potential to improve the deployment process while aligning with Y Combinator’s mission and values.

# Candidate Q&A

The following questions are designed to give candidates the opportunity to demonstrate their understanding of the role and their fit with Y Combinator’s culture.

**Q. How do you approach learning a new technology that is critical for a project you are working on?**

A. Look for a structured approach to learning, resources used, and how the candidate applies new knowledge to the project.

**Q. Describe a situation where you had to collaborate with a team to solve an infrastructure problem.**

A. Assess the candidate’s ability to work in a team, their role in the collaboration, and the outcome of the problem-solving effort.

**Q. What strategies do you use to ensure that your work aligns with the company’s mission and values?**

A. Evaluate the candidate’s understanding of Y Combinator’s mission and values and how they incorporate them into their work.

**Q. Can you give an example of a time when you had to prioritize security over convenience? What was the situation, and what did you do?**

A. Look for a commitment to security and the candidate’s ability to make tough decisions that align with Y Combinator’s values.

**Q. How do you handle feedback on your work, especially when it involves criticism?**

A. Assess the candidate’s receptiveness to feedback, their ability to learn from it, and how they maintain a positive attitude.

**Q. What do you think sets Y Combinator apart from other startup accelerators, and how do you see yourself contributing to that difference?**

A. Gauge the candidate’s understanding of Y Combinator’s unique approach and their potential to contribute to the organization’s vision and mission.

# Candidate Evaluation

Complete the following scorecard for the Infrastructure Software Engineer role at Y Combinator. Refer to the evaluation guides for each competency to determine the candidate’s score.

| Competency | Rating (1-5) | Interviewer Comments |
| --- | --- | --- |
| Technical Proficiency in Ruby on Rails and AWS |  |  |
| Infrastructure Management |  |  |
| Security and Performance Optimization |  |  |
| Problem-Solving and Debugging |  |  |
| Communication and Collaboration |  |  |
| Adaptability and Learning |  |  |
| Alignment with Company Values |  |  |
|  |  |  |
| **Total** |  |  |