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Introduction

This Gold Client program is used to artificially inflate number range statuses (current numbers) for the sole purpose of creating a buffer between natively created data within the target client and data being copied to the target via Gold Client. Generating a buffer will help avoid number range conflicts that might otherwise occur when creating new records in the target database. In turn, this provides users additional flexibility to copy data to the target.

Executing this utility in ‘Update Database’ mode will perform an update to records stored exclusively within the NRIV (Number Range Intervals) table.

Reference the Important Points section of this document for details on how the buffer is calculated.

This utility is a software enhancement that was released as part of Gold Client version 8.1.2.

Security Details

The Number Range Utility leverages the Gold Client authorization activity number ‘81’ since ideally it should only be executed by Gold Client administrators. For more details, reference the Gold Client Security Guide.

This utility cannot be executed in Production systems as a programmatic safeguard exists which prevents the occurrence.
How to Execute the Utility

From release 8.2 forwards, the utility can be accessed via the Post Process buttons located within Client Construct or Data Echo (Fig 1.0). Earlier versions of Gold Client must access it via the Configuration button.
Select the Number Range Utility from whichever Post Process button was selected from the main Gold Client screen, Client Construct (Fig. 1.1) and Data Echo (Fig. 1.2)

The end-user has the following options available when executing this utility (Fig. 2.0):

- **Processing Options**
  - “Summary Report” is the default setting and can be used to check the outcome in test mode
  - “Update Database” is used to perform the actual update to the NRIV table

- **Increase by %**
  - The default value is ‘1’ and can be any value between 1-99; however, it is highly recommended that this value be of a conservative nature -- typically a range of 5-10% is suitable for most customers
  - This value is used as the multiplier to inflate the number range current number to a higher number (based on the remaining numbers within the given range)

- **Selection Criteria**
  - “All Number Range objects” is the default setting and will update all NR objects in your system
  - “Select Number Range objects” allows the user to be selective about which number range objects are included (Fig. 2.1); available criteria include: Object, Sub-object, Number Range Number, and Year
  - Reference the **Important Points** section of this document for additional details that should be considered regarding this selection
**Number Range Table Exception**

- This table can be maintained to include number range objects that should never be included in the program’s execution -- even when the ‘All Number Range objects’ option is selected.
- A list of known number range objects has already been added to this table as part of the standard Gold Client configuration (Fig. 2.2).
- Customers can add other number range objects to the table according to the organization’s requirements.
- Note: this feature was released in version 8.5.1.

Figure 2.2

```
Display View "Number Range Utility Exception Table"

<table>
<thead>
<tr>
<th>Object</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PKK_BELEG</td>
<td>Number Range for Documents in Contract A/R and A/P</td>
</tr>
<tr>
<td>GL_FLEX0</td>
<td>Number Assignment for Object Tables GLFLEX</td>
</tr>
<tr>
<td>GL_FLEX1</td>
<td>Number assignment for object tables GLFLEX</td>
</tr>
<tr>
<td>GL_FLEX2</td>
<td>Number Assignment for Object Tables GLFLEX</td>
</tr>
<tr>
<td>GL_FLEX3</td>
<td>Number Assignment for Object Tables GLFLEX</td>
</tr>
<tr>
<td>GL_FLEX4</td>
<td>Number Assignment for Object Tables GLFLEX</td>
</tr>
<tr>
<td>GL_FLEX5</td>
<td>Number Assignment for Object Tables GLFLEX</td>
</tr>
<tr>
<td>GL_FLEX6</td>
<td>Number Assignment for Object Tables GLFLEX</td>
</tr>
<tr>
<td>GL_FLEX7</td>
<td>Number Assignment for Object Tables GLFLEX</td>
</tr>
<tr>
<td>GL_FLEX8</td>
<td>Number Assignment for Object Tables GLFLEX</td>
</tr>
<tr>
<td>HR_FEVAL2</td>
<td>HR-PAY: Accounting analyses</td>
</tr>
<tr>
<td>ISU_ERDK</td>
<td>IS-U Print Documents</td>
</tr>
</tbody>
</table>
```
A sample output of this program’s execution (Fig. 3.0); the data displayed here is explained below.

**Header information:**
- Report Mode: ‘Summary Report’ or ‘Update Database’ depending on user’s selection on the input screen
- NRIV records read: number of records read from the NRIV table depending on user’s selection on the input screen
- Increase by %: value entered by user on the input screen

**Detail information:**
- Object – name of the number range object
- Short text – description of the number range object
- Subobject Value – number range object subobject value
- Number – number range number
- Year – to fiscal year
- From Number – first number of the range
- To Number – last number of the range
- Number Status - the current number
- Updated Number - the artificially inflated number
- Remaining % - the percent of numbers remaining within the range
- Warning % - the value set in SAP for each Number Range object that once this percentage is reached a warning message is displayed
When executing the program using the 'Update Database' processing option, the user will be presented with a confirmation message. (Fig. 3.1) Selecting the 'Continue' button will permit the user to proceed while selecting the 'Cancel' button will end the process.

If the update process continues, the user will be presented with an information message about the need to flush the number range buffer. (Fig 3.2)

Flushing the number ranges must be executed via standard SAP t-code SM56; however, a short-cut to this transaction has been provided for ease-of-use purposes. (Fig 3.3)
Execution Log

This Number Range solution has been enhanced as part of the 8.7 release by adding a logging function. The details recorded in this log should help a team have proper visibility and not have to wonder whether the solution has been executed or not in a given client.

Selecting the Execution Log function (Fig. 4.0) provides the user with logging / historical details (Fig. 4.1). Who, when, and the percentage that was used, are all recorded in the log.

If the solution is executed using one or more specific number range objects, then the ‘Reason for change’ comments should reflect that fact (Fig. 4.2).

Be aware that the same logging details are also visible when executing the Configuration Change Log. Go to ZGOLD and select the Configuration menu. On the Gold Client Setup Utility screen, select the executable named Configuration Change Log (Fig. 4.3). The Config Event will be ‘NUM RANGE’ and will share the same logging content that is displayed when running it from the Number Range Solution (Fig. 4.4).
Figure 4.3

Gold Client Setup Utility

- Data Framework
  - Client Construct
  - Data Echo
  - Data Type Hierarchy Report
  - Data Type Table Query
  - Data Type Tags Maintain
  - Configuration Change Log
- Additional Tools
- Config Copy Tools
- S4/HANA Tools

Figure 4.4

Gold Client: Configuration Change Log

<table>
<thead>
<tr>
<th>User Name</th>
<th>Date</th>
<th>Time</th>
<th>Data Type</th>
<th>Config Event</th>
<th>Reason for change</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGEOGE</td>
<td>01/12/2021</td>
<td>11:27:46</td>
<td>NUM RANGE</td>
<td>Increase by 01%: All Number Ranges Updated</td>
<td></td>
</tr>
</tbody>
</table>
**Important Points**

This section includes several meaningful insights and recommendations regarding this program.

**Calculating the Number Range Exceptions**

- The logic used to calculate the inflated numbers is as follows:
  - Subtract the Current Number (NRIV-NRLEVEL) value from the To Number (NRIV-TONUMBER) value to determine the remaining amount of numbers within the allowed range
  - Multiply the calculated value from the previous step by the percentage entered by the user on the input screen; round the value up to the next integer as needed
  - Add the calculated value from the previous step to the Current Number (NRIV-NRLEVEL) value thereby resulting in the inflated number

- This program updates only internal number ranges and ignores those which are defined as external (Fig. 5.0)

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**Figure 5.0**

*Data Browser: Table NRIV: Selection Screen*
Number Range Exceptions

- With respect to the ‘All Number Range objects’ or ‘Select Number Range objects’ settings, the Qlik team has learned that a few specific number range objects should not be buffered and therefore should *not* be included in this program’s execution. The specific objects, their descriptions, and the reason for excluding them are listed below.

**FKK_BELEG** (Number Range for Documents in Contract A/R and A/P)

**ISU_ERDK** (IS-U Print Documents)
  - Buffering these two number range objects causes performance issues because the relevant SAP programs look for the last number used rather than the next number available. The assumption our team has made is that SAP doesn’t want these number ranges to have any gaps.

**GL_FLEX0** through **GL_FLEX8** (Number Assignment for Object Tables GLFLEX)
  - Buffering these number range objects has been known to cause shortdumps when executing SAP programs that call these specific number ranges

Your organization may be immune to these issues if no numbers are being consumed within these ranges. The easiest way to acquire this information is to query table NRIV using these number range objects and then check the Number range status (NRLEVEL) field to see if values exist. In the screen capture below, numbers are being consumed for several of the GL_FLEX* objects.

![Data Browser: Table NRIV Select Entries](image-url)
Flush the Buffer

After the execution of this utility, it is important to **always** flush the Number Range buffer via t-code SM56. If this task is not completed, number range conflicts may still occur even after executing the Number Range Utility.

Noteworthy Items

- This utility does not resolve those isolated situations where a Number Range’s current number is higher in the target client than the source client
- This utility updates records stored only in the NRIV table
- After having executed this utility, it’s possible that a warning message may appear when creating new records in the Target client; see the example below (Fig 5.1). This is only a warning and SAP should allow you to continue creating the actual record.
- This message may occur when new records being created exceed the warning percentage defined for the relevant Number Range object (Fig 5.2). For whatever reason, SAP may have this warning value set really high (90% or higher) for some Number Range Objects. The higher the warning value is set, and the larger the increase when executing this utility, increases the likelihood of this warning message appearing.
- If local buffering is enabled in your target system, the local buffers may also need to be reorganized in conjunction with flushing the number range buffers. Tables NRIVSHADOW and NRIV_LOKAL store data for number range objects that are buffered parallel or locally. Flushing the number range buffer in transaction SM56 will not adjust these tables, and if this is configured in your system, it could lead to number range conflicts. Flushing the local buffers can be accomplished with standard SAP program NK_REORGANIZE. It moves records in those tables to archiving tables and deletes the old local buffer. Before executing, consult SAP notes 1244898 and 1030400 for additional information.
Check number range interval (approaching interval end)

Message no. M7560

Diagnosis

The end of the interval for number assignment (material documents or reservations) has nearly been reached.

Procedure

Contact your system administrator.

If you are authorized to do so, do you want to check the number ranges for the

- Material documents
- Reservations?
**Number Range Object: Display**

Change Documents

<table>
<thead>
<tr>
<th>Object</th>
<th>WTY_CLAIM</th>
<th>Number range object has no intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short text</td>
<td>Warranty Claim</td>
<td></td>
</tr>
<tr>
<td>Long text</td>
<td>Warranty Claim</td>
<td></td>
</tr>
</tbody>
</table>

Interval characteristics

- To-year flag
- Number length domain: WTY_CLAIM
- No interval rolling

Customizing specifications

- Number range transaction
- Warning %: 98.0%

---

**Percentage for warning message**

Percentage of numbers remaining in a number range, upon reaching which in number assignment a warning is given.

**Examples**

You have defined an interval from 1 to 1000. If you want to issue a warning at the number 900, enter 10 (%) here.
Why the Number Range Solution is Needed

Some users might struggle to understand why Gold Client has a solution for adding a buffer to number ranges. The content in this section provides some visual examples as to what might happen if this solution was not available or was not executed as part of the team’s refresh process. The first four graphs explain the sequence of events that might lead to number range issues, and the final two graphs explain the solution that should avoid them.

The hypothetical example in the graph below shows a number range in Production that consists of 100,000 records where only 30,000 have been consumed to date. The entire contents of table NRIV are copied from Production to the Target client so the result is that they match initially.
Of course, the pace with which number range values are consumed in Production should exceed all non-Prod systems. In this hypothetical example where 3-months’ time has passed, the growth in Prod is 10,000 records whereas in the Target client it is a marginal number.
As time progresses it is very likely that Production data, having been created with higher numbers, will be copied to the Target client as represented by the arrow. There is no problem at this point because the data being copied to the Target is higher in the number range with respect to the data being natively created in the Target.
The problem eventually occurs as new data continues to be natively created in the Target client for those number range values which have already been consumed by data that has been copied from Production. The SAP program does not expect the data to already exist in the database and the result is that of a shortdump. This "data conflict" is represented by the red segment in the graph.
Generating a buffer between data that is copied from Production and data that is natively created in the target client will help avoid number range conflicts. Creating this buffer is the sole purpose of the Number Range Utility being available within Gold Client.

Here is a reminder of the original graph and the result after having copied the NRIV table to the Target client.
Executing the Number Range program will create a buffer in the Target client to allow for data to be copied from Prod while still being able to create new data in the Target client to avoid conflicts.

In the hypothetical example below, the program was executed with a 20% increase which is calculated using the remaining range. 100,000 - 30,000 = 70,000 * 20% = 14,000; this value is then appended to the range which has been consumed: 30,000 + 14,000 = 44,000. The buffer in this example is reflected in the graph below.

Any newly created data in the Target client will be created above the buffered range to avoid this conflict.
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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