Guide to installing Oracle 10G Enterprise Edition Server
(and creating databases)
on Windows, for Controller 8.2

Overview

Controller 8.2 is the first release that supports databases stored on an Oracle 10G server.

This document is intended to show:
(a) how to install Oracle 10G in a way that makes it compatible for hosting Controller databases
(b) how to create the 2 initial databases that Controller requires
(c) how to create the third extra database that (optionally) some customers may use for advanced functionality

<<It is intended that a future version of this document, will have an Appendix which describes the slight differences that you would have to understand if you want to so the same thing but with Oracle 9i. >>

In general, we shall mostly use the default settings for installing Oracle 10G – also known as "Oracle 10.2.0.1.0" – on a Windows 2003 server.

We shall also patch it to the latest Oracle server patch set available at the time of writing, then create some databases for the Controller system to utilise. For ‘normal’ use, Controller 8 requires 2 separate databases. There is an optional third that you may wish to create for a Data Mart publish repository.

It is absolutely VITAL that you read the following bullet-point notes carefully, before proceeding, so that no confusion arises:

NOTES:
• This is an unofficial guide, intended to:
  o give a quick/easy guidelines and advice to people already familiar with Controller
  o plus illustrate clearly (with screenshots) the ideas associated with Controller so that they can perform the same steps in their own unique Oracle environment
• Most importantly, the official documentation (e.g. "ctrl1_inst.pdf" for Controller 8.2, plus http://support.cognos.com/en/support/products/controller82_software_environments.html) always take precedence over this unofficial document.
  o The reader should be familiar with the official documentation *before* reading/using this document
• This document is intended to demonstrate how to create a brand-new Oracle 10G server, complete with suitable databases, ready for use by Controller 8.2
  o For performance reasons, it is ideal if customers dedicated server hardware, just for Controller (i.e. dedicated Oracle server, just for Controller)
    ▪ However, we understand that most customers will have existing Oracle servers, and will probably share the server with other non-Controller databases

1 NOTE: Controller (2.x or 8.x) works fine on non-Windows Oracle 9i, e.g. UNIX, but (for the sake of simplicity) this guide just has screenshots etc. from the Windows version
2 One for the Controller application’s data repository, and the other is the “ContentStore” which stores some configuration data for the reporting server system.
Also, this document talks about how to install the Oracle server
- This is purely for illustrative purposes only – naturally, the customer’s Oracle DBA will have a clearer understanding of their needs than any document could.
- Customers can read this documentation, to understand how a (theoretical) Oracle server (on Windows) was installed, so that they can ensure that their server has the same settings.

Most customers will probably be using a different operating system (e.g. a flavour of UNIX) from the one that this guide has screenshots from (Windows 2003), to host their Oracle server.
- The idea of this guide, is that it can be used by the customer’s Oracle DBA to understand the general settings required.
- In other words, customer’s Oracle DBAs can use this document and “translate” the procedures into some that will work for their configuration of Oracle 10G (on whatever operating system they use).

The recommendation for the “application repository” database character set (i.e. the non-Unicode “WE8MSWIN1252”) is different from the (Unicode) character set required for the “contentstore” database.
- These character set recommendations are not expected to change until the next major release of Controller (?v9?), which will perhaps be released sometime in 2008 or later.
Details

(1) Install Oracle 10G rel2 server

- Insert the Oracle CD, and run `setup.exe`
- We shall just use a "basic installation" and accept all the default options (see below)

**TIP:** Remember the passwords that you create here!

![Oracle Database 10g Installation - Installation Method](image)

**Select Installation Method**

- **Basic Installation**
  Perform full Oracle Database 10g installation with standard configuration options requiring minimal input. This option uses file system for storage, and a single password for all database accounts.

  - Oracle Home Location: `OracleProduct10.2.0db.1`
  - Installation Type: `Enterprise Edition (1.3.0B)`
  - Create Starter Database (additional T2CORE)
  - Global Database Name: `ord`
  - Database Password: `********`
  - Confirm Password: `********`

**Advanced Installation**

Allows advanced selections such as different passwords for the SYS, SYSTEM, SYSMAN, and DBSNMP accounts, database character set, product languages, automated backups, custom installation, and alternative storage options such as Automatic Storage Management.

- Next
TIP:
Problem: The install has detected that the primary IP address of the system is DHCP-assigned. Recommendation: Oracle supports installations on systems with DHCP-assigned IP addresses; however, before you can do this, you must configure the Microsoft LoopBack Adapter to be the primary network adapter on the system. See the Installation Guide for more details on installing the software on systems configured with DHCP.

- Accept the default options and click **next** to start the install process
- After the process has finished, acknowledge the following screen:
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Acknowledging the following screen also:

**End of Installation**

**The installation of Oracle Database 10g was successful.**

Please remember:

- Enterprise Manager Database Control URL is: http://142.88.126.250:1158/em
- Your database configuration files have been installed in D:/oracle/product/10.2.0
- While other components selected for installation have been installed in D:/oracle/product/10.2.0/db_1
- Be cautious not to accidentally delete these configuration files.
- The SQL*Plus URL is: http://142.88.126.250:5560/sqlplus
- The SQL*Plus DBA URL is: http://142.88.126.250:5560/sqlplus/dba
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Richard.Collins@Cognos.com – 21st June 2007

(2) Upgrade ("patch") Oracle Server to 10.2.0.3.0 or later

- There are no known Controller-specific issues with Oracle 10G release 2 (i.e. without any patched)
  - However, to ensure that you do not receive any Oracle-specific known bugs, it would be sensible to upgrade to the latest\(^3\) patch
- It is important to patch Oracle Server before you create the Controller databases, because it will save you time later!

To patch the Oracle server:
- Download the 10.2.0.3.0 patch (a.k.a. "5337014 - 10g Release 2 (10.2.0.3) Patch Set 2 for Microsoft Windows (32-Bit)") from Oracle

For full instructions, launch "README.html". However, normally you simply do the following:

- Note the name of your current home instance (e.g. OraDb10g_home1):
- Launch "setup.exe" from the extracted patch:
  - Click "Next"
  - Enter the name (e.g. "OraDb10g_home1") of your home:

\(^3\) 10.2.0.3.0 as of April 2007
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e.g.

**Specify Home Details**

**Destination**
Enter or select a name for the installation:

<table>
<thead>
<tr>
<th>Name:</th>
<th>OraDb10g_home1</th>
</tr>
</thead>
</table>

Path: D:\oracle\product\10.2.0\db_1

- **Next**
- You will be prompted to shut down several Oracle Windows services:

  - Repeat for all the services beginning with Oracle
  - Click Retry and then **Next** to begin the patch install process:

- **Install**

  - After the installation (approx 5 minutes) click “Exit”
  - Finally, **Reboot** the Oracle server to 100% ensure all settings in place
(3) Create Oracle databases for Controller-use

It is important to stress that the database that was created during the installation of Oracle server itself shall not be used for Controller.
[This database was purely created simply to get through the installation wizard].

Instead, we shall create 2 new databases for Controller to use, since we require specific settings to be chosen (during each database’s creation), to ensure that Controller works properly.

In this section, we shall create the 2 databases that Controller 8 requires:
- “application repository” database which stores the application data
- “contentstore” which stores the configuration of the Cognos 8 software components

Finally, we shall discuss the optional creation of a third "data mart" database.

First we shall create a database for the Controller 8 “Application” repository:

- Here we shall use the "Database Configuration Assistant"

Next, “Create a database”, Next
Choose “General Purpose” (see below) then Next

Complete the following as appropriate:

Global Database Name: ccr

A database is referenced by at least one Oracle8i instance, which is uniquely identified from any other instance on this computer by an Oracle System Identifier (SID).

SID: ccr

(in the above example, we are creating the Cognos Controller repository database - called “ccr” – which stores almost all of the information regarding Controller).

Next
In the “management options”, configure as desired, and click Next.

In the “database credentials” screen, choose an appropriate password, Next.

“Storage Options” – typically click Next.
“Database File Locations” - typically click Next.
“Recovery Configuration” - typically click Next.
“Database Content” - typically click Next.

“Initialization Parameters”
- In the “memory” tab, allocate as much memory as possible to Controller.
  - For example, 50%.
- In the “sizing” tab, ensure that the number of “processes” is 150.
- In the “character sets” it is *VITAL* that we get the correct value:

Ensure that you choose WE8MSWIN1252 as the Database character set.

WE8MSWIN1252 has been extensively tested in Controller 8. Unicode (AL32UTF8) has NOT been tested, and we believe that it would cause issues with consolidations.
NOTE: The National Character set should\(^5\) be AL16UTF16

- Click on “All Initialization Parameters” and then “All Initialization Parameters”

**TIP:**
- When inside the “all initialization parameters” screen, you can click on the “name” tab to sort alphabetically
- If you do not remember to make these changes now, you can change them later by adjusting the values inside the “init.ora” file associated with the database (e.g. “D:\oracle\product\10.2.0\admin\ccr\pfile\init.ora.xxx”)

- The performance of your Oracle database can be increased by changing the default setting of the `optimizer_index_cost_adj` parameter\(^6\).
  - The official Cognos install document recommends that you change the default setting (of 100) to a much smaller number, for example **5**

| `optimizer_index_cost_adj` | 5 | | Optimizer |

- change the value of `UTL_FILE_DIR` to fit the Server Directory value in Enhanced Reporting Optimisation section in the Cognos Controller Configuration Utility.
  
  ![UTL_FILE_DIR](image)

  For more information on ERO, see attached document below:

  ![ERO config on Oracle.doc](image)

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\(^5\) In fact, it should work OK on UTF8, but we shall stick with the default (AL16UTF16) here

\(^6\) This parameter works in conjunction with the Controller server preference `IDX_COST_ADJ`. This allows the possibility to tune Oracle server setting `optimizer_index_cost_adj` during the `xdb` query in report generator. The setting is reset to default value in current Oracle instance after `xdb` query. Cognos recommends a setting between 4-20 but this must be evaluated carefully at each customer site.
• Typically, for Oracle 10G the other (default) values inside “All Initialization Parameters” are OK
• **NEXT**
• At the “database storage” screen, choose your preferred values, then **Next**

**TIP:** Redo logs can have a large impact on performance. Therefore, please seriously consider not using redo logs, for maximum performance

• **Finish, OK**

This will start the Database creation process
  o **Click Close.**

Once this is finished, fill in the database passwords (**and remember them!!!**)

![Database Configuration Assistant](image)

... and click **Exit**
Secondly, we shall create a database for the Controller 8 "ContentStore":

- Again use the "Database Configuration Assistant"
- Select "Create a database", then **Next**
- Choose "New Database" (see below)

<table>
<thead>
<tr>
<th>Select</th>
<th>Template Name</th>
<th>Includes Datafiles?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data Warehouse</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>General Purpose</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td><strong>New Database</strong></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Transaction Processing</td>
<td>Yes</td>
</tr>
</tbody>
</table>

- Complete the following as appropriate (e.g. call database "cs"):
  
  Global Database Name: **cs.test**

  A database is referenced by at least one Oracle9i instance which is uniquely identified from any other instance on this computer by an Oracle System Identifier (SID).

  SID: **cs**

  (in the above example, we are creating the Cognos "ContentStore" repository database - called "cs" – which stores some configuration information regarding Controller's Cognos8 BI "run-time" reporting system).

- **Next**

- In the "management options", configure as desired (typically accept the defaults), and click **Next**

- Inside "Database Credentials", choose a password (and **remember the password!**), then **Next**
- "Storage Options" – typically click **Next**
- "Database File Locations" - typically click **Next**
- "Recovery Configuration" - typically click **Next**
- "Database Content" - typically click **Next**

- "Initialization Parameters"
  - In the "memory" tab, the remember that the ContentStore is typically small and relatively infrequently used
    - therefore there is no need to allocate a huge amount of memory
    - For example, I often choose **20%**
  - In the "sizing" tab, I shall leave the number of "processes" as the default **150**
Click the **Character Set** tab
- On Window Servers:
  - Use "Unicode" and "AL32UTF8" (you could use AL16UTF16)
  - Choose **National Character Set AL16UTF16** (not UTF8, which is your only other option)

Next
- In the "Connection" tab, choose the default ("dedicated server mode")

Typically, for Oracle 10G the values inside "All Initialization Parameters" are OK

**TIP**: Redo logs can have a large impact on performance. Therefore, please seriously consider not using redo logs, for maximum performance

Finish, OK

This will start the Database creation process
Finally, consider creating a new database for storing the Data Mart data

- This is an optional step.
- For full details, see page 46/47 of ctrl_inst.pdf.
- Controller can publish its data to a "Data Mart" for reporting from other Cognos (and 3rd party) tools.
- Most customers do not use this functionality, but if you do then you may want to create a separate dedicated database for this data.

For example, repeat the instructions on pages 8 to 11, but:
  - instead of calling the database "ccr" you might call it "ccrDataMart"
  - you can skip the ERO/UTL_FILE_DIR section

7 Alternatively, you can merely publish data to a new “user/schema” inside the existing Controller application database repository (i.e. the first database that we created earlier in this section).
(4) Scripts to run (e.g. for creating the tablespaces etc.)

To run the following scripts, launch an appropriate tool (e.g. SQLPlus Worksheet\(^8\)) and logon as an appropriate user (e.g. SYSTEM):

Tablespace creation - Overview

The older Controller 2.x generation of products required 6 tablespaces to be created (FRANGO_TABLE, FRANGO_INDEX, XDB_TABLE, XDB_INDEX, FRANGO_LOB, FRANGO_TEMP). You can still use this method for Controller 8.1.x with no problems (for more information, see separate document "02. Quick guide to installing Oracle 9i Server _and creating databases_ on Windows, for Controller 2.x or 8.x - Oct 2006.pdf").

However, since Controller 8.2, the official documentation (see page 42 of "ctrl_inst.pdf") now recommends the use of one tablespace only. We shall therefore do this here.

As per the official documentation (blue):

(6) Create a single tablespace and set it as the default tablespace for exclusive use by the user account that accesses the Controller database.

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\(^8\) Installing the Oracle 10g database server does *not* install SQL*Plus Worksheet. **Instead, you must install the 10G client afterwards.** During the wizard, chose the installation type ‘administrator’.

NOTE: it is not sufficient to simply do a custom install of the client and choose the SQL plus Java environment.
Tablespace creation - NOTES

- Naturally the following script should be edited, so that the correct file locations are in place, before running it
- This script may take a few minutes to run
- In theory you can rename the table "CONTROLLER_TABLE" to anything you desire. However, Cognos UK support recommends that you use the table name "CONTROLLER_TABLE" to make it quicker/easier for us to support you
  - Whatever table name you choose, you *must* make a note of it, since you will need to tell Cognos support the table name if you want to receive quick support with sending them your database
- The new tablespace should ideally have auto extend on, but you may get Oracle errors if the tablespace file exceeds 4G – check with your Oracle DBA for more info).
- It also *may* have extends autoallocate instead of using Uniform size (see examples).

WARNING:
- unless the situation is a controlled test environment, GO FOR LARGE ESTIMATES OF SIZE, for example, *at least* 20Gb

TIP:
- It is recommended that the temporary tablespace for Controller is created using locally managed temp files with uniform extent sizes of 128K. The 128K extent size is recommended because numerous modules such as consolidating make extensive use of global temporary tables, which also reside in the temporary tablespace. Since each user instantiates a temporary segment for these tables, large extent sizes may result in space allocation failures.
- If possible, place the tablespaces on separate disks from where the Oracle Home and the system tablespace are located. Index tablespaces should be separated from data tablespaces.
  - e.g.:
    - Disk0: Operative System
    - Disk1: Oracle_home
    - Disk2: System tablespace, temp and Undo tablespace.
    - Disk3: Controller_table

Again, I stress that the size of the tablespace(s) that we are creating are quite large. **This is necessary!** Please ensure that you do not restrict the sizes of the tablespace(s) unnecessarily, since the application probably will need large settings

Also, monitor the size used/available periodically, to ensure there is enough left. This is especially relevant for the "TEMP" tablespace
Tablespace creation - Steps

(1) Launch SQL Plus Worksheet and logon to the database as SYSTEM

![Oracle Enterprise Manager Login](image)

Username: system
Password: ********
Service: ccr
Connect as: SYSDBA

(2) Run the following script:

```sql
CREATE tablespace CONTROLLER_TABLE
Datafile 'D:\oracle\product\10.2.0\oradata\ccr\CONTROLLER_TABLE.DBF'
Size 20000M
AUTOEXTEND ON NEXT 50M MAXSIZE 32000M
NOLOGGING
ONLINE
PERMANENT
Extent management local AUTOALLOCATE
BLOCKSIZE 8K
SEGMENT SPACE MANAGEMENT MANUAL;
```

TIP: It will take a few minutes (e.g. 5 mins) to create the large file that is mentioned, so be patient and wait for the "tablespace created" message.
(5) User creation & granting permissions

As per the official documentation (blue - see page 42 of "ctrl_inst.pdf") we need to:

(3) Determine which user account Controller Web Services Server will use to access the database.
   • In this example, I shall create a new user/schema called "controllerlive"
   • You may (for example) create more than one (e.g. controlertest, controllertraining etc.)

(4) Grant the following privileges to the user account that accesses the database:
create session, alter session, create table, create database link, create sequence, create trigger, create view, create procedure, create materialized view, create synonym, create job, select_catalog_role, unlimited tablespace

(5) Connect as sys and grant execute privileges to the user account for the DBMS_LOCK procedure.

You can do this by running a modified version of the following script:

```sql
-- NOTE: Replace <user> and <password> with the user and password to be created.
create user <user>
    identified by <password>
    default tablespace controller_table;
grant create session, alter session, create table, create database link, create sequence, create trigger, create view, create procedure, create materialized view, create synonym, create job, select_catalog_role, unlimited tablespace to <user>;
grant execute on dbms_lock to <user>;
```

For example:

```sql
create user controllerlive
    identified by controller
    default tablespace controller_table;
grant create session, alter session, create table, create database link, create sequence, create trigger, create view, create procedure, create materialized view, create synonym, create job, select_catalog_role, unlimited tablespace to controllerlive;
grant execute on dbms_lock to controllerlive;
```
(6) Post-install performance tips and maintenance recommendations

The Controller super-user can "optimise" the database from within the Controller application itself.

i.e. the end-user should (fairly regularly) perform an optimise with the 'Analyze schema' option ticked, to ensure that performance is "tip-top".

However, in addition, the Oracle DBA can play his/her part by regularly automatically running jobs to optimise the database. For complete information, see page 27+ of ctrl_inst.pdf.

TIP: The following SQL statement should be scheduled to be run weekly in Oracle!

Cognos 8 Controller provides an SQL procedure that analysis the schema in the Controller database and gathers the appropriate statistics, which Oracle requires for optimal performance. This procedure can be run by the Controller user, but we recommend that you create a job (e.g. called "Analyze_Controller_Schema_week") and schedule it to run automatically on a weekly basis, for example by using the following script:

```sql
DECLARE JOB BINARY_INTEGER;
BEGIN
DBMS_SCHEDULER.create_job (  
  job_name => 'Analyze_Controller_Schema_week',  
  job_type => 'PLSQL_BLOCK',  
  job_action => 'BEGIN PRC_ANALYZE_SCHEMA; END;',  
  start_date => SYSTIMESTAMP,  
  repeat_interval => 'freq=weekly; byday=sat; byhour=9; byminute=0; bysecond=0;',  
  end_date => NULL,  
  enabled => TRUE,  
  comments => 'Analyze schema job to be run Saturdays 9:00 AM');
END;
```