HHS CMS HR BizFlow System

Deployment

Document Control Information

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# Introduction

This document describes how to deploy the HHS CMS BizFlow HR system. It is assumed that there are 3 environments, DEV, QA, and PROD. The instruction for deployment for each environment will be the same except for configuration. Configuration should be done specifically for each target environment.

# Required system version information

1. BizFlow: BizFlow Server version 12.4
2. Database: Oracle 12c
3. Web Server: Tomcat 7
4. Java: JDK 7

# Development directory structure

The following directory capture will be delivered as part of the release of the system.

CMS-BizFlow/database/

CMS-BizFlow/deploy/

CMS-BizFlow/java/cmspdf

CMS-BizFlow/process/

CMS-BizFlow/report/

CMS-BizFlow/ui/wm-project/

CMS-BizFlow/webapps/bizflow

## database Directory contents

This directory contains database scripts (.sql files) to create database schema, users, and other objects, which includes the definition for tables, stored procedures, functions, triggers, sequence.

The DBA will execute the database scripts in Oracle database client (e.g. SQLPlus, SQL Developer, etc.) in the designated order (as part of the filename) so that the database for the system can be created.

Script file example:

CMS\_HR\_DB\_01\_create\_schema.sql

CMS\_HR\_DB\_02\_grant\_permission\_bizflow.sql

CMS\_HR\_DB\_03\_create\_model\_objects.sql

CMS\_HR\_DB\_04\_grant\_permission\_model.sql

CMS\_HR\_DB\_05\_create\_program\_objects.sql

CMS\_HR\_DB\_06\_grant\_permission\_program.sql

CMS\_HR\_DB\_07\_1\_insert\_seed\_data\_LOOKUP.sql

CMS\_HR\_DB\_07\_2\_insert\_seed\_data\_REQUEST.sql

CMS\_HR\_DB\_07\_3\_insert\_seed\_data\_GRADE.sql

CMS\_HR\_DB\_07\_4\_insert\_seed\_data\_ADMIN.sql

CMS\_HR\_DB\_07\_5\_insert\_seed\_data\_LOC\_1.sql

...

CMS\_HR\_DB\_07\_9\_insert\_seed\_data\_LOC\_5.sql

## deploy directory contents

This directory contains script to capture web runtime files, deployment scripts, etc.

It is assumed Apache ANT is available to run the runtime capture script (build.xml).

The deployment script for UI module is for Linux server environment where shell program is available.

For example:

build.xml

deploy\_ui\_dev.sh

deploy\_ui\_qa.sh

deploy\_ui\_prod.sh

## java directory contents

This directory contains custom developed modules. Currently, PDF document generation module is added.

For example:

cmspdf/src

cmspdf/lib

cmspdf/resources

cmspdf/PDF\_Configuration

## process directory contents

This directory contains BizFlow Import Export file (.bix files), which contains the process definition, the application definition, user group definition, BizCove and menu design.

The system administrator will use BizFlow Process Studio in order to import the .bix file to a designated BizFlow Server environment.

BIX file example:

CMS.bix

## report directory contents

This directory contains BizFlow Advanced Reporting Export file (.zip file), which contains data source, report domain definition, input control definition, and report definition.

The system administrator will use command line tool to import the report export (.zip) file to the designated BizFlow Advanced Reporting Server environment.

Report export file example:

hhscmsreport.zip

## wm-project directory contents

This directory contains WebMaker project export files (.zip files), which is form design source code.

The system administrator will use WebMaker Design Studio in order to import each of the project export files, generate runtime files, then, deploy them to the designated environments. As an alternative, wm-runtime directory contains the same generated web application files, which is ready to be deployed without going through WebMaker Design Studio.

WebMaker project export file example:

cmscommon\_export.zip

StratConMain\_export.zip

StratCon\_GEN\_export.zip

StratCon\_POS\_export.zip

StratCon\_MTG\_export.zip

StratCon\_AOC\_export.zip

StratCon\_smeja\_export.zip

StratCon\_RI\_export.zip

StratCon\_TR\_export.zip

StratCon\_apr\_export.zip

classification\_main\_export.zip

classification\_gen\_export.zip

...

## wm-runtime directory contents

This directory contains WebMaker runtime directories and files, which are generated from WebMaker Design Studio after importing respective project export files.

The system administrator will simply copy all of the runtime files to the designated web server (i.e. Tomcat) directory of the target environment. Then, the WebMaker application configuration files (morphyc.xml file), which should be tailored for the target environment will be copied to the designated directories.

\webapps\bizflowwebmaker\cmscommon\

\webapps\bizflowwebmaker\StratConMain\

\webapps\bizflowwebmaker\StratCon\_AUT\

\webapps\bizflowwebmaker\StratCon\_GEN\

\webapps\bizflowwebmaker\StratCon\_POS\

\webapps\bizflowwebmaker\StratCon\_MTG\

\webapps\bizflowwebmaker\StratCon\_AOC\

\webapps\bizflowwebmaker\StratCon\_smeja\

\webapps\bizflowwebmaker\StratCon\_RI\

\webapps\bizflowwebmaker\StratCon\_TR\

\webapps\bizflowwebmaker\StratCon\_apr\

\webapps\bizflowwebmaker\classification\_main\

\webapps\bizflowwebmaker\classification\_gen\

...

\configuration\DEV\tomcat\conf\context.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\cmscommon\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\StratConMain\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\StratCon\_AUT\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\StratCon\_GEN\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\StratCon\_POS\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\StratCon\_MTG\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\StratCon\_AOC\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\StratCon\_smeja\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\StratCon\_RI\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\StratCon\_TR\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\StratCon\_apr\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\classification\_main\doc\morphyc.xml

\configuration\dev\tomcat\webapps\bizflowwebmaker\classification\_gen\doc\morphyc.xml

...

The same set of configuration files for QA and PROD environments will be provided under the respective directories.

\configuration\qa\

\configuration\prod\

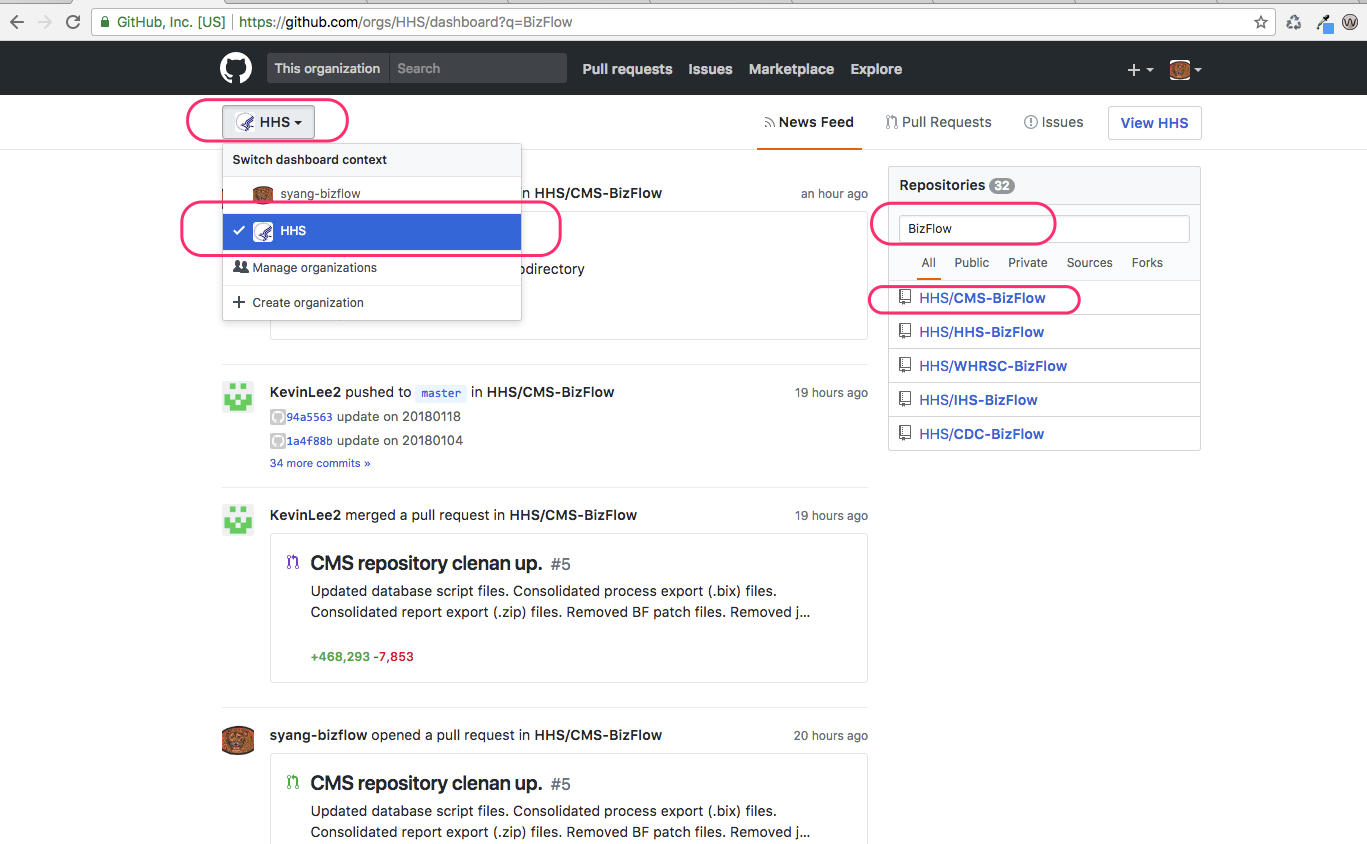
# Methods of deployment file delivery

The following methods of deployment file delivery may be considered.

* USB drive to HHS team
* Upload to a designated ftp/sftp site in HHS network by authorized Deloitte team
* Upload from HHS issued laptop by authorized Deloitte team
* Download from HHS CMS BizFlow HR Confluence site (https://hrbizflow.atlassian.net/wiki/display/HB) by HHS personnel.
* Download from HHS GitHub site (https://github.com/HHS) by HHS personnel.

## Development repository in GitHub

1. Log in to GitHub for HHS (https://github.com/HHS).
2. On the dashboard, select context dropdown to “HHS”.
3. On the Repositories pain, search for “BizFlow”, and select “HHS/CMS-BizFlow”.



1. Verify the URL and repository name.
2. Click “Clone or download” button. If you intend to set up local git repository and continue to use it in the future, clone the repository using SSH or HTTPS option. If you want to download the entire repository for each build/deploy, select “Download ZIP” option.

# Deployment Steps

## Database Deployment

A DBA should perform the following steps using Oracle database client.

### Create database schema and user

Log in to the database system as Oracle system user, and execute the following script. Before executing the SQL script, you may want to edit the password for the database user (CMSADMIN, CMSDEV, and HHS\_CMS\_HR) in the script. Make a note of the database user name and password for later configuration steps.

Also, make sure the target directory where the tablespace file will be generated is already created in the file system that the DBMS is installed.

For the first SQL script file, it is recommended to execute the statements within the SQL script file one by one manually and make sure that no critical error occurs. The reason is that the first script creates tablespace, datafile, user/schema, security role,etc., which are prone to error depending on the DBMS environment. If a critical error occurs (e.g. directory does not exist, disk full, etc.) you need to resolve those issues before moving to the next command. In general, you may safely ignore “object/table/view/symbol does not exist” type of error returned when executing DROP statements.

CMS\_HR\_DB\_01\_create\_schema.sql

It will perform the following actions.

* Define database, specifying tablespace and database file location.
* Create database users and schemas.
* Create database roles.
* Grant permissions to the database users and roles.

### Grant permission required for program object creation

Using the Oracle system user login, execute the following script. This is pre-requsite for certain functions and stored procedures defined later on, which need to access objects in BIZFLOW schema.

CMS\_HR\_DB\_02\_grant\_permission\_bizflow.sql

It will perform the following actions.

* Grant permissions for accessing BizFlow’s core database tables to the designated database user.

### Create objects for business data model

Log in to the database system using the newly created database user account (id = HHS\_CMS\_HR), using the password that was set in the step 5.1.1. As the HHS\_CMS\_HR database user, execute the following script.

CMS\_HR\_DB\_03\_create\_model\_objects.sql

It will perform the following actions.

* Create tables for CMS business data storage.
* Create sequences, constraints, and triggers associated with the tables.
* Create stored procedures.

### Grant permission to the business data mode objects created

Using the Oracle system user login, execute the following script.

CMS\_HR\_DB\_04\_grant\_permission\_model.sql

It will perform the following actions.

* Grant permissions for accessing the newly created database objects for business data model in the previous step to the designated database roles.

### Create core table and program objects

Using the HHS\_CMS\_HR user login, execute the following script.

CMS\_HR\_DB\_05\_create\_core\_table.sql

It will perform the following actions.

* Create tables for generic use by program objects (functions and stored procedures).
* Create sequences, constraints, and triggers associated with the tables.

CMS\_HR\_DB\_06\_create\_core\_program.sql

It will perform the following actions.

* Create stored procedures.
* Create functions.

### Grant permission to the core table and program objects created

Using the Oracle system user login, execute the following script.

CMS\_HR\_DB\_07\_grant\_permission\_core.sql

It will perform the following actions.

* Grant permissions for accessing the newly created database objects for program to the designated database roles.

### Insert seed data (a.k.a. day-zero data)

Using the HHS\_CMS\_HR user login, execute the following scripts.

CMS\_HR\_DB\_08\_1\_insert\_seed\_data\_LOOKUP.sql

CMS\_HR\_DB\_08\_2\_insert\_seed\_data\_REQUEST.sql

...

CMS\_HR\_DB\_08\_?\_insert\_seed\_data\_\*.sql

It will perform the following actions.

* Insert the data into ADMIN\_CODES table to be used as reference data for Admin Code field.
* Insert the data into GRADE\_DETAIL table to be used as reference data for Grade field.
* Insert the data into REQUEST\_CONTROL table to be used as seed data for generating Request Number.
* Insert the initial lookup data into TBL\_LOOKUP table, which will be used as part of numerous dropdown fields.
* Insert the data into LOCATION table to be used as reference data for Location field. The number of records for this table is so large so that it is broken into multiple files.

### Create objects used for Reporting

Using the HHS\_CMS\_HR user login, execute the following script.

CMS\_HR\_DB\_08\_report\_objects.sql

It will perform the following actions.

* Create functions used for report views.
* Create views for business data from HHS\_CMS\_HR schema.

### Grant permission to the report objects created

Using the Oracle system user login, execute the following script.

CMS\_HR\_DB\_09\_grant\_permission\_report.sql

It will perform the following actions.

* Grant permissions for accessing the newly created database objects for report to the designated database roles.

### Create objects used in BIZFLOW database

Using the BIZFLOW user login, execute the following script.

CMS\_BIZFLOW\_DB\_01\_create\_objects.sql

It will perform the following actions.

* Create functions.

### Create report objects used in BIZFLOW database

Using the BIZFLOW user login, execute the following script.

CMS\_BIZFLOW\_DB\_02\_report\_objects.sql

It will perform the following actions.

* Create report lookup table and insert reference data.
* Create functions.
* Create views for process data from BIZFLOW schema.

## BIX deployment

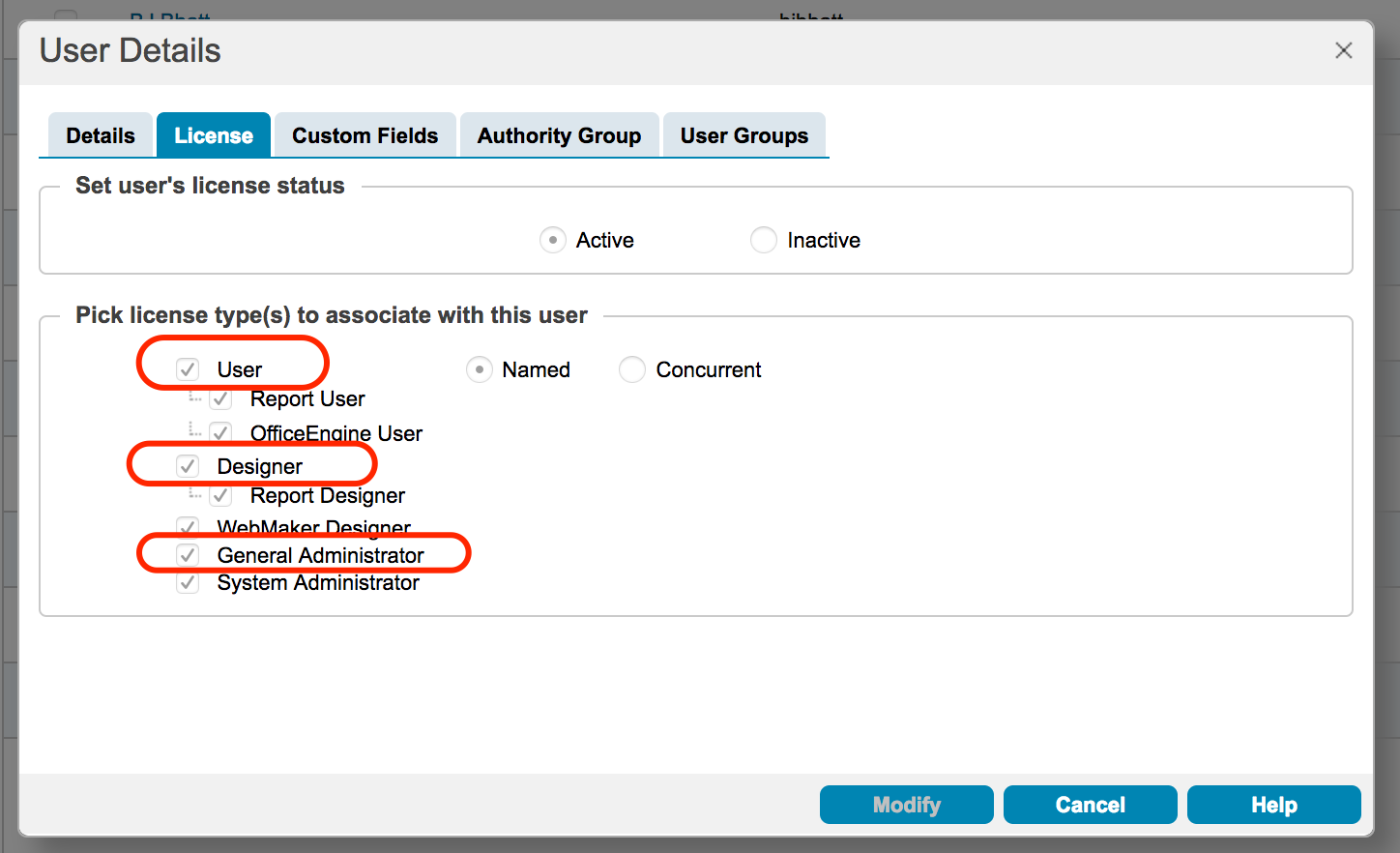
Import BizFlow Process definitions and BizCoves

Pre-requisite

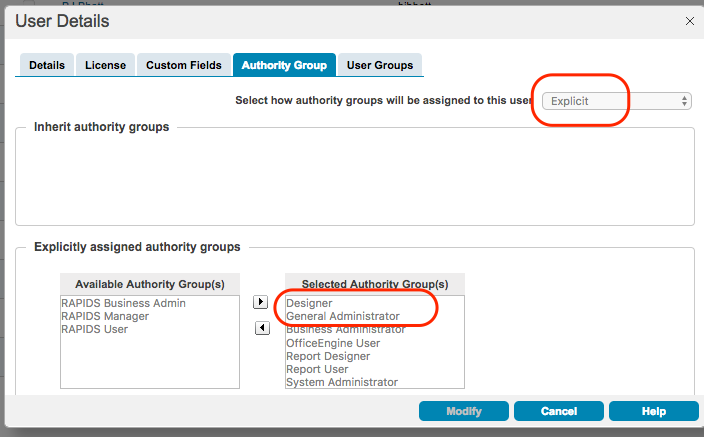
* BizFlow Server is installed and BizFlow Server is running.
* BizFlow Process Studio (BPS) is installed.
* BizFlow user with “General Administrator” and “Designer” license is created for migration.

In this instruction, a user login “import\_user” is assumed to be set up with the necessary permission. In order to verify the BizFlow user with proper permission, log in to BizFlow Portal site as a system administrator, and check the Authentication configuration.

1. Log in to BizFlow Portal as a system administrator.
2. Click “ADMINISTRATION” tab on the top right corner.
3. Click Authentication on the administration page.
4. Search the user login to verify and click on the login ID found to open User Details wizard.
5. Click License tab and Authority Group tab in the wizard to verify the license assignment and Authority Group assignment.

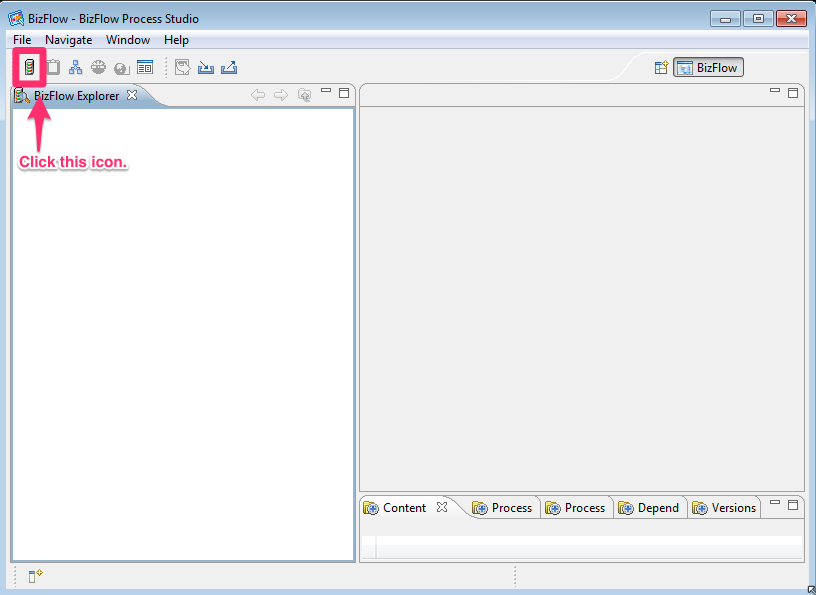


For Authority Group assignment option, it is recommended to use “Explicit”. Then, make sure explicitly select Designer and General Administrator Authority Group along with others.

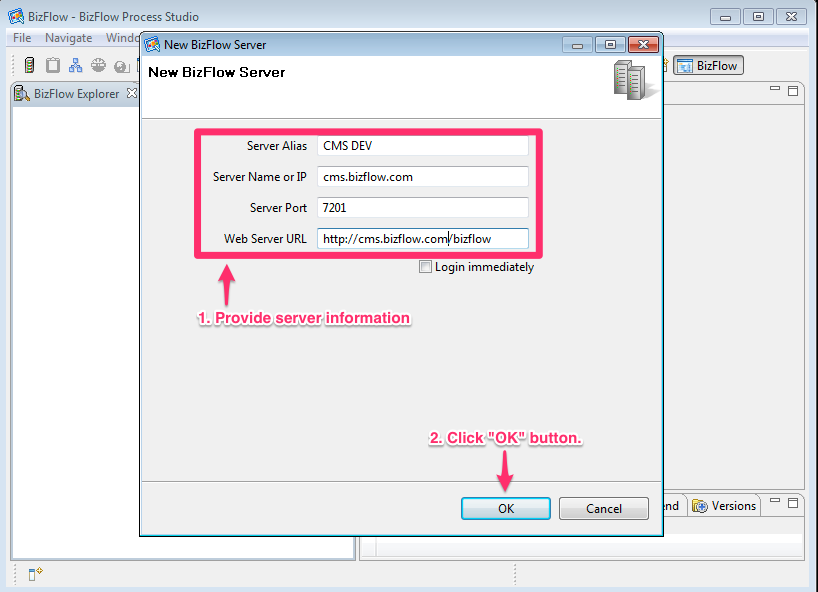


When all pre-requisite for BIX import are verified, begin the import steps.

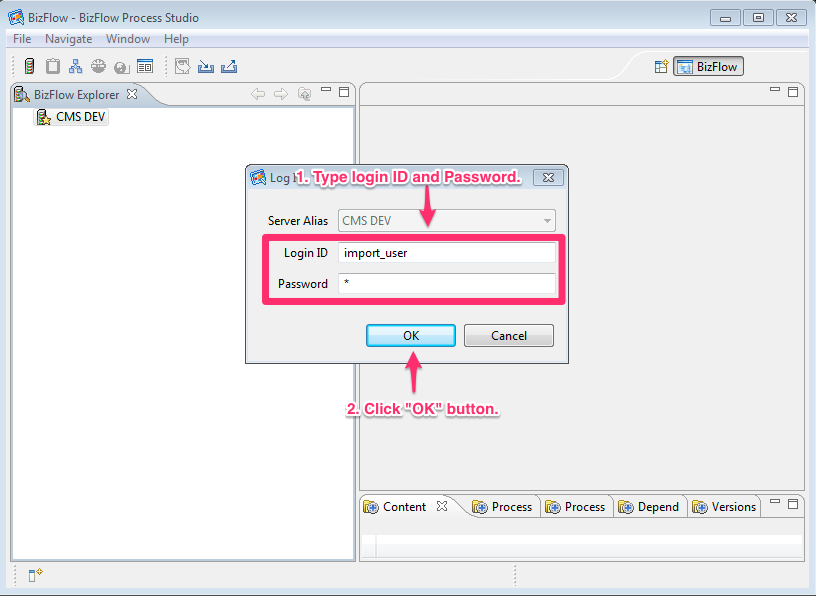
1. Step1 – Register BizFlow server to BPS
   1. Launch BPS and click “BizFlow Server” icon.



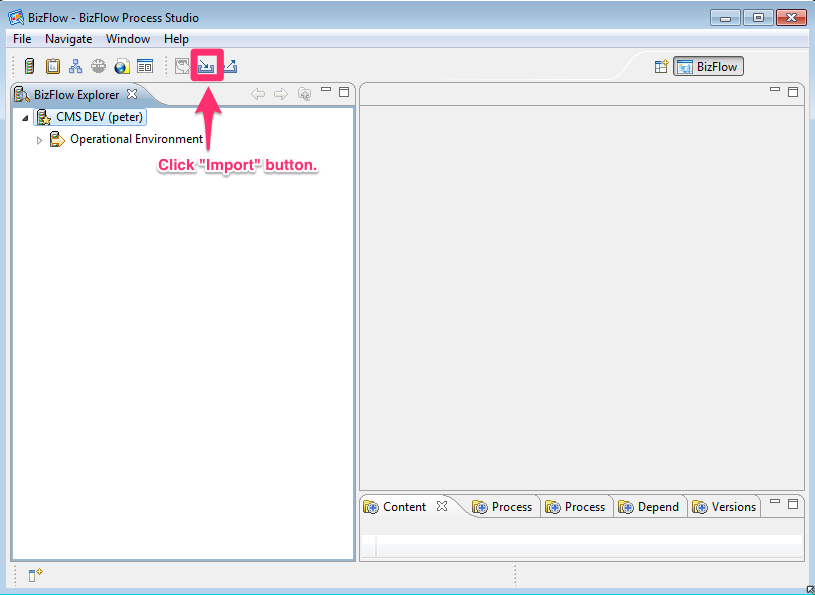
* 1. Provide Server information.



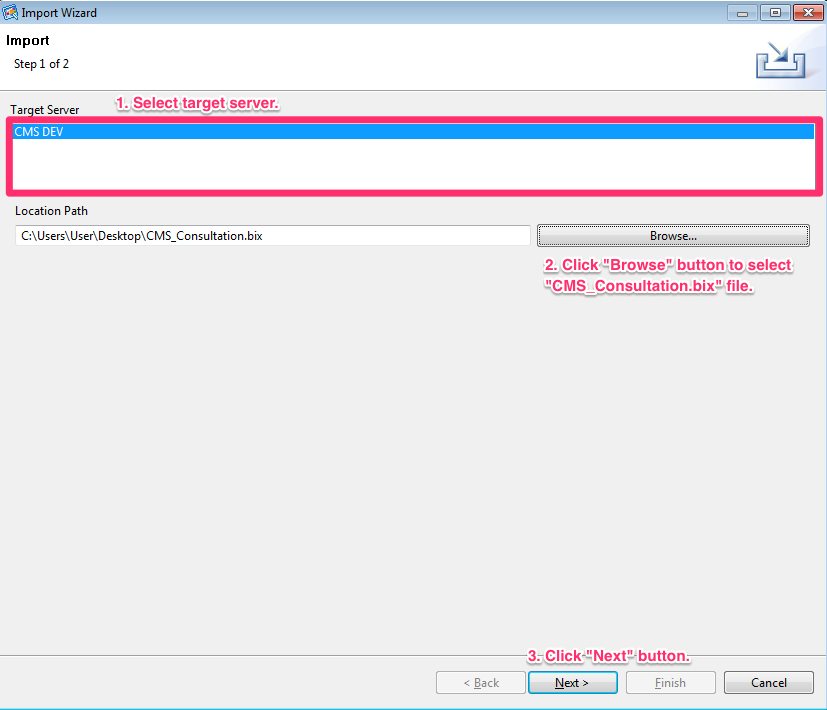
1. Step 2 - Log on to BizFlow Server.
2. This user needs to have “General Administrator” and “Designer” license.



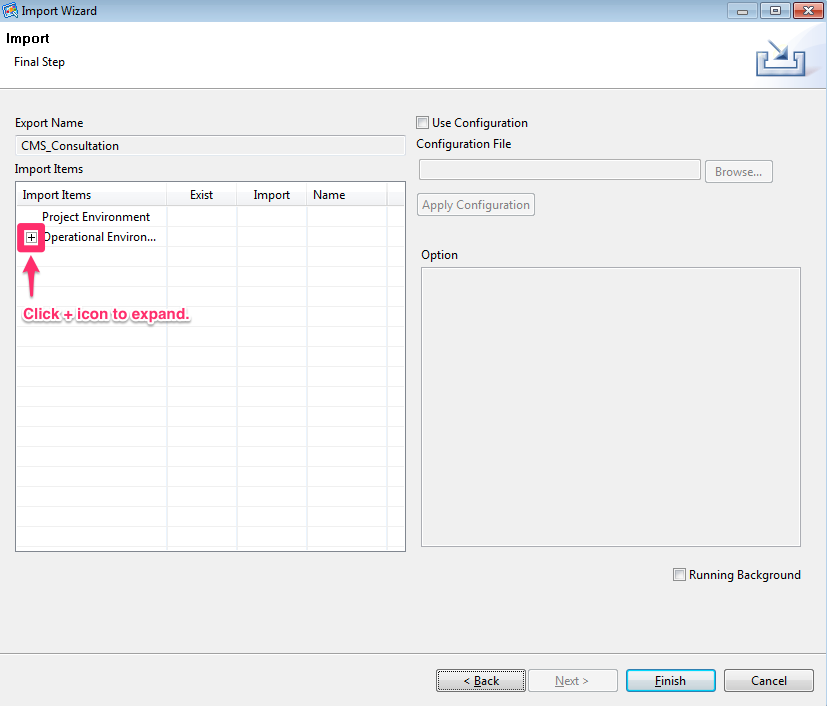
1. Step 3 - Click “Import” button.



1. Step 4 - Select BizFlow BIX file.
2. Select proper server alias name in “Target Server” section.
3. Click “Browse” button and select “CMS\_Consultation.bix” file.
4. Click “Next” button.

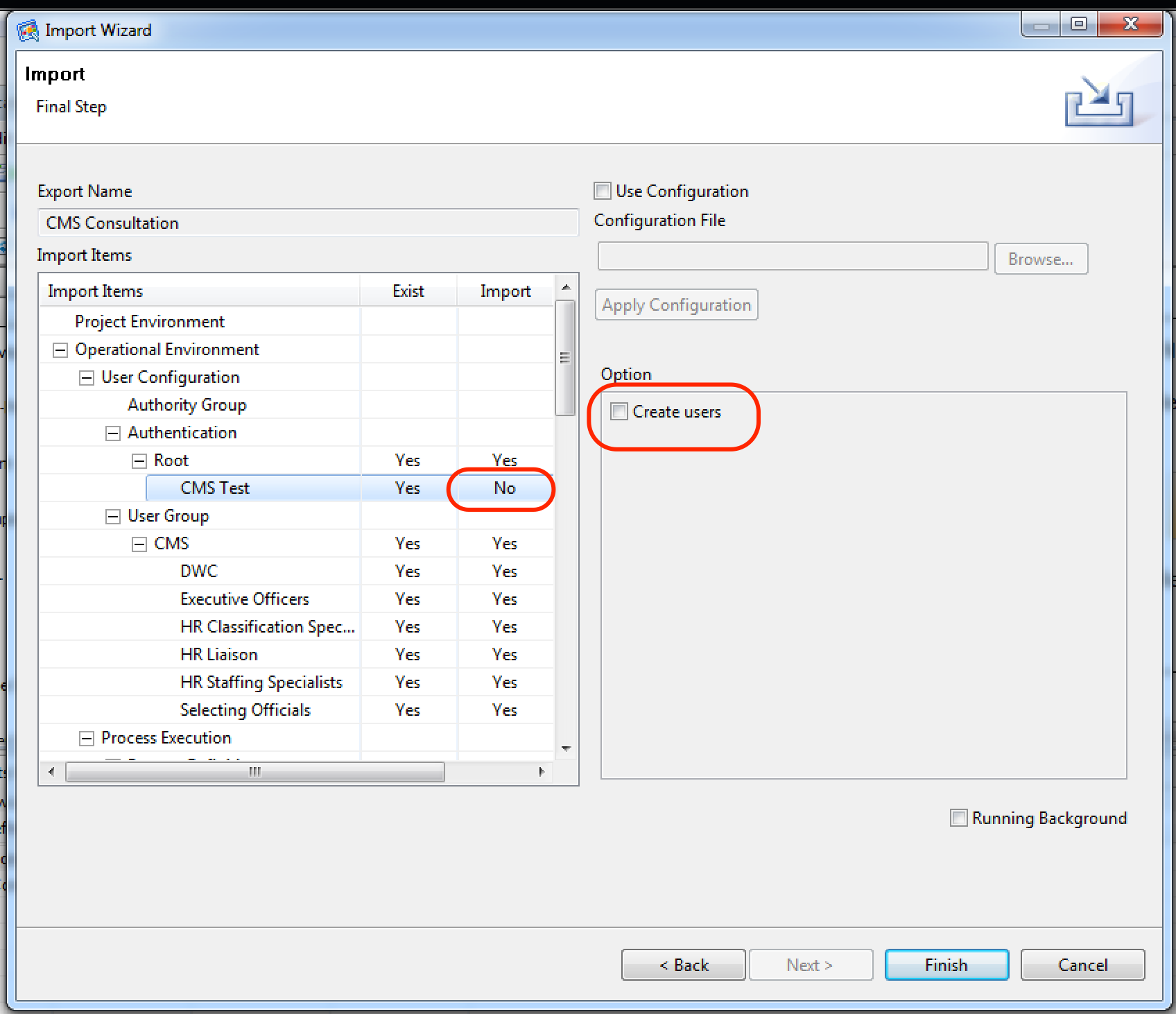


1. Step 5 - Click “+” icon to expand items and select “/Operational Environment/User Configuration/Authentication/Root/CMS Test”.

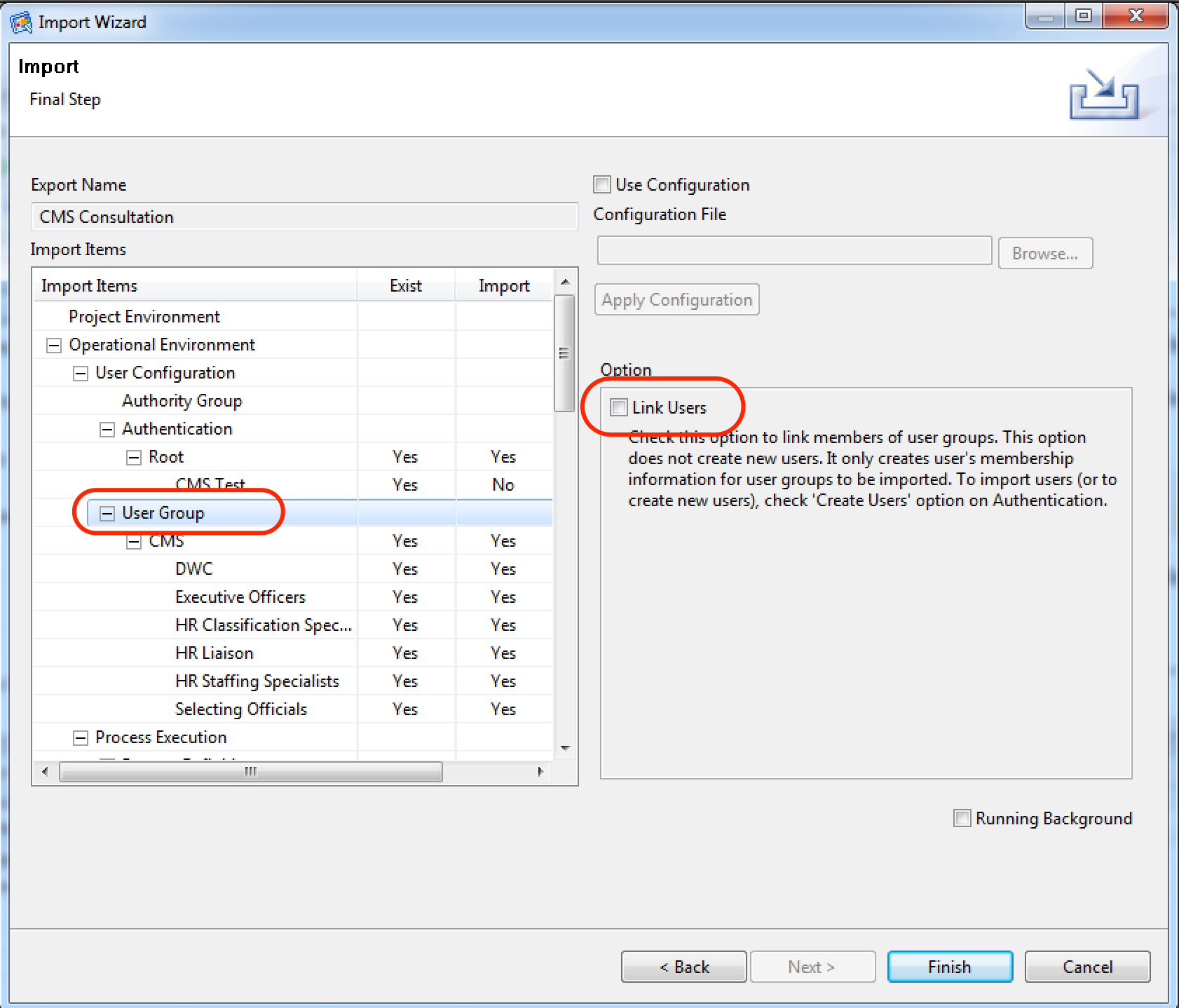


1. Step 6 - Uncheck “Create Users” option.
2. Import column should be set as “No”.

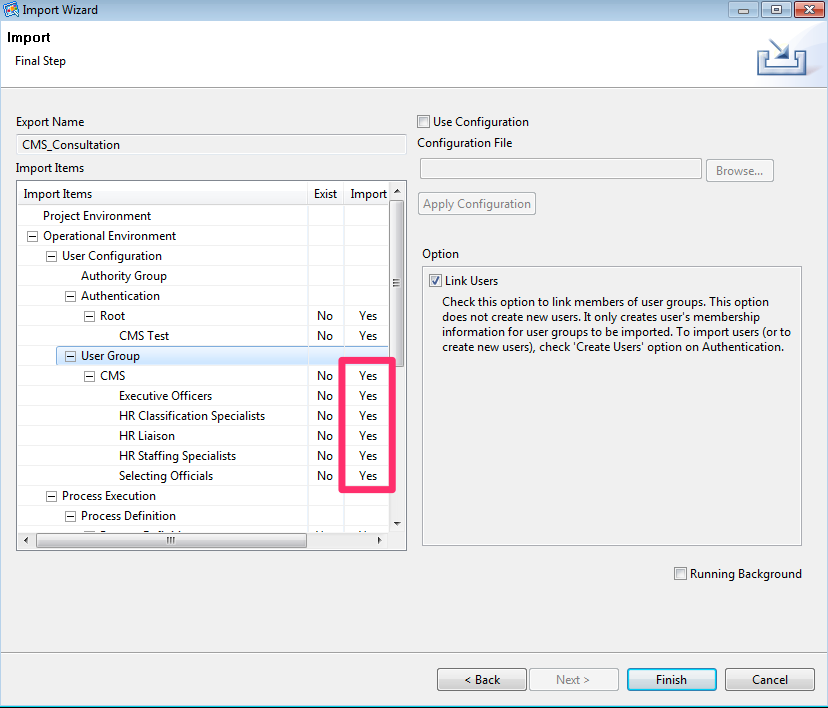
**Note**: The Create User option may be turned on in case user login accounts should be migrated, but in general, it should not be used. In the future deployment package, the test user entry may be excluded so that you may skip the Step 6.



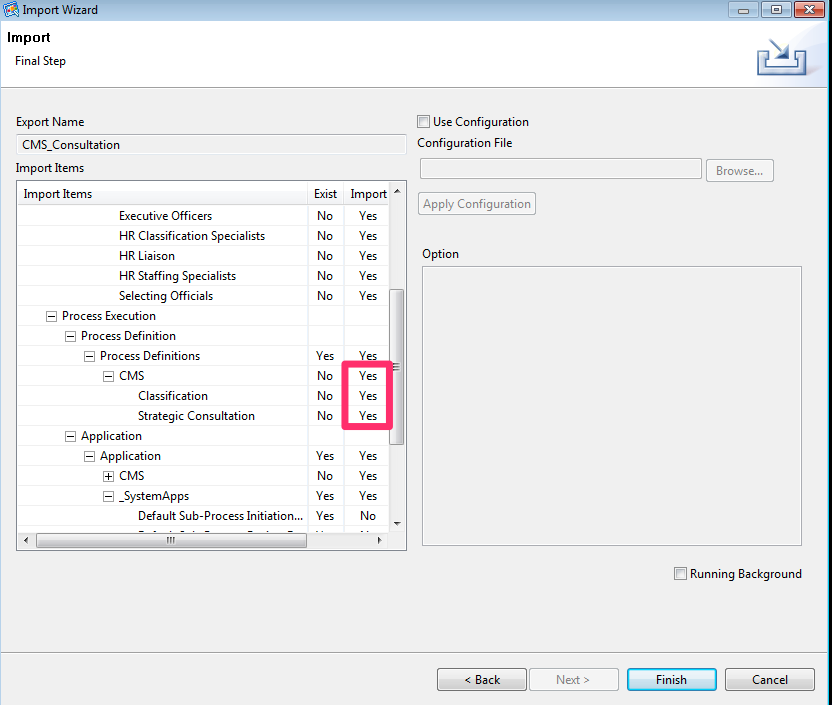
1. Step 7 - Uncheck “Link Users” option in “/Operational Environment/User Configuration/User Group”.



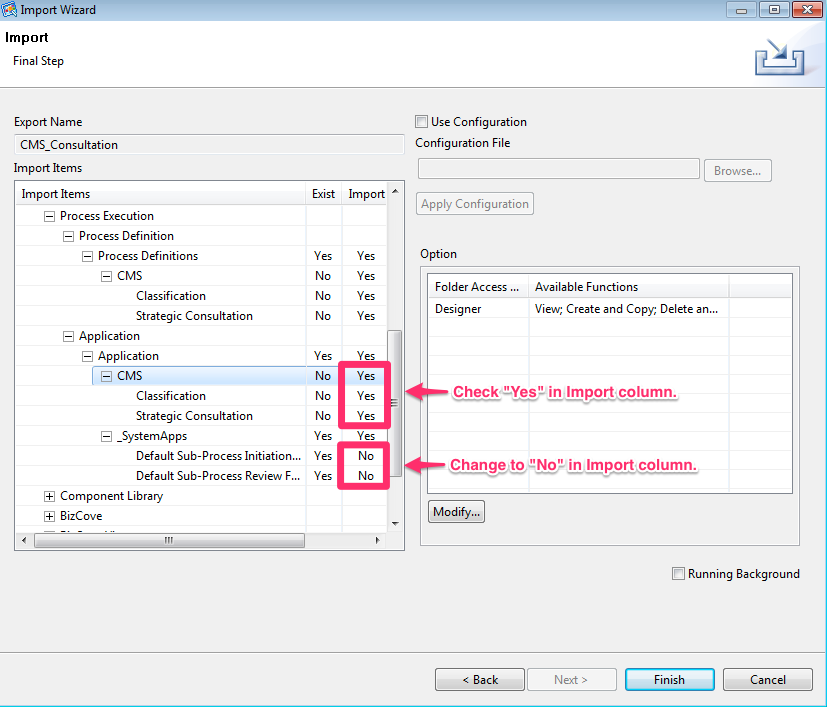
1. Step 8 - All user group under “/Operational Environment/User Configuration/User Group/CMS” should have “Yes” in “Import” column.



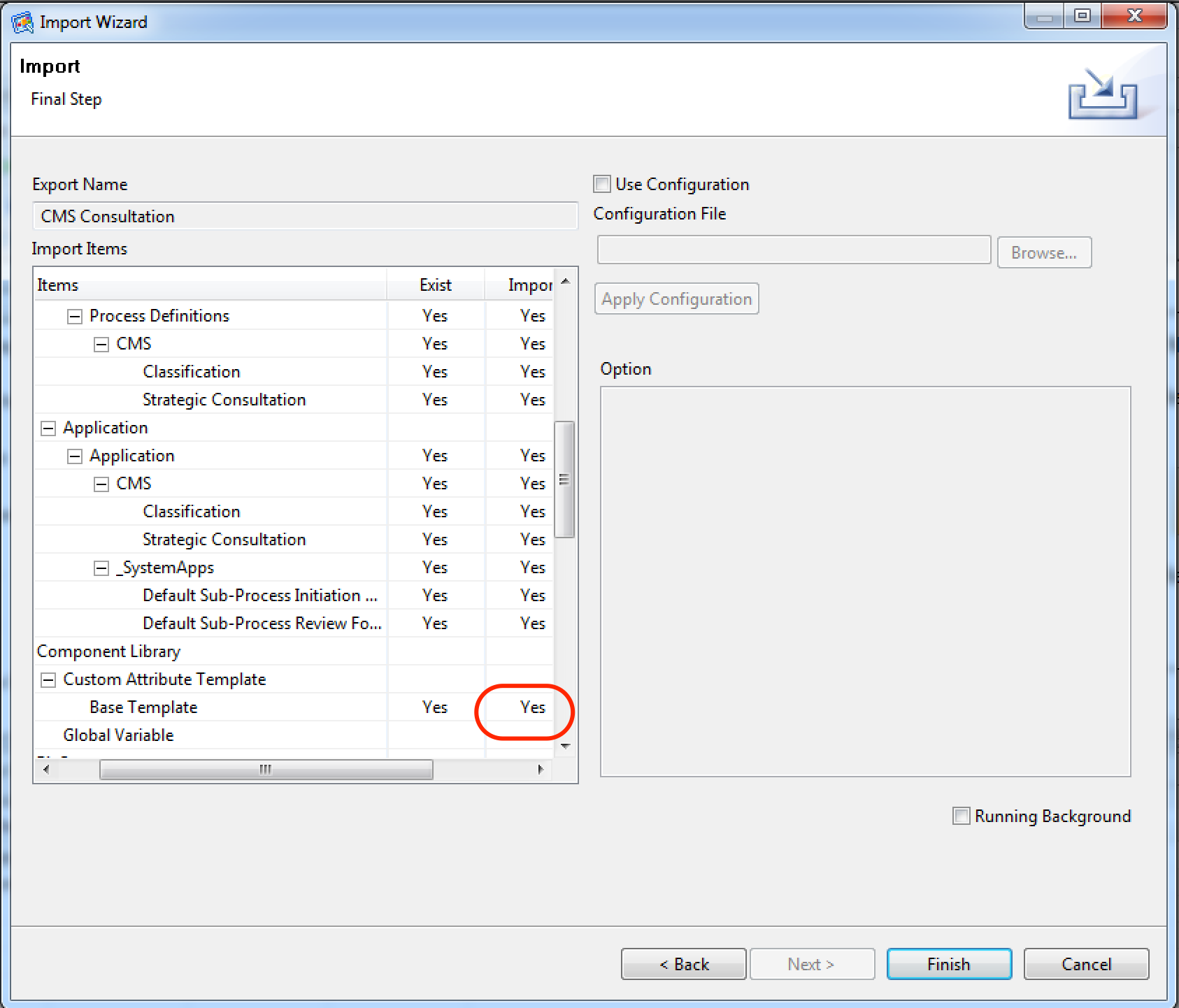
1. Step 9 - All Process Definitions under “/Operational Environment/Process Execution/Process Definition/Process Definitions/CMS” should have “Yes” in “Import” column.



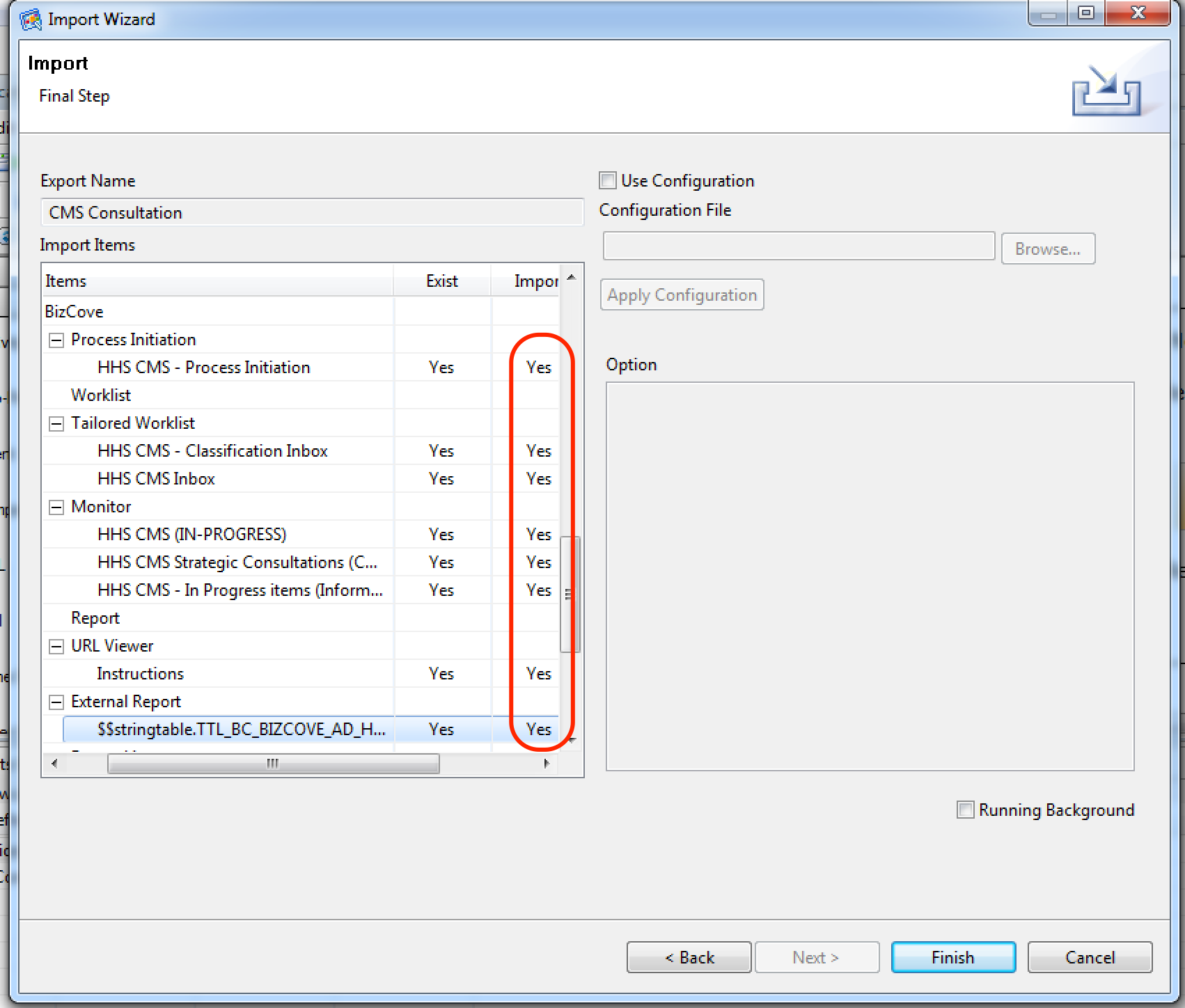
1. Step 10 - Application
2. All Applications under “/Operational Environment/Application/Application/CMS” should have “Yes” in “Import” column.
3. All Application under “/Operational Environment/Application/Application/\_SystemApps” should have “No” in “Import” column.



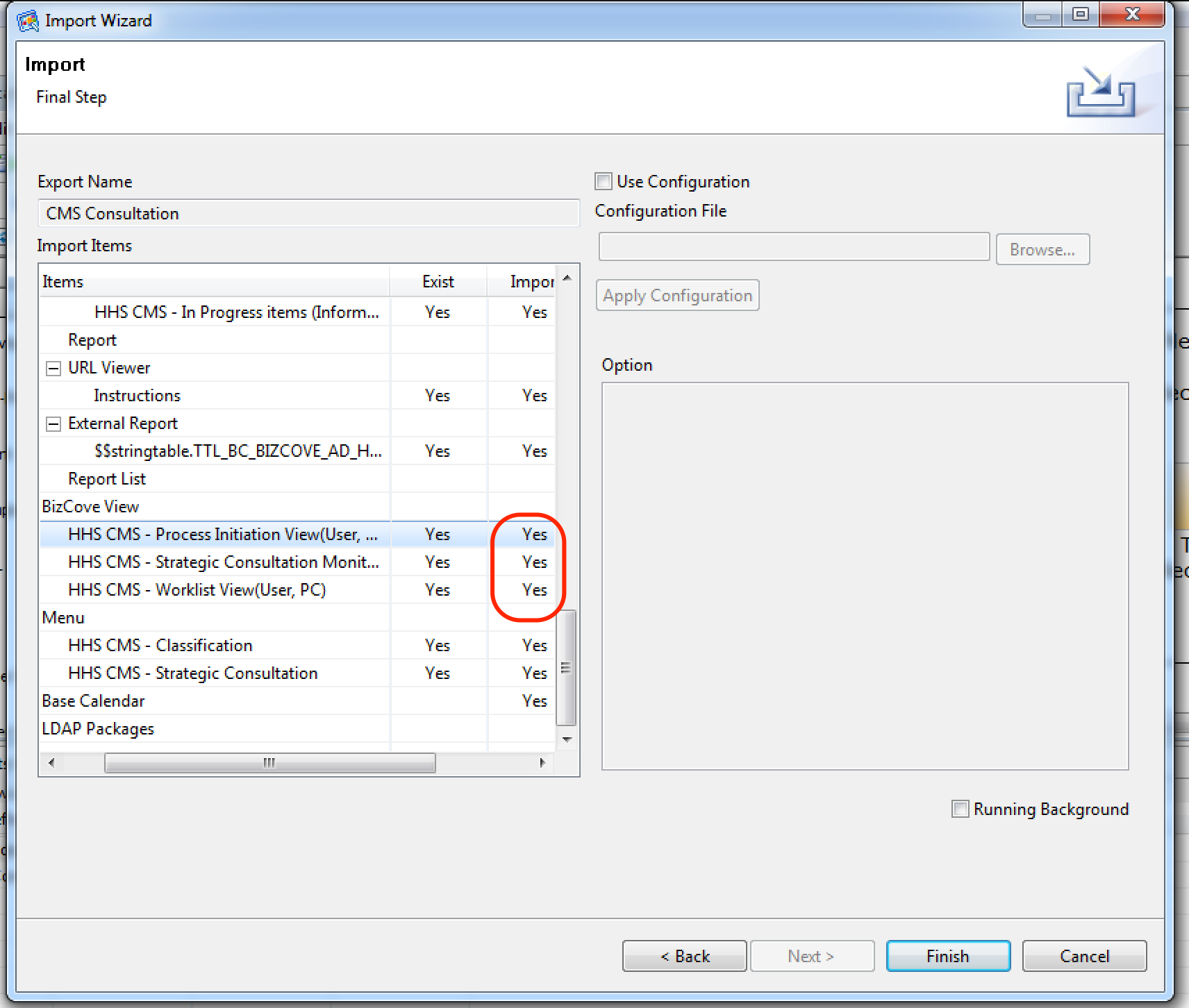
1. Step 11 – Set the value in “Import” column to “Yes” under “/Operational Environment/Component Library/Custom Attribute Template/Base Template”.



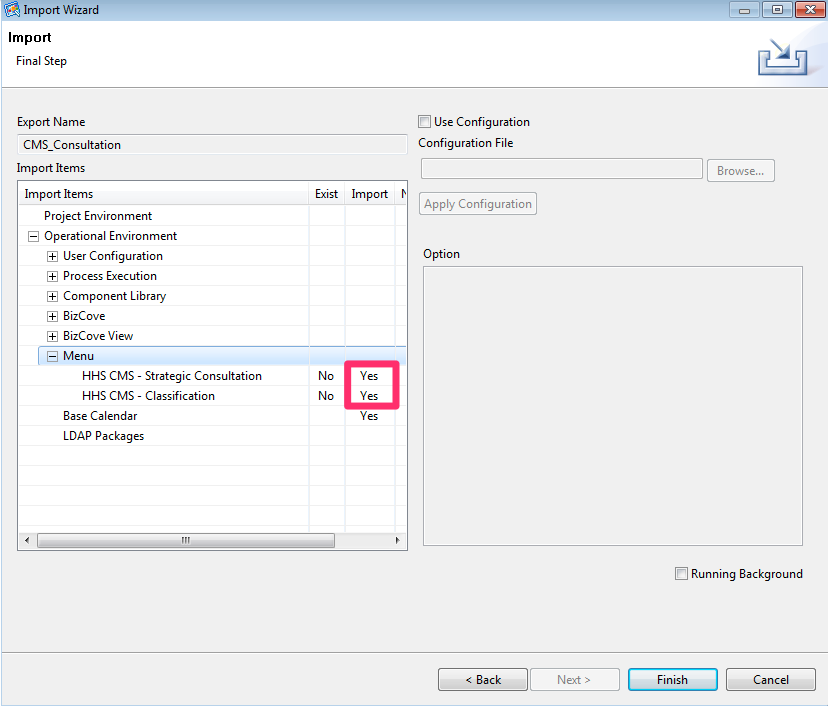
1. Step 12 - BizCove
2. All BizCoves except “External Report” under “/Operational Environment/BizCove” should be set to “Yes” in Import column.
3. A BizCove under “/Operational Environment/BizCove/External Report” should be set to “Yes” in Import column.



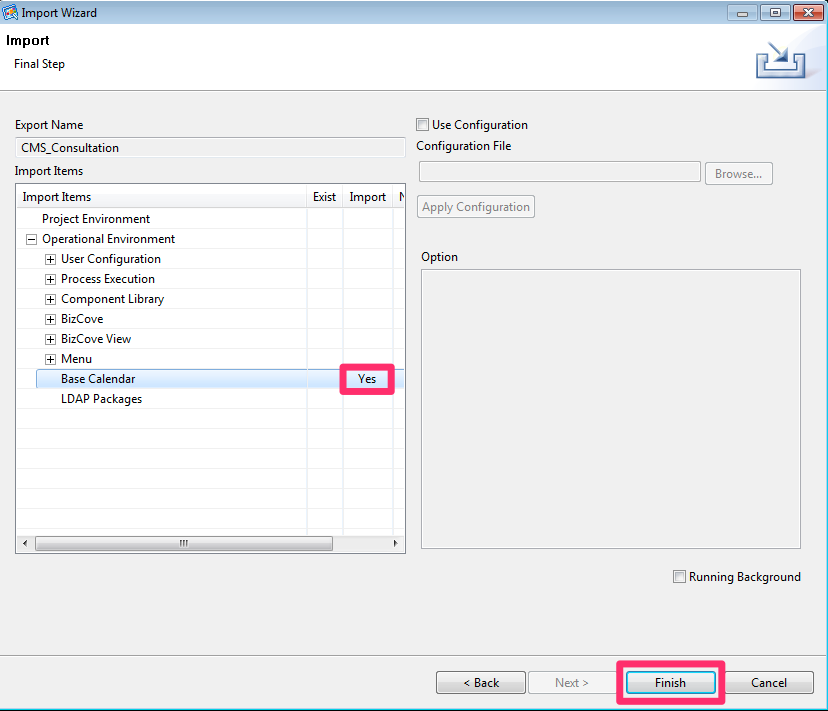
1. Step 13 - All BizCove View under “/Operational Environment/BizCove View” should have “Yes” in Import column.



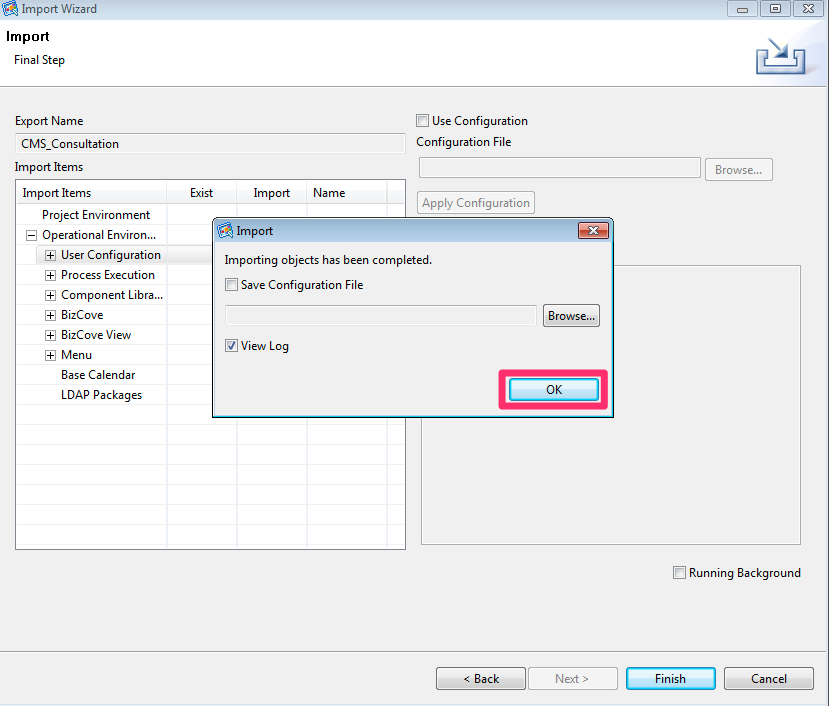
1. Step 14 - All Menu under “/Operational Environment/Menu” should have “Yes” in Import column.



1. Step 15 - Base Calendar under “/Operational Environment/Base Calendar” should have “Yes” in Import column and then click “Finish” button.



1. Step 16 - Click “OK” button and check log files.



1. Repeat Step 1 through Step 16 per each environments.

## Report Deployment

It is assumed that BizFlow Advanced Reporting (BAR) is installed on the server. In order to deploy report files to the reporting server, we need to install BAR Deployment Tool. Normally, BAR Deployment Tool is installed as part of the BAR server component on the server machine, especially Windows based server environments. However, the BAR for Linux has known issues at the moment. As a workaround, BAR Deployment Tool needs to be installed on a Windows machine that has network connection to the BAR server machine, and the user will execute the deployment tool in the Windows machine’s command line.

1. On the designated Windows machine, copy the BAR installation file (BizFlow\_Advanced\_Reporting\_12.4.zip) and extract it in a temporary directory.
2. From the extracted directory, copy **BizFlowReporting** directory and its contents to a designated directory which the user has full access to.

For example:

C:\Users\john.doe\BAR\BizFlowReporting\

1. Open js.jdbc.properties file in a text editor, and update the following database connection information entries to point to the target environment’s BAR database.

For example:

C:\Users\john.doe\BAR\BizFlowReporting\buildomatic\build\_conf\default\js.jdbc.properties

Make sure the properties are set as the following, with the appropriate values for the highlighted portion per each target environment.

**WARNING**: Before running any import or export command, make sure the connection information in the file is correct for the target environment. Failing to verifying the correct database connection information may result in overwriting report definition and dependent report constructe. Such failure may cause error or put the report structure in inconsistent state.

**metadata.hibernate.dialect**=com.jaspersoft.ji.hibernate.dialect.OracleJICustomDialect

**metadata.jdbc.driverClassName**=oracle.jdbc.driver.OracleDriver

**metadata.jdbc.url**=jdbc:oracle:thin:@dbhost:1521:sid

**metadata.jdbc.username**=bizflowreport

**metadata.jdbc.password**=*password\_of\_bizflowreport\_db\_login*

**propsToEncrypt**=metadata.jdbc.password

**encrypt**=false

The database connection information (DB server name, port number, and SID/Service Name, password) of BIZFLOWREPORT schema for each environment should be acquired from DBA team.

1. Open a command line, and change directory to the BAR build directory (buildomatic).

For example:

cd C:\Users\john.doe\BAR\BizFlowReporting\buildomatic

1. For the first time report import, export the current report data source information as a backup. You will need to use this each time report is imported. Create the data source export for each of the target environment.

For each environment, make JDBC connection info for the target database in the js.jdbc.properties file, and run the export command. Repeat the setting JDBC information and export command for each target environment.

js-export.bat --output-zip hhscmsreport\_datasource\_dev.zip --uris /organizations/organization\_1/datasources/BizFlow\_Data\_Source

js-export.bat --output-zip hhscmsreport\_datasource\_qa.zip --uris /organizations/organization\_1/datasources/BizFlow\_Data\_Source

js-export.bat --output-zip hhscmsreport\_datasource\_prd.zip --uris /organizations/organization\_1/datasources/BizFlow\_Data\_Source

Once the data source back up is created, we can re-use this in the future and do not need to back up data source each time unless there is data source connection information change

1. Copy report export file in the buildomatic directory.

For example:

copy *hhscmsreport.zip* C:\Users\john.doe\BAR\BizFlowReporting\buildomatic\

1. In the buildomatic directory, execute import command to import the report to BAR server for the target environment.

For example:

js-import --update --skip-user-update --input-zip *hhscmsreport.zip*

**Note**: The report export zip file contains the data source information of the database for the report development environment from which the export file is generated. By importing the export zip file, the database connection information of the target BAR server is overwritten. Therefore, we will need to restore the data source information of the target environment using the backup file in the next step.

1. In the buildomatic directory, execute import command to import the data source backup file so that the correct data source connection information is restored for the target environment.

For example:

js-import --update --skip-user-update --input-zip *hhscmsreport\_datasource\_dev.zip*

## Java Module Build

### CMS PDF Module

CMS PDF module is used to generate PDF document attachment in BizFlow work item handler. It is built using Java. Apache ANT build script is used to generate the JAR file. The module requires dependent library files and configuration files. It will be deployed to WebMaker server directory.

#### Pre-requisite:

* JDK 1.7
* Apache Ant 1.9.x or later

#### Build Steps

1. Open command line interface, and change directory to the cmspdf module directory.

cd java/cmspdf

1. Using a text editor, modify cmspdf.properties file in the cmspdf directory for the JDK location in the build machine.

**jdk.home.1.7**=*<full\_path\_to\_jdk\_1.7\_home>*

1. Run ANT script.

ant -f cmspdf.xml

1. Capture the generated jar file.

out/artifacts/lib/cmspdf.jar

1. Deploy the jar file onto the target tomcat location.

*<tomcat\_dir>*/webapps/bizflowwebmaker/WEB-INT/lib/

#### Static Files for the Initial Deployment

The following instructions are to deploy the dependent library files and configuration files for the cmspdf module. They should be copied onto the target tomcat location along with the freshly built cmspdf.jar file.

Normally, the library files and configuration files will only need to be deployed once per environment. Any subsequent code change to the module will require the rebuild and redeploy of the cmspdf.jar file only under normal circumstances. If there is library change or configuration change, you need to refresh the changed files using the following steps.

1. Create PDF\_Configuration directory onto the target tomcat location.

mkdir <tomcat\_dir>/webapps/bizflowwebmaker/WEB-INF/PDF\_Configuration/

1. Copy the generated configuration files to the target location.

* From (source repository):

out/artifacts/conf/\*

* To (target environment):

*<tomcat\_dir>*/webapps/bizflowwebmaker/WEB-INF/PDF\_Configuration/

1. Copy the generated configuration files to the target location.

* From (source repository):

out/artifacts/conf/HWSessionFactory.properties

out/artifacts/conf/log4j.properties

* To (target environment):

<tomcat\_dir>/webapps/bizflowwebmaker/WEB-INF/classes/

1. Copy the library files to the target location.

* From (source repository):

lib/activation-1.1.jar

lib/bcmail-jdk15on-1.54.jar

lib/bcpkix-jdk15on-1.54.jar

lib/bcprov-jdk15on-1.54.jar

lib/commons-collections-3.2.1-LICENSE.txt

lib/commons-collections-3.2.1.jar

lib/commons-logging-1.2.jar

lib/fontbox-2.0.4.jar

lib/hsfrmwk.jar

lib/hwjo.jar

lib/hwjsp.jar

lib/mail-1.4.jar

lib/pdfbox-2.0.4.jar

lib/pdfbox-app-2.0.4-sources.jar

lib/pdfbox-app-2.0.4.jar

lib/pdfbox-debugger-2.0.4.jar

lib/pdfbox-tools-2.0.4.jar

lib/rijndael-api.jar

* To (target environment):

<tomcat\_dir>/webapps/bizflowwebmaker/WEB-INF/lib/

## UI Module Packaging

UI modules are captured from DEV environment's web application directory, using ANT build file.

The ANT build file will package the UI modules in a zip file. Especially for WebMaker runtime files, the script will capture configuration files separately per environment, which will be deployed to the target environment appropriately by the deployment script later on. The script also appends timestamp to the JavaScript and CSS file references in the web application files so that the web browser cache is forced to be refreshed at the first time loading after the new deployment.

### Pre-requisite on DEV Server

* JDK/JRE 1.7
* Apache Ant 1.9.x or later
* Administrator (or sudo) access to DEV server machine
* UI modules are deployed and tested in DEV server, and ready for promotion to higher environments (e.g. QA and PROD)
  + WebMaker form runtime files
  + cmspdf files
  + BizFlow solution files

### Packaging Steps

1. Login to DEV server machine with an administrator (or sudo) account.
2. In the command line prompt, create a work directory where files will be generated, and change directory to it.

For example:

mkdir -p work/deploy

cd work/deploy

1. Copy UI packaging script to the deployment directory.

* From (source repository):

deploy/build.xml

* To (target environment):

*<DEV\_server\_dir>*/work/deploy/

1. Using a text editor, modify the following property value in the build.xml file for tomcat web application directory setting. Specify the full path to the tomcat directory.

<property name="**webserver.dir**" value="*full\_path\_to\_tomcat\_directory*" />

1. In the command line prompt, run ANT. The following will execute the default target, which will generate a zip file.

ant

1. Capture the generated zip file. The packaging script will create the intermediate directories and generate the UI runtime zip file with timestamp suffix.

For example:

*<DEV\_server\_dir>*/work/deploy/deployment/ui/runtime\_*20180201\_132525*.zip

## Web Application (UI Module) Deployment

UI modules are deployed to the higher environments (e.g. QA, PROD) using shell scripts.

The deployment script will stop tomcat service, copy runtime files to tomcat web application directory, and start tomcat service.

1. Login to higher environment server machine with an administrator (or sudo) account.
2. In the command line prompt, create a work directory where the deployment package file will be placed, and change directory to it.

For example:

mkdir -p work/deploy/baseline/ui

cd work/deploy

1. Copy UI deployment script to the deployment directory.

* From (source repository):

deploy/deploy\_ui\_qa.sh

* To (target environment):

<DEV\_server\_dir>/work/deploy/

1. Using a text editor, modify the following property value in the deploy\_ui\_*qa*.sh file for tomcat web application directory setting. Specify the full path to the tomcat directory.

**DIR\_DEPLOY**=*<full\_path\_to\_deploy\_baseline\_directory\_above>*

**DIR\_TOMCAT**=*<full\_path\_to\_tomcat\_directory>*

1. In the command line prompt, make the UI deployment script mode executable.

For example:

chomod 744 deploy\_ui\_qa.sh

1. Copy UI deployment package file to the UI deployment directory.

For example:

* From (source repository):

runtime\_20180201\_132525.zip

* To (target environment):

*<DEV\_server\_dir>*/work/deploy/baseline/ui

1. In the command line prompt, extract the UI runtime zip file. If there is previous extract of runtime files, remove it before fresh extract.

For example:

cd baseline/ui

rm -rf runtime

unzip runtime\_*20180201\_132525*.zip

1. In the command line prompt, change directory back to the deployment directory, and run the deployment script.

For example:

cd <DEV\_server\_dir>/work/deploy

./deploy\_ui\_qa.sh -nodebug

Note: The deployment script has "-nodebug" option for real deployment action. If you run the script without the option, it will try to test directory setting without actually deploying any file. This is a precautionary measure to prevent accidental overwriting of the target application files. In order to run the deployment script in "DEBUG" mode, i.e. without "-nodebug" option, a dummy script should be placed in the deployment directory. Make sure the dummy script mode is executable.

For example:

* From (source repository):

deploy/script1.sh

* To (target environment):

*<DEV\_server\_dir>*/work/deploy/

cd <DEV\_server\_dir>/work/deploy

chomod 744 script1.sh

./deploy\_ui\_qa.sh

## Configuration

After deploying web application runtime files, we need to make changes to the configuration.

### BizFlow Server Configuration files.

#### server.ini Configuration

1. Log in to the machine where BizFlow Server is installed.
2. Open <BIZFLOW\_SERVER\_DIRECTORY>/bin/server.ini file in a text editor.
3. Find and set the following entry.

[DeadlineMailSender=DoNotReply@hhs.gov](mailto:DeadlineMailSender=DoNotReply@hhs.gov)

**FROM\_EMAIL**=DoNotReply@hhs.gov

1. This change requires BizFlow Server service restart. Restart the services after all the other configuration steps are completed.

#### hwserver.ini Configuration

1. Log in to the machine where BizFlow Server is installed.
2. Open <BIZFLOW\_SERVER\_DIRECTORY>/hwserver/system/hwsystem.ini file in a text editor.
3. Find and set the following entry under PROCESSDESIGNER section (If the property does not exist, create one under the section).

[PROCESSDESIGNER]

**…**

**WITEM\_EMAIL\_SENDER**=DoNotReply@hhs.gov

1. This change requires BizFlow Server service restart. Restart the services after all the other configuration steps are completed.

### Web Server Configuration files.

#### JNDI Configuration

1. Continue to use the system administrator login to the server machine that hosts the web server.
2. Launch a text editor (e.g., notepad) as an administrator, open the Tomcat context configuration file.

For example:

D:\Program Files\Apache Software Foundation\Tomcat7\conf\context.xml

1. Near the end of the context.xml file, enter the following content for JNDI configuration.

===============================================================================

<Context>

<!-- There may be some existing content. Make sure you enter the following within the "Context" element. -->

<Resource

name="jdbc/workflowdb"

auth="Container"

type="javax.sql.DataSource"

initialSize="2"

maxActive="200"

maxIdle="30"

maxWait="10000"

driverClassName="oracle.jdbc.OracleDriver"

**url**="jdbc:oracle:thin:@example.server.com:1521:orcl"

**username**="bizflow"

**password**="bizflow\_database\_password"

validationQuery="select 1 from dual"

defaultTransactionIsolation="READ\_COMMITTED"

defaultAutoCommit="true"

/>

</Context>

The only attribute values need updates are the highlighted ones above.

* **url**: The value should be the standard JDBC connection URL to the database server, which holds the BizFlow core database as well as the HHS CMS BizFlow HR database.
* **username**: The value should be the database username used as part of BizFlow Server installation, i.e., the schema name for BizFlow core database. It is assumed “bizflow” is the database username used. If not, specify the correct username.
* **password**: The value should be the database password for the username assigned.

1. In the same editor, open each of the morphyc.xml file under webmaker runtime directory, and modify the web server URL to point to the correct one for each environment.

For example:

D:\Program Files\Apache Software Foundation\Tomcat7\webapps\bizflowwebmaker\StratConMain\doc\morphyc.xml

==============================================================================

<?xml version="1.0" encoding="UTF-8"?>

<morphyc xmlns="http://www.hyfinity.com/xfactory">

<blueprints>

<project desc="" location="CMS/mvc/" name="mvc-StratConMain" user="CMS" />

</blueprints>

<xfact:xplatform xmlns:xfact="http://www.hyfinity.com/xfactory" xmlns:ns1="http://www.hyfinity.com/xfactory" mode="static">

<platform\_cleanup enabled="false" run\_interval="">

<engine\_cleardown min\_idle\_time="" />

</platform\_cleanup>

...

<xfact:agent\_configuration>

<xfact:agent agent\_id="mvc-StratConMain-HWActivityService\_Proxy-HWActivity" http\_hdr="false" instance="http://dev.bizflow.hhs.gov/bizflow/webservice/HWActivity.hws" protocol="http" type="soap\_service" />

<xfact:agent agent\_id="mvc-StratConMain-HWApplicationsService\_Proxy-HWApplications" http\_hdr="false" instance="http://dev.bizflow.hhs.gov/bizflow/webservice/HWApplications.hws" protocol="http" type="soap\_service" />

<xfact:agent agent\_id="mvc-StratConMain-HWProcessService\_Proxy-HWProcess" http\_hdr="false" instance="http://dev.bizflow.hhs.gov/bizflow/webservice/HWProcess.hws" protocol="http" type="soap\_service" />

<xfact:agent agent\_id="mvc-StratConMain-HWProcessDefinitionService\_Proxy-HWProcessDefinition" http\_hdr="false" instance="http://dev.bizflow.hhs.gov/bizflow/webservice/HWProcessDefinition.hws" protocol="http" type="soap\_service" />

<xfact:agent agent\_id="mvc-StratConMain-HWSessionService\_Proxy-HWSession" http\_hdr="false" instance="http://dev.bizflow.hhs.gov/bizflow/webservice/HWSession.hws" protocol="http" type="soap\_service" />

<xfact:agent agent\_id="mvc-StratConMain-HWUserService\_Proxy-HWUser" http\_hdr="false" instance="http://dev.bizflow.hhs.gov/bizflow/webservice/HWUser.hws" protocol="http" type="soap\_service" />

<xfact:agent agent\_id="mvc-StratConMain-HWWorkitemService\_Proxy-HWWorkitem" http\_hdr="false" instance="http://dev.bizflow.hhs.gov/bizflow/webservice/HWWorkitem.hws" protocol="http" type="soap\_service" />

<xfact:agent agent\_id="mvc-StratConMain-HWWorkitemDataService\_Proxy-HWWorkitemData" http\_hdr="false" instance="http://dev.bizflow.hhs.gov/bizflow/webservice/HWWorkitemData.hws" protocol="http" type="soap\_service" />

<xfact:agent agent\_id="mvc-StratConMain-workflowdb-Database" driver="" instance="jdbc/workflowdb" isolation\_level="TRANSACTION\_READ\_COMMITTED" protocol="jndi" pwd="" type="rdbms" uid="" />

</xfact:agent\_configuration>

</xfact:xplatform>

</morphyc>

You only need to modify the beginning portion of the URL to BizFlow Web Service per environment.

For example, for DEV environment, it may be *dev.bizflow.hhs.gov*.

For QA/TEST environment, it may be *qa.bizflow.hhs.gov*.

For PROD environment, it may be *prod.bizflow.hhs.gov*.

Also, if SSL is enabled for the web server, the protocol portion of the URL would be “http**s**://” instead of “http://”. For example, https://*dev.bizflow.hhs.gov* for development environment.

1. Restart Tomcat service to reload the changed configuration files.

#### WebMaker Server Configuration

HHS CMS client stakeholders requested to set the web session timeout to 10 minutes. In order to comply, you need to set the timeout to WebMaker web application.

1. Continue to use the system administrator login to the server machine that hosts the web server.
2. Continue to use the editor as administrator to open the WebMaker web application deployment descriptor, i.e. web.xml file and edit.

For example:

D:\Program Files\Apache Software Foundation\Tomcat7\webapps\bizflowwebmaker\WEB-INF\web.xml

1. Set the session timeout value to 10 (unit in minutes).

<session-config>

<session-timeout>10</session-timeout>

</session-config>

1. Restart Tomcat service to reload the changed configuration files.

#### BizFlow Advanced Reporting (BAR) Configuration

Linux JVM may not be configured to use AWT headless mode. JasperReports Server doesn’t provide a virtual X frame buffer on Linux, which will cause error regarding JRStyledTextParser when running report. In order to prevent the error, make the following configuration change.

1. Log in to the machine where web server (i.e. Tomcat) that hosts BAR web application is installed.
2. Open Tomcat startup script in text editor.
3. Add the following to JAVA\_OPTS environment variable.

-Djava.awt.headless=true

1. For email notification for scheduled report the email server information must be configured. In the text editor, open the following file.

<tomcat\_dir>/webapps/bizflowadvreport/WEB-INF/js.quartz.properties

1. Specify the email server information.

Note: **username** and **password** may be left blank if email sender authentication is not used. The **from** email address should be set to an appropriate group email for BizFlow Advanced Reporting administrator. **protocol** and **port** may be changed as appropriate if different from the default setting.

report.scheduler.mail.sender.host=*<hostname\_or\_ip\_address>*

report.scheduler.mail.sender.username=*<email\_account\_userid>*

report.scheduler.mail.sender.password=*<email\_account\_password>*

report.scheduler.mail.sender.from=*<baradmin@hhs.gov>*

report.scheduler.mail.sender.protocol=smtp

report.scheduler.mail.sender.port=25

1. Reporting audit may be enabled/disabled using the following steps. In the text editor, open the following file.

<tomcat\_dir>/webapps/bizflowadvreport/WEB-INF/js.config.properties

1. Specify true for the following properties.

# enable or disable auditing monitoring feature

**feature.audit\_monitoring.enabled**=true

# Enable or disable Auditing

**audit.records.enabled**=true

# Enable or disable Monitoring

**monitoring.records.enabled**=true

1. CLOB in reporting is disabled by default. In order to enable CLOB data type, you need to change the following configuration.

File: <tomcat\_dir>/webapps/bizflowadvreport/WEB-INF/ applicationContext-semanticLayer.xml

Bean: jdbcMetaConfiguration

Property: jdbc2JavaTypeMapping

Change: uncomment CLOB entry and set data type

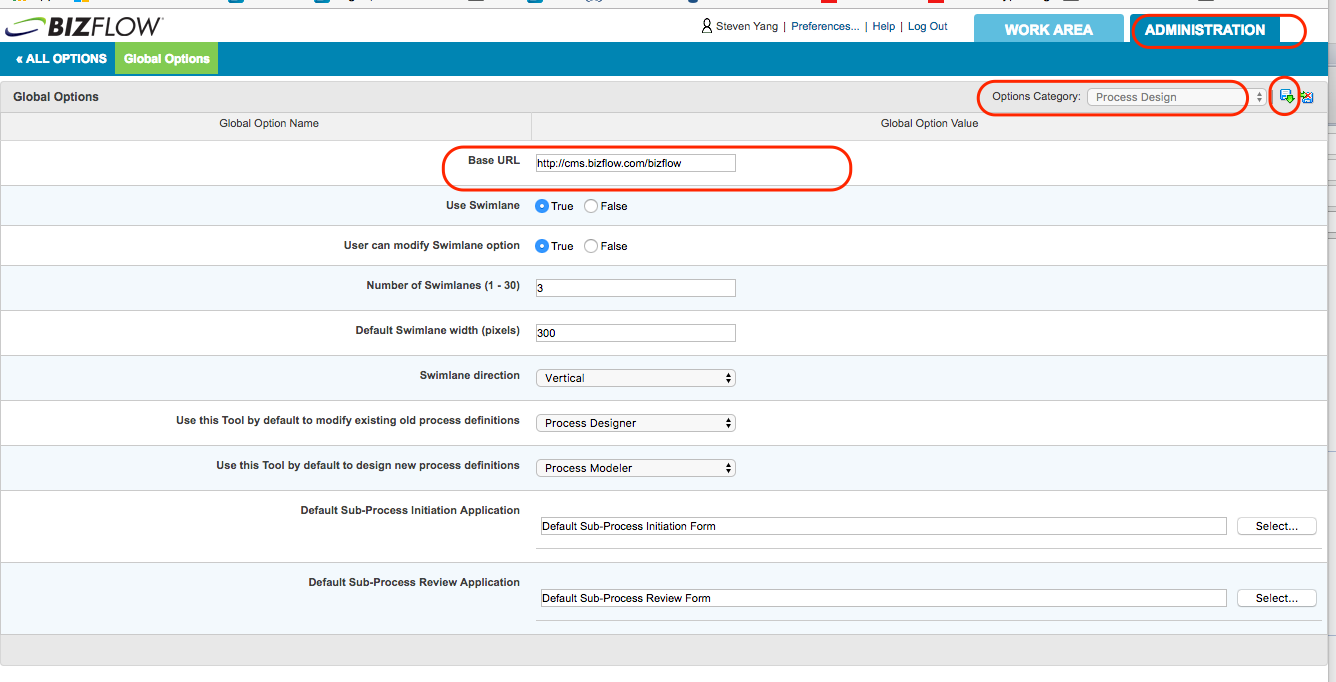
<entry key="**CLOB**" value="**java.lang.String**"/>

### BizFlow Web Portal Configuration

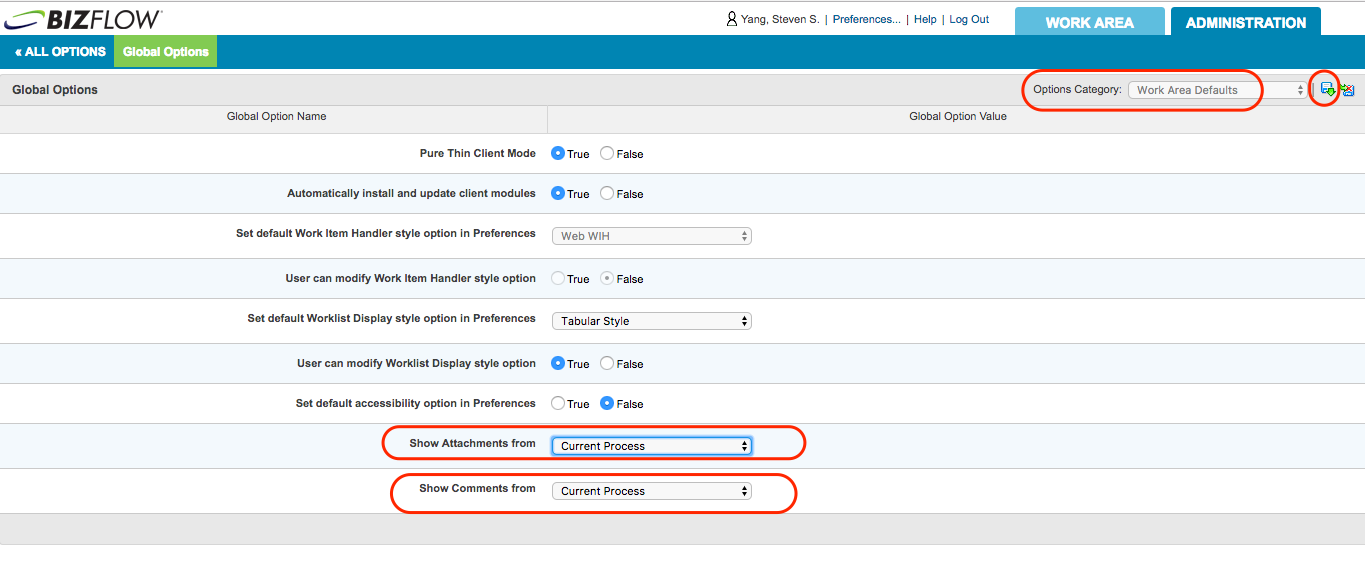
1. Log in to BizFlow Web Portal as a system administrator.
2. Click on ADMINISTRATION tab at the top right corner.
3. Click on Global Options on the configuration page.
4. Select “Process Design” option for Options Category dropdown on the upper right corner.
5. Click disk icon next to the Options Category to check out.
6. Type the URL of the BizFlow Web Portal to the field labled “Base URL”.

For example, “http://dev.bizflow.hhs.gov/bizflow”

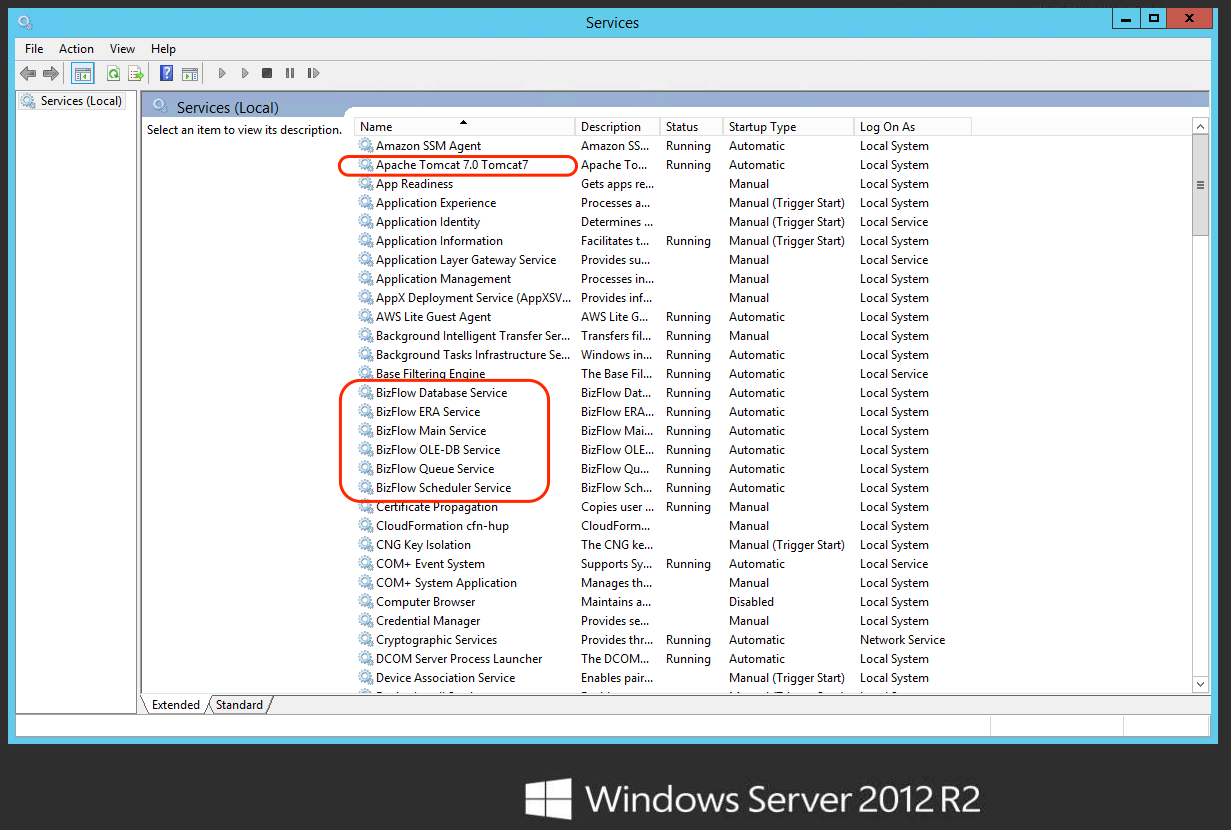
1. Click the disk icon with down arrow to check in the change.



1. Select “Work Area Defaults” option for Options Category dropdown on the upper right corner.
2. Click disk icon next to the Options Category to check out.
3. Set “Current Process” option for Show Attachment dropdown.
4. Set “Current Process” option for Show Comments dropdown.
5. Click the disk icon with down arrow to check in the change.



1. Log out of BizFlow Web Portal
2. Log in to the server machine which hosts BizFlow Server and BizFlow Web Application as a system administrator.
3. Open Services applet.
4. Restart all BizFlow related services and BizFlow Web Server (Tomcat) service.



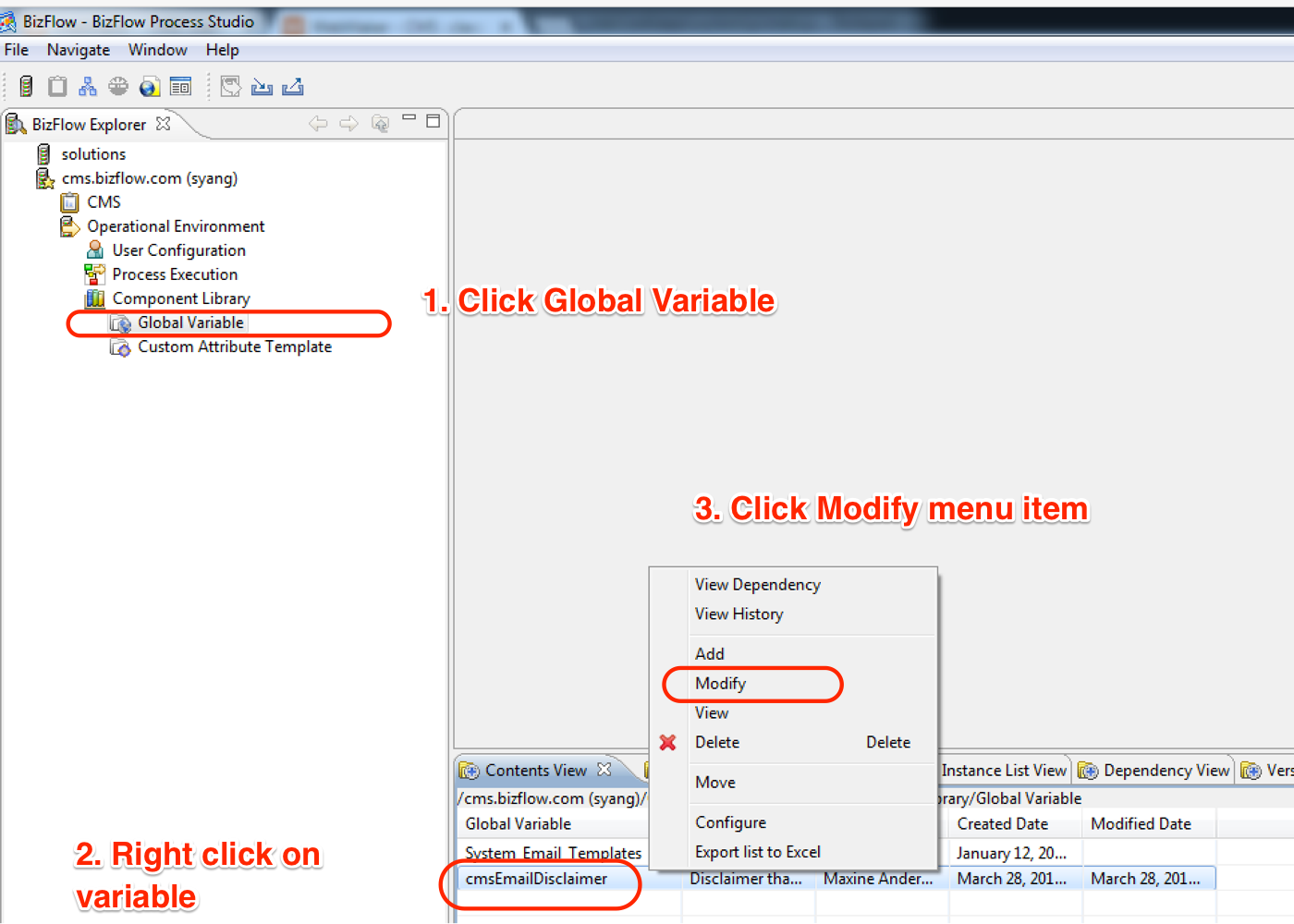
### BizFlow Global Variable Configuration

After the first deployment of BIX file, the Global Variable should be configured for each environment. Any subsequent BIX import will not overwrite the value of the variable. The value must be set manually per environment. Currently, there is only one Global Variable.

* **cmsEmailDisclaimer** - Disclaimer that is displayed in system-generated emails
* **specialProgramEmailAddress** - Email address for the Special Programs group

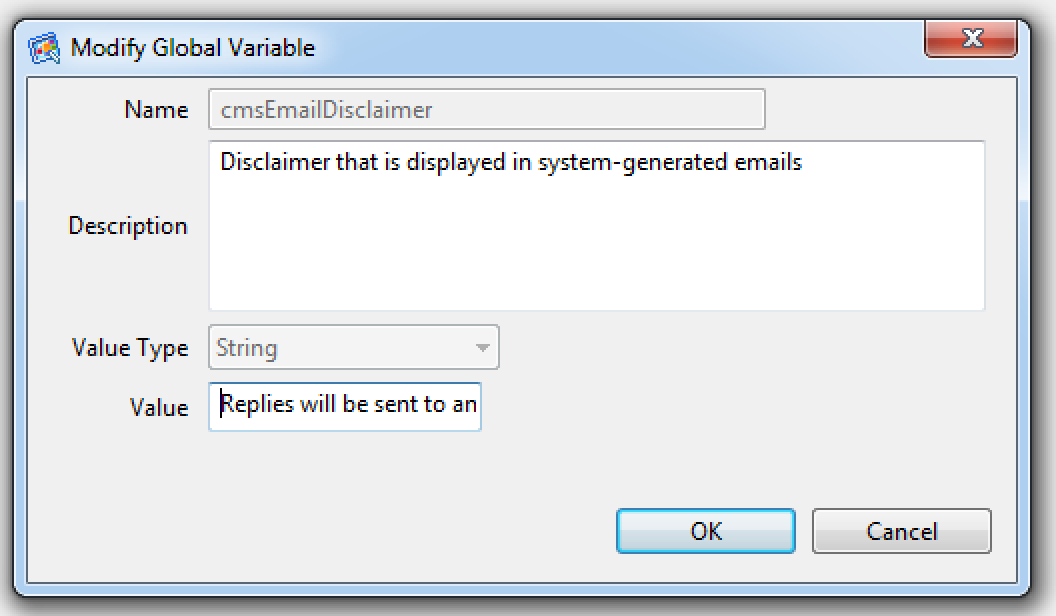
In order to set the value, follow the steps below.

1. Open BizFlow Process Studio (BPS), and log in to the target server.
2. Open Operational Environment > Component Library from BizFlow Explorer pane, and select Global Variable.
3. In Content View, right-click on the variable, then choose Modify menu item.



1. In Modify dialog, set the content of Value field as appropriate.

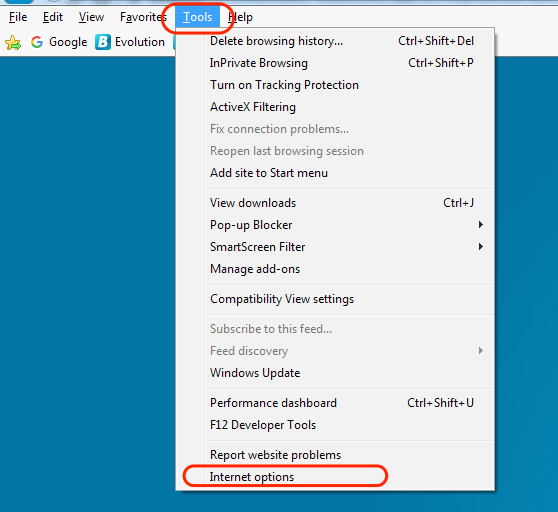
For example: Replies will be sent to an unmonitored mailbox. Please do not respond to this email.



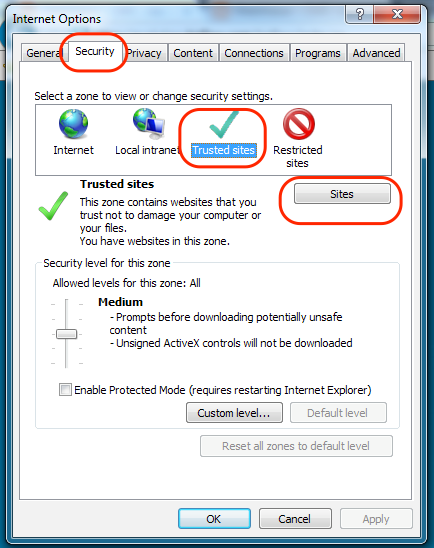
### Internet Explore Configuration

If the user is using MicroSoft Internet Explorer to access BizFlow Web Portal, the following options must be set. The instruction below is for the individual users changing the option of their Internet Explorer. However, it is recommended that the HHS-wide system administrator (for Internet Explorer group policy) controls it centrally.

1. Open Internet Options menu in the Internet Explorer.



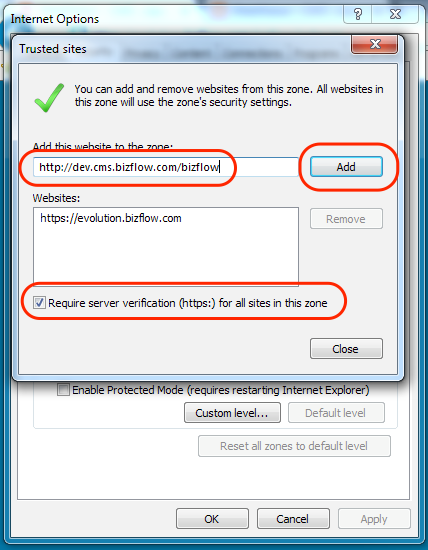
1. Click Security > Trusted Sites, then click Sites button.



1. Set the Trusted Sites listing to include the HHS CMS BizFlow HR site URL.

For example, “http://dev.bizflow.hhs.gov/bizflow”

**Note**: If the site URL to be added is using http, not http**s**, you need to uncheck the “Require server verification (https:) …” checkbox before clicking “Add” button.



1. Close the open dialog boxes by clicking Close button, then OK button.

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