Database Maintenance using the UC4 Utilities

Regular maintenance of the UC4 database is vital to the performance of the UC4 system. Without regular maintenance, tables that hold data relating to the previously ran objects will continue to grow to an unmanageable size. The time it takes to return the results of a query against these tables will increase which in turn will impact the running of other statements.

There are 2 supported methods for maintaining the database, using UC4 Utilities (Archive/Reorg/Unload) or Partitioning with ILM.
The most popular method of maintaining the database is with UC4 Utilities.

*Configuration for ILM is dependent on the rules set up in your database environment and is something your DBA should be familiar with. More information for ILM configuration can be found:
Administration Guide > Database > Database Maintenance > Method B – Partitioning with ILM

Depending on your record storage policy, there are 2/3 steps involved with Database Maintenance using UC4 Utilities.

1) **UC4.DB Archive** *(Optional)*
2) **UC4. DB Reorg**
3) **UC4. DB Unload**

The amount of days removed from the database can be configured to each Client. For example, if Client 100 is your Test Client and you run thousands of jobs, whereas Client 500 runs your Administrative task for this instance. In the Test Client you might not need to keep more than 7 days of history, but in your Admin Client might want to keep 90 days so you can go back and view what Administrative jobs have ran in the past quarter.
With the ability to configure each Client, Maintenance steps need to be ran for each individual Client, including Client 0.

Initial parameters for DB.Archive and DB.Unload need to be configured for Client 0.
By default, Clients will inherit the Archive parameters from Client 0. Parameters can be customized for each Client as well.
Parameters can be configured through the Graphical Interface.

The tables affected by the Database Maintenance are:

AH – Statistics
RH/RT – Reports
MELD –Messages
OH – Version Management and Deleted Objects
XAO – Auditing Records

Performance improvement

The archiving, reorganizing and unloading processes can take some time if huge amounts of data are involved. The following tips can help to improve performance by accelerating the above processes:

- When reorganizing, avoid using the option "Keep the last *n* statistics." By doing so, the utility UC4.DB Reorg does not count all statistical records of all objects but directly starts the reorganization process using the date as a basis.
- Only reorganize reports if they should be reorganized before the statistical records. If this option is not activated, the utility UC4.DB Reorg reorganizes reports together with the statistical records.
- In the utility UC4.DB Unload, specify that no REORG files should be generated. The corresponding parameter suppress_output= is available in the INI file section [REORG].

Step 1 – UC4.DB Archive *(Optional)*

Copies Statistical Records/Reports and Messages and stores them in an Archive file which can be stored and viewed using the Archive Browser at a later date. Records are then flagged with an Archive flag to indicate they have been Archived.

**If there is no need to view this info at a later date, this step can be skipped. If skipping the Archive step, change the parameter 'no_archive_check=1' in the INI file for the Reorg and Unload.

More information can be found:
*Administration Guide > Utilities > UC4.DB Archive*

Archiving affects 4 tables:
MELD – Messages
AH – Statistics
RH/RT - Reports

DB.Archive GUI:
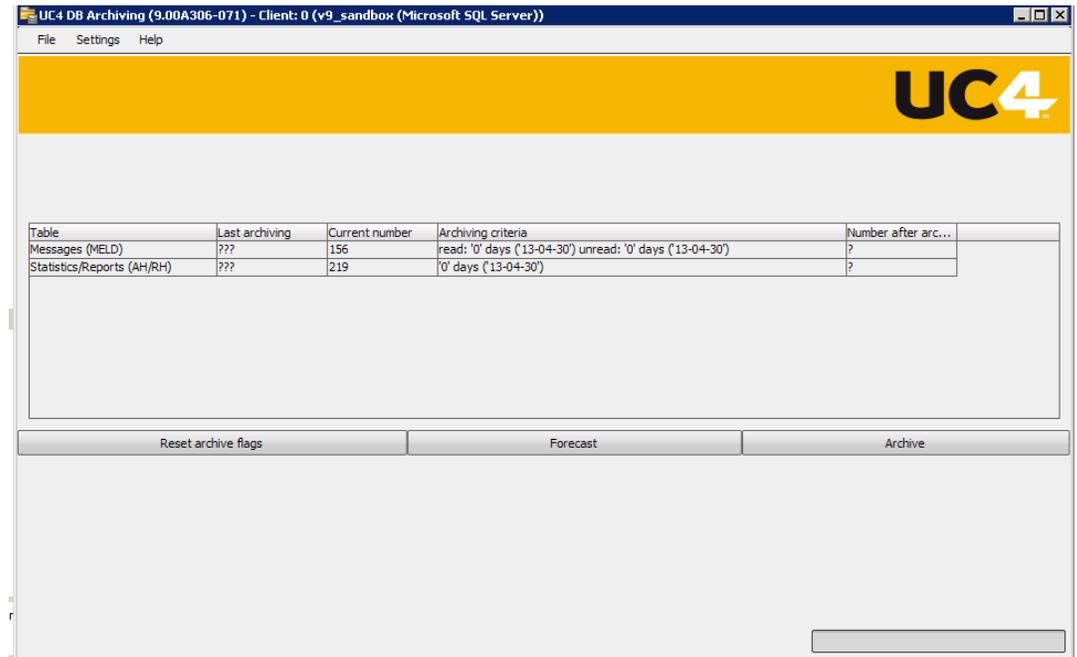
To edit parameters, select 'Settings' under the Settings menu.

Specify the number of dates to keep in the database for the Messages and Statistics Tab:
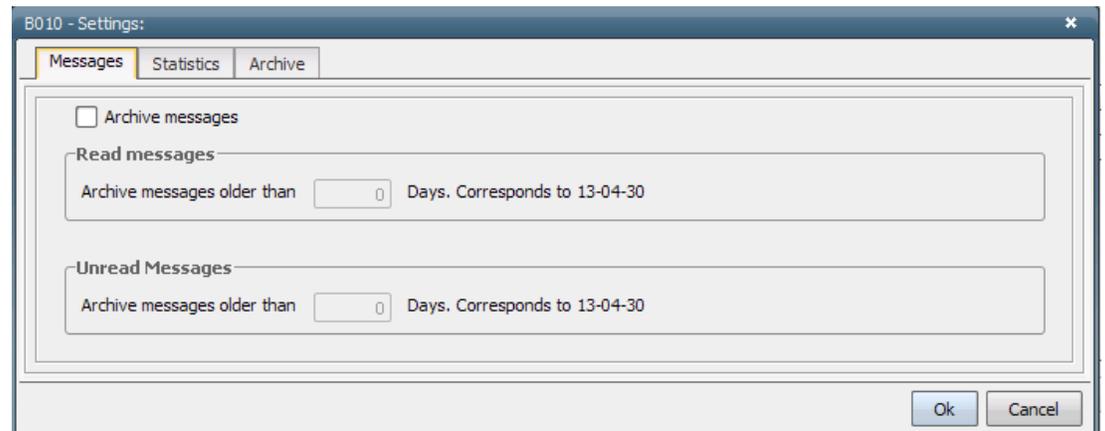
On the Archive tab, specify where the Archived files should be stored and the size for each file.
*The location should be local to where the DB.Archive will be running.
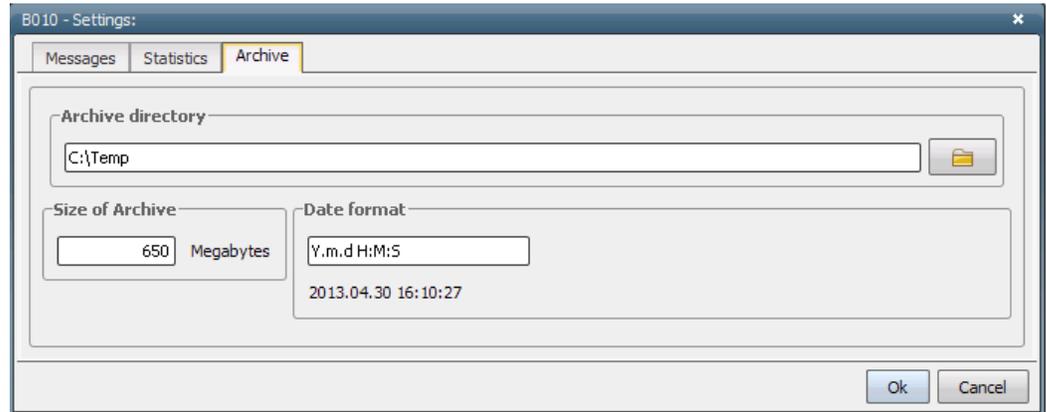
Archived Data can be viewed using the Archive Browser UCYBARBR.EXE.
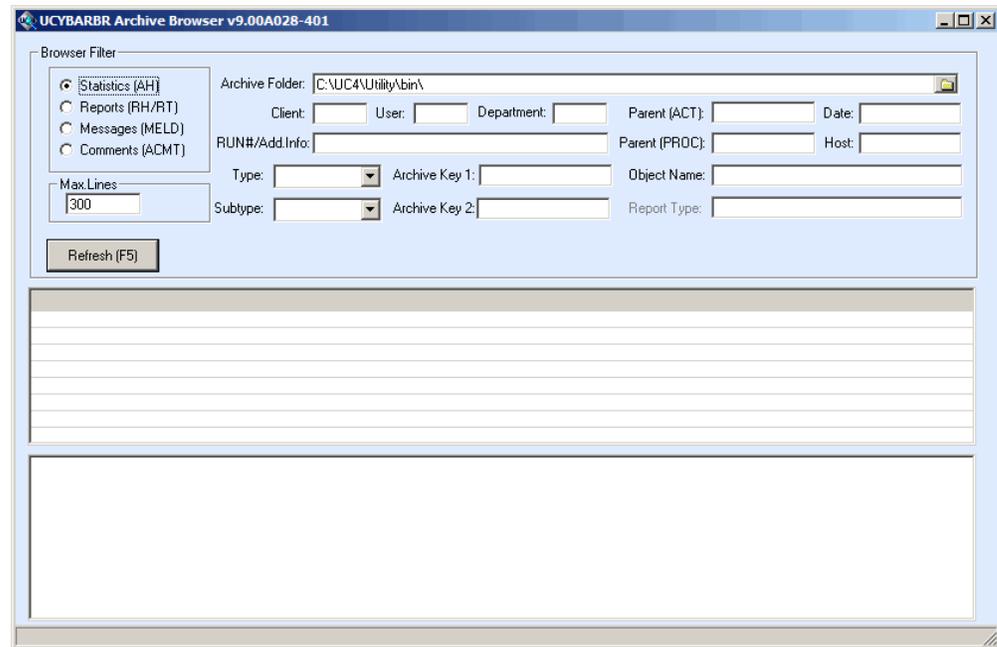
This Archive Browser contains the basic functions for analyzing UC4 archive files. You can modify this program if you require additional functions. The source code of the Archive Browser is provided on the UC4 CD in the folder "CD:TOOLS\SOURCE\UCYBARBR". The source code is available in Microsoft Visual Basic. The Archive Browser will be adjusted to the requirements of new versions but no further development is planned.

More information can be found:
Administration Guide > Utilities > UC4.DB Archive > Archive Browser

Step 2 – UC4.DB Reorg

DB.Reorg marks records with a deletion flag for removal from the database through the DB.Unload Utility. This includes any objects that have been moved to the Recycle Bin.

Reorging affects the following tables:
MELD – Messages
AH - Statistics
RH/RT - Reports
OH – Version Management *(if Version Management has been enabled)*
XAO – Auditing Records *(if Auditing has been enabled)*

More information can be found:
Administration Guide > Utilities > UC4.DB Reorg

DB.Reorg GUI:
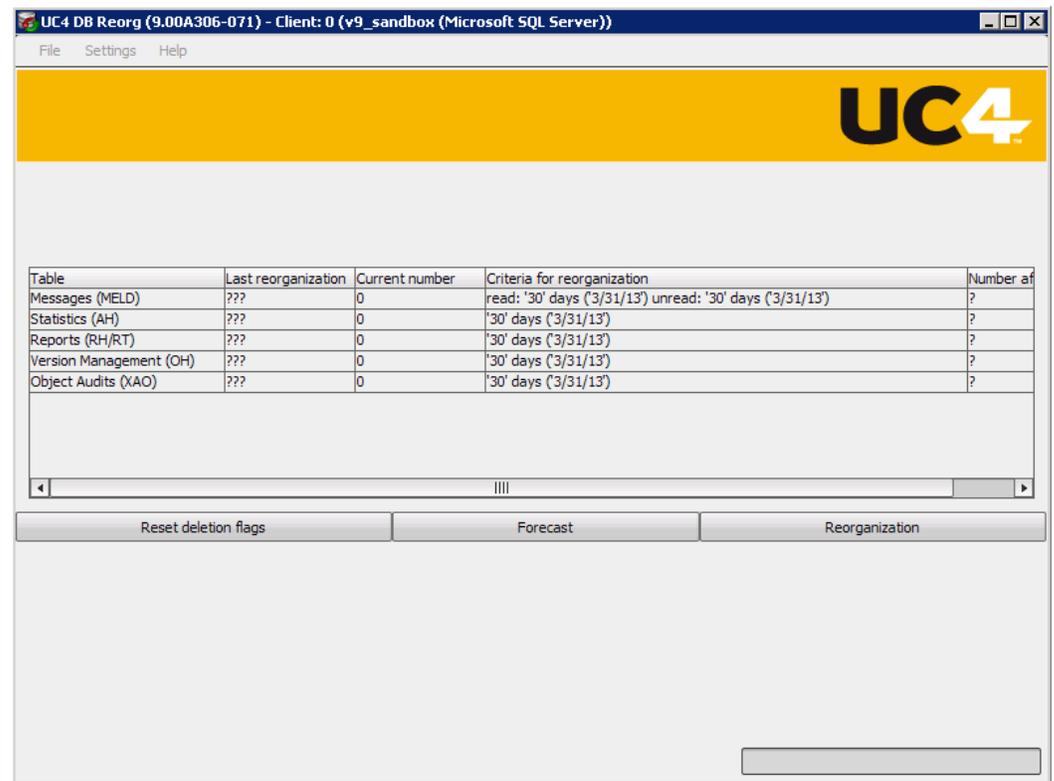
To edit/define parameters, select 'Settings' under the Settings menu.

*The dates defined for DB.Reorg do not need to match. The DB.Unload will only remove records with both the DB.Archive and DB.Reorg flags set.
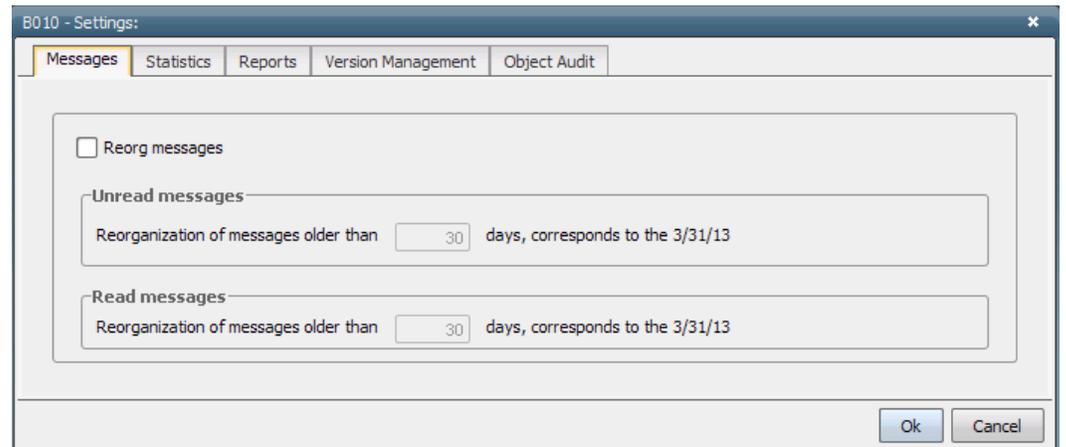
Statistics, Reports, and Version Management Tab

DB.Reorg allows you to reorganize records older than *x* days AND keep the last *n* records.

This is useful for accessing records for objects that aren't executed very often. The utility checks the number of records that lie within the reorganization period and if this number is below *n*, it also keeps *n* records that do not lie within the reorganization period.
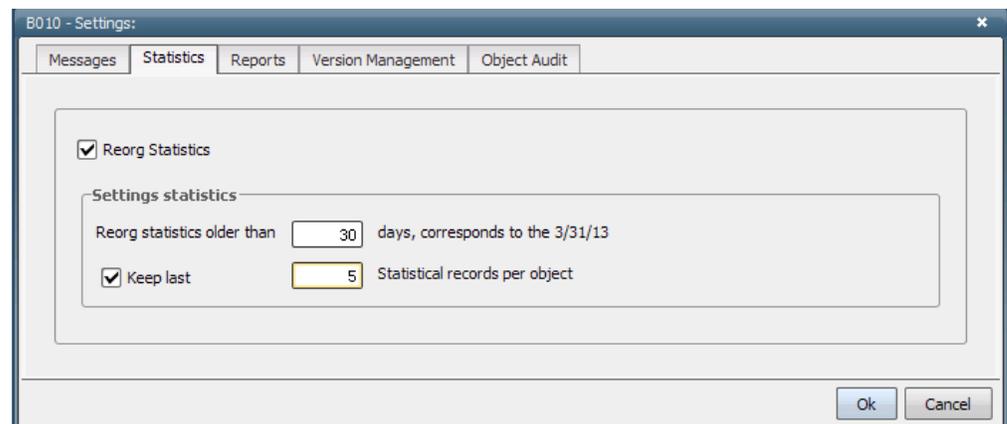
Object Audit Tab

When OBJECT_AUDIT is enabled through the UC_CLIENT_SETTINGS variable, records are written to the XAO table.
More information about Object Auditing can be found:
Administration Guide > Utilities > UC4.DB Revision Reports
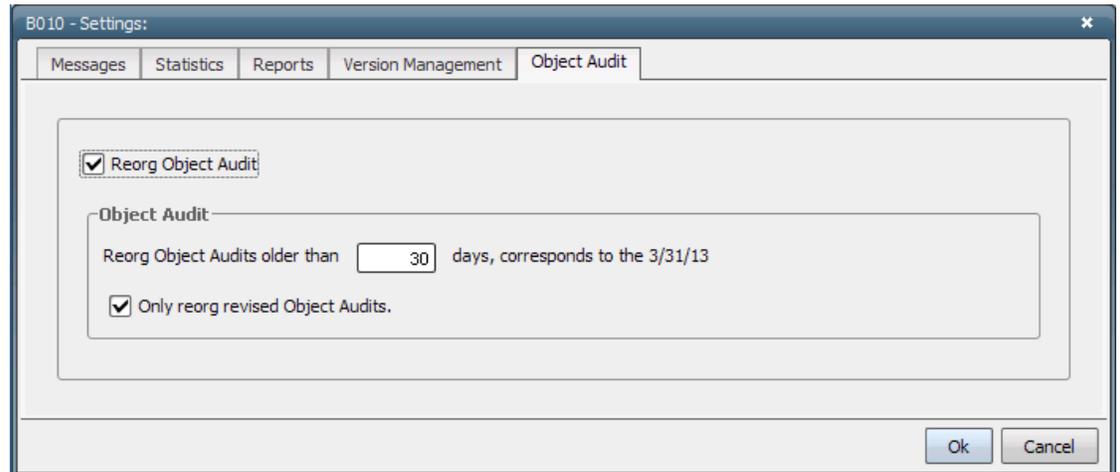
Step 3 – UC4.DB Unload

Removes the records flagged with the Archive and Reorg flags (or just Reorg if the Archiving step is ignored).
Please be aware, once the data has been 'Unloaded' it CANNOT be restored.

More information can be found:
*Administration Guide > Utilities > UC4.DB Unload*

Unload GUI:
Select 'Reorganize database' in the DB.Unload GUI to remove the records marked for deletion.
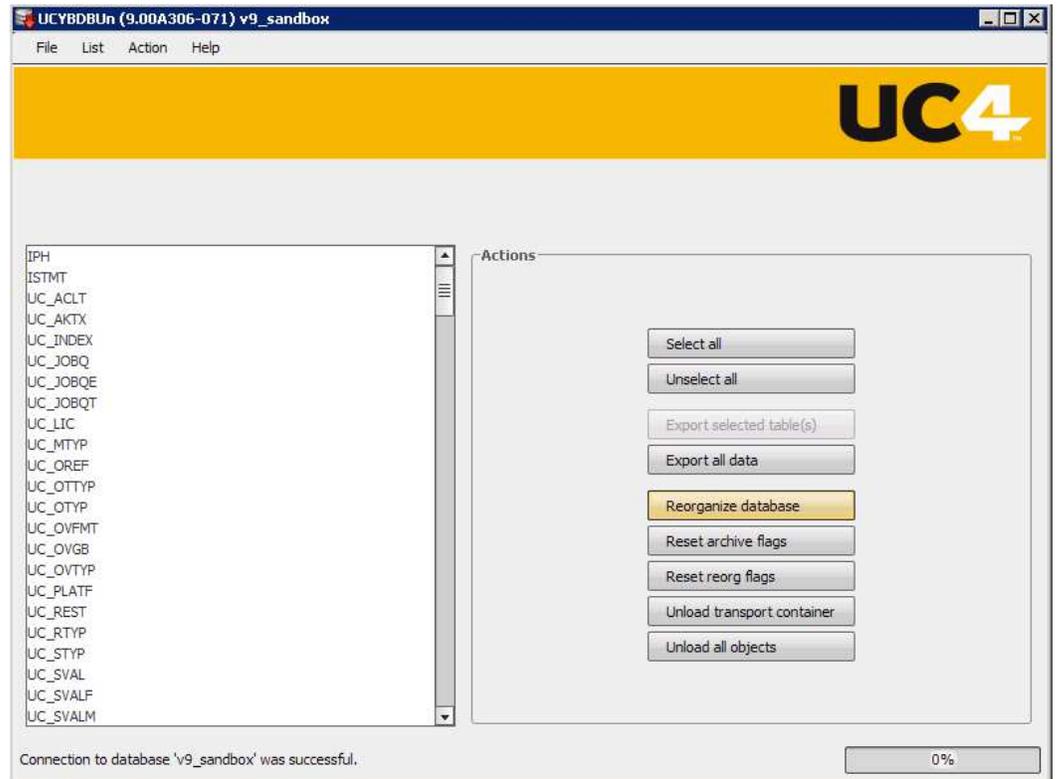
When running the DB.Unload in Batch mode, the syntax would be:
ucybdbun -BREORG

The DB.Unload can also be used to reset the flags for records in one or all client, which have already been flagged by the DB.Archive or DB.Reorg.
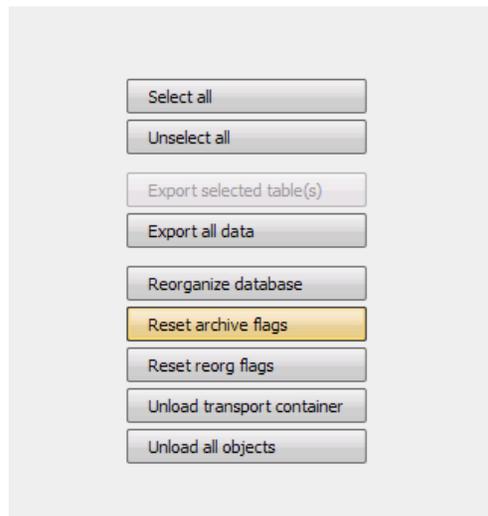
Example Runbook of UC4 Maintenance:

Create a SQLI variable named 'CLIENTS'.
Add the following SQL statement to the variable:
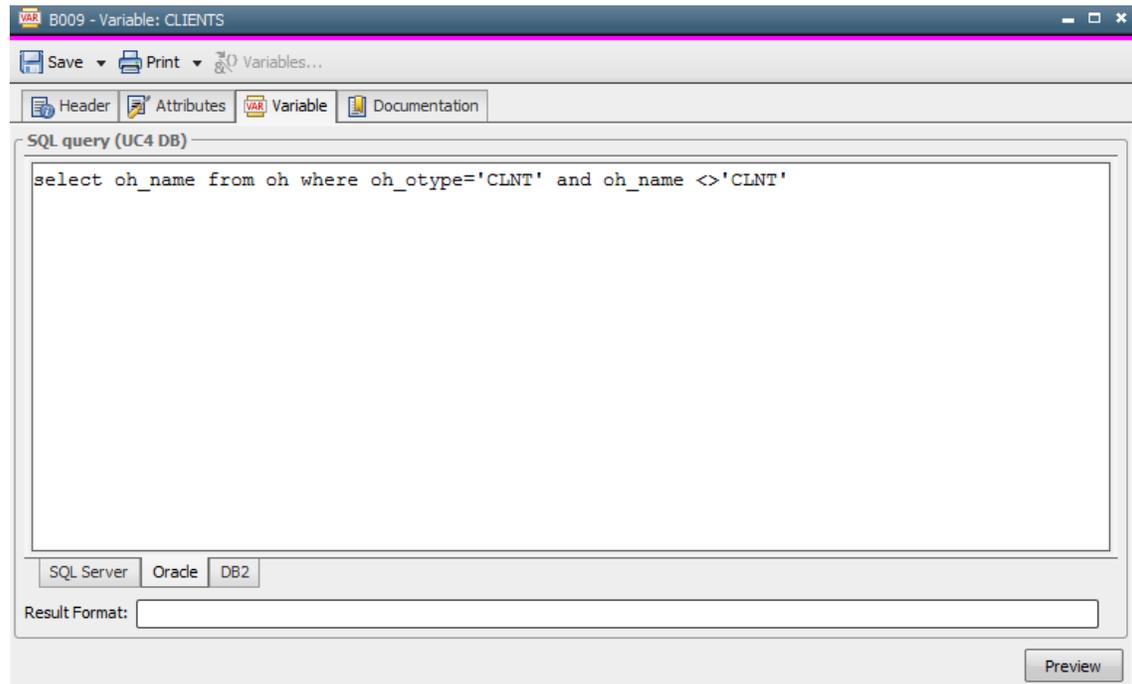
DB.Archive

Create a Job object called 'ARCHIVE.CLIENT.ALL'.
In the Process Tab of the job add the following script depending on which OS the Job will be ran on.

For Unix:

```
:set &clnt#=prep_process_var(CLIENTS)
:process &clnt#
:  set &num#=get_process_line(&clnt#,1)
<path to utility/bin/ ucybdbar ie /home/qa4/uc4/v9/utility/bin/ucybdbar >  -B -
S&num#
:endprocess
:close_process &clnt#
```

For Windows:
 On the 'Windows' tab, put in the path to the Utility Bin Directory.

On the Process Tab, the script will be similar to Unix.

```
:set &clnt#=prep_process_var(CLIENTS)
:process &clnt#
:  set &num#=get_process_line(&clnt#,1)
ucybdbar  -B -S&num#
:endprocess
:close_process &clnt#
```

DB.Reorg

Create a Job object called 'REORG.CLIENT.ALL'.

In the Process Tab of the job add the following script depending on which OS the Job will be ran on.

For Unix:

```
:set &clnt#=prep_process_var(CLIENTS)
:process &clnt#
:  set &num#=get_process_line(&clnt#,1)
```
<path to utility/bin/ ucybdbre ie /home/qa4/uc4/v9/utility/bin/ucybdbre> -B -
S&num#
```
:endprocess
:close_process &clnt#
```
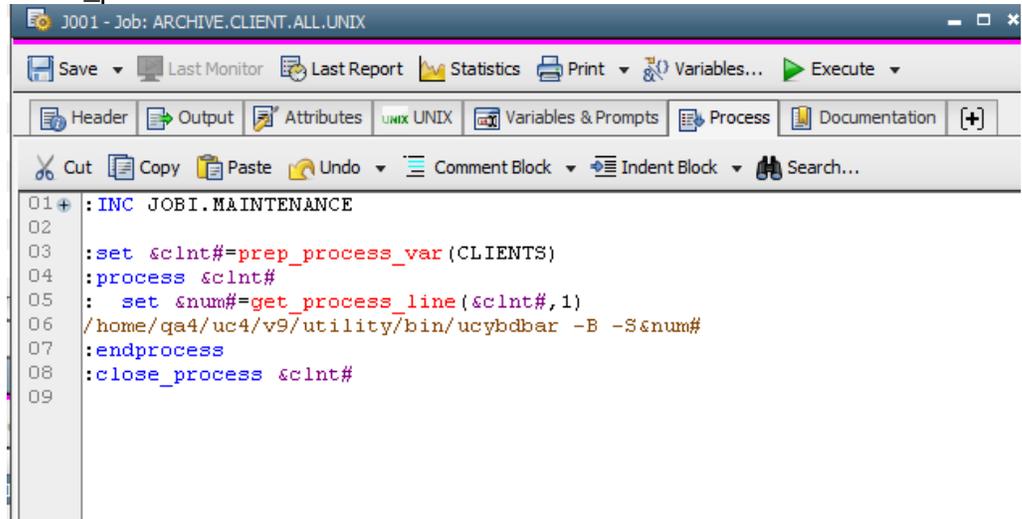

For Windows:
 On the 'Windows' tab, put in the path to the Utility Bin Directory.
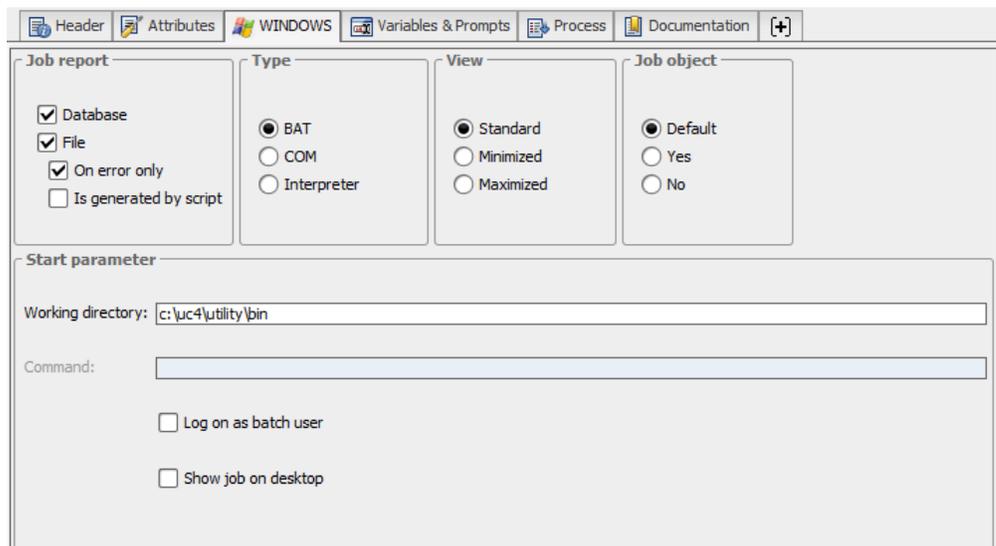
On the Process Tab, the script will be similar to Unix.

```
:set &clnt#=prep_process_var(CLIENTS)
:process &clnt#
:  set &num#=get_process_line(&clnt#,1)
ucybdbre  -B -S&num#
:endprocess
:close_process &clnt#
```

DB.Unload

Create a Job object called 'UNLOAD.ALL'.
In the Process Tab of the job add the following script depending on which OS the Job will be ran on.

For Unix:

<path to utility/bin/ ucybdbun ie /home/qa4/uc4/v9/utility/bin/ucybdbun> -
BREORG

For Windows:
 On the 'Windows' tab, put in the path to the Utility Bin Directory.

On the Process Tab, the script will be similar to Unix.

ucybdbre -BREORG

WorkFlow

Putting it all together in a WorkFlow:
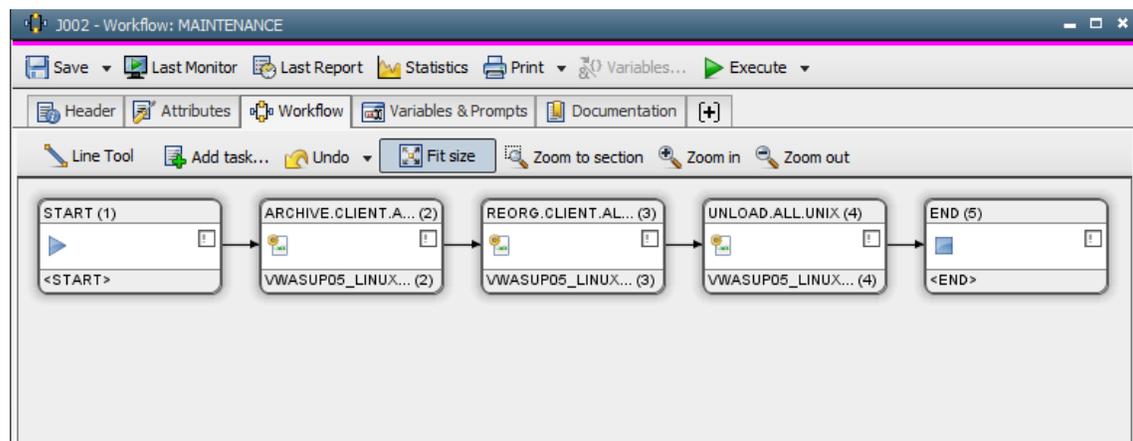
Schedule

Create a Schedule Object and schedule the MAINTENANCE WorkFlow to run as often as you would like.

Activate the Schedule