

Copying Objects between Separate UC4 Systems or Clients

Abstract

The intent of this document is to discuss the different ways to copy objects between UC4 systems or UC4 clients. This will cover Export/Import between systems or clients, using Transport Cases, and using the Client Copy utility. This will not cover copying a full database.

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Export/Import

One way to copy objects between UC4 systems or clients is through the use of the Export and Import functions within UC4. Information for objects moved in this way is stored in an XML file and usually requires a connection to the UC4 UI unless using scripting. The Export and Import functions are usually used for small amounts of objects to be moved quickly between systems or clients.

Export/Import

Brief overview

One way to copy objects between UC4 systems or clients is through the use of the Export and Import functions within UC4. Information for objects moved in this way is stored in an XML file and usually requires a connection to the UC4 UI unless using scripting. The Export and Import functions are usually used for small amounts of objects to be moved quickly between systems or clients.

Advantages

Speed

Copying objects between UC4 systems or Clients is fairly quick when using the Export/Import function. This is because the export is done locally and is used for small amounts of objects as there is a size limitation of the XML files not exceeding 2048 KB (2 MB).

If you are seeing slow times for Export/Import function, it may indicate network performance problems if the XML files are being stored on a network or shared drive or the UI connection is slow. If the UI connection is local to the Automation Engine components (WPs and CPs) and the XML file is local as well, this could point to other slowdowns in the database. If you see this, please open a ticket with UC4 Support to troubleshoot where the slowdown is occurring.

Ease of use

The Export/Import function is a fairly easy function and any user can import or export objects as long as they have the correct authorizations. The process of exporting and importing is a matter of a right-click or using the UI Menus. The scripting functions to automate exporting and importing are also fairly straight-forward.

No folder structure dependence

Objects can be exported from any Folder location within the Explorer window in the UC4 UI. Objects can also be imported into any Folder location. Any import with multiple objects in it will import all objects into the folder where the import is performed.

No server machine dependence

Unlike the other two options for copying objects, the UC4 utilities are not required to perform the export and import functions. Exports and imports can be performed from a user's local machine and the XML files can be stored there as well.

No database dependence

Since no UC4 utility is being used, no database connection is required. Everything is done via XML files.

Disadvantages

Folder structure not kept

Unlike using the Transport Case or Client Copy options, the folder structure is not kept between clients/systems. This means that if the folder structure of the object(s) needs to be kept, the same folder structure needs to already exist in the target system and the Import needs to be performed from that location.

Cannot be used for large amounts of objects

There is a limit on the size of the XML file that is exported or imported. This means that there is a finite amount of objects that can be exported/imported. The size limit is 2048 KB (2 MB). If this limit is exceeded, an error message will be shown in the UI or written to log file. As the size of objects differs for every object, there is no way to tell how many objects this will include. If the size limit is hit, it would be a better idea to use the Transport Case.

Only one folder can be exported from or imported to at a time

Objects from multiple folders cannot be exported at the same time. One or more objects can be chosen at a time for Export, but only if they are in the same folder. Multiple objects within an XML file will be imported into a single folder only and have to be moved from there if desired.

How To – Manual Export and Import

Requirements

The following requirements must be met for Exporting objects:

- Read and Write access to the folder where the XML file will be stored on the Operating System
- Read authorizations on the object(s) being exported for the UC4 User attempting to perform the export
- If exporting multiple objects, the objects must reside in the same folder

The following requirements must be met for Importing objects:

- Objects cannot be imported into the Client's <No Folder>
- Read access to the folder where the XML file is stored on the Operating System
- Write authorizations for the object(s) being imported for the UC4 User attempting to perform the import

Exporting Manually

To export an object manually via the UI, the following steps should be followed:

- 1) Log into the Client where the object(s) is currently stored
- 2) Navigate to the folder where the object(s) is
- 3) If exporting multiple objects, highlight all the objects in the Explorer that should be exported
- 4) Right-click the object or selection of objects, choose "External & Printing", choose "Export..."
- 5) Browse to the OS folder where the XML file should be kept
- 6) Enter the desired name for the XML file (uc4_export.xml is used by default)

- 7) Click “Save”

Importing Manually

To import an object manually via the UI, the following steps should be followed:

- 1) Log into the Client where the object(s) should be imported
- 2) Navigate to the folder where the object(s) should be imported
- 3) Right-click in the Explorer and choose “Import...”
- 4) If the objects being imported already exist in the current system and should be overwritten, choose “Replace existing objects”. This will also allow for the object “Keep existing folder links”. If there are links to the object and they should be kept, keep this option checked; if they should be removed, uncheck this option.
- 5) Click “Choose File...”
- 6) Browse to the OS folder where the XML file is stored
- 7) Choose the desired XML file
- 8) Click “Open”

This will bring up a window with any pertinent messages showing the import status of the objects and any errors that occur.

Drag and Drop in the same system

It is possible to copy objects using a drag-and-drop method if the two clients are open in the same UI and are on the same UC4 system. To do this, using the following steps:

- 1) Log into the Client where the object(s) is currently stored
- 2) In the same UI instance, go to the “Connections” menu and choose “New Connection”
- 3) Log into the Client on the same system where the object(s) should be moved
- 4) Navigate to the Folder where the object(s) should be moved
- 5) Navigate to the Client where the object(s) is currently stored
- 6) Navigate to the Folder where the object(s) is currently stored
- 7) If copying multiple objects, highlight all the objects in the Explorer
- 8) Select the object(s) being copied and drag them to the correct Client tab in the “Desktops” area at the bottom of the UI window
- 9) Continue to drag the objects into the Explorer window in the target Client

How To – Using UC4 Scripting to Export and Import Objects

It is possible to use UC4 scripting functions to both Export and Import objects

Requirements

- A knowledge of UC4 scripting is necessary for using the EXPORT and IMPORT functions.

When using the EXPORT scripting function, the same requirements as exporting manually must be met as well as the following:

- The EXPORT script function must be run from the Client where the object(s) currently exists
- Any user who started the WP AutomationEngine process(es) must have access to the folder specified in the EXPORT script function

When using the IMPORT scripting function, the same requirements as importing manually must be met as well as the following:

- The IMPORT script function must be run from the Client where the object(s) should be imported
- Any user who started the WP AutomationEngine process(es) must have access to the OS folder specified in the IMPORT script function
- If using scripting on a multi-server UC4 system, the file must exist in the same place on each server running the WP AutomationEngine processes. It is recommended to use a UNC path to a network share for importing via script in this way.

Using the EXPORT function

The following syntax should be used for an EXPORT statement:

```
:SET <scripting variable name># = EXPORT('<object name>', '<full path/file.xml>')
```

For example, if exporting the object called "JOBS.TEST" to a folder called \\ServerName\Folder\Subfolder\uc4_export.xml, the following could be used:

```
:SET &RET# = EXPORT('JOBS.TEST',
'\\ServerName\Folder\Subfolder\uc4_export.xml')
```

Or using variables, the following could be used:

```
:SET &OBJECT_NAME# = 'JOBS.TEST'
:SET &PATH_AND_FILE# = '\\ServerName\Folder\Subfolder\uc4_export.xml'
:SET &RET# = EXPORT(&OBJECT_NAME#, &PATH_AND_FILE#)
```

Printing the &RET# variable will either return one of the following:

0 for a successful run

20693 if the object does not exist in the client

21723 if the target file cannot be written to.

If the target file already exists, it will be overwritten.

Using the IMPORT function

The following syntax should be used for an IMPORT statement:

```
:SET <scripting variable name># = IMPORT( '<full path/file.xml>', '<Folder where the object should be imported [optional]>', '<object setting [optional]>', '<link setting [optional]>')
```

For information on the object settings (options for overwriting existing objects) and link settings, please see the UC4 documentation (explained below).

For example, if importing object(s) from a folder called \\ServerName\Folder\Subfolder\uc4_export.xml, the following could be used:

```
:SET &RET# = IMPORT( '\\ServerName\Folder\Subfolder\uc4_export.xml')
```


If importing to a specific Folder on the Client where the object(s) is being imported, for example FOLDER/IMPORTS, the following could be used:

```
:SET &RET# = IMPORT("\\ServerName\Folder\Subfolder\uc4_export.xml',
'FOLDER/IMPORTS')
```

Or using variables, the following could be used:

```
:SET &IMPORT_FOLDER# = 'FOLDER/IMPORTS'
:SET &PATH_AND_FILE# = '\\ServerName\Folder\Subfolder\uc4_export.xml')
:SET &RET# = IMPORT(&PATH_AnD_FILE#, &IMPORT_FOLDER')
```

Printing the &RET# variable will either return one of the following:

- 0 for a successful run
- 20657 if the target folder does not exist in the Client
- 20692 if the file does not exist on the OS
- 21724 if file access is not possible due to missing authorization
- 21729 if the XML file to be imported does not have the required UC4 format
- 21730 if the imported XML file does not meet the required encoding
- 21732 if further information is provided in the activation log

What Does Not get Copied

Passwords

For security reasons, passwords cannot be copied over in XML files. Passwords in USER objects will be changed to the default of "pass". Login objects will not keep the password that was originally given. Passwords in Connection objects will also not be kept when exported and imported.

Folder structure

The original folder structure of an exported object will not be kept, as discussed in the "Disadvantages" section above.

Solution tabs in Workflows

The Solution Tab on the Properties of a RA task within a workflow will not keep any information that is within the "RA" tab (this tab is only available when the task is an RA Job).

Authorizations from Object properties

Any authorizations within object properties (found by right-clicking the object, choosing Properties, and going to the "Authorizations" tab) will not be kept when exporting and importing objects.

System Variables in UC4 regarding Import/export

MAX_IMPORT_SIZE (UC_SYSTEM_SETTINGS)

UC4 administrators with access to Client 0 can change the maximum size of the XML file for imports within Client 0 in the MAX_IMPORT_SIZE Key within the UC_SYSTEM_SETTINGS variable. The maximum value allowed is 2048 (KB). The allowed values are between 0 and 2048 (defaulted to 1024).

MAX_EXPORT_COUNT (UC_SYSTEM_SETTINGS)

UC4 administrators with access to Client 0 can change the maximum amount of objects that can be exported into a single XML file. This can be done in Client 0 in the MAX_EXPORT_COUNT Key within the UC_SYSTEM_SETTINGS variable. The allowed values are between 0 and 1,000,000, defaulted to 1000.

Extra Documentation

Manually Exporting and Importing objects

More information on manually exporting and importing objects can be found in the UC4 documentation under:

User Guide, UserInterface, Importing and Exporting Objects
Inside UC4 Guide, XML Files of Objects

Copying via Drag and Drop

More information on copying objects via Drag and Drop can be found in the UC4 documentation under:

User Guide, UserInterface, Using Desktop Modes

Exporting via script

More information on the EXPORT script function can be found in the UC4 documentation under:

UC4 Script Guide, Ordered by Function, Handle Objects, EXPORT

Importing via script

More information on the IMPORT script function can be found in the UC4 documentation under:

UC4 Script Guide, Ordered by Function, Handle Objects, IMPORT

Transport Cases

A transport case can be used to move many objects from one client to another client or system while keeping the folder structure the original objects had. This can be done in three steps that include moving objects to a Transport Case folder, using the UC4.DB Unload utility to unload the Transport Case, and using the UC4.DB Load utility to load the objects into another Client or system.

Advantages

Connection object and Login object passwords are kept

While user passwords are not kept (see below), the Connection object and Login object passwords are kept.

Large amounts of objects can be copied

Large amounts of objects can be copied using Transport Cases. There is no limit on the amount of objects that can be moved or the size of the text file created.

Folder structure is kept

Objects that are unloaded via Transport Case will be loaded into the target client with the same folder structure. For example, if an object called 'JOBS.TRANSPORT' is in the folder '/FOLDER/SUBFOLDER/JOBS' and the JOBS.TRANSPORT object is unloaded from the source client and loaded into the destination client, it will be loaded into the folder '/FOLDER/SUBFOLDER/JOBS' even if that folder structure did not exist to begin with.

Not system specific

Objects in a Transport Case can be loaded into any system worldwide as long as it is on the same or later version and build, regardless of system database or operating system.

Can copy objects from multiple folders

Multiple objects from multiple folders can be copied unlike using Export and Import.

Disadvantages*Can take quite a bit of time*

Depending on variables like amount of objects being transported, network speed, database speed, load on the target system, etc..., the loading of a Transport Case can take some time. There are some best practices to help avoid this:

- There should be no activities running in the target client in order to make sure that the UC4 Automation Engine is not obstructed by database locks caused by the utility UC4.DB Load.
- Turn off Version Management and Revisioning – otherwise a version is generated for each loaded object which affects performance greatly.

Requires use of the UC4 utilities

Any user unloading or loading a Transport Case will need to have access to the UC4 utilities. No password is necessary to load a Transport Case so all security is based on a user's access to the utilities. This means that if something goes wrong with a Transport Case move, it could be a problem with the AutomationEngine or either of the utilities which could then point to other problems.

Requires a database connection

Because the utilities are necessary for copying objects via Transport Case, a database connection must be set up as well. This is a standard part of setting up the utilities, but the database connection could be another point of failure.

Does not keep User passwords

User passwords are not kept when loading a Transport case. All User passwords will be set to the default of "pass".

How To – Using Transport Cases to Copy Objects

There are two methods of using a Transport Case; the first is done by placing objects into a Transport Case in a client and copying only those objects. The second is to copy all objects in a client and can be done simply using the UC4.DB Unload utility. Both of these methods are described below.

Requirements

The following requirements are necessary to use the Transport Case and Load or Unload the Transport Case:

- The UC4 User moving objects to the Transport Case must have the Privilege “Access to Transport Case”
- Access to a working UC4.DB Unload and UC4.DB Load utility

Place objects in Transport Case (copying only some objects)

The first step to take is to put objects into the Transport Case. There are two ways to this, only available in the UC4 UserInterface.

Log into the Client where the object(s) to be copied is stored and navigate to the folder where the object(s) is stored.

- Highlight the object(s) to be transported and select *Transport* from the *File* menu or by right-clicking the object(s) and choosing “External & Printing” and then “Transport Case”
- Highlight the object(s) to be transported and drag them and drop them into the “Transport Case” in the left pane of the Explorer window

These objects are not moved; they are copied and displayed in the Transport Case and registered for transport. They can be removed by going into the Transport Case folder, choosing the object(s) to be removed, right-click them, and choose “Remove”.

Unload the Transport Case (used for copying only some objects)

Use the UC4.DB Unload utility to unload the Transport Case. There are two ways to do this. To do this via the UC4.DB Unload UI, please use the following steps:

- 1) Open the UC4.DB Unload UI using the ucybdbun.jar file or ucybdbung.exe (only in a Windows environment)
- 2) Choose “Unload Transport Container”
- 3) Answer the prompt of unloading the transport container for all clients – Choosing “No” will allow the unloading of the transport container for a single client
- 4) If a single client is to have its transport container unloaded, choose which client’s transport container should be unloaded and click “OK”
- 5) By default, a file is created in the utility/db directory called uc_data.txt that contains the structure for the objects in the Transport Case

Please note: The utility UC4.DB Unload checks the UC4 Explorer's folder structure. If the message: “U0021148 Folder structure is corrupt. '&01' <> '&02'. Starting automatic folder repair function.” Appears, the unload will need to be run in batch mode with the flags -BREPAIR in order to have the folder structure automatically corrected

The above steps can also be done via batch mode; an example assuming unloading the Transport Case for Client 100 is below in Windows:

```
ucybdbun.exe -BTRANSPORT -C0100
```

Unload All Objects of a client (used for copying all objects in a client)

If all objects in a Client should be copied, this can be done using the following steps:

- 1) Open the UC4.DB Unload UI using the ucybdbun.jar file or ucybdbung.exe (only in a Windows environment)
- 2) Choose “Unload All Objects”
- 3) Choose “No” when asked to export all objects of all clients
- 4) Choose the client with the objects that should be fully copied
- 5) Click “OK” which will start the unload of the objects in the client
- 6) By default, a file is created in the utility/db directory called uc_data.txt that contains the structure for the objects in the Clients

The above steps can also be done via batch mode; an example assuming unloading the Transport Case for Client 100 is below in Windows:

```
ucybdbun.exe -BTRANSPORTALL -C0100
```

Load the Transport Case into another Client/System

Once the Transport Case has been created, the following can be done to load the Transport Case (called by default uc_data.txt) into the new Client or UC4 System (called the target client from here on):

- 1) Make sure that no activities are running in the target client
- 2) Turn off Version Management and Revision in the target client
- 3) Ensure that the target client is of the same ServicePack version or later than the original client
- 4) Run the ucybdbld.jar or ucybdbldg.exe (on windows only) program that points to the database for the system the target client is on
- 5) Browse to the uc_data.txt Transport Case file and when ready, hit the “open” button
- 6) Confirm that you are loading a Transport Case – shown by the message “Loading in mode ‘TRANSPORT’ – by clicking “OK”
- 7) A window will pop up asking if the client should be kept:
 - a. Choose “Yes” if the objects should be loaded into the client of the same number as the original client and skip step 8 below
 - b. Choose “No” if the objects should be loaded into the client of a different number and follow step 8 below
- 8) Choose the client where the objects should be loaded and click “OK”

PLEASE NOTE: Loading objects into Client 0 may overwrite important system variables

- 9) There may be objects that already exist in the target client. You can choose to overwrite these individually by choosing “Yes” when prompted. You can also choose “All” to overwrite all existing objects and not be prompted again
- 10) The load process may take some time. Once it is finished, the objects should be in the target client.

The above steps can also be done via batch mode; an example assuming loading the Transport Case located in C:\UC4\Utility\db\uc_data.txt into Client 100 is below in Windows:

```
ucybdbld.exe -B -XC:\UC4\Utility\db\uc_data.txt -C0100
```

By default the above will not overwrite existing objects of the same name in the target client. To overwrite, the flag -EREPLACE should be added to the above command.

PLEASE NOTE: The utility will display the message “U0038129 Waiting 1 minute for the generation of Version Control Objects. Processing will be continued afterwards.” If a Transport Case should be loaded and revisioning has been activated in the UC4 system. Do not cancel the utility UC4.DB Load. It starts loading as soon as the data that is required for revisioning has been processed. This procedure ensures that no data that is relevant for the revisioning process is lost even if objects are loaded several times. Depending on the size of objects that should be loaded, this process can take some time.

Mass Changes to objects using the DB Change utility

The UC4.DB Change utility can be used to make mass changes to attributes within objects in a Transport Case. For more information on this, please see the UC4 White Paper “Using the UC4.DB Change Utility to Modify Attributes of Objects, available at <http://community.uc4.com> and <http://support.uc4.com>.

What doesn't get copied

The following items do not get copied when loading a Transport Case:

- *Reports*
- *Version Management*
- *Passwords on User Objects*
- *Links between Users and UserGroups if the UserGroups do not already exist in the target client*

Extra Documentation

Transport Cases

More information on Transport Cases in general can be found in the UC4 documentation under:

User Guide, UserInterface, UC4 Explorer, UC4 Transport Case

Administration Guide, Database, Transporting Data, General Procedure

Unloading transport cases

More information on unloading transport cases can be found in the UC4 documentation under:

Administration Guide, Utilities, UC4.DB Unload, Unloading Databases

Loading transport cases

More information on loading transport cases can be found in the UC4 documentation under:

Administration Guide, Utilities, UC4.DB Load, Loading Databases

Loading and unloading transport cases via batch mode

More information on loading and unload Transport cases via batch mode can be found under:

Administration Guide, Start Parameters, Utilities

Client Copy

The UC4.DB Client Copy utility can be used to copy all objects from one client to another.

Advantages

Option of keeping user passwords

There is a “Reset password” option when copying clients. If checked, all user passwords will be reset to the default of “pass”. If unchecked, user passwords will be kept.

Folder structure is kept

As the full client is copied from the source to the destination client, all folders will remain the same between the two.

All objects are copied

Connection object and Login object passwords are kept

Not database specific

Clients can be copied from any type of supported database to any other type of supported database as long as the connections are set up correctly.

Disadvantages

Cannot choose only specific objects

All objects from a client must be copied.

Can take quite a bit of time

Depending on variables like amount of objects being copied, network speed, database speed, load on the target system, etc..., the copying of a full client can take some time.

Requires use of the UC4 utilities

Any user copying a client will need to have access to the UC4 utilities. A password to client 0 is required.

Requires a database connection to the source and destination databases

Because the utilities are necessary for the UC4.DB Client Copy utility, two database connections must be set up as well. This is a standard part of setting up the utilities, but the database connections could be another point of failure.

Destination Client must be empty

The destination client must be empty in order to copy a client to it. If the destination client already has objects in it, the destination client must be deleted before the source client is copied.

How to – Use the UC4.DB Client Copy utility to copy a client

Requirements

The following requirements are necessary to use the UC4.DB Client Copy utility:

- Access to a working UC4.DB Client Copy utility which includes access to the source and destination databases
- Administrator access to Client 0 on both the source and the destination client systems
- In order to run in batch mode, the system client 0 on both the source and destination systems must have a user object for the user who start the utility in batch mode. For example: There must be the User object "SMITH/<department>". Note that no other User object can start with "SMITH" (for example, SMITH/UC4 and SMITH/TEST would not work).

Using the UC4.DB Client Copy GUI

The following steps should be used for copying a client via the utility gui:

- 1) Start the UC4.DB Client Copy GUI by running either ucydbcc.jar or ucydbccg.exe (available only on Windows)
- 2) Enter the login credentials for the Client 0 user for the Destination and Source systems
- 3) Choose a Source Client from the left hand pane
- 4) Choose a Destination Client from the right hand pane
- 5) Choose extra options
 - Reset Password – checking this option will reset all users' passwords to the default of "pass"
 - Copy VC objects – checking this option will copy all version control objects from the source to the destination client
 - Copy UC4 Messages – checking this option will copy all Messages from the source to the destination client
 - Copy UC4 statistics/reports – checking this option will copy all statistics and reports from the source to the destination client

PLEASE NOTE: Messages, statistics, and reports can be copied by themselves after the initial client copy process is run. More information can be found in the UC4.DB Client Copy documentation (explained below).

- 6) Click the "Copy client" button
- 7) A prompt will ask if this is really the wanted action – Click "Copy client" to go forward with the client copy process. Click "cancel" to cancel the operation
- 8) If the destination client already exists and has objects in it, another prompt will ask if you'd like to delete the original destination client. Choose "Delete client" to delete the original destination client or "Cancel" to choose a different destination client.
- 9) At this point, the client copy will start. This may take some time.

Using the UC4.DB Client Copy Batch script

The Client Copy can also be run via batch script. A simple example for this would be copying client 0100 on the source system to client 0200 on the destination system. This example assumes that the Client Copy ini file is set up in such a way that the database

connection for both source and destination systems are set up correctly. In Windows, the script would be:

```
ucydbbcc.exe -B -S0100 -D0200
```

In the example above, -S shows the source client and -D shows the destination client

Extra Documentation

Client Copy UI

More information on running the UC4.DB Client Copy can be found in the UC4 documentation under:

Administration Guide, Utilities, UC4.DB Client Copy, Copying and Deleting Clients

Client Copy Batch

More information on running the UC4.DB Client Copy from batch script can be found in the UC4 documentation under:

Administration Guide, Start Parameters, Utilities (UC4.DB Client Copy section)

Changes to flat files

While changes can be made using a text editor the XML files from an export or the Transport Case txt files, UC4 cannot Support problems that arise after a manual edit is made to the flat files.

Transport Cases can be changed by using the UC4.DB Change utility. More information on this can be found in a whitepaper on <https://community.uc4.com> and on <http://support.uc4.com> as well as in the UC4 documentation under Administration Guide, Utilities, UC4.DB Change, Modifying Exported Data.