

Database Migration

Client: Anonymous

Business Size: Corporation

Industry: Commodities Trader

Country: International

Technology: Sybase ASE, Microsoft SQL Server, SSIS, ASP.Net 6, C#, Octopus, Jira, Confluence

Objective: Migration of selected data from Sybase ASE to SQL Server

The Brief

The client, a long-standing global natural resources producer and trader of more than 60 commodities, requested a subset of data from the existing database (Sybase ASE) to be migrated to a new financial SQL Server database. Direct SQL statements and API calls in the target system would be required for data ingestion. Successful migration would be confirmed via comparison reports.

Methodology

The project utilized a part of the Scrum framework with daily stand-up meetings, planning, and backlog refinement. Various tools were used, including DBeaver (Sybase), SQL Server Management Studio, Visual Studio (C# .net6, SSIS), JIRA, Confluence, Octopus, and MS Teams. Client staff also contributed to the software solution's development, leveraging existing code and expertise while meeting their user management needs.

Challenges and Solutions

Our consultant's main role as a developer was to identify the data set required for the migration and produce reports for the users to confirm the contents of the data set.

In addition to the data itself, scripts were required to create tables, indexes, views, procedures, and functions. The tools used for this stage were SQL and Excel.

Identifying the dataset required analysing and understanding the complex database structure, data values, and relationships. Due to the limited source database documentation, a few of the client's experts provided essential guidance, enabling our consultant to fully understand the underlying model. The large scale of the data, and the requirement for the extract to be produced in a timely manner, required a massive, optimized set-based query.

A complex set of cascading rules were required to validate the extract's contents. These required several iterations of feedback and analysis to polish, and careful

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design of indexes were applied to the underlying tables to significantly improve performance. On migration day, 7 years of the entire company's data was analysed, and the proper subset was fully extracted in under 1 hour, and was considered 100% correct.

Once the data set was extracted, part of it was migrated to the finance database, via SSIS tasks. This covered populating the control tables, import of data, and enriching this data from other Databases. This prepared the way for the main data migration program to run.

The migration program was a C# .NET console application, originally authored by another consultant from OCS, but required enhancements to deal with the vagaries of the target system's API which was still under active development. Issues included permission errors, service errors, coding errors, and timeout issues, to name a few.

To cope with these issues a clear-down SQL script that undid all the work attempted in the previous run was needed, along with input from the API developers to help resolve the issue and then try a re-run. To cope with performance issues such as time-outs the data objects were serialized into JSON and then de-serialized on load.

At various stages, reconciliation and statistics reports were generated to confirm the state of the migration. These were Excel with data extracts performed against various databases or produced by the migration program. These reports were used during the development to help validate the collection and help resolve issues.

Technology and Skills

The SQL databases included Sybase ASE (Data Analysis, Stored Procedures, Functions, Table, Views and Indexes), and Microsoft SQL Server (Data Analysis, SQL, SSIS).

Additional technology utilized included ASP.Net 6, C#, Scrum, Bitbucket, Octopus (pipeline to build and release), JIRA, and Confluence.

Of course, considerable benefit was also gained through collaboration and communication with others involved in the project.

Lessons learned

During a delay caused by the absence of a project manager, our consultant conducted a deep analysis of the main database, learned the target API, and developed good relationships with client staff. When the new project manager was finally assigned, a deep understanding of the project requirements had

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already been ascertained and our consultant was able to immediately collaborate with him and the rest of the team.

The project demonstrated the importance of analysis, design, testing, writing re-runnable procedures, effective collaboration, communication, and adaptability in delivering a successful software solution.