AlphaSense

Director of Engineering - Cloud Platform

[Interview preparation]

Introduction

We are excited you are considering joining AlphaSense! This document will help you be prepared for our further interview steps.

The first part of the Technical interview will have three following assignments:

- System Design
- Engineering Team & Operations setup
- FinOps Strategy *(optional)*

Here are a few different options for how this assignment can be used:

- You can use this material for the preparation, while the solution can be provided during the interview itself (any kind of deliverables are completely optional), so you don't need to spend much extra time at home
- You can create a deck (slides) describing your proposal if you prefer
- You can create a free-form description of the solution (e.g., Google document)
- Any other format of presentation, like Miro, LucidChart, etc., is also acceptable

You should be ready to cover the presentation of each task in at most 5-10 minutes per task (outside of our follow-up questions).

Recommendations:

- For the system design & delivery diagram, use https://app.diagrams.net/ (draw io), as you might be asked to use it during the role skills interview (or similar tool)
- Considering the engineering team proposal, think about the potential team structure, roles of individuals, and all needed supporting roles to make the team operational.

Interview preparation guidelines

1. System Design Assignment

During the interview, you will be asked to design a cloud platform for **Multi-Tenant SaaS and Single-Tenant (Customer Managed) Twitter for Financial Professionals.**

Let's imagine we have already developed Twitter for financial professionals at this point, which is currently used by professionals around the world as a multi-tenant offering (deployed on one cloud provider).

Current Architecture and Delivery for already built existing Multi-Tenant Twitter product:

- Microservices architecture
  - About 100 microservices
  - Backend - Java, Golang, NodeJS
  - Frontend - React
- Infrastructure
  - AWS locked services - RDS, EC2, Dynamo, S3
  - Kubernetes

Now, we have decided to implement a multi-cloud (AWS, Azure, GCP) version of the solution that would have similar functionality but will be used as a single tenant private cloud deployment solution having collaboration and conversation on internal company private topics - meaning that all the data should be managed and secured within the boundaries of their organization in an isolated environment **(Single-Tenant solution)**.

Non-functional requirements for the Single-Tenant solution:

- Enterprise Twitter Solution should be deployed on private cloud environments of our customers - AWS, GCP, and Azure
- Enterprise Twitter Solution should be primarily managed by our customers - meaning that we should have very limited access to customers' environments as solution providers (due to security concerns)
- Enterprise Twitter Solution should be a scalable product offering (not a customer-per-customer custom solution), meaning we can deploy it to 100 customers within the next 2 years and operate without large constraints for us as a service provider.

** specified technical details **do not represent the** current AlphaSense state of solution and architecture and are used for illustrative and interview purposes only.*

Assignment summary:

Design a Cloud Platform for the Multi-tenant SaaS solution described above and a Single-Tenant (private cloud) customer-managed solution we are planning to build.

Important notes:

- There is no "right" solution (but the design of the system can be good or not)
- The focus is on underlying multi-cloud infrastructure technology choices, cloud services provisioning, and application deployment.
- This assignment will be used to facilitate a two-way dialogue during our interview.
- The assignment is free-form, and you can introduce additional assumptions about architecture and the current solution.
- If you prefer to have preparation done before the interview, then you are advised to prepare materials in an editable format so you can make adjustments during the interview.

2. Engineering Team & Operations setup task

Continuing the previous task, we ask you to consider the cloud platform engineering department structure that you would create for such an Engineering Organisation:

- The organization has 10 engineering sub-departments focused on different parts of the product functionality
- Every engineering sub-department has about 4-6 teams
    - In total, there are 50 engineering teams
    - Teams are full-stack and cross-functional (5-6 engineers per team)
- Some of the Technologies in use
    - Kubernetes - used by all sub-departments
    - ScyllaDB - used by all sub-departments
    - MongoDB - used by 3 sub-departments
    - Solr - used by 1 sub-department
    - Clickhouse - used by 1 sub-department

** specified teams' formation details **do not represent the** current AlphaSense state of Engineering and are used for illustrative and interview purposes only.*

Assignment summary:

Come up with a Cloud Platform Engineering sub-department structure, team formation, and investment to support the R&D teams described above, specifically focusing on the following:

- What should the model of interaction between the R&D teams listed above and Cloud Platform Engineering look like?
- What is the recommended model of ownership for the listed Technologies above?
- What kind of skills are we looking for in the Cloud Platform engineering team?

3. **FinOps Strategy** (Optional)

We ask you to develop a FinOps strategy for our R&D department for the solution based on the context from assignments 1) and 2). The focus should be on creating an actionable plan on how to adopt the FinOps strategy and achieve sizable cost transparency and optimization as one of the key outcomes.

Side note

All the assignments are intentionally open-ended to facilitate further deep-dive conversation during the interview process.