State School District – SAP SQL Anywhere Database Migration to AWS RDS PostgreSQL

MLOGICA

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Industry: Public Sector
Headquarters: U.S.
Coverage: Statewide

Our Customer
Serving multiple regions throughout the state, this school district provides and oversees educational services for staff and educators in over one hundred schools, and thousands of students from pre-kindergarten through 12th grade. With a mission to educate its students to become thriving members of a dynamic, fast-evolving society, district leaders are focused on innovation, yet struggled to adapt their technology and services to meet the needs of all stakeholders.

The Challenge
The Customer's existing on-premise SAP SQL Anywhere databases presented multiple challenges, including:

Scalability and performance bottlenecks: The school district's on-site databases struggled to keep pace with growing business needs, creating persistent performance and scalability issues.

Escalating costs: Annual licensing and maintenance costs for their existing system cost millions that could have been redirected to student services, without providing the scalability and adaptability needed to meet modern demands.

Technical debt: The legacy database system was rife with technical debt and workarounds that blocked innovation.

Operational overhead: The on-site database consumed undue IT resources, resulting in increasing operational overhead to support a system that was unable to meet current, much less future requirements.

Due to these escalating cost and operational challenges, cloud migration emerged as the clear solution. The goal of the project was to remove recurring licensing, infrastructure and maintenance costs and transition to the

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cost-effective, pay-as-you-go pricing model of the cloud. Other major value drivers were cloud-native scalability and agility that would help the district adapt to spikes in service demand and enable easy integration of new technologies to enhance functionality and user experience system-wide.

It was decided to migrate the district's large-scale database from their existing on-premise SAP SQL Anywhere environment to AWS RDS PostgreSQL on the cloud. Our Customer, seeking a provider with extensive experience both in legacy systems and cloud platforms, selected mLogica to navigate this complex legacy modernization journey.

The Solution

Using mLogica's cost-efficient, automated [STAR*M Distributed Workload Modernization](#) software, our team of expert database consultants and cloud migration architects collaborated with the Customer to deliver a time- and cost-efficient cloud migration. We employed a machine learning and GenAI-driven migration factory approach to seamlessly convert this public sector educational organization's source SAP SQL Anywhere databases to AWS RDS PostgreSQL architecture across all locations.

Assessment

The mLogica team extracted source code and data definitions, generating exception reports and supporting a thorough review process with the Customer. A comprehensive assessment of the existing SAP SQL Anywhere environment laid the necessary groundwork. This involved:

In-depth analysis: Our team meticulously examined each component of the existing database system, identifying all underlying technologies, system interdependencies and potential risks.

Categorization by complexity: All legacy database programs that had accrued to this public sector educational organization's system over decades were identified and then categorized based on size, complexity, suitability for cloud migration and the scope of changes required.

Execution

With a clear understanding of the full scope of this project, and the mandate that there be no interruption of this vital public sector organization's services, we presented the Customer with a detailed roadmap that would ensure minimal

disruption and no [surprises](). The migration process was divided into two phases: (I) Mobilization and (II) Migration.

Phase I: Mobilization
The Mobilization phase prepared the mLogica team to conduct a seamless [database migration]() by:

- Finalizing all project requirements
- Establishing a dedicated conversion factory model to streamline tasks
- Conducting a pilot refactor/replatforming using a representative set of databases

First, our team ensured all requirements were clearly identified and documented. This included validating the system inventory identified during the assessment phase and finalizing any missing details. A standardized schema naming convention was defined for clarity and, finally, testing criteria for the entire project were determined.

Next, a migration factory model was established to support and accelerate the database migration process. This dedicated team, leveraging machine learning (ML)- and generative AI (GenAI)-powered STAR*M, would handle the migration-level tasks with maximum efficiency and accuracy, eliminating the high rates of human error that often doom modernizations.

To validate the execution approach and identify potential issues, a pilot migration process was established to test a sample set of databases. This involved porting one hosted and one non-hosted database, including metadata migration, data extraction from the source, the loading of data into the target environment and thorough unit testing.

Additionally, approximately twenty databases from each environment, both hosted and non-hosted, were cloned to create a realistic testing ground. Throughout the pilot migration process, key lessons were documented to ensure a smooth, large-scale database migration.

Phase II: Migration
The Migration phase supported the transition of the source SAP SQL Anywhere databases to the AWS RDS PostgreSQL cloud platform. This included all remaining databases not addressed during the Mobilization phase.

To ensure a seamless transition, a test run was conducted for all 890 databases, divided into batches. This exercise simulated the full process, testing the migration and scripts, and identifying any potential roadblocks prior to moving the actual data. Once this trial proved successful, code translation was performed for all databases and the migration of all databases was executed, again in batches, including:

Metadata migration: The structures, properties and definitions of the tables and columns were converted for the target AWS RDS PostgreSQL environment.

Data extraction: Data was carefully extracted from the source SAP databases, ensuring it was formatted correctly for the target environment.

Data loading: The extracted data was then loaded into the corresponding tables in the target environment.

Unit testing: Rigorous unit tests were performed to verify the accuracy and completeness of the converted components and data in each database.

This systematic approach, preceded by a detailed preliminary test run, minimized risks and ensured a seamless large-scale database migration. The mLogica team also integrated the deployment automation feature of our STAR*M Distributed Workload Modernization migration tool, which facilitates data transformation and loading into the target environment.

STAR*M's unique automated migration factory capabilities enabled the efficient transfer of the Customer's SAP SQL Anywhere databases to the AWS RDS PostgreSQL cloud database, including:

Automated data layout and migration: STAR*M generated target DDLs with accurate definitions for tables, indexes, views and grants.

Performance optimization: Our team conducted initial smoke tests and remediated any issues arising during the conversion process. We further fine-tuned the converted programs to meet required performance SLAs.

Regression and ad hoc testing: We applied regression testing to validate individual workflows and followed up with ad hoc fixes to remediate defects, eliminating the need for further regression cycles.

Testing and Quality Assurance

Following the migration, we executed a comprehensive quality assurance (QA) process to ensure the migrated workloads functioned seamlessly, including: Unit testing (UT): This phase precisely tested individual units of the databases, identifying and remediating any defects.

System integration testing (SIT): We verified that migrated components interacted flawlessly and validated data properties to ensure they adhered to Customer specifications.

User acceptance testing (UAT): End users participated in UAT testing, verifying the converted programs met their functional needs and delivered expected outputs.

Go-Live and Post-Migration Support

Upon successful completion of testing, we configured the AWS RDS PostgreSQL architecture for deployment across development, QA, pre-production and production environments. We also provided expert post-go-live support, which included:

24/7 managed service and help desk support: With 24/7 managed service and support, our team remained engaged with the Customer's AWS RDS PostgreSQL architecture to ensure uninterrupted operation of the migrated programs. Defect resolution: An escalation-based issue resolution process was established to identify, triage, track and remediate any user-reported issues arising post-deployment, according to criticality.

The Benefits

This successful transition to AWS RDS PostgreSQL produced a host of valuable benefits for this vital public sector educational organization:

Cost optimization: This modernization allowed the Customer to eliminate expensive annual SAP SQL Anywhere licensing and operational costs associated with on-premise infrastructure management.

Enhanced agility and scalability: The new cloud-based environment provides dynamic scaling capabilities to meet the organization's growing demands.

Reduced operational burden: IT resources were freed from the tasks of managing in-house infrastructure, enabling the Customer to focus on strategic initiatives.

Removal of technical debt: The transition to AWS RDS PostgreSQL erased technical debt associated with SAP SQL Anywhere, allowing the Customer a clear path to future innovation on demand.

Improved performance: The cloud-based infrastructure delivered unmatched performance compared to their legacy self-hosted environment.

Unlocking innovation and strengthening security: The Customer gained access to a multitude of cloud-based services and tools to improve the functionality of their applications and exploit new opportunities, while also allowing them to leverage leading-edge AWS security.

The Power of mLogica's STAR*M Migration Factory Model
The key differentiator in this project was mLogica's automated, GenAI-powered STAR*M technology and migration factory model. This automated migration solution played a pivotal role in the transfer of hundreds of databases across different regions, accelerating the entire process while ensuring full conversion accuracy through:

Automated workflows: STAR*M handled core tasks like data layout generation, code conversion and deployment automation, minimizing project-delaying human error and the need for manual intervention.

Dramatically reduced timelines: Automation substantially accelerated the migration process, allowing the Customer to take advantage of cloud-native scalability, technologies and security features more quickly.

Cost benefits: Automating manual tasks translated into substantial cost and resource savings for the Customer throughout the project. In addition, by accelerating this transition, the Customer was able to more quickly eliminate the infrastructure, licensing and maintenance expenses of their previous system.

Scalability and repeatability: The automation capabilities of STAR*M made it easier and simpler to execute the organization's large-scale, complex migrations from source to target environment and enabled a seamless transition across multiple regions.

Conclusion

By partnering with mLogica and leveraging our STAR*M Distributed Workload Modernization solution and migration factory model, the Customer was able to shorten transition timelines, minimize disruptions and ensure the secure transfer of their data to AWS RDS PostgreSQL. They can now leverage a host of cloud-native features and benefits, including leading-edge security, dynamic scalability, agility, performance efficiencies and on-demand access to up-to-the-minute technologies.

With mLogica's automated, GenAI-powered STAR*M solution and migration factory methodology, government and public sector organizations enjoy secure, efficient cloud migration, and gain access to best-in-class technologies and streamlined database environments while saving millions on licensing, infrastructure and support costs.

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