

DATA WAREHOUSE TROUBLESHOOTING

## Category: Guide

Description:
Guide explaining common Data Warehouse problems and solutions.

Purpose:

Facilitate consistent and reliable Data Warehouse troubleshooting.



Data Warehouse Troubleshooting

Common Problems and Solutions for Hosted Clients

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# General Caveats and Recommendations

* **IMPORTANT:** Check Box.com to verify that there are no client-specific procedures (for example, resulting from client-specific custom ETL scripts) before taking any actions. The following clients need special attention: AMGEN, ALLSTATE, CNA, GOOGLE, MAGELLAN, WHIRLPOOL and ZURICH.
* **IMPORTANT:** “Google is slightly different than our other clients, as they are on MSSQL, not on Oracle. Their Data warehouse ETL scripts for production are located on the Windows server SQLP002. Since this is located on a Windows box and not Linux, the Linux Data warehouse refresh script cannot be used.” Please see the document titled “Custom DataWarehouse ETL Scripts-Google” (quoted above) for additional details.
* **IMPORTANT:** For releases prior to 3.3, it is important you understand how the WH\_RUN\_PIVOT procedure works. Note at this time only a handful of clients (WPX, ESI, MAGELLAN, and GOOGLE) are using these older versions in production.
* This documentation is primarily written for releases that are current as of late 2014 (3.3 SP3 through 4.0).
* Note that prior to the release of Data Warehouse, some of our clients opted to use our Data Mart offering. This is a separate product and is not discussed here.
* Check Salesforce.com for information about known bugs in current or older releases.
* Consult public documentation for information about specific Data Warehouse releases.
* The errors listed here are primarily derived from error notifications that were generated in the hosted environment in September and October 2014. This is not an exhaustive list of possible failure modes for the Data Warehouse product.
* Many errors can have multiple causes. The solutions documented here may not work in all circumstances.
* If you encounter a novel scenario, the first step in troubleshooting is usually to run the Data Warehouse refresh again manually.

# Client-Driven Scenarios

## Client reports that the Data Warehouse has not been updated recently.

If a client reports that their Data Warehouse has not been updated recently:

### Is this a known issue?

* 1. Check Salesforce to see if there have been any automatic notifications created recently for the data warehouse instance in question.
	2. Check your e-mail for any notifications from warehouse@573126-linuxp025.mitratech-dfw.com or warehouse@462682-linuxp013.mitratech-ord.com that relate to the instance.

### Is the cron job active?

1. If there are **not** any previous alerts on this Data Warehouse instance, then check the cron table to see if the DWH instance has been commented out:
	1. Log in to the Data Warehouse server using SSH with your personal account.
	2. Sudo warehouse:

**sudo -u warehouse -i**

* 1. Print the commented lines in the warehouse cron table:

**crontab –l | grep ‘#’**

Example output:

#0 \*/2 \* \* \* /opt/mitratech/warehouse/TCWH\_WHIRLPOOL\_wPatch6/WH\_refresh.sh refresh > /dev/null 2>&1

#45 1 \* \* \* /opt/mitratech/warehouse/TCWH\_WHIRLPOOL\_wPatch6/WH\_refresh.sh initial > /dev/null 2>&1

#13 \*/3 \* \* \* /opt/mitratech/warehouse/TCWH\_SEVENTYSEVEN/WH\_refresh.sh deploy > /dev/null 2>&1

1. If the instance being complained about is in this list, and there is not an additional comment explaining why, then research why the instance is commented out (e.g. send an email to hostingteam@mitratech.com asking if anyone recently turned it off).
2. If there is not a good reason for the job to be commented out, then edit the cron table and remove the hash/pound symbol (#), to reactivate the job.
* **crontab –e**
* Switch to insert mode.
* Remove the relevant hash symbol.
* Press escape.
* Type :wq (colon, w, q) to write and quit.
1. Once complete, run a manual refresh. Generally speaking:

**/opt/mitratech/warehouse/[TCWH\_ABCD]/WH\_refresh.sh refresh**

Note that [TCWH\_ABCD] is a placeholder; replace that with the actual folder name.

Note: this refresh may fail if there have been design changes since the last refresh.

Note: WH\_refresh.sh refresh is equivalent to running TeamConnect\_Warehouse.sh, using proprietary hosting wrapper script.

1. If the instance being complained of is not in the commented cron jobs list, check to see if the cron job is missing entirely:

**crontab –l**

1. If the job is present in the cron table, investigate whether the job might be failing to start:
	1. Check the WH\_LAST\_REFRESH table for the instance, to see if the client is simply mistaken.

Example:

**SELECT last\_refresh\_date**

**FROM MAESTRO\_DW.WH\_LAST\_REFRESH**

**ORDER BY LAST\_REFRESH\_DATE DESC;**

* 1. If the last refresh date does suggest there is a failure, try running manually to see if you can reproduce the problem, and either resolve or escalate to support depending on the results.
1. If the job is missing entirely from the cron table, then research why the job is missing. If there is no good reason, add the job to the cron table.
* **crontab –e**
* Switch to insert mode.
* Insert the required line (note that format is minutes, hours, days, weeks, months). Example:
* 15 \*/2 \* \* \* /opt/mitratech/warehouse/TCWH\_LINN/WH\_refresh.sh refresh > /dev/null 2>&1
* (This example runs every other hour at 15 minutes past the hour).
* Press escape.
* Type :wq (colon, w, q) to write and quit.

## Client reports that data for a table or field is missing or incorrect.

If a client reports that data is missing in their Data Warehouse, it is important to identify what type of data is missing.

### System field data is missing

System fields are the fields that exist out-of-the-box; for example, matter name, contact name, or invoice number.

1. Identify the affected object (contact, task, invoice, etc.).
2. If data is missing after a certain point, then set the last refresh date in the database to that point.

Example (using invoices):

**UPDATE WH\_LAST\_REFRESH SET last\_refresh\_date = ’01-JAN-2014’ WHERE entity\_code = ‘INVC’;
COMMIT;**
3. If there is no known-good point, then remove the row entirely:

**DELETE FROM WH\_LAST\_REFRESH WHERE entity\_code = ‘INVC’;
COMMIT;**

1. Run an install, followed by an initial load.

**WH\_refresh.sh deploy**

Note: this is equivalent to running WH\_install.sh and then running TeamConnect\_Warehouse\_initial.sh.

### Custom field data is missing

1. Run an install, followed by an initial load.

**WH\_refresh.sh deploy**

1. If this does not resolve the issue, then escalate the issue as a possible defect to support.

# Alert-Driven Scenarios

## ORA-12519 Error

### Scripts Affected

Any.

### Error Signature

ERROR 21-09 12:06:16,691 - org.pentaho.di.trans.steps.databasejoin.DatabaseJoinMeta@571cb4a6 - A database error occurred:
Error occured while trying to connect to the database

Error connecting to database: (using class oracle.jdbc.driver.OracleDriver)
Listener refused the connection with the following error:
ORA-12519, TNS:no appropriate service handler found

### Analysis

This error can occur in any script, but tends to occur in transformations and jobs that generate a lot of database connections. It occurs when multiple ETL processes are running at the same time and the database hits its process limit. The database listener cannot hand off a service process to the ETL process, and instead returns an ORA-12519.

### Remedy

Run the job again manually or wait until next refresh.

For a more permanent solution, reschedule ETL processes in cron table to avoid overlaps.

## ORA-12516 Error

### Scripts Affected

Any.

### Error Signature

ERROR 09-10 12:23:45,846 - Truncate WH\_PHASES - An error occurred, processing will be stopped:
Error occured while trying to connect to the database
Error connecting to database: (using class oracle.jdbc.driver.OracleDriver)
Listener refused the connection with the following error:
ORA-12516, TNS:listener could not find available handler with matching protocol stack

### Analysis

This error can occur in any script, but tends to occur in transformations and jobs that generate a lot of database connections. It occurs when multiple ETL processes are running at the same time and the database hits its process limit. The database listener cannot hand off a service process to the ETL process, and instead returns an ORA-12516.

### Remedy

Run the job again manually or wait until next refresh.

For a more permanent solution, reschedule ETL processes in cron table to avoid overlaps; possibly escalate to a DBA to discuss the process limit on the database; or review script to see if the number of connections created might be excessive.

## ORA-12520 Error

### Scripts Affected

Any.

### Error Signature

ERROR 24-08 18:00:51,363 - Input WH\_ASSIGNEE\_ROLES\_TEMP Oracle - An error occurred, processing will be stopped:
Error occured while trying to connect to the database

Error connecting to database: (using class oracle.jdbc.driver.OracleDriver)
Listener refused the connection with the following error:
ORA-12520, TNS:listener could not find available handler for requested type of server

### Analysis

This error can occur in any script, and is probably intermittent.

### Remedy

Run the job again manually or wait until next refresh.

If the job continues to fail, escalate to the DBA to verify that the database instance is properly registered with the Oracle NET listener.

For a more permanent solution, reschedule ETL processes in cron table to avoid overlaps.

## “Entry to update with following key could not be found.”

### Scripts Affected

Refresh.

### Error Signature

This error will occur while running **WH\_APPR\_PROJ.ktr.**

ERROR 24-09 10:18:43,250 - Update WH\_PROJECT - org.pentaho.di.core.exception.KettleDatabaseException:
Entry to update with following key could not be found: [2601795]

at org.pentaho.di.trans.steps.update.Update.lookupValues(Update.java:121)
at org.pentaho.di.trans.steps.update.Update.processRow(Update.java:315)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)
at java.lang.Thread.run(Thread.java:662)

### Analysis

This error occurs when a new project record is added between the time that the input step on **WH\_PROJECT.ktr** is run, and the time the input step on **WH\_APPR\_PROJ\_OBJ.ktr** is run.

Because the update step cannot find the new record (it was never inserted into the DWH, this error is thrown). This error should go away on a repeated DWH run, although it might occur with a different record (note the project primary key is in brackets).

### Remedy

Run refresh manually or wait until next refresh:

**/opt/mitratech/warehouse/[TCWH\_ABCD]/WH\_refresh.sh refresh**

## LoggingRegistry$1.compare NullPointerException

### Scripts Affected

Any.

### Error Signature

ERROR 20-09 00:37:47,550 - Input ENTITY\_CODE - Error initializing step [Input ENTITY\_CODE]
ERROR 20-09 00:37:47,550 - Input ENTITY\_CODE - java.lang.NullPointerException
at java.util.Date.getMillisOf(Date.java:939)
at java.util.Date.compareTo(Date.java:959)
at org.pentaho.di.core.logging.LoggingRegistry$1.compare(LoggingRegistry.java:108)
at org.pentaho.di.core.logging.LoggingRegistry$1.compare(LoggingRegistry.java:102)
at java.util.Arrays.mergeSort(Arrays.java:1270)
at java.util.Arrays.mergeSort(Arrays.java:1281)
at java.util.Arrays.mergeSort(Arrays.java:1282)
at java.util.Arrays.mergeSort(Arrays.java:1281)
at java.util.Arrays.mergeSort(Arrays.java:1281)
at java.util.Arrays.mergeSort(Arrays.java:1282)
at java.util.Arrays.mergeSort(Arrays.java:1282)
at java.util.Arrays.mergeSort(Arrays.java:1282)
at java.util.Arrays.mergeSort(Arrays.java:1282)
at java.util.Arrays.sort(Arrays.java:1210)
at java.util.Collections.sort(Collections.java:157)
at org.pentaho.di.core.logging.LoggingRegistry.registerLoggingSource(LoggingRegistry.java:102)
at org.pentaho.di.core.logging.LogChannel.<init>(LogChannel.java:42)
at org.pentaho.di.core.database.Database.<init>(Database.java:198)
at org.pentaho.di.trans.steps.tableinput.TableInput.init(TableInput.java:325)
at org.pentaho.di.trans.step.StepInitThread.run(StepInitThread.java:52)
at java.lang.Thread.run(Thread.java:662)

### Analysis

This is a bug in Pentaho 4.2, which we use for TC DWH through 3.4 SP1 U1. See <http://jira.pentaho.com/browse/PDI-8998>

### Remedy

Run the job manually or wait for the next refresh.

For a more permanent fix, edit kitchen.sh and insert an argument for -DKETTLE\_MAX\_LOGGING\_REGISTRY\_SIZE:

* 1. **vim /opt/mitratech/warehouse/[TCWH\_ABCD]/kitchen.sh**
	2. Switch into insert mode.
	3. On the line starting with OPT, add “-DKETTLE\_MAX\_LOGGING\_REGISTRY\_SIZE=10000” (inside the existing double quotes).
	4. Save and quit (:wq).

## “IndexOutOfBoundsException: Index: 8, Size: 8”

### Scripts Affected

Any.

### Error Signature

ERROR 02-04 18:04:46,122 - null - java.lang.IndexOutOfBoundsException: Index: 8, Size: 8
at java.util.ArrayList.RangeCheck(ArrayList.java:547)
at java.util.ArrayList.get(ArrayList.java:322)
at org.pentaho.di.core.logging.LoggingRegistry.registerLoggingSource(LoggingRegistry.java:115)
at org.pentaho.di.core.logging.LogChannel.<init>(LogChannel.java:42)
at org.pentaho.di.core.database.Database.<init>(Database.java:198)
at org.pentaho.di.trans.steps.databaselookup.DatabaseLookup.init(DatabaseLookup.java:619)
at org.pentaho.di.trans.step.StepInitThread.run(StepInitThread.java:52)
at java.lang.Thread.run(Thread.java:662)

### Analysis

This is a bug in Pentaho 4.2.

### Remedy

Run the job manually or wait for the next refresh.

## “NO CONNECTION OR INCOMPATIBLE VERSION”

### Scripts Affected

Any.

### Error Signature

INFO 22-09 16:55:07,543 - NO CONNECTION OR INCOMPATABLE VERSION! - Can't connect to the database or this version of Data Warehouse is incompatable with the source version of TeamConnect.

### Analysis

This error can occur for several reasons. The most obvious reason is that the data warehouse version does not match the version of TeamConnect. Generally, it means that it cannot successfully return any rows from the TC\_VERSION table in the source schema.

### Remedy

Verify that DWH version is correct. Make sure that **kettle.properties** references the correct TeamConnect schema. Make sure TC\_VERSION table exists in the source schema.

You can increased the logging level of a script (e.g. WH\_install.sh) by editing the file and changing the log level parameter from “basic” to “Debug.” You can then take the SQL statement that is echoed in the log and run it against the database to confirm that no rows are returned.

## “IO Error: Socket read timed out”

### Scripts Affected

Any.

### Error Signature

For example, at the beginning of running a refresh job:

ERROR 26-09 07:01:42,072 - Check TC\_VERSION - An error occurred executing this job entry:
Error occured while trying to connect to the database

Error connecting to database: (using class oracle.jdbc.driver.OracleDriver)
IO Error: Socket read timed out.

### Analysis

Connection to the database has been established but has timed out. Error is probably intermittent.

### Remedy

Try running again manually or wait until next refresh. If that does not work, check database connectivity and possibly escalate to DBA / Hosting Manager.

## “IO Error: Connection reset”

### Scripts Affected

Any.

### Error Signature

For example, at the beginning of running a refresh job:

ERROR 06-09 23:11:06,899 - Check TC\_VERSION - An error occurred executing this job entry:
Error occured while trying to connect to the database

Error connecting to database: (using class oracle.jdbc.driver.OracleDriver)
IO Error: Connection reset

### Analysis

Connection to the database has been established but has been reset. Error is probably intermittent.

### Remedy

Try running again manually or wait until next refresh. If that does not work, check database connectivity and possibly escalate to DBA / Hosting Manager.

## “No more data to read from socket”

### Scripts Affected

Any.

### Error Signature

ERROR 25-06 00:15:58,328 - Target\_TeamConnect\_Warehouse - org.pentaho.di.core.exception.KettleDatabaseException:
Error comitting connection
No more data to read from socket

at org.pentaho.di.core.database.Database.commit(Database.java:697)
at org.pentaho.di.core.database.Database.commit(Database.java:667)
at org.pentaho.di.core.database.Database.disconnect(Database.java:558)
at org.pentaho.di.trans.steps.update.Update.dispose(Update.java:562)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:69)
at java.lang.Thread.run(Thread.java:662)
Caused by: java.sql.SQLException: No more data to read from socket
at oracle.jdbc.driver.T4CMAREngine.unmarshalUB1(T4CMAREngine.java:1200)
at oracle.jdbc.driver.T4CMAREngine.unmarshalSB1(T4CMAREngine.java:1155)
at oracle.jdbc.driver.T4CTTIfun.receive(T4CTTIfun.java:279)
at oracle.jdbc.driver.T4CTTIfun.doRPC(T4CTTIfun.java:186)
at oracle.jdbc.driver.T4C7Ocommoncall.doOCOMMIT(T4C7Ocommoncall.java:75)
at oracle.jdbc.driver.T4CConnection.doCommit(T4CConnection.java:558)
at oracle.jdbc.driver.PhysicalConnection.commit(PhysicalConnection.java:3674)
at oracle.jdbc.driver.PhysicalConnection.commit(PhysicalConnection.java:3680)
at org.pentaho.di.core.database.Database.commit(Database.java:687)
... 5 more

### Analysis

Connection to the database has failed. Error is probably intermittent.

### Remedy

Try running the job again manually or wait until the next refresh. If that does not work, check DB connectivity; possibly escalate to DBA / Hosting Manager.

## ORA-28000 Error

### Scripts Affected

Any.

### Error Signature

For example, at the beginning of running a refresh job:

ERROR 20-09 00:07:11,071 - Oracle System Date - A database error occurred, stopping everything:
Error occured while trying to connect to the database

Error connecting to database: (using class oracle.jdbc.driver.OracleDriver)
ORA-28000: the account is locked

### Analysis

One or more of the database accounts referenced in **kettle.properties** and **shared.xml** is locked. Determining the exact account requires a careful review of the script being run; for example, in the refresh script, the error shown above would occur because

### Remedy

Escalate to DBA / Hosting Manager for database account unlock.

## ORA-00904 Error

### Scripts Affected

Initial or Refresh.

### Error Signature

ERROR 25-08 21:07:48,961 - Insert / Update WH\_INVOICE - org.pentaho.di.core.exception.KettleStepException:
Error in step, asking everyone to stop because of:

Error looking up row in database
ORA-00904: "INVOICE\_NONUSTAX\_SUMMARY\_LVL": invalid identifier

at org.pentaho.di.trans.steps.insertupdate.InsertUpdate.processRow(InsertUpdate.java:307)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)
at java.lang.Thread.run(Thread.java:662)
Caused by: org.pentaho.di.core.exception.KettleDatabaseException:
Error looking up row in database
ORA-00904: "INVOICE\_NONUSTAX\_SUMMARY\_LVL": invalid identifier

### Analysis

The most likely cause of an ORA-00904 error is that a custom field has been added to TeamConnect, but the Data Warehouse design has not yet been updated.

### Remedy

Run the install script to update the Data Warehouse design, followed by an initial load to load any existing custom field data. In the hosted environment:
 **WH\_refresh.sh deploy**

If this does not resolve the issue, then escalate to support for further analysis.

## ORA-01430 Error

### Scripts Affected

Install.

### Error Signature

ERROR 16-09 10:19:20,366 - Alter Table Add Column - org.pentaho.di.core.exception.KettleStepException:
Error while running this step!

Couldn't execute SQL: ALTER TABLE WHCC\_HIST\_MANA ADD ( "NARRATIVETYPEHIMN" NUMBER )

ORA-01430: column being added already exists in table

at org.pentaho.di.trans.steps.sql.ExecSQL.processRow(ExecSQL.java:208)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)
at java.lang.Thread.run(Thread.java:662)
Caused by: org.pentaho.di.core.exception.KettleDatabaseException:
Couldn't execute SQL: ALTER TABLE WHCC\_HIST\_MANA ADD ( "NARRATIVETYPEHIMN" NUMBER )

ORA-01430: column being added already exists in table

at org.pentaho.di.core.database.Database.execStatement(Database.java:1650)
at org.pentaho.di.core.database.Database.execStatement(Database.java:1595)
at org.pentaho.di.core.database.Database.execStatements(Database.java:1800)
at org.pentaho.di.trans.steps.sql.ExecSQL.processRow(ExecSQL.java:182)
... 2 more
Caused by: java.sql.SQLException: ORA-01430: column being added already exists in table

### Analysis

An ORA-01430 error occurs because the ETL process is trying to alter a table by adding a column that already exists. This may occur if there are more than one ETL Install process running at the same time for the same instance (which produces a race condition). There is also at least one other possible cause, to wit: the logic that Pentaho uses to check the existence of a column is to run a select query on the column; if the query returns a null result set *or an error*, then it treats the column as not existing; this can lead to false negatives.

### Remedy

Kill any running install processes, and run the install script, followed by an initial load to load any existing custom field data. In the hosted environment:
 **WH\_refresh.sh deploy**

If this does not resolve the issue, then escalate to support for further analysis.

## ORA-01722 Error

### Scripts Affected

Initial or Refresh.

### Error Signature

ERROR 24-09 15:16:52,268 - Table output - org.pentaho.di.core.exception.KettleDatabaseBatchException:
Error updating batch
ORA-01722: invalid number

at org.pentaho.di.core.database.Database.emptyAndCommit(Database.java:1503)
at org.pentaho.di.trans.steps.tableoutput.TableOutput.dispose(TableOutput.java:658)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:79)
at java.lang.Thread.run(Thread.java:662)
Caused by: java.sql.BatchUpdateException: ORA-01722: invalid number

at oracle.jdbc.driver.OraclePreparedStatement.executeBatch(OraclePreparedStatement.java:10296)
at oracle.jdbc.driver.OracleStatementWrapper.executeBatch(OracleStatementWrapper.java:216)
at org.pentaho.di.core.database.Database.emptyAndCommit(Database.java:1486)
... 3 more

### Analysis

An ORA-01722 error indicates that the ETL process is trying to insert a non-numeric value into a number field. This can be caused by the following scenario:

* Client adds a custom field to TeamConnect as a numeric field.
* Data Warehouse is built.
* Client drops the custom field from TeamConnect.
* Client adds a new custom field with the same name.
* Data Warehouse install runs.
* Data Warehouse refresh runs.

The refresh will fail, because the Data Warehouse design still has the field listed as a number (the logic for checking field existence, that runs during the install script, is only checking the name of the field, not the type).

### Remedy

There are several alternative solutions to this :

* Drop the particular column and run the install script followed by an initial load to repopulate the fields. This is disfavored because it is an “out-of-band” solution.
* Drop and rebuild the Data Warehouse. This is disfavored because of the amount of time it takes to recreate a production instance.

**WH\_refresh.sh remove**

**WH\_refresh.sh deploy**

* Have client remove column from TeamConnect again, run the install, then re-add the column and run install again.

This is the preferred option, but requires coordination with the client.

## “Exception while loading class oracle.jdbc.driver.OracleDriver”

### Scripts Affected

Any, but usually manifests on install (because this occurs during deployment).

### Error Signature

ERROR 22-09 17:27:29,882 - Source DB Type - An error occurred executing this step:
Error occured while trying to connect to the database

Exception while loading class
oracle.jdbc.driver.OracleDriver

### Analysis

This error occurs because the Oracle JDBC driver (**ojdbc6.jar**) was not placed in the /libext/JDBC directory prior to attempting to run the install.

### Remedy

Copy the **ojdbc6.jar** JDBC driver from a working instance into the appropriate directory; for example:

**cp /opt/mitratech/warehouse/TCWH\_SMG/libext/JDBC/ojdbc6.jar /opt/Mitratech/warehouse/[TCWH\_ABCD]/libext/JDBC/ojdbc6.jar**

## ORA-01400 Error in Data Warehouse 3.4 SP1

### Scripts Affected

Refresh.

### Error Signature

This may occur while running **WH\_PROJECT.ktr**:

ERROR 22-09 14:55:51,049 - Insert / Update WH\_PROJECTS\_VW 2 - org.pentaho.di.core.exception.KettleStepException:
Error in step, asking everyone to stop because of:

Error inserting/updating row
ORA-01400: cannot insert NULL into ("SALES\_DEMO12\_DW"."WH\_PROJECTS\_VW"."PROJECT\_PRIMARY\_KEY")

at org.pentaho.di.trans.steps.insertupdate.InsertUpdate.processRow(InsertUpdate.java:307)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)
at java.lang.Thread.run(Thread.java:662)
Caused by: org.pentaho.di.core.exception.KettleDatabaseException:
Error inserting/updating row

### Analysis

This error occured in DWH 3.4 SP1 and seems to be because of a misconfigured upsert step.

### Remedy

Upgrade DWH to 3.4 SP1 U1 or later.

## ORA-01861 in Data Warehouse 3.4

### Scripts Affected

Refresh.

### Error Signature

This may occur while running **WH\_USER\_REMOVAL.ktr** or other removal transformations:

ERROR 22-09 12:40:13,667 - WH\_REMOVED\_RECORDS input - org.pentaho.di.core.exception.KettleDatabaseException:
An error occurred executing SQL:
SELECT
ENTITY\_CODE
, APPLICATION\_ID
, PRIMARY\_KEY
, MODIFIED\_ON
, REMOVED\_ON
, ? RUNSTARTTIME
FROM WH\_REMOVED\_RECORDS
WHERE ENTITY\_CODE = 'USER'
AND REMOVED\_ON < ?

ORA-01861: literal does not match format string

at org.pentaho.di.core.database.Database.openQuery(Database.java:1912)
at org.pentaho.di.trans.steps.tableinput.TableInput.doQuery(TableInput.java:225)
at org.pentaho.di.trans.steps.tableinput.TableInput.processRow(TableInput.java:133)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)
at java.lang.Thread.run(Thread.java:662)
Caused by: java.sql.SQLDataException: ORA-01861: literal does not match format string

### Analysis

This error occurs when certain records are removed from TeamConnect. The error occurs because a date variable in some removal transformations is set as a string instead of a date type in Data Warehouse 3.4.

### Remedy

Upgrade Data Warehouse to 3.4 SP1 U1 or later.

**Do** **not** remove records from the WH\_REMOVED\_RECORDS table in the TeamConnect schema; while this will temporarily relieve the problem, it will also cause the Data Warehouse not to be able to remove the records later.

## “No space left on device”

### Scripts Affected

Initial or Refresh.

### Error Signature

There are at least two variants of this error:

* 1. This occurs because of the /tmp partition filling up:

ERROR 20-09 07:26:28,837 - Join LAST\_REFRESH\_DATE 2 - org.pentaho.di.core.exception.KettleFileException:

PROJECT\_NAME String : Unable to write value data to output stream
No space left on device

No space left on device

at org.pentaho.di.core.row.ValueMeta.writeData(ValueMeta.java:2060)
at org.pentaho.di.core.row.RowMeta.writeData(RowMeta.java:468)
at org.pentaho.di.trans.steps.joinrows.JoinRows.cacheInputRow(JoinRows.java:407)
at org.pentaho.di.trans.steps.joinrows.JoinRows.processRow(JoinRows.java:271)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)
at java.lang.Thread.run(Thread.java:662)
Caused by: java.io.IOException: No space left on device
at java.io.FileOutputStream.writeBytes(Native Method)
at java.io.FileOutputStream.write(FileOutputStream.java:282)
at java.io.DataOutputStream.write(DataOutputStream.java:90)
at java.io.FilterOutputStream.write(FilterOutputStream.java:80)
at org.pentaho.di.core.row.ValueMeta.writeString(ValueMeta.java:2123)
at org.pentaho.di.core.row.ValueMeta.writeData(ValueMeta.java:2027)
... 5 more

* 1. This occurs because of the /opt partition (partition where ETL logging is stored) has filled up:

ERROR 12-10 12:26:16,235 - Text file output - Exception trying to close file: java.io.IOException: No space left on device
ERROR 12-10 12:26:16,236 - BUILD\_CHANGE\_LOAD - Errors detected!
INFO  12-10 12:26:16,236 - Text file output - Finished processing (I=0, O=506, R=506, W=506, U=0, E=1)

### Analysis

In some circumstances, the ETL process will cache query results on disk. Generally, it will cache these files in the /tmp directory/partition (or more generally the location specified by the java.io.tmpdir parameter, which defaults to /tmp but can be overriden in the **kitchen.sh** file). If the partition where the temporary directory is mounted fills up, the “No space left on device” error will occur.

The ETL process will also generate a large amount of logging. This can fill up a disk partition, which will result in an exception while trying to close the file.

### Remedy

In all circumstances, it is recommended to check to see which disk partition is actually full before proceeding (**df -h**).

**Scenario 1**: Temporarily modify **kitchen.sh** to point java.io.tmpdir to another location with more space and re-run initial load:

1. **vim /opt/mitratech/warehouse/[TCWH\_ABCD]/kitchen.sh**
2. Switch into insert mode.
3. On the line starting with OPT, add “-DJAVA.IO.TMPDIR=[/path/to/tmpdir]” (inside the existing double quotes).
4. Save and quit (:wq).

**Scenario 2:** Remove old log files and then manually re-run the job.

##  Oracle-00942 Error

### Scripts Affected

Initial or Refresh.

### Error Signature

There are a several different versions of the ORA-00942 error in TeamConnect Data Warehouse.

* 1. This version occurs while performing inserts or updates, for example, in **WH\_CONTACT.ktr**:

ERROR 17-09 06:13:39,258 - Execute SQL script- UPDATE CONTACT REFERENCES 8 - org.pentaho.di.core.exception.KettleStepException:
Error while running this step!

Couldn't execute SQL: UPDATE WH\_INVOLVED\_AINP SET ( CREATED\_BY\_CONTACT\_FIRST\_NAME , CREATED\_BY\_CONTACT\_MIDDLE\_NAME , CREATED\_BY\_CONTACT\_TYPE , CREATED\_BY\_CONTACT\_NAME ) = (SELECT WH\_HELPER\_CONTACT.CONTACT\_FIRST\_NAME , WH\_HELPER\_CONTACT.CONTACT\_MIDDLE\_NAME , WH\_HELPER\_CONTACT.CONTACT\_TYPE , WH\_HELPER\_CONTACT.CONTACT\_NAME FROM WH\_HELPER\_CONTACT WHERE WH\_HELPER\_CONTACT.CONTACT\_PK = WH\_INVOLVED\_AINP.CREATED\_BY\_CONTACT\_PK ) WHERE EXISTS ( SELECT CONTACT\_PK FROM WH\_HELPER\_CONTACT WHERE WH\_HELPER\_CONTACT.CONTACT\_PK = WH\_INVOLVED\_AINP.CREATED\_BY\_CONTACT\_PK )

ORA-00942: table or view does not exist

at org.pentaho.di.trans.steps.sql.ExecSQL.processRow(ExecSQL.java:218)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:50)
at java.lang.Thread.run(Thread.java:662)
Caused by: org.pentaho.di.core.exception.KettleDatabaseException

* 1. This version occurs while performing deletes, for example, in **WH\_PROJECT\_REMOVAL.ktr**:

ERROR 19-06 14:35:42,827 - Execute SQL DELETE DATAMART RECORD - org.pentaho.di.core.exception.KettleStepException:
Error while running this step!

Couldn't execute SQL: DELETE FROM WH\_CF\_TRAN\_TRTY\_COAG WHERE PROJECT\_ID = 20922

ORA-00942: table or view does not exist

at org.pentaho.di.trans.steps.sql.ExecSQL.processRow(ExecSQL.java:208)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)
at java.lang.Thread.run(Thread.java:662)
Caused by: org.pentaho.di.core.exception.KettleDatabaseException:
Couldn't execute SQL: DELETE FROM WH\_CF\_TRAN\_TRTY\_COAG WHERE PROJECT\_ID = 20922

ORA-00942: table or view does not exist

at org.pentaho.di.core.database.Database.execStatement(Database.java:1650)
at org.pentaho.di.core.database.Database.execStatement(Database.java:1595)
at org.pentaho.di.core.database.Database.execStatements(Database.java:1800)
at org.pentaho.di.trans.steps.sql.ExecSQL.processRow(ExecSQL.java:182)
... 2 more
Caused by: java.sql.SQLSyntaxErrorException: ORA-00942: table or view does not exist

* 1. This version occurs while performing deletes, for example, in **WH\_INVOLVEDS\_REMOVAL.ktr**:

ERROR 29-08 17:18:58,830 - Execute SQL DELETE DATAMART RECORD - org.pentaho.di.core.exception.KettleStepException:
Error while running this step!

Couldn't execute SQL: DELETE FROM WH\_CF\_INPA\_0155 WHERE INVOLVED\_ID = 13703559

ORA-00942: table or view does not exist

at org.pentaho.di.trans.steps.sql.ExecSQL.processRow(ExecSQL.java:208)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)
at java.lang.Thread.run(Thread.java:662)
Caused by: org.pentaho.di.core.exception.KettleDatabaseException:
Couldn't execute SQL: DELETE FROM WH\_CF\_INPA\_0155 WHERE INVOLVED\_ID = 13703559

* 1. This version occurs specifically when updating materialized views in Oracle 11g:

ERROR 04-09 20:41:23,940 - UPDATE PROJECTS VIEW - An error occurred, processing will be stopped:
Couldn't execute SQL: BEGIN
DBMS\_MVIEW.REFRESH('WH\_PROJECTS\_VW');
END;

ORA-00942: table or view does not exist
ORA-06512: at "SYS.DBMS\_SNAPSHOT", line 2558
ORA-06512: at "SYS.DBMS\_SNAPSHOT", line 2771
ORA-06512: at "SYS.DBMS\_SNAPSHOT", line 2740
ORA-06512: at line 2

### Analysis

1. The first example above is the more common variant.

An ORA-00942 error will generally appear during a refresh job if a new custom object or category has been created in TeamConnect since the last time WH\_install has been run. The install job should create the table, and resolve the issue.
2. The second and third examples are less common. These particular errors occurred because the WH\_CF\_TRAN\_TRTY\_COAG table was dropped before the records in the analog tables were removed from the Data Warehouse. The dropped table can represent either an entire custom object or an object category.
3. See above.
4. The fourth and final example, relating to materialized views, indicates that the materialized views have become unusable.

### Remedy

In the first three cases, the recommended solution is to manually run the install script followed by a refresh or initial load (which can be accomplished by running **WH\_refresh.sh deploy**). Note that in the second and third examples, you may need to clear rows manually from WH\_REMOVED\_RECORDS to prevent looping.

In the final example, relating to materialized views, it is also recommended to try running an install and a refresh manually. However, if this does not work, it may be necessary to drop and rebuild the Data Warehouse entirely.

## Oracle-00001 Error

### Scripts Affected

Initial or Refresh.

### Error Signature

There are a couple different versions of the ORA-00001 error that can occur:

* 1. This version occurs while performing inserts or updates, for example, in **WH\_PROJECT.ktr**:

ERROR 16-09 17:46:47,435 - Insert / Update WH\_PROJECTS\_VW - org.pentaho.di.core.exception.KettleStepException:
Error in step, asking everyone to stop because of:

Error inserting/updating row
ORA-00001: unique constraint (PRUDENTIAL\_UAT\_DW.WH\_PROJECTS\_VW\_PK) violated

at org.pentaho.di.trans.steps.insertupdate.InsertUpdate.processRow(InsertUpdate.java:307)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)
at java.lang.Thread.run(Thread.java:662)
Caused by: org.pentaho.di.core.exception.KettleDatabaseException:
Error inserting/updating row
ORA-00001: unique constraint (PRUDENTIAL\_UAT\_DW.WH\_PROJECTS\_VW\_PK) violated

* 1. This version occurs while performing updates or deletes on certain tables, such as **WH\_CONTACT.ktr**:

ERROR 18-07 15:27:49,003 - Output WH\_CONTACT\_SECURITY - Because of an

error, this step can't continue:

ERROR 18-07 15:27:49,004 - Output WH\_CONTACT\_SECURITY -

org.pentaho.di.core.exception.KettleException:

Error batch inserting rows into table [WH\_CONTACT\_SECURITY].

Errors encountered (first 10):

ORA-00001: unique constraint (TC\_DWH.WH\_CONTACT\_SECURITY\_PK) violated

### Analysis

In general, when an ORA-00001 error occurs, it is because duplicate records are being inserted for some reason. It is often useful to query the database to identify the referenced unique constraint, and determine the table and columns that it applies to.

In the above examples:

1. This error resulted from two initial load jobs occurring at the same time.
2. This error (which occurred in an on-premise environment), the problem was traced back to records with overlapping effective\_to and effective\_from dates in the J\_CONT\_DEFAULT\_RATE table in the TeamConnect schema. Fixing this issue required fixing the client’s contact records.

There is also a version of this error that can occur if there are two custom fields with the same name, in different categories. This error will manifest as an ORA-00001 error on a WH\_PROJECT\_XXXX\_CF\_VW view in TeamConnect Data Warehouse 3.4 SP1. See support case #2014-0819-108163.

### Remedy

In the first example, the issue was resolved by running the initial load manually.

**WH\_refresh.sh initial**

If the script fails again, then the issue should be escalated to support.

## ORA-01033 Error

### Scripts Affected

Any.

### Error Signature

ERROR 24-06 17:00:46,462 - WH\_MILESTONE - org.pentaho.di.core.exception.KettleException:
Unable to perform logging at the end of the transformation

Error writing log record to table [WH\_EXTRACT\_LOG]

Error occured while trying to connect to the database

Error connecting to database: (using class oracle.jdbc.driver.OracleDriver)
ORA-01033: ORACLE initialization or shutdown in progress

### Analysis

Database is not available because of a shutdown or restart.

### Remedy

Try running the job again manually or wait until the next refresh. If that does not work, check DB connectivity; possibly escalate to DBA / Hosting Manager.

## ORA-01555 Error

### Scripts Affected

Any.

### Error Signature

ERROR 16-09 05:02:36,253 - Input T\_PROJECT - org.pentaho.di.core.exception.KettleDatabaseException:
Couldn't get row from result set
ORA-01555: snapshot too old: rollback segment number 9 with name "\_SYSSMU9\_3945653786$" too small

at org.pentaho.di.core.database.Database.getRow(Database.java:2796)
at org.pentaho.di.core.database.Database.getRow(Database.java:2768)
at org.pentaho.di.trans.steps.tableinput.TableInput.processRow(TableInput.java:143)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)
at java.lang.Thread.run(Thread.java:662)
Caused by: java.sql.SQLException: ORA-01555: snapshot too old: rollback segment number 9 with name "\_SYSSMU9\_3945653786$" too small

at oracle.jdbc.driver.T4CTTIoer.processError(T4CTTIoer.java:440)
at oracle.jdbc.driver.T4CTTIoer.processError(T4CTTIoer.java:396)
at oracle.jdbc.driver.T4C8Oall.processError(T4C8Oall.java:837)
at oracle.jdbc.driver.T4CTTIfun.receive(T4CTTIfun.java:445)
at oracle.jdbc.driver.T4CTTIfun.doRPC(T4CTTIfun.java:191)
at oracle.jdbc.driver.T4C8Oall.doOALL(T4C8Oall.java:523)
at oracle.jdbc.driver.T4CPreparedStatement.doOall8(T4CPreparedStatement.java:207)
at oracle.jdbc.driver.T4CPreparedStatement.fetch(T4CPreparedStatement.java:1084)
at oracle.jdbc.driver.OracleResultSetImpl.close\_or\_fetch\_from\_next(OracleResultSetImpl.java:359)
at oracle.jdbc.driver.OracleResultSetImpl.next(OracleResultSetImpl.java:263)
at org.pentaho.di.core.database.Database.getRow(Database.java:2784)
... 4 more

### Analysis

ORA-01555 errors can theoretically happen on any step that does a long-running query on the database. The error occurs because the query takes a long time to run, and there are other queries (possibly from other ETL processes) that fill up the TEMP tablespace while the query is running.

### Remedy

Try running the job again manually. If it fails again, escalate to a DBA to discuss re-sizing of the TEMP tablespace.

## ORA-00959 Error

### Scripts Affected

Any.

### Error Signature

ERROR 05-09 15:07:13,431 - Check TC\_VERSION - An error occurred executing this job entry :
Couldn't execute SQL: CREATE TABLE WH\_LAST\_REFRESH ( ENTITY\_CODE NVARCHAR2(9) , LAST\_REFRESH\_DATE DATE , LAST\_REFRESH\_SYSTEM\_DATE DATE)

ORA-00959: tablespace 'CAESARS\_TEST\_DW\_DAT' does not exist

### Analysis

An ORA-00959 error will occur if the default tablespace specified for the database user does not exist.

### Remedy

Verify that the Data Warehouse schema was created properly. Escalate to a DBA if necessary.

## ORA-12899 Error

### Scripts Affected

Initial or Refresh.

### Error Signature

ERROR 04-05 00:48:17,325 - Output WH\_CONTACT -
org.pentaho.di.core.exception.KettleDatabaseBatchException:
Error updating batch
ORA-12899: value too large for column
"RECKITTBENCKISER\_DW"."WH\_CONTACT"."CURRENCY\_SYMBOL" (actual: 3, maximum: 2)

org.pentaho.di.core.database.Database.emptyAndCommit(Database.java:1459)
org.pentaho.di.trans.steps.tableoutput.TableOutput.dispose(TableOutput.java:625)
org.pentaho.di.trans.step.RunThread.run(RunThread.java:69)
java.lang.Thread.run(Thread.java:662)

### Analysis

An ORA-12899 error is generally the result of a defect in the Data Warehouse scripts. The error is caused by a column data type in the Data Warehouse table being defined as too small. In the above example, the column is set to take a CURRENCY\_SYMBOL value that is 2 characters long; however, in TeamConnect the analogous column takes values that are 3 characters. So, some (three-character) legitimate values cannot be inserted into the Data Warehouse.

### Remedy

The solution is to modify the column so that it will accept values of the same length that TeamConnect can accept. For example:

**ALTER TABLE wh\_contact MODIFY currency\_symbol NVARCHAR2(3); COMMIT;**

If a defect on the relevant column has never been reported before, a defect ticket should be escalated to support so that it can be forwarded to engineering for resolution.

## ORA-24816 Error

### Scripts Affected

Initial or Refresh.

### Error Signature

This error occurs in dynamically-generated KTR files, such as **WH\_CF\_SECH\_INIT.ktr** or **WH\_CF\_SECH\_LOAD.ktr:**

ERROR 03-10 16:35:17,652 - Table output - Because of an error, this step can't continue:
ERROR 03-10 16:35:17,652 - Table output - org.pentaho.di.core.exception.KettleException:
Error inserting row into table [WH\_CF\_SECH] with values: [821407], [], [null], [null], [null], [null], [null], [null], [Complaint of "Washer leaks from underneath." On 04/10/09 Sears Service cites, "Installed boot, tested for leaks, said it would lock up, could not get any failure." Complaint of "Door can open during wash cycle/keep stopping." On 02/09/09 Sears Service cites, "Instruct customer: No HE soap present, ran sanitary, soap in, no failure. Small freezer in same outlet on extension cord." Complaint of "Cutts off/senior tech." Called STAC Limbert, order control, wrong control installed in 05 MOD#11044936202." On 01/16/09 Sears Service cites, "Replaced PCB unit chk ok. Cust is overloading unit." Complaint of "Stops in middle of cycle & wont unlock. Send senior tech/call STAC for part info." On 12/20/08 Sears Service cites, "Unable to diagnose, cust is useing wrong detergente and exsev amounts and hose might of been pinched." Complaint of "Not always starti
ng." On 12/01/08 Sears Service cites, "Instruct customer: Pump had dabre in it, cleaned unit, chk ok." Service request "MPA Check." On 04/26/07 Sears Service cites, "Performed PM chk chk ok." Complaint of "Boot came off again." On 09/22/05 Sears Service cites, "Replaced controller and door latch." Complaint of "Needs new rubbe gasket." On 11/11/04 Sears Service cites, "Instruct on tub boot."], [null], [ROOT\_NONO], [null], [3201077408]

Error inserting/updating row
ORA-24816: Expanded non LONG bind data supplied after actual LONG or LOB column

### Analysis

An ORA-24816 error is caused by a peculiar Oracle requirement that values for LOB columns must come at the end of the values list in an update statement.

Because the order of columns inserted in the "Table Output" step in an INIT or LOAD transformation is determined by the order of the columns selected in the "Table Input" step, the solution is to change the order of columns selected in the "Table Input" step. This ultimately is a TeamConnect defect, but there is no general workaround at this time.

### Remedy

Modify the .ktrs file for WH\_CF\_XXXX\_INIT and WH\_CF\_XXX\_LOAD using Spoon so that the CLOB fields are the last ones selected in the Table Input step. This will need to be repeated after any WH\_install:

* 1. Run a **desc** on the relevant Data Warehouse table to ensure you know which columns are LOB columns, and which ones are ordinary data types.
	2. Copy the existing .ktr files to a shared mount using scp.
	3. On your workstation, open the Spoon tool.
	4. Open each .ktr file in Spoon.
	5. Edit the “Table Input” step. Re-arrange the SELECT query so that the LOB columns are **last** in the column list (before the FROM clause).
	6. Save the files.
	7. Copy them to the ETL script server.
	8. Rename the existing files as backups.
	9. Copy the new files into the WH\_CF\_INIT and WH\_CF\_LOAD directories so that they are picked up by the ETL job.
	10. Be sure to keep a backup copy of the new files as well, as you may need to copy them back in (e.g. if they are overwritten by a subsequent install).

## ORA-00972 Error

### Scripts Affected

Install.

### Error Signature

ERROR 15-08 15:27:53,374 - Execute SQL COLUMNS - org.pentaho.di.core.exception.KettleStepException:
Error while running this step!

Couldn't execute SQL: ALTER TABLE WH\_CF\_FRCL ADD ( "MTWOFORECLSONEACTIONRULEISSUES$" NVARCHAR2(700) )

ORA-00972: identifier is too long

### Analysis

An ORA-00972 error occurs when trying to add a table or a column that is longer than 30 characters long. This occurred in versions of TeamConnect Data Warehouse prior to 3.3 SP3 when a client would create a custom field with a very long name. In more recent releases, this issue should be rare.

### Remedy

Refer back to client to rename field/object, if possible. Possibly escalate defect report to support.

## ORA-0911 Error

### Scripts Affected

Install.

### Error Signature

ERROR 13-10 17:42:25,157 - Execute SQLWH\_PROJECT - org.pentaho.di.core.exception.KettleStepException:
Error while running this step!

Couldn't execute SQL: CREATE ${WH\_ORACLE\_INDEX} WH\_PROJECT\_ADCO\_IDX21 ON WH\_PROJECT\_ADCO (DEFAULT\_CATEGORY)

ORA-00911: invalid character
        at org.pentaho.di.trans.steps.sql.ExecSQL.processRow(ExecSQL.java:218)
        at org.pentaho.di.trans.step.RunThread.run(RunThread.java:50)
        at java.lang.Thread.run(Thread.java:662)
Caused by: org.pentaho.di.core.exception.KettleDatabaseException:
Couldn't execute SQL: CREATE ${WH\_ORACLE\_INDEX} WH\_PROJECT\_ADCO\_IDX21 ON WH\_PROJECT\_ADCO (DEFAULT\_CATEGORY)

ORA-00911: invalid character
        at org.pentaho.di.core.database.Database.execStatement(Database.java:1664)
        at org.pentaho.di.core.database.Database.execStatement(Database.java:1604)
        at org.pentaho.di.core.database.Database.execStatements(Database.java:1752)
        at org.pentaho.di.trans.steps.sql.ExecSQL.processRow(ExecSQL.java:192)
        ... 2 more

### Analysis

This error occurs when a Data Warehouse instance is upgraded from an older version (for example 3.3 SP2) to a newer version (3.4 or higher) and an old kettle.properties file is copied over. Because the old **kettle.properties** file is missing some parameters, Pentaho will incorrectly parse references to them, sending curly braces (${WH\_ORACLE\_INDEX}) to the database instead of the correct value (in this case, INDEX or BITMAP INDEX).

### Remedy

Make sure **kettle.properties** includes these lines:

WH\_LOOKUP\_POPULATION=NAME

WH\_REFRESH\_LOOKUPS=NO

WH\_DEFAULT\_LOCALE=en\_US

#This will allow regular INDEX or BITMAP INDEX creation for some of oracle indexes (doesn't apply to MSSQL) - valid input: INDEX and BITMAP INDEX

WH\_ORACLE\_INDEX=INDEX

## “NL Exception was generated”

### Scripts Affected

Install.

### Error Signature

ERROR 13-10 16:00:06,895 - Check TC\_VERSION - An error occurred executing this job entry:
Error occured while trying to connect to the database

Error connecting to database: (using class oracle.jdbc.driver.OracleDriver)
IO Error: NL Exception was generated

### Analysis

This seems to result from some kind of file corruption.

### Remedy

Follow these steps:

* 1. Delete the ETL scripts and its directory.
	2. Deploy a fresh copy from UCM3.
	3. Copy over the JDBC driver to /libext/JDBC; copy over WH\_refresh.sh script; modify kitchen.sh to include JAVA\_HOME parameter and value; chmod u+x \*.sh; Copy kettle.properties and shared.xml from another working instance; modify these files accordingly.
	4. Test to verify it is now working.

## OutOfMemoryError

### Scripts Affected

Any.

### Error Signature

ERROR 15-10 08:47:38,656 - Table output - java.lang.OutOfMemoryError: Java heap space
        at java.lang.reflect.Array.newArray(Native Method)
        at java.lang.reflect.Array.newInstance(Array.java:52)
        at oracle.jdbc.driver.BufferCache.get(BufferCache.java:226)
. . .

### Analysis

An OutOfMemory error occurs because the ETL process has exhausted available heap space. This is particularly common during initial loads.

### Remedy

Modify **kitchen.sh** and increase the value for JAVAMAXMEM, and then run the job again manually:

* 1. **vim kitchen.sh**
	2. On about line 54, you should see this bash block:

if [ -z "$JAVAMAXMEM" ]; then

 JAVAMAXMEM="1024"

fi

if [ -z "$PENTAHO\_DI\_JAVA\_OPTIONS" ]; then

 PENTAHO\_DI\_JAVA\_OPTIONS="-Xmx${JAVAMAXMEM}m"

fi

* 1. Switch to insert mode (by hitting the **Insert** key).
	2. Change “1024” to “2048”.
	3. Save and exit (**Esc** then **:wq**).

## ORA-01653 Error

### Scripts Affected

Any.

### Error Signature

ERROR 11-10 18:25:13,971 - Source DB Type - An error occurred executing this step:
Error occured while trying to connect to the database

Error connecting to database: (using class oracle.jdbc.driver.OracleDriver)
ORA-00604: error occurred at recursive SQL level 1
ORA-01653: unable to extend table SYS.AUD$ by 8192 in tablespace SYSTEM
ORA-02002: error while writing to audit trail
ORA-00604: error occurred at recursive SQL level 1
ORA-01653: unable to extend table SYS.AUD$ by 8192 in tablespace SYSTEM

### Analysis

An ORA-01653 error occurs when the database cannot extend a segment. This can be caused by the data file hitting its maximum size, or because the partition that an autoextend data file lives on, has run out of space.

### Remedy

Escalate to DBA to either add a new data file, or to resolve disk space issue.

## “Unable to read file [file://…]” Error

### Scripts Affected

Initial or Refresh

### Error Signature

ERROR 15-10 18:12:26,577 - EXEC\_LOAD\_TRANSFORM - org.pentaho.di.core.exception.KettleException:

Unexpected error during transformation metadata load

Unable to read file [file:///opt/mitratech/warehouse/TCWH\_NETAPP\_TEST/TCWH/WH\_CF\_LOAD/WH\_CF\_CONT\_EXTE\_LAFI\_LOAD.ktr]

Could not read from "file:///opt/mitratech/warehouse/TCWH\_NETAPP\_TEST/TCWH/WH\_CF\_LOAD/WH\_CF\_CONT\_EXTE\_LAFI\_LOAD.ktr" because it is a not a file.

 at org.pentaho.di.job.entries.trans.JobEntryTrans.getTransMeta(JobEntryTrans.java:1195)

 at org.pentaho.di.job.entries.trans.JobEntryTrans.execute(JobEntryTrans.java:611)

 at org.pentaho.di.job.Job.execute(Job.java:503)

 at org.pentaho.di.job.Job.execute(Job.java:642)

 at org.pentaho.di.job.Job.execute(Job.java:420)

 at org.pentaho.di.job.entries.job.JobEntryJobRunner.run(JobEntryJobRunner.java:63)

 at java.lang.Thread.run(Thread.java:662)

Caused by: org.pentaho.di.core.exception.KettleXMLException:

Unable to read file [file:///opt/mitratech/warehouse/TCWH\_NETAPP\_TEST/TCWH/WH\_CF\_LOAD/WH\_CF\_CONT\_EXTE\_LAFI\_LOAD.ktr]

### Analysis

This error may occur after upgrading a Data Warehouse, without first running the install script (**WH\_refresh.sh install**, or **WH\_install.sh**) to generate all the necessary KTR files to load custom fields.

### Remedy

Run **WH\_install.sh** or **WH\_refresh.sh install**, then run the job again manually.

## ORA-01752 Error

### Scripts Affected

Initial or Refresh

### Error Signature

ERROR 15-10 10:45:47,366 - Execute SQL DELETE DATAMART RECORD - org.pentaho.di.core.exception.KettleStepException:

Error while running this step!

Couldn't execute SQL: DELETE FROM WH\_CF\_INPA\_OCAT WHERE INVOLVED\_ID = 32503

ORA-01752: cannot delete from view without exactly one key-preserved table

 at org.pentaho.di.trans.steps.sql.ExecSQL.processRow(ExecSQL.java:208)

 at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)

 at java.lang.Thread.run(Thread.java:662)

Caused by: org.pentaho.di.core.exception.KettleDatabaseException:

Couldn't execute SQL: DELETE FROM WH\_CF\_INPA\_OCAT WHERE INVOLVED\_ID = 32503

### Analysis

An ORA-01752 error may occur in Data Warehouse 3.4 or 3.4 SP1. This occurs because there is a record in the WH\_REMOVED\_RECORDS table in TeamConnect that has already been removed from the Data Warehouse.

When a record is deleted in TeamConnect, a trigger inserts a row into WH\_REMOVED\_RECORDS. The Data Warehouse ETL scripts then read from this table and delete the corresponding records in the DW through the WH\_CF and WH\_CC views. However, if the view does not contain a corresponding record (i.e. because it has already been deleted), an ORA-01752 error will be returned.

The most likely cause of this is that there was a prior error that caused the ETL refresh process to die, after the record in the DW was deleted, but before the WH\_REMOVED\_RECORDS table in the TeamConnect transactional schema was purged.

### Remedy

Use these steps to resolve this error:

* 1. Verify the contents of WH\_REMOVED\_RECORDS by querying the database:

**alter session set current\_schema = NETAPP\_TEST\_TC;**

**select \* from WH\_REMOVED\_RECORDS;**

***ENTITY\_CODE APPLICATION\_ID PRIMARY\_KEY MODIFIED\_ON REMOVED\_ON***

***----------- -------------- ----------- ----------- ----------***

***INVL 5 32503 15-OCT-14 15-OCT-14***

* 1. Escalate to DBA to remove the offending row(s); or do the following:
		1. Open Spoon by running Spoon.bat on a Windows machine.
		2. Create a New Job (File > New >Job).
		3. Add a START step.
		4. Add an “SQL” step to the new job by searching for “SQL” under the Design tab in the left pane, and then dragging that to the main pane.
		5. Configure the “SQL” step as follows:
			1. Select “Source\_TeamConnect\_data” as the connection.
			2. For the SQL to execute, type:

DELETE FROM WH\_REMOVED\_RECORDS WHERE ENTITY\_CODE = 'INVL' AND PRIMARY\_KEY = 32503

(**Note**: do **not** include a semicolon at the end).

* + - 1. Click “OK”.
		1. Create a hop connecting START to Transformation, by click-dragging the mouse over both, and then right-clicking once both are selected (click “New Hop”).
		2. Save the transformation with a descriptive name (for example, **INVL\_32503.kjb**).
		3. Using SCP, push the file to the relevant server:

**scp /mnt/hosting/gwen.dallas/INVL\_32503.kjb linuxp025:/tmp**

* + 1. Go to the relevant server using ssh, sudo as warehouse, and move the file to the appropriate location:

**sudo -u warehouse -i**

**cp /tmp/INVL\_32503.kjb /opt/mitratech/warehouse/TCWH\_NETAPP\_TEST/TCWH**

* + 1. Use kitchen.sh to run the job:

**./kitchen.sh -file=./TCWH/INVL\_32503.kjb**

*INFO 15-10 11:15:35,241 - Kitchen - Start of run.*

*INFO 15-10 11:15:35,331 - INVL\_32503 - Start of job execution*

*INFO 15-10 11:15:35,334 - INVL\_32503 - Starting entry [SQL]*

*INFO 15-10 11:15:35,819 - INVL\_32503 - Finished job entry [SQL] (result=[true])*

*INFO 15-10 11:15:35,820 - INVL\_32503 - Job execution finished*

*INFO 15-10 11:15:35,832 - Kitchen - Finished!*

*INFO 15-10 11:15:35,832 - Kitchen - Start=2014/10/15 11:15:35.242, Stop=2014/10/15 11:15:35.832*

*INFO 15-10 11:15:35,832 - Kitchen - Processing ended after 0 seconds.*

* + 1. Re-run the database query to verify the row was removed.
		2. Exit out of warehouse uid and remove the file from /tmp.

**exit**

**rm /tmp/INVL\_32503.kjb**

* 1. Re-run the original refresh job manually.
	2. TeamConnect Data Warehouse 3.4 SP1 Update 1 should resolve this issue.

For prior versions, there are several informal (developed by Gunawan and support rather than Dev) patches that can be applied if this issue re-occurs. Please see attachment below. In this case, WH\_INVOLVED\_REMOVAL.ktr may need to be patched.



## ORA-04031 Error

### Scripts Affected

Any.

### Error Signature

ERROR 17-10 17:37:45,735 - Input Lookup Columns - An error occurred, processing will be stopped:
Error occured while trying to connect to the database

Error connecting to database: (using class oracle.jdbc.driver.OracleDriver)
ORA-00604: error occurred at recursive SQL level 3
ORA-04031: unable to allocate 88 bytes of shared memory ("shared pool","select /\*+ rule \*/ bucket, e...","SQLA^bbcee4f7","opn: qkexrInitOpn")

### Analysis

An ORA-04301 error occurs when the database’s System General Area (SGA) memory pool is exhausted. This may occur as the result of large query results being cached, due to concurrent jobs.

### Remedy

Run the job again manually. If this does not work, escalate to the DBA to investigate memory re-sizing.

## ORA-00439 Error

### Scripts Affected

Install.

### Error Signature

ERROR 20-10 19:00:42,361 - Check TC\_VERSION - An error occurred executing this job entry :
Couldn't execute SQL: CREATE BITMAP INDEX WH\_CONTACT\_IDX19 ON WH\_CONTACT (CONTACT\_DEFAULT\_CATEGORY)

ORA-00439: feature not enabled: Bit-mapped indexes

INFO  20-10 19:00:42,363 - WH\_create\_ORACLE\_target - Finished job entry [Create WH\_CONTACT] (result=[false])
ERROR 20-10 19:00:48,167 - Execute SQLWH\_PROJECT - Unexpected error
ERROR 20-10 19:00:48,167 - Execute SQLWH\_PROJECT - org.pentaho.di.core.exception.KettleStepException:
Error while running this step!

### Analysis

An ORA-00439 error occurs when BITMAP INDEX is set as the value for the WH\_ORACLE\_INDEX property in **kettle.properties**, but the Oracle database is not configured to use bitmap indexes. Note that BITMAP INDEX is the default index type used for several versions of TeamConnect Data Warehouse. This issue was discovered when building a Data Warehouse on Austin Data Center server trainingdata01.

### Remedy

Modify kettle.properties by changing WH\_ORACLE\_INDEX=INDEX instead of BITMAP INDEX.

## ORA-004021 Error when rebuilding BO\_LOCALTIME

### Scripts Affected

Install.

### Error Signature

ERROR 11-11 16:24:24,860 - Check TC\_VERSION - An error occurred executing this job entry :

Couldn't execute SQL: CREATE OR REPLACE FUNCTION BO\_LOCALTIME

(

 p\_date date

 ,p\_timezone varchar2

)

return date deterministic as

 v\_date date ;

 p\_timezonefull varchar2(50);

begin

 if upper(p\_timezone) not in ('GMT','UTC','ECT','EET','ART','EAT','MET','NET','PLT','IST','BST','VST','CTT','JST','ACT','AET','SST','NST','MIT','HST','AST','PST','PNT','MST','CST','EST','IET','PRT','CNT','AGT','BET','CAT','PDT','CDT','EDT') then

 raise\_application\_error(-20999,'Incorrect time zone');

 end if;

 IF p\_timezone = 'PST' THEN p\_timezonefull := 'America/Los\_Angeles';

 elsif p\_timezone = 'CST' THEN p\_timezonefull := 'America/Chicago';

 elsif p\_timezone = 'EST' THEN p\_timezonefull := 'America/New\_York';

 else p\_timezonefull := p\_timezone;

 END if;

 if p\_date is null then

 return null ;

 else

 return cast(from\_tz(cast(p\_date as timestamp), 'GMT') at time zone p\_timezonefull as date);

 end if;

end;

ORA-04021: timeout occurred while waiting to lock object

### Analysis

The BO\_LOCALTIME function is used for time conversions in Business Object reports. Running install generally rebuilds this function. This error occurs when there is a lock on the function, perhaps caused by a long-running BO query.

### Remedy

Try running again manually. If it fails, escalated to DBA to clear hung sessions, which should remove the lock.

# Deadlocks (ORA-00060)

Concurrency deadlocks occur when two uncommitted transactions attempt to obtain locks on rows which have already been locked by the other transaction. For example:

|  |  |
| --- | --- |
| **TRANSACTION A** | **TRANSACTION B** |
| UPDATE ABCD SET VAL\_COL = 1234 WHERE PK\_COL = 1234; | UPDATE EFGH SET VAL\_COL = 1234WHERE PK\_COL = 5678; |
| UPDATE EFGH SET VAL\_COL = 5678WHERE PK\_COL = 5678; | UPDATE ABCD SET VAL\_COL = 5678 WHERE PK\_COL = 1234; |

True concurrency deadlocks will only happen on UPDATE and DELETE statements.

If an ETL process is running and a concurrency deadlock occurs (note that the process is multi-threaded and will open multiple transactions on the database simultaneously), then an error like this will occur (in environments using Oracle RDBMS):

ERROR 28-06 10:02:09,387 - Update WH\_LINEITEM INVOICE\_POSTING\_STATUS - Error in step, asking everyone to stop because of:
ERROR 28-06 10:02:09,387 - Update WH\_LINEITEM INVOICE\_POSTING\_STATUS - org.pentaho.di.core.exception.KettleDatabaseException:
Error inserting/updating row
ORA-00060: deadlock detected while waiting for resource

at org.pentaho.di.core.database.Database.insertRow(Database.java:1415)
at org.pentaho.di.trans.steps.update.Update.lookupValues(Update.java:184)
at org.pentaho.di.trans.steps.update.Update.processRow(Update.java:315)
at org.pentaho.di.trans.step.RunThread.run(RunThread.java:40)
at java.lang.Thread.run(Unknown Source)
Caused by: java.sql.SQLException: ORA-00060: deadlock detected while waiting for resource

The SQL Server variant looks like this:

ERROR 12-08 22:06:14,876 - org.pentaho.di.trans.steps.update.Update - org.pentaho.di.core.exception.KettleDatabaseException:

Error inserting/updating row

Transaction (Process ID 125) was deadlocked on lock resources with another process and has been chosen as the deadlock victim. Rerun the transaction.

 at org.pentaho.di.core.database.Database.insertRow(Database.java:1325)

 at org.pentaho.di.core.database.Database.insertRow(Database.java:1239)

 at org.pentaho.di.core.database.Database.insertRow(Database.java:1227)

 at org.pentaho.di.trans.steps.update.Update.lookupValues(Update.java:178)

 at org.pentaho.di.trans.steps.update.Update.processRow(Update.java:288)

 at org.pentaho.di.trans.step.BaseStep.runStepThread(BaseStep.java:2889)

 at org.pentaho.di.trans.steps.update.Update.run(Update.java:511)

Caused by: java.sql.SQLException: Transaction (Process ID 125) was deadlocked on lock resources with another process and has been chosen as the deadlock victim. Rerun the transaction.

As with other errors, this will cause the ETL job to terminate.

Note that most deadlocks are intermittent. If a deadlock occurs, the first step should be to try re-running the job manually.

A more permanent solution to a deadlock problem may be to reduce the commit size for the step, by editing the offending transformation in Spoon:

1. Copy the relevant .ktr file to a shared mount using scp.
2. On your workstation, open the Spoon tool.
3. Open the .ktr file in Spoon.
4. Open the relevant step by clicking its icon. Remember it will probably be a Delete, Update, or Update/Insert step.
5. Note whether the step has a copy count attached (in the top left side of the icon may be a “x2 or x3” or x and some number, indicating the number of copies of this step that will run).
6. Lower the commit size. Note that a value of zero is infinite.
7. Click “OK” to close the dialog box for the step.
8. If necessary, reduce the number of copies of the job, by right-clicking the icon in Spoon, and clicking “Change number of copies to start” in the pop-up menu.
9. Save the .ktr file.
10. Make a backup of the existing .ktr file.
11. Replace the existing .ktr file with the modified one.
12. Run the relevant job manually to verify the workaround.

The steps above will usually work, although in some extreme cases you may have to reduce the commit size to 1 (remember that any commit size greater than 2 can theoretically produce a concurrency deadlock).

A defect report should also be escalated to support; concurrency deadlocks are always the result of poorly written code.

Finally, note that there are some rare forms of the ORA-00060 deadlock error that do not indicate a concurrency problem, but some other form of resource conflict. If you see a deadlock on a SELECT or INSERT statement, then the issue should be escalated to a DBA immediately.

# Hangs

Hangs can be very difficult to diagnose and resolve. Please note that Data Warehouse logs are not always useful in identifying the root cause of a hang, in large part because a step is only logged after it has completed; the step that is hanging therefore never gets logged.

When a hang occurs, it is generally necessary to identify the SQL that was running when the script hung. This can be accomplished using this script:

**SELECT a.username, a.sid**

**, a.serial#**

**, b.sql\_text**

**FROM v$session a**

**, v$sqlarea b**

**WHERE a.sql\_address=b.address**

**AND a.username='ABCD\_DW';**

(ABCD\_DW should be replaced by the actual name for the Data Warehouse database account).

Furthermore, you may wish to check if the Data Warehouse is growing:

**SELECT sum(bytes)/1024/1024/1024 AS size\_in\_gb FROM user segments;**

Finally, you should check to verify whether the process is still running:

**WH\_refresh.sh status**

**ps auxfwww|grep -i "/bin/sh"|grep -i "refresh"|awk '{print $2}'**

# Microsoft SQL Server Issues

## Transaction Log Full

### Scripts Affected

Any (usually Initial or Refresh).

### Error Signature

ERROR 16-08 14:01:05,116 - org.pentaho.di.trans.steps.delete.Delete - Error in step, asking everyone to stop because of:

Error inserting/updating row

The transaction log for database 'google' is full. To find out why space in the log cannot be reused, see the log\_reuse\_wait\_desc column in sys.databases

### Analysis

This error is caused by the transaction logs filling up.

### Remedy

As noted in the error message, check the sys.databases table using Microsoft SQL Server Express. Escalate to SQL Server DBA for assistance in clearing the transaction logs.

# Additional Information

## Hosted Environment Script

Data Warehouses in the hosted environment are run using the **WH\_refresh.sh** script. This script wraps the out-of-the-box scripts.

To run the script:

* 1. Log on to the Data Warehouse script server.
	2. **sudo -u warehouse -i**
	3. **/opt/mitratech/warehouse/[TCWH\_ABCD]/WH\_refresh.sh [option]**

[TCWH\_ABCD] is generally TCWH\_ plus the name of the client, for example, the TCWH\_SMG directory contains the current scripts for Scott’s Miracle Grow (SMG).

[option] is one of the following:

* **refresh** – this runs the DWH refresh; equivalent to TeamConnect\_Warehouse.sh.
* **refresh\_custom** – runs a custom refresh; generally this will not be used, however, one should check Box for custom ETL scripts to be sure.
* **initial** – runs an initial load; equivalent to TeamConnect\_Warehouse\_initial.sh.
* **install** – runs an initial load; equivalent to WH\_install.sh.
* **deploy** – equivalent to running install and then initial**.**
* **status** – shows status of the script.
* **stop** – stops currently running jobs for this client.
* **reset** – removes the .pid and .missed files (this may be useful if you get errors indicating that a PID file already exists)**.**

## How to Read a Data Warehouse Log

When a Data Warehouse error occurs, it may be necessary to read the entire log to understand the context of the error notification. Logs are stored in this directory:

**/opt/mitratech/warehouse/[TCWH\_ABCD]/TCWH\_logs**

Generally, it will be useful to do **ls -lrt** in the logging directory to identify the most recent log file for review (using **less** or **more,** for example). The files are named using this convention:

 **ScriptName\_MMDDYYYY\_HHMM.log**

So for example, the TeamConnect\_Warehouse\_100062014\_1625.log file is a file that was created by a regular refresh on October 6, 2014, that started at 4:25 p.m (the actual end time may be several minutes or hours later). Note that this naming convention still holds even for jobs started using the WH\_refresh.sh script described above.

The method for reading the log has not changed substantially since the early releases of the TeamConnect Data Warehouse product. This explanation from a 2009 Mitrawiki article still applies today:

The Data Warehouse log files are very raw and contain lots of information about what is occurring during various parts of the warehouse creation and data loading processes.

The best way to analyze a log file is to use the search feature of a text editing program. It can be used to search for specific strings.

In general the first string to search for is "error." In most cases the first error lines generated in the log file pertain to the cause of the problem. Many more error lines will be generated but they are most likely the result of the first error in the log. Once the first error section is located the next search string would be "Caused by: java.sql.SQLException:" The text right after this will be the error returned from the database in the example below the database error is "Invalid object name 'Y\_SYSTEM'." This error message can be used in conjunction with this document to identify and correct an issue that you might be having.

Once an error is found it is possible to find out which part of the process has failed by searching backwards through the file for the word “opening” This should reveal the file name of the transformation that is generating the error in the log file.

Note that the last step described above involves searching for a reference to a .ktr (transformation file) or .kjb (job file).

## Information about WH\_RUN\_PIVOT

WH\_RUN\_PIVOT is a procedure that is particularly important prior to Data Warehouse 3.3.

The following information is quoted from page 19 of the **TeamConnect Data Warehouse 3.2 Installation & Configuration Guide:**

WH\_RUN\_PIVOT is a database procedure that is called multiple times during the refresh job. If an error occurs during a call to this procedure, the Data Warehouse database will be left in an inconsistent state. Errors in Data Warehouse jobs can occur for several reasons. If your log file indicates that an error occurred, search the file for the character string **WH\_RUN\_PIVOT.0 - Error**…

If a WH\_RUN\_PIVOT error is found, you should not re-run the refresh job immediately. Instead, you should do the following:

1. Read the job log to determine why WH\_RUN\_PIVOT failed. There are several possible reasons.
2. Correct the cause of the failure, usually by adjusting database parameters…
3. Use a database utility to manually re-run the WH\_RUN\_PIVOT procedure.
4. Re-run the refresh job.

## Tips and Tricks

### Skipping Unique Codes

From time to time it will be necessary to skip the loading of an entire set of records for an entity. For example, a client may have no interest in reporting on documents.

To skip the loading of records of a certain entity-type (we will assume documents for this example):

1. Log in to the database.
2. Modify the appropriate row in the Data Warehouse schema’s WH\_LAST\_REFRESH table, setting the value of the LAST\_REFRESH\_DATE column to a data in the future.

**UPDATE ABCD\_WH.WH\_LAST\_REFRESH SET LAST\_REFRESH\_DATE = ’01-JAN-2034’ WHERE ENTITY\_CODE = ‘DOCU’;**

Note that DOCU is the four-letter code for document. The other codes are:

ACCT Accounts

CONT Contacts

CTGR Categories

HIST Histories
INVC Invoices

INVL Involved Party Records

PROJ Projects (including all custom objects)

TASK Tasks

UGRP User Groups

USER Users

ALL Everything

### Reloading records of a specific entity type

Similarly, the LAST\_REFRESH\_DATE value in WH\_LAST\_REFRESH can be set to a date in the past, or removed entirely, to force records to be reloaded. Note: if a row is missing, the scripts will use January 1, 1900 as the default date.

### Checking Data Warehouse Job Status

While a Data Warehouse job is running, there are two ways to determine what a Data Warehouse job is currently doing:

* 1. Tail the log. This will allow you to see which transformation is currently being run.

	If you are running an initial load, you can use the linenr values (compared against the count of records in the database) to gauge how far the process has moved.
	2. Check the WH\_LAST\_REFRESH table in the database to see which entities have been updated recently, and which ones have not.

### Estimate the Size of the Data Warehouse Target Schema

To estimate the size of a Data Warehouse before it is built:

1. Determine the size of the TeamConnect tablespace (note:segment allocated space will generate a slight over-estimate):

**SELECT SUM(BYTES)/1024/1024 MB FROM DBA\_SEGMENTS WHERE OWNER = ‘DWH\_SCHEMA\_NAME’;**

1. Sum the sizes of files stored in TeamConnect:

**SELECT SUM(DOCUMENT\_SIZE)/1024/1024 MB from TC\_SCHEMA.T\_DOCUMENT;**

1. Subtract the size of documents from the total TeamConnect size.
2. Multiple the value by 1.5 to estimate the size of the target schema.