

A photograph of the New York City skyline at sunset, viewed from across a body of water. The One World Trade Center is prominent on the left. The sky is filled with wispy clouds illuminated by the setting sun.

ENTERPRISE

Installation and Administration Guide

Version 2020

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Thank you,

The TEOCO Documentation team

Change History

This table shows the change history of this guide:

Edition	Date	Reason
1	31 March 2020	First edition.

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1 Introduction and Prerequisites

This manual describes how to install the ENTERPRISE suite of products. It also describes other administrator tasks, such as how to configure a database, set up projects and users, and create fields and field groups. Some of these tasks are performed within ENTERPRISE and some using the separate ENTERPRISE Administrator tool. Once ENTERPRISE has been installed, the ENTERPRISE Administrator tool is accessible under TEOCO on the Start menu (this, together with other paths specified in this guide, assumes an installation on Windows 10).

The table below describes where to find this information.

For Information On This	Read This Section
Installation environment	Before Installing ENTERPRISE on page 12
Coordinate System (EPSG)	About the EPSG Coordinate System on page 11
Installing the ENTERPRISE Suite	Installing ENTERPRISE on page 15
Configuring a database	Creating and Managing Your Oracle Database on page 31
Upgrading a database	Upgrading Your Database
Setting up and managing projects	Setting Up Projects on page 61
Defining Status Fields	About Status Fields on page 68
Creating groups and users	Creating Groups and Users on page 93
Sandboxes	About Sandboxes on page 109
Defining permissions	About Permissions on page 112
Database scripts and settings	Database Scripts and Database Settings on page 129
Distributed predictions and arrays	Distributed Tasks on page 163
Advice on your network and project configuration options	Deploying ENTERPRISE in a Citrix Environment on page 203
Deploying in a Citrix environment	Deploying ENTERPRISE in a Citrix Environment on page 203
Checking that your software is appropriately licensed	Procuring Licenses

Important:

- Users do not automatically gain permissions to new projects. For each new project created after you have created users, you will have to add the permissions to the project for users as required.
- Ensure you read the section on coordinate system usage. See About the EPSG Coordinate System on page 11.

Note: For software building purposes ENTERPRISE 2020 is designated as version 10.0 in some contexts.

About the EPSG Coordinate System

Since version 8.0, ENTERPRISE has used projection systems specified by a single number, termed EPSG (European Petroleum Survey Group), for storing and converting geographical coordinates. The third-party tools Oracle Locator and GDAL (Geospatial Data Abstraction Library) are instrumental in the use of EPSG.

- From version 8.0 onwards, The single geodetic EPSG code is set for each database for the purpose of controlling the regional load functionality. In addition to the geodetic EPSG for regional load, each project and sub-project from also has a projected EPSG code (and inferred geodetic EPSG code).

Coordinate Related Error Messages

If a coordinate conversion error arises during the rendering of symbols on the Map View, a warning like this appears in the Message Log:

```
2015-10-27 17:16:27: A GIS failure #1 occurred: latitude or longitude exceeded limits  
2015-10-27 17:16:27: Radial cannot be calculated for Antenna on Cell: 'SEI1133A' Please check all Coordinates.
```

This arises due to bad data and is not an ASSET failure. If you see such a warning, identify the associated property or antenna and check for these possible causes:

- The coordinates of the physical antenna are beyond the bounds of the defined datum
- The coordinates of the physical antenna may have absolute values but have been defined as an offset from the base property

Before Installing ENTERPRISE

Prior to installing ENTERPRISE:

Read the Release Notes available from the TEOCO Resource Center web site at:
<https://resources.teoco.com>. These will give you important information specific to your build of ENTERPRISE and will specify if there are any patches or pre-requisites if you are upgrading from a previous version.

Important:

- It is essential to have your Oracle software installed and to have rebooted your machine since Oracle installation, prior to installing ENTERPRISE. The Oracle database for use with ENTERPRISE can be created before or after ENTERPRISE installation.
 - ENTERPRISE 10.0 is a 64-bit application. It requires a 64-bit Oracle client, with the Installation Type set to 'Administrator'. 'InstantClient' is not supported.
-

Installing Oracle Standard or Oracle Enterprise

To use ENTERPRISE in an operational environment, you will require either Oracle Standard or Oracle Enterprise Editions. Before installing Oracle, check the compatibility of ENTERPRISE 10.0 against both the version of Windows and the version of Oracle you plan to use.

Installing Oracle

To install Oracle:

1. If you are upgrading from an older version of Oracle, uninstall the previous version before installing.
2. Download the required version from the Oracle web site and follow the installation instructions available from there.

Note: Any existing databases will be detected during installation. These can usually be migrated to the new version of Oracle after installation using the Oracle Database Upgrade Assistant.

Installing the ODBC Driver

You should only install an ODBC driver if the version of Oracle you are using does not support your current ODBC driver. For more information on which driver to use for which version, see Creating and Managing Your Oracle Database on page 31.

If your Oracle database does not support your ODBC driver, you will need to download the required driver from the Oracle web site and install it on all of the PCs where ENTERPRISE will be used.

To do this:

1. From the Oracle website, follow the links to download supported oracle drivers.
2. Download the appropriate ODBC driver.
3. Unzip the downloaded file and follow the instructions in the Oracle Driver Instructions supplied, that is:
 - o From the **Start** menu, point to **Programs, Oracle Installation Products**, and then click **Universal Installer**.
 - o On the Welcome page, click **Next**.
 - o Click the **Browse** button next to the **Source Path** entry, locate the **.jar** file that was unzipped from the ODBC package, and then click **OK**.
 - o Click **Next** and then click **Install** to start the installation.

Hardware and Software Requirements

On client PCs and servers, it is recommended that you check the performance of ENTERPRISE with any virus checkers on and then off.

Please contact Product Support for information about the currently recommended hardware specifications for running ENTERPRISE:

- On normal client PCs which will be doing most of the analytical work
- On high speed client PCs used for large-scale frequency planning, larger scale 3g simulations and anything else memory intensive
- On servers

For usability, a minimum screen resolution of 1920 x 1080 is recommended.

Supported Software Configurations

For the latest and most detailed information on supported software configurations, please visit the TEOCO Resource Center (<https://resources.teoco.com>) and follow these steps:

1. Click the 'Release Downloads' link.
This accesses the 'Product Downloads' page.
2. In the Product filter box, select 'Enterprise'.
3. Find the row that contains the description: 'Tested configurations for Enterprise Vnn'
appropriate to the required version.
4. Click the 'Download' link.
This downloads the corresponding 'ENTERPRISE Installation Configurations' document.

For any further queries on this, or if there is a particular configuration that you are not sure about or would like advice on, please contact your regional Product Support team.

Making the Necessary Decisions

Before you can install ENTERPRISE, you need to have decided on:

- The configuration of the network
- The directory structure for the project
- The directory structure for the map data

If you have an older version of ENTERPRISE, you will also want to upgrade your current database to the new version. For information on this, see Upgrading Your Database.

For some suggestions on network and project configuration, see Network and Project Configuration Methods on page 193. Alternatively, you can accept the default options during installation to install a ready-made configuration of ENTERPRISE.

Important: For information on the operating systems on which ENTERPRISE 10.0 is supported, see the Release Notes for this version.

Databases

The database server needs to run the server version of your Oracle database and, on the client PCs, a client version of the software needs to be available.

Any client laptops used standalone for ENTERPRISE modules will require a version of the database software capable of operating in both standalone and client mode.

2 Installing ENTERPRISE

This chapter provides information about:

- Installing ENTERPRISE
- Installing the Distributed Simulator client program
- Using multiple versions of ENTERPRISE simultaneously, for evaluation purposes
- Repairing an installation of ENTERPRISE
- Running Add-Ins from the File Menu
- Customizing the Administrator user interface

Uninstalling Previous Versions of ENTERPRISE

Although it is possible to have multiple versions of ENTERPRISE installed concurrently on the same machine, it is not recommended to do this in production environments. Therefore, before you begin installing the latest version, you may need to uninstall previous versions of the software.

To do this:

1. Ensure any data you want to keep has been committed and that ENTERPRISE is closed.
2. From the **Start** menu, click **Control Panel**.
3. Click **Programs / Programs and Features**.
4. Select **TEOCO ENTERPRISE** from the list of currently installed programs.
5. Right-Click on it and choose the **Uninstall** option.
6. Follow the Install Shield Wizard instructions, including restarting your machine.

Important: This will not uninstall certain propagation models. If you want to install more up-to-date versions of them, these should be removed separately from the list of currently installed programs, otherwise they will not appear in the list of components to install.

Installing ENTERPRISE

Before installing ENTERPRISE, ensure that:

- You have Administrator permissions under Microsoft® Windows®, otherwise you will not be able to install any software.
- If you are:
 - installing on a Windows 2008 Server
and/or
 - you are going to install the Volcano Model,
you see .NET Framework on page 17 before proceeding.

To install ENTERPRISE:

1. Download the ENTERPRISE executable from the ENTERPRISE Suite Downloads page of the TEOCO Resource Center web site at <https://resources.teoco.com> and double-click it.

Important: If you are installing a patch executable and you have User Account Control (UAC) turned on, instead of double-clicking the executable you must right click on it and click Run as Administrator on the menu that appears, in order for the patch to be applied. (To check your UAC setting, click Start, type UAC in the "Search programs and files" field, then click Change User Account Control settings. The User Account Control Settings dialog box appears. If the slider is at the bottom (Never notify) then UAC is off.)

If a page stating that ENTERPRISE requires other items to be installed appears, click the Install button and follow the subsequent on-screen instructions.

Note: Some of these items are optional. You are advised to install the SafeNet Sentinel System Driver in case a circumstance arises in which you require a hardware dongle. You need only install the TEOCO License Server if you intend to use this machine as a local license server.

If a dotnetfx module security warning is displayed, click the Run button.

2. On the **Welcome to the InstallShield Wizard** for ENTERPRISE page, click **Next**.
3. On the **License Agreement** page, read to the bottom of the terms of the license agreement (scroll down as necessary), select 'I accept the terms', and click **Next**.
4. On the **Customer Information** page, specify your User Name and Organization, then click **Next**.
5. On the **Setup Type** page, select the type of installation you require, either 'Complete' or 'Custom':
 - Complete – All products and options (according to license) will be installed.
Click **Next**.
 - Custom – This will enable you to select which products and options to install.

Note: If you want to install options relating to the Distributed Tasks functionality, choose the Custom option. See Enabling Distributed Tasks.

Click **Next**.

6. If you selected a Custom installation, the **Custom Setup** page appears, enabling you to select which products and options to install. You can click the **Help** button to see what the icons mean. You can click the **Change** button if you want to change the folder where the software is installed. Click **Next**.
7. On the **License Server** page, specify the name of the license server. Click **Next**.
For information on this, see Installing a Software License Server on page 210.
8. If you have a Bing Maps license key, specify it here. Click **Next**.
9. Click **Next**.
10. On the **Ready to Install the Program** page, Click **Install**. The on-screen instructions that appear during installation are determined by the products you have purchased and the Setup type you have chosen. They can include dialog boxes for:
 - .NET framework
 - ARRAYWIZARD Agent configuration
 - Coordinator hostname relating to the Distributed Tasks System

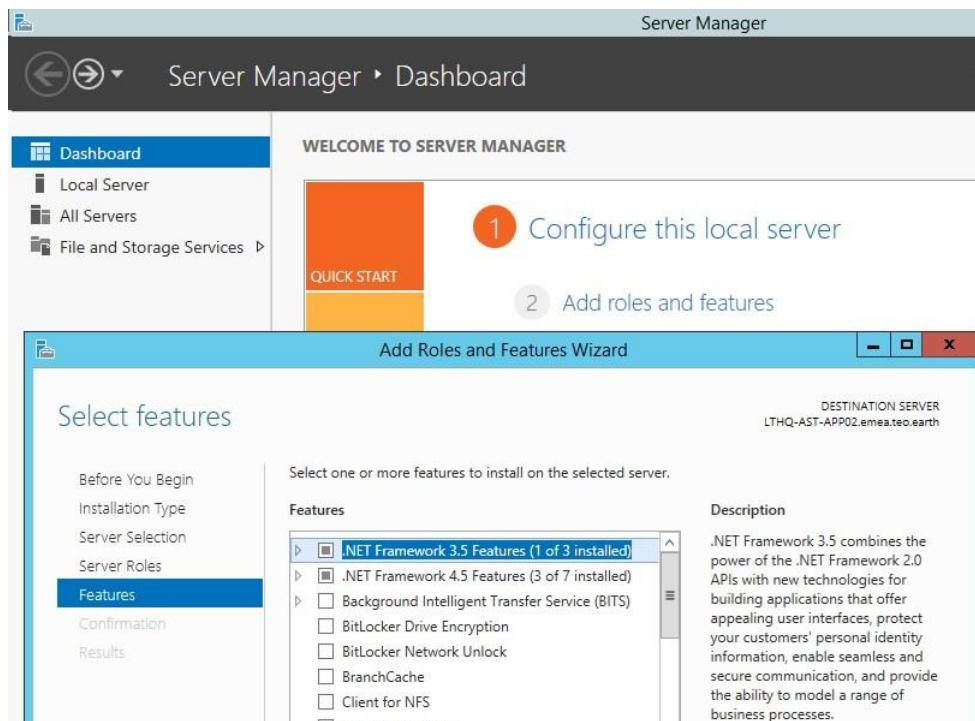
11. On the **InstallShield Wizard Completed** page, click **Finish**.

Your software should now be available for use. You can:

- Set up a demonstration project: If you ordered ENTERPRISE for trial purposes you can set up a demonstration project with access to ready-made project information.
- Set up a blank database. If you do not have a database administrator to do this for you, you can do it yourself using templates or with a simple Oracle database creation utility. See Creating an Oracle Database on page 34.
- Upgrade an existing database. If you have an existing database, you may need to upgrade it to work with your new version of ENTERPRISE. For information on this important process, see Upgrading Your Database.

.NET Framework

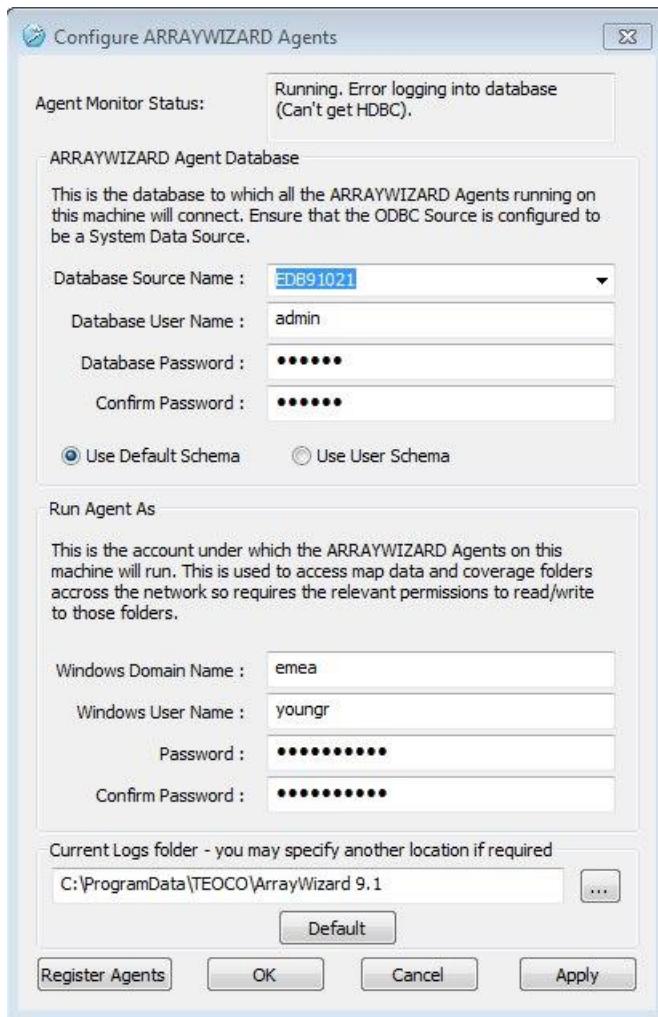
If you do not have Microsoft .NET Framework already installed, then it will be installed automatically, unless you are installing on a Windows 2012 Server or a Windows 2016+ Server. In those cases, before you run the ENTERPRISE installer, you must activate .NET Framework from the Server Manager window. This picture shows the required selection on a Windows 2012 Server:



If you are going to install the Volcano Model, you must first install .NET Framework 4.7.2. An option appears during ENTERPRISE installation to enable you to choose to do this.

ARRAYWIZARD Server

If you have selected ARRAYWIZARD, the Configure ARRAYWIZARD Agents dialog box appears. You can add database details and click **OK** or click **Cancel** to skip this step.



The details to be added in this dialog box are as follows.

In the ARRAYWIZARD Agent Database pane:

In this field	Type
Database Source Name	The name of the database to be used
Database User Name	The user name you use to access your database
Database Password/Confirm Password	The password you use to access your database

Select **Use Default Schema** if you want this agent to connect to the default schema

- OR -

Select **Use User Schema** if you want this agent to connect to the personal schema for the user specified in the **Database User Name** field.

For more information, see the *ARRAYWIZARD User Reference Guide*.

In the **Run Agent As** pane:

In this field	Type
Windows Domain Name	The name of your Windows network
Windows User Name	The user name you use to access your Windows network. Note: This user must be a member of the administrators group on the agent machine.
Password/Confirm Password	The password you use to access your Windows network

Note: This account must have access to folders containing predictions, coverage details and map data.

In the **Current Logs folder** pane:

Check that the default path is accessible. The default path for the logs should not be changed unless there is a compelling reason to do so. If you change the path and then wish to revert to the default path you can click the **Default** button.

If you click **Cancel** you can open this dialog box and configure the ARRAYWIZARD agents later by clicking Start, All Programs then navigating to the folder where ARRAYWIZARD is installed and selecting **Configure ARRAYWIZARD Agents**.

Note: You can use the **Register Agents** button to add all 2g, 3g and prediction agents automatically rather than adding them manually via the ARRAYWIZARD Administrator as described in the *ARRAYWIZARD User Reference Guide*.

Enabling Distributed Tasks

You can get ENTERPRISE to distribute the processing required to generate predictions or arrays between a number of agent machines linked by a network. The processing requires the installation of some software on the agent machines and is managed by at least one distribution coordinator application. During a complete ENTERPRISE installation, the agent software will be installed and you will be prompted to specify the name of the machine where the default coordinator will be run and the identity of the Admin port.

To install the default distribution coordinator application and the user interface associated with it you must carry out a custom installation and select these features for inclusion.

If you choose not to specify a machine name and Admin port during ENTERPRISE installation and your machine has not had Distributed Tasks software installed before, the components included in the current installation will not be usable until you supply these details. If you have installed the coordinator application you can add the required details after ENTERPRISE installation, by right-clicking the coordinator icon  in your system tray and selecting **Configure Coordinator Targets** from the menu that appears.

Warning: Any earlier versions of the Distributed Coordinator service existing on the same machine will be stopped when the latest version is installed.

In the ENTERPRISE installer you can specify multiple occurrences of distributed array agents and distributed prediction agents.

For more information, see [Distributed Tasks](#) on page 163.

Installing Third Party Propagation Models

You can install propagation models from Myriad and Volcano for use with ENTERPRISE. For more information on how to do this, contact Product Support.

Licensing ENTERPRISE

Having installed your ENTERPRISE software, you can license it.

For more information, see [Procuring Licenses](#).

Installing ENTERPRISE from the Command Line

You can install ENTERPRISE from a command line so that no user intervention is required. This method of installation could be used for example from a batch file for deploying to multiple systems.

To install ENTERPRISE from a command line:

Type this command:

```
Setup.Exe /S /v"/qn/norestart <options>"
```

Where norestart indicates that the server should not automatically reboot after installation, and options include:

ADDLOCAL=ALL for a complete install or

ADDLOCAL=<product list> for a partial install

COORDINATORHOSTNAME=<machine name> to specify the machine on which the Distributed Tasks Coordinator will be installed

COORDINATORPORT=<port number> to specify the port number for the Distributed Tasks Coordinator

INSTALLDIR=<path> to specify an alternative installation location

LICENCESERVER=<name> to set the name of the license server

and:

<product list> is a comma separated list of required components.

Important: No spaces are allowed in the product list.

The following tables show the components that can be included in the product list.

Each component that you require must be individually specified but the specification of any individual component will also result in the installation of core components. Component names are case sensitive and must be typed as shown (some include x64 and others X64).

This table describes the ENTERPRISE Core components available for inclusion in the product list:

Core Component	Description
_01_CoreProgram_AIRCOM_x64	The Core program.
_01_Upgrade_x64	Database upgrade components.
_01_ScriptSamples	Sample Database Events Scripts.
_01_DistPredClient_x64	The Distributed Tasks client software.
_01_Core_Docs	The ENTERPRISE pdf User Guides.

Core Component	Description
_01_Core_Help_x64	The ENTERPRISECore.chm and COMMANDER.chm Help files.

This table describes the ASSET components available for inclusion in the product list. For these components to work, ENTERPRISE Core components must be installed.

ASSET Component	Description
_03_Asset_Program_x64	The ASSET program.
_03_ASSET3G_Docs	The ASSET pdf User Guide.
_03_ASSET3G_Help_X64	The ASSET.chm and ENTERPRISESuite.chm Help files.
_03_DistSim_Program_x64	The Distributed Simulation program.
_03_MentorIntegration_x64	Support for Mentor.

This table describes the Administrator components available for inclusion in the product list. For these components to work, ENTERPRISE Core components must be installed.

Administrator Component	Description
_02_ADMIN_Program_x64	The Administrator program.
_02_ADMIN_ENTRegEntries_X64	Registry entries for Administrator.
_02_ADMIN_Docs	The Administrator pdf User Guide.
_02_ADMIN_Help_x64	The Administrator chm Help file.

This table describes the ASSET BACKHAUL components available for inclusion in the product list. For these components to work, ENTERPRISE Core components must be installed.

ASSET Backhaul Component	Description
_07_BACKHAUL_Program_x64	The ASSET BACKHAUL program.
_07_BACKHAUL_Docs	The ASSET BACKHAUL pdf User Guide.
_07_BACKHAUL_Help_x64	The ASSET BACKHAUL chm Help file.

This table describes the ARRAYWIZARD components available for inclusion in the product list. For these components to work, ENTERPRISE Core and ASSET components must be installed.

ARRAYWIZARD Component	Description
_12_AW_Admin_x64	The ARRAYWIZARD Administrator.
_12_AW_Server_x64	The ARRAYWIZARD server setup.
_12_AW_Docs	The ARRAYWIZARD pdf User Guide.
_12_AW_Help	The ARRAYWIZARD chm Help file.

This table describes the Distributed Tasks components available for inclusion in the product list. For these components to work, ENTERPRISE Core and ASSET components must be installed.

Distributed Tasks Component	Description
_43_CoordinatorService_x64	The Distributed Tasks Coordinator service. Note: If you include this in the product list, then to prevent the Coordinator Target Configuration dialog box from appearing and interrupting the installation, you must include the COORDINATORHOSTNAME and COORDINATORPORT options.
_43_CoordinatorUI_x64	The Distributed Tasks Coordinator User Interface.

Distributed Tasks Component	Description
_43_PredAgentService_x64	The service supporting distributed predictions agents.
_43_ArrayAgentService_x64	The service supporting distributed array agents.
_43_DistPredHelp	The Distributed Tasks chm Help file.

This table describes the Licensing components available for inclusion in the product list:

Licensing Component	Description
RegEntries_x64	Licensing for registry entries.
_00_LicensingAircom_x64	Licensing for Aircom software.

This table describes the PAM components available for inclusion in the product list:

PAM Component	Description
_42_PredAccess_x64	The Prediction Access Module.

This table describes the PGA components available for inclusion in the product list:

PGA Component	Description
_43_PredGenAPIWebService_x64	The Prediction Generation API Web Service.
_43_PredGenAPIWebService_Docs	The Prediction Generation API Web Service documentation.

This table describes the SDK components available for inclusion in the product list:

SDK Component	Description
_41_SDK	The Software Development Kit.

Examples:

For a complete install with the default options:

```
Enterprise10_setup_X64.exe /S /v"/qn/norestart ADDLOCAL=ALL"
```

To install ASSET only:

```
Enterprise10_setup_X64.exe /S /v"/qn/norestart
ADDLOCAL=RegEntries_x64,_00_LicensingAircom_x64,_02_ADMIN_Program_x64,_02
_Admin_ENTRegEntries_X64,_02_ADMIN_Help_x64,_02_ADMIN_Docs,_03_Asset_Prog
ram_x64,_03_ASSET3G_Help_X64,_03_ASSET3G_Docs, INSTALLDIR="\D:\Program
Files\ENTERPRISE 10.0\ "BINGLICENCEKEY=AnSECRJ8c7H12Zzvg-
oBEDWQsugx_qtmue-wawlTjWb0swIpaQM869fNw3qff-H3"
LICENCESERVER=prdpwngis0124
```

Note: The Myriad and Volcano third party propagation models can be installed with a call to a separate executable from the command line. For more information, contact Product Support.

Installing a PDF Reader (optional)

If a PDF reader (required for reading user guides in PDF format) is not already installed, download and install one. The Adobe Acrobat Reader is available from the Adobe website at www.adobe.com.

Installing the Distributed Simulator (optional)

If you have purchased ASSET, you may want to run simulations on networked PCs to harness extra processing power. These PCs do not need ENTERPRISE installed on them, but you do need to install the Distributed Simulator on any networked PCs you select for participation in distributed simulations. The Distributed Simulator will have been installed by default on PCs that already have a Typical ENTERPRISE installation but it will still have to be configured as described in the next sections.

To install the Distributed Simulator onto a single machine:

1. Start the Enterprise installation as described under Installing ENTERPRISE on page 15 and select a Custom Setup.
2. On the **Custom Setup** page, expand the item called ASSET and select Simulation Distribution Client. Deselect all the other checkboxes for all the other products, then click **Next**.
3. On the **Start Copying Files** page, click **Next**. A progress bar appears followed by the **Install Wizard Complete** page.
4. Click **Finish**. Now configure the PC using the following instructions.

Configuring the Distributed Simulator Server

The Distributed Simulator Server makes use of DCOM technology which enables programs to be used across a network and manages all the network and security issues. You need to install DCOM and set up the permissions so that all the required users are permitted to run the Distributed Simulator.

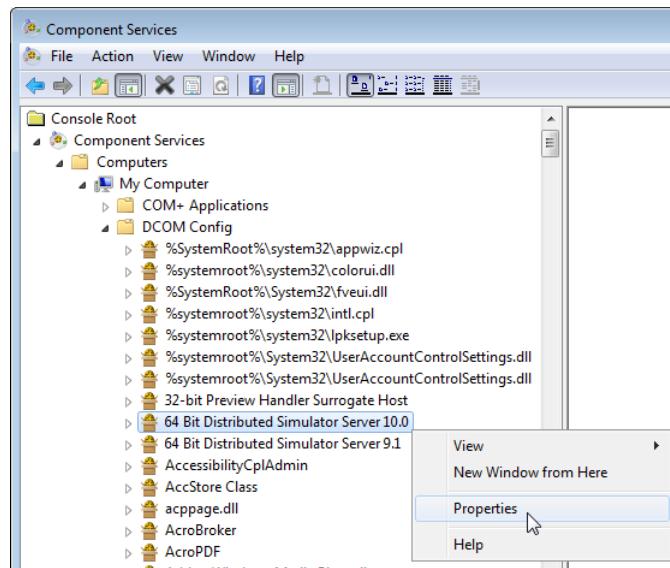
To do this, on each client PC:

1. Identify which users or groups are to be given permission to use distribution.

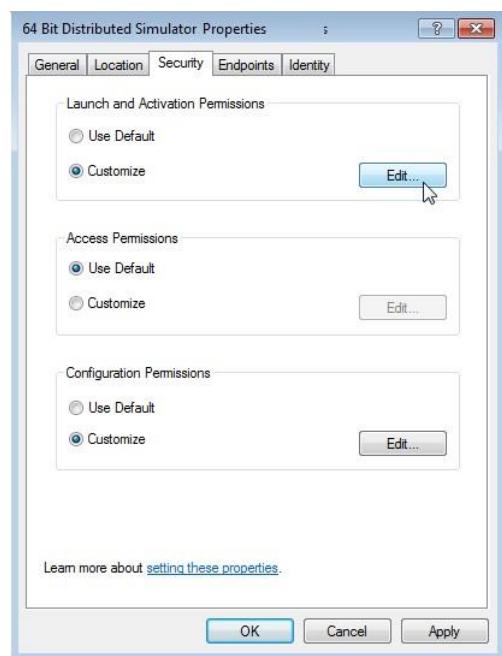
Note: These users should be the users logged in when ENTERPRISE is running.

2. Open the **Component Services** dialog box in Windows (in Windows 7, click on the Windows Start button and type Component Services in the **Search programs and files** field and press the **Return** key).
3. In the left hand pane of the **Component Services** dialog box, browse to the DCOM Config folder and expand it.

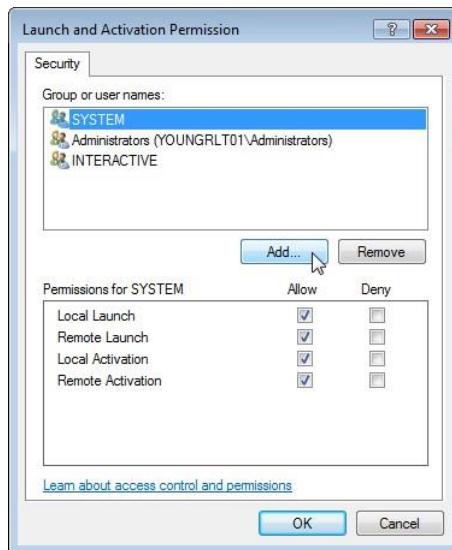
4. In the list that appears, select **64 Bit Distributed Simulator Server 10.0** then right-click and select **Properties**:



5. In the **64 Bit Distributed Simulator Server Properties** dialog box click the **Security** tab, select **Customize** under **Launch and Activation Permissions**, then click **Edit**:



6. In the **Launch Permission** dialog box, click **Add** to begin adding all the users and groups who need access.:



7. In the **Select Users, Computers, Service Accounts or Groups** dialog box, type the users or groups you require and click **Add**. You can use the **Advanced** button to search for users.
8. Ensure that the permissions shown in the bottom pane of the **Launch and Activation Permission** dialog are all set to **Allow** for each user or group that you add.
9. When you have entered the users or groups you require click **OK** to close the **Launch and Activation Permission** dialog box.
10. In the middle pane of the **64 Bit Distributed Simulator Server Properties** dialog box, select **Customize** under **Access Permissions** then click **Edit**.
11. In the **Access Permission** dialog box, as before, add all the users and groups who need access. Ensure that the permissions shown in the bottom pane of the **Access Permission** dialog box are all set to **Allow** for each user or group that you add.
12. When you have entered the users or groups you require click **OK** to close the **Access Permission** dialog box.
13. You do not need to change the **Configuration Permissions** section. Click **OK** to close the **64 Bit Distributed Simulator Server Properties** dialog box.

Using Multiple Versions of ENTERPRISE for Evaluation

If you are evaluating a new version of ENTERPRISE, you will want to retain your existing version for use.

Evaluating Version 10.0 and Using a Previous Version

If you are evaluating Version 10.0 and using a previous version, during installation of Version 10.0, ENTERPRISE will automatically retain your existing version.

Important: Although it is possible to have multiple versions of ENTERPRISE installed concurrently on the same machine, it is not recommended to do this in production environments.

Repairing an Installation of ENTERPRISE

To repair an installation:

1. Ensure that ENTERPRISE is closed.
2. From the **Start** menu, click **Control Panel**.
3. Click **Programs / Programs and Features**.
4. Select TEOCO ENTERPRISE from the list of currently installed programs.
5. Right-Click on it and choose the **Repair** option.
6. Follow the Install Shield Wizard instructions, including restarting your machine.

ENTERPRISE repairs the installation of the products that you installed and you can continue using them as before.

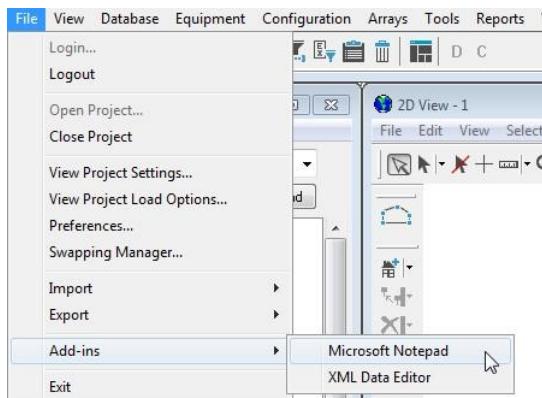
Important: If any patches were applied to your installation prior to repair, you will need to reapply these patches.

7. From the desktop, double-click the saved registry settings file.
8. In the dialog box that appears, click **Yes**.

The saved registry settings will automatically import to the location that they were saved from.

Running Add-Ins from the File Menu

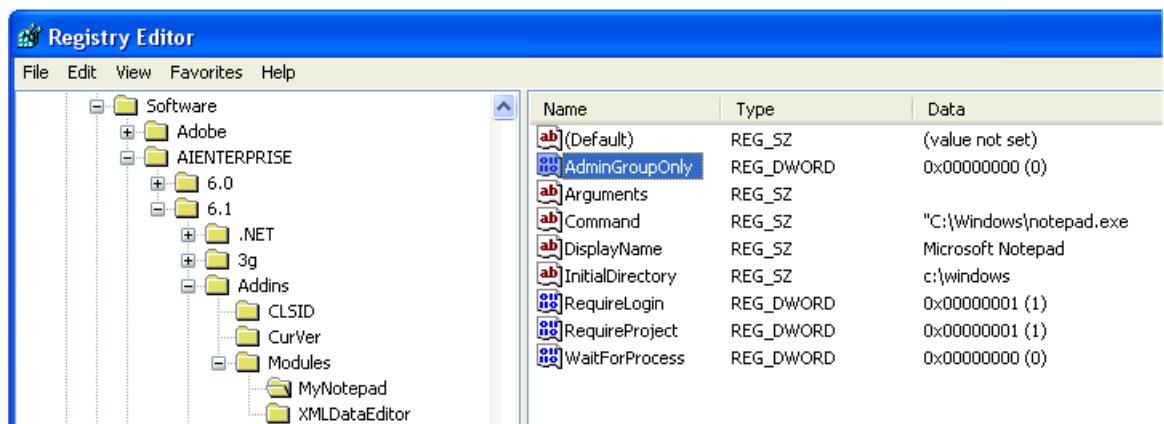
You can add third party programs to the ENTERPRISE file menu so that you can start them from there. This picture shows an example where Microsoft Notepad has been added:



To do this:

1. Open Regedit.
2. Locate the folder My Computer\HKEY_CLASSES_ROOT\Software\AIENTERPRISE\10.0\Addins\Modules.
3. Right-click the **Modules** folder and on the menu that appears select **New**.
4. On the submenu that appears click **Key**.
5. Type a name for the new registry key.

6. With the new registry key selected in the left-hand pane, right-click in the right-hand pane and click **New**.
7. Add the required values as shown in this picture:



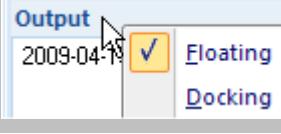
Customizing Administrator

The ENTERPRISE Administrator tool is configured by default to show:

- The Menu Bar and Admin Toolbar at the top
- A Navigation pane on the left
- A Main pane containing the TEOCO web page on the right
- An Output pane containing the Message Log at the bottom

You can change this appearance if you wish. This table describes how to customize Administrator.

To Achieve This	Do This
Move the Menu Bar or Admin Toolbar.	<ul style="list-style-type: none"> • Move the mouse pointer over the three dots to the left of the bar so that the mouse pointer changes to a cross. • Click and hold down the left mouse button, drag the bar to the required location and then release the mouse button. <p>Note: If you drag a bar to anywhere on an edge of the Administrator window, it will be absorbed into that edge:</p>

To Achieve This	Do This
Change what options appear in the Navigation pane.	<ul style="list-style-type: none"> At the bottom of the navigation pane, click the down arrow. Click Navigation pane Options. Select the options representing the content that you want to be included in the navigation pane. For each option selected, a button will appear at the bottom of the Navigation pane. Note: If you select more than one option, you can change the order in which the buttons representing those options appear by using the Move Up and Move Down buttons. You can restore the original order by clicking the Reset button. Click OK.
Hide or Show Navigation pane buttons.	<ul style="list-style-type: none"> At the bottom of the Navigation pane, click the down arrow. Click Show Fewer Buttons or Show More Buttons as appropriate.
Auto Hide the Output pane.	<p>Click . The Output pane will be closed and represented by a button in one of the edges of the Administrator Window. It will open when you move the mouse pointer over the button:</p>  <p>To restore the Output pane so that it is always visible, click .</p>
Move the Output pane.	<p>Click in the title bar of the Output pane:</p>  <p>Hold down the left mouse button, drag the bar to the required location and then release the button.</p>  <p>When you drag the bar, a number of icons like this one:  appear. If you move the mouse pointer over one of these icons, an area of the screen is shaded to show where the Output pane will be positioned (docked) if you then release the mouse button.</p> <p>The Output pane will remain where you have positioned it next time you open Administrator. If it has been positioned using an icon it will be in Docking mode. If it has been positioned elsewhere it will be in Floating mode. You can change the mode of the Output pane by right-clicking on the title bar and selecting Floating or Docking as required:</p> 
Add functions to the Menu Bar and Admin Tool Bar.	<ul style="list-style-type: none"> Right-click on the required bar. Click Customize. In the Customize Window, on the Commands tab, in the Categories pane, select the group of commands you require. In the Commands pane, click the command you wish to add to the bar, hold the left mouse button down, drag the command into position on the bar and release the mouse button.
Change the appearance (skin) of Administrator.	<p>On the Configuration menu, select Application Look.</p> <p>From the skins listed, select the one you require. The currently selected skin is marked with a bullet point:</p> 

To Achieve This	Do This										
Add short cuts in the Navigation pane to web sites to be displayed in the Main pane.	<ul style="list-style-type: none"> In the Navigation pane click Web Administration. Right-click in the Navigation pane. In the menu that appears, click Customize. In the Customize dialog box, select the External Web Pages tab. Click the Add Page button. In the Name field, type a name for the shortcut that will appear in the Navigation Pane. In the URL field, type the web address of the required page. In the Request Type pane, select the required HTTP request type to specify which method will be used to retrieve data, Get or Post. If the web site requires Windows user name, Windows password and Oracle identifiers, you can include these in the Context and Value columns as shown in this example: <table border="1"> <thead> <tr> <th>Context</th><th>Value</th></tr> </thead> <tbody> <tr> <td>password</td><td>{pw}</td></tr> <tr> <td>user</td><td>{usr}</td></tr> <tr> <td>tns</td><td>{tns}</td></tr> <tr> <td>dsn</td><td>{dsn}</td></tr> </tbody> </table> <ul style="list-style-type: none"> Click OK. A short cut to the specified web page appears in the Navigation Pane for future use. 	Context	Value	password	{pw}	user	{usr}	tns	{tns}	dsn	{dsn}
Context	Value										
password	{pw}										
user	{usr}										
tns	{tns}										
dsn	{dsn}										
Change the web page displayed by default when Administrator opens.	<ul style="list-style-type: none"> Open Regedit. Select the Admin folder where the Homepage setting is stored (normally under HKEY_LOCAL_MACHINE\SOFTWARE\AIRCOM International\ENTERPRISE\10.0\Admin). Change the Homepage path to the path of the page required:  HomePage REG_SZ https://resources.teoco.com/login.aspx?ReturnUrl=%2fdefault.aspx 										

3 Creating and Managing Your Oracle Database

ENTERPRISE 2020 requires an Oracle 12c or 19c database. For more information on which combinations of Oracle and Windows are supported for this version, please consult the Release Notes that were provided with this release of ENTERPRISE.

Sources of Help with Your Database

Since setting up an Oracle database is quite complex unless you have Oracle experience, you should consider consulting the following three sources of help when configuring your database.

- Utilities are available from Product Support to make set up easier. However, these utilities are designed for use under Microsoft® Windows™. If you wish to use an alternative platform for Oracle (for example, UNIX) you should seek the assistance of a qualified Oracle database administrator to set up and configure your database.
- Some database configuration parameters are provided in the following sections to assist with the setting up your database.
- Your company policy may dictate that the database be configured in a certain way. If ENTERPRISE is to be used on a corporate-wide database server, always seek professional assistance from your IT department, your database support contact, or Product Support.

Configuring Oracle to Support Other Character Sets

If you require your database to be able to handle a character set other than the 26 character English alphabet, you must configure your database server and ENTERPRISE client accordingly.

This example shows what you need to do in Windows 7 to use a Chinese character set, other character sets can be accommodated in a similar way.

To support Chinese characters, you will need to ensure that:

- The NLS_LANG parameter in the Windows Registry of the machine on which you are running ENTERPRISE is set for Chinese (PRC):
`SIMPLIFIED CHINESE_CHINA.ZHS16GBK`
It is best to do this before installing Oracle (see below).
- The Windows Regional and Language Options of the machine on which you are running ENTERPRISE are set to support Chinese (PRC)
- Your database is created with the ZHS16GBK character set
- Old data from a database created with an English (US) character set is migrated correctly

If you do not do so, Chinese characters will not be stored or retrieved correctly.

Selecting Chinese Character Support Before Installing Oracle (Recommended)

If you select Chinese (PRC) in the Region and Language Options of Windows before you install Oracle, the Oracle installation will detect this and will automatically set the NLS_LANG parameter to include the value `SIMPLIFIED CHINESE_CHINA.ZHS16GBK` so that you will not need to edit it.

Selecting Chinese Character Support After Installing Oracle

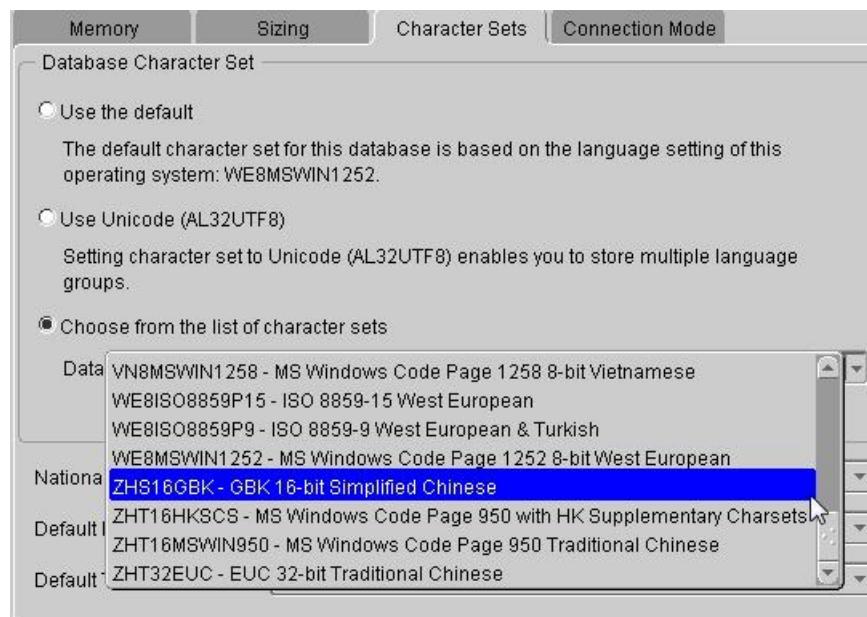
If you install Oracle without first selecting Chinese (PRC) in the Region and Language Options of Windows and you subsequently need it to support Chinese characters, you will need to edit the NLS_LANG parameter manually in your Windows Registry to include the value SIMPLIFIED CHINESE_CHINA.ZHS16GBK.

For more information on locating and configuring the NLS_LANG parameter, see the Oracle NLS_LANG FAQ available on the Oracle web site.

Configuring Your Database Server

On the machine on which your database is to be held:

Create your database with ZHS16GBK character set by selecting that option in the Character Sets tab of the Oracle Database Configuration Assistant wizard. This picture shows an example of the Character Sets tab:



Notes:

- If you are creating your database on a server machine and you are running ENTERPRISE on a different (client) machine, it is not necessary to have the Windows Regional and Language Options of the server machine set to support Chinese (PRC). The character set selected on the Character Sets tab of the Oracle Database Configuration Assistant wizard by default is determined by the Regional and Language Options of Windows on the machine in question, but you can change it to ZHS16GBK for Chinese (PRC).
 - If you are creating your database on the same machine that you are running ENTERPRISE on and you have already selected Chinese (PRC) in the Regional and Language Options of Windows then the character set selected on the Character Sets tab of the Oracle Database Configuration Assistant wizard will be ZHS16GBK for Chinese (PRC) by default.
-

Configuring Your ENTERPRISE Client

The following considerations apply to the machine on which you are running ENTERPRISE whether or not this is the machine on which you have your database.

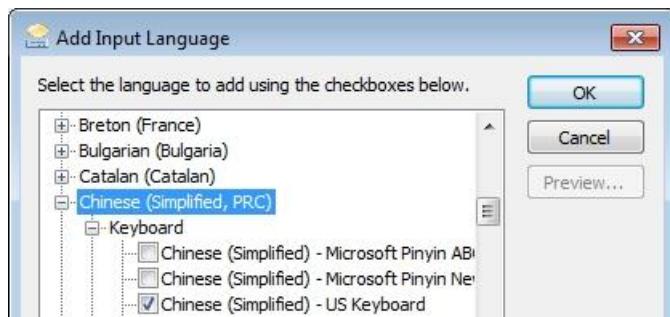
You must set the Regional and Language Options of Windows to support Chinese (PRC).

To do this:

1. In Windows, open the **Region and Language** dialog box (in Windows 7, select Start>Control Panel>Region and Language).
2. Click the **Keyboards and Languages** tab:



3. In the **Keyboards and other input languages** panel, click **Change keyboards...**.
4. In the **Text Services and Input Languages** dialog box, on the **General** tab, click **Add**.
5. In the **Add Input Language** dialog box, select the required keyboard type under Chinese (Simplified, PRC) and click **OK**:



The selected keyboard is listed in the **Installed services** pane of the **Text Services and Input Languages** dialog box and can be selected from the drop-down list in the **Default input language** pane.

6. Select the required keyboard and click **OK**:



Migrating an English Character-set Database to Support Chinese Characters

If you have an old database created with the English (US) character-set (WE8MSWIN1252), you will need to do the following to allow you to use Chinese (PRC) characters with this data in future:

1. Make a complete backup of your existing database in case problems arise during character set migration.
2. Export your existing database dump.
3. Create a new blank database with the ZHS16GBK character-set using Oracle Database Configuration Assistant. The ZHS16GBK character set is selected by default if the Windows Regional and Language Options of the machine are set to support Chinese (PRC).
4. Import the old database dump into this new database.

Note: For more information about character set migration, see
http://download.oracle.com/docs/cd/B28359_01/server.111/b28298/ch11charsetmig.htm

Creating an Oracle Database

When you have installed Oracle 12c or 19c with the relevant ODBC driver, the next step is to create an Oracle database.

Tip: For information on which drivers to use with which version, and any further information on supported versions of Oracle, check the release notes supplied with ENTERPRISE, or visit the support area of our website where you can find the most up-to-date information and also download the relevant ODBC driver.

To create an Oracle database for use with ENTERPRISE you will have to set the following:

- Instance parameters
- Tablespaces

Note: If you wish to use an Oracle template to define your instance parameters, before creating your database you should obtain the ENTERPRISE templates from Product Support.

To create an Oracle database:

1. From the **Start** menu, select the **Configuration and Migration Tools** sub-folder of your Oracle home directory and run the **Database Configuration Assistant**.
2. Follow the database creation steps, completing the instance parameters as required.

The following sections contain some important guidelines for how some of the parameters in the Database Configuration Assistant wizard should be set.

About the Oracle Instance Parameters

When you create your Oracle database, you can configure instance parameters yourself or use a template provided by Product Support. For information about configuring instance parameters yourself, see the Oracle online help.

If you use a template, you must extract it to the Oracle templates folder on your PC. For example:

```
C:\app\user.name\product\12.1.0\dbhome_1\assistants\dbca\templates
```

The template is then available for use during the creation of your database.

Important: Within the Database Configuration Assistant wizard, it is essential that you choose the following settings. (These are required for the GDAL coordinates to work in ENTERPRISE.)

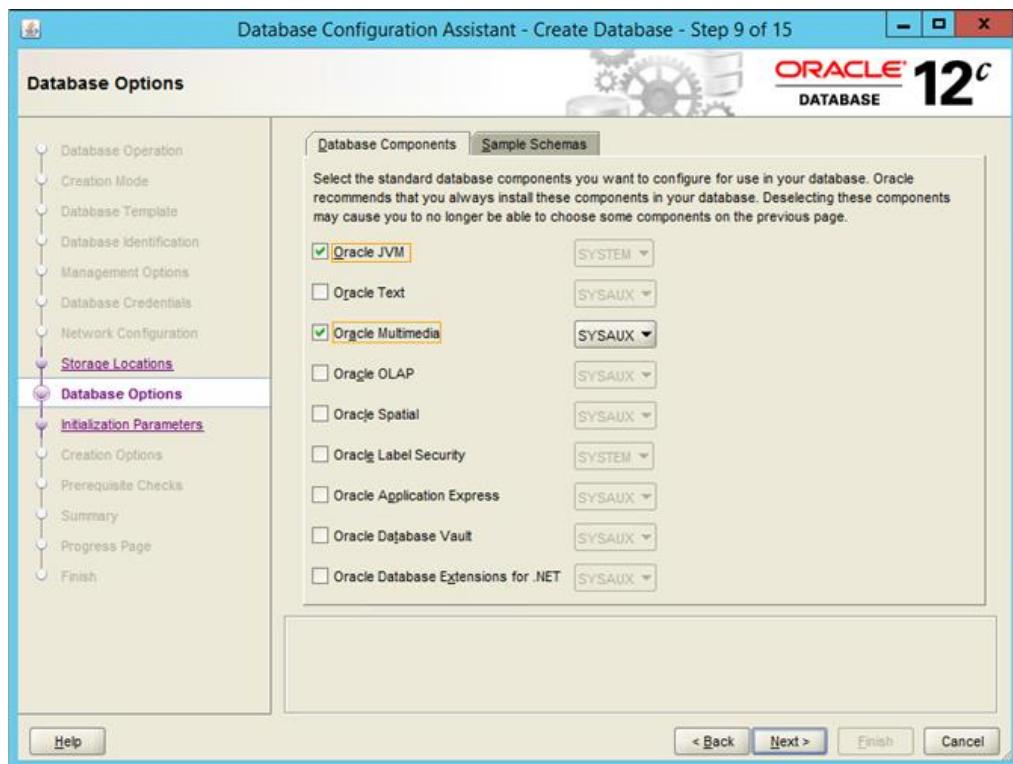
For an **Oracle 12c** database:

For a Custom Database, when you are setting the Database Options, there is a Database Components tab. Ensure that these options are selected:

- Oracle JVM
- Oracle Multimedia

(In Oracle 12c, the Oracle XML DB option is automatically built-in.)

This picture shows an example:



Initial Guideline for Memory Management Values

The Database Configuration Assistant contains Initialization Parameters, which includes a Memory tab.

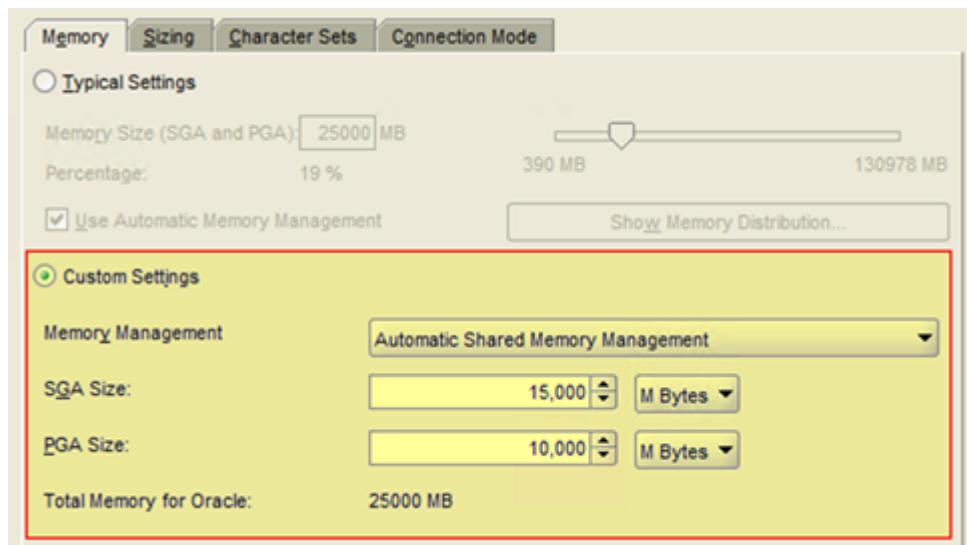
On this tab, we strongly recommend that you:

- Select the Custom Settings option
- Choose Automatic Shared Memory Management (ASMM)
- As an initial guideline, set the memory sizes as follows:
 - PGA: set this to a minimum of 200 MB for each concurrent user expected to be connected to the database
 - SGA: set this to a minimum of $1.5 \times$ the value set for PGA.

This table shows some example values:

Concurrent Users	PGA (MB)	SGA (MB)
5	1,000	1,500
10	2,000	3,000
20	4,000	6,000
50	10,000	15,000
100	20,000	30,000
200	40,000	60,000
500	100,000	150,000

So, using the above example of 50 concurrent users, you would set the parameters in the wizard as follows:



Example of Memory tab in the Initialization Parameters of the Database Configuration Assistant

Important: The above recommended values serve as baseline starting values. However, for optimum performance, and to prevent the SGA memory regions from being undersized (ORA-errors), SGA parameters (including shared_pool; db_cache_size; large_pool; java_pool) should be tuned for peak workloads by your DBA.

About the Oracle Tablespaces

Your database requires three tablespaces - two data tablespaces (one for the data itself and one for indexes) plus a temporary tablespace. The first time you log on to the database using the Administrator tool, you will be asked for the names of these three tablespaces. The following names are required:

- PERM
- INDX
- TEMP

Administrator will then populate the database with the tables, procedures and constraints required by ENTERPRISE (see Populating the Product Schemas).

If you intend to use database settings management (for more information see Database Settings Management on page 160) you should create a tablespace called:

- SETTINGS

You will also need to create a tablespace to accommodate history data in the database (for more information see Using Version History on page 52). The recommended name for this tablespace is:

- VERSIONS

Important: Using the Version History feature may result in the storage of a large amount of data. You must create a VERSIONS table to hold this data rather than attempting to use the SYSTEM table or any other existing Oracle generated table.

The recommended parameters for the tablespaces are:

Tablespace Name	Description	Data files	Data file Autoextend?
PERM	Locally managed – Uniform size 1 MB	500 MB	Yes
INDX	Locally managed – Uniform size 1 MB	500 MB	Yes
TEMP	Locally managed – Uniform size 1 MB	100 MB	Yes
SETTINGS	Locally managed – Uniform size 10 MB	500 MB*	Yes
VERSIONS	Locally managed – Uniform size 10 MB	5 GB	Yes

* The number of users that you have will determine how large the SETTINGS tablespace needs to be. When you create it, an allowance in the order of 5 MB per user per project is likely to be necessary. For example, if you have a total of sixty users and two projects, a size setting of 600 MB (5 x (60 x 2)) is appropriate. The Extent Management parameter should be set to Locally Managed with a Uniform Allocation of Size 10 MB. The Enable Logging parameter should be set to 'No'.

About the Tnsnames.ora File

The `tnsnames.ora` file is located on the server and on each client PC. It defines the “Connect Descriptors” which tell Oracle how to connect to each available database.

In the case of the ENTERPRISE database, the connect descriptor specifies a TCP connection to an instance with a specific Oracle SID on a specific host machine and via a specific TCP port number (default is 1521 for Oracle).

The `tnsnames.ora` file should have an entry for your database added that looks like the following extract:

```
MY_DB_SERVICE_NAME =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = HOST_NAME) (PORT = 1521))
    )
    (ASSET Backhaul_DATA =
      (SERVICE_NAME = SID)
    )
  )
```

Note: In the extract shown, items in bold indicate where the values for your database should go.

If there is no entry for the database you have added, or if it is incorrectly specified, then your applications (including ENTERPRISE) will be unable to connect to the database.

About the Listener.ora File

The listener is an Oracle Service that runs on the server and provides the connectivity between the Oracle Instance processes and IO system. The listener is configured through a text file called `listener.ora`. The `listener.ora` file should have an entry for your database that looks like the following extract.

The first part (`SID_LIST_LISTENER = ...`) tells the listener which database instances to provide IO for. The second part of the file (`LISTENER = ...`) tells the listener service which IO connections to listen on for connection requests to the database, as shown:

```
# listener.ora Network Configuration File:
C:\oracle\product\10.2.0\db_1\network\admin\listener.ora
# Generated by Oracle configuration tools.

SID_LIST_LISTENER =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = SID)
      (ORACLE_HOME = C:\oracle\product\10.2.0\db_1)
      (PROGRAM = extproc)
    )
  )

LISTENER =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS = (PROTOCOL = IPC) (KEY = EXTPROC1))
      (ADDRESS = (PROTOCOL = TCP) (HOST = server IP address) (PORT = 1521))
    )
  )
```

Note: In the example, the items in bold indicate where the values for your setup should go.

Verifying a Connection

You can verify that a connection to the new instance is possible using the Oracle Net Configuration Assistant.

To do this:

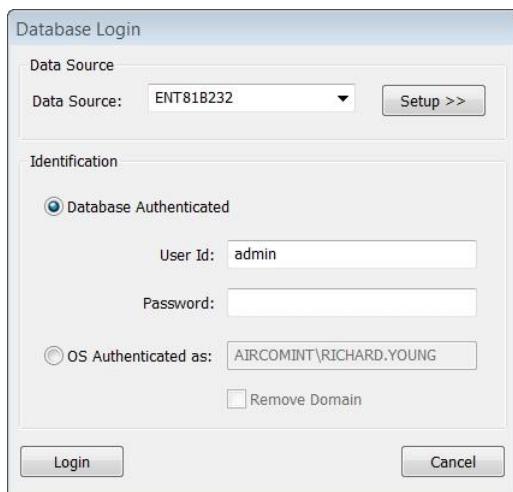
1. Open the Oracle Net Configuration Assistant.
From the Start menu, point to All Programs, Oracle, Configuration and Migration Tools, then click **Net Configuration Assistant**.
2. Select **Local Net Service Name Configuration** and click **Next**.
3. Select **Test** then click **Next**.
4. Select your database instance from the drop down list and then click **Next**.
5. If the details show that the test was successful, click **Finish**. If the test was unsuccessful click **Cancel** and contact Product Support.

Configuring the ODBC Connection

When you have created your Oracle database you need to configure the ODBC connection for it.

To do this:

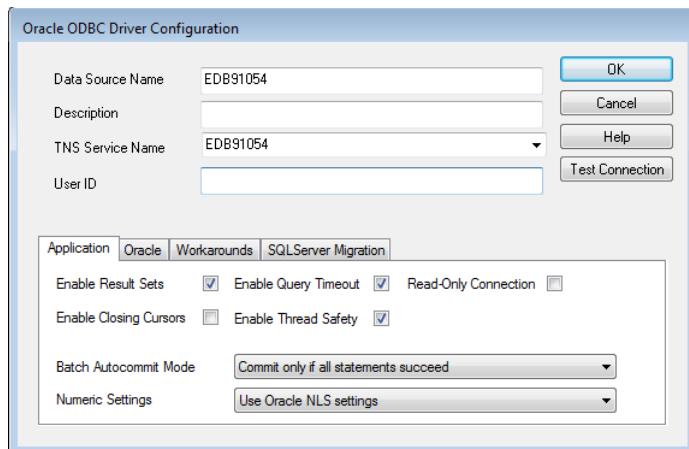
1. From the **Start** menu, click **TEOCO** then **Administrator**. The **Database Login** dialog box appears.
2. In the **Database Login** dialog box, do not type a username and password, but click the **Setup** button to configure the ODBC source:



3. If the database will be used by more than one user, or you will be using **ARRAYWIZARD**, click the **System DSN** tab, otherwise click the **User DSN** tab.
4. Click **Add**.
5. Click the Oracle ODBC driver and click **Finish**:



6. In the **Oracle ODBC Driver Configuration** dialog box , type the Data Source Name in the **Data Source Name** field and the TNS Service Name in the **TNS Service Name** field:



You do not need to type a Description.

Important:

- Do not type a User ID or click the Test Connection button in this dialog box. If you do so, an entry is added to the registry which interferes with OS authentication.
- Do not select the **Enable Closing Cursors** option. Selecting it would result in the generation of an Oracle ORA-00911 error.

-
7. Click **OK**.
 8. Click **OK** to return to the **Database Login** dialog box and from the drop down list in the **Data Source** box, select your new database.

Now you can populate data dictionary entries that define the schema.

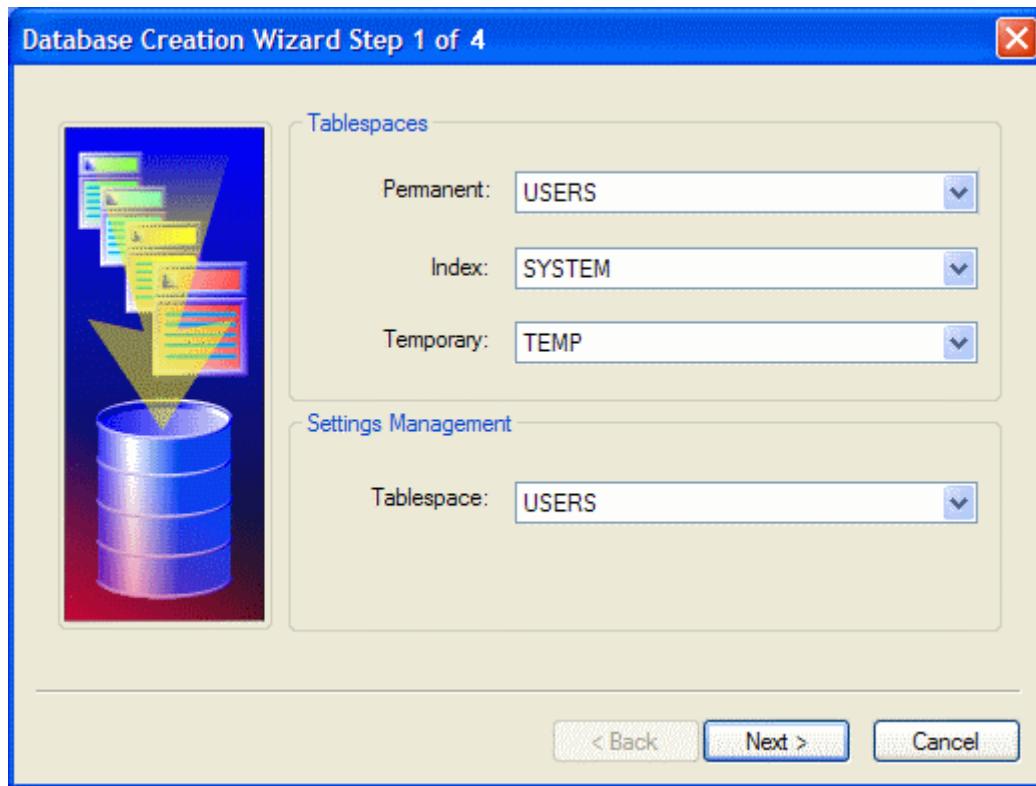
Populating the Product Schemas

After creating a blank database instance suitable for ENTERPRISE you need to connect to the database and populate the data dictionary entries that define the ENTERPRISE schema. This sets up the required tables, stored procedures and constraints.

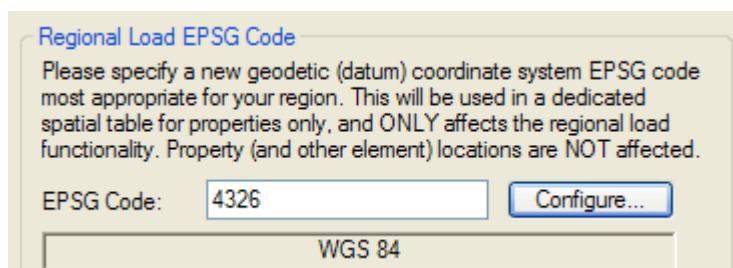
To do this:

1. In ENTERPRISE Administrator, in the **Database Login** dialog box, from the drop-down list, select the Data Source for your database.
2. Type the User Id and Password that you set when you created your database.
3. Click **Login**.

The Database Creation Wizard appears:



4. Choose the tablespace names required by ENTERPRISE. Where available, select PERM from the Permanent drop-down list, INDX from the Index drop-down list and TEMP from the Temporary drop-down list. If you wish to store settings in the database (for more information see Database Settings Management on page 160), and you have created a tablespace called SETTINGS (for more information see About the Oracle Tablespaces on page 37) you can select SETTINGS from the drop-down list in the Settings Management pane.
5. Click **Next**.
6. Specify a geodetic (datum) coordinate system EPSG code that is most appropriate for your region (you can click the Configure button to look up the relevant EPSG code):



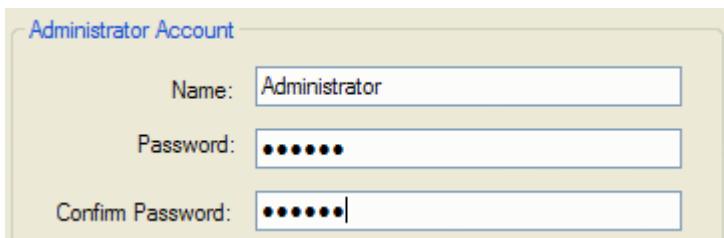
This will be used in a dedicated spatial table for Properties only, and ONLY affects the regional load functionality. Property (and other element) locations are NOT affected.

Any database that is created in ENTERPRISE 10.0, or upgraded to ENTERPRISE 10.0, must have a single geographic EPSG (representing a datum) set for the whole database. Although this sounds highly restrictive, it is only applicable to the functionality of 'Regional Load', that is the functionality used to geographically restrict which network element data is loaded at project run time.

Assuming that the accuracy of the regional load algorithm does not have to be more than 200m, this value can be almost arbitrary. It is recommended to select the datum that is used by the majority of projects, or the projects where the most accurate Regional Load is required.

Important: For general information about EPSG codes, see About the EPSG Coordinate System on page 11.

7. Click **Next**.
8. Type a user name and password for the administrator account. This will be the password for the Super User. For more information about users, see About User Types.



9. In the **Internal Schema Password** pane, select an option to indicate whether you want to use the default schema password or set your own password. Only set your own password if you think you will need to change the default schema:



10. Click **Next**.

11. In the **Database Privileges** pane, review the system privileges granted to the ENTERPRISE schema and revoke any that you do not wish to allow by deselecting the associated check box.

Important: Revoking privileges in this way will result in the loss of the related functionality and is therefore not recommended. For example, if you wish to use ARRAYWIZARD, these privileges must be enabled when you first open the ARRAYWIZARD Administrator, otherwise you will not be able to log in to it and the message "You do not have the database privilege to configure ARRAYWIZARD" will appear in its message log.

You can subsequently access and change these options again using the **Database Privileges** option from the **Configuration** menu in Administrator. For more information see Revoking Database Privileges on page 58.

-
12. Click **Finish**.

ENTERPRISE Administrator configures the database. This can take a few minutes depending on the speed of your machine.

After schema creation (and after upgrading to version 10.0), this message is shown in the Message log:

```
*****
Please note: the SELECT ANY DICTIONARY privilege has been revoked from all schemas
except for NETWORK_PLANNING schema. If your database security policy does not allow
the SELECT ANY DICTIONARY privilege to be granted to any schemas, then replace this
privilege with the following grants (via SYS user):

    revoke select any dictionary from network_planning;

    grant select on sys.dba_sys_privs to network_planning;
    grant select on sys.dba tablespaces to network_planning;
    grant select on sys.dba_profiles to network_planning;
    grant select on sys.dba_users to network_planning;
    grant select on sys.v$instance to network_planning;
    grant select on sys.v$parameter to network_planning;
    grant select on sys.gv$session to network_planning;
    grant select on sys.dba_roles to network_planning;
    grant select on sys.dba_role_privs to network_planning;
    grant select on sys.all_tab_cols to network_planning;
    grant select on sys.all_users to network_planning;
    grant select on sys.product_component_version to network_planning;
    grant select on mdsys.sdo_coord_ref_system to network_planning;
    grant select on sys.all_indexes to network_planning;
*****

```

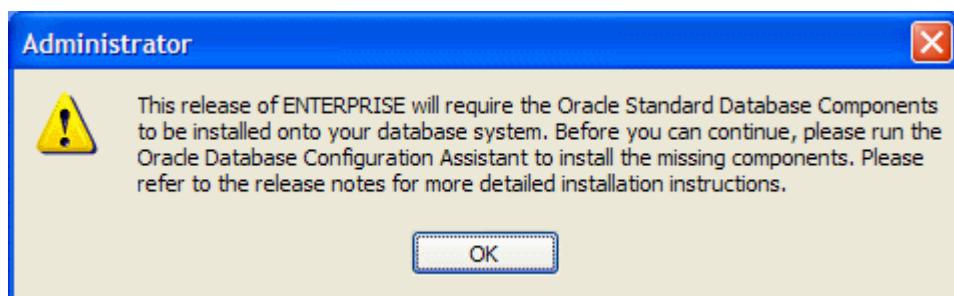
Upgrading Your Database

Important: If you have any doubts about the following advice and instructions, please contact the appropriate Product Support office for assistance. These guidelines apply to upgrades from ENTERPRISE version 9.1 onwards.

Initial Advice

When you install ENTERPRISE 10.0 and try to connect to a database that has an older schema version, an error message appears.

The error message may be as shown in this example:



In this case, run the Oracle Database Configuration Assistant and select Configure Database Options, then set the Standard Database Components as described under Creating an Oracle Database on page 34 before upgrading the database.

If, instead, the error message just states that your database needs to be upgraded, you can follow the upgrade procedure described in this section.

Note: Only the Super User can upgrade the database.

Before starting the upgrade:

1. Check that you have sufficient physical disk space and tablespaces available. This is especially important for the AIRCOM schema tablespace where the schema will be migrated to become NETWORK_PLANNING.
2. Set the existing AIRCOM schema tablespace to AUTOEXTEND.

Performing the Upgrade

It is important to perform the upgrade procedure for ENTERPRISE 10.0 correctly. Before proceeding with these steps, please read the preceding sections carefully.

Important: If you have any doubts about the following advice and instructions, please contact the appropriate Product Support office for assistance.

To upgrade a database:

1. Ensure that:
 - No users are logged into the database.
 - The database is not connected to any ARRAYWIZARD services.
 - All uncommitted work that you wish to keep is committed. When you upgrade, any uncommitted work is deleted.
 - You have performed a full backup of the database and make sure that it is complete and archived safely.

Important: It is vital that you keep a full database backup to ensure minimal data loss. A full backup contains all projects, that is, everything that you have entered in the tool including users and groups, permissions, map data and projection settings.

2. In the Administrator tool, from the **Database** menu, click **Login** and choose the database you require.
3. Type the username and password of an account with administrator permissions.
4. In the left pane, select **Utilities**.
5. In the right pane, double-click the **Upgrade Database** option to start the Database Upgrade Wizard.
6. On the Database Upgrade Wizard Step 1 of 4 page, when you are sure that your data has been committed and backed up, click **Next**.
7. On the Database Upgrade Wizard Step 2 of 4 page:
 - Select the Verbose Mode option if you want the content of the upgrade log file to be reported in the Message Log window, or leave it blank if you do not.
 - Select the Open Windows Explorer option if you want Windows Explorer to open at the location of the log file when the upgrade is complete, or leave it blank if you do not.
- Click **Next**.
8. On the Database Upgrade Wizard Step 3 of 4 page, select the Drop backup tables option if you wish to recover disk space by deleting any backup tables that were created during previous database upgrades, or leave it blank if you do not. Any such tables are listed and labelled according to the version at which they were created, so for example version 9.0 tables that were backed up when upgrading to version 9.1 are labelled as version 9.1.0.

Note: When the current upgrade is performed your existing database tables are backed up. You can delete these latest backup tables (together with any older ones if you have not selected the delete option at this step) by selecting **Delete Upgrade Backup Tables** from the **Utilities** menu after the current upgrade has completed. For more information, see Deleting Backup Tables on page 51.

Click **Next**.

9. On the Database Upgrade Wizard Step 4 of 4 page, review the summary information presented, then click **Finish**. A successful upgrade will result in this message appearing in the message log:

```
*****
Please note: the SELECT ANY DICTIONARY privilege has been revoked from all schemas
except for NETWORK_PLANNING schema. If your database security policy does not allow
the SELECT ANY DICTIONARY privilege to be granted to any schemas, then replace this
privilege with the following grants (via SYS user):
```

```
revoke select any dictionary from network_planning;

grant select on sys.dba_sys_privs to network_planning;
grant select on sys.dba tablespaces to network_planning;
grant select on sys.dba_profiles to network_planning;
grant select on sys.dba_users to network_planning;
grant select on sys.v$instance to network_planning;
grant select on sys.v$parameter to network_planning;
grant select on sys.gv$session to network_planning;
grant select on sys.dba_roles to network_planning;
grant select on sys.dba_role_privs to network_planning;
grant select on sys.all_tab_cols to network_planning;
grant select on sys.all_users to network_planning;
grant select on sys.product_component_version to network_planning;
grant select on mdsys.sdo_coord_ref_system to network_planning;
grant select on sys.all_indexes to network_planning;
```

For full details on upgrading an Oracle database, contact Product Support.

Repredicting Pathloss

When you upgrade from a version prior to 9.1, any pathloss files stored from previous versions become redundant. This applies to all propagation models. You must therefore create new pathloss predictions. For more information on how to do this, see the *ASSET User Reference Guide*. The pathloss files created by your new predictions will be separate from the old ones and you can delete the old files since they will no longer be used. If you do not delete the old files and a requirement for disk space arises, the Prediction and Array File Management System uses a caching algorithm to purge them and create the required disk space. For more information, see the *ASSET Technical Reference Guide*.

Updating Grid Data Loader Headers

At version 10.0, some of the column headers of the Grid Data Loader changed. On upgrading from an earlier version you will need to update your Grid Data Loader headers. A spreadsheet showing how the previous column names map to the current ones is available in the Samples\Grid Data Loader - Header Files sub-folder of the folder to which ENTERPRISE was installed (typically C:\Program Files\TEOCO\ENTERPRISE 10.0). The name of the spreadsheet file is GridDataLoader_v91_v2020_Mapping.xlsx.

Patching Your Database

Bug fixes and enhancements to the production database schemas are released as database patches.

When such an update becomes available:

- The **Patch Database** option on the **Utilities** menu in Administrator is enabled.
- When you log in to Administrator, this message appears in the Administrator Message Log:

```
*****
WARNING: There is a patch available to update your database schemas.
The patch version of the database you are using (90000) is older than
the version of Administrator you are running (90001).
You can run the patch via the menu 'Utilities | Patch Database...'.
*****
```

- Whenever a user logs in to ENTERPRISE, a similar warning message appears.

The way in which the warning message is presented on logging in to ENTERPRISE depends on the nature of the database patch.

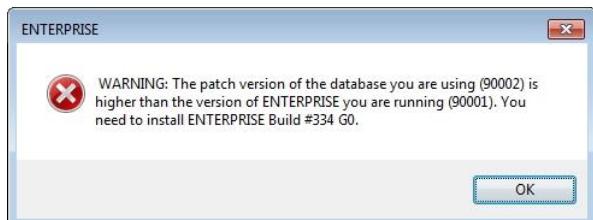
If the patch will make changes to the database that mean that you can not revert to an earlier version of ENTERPRISE and use the patched database with it, the message appears in its own window:



If you will still be able to revert to an earlier version of ENTERPRISE after applying the database patch, the first paragraph of the message only appears in the ENTERPRISE **Message Log** window:

```
*****
WARNING: There is a patch available to update your database schemas.
The patch version of the database you are using (90000) is older than
the version of ENTERPRISE you are running (90001). Ask your database
administrator to run the database patch in the Administrator.
*****
```

If you revert to an earlier version of ENTERPRISE after having installed a patch that prevents the patched database from working with earlier versions, you will be unable to log in to ENTERPRISE. On attempting to do so a message will appear in its own window to inform you which version of ENTERPRISE is required to work with the patched database:



Applying a Database Patch

To apply a database patch:

From the **Utilities** menu, click **Patch Database**.

1. The first page of the Database Schema Patch Wizard appears, advising you to back up your database.
2. If you have backed up your database, click **Next**. The second page of the wizard appears:



This page shows the current patch number, the patch number of the available patch and any notes describing the purpose of the patch.

3. Click **Next**. The third page of the wizard appears.
4. If you want details of the action of the patch's Oracle SQL Scripts to be shown in the Message Log, select the **Verbose Mode** option.
5. Click **Finish**. The patch is applied and a progress bar appears.

Once the patching process is complete a message appears in the Message Log. This picture shows an example of the sort of message that appears if the patch was successful:

```
Parsing SQL scripts control file 'X:\9.0_build334\Configuration\Upgrade\SCRIPTS\DBPatch.dfl'...
Starting Database Schema Patch...
Database Schema Patch completed.
Log file located in: 'X:\9.0_build334\Configuration\Upgrade\SCRIPTS\Patch900_ent90_06072015_122739.log'
```

After a successful patch, the **Patch Database** option on the **Utilities** menu is no longer enabled.

If the patch failed, a message like this appears:

```
The database patch has failed. Please consult product support.
```

If the patch fails or other error messages are shown in the Message Log, contact TEOCO Support and provide the patch log file for analysis.

Using OS Authentication

You can choose to use the Operating System (OS) to authenticate user passwords. This means, if the information held on the server recognises the username as valid, the user is automatically logged into the ENTERPRISE database. They do not have to type a password.

As ENTERPRISE stores additional security information for each user, you need to manage the user accounts in Administrator. For more information, see Creating Groups and Users on page 93.

Using OS Authentication with Windows

Before you can use OS authentication with Windows, you need to amend the sqlnet.ora file. On the server, locate the sqlnet.ora file and add:

```
sqlnet.authentication_services= (nts)
```

Important: If you have remote databases, contact your Database Administrator to establish the correct configuration for OS authentication.

Using OS Authentication with Unix

Before you can use OS authentication with Unix, you need to amend the ldap.ora and sqlnet.ora files and execute some sql commands.

To do this:

1. Include the following in your ldap.ora file:

```
DIRECTORY_SERVERS= (dc32-emea-dc01.emea.teo.earth::389)
DEFAULT_ADMIN_CONTEXT = "OU=EOs,DC=emea,DC=teo,DC=earth"
DIRECTORY_SERVER_TYPE = AD
```

where the first line defines the server (in this case an AD server), the second line specifies the directory context search path on the AD server, and the third line indicates the server type, which could be AD, OID (Oracle TNS config) and so on.

2. Include the following in your sqlnet.ora file:

```
SQLNET.DIRECTORY_PATH= (LDAP,TNSNAMES)
```

3. Set the OS user up to use external authentication 'OPSS' in ENTERPRISE Administrator.
4. Set the Oracle Database to use remote os authentication – OPS\$ users with these commands:

```
Alter system set remote_os_authentication=TRUE scope=spfile;
Shutdown abort;
Startup;
```

where the second and third lines restart the database so that the database changes can take effect.

Troubleshooting OS Authentication

If OS authentication is not working correctly, follow these steps:

1. Run sqlplus nolog, log on to your database and execute the following sql commands:

```
conn sys/system@<dbname> as sysdba
alter system set os_authent_prefix='' scope=spfile;
alter system set remote_os_authent=true scope=spfile;
show parameter os_auth;
```

The last of these commands should result in this being displayed:

NAME	TYPE	VALUE
os_authent_prefix	string	
remote_os_authent	boolean	TRUE

2. Locate the sqlnet.ora file and within it the following:

```
SQLNET.AUTHENTICATION_SERVICES= (NTS) - (Windows only)
NAMES.DIRECTORY_PATH= (TNSNAMES, EZCONNECT)
```

Ensure that this appears as shown here and is not preceded by '#'.

3. If you have already created the OS authentication user, use ENTERPRISE Administrator to delete the user, then close ENTERPRISE Administrator.
4. Open the **Services** window and stop and restart the OracleService for your database.
5. Open ENTERPRISE Administrator, log on as Administrator and recreate the deleted OS authentication user.
6. Close ENTERPRISE Administrator. You should now be able to log on to ENTERPRISE using the newly created OS authentication user.

About Database Errors

Database errors are recorded in the Database Exception Log. You can view the log file or empty the file of entries.

To view the Database Exception Log:

1. Select **Database Exception Log** from the **Utilities** menu.
2. Click on **View Database Exceptions**.

To empty the Database Exception Log:

1. Select **Database Exception Log** from the **Utilities** menu.
2. Click on **Empty Logged Exceptions**.

Refreshing the Database View

To ensure that ENTERPRISE Administrator is showing the latest state of the database including for example any new projects added by users:

From the **Utilities** menu select **Refresh All**.

Backing Up and Restoring Databases

The frequency with which you should perform an Oracle export to back up your database depends on how much ENTERPRISE is used. The more changes that are made, the more frequent backups should be, but they are likely to be necessary either daily or weekly. For more information on how to perform an Oracle export, refer to your Oracle documentation. You should export your database with the System user.

Having carried out an Oracle export it is advisable to zip it and copy it to another server, preferably in a different location.

This table shows what additional backups are also recommended:

Back Up This	This Often
The folder where you store your user defined vectors.	Once a month (unless many user defined vectors are being created in which case back up more often).
The Preferences folder where you store your favorites.	Once a month (unless many favorites are being created in which case back up more often).
All your map data.	Once to another server and to DVD.

You can create scripts and scheduled tasks to perform these backups. For moving backups from one server to another, robocopy.exe is recommended.

Note: To back up individual ENTERPRISE projects you can use the ENTERPRISE Export or XML Export facilities described in the *ENTERPRISE User Reference Guide*.

To restore a dumped database:

1. Create a new empty database using Oracle's Database Configuration Assistant and an ENTERPRISE template from Product Support.
2. Remove the tablespaces in your new empty database and replace them with the tablespaces in your dump.
3. Import the database dump into your new empty database.
4. Check the import log file for ORA-messages.
5. Compile any invalid objects.
6. Select the **Upgrade Database** option from the **Utilities** menu in ENTERPRISE Administrator.

Deleting Backup Tables

During database upgrades, backup tables are created. These occupy disk space and so you may wish to delete them.

To delete backup tables:

1. From the **Utilities** menu, click **Delete Upgrade Backup Tables**.
2. On the Delete Upgrade Backup Tables Wizard Step 1 of 2 page, read the cautionary note then click **Next**.
3. On the Delete Upgrade Backup Tables Wizard Step 2 of 2 page, scroll down the list of tables identified to make sure that you want to delete them all.

Important: Depending on whether or not you chose to delete backup tables when upgrading your database (for more information see Performing the Upgrade on page 45), the list may contain tables backed up at different versions. You can not select from the list or recover the tables once deleted.

4. If you are sure you want all the listed tables to be deleted, click **Finish**.

Using Version History

Assuming you have created a VERSIONS tablespace, you can use ENTERPRISE's Version History feature to keep track of changes to single objects. You activate the feature from the History dialog box. For information on creating a VERSIONS tablespace, see About the Oracle Tablespaces on page 37.

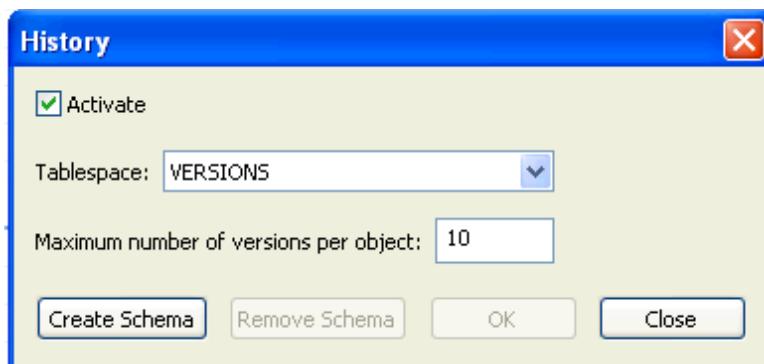
To configure and activate object versioning:

1. Open ENTERPRISE Administrator.
2. In the left-hand pane, click **Configuration** and in the right-hand pane double-click **History**.

- or -

From the **Configuration** menu, click **History**.

The **History** dialog box appears. This picture shows an example:



3. From the drop-down list in the **Tablespace** field, select the VERSIONS tablespace.

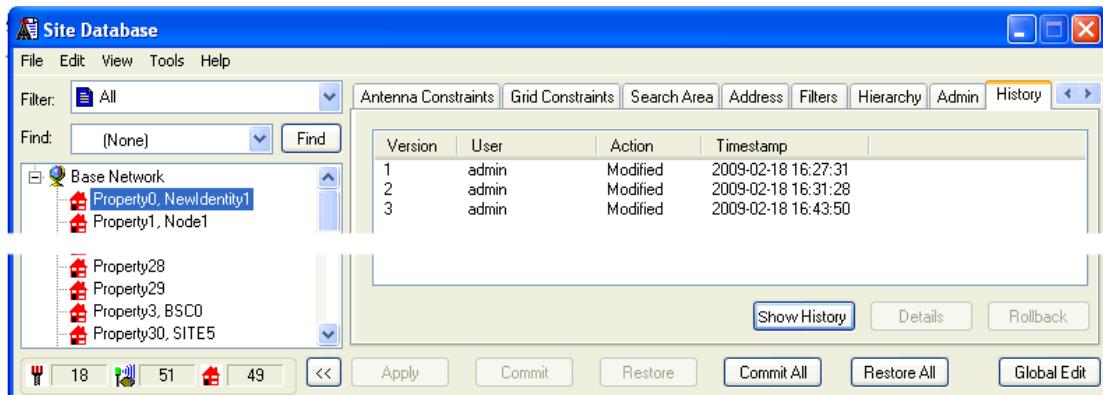
Important: Do not use any other tablespace for this purpose.

4. Type the maximum number of versions per object. After this number of versions of an object has been stored, the next version to be stored will overwrite the oldest of the existing versions.

Note: The higher the maximum number of versions retained, the greater the demand on storage space will be. The highest permissible number is 100.

5. Click **Create Schema**. The history schema is created within the VERSIONS tablespace.
6. Select the **Activate** option. When the Activate option is selected, version history is recorded. You can uncheck the Activate option later to stop further version history being recorded while retaining the existing version history. Version history recording will be resumed when the Activate option is again selected.
7. Click **OK**.

History tabs are visible in the **Site Database** window in ENTERPRISE. This picture shows an example:



For more details on the use of these tabs, see the *ENTERPRISE User Reference Guide*.

Removing the History Schema

Important: You can delete your accumulated history records but having done so, you cannot recover them.

To delete your history records:

1. Click **Remove Schema**. A warning message appears.
2. Click **Yes**.

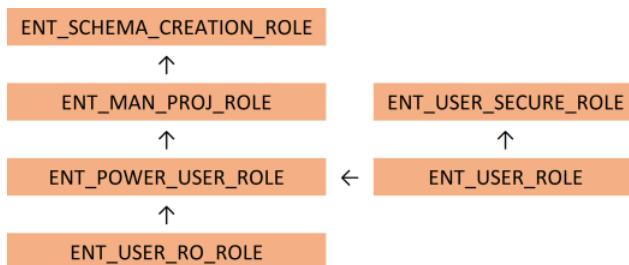
If you then click **Create Schema** again, a new version history will be started.

Managing Oracle Roles and Privileges

When you run the Database Creation Wizard (for more information, see Populating the Product Schemas on page 41), a number of ENTERPRISE-specific default schemas and Oracle roles are created. This table shows which of the Oracle roles is granted to which type of ENTERPRISE user:

	Super User	Regional Super User	Normal User	Power User	Sandbox User
ENT_USER_RO_ROLE	YES	YES	YES	YES	YES
ENT_USER_ROLE	YES				
ENT_USER_SECURE_ROLE	YES	YES	YES	YES	YES
ENT_POWER_USER_ROLE	YES			YES	
ENT_MAN_PROJ_ROLE	YES	YES			
ENT_SCHEMA_CREATION_ROLE	YES				

This diagram shows which roles belong to which others in a parent-child relationship:



So for example:

- The ENT_SCHEMA_CREATION_ROLE includes:
 - the ENT_MAN_PROJ_ROLE
 - the ENT_POWER_USER_ROLE
 - the ENT_USER_RO_ROLE
- The ENT_POWER_USER_ROLE includes:
 - the ENT_USER_ROLE
 - the ENT_USER_RO_ROLE
- The ENT_USER_SECURE_ROLE includes:
 - the ENT_USER_ROLE

The following tables show the system privileges associated with ENTERPRISE roles. The Admin? column indicates whether or not the Oracle "With Admin" option applies to a system privilege.

ENT_POWER_USER_ROLE

Privilege	Admin?	Grantee	Type
ALTER USER	NO	ENT_POWER_USER_ROLE	Privilege
CREATE USER	NO	ENT_POWER_USER_ROLE	Privilege
DROP USER	NO	ENT_POWER_USER_ROLE	Privilege
CONNECT	YES	ENT_POWER_USER_ROLE	Role

These system privileges are required to allow the Administrator and Power users to manage ENTERPRISE users.

ENT_MAN_PROJ_ROLE

Privilege	Admin?	Grantee	Type
ALTER PROFILE	NO	ENT_POWER_USER_ROLE	Privilege

This system privilege will allow the Administrator and Super Regional users to run the Database Profile Editor to update the ENT_DEFAULT_PROFILE profile settings.

As a Database Administrator you can choose to revoke this privilege when you run the Database Creation Wizard (for more information, see Populating the Product Schemas on page 41) or under the **Database Privileges** option of the **Configuration** menu in the Administrator tool (for more information, see Revoking Database Privileges on page 58).

ENT_SCHEMA_CREATION_ROLE

Privilege	Admin?	Grantee	Type
ADMINISTER DATABASE TRIGGER	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
ALTER ANY INDEX	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
ALTER ANY PROCEDURE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
ALTER ANY ROLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
ALTER ANY SEQUENCE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
ALTER ANY TABLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
ALTER ANY TRIGGER	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
ALTER ANY TYPE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
ALTER PROFILE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
ALTER SESSION	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
ALTER USER	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
ANALYZE ANY	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
BACKUP ANY TABLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
BECOME USER	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
COMMENT ANY TABLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE ANY INDEX	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE ANY PROCEDURE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE ANY SEQUENCE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE ANY SYNONYM	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE ANY TABLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE ANY TRIGGER	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE ANY TYPE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE ANY VIEW	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE PROFILE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE PUBLIC SYNONYM	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE ROLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE SESSION	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE TYPE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
CREATE USER	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
DELETE ANY TABLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
DROP ANY INDEX	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
DROP ANY PROCEDURE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
DROP ANY ROLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
DROP ANY SEQUENCE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
DROP ANY TABLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
DROP ANY TRIGGER	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
DROP ANY TYPE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
DROP ANY VIEW	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
DROP PROFILE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
DROP PUBLIC SYNONYM	NO	ENT_SCHEMA_CREATION_ROLE	Privilege

Privilege	Admin?	Grantee	Type
DROP USER	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
EXECUTE ANY PROCEDURE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
EXECUTE ANY TYPE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
GRANT ANY OBJECT PRIVILEGE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
GRANT ANY PRIVILEGE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
GRANT ANY ROLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
INSERT ANY TABLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
LOCK ANY TABLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
QUERY REWRITE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
SELECT ANY DICTIONARY	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
SELECT ANY SEQUENCE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
SELECT ANY TABLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
UNDER ANY TYPE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
UPDATE ANY TABLE	NO	ENT_SCHEMA_CREATION_ROLE	Privilege
SCHEDULER_ADMIN	NO	ENT_SCHEMA_CREATION_ROLE	Role

These system privileges are used during the creation of the ENTERPRISE schemas. After schema creation, this role will only be granted to the Administrator user who will use the system privileges to:

- Run the database upgrade
- Run the database patches
- Set up History schemas
- Set up Arraywizard schemas

As a Database Administrator you can choose to revoke the ENT_SCHEMA_CREATION_ROLE role from the Administrator schema when you run the Database Creation Wizard (for more information, see Populating the Product Schemas) or under the **Database Privileges** option of the **Configuration** menu in the Administrator tool (for more information, see Revoking Database Privileges on page 58).

Managing Default Schemas

The following tables show the Oracle roles and privileges associated with the default schemas. The Admin? column indicates whether or not the Oracle "With Admin" option applies to a system privilege.

ADMINISTRATOR schema

Role	Admin?	Default Role?	Grantee
CONNECT	NO	YES	ADMINISTRATOR
ENT_MAN_PROJ_ROLE	YES	YES	ADMINISTRATOR
ENT_POWER_USER_ROLE	YES	YES	ADMINISTRATOR
ENT_SCHEMA_CREATION_ROLE	NO	YES	ADMINISTRATOR
ENT_USER_ROLE	YES	YES	ADMINISTRATOR
ENT_USER_RO_ROLE	YES	YES	ADMINISTRATOR
ENT_USER_SECURE_ROLE	YES	NO	ADMINISTRATOR

This schema represents the Super User for ENTERPRISE. By default this schema will have all the ENTERPRISE roles granted as well as the system privileges associated with those roles.

As a Database Administrator you can choose to revoke the ENT_SCHEMA_CREATION_ROLE role from the Administrator schema when you run the Database Creation Wizard (for more information, see Populating the Product Schemas on page 41) or under the **Database Privileges** option of the **Configuration** menu in the Administrator tool (for more information, see Revoking Database Privileges on page 58).

NETWORK_PLANNING schema

Privilege	Admin?	Grantee	Type
ALTER SYSTEM	NO	NETWORK_PLANNING	Privilege
SELECT ANY DICTIONARY	NO	NETWORK_PLANNING	Privilege
UNLIMITED TABLESPACE	NO	NETWORK_PLANNING	Privilege
RESOURCE	NO	NETWORK_PLANNING	Role

This schema is locked and has no CREATE SESSION privilege.

The SELECT ANY DICTIONARY privilege only exists in the NETWORK_PLANNING schema. If your database security policy does not allow the SELECT ANY DICTIONARY privilege to be granted to any schemas, then use the SYS user to replace this privilege with the following grants:

```
revoke select any dictionary from network_planning;

grant select on sys.dba_sys_privs to network_planning;
grant select on sys.dba tablespaces to network_planning;
grant select on sys.dba_profiles to network_planning;
grant select on sys.dba_users to network_planning;
grant select on sys.v$instance to network_planning;
grant select on sys.v$parameter to network_planning;
grant select on sys.gv$session to network_planning;
grant select on sys.dba_roles to network_planning;
grant select on sys.dba_role_privs to network_planning;
grant select on sys.all_tab_cols to network_planning;
grant select on sys.all_users to network_planning;
grant select on sys.product_component_version to network_planning;
grant select on mdsys.sdo_coord_ref_system to network_planning;
grant select on sys.all_indexes to network_planning;
```

EDS_SOA_CLIENT schema

Role	Admin?	Default Role?	Grantee
CONNECT	NO	YES	EDS_SOA_CLIENT
ENT_USER_RO_ROLE	NO	YES	EDS_SOA_CLIENT
ENT_USER_SECURE_ROLE	NO	NO	EDS_SOA_CLIENT

This schema is for the EDS feature. It has the privileges of the ENTERPRISE roles for accessing the NETWORK_PLANNING schema objects.

SETTINGS schema

Privilege	Admin?	Grantee	Type
UNLIMITED TABLESPACE	NO	SETTINGS	Privilege
ENT_USER_ROLE	NO	SETTINGS	Privilege

This schema is locked and has no CREATE SESSION privilege. It has the privileges of the ENTERPRISE roles for accessing the NETWORK_PLANNING schema objects.

HISTORY schema

Privilege	Admin?	Grantee	Type
UNLIMITED TABLESPACE	NO	HISTORY	Privilege
ENT_USER_ROLE	NO	HISTORY	Privilege

This schema is created when you configure Version History (for more information, see Using Version History on page 52). It is locked and has no CREATE SESSION privilege. It has the privileges of the ENTERPRISE roles for accessing the NETWORK_PLANNING schema objects.

ARRAYWIZARD schema

Privilege	Admin?	Grantee	Type
ALTER USER	YES	ARRAYWIZARD	Privilege
CREATE SEQUENCE	NO	ARRAYWIZARD	Privilege
CREATE SESSION	NO	ARRAYWIZARD	Privilege
CREATE TABLE	NO	ARRAYWIZARD	Privilege
SELECT ANY TABLE	NO	ARRAYWIZARD	Privilege
UNLIMITED TABLESPACE	NO	ARRAYWIZARD	Privilege
AW_ADMIN_ROLE	NO	ARRAYWIZARD	Role
ENT_USER_RO_ROLE	YES	ARRAYWIZARD	Role

This schema is created when you configure ARRAYWIZARD (for more information, see ARRAYWIZARD Server on page 18). It has the privileges of the ENTERPRISE roles for accessing the NETWORK_PLANNING schema objects.

Revoking Database Privileges

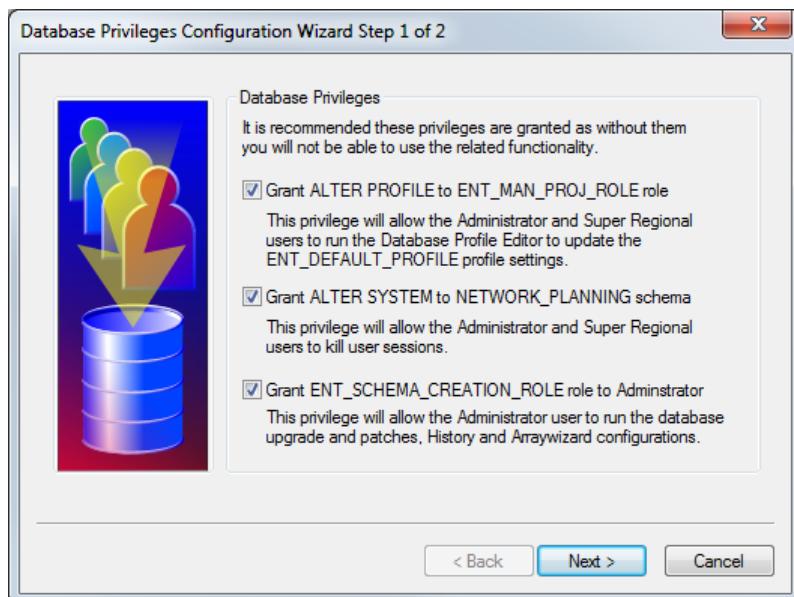
ENTERPRISE requires certain system privileges to be fully functional. If however, as a Database Administrator, you do not want to allow such privileges to be granted to the ENTERPRISE schemas due to database security policy, you can choose to control the following:

- ALTER PROFILE
- ALTER SYSTEM
- ENT_SCHEMA_CREATION_ROLE

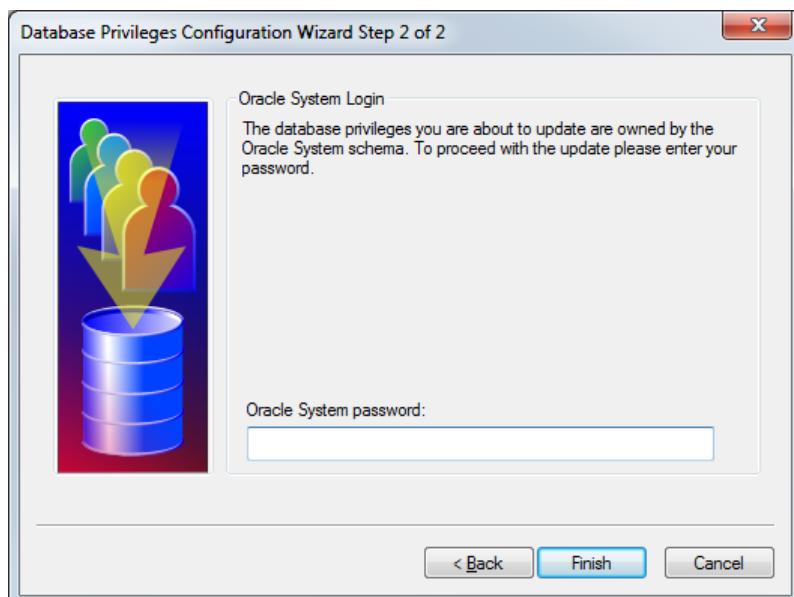
These privileges can be controlled when you run the Database Creation Wizard (for more information, see Populating the Product Schemas on page 41), or subsequently from the **Configuration** menu in Administrator.

To revoke database privileges from the Configuration menu:

1. In Administrator, from the Configuration menu, click **Database Privileges**. The first page of the Database Privileges Configuration Wizard appears:



2. Select the required options and click Next. The second page of the Database Privileges Configuration Wizard appears:



Type your database password and click **Finish**.

Once privileges have been revoked, attempts to use the associated functionality will result in notification that you do not have the necessary privileges, for example:

You do not have the database privilege to modify the profile.

Please ask your Oracle DBA to grant you this privilege via the menu option 'Configuration | Database Privileges...'.

4 Setting Up Projects

This chapter describes how to create and manage projects.

Creating a Project

When you have set up an Oracle database, you need to create a project. Project creation is performed in ENTERPRISE not Administrator, so you must either:

- Log in to ENTERPRISE as the Super User to create the project. For more information about Super Users, see [About User Types](#).
- Use Administrator to create a user who can create projects. That user can then log in to ENTERPRISE to create the project.

Creating Your First Project

Only a Super User or a user with Create Project permissions can create a project. For more information, see [About User Types](#).

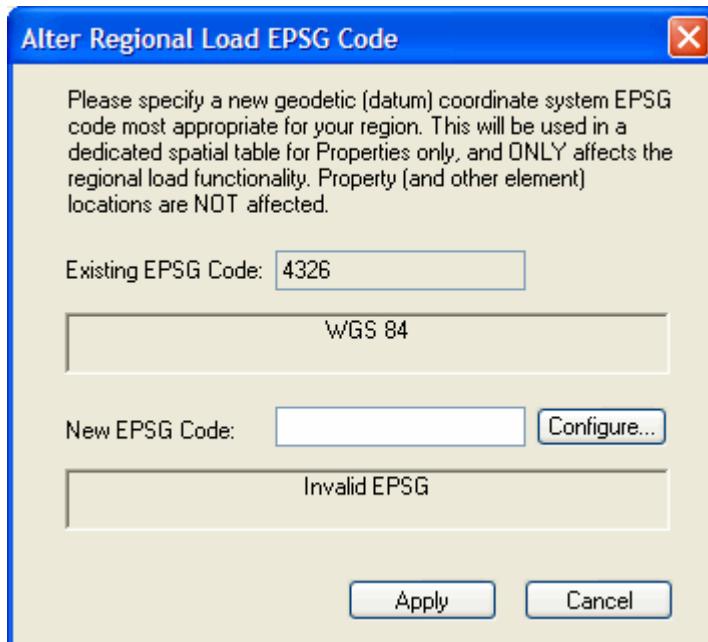
To create and configure a project:

1. Start ENTERPRISE.
2. In the **Database Login** dialog box, select the appropriate data source.
3. Select either Database Authenticated or OS Authenticated identification.
 - If you select Database Authentication, type your user name and password.
 - If you select OS Authentication, your username will be automatically shown in the box. You do not have to type a password. For more information, see [Using OS Authentication](#) on page 49.
4. Click **Login**.
5. In the **Project Manager** dialog box, click **Add** to create a new project. For complete instructions on doing this, press F1 on the **Project Manager** dialog box in ENTERPRISE or see the *ENTERPRISE User Reference Guide*.
6. When you have created projects, log out of ENTERPRISE and back into Administrator to:
 - Load the coordinate system database, if needed.
 - Add all your groups and users. For more information, see [Creating Groups and Users](#) on page 93.
 - Create fields. For more information, see [About Status Fields](#) on page 68.

Altering the Regional Load EPSG Code (Coordinate System)

The coordinate system is normally set when you create a new database (for more information, see [Populating the Product Schemas](#)), or perform an upgrade.

This option enables you, where necessary, to modify the geodetic (datum) coordinate system EPSG code most appropriate for your region:



Example of the Alter Regional Load EPSG Code dialog box

Note: This will be used in a dedicated spatial table for Properties only, and ONLY affects the regional load functionality. Property (and other element) locations are NOT affected.

Important: For information about EPSG codes, see About the EPSG Coordinate System on page 11.

To modify the Regional Load EPSG Code, if appropriate:

1. Ensure that there are no users logged in to the database.
2. In Administrator, from the **Utilities** menu, point to **Coordinate System**, and click **Alter Regional Load EPSG code**.
3. In the New EPSG Code field, type the required EPSG code.

Tip: You can use the **Configure** button to access a list of EPSG codes from which you can select the one you need and click **OK**.

A description of your chosen new coordinate system is shown below the EPSG code.

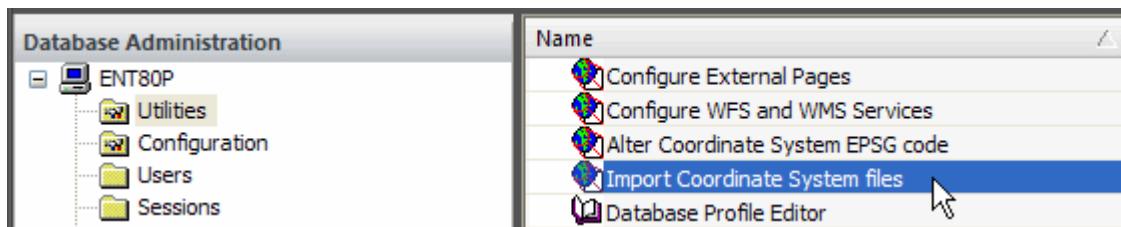
4. Click **Apply**. The new coordinate system is adopted.

Importing Coordinate System Files

The ENTERPRISE installation includes a set of text files supplied with the GDAL library, which provide the coordinate systems data. These files are imported into the database at the time of creation or upgrade and are subsequently used to initialise the coordinate system library at the Login/Project Start/Project Info stage.

The purpose of the 'Import Coordinate System Files' option is to enable you to provide updated coordinate system information for ENTERPRISE after database creation or database upgrade to use in the event of additional standard or custom coordinate systems being added.

Important: This option should only be used in very specific circumstances. If in doubt, please contact the appropriate Product Support office for advice.



Administrator - Import Coordinate System Files option

Important: For information about EPSG codes, see [About the EPSG Coordinate System](#) on page 11.

Loading a Subset of Project Data (Site Region Load)

If you have large numbers of sites in a project, you may want to load only sites in a specified region, which can be either a polygon or rectangle. By loading a subset of site data, ENTERPRISE can run faster.

For the implications of region loading, see [How Region Loading Affects the Project](#) on page 64.

When setting up a site region load for a project, you can use any of these methods:

Method 1 (recommended)

Summary: While the project is *open*, create the **polygon** in the usual way, within the normal **Map View** window (or just use a polygon that already exists in your normal vector folders). Then, after *closing* the project, specify that it is also to be used as the region load polygon.

This method has the significant benefit that you can visualise your sites/nodes in the normal 'open project' Map View while viewing or creating the polygon.

For full instructions, see [Setting Up Site Region Load Using Method 1](#) on page 64.

Method 2

Summary: While the project is *closed*, create a **polygon** within the Region Load Map View (this polygon is exclusive to site region load and will not be stored in your normal vector folders.) With this method, you cannot visualise your sites/nodes while creating the polygon.

For full instructions, see [Setting Up Site Region Load Using Method 2](#) on page 66.

Method 3

Summary: While the project is *closed*, create a **rectangle** by specifying coordinates. With this method, you cannot visualise your sites/nodes while creating the rectangle.

For full instructions, see [Setting Up Site Region Load Using Method 3](#) on page 67.

Important: Whichever method you choose, there is one restriction: any polygon used for region load must be a single polygon only (in other words, the vector must contain only one feature) and it must be limited to a maximum of 100 points.

How Region Loading Affects the Project

When using region loading, each time you open the project, the title bar indicates that you have 'Region Load' in operation.

The project will contain:

- All 'Committed' network elements (sites, nodes, microwave links, and so on) that are inside the region you have chosen
- All 'Committed' repeaters, and all their parent objects (sites, nodes, Properties, and so on) regardless of the chosen region
- All 'Applied-only' network elements (sites, nodes, repeaters, microwave links, and so on) relating to the individual user, regardless of the chosen region
- All hierarchical parent switches (such as MSCs, BSCs, WMSCs, RNCs, SGSNs, CDMA MSCs, CDMA BSCs, SAEGWs) and their associated Properties, regardless of the chosen region

Where remote antennas are used, the project will contain:

- Any Properties (regardless of the chosen region) that contain an antenna that is used by a cell that is located inside the chosen region
- Any Properties (regardless of the chosen region) that contain a cell that uses an antenna that is located inside the chosen region

When region loading is active:

- Map data is not affected in any way. You can leave your map data extents as they are, seeing map data for the whole country, while viewing only the subset of sites you have loaded.
- You can still add sites to all areas or move sites outside the chosen region.

Setting Up Site Region Load Using Method 1

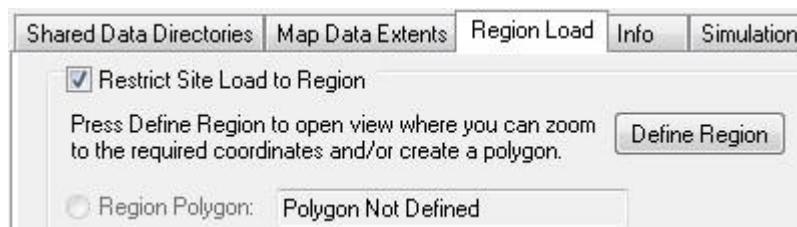
This section describes how to load a subset of project data using a polygon created in an open project.

Tip: This is the recommended method, because you can visualise your sites/nodes in the normal Map View window while creating the polygon.

To do this:

1. Visualise your sites/nodes in the normal Map View window.
2. Create your polygon in the usual way, or decide which existing polygon you want to use.
3. If the project is already open, close it.
4. In the **Project Manager** dialog box, select the appropriate project, and click  .
5. In the **Project Settings** dialog box, click on the **Region Load** tab.

6. Select the '**Restrict Site Load to Region**' checkbox:



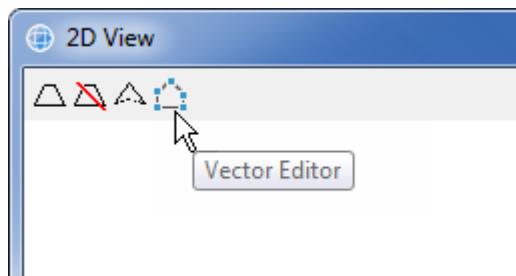
7. Click **Define Region**.

8. In the **Map View** window that appears, right-click and then click **Properties**.

9. From the **Data Types** list, choose what you want to display, for example any map layers or vectors, and then click **OK & Redraw**.

Tip: If necessary, you can use zooming and panning options by right-clicking on the Map View.

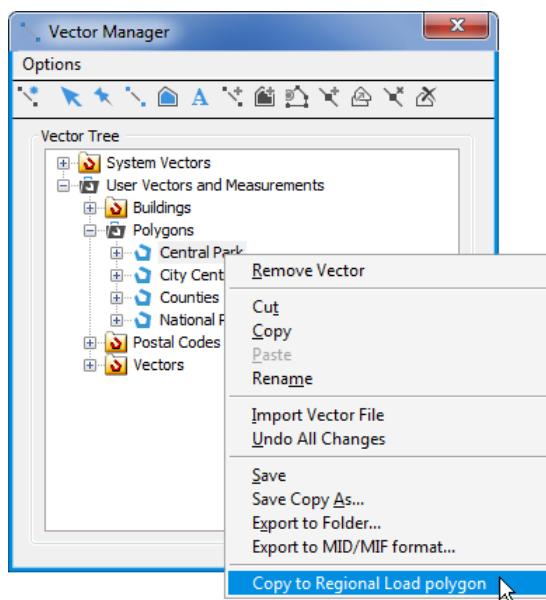
10. In the **Map View** window, click the **Vector Editor** button:



11. In the **Vector Manager** dialog box, select the required vector.

Note: Any system or user vector can be used, provided it consists of a single polygon with no more than 100 points.

12. Right-click on the vector and select '**Copy to Regional Load polygon**', as shown in this example:

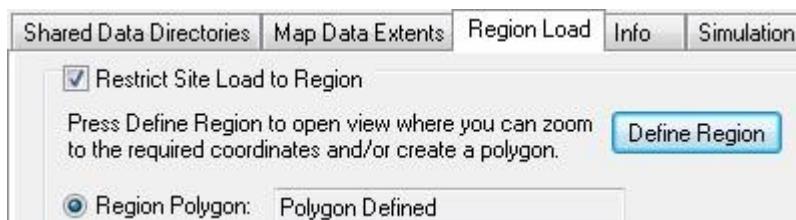


The polygon is displayed on the **Regional Load Map View**:



13. When you have finished, close the **Map View** window.

14. In the **Project Settings** dialog box, ensure that the '**Region Polygon**' radio button is selected, and it reads 'Polygon Defined':



15. Click **OK**.

16. In the **Project Manager** dialog box, click **Start**.

Setting Up Site Region Load Using Method 2

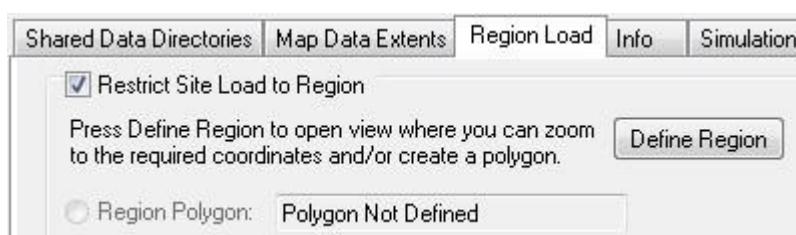
This section describes how to load a subset of project data using a polygon that you create within the temporary Regional Load Map View, while the project is closed.

Note:

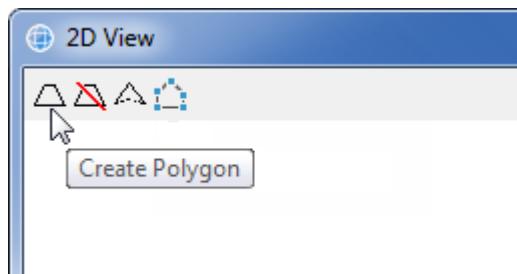
- This method does *not* enable you to visualise your sites/nodes while creating the polygon.
 - A polygon created with this method is exclusive to site region load and will not be stored in your normal vector folders.
-

To do this:

1. If the project is already open, close it.
2. In the **Project Manager** dialog box, select the appropriate project, and click **Info...**.
3. In the **Project Settings** dialog box, click on the **Region Load** tab.
4. Select the '**Restrict Site Load to Region**' checkbox:



5. Click **Define Region**.
6. In the **Map View** window that appears, right-click and then click **Properties**.
7. From the **Data Types** list, choose what you want to display, for example any map layers or vectors, and then click **OK & Redraw**.
8. In the **Map View** window, click the **Create Polygon** button .



9. Click the start point and all subsequent points of the polygon (up to a maximum of 100).

Tip: You can use zooming and panning options at any time by right-clicking on the Map View. You can continue making a polygon after panning, by clicking **Cancel Pan**. To undo your polygon points and start again, press the **Esc** key.

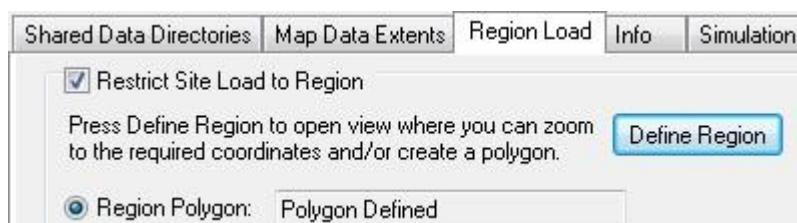
10. To complete your region polygon, double-click at the final point of the polygon.

If you are not satisfied with your region polygon, either:

- o Click the **Delete Polygon** button  and start again
- o Click the **Move Point** button , and then click and drag the points of your polygon as required

11. When you have finished, close the **Map View** window.

12. In the **Project Settings** dialog box, ensure that you select the '**Region Polygon**' option.



13. Click **OK**.

14. In the **Project Manager** dialog box, click **Start**.

Setting Up Site Region Load Using Method 3

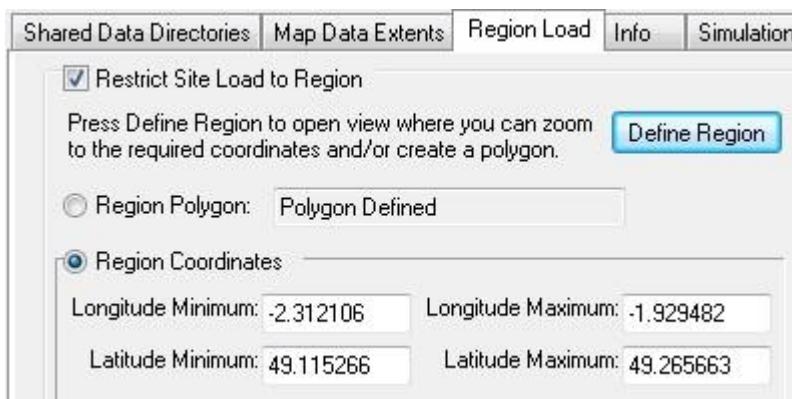
This section describes how to load a sub-set of project data using the rectangle method (specifying region coordinates).

To do this:

1. If the project is already open, close it.
2. In the **Project Manager** dialog box, select the appropriate project, and click **Info...**
3. In the **Project Settings** dialog box, click on the **Region Load** tab.

4. Select the '**Restrict Site Load to Region**' checkbox.

5. Select the '**Region Coordinates**' option:



6. Use the Regional Load Map View to define the area:

- Click **Define Region**.
- In the **Map View** window that appears, right-click and then click **Properties**.
- From the **Data Types** list, choose what you want to display, such as map layers or vectors, and then click **OK & Redraw**.
- In the **Map View** window, right-click and you can then use the zoom and pan options to help finalise your region.
- When you have finished, close the **Map View** window.
The coordinates will appear automatically.

7. In the **Project Settings** dialog box, click **OK**.

8. In the **Project Manager** dialog box, click **Start**.

As an alternative, you can specify the Longitude/Latitude values manually.

About Status Fields

To keep track of the progress of each network element within the engineering cycle, you can define your own fields to:

- Show the rollout phase of a site or link, for example, Proposed, Under Development, Operational and so on
- Record any other data which is associated with an element, such as name of engineer
- Divide the network into regions, which you can then filter on
- Record the budgeted cost of the site

For example you could create a field called Site Status with the mutually exclusive picklist options Proposed, Operational and so on.

You can use status fields in filters to display or modify sites based on their status. For example, you could choose to display only BSCs whose status was Completed.

Tips:

- It is a good idea to set up fields when you first create a project as you will know that there are no users logged in. You can add or edit fields later but you will have to wait until everyone has logged out.
- One of the Load Options in the Project Manager dialog box allows you to choose whether to include user defined fields when you load your project. For more information, see the *ENTERPRISE User Reference Guide*.

Defining Fields

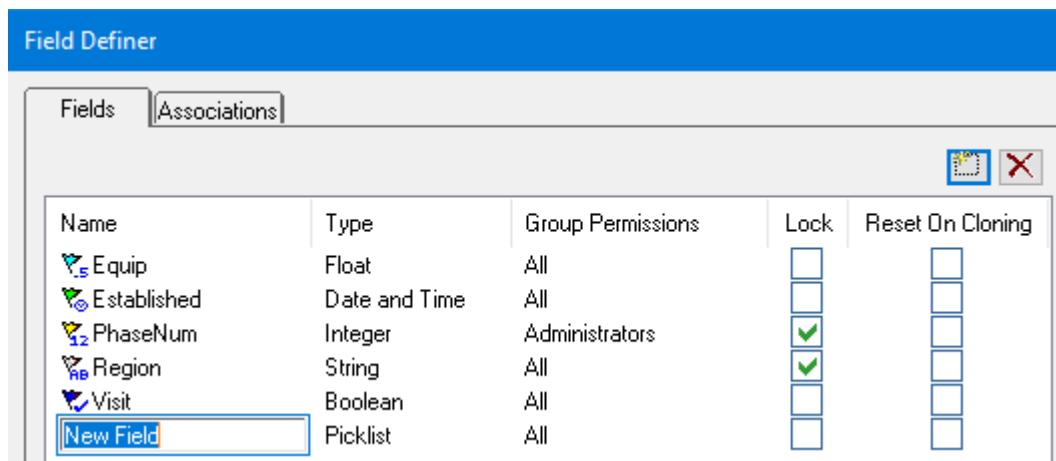
You can define fields for networks, Properties, MSCs, BSCS, sites, cells, UMTS elements, CDMA elements, logical nodes and links.

To do this:

1. Ensure that all users are logged out of the project whose fields you wish to change.
2. In Administrator, from the **Utilities** menu, click **Field Definer**.
3. Select the project in which you want to create or edit fields.
4. Click **OK**.

The **Field Definer** dialog box appears.

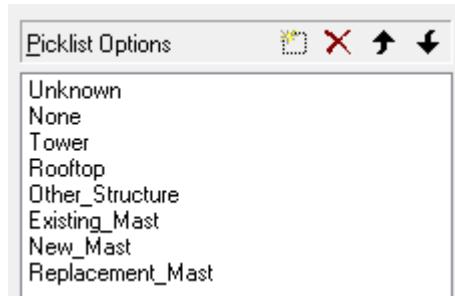
5. On the **Fields** tab of the **Field Definer**, click the **Add Field** button  and type the name of the field, for example, Antenna:



6. Ensure that the new field is selected, and choose the most appropriate type for it (Boolean, Date and Time, Float, Integer, String or Picklist).
7. If you chose Picklist, ensure that the field is still selected then in the **Picklist Options** pane, click the **Add** button to add your options.

Tips:

- You can rename fields and options by double-clicking them.
- For picklists, it is recommended that the first option in each group is named "Unknown", or similar. By default, in the **Site Database**, all new and existing network elements will be set to this first option. You can use the arrows to reorder the picklist options, as in this example:



-
8. In the **Group Permissions** column, for each defined field, you can specify which groups have field status editing permissions in the **Site Database**. By default, this is the All group. To do this, double-click in this column for the appropriate field. In the dialog box that appears, select the required group(s) and click **OK**.

Note: The user permissions conferred by groups will not override any object permissions assigned. For more information on user permissions and object permissions, see *About Permissions* on page 112.

9. For information on the purpose of the **Lock** column, see *Locking Fields in the Field Definer* on page 71.

10. With regard to the **Reset On Cloning** column, network elements can be copied using the **Clone Object** button in the Map View (for further information, see the *ENTERPRISE User Reference Guide*).

For each field you can:

- Select the **Reset On Cloning** checkbox if you want any copies that you make of an associated network element to have default settings for this field. Picklists will be set to the first picklist item, integers and floats will be set to zero, strings will be blank and Booleans set to false.
- or -
- Leave the **Reset On Cloning** checkbox unselected if you want any copies that you make of an associated network element to have the current settings for this field.

Note: If a user copies an element, but does not have user or group permissions to edit fields, the new element will have its fields reset to their default values.

11. Fields must be associated with the appropriate network element object types. See *Associating Fields with Network Element Types*.

12. Repeat these instructions until you have added all of the required fields and options.

13. Save your changes by clicking **Commit**.

You cannot commit a picklist field if you have not added its options.

You cannot change the field type once committed, as this might make user data unusable.

The fields will be loaded next time the project is opened.

Locking Fields in the Field Definer

If you are a Super User or a Regional Super User, you can create and edit fields in the **Field Definer** dialog box, as described in Defining Fields. You can also specify which groups have user permissions to edit the status of the defined fields in the **Site Database**.

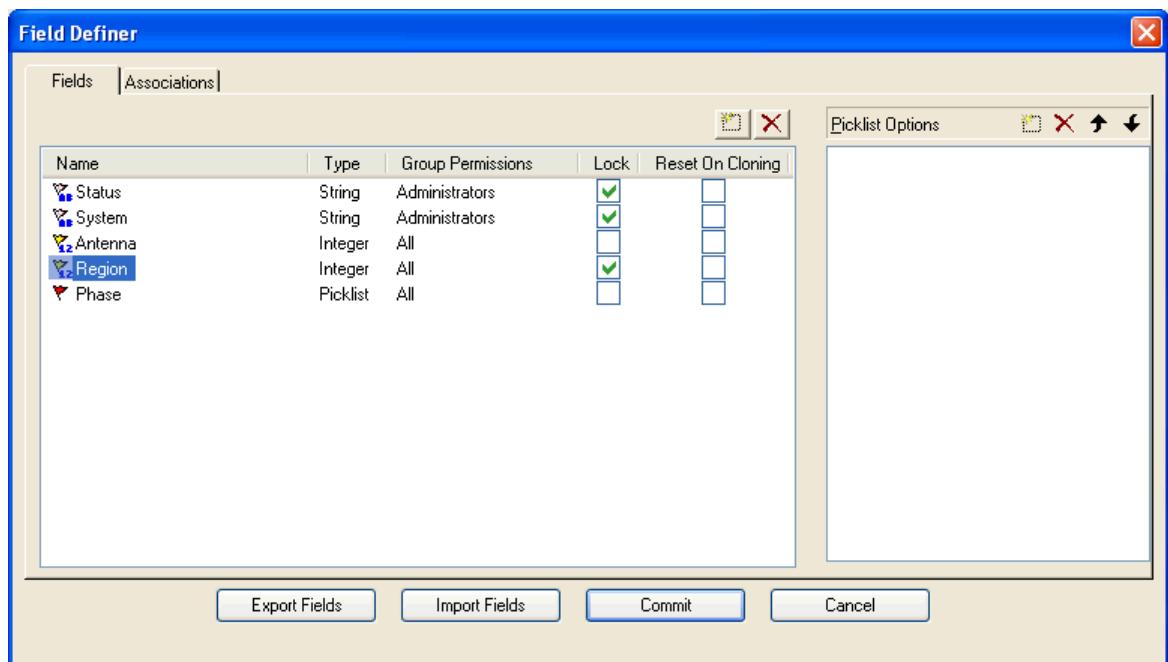
By default, Power Users have the same capability, but you can use a locking feature, specific to each defined field, to prevent Power Users from modifying any specific field and its group-dependent user permissions. However, they will still be able to define new fields.

Note: If Power Users are not in use then the **Lock** column is not displayed. For more information, see Hiding the Power Users Group on page 98.

If you want to do this:

1. Ensure that all users are logged out of the project whose fields you wish to change.
2. In Administrator, from the **Utilities** menu, click **Field Definer**.
3. Select the project in which you want to create or edit fields.
4. Click **OK**. The **Field Definer** dialog box appears.

This picture shows an example dialog box:



5. For each appropriate field, select the checkbox under the **Lock** column.

This will prevent Power Users from:

- o Renaming the field
- o Setting the field to reset on cloning (see Defining Fields)
- o Modifying picklist options
- o Changing associations (see Associating Fields with Network Element Types)
- o Importing a field to overwrite the current field

Note: This will not prevent them from defining new fields.

Power Users will not be able to access the **Lock** checkbox. For more information on the different types of user, see [About User Types](#).

6. Save your changes by clicking **Commit**.

Examples of Field Definitions

Some examples of fields that could be created are:

Field	Type	Options
Rollout Phase	Picklist	unset, Planned, Acquired, In-Build, On-Air
Vendor Equipment	Picklist	unset, Nokia, Ericsson, Siemens
Region	Picklist	unset, North, South, East, West
Equipment Costs	Float	any decimal number
Planner's Name	String	any text
Visit Due	Boolean	True or False
Phase Number	Integer	0,1,2,3,4...
Established	Date and Time	date and time limits and timezones

Important: When defining fields, it is important that you associate each field with the appropriate network element object type(s), such as Properties, sites, cells or microwave links. See [Associating Fields with Network Element Types](#).

Tip: For picklists, it is strongly recommended that the first option in each group is named "unset", "unknown", or similar, so that this can be the default when no particular option has yet been assigned.

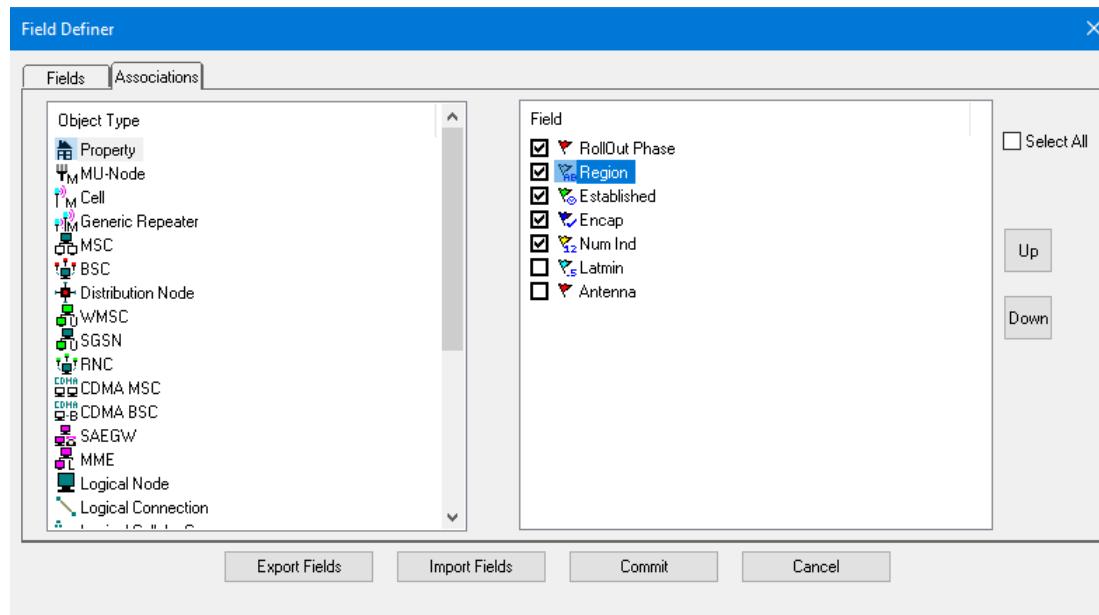
Associating Fields with Network Element Types

When you have defined your fields you must associate them with the relevant network element object type(s). This determines which fields against each network element object type in the Site Database.

To associate one or more network element(s) with fields:

1. In Administrator, from the **Utilities** menu, click **Field Definer**.
2. Select the project in which you want to create associations then click **OK**.
3. On the **Associations** tab, click the appropriate network element in the **Object Type** pane.

4. Select the checkbox(es) next to the field(s) that you want to associate with the network element as shown in this example:



Tip: If you have long lists of fields, you can move the position of a field in the list by selecting it and using the **Up** and **Down** buttons. This will only affect the specific network element object type. You need to Commit this if you want to save the order. Click on the **Select All** option if you want to select all the available fields.

Note: Fields of the Date and Time type are not supported by all network object types and will not be available for association when an unsupported object type is selected. The Object types that do not support Date and Time type fields are: Logical Connection, Logical Cellular Connection, Link (PTP), Link (PMP), Passive Repeater Link (Back to Back), Passive Repeater Link (Reflector), Multi Radio Link, Dual Polar Link, PmP Hub and PmP Sector.

5. When you have finished associating your fields with the relevant network elements (including any reordering of the Field lists) save your changes by clicking **Commit**.

Note: Fields in the Site Database operate independently of network hierarchy level or technology. For example, if you have the same field associated for the Property, site and cell object types, an individual field assignment in the Site Database at the site level will not affect or update the other levels. Although it is possible to associate fields to multiple object types, it is recommended to only associate fields to the object types where they are relevant and necessary.

Exporting and Importing Fields

In the **Field Definer**, you can export all fields as a .txt file, and also import .txt files containing fields.

Note: If you are importing fields that you have used in older versions of ENTERPRISE, you may need to first edit the import file to get the correct order.

To export fields:

1. In ENTERPRISE Administrator, from the **Utilities** menu, click **Field Definer**.
2. Select the project from which you want to export fields.

3. Click **OK**.
4. In the **Field Definer**, click **Export Fields**.
5. Select a location and type a name for the file.
6. Click **Save**.

You can import a text file containing fields, but this will overwrite all existing fields you may have in that project.

To do this:

1. Click **Import Fields**.
2. Click **Yes** to overwrite any existing fields with the fields you will be importing.
3. Select the required .txt file and click **Open**.
4. When prompted as to whether the fields are in the Link Planet format, click **No** if you are importing a file that you previously exported using the **Field Definer**.

The fields are imported into the project, overwriting existing fields.

Deleting Fields

To delete fields:

1. From the **Utilities** menu, click **Field Definer**.
2. Select the project whose fields you want to edit, and click **OK**.

Note: To delete fields from a project, that project must not currently be in use.

3. Select the field that you want to remove.
4. In the appropriate pane, click the **Delete** button. You are asked to confirm the deletion by clicking **OK**.

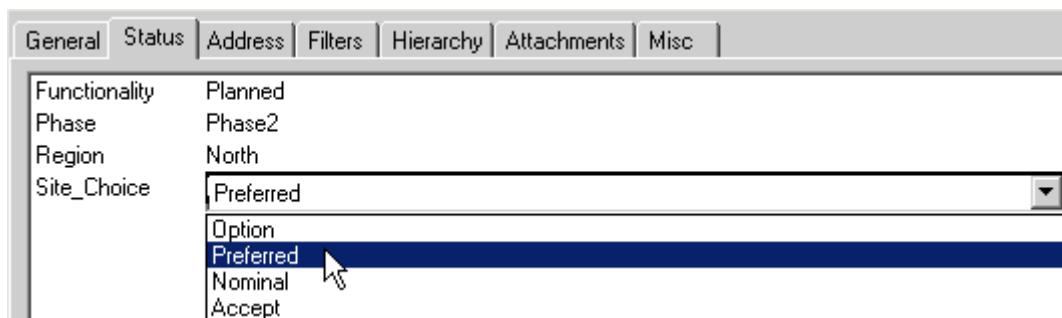
Important: If you delete a field, any corresponding field options assigned to the network elements in the database will be removed, and any filters that include rules based on that field will be automatically modified, by having the corresponding rule(s) removed from the filter.

Viewing Fields in ENTERPRISE

To see if an item has a field:

1. In ENTERPRISE, from the **Site Database** window, click the required item.
2. Click the **Info** button to expand the **Site Database** window.
3. Click the required network element.

4. Click the **Status** tab to view the fields and to see which fields are associated with the element as shown in this example:



5. If required, choose a different field for the network element.

Note: You can also view fields in the Link and Logical Connection databases and use them as rules in the Filter Wizard.

Configuring User Settings for a Project

In ENTERPRISE, all user settings and preferences are by default stored in and retrieved from the Windows Registry. The specific location is:

`HKEY_CURRENT_USER\Software\TEOCO\ENTERPRISE\Settings`

The value is set per Server, Instance, Project and User, in that order.

Normally, when ENTERPRISE is started it uses the settings found at this location and if no settings exist, ENTERPRISE populates the registry with defaults. You can upload settings to be used as defaults for a project from a user's machine into the database. The next time a user logs on who does not have their own custom settings for a particular area, these uploaded defaults will be used. For more information see Managing User Settings for use as Project Defaults on page 77.

If Database Settings Management is enabled, user settings and preferences are stored in the database. For more information see Database Settings Management on page 160.

Important: As certain ENTERPRISE criteria and values are stored by default in the registry, all ENTERPRISE users need sufficient privileges to enable the registry to be written to on the user's behalf. Contact your IT department to ensure that standard users have these rights.

Exporting Registry Settings

To export Registry settings:

1. From the **Start** menu, click **Run**.
2. In the **Run** dialog box, type `regedit` and click **OK**.
3. In the **Registry Editor** dialog box, select:
`HKEY_CURRENT_USER\Software\Aircom International\ENTERPRISE\Settings`
4. From the **Registry** menu, click **Export Registry File**.
5. In the **Export Registry File** dialog box, browse to a convenient location, for example, the Desktop, and type a name for the registry settings file.
6. Click **Save**.

Importing Registry Settings

To import Registry settings:

1. From the **Start** menu, click **Run**.
2. In the **Run** dialog box, type `regedit` and click **OK**.
3. In the **Registry Editor** dialog box, select:
`HKEY_CURRENT_USER\Software\AIRCOM International\ENTERPRISE\Settings`
4. From the **Registry** menu, click **Import Registry File**.
5. Browse to and select the file containing the saved registry settings and click **Open**.

Locating Log Files

From version 9.0 onwards, ENTERPRISE complies with Microsoft User Account Control (UAC) and logs appear in two locations according to whether they are user specific, or system or machine specific.

User Specific Logs

User specific logs are written to the following path by default:

`%LOCALAPPDATA%\TEOCO\{ProductNameOrArea}`

where `%LOCALAPPDATA%` will resolve to the user\service local windows profile and `{ProductNameOrArea}` would be ENTERPRISE, Distributed Tasks or ARRAYWIZARD.

To specify the folder to which log files will be written (for ENTERPRISE, Administrator or DB Commander ONLY), you can use a Registry value.

To do this:

1. Create a Registry key:
`HKEY_LOCAL_MACHINE\SOFTWARE\AIRCOM International\ENTERPRISE\10.0\Logging`
2. Create a string value (REG_SZ) with a value name of `MessageLogFolder`
3. Set the value data as "C:\DEBUG".
4. In Windows Explorer, create the folder C:\DEBUG.

To avoid clashes when different applications are writing to the same log folder, you can also create a DWORD 32 Bit value (REG_DWORD) with a value name of `UseEnhancedLogfilename`. To activate this, set the value data to 1. The default value is 0 (inactive). When activated, the filename used contains several parameters designed to make the name unique across application sessions.

System or Machine Specific Logs

System or machine specific logs are written to the following path by default:

`C:\Windows\System32\config\systemprofile\AppData\Local\TEOCO\{ProductNameOrArea}`

Changing the Zoom Threshold

You can also use a Registry key to alter the threshold for zooming on the map view. The Maximum Vector Zoom Level is shown under Display/Map Settings in the Registry. If the display width on the map exceeds this value, or 1000 metres if a value is not set, then the Map Information Window displays the following message:

n/a (display width exceeds nnnn units).

The value is set per Server, Instance, Project and User, in that order.

Managing User Settings for use as Project Defaults

You can import settings such as those held in templates and the colors and symbols used on map views from a user who already has them set up as you want them. These settings are then stored in the database and you can use them as defaults for all the project's users.

To import user settings for use as project defaults:

1. In Administrator, from the **Configuration** menu, click on **Settings Management, Import Defaults** then select a project and click **OK**.

- or -

In the left-hand pane of the Administrator main Window, right-click on a project and select **Settings Management** and then **Import Defaults**.

2. Type the path to and name of the settings (.stt) file containing the user settings that you wish to import, or browse to it.

3. In the **Mode** panel:

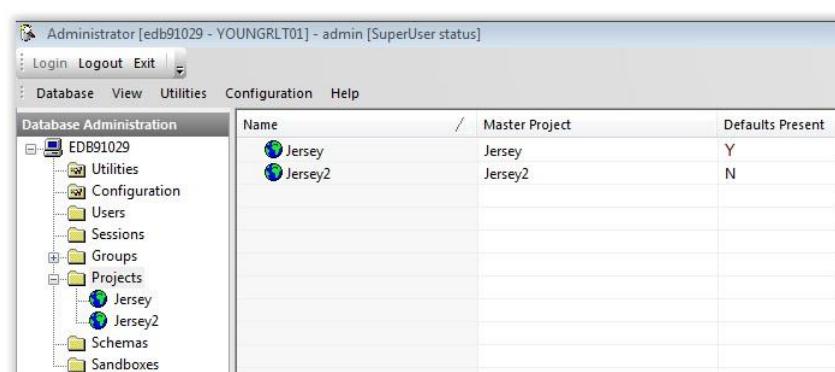
Select **Merge** if you wish to merge the settings in the imported settings file with existing defaults.

Note: This option is only available if existing defaults are present for the project.

- or -

Select **Replace** if you wish to replace the existing defaults with those in the imported settings file.

4. Click **Import**. If you then select **Projects** in the left hand pane you will see that there is a Y in the **Defaults Present** column in the right hand pane next to the relevant project to indicate that the settings file has been successfully imported:



Having imported a settings file you can export it again for storage and use elsewhere, or delete the default settings.

To export user settings:

1. In Administrator, from the **Configuration** menu, click on **Settings Management, Export Defaults** then select a project and click **OK**.
- OR -
In the left-hand pane of the Administrator main window, right-click on a project and select **Settings Management** and then **Export Defaults**.
2. Type the path to and name of the settings (.stt) file that is to contain the user settings that you wish to export, (or browse to an existing settings file that you wish to overwrite).
3. Click **Export**.

To delete user settings:

1. In Administrator, from the **Configuration** menu, click on **Settings Management, Delete Defaults** then select a project and click **OK**.
- OR -
In the left-hand pane of the Administrator main window, right-click on a project and select **Settings Management** and then **Delete Defaults**.
2. A confirmation dialog box appears. Click **OK** to confirm the deletion.

Resetting User Settings Across a Project

To reset user settings for all users across a project:

1. In Administrator, in the left hand pane, right-click on the project for which the settings are to be reset.
2. Click on **Delete User Settings**.

The default settings are applied to the project.

Resetting an Individual User's Settings

To reset user settings for an individual user:

1. In Administrator, in the left hand pane, click on the project you require. A list of users appears in the right hand pane.
2. Right-click on the required user.
3. On the menu that appears, click on **Delete Settings**.

The default settings are applied to the user.

Setting Global Upper Limits for Neighbours

ENTERPRISE provides the option to set upper limits for the number of outward neighbour relationships allowed for each cell.

There are two approaches you can take:

- Set and enforce the limits on a global basis (per project) in the **ENTERPRISE Administrator**
- Allow users to set the limits on a cell-specific basis in the **Site Database**

Note: Neighbour limits are always visible on the cells in the Site Database. If you enforce global limits, they appear there as read-only values. If you do not enforce them, users can edit the values manually on a cell-specific basis.

Whichever approach you use, the following principles apply:

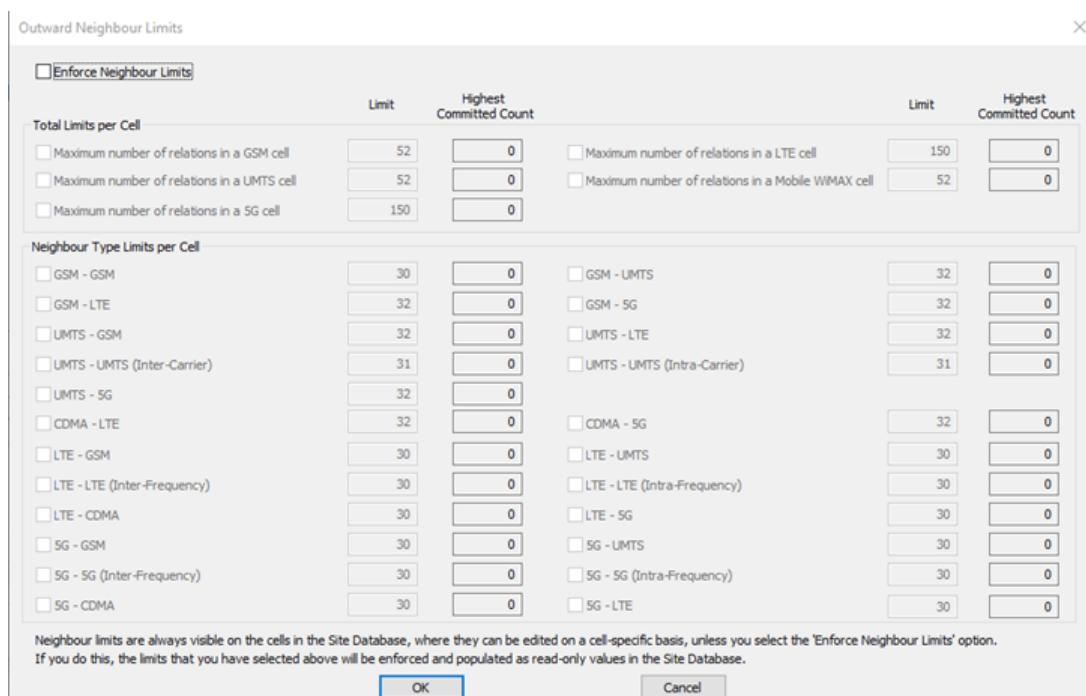
- When set and enforced, global limits always override cell-specific limits
(the original cell-specific limits will be automatically restored if you subsequently unenforce the global limits)
 - It is possible to choose an approach selectively for each type of limit
 - Total Limits always overrule Neighbour Type Limits
 - All of these limits represent the outward neighbour relationships from each cell
-

Important: You can increase the neighbour limits without needing users to Commit their neighbour data or log out of the project. Users will simply need to reopen the project to see the newly increased neighbour limits. However, if you want to decrease the neighbour limits, you must ensure that there is no uncommitted neighbour data (that is, all neighbour relations must be in a Committed state), and that all users are logged out of the project.

To set and enforce global neighbour limits:

1. From the **Configuration** menu, click **Neighbour Limits**.
2. In the **Project Selector** dialog box, click the project you require.
3. Click **OK**.

The **Outward Neighbour Limits** dialog box appears:



4. If you want to set limits for the project, select the **Enforce Neighbour Limits** checkbox. This activates the checkboxes for Total Limits per Cell and Neighbour Type Limits per Cell.
5. In these checkboxes, select the individual Total Limits per Cell and Neighbour Type Limits per Cell that you wish to set.

6. Specify the required limits for your selections in the **Limit** column. The values must always be equal to or greater than the values in the **Highest Committed Count** column (which represent the highest existing values in the database for that project).
7. If you want to enforce the limits that you have set, ensure the **Enforce Neighbour Limits** checkbox remains selected.
8. Click **OK**.

Tips:

- You can deactivate the global neighbour limits at any time by deselecting the **Enforce Neighbour Limits** checkbox.
 - Users can view the global neighbour limits within an open project, by clicking **Neighbour Limits** from the **Configuration** menu in ASSET.
-

How the Limits are Imposed when Neighbours are Added

ENTERPRISE always checks the number of relationships for each cell in the Site Database and prevents the neighbour limits being exceeded, in accordance with the following:

Method of Adding Neighbours	Outcome when Limits are Exceeded
Manually in the Site Database (including Global Editor)	For cells where limits would become exceeded, the additional neighbour(s) will not be accepted into the Site Database.
Imported files using *.csv format	For cells where limits would become exceeded, the neighbour relationships are not imported.
Imported files using the XML Import	For cells where limits would become exceeded, the neighbour relationships are not imported. However, there is one specific exception, as explained in the following warning: Important: In the specific case where the import file contains a mutual (outward/inward) neighbour relationship between two cells, and where there is no such (mutual) relationship for those cells already in the Site Database, a mutual relationship will be created unless <i>both</i> their outward and inward relationships fail the Neighbour Limits check. In all other cases, the XML Import will obey the limits in the normal way.
Neighbour Planner	The provisional neighbour relationships appear as normal in the Neighbour Analysis, but for cells where limits would become exceeded, they cannot be included in a database update.

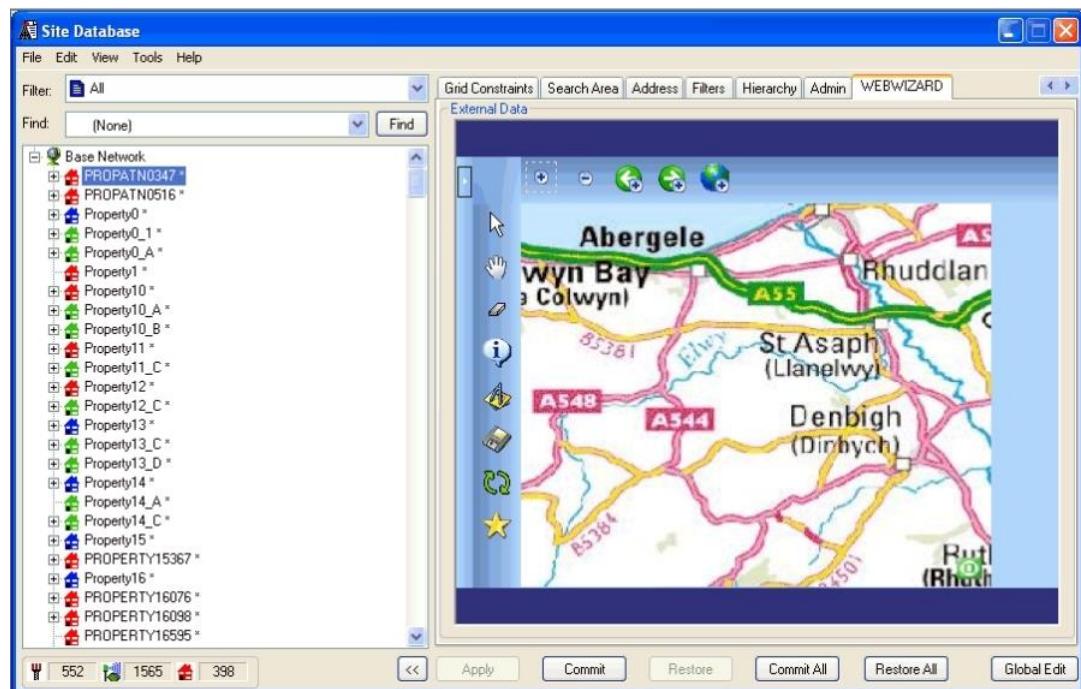
For all these outcomes, a relevant warning is displayed.

Configuring External Data Pages

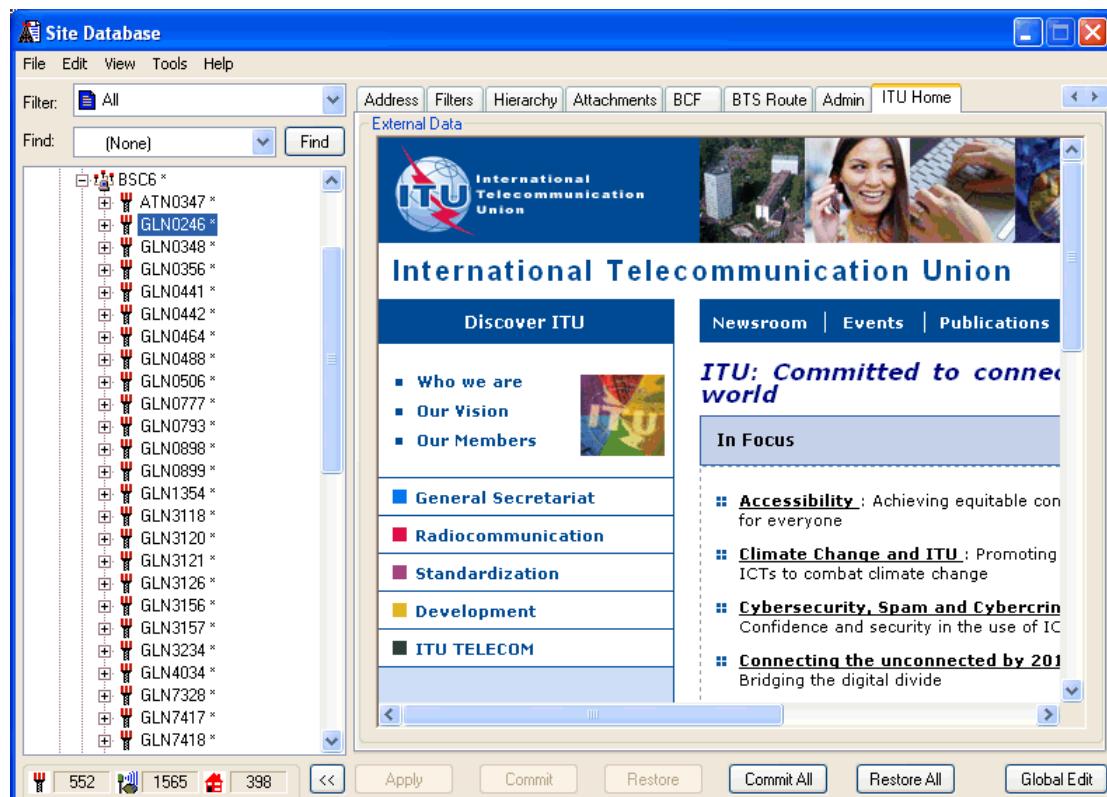
In ENTERPRISE, you can generate external web content that responds to requests from the Site Database. This feature is highly customizable and has a wide variety of applications, including the following possible scenarios:

- If you have useful documentation (for example, user instructions or design guidelines containing recommended parameter values) on an external website, you can create an external page that will display the relevant details for the selected network element (in other words, site details when you select a site, BSC details when you select a BSC and so on).
- If you select a cell in the Site Database, the Cell ID (or another piece of context information) is passed to the web server, which then uses this to retrieve external information (for example, database information or performance counters) for the selected cell and display it.

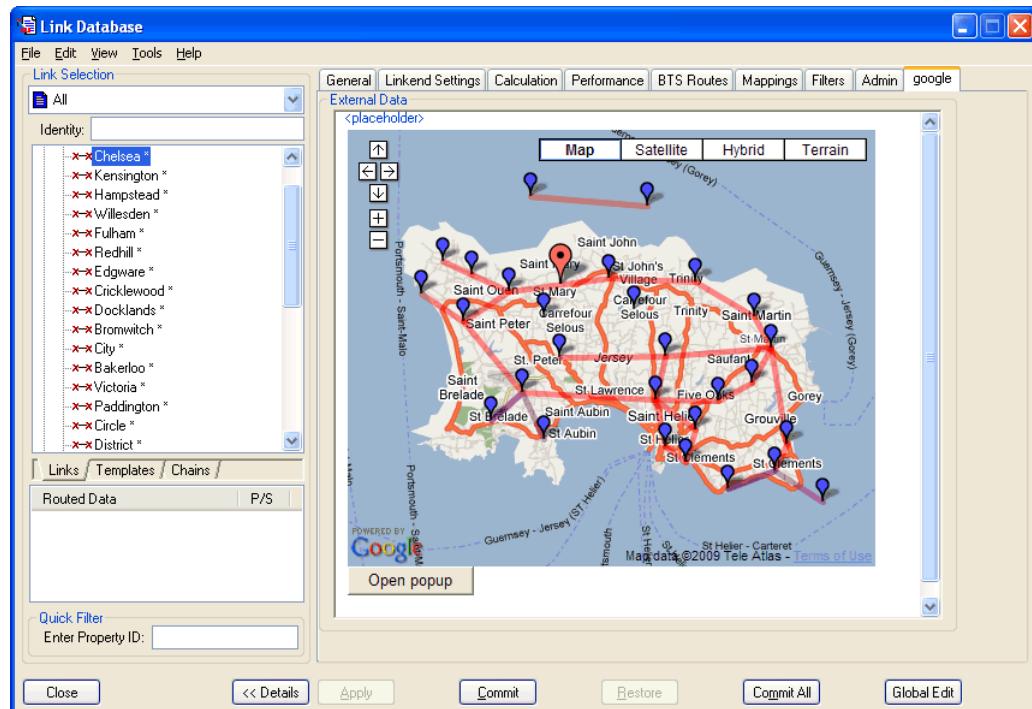
- You can pinpoint the precise geographical location and environment of particular network elements by creating an external page that links the element to a web-based map visualisation platform. You could use WEBWIZARD, which is a powerful and easy-to-use web-based GIS and report distribution tool, for this purpose. This picture shows an example:



- By using XSLT or an XML parser, you can generate data summary pages using XML, displaying the parameter values that you want to see.
- You can simply link to any public website that might be useful. This picture shows an example, where the external data page displays the ITU home page to provide useful reference information:



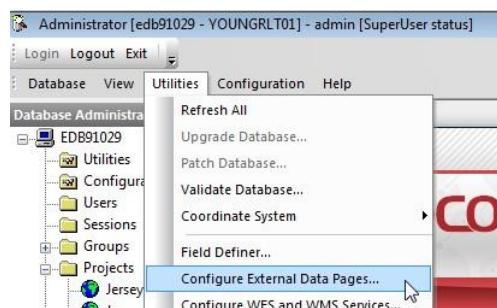
You can also create external data pages for the Link Database, which enable you to display links between Properties on a web-based map visualisation platform:



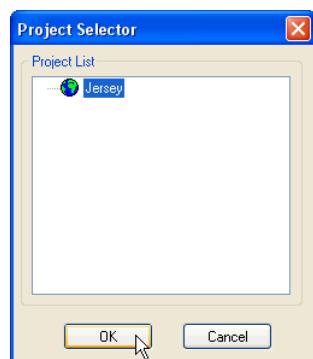
Viewing links on a web-based map

To define which information is displayed on external pages:

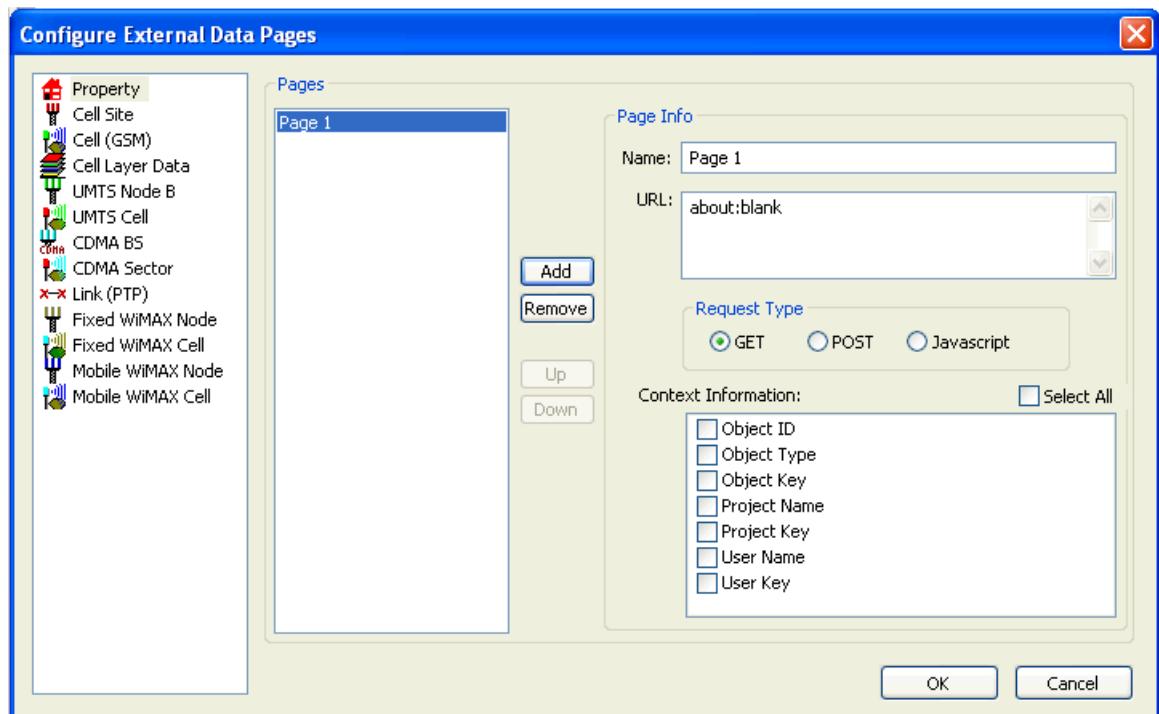
1. From the Utilities menu, click **Configure External Data Pages**:



2. In the **Project Selector** dialog box, select the required project and click **OK**:



The Configure External Data Pages dialog box appears:



3. In the left-hand pane, select the network element type for which you want to display data on the external page, and then click the **Add** button.
4. In the **Page Info** pane:
 - o Type a name for the external page
 - o Type the URL (Universal Resource Locator) for the external page
5. Select the required HTTP request type to specify which method will be used to retrieve the data, Get, Post or JavaScript.
6. In the **Context Information** pane, select the context information that you want to pass to the external page. You can choose any number from the following:

For this Server Variable Type	This is Displayed on the Data Page
Object ID	ID
Object Type	TYPE
Object Key	KEY
Project Name	PROJECT_N
Project Key	PROJECT_K
User Name	USER_N
User Key	USER_K

Tip: You can select all of the types at once by selecting the **Select All** checkbox.

7. Click **OK**.

Note: You can add multiple pages for each object type and you can change the order in which the pages are listed in the Site Database by using the **Up** and **Down** buttons. To remove a page, select it in the list and click the **Remove** button.

Configuring Web Feature Services (WFS) and Web Map Services (WMS)

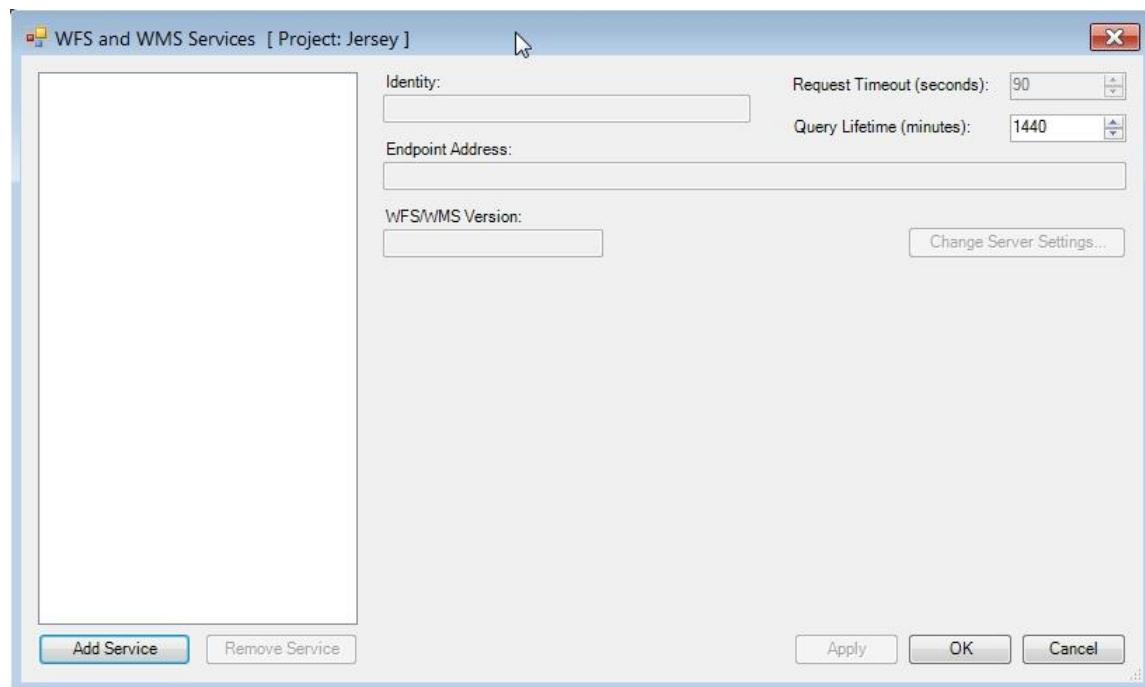
You can map Web Feature Service features (based on the Open Geospatial Consortium's standard) on to ENTERPRISE network elements (objects). Once this is done, ASSET will be capable of requesting data from a Web Feature Service and presenting it in the Map View window. ASSET users will also be able to use the Filter Wizard to create filtering rules based on Web Feature Service features and attributes. For more information on creating filters with the Filter Wizard, see the ENTERPRISE User Reference Guide. Web Map Service (WMS) images can also be shown in the Map View window.

Important: You can only add WFS and WMS services to top-level projects, not sub-projects. Services added to top-level projects can however be accessed by users who log into sub-projects.

To start the Web Feature and Web Map Service configuration process:

1. On the **Utilities** menu click **Configure WFS/WMS Services**.
2. If you do not already have one open, select a project.

When you have a project open, the **WFS/WMS services** dialog box appears. This picture shows an example:



Example WFS/WMS Services dialog box

Adding, Editing and Removing WFS and WMS Services

To add a WFS or WMS service and map features and attributes to ENTERPRISE network elements (object types):

1. In the **WFS and WMS Services** dialog box, click **Add Service**. Step 1 of the Add WFS/WMS Service Wizard appears. This table shows how to complete the step:

In This Field	Do This
Identity	Type a unique name for this web feature service configuration, that is, a name which represents all the settings that you make in this wizard.
Request Timeout (seconds)	Select the interval for which ENTERPRISE will wait for a response from the WFS or WMS server.
Endpoint Address	<p>Type the universal resource location address for the WFS or WMS server.</p> <p>This is an example of a WFS endpoint:</p> <ul style="list-style-type: none"> • http://ogi.state.ok.us/geoserver/wfs <p>These are examples of WMS endpoints:</p> <ul style="list-style-type: none"> • http://ogi.state.ok.us/geoserver/wms • http://demo.cubewerx.com/demo/cubeserv/cubeserv.cgi • http://maps.bgs.ac.uk/ArcGIS/services/BGS_Detailed_Geology/MapServer/WMServer • http://neowms.sci.gsfc.nasa.gov/wms/wms
WFS/WMS Version	Select the appropriate retrieval method for the service.
Query Lifetime (minutes)	<p>The length of time for which the data retrieved by a query is considered valid. If the query is repeated within the specified interval, data retrieval will not take place again.</p> <p>Note: Bing datasources have a fixed query lifetime of 1 month. (43200 minutes).</p>
Username	If the service you require is on a secure server (https://), the user name required to access this server.
Password	If the service you require is on a secure server (https://), the password required to access this server.

2. Click **Next**. Step 2 of the Add WFS/WMS Service Wizard appears. This is a testing step during which the details you supplied at Step 1 are automatically verified. You can click Stop to end the process. If you do this or if the verification fails, you are prompted to return to Step 1. If the verification is successful you are prompted to proceed to the next step.

Important: If an error message appears that says "There was a problem authenticating with your web proxy server", see Troubleshooting Your Proxy Server on page 87.

3. Click **Next**. Step 3 of the Add WFS/WMS Service Wizard appears. On this page:

- For WMS you can see a summary of your settings, then click Finish. The new WMS server configuration is listed in the left-hand pane of the WFS and WMS Services dialogue box. If the EPSG code set for the project is supported by the WMS server, it appears automatically in the EPSG code field that appears on the WFS and WMS Services dialog box for a WMS service after the Wizard is completed. If the EPSG code is not supported then the field remains blank and you must select a code appropriate to the region from the drop-down list. For more information, see Populating the Product Schemas.

- For WFS you can optionally map string type WFS attributes to ENTERPRISE object types so that ENTERPRISE filters can use WFS attribute values as criteria. This table shows how to complete the step:

In This Column	Select
Object Type	The ENTERPRISE network element to which a string type WFS attribute is to be mapped.
WFS Feature	The WFS feature to which the attribute to be mapped belongs.
WFS Attribute	The WFS attribute to be mapped.
Enabled	This option to carry out the mapping when the wizard completes. If you do not select the option, the details of the potential mapping are retained in the configuration for future use but the mapping does not take place.
Any	The furthest left column of a row (or rows by pressing the Ctrl key) and press the Delete key to delete the row or rows.

Note: You can make mappings to other network elements by adding more lines to the table, but you can only map one WFS feature per network element.

4. For WFS, click **Next**. Step 4 of the WFS Service Wizard appears. This shows a summary of your settings. To change them you can click **Back** and edit the selections you made on previous steps. Otherwise click **Finish**. The new WFS server configuration is listed in the left-hand pane of the **WFS and WMS Services** dialogue box.

To edit WFS/WMS service settings:

1. In the left-hand pane of the **WFS and WMS Services** dialog box, select the service configuration to be edited.
You can now modify the Identity, Request Timeout and Query Lifetime settings.
To confirm modifications to these settings, click **OK**.
- or -
To edit any other settings, go to step 2.
2. Click **Change Server Settings**. Step 1 of the Add WFS/WMS Service Wizard appears and you can change the settings that you made on this and subsequent steps when adding a service.

Note: You will need to use the **Change Server Settings** button if the set of features available on the server changes.

To remove a WFS/WMS service:

1. In the left-hand pane of the **WFS and WMS Services** dialog box, select the service configuration to be removed.
2. Click **Remove Service**.

Troubleshooting Your Proxy Server

When you are adding or editing a WFS service you may encounter the following error message:
"There was a problem authenticating with your web proxy server."

To resolve this problem:

1. Open the Admin100.exe.config file and the ENTERPRISE100.exe.config files. These files are normally found in C:\Program Files\TEOCO\ENTERPRISE 10.0, however if you are a Citrix user, you will need to locate them on your Citrix server.

2. In each file, replace the <defaultProxy> element with:

```
<defaultProxy enabled="true" useDefaultCredentials="true">
    <proxy bypassonlocal="True" proxyaddress="http://<IP
address>:<port>"/>
</defaultProxy>
```

3. In each file, replace the <IP address> element with the IP address of the required proxy server.

4. In each file, replace the <port> element with the port identification of the required proxy server.

5. Save the edited files.

Important: When you have made these edits you must re-start Administrator for them to take effect.

Note: For further information on configuring the <defaultProxy> element, see <http://msdn.microsoft.com/en-us/library/kd3cf2ex.aspx>.

Using Microsoft Bing Maps

If you want to use Web Map Services to access Microsoft Bing Maps, and you did not enter a Bing Maps license key when you installed ENTERPRISE, you will need a license key to include in the Enterprise100.exe.config file. For more information, go to www.bingmapsportal.com.

Having obtained a license key, to make it effective:

1. Add the license key between the speech marks after LicenseKey= in the following line of the Enterprise100.exe.config file which is located in the folder to which your ENTERPRISE software has been installed:

```
<BingConfigSection LicenseKey="" 
UseHTTPS="true"></BingConfigSection>
```

2. Save the modified Enterprise100.exe.config file.

Removing User Applies

You can remove all the changes that a user has applied to the ENTERPRISE database for a particular project.

To do this:

1. In the left pane of ENTERPRISE Administrator, right-click on the required project.
2. From the menu that appears, select **Remove all User Applies**.
3. In the **Remove all User Applies** dialog box, expand the drop-down list in the User field and click on the required user.
4. Click **Delete**.

Deleting Projects

To delete a project:

1. In Administrator, log in to the required database.
2. In the left pane, expand the tree and select **Projects**.
3. In the right pane, right-click on the project you want to delete and from the menu that appears, click **Delete**.

Note: To delete a project, it must not currently be in use.

The project and any subprojects are permanently deleted.

Users with Enable Project Creation permissions (and access to a particular project) can also remove the project from the **Project Management** dialog box in ENTERPRISE. This does not actually delete the project but marks it as deleted in the database. You can restore projects deleted by users.

In this picture you can see a project that has been deleted by a user in ENTERPRISE:



Restoring a Deleted Project

Users with Enable Project Creation permissions (and access to a particular project) can delete a project from the **Project Management** dialog box in ENTERPRISE. This does not actually delete the project but marks it as deleted in the database. You can restore projects deleted by users.

To restore a project that a user has deleted:

Right-click on the project and click **Restore**.

Viewing and Killing User Sessions

To view the user sessions currently in progress:

Click **Sessions** in the left pane. User sessions are shown in the right pane:

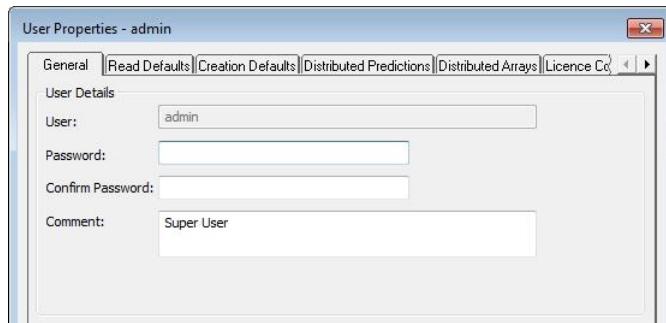
Name	/	Project	Project Type	Start Time	Host Name	O/S User
admin	No Active Project	Master	2015-03-10 10:43:49	EMEA\YOUNGRLT01	NT AUTHORITY\SYSTEM	
admin	Jersey	Master	2015-03-10 11:38:00	EMEA\YOUNGRLT01	EMEA\youngr	
admin	No Active Project	Master	2015-03-10 11:38:56	EMEA\YOUNGRLT01	EMEA\youngr	

To view the properties of a session:

Right-click the required session and select **Properties**:

Name	/	Project	Project Type	Start Time	Host N
admin	No Active Project	Master	2015-03-10 10:43:49	EMEA\	
admin	Jersey	Master	2015-03-10 11:38:00	EMEA\	
admin	No Active Project	Master	2015-03-10 11:38:56	EMEA\	

The **User Properties** dialog box appears:



To kill a user session:

Right-click the required session and select **Kill Session**:

Name	/	Project	Project Type	Start Time
admin	No Active Project	Master	2015-03-10 10:43:49	
admin	Jersey	Master	2015-03-10 11:38:00	
admin	No Active Project	Master	2015-03-10 11:38:56	

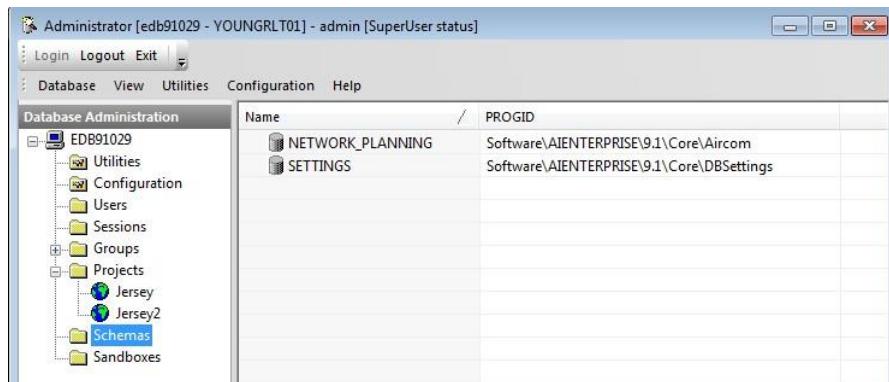
A confirmation warning appears. Click **Yes** to kill the session.

You can also use the right-click menu shown above to refresh the current view and to write the current selection to the clipboard.

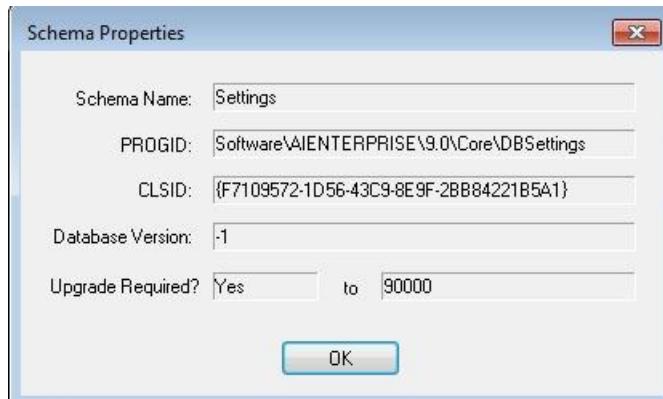
Viewing Schemas

To view details of the database schemas in use:

1. Click **Schemas** in the left pane. The schemas are listed in the right pane:



2. Double-click on the required schema. The **Schema Properties** dialog box appears:



Allowing Large Array Support on a Machine

You can set up support for large arrays on the local machine. This feature is a swapping system that can significantly increase the memory available for array processing, while at the same time ensuring available physical memory resources are distributed across multiple users sharing a system.

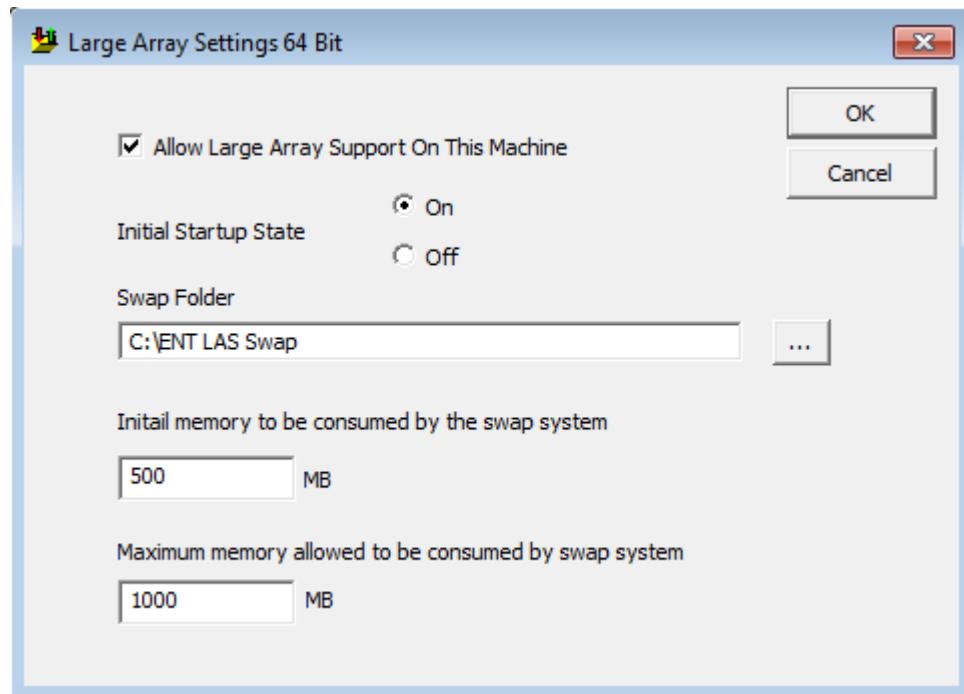
Note: This is applicable to all types of array, for example: simulation arrays, coverage/interference arrays, traffic arrays, and height or clutter rasters. It also applies to both reading arrays and creating new arrays.

To allow Large Array Support:

1. Select Large Array Settings from:
Start/TEOCO.

Note: If a project is open when you do this, changes will not take effect until the project has been closed and reopened.

The Large Array Settings dialog box appears:



2. Select the **Allow Large Array Support On This Machine** checkbox.
3. Select **On** as the initial start-up state to enable this array support by default for any new projects that are accessed on this machine.

-or -

Select **Off** to make the swapping process inactive by default when a project is first accessed.

Tip: You can still enable or disable this feature when working in an open project (assuming that Large Array Support has been allowed). For more information see the 'Setting Up a Project' chapter in the *ENTERPRISE User Reference Guide*.

4. In the **Swap Folder** text box, type the path or browse to a folder which will be used for the swapping process.

Important: It is strongly recommended that this folder is on a local drive.

5. If necessary, edit the initial memory (in MB) to be consumed by the swapping system.
6. If necessary, edit the maximum memory (in MB) that can be consumed by the swapping system.
7. Click **OK**.

Assuming a realistic dimensioning exercise has been completed to analyse the typical operations that users will perform, and sufficient physical memory has been provided for those users and those use cases, it is recommended that Large Array Support is initially disabled. For assistance with dimensioning exercises, and with Large Array Settings, please contact Product Support.

To withhold support for large arrays:

1. In the **Large Array Settings** dialog box, ensure the **Allow Large Array Support On This Machine** checkbox is not selected.
2. Click **OK**.

5 Creating Groups and Users

Before you create groups and users, ensure you have:

- Configured your Oracle database. For information on this, see [Creating and Managing Your Oracle Database](#) on page 31.
- Configured the Oracle files for OS authentication if you are using this feature, this must be done on each user's PC. For more information, see [Using OS Authentication](#) on page 49.
- Logged into Administrator and the required database using a user name and password that has database administrative privileges.
- Defined a database profile if you want to associate users with a security default other than the standard Oracle default. For more information, see [Editing the ENTERPRISE Database Security Settings](#) on page 161.
- Created the projects you require. For information on this, see [Creating Your First Project](#).

Important: Users do not automatically gain permissions to new projects. For each new project created after you have created users, you will have to add the permissions to the project for users as required.

Tips on Group and User Naming

The following list shows tips for naming groups and users:

- Give functional groups plural names, for example, `Model_Tuners`.
- Each name must be unique. You cannot have a user with the same name as another user or group, nor a group with the same name as another group or user.
- Names cannot be the same as internal database names, so you cannot have the names `TEOCO`, `dba`, `sys`, `system` and `connect`.
- You cannot have a user name of `user`.
- User and group names cannot start with a numeric character.
- User and group names cannot contain spaces, instead use the underscore character.
- User names are case insensitive.

About Groups

The best way to grant user permissions to users is to create a group containing the particular user permissions required, then create a user and make the user a member of that group. Users inherit the user permissions that exist in the groups to which they belong.

Important: You should create groups before users, because you can manage many users by creating and assigning them to groups.

When the Administrator tool is used for the first time, three groups are automatically created.

Group	Description
All	All users belong to this group by default and cannot be removed from it. This is so that object permissions and filter permissions can be granted to all users as a group. Membership of this group does not confer any user permissions.
Administrators	Members of this group have full user permissions in ENTERPRISE. Only the Super User can assign other users to this group and those users will also have full user permissions in ENTERPRISE. Members of the Administrators group are known as Regional Super Users. Members of the Administrators group can use ARRAYWIZARD.
Power Users	<p>By default, Power Users can create new users and add them to existing groups but cannot create new groups or edit permissions. However their permissions are configurable. For more information see Configuring Permissions for Power Users on page 118. The Super User and Regional Super Users can assign other users to this group.</p> <p>Note: This group is only visible if the Super User has configured ENTERPRISE Administrator so that Power User functionality is utilised. For more information on this configuration, see Hiding the Power Users Group on page 98.</p> <p>Members of the Power Users group can use ARRAYWIZARD.</p>

The Super User and the Regional Super Users can create additional groups to supplement the automatically created groups as required.

Before you create groups and users, take advice from engineering groups to ensure that their requirements are met.

Example of Groups and Users

You might want:

- Regional groups, for example, North, as a way of grouping users according to area. Regional groups would not require write permissions for anything.
- Groups that define distinct job functions in your organisation, for example, Cell_Planners, who might have permissions to create Properties, basestations and other relevant items.
- A group for each writeable permission, for example, Propagation_Models, so that you can easily see who has which permissions.

Each user will inherit permissions from each of the groups to which they belong. For ease of editing and clarity, it is best if users have permissions determined by their groups. If necessary you can give additional permissions on a per user basis, but this is not recommended.

Adding a Group

To add a group:

1. Log in to the required database in Administrator.
2. In the left pane of the Administrator, expand the tree and select **Groups**.
3. In the right pane, double-click **Add Group**.
4. Name your group and add any comments, then click **Next**.

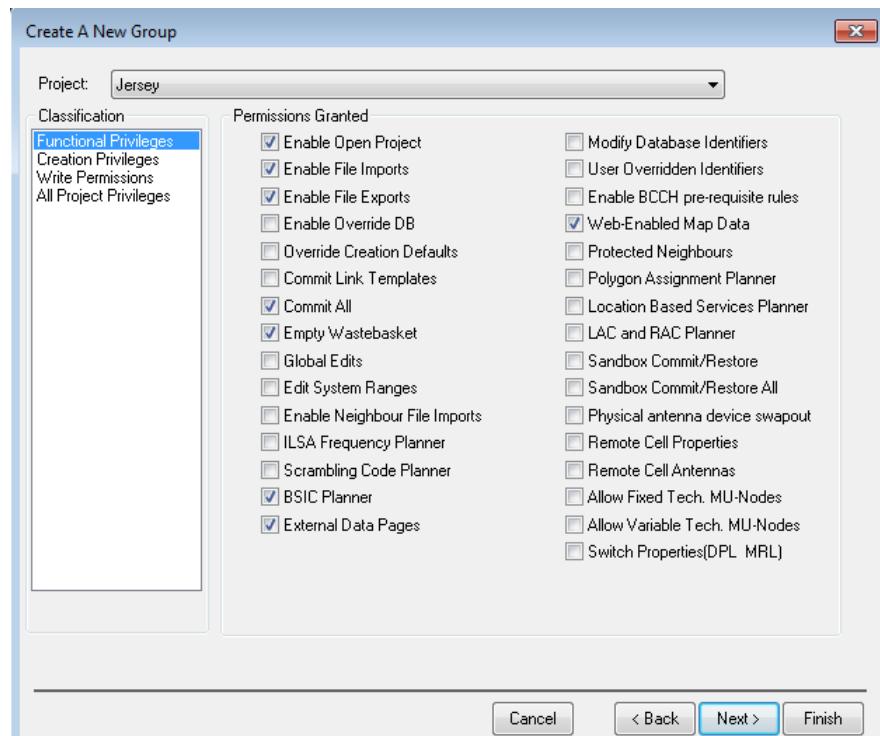
Note: For more information, see Tips on Group and User Naming on page 93.

5. If you have already created users that you want to be members of this group, select a user that you want to add to the group then click the arrow button to move it to the **Group User Membership** list. Repeat for each user that you want to be a member of the group. If you have not yet created users, proceed to the next step directly.
6. Click **Next**.

7. For each project, check the **Enable Open Project** checkbox, then for each class of user permissions, select the data elements you want users in this group to be able to create or modify. There are four classes of user permissions:

- Functional Privileges - determine who can perform project handling tasks
- Creation Privileges - determine who can create network elements and system filters
- Write Permissions - determine who can change information held on the database
- All Projects Privileges - determine who can create new projects, see read-only projects, and use All Projects equipment folders. Since the permissions within it apply to all projects, when you select this class the **Project** field is not enabled.

In this example the group members will have permission to perform BSIC planning in the Jersey project:

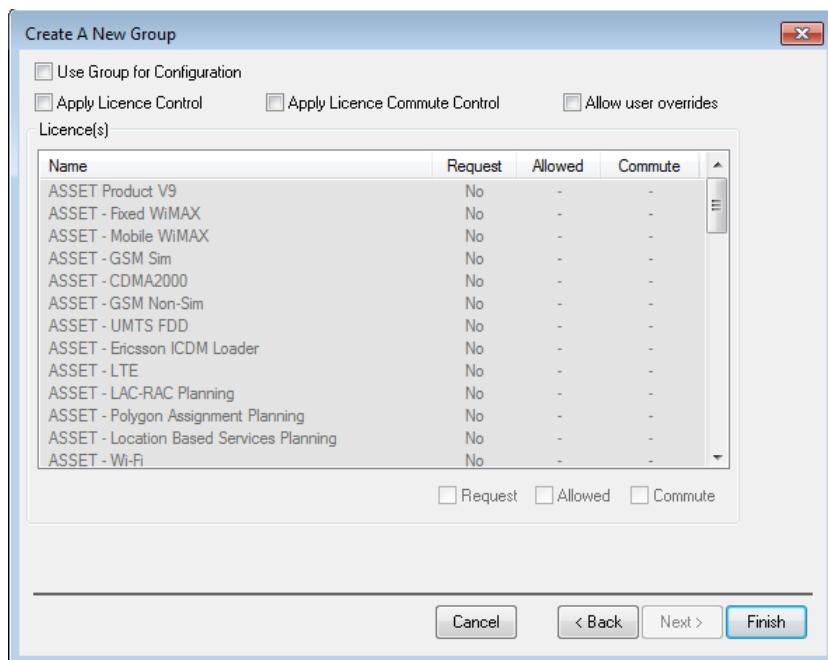


If you are creating a regional group, (for example `North`), rather than a functional group (for example `Cell_Planners`), you do not have to select the **Enable Open Project** checkbox or grant any user permissions, as regional groups are a way of grouping users according to area.

The **Coverage Schemas** checkbox only applies to the system coverage schema, and not to user coverage schemas.

Tip: You can select or clear all the permission checkboxes for a classification by right-clicking on the classification and from the menu that appears, clicking **Select All** or **Unselect All**.

8. Continue until you have assigned user permissions for each project, then click **Next**. The License Configuration page appears. This picture shows an example:



9. If you wish to control license allocation via Group Properties, there are a number of choices that you can make on the License Configuration page. This table describes them:

To Control	Do This
Whether or not license requests are determined by the Group Properties.	Select the Use Group for Configuration option. The Request column is activated.
Whether or not a license request for a selection is generated when a member of this group logs in.	Make a selection in the Name column, then click the Request option. When the Request column shows Yes for the selected row, a license request is generated when a member of this group logs in. You can make multiple selections using the Shift key.
Whether or not license allocation is determined by the Group Properties.	Select the Apply License Control option. The Allowed column is activated.
What members of this group are allowed a license for.	Make a selection in the Name column, then click the Allowed option. When the Allowed column shows Yes for the selected row, members of this group are allowed licenses for this selection. You can make multiple selections using the Shift key.
Whether or not commuter license allocation is determined by the Group Properties.	Select the Apply License Commute Control option. The Allowed column is activated.
What members of this group are allowed a commuter license for.	Make a selection in the Name column, then click the Commute option. When the Commute column shows Yes for the selected row, members of this group are allowed commuter licenses for this selection. You can make multiple selections using the Shift key.
Whether members of this group can change the start-up state, or the licenses that are selected for request, from what is specified by their administration profile.	Deselect the Allow user overrides option to deny these permissions.

10. Click **Finish**.

The new group appears in the right pane:

The screenshot shows the 'Database Administration' window with the title bar 'Administrator [ent8b214 - UKDOC01007LT] - ADMIN [SuperUser status]'. The menu bar includes 'Login Logout Exit', 'Database View Utilities Configuration Help', and 'Database Administration'. The left pane displays a tree structure under 'ENT8B214': Utilities, Configuration, Users, Sessions, and Groups. The 'Groups' node is selected. The right pane lists groups with columns 'Name' and 'Comment'. The table contains the following data:

Name	Comment
Add Group	
Administrators	Administrators
All	Group All
Power Users	Power Users
South	

11. Repeat steps 3 to 10 until you have created all the groups with the required user permissions for each project.

Important: Users do not automatically gain permissions to new projects. For each new project created after you have created users, you will have to add the permissions to the project for users as required.

Controlling Neighbour Planning Permissions

If you wish to control which users can amend the neighbour-related parameters in the **ENTERPRISE Neighbour Analysis** dialog box, you can do so by creating three special groups.

By default, all users are able to amend the neighbour-related parameters and the three groups do not exist.

Important: If you create the groups, no users will be able to amend the parameters unless you add the users to the groups.

To prevent all users from amending the neighbour-related parameters:

Create three new groups, one called Neighbour_Protected, one called Neighbour_Priority and one called Neighbour_PlannedStatus.

To allow only particular users to amend the neighbour-related parameters:

Add the required users to the Neighbour_Protected, Neighbour_Priority and Neighbour_PlannedStatus groups.

For more information on the **Neighbour Analysis** dialog box, see the *ASSET User Reference Guide*.

Hiding the Power Users Group

If you have Super User permissions and do not require the Power User functionality to be available within ENTERPRISE Administrator, you can switch it off.

To do this:

1. From the **Configuration** menu, click **Application Configuration**.
2. In the dialog box that appears, deselect the **Power Users** checkbox.
3. Click **OK**.

Editing a Group

Having created a group, you can change:

- which users belong to that group
- what user permissions users have as a result of belonging to the group
- what settings for distributed predictions membership of the group confers
- what settings for distributed arrays membership of the group confers
- what license configuration and license permissions are associated with the group

To edit a group:

1. Log in to the required database in the Administrator.
2. In the left pane of the Administrator, expand the tree and select **Groups**.
3. In the right pane double-click the group whose permissions you want to change.
4. Edit the settings on the tabs as required.
5. Click **Close**.

Notes:

- A user who does not have the Enable File Imports user permission can still import user settings.
- A user may belong to more than one group so that:
 - the Distributed Predictions/Arrays settings for the groups may be different. These are shown on the **Distributed Predictions/Arrays** tabs in the **Group Properties** dialog box. In this case the settings of the group that allows the greatest number of tasks and the greatest user distribution priority will apply to the user.
 - the license permission settings for the groups may be different. These are shown in the **Allowed** and **Commute** columns on the **License Configuration** Tab in the **Group Properties** dialog box. In this case the settings of the group that allows the most access will apply to the user.
 - the license configuration settings for the groups may be different. These are shown in the request column on the **License Configuration** tab in the **Group Properties** dialog box. In this case a particular license is requested if any of the groups to which the user belongs is set to request it, provided that any configured license permissions allow it.

For more information on license configuration and license permission settings for a group, see Adding a Group.

About Users

There are a number of types of user. For more information about the types of user and who can create which user type, see [About User Types](#).

There are two ways in which users can log in to ENTERPRISE. These are:

- With a username and password
- Automatically using authentication from the operating system (OS) where the user will be connected automatically to the database if the server confirms that they exist

You might want to use OS authentication so that:

- Users do not have to remember a password to use ENTERPRISE
- If a user's Windows account is removed, for example when they leave the company, their access to ENTERPRISE is automatically removed at the same time

If you want to create a large number of users who can automatically log in to ENTERPRISE, use the Add Batch OS Users feature. For more information, see [Adding Batch OS Users](#) on page 105.

Important: Users do not automatically gain permissions to new projects. For each new project created after you have created users, you will have to add the permissions to the project for users as required.

About User Types

There are a number of types of user in ENTERPRISE. This table describes each type of user:

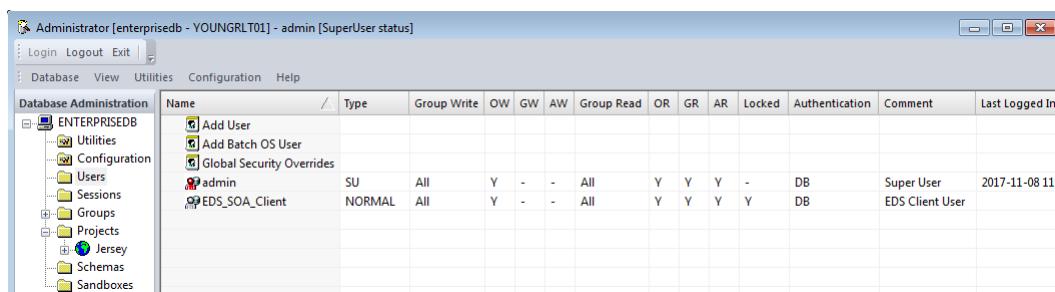
This User	Is Created	Can Do This
Super User (SU)	Automatically when the Administrator tool is used for the first time. There is only one Super User. By default, the Super User is called Administrator, but you can change this name. For more information, see Editing a User on page 106.	<ul style="list-style-type: none"> • Create edit and remove all other types of user, including Regional Super Users. • Adopt and impersonate other users' sessions. • Upgrade the database. • Control group-dependent permissions for fields and Power User access to fields. • Use ENTERPRISE with full user permissions. • Set Global Security Overrides.
Regional Super User (RSU)	By the Super User and is a member of the Administrators group.	<ul style="list-style-type: none"> • Create, edit and remove users but cannot add or remove users to or from the Administrator group. • Adopt and impersonate other users' sessions. • Control group-dependent permissions for fields and Power User access to fields. • Use ENTERPRISE with full user permissions. • View Global Security Overrides.

This User	Is Created	Can Do This
Power User (PU)	By the Super User or a Regional Super User and is a member of the Power Users group. This type of user is optional. The Super User can configure the functionality associated with it to be visible within ENTERPRISE Administrator or not. For further information see Hiding the Power Users Group on page 98.	<ul style="list-style-type: none"> Create, rename and remove Normal Users but cannot add or remove users to or from the Administrator or Power User groups. Adopt and impersonate other users' sessions. Control group-dependent permissions for fields unless prevented by the Super User or Regional Super User. Use ENTERPRISE with full user permissions. Configure Sandboxes (if granted the Sandbox Configuration permission by the SU or RSU). View Global Security Overrides.
Normal User (NORMAL)	By the Super User or Regional Super User.	<ul style="list-style-type: none"> Use ENTERPRISE as defined by the permissions given to them.

Adding a User Without OS Authentication

To add a user:

1. Log in to the required database in the Administrator.
2. In the left pane of the Administrator, click **Users**. Any existing users are displayed:



3. In the right pane, double-click **Add User**.
4. Type a User ID and password. For more information, see Tips on Group and User Naming on page 93. This user must type this username and password to log in to ENTERPRISE.
5. Select if you want to **Lockout** the account. This may be useful if you need to create new user accounts but do not want them to be active straightaway, for example new staff who have not yet joined your department.
6. Select if you want the password for this account to expire. If you choose this, the user will be asked to change their password when they first log into ENTERPRISE.
7. Select which profile you want to use, either the Oracle DEFAULT or ENT_DEFAULT_PROFILE. For more information about these profiles, see Editing the ENTERPRISE Database Security Settings on page 161.
8. Click **Next**.
9. In the **All Groups** pane, select the first group to which you want the user to belong, then click the arrow button to move it to the **Users Group Membership** list. Repeat for each group to which the user will belong.

Note: All users are members of the group All. You cannot select both the Administrators group and the Power Users group.

10.Click **Next**. The **Functional Privileges** page appears.

11.If you have included either the Administrators group or the Power Users group in your selection, you will not be able to modify the associated privileges and permissions. (For information on how a Super User can modify permissions for Power Users see Configuring Permissions for Power Users on page 118).

Tip: Even when you are adding a normal user it is recommended that you do not specify any other permission settings here but instead let the user inherit privileges from the groups they belong to, so click **Next**.

12.Select the **Write** checkboxes to determine who can edit the project data items that this user creates (such as Properties, sites, links, nodes, connections and so on). The following table describes the permissions set when you select different **Write** checkboxes:

Selecting This 'Write' Checkbox	Gives These Permissions
Owner	This user only can change the project data items that they have created.
Default Group	Members of the default group can access project data items that this user creates. Note: This group need not be the one to which the user belongs. For full details of how powerful this feature is, see Examples of Setting Permissions on page 123.
All	All users can change the project data items that this user has created.

Note: These permissions can be changed in ENTERPRISE. For more information, see the *ENTERPRISE User Reference Guide*.

13.Click **Next**.

14.Select the **Read** checkboxes to determine who can view the project data items that this user creates (such as Properties, sites, links, nodes, connections and so on). The following table describes the permissions set when you select different **Read** checkboxes:

Selecting This 'Read' Checkbox	Gives These Permissions
Owner	Only this user can view the project data items that they have created.
Default Group	Members of the default group can view project data items that this user creates. Note: This group need not be the one to which the user belongs.
All	All users can view the project data items that this user has created.

15.Click **Next**. The **License Configuration** page appears.

16.If you wish to control license allocation via User Properties, there are a number of choices that you can make on the **License Configuration** page. This table describes them:

To Control	Do This
Whether or not a license request for a selection is generated when this user logs in.	Make a selection in the Name column, then click the Request option. When the Request column shows Yes for the selected row, a license request is generated when this user logs in. You can make multiple selections using the Shift key.

To Control	Do This
Whether or not license allocation is determined by the User Properties.	Select the Apply License Control option. The Allowed column is activated.
What this user is allowed a license for.	Make a selection in the Name column, then click the Allowed option. When the Allowed column shows Yes for the selected row, this user is allowed a license for this selection. You can make multiple selections using the Shift key.
Whether or not commuter license allocation is determined by the User Properties.	Select the Apply License Commute Control option. The Commute column is activated.
What this user is allowed a commuter license for.	Make a selection in the Name column, then click the Commute option. When the Commute column shows Yes for the selected row, this user is allowed a commuter license for this selection. You can make multiple selections using the Shift key.
The Startup Mode applied to this user.	From the Startup Mode drop-down list, select the licensing behaviour that will be applied when this user starts up ENTERPRISE. For more information on the available options, see Setting the Startup Licensing Behavior on page 214.
Whether this user can change the start-up state, or the licences that are selected for request, from what is specified by their administration profile.	Deselect the Allow user overrides option to deny these permissions.

Important: License permissions allocated to an individual user as User Properties will override any license permissions that the user would otherwise inherit by virtue of belonging to a group.

17. Click **Next**. The **Contact Details** page appears.

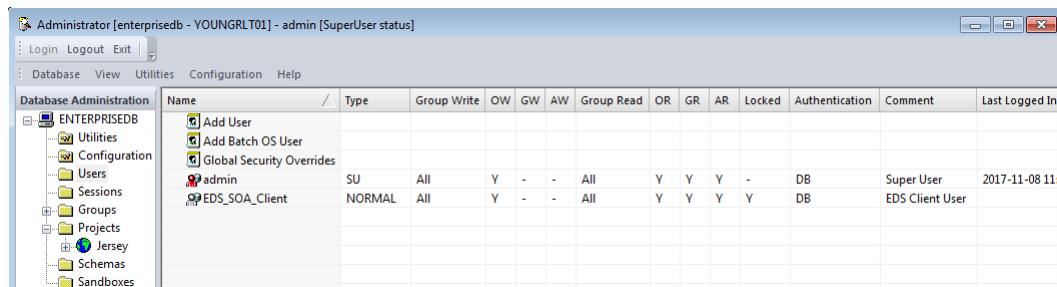
18. Type in the name, email address and telephone number of the new user.

19. Click **Finish**.

Adding a User With OS Authentication

To add a user with OS authentication:

1. Log in to the required database in the Administrator.
2. In the left pane of the Administrator, click **Users**. Any existing users are displayed:



3. In the right pane double-click:

- **Add User**, if you want to add a new user with OS authentication
- OR -
- A user's name, if you want to enable OS authentication for a user that has already been created.

4. Select the **Use OS External Authentication** checkbox and click **Users**.
5. Select a domain from the list available.
6. Select the **Do not use Domain in User Name** checkbox if you want only the user's name to display when they log into ENTERPRISE.
7. Select a filter and click the **Search** button.

Note: If your search returns groups and you double-click on a group in the list, the name of the group appears in the search path field below the filters so that you can carry out a further search for users in that group. To remove the last group name from the search path you can click on the **up arrow** button next to the search path field.

8. From the list of available users, select the name you require.

Tip: To quickly find a name, click in the list and then press the first letter of the name you are looking for. Continue pressing the same letter to move through the list of names that start with that letter.

9. Click **Add**, the name appears in the **Selected User** pane.

10. Click **OK**.

The domain, if you have chosen to include it, followed by the user's name appears in the **UserId** box.

11. In the **Create a New User** dialog box (or the **User Properties** dialog box if you are enabling OS authentication for an existing user), select which profile you want to use, either the Oracle **DEFAULT** or **ENT_DEFAULT_PROFILE**. For more information about these profiles, see [Editing the ENTERPRISE Database Security Settings](#) on page 161.
12. Click **Next** (or if you are enabling OS authentication for an existing user click **Apply** and then **Close** to complete the process).
13. In the **All Groups** pane, select the first group to which you want the user to belong, then click the arrow button to move it to the **Users Group Membership** list. Repeat for each group to which the user will belong.

Note: All users are members of the group **All**.

14. Click **Next**. The **Functional Privileges** page is displayed.

15. If you have included either the Administrators group or the Power Users group in your selection (you cannot include both), you will not be able to modify the associated privileges and permissions. (For information on how a Super User can modify permissions for Power Users see [Configuring Permissions for Power Users](#) on page 118).

Tip: Even when you are adding a normal user it is recommended that you do not specify any other permission settings here but instead let the user inherit privileges from the groups they belong to, so click **Next**.

16. Select the **Write** checkboxes to determine who can edit the project data items that this user creates (such as Properties, sites, links, nodes, connections and so on). The following table describes the permissions set when you select different **Write** checkboxes:

Selecting This 'Write' Checkbox	Gives These Permissions
Owner	This user only can change the project data items that they have created.
Default Group	Members of the default group can access project data items that this user creates. Note: This group need not be the one to which the user belongs. For full details of how powerful this feature is, see Examples of Setting Permissions on page 123.
All	All users can change the project data items that this user has created.

Note: These permissions can be changed in ENTERPRISE. For more information, see the *ENTERPRISE User Reference Guide*.

17. Click **Next**.

18. Select the **Read** checkboxes to determine who can view the project data items that this user creates (such as Properties, sites, links, nodes, connections and so on). The following table describes the permissions set when you select different **Read** checkboxes:

Selecting This 'Read' Checkbox	Gives These Permissions
Owner	Only this user can view the project data items that they have created.
Default Group	Members of the default group can view project data items that this user creates. Note: This group need not be the one to which the user belongs.
All	All users can view the project data items that this user has created.

19. Click **Next**. The **Licence Configuration** page appears.

There are a number of choices that you can make on the **Licence Configuration** page, as described under Adding a User Without OS Authentication.

Important: Licence permissions allocated to an individual user as User Properties will override any licence permissions that the user would otherwise inherit by virtue of belonging to a group.

20. Type in the name, email address and telephone number details of the new user.

21. Click **Finish**.

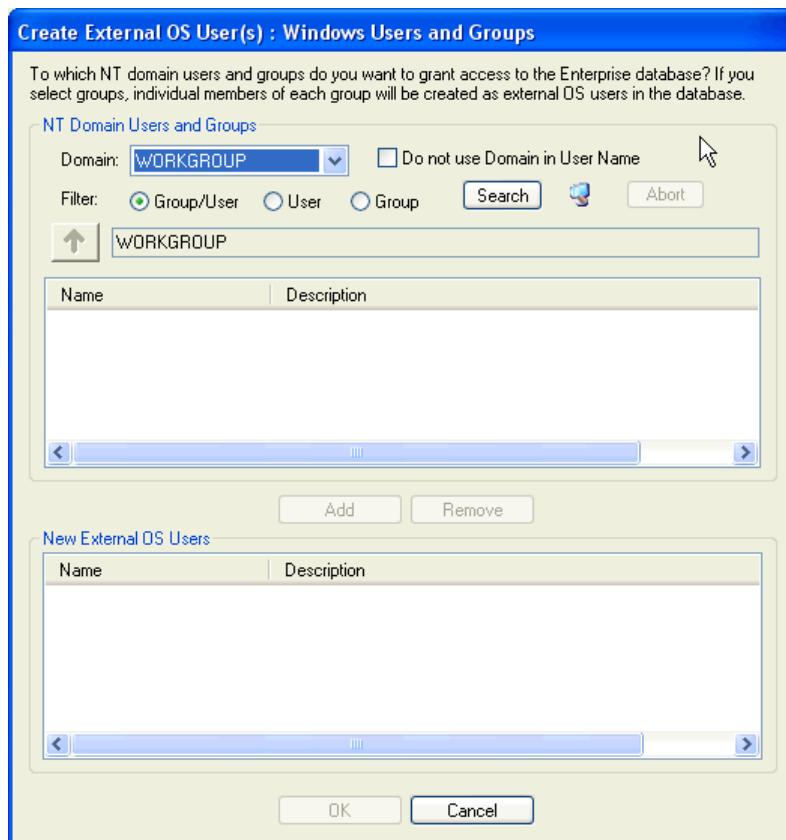
Adding Batch OS Users

You can choose to add a large number of users with OS authentication. When you create users in a batch, they all become members of the same groups - you cannot apply different groups and permissions to individual users at this stage. You can, however, edit users on an individual basis once you have finished adding the batch.

To add users with OS authentication in a batch:

1. Log in to the required database in the Administrator.
2. In the left pane of the Administrator, expand the tree and select **Users**.
3. In the right pane double-click **Add Batch OS User**.

This dialog box appears:



4. Select a domain from the list available.
5. Select the **Do Not Use Domain in Username** checkbox if you want only the user's name to display when they log into ENTERPRISE.
6. Select a filter if you want to limit the names that you can then choose from.
7. Click **Search**. The magnifying glass icon next to the **Search** button will be animated to indicate that the search is in progress until a list of names is returned from the server. You can click **Abort** to end the search. Due to the nature of the search the abort process may take some time during which the text on the button is changed to "Aborting".
8. From the list of available groups and users, select the name you want to add.

Tip: To quickly find a name, click in the list and then press the first letter of the name you are looking for. Continue pressing the same letter to move through the list of names that start with that letter.

Note: If you double-click on a group in the list, the name of the group appears in the search path field below the filters so that you can carry out a further search for users in that group. To remove the last group name from the search path you can click on the **up arrow** button next to the search path field.

9. Click **Add**, the name will appear in the **New External OS Users** pane. You can select names in this pane and click on **Remove** to take them out of the selection.

10. Click **OK** to confirm your selections.

Clicking **OK** results in the users' names appearing in the **Users Selected** pane of the **Create External OS User(s)** dialog box.

11. If you have added more than 50 users, select the **Users Greater Than 50 Continue?** checkbox.

12. Select **Lock Account** if you do not yet want **all** the accounts to be available immediately.

Note: Accounts can only be unlocked by editing each individual user account and clearing the checkbox. If you only want to lock a small number of accounts, it is recommended that you do not lock accounts during the adding of batch OS users but instead, after you have finished adding the users, you open each account and select to lock it.

13. Click **Next**. You can now define the security and permissions for all the users you have added. For more information, see step 13 of Adding a User With OS Authentication.

Editing a User

To edit a user:

1. In the left pane of the Administrator, select **Users**.
2. In the right pane, double-click the user account you want to edit.

This table describes the properties you change on each tab:

On This Tab	You Can
General	Change the username and password. Select OS External Authentication. Change the profile. Lockout the account and expire the password.
Groups	Change the groups that the user belongs to.
Security	Set any individual permissions (not recommended). For clarity, it is best if users inherit permissions from their groups rather than having individual additional permissions.
Creation Defaults	Change who can edit new objects that the user will create in future.
Read Defaults	Change who can view new objects that the user will create in future.
Distributed Predictions	Enable this user to carry out distributed prediction processing. You can then, in relation to distributed predictions, specify the maximum number of concurrent tasks that can be run for this user, and set the priority for those tasks relative to other users.
Distributed Arrays	Enable this user to carry out distributed array processing. You can then, in relation to distributed arrays, specify the maximum number of concurrent tasks that can be run for this user, and set the priority for those tasks relative to other users.

On This Tab	You Can
Contact Details	Change the name, addresses and telephone numbers associated with this user.
Licence Configuration	<p>Control:</p> <ul style="list-style-type: none"> • whether licence requests are generated when this user logs in • which licences this user is allowed • which commuter licences this user is allowed • whether or not a user can change the start-up state from that selected on their administration profile • whether or not a user can change the licences that are selected for request from those selected on their administration profile <p>Important: Licence permissions allocated to an individual user as User Properties will override any licence permissions that the user would otherwise inherit by virtue of belonging to a group.</p> <p>For more information on Licence Configuration settings for a user, see Adding a User Without OS Authentication.</p>

Click **Apply** to save the changes.

Tip: To lock and unlock an account without opening the **User Properties** dialog box, right-click on the name of the user and, from the menu that appears, select Lock/Unlock User.

Changing a User's Group Membership

To change which groups a user belongs to:

1. Ensure you are logged in to the required database in the Administrator.
2. In the left pane of the Administrator, expand the tree and select **Users**.

Tip: If you have a large number of users, you can sort the list in alphabetical order by clicking the **Name** column. The list of users will sort themselves into alphabetical ascending order. If you wish the list to be in descending order, click the column heading again.

3. In the right pane, select the user whose membership you want to change.
4. Double-click the user account you want to edit.
5. Click the **Groups** tab.
 - To remove membership of a group, click the group in the **Users Group Membership** pane and click the << button.
 - To make the user a member of another group, in the **Available Groups** pane, select the group and click the >> button.

Tip: You can see who belongs to which group by expanding the **Groups** folder in the left pane and clicking the group you are interested in:

The screenshot shows the Database Administration interface. On the left, there is a tree view of database objects under 'EN62B146'. The 'Groups' folder is expanded, showing sub-folders like 'Administrators', 'All', 'Model_Tuners', 'Power Users', and 'Southern'. In the right pane, a table lists users with their type and group assigned. The table has columns: Name, Type, and Group. Two rows are visible: 'DemoUser' (Type: NORMAL, Group: All) and 'Richard' (Type: NORMAL, Group: All).

Name	Type	Group
DemoUser	NORMAL	All
Richard	NORMAL	All

Changing User Permissions for New Objects

When editing a user, you can change who can edit new objects that the user creates. These permissions will only affect new objects as they apply at the time of creation of an object, and are recorded in the database. Therefore access to all existing objects is not changed.

To change the user permissions for new objects:

1. In the left pane of the Administrator, select **Users**.
2. In the right pane, right-click on the user you want to edit and from the menu that appears, click **Properties**.
3. On the **Creation Defaults** tab, choose from the list of groups shown in the **Default Group** box to set the group that by default can access objects that this user creates (if they have edit permissions to do so).

Tip: The user does not have to belong to the group that you have set, as long as you have also selected the owner, so they can write to their own new objects.

For information on how to change the permissions on existing objects, see Changing the Object Permissions of Existing Objects

Deleting Users and Groups

You can delete users and groups. Deleting a user will:

- Delete the user from all projects
- Delete all objects that the user has applied to the database
- Transfer ownership of the user's objects to the user Unknown

Deleting a User

To delete a user:

1. Log in to the required database in the Administrator.
2. In the left pane of the Administrator, expand the tree and select **Users**.

Tip: If you have a large number of users, you can sort the list in alphabetical order by clicking the **Name** column.

3. In the right pane, select the user you want to delete.
4. Right-click on the user and from the menu that appears, click **Delete User**.
5. In the dialog box that appears, choose a new owner for the deleted user's committed objects then click **Yes**. If you do not choose a new owner, all these objects will be owned by the user Unknown.

Deleting a Group

To delete a group:

1. Log in to the required database in the Administrator.
2. In the left pane of the Administrator, expand the tree and select **Groups**.
3. Ensure that nobody is still a member of the group you wish to remove. To do this:
 - o In the left pane, expand groups.
 - o Click the required group.
The right pane shows any members of this group.
4. In the left pane, click to select **Groups**.
5. In the right pane, right-click on the required group and click **Remove Group**.
6. In the dialog box that appears, choose a new owner for the deleted group's committed objects then click **Yes**. If you do not choose a new owner, all these objects will be owned by the group Unknown.

The group is deleted.

About Sandboxes

A Sandbox is an optional environment within ENTERPRISE in which users can experiment with network changes and see each other's applied changes without having to commit them and without making them visible to other users. If you add a Sandbox in ENTERPRISE Administrator, then users who you add to that Sandbox (sandbox members) will have the option to log in to the Sandbox environment in ENTERPRISE where they will have Sandbox Apply and Commit options.

A Sandbox Apply will make changes visible to the other users of the Sandbox. A Sandbox Commit will make changes visible to all users. You can set up multiple Sandboxes with different users in each.

For more information, see the *ENTERPRISE User Reference Guide*.

Adding a Sandbox

Important: You can only add a Sandbox if you have logged in to ENTERPRISE Administrator as a Super User, a Regional Super User or a Power User who has been granted Sandbox creation privileges.

To add a Sandbox:

1. In the left pane of the Administrator, select **Sandboxes**.
2. In the right pane, double-click **Add Sandbox**.

3. Name your sandbox, provide and confirm a password, add any comments required, then click **Next**.

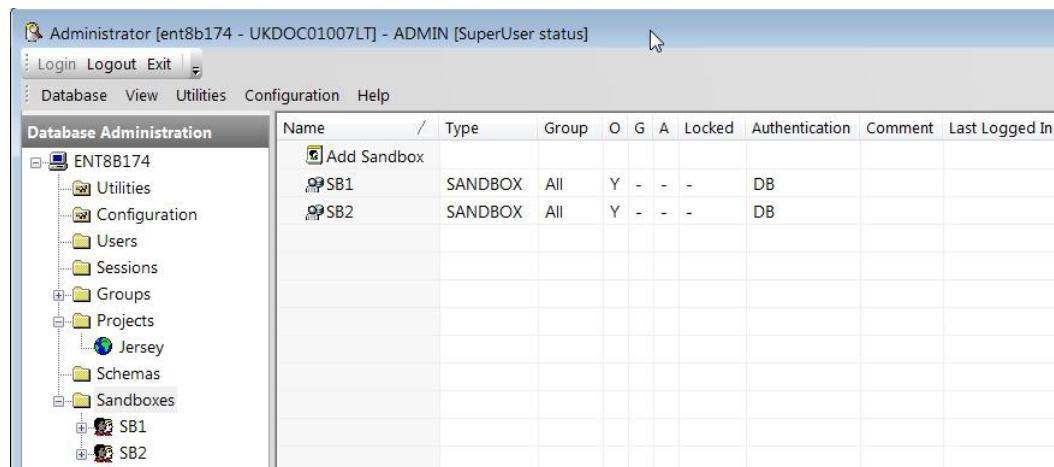
Note: The password is required only for the purpose of creating the sandbox, it will not be needed in ENTERPRISE as users who have access to this sandbox will log in with their own passwords.

4. For each project, check the **Enable Open Project** checkbox, then for each set of user permissions, select the data elements you want users in this Sandbox to be able to create or modify. There are four classes of user permissions:
- Functional Privileges - determine who can perform project handling tasks
 - Creation Privileges - determine who can create network elements and system filters
 - Write Permissions - determine who can change information held on the database
 - All Projects Privileges - determine who can create new projects, see read-only projects, and use All Projects equipment folders. Since the permissions within it apply to all projects, when you select this class the **Project** field is not enabled.

Continue until you have assigned user permissions for each project, then click **Next**.

Warning: The permissions that you assign to a Sandbox are extended to users of the Sandbox when they log in to the sandbox. The Sandbox permissions override the permissions that you have given users in their own right.

5. On the **Object Creation Default** step, click **Next**. The **Licence Configuration** page appears.
6. On the **Licence Configuration** page, click **Next**. The **Contact Details** page appears.
7. On the **Contact Details** page, click **Finish**. The sandbox is listed in the right pane, and in the **Sandboxes** folder in the left pane. This picture shows an example:



Adding Groups to a Sandbox

When you add a group to a Sandbox, users who are members of that group will be able to log in to ENTERPRISE as Sandbox users.

To add a group to a Sandbox:

1. In the left pane of the Administrator, expand the **Sandboxes** folder:



2. Expand the required Sandbox:



3. Click **Groups**.
4. In the right pane, double-click **Add Group**.
5. In the **Available Groups** pane, select the group to which you wish to give access to this Sandbox, then click the **arrow** button to move it to the **Sandbox Group Membership** list. Repeat for each group to be given access to this Sandbox.
6. Click **Apply**.
7. Click **Close**. The newly added group is listed in the right pane.

Adding Users to a Sandbox

When you add a user to a Sandbox, that user will be able to log in to ENTERPRISE as a Sandbox user.

To add a user to a Sandbox:

1. In the left pane of the Administrator, expand the **Sandboxes** folder:



2. Expand the required Sandbox:



3. Click **Users**.
4. In the right pane, double-click **Add User**.
5. In the **Available Users** pane, select the user to which you wish to give access to this Sandbox, then click the **arrow** button to move it to the **Sandbox User Membership** list. Repeat for each user to be given access to this Sandbox.
6. Click **Apply**.

7. Click **Close**. The newly added user is listed in the right pane.

Converting Users into Sandboxes

You can convert an existing user into a Sandbox to which other users can be given access.

Warning: When you convert a user into a Sandbox, the group membership of the user is lost and is not automatically restored if the user is subsequently removed from Sandboxes and made a normal user again.

To convert a user into a Sandbox:

1. In the left pane of the Administrator, right-click **Sandboxes**.
2. Click **Properties**.
3. In the Sandboxes dialog box, click the **Sandboxes** tab.
4. In the **Available Users** pane, select the user to which you wish to convert into a Sandbox, then click the **arrow** button to move it to the **Sandboxes** list. Repeat for each user to be converted.
5. Click **Apply**.
6. Click **Close**. The newly added Sandbox is listed under the Sandboxes folder in the left pane.

About Permissions

To take full advantage of the comprehensive permissions model that ENTERPRISE uses, you should:

- Use Administrator to apply permissions rather than using the standard database security settings
- Define groups and users using Administrator rather than the standard database administration program

ENTERPRISE uses a permissions system, which behaves something like file permissions on Microsoft Windows Server or on UNIX systems, where, for each project, a user has permissions that allow them read/write access to data elements in that project. These **user permissions** are set up when you create a user and are needed before a user can open a project, create or edit objects and filters such as sites, propagation models, cell layers, links, logical connections, bitrates, vectors and so on. These permissions have been discussed in [About Groups on page 93](#) to [Changing User Permissions for New Objects on page 108](#).

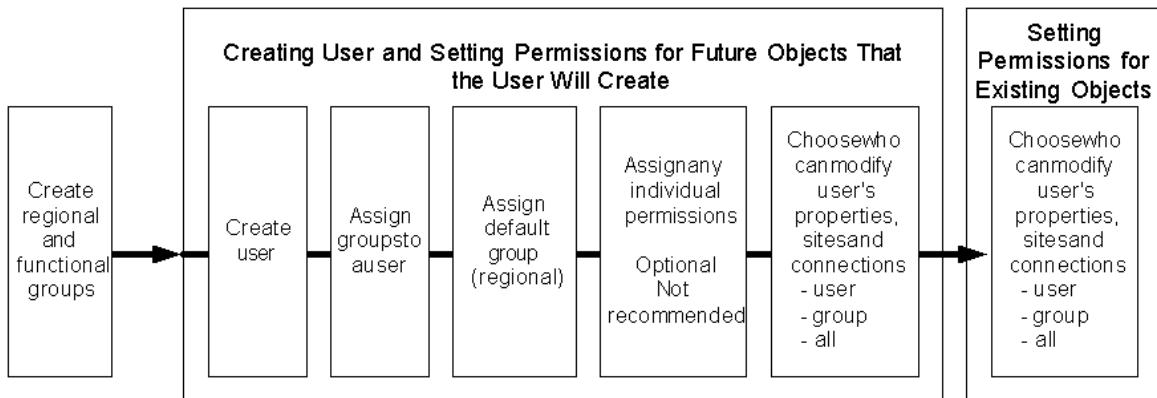
However, as well as user permissions, you can set **object permissions** and **filter permissions** that apply to all existing items that appear in the Site Database and filter database hierarchies, for example, Filters, Properties, MSCs, BSCs, sites, UMTS elements, LMUs, and so on. You can change who owns the object or filter, and also whether it can be modified by a combination of the owner, all members of any group, or all users. What users can access is also affected by **licence permissions** which are set in the Allow and Commute columns on the Licence Configuration tab of the Group Properties dialog box. The term **write permissions** refers to user and group permissions that confer the ability to add or edit data to the ENTERPRISE database.

An AND operation is performed between the user and object and filter permissions. When a user creates an item or filter, they will always have both these permissions for the item or filter. If the item or filter is someone else's, they may not.

So if a user wishes to edit an item owned by someone else, for example a Property, they will need both:

- User permissions (usually by being a member of a group who can edit Properties)
- Object-specific permissions (the specific Property has to be editable by people other than its owner)

This diagram shows the way in which you create permissions in the Administrator:



Creating a User and Setting User Permissions and Object Permissions

Setting ENTERPRISE Functional Privileges

To set ENTERPRISE Functional Privileges:

1. In the Administrator left-hand pane, click on **Groups**.
2. If you are creating a new group, in the Administrator right-hand pane, double-click on **Add group**. Type in a name for the group and click **Next**, then click **Next** again.
- or -

If you are editing an existing group, in the Administrator right-hand pane, right click the name of the group you wish to edit and from the resultant menu, click **Properties**, then select the **Security** tab.

3. In the **Classification** Pane, select **Functional Privileges 1**.
4. Select checkboxes to assign privileges as follows:

Select this checkbox	To enable users in this group to
Enable Open Project	Open ENTERPRISE projects.
Enable File Imports	Import files into the ENTERPRISE database. Note: User Settings Import is always allowed from the File/Import menu, even if this checkbox is not ticked. This is so that users always have full control of their own user settings.
Enable File Exports	Export files from the ENTERPRISE database. Note: User Settings Export is always allowed from the File/Export menu, even if this checkbox is not ticked. This is so that users always have full control of their own user settings.
Enable Override DB	Change the folders where map data, user preferences, predictions and colors are stored.
Override Creation Defaults	Change object permissions for objects when they are created.

Select this checkbox	To enable users in this group to
Commit Link Templates	Commit link templates created using the ASSET Backhaul tool to the ENTERPRISE database.
Commit All	Commit all changes made in ENTERPRISE to the ENTERPRISE database.
Empty Wastebasket	Permanently remove items in the Wastebasket from the ENTERPRISE database.
Global Edits	Use the Global Editor to change all network elements identified by a filter.
Edit System Ranges	Edit, in the ASSET Backhaul tool, link template distance ranges that are in the System Ranges group (for all users in a project).
Enable Neighbour File Imports	Use the Add Neighbours , Delete Neighbours and Live Neighbours options available from the Tools menu.
ILSA Frequency Planner	Use the ILSA Frequency Planner available from the Tools menu. You will also need object permissions on Base Stations. For more information, see Changing the Object Permissions of Existing Objects.
Scrambling Code Planner	Use the Scrambling Code Planner available from the Tools menu.
BSIC Planner	Use the BSIC Planner Wizard available from the Tools menu.
External Data Pages	<p>Use the Configure External Data Pages dialog box available from the Configuration menu to create and edit external data pages for the Site Database.</p> <p>Use any links in external data pages generated in the Site Database.</p>
Modify Database Identifiers	Use the Override Database defined Identifiers option in the Identifier Options dialog box.
User Overridden Identifiers	Use the Enforce Naming Convention (On Commit) option in the Identifier Options dialog box.
Enable BCCH pre-requisite rules	Change the BCCH pre-requisite rule on the General tab of the Preferences dialog box.
Web Enabled Map Data	Have WFS Services included in the Filter Wizard.
Protected Neighbours	Control the protection of neighbouring cells.
Polygon Assignment Planner	Use the Polygon Assignment Planner available from the Tools menu.
Location Based Services Planner	Use the Location Based Services Planner available from the Tools menu.
LAC and RAC Planner	Use the LAC and RAC Planner available from the Tools menu.
Sandbox Commit/Restore	Commit individual changes made in the Sandbox environment to the Site Database and restore individual Site Database details to a Sandbox.
Sandbox Commit/Restore All	Commit all changes made in the Sandbox environment to the Site Database and restore all Site Database details to a Sandbox.
Physical Antenna Device Swapout	<p>Replace an existing antenna device with another device on a Property by modifications to the logical antenna.</p> <p>Note: This is only applicable to the XML Import.</p>
Remote Cell Properties	Locate a cell on a Property that is different from the Property of the cell's parent node in the Site Database and Map View.

Select this checkbox	To enable users in this group to
Remote Cell Antennas	Select antennas from Properties other than the cell's own Property when assigning antennas for a cell in the Site Database.
Allow Fixed Tech. MU-Nodes	Set MU-Nodes in the Site Database to Fixed Technology. This is equivalent to selecting the Fixed Technology checkbox on the General tab for an MU-Node in the ASSET Site Database.
Allow Variable Tech. MU-Nodes	Set MU-Nodes in the Site Database to Variable Technology. This is equivalent to not selecting the Fixed Technology checkbox on the General tab for an MU-Node in the ASSET Site Database.

5. Click **Finish**.

Setting ENTERPRISE Creation Privileges

To set ENTERPRISE Creation Privileges:

1. In the Administrator left-hand pane, click on **Groups**.
2. If you are creating a new group, in the Administrator right-hand pane, double-click on **Add group**. Type in a name for the group and click **Next**, then click **Next** again.
- or -
If you are editing an existing group, in the Administrator right-hand pane, right click the name of the group you wish to edit and from the resultant menu, click **Properties**, then select the **Security** tab.
3. In the **Classification** pane, select **Creation Privileges**.
4. Select checkboxes to assign privileges as follows:

Select this checkbox	To enable users in this group to
System Filters	Create system level filters.
Networks and PLMNs	Create logical networks and Public Land Mobile Networks.
Properties	Create Properties.
(W)MSC/SGSNs	Create Mobile Switching Centres, Wideband Mobile Switching Centres and Serving General Packet Radio Service Support Nodes.
BSC/RNCs	Create Base Station Controllers and Radio Network Controllers.
MME/SAEGWs	Create Mobility Management Entities and System Architecture Evolution Gateways.
Base Stations	Create Sites or Nodes for any of the technologies.
Logical Nodes	Create Logical Nodes.
Distribution Nodes	Create Distribution Nodes.
MW Links	Create Microwave Links.
Logical/Cellular Connections	Create Logical and Cellular Connections.

5. Click **Finish**.

Setting ENTERPRISE Write Permissions

To set ENTERPRISE Write Permissions:

1. In the Administrator left-hand pane, click on **Groups**.

If you are creating a new group, in the Administrator right-hand pane, double-click on **Add group**. Type in a name for the group and click **Next**, then click **Next** again.

- or -

If you are editing an existing group, in the Administrator right-hand pane, right click the name of the group you wish to edit and from the resultant menu, click **Properties**, then select the Security tab.

2. In the **Classification** pane, select **Write Permissions 1**.
3. Select checkboxes to assign permissions as follows:

Select this checkbox	To give users ENTERPRISE database write permission to add or edit
System Vectors	System vectors such as coastline, buildings and streets.
Hexagon Grids	Range of sizes for Hexagon radius.
Equipment	Equipment such as antennas and amplifiers, and ASSET Backhaul modulation types and radios.
Propagation Models	Standard Macrocell, Microcell, Volcano, Stanford University Interim and Standard Long Range propagation models.
Carrier Layers	Logical groups of carriers associated with 2g cells in a network.
Cell Layers	Logical groups of transceivers on a 2g cell.
C-TRX Mapping	Channel to transceiver mappings for 2g.
Coverage Schemas	Schemas determining how 2g coverage is represented on the Map View.
2g Carriers	Absolute Radio Frequency Carrier Numbers associated with frequency bands.
2.5g Settings	Channel coding schemes for GPRS (General Packet Radio Service) and EGPRS (Enhanced General Packet Switched Services). Also channel (timeslot) occupancy for GPRS.
Bearers	Settings such as bitrates and link quality requirements for the air interface connections which transport voice and data between cells and terminal types.
3g Carriers	Channels associated with Nodes or Code Division Multiple Access base stations.
Services	Costs, data rates, supported bearers and other requirements such as quality of service made available to specific terminal types.
Terminal Types (also relates to Clutter Parameters)	Types of mobile terminal in the network, able to represent user densities on a geographical (vector/clutter) basis. Also provides permission for editing the Clutter Parameters.
System Filter Folders	System filters (filters available to all users).
Intf Weights, FH Gain, C/I-BER	Interference Weights, Frequency Hopping Diversity Gain, Carrier to Interference to Bit Error Rate conversion rates.

Select this checkbox	To give users ENTERPRISE database write permission to add or edit
CQI Tables	The values in the HSDPA Table Editor, associated with UMTS HSPA.
System Compound Arrays	System-wide mathematical expressions for the generation of compound arrays (available to all users).
MIMO / MUG Parameters	The MIMO parameters associated with the AAS Look-Up Tables for UMTS, Mobile WiMAX or LTE. -and- The MUG parameters associated with the Proportional Fair Scheduler Multi User Gain table for LTE.
BSIC Schemas	The BSIC (Base Station Identity Code) schemas for GSM.
Scrambling Code Schemas	The scrambling code schemas for UMTS.
PN Index Schemas	The PN Code Index schemas for Mobile WiMAX.
LTE Physical Cell ID Schemas	The physical cell ID schemas for LTE.
LTE Frame Structures	Frame structures for LTE.
LTE Frequency Bands	Frequency bands for LTE.
Relative Antenna Location	Relative locations for antennas. If this is not enabled, the user can only edit absolute locations for antennas. Note: Lack of this permission may have an impact on XML Imports. If so, appropriate messages will be displayed at the time of import.
LTE Power Calculation Method	The Auto-Calculate method for Max Tx Power and RS PPRE on the Power subtab of the LTE Params tab for an LTE cell in the Site Database.
Height - Pred Offset	The Height Prediction Offset.
System Favourites	A Favourite Map View into the System Favourites folder to make it accessible to all users.

For further information about these settings, see the ENTERPRISE User Reference Guide.

4. Click Finish.

Setting ENTERPRISE All Project Privileges

There are three privileges that you can assign across all projects for a group.

To set ENTERPRISE All Project Privileges:

1. In the Administrator left-hand pane, click on **Groups**.
2. If you are creating a new group, in the Administrator right-hand pane, double-click **Add group**. Type in a name for the group and click **Next**, then click **Next** again.
- or -
If you are editing an existing group, in the Administrator right-hand pane, right click the name of the group you wish to edit and from the menu that appears, click **Properties**, then select the **Security** tab.
3. In the **Classification** pane, select **All Project Privileges**.

4. Select checkboxes to assign privileges as follows:

Select this checkbox	To enable users in this group to
Enable Project Creation	Create new projects.
Show Read Only Projects	See and select read-only projects from the Project Selector dialog box.
Enable All Projects Equipment Folders	Select the Add to All Projects option that appears in dialog boxes for antennas and equipment.

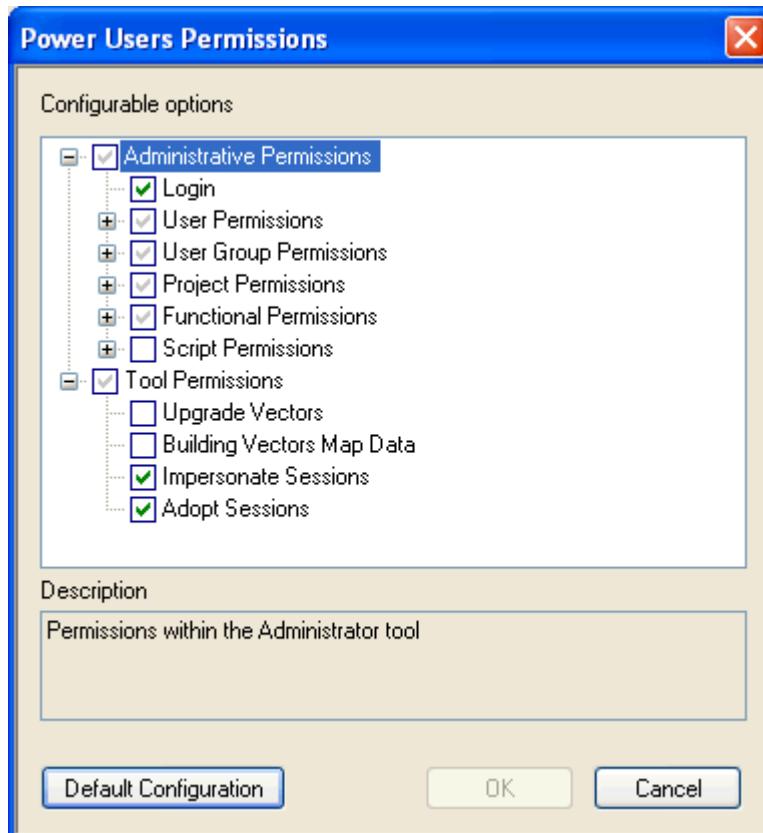
5. Click **Finish**.

Configuring Permissions for Power Users

If you are a Super User you can select the user permissions that members of the Power Users group can have. These permissions determine the options accessible to the Power User from the **Utilities** menu.

To configure permissions for power users:

1. From the **Configuration** menu, select **Power User Configuration**.
2. The Power Users Permissions dialog box appears:



Select the checkboxes for the permissions that you wish to grant to Power Users. The **Description** panel near the bottom of the dialog box shows a description of the purpose of the currently selected permission.

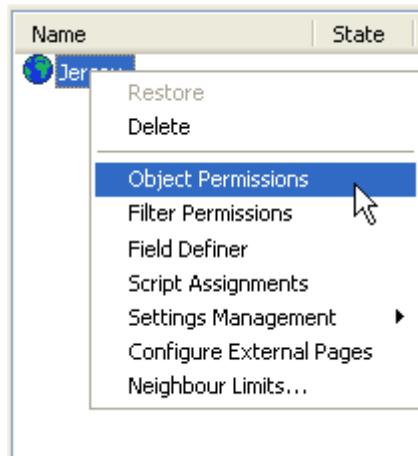
3. Click **OK**.

Note: Members of the Administrators and Power Users groups are able to use ARRAYWIZARD. For more information on ARRAYWIZARD, see the *ARRAYWIZARD User Reference Guide*.

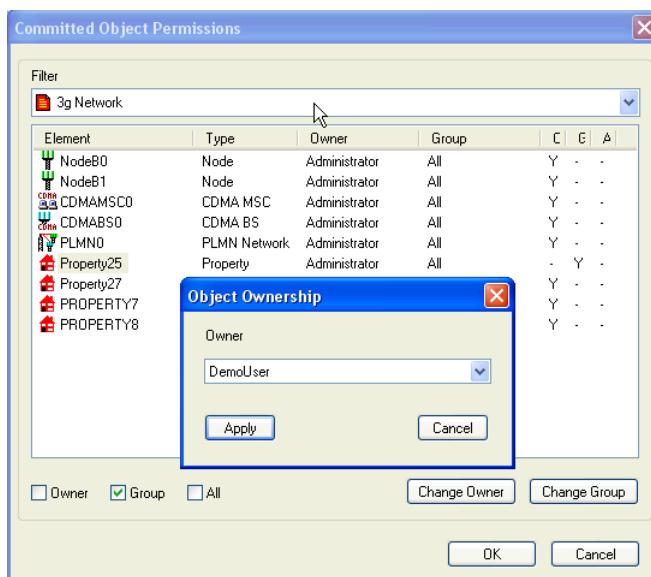
Changing the Owner of Existing Objects

To give a user permission to modify an existing object that appears in the Site Database hierarchy:

1. In the left pane of the Administrator, click to select the **Projects** folder.
2. In the right pane, right-click on the required project and click Object Permissions.



3. In the window that appears, select a filter, then select the existing element whose ownership you wish to change and click the **Change Owner** button.



4. In the Object Ownership dialog box, change the owner as required.
5. Click **Apply**.
6. You can change the group which has access to the object by clicking **Change Group**, then clicking **Apply**.
7. Click **OK** to close the **Object Permissions** dialog box.

Note: You can also retain the same owner for an object but enable members of that user's default group or all users to edit the object.

Changing the Object Permissions of Existing Objects

To give a user permission to modify an existing element that appears in the Site Database hierarchy:

1. In the left pane of the Administrator, click to select the **Projects** folder.
2. In the right pane, right-click on the required project and click **Object Permissions**.
3. In the window that appears, select a filter, then select the existing element whose permissions you wish to change.
Select one or more of the checkboxes at the bottom of the dialog box to set the access to this object to:
 - Owner only
 - All members of the owner's default group (including the owner)
 - All users (with write permissions for this object type)
4. Click **OK** to close the **Committed Object Permissions** dialog box.

Note: If you withhold object permissions from a user then when that user opens ENTERPRISE the text (Region Load | View Permission Load) appears at the top of the screen, next to the project name, to indicate that object permissions have been set. This picture shows an example:



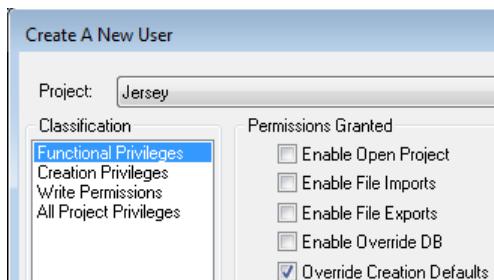
The View Permission Load functionality is a subset of the Region Load functionality which is why Region Load appears, even if the Restrict Site Load to Region option is not selected. For more information on Region Load, see Loading a Subset of Project Data (Site Region Load) on page 63. Similarly the Partial Load functionality is also a subset of the Region Load functionality, so the same applies if the text Region Load | Partial Load) appears. For more information on Partial Load, see Choosing What is Loaded When You Open a Project in the *ENTERPRISE User Reference Guide*.

Allowing Users to Change Object Permissions in ENTERPRISE

You can enable a user to change the permissions for an object they create. For example, a user in the group `South` has created a network element that they then want users of the group `North` to modify.

To enable a user to change object permissions for objects at creation:

Select the **Override Creation Defaults** checkbox when you are adding or editing the user.



Now, when the users log into ENTERPRISE, they can change these permissions by clicking the **Utilities** tab, and from the **Tools** menu, clicking **Creation Defaults**.

Tip: The user can always change permissions on their existing objects on the **Admin** tab in the Site Database.

For more information about changing permissions in ENTERPRISE, see the *ENTERPRISE User Reference Guide*.

Editing Filter Permissions

You can change the permissions on existing filters. For example, imagine you have created a filter and assigned it to a specific project team, indicated by a particular group (`South_CellPlanners`). If the team is replaced by another, you need to modify the permissions to ensure the new team can access the filter.

Note: All users must be logged out of the project. If they are not, an error message appears.

To edit permissions:

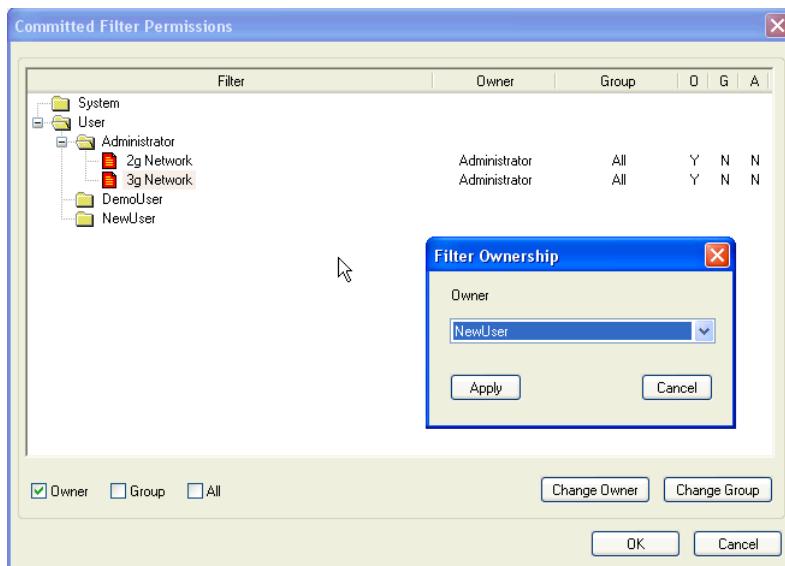
1. In the left pane, expand **Projects** and right-click on the project containing the filter you wish to modify.
2. From the menu that appears, click **Filter Permissions**.

Changing the Owner or Group of Existing Filters

To change the owner of an existing filter:

1. In the left pane, right-click on the project containing the filter you wish to modify.
2. From the menu that appears, click **Filter Permissions**.
3. In the dialog box that appears, select the required filter.
4. Click **Change Owner**.
5. From the list that appears, select a new owner and click **Apply**.

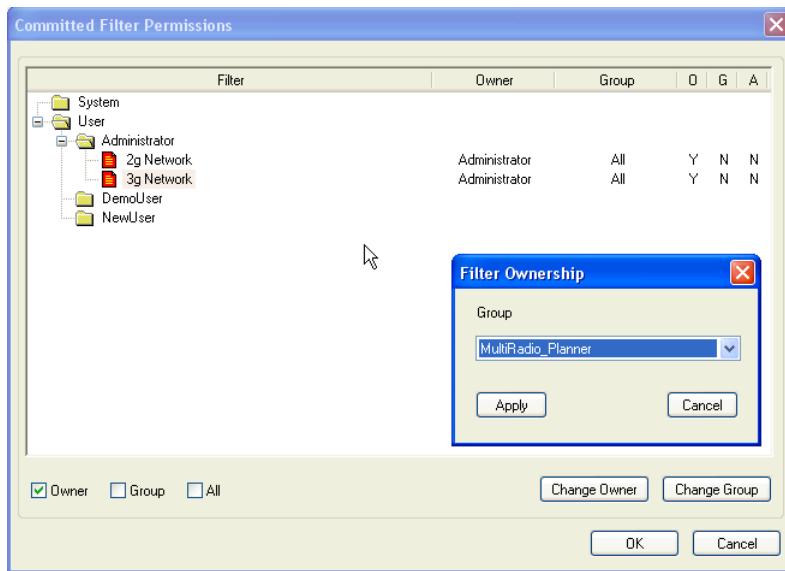
This picture shows an example of changing an owner of an existing filter permission:



To change the group of an existing filter:

1. In the left pane, right-click on the project containing the filter you wish to modify.
2. In the dialog box that appears, select the required filter.
3. Click **Change Group**.
4. From the list that appears, select a new group and click **Apply**.

This picture shows an example of changing the group of an existing filter permission:



Changing the Filter Permissions of Existing Filters

To give a user permission to modify an existing filter.

1. In the left pane, right-click on the project containing the filter you wish to modify.
2. Select the required filter.

3. Select one or more of the checkboxes at the bottom of the dialog box to set the access to this filter to:
 - Owner only
 - All members of the owner's default group (including the owner)
 - All users (with write permissions for this object type)
4. Click **OK** to close the **Committed Filter Permissions** dialog box.

Examples of Setting Permissions

Example of Using Users and Groups

This example illustrates how a Super User or Regional Super User sets up the permissions for groups and users.

First, the Super User or Regional Super User sets up these **groups**:

Group	Permissions
Admin	Writeable on everything. Also able to create new projects.
North	Enable Open Project permissions only
South	Enable Open Project permissions only
Cell_Planners	Enable Open Project permissions Writeable on Basestations and Filters

The Super User or Regional Super User then creates these **users**:

User	Member Of	Default Group	User's Objects Can Be Modified By
John	North Cell_Planners	North	All members of his default group
Pierre	North Cell_Planners	North	Owner
Emma	South Cell_Planners	South	All members of her default group
David	North	North	N/A (as group have no permission to create objects)
Admin User	Admin North South	Admin	All Users

The results therefore are that:

- The only people who can edit John's sites are members of his default group, North AND who have permission to edit basestations. Therefore only John, Pierre and AdminUser can edit John's sites.
- Pierre is the only person who can edit his own sites, because his objects are set to be modified by owner only.
- Emma can only edit sites created by herself and by AdminUser.
- David cannot edit any sites.

Example of Setting the Default Group for a User

This example describes how to set the default group for a new user to allow other users access to objects created by the new user.

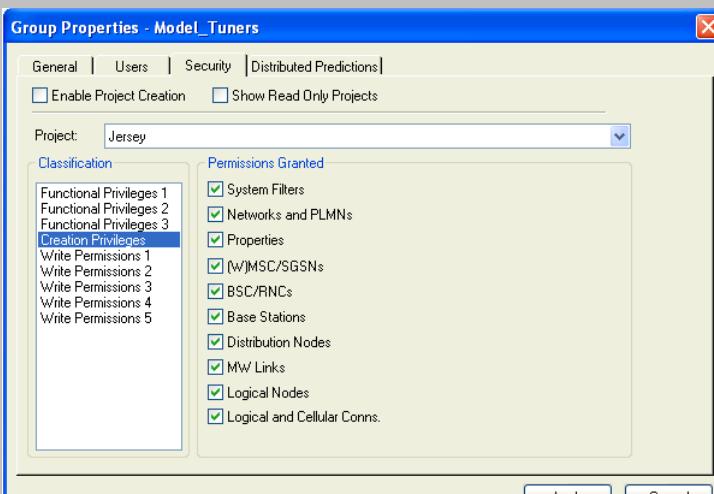
In this example, three users exist:

User	Group	Inheriting these permissions from the group(s)
David	South	None
Pierre	Cell_Planners	Basestations and Filters
Emma	South Cell_Planners	Basestations and Filters

A new user, per_svensson is created:

The screenshot shows the 'Create A New User' dialog box. The 'User Details' tab is active. In the 'UserId' field, 'per_svensson' is entered. The 'Password' and 'Confirm' fields both contain '*****'. The 'Comment' field contains the text 'Model Tuner - working mainly in the North of the country.'. On the right side, under 'Authentication', there is a checkbox for 'Use External OS Authentication' and a 'Users...' button. Under 'Security Profile', there are checkboxes for 'Lock account' and 'Expire password', and a dropdown menu set to 'ENT_DEFAULT_PROFILE'. At the bottom, there are buttons for 'Cancel', '< Back' (disabled), 'Next >', and 'Finish'.

He belongs to these groups:

Group	Permissions
North	Enable Open Project permissions only
Model_Tuners	Writeable on, amongst other items, basestations, as shown here: 
All	None

Write permissions for objects that Per creates can be:

- Restricted exclusively to the owner of the objects (Per himself)
- Restricted exclusively to users belonging to a specified group
- Granted to the owner of the objects and a specified group
- Granted to all users

As shown in the following four examples.

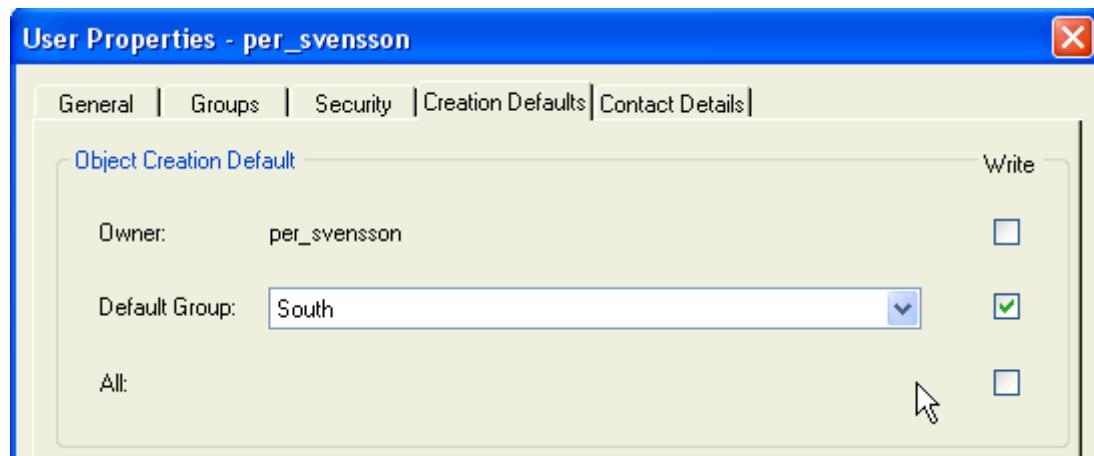
Note: If no write permissions are selected the user will be able to create objects but will not be able to commit them.

1. Objects Per creates can be set to be editable by the owner:



In this case objects created by Per can be edited by Per only and not by his group.

2. Objects Per creates can be set to be editable by members of a specified group:



In this case objects created by Per can be edited by members of the group South provided that those group members also have object permissions.

To edit Per Svensson's basestations for example, you have to be a user with both permission to edit basestations and membership of the group South. Therefore:

- o David, a member of the group South, but not a member of any group who has write permissions, cannot edit per_svensson's basestations.
- o Pierre, a member of cell_planners (who can edit basestations) cannot edit per_svensson's objects because he is not in the group South.
- o Emma, a member of cell_planners and south can edit Per's basestations.
- o Per Svensson, a member of model_tuners (who can edit basestations) can create but not edit his own basestations because he is not in the group South.

3. Objects Per creates can be set to be editable by Per and by members of group South:



4. Objects Per creates can be set to be editable by all users:



In this case all users who have write permissions on particular objects by virtue of belonging to a group where those permissions have been granted them will be able to change any of those particular objects created by Per.

Important: If the **All** box is ticked, **all** users with appropriate write permissions will be able to edit Per's objects, irrespective of their creation privileges.

Example of Changing Object Permissions on a Specific Site

This example illustrates how to change object permissions on a specific site which a user, John, owns.

If John decides that there is a particular site, Site 4A, that only he wants to edit, he would ask the administrator to change the object permissions on that site.

Using the **Object Permissions** dialog box, the administrator would see that Site 4A has the object permissions associated with all the objects that John creates, that is, members of John's default group can edit it, as shown here:

Element	Type	Owner	O	G	A
Jersey15	Cell Site	liz	Y	-	-
Site4A	Cell Site	john	Y	Y	-
BSC5	BSC	liz	Y	-	-
Helper20	Cell Site	liz	Y	-	-

The administrator selects the site, and clears the **Group** checkbox at the bottom of the dialog box. The object permissions for Site 4A change in the table and Site 4A can only now be edited by John as shown here.

Element	Type	Owner	O	G	A
Jersey15	Cell Site	liz	Y	-	-
Site4A	Cell Site	john	Y	-	-
BSC5	BSC	liz	Y	-	-

Setting Global Security Overrides

As a Super User you can use Global Security Overrides to grant or deny a permission or privilege to all users, including Sandbox users, irrespective of existing user or group settings.

Important: You can only do this when no other user is logged in to ENTERPRISE. If you try to set Global Security Overrides when other users are logged in, an error message identifying those users is displayed.

To set Global Security Overrides:

1. Log in to the required database in the Administrator as the Super User.
2. In the left pane of the Administrator, select **Users**.
3. In the right pane, double-click **Global Security Overrides**.
4. The **Global Security Overrides** dialog box appears.

To the left of each permission listed in the right pane, there is a pair of checkboxes:

- Select the left checkbox of the pair to indicate that the setting in the right checkbox is to be applied globally
 - or -
 - Leave the left checkbox of the pair blank to indicate that the setting in the right checkbox will not be applied globally
- Select the right checkbox of the pair to indicate that this permission is to be granted
 - or -
 - Leave the right checkbox of the pair blank to indicate that this permission is denied.

So, for example, suppose that five users have the BSIC Planner permission granted through membership of a group, while all other users are denied that permission. This table describes the possible settings:

This Setting	Means This
<input type="checkbox"/> <input checked="" type="checkbox"/> BSIC Planner	The permission setting is not enabled because the global setting is not selected. Group permissions apply. Five users have the permission and the rest do not.
<input checked="" type="checkbox"/> <input type="checkbox"/> BSIC Planner	The denied permission is globally applied. Group permissions are overridden. No users have the permission.
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> BSIC Planner	The granted permission is globally applied. Group permissions are overridden. All users have the permission.

The permissions of any new users that you add will also be governed by your Global Security Overrides settings.

6 Database Scripts and Database Settings

Having installed ENTERPRISE you can use ENTERPRISE Administrator to:

- Configure Database Events Scripts
- Enable Database Settings Management
- Edit Database Security Settings

This chapter describes these facilities.

About Database Events Scripts

Database events scripts enable Regional Super Users (RSUs) programmatic access to ENTERPRISE project and sub-project data via an XML interface in VBScript and JScript programming languages. They give RSUs more control over the data values which are applied and committed by users.

For example, ENTERPRISE allows a user to assign more than 32 GSM neighbours to a cell, but the physical and logical limitations of your network may preclude this. In this case the RSU can create a script to restrict the number of neighbours on GSM cells to ensure the physical limit is not exceeded.

There are some prerequisites and concepts which need to be understood before you can begin to use Database Events Scripts.

- As an RSU you will need an understanding of VBScript or JScript and be comfortable using either of the two languages. If you are new to these languages, the following links can help to get you get started:
 - <http://www.w3schools.com/vbscript>
 - <http://www.w3schools.com/js>

Note: VBScript is generally considered easier to learn than JScript.

-
- You will need an understanding of XML and how to navigate XML structures using VBScript or JScript. The following link can help to you get started: <http://www.w3schools.com/xml>

A VB script template and a Jscript template are supplied in the \samples\db event scripts folder of your ENTERPRISE installation. You should base your own scripts on these templates. Two example scripts are also supplied.

How Do Database Scripts Access ENTERPRISE Data?

Scripts have read only access to ENTERPRISE database data as XML only.

Important: It is the responsibility of the script writer to:

-
- Decode the XML data and interpret it appropriately.
 - Give appropriate warnings and ensure that commit errors are reported to users so they know what to do in the event of a commit being stopped.

As a guide to understanding the structure of the XML data for ENTERPRISE objects you can dump the XML data for objects using the 'xml' property and use this as a basis for navigating the data. For example, to dump the XML for an MSC object named "MSC0" using VBScript, the following code is required:

```
Set msc = Core.DBScriptEvents.FindDBObject("MSC0", MSC_OBJECT)
Set fso = CreateObject("Scripting.FileSystemObject")
Set ofs = fso.CreateTextFile("c:\xml-dump.txt", True, False)
'Dump the xml to file.
ofs.WriteLine(msc.xml)
ofs.Close
```

You can use the XML DOM node returned by the script (in the example the variable name 'msc' holds a XML DOM node reference to the XML data) to navigate through the returned XML data with the properties and methods of the IXMLDOMNode interface.

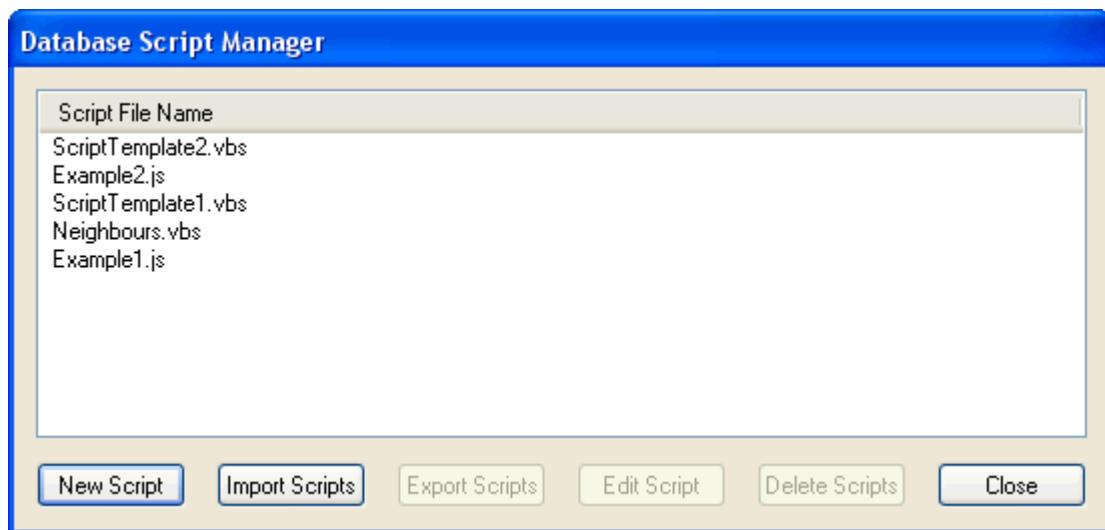
Managing Database Events Scripts

You can create, import, export, edit and delete scripts using the Database Script Manager.

To open this:

In Administrator, from the **Utilities** menu, point to **Database Script Events** then click **Script Manager**.

The **Database Script Manager** appears, as shown in this example:



Creating Scripts

To create a script:

1. Click **New Script**.
2. In the dialog box that appears, type a script file name. Ensure that you add a .vbs or .js file extension.
3. Click **OK**. The new script file name appears in the **Database Script Manager**.

Importing Scripts

To import scripts:

1. Click **Import Scripts**.
2. In the dialog box that appears, use the **file type** drop-down list to display either .vbs or .js files.
3. Browse to the folder containing your scripts.
4. Select the script(s) you wish to import.

Tip: You can use the **Shift** key to select multiple scripts for import.

5. Click **Open**. The imported scripts are listed in the **Database Script Manager**.

Note: If you import a script with the same name as one that already exists on the database, you can either overwrite or keep the existing script.

Exporting Scripts

To export a script:

1. In the **Database Script Manager**, select the script(s) that you wish to export.

Tip: You can use the **Shift** key to select multiple scripts for export.

2. Click **Export Scripts**.
3. Browse to the folder where you want to keep your scripts.
4. Click **OK**. A copy of the selected script is exported to the folder of your choice. The original script remains on the ENTERPRISE database.

Note: If you export a script with the same name as one that already exists in the folder you are exporting to, you can either overwrite or keep the existing script.

Editing Scripts

To edit a script:

1. In the **Database Script Manager**, select the script you wish to edit.

Note: You can only edit one script at a time.

2. Click **Edit Script**.

Tips:

- By default, Notepad is opened to edit scripts, but you can also edit scripts using a user defined editor. To do this right click on the script you want to edit and click on **Browse**. Locate the editor .exe, for example 'UEDIT32.EXE' (UltraEdit), click **Open** and the script will be opened in the chosen editor. Administrator will become inactive until you have closed your editor.
- When you save your edited script, ensure that the encoding is set to ANSI or UTF-8.

- You can use an include statement, such as:
`<!--#include file="CommonFunc.vbs"-->`
to include another script that is stored in the database (in this case CommonFunc.vbs) in the script that you are currently editing.
-

Important: Scripts and script assignments are cached locally on users' machines. If a user is logged in to a project and you attempt to edit a script assigned to that project, users will need to re-open the project before your script updates will take effect. See Clearing the Script Cache on page 159 for further information.

Deleting Scripts

To delete a script:

1. In the **Database Script Manager**, select the script(s) that you wish to delete.
-

Tip: You can use the **Shift** key to select multiple scripts for deletion.

2. Click **Delete Scripts**.
-

Note: If a user is logged in to a project that uses a script that you wish to delete, the deletion will not affect the user until the next time that they log on to the project.

Assigning Database Events Scripts

Having made scripts available using the Database Script Manager, as a Regional Super User you can:

- Assign the scripts to specific object types (such as MSCs, BSCs and cells) within a particular project or sub-project so that only those object types are affected by the scripts when the Apply or Commit event occurs
- Choose when the scripts are executed
- Switch scripts off to speed up performance or to disable erroneous scripts temporarily
- Select scripts to be executed when Commit All is performed on the Site Database

To assign Database Events Scripts:

1. In Administrator, from the **Utilities** menu, click **Database Script Events** and then **Script Assignments**.
2. In the dialog box that appears, select the project or sub-project within which you wish to assign scripts.

3. Click **OK**. The **Script Assignment** dialog box appears. This picture shows an example:

Script Assignment								
Object Scripts		Commit All Scripts						
Object Type		Before Commit Script	Before Apply Script	After Commit Script	After Apply Script	Insert Script	Enable Script	Ignore Script Error
BSC		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
CDMA BSC		(no script)	(no script)	(no script)	(no script)	(no script)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CDMA MSC		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
Cell		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Distribution Node		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
Generic Repeater		(no script)	(no script)	(no script)	(no script)	(no script)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Link (PMP)		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
Link (PTP)		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Logical Cellular Conn.		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
Logical Connection		(no script)	(no script)	(no script)	(no script)	(no script)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Logical Network		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
Logical Node		(no script)	(no script)	(no script)	(no script)	(no script)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MME		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
MSC		(no script)	(no script)	(no script)	(no script)	(no script)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
MU-Node		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
PLMN Network		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PMP Sector		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
PTP Link End		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Passive Repeater Link (Back to Back)		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
Passive Repeater Link (Reflector)		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Property		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
RNC		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
SAEGW		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>
SGSN		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
WMSC		(no script)	(no script)	(no script)	(no script)	(no script)	<input type="checkbox"/>	<input type="checkbox"/>

On the **Object Scripts** tab, a list of all the supported object types is displayed in the **Object Type** column.

4. Depending on when you want the script to be executed, double-click in the appropriate column in the row of the object type you want to assign a script to. This table describes the columns available:

Select this column	To Execute the Script
Before Commit Script	After the Commit button is clicked, but before changes are written to the database
After Commit Script	After the Commit button is clicked, and after changes are written to the database
Before Apply Script	After the Apply button is clicked, but before changes are written to the database
After Apply Script	After the Apply button is clicked, and after changes are written to the database
Insert Script	After a new object is created, and after changes are written to the database

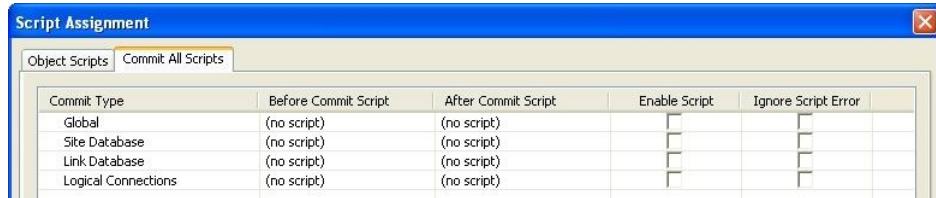
Note: The use of scripts relating to **After Commit**, **After Apply** and **Insert** will mean that the scripts are not executed if a database write operation fails. This is useful if, for example, the script triggers the use of another system that assumes that the database write operation has taken place.

5. In the drop down-list that appears, select the script you wish to assign.
 6. To make the script active next time the project is loaded, select the **Enable Script** checkbox.
 7. To allow the Commit and Apply events to take place even if there is an error when the script is run, select the Ignore **Script Error** checkbox. If you do not select this option, the Commit and Apply events will not be allowed if the script fails. The script error will be reported in the Message Log.

8. Repeat steps 4 to 7 until you have assigned all the scripts you need. You can select a script from more than one column for each object type.

Tip: If you have assigned scripts to a number of object types, you can select all of the **Enable Script** and **Ignore Script Error** checkboxes at once by right clicking in the appropriate column and then clicking **Select All**. You can clear the checkboxes for all selected object types by clicking on **Clear All**.

9. If you also want to assign scripts to be executed when Commit All is performed on the Site Database, select the **Commit All Scripts** tab. This picture shows an example of the **Commit All Scripts** tab:



10. Scripts can be assigned to:

- a Global Commit All from the ENTERPRISE **Database** menu
- a Commit All on the ENTERPRISE **Site Database** dialog box
- a Commit All on the ENTERPRISE **Link Database** dialog box
- a Commit All on the ENTERPRISE **Logical/Cellular Connection Database** dialog box

Depending on when you want the script to be executed, double-click in the appropriate column next to the commit type you want to assign a script to. This table describes the columns available:

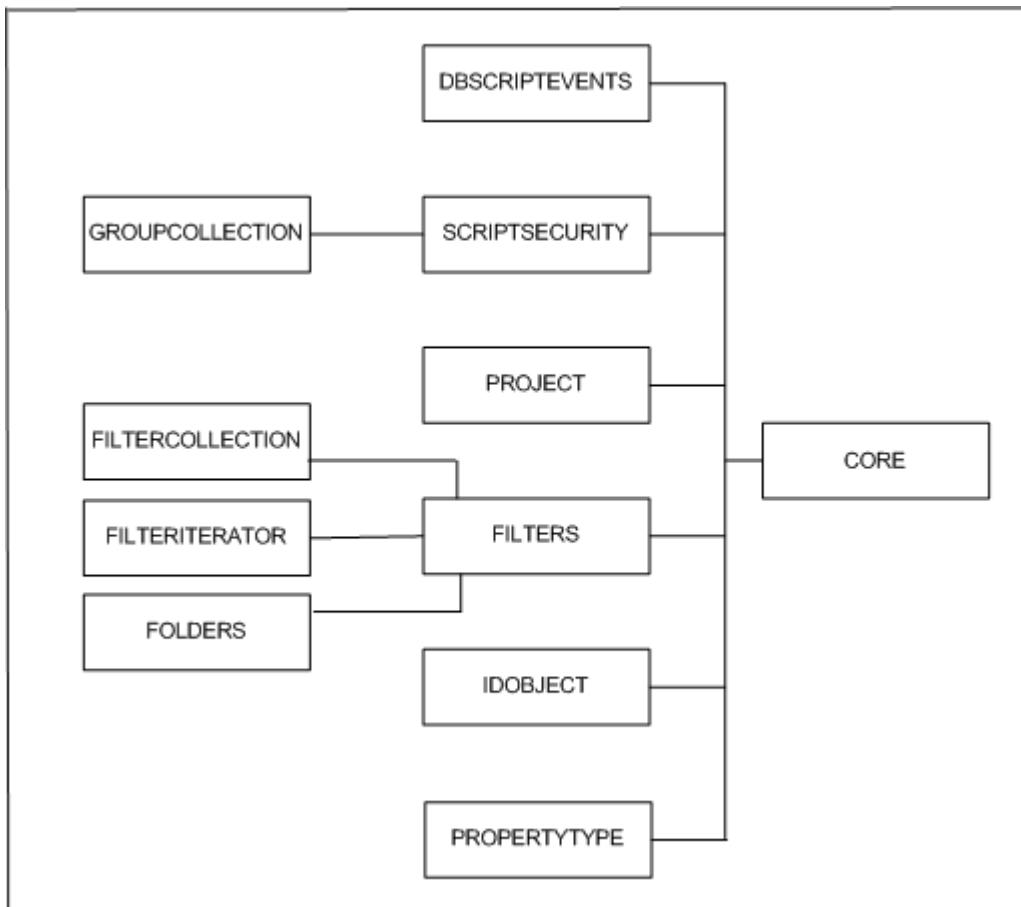
Select this column	To Execute the Script
Before Commit Script	After the Commit button is clicked, but before changes are written to the database
After Commit Script	After the Commit button is clicked, and after changes are written to the database

11. In the drop down-list that appears, select the script you wish to assign.
12. To make the script active next time the project is loaded, select the **Enable Script** checkbox.
13. To allow the Commit events to take place even if there is an error when the script is run, select the **Ignore Script Error** checkbox. If you do not select this option, the Commit events will not be allowed if the script fails. The script error will be reported in the Message Log.
14. Repeat steps 10 to 13 until you have assigned all the scripts you need. You can select a script from one or both columns for each commit type.
15. Click **Commit**.

Using the Scripting Object Model

Whether you are programming in VBScript or JScript, ENTERPRISE automatically creates an object model for you to interact with your project data.

This picture illustrates the object model hierarchy:



Database Events Scripts Object Model

The properties and methods associated with the objects shown in the picture are described in the following topics.

Core Object Properties

This table gives details of the core object properties.

To do this	Use this property	Permissions	VBScript example
Obtain a reference to the DBScriptEvents object. This can be used at the start of each script to refer directly to the DBScriptEvents object throughout the script.	Core.DBScriptEvents	Read only	Set DBScriptEvents = Core.DBScriptEvents

DBScriptEvents Object Properties

This table gives details of the DBScriptEvents object properties.

To do this	Use this property	Default	Permissions	VBScript example
Control whether an event can occur. This is a Boolean property. When the script has finished executing, ENTERPRISE looks at the value of this property. If it is set to True the event can occur, if it is set to False the event will not be allowed to occur.	Core. DBScriptEvents. Event*	False	Read/Write	Core. DBScriptEvents. Event = True
Output a meaningful message to users when they apply or commit data which is not allowed. This is a string based property the contents of which are output only when Core.DbScriptEvents. Event is set to False.	Core. DbScriptEvents. ReturnString	Empty string	Read/Write	Core. DbScriptEvents. ReturnString = "You cannot commit this GSM cell"
Allow the script to determine the type of the object being applied or committed. Each object type has a unique identifier associated with it. This property returns the identifier for the object being applied or committed. The value returned can be used as input to the GetCellNeighbours() method to obtain the list of neighbours for a given cell.	Core. DbScriptEvents. ObjectType*	The type of object being applied or committed	Read Only	objType = Core. DBScriptEvents. ObjectType
Allow the script to obtain the name of the object which is being applied or committed. This is the same name which is seen in the Site Database dialog box.	Core. DbScriptEvents. ObjectName*	The name of the object being committed such as MSC0	Read Only	objname = Core. DBScriptEvents. Objectname
Return the database key of the object being applied or committed.	Core. DbScriptEvents. ObjectKey	The database key of the object being applied or committed	Read Only	objKey = Core. DbScriptEvents. ObjectKey

DBScriptEvents Object Methods

This table gives details of the DBScriptEvents Object Methods.

To do this	Use this method	Return value	VBScript example
Add a string to the ENTERPRISE message log window during execution of the script. This can be useful for providing users with additional information whilst a script is running.	Core.DbScriptEvents.AddMessage(<"string">)	None	Core.DbScriptEvents.AddMessage "This is a message to the message log")
Obtain object data as XML. If the specified object cannot be found, a script error is triggered which will stop the script. For more information on accessing the contents of the returned interface, see IDBObject Object Methods.	Core.DbScriptEvents.BeforeObjectXML**	This method returns a Microsoft IXMLDOMNode interface. Using the returned interface it is possible to navigate the XML data for the requested object, for example, enforce a naming convention for the returned object. Information on the properties and methods on this interface is available from the web address shown after this table.	Set msc = Core.DbScriptEvents.BeforeObjectXML
Obtain object data as XML. If the specified object cannot be found, a script error is triggered which will stop the script. For more information on accessing the contents of the returned interface, see IDBObject Object Methods.	Core.DbScriptEvents.AfterObjectXML**	This method returns a Microsoft IXMLDOMNode interface. Using the returned interface it is possible to navigate the XML data for the requested object, for example, enforce a naming convention for the returned object. Information on the properties and methods on this interface is available from the web address shown after this table.	Set msc = Core.DbScriptEvents.AfterObjectXML
Obtain the contents of the data object before being applied. For more information on accessing the contents of the returned interface, see IDBObject Object Methods.	Core.DBScriptEvents.BeforeObject	This method will return an object interface to the ENTERPRISE data object	Set IDBObject = Core.DBScriptEvents.BeforeObject
Obtain the contents of the data object after being applied. For more information on accessing the contents of the returned interface, see IDBObject Object Methods.	Core.DBScriptEvents.AfterObject	This method will return an object interface to the ENTERPRISE data object	Set IDBObject = Core.DBScriptEvents.AfterObject

To do this	Use this method	Return value	VBScript example
<p>Obtain object data as XML.</p> <p>The first input parameter is a string specifying the name of the object, for example "MSC0".</p> <p>The second parameter specifies the type of object requested, for example "MSC_OBJECT".</p> <p>Each object type has a unique number associated with it. See Supported Object Types and Uses for a definitive list of object type constants.</p> <p>If the specified object cannot be found, a script error is triggered which will stop the script.</p>	Core.DbScriptEvents.FindDBObject(<"string">, <int>)	This method returns a Microsoft IXMLDOMNode interface. Using the returned interface it is possible to navigate the XML data for the requested object, for example, enforce a naming convention for MSC objects. Information on the properties and methods on this interface is available from the web address shown after this table.	Set msc = Core.DbScriptEvents.FindDbObject("MSC0", MSC_OBJECT)
Return an IDBObject by key.	Core.DbScriptEvents.FindDBObjectObj(<int>,<int>)	IDBObject	Set IDBObject = Core.DBScriptEvents.FindDBObjectObj. ADDMESSAGE (IDBOBJECT.ID)
Return an IDBObject by name.	Core.DbScriptEvents.FindDBObjectObjSlow(<"string">, <int>)	IDBObject	Set IDBObject = Core.DBScriptEvents.FindDBObjectObjSlow. ADDMESSAGE (IDBOBJECT.ID)
<p>Populate an XMLDOMNode with the selected cell types for the current project. When used within a region load the data returned is limited to the region.</p> <p>The following cell types are supported: GSM, UMTS, IS95 BS Sector, AMPS</p> <p>The second parameter is the type of cell. See Supported Neighbour Object Types for the values which can be used.</p> <p>You must also pass a filter name as a second parameter. Use "All" to obtain neighbours for all cells within a project. If you are performing this on a large database (one with more than a thousand cells for example), commit actions may be slowed down considerably. In such cases you can restrict the neighbour list using a filter to increase performance. This parameter is case sensitive, so the name specified must match the filter name exactly.</p>	Core.DbScriptEvents.GetNeighboursList(<int>)	This method returns all neighbour definitions for the specified cell type in XML within the specified filter. If a cell does not have any neighbours no XML tag is returned for the cell.	Set gsmNeighbours = Core.DbScriptEvents.GetNeighbourList(GSM_CELL_NEIGHBOUR, "All")

To do this	Use this method	Return value	VBScript example
<p>Populate an IXMLDOMNode with all neighbours for a specific cell.</p> <p>The following cell types are supported: GSM, UMTS, IS95 BS Sector, AMPS</p> <p>See the script example "Mutual Neighbours.vbs" in your installation folder for an example of using this method to determine whether cells are mutual neighbours.</p> <p>The first parameter is the cell name. This is not case sensitive.</p> <p>The second parameter is the type of cell. See Supported Neighbour Object Types for the values which can be used.</p>	Core. DbScriptEvents. GetCell Neighbours (<"string">, <int>)	<p>Calling this method will return all neighbour definitions for the specified cell type in XML. If a cell does not have any neighbours the XML object model will only contain the <NEIGHBOURS-LIST/> tag.</p> <p>This method returns a Microsoft IXMLDOMNode interface. Using the returned interface it is possible to navigate the XML data for the requested object, for example count the number of neighbours for a cell. See the following link for information on the properties and methods on the IXMLDOMNode interface.</p>	<pre>Set gsmNeighbours = Core. DbScriptEvents. GetCell Neighbours ("Site0A", CELL_GSM _OBJECT)</pre>
Disable all the dialog boxes in ENTERPRISE.	Core. DbScriptEvents. DisableUI	None.	Core. DBScriptEvents. DisableUI()
Enable all the dialog boxes in ENTERPRISE.	Core. DbScriptEvents. EnableUI	None.	Core. DBScriptEvents. EnableUI()

Note: ** If you run a Commit script and attempt to output the Before and After XML objects in the script, the Before XML object will contain only the object type and the After XML object will contain the updated object values.

The Microsoft XML DOM website is at:
<http://msdn.microsoft.com/library/default.asp?url=/library/en-us/xmlsdk/html/xmobjpmxmldelement.asp>

ScriptSecurity Object Methods

The security object enables you to obtain details of the current user and the current user's security group. This table shows the methods that you can use with the security object.

To do this	Use this method	Return value	VBScript example
Add a string to the ENTERPRISE message log window during execution of the script.	Core. ScriptSecurity. AddMessage (<"string">)	None.	Core.ScriptSecurity. AddMessage ("Hello")
Obtain the current user for the open project.	Core. ScriptSecurity. CurrentUser	The current user as a string.	Core.ScriptSecurity. AddMessage ("user logged in = " & Core.ScriptSecurity. CurrentUser)

To do this	Use this method	Return value	VBScript example
Obtain the current user database key.	Core.ScriptSecurity.CurrentUserKey	The current user's database key as a value.	Core.ScriptSecurity.AddMessage ("user key = " & Core.ScriptSecurity.CurrentUserKey)
Determine whether the current user is a member of a particular group.	Core.ScriptSecurity.IsMemberofGroup	If found, a boolean value of True will be returned.	Core.ScriptSecurity.IsMemberofGroup ("ALL")
Determine whether a user is a member of a particular group.	Core.ScriptSecurity.IsUserMemberofGroup(<"string">, <"string">)	If found, a Boolean value of True will be returned.	If (Core.ScriptSecurity.IsUserMemberofGroup ("UserA", "GroupA") = True) Then Core.DBScriptEvents.AddMessage ("UserA is a member of GroupA") End If
Determine whether the current user is in Adopt Session mode.	Core.ScriptSecurity.IsSessionAdopted	If in Adopt Session, a Boolean value of True will be returned.	If (Core.ScriptSecurity.IsSessionAdopted = True) Then Core.DBScriptEvents.AddMessage ("In Adopt Session mode") End If
Obtain the adopted user for the open project. This method should be used in conjunction with Core.ScriptSecurity.IsSessionAdopted	Core.ScriptSecurity.AdoptedUser	The adopted user as a string.	If (Core.ScriptSecurity.IsSessionAdopted = True) Then Core.DBScriptEvents.AddMessage (Core.ScriptSecurity.AdoptedUser) End If
Obtain a collection of the groups for the current project. For more information on methods for manipulating the returned group collection, see GroupCollection Object Methods on page 140.	Core.ScriptSecurity.GroupCollection	An interface to the Group collection object.	Set GroupCollection = Core.ScriptSecurity.GroupCollection For Each group In GroupCollectionCore.ScriptSecurity.AddMessage (group) Next

GroupCollection Object Methods

The GroupCollection object methods enable you to obtain details of the different security groups that the current ENTERPRISE user belongs to. This table shows the various methods.

To do this	Use this method	Return value	Vbscript example
Find out the number of security groups inside a group collection object.	GroupCollection.Count	The number of groups.	<pre>Set GroupCollection = Core.ScriptSecurity.GroupCollection message = "Items in collection = " & GroupCollection.Count Core.ScriptSecurity.AddMessage(message)</pre>
Access the group collection via a direct index into the collection. The parameter value must not be greater than the value returned from the "count" method.	GroupCollection.Item(<int>)	The group name as a string for the position requested. A runtime error will occur if the requested item is outside of the Group collection size.	<pre>Set GroupCollection = Core.ScriptSecurity.GroupCollection group = GroupCollection.Item(1) Core.ScriptSecurity.AddMessage("Item at position 1 = " & group)</pre>
Search in a group collection for a specific group to see if it exists.	GroupCollection.Find	If found, the return value will be the position of the group collection. A -1 value is returned if the search does exist.	<pre>Set GroupCollection = Core.ScriptSecurity.GroupCollection index = GroupCollection.Find("ALL")</pre>

Project Object Methods

The project object methods enable you to obtain details of the current project setup. This table shows the various methods.

To do this	Use this method	Return value	Vbscript example
Add a string to the ENTERPRISE message log window during execution of the script.	Core.Scriptproject.addMessage	None.	<pre>Core.Scriptproject.addMessage("Hello")</pre>
Obtain the current project name.	Core.Scriptproject.CurrentProject	The current project name as a string.	<pre>project = Core.Scriptproject.CurrentProject Core.Scriptproject.addMessage("Project Name is: " & project)</pre>
Obtain the current project number.	Core.Scriptproject.CurrentProject Number	The current project number.	<pre>projectno = Core.Scriptproject.CurrentProjectNumber Core.Scriptproject.addMessage("Project No is: " & projectno)</pre>

To do this	Use this method	Return value	Vbscript example
Obtain the current project vector path setting.	Core.Scriptproject.vectorpath	The current project vector path setting as a string.	<pre>path = Core.Scriptproject.vectorpath Core.Scriptproject.addMessage("Vector path is: " & path)</pre>
Obtain the current project height path setting.	Core.Scriptproject.heightpath	The current project height path setting as a string.	<pre>path = Core.Scriptproject.heightpath Core.Scriptproject.addMessage("Height path is: " & path)</pre>
Obtain the current project clutter path setting.	Core.Scriptproject.clutterpath	The current project clutter path setting as a string.	<pre>path = Core.Scriptproject.clutterpath Core.Scriptproject.addMessage("Clutter path is: " & path)</pre>
Obtain the current project text path setting	Core.Scriptproject.textpath	The current project text path setting as a string.	<pre>path = Core.Scriptproject.textpath Core.Scriptproject.addMessage("Text path is: " & path)</pre>
Obtain the current project backdrop path setting.	Core.Scriptproject.backdroppath	The current project backdrop path setting as a string.	<pre>path = Core.Scriptproject.backdroppath Core.Scriptproject.addMessage("Backdrop path is: " & path)</pre>
Obtain the current project building raster path setting.	Core.Scriptproject.buildingrasterpath	The current project building raster path setting as a string.	<pre>path = Core.Scriptproject.buildingrasterpath Core.Scriptproject.addMessage("Building raster path is: " & path)</pre>
Obtain the current project user preference path setting.	Core.Scriptproject.UserPrefPath	The current project user preference path setting as a string.	<pre>path = core.Scriptproject.UserPrefPath Core.Scriptproject.addMessage("User preference path is: " & path)</pre>
Obtain the current project prediction path setting.	Core.Scriptproject.PredictionPath	The current project prediction path setting as a string.	<pre>path = Core.Scriptproject.PredictionPath Core.Scriptproject.addMessage("Prediction path is: " & path)</pre>

To do this	Use this method	Return value	Vbscript example
Obtain the current project coverage array path setting.	Core.Scriptproject.CoverageArrayPath	The current project coverage array path setting as a string.	<pre>path = Core.Scriptproject. CoverageArrayPath Core.Scriptproject. addMessage("Coverage array path is: " & path)</pre>
Obtain the current project user vector path setting.	Core.Scriptproject.UserVectorPath	The current project user vector path setting as a string.	<pre>path = Core.Scriptproject. UserVectorPath Core.Scriptproject. addMessage("User vector path is: " & path)</pre>
Obtain the mapping data extents. You will need to declare four parameters and then pass the parameters in the following order: East Minimum, East Maximum, North Minimum, North Maximum	Core.scriptproject.MapDataExtents <param1>, <param2>, <param3>, <param4>	The current project mapping data extents setting.	<pre>EastMin = 1 EastMax = 1 NorthMin = 1 NorthMax = 1 Core.scriptproject. MapDataExtents EastMin, EastMax, NorthMin, NorthMax Core.Scriptproject. addMessage("EastMin = " & EastMin) Core.Scriptproject. addMessage("EastMax = " & EastMax) Core.Scriptproject. addMessage("NorthMin = " & NorthMin) Core.Scriptproject. addMessage("NorthMax = " & NorthMax)</pre>
If region load is on, you can check if a co-ordinate is inside the region load. The first parameter is the x co-ordinate, and second parameter is the y co-ordinate. Coordinates are in Easting, Northing.	Core.scriptproject.InPolygonRegion (<int>, <int>)	A boolean value. True if the co-ordinate is inside the polygon region, otherwise False.	<pre>if Core.scriptproject. InPolygonRegion(5, 9) then Core.Scriptproject. addMessage("point in region") end if</pre>

Filters Object Methods

The filters object methods enable you to manipulate a particular filter as for example in the case of an ENTERPRISE data object inside a filter. This table shows the various methods.

To do this	Use this method	Return value	Vbscript example
Add a string to the ENTERPRISE message log window during execution of the script	Core.ScriptFilters.addMessage	None	Core.ScriptFilters.addMessage("Hello")
To obtain the Filters collection object interface. For more information on methods for manipulating the returned filter collection, see FilterCollection Object Methods on page 144.	Core.ScriptFilters.FilterCollection	The ENTERPRISE interface to the list of filters as a collection.	Set IDBFilters = Core.ScriptFilters.FilterCollection

FilterCollection Object Methods

After obtaining the filter collection object interface via core.ScriptFilters.FilterCollection, you can navigate on this filter collection object to obtain a specific filter. This table shows the various methods.

To do this	Use this method	Return value	Vbscript example
Obtain the number of filters inside the filter collection.	IDBFilters.NumFilters	The number of filters.	Set IDBFilters = Core.ScriptFilters.FilterCollection count = IDBFilters.NumFilters Core.ScriptFilters.addMessage ("Filters count: " & count)
Find a specific filter inside the filter collection	IDBFilters.FindFilter (<"string">)	An ENTERPRISE filter object interface.	Set IDBFilters = Core.ScriptFilters.FilterCollection Set FilterObject = IDBFilters.FindFilter ("Selection") if not(FilterObject Is Nothing) Then Core.ScriptFilters.AddMessage("Filter found = " & FilterObject.Name) End if

To do this	Use this method	Return value	Vbscript example
<p>Access the filter collection via a direct index into the collection.</p> <p>Note: The index is zero based.</p> <p>Accessing an element outside the boundary will lead to a scripting error. The returning object should be checked for validity before use.</p>	IDBFilters.Filter(<int>)	An ENTERPRISE filter object interface.	<pre>Set IDBFilters = Core.ScriptFilters.FilterCollection For i = 1 to IDBFilters.NumFilters set FilterObject = IDBFilters.Filter(i-1) FilterName = FilterObject.Name Core.ScriptFilters.AddMessage("Iterating filter list " & FilterName) Next</pre>
<p>Find a subset of filters by specifying a filter-folder name.</p> <p>This will return the folders collection object.</p>	IDBFilters.FindFolder(<"string">)	An ENTERPRISE folder collection object interface	<pre>Set IDBFilters = Core.ScriptFilters.FilterCollection Set Folder = IDBFilters.FindFolder("System\My Filters")</pre>
To obtain the number of ENTERPRISE data objects for a filter object	IDBFilters.Size	The number of ENTERPRISE data objects inside the filter.	<pre>Set FilterObject = IDBFilters.FindFilter("Selection") if not(FilterObject Is Nothing) Then Core.ScriptFilters.AddMessage("Filter object count = " & FilterObject.Size) End if</pre>
<p>Obtain the filter iterator object interface so that you can manipulate the ENTERPRISE data objects inside the filter object.</p> <p>For more information on methods for accessing the filter contents, see FilterIterator Object Methods on page 146.</p>	IDBFilters.Iterator	The object interface to the filter contents.	<pre>Set IDBFilterIterator = FilterObject.Iterator</pre>

Folders Collection Object Methods

After obtaining the folder collection object interface via `core.ScriptFilters.FilterCollection.FindFolder`, you can navigate on this collection object to either walk the folder tree or obtain a filter. This table shows the various methods.

Note: Folders can be filter names too, use the “`IsFilter`” method to detect whether the folder points to a filter.

To do this	Use this method	Return value	Vbscript example
Obtain the name of the folder.	<code>Folder.Name</code>	The name of the folder.	<pre>Set Folder = IDBFilters.FindFolder ("System\My Folder") Core.ScriptFilters.AddMessage("Folder name:" & Folder.Name)</pre>
Obtain the number of filters or folders below this folder.	<code>Folder.Size</code>	The number of filters/folders.	<pre>Set Folder = IDBFilters.FindFolder ("System\My Folder") Core.ScriptFilters.AddMessage("Folder size:" & Folder.Size)</pre>
Test whether the folder is pointing to a filter.	<code>Folder.IsFilter</code>	True or False.	<pre>Set Folder = IDBFilters.FindFolder ("System\My Folder\My Filter") Core.ScriptFilters.AddMessage("Folder is a filter:" & Folder.IsFilter)</pre>
Obtain a filter object from a folder.	<code>Folder.Filter</code>	A filter object will be returned if successful.	<pre>Set Folder = IDBFilters.FindFolder ("System\My Folder\My Filter") Set Filter = Folder.Filter Core.ScriptFilters.AddMessage("Filter name - " & Filter.Name)</pre>
Iterate the folders beneath this folder.	<code>For each f in Folder</code>	A collection below the current object.	<pre>Set Folder = IDBFilters.FindFolder ("System\My Folder") For Each F in Folder Core.ScriptFilters.AddMessage("Folder name - " & F.Name) Next</pre>

FilterIterator Object Methods

After obtaining a filter object from the filter collection via `IDBFilters.FindFilter(<"FilterName">)` or `IDBFilters.Filter(<int>)`, you can then navigate the data contents of that filter via the filter iterator object. This table shows the various methods.

To do this	Use this method	Return value	Vbscript example
<p>Filter on data elements inside a filter object.</p> <p>The contents of the filter iterator will have all the different types of ENTERPRISE data elements defined by that filter.</p> <p>The parameter is the Object Type. This is a numeric value identifying the specific data type you wish to filter on. For more information on the data type numeric values, see Supported Object Types and Uses.</p>	<code>IDBFilterIterator.Reset(<int>)</code>	None.	<pre> Set FilterObject = IDBFilters.FindFilter ("Selection") if not(FilterObject Is Nothing) Then Set IDBFilterIterator = FilterObject.Iterator IDBFilterIterator.Reset (5100) size = IDBFilterIterator.Size (5100) For x=1 to size Set IDBObject = IDBFilterIterator. Current Core.ScriptFilters. addMessage("Object ID: " & IDBObject.ID) Set NextObj = IDBFilterIterator.Next Next End if This example will write out all the property IDs for the Selection filter. </pre>

To do this	Use this method	Return value	Vbscript example
Obtain the ENTERPRISE data object interface that the filter iterator object is pointing to.	IDBFilterIterator.Current	An object interface to the ENTERPRISE data object. For more information on how to access its contents, see IDBObject Object Methods .	<pre>Set FilterObject = IDBFilters.FindFilter("Selection") if not(FilterObject Is Nothing) Then Set IDBFilterIterator = FilterObject.Iterator IDBFilterIterator.Reset(5100) size = IDBFilterIterator.Size(5100) For x=1 to size Set IDBObject = IDBFilterIterator.Current Core.ScriptFilters. addMessage("Object ID: " & IDBObject.ID) Set NextObj = IDBFilterIterator.Next Next End if</pre>
Advance the filter iterator object to retrieve the next ENTERPRISE data object in the filter iterator.	IDBFilterIterator.Next	An object interface to the ENTERPRISE data object.	<pre>Set FilterObject = IDBFilters.FindFilter("Selection") if not(FilterObject Is Nothing) Then Set IDBFilterIterator = FilterObject.Iterator IDBFilterIterator.Reset(5100) size = IDBFilterIterator.Size(5100) For x=1 to size Set IDBObject = IDBFilterIterator.Current Core.ScriptFilters. addMessage("Object ID: " & IDBObject.ID) Set NextObj = IDBFilterIterator.Next Next End if</pre>

To do this	Use this method	Return value	Vbscript example
<p>Search to determine whether a data object is inside the filter iterator object.</p> <p>The first parameter is the object type. This is a numeric value identifying the specific data type you wish to search for. For more information on the data type numeric values, see Supported Object Types and Uses.</p> <p>The second parameter is the database key of the object you are finding.</p>	IDBFilterIterator.FindObject (<int>, <int>)	<p>The ENTERPRISE data object interface.</p> <p>For more information on how to access its contents, see IDBObject Object Methods.</p>	<pre>Set FilterObject = IDBFilters.FindFilter ("Selection") if not(FilterObject Is Nothing) Then Set IDBFilterIterator = FilterObject.Iterator Set IDBObject = IDBFilterIterator. FindObject(Core.DbScript Events.ObjectType,Core. DbScriptEvents.ObjectKey) if not (IDBObject is Nothing) Then Core.ScriptFilters. AddMessage("Data object exists inside " & FilterObject.Name) End if End if</pre> <p>This example will determine if the current object being committed/applied is inside the Selection filter.</p>
<p>Search to determine whether a data object is inside the filter iterator object.</p> <p>The first parameter is the object type. This is a numeric value identifying the specific data type you wish to search for. For more information on the data type numeric values, see Supported Object Types and Uses.</p> <p>The second parameter is the name of the object you are finding. The name is case insensitive.</p>	IDBFilterIterator.FindObjectID (<int>, <"string">)	<p>The ENTERPRISE data object interface.</p> <p>For more information on how to access its contents, see IDBObject Object Methods.</p>	<pre>Set FilterObject = IDBFilters.FindFilter ("Selection") if not(FilterObject Is Nothing) Then Set IDBFilterIterator = FilterObject.Iterator Set IDBObject = IDBFilterIterator. FindObjectID(5102, "msc01") if not (IDBObject is Nothing) Then Core.ScriptFilters. AddMessage "Data object exists inside " & FilterObject.Name End if End if</pre>
Obtain the filter name of the current filter iterator object.	IDBFilterIterator.Name	The filter name from the current iterator object as a string.	Filtername = IDBFilterIterator.Name

To do this	Use this method	Return value	Vbscript example
<p>Obtain the number of specific data element type.</p> <p>The parameter is the Object Type. This is a numeric value identifying the specific data type you wish to filter on. For more information on the data type numeric values, see Supported Object Types and Uses.</p>	IDBFilterIterator.Size(<int>)	The count of data elements inside the filter object for the requested data element type.	
Pass the BeforeObject/AfterObject plus any object returned by the Filters FindObject interface to the filter, allowing you to test its existence against the filter.	IDBFilterIterator.IsActive(<IDBObject>)	A boolean value, true or false, indicating whether the object is within the filter.	<pre> Set IDBObject = Core.DbScriptEvents. BeforeObject Set FilterObject = IDBFilters.FindFilter ("Selection") if not(FilterObject Is Nothing) Then Set IDBFilterIterator = FilterObject.Iterator if IDBFilterIterator. IsActive(IDBObject) Then Core.ScriptFilters. AddMessage("Data object exists inside filter") End if End if </pre>

IDBObject Object Methods

When you have an interface to an ENTERPRISE data object, you can use these methods to obtain information.

Note: As Filter objects are also IDBObjects these methods will work on a Filter.

To do this	Use this method	Return value	Vbscript example
Obtain the name of the data object.	IDBObject.ID	If one exists, the name of the data object as a string.	<pre> Set IDBFilters = core.ScriptFilters. FilterCollection Set FilterObject = IDBFilters.FindFilter ("Selection") if not(FilterObject Is Nothing) Then Set IDBFilterIterator = FilterObject.Iterator IDBFilterIterator.Reset(5100) size = IDBFilterIterator.Size(5100) For x=1 to size Set IDBObject = IDBFilterIterator.Current Core.ScriptFilters.AddMessage ("Object ID: " & IDBObject.ID) Core.ScriptFilters.AddMessage ("Object Key: " & IDBObject.Key) Core.ScriptFilters.AddMessage ("Object Owner: " & IDBObject.Owner) Core.ScriptFilters.AddMessage ("Object Group: " & IDBObject.Group) Core.ScriptFilters.AddMessage ("Object CreateDate: " & IDBObject.CreateDate) Core.ScriptFilters.AddMessage ("Object ModifyDate: " & IDBObject.ModifyDate) Core.ScriptFilters.AddMessage ("Object ModifyUser: " & IDBObject.ModifyUser) Core.ScriptFilters.AddMessage ("Current Object Type: " & IDBObject.ObjectType) Core.ScriptFilters.AddMessage ("Current Object State: " & IDBObject.State) Core.ScriptEvents.AddMessage ("Enabled Techs = " & Core.ScriptFilters. EnabledTechnologies) Set NextObj = </pre>

To do this	Use this method	Return value	Vbscript example
			<pre>IIDBFilterIterator.Next Next End if</pre>
Obtain the database key of the data object.	IDBObject.Key	The database key.	See preceding example.
Obtain the owner of the data object.	IDBObject.Owner	The owner as a string.	See preceding example.
Obtain the security group of the data object.	IDBObject.Group	The security group as a string.	See preceding example.
Obtain the create date of the data object.	IDBObject.CreateDate	The create date as a string.	See preceding example.
Obtain the modify date of the data object.	IDBObject.ModifyDate	The modify date as a string.	See preceding example.
Obtain the modify user of the data object.	IDBObject.ModifyUser	The modify user as a string.	See preceding example.
Obtain the type of the data object.	IDBObject.ObjectType	<p>The object type. For more information on the data type numeric values mapping, see Supported Object Types and Uses</p>	See preceding example.
Obtain the database diff state of the data object.	IDBObject.State	<p>The database state as a value from the diff database table. 0 = inserted - the user just inserted the data object into the diff table. 1 = modified – the user modified a committed data object. 2 = deleted – the user has committed the data object from the diff table</p>	See preceding example.

To do this	Use this method	Return value	Vbscript example
Obtain the enabled technologies on the available technologies where relevant.	IDBObject.Enabled Technologies	<p>For all elements except MU-Node, there is a single return value as follows:</p> <ul style="list-style-type: none"> -1 = Not Applicable 0 = Not Active (CellOnly) 14 = CDMA 208 = GSM 257 = UMTS 512 = Fixed WiMAX 2048 = Mobile WIMAX 8192 = LTE 32768 = WIFI 65536 = 5G <p>For MU-Node only, the return value is a combination of the above values based on bitwise OR and AND operations.</p> <p>For example, using OR, an MU-Node with LTE, GSM and UMTS available gives an initial value of 8657.</p> <p>Then using AND to test which available technologies are enabled, 8657 AND 8192 = 8192 indicating that LTE is present, but 8192 AND 65536 = 0 indicating 5G is not present.</p>	See preceding example.

To do this	Use this method	Return value	Vbscript example
Obtain the data object as XML.	IDBObject.xml	A Microsoft IXMLDOMNode interface. Using the returned interface it is possible to navigate the XML data for the requested object, for example, enforce a naming convention for the returned object. Information on the properties and methods on this interface is available from the web address shown after this table.	<pre> Set IDBFilters = core.ScriptFilters. FilterCollection Set FilterObject = IDBFilters.FindFilter ("Selection") if not(FilterObject Is Nothing) Then Set IDBFilterIterator = FilterObject.Iterator IDBFilterIterator.Reset(5100) size = IDBFilterIterator.Size(5100) For x=1 to size Set IDBObject = IDBFilterIterator.Current set ObjectXML = IDBObject.xml Set xmlAttributes = ObjectXML.attributes xmlID = xmlAttributes.getNamedItem ("ID").text Core.ScriptFilters.addMessage ("ID from xml: " & xmlID) Set NextObj = IDBFilterIterator.Next Next End if </pre>
Obtain the XML document as a text string.	IDBObject.xmltext	A string.	<pre> Set MyObj = Core.ScriptEvents.AfterObject For Each Child in MyObj.Children Core.ScriptEvents.AddMessage Child.Name Next </pre>
Obtain the children objects for this object. This is useful for hierarchy navigation. <i>Currently this is only supported by GSM and UMTS network elements as these are most popular.</i>	IDBObject.Children	A collection object containing a list of child IDBObjects.	<pre> Set MyObj = Core.ScriptEvents.AfterObject For Each Child in MyObj.Children Core.ScriptEvents.AddMessage Child.Name Next </pre>

To do this	Use this method	Return value	Vbscript example
Obtain the parents for this object. This is useful for hierarchy navigation. <i>Currently this is only supported by GSM and UMTS network elements as these are most popular. An object can have multiple parents when it is attached to a property object.</i>	IDBObject.Parents	A collection object containing a list of parent IDBObjects.	<pre>Set MyObj = Core.ScriptEvents.BeforeObject For Each Parent in MyObj.Parents Core.ScriptEvents.AddMessage Parent.Name Next</pre>
Obtain a user defined field value for this object	IDBObject.GetFieldValue (FlagGroup, FlagName)	A string representing the field value.	<pre>Set MyObj = Core.ScriptEvents.BeforeObject Core.ScriptEvents.AddMessage (MyObj.GetFieldValue ("MyGroup", "Status"))</pre>

The Microsoft XML DOM website is at:
<http://msdn2.microsoft.com/en-us/library/ms757048.aspx>

Script.PropertyType Object Methods

The script property type methods enable you to retrieve data objects under the Location View of a property. You must call the method Core.Script.PropertyType.SetCurrentProperty(<"string">) to set the current property for which you wish to obtain the dependent data objects.

To do this	Use this method	Return value	Vbscript example
Add a string to the ENTERPRISE message log window during execution of the script.	core.Script.PropertyType.addMessage (<"string">)	None	core.Script.PropertyType.AddMessage ("Hello")
Set the current property for which you wish to obtain the dependant data objects.	Core.Script.PropertyType.SetCurrentProperty (<"string">)	None	Core.Script.PropertyType.SetCurrentProperty ("Property1")

To do this	Use this method	Return value	Vbscript example
<p>Obtain a data object as XML.</p> <p>The first parameter is the Object Type. This is a numeric value identifying the specific data type you wish to search for. This parameter is necessary because different data elements can have the same ID name.</p> <p>For more information on the data type numeric values, see Supported Object Types and Uses.</p> <p>The second parameter is the ID name of the data object you wish to obtain the XML for.</p>	core.Script.PropertyType.XML(<int>, <"string">)	A Microsoft IXMLDOMNode interface. Using the returned interface it is possible to navigate the XML data for the requested object, for example, enforce a naming convention for the returned object. Information on the properties and methods on this interface is available from the web address shown after this table.	<pre>Set xmlMsc = core.Script.PropertyType. XML(5102, "MSC1") Set mscAttributes = xmlMsc.attributes mscID = mscAttributes. getNamedItem("ID").text message = "MSC ID from xml: " & mscID core.Script.PropertyType. addMessage(message)</pre>
Obtain the property collection object interface.	Core.Script.PropertyType.PropertyCollection	All the properties as a collection of string objects for the current property.	<pre>Set PropertyCollection = Core.Script.PropertyType. PropertyCollection The number of items inside the returned collected can be obtained: core.Script.PropertyType. addMessage("Items in Property collection: " & PropertyCollection. Count) The collection can be accessed via a index value: core.Script.PropertyType. addMessage("Property collection at position 1: " & Property Collection.Item(1)) The collection can be iterated: For Each Property In PropertyCollection core.Script.PropertyType. addMessage("Property Collection - Property ID:" & Property) Next</pre>
Obtain the MSC collection object interface.	Core.Script.PropertyType.MscCollection	All the MSCs as a collection of string objects for the current property.	Set MscCollection = Core.Script.PropertyType. MscCollection

To do this	Use this method	Return value	Vbscript example
Obtain the WMSC collection object interface.	Core.Script.PropertyType. WMscCollection	All the MSCs as a collection of string objects for the current property.	Set WMscCollection = Core.Script.PropertyType. WMscCollection
Obtain the SGSN collection object interface.	Core.Script.PropertyType. SGSNCollection	All the SGSNs as a collection of string objects for the current property.	set SGSNCollection = Core.Script.PropertyType. SGSNCollection
Obtain the Distribution Node collection object interface.	Core.Script.PropertyType. DNodeCollection	All the Distribution Nodes as a collection of string objects for the current property.	set DNodeCollection = Core.Script.PropertyType. DNodeCollection
Obtain the BSC collection object interface.	Core.Script.PropertyType. BscCollection	All the BSCs as a collection of string objects for the current property.	set BscCollection = Core.Script.PropertyType. BscCollection
Obtain the CDMA MSC collection object interface.	Core.Script.PropertyType. CdmaMscCollection	All the CDMA MSCs as a collection of string objects for the current property.	set CdmaMscCollection = Core.Script.PropertyType. CdmaMscCollection
Obtain the CDMA BSC collection object interface.	Core.Script.PropertyType. CdmaBscCollection	All the CDMA BSCs as a collection of string objects for the current property.	set CdmaBscCollection = Core.Script.PropertyType. CdmaBscCollection
Obtain the CDMA BS collection object interface.	Core.Script.PropertyType. CdmaBsCollection	All the CDMA BSs as a collection of string objects for the current property.	set CdmaBsCollection = Core.Script.PropertyType. CdmaBsCollection
Obtain the CDMA Sector collection object interface.	Core.Script.PropertyType. CdmaSectorCollection	All the CDMA Sectors as a collection of string objects for the current property.	set CdmaSectorCollection = Core.Script.PropertyType. CdmaSectorCollection
Obtain the CDMA Repeater collection object interface.	Core.Script.PropertyType. CdmaRepeaterCollection	All the CDMA Repeaters as a collection of string objects for the current property.	set CdmaRepeaterCollection = Core.Script.PropertyType. CdmaRepeaterCollection
Obtain the MME collection object interface.	Core.Script.PropertyType. MmeCollection	All the MMEs as a collection of string objects for the current property.	set MmeCollection = Core.Script.PropertyType. MmeCollection
Obtain the SAEGW collection object interface.	Core.Script.PropertyType. SaegwCollection	All the SAEGWs as a collection of string objects for the current property.	set SaegwCollection = Core.Script.PropertyType. SaegwCollection
Obtain the Cellsite collection object interface.	Core.Script.PropertyType. CellsiteCollection	All the Cellsites as a collection of string objects for the current property.	set CellsiteCollection = Core.Script.PropertyType. CellsiteCollection
Obtain the GSM Cell collection object interface.	Core.Script.PropertyType. GsmCellCollection	All the GSM Cells as a collection of string objects for the current property.	set GsmCellCollection = Core.Script.PropertyType. GsmCellCollection

To do this	Use this method	Return value	Vbscript example
Obtain the GSM Repeater collection object interface.	Core.Script.PropertyType. GsmRepeaterCollection	All the GSM Repeaters as a collection of string objects for the current property.	set GsmRepeaterCollection = Core.Script.PropertyType. GsmRepeaterCollection
Obtain the UMTS Repeater collection object interface.	Core.Script.PropertyType. UmtsRepeaterCollection	All the UMTS Repeaters as a collection of string objects for the current property.	set UmtsRepeaterCollection = Core.Script.PropertyType. UmtsRepeaterCollection
Obtain the CDMA Repeater collection object interface.	Core.Script.PropertyType. CdmaRepeaterCollection	All the CDMA Repeaters as a collection of string objects for the current property.	set CdmaRepeaterCollection = Core.Script.PropertyType. CdmaRepeaterCollection
Obtain the easting/northing coordinates for a property object.	Core. Script.PropertyType. GetPropertyCoordEN (PropertyObj, <int>, <int>)	The coordinates will be returned via the two integer parameters.	Set Site=Core.DBScriptEvents.BeforeObject Core.Script.PropertyType. GetPropertyCoordEN Site, Easting, Northing
Obtain the longitude/latitude coordinates for a property object.	Core. Script.PropertyType. GetPropertyCoordDLL (PropertyObj, <double>, <double>)	The coordinates will be returned via the two parameters.	Set Site=Core.DBScriptEvents.AfterObject Core.Script.PropertyType. GetPropertyCoordDLL Site, Longitude, Latitude

The Microsoft XML DOM website is at:
<http://msdn2.microsoft.com/en-us/library/ms757048.aspx>

Supported Object Types and Uses

The following table shows which object types you can use in the FindDBObject() method, which ones support Apply scripts and which ones support Commit scripts:

Object Type	Decimal	Description	FindDBObject ()method	Commit	Apply
PROPERTY_OBJECT	5100	Property	Yes	Yes	Yes
LOGICAL_NODE_OBJECT	1200	Logical node	Yes	Yes	Yes
LOGICAL_CONNECTION_OBJECT	1300	Logical connection	Yes	Yes	No
LOGICAL_CELLULAR_CONNECTION_OBJECT	1301	Logical cellular connection	Yes	Yes	No
LOGICAL_NETWORK_OBJECT	1100	Logical network	Yes	Yes	Yes
PLMN_NETWORK_OBJECT	1101	PLMN network	Yes	Yes	Yes
MUNODE_OBJECT	1241	MU-Node	Yes	Yes	Yes
CELL_OBJECT	1242	Cell	Yes	Yes	Yes
GENERIC_REPEATEROBJECT	1221	Repeater	Yes	Yes	Yes

Object Type	Decimal	Description	FindDBObject ()method	Commit	Apply
MSC_OBJECT	5102	MSC	Yes	Yes	Yes
BSC_OBJECT	5103	BSC	Yes	Yes	Yes
CELLSITE_OBJECT	5105	BTS	Yes	No	No
DISTRIBUTION_OBJECT	5104	Distribution	Yes	Yes	Yes
CELL_GSM_OBJECT	5107	Cell GSM	Yes	No	No
REPEATER_OBJECT	5108	GSM repeater	Yes	No	No
WMSC_OBJECT	1211	WMSC	Yes	Yes	Yes
SGSN_OBJECT	1212	SGSN	Yes	Yes	Yes
RNC_OBJECT	1213	RNC	Yes	Yes	Yes
NODE_B_OBJECT	1214	Node	Yes	No	No
CELL_UMTS_OBJECT	2300	Cell UMTS	Yes	No	No
UMTS_REPEATEROBJECT	1222	UMTS repeater	Yes	No	No
CDMA_MSC_OBJECT	1218	CDMA MSC	Yes	Yes	No
CDMA_BSC_OBJECT	1219	CDMA BSC	Yes	Yes	No
CDMA_BS_OBJECT	1220	CDMA BS	Yes	No	No
CDMA_SECTOR_OBJECT	2502	CDMA sector	Yes	No	No
CDMA_REPEATEROBJECT	1223	CDMA repeater	Yes	No	No
MME_OBJECT	11014	MME	Yes	Yes	Yes
SAEGW_OBJECT	11013	SAEGW	Yes	Yes	Yes
ENODE_B_OBJECT	11002	eNodeB	Yes	No	No
CELL_LTE_OBJECT	11005	Cell LTE	Yes	No	No
LTE_REPEATEROBJECT	11008	LTE Repeater	Yes	Yes	Yes
FIVEG_NODE_OBJECT	13004	5G Node	Yes	No	No
CELL_FIVEG_OBJECT	13005	Cell 5G	Yes	No	No
FIVEG_REPEATEROBJECT	13006	5G Repeater	Yes	No	No
LINK_PTP_OBJECT	511	Link (PTP)	Yes	Yes	Yes
LINK_PMP_OBJECT	512	Link (PMP)	Yes	Yes	Yes
PASSIVE_REPEATEROBJECT	514	Passive repeater link (back to back)	Yes	Yes	No
PASSIVE_REPEATEROBJECT	515	Passive repeater link (reflector)	Yes	Yes	No
TRANS_LINKEND_PTP_OBJECT	521	PTP Linkend	No	Yes	Yes
TRANS_NODE_PMP_SECTOR_OBJECT	552	PMP Sector	No	Yes	Yes

Clearing the Script Cache

When users log in to projects that have scripts assigned to objects, the scripts are cached locally on users' machines to decrease the amount of database traffic. This can complicate script writing since you need to close a project and re-open it to see new script changes. You can avoid this complication by clearing the script cache in ENTERPRISE.

To do this:

1. Click the **Utilities** tab on the main menu.
2. From the **Tools** menu, click **Clear DB Script Events** cache.

The script cache for the project session will be cleared. Any new script changes which you have made will apply when commit actions are made.

Supported Neighbour Object Types

The following table shows the supported neighbour object type constants that you can use in the GetCellNeighbours() and GetNeighboursList() methods:

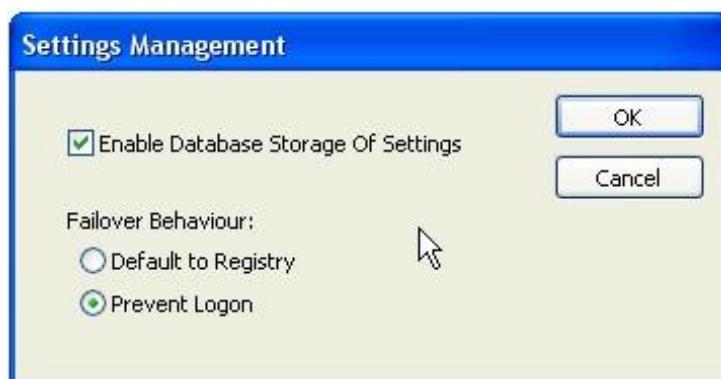
Neighbour Object Type	Represents these neighbours
UMTS_CELL_NEIGHBOURS	UMTS
IS95_BS_SECTOR_NEIGHBOURS	CDMA/IS95
GSM_CELL_NEIGHBOURS	GSM
AMPS_CELL_NEIGHBOURS	AMPS
LTE_CELL_NEIGHBOURS	LTE
FIVEG_CELL_NEIGHBOURS	5G

Database Settings Management

The database settings management service is intended to give administrators with large numbers of ENTERPRISE users more flexibility in the handling of user settings. If it is enabled, user settings are stored in the database rather than in the registry. For more information on creating the settings database schema, see [About the Oracle Tablespaces](#) on page 37. If for any reason the service is subsequently unable to access the database, a "failover behaviour" will occur. You can set this behaviour to either default to the registry or prevent logon. You can specify an alternative password for the settings schema if you wish.

To enable database settings management:

1. From the **Configuration menu**, select **Settings Management** and click on **Configure Settings Management**. The **Settings Management** dialog box is displayed:



2. Select the checkbox to enable database storage of settings.
3. Select the failover behaviour you require.
4. Click **OK**.

When you click on **OK**, the fact that you have enabled database storage of settings is recorded in the database and will come into effect for the next user who logs on. Users who are already logged on are unaffected until they log off and on again.

Editing the ENTERPRISE Database Security Settings

Oracle has default security settings which are applied to each database that you create.

These security settings determine:

- The number of days after which a user's password will expire
- Whether passwords can be reused
- The number of unsuccessful attempts to log into ENTERPRISE before a user's account becomes locked

ENTERPRISE creates its own default security settings in a profile called ENT_DEFAULT_PROFILE, which you can edit. You can associate this profile with individual ENTERPRISE users to override the Oracle defaults. This profile cannot, however, be applied to the Super User.

The ENT_DEFAULT_PROFILE can be edited by the Super User and by Regional Super Users.

To edit the ENTERPRISE database profile:

1. Open ENTERPRISE Administrator.
2. From the **Utilities** menu, click **Database Profile Editor**.
3. Edit the settings as described in the following table. Where you choose to leave the setting as **DEFAULT**, the profile will use the Oracle default setting. For more information, see your Oracle documentation.

In This Pane	You Can
Profile	View the profile name, which is automatically created by ENTERPRISE.
Password	Select in how many days you want the password to expire. To do this, select Specify and type the number of days in the box. Select how many additional days, after the password has expired, that the user can log on before their account becomes locked. Each time the user logs on, a warning message will tell them their password has expired and that they have x days until their account is locked. To do this, select Specify and type the number of days in the box.
Password Reuse	Select if you want the user to be able to reuse a password.
Failed Login	Select the number of times a user can unsuccessfully try to log into ENTERPRISE before their account is locked. Select the number of days a locked account remains locked.

4. Click **OK** to save the changes and close the Database Profile Editor.

To associate the ENT_DEFAULT_PROFILE with a user, see Adding a User Without OS Authentication.

7 Distributed Tasks

ENTERPRISE enables you to speed up the process of generating predictions and arrays by distributing them across a number of designated agent machines on the network.

This is controlled by at least one software application called a coordinator, which manages the distribution of the tasks.

Coordinator machines and agents can also have ENTERPRISE installed, but this is not a necessity.

Specific client machines (with ENTERPRISE installed) can then be enabled to have their tasks (predictions and/or arrays) distributed to the agent machines.

Optionally, multi-core processors can be used on the agent machines, for even faster results. You can also configure an agent machine to use multiple instances ("occurrences") of Distributed Prediction and/or Distributed Array agents, to increase the number of threads available to work on that machine.

On agent machines you can access the Distributed Tasks System functionality from menus that appear when you right click on one of the associated System Tray icons. There is an icon for the Distributed Task System Monitor  , an icon for Distributed Prediction agents  and an icon for Distributed Array agents  .

Here is a summary of the three main definitions related to the Distributed Tasks system:

- **Coordinator** - manages the distribution of tasks between clients and agents (controllable from the System Monitor System Tray icon).
- **Client** - ENTERPRISE user machine that can send distributed tasks to agents
- **Agent** - machine that performs the distributed tasks for clients (controllable from the associated Agent user interface's System tray icon).

Note:

- The distributed predictions functionality is available for all technologies
- The distributed arrays functionality is available only for GSM, UMTS and LTE

Configuring Distributed Tasks - Factors to Consider

When configuring your system to distribute tasks, you should consider the following factors.

Firewall Settings and Ports for Distributed Tasks

In organisations where the machines hosting the Distributed Tasks System components have firewalls in operation, the following types of port must be opened in the firewalls on those hosts in order to allow the components to communicate with one another.

Note: All of the Distributed Tasks System components communicate using UDP over IP.

- Well-known (listening) ports:
 - The machine hosting the coordinator service must have the Coordinator Admin, Agent, and Client Ports (whose port numbers are specified in the 'Coordinator Ports' section of the Coordinator Options '**Network**' tab), opened in the firewall for inbound access over UDP.

If the host has a system monitor component installed, then a UI Port must also be opened in the firewall for inbound access over UDP, for every version of the system monitor installed on that host.

If the system monitor components from more than one version of ENTERPRISE are installed, then consecutive UI ports must be opened, starting from the port number specified in the 'UI Ports' section of the **Coordinator Options** dialog box.
 - Each machine hosting an agent service must have an Agent Port opened in the firewall for inbound access over UDP, for every version of the agent service installed on that host.

If the agent service components from more than one version of ENTERPRISE are installed, then consecutive agent ports must be opened, starting from the port number specified in the 'Agent Ports' section of the **Coordinator Options** dialog box.
 - The machine hosting the ENTERPRISE tool must have a Client Port opened in the firewall for inbound access over UDP, for every version of ENTERPRISE installed on that host.

If more than one version of ENTERPRISE is installed, then consecutive client ports must be opened, starting from the port number specified in the 'Client Ports' section of the **Coordinator Options** dialog box.
 - If the host has a system monitor component installed, then a UI Port must also be opened in the firewall for inbound access over UDP, for every version of the system monitor installed on that host.
 - If the system monitor components from more than one version of ENTERPRISE are installed, then consecutive UI ports must be opened, starting from the port number specified in the 'UI Ports' section of the **Coordinator Options** dialog box.
- Ephemeral (dynamic) ports:

The protocol used by the distributed tasks system makes use of ephemeral (dynamic) ports. Some firewalls may block these for all applications by default, so you should check for this when configuring the firewalls. Under Windows Server 2008, Windows XP and Windows 7, the default ephemeral port range is [49152-65535]. However, this range may not be correct for every machine, as it may have been changed by a system administrator via the Windows registry (details available on Microsoft's MSDN web pages).

For more information on ephemeral port ranges for Windows Server versions, see the Microsoft Knowledge Base <http://technet.microsoft.com/en-gb/ms772425.aspx>.

For more information on ephemeral ports, see http://en.wikipedia.org/wiki/Ephemeral_port.

For more information on the default port settings, see Firewall Port Details.

Warning: Following the installation of Distributed Tasks System components from new ENTERPRISE versions on any host machine, it is possible that the firewall on that host may prevent those components from communicating with the coordinator. This is so even if components from previous ENTERPRISE versions have been uninstalled from that host.

This happens because the coordinator service remembers, for a time, details of past agent and coordinator UI registrations from all hosts, including the port number used for that

component. This port number is essentially reserved for that component, should it connect again in the future, which could cause the port number allocated to the newly installed component at registration time to be above the range of ports originally opened in the firewall on that host.

To avoid such problems, stop the coordinator service then delete the 'Agents.xml' and 'Hosts.xml' files from the 'Common\config' folder on the machine hosting the coordinator service at the same time as you uninstall the previous version or versions. You can then restart the coordinator service.

Other Settings for Distributed Tasks

Microsoft XML DLL Version on Component Hosts

The Distributed Tasks System components will not function correctly unless version 6 of the Microsoft XML library API's (MSXML6.dll) is installed on the component host machine.

Common Folder Security Settings

The permissions and security settings on all folders used by the Distributed Tasks System (for example the map data folder; prediction folder; coverage arrays folder; cache folders where applicable and so on) should all share the same account credentials that are configured in the **Security** pane of the **Agent** tab of the **Distributed Task Coordinator Options** dialog box.

Host Machine DNS Search Path Settings

Any domain to which a Distributed Tasks System host machine belongs must be included in the DNS Suffix Search List of every host machine.

Updating the Coordinator

The coordinator service is engineered to be backwards-compatible with all previous releases of ENTERPRISE, but improvements to the coordinator may be required by the latest release.

Following installation of a new release of ENTERPRISE, the target coordinator must also be updated to the one from the same installer if the Task Distribution System is required. You should also delete the coordinator status XML files, 'Agents.xml' and 'Hosts.xml' (which can be found in the 'Common\config' folder on the machine hosting the coordinator) before starting the updated coordinator service.

When a new release of ENTERPRISE is installed on a machine using an existing coordinator, you must uninstall the old coordinator and then install the new one. More than one version cannot coexist on the same machine because the same network configuration defaults are used on all versions, and this would cause port conflicts.

Tuning Performance

To maximise the performance of the Distributed Tasks System components, you should consider the following factors.

Choosing the Map Data Tile Size

During the processing of prediction tasks, the prediction system loads geo-data tiles. The greater the amount of data loaded in any given tile, the greater the load on the network and geo-data server. If prediction areas are small, it is efficient to have small tiles. If tasks are large, it is efficient to have large tiles.

When large numbers of predictions are performed simultaneously (that is, when distributed predictions are in use), demand on the geo-data server is likely to be very high. If prediction tasks are small while tile size is large, there will be wasted bandwidth and reduced overall throughput.

You should choose a size of geo-data tiles that will minimise the overhead in the general case. You can achieve this by using a strict chequerboard arrangement of height data with tiles of equal size that have aligned joints and no overlaps and where each file is 720 pixels by 720 pixels. This results in 1MB tile files. You can also use a small multiple of that size (for example 1440 x 1440 = 4MB).

Note: The TEOCO support team can provide you with a powertool for creating tiles of the required size from existing geo-data.

Handling Geo-Data Storage

You need to consider the demand for the throughput of geo-data (height & clutter), as capacity is consumed by all compatible prediction agents that comprise the prediction agent farm. High demand can cause data contention and a performance bottleneck. For example, if the geo-data is hosted on a single server with a single network adaptor, the maximum capacity of its network adaptor may quickly be reached during periods of high demand. This is likely if map-data tile size is large and tasks are small (that is, when the ratio of time spent performing geo-data reads to that spent performing prediction calculations, is large). Such a bottleneck would result in lower than expected throughput of prediction tasks. Various I.T. solutions could be used to minimise such a bottleneck, for example the map data could be hosted on a SAN that is connected to a server-cluster employing network load balancing.

Handling Prediction Data Storage

You also need to allow for the throughput of prediction file data. A bottleneck here can impact not only task throughput at prediction generation time, but also the performance at array creation time when prediction data is consumed.

Comparing Performance

When examining the throughput and speed of Distributed Tasks System components, you should consider the following factors.

Comparing Like for Like

The performance of one agent can only be compared meaningfully with that of another agent if they are hosted on machines of exactly the same specification (processor, memory, disk model), and if they are configured to use exactly the same distribution settings (L.A.S. mode, number of threads, and so on). The performance of agents can never be compared meaningfully with that of clients, even if the rules for comparing agents are observed, because clients have vastly different memory requirements to agents.

Scaling Throughput

Ideally, doubling the number of processing resources would double the throughput. However, due to overheads in processing and data movement, and the unpredictability of the operating system's task scheduling, such perfect scaling is rarely achieved.

Configuring Additional Models for Prediction Tasks

This functionality is applicable to the supplied propagation models as well as all supported third party propagation models. Due to caching and/or a vendor specific centralised feature (such as licensing), some propagation models require special configuration to allow them to perform correctly when running on distributed agents.

Configuring MYRIAD Models

MYRIAD models require some folders to be configured to point to cache data, usually located on the geo-data server, via UNC paths. These include:

- The Output directory on the Parameters tab of the MYRIAD model parameter dialog box
- The Computed data index file settings on the Radio tab of the MYRIAD model parameter dialog box
- The Result directory on the Advanced tab of the MYRIAD model parameter dialog box

Note: When using multiple Distributed Prediction agent occurrences with a MYRIAD model, use 4-threaded occurrences, and then vary the number of occurrences to fit the machine's CPU resources.

For more information on these configuration settings, see the Distributed Predictions section in the *MYRIAD User Reference Guide*.

Configuring the Volcano Model

The Volcano Model allows you to configure optional files and temporary folders to point to additional data, usually located on the geo-data server, via UNC paths. These include:

- The additional attenuation file on the **Clutters** tab of the **Volcano Rural model parameter** dialog box - input file for configuration
- Some additional output files, as specified on the **Additional Outputs** tab of the Volcano Urban model - output file for additional results

It is also advisable to define the system environment variable, `LSFORCEHOST`, to point to the licence server on each agent machine.

For more information on these configuration settings, see the Volcano Licence Installation chapter in the *Volcano Installation Guide*.

Setting Up Coordinator Machines

A coordinator machine manages the distribution of tasks between Clients and Agents. There must be one default coordinator machine, but extension coordinators can also be added.

Important:

- Coordinators should be servers to which all the Clients and Agents have access.
- ENTERPRISE does not have to be installed on coordinator machines.
- When a new release of ENTERPRISE is installed on a machine using an existing default coordinator, you must uninstall the old default coordinator and then install the new one. More than one version cannot coexist on the same machine because the same network configuration defaults are used on all versions, and this would cause port conflicts. For more information, see Other Settings for Distributed Tasks on page 165.

The installation of coordinators is contained within the same Installation Wizard as that used for installing ENTERPRISE (which is described generally in Chapter 2 of the *Installation and Administration Guide*).

Tip: If ENTERPRISE has already been installed, you can access these options using the **Modify** option in the Installation Wizard (using the Control panel, right-click on TEOCO ENTERPRISE from the list of programs, and choose the **Change** option).

To install the default Coordinator:

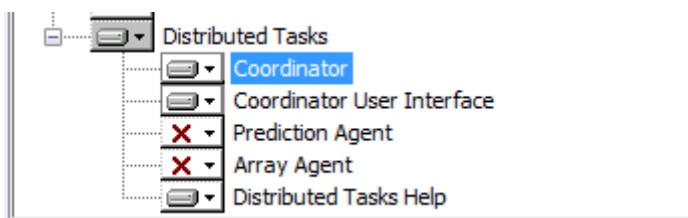
1. Within the installation process, one of the pages of the wizard allows you to choose the setup type (Complete or Custom).

Select the '**Custom**' option.

2. Click **Next**.

You will see the **Custom Setup** page, enabling you to select which products and options you want to install.

3. Under the **Distributed Tasks** heading, install the '**Coordinator**' option and (optionally) the '**Coordinator User Interface**' option:



4. Optionally, install the 'Distributed Tasks Help', which is part of the main Administrator Help, and may be useful if ENTERPRISE is not installed.
5. You do not need to install any other option for this machine, so complete the pages of the Installation Wizard and click **Finish**.

Setting Up ENTERPRISE User Machines as Clients

A machine that has ENTERPRISE installed can be set up as a Client so that it can send distributed tasks to Agents.

The installation of the Distributed Tasks Client option is contained within the same Installation Wizard as that used for installing ENTERPRISE (which is described generally in Chapter 2 of the *Installation and Administration Guide*).

Tip: If ENTERPRISE has already been installed, you can access these options using the **Change** option in the Installation Wizard (using the Control panel, right-click on TEOCO ENTERPRISE from the list of programs, and choose the **Change** option).

To install the Client option:

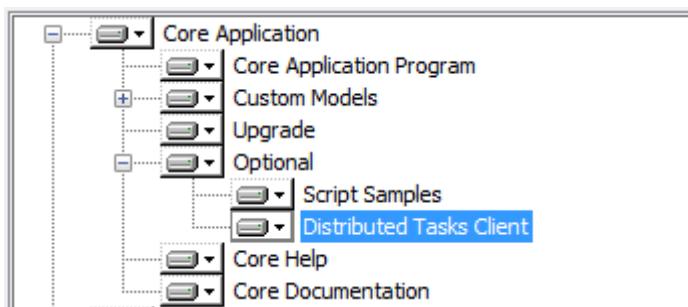
1. Within the installation process, one of the pages of the wizard allows you to choose the setup type (Complete or Custom).

Select the 'Custom' option.

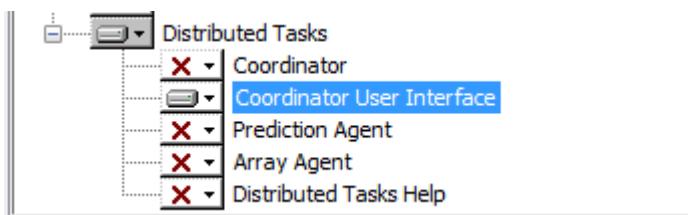
2. Click **Next**.

You will see the **Custom Setup** page, enabling you to select which products and options you want to install.

3. Under the Core Application heading, and Optional sub-heading, install the '**Distributed Tasks Client**' option:



4. Optionally, under the **Distributed Tasks** heading, you can also install the 'Coordinator User Interface', which enables interaction with the Coordinator:



5. Complete the pages of the Installation Wizard and click Finish.

Important:

- It is possible, if required, to set up an ENTERPRISE user machine not only as a Client but as an Agent too. If you want to do this, perform the additional steps in Setting Up Agent Machines on page 169.
- File storage relating to created predictions or arrays is automatically managed within ENTERPRISE by a caching algorithm. As a vital input to this algorithm, you must set the *maximum disk space* for the storage of these files, for the prediction folder and output array folder, which are specified on the Shared Data Directories tab of the Project Settings dialog box. For more information, see 'About the User Data Directories Tab' and 'About the File Caching System for Predictions and Arrays' in the 'Setting up a Project' chapter of the *ENTERPRISE User Reference Guide*.

Setting Up Agent Machines

An Agent is a machine that performs the distributed tasks for ENTERPRISE user machines that are enabled as Clients.

Notes:

- The machine can operate as a Prediction Agent or an Array Agent or both (depending on your exact requirements).
- It is possible for a machine to operate as both an Agent and a Client, but if it is Agent-only, ENTERPRISE does not have to be installed on the Agent machine.

The installation of the Agent options is contained within the same Installation Wizard as that used for installing ENTERPRISE (which is described generally in Chapter 2 of the *Installation and Administration Guide*).

Tip: If ENTERPRISE has already been installed, you can access these options using the **Change** option in the Installation Wizard (using the Control panel, right-click on TEOCO ENTERPRISE from the list of programs, and choose the **Change** option).

To install one or both of the Agents:

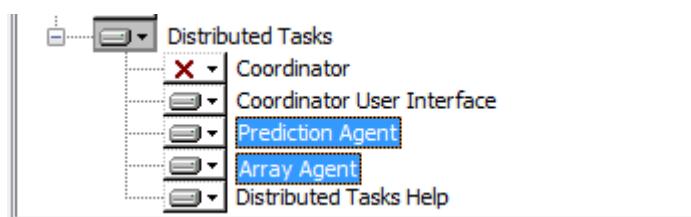
1. Within the installation process, one of the pages of the wizard allows you to choose the setup type (Complete or Custom).

Select the 'Custom' option.

2. Click **Next**.

You will see the **Custom Setup** page, enabling you to select which products and options you want to install.

3. Under the **Distributed Tasks** heading, install '**Prediction Agent**' or '**Array Agent**' or both:



4. Optionally, you can also install the 'Coordinator User Interface', which enables interaction with the Coordinator.
5. Optionally, install the 'Distributed Tasks Help', which is part of the main Administrator Help, and may be useful if ENTERPRISE is not installed.
6. Complete the pages of the Installation Wizard and click **Finish**.

Configuring Coordinator Targets

The clients, agents and coordinators must all recognise the hostname of the machine on which the default coordinator application is installed. This machine is known as the default target coordinator machine.

There may be more than one target coordinator machine to allow the distribution of tasks to agents that may be on:

- a different group of servers within the local data centre
- a remote data centre (connected to the primary one)
- a cloud resource

The hostname or hostnames of the target coordinator machine or machines will normally be set when ENTERPRISE is installed, but can be set subsequently.

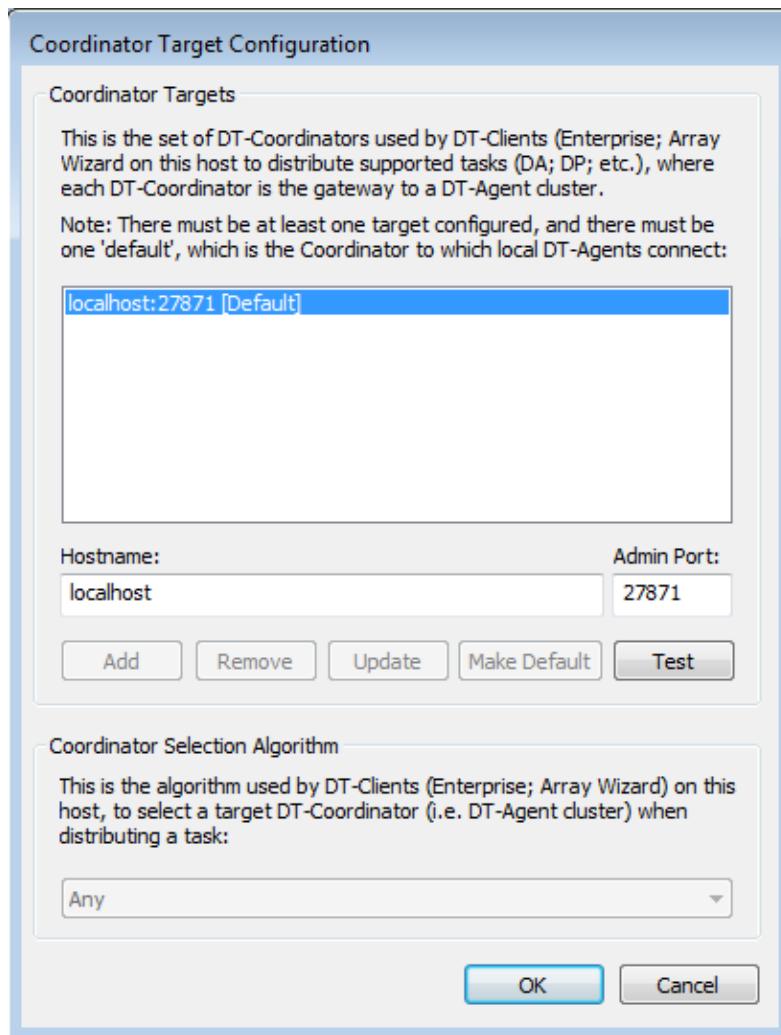
To set the coordinator hostname:

1. Either:

Click Start/TEOCO/Coordinator Target Configuration

- or -

If you have the coordinator application installed, right-click the coordinator icon  in your system tray and from the menu that appears, select **Configure Coordinator Targets**. The Coordinator Target Configuration dialog box appears:



2. In the **Coordinator Targets** pane of the dialog box that appears, click the target coordinator machine for which the hostname is to be set.

If the target coordinator machine you have selected is not currently the default machine and you want it to be, click **Make Default**

If you want to remove the selected machine, click Remove.

3. In the Hostname and Admin Port fields, type the name and admin port identity of the machine on which the coordinator application you require is installed and click Update.

Tips:

- To add details for a new coordinator machine, select the default machine in the Coordinator Targets pane, edit the Hostname and Admin Port as required, then click Add. A new entry will appear in the Coordinator Targets pane.
- To check that the connection to the specified target coordinator machine is working, click Test.

4. Optionally, in the **Coordinator Selection Algorithm** pane, select a particular algorithm to govern the manner in which tasks are distributed to agent clusters, or leave the default setting of Any.
5. Click **OK**.

If necessary (for example, to facilitate the use of a script to automate deployment), coordinators can also be configured from the command line.

To set the default coordinator hostname from the command line:

1. Open a command prompt window.
2. Change the directory to that in which SetCoordinatorTargetsDlg100.exe resides (normally Program Files/TEOCO/ENTERPRISE 10.0/Common).
3. Type SetCoordinatorTargetsDlg100.exe followed if required by a space and any of the optional parameters described in this table:

This Option	Does This
-?	Displays the options described in this table.
-@=spIAT filename	Reads the remaining options described in this table from the specified .txt file (one per line).
-additionalcoordinator=Hostname:Admin Port	Overrides any locally configured coordinator settings with the specified settings for additional coordinators.
-defaultcoordinator=Hostname:Admin Port	Overrides any locally configured coordinator settings with the specified settings for the default coordinator.
-getstatustext>Errorlevel	Displays the status text associated with the error level returned by the previous run of the executable.
-nodialog	Runs this tool in console mode. This allows the coordinator target to be specified without manual intervention when used together with the '-coordinator' option.
-novalidation	Disables settings validation so that if necessary the hostname setting can be made on a remote machine without immediate access to the coordinator. Warning: You must be sure that your settings are valid if you use this option since it has the potential to allow invalid settings to be retained.

4. Press the **Return** key.

To set coordinator account details from the command line:

1. Open a command prompt window.
2. Change the directory to that in which CoordinatorService.exe100.exe resides (normally Program Files/TEOCO/ENTERPRISE 10.0/Common).
3. Type SetCoordinatorTargetsDlg100.exe followed by a space and then

-agentaccount=<network-domain>/<account-username>/<account-password>

where <network-domain> is optional so that for example for a user "bob" the argument "/bob/bobspassword" is allowed.

About the User Interface for Distributed Tasks

The user interface supporting distributed tasks includes the following:

- On the 'Coordinator' machine used to manage the distribution of tasks:
 - A coordinator menu accessible by right-clicking on a system tray icon  (or alternatively, particularly for Citrix deployments, in a window).
 - A Distributed Task System Monitor window, accessed via the **coordinator** menu.
 - A Distributed Task Coordinator Options dialog box, accessed via the **coordinator** menu.
 - A dialog box for setting the coordinator hostname (which appears during ENTERPRISE installation, and can be accessed via the **coordinator** menu or the **Start Menu**).
- For more information on the above, see Using the Coordinator Menu on page 175 and Configuring Coordinator Targets on page 170.
- On each 'Agent' machine:
 - A dialog box for setting the coordinator hostname which appears during ENTERPRISE installation and can be accessed via the Start Menu.
And (as appropriate) one or both of the following:
 - An agent menu accessible to the user of an agent machine by right-clicking on a system tray icon  . This menu allows the user to enable or disable the agent machine for the purposes of processing distributed **predictions**.
 - An agent menu accessible to the user of an agent machine by right-clicking on a system tray icon  . This menu allows the user to enable or disable the agent machine for the purposes of processing distributed **arrays**.
- On each 'Client' machine:
 - A dialog box for setting the coordinator hostname which appears during ENTERPRISE installation and can be accessed via the Start Menu.

Agent and Client machines will also see the coordinator system tray icon if their installation included the 'Coordinator User Interface' option.

Important: All ENTERPRISE users who need to be clients of the Distributed Tasks System functionality must have the appropriate permissions enabled in ENTERPRISE Administrator. See Setting Distribution Permissions for Clients on page 173.

Setting Distribution Permissions for Clients

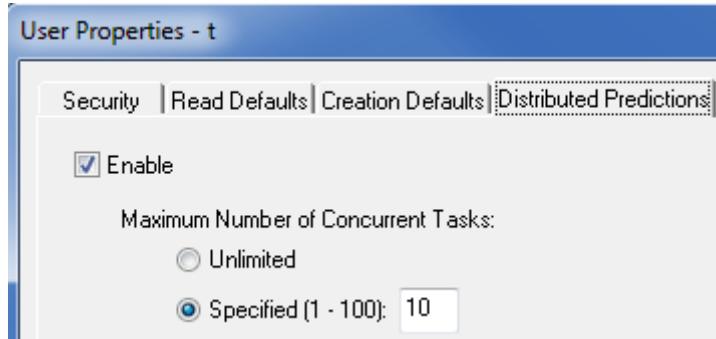
All ENTERPRISE users who need to be clients of the Distributed Tasks System functionality must have the appropriate permissions enabled in ENTERPRISE Administrator.

To enable the use of Distributed Tasks for a user:

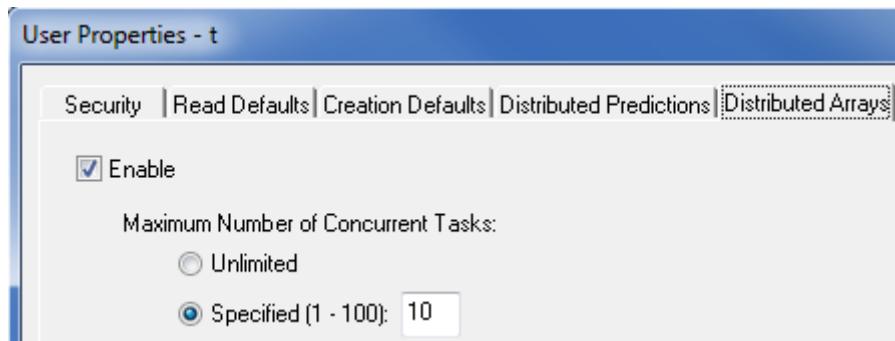
Note: This example enables distribution for both Predictions and Arrays, but they can be set independently of each other.

1. Log in to ENTERPRISE Administrator.
2. In the left pane, click **Users**.

3. In the right pane, right-click on the appropriate user.
4. In the menu that appears, click **Properties**.
5. Click the **Distributed Predictions** tab.
6. Select the **Enable** checkbox and set the associated parameters as required:



7. Click the **Distributed Arrays** tab.
8. Select the **Enable** checkbox and set the associated parameters as required:



9. Click **Apply**.

10. Click **Close**.

Tip: You can also do this for Group permissions, instead of (or in addition to) individual users. See Creating Groups and Users on page 93.

About the Agent Menu

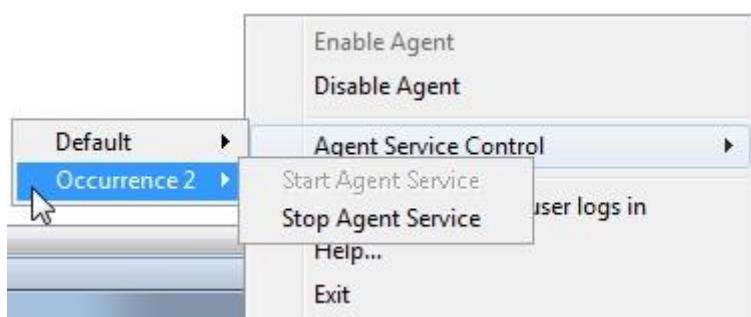
To access an agent menu:

Right-click the required agent icon in the system tray.

There are two versions of each agent icon which indicate the state of the agent. This table describes them:

Prediction Agent icon	Array Agent icon	Indicates
		The agent is enabled.
		The agent has been disabled.
		There are no associated agent instances running.

This picture shows an example of the agent menu:

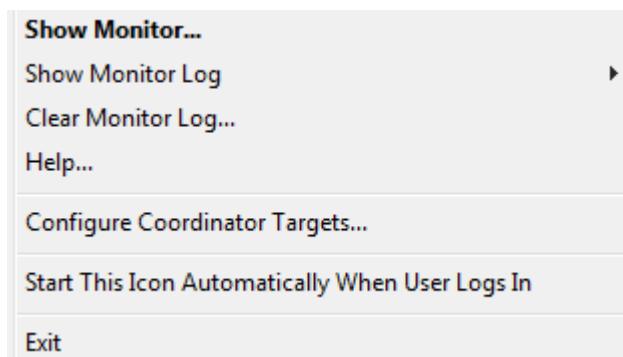


This table shows what each menu item is for:

Choose This Option	To Do This
Enable Agent	Allow your machine to be used to perform distributed processing on behalf of another machine.
Disable Agent	Prevent your machine from being used to perform distributed processing on behalf of another machine.
Agent Service Control	Select the agent occurrence for which you want to start or stop the agent service.
Start Agent Service	Start the Agent Service.
Stop Agent Service	Stop the Agent Service.
Start Agent UI when user logs in	Display the agent icon in the system tray automatically when you log in to your machine.
Help	Access the on-line help for distributed tasks.
Exit	Remove the agent icon from the system tray. This does not disable the agent. You can get the agent icon back in the system tray by accessing it from the Start menu.

Using the Coordinator Menu

To access the **coordinator** menu, right-click the coordinator icon  in the system tray. This picture shows an example of the **coordinator** menu:



This table shows what each menu item is for:

Choose This Option	To Do This
Show Monitor	Display the Distributed Task System Monitor window. For more information on using this window, see Monitoring Your Distributed Tasks on page 180.
Show Monitor Log	Display the contents of the monitor log file. A sub-menu allows you to choose between abridged and full versions.
Clear Monitor Log	Erase the current contents of the monitor log file.
Help	Access the on-line help for distributed tasks.
Configure Coordinator Targets	Display the hostname entry dialog box. For more information on using this dialog box, see Configuring Coordinator Targets on page 170.
Start This Icon Automatically When User Logs In	Display the coordinator icon in the system tray automatically when you log in to your machine.
Exit	Remove the coordinator icon from the system tray. This does stop the coordinator service. You can get the agent icon back in the system tray by accessing it from the Start menu.

Using Citrix

If you are using Citrix, publish the Distributed Tasks Coordinator application as follows:

```
CoordinatorUInn.exe -notrayicon
```

where nn is the software version number.

The Coordinator menu appears:



While the appearance of the Coordinator menu is different to that illustrated in Using the Coordinator Menu on page 175, the available options are largely the same.

Logging On to the Coordinator

Users will have to log on in order to access the coordinator if security settings have been made to require this. For more information see Setting the Coordinator Options on page 177.

Setting the Coordinator Options

To set your coordinator options:

1. Right-click on the coordinator icon  in your system tray. A menu appears.
2. Click **Show Monitor**. The **Distributed Task System Monitor** window appears.
3. From the **View** menu, click **Coordinators**.
4. Right-click the required coordinator. A menu appears.
5. Click **Coordinator Options**. The **Distributed Task Coordinator Options** dialog box appears. This table describes the tabs and panes available in the dialog box and the settings you can make.

Use this tab/pane	To specify
Agent tab: Agent Log Folder	<p>The folder path where the log file will reside, if you want to override the default folder path.</p> <p>There are two potential locations for agent log files:</p> <ul style="list-style-type: none"> • An agent-local folder - this is where each agent writes to a folder of the specified name on the specified agent-local drive. For example, if the agent log folder path is specified as 'C:\AgentLogs' in the Coordinator Options dialog, then the log file will be written to that location on each agent machine. There is no need to create the folder. • A central-folder on a server - this is where all agents write to the folder of the specified name on the specified central server. In this case, the folder must be specified in UNC format (for example: '\\MyServer\AgentLogs'), and the names of the log files created there will indicate the agent type, agent version and patch-level. The central folder must be accessible by every agent machine, that is, it must be shared for read/write access with 'Everyone'. <p>Note: In both the above cases, if the folder path you specify is not accessible by any agent (such as when a file with the same name as the folder already exists on that path, or if there are access restrictions), then the agent will revert to its default log folder. For more information, see Locating Log Files on page 76.</p> <p>The Agent Log File name generated by the system will contain the agent type and release version information. If the folder path is specified as a UNC path (common to all agents that register with the Coordinator), the log file name will also contain the hostname of the associated agent.</p> <p>For example, for an agent appearing in the 'Prediction Agents' view of a System Monitor window as "Prediction Generator V10.0 Build 248 Patch Level K1.0.1 (ENTERPRISE Build #248 R0)", on host 'UKDT123', the generated log file name would be as follows:</p> <ul style="list-style-type: none"> • For an agent-local folder (non-UNC path): "PredictionAgent_V100_248_K101_#248_R0.log" • For a central folder common to all agents (UNC path), see Locating Log Files on page 76.

Use this tab/pane	To specify
Agent tab: Maximum Agent Log File Size Logging Level	<p>The maximum size that the log file can be, and the logging level:</p> <ul style="list-style-type: none"> • Important - records errors • Information - records errors and additional information • Verbose - records full task process details (useful for Product Support).
Agent tab: Agent Policy Default	<p>The default behaviour for agent machines when handling distributed tasks. This determines the priority of the distributed processing task relative to other functions required of the agent machine. Eight possible default behaviours are provided for you to select from, or you can configure your own. For more information see Setting the Default Agent Policy on page 178.</p>
Agent tab: Security	<p>Mandatory details of the account to be used by agents to read map data and write predictions over the network. The Domain, User Name and Password are required. The system will test the credentials supplied, and will present a warning prompt if the test fails.</p>
User Interface tab: Security	<p>A list of users who can set or view the coordinator options. If you create this list, users will be required to log on in order to be able to access the coordinator.</p>
User Interface tab: Monitor Window	<p>The number of days after which agents that have been offline will be removed from the Distributed Task System Monitor window, and the number of seconds after which the coordinator refreshes the user interface.</p> <p>Important: If you set the refresh interval to 0, the coordinator will refresh the user interface instantaneously every time it is notified of agent activity. This can result in a lot of unnecessary processing and is not recommended.</p>
Coordinator tab: Logging	<p>The path to a log file on the coordinator machine, and the maximum size that the file can be. Also logging level (same definitions as for Agent tab above).</p>
Coordinator tab: Dynamically Licensed Models	<p>The interval at which a task, based on a third party propagation model using a dynamic licensing system, can be re-tried if a licence is initially unavailable.</p> <p>The maximum time for which tasks waiting for dynamic licences can be re-tried at the interval specified above.</p>
Coordinator tab: Distribution Algorithm	<p>The maximum number of tasks that each user can have waiting at the coordinator.</p>
Coordinator tab: Collect Statistics	<p>Whether to include non-fatal errors in the Failed Tasks column of the Agent View in the Distributed Task System Monitor window (by default, only fatal errors are included).</p>
Network tab	<p>The port numbers used to achieve distributed processing. See Port Details.</p>

Setting the Default Agent Policy

The behaviour of an agent machine which is required to perform another task while processing a distributed task is determined by the Default Agent Policy specified on the **Agent** tab of the **Distributed Task Coordinator Options** dialog box. Seven predefined defaults are available on the drop down list. This table describes the effect of each of them.

This Default	Has This Effect
Server	The Distributed Tasks System runs at normal priority all the time.
Server (Single Threaded)	The Distributed Tasks System runs at normal priority all the time, but only uses a single thread, irrespective of the number of processors available.
Server (Low Priority)	The Distributed Tasks System runs at low priority all the time.
Desktop	The Distributed Tasks System runs at high priority when the agent machine is not being used for anything else, but when the agent machine is used for something else the Distributed Tasks System stops immediately.
Desktop (Single Threaded)	The Distributed Tasks System runs normal priority when the agent machine is not being used for anything else and only uses a single thread, irrespective of the number of processors available. When the agent machine is used for something else the Distributed Tasks System stops immediately.
Desktop (Graceful Shutdown)	The Distributed Tasks System runs at high priority when the agent machine is not being used for anything else, but when the agent machine is used for something else the Distributed Tasks System stops after the distributed tasks currently running have been completed.
Desktop (Low Priority)	The Distributed Tasks System runs at low priority when the agent machine is not being used for anything else, but when the agent machine is used for something else the Distributed Tasks System stops immediately.

The defaults shown in the table are defined in the CoordinatorOptions.xml file, normally located at C:\Program Files\TEOCO\ENTERPRISE 10.0\Common\config. You can edit this file to change the effects of the predefined defaults or to define additional defaults of your own. This picture shows an example of part of the .xml file defining one default:

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
- <COORD-OPTIONS VERSION="1.100000">
  <BACKWARD-COMPATIBILITY2>FJk</BACKWARD-COMPATIBILITY2>
  <BACKWARD-COMPATIBILITY3>0;kJP</BACKWARD-COMPATIBILITY3>
  <BACKWARD-COMPATIBILITY1>)dIWYa~</BACKWARD-COMPATIBILITY1>
  <BACKWARD-COMPATIBILITY4>S_wtIn</BACKWARD-COMPATIBILITY4>
  <CLIENT-QUEUE-SIZE>4</CLIENT-QUEUE-SIZE>
  <CLIENT-PORT>27873</CLIENT-PORT>
  <AGENT-PORT>27872</AGENT-PORT>
  <ADMIN-PORT>27871</ADMIN-PORT>
  <PREFERRED-IP-ADDRESS />
  <LOGFILE-PATH />
  <MAX-LOGFILE-SIZE>10240</MAX-LOGFILE-SIZE>
  <MONITOR-THREAD-POLL-FREQ-SEC>20</MONITOR-THREAD-POLL-FREQ-SEC>
  <MAX-WAIT-FOR-STATUS-CHANGE-SEC>80</MAX-WAIT-FOR-STATUS-CHANGE-SEC>
  <MAX-POSS-TIME-FOR-JOBSTART-NOTIFICATION-OUTSTANDING>130</MAX-POSS-TIME-FOR-JOBSTART-NOTIFICATION-OUTSTANDING>
  <MAX-POSS-TIME-FOR-JOBSTART-NOTIFICATION-OUTSTANDING-CLIENT>600</MAX-POSS-TIME-FOR-JOBSTART-NOTIFICATION-OUTSTANDING-CLIENT>
  <MAX-POSS-TIME-BETWEEN-JOBSTART-AND-PROGRESS>1800</MAX-POSS-TIME-BETWEEN-JOBSTART-AND-PROGRESS>
  <MAX-POSS-TIME-FOR-PREDICTION>43200</MAX-POSS-TIME-FOR-PREDICTION>
  <MAX-POSS-TIME-BETWEEN-PROGRESS-MSGS>10800</MAX-POSS-TIME-BETWEEN-PROGRESS-MSGS>
  <MAX-TIME-SINCE-AGENT-CONTACT>240</MAX-TIME-SINCE-AGENT-CONTACT>
  <MAX-NUM-FAILED-REGISTERJOB-CALLS>20</MAX-NUM-FAILED-REGISTERJOB-CALLS>
  <CLIENT-MONITORING-INTERVAL>600</CLIENT-MONITORING-INTERVAL>
  <UI-UPDATE-INTERVAL-SEC>5</UI-UPDATE-INTERVAL-SEC>
  <CLIENT-PROGRESS-UPDATE-INTERVAL-SEC>6</CLIENT-PROGRESS-UPDATE-INTERVAL-SEC>
  <MAX-NUM-FAILED-SENDS-TO-UI>20</MAX-NUM-FAILED-SENDS-TO-UI>
  <NUM-BYTES-TO-READ-FOR-SHORT-LOG>512000</NUM-BYTES-TO-READ-FOR-SHORT-LOG>
  <LOG-LEVEL-COORD>1</LOG-LEVEL-COORD>
  <UI-PORT>27915</UI-PORT>
  <UI-PORT-UPDATED>0</UI-PORT-UPDATED>
  <CLIENT-LISTENER-PORT>27885</CLIENT-LISTENER-PORT>
  <AGENT-LISTENER-PORT>27875</AGENT-LISTENER-PORT>
  <AGENT-LOGFILE-PATH>C:\Settings (Project)\DistrAgent.log</AGENT-LOGFILE-PATH>
  <AGENT-MAX-LOGFILE-SIZE>10240</AGENT-MAX-LOGFILE-SIZE>
  <AGENT-LOG-LEVEL>1</AGENT-LOG-LEVEL>
  <MAX-NUM-CANDIDATE-JOBS>10</MAX-NUM-CANDIDATE-JOBS>
  <MAX-NUM-AVAILABLE-JOBS>20</MAX-NUM-AVAILABLE-JOBS>
  <SKIP-ENGINE-VERSION-CHECK>0</SKIP-ENGINE-VERSION-CHECK>
  <DAYS-BEFORE-DEAD-AGENT-CULL-IN-UI>30</DAYS-BEFORE-DEAD-AGENT-CULL-IN-UI>
  <THIRD-PARTY-MODELS-LICENSED-BY-DEFAULT>true</THIRD-PARTY-MODELS-LICENSED-BY-DEFAULT>
  <HELP-INDEX>4cff02aac0489f90a0a5011b7a130a12</HELP-INDEX>
  <HELP-DATA>eeef48d387263c1ceef91ec36dfd04d20</HELP-DATA>
  <HELP-DATA-BLOB>877bd7108a38ff1961a4db3bf85b124d</HELP-DATA-BLOB>
  <COLLECT-NONFATAL-AGENT-ERRORS>false</COLLECT-NONFATAL-AGENT-ERRORS>
- <AGENT-POLICIES>
  - <AGENT-POLICY ACTIVE="TRUE" NAME="Server">
    <DESCRIPTION>System runs at normal priority all the time</DESCRIPTION>
    <DEFAULT-THREAD-PRIORITY>NORMAL</DEFAULT-THREAD-PRIORITY>
    <THREADS-LIMIT>0</THREADS-LIMIT>
    <DEFAULT-MODE>RUNNING</DEFAULT-MODE>
    <LOGIN-EVENT-ACTION>NONE</LOGIN-EVENT-ACTION>
    <LOGOUT-EVENT-ACTION>NONE</LOGOUT-EVENT-ACTION>
    <SCREENSAVEOFF-EVENT-ACTION>NONE</SCREENSAVEOFF-EVENT-ACTION>
    <SCREENSAVEON-EVENT-ACTION>NONE</SCREENSAVEON-EVENT-ACTION>
    <DISPLAYLOCK-EVENT-ACTION>NONE</DISPLAYLOCK-EVENT-ACTION>
    <DISPLAYUNLOCK-EVENT-ACTION>NONE</DISPLAYUNLOCK-EVENT-ACTION>
    <KEYMOUSE-EVENT-ACTION>NONE</KEYMOUSE-EVENT-ACTION>
    <LOWCPU-EVENT-ACTION>NONE</LOWCPU-EVENT-ACTION>
    <MAX-CPU-USAGE-FOR-LOW-CPU-TEST>6</MAX-CPU-USAGE-FOR-LOW-CPU-TEST>
    <RUNNING-AVE-WINDOW-FOR-LOW-CPU-TEST>600</RUNNING-AVE-WINDOW-FOR-LOW-CPU-TEST>
  </AGENT-POLICY>
```

Monitoring Your Distributed Tasks

To monitor the state of your distributed tasks:

Either:

Double-click on the coordinator icon  in your system tray

- or -

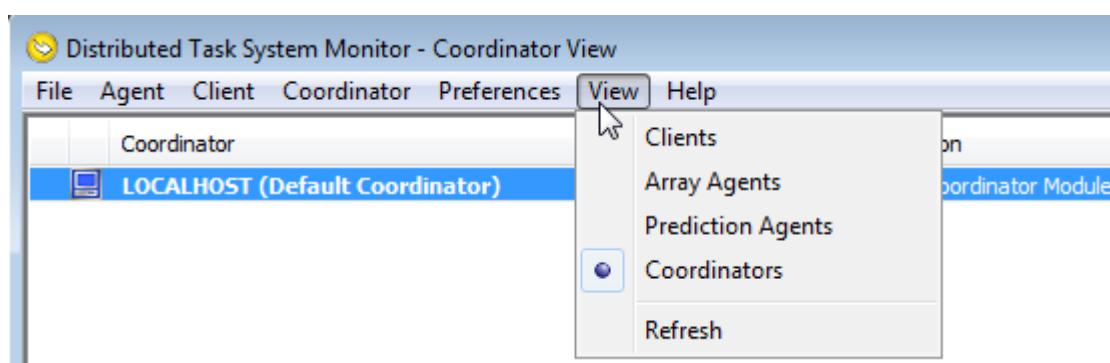
Right-click on the coordinator icon  in your system tray and on the menu that appears, click **Show Monitor**.

The **Distributed Task System Monitor** window appears.

From the **View** menu, four views are available in the **Distributed Task System Monitor** window, these are:

- Clients view
- Array Agents view
- Prediction Agents view
- Coordinators

Select the required view, as shown here:



Using the Clients View

To open the Clients view:

In the **Distributed Tasks System Monitor** window, from the **View** menu, click **Clients**.

The **Clients View** appears with any existing clients listed in it. For more information on controlling these agents, see Accessing Agent Options from the System Monitor on page 185.

You can change the order in which the columns appear in the window by dragging and dropping the column headers. This table describes what the columns are for.

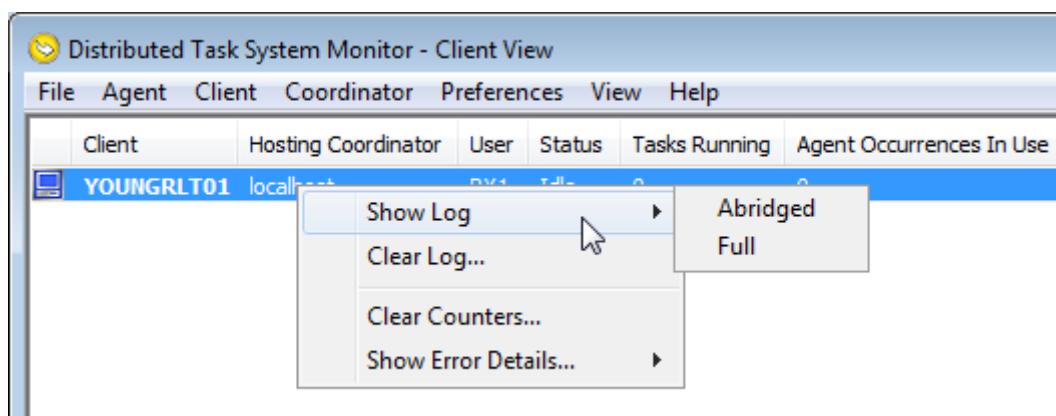
This column	Shows
Client	The host name for the client.
User	The ENTERPRISE user to which the process belongs.
Status	The current status of the client can be either: <ul style="list-style-type: none"> • Idle - the client is not active • Running Distributed Tasks - the client is active
Tasks Running	The number of tasks currently running on agents for this client.
Agent Occurrences In Use	The number of agent occurrences that this client is currently using.

This column	Shows
Successful Tasks	The number of successful tasks (of all types) completed since this client was connected.
Failed Tasks	The number of tasks (of all types) that have failed since this client was connected.
Tasks Queued	The number of tasks (of all types) queued at the Coordinator, ready to be sent to agents.
Versions	The ENTERPRISE versions on the client machine. Versions are shown separately for Prediction Generator and the Coverage (Array) Generator. Warning: For a client machine to get distributed tasks carried out on an agent machine, both machines must be running the same version of the software.
Process ID	An identifier that enables you to distinguish between instances of the client on the same host.
Large Array	Whether or not Large Array Support is enabled on the client machine.

Accessing Client Options from the System Monitor

To access options associated with a client:

Right-click on the client in the Clients View of the **System Monitor** window. A menu of options appears:



This table describes what the options are for.

Select This Option	To Do This
Show Log	Display the contents of the log file for the selected client, either in full or in abridged form.
Clear Log	Erase the contents of the log file for the selected client.
Clear Counters	Resets the numeric values in those columns that have them, to zero.
Show Error Details	See error text and error count. This option is accessible only if there are errors.

Using the Array Agents View

To open an Agent view:

In the **Distributed Tasks System Monitor** window, from the **View** menu, click **Array Agents**.

The **Agents View** appears with your agents listed in it. For more information on controlling these agents, see Accessing Agent Options from the System Monitor on page 185.

You can change the order in which the columns appear in the window by dragging and dropping the column headers. This table describes what the columns are for.

This column	Shows
Agent	The host name of the agent machine.
Status	<p>The current status of this agent machine. This can be:</p> <ul style="list-style-type: none"> • Offline - Not communicating with this coordinator (probably switched off). • Disabled at Agent - A user on the agent machine has disabled it. • Disabled at Coordinator - Disabled by an administrator via the System Monitor window. <p>Note: An agent machine that has been disabled remotely by an administrator cannot be enabled locally by a user.</p> <ul style="list-style-type: none"> • Unavailable - The agent is occupied with non distributed tasks. • Idle - Available but not processing distributed tasks as there is no compatible work to do. <p>Note: This status may arise because the agent machine is not running the same version of ENTERPRISE as the originating machine. For more information, see Versions later in this table.</p> <ul style="list-style-type: none"> • Running Prediction Tasks or Running Coverage Tasks - the agent is active processing the appropriate tasks. • Unlicensed / Error - The agent cannot get a licence or has another problem that is preventing it from communicating with the coordinator. Check the log file on the agent machine for diagnosis information. • Quarantined – The coordinator has decided not to send any more tasks to this agent because of repeated errors. To clear this status, restart the agent service on the agent machine or disable and then re-enable it. • Stopping – The agent is waiting for tasks to stop before entering another state. • Restarting – The agent has been asked to restart and is in the process of doing so. • Configuration Error – The agent is not correctly configured on the Agent tab of the Distributed Task Coordinator Options dialog box. Check that the password used in the Security pane of this dialog box is correct.
Agent Policy	<p>The behaviour of an agent machine when required to perform another task while processing a distributed task.</p> <p>For more information see Setting the Default Agent Policy on page 178.</p>

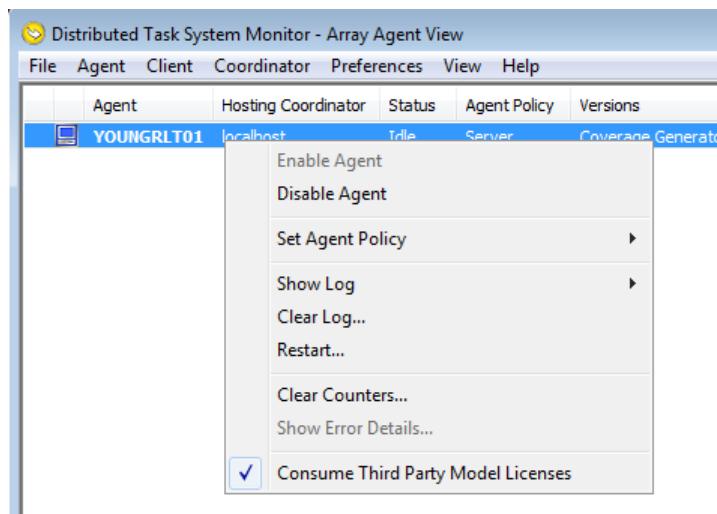
This column	Shows
Versions	<p>The ENTERPRISE versions of the occurrences available on the agent machine. Multiple occurrences are labelled as shown in this example:</p>  <p>The colour of the text in the Versions column indicates the status of the agent occurrence:</p> <ul style="list-style-type: none"> Blue - working Red - error <p>Warning: For an agent machine to be able carry out distributed tasks on behalf of another machine, both machines must be running the same version of ENTERPRISE.</p>
Threads in Use	The number of tasks currently being processed.
Working for Client	A list of client names that the agent is working for.
Working for User	A list of ENTERPRISE user names that the agent is working for.
Successful Tasks	The number of successful tasks (of all types).
Failed Tasks	<p>The number of fatally failed tasks (of all types).</p> <p>Note: This is the default setting. If you want to show all failed tasks, select the 'Collect Statistics about non-fatal agent errors' option in the Distributed Task Coordinator Options dialog box. For more information see Setting the Coordinator Options on page 177.</p>
Forced Resets	<p>The number of times that the agent machine has been re-started by the coordinator.</p> <p>Note: The coordinator restarts an agent if:</p> <ul style="list-style-type: none"> A task is taking too long to complete The agent does not respond to polls The agent "forgets" any tasks
Quarantines	<p>The number of times that the agent machine has been quarantined by the coordinator.</p> <p>Note: An agent machine is quarantined (that is, tasks are no longer sent to it) if it continually fails to accept tasks.</p>
Orphans	The number of times that the coordinator has identified tasks belonging to an agent which no longer exists, for example because the agent machine has crashed. Such tasks are automatically resubmitted for processing elsewhere.
CPU Speed	The processor speed of the agent machine.
Installed RAM	The total amount of random access memory on the agent machine.
Disk Space	The total disk space on the agent machine.
	Warning: This is not the available disk space.
Installed Processors	The number of processors that the agent machine has.

This column	Shows
3rd Party Models	<p>Whether or not an agent machine is licensed to use one of the third party propagation models which are licensed via the TEOCO licensing system.</p> <p>For example, if you have ten ASSET licences and one Wavecall licence, you can normally control which machine uses the Wavecall licence with the Get and Drop Licence functions of the Using License Administrator. However if you are using Distributed Tasks, the Licence Administrator is not available on the agent machines.</p> <p>So, to assign the Wavecall licence (or any other third party model licence) to an agent machine:</p> <p>In the Distributed Task Coordinator Monitor window, right-click the line relating to the appropriate agent machine, and select 'Consume Third Party Model Licences'.</p>
Threads	The number of tasks that can be processed concurrently.
Thread Priority	The priority of the thread arising from the agent policy. This can be Low, Normal or High.
Large Array	Whether or not Large Array Support is enabled on the agent machine.
Last Started	The date and time when the agent machine was last started.

Accessing Agent Options from the System Monitor

To access options associated with an agent:

Right-click on the agent in the Agents View of the **System Monitor** window. A menu of options appears:



This table describes the options:

Select This Option	To Do This
Enable Agent	Make the selected agent available for the processing of distributed tasks.
Disable Agent	Make the selected agent unavailable for the processing of distributed tasks. Note: An agent that has been disabled from the coordinator cannot be enabled from the agent machine.
Set Agent Policy	Set the required behaviour of the selected agent machine. For more information on the options available, see Setting the Default Agent Policy on page 178.
Show Log	Display the contents of the log file for the selected agent, either in full or in abridged form.
Clear Log	Erase the contents of the log file for the selected agent.

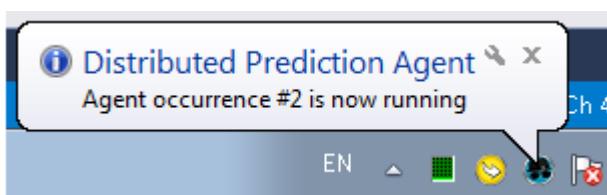
Select This Option	To Do This
Restart	Start the selected agent again.
Clear Counters	Reset statistics on such processing events as successes, failures and restarts.
Show Error Details	See error text and error count. This option appears only if there are errors.
Consume Third Party Model Licences	Enable the selected agent machine to consume licences for third party propagation models. For more information, see '3rd Party Models' in Using the Agent View.

There are also a number of options available from the **Agent** menu that enable you to perform actions for all agents of the selected type, rather than individual agents. The **Agent** menu provides these options under two sub-menus, one for Array agents and one for Prediction agents:

- Retrieve All Logs
- Clear All Logs
- Clear All Counters
- Restart All

Monitoring the State of Agent Occurrences

When an agent service occurrence starts, stops, connects to or disconnects from the Coordinator, a balloon popup appears, as shown in this example:



At any other time you can see the current state of the set of agent occurrences under the control of an agent icon.

To do this:

Position the mouse pointer over the agent icon.

A message appears, summarizing how many occurrences are installed; running, connected, actively working on tasks and so on, as shown in this example:



An overall status is also indicated:

- If none of the associated agent occurrences are currently working on tasks, the message will show the status as 'Idle'
- If any of the associated agent occurrences are currently working on tasks, the message will show the status as 'Working'
- If the agent has been disabled from the Coordinator Monitor, the message will show the status as 'DISABLED at coordinator' (the agent icon will also appear with a red half-cross in this case)
- If the agent has been disabled from the agent icon, the message will show the status as 'DISABLED at agent' (the agent icon will also appear with a red half-cross in this case – the same as appears when the agent has been disabled)
- If none of the associated agent occurrences are currently connected to the coordinator, the message will show the status as 'OFFLINE' (the agent icon will also appear with a

red half-cross in this case – the same as appears when the agent has been disabled from the agent icon or the Coordinator Monitor)

- If none of the associated agent occurrences are currently running, the message will show the status as 'STOPPED' (the agent icon will also appear with a red full-cross in this case).

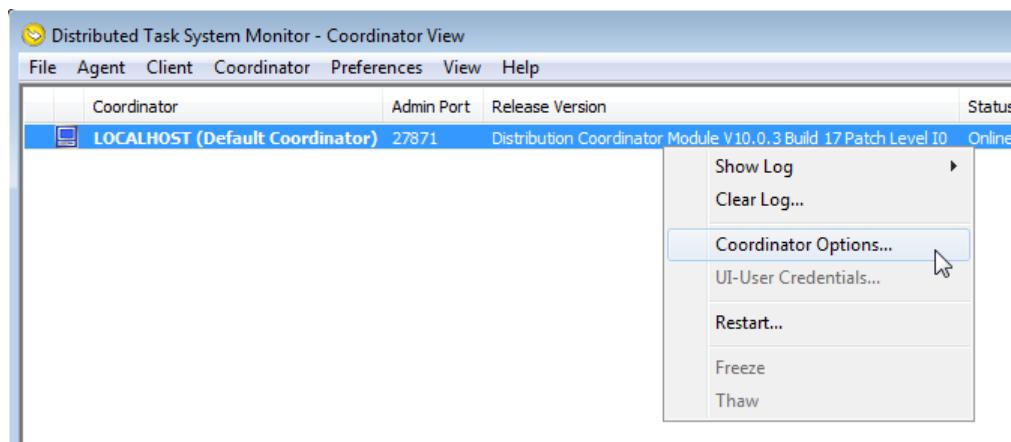
Using the Coordinators View

To open the Coordinators view:

In the **Distributed Tasks System Monitor** window, from the **View** menu, click **Coordinators**.

The **Coordinators View** appears with your coordinators listed in it and the status of them shown.

To access options associated with a coordinator displayed in the Coordinators View of the **System Monitor** window, right click on it. A menu of options appears:



This table describes what the options are for.

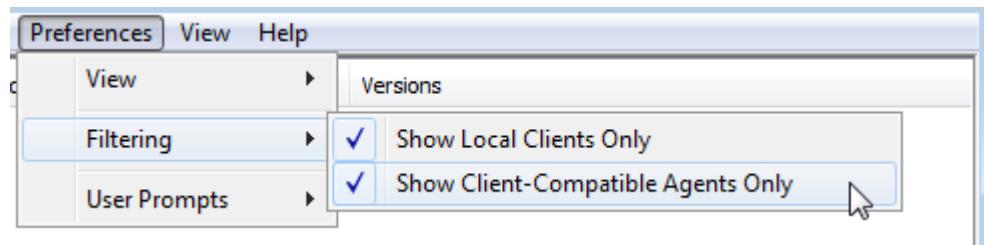
Select This Option	To Do This
Show Log	Display the contents of the log file for the selected coordinator, either in full or in abridged form.
Clear Log	Erase the contents of the log file for the selected coordinator.
Coordinator Options	Open the Distributed Task Coordinator Options dialog box for the selected coordinator. For more information, see Setting the Coordinator Options on page 177.
UI-User Credentials	Enter a user name and password for permission to access the coordinator if such permissions have been set up on the User Interface tab of the Distributed Tasks Coordinator Options dialog box. For more information, see Setting the Coordinator Options on page 177.
Restart	Restart the currently selected coordinator.
Freeze	Take the agents associated with the currently selected coordinator off-line.
Thaw	Bring the agents associated with the currently selected coordinator back on-line.

Filtering Views

You can filter the information displayed in the **Distributed Task System Monitor** window.

To filter your views:

1. From the **Preferences** menu, select **Filtering**. The filtering options appear:



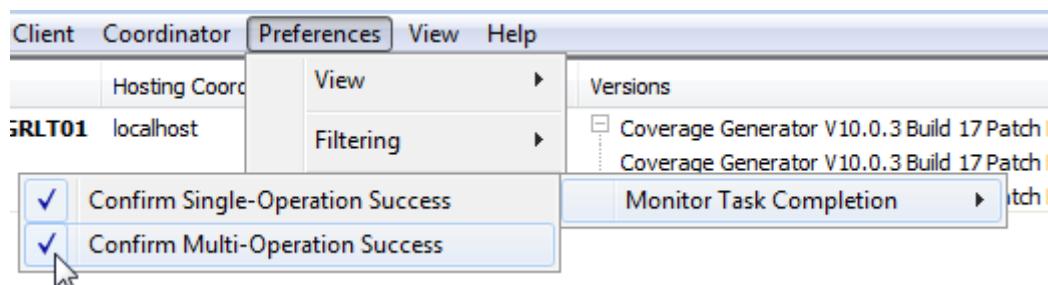
2. Select the required options. The display is updated to reflect your choices.

Controlling User Prompts

You can control which prompts concerning task completion are displayed to users.

To select user prompts:

1. From the **Preferences** menu, click **User Prompts**.
2. Click **Monitor Task Completion**. The task completion notification options appear:



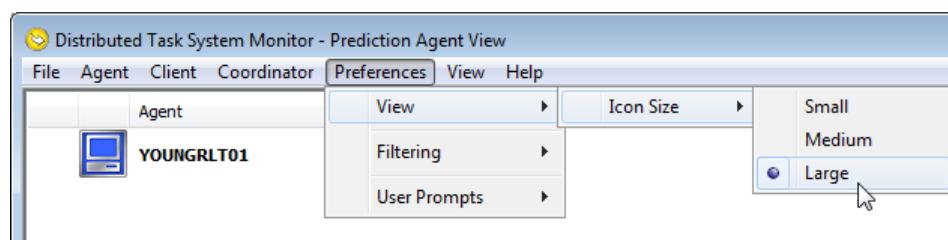
3. Select the required options.

Setting Icon Sizes

You can choose to have small, medium or large icons in your **System Monitor** views.

To choose the icon display size:

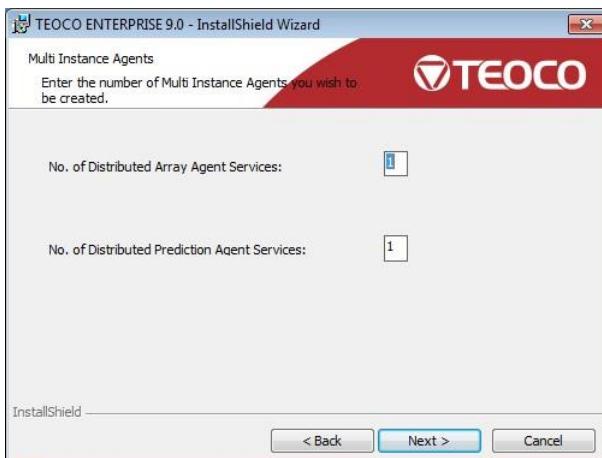
1. From the **Preferences** menu, click **View**.
2. Click **Icon Size**. The available icon sizes appear:



3. Select the required option. The display is updated with your chosen icon size.

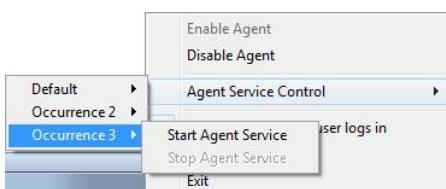
Using Multiple Agent Occurrences on a Machine

You can configure an agent machine to have up to 99 occurrences of Distributed Array agents and up to 99 occurrences of Distributed Prediction agents. You can do this when you install ENTERPRISE as shown in this picture:



Note:

Once installed, you can control the Windows service associated with each agent occurrence by right clicking on the appropriate Distributed Agent icon for Predictions or Arrays in the System Tray. From the menu that appears, you can click Agent Service Control, select the required occurrence, then click **Stop Agent Service**, or **Start Agent Service** as required:



You can move your cursor over the agent icons at any time to display the agent status, as shown in this example:

Distributed Prediction Agent V9.1.0 - Working (all 3 installed occurrences active)

Warning:

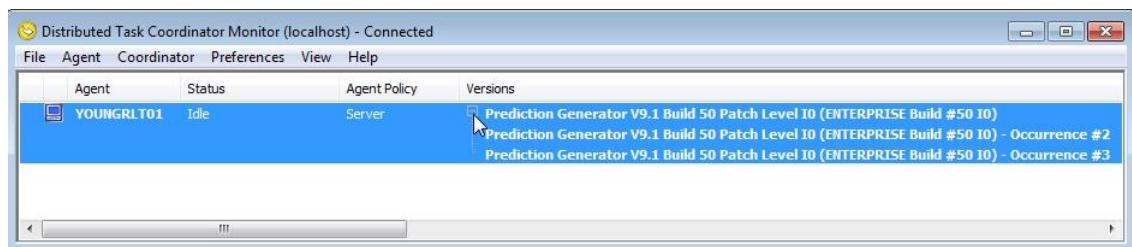
Ensure that sufficient agent ports are available for additional agent occurrences. If there are not enough ports, some occurrences will fail to connect to the Coordinator. For more information on assigning ports, see Firewall Port Details.

Having added new agents, you will be able to see them in the Distributed Task Coordinator Monitor.

To do this:

1. Double-click the Distributed Task Coordinator Monitor icon in the System Tray. The Distributed Task Coordinator Monitor window opens.

2. Click on the plus icon by the first instance to expand the view and show the additional instances. This picture shows an example:



You will also be able to see your new agents in Windows Services.

To do this:

1. Click **Start**.
2. Click **Control Panel**.
3. Click **Administrative Tools**.
4. Double-click the **Services** short-cut.

The **Services** window appears and the agent service instances are listed as shown in this example:

Distributed Predictions Agent Service 9.1	Runs pathloss prediction calculations...	Started	Automatic	Local System
Distributed Predictions Agent Service 9.1 (occurrence #2)	Runs pathloss prediction calculations...	Started	Automatic	Local System
Distributed Predictions Agent Service 9.1 (occurrence #3)	Runs pathloss prediction calculations...	Started	Automatic	Local System

Troubleshooting Distributed Tasks

If you are having difficulties with Distributed Tasks, ensure that:

- For the required user, the **Enable Distribution** option is selected on the **Distributed Predictions** tab and/or the **Distributed Arrays** tab of the **User Properties** dialog box in ENTERPRISE Administrator. See Setting Distribution Permissions for Clients on page 173.
- ENTERPRISE can locate the Distributed Task Coordinator. For more information, see Configuring Coordinator Targets on page 170.
- A licence for the required type of distributed tasks (predictions or arrays) is available.
- You have supplied the Domain, User Name and Password in the **Security** pane on the **Agent** tab of the **Distributed Task Coordinator Options** dialog box. For more information, see Setting the Coordinator Options on page 177.
- The Coordinator Service is running. To check this go to start/Control Panel/Administrative Tools/Services and make sure that there is a service called Distributed Task Coordinator Service and that it has a Status of Started.
- The ports specified on the **Network** tab of the **Distributed Task Coordinator Options** dialog box are open in Windows Firewall. For more information, see Setting the Coordinator Options on page 177.
- You check the error logs for messages that may indicate what the problem is. The relevant log files are called Coordinator.log and DistrAgent.log. The default location for these files is C:\Program Files\TEOCO\ENTERPRISE 10.0\Common\logs.

Also see Hints and Tips for Distributed Tasks on page 191.

Hints and Tips for Distributed Tasks

These hints and tips may provide some useful general guidance. But if in doubt, please contact Product Support.

- File storage relating to created predictions or arrays is automatically managed within ENTERPRISE by a caching algorithm. As a vital input to this algorithm, you must set the *maximum disk space* for the storage of these files, for the prediction folder and output array folder, which are specified on the Shared Data Directories tab of the Project Settings dialog box. For more information, see 'About the Shared Data Directories Tab' and 'About the File Caching System for Predictions and Arrays' in the 'Setting up a Project' chapter of the *ENTERPRISE User Reference Guide*.
- Coverage calculations are different in nature to predictions in terms of the machine usage characteristics. Predictions are dominated by CPU speed, whereas coverage is dominated by network throughput. Therefore, specifically for array agents:
 - For the best calculation times, ensure the array agents can access the prediction and array folders with the best performance network possible.
 - For the best access to the final results, ensure the best network speed between the output array folder and the machine running ENTERPRISE.
- After the distributed coverage has completed, it may speed up later operations (such as rendering the arrays on the Map View) if the coverage arrays of interest are first saved to a 3ga file local to the machine running ENTERPRISE. To do this, locate the appropriate arrays in the **Array Manager** dialog box, and save to a local 3ga file (no need to delete and reload the file). For example, this could be beneficial for large arrays and low Large Array Support settings (say 200 MB), where swapping from the output array folder across the network may be slower than a local file.
- Machines can have a prediction agent and an array agent installed at the same time. They will compete for machine resources, but neither uses a lot of RAM. As prediction is CPU dominated and coverage is network throughput dominated, together they will use the machine well.
- As with predictions, requested coverage calculations may already exist and be up-to-date. This helps to deliver the final results quickly without calculation. Therefore, if users share an output array directory, then one user's coverage may help other users.
- The Signal Coverage wizard for GSM, UMTS and LTE provides a 'Max Nth Required' parameter for the number of server layers you want to display. Do not set this value to a greater number than the Nth layer that you wish to see (there is no need for any 'extra margin').

8 Network and Project Configuration Methods

This chapter suggests a number of ways to configure an ENTERPRISE system. These are intended as a guide to possible configurations, not as detailed network designs.

Deciding on Your Network Setup

ENTERPRISE stores its data in Oracle databases.

You can achieve improved performance if you separate the various serving aspects between several machines, that is, use file servers for prediction and mapping data, and use a dedicated server for the ENTERPRISE database. This however could increase the associated installation costs.

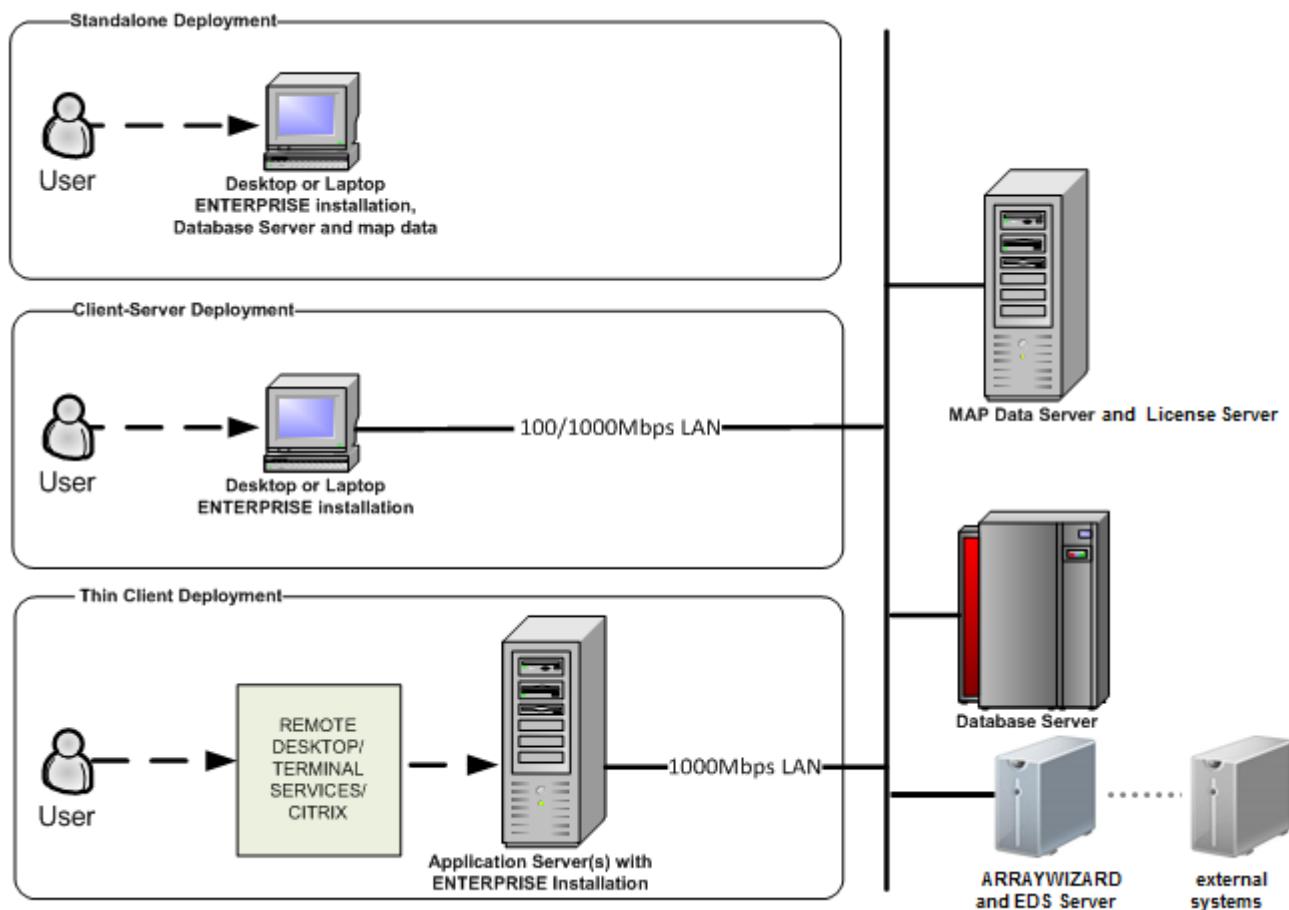
When deciding which setup to choose you should consider:

- Company structure - do you have a central engineering group or decentralised regional offices?
- Network infrastructure - LAN and WAN network bandwidth and latency
- The hardware and software available
- IT and administrative considerations

The configurations described here assume that no existing Windows Server (used for user account management) or corporate database server exists. Where these do exist, the configurations will need appropriate modification.

Different ENTERPRISE Configurations

Different configurations are necessary to make best use of the ENTERPRISE suite under different conditions. We are always happy to work with our clients to develop the best solution to meet the technical needs of their organisation and make optimum use of existing infrastructure and equipment. For further information, contact Product Support. This diagram illustrates the three possible types of deployment architecture:



ENTERPRISE Deployment Architectures

Standalone System

This is the simplest configuration consisting of a PC running the RDBMS database and ENTERPRISE.

Network Configuration

There are three recommended options for ENTERPRISE network configuration. These are to have:

- Central Oracle/file servers with ENTERPRISE software running on remote clients.
- ENTERPRISE software running on centralised application processors running Windows Server with Terminal Services (also known as Remote Desktop Services).
- ENTERPRISE software running on centralised application processors running Windows Server with Citrix XenApp.

Note: For a list of the tested configurations for this ENTERPRISE version, see the 'Product Downloads' page on the TEOCO Resource Center web site (at resources.teoco.com).

It is also possible to have a mixed configuration with local users accessing central Oracle and file servers, and users with slower WAN access using Citrix or Terminal Services.

Benefits of Citrix and Terminal Services

Some of the advantages of Citrix and Terminal Services implementations are that they:

- Are supported on high latency/low bandwidth WAN (or even modem) links
- Provide planning capabilities for users on PCs with minimal memory or processors
- Allow related third party products such as MapInfo software to be shared and accessed on the same server cluster
- Facilitate upgrades and patches
- Enable Technical Support to share user sessions and troubleshoot problems or show how features can be used

The choice of access method is likely to be driven by IT policies as much as technical merit, but the particular benefits associated with each of these two methods are as follows.

Why Use Windows Server Terminal Services?

Using Terminal Services to access ENTERPRISE gives you these advantages:

- All the main functions required for a centralised ENTERPRISE installation (such as load balancing and the mapping of local drives and printers) are provided
- There is a single source of software and technical support
- It should be cheaper than a Citrix based solution

Why Use Citrix XenApp?

Using Citrix XenApp to access ENTERPRISE gives you these advantages:

- It is a well established method, ENTERPRISE customers have been using Citrix based installations since 2002
- It provides more client options (including PDAs and Unix)
- It easily enables secure remote access

Please contact Product Support for further information on configuring Citrix based installations.

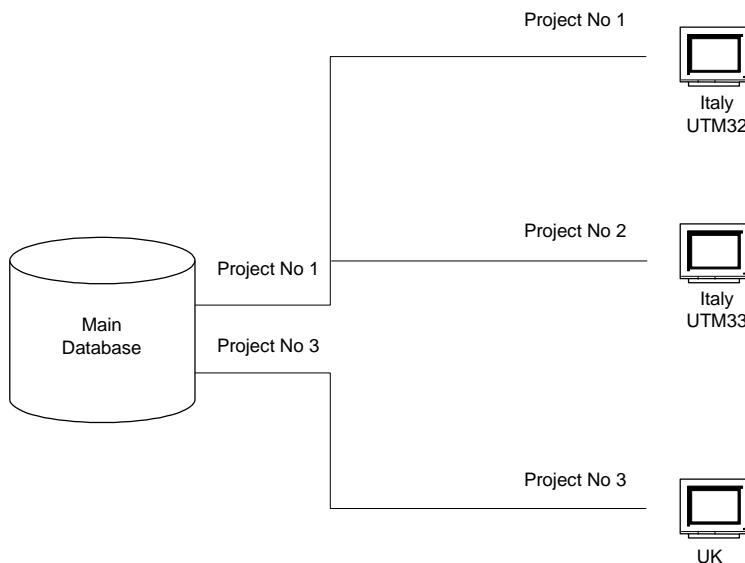
Project Configurations

The different scenarios of database management are described in this section.

ENTERPRISE supports an unlimited number of projects per database installation. Projects can be defined to contain data that relates to different countries, regions within the same country or even multiple networks from the same country. Each project can be optionally defined to use different mapping data, prediction files and co-ordinate systems.

Projects work either independently or together. ENTERPRISE copes with this by prefixing all database table entries with the corresponding project number.

This concept is explained in this diagram. Three projects exist, the first two being Italy UTM32 and Italy UTM33 which share project data, whereas the UK project is separate.



Project Data Sharing

Deleting Project No 2 will not delete project data, whereas deleting Project No 1 will leave project 2 empty. This is due to Project No 1 being the master database and Project No 2 just a reference.

Single Project

Characteristics of this system are that:

- Mapping data for a particular country or area can be contained within a single projection or zone
- An entire database is contained within one project
- A global view of the network is provided so that for example you can perform a plot of the entire network
- Global parameters are easy to manage

Region Loading (Site Region Load)

If you have large numbers of sites in a project, you may want to load only sites in a specified region, which can be either a polygon or rectangle. By loading a subset of site data, ENTERPRISE can run faster.

When you open the project, the title bar indicates that you have a region loaded. The project will contain:

- All 'Committed' network elements (sites, nodes, links, repeaters and so on) that are inside the region you have chosen
- All 'Applied-only' network elements (sites, nodes, links, repeaters and so on) relating to the individual user, regardless of the chosen region
- All hierarchy-related MSCs and BSCs, WMSCs, RNCs, SGSNs, CDMA MSCs, CDMA BSCs and the Properties they are on, regardless of the chosen region

A possible strategy is to have one main project where all the sites are visible and a number of sub-projects each with different load areas.

For full information on loading a region, see [Setting Up Projects](#) on page 61.

Multiple Projects - Shared Data

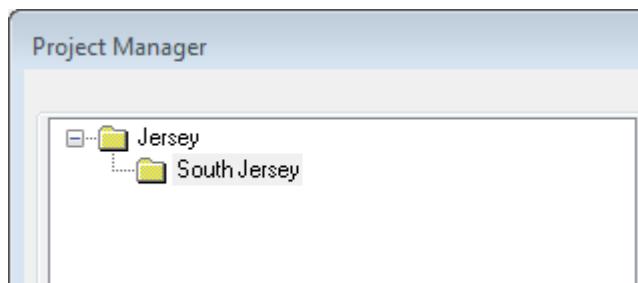
Sometimes it is necessary or advisable to create separate projects that share the same fundamental project data and use the same database. For example, you might need to do this because of map projection constraints or multiple incompatible map data types.

Map Projection Constraints

If a network spans over a large country or area and the map data cannot be contained/obtained with a single projection or zone, multiple projects will have to be created to accurately model the site co-ordinates.

Characteristics of this system are:

- Shared projects are shown as subprojects in the **Project Management** dialog box:



- The entire database can be viewed from any project.
- A global view of entire network; for example, you can perform a plot of the entire network, however invalid results may occur when viewing things, such as coverage or sites, in the wrong projection or UTM zone.
- The ability to work in the transitional regions between two projections or zones.
- A more complex project usage since users must ensure they are using the correct map data. It can be changed in the Project Settings dialog box as usual.

Note: Modifying site locations or adding sites whilst using the wrong map projection or beyond its validity may cause inaccurate results.

Multiple Incompatible Map Data Types

You may need to use multiple projects with shared data when you wish to use different mapping data for the same area. For example, if you obtained clutter from different map data vendors, you will probably have different morphology classes.

Note: ENTERPRISE directly supports multi-resolution mapping and so does not require separate projects.

Characteristics of this system are:

- The entire database can be viewed from any project
- Ability to use two or more different sets of mapping data

Multiple Projects - Separate Data

You can have different projects for different regions, but you may not need to do this because you can use the same project but choose to load only the data applicable to your area using the **Region Load** tab.

You may want to have multiple projects and separate data in cases where:

- The network(s) is spread over different countries or areas too far from each other to make the shared tables option feasible
- You want to physically separate the database into regions but at the cost of isolating the individuals

Note: Although separate projects enforce regionalisation, this method should not be used in the place of database groups. Adequate security can be obtained by suitable definition of user and group permissions.

Project Folder Structures

This section describes possible folder structures for projects.

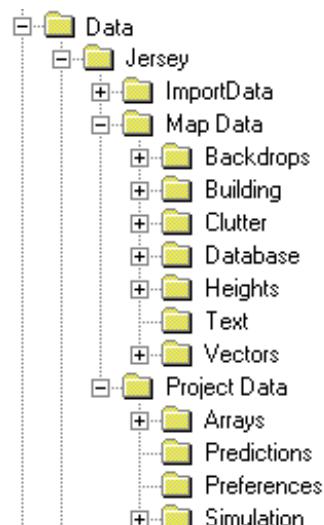
The location of mapping data and prediction files is dependent on a number of factors:

- Database configuration
- Project configuration
- Hardware specifications, for example the available hard drive space on each PC
- Complexity of configuration

This section on project folder structures should be used as a guideline only. There are no definite requirements that prevent you from diverging from these recommendations but if your project is new they will form a good starting point upon which to build.

We recommend configuring a file server to share a folder called ENTERPRISEDData. Each client PC can then refer to that machine using either the UNC path for example, \\servername\ENTERPRISEDData or by mounting the share as a permanent network drive.

The following picture shows a suggested structure created beneath the ENTERPRISEDData share replacing the country names with those applicable to your project.



Suggested directory structure for a network share

Map Data

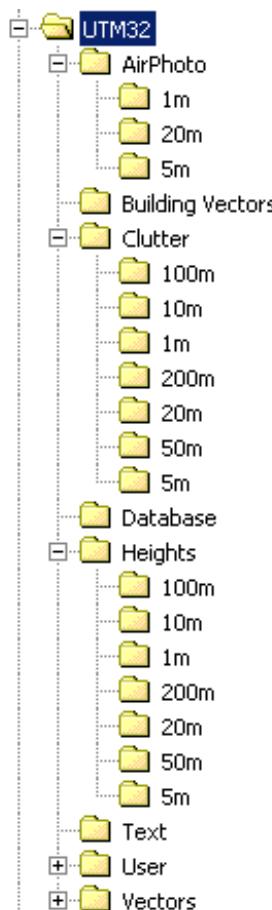
It is important to have a sensible directory structure for map data. Filename conventions can help minimise potential problems and simplify administrative tasks.

Defining a Directory Structure

In defining a directory structure it is important not to have numerous files stored in one directory as this slows down data retrieval and therefore ENTERPRISE performance.

The directory structure should allow and logically store many map data projections simultaneously:

- In the case of a country covering more than one projection or zone, for example, UTM32 and UTM33, multiple mapping datasets will be required. If national coverage plots are necessary, then the whole territory in the most significant map projection zone must also be obtained. However, this may not be feasible for a large country spanning numerous zones.
- In the case of just having one set of mapping data the example shown below is still applicable but taking just the one subset for example, if the country was covered by only UTM32.
- In the situation of having different projections or sets of mapping data, the directory structure shown here still applies.



Example map data directory structure

Points to note about the structure shown include:

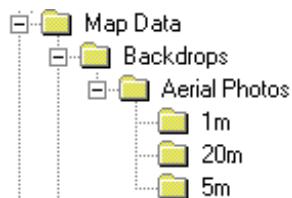
- The first level distinguishes between the various projections
- The next separates the different data types
- Where data is of multiple pixel sizes, this is divided in directories named as the pixel size but using a four-digit number padded with zeros

Note: Although it is advisable to cache local copies of the frequently used map data on the client PCs, the actual structure should be as close as possible to that used on the server. If User Vectors are to be shared across the project they should always be located on the server machine because they are the data that most frequently get updated.

Storing Backdrops

To take full advantage of the Visibility Settings feature, you should store backdrops using:

- A folder for each resolution used (1m, 5m, 20m and so on) as shown here:



The main folder, Aerial Photos, is the one that you specify on the Map Data Directories tab of the Project Settings dialog box.

- A top level index file which references the sub-folders, so for the example shown, the index file in the Backdrops folder would contain only 20m\, 5m\ and 1m\
- An index file in every sub-folder which lists the images in it. For example, the index file in the 20m sub-folder might look like:

55354545.bmp 553500 554500 5454500 5455500 20

Note: Any sub-folders immediately below the Backdrops folder support spaces in their filenames (first level index file) but any further sub-folders do not.

Storing the Map Data

You can store mapping data:

- On a server. This is economical on hard disk space and administration is straightforward. However, since the mapping data must be loaded from the server, performance is compromised.
- On each local PC. This allows optimal performance but requires more hard disk space. Administration can be more complex because if the mapping data is modified or edited it will have to be modified on all the local PCs.

Many corporate users of ENTERPRISE adopt a compromise by locating very large or infrequently accessed data sets on the server while having for example heights, clutter and system vectors on each local machine.

During project setup you can identify where map data is stored and so distinguish between server and local machine data. It is advisable to keep local machine data at the same location on all clients as this allows the storage of local paths as system wide settings.

Using Filename Conventions

A filename convention should allow easy identification of the properties of the data type and should not be restricted to a traditional MS-DOS 8.3 filename. However, spaces and special characters should be avoided. Underscores or mixed cased letters could be used consistently to separate meaningful names. The following convention is recommended for the raster data formats, that is, heights, clutter, building rasters, and backdrops (such as aerial photographs or scanmaps):

TTZZ±EEEE±NNNN.XXXX.ext

Where:

TT is the data type (ht for height, cl for clutter, br for building rasters, bd for backdrops)

ZZ is the projection zone number if applicable

EEEE is the first four significant digits of the EastMin co-ordinate

NNNN is the first four significant digits of the NorthMin co-ordinate

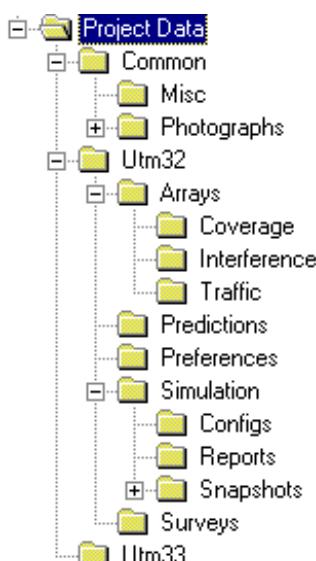
XXXX is the zero padded four-digit number that corresponds to the pixel size for example, 0050 for 50m data

ext is the file type extension (bin for general binary data, bmp for image type data)

In the case of the remaining data no fixed naming convention is proposed, but it is recommended that the filename allows for easy grouping into classes when sorted alpha-numerically. A possible suggestion could be using a two-digit code denoting the source of the data, followed by a meaningful description using the mixed case method to separate words without spaces.

Project Data

It is important to note that if multiple map data projections exist for the project then data created by users will need to be divided into directories that correspond to those projection names. However, there will be data such as photographs that are projection independent and so will be stored in the Common directory as can be seen in this diagram:



Example project data directory structure

Common Photographs

Photographs should be divided into those needed for equipment and those that correspond to network elements.

It is suggested that the Network Elements directory mimics the real life network structure as close as possible to allow easy hierarchical identification.

Projection-Specific Arrays

Any public coverage, interference and traffic arrays that are created and stored to disk should be stored in the Arrays folder.

Projection-Specific Preferences

The preferences can be stored on either the server or on the client PCs. Placing the preferences on the server lends itself well to the concept of having a common set of preferences. However, take care when creating preferences especially when you have many users. This could cause a very long list of preferences to build up most of which will not be relevant to the majority of users.

Preferences stored on a client PC will be seen only when using that PC.

Preferences are sometimes map projection-specific since they can store geographical co-ordinates within them in grid format.

Projection-Specific Prediction Files

It is recommended that prediction files are stored on a server. If there are multiple projects, there should be one directory per project storing this data.

In the case of a large country or area where the mapping data covers more than one projection or zone as described in Multiple Projects - Shared Data, there should still be one directory per project. However, the sites near the border region need to be predicted in both projections and zones so that their coverage can be seen in both projects. For example, viewing the coverage for an entire country or area spanning more than one projection or zone it is recommended that you calculate predictions for all the sites in the most significant projection or zone.

Projection-Specific Surveys

Both CW and Testmobile data can be map projection specific if the data is not recorded in Longitude / Latitude. If the data is in grid format then it will be necessary to store them beneath the projection data folder.

9 Deploying ENTERPRISE in a Citrix Environment

In general, the steps necessary to install ENTERPRISE under Citrix are largely the same as for a single machine. However the following factors must be considered when dimensioning and deploying ENTERPRISE products in a Citrix environment.

For further information on the use of Citrix, see the Citrix user documentation.

Dimensioning User Numbers

RAM requirements for ENTERPRISE depend on the type of user. There are usually three types of user: Optimisers requiring 1 GB each, Planners requiring 2 GB each. Every user requires one thread or vCPU each per session.

Creating a DataStore Database

A Citrix Farm requires a DataStore database with which servers will communicate to retrieve system and licence information. Two types of database are suitable for the DataStore database. This table shows which type is appropriate under what circumstances.

This type of database	Is suitable for
SQL MSDE (Microsoft SQL Desktop Edition)	A single server.
Oracle	Citrix farms of two or more servers. Oracle Client/Server must be installed on each Citrix Server for connectivity to the Oracle database. The Oracle database can be installed on the Citrix Controller or a Unix server. If you are already running an ENTERPRISE database you can either create a new database or use your existing one.

To create a DataStore database with Oracle:

1. If you do not already have Oracle installed, install it using the default database.
2. On the Oracle server, run SQL Plus. At the connection prompt, type internal.
3. Use the following commands as guidelines for creating a tablespace and user:

```
create tablespace MFXPIMA datafile
'D:\ORADATA\MFXPIMA.DBF' size 5000k autoextend on next
5000k maxsize unlimited;
create user MFXP identified by MFXP01 default tablespace
MFXPIMA temporary tablespace TEMP;
grant connect, resource to MFXP;
```

The tablespace is named MFXPIMA and saved in D:\ORADATA\MFXPIMA.DBF. The user is named MFXP and has the password MFXP01. Temp is the default temporary tablespace for Oracle.

This Database should be backed up on a monthly basis, see the Oracle DBA or associated support person to enable this process.

Installing Software and Patches Across Multiple Blades

You can use Citrix Studio to roll out applications across multiple blades. The application being published must exist on at least one server in the farm, but does not need to exist on the server where the installation manager is run from.

Citrix Load Balancing

Citrix is able to balance the load across the individual application servers within a farm. This ensures that processing load is spread evenly amongst every server within the application farm. It is accomplished using load evaluators which run on each individual server. These report the load of each server back to a central data collector which subsequently creates a performance index for each server. As connection requests arrive they can be routed accordingly.

Publishing ENTERPRISE to Your Citrix Environment

The procedure for publishing ENTERPRISE requires that you have:

- Installed ENTERPRISE on a Citrix server. For more information, see [Installing ENTERPRISE](#).
- Installed Citrix Xenapp.
- Created a machine catalogue. A machine catalogue enables you to form groups of Virtual Machines on which applications are executed.
- Created a delivery group. A delivery group allows you to control access to applications by selecting from a machine catalogue those machines to which applications are to be delivered.

For further information on the last three points, see the Citrix user documentation.

With these prerequisites in place you can publish ENTERPRISE to your Citrix environment.

To publish ENTERPRISE:

1. Open Citrix Studio.
2. Open the **Applications pane**. Any already published applications are displayed. This picture shows an example where **Calc** and **Notepad** have been published:

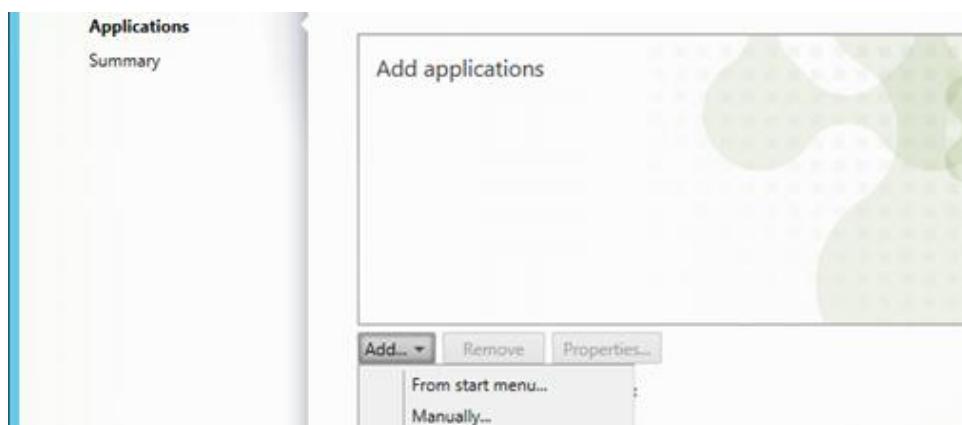
Name	Source	Status
Calc	Master Image	Enabled
Notepad_Chris	Master Image	Enabled

3. In the **Actions** pane on the right, click **Add Applications**. The **Add Applications** page appears:

Name	Machines
TEST_GRP	1

4. Select the delivery group to which ENTERPRISE will belong.

5. Click **Next**. The **Add applications** pane appears:



6. Click **Add**. A drop-down list of options appears.
7. Click **Manually**. The **Add Applications Manually** page appears.
8. Specify the required details. This picture shows an example taken at version 9.1:

Add Applications Manually

Add an Application Manually

You can add applications from the virtual machine in this Delivery Group or from a different network location.

Path to the executable file:

Browse...

Command line argument (optional):

Working directory:

Browse...

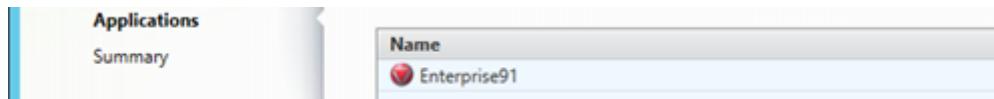
Application name (for user):

Application name (for administrator):

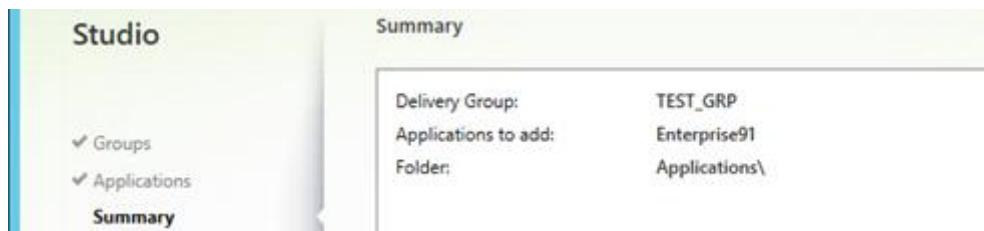
OK Cancel

Important: Ensure that you specify **Common** as the working directory.

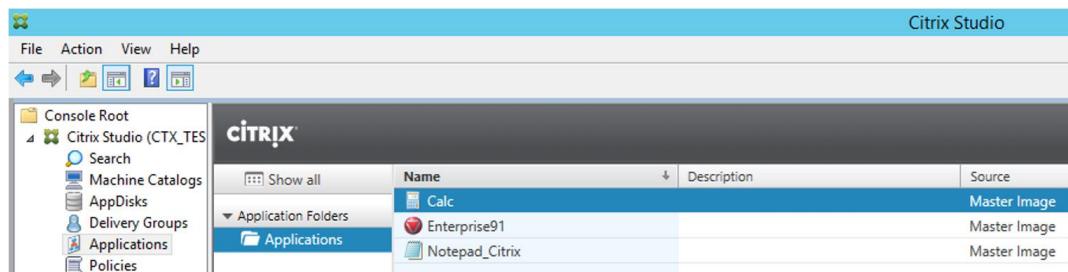
9. Click **OK**. Enterprise is listed as the application to be published:



10. Click **Next**. A summary showing the application to be published and the group and folder to which it will belong appears:



11. Click **Finish**. ENTERPRISE is published and becomes available in the **Applications** pane:



Configuring for Optimum ASSET Performance

The following tips will help you to optimise your installation of ASSET.

1. Dimension your projects so that you only load what you think you are going to use. Try to avoid overly large projects with more than 30,000 sectors.

The use of regional load will result in significant improvements to your load time and tool performance. It will give you a better return on investment on your Citrix deployments.

2. Frequently housekeep and optimize your database.

Unless you have a very small dataset the database will perform better if you frequently run statistics analysis. You can easily schedule a script to perform this overnight. Consider optimizing your tablespace and index management, move some of the high volume tables to a different storage area.

3. Turn off features such as the Large Array Support Swapping System within the project if you are not going to be doing large array calculation. You can access this option from the **File** menu.

Large array support consumes memory to facilitate paging and swapping. This reduces the available memory for ASSET so it is better to enable the feature only when it is required.

4. If you are doing a large commit all, turn off the auto-refresh feature.

Auto-refresh occurs every time an object is committed to ensure that your data is up to date in a multi-user environment. It can have a negative effect if you are committing a large number of objects, it is sometimes quicker to restart the project after the commit all.

5. Optimize the structure of your filters.

Configure your filters such that the most selective rules based on object type appear first. If possible, put object in polygon rules last, as these take the longest to evaluate.

6. Ensure that you have map data that is appropriate to the view resolution.

Asking the tool to decimate 5m map data to 50m will slow it down.

7. Configure your prediction radii with care.

Setting too large a prediction radius across the board is wasteful and can have a huge affect on the prediction performance. Use the Maximum Prediction Radius Calculator to configure a sensible area automatically.

8. Never run ASSET on the same machine as your database.

Oracle is resource hungry and will compete with ASSET for CPU time. Your projects will perform much more quickly if you can access your database over a local area network. Avoid connecting to your database over a wide area network or an Extranet otherwise you will incur latency penalties.

9. Avoid creating XML exports for which any one file is greater than 1mb, otherwise they can take a long time to import.

When exporting XML files, use the options button available to configure split file size. This is most appropriate for network elements such as sectors, sites and properties. Choose 64,000 per file which is roughly 1Mb.

10 Managing Licenses

The procurement of licenses for ENTERPRISE installations will normally be carried out by you, the administrator, on behalf of numerous users with a software-based system called SafeNet Sentinel. Your order for ENTERPRISE will entitle you to a number of licenses which you can procure using the License Fulfilment Wizard provided.

About License Management

You will need to generate lock codes in order to use licenses. For more information see Generating Lock Codes.

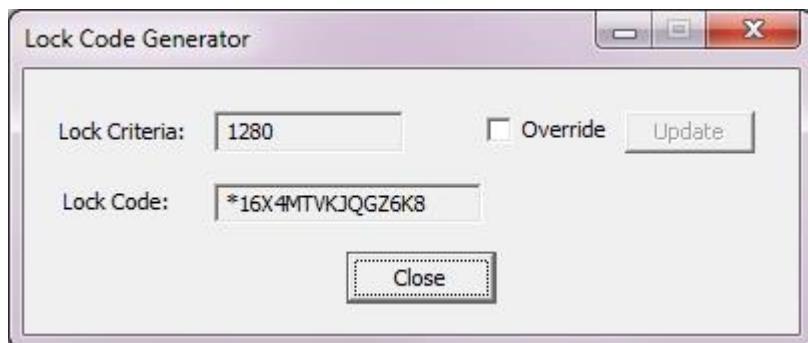
To use network licenses you must create a software license server. You can do this before installing ENTERPRISE if you wish. For more information see Installing a Software License Server on page 210.

Generating Lock Codes

You will need a lock code for each machine on which there is a stand-alone installation of ENTERPRISE and for each machine that is to be used as a network server. The lock code must be created by running the Lock Code Generator on each user machine and/or each network server.

To do this:

1. Click on Start/TEOCO/Locking Code Generator. The **Lock Code Generator** dialog box appears and a lock code is generated automatically.
2. Make a note of the code displayed in the **Lock Code** field:



3. Click **Close**.
4. Supply this lock code to Product Support.

Installing a Software License Server

If your ENTERPRISE users are going to be licensed with Network licenses rather than standalone client-based licenses, you must set up a software license server.

The licensing software is available from the TEOCO Resource Center website at: <https://resources.teoco.com>, by clicking the 'Release Downloads' link to access the 'Product Downloads' page.

To configure this:

1. Install the license server software, available as described above.
2. Run the setup executable (LicenceServerSetup.exe) and complete the installation wizard.
3. Click Start/Control Panel.
4. Double-click **Administrative Tools**.
5. Double-click **Services**.
6. Ensure that there is a service named 'Aircom Software Licensing Server' listed, and that it has a Status of Started and a Startup Type of Automatic.

Warning: The service will not run successfully if you attempt to run it on a Virtual Machine System.

Monitoring Your Software Licence Server

If you are a license administrator using network licenses and you have installed your license server and generated your licenses, you can view and edit your license server details.

To monitor your software license server:

1. On your license server machine, click Start/TEOCO/Software Licensing Administrator.
2. In the **WlmAdmin** window that appears, on the **Edit** menu, click **Defined Server List**.
3. In the **Server** field of the **Defined Server List** dialog box that appears, type the name of your license server.
4. Click **Add**.
5. Click **OK**.
6. In the left hand pane of the **WlmAdmin** window, click the **plus** sign adjacent to Defined Servers.
7. Click your license server in the left pane and the details associated with it appear in the right pane.

Tip: To store your server name so that it is visible in the **WlmAdmin** window in future:

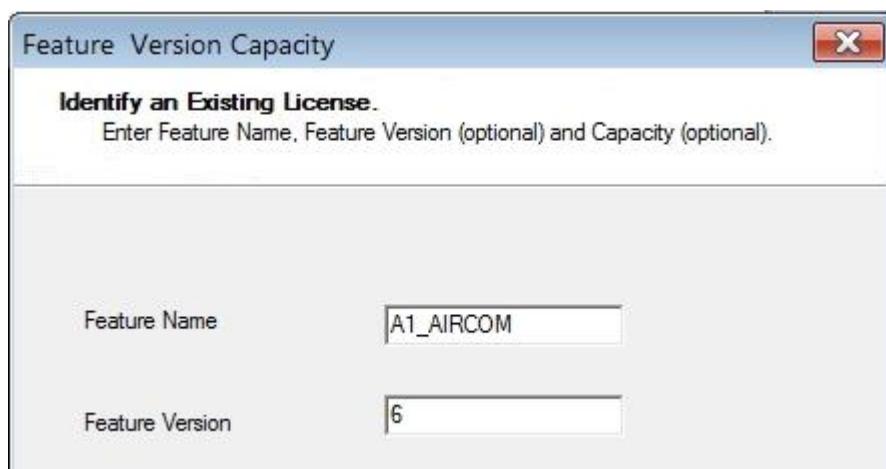
- In the **WlmAdmin** window, on the **Edit** menu, click **Preferences**.
 - Select the "Discover defined servers on startup" option.
 - Click **OK**.
-

Blocking Users from License Access

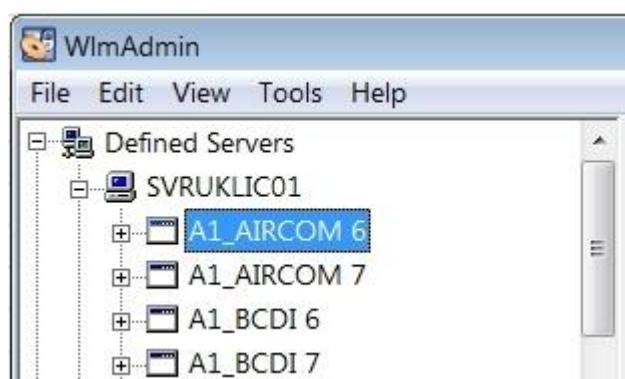
If you are using network licenses you may wish to prevent specified users from accessing particular licenses. You can do this by adding a user to a reservation file which is held on the server and which controls group access to licenses. By adding a user to an excluded group, you can prevent access to a specified license. To generate the required reservation file you can use a utility called Wlsgmgr.

To prevent a user from using a particular license:

1. In Windows Explorer, open your License Server folder. This is normally located under Program Files and TEOCO.
2. Double-click Wlsgmgr.exe to open the utility.
3. In the Wlsgmgr window, from the **File** menu, click **New**. This begins the creation of a reservation file.
4. From the **Feature** menu, click **Add**. The **Add License Reservation Wizard** appears.
5. Click **Next**.
6. On the **Feature Version Capacity** page, in the **Feature Name** field, type the name of the feature that you do not want a particular user to be able to access a license for. Then in the **Feature Version** field, type the version number if there is one (otherwise leave this field blank):



Tip: Feature names and versions are visible in the WlmAdmin utility:



For more information on using WlmAdmin, see Monitoring Your Software Licence Server.

7. Click **Next**.

8. On the **Group** page, in the **Group Name** field, type a name for the group whose members are to be denied access to the selected feature.
 9. In the **Tokens** field, set the number to 0.
 10. Click **Next**.
 11. On the **Members** page, click **Add**.
 12. In the **Member** dialog box, type the name (recognised by the network) of the user to be added to the excluded group.
 13. Click **OK**.
 14. On the **Members** page, click **Finish**. In the Wlsgrmgr window, the feature is shown in the upper panel and the group name in the lower panel.
 15. From the **File** menu, click **Save As**.
 16. In the **Save As** dialog box, from the drop-down list for the **Save in** field, select your License Server folder.
-
- Warning:** Do not change the default name of the reservation file from `lsreserv`. If you do, the file will not be effective.
-
17. Click **Save**.
 18. When you next restart your license server, the exclusion that you have specified in the reservation file will take effect.

Notes:

- You can edit your reservation file with the Wlsgrmgr utility by clicking **Open** on the **File** menu and selecting the file from the License Server folder. Right-click on a Feature or Group and click **Properties** to access the associated details.
- You must define a group for each feature that you wish to protect, and add the user or users to be blocked from specific features to the corresponding groups.

Tip: The Wlsgrmgr utility can also be used to specify particular groups for inclusion rather than exclusion. You can use it for group token allocation if required, and to ensure that the server reserves a specified number of tokens for a particular group.

Setting Up Redundant Servers

If your users are provided with network licenses, as a license administrator you may wish to set up backup servers to supply licenses in the event that your normal license server fails.

To do this:

1. Install the license server software on each backup server. For more information on how to do this, see [Installing a Software License Server](#) on page 210.
2. On your normal license server, click Start/TECOO/Redundant Server setup Tool.
3. In the **WrlfTool** window that appears, from the **File** menu, select **New**.
4. Click **Add Server**.
5. In the **Add Server to Pool** dialog box type the name and IP address of an alternative server.

6. Click **OK**. Your server is listed in the **WrlfTool** window.
7. Repeat steps 3 to 5 until you have a minimum of 3 servers listed. The maximum number you can add is 11.

Note: The order in which the servers appear on the list is the order in which they will be called upon if the normal license server fails. You can change this order using the **Move Up** and **Move Down** buttons. If more than half the listed servers go down, the license server software stops working.

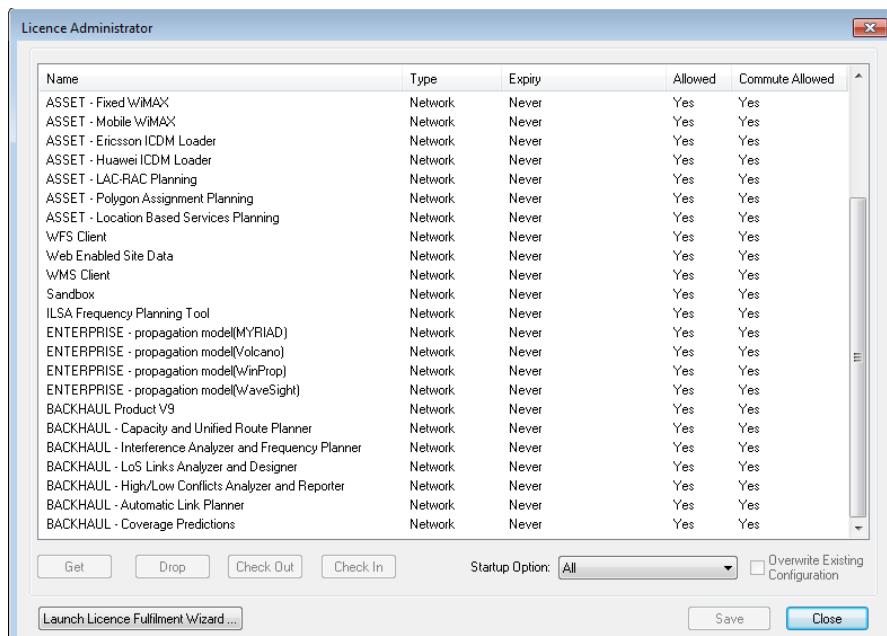
8. In the **WrlfTool** window, from the **File** menu, select **Save As**.
9. In the **Save As** dialog box that appears, from the "Save in" drop down field, select the folder where your normal license server is installed. By default this is C:/Program Files/TEOCO/License Server.
10. Click **Save**. The lservrlf license file is stored in the specified location.
11. Copy the lservrlf license file to the same location on each of your listed backup servers.
12. Restart the TEOCO Software Licensing Server service on all licence server machines. For more information on accessing services, see [Installing a Software License Server](#) on page 210.

Administrating License Use

Licenses are configured centrally on the ENTERPRISE database and you can control their distribution to users via the License Administration tabs in the Group Properties and User Properties dialog boxes. For more information see [Adding a Group](#) and [Adding a User Without OS Authentication](#). Users themselves can control their license use with the License Administrator in ENTERPRISE.

Using License Administrator

You can access the License Administrator from the ENTERPRISE Help menu. This picture shows an example of the License Administrator:



License Administrator

Users can use the License Administrator to:

- Set the default licensing behaviour on ENTERPRISE startup
 - View the license details currently associated with a particular product
 - Get licenses for individual products
 - Drop licenses for individual products
 - Check out commuter licenses for individual products
 - Check in commuter licenses for individual products
-

Note: Two licenses are required to use a third party propagation model with ENTERPRISE: one license direct from the vendor, and one within ENTERPRISE. You can use the ENTERPRISE propagation model licenses (these are shown in the License Administrator) to control which users are allowed to access propagation models.

Setting the Startup Licensing Behavior

To use License Administrator to set the licensing behavior that will be applied when ENTERPRISE starts up:

1. Click on the **down arrow** in the **Startup Option** field to display the available options described under step 2.
2. Select:

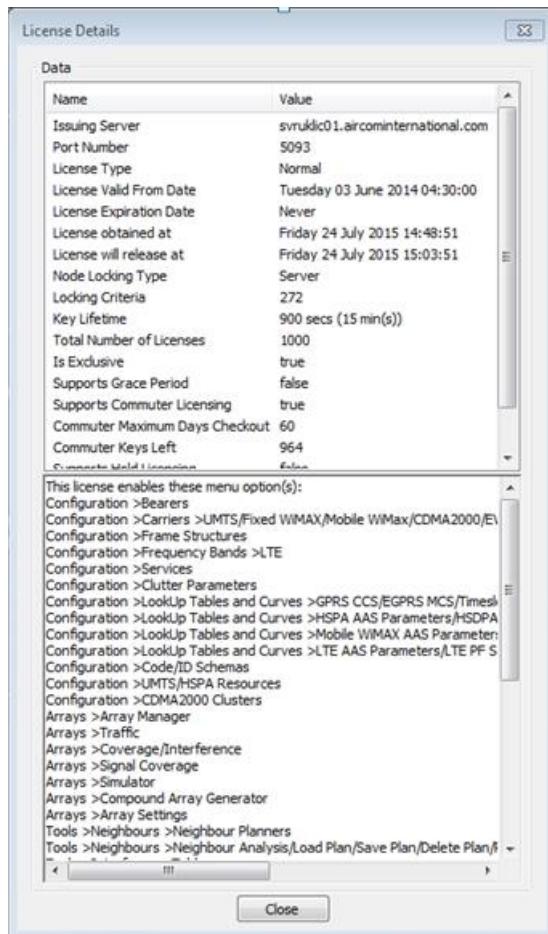
This option	To do this
All	Attempt to obtain licenses for all modules installed on the machine.
Prompt	Display the License Administrator dialog box at ENTERPRISE login so that the user can specify the licenses they require using the Get Licence and Drop License buttons.
User Configuration	Obtain the licenses determined in ENTERPRISE Administrator by the Request column on the License Configuration tab of the User Properties for this user. If a user makes configuration changes and selects the Overwrite Existing Configuration option, the changed configuration is saved for that user's future sessions.
Group Configuration	Obtain licenses determined in ENTERPRISE Administrator by a combination of the Request columns of the License Configuration tabs of the Group Properties for all the groups to which a user belongs. The influence of the Request column settings is limited by the associated license permissions (that is, the Allowed and Commute column settings).

3. Click **Close**. The setting selected is stored within the current user configuration and takes effect whenever the user starts ENTERPRISE.

Viewing License Details for Individual Products

To access the details of your license:

Double-click the product name. The License Details dialog box appears:



License Details dialog box

This table provides further information on the upper pane of license details:

This Field	Indicates
Issuing Server	The IP address or hostname of the server that issued the license token (appears only for a network license).
License Type	<p>The type of license. This can be:</p> <ul style="list-style-type: none"> • 'Normal' – a standard license • 'Perpetual' – a never expiring stand-alone license • 'Grace' – a grace license which will expire once the 'Grace Period Elapsed Time Usage' has been used up • 'Trial' – a trial license which expires once the 'Trial Days Count' has been used up
License Valid From Date	The beginning of the validity period of this license.
License Expiration Date	The end of the validity period of this license.
License obtained at	The time and date when the license request was granted.

This Field	Indicates
License will release at	The time and date when the serving system will release the license back into the system unless a renewal takes place. (ENTERPRISE performs this automatically and so this value is updated after every renewal).
Node Locking Type	<p>The type of node lock the license is using. This can be:</p> <ul style="list-style-type: none"> • ‘Unlocked’ – can be installed on an appropriate serving system and used by any clients with access to that serving system • ‘Client’ – can be installed on an appropriate serving system but can only be used by a client which matches the client lock code given the specific client lock criteria • ‘Server’ – can only be installed on a serving system which matches the server lock code given the specific server lock criteria but can be used by any client with access to the serving system • ‘Client and Server’ – can only be installed on a serving system which matches the server lock code given the specific server lock criteria and also can only be used by a client which matches the client lock code given the specific client lock criteria
Locking Criteria	The lock criteria code. The default is 260 but an alternative can be supplied by Product Support. For more information see Generating Lock Codes.
Key Lifetime	In seconds and minutes, the time for which an issued key is valid before a renewal must be completed to prevent the token from being released.
Total number of licenses	The number of licenses purchased for this feature, NOT how many are still available or in use.
Is Exclusive	<p>Whether the license is exclusive or additive.</p> <p>True = Exclusive</p> <p>False = Additive</p>
Trial Days Count	How many days usage is available on your trial license. This appears only if the ‘License Type’ is set to ‘Trial’.
Supports Grace Period	<p>Whether the license allows grace period functionality.</p> <p>True = Yes</p> <p>False = No</p> <p>Note: It does not indicate that the license is actually running in grace mode (see License Type above).</p>
Grace Period Calendar Days Usage	The number of days that the customer is allowed during which to use the number of hours defined in the Grace Period Elapsed Time Usage field.
Grace Period Elapsed Time Usage	The maximum number of hours that the customer is allowed to use the software.
Supports Commuter Licensing	<p>Whether or not the license supports checking-out for remote usage from the network server.</p> <p>True = Yes</p> <p>False = No</p>
Commuter Maximum Days Checkout	The maximum number of days the checked-out license is valid for from the time of the initial check-out. This will only appear if ‘Supports Commuter Licensing’ is set to ‘True’. After the period expires the client will no longer be able to use the license and it should be checked back in to the server.
Commuter Keys Left	The number of licenses remaining on the server that are available for commuter licensing. This will only appear if ‘Supports Commuter Licensing’ is set to ‘True’.

This Field	Indicates
Supports Hold Licensing	<p>That you can specify a period for which a surrendered license will still be available exclusively to you.</p> <p>For example, if you create a license with a 5 minute hold time, the server, when you indicate that you've finished with the license, will leave it allocated to you for 5 minutes instead of placing it back in the pool. After 5 minutes the license is placed back in the pool as normal. If you restart an application within the 5 minute hold period you are guaranteed to get that license back even if there are no spare licenses remaining on the server.</p> <p>This will only appear if 'Supports Commuter Licensing' is set to 'True'.</p>
Is Redundant License	<p>If the license is held on a server within a redundant pool, indicates whether or not it is a redundant license.</p> <p>True = Yes False = No</p>
Expires Soon	<p>The license is due to expire within 2 weeks.</p> <p>Note: This item will only appear within the 2 weeks expiry period and is not displayed at all for commuter licenses as they have a limited fixed period of validity.</p>

The lower pane of license details shows which menu options are made available by this license. For more information see [Associating Menu Options with Licenses](#).

Associating Menu Options with Licenses

This table shows which menu options in ENTERPRISE are made available by which licenses:

This license	Makes these menu items available
ENTERPRISE Product Suite	(This license is needed for all options)
ASSET Product	<p>Configuration >LookUp Tables and Curves >Mobile WiMAX AAS Parameters</p> <p>Configuration >LookUp Tables and Curves >LTE AAS Parameters/LTE PF Scheduler Multi User Gain/LTE Rach RSI Config Tables/LTEPreamble Max Cell Range</p> <p>Configuration >Code/ID Schemas</p> <p>Configuration >UMTS/HSPA Resources</p> <p>Configuration >CDMA2000 Clusters</p> <p>Arrays >Array Manager</p> <p>Arrays >Traffic</p> <p>Arrays >Coverage/Interference</p> <p>Arrays >Signal Coverage</p> <p>Arrays >Simulator</p> <p>Arrays >Compound Array Generator</p> <p>Arrays >Array Settings</p> <p>Tools >Neighbours >Neighbour Planners</p> <p>Tools >Neighbours >Neighbour Analysis/Load Plan/Save Plan/Delete Plan/Plan Options</p> <p>Tools >Interference Tables</p> <p>Tools >Polygon Assignment Plan</p> <p>Tools >LAC & RAC Assignment Plan</p>

This license	Makes these menu items available
	Tools >Location Based Services Plan Tools >GSM Planners Tools >Mobile WiMAX Planners Tools >UMTS Planners Tools >CDMA2000 Planners Tools >LTE Planners Tools >Model Assignment Calculator Tools >Prediction Radius Calculator Tools >Maximum Cell Range Calculator Tools >Location Services Tools >Static Traffic Analysis Tools >Link Verifier/Reparenter Tools >BCF Types Reports >GSM Cell Info Report Reports >FCC 600 Report Reports >GSM Frequency Plan Reporter
ASSET - Fixed WiMAX	Configuration >Bearers >Fixed WiMax Configuration >Carriers >Fixed WiMax Configuration >Services >Fixed WiMax Configuration >ClutterParameters >Fixed WiMax Arrays >Signal Coverage >Fixed WiMax Coverage Wizard Simulator >Simulator Wizard >Fixed WiMax
ASSET - Mobile WiMAX	Configuration >Bearers >Mobile WiMax Configuration >Carriers >Mobile WiMax Configuration >Services >Mobile WiMax Configuration >ClutterParameters >Mobile WiMax Configuration >LookUp Tables and Curves >Mobile WiMax AAS Parameters Configuration >CodeID Schemas >Mobile WiMax PN Code Schemas Arrays >Signal Coverage >Mobile WiMax Coverage Wizard Simulator >Simulator Wizard >Mobile WiMax Tools >Mobile WiMax Planners
ASSET - GSM	Configuration >Bearers >GSM/EGPRS Configuration >Clutter Parameters >GSM Arrays >Signal Coverage >GSM Best Server Wizard
ASSET - CDMA 2000	Configuration >Bearers >CDMA2000/EV-DO Configuration >Carriers >CDMA2000/EV-DO Configuration >Services >CDMA2000/EV-DO Configuration >ClutterParameters >CDMA2000/EV-DO Configuration >CDMA2000 Clusters Arrays >Signal Coverage >CDMA2000/EV-DO Pilot Coverage Wizard Simulator >Simulator Wizard >CDMA2000/EV-DO Tools >CDMA2000 Planner

This license	Makes these menu items available
ASSET - Ericsson ICDM Loader	Tools >Interference Tables >Load Interference Table >Ericsson ICDM(*.msmt)
ASSET - LTE	Configuration >Bearers >LTE Configuration >Carriers >LTE Configuration >Frame Structures Configuration >Frequency Bands >LTE Configuration >ClutterParameters >LTE Configuration >LookUp Tables and Curves >LTE AAS Parameters/LTE PF Scheduler Multi User Gain/LTE Rach RSI Config Tables/LTE Preamble Max Cell Range Configuration >Code/ID Schemas >LTE Physical Cell ID Schemas/LTE Rach RSI Schemas Arrays >Signal Coverage >LTE Pilot Coverage Wizard Tools >LTE Planners
ASSET - LAC-RAC Planning	Tools >LAC & RAC Assignment Plan
ASSET - Polygon Assignment Planning	Tools >Polygon Assignment Plan
ASSET - Location Based Services Planning	Tools >Location Based Services Planning
ASSET - Wi-Fi	Configuration >Carriers >Wi-Fi Configuration >ClutterParameters >Wi-Fi Arrays >Signal Coverage >Wi-Fi Coverage Wizard
ASSET - Huawei ICDM Loader	Tools >Interference Tables >Load Interference Table >Huawei ICDM(*.txt, *.csv)
Web Enabled Site Data	ENTERPRISE Administrator >Utilities >Configure External Data Pages
WFS Client	ENTERPRISE Administrator >Utilities >Configure WFS and WMS Services
WMS Client	ENTERPRISE Administrator >Utilities >Configure WFS and WMS Services
Sandbox	Allows user to log into ENTERPRISE as a Sandbox user
ENTERPRISE - Site Backhaul Ranking	ASSET Backhaul >Tools >Site Backhaul Ranking
ENTERPRISE - Propagation Model(MYRIAD)	Allows you to run the third party propagation model predictions. External licence from the model vendor is also required
ENTERPRISE - Propagation Model(Volcano)	Allows you to run the third party propagation model predictions. External licence from the model vendor is also required
ENTERPRISE - Propagation Model(WPM)	Allows you to run the third party propagation model predictions. External licence from the model vendor is also required
ILSA Frequency Planning Tool	Tools >GSM Planners >ILSA Frequency Planner
ASSET Backhaul Product	(This license is needed for all ASSET Backhaul options)
ASSET Backhaul Backhaul Capacity and URP	Tools>Unified Route Planner
ASSET Backhaul Interference Analyzer and Frequency Planner	Tools>Interference Analysis>Interference Wizard Load Interface Data Save Interference Data View Interference Data
ASSET Backhaul Los Links Analyzer and Designer	Tools>LoS Wizard>LoS Wizard Load LoS Data Save LoS Data View LoS Data

This license	Makes these menu items available
ASSET Backhaul High/Low Conflicts Analyzer and Reporter	Tools>High Low Conflict Wizard>High Low Conflict Wizard Load High Low Conflict View High Low Conflict Clear High Low Conflict
ASSET Backhaul Automatic Link Planner	Tools>Automatic Planner>Frequency Planner Frequency and Capacity Planner
ASSET Backhaul Coverage Prediction	Arrays>Array Manager Microwave Coverage Wizard

Licensing ASSET Geo and Distributed Agents

ASSET Geo and Distributed Agents are not licensed using the License Administrator. Licenses for these features must exist on the license server in order for them to be available for use in ENTERPRISE.

To use ASSET Geo, you must have selected it for installation in the installer. When it is licensed for use and you click on the ASSET Geo icon in the Map View window, ASSET Geo appears without any error message.

Getting Licenses for Individual Products

To use License Administrator to get a license for a particular product or products:

1. Select the product or products you require licenses for (you can hold the **Ctrl** key down to multi-select).
2. Click the **Get** button.
- or -
Right-click and, from the menu that appears, click **Get**.
3. Click **Close**.

Dropping Licences for Individual Products

To use License Administrator to drop a license for a particular product or products:

1. Select the product or products you wish to drop licenses for (you can hold the **Ctrl** key down to multi-select).
2. Click the **Drop** button.
- or -
Right-click and, from the menu that appears, click **Drop**.
3. Click **Close**.

Checking Out Commuter Licenses

A commuter license is one which can be checked out for remote usage from the network server.

Important: You cannot use commuter licenses on a virtual machine.

To use License Administrator to check out a commuter license for a particular product or products:

1. Select the product or products that you want to check out commuter licenses for (you can hold the **Ctrl** key down to multi-select).
2. Click the **Check Out** button.
- or -
Right-click and, from the menu that appears, click **Check Out**.
3. Click **Close**.

Checking In Commuter Licenses

To use License Administrator to check in a commuter license for a particular product or products:

1. Select the product or products that you want to check in commuter licenses for (you can hold the **Ctrl** key down to multi-select).
2. Click the **Check In** button.
- or -
Right-click, and from the menu that appears, click **Check In**.
3. Click **Close**.

11 Firewall Port Details

This table shows the default port settings for ENTERPRISE components:

Component	Port number (defaults)	Inbound/ Outbound	Protocol	Description
ARRAYWIZARD Administrator	1521 (ephemeral port range on host OS)	Both	TCP	Oracle: Uses 1521 to establish connection. One port per session.
ARRAYWIZARD Agent	1521 (ephemeral port range on host OS)	Both	TCP	Oracle: Uses 1521 to establish connection. One port per session.
ARRAYWIZARD AgentMonitor	1521 (ephemeral port range on host OS)	Both	TCP	Oracle: Uses 1521 to establish connection. One port per session.
ARRAYWIZARD Scheduler Service	135 (ephemeral port range on host OS)	Inbound	TCP	DCOM: Uses 135 to establish connection. One port per session.
Distributed Tasks Coordinator	27871 27872 27873 (ephemeral port range on host OS)	Inbound	UDP	Well-known general-admin listener port (default). Well-known agent listener port (default). Well-known client listener port (default). Established connection ports.
Distributed Tasks Coordinator UI's	28105 ... 28194 (ephemeral port range on host OS)	Inbound	UDP	Coordinator-allocated coordinator listener port. Coordinator-allocated coordinator listener port. Established connection ports.
Distributed Tasks Distribution Agents	27875 ... 28074 (ephemeral port range on host OS)	Inbound	UDP	Coordinator-allocated coordinator listener port. Coordinator-allocated coordinator listener port. Established connection ports.
	5093	Inbound	UDP	Licence server port.
Distributed Tasks ENTERPRISE Client	28075	Inbound	UDP	Coordinator-allocated coordinator listener port.

Component	Port number (defaults)	Inbound/ Outbound	Protocol	Description
	...			
	28104	Inbound	UDP	Coordinator-allocated coordinator listener port.
	(ephemeral port range on host OS)	Inbound	UDP	Established connection ports.
	5093	Inbound	UDP	Licence server port.
EAWS	9091	Both	HTTP	HTTP Endpoint
	9092	Both	TCP	TCP Endpoint
	9093	Inbound	HTTP	WSDL Endpoint
EDS - Presentation Service	8732	Both	HTTP	WS Endpoint
	8734	Both	TCP	TCP Endpoint
	8730	Inbound	HTTP	WSDL Endpoint
	8733	Inbound	TCP	REST Service
EDS - Presentation Service (Basic)	8632	Both	TCP	WS Endpoint
	8634	Both	TCP	TCP Endpoint
	8630	Inbound	TCP	WSDL Endpoint
	8633	Inbound	TCP	REST Service
EDS - Notification Service	8832	Both	TCP	WS Endpoint
	8834	Both	TCP	TCP Endpoint
	8830	Inbound	TCP	WSDL Endpoint
	8833	Inbound	TCP	REST Service
ENTERPRISE Oracle client	1521 (ephemeral port range on host OS)	Both Both	TCP	Oracle: Uses 1521 to establish connection. One port per session.
ENTERPRISE Administrator	1521 (ephemeral port range on host OS)	Both	TCP	Oracle: Uses 1521 to establish connection. One port per session.
Licence Server	5093 or 5096	Both	TCP	License server port.
MYRIAD	Imgrd.exe uses 27000 LICPIFT.exe uses 64221		TCP	Can be configured in License file. For more information, see Configuring Ports for MYRIAD on page 227.
Web Enabled Map Data: MapQuest Open Street Maps	443	Outbound	TCP	Standard port for accessing HTTPS map data served by MapQuest Open Street Maps (OSM). Configure your firewall to permit access to openstreetmaps.org.

Component	Port number (defaults)	Inbound/Outbound	Protocol	Description
Web Enabled Map Data: Bing Maps	80	Outbound	TCP	Standard port for accessing HTTP map data served by Bing Maps (if enabled). Configure your firewall to permit access to <code>virtualearth.net</code> .
	443	Outbound	TCP	Standard secure HTTPS port for accessing map data served by Bing Maps (if enabled)

Notes:

- For Distributed Tasks, you can define the port ranges on the **Network** tab of the **Distributed Task Coordinator Options** dialog box (which is described in Setting the Coordinator Options on page 177). Valid port numbers range from 1024 to 49151. If any agent machines have instances that fail to connect to the Coordinator, this may be because the configured agent port range is insufficient to provide them all with a unique port on that host machine. In such cases, the associated agent log(s) will contain entries showing a ‘Port Allocation Failure’ error. To prevent this, specify a larger **Agent Port Range** on the **Network** tab. You must also adjust the **Client Port Range** and **UI Port Range** accordingly, as the default port ranges are contiguous.
- For the Coordinator-UI, Distribution Agent and Enterprise Client components, the port range sizes in the above table only restrict the number of instances of the component on a particular host (as opposed to the total number across all hosts connected to a coordinator).

12 Configuring Ports for MYRIAD

Use of the MYRIAD model requires the configuration of two ports, one used by the lmgrd.exe file and the other by the LICPIFT.exe file.

By default, lmgrd.exe uses port 27000, but can use ports 27000 to 27009.

By default, LICPIFT.exe uses port 64221, but can use ports between 49152 and 65535.

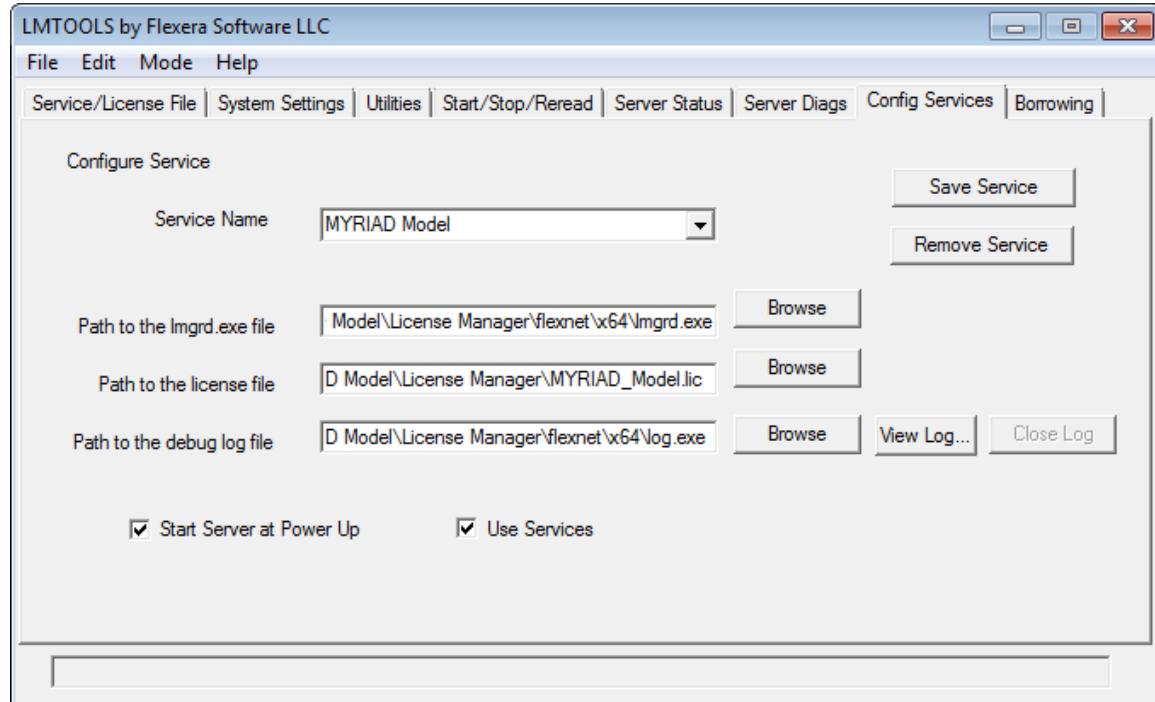
You can see the current port allocations in the log file that is created when you start the license server. This picture shows an example:

```

1 14:13:35 (lmgrd) -----
2 14:13:35 (lmgrd) Please Note:
3 14:13:35 (lmgrd)
4 14:13:35 (lmgrd) This log is intended for debug purposes only.
5 14:13:35 (lmgrd) In order to capture accurate license
6 14:13:35 (lmgrd) usage data into an organized repository,
7 14:13:35 (lmgrd) please enable report logging. Use Flexera Software, Inc.'s
8 14:13:35 (lmgrd) software license administration solution,
9 14:13:35 (lmgrd) FLEXnet Manager, to readily gain visibility
10 14:13:35 (lmgrd) into license usage data and to create
11 14:13:35 (lmgrd) insightful reports on critical information like
12 14:13:35 (lmgrd) license availability and usage. FLEXnet Manager
13 14:13:35 (lmgrd) can be fully automated to run these reports on
14 14:13:35 (lmgrd) schedule and can be used to track license
15 14:13:35 (lmgrd) servers and usage across a heterogeneous
16 14:13:35 (lmgrd) network of servers including Windows NT, Linux
17 14:13:35 (lmgrd) and UNIX. Contact Flexera Software, Inc. at
18 14:13:35 (lmgrd) www.flexerasoftware.com for more details on how to
19 14:13:35 (lmgrd) obtain an evaluation copy of FLEXnet Manager
20 14:13:35 (lmgrd) for your enterprise.
21 14:13:35 (lmgrd)
22 14:13:35 (lmgrd) -----
23 14:13:35 (lmgrd)
24 14:13:35 (lmgrd)
25 14:13:35 (lmgrd) pid 2172
26 14:13:35 (lmgrd) Detecting other license server manager (lmgrd) processes...
27 14:13:35 (lmgrd) Done rereading
28 14:13:35 (lmgrd) FLEXnet Licensing (v11.9.0.0 build 87342 i86_n3) started on B-W7DEVAUX (IBM PC) (6/19/2013)
29 14:13:35 (lmgrd) Copyright (c) 1988-2010 Flexera Software, Inc. All Rights Reserved.
30 14:13:35 (lmgrd) US Patents 5,390,297 and 5,671,412.
31 14:13:35 (lmgrd) World Wide Web: http://www.flexerasoftware.com
32 14:13:35 (lmgrd) License file(s): C:\Program Files (x86)\MYRIAD Model\MYRIAD Model411_8.0\License Manager\MYRIAD_Model.lic
33 14:13:35 (lmgrd) lmgrd tcp-port 27000
34 14:13:35 (lmgrd) Starting vendor daemon...
35 14:13:35 (lmgrd) Started LICPIFT (pid 1220)
36 14:13:35 (LICPIFT) FLEXnet Licensing version v11.9.0.0 build 87342 i86_n3
37 14:13:35 (LICPIFT) Server started on B-W7DEVAUX for: MYRIAD_Model
38 14:13:35 (LICPIFT) EXTERNAL FILTERS are ON
39 14:13:35 (lmgrd) LICPIFT using TCP-port 64221
40

```

You can find the location of this log using the LMTOOLS viewer. To open this, double click on the lmtools.exe file which is normally found under the Program Files/MYRIAD Model/flexnet folder. This picture shows an example of the viewer:



The location of the license file is also shown in this viewer.

You can change the port allocations by editing the license file in a text editor as shown in this example, where lmgrd has been changed to use port 27005, while LICPIFT.exe is still set to use the default port 64221:

```
SERVER ServerName 0123456789ab 27005
USE_SERVER
VENDOR LICPIFT PORT=64221
FEATURE MYRIAD_Model LICPIFT 4.0 20-jan-2018 3 HOSTID=ANY BORROW=720 \
SIGN=E9782EBA6C39
```

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