

EUROCONTROL IMPROVES ETL DEVELOPMENT TIME-TO-MARKET AFTER UPGRADING TO ORACLE DATA INTEGRATOR 12C

BACKGROUND

THE CLIENT

Eurocontrol is the European organization for the safety of air navigation and consists of 41 member states. Its responsibilities include management of the air traffic network, route charging, and working with other organizations to build a Single European Sky. It aims to run safer, more efficient, and more environmentally friendly operations in a growing market. Annual air traffic currently stands at approximately 10 million flights per year.

PRISME provides Air Traffic Network Business Intelligence to a number of specialized business areas across Eurocontrol and for external stakeholders including Air Navigation Service Providers, Airports, and Aircraft Operators. PRISME delivers information and insights through multiple channels, including a range of Oracle Business Intelligence Enterprise Edition (OBIEE) dashboards, Oracle Business Intelligence Publisher (BIP) reports, web services, file exports, and direct database access for ad-hoc requests. Eurocontrol and its stakeholders use PRISME data to

improve understanding of the air traffic and optimize performance across multiple axis: flight delays, CO2 emissions, optimized use of civilian and military airspace, implementation of Communication, Navigation and Surveillance programs, etc.

EUROCONTROL



European Organisation for the Safety of Air Navigation

41 member states

www.eurocontrol.int

With 100 billion rows of source data, PRISME retains more than 20 years of historical traffic and 7 years of forecasts. Every month, 30,000 data integration jobs are executed to cleanse, match, and transform that data. The importance of decisions based on that information requires a highly performant and reliable data integration system. Oracle Data Integrator was the tool of choice and has proven to be very flexible and robust.

THE CHALLENGE

The original goal of the project was to migrate Oracle Warehouse Builder (OWB) to Oracle Data Integrator (ODI). However, at the start of the project, ODI 12c had not been released and there was no migration utility to migrate from OWB to ODI 11g. A decision was taken to undertake all new ETL development in ODI 11g until ODI 12c was released. Eurocontrol planned to then upgrade the newly developed ODI 11g interfaces, packages, and procedures to ODI 12c. The move from OWB to ODI 12c could be done with low risk and impact using ODI 12c's capability to execute OWB mappings and process flows directly.

With datasets storing critical air traffic demand data and data pertaining to usage of airspaces, the upgrade had to be repeatable, executed with minimal downtime, and completed without any impact on the existing systems. Had we not been able to implement the upgrade so quickly, the short-term traffic demand prediction would have been impacted. These predictions are an important component of the pre-tactical decision-making at Eurocontrol.

SOLUTION AND APPROACH

Rittman Mead decided to start by cloning the ODI 11g repository using datapump and upgrading the cloned repositories, rather than upgrading in situ and placing the live environments at risk. Each repository was imported into its own Oracle 12c Pluggable Database so it could easily be cloned, backed up, and restored.

ORACLE®
FUSION MIDDLEWARE
DATA INTEGRATOR
12^c

The Oracle Data Integrator Upgrade Assistant has the following prerequisites. First, each work repository has to be reconnected with the master repository. The connection information stored in the master repository on the new Oracle 12c database was still pointing to work repositories located on the 11g database. This was fixed by connecting to the master repository and updating the connection details for each work repository to point to the correct database.

Second, the system table SCHEMA_VERSION_REGISTRY\$ required updating with the repository schema information. This table, which stores relevant information about Fusion Middleware repositories on the system, is updated during the execution of the Repository Creation Utility (RCU). Cloning of the ODI repository schemas must occur after the 11g RCU has been run in the new environment. After the repository was cloned, the Upgrade Assistant was ready to begin.

Note: It is recommended to create the ODI repository schema through RCU which will make these registry entries for you. After that the datapump can be used to copy over the production tables and data to the newly created schemas.

Each upgrade creates an upgrade key, which is useful in avoiding issues during assignment of new GUIDs when importing an ODI 11g object into the ODI 12c repository.

Rittman Mead's experience with past ODI upgrades helped Eurocontrol reduce risk and shorten time spans to only two man-days. Their detailed knowledge of the differences between ODI 11g and 12c helped to prepare the environment for upgrade. After the upgrade, Rittman Mead performed several additional tasks to finalize the migration:

- Modification of Groovy scripts using the ODI SDK to work with the new Mapping objects, object GUIDs rather than object IDs, and several other changes
- Update the Eurocontrol custom Knowledge Modules to utilize the object GUIDs via the Substitution API: <http://www.rittmanmead.com/2014/03/ditips-odi12c-sub-api-guids/>
- Temporary Interfaces are implemented as both Reusable Mappings (to simulate the former "Use Temp Interface as Derived table (Sub-select)" inline view use of the Interface) and Mappings (to load an actual target table). Depending on how the Temporary Interface was being used in ODI 11g, one of these upgraded Mappings may need to be deleted
- Upgraded Mappings are created using the Dataset component. This component mimics the layout of an ODI 11g Interface, but limits the ability to use all of the flow-based components available in ODI 12c Mappings. The Dataset component has a "Convert to flow" command that updates a Mapping to the flow-based format. This can be completed as an optional final step of the upgrade. <http://www.rittmanmead.com/2015/04/di-tips-odi-convert-to-flow/>

BENEFITS

Eurocontrol was previously using Oracle Warehouse Builder (OWB) and was planning a migration to Oracle Data Integrator. Following Oracle's recommendation, the decision was made to start all new development in ODI 11g while waiting for a migration utility to be released, thus limiting the OWB development objects that would eventually need to be migrated. Oracle Data Integrator 12c, with a new flow-based paradigm, provides a development approach that is very similar to OWB. It made sense to upgrade the newly developed ETL, created in ODI 11g, to ODI 12c in order to reduce the learning curve for OWB developers and to allow for the migration from OWB to ODI.

Another positive aspect of this upgrade has been the stability and functionality of ODI 12c. The 12c standalone agents at Eurocontrol have 100% uptime since the upgrade. Developers can rely on ODI 12c to generate code that implements the Mapping business logic as expected. They can also implement more modular and reusable projects by leveraging the new Mapping Deployment Specifications and Reusable Mappings. Thanks to that, development time has been greatly reduced and less effort is spent in maintenance. As a result, PRISME can now deliver more projects every year. For instance, a new real-time load using web services has been implemented using the native support of SOAP and XML in ODI 12c. This data is refreshed every three minutes on a dashboard and is being

reviewed for a potential use in the operational room to help air traffic flow control managers make more informed operational decisions.

Due to the criticality of data being processed through ODI, the upgrade to ODI 12c had to avoid major downtime and limit risk taken on the existing ODI 11g repositories. With only one day of development code freeze and a planned downtime of less than 5 minutes, the upgrade to Oracle Data Integrator 12c was a success and brought a state of the art data integration architecture to Eurocontrol.

ORACLE PARTNER

The data integration team at Rittman Mead led the upgrade from ODI 11g to ODI 12c. With their focus on technical excellence and community support, they were well informed of the 12c version and its capabilities short after its release. Thanks to their significant experience administering data integration migrations, the entire Oracle Data Integrator upgrade operation could be planned, the risks could be foreseen and mitigated, and the upgrade was a complete success.

RITTMAN MEAD 
Training, Consulting, and Managed Services
www.rittmanmead.com