

User Guide

ReQuon 3

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SINGLE
STEP
CONSULTING

+61 403241096

 enquiries@singlestepconsulting.com.au

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1 Introduction

ReQuon 3 is a Data Reconciliation and Quality Tracking tool developed by, and for, Data Migration professionals. Having been actively used across a variety of projects and industries, the solution encapsulates the expertise and learnings of the author across many years and includes many time-saving features to fast track any data reconciliation effort.

1.1 Purpose

The purpose of this document is to provide guidance and practical advice on how to get the most out of your implementation of ReQuon 3.

1.2 Scope

This document covers the use of the ReQuon software, including explanations of the key concepts involved. While basic reconciliation tasks can be accomplished with little or no SQL experience, it is expected that practitioners with moderate to strong SQL skills will be required to perform more advanced reconciliation and data quality extraction tasks.

1.3 Intended Audience

This document supports a range of target audiences.

- Project Managers and Data Migration Managers will benefit from a shared understanding of the key concepts and reconciliation techniques supported by the tooling. The shared understanding will assist in communication and scope definition between the project management team and the data migration / reconciliation practitioners.
- Data Engineers will get practical advice and guidance on how to:
 - Scope and plan out the data reconciliation and data quality tracking activities.
 - Setup and configure the software.
 - Operate the software to define reconciliation checks, execute and test the reconciliation checks and report and publish the reconciliation results.

2 System Overview

2.1 Key Features

ReQuon 3 supports 2 complementary sub-processes within a typical data migration exercise:

- 1) data reconciliation between the source and target systems, and
- 2) data quality measurements over time (either at the source and/or the target) to track data quality improvement initiatives.

ReQuon 3 includes the following key features and capabilities:

- Supports connectivity to ODBC compliant data sources, as well as Excel files and delimited or fixed width text files.
- Supports both synchronous and asynchronous data capture (where supported by the relevant ODBC/OLEDB drivers)
- Supports a range of different reconciliation types including:
 - Type 1 – Record Counts by table / file
 - Type 2 – Group-By Aggregates
 - Type 3 – Entity-Dimension Sampling
- Provides the ability to import table and column metadata, from source and target systems, to increase productivity and reduce errors in data capture definitions.
- Supports the bulk generation of data capture skeleton definitions based on the table and column metadata to fast track the data reconciliation exercise.
- Provides a data storage repository for data capture definitions, promoting knowledge capture and potential reuse across projects utilizing similar source or target systems.
- Supports both Ms Access and SQL Server as the backend data storage repository
- Supports reporting of reconciliation results across different temporal baselines (e.g., Dry Run 1, Dress Rehearsal, Final Go-Live, etc.)
- Supports parameter substitution within capture definitions, to minimize / eliminate the need to adjust the capture definitions when moving from one baseline to another.
- Supports the definition, capture and reporting of key data quality metrics that need to be improved and tracked to support a successful data migration.
- Provides the ability to execute data extraction queries from source and/or target systems directly into Excel files (Pull-Thru Queries). Typically used in conjunction with the Data



Quality Metrics analysis to extract erroneous records for distribution to Data Quality Owners to action the required data quality remediations.

- Supports the recording and linking of reconciliation anomalies to reconciliation results for reporting and tracking purposes.
- Supports the generation of consolidated Excel based Reconciliation Report(s) for distribution to interested parties, using customizable templates.

2.2 Key Concepts / Terminology

2.2.1 Stages

The technical reconciliation approach within ReQuon employs a concept of "**Stages**" through which the migrated data moves from source to target (refer to the diagram below).



Each Stage typically represents a physical layer from which reconciliation metrics can be captured and subsequently compared (reconciled) against metrics captured from a different Stage. For the set of metrics to be reconcilable, the metric definitions need to consider any selection criteria and/or transformation rules that have been applied between one stage and any subsequent stages.

Understanding the relevant data migration approach and environments architecture applicable to a particular project will help determine:

- What **Stages** are involved.
- What reconciliations may be required, between different **Stages**.

The following diagrams illustrate a set of typical data migration environment architectures and how the **Stage** Numbers may be allocated to various systems / layers.

In its simplest form, a reconciliation is performed between a Source Database and a Target Database. The target database may be a straight one-for-one copy of the source database, or it may have been heavily transformed.

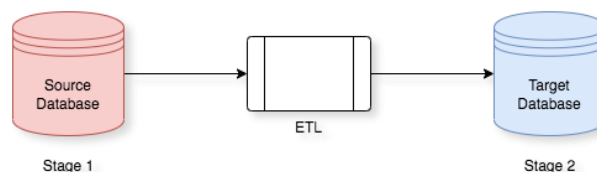


Figure 1 - Simple Source to Target Architecture

In more complex architectures, a dedicated migration staging environment with 1, 2 or more intermediate layers are employed to simplify the transformation (and reconciliation) process between various layers / stages of the data migration end-to-end processing.

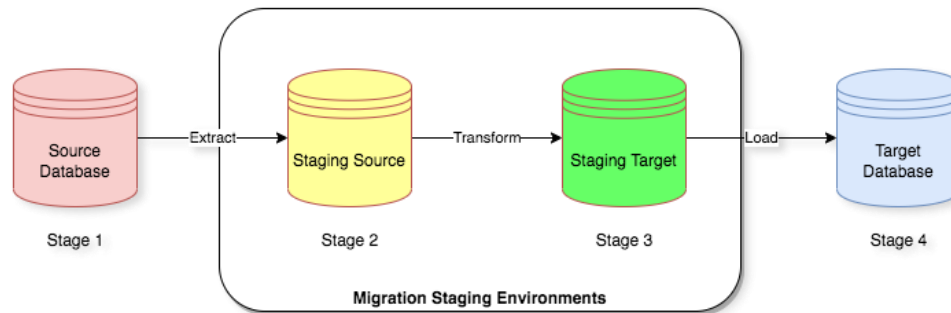


Figure 2 - Two-Layer Migration Staging Architecture

In Figure 2, Staging Source (Stage 2) would typically represent a selective one-to-one copy of the Source Database (Stage 1). The Staging Target (Stage 3) layer would typically represent a transformed "load ready" data set awaiting final loading into the Target Database (Stage 4).

Note: A **Stage** may represent a separate database, a particular schema within a single database or a collection of Excel or flat files.

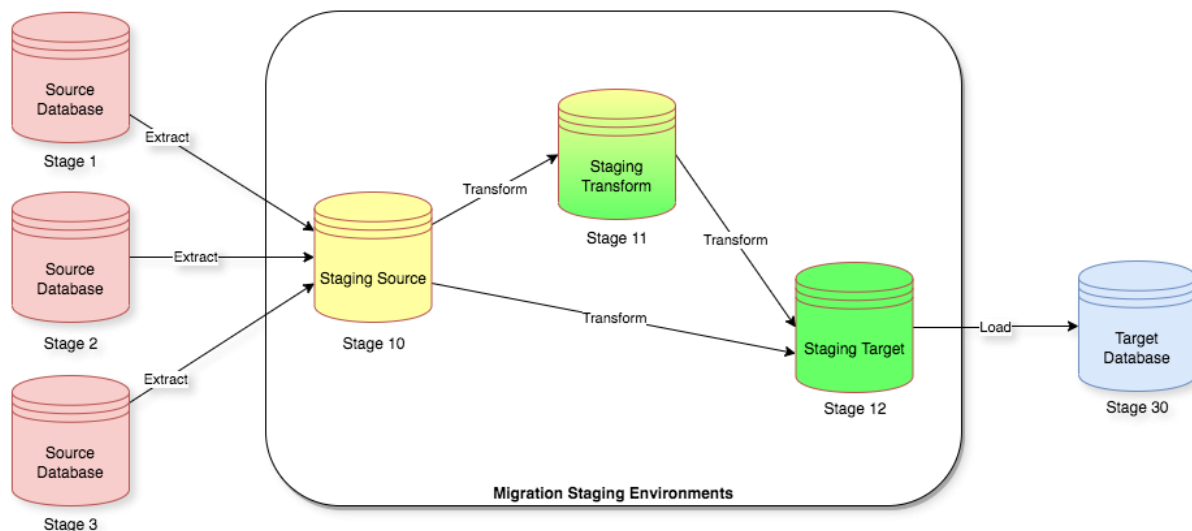


Figure 3 - Multi-Source + 3-layer Migration Staging Architecture

In Figure 3, the introduction of multiple data sources may lead to increased complexity in the transformation processes (e.g., for merging, deduplication, etc.) requiring the introduction of an intermediate Staging Transform layer for a subset of tables. Regardless of the structure involved, the overall reconciliation exercise can be decomposed into a set of reconciliations between 2 stages.

Note: Stage number 0 is reserved for storing the default values for substitution-parameters – these will be discussed in more detail in section 4.1.9, Shortcut Menus and Miscellaneous Popups.

2.2.2 Load Id

Reconciliation metrics need to be captured at an appropriate point in time to be effective. The concept of a **Load ID** is used to define a temporal reference point / baseline against which a set of metrics can be captured and subsequently reported.

For example: -

- Load 1 might refer to an internal Dry Run
- Load 2 could refer to Dry Run 1
- ...
- Load 5 could refer to formal Dress Rehearsal 1
- Load 6 could refer to formal Dress Rehearsal 2
- Load 7 could refer to the final Go-live conversion

The number of reconciliation baselines required will usually be defined in the project's Data Migration Strategy and informed by the acceptability of the results of prior reconciliations.

2.2.3 Reconciliation Types

Three main (3) reconciliation types are supported in ReQuon as defined in the table below.

Type	Definition
1	Record Counts. This is the simplest reconciliation method and is generally performed first before embarking on the more complex type 2 and type 3 reconciliations. This type of reconciliation is generally performed for all tables.
2	Group-By Aggregates. This type of reconciliation groups the data by one or more key attributes within the data set (e.g., Year and Month associated with a transaction date, Customer Types, etc.) and then aggregates one or more associated attributes (e.g., sum of invoice amount, etc.) for each grouping. Comparisons (reconciliations) are then performed for each data grouping / aggregate. The purpose of this type of reconciliation is to verify the correct distribution of key values (e.g., totals by month, etc.) within a chosen data set. As such, this type of reconciliation is typically applied to key transactional tables / data sets (such as Purchase Orders, Invoices, etc.).
3	Entity – Dimension Sampling. The purpose of this type of reconciliation is to provide a more business-oriented view of the reconciliation data. It does this by executing a set of Type 2 Group-By Aggregates (referred to as Dimensions) around a central business entity (such as a customer, supplier or project, etc.) to provide a holistic view of that business entity.

Type	Definition
	This type of reconciliation is often complex and time consuming and hence is generally used in sampling context i.e., a subset of business entity ID's (such as the Project Numbers associated with the Top n projects based on some criteria) are selected for analysis.

The progressive application of the different types of reconciliations, beginning with Type 1's and moving into Type 2's and Type 3's, supports a layered, risk-based approach.

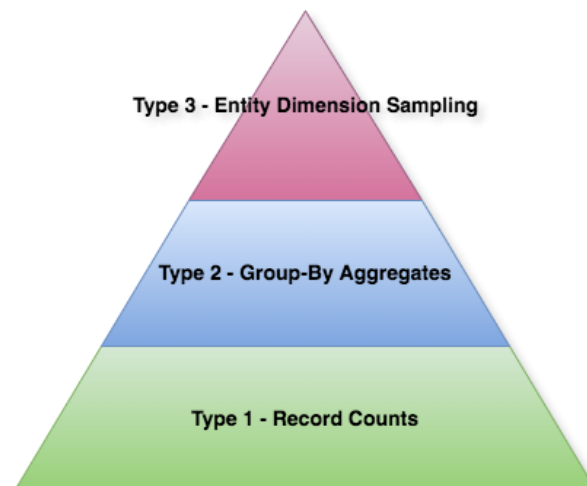


Figure 4 - Layering of Technical Reconciliation Types

2.2.4 Processing Statistics

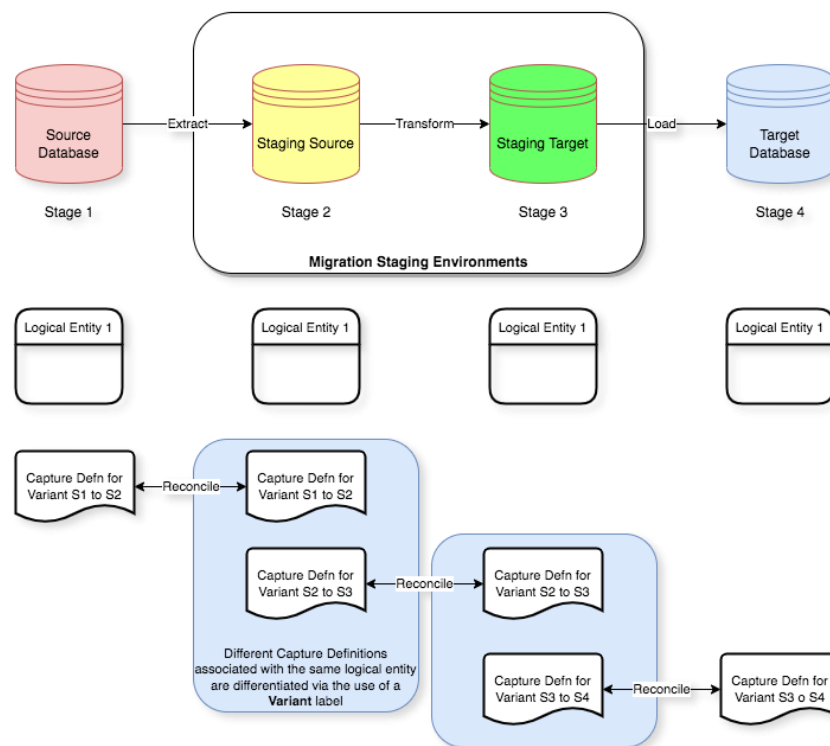
In addition to the 3 types of reconciliations, a complimentary set of metrics (referred to as Processing Statistics) can also be captured. Progressing Statistics are not used in Stage-to-Stage comparisons, but are rather used to provide summary reports such as: -

- The number of staging records that passed or failed validation
- The number of staging records that are unprocessed vs processed vs failed.

Processing Statistics help identify exceptions that may have led to a reconciliation variance detected in the Type 1, 2 and/or 3 reconciliation results.

2.2.5 Variants

Often, different data reconciliation metrics will be captured from the same table for different purposes. For example, the metrics captured from a **Staging Source** (Stage 2) table for comparison with a **Source Database** (Stage 1) table may be different from the metrics that need to be compared (reconciled) with a **Staging Target** (Stage 3) table where certain records have been excluded based on the defined selection criteria.



To differentiate between these metrics, the keys used to identify a specific metric definition include an additional label referred to as the "**Variant**". E.g., a variant of "S1-2" may be used to refer to a metric designed to reconcile between Stages 1 and 2 while "S2-3" would be used to refer to a metric designed to reconcile between Stages 2 and 3.



Similarly, if different selection criteria apply to different releases, the Variant label may include an indication of which release the reconciliation definition applies. E.g., S1_4_Rel1 may be used when reconciling a table between Stage 1 and Stage 4 for the R1 release, while S1_4_Rel2 could be used for the R2 release.

Another use of the **Variant** label occurs where data from a single source table gets split into 2 or more tables in a downstream stage, or vice versa i.e., a One-To-Many or a Many-To-One scenario. For example, a Party table from the source system may get split into Supplier, Customer and Employee tables as part of the transformation rules. In such a situation, three variants of the same metric may be defined such as "S1-2_SUPP", "S1-2_CUST" and "S1-2_EMPL".

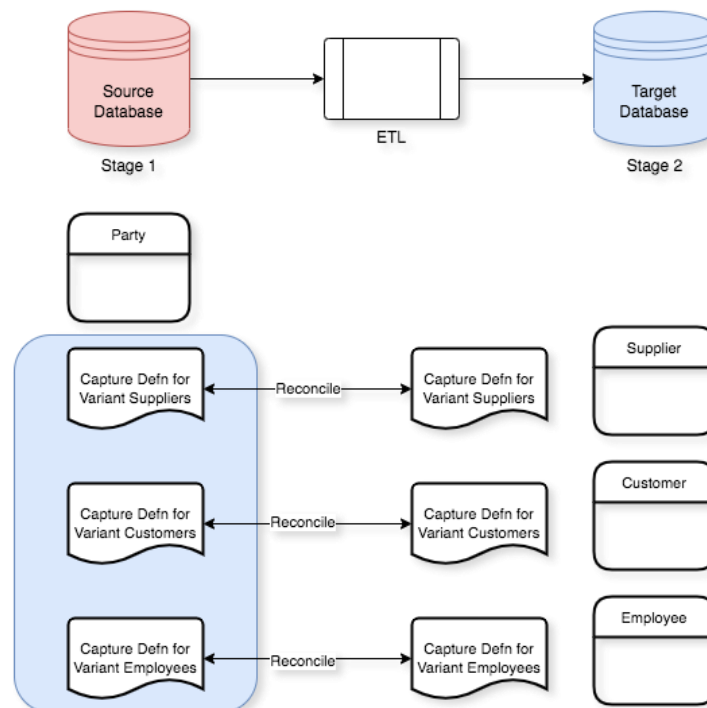


Figure 5 - Use of Variants in One-to-Many (or Many-to-One) Scenarios

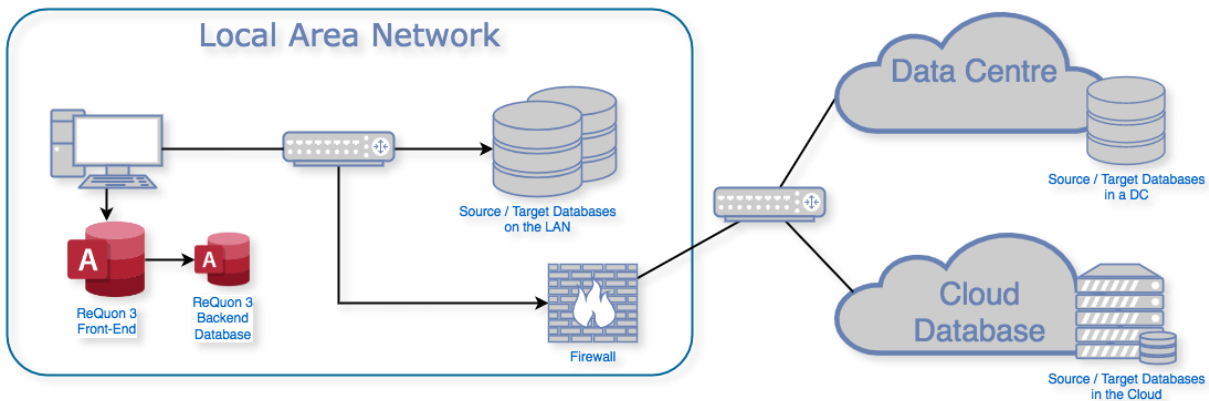
2.3 Environment

ReQuon can be setup in a few different environment configurations to suit the size and needs of the data reconciliation team. Typical configurations include:

- Single-user standalone
- Multi-user shared Ms Access backend on a network drive
- Multi-user shared SQL Server backend (local network or cloud hosted)

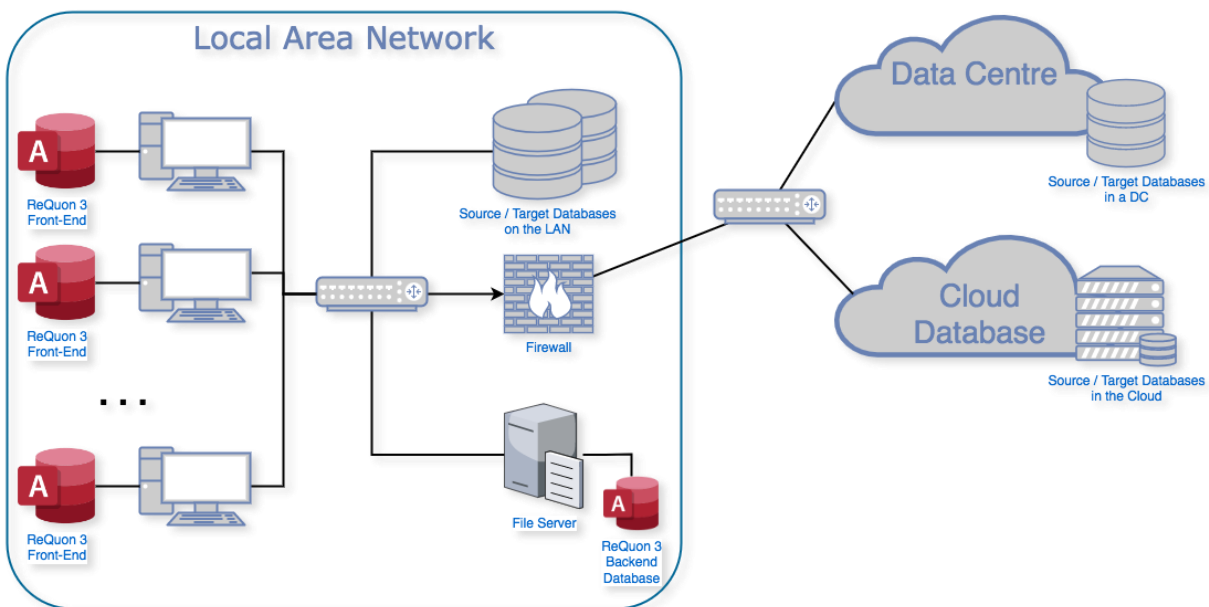
2.3.1 Single-User Standalone

In this configuration, ReQuon is installed on a single Windows PC using a local Ms Access backend database.



2.3.2 Multi-User, Shared Ms Access Backend

The configuration is suitable for small project teams (e.g., up to 1 to 10 users)

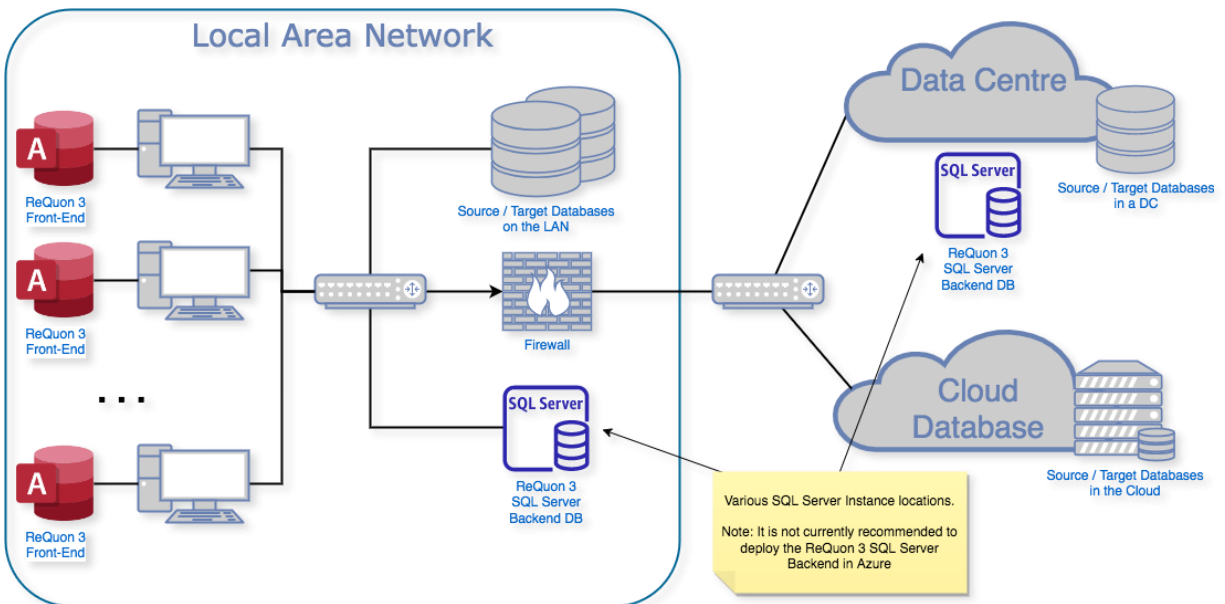




2.3.3 Multi-User, Shared SQL Server Backend

The configuration is suitable for small to large team sizes. The SQL Server database instance where the ReQuon 3 backend will be hosted can reside in various locations, including:

- On-Premise within the Local Area Network, or
- In a company Data Centre



3 Installation

3.1 Hardware Requirements

The following **minimal** hardware requirements are generally based around the Microsoft recommendations for Ms Office which include a Windows capable PC with:

- 4 GB RAM; 2 GB RAM (32-bit)
- 4 GB of available disk space
- 1280 x 768 screen resolution

3.2 Software Requirements

The following additional software components are required in a typical ReQuon installation.

- Windows 11, Windows 10, Windows 8.1, Windows Server 2019, Windows Server 2016.
- Microsoft Access (2016, 365) – Full version or the free runtime edition. ReQuon supports both 32 bit and 64-bit editions.
- Microsoft Excel (2016, 365)
- ODBC and/or OLEDB drivers for the relevant source and target systems to be reconciled.
- Optional: SQL Server backend database.

3.3 Pre-Installation Checklist

Prior to commencing the installation, you should decide which environment configuration best suits your needs. The following table identifies the relevant items applicable to each configuration.

Step	Instructions	Single-User Standalone	Multi-User, Access Backend	Multi-User, SQL Server Backend ¹
1	Identify the end-user PC's and ensure they have at least Windows 7 (preferably Windows 10 or 11)	✓	✓	✓
2	Ensure you have an Administrator password for the PC(s) (required to register some libraries as part of the installation)	✓	✓	✓
3	Ensure each PC has an up-to-date version of either: - the full version of Microsoft Access 2016 / 365, or - the equivalent run-time edition	✓	✓	✓
4	In multi-user environments using MS Access backends, ensure all end-user PCs are running the same bitwise version of Ms Access (e.g., 32 bit or 64 bit). Warning: DO NOT mix bitwise versions as this will lead to corruption of the backend database. It is also highly recommended to maintain all users on the same version of Ms Access to eliminate the possibility of incompatibility between versions.	N/A	✓	N/A
5	Confirm the network directory for the Ms Access shared database and ensure the end-users have read, write and delete permissions in the directory.	Optional	✓	N/A
6	Identify the SQL Service instance on which the ReQuon backend database(s) – one for each project	N/A	N/A	✓

¹ ReQuon 3 Pro Edition only

3.4 Installing the system

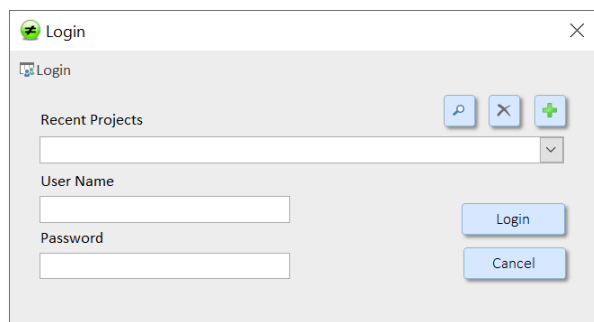
3.4.1 Client Installation

Step	Instructions	Actioned
1	Download the ReQuon 3 Client installation program from the link provided in your subscription confirmation	
2	Execute the installer and following the instructions provided. This will create the application directory structure and copy the application files into the relevant directories.	
3	Download your subscription licence file from your subscription confirmation email and save a copy to the application folder (e.g. C:\ReQuon)	

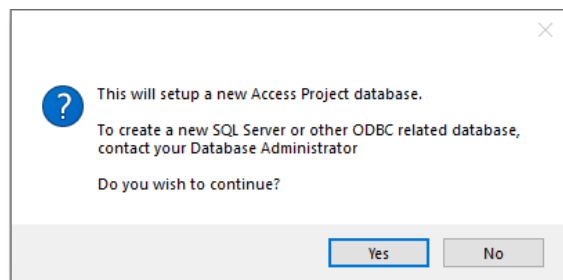
3.4.2 Ms Access Backend Installation

3.4.2.1 On a Local PC

Upon initial start-up of the application, the following popup will be displayed.



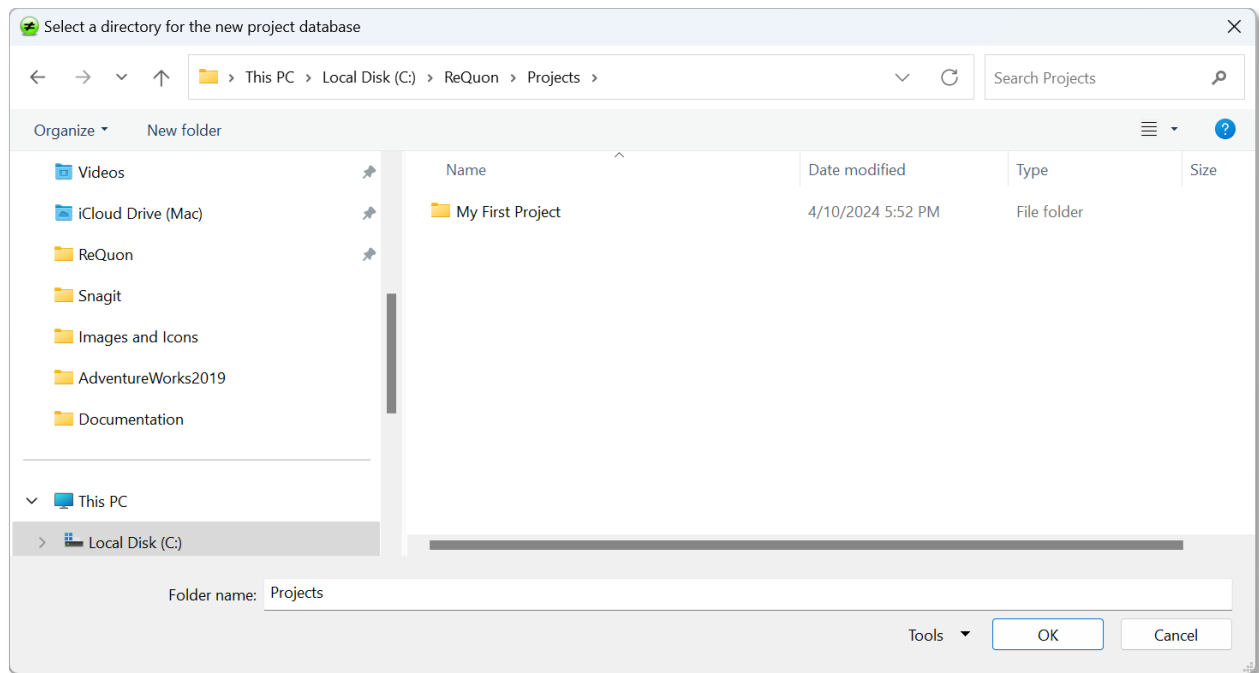
To create a new Ms Access based backend database, click on the  button. On the subsequent dialog box, click on the Yes button to continue.



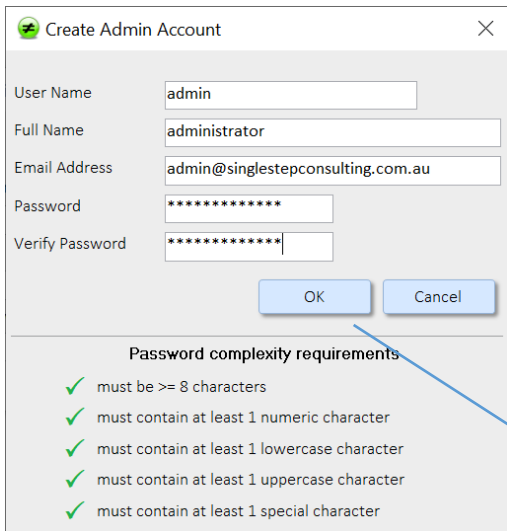
A Windows dialog will appear where you can create, navigate to and select a directory to store your project directory.

Note: Each ReQuon 3 backend database stores the reconciliation capture definitions and captured metrics for one Project.

In the following example, a directory "C:\ReQuon\Projects\My First Project" has been created and selected. Click OK to continue.



A new empty project database will be created in the selected directory and then the user will be prompted to create the administrator account for the new project database.



Create Admin Account

User Name: admin

Full Name: administrator

Email Address: admin@singlestepconsulting.com.au

Password: *****

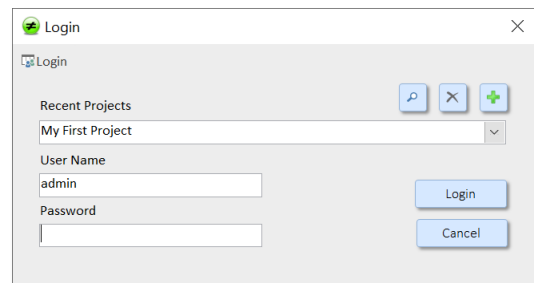
Verify Password: *****

OK Cancel

Password complexity requirements

- ✓ must be >= 8 characters
- ✓ must contain at least 1 numeric character
- ✓ must contain at least 1 lowercase character
- ✓ must contain at least 1 uppercase character
- ✓ must contain at least 1 special character

Enter the relevant details and click OK to create the admin account and open the new project database. You will be presented with the ReQuon login screen, with the newly created project database pre-selected in the list of "Recent Projects". Enter the admin account User Name and Password and click the Login button to continue.



Login

Recent Projects

My First Project

User Name: admin

Password: *****

Login Cancel

3.4.2.2 On a Network File Server

Prior to creating a new Ms Access based project database on a network file server, perform the following steps:

- Create a drive mapping on the end-user's PC pointing to an appropriate directory on the file server. E.g., R: drive
- Create a suitable directory structure to store future ReQuon project databases under the mapped driver. An example directory structure would be:

```
R:\ReQuon\Project Dbs\
```

- Ensure the end-user as Read, Write and Delete permissions on the lowest level folder in the directory structure and that the permissions are inherited to any subsequently created sub-directories.

Once this initial setup has been completed, the creation process for a new Ms Access based project database on a network file server is identical to that for a local database.

3.4.3 SQL Server Backend Installation

Currently under development.

4 Application Overview

4.1 Navigation

The main application window has four (4) main areas:

1. Title Bar
2. Drop-down menus
3. Main document window
4. Status / message bar

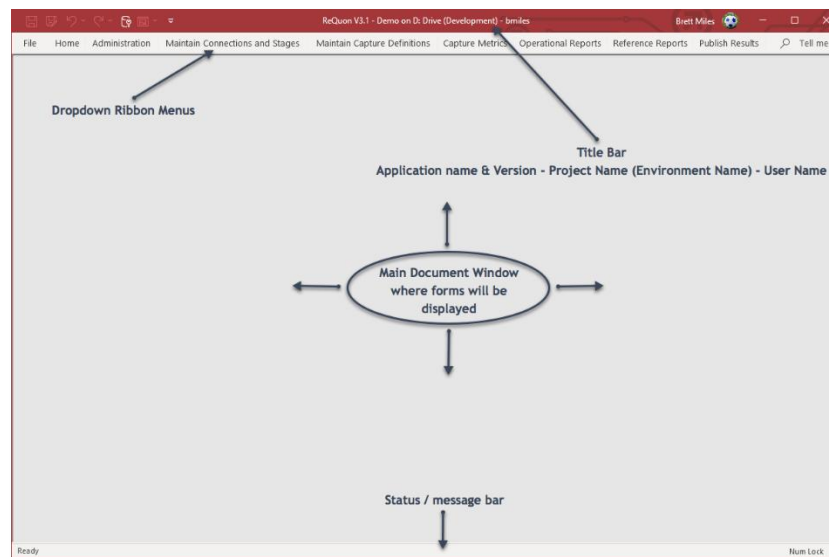


Figure 6 - Overall Application Window

Starting with the Administration Menu, the organization of the drop-down menus, working from left to right, generally represents the chronological order in which the functionality within the application will be exercised.

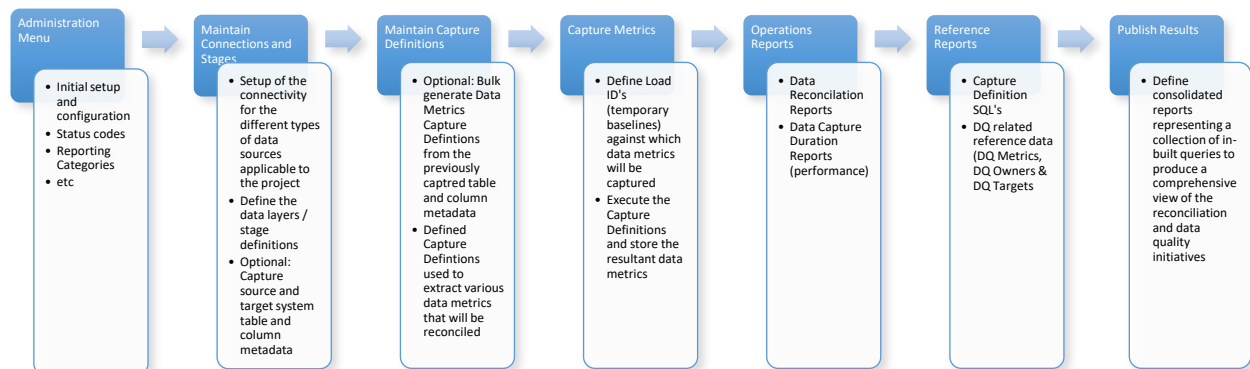
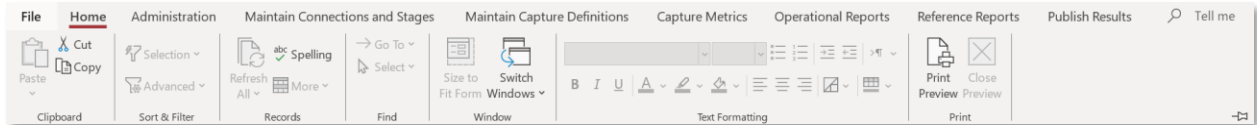


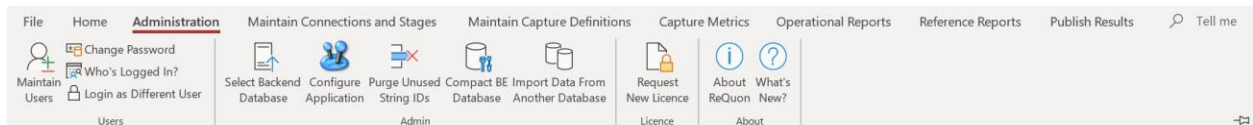
Figure 7 – Menu Ordering vs Activity Ordering

4.1.1 Home Menu

The home menu provides access to basic functionality that is shared across the entire application such as Copy and Paste, Finding and Filtering of data, etc.



4.1.2 Administration Menu



Menu Group	Menu Item	Notes
Users	Maintain Users	- Add, edit and change users and user roles. - Reset passwords
	Change Password	
	Who's Logged In?	View who is logged into either the front-end application or backend database
	Login as Different User	Displays the login screen where either: - a different user can be selected for the current project database, and/or - a different user and project database
Admin	Select Backend Database	Used to select an existing project database and make it the current database ready for a subsequent login.
	Configure Application	Provides access to application / project specific configuration settings and reference data.
	Purge Unused String IDs	ReQuon maps textual values (such as Group By values returned in Capture results, entity samples values, etc.) to String IDs to reduce space across multiple load id's. This function will delete any String ID's that are not being referenced so that the backend database size can be reduced – refer Compact BE Database below.
	Compact BE Database	For Ms Access backend databases only , this function will run the standard Compact and Repair function to reduce the size of the backend database and attempt to repair any data corruption, if detected.
	Import Data from Another Database	- Allows the user to import data from another ReQuon project database (Ms Access only). - Useful for sharing reference data between projects as well as reusing Capture Definitions for projects involving similar source and/or target systems.
Licence	Request New Licence	Request a new ReQuon licence
About	About ReQuon	Provides application version, licence details and access to support library details
	What's New?	Display recent release notes

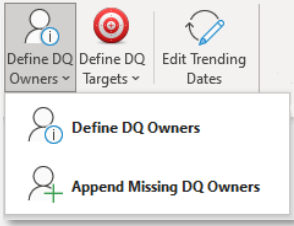
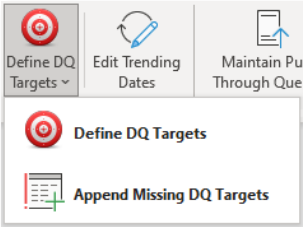
4.1.3 Maintain Connections and Stages Menu

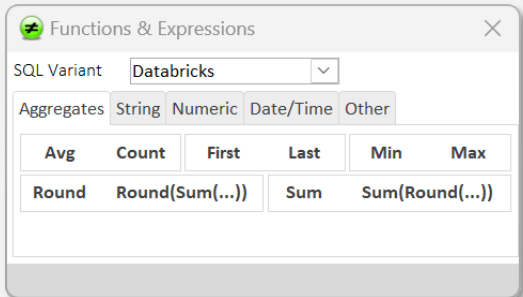
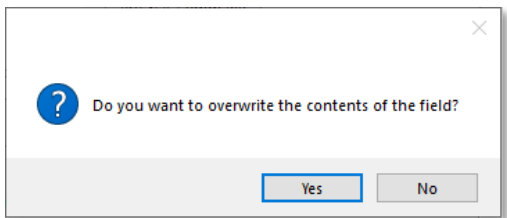


Menu Group	Menu Item	Notes
Connections	Edit SQL Variants / Connection Types	- A SQL Variant recognizes that different databases (e.g., Ms Access vs SQL Server vs Oracle, etc.) contain variations in supported SQL syntax. ReQuon comes with several pre-configured SQL Variants, however the user can configure a set of key syntax settings to support other variations. - Connection Types represent the different Connection String syntaxes that can be used to connect to a database via ODBC / OLEDB connections. For example, SQL Server supports Standard Security (SS User and Password), Trusted Connections, Azure Standard Security, etc.
	Edit System Parameter Expressions	Different SQL Variants also support different syntax for key functions such as date and time related calculations that are used in several predefined substitution parameters.
	Maintain Connections	- This is where the actual DNS-Less connection strings for each source and target database are defined. - If different client computers have different ODBC drivers for the same database, it is possible to define a different connection string for each client computer for the same "logical" connection name.
Stages	Edit Stage Definitions	- Used to define the persistent data Stages of interest to the reconciliation exercise. - Note: a single "logical" connection can relate to 1 or more Stages.
	Import Stage Table Metadata	- Used to review a list of tables or views from a particular "Stage", select the items of interest and import the column metadata (names, data types, sizes, etc.) into the ReQuon project repository. - The imported metadata can be used to bulk generate Capture Definition skeletons as well as provide lookups the users maintaining the capture definitions.
	Edit Stage Table Metadata	Provides the ability to manually maintain the imported metadata. This is particularly useful for Excel and text files where the correct data types may not be retrieved via the applicable driver.

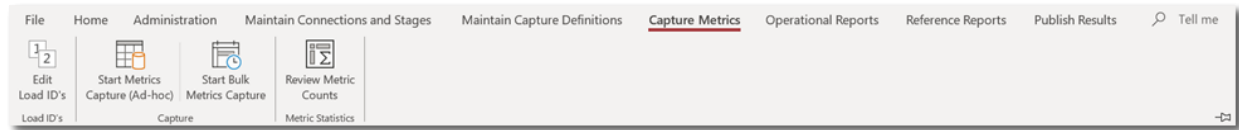
4.1.4 Maintain Capture Definitions Menu



Menu Group	Menu Item	Notes
Maintain Capture Definitions	Bulk Create Capture Defns	Used to bulk generate Capture Definition skeletons from the imported Stage Table metadata. The skeleton definitions can then be allocated to the Reconciliation Engineers to build out the capture definitions as required.
	Type 1 (Record Counts) Type 2 (Grouping Expr's) Processing Statistics Type 3 (Entity Dim. Sampling)	Used to maintain the relevant type of Capture Definition
	Type 3 Sample Details	- Used to import or edit a list of Entity Id's by Entity Type. - Define whether the Entity Id should be treated as Case Sensitive or Case Insensitive. - Individual sample values can be assigned an optional "Sample Set" label. This can be useful for selecting a small sample subset for development / testing purposes, for example.
Data Quality Metrics	Define DQ Metrics	Used to define the set of DQ metrics that need to be measured and tracked over time. Generally, these will represent the key data quality measures that need to be achieved before a final go-live data migration is performed.
	Define DQ Capture Defns	Used to maintain the Data Quality Capture Definitions used to measure and collect the DQ Metrics
	Define DQ Owners 	Define DQ Owners: Accountability for the DQ Metrics needs to be assigned to an DQ Owner within the Business. The DQ Owners will be the recipients of the DQ Reports and DQ Extracts containing details of the data that needs to be remediated. Append Missing DQ Owners: Will create DQ Owners that are found in the DQ Metrics captured that haven't been previously defined. These can then be edited via the "Define DQ Owners" form.
	Define DQ Targets 	Define DQ Targets: Each DQ Metric can be assigned a target value representing the acceptable number of invalid records (usually zero) that need to be achieve by a given date. Append Missing DQ Targets: Will create DQ Targets for any combinations of DQ Metric, Owner and relevant drilldown levels (1 to 4) found in the DQ Metrics captured that haven't been previously defined. These can then be edited via the "Define DQ Targets" form.

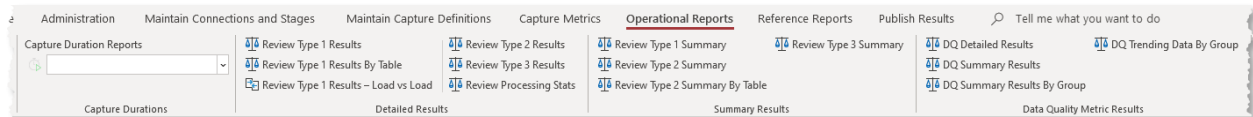
Menu Group	Menu Item	Notes
	Edit Trending Dates	Used to define the regular (e.g., daily, weekly, fortnightly or monthly) DQ Target measurement dates to support the reporting of the metrics over time and assess if the business is on track to meet the targets by the relevant target date.
Pull-Through Queries	Maintain Pull-Through Queries	- Pull-Through Queries are used to extract data from a Stage and write the data to an Excel file for subsequent review and analysis - Typically used in conjunction with the Data Quality Metrics, to extract the erroneous data requiring remediation for sharing with the relevant DQ Owner - Other potential uses include extracting: - source system reference data - entity id's for Type 3 Sampling
Editing Functions	SQL Functions Popup	Displays a floating form with common SQL functions & expressions. Used to insert into relevant fields on the Capture Definition forms, using the syntax specific to the selected SQL Variant. 
	External Text Editor	- This command will copy the text from the currently selected control to the external editor (default is NotePad.exe) defined under the Application Settings menu. - If the text is edited and then the editor closed, the user is asked if they want to overwrite the contents of the current control. 

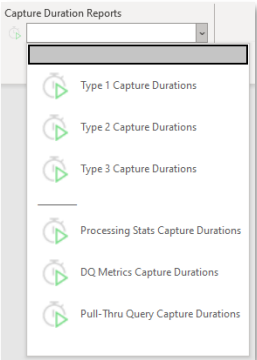
4.1.5 Capture Metrics Menu



Menu Group	Menu Item	Notes
Load ID's	Edit Load ID's	Used to define meaningful identifiers for the specific point-in-time data captures and reconciliation results. Refer to section 2.2.2 Load Id, under Key Concepts
Capture	Start Metrics Capture (Ad-hoc)	Allows the user to execute all Capture Definitions of a specific type (E.g., Type 1 Record Counts) and/or one or more individually selected capture definitions within a type. Particularly useful while developing and testing the Capture Definitions.
	Start Bulk Metrics Capture	- Allow the user to edit and maintain a Data Capture queue or different types of Capture Types for different Stages and then execute the same. - Execution can be either immediate or at a specific date / time in the future (scheduled).
	Review Metric Counts	This function displays the record counts of the detailed metric captures, by Capture Definition and Load ID (or Measurement Date for Data Quality related captures).

4.1.6 Operational Reports Menu

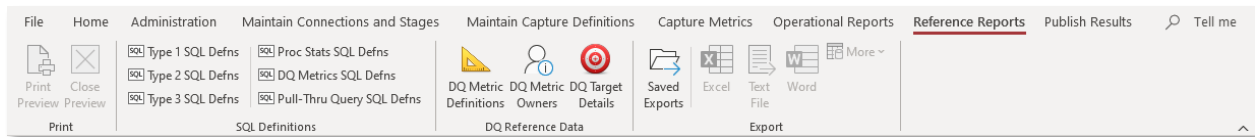


Menu Group	Menu Item	Notes
Capture Durations	Capture Duration Reports 	- Report on the amount of time each individual Capture Definition took to execute. - Useful during development and testing to identify long-running queries that may require performance tuning to reduce the time taken to perform and end-to-end reconciliation process
Detailed Results	Review Type 1 Results Review Type 2 Results Review Type 3 Results Review Processing Stats	View reports containing the lowest level of detail for each of the different reconciliation types.



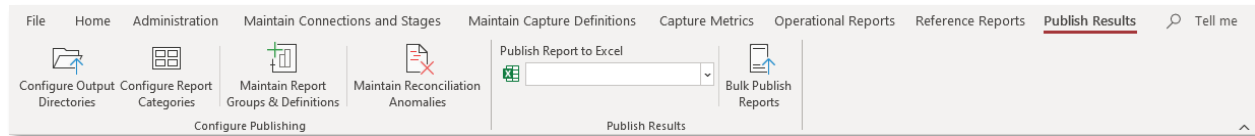
Menu Group	Menu Item	Notes
	Review Type 1 Results by Table	- Where a Stage supports Table Members, the report rolls-up the results to the Table Levels - If the Stage does not support Table Members, this report effectively provides the same results as "Review Type 1 Results"
	Review Type 1 Results – Load vs Load	- This report compares the record counts from applicable to a single Stage, from one Load ID (e.g., Dry-Run 1) to another (e.g. Dry-Run 2). - Useful to assess data volume growth over time

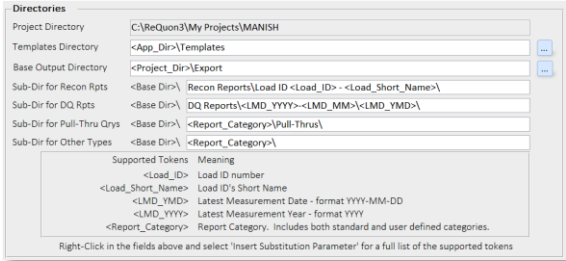
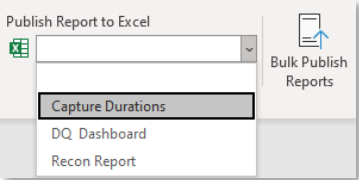
4.1.7 Reference Reports Menu



Menu Group	Menu Item	Notes
SQL Definitions	Various	- Used to report on the generated SQL Statements associated with the various Capture Definitions - Can be run for a specific Stage (or all Stages) - Can be run with or with substitution parameters values - Can be run for a specific Load ID (applicable when using parameter substitution)
DQ Reference Data	DQ Metric Definitions DQ Metric Owners DQ Target Details	Used to report on the various data quality related reference data.

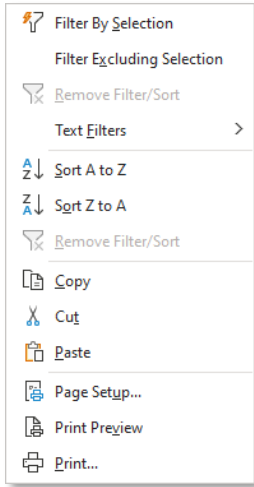
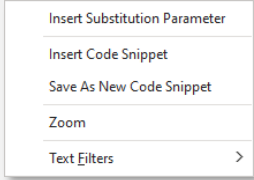
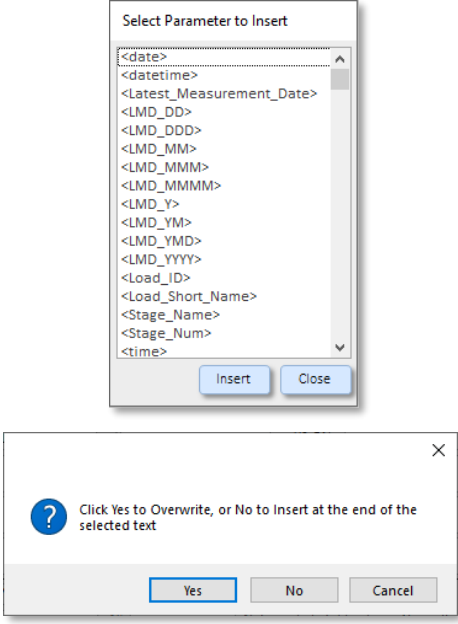
4.1.8 Publish Results Menu



Menu Group	Menu Item	Notes
Configure Publishing	Configure Output Directories	Configures the directory that the published reports should be exported to, dependent upon the type of extract. Supports several different substitution parameters. 
	Configure Report Categories	- Maintains the list of user-defined reporting categories that can then be associated with different extracts. - Note: Reporting Category can be used as a substitution parameter in the definition of the Output Directories (see above)
	Maintain Report Groups & Definitions	- Allows the user to define a Report Group containing a collection of data extracts (based on pre-defined queries with user-defined parameter values) to produce a consolidated Excel based report. Typical "Report Groups" include: - Reconciliation Report - Data Quality Dashboard - Capture Durations / Performance - A predefined set of Excel templates are provided which can be customized to suit the organizational requirements
	Maintain Reconciliation Anomalies	- While not actually a report, this form is used to document the reconciliation anomalies identified in the reconciliation results, including any root cause analysis and planned resolutions. - This is usually the last activity required before the final Data Reconciliation Report can be published.
Publish Results	Publish Report to Excel Bulk Publish Reports	 - This dropdown presents the list of Report Groups (as previously defined above) for execution and saving to file for subsequent distribution to the interested parties - The Bulk Publish Reports option allows the user to select multiple reports to be generated and saved to a common folder for later retrieval.

4.1.9 Shortcut Menus and Miscellaneous Popups

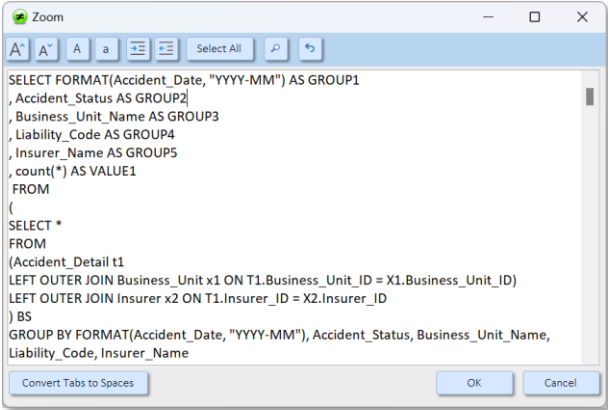
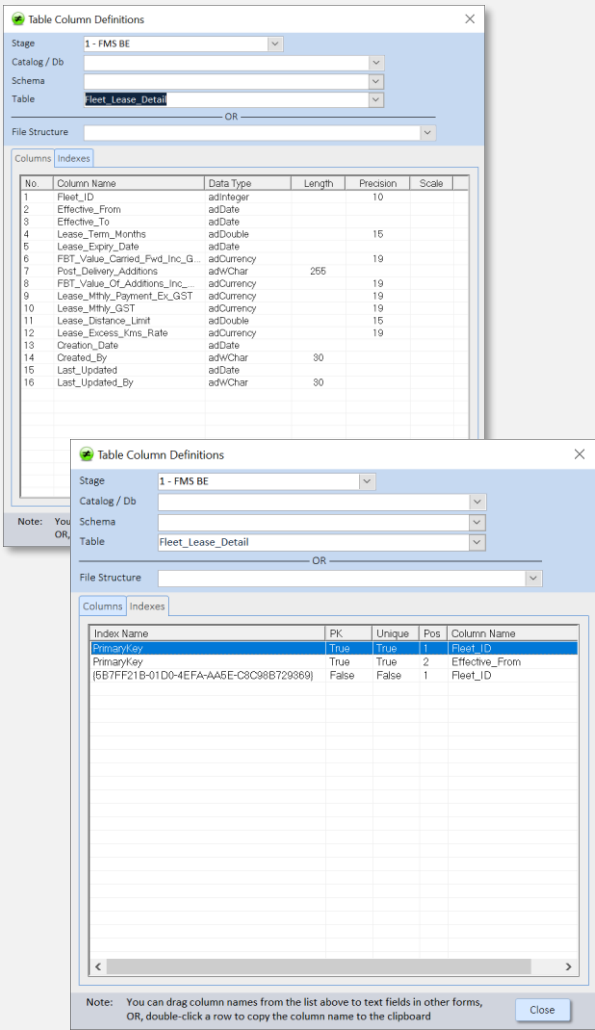
In addition to the editing and maintenance forms, there are several supporting shortcut menus and popup forms available throughout the application. Shortcut menus are accessed by right-mouse-clicking in any form field.

Shortcut Menu / Popup Name	Screenshot
Standard Shortcut Menu Most common fields will display the following shortcut menu providing access to an array of filtering, record sorting and copy/paste functions.	 A right-click context menu with the following items: Filter By Selection, Filter Excluding Selection, Remove Filter/Sort, Text Filters (with a right arrow), Sort A to Z, Sort Z to A, Remove Filter/Sort, Copy, Cut, Paste, Page Setup..., Print Preview, and Print...
Insert Shortcut Menu Provides access to several other forms / popups.	 A right-click context menu with the following items: Insert Substitution Parameter, Insert Code Snippet, Save As New Code Snippet, Zoom, and Text Filters (with a right arrow).
Insert Substitution Parameter Allows the user to select one of the pre-defined substitution parameters and either replace the entire field or append the parameter at the end of the field.	 Two screenshots are shown. The top one is a 'Select Parameter to Insert' dialog box with a list of parameters: <date>, <datetime>, <Latest_Measurement_Date>, <LMD_DD>, <LMD_DDD>, <LMD_MM>, <LMD_MMM>, <LMD_MMMM>, <LMD_Y>, <LMD_YM>, <LMD_YMD>, <LMD_YYYY>, <Load_ID>, <Load_Short_Name>, <Stage_Name>, <Stage_Num>, and <time>. The bottom one is a confirmation dialog box with a question mark icon and the text 'Click Yes to Overwrite, or No to Insert at the end of the selected text', with 'Yes', 'No', and 'Cancel' buttons.



Shortcut Menu / Popup Name	Screenshot
Insert Code Snippet Code snippets are re-usable pieces of SQL that may be applicable to multiple capture definitions. A typical example would be Staging Source table validation and/or status flags that are used to filter the valid records for transformation to the downstream Staging Target stage. - Allows the user to select and insert a previously defined code snippet either replacing the entire field or appending the snippet at the end of the field. - A code snippet can itself contain substitution parameters e.g., <date> in the example refers to the current date substitution parameter.	
Save as New Code Snippet - Allows the user to select a snippet of SQL from an existing field and save it as a new re-usable code snippet. - The selected text is copied into the Build Block Text field awaiting the user to assign a meaningful name to the snippet and specify which Stage the snippet is valid in.	
Expression Reordering - This shortcut menu is available for the aggregate expression fields on the Type 2 and Type 3 Capture Definition forms. - This provides the following reordering commands: Move Up & Move Down: These commands move the currently selected Expression row up or down while swapping position with the row above or below as applicable. Push Up & Push Down: If there are empty expressions in the set of Expression rows, these commands push all the Expressions rows above or below the selected row while maintaining the relative positions of the expressions.	



Shortcut Menu / Popup Name	Screenshot
Zoom - Opens a popup edit form containing the contents of the currently selected field - Available on long text fields - Can be accessed via the shortcut menu or by pressing Shift-F2 in an eligible field.	
Table Column Definitions (Stage table metadata) - Accessed via the information icon  on the various Capture Definition forms (generally found next to the Table Name field) - Includes tabs for both Column and Index metadata - Column names can be dragged from the popup into the main form, either replacing the whole field, or if the cursor has been positioned in the target field, it will insert into the nominated position within the existing text.	

5 Detailed Instructions

5.1 Initial Setup and Configuration

After logging into the system as an administrator, there are several initial setup and configuration tasks that should be performed. These can be accessed via the "Configure Application" option under the Administration Menu (refer section 4.1.2). These tasks would generally be performed in the order (top to bottom) of the configuration groups listed in the left-hand side of the form, starting with "General Settings".

5.1.1 General Settings

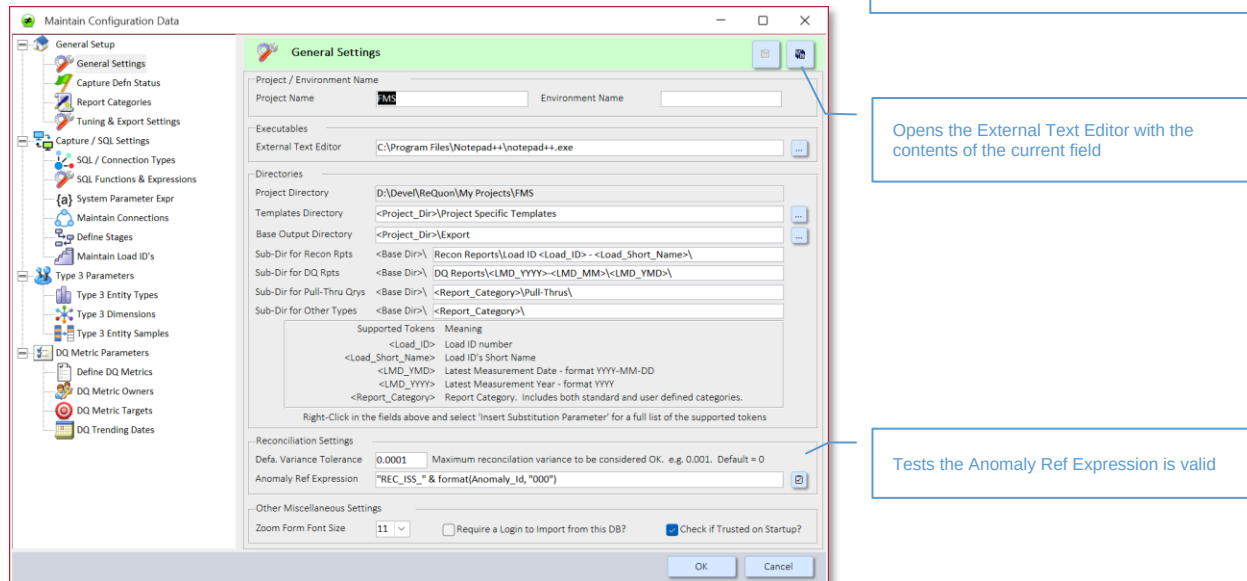
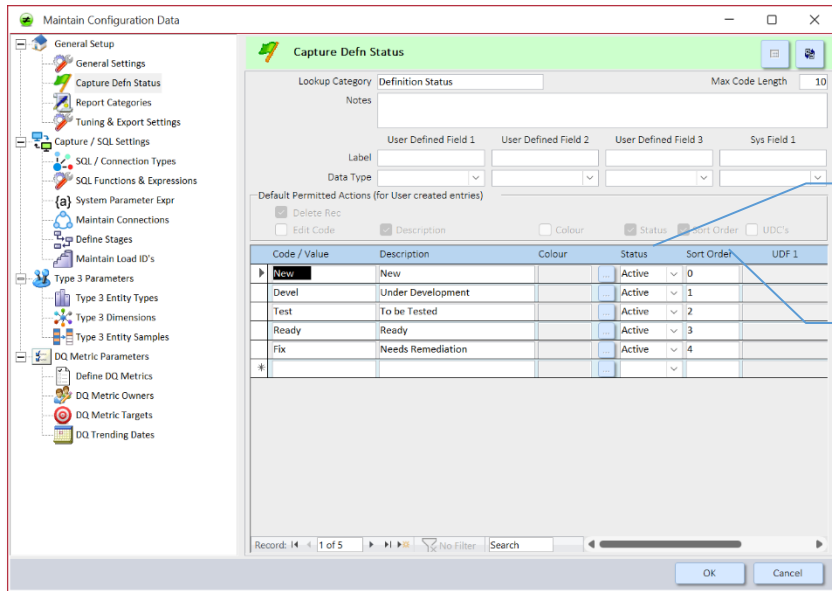


Figure 8 - General Settings

5.1.2 Capture Definition Status

Used to track the development and testing state of the Capture Definitions



Lookup Category: Definition Status Max Code Length: 10

Notes:

User Defined Field 1 User Defined Field 2 User Defined Field 3 Sys Field 1

Label:

Data Type:

Default Permitted Actions (for User created entries)

☐ Delete Rec ☐ Edit Code ☐ Description ☐ Colour ☐ Status ☐ Sort Order ☐ UDC's

Code / Value	Description	Colour	Status	Sort Order	UDF 1
New	New		Active	0	
Devel	Under Development		Active	1	
Test	To be Tested		Active	2	
Ready	Ready		Active	3	
Fix	Needs Remediation		Active	4	
*					

Record: 1 of 5

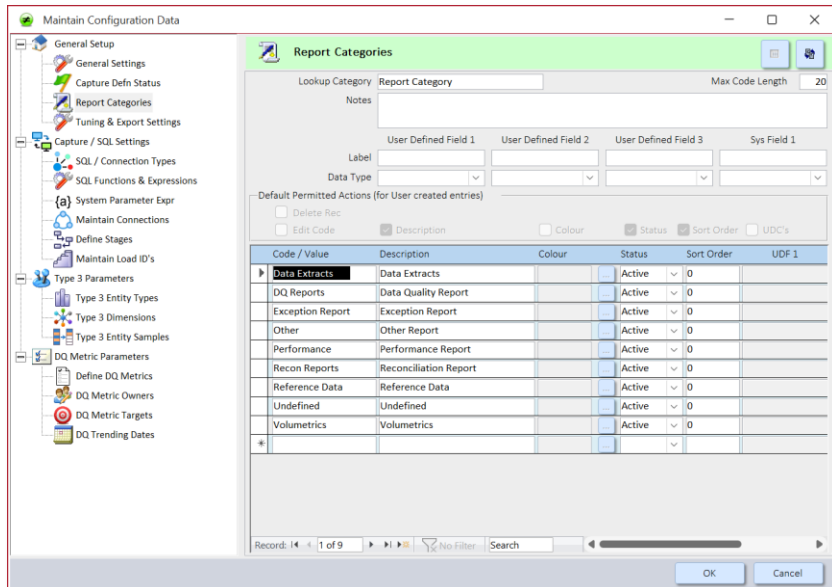
OK Cancel

Inactive values will not be displayed in the dropdown lists on other forms

Order of the options as displayed in the dropdown lists

5.1.3 Report Categories

Used to categorise different types of report and provide substitution parameters that can be used to define the target export directory.



Lookup Category: Report Category Max Code Length: 20

Notes:

User Defined Field 1 User Defined Field 2 User Defined Field 3 Sys Field 1

Label:

Data Type:

Default Permitted Actions (for User created entries)

☐ Delete Rec ☐ Edit Code ☐ Description ☐ Colour ☐ Status ☐ Sort Order ☐ UDC's

Code / Value	Description	Colour	Status	Sort Order	UDF 1
Data Extracts	Data Extracts		Active	0	
DQ Reports	Data Quality Report		Active	0	
Exception Report	Exception Report		Active	0	
Other Report	Other Report		Active	0	
Performance Report	Performance Report		Active	0	
Recon Reports	Reconciliation Report		Active	0	
Reference Data	Reference Data		Active	0	
Undefined	Undefined		Active	0	
Volumetrics	Volumetrics		Active	0	
*					

Record: 1 of 9

OK Cancel



5.1.4 Tuning & Export Settings

It is generally recommended to leave the Tuning Parameters set to the default values.

Enabling debug logging will slow down capture performance. Should be left off unless instructed by support when diagnosing an error condition

When exporting to Excel, enabling this option will override the default numeric formats.
Note: Using an Excel Template can provide more control i.e., at an individual field level

Specifies an Ms Office Theme to be applied to Excel export files, even where no template has been provided.

5.1.5 SQL Variants / Connection Types

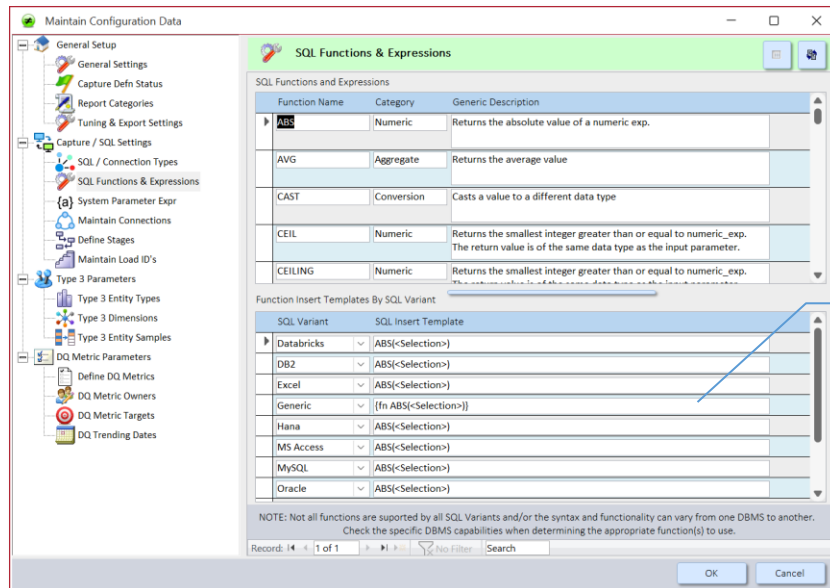
Connection Types represent the different Connection String syntaxes that can be used to connect to a database via ODBC / OLEDB connections. For example, SQL Server supports Standard Security (SS User and Password), Trusted Connections, Azure Standard Security, etc.

Retrieve the list of OLEDB Providers installed on the current PC to populate the dropdown list

A SQL Variant recognizes that different databases (e.g., Ms Access vs SQL Server vs Oracle, etc.) contain variations in supported SQL syntax. ReQuon comes with several pre-configured SQL Variants, however the user can configure several key syntax settings to support other variations

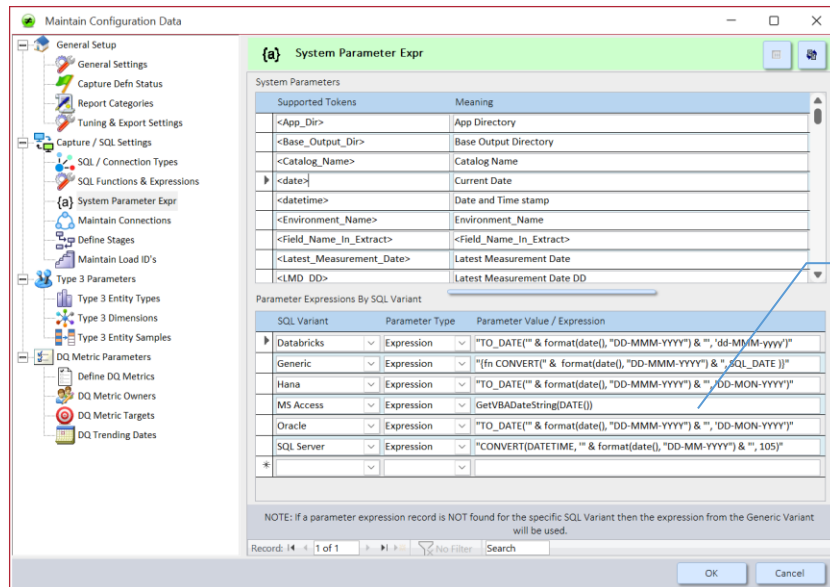
Setting Name	Setting Data Type	Setting Value
Column Name Delimiter(s)	Text	
Natively Supports Table Members ?	Yes/No	Yes
Requires Nested Joins ?	Yes/No	Yes
String Delimiter(s)	Text	"
Identifier Delimiter(s)	Text	[]
Use 'AS' with Column Name Alias ?	Yes/No	Yes
Use 'AS' with Table Name Alias ?	Yes/No	Yes

5.1.6 SQL Functions & Expression



Where applicable, the Generic variant uses the ODBC Scalar Function referred to in Section Appendix B.

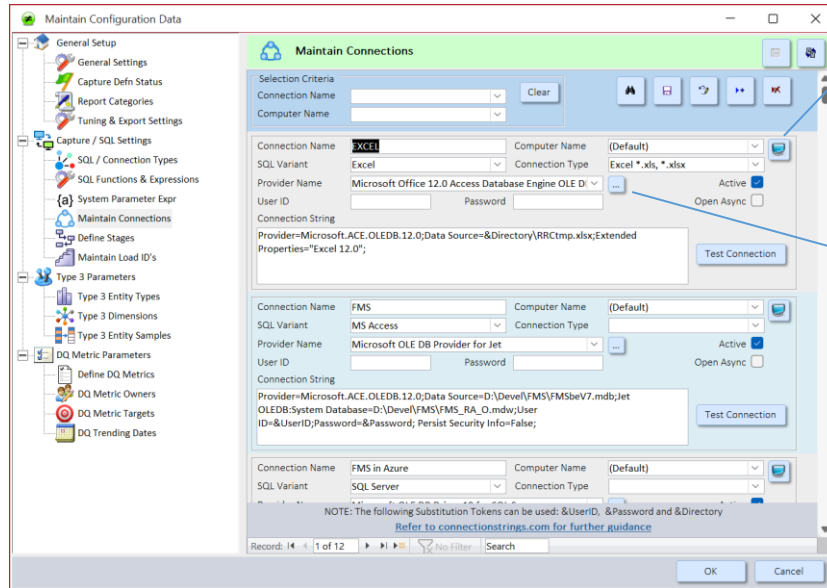
5.1.7 System Parameter Expressions



Different SQL Variants also support different syntax for key functions such as date and time related calculations that are used in several predefined substitution parameters.

5.1.8 Maintain Connections

This is where the actual DNS-Less connection strings for each source and target database are defined.



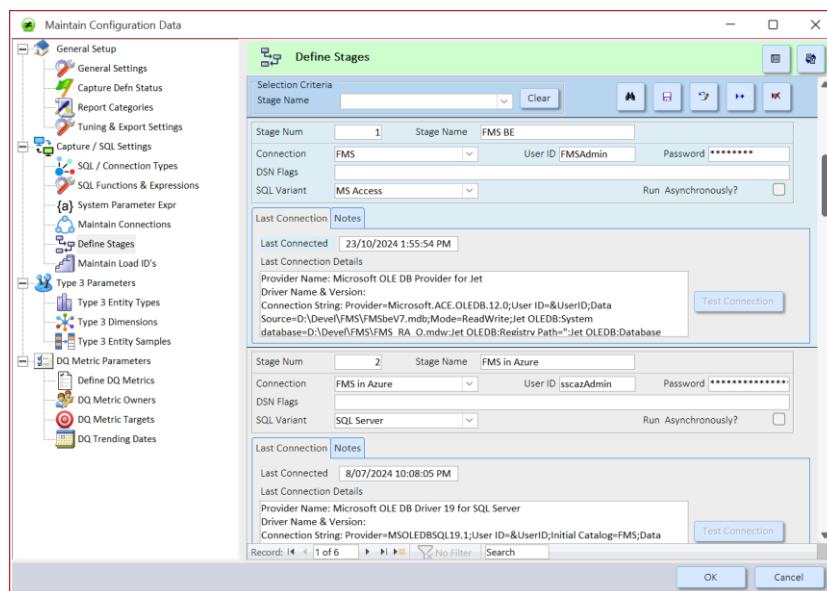
If different client computers have different ODBC drivers for the same database, it is possible to define a different connection string for each client computer for the same "logical" connection name.

This button retrieves the current computer name.

Retrieve the list of OLEDB Providers installed on the current PC to populate the dropdown list

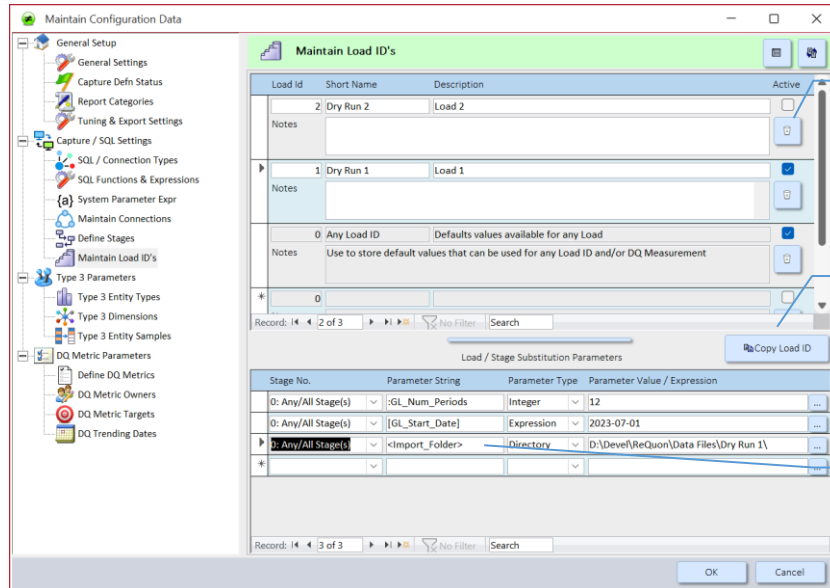
5.1.9 Define Stages

This is where we define the **Stages** of interest for reconciliation purposes and associate them with one of the previously defined **SQL Variants**, **Connections** and associated login details.



5.1.10 Maintain Load ID's

Used to define meaningful identifiers for the specific point-in-time data captures and reconciliation results. Refer to section 2.2.2 Load Id, under Key Concepts.



Load ID	Short Name	Description	Active
2	Dry Run 2	Load 2	☐
1	Dry Run 1	Load 1	☒
0	Any Load ID	Defaults values available for any Load	☒
0	Any Load ID	Use to store default values that can be used for any Load ID and/or DQ Measurement	☒

Stage No.	Parameter String	Parameter Type	Parameter Value / Expression
0: Any/All Stage(s)	[GL_Num_Periods]	Integer	12
0: Any/All Stage(s)	[GL_Start_Date]	Expression	2023-07-01
0: Any/All Stage(s)	[Import_Folder]	Directory	D:\Devel\ReQuon\Data Files\Dry Run 1\

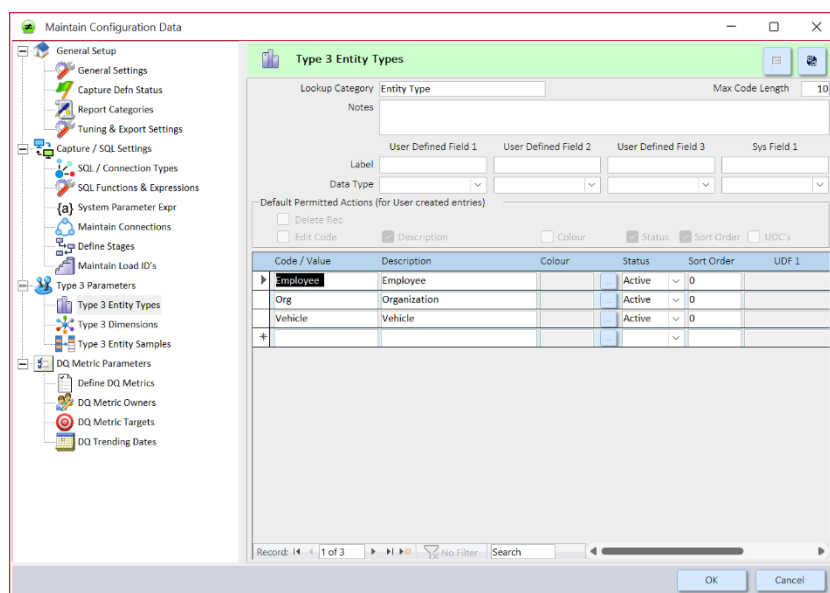
Used to purge all results associated with the selected Load ID. Deleting the Load ID record will also result in the purging of the results.

Copy Load ID will create a new Load ID and copy all the associated Substitution Parameters.

The Parameter String can use any string, with or without leading and/or trailing delimiters, as long as it won't get confused with the surrounding text / SQL.

5.1.11 Type 3 Entity Types

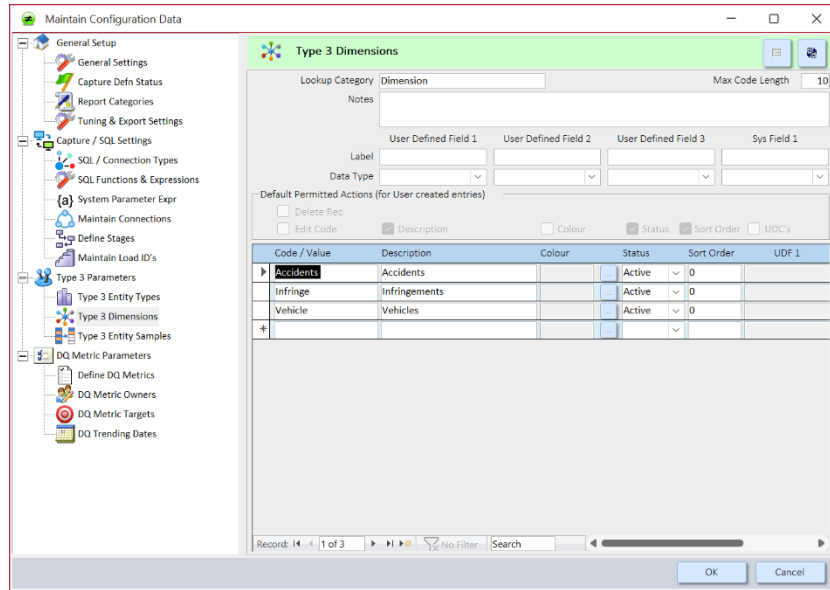
This form is used to define the various business **Entities** of interest from a reconciliation perspective to be used within the Type 3 Entity Dimension Sampling Capture Definitions.



Code / Value	Description	Colour	Status	Sort Order	UDF 1
Employee	Employee		Active	0	
Org	Organization		Active	0	
Vehicle	Vehicle		Active	0	

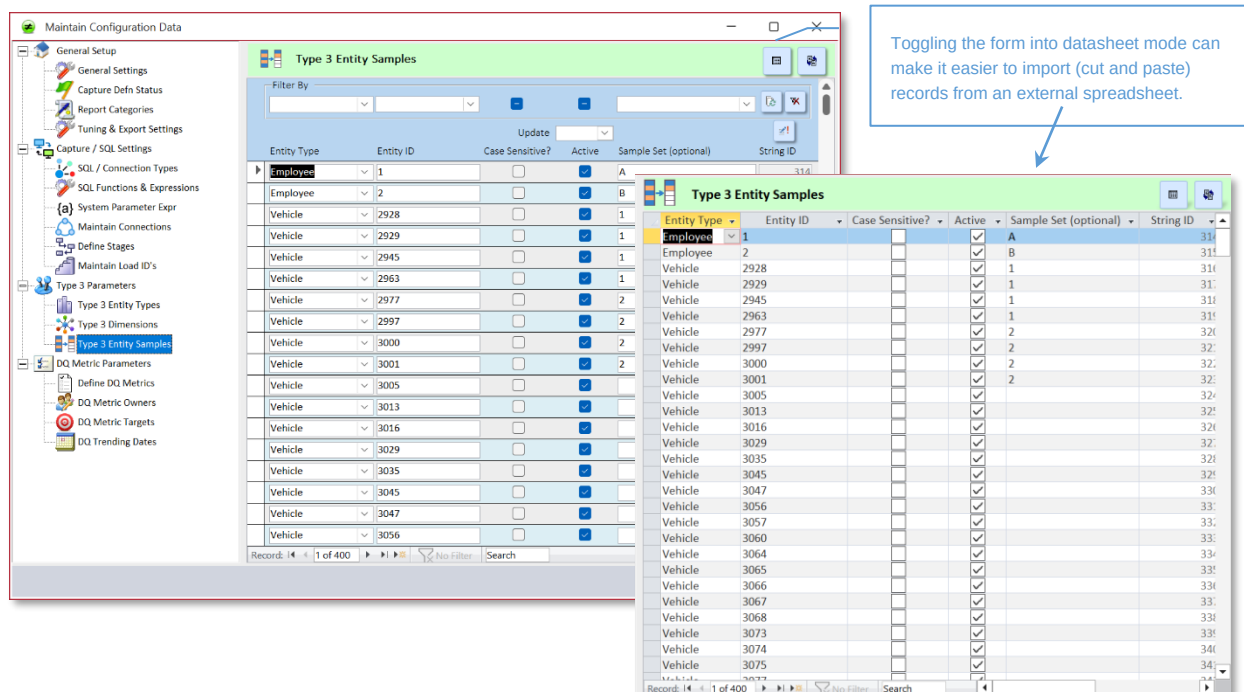
5.1.12 Type 3 Dimensions

This form is used to define the various **Dimensions** by which the business **Entities** will be measured within the Type 3 Entity Dimension Sampling Capture Definitions.



5.1.13 Type 3 Entity Samples

This form is used to define the **Entity Id's** sample values that the Type 3 Capture Definitions will be executed against and subsequently reconciled across its' various **Dimensions**.





5.1.14 Define DQ Metrics

This is used to define the key Data Quality Metrics that are important to monitor and track in the lead-up to the final data migration. The Default Target Date is the date by which the data quality target levels should be achieved.

Metric ID	Metric Code	Metric Name
1	No Active Regs	Active Vehicles with no active Registration
2	Inactive Empl Veh	Inactive Employees with Active Vehicle
3	Veh Vs Empl Loc	Mismatched Employee Location vs Vehicle Assigned Location
*	(New)	

The Tag can be used in the "DQ Trending Data By Group" reporting query to filter the set of metrics included in a particular report.

This can be useful where you need to produce different DQ reports for different parts of the business, such as Accounts Payables versus Accounts Receivables.

5.1.15 DQ Metric Owners (and Owner Groups)

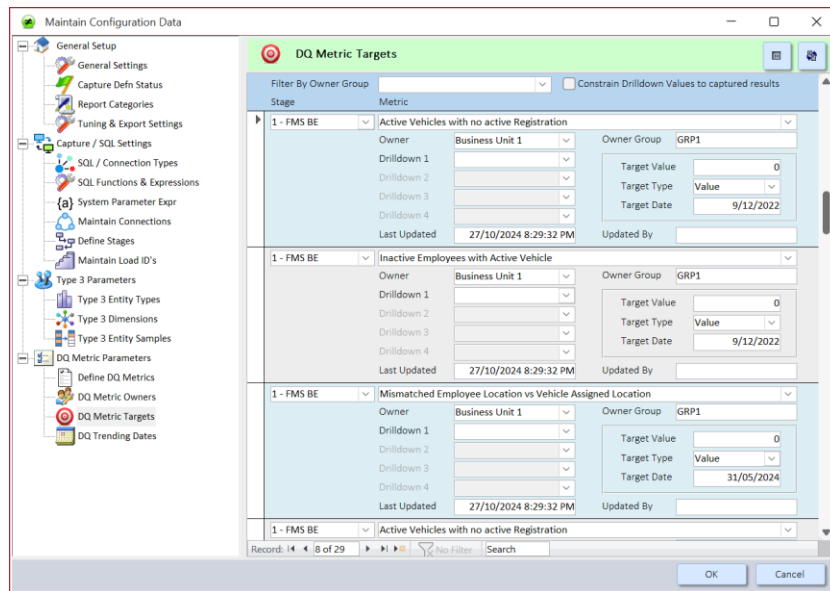
This form is used to define and maintain the Data Quality Owners (and Owner Groups) that will be accountable for achieving the Data Quality Targets by the required Target Date. The table below explains each of the fields in more detail.

Owner Code	Owner Name	Is a Group?	Creation Date
1	Business Unit 1		8/08/2022 8:45:03 PM
10	Business Unit 10		9/07/2024 9:17:15 PM
12	12		12/10/2024 9:36:06 AM
14	14		12/10/2024 9:36:06 AM
18	18		12/10/2024 9:36:06 AM

Field	Description
Owner Code	The Owner Codes (that are not Owner Groups) should correspond to values contained within the DQ Metrics Capture results. An Owner Code that IS an Owner Group may or may not exist with the DQ Metrics Capture results. A typical example of a data field from which Owner Codes would be sourced would be an Organization Code or a Business Unit ID i.e., where the organization and/or business unit takes responsibility for remediating any identified data quality issues.
Owner Name	Self-explanatory. Used in DQ Reports
Is a Group ?	This field indicates if the Owner Code is also an Owner Group. An Owner Group is a grouping of one or more Owner Codes and can be used to roll-up results for reporting purposes OR for taking accountability for the DQ issue remediation.
Exclude from DQ Reports	Excludes the applicable Owner Codes from the Data Quality reports
Exclude from Pull-Thrus	Excludes the applicable Owner Codes from the Data Quality extracts defined within the Pull-Through queries.

5.1.16 DQ Metric Targets

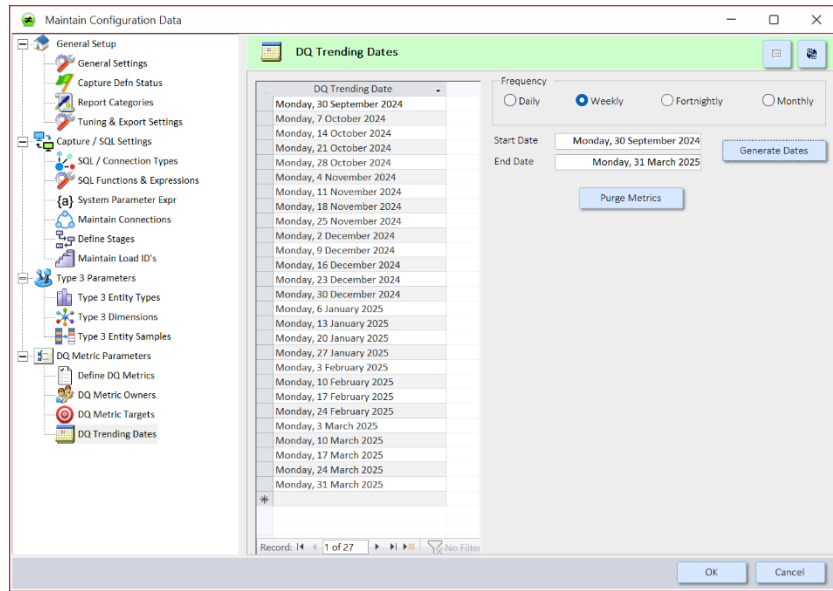
This form is used to define the Data Quality Target levels applicable to a particular DQ Metric that need to be achieved by the nominated Target Date.



Field	Description
Drilldown 1 to 4	If required, targets can be set up to 4 drilldown levels below the Owner level. This will depend upon whether additional Group-By Expressions were defined within the corresponding DQ Metrics Capture Definition.
Target Value	The Target Value represents the number of records with a DQ issue and will generally set to zero, however, the business may accept a small quality of issues to remain unresolved for the final data migration.
Target Date	The date by which the Target Value needs to be achieved by. E.g., The target date may be set to the week before the final Dry Run or Dress Rehearsal to ensure the data migration is successful.

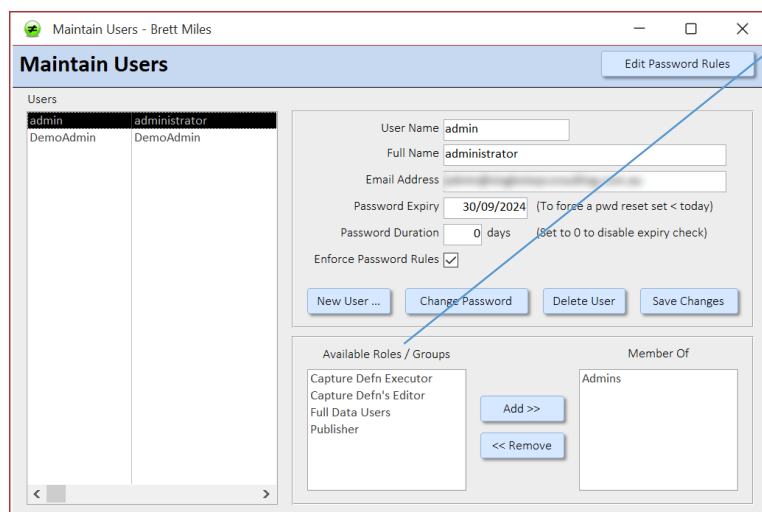
5.1.17 DQ Trending Dates

This form is used to define the DQ reporting dates that the DQ Metrics captures will be executed and reported against, showing the trend of the data quality improvement initiatives over time and forecasting whether the Target Value will be achieved by the Target Date based on the average clearance rate.

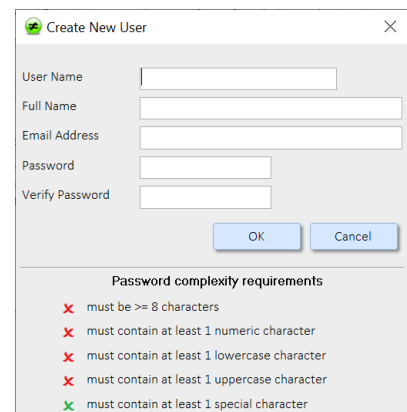


5.2 Adding Users

While the initial administrator account was created during the project database creation process, we can use the "Maintain Users" form (under the Administration Menu) to define additional users and assign the applicable Roles.



After creating a new user, select the applicable role(s) to be assigned to the user and click the "Add >>" button.

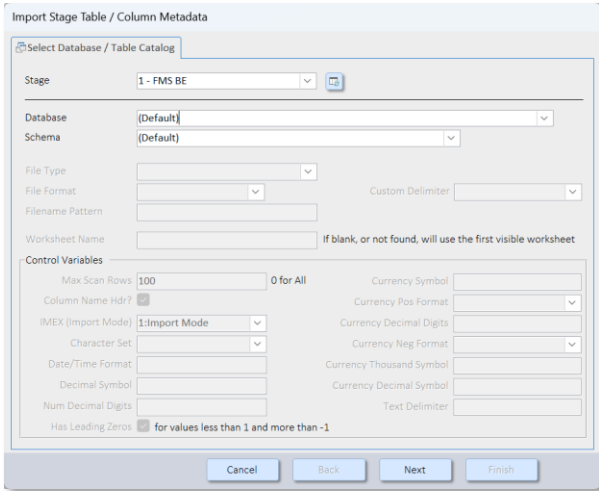
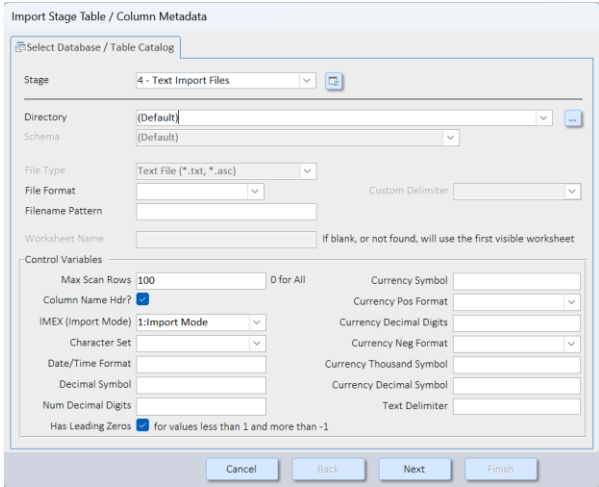




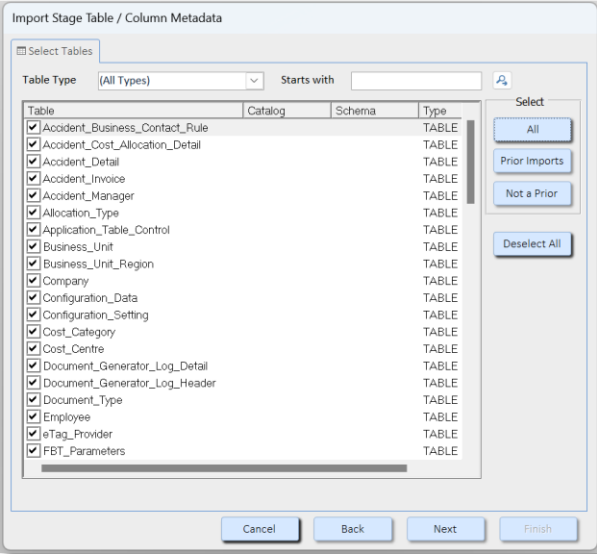
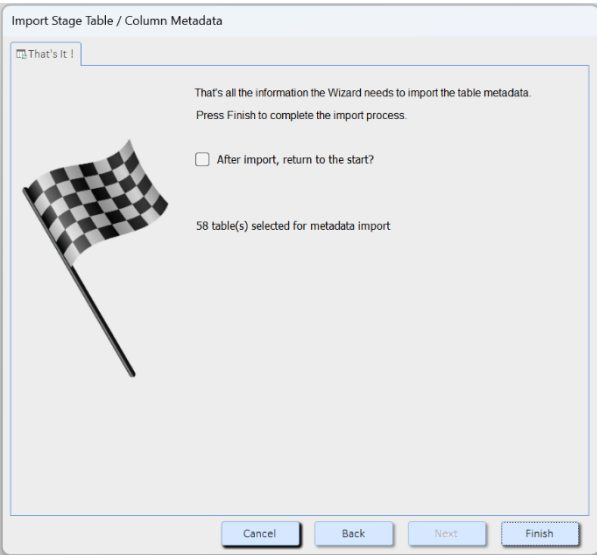
5.3 Importing Stage Table Metadata

While optional, importing the table, column and index metadata from the applicable Stage databases / files can assist in fast-tracking the Capture Definition process (by used bulk creation) and reduce development times by reducing table and field level naming errors.

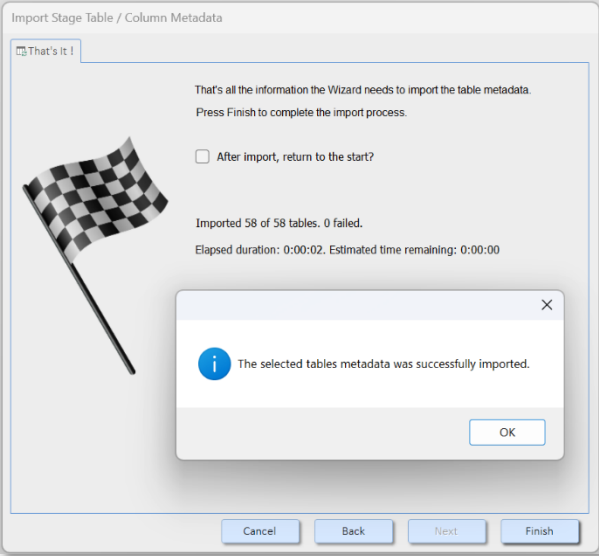
If the table metadata changes after the initial import was performed, it can simply be re-imported to retrieve the latest up-to-date information.

No.	Instructions	Screenshot
1	Select the applicable Stage, Database and Schema from which the Table meta data is to be imported and Click Next. Note: Not all data sources will have a Database or a Schema. For example, an Ms Access database is standalone and does not contain multiple internal databases or Schema. In contrast, Oracle or SQL Server based sources do support multiple internal databases and schema.	Non-file-based data Stage  File-based (Text / Excel) data Stage 



No.	Instructions	Screenshot
2	- Depending upon the type of data source, there may be several "Table Types" available for import. Use the Table Type dropdown to filter the list of objects by Type. - Select one or more tables from the list or click: - Select "All" to select all objects in the list "Prior Imports" to select any objects that have previously had their metadata imported. "Not a Prior" to select any objects that have not previously had their metadata imported. - Click Next to continue	
3	- If you want to import Table Metadata from more Stages, enable the "After import, return to the start?" checkbox. - When ready, click "Finish" to being the import process.	



No.	Instructions	Screenshot
4	• The form will show the progressive number of tables imported as well as the Elapsed and Estimated time remaining to complete the import. • At the end of the import process, you should receive a popup message advising that the import was successful.	

5.4 Maintaining Stage Table Metadata

Manually maintaining the Stage Table Metadata is particularly useful for:

- file-based data sources (i.e., Excel and text files) where the correct data types may not be retrieved via the applicable driver,
- Minor adjustments to previously imported metadata

Column view

Maintain Stage Table Metadata

Filter Tables By

Stage Tables | File Structure Definitions

Stage	Catalog / DB	Schema Name	Table Name	File Structure
1: FMS BE			FBT_Statutory_Rate	
1: FMS BE			Fleet	
1: FMS BE			Fleet_Allocation_Header	
1: FMS BE			Fleet_Correspondence	
1: FMS BE			Fleet_Cost_Allocation_Detail	
1: FMS BE			Fleet_FBT_Detail	
1: FMS BE			Fleet_Lease_Detail	
1: FMS BE			Fleet_Registration	

Record: 14 of 24 of 213

Stage Table Columns | Indexes

Position	Column Name	Nullable?	Data Type	ADO Data Type	Max Length	Numeric Precision	Numeric Scale	Date/Time Precision
1	Fleet_ID	☒		adInteger		10		
2	Effective_From	☒		adDate				0
3	Effective_To	☒		adDate				0
4	Allocation_Type_Code	☐		adWChar	3			
5	Employee_ID	☒		adInteger		10		
6	Business_Unit_ID	☒		adInteger		10		
7	Location_ID	☒		adInteger		10		
8	Vehicle_Use_Class	☒		adWChar	15			
9	Odometer_Reading_kms_From	☒		adInteger		10		

Record: 14 of 1 of 16

Index view

File Structure Definitions view

Maintain Stage Table Metadata

Filter Tables By

Stage Tables | File Structure Definitions

Stage	Catalog / DB	Schema Name	Table Name	File Structure
1: FMS BE			FBT_Statutory_Rate	

Record: 14 of 1 of 16

Stage Table Columns | Indexes

Index Name	Index Catalog	PK	Unique	Position	Clustered	Type	Column Name	Collation	Nulls	Null Collation	Cardinality
PrimaryKey		☒	☒	1	☐	1	Cost_Allocation_Header_ID		1		10989
AlternativeKey		☐	☒	1	☐	1	Fleet_ID		0		10989
AlternativeKey		☐	☒	2	☐	1	Effective_From		0		10989
{06B55FE-E1D9-4544-A4F6-980C3345079B}		☐	☐	1	☐	1	Location_ID		0		327
{320A0089-4EF9-4D28-9F71-5BFD6277061}		☐	☐	1	☐	1	Fleet_ID		0		2653
{3C792202-AEAC-4CE2-B7E4-25C93E680B7D}		☐	☐	1	☐	1	Allocation_Type_Code		0		5
{97B9AC3A-9CDD-4DF2-8EF4-3B7D8DE2C25}		☐	☐	1	☐	1	Vehicle_Use_Class		0		2
{E2F70AEF-8446-4037-8382-39EA2EF8E9BC}		☐	☐	1	☐	1	Business_Unit_ID		0		15
Allocation_Type_Code		☐	☐	1	☐	1	Allocation_Type_Code		0		5

Record: 14 of 1 of 12



File Structure Name	File Type	File Format	Custom Delimiter	Worksheet Name	Text Delim.	Column Headers?	Max Scan Rows	IMEX	Character Set	D
AP Invoice Header - Standard PO	Text File (*.txt, *.asc)	CSV Delimited				☒	100	1:Import Mode	ANSI	
Excel Test	Excel (*.xls, *.xlsx, *.xlsm, *.xlsb)			This is a full length Worksh		☒	100	1:Import Mode		
*						☐	100			

Date Time Format	Decimal Symbol	No. of Digits	Leading Zeros?	Symbol	Position Format	No. of Digits	Negative Format	000's Symbol	Decimal Symbol	Import Date	Imported From
			☐							29-Sep-24 15:34	
			☐							29-Sep-24 16:07	D:\Devel\ReQuon\Data Files\21.2 - COINS Standard PO - Headers.xlsx
			☐							29-Sep-24 16:10	

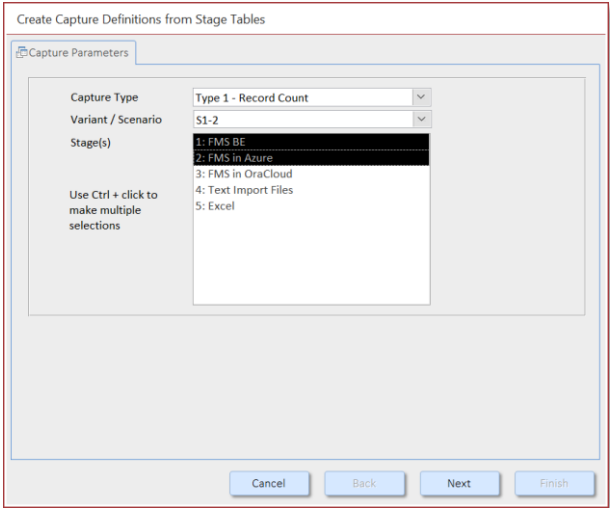
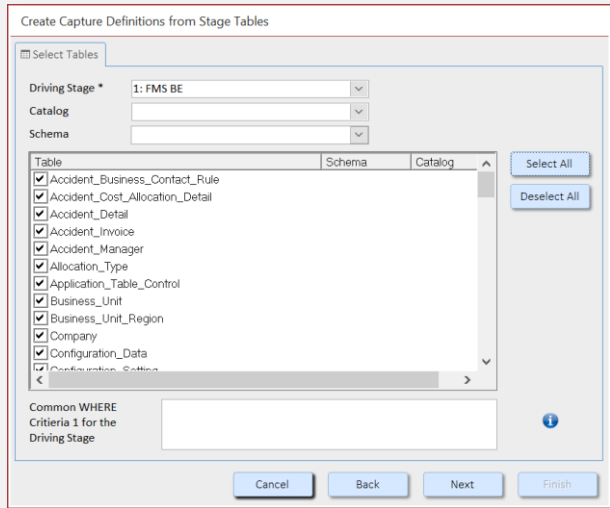
The File Structure Definitions view shows the parameters used to read the Text or Excel files and import the column metadata (as per the Column View above). Additional information includes when the import occurred, the file that the metadata was imported from, and in the case of Excel files, the Worksheet Name that contained the data that was analysed.

Note: If you have multiple source files of the same structure you only want /need to import the metadata from ONE of the source files. The resulting "File Structure" can be associated with the other files, usually by doing a UNION / UNION ALL query in the relevant Capture Definition. For more details, refer to Section 5.7 "Working with File-Based Data Sources / Stages".

5.5 Bulk Generating Capture Definitions

Skeleton Capture Definitions can be bulk created from imported Table Metadata for the following types of Capture Definitions:

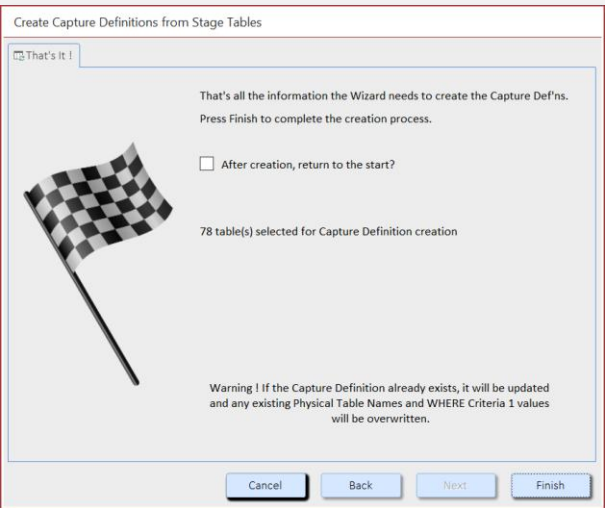
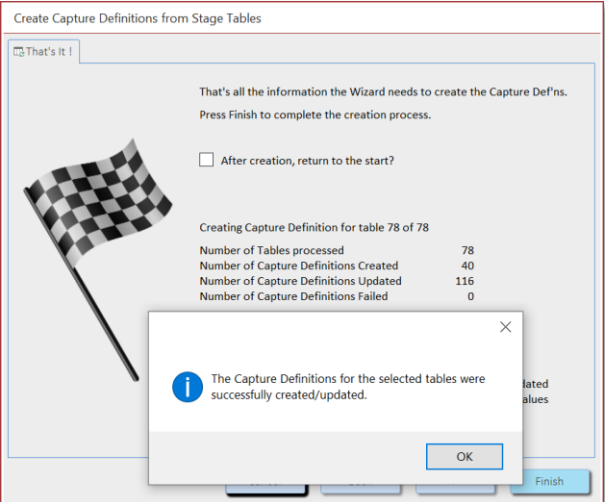
- Type 1 – Record Counts
- Type 2 – Group-By Aggregates, and
- Processing Statistics

No.	Instructions	Screenshot
1	• Select the relevant Capture Type. • Select an existing Variant, or type in a new Variant label. • Select one or more Stages for which to bulk create the skeleton Capture Definitions. • Click Next	
2	• Select the Driving Stage plus the Catalog and Schema (if applicable) to display the list of available tables. • Select the desired tables for which Capture Definitions should be generated. • Select Next An optional common WHERE condition can be defined that will be added to every capture definition on the Driving Stage side. Clicking the  icon will open the “Table Column & Index Metadata” form, which can assist in identify the correct name of a common column to use in the WHERE condition.	



No.	Instructions	Screenshot																				
3	For each secondary Stage: - Select the Stage - If the table in the Secondary Stage will be in a different Schema to the table from the Driving Stage, enter the New Schema name - If the table name in the secondary Stage is different to name in the Driving Stage, AND if the secondary stage table name can be derived from any combination of: - the source schema name, - the source table name - a static prefix and/or suffix - the application of common transformation functions as such replacing / removing certain characters, changing the case (upper or lower) etc., then this can be accomplished ticking the “Set Physical Table Name” checkbox and adding an appropriate Transformation Expression. The expression can be validated by clicking  on the icon. Note: Right-clicking in the Transformation Expression text box will display a popup menu below. Insert Substitution Parameter Insert Code Snippet Save As New Code Snippet Common Functions Zoom The popup menu provides access to the substitution parameters <Source_Schema_Name> and <Source_Table_Name>, as well as Common VBA functions, however, ANY appropriate VBA function can be used. The Transformation Expression can be saved as a “Code Snippet” for future re-use. - Click the "Save" button to save the updates. - Repeat the above process for all secondary Stages. - Once all the updates have been saved, click Next.	Create Capture Definitions from Stage Tables Rename Tables (Optional) Secondary Stage(s) 2: FMS in Azure New Catalog FMS_Demo New Schema FMS_DEMO Note:The Business Object / Logical Table Name used in the Capture Definition will be defaulted to the physical table name(s) from the Driving Stage. Set Physical Table Name☐ Transform Expression Common WHERE Criteria 1 for the Secondary Stage <table><tr><th>Stage</th><th>Catalog</th><th>Schema</th><th>Set Table?</th><th>Table Name Transform Expression</th></tr><tr><td>2: FMS in Azure</td><td>FMS_Demo</td><td>FMS_DEMO</td><td>No</td><td></td></tr></table> Cancel Back Next Finish Create Capture Definitions from Stage Tables Rename Tables (Optional) Secondary Stage(s) 2: FMS in Azure New Catalog FMS_Demo New Schema FMS_DEMO Note:The Business Object / Logical Table Name used in the Capture Definition will be defaulted to the physical table name(s) from the Driving Stage. Set Physical Table Name☒ Transform Expression "STG_" & REPLACE(UCASE("<Source_Table_Name>"), "_", "") Common WHERE Criteria 1 for the Secondary Stage <table><tr><th>Stage</th><th>Catalog</th><th>Schema</th><th>Set Table?</th><th>Table Name Transform Expression</th></tr><tr><td>2: FMS in Azure</td><td>FMS_Demo</td><td>FMS_DEMO</td><td>Yes</td><td>"STG_" & REPLACE(UCASE("<Source_Table_Name>"), "_", "")</td></tr></table> Cancel Back Next Finish As an example, the following Transformation Expression, "STG_" & REPLACE(UCASE("<Source_Table_Name>"), "_", "") ... will take the name of the source table, convert it to uppercase (using the UCASE function), remove any underscores from the name (using the REPLACE function) and then prefix the target table name with the static text "STG_" . Expression evaluated successfully Example inputs: Source Schema = Source Table = Accident_Business_Contact_Rule Result = "STG_ACCIDENTBUSINESSCONTACTRULE" OK	Stage	Catalog	Schema	Set Table?	Table Name Transform Expression	2: FMS in Azure	FMS_Demo	FMS_DEMO	No		Stage	Catalog	Schema	Set Table?	Table Name Transform Expression	2: FMS in Azure	FMS_Demo	FMS_DEMO	Yes	"STG_" & REPLACE(UCASE("<Source_Table_Name>"), "_", "")
Stage	Catalog	Schema	Set Table?	Table Name Transform Expression																		
2: FMS in Azure	FMS_Demo	FMS_DEMO	No																			
Stage	Catalog	Schema	Set Table?	Table Name Transform Expression																		
2: FMS in Azure	FMS_Demo	FMS_DEMO	Yes	"STG_" & REPLACE(UCASE("<Source_Table_Name>"), "_", "")																		



No.	Instructions	Screenshot
4	• If you want to generate Capture Definitions for more Stages, enable the "After creation, return to the start?" checkbox. • When ready, click "Finish" to begin the generation process.	
5	• The form will show the progressive number of tables processed. • At the end of the import process, you should receive a popup message advising that the generation process was successful.	

After the process has completed, the results can be viewed in the relevant Capture Definition maintenance form. In the example above, here are the results for one of the source tables:



Business Object

Member

Variant

Stage

File Based?

Classification

Accident_Business_Contact_Rule		S1-2	1: FMS BE		
Accident_Business_Contact_Rule		S1-2	2: FMS in Azure		
Accident_Cost_Allocation_Detail		S1-2	1: FMS BE		
Accident_Cost_Allocation_Detail		S1-2	2: FMS in Azure		
Accident_Detail		S1-2	1: FMS BE		
Accident_Detail		S1-2	2: FMS in Azure		
Accident_Invoice		S1-2	1: FMS BE		

Type 1 (Record Counts) Capture Definition

Source File Details

Notes

Stage

1: FMS BE

Business Obj.

Accident_Business_Contact_Rule

Table Member

Variant

S1-2

Table Name

Accident_Business_Contact_Rule

Seq. No.

0

Version No.

8

Catalog / DB

<Enter or Select Catalog>

Schema

<Enter or Select Schema>

File Based?

☐

Active

☒

Base Table

Accident_Business_Contact_Rule as T1

Join Type(s)

XREF Table(s)

Join Condition

Base Select

Pre-SQL Command

WHERE

Criteria 1

Criteria 2

Count Expr

COUNT(*)

Generated SQL

SELECT COUNT(*) AS RECORD_COUNT
FROM Accident_Business_Contact_Rule AS t1

This was the driving Stage / Table Name.

Business Object

Member

Variant

Stage

File Based?

Classification

Accident_Business_Contact_Rule		S1-2	1: FMS BE		
Accident_Business_Contact_Rule		S1-2	2: FMS in Azure		
Accident_Cost_Allocation_Detail		S1-2	1: FMS BE		
Accident_Cost_Allocation_Detail		S1-2	2: FMS in Azure		
Accident_Detail		S1-2	1: FMS BE		
Accident_Detail		S1-2	2: FMS in Azure		
Accident_Invoice		S1-2	1: FMS BE		

Type 1 (Record Counts) Capture Definition

Source File Details

Notes

Stage

2: FMS in Azure

Business Obj.

Accident_Business_Contact_Rule

Table Member

Variant

S1-2

Table Name

Seq. No.

0

Version No.

4

Catalog / DB

FMS

Schema

dbo

File Based?

☐

Active

☒

Base Table

Accident_Business_Contact_Rule as T1

Join Type(s)

XREF Table(s)

Join Condition

Base Select

Pre-SQL Command

WHERE

Criteria 1

Criteria 2

Count Expr

COUNT(*)

AS RECORD_COUNT

Generated SQL

SELECT COUNT(*) AS RECORD_COUNT
FROM FMS.dbo.Accident_Business_Contact_Rule t1

Substitute Parameters? ☒

Generate SQL

In this example, the secondary Stage used a different Catalog & Schema. No Transformation Expression was used so the Business Object (Logical Table) name is taken from the original source table but can be subsequently modified.

Where the Table Name field is blank, the table name is assumed to be the same as the Business Object name. If this is NOT the case, the Table Name field can be populated with the actual table name in the secondary Stage.



5.6 Creating / Maintaining Capture Definitions

5.6.1 Structure of a Capture Definitions form

While each type of Capture Definition form has its own specific features based on the reconciliation type, they all share the same basic structure. In this manual, we will explore the Type 2 – Group-By Aggregates form and then note any key points of difference for the other types.

The screenshot shows the 'Maintain Type 2 (Grouping Expressions) Capture Definitions' form. It is divided into three main sections:

- Summary List of Capture Defns:** A table listing existing capture definitions. The table has columns: Business Object, Member, Variant, Stage, File Based?, and Classification. The table shows several entries for 'Accident_Detail' and 'AP Invoice Header'.
- Main Edit Subform:** A form for editing a specific capture definition. It includes fields for Stage, Business Obj, Table Member, Catalog/DB, Schema, Base Table, Base Select, WHERE Criteria 1, WHERE Criteria 2, Expression 1 through 6, and Generated SQL. The 'Base Table' is 'Accident_Detail' and the 'Base Select' is 'SELECT * FROM'. The 'Generated SQL' is 'SELECT FORMAT(Accident_Date, 'YYYY-MM') AS GROUP1, Accident_Status AS GROUP2, Business_Unit_Name AS GROUP3'.
- Common commands:** A set of buttons for managing the capture definition, including Refresh, Add New, Copy Defn, Delete Rec(s), Reset Status, Toggle Active, Purge Results, and Add Anomaly / Association.

Figure 9 - Anatomy of a Maintain Capture Definitions form

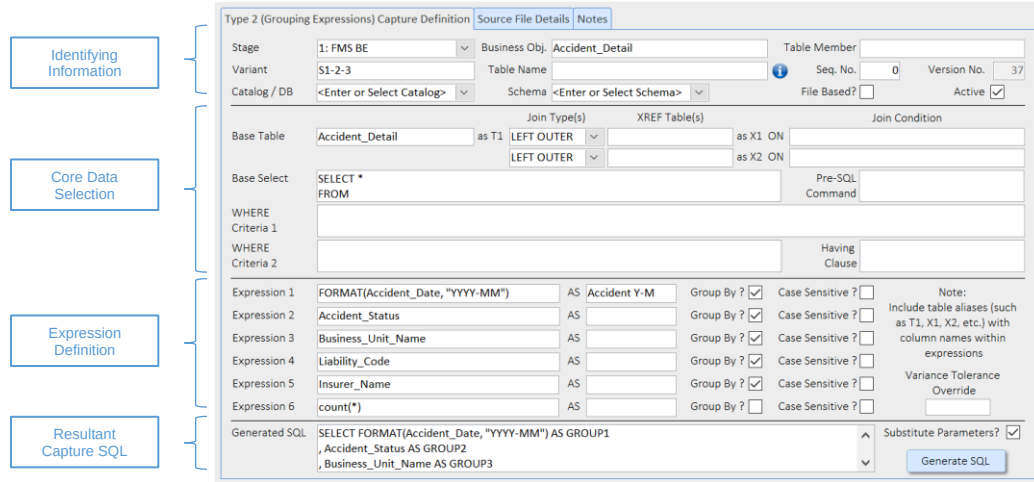
Summary List of Capture Definitions

This section of the form provides a list of the existing Capture Definitions. The list can be sorted and/or filtered as required and provides details such as:

- Definition Status – custom status to indicate the development status of the definition. E.g., New, Under Development, To be Tested, Ready, etc.
- Active Status – only capture definitions flagged as Active will be executed.
- Details of the most recent (active Load ID) execution including:
 - processing status e.g., Null or U = Unprocessed, F = Failed, P = Processed, M = Mixed (applicable to Type 3 capture results)
 - Most recent error message, if applicable
 - When the execution started
 - Record Count

Main Edit Subform

This is where the core details of the capture definitions are entered / defined and is comprised of four (4) key sections.



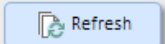
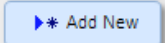
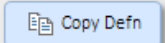
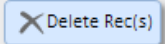
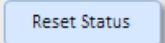
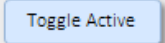
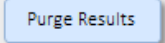
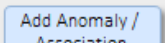
The screenshot shows the 'Main Edit Subform' with four sections highlighted by blue boxes on the left:

- Identifying Information:** Includes fields for Stage (1: FMS BE), Variant (S1-2-3), Business Obj. (Accident_Detail), Table Member, Seq. No. (0), Version No. (37), Catalog / DB (<Enter or Select Catalog>), Schema (<Enter or Select Schema>), File Based? (checkbox), and Active (checkbox).
- Core Data Selection:** Includes Base Table (Accident_Detail as T1), Join Type(s) (LEFT OUTER), XREF Table(s) (as X1 ON, as X2 ON), Base Select (SELECT * FROM), WHERE Criteria 1, WHERE Criteria 2, and Having Clause.
- Expression Definition:** Includes a table for expressions with columns for Expression, AS, Group By, Case Sensitive, and a Note. The expressions are:

Expression	AS	Group By	Case Sensitive	Note
Expression 1	FORMAT(Accident_Date, "YYYY-MM")	AS Accident Y-M	☒	☐
Expression 2	Accident_Status	AS	☒	☐
Expression 3	Business_Unit_Name	AS	☒	☐
Expression 4	Liability_Code	AS	☒	☐
Expression 5	Insurer_Name	AS	☒	☐
Expression 6	count(*)	AS	☐	☐
- Resultant Capture SQL:** Includes the Generated SQL (SELECT FORMAT(Accident_Date, "YYYY-MM") AS GROUP1, Accident_Status AS GROUP2, Business_Unit_Name AS GROUP3) and a checkbox for Substitute Parameters? (checked).

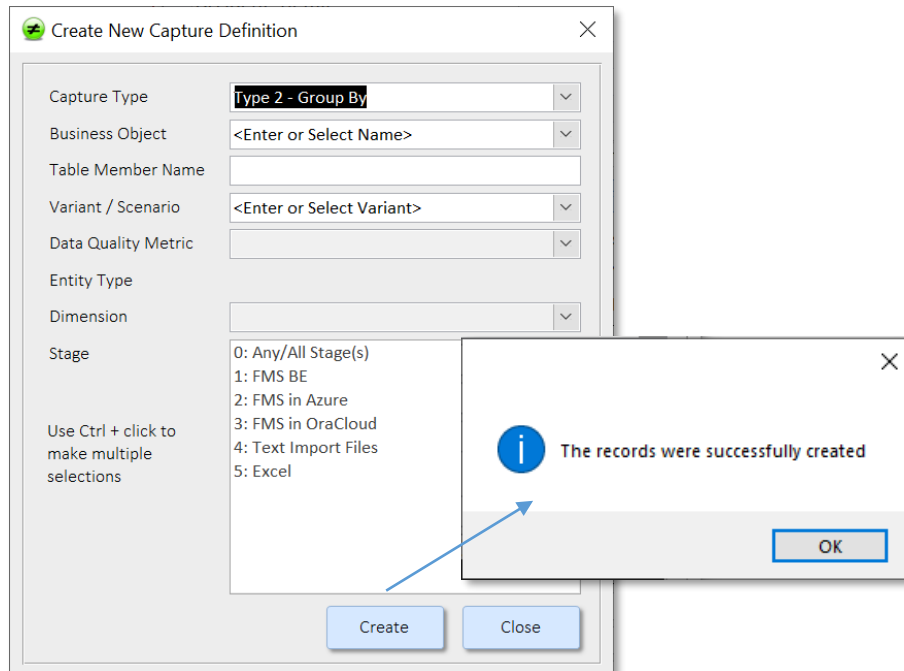
- Identifying information:** This section contains the fields that uniquely identify the capture definition, namely Capture Type, Stage, Business Object, Table Member and Variant. Also includes details of the table Schema and physical Table Name as well as the version number of the definition.
- Core Data Selection:** This section defines the core SQL selection statement together with the relevant filtering conditions. For simply SQL statements comprising 1 to 3 tables, the Join Types, Cross-Reference (XRef) Table(s) and Join Condition fields can be used to generate the core data selection SQL. Alternatively, for complex extraction logic, the Base Select field can store any custom-made SQL.
- Expression Definition:** This section contains details for the various group-by and aggregate expressions i.e., the metrics to be captured.
- Resultant Capture SQL:** This section displays the SQL generated from the information in the 2 previous sections. The "Substitute Parameters?" checkbox can be enabled to view the SQL after any parameter values have been substituted in the SQL.

Common Commands

Button	Function	
Refresh	Re-queries the form to reflect the latest data	
Add New	Launches a popup form to create a new Capture Definition across one or more Stages	
Copy Defn	User to clone an existing capture definition allowing re-use for similar capture definitions. E.g., similar expressions across different Stages.	
Delete Rec(s)	Allows the deletion of any capture definitions selected from the Summary Information List	
Reset Status	Clicking this button will set the processing status of any records in the Summary List to a state of Unprocessed (null or U). If the Summary List has been filtered, only the filter records will be updated	
Toggle Active	This will toggle the Active Status of the records in the Summary List i.e., if the status was Active, it will be set to Inactive, and vice versa	
Purge Results	This will delete any previously captured details results (applicable to Type 2, Type 3, Processing Statistics, DQ Metrics).	
Edit field in Text Editor 	Copies the contents of the currently selected field into the external text editor.	
Add Anomaly / Association	Launches a form to create a new reconciliation anomaly record (or select a previously defined one) and associates it with the current Capture Definition.	

5.6.2 Adding a New Capture Definition

The form is used to create a new Capture Definition across one or more Stages. Once they have been created, they can be edited to add the core selection SQL and metric expressions.



Create New Capture Definition

Capture Type: **Type 2 - Group By**

Business Object: **<Enter or Select Name>**

Table Member Name:

Variant / Scenario: **<Enter or Select Variant>**

Data Quality Metric:

Entity Type:

Dimension:

Stage: **0: Any/All Stage(s)**
1: FMS BE
2: FMS in Azure
3: FMS in OraCloud
4: Text Import Files
5: Excel

Use Ctrl + click to make multiple selections

Create **Close**

The records were successfully created

OK



5.6.3 Defining the Capture Definition details

The essence of a Capture Definition is the data selection logic together with the capture metrics in the form of Grouping and Aggregate expressions.

Example 1. In this example, the "Base Select" field has been used to define the core SQL select statement, together with the "WHERE Criteria 1" field.

While the WHERE criteria can be included in the Base Select statement, its' inclusion in the dedicated WHERE Criteria n fields help improve visibility without having to Zoom into the Base Select field.

File based capture definitions (i.e., Excel or text files) will be covered in a later section.

Type 2 (Grouping Expressions) Capture Definition

Stage: 1: FMS BE
Variant: S1-2-3
Catalog / DB: <Enter or Select Catalog>
Table Name: Accident_Detail
Table Member: Seq. No. 0 Version No. 37
File Based? ☐ Active ☒

Base Table: Accident_Detail as T1
Join Type(s): LEFT OUTER
XREF Table(s):
Join Condition: as X1 ON
as X2 ON

Base Select: SELECT *
FROM

WHERE Criteria 1:
WHERE Criteria 2:

Expression 1: FORMAT(Accident_Date, "YYYY-MM") AS Accident_Y-M
Expression 2: Accident_Status AS
Expression 3: Business_Unit_Name AS
Expression 4: Liability_Code AS
Expression 5: Insurer_Name AS
Expression 6: count(*) AS

Generated SQL: SELECT FORMAT(Accident_Date, "YYYY-MM") AS GROUP1
, Accident_Status AS GROUP2
, Business_Unit_Name AS GROUP3
, Liability_Code AS GROUP4
, Insurer_Name AS GROUP5
, count(*) AS VALUE1

Pre-SQL Command:

Clicking the icon will open the Table Column & Index Metadata form

The optional Pre-SQL Command specifies a command to be send to the target database PRIOR to the execution of the Capture Definition.

If an Alias name is defined for an Expression, it will be included as metadata when the reconciliation results are exported via the Publish Results menu

Zoom

SELECT *
FROM
(Accident_Detail t1
LEFT OUTER JOIN Business_Unit x1 ON T1.Business_Unit_ID = X1.Business_Unit_ID)
LEFT OUTER JOIN Insurer x2 ON T1.Insurer_ID = X2.Insurer_ID

Convert Tabs to Spaces

OK Cancel

Table Column Definitions

Stage: 1 - FMS BE
Catalog / Db:
Schema:
Table: Accident_Detail
File Structure:

Columns

No	Column Name	Data Type	Length	Precision	Scale
1	Accident_ID	sdInteger		10	
2	Accident_Date	sdDate			
3	Accident_Notification_Date	sdDate			
4	Accident_Status	sdVarChar	5		
5	Accident_Status_Date	sdDate			
6	Fleet_ID	sdInteger	10		
7	Business_Unit_ID	sdInteger	10		
8	Driver_Involved	sdVarChar	100		
9	Relationship_With_Assignee_Co.	sdVarChar	10		
10	Accident_Description	sdVarChar	80		
11	Liability_Code	sdInteger	5		
12	Accident_Manager_ID	sdInteger	10		
13	Accident_Manager_Notification...	sdDate			
14	Accident_Manager_Ref_Number	sdVarChar	50		
15	Insurance_ID	sdInteger	10		
16	Insurance_Claim_Sent_Date	sdDate			
17	Insurance_Claim_Number	sdVarChar	50		
18	TwoCoverable	sdBoolean	2		
19	Src_Party_Registration_Number	sdVarChar	10		
20	Src_Party_Registration_State_e...	sdVarChar	5		
21	Notes	sdVarChar	0		
22	Creation_Date	sdDate			
23	Created_By	sdVarChar	80		
24	Last_Updated	sdDate			
25	Last_Updated_By	sdVarChar	80		

Note: You can drag column names from the list above to text fields in other forms, OR, double-click a row to copy the column name to the clipboard

Close

Zoom

SELECT FORMAT(Accident_Date, "YYYY-MM") AS GROUP1
, Accident_Status AS GROUP2
, Business_Unit_Name AS GROUP3
, Liability_Code AS GROUP4
, Insurer_Name AS GROUP5
, count(*) AS VALUE1
FROM
(
SELECT *
FROM
(Accident_Detail t1
LEFT OUTER JOIN Business_Unit x1 ON T1.Business_Unit_ID = X1.Business_Unit_ID)
LEFT OUTER JOIN Insurer x2 ON T1.Insurer_ID = X2.Insurer_ID
) BS
GROUP BY FORMAT(Accident_Date, "YYYY-MM"), Accident_Status, Business_Unit_Name,
Liability_Code, Insurer_Name

Convert Tabs to Spaces

OK Cancel



Example 2. In this example, the Join Type(s), Xref Table(s) and Join Condition fields are used to define the core SQL select statement, together with the "WHERE Criteria 1" field.

Type 2 (Grouping Expressions) Capture Definition

Stage: 2: FMS in Azure, Business Obj.: Accident_Detail, Table Member: Accident_Detail

Variant: S1-2-3, Table Name: Accident_Detail, Seq. No.: 0, Version No.: 17

Catalog / DB: <Enter or Select Catalog>, Schema: <Enter or Select Schema>, File Based?: , Active: ☒

Join Type(s): LEFT OUTER, XREF Table(s): Business_Unit, Insurer, Join Condition: T1.Business_Unit_ID = X1.Business_Unit_ID, T1.Insurer_ID = X2.Insurer_ID

Base Table: Accident_Detail as T1, Base Select: , WHERE Criteria 1: Accident_Status <> 'Cancelled', WHERE Criteria 2: , Having Clause: , Pre-SQL Command: , Case Sensitive?: , Variance Tolerance Override: , Note: Include table aliases (such as T1, X1, X2, etc.) with column names within expressions

Expression 1: format(Accident_Date, 'yyyy-MM') AS Accident Y-M, Expression 2: Accident_Status AS , Expression 3: Business_Unit_Name AS , Expression 4: Liability_Code AS , Expression 5: Insurer_Name AS , Expression 6: count(*) AS

Generated SQL: SELECT format(Accident_Date, 'yyyy-MM') GROUP1, Accident_Status GROUP2, Business_Unit_Name GROUP3

Substitute Parameters?: ☒ Generate SQL

Zoom

SELECT FORMAT(Accident_Date, 'YYYY-MM') AS GROUP1, Accident_Status AS GROUP2, Business_Unit_Name AS GROUP3, Liability_Code AS GROUP4, Insurer_Name AS GROUP5, count(*) AS VALUE1 FROM (SELECT * FROM (Accident_Detail t1 LEFT OUTER JOIN Business_Unit x1 ON T1.Business_Unit_ID = X1.Business_Unit_ID) LEFT OUTER JOIN Insurer x2 ON T1.Insurer_ID = X2.Insurer_ID) BS GROUP BY FORMAT(Accident_Date, 'YYYY-MM'), Accident_Status, Business_Unit_Name, Liability_Code, Insurer_Name

Convert Tabs to Spaces OK Cancel

5.6.4 Key Differences between Capture Types

Type 1 – Record Counts

Type 1 (Record Counts) Capture Definition

Stage: 1: FMS BE, Business Obj.: Accident_Business_Contact_Rule, Table Member: Accident_Business_Contact_Rule

Variant: S1-2, Table Name: Accident_Business_Contact_Rule, Seq. No.: 0, Version No.: 8

Catalog / DB: <Enter or Select Catalog>, Schema: <Enter or Select Schema>, File Based?: , Active: ☒

Join Type(s): , XREF Table(s): , Join Condition: , Base Table: Accident_Business_Contact_Rule as T1, Base Select: , WHERE Criteria 1: , WHERE Criteria 2: , Having Clause: , Pre-SQL Command: , Case Sensitive?: , Variance Tolerance Override: , Note: Treat 'Base Select' as Final. Note: If so, then the SQL must return a single row with a column called 'RECORD_COUNT'

Count Expr: COUNT(*) AS RECORD_COUNT

Generated SQL: SELECT COUNT(*) AS RECORD_COUNT FROM Accident_Business_Contact_Rule AS t1

Substitute Parameters?: ☒ Generate SQL

Only one expression is applicable for the Type 1 Capture Definitions, namely the expression representing the record count itself.

The default value is Count(*) however if supported by the target database another option could be:

Count (Distinct Accident_ID)



Type 3 – Entity Dimension Sampling

For Type 3 Capture Definitions, the identifying fields Business Object has been replaced with the combination of Entity Type and Dimension. In addition, we need to specify which field represents the Entity ID and whether it is numeric (or text based).

The screenshot shows the 'Type 3 (Entity Dimension Sampling) Capture Definition' dialog box. Key fields include:

- Stage: 1: FMS BE
- Variant: S1-2-3
- Catalog / DB: <Enter or Select Catalog>
- Entity Type: Vehicle
- Table Name: Fleet
- Dimension: Accidents
- Base Table: Fleet
- Base Select: (Empty)
- WHERE Criteria 1: (Empty)
- WHERE Criteria 2: (Empty)
- Entity ID Field Name: t1.Fleet_ID
- Expressions: Year(Accident_Date), Liability_Code, abs(nz(Recoverable,0)), Cost_Type, sum(nz(Invoice_Amount_Ex_GST,0)), count(*)
- Generated SQL: SELECT COUNT(*) AS RECORD_COUNT, Year(Accident_Date) AS GROUP1, Liability_Code AS GROUP2

For Type 3 Capture definitions the Business Object field has been replaced with the combination of Entity Type and Dimension

Type 3 Capture definitions require the field corresponding to the Entity ID to be specified

Data Quality Capture Definitions

Unlike other types of Capture Definitions, the unique identifier fields for a Data Quality Capture Definition are simply the combination of Stage and DQ Metric.

In addition, what would normally be Expression 1 in a Type 2 definition is explicitly dedicated to deriving a value used to represent the accountable DQ Owner.

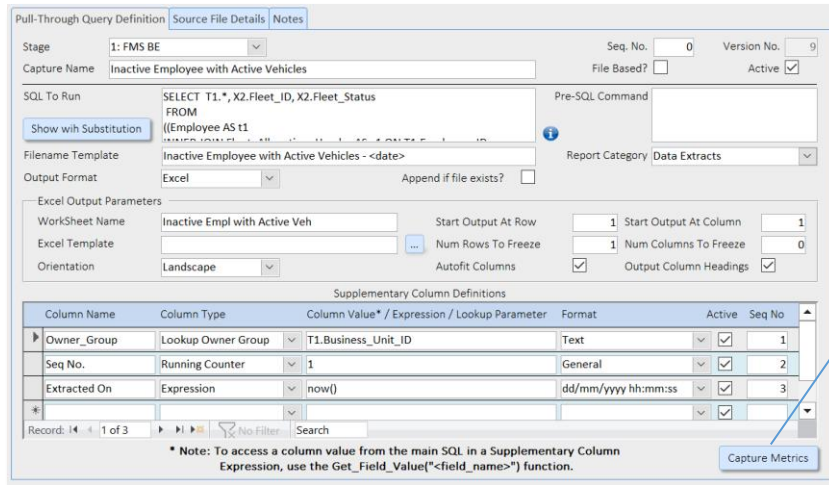
The screenshot shows the 'Data Quality Metrics Capture Definitions' dialog box. Key fields include:

- Stage: 1: FMS BE
- DQ Metric: Inactive Employees with Active Vehicle
- Catalog / DB: <Enter or Select Catalog>
- Table Name: Employee
- Base Table: Employee
- Base Select: (Empty)
- WHERE Criteria 1: T1.Termination_Date < date() and X2.Fleet_Status = "A"
- WHERE Criteria 2: (Empty)
- Owner Code: T1.Business_Unit_ID
- Value 1: count(*)
- Value 2: (Empty)
- Value 3: (Empty)
- Value 4: (Empty)
- Value 5: (Empty)
- Generated SQL: SELECT T1.Business_Unit_ID AS GROUP1, count(*) AS VALUE1 FROM

Pull-Through Queries

Pull-Through Queries are significantly different from all other types of Capture Definitions. They are used to extract data from a **Stage** and write the data to an Excel file for subsequent review and analysis.

The unique identifier fields for a Pull-Through Query definition are the combination of Stage and Capture Name (free text).

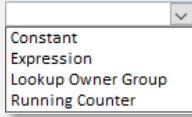


The Capture Metrics button will launch the "Start Metrics Capture (Ad-hoc)" form to allow the user to run the extract on demand.

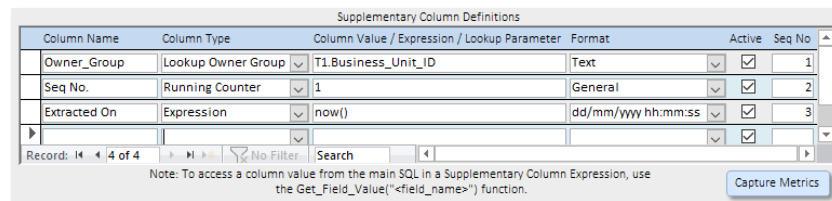
Field	Description
SQL to Run	The final SQL to be executed against the Stage data source. Can include Substitution Parameters as required.
Filename Template	Used as the template for the filename of the Excel file to be saved to. Can include Substitution Parameters in the name – e.g., <date> for the current extraction date.
Report Category	One of the user-defined categories setup during the initial configuration. Can be used as a Substitution Parameter within the Output Directory definitions to organize different types of extracts into different folders.
Output Format	Currently only Excel is supported
Worksheet Name	If not specified, Sheet 1 will be used
Excel Template	A pre-defined template that contains various formatting options to be used for the extract. Note: To create a template for a particular extract, generate an extract without a template, remove the data and format the header row (usually row 1) and the first data row (usually row 2) and then save it as an Excel Template file (*.xltx or *.xltm)
Start Output at Row	For extracts without an Excel Template, this will usually be row 1. Where a template is used it is usually row 2 and we disable "Output Column Headings"
Start Out at Column	Usually set to column 1
Num Rows to Freeze	Used to freeze the corresponding number of rows and columns in the Excel spreadsheet to assist when scrolling up and down through the sheet
Num Columns to Freeze	
Autofit Columns	Will automatically resize the columns to fit the data. Useful when no template is used.
Output Column Headings	If enabled, the first exported row will contain the column headings prior to the actual data. Usually disabled when using a template that has customized the headings

Supplementary Column Definitions

Supplementary columns represent data that is not available in the data extracted via the "SQL to Run" but which we want to include in the Excel extract itself. They will be added as additional columns after the last column from the extract itself.

Field	Description
Column Name	Self-explanatory
Column Type	The following column types are supported.  - The syntax for Expressions is based on the Ms Access VBA expressions and inbuilt functions. In addition, the expression can use a custom function <code>Get_Field_Value("<field_name>")</code> to retrieve the field value for inclusion in further calculations. - The Lookup Owner Group type is used to lookup a field that IS contained in the extract (representing an Owner Code) and then retrieve the corresponding Owner Code. Useful for subsequent filtering of the results.
Column Value / Expression / Lookup Parameter	The derivation of the column value.
Format	The format syntax relates to the formatting codes used in Excel
Active	Only active supplementary columns will be included in the extract.
Seq No.	Controls the order that the supplementary columns will be added to the extract

Example supplementary column definitions.



For further details on Ms Access expressions and functions, refer to the following resources:

Expressions:

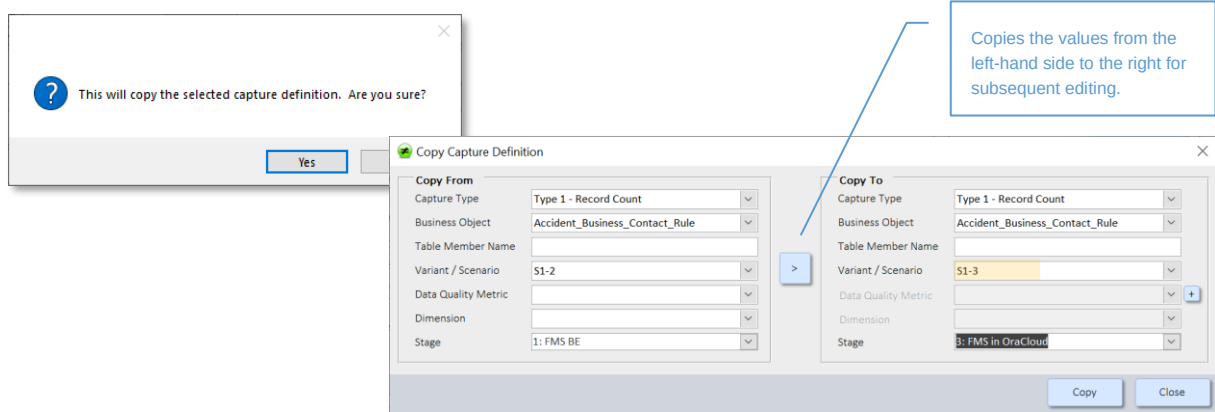
https://support.microsoft.com/en-us/topic/684295d0-97c2-443c-8e0a-8c6b635bec56#ID0EBBD=Creating_expressions

Access Functions (by category):

<https://support.microsoft.com/en-us/office/access-functions-by-category-b8b136c3-2716-4d39-94a2-658ce330ed83>

5.6.5 Copying an existing Capture Definition

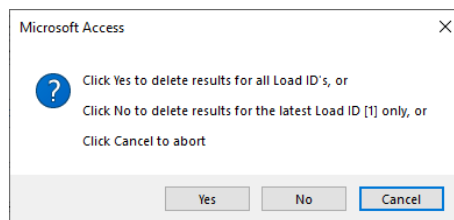
After clicking on the Capture Defn button, the user will be prompted to continue. If they click Yes, the Copy Capture Definition popup form will be displayed.



At least one of the identifying fields needs to be different before the Copy button is enabled. Clicking Copy will copy all the details from the original definition into the new definition.

5.6.6 Purging Capture Results

While not necessary, if for whatever reason you want to delete old capture results (for an individual Capture Definition) then this can be achieved by clicking on the **Purge Results** button. The user will be presented with the following dialog box for confirmation.

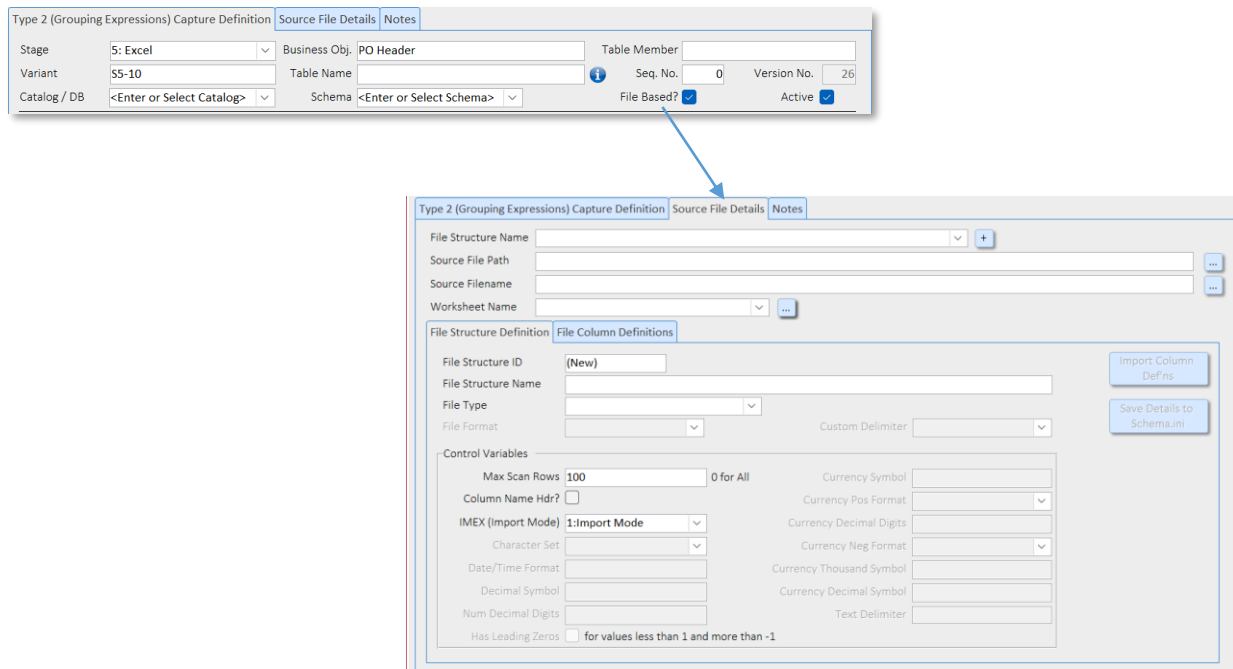


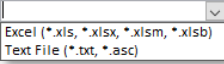
If the reason for purging old results is to reduce the database size of an Ms Access backend, the purging will need to be followed by running the "Compact BE Database" command under the Administration menu. Refer to Appendix C – "General Housekeeping".

5.7 Working with File-Based Data Sources / Stages

When working with file-based data sources (i.e., Excel spreadsheets or flat text files – delimited, fixed width, etc.) there are several special considerations and constraints that need to be catered for.

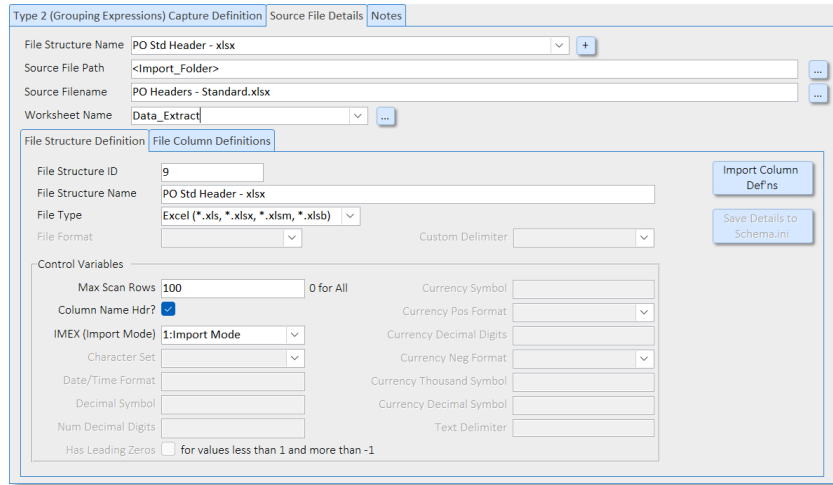
Setting the "File Based?" checkbox to true enables fields on the "Source File Details" tab.



Field	Description
File Structure Name	The dropdown presents the list of previously defined structures. One file structure may apply to multiple input files. To add a new structure definition, click on the  button next to the field.
Source File Path	Specifies the directory where the source file for the current Capture Definition is located. Can incorporate Substitution Parameters.
Source File Name	The name of the source file for the current Capture Definition
File Type	Either Excel or Text file 
Worksheet Name	The name of the sheet within the Excel file that we will be reading from. Clicking on the  button will read the available worksheets within the file and populate the dropdown list for select.

5.7.1 Excel based data sources

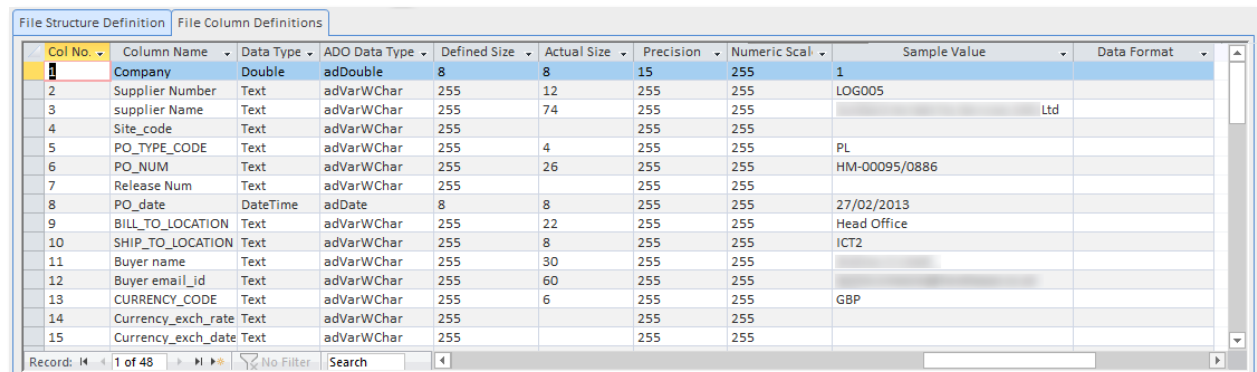
Step 1 – Specify the Control Variables



Field	Description
File Structure ID	Automatically assigned – not editable
File Structure Name	A descriptive name to refer to the file structure
File Type	Select "Excel"
Max Scan Rows	The number of rows of the data set that will be scanned to derive the data types for each of the columns
Column Name Hdr?	Set to true if the file contains column headers
IMEX (Import Mode)	Setting IMEX=1 tells the driver to use Import mode. This tells the driver to always read "intermixed" (numbers, dates, strings etc.) data columns as text.

Step 2 – Import the Column Definitions

After setting the Control Variables, clicking on the "Import Column Def'ns" button will scan the import file to read and derive the column definitions. These can then be manually revised if and as required.



Col No.	Column Name	Data Type	ADO Data Type	Defined Size	Actual Size	Precision	Numeric Scal	Sample Value	Data Format
1	Company	Double	adDouble	8	8	15	255	1	
2	Supplier Number	Text	adVarChar	255	12	255	255	LOG005	
3	supplier Name	Text	adVarChar	255	74	255	255		Ltd
4	Site_code	Text	adVarChar	255		255	255		
5	PO_TYPE_CODE	Text	adVarChar	255	4	255	255	PL	
6	PO_NUM	Text	adVarChar	255	26	255	255	HM-00095/0886	
7	Release Num	Text	adVarChar	255		255	255		
8	PO_date	DateTime	adDate	8	8	255	255	27/02/2013	
9	BILL_TO_LOCATION	Text	adVarChar	255	22	255	255	Head Office	
10	SHIP_TO_LOCATION	Text	adVarChar	255	8	255	255	ICT2	
11	Buyer name	Text	adVarChar	255	30	255	255		
12	Buyer_email_id	Text	adVarChar	255	60	255	255		
13	CURRENCY_CODE	Text	adVarChar	255	6	255	255	GBP	
14	Currency_exch_rate	Text	adVarChar	255		255	255		
15	Currency_exch_date	Text	adVarChar	255		255	255		



Step 3 – Configuring the Capture Definition

Specifying the Capture Definition for an Excel-based data source is very similar to any other data source, however, there are some points of difference to be aware of.

1. The core structure of a SQL Statement for one or more Excel files is of the form: -

```
SELECT * FROM [<WorksheetName>$] {optional AS <Alias>}  
{optional IN '<Enter_Full_Path_and_Filename>' 'Excel 12.0;'}}}
```

In the following example, the first SELECT statement doesn't require the optional file details because they will be derived from the File Structure Definition details.

Example 1

```
SELECT * FROM [Sheet1$] AS t1  
UNION ALL  
SELECT * FROM [Data Sheet$] AS t2 IN 'D:\ImportDir\Customer.xlsx'  
'Excel 12.0;'
```

2. The list of available scalar functions available for use in the SQL expressions depends upon the ODBC driver being used. Assuming you use the Provider=Microsoft.ACE.OLEDB.12.0 for the Excel Connection Type, the list of functions is similar to connecting to a Ms Access database. Check your specific driver / provider for details.

To access the Zoom form, double-click on one of the supported text fields (typically text fields that can contain long values)



5.7.2 Text file data sources

Step 1 – Specify the Control Variables

Field	Description
File Structure ID	Automatically assigned – not editable
File Structure Name	A descriptive name to refer to the file structure
File Type	Select "Text File"
Format	Supported formats include: • CSV Delimited • Custom Delimited • Fixed Length • Tab Delimited
Custom Delimiter	Only applicable when the Format is set to Custom Delimited. Supports any single character except a double quotation mark (").

Control Parameters

Full details on the control parameters can be found online at <https://docs.microsoft.com/en-us/office/client-developer/access/desktop-database-reference/initializing-the-text-data-source-driver#customizing-the-schemaini-file-for-text-and-html-data>. ReQuon will automatically create a suitable schema.ini file based upon the information captured in the form.

The table below provides a summary of the Control Variables.

Field	Description
Max Scan Rows	Indicates the number of rows to be scanned when guessing the column data types. If this is set to 0, the entire file is searched
Column Name Hdr?	Set to true if the file contains column headers
IMEX (Import Mode)	Setting IMEX=1 tells the driver to use Import mode. This tells the driver to always read "intermixed" (numbers, dates, strings etc.) data columns as text.
Character Set	Can be set to OEM, ANSI, UNICODE, or the decimal number of a valid code page, and indicates the character set of the source file.
Date Time Format	Can be set to a format string indicating dates and times. This entry should be specified if all date/time fields in the import/export are handled with the same format. All the Microsoft Jet database engine formats except AM and PM are supported. In the absence of a format string, the Windows Control Panel short date picture and time options are used.
Decimal Symbol	Can be set to any single character that is used to separate the integer from the fractional part of a number. If this entry is absent, the default value in the Windows Control Panel is used.
Num Decimal Digits	Indicates the number of decimal digits in the fractional portion of a number. If this entry is absent, the default value in the Windows Control Panel is used.
Has Leading Zeros	Specifies whether a decimal value less than 1 and greater than -1 should contain leading zeros; this value can either be False (no leading zeros) or True.
Currency Symbol	Indicates the currency symbol to be used for currency values in the text file. Examples include the dollar sign (\$) and Dm. If this entry is absent, the default value in the Windows Control Panel is used.
Currency Pos Format	Can be set to any of the following values: • Currency symbol prefix with no separation (\$1) • Currency symbol suffix with no separation (1\$) • Currency symbol prefix with one character separation (\$ 1) • Currency symbol suffix with one character separation (1 \$) If this entry is absent, the default value in the Windows Control Panel is used.
Currency Decimal Digits	Specifies the number of digits used for the fractional part of a currency amount. If this entry is absent, the default value in the Windows Control Panel is used.
Currency Neg Format	Can be one of the following values: (\$1), -\$1, \$-1, \$1-, (1\$), -1\$, 1-\$, 1\$-, -1 \$, -\$ 1, 1 \$-, \$ 1-, \$-1, 1- \$, (\$ 1), (1 \$) The dollar sign is shown for purposes of this example, but it should be replaced with the appropriate CurrencySymbol value in the actual program. If this entry is absent, the default value in the Windows Control Panel is used.
Currency Thousand Symbol	Indicates the single-character symbol to be used for separating currency values by thousands in the text file. If this entry is absent, the default value in the Windows Control Panel is used.
Currency Decimal Symbol	Can be set to any single character that is used to separate the whole from the fractional part of a currency amount. If this entry is absent, the default value in the Windows Control Panel is used.
Text Delimiter	Can be set to any single character that is used to delimit strings that contain any of the other special characters. E.g. "abc","xyz,pqr","hij". If this entry is not present the default delimiter is a double quote.

Step 2 – Import (or manually define) the Column Definitions

After setting the Control Variables, if the File Format is **not set** to "Fixed Length", then the "Import Column Def'ns" button will be enabled and can be used to import column definitions. If the File Format **is set** to "Fixed Length" however, the user will need to manually enter the column definitions into the "File Column Definitions" tab.

In the imported column definitions below (from a csv file), some potential manual adjustments to the definitions might include changing the Data Type and ADO Data Type from a text related data type to Date or Timestamp related data type if the import didn't recognize the correct type.

File Structure Definition									
File Column Definitions									
Col No.	Column Name	Data Type	ADO Data Type	Defined Size	Actual Size	Precision	Numeric Scal.	Sample Value	Data Format
1	COMPANY	Long	adInteger	4	4	10	255	1	
2	INVOICE_NUM	Double	adDouble	8	8	15	255	9225632320	
3	INVOICE_DATE	DateTime	adDBTimeStamp	16	16	19	0	31/07/2014	
4	INVOICE_TYPE_LOOK	Text	adVarChar	255	4	255	255	CINV	
5	DESCRIPTION	Text	adVarChar	255	30	255	255	3 key cabs soap toilet rool de	
6	INVOICE_RECEIVED	DateTime	adDBTimeStamp	16	16	19	0	31/07/2014	
7	VENDOR_NUM	Text	adVarChar	255	6	255	255	ADV048	
8	VENDOR_NAME	Text	adVarChar	255	26	255	255	Ltd	
9	VENDOR_SITE_CODE	Text	adVarChar	255		255	255		
10	GL_DATE	DateTime	adDBTimeStamp	16	16	19	0	28/08/2014	
11	INVOICE_CURRENCY	Text	adVarChar	255	3	255	255	GBP	
12	INVOICE_AMOUNT	Double	adDouble	8	8	15	255		
13	VAT Amount	Double	adDouble	8	8	15	255		
14	PAYMENT_METHOD	Text	adVarChar	255	1	255	255	b	
15	TERMS_NAME	Text	adVarChar	255	7	255	255	30 days	

Step 3 – Save to the File Structure Definition to a Schema.ini file

Clicking the "Save Details to Schema.ini:" button allows the File Structure Definition, including any associated File Column Definitions, to be written to a schema.ini file in the same directory as the file. The Schema.ini file is used by the Text Importer to determine how to interpret / convert the source file. It also provides the ability to save the same file structure details to a list of multiple files (selected in a subsequent step) where they have the same structure (as determined by the user)

This is useful where a UNION / UNION ALL, of multiple files will be used as the "Base Select" for a single capture definition, where only one file can be specified in "Source Filename" field.

Step 4 – Configuring the Capture Definition

Specifying the Capture Definition for a Text-file-based data source is very similar to any other data source, however, there are some points of difference to be aware of.

1. Assuming the use of the Microsoft Office 12.0 Access Database Engine OLE DB Provider in text mode, the core structure of a SQL Statement for one or more text files is of the form:

```
SELECT * FROM `<Enter_Text_Filename_Without_Path>` {optional AS  
<Alias>}
```

Note: If the filename doesn't contain spaces, the slanted quotes ` are not required.

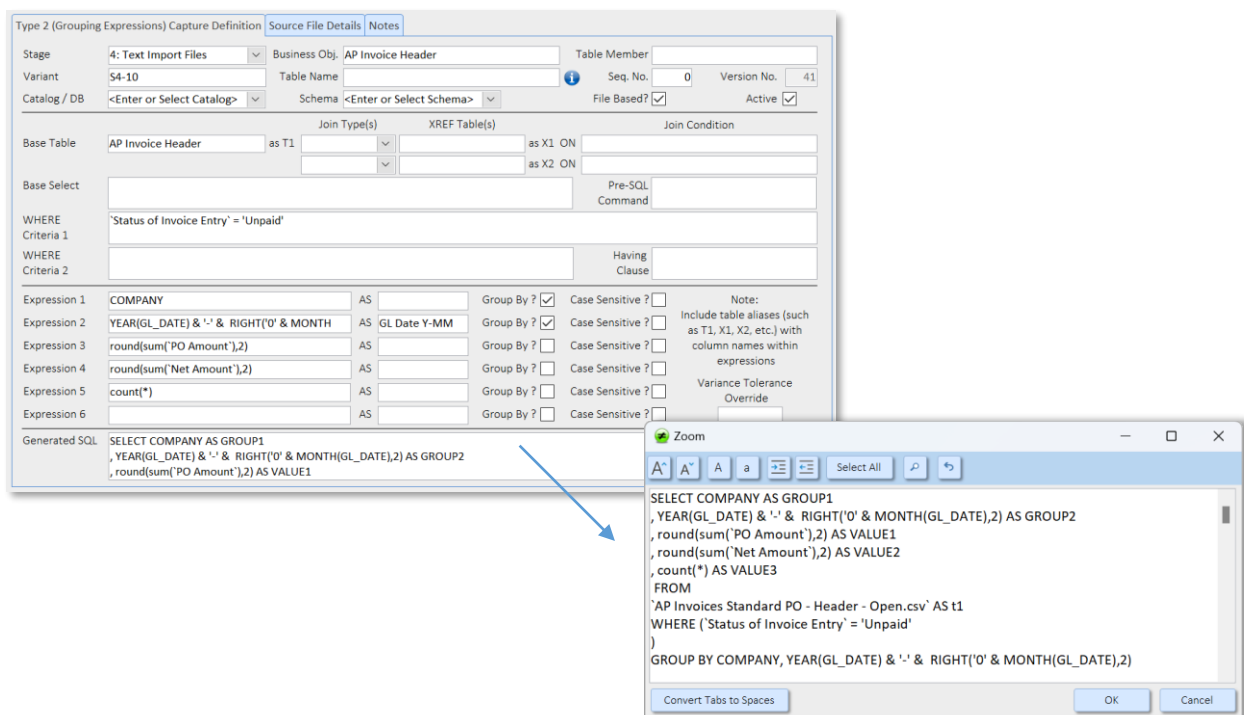
Example 1. A Union of three files

```
SELECT * FROM `InvoiceHeaders_PRD 2024-01.csv`  
UNION ALL  
SELECT * FROM `InvoiceHeaders_PRD 2024-02.csv`
```

2. The list of available scalar functions available for use in the SQL expressions depends upon the ODBC driver being used. Assuming you use the Driver=Microsoft Access Text Driver, the list of functions is similar to connecting to an Ms Access database, however, we have found some deviations. Check your specific driver / provider for details.

Warning: the format function available in Ms Access does not error when processing Text files but returns null when trying to format a date field to 'yyyy-mm'. In this scenario, the same result can be achieved with the follow expression:

`YEAR(<datefield>) & '-' & RIGHT('0' & MONTH(<datefield>),2)`



The screenshot shows the 'Type 2 (Grouping Expressions) Capture Definition' dialog box. The 'Source File Details' tab is active. The 'Base Table' is 'AP Invoice Header'. The 'WHERE' clause is 'Status of Invoice Entry' = 'Unpaid'. The 'Generated SQL' section shows a complex query with aliases. A 'Zoom' window is open over the 'Generated SQL' section, displaying the full SQL statement.

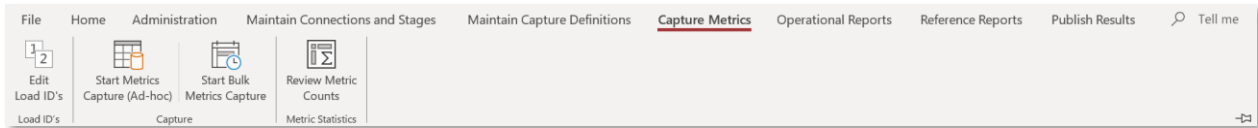
```
SELECT COMPANY AS GROUP1  
, YEAR(GL_DATE) & '-' & RIGHT('0' & MONTH(GL_DATE),2) AS GROUP2  
, round(sum('PO Amount'),2) AS VALUE1  
, round(sum('Net Amount'),2) AS VALUE2  
, count(*) AS VALUE3  
FROM  
'AP Invoices Standard PO - Header - Open.csv' AS t1  
WHERE ('Status of Invoice Entry' = 'Unpaid'  
)  
GROUP BY COMPANY, YEAR(GL_DATE) & '-' & RIGHT('0' & MONTH(GL_DATE),2)
```




5.8 Executing the Capture Definitions (Metrics Capture)

ReQuon provides two methods to execute the Capture Definitions and retrieve and store the results for subsequent analysis:

- Ad-hoc Metric Capture, and
- Scheduled / Queued Capture (Bulk Metrics Capture)



- It also allows the user to review metric count statistics to identify opportunities to purge old results

5.8.1 Ad-hoc Metrics Capture

Allows the user to execute all Capture Definitions of a specific type (E.g., Type 1 Record Counts) and/or one or more individually selected capture definitions within a type. Particularly useful while developing and testing the Capture Definitions.

Field	Description
Current Load ID	The currently active Load ID – not editable. Usually there should only be one active Load ID at any point in time. If there are multiple active Load IDs however, the Load ID with the highest number will be used.
Stage	Dropdown to select the Stage from which metrics should be captured
Capture Type	Dropdown to select the type of Capture Definition(s) to be executed. Once this has been selected, several other fields on the form will be enabled / disabled depending upon their relevance to the selected type.

Field	Description
DQ Measurement Date Override	Only applicable for Data Quality Metrics capture type. Defaults to today's date but can be overridden if desired (generally if the capture for a pre-planned DQ Trending Date was missed but you want the results to be listed against that date anyway)
Variant Like?	Freeform text field. Allows the user to specify a specify Variant label or enter a string with one or more wildcard characters (e.g., "*" for any number of characters or "_" for exactly one character) For example, a string of "S1-10" would only pick any Capture Definitions with exactly that Variant label whereas a value of "S1-10*" would pick-up any Capture Definition with a label starting with S1-10.
Entity Type	Dropdown to filter the Capture Definitions by Entity Type. Only applicable to the Type 3 – Entity Dimension Sampling capture type.
Dimension	Dropdown to filter the Capture Definitions by Entity Dimension. Only applicable to the Type 3 – Entity Dimension Sampling capture type.
Sample Set	Dropdown to filter the list of sample Entity ID's to be used when executing the Capture Definition. Only applicable to the Type 3 – Entity Dimension Sampling capture type.
Max Error Count	If the capture process encounters this quality of errors, it will abort. Set it to 0 for no limit.
Cmd Timeout (secs)	If an individual capture definition (SQL) takes longer than this number of seconds to execute, the individual capture will be aborted. Set it to 0 for no timeout.
Run Async	If the ODBC / OLE provider supports asynchronous execution AND this checkbox is enabled then the SQL statements will be run in asynchronous mode, allowing several SQL statements to be executing concurrently.
Parallelism	If the capture SQL's are running in asynchronous mode, then this sets the upper limit on how many SQL's can be running concurrently.
Force Capture?	If the "Force Capture?" checkbox is enabled, all Capture Definitions, regardless of their processing status, will be selected for capture. If it is disabled, only Unprocessed or previously Failed capture definitions will be selected for execution.
Pause On Error?	If the "Pause On Error?" checkbox is enabled AND an error occurs during a capture process, the processing will be paused, and a popup error message will be displayed. This is useful while debugging the capture definitions. If it is disabled, the capture definition will be skipped, and processing will continue with the next definition in the list. This is useful in an unattended mode where the user wants to run several capture definitions and then review the outcome later.
DSN	DSN in the context is equivalent to the connection name. Gets pre-populated when the Stage is selected
User ID	The user ID to use for the capture executions. Gets pre-populated when the Stage is selected (if one has been defined). Not applicable for Text-based Capture Definitions / Stages.
Password	The password to use for the capture executions. Gets pre-populated when the Stage is selected (if one has been defined). Not applicable for Text-based Capture Definitions / Stages.



The screen below shows an example of the form after the various input parameters have been set.

This tab shows all Capture Definitions satisfying the selection criteria

By Selection tab

This tab shows all Capture Definitions satisfying the selection criteria but provides the user with the ability to select a subset of records for processing, by setting the "Capture ?" checkbox.

Useful for testing the capture definitions during development.

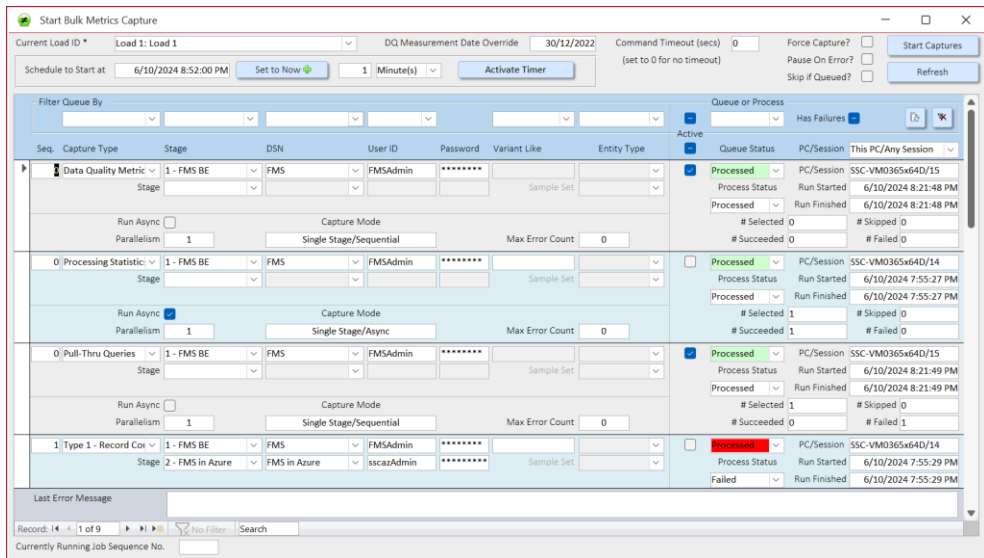
After the metrics have been executed (by clicking the "Start Metrics Capture" button), the results of the execution will be shown in the form.

5.8.2 Scheduled / Queued Capture

Bulk Metrics Capture form allows the user to edit and maintain a Data Capture queue for different types of Capture Types and/or different Stages and then execute the same. Execution can be either manually started or scheduled to start at a specific date / time in the future.

The Bulk Metrics Capture form has four (4) distinct sections:

1. The top section contains the global control parameters that apply to all queue entries. It also includes the main fields and controls to schedule or manually initiate the capture processing.
2. The next section contains various fields to filter the list of queue entries. If a queue entry has been excluded by one of the filters it will NOT be captured, even it is marked as Active. This section can also be used to toggle the Active status of all unfiltered queue entries as well as filter the processing status section for a specific PC and user session.
3. The main section contains the actual queue entries specifications (left-hand side), and the processing status details (right-hand side).
4. The bottom section displays the most recent error reported during the latest execution of the selected capture queue entry, as well as the total number of queue entries included in the current filtering.



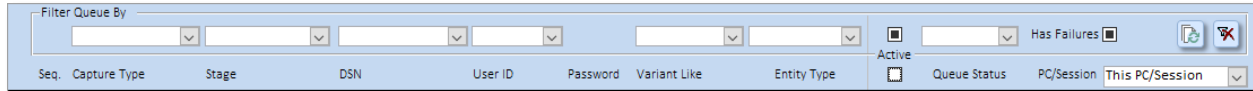
The screenshot shows the 'Start Bulk Metrics Capture' window. It is divided into four main sections as indicated by the callouts:

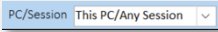
- Global input parameters & controls:** This section at the top includes fields for 'Current Load ID' (Load 1), 'DQ Measurement Date Override' (30/12/2022), 'Command Timeout (secs)' (0), 'Force Capture?' (checkbox), 'Pause On Error?' (checkbox), 'Skip if Queued?' (checkbox), 'Start Captures' button, and 'Refresh' button. It also has a 'Schedule to start at' field set to 6/10/2024 8:52:00 PM and an 'Activate Timer' button.
- Queue filters and controls:** This section includes a 'Filter Queue By' area with dropdowns for 'Seq.', 'Capture Type', 'Stage', 'DSN', 'User ID', 'Password', 'Variant Like', and 'Entity Type'. It also has a 'Queue or Process' section with 'Active' and 'Has Failures' checkboxes and buttons for 'Queue Status' and 'PC/Session'.
- Capture Queue Entries and processing status information:** This is the main table area. It lists queue entries with columns for 'Seq.', 'Capture Type', 'Stage', 'DSN', 'User ID', 'Password', 'Variant Like', 'Entity Type', 'Active', 'Queue Status', 'PC/Session', 'Process Status', 'Run Started', 'Run Finished', '# Selected', '# Skipped', '# Succeeded', and '# Failed'. The first entry is 'Data Quality Metric' with a 'Processed' status. The second entry is 'Processing Statistics' with a 'Processed' status. The third entry is 'Pull-Thru Queries' with a 'Processed' status. The fourth entry is 'Type 1 - Record Cor' with a 'Failed' status.
- Queue error details and context information:** This section at the bottom includes a 'Last Error Message' field and a 'Currently Running Job Sequence No.' field.

Global Input parameters and controls

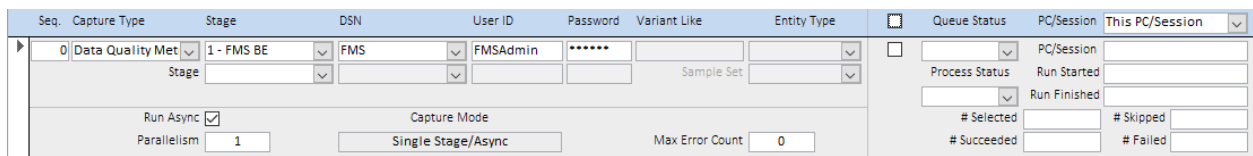
Field	Description
Current Load ID	The currently active Load ID – not editable. Usually there should only be one active Load ID at any point in time. If there are multiple active Load IDs however, the Load ID with the highest number will be used.
DQ Measurement Date Override	Only applicable for Data Quality Metrics capture type. Defaults to the latest pre-defined DQ Trending date <= today. If no trending dates have been defined it will default to today's date. Can be overridden if required.
Max Error Count	If the capture process encounters this quality of errors, it will abort. Set it to 0 for no limit.
Command Timeout (secs)	If an individual capture definition (SQL) takes longer than this number of seconds to execute, the individual capture will be aborted. Set it to 0 for no timeout.
Force Capture?	If the "Force Capture?" checkbox is enabled, all Capture Definitions, regardless of their processing status, will be selected for capture. If it is disabled, only Unprocessed or previously Failed capture definitions will be selected for execution.
Pause On Error?	If the "Pause On Error?" checkbox is enabled AND an error occurs during a capture process, the processing will be paused, and a popup error message displayed.
Skip if Queued?	If multiple computers have been setup to execute the queue, the first computer to select a queue entry will set its' status to Queued. - If this checkbox is enabled (set) any subsequent computers will skip over this queue entry and pick up the next unqueued entry. - If the checkbox is disabled, any subsequent computers will still attempt to process the same queue entry but will compete for individual capture definitions within the set. Note: Would generally NOT be used when "Force Capture?" is enabled (as it will unnecessarily re-process the same Capture Definition multiple times)
Schedule to Start at	Allows the user to specify a scheduled time for the capture processing to start.
Set to Now  1 Minute(s) 	Used to update the "Schedule to Start at" field by x units of time from Now. The available units of time include: Minutes, Hours or Days. Note: when using Minutes as the unit, it doesn't add 60 seconds to the current time but rather sets the value to the next whole minute. E.g., if the current time was 10:17:34 (hh:mm:ss) then adding one minute will set the time to 10:18:00.
Activate Timer	Starts the schedule timer. Once the current time exceeds the date/time specified in the "Schedule to Start at" field, the capture processing will start for the current PC.
Start Captures	Manually starts the capture processing for the current PC
Refresh	Refreshes the entire form.

Queue filters and controls



Field	Description
Top / 1st Row	
Contains various dropdown and checkbox filters	Used to filter the queue entries by: - Capture Type - Stage - DSN / Connection - User ID - Variant Like - Entity Type - Active status (tri-state: Active, Inactive, both) "Queue or Process" Status - Has Failures
 	Filter controls. - The first button refreshes the filter dropdowns. - The second button clears all the filters to display all queue entries
Bottom / 2nd Row	
	Clicking the checkbox set the Active status of any filtered queue entries, the match the status of the checkbox.
	The dropdown does NOT filter the queue entries per se but rather filters which processing statistics data to display for the queue entries. Generally, this defaults to the current computer and any session but can be used to view the processing results from different computers and/or different user sessions.

Capture Queue Entries and processing status information



Field	Description
Core Queue Entry Specification details	
Seq No.	The sequence number in which the queue entries will be processed
Capture Type	The type of Capture Definition to be executed for the current queue entry
Stage(s)	Either one or two Stages for which the metrics are to be captured from
DSN (Connection Name)	The Connection Name to use – defaulted once the Stage is selected
User ID	User Id to use for the specific Stage
Password	The Password to use for the specific Stage
Variant Like	Optional filter to restrict the Capture Definitions to be executed as part of this queue entry. Can contain wildcards
Entity Type	Optional filter to restrict the Capture Definitions to be executed as part of this queue entry. Only applies to Type 3 Capture Type.
Sample Set	Optional filter to restrict the set of Entity ID's to be used in Type 3 Capture Definitions (only).
Queue Entry Specific Control Parameters	
Active state	Enables or disables the specific queue entry
Run Async	If the ODBC / OLE provider supports asynchronous execution AND this checkbox is enabled then the SQL statements will be run in asynchronous mode, allowing several SQL statements to be executing concurrently.

Field	Description
Parallelism	If the capture SQL's are running in asynchronous mode, then this sets the upper limit on how many SQL's can be running concurrently.
Capture Mode	This read-only field provides informational on the Capture Mode that will be used. The following modes are available: • Single Stage/Async • Single Stage /Sequential • Paired Capture/Lock Step: In this asynchronous mode, the capture process submits the pair of Stage SQL's for the same Capture Definition at essentially the same time. i.e. keeps them in "Lock Step". This option is useful for source / targets that are not static but are being dynamically migrated incrementally (in near real time or micro batches) • Paired Capture/Sequential
Max Error Count	The capture process will abort if this value is exceeded. Set it to 0 for no limit.
Queue Entry Processing Status fields	
Queue Status	Processing status of the overall queue entry: • Unprocessed • Queued • In Progress • Processed • Failed • Aborted
Process Status	Status of the processing for the specific PC and Session: • Unprocessed • In Progress • Processed • Failed • Aborted • Mixed (only applies if the selected PC / Session is "All Computers" – indicates that the processing status varies across the set of PCs used)
PC/Session	Provides the context for the processing statistics: • This PC/Session • All Computers • 0 to many entries representing specific PC and Session combinations
Run Started	When the specific capture process for the selected PC and Session started
Run Finished	When the specific capture process for the selected PC and Session finished
# Selected	The number of Capture Definitions that met the Queue Entry selection criteria at the time the processing commenced for the specific PC and Session.
# Skipped	The number of Capture Definitions that were skipped by this selected PC during the applicable session – generally because another PC picked them up first.
# Succeeded	The number of Capture Definitions that were successfully processed by the selected PC during the applicable session.
# Failed	The number of Capture Definitions that failed processing by the selected PC during the applicable session.

Queue error details and context information

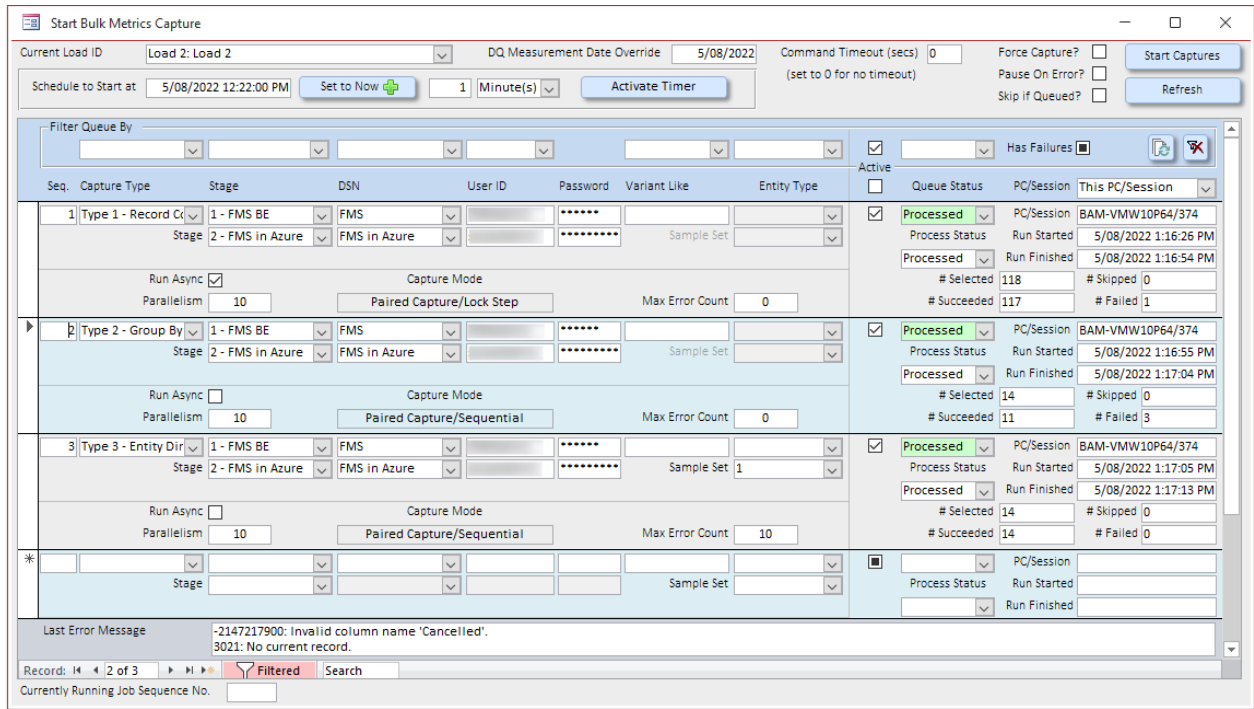
Last Error Message

Record: 1 of 8
No Filter
Search

Currently Running Job Sequence No.

Field	Description
Last Error Message	If the Queue Entry selected in the main part of the form encountered an error condition, the most recent error message will be displayed here
Record x of y	The record number of the selected queue entry (x) within the filtered list of y records
Currently Running Job Sequence No.	Self-explanatory. If multiple queue entries have the same Job No., the active one is also highlighted in Yellow while it is running.

The screenshot below provides an example of what the queue looks like after the capture process has been run.



The screenshot shows the 'Start Bulk Metrics Capture' window. It includes a 'Current Load ID' dropdown set to 'Load 2: Load 2', a 'DQ Measurement Date Override' of '5/08/2022', and a 'Command Timeout (secs)' of '0'. There are buttons for 'Set to Now', '1 Minute(s)', 'Activate Timer', 'Force Capture?', 'Pause On Error?', 'Skip if Queued?', 'Start Captures', and 'Refresh'.

The 'Filter Queue By' section has several dropdowns. Below this is a table with columns: Seq., Capture Type, Stage, DSN, User ID, Password, Variant Like, Entity Type, Active, Queue Status, PC/Session, and This PC/Session. The table lists three capture jobs:

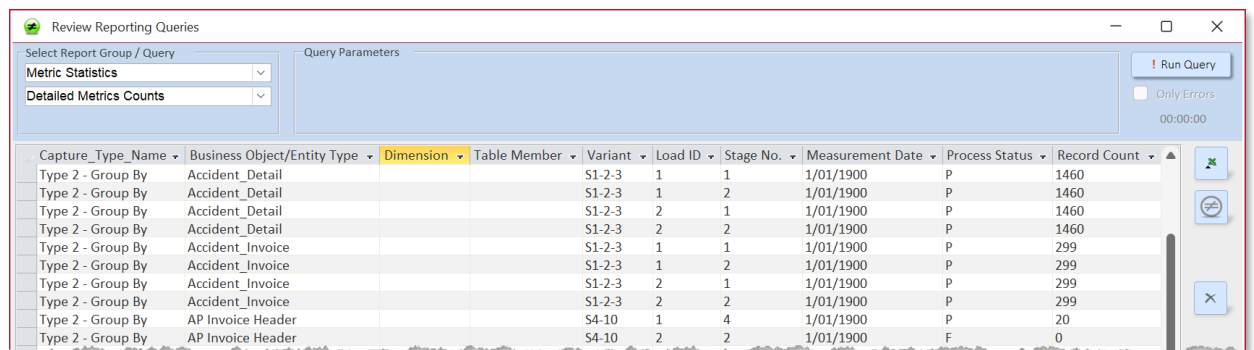
Seq.	Capture Type	Stage	DSN	User ID	Password	Variant Like	Entity Type	Active	Queue Status	PC/Session	This PC/Session
1	Type 1 - Record Cd	1 - FMS BE	FMS		*****			☒	Processed	BAM-VMW10P64/374	
		2 - FMS in Azure	FMS in Azure		*****						
		Run Async									
		Parallelism	10								
		Capture Mode	Paired Capture/Lock Step								
		Max Error Count	0								
2	Type 2 - Group By	1 - FMS BE	FMS		*****			☒	Processed	BAM-VMW10P64/374	
		2 - FMS in Azure	FMS in Azure		*****						
		Run Async									
		Parallelism	10								
		Capture Mode	Paired Capture/Sequential								
		Max Error Count	0								
3	Type 3 - Entity Dir	1 - FMS BE	FMS		*****			☒	Processed	BAM-VMW10P64/374	
		2 - FMS in Azure	FMS in Azure		*****						
		Run Async									
		Parallelism	10								
		Capture Mode	Paired Capture/Sequential								
		Max Error Count	10								

Below the table, there is a 'Last Error Message' section showing an error: '-2147217900: Invalid column name 'Cancelled'. 3021: No current record.' There is also a 'Record: 14 of 3' indicator and a 'Filtered' button.

Where failures were encountered, the user would generally go back to the relevant "Maintain Capture Definitions" form to determine the cause of the issues and resolve them accordingly.

5.8.3 Review Metric Counts

This function displays the record counts of the detailed metric captures, by Capture Definition and Load ID / Measurement Date (for Data Quality related captures). This is useful to identify opportunities to purge old results e.g. prior to a database upgrade or just to reduce disk space (by conducting a purge followed by a Compact BE Database command). Users with the appropriate permissions can purge individual results from this form using the  button.



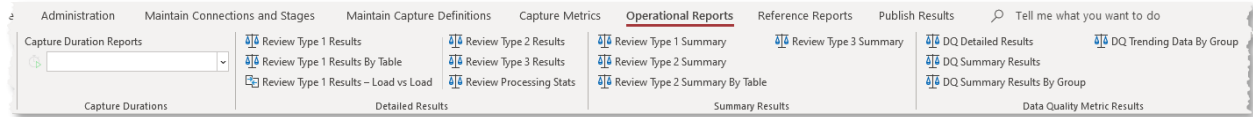
The screenshot shows the 'Review Reporting Queries' window. It has a 'Select Report Group / Query' dropdown set to 'Metric Statistics' and a 'Detailed Metrics Counts' dropdown. There is a 'Query Parameters' section and a 'Run Query' button. Below this is a table with columns: Capture_Type_Name, Business Object/Entity Type, Dimension, Table Member, Variant, Load ID, Stage No., Measurement Date, Process Status, and Record Count.

Capture_Type_Name	Business Object/Entity Type	Dimension	Table Member	Variant	Load ID	Stage No.	Measurement Date	Process Status	Record Count
Type 2 - Group By	Accident_Detail			S1-2-3	1	1	1/01/1900	P	1460
Type 2 - Group By	Accident_Detail			S1-2-3	1	2	1/01/1900	P	1460
Type 2 - Group By	Accident_Detail			S1-2-3	2	1	1/01/1900	P	1460
Type 2 - Group By	Accident_Detail			S1-2-3	2	2	1/01/1900	P	1460
Type 2 - Group By	Accident_Invoice			S1-2-3	1	1	1/01/1900	P	299
Type 2 - Group By	Accident_Invoice			S1-2-3	1	2	1/01/1900	P	299
Type 2 - Group By	Accident_Invoice			S1-2-3	2	1	1/01/1900	P	299
Type 2 - Group By	Accident_Invoice			S1-2-3	2	2	1/01/1900	P	299
Type 2 - Group By	AP Invoice Header			S4-10	1	4	1/01/1900	P	20
Type 2 - Group By	AP Invoice Header			S4-10	2	2	1/01/1900	F	0

Note: you will need to rerun the query to see the updated counts.

5.9 Reviewing the Capture / Reconciliation Results

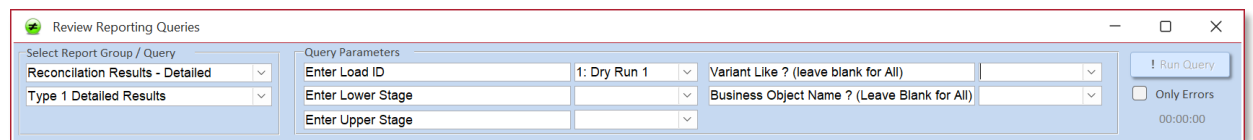
Having executed the Capture Definitions and retrieving the relevant metrics, the next step is to review the results via the Operational Reports menu.



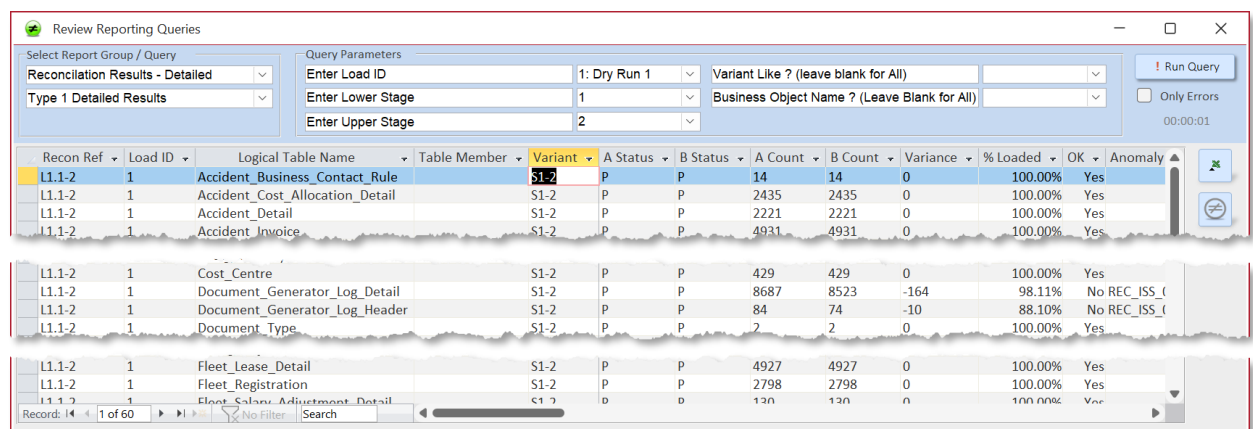
The various types of Operational Reports are described in section 4.1.6. All the reports use a common Report Viewer form that allows the user to select the required report, enter the relevant input parameters and then execute the report.



For the purposes of this guide, we will select and run Type 1 Detailed Results report (within the "Reconciliation Results – Detailed" Report Group).



The form displays the list of Query Parameters required to run the specific report. Once all the mandatory input parameters have been entered, the "Run Query" button will be enabled. Below is an example output for a Type 1 Detailed Results report.



5.9.1 How to interpret the results

The key elements of a reconciliation report are illustrated below.

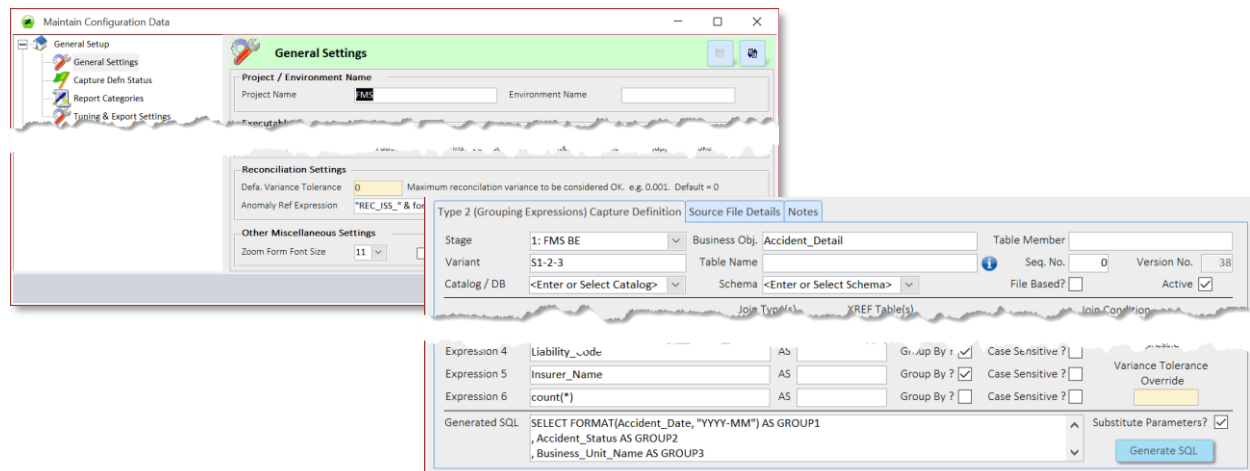
Identifying fields				Processing status of the lower (A) and Upper (B) Stages				Indicates if the results from Stage A and B match				
Recon Ref	Load ID	Logical Table Name	Table Member	Variant	A Status	B Status	A Count	B Count	Variance	% Loaded	OK	Anomaly Ref
L2.1-2	2	Cost_Category		S1-2	P	P	10	10	0	100.00%	Yes	
L2.1-2	2	Cost_Centre		S1-2	P	P	429	429	0	100.00%	Yes	
L2.1-2	2	Document_Generator_Log_Detail		S1-2	P	P	8687	8523	-164	98.11%	No	
L2.1-2	2	Document_Generator_Log_Header		S1-2	P	P	84	74	-10	88.10%	No	
L2.1-2	2	Document_Type		S1-2	P	P	2	2	0	100.00%	Yes	
L2.1-2	2	Employee		S1-2	P	P	4034	4034	0	100.00%	Yes	

Metrics captured from the lower (A) and upper (B) Stages, together with derived metrics.

Anomaly previously linked to this result

Differences for the Type 2 and Type 3 Reconciliation results include:

- The Identifying fields will include Group 1 to Group 5 fields, as well as Entity and Dimension elements (for Type 3 only)
- "A Value 1" to "A Value 5" (for the lower Stage) and "B Value 1" to "B Value 5" (for the upper Stage) – these contain the expression metrics not flagged as Group By fields.
- Var 1 to Var 5 – the variances between the corresponding A & B Value metrics.
- Matched field. This is a Yes/No derived column that indicates that the Identifying fields from Stage A were also found in Stage B. Where mismatches are found (i.e., Matched = No) this could be indicative of either:
 - Missing data from one of the Stages, or
 - Incorrect group by expressions in the Capture Definition in one of the Stages. e.g. if for one Stage we were grouping a date field in "yyyy-mm" format while in the other stage we are grouping by "yyyy", we will get mismatched results.
- OK field. This is a Yes/No derived column that indicates whether all Variance fields are 0 (or less than a pre-configured Variance Tolerance). The Default Variance Tolerance is defined under the Administration / Configure Application / General Settings. A Variance Tolerance Override can be defined at an individual Capture Definition and takes precedence over the default value.



The screenshot shows two overlapping windows from the ReQuon 3 application. The top window is the 'Maintain Configuration Data' dialog, specifically the 'General Settings' tab. It displays fields for 'Project / Environment Name', 'Project Name' (set to 'FMS'), and 'Environment Name'. Below this, the 'Reconciliation Settings' section shows 'Defa. Variance Tolerance' set to 0 and 'Anomaly Ref Expression' set to '"REC_ISS_" & for'. The bottom window is the 'Type 2 (Grouping Expressions) Capture Definition' dialog. It shows 'Stage' set to '1: FMS BE', 'Business Obj.' set to 'Accident_Detail', and 'Table Member' set to 'S1-2-3'. The 'Table Name' is 'Accident_Detail'. The 'Catalog / DB' is set to '<Enter or Select Catalog>' and the 'Schema' is '<Enter or Select Schema>'. The 'Seq. No.' is 0 and the 'Version No.' is 38. The 'File Based?' checkbox is unchecked, and the 'Active' checkbox is checked. The 'Generated SQL' section shows the following query:

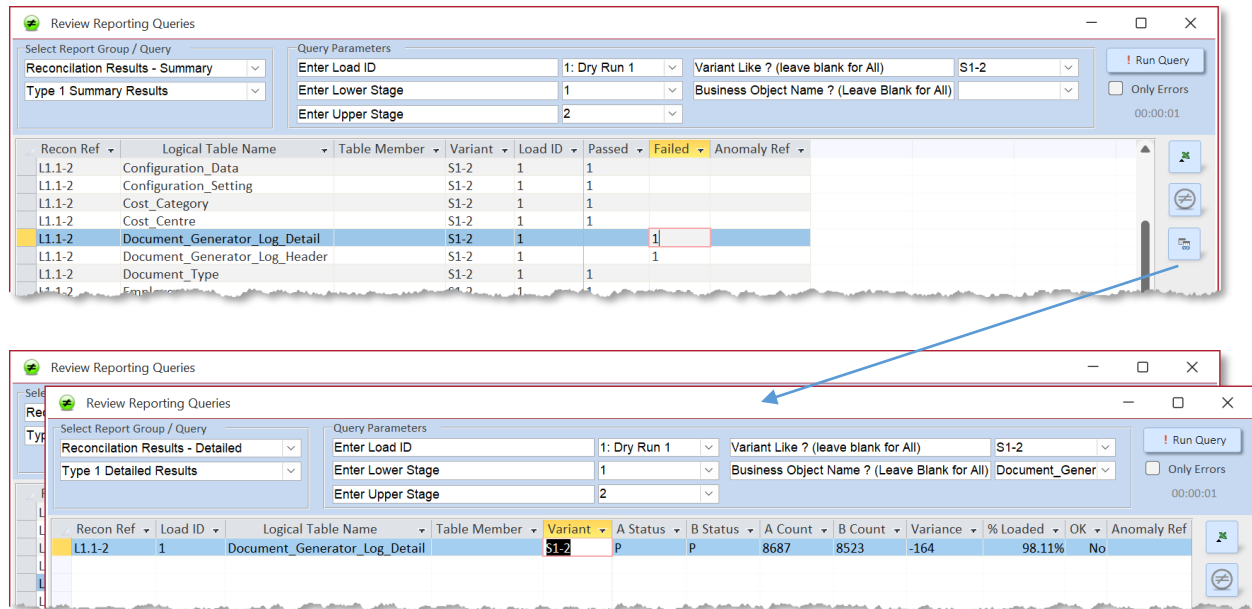

```
SELECT FORMAT(Accident_Date, "YYYY-MM") AS GROUP1
, Accident_Status AS GROUP2
, Business_Unit_Name AS GROUP3
```

 The 'Group By' checkbox is checked, and the 'Case Sensitive?' checkbox is unchecked. The 'Variance Tolerance Override' field is empty. The 'Substitute Parameters?' checkbox is checked, and the 'Generate SQL' button is visible.

5.9.2 Drilling Down from Summary Results

When reviewing any of the “Reconciliation Results – Summary” related reporting queries, the review form provides the ability to select a particular record from the results and drill-down into the corresponding detailed report.

For example, having selected the “Document_Generator_Log_Detail” record in the screenshot below and then clicking on the Drilldown button, a second review form will be opened with the corresponding detailed results.



The first screenshot shows the 'Review Reporting Queries' window with the 'Reconciliation Results - Summary' query selected. The table below lists various logical table names, with 'Document_Generator_Log_Detail' highlighted in blue. A blue arrow points from this row to the second screenshot.

Recon Ref	Logical Table Name	Table Member	Variant	Load ID	Passed	Failed	Anomaly Ref
L1.1-2	Configuration_Data		S1-2	1	1		
L1.1-2	Configuration_Setting		S1-2	1	1		
L1.1-2	Cost_Category		S1-2	1	1		
L1.1-2	Cost_Centre		S1-2	1	1		
L1.1-2	Document_Generator_Log_Detail		S1-2	1		1	
L1.1-2	Document_Generator_Log_Header		S1-2	1		1	
L1.1-2	Document_Type		S1-2	1	1		
L1.1-2	Employment		S1-2	1	1		

The second screenshot shows the same window but with the 'Reconciliation Results - Detailed' query selected. The table below shows detailed reconciliation data for the selected record.

Recon Ref	Load ID	Logical Table Name	Table Member	Variant	A Status	B Status	A Count	B Count	Variance	% Loaded	OK	Anomaly Ref
L1.1-2	1	Document_Generator_Log_Detail		S1-2	P	P	8687	8523	-164	98.11%	No	

5.10 Recording Anomalies

After the Capture Definitions have been executed and the results analysed, reconciliation errors (anomalies) may be identified. The anomalies may be the result of errors in the data migration logic, or they may be errors in the reconciliation logic. Either way, they should be recorded, analysed and ideally resolved before the next execution.

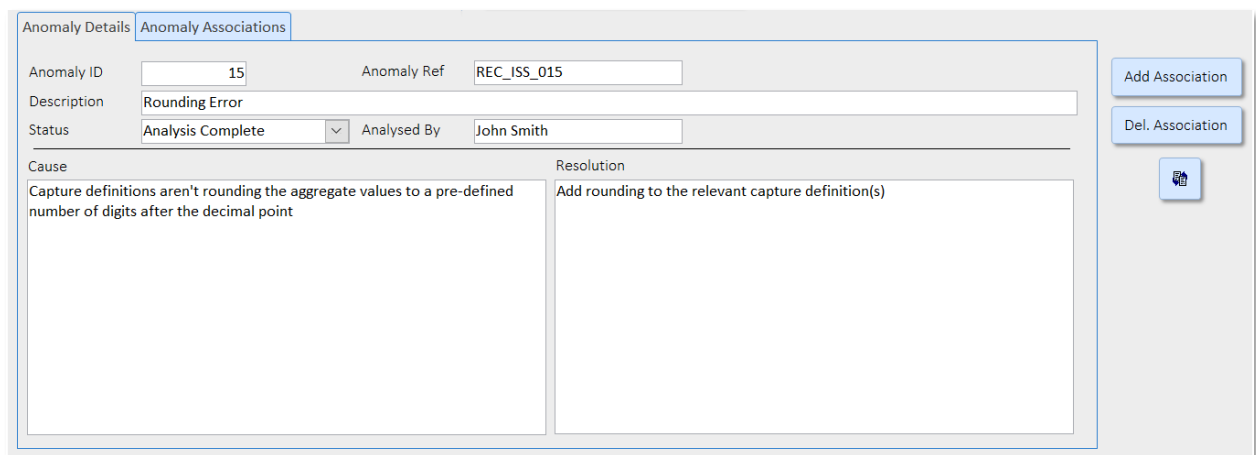
5.10.1 Anomaly Fundamentals

Before proceeding, it's worth discussing some basic definitions and concepts around anomalies, as implemented within ReQuon.

There are two (2) key components required to define an anomaly with ReQuon:

1. The Anomaly Details (header), plus
2. One or more associations between the Anomaly Details and the captured reconciliation metrics where the anomaly was detected.

As a minimum, an Anomaly Details record includes a system assigned Anomaly ID (non-editable), a system generated Anomaly Ref (configurable / editable), a Description and a Status. Over time, details such as the root cause and the resolution will be added once the analysis has been performed.



Anomaly association records link the anomaly header record to one or more metric capture results, that are impacted by the specific anomaly. The association records can be linked at different levels with the metric capture hierarchy, as illustrated in Figure 10 - Anomaly Hierarchy Levels. Table 1 - Anomaly Hierarchy Levels by Capture Types, details which Association Levels are applicable to which Capture Types.

Figure 10 - Anomaly Hierarchy Levels

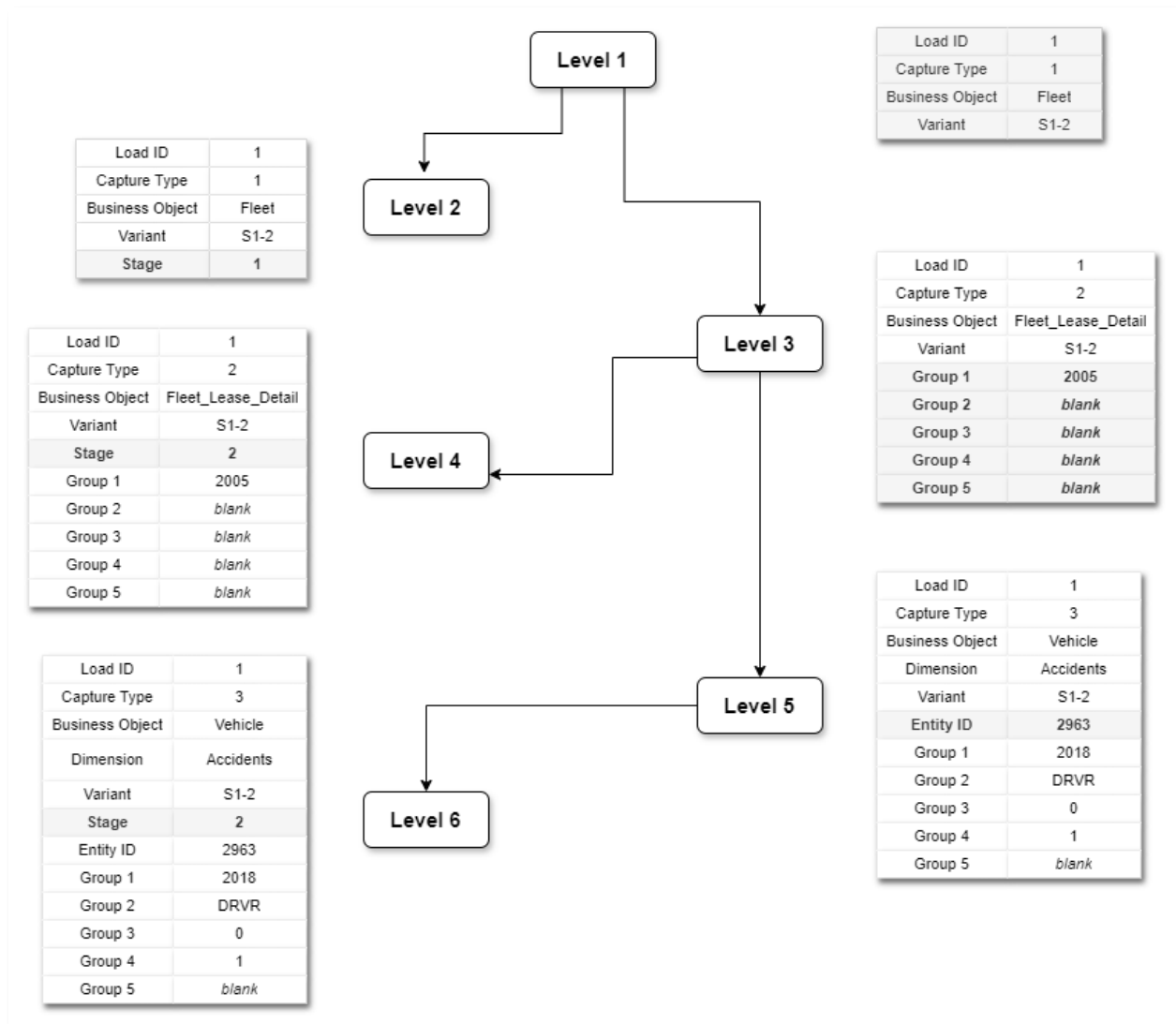


Table 1 - Anomaly Hierarchy Levels by Capture Types

Association Levels	Applicability By Capture Type			
	Type 1	Type 2	Type 3	Processing Statistics
Level 1 – Load ID & Capture Def'n	✓	✓	✓	✓
Level 2 – Load ID, Capture Def'n & Stage	✓	✓	✓	✓
Level 3 – Load ID, Capture Def'n, & Group By's	✗	✓	✓	✓
Level 4 – Load ID, Capture Def'n, Group By's & Stage	✗	✓	✓	✓
Level 5 – Load ID, Capture Def'n, Group By's & Entity ID	✗	✗	✓	✗
Level 6 – Load ID, Capture Def'n, Group By's, Entity ID & Stage	✗	✗	✓	✗

5.10.2 Different ways of creating an Anomaly and/or Association

There are several pathways for creating anomalies and their related association(s), however, they all utilize a common “New Anomaly and/or Association” wizard to guide the user through the process. The wizard is described in the section 0. The three pathways are:

1. Via the Maintain Capture Definitions forms
2. Via the Review Reporting Queries form, or
3. Via the Maintain Reconciliation Anomalies form

Note: While any anomaly, at any anomaly association level, can be created via any of the 3 pathways, there are different scenarios that may favour one method over another.

5.10.2.1 Anomalies via the Maintain Capture Definitions forms

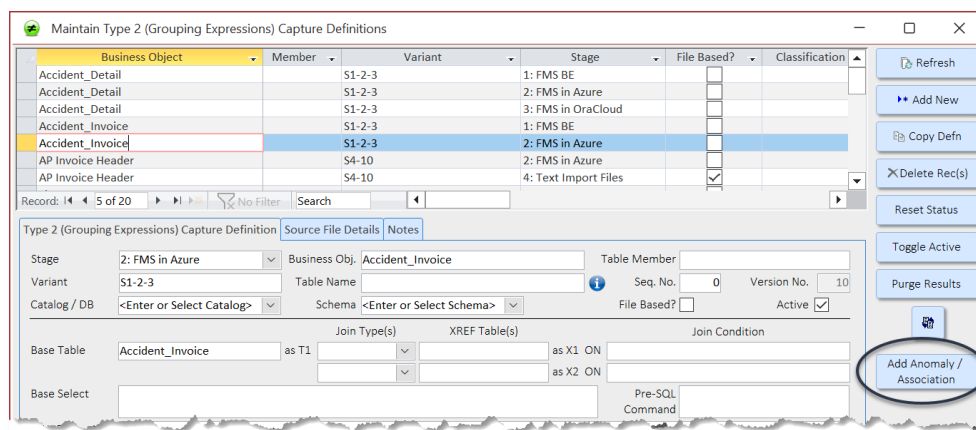
The four capture definition forms that support the creation of anomalies/associations are:

- Type 1 (Record Counts),
- Type 2 (Grouping Expressions),
- Type 3 (Entity Dimension Sampling), and
- Type PS (Processing Statistics)

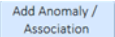
The capture definition forms would typically be used for creating anomalies and associations at Level 1 (Load ID & Capture Def'n) and Level 2 (Load ID, Capture Def'n & Stage). i.e. Level 1 and Level 2 are commonly caused by errors in the data migration or reconciliation logic that affects all the related captured metrics data.

An example of a **Level 1** anomaly/association could be a situation where rounding errors are occurring for **both stages** related to a capture definition.

An example of a **Level 2** anomaly / association might be an incorrect set of selection criteria on **one of the stages** associated with a capture definition. This might require changes to the data migration logic and/or the reconciliation logic.





Upon clicking the  button, if an existing anomaly association already existed for this Capture Definition, then you would see a dialog box like the following:

ReQuon

 A Reconciliation Anomaly **already exists** entitled:
[Rounding Error]

Recon Type : 2
Business Object: Accident_Invoice
Table Member :
Variant : S1-2-3
Stage : 2
Load ID : 1

Click **Yes** to review the details, or **No** to create a new Anomaly/Association?

Clicking “Yes” will open the Maintain Anomalies form, while clicking “No” will launch the “New Anomaly and/or Association” Wizard. If no existing anomaly has been associated with this Capture Definition, then the “New Anomaly and/or Association” Wizard will be launched.

5.10.2.2 Anomalies via the Review Reporting Queries form

The Review Reporting Queries form is accessible via the Operational Reporting menu. If the reporting query being reviewed supports anomalies, then the Add Anomaly / Association button will be  enabled. The Review Reporting Queries form is suitable as a launching pad for all types and levels of anomalies/associations, since the relationship between the results and the anomalies are clearly visible.

In the example below, we can see a variance in the record counts for Logical Tables "Document_Generator_Log_Detail" and "Document_Generator_Log_Header". The “Anomaly Ref” column is blank indicating that no anomaly record has been linked to these results.

Review Reporting Queries

Select Report Group / Query
Reconciliation Results - Detailed
Type 1 Detailed Results

Query Parameters
Enter Load ID: 1: Dry Run 1
Enter Lower Stage: 1
Enter Upper Stage: 2
Variant Like ? (leave blank for All)
Business Object Name ? (Leave Blank for All)

☐ Only Errors 00:00:01

Recon Ref	Load ID	Logical Table Name	Table Member	Variant	B Status	A Count	B Count	Variance	% Loaded	OK	Anomaly Ref
L1.1-2	1	Company		S1-2	P	5	5	0	100.00%	Yes	
L1.1-2	1	Configuration_Data		S1-2	P	1	1	0	100.00%	Yes	
L1.1-2	1	Configuration_Setting		S1-2	P	2	2	0	100.00%	Yes	
L1.1-2	1	Cost_Category		S1-2	P	10	10	0	100.00%	Yes	
L1.1-2	1	Cost_Centre		S1-2	P	429	429	0	100.00%	Yes	
L1.1-2	1	Document_Generator_Log_Detail		S1-2	P	8687	8523	-164	98.11%	No	
L1.1-2	1	Document_Generator_Log_Header		S1-2	P	84	74	-10	88.10%	No	
L1.1-2	1	Document_Type		S1-2	P	2	2	0	100.00%	Yes	
L1.1-2	1	Employment		S1-2	P	1034	1034	0	100.00%	Yes	
L1.1-2	1	Job_Description		S1-2	P	122	122	0	100.00%	Yes	
L1.1-2	1	Lease_Type		S1-2	P	10	10	0	100.00%	Yes	
L1.1-2	1	Leasing_Company		S1-2	P	10	10	0	100.00%	Yes	

Record: 16 of 60
No Filter Search

To add a new anomaly/association, select the relevant record, click on the  icon, and follow the instructions.



5.10.2.3 Anomalies via the Maintain Reconciliation Anomalies form

The Maintain Reconciliation Anomalies form is accessible via the Publish Results menu. It not only supports the creation of any type of anomaly/association but is also the **only mechanism** that supports the deletion of either an anomaly association or an anomaly itself.

It is also the main channel for updating the anomaly details as the root cause analysis is conducted, a resolution identified and implemented, and subsequent retesting verifies that the issue has been resolved.

The screenshot displays the 'Maintain Reconciliation Anomalies' form. The top section contains a table with columns: Anomaly Ref, Anomaly Description, Load ID, Recon Type, Logical Table / Entity, and Dimension. The table lists several anomalies, with 'REC_ISS_015 Rounding Error' highlighted. To the right of the table are buttons for 'Refresh', 'Add Anomaly', and 'Del. Anomaly'. Below the table is a search bar and a record count indicator 'Records: 14 3 of 8'. The bottom section of the form is divided into two tabs: 'Anomaly Details' and 'Anomaly Associations'. The 'Anomaly Details' tab is active, showing fields for 'Anomaly ID' (15), 'Anomaly Ref' (REC_ISS_015), 'Description' (Rounding Error), 'Status' (Analysis Complete), 'Analysed By' (John Smith), 'Cause' (Capture definitions aren't rounding the aggregate values to a pre-defined number of digits after the decimal point), and 'Resolution' (Add rounding to the relevant capture definition(s)). To the right of the details section are buttons for 'Add Association' and 'Del. Association'. Below the main form is a smaller, torn-edge screenshot showing a more detailed view of the 'Anomaly Associations' tab, which includes additional columns like 'Variant', 'Table Member', 'Assoc. Level', 'Stage', 'Entity ID', 'Group 1', and 'Group 2'.

Anomaly Ref	Anomaly Description	Load ID	Recon Type	Logical Table / Entity	Dimension
REC_ISS_013	Incorrect selection criteria	1	Type 2 - Group By	Accident_Detail	
REC_ISS_015	Rounding Error	2	Type 2 - Group By	Fleet_Lease_Detail	
REC_ISS_015	Rounding Error	2	Type 2 - Group By	Accident_Invoice	
REC_ISS_016	Conversion errors due to incompatibility of nulls in	1	Type 3 - Entity Dimension	Vehicle	Infringements
REC_ISS_017	Records missing from the Document Generator Lo	1	Type 1 - Record Count	Document_Generator_Log_Detail	
REC_ISS_017	Records missing from the Document Generator Lo	2	Type 1 - Record Count	Document_Generator_Log_Detail	
REC_ISS_017	Records missing from the Document Generator Lo	1	Type 1 - Record Count	Document_Generator_Log_Heade	
REC_ISS_017	Records missing from the Document Generator Lo	2	Type 1 - Record Count	Document_Generator_Log_Heade	

Records: 14 3 of 8

Anomaly Details | Anomaly Associations

Anomaly ID: 15 | Anomaly Ref: REC_ISS_015

Description: Rounding Error

Status: Analysis Complete | Analysed By: John Smith

Cause: Capture definitions aren't rounding the aggregate values to a pre-defined number of digits after the decimal point

Resolution: Add rounding to the relevant capture definition(s)

Add Association | Del. Association

Anomaly Associations

Load ID	Recon Type	Logical Table / Entity	Dimension	Table Member	Variant	Assoc. Level	Stage	Entity ID	Group 1	Group 2
2	Type 2 - Group By	Fleet_Lease_Detail			S1-2-3	3			2005	
2	Type 2 - Group By	Accident_Invoice			S1-2-3	4	2: FMS in Azure		2021-07	-1

Clicking the **Add Anomaly** button inserts a new record into the table and positions the user into the Anomaly Details section of the form where the Description and other details can be entered. At this point no association has been created. Clicking the **Add Association** button will launch the "New Anomaly and/or Association" Wizard.



5.10.3 The “New Anomaly and/or Association” Wizard

The operation of the “New Anomaly and/or Association” wizard is described below.

Step 1 – Choose “Create a New Anomaly” or “Select an Existing Anomaly”

New Anomaly and/or Association

Create / Select Anomaly

Create or Select

☒ Create a New Anomaly ☐ Select an Existing Anomaly

Create a new Anomaly

Anomaly Ref

Description

Status New

Analysed By

Cause

Resolution

Cancel Back Next Finish

If creating a new anomaly, enter the relevant details (Description as a minimum) and then click Next.

If looking to create a new association against an existing anomaly, select the appropriate anomaly from the list and then click Next.

New Anomaly and/or Association

Create / Select Anomaly

Create or Select

☐ Create a New Anomaly ☒ Select an Existing Anomaly

Selected Anomaly details

Anomaly Ref REC_ISS_015

Description Rounding Error

Status Analysis Complete

Analysed By John Smith

Cause Capture definitions aren't rounding the aggregate values to a pre-defined number of digits after the decimal point

Resolution Add rounding to the relevant capture definition(s)

Select an existing Anomaly

Anomaly Ref	Anomaly Description	Status	Analysed By
REC_ISS_013	Incorrect selection criteria	New	
REC_ISS_015	Rounding Error	Analysis Complete	John Smith
REC_ISS_016	Conversion errors due to incompatibility of nulls	New	
REC_ISS_017	Records missing from the Document Generator	New	

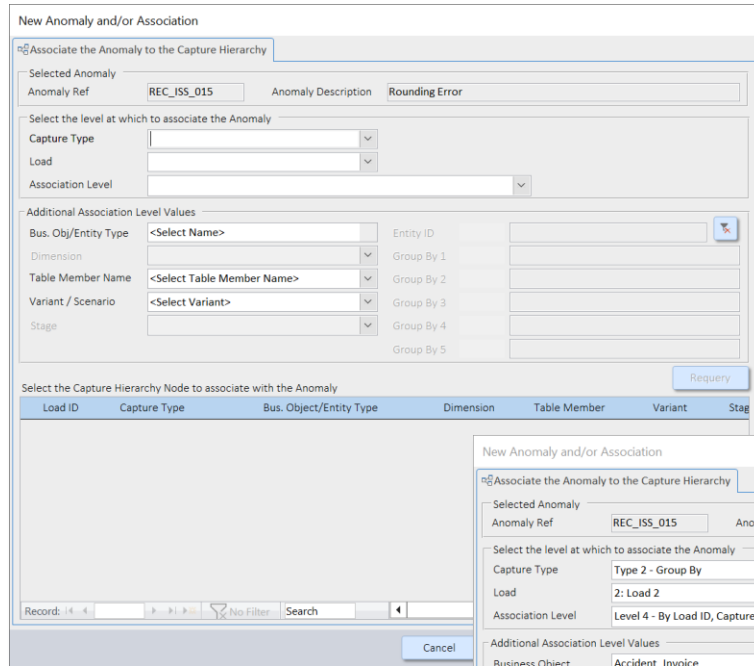
Record: 14 of 4

No Filter Search

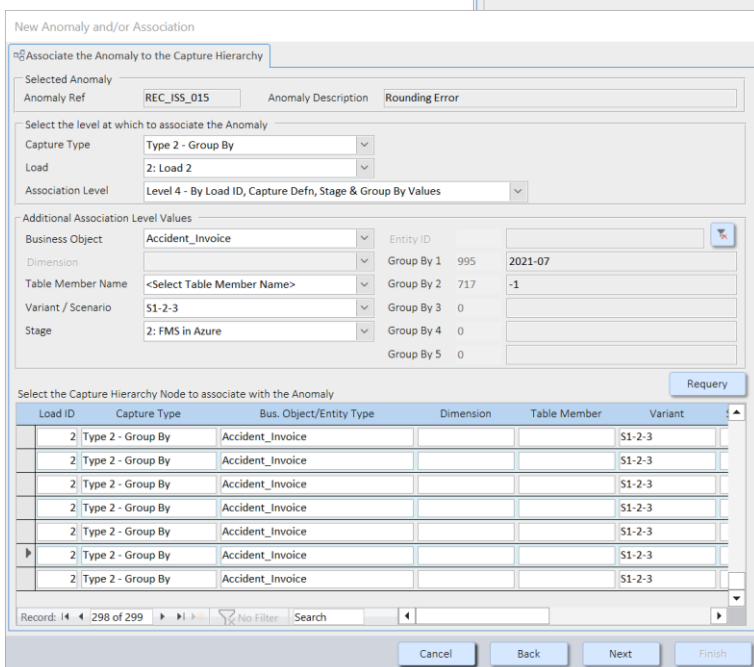
Cancel Back Next Finish

Step 2 – Select the level at which to associate the Anomaly

The next step is to decide the level, within the metrics capture hierarchy, to create an association to the anomaly. As a minimum, the Capture Type, Load Id and Association Level must be specified. For association levels > 1, additional parameter values need to be entered.



Click the **Request** button to populate the Capture Hierarchy Node list based on the parameter values entered.



Load ID	Capture Type	Bus. Object/Entity Type	Dimension	Table Member	Variant
2	Type 2 - Group By	Accident_Invoice	995	717	S1-2-3
2	Type 2 - Group By	Accident_Invoice	995	717	S1-2-3
2	Type 2 - Group By	Accident_Invoice	995	717	S1-2-3
2	Type 2 - Group By	Accident_Invoice	995	717	S1-2-3
2	Type 2 - Group By	Accident_Invoice	995	717	S1-2-3
2	Type 2 - Group By	Accident_Invoice	995	717	S1-2-3
2	Type 2 - Group By	Accident_Invoice	995	717	S1-2-3

Fill out any additional parameters from the fields enabled.

Note: The Entity Id and Group By fields cannot be entered directly but are populated automatically when a record from the list of Capture Hierarchy Nodes has been selected.

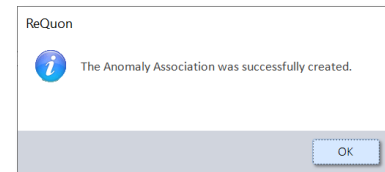
As you select different records from the list, you will see the relevant Entity ID and/or Group By values populated. Once you have selected an appropriate record, click on the Next button.



Step 3 – Confirm your selections.

If all required fields from the previous screen have been entered, the final screen will be displayed awaiting your confirmation to proceed. Click Finish to create the anomaly association. You will be presented with an appropriate message advising whether the anomaly association was successfully created or not.

If the creation was successful, and you ticked the checkbox “Open Anomalies form after creation / selection?”, the Anomalies form will be opened with the newly created Anomaly / Association pre-selected.



Example of the Anomalies Form

Maintain Reconciliation Anomalies									
Anomaly Ref	Anomaly Description	Load ID	Recon Type	Logical Table / Entity	Dimension	Variant	Table Member	Assoc. Level	
REC_ISS_013	Incorrect selection criteria		1 Type 2 - Group By	Accident_Detail		S1-2-3		3	
REC_ISS_015	Rounding Error		2 Type 2 - Group By	Fleet_Lease_Detail		S1-2-3		3	
REC_ISS_015	Rounding Error		2 Type 2 - Group By	Accident_Invoice		S1-2-3		4	
REC_ISS_016	Conversion errors due to incompatibility of nulls in		1 Type 3 - Entity Dimension	Vehicle	Infringements	S1-2-3		1	
REC_ISS_017	Records missing from the Document Generator Lo		1 Type 1 - Record Count	Document_Generator_Log_Detail		S1-2		1	
REC_ISS_017	Records missing from the Document Generator Lo		2 Type 1 - Record Count	Document_Generator_Log_Detail		S1-2		1	
REC_ISS_017	Records missing from the Document Generator Lo		1 Type 1 - Record Count	Document_Generator_Log_Heade		S1-2		1	
REC_ISS_017	Records missing from the Document Generator Lo		2 Type 1 - Record Count	Document_Generator_Log_Heade		S1-2		1	
Record: 1 of 3 of 8 Unfiltered Search									
Anomaly Details Anomaly Associations									
Load ID	Recon Type	Logical Table / Entity	Dimension	Table Member	Variant	Assoc. Level	Stage	Entity ID	Group 1 Group 2
	2 Type 2 - Group By	Fleet_Lease_Detail			S1-2-3	3		2005	
	2 Type 2 - Group By	Accident_Invoice			S1-2-3	4 2: FMS in Azure		2021-07	-1

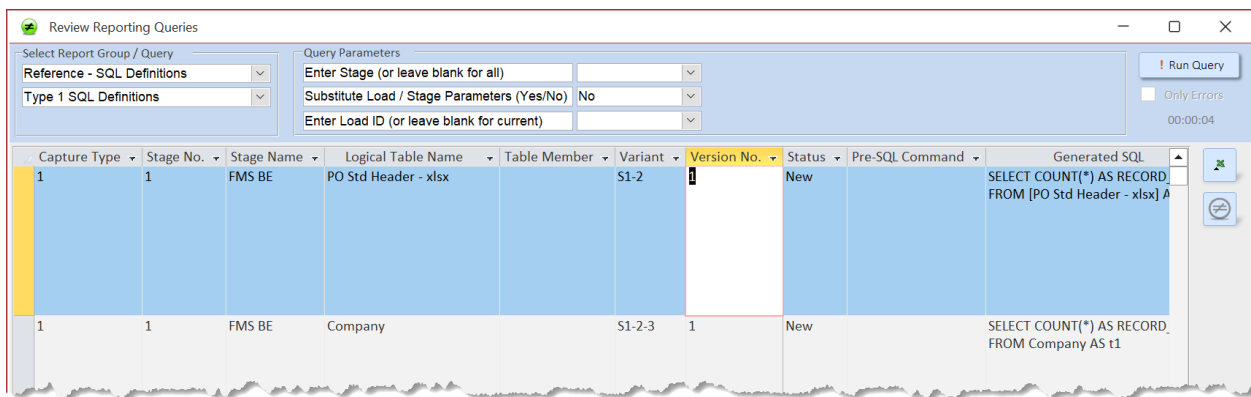
5.11 Reference Reports

The reference reports use the same Review Reporting Queries form discussed under the Operational Reports, section 5.9. The types of reference reports are described in section 4.1.7, Reference Reports Menu, but essentially cover:

- The SQL Definitions associated with the various types of Capture Definitions, and
- Data Quality Metrics related reference data (Metric definitions, DQ Owners and Targets)

SQL Definitions

The screenshot below shows an example of the output of a Type 1 SQL Definitions report executed for All Stages, no substitution of parameter values for the current Load ID.



Capture Type	Stage No.	Stage Name	Logical Table Name	Table Member	Variant	Version No.	Status	Pre-SQL Command	Generated SQL
1	1	FMS BE	PO Std Header - xlsx		S1-2	1	New		SELECT COUNT(*) AS RECORD FROM [PO Std Header - xlsx] A
1	1	FMS BE	Company		S1-2-3	1	New		SELECT COUNT(*) AS RECORD FROM Company AS t1

The results can be exported to Excel by clicking on the  export button and following the prompts.

5.12 Publishing Results

Generating reports and analysis during a data migration exercise, particular the final Go-Live conversion, can be a time-consuming and stressful process. ReQuon simplifies and fast-tracks this process by allowing the data reconciliation analyst to:

- Pre-configure one or more consolidated "Report Export Group" definitions, comprising multiple operational and reference data reports, for publishing to a single Excel Workbook.
- Utilize out-of-the-box Excel templates to accelerate setup of the reports. Can be customized as required.
- The consolidated reports can be run individually (on-demand), or bulk published as a set of reports via a single initiation.

The various menu options under the "Publish Results" menu are described in section 4.1.8, Publish Results Menu. This section will focus primarily on the "Maintain Report Groups & Definitions" form.



5.12.1 Maintaining Report Export Groups and Definitions

The Maintain Report Export Groups and Definitions form is comprised of two (2) main sections:

1. The Report Export Group list, where new report groups can be created, and header level parameters defined.
2. The Report Content Definitions list, where individual report queries are added to the report group and configured with the relevant input parameters required.

We will start by looking at the setup of a typical Reconciliation Report.

Report Export Group header

Field	Description
Short-Name	Used in the report menus to refer to the specific report
Filename Template	A template for the export filename (excluding the file extension). Can contain substitution parameters such as <Load_ID> and <date>. Right-click in the field to access the substitution parameter popup menu.
Excel Template	The base Excel template to use when generating the report. Can contain static content not sourced from the report content queries
Title	Title for the report. Can be substituted into the report during generation.
Subject	Subject of the report. Can be substituted into the report during generation.
Report Category	Selects one of the pre-configure report categories, which can be used in the Output Directory configuration to determine where the generated report will be saved to.
Load ID	The Load ID specified here can be automatically passed to every query defined within the report group

Field	Description
Active	Only active reports will be visible in the report menus for execution.

Report Content Definitions

Sequence	Query Name	Worksheet Name	Active	Param Name	Param Value
1	Type 1 Detailed Results	Type 1 Detailed Results S1-2	☒	Enter Load ID	[Report Load ID]
	Excel Template	Type 1 Details Results.xltx		Enter Lower Stage	1
	Orientation	Landscape		Enter Upper Stage	2
	Output Column Headings	☐	Autofit Columns	☐	
	Start Output At Row	2	Start Output At Column	1	
	Num Rows To Freeze	0	Num Columns To Freeze	5	
	Description Detailed results of Type 1 (Record Count) comparisons between Stages 1 and 2				

Field	Description
Sequence	The sequence number field determine the order of the worksheets within the consolidated Excel workbook.
Query Name	Dropdown list containing the names of 30+ in-build operational and reference data reporting queries that can be incorporated into the report export group.
Worksheet Name	The name that will be given to the worksheet tab within the consolidated report
Active	Only active content definitions will be included in the generated report. Enabling or disabling individual definitions allows the user to customise the content for a particular report execution without having to permanently delete entries.
Excel Template	The name of an existing Excel Template suitable for the selected reporting query. Can be one of the out-of-the-box templates or a custom-made template
Orientation	Landscape or Portrait. Landscape is the most common orientation used.
Output Column Headings	If enabled, the first exported row will contain the column headings prior to the actual data. Usually disabled when using a template that has customized the headings.
Autofit Columns	If enabled, the column width with automatically resized fit the data. Useful when no template is used.
Start Output at Row	For extracts without an Excel Template, this will usually be row 1. Where a template it used it is usually row 2 and we disable "Output Column Headings"
Start Out at Column	Usually set to column 1
Num Rows to Freeze Num Columns to Freeze	Used to freeze the corresponding number of rows and columns in the Excel spreadsheet to assist when scrolling up and down through the sheet
Autofit Columns	Will automatically resize the columns to fit the data. Useful when no template is used.
Param Name 1 to 6 Param Value 1 to 6	Upon selecting the Query Name, the relevant parameter names will automatically be populated. The user specifies the appropriate parameter values suitable for the required output, utilizing the values presented in the Param Value dropdown lists, or free text (as applicable to the parameter). Note: For parameters involving Load ID, [Report Load ID] is a special value that means use the Load ID that was specified in the Report Export Group header record.
Description	A user-defined description to explain what the extract represents. The description can be substituted into the export as part of the Table or Contents. Refer to the out-of-the-box "Data Reconciliation Report.xltm" template.

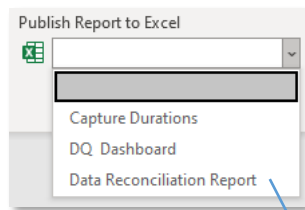
5.12.2 Running the Reports

After configuring the required Report Export Groups, they can be run via one of two ways:

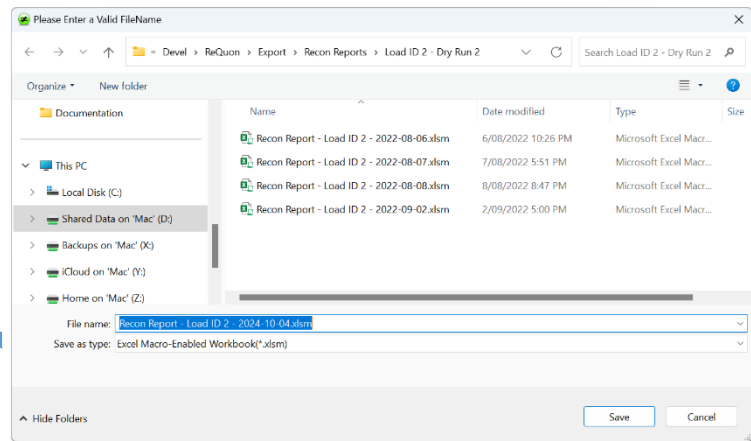
1. Selection from the "Publish Report to Excel" dropdown, or
2. Selection via the "Bulk Publish Report" form

Publish Report to Excel

The dropdown will list all active Report Export Group reports. To run the report, simply select it from the list.



A dialog box will be displayed to specify the directory and filename to use when saving the report. Both the directory and the filename will be defaulted based on the Output Directory configuration and the filename template specified in the Report Export Group header (after any substitution parameters have been applied).



Click Save to start the generation process.

Warning: If a file already exists with the same name, it will be overwritten.

While the report is being generated the progress of the current query can be viewed in either the left or right-hand side of the Status / Message bar, at the bottom of the application window.

2: Generating file Recon Report - Load ID 2 - 2022-08-06.xlsm, worksheet Type 2 Detailed Results S1-2 - record 840

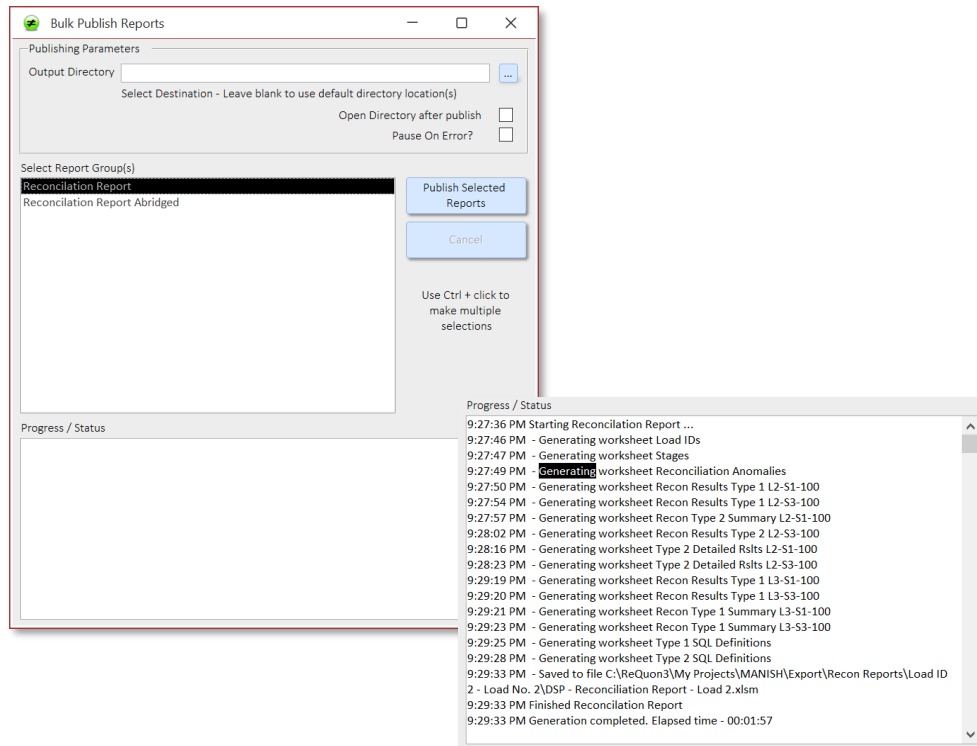
Generating SQL's for Capture Type = 1 Num Lock

At the end of the generation process, the exported file will be automatically opened in Excel for viewing.

Bulk Publish Report

The Bulk Publish Reports option allows the user to select multiple reports to be generated and saved to either:

- a common folder (if the Output Directory is specified), or
- the default locations previously configured, based on the category of the report.



While the reports are being generated the progress of the current query can be viewed in either the left or right-hand side of the Status / Message bar, at the bottom of the application window. In addition, the overall progress (by Excel sheet within each report) can be viewed directly in the form.

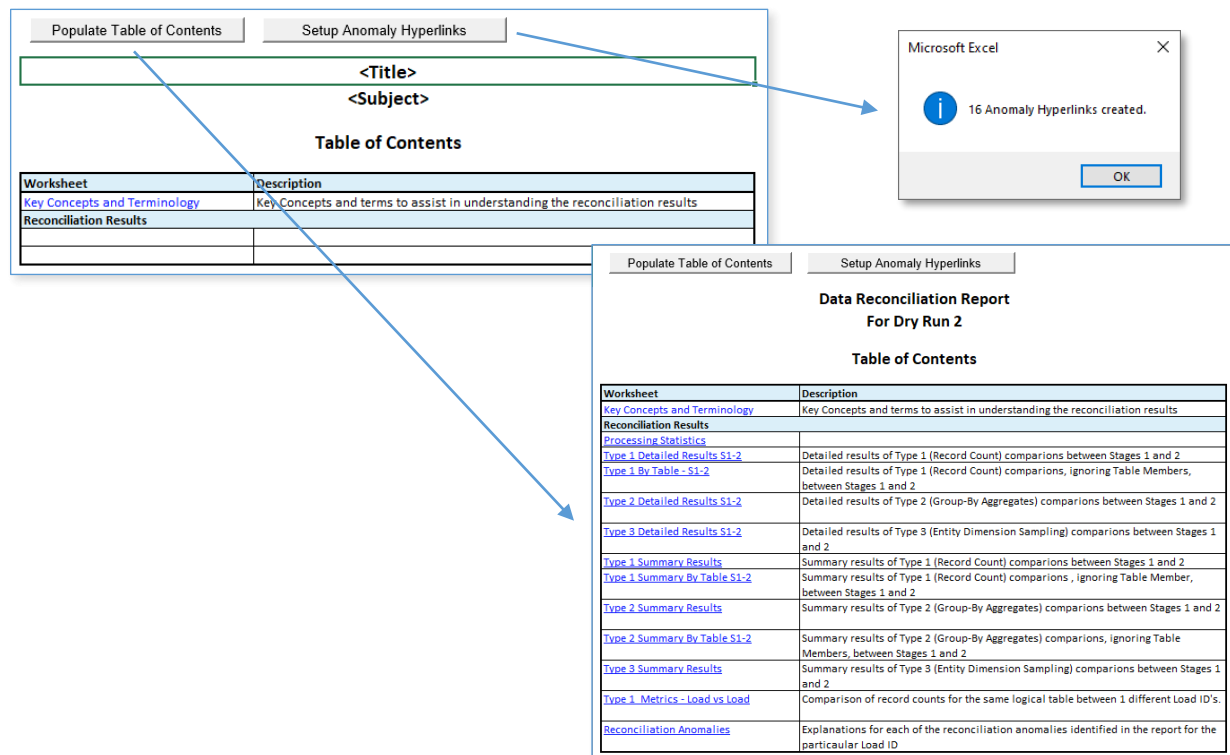
2: Generating file Recon Report - Load ID 2 - 2022-08-06.xlsm, worksheet Type 2 Detailed Results S1-2 - record 840

Generating SQL's for Capture Type = 1  Num Lock

5.12.3 Key Features of the Reconciliation Report Template

The reconciliation report template contains several specific features including:

1. Macro to generate a Table of Contents with hyperlinks to each worksheet.
2. Macro to setup hyperlinks between the anomaly references in the relevant reconciliation results and the Reconciliation Anomalies sheet, which contains the details of each anomaly.
3. Embedded contextual information (in the form of the expression definitions and column aliases from the Capture Definitions) for the **Group-By** and **Value** fields in Type 2, Type 3 and Processing Statistics query output.



Populate Table of Contents Setup Anomaly Hyperlinks

<Title>
<Subject>

Table of Contents

Worksheet	Description
Key Concepts and Terminology	Key Concepts and terms to assist in understanding the reconciliation results
Reconciliation Results	
Processing Statistics	
Type 1 Detailed Results S1-2	Detailed results of Type 1 (Record Count) comparisons between Stages 1 and 2
Type 1 By Table - S1-2	Detailed results of Type 1 (Record Count) comparisons, ignoring Table Members, between Stages 1 and 2
Type 2 Detailed Results S1-2	Detailed results of Type 2 (Group-By Aggregates) comparisons between Stages 1 and 2
Type 3 Detailed Results S1-2	Detailed results of Type 3 (Entity Dimension Sampling) comparisons between Stages 1 and 2
Type 1 Summary Results	Summary results of Type 1 (Record Count) comparisons between Stages 1 and 2
Type 1 Summary By Table S1-2	Summary results of Type 1 (Record Count) comparisons, ignoring Table Member, between Stages 1 and 2
Type 2 Summary Results	Summary results of Type 2 (Group-By Aggregates) comparisons between Stages 1 and 2
Type 2 Summary By Table S1-2	Summary results of Type 2 (Group-By Aggregates) comparisons, ignoring Table Members, between Stages 1 and 2
Type 3 Summary Results	Summary results of Type 3 (Entity Dimension Sampling) comparisons between Stages 1 and 2
Type 1 Metrics - Load vs Load	Comparison of record counts for the same logical table between 1 different Load ID's.
Reconciliation Anomalies	Explanations for each of the reconciliation anomalies identified in the report for the particular Load ID

Microsoft Excel

16 Anomaly Hyperlinks created.

OK

Populate Table of Contents Setup Anomaly Hyperlinks

Data Reconciliation Report
For Dry Run 2

Table of Contents

Worksheet	Description
Key Concepts and Terminology	Key Concepts and terms to assist in understanding the reconciliation results
Reconciliation Results	
Processing Statistics	
Type 1 Detailed Results S1-2	Detailed results of Type 1 (Record Count) comparisons between Stages 1 and 2
Type 1 By Table - S1-2	Detailed results of Type 1 (Record Count) comparisons, ignoring Table Members, between Stages 1 and 2
Type 2 Detailed Results S1-2	Detailed results of Type 2 (Group-By Aggregates) comparisons between Stages 1 and 2
Type 3 Detailed Results S1-2	Detailed results of Type 3 (Entity Dimension Sampling) comparisons between Stages 1 and 2
Type 1 Summary Results	Summary results of Type 1 (Record Count) comparisons between Stages 1 and 2
Type 1 Summary By Table S1-2	Summary results of Type 1 (Record Count) comparisons, ignoring Table Member, between Stages 1 and 2
Type 2 Summary Results	Summary results of Type 2 (Group-By Aggregates) comparisons between Stages 1 and 2
Type 2 Summary By Table S1-2	Summary results of Type 2 (Group-By Aggregates) comparisons, ignoring Table Members, between Stages 1 and 2
Type 3 Summary Results	Summary results of Type 3 (Entity Dimension Sampling) comparisons between Stages 1 and 2
Type 1 Metrics - Load vs Load	Comparison of record counts for the same logical table between 1 different Load ID's.
Reconciliation Anomalies	Explanations for each of the reconciliation anomalies identified in the report for the particular Load ID

Figure 11 - Example Reconciliation Report Table of Contents

Recon_Ref	Load ID	Logical Table Name	Table Member	Variant	A Value 1	B Value 1	Var 1	A Value 2	B Value 2	Var 2	A Value 3	B Value 3	Var 3	Matched	OK	Anomaly Ref	
L2.1-2	2	Fleet		S1-2-3	3	3	0	0	0	0	0	0	0	0	✓	-1	
L2.1-2	2	Fleet		S1-2-3	7	7	0	0	0	0	0	0	0	0	✓	-1	
L2.1-2	2	Fleet		S1-2-3	2	2	0	0	0	0	0	0	0	0	✓	-1	
L2.1-2	2	Fleet_Lease_Detail		S1-2-3	0	0	0	0	0	0	17	17	0	0	✓	-1	
L2.1-2	2	Fleet_Lease_Detail		S1-2-3	0	0	0	0	0	0	1	1	0	0	✓	-1	
L2.1-2	2	Fleet_Lease_Detail		S1-2-3	1240	1240	0	0	0	0	1	1	0	0	✓	-1	
L2.1-2	2	Fleet_Lease_Detail		S1-2-3	0	0	0	606.73	606.73	0	1	1	0	0	✓	-1	
L2.1-2	2	Fleet_Lease_Detail		S1-2-3	7573.75	7573.75	0	756.4975	756.4975	0	4	4	0	0	✓	-1	
L2.1-2	2	Fleet_Lease_Detail		S1-2-3	2729.7143	2729.7142	-0.0001	853.2486	853.2485	-0.0001	14	14	0	0	✓	-1	REC_ISS_015
L2.1-2	2	Fleet_Lease_Detail		S1-2-3	15850.9967	15850.9967	0	716.9595	716.9594	-0.0001	246	246	0	0	✓	-1	
L2.1-2	2	Fleet_Lease_Detail		S1-2-3	16222.4214	16222.4214	0	795.5302	795.5301	-0.0001	252	252	0	0	✓	-1	
L2.1-2	2	Fleet_Lease_Detail		S1-2-3	30291.3021	30291.302	-0.0001	845.3629	845.3629	0	369	369	0	0	✓	-1	
L2.1-2	2	Fleet_Lease_Detail		S1-2-3	30137.1541	30137.154	-0.0001	774.287	774.287	0	528	528	0	0	✓	-1	

Figure 12 - Example of an Anomaly Hyperlink



Anomaly Ref	Business Obj / Entity Type	Variant	Load	Capture Type	Description	Cause	Resolution	Status	Analysed By
REC_ISS_001	Fleet_Lease_Detail	S1-2-3	Dry Run 2	2	Anom 1			New	
REC_ISS_002	PO Header	S5-10	Dry Run 2	2	Anom 2			New	
REC_ISS_011	Vehicle	S1-2-3	Dry Run 2	3	First type 3 detailed anomaly			New	
REC_ISS_015	Fleet_Lease_Detail	S1-2-3	Dry Run 2	2	Rounding Error	Capture definitions aren't rounding the aggregate values to a pre-defined number of digits after the decimal point	Add rounding to the relevant capture definition(s)	Analysis Complete	John Smith
REC_ISS_017	Document_Generator_Log_Detail	S1-2	Dry Run 2	1	Records missing from the Document Generator Log tables			New	
REC_ISS_017	Document_Generator_Log_Header	S1-2	Dry Run 2	1	Records missing from the Document Generator Log tables			New	
REC_ISS_019	AP Invoice Header	S4-10	Dry Run 2	2	Type 2 Summary Results			New	
REC_ISS_020	Vehicle	S1-2-3	Dry Run 2	3	Type 3 Summary Results			New	
REC_ISS_021	Fleet	PS	Dry Run 2	PS	Processing Stats			New	

Figure 13 - Example of an Anomaly Master List

Recon_Ref	Load ID	Logical Table Name	Variant	A Status	B Status	Group1	Group2	Group3	Group4	Group5	A Value 1	B Value 1	Var 1	A Value 2	B Value 2	Var 2	A Value 3	B Value 3	Var 3		
L2.1-2	2	Fleet	S1-2-3	P	P	3	3	0	Inactive		3	3	0	0	0	0	0	0	0	0	
L2.1-2	2	Fleet	S1-2-3	P	P	3	3	1	Inactive		7	7	0	0	0	0	0	0	0	0	
L2.1-2	2	Fleet	S1-2-3	P	P	4	12	1	Inactive		2	2	0	0	0	0	0	0	0	0	
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P						0	0	0	0	0	0	17	17	0	0	
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	1997					0	0	0	0	0	0	1	1	1	0	
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2001					1240	1240	0	0	0	0	1	1	1	0	
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2003					0	0	0	606.73	606.73	0	1	1	1	0	
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2004					375	7573.75	0	756.4975	756.4975	0	4	4	4	0	
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2005					743	2729.7142	-0.0001	853.2486	853.2485	-1E-04	14	14	14	0	
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2006					967	15850.9967	0	716.9595	716.9594	-0.0001	246	246	246	0	
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2007					16222	4214	16222	4214	0	795.5302	795.5301	-0.0001	252	252	0
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2008					30291	3021	30291	302	-0.0001	845.3629	845.3629	0	369	369	0
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2009					30137	1541	30137	154	-0.0001	774.287					0
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2010					3449	1.9978	31902.9977	-0.0001	816.714						0
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2011					2.7221	30762.722	-1E-04	839.5124							0
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2012					3.5767	34233.5767	0	857.8856							0
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2013					6.9548	35966.9548	0	914.5839							0
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2014					6.4649	37476.4648	-1E-04	890.4912	890.4911	-0.0001	332	332	332	0	
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2015					7.3736	36887.3736	0	889.5973	889.5973	-1E-04	203	203	203	0	
L2.1-2	2	Fleet_Lease_Detail	S1-2-3	P	P	2016					28629	8846	28629	8846	-1E-04	870.8641	870.8641	-1E-04	165	165	0

Figure 14 - Example of embedded contextual information for expressions

5.12.4 Key Features of the DQ Dashboard Template

The data quality dashboard template provides a high level, visual representation of the key DQ issues to complement the DQ Detailed Results Report.

1. Matrix Based Summary Dashboard (DQ Metrics vs Owner Groups).
2. DQ Detailed Results Report
3. DQ Metrics Trending Charts

Metric Name	Values	Owner Group										
		Investment Management	Management Services	Group						NZ	Singapore	Asia
AP Invoices - Not fully Paid after 90 days	Latest Count	1	3	13		90	650	0	0	6	228	
	Target Date	06-May-13	06-May-13	06-May-13		05-Aug-13	05-Aug-13	05-Aug-13	06-May-13	05-Aug-13	05-Aug-13	
	\$Value	\$56	-\$2,021	-\$48,290		-\$95,054	\$1,219,481			-\$967,461	\$3,401,838	
	On Target	✗	✗	✗		✗	✗	✓	✓	✗	✓	
ICT Assets - not match to Asset Register on Serial No.	Latest Count	420	397			489	2543		2831			
	Target Date	06-May-13	06-May-13			05-Aug-13	05-Aug-13		06-May-13			
	\$Value											
	On Target	✗	✗			✗	✗		✗			
Open AR Invoices older than 30 days	Latest Count	2	15	27		482	354	11	0	7	162	
	Target Date	06-May-13	06-May-13	06-May-13		05-Aug-13	05-Aug-13	05-Aug-13	06-May-13	05-Aug-13	05-Aug-13	
	\$Value	\$868,635	\$684,203	\$6,478,664		\$272,286,787	\$108,910,918	\$47,072		-\$253,780	\$30,319,385	
	On Target	✓	✗	✗		✓	✗	✗	✓	✗	✗	
PO's - not Finally Closed < \$10	Latest Count		84	140		31455	14618			512	2911	
	Target Date		06-May-13	06-May-13		05-Aug-13	05-Aug-13			05-Aug-13	05-Aug-13	
	\$Value		\$5	\$1		\$1,120	\$676			\$106	\$193	
	On Target		✗	✗		✗	✗			✗	✗	
Projects - Open but Inactive since FY11	Latest Count		109	23		27	74		2		11	
	Target Date		06-May-13	06-May-13		05-Aug-13	05-Aug-13		06-May-13		05-Aug-13	
	\$Value											
	On Target		✗	✗		✓	✗		✓		✓	
GL - Unposted Journals	Latest Count			0	126		3			2	7	15
	Target Date			06-May-13	05-Aug-13		05-Aug-13			05-Aug-13	05-Aug-13	05-Aug-13
	\$Value											
	On Target			✓	✗		✓			✗	✓	✓
PO's - Finally Closed with Open or Partially Paid Invoices	Latest Count						110				5	
	Target Date						05-Aug-13				05-Aug-13	
	\$Value						-\$409,140				\$7,118	
	On Target						✗				✗	

Figure 15 - DQ Summary Dashboard

Stage	Metric Name	Owner Group	Priority	Baseline Date	Baseline Value	Latest Date	Latest Value	Target Date	Target Value	Avg Daily Rate	Req'd Run Rate	% Complete	Est. Completion Date	On Target
Oracle R11	AP Vendor - Mandatory Address Line 1 Missing	Singapore	High	1/28/2013	1	25-Feb-13	1	12-Apr-13	0	0.03	0.03	0.00%		No
Oracle R11	Mismatch between AP Retention and Custom Retention	Singapore	High	1/28/2013	922	25-Feb-13	922	12-Apr-13	0	0	27.46	0.00%		No
Oracle R11	PO's - not Finally Closed < \$10	Singapore	High	1/28/2013	4580	25-Feb-13	3629	12-Apr-13	0	45.9103	108.1	20.76%	15-Jun-2013	No
Oracle R11	Projects - Open but Inactive since FY11	Singapore	High	1/28/2013	20	25-Feb-13	10	12-Apr-13	0	0.48276	0.3	50.00%	26-Mar-2013	Yes
Oracle R11	GL - Unposted Journals	Singapore	Low	1/28/2013	13	25-Feb-13	8	12-Apr-13	0	0.24138	0.24	38.46%	12-Apr-2013	No
Oracle R11	AP Invoices - Not fully Paid after 90 days	Singapore	Med	1/28/2013	387	25-Feb-13	340	12-Apr-13	0	2.26897	10.13	12.14%	22-Sep-2013	No
Oracle R11	Open AR Invoices older than 30 days	Singapore	Med	1/28/2013	237	25-Feb-13	254	12-Apr-13	0	-0.8207	7.57	-7.17%		No
Oracle R11	PO's - Finally Closed with Open or Partially Paid Invoices	Singapore	Med	1/28/2013	3	25-Feb-13	4	12-Apr-13	0	-0.0483	0.12	-33.33%		No

Figure 16 - DQ Detailed Results Report

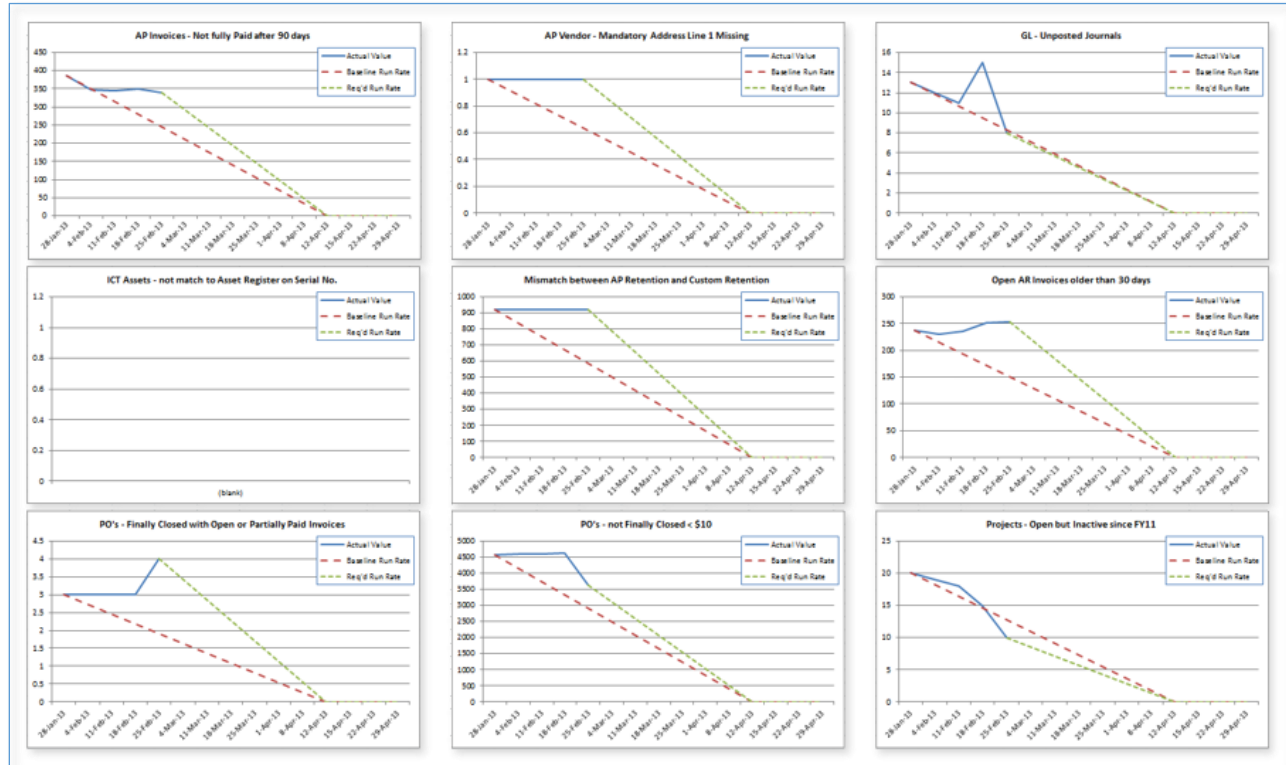


Figure 17 - DQ Metrics Trending Charts

Appendix A Acronyms, Abbreviations & Definitions

Term	Meaning
Load ID	Reconciliation metrics need to be captured at an appropriate point in time to be effective. The concept of a Load ID is used to define a temporal reference point / baseline against which a set of metrics can be captured and subsequently reported. Refer to section 2.2.2 for more details.
ODBC	Open Database Connectivity (ODBC) is a standard application programming interface (API) for accessing database management systems (DBMS). Refer https://en.wikipedia.org/wiki/Open_Database_Connectivity
OLEDB	OLE DB (Object Linking and Embedding, Database, sometimes written as OLEDB or OLE-DB), an API designed by Microsoft, allows accessing data from a variety of sources in a uniform manner. The API provides a set of interfaces implemented using the Component Object Model (COM); it is otherwise unrelated to OLE. Microsoft originally intended OLE DB as a higher-level replacement for, and successor to, ODBC, extending its feature set to support a wider variety of non-relational databases, such as object databases and spreadsheets that do not necessarily implement. Refer https://en.wikipedia.org/wiki/OLE_DB
SQL Variant	A SQL Variant recognizes that different databases (e.g., Ms Access vs SQL Server vs Oracle, etc.) contain variations in supported SQL syntax. ReQuon comes with several pre-configured SQL Variants, however the user can configure several key syntax settings to support other variations.
Stage	Each Stage typically represents a physical layer from which reconciliation metrics can be captured and subsequently compared (reconciled) against metrics captured from a different Stage . Refer to section 2.2.1 for more details.
Variant	To differentiate between multiple set of metrics that need to be defined and captured from the same Stage and Logical table , the identifying keys used to identify a specific metric definition includes an additional label referred to as the " Variant ". Refer to section 2.2.5 for more details.

Appendix B Microsoft ODBC Desktop Database Drivers – Scalar Functions

The Microsoft ODBC Desktop Database Drivers support the following **minimum** set of scalar functions:

CONCAT	LCASE	RIGHT
CONVERT	LEFT	RTRIM
CURDATE	LENGTH	SUBSTRING
CURTIME	LOCATE	UCASE
DATABASE	LTRIM	USER
DAYOFMONTH	MOD	YEAR
DAYOFWEEK	MONTH	

Further details can be found at:

<https://learn.microsoft.com/en-us/sql/odbc/reference/appendixes/scalar-function-escape-sequence>

<https://docs.microsoft.com/en-us/sql/odbc/microsoft/scalar-functions>

<https://docs.microsoft.com/en-us/sql/odbc/reference/appendixes/appendix-e-scalar-functions>

<https://support.microsoft.com/en-us/office/odbc-scalar-functions-4d311cc4-aadb-486c-a11b-3bf8b77543f1>

<https://learn.microsoft.com/en-us/sql/odbc/reference/develop-app/interoperability-of-sql-statements>

<https://learn.microsoft.com/en-us/sql/odbc/reference/appendixes/appendix-c-sql-grammar>

<https://learn.microsoft.com/en-us/sql/odbc/reference/appendixes/odbc-escape-sequences>

<https://learn.microsoft.com/en-us/sql/odbc/reference/appendixes/date-time-and-timestamp-escape-sequences>

Appendix C General Housekeeping

C.1 Ms Access Backend

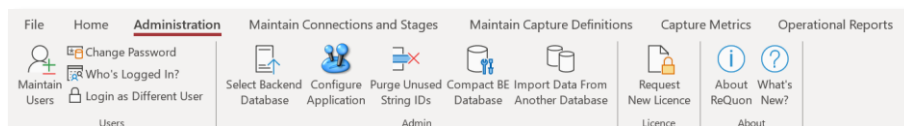
The primary housekeeping activities for a Microsoft Access database are:

- Ensure you take regular backups of your project backend database(s).
- Manage the size of the databases (which is limited to 2Gb).

“Database files can grow quickly as you use them, sometimes impeding performance. They can also occasionally become corrupt or damaged. You can use the Compact and Repair Database command to prevent or fix these problems. The compact process does not compress your data — it makes your database file smaller by eliminating unused space. The Compact and Repair Database command can also help improve performance of your database.”²

There are three ways to manage the size of your project backend databases:

1. Purge old metric capture results once they are no longer required. E.g. once the results have been published. There are 3 ways to purge results:
 - Purge results for an individual Capture Definition via the Capture Definition forms. Refer section 5.6.6.
 - Purge all results for a specific Load ID. Refer section 5.1.10 – “Maintain Load ID's”.
 - Purge results for a specific Capture Definition and Load ID. Refer section 5.8.3 – “Review Metric Counts”.
2. Purge Unused String IDs. ReQuon stores “Group By” strings once and then references them in the capture results, via a String Id. If the results that referenced a particular string have all been deleted, then the unused String Id's can also be deleted to free up space. To purge any unused strings from the currently selected backend database, navigate to the Administration menu and click on the “Purge Unused String IDs” option.



3. Run Compact and Repair on the backend (BE) database. To compact and repair the currently selected backend database, navigate to the Administration menu and click on the “Compact BE Database”

Note: This saves a copy of the original (uncompacted) database and then compacts the backend. The last 3 versions of the backend are retained in case you need to recover to an earlier version.

² <https://support.microsoft.com/en-au/office/compact-and-repair-a-database-6ee60f16-aed0-40ac-bf22-85fa9f4005b2>

Appendix D Troubleshooting

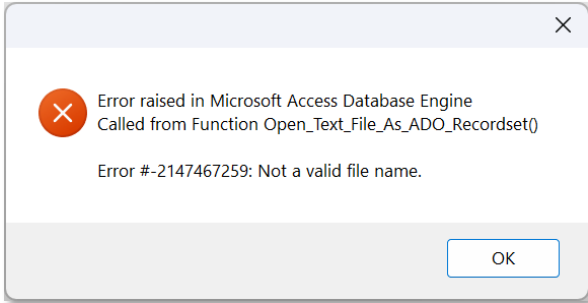
D.1 Connectivity

There are a wide variety of reasons / causes that result in the inability to connect to a data source. The following table provides some common causes. Wherever possible, refer to the vendor documentation for the relevant ODBC or OLEDB drivers.

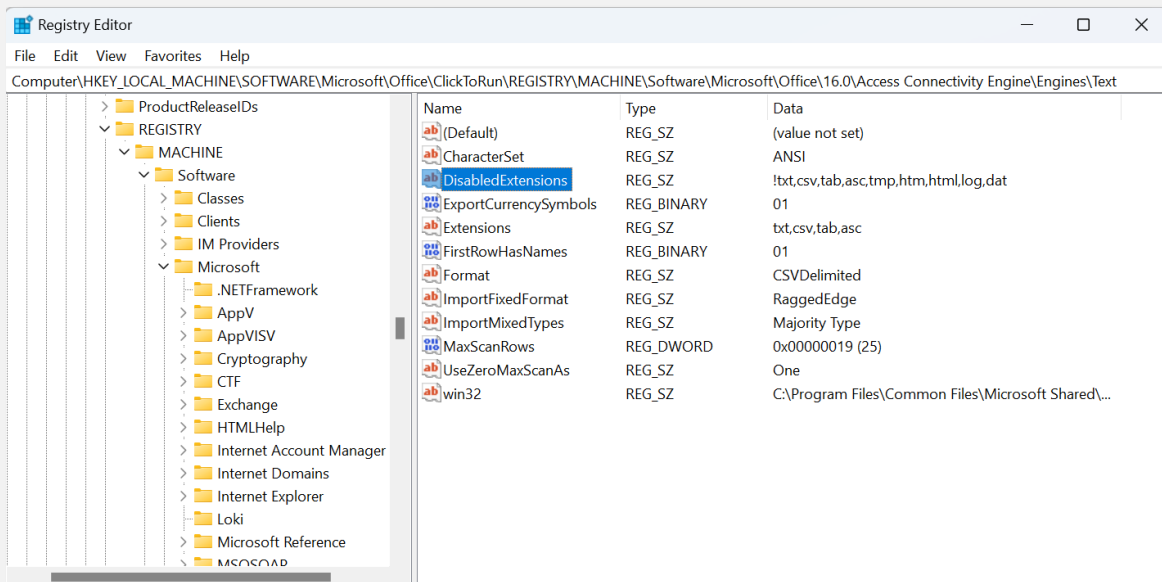
Symptom	Possible Causes / Resolution
Unable to establish a connection to a data source	Wrong driver installed or wrong version. Ensure the bitness (32-bit vs 64-bit) of the driver you have installed matches the bitness of the version of Ms Office / Access that you installed. Unless a specific reason exists, generally aim to install the latest version of the driver.
	Invalid / mis-formed connection string. Check the relevant documentation to ensure the correct parameter names and values have been specified. Some drivers can be quite finicky with the structure of the connection string. E.g. an unexpected space char can cause some drivers to error.
	Invalid login / authentication credentials. Depending upon the security regime setup for the specific data source, verify that you have the correct username/password details or authentication keys / certificates, etc.
	Firewall settings are blocking the relevant ip-address(es) and/or ports. Consult with the data source and/or networking support teams to determine if this may be the cause of the error.
Connection works sometimes and fails other times	Instability of the source system. Check if there are any known issues with the stability of the target data source
	The Connection is via a load balancer and not all the required ip-address / ports have been opened. Consult with the data source and/or networking support teams to determine if this may be the cause of the error.



D.2 Importing Metadata

Symptom	Possible Causes / Resolution
Import fails with “Not a valid file name.” but the filename is correct. 	The file extension is not in the list of accepted extensions. Resolution: Refer to Much ADO About Text Files Working with Custom File Extensions - https://learn.microsoft.com/en-us/previous-versions/windows/internet-explorer/ie-developer/scripting-articles/ms974559(v=msdn.10)#working-with-custom-file-extensions While the above link refers to the older Jet database engine, the same applies to the newer ACE (Access Connectivity Engine). Depending upon your version of Ms Access installed, you may need to search for the applicable registry path.

Example configuration within the register to allow the processing of *.dat files via the Text reader.





D.3 Capture Metric Failures

Symptom	Possible Causes / Resolution
Metric capture fails with an error such as: Syntax error (missing operator) in query expression 'SUM(75thpercentile)'	Field name commences with a numeric character. E.g. 75thPercentile. Some drivers (such as the csv text driver) don't expect field names to commence with a number, so an expression such as SUM(75thPercentile) will cause the capture to fail. To resolve this, ensure the field name is enclosed in the appropriate field name delimiters. E.g. SUM([75thPercentile])
Use of the standard format function on a date field within a text-based source file returns null	The format function available in Ms Access does not error when processing Text files but returns null when trying to format a date field to 'yyyy-mm'. In this scenario, the same result can be achieved with the follow expression: YEAR(<datefield>) & '-' & RIGHT('0' & MONTH(<datefield>),2)
Formatting of field data types for text file imports not as expected based on the schema.ini definition	The schema.ini has not be saved after making changes to the field type / formatting definitions in the database. Re-save the schema.ini file, making sure that you select ALL the files that are referenced in the capture definition. Repeat, every time new files are added to the capture definition.
	One or more of the file names contain special characters that cause the txt driver to NOT find the relevant entry in the schema.ini file. e.g. a filename containing % (such as %3A being a html encoded replacement for the colon : character) will cause the lookup within the schema.ini file to not find a match. The workaround is to rename the file to remove any special characters. Note: Remember to re-generate / save the schema.ini file using the new file names.



Symptom	Possible Causes / Resolution																														
Error "In the text file specification '<filename>' the Col<n> option is invalid"	- If the imported metadata included a memo / adLongVarChar field with a Defined Size > 99999 then upon execution of the Capture Definition you will get this error. File Structure DefinitionFile Column Definitions <table><tr><th>Col No.</th><th>Column Name</th><th>Data Type</th><th>ADO Data Type</th><th>Defined Size</th><th>Actual Size</th></tr><tr><td>1</td><td>id</td><td>Long</td><td>adInteger</td><td>4</td><td>4</td></tr><tr><td>2</td><td>schema_id</td><td>Text</td><td>adVarChar</td><td>255</td><td>72</td></tr><tr><td>8</td><td>nodes</td><td>Memo</td><td>adLongVarChar</td><td>536870910</td><td>134444</td></tr><tr><td>9</td><td>rules</td><td>Memo</td><td>adLongVarChar</td><td>536870910</td><td>6336</td></tr></table> There are two options to address this issue: - Manually modify the relevant column definitions and change the Defined Size to 99999 or less. - If there were no overridden column definitions, then you can delete all of the File <i>Column</i> Definitions for the specific file and simply rely on the File <i>Structure</i> Definition to correctly import the data.	Col No.	Column Name	Data Type	ADO Data Type	Defined Size	Actual Size	1	id	Long	adInteger	4	4	2	schema_id	Text	adVarChar	255	72	8	nodes	Memo	adLongVarChar	536870910	134444	9	rules	Memo	adLongVarChar	536870910	6336
Col No.	Column Name	Data Type	ADO Data Type	Defined Size	Actual Size																										
1	id	Long	adInteger	4	4																										
2	schema_id	Text	adVarChar	255	72																										
8	nodes	Memo	adLongVarChar	536870910	134444																										
9	rules	Memo	adLongVarChar	536870910	6336																										