



Advarra Migrates and Modernizes Mission-critical Legacy Databases on AWS



Executive Summary

Advarra is a leading provider of integrated clinical research solutions. The company's technology and services protect clinical trial participants, promote regulatory compliance, increase clinical site efficiency, and boost research performance. Based in Columbia, Maryland, Advarra has been operating for more than 35 years and is now leveraging cloud solutions on AWS to set the stage for further growth.

Recently, Advarra decided to refactor and replatform a set of applications from Oracle databases to improve performance. Completing the project required outside expertise and involvement. As an AWS Premier Tier Services Partner with the AWS Migration Competency, ClearScale was an ideal fit. ClearScale led Advarra through a comprehensive Migration Readiness and Planning (MRP) process and helped the company make critical improvements to its IT ecosystem during the transition to AWS.

"We knew that we wanted to move our applications to PostgreSQL on AWS but just didn't have the resources to make it happen. ClearScale helped us execute the migration of our critical databases from Oracle to PostgreSQL. ClearScale was an excellent partner, helping us to navigate the challenges that arose and find the best path forward."

Kyle Brandon, Vice President, Server Engineering, Advarra

The Challenge

Before this engagement began, several groups within Advarra were working on several Oracle based software products, each with important implications for the business. Additionally, Advarra had already started laying the groundwork for a database migration to AWS, and internal engineering resources had also started learning about various AWS products.

The problem, however, was that Advarra lacked the bandwidth to execute on all of its priorities. The company needed to complete migrations for multiple databases, while also making crucial application updates. Advarra also wanted to reduce its cost footprint and pave a path for new feature developments on the cloud. These high-level migrations and modernizations were essential to long-term success, but the resources weren't available internally.

On a more detailed level, Advarra hoped to accomplish the following:

- Re-platform incompatible features between the existing database layer and Amazon RDS for PostgreSQL
- Ensure key areas of functionality had the same or better performance after moving to PostgreSQL
- Transition the selected products from Oracle to PostgreSQL with minimal impact to product functionality.

Given these objectives and limited capacity, Advarra needed help from an experienced AWS services provider. ClearScale, with 11 AWS competencies and successful migrations in a wide range of industries, was the right partner for the project.

The ClearScale Solution

ClearScale engineers compiled an inventory of the targeted applications and databases, identifying potential roadblocks and potential migration options along the way.

The database discovery process uncovered a difficult challenge that required a custom solution from ClearScale. Advarra's Oracle database relied on database triggers for a data auditing mechanism with extensive logging capabilities. This mechanism was core to how Advarra maintained compliance for the affected products, as it produced logs for potential auditing reviews. The applications being converted depended on this mechanism, but refactoring it was no simple task.

After a round of prototyping, ClearScale and Advarra agreed on a solution that involved a direct Oracle to Postgres refactoring approach instead of making major changes to the application codebase. ClearScale developed a migration plan, refactoring plan, and quality assurance plan accordingly, making sure no application would experience any downtime.

Advarra's applications also had strict requirements around availability, performance, and quality. The company's existing automated testing suites weren't able to baseline metrics across various databases and applications. Moreover, the manual testing suites required significant resource allocations and were not readily available due to other business priorities.

After several brainstorming sessions, ClearScale proposed a solution that would decouple application logic from database queries and empower the Advarra team going forward. The solution would also achieve Advarra's goals without requiring massive application refactoring.

After gaining approval, ClearScale created a separate application to test SQL queries and stored procedures. The testing application was beneficial in four important ways:

1. It excluded the application layer from performance baseline identification and created an equal comparison between Oracle and Postgres performance
2. It created an extensible and reusable mechanism for Advarra teams to build on top of, laying the foundation for future performance and load testing for the converted applications.
3. It provided a performance baseline for existing Oracle databases and Postgres databases

After establishing the plan and discussing risks, ClearScale and Advarra started executing the migration with careful consideration over who was working on what codebases. The two sides also collaborated to define a development plan that clarified how teams would release and test new features.

The Benefits

After the successful execution of the database migration and modernization project, Advarra is better positioned in the following ways:

- The engineering team has the ability to identify migration shortcomings early due to increased migration observability
- The engineering team can also perform production migrations with minimal risk
- The new performance testing suite is extensible and scalable enabling engineers to validate performance before rolling out modernized applications
- The new RDS instances come with sizing recommendations that account for projected users growth and cost-effectiveness goals

ClearScale was instrumental not only in carrying out the actual migration and modernization work, but also in guiding Advarra to the right combination of cloud technologies. Now, Advarra can develop new features, keep data safe, and accelerate innovation on the leading cloud platform in the world.