Interview Guide for Infrastructure Software Engineer

Y Combinator

Created by Deliverables AI

January 11, 2024 11:50 AM

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About this Guide

Welcome to this strategic guide to streamline and enhance the interview process for the position of Infrastructure Software Engineer. This document serves as a comprehensive resource for hiring teams, ensuring a structured, efficient, and effective evaluation of candidates. Through structured interviewing, our aim is to identify a candidate who not only possesses the necessary technical skills and experience but also aligns with Y Combinator's values and culture.

The playbook outlines a clear structure for the interview process, including a detailed assessment of key competencies, practical assignments, and behavioral insights. Through this approach, we aspire to understand each candidate's potential and ensure the best fit for both the role and Y Combinator.

The guide includes both behavioral and situational interview questions. We recommend dividing up competencies and questions between two or three interviewers and using a combination of both types to assess a candidate's suitability for the role.

- **Behavioral** questions are based on the premise that past behavior predicts future performance. These questions prompt candidates to recount specific past experiences, focusing on their actions and outcomes. They are effective for roles where past experience is a strong indicator of success, especially in skills like problem-solving and leadership. For example, asking "Describe a time when you worked under a tight deadline" assesses time management and pressure handling.

- **Situational** questions are hypothetical and designed to assess how candidates might handle future situations. They test judgment and problem-solving abilities, asking candidates to respond to imaginary scenarios. These questions are useful for evaluating less experienced candidates or roles requiring adaptability. An example is, "How would you handle a project falling behind schedule?" which gauges analytical thinking and adaptability.

Both behavioral and situational questions are valuable in interviews but serve different purposes. Behavioral questions are best for roles where past experience predicts success, while situational questions suit roles requiring future problem-solving and adaptability. A combination of both types offers a comprehensive assessment of a candidate's capabilities.

This interview guide was created by Deliverables AI using GPT-4 and is based on the job description and company description provided. It should be used in conjunction with an interviewer's expertise and knowledge of the domain to assess the candidate's suitability for the role. Research shows that structured interviews are significantly more effective and less biased at identifying successful future employees and we welcome any feedback you have to feedback@deliverables.ai.

Y Combinator Mission, Vision, and Values

Mission

Y Combinator's mission is to increase the number of startups by assisting founders in their creation. The organization aims to get startups through their initial phase, often helping them build something impressive enough to raise significant amounts of money on a larger scale.

Vision

Y Combinator envisions a world where startups are the norm rather than the exception. They believe that startups are, on balance, a good thing, as their founders and early employees can be much more productive than they would be working for an established company. Y Combinator's vision is to apply mass production techniques to startup funding, making the process more efficient and beneficial for founders.

Values

Y Combinator values integrity, respect, and accountability. They believe these traits are critical for founders to possess. The organization is built on a network of trust, with its strength and value hinging on the trustworthiness of its members. Unethical behavior is not tolerated, as it puts the reputation of the entire community at risk. Y Combinator also values the idea of putting the founders' interests first, even before their own. This approach, while seemingly counterintuitive in a for-profit business, has proven to be more scalable and beneficial in the long run.

Y Combinator also values evidence of demand for a startup's solution and the strength of the founding team. They believe in the importance of launching and testing ideas quickly, rather than overplanning or overthinking. This approach is based on the understanding that the market and user needs can change rapidly, and startups need to be agile and responsive to these changes.

In summary, Y Combinator's mission, vision, and values revolve around fostering a supportive and ethical environment for startups, promoting efficiency and productivity, and encouraging quick action and responsiveness to market demands.

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.

Interview Agenda

Welcome and Introduction

- Warmly greet the candidate.
- Introduce the interview team members and their roles.
- Explain the structure and expected duration of the interview.

Company Overview

- Share Y Combinator's mission to increase the number of startups by assisting founders.
- Discuss the vision of a world where startups are prevalent and the belief in the superior productivity of startup founders and early employees.
- Highlight Y Combinator's core values: integrity, respect, accountability, founder focus, evidence-based demand valuation, and the principle of action over deliberation.

Job Overview

- Outline the role of an Infrastructure Software Engineer at Y Combinator.
- Detail the key responsibilities including providing a stable platform, securing applications and data, improving developer experience, debugging performance issues, and shipping shared code.
- Clarify expectations of experience with AWS, Docker, Terraform, Ruby on Rails, Postgres, React, and overall web application development.

Competency Deep Dive

- Technical Proficiency in Web Application Development
- AWS Platform Mastery
- Infrastructure as Code Expertise
- Security and Compliance Acumen
- Performance Tuning and Optimization
- Collaboration and Team Problem-Solving
- Adaptability and Continuous Learning
- Proactive Problem-Solving

Candidate Vision and Strategy

- Ask about the candidate's vision for the role.
- Discuss how they would approach evolving the shared infrastructure.
- Explore their strategies for maintaining a high-performance, secure platform.

Q&A and Wrap Up

- Invite the candidate to ask any questions they may have about the role, team, or company.
- Provide a timeframe for the next steps in the hiring process.
- Thank the candidate for their time and participation in the interview.

Competency Framework

The following competencies have been identified for the Infrastructure Software Engineer role at Y Combinator:

1. **Technical Proficiency in Web Application Development**: Expertise in the development, debugging, and optimization of MVC web applications, with adeptness in technologies like Ruby on Rails and experience with Postgres.
2. **AWS Platform Mastery**: Comprehensive knowledge of AWS services, especially ECS, RDS, IAM, and CloudWatch, with a strong track record of deploying and managing applications within AWS.
3. **Infrastructure as Code Expertise**: Skilled in using Infrastructure as Code techniques, specifically Terraform, to systematically manage complex infrastructure with code.
4. **Security and Compliance Acumen**: Solid understanding of application and data security principles, ensuring robust compliance and protection, reflecting Y Combinator's value of integrity and trust.
5. **Performance Tuning and Optimization**: Capability to pinpoint and mitigate performance issues in web applications, improving overall efficiency and user experience.
6. **Collaboration and Team Problem-Solving**: Strong communication skills with a team-oriented mindset, able to engage with product engineers and external stakeholders, embodying Y Combinator's values of respect and accountability.
7. **Adaptability and Continuous Learning**: Proven ability to rapidly assimilate new technology stacks and methodologies, demonstrating flexibility and a growth mindset crucial in a fast-paced startup ecosystem.
8. **Proactive Problem-Solving**: Demonstrated initiative in identifying and addressing engineering challenges, often preemptively, which is in line with Y Combinator's proactive and founder-supportive ethos.

Competency 1. Technical Proficiency in Web Application Development

Advanced skills in crafting, troubleshooting, and refining MVC web applications, particularly with Ruby on Rails, supplemented by solid Postgres knowledge and a deep understanding of integrating with AWS services.

Lead Question

"Considering a complex web application you developed, can you describe a difficult problem you encountered and how you went about solving it, including any debugging strategies, optimization techniques, and the decision-making process behind your chosen solution? How did you ensure the application's security and scalability in the process?"

Assess the complexity of the problem described, the effectiveness and innovativeness of the debugging methods and solutions, their approach to optimizing performance, and their consideration for security and scalability.

Situational Scenario

"Your team has discovered that a web application you're responsible for is experiencing slower response times under high traffic. How would you approach diagnosing and resolving the issue? Mention specific tools or methods you would use."

Look for the candidate's methodical problem-solving approach, familiarity with performance profiling and analysis tools, knowledge of scaling solutions, and communication skills.

Diving Deeper

Architecture Design and Planning: "Could you describe your experience with system architecture and design patterns for web applications? Specifically, discuss a time when a design decision significantly impacted the project."

Cloud Services Integration: "Explain a situation where you integrated multiple AWS services for a web application. What challenges did you face, and how did you overcome them?"

Continuous Integration/Continuous Deployment (CI/CD): "Discuss your experience setting up or improving a CI/CD pipeline. What tools did you use, and how did it benefit the development process?"

Evaluation

Rating 1	Rating 2	Rating 3	Rating 4	Rating 5
Lacks basic problem-solving; limited debugging or optimization skills.	Some understanding; basic troubleshooting, with few optimization efforts.	Adequate problem-solving; competent debugging, can perform common optimizations.	Proficient approach; strong debugging and optimization, considers scalability.	Expert problem-solving; innovative debugging and optimization, ensures secure scalability.

Competency 2. AWS Platform Mastery

Possesses extensive knowledge and practical experience with AWS services, particularly ECS, RDS, IAM, and CloudWatch. Demonstrates proficiency in deploying and managing robust applications on AWS, understanding core AWS principles and best practices.

Lead Question

"Can you describe an end-to-end process for deploying a high-availability application using ECS, RDS, and CloudWatch? What considerations would you make for security, scalability, and monitoring?"

Look for a structured response detailing steps for deployment, security implementations, scalability planning, and monitoring setup. Depth of knowledge about AWS services and ability to foresee potential issues.

Situational Scenario

"Imagine you need to migrate a production database from an EC2-instance-hosted PostgreSQL to RDS without significant downtime. How would you approach and execute this migration?"

Evaluate familiarity with database migrations, AWS service integration, strategies for minimizing downtime, and potential risks.

Diving Deeper

AWS Security and Compliance: "How do you ensure compliance with security best practices and manage IAM roles and policies in a growing AWS infrastructure?"

Scalability and Performance Tuning: "Describe strategies you use to scale an AWS application and maintain its performance under increasing load."

Infrastructure as Code: "Explain how you would use Terraform to manage and version-control your AWS infrastructure."

Evaluation

Rating 1	Rating 2	Rating 3	Rating 4	Rating 5
Lacks basic knowledge of AWS services.	Some understanding of AWS, struggles with implementation.	Competent with deployment and monitoring, may lack in security or scalability.	Strong in all areas with minor gaps in advanced concepts or best practices.	Expert-level mastery, advanced knowledge of all aspects; insightful, innovative solutions.

Competency 3. Infrastructure as Code Expertise

The candidate is adept in employing Infrastructure as Code (IaC) methodologies, particularly in Terraform, to orchestrate and maintain complex technology systems via code, ensuring stability, scalability, and efficiency.

Lead Question

"Describe an infrastructure setup you've implemented using Terraform. What were the key considerations for the design, how did you manage state across multiple environments, and how did you ensure security and compliance in your configuration?"

Look for clarity in understanding Terraform design principles, state management practices such as backend configuration, and methods used to secure infrastructure code, such as policy as code frameworks.

Situational Scenario

"Imagine you need to deploy a microservices architecture on AWS using Terraform, ensuring auto-scaling, load balancing, and zero downtime deployment strategies. Describe your approach."

Evaluate their approach to AWS resource setup with Terraform, understanding of scaling and load-balancing services, and strategies for blue-green or canary deployments.

Diving Deeper

Version Control and Collaboration: "How do you handle version control for IaC with a team?"

Testing IaC: "What methods do you use to test your Terraform configuration?"

Continuous Integration/Continuous Deployment (CI/CD) Integration: "How would you integrate Terraform with a CI/CD pipeline?"

Evaluation

Rating 1	Rating 2	Rating 3	Rating 4	Rating 5
Minimal understanding, cannot describe basic Terraform concepts.	Basic Terraform usage, struggles with complex setups.	Moderate usage, understands principles, some gaps in state management.	Proficient, manages complex setups, good security practices.	Expert, innovates and optimizes, strong security and compliance.

Competency 4. Security and Compliance Acumen

Expertise in identifying and mitigating security risks, ensuring compliance with industry and legal standards, protecting data integrity, and understanding the importance of security practices within the context of Y Combinator's mission.

Lead Question

"Can you describe a time when you had to implement a security or compliance solution in an existing infrastructure? How did you ensure that the solution was robust, maintained data integrity, and aligned with legal and industry standards?"

Look for specific examples demonstrating knowledge of security protocols, the candidate's ability to integrate them smoothly, and their understanding of compliance requirements.

Situational Scenario

"Imagine that an external compliance audit has discovered a significant vulnerability in our infrastructure. How would you approach this situation to resolve the vulnerability and prevent future occurrences?"

Expect a structured approach to problem-solving, understanding of urgency, communication skills, and preemptive measures for future security.

Diving Deeper

Incident Response Proficiency: "Tell me about a time you handled a security breach. What steps did you take from detection to resolution?"

Compliance Policy Implementation: "How do you stay updated with changing compliance regulations, and how have you implemented these changes in the past?"

Security Framework Knowledge: "What security frameworks do you have experience with, and how have you applied them in your previous roles?"

Evaluation

Rating 1	Rating 2	Rating 3	Rating 4	Rating 5
Vague or incorrect security concepts, lacks experience.	Basic understanding, but minimal direct experience.	Adequate experience with some evidence of proactive measures.	Strong experience, clear examples, proactive and holistic approach.	Expert knowledge, comprehensive experience, advanced preventive strategies.

Competency 5. Performance Tuning and Optimization

Capability to pinpoint and mitigate performance bottlenecks in web applications, ensuring the enhancement of overall efficiency, scalability, and user experience.

Lead Question

"Describe your most complex performance optimization in a web application, including the tools & strategies used. How did you measure success? Were there trade-offs, and how did you handle them? Can you provide a before-and-after performance metric?"

Evaluate the depth of understanding in diagnosing performance issues, use of specific tools, understanding trade-offs, and the ability to quantify improvements.

Situational Scenario

"Imagine our Ruby on Rails application is experiencing slow page loads and increased server response times. How would you go about diagnosing and resolving these performance issues?"

Assess diagnostic methodology, systematic problem-solving skills, familiarity with Rails performance tools and optimization techniques.

Diving Deeper

Diagnostic Proficiency: "How would you diagnose a performance issue in a web application that only occurs under heavy load?"

Solution Implementation: "Explain how you would go about implementing caching in a multi-tier web application."

Awareness of Modern Standards: "How do you stay updated with the latest performance optimization techniques and standards?"

Evaluation

Rating 1	Rating 2	Rating 3	Rating 4	Rating 5
Failed to describe process, lacked detail and understanding.	General process described, but lacking depth or practical examples.	Adequate process with some practical knowledge, but minimal specifics.	Good process with practical examples; some metrics provided.	Expert process, sophisticated tools/metrics used, clear trade-offs handled deftly.

Competency 6. Collaboration and Team Problem-Solving

Strong communication skills, team-oriented, actively collaborates with product engineers and external stakeholders, embodying Y Combinator's values of respect and accountability, with the ability to effectively problem-solve in a group setting.

Lead Question

"Tell me about a time when you worked on a team to solve a complex problem. What role did you play and how did the team come to a solution? Can you detail the steps taken to ensure effective communication among team members, and how you incorporated feedback from external stakeholders into your problem-solving process?"

Look for clear evidence of the candidate's ability to actively engage in the group, facilitate inclusive communication, and integrate stakeholder feedback into a cohesive solution.

Situational Scenario

"Your team needs to urgently debug a complex application performance issue right before major updates are deployed. You suspect there are multiple layers to the problem involving the infrastructure and code. How would you approach the collaborative problem-solving process?"

Evaluate the candidate's ability to quickly establish a logical, structured problem-solving approach, their consideration of each team member's expertise, and the incorporation of collective insights.

Diving Deeper

Stakeholder Engagement: "How would you manage a difference in problem-solving opinion between a team member and an external stakeholder?"

Conflict Resolution: "Describe a situation where you resolved a conflict within a team environment. What was your approach?"

Inclusive Communication: "Can you provide an example of when you have made extra efforts to include quiet or remote team members in decision-making?"

Evaluation

Rating 1	Rating 2	Rating 3	Rating 4	Rating 5
Minimal collaborative effort; ignores feedback; poor communication.	Limited collaboration; occasional feedback use; communication gaps.	Average collaboration; some use of feedback; adequate communication.	Good collaboration; integrates feedback well; clear communication.	Exceptional collaboration; feedback drives solutions; communication excels.

Competency 7. Adaptability and Continuous Learning

Proven ability to rapidly assimilate new technology stacks and methodologies, demonstrating flexibility and a growth mindset crucial in a fast-paced startup ecosystem. This candidate must be versatile, eager to learn, and comfortable with rapidly shifting technology landscapes, aligning with the dynamism of a startup.

Lead Question

"Can you describe a time when you had to quickly learn a new technology or adapt to a significant change in your work environment? What was the situation, how did you approach it, and what was the outcome? Please include any specific learning strategies you employed and how you balanced this with your existing workload."

Look for evidence of a proactive approach, effective learning strategies, actual integration of new skills, and how they balanced learning with other responsibilities.

Situational Scenario

"Imagine we're migrating to a new cloud service that you are not familiar with. Outline your approach to mastering this technology within a tight deadline, ensuring minimal disruption."

Assess candidate's strategy for learning under pressure, prioritization of tasks, and their ability to minimize service disruption during transitions.

Diving Deeper

Growth Mindset and Problem-Solving: "Describe an instance where there was no clear solution to a technical problem you encountered. How did you navigate this challenge, and what was the result?"

Proactivity and Initiative: "Give an example of a time you anticipated a potential problem with our tech stack and how you took initiative to address it before it became an issue."

Resourcefulness and Learning Agility: "Talk about a resource, such as a tool or method, that you've adopted recently to enhance your technical skills or work efficiency. How has it changed your workflow?"

Evaluation

Rating 1	Rating 2	Rating 3	Rating 4	Rating 5
Does not demonstrate adaptability; is resistant to change or learning.	Struggles with adaptability; shows limited effort to learn or adapt.	Shows basic adaptability; takes some action to learn, but not proactively.	Adapts well to changes; actively pursues learning opportunities effectively.	Excels in adaptability; demonstrates strong evidence of proactive and continuous learning, leading to impactful outcomes.

Competency 8. Proactive Problem-Solving

Demonstrated initiative in identifying and preemptively responding to engineering challenges, indicative of resourcefulness and foresight, aligning with Y Combinator's ethos of empowering and supporting founders.

Lead Question

"Tell me about a time when you anticipated a significant issue in your infrastructure before it became problematic. How did you identify the potential problem, and what measures did you take to address it? What was the outcome?"

Assess the candidate's ability to foresee potential issues, their process for identifying and diagnosing problems, and the effectiveness of their preemptive actions.

Situational Scenario

"Imagine that you've noticed a pattern of slight performance degradation during peak usage times. No direct impact on users has occurred yet. How would you handle this?"

Evaluate candidate's approach to a subtle problem, their diagnostic process, and their proactive measures to prevent user impact.

Diving Deeper

Risk Assessment: "Can you describe the strategies you use to gauge and mitigate risks in software infrastructure?"

Innovation in Problem-Solving: "Describe a problem you solved with a novel or uncommon approach. What prompted you to take this direction?"

Collaboration and Communication: "Share an example where you had to collaborate with multiple teams to prevent a potential issue. How did you manage the communication?"

Evaluation

Rating 1	Rating 2	Rating 3	Rating 4	Rating 5
Identifies problems only post-occurrence; reactive measures.	Recognizes issues but with delay; some proactive steps.	Good foresight; occasionally proactive, identifies most risks.	Strong preventive actions; acts on nuanced performance insights.	Exceptional foresight; innovative, mitigates issues before arising.

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
1. Technical Proficiency in Web Application Development		
2. AWS Platform Mastery		
3. Infrastructure as Code Expertise		
4. Security and Compliance Acumen		
5. Performance Tuning and Optimization		
6. Collaboration and Team Problem-Solving		
7. Adaptability and Continuous Learning		
8. Proactive Problem-Solving		
Total		

Other Interviewer Comments: