

D&A TRANSFORMATION TALES

Seamless Database Migration from Ingres to Oracle database for Elevated Performance and Security



BACKGROUND

As a global leader in seamless payments, our client has revolutionized the payment industry, empowering commerce across all channels, including in-store, online, and mobile. They understand the critical role of payments in connecting merchants and consumers, striving to provide a fast, simple, and secure purchasing experience. By reducing the complexity of payments and offering a diverse range of payment alternatives, they drive sales opportunities while enhancing the overall consumer experience. Given our experience in delivering the promised results using cutting-edge technology and a team of great talents, the client sought Aspire Systems to help them seamlessly migrate their applications from Ingres to Oracle database, presenting several other complex challenges:

- Migrating Ingres to Oracle DB
- Compiling Pro *c and generating executable files like Ingres
- Loading and unloading data between flat files and tables
- Managing 12 DB Applications one by one for dependency data migration
- Migrating Unix from Suse to RedHat.
- Password encryption and decryption in C and Shell scripts
- Integrating with the Uniface frontend with the same behavior as Ingres backend C executables.



THE SOLUTION

Our team of experts began by thoroughly evaluating the client's existing system, including the Ingres database, C programs, and Frontend Uniface integration. We conducted a comprehensive analysis to identify potential challenges and areas requiring special attention during the migration process. This initial assessment helped us devise a tailored plan that considered the client's specific requirements and unique complexities.

Recognizing the criticality of data accuracy and consistency, we proposed the use of HVR for data replication between Ingres and Oracle. This real-time data replication solution ensured seamless and efficient data migration, minimizing downtime during the transition. Our team designed the Oracle database schema to mirror the Ingres database, ensuring data compatibility and integrity. Below is how we approached and developed the proposed solution to the client:

- **Database Migration:** Created an Oracle database equivalent to Ingres, utilizing HVR for efficient data replication.
- **Compiling Pro C:** Modified C programs to work with Oracle using the Pro *C compiler, generating executable files as expected.
- **Data Loading and Unloading:** Employed UTL file and SQL*Loader instead of Ingres Copy commands, improving performance during data transfer between flat files and tables.
- **Object Changes:** Successfully migrated all Ingres objects, including tables, functions, procedures, and views, to Oracle.
- **Frontend Integration:** Integrated the Uniface Frontend with the Oracle backend, ensuring the same behavior as Ingres while significantly enhancing performance.

- **Application Migration:** Utilized HVR to synchronize data between Oracle and Ingres during the step-by-step migration of the 12 dependent database applications.
- **Unix Migration:** Smoothly transitioned from Suse to RedHat, modifying shell scripts and scheduling jobs in Cron on RedHat.
- **Password Encryption/Decryption:** Introduced an HSM key server for enhanced encryption and decryption processes.

Data Migration Model Design and Development

- **Database Structure Creation:** Developed an Oracle database structure mirroring the Ingres database.
- **Stored Procedures and Functions:** Migrated database stored procedures, functions, and scheduled CRON jobs from Ingres to Oracle.
- **C and Ingres C Migration:** Successfully transitioned C and Ingres C programs to Oracle Proc programs, implementing new approaches.

Development and Testing

- **Development:** Developed Oracle Procedures, Functions, C, and Proc programs for database migration.
- **Unit Testing:** Conducted unit testing to validate the functionality of individual specifications.
- **Integration Testing:** Performed integration testing to ensure seamless interaction between the Uniface front-end screen and the back-end C executables



TECHNOLOGY SNAPSHOT

- HVR
- C,Pro *C
- Unix Shell Scripting
- Oracle 12c, PL SQL
- Uniface
- Redhat Platform



BUSINESS BENEFITS

- **Enhanced Transaction Handling** - The new system efficiently handles a vast number of transactions daily, ensuring smooth and secure payment processing.
- **Improved Performance** - Tuned the application to achieve an impressive performance of 1,000 transactions per second, significantly reducing processing time.
- **Simplified Processes** - The migration to Oracle simplified the application, making it more user-friendly and faster, ultimately enhancing the overall user experience.





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