



## **ENOVIA SmarTeam**

# **Oracle 10g R2 Installation Guide for Server and Clients**

© Dassault Systèmes, 2004, 2009. All rights reserved.

CATIA, ENOVIA, SMARTEAM and the 3DS logo are registered trademarks of Dassault Systèmes or its subsidiaries in the US and/or other countries.

**PROPRIETARY RIGHTS NOTICE:** This documentation is the property of Dassault Systèmes. This documentation shall be treated as confidential information and may only be used by employees or contractors of the Customer in accordance with the terms of the End-User License Agreement accepted by Customer.

Any use of the Licensed Program contained in this media or accompanying it, is subject to the terms of the End User License Agreement accepted by Customer. The Licensed Program is protected by international copyright laws and international treaties. Unauthorized use, reproduction and/or distribution of any of the Licensed Program, or any part thereof, may result in severe civil and/or criminal penalties, and will be prosecuted to the maximum extent possible under the law. Company names and product names mentioned herein are the property of their respective owners and certain portions of the Licensed Program contain elements subject to copyright owned by these entities. See the Documentation CD provided with the Licensed Program for details and/or additional terms and conditions relating to these entities.

Part Number: DBM-19-190409

# Table of Contents

Table of Contents iii

<b>Chapter 1: Introduction</b>	<b>1</b>
Overview	1
Use of Oracle Components	1
Software Location	1
Related Documentation	2
Internet Site	2
<b>Chapter 2: Installation Checklist</b>	<b>3</b>
Oracle Server Installation Checklist	3
Oracle Client Installation	4
<b>Chapter 3: System Requirements</b>	<b>5</b>
Hardware and Software Requirements	5
Server Requirements	5
Client Requirements	5
Order of Installation	6
Compatibility	6
Prerequisites for Oracle Server Installation	6
<b>Chapter 4: Oracle Server Installation Process</b>	<b>9</b>
Installing Oracle 10g R2	9
Running the Oracle Server Installation	9
Standard Edition Installation	12
Running Network Configuration	15
<b>Chapter 5: Database Configuration Assistant Server Post Installation</b>	<b>17</b>
Adjusting SQLNET.ORA	17
Applying Oracle Patches	18
Setting Up Oracle Databases	18
Creating an Oracle Database	18
Configuring Oracle Database Initialization Parameters	24
Oracle Server Setup	32
Oracle Database Schema	32
Single SmarTeam Database Schema in Oracle Instance	32

Database Privileges for SmarTeam Database Schema .....	33
Creating a SmarTeam Database .....	33
<b>Chapter 6: Oracle Client Installation Process .....</b>	<b>35</b>
Installing Oracle 10g R2 Client .....	35
Before-Installation Activities .....	35
Running the Client Installation .....	35
Client Installation Types .....	38
Exiting Oracle Installer .....	40
<b>Chapter 7: Oracle Client Post Installation .....</b>	<b>43</b>
Unable to Connect to Database .....	43
Adjusting SQLNET.ORA .....	43
Connecting by SmarTeam to the Oracle Server .....	43
Oracle Client Setup .....	43
<b>Chapter 8: Troubleshooting .....</b>	<b>44</b>
Installation Troubleshooting .....	44
Uninstalling Oracle Server .....	44
Uninstalling Oracle Client .....	44
Converting the Standard Edition to Enterprise Edition .....	45
<b>Appendix A: Oracle Fine Tuning for SmarTeam – Editor Implementer .....</b>	<b>46</b>
Introduction .....	46
Essentials .....	47
Configuring Oracle Parameters .....	47
Memory Tuning .....	47
SGA .....	47
DB_BLOCK_SIZE .....	47
Log Buffer .....	48
MTS .....	48
Memory Parameters PGA/UGA Tuning .....	48
Overall Memory Calculation .....	48
Advanced Oracle Memory Tuning .....	49
I/O Tuning and Data Processing .....	50
General Settings .....	50
Tables and Indexes .....	51
Collecting Statistics .....	52
REDO Logs .....	52
Rollbacks .....	52
Backup and Recovery .....	52
Replication .....	53
Applying Configuration Changes .....	53
OS Throughput Performance .....	53
General Recommendations .....	54
Case-Sensitive Queries .....	55

Data Model Designer Performance Improvement Tips .....	55
More Performance Improvement Tips .....	56

# Chapter 1: Introduction

## Overview

This document outlines the procedures required to install an Oracle Server and Oracle Client for the SmarTeam environment.

This guide assumes knowledge and experience in installing Oracle, including the installation of previous Oracle versions. The main purpose of this document is to highlight the installation procedure and the components of an Oracle database that are required by SmarTeam related applications.

## Use of Oracle Components

The Licensed Products you have purchased, as defined in the license agreement applicable to such Licensed Products (the "Program License Agreement"), are shipped with the Oracle Component, as defined in the Oracle Component Sublicense Agreement and subject thereto.

You are authorized to use this Oracle Component only in conjunction with and in support of the Licensed Products you have purchased from SmarTeam, and are authorized to install and use this Oracle Component only in association with your licensed use of the Licensed Products for the storage and management of data used or generated by the Licensed Products and not for any other data management purposes.

## Software Location

SmarTeam Corporation supplies Oracle 10g R2 (10.2) Enterprise Edition CDs in the following configurations:

- Oracle 10g release Enterprise Edition - 1 CD
- Oracle 10g release 2 (10.2) Client - 1 CD
- Oracle 10g release 2 (10.2) Documentation, Viewable - 1 CD

## Related Documentation

The following document is referred to in this guide. This document can be located on the Oracle 10g R2 Database Documentation CD by clicking index.htm and navigating to Upgrade Information, Upgrade Guide..

Document	Remarks
Oracle Database Upgrade Guide	For upgrading from any Oracle version to Oracle 10g R2.

## Internet Site

You are highly recommended to frequently visit our website for the latest updates and plug-in products, including the latest Service Packs, Program Directory (Release Notes) Hotfixes and technical support at <http://support.smarteam.com/>.

In addition, you will also be able to view any installation known issues.

# Chapter 2: Installation Checklist

There are two types of installations for the Oracle 10g R2 software:

- **Oracle Server Installation:** Installs Oracle 10g R2 software on a designated server
- **Oracle Client Installation:** Installs Oracle 10g R2 software on a workstation

**Note:** The installation process for both are different. You must complete all stages of this checklist to successfully install Oracle 10g R2.

## Oracle Server Installation Checklist

\*Requirement: M = Mandatory, O = Optional

<input type="checkbox"/>	Item	M/O*	Reference
Stage 1: Pre-Installation			
<input type="checkbox"/>	Define installer privileges as a member of the local Administrator's group	M	See <a href="#">Prerequisites for Oracle Server Installation</a>
<input type="checkbox"/>	Uninstall previous versions of Oracle	M	See <a href="#">Uninstall Previous Versions:</a>
Stage 2: Installation Process			
<input type="checkbox"/>	Install Oracle 10g R2 Server software	M	See <a href="#">Running the Oracle Server Installation</a>
<input type="checkbox"/>	Configure the Oracle 10g R2 network	M	See <a href="#">Running Network Configuration</a>
Stage 3: Post Installation			
<input type="checkbox"/>	Adjust the SQLNET.ORA configuration file for SmarTeam applications, e.g., SmarTeam – Multi-site	M	See <a href="#">Adjusting SQLNET.ORA</a>
<input type="checkbox"/>	Apply latest Oracle patch/patchset	M	See <a href="#">Applying Oracle Patches</a>
<input type="checkbox"/>	Create the Oracle database	M	See <a href="#">Creating an Oracle Database</a>
<input type="checkbox"/>	Configure the Oracle Database Initialization Parameters	M	See <a href="#">Configuring Oracle Database Initialization Parameters</a>
<input type="checkbox"/>	Perform the Oracle Server Setup	M	See <a href="#">Oracle Server Setup</a>



## Oracle Client Installation

<input type="checkbox"/>	Item	M/O*	Reference
<b>Stage 1: Pre-Installation</b>			
<input type="checkbox"/>	Define installer privileges as a member of the local Administrator's group	M	See <a href="#">Prerequisites for Oracle Server Installation</a>
<b>Stage 2: Installation Process</b>			
<input type="checkbox"/>	Install Oracle 10g R2 Basic Client software	M	See <a href="#">Basic Client</a>
<input type="checkbox"/>	Install Oracle 10g R2 Administrative Task Client	M	See <a href="#">Administrative Tasks Client</a>
<b>Stage 3: Post Installation</b>			
<input type="checkbox"/>	Grant read permission for the Oracle Home Directory to authenticated users	M	See <a href="#">Unable to Connect to Database</a> for details
<input type="checkbox"/>	Adjust the SQLNET.ORA configuration file for SmarTeam applications, e.g., SmarTeam – Multi-site	M	See <a href="#">Adjusting SQLNET.ORA</a> for details
<input type="checkbox"/>	Verify that the OLEDB Provider registered successfully, if you are a Microsoft Windows XP user If the OLEDB Provider failed to register, register it	M	See <a href="#">Connecting by SmarTeam to the Oracle Server</a> for details
<input type="checkbox"/>	With the SmarTeam Database Connection Manager, create an alias for your SmarTeam schema in the Oracle database	M	See SmarTeam Database Connection Manager Guide for details
<input type="checkbox"/>	Perform the Oracle Client Setup	M	See <a href="#">Oracle Client Setup</a> for details

# Chapter 3: System Requirements

## Hardware and Software Requirements

Refer to the Oracle section in the Hardware and Software Requirements documentation. This section provides details of the hardware, software and system requirements required for a successful server and client installation of the Oracle 10g R2 software.

In addition, you determine the size of the specific customer configuration. Contact the SmarTeam support team to obtain the most recent metrics, test results and recommendations.

### Server Requirements

This installation presumes that you have the following hardware and software configuration:

- Number of CPUs: 1 (2 are recommended)
- Minimum Processor Type: Pentium III, 700 MHz
- RAM: 512MB
- Hard-disk drive space: 4.5 GB [3GB for installation + 1.5 GB for database]
- OS: Windows 2000 SP3

**Notes:** Even though Oracle software functions with the minimum system requirements, we highly recommend that you use a computer with higher than the minimum requirements.

### Client Requirements

#### Custom Client

165 MB of free disk space is required for an Oracle Custom client installation.

#### Administrator Client

510 MB of free disk space is required for an Oracle Administrator client installation.

For other hardware configurations, refer to the requirements recommended by your software vendor, for example, SmarTeam, CAD, and Office.

## Order of Installation

Refer to [Chapter 2, Installation Checklist](#) for a detailed list of all the steps that need to be performed.

The installation procedure is split into the following stages:

Stage 1: Consists of analyzing the prerequisites required for installation [Chapter 3 Server Requirements](#) and [Client Requirements](#).

Stage 2: Consists of software installation and network configuration followed by some manual changes [Chapter 4 Running the Oracle Server Installation](#) and [Chapter 6 Client Installation Types](#).

Stage 3: Consists of creating the Oracle database [Chapter 5 Creating an Oracle Database](#) and [Chapter 7 Connecting by SmarTeam to the Oracle Server](#).

## Compatibility

This describes the compatibility of the different Oracle versions that are supported by SmarTeam. SmarTeam currently supports Oracle 10g R2. It is recommended to have both server and clients with the same version.

In general, all SmarTeam applications can work with different Oracle versions on server and client. However, the following applications must have the same version of Oracle on both client and server:

- SmarTeam – Multi-site Admin Tools applications: DBSiteManager, DataModelPropagator
- The SmarTeam – Editor's DataModelDesigner-family applications, working in the SmarTeam – Multi-site environment

In addition, all Oracle servers, working in the SmarTeam – Multi-site environment, must have the same version.

## Prerequisites for Oracle Server Installation

Before installing Oracle 10g R2 software, you must perform the following steps in the order specified for Oracle Server and Oracle Client installations:

### ■ Privileges Required for Installer User:

The Installer must be a member of the local Administrators group.

**Note:** Due to a known Oracle server limitation, you must not use a minus sign (-). Naming the Oracle user with a minus (-) sign might cause an error in SmarTeam applications.

### ■ Uninstall Previous Versions:

Oracle supports multiple Oracle homes of different versions (7.3.4.x, 8.0.x, 8.1.6.x, 8.1.7.x and 9i) working on the same computer. However, we recommend that you de-install previous versions. If you want to use your old databases with Oracle 10g R2, you should upgrade them according to Oracle Database Upgrade Guide.

**Note:** You cannot upgrade a database, which is prior to Oracle 8.1.7, directly to Oracle10g. Please refer to Oracle 8.17 Migration Guide and Oracle 9i Database Migration Release 2. If you are upgrading existing Oracle software, refer to the relevant native Oracle documentation for the required upgrade procedure.

# Chapter 4: Oracle Server Installation Process

## Installing Oracle 10g R2

This chapter provides a step-by-step description of the installation process for installing Oracle 10g R2 software on a designated server or local workstation.

There are two types of installation types for Oracle 10g R2 software:

- **Server:** Installs Oracle 10g R2 on the server. (see [Running the Oracle Server Installation](#) for details)
- **Client:** Installs Oracle 10g R2 on client machine, but uses a database located on a remote server (see [Running the Client Installation](#) for details)

### Buttons

These buttons are available at the bottom of the installation windows:

- **Next:** Confirms your selection in the current window and proceeds to the next window.
- **Previous:** Enables you to return to the previous window.
- **Cancel:** Allows you to exit the installation process.

## Running the Oracle Server Installation

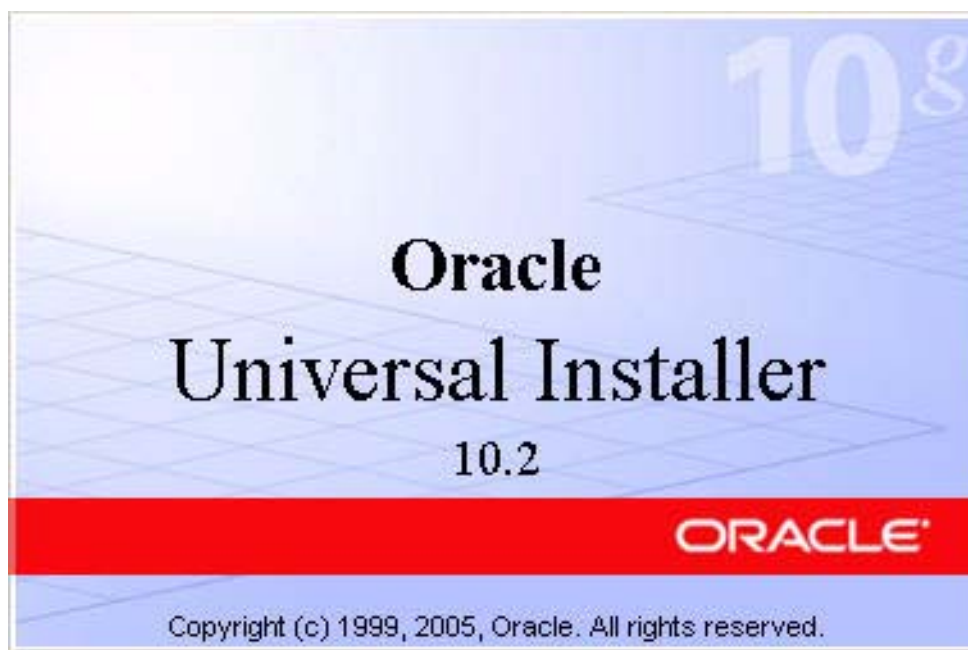
The Oracle Server installation process has two general steps:

- **Installing Oracle 10g R2 Software:** Installs all files on the server. This procedure presumes that you are installing the Oracle Software for the first time and not upgrading.
- **Network Configuration:** Configures the means by which the Oracle Server is recognized and connected on the network with Oracle Clients.

**Note:** The Oracle Server installation must be performed on the computer on which Oracle will be installed; installation using a Terminal Server will not succeed.

### *To begin installing:*

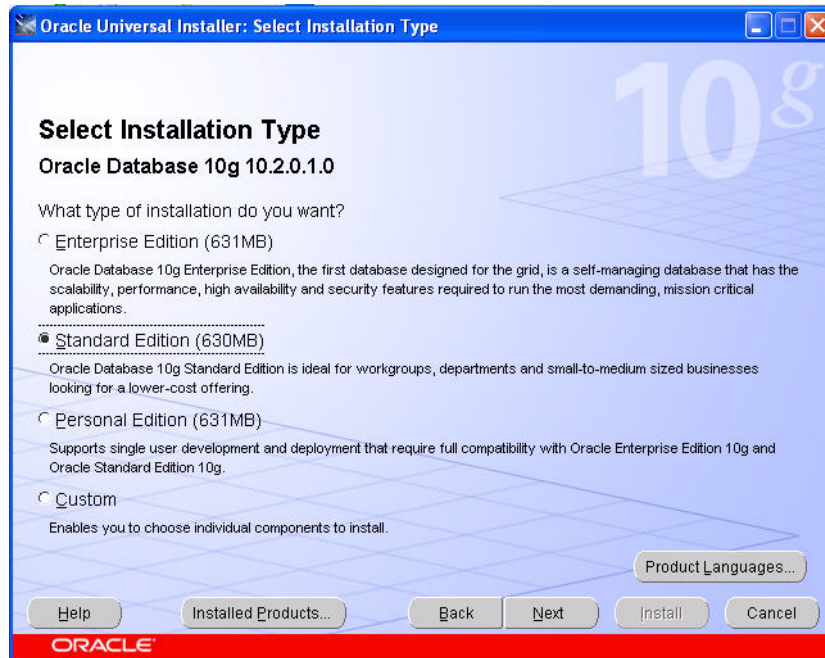
1. Run Oracle 10g Release 2 (10.2) - Oracle 10g R2 Server CD and launch the Oracle Universal Installer application by clicking **Install**.



2. In the Select Installation Method window, select **Advanced** from the checkboxes:
  - Basic
  - Advanced
3. In the Select Installation Type window, select **Standard** from the checkboxes:
  - Enterprise
  - Standard
  - Personal
  - Custom - Only, if you have a SmarTeam – Multi-site license, select **Custom**
  - Click **Next** and proceed with the installation as follows

**Notes:**

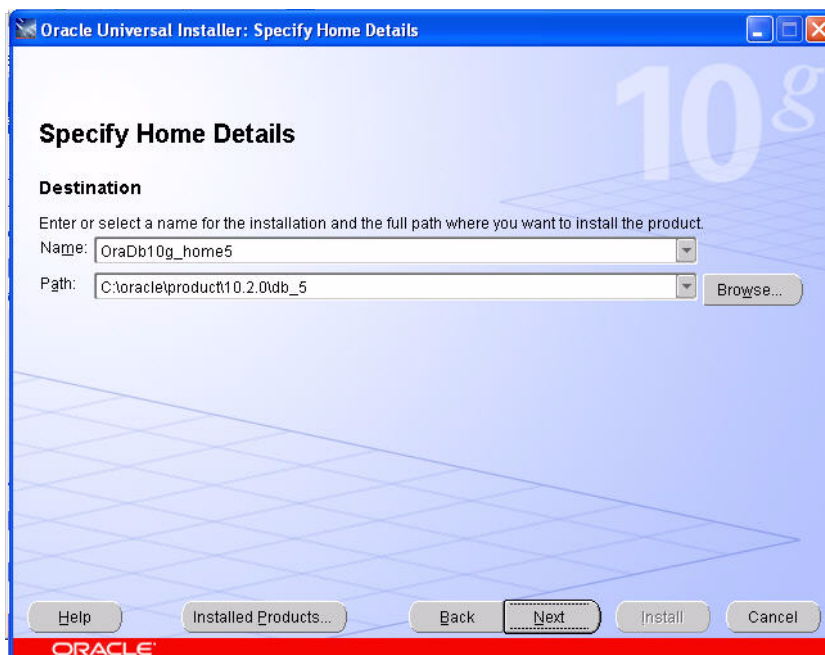
- Do NOT select Enterprise Edition or Personal Edition options as they include forbidden components
- The Custom installation type is essentially an Enterprise Edition installation type. The difference is that the default Enterprise Edition installation installs components that are forbidden to use in accordance with the license agreement. The Custom installation type provides the ability to select the specified list of the Enterprise Edition components that must be installed (required for SmarTeam – Multi-site)
- If you already have Standard Edition installed and need to install Custom for SmarTeam – Multi-site see [Converting the Standard Edition to Enterprise Edition](#)



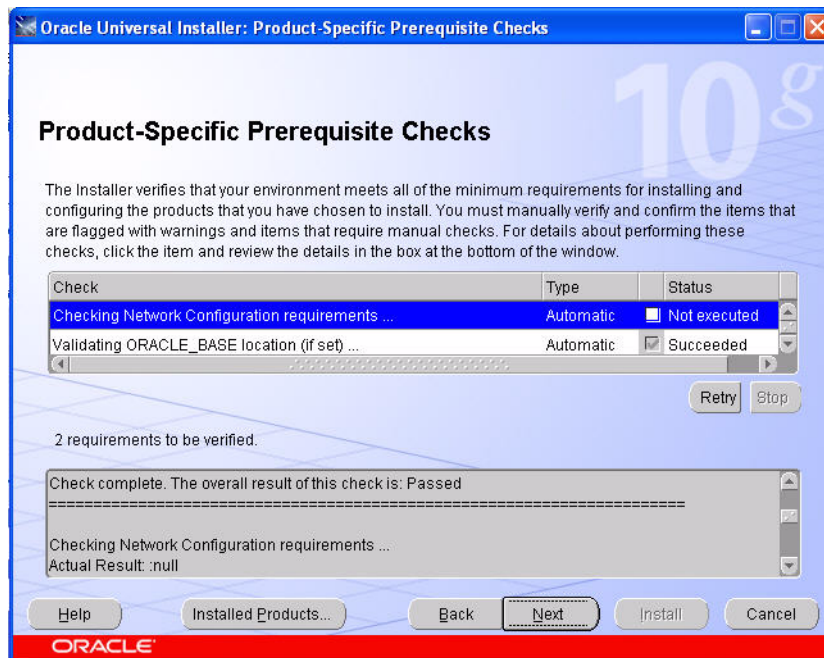
4. In the **Specify Home Details** window:

- The source path shows the location from where the Oracle installation is taken
- The destination path designates the Oracle Home - location where the Oracle software will be installed
- To change the destination path, click **Browse** and select a new destination path
- Click **Next**

**Note:** If a previous **Oracle** version is installed, you need to define a different path and name than the ones defined in that version.



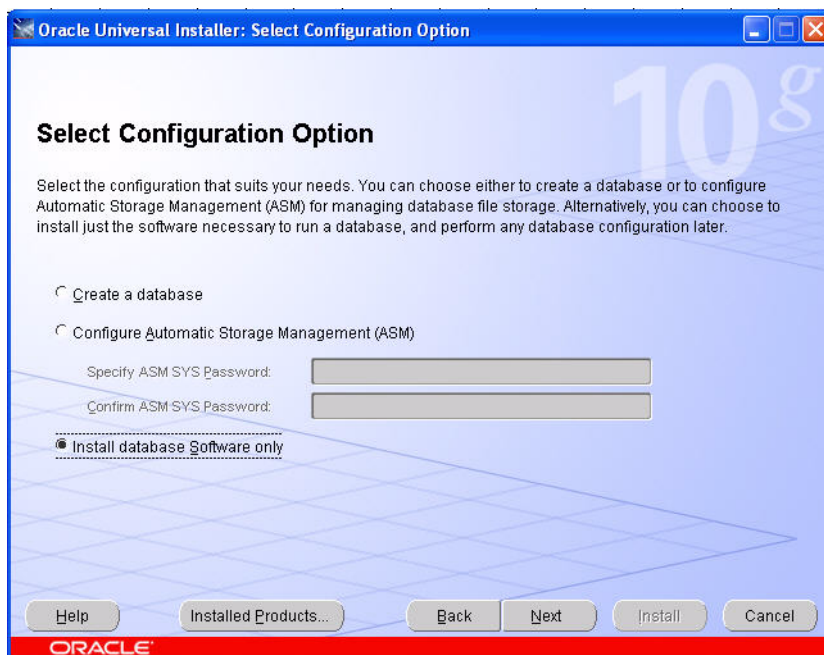
5. In the Product-Specific Prerequisites Check window, click **Next**.



## Standard Edition Installation

This section is relevant if you selected the Standard Edition in the Installation Types window.

1. In the Select Configuration Option window:
  - Install database software only
  - Click **Next**





2. After completing step 2 of the Oracle Standard Edition installation process, go to [Step 6](#) for further details.

For Custom Installation for SmarTeam – Multi-site go to the next step.

### Custom Installation for SmarTeam – Multi-Site

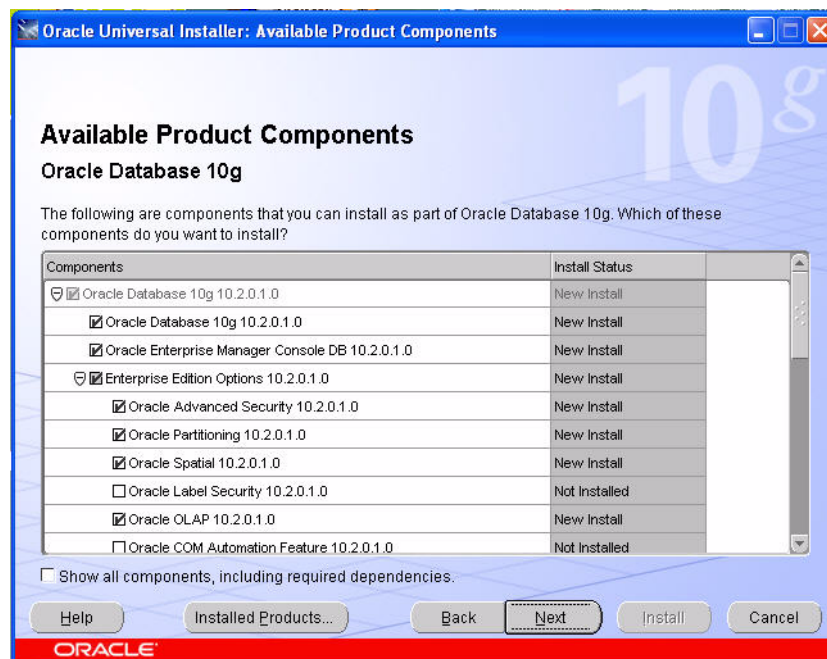
This section is relevant if you have a SmarTeam Multi-Site license and selected Custom in the Installation Types window.

3. In the Available Product Components window, select or clear the relevant components and click **Next**.

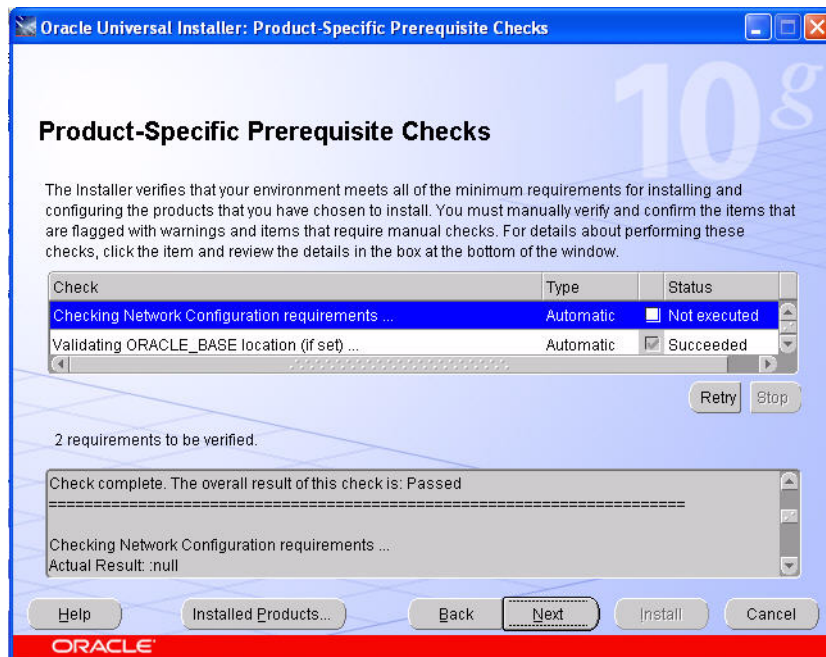
You may not be able to clear some components as they are protected based on the customization of other products in your machine.

If you are not able to remove a particular component, continue selecting and de-selecting and then return to the component you could not remove and try again. After completing your selections, recheck your list with the one displayed.

Oracle Database 10g (10.2.0.1.0)
Oracle Enterprise Manager Console DB (10.2.0.1.0)
Enterprise Edition Options (10.2.0.1.0)
Oracle Net Services (10.2.0.1.0)
Oracle Net Listener (10.2.0.1.0)

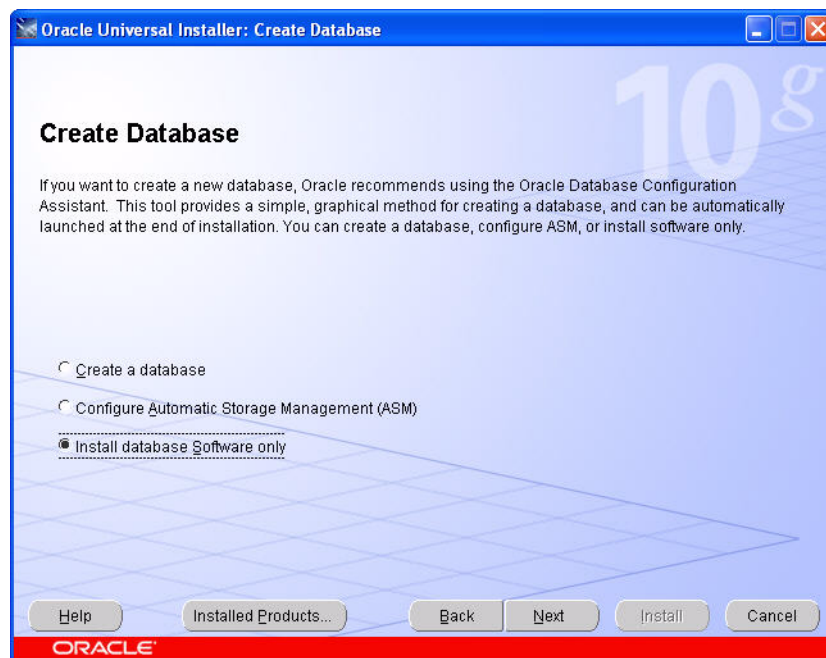


4. In the Product-Specific Prerequisites Check window, **Next**.



5. In the Create Database window:

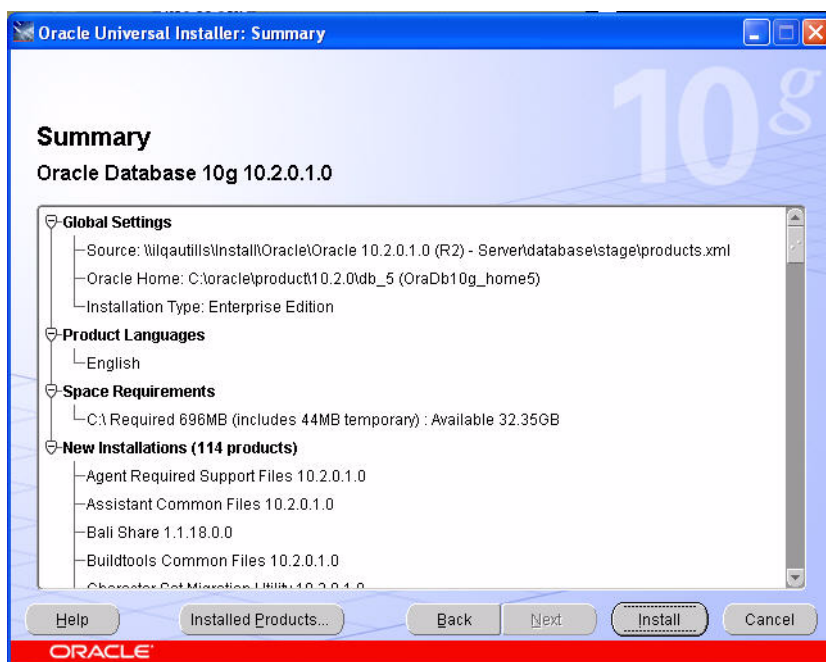
- Install database software only
- Click **Next**.



6. In the Summary window, which shows a list of all your selected options and components.

- If required, make changes by clicking **Previous** to reopen the Available Products Components window
- Click **Install** to start the Oracle 10g R2 installation

During the installation process, the Configuration Tools window indicates progress for specific installation stages.



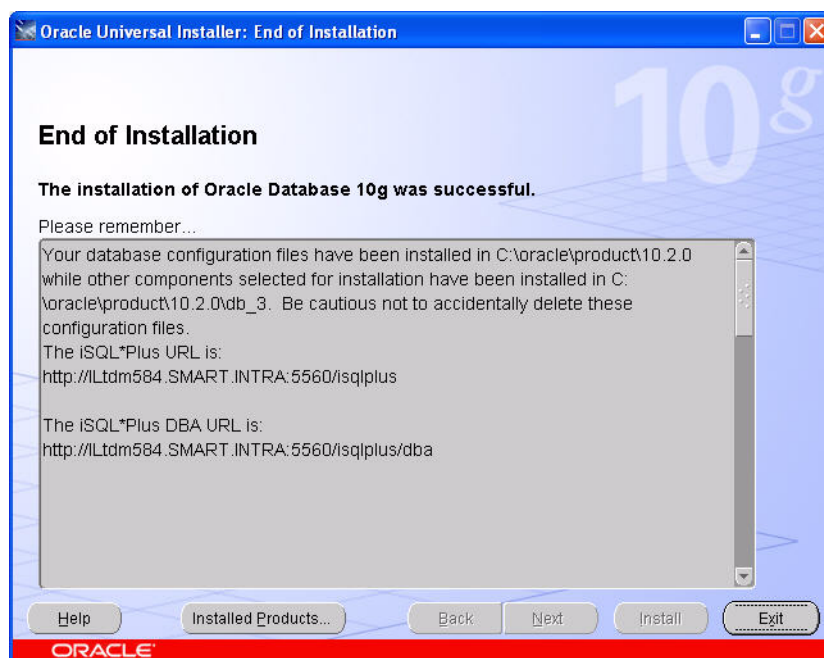
## Running Network Configuration

1. When the Oracle Net Configuration Assistant window appears:

- Select **Perform typical configuration**
- Click **Next**



2. At the end of Oracle 10g R2 Database Server Installation, the End of Installation window appears. Click **Exit** to close the Oracle Universal Installer.



**IMPORTANT!** You need to use the Oracle 10g R2 Client Installation procedure for installing the Enterprise Manager Utility. The server installation does not install this. Choose the **Enterprise Manager Java Console** component. For details on how to install the Enterprise Manager Utility, see [Oracle Client Installation Process](#).

# Chapter 5: Database Configuration Assistant Server Post Installation

After completing the Oracle 10g R2 installation process you must perform the following post-installation activities:

- Adjusting SQLNET.ORA
- Applying Oracle patches
- Setting Up Oracle Database
- Oracle Server Setup

## Adjusting SQLNET.ORA

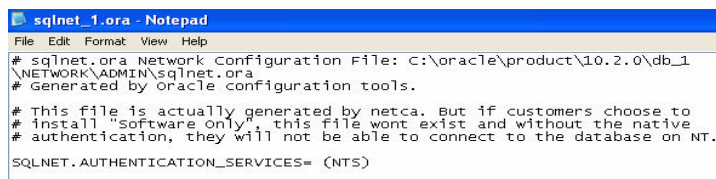
Adjust the configuration file SQLNET.ORA for SmarTeam applications (specifically SmarTeam – Multi-site).

Perform the following adjustments:

- **Disable NAMES.DEFAULT\_DOMAIN** by adding # at the beginning of the row. Disabling this option is necessary for SmarTeam – Multi-site to function correctly. Enabling this option affects the Oracle replication global name and service name resolution mechanism.
- **Disable SQLNET.AUTHENTICATION\_SERVICES** by setting the value to **NONE**. By setting the option to NTS (default), could prevent the Oracle client from connecting to the database if the client and database are located in different domains and there is no trust relationship between those domains. Thus, it is recommended to disable that option unless there is a special requirement for enabling it, for example, if you are using enterprise-level OS based authentication.

*To adjust SQLNET.ORA:*

1. Locate file SQLNET.ORA in <Oracle Home>\network\ADMIN, for example, C:\Oracle\product\10.2\db\_1\network\admin.
2. Open **SQLNET.ORA** file with any text editor, for example, Microsoft Notepad.



```
sqlnet_1.ora - Notepad
File Edit Format View Help
# sqlnet.ora Network Configuration File: C:\oracle\product\10.2.0\db_1
# NETWORK\ADMIN\sqlnet.ora
# Generated by Oracle configuration tools.

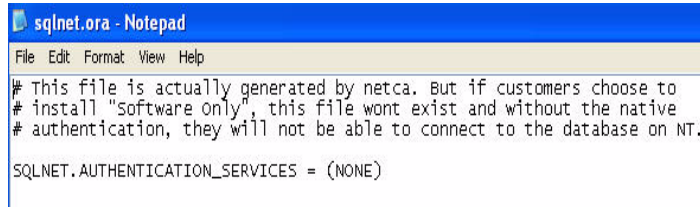
# This file is actually generated by netca. But if customers choose to
# install "Software only" this file wont exist and without the native
# authentication, they will not be able to connect to the database on NT.

SQLNET.AUTHENTICATION_SERVICES= (NTS)
```

3. Fix the Oracle SQL networking parameters by removing the **NAMES.DEFAULT\_DOMAIN** parameter line and setting SQLNET.AUTHENTICATION\_SERVICES to NONE.

**Note:** If these parameters lines do not appear, no change is required.

If the file SQLNET.ORA does not exist, it is recommended to create it.



```
# This file is actually generated by netca. But if customers choose to
# install "software only", this file wont exist and without the native
# authentication, they will not be able to connect to the database on NT.

SQLNET.AUTHENTICATION_SERVICES = (NONE)
```

## Applying Oracle Patches

SmarTeam works with the basic Oracle 10.2 version, but it is recommended that you obtain an access link to the ENOVIA SmarTeam support site, download and install the latest recommended patch/patchset. This patch/patchset includes a detailed installation Guide. For Microsoft Vista support, install patchset 10.2.0.3.

## Setting Up Oracle Databases

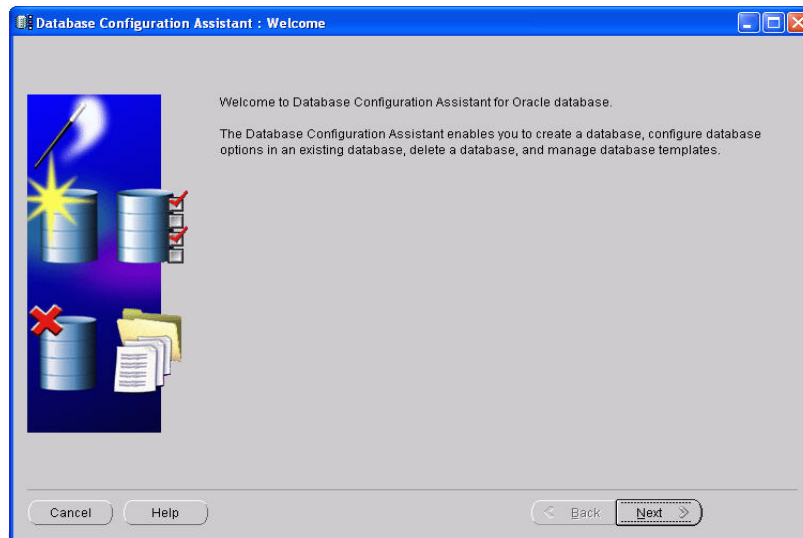
Setup activities include the following:

- Creating an Oracle Database
- Configuring Oracle Database Initialization Parameters
- Important Notes
- Oracle Server Setup

### Creating an Oracle Database

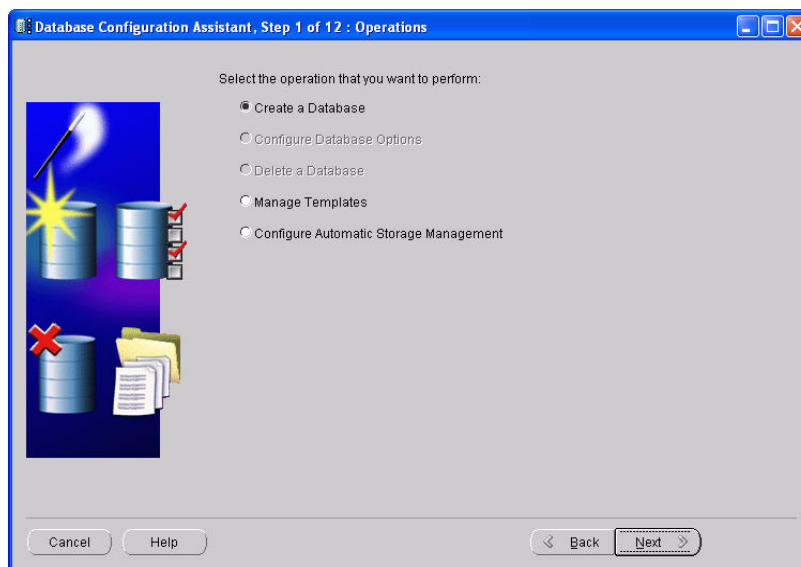
After installing the Retailer Server, the Oracle Database needs to be created.

1. From the **Start** menu:
  - Start **Oracle Database Configuration Assistant** window
  - Click **Next**



2. In the Oracle Database Configuration Assistant:

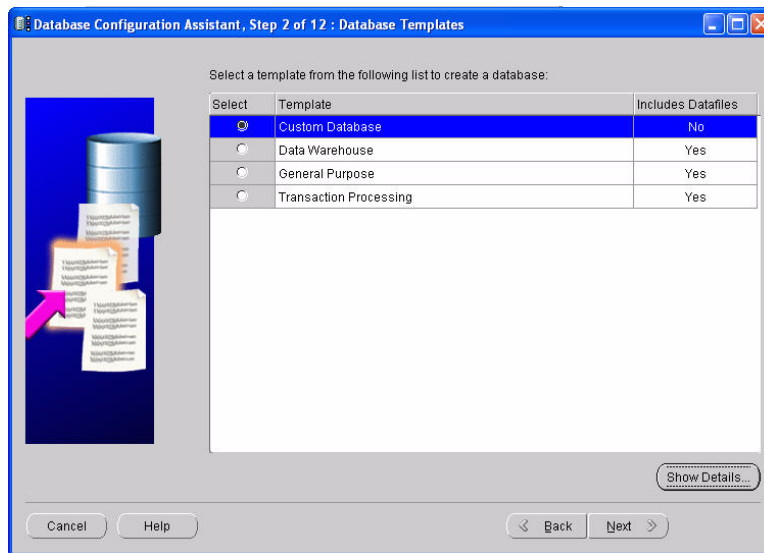
- Select **Create a database**
- Click **Next**



3. In the Oracle Database Configuration Assistant window:

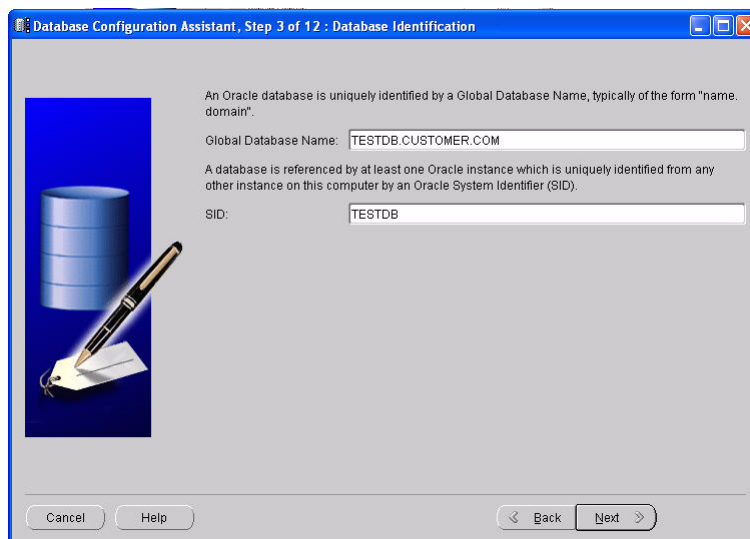
- Select **Custom Database**
- Click **Next**





4. In the Database Name window:

- Choose a **Global Database Name** for your database in the following format **DBNAME.DB\_DOMAIN**. For more information, refer to Oracle 10g R2 Concepts
- Click **Next**

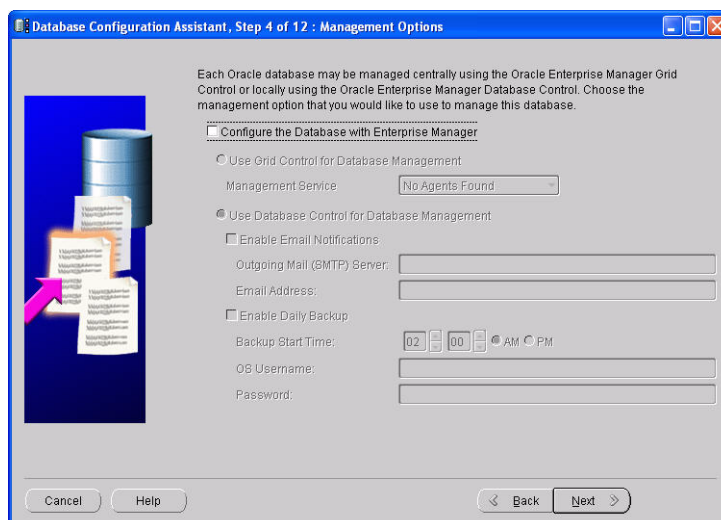


5. In the Oracle Database Configuration Assistant window:

- Clear the **Configure the Database with Enterprise Manager**
- Click **Next**

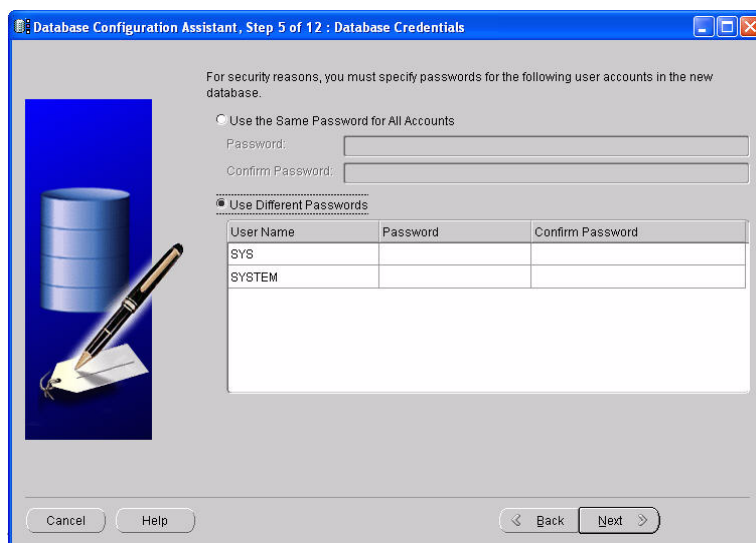
**Note:** This option is not necessary for SmarTeam functionality but could be checked if required by a specific customer environment.





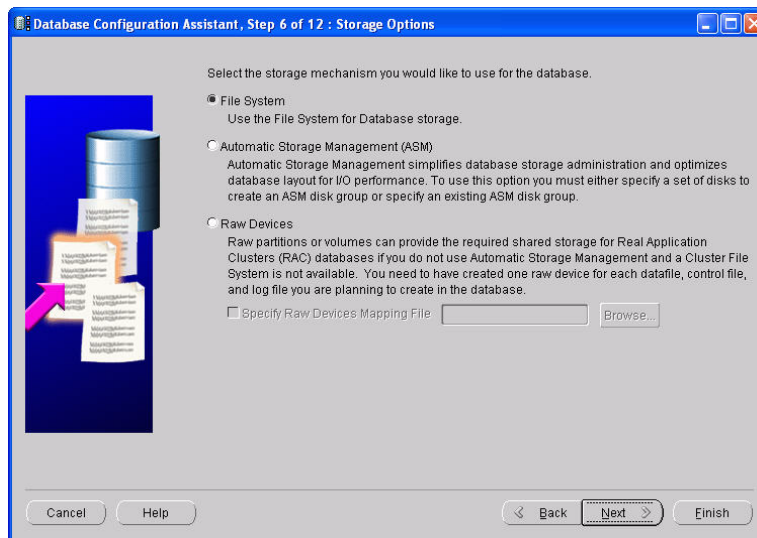
6. In the Database Credentials window:

- Set up Oracle administrative users passwords by selecting the Use Different Passwords option
- Click **Next**



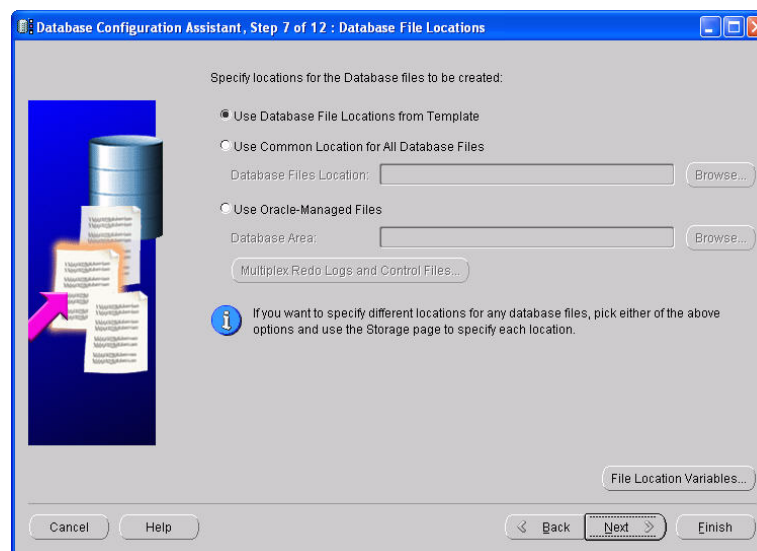
7. In the Storage Options window, set up the Oracle storage mechanism:

- Select the **File System** option
- Click **Next**



8. In the Database File Locations window, set up the default Oracle data files:

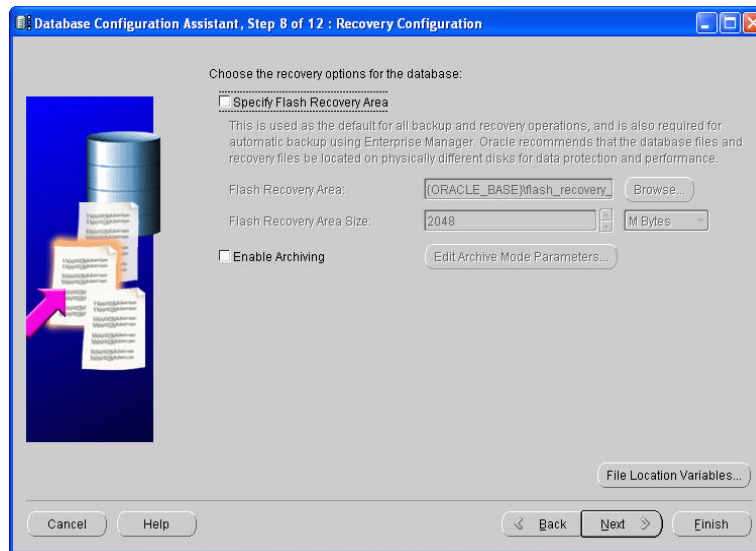
- Select the **Use Database File Locations from Template** option
- Click **Next**



9. In the Recovery Configuration window:

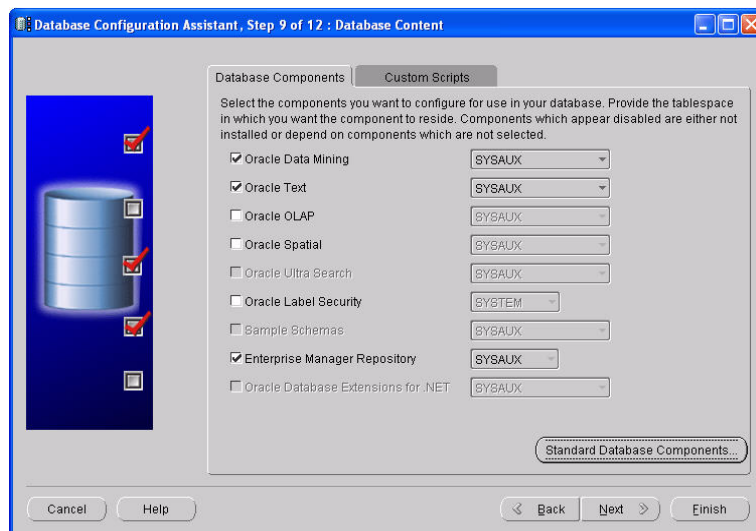
- Clear the **Flash Recovery Area** option
- Click **Next**

**Note:** This feature is not necessary for SmarTeam functionality; it requires additional administration and therefore is not recommended for the default installation.



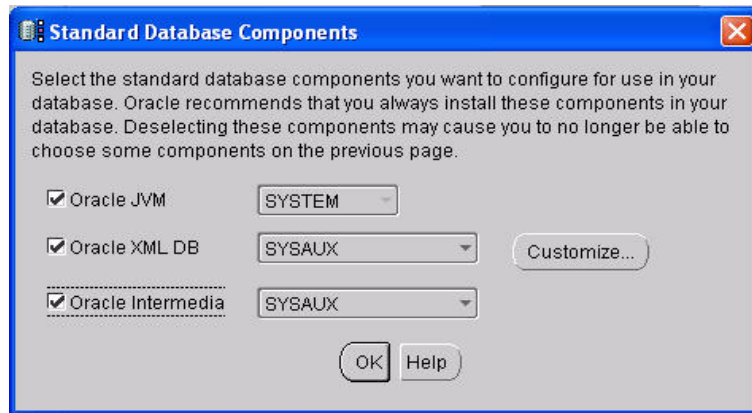
10. In the Database Content window:

- Clear the checkboxes:
  - Oracle OLAP
  - Oracle Spatial
  - Oracle Label Security
- Click the **Standard Database Components** button



11. In the Standard Database Components dialog:

- Verify the checkboxes are selected for:
  - Oracle JVM
  - Oracle XML DB
  - Oracle Intermedia



## Configuring Oracle Database Initialization Parameters

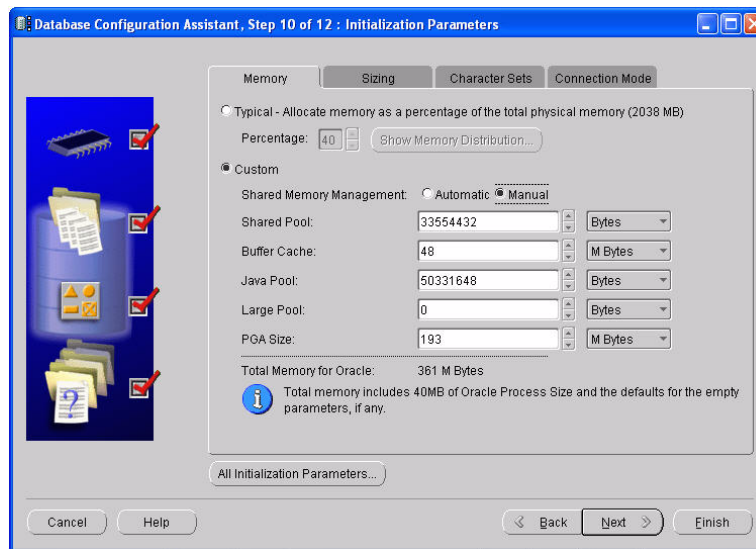
Before creating the Oracle Database, the parameters need to be set. It is very important to provide correct values for environment requirements such as the number of users and the estimated workload.

**Note:** The values shown in the windows below are examples and should be replaced with values relevant to the application. For more information, refer to *Oracle Fine-Tuning for SmarTeam Implementers*.

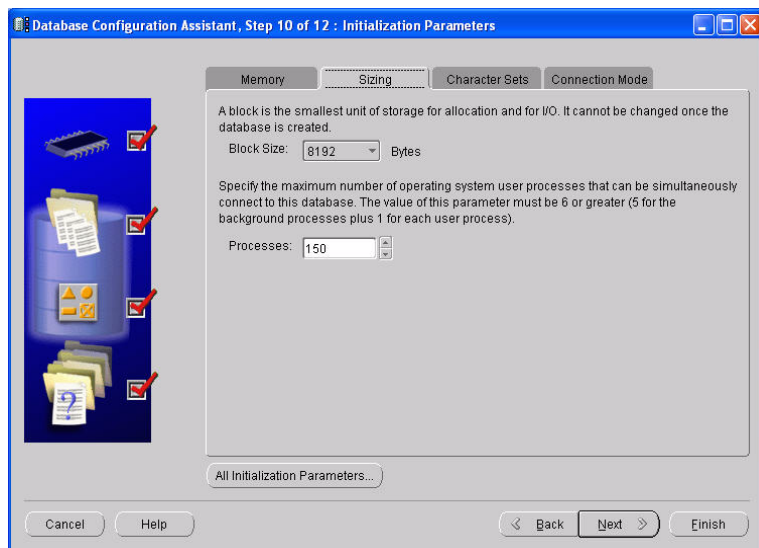
The tabs in the Initialization Parameters window, with the corresponding parameters are:

Tab	Parameter
Memory	Database memory allocation
Character Sets	Database character set
DB Sizing	Data Block sizing
File Locations	Initialization parameters file and Trace File Locations
Archive	Archive Log Mode

1. In the **Memory** tab of the Database Configuration Assistant, set up the Database memory parameters.
  - Typical:
    - Select a value for the Percentage of physical memory from the drop-down list
    - Select a Database Type from the drop-down list
  - Custom:
    - Select a value for the sizes of each of the Custom settings from the drop down lists
  - Click **Next**



2. In the **DB Sizing** tab of the Database Configuration Assistant, the option exists to change the default values accordingly. SmarTeam does not have any special requirements for those parameters, so you can set them according to your needs or leave the default values. For example, the value **BLOCK SIZE** can be set to 4 Kilobytes.



3. In the **Character Set** tab, you can set the database character set to one of the options according to the guidelines below and set the database national character set.

The options are:

- **Use the default**

The default character set is obtained by the Oracle Database Creation Assistance application from the OS regional settings. Therefore, it is usually set to **WE8MSWIN1252**, which is acceptable for all West European languages (English is always included).

- **Use Unicode** (do not use)

**Note:** Do not use this option. At present, SmarTeam does not support Unicode as a database character set. Choosing Unicode while working with double-byte languages (Chinese, Japanese) or specific characters of the Western languages (special French or German letters) may result in data corruption.

#### ■ Choose from the list of character sets

If you are going to use character set different from the default, for example if you plan to import a dump file from another Oracle database, you should configure the character set for the new Oracle database to be compatible with the character set in the Oracle database in which your dump file was created. For multi-byte languages such as Japanese, Chinese and Korean, their unique character-set must be used.

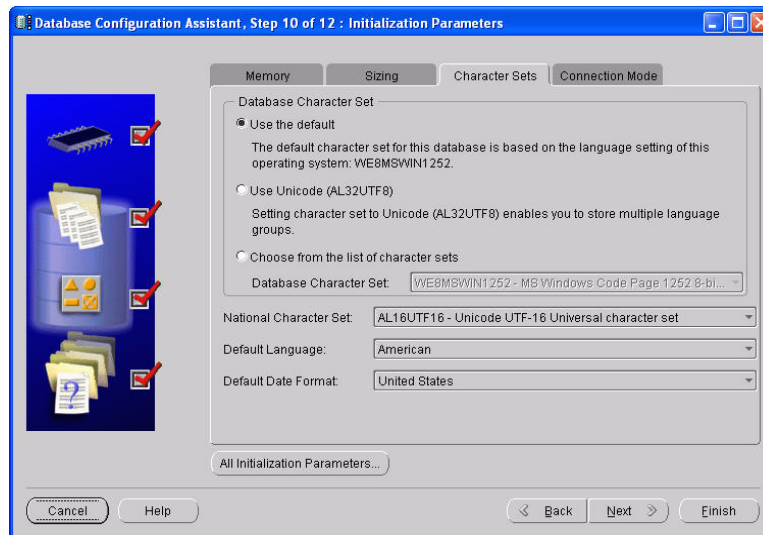
---

**IMPORTANT!** If you are planning to use the database in the SmarTeam – Multi-site system, all sites must have the same character set.

---

#### ■ National Character Set

For most cases, leave the default setting.



4. In the Oracle Database Configuration Assistant window:

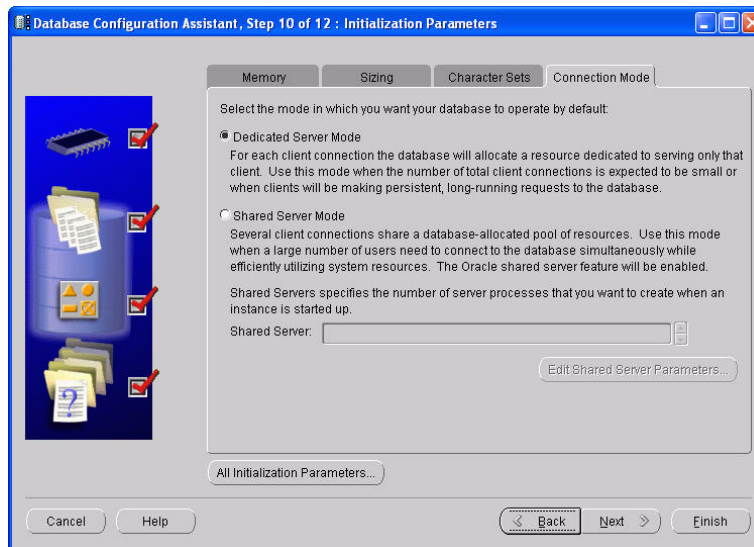
#### ■ Select the Connection Mode tab

■ In the Connection Mode tab, select the default mode for your database:

- **Dedicated Server Mode** provides better performance when you have sufficient resources on your computer to support all users
- **Shared Server Mode** is preferable if your system is likely to be overloaded by too many user connections

**Note:** It is recommended that you employ an experienced DBA to set this option.

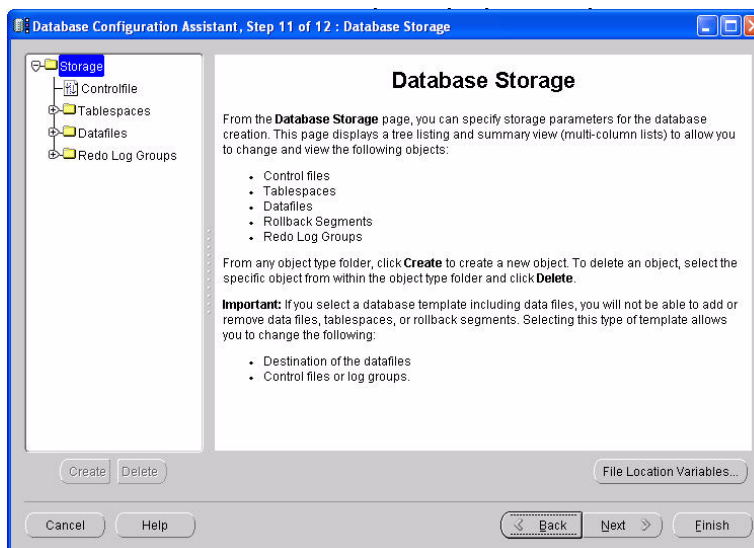
#### ■ Click Next



**Note:** We recommend that this option be set by an experienced DBA only.

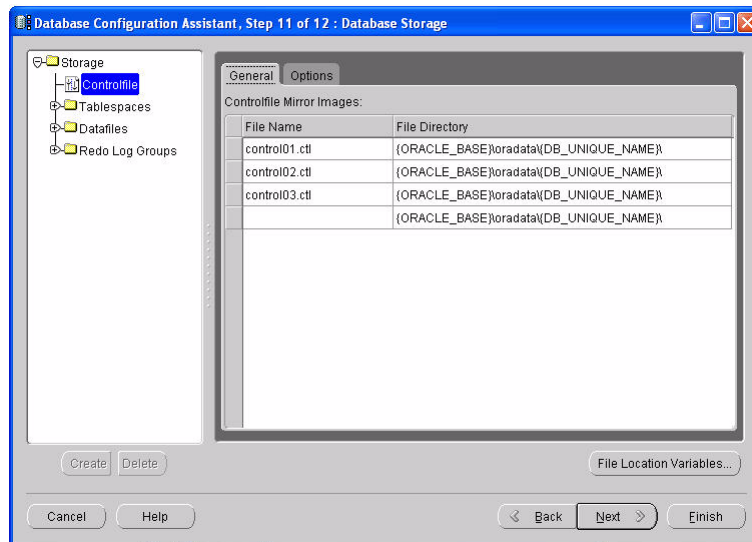
5. In the Database Storage window specify the storage parameters for database creation:

- In the **Storage Parameter** tree, select an object type
- Click **Create/Delete** to create/delete an object from the tree
- If you select the **Controlfile** node:
  - In the Controlfile, the Controlfile General tab window appears, it is recommended that you deploy the control files through your physical devices deploying control files through your physical devices in order to protect them from media crash.



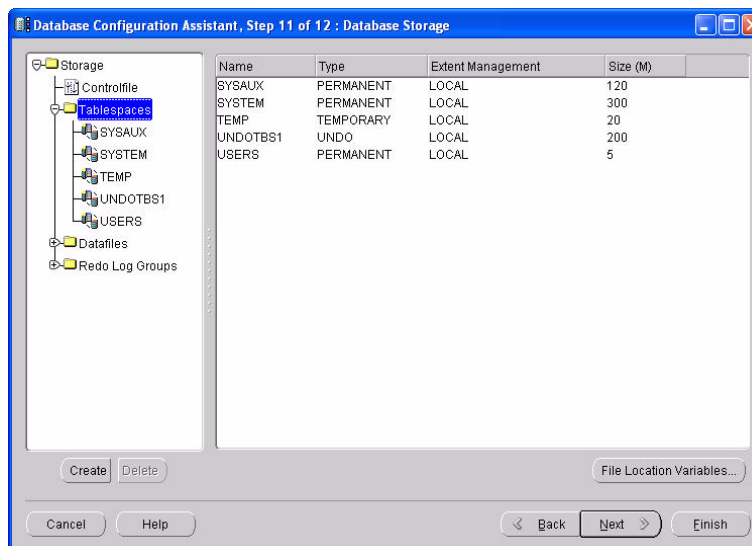
**Note:** We recommend deploying control files through your physical devices in order to protect them from media crash.





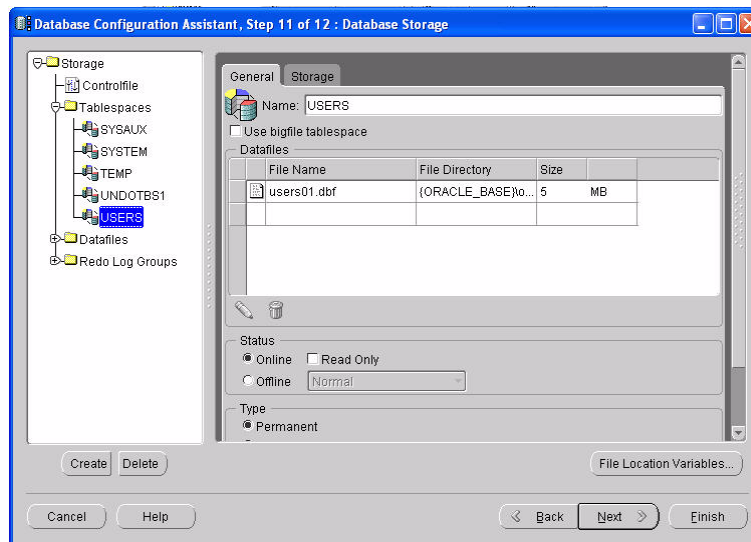
6. Expand **Tablespace** branch as shown at right in the left pane.

The default Oracle tablespaces and parameters are displayed. You can add new tablespaces on this page as well. It is recommended, however, to leave the USERS tablespace as the default tablespace. If you decide to use the USERS tablespace as a working tablespace you should enlarge it, as shown in the example in the next step. You can also consider redeployment of tablespaces through your physical devices in order to improve performance.



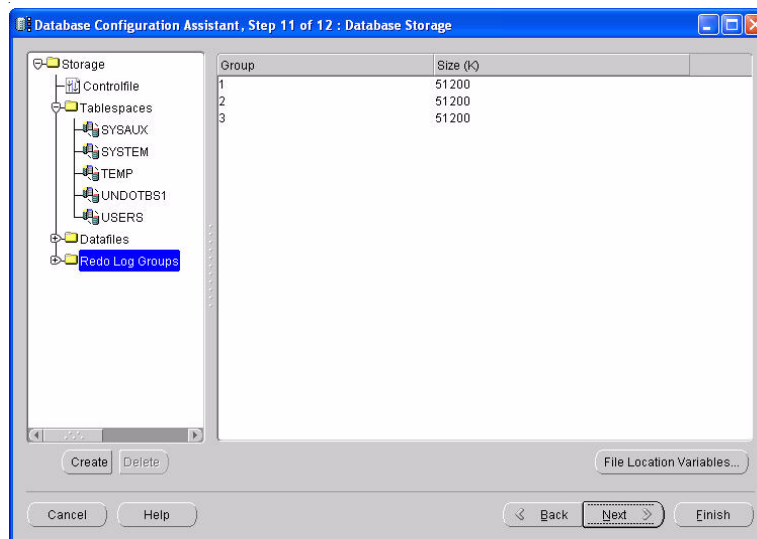
7. To enlarge the working tablespace, change the size of the datafile of the tablespace and/or add another datafile.





8. Set up Oracle database REDO logs according to your environment needs. The default values are sufficient for most installations:

- Set the Tablespace Storage Parameter
- Click **OK**
- Click **Next**



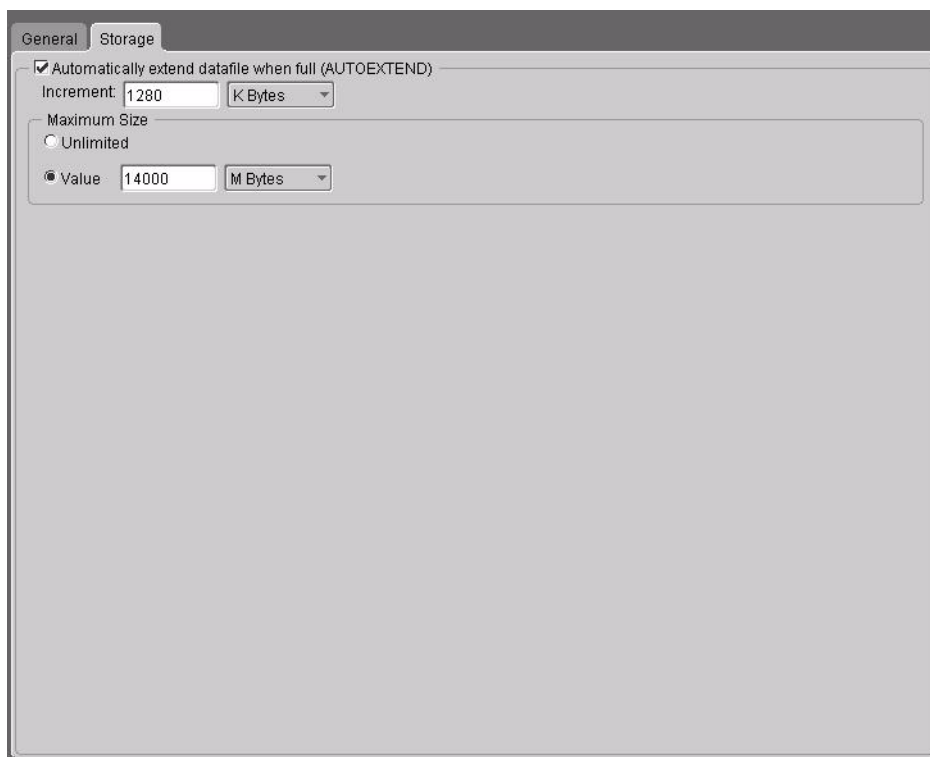
### Important Notes

- It is recommended to separate tables and indexes through distinct tablespaces for better performance. You can use SmartDBRepairing utility to do this. If you decide to move indexes to another tablespace – INDX by default – you have to enlarge it beforehand.
- SmarTeam – Multi-site database site requires larger SYSTEM tablespace than a regular database. For more information about specific requirements for SmarTeam applications, refer to the respective installation guides and other documentation. You can perform all these tasks after the database creation has been completed.

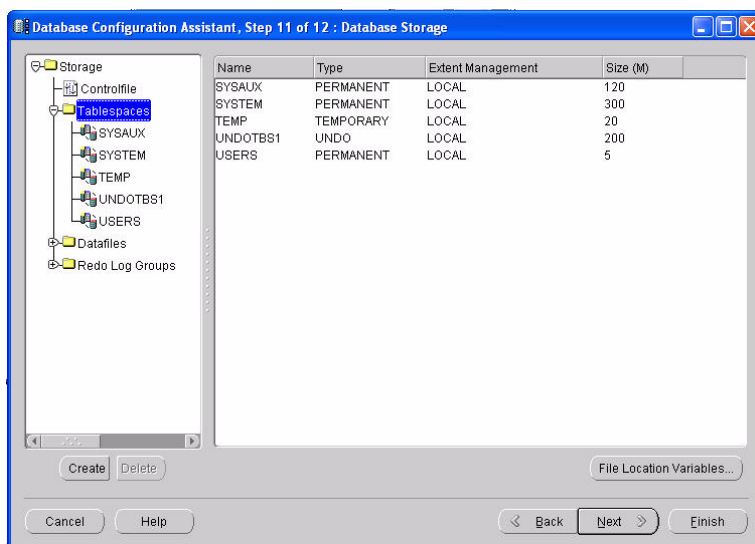
- Oracle recommends setting tablespace storage parameters to **AUTOMATIC** allocation (**LOCALLY** managed tablespace). This is set by default for all tablespaces in the installation. If you want to create additional tablespaces it is recommended to leave that default value as well.

9. In the Storage tab pane of the Database Storage window:

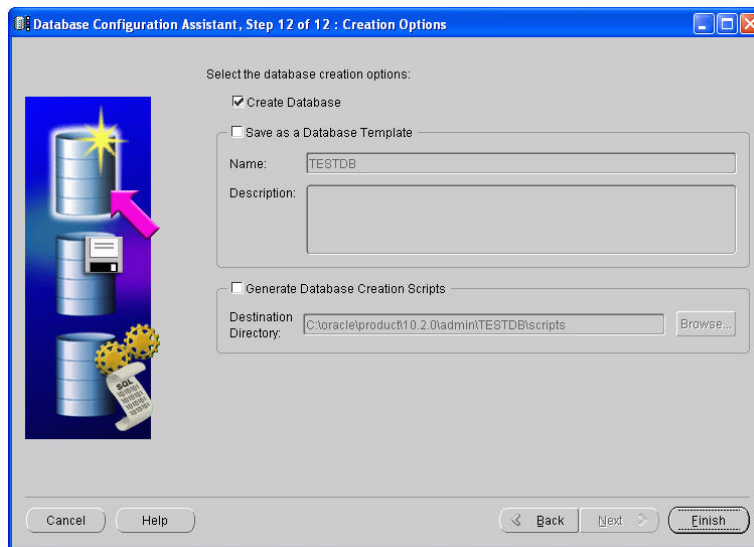
- Select the **Value** radio button
- Type a storage value in the field
- Select a storage value size in megabytes or kilobytes from the dropdown list
- Click **OK**



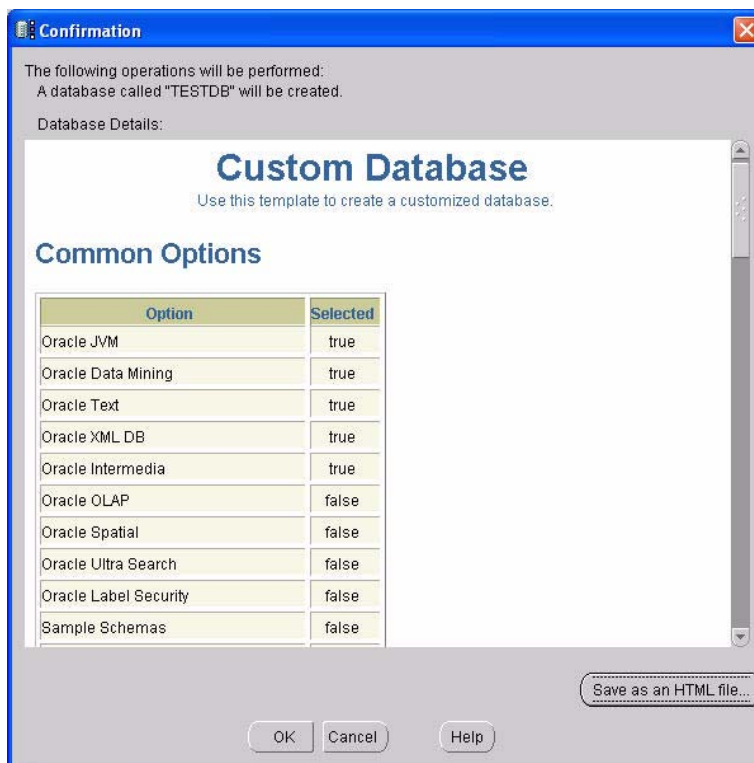
10. In the Tablespace list window, click **Next**.



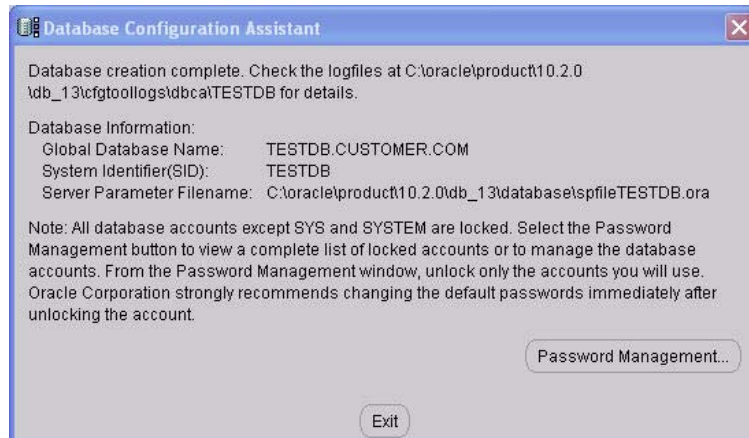
11. In the Creation Options window, if you finished setting up the database parameters, click **Finish**.



12. Before Oracle creates the database, it displays the actions it is going to perform.  
If you approve, click **OK** or **Cancel** to return to the parameter modification window  
During database creation, Oracle displays a progress window.



13. After the database was successfully created, a summary dialog appears.



14. After the database is created, disable the RECYCLE BIN functionality by performing the following procedure:

- Log in SQL\*plus as SYSTEM database user;

If you are using an SP file:

- Run the command: `alter system set RECYCLEBIN=OFF SCOPE=BOTH;`

If you are using INIT.ORA:

- Run the command: `in INIT.ORA: _RECYCLEBIN=OFF`

**Note:** The Oracle 10g R2 has introduced a new feature called *RECYCLE BIN*. Using this feature may cause problems for functioning of all data model management utilities and SmarTeam - Multi-site and result in data model corruption.

## Oracle Server Setup

This section explains how to create, or select an existing Oracle SmarTeam Database schema for the Oracle Instance you have created.

### Oracle Database Schema

A SmarTeam database on Oracle is an Oracle database schema, which contains basic SmarTeam, objects such as tables, indexes, packages and triggers. In general, an Oracle database can contain several SmarTeam databases. However, performance problems can occur in such a configuration. SmarTeam users connected to one schema may affect the performance of another SmarTeam schema. Also, it may be difficult to determine the origin of the performance problem when users, who are connected to several SmarTeam schemas, obstruct each other's picture.

### Single SmarTeam Database Schema in Oracle Instance

To avoid performance problems, it is recommended that you use only one SmarTeam schema in an Oracle database production environment. Use multiple SmarTeam schemas where performance is not relevant, for example, in a test or development environment.

**Note:** In any case, if the SmarTeam Database schema participates in a SmarTeam – Multi-site environment, it should be the only one in an Oracle instance.

## Database Privileges for SmarTeam Database Schema

A SmarTeam Database schema can be created either by the Enterprise Manager application or manually in SQL\*Plus. In any case, SmarTeam requires the following minimal system privileges to be granted to a SmarTeam Database schema:

- CONNECT
- RESOURCE
- CREATE VIEW

**Note:** Some DBAs may consider granting RESOURCE privilege to a regular database user too risky. In that case, they can grant quotas on certain tablespaces according to their security rules. They should grant quota on the SYSTEM table space in a SmarTeam – Multi-site environment in any circumstances.

If a SmarTeam database user has been created in advance and contains SmarTeam data, you can continue using it in Multi-site environment.

**Note:** It is highly recommended not to grant DBA privileges to a SmarTeam Database schema or to choose a built-in Oracle DBA user, SYS or SYSTEM, to be the SmarTeam Database schema.

## Creating a SmarTeam Database

A SmarTeam database is usually created by either copying it from another source database by the SmartDBExplorer utility or by the Create/Modify Database functionality of the SmarTeam Data Model Designer and its family applications. While data is copied to Oracle schema you may encounter error messages related to lack of space in the SmarTeam user default table space, for example:

```
"Unable to extend table %s.%s by %s in tablespace %s" .
```

If this occurs, you should enlarge the SmarTeam default tablespace so that it can contain all data and leave 50% free space. For this purpose, use Enterprise Manager Console functionality or the regular SQL\*PLUS syntax. As an example, standard SmDemo database (tables and indexes) may take about 200 MB.

# Chapter 6: Oracle Client Installation Process

## Installing Oracle 10g R2 Client

This section describes the installation of Oracle clients, including:

- Basic Client
- Administrative Tasks Client

**Note:** Because of a known Oracle issue, if you are installing the Oracle 10g R2 client on a Windows XP machine, after the installation you will need to verify that OLEDB Provider was successfully registered. See the section [Connecting by SmarTeam to the Oracle Server](#) in [Oracle Client Post Installation](#).

**Note:** Regarding Oracle 32-bit client on Windows Vista operating system.

When installing Oracle 10gR2 (10.2.0.1) client, the following error message appears: “This program has known compatibility issues... Oracle 10g is incompatible with this version of Windows”.

Ignore this message. Click *Run program* to continue the installation.

For Windows Vista, the Oracle 10gR2 (10.2.0.3) patch is supported, and recommended.

For Windows Vista with Service Pack 1 or later, the Oracle 10gR2 (10.2.0.4) patch is supported.

## Before-Installation Activities

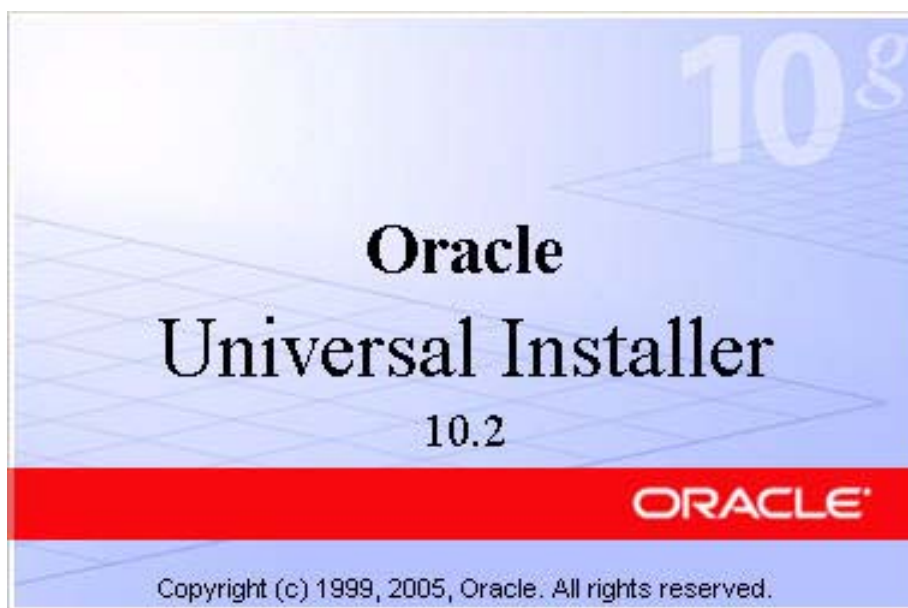
See [Client Requirements](#) for details.

## Running the Client Installation

This section describes the Oracle Client installation procedure.

**To begin installing:**

- 1 Insert the Oracle 10g Release 2 (10.2) – Oracle 10g R2 Client CD and launch the Oracle Universal Installer application by clicking Install/Deinstall Products.

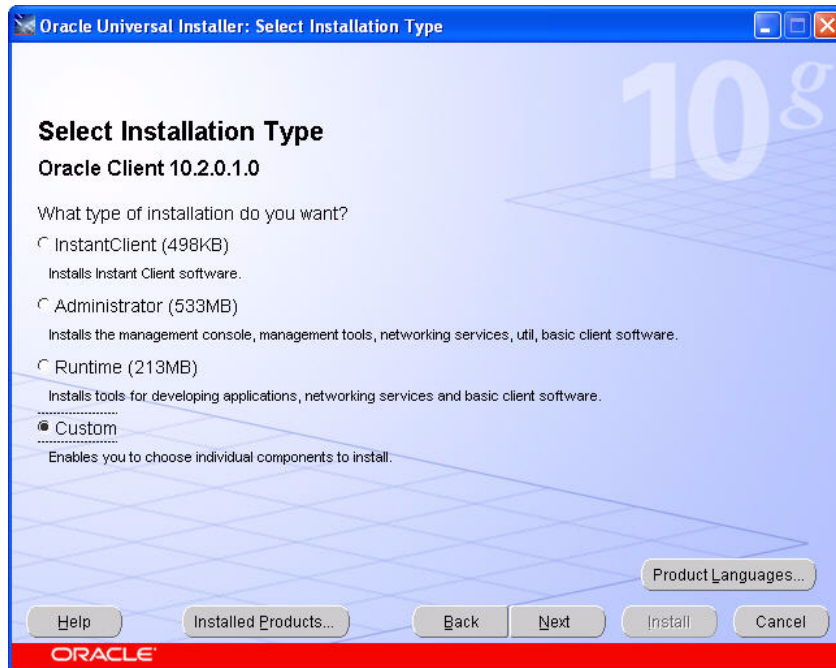


**2** In the **Welcome** window:

- Click **Next** to start the Oracle client installation.

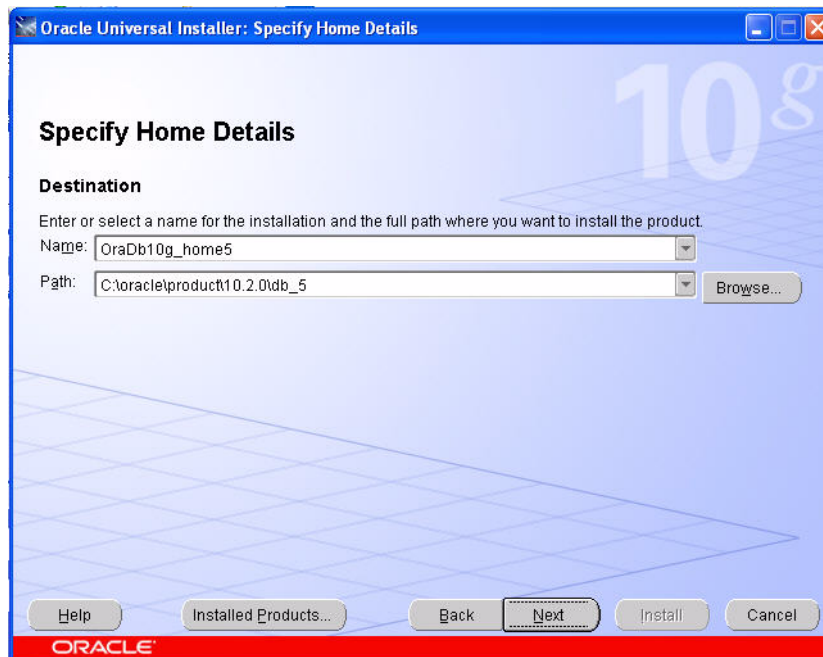


**3** In the **Select Installation Type** window, select **Custom**.



- 4 In the **Specify Home Details** window, if you require it, change the **Oracle Home name**, click **Next**.

**Note:** If a previous **Oracle** version is installed, you need to define a different path and name than defined in that version.





## Client Installation Types

You are prompted to select the type of client you want to install. The choice of client depends on the purpose of the installation.

To use Oracle with SmarTeam optimally, it is recommended to use the Custom option to perform the two types of client installations:

- Basic Client
- Administrative Tasks Client

### Basic Client

This type of Client supports basic SmarTeam functionality only. Select the Custom Client option and choose the following items, as shown.

- Oracle Net 10.2.0.1.0
- Oracle Windows Interfaces 10.2.0.1.0
  - Oracle Provider for OLE DB 10.2.0.1.0

**Note:** The Custom Client procedure is used to install the Basic Client because the Oracle Runtime Client procedure does not install the Oracle OLE DB Provider, which is a necessary component for SmarTeam, and, furthermore, it installs many space-consuming components not related to SmarTeam applications.

### Administrative Tasks Client

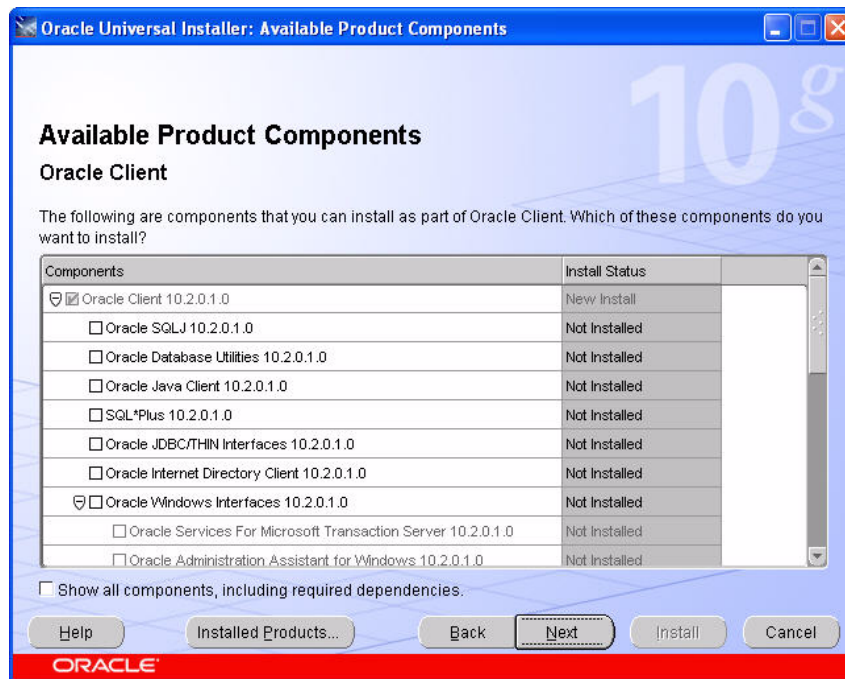
This type of Client is used for Oracle advanced usage and maintenance and for SmarTeam Multi-site administrative functionality. Select the Custom Client option and choose the following items, as shown.

- Oracle Net 10.2.0.1.0
- Oracle Windows Interfaces 10.2.0.1.0
  - Oracle Provider for OLE DB 10.2.0.1.0
- Enterprise Manager 10g Java Console 10.2.0.1.0
- Oracle Database Utilities 10.2.0.1.0

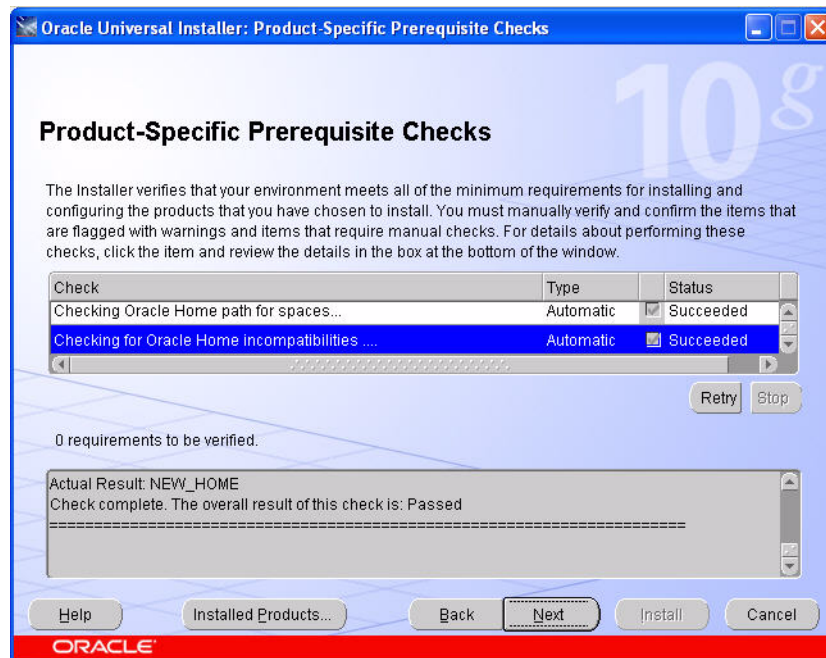
#### Notes:

- The Custom Client procedure is used to install the Administrative Tasks Client because the Oracle Administrator Client procedure installs many components not related to SmarTeam applications and requires a lot of space.
  - The Administrator Client option can be used to set up Oracle client if you are going to use the machine for Oracle management and/or SmarTeam Multi-site management. However, the Administrator Client Installation installs many components not related to SmarTeam applications and requires a lot of space.
  - It is not recommended to use the Runtime Client option.
- 5** In the Available Product Components window, according to which Client Installation type you select, see [Client Installation Types](#) for details
- Select the relevant Oracle Product Components checkboxes.

- Click **Next**.

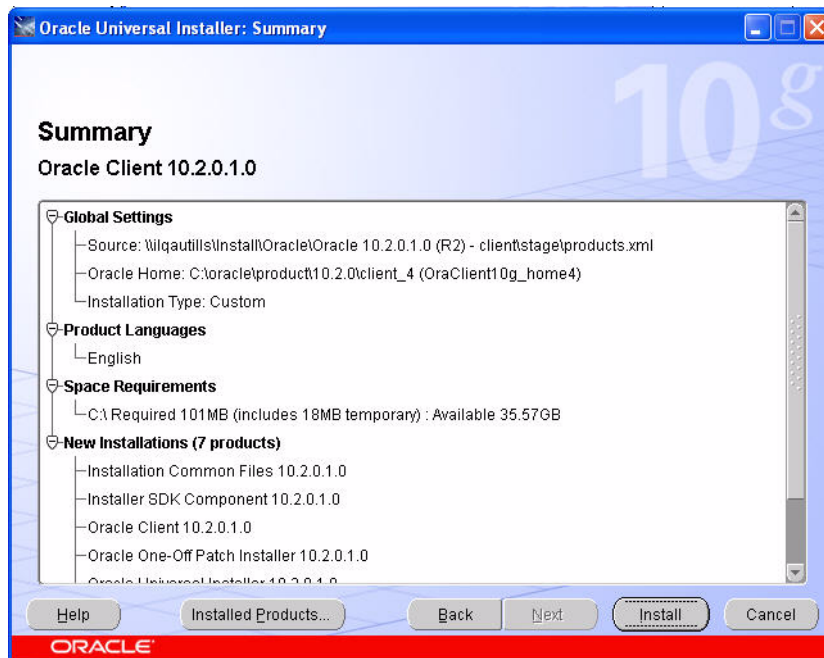


- 6 In the Product-Specific Prerequisites Check window, **Next**.



- 7 In the Summary window, which shows a list of all your selected options and components.
  - If required, make changes by clicking **Previous** to reopen the Available Products Components window
  - Click **Install** to start the Oracle 10g R2 installation

During the installation process, the Configuration Tools window indicates progress for specific installation stages.



## Exiting Oracle Installer

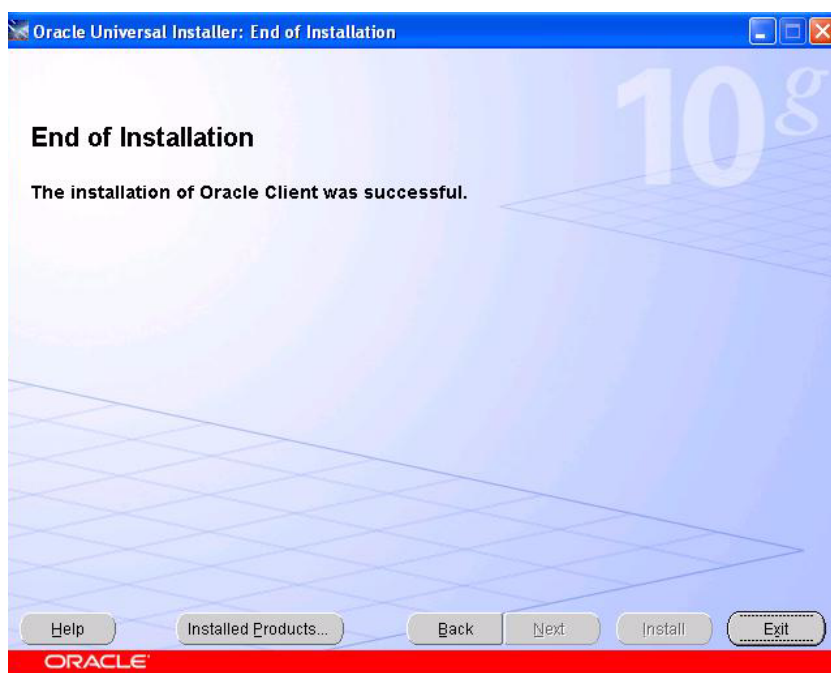
1. In the Welcome window:
  - Select **Perform typical configuration**
  - Click **Next**



2. In the Database Service window, click **Next**.



3. Oracle 10g R2 Runtime Client Installation has been successfully completed, click **Exit** and proceed to the [Oracle Client Post Installation](#) in [Chapter 7](#).



# Chapter 7: Oracle Client Post Installation

After completing the Oracle 10g R2 Client installation process, you must perform the following tasks as described in this chapter.

## Unable to Connect to Database

If you cannot connect to an Oracle database as an Authenticated user, it may be due to the known Oracle issue (Bug: 2498880). Users that are not local Administrators receive an error message when attempting to connect SmarTeam to the Oracle database. The solution is to install Oracle patch 10.2.0.3 on the client machine. For more information refer to <http://metalink.oracle.com/> site for FAQ - Article-ID: 215255.1

## Adjusting SQLNET.ORA

For further information see [Adjusting SQLNET.ORA](#).

**Note:** Failing to perform post-installation activities may cause future problems in functioning of SmarTeam applications.

## Connecting by SmarTeam to the Oracle Server

SmarTeam, which no longer supports BDE, uses the ADO (OLE DB) Provider to connect to databases. Accordingly, you need to use the SmarTeam Database Connection Manager to create an Alias for your SmarTeam schema in Oracle database.

## Oracle Client Setup

*Use the following operations to set up an Oracle Client:*

1. Create **Net Service** to the database you are going to use in your SmarTeam application, using either Net Manager application or manually editing the TNSNames.ORA configuration file.
2. Use SmarTeam Database Connection Manager to set up connection to your SmarTeam database.

# Chapter 8: Troubleshooting

## Installation Troubleshooting

Please see the Web site <https://support.smarteam.com> for the latest information on troubleshooting.

## Uninstalling Oracle Server

---

**IMPORTANT!** It is highly recommended to perform a backup of your databases and network configuration files prior to uninstalling Oracle Server.

---

*To uninstall Oracle Server, perform the following actions:*

1. Shutdown the databases.
2. Shutdown non-database services like Listener services, Oracle Intelligent Agent services.
3. Launch Oracle Universal Installer and use the Deinstall option, which removes the Oracle software from your computer.
4. After deinstallation, cleanup the registry.
5. Restart the computer.
6. Delete Oracle folders.

## Uninstalling Oracle Client

*To uninstall Oracle Client perform following:*

1. Launch Oracle Universal Installer and select the Deinstall option.  
Oracle 10g R2 software is removed from your computer.
2. Cleanup the registry after deinstallation.
3. Restart the computer.
4. Delete remaining Oracle folders.

## Converting the Standard Edition to Enterprise Edition

If you install SmarTeam - Multi-site at a later date you need to perform the following instructions to convert your Oracle Standard Edition database to Oracle Enterprise Edition:

***To convert Oracle Standard to Oracle Enterprise edition:***

1. Backup the database.
2. Deinstall the Oracle Standard Edition software.
3. Install the Oracle Enterprise Edition software (optionally on Unix in a new ORACLE\_HOME), by selecting Custom (for further details see [Custom Installation for SmarTeam – Multi-Site](#)).
4. If you have an existing database, point your ORACLE\_SID to this pre-existing database.
5. Startup the database.
6. Run the "catalog.sql" and "catproc.sql" scripts ).

Your database now uses the customized version of the Oracle Enterprise Edition software.



# Appendix A: Oracle Fine Tuning for SmarTeam – Editor Implementer

## Introduction

This Appendix is designed to assist an organization's Application Engineer or System Administrator to fine-tune your Oracle database to provide better performance for the SmarTeam environment.

This Appendix assumes that the SmarTeam implementer possesses knowledge and experience in setting up and tuning of Oracle database. The main purpose of this document is to describe basic considerations for Oracle Tuning techniques that are required by SmarTeam-related applications and to suggest some ideas that may help in difficult situations.

---

**IMPORTANT!** Incorrect handling of Oracle Tuning may cause serious performance degradation. It is recommended therefore to perform tuning in a test environment at first. Prior to tuning the production system, make a cold backup of your database(s). We have refrained from making any tuning suggestions that may have a dangerous effect on the system if implemented improperly. If the system still does not reach your expected performance goals, contact SmarTeam support.

---

This Appendix applies to Oracle 10g releases:

- Oracle 10g release 1 - 10.1.0.2
- Oracle 10g release 2 - (10.2.0.3)

In general, it is recommended to apply the latest available Oracle patch/patchset. Please consult SmarTeam support for information on the most applicable Oracle patch/patchset.

If nothing is said about specific versions, the same approach should be applied.

**Note:** SmarTeam Corporation will try to keep this information up to date by applying knowledge obtained from QA testing and customer experience. Please check for the most recent version of this document on our Web site.

## Essentials

### Configuring Oracle Parameters

Oracle 10g and Oracle 9i support the SPFILE configuration file feature, which can replace using the INIT\*.ORA configuration file. The SPFILE is a binary-text file; it can be edited only using Oracle utilities. One of the benefits of using it is that you can start up the database from a remote computer, without having to access to INIT\*.ORA.

It is generally recommended to use SPFILE for maintaining Oracle configuration. While using SPFILE it is also recommended to keep INIT\*.ORA file updated with the latest configuration from SPFILE.

The file's default location is <ORACLE\_HOME>\<ORACLE\_PRODUCT>\database.

For more information on using SPFILE refer to native Oracle documentation or Oracle metalink support site.

#### Init\*.ora

**Note:** The information in this section is provided for backward compatibility.

The init.ora file is Oracle's initialization file.

The file can be named init.ora or init<sid>.ora where sid refers to the Oracle SID provided during the Oracle database configuration.

The file's default location is:

<ORACLE\_HOME>\ADMIN\<ORACLE\_SID>\PFILE\init<SID>.ora.

Use a text editor, such as Notepad, to open the init<SID>.ora file. The path in this file points to the location of the init.ora file used by Oracle for initialization when the database starts. You can locate this file for editing according to the indicated path.

## Memory Tuning

### SGA

The **SGA** (System Global Area) is an area within the Oracle server's computer RAM that is used for the benefit of connected Oracle users, and is pre-allocated according to specific parameters (as described in this document).

### DB\_BLOCK\_SIZE

In most cases the DB\_BLOCK\_SIZE value will be OK.

This value cannot be changed after the database is created, and should never be changed in the init\*.ora or SPFILE configuration files.

## Log Buffer

The **LOG\_BUFFER** parameter is important for data flushing to REDO logs. If its size is small, transactions will be processed slowly.

Oracle recommends setting this value between 1 MB to 10 MB, we recommend 5 MB.

## MTS

Oracle has an MTS (Multi-Thread Server) option that makes servers available to support more user connections in a memory-limited environment. This option makes systems more complex, increasing the risk of making mistakes, therefore it is recommended to avoid using it until you have more than 200 users.

For details of setting up MTS, refer to the Oracle documentation.

## Memory Parameters PGA/UGA Tuning

The PGA is Process Global Area **and** the UGA - User Global Area.

Both these terms refer to the memory that Oracle dedicates for end-user processing.

Set the **PGA\_AGGREGATE\_TARGET** to 20 % of the available memory on the server, after subtracting 500 MB.

## Overall Memory Calculation

For a dedicated server, where only Oracle is running and administrative tools are not regularly activated, use the procedure described below.

- Windows NT4 requires approximately 80MBytes for regular work
- Windows 2000 and higher versions require approximately 130Mbytes for regular work
- For X concurrent users, X MB is to be reserved in the computer's RAM for PGA/UGA
- 32Mbytes minimum should be reserved for the Oracle JServer
- Remaining available RAM should be divided between the shared pool and the buffer cache in a ratio of 1/3 respectively.

**Note:** To calculate the amount of available memory, subtract the value that appears in **MEM Usage** from the **Total Physical Memory**, as displayed in the **Windows Task Manager, Performance** page. Do it carefully, to avoid swapping!

### Example

We make following assumptions:

- Total Memory = 1 GB
- Memory used by OS (Windows 2000 Server) = 130-150 MB
- Memory pre-allocated for non-Oracle or Oracle administrative tools = 50 MB
- As a result, memory left for Oracle = 1 GB - 150 MB - 50 MB = 800 MB.

<b>PGA_AGGREGATE_TARGET</b>	20% of the available Oracle memory
<b>SGA_TARGET</b>	80% of the available Oracle memory

The following table consists of figures optimized for a different number of users and the amount of available physical memory.

Physical RAM	OS	Number of Users	Jserver	Total PGA/UGA	Buffer Cache	Shared Pool	Total Oracle Used
MB			MB	MB (1 MB per user)	MB (Calculated)	memory, MB	memory, MB
256	Windows NT4	10	30	10	57	69	156
512	Windows 2000	50	30	50	182	110	362
1024	Windows 2000	100	30	100	528	226	874
2048	Windows 2000	300	30	300	1146	432	1898

#### Notes:

- As shown in the table, 256MBytes is not enough memory to expect fair performance, even for a small number of users.
- If user operations are large (such as large queries, large updates), it will take a long time for the operations to finish.
- As a general recommendation, start with 512 MB for small databases and a small number of users, and increase the memory depending on the workload and number of concurrent users.

## Advanced Oracle Memory Tuning

### 1) Simple Advisory of SGA and PGA Tuning

For version 10.2 and above

Select the v\$sga\_target\_advice and v\$pga\_target\_advice views, which gives you the information you need to modify the SGA\_TARGET parameter. For example, if you increase sga\_target in X, how will it affect the physical reads?

### 2) SGA\_Target Advanced Tuning

Includes the following, as fixes size, they usually are zero or too small to be relevant

col value for a15

col name for a40

```
select name, value from v$parameter where name like 'db%_k_cache_size'
```

### 3) Memory over 2GB per Oracle Process

Sga\_target can not be above the size of max\_sga\_target.

If the server has 4GB memory and you want more than 2GB (actually 1.8G) of memory for Oracle, before you increase the values perform the following:

Add flag /3GB to c:\boot.ini and restart the server. This is performed to enable Oracle to use more than 2GB of memory (up to 3GB maximum).

### 4) SGA\_MAX\_SIZE

If you want to change sga\_target to be more then max-sga\_target, first alter it with the following command:

```
set sga_max_size to more than or equal to SGA target
alter system set sga_max_size=<maximum SGA_Target cannot be more >
scope=spfile;
```

For the change to become effective, you need to bounce the database.

### 5) Log Buffer Parameter

For previous Oracle versions, Oracle recommended setting the log buffer up to 1MB. From Oracle 10g, they changed the recommendation to be from 1 MB to 10 MB. SmarTeam recommends that you set this value at 5 MB.

Remember, one process can use up to 5%, only.

## I/O Tuning and Data Processing

### General Settings

Set the init.ora parameter LOG\_CHECKPOINT\_INTERVAL to 999999.

i.e. LOG\_CHECKPOINT\_INTERVAL = 999999

Set the init.ora parameter LOG\_CHECKPOINT\_TIMEOUT to 0

i.e. LOG\_CHECKPOINT\_TIMEOUT=0

The parameter OPEN\_CURSORS should be 300 (default).

### Oracle 10g

It is very important to set the RECYCLEBIN parameter for Oracle 10g to FALSE, by issuing the following command in SQL\*Plus as SYSTEM database:

```
ALTER SYSTEM SET "RECYCLEBIN"=FALSE;
```

Failure to do that may cause data model change applications and SmarTeam - Multi-site applications to fail.

## Tables and Indexes

The SmarTeam data model requires maintenance for both tables and indexes. Indexes should be rebuilt periodically in order to make them balanced (for example, once a week) and it is recommended to put some SmarTeam tables into the Oracle cache.

### Rebuilding Indexes

It is recommended to rebuild indexes periodically in order to balance them. You can do it using either using SmarTeam's SmartDBRepairing utility or manually using dynamically created sql script. Once indexes have been rebuilt, it is recommended to re-collect statistics.

### Table Caching

Usually, Oracle automatically caches frequently used tables in the memory in the most efficient way.

Oracle maintains a mechanism that allows a performance improvement when extracting information from tables. When the Buffer Cache reaches its size limit, Oracle performs a memory-releasing procedure, flushing less recently used tables to the disk to obtain additional space. Typically, tables that are constantly accessed are not flushed. Tables that were flushed and then accessed again are reloaded to memory, a costly procedure. There are several important tables in the SmarTeam - Editor that are frequently used and should not be flushed by the procedure from their location in the Buffer Cache.

You can ensure that they are not flushed by the procedure by either using Oracle Enterprise Manager or by the SQL+ command:

```
ALTER TABLE TABLE_NAME STORAGE (BUFFER_POOL KEEP) CACHE;
```

After any data model changes, (using either the SmarTeam Data Model Designer or a SmarTeam upgrade), connect to SQL+ as a SmarTeam - Editor user and execute the following entries:

```
ALTER TABLE TDM_LAST_OBJECT_ID STORAGE (BUFFER_POOL KEEP) CACHE;
ALTER TABLE OBJECT_LOCKING STORAGE (BUFFER_POOL KEEP) CACHE;
ALTER TABLE TDM_MULTI_TAB STORAGE (BUFFER_POOL KEEP) CACHE;
ALTER TABLE TDM_TITLES STORAGE (BUFFER_POOL KEEP) CACHE;
ALTER TABLE TDM_QUERY_DEFINITION STORAGE (BUFFER_POOL KEEP) CACHE;
ALTER TABLE TDM_QUERY_DESCRIPTION STORAGE (BUFFER_POOL KEEP) CACHE;
ALTER TABLE TDM_QUERY_RESULT_LIST STORAGE (BUFFER_POOL KEEP) CACHE;
ALTER TABLE TDM_CLASS STORAGE (BUFFER_POOL KEEP) CACHE;
ALTER TABLE TDM_CLASS_HIERARCHY STORAGE (BUFFER_POOL KEEP) CACHE;
```

In the case you have other frequently used tables, like some user-defined classes, you may consider placing them into cache as well. However, you need to be careful - if you place too many tables into cache, there will be not enough space in memory and the operation will not have impact on performance. It is recommended to use this option after analyzing Oracle sql traces and with accordance with Oracle run-time counters like CACHE HIT RATIO.

## Collecting Statistics

The cost-based optimizer collects information about the database structure and decides the best execution plan for user commands in order to save time.

Oracle 10g collects statistics automatically. Besides, Oracle provides several methods to collect statistics, such as using the DBMS\_STATS package.

The correct syntax is following (run it in SQL+, connected as a database user with DBA privileges, i.e. SYSTEM):

```
exec DBMS_STATS.GATHER_SCHEMA_STATS (ownname=> 'SMARTTEAM');
```

It is recommended to run the optimizer in scheduled mode once per fixed period of time (for example, once a week) when database usage is at its minimum. By default, a scheduled task runs the statistics each night.

Verify you also have statistics on sys and system users.

## REDO Logs

Oracle sets three 100 MB REDO LOG groups for both Oracle 10g and Oracle 9i by default and that is sufficient for most configurations.

## Undo Tablespace

UNDO tablespace is required for processing un-committed transactions. The UNDO tablespace is automatically managed. The UNDO tablespaces should be set large enough for any unexpected growth, for example, 500 MB.

## Backup and Recovery

This section is relevant when using **ARCHIVE LOG MODE**.

If a customer has a dual CPU or more than two, it is possible to improve recovery processing by setting the parameter **FAST\_START\_PARALLEL\_ROLLBACK = LOW** in the init\*.ora file.

## Replication

When Oracle replication is used in a SmarTeam - Multi-site environment, the following parameters should be used:

```
PROCESSES=..Add 12 to the current value
GLOBAL_NAMES=TRUE
OPEN_LINKS=4Add 2 per additional site
JOB_QUEUE_PROCESSES=3 Add 1 per additional site
(limited to 36)
PARALLEL_MAX_SERVERS=10
PARALLEL_MIN_SERVERS=2
```

## Applying Configuration Changes

### Working with SPFILE

The change to configuration parameters usually occurs in the Enterprise Manager application. In that case you will be prompted to restart the database.

If you change configuration parameters using SQL\*Plus, you should specify the SCOPE of the change, and proceed accor

### Working with INIT\*.ORA

To apply changes made to the init.ora file, save your changes then close the file. For your changes to take effect, either restart the computer or proceed as follows:

1. From the command prompt type SQLPLUS to start the Oracle Server Manager.
2. From the SQLPLUS prompt type the following string:

```
connect user/password@<service_name> as SYSDBA

where
```

**service\_name** is the name provided to connect to the database, e.g. **smartora.smarteam.com**.

For example: **connect sys/man@<service\_name> as SYSDBA**

The message **Connected** is displayed.

3. .Type shutdown immediate to shutdown the database.
4. After the database is completely shutdown, type startup.

If the startup command does not work because the init\*.ora file is not found, enter the following command:

```
startup pfile=<Full path>'<init*.ora >'
```

## OS Throughput Performance

### Microsoft Windows NT

#### *To improve throughput performance:*

- 1 From the Start menu select **Services, Control Panel** to open the Control Panel window.
- 2 In the Control Panel window, select **Network** then double-click the icon.



- 3 In the Services tab select **Server** then click **Properties**.
- 4 In the Server window, select **Maximize Throughput for Network Applications** then click **OK**.



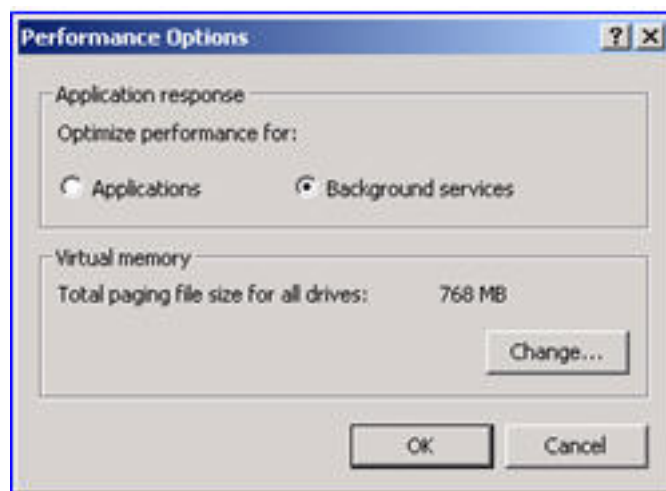
- 5 In the Server window, click **Close**.
- 6 When prompted, select to restart your computer.

## Microsoft Windows 2000

Locate the **My Computer** icon on your desktop then from the right click popup menu select **Properties** to display the **System Properties** window.

### *To improve throughput performance:*

- 1 In the System Properties window, click the **Advanced** tab then click **Performance Options** to display the Performance Options window
- 2 In the Performance Options window, select the **Background services** option, then click **OK**.



- 3 In the System Properties window, click **OK** to save your changes and exit the window.

## General Recommendations

- The database server should be a server dedicated for Oracle and by no means should be a PDC or BDC.

- For media fault tolerance, you may consider different methods such as RAID5.
- To ensure availability of the database for the end-users you may consider using clustering solutions.
- For improved performance, you may consider putting every datafile (tablespace) on a separate physical disk. Please remember that putting datafiles on different logical disks of the same physical disk does not improve performance at all.
- Additional redolog files from each single redolog group should reside on different physical disks for backup purposes in case of disk failure.
- Copies of the control files should reside on different physical disks for backup purposes in case of disk failure.
- Periodic database backup should be performed as described in the **Oracle Backup and Recovery Guide** provided by **SmarTeam**.

## Case-Sensitive Queries

Due to known Oracle limitations, users may experience performance degradation during searches and Life-Cycle operations when a case-sensitive file name or directory name attribute is used. The following technique overcomes those difficulties and can improve performance of searches in this case. In addition, this technique could be useful in general for searches on any case-sensitive attribute.

The technique consists of creating functional-based indexes. In the following example, the functional-based index is created on the `TN_DOCUMENTATION` table, `FILE_NAME` attribute.

Before creating functional-based indexes, the following sql statements should be run in SQL+ by a user with DBA authorization.

```
ALTER SYSTEM SET QUERY_REWRITE_ENABLED=TRUE;
ALTER SYSTEM SET QUERY_REWRITE_INTEGRITY=TRUSTED;
```

Then perform the following statements to create the functional-based indices:

```
CREATE INDEX SMARTEAM.TN_DOCUMENTATION_IFUNC
ON SMARTEAM.TN_DOCUMENTATION (UPPER (FILE_NAME))
```

It is necessary to collect statistics on the schema after creating functional-based indexes.

**Note:** The DataModelDesigner/Upgrade-family applications may delete functional-based indexes while changing the data model or during an upgrade operation. You should verify that all functional-based indexes still exist after the DataModelDesigner/Upgrade-family applications have executed and re-create them if necessary.

## Data Model Designer Performance Improvement Tips

With large SmarTeam databases (more than several gigabytes), using the SmarTeam Data Model Designer and its family applications can take a long time because of the large number of operations required to change the data model, for example, copying records.

Here are some tips that may help in improving the performance of data model changes processing:

- Set the ARCHIVELOG to off prior to starting the SmarTeam Data Model Designer operations. In the case of failure, an alternative restore procedure must be implemented: for example, the Export operation in the case of regular SmarTeam database and the Restoring from Cold Backup operation in the case of SmarTeam - Multi-site.
- Reserve at least 40% free space in all the tablespaces to insure the proper operation of the SmarTeam Data Model Designer

## More Performance Improvement Tips

The following additional parameters can be set to improve performance in Oracle 10g and 9i:

- Set CURSOR\_SPACE\_FOR\_TIME to TRUE to slightly improve performance, providing the computer has enough memory.
- Set the SESSION\_CACHED\_CURSORS parameter to its optimal value.