SIEMENS

XHQ

Backup and Recovery Guide

About This Guide

XHQ Backup Information 1

XHQ Administration Utility 2

High Performance Database 3

Solution Migration 4

Disaster Recovery 5

11/2020 V6.1

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER
Indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ **WARNING**
Indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ **CAUTION**
Indicates that minor personal injury can result if proper precautions are not taken.

NOTICE
Indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage. See the topic, Visual Cues for Online Viewing, for additional XHQ-specific notices.

Qualified Personnel

The product/system described in this documentation may be operated only by personnel qualified for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ **WARNING**
Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

All names identified by ® are registered trademarks of Siemens AG. The remaining trademarks in this publication may be trademarks whose use by third parties for their own purposes could violate the rights of the owner. For a complete list, see the Copyrights and Trademarks topic.

Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Siemens Industry Software Inc.
6 Journey, Suite 200
Aliso Viejo, CA 92656-5318, USA
siemens.com/xhq

Additionally, Siemens' guidance on appropriate security measures should be taken into account. For more information about industrial security, please visit https://www.siemens.com/industrialsecurity.

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends to apply product updates as soon as available and to always use the latest product versions. Use of product versions that are no longer supported, and failure to apply latest updates may increase customer's exposure to cyber threats.

For the Siemens Security Advisory, visit https://www.siemens.com/industrialsecurity.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under https://www.siemens.com/industrialsecurity.

While every effort is made to ensure the accuracy of content, the XHQ product documentation set (which includes online help) could contain inaccuracies or out-dated material (which includes product screenshots and images) due to the large number of product enhancements being added. As such, the documentation set is subject to change at any time without notice. Refer to the README for documentation corrections and addendum. Please note, updates to the documentation set are reflected in the next general availability major release of XHQ.

Table of Contents

About This Guide **8**
Conventions Used in This Guide 8
Visual Cues for Online Viewing 9
Related XHQ Product Documentation 10
Contacting Customer Support 12
General Feedback and Comments 13

1 | XHQ Backup Information **14**
To backup the current repos folder 15

2 | XHQ Administration Utility **16**
Getting Started 19
To access the XHQ Administration Utility 19
To access the log file 19
User Authentication 20
To change to a different user 20
About xhqci 21
Repos Comparison 22
Output File Naming Conventions 23
About the Comparison Results Table 25
To compare repositories 27
To export selected comparison results 28
About Sorting and Grouping 30
Repos Synchronization 31
To prepare for a repos synchronization 32
To perform a repos synchronization 33
Order of Synchronization 35
Repos Management 37
To manage the repos 37
Support Information 39
Online Backup 40
To perform an online backup of the repos 40
Export Configurations 42
To export the repos configuration 42
Online Backup and Export Configurations 44
When to use the Online Backup and Export Configurations Tab 44
To perform an online backup and export repos configurations 45

Create and Start an Empty Repos ... 47
To create an empty repos ... 47
Recreate the Repos and Import Configurations ... 49
To recreate a repos ... 49
Delete Cache ... 52
To delete the cache ... 52
Switch Repos ... 53
To switch repos ... 53
PA Administration ... 55
To create the configuration database ... 55
To set the current configuration database from XHQ Administration Utility ... 57
To set the current configuration database from XHQ Engineering Environment ... 58
To configure license servers for the current configuration database ... 58
To configure package and log directories for the current configuration database ... 59
To configure site connections ... 60
To create data store default tables ... 61
To create data mart default tables ... 63
To export site configuration data to an XML file ... 64
To import site configuration data from the XML file ... 65

3 | XHQ High-Performance Database Backup and Restore ... 67
XHQ and Data Recorder Data Backup and Restore ... 68
To restore Data Recorder data ... 70
Backup and Recovery for the LEGACY XHQ High-Performance Database ... 71
To prepare the high-performance database for backup and recovery ... 71
A Typical Backup Scenario ... 73
Backup Requirements ... 73
Performing a Manual, Full Backup ... 73
A Typical Recovery Scenario ... 75
Recovery Requirements ... 75
Performing a Full Restore ... 75
To perform a full restore ... 76
bkDaily versus bkFull ... 77

4 | Solution Migration ... 78
Glossary of Terms ... 79
Package Contents ... 79
Pre-requisite Checklist ... 79
Exporting from the Source Solution ... 81

To export embedded database data from the source solution ... 81
To export LEGACY embedded database data from the source solution ... 81
Importing into the Destination Solution ... 83
To import the embedded database data into the destination solution ... 83
To import the LEGACY embedded database data into the destination solution ... 83
Rescuing the Import ... 85
To rescue import of embedded database data from the destination solution ... 85
Conversion from the LEGACY Embedded Database ... 87
To convert an existing solution from the LEGACY embedded database ... 87
How to Copy the XHQ Solution ... 89
To transfer the solution content ... 89
How to Rename a Server ... 92
Non-standard Database Content ... 93

5 | Disaster Recovery ... 94

Glossary of Terms ... 94
Package Contents ... 95
Pre-requisite Checklist ... 95
General Approach ... 96
Special Considerations due to Disaster Recovery ... 96
Copying the Source Solution to the Destination Solution ... 98
To copy the solution ... 98
Renaming a Server ... 102

About This Guide

Conventions Used in This Guide

The following formatting cues are designed to allow you to quickly locate and understand the information provided in this guide.

Formatting Conventions

Convention	Example
Acronyms are spelled out the first time they appear.	Alert Notification System (ANS)
Bold is used for menu names, command options, and dialog box names in primary task procedures.	From the **XHQ Workbench**, go to the **Add** menu and click **New Component**.
Italic is used for glossary terms.	The first step in building this model is to develop reusable software building blocks, called *components*.
A **`monospaced font`** is used for program and code examples.	The subdirectory `\log` is automatically created below the location you choose. All log files are written to this subdirectory. **`C:\XHQ`**
Key combinations appear in uppercase, bold. If joined with a plus sign (+), press and hold the first key while you press the remaining keys.	**CTRL+B**
In See Also notices, sub-chapter headings are in italics, chapter headings are in quotes, and guide titles are in bold.	For more information, go to the *About install.properties* topic located in the "Working with PROPERTIES Files" chapter of the **XHQ Administrator's Guide**.

Visual Cues for Online Viewing

This document uses the following styled paragraphs.

Important notices provide information that are required to completing a given task.

XHQ must run as a domain user.

Warnings tell you that failure to take or avoid a certain action could result in loss of data or application malfunction.

WARNING

Do not modify the `shutdown.dat` template file.

Notes are used to offer information that supplement important points of the main text. Tips suggest certain techniques and procedures that may help you achieve your task quickly.

Depending on your network configuration, include domain information only if the domains are different.

See Also notices provide you with additional references to similar topics and/or concepts within the documentation set. Sub-chapter headings are in italics, chapter headings are in quotes, and guide titles are in bold.

For more information, go to the About the Options Menu topic located in the "Working with PROPERTIES Files" chapter of the **XHQ Administrator's Guide**.

Tips provide additional hints to help you use the product more efficiently.

Use the `NavbarWestVerticalOffset` property to make fine adjustments in pixels. The upper, left-hand corner is the origin. The positive horizontal direction moves to the right and the positive vertical direction moves down.

Web References point you to external web sites that give additional information on the given topic.

Refer to Microsoft support information with regards to the various server settings for application performance and network utilization.

`http://support.microsoft.com`

Related XHQ Product Documentation

The XHQ documentation set includes the following titles.

XHQ Documentation Set

Title	Target Audience
XHQ Administrator's Guide Provides the steps required to begin administering XHQ. It also covers security and access, property settings, redundancy, and localization.	Administrators
XHQ ANS User's Guide Learn how to use and administer the XHQ Alert Notification System (XHQ ANS).	ANS Users, Administrators
XHQ Backup and Recovery Guide Learn how to properly backup XHQ.	Administrators
XHQ Connection Guide Provides information on injecting an XHQ-supported connector type and configuring the connection.	Connector Developers
XHQ Developer's Guide Introduces the XHQ Development Client (Workbench and Solution Builder) user interface and provides information on how to set-up XHQ, develop reusable components, create views, and build a solution hierarchy.	Content and Solution Developers
XHQ Getting Started Gives you step-by-step instruction on how to set up your model and solution.	Content, Connector, and Solution Developers
XHQ Installation Guide Provides the system requirements, installation instructions, and upgrade information for the current release of the XHQ System.	Administrators
XHQ Integrated Data Gateway Guide Includes information on the ADO.NET and the XHQ OPC UA Server.	Application Engineers, Integrators
XHQ Performance Analytics Guide Learn how to use the Engineering Environment to enable the generation of the processes necessary to extract and transform data for source systems, and populate the XHQ Data Store and Data Mart.	Solution Developers/Users, Analysts
XHQ Performance Management Guide Learn how to use Target Management to monitor performance indicators and eLogs to create shift reports.	Administrators, End Users
XHQ Reference Guide Lists the functions and methods used in XHQ, and provides examples,	Content and Solution Developers

Title	Target Audience
usage notes, and parameter descriptions.	
XHQ Reporting Services Guide Introduces the XHQ Reporting Services and provides instruction on how to connect to an XHQ data source.	Application Engineers, End Users
XHQ SDK Reference Guide Provides a set of development tools that allows you to create applications that extend XHQ. Includes information on the Client API and Web Services.	Application Engineers, Integrators
XHQ Solution Design and Architecture Provides best-practice examples for XHQ solution design. Includes information on tag synchronization.	Solution Architects
XHQ Solution Viewer User's Guide Gives you step-by-step instruction on how to access your solution through a browser client and set browser preferences.	All End Users
XHQ System Guide Contains information regarding secure handling of an XHQ implementation.	Administrators, Application Engineers, Integrators
XHQ Trend Viewer User's Guide Learn how to use the XHQ Trend Viewer to view both real-time and historical data.	All End Users

Contacting Customer Support

XHQ Customer Support is a second-level customer support offering, that is, it does not provide XHQ end users with direct support. XHQ end users are to contact their local company help desk or internal application support staff and, in turn, those representatives contact the XHQ Customer Support Team. These representatives are expected to have attended basic product administrative training or possess comparable skills with XHQ, and know and support the specific XHQ customer solution in use.

If the details or response times noted below deviate from those specified in a specific customer contract, the customer contract always takes precedence.

For general XHQ product support or related questions, pre-registered customer or partner support staff with a valid XHQ customer support agreement may contact the XHQ Customer Support Team using any of the following means:

Web Portal

The support portal leverages a system called GTAC (Global Technical Access Center). GTAC provides one common support entry point for many Siemens products. It is available via this URL:

https://www.siemens.com/gtac

Customers must be pre-registered to be able to use the web portal. A log-in can be requested at any time by self-registering in the GTAC portal. Note, the end-user "sold to" identifier is needed in order to register.

Use of the support portal is the preferred means to report incidents to the XHQ Customer Support Team unless immediate interactive telephone assistance is required. The support portal is available twenty four hours per day/seven days per week ("24/7").

E-mail

support.xhq@siemens.com

Phone Support and Hours of Coverage

International: +1 (949) 448-7463

U.S. only: +1 (877) 700-4639

The following paid support levels are available:

Bronze Support: 9/5

9 x 5 hours support. 9 hours per day, 5 days per week, Monday to Friday. Daylight Saving Time is honored.

Choice of one coverage zone out of the following options (the default is Americas):

- Americas (7 am - 6 pm PST; 11 hours coverage due to PST/CST/EST time zone coverage overlap)
- South Central Asia (9:30 am - 6 pm IST; 9 hours coverage)

Excludes national holidays as defined by the following countries for the related coverage zone:

- USA/California (Americas)
- India/Pune (South Central Asia)

Example Americas zone: *Implies coverage from 7:00 AM to 6:00 PM, Pacific Time, Monday to Friday, excluding US national holidays.*

Silver Support

Ability to leverage both support coverage zones **Americas** and **South Central Asia** as defined in Bronze for extended daily coverage hours.

The weekly start/end times of coverage follow the local times of the following coverage zone:

- California/USA (Americas)

This implies weekday coverage from 7 am until 6 pm Pacific Time, Monday to Friday, as in the Americas support coverage zone but with the ability to additionally leverage the South-central Asia coverage zone for additional coverage hours.

Gold Support: 24/7

Silver Support coverage plus 24 hours per day, 7 days per week emergency support for Severity One incidents.

Postal Mail

Siemens Industry Software Inc.

XHQ Operations Intelligence

Attn: XHQ Customer Support Department

6 Journey, Suite 200

Aliso Viejo, CA 92656, USA

General Feedback and Comments

Please send an e-mail to:

info.xhq@siemens.com

Siemens Industry Software Inc. and affiliated Siemens Industry Software companies (collectively referred to as "SISW") are committed to working with our customers. Your comments, suggestions, and ideas for improvements are very important to us. Thank you for taking the time to send us your feedback.

1 | XHQ Backup Information

This section contains important information to help you prepare for a successful backup of XHQ.

- Before backing up the repos, shutdown the XHQ Server by running the `xhqboot` batch file. Use the `xhqboot shutdown complete` command.
- Backing up the XHQ System can be easily done by copying your repository folder (repos) from the location specified by the environment variable **`%XHQ_SERVER_REPOS%`** (which is typically `C:\XHQ\data\repos`) to a different location (preferably, to another server). You should also save any customized `.html`, `.js` or `.ini/startup` files. Should hardware failure occur, these support files, as well as your entire solution, can then be easily replaced.
- To protect your customized web scripts from being overwritten during an upgrade, make sure you use the files located in the location specified by the environment variable **`%XHQ_WEB_DATA%\repos\conf\web`** directory, which by default is `C:\XHQ\data\repos\conf\web`.

  For more information on these files, go to topic, *About the XHQ Web Files*, located in the XHQ Administrator's Guide.

- The XHQ Alert Notification System (XHQ ANS) data may also need to be backed up. See the topic, *High Performance Database*, for details.
- If you choose to rename the repos before installation, you must change the repository folder name back to the original name after upgrading and before starting the XHQ Server. This keeps the connection configuration and backend connectivity intact and ensures that you see the solution properly. In addition, you should never simply rename or move the repos folder.
- Prior to backing up your repository and upgrading, make sure that these files are present in the **`repos`** directory (which is typically `C:\XHQ\data\repos`): `storage.properties`, and `xhqboot.properties`. If any of these three files are missing, go to **`\XHQ\data\repos_empty`**, copy the missing files, and put them in the `repos` directory. Proceed with the backup of your repos and the upgrade of the XHQ system.
- After the upgrade process, compare the `storage.properties`, and `xhqboot.properties` located in the current `repos` directory with the same files in your `repos` backup.
- Prior to installing the XHQ System, check the installation pre-requisites (such as System Requirements) located in the *XHQ Installation Guide*.
- Refer to the README, located at the root of the XHQ installation media, for a list of possible migration and installation issues.

To backup the current repos folder

1. Shutdown the XHQ Server.
2. Determine the backup location for the repository folder (`repos`).
3. **Navigate** to the installation location for the XHQ Server.

   Example: Typically, it is located in `C:\XHQ\data\`.
4. **Locate** the repos folder, right-click on the filename, and select **Copy**.
5. **Paste** the repos folder into the backup location.
6. RECOMMENDED
   For tracking purposes, rename the copied folder using the XHQ version information (and build number, if available).

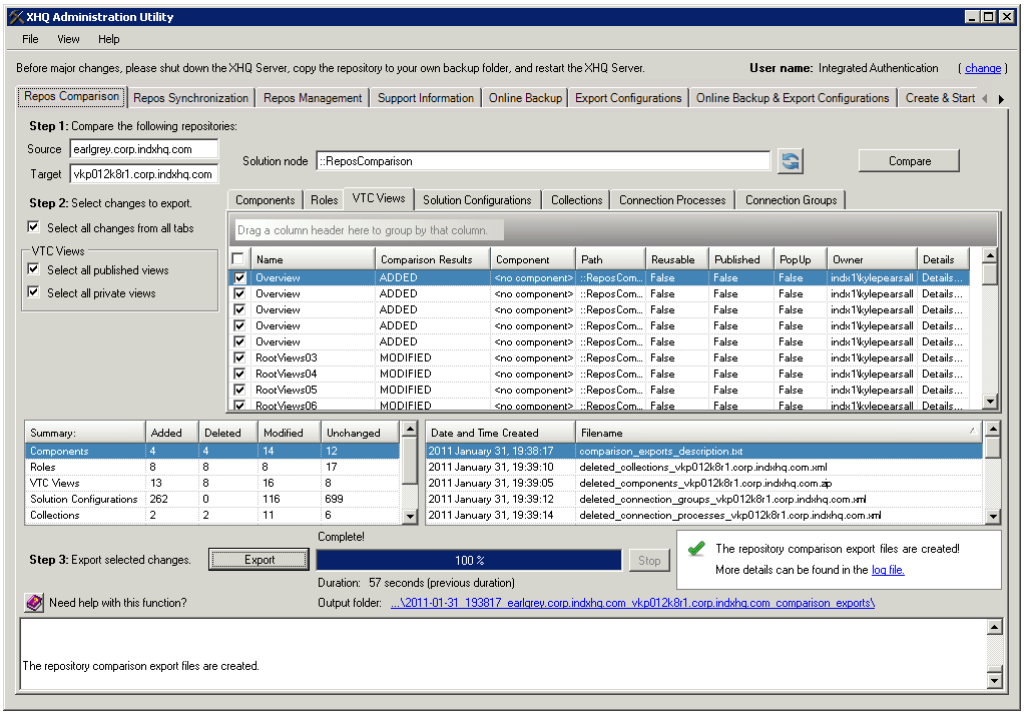
   Example: From "repos" to "repos_backup_4.5_b003"

2 | XHQ Administration Utility

The XHQ Server often requires users to perform complex, multi-step procedures on XHQ via the command-line and/or perform manual operations on XHQ-related folders and files. Some of these activities pertain generally to backing up and restore various XHQ modules. The XHQ Administration Utility provides an interactive graphical user interface that helps avoid these procedures and manual operations.

The sequences documented in this chapter and implemented in the utility are the only supported approaches to the backup and recovery functions in XHQ.

The XHQ Administration Utility is a program that performs a number of typical backup and restore functions on XHQ Servers.



The XHQ Administration Utility – Repos Comparison tab

The utility consists of the following features:

- **Repos Comparison**
  Compare the differences (components, roles, VTC views, collections, connection groups, and connection processes) of two running XHQ repositories, and select which objects to export. The exported comparison file set can be used in the Repos Synchronization function, to be applied to one or more selected servers.
- **Repos Synchronization**
  Synchronize repos contents for the selected server(s) by applying all selected comparison file sets.
- **Repos Management**
  Validate and compress the repository (repos).
- **Support Information**
  Gather information to send to the XHQ Customer Support Team for help in troubleshooting problems.

- **Online Backup**
  Execute an online backup of the XHQ solution (repos).
- **Export Configurations**
  Exports the repos configurations for the XHQ roles, the model, the solution definition, solution connections, and solution configurations.
- **Online Backup & Export Configurations**
  Perform an online backup of the repos and export all XHQ model and solution configurations necessary to recreate the given repos.
- **Create & Start Empty Repos**
  Generate an empty repos by: shutting down the XHQ Server; moving the existing repos to a backup folder; creating a new repos; copying contents of the `repos_empty` directory to the new repos; and finally, restarting the XHQ Server.

  
  In an empty repos, no XHQ solution exists. This enables you to develop a solution from scratch.
- **Re-create Repos & Import Configurations**
  Recreate a repos by importing previously exported XHQ model and solution configurations.

  
  This process involves several restarts of the XHQ Server. It also does not re-create the cache data of the original repos.

  
  This process can compact the XHQ model and solution significantly in order to save disk space. It can also eliminate various solution and model corruptions.
- **Delete Cache**
  Set the options to: delete the cache during the next XHQ Server restart, delete the tags collection, and/or restart the XHQ Server immediately after cache deletion.
- **Switch Repos**
  Switch repos by: shutting down the XHQ Server; renaming the current repos directory; moving (or copying) the selected repos to the current repos; and finally, restarting the XHQ Server.
- **PA Administration**
  Configure and manage settings for the XHQ Performance Analytics (PA) Engineering Environment.

  
  This feature is available only if XHQ Performance Analytics SQL Server is installed.

Important Things to Note

- Prior to making major changes using the XHQ Administration Utility, shut down the XHQ Server, copy the repos to your own backup folder, and then restart the XHQ Server.
- The XHQ Administration Utility does not run over the network. It must be run locally, on a machine that is an XHQ Server (in other words, a machine where the XHQ Server is installed) or an XHQ Development Client. All functions are available when it is run on an XHQ Server. However, when run on an XHQ Development Client, only the Repos Comparison and Repos Synchronization functions are available.
- The default location for the backup folder on the **XHQ Development Client** (for All users and single user installations) is `%USERPROFILE%\Application Data\XHQ\XHQ devClient\repos\backups`.
- The default location for the backup folder on the **XHQ Server** is `%XHQ_SERVER_REPOS%\..\backups\repos_backups`, which is one level up from `%XHQ_SERVER_REPOS%`.

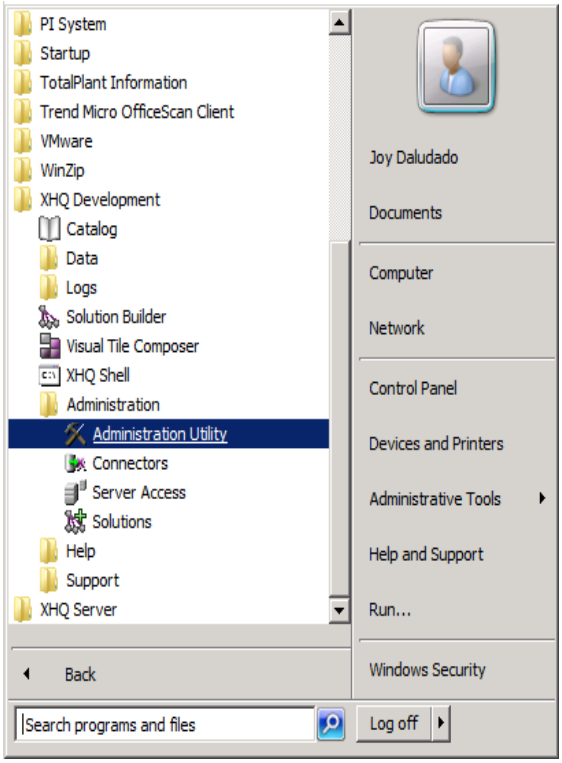
- If Performance Analytics (PA) is installed and configured, the default location for the PA configuration file is `%XHQPA_ETL_PACKAGE_CONFIG%`.

Do not modify the backup folders, subfolders, or files that are created and managed by the XHQ Administration Utility.

Getting Started

To access the XHQ Administration Utility

1. From the **Start** menu, point to **All Programs**, then to **XHQ Development**, then to **Administration**.



2. Click **XHQ Administration Utility**.

In addition to the Start menu, you can also start the utility on an XHQ Server by going to `%XHQ_SERVER_HOME%\bin` (which by default is `C:\Program Files (x86)\XHQ\XHQ Server\bin`) and double-clicking on the **`XhqAdministrationUtility.exe`** file. On XHQ Development Client, this executable is located in `%XHQ_DEV_HOME%\bin`.

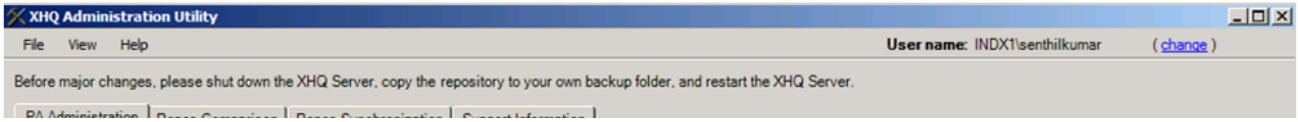
For a list of XHQ environment variables and their default paths, go to the topic, *Distribution of XHQ Server and devClient Files*, located in the XHQ Installation Guide.

To access the log file

1. From the **File menu**, click **Log File**.
   This opens `%XHQ_SERVER_LOGS%\XhqAdministrationUtility.out` whether a function is running or not.
2. Open `XhqAdministrationUtility.out` file using a text editor.

User Authentication

When the XHQ Administration Utility is first launched, the User name defaults to the logged on user.

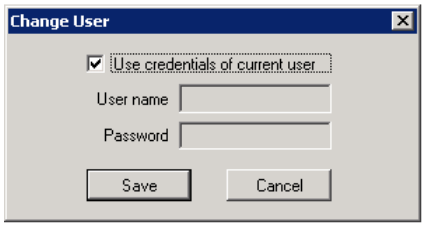


XHQ Administration Utility – User Authentication

With Integrated Authentication, the credentials (User name and Password) of the current user are used. To log-in using a different set of credentials, do the following.

To change to a different user

1. Click **Change**.
   The "Change User" dialog box appears.



2. **Deselect** Use credentials of current user.
   This enables the User name and Password options.
3. Enter a **User name** and the corresponding **Password**.

   Examples: (For domain users) "`acme\johndoe`"

   (For local users) "`johndoe`"

4. Click **Save**.
   This returns you to the utility.

About xhqci

Each XHQ Administration Utility function corresponds to either a single or a set of `xhqci` command-line(s).

Specific credentials used for authentication is only available for `xhqci` commands It is used by all XHQ Administration Utility functions.

Example 1: Online backup => `xhqci backup`

Example 2: Recreate Repos =>
```
xhqci importconndefs
xhqci importconngroups
xhqci importconnprocs
xhqci importmodel
xhqci importrolemappings
xhqci importroles
xhqci importsoln
xhqci importsolndefs
```

To review the **security requirements** for the `xhqci backup` command, go to topic, *Online Backup*, located in the XHQ Administrator's Guide.

For general information on `xhqci`, refer to the topic, *Using the xhqci Utility*, located in the XHQ Administrator's Guide.

Also see the topic, *Order of Synchronization*, for a listing of repos synchronization functions and their related xhqci command-line syntax.

Continuing with Example 1 above (the Online backup example), if the credentials for the utility are set to **Integrated Authentication**, then the corresponding **`xhqci backup`** command-line does not set the `uid` and `pw` parameters.

Example:
```
xhqci backup "directory=myBackupDirectory"
```

However, if the credentials for the utility are changed to a specific User name and Password, then the `uid` and `pw` parameters are used with the **`xhqci backup`** command-line.

Example:
```
xhqci backup "directory=myBackupDirectory"
"uid=domain\user" "pw=userPassword"
```

In Example 2 above (the Recreate Repos example), if a user is specified, then the uid and pw parameters are used for each of the xhqci command-lines.

Repos Comparison

This feature allows you to make a comparison between two running XHQ repositories.

You must have XHQ solution **administrative privileges** on both the source and target servers.

Due to the large amount of objects being compared, a repos comparison of solutions can take several hours to complete (for example, 9 hours). The amount of time depends on the size of the solution.

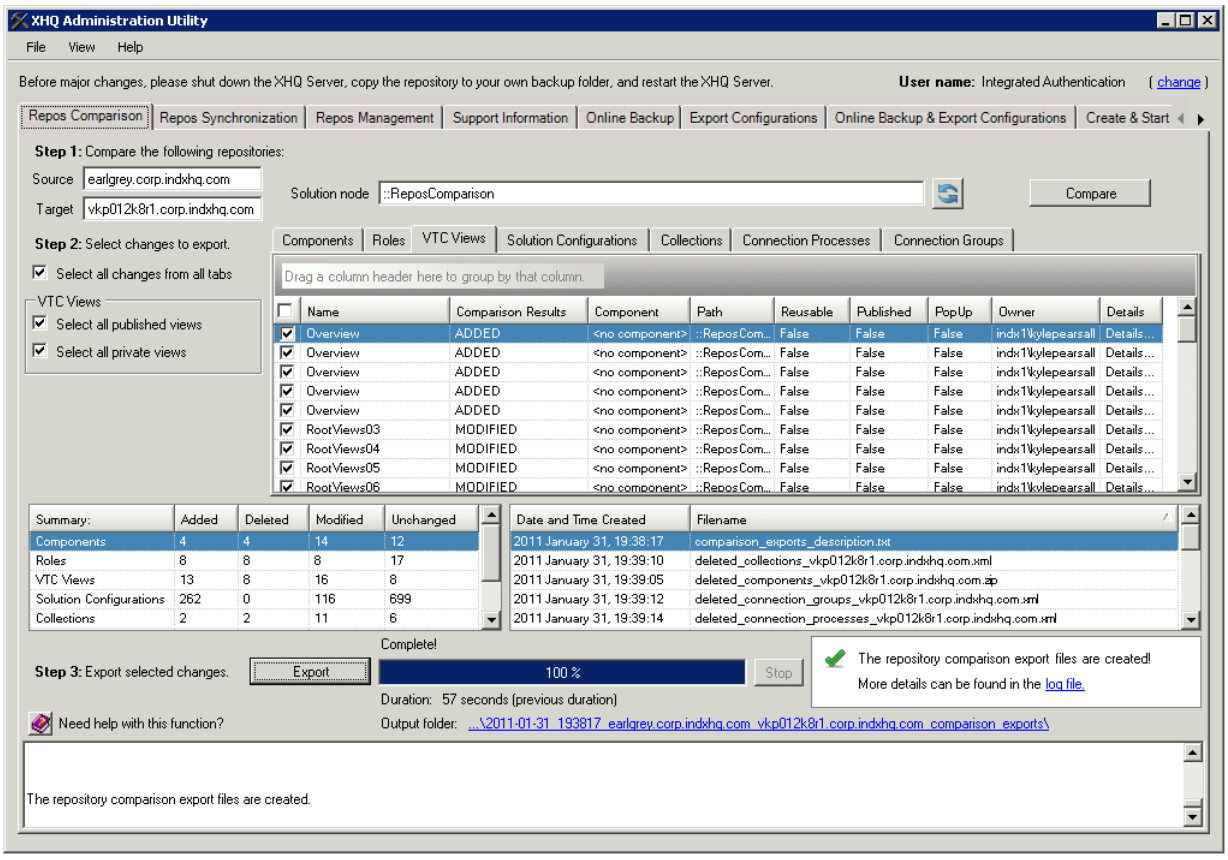
The comparisons are made for:

- Components
- Roles
- View Tile Composer (VTC) Views
- Solution Configurations
- Collections
- Connection Processes
- Connection Groups

If the component is unchanged between two reposes, the repos comparison results will not have any information about its views.

Tags are not compared.

When the comparison is run, the function checks if the given solution node exists on both the Source and Target systems. Therefore, the XHQ Server must be started on both systems.



Repos Comparison Tab

Comparison results are categorized as:

- **`UNCHANGED`**
  The item exists, and are identical, in both repositories.
- **`MODIFIED`**
  The item exists in both repositories, but are not identical.

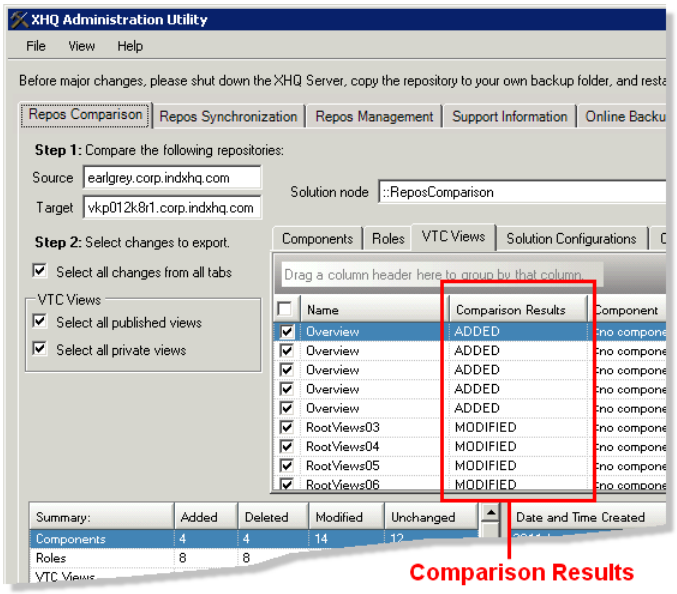
  When a `MODIFIED` item is exported, it is exported from the **source** repository.

- **`ADDED`**
  The item exits in the source repository, but does not exist in the target repository.

  When an `ADDED` item is exported, it is exported from the **source** repository.

- **`DELETED`**
  The item does not exist in the source repository, but does exist in the target repository.

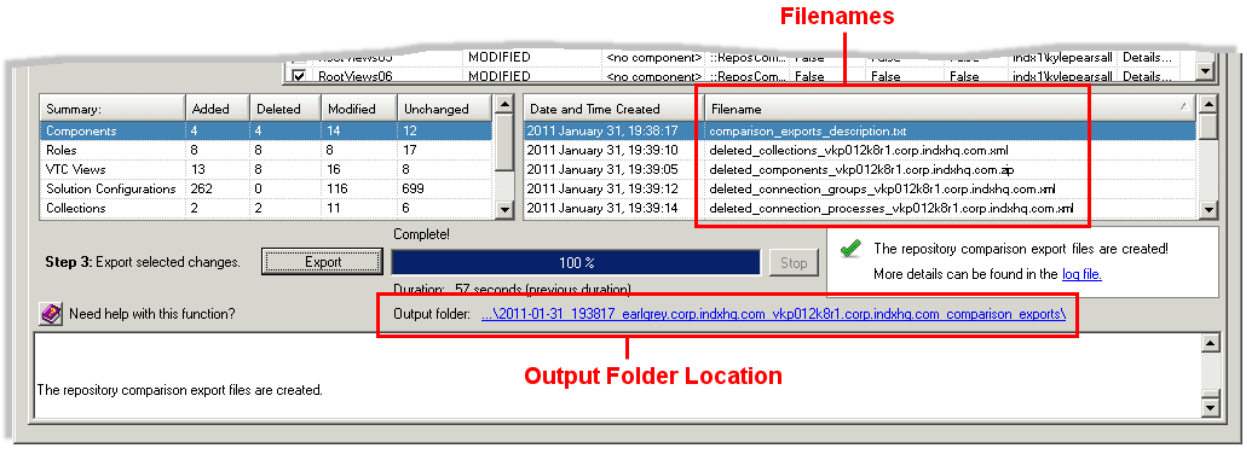
  When a `DELETED` item is exported, it is exported from the **target** repository.



Comparison Results Column

Output File Naming Conventions

The output file is the repos comparison export file that is created. These export files are saved in the given output folder. On XHQ Servers, it is in the `%XHQ_SERVER_REPOS%\..\backups\repos_comparisons` directory. On XHQ Development Clients, it is in the `%USERPROFILE%\Application Data\XHQ\XHQ devClient\repos\backups\repos_comparisons` directory.



Output Filenames and Folder Location

The output files for `ADDED` and `MODIFIED` items are named according to the following format: `selected_<items>_<source_server_name>.<file extension>`

Export Filenames for Selected Items

The export filename for selected:	Is in this following format:
Collections	`selected_collections_<source_server_name>.xml`
Components	`selected_components_<source_server_name>.zip`
Connection Groups	`selected_connection_groups_<source_server_name>.xml`
Connection Processes	`selected_connection_processes_<source_server_name>.xml`
Roles	`selected_roles_<source_server_name>.xml`
Solution Configurations	`selected_solution_configurations_<source_server_name>.xml`
VTC Views	`selected_vtc_views_<source_server_name>.zip`

The output files for DELETED items are named according to the following format: `deleted_<items>_<target_server_name>.<file extension>`

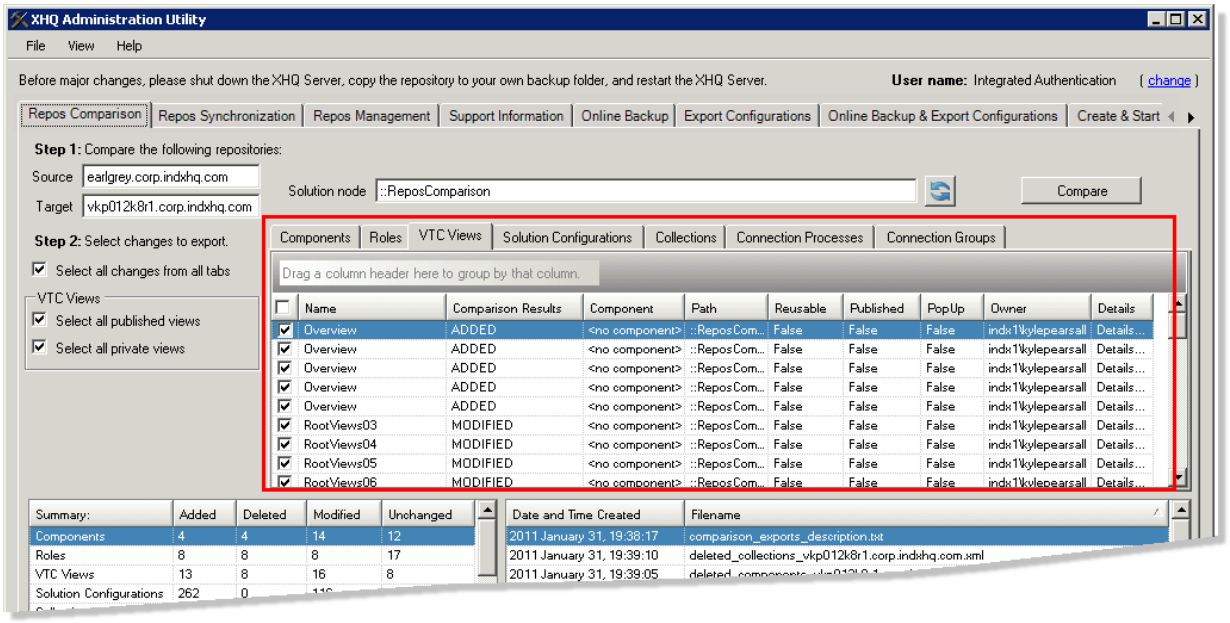
Output Filenames for Deleted Items

The output filename for deleted:	Is in this following format:
Collections	`deleted_collections_<target_server_name>.xml`
Components	`deleted_components_<target_server_name>.zip`
Connection Groups	`deleted_connection_groups_<target_server_name>.xml`
Connection Processes	`deleted_connection_processes_<target_server_name>.xml`

The output filename for deleted:	Is in this following format:
Roles	`deleted_roles_<target_server_name>.xml`
Solution Configurations	`deleted_solution_configurations_<target_server_name>.xml`
VTC Views	`deleted_vtc_views_<target_server_name>.zip`

About the Comparison Results Table

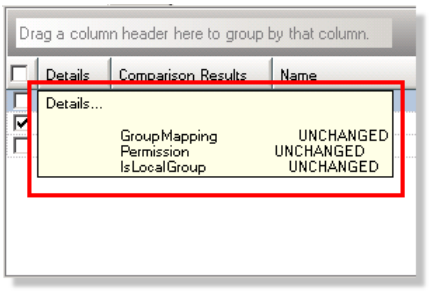
The comparison results are listed in a tabbed table.



Comparison Results Table

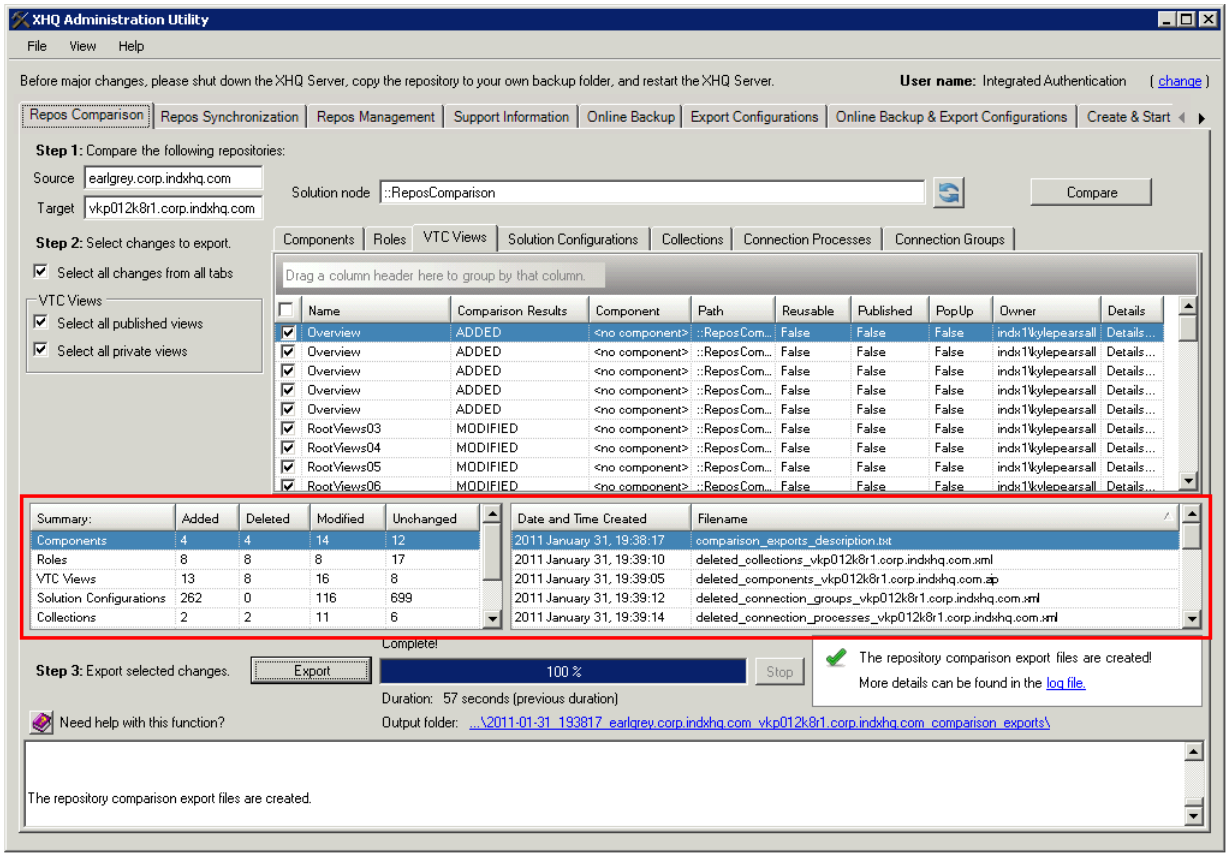
Items marked `UNCHANGED` are not listed on the Comparison Results.

To view the details of a given comparison result entry, place the cursor over the **Details** field. A Tooltip appears, displaying the details for that given comparison result.



Details of the Comparison Result Displayed in a Tooltip

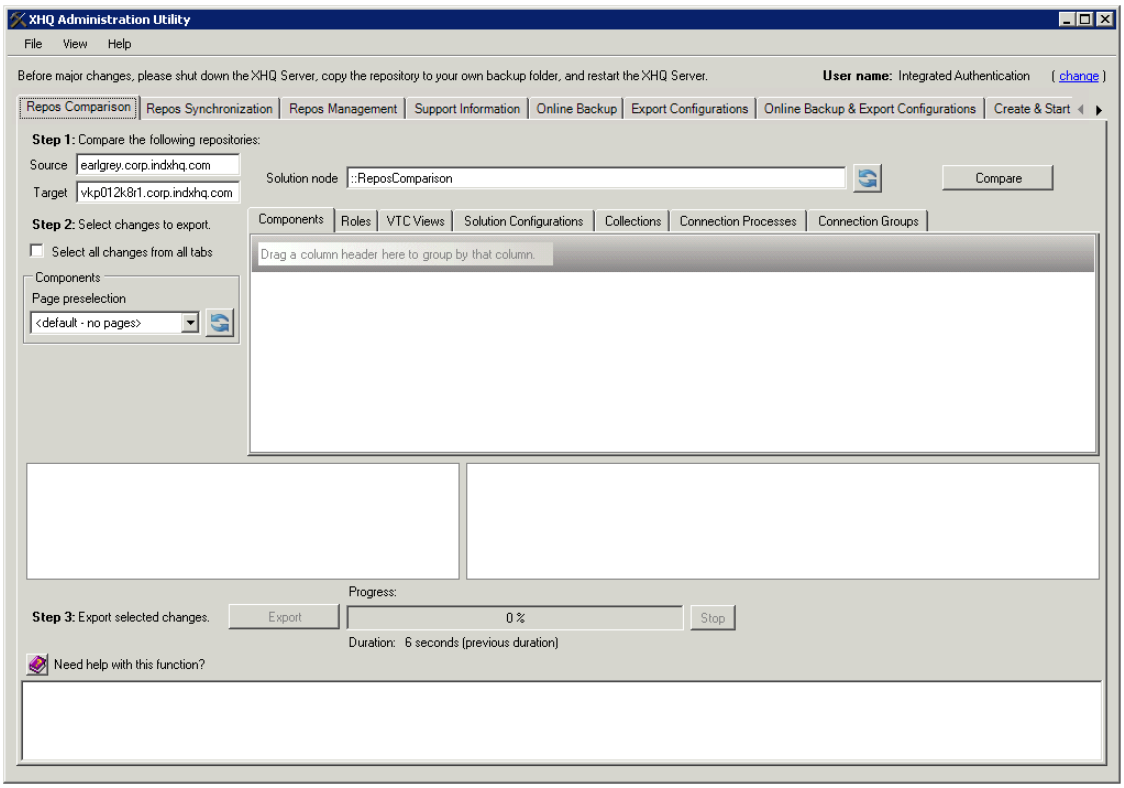
Just below the comparison results table are the comparison summary table and the export file description table.



Comparison Summary and Export File Details

To compare repositories

1. From the XHQ Administration Utility, click the **Repos Comparison tab**.



2. Enter the **hostnames** running the **source** repository and the **target** repository.
3. Enter the **Solution node** to compare.
4. Click **Compare**.
   A message appears, asking you to confirm this action.

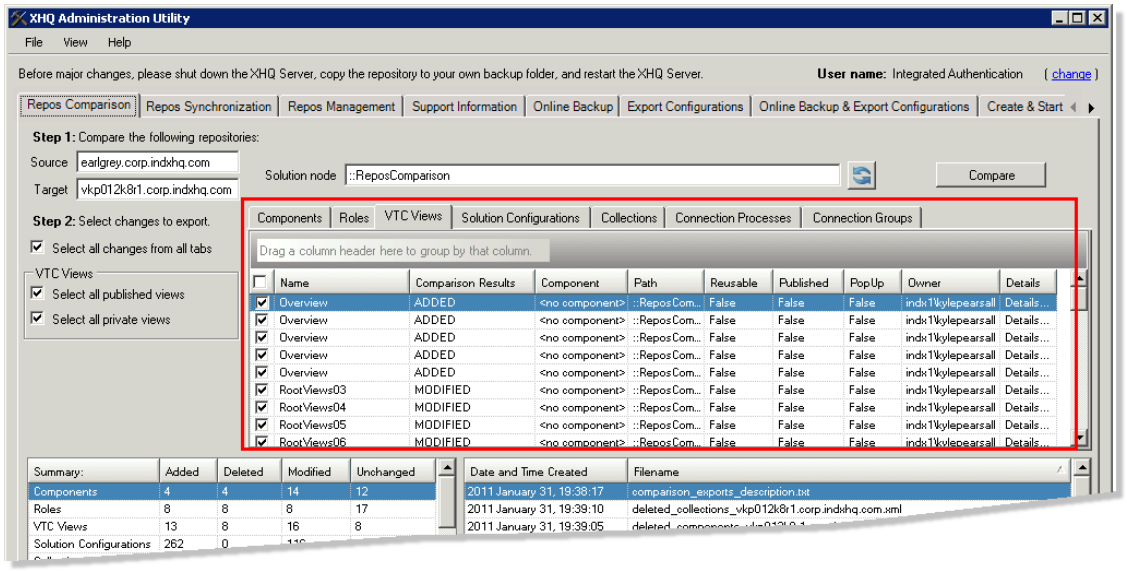
   Large repositories may take several minutes to complete this process.

5. Click **Yes**.

At this point, during the comparison, the export file description table is empty. Your next step is to export the selected comparison results.

To export selected comparison results

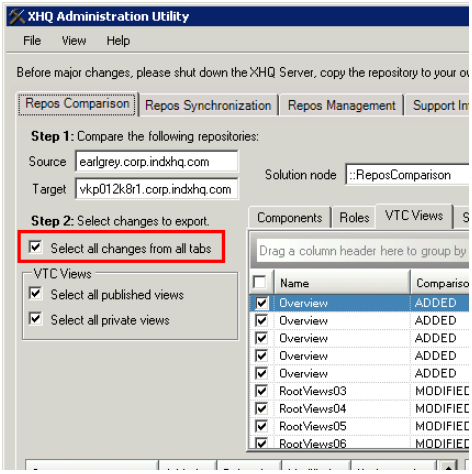
1. Note the comparison results.



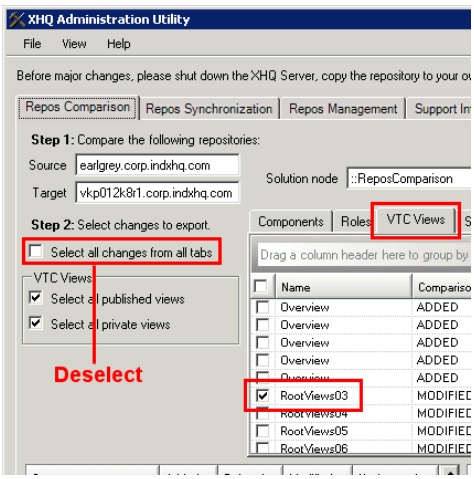
> The Export function creates multiple files for each export configuration set if more than one kind of selected/deleted item(s) is/are selected.

2. Do the following:

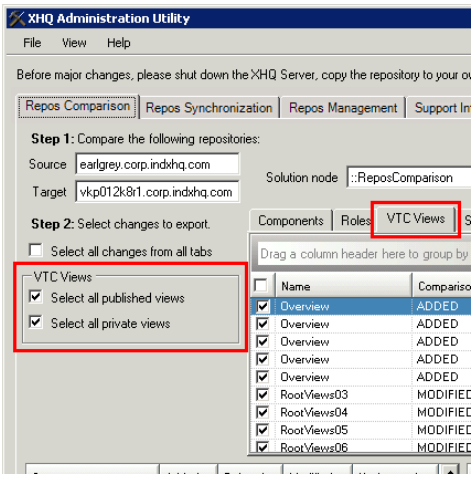
- To export **all** the changes, check the **Select all changes from all tabs** options.



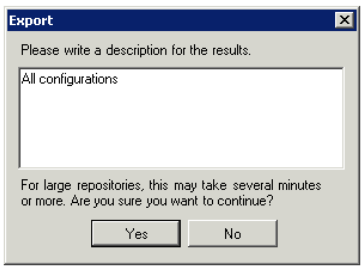
- To export **individual** changes, click through the tabs and select (check) individual results.



- For **VTC Views**, to export only published or only private views, click the **VTC Views tab**, in the **Options-VTC Views** group, check the desired option.



3. Click **Export**.
   The "Export" dialog box appears.

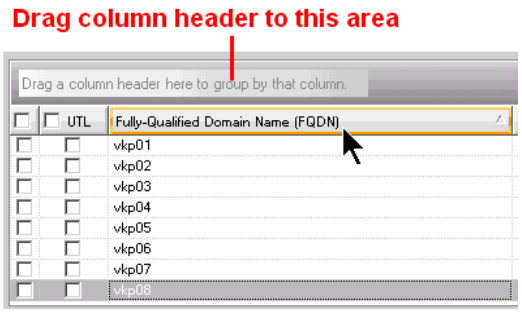


4. **Enter a description** for the exported comparison file and click **Yes**.

About Sorting and Grouping

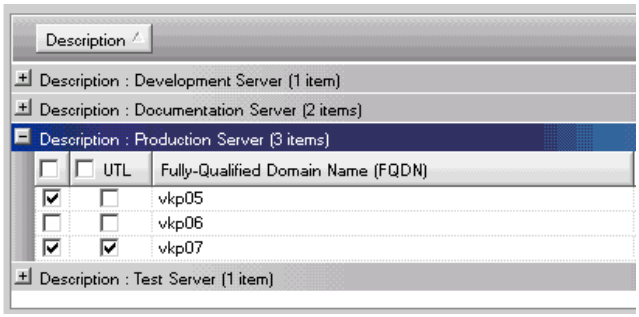
To **sort**, you simply click on the column header to refresh the list and sort in ascending order. Click the column header again to sort in descending order.

To **group by** a column's values, drag a column header to the designated area(s) below the tabs.



Grouping by Column

Consider the following example.

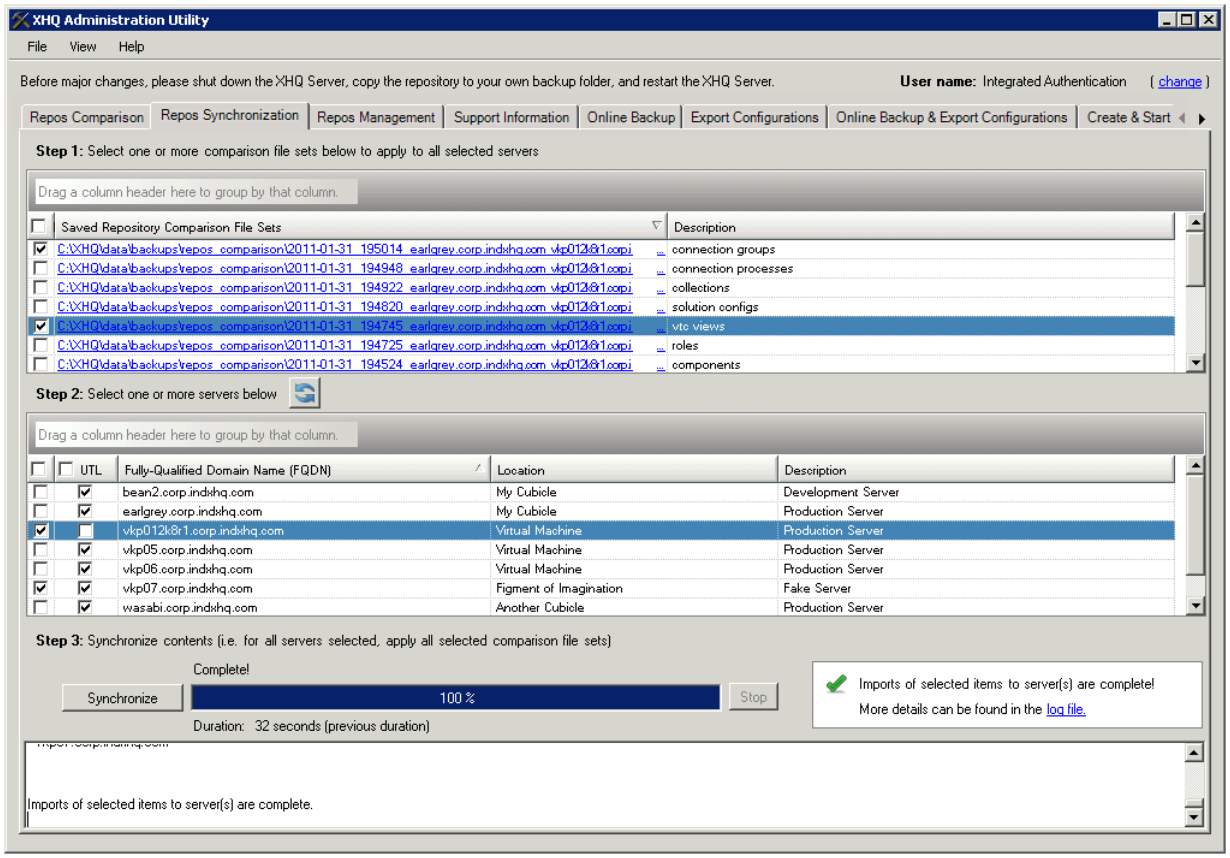


In this case, the rows are grouped by the Description column. All items with the same description appear in the navigable list for each Description row.

Repos Synchronization

The Repos Synchronization function allows you to apply XHQ configurations from one or more comparison file sets to one or more servers.

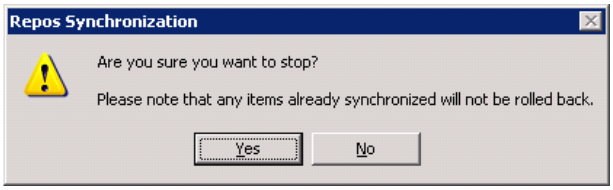
Prior to synchronizing, backup all your solutions located on the servers (to which the compare set files are to be applied). This is done by shutting down the XHQ Server, copying the repos to a backup folder, and then restarting the XHQ Server.



Repos Synchronization Tab

SIDEBAR: WHAT HAPPENS IF YOU STOP THE PROCESS BEFORE SYNCHRONIZATION IS COMPLETE?

If you click **Stop** during the synchronization process, the following message appears. Any items already synchronized are not rolled back.



To prepare for a repos synchronization

1. From the XHQ Administration Utility, run a **Repos Comparison** to create the comparison file(s).

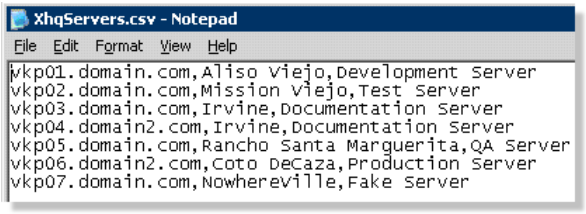
   For more information, see the topic, *Repos Comparison*.

2. Next, using a text editor, **create a text file** listing the Fully-Qualified Domain Names (FQDN) of all servers you wish to reference. The format for this list is as follows:

```
ServerName<1>,Location<1>,Description<1>
ServerName<2>,Location<2>,Description<2>
...
ServerName<n>,Location<n>,Description<n>
```

   The ServerName must be in the form `<server>.<domain>.com`, at the very least. For example, the form `<server>.<subdomain>.<domain>.com` is also valid.

   There is no space after the comma.



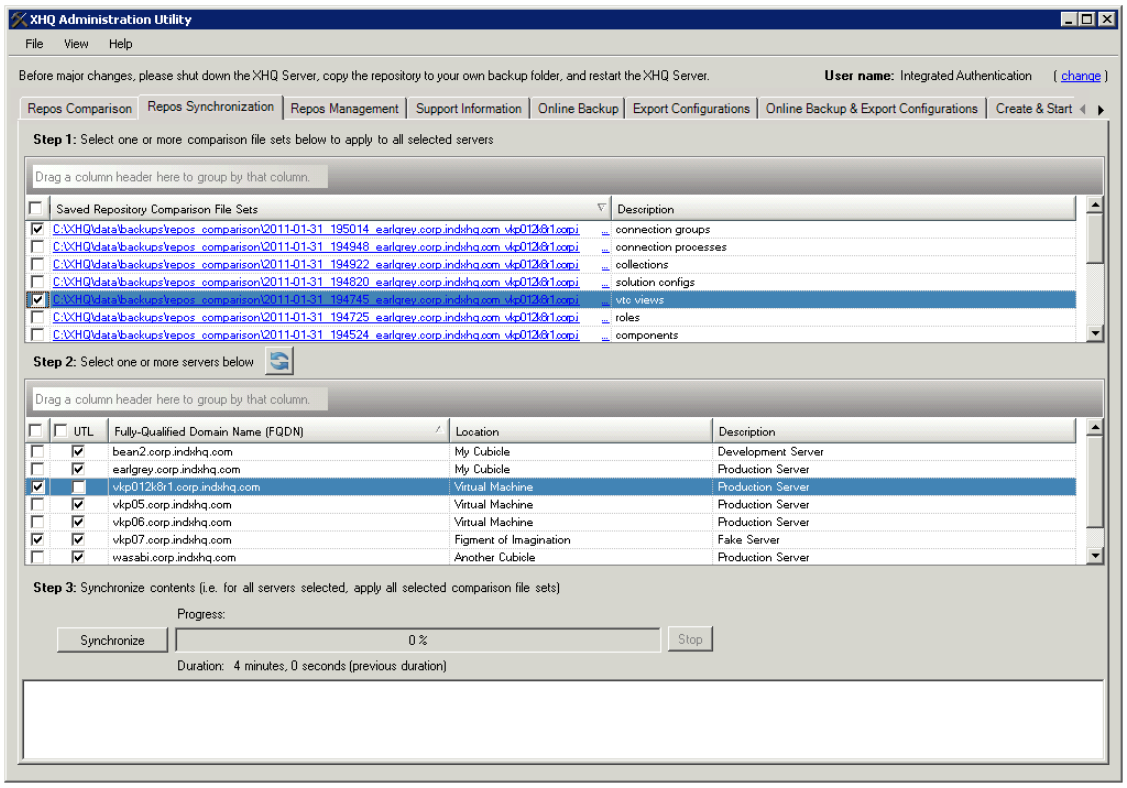
   This list is used to populate the Servers panel for Repos Synchronization.

3. Name this text file **`XhqServers.csv`**.
   On XHQ Servers, save it in the `%XHQ_SERVER_HOME%\bin` directory (which by default is `C:\Program Files (x86)\XHQ\XHQ Server\bin`). For XHQ Development Clients, save it in the `%XHQ_DEV_HOME%\bin` directory.
4. Go back to the XHQ Administration Utility and click the **Repos Synchronization tab**.
5. Click **Refresh XHQ Server List**.
   This populates the Server panel with a list of available servers, as recorded in the `XhqServers.csv` file.

You are now ready to execute a repos synchronization.

To perform a repos synchronization

1. Click the **Repos Synchronization tab**.

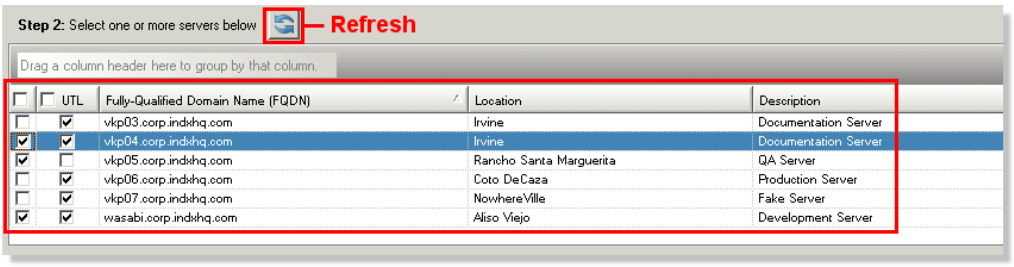


A list of comparison file sets appears in the top panel, under the **Saved Repos Comparison File Sets** column.

5. From this list, **select one or more comparison file sets** to apply to all selected servers.

> As in the Repos Comparison interface, you can sort and group the given list through the column header. For more information, go to the topic, *About Sorting and Grouping*.

6. Next, click **Refresh** (if needed).



This populates the **Server panel** with a list of available servers, as recorded in the `XhqServers.csv` file you created in the preceding set of instructions.

7. In the **first column** of the Server panel, do one of the following:

- Check the box located at the header of the column to select ALL the servers listed.

or

- Check the individual box of the server(s) to which you want to apply the synchronization.

8. OPTIONAL

In the **UTL column** of the Server panel, do one of the following:

- Check the box located at the header of the column to perform an Update-To-Latest (UTL) to all the servers listed. By default, this box is checked.

or

- Check the individual box of the server(s) to which you want to perform the UTL.

The **Update-To-Latest** is performed after the Model configurations are applied but before the Solution configurations are applied. See the topic, *Order of Synchronization*, for more information.

9. Click **Synchronize**.

For synchronization details on XHQ Servers, access the log file, `XhqAdministrationUtility.out`, which is located in the `%XHQ_SERVER_LOGS%` directory. On XHQ Development Clients, the log file is at `%XHQ_DEV_HOME%\log`.

Order of Synchronization

The order of synchronization is as follows. For each entry, the related `xhqci` command-line syntax is given.

The username and password are only set if specific credentials are supplied.

Order of Synchronization

Repos Synchronization Order	xhqci Command-line Syntax
1. Import Deleted Roles	`xhqci importrolemappings "file=<path_to>\deleted_roles_ prod.server.com.xml" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"`
2. Import Selected Roles	`xhqci importrolemappings "file=<path_to>\selected_roles_ dev.server.com.xml" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"`
3. Import Deleted Components	`xhqci importmodel "file=<path_to>\deleted_components_ prod.server.com.zip" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"`
4. Import Selected Components	`xhqci importmodel "file=<path_to>\selected_components_ dev.server.com.zip" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"`
5. Update-To-Latest (UTL)	`xhqci updatesoln "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"`
6. Import Deleted Connection Groups	`xhqci importconngroups "file=<path_to>\ deleted_connection_groups_prod.server.com.xml" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"`
7. Import Deleted Connection Processes	`xhqci importconnprocs "file=<path_to>\ deleted_connection_processes_prod.server.com.xml" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"`
8. Import Selected Connection Processes	`xhqci importconnprocs "file=<path_to>\ selected_connection_processes_dev.server.com.xml" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"`
9. Import Selected Connection Groups	`xhqci importconngroups "file=<path_to>\ selected_connection_groups_dev.server.com.xml" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"`
10. Import Deleted Solution Configurations	Deleted solution configurations are applied and then updated in the solution using the Update-To-Latest function.
11. Import Deleted Collections	`xhqci importsoln "file=<path_to>\deleted_collections_ prod.server.com.xml" "eshost=prod.server.com"`

Repos Synchronization Order	xhqci Command-line Syntax
	"sshost=prod.server.com" "uid=<username>" "pw=<password>"
12. Import Selected Solution Configurations	xhqci importsoln "file=<path_to>\selected_solution_configs_ dev.xml" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"
13. Import Selected Collections	xhqci importsoln "file=<path_to>\ selected_collections_dev.server.com.xml" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"
14. Import Deleted VTC Views	xhqci importvtcviews "file=<path_to>\ deleted_vtc_views_prod.server.com.zip" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"
15. Import Selected VTC Views	xhqci importvtcviews "file=<path_to>\selected_vtc_views_ dev.server.com.zip" "eshost=prod.server.com" "sshost=prod.server.com" "uid=<username>" "pw=<password>"

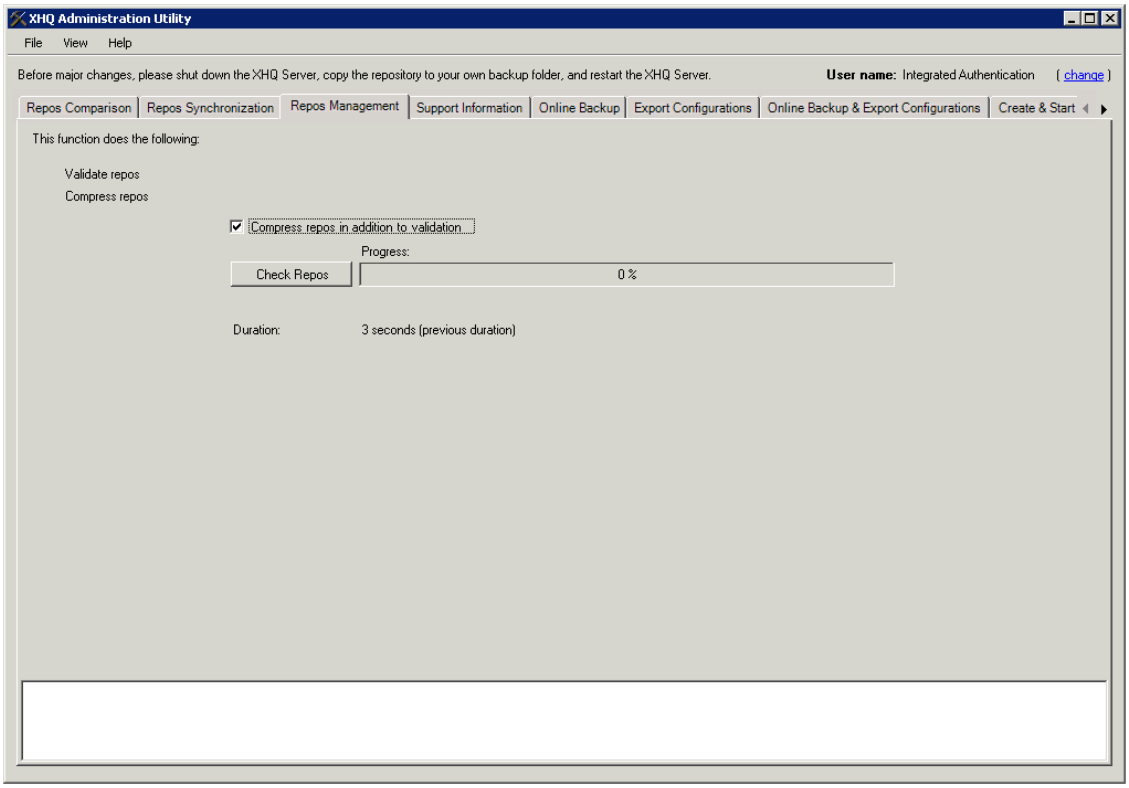
For more information on these command-lines, go to the topic, *Using the xhqci Utility*, located in the XHQ Administrator's Guide.

Repos Management

This function validates and compresses the repos.

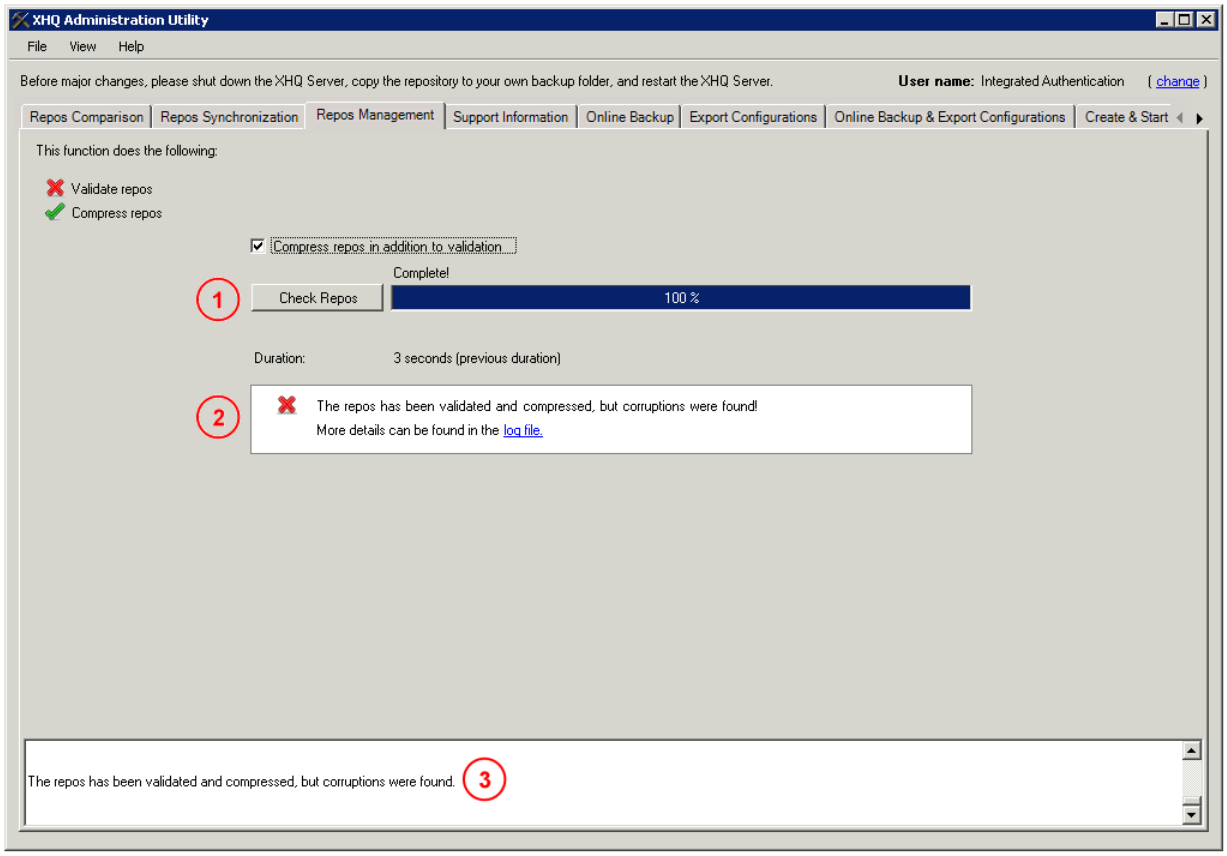
To manage the repos

1. From the XHQ Administration Utility, click the **Repos Management tab**.



2. OPTIONAL
   Check **Compress repos in addition to validation**.
3. Click **Check Repos**.

Upon completion, note the following:

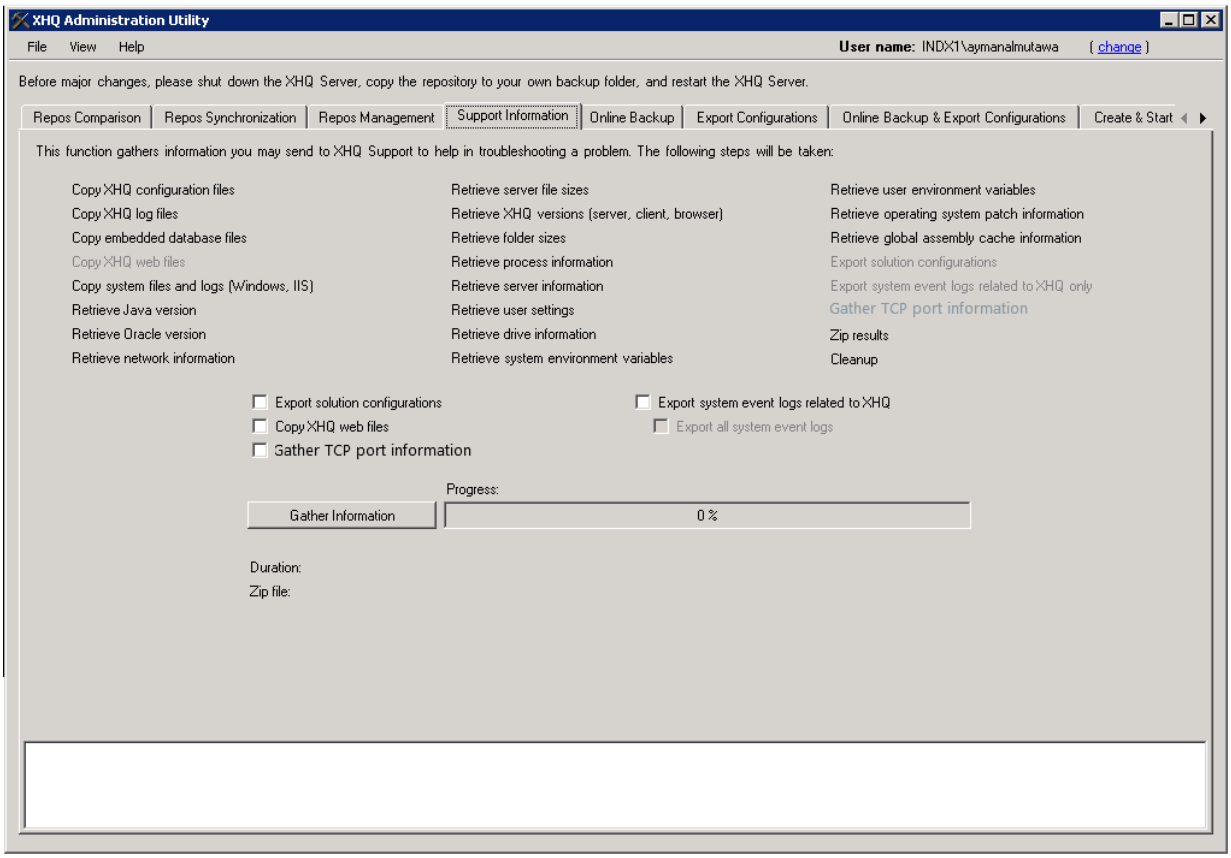


Repos Management Complete Indicators

Item	Description
1	The progress indicator shows 100% completion.
2	In the backup message box: • A check mark appears if the repos validated with no corruptions, and was successfully compressed. • A warning icon appears if corruptions were found or if the compression was unsuccessful. For details of this process, click the log file link or scroll the contents of the output pane below (Item 3).
3	The output pane displays the status during the backup process. **Note:** The contents of this output are written to the log file.

Support Information

The Support Information function allows you to gather information to send to the XHQ Customer Support Team for help in troubleshooting problems.



Support Information Tab

The output is a **`ZIP file`** located in the `%XHQ_SERVER_DATA%\backups\support_information` folder.

Example ZIP filename: `2018-02-13_150751_vat2k12r2-03_xhq_server_support_information.zip`

The XHQ Administration Utility truncates the hostname of the machine to no more than 64 characters. In the above example ZIP filename, if the hostname, `vat2k12r2-03`, was more than 64 characters, it would be truncated down to 64 characters. This is done for both the XHQ Server and XHQ Development Client versions of the XHQ Support Information tool.

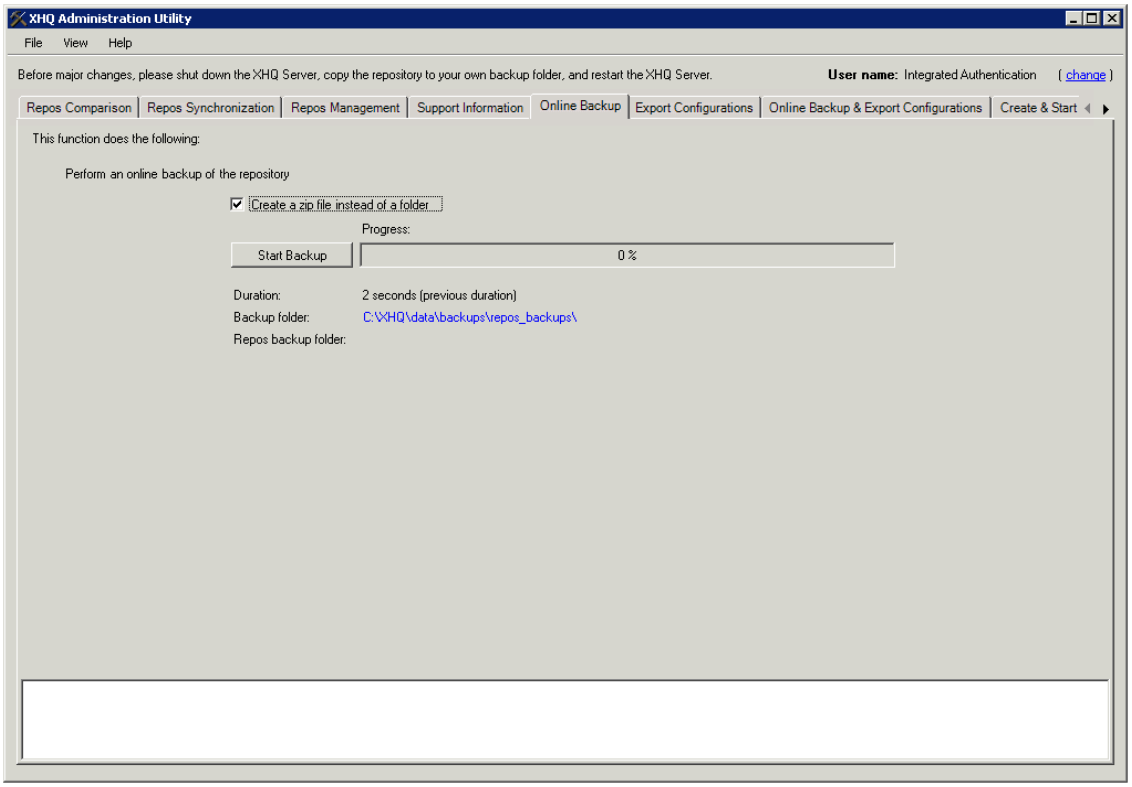
Online Backup

The online backup process does not shut down (restart) the XHQ Server.

You may also use the **xhqci utility** to backup your repos. For more information, go to topic, *Online Backup*, located in the XHQ Administrator's Guide.

To perform an online backup of the repos

1. From the XHQ Administration Utility, click the **Online Backup tab**.



2. OPTIONAL
   Check **Create a zip file instead of a folder**.
   This creates a ZIP file for the repos backup.

   The zipped file is as much as 90% smaller than the actual size.

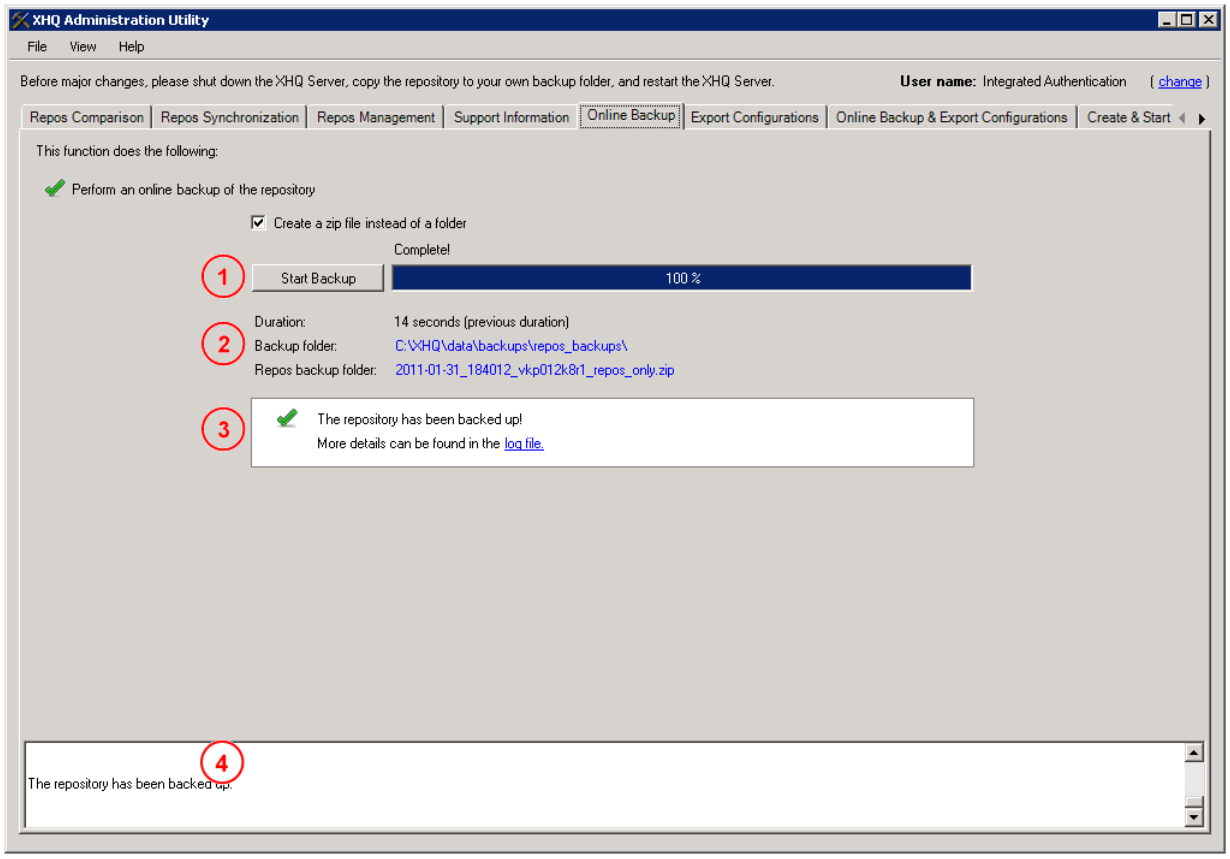
   The default backup location is in the `C:\XHQ\data\backups\repos_backups\` directory. The folders have the **`_repos_only`** extension.

3. Click **Start Backup**.
   A message appears, asking you to confirm this action.

   Large repositories may take several minutes to complete the backup process.

4. Enter a **description**.
5. Click **Yes**.
   The backup process begins.

Upon a successful completion of an online backup of the repos, note the following:



Online Backup Complete Indicators

Item	Description
1	The progress indicator shows 100% completion.
2	The backup folder location and backup repos folder name are displayed. **Note:** The backup folder is located in the same directory as the repos folder.
3	A checkmark appears in the backup message box. For details of this process, click the log file link or scroll the contents of the output pane below (Item 4).
4	The output pane displays the status during the backup process. **Note:** The contents of this output are written to the log file.

Export Configurations

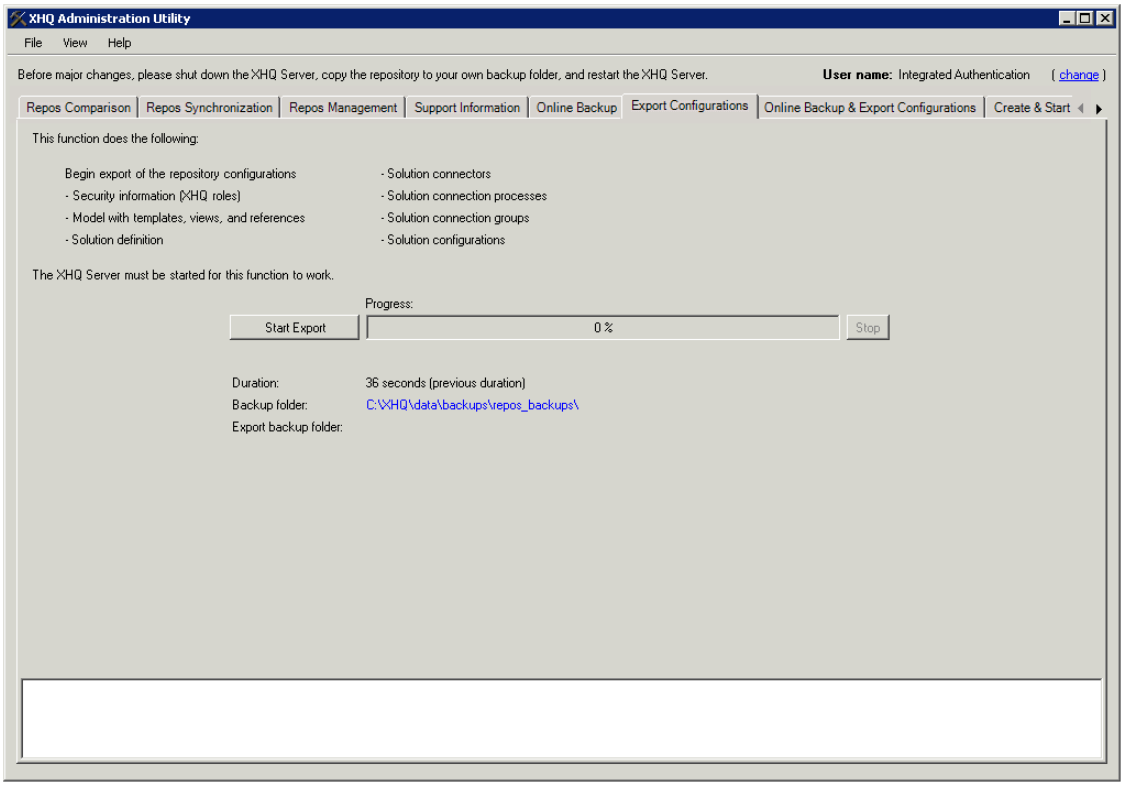
The following repos configurations are exported:

- Roles (security information)
- Model (with templates, views, and references)
- Solution Definition
- Solution Configurations
- Solution Connectors
- Solution Connection Processes
- Solution Connection Groups

In order to export the XHQ repos configurations, the XHQ Server must be started.

To export the repos configuration

1. From the XHQ Administration Utility, click the **Export Configurations tab**.



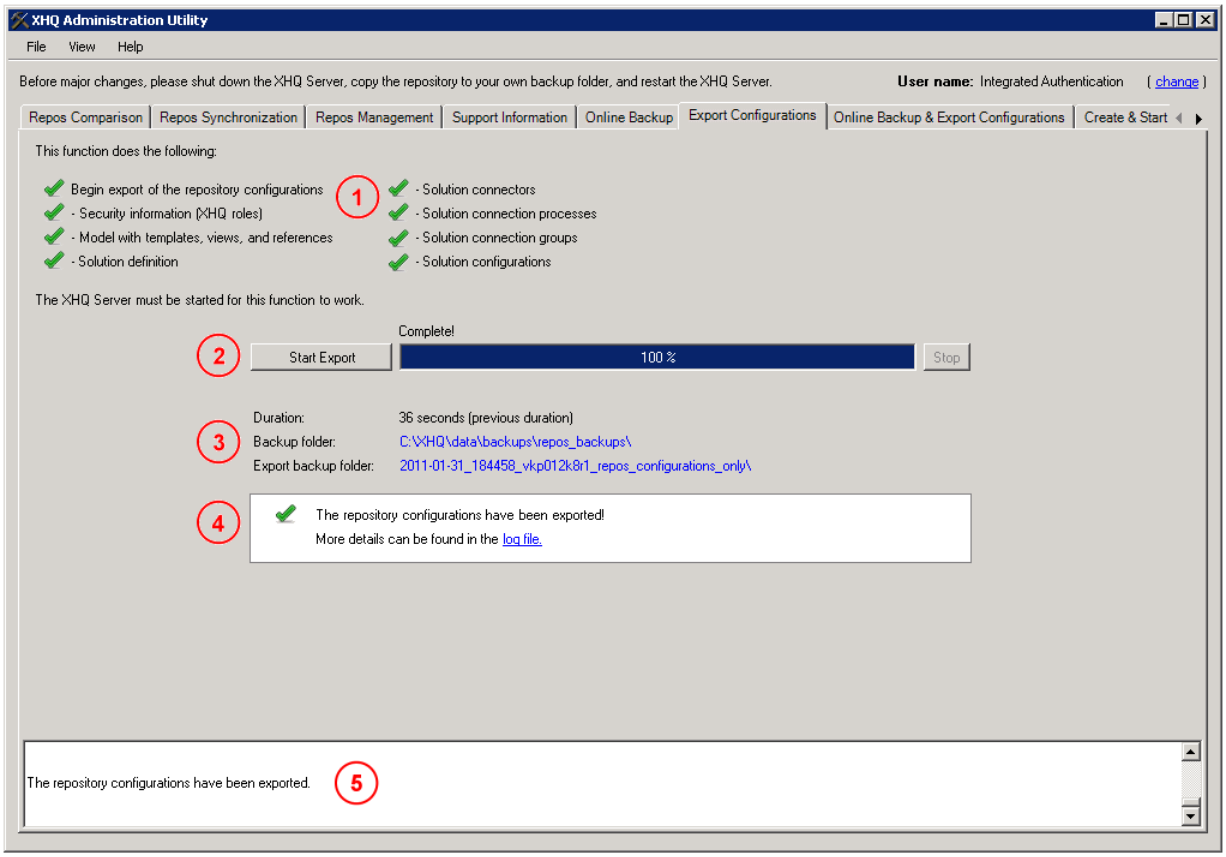
2. Click **Start Export**.
   A message appears, asking you to confirm this action.

   Large repositories may take several minutes to complete the export process.

3. Click **Yes**.
   The export process begins.

   The Stop button is enabled during a set period of time within the process.

Upon a successful completion of an export, note the following:



Export Complete Indicators

Item	Description
1	A checkmark appears next to each repos configuration that is successfully exported.
2	The progress indicator shows 100% completion.
3	The backup folder location and export backup folder name are displayed. **Note:** The backup folder is located in the same directory as the repos folder.
4	A checkmark appears in the export configuration message box. For details of this process, click the log file link or scroll the contents of the output pane below (Item 5).
5	The output pane displays the status during the export process. **Note:** The contents of this output are written to the log file.

Online Backup and Export Configurations

In addition to performing an online backup of the repos, the following repos configurations are exported:

- Roles (security information)
- Model (with templates, views, and references)
- Solution Definition
- Solution Configurations
- Solution Connectors
- Solution Connection Processes
- Solution Connection Groups

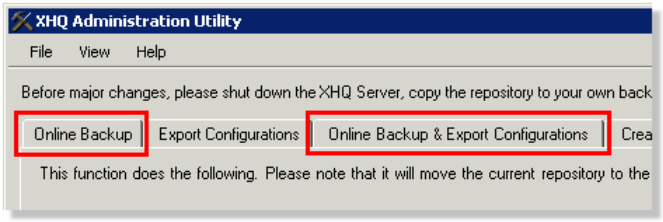
In order to export the XHQ repos configurations, the XHQ Server must be started.

The exported repos and file set can be used to recreate the repos using the Re-create Repos & Import Configurations function. The default export location is typically located in the `C:\XHQ\data\backups\repos_backups\` directory. The folders have the **`_repos_and_configurations`** extension.

Again, the online backup process does not shut down (restart) the XHQ Server. If the XHQ Server is not available, the backup/export process fails.

When to use the Online Backup and Export Configurations Tab

Two separate tabs for the Online Backup & Export Configurations already exist. So why is this functionality needed? How is it different?

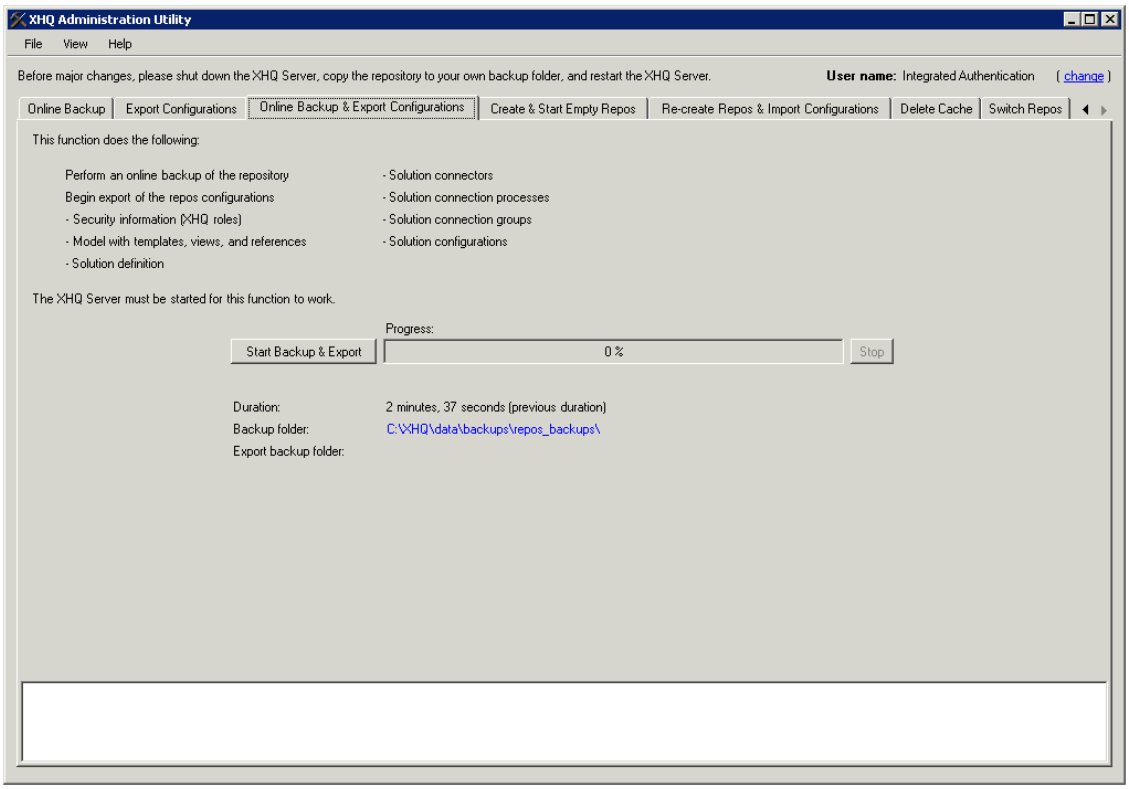


Online Backup & Export Configurations versus Online Backup & Export Configurations

The **Online Backup & Export Configurations** functionality is used specifically when a re-creation of the repos is needed to make the repos smaller or to resolve corruption issues. It is used in conjunction with the **Re-create Repos & Import Configurations** function, which requires the importation of all exported configurations to recreate the model/solution. In this case, the backup and exports have to be performed nearly simultaneously. The original repos remains intact and nothing is lost (for example, properties files, tag sync files, and so forth). Because of this, doing an Online Backup separately from the Export Configurations does not suffice.

To perform an online backup and export repos configurations

1. From the XHQ Administration Utility, click the **Online Backup & Export Configurations tab**.



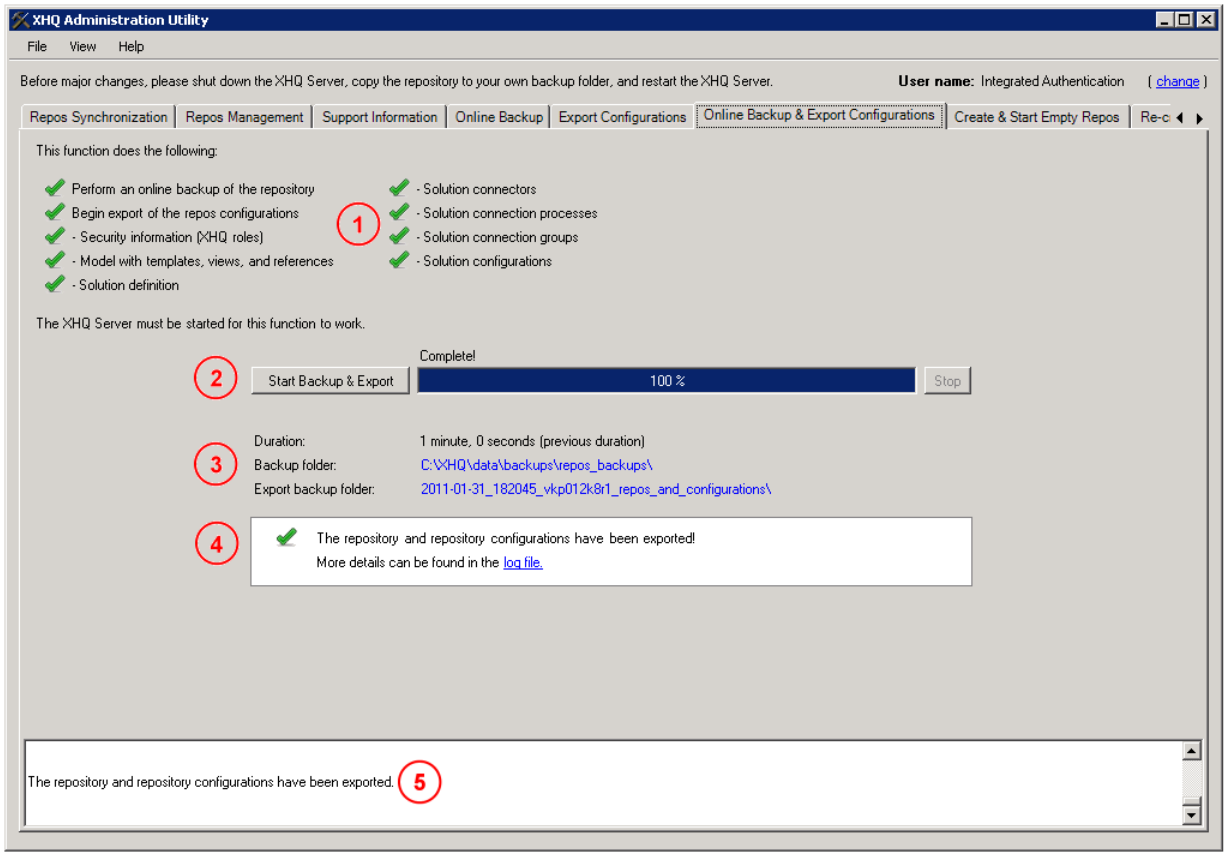
2. Click **Start Backup/Export**.
   A message appears, asking you to confirm this action.

   Large repositories may take several minutes to complete this process.

4. Click **Yes**.
5. OPTIONAL
   Click Stop (to the right of the progress bar) to end the process.

   The Stop button is enabled during the online backup step.

Upon a successful completion of an online backup and export of the repos, note the following:



Online Backup and Export Complete Indicators

Item	Description
1	A checkmark appears next to each function that successfully completed.
2	The progress indicator shows 100% completion.
3	The backup folder location and export backup folder name are displayed. **Note:** The backup folder is located in the same directory as the repos folder.
4	A checkmark appears in the message box. For details of this process, click the log file link or scroll the contents of the output pane below (Item 5).
5	The output pane displays the status during the online backup and export processes. **Note:** The contents of this output are written to the log file.

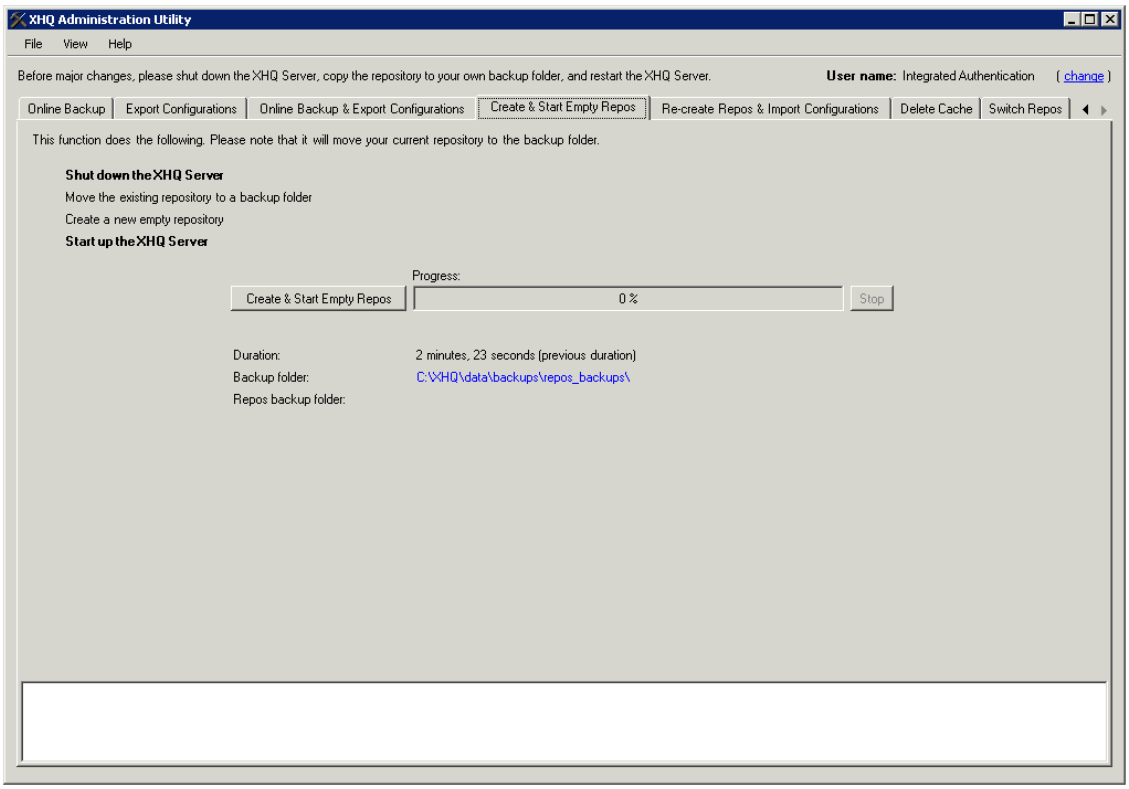
Create and Start an Empty Repos

This process consists of the following tasks:

- Shuts down the XHQ Server.
- Moves the existing repos to the backup folder.
  The default backup location is the `C:\XHQ\data\backups\repos_backups\` directory. The folders have the **`_repos_only`** extension.
- Copies the `repos_empty` directory to the repos directory.
- Starts the XHQ Server.

To create an empty repos

1. From the XHQ Administration Utility, click the **Create & Start Empty Repos tab**.



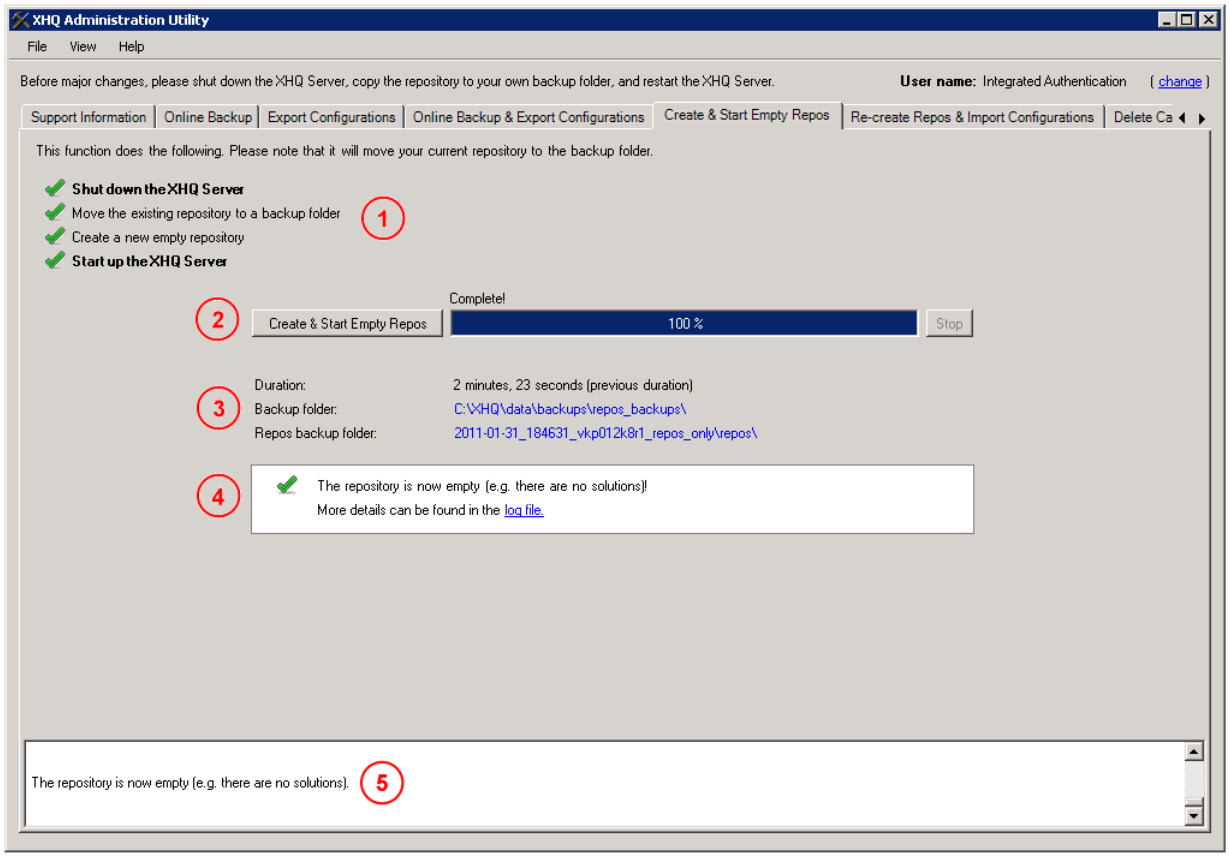
2. Click **Create & Start Empty Repos**.
   A message appears, asking you to confirm this action.

   Large repositories may take several minutes to complete this process.

3. Click **Yes**.
4. OPTIONAL
   Click Stop (to the right of the progress bar) to end the process.

The Stop button is enabled during every step except for the XHQ Server start-up step. If the function is stopped, the backed-up repos is moved back to the current repos.

Once an empty repos is successfully created, note the following:



Create & Start Empty Repos Complete Indicators

Item	Description
1	A checkmark appears next to each function that successfully completed.
2	The progress indicator shows 100% completion.
3	The backup folder location and repos backup folder name are displayed. **Note:** Clicking on these links opens Windows Explorer at the given location.
4	A checkmark appears in the message box. For details of this process, click the log file link or scroll the contents of the output pane below.
5	The output pane displays the status during this process. **Note:** The contents of this output are written to the log file.

Recreate the Repos and Import Configurations

This process recreates a repos by importing (previously exported) XHQ model and solution configurations.

This process involves several restarts of the XHQ Server. It also does not re-create the cache data of the original repos.

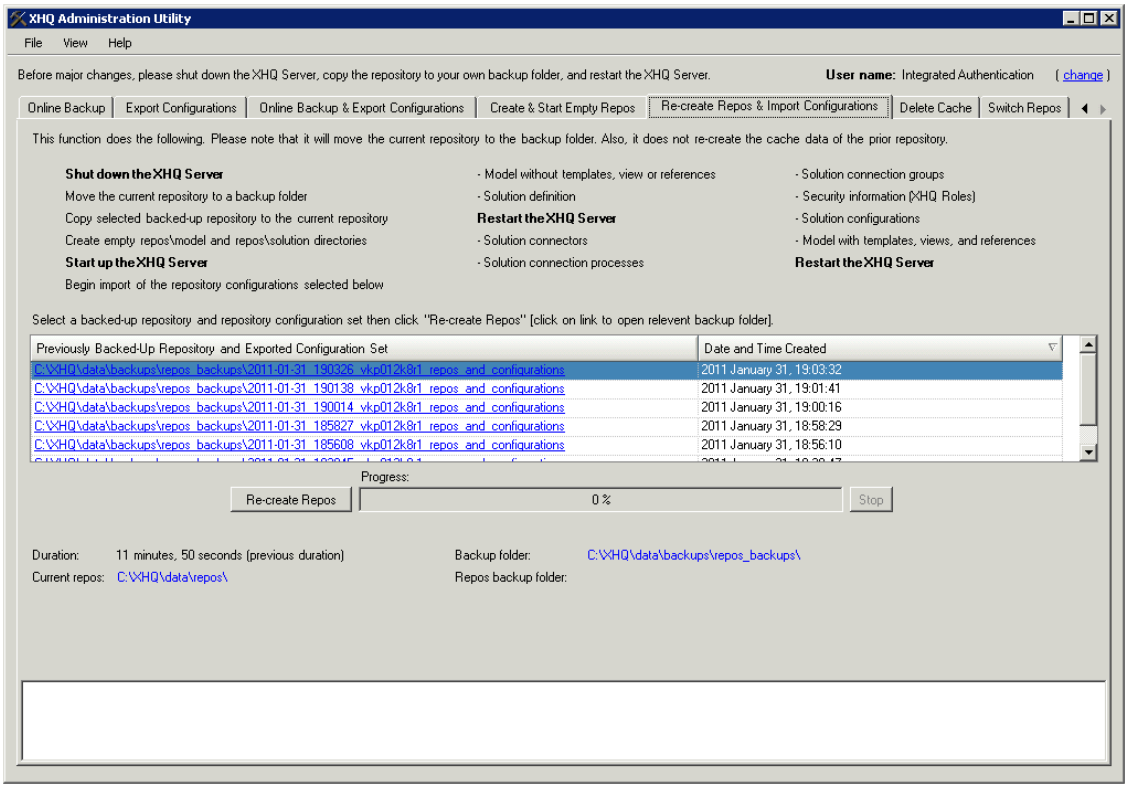
This process can compact the XHQ model and solution significantly in order to save disk space. It can also eliminate various solution and model corruptions.

This process consists of the following tasks:

- Shuts down the XHQ Server.
- Moves the existing repos to the backup folder.
  The default backup location on XHQ Servers is the `C:\XHQ\data\backups\repos_backups` directory.
  The folders have the **`_repos_only`** extension.
- Copies the selected (and previously backed-up and exported) repos to the repos directory.
- Deletes the original `repos\model` and `repos\solution` directories, and creates new ones.
- Starts the XHQ Server.
- Imports the repos configurations (which involves multiple restarts of the XHQ Server).

To recreate a repos

1. From the XHQ Administration Utility, click the **Re-create Repos & Import Configurations tab**.



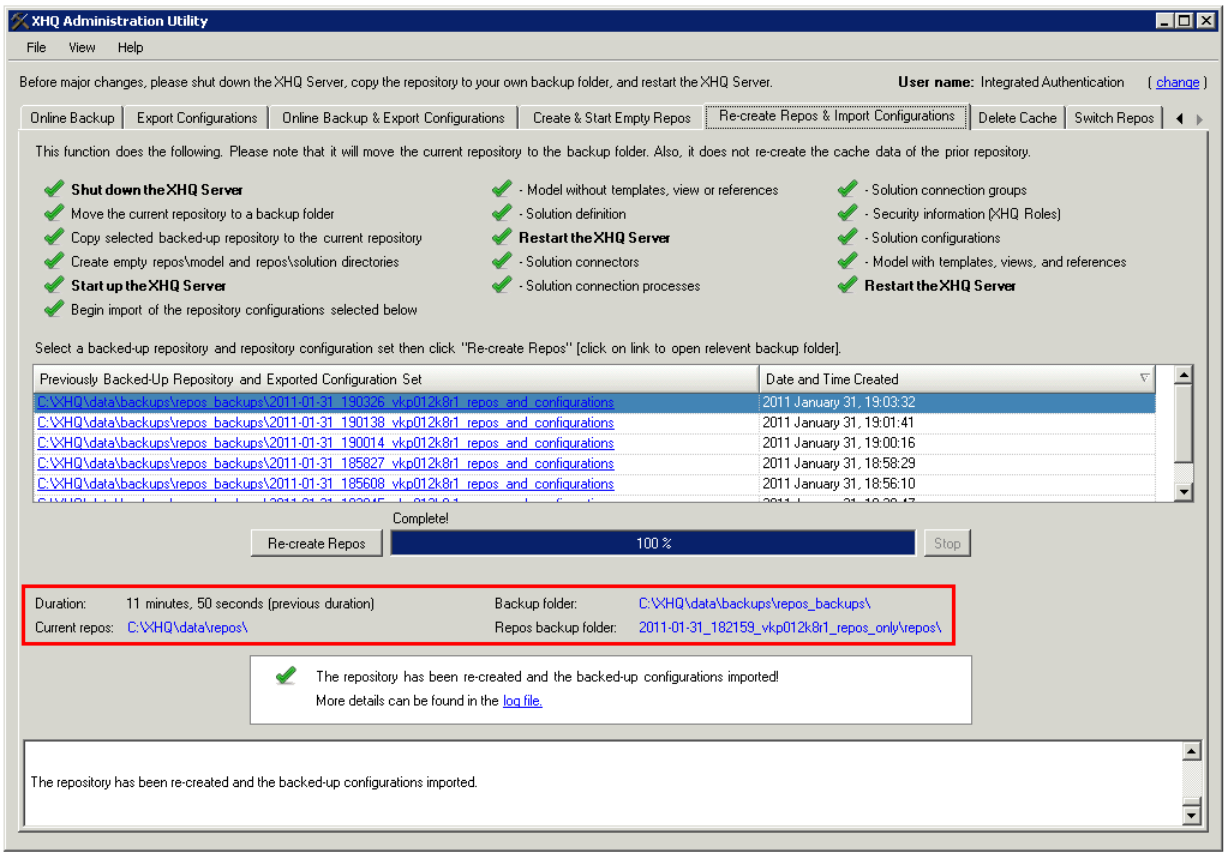
2. From the table, **select** (to highlight) a backed-up repos and repos configuration set, and click **Re-create Repos**. A message appears, asking you to confirm this action.

   Large repositories may take several minutes to complete this process.

3. Click **Yes**.
4. OPTIONAL
   Click Stop (to the right of the progress bar) to end the process.

   The Stop button is disabled after the current repos backup and re-creation of the `repos\model` and `repos\solution` folders, but before the initial start-up of the XHQ Server prior to import operations.

Once the repos is successfully re-created, note the following folder locations:



Backup and Repos Locations

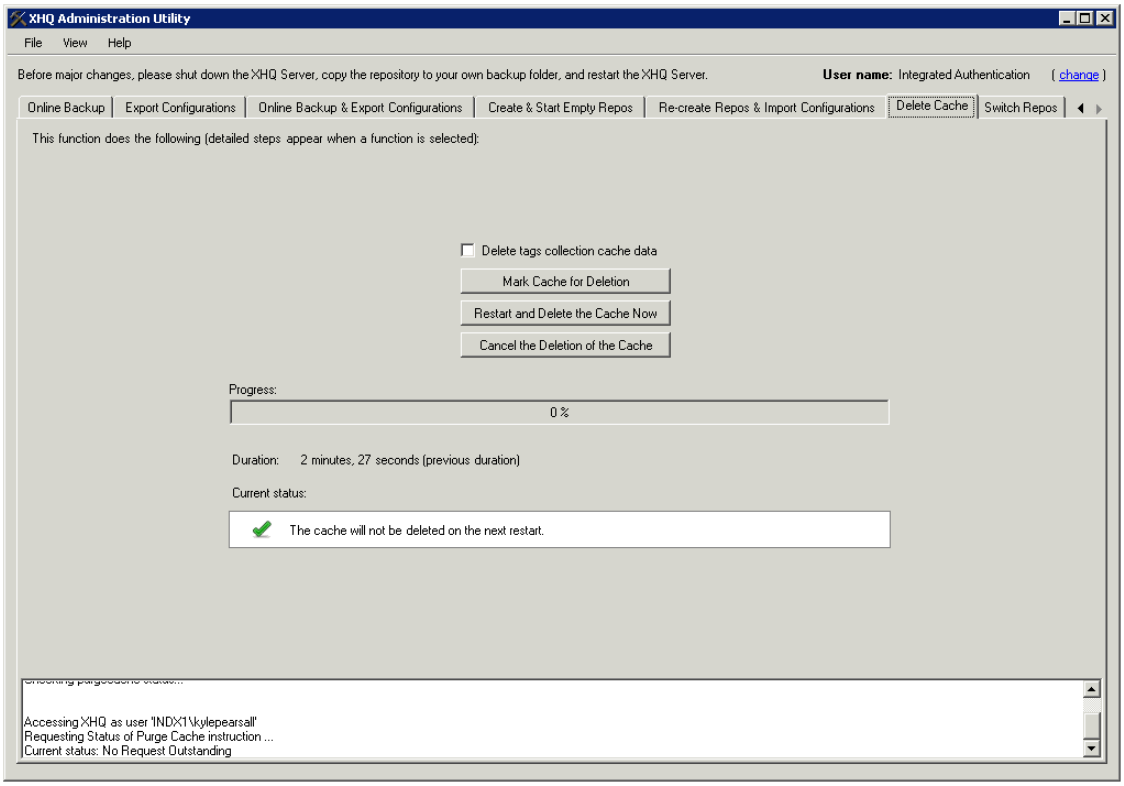
Directory	Description
Current repos	The location of the existing repos directory. **Default location:** `%XHQ_SERVER_REPOS%`
Backup folder	The location of the backup folder. **Default location:** `%XHQ_SERVER_REPOS%\..\backups\repos_backups`

Directory	Description
	(which is one level up from `%XHQ_SERVER_REPOS%`, by default `C:\XHQ\data\backups\repos_backups`).
Repos backup folder	The link to the specific folder for the repos backup created when this function last ran. **Note:** This is different than the backup folder, which is a link to the backup root folder.

Delete Cache

To delete the cache

1. From the XHQ Administration Utility, click the **Delete Cache tab**.



2. Select (check) any of the following:
   - **Delete tags collection cache data**
     Check this box to delete the tags collection data.
   - **Mark Cache for Deletion**
     This sets the cache to be deleted (but not the tags collection data) on the next XHQ Server. This **does not restart** the XHQ Server at the time the function is run.
   - **Restart and Delete the Cache Now**
     This deletes the cache then restarts the XHQ Server during this session.

     Large repositories may take several minutes to complete this process.

   - **Cancel the Deletion of the Cache**
     This cancels the request to delete the cache. This **does not restart** the XHQ Server at the time the function is run.

   For each of the clickable options, a message appears, asking you to confirm the action.
3. Click **Yes**.

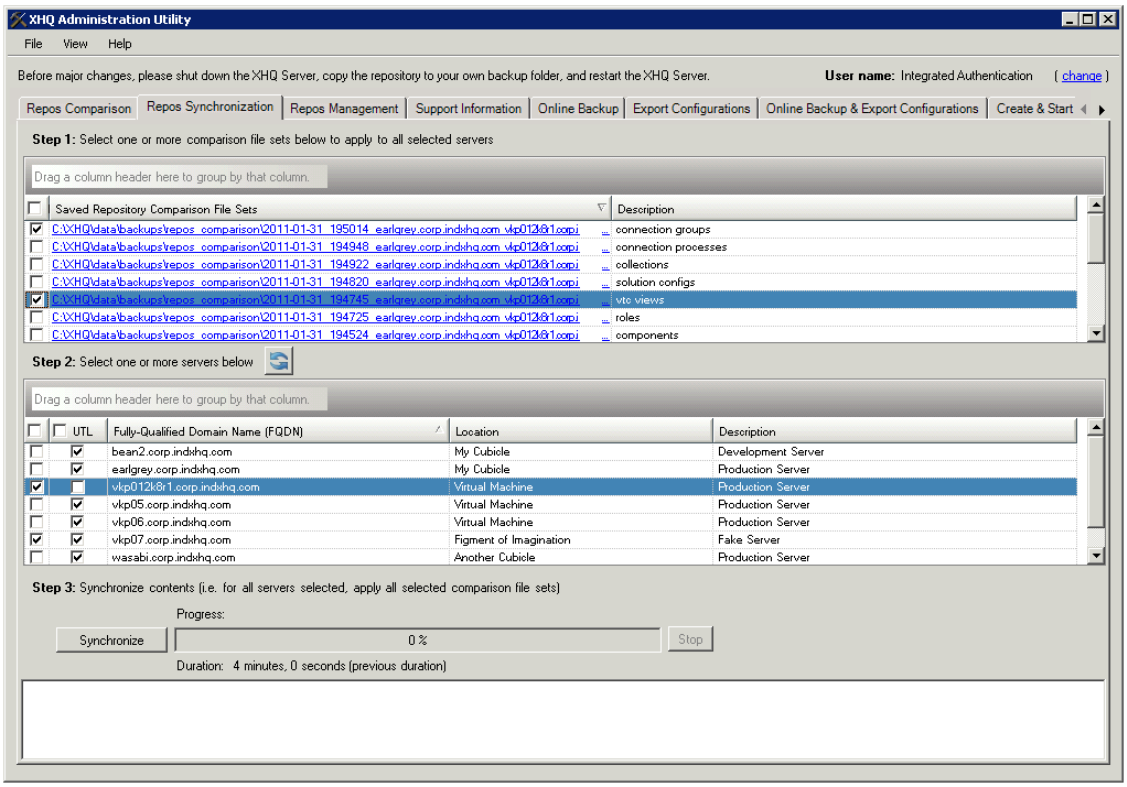
Switch Repos

This process consists of the following tasks:

1 - Shuts down the XHQ Server.
2 - Moves the existing repos to a backup folder.
3 - Moves (or copies) the selected repos to the current repos.
4 - Starts the XHQ Server.

To switch repos

1. From the XHQ Administration Utility, click the **Switch Repos tab**.



2. From the table, select (to highlight) the repos to which you want to switch.

   The table can include backed-up repositories contained in folders, or ZIP files, created by the Online Backup function.

3. OPTIONAL
   Select any of the following options.
   - **Copy** the selected backup repos to the current repos instead of moving it.
   - **Delete** cache data during start-up, including the tag collection data.

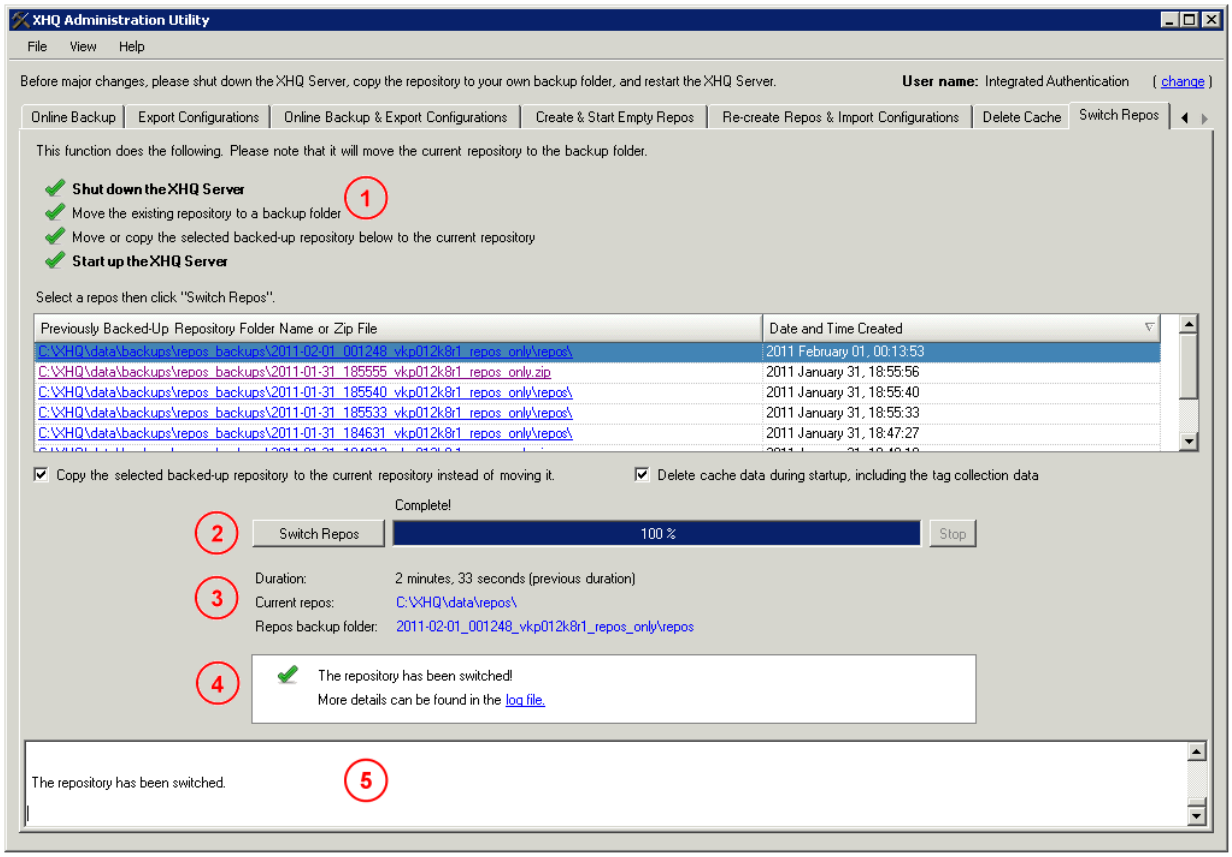
   By default, these options are selected (checked). However, if a ZIP file is selected from the table, the "Copy the selected backed-up repos..." option is **disabled**. ZIP files are only unzipped to the current repos directory; backed-up ZIP files are not deleted.

4. Click **Switch Repos**.
   A message appears, asking you to confirm this action.

Large repositories may take several minutes to complete this process.

5. Click **Yes**.

Once the repos is successfully switched, note the following:



Repos Switch Complete Indicators

Item	Description
1	A checkmark appears next to each function that successfully completed.
2	The progress indicator shows 100% completion.
3	The current repos location and repos backup folder name are displayed. **Note:** Clicking on these links opens Windows Explorer at the given location.
4	A checkmark appears in the message box. For details of this process, click the log file link or scroll the contents of the output pane below.
5	The output pane displays the status during this process. **Note:** The contents of this output are written to the log file.

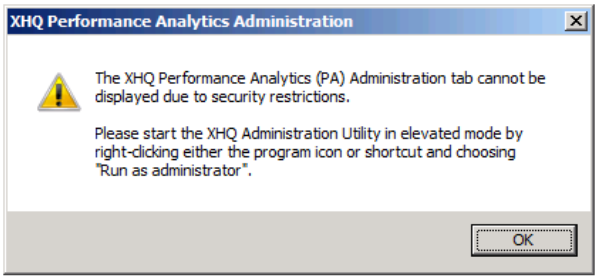
PA Administration

The PA (Performance Analytics) Administration tab is used to configure:

- Dynamic, runtime data;
- Project, source sites and the data connections associated with each site;
- License servers for each project;
- Package and log directories for each project;
- Create default tables for Data Store and Data Mart databases;
- Export and import configuration data at site level.

You must have **administrative privileges** on the server and XHQ Performance Analytics installed.

If UAC is enabled and the XHQ Administration Utility is launched in non-elevated mode, the following message appears and the PA Administration tab is hidden.

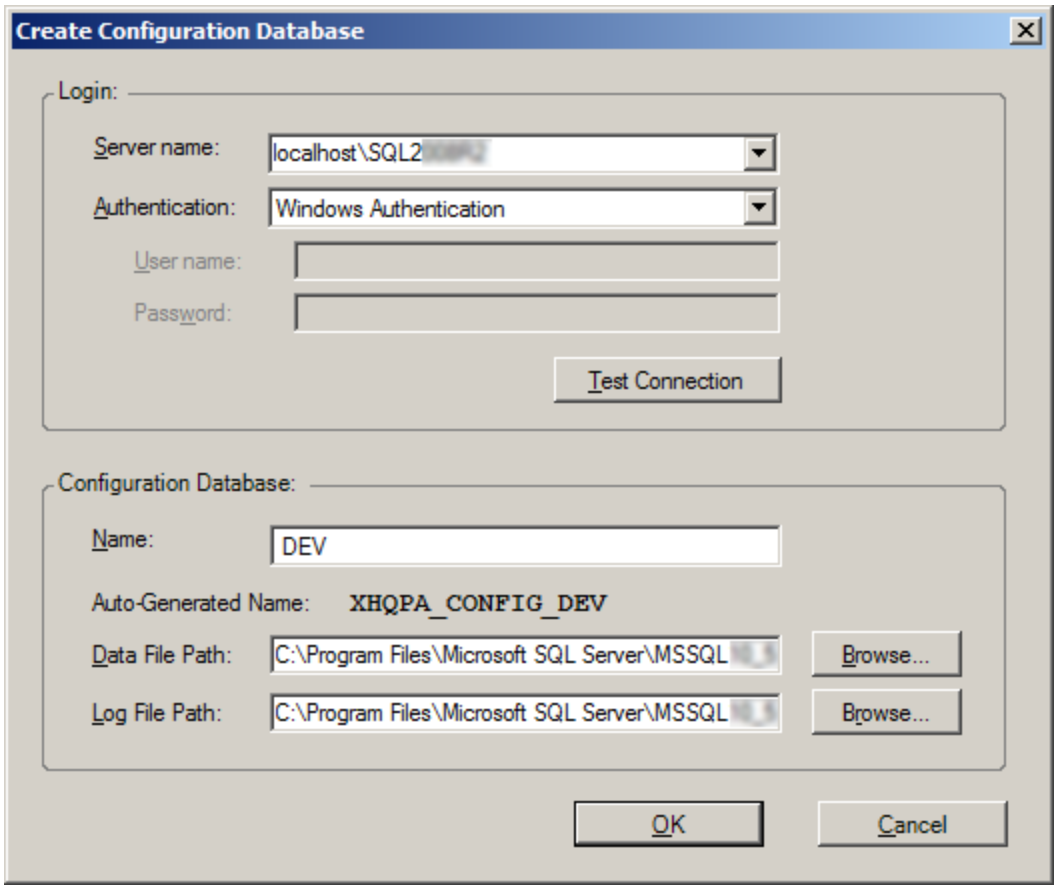


To start the XHQ Administration Utility in **elevated mode**, right-click either the utility program icon or shortcut and select **Run as administrator**.

To create the configuration database

The configuration database stores the connection information (such as the source and target databases, the usernames, and passwords) for the various data sources. The default filename for the configuration database is **XHQPA_CONFIG**.

1. From the XHQ Administration Utility, click the **PA Administration tab**.
2. Click **Create New Configuration Database**.
   The "Create Configuration Database" dialog appears.



3. For the **Login**, select or enter a SQL **Server name** and instance.
4. Select the **Authentication** type.
5. If you picked **SQL Server Authentication**, enter the **User name** and **Password**.
6. Click **Test Connection**.
   If the log-in is successful, the **Configuration Database** group options are enabled.
7. Enter configuration database **Name**.
   The Auto-Generated Name label shows the name of the new configuration database.

   All configuration databases have "**XHQPA_CONFIG_**" prefix in order to indentify them as configuration databases.

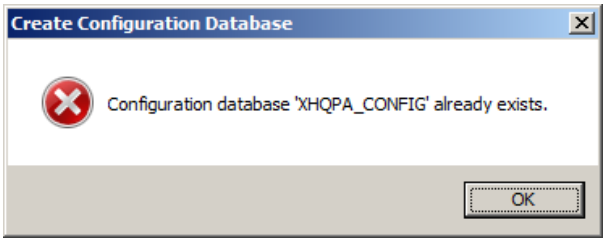
   Changing the name will render the configuration database useless.

   The **Data File Path** and **Log File Path** are automatically populated with the configured values for the selected SQL Server.
8. To change the default path values, either enter a path manually or click **Browse** to select a different path.

   The **Browse** buttons are disabled for remote SQL Servers.

10. Click **OK**.

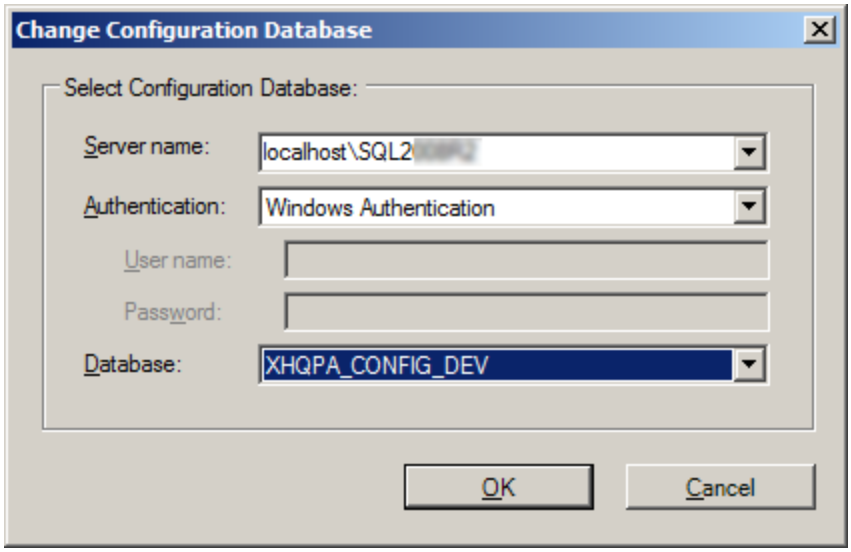
    If the configuration database with the specified name already exists, an error message appears.



To set the current configuration database from XHQ Administration Utility

XHQ Engineering Environment supports multiple configuration databases. However, only one configuration database can be set as current configuration database.

1. From the XHQ Administration Utility, click the **PA Administration tab**.
2. Click **Change Configuration Database**.
   The "Change Configuration Database" dialog appears.



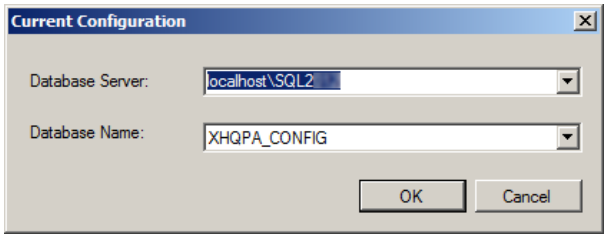
3. Select or enter the SQL **Server name** and instance.
4. Select the **Authentication** type.
5. If you selected **SQL Server Authentication**, enter the **User name** and **Password**.
6. Select a configuration database from the **Database** drop-down list.
7. Click **OK**.

   The current configuration database is changed to the selected configuration database.

> Since the current configuration database setting is shared between the XHQ Administration Utility and XHQ Engineering Environment, it is advisable to either:
>
> Close the XHQ Engineering Environment before changing the configuration database;
>
> *or*
>
> Restart the XHQ Engineering Environment after changing the configuration database.

To set the current configuration database from XHQ Engineering Environment

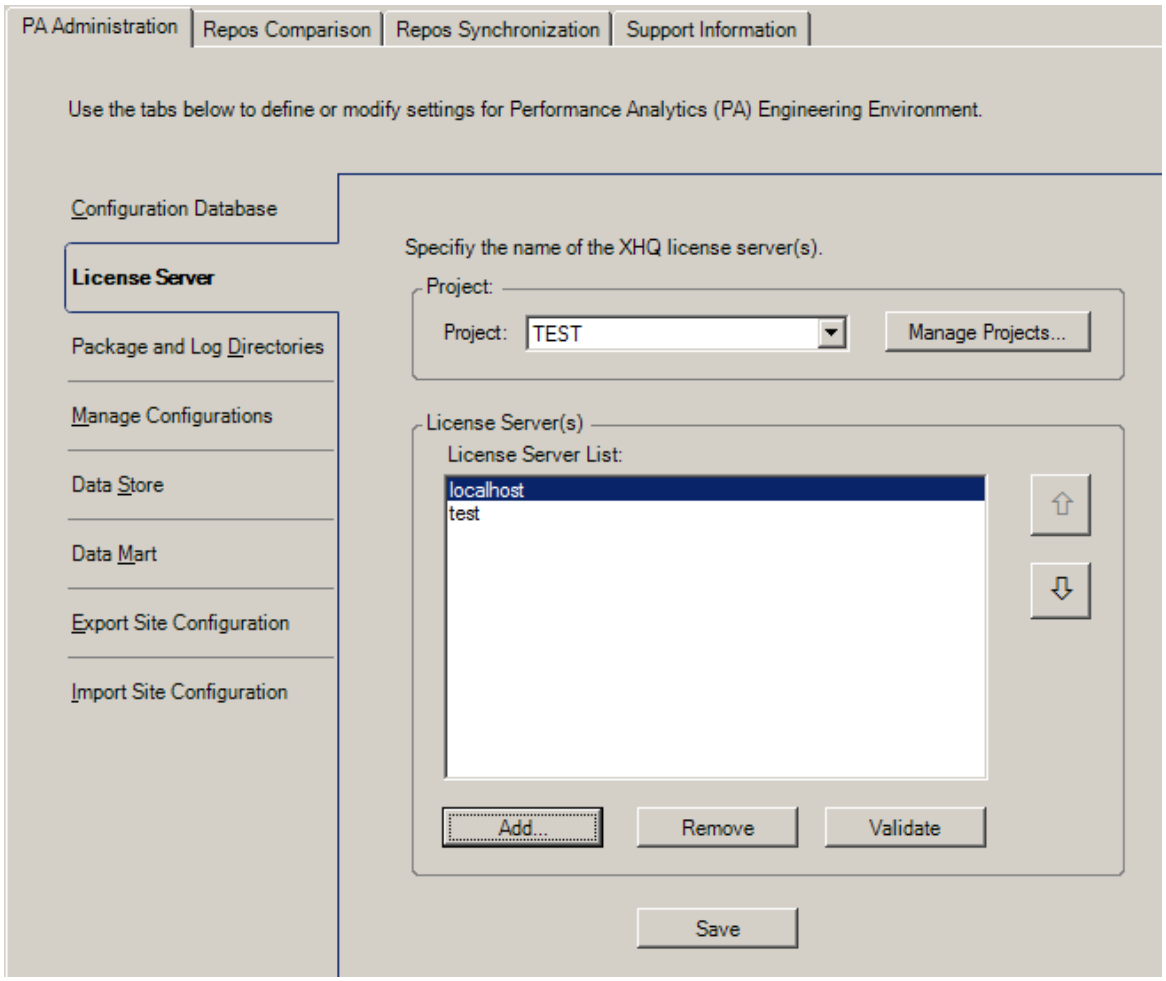
1. On the **Configuration menu**, click **Current Configuration Server**.
   The "Current Configuration" dialog box appears.



2. Select, or enter, the **Database Server** where the configuration database is located.
3. Select the configuration **Database Name**.
4. Click **OK**.

To configure license servers for the current configuration database

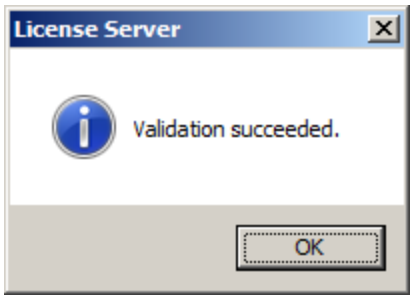
1. In XHQ Administration Utility, click the PA Administration tab and then click the **License Server tab**.

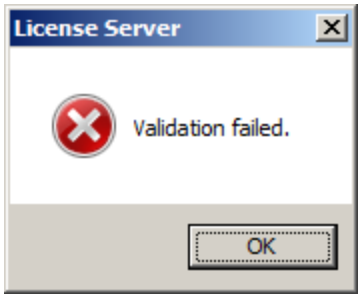


2. Select a **Project**.
3. To create a new project, click **Manage Projects**.

   The License Server List shows the list of XHQ servers configured for the selected project.

2. To add a new license server, click **Add**.
   The "Add License Server" dialog appears.
3. Enter the **XHQ server name** and click **OK**.
   The newly created license server is added to the list.
4. To remove a license server from the list, select the license server and click **Remove.**
5. To validate a license server, select the license server and click **Validate**.
   A message box appears, indicating whether the validation succeeded or not.

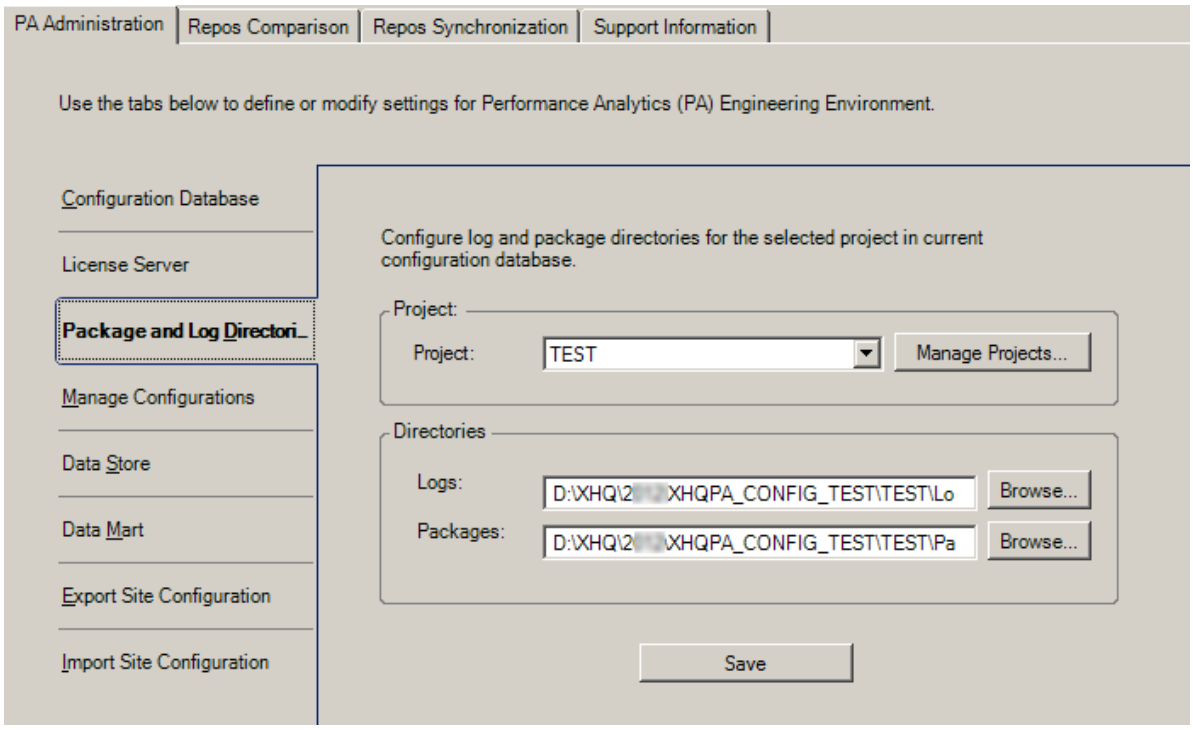




8. To rearrange license servers, select a license server and click either the **Up or Down arrows**.
   The XHQ Engineering Environment and scheduler service will try to resolve the license server in the order specified in the License Server List.

To configure package and log directories for the current configuration database

1. In XHQ Administration Utility, click the PA Administration tab and then click the **Package and Log Directories tab**.



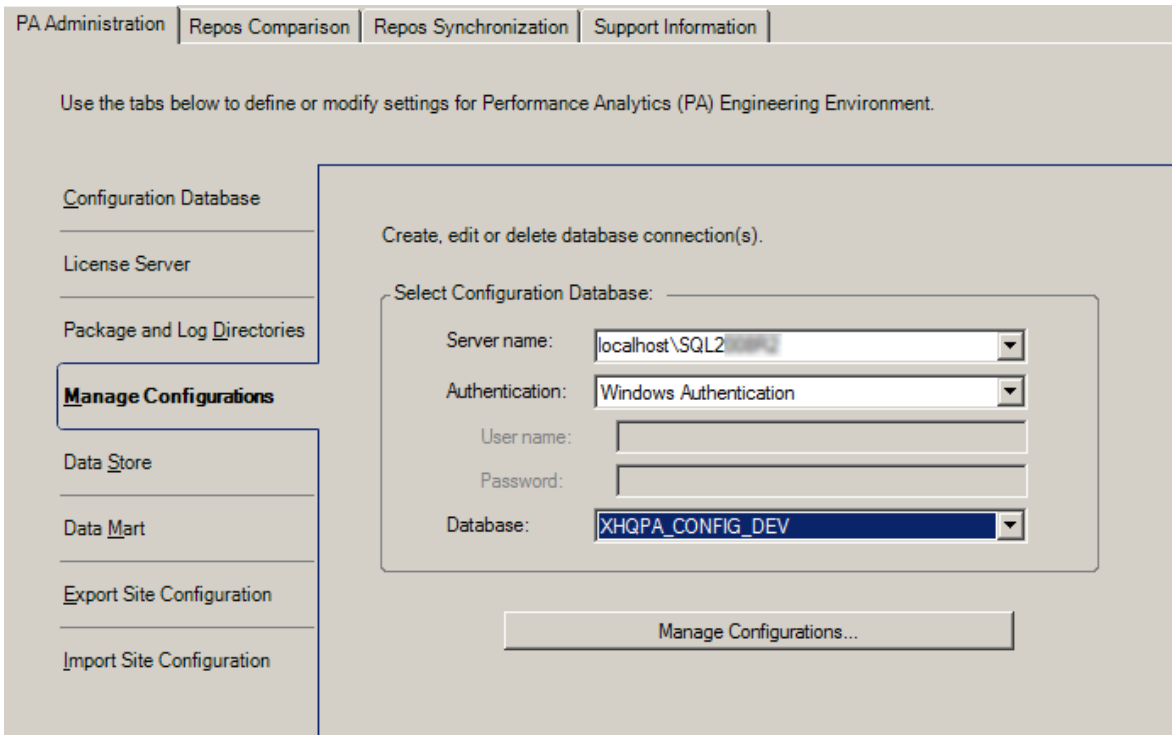
2. Select a **Project**.
3. To create a new project, click **Manage Projects**.

   The **Logs** and **Packages** text boxes show the configured log and package directories for the selected project. They are empty if the log and package directories are not configured.
4. To change the default path values, either enter a path manually or click **Browse** to select a different path.
5. Click **Save**.

The Save button will not be enabled if the log or package directory is empty.

To configure site connections

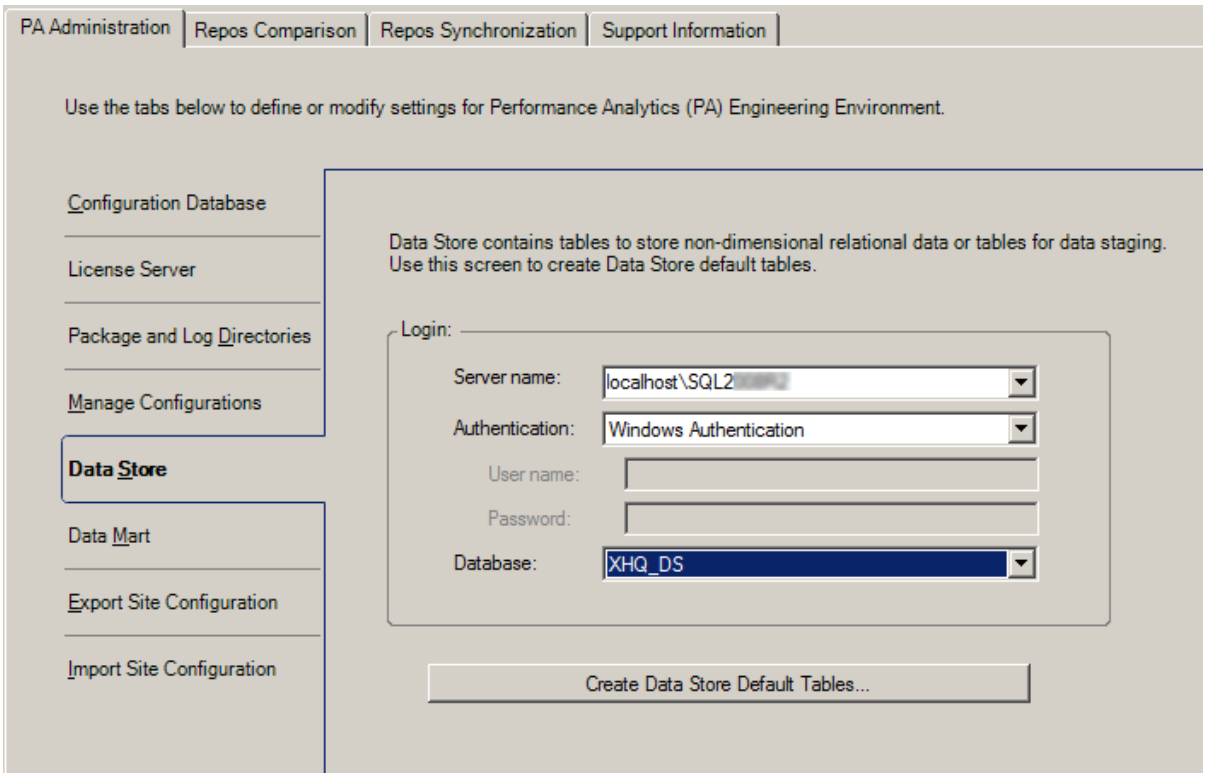
1. In XHQ Administration Utility, click the PA Administration tab and then click the **Manage Configurations tab**.



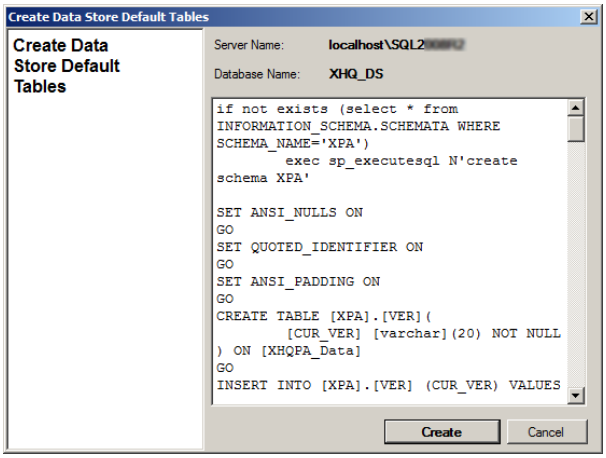
2. Select or enter SQL **Server name** and instance.
3. Select the **Authentication** type.
4. If you picked **SQL Server Authentication**, enter the **User name** and **Password**.
5. Select a configuration **Database**.
6. Click **Manage Configurations**.
   The "Manage Configurations" dialog appears.
7. Refer to the topic, “Defining Connections and Data Sources”, located in the XHQ Performance Analytics Guide to manage connections.

To create data store default tables

1. In XHQ Administration Utility, click the PA Administration tab and then click the **Data Store tab**.



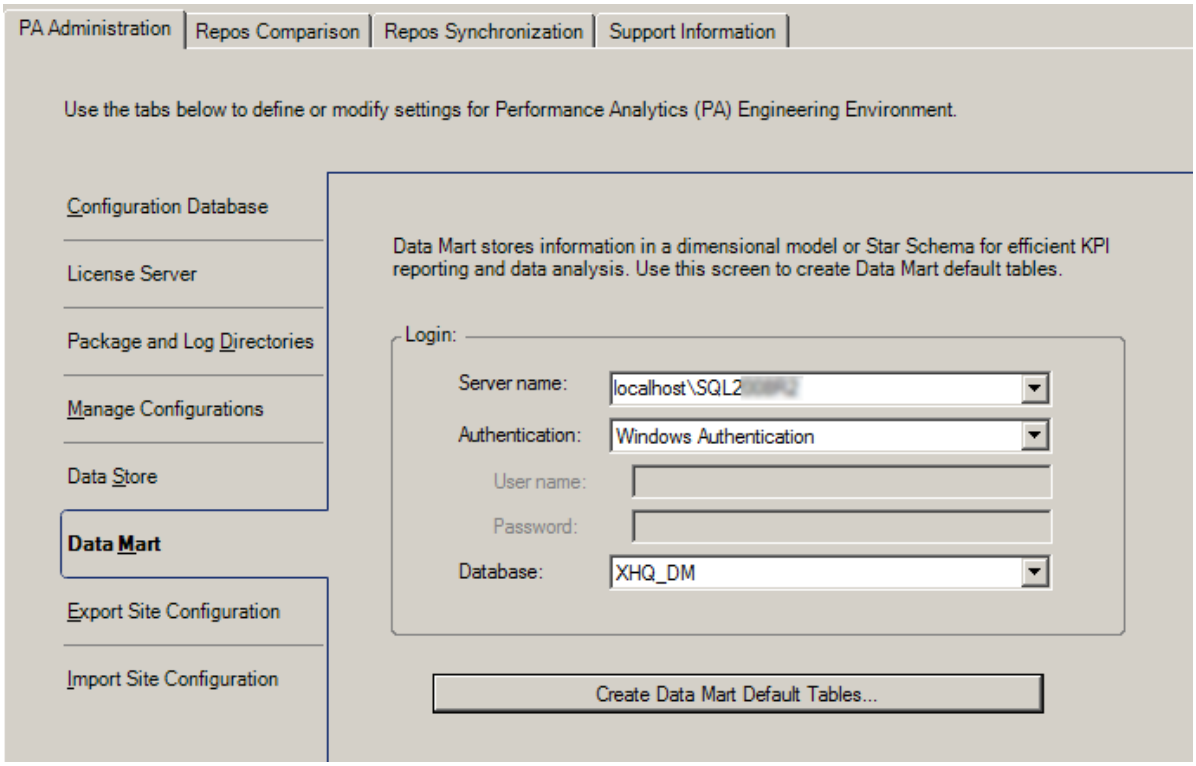
2. Select or enter the SQL **Server name** and instance.
3. Select the **Authentication** type.
4. If you picked **SQL Server Authentication**, enter the **User name** and **Password**.
5. Select a data store **Database**.
6. Click **Create Data Store Default Tables**.
   The "Create Data Store Default Tables" dialog appears.



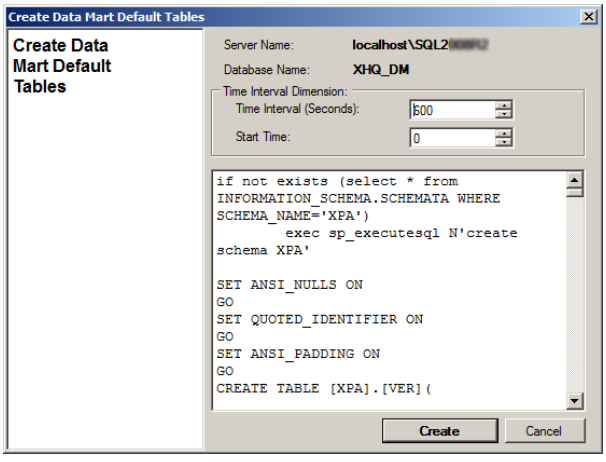
6. Update the script if necessary.
7. Click **Create**.

To create data mart default tables

1. In XHQ Administration Utility, click the PA Administration tab and then click the **Data Mart tab**.



2. Select or enter SQL **Server name** and instance.
3. Select the **Authentication** type.
4. If you picked **SQL Server Authentication**, enter the **User name** and **Password**.
5. Select a data mart **Database**.
6. Click **Create Data Mart Default Tables**.
   The "Create Data Mart Default Tables" dialog appears.

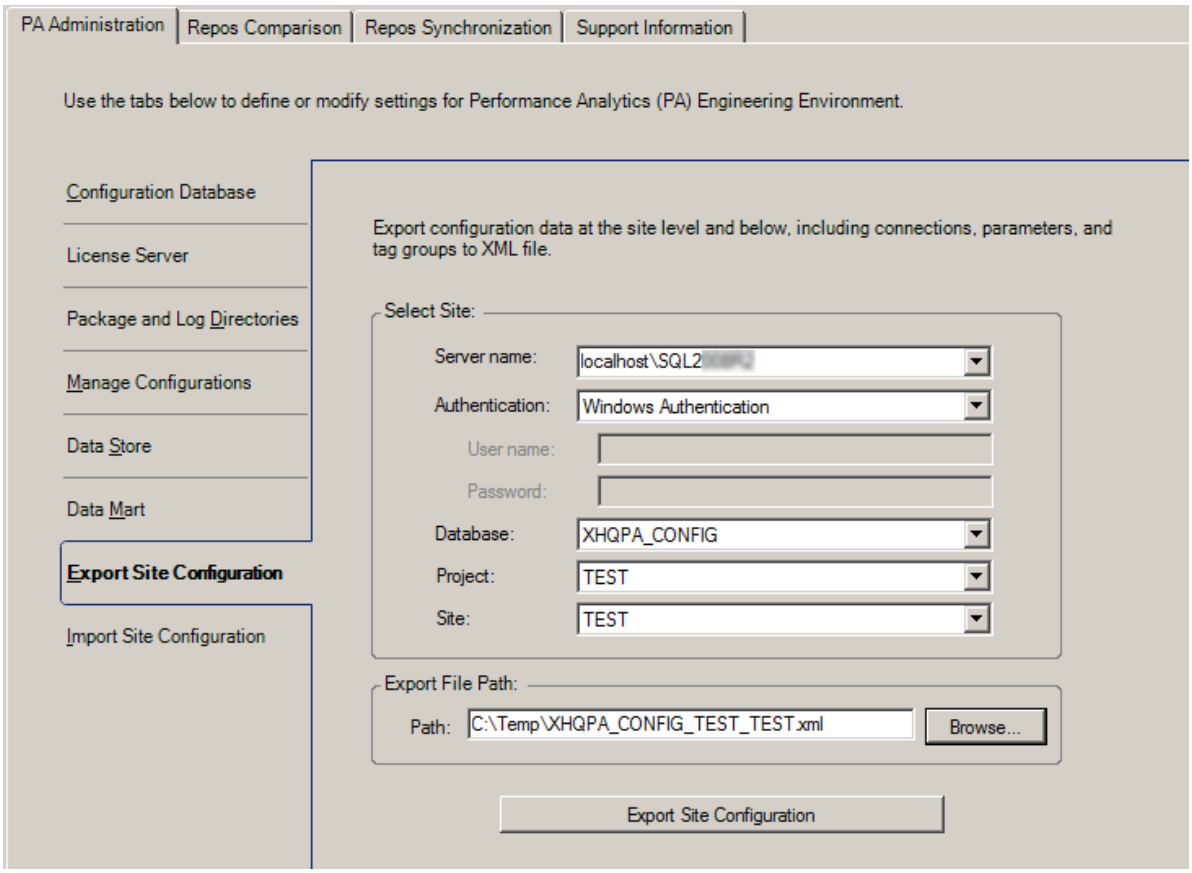


6. Set the **Time Interval** value in seconds.
   This is used to create Time Dimension table.

7. Set the **Start Time** value in seconds.
   This is used to create Time Dimension table.
8. Update the script if necessary.
9. Click **Create**.

To export site configuration data to an XML file

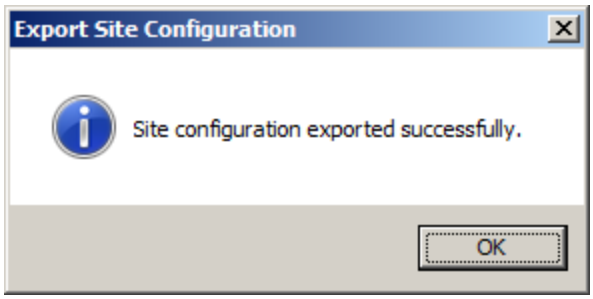
1. In XHQ Administration Utility, click the PA Administration tab and then click the **Export Site Configuration tab**.



2. Select or enter SQL **Server name** and instance.
3. Select the **Authentication** type.
4. If you picked **SQL Server Authentication**, enter the **User name** and **Password**.
5. Select a configuration **Database**.
6. Select a **Project** and **Site**.
7. For the **Export File Path**, either enter a path manually or click **Browse** to select a different path.

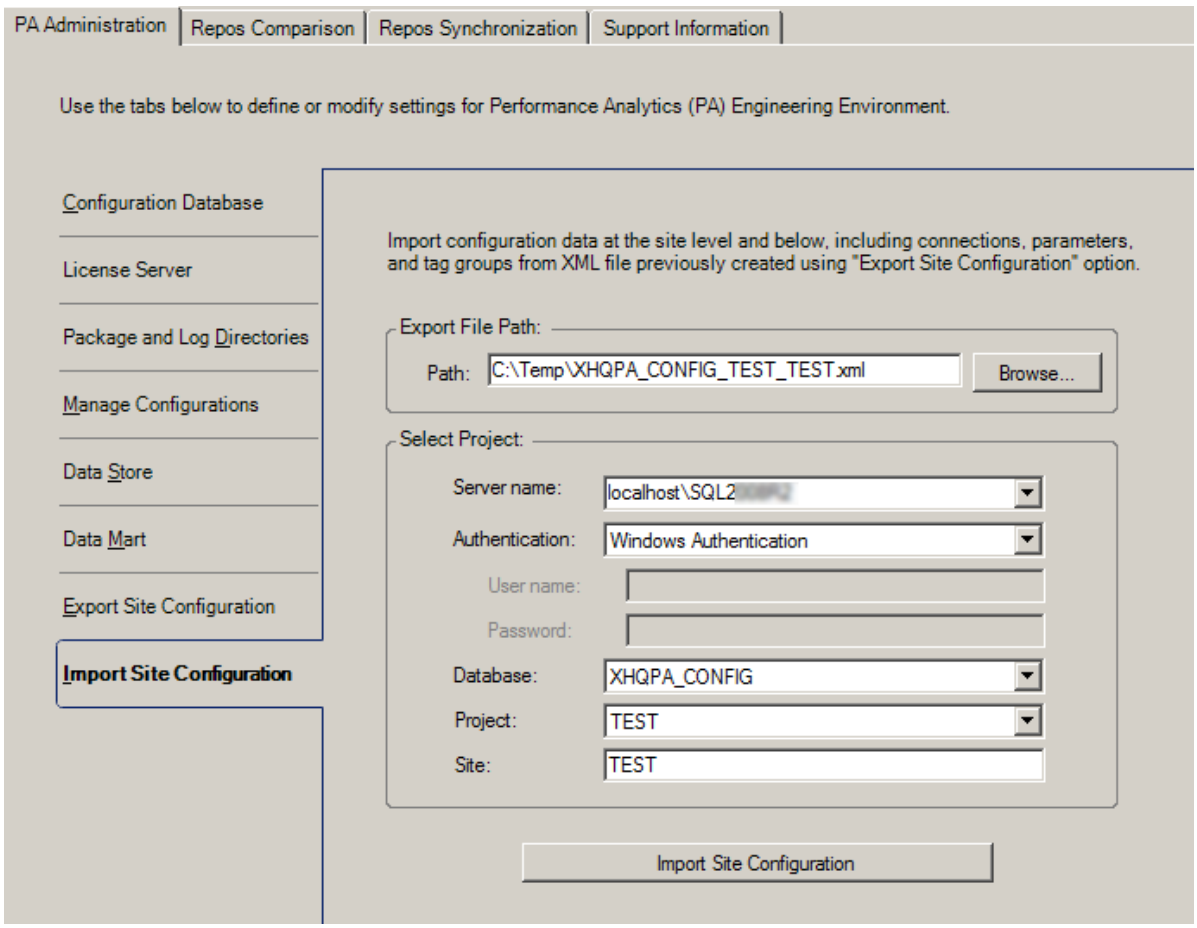
   The exported XML file contains sensitive information such as site configurations, connection strings and encrypted passwords. **Do not store this file in shared folders.**

8. Click **Export Site Configuration**.
   A status message appears, indicating whether the export succeeded or not.



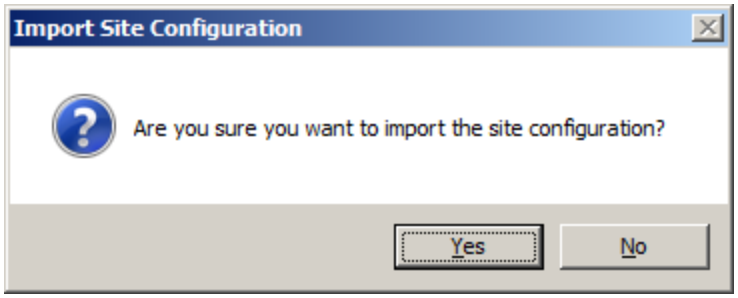
To import site configuration data from the XML file

1. In XHQ Administration Utility, click the PA Administration tab and then click the **Import Site Configuration tab**.

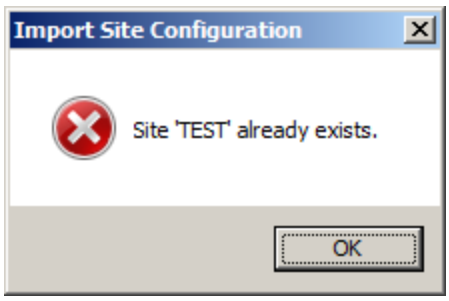


2. For the **Export File Path**, use the exported XML file (see the "Export Site Configuration" task) and either enter the given path manually or click **Browse** to navigate to the file location.
3. Select or enter SQL **Server name** and instance.
4. Select the **Authentication** type.
5. If you picked **SQL Server Authentication**, enter the **User name** and **Password**.
6. Select a configuration **Database**.
7. Select a **Project**.

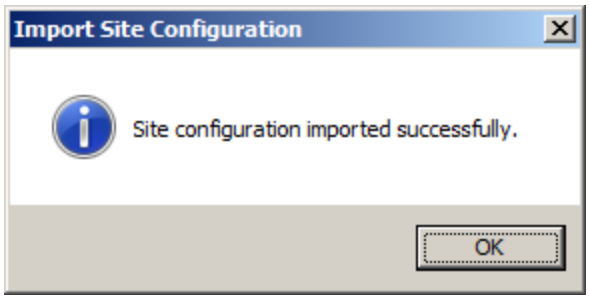
8. If necessary, modify the source **Site**.
9. Click **Import Site Configuration**.
   A confirmation message appears.



10. Click **Yes**.
    If the target site already exists, the following message appears.



If the import is successful, then the following message appears.



3 | XHQ High-Performance Database Backup and Restore

To perform a full **backup**, open the **Windows Command Prompt** (CMD) as **Administrator**, run the change directory (cd) command and go to the **%XHQ_DBMS_HOME%\dbadmin\backup** folder (which by default is C:\XHQ\XHQDB\dbadmin\backup).

Run the following backup command.

```
> xhqbackup "database instance" "backup files directory destination"
```

Where:

- *database instance* is the XHQ instance name for which you run the backup. Usually, the instance is XHQ or XHQHIST.
- *backup files directory destination* is the directory into which the backup files should be placed.

Performing a **restore** is similar. Again, open the **Windows Command Prompt** (CMD) as **Administrator**, run the change directory (cd) command and go to the **%XHQ_DBMS_HOME%\dbadmin\backup** folder (which by default is C:\XHQ\XHQDB\dbadmin\backup).

Run the following restore command.

```
> xhqrestore "database instance" "backup files directory location"
```

Where:

- *database instance* is the XHQ instance name for which you run the backup. Usually, the instance is XHQ or XHQHIST.
- *backup files directory location* is the directory that contains the data files you want to restore.

These backup and restore commands do not apply to the **legacy** High-Performance Database.

Refer to the topic, *Backup and Recovery for the Legacy High Performance Database*.

XHQ and Data Recorder Data Backup and Restore

The `xhqdpbackup.cmd` script is a utility that allows you to backup either XHQ or XHQ Data Recorder data. The required parameters are:

- The database name
  The options are **XHQ** (for XHQ/ANS/PM) or **XHQHIST** (for the XHQ Data Recorder).
- The XHQ password

  A **valid** password:

  - Is a minimum of 8 ASCII printable characters;
  - Is a maximum of 30 ASCII printable characters;
  - Must contain at least one **uppercase** letter;
  - Must contain at least one **lowercase** letter;
  - Must contain at least one **number**;
  - Must contain at least one of the following **special characters** (these are the only special characters allowed):

{ (open curly bracket)	- (dash)
} (close curly bracket)	+ (plus sign)
[(open straight bracket)	# (number sign)
] (close straight bracket)	? (question mark)
$ (dollar sign)	~ (tilde)
! (exclamation mark)	_ (underscore)

    Again, all other characters (such as @, ^, &, >, <, |, ") are not allowed;
  - Does not contain any spaces;
  - Complies with the convention for selecting secure passwords at your company, or in accordance with reasonable industry practice.

  The password is **case-sensitive**.

- The backup (or restore) location
  The location where the backup file are placed (or where the restore file is found).

For Backup

xhqdpbackup <database_name> <xhq_password> <backup_location>

Data Recorder backup example:

```
xhqdpbackup xhqhist xhqpwd C:\backup
```

XHQ backup example:

```
xhqdpbackup xhq xhqpwd C:\backup
```

For Restore

xhqdprestore <database_name> <xhq_password> <backup_location>

Data Recorder restore example:

```
xhqdprestore xhqhist xhqpwd C:\backup
```

XHQ restore example:

```
xhqdprestore xhq xhqpwd C:\backup
```

WARNING: Running the restore process **deletes** existing XHQ/ANS/PM or Data Recorder data. You must run the backup prior to the restore process or else you will loose your data.

To restore Data Recorder data

1. Run **xhqdpbackup** to backup your data.
2. Navigate to the backup location (which is `C:\backup` in the examples above) and verify that the **.DMP** file exists.
3. **Stop** the XHQ Data Recorder.
4. In a command window, run the **xhqdprestore.cmd** script:

   xhqdprestore xhqhist xhq <backup_location>

   Example: `xhqdpbackup xhqhist xhq C:\backup`

```
z:\dev\src\database\backup>xhqdprestore xhqhist xhq c:\backup_
```

When the restore process is complete, the following message appears.

```
################################################
#----------------------------------------------
#
#   xhqhist restore completed...
#
#   Please check the log file for errors:
#   c:\backup\restore_xhqhist.log
#
#----------------------------------------------
################################################
```

Backup and Recovery for the LEGACY XHQ High-Performance Database

This one-time procedure involves enabling the database for `archivelog` mode, adding mirror copies of the online redo logs and placing the archived log files into a separate directory. This is done by executing a batch script, as shown in the following procedure.

It is only necessary to perform this procedure once after the installation of the XHQ System. You will need to shutdown and restart the XHQ System.

Once the database has been prepared for backup and recovery, the process of backing up the XHQ High-Performance Database engine involves writing an *image* (or a temporary snapshot) of the database to a backup location.

We recommend you store these backup files on a separate disk, or copy them onto another disk and/or tape so that they will be readily available if the online database disk is lost.

You must use the command script, **`bkFull.cmd`**, daily in order to make sure that you can recover the database consistently.

Typically, this script can be found in the standard location you specified during the XHQ installation for data and configuration files, in the **`C:\XHQ\data\dbadmin\XHQ\backup`** directory. Schedule this script to run **daily** using the Windows Task scheduler (in typical situations, this script is run nightly).

Because this is a *hot backup*, you do not need to shutdown the XHQ System during backup, but it is recommended for the last backup you perform before an XHQ upgrade.

The XHQ High-Performance Database engine also keeps track of all changes since the time of the last full backup in the form of *archived redo log files*. If a failure does occur, the database can be restored from the most recent full backup, and then these archived redo logs can be applied to recover the database to the state it was in at the time the most recent redo log was archived.

An *archived redo log* is a copy of an online redo log file. The archived copies are necessary because the database uses a fixed set of online redo log files in a circular fashion that causes older change logs to be overwritten as needed. The archived copy is made at the time that the current online redo log file becomes full and the database switches to the next online redo log. This means that the most recent changes, those made since the last redo log switch, are recorded only in the current online redo log file.

To prepare the high-performance database for backup and recovery

1. **Shutdown** the XHQ System.
2. Call the **`addredolog.cmd`** script and pass the following switches:

Switch	Description
database_name	The database instance name.
xhq_password	The XHQ password. A **valid** password: • Is a minimum of 8 ASCII printable characters; • Is a maximum of 30 ASCII printable characters; • Must contain at least one **uppercase** letter; • Must contain at least one **lowercase** letter; • Must contain at least one **number**; • Must contain at least one of the following **special characters** (these are the only special characters allowed): { (open curly bracket) - (dash) } (close curly bracket) + (plus sign) [(open straight bracket) # (number sign)] (close straight bracket) ? (question mark) $ (dollar sign) ~ (tilde) ! (exclamation mark) _ (underscore) Again, all other characters (such as @, ^, &, >, <, |, ") are not allowed; • Does not contain any spaces; • Complies with the convention for selecting secure passwords at your company, or in accordance with reasonable industry practice. The password is **case-sensitive**. **Related Topic:** *Changing the XHQ High-Performance Database Password*, located in the XHQ Administrator's Guide.
onlinelog_dest	The online redo log file location.
archivelog_dest	The redo log archive file location.

Syntax: `addredolog database_name xhq_password onlinelog_dest archivelog_dest`

Use double quotes to enclose a given path if a folder name includes spaces.

SIDEBAR ABOUT REDUNDANCY

To ensure that the online redo log files survive a failure of the database disk, the database should be configured to keep a second, mirrored copy of the online redo logs on a second disk. This is typically the same disk that is used to store the full backups and archived logs. During a recovery, the mirror copies of the online logs are applied after the archived logs to bring the database up to the state immediately before the failure.

A Typical Backup Scenario

You install the XHQ System on one disk, for example **`X:`**, and use a second disk, **`Y:`**, as the backup/log location. The **`X:`** drive then contains the XHQ System and the XHQ High-Performance Database engine software, as well as the online database files. The **`Y:`** drive contains the following:

- The last full backup from **`bkFull.cmd`** (which runs every seventh day and is tracked by XHQ and the database);
- Any archived log files (or their backups) generated since that backup;
- The mirror copies of the online redo log files.

Backup Requirements

The following conditions must be met in order to successfully backup the XHQ High-Performance Database engine.

- The user initializing the backup must be a member of the local machine's **Administrator Group**.
- The database is configured to run in **Archivelog Mode**, as instructed in the topic, *Backup and Recovery for the Legacy High Performance Database*. In addition, all archived logs (or their backups) between the last full backup and the time of failure must be available. This means that the archive log location and the online redo log mirror copies must be on a separate disk drive.

Performing a Manual, Full Backup

The **`bkFull`** script has five parameters (see the list below) and is designed to be **run every seventh day**, with the following logic:

- If the number of days from the last, full database backup is greater than six (6), then a full database backup is performed. So, by default, a weekly database backup is performed. It also deletes the older backups by applying a retention policy of "x" number of days, which is the *redundancy* parameter of the script.
- Otherwise, it backs up all archivelog files that are not yet backed up and clears the older, expired archivelog (according to the retention policy set, again, by the *redundancy* parameter).

If there are many generated archivelog files during a day (for example, on a busy server) and there is not enough free space for these files, first do the following before taking any action:

- Be careful with the generated redo backups, you will need them for a complete/consistent database recovery.
- Make sure you have a valid copy of all redo backups generated from the last full database backup, to ensure that you'll be able to fully recover the database.

Once these have been addressed, then run the script more than once a day with the retention parameter set to zero (0).

To perform a **manual, full** backup, open the **Windows Command Prompt** (`CMD`) as **Administrator**, run the change directory (`cd`) command and go to the directory containing the **`bkFull.cmd`** script

Run the following command:

> bkFull oracle_sid sys_password backup_directory redundancy working_directory

Where:

- *oracle_sid* is the Oracle instance name for which you run the backup. Usually, the Oracle instance is XHQ or XHQHIST.
- *sys_password* is the password for the sys Oracle user and is needed to perform the database backup (which is the password specified during XHQ installation).

A **valid** password:

- Is a minimum of 8 ASCII printable characters;
- Is a maximum of 30 ASCII printable characters;
- Must contain at least one **uppercase** letter;
- Must contain at least one **lowercase** letter;
- Must contain at least one **number**;
- Must contain at least one of the following **special characters** (these are the only special characters allowed):

{ (open curly bracket)	- (dash)
} (close curly bracket)	+ (plus sign)
[(open straight bracket)	# (number sign)
] (close straight bracket)	? (question mark)
$ (dollar sign)	~ (tilde)
! (exclamation mark)	_ (underscore)

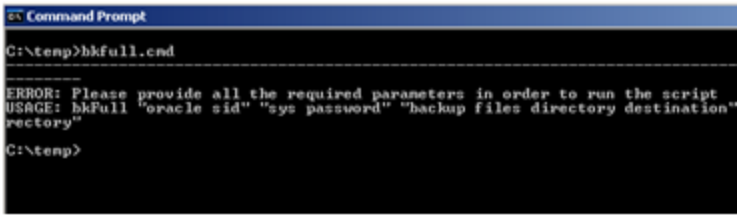
  Again, all other characters (such as @, ^, &, >, <, |, ") are not allowed;
- Does not contain any spaces;
- Complies with the convention for selecting secure passwords at your company, or in accordance with reasonable industry practice.

The password is **case-sensitive**.

- *backup_directory* is the directory into which the backup files should be placed (for example, **`F:\backup`**).
  Consider that the amount of disk space needed is dependent on how many backup cycles are kept and the size of your database. Typically, three to five gigabytes and above should suffice. All of the directory contents should be backed up to tape regularly.
- *redundancy* represents the number of days the existing backups are kept. For example, a "7" means the script will delete all backups older than 7 days.

  Important: Plan this parameter carefully. It is similar to a recoverability window.
- *working_directory* is the location of the temporary and log files generated by the backup.

You can easily check the description of all parameters by running the script with no parameters.



After running the script, check the last output line. It indicates whether or not an error occurred. If an error has occurred, contact the XHQ Customer Support Team and forward the log file.

A Typical Recovery Scenario

Using the same **`X:`** and **`Y:`** situation explained in the topic, *A Typical Backup Scenario*, the overall recovery procedure after a failure of the online disk **`X:`** is then:

1. Restore an image of the failed **`X:`** disk to a replacement drive, or otherwise reconstruct the XHQ and Oracle software installations on the new **`X:`** drive using exactly the same directory structure as the original installation.

   If you use image backups, a new image need only be made when the software itself is changed, (for example, after an XHQ version upgrade). You will, however, still need daily backups.

2. Restore the database contents using the backup and log files that should still be available on the separate, backup/archive disk **`Y:`** by running the **`rsFull.cmd`** script, which can typically be found in the **`C:\XHQ\data\dbadmin\XHQ\backup`** directory. This script performs the following steps:
   - Restores the database files from the latest full backup;
   - Applies the archived redo logs to recover to the last archived log time;
   - Applies the online redo logs to recover to the point of failure (if they were not damaged).
3. Restore a recent backup copy of the XHQ repository directory. The copy/restore of the XHQ repos directory must be managed separately using operating system commands.
4. Start the XHQ System.

Recovery Requirements

Like the backup process, the following conditions must be met in order to successfully restore the XHQ High-Performance Database engine.

- The user initializing the restore must be a member of the local machine's **Administrator Group**.
- The database is configured to run in **Archivelog Mode**. In addition, all archived logs between the last full backup and the time of failure must be available. This means that the archive log location and the online redo log mirror copies must be on a separate disk drive.
- The subject **database instance name** can be XHQ or XHQHIST.
- The **sys user password** is needed to perform the database restore.

Performing a Full Restore

The full restore approach allows a database to be restored (or recovered) up until the point of failure. In other words, there is no data loss between a previous backup and the point of failure, as long as the archivelogs (offline) and the mirrored Redo Log (online) members are available on a separate hard-drive. Use the full restore only if the hard-drive (where the Data Files, Redo Logs and Control Files are kept) completely fails.

To perform a full restore, make sure that:

- The database structure (layout) has been restored from an image or re-installed exactly the same way with the same directory structure.
- The archived log files (which are offline) and mirror copies of the redo log files (online) are intact on the secondary drive.

- The last full backup files are intact on the secondary drive, or have been restored from tape to the local backup directory.

To perform a full restore

1. Open the **Windows Command Prompt** (`CMD`) as **Administrator**, run the change directory (`cd`) command and go to the directory containing the **`rsFull.cmd`** script.
2. Run the following command:

   ```
   > rsFull oracle_sid sys_password backup_directory working_directory
   ```

   Where:

   - *oracle_sid* is the Oracle instance.
     Usually, the Oracle instance is XHQ or XHQHIST.
   - *sys_password* is the password specified during the XHQ installation.

     A **valid** password:

     - Is a minimum of 8 ASCII printable characters;
     - Is a maximum of 30 ASCII printable characters;
     - Must contain at least one **uppercase** letter;
     - Must contain at least one **lowercase** letter;
     - Must contain at least one **number**;
     - Must contain at least one of the following **special characters** (these are the only special characters allowed):

{ (open curly bracket)	- (dash)
} (close curly bracket)	+ (plus sign)
[(open straight bracket)	# (number sign)
] (close straight bracket)	? (question mark)
$ (dollar sign)	~ (tilde)
! (exclamation mark)	_ (underscore)

       Again, all other characters (such as @, ^, &, >, <, |, ") are not allowed;
     - Does not contain any spaces;
     - Complies with the convention for selecting secure passwords at your company, or in accordance with reasonable industry practice.

     The password is **case-sensitive**.
   - *backup_directory* is the directory into which the backup files should be placed (for example, **`F:\backup`**).
   - *working_directory* is the directory for the temporary and log files created during the restore.

   The script attempts to shutdown the database instance before performing the restore. So, if it's already shutdown, an error message appears, which will be ignored.
3. If the database restore finished without any errors, you should make a new full backup of the restored database using the **`bkFull.cmd`** script before using the system.

bkDaily versus bkFull

The `bkDaily.cmd` script is used to backup the changes made to the XHQ High-Performance Database system on a daily basis. Running the `bkDaily` script, instead of scheduling the `bkFull` script on a daily basis, significantly reduces the backup file size required.

There is one significant difference between the two backup methods. While the backups done with the `bkFull` script can be used to restore the database in a consistent manner (with zero (0) data loss, for the most part) up to the point of the crash, the backups done with `bkDaily` can only be used for a point-in-time restore with **no possibility** to recover the database up to date. Consider the following example:

> You backup on the 10th of the month using the `bkDaily` script. On the 15th, the database has an issue and you want to restore. Because you used `bkDaily`, you can only recover the database from the 10th and you essentially lose the data from the last 5 days.

Best Practices

Use `bkFull` on a daily basis. You can still use `bkDaily` as an additional safety backup, but with the previously stated limitation.

Typically situations when `bkDaily` is useful: tests, migrations, QC or DEV rebuilds.

Schedule `bkDaily` after the XHQ High-Performance Database has been put in the online backup mode and after the `bkFull` script has been run.

The required parameters for `bkDaily` are the XHQ password and the backup destination (the directory into which the latest backup files are placed):

```
bkDaily.cmd xhq_password <backup_directory>
```

4 | Solution Migration

This document describes a work procedure that must be followed in order to migrate an XHQ solution using the XHQ High-Performance Database from a source XHQ Server to a destination XHQ Server.

The procedure scope covers migration of the XHQ System (specifically, the repos and embedded database) and covers the optional modules delivered with the XHQ product (such as the XHQ Alert Notification System). If additional custom solutions have been implemented, then these may require additional steps during the migration and the documentation for those solutions will additionally need to be reviewed to determine those additional steps. This would likely be the case for solutions using Intelligence Packs or XHQ Performance Management as part of a custom solution built off the XHQ System.

An XHQ Embedded Database Interactive Backup and Migration Utility and associated batch files are provided in addition to this document and must be used as part of this work procedure. The provided utility also updates internal database structures which is a required step in the migration process.

Glossary of Terms

Term	Description
Source solution	The XHQ solution running on the "source server" and which needs to be migrated to a (new) "destination" server.
Destination solution	The XHQ solution running on the "destination server" and which needs to be replaced by the "source solution" which is running on the "source" server.
Solution migration	The goal of the solution migration procedure is to transfer the source solution to the destination server so that it replaces any previously running solution on the destination server with a copy of the product scope of the source solution. This, in effect, allows the source solution to be transferred to the destination server and will replace any previous solution running there.
Export	Procedure of exporting embedded database data from the source solution which is running on the source server and saving it into a backup `.dmp` file
Import	Procedure of importing embedded database data from the source solution running on the source server into the solution running on the destination server using the previously exported backup `.dmp` file.

Package Contents

File	Description
`xhqexport.bat`	The batch file used to **export** embedded database data from the solution running on the source system.
`xhqimport.bat`	The batch file used to **import** embedded database data into the solution running on the destination system.
`xhqrescue.bat`	The batch file used to **rescue** an embedded database by importing the automatic backup of the database, which was created prior to the initial import attempt, back into the solution running on the destination system.
(this document)	The XHQ Solution Migration Procedure documentation.

Pre-requisite Checklist

- ☐ The XHQ software must be installed on the destination server.

  The XHQ password used on the destination system must be identical to that used on the source system.

- ☐ The Windows Script Hosting (WSH) must be installed and enabled on both the source and destination machines during this procedure. If previously disabled, then it can be disabled again after the procedure is complete.

- The account executing the provided utility and batch files must have sufficient administration privileges on both systems. At a minimum, the same privileges are needed that would be required to install XHQ.
- The source solution must be XHQ 4.6.0.307, or later.
- You must have adequate disk space during the solution import.
- Should an error occur during import with regards to insufficient disk space, you **must re-install the system** and run the import again.
- The following procedure should only be executed by suitably qualified and trained XHQ administrators.

The procedure documented in this section assumes that the source server will be taken out of commission and replaced by the destination server immediately after the migration steps have been completed.

Exporting from the Source Solution

To export embedded database data from the source solution

Both XHQ and XHQHIST instances are exported.

1. The source solution's XHQ Server needs to be shut down prior to executing the command-line batch file, **`XHQEXPORT`**.

WARNING

The provided utility does not check the status of the XHQ solution on the source server. Make sure the solution on the source server is first cleanly shutdown using **`xhqboot shutdown`**. **Do not use `xhqboot shutdown complete`**, since this would also shut down the embedded database, which is needed for the export.

2. From the XHQ installation media, go to **`\Support\Siemens`**, locate and extract the **XHQ Solution Migration Procedure.zip** file.
3. Open a **Windows Command Prompt** (CMD) as **Administrator** and run **`xhqexport`**.
   The backup files are stored in the same folder where the script was executed. This results in two subfolders, "xhq" and "xhqhist."
4. Copy the parent folder (containing both subfolders) to the destination server in the **same directory** as the **`xhqimport.bat`** file

The following procedure show you how to export data from the **LEGACY** High-Performance Database.

To export LEGACY embedded database data from the source solution

In addition to the XHQ instance, the XHQHIST instance is also exported.

1. The source solution's XHQ Server needs to be shut down prior to executing the command-line batch file **`XHQEXPORT`**.

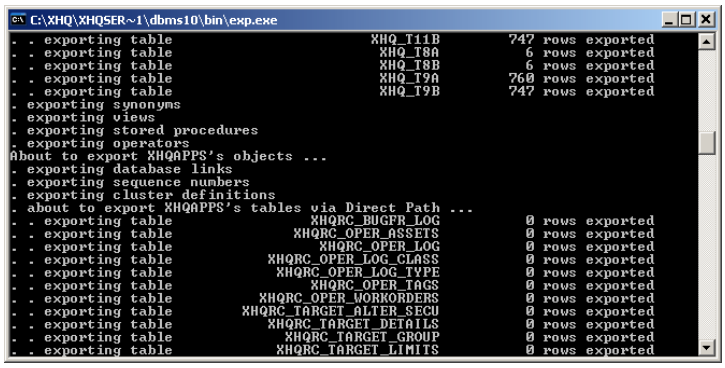
WARNING

The provided utility does not check the status of the XHQ solution on the source server – please ensure that the solution on the source server is first cleanly shut down using "xhqboot shutdown" (not xhqboot shutdown complete since that would also shut down the embedded database but it needs to be running for the export procedure to work).

2. Locate and extract the XHQ Migration Procedure ZIP file.
   The file can be found in the XHQ installation media, under `\Support\Siemens`. Make sure the location where the files are extracted to has enough space for the database to be saved.

   For users of the legacy database, extract the XHQ Migration Procedure Legacy ZIP file.

3. **Run** the command-line batch file **`XHQEXPORT`** from a Windows Command Prompt (`CMD`).



The export progress is visible in a separate DOS window as shown above.

The backup files are stored in the same folder where the script was executed.

As the result in executing the `XHQEXPORT` script, two DMP files are created in the directory from which the **`XHQEXPORT`** command was launched:

- One file for the `XHQ` instance called `XHQORABACKUP.DMP`;
- And one file for the `XHQHIST` instance called `XHQHORABACKUP.DMP`.

4. Either copy both DMP files or copy the entire folder (containing both DMP files) to the destination server when importing the embedded database data to the destination solution.

Importing into the Destination Solution

To import the embedded database data into the destination solution

The import utility backs up the XHQ destination solution database prior to importing data. To revert back to this original database to restore data, run the rescue import utility, **xhqrescue**.

1. **Shutdown** the XHQ Server of the destination solution, using the **xhqboot shutdown** command.
2. Transfer the **source repos** from the source server to the destination server.

   WARNING

   This must occur before the destination XHQ solution is started up and before the database data is imported in the following steps. If the destination solution is started up before the source repos is copied, then the solution may potentially be unusable and the result will not be supported by the XHQ Customer Support Team.
3. Open CMD as **Administrator** and run **xhqimport**.
   A warning message appears, asking you to verify database import.
4. Click **Yes**.
5. Wait for the "**End of the Migration Import Utility**" message to appear in CMD.
6. **Start-up** the destination solution and **validate** the solution.
7. Then, **shutdown** theXHQ destination solution and **backup** the XHQ destination solution completely to ensure a valid working backup exists before moving the destination system into production.

Once the import is completed, backup the "xhq" and "xhqhist" subfolders in case they are ever needed.

Use the following procedure for the **LEGACY** XHQ High-Performance Database.

To import the LEGACY embedded database data into the destination solution

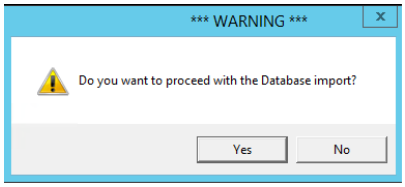
1. Prior to executing the command-line batch file **XHQIMPORT** on the destination server, the XHQ Server of the destination solution must be **shutdown** using the `xhqboot shutdown` command.
   The import shuts the solution down, if not already shutdown, while giving a brief notification about it.
2. **Transfer** the entire folder (containing the DMP files) from the source solution server to the destination solution server and place it in the same directory as the **XHQIMPORT** script.
3. The source repos must be transferred from the source server to the destination server. Note that this must occur **BEFORE** the destination XHQ solution is started up and before the database data is imported in the subsequent steps.
   If the destination solution is started up before the source repos is copied, then the solution will potentially be unusable and the result will be likely inconsistent and will not be supported by the XHQ Customer Support Team.

When XHQIMPORT.BAT is executed, a backup of the current XHQ and XHQHIST data is done prior to the import of the new data.

The utility backs up the destination solution embedded database data before importing the source solution data by creating two rescue dump files: one in the form of **YYYYMMDD_hostname.DMP** and the other **YYYYMMDD_HISThostname.DMP**. These backup files are not intended to replace a real XHQ solution backup and there is no guarantee that these files can be used to restore the embedded database later on. These DMP files are intended to be an aid to the utility validation if there are import problems. If problems occur, these files may be usable as safety/rescue backup files, such that they could be used to try and revert the destination solution embedded database to the state prior to launching the XHQIMPORT utility.

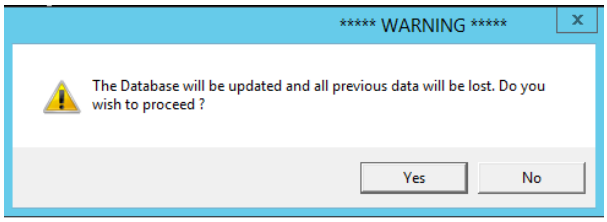
For more information, go to the topic, *Rescuing the Import*.

4. **Run** the command-line batch file **XHQIMPORT** from a Windows Command Prompt.

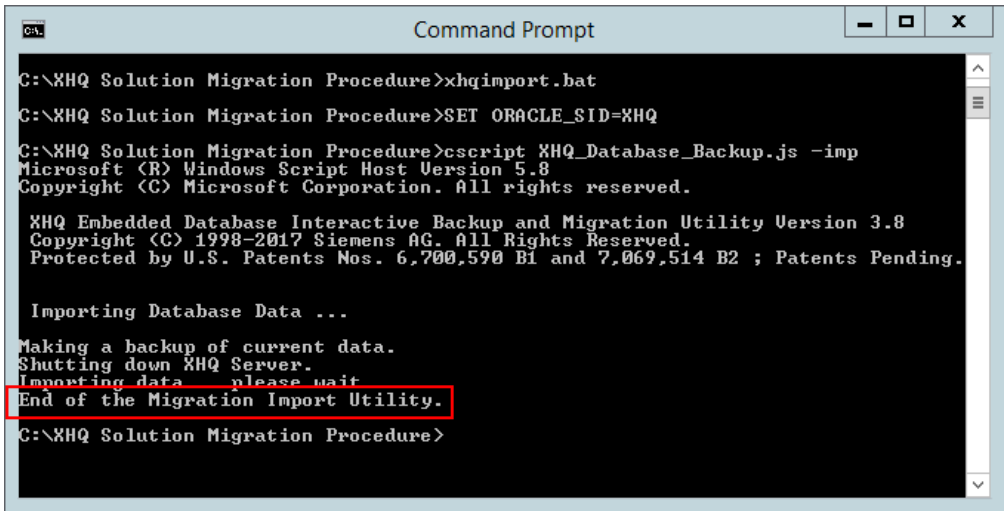


5. Click **Yes**.

   The following message appears only if you did not copy the entire folder (containing both DMP files) from the source server to the destination server.



6. Acknowledge by clicking **Yes**.
8. The utility tries to shutdown the destination solution prior to importing data to the embedded database. If the solution is already shutdown, the script continues.
9. The utility imports the embedded database source solution data from both DMP files, **XHQORABACKUP.DMP** and **XHQHORABACKUP.DMP**.



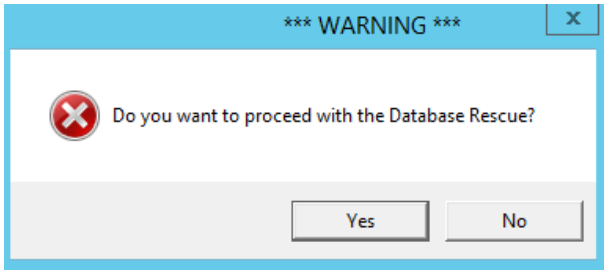
10. Wait for the "End of the Migration Import Utility." message to appear on the screen.
11. When the import is done, both the **XHQORABACKUP.DMP** and **XHQHORABACKUP.DMP** files are no longer needed but should be saved until the destination solution has been completely validated. Backup the these rescue DMP files to a safe location just in case it is ever needed.
12. **Start-up** the destination solution and **validate** the solution for correctness.
13. **Shutdown** the XHQ destination solution and **backup** the XHQ destination solution completely to ensure a valid working backup exists before moving the destination system into production.

Rescuing the Import

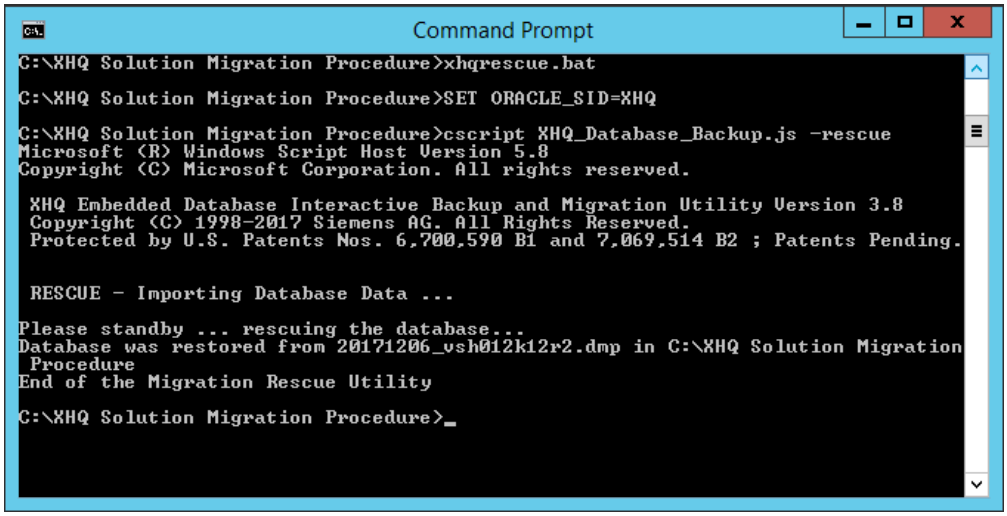
As a precaution, **XHQIMPORT** takes a logical backup of the XHQ destination solution database, prior to dropping the data. (See step 3 of the topic, *Importing into the Destination Solution*.) The backup files, **YYYYMMDD_hostname.DMP** and **YYYYMMDD_HISThostname.DMP**, can be used by **XHQRESCUE** to **restore data** that was dropped on the XHQ destination solution.

To rescue import of embedded database data from the destination solution

1. To utilize the XHQ Backup/Migrate utility in rescue mode, **run** the command-line batch file **XHQRESCUE** from a Windows Command Prompt.
   This will revert the destination solution to the version prior to the drop command.



2. Click **Yes**.


Command Prompt
C:\XHQ Solution Migration Procedure>xhqrescue.bat
C:\XHQ Solution Migration Procedure>SET ORACLE_SID=XHQ
C:\XHQ Solution Migration Procedure>cscript XHQ_Database_Backup.js -rescue
Microsoft (R) Windows Script Host Version 5.8
Copyright (C) Microsoft Corporation. All rights reserved.
XHQ Embedded Database Interactive Backup and Migration Utility Version 3.8
Copyright (C) 1998-2017 Siemens AG. All Rights Reserved.
Protected by U.S. Patents Nos. 6,700,590 B1 and 7,069,514 B2 ; Patents Pending.
RESCUE - Importing Database Data ...
Please standby ... rescuing the database...
Database was restored from 20171206_vsh012k12r2.dmp in C:\XHQ Solution Migration Procedure
End of the Migration Rescue Utility
C:\XHQ Solution Migration Procedure>

Conversion from the LEGACY Embedded Database

This conversion process involves copying existing information to a new, destination server. Both source and destination servers must be available and have the same XHQ version installed. Copying data from the source to the destination is similar to migrating XHQ to new hardware. You **copy the repos and the database contents** (ANS, eLogs, TM, and so forth).

You will also need to **update the XHQ solution** to account for differences between the LEGACY embedded database and the updated High-Performance Database. This involves removing Oracle-specific terminology from the XHQ Cache connector queries and all queries against ANS/eLogs/TM views.

To convert an existing solution from the LEGACY embedded database

1. Both source and destination servers must be available and have the same XHQ version installed.
   Steps 2 through 18 show you how to migrate the XHQ data by copying the repos and the database contents from the source server with the LEGACY embedded database to the destination server with the updated High-Performance Database.
2. *Copy the XHQ Solution* (repos) from the source to the destination.
3. From the **source server**, install the **XHQ High-Performance Database Patch**.

   You must apply the XHQ High-Performance Database Patch on the source server before executing the *Export utility with the Legacy XHQ Database Migration*.

   For more information on the database patch, go to the topic, *Installing the XHQ High-Performance Database*, located in the XHQ Installation Guide.

   Do the following to migrate the embedded database data from the legacy embedded database. This is needed to preserve all application data, such as XHQ ANS excursions.
4. From the **source server**, launch the **XHQ installation media**.
5. Go to **`\Support\Siemens`** and locate **`XHQ Legacy Database Migration.zip`**.
6. **Copy** **`XHQ Legacy Database Migration.zip`** and **extract** it to a drive on the **source server**.

   Example: `C:\Migration`
7. Open Windows CMD as **Administrator**.
8. **Change directory** (cd) to the extracted folder in **step 6**.
9. Run **`export`**.
   This command shuts down XHQ and restarts just the database services.

   After a successful export (no errors), you are prompted to continue.
10. Type **Yes**.
11. **Copy all** the contents of the **exported folder** and paste into the target **destination server**.
12. From the **destination server**, launch the XHQ installation media.
13. Go to **`\Support\Siemens`** and locate **`XHQ Legacy Database Migration.zip`**.
14. **Copy** **`XHQ Legacy Database Migration.zip`** and **extract** it to a drive on the **destination server**.
15. Open CMD as **Administrator**.
16. **Change directory** (cd) to the extracted folder in **step 14**.
17. Run **`import`**.

    After a successful import, you are prompted to continue.

18. Click **Yes**.

For Oracle Thick/OCI Connector Users

You must install either the Oracle instant client or the basic client. For details, go to the topic, *Using the Oracle Thick Connector on XHQ with PostgreSQL*, located in the XHQ Connection Guide.

19. Next, make sure all the queries used in the XHQ Cache connector and queries against ANS/eLogs/TM views **use the PostgreSQL syntax**.
    This involves updating the queries having Oracle-specific syntax.
20. Test, check relevant log files, and, if any, fix remaining errors.

How to Copy the XHQ Solution

In this case, some steps of the following procedure do not need to be followed since they will have already been carried out during any initial data and configuration migration and the subsequent migration can assume two identical XHQ versions and correctly configured systems. The following tasks can therefore also be used for this "Solution Copy" use case and the steps that are not required or are modified in this simplified migration use case are noted below.

To transfer the solution content

1. XHQ must be installed and available.

   Install XHQ on the destination server in the desired version and patch level and with the desired options and using the same XHQ password that is in use on the source server.

   The install options chosen must, at a minimum, be equivalent or a superset of the install options chosen when the source server was installed. Make sure that the destination server XHQ installation is successful before continuing. This step is needed to ensure compatibility between the repos and embedded databases used on both systems.

2. Check the XHQ solution on the source server to ensure there are no errors or corruptions by using the XHQ repos validation utility and `xhqci`.

   The simplest such check is to use **`xhqci`** as follows:

   a. Open a command prompt and type in the following:

   ```
   C:\>xhqci debugsoln
   ```

   b. When the menu comes up, type in **`45`** for Validate Solution.

   - If it returns **zero** corrupted components, collections, and configs, then the repos is **clean**.
   - If it returns any corrupted items, **contact the XHQ Customer Support Team** and **do not proceed** with the solution migration procedure. The output of the corruption check is stored in the **`solutionlogx.out`** file.

3. Ensure that the XHQ solution running on the source server is current and reflects all changes previously made to the model. If unsure of this status, do an **Update to Latest** for the solution before any migration occurs.

   Running an **Update to Latest** on the production system may impact end-users due to the performance impact on the system. In general, **Update to Latest** is run on a development system and the updated repos is then promoted to the production system.

   Update to Latest can be run as follows:

   Open a command prompt and type in the following:

   ```
   C:\>xhqci updatesoln
   ```

4. From the next work procedure step onwards, the XHQ solution on the source server will no longer be accessible to the end-users until the solution data copy step is complete in the case of a Solution Copy or ever again in the case of immediate replacement by the destination server.

   If the intent is to replace the source server during the execution of this procedure then steps need to be taken to ensure that it will not be made available to end-users ever again, that is, during the migration itself or after the solution migration is complete and the destination server has replaced it. The solution data will have been backed up in order to be able to migrate the solution so any accidental re-activation of the source server could cause users to update the wrong solution

and to lose those updates.

5. **Shut down the XHQ solution** on the source server, but not the embedded database, by using **`xhqboot shutdown`** instead of `xhqboot shutdown complete`.
6. **Shut down the XHQ solution on the source server** completely (including the embedded database) by using **`xhqboot shutdown complete`**.
7. **Copy the repos directory** located in the **`%XHQ_SERVER_REPOS%`** to a temporary directory on the source server and create a `.zip` file of the repos to use for the repos transfer to the destination server. You can use a tool such as 7-Zip, WinZIP, or the compression capability that is built into Windows.
8. OPTIONAL
   At this point, you may choose to restart XHQ on the source server using the `xhqboot startup` command.
9. **Transfer the zip file** that was created in step 9 over to the destination server and unzip it to become the new repos folder on the destination server in order to prepare for the next steps.

   Take care to reconstruct the source repos structure correctly and not accidentally unzip the repos a level deeper than intended, for example, `repos\repos` instead of just `repos`. The usage of a `.zip` file for repos transfer is recommended due to avoidance of most transfer related issues during the repos file transfer and the checksum usage of the zip utility.

   Note that the copied repos will contain the following important items in the most current version used prior to the source server in the `\Users` directory and the `\Images` directory.

10. Check the source server properties files and manually add, delete, or correct any entries that were previously made on the source server and are still required on the destination server.

    In general, few changes are needed since the properties files are contained in the repos and are transferred with the repos but the following properties files:
    `globalsettings.properties` and `ans.properties` should be checked as a matter of course since the source server name may still be present if the server name is not being reused and would need to be replaced with the destination server name. The server name may also not have been fully qualified and usually needs to be entered fully qualified to avoid issues.

    The following example shows some typical settings that need to be checked in the associated properties files:

    - **`ansmail.properties`**
      Ensure that the **`source server`** name is replaced by the fully qualified destination server name.

      Example:
      ```
      Trend: http://<destination server>/indx/xans/
      ans_trend.jsp?DefinitionId=<%EventDefId%>&StartTime
      =<%EventTimeMillis%>
      ```

11. End-users may have previously saved some "favorite trends". In this case, since the favorites are generally stored on the server in the **`\User\<username>`** directories, all URLs in the end-user's favorites must be updated to reflect the new server name.

    Example: *This:*

    URL+Example|http\://**<source server>**/indx/xhqNavbar.html?trend\
    =true&savedURL\=false&t3\=7200000&t7\=30s&t6\=All&t12\
    =MM%2Fdd%2Fyy&t13\=hh%3Amm%3Ass+a&t16\=0&p1\
    =%3A%3ARefinery.ProductsDivision.Hydrocracker.SRGasOilFeed.

CurrentValue&p12\=true&p4\=0&p5\=SOLID&p6\=None&p7\
=(0%2C0%2C0)&p10\=Fits&p13\=5&p19\=false^~Dummy|\
:\:PiPHD%2CDummy%2C

becomes this:

URL+Example|http\://**<destination server>**/indx/xhqNavbar.html?trend\
=true&savedURL\=false&t3\=7200000&t7\=30s&t6\=All&t12\
=MM%2Fdd%2Fyy&t13\=hh%3Amm%3Ass+a&t16\=0&p1\
=%3A%3ARefinery.ProductsDivision.Hydrocracker.SRGasOilFeed.
CurrentValue&p12\=true&p4\=0&p5\=SOLID&p6\=None&p7\
=(0%2C0%2C0)&p10\=Fits&p13\=5&p19\=false^~Dummy|\
:\:PiPHD%2CDummy%2C

12. The Web Files will need checking since they are transferred with the repos. If any of the default web files have been previously modified on the source server then the web files must be manually checked and all custom changes made in the XHQ web directory (which is in the location specified by the environment variable **`%XHQ_WEB_HOME%`**) on the source server need to be validated for relevance and, if relevant, manually added to the equivalent files in the destination server web directory.

    This will ensure that the web files and JavaScript files work correctly.

    Many sites also customize **`xhqnavbar.aspx`** as part of their custom solution so this may also require checking and modification at this stage.

13. **Open the `conf\web` folder** and check any `.js` files and `.css` files for server name references which may need to be modified to reflect the new destination server name.

14. The **`config.json`** file, located in the **`%XHQ_WEB_HOME%\webapps\ans\app\config`** directory, needs the correct and fully qualified server name (**`<server name>`**) to be added or updated in order for XHQ ANS to operate correctly after the migration.

    The following settings need to be updated to use the fully qualified server name (note text in bold):

    The default text:

```
<context-param>
<param-name>ans.server.hostname</param-name>
<param-value><server name></param-value>
</context-param>
```

    and:

```
<context-param>
<param-name>ans.xhq.trendurl</param-name>
<param-value>//<server name>/indx/xhqTrend.aspx</param-value>
</context-param>
```

    becomes:

```
<context-param>
<param-name>ans.server.hostname</param-name>
<param-value><fully qualified server name></param-value>
</context-param>
```

    and:

```
<context-param>
<param-name>ans.xhq.trendurl</param-name>
<param-value>//<fully qualified server name>/indx/xhqTrend.aspx
</param-value>
```

```
</context-param>
```

15. Validate that all system DSNs are available and equivalent. If any System DSNs were created on the source server then these must also be created on the destination server.
16. If any Access databases are in use on the source server then they must also be copied to the destination server and integrated in an equivalent fashion.
17. **Start-up XHQ** on the destination server using **`xhqboot startup`** and validate the migrated solution.
18. If the XHQ ANS is in use, then depending on the migration steps and time frame, it may be necessary to **run XHQ ANS backfill** in order to fill any gaps in the alert history that may have occurred during the migration period while the destination server was not active. Please consult the XHQ ANS User's Guide for details on how to use XHQ ANS backfill.

How to Rename a Server

If a server is renamed, then some configuration files will require updates. See steps 10 through 17 in the topic, *To transfer the solution content*,for the checks and changes required in this case.

Non-standard Database Content

The embedded database may have been additionally used for non product related data storage if the customer licensing permits and the Siemens Industry Software Inc. project team implemented. If additions were made to the structure of the user schemas used by XHQ then this data might not be migrated and would also cause the additional risk of data loss. For example, if functions were created in another schema and then called by their synonym name instead of the owner.function name, these would not be migrated. Such project specific items would need to migrated as part of additional project specific and project provided migration steps. An example might be the usage of a basic PL/SQL block such as the following one to get all functions.

```
declare
v_function_name varchar(255);
v_sql varchar(255);
v_grant varchar(255);
cursor c1 is
select object_name from all_objects where owner='XHQAPPS' and object_type='FUNCTION';
begin
open c1;
loop
    fetch c1 into v_function_name;
    exit when c1%notfound;
    v_sql   :='create or replace public synonym '||v_function_name||' for XHQAPPS.'||v_
function_name;
    v_grant :='grant execute on '||v_function_name||' to xhq';
    execute immediate v_sql;
end loop;
close c1;
end;
/
```

5 | Disaster Recovery

This chapter shows you how to configure, update, and maintain an XHQ disaster recovery solution using regular backups taken from a **source** XHQ Server and recovered to a **destination** XHQ Server, which can be used as an online backup system to initiate disaster recovery.

The procedure scope covers periodic backup of the XHQ Platform (specifically, the repos and embedded database) and covers the optional product modules delivered together with the core XHQ product (such as the XHQ Alert Notification System). If additional custom solutions have been implemented, then these may require additional steps to ensure they are also backed up and later available on the disaster recovery server and the documentation for those external solutions will additionally need to be reviewed to determine those additional steps. This would likely be the case for solutions using XHQ API based add-on software modules as part of a custom solution built on the XHQ Platform.

To recover from a corrupted XHQ High-Performance Database without having to reinstall XHQ, you must disable disk write caching (which by default is enabled). The disk that hosts the XHQ High-Performance Database should not have disk write caching enabled unless it is connected to an Uninterruptible Power Supply (UPS).

An XHQ Embedded Database Interactive Backup and Migration Utility and associated batch files are provided in addition to this document and must be used as part of this work procedure. The provided utility also updates internal database structures on the destination solution which is a required step in the update process.

This process leverages the general *Solution Migration* process but on a regular basis compared to the prior process which assumed it would be a one time activity due to, for example, a server swap. For convenience and consistency, the actual transfer approach will still use the term “migration” and most steps to backup and transfer data remain identical to the prior chapter.

Glossary of Terms

Term	Description
Source solution	The XHQ solution running on the "source server" that needs to be made available to a (disaster recovery focused) "destination" server.
Destination solution	The XHQ solution running on the "destination server" that needs to be replaced/updated by the "source solution" which is running on the "source" server.
Solution migration	The goal of the solution migration procedure is to transfer the source solution to the destination server so that it replaces any previously running solution on the destination server with a copy of the product scope of the source solution. This, in effect, allows the source solution to be transferred to the destination server and will replace any previous solution running there.
Export	Procedure of exporting embedded database data from the source solution running on the source server and saving it into a backup `.dmp` file
Import	Procedure of importing embedded database data from the source solution running on the source server, into the solution running on the destination server, using the previously exported backup `.dmp` file.

Package Contents

File	Description
`xhqexport.bat`	The batch file used to export embedded database data from the solution running on the source system.
`xhqimport.bat`	The batch file used to import embedded database data into the solution running on the destination system.
`xhqrescue.bat`	The batch file used to rescue an embedded database by importing the automatic backup of the database, which was created prior to the initial import attempt, back into the solution running on the destination system.
(this document)	The XHQ Backup and Recovery Guide.

Pre-requisite Checklist

- The destination XHQ Platform must be installed with an identical set of the install options chosen when installing XHQ on the source system.

  The XHQ password used on the destination system must be identical to that used on the source system.

- The Windows Script Hosting (WSH) must be installed and enabled on both the source and destination machines during this procedure. If previously disabled, then it can be disabled again after the procedure is complete.
- The account executing the provided utility and batch files must have sufficient administration privileges on both systems. At a minimum, the same privileges are needed that would be required to install XHQ.
- The source and destination systems must be running the same XHQ build and using the same Windows operating system.
- You must have adequate disk space during the solution import. Should an error occur during import with regards to insufficient disk space, you must (worst case) re-install the system and run the import again.
- The following procedure should only be executed by suitably qualified and trained XHQ administrators.
- Any custom schema/data that is included in the source database but is not part of XHQ is also backed up in the `xhqorabackup.dmp` file. However, custom schemas/data are not automatically restored onto the destination server. These must be restored manually. Only XHQ "owned" data is restored automatically.
  The `xhqorabackup.dmp` file is located in the backup destination directory.

  The procedure documented in this section assumes that the source server remains in use and the destination server serves the function of a disaster recovery system.

General Approach

It is desired to perform a solution migration but to continue to use the source server afterwards since the solution transfer in this case is intended to update a suitable backup system that can be used to replace the source system in the case of a "disaster" where the source system would be expected to be unavailable for an extended period of time.

In this case, some steps of the following procedure do not need to be followed on subsequent updates after the initial setup and first data migration since they will have already been carried out during any initial data and configuration migration and the subsequent migration can assume two identical XHQ versions and correctly configured systems. The steps that are only required for the initial data migration are noted below.

Note that any use of the source server after the data copy to the destination server will result in the source server being updated and obviously having more current data than the destination server. Some examples of such updates would be XHQ XHQ ANS, Tag Sync updates, VTC tile usage, and updates to end-user favorites.

This issue is resolved by a subsequent additional migration of the data from the source server to the destination server where the update frequency of the data to the destination system reflects the maximum acceptable time that can pass where data loss can be tolerated, for example, later updated end-user favorites would not be available for any changes done after the time the destination system was last refreshed and would be lost but this can be considered acceptable for a day compared to the effort needed for a synchronous replication.

The destination system can be promoted to become the source system in the case of a disaster. If the original source system is later taken online again, the complete process can be run in reverse to update it with a copy of the more current destination system and to allow the roles to be switched again if desired.

Special Considerations due to Disaster Recovery

The following cases must be considered on the destination server when used as a disaster recovery solution.

Connectors

It is generally a good practice to have all of the connectors on the destination solution configured to manual start to avoid accidental additional load on the back end systems. This can be done with a bulk edit via an export of the connector configuration information to reconfigure them not to automatically start. Manually stopping the connectors is not adequate since a system restart would activate them and setting them to on-demand is also not adequate for the same reason.

It is acknowledged that this is non-ideal since it requires a configuration change every time the system is copied so a global property will be available with XHQ 4.7 SP1 that can be used to disable the connector auto-start for all connectors. In this case, this property will simplify the destination solution configuration but the property must then also be removed in the case of the disaster usage so that the connectors will start up.

If XHQ is configured on the source server to write back to back end systems like Historians, the destination server typically needs a global property set to prevent this write capability by default.

Override of the XHQ internal protection of database ownership

The internal database has protection against accidental usage by the wrong server. There are two internal checks: the cache database and the ANS database where the owner is stored. These need to be updated in order to have another server use the databases. This is addressed automatically during the migration procedure but can also be addressed by a standalone script. In XHQ 4.7 SP1, additional properties will make this easier to control by allowing specification of a property to disable this check.

The xhq-sserver process already supports an option to ignore the server – database assignment by using –rsn as follows:

```
"%XHQ_SERVER_HOME%\jre\bin\xhq_sserver" -server -Xrs -XX:+UseConcMarkSweepGC -
Dnet.indx.Home="%XHQ_SERVER_HOME%" -Dnet.indx.Logs="%XHQ_SERVER_LOGS%" -
Dnet.indx.Repos="%XHQ_SERVER_REPOS%" -classpath "%XHQ_SERVER_HOME%\lib\server.jar;%XHQ_
SERVER_HOME%\lib\db2j.jar;%XHQ_SERVER_HOME%\java\lib\collections.jar;%XHQ_SERVER_
HOME%\lib\ojdbc_embed.jar;%XHQ_SERVER_HOME%\lib\sqljdbc4.jar;%XHQ_SERVER_
HOME%\lib\jna.jar;%XHQ_SERVER_HOME%\lib\platform.jar" XHQLoader server
net.indx.repository.solution.cache.CacheServer -rsn
```

Transfer of the XHQ cache data

If a backup of the XHQ cache instance is also transferred from the source solution to the destination solution, then the backup solution will have all the needed data for the Tag Sync (for example) up to the point of the backup so that the destination server would only need to update anything that is outdated. In reality, since the destination solution will usually not be online to avoid additional back end load, this may not be of much value and it is easier for XHQ to repopulate the complete cache and do a complete Tag Sync in the case the destination solution is needed.

Automation and General Procedure

The procedure to generate the backups can be automated with scripts and e.g. combined with a nightly server backup. It is also possible to leverage online backups so that there is no downtime during the backup but an offline backup is preferred. The recovery of the data to the destination system can be done asynchronously and also scripted to a large extent if desired. In the current XHQ version, no automation scripts are provided for this procedure.

Typically, a customer would execute this procedure and create a summary document of the backup steps on the source solution, the recovery steps on the destination solution, and the activation steps needed in a disaster scenario. These customer specific summaries can be used as the input specification for automating the procedure.

The activation procedure must consider server rename, activation of the connectors by default, change of the write prevention system property if needed, and activation of a new backup server to ensure disaster recovery capability is restored.

Server Rename

The destination solution will be running with a different XHQ server name than the source solution. In the case of a real disaster, users can be directed to this server via a launch page or specific information the server can be renamed and the solution can be updated to take over the source solution server name. Important is that this is considered and documented up front in the disaster recovery procedures.

Copying the Source Solution to the Destination Solution

To copy the solution

1. *This step can be skipped during a subsequent Solution Copy.*

   Install XHQ on the destination server in the version and patch level that matches the source server, using the same Windows operating system version, with the same options and using the same XHQ password that is in use on the source server.

   The install options chosen must be the same as the install options chosen when the source server was installed. So, if the source server has the XHQ Alert Notification System, then this must be installed on the destination server as well. Make sure that the destination server XHQ installation is successful before continuing. This step is needed to ensure compatibility between the repos and embedded databases used on both systems.

2. Check the XHQ solution on the source server to ensure there are no errors or corruptions by using the XHQ repos validation utility and `xhqci`.

   The simplest such check is to use **`xhqci`** as follows:

   a. Open a command prompt and type in the following:

      ```
      C:\>xhqci debugsoln
      ```

   b. When the menu comes up, type in **`45`** for Validate Solution.

      - If it returns **zero** corrupted components, collections, and configs, then the repos is **clean**.
      - If it returns any corrupted items, *contact the XHQ Customer Support Team* and **do not proceed** with the solution migration procedure. The output of the corruption check is stored in the **`solutionlogx.out`** file.

3. Ensure that the XHQ solution running on the source server is current and reflects all changes previously made to the model. If unsure of this status, do an **Update to Latest** for the solution before any migration occurs.

   > Running an **Update to Latest** on the production system may impact end-users due to the performance impact on the system.

   Update to Latest can be run by opening a command prompt and typing in the following:

   ```
   C:\>xhqci updatesoln
   ```

4. From the next work procedure step onwards, the XHQ solution on the source server will no longer be accessible to the end-users until the solution data copy step is complete in the case of an offline solution backup.

   > If the intent is ever to replace the source server during the execution of this procedure then steps need to be taken to ensure that it will not be made available to end-users ever again, that is, during the migration itself or after the solution migration is complete and the destination server has replaced it. The solution data will have been backed up in order to be able to migrate the solution so any accidental re-activation of the source server could cause users to update the wrong solution and to lose those updates.

5. *This step can be skipped during a subsequent Solution Copy.*

   Stop the XHQ solution on the source server using **`xhqboot shutdown complete`**.
   Upgrade the XHQ version on the source server to the same XHQ version and patch level as was installed on the destination server if needed.

   Follow the instructions in the *XHQ Installation Guide* describing the upgrade procedure, reboot the source server, and ensure the upgrade is successful before continuing. This step is needed to ensure compatibility between the repos and embedded databases used on both systems.

6. **Shut down the XHQ solution** on the source server, but not the embedded database, by using **`xhqboot shutdown`** instead of `xhqboot shutdown complete`.
7. **Export the embedded database** as described in the topic, *Exporting from the Source Solution*. Transfer the resulting database export file to the destination server.

   It is possible to export the embedded database without first shutting down the XHQ solution as described in step 6 and it is also possible to make an online backup of the repos using the associated XHQ backup command. This is not recommended since an offline backup will have the most complete consistency with the associated repos backup.

   If the export does occur without shutting down the embedded database, the later import process on the destination server will correct any static database fields that would cause issues; for example, it will remove the stored current solution server information. This avoids the need to restart the destination XHQ Server one or more times to purge this internal information.
8. **Shut down the XHQ solution on the source server** completely (including the embedded database) by using **`xhqboot shutdown complete`**.
9. **Copy the repos directory** located in the **`%XHQ_SERVER_REPOS%`** to a temporary directory on the source server and create a .zip file of the repos to use for the repos transfer to the destination server. The usage of WinZIP is recommended for this purpose.
10. Do one of the following:
    - If the intent is not to replace the XHQ solution on the source server with the migrated solution on the destination server at the end of this migration procedure but to continue using the XHQ solution on the source server (normal case when only creating a backup for update of the destination), then the XHQ solution on the source server can be made available again at this time by using **`xhqboot startup`**.

    or

    - If the intent is to replace the source server after the migration procedure is complete, then the XHQ solution on the source server should remain offline. This is an unlikely scenario in the case of disaster recovery related backups since the source server is accessible so would not be replaced.
11. Make sure that the XHQ solution on the destination server is not in use. It will now be replaced with the solution that was previously running on the source server.
12. **Stop the XHQ Server on the destination server** using **`xhqboot shutdown`**.
13. **Shut down the World Wide Web Publishing Service** on the destination server as follows:
    a. Go to **Start** > **Run**, type **`services.msc`** and press **Enter**.
    b. Locate and **stop** the "World Wide Web Publishing" Service.

    This step is needed since the IIS may be using the repos folder and the following steps could fail due to file locks being in use.
14. **Back up and rename the repos folder** that was in use on the destination server. This backup is for safety in case the new copy has unexpected issues and there is a need to continue using the prior version on the destination server.
15. **Transfer the zip file** that was created in step 9 over to the destination server and unzip it to become the new repos folder on the destination server in order to prepare for the next steps.

    Take care to reconstruct the source repos structure correctly and not accidentally unzip the repos a level deeper than intended, for example, repos\repos instead of just repos. The usage of a `.zip` file for repos transfer is recommended due to avoidance of most transfer related issues during the repos file transfer and the checksum usage of the zip utility.

    Note that the copied repos will contain the following important items in the most current version used prior to the source server `migration/promotion`: the `\Users` directory

and the `\Images` directory.

16. Import the embedded database export file created in step 7, and which was transferred to the destination server, as described in the topic, *Importing into the Destination Solution*.

    Backup the destination server and existing XHQ solution completely. The import procedure will irrevocably delete all XHQ data from the embedded database of the destination solution on the destination server. It may also shut down the destination solution without warning.

    Non-standard product database content (for example, content that may have been additionally added for non-product related data storage e.g. for custom solutions or additional database artifacts such as functions) may be irrevocably deleted and will need to be added again manually after this procedure is complete so ensure that an adequate backup is available.

17. Check the source server properties files and manually add, delete, or correct any entries that were previously made on the source server and are still required on the destination server.

    In general, few changes are needed since the properties files are contained in the repos and are transferred with the repos but the following properties files:

    `storage.properties, globalsettings.properties, ans.properties, ansmail.properties`

    must be checked as a matter of course since the source server name may still be present if the server name is not being reused and would need to be replaced with the destination server name. The server name may also not have been fully qualified and usually needs to be entered fully qualified to avoid issues.

    The following examples show some typical settings that need to be checked in the associated properties files:

    - `storage.properties`
      Ensure that the `source server` name is replaced by the fully qualified destination server name.

      Example: `db.jdbc.url=jdbc:oracle:thin:@<destination server>:1521:XHQ`

    - `globalsetting.properties`
      Ensure that the `source server` name is replaced by the fully qualified destination server name.

      Example: `WebServer=<destination server>`

    - `ansmail.properties`
      Ensure that the `source server` name is replaced by the fully qualified destination server name.

      Example: `Trend: http://<destination server>/indx/xans/ans_trend.jsp?DefinitionId=<%EventDefId%>&StartTime=<%EventTimeMillis%>`

18. End-users may have previously saved some "favorite trends". In this case, since the favorites are generally stored on the server in the **`\User\<username>`** directories, all URLs in the end-user's favorites must be updated to reflect the new server name. This step should not be needed with a recent XHQ version, if the favorites were corrected one time on the source system for all users with this older storage syntax – newer systems do not store the server URL in the favorite to avoid this issue.

    Example: *This:*

    ```
    URL+Example|http\://<source server>/indx/xhqNavbar.html?trend\
    =true&savedURL\=false&t3\=7200000&t7\=30s&t6\=All&t12\
    =MM%2Fdd%2Fyy&t13\=hh%3Amm%3Ass+a&t16\=0&p1\
    =%3A%3ARefinery.ProductsDivision.Hydrocracker.SRGasOilFeed.
    CurrentValue&p12\=true&p4\=0&p5\=SOLID&p6\=None&p7\
    =(0%2C0%2C0)&p10\=Fits&p13\=5&p19\=false^~Dummy|\
    :\:PiPHD%2CDummy%2C
    ```

    becomes this:

```
URL+Example|http\://<destination server>/indx/xhqNavbar.html?trend\
=true&savedURL\=false&t3\=7200000&t7\=30s&t6\=All&t12\
=MM%2Fdd%2Fyy&t13\=hh%3Amm%3Ass+a&t16\=0&p1\
=%3A%3ARefinery.ProductsDivision.Hydrocracker.SRGasOilFeed.
CurrentValue&p12\=true&p4\=0&p5\=SOLID&p6\=None&p7\
=(0%2C0%2C0)&p10\=Fits&p13\=5&p19\=false^~Dummy|\
:\:PiPHD%2CDummy%2C
```

19. *This step can be skipped during a subsequent Solution Copy.*

    The Web Files will need checking since they are transferred with the repos. If any of the default web files have been previously modified on the source server then the web files must be manually checked and all custom changes made in the XHQ web directory (which is in the location specified by the environment variable **`%XHQ_WEB_HOME%`**) on the source server need to be validated for relevance and, if relevant, manually added to the equivalent files in the destination server web directory.

    This will ensure that the web files and JavaScript files work correctly.

    Many sites also customize **`xhqnavbar.aspx`** as part of their custom solution so this may also require checking and modification at this stage.

20. Open the `%XHQ_WEB_DATA%\repos\conf\web` directory (which by default is `<systemdrive>:\XHQ\data\repos\conf\web`), and check any `.js`, `.json`, and `.css` files for server name references that may need to be modified to reflect the new destination server name.

21. *This step can be skipped during a subsequent Solution Copy.*

    Validate that all system DSNs are available and equivalent. If any System DSNs were created on the source server then these must also be created on the destination server.

22. If any Access databases are in use on the source server then they must also be copied to the destination server and integrated in an equivalent fashion.

23. **Start-up XHQ** on the destination server using **`xhqboot startup`** and validate the migrated solution.

24. **Shut down XHQ** on the destination server using **`xhqboot shutdown complete`** and backup the complete destination server and XHQ installation to a safe location.

25. **Start-up XHQ** on the destination server using **`xhqboot startup`**.

26. *This step can be skipped during a subsequent Solution Copy.*

    If the source server is being replaced by the destination server, then the destination server is now ready to be activated as the new production system. If needed, update DNS and any other network related locations to reflect any server name changes or IP changes that were made during the migration and note that DNS changes may take some time to propagate through the network before being available on the clients.

27. After the migration has been deemed successful, delete all `.PAR` files that were temporarily created by running the migration utility. There will usually be between one and three of these .PAR files depending on whether an export (creates `XHQBKPEXP.PAR`) or export and import (creates `XHQBKPIMP.PAR` and `XHQRESCUEBKP.PAR`) was executed. These parameter files are used during the database export/import procedure and will contain the embedded database password since the embedded database requires this file syntax for the export/import procedure. They are not automatically deleted since they may be required to assist in analyzing problems with the database migration and since they can assist in manual recovery of data.

28. If the XHQ ANS is in use, then depending on the migration steps and time frame, it may be necessary to **run XHQ ANS backfill** in order to fill any gaps in the alert history that may have occurred during the migration period while the destination server was not active. Please consult the XHQ ANS User's Guide for details on how to use XHQ ANS backfill.

29. Ensure the connectors on the destination server are disabled unless it is desired to have the destination server update the cache and run tag sync to pre-populate with data. If XHQ is configured on the source server to write

back to back end systems like Historians, the destination server typically needs a global property to prevent this write capability by default.

Renaming a Server

If a server is renamed, then some configuration files will require updates. See steps 17 through 24 in the topic, *To migrate or copy the solution*, for the checks and changes required in this case.

The **XHQ Solution Viewer Applet** requires the following steps to update the `netinfo.js` file it uses.

1. Go to **XHQ Web Root directory** `%XHQ_WEB_HOME%\indx`, which by default is `C:\Program Files (x86)\XHQ\XHQ Web Root\indx`, and locate the **`netinfo.js`** file.
2. Update **`netinfo.js`** with the new server name.