Contingency Contractor Optimization Phase 3, Installation Instructions Contingency Contractor Optimization Tool - Prototype

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Contingency Contractor Optimization Phase 3, Installation Instructions Contingency Contractor Optimization Tool – Prototype – Release 2.2

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RELEASE 2.2 INSTALLATION INSTRUCTIONS

These instructions assume that you are updating an existing installation of the Contingency Contractor Optimization Tool – Prototype (CCOT-P).

Release 2.2 includes minor updates to the database and to the third party libraries, so this update process is slightly different from a normal update.

1) The source code can be found in the */dist/Source* folder.
2) Download the latest SQL Server JDBC driver: *sqljdbc41.jar* (see 6. SQL Server JDBC driver).
3) BEFORE installing release 2.2, you will need to update the database.
   a. Go to the */dist/Applications/CcotDatabaseUpdate* folder.
   b. From the command line, run this command to view the usage instructions:
      java –jar CcotDatabaseUpdater.jar
   c. Type in the command with the specified arguments per the instructions provided.
   d. Perform step 1 first. This will generate the sql query to add a new column to the database.
   e. Next, perform step 2. This will populate the new column.
4) Now you may begin installation of release 2.2 (see New Installation: Configuring the Web Application:).
   a. Stop the server.
   b. Copy all of the .properties files (except hibernate.cfg.xml) from the top level of your current *<CCOT webapp directory>/WEB-INF/classes* folder and paste them into the corresponding release 2.2 folder.
   c. Update *hibernate.cfg.xml* (see step 1a under New Installation: Configuring the Web Application:).
   d. Copy over the updated SQL Server JDBC driver (*sqljdbc41.jar* downloaded in step 2 above) to the *Applications/CCOT/war/WEB-INF/lib* folder.
   e. Update the third party libraries (see step 4 under New Installation: Configuring the Web Application:).
   f. Delete (or back up) your current CCOT webapp directory.
   g. Deploy the WAR file to the server (see Deploying the Web Application:).
   h. Restart the server.

BEFORE YOU BEGIN

Be sure that the following software is already installed on your system before beginning. Download links are provided in case installation is required.

1. Java Runtime Environment (JRE) 1.7 or higher

JRE 1.7 or higher is sufficient for CCOT. However, the Java Development Kit (JDK) installation link is included if preferred.

JRE: https://www.java.com/en/download/manual.jsp

After installing the JRE, add JRE_HOME installation path to the environment variables
1. Identify the JRE installation path.
2. Right-click the **My Computer** icon on your desktop and select **Properties**.
3. Click the **Advanced** tab.
4. Click the **Environment Variables** button.
5. Under **System Variables**, click **New**.
6. Enter the variable name as JRE_HOME.
    - Enter the variable value as the JRE installation path
7. Click **OK.**
8. Click **Apply Changes.**

If you prefer to install the JDK instead:
http://www.oracle.com/technetwork/java/javase/downloads/index.html

After installing the JDK, Add JAVA_HOME installation path to the environment variables
1. Identify the JDK installation path.
2. Right-click the **My Computer** icon on your desktop and select **Properties**.
3. Click the **Advanced** tab.
4. Click the **Environment Variables** button.
5. Under **System Variables**, click **New**.
6. Enter the variable name as JAVA_HOME.
    - Enter the variable value as the JDK installation path
7. Click **OK.**
8. Click **Apply Changes.**

2. A web server which can deploy WAR files and is configured for authentication.

We recommend either Apache Tomcat 7 or 8.

Apache Tomcat is an open source software implementation of the Java Servlet and JavaServer Pages (JSP) technologies. Different versions of Apache Tomcat are available for different versions of the Servlet and JSP specifications. The mapping between the specifications and the respective Apache Tomcat versions is:

Servlet Spec	JSP Spec	EL Spec	WebSocket Spec	Apache Tomcat version	Actual release revision	Support Java Versions
4.0	TBD (2.4?)	TBD (3.1?)	TBD (1.2?)	9.0.x	None	8 and later
3.1	2.3	3.0	1.1	8.0.x	8.0.23	7 and later

(from http://tomcat.apache.org/whichversion.html)

Tomcat 7: http://tomcat.apache.org/download-70.cgi
Tomcat 8: http://tomcat.apache.org/download-80.cgi

See *RUNNING.txt* for set up instructions.

Modify the *conf/tomcat-users.xml* file to add user access to the Tomcat server using basic authentication.

3. Visual C++ redistributable for Visual Studio 2012
http://www.microsoft.com/en-us/download/details.aspx?id=30679

4. Microsoft SQL server 2008 or 2012
https://www.microsoft.com/en-us/sqlserver/default.aspx

5. SQL Server Management Studio, or other database maintenance tool
http://www.microsoft.com/en-us/download/details.aspx?id=7593

6. SQL Server JDBC driver
http://www.microsoft.com/en-us/download/details.aspx?displaylang=en&id=11774

Be sure that you are using *sqljdbc41.jar*. Do not use *sqljdbc.jar* – it will cause issues.

SET UP THE SERVERS

Install the servers for the database, solver, and web application. All may be installed on the same machine, but this can degrade performance. For the best performance, install each server on a different machine. At a minimum, the solver server needs to be on a separate machine from the database and web application servers.

Populating the Database:

1. On the database server, create a database account using SQL Server Authentication (not Windows authentication). This will be the account that the web application uses to connect to the database. You will need the database name, account, and password later for the web application WAR file.
2. Restore the supplied, backed up database.
3. Once the database is restored, add the account that was created in step 1, and add it as a user to the database with read and write access.
4. Add user accounts to the LT_LoginRoles table. Only the account names are needed, not the domain. You can add roles to the user by setting the bit in the Admin/Planner/Analyst columns. After adding at least one user with the Admin role, you may use the Login Role Editor in the CCOT application.

Setting up the Solver:

If you have the old CCOT solver already installed, you will need to delete the folder (Applications/CCOTSolver or OSINativeSolver) before installing the new solver.

1. Download a copy of CPLEX from the IBM website.
    a. IBM website: http://www-01.ibm.com/software/howtobuy/passportadvantage/pao_customers.htm
2. Install CPLEX using the instructions provided with the download, called CPLEX "Quick Start Guide."
    a. You can use the most current version of CPLEX (if downloading from the web), but the SNL installation is currently using CPLEX v12.4.
3. You will want to run the x86-64 executable.
    a. Pre-Installation Steps:
        i. Install CPLEX to the default location.
        ii. Uncheck "Copy the sample." CCOT does not make use of the samples, so it doesn't matter where these are installed.
        iii. Uncheck "Yes, make the association." CCOT only uses the CPLEX Java API, so associating files with CPLEX is unnecessary.
        iv. Uncheck "Yes, update the PATH variable."
    b. Installing:
        i. Click "Install."
    c. Post-Installation Steps:
        i. Uncheck "Readme file" and "CPLEX Optimization Studio IDE."

4. After CPLEX has installed, locate the file paths of the following files. You will need these locations for the CcotSolver installation in step 6.
    a. cplex.jar – This will be located somewhere like "C:\Program Files\IBM\ILOG\CPLEX_Studio124\cplex\lib." You will need to note the entire file path.
    b. cplex<version num>.dll – This will be located somewhere like "C:\Program Files\IBM\ILOG\CPLEX_Studio124\cplex\bin\x64_win64." You will need to note the directory path.
5. On the CCOT distribution CD, copy the solver distribution folder (Applications/CCOTSolver) and libraries to a directory on the solver server. This directory can be anywhere on the solver server, but you probably want it to be external to the CPLEX directory.
    a. This should be a permanent location on the server and is not temporary just for installation purposes.
    b. You can run the solver manually via CcotSolver.bat.
    c. If you want to install it as a service, you will use the installCplexService.bat. Either download the apache-commons-daemon (zip) from the web or, provided for your convenience, copy these files from the CCOT distribution CD.
        i. Apache Commons Daemon: http://commons.apache.org/proper/commons-daemon/download_daemon.cgi
        ii. CCOT CD: ThirdPartyLibraries/commons-daemon-1.0.15-bin-windows.zip
    d. Copy prunmgr.exe and prunsrv.exe (select the version appropriate for your machine) to the CCOTSolver folder (created in step 6a).
6. Open the CcotSolver.bat or installCplexService.bat (if running it as a service) file and check the following values:
    a. If needed, update the -Djava.library.path with the *directory* in which the .dll (step5b) is located.
    b. If needed, update the -cp with the *full file path and filename* of the cplex.jar (step 5a).
    c. Save any changes you make.
7. Take note of the server name and port on which the solver's RMI service is installed. You will need these for the web application WAR file. This port can be modified in the CcotSolver.bat or intallCplexService.bat. The default port has been set to 9874.
8. You may either start up CCOT manually or install it as a Windows service.
    a. To install it as a service, run installCplexService.bat.If needed, run Windows services.msc to set the desired startup behavior (automatic, manual, etc.).
    b. To start manually, run CcotSolver.bat.

New Installation: Configuring the Web Application:

1. The source code can be found in the */dist/Source* folder.
2. In the OCS Web project or the generated Applications/CCOT/war/WEB-INF/classes directory, edit the properties files appropriately for the CCOT deployment.
   a. Set the database server, database name, username, and password in hibernate.cfg.xml.
   b. Modify display.properties (classification banner and popup text).
   c. In solver.properties, set the server name (solver.rmihost) for the server the solver is being hosted on along with the port (solver.rmiport).
   d. In header.properties, set user.header to the field in the http header that contains the authenticated username.
3. Copy over the SQL Server JDBC driver (sqljdbc41.jar) to the Applications/CCOT/war/WEB-INF/lib directory.
4. The third party software listed in APPENDIX A. REQUIRED THIRD-PARTY LIBRARIES is required for CCOT to function. You may download these from the web, or, for your convenience, we have included the versions we use in the 'ThirdPartyLibraries' directory of the CCOT distribution CD.
5. Copy the third-party .jar files (either via downloads or provided in the 'ThirdPartyLibraries' directory) into the Applications/CCOT/war/WEB-INF/lib directory. For your convenience, we have included the copyThirdPartyLibraries.bat file to do this for you.
   a. To copy these libraries to the war directory using the supplied libraries, run copyThirdPartyLibraries.bat <third-party-directory> <war-directory>
      i. <third-party-directory> is the directory the third party libraries are located in (i.e. ThirdPartyLibraries)
      ii. <war-directory> is the path to the war directory (i.e. Applications/CCOT/war)
6. Build the WAR file with the appropriate properties files. The CcotSolver.jar (solver) should either be in the WAR file under WEB-INF/lib or on the web application server's classpath.
   a. To build the war file, zip up everything in the Applications/CCOT/war folder structure. Rename the zip file with a .war extension.
7. Ensure that the web application server's JVM is configured with at least 8 GB memory for CCOT. If using Tomcat, this can be done by opening up Configure Tomcat, navigating to the Java tab, and entering the maximum memory pool.

Deploying the Web Application:

1. Deploy the WAR file to the web application server. For Tomcat, this will most likely be located in C:\Program Files\Apache Software Foundation\Tomcat 7.0\webapps. It is best to stop the service, copy the new WAR file over, then restart the service.
2. If the web application doesn't respond, try restarting the web server.

Update Installation

1. The source code can be found in the */dist/Source* folder.
2. Stop the server.
3. In the OCS Web project or the generated Applications/CCOT/war/WEB-INF/classes directory, edit the properties files appropriately for the CCOT deployment.
   a. Copy all of the .properties files (except hibernate.cfg.xml) from the top level of your current *<CCOT webapp directory>/WEB-INF/classes* folder and paste them into the corresponding release 2.2 folder.
   b. Update hibernate.cfg.xml. Set the database server, database name, username, and password.
4. Copy over the SQL Server JDBC driver (sqljdbc41.jar) to the Applications/CCOT/war/WEB-INF/lib directory.
5. The third party software listed in APPENDIX A. REQUIRED THIRD-PARTY LIBRARIES is required for CCOT to function. You may download these from the web, or, for your convenience, we have included the versions we use in the 'ThirdPartyLibraries' directory of the CCOT distribution CD.
6. Copy the third-party .jar files (either via downloads or provided in the 'ThirdPartyLibraries' directory) into the Applications/CCOT/war/WEB-INF/lib directory. For your convenience, we have included the copyThirdPartyLibraries.bat file to do this for you.
   a. To copy these libraries to the war directory using the supplied libraries, run copyThirdPartyLibraries.bat <third-party-directory> <war-directory>
      i. <third-party-directory> is the directory the third party libraries are located in (i.e. ThirdPartyLibraries)
      ii. <war-directory> is the path to the war directory (i.e. Applications/CCOT/war)
7. Delete (or back up) your current CCOT webapp directory.
8. Build the WAR file with the appropriate properties files. The CcotSolver.jar (solver) should either be in the WAR file under WEB-INF/lib or on the web application server's classpath.
   a. To build the war file, zip up everything in the Applications/CCOT/war folder structure. Rename the zip file with a .war extension.
9. Deploy the WAR file to the server (see Deploying the Web Application:).
10. Restart the server.

Set up the Polling Application (optional):

1. Copy the Applications/CcotPoller distribution folder to a directory on the desired host..Ideally, the polling application will be on a server separate from the web application, solver, and database server since its role is to poll whether all components of CCOT are up and running. Applications/CcotPoller includes the following: poller.properties and CcotPoller.jar.

    a. Modify poller.properties to point at the proper locations for the web application, database, and solver.

    b. If you wish to install it as a service, copy prunmgr.exe and prunsrv.exe (select the version appropriate for your machine) to the CcotPoller folder. See step 5c of Setting up the Solver: for the location of these files.

2. Copy over the SQL Server JDBC driver to the CcotPoller folder created in step 1.

3. You may either start up the web application manually or install it as a Windows service.

    a. To install it as a service, in the folder created in step 1, run "installService.bat <SQL driver>", which will install the solver as a service, where <SQL driver> is the name of the SQL JDBC driver jar name (e.g. sqljdbc41.jar). If needed, run Windows services.msc to set the desired startup behavior (automatic, manual, etc.).

    b. To start manually, in the folder created in step 1, run "CcotPoller.bat <SQL driver>" where <SQL driver> is the name of the SQL JDBC driver jar name (e.g. sqljdbc41.jar).

APPENDIX A. REQUIRED THIRD-PARTY LIBRARIES

CCOT Web Application Required Libraries
antlr-2.7.7.jar
commons-beanutils-1.8.3.jar
commons-collections-3.1.jar
commons-fileupload-1.2.2.jar
commons-logging-1.1.1.jar
dom4j-1.6.1.jar
gwt-servlet.jar
gwt-servlet-deps.jar
gwtupload-1.0.1.jar
hibernate-commons-annotations-4.0.2.Final.jar
hibernate-core-4.2.17.Final.jar
hibernate-jpa-2.0-api-1.0.1.Final.jar
javassist-3.18.1-GA.jar
jboss-logging-3.1.0.GA.jar
jboss-transaction-api_1.1_spec-1.0.1.Final.jar
log4j-1.2.17.jar
poi-3.11-20141221.jar
poi-excelant-3.11-20141221.jar
poi-ooxml-3.11-20141221.jar
poi-ooxml-schemas-3.11-20141221.jar
poi-scratchpad-3.11-20141221.jar
requestfactory-server.jar
slf4j-api-1.7.12.jar
slf4j-log4j12-1.7.12.jar
xmlbeans-2.6.0.jar

CCOTPoller Required Libraries (if installing as service)
prunmgr.exe
prunsrv.exe

CCOTSolver Required Libraries (if installing as service)
prunmgr.exe
prunsrv.exe