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# WebDocWf JDBC-2-JDBC Loader Manual

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## Abstract

Did you ever want to transfer data from one JDBC source to another and do some kind of transformation during copy, like: normalize unnormalized data / create artificial keys / execute SQL statements during / before / after trans-

fer ?

Did you ever want to create a database like the following in one step: create the tables, load initial data, create indexes, create primary keys, create foreign keys ?

If your answer is yes, you need this loader !

## Introduction

The WebDocWf JDBC-2-JDBC Loader copies data from one JDBC source database into another JDBC target database. It can work on different types of database vendors. Possible source/target databases are: MSSQL, MySql, Access, Excel, CSV (using a CSV JDBC driver),...

The loader offers many possibilities: creating databases, creating tables, inserting data into an empty database, inserting data in to an existing database, updating columns with constant values, updating relations, updating columns with system-date/time, updating columns with a current user ID, executing every possible SQL statement, creating artificial keys using the Enhydra DODS objectid logic, ...

The transformation commands are based on a special XML DTD/schema. The number of transformations in one XML loadJob file is not limited.

The loader supports commit counts and restartable jobs using a separate table to store restart information.

Loader output is written to a log file according to a logmode parameter (none, normal or full).

Data columns are written to the target table using several modes: Key (value used to identify the row), Overwrite (value is written to the row no matter which value was there before or what is the new value), Update (value is only written if the current value is NULL), SetIfCreated (value is only written if the row is newly created) and SetNull (value is only written if the new value is NULL).

The loader can be started as a standalone application using them main-method or can be used from within another Java application using the public API.

## Starting the loader

### Starting as application

Using native Java VM commands you can start the loader with the following syntax:

**java org.webdocwf.util.loader.Loader [options] loadJob\_xml\_filename**

"loadJob\_xml\_filename" is the name of the XML file which is based on the Loader DTD/schema and contains all processing instructions.

#### Table Options. Options are:

option	meaning	sample
-m	defines the default logmode. Possible values are "none", "normal" (is the default) and "full". Is "normal" otherwise	-m none
-r	starts the Loader in restart mode after abnormal termination in a prior execution.	-r

option	meaning	sample
-u	defines the current UserID used in UserID value columns.	-u r004d\meier
-v	defines variables used in variable columns.	-v varname1=varval1;varname2=varval2
-l	defines the logfile directory. The default is the current working directory.	-l c:\my_directory_for_logfiles
-f	defines the logfile name. The default is "LoaderLog-YYYY-MM-DD-HH-mm-SS.txt".	-f c:\somewhere\down\..\mydir2\mylog.txt
-d	the filename of the XML DB-vendor configuration file. The default is "LoaderDBVendors.xml".	-d MyVendor.xml
-e	defines to set the default of "onError-Continue" to "true". Is false otherwise.	-e
-p	Extend the classpath with additional paths.	-p c:\webdocwf\webdocwf310\lib\csvjdbc.jar;c:\webdocwf\webdocwf310\lib\JTurbo.jar
-c	Sets the default commit count. System default is "100".	-c 1000

The order of the options is not relevant.

A complete start command example:

```
java -cp c:\webdocwf\webdocwf310\lib\wdw.jar;c:\webdocwf\webdocwf310\lib\webdocwf.jar
org.webdocwf.util.loader.Loader -m none -r -u myID -v myvar1=value1;myvar2=value2;myvar3=value3 -l
c:\mylogs -f loadlogs\mylog.txt -d MyDB.xml -e -p c:\webdocwf\webdocwf310\lib\csvjdbc.jar -c 1000 MyLoad-
Job.xml
```

Another one:

```
load -u myID MyLoadJob.xml
```

WebDocWf contains startup scripts under the "bin" directory to start the loader. Under Windows 2000 simply use the "load" command.

Be sure to include necessary entries in the classpath for extra JDBC drivers which are used in your loader jobs or simply use the -p Parameter !

## Starting from Java

The Loader can be used from every Java application by its public constructor.

```
public Loader(String loadJobFileName, String mode, String userID, String logDirName,
String logFileName, boolean restartIndicator, Map variableValues, String vendorFileName,
boolean onErrorContinue, String additionalPaths, int commitCount)
```

To start the load process simply do the following:

```
Loader myLoader=new Loader("MyLoadJob.xml", Loader.LOGMODE_NONE, "myID", null, null,
false, null, null, true, null, 0);
```

```
myLoader.load();
```

The logmodes are defined as public String constants in the Loader class. Their names are: Loader.LOGMODE\_NONE, Loader.LOGMODE\_NORMAL, Loader.LOGMODE\_FULL.

There is a second public constructor using defaults for all options:

```
public Loader(String loadJobFileName)
```

You can also use the "getxxx" and "setxxx" methods for the additional options as defined in the API documentation.

## Loader jobs

A Loader job is a XML file correspondig to the Loader DTD/schema. The root element is <loaderJob>...</loaderJob>

## The <loaderJob> root element

The root tag of the XML file is <loaderJob>, all other tags are children of this element and there can be just one <loaderJob>. The element <loaderJob> may have several attributes. These attributes are default values for the attributes with the same name in the <importDefinition> and <sql> elements. If those attributes are not specified in an <importDefinition> or <sql> element, the Loader takes the default values from <loaderJob> element.

### Example 1. Example of a <loaderJob> element:

```
<loaderJob logMode="full" objectIDIncrement="5" objectIDTableName="myAdminObjectID"
objectIDColumnName="myNext" onErrorContinue="false" commit="true" userID="r004d\meier"
logDir="c:\mylogs" logFile="myFile.txt" vendorConfig="MyVendorConfig.xml" objectIDAutoCrea
objectIDStartValue="150000" commitCount="1000" oidLogic="false" tableMode="Cache">
...
</loaderJob>
```

**Table 2. <loaderJob> attributes:**

attribute	default for	description	param
logMode	<importDefinition> and <sql>	defines the default log-mode. Possible values are: "normal", "none" and "full". The system default is "normal".	-m
objectIDIncrement	<importDefinition>	Defines the incremental value for global unique objectID's as used by Enhydra DODS. Default is 20.	none
objectIDTableName	<importDefinition>	Defines the table name for global unique objectID's as used by Enhydra DODS. Default is "objectid".	none
objectIDColumnName	<importDefinition>	Defines the column name	none

attribute	default for	description	param
		for global unique objectID's as used by Enhydra DODS. Default is "next".	
onErrorContinue	<sql>	Defines if the load job should continue if an error in a SQL statement occurs. Default is "false"	-e
commit	<sql>	Defines if SQL statement blocks should be committed separately. Default is "false"	none
userID	none	Defines the value for userID columns.	-u
logDir	none	Defines the target directory for the logfile. Default is the current working directory	-l
logFile	none	Defines the logfile name. Default is "LoaderLog-YYYY-MM-DD-HH-mm-ss.txt"	-f
vendorConfig	none	Defines the name of the DB vendor configuration XML file. Default is "LoaderDB-Vendors.xml"	-d
objectIDAutoCreate	<importDefinition>	Defines if the objectID table should be created automatically if not present. Default is "false".	none
objectIDStartValue	<importDefinition>	Defines the start value for objectIDs ONLY if the objectID table is created automatically. Default is "1"	none
commitCount	<importDefinition>	Defines the default commit count. System default is "100"	-c
oidLogic	<importDefinition> <table>	Defines the default if tables use the DODS oid logic. The system default is "true".	none
tableMode	<importDefinition> <table>	Defines the default access method for tables. The system default is "Query".	none

Attributes of the loaderJob element are overridden by the corresponding parameters of the application/constructor !

## Example 2. Subelements

```
<loaderJob ...>
ONE TIME SUBELEMENTS:
```

```
<restartCounter.../>
<variables>
...
</variables>
<jdbcDefaultParameters>
...
</jdbcDefaultParameters>
MULTIPLE SUBELEMENTS IN EVERY ORDER/COMBINATION:
<sql>
...
<sql>
<definitionInclude>
...
</definitionInclude>
<importDefinition>
...
</importDefinition>
</loaderJob>
```

## The <restartCounter> element

This element defines a restart-table for storing restart information. This is an optional element/feature of the Loader. Jobs are only restartable if this element is specified. Additionally importDefinitions must have a defined value sort order to be able to restart.

### Example 3. Example of a restartCounter

```
<loaderJob ...>
  <restartCounter tableName="MyRestart" importDefinitionColumnName="MyName"
    restartCounterColumnName="MyCounter" restartAutoCreate="true" />
  ...
</loaderJob>
```

The default attributes are: "LOADERRESTART" as the tablename, "IMPORTDEFINITION" and "RESTART-COUNTER" as columnnames and "false" for the AutoCreate attribute.

If a loaderJob is started without the "-r" parameter all entries in this table are deleted !

## The <variables> element

This element together with it's subelements defines logical variables to be used in constantColumns, SQL-statements, source-data and JDBC parameters.

### Example 4. Example of variables

```
<loaderJob ...>
  ...
  <variables prefix="!" suffix="!" override="false" replaceInConstants="true" replaceInSQL="true"
    replaceInData="true" replaceInJDBC="true">
    <variable name="myvar1" value="myVall" prefix="$" suffix="$" override="true" replaceInSQL="true"
      replaceInData="false" replaceInJDBC="false"/>
    <variable name="myvar2" prefix="$" suffix="$"/>
  </variables>
</loaderJob>
```

```
        <variable name="myvar3" value="myVal3" />
    </variables>
    ...
</loaderJob>
```

In this example the following will be done:

All occurrences of "\$myvar1\$" will be replaced by "myVal1" or the override value specified in the application/constructor parameters. The replace will take place in SQL statements only.

All occurrences of "\$myvar2\$" will be replaced by the value specified in the application/constructor parameters. The replace will take place in constant columns, source data and JDBC parameters. If there is no value specified in the application/constructor parameters for this variable name an exception will occur. A NULL value for myvar2 can be specified by "-v myvar2=;myvar3=myval3"

All occurrences of "!myvar3!" will be replaced by the value "myVal3" which can NOT be overridden by parameters. Conflicts between variable definitions and parameters lead to a runtime exception ! The replace will take place in constant columns, source data and JDBC parameters.

The system defaults are: prefix="%" suffix="%" override="true" replaceInConstants="false" replaceInSQL="false" replaceInData="false" replaceInJDBC="false"

## The <jdbcDefaultParameters> element

This element together with it's subelements defines the default JDBC parameters for import definitions and SQL statements.

### Example 5. Example of JDBC default parameters

```
<loaderJob ...>
    ...
    <jdbcDefaultParameters>
        <jdbcSourceParameters>
            <jdbcSourceParameter name="JdbcDriver" value="org.myDriver.JDBCdriver" />
            <jdbcSourceParameter name="Connection.Url" value="jdbc:mysql:MySourceDatabase" />
            <jdbcSourceParameter name="User" value="myDBUserName" />
            <jdbcSourceParameter name="Password" value="myDBPassword" />
        </jdbcSourceParameters>
        <jdbcTargetParameters>
            <jdbcTargetParameter name="JdbcDriver" value="org.myDriver2.JDBCdriver2" />
            <jdbcTargetParameter name="Connection.Url" value="jdbc:mysql:MyTargetDatabase" />
            <jdbcTargetParameter name="User" value="myDBUserName2" />
            <jdbcTargetParameter name="debug" value="on" />
        </jdbcTargetParameters>
    </jdbcDefaultParameters>
    ...
</loaderJob>
```

If there is no specified password you will be asked during runtime.

All values can use the variable-replace functionality defined in the variables element.

## The <sql> element

This element together with its subelements executes SQL statements on a target database.

### Example 6. Example of the sql element

```
<loaderJob ...>
  ...
  <sql logMode="none" onErrorContinue="true" commit="true">
    <jdbcTargetParameters>
      <jdbcTargetParameter name="JdbcDriver" value="org.myDriver2.JDBCdriver2"/>
      <jdbcTargetParameter name="Connection.Url" value="jdbc:myDriver2:MyTargetDatabase"/>
      <jdbcTargetParameter name="User" value="myDBUserName2"/>
      <jdbcTargetParameter name="debug" value="off"/>
    </jdbcTargetParameters>
    <sqlStmt>
      CREATE DATABASE Together;
      CREATE TABLE tabl (coll varchar(250));
    </sqlStmt>
  </sql>
  ...
  <sql logMode="full" onErrorContinue="false" commit="false">
    <jdbcTargetParameters>
      <jdbcTargetParameter name="JdbcDriver" value="org.myDriver2.JDBCdriver2"/>
      <jdbcTargetParameter name="Connection.Url" value="jdbc:myDriver2:MyTargetDatabase"/>
      <jdbcTargetParameter name="User" value="myDBUserName2"/>
      <jdbcTargetParameter name="debug" value="off"/>
    </jdbcTargetParameters>
    <sqlStmt>
      <include href="c:\mySQLFile1" parse="text"/>
    </sqlStmt>
  </sql>
  ...
</loaderJob>
```

## The <definitionInclude> element

This element includes another xml file with import definitions.

### Example 7. Example of the definitionInclude element

```
<loaderJob ...>
  ...
  <definitionInclude>
    <include href="c:\MyImportDefinitions1" parse="xml"/>
  </definitionInclude>
  ...
</loaderJob>
```

The included file must have the following structure/content:

### Example 8. Example of an included definition file

```
<definitionInclude>
```



```
<importDefinition...>
...
</importDefinition...>
<importDefinition...>
...
</importDefinition...>
...
</definitionInclude>
```

## The <importDefinition> element

This element imports and transforms data of a source table into a target database.

### Example 9. Example of the importDefinition element

```
<loaderJob ...>
...
<importDefinition name="MyDef1" tableName="MySourceTable1" logMode="full" objectIDIncre
  objectIDColumnName="MyNext" objectIDAutoCreate="true" objectIDStartValue="500" commi
    <sortColumns>
      <sortColumn entry="ColName1"/>
      <sortColumn entry="ColName2"/>
    </sortColumns>
    <jdbcParameters>
      <jdbcSourceParameters>
        <jdbcSourceParameter name="JdbcDriver" value="org.myDriver.JDBCdriver"/>
        <jdbcSourceParameter name="Connection.Url" value="jdbc:myDriver:MySourceDataba
        <jdbcSourceParameter name="User" value="myDBUserName"/>
        <jdbcSourceParameter name="Password" value="myDBPassword"/>
      </jdbcSourceParameters>
      <jdbcTargetParameters>
        <jdbcTargetParameter name="JdbcDriver" value="org.myDriver2.JDBCdriver2"/>
        <jdbcTargetParameter name="Connection.Url" value="jdbc:myDriver2:MyTargetDatab
        <jdbcTargetParameter name="User" value="myDBUserName2"/>
        <jdbcTargetParameter name="debug" value="on"/>
      </jdbcTargetParameters>
    </jdbcParameters>
    <valueColumns>
      <valueColumn sourceColumnName="Col19" targetTableName="TargetTab1" targetTableID=
        targetColumnName"Col17" valueMode="Key"/>
      <valueColumn sourceColumnName="Col20" targetTableName="TargetTab1" targetTableID=
        targetColumnName"Col18" valueMode="Update"/>
      <valueColumn sourceColumnName="Col21" targetTableName="TargetTab1" targetTableID=
        targetColumnName"Col19" valueMode="Overwrite"/>
      <valueColumn sourceColumnName="Col22" targetTableName="TargetTab1" targetTableID=
        targetColumnName"Col20" valueMode="SetIfCreated"/>
      <valueColumn sourceColumnName="Col22" targetTableName="TargetTab1" targetTableID=
        targetColumnName"Col21" valueMode="SetNull"/>
      <valueColumn sourceColumnName="Col31" targetTableName="TargetTab2" targetTableID=
        targetColumnName"Col17" valueMode="Key"/>
      <valueColumn sourceColumnName="Col32" targetTableName="TargetTab3" targetTableID=
        targetColumnName"Col18" valueMode="Key"/>
      <valueColumn sourceColumnName="Col33" targetTableName="TargetTab4" targetTableID=
        targetColumnName"Col19" valueMode="Key"/>
      <valueColumn sourceColumnName="Col34" targetTableName="TargetTab5" targetTableID=
        targetColumnName"Col20" valueMode="Key"/>
      <valueColumn sourceColumnName="Col35" targetTableName="TargetTab5" targetTableID=
        targetColumnName"Col21" valueMode="Key"/>
    </valueColumns>
```

```
<variableColumns>
  <variableColumn name="var1" targetTableName="TargetTab1" targetTableID="0"
    targetColumnName="Col11" valueMode="Key"/>
  <variableColumn name="var2" targetTableName="TargetTab1" targetTableID="0"
    targetColumnName="Col12" valueMode="Update"/>
  <variableColumn name="var3" targetTableName="TargetTab1" targetTableID="0"
    targetColumnName="Col13" valueMode="Overwrite"/>
  <variableColumn name="var4" targetTableName="TargetTab1" targetTableID="0"
    targetColumnName="Col14" valueMode="SetIfCreated"/>
  <variableColumn name="var5" targetTableName="TargetTab1" targetTableID="0"
    targetColumnName="Col15" valueMode="SetNull"/>
  <userIDColumn targetTableName="TargetTab1" targetTableID="0" targetColumnName="Col
    valueMode="Key"/>
  <userIDColumn targetTableName="TargetTab1" targetTableID="0" targetColumnName="Col
    valueMode="Update"/>
  <userIDColumn targetTableName="TargetTab1" targetTableID="0" targetColumnName="Col
    valueMode="Overwrite"/>
  <userIDColumn targetTableName="TargetTab1" targetTableID="0" targetColumnName="Col
    valueMode="SetIfCreated"/>
  <userIDColumn targetTableName="TargetTab1" targetTableID="0" targetColumnName="Col
    valueMode="SetNull"/>
  <timestampColumn targetTableName="TargetTab1" targetTableID="0" targetColumnName="
    valueMode="Key"/>
  <timestampColumn targetTableName="TargetTab1" targetTableID="0" targetColumnName="
    valueMode="Update"/>
  <timestampColumn targetTableName="TargetTab1" targetTableID="0" targetColumnName="
    valueMode="Overwrite"/>
  <timestampColumn targetTableName="TargetTab1" targetTableID="0" targetColumnName="
    valueMode="SetIfCreated"/>
</variableColumns>
<constantColumns>
  <constantColumn constantValue="myVal%var12345%" targetTableName="TargetTab1"
    targetTableID="0" targetColumnName="Col47" valueMode="Key"/>
  <constantColumn constantValue="myVal2" targetTableName="TargetTab1" targetTableID
    targetColumnName="Col48" valueMode="Update"/>
  <constantColumn constantValue="myVal3" targetTableName="TargetTab1" targetTableID
    targetColumnName="Col49" valueMode="Overwrite"/>
  <constantColumn constantValue="myVal4" targetTableName="TargetTab1" targetTableID
    targetColumnName="Col50" valueMode="SetIfCreated"/>
  <constantColumn targetTableName="TargetTab1" targetTableID="0" targetColumnName="C
    valueMode="Overwrite"/>
  <constantColumn targetTableName="TargetTab1" targetTableID="0" targetColumnName="C
    valueMode="SetIfCreated"/>
</constantColumns>
<relationColumns>
  <relationColumn relationSourceTableName="TargetTab2" relationSourceTableID="0"
    relationSourceColumnName="Key21" targetTableName="TargetTab1" targetTableID="0"
    targetColumnName="Col61" valueMode="Key"/>
  <relationColumn relationSourceTableName="TargetTab2" relationSourceTableID="0"
    relationSourceColumnName="Key22" targetTableName="TargetTab1" targetTableID="0"
    targetColumnName="Col62" valueMode="Key"/>
  <relationColumn relationSourceTableName="TargetTab3" relationSourceTableID="0"
    targetTableName="TargetTab1" targetTableID="0"
    targetColumnName="Col63" valueMode="Update"/>
  <relationColumn relationSourceTableName="TargetTab4" relationSourceTableID="0"
    targetTableName="TargetTab1" targetTableID="0"
    targetColumnName="Col64" valueMode="Overwrite"/>
  <relationColumn relationSourceTableName="TargetTab5" relationSourceTableID="0"
    targetTableName="TargetTab1" targetTableID="0"
    targetColumnName="Col65" valueMode="SetIfCreated"/>
  <relationColumn relationSourceTableName="TargetTab5" relationSourceTableID="1"
    targetTableName="TargetTab1" targetTableID="0"
    targetColumnName="Col66" valueMode="SetNull"/>
</relationColumns>
```

```
<tables>
  <table tableName="TargetTab1" tableID="0" insert="true" tableMode="Query" oidLogi
  <table tableName="TargetTab2" tableID="0" insert="false" tableMode="Cache" oidLog
  <table tableName="TargetTab3" tableID="0" insert="false" tableMode="Cache" oidLog
  <table tableName="TargetTab4" tableID="0" insert="false" tableMode="Cache" oidLog
  <table tableName="TargetTab5" tableID="0" insert="false" tableMode="Cache" oidLog
  <table tableName="TargetTab5" tableID="1" insert="false" tableMode="Cache" oidLog
</tables>
</importDefinition>
...
</loaderJob>
```

The "name" attribute of importDefinitions must be unique within one loaderJob in order to make the restart functionality work correctly.

If a constantColumn has no constantValue attribute the value is NULL.

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