How to Copy Master Data Using a Delta Refresh Process
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**Introduction**

The purpose of this document is to help keep the master data in your target client fresh by periodically copying master data that has been newly created and/or has been changed in your production system.

This guide provides the necessary steps for copying master data based on date ranges, specifically using created on and changed on dates, as the basis for the data selection.

For most organizations, the Gold Client steps defined in this document should be deployed by your designated Powerusers (Superusers) with possible assistance in some areas from the Basis team.

It is possible to setup a similar process for copying transactional data; however, this document specifically focuses on master data since keeping it refreshed is a more common requirement among Gold Client customers.

If your organization feels the need to vary from the recommended processes documented here, freely contact the Qlik team to discuss alternative approaches and potential impacts.

Note: The screen captures in this document are from the 8.7 version of Gold Client. It should be possible to use the copy process described here for versions 8.0-8.5 but the screens may look a bit different. Prior to version 8.0, it’s unlikely that this process could be executed due to the enhancements having been made to the software in recent years.
Process Overview

Important: This use case assumes that a target client has already been created using Gold Client software and our recommended best practices which means that an initial mass load of all master data into the target client has already been performed. Reference the use case document named *How to Build a Target Client Using a Repeatable Process* for details about this process.

It is first necessary for your organization to determine which data objects are in scope for the delta refresh process; some typical examples are: materials, customers, vendors, cost centers, assets, GL accounts, internal orders, and equipment. Once this list of data objects is known, the team must then create a series of scenarios that covers the scope of data to be copied.

For each data object that is to be copied, two scenarios could be created; the first is using a Created On date, and the second, a Changed On date. Each organization can decide if only one date or both should be included in the selection criteria. For the purpose of providing holistic documentation, this guide covers both sets of dates.

Using a Changed On date for some data objects is not as easy as it seems. Objects like Customers, Vendors, and GL Accounts do not contain a Changed On date field on their respective tables so this means that the Change Document tables (i.e. CDHDR) must be used as the basis for the Scenario instead. What this means is that to create the Scenario in a meaningful (and optimal) manner is that the Change Document object type must be known (Tip: see the Appendix for a list of the more common master data Change Object types). Configuration may then need to be added to the Data Echo framework to support these requirements.

Once the Scenarios have been created for the various data objects, they can be added to a single Export ID so that they are all managed in a central location. The ‘Adjust Date Range’ functionality located within Export Control can then be used to create a dynamic variable such as ‘today -7 days’. This program and variable, along with the Scenarios assigned to the Export ID, will be set to execute as periodic jobs that will help make this a repeatable copy process. Additionally, the auto-import option available in Export Control can be used so that the import process runs after the export is complete which then fully automates this process.
Creating Data Scenarios

Prior to copying data, your organization must first identify which data objects are in scope for the given data refresh process. Once this list is known, the team must then create a series of scenarios that covers the scope of data to be copied. This section focuses on how to create these scenarios.

For each data object that is to be copied, two scenarios could be created. The first is using a Created On date, and the second, a Changed On date; in this manner, data that has been created or changed within the selected date range will be included in the data copy. Each organization can decide if only one or both dates should be included and whether or not other dates also should be included for certain data objects. For the purpose of providing holistic documentation, this section covers both Created On and Changed On dates.

Additionally, for certain data objects it may be necessary to create a Scenario for Changed On dates using the Change Document tables of CDHDR and CDPOS. Taking into account these variables, there are really three different types of Scenarios that could be created and so the section of this document is organized accordingly:

1. Using the Created On date from the data object’s header table
2. Using the Changed On date from the data object’s header table
3. Using the Changed On date from the Change Document header table
Creating Scenarios Using the Data Object’s Created On Dates

This section is used when needing to create a Scenario for a data object using Created On dates. The material master object is used in this example. The material header table, MARA, contains a Created On field, and data type MM - MATERIAL MASTER is used to create the Scenario.

Tip: See the Appendix for a list of the most commonly used master data types available in Gold Client

1. In the Source client (typically Production), go to t-code ZGOLD and select the Data Snap function
2. Input the data type to be used; for example, MM - MATERIAL MASTER, and select the Execute button (Fig. 1.0)

3. On the following screen, populate the mandatory Export Description field with a relevant value (Fig. 1.1)

4. In the Created On date fields input a date range using ‘today’ as the end date (Fig. 1.2)
   - Notes:
i. If the Data Snap screen does not contain the Created On date field, it must first be added to the Data Snap configuration. Reference the section in the Appendix named Configuring Data Snap for detailed instructions on how to make this change.

ii. The date range input here is essentially irrelevant since it will be changed later on in the process, so the recommendation is just to put in something simple like a 2-day period.

iii. Based on the Data Snap configuration that has been defined, other fields besides Created On may be mandatory. In most cases these fields can simply be populated by an asterisk (*).

5. Select the 'Save As Scenario' button located on the toolbar. Click the 'Online' button when the system asks how to “Execute Save Scenario” (Fig. 1.3).

6. Close the message that appears regarding the number of data records found. The system then responds with the Scenario number that was saved (Fig. 1.4); make note of this detail as the Scenario number will be used when adding it to the Export Control function.
7. Return to the previous screen to repeat steps 2-6 above for other data objects as warranted
8. Once all Scenarios have been created for the various data objects using Created On dates, exit out to the main Gold Client screen
Creating Scenarios Using the Data Object’s Changed On Dates

This section is used when needing to create a Scenario for a data object using Changed On dates. This content uses the equipment master object as an example. The equipment header table, EQUI, contains a Changed On field, and data type CA - EQUIPMENT DATA is used to create the Scenario.

1. In the Source client (typically Production), go to t-code ZGOLD and select the Data Snap function
2. Input the data type to be used; for example, CA - EQUIPMENT DATA, and select the Execute button (Fig. 2.0)

![Figure 2.0]

3. On the following screen, populate the mandatory Description field with a relevant value (Fig. 2.1)

![Figure 2.1]

4. In the Changed On date fields input a date range using ‘today’ as the end date (Fig. 2.2)
   - Notes:
     i. If the Data Snap screen does not contain the Changed On date field, it must first be added to the Data Snap configuration. Reference the section

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in the Appendix named Configuring Data Snap for detailed instructions on how to make this change.

ii. The date range input here is essentially irrelevant since it will be changed later on in the process, so the recommendation is just to put in something simple like a 2-day period.

iii. Based on the Data Snap configuration that has been defined, other fields besides Changed On may be mandatory. In many cases these fields can simply be populated by an asterisk (*).

Figure 2.2

5. Select the ‘Save As Scenario’ button located on the toolbar. Click the ‘Online’ button when the system asks how to “Execute Save Scenario” (Fig. 2.3).

Figure 2.3

6. Close the message that appears regarding the number of data records found. The system then responds with the Scenario number that was saved (Fig. 2.4); make note of this detail as the Scenario number will be used when adding it to the Export Control function.

Figure 2.4
7. Return to the previous screen to repeat steps 2-6 above for other data objects as warranted
8. Once all Scenarios have been created for the various data objects using Changed On dates, exit out to the main Gold Client screen
Creating Scenarios Using Change Documents

This section is used when needing to create a Scenario for a data object using Change Documents as the basis for the selection criteria since the data object’s primary table does not contain a Changed On date. This following content will use the customer master, vendor master, and GL account objects as examples. Because the respective header tables for these data objects (KNA1, LFA1, and SKA1) do not contain a Changed On field, a custom data type will need to be defined first which can then be used to create the Scenario.

1. In the Source client (typically Production), go to t-code ZGOLD and select the Configuration button. From the Gold Client Setup Utility screen, select the executable named Data Echo which is located under the Data Framework folder.
2. Locate and highlight data type CA - CHANGE DOCUMENTS; use the ‘Copy’ function to create a new iteration of this data type.
   - Tip: You may need to first select the ‘Display All’ filter/button located on the toolbar so that all data types appear in the left-hand frame
   - Important! It is imperative that a copy of CA - CHANGE DOCUMENTS be used in this refresh process to isolate it from all other copy processes that may already include data type CA - CHANGE DOCUMENTS

3. Name the data type something like CA - CHANGE DOCS FOR MD REFRESH and enter a File ID of CACDMD or similar (Fig. 3.0)

4. The newly created data type will be appended to the end of the Data Type list; locate the new data type and open it; then double-click on the ‘Linkages’ maintenance view (Fig. 3.1)
5. Add a link to each relevant data type; in this example a link is added to CA - GL ACCOUNTS, CA - VENDOR MASTER and to SD - CUSTOMER MASTER (Fig. 3.2); repeat this linking process to any other data types as per your organization’s requirements

6. After adding a link to each data type, it is **critical** to add the linkage details (Fig. 3.3 - 3.5)
   - Note: The linkage details for GL Accounts is an unusual case where truncation must be used to dissect the Chart of Accounts value and the GL Account value from the concatenated value that is stored in CDHDR-OBJECTID; other data types could require similar logic depending on how the data is stored in this table-field
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Figure 3.3

Figure 3.3.1
7. Staying within this same data type, select the 'Data Snap' maintenance view
8. Define the Data Snap configuration using fields OBJECTCLAS and UDATE (Fig. 3.6)

9. Exit the Data Echo framework and return to the main Gold Client screen
10. Select the Data Snap function
11. Input the new data type created in the previous steps; in this example, CA - CHANGE DOCS FOR MD REFRESH; select the Execute button (Fig. 3.7)
12. On the following screen, populate the mandatory Description field with a relevant value (Fig. 3.8)

13. In the Date field input the relevant date range using ‘today’ as the end date, and in the Change Doc Object field input the relevant object types that need to be included in the export (Fig. 3.9). In this example, values KRED, DEBI, and SACH are used which respectively represent Vendors, Customers, and GL Accounts.
   - Tip: see the Appendix for a list of the more common master data Change Object types
14. Select the ‘Save As Scenario’ button located on the toolbar. Click the ‘Online’ button when the system asks how to “Execute Save Scenario” (Fig. 3.10).

15. Close the message that appears regarding the number of data records found. The system then responds with the Scenario number that was saved (Fig. 3.11); make note of this detail as the Scenario number will be used when adding it to the Export Control function.

16. Exit out to the main Gold Client screen
Exporting the Master Data

Once the various Scenarios have been created, they need to be assigned to an Export ID so that the data copy can be initiated. The export will be subsequently defined as a periodic background job. Additionally, optional settings should be defined so that the data import will occur automatically. Having these settings defined leads to an automated copy process.

If needed, leverage the Gold Client Data Echo User Guide for more details on using the Export Control function.

1. In the Source client (typically Production), go to t-code ZGOLD and select the Export Control function
2. On the next screen create a new Export ID and input a relevant description (Fig. 4.0)
3. Click on the newly created Export ID to display its details screen (Fig. 4.0)

4. Click on the 'Add Container' button to add a new entry (Fig. 4.1)
5. Input a Data Type and Scenario number into their respective fields (Fig. 4.2)
   - **Tips:**
     i. *Input the Data Type value first, then the Scenario number*
     ii. *Use the lookup functions on both fields as this is the easiest input method*

6. Repeat steps 4 and 5 as often as necessary to add all relevant Scenarios
   - In the figure below, you will notice some Data Types, such as MM – MATERIAL MASTER, are listed twice but with different Scenario numbers; this is because one uses a **Created On** date range and the other one uses a **Changed On** date range
   - Data Types such as SD - CUSTOMER MASTER are listed only once and they use a **Created On** date. Since these data objects do not have a **Changed On** date field in their respective tables, they are exported via data type CA – CHANGE DOCS FOR MD REFRESH instead.

   ![Figure 4.2](image-url)

7. Select the ‘Import Options’ button (Fig. 4.3)

   ![Figure 4.3](image-url)

8. In the pop-up window that displays, input into the Target Destination field the appropriate RFC value that will be used to communicate to the target client. Also, check any additional options that should be selected regarding the import process, and then select the ‘Accept’ button (Fig. 4.4).
   - **Tip: You can ignore the section of this window named ‘Restrict Import’**
9. Select all Containers so that they will be included in the initial export as well as all subsequent and periodic exports (Fig. 4.5)

10. Select the ‘Schedule Jobs’ function. A message should appear assuming that the auto-import step was executed as recommended in steps 7-8 (Fig. 4.6). Select ‘Ok’ for the automated import to occur or otherwise select ‘Cancel’. This process assumes the user selects ‘Ok’ to continue.
11. In the next pop-up window that appears, change the defaulted export job name if desired (Fig. 4.7)
12. Change the export Start Options from 'Immediate' to 'Date/Time' and input a future date and time; click 'Accept' when done (Fig. 4.7)
   - Note:
     i. This job will need to be further updated so the recommendation would be to schedule this job at least one hour into the future so that you have time to modify it prior to its release
     ii. Select the 'Parallel Processing' option if so desired
13. A message appears stating that the job was submitted (Fig. 4.8); close the message and exit out to the main Gold Client screen

Figure 4.7

Figure 4.8
Automating the Refresh Process

To fully automate this refresh process it’s very important to automatically move the Created On and Changed On date ranges forward in the future so that the variant used for the data selection criteria always uses ‘today’ as the end date and then looks backwards in time a certain number of days, for example, ‘today minus 7 days’ for a refresh process that runs on a weekly basis or ‘today minus 30 days’ for a monthly refresh.

There is a function named ‘Adjust Date Range’ that is located within the Export Control function. A variant will be created for this program that will be used to adjust the date range for all of the Scenarios assigned to the relevant Export ID.

1. In the Source client (typically Production), go to t-code ZGOLD and select the ‘Export Control’ function
2. Select the relevant Export ID (created earlier in the process) and then select the ‘Adjust Date Range’ button (Fig. 5.0)

![Export Control Interface]

3. On the next screen, define the settings as follows (Fig. 5.1):
   - Processing Options: ‘Update Database’
   - Export ID: should already be populated with the relevant Export ID; if not, input as needed
   - Start Date: input today’s date
   - Radio button for date range: select the appropriate option
     - This document assumes a weekly refresh is used so ‘Last 7 days’ is selected
   - Tip: confirm the date range is correct using the ‘Calculated Date Range’ fields
4. Click the ‘Save’ button to create a variant for this screen (Fig. 5.2)
   • Provide a name and description for the variant
   • For the ‘Start Date’ field input a Selection variable = D (Dynamic Date), and for Name of Variable = Current Date
5. Save the variant; the system returns the user back to the Date Range Utility screen
6. Go to t-code SM37 to locate the job you scheduled in the previous process (“Exporting the Master Data”)
7. Select the job and then choose menu path: Job > Change
8. Click the Step button located on the toolbar (Fig. 5.3) which will take the user to the Step List Overview screen (Fig. 5.4)

![Change Job MD DELTA REFRESH TESTING](image)

9. Click the Create button and a new window will appear (Fig. 5.5). Input program /HTG/GLC_UTL_R_50 and the variant created in the previous steps, and then save your changes. The user is taken back to the Step List Overview screen. The job now includes two steps instead of just one (Fig. 5.6).
   - Notice that the new entry was added as the second step, but we need it to be the first step so that it will execute first (thereby adjusting the date range) before the export job runs.
10. To change the sequence of these two jobs, do the following:
   - Click anywhere on step 2
   - Select the Choose button located on the toolbar (Fig. 5.7)
   - Click anywhere on step 1
   - Select the Move button (Fig. 5.8); the result should be that the two steps are reversed leading to this result (Fig. 5.9)
11. Back out from this screen to return to the Change Job screen
12. Click the Start Condition button located on the toolbar (Fig. 5.10)

13. Click the Period values button and set the appropriate values (daily, weekly, monthly, etc.) according to your organization’s requirement
14. Freely adjust the Scheduled Start date and time if desired, and then save the changes; this will close the window and return the user back to the Change Job screen.
15. Save your changes once more from the Change Job screen; the system should then return the user to the Job Overview screen

The job should now execute at the date and time in which it was set for release and should repeat based on the periodic settings defined earlier in this process. The Adjust Date Range should be executed first, followed by the actual data export, and as long as the export was initiated with the automatic import settings defined, the process is now repeatable and automated.

*Tip:* Check on the first couple of runs to ensure that both the export and import are completing as expected, and to ensure that it’s occurring on a periodic basis. If not, and you are unable to resolve yourself, submit a support case to the Qlik team.
Appendix

Configuring Data Snap

If you need to customize the Data Snap screen to include a field such as Created On or Changed On, perform the following steps. Note: this customizing task can also be performed via the Data Echo framework (Configuration menu > Framework > Data Echo).

1. Go to ZGOLD and select the Data Snap function
2. On the next screen input the data type that needs to be maintained (Fig. 6.0)
3. Select the Data Type Manager button (Fig. 6.0)

4. Open the data type and double-click the Data Snap maintenance view (Fig. 6.1)
5. Click on the ‘pencil’ icon to convert the screen from display mode to change mode, and then click the ‘green plus’ icon to add a new row (Fig. 6.2).

6. Add the respective table and field values (one per row) as required
7. Save changes and exit back to the Data Snap screen
8. Repeat steps 2-7 for other data types as required

Tip: Reference the Gold Client Data Echo User Guide for more information and details regarding this customizing activity.

List of Commonly Used Master Data Types

The list of Gold Client data types below represents those which tend to be the most commonly used; however, this is not a complete list but rather a subset of the available data types that are delivered standard with the Gold Client software.

<table>
<thead>
<tr>
<th>Data Object</th>
<th>Data Type</th>
<th>Header Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset</td>
<td>CA - ASSET MASTER</td>
<td>ANLA</td>
</tr>
<tr>
<td>Bill of Materials</td>
<td>CA - BILL OF MATERIALS</td>
<td>STKO</td>
</tr>
<tr>
<td>Business Partner</td>
<td>CA - BUSINESS PARTNERS</td>
<td>BUT000</td>
</tr>
<tr>
<td>Cost Center</td>
<td>CA - COST CENTERS</td>
<td>CSKS</td>
</tr>
<tr>
<td>Customer</td>
<td>SD - CUSTOMER MASTER</td>
<td>KNA1</td>
</tr>
<tr>
<td>Document</td>
<td>CA - DOCUMENT MANAGEMENT</td>
<td>DRAD</td>
</tr>
<tr>
<td>Equipment</td>
<td>CA - EQUIPMENT DATA</td>
<td>EQUI</td>
</tr>
<tr>
<td>Functional location</td>
<td>PM - FUNCTIONAL LOCATIONS</td>
<td>IFLOT</td>
</tr>
<tr>
<td>GL Account</td>
<td>CA - GL ACCOUNTS</td>
<td>SKA1</td>
</tr>
<tr>
<td>Material</td>
<td>MM - MATERIAL MASTER</td>
<td>MARA</td>
</tr>
<tr>
<td>Personnel data</td>
<td>HR - PERSONNEL MASTER</td>
<td>PA0003</td>
</tr>
<tr>
<td>Profit Center</td>
<td>CA - PROFIT CENTERS</td>
<td>CEPC</td>
</tr>
<tr>
<td>Project</td>
<td>PS - PROJECT DEFINITIONS</td>
<td>PROJ</td>
</tr>
<tr>
<td>Purchasing Info record</td>
<td>MM - PIR</td>
<td>EINA</td>
</tr>
<tr>
<td>Vendor</td>
<td>CA - VENDOR MASTER</td>
<td>LFA1</td>
</tr>
<tr>
<td>WBS Element</td>
<td>PS - WBS ELEMENTS</td>
<td>PRPS</td>
</tr>
<tr>
<td>Work Center</td>
<td>CA - WORK CENTER HIERARCHY</td>
<td>CRHD</td>
</tr>
</tbody>
</table>
**Change Document Object Types**

This list contains those details relevant for using Change Document Objects as the basis for the export when the data object table itself does not contain a ‘Changed On’ type of field. This is not a complete list, but freely query table TCDOB ("Objects for change document creation") for additional data objects as needed. And keep in mind that you only need to use these details to copy those data objects whose header table does not have a Changed On date field.

<table>
<thead>
<tr>
<th>Data Object</th>
<th>Data Type</th>
<th>Header Table</th>
<th>Change Doc Object</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer</td>
<td>SD - CUSTOMER MASTER</td>
<td>KNA1</td>
<td>BPAR DEBI TESTRF</td>
</tr>
<tr>
<td>Document</td>
<td>CA - DOCUMENT MANAGEMENT</td>
<td>DRAD</td>
<td>DOKUMENT</td>
</tr>
<tr>
<td>GL Account</td>
<td>CA - GL ACCOUNTS</td>
<td>SKA1</td>
<td>SACH</td>
</tr>
<tr>
<td>Purchasing Info Record</td>
<td>MM - PIR</td>
<td>EINA</td>
<td>INFOSATZ</td>
</tr>
<tr>
<td>Vendor</td>
<td>CA - VENDOR MASTER</td>
<td>LFA1</td>
<td>KRED KRED_N</td>
</tr>
</tbody>
</table>
Support Information

Qlik Analytics (ISR) Ltd. can be contacted either by telephone or via email. Any support related issue regarding problems with or use of the Gold Client software and process can be reported for resolution.

If our offices are closed, or staff is unable to directly respond to a support request, we will respond within 24 hours of the initial call. Problems related to the export or import processing may require code enhancements. If a code enhancement or fix is required, resolution time may vary.

As per the maintenance agreement, any repairs or enhancements to the Gold Client software will immediately be deployed to all customers up-to-date with their maintenance contract. It is the choice of the customer as to if and when such enhancements are implemented. In addition, customers may request a planning session with Qlik to review changes in the software and how the changes might impact their environment.

We can also be contacted to discuss application or feasibility of using the Gold Client process to resolve a current challenge the project team faces. When this is required, a planning session can be scheduled in advance to ensure proper participation by both Qlik and the client.

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