Managing RDBMS Servers with Tivoli

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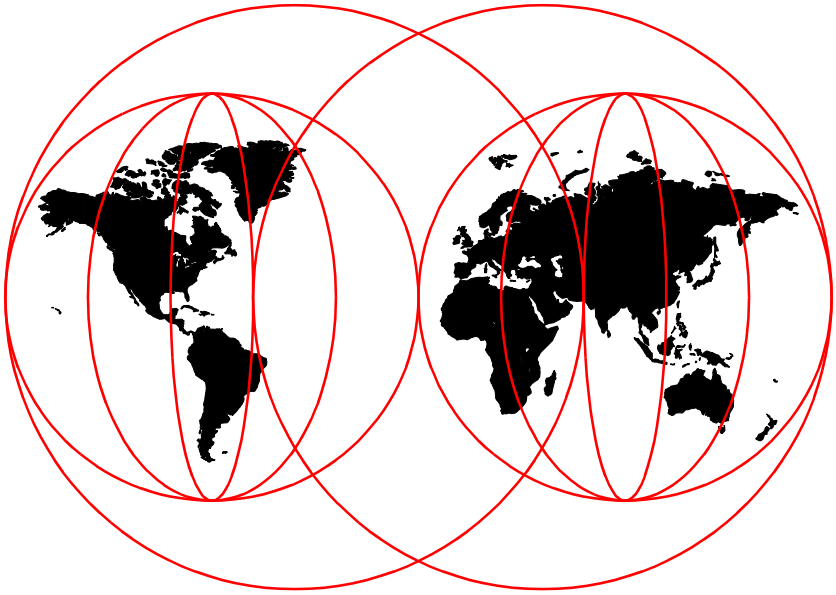

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September 1998

Take Note!

Before using this information and the product it supports, be sure to read the general information in Appendix A, “Special Notices” on page 411.

First Edition (September 1998)

This edition applies to Tivoli Manager for DB2, Tivoli Manager for MS SQL, Tivoli Manager for Oracle, Tivoli Manager for Sybase and Tivoli Manager for Informix for use with the Windows NT and UNIX operating systems.

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Preface

In this redbook we introduce the Tivoli database management products, Tivoli's solution for managing RDBMS servers in the enterprise.

We give an overview of the Tivoli strategy for managing RDBMS servers and applications and then show detailed examples of how to use the Tivoli database management products for Oracle, Sybase, Informix, DB2 and Microsoft SQL Server and how to integrate them with other Tivoli applications.

This redbook will help you position and understand how to manage large, distributed RDBMS server installations using Tivoli.

The examples provided may be especially helpful to service providers as a start in client implementations.

The Team That Wrote This Redbook

This redbook was produced by a team of specialists from around the world working at the Systems Management and Networking ITSO Center, Raleigh.

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Chapter 1. Introduction

In this chapter we introduce the Tivoli strategy for managing RDBMS servers and the actual Tivoli database management products. We give a brief overview of Tivoli systems management and then introduce the Tivoli database management products.

1.1 What Is Tivoli?

We give only a brief overview of Tivoli here. A comprehensive introduction to Tivoli can be found in the redbook *An Introduction to Tivoli's TME 10*, SG24-4948.

Tivoli provides a suite of enterprise management software (Tivoli Enterprise Software) that is based on the Tivoli Framework. This framework provides a wide array of services that can be used by systems management applications that reside on top of this framework.

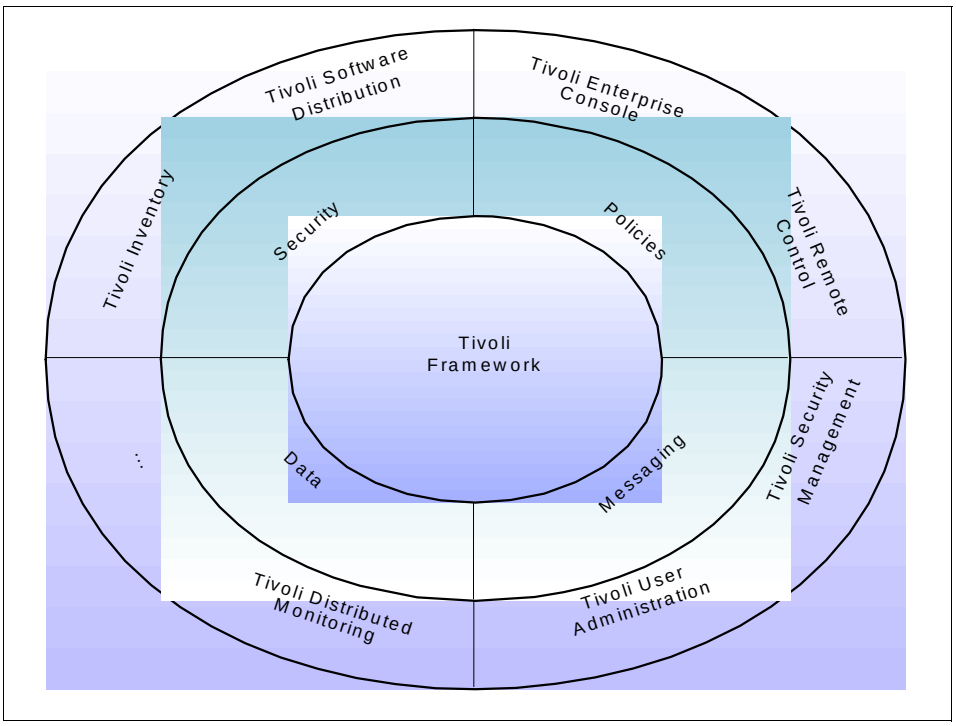


Figure 1. Tivoli Architecture

Tivoli provides a set of key applications that reside on top of the Tivoli Framework and that address core functions of systems management. These core applications are:

- Tivoli Distributed Monitoring
- Tivoli Enterprise Console
- Tivoli User Administration
- Tivoli Security Management
- Tivoli Software Distribution
- Tivoli Inventory
- Tivoli Remote Control

Besides these core applications, management functionality for specific components can easily be integrated with the Tivoli Framework and the Tivoli core applications. We explain a little bit more about such Tivoli modules in the next section.

1.2 Tivoli Modules

Based on the Tivoli Framework, Tivoli modules provide systems management functions for systems, databases, applications, etc. Such modules are available from Tivoli and its partners, organized in the Tivoli Partner Association.

The advantage of the Tivoli modules is that they can utilize the services provided by the Tivoli Framework and the Tivoli core applications and therefore all modules share a common set of functions and services, whereas the specific module can focus on a certain area of expertise.

In such a way, the Tivoli modules can provide best-of-breed management functions for a certain component, whereas the Tivoli framework and the core applications provide the backbone for an enterprise systems management solution.

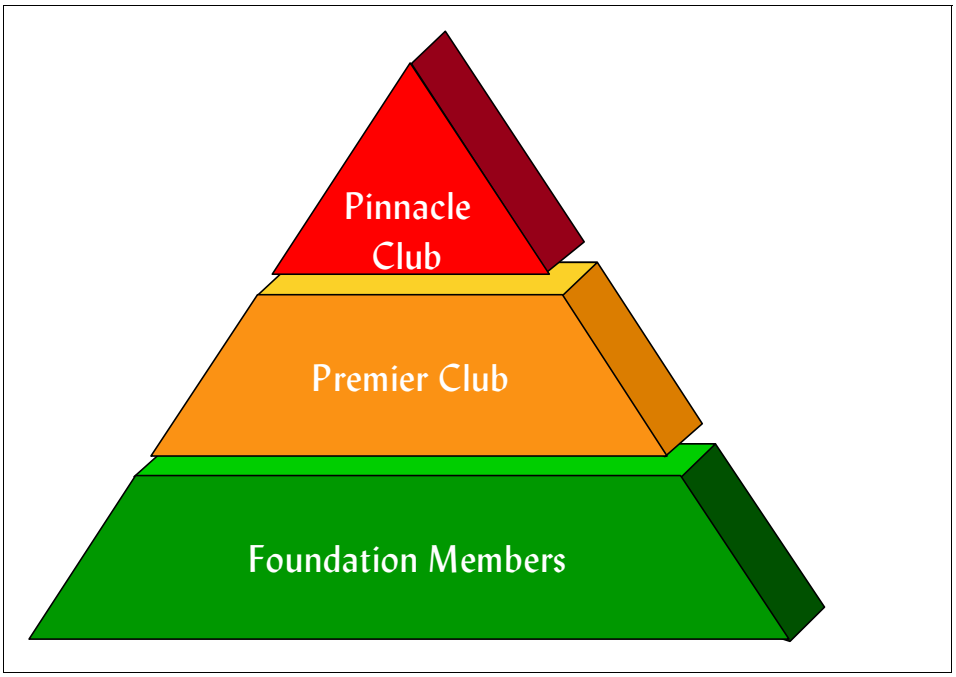


Figure 2. Tivoli Partner Modules

Depending on the depth of integration with Tivoli, Tivoli modules are grouped into three integration levels, foundation, premiere and pinnacle (refer to the redbook *An Industry Around the Tivoli Framework: Examples from the 10/Plus Association*, SG24-2122). The Tivoli database management products are all pinnacle level modules, that is, they are integrated directly on the Tivoli Framework level.

1.3 Challenges When Managing RDBMS Servers

With distributed client/server environments growing, the number of RDBMS servers is also growing in the enterprise, thus making the task of managing these RDBMS servers more and more complex.

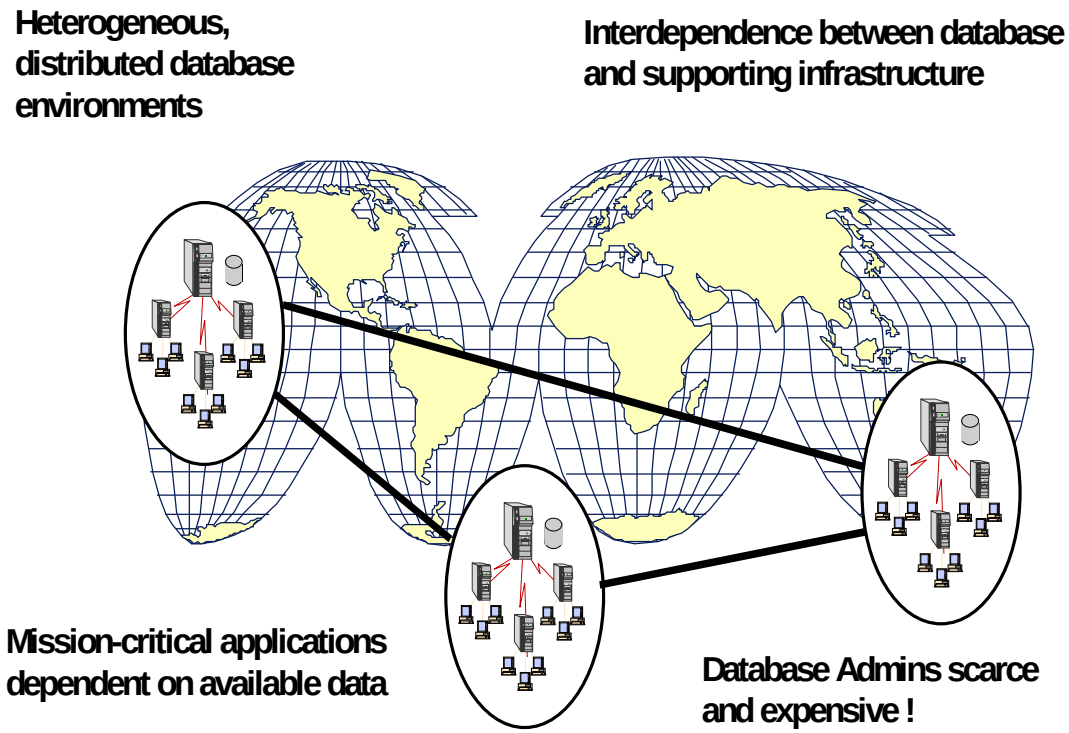


Figure 3. Database Management Challenges

In traditional IT environments there were usually only a few RDBMS server systems necessary which were managed by dedicated professionals. This task was usually performed centrally, for example, at the headquarters of an organization, where the RDBMS servers were concentrated.

With the rollout of more and more client/server systems and applications the number of RDBMS servers is not only growing, but they are also highly distributed across many locations. Therefore, it is not feasible anymoren to have dedicated professionals managing each of these servers.

Nevertheless, it is still necessary to manage the distributed RDBMS servers efficiently, as they are running business-critical applications.

Management of RDBMS servers can involve, for example, the following tasks:

- Ensuring that all the RDBMS server processes are running

- Ensuring that there is enough file system space left on the database server
- Creating, modifying and deleting RDBMS users
- Managing tablespaces

There are a number of dedicated RDBMS management tools available in the marketplace that provide good functionality; however, they usually constitute point products that are not integrated into a wider systems management solution.

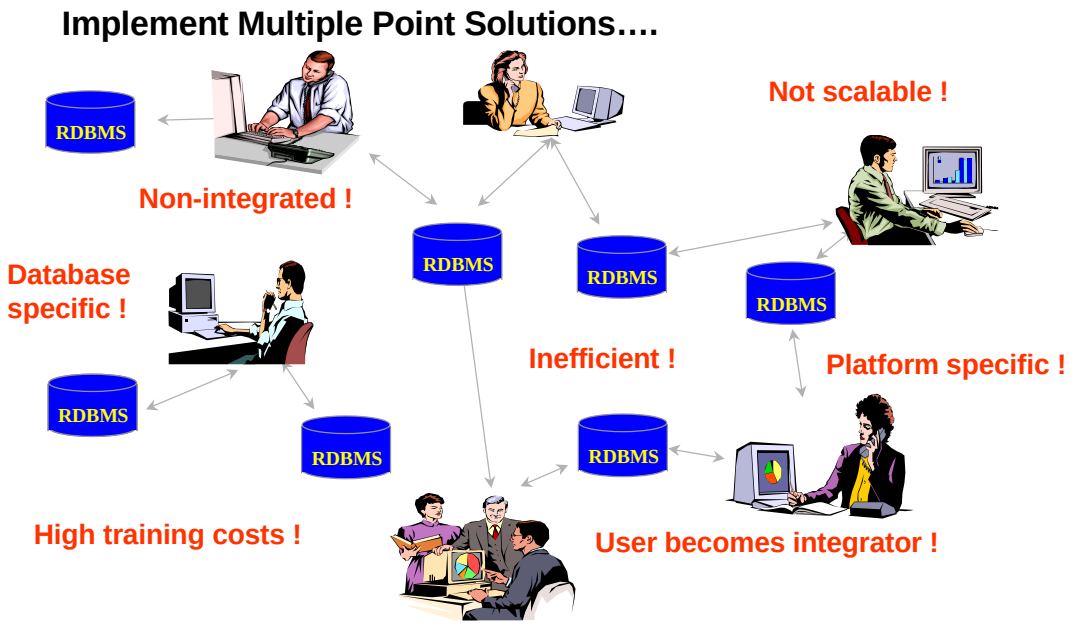


Figure 4. Implementing Multiple Point Solutions

This then leads to the management of RDBMS systems being a separated task from other systems management tasks and thus often duplicating efforts.

The Tivoli database management products provide component management of RDBMS servers which is integrated into Tivoli and therefore allows the administrator to apply the same management paradigm that is applied to other components managed by Tivoli.

1.4 The Tivoli RDBMS Management Modules

The Tivoli database management products provide systems management functions for RDBMS servers and are tightly integrated with the Tivoli Framework.

Tivoli modules are available for the most popular RDBMS servers, at the moment:

- Tivoli Manager for Oracle
- Tivoli Manager for MS SQL
- Tivoli Manager for Sybase
- Tivoli Manager for DB2
- Tivoli Manager for Informix

These modules allow centralized management of all RDBMS servers in your enterprise from the Tivoli desktop.

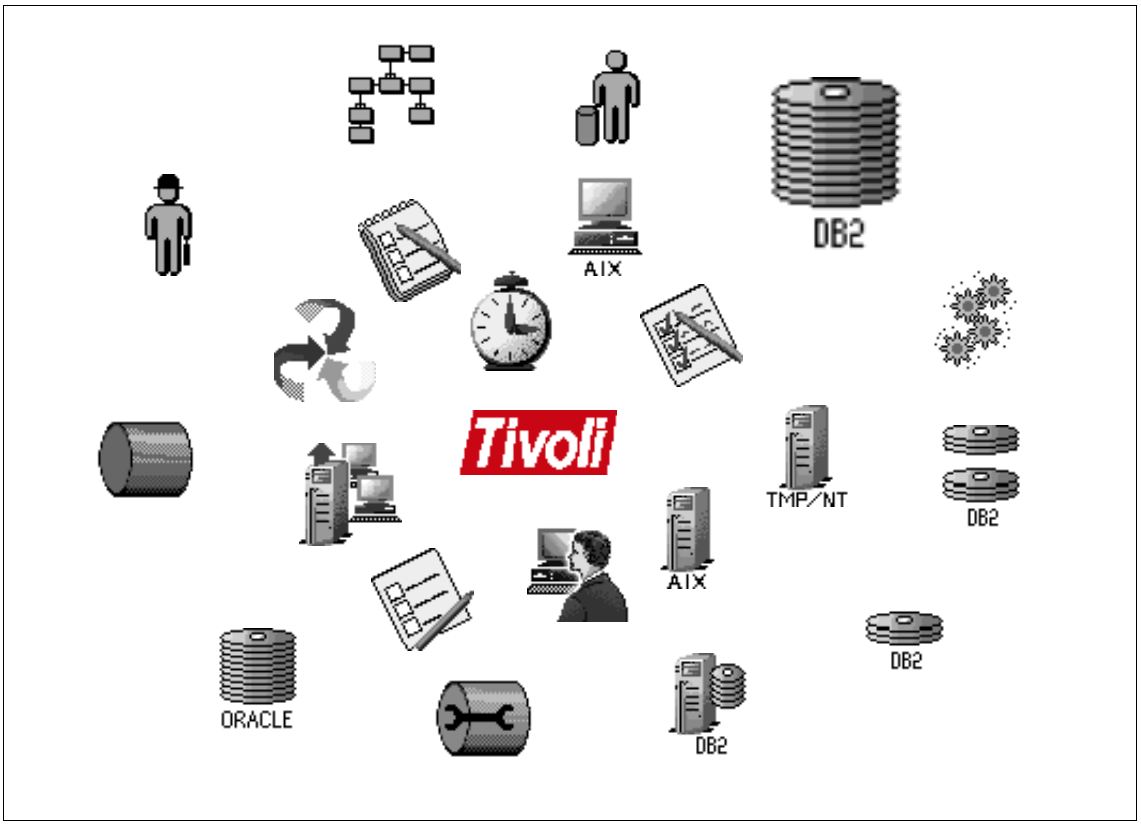


Figure 5. Everything Managed by Tivoli

The Tivoli database management products reside on top of the Tivoli core applications and also directly integrate with the Tivoli Framework as shown in the following figure.

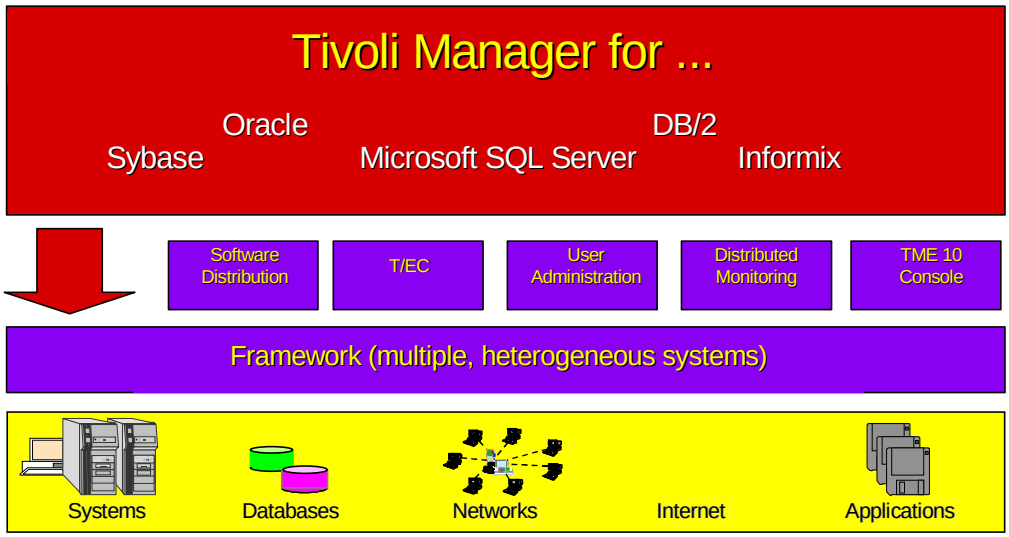


Figure 6. Tivoli Database Management Products Architecture

On the one hand, the Tivoli database management products use core applications such as Tivoli Distributed Monitoring and Tivoli Enterprise Console, while on the other hand they directly integrate with the Tivoli Framework, for example, by adding new resource types for RDBMS servers to the Tivoli object database.

The modules provide management in the following areas:

- Security
- Monitoring and event management
- User management
- Database management

Besides, other Tivoli core applications can be utilized for database management. For example, Tivoli Software Distribution can be used to distribute RDBMS servers and clients. We explain this in a little more detail in 7.3, “Deploying RDBMS Components Using Tivoli” on page 398.

1.4.1 Security and Secure Delegation

As the Tivoli database management products are integrated with the Tivoli Framework, they can instantly leverage the security features of the Tivoli Framework and other framework capabilities, such as policies.

For example, the RDBMS modules provide designated TMR roles that can be used to control access to specific RDBMS operations. As the authorization is performed by the Tivoli Framework, you have full control and accountability of the access to RDBMS resources and the access control mechanism is the same that can be used for other resources managed by Tivoli.

One practical example for this is that on a UNIX RDBMS server you can eliminate the use of the "root" or DBA accounts to perform database operations but instead perform operations from the Tivoli desktop and have the Tivoli Framework control the access.

This allows for the concept of secure delegation. Repetitive and routine tasks that needed to be performed by a DBA before can now be delegated to junior administrators that have exactly the access rights to database resources they need, thus taking workload away from the DBA.

1.4.2 Monitoring and Event Management

A major component of the Tivoli RDBMS modules are the monitoring collections provided with each module. These are standard Tivoli Distributed Monitoring collections for use with the Tivoli Distributed Monitoring product. A large number of predefined monitors is provided with each Tivoli RDBMS module for almost any component of the specific RDBMS to be monitored.

Further, Tivoli Distributed Monitoring allows you to easily modify these monitoring collections or add your own monitoring collections, should the existing ones not fully satisfy your needs. Refer to the redbook *Creating Custom Monitors for Tivoli Distributed Monitoring*, SG24-5211 for more information on this topic.

Besides the synchronous monitoring capabilities of Tivoli Distributed Monitoring collections, event management is provided by integrating with Tivoli Enterprise Console (TEC). This allows for TEC events to be sent in case of certain RDBMS conditions. The modules provide customized *.baroc files that allow you to process RDBMS-related events in TEC.

1.4.3 User Management

Another common management task that is addressed by the Tivoli RDBMS modules is management of RDBMS users. This function allows you to keep your user definitions consistent across a large number of distributed RDBMS servers.

1.4.4 Database Management

The Tivoli database management products also allow you to perform direct management of database resources from the Tivoli desktop. For example. you can start and shut down databases or database instances, you can manage tablespaces, etc.

Besides these core functions provided by the Tivoli RDBMS modules, additional management function can be achieved by utilizing other Tivoli Framework services, core applications, partner modules, etc. For example, Tivoli Software Distribution can be used to automate RDBMS management, job scheduling services can be used to automate operations, etc.

The Tivoli RDBMS modules also provide many functions to directly operate the RDBMS from the Tivoli desktop, such as table space and instance management.

1.5 RDBMS Management Partner Strategy

The Tivoli strategy for database management fits in the general Tivoli partner strategy.

Tivoli provides and will continue to provide the Tivoli Framework, the Tivoli core applications and management modules for selected components. The Tivoli RDBMS management modules are an example.

In areas of extended component management functionality or areas that require a highly specialized expertise, Tivoli partners with other vendors that integrate their solutions into the Tivoli solution, thus contributing unique expertise in a specialized field while at the same time leveraging Tivoli as the enterprise systems management backbone.

For RDBMS management, Tivoli provides modules for all major RDBMS servers, such as Oracle, Sybase and DB2. These modules provide a common set of management operations for RDBMS servers that can be used across platforms and from a consistent user interface.

For areas of extended functionality in RDBMS management, partner vendors will link their dedicated RDBMS management solutions to Tivoli and the Tivoli RDBMS modules, so that the common interface for management is maintained while at the same time functionality is added.

Areas, where such extended functionality could be used are, for example:

- SQL analysis

- Real-time database performance management
- Schema management

One example of a Tivoli integrated partner product is DBArtisan from Embarcadero Systems.

DBArtisan is a tool that enhances the productivity of a database administrator by providing an efficient and powerful tool for major database administration tasks, such as:

- Schema management
- Graphical object alteration
- Space management
- Security management
- SQL and PL/SQL scripting
- Workgroup communication
- Data management
- Performance monitoring

The integration of DBArtisan and the Tivoli database management products allows you to combine the strengths of both products, DBArtisan's strength in database administration and Tivoli's strength in scaling database management to the enterprise level.

1.6 The Complete Picture

The following figure illustrates how the Tivoli database management products fit in with the Tivoli strategy for total systems management.

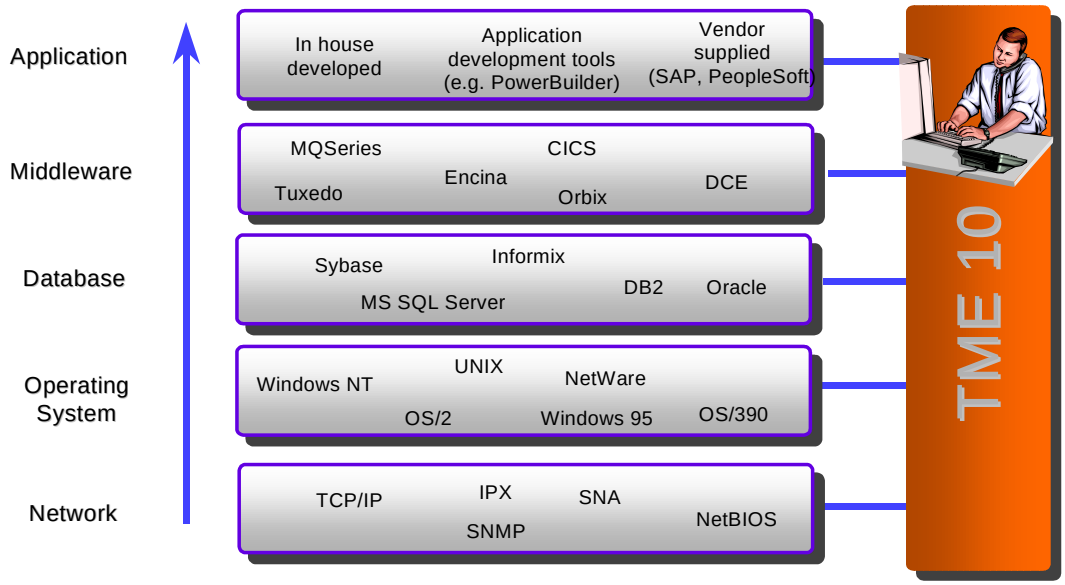


Figure 7. Total Systems Management

Tivoli allows for management of all system components of the IT system, with the main components being the network, operating systems, databases, middleware and applications.

This strategy is consistent and comprehensive. Tivoli provides management function for all layers and partners contribute additional management functionality for specific components or functions.

Tivoli database management constitutes the Tivoli product to manage the database layer. This layer as well as the Tivoli database management products integrate with the other layers.

1.7 Tivoli RDBMS Modules vs. RIM

People are often confused by the term database, used in conjunction with Tivoli. One reason for this is that the Tivoli Framework and the core applications use databases themselves. The Tivoli Framework stores application information in a proprietary object database, which is part of the framework itself.

Tivoli core applications, such as Tivoli Inventory, Tivoli Enterprise Console and Tivoli Software Distribution (3.6) store information in an RDBMS. In order

for the Tivoli applications not be dependent on one particular RDBMS server, the applications do not directly access the RDBMS, but utilize a component called RDBMS Interface Module (RIM).

RIM is part of the Tivoli Framework and shields the access to the RDBMS from the Tivoli application. Therefore, different RDBMSs can be supported and support for a specific RDBMS needs only to be added in the RIM layer but not in every application.

The following figure shows an overview of the RIM architecture.

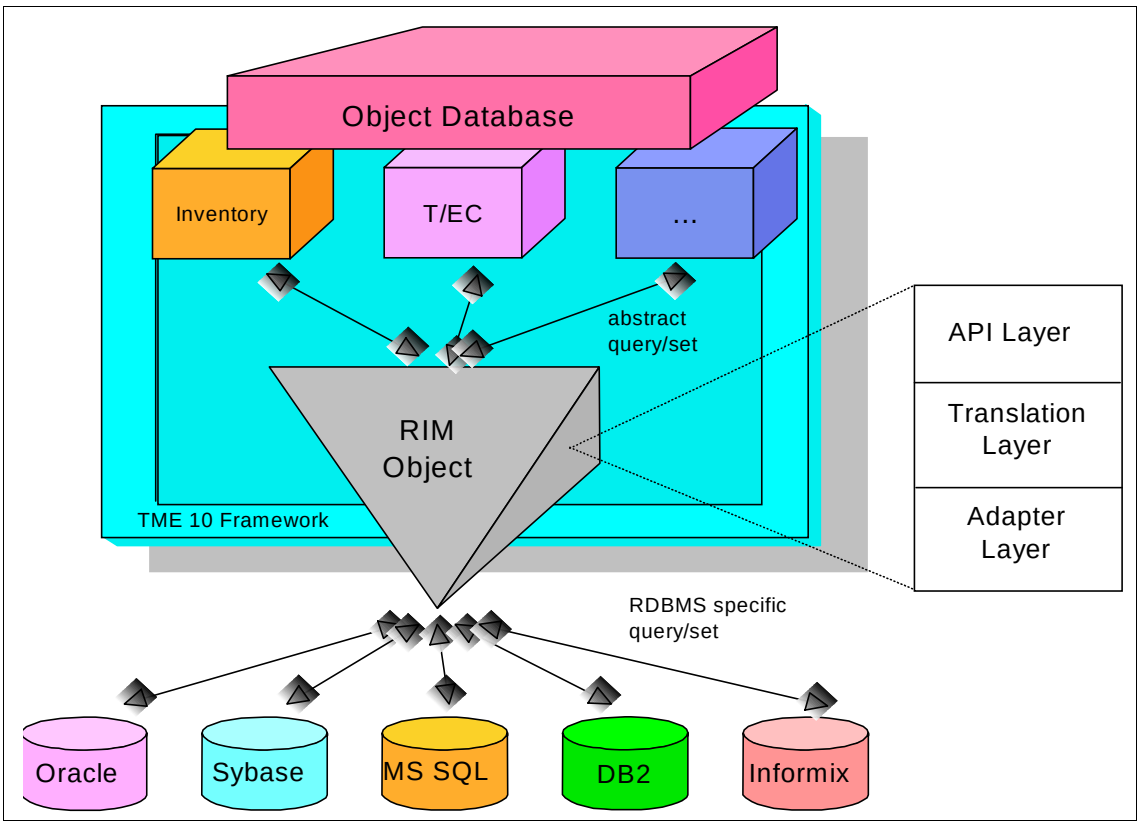


Figure 8. RDBMS Interface Module

As you can see from the above figure, the Tivoli applications communicate only through the RIM object but not directly with the RDBMS application.

You should notice that the Tivoli RDBMS modules have nothing to do with RIM, as they provide the functions to *manage* RDBMS servers, but do not

provide a means for Tivoli applications to access their data stored in an RDBMS.

1.8 A Word on Naming

The Tivoli database management modules are now called Tivoli Manager for Oracle, Tivoli Manager for Sybase, etc.

Earlier versions of these products were called TME 10 Module for Oracle, TME 10 Module for Sybase, etc. We generally use the new naming convention, however, when referring to the products. For example, in screen captures you will occasionally see the old names.

1.9 How to Read This Book

In this redbook we perform scenarios with the different Tivoli RDBMS management modules. For this purpose we set up a Tivoli TMR environment in which we perform all the scenarios.

We start in Chapter 2, “Tivoli Manager for Oracle” on page 17 explaining our TMR setup and then perform the examples with Tivoli Manager for Oracle in this environment.

In the subsequent chapters we then extend the existing TMR environment and perform the examples with the modules for Sybase, MS SQL and Oracle.

Thus, reading Chapter 2, “Tivoli Manager for Oracle” on page 17 will give you a good understanding of our TMR setup; however, you can refer to each chapter separately if you are interested in a particular module. The chapter on Oracle is the most comprehensive though, as we show in detail all the steps necessary in our environment, such as setting up TEC rule bases.

Therefore, you might want to read the chapter on Oracle even if you are particularly interested in modules for another RDBMS.

In Chapter 7, “Design Considerations Involving Tivoli RDBMS Modules” on page 397 we summarize the experiences from the previous chapters and give some guidelines that help in planning the use and deployment of the Tivoli RDBMS modules.

In Chapter 8, “Product Futures” on page 405 we talk a little bit about future enhancements to the Tivoli database management products.

In Chapter 9, “Questions & Answers” on page 407 we answer some of the most common questions regarding the Tivoli RDBMS modules.

Chapter 2. Tivoli Manager for Oracle

In this chapter we introduce the Tivoli Manager for Oracle. We show how to install the module and then perform database management scenarios in our environment.

In this chapter we assume that you are familiar with the Tivoli Framework and the Tivoli core applications.

2.1 Overview and Objective

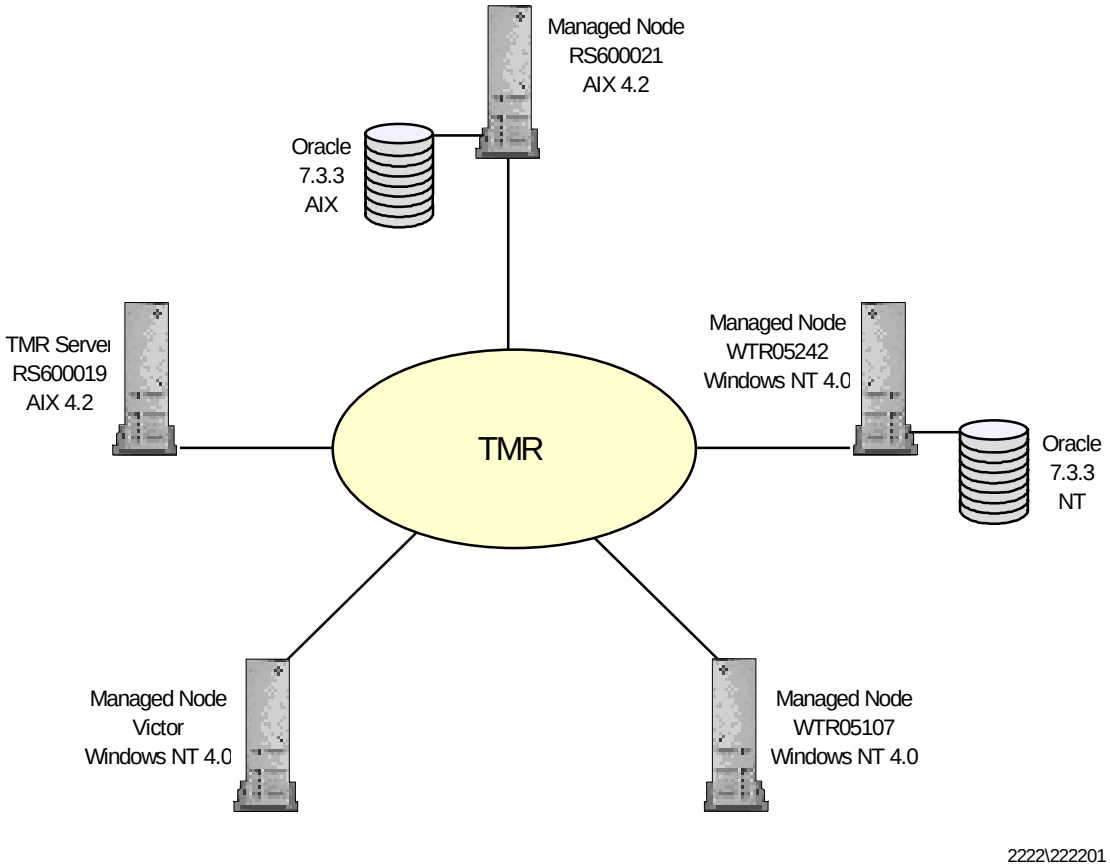


Figure 9. TMR Environment Used for Oracle Scenario

In this chapter we perform all the necessary steps to get Tivoli Manager for Oracle up and running. We install an Oracle server on AIX and Windows NT and set up our Tivoli environment to manage these RDBMS servers.

In order to monitor some real database activity and to also show some integration with other Tivoli products we use the AIX Oracle RDBMS as the database server for Tivoli Enterprise Console in our environment and the Windows NT Oracle RDBMS as the database server for Tivoli Inventory.

We perform the following task:

- Installing and configuring Oracle for AIX
- Installing and configuring Oracle for Windows NT
- Installing Tivoli Manager for Oracle
- Setting up administrator roles
- Registering Oracle databases
- Managing Oracle databases, tablespaces, rollback segments and database instances
- Using Tivoli Manager for Oracle tasks and jobs
- Managing Oracle users
- Monitoring Oracle databases with Tivoli Distributed Monitoring
- Event forwarding to Tivoli Enterprise Console

2.2 Prerequisites

The Tivoli Manager for Oracle, Version 1.0. consists of the following components:

- Tivoli Manager for Oracle - Framework
- Tivoli Manager for Oracle - Distributed Monitoring
- Tivoli Manager for Oracle - User Management

The Tivoli Manager for Oracle, Version 1.0 is compatible with the TME Framework, Version 3.1 or higher and all versions of the Tivoli Enterprise Console. The Tivoli Manager for Oracle - Distributed Monitoring requires Tivoli Distributed Monitoring Version 3.0.2 or later.

We suggest that the release notes be reviewed for these products prior to installation.

Tivoli Manager for Oracle manages Oracle Version 7.X.

2.3 Installed Platform Systems

The following tables contain the hardware and software platforms that we installed on our systems.

TMR Server	rs600019
Platform	AIX 4.2
Hardware	RS/6000
Software	TME 10 Framework 3.2 TME 10 Distributed Monitoring 3.5 TME 10 Distributed Monitors for NT TME 10 Distributed Monitors for UNIX
Patches	3.2-TMF-0002 3.2-TMF-0007 Distributed Monitoring Service Pack 1

Managed Node	rs600021
Platform	AIX 4.2
Hardware	RS/6000
Software	TME 10 Framework 3.2 TME 10 Distributed Monitoring 3.5 TME 10 Tivoli Enterprise Console 3.1 Oracle 7.3.3 for AIX
Patches	3.2-TMF-0002 3.2-TMF-0007

Managed Node	wtr05242
Platform	Windows NT 4.0
Hardware	Intel Pentium

Managed Node	wtr05242
Software	TME 10 Framework 3.2 Oracle 7.3.3 for NT
Patches	3.2-TMF-0002 3.2-TMF-0007 Windows NT Service Pack 3

Managed Node	VICTOR
Platform	Windows NT 4.0
Hardware	Intel 486
Software	TME 10 Framework 3.2
Patches	3.2-TMF-0002 3.2-TMF-0007 Windows NT Service Pack 3

Managed Node	wtr05107
Platform	Windows NT 4.0
Hardware	Intel Pentium
Software	TME 10 Framework 3.2
Patches	3.2-TMF-0002 3.2-TMF-0007 Windows NT Service Pack 3

Note

All the NT managed nodes have the Tivoli desktop installed. Other patches will be required after the installation of Tivoli Manager for Oracle.

The network is token-ring and we are using TCP/IP as the transport protocol.

2.4 Setting Up Our TMR

We have set up the TMR as shown in Figure 9 on page 17. There are two Oracle databases; one operating on AIX and the other one under Windows NT. The database operating under AIX also provides the back end database to the Tivoli Enterprise Console (TEC) in our setup. The Oracle database on the NT managed node is running the default database.

The following figure shows the main window of the Tivoli desktop in our environment.

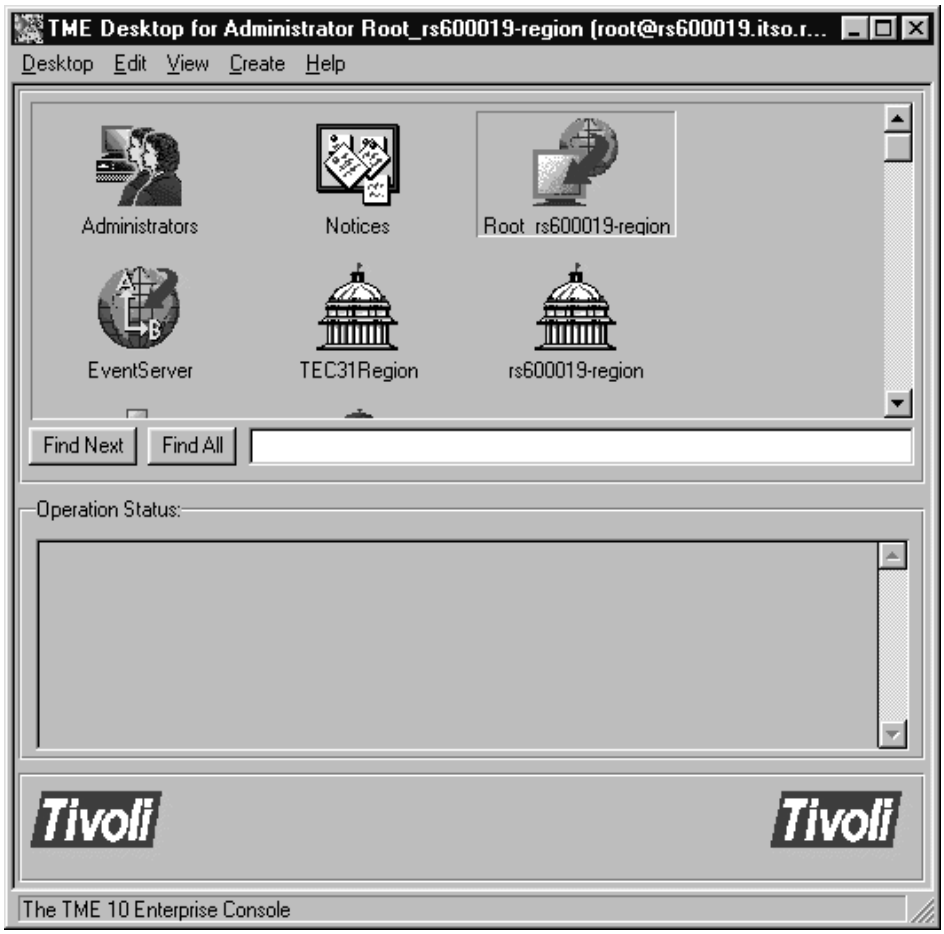


Figure 10. Tivoli Desktop

You can see that we have installed TEC and that the event server is up and running. Double-clicking on **rs600019-region** will open the Policy Region window.

Figure 11. Policy Region Window

You can see our TMR server rs600019, the AIX managed node rs600021 and three Windows NT managed nodes: victor, wtr05107 and wtr05242.

2.5 Setting Up Oracle

In this section we explain the steps necessary to install and configure Oracle.

2.5.1 Setting Up Oracle on AIX

We only give a brief summary here of how to install Oracle for AIX on rs600021. A more detailed explanation of how to install Oracle for AIX can be found in the redbooks *TME 10 Deployment Cookbook: Inventory and Company*, SG24-2120 and *TEC Implementation Examples*, SG24-5216.

Before installing Oracle on AIX, the AIX Base Application Development Toolkit must be installed. To check if this component is installed, you can use the following command:

```
lslpp -l bos.adt.base
```

If this component is not installed, you can install it using SMIT.

In order to install Oracle we perform the following steps:

1. As a user root, create the dba and oper groups on rs600021:

```
mkgroup '-A' dba
mkgroup '-A' oper
```

2. Create a user ID named oracle on rs600021:

```
mkuser pgrp='dba' groups='dba','staff' home='/home/oracle' oracle
```

3. Create an Oracle home directory. We decided to use /home/oracle and create this as a separate file system with 400 MB of size.
4. Change the owner and group of that directory to oracle and the owner group to dba:

```
chwown oracle.dba /home/oracle
chmod 755 /home/oracle
```

5. Create a bin directory. We use /usr/lbin:

```
mkdir /usr/lbin
```

6. Create a login script for the oracle user that sets the Oracle environment variables, such as ORACLE_HOME.
7. As user root, create a directory as a mount point for the Oracle CD-ROM. Create another directory with about 50 MB of disk space to be used by the Oracle installation script as a working directory. This directory is named /oracle_link.

```
mkdir /mount_point
chmod 777 /mount_point
mkdir /oracle_link
chmod 777 /oracle_link
mount -rv cdrfs /dev/cd0 /mount_point
```

8. Run the Oracle link script:

```
cd /mount_point/orainst
./start.sh
```

When prompted for the Oracle link directory, type in `/oracle_link`.

9. Run the Oracle pre-installation script:

```
cd /oracle_link/orainst
./rootpre.sh
```

10. As user oracle run the Oracle installer:

```
cd /oracle_link/orainst
./orainst
```

11. During the installation we enter the values that the installer asks for. We install the products Oracle Data Query, Oracle Easy*SQL ORACLE7 Server (RDBMS) and Oracle UNIX Installer and Documentation. When asked for the Oracle SID, we enter tec.

12. As root we run the post-installation script $ORACLE_HOME/orainst/root.sh and edit the /etc/oratab file to bring up the database at system boot time.

13. Now we can start the Oracle RDBMS by typing `dbstart` as the oracle user.

2.5.2 Setting Up Oracle on Windows NT 4.0

We set up the Microsoft Windows NT 4.0 machine wtr05242 to run a copy of Oracle 7.3.3.

The installation of Oracle under Windows NT is rather simple. Either insert the CD into the machine and allow autoplay to start the installation or setup.exe can be run from the CD. The first question you will be asked is which language you wish to install.

The next step after installing your language is that of where to install the product. We suggest that you take the default directory. (Providing that you have enough storage space to install the product in this location. Our installation took about 200 MB without data.) This will vary from user to user depending on which additional Oracle modules are installed. Consult your Oracle installation guide for details.

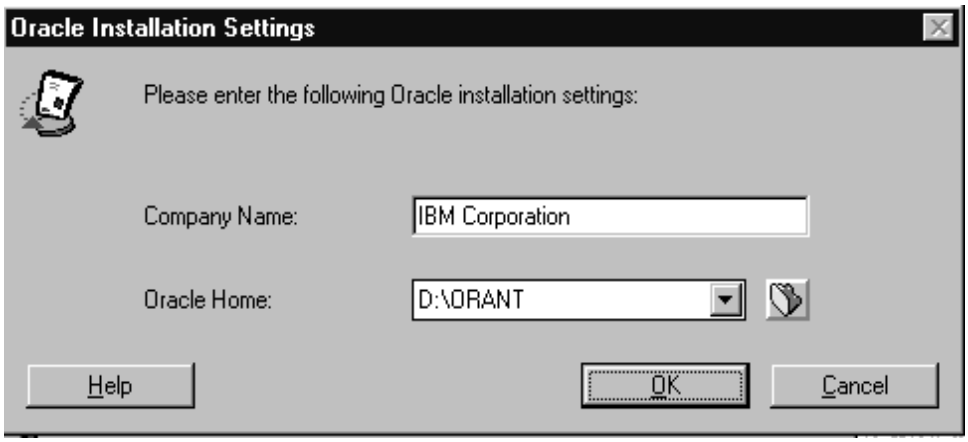


Figure 12. Oracle Installation Settings Window

We choose to install Oracle onto an NTFS partition and change the default directory from C: to D:. The next window will ask whether you want to install a server or a client. Select **Server** here. The following window prompts which additional server software options you want to install. We selected the default which is **None**.

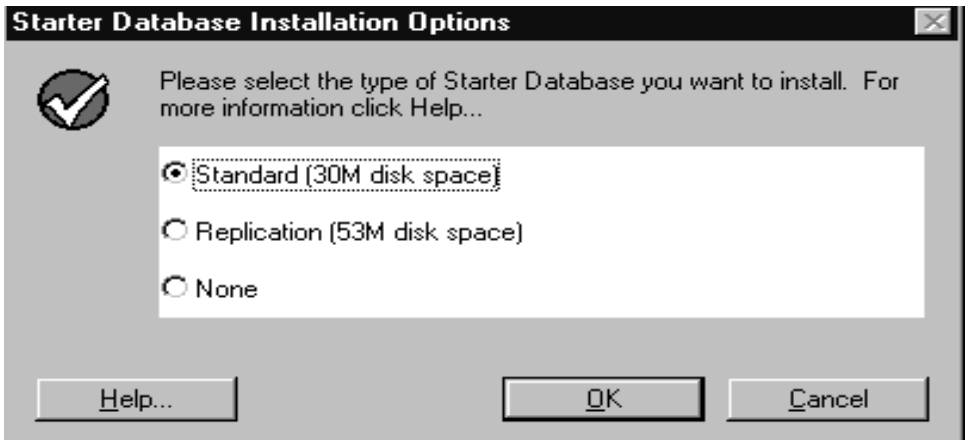


Figure 13. Starter Database Installation Options Window

In the installation window shown in Figure 13 we are given the option of installing a starter database. We select **Standard**. The next window will prompt the user for where they want to install the online documentation. We select Hard Drive here.

The installation will then start to copy the files to the hard drive. The installation will take around 15 minutes. (This will depend on the speed of the computer.)

At the completion of the installation check if the Oracle server is running on the computer. This is done by looking at the services running on the machine. To do this go to the Windows NT control panel and double-click the **Services** icon. The following window will appear.

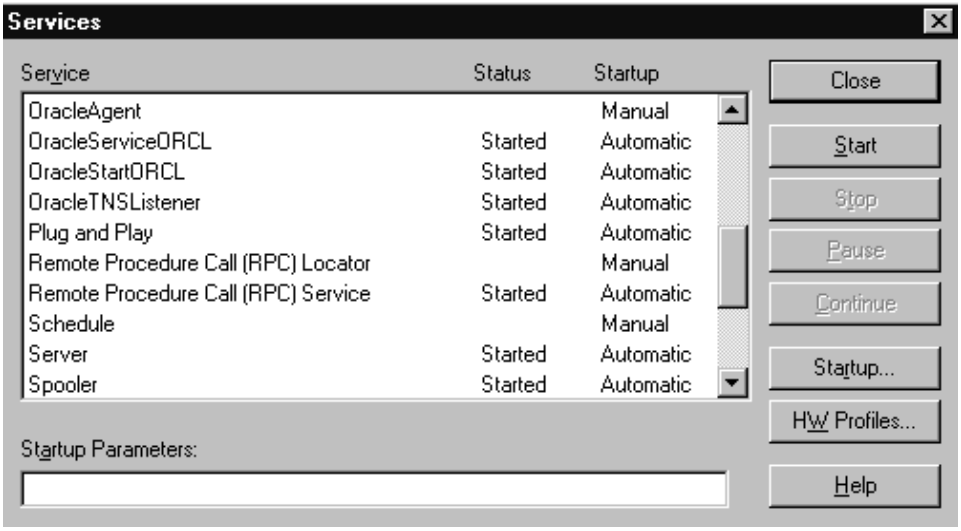


Figure 14. Services Window

There are three services started:

- OracleServiceORCL
- OracleStartORCL
- OracleTNS Listener

If they are not started, do it manually by selecting the service and clicking on the **Start** button.

Most of the Oracle parameters are stored in the Windows NT registry. These values will be useful later either for RIM configuration or for registering an Oracle database in a policy region.

Note

The values stored in the registry can be found running regedit or regedt32. The key in which the values are stored is HKEY_LOCAL_MACHINE/SOFTWARE/ORACLE. The most important keys are ORACLE_HOME and ORACLE_SID. Our values here are D:\ORANT and ORCL respectively.

2.6 Installing Tivoli Manager for Oracle

Tivoli Manager for Oracle is installed from the Tivoli desktop in the same way as any other Tivoli application.

In the Tivoli desktop main window we select **Desktop** from the menu bar and then **Install -> Install Product...** from the pull-down menu.

The Install Product window will appear. We click on the **Install Media...** button and then select the path to the CD-ROM drive or mount point of the Tivoli Manager for Oracle CD. When finished, we click on the **Set Media & Close** button which will take us back to the Install Product window as shown in Figure 15 on page 27.

Figure 15. Install Product Window

In the Select Product to Install section you should now see the three components of Tivoli Manager for Oracle. We first install the Framework component.

Click on **TME 10 Module for Oracle - Framework, Version 1.0**. All managed nodes in your environment should be listed in the Clients to Install On section.

Note

You need to install the TME 10 Module for Oracle - Framework Version 1.0 on all managed nodes that contain Oracle components you want to manage.

We click on the **Install** button. The following figure appears.

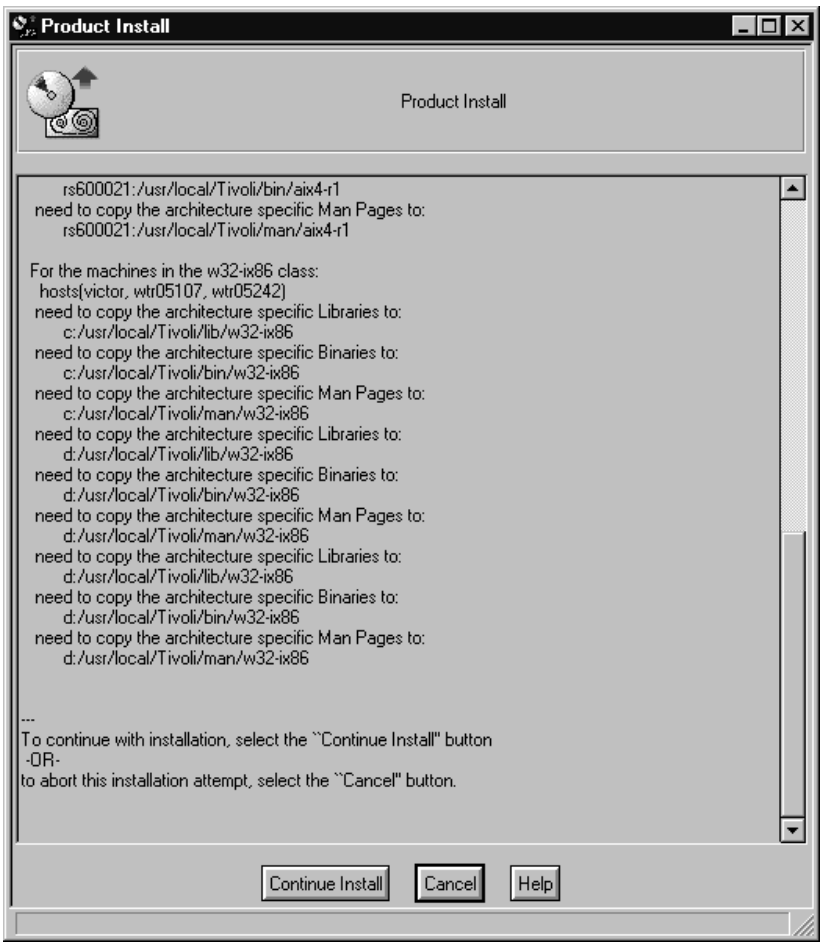


Figure 16. Product Install Window

Review the messages carefully and, if no problems are reported, click on the **Continue Install** button. This will start the actual installation. You will see messages appearing in the window until eventually the Finished product installation message appears as shown in the following figure.

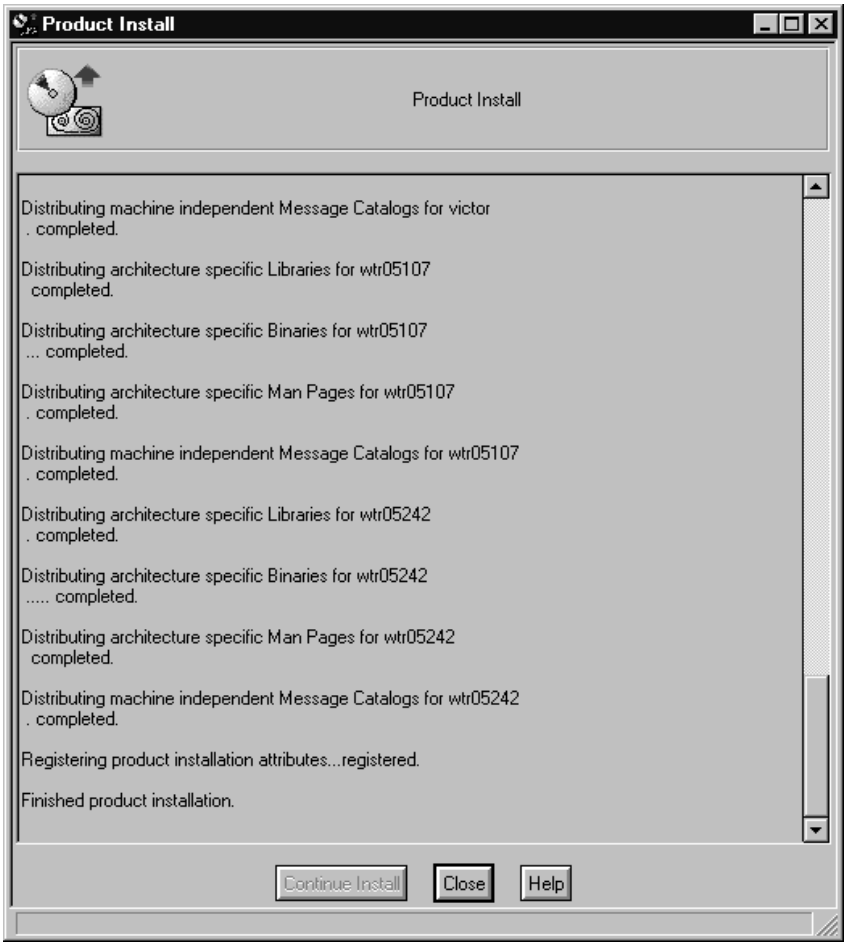


Figure 17. Product Install Window

We click on **Close** to get back to the Install Product window as shown in Figure 15 on page 27.

We perform the same procedure for the other two installation components. First, we install TME 10 Module for Oracle - User Management Version 1.0, which also needs to be installed on all managed nodes that have Oracle components installed that we want to manage.

Finally, we install TME 10 Module for Oracle - Distributed Monitoring, Version 1.0. After the installation, on the TMR server rs600019 a number of files are located in the /usr/local/Tivoli/bin/generic/OracleSentry directory. The collection files are called M7OracleInstance.col and M7OracleDatabase.col.

In the /usr/local/Tivoli/bin/generic/OracleSentry directory you will also find a BAROC file that can be imported into a Tivoli Enterprise Console rule base to enable event forwarding from the Oracle monitors.

To display the contents of this directory we use the ls command on rs600019, which produces the following output:

```
root@rs600019:/usr/local/Tivoli/bin/generic/OracleSentry# ls
ESMSentry.baroc                  M7OracleInstance.baroc
M7OracleDatabase.baroc           M7OracleInstance.col
M7OracleDatabase.col             M7OracleInstanceDefaults.sh
M7OracleDatabaseDefaults.sh      M7OracleInstanceDefaultsDrop.sh
M7OracleDatabaseDefaultsDrop.sh
root@rs600019:/usr/local/Tivoli/bin/generic/OracleSentry#
```

While the installation of TME 10 Module for Oracle - Distributed Monitoring Version 1.0 is running we can trace the output of the install operation by using the tail -f OracleSentry_GBIN_after.output command as shown in the following figure:

```
Telnet - rs600021
Connect  Edit  Terminal  Help
Loading Defaults For Free Space Fragmentation by Tablespace
Loading Defaults For Free Tablespace
Loading Defaults For Free Tablespace By Tablespace
Loading Defaults For Maximum Extents
Loading Defaults For Maximum Extents By Tablespace
Loading Defaults For Maximum Extents By User
Loading Defaults For NT Service Status
Loading Defaults For Rows In DUAL Table
Loading Defaults For Temporary Extents
Loading Defaults For Temporary Extents By Tablespace
Loading Defaults For Unix Core Dump Space
Loading Defaults For SQL*Net V1 TCP/IP Listener
Loading Defaults For SQL*Net V2 Listener
root@rs600019:/tmp# tail -f OracleSentry_GBIN_after.output
\Loading Defaults For Maximum Extents By User
Loading Defaults For NT Service Status
Loading Defaults For Rows In DUAL Table
Loading Defaults For Temporary Extents
Loading Defaults For Temporary Extents By Tablespace
Loading Defaults For Temporary Extents By User
Loading Defaults For Unix Core Dump Space
Loading Defaults For SQL*Net V1 TCP/IP Listener
Loading Defaults For SQL*Net V2 Listener
Loading Defaults For User Dump Space
```

Figure 18. Telnet Window

After the installation of all three components is completed, we use the winstall -a command to verify that all components are installed as shown in the following figure.

```
Telnet - rs600021
Connect  Edit  Terminal  Help
                                   Product List
*-----------------------------------------------------------------------------*

TME 10 Framework
TME 10 Inventory, Version 3.2
TME 10 Enterprise Console 3.1 Logfile Adapter
TME 10 Enterprise Console 3.1 NT Event Log Adapter
TME 10 Module For Oracle - Framework, Version 1.0
TME 10 Module For Oracle - Distributed Monitoring, Version 1.0
TME 10 Module For Oracle - User Management, Version 1.0
TME 10 Enterprise Console 3.1 Rule Builder
TME 10 Distributed Monitoring 3.5
TME 10 Enterprise Console 3.1
TME 10 Enterprise Console 3.1 Server
TME 10 Distributed Monitoring TEC Monitors
TME 10 Distributed Monitoring TME Monitors

*-----------------------------------------------------------------------------*
                                    Patch List
*-----------------------------------------------------------------------------*

TME 10 Framework Patch 3.2-TMF-0002
TME 10 Platform Patch 3.2-TMF-0007
Distributed Monitoring 3.5, Maintainance Release 1
root@rs600019:/#
```

Figure 19. Output from wlsinst Command

The Tivoli Manager for Oracle module installs a driver program on the managed nodes where it is installed. This driver program is started by Tivoli when RDBMS management operations are initiated and communicates with the Oracle RDBMS server.

For the different versions of Oracle that are supported by the module there are different driver programs, located in the $BINDIR/bin directory. For Version 1.0 of the Oracle module, these files are:

```
M7SQLEnginev70
M7SQLEnginev71
M7SQLEnginev72
M7SQLEnginev73
```

The module will automatically invoke the right version.

Note

On a Windows NT managed node, the driver files are also located in the $BINDIR/bin directory, but have the .EXE extension, for example, M7SQLEnginev70.EXE. ($BINDIR is the Tivoli binary directory, for example, /usr/local/Tivoli/bin/aix4-r1.)

If the module is performing an operation on a managed node now, you could watch for the driver process, for example, by typing:

```
ps -ef | grep M7SQLEnginev
```

2.7 Using Tivoli Manager for Oracle

First, we create a new policy region for Oracle databases and register two Oracle databases in the region: one for AIX (rs600021) and one for Windows NT (wtr05242). Before we can register the databases, we have to assign the TMR roles and resource roles to the administrator.

2.7.1 Assigning TMR Roles to an Administrator

First, we have to assign the TMR roles for Oracle to an administrator. To do so, we open the Administrators window. We only have one administrator in our environment. We select the **Root_rs600019-region** administrator with the right mouse button and then select **Edit TMR Roles...** from the pop-up menu as shown in the next figure.

Figure 20. Administrators Window

We select all available roles for Oracle and assign them to the administrator.

Figure 21. Set TMR Roles Window

Once we have selected the roles, we click the left arrow button and then the **Change & Close** button.

Note

The TMR roles oracle_monitor, oracle_admin, oracle_operator, oracle_dba and oracle_user are added to the available TMR roles during the installation of the Tivoli Manager for Oracle.

2.7.2 Assigning Resource Roles

Back in the Administrators window, we select **Edit Resource Roles...** from the pull-down menu of the Root administrator and assign all available Oracle roles for the Administrators and Oracle resources.

Figure 22. Set Resource Roles Window

We select the **Administrators** resource and select all available roles, click the left arrow button and then select the **Change** button. Afterwards, we select the **Oracle** resource and select all available roles again, then click the left arrow button and select **Change & Close**.

2.7.3 Restarting the Tivoli desktop

We have to restart the desktop to activate the newly assigned roles. After restarting the desktop, we are ready to register Oracle databases.

2.7.4 Creating an Oracle Region

We decide to create a new policy region to manage the Oracle databases separately from other managed objects. We call the new policy region Oracle. To create the new policy region in the Tivoli desktop main window we select **Create** from the menu bar and then **Region...** from the pull-down menu.

Figure 23. Create Policy Region Window

We enter Oracle in the Name field and select the **Create & Close** button to finish creating the policy.

2.7.5 Setting Oracle Managed Resources

Before we can register any database in the region, we have to assign the Oracle managed resources to the policy region.

We enter the region by double-clicking the **Oracle** icon on the Tivoli desktop. Then we open the associated dialog by selecting **Properties** from the menu bar and then **Managed Resources...** from the pull-down menu in the Oracle Policy Region Window, as shown in the following figure.

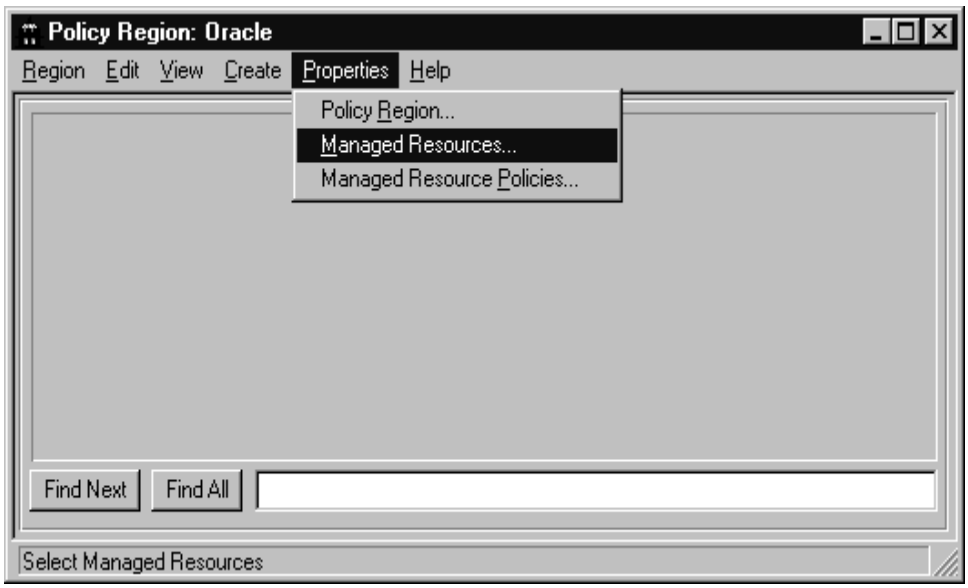


Figure 24. Policy Region: Oracle Window

In the Set Managed Resources window we select all available items for the Oracle resources.

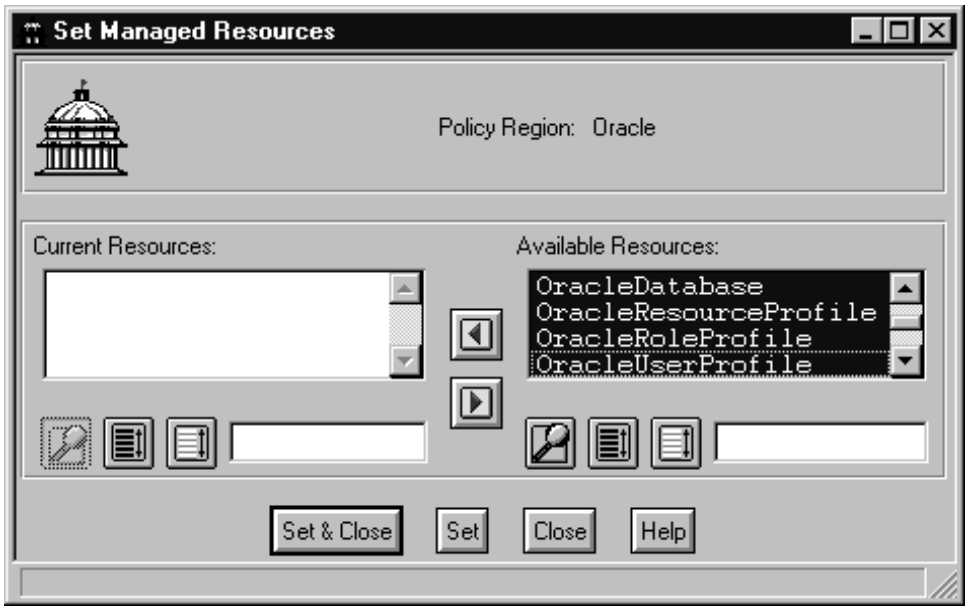


Figure 25. Set Managed Resources Window

Then we click the left arrow button and select **Set & Close** to assign the resources to the region. After that step the policy region is ready to register Oracle databases.

2.7.6 Registering an AIX Oracle Database

The first database we register is the Oracle database on rs600021. For this database we have to create a database object in the policy region. We select **Create** from the menu bar in the Policy Region: Oracle window and then **OracleDatabase...** from the pull-down menu.

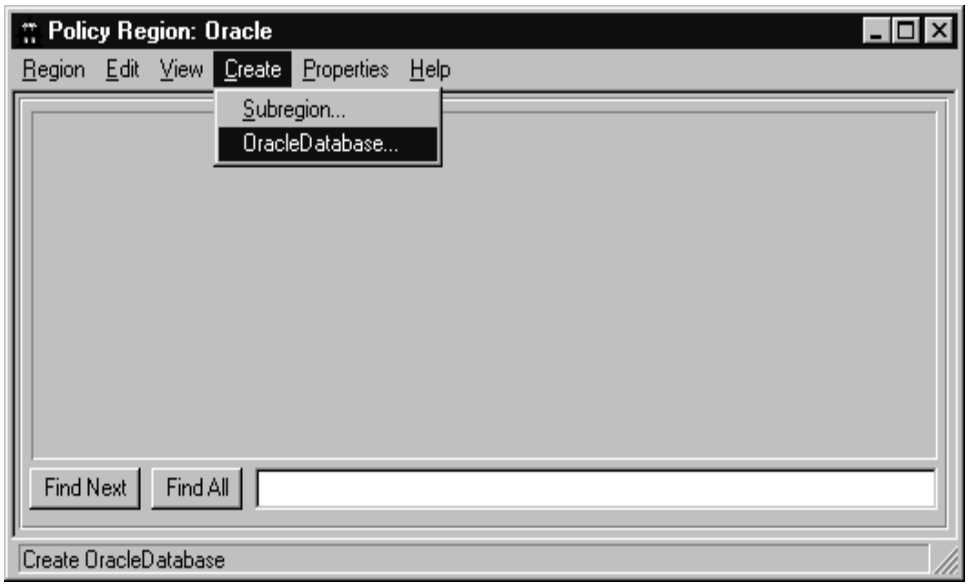


Figure 26. Policy Region: Oracle Window

The first database we register is the Oracle database on the AIX machine rs600021 as mentioned. We fill in the values as shown in the following figure.

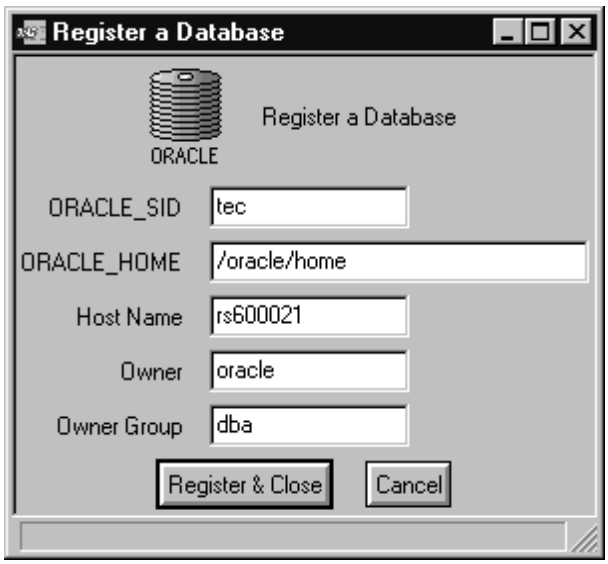


Figure 27. Register a Database Window

- ORACLE_SID is the Oracle system identifier. This is the value we specified during the installation of Oracle.
- ORACLE_HOME is the path of the Oracle system.
- Host Name is the hostname of the machine where the database resides.
- Owner is the user ID on rs600021 to access the database. This is the Oracle database owner.
- Owner Group is the group on rs600021 to access the database.

We click the **Register & Close** button. After completion of the command we get the first managed resource in the database policy region. The registration for the database is complete.

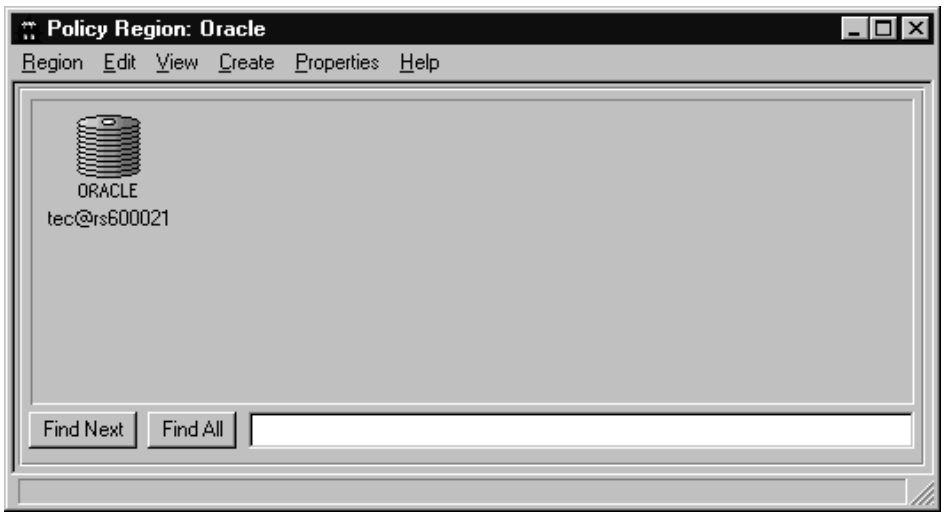


Figure 28. Policy Region: Oracle Window

2.7.7 Registering the NT Oracle Database

The second database we want to register in the Oracle policy region is on wtr05242. We fill in the fields with the appropriate values as shown in the following figure.

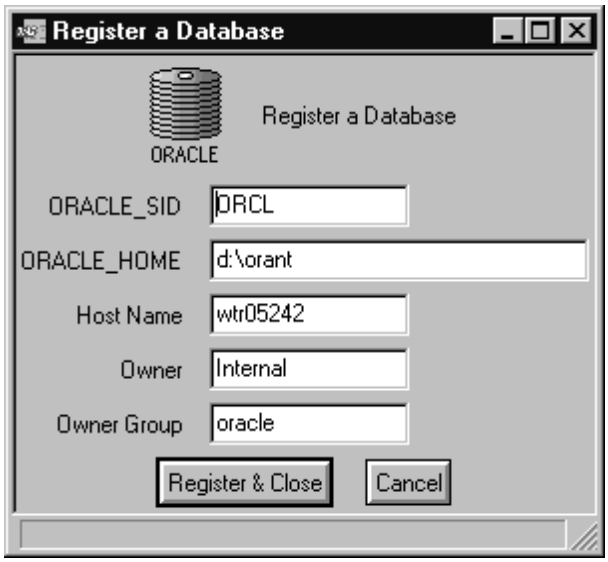


Figure 29. Register a Database Window

Registering the Windows NT Oracle database will require entries for the fields Owner and Owner group that are different from a UNIX install. Windows NT does not use the UNIX group ID concept when allocating permissions to users. The values used here are internal for Owner and oracle for Owner group where internal corresponds to a built-in administrative group within Oracle and oracle corresponds to its password. Select **Register & Close** to complete the registration.The Windows NT Oracle database appears as the second resource to be managed in the Oracle policy region.

Note

In order to get the Tivoli Manager for Oracle to register an NT database it is required that a patch be loaded on to the TMR server and managed nodes running the Tivoli Manager for Oracle - Framework.

The patch name is 1.0-ORA-0001 and is readily available from the Tivoli ftp site (ftp.tivoli.com).

To ensure that the registrations are working correctly the databases are inspected. Select **Properties...** to inspect the properties of the Oracle database registered on rs600021. After clicking the right button on the database icon the menu appears as shown in the next figure.

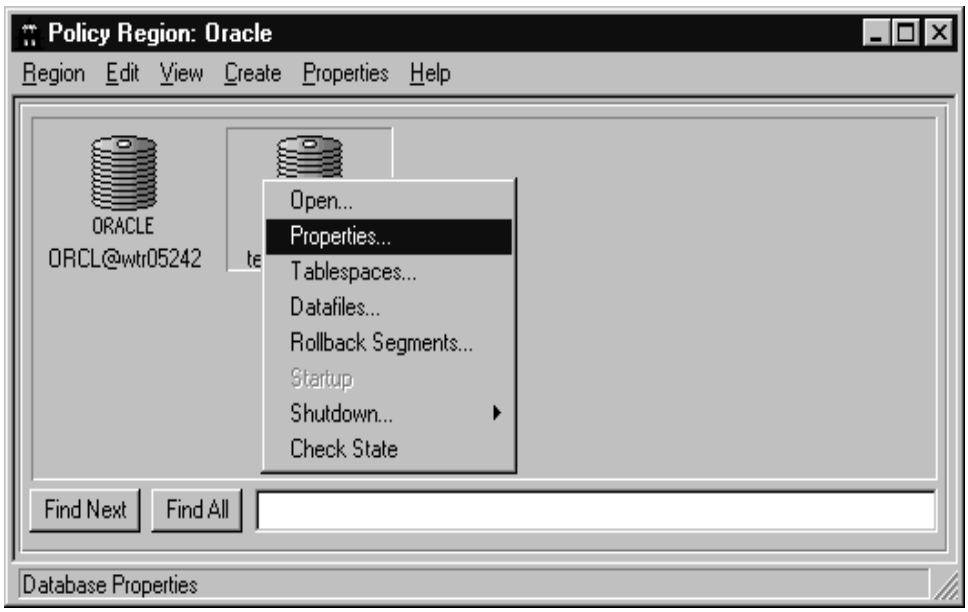


Figure 30. Policy Region: Oracle Window

After selecting **Properties...** from the pop-up menu the base information of the AIX Oracle database is displayed as shown in the next figure.

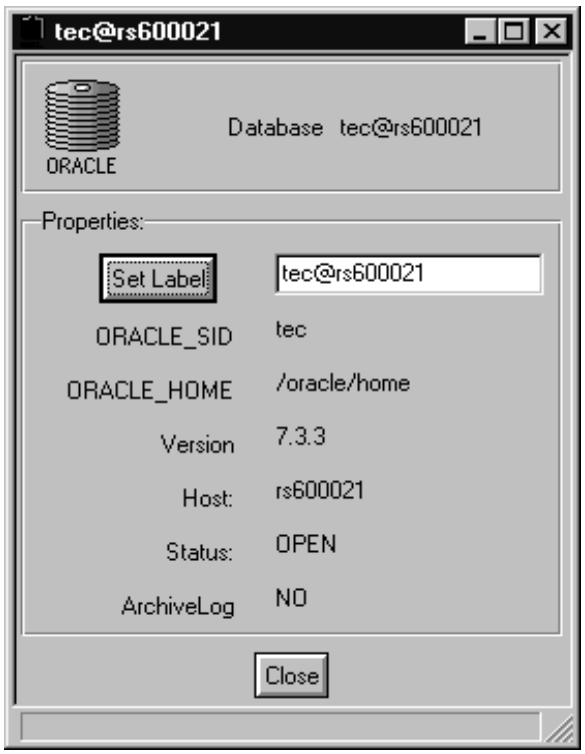


Figure 31. Database Properties Window

The registration is finished now.

The database registration for our two databases has created two Tivoli objects of resource type Oracle that can be displayed with the command:

```
wls -l Oracle
```

The output for our environment is:

```
1412995864.2.62#M7Database::Database#   tec@rs600021
1412995864.5.88#M7Database::Database#   ORCL@wtr05242
```

You can list the other resource types added to the TMR by the installation of Tivoli Manager for Oracle by typing:

```
wlookup -lR | grep Oracle
```

In our environment, the output looks like the following:

```
OracleDatabase:  Fri Jun 12 09:32:44 1998
OracleDatabaseGUI
```

```
OracleInstance:  Fri Jun 12 09:32:52 1998
OracleInstanceGUI
OracleResourceProfile:  Fri Jun 12 09:04:19 1998
OracleRoleProfile:  Thu Jun 11 15:18:00 1998
OracleUserProfile:  Thu Jun 11 15:18:04 1998
```

Note

You should notice that you can also register databases from the command line using the oregdb command. This command is added to the $BINDIR/bin directory at the TMR server during the installation of Tivoli Manager for Oracle. This command is especially useful when you want to register a large number of database servers in batch mode. You can use the command man oregdb to get more information on the command.

2.7.8 Managing Oracle Databases

Here we discuss some of the features available in administering the Oracle database using Tivoli Manager for Oracle Framework. The topics covered are shutting down and starting up the database, tablespace and datafile management, and finally rollback segments.

2.7.8.1 Shutting Down and Starting Up the Database

This procedure is exactly the same as starting and shutting down the database from the Oracle Instance Manager. The authority in which the Tivoli Manager for Oracle shuts down the database is that of the database system administrator. The required role within Tivoli to perform these actions is that of an oracle_dba.

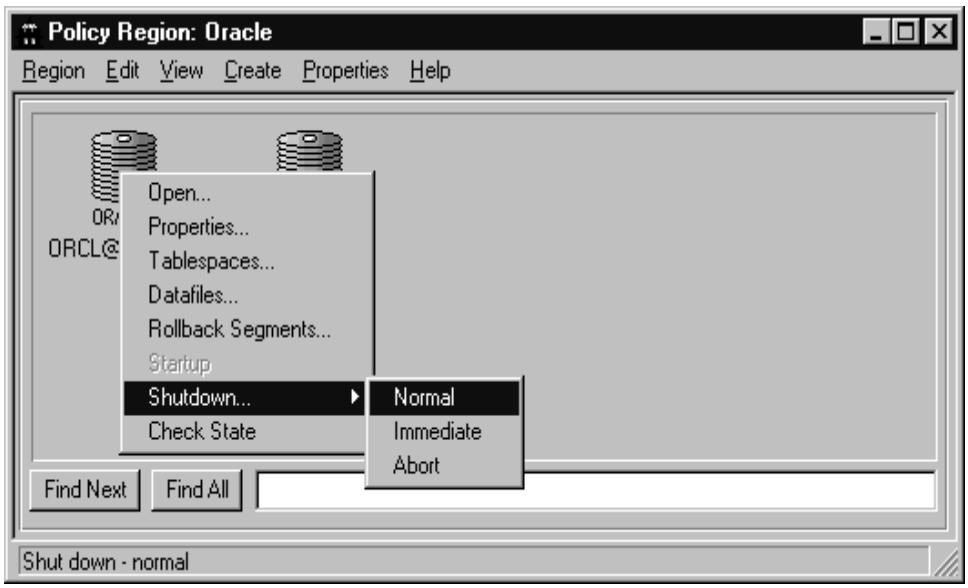


Figure 32. Policy Region: Oracle Window

To shut down the database click the right mouse button on the database icon and select **Shutdown...** from the pull-down menu. A cascaded menu appears with three options Normal**,** Immediate and Abort. Select **Normal** from the cascaded pull-down menu for a regular shutdown.

Note

Normal shutdown means the following:

- No client can connect.
- Shutdown takes place after the last client disconnects.
- All the regular housekeeping is performed on the database, so that no instance recovery is required in the next start-up.

Immediate shutdown means the following:

- All SQL statements are terminated immediately.
- Any uncommitted transactions are rolled back.
- All users currently connected to the database are disconnected.

Abort shutdown means an immediate Shutdown, but all uncommitted transactions are not rolled back.

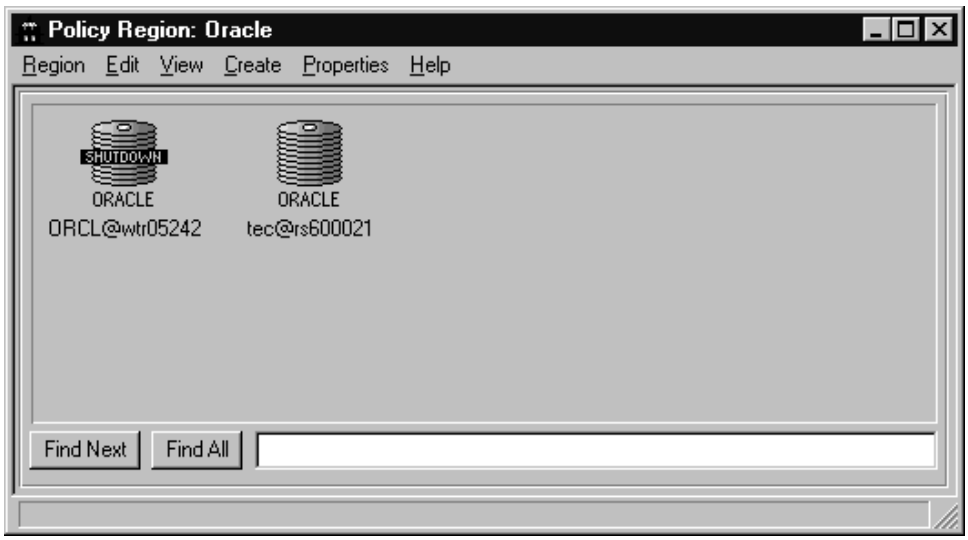


Figure 33. Policy Region: Oracle Window

The diagram above shows the Windows NT Oracle database ORCL@wtr05242 in a shutdown state and the AIX Oracle database tec@rs600021 in the operational state.

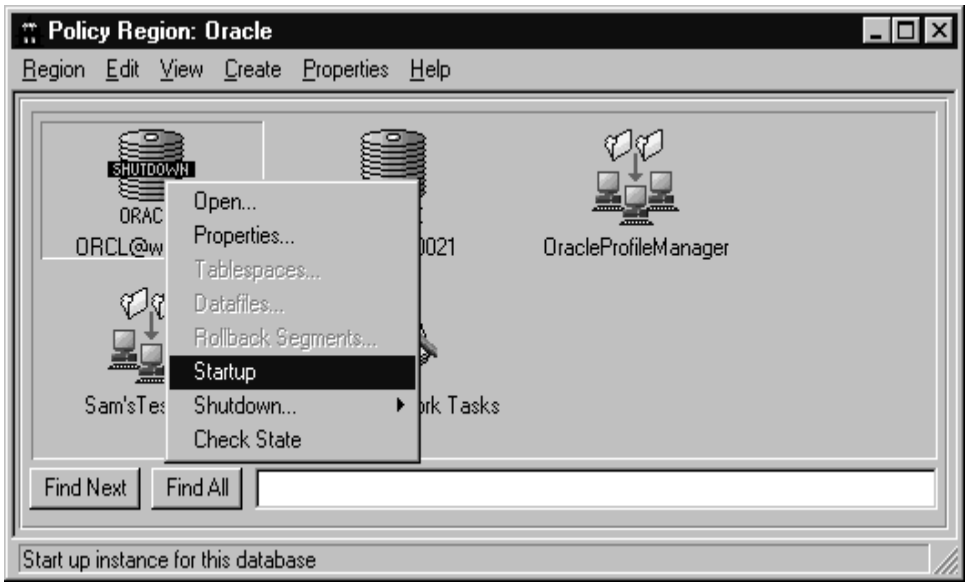


Figure 34. Policy Region: Oracle Window

To start up the database click the right mouse button on the database icon and select **Startup** from the pull-down menu. After the startup procedure is finished the icon is automatically refreshed and shows the database in the operational state.

2.7.8.2 Checking the State of the Database

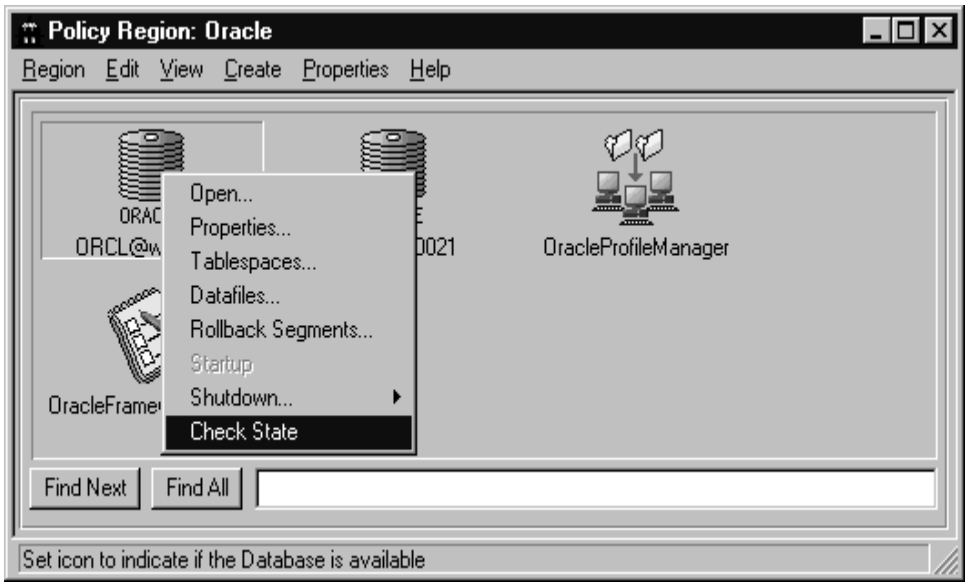


Figure 35. Policy Region: Oracle Window

To see whether the database is up or down at this moment in time, check the database state. Select the right mouse button on the database icon and select **Check State** from the pull-down menu. The refreshed icon will show the actual state.

This operation can be performed from the Tivoli desktop only.

In the next section we are going to describe how to perform the Oracle tablespace and datafile manipulation as well as the manipulation of rollback segments. This includes the creation, modification and deletion of the physical and logical database resources.

2.7.9 Managing Tablespaces

In this section we show how tablespaces are manipulated under Tivoli Manager for Oracle. The topics covered will be creating, deleting, taking a

tablespace online or offline, managing the default storage of a tablespace, and finally dropping a tablespace.

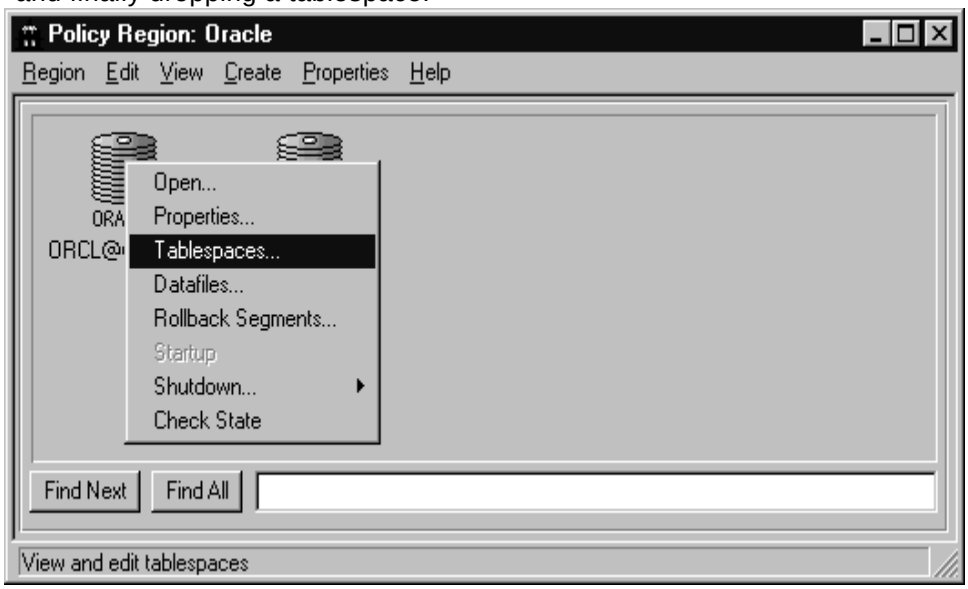


Figure 36. Policy Region: Oracle Window

This opens a new dialog with the currently defined tablespaces for the database. The following window will appear.

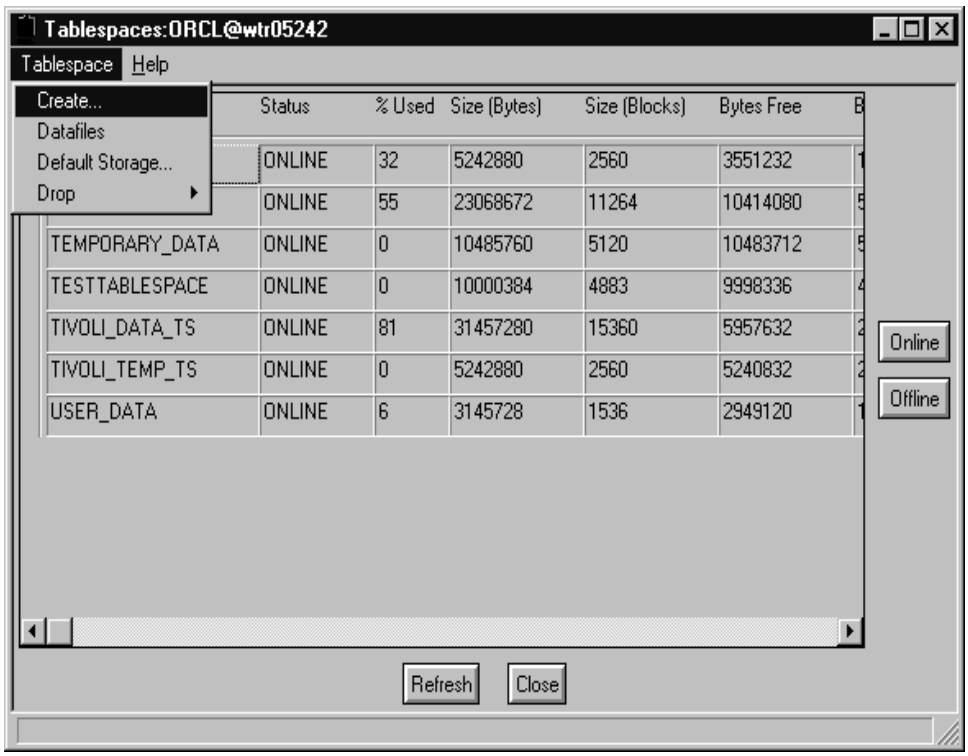


Figure 37. Tablespaces ORCL@wtr05242 Window

Figure 37 on page 51 summarizes the same information about tablespaces available from the Oracle Storage Manager under Windows NT.

2.7.9.1 Creating Tablespaces

In order to create a new tablespace, select the right mouse button on the database icon and select **Tablespaces...** from the pull-down menu. Figure 37 on page 51 will appear. Select **Create...** from the pull-down menu and the following window will appear.

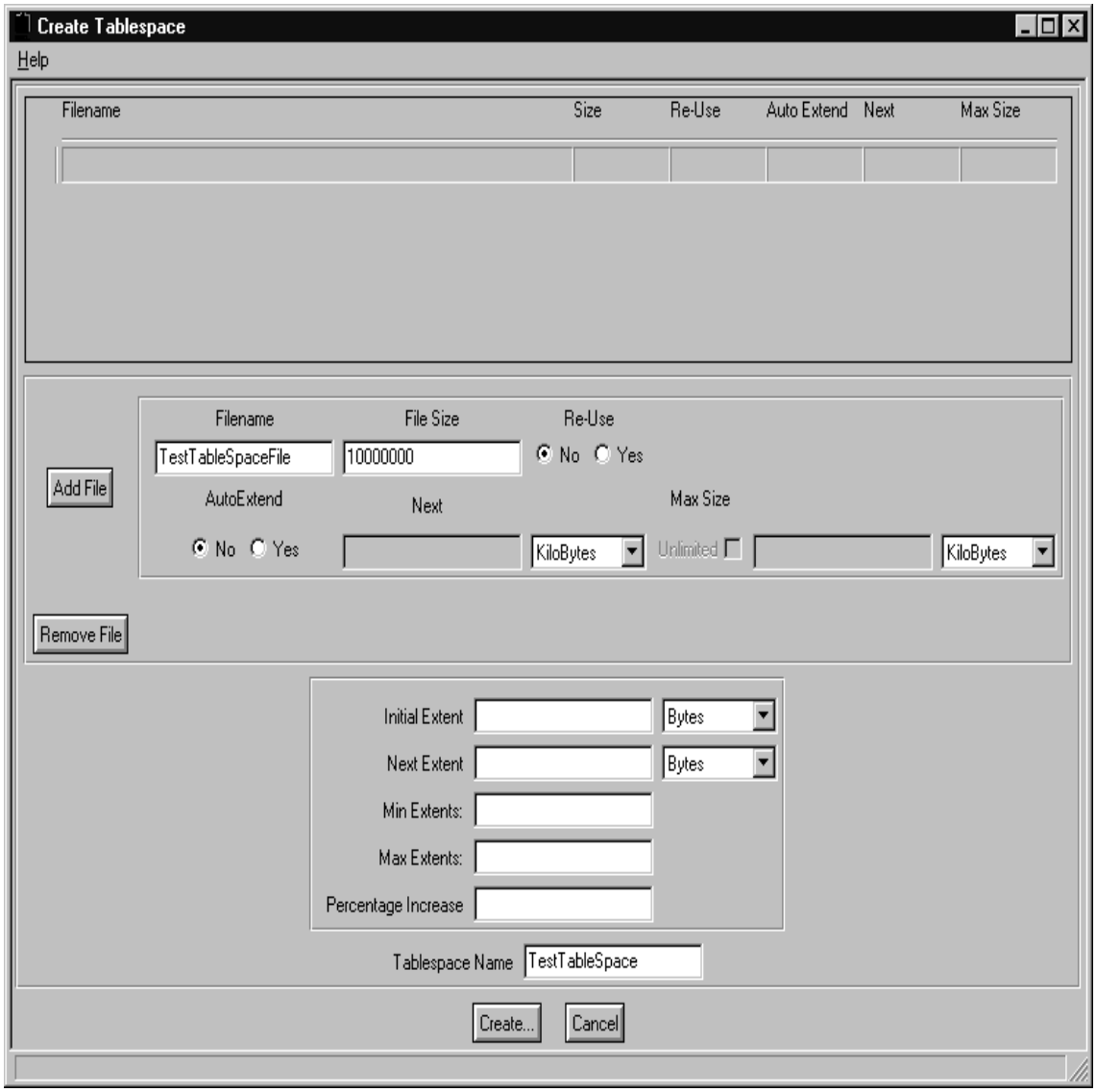


Figure 38. Create Tablespace Window

In order to create a tablespace follow these steps:

1. Define at least one datafile for the new tablespace. To create a datafile enter the Filename and the File Size and select the **Add File** button. If there is already a datafile created, you can reuse it by selecting the **Yes** button in the Re-Use selection box. Additionally, there are other default

values, which can be changed. In our example, we named the datafile TestTableSpaceFile and specified the file size to be 10000000 bytes.

2. The final step in the creation of a tablespace is that of entering the name of the tablespace and committing the changes by choosing the **Create...** button. The new tablespace will appear in the list of tablespaces automatically.

Note

The datafile is not created until the tablespace is created. If you have not defined a file size the creation of the tablespace will fail.

The same command can be run from SQL*NET as follows:

```
CREATE TABLESPACE TestTableSpace DATAFILE 'TestTableSpaceFile' SIZE
10000000.
```

2.7.9.2 Switching the Tablespace to Offline and Online

In order to take the tablespace online and offline it is required to have the privileges of an oracle_dba.

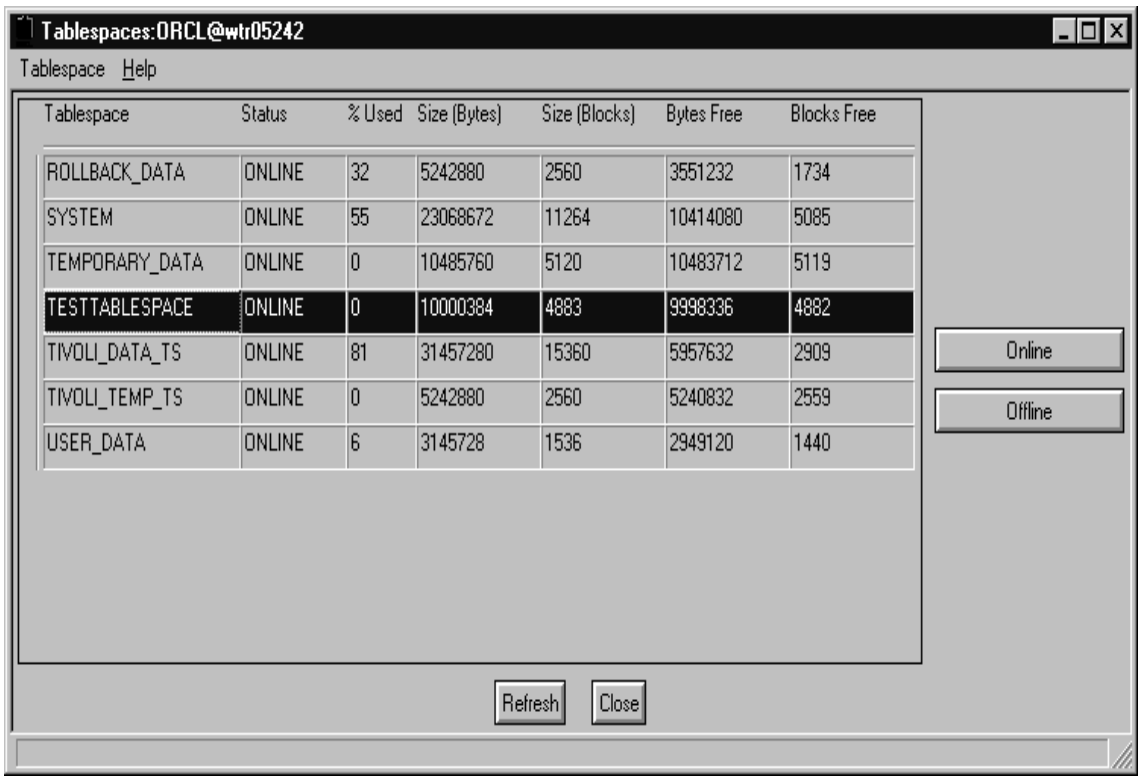


Figure 39. Tablespaces: ORCL@wtr05242 Window

To take a tablespace offline select the row containing the name of the tablespace. In this example this is TESTTABLESPACE. Note, that the **Online** and **Offline** buttons are now activated. To take the tablespace offline select the **Offline** button and to bring it online select the **Online** button.

2.7.9.3 Managing the Default Storage of a Tablespace

To manage the default storage of a tablespace ora_dba privileges are required.

Select **Default Storage...** from the **Tablespace** menu to enter the dialog for the default storage management.

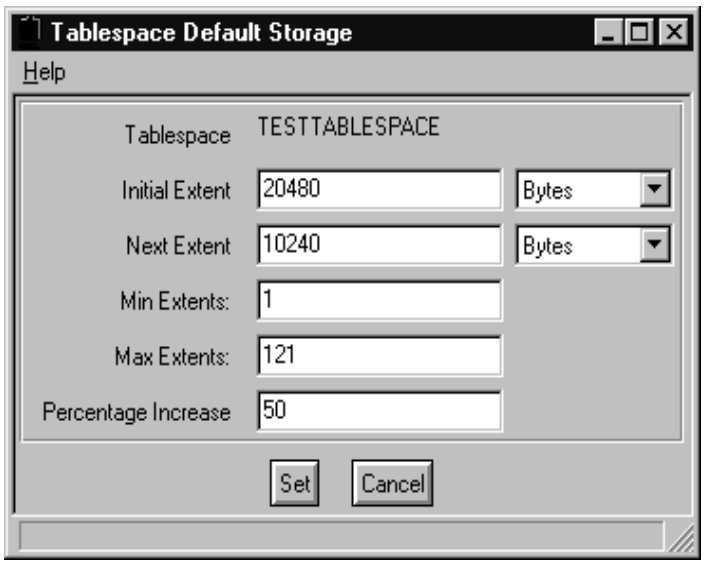


Figure 40. Tablespace Default Storage Window

If changes to the default values need to be made, change the value and select the **Set** button to activate the changes.

Note

A logical unit of storage in an Oracle database containing a number of contiguous data blocks is called an extent. When the allocated space of a database is completely used, Oracle allocates a new extent to enlarge the database.

Here are the definitions of the following attributes that can be changed for the default storage tablespace:

- Initial size:

  The size of the object's first extent. The default is to specify it in bytes.

- Next size:

  The size of the next extent to be allocated for the object, also stored in bytes.

- Min extents:

  The minimum number of extents, that are created when a segment is created.

- Max extents:

  The total number of extents, including the first, that Oracle can allocate for the object.

- Percentage increase:

  This value determines the percentage the next extent will grow compared to the previous extent.

2.7.9.4 Dropping a Tablespace

To drop a tablespace you need to have the ora_dba privilege.

It is strongly suggested that you have an Oracle administrator background before a task such as this is performed.

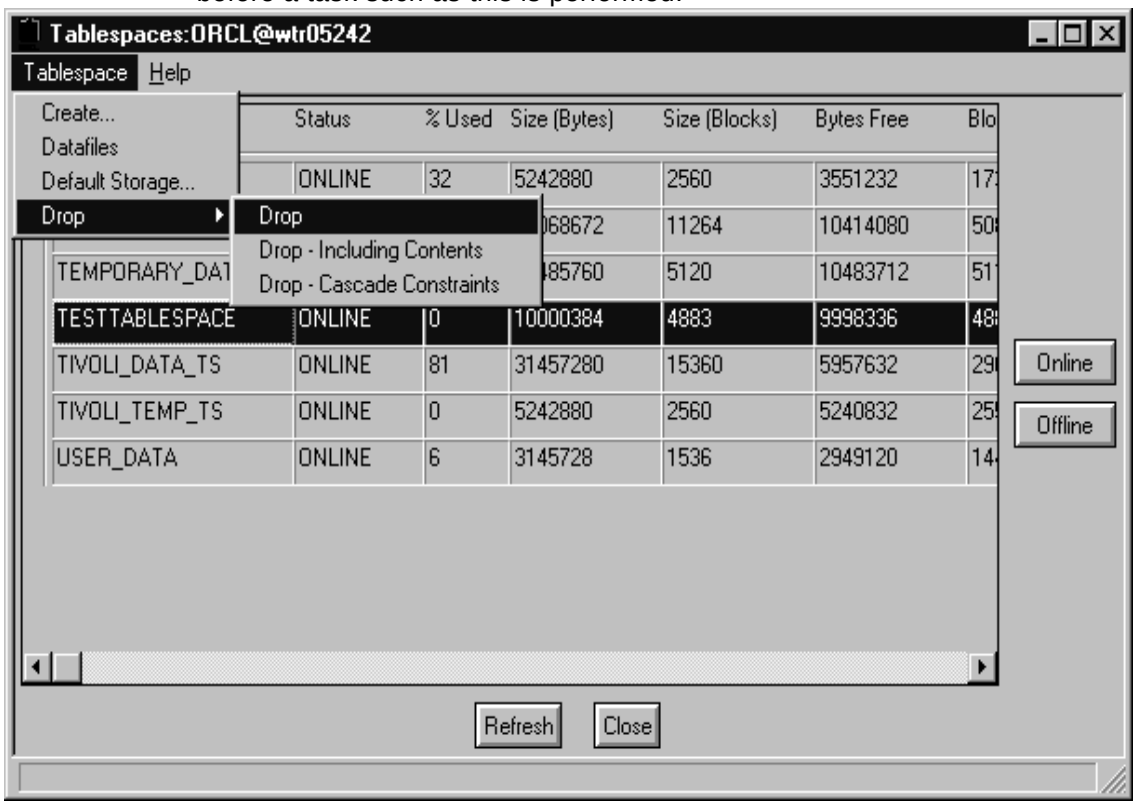


Figure 41. Tablespaces: ORCL@wtr05242 Window

To drop a tablespace select the **Tablespace** menu and from there select the **Drop** menu item. From this menu you are given three options to drop the tablespace.

They are:

1. Drop: Select this option to drop the highlighted tablespace if the tablespace does not contain any objects.
2. Drop Including Contents: Select this option and it will drop the tablespace and all of its contents.
3. Drop Cascade Constraints: Select this option and it will drop additionally all referential constraints referring to the tablespace to be deleted.

2.7.9.5 Adding Data Files to Tablespace

A datafile can be added to a tablespace using the Tivoli Manager for Oracle. In order to do this select the tablespace in the tablespace window and then select **Datafiles** from the **Tablespace** pull-down menu as shown in Figure 42 on page 58.

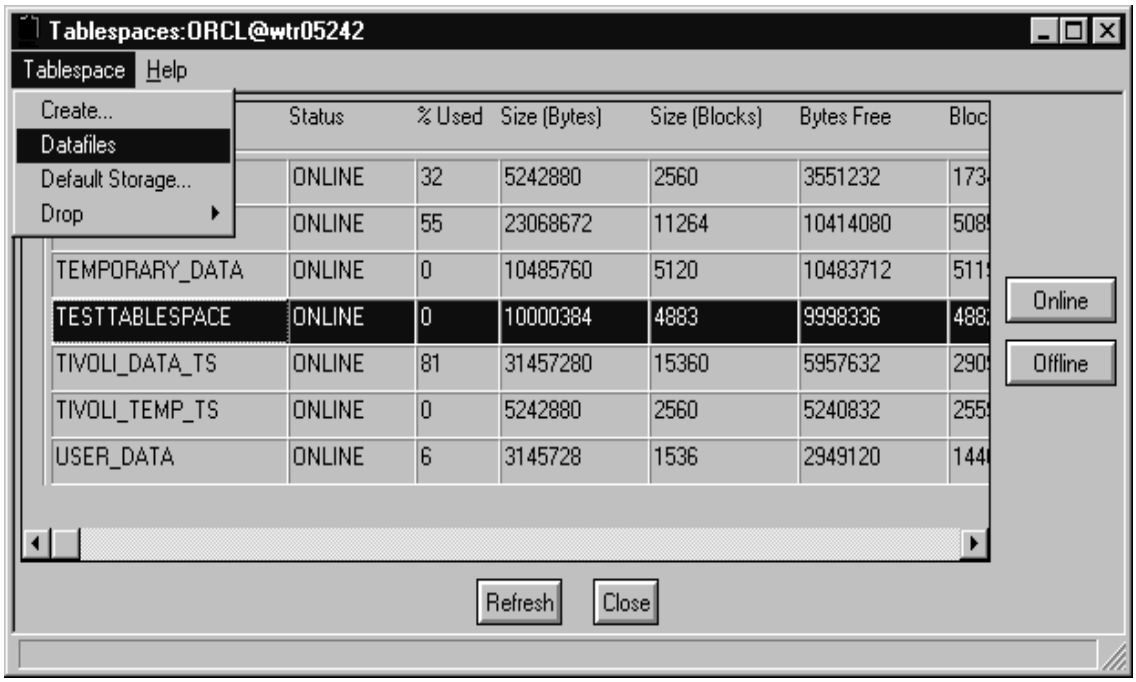


Figure 42. Tablespaces: ORCL@wtr05242 Datafiles Window

The Tablespace Datafiles Window appears. We enter the value File2 for the Filename and 2000000 for the File Size to be created as shown in Figure 43 on page 59.

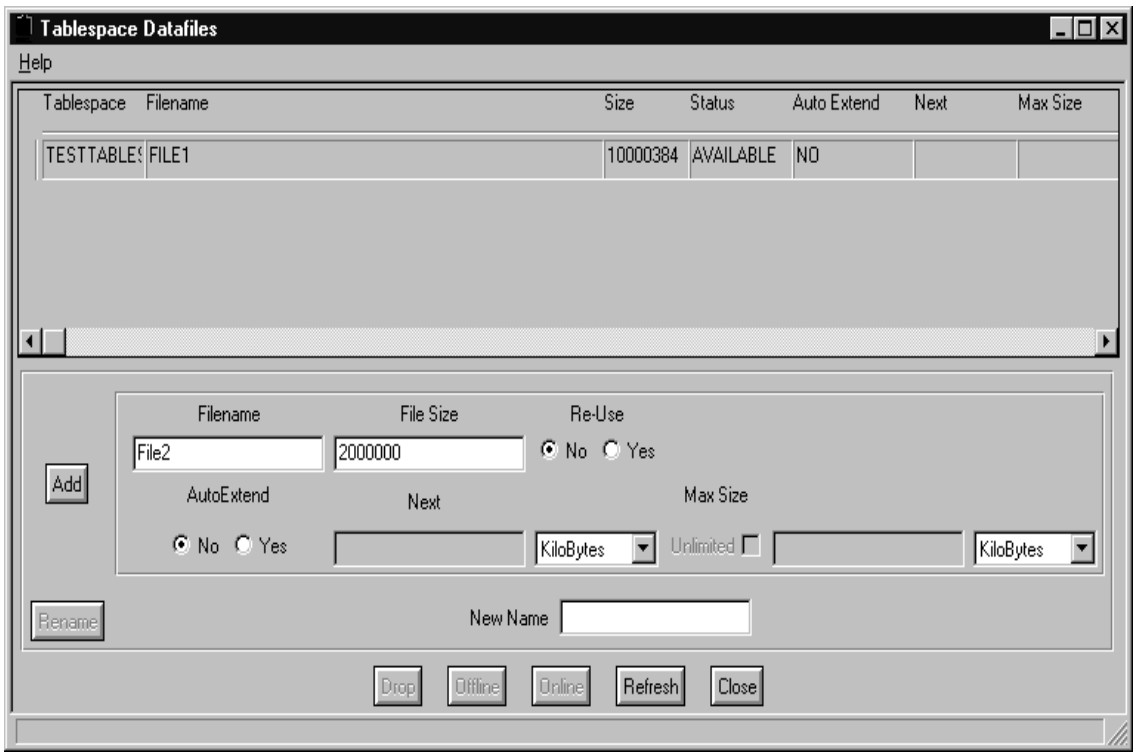


Figure 43. Tablespace Datafiles Window

After completing all the details the **Add** button is selected. This datafile is now added to the existing tablespace. The default values were used here for File2. At the bottom of the window there are other options that can be used to manipulate the dataspace. They are the following:

- Dropping a datafile
- Taking a datafile offline within a tablespace
- Taking a datafile online within a tablespace

These options will be outlined in greater detail in the next section.

2.7.9.6 Managing Data Files

As you can see from the previous section, data files can be manipulated from the **Tablespace** menu. Additionally, there is an option to manipulate all the datafiles of an Oracle database from the database icon. To manage the datafiles we click the right button on the database icon and select **Datafiles...** from the pull-down menu as shown in Figure 44 on page 60.

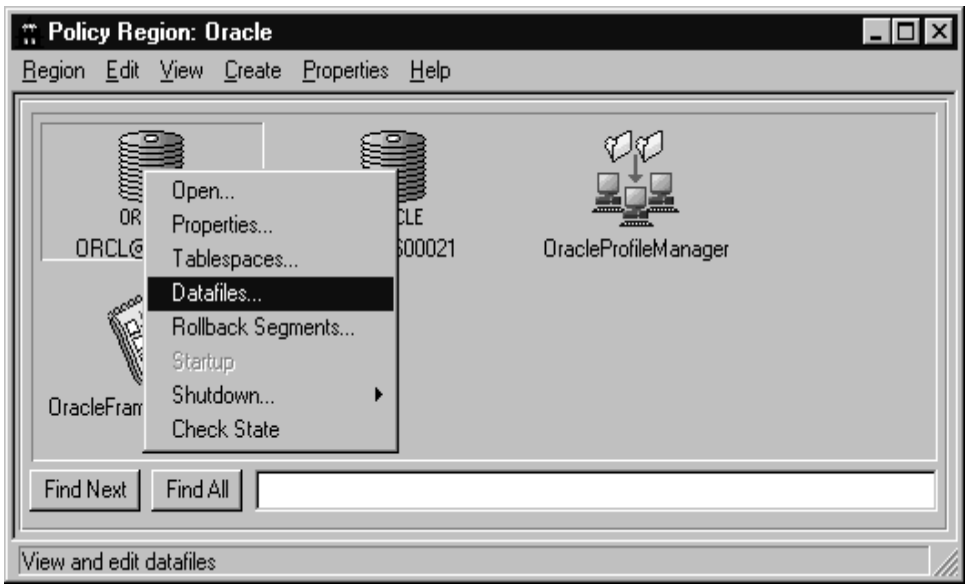


Figure 44. Policy Region: Oracle Window

The following dialog appears:

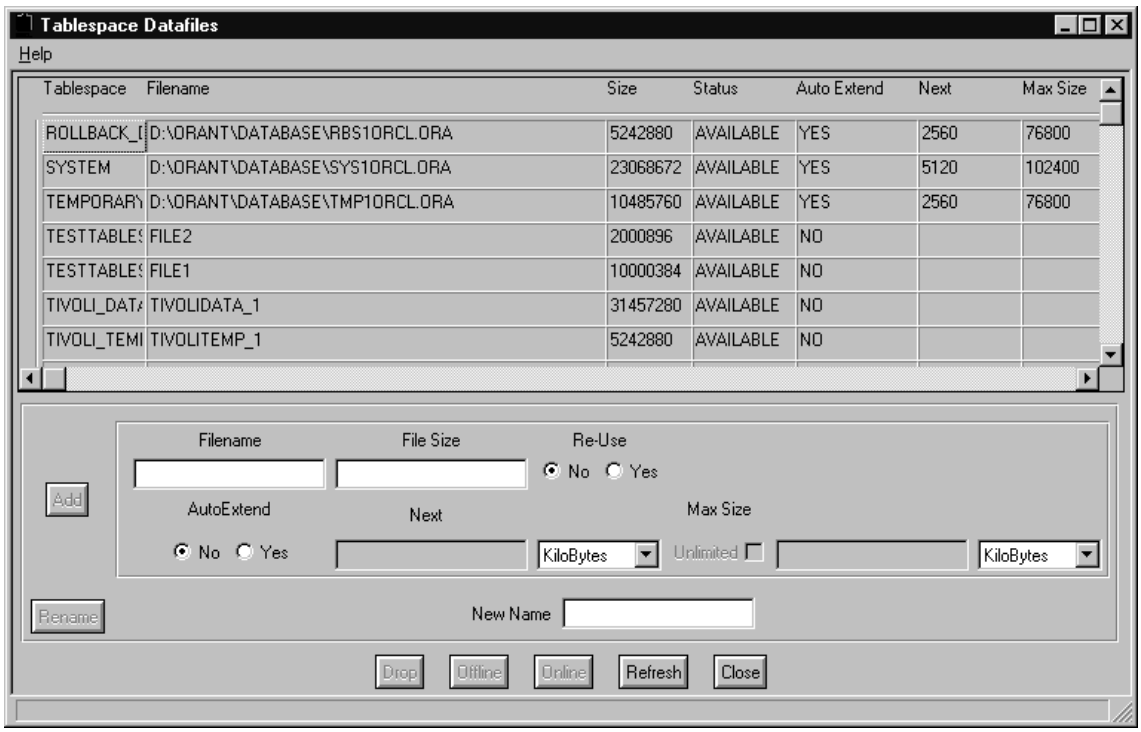


Figure 45. Tablespace Datafiles Window

In this dialog you can see all data files belonging to all tablespaces of the Oracle database. This is the only difference from managing the data files from the Tablespace window, which only shows the datafiles belonging to the tablespace selected.

Note, that except for the **Refresh** and **Close** button all actions are disabled.

In this scenario we describe how to bring a datafile offline, online and to drop the data file from a tablespace. In order to perform any of these actions select the datafile first. All the buttons are enabled now, as shown in Figure 46 on page 62.

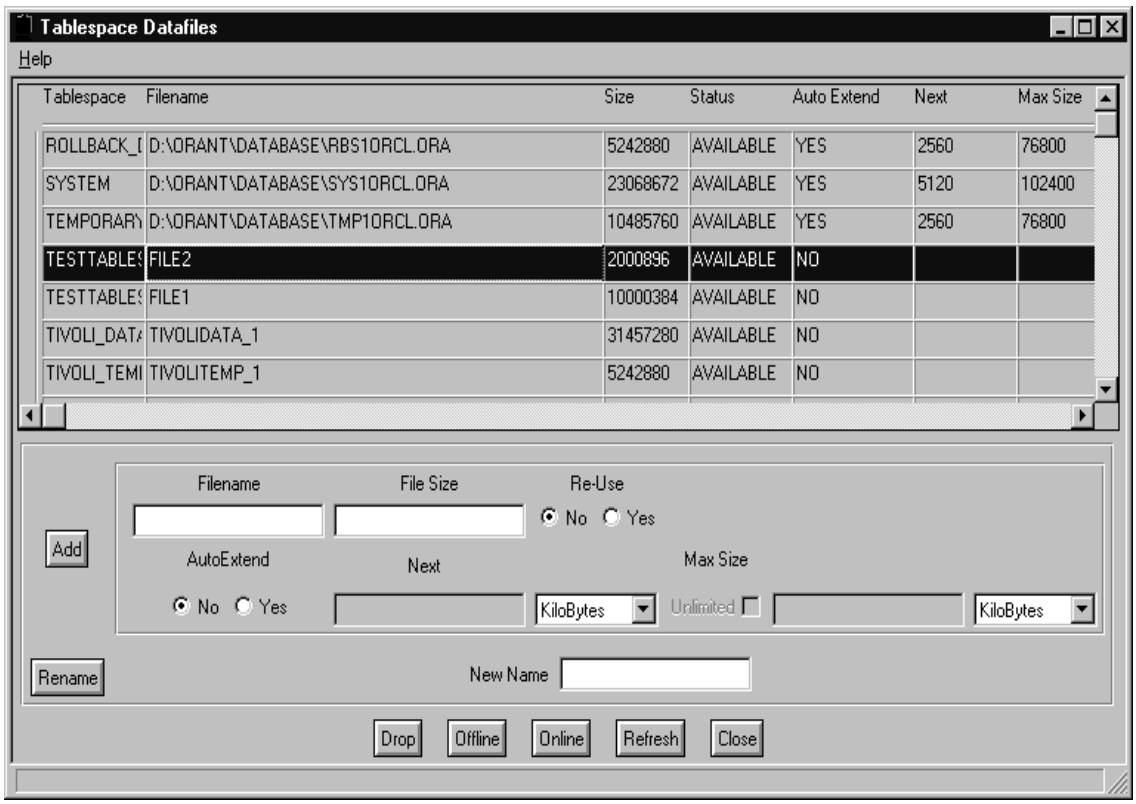


Figure 46. Tablespace Datafiles Window

- To take the selected data file offline, click the **Offline** button.
- To take the selected data file online, click the **Online** button.
- To drop the selected data file, click the **Drop** button.

Note

Dropping a datafile is similar to dropping a tablespace. Without detailed knowledge of the Oracle database, dropping a data file is not recommended.

2.7.10 Managing Rollback Segments

Oracle uses objects called rollback segments to store all the data necessary to undo or reverse changes made by transactions to the Oracle database.

In this section there is a discussion on how the Tivoli Manager for Oracle administers rollback segments such as adding segments, taking the segments online and offline, specifying the default storage size and dropping a rollback segment. To open the Rollback Segments window, select the database icon with the right mouse button to pop up the menu and select the **Rollback Segments...** menu item as shown in Figure 47 on page 63.

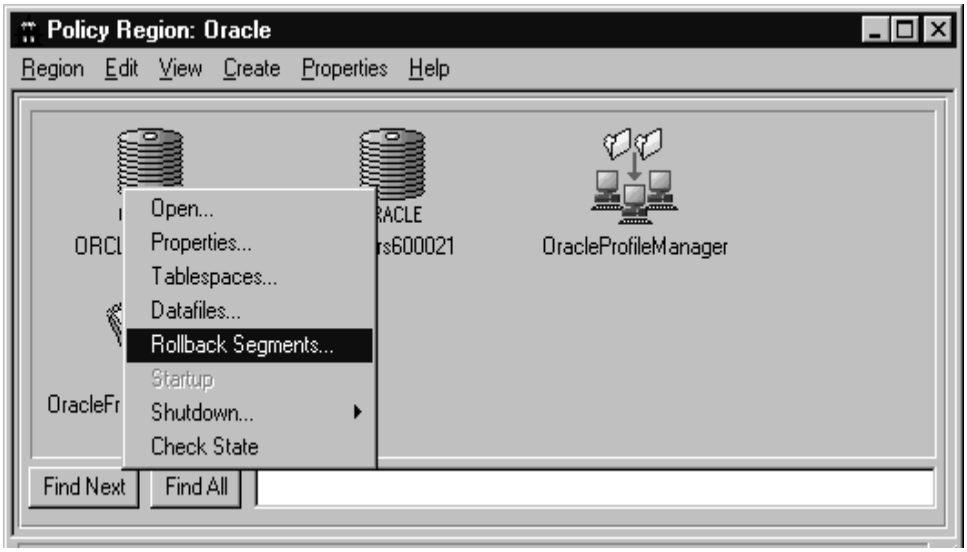


Figure 47. Policy Region: Oracle Window

When you select **Rollback Segments...** the Rollback Segments window will appear as shown in Figure 48 on page 64.

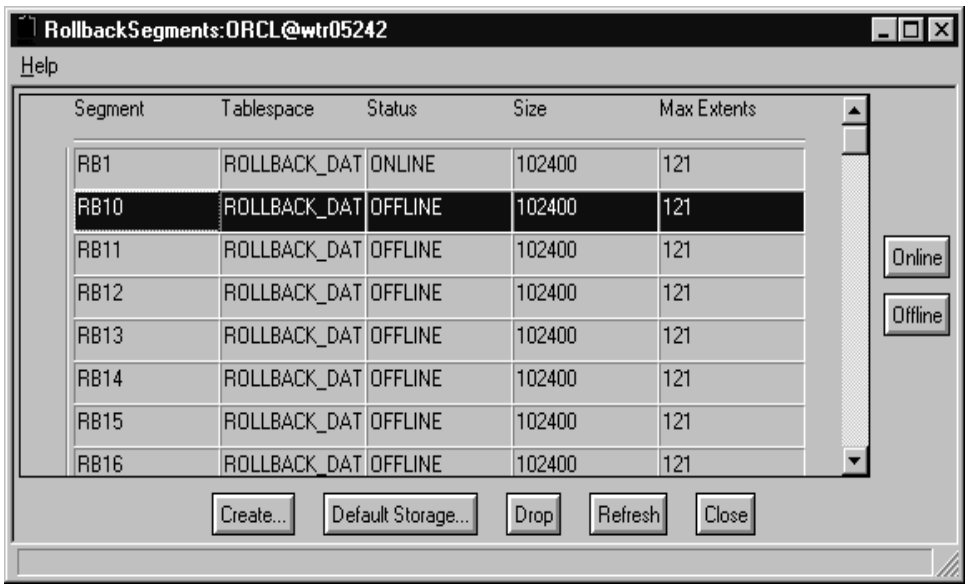


Figure 48. RollbackSegments: ORCL@wtr05242 Window

To create a rollback segment select the **Create** button. The following window will appear.

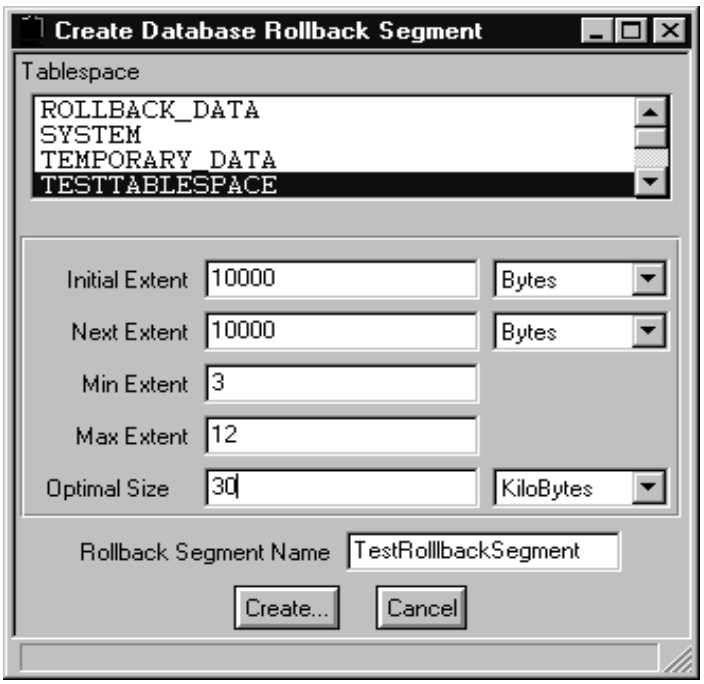


Figure 49. Create Database Rollback Segment Window

In order to create a rollback segment sucessfully the tablespace associated with the segment must be online. Each rollback segment must have at least two extents allocated to it. From the list of tablespaces available, select the tablespace in which the rollback segment is to be created. Fill in the rest of the values as needed and finally the Rollback Segment Name and select the **Create...** button.

Note

You can leave the field Optimal Size blank. If you do not wish for Oracle to use its default, please consult the Oracle documentation before supplying a value here.

2.7.10.1 Taking Rollback Segments Online and Offline

Referring to Figure 48 on page 64, note the two buttons on the right-hand side of the window: **Online** and **Offline**. If you have oracle_dba privileges, then you will be able to bring the rollback segments online and offline.

2.7.10.2 Managing the Default Storage for a Rollback Segment

If changes need to be made to any settings on an existing rollback segment, referring to Figure 48 on page 64 you will see the **Default Storage...** button. To manage the values of the default storage of a rollback segment click this button and the following window will appear:

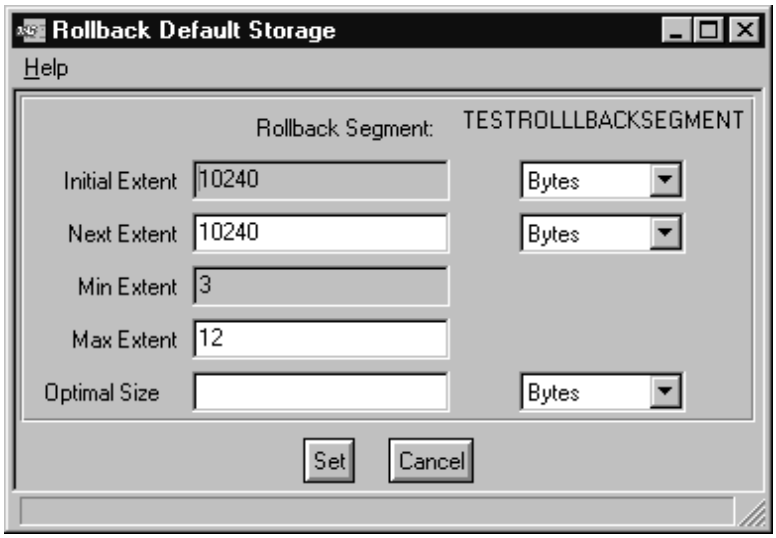


Figure 50. Rollback Default Storage Window

Note that you cannot change the initial extent and the minimal extent of the rollback segment. If these values are to be altered, dropping and recreating the rollback segment is advised. After changing the values click on the **Set** button to commit the changes and to return to RollbackSegments window as shown in Figure 48 on page 64.

2.7.10.3 Dropping a Rollback Segment

Referring to Figure 48 on page 64 on the bottom of the dialog window there is an option to drop the rollback segment. Select the segment which you wish to drop and click the **Drop** button. You will be asked to confirm the operation. If **Yes** is selected, the rollback segment will be dropped.

Note

You have to take the rollback segment offline, before it can be dropped.

2.7.11 Managing Oracle Database Instances

In this section we describe how the Tivoli Manager for Oracle administers a database instance within Oracle. Topics covered in this section include starting and stopping an Oracle instance, managing an instance, viewing processes, managing sessions and parameters and finally displaying product information about installed features on the Oracle server.

2.7.11.1 Opening an Oracle Instance

In order to manipulate an Oracle instance an Oracle Instance managed resource must be opened. The authority required for this role is that of an oracle_user.

Figure 51. Policy Region: Oracle Window

Select the database icon with the right mouse button and then select **Open...** from the pop-up menu. This will display the following window.

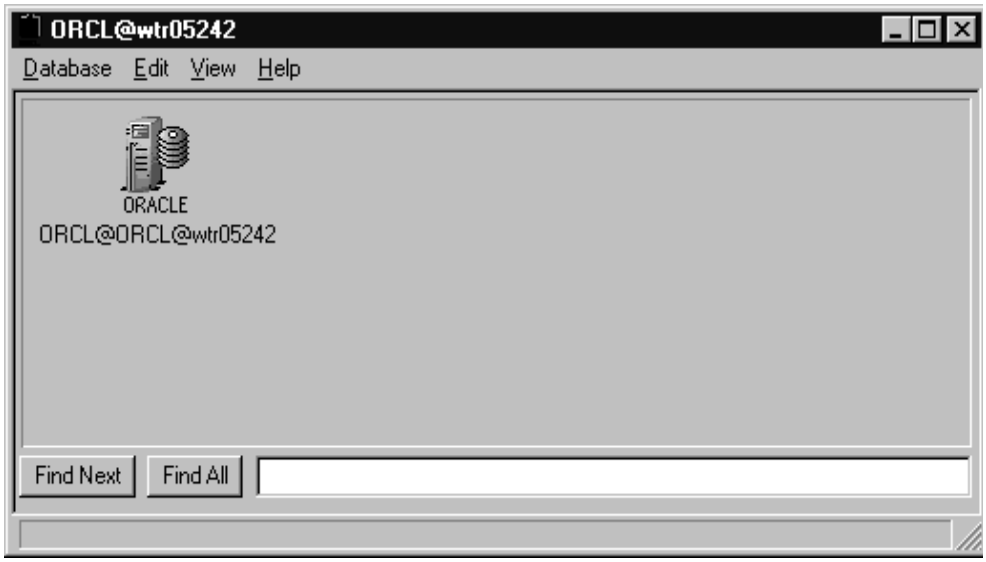


Figure 52. ORCL@wtr05242 Window

The database identifier in this window is ORCL@wtr05242 as represented by the window title. The icon ORCL@ORCL@wtr05242 represents an instance.

2.7.11.2 Starting Up an Instance

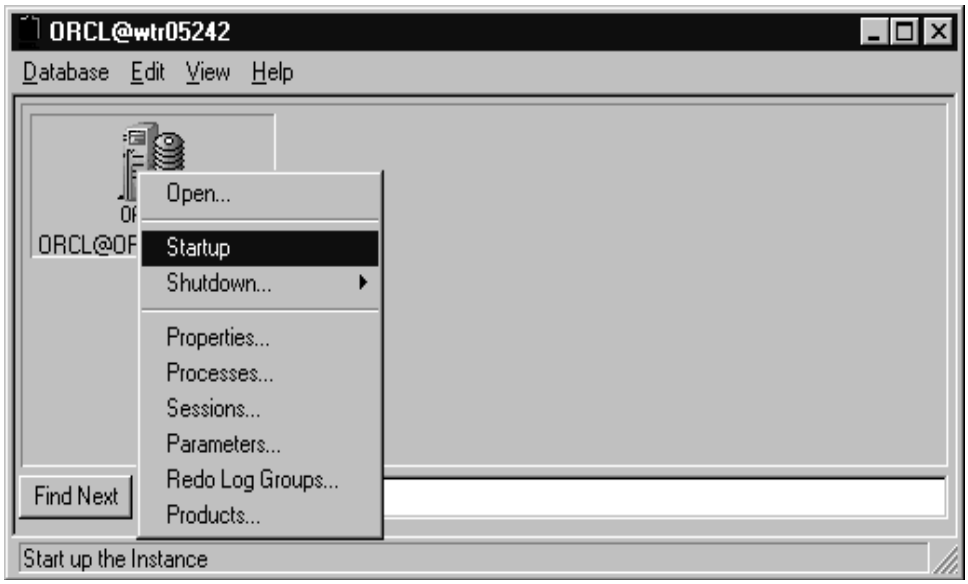


Figure 53. ORCL@wtr05242 Startup Window

In order to start the instance the oracle_dba authority is required. Select the database icon with the right mouse button and then select **Startup** from the pop-up menu to start the database instance. Alternatively, you can use the osstartup command from the command line.

2.7.11.3 Shutting Down an Instance

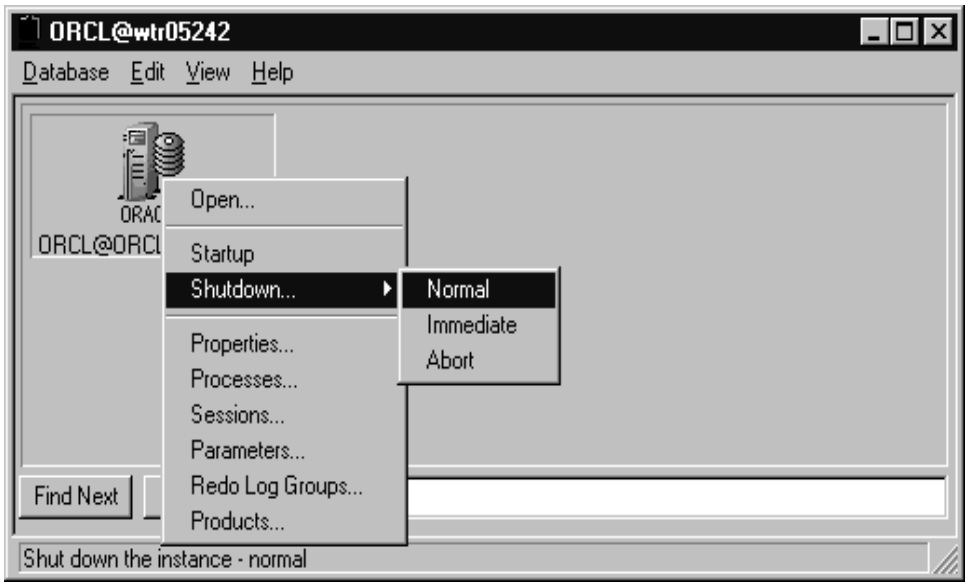


Figure 54. ORCL@wtr05242 Window

In order to shut down an instance the oracle_dba authority will be needed. Select the database icon with the right mouse button and then select **Shutdown...** from the pop-up menu. A cascaded menu appears and you are given three options to shut down the instance. They are:

1. Normal
2. Immediate
3. Abort

For more detailed information on these options refer to Section 2.7.8.1, “Shutting Down and Starting Up the Database” on page 46.

2.7.11.4 Managing an Instance

Besides starting and stopping an instance we can also display various information on the state of an Oracle database instance as well as general information about the instance itself. To access the instances properties

dialog select the right mouse button on the database instance icon and select **Properties...** from the pop-up menu.

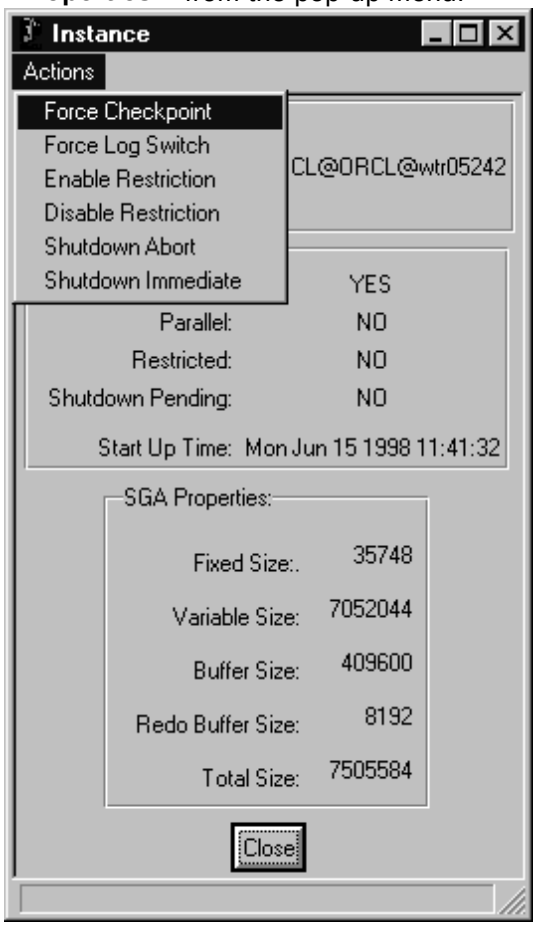


Figure 55. Instance Actions Window

From this dialog box the environment of the database instance can be seen. Various administrative tasks for this specific instance can be performed.

From the **Actions** menu bar there are six options:

1. Force Checkpoint
2. Force Log Switch
3. Enable Restriction
4. Disable Restriction
5. Shutdown Abort

6. Shutdown Immediate

The first action, that can be performed is Force Checkpoint on the database instance. Forcing a checkpoint is for either the current database instance or all the database instances.

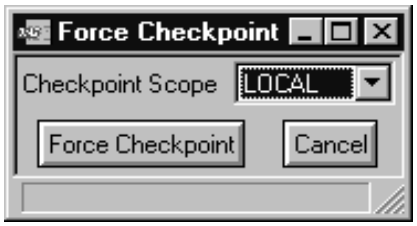


Figure 56. Force Checkpoint Window

In Figure 56 on page 71 the Checkpoint Scope can either be LOCAL or GLOBAL. The LOCAL option forces a checkpoint for the current instance and the GLOBAL option forces a checkpoint for all instances of the database.

The next action that can be performed is Force Log Switch on the database instance. This action forces the current instance to write a new redo log file, regardless whether the current redo log file is full. Forcing a log switch also forces a checkpoint.

The next two items Enable Restriction and Disable Restriction allow the user with oracle_dba privileges to switch access to the database either in the restricted session mode or in the normal public mode. Restricted access means only users with the OSOPER, OSDBA roles or any user that has been granted the RESTRICTED SESSION privilege, can establish a session to the database instance.

Finally the options Shutdown Abort and Shutdown Immediate have already been covered in Section 2.7.8.1, “Shutting Down and Starting Up the Database” on page 46.

2.7.11.5 Managing Processes and Sessions

In this section the management of database-related processes and the database sessions is covered.

To view processes select the database icon with the right mouse button and then select **Processes...** from the pull-down menu as shown in Figure 57 on page 72.

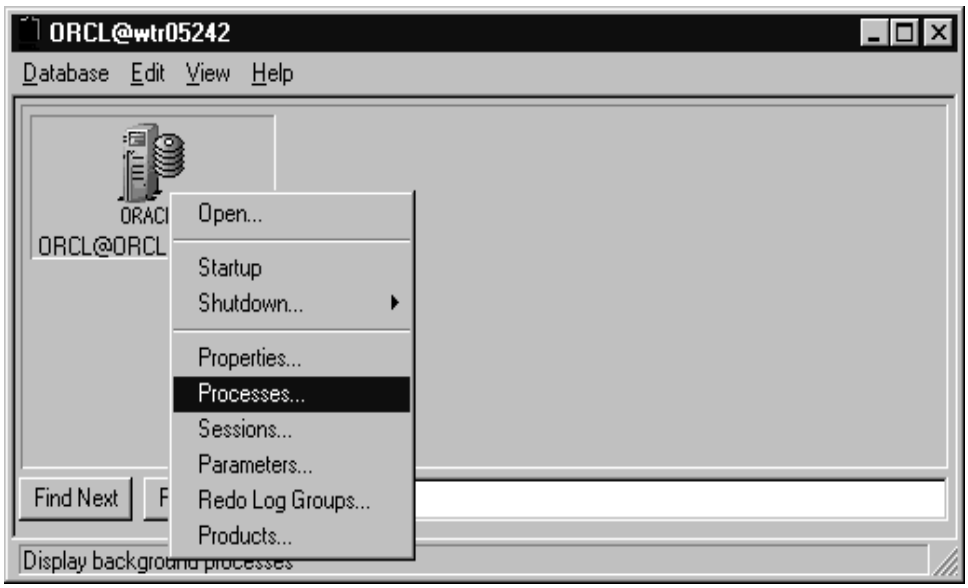


Figure 57. ORCL@wtr05242 Window

The process window for Windows NT is not as comprehensive as the one for AIX. Shown here is the rs600021 Oracle database which gives a more detailed view of process owners and IDs. Seen below the window displays the processes, which refer to the Oracle database system.

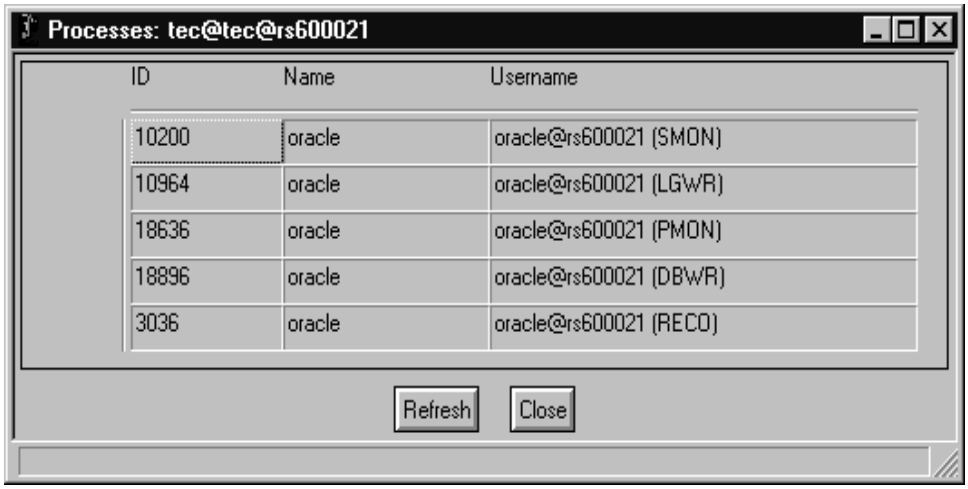


Figure 58. Processes: tec@tec@rs6000021 Window

To manage the sessions running on an Oracle database select **Sessions...** from the database icon pop-up menu, which is displayed when the database icon is selected with the right mouse button.

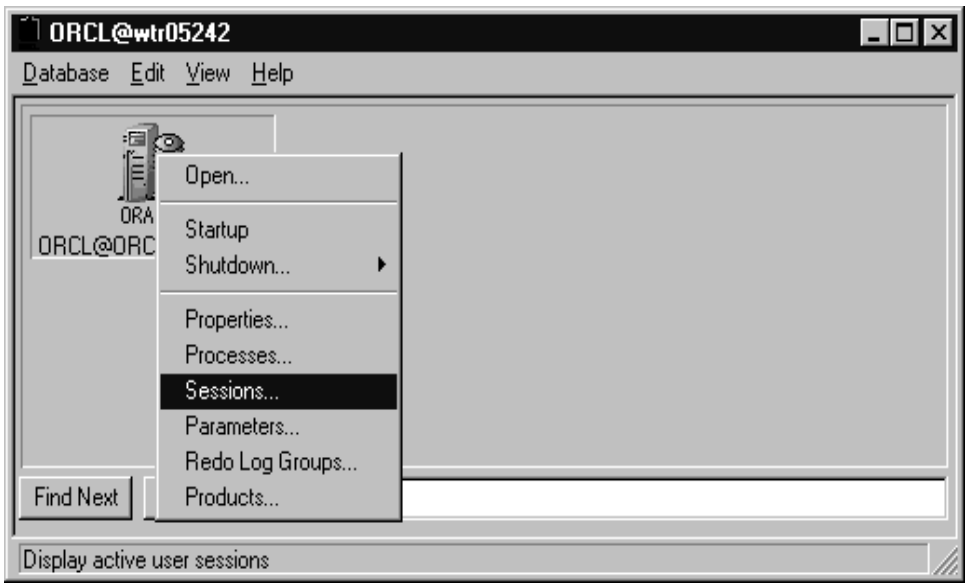


Figure 59. ORCL@wtr05242 Window

The sessions window displayed in Figure 60 on page 74 shows all the currently open sessions with this Oracle database instance. In order to kill a session, oracle_dba privileges are required. To kill a sessions, select the row containing the session, you want to kill and click the **Kill** button.

Note

When using Kill the terminated session on the user's desktop will not reflect any change until that user tries to do something. The user will then see that his or her session has been terminated.

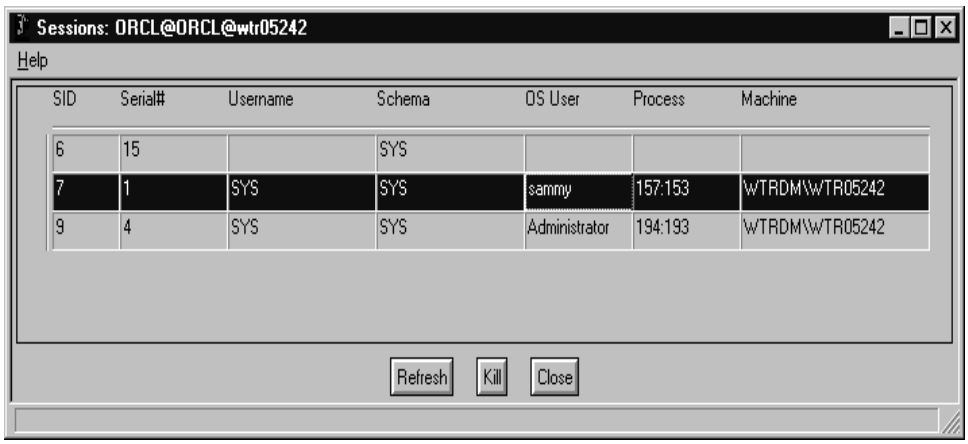


Figure 60. Sessions: ORCL@wtr05242 Window

2.7.11.6 Managing Parameters

To manage the parameters of an Oracle database select **Parameters...** from the database icon pop-up menu, which is displayed when you select the database icon with the right mouse button.

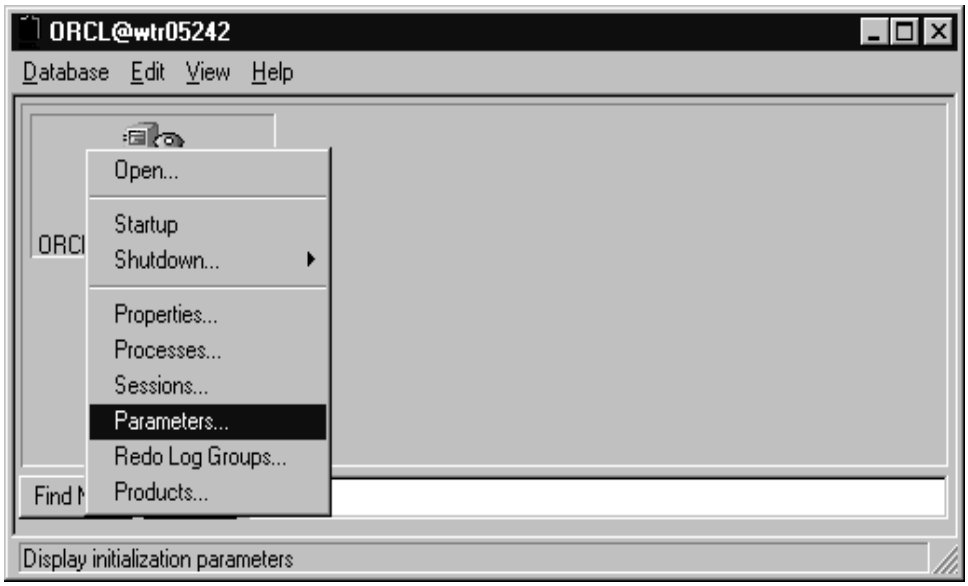
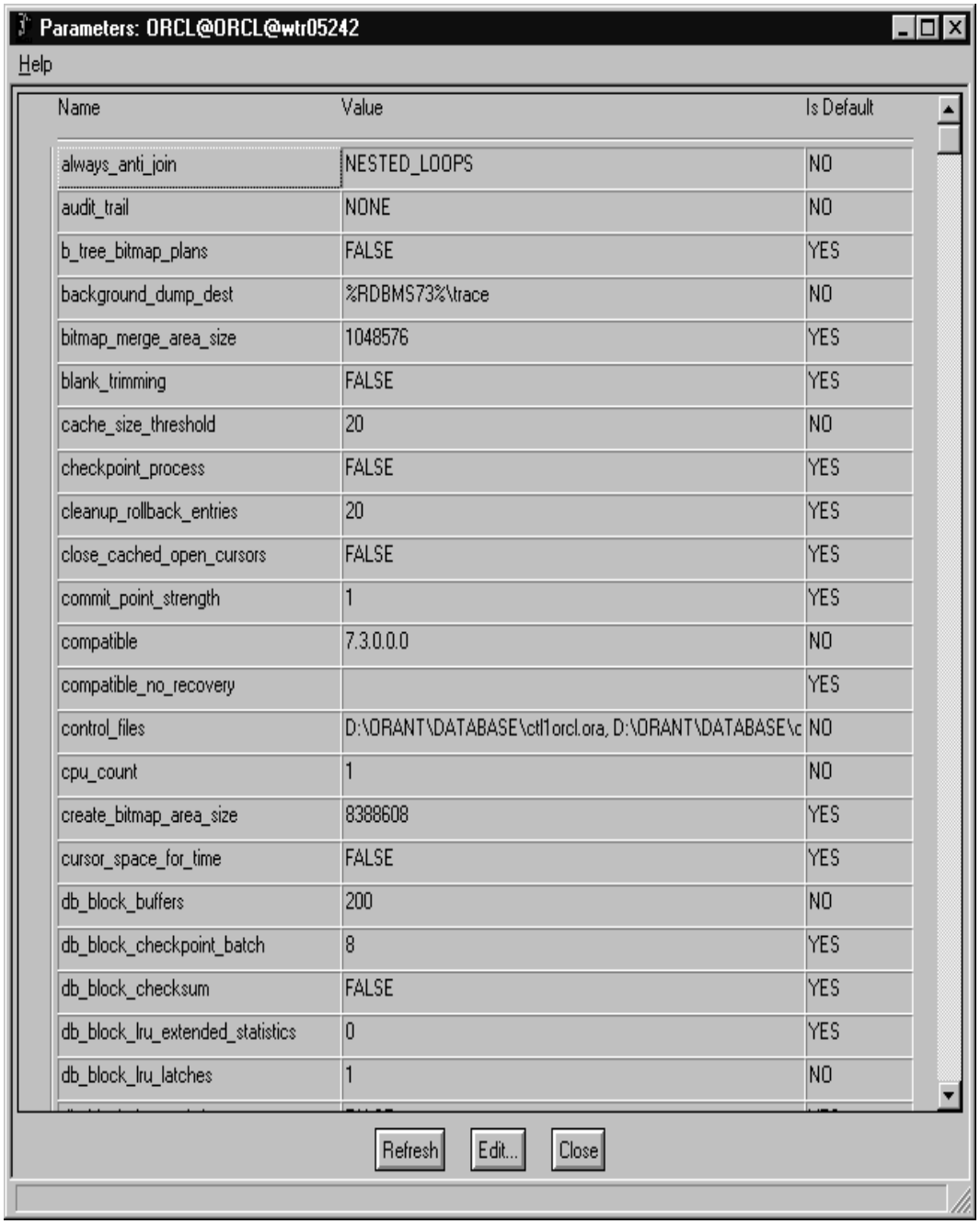


Figure 61. ORCL@wtr05242 Parameters... Window

The information displayed in Figure 61 on page 74 is an exact copy of the init.ora file, which resides in the database directory on the machine where

Oracle is installed. Any changes made to these parameters will not be reflected until the instance is started again. When changes are made, Tivoli Manager for Oracle copies the old parameters into a file init.ora.old.



Name	Value	Is Default
always_anti_join	NESTED_LOOPS	NO
audit_trail	NONE	NO
b_tree_bitmap_plans	FALSE	YES
background_dump_dest	%RDBMS73%\trace	NO
bitmap_merge_area_size	1048576	YES
blank_trimming	FALSE	YES
cache_size_threshold	20	NO
checkpoint_process	FALSE	YES
cleanup_rollback_entries	20	YES
close_cached_open_cursors	FALSE	YES
commit_point_strength	1	YES
compatible	7.3.0.0.0	NO
compatible_no_recovery		YES
control_files	D:\ORANT\DATABASE\ctl1orcl.ora, D:\ORANT\DATABASE\c	NO
cpu_count	1	NO
create_bitmap_area_size	8388608	YES
cursor_space_for_time	FALSE	YES
db_block_buffers	200	NO
db_block_checkpoint_batch	8	YES
db_block_checksum	FALSE	YES
db_block_lru_extended_statistics	0	YES
db_block_lru_latches	1	NO

Figure 62. Parameters: ORCL@wtr05242 Window

To edit a value select the row containing the variable and click on the **Edit...** button. The resulting dialog window is shown in Figure 63 on page 77. In our case we have selected cleanup_rollback_entries.

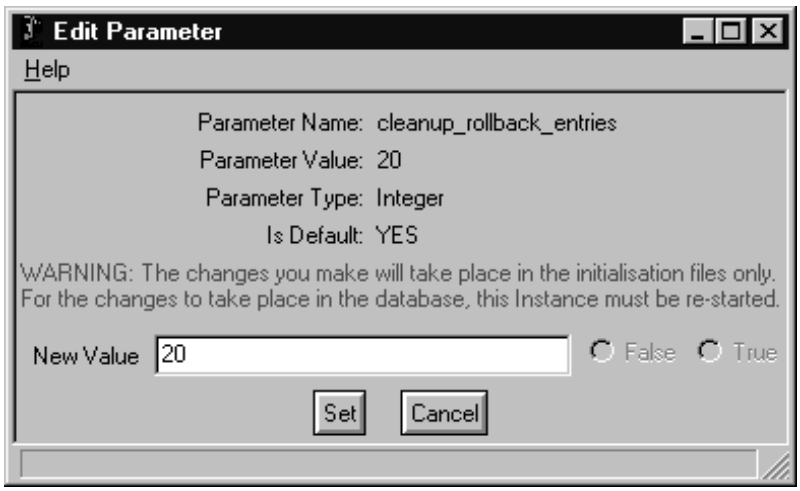


Figure 63. Edit Parameter Window

Enter the required value in the New Value field and click the **Set** button to commit the new value.

2.7.11.7 Displaying the Product Information

To display the product information of what is installed select **Products...** from the database icon pop-up menu, which is displayed when the database icon is selected with the right mouse button.

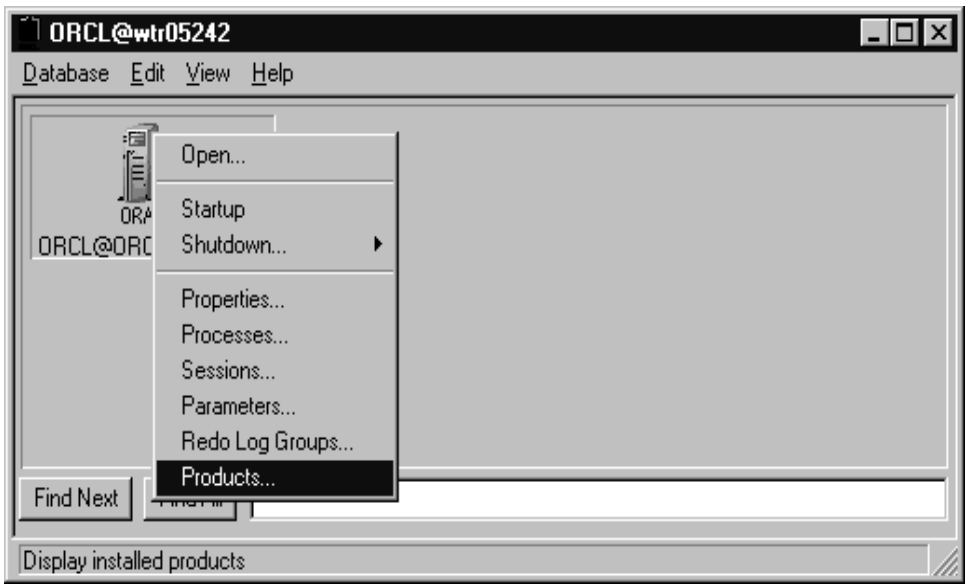


Figure 64. ORCL@wtr05242 Products... Window

The product information window on Figure 65 on page 78 shows what modules have been installed in this Oracle installation.

Figure 65. Products: ORCL@ORCL@wtr05242 Window

2.7.11.8 Managing Redo Logs

In this section the following are will be covered: adding and dropping of redo logs for new and existing members.

To manage the redo logs within an Oracle database instance select **Redo Log Groups...** from the database icon pop-up menu, which is displayed when you select the database icon with the right mouse button.

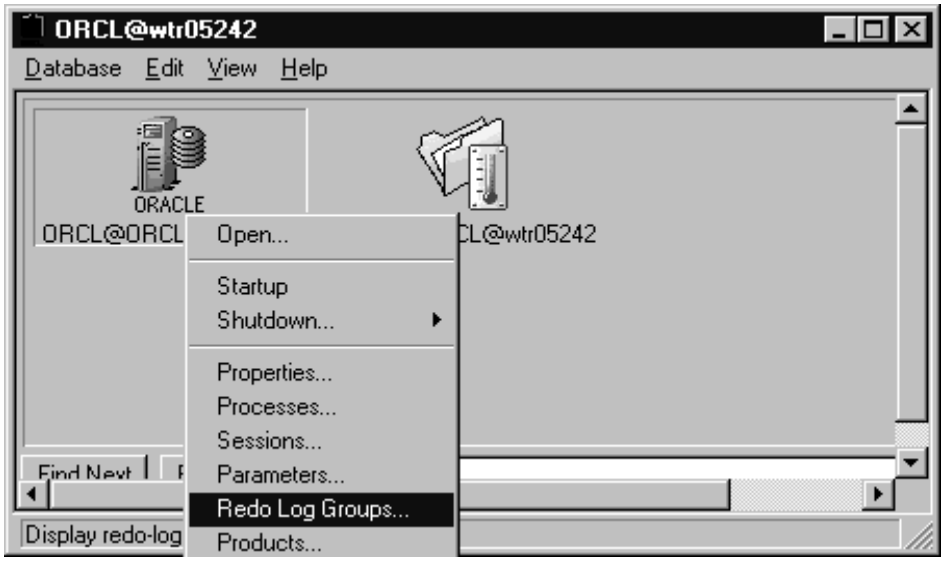


Figure 66. ORCL@wtr05242 Redo Log Groups Window

The following window will appear.

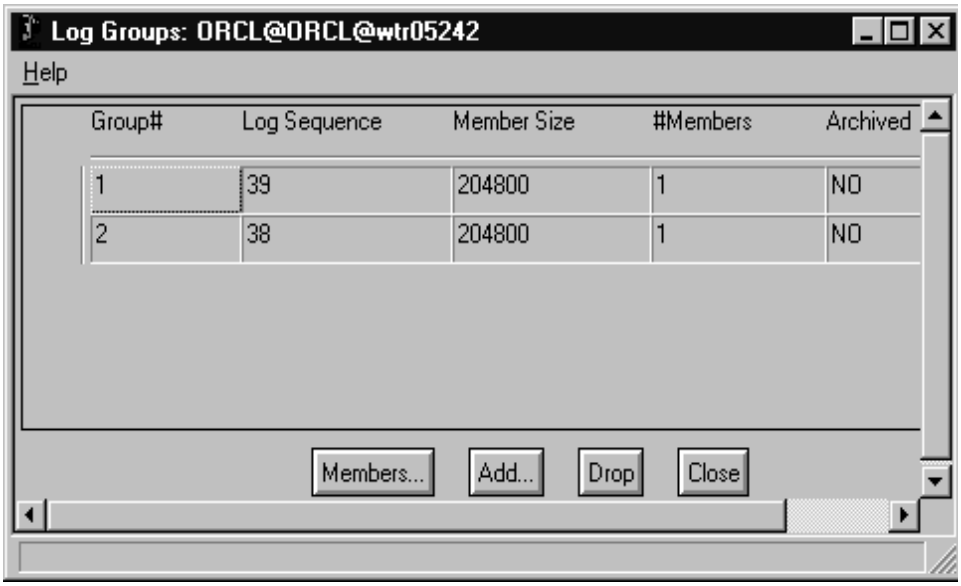


Figure 67. Log Groups: ORCL@ORCL@wtr05242 Window

To add a redo log group select the **Add...** button.

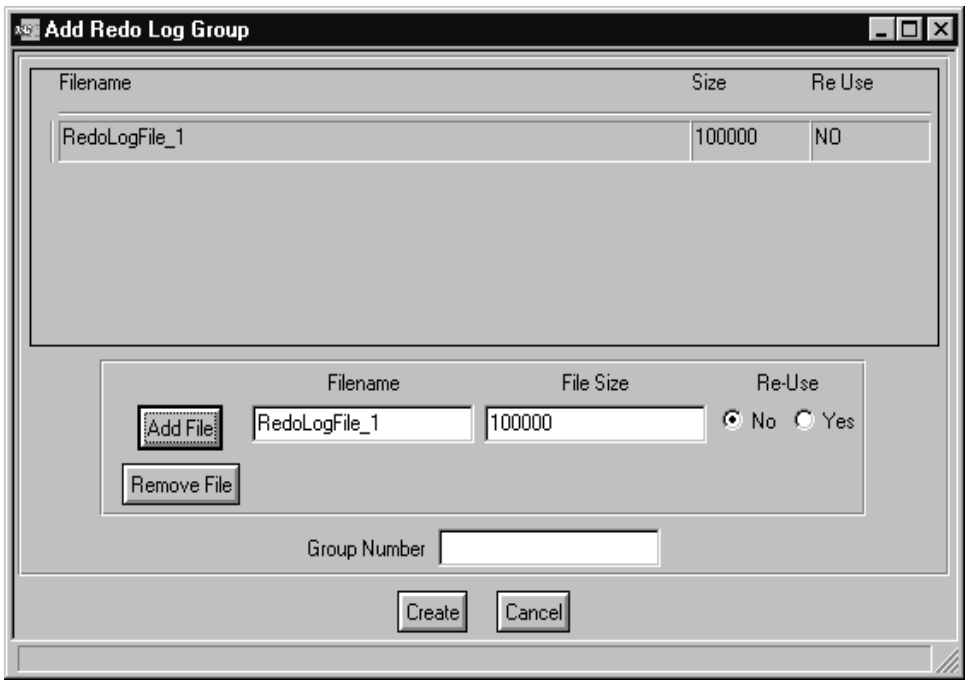


Figure 68. Add Redo Log Group Window

To add a member to the redo log group enter the Filename and File Size and select if any files are to be re-used. Then click on **Add File**. The file name then appears in the list box on the top of the window. In our example the name of the file is RedoLogFile_1 and the size specified is 100000 bytes. This file is created only when the **Create** button is selected. The group number must be entered, otherwise an SQL error will occur. Ensure this number is unique by referencing the previous window, which has a listing of the existing redo logs. In the window note that there is also a Remove File button, which can be used to remove a file from a redo log file group.The last file from a redo log cannot be removed. If this last file is to be removed, the redo log group will need to be dropped.

From the Redo Log Group Windows shown in Figure 67 on page 80 the redo log group can also be dropped. Select the group to be deleted and then select the **Drop** button. You will be asked to confirm this operation. If you wish to continue this operation, click **Yes**.

Additionally, it is possible to add a new file to an existing redo log group or to remove a file from a redo log group. This can be done from the log group member window. To enter this window, you have to highlight the redo log

group that you wish to modify and then select the **Member...** button on the redo log group window as shown in Figure 67 on page 80. The following window appears:

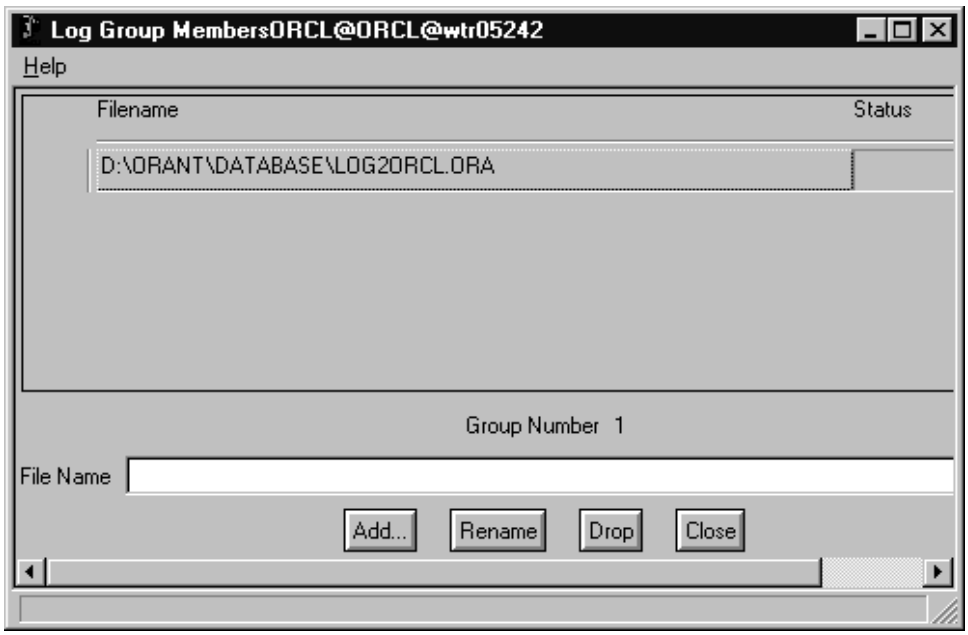


Figure 69. Log Group MembersORCL@ORCL@wtr05242 Window

To add a new member to this group, enter the file name of the new file in the field File Name and select the **Add...** button.

To rename an existing file in the redo log group, select the file in the list, enter the new file name and select the **Rename** button.

Note

To rename a member of a redo log group use the following procedure. First rename the physical file from the operating system to the new file name. Then rename the member in the log group. If this is not done, an SQL error will occur on renaming.

To drop a member of a redo log group, select the file in the list and select the **Drop** button. If you have not selected any member, selecting the **Drop** button will not perform any action.

2.7.12 Oracle Framework Tasks and Jobs

The Tivoli Manager for Oracle contains an Oracle task library, which includes the management tasks ChangeOracleHome and DiscoverOracleDB. These tasks are executed, as any task, as a part of a task library. The first thing, that has to be done is to install the Oracle Framework task library. The installation has to be performed from the command line. From a command line session (in our example on the TMR server) we enter the following commands:

```
cd /usr/local/Tivoli/bin/generic/OracleFrameworkTasks
wtll -p Oracle -P cat OracleFrameworkTasks.tlf
```

We found that the OracleFrameworkTasks.tlf does not install the w32-ix86 library onto the NT managed nodes. When the DiscoverOracleDB task was run to automatically find all Oracle database instances onto NT managed nodes, the task was not found.

In order to fix this problem manually patch the export file to distribute the task onto the NT managed nodes. This can be done by:

```
wtll -F ora "OracleFramework Tasks"
# Create an export file ora in tar format
# from the OracleFrameworkTasks task library

tar -xvf ora
# Extract all files from this archive
# 1.w32-ix86 file was found to be missing

cp 1.sunos4 1.w32-ix86
# Supply the missing file by copying an existing perl script after
# running a diff on all the script provided by the other platforms and
# verifying that there was no difference between all these scripts.

vi tll
# After examining the tll file we found that the file 1.w32-ix86 was
# missing. The tll file was modified to include the missing entry.

wtll -p Oracle -P /bin/cat tll
# Install the new tasklibrary after removing the initially installed
# tasklibrary.
```

After successfully installing this task library open the policy region window that was specified on the command line. In our example, this is the Oracle policy region. It contains a new task library icon OracleFramework Tasks.

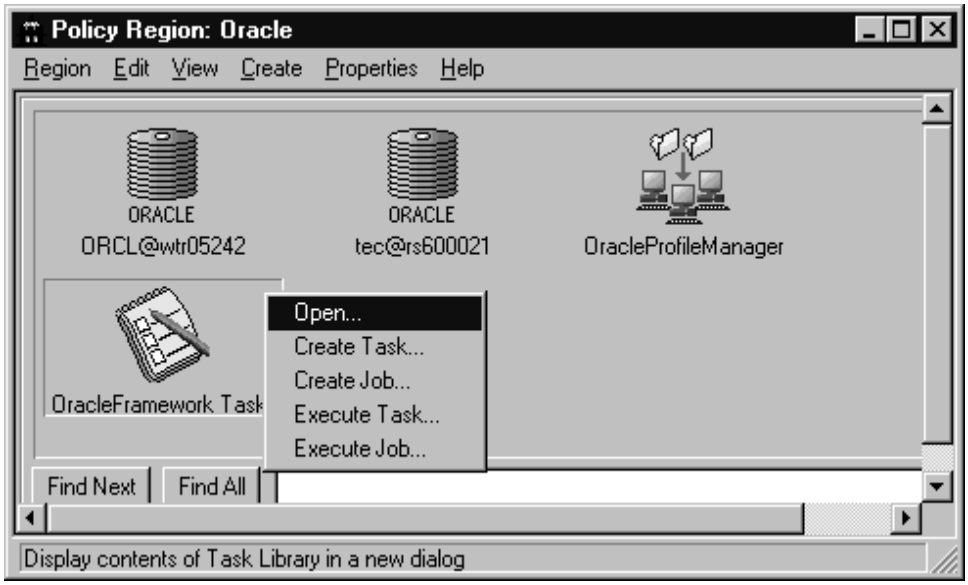


Figure 70. Policy Region: Oracle Window

Select **Open...** from the pop-up menu of the OracleFramework Tasks as shown in Figure 70 on page 84 and the window below will appear. In this window you will see two tasks which have been created by default: ChangeOracleHome and DiscoverOracleDB.

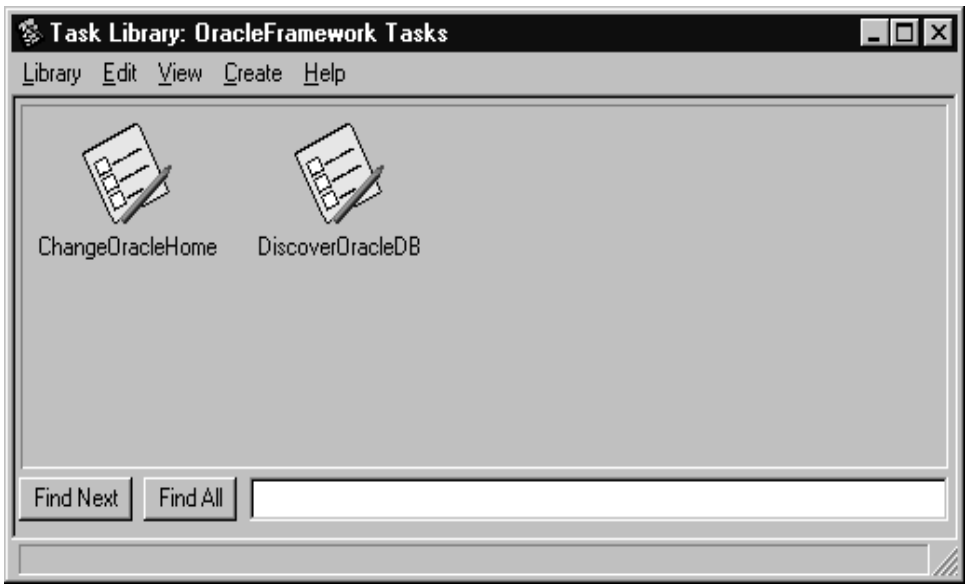


Figure 71. Task Library: OracleFramework Tasks

These tasks run in the same way as any task in the Tivoli Framework. The ChangeOracleHome task is used to change the ORACLE_HOME attribute within the Tivoli repository. It does not affect the physical location of a database. DiscoverOracleDB is used to discover and register Oracle databases on one or more managed nodes automatically.

A task can be customized. If customized tasks are to be run, a copy of the original task should be made, customized and saved as a new task.

2.7.13 Managing Users

In this section we cover the Tivoli Manager for Oracle User Management Version 1.0. This module allows you to manipulate an existing Oracle database. The features included in this module are creating Oracle users, roles and profiles and distributing these objects via the Tivoli Framework.

2.7.13.1 Configuring the Policy Region

As with any policy region in order to use managed resources, these resources have to be included in the policy region. This is done by adding available resources to the current resources from the Set Managed Resources window as seen below.

Figure 72. Set Managed Resources Window

Highlight the available resources required, in this case OracleDatabase, OracleResourceProfile, OracleRoleProfile and OraceUserProfile and click the left arrow button. To commit these changes select **Set & Close**.

The next step is to create a profile manager within this policy region. In order to do this select the **ProfileManager...** option from the **Create** menu in the policy region as shown in the following window.

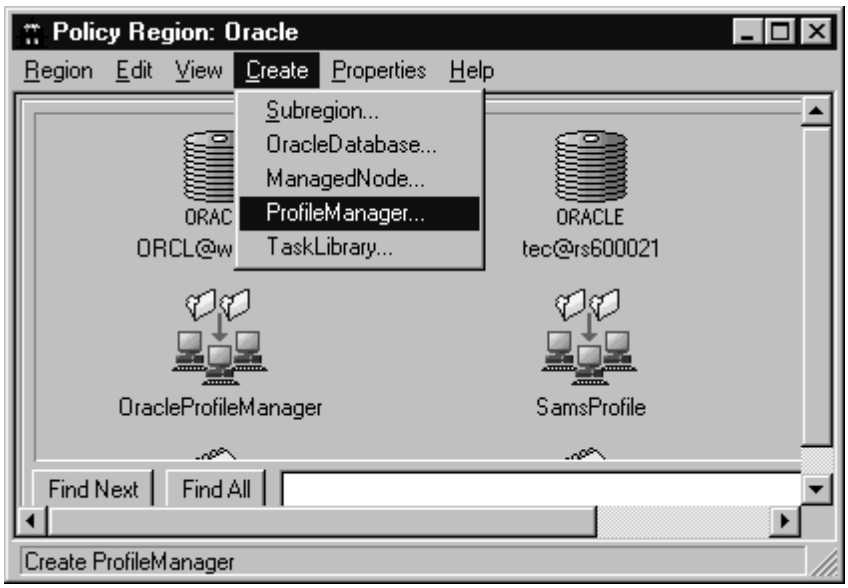


Figure 73. Policy Region: Oracle Window

The Create Profile Manager Window will appear.

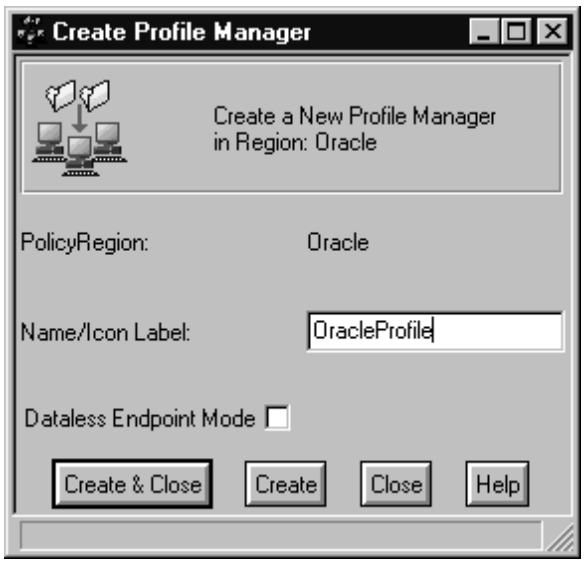


Figure 74. Create Profile Manager Window

Enter the name of the new profile manager in the Name/Icon Label field.

Note, that we did not select Dataless Endpoint Mode. Select **Create & Close** to complete the creation of this profile. In this example we have created a profile named OracleProfile.

The new profile manager should appear in the policy region as shown in Figure 75 on page 88.

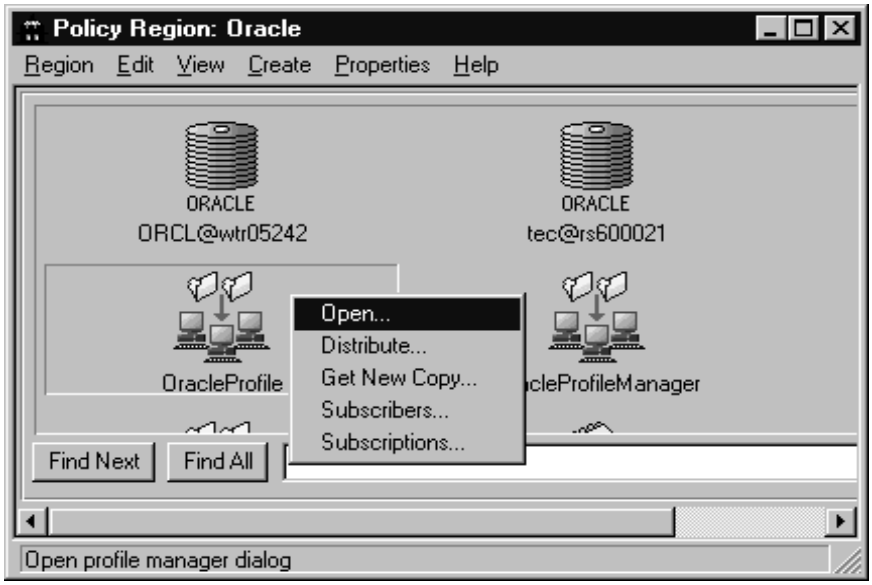


Figure 75. Policy Region: Oracle Window

Select the profile manager icon with the right mouse button and then select **Open...** from the pop-up menu. The following window will appear.

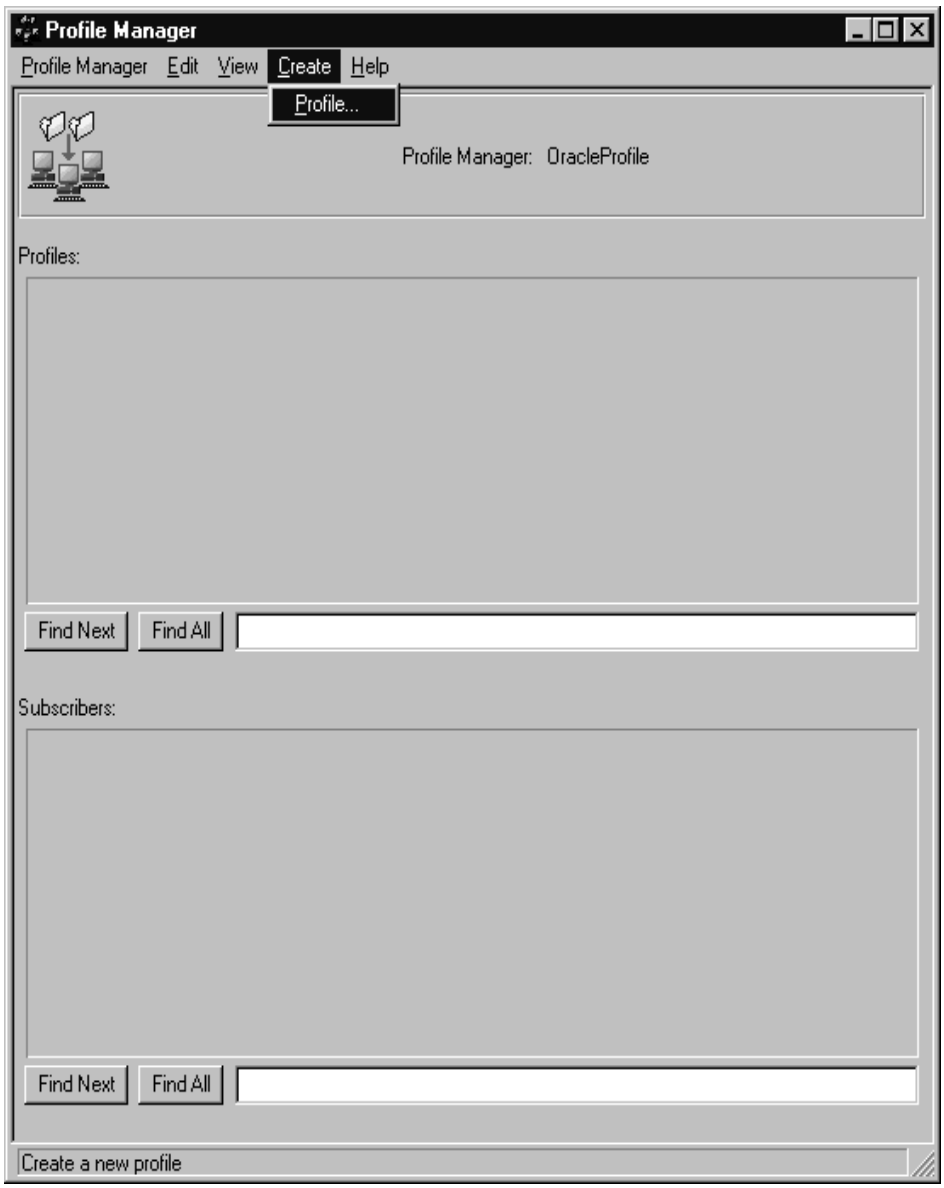


Figure 76. Profile Manager Window

To create a new profile within the profile manager, select the **Profile...** option from the **Create** menu and the window to create a profile will appear as shown in Figure 77 on page 90.

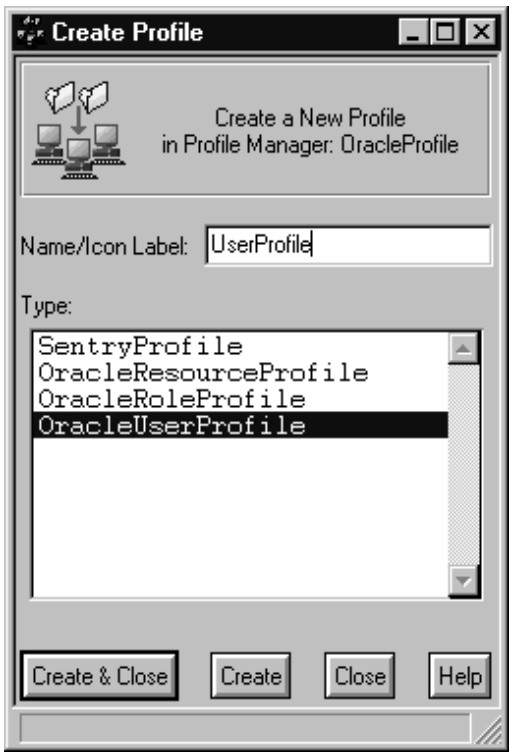


Figure 77. Create Profile Window

Enter the name of the new profile in the Name/Icon Label field and select the type of profile you wish to create. Tivoli Manager for Oracle User Management installs three new types of profiles: OracleResouceProfile, OracleRoleProfile and OracleUserProfile. In the example above we select **OracleUserProfile** as the type and UserProfile as the name of the profile. If any of these profiles are missing you may have forgotten to make it available as a managed resource in this policy region. Select **Create & Close** to create the profile and close the window.

You may create Oracle resource and Oracle role profiles in exactly the same way. After that your profile manager window will look like Figure 78 on page 91.

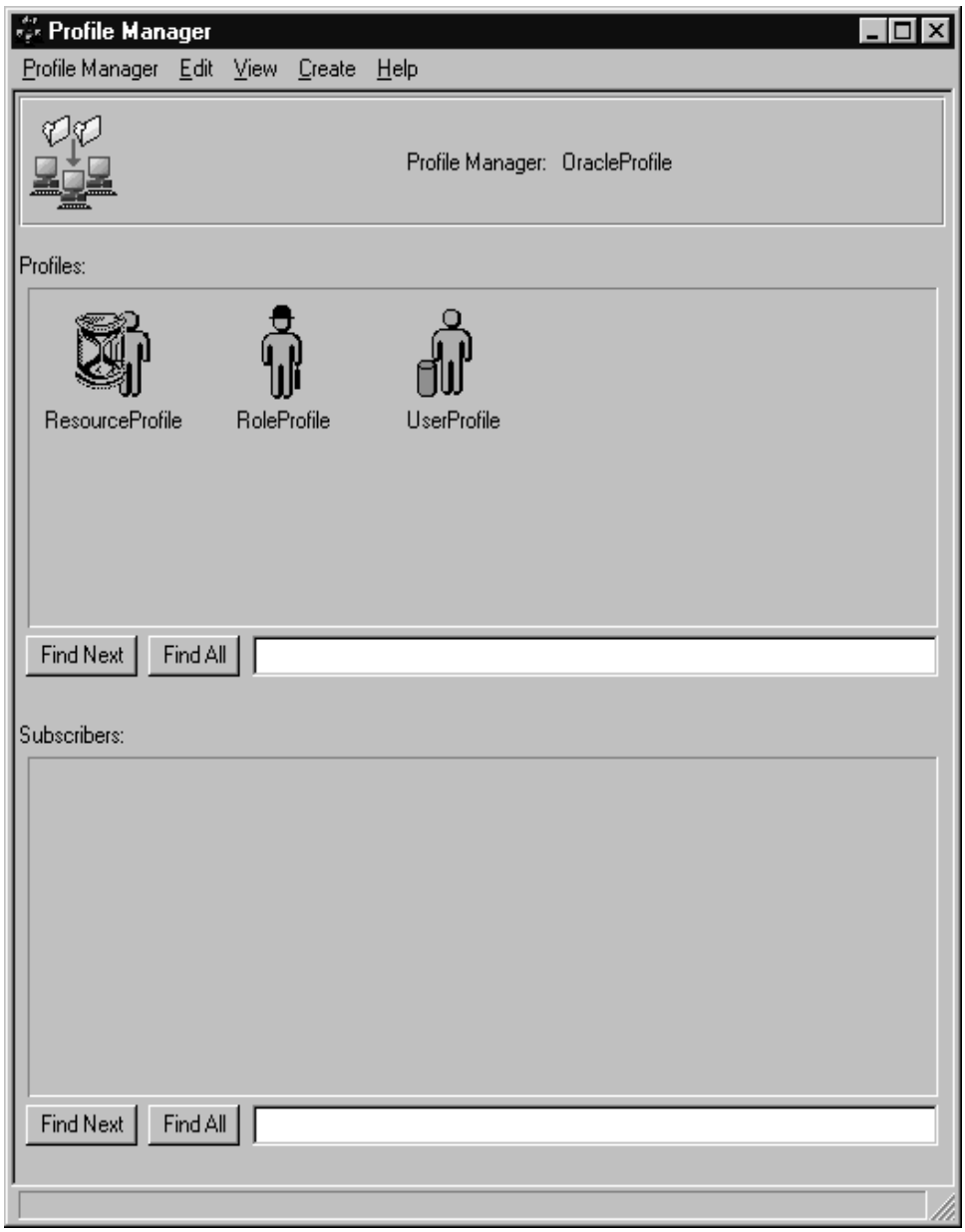


Figure 78. Profile Manager Window

Note

These three resources correspond to the same resources of the Windows NT Oracle Security Manager as shown in Figure 79 on page 92. This corresponds only to one Oracle database.

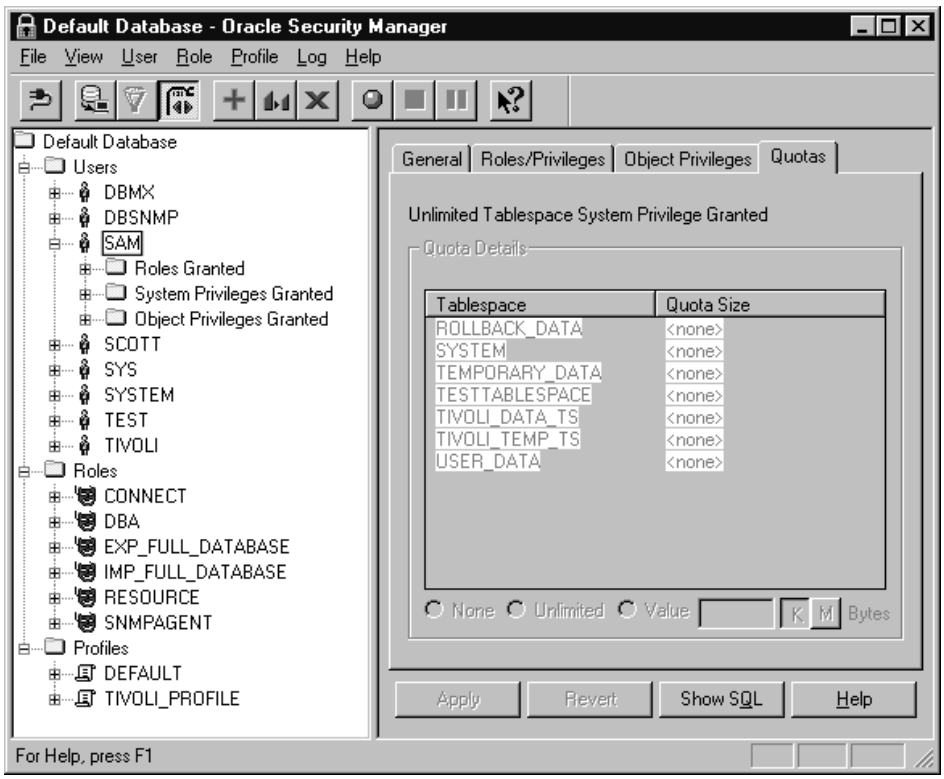


Figure 79. Default Database - Oracle Security Manager Window

The next step is to add subscribers to the profile manager. This can be done in the following ways within the Tivoli Framework: Drag and drop a managed database icon from the policy region window into the profile manager's subscriber box or from in profile manager manually add the subscribers from the Subscribers menu or finally by using the command line. This procedure is the same throughout the Tivoli Framework.

The subsequent window should appear as shown in Figure 80 on page 93 detailing the new subscribers to this profile. There are two subscribers to this profile manager ORCL@wtr05242 and SamsProfile.

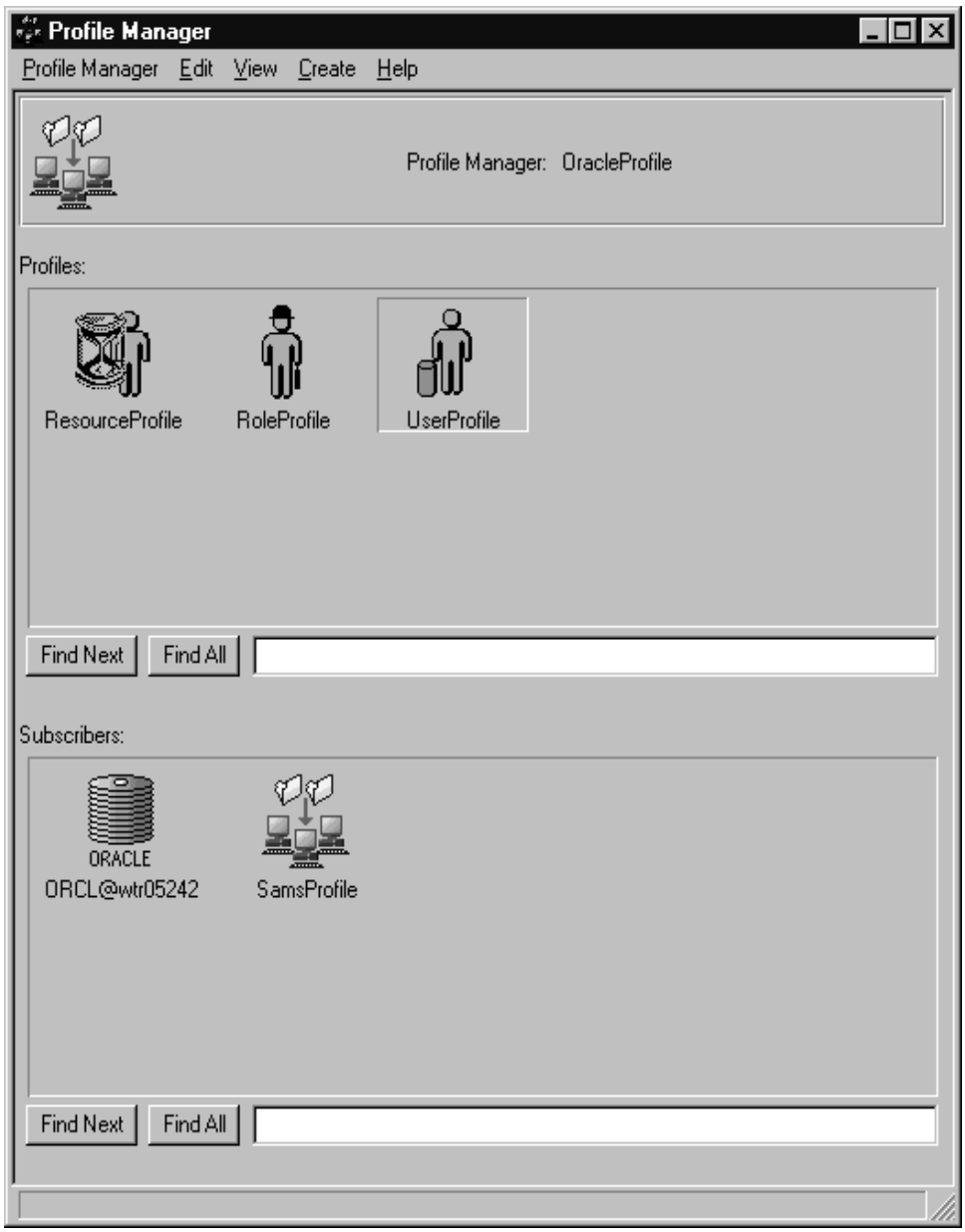


Figure 80. Profile Manager Window

2.7.13.2 Populating an Oracle User Profile

In this and the following sections we discuss populating of the Oracle user profile from an existing Oracle database, copying and moving profiles, locking and unlocking records and distributing profiles.

The first step in using the Oracle user profile in the Tivoli Manager for Oracle is to read the information from a database regarding users. This is done by selecting the newly created **UserProfile** profile icon from the profile manager. The following window will appear. Select **Profile** from the menu bar and then **Populate...** from the pull-down menu.

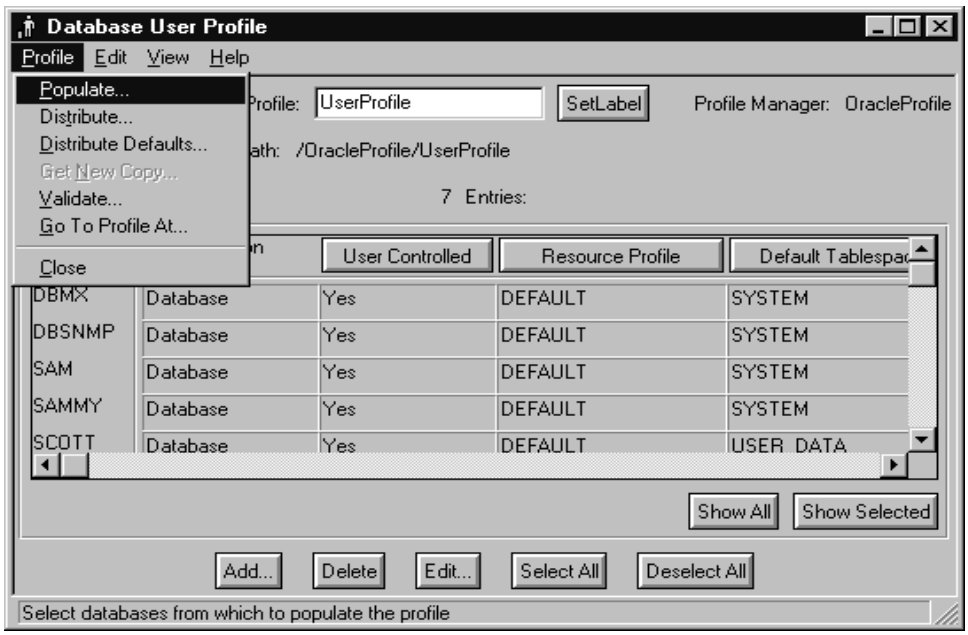


Figure 81. Database User Profile Window

The following window will appear.

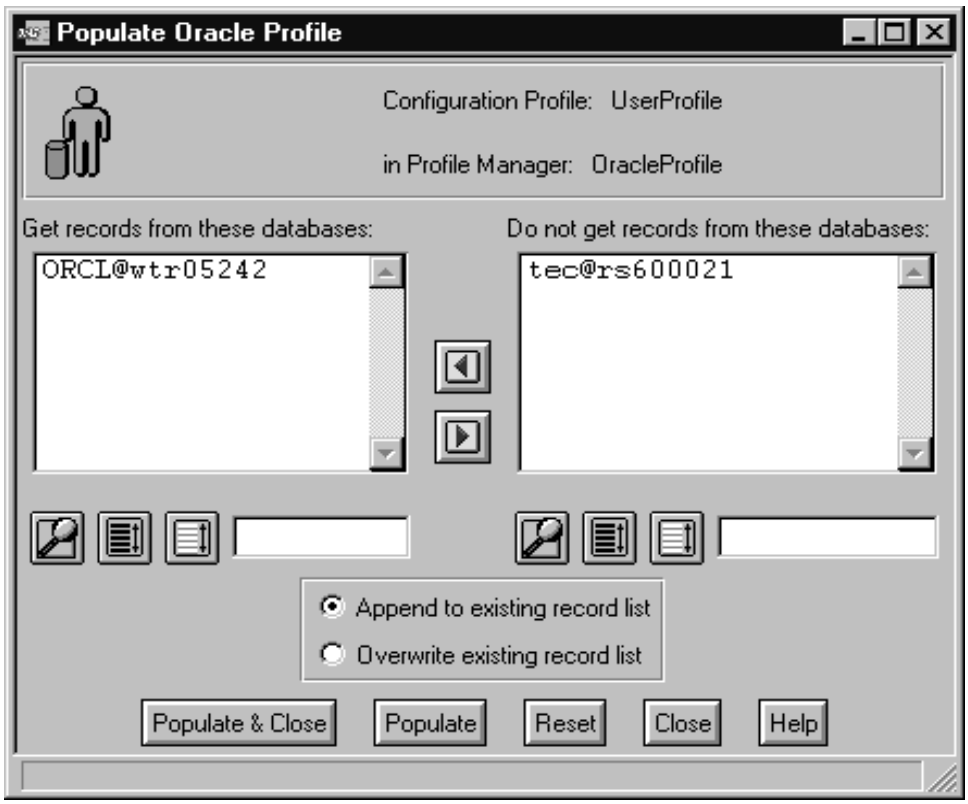


Figure 82. Populate Oracle Profile Window

Select the database from which you wish to read the user configuration and select **Populate & Close** to start the transaction. Note, that there are two options to append or overwrite an entry. If this is a new profile or you wish to start a new profile, select Overwrite existing record list; If you wish to add users from another database and you already have data in this table and you wish to keep it, select **Append to existing record list**.

After the selecting **Populate & Close** you will see the error as shown in Figure 83 on page 96.

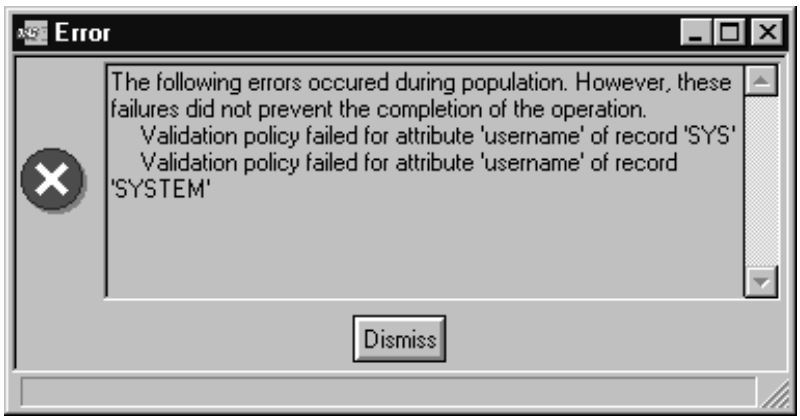


Figure 83. Error Window

This message confirms that the user names SYS and SYSTEM were not read into the profile. This is a security feature in the Tivoli Manager for Oracle validation policy. Select the **Dismiss** button and the database profile window appears as shown in Figure 84 on page 96.

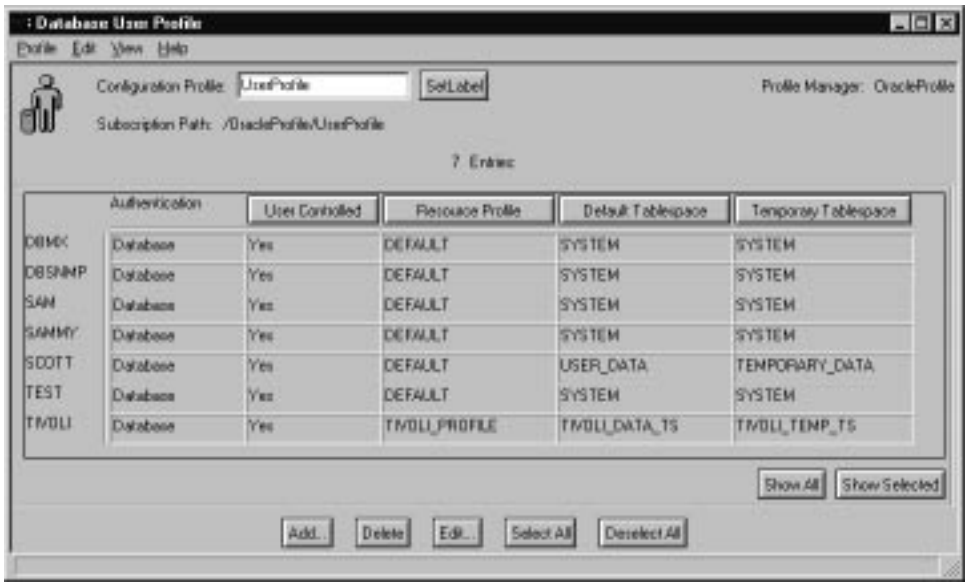


Figure 84. Database User Profile Window

2.7.13.3 Copying, Adding and Deleting User Profile Records

One of the most useful features of the Tivoli Manager for Oracle is that of copying user profile information from one Oracle profile to another and distributing this profile to create new users in a different Oracle database. In our example, we have two profiles: OracleProfile and OracleProfile2. Each profile contains a different registered database.

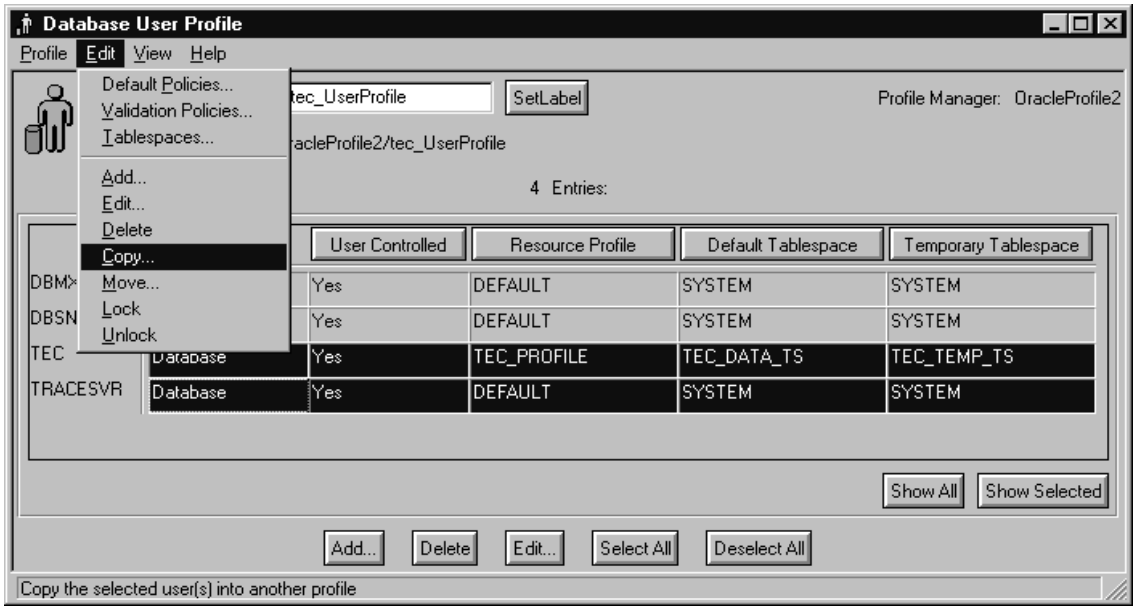


Figure 85. Database User Profile

After highlighting the user profiles that we wish to copy into another Oracle user profile we select the **Copy...** option from the **Edit** menu. The following window will appear.

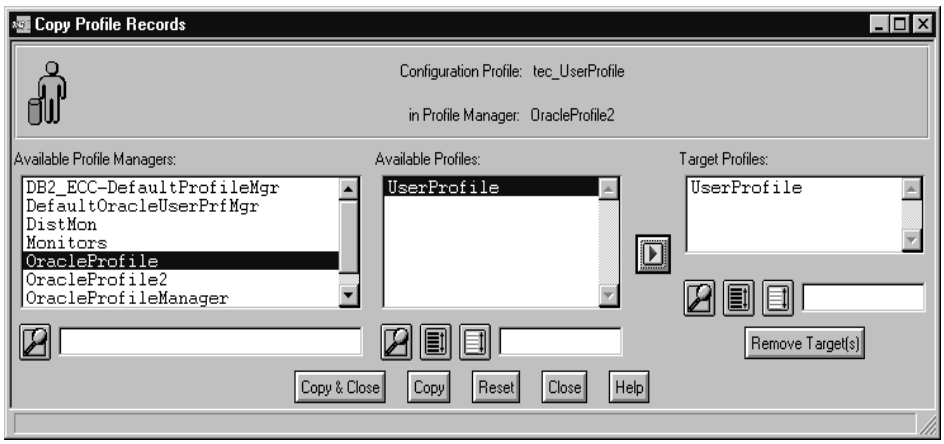


Figure 86. Copy Profile Records Window

Select the target profile manager and the available profile you wish to copy this profile to, copy that profile to the list of target profiles and select the **Copy & Close** button.

Next, drag and drop the target user profile onto the list of subscribers on the window from the profile manager window (see Figure 80 on page 93).

Then open the subscribing database window that has been updated with this profile. The following window should be seen.

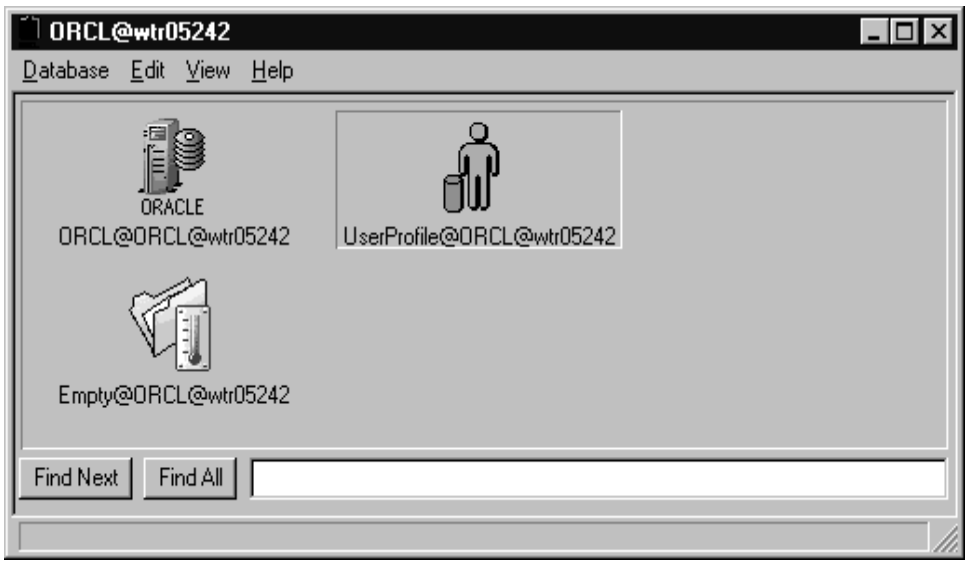


Figure 87. ORCL@wtr05242 Window

To add these user changes to this Oracle database the changes must be distributed. This is done by double-clicking the **UserProfile@ORCL@wtr05242** icon in this example to bring up the following window.

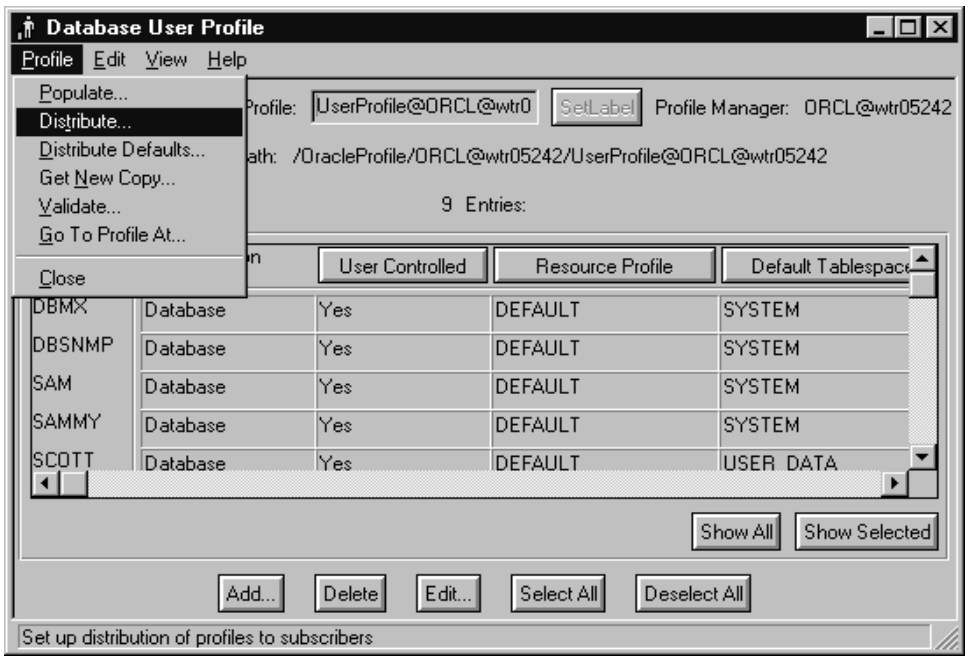


Figure 88. Database User Profile Window

The action of distributing the profile will cause changes in the actual database. There are two options used to distribute these profiles. Preserving the modifications in the subscriber's copies of the profile is used to keep changes other administrators may have made to this profile.The second is to make each subscriber's profile an exact copy, which overwrites all differences between the subscribers profiles.

Note

When copying user profiles it is important to note the default tablespace that these users belong to. If the database that these users are being imported to does not have this tablespace available, there will be an SQL error on user creation. There are no changes made to the Oracle database unless a distribution occurs.

You also can drop an Oracle user using the Tivoli Manager for Oracle by removing the user record from the profile and distributing this changed profile to the database. To delete a user perform the following procedure. Referring to Figure 88 on page 100 select the row that contains the user you wish to

delete from the user profile and click the **Delete** button. Then you will be shown the following dialog box.

Figure 89. Delete Database User Window

Deleting Without Cascade deletes just the user, whereas Delete With Cascade deletes the user and all his or her objects.

2.7.13.4 Editing a User Record

You also can change the attributes of a user record. As shown in Figure 90 on page 101 the user record must be selected first and then the option **Edit...** from the **Edit** menu is selected.

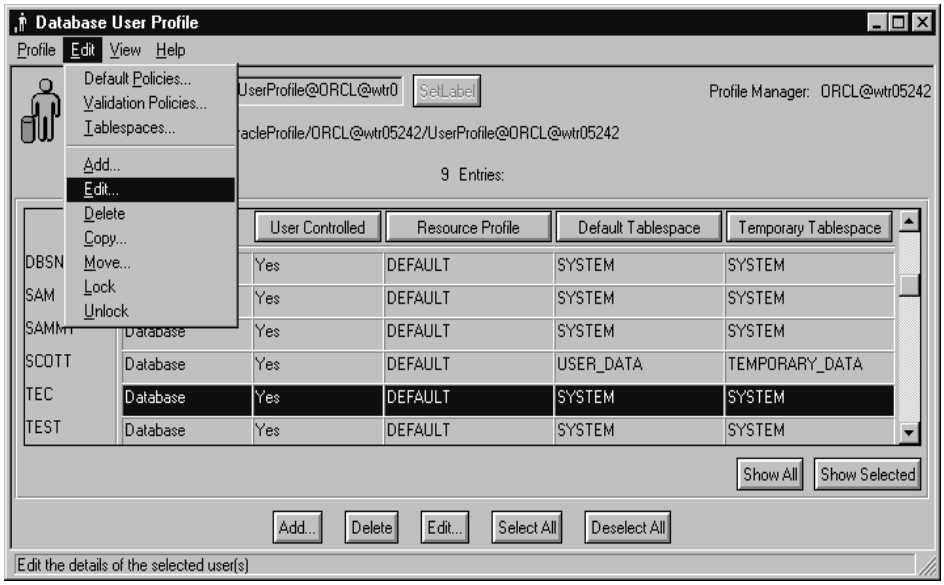


Figure 90. Database User Profile Window

The following window will appear.

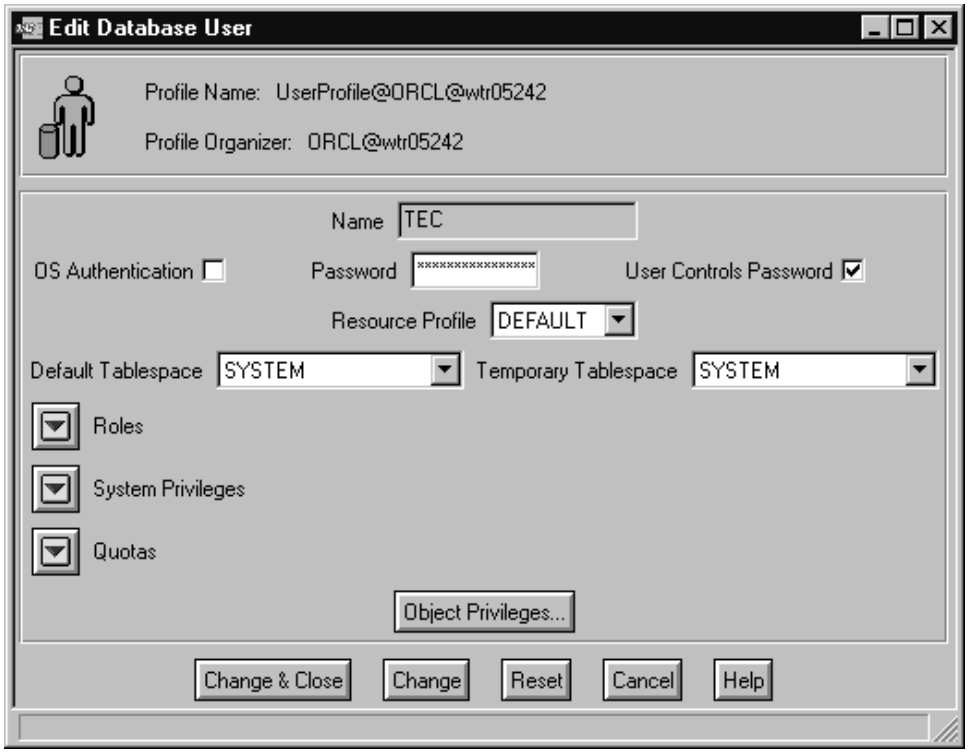


Figure 91. Edit Database User Window

If you want that the user is to be authenticated by the operating system, select the **OS Authentication** check box; otherwise user authentication is done by Oracle itself and you may enter the password into the Password field. If you want to change roles, system privileges or quotas, expand the dialog by clicking on the appropriate down arrow. Click on the **Add...** button to get a list of available options. For the system privileges you will get the following window.

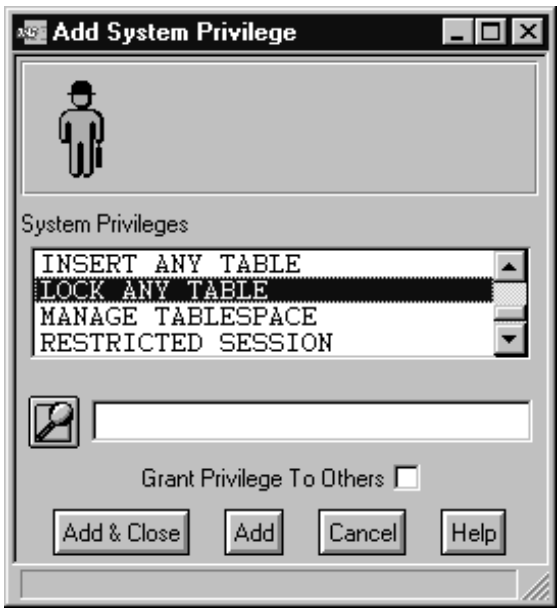


Figure 92. Add System Privilege Window

Select the privilege, you wish to add and click the **Add** or **Add & Close** button.

At the bottom of Figure 91 on page 102 there is a button for object privileges, which works the same way as the system privilege. An object privilege is the right to perform an action on a specific table, view, sequence, procedure, function or package.

2.7.14 Managing Database Roles

Managing a role is exactly the same as managing the users in the way of creating, populating, subscribing, distributing and deleting Oracle user profiles.

2.7.14.1 Adding Database Roles and Privileges

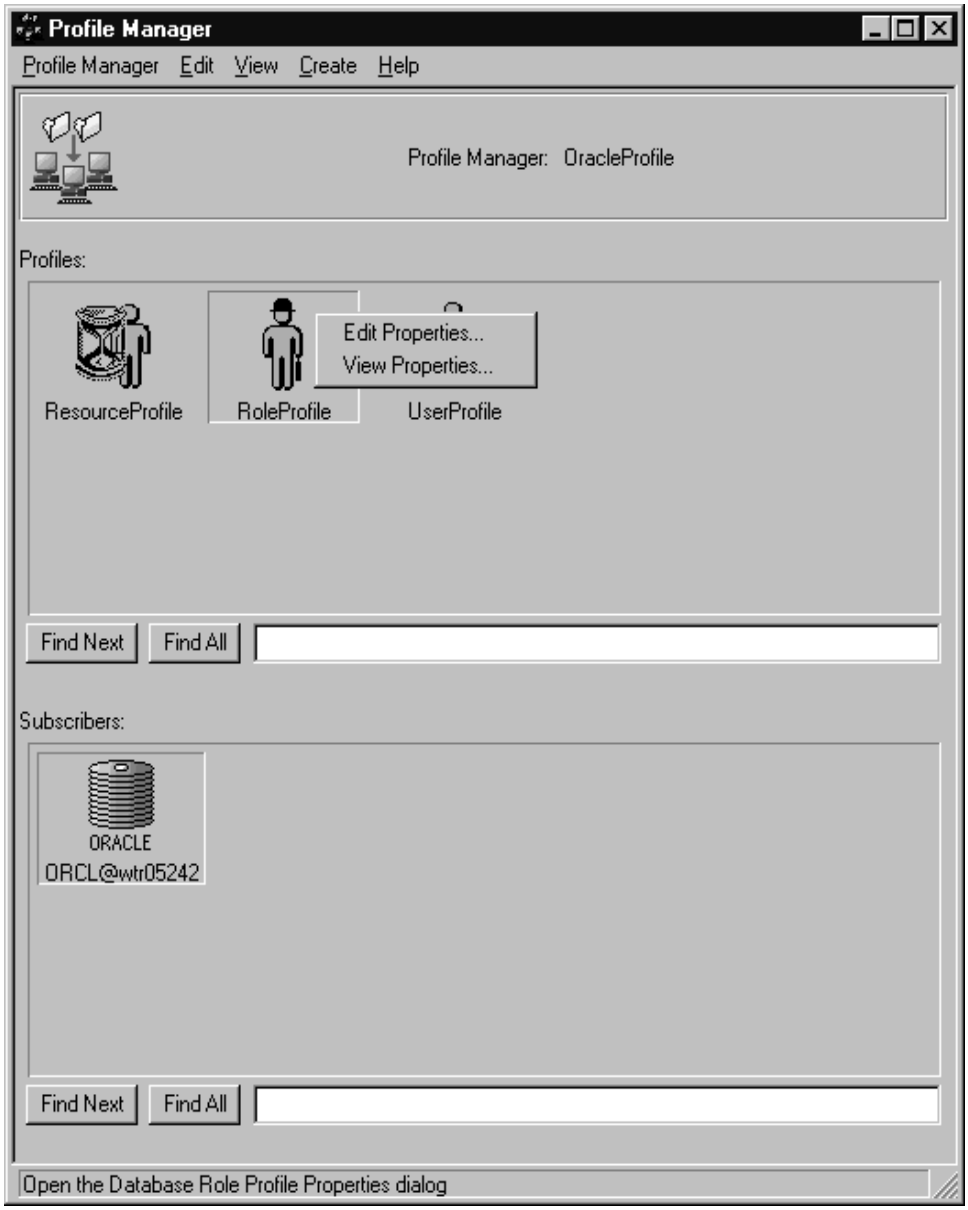


Figure 93. Profile Manager

Select **Edit Properties...** from the RoleProfile pop-up menu. The following window will appear.

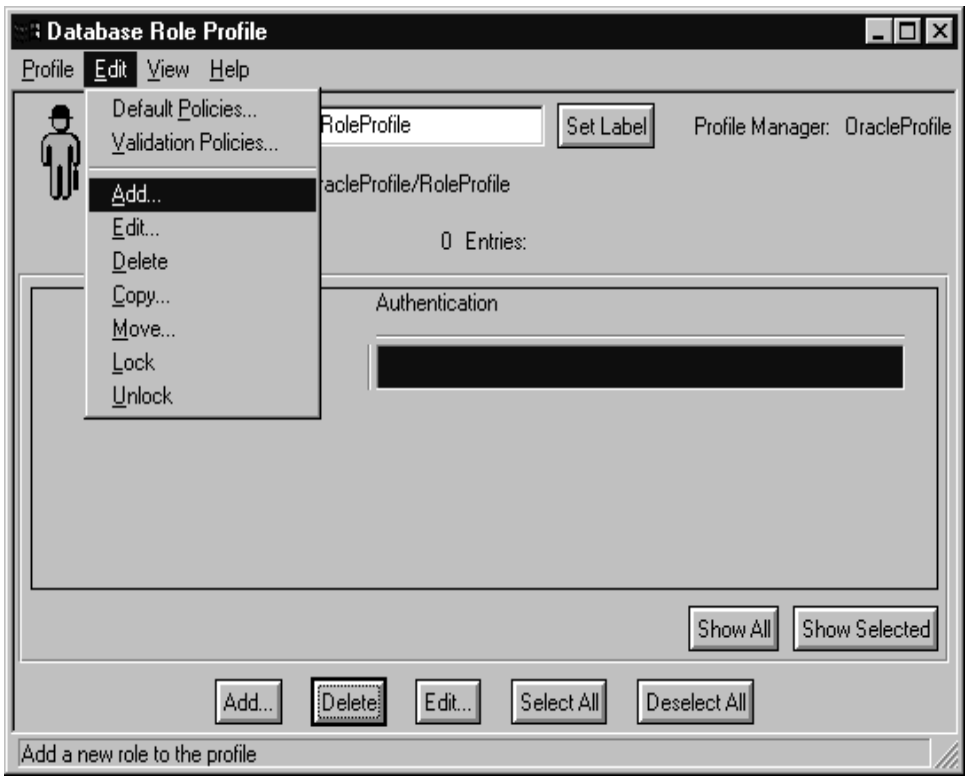


Figure 94. Default Role Profile Window

From the **Edit** menu we can select **Add...** to add a new role.

Note

It is possible as with the user profile to import role profiles from an existing Oracle database using the **Populate...** option from the **Profile** pull-down menu. There are restrictions in that the default roles within the Oracle database cannot be imported if the default validation policy restrictions are enabled. We disabled the validation policy for role names and then we could import all roles from the Oracle database. We do suggest that you leave the validation policy restrictions enabled, since it will otherwise allow modifications of the dba and system signon.

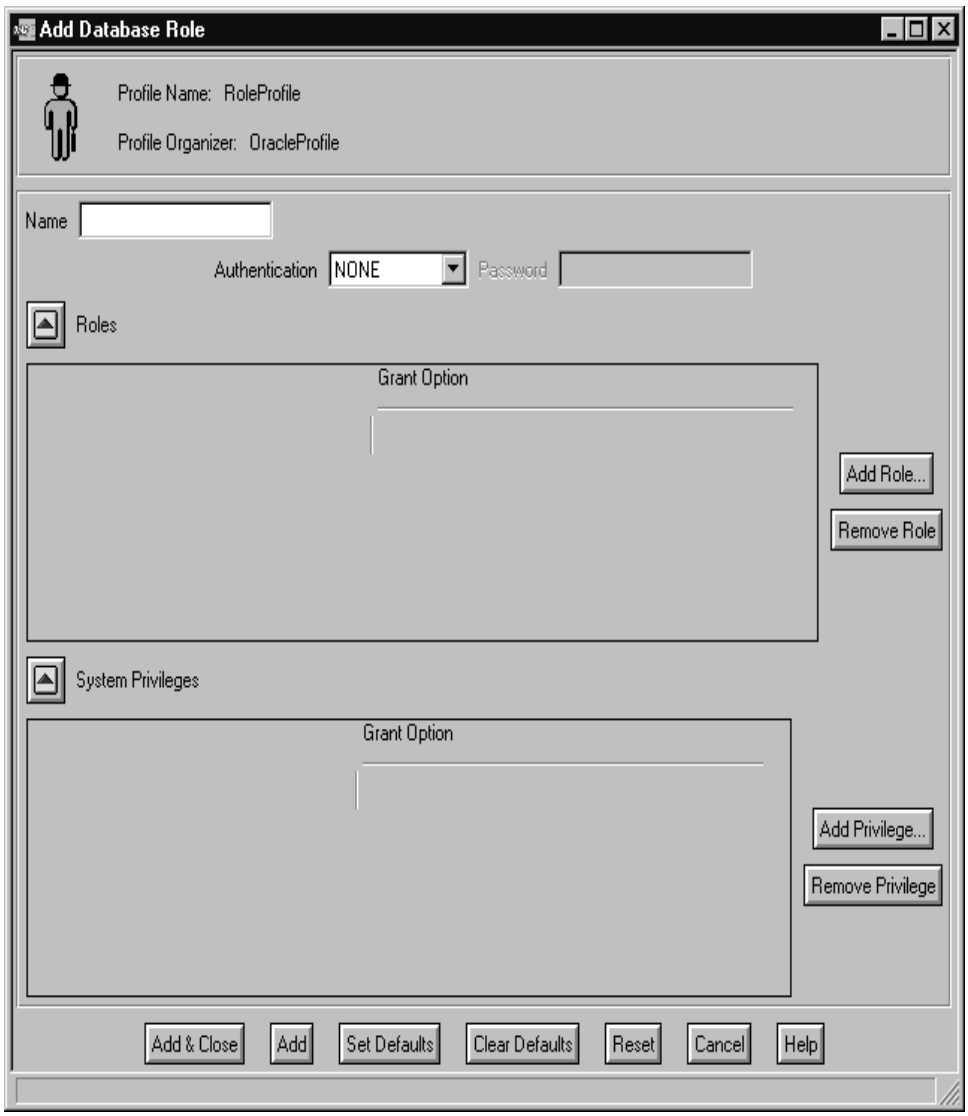


Figure 95. Add Database Role Window

This window is navigated in the same way as the Add Database User window in the previous section. Enter the name of the new role in the box. The **Add Role...** and **Remove Role...** buttons are on the right-hand side of the window, which allow the modification of roles and privileges.

If Add Role... is selected, the window on the left-hand side as shown in Figure 96 on page 107 will appear.

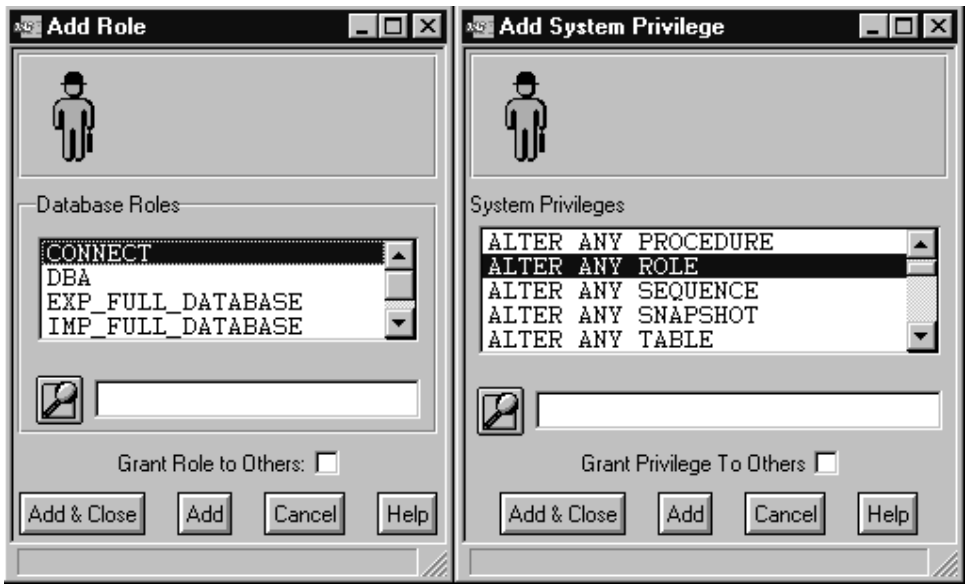


Figure 96. Add Role and Add System Privilege Window

If you select Add Privilege..., the window on the right-hand side in Figure 96 on page 107 will appear.

To add a role or a system privilege, highlight the role or the privilege you wish to allocate to this user and click **Add & Close**. You can add one role or one privilege at a time. Additionally, there is a check box within the windows to allow the user to grant the roles or privileges to other users.

After assigning roles and privileges the Add Database Role window shows all the assigned properties. The assigned roles and properties in our example are shown in Figure 97 on page 108.

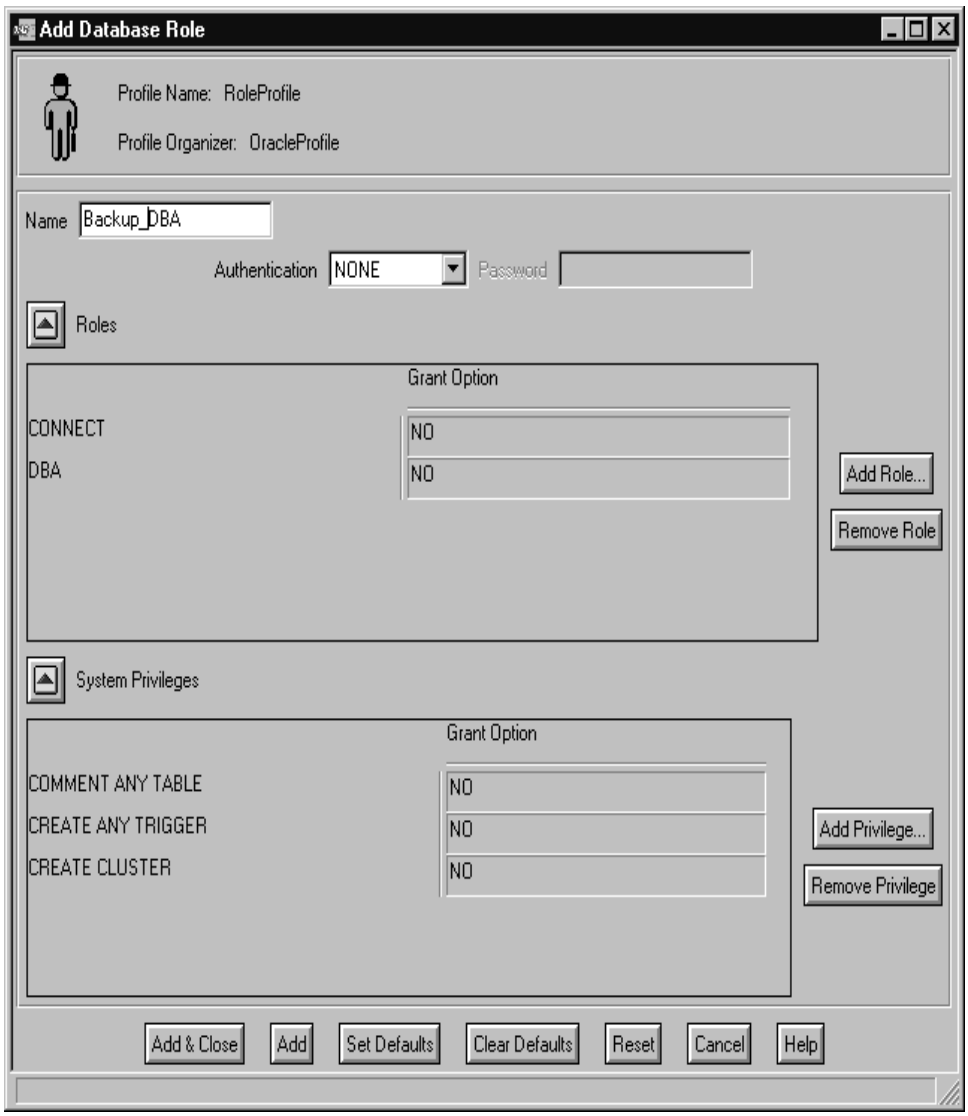


Figure 97. Add DatabaseRole Window

Don't forget to enter the name of the new role in the Name field. In our example we have used Backup_DBA. Select **Add & Close** and you will be returned to the Database Role Profile window, where you should see the new role. In our example two new roles were added as shown in Figure 98 on page 109.

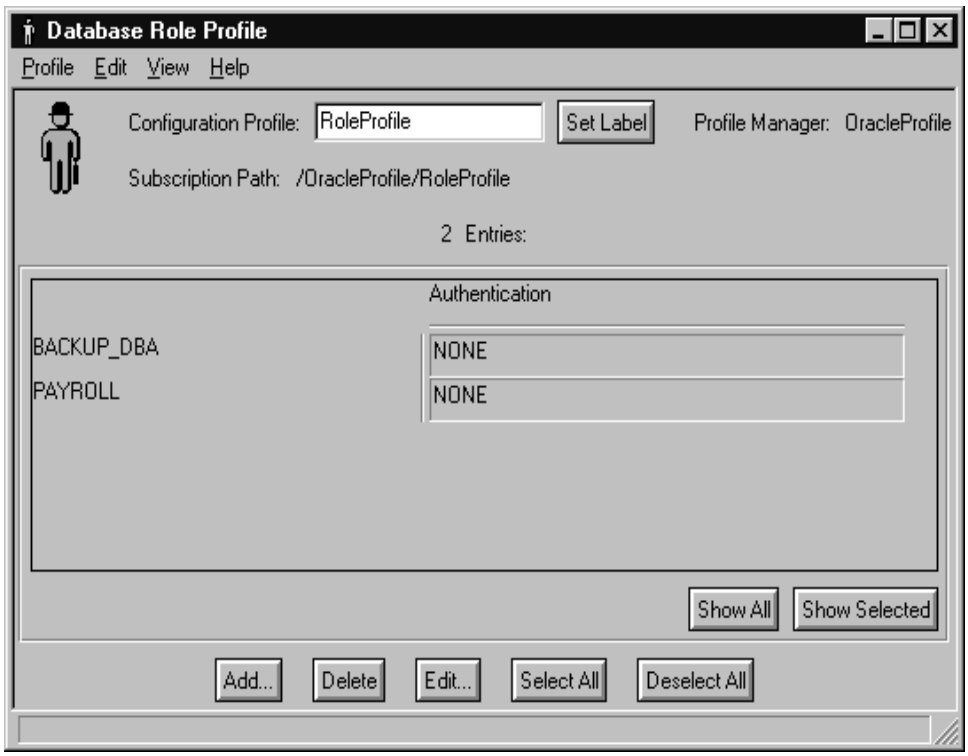


Figure 98. Database Role Profile Window

Close this window and drag the RoleProfile icon to the subscribing database icon. Then, open the subscribing database by double-clicking on the database icon in the subscriber box of the Profile Manager window. The following window will appear.

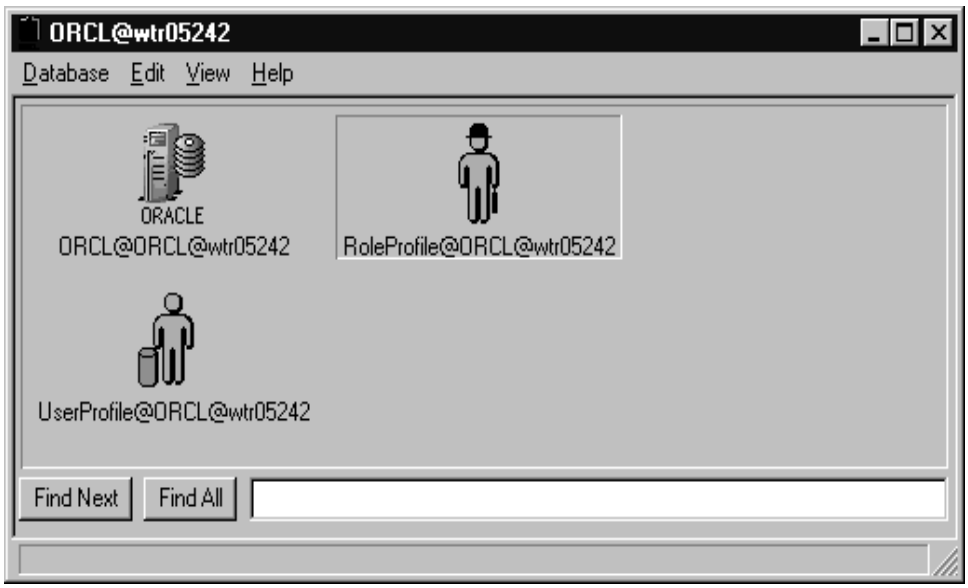


Figure 99. ORCL@wtr05242 Window

Double-clicking the **RoleProfile** icon will open the assigned database role profile for this Oracle database. Distribute the profile by selecting the **Distribute** option from the **Profile** pull-down menu as shown in Figure 100 on page 111.

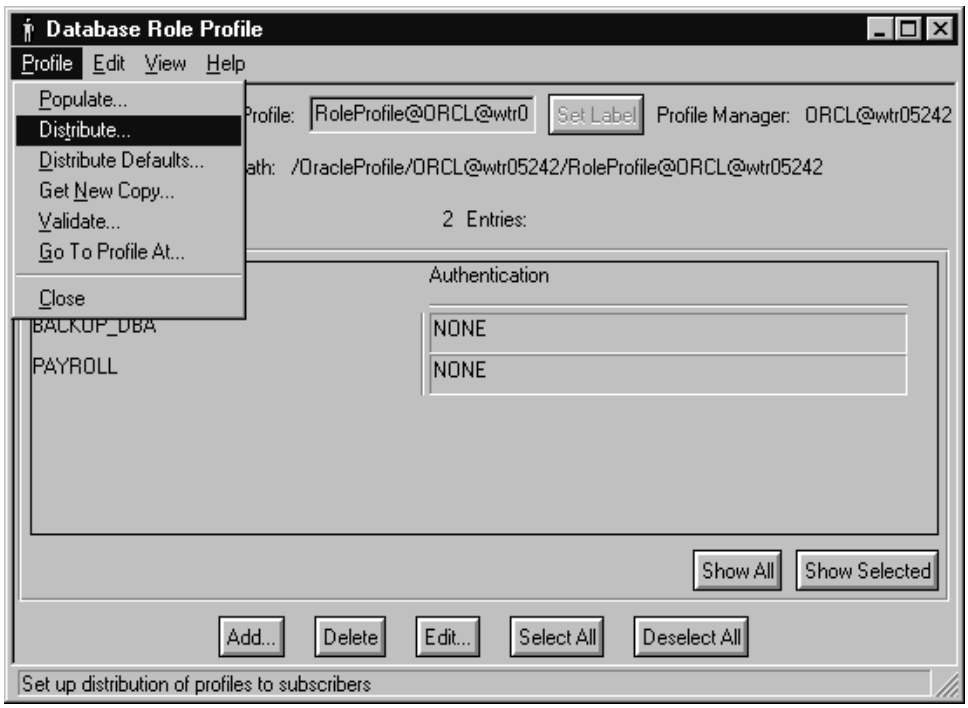


Figure 100. Database Role Profile Window

Two options are available to distribute this profile. Preserving the modifications in subscriber's copies of the profile is used to keep changes other administrators may have made to this profile. The second is to make each subscriber's profile an exact copy, which overwrites all differences between the subscribers profiles.

2.7.14.2 Removing a Role

Removing a role is done in a similar way. From the Profile Manager window, as shown in Figure 94 on page 105, select the roles you want to remove from the Oracle database and click the **Delete** button.

Close this window and drag the RoleProfile icon to the subscribing database icon. Then, open the subscribing database by double-clicking on the database icon in the subscriber box of the Profile Manager window. The window as shown in Figure 98 on page 109 will appear. The role profiles that have been removed in the previous step should not appear in this window. Distribute the profile by selecting the **Distribute** option from the **Profile** pull-down menu as shown in Figure 100 on page 111.

Note

You will not see, what you are adding or deleting!

When you add or delete any roles from the RoleProfile, UserProfile and ResourceProfile, the information is kept internally, but you cannot see the transactions to be performed when the profiles are distributed. There are no lists displayed of the roles to be added or to be deleted. We recommend that changes you have made are distributed immediately, so that there will be no confusion later on.

2.7.15 Managing Resource Profiles

Managing a resource profile is exactly the same as managing the users in the way of creating, populating, subscribing, distributing and deleting Oracle user profiles.

2.7.15.1 Adding a Resource Profile

First select the **ResourceProfile** icon with the right mouse button and select the **Edit Properties...** button as shown in Figure 101 on page 113.

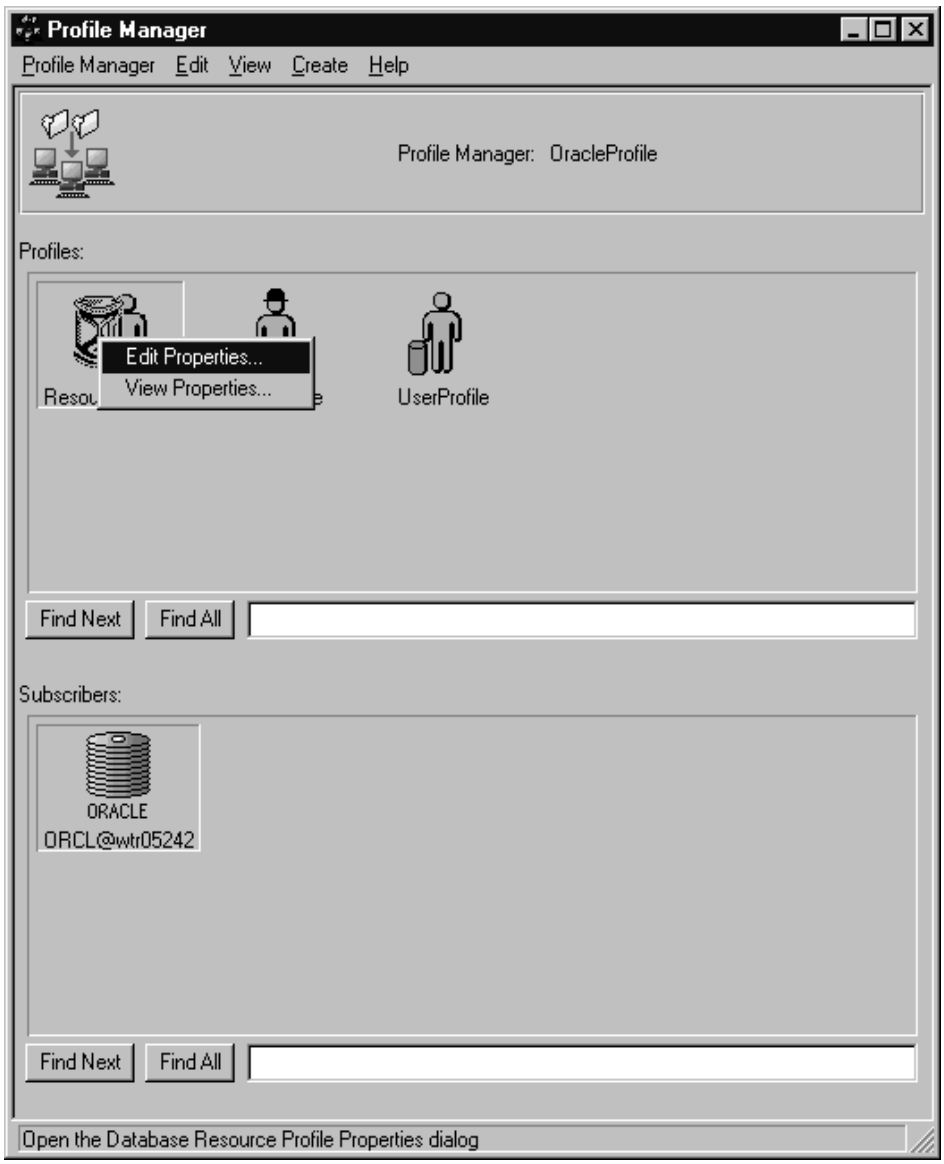


Figure 101. Profile Manager Window

The following window will appear.

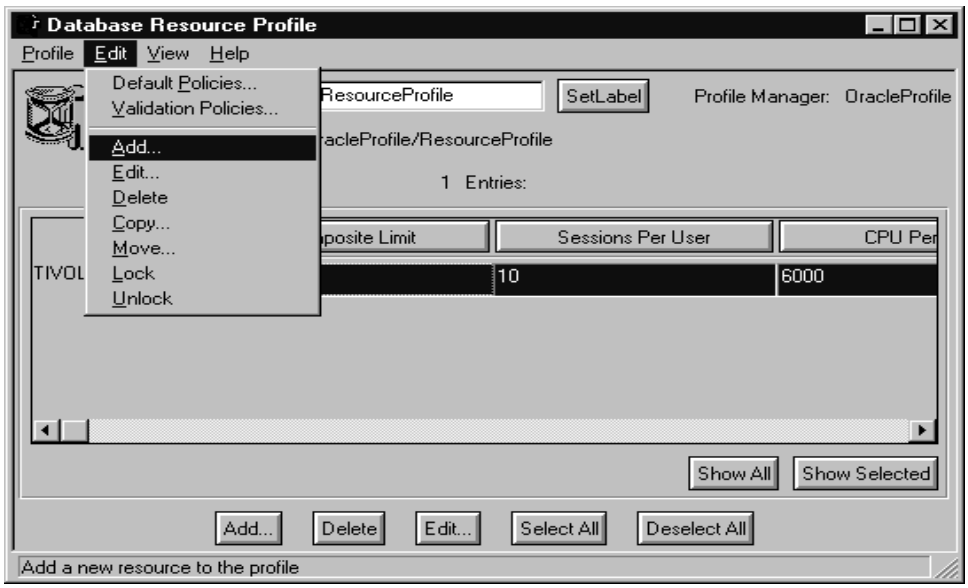


Figure 102. Database Resource Profile Window

To add a new resource, select **Add...** from the **Edit** pull-down menu. You may get an example of profile records by populating the resource profile from an existing database. This procedure is covered in the beginning of the Section 2.7.13, “Managing Users” on page 85, where we covered the steps needed to populate a database profile.

After selecting the **Add...** menu item the following window appears.

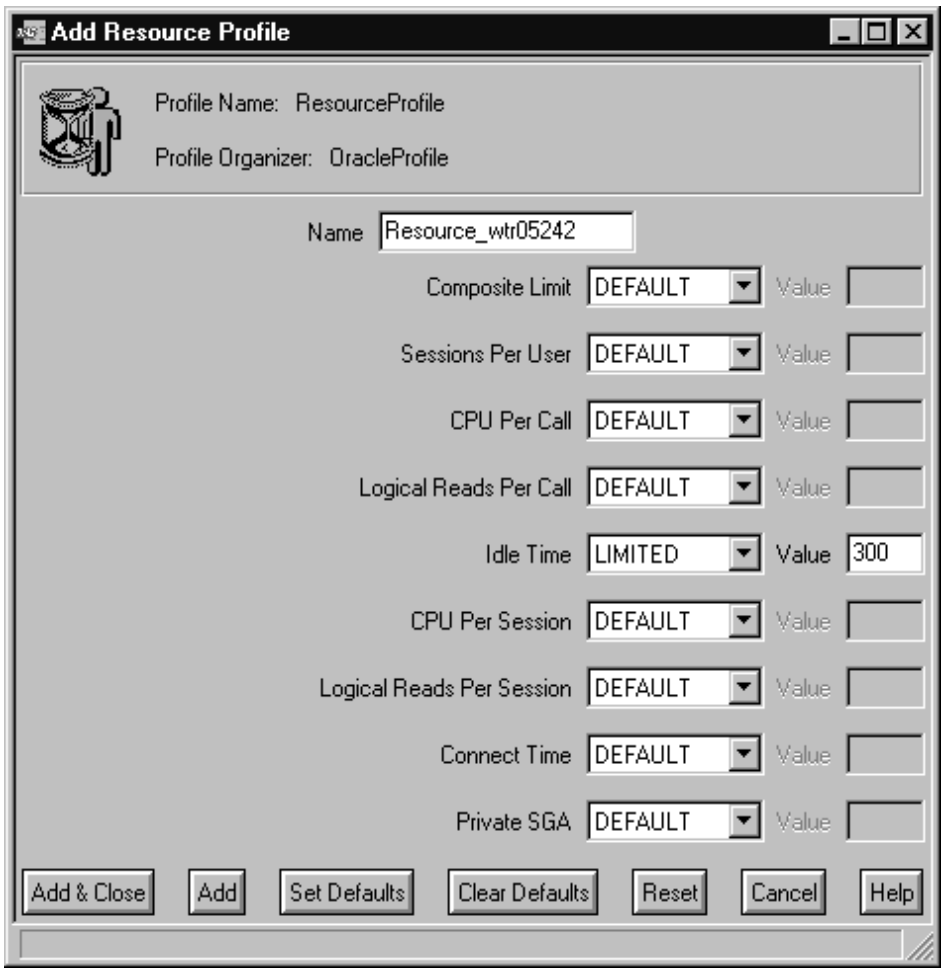


Figure 103. Add Resource Profile Window

Enter the name of the new resource you wish to add. For each value there are three values available from the drop-down menu: DEFAULT, LIMITED and UNLIMITED. Selecting LIMITED will allow you to enter a value. In the example above we change the Idle Time value to 300. If you have any questions about these values and their default values, consult the Oracle administrator's guide. Select **Add & Close** after you have finished setting these values.

Close this window and drag the ResourceProfile icon to the subscribing database icon. Then, open the subscribing database by double-clicking on the database icon in the subscriber box of the Profile Manager window. The

window as shown in Figure 98 on page 109 will appear. The resource profiles that have been added in the previous step should now appear in this window. Distribute the profile by selecting the **Distribute...** button from the **Profile** pull-down menu as shown in Figure 104 on page 116.

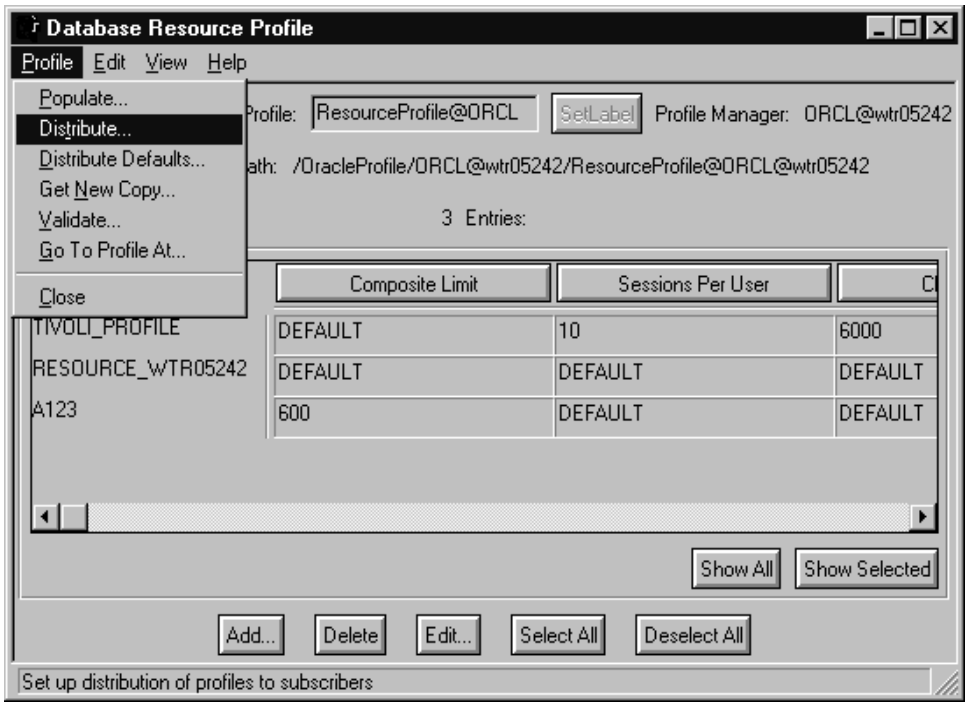


Figure 104. Database Resource Profile Window

When this action is completed the Oracle Database will be updated with these changes.

2.7.15.2 Deleting a Resource Record

Removing a resource record is done in a similar way. From the Database Resource Manager window, as shown in Figure 102 on page 114, select the resource record from the Oracle database to be removed and click the **Delete** button.

Close this window and drag the ResourceProfile icon to the subscribing database icon. Then open the subscribing database by double-clicking on the database icon in the subscriber box of the Profile Manager window. The window as shown in Figure 104 on page 116 will appear. The role profiles that have been removed in the previous step should not appear in this window. Distribute the profile by selecting the **Distribute...** from the **Database**

pull-down menu as shown in Figure 104 on page 116. When this action is complete the resources will be deleted from the Oracle Database.

2.7.15.3 Editing User Roles and Resource Records

In this section we cover how existing records can be modified using the Edit function within Tivoli Manager for Oracle. There will be only one example presented here, since editing any of the records is similar to the Add function without the option to change the name.

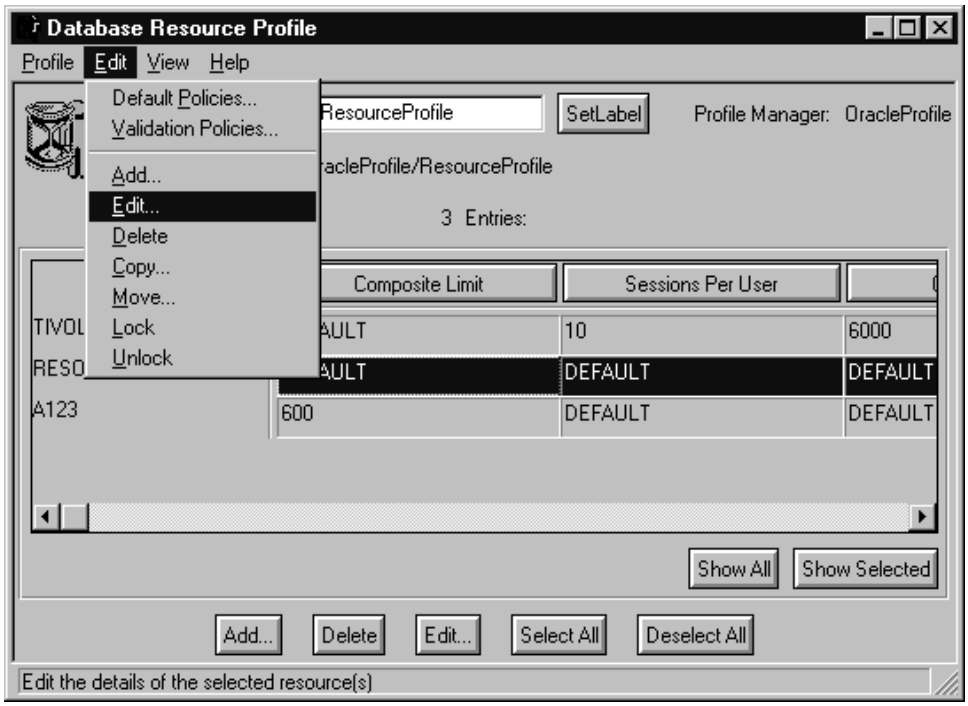


Figure 105. Database Resource Profile Window

Select the row containing the record to be modified and from the **Edit** pull-down menu select the **Edit...** menu item and the following window will appear.

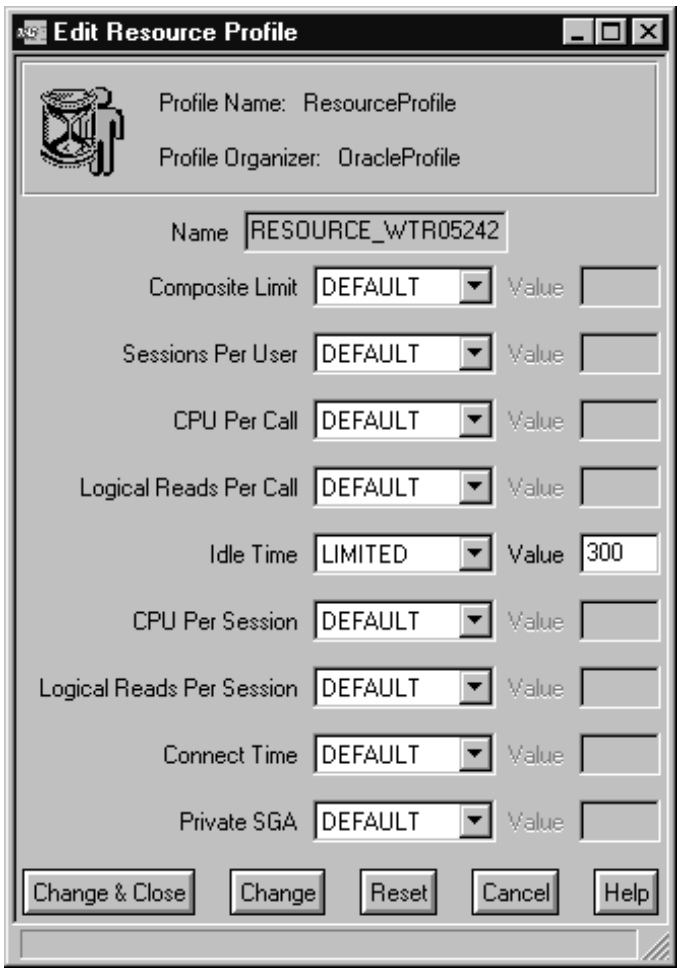


Figure 106. Edit Resource Profile Window

Notice that the window shown in Figure 106 on page 118 is exactly the same as the window shown in Figure 103 on page 115, except that the name cannot be changed. Perform the appropriate changes, select the **Change & Close** button and then distribute the changes to the database covered in previous section.

2.7.15.4 Locking and Unlocking Records

In this section we discuss what locking does within a profile. To lock a record in the database user profile select the row containing the record and select **Lock** from the **Edit** pull-down menu as shown in Figure 107 on page 119.

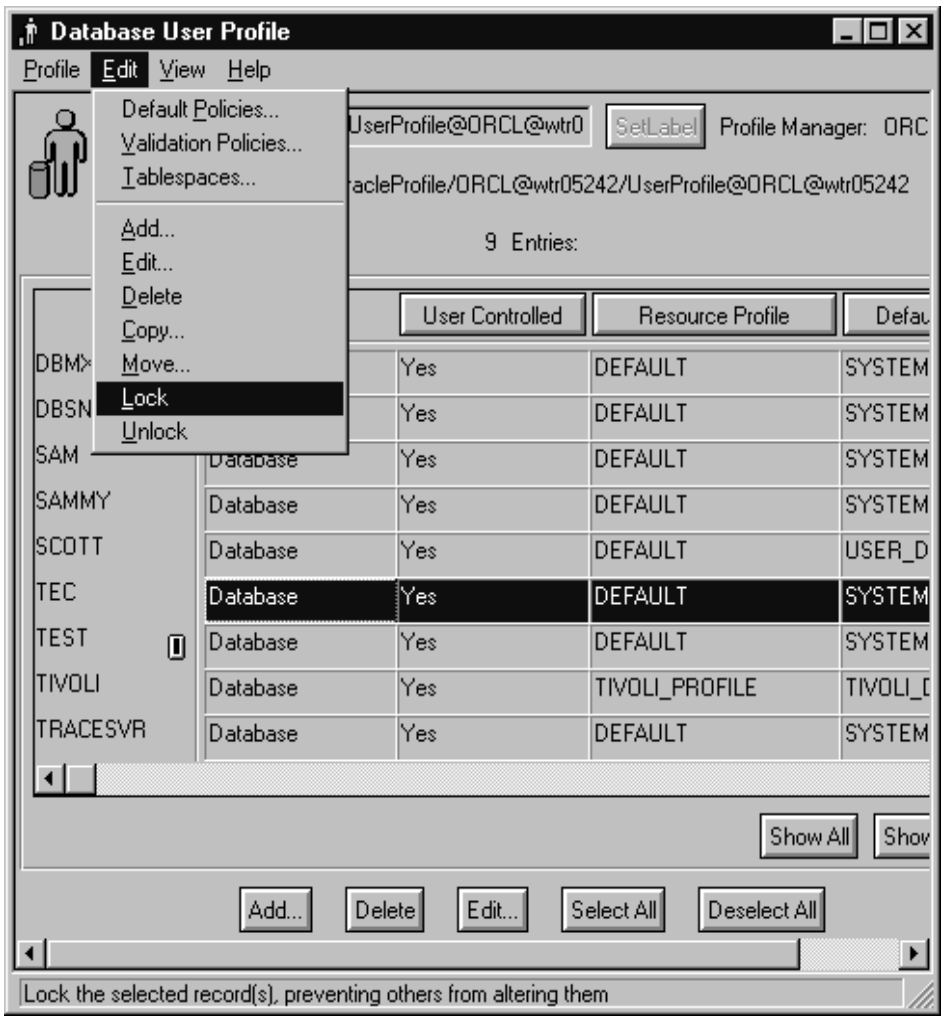


Figure 107. Database User Profile Window

In this figure you see that the TEST user record has been locked as indicated by a small padlock icon. This record cannot be changed within the profile as long as it remains locked. To unlock it select the row and then **Unlock** from the **Edit** pull-down menu. This locking feature only refers to the editing of the records within Tivoli Manager for Oracle and has nothing to do with the Oracle database itself.

2.7.16 Using Tivoli Manager for Oracle Monitors

Once Tivoli Manager for Oracle - Distributed Monitoring is installed, we have a new notice group called Oracle Sentry. We have to subscribe to this group all the administrators we want to receive notices from the Tivoli Manager for Oracle.

Figure 108. Set Notice Groups Window

Tivoli Manager for Oracle Distributed Monitoring works with two different monitoring collections: OracleDatabase and OracleInstance. Each one of these collections contains different monitors that enable us to effectively manage all the different aspects of an Oracle database. This characteristic also enables the Tivoli Manager for Oracle to support Oracle Parallel Server.

The monitors are concerned with two different endpoints: one for the Oracle database and the other for the Oracle instance.

To add or edit a monitor, you can use either the graphical user interface (GUI) or the command line interface (CLI), but first you have to check if you have the required roles to work with these monitors.

2.7.16.1 Required Roles

Since there are many different operations working with Tivoli Manager for Oracle, there are a number of different authorization roles.

Activity	Context	Required Role
Add a monitor to a profile	Profile manager	**admin**
Set user and group ID	Profile	**senior**
Distribute a profile to next level	Profile	**admin**
Distribute a profile to all levels or Distribute from an Oracle endpoint	Profile and Oracle endpoint	**admin** (Profile) and **oracle_admin** (Oracle endpoint)

Table 1. Authorization Roles for Tivoli Manager for Oracle Distributed Monitoring

2.7.16.2 Setting User and Group ID

To be able to start working with the new monitors, we have to change the user and group ID of the monitoring profile. These items have to be determined to specify the operative system context under which the Tivoli Manager for Oracle Distributed Monitoring monitors are going to be executed. Common monitors can be run with the user and group ID of nobody (the Tivoli Distributed Monitoring default), but the Tivoli Manager for Oracle Distributed Monitoring monitors can only be run for a Tivoli administrator that has the oracle_monitor role and as a consequence the user ID under which the monitor runs needs to be one of the login IDs of this administrator.

We set the login name for the database user for the administrator we are working with.

To do this we double-click the **Administrators** icon from the Tivoli desktop. In the Administrators window we select the icon for our administrator (Root_rs600019-region) with the right mouse button and then select **Edit Logins...** from the pull-down menu. The following window will appear.

Figure 109. Set Login Names Window

We enter `oracle` in the Add Login Name field and press Enter. Then we click **Change &Close**.

To modify the TME 10 Distributed Monitoring profile, select the **Set User & Group ID...** option from the **Edit** menu in the TME 10 Distributed Monitoring Profile Properties window as shown in the following figure.

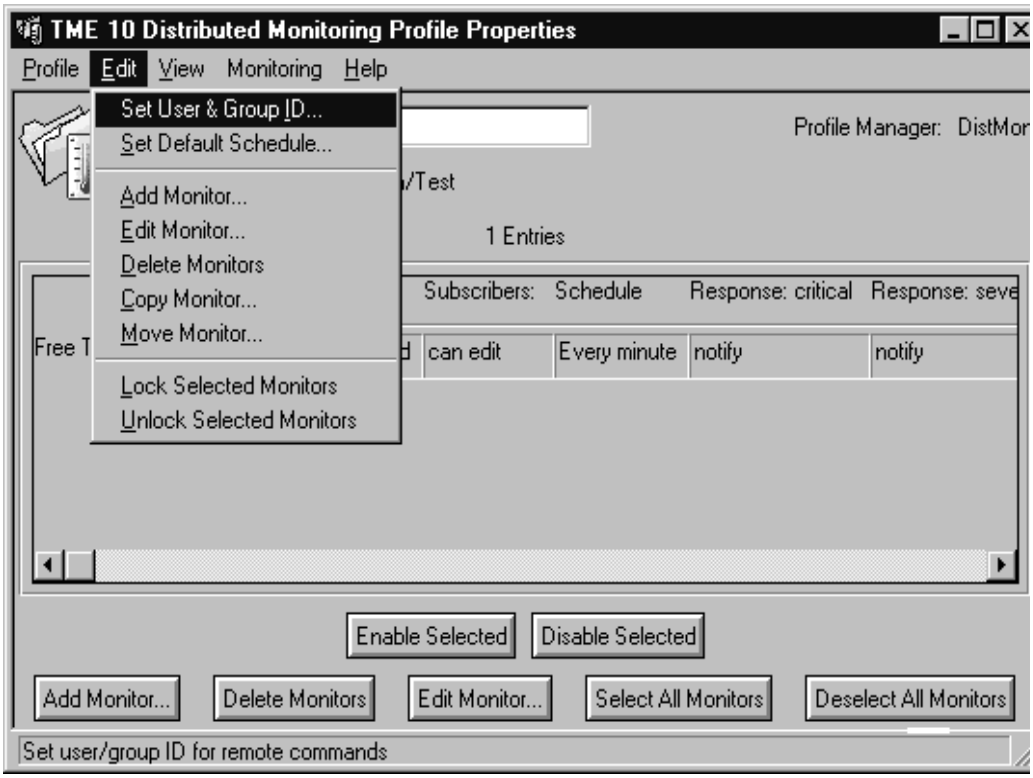


Figure 110. TME 10 Distributed Monitoring Profile Properties Window

The Edit Default Policies window will appear.

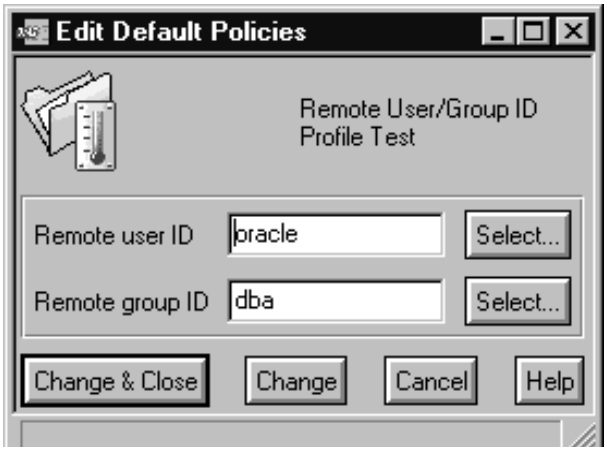


Figure 111. Edit Default Policies Window

We enter `oracle` in the Remote user ID field and `dba` in the Remote group ID field. This is the UNIX user ID and group ID of our Oracle database running on rs600021. Then we click the **Change & Close** button.

We create another monitoring profile for the Windows NT monitors. In this monitor we also need to change the user and group ID of the monitoring profile. In the Remote user ID, we need to set the name of any Windows NT administrator and we leave blank the Remote group ID field. For our example, we set the properties as shown in the following figure.

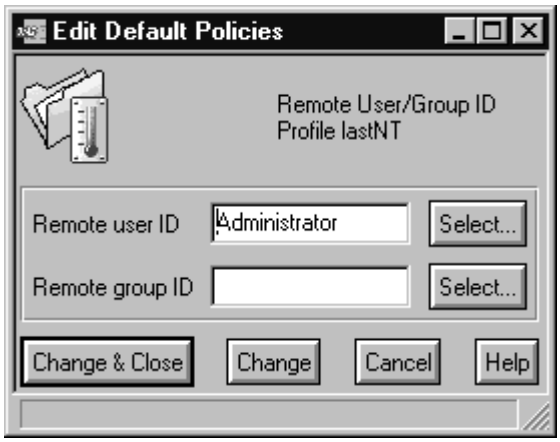


Figure 112. Edit Default Policies Window

When finished we clicked on **Change & Close**.

When working with these monitors, it is necessary to create two different monitoring profiles, one for monitors for Windows NT and one for UNIX databases.

2.7.16.3 Creating an Example Monitor

We decided to create a monitor from the OracleInstance monitoring collection to check the availability of the endpoint database.

From the TME 10 Distributed Monitoring Profile Properties window, we select the **Add monitor...** button. The Add Monitor to TME 10 Distributed Monitoring Profile window will appear.

Figure 113. Add Monitor to TME 10 Distribute Monitoring Profile Window

By clicking on **OracleInstance** we select the monitoring collection we want to work with. This will display all the monitoring sources in that monitoring collection.

We select the **RDBMS State** monitor by clicking on it. We click the **Add Empty...** button to set the characteristics of the monitor. The Edit Monitor window will appear.

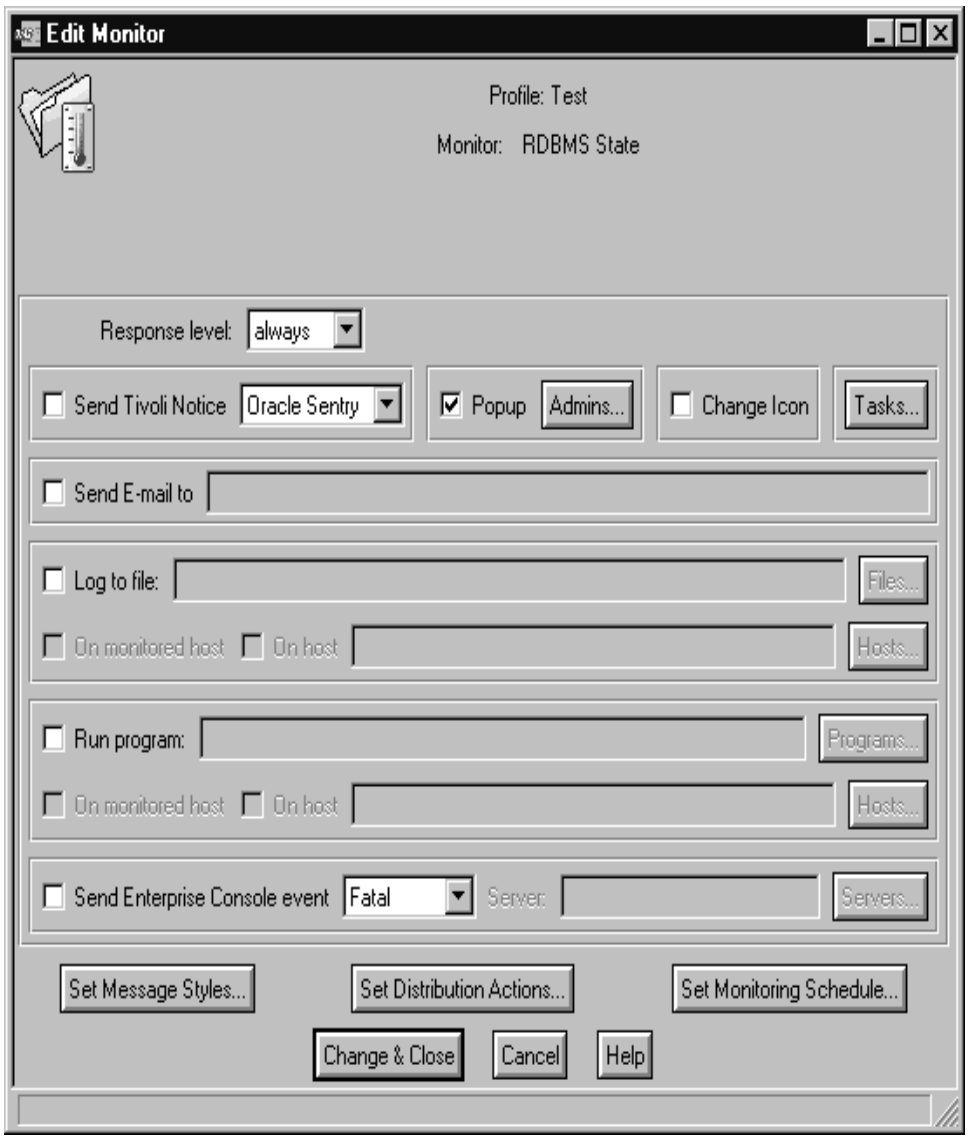


Figure 114. Edit Monitor Window

We set the Response level to **always** and click on the **Popup** check box. In this item, we have to select the administrators that we want to receive the

monitor's pop-up. We set the administrators by clicking on the **Admins...** button. This will display the following window.

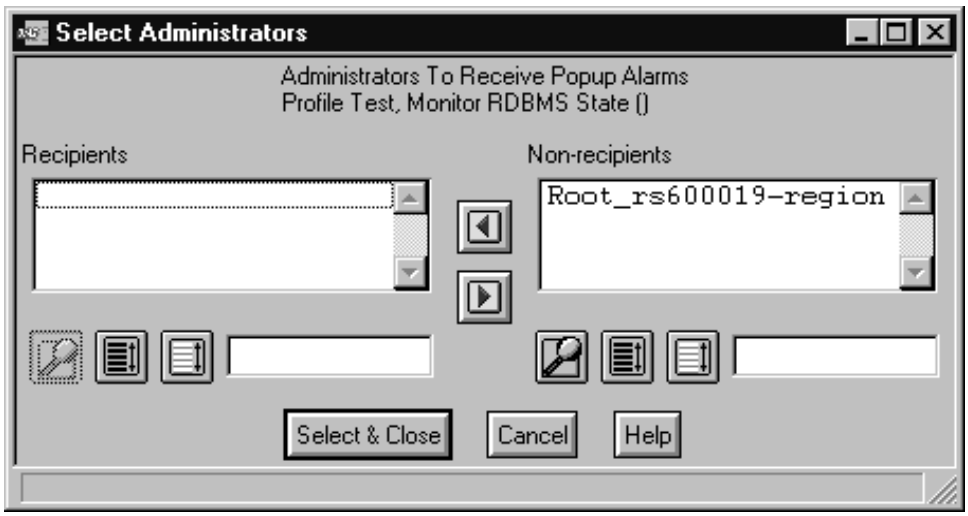


Figure 115. Select Administrators Window

To select the administrator, we can click once on it and click on the left arrow button or we can double-click on the administrator we want to receive the pop-up. Then we select the **Select & Close** button. This will take us back to the Edit Monitor window.

We also have to set the monitoring schedule. We do this by clicking the **Set Monitoring Schedule...** button. When the Set Monitoring Schedule window appears, we have to set the Start Monitoring activity and the Check monitor every fields as shown in the next figure.

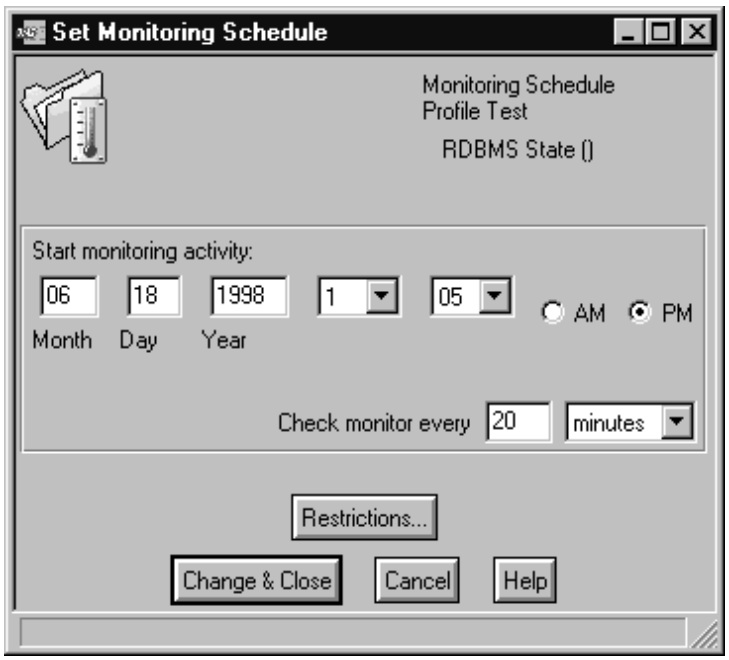


Figure 116. Set Monitoring Schedule Window

By clicking the **Change & Close** button, we go back to the Edit Monitor window and then we click the **Change & Close** button to finally set the new monitor.

Now, we have to save the monitor we just added. To do this, we select **Profile** from the menu bar and then **Save** from the pull-down menu.

The final part is to distribute the profile to all the subscribers we want to be checked by this monitor.

From the **Profile** menu of the TME 10 Distributed Monitoring Profile Properties window select the **Distribute...** option. This will display the Distribute Profile window.

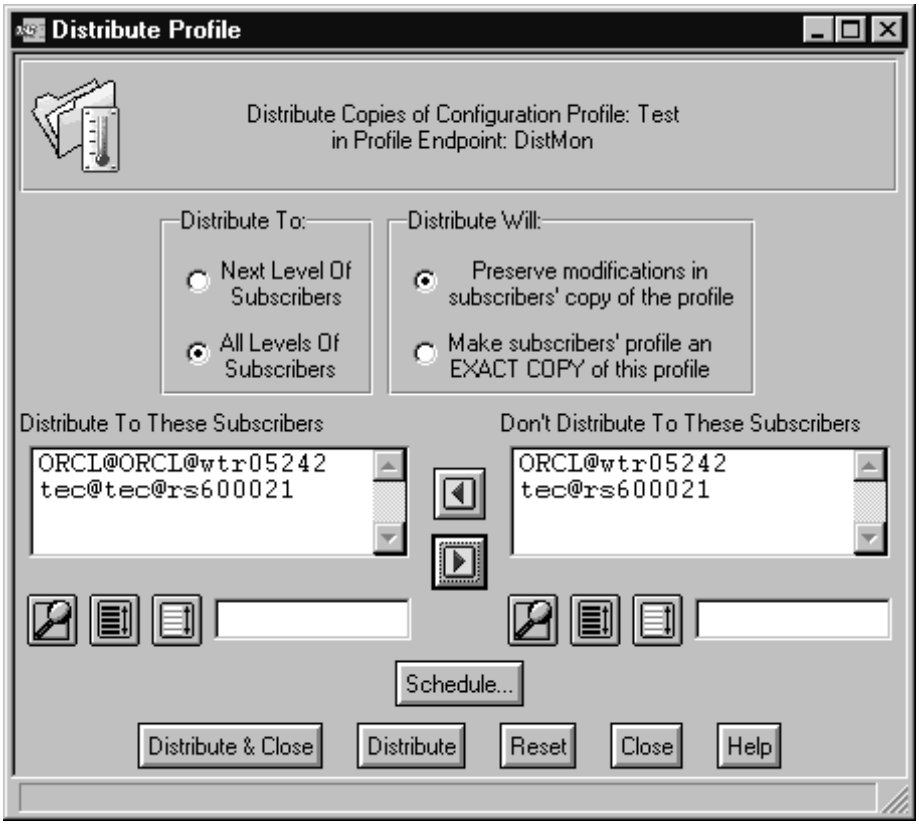


Figure 117. Distribute Profile Window

In this window, we select the Oracle endpoints we want to monitor. The monitor distribution will start by clicking the **Distribute & Close** button.

The result of this monitor shows the state of the Oracle database in the managed node rs600021.

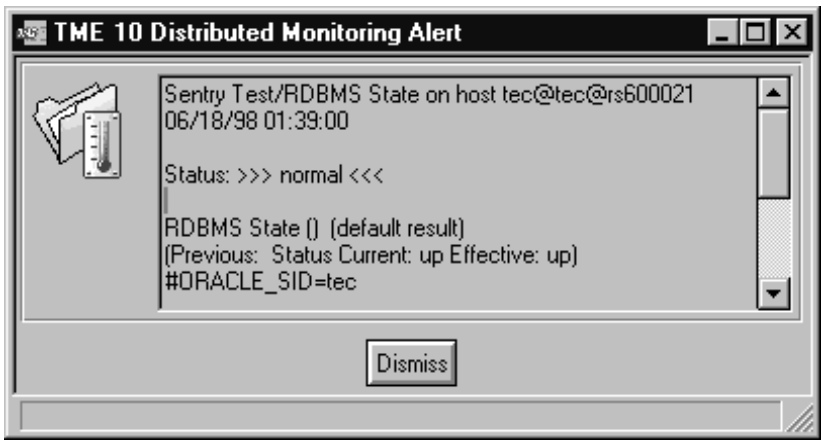


Figure 118. TME 10 Distributed Monitoring Alert Pop-Up Window

It is worth mentioning that although we can set the frequency of the monitors as once a minute, it is recommended not to set the frequency higher than what you think you need.

2.7.17 Installing the Oracle Distributed Monitoring Task Library

With the Tivoli Manager for Oracle Distributed Monitoring, comes another task library, which contains a number of pre-defined database monitoring tasks.

The installation procedure for this task library can only be run from the command line interface (CLI).

To begin the installation of this task library, we use the wtll command. With this command, we initiate to import the task library definitions to be able to create the new task library in a certain policy region.

We switch to the /usr/local/Tivoli/bin/generic/OracleSentryTasks/ directory.

We run the command as shown in the following figure.

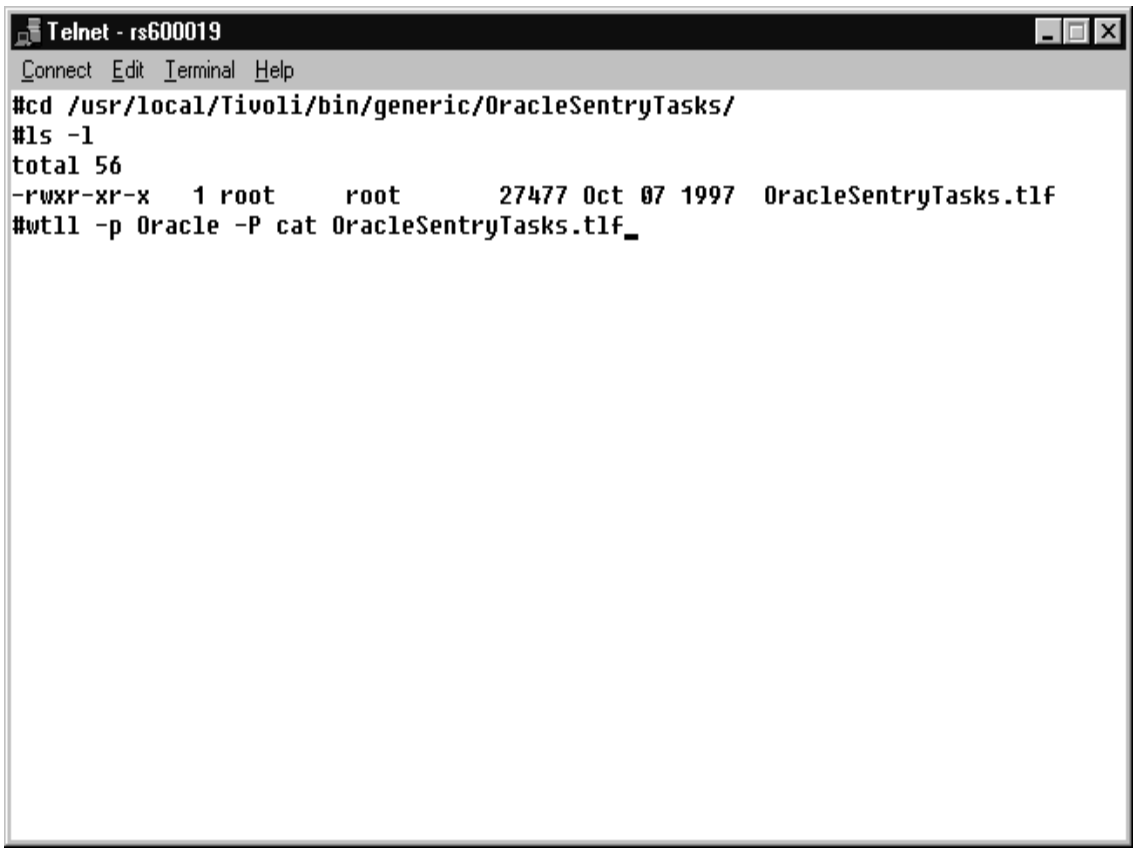


Figure 119. Telnet Window

The -p <policy region> flag specifies the policy region where we want to create the Oracle Distribute Monitoring task library.

The -P cat flag specifies that the task library does not need to be passed through a pre-processor; therefore, we just specify the cat command.

After running this command, we will have the new task library in the specified policy region.

Figure 120. Policy Region: Oracle Window

In the new task library window, we have five new tasks:

- CreateHistoryTable
- CurrentRunningSQL
- DisableMonitoring
- EnableMonitoring
- PurgeHistoryTable

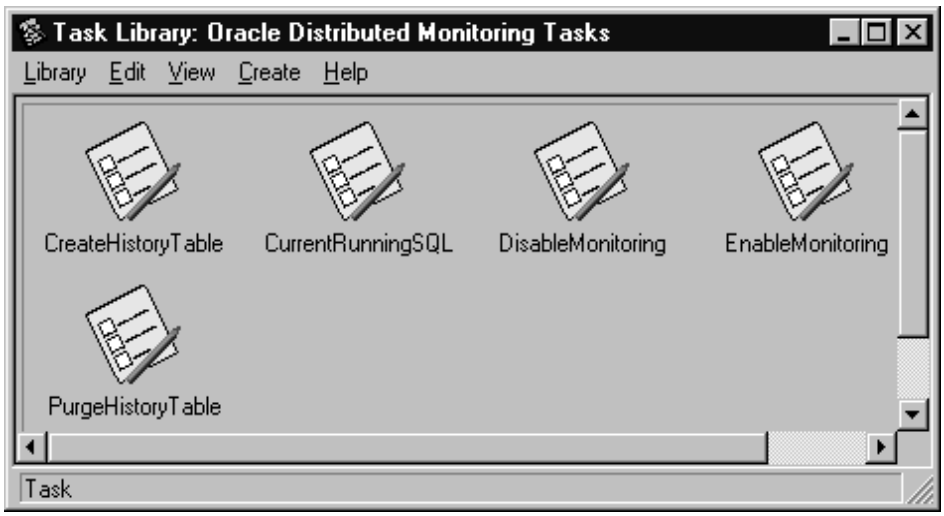


Figure 121. Task Library Window

We have to mention that all of these tasks follow a certain validation. When distributing a task, we have to make sure that the administrator who is running this task also has an account with the same privileges on the client the task is going to be run.

2.7.17.1 CreateHistoryTable Task

With this task, a special table in the Oracle database is created. In this table we can store the results of the monitors we are working with.

To run the CreateHistoryTable task, double-click on the **CreateHistoryTable** icon. The Execute Task window will appear.

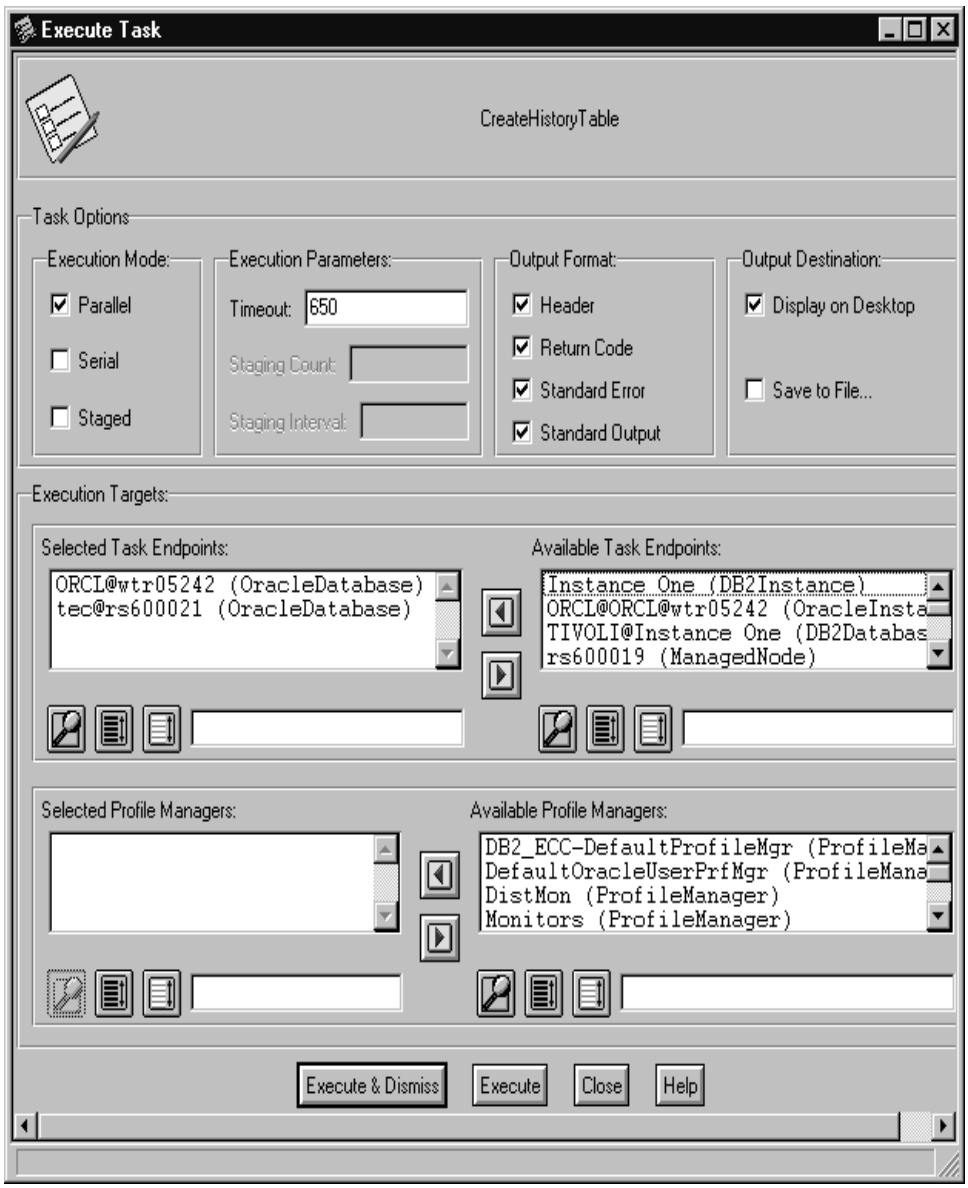


Figure 122. Execute Task Window

For our example, when filling in the items, we specified the parallel execution mode (the default). The time-out was chosen to be 650 seconds. In the Output Destination, we specify **Display on Desktop**.

After that, we select the targets from the Available Task Endpoints. This task should only be run on OracleDatabase endpoints.

If we want to run the task for all the subscribers of a specific profile manager, we have to choose the profile manager from the available profile managers list.

We then click the **Execute & Dismiss** button and we get the CreateHistoryTable window.

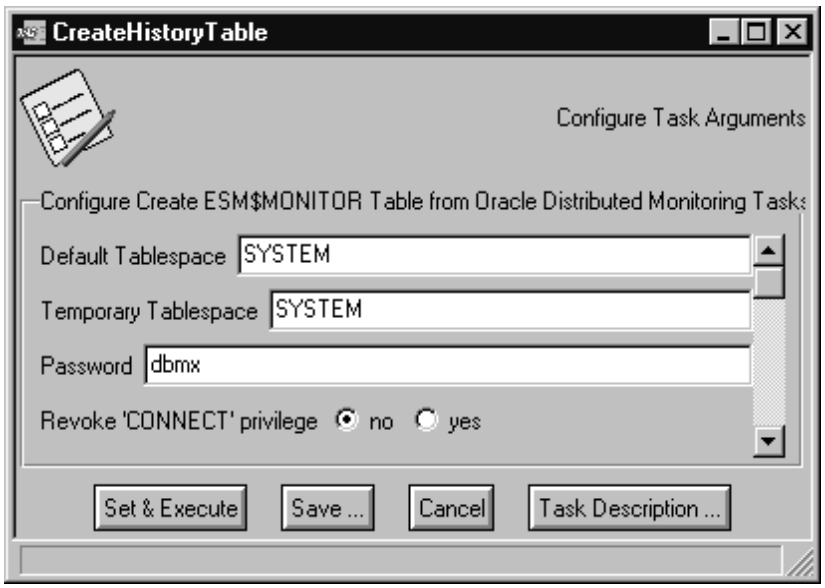


Figure 123. CreateHistoryTable Window

In our example, we decide to work with the SYSTEM tablespace. If you decide to create the table in a different tablespace, make sure the tablespace already exists. The Revoke 'CONNECT' privilege item is used to prevent the DBMX user from logging in, but the Tivoli Manager for Oracle still has access to the table owned by DBMX, so we click the **Set & Execute** button that initializes the task. We get the following window.

Figure 124. CreateHistoryTable Output Window

2.7.17.2 PurgeHistoryTable Task

By running this task, we remove all the data from the ESM$MONITOR table. Since this table is used for storing the results of monitoring sessions, it can grow in a very fast way if we have multiple monitors running on a database.

To run the task, double-click on the **PurgeHistoryTable** icon. This will display the following window.

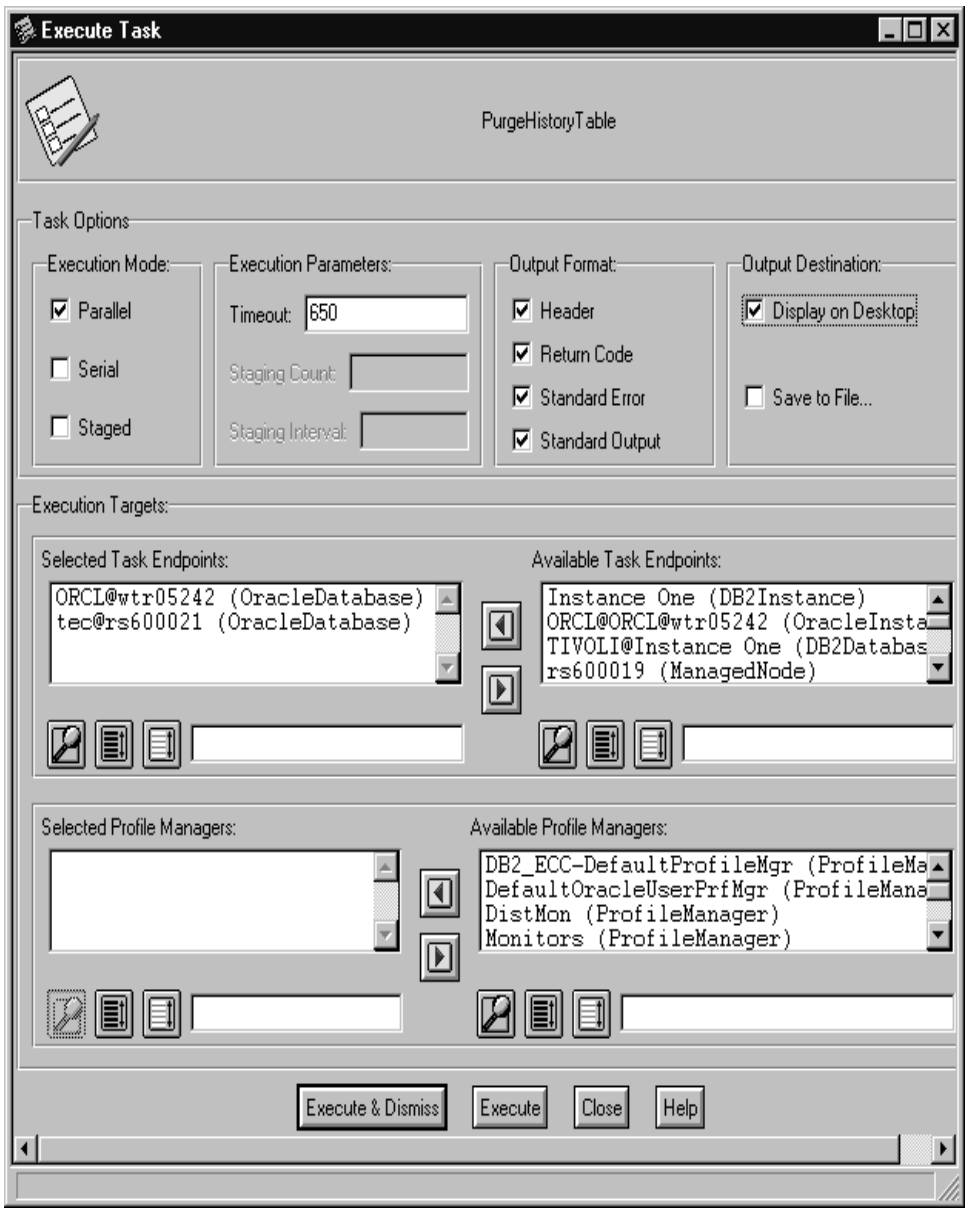


Figure 125. Execute Task Window

This task can only be run on Oracle database endpoints. We select all the Oracle database endpoints we are working with. We then click the **Execute & Dismiss** button. The following window appears.

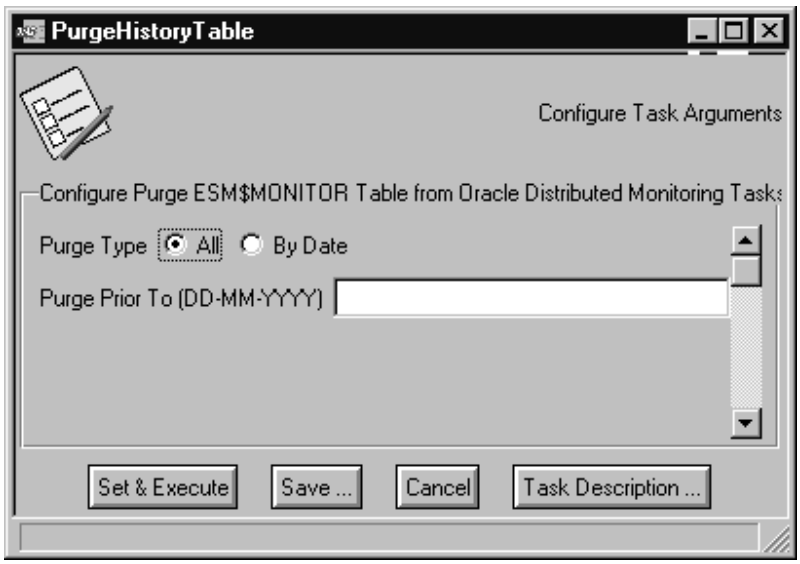


Figure 126. PurgeHistoryTable Window

With the All Purge Type, we set the task to delete all the records in the table and with the By Date Purge Type, we set the task to purge all the records before a selected date. For our example we select the first one.

After clicking the **Set & Execute** button, we get the following window.

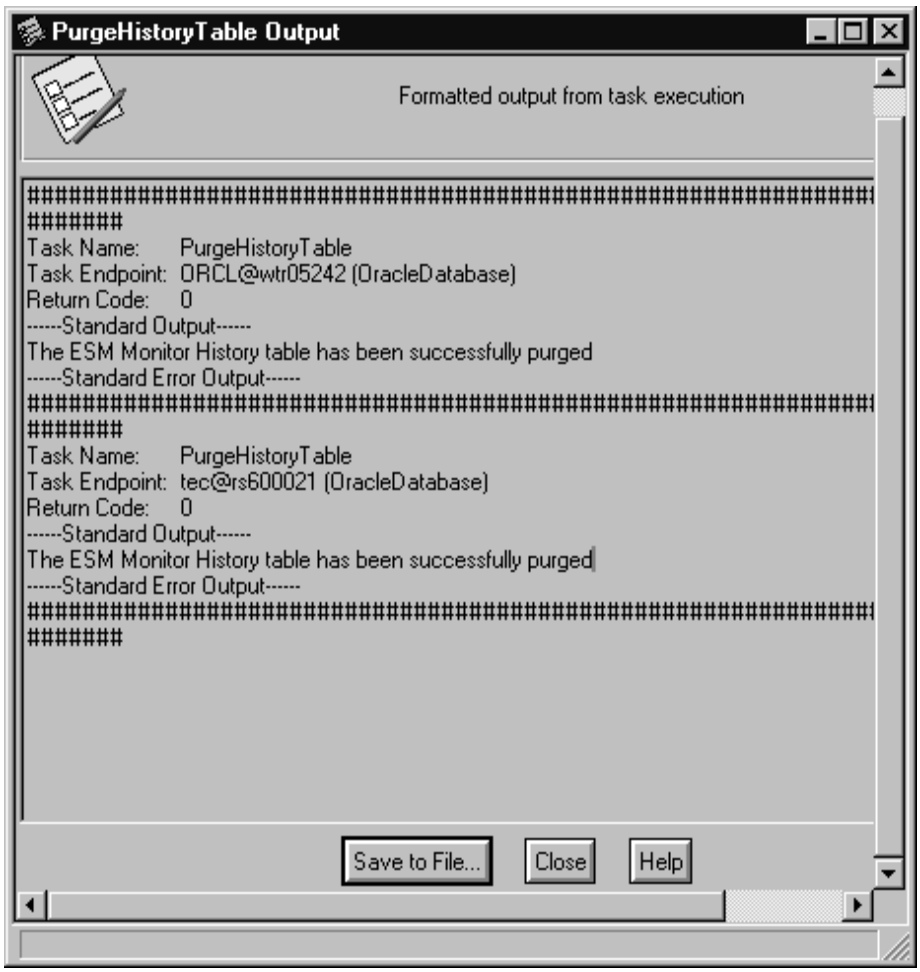


Figure 127. PurgeHistoryTable Output

2.7.17.3 CurrentRunningSQL Task

With this task, we can retrieve all the current SQL statements for any user connected to an Oracle database.

We start the task by double-clicking the **CurrentRunningSQL** icon. You have to fill out all the items and select the task endpoints you need. This task can be run either against Oracle database or Oracle instance endpoints.

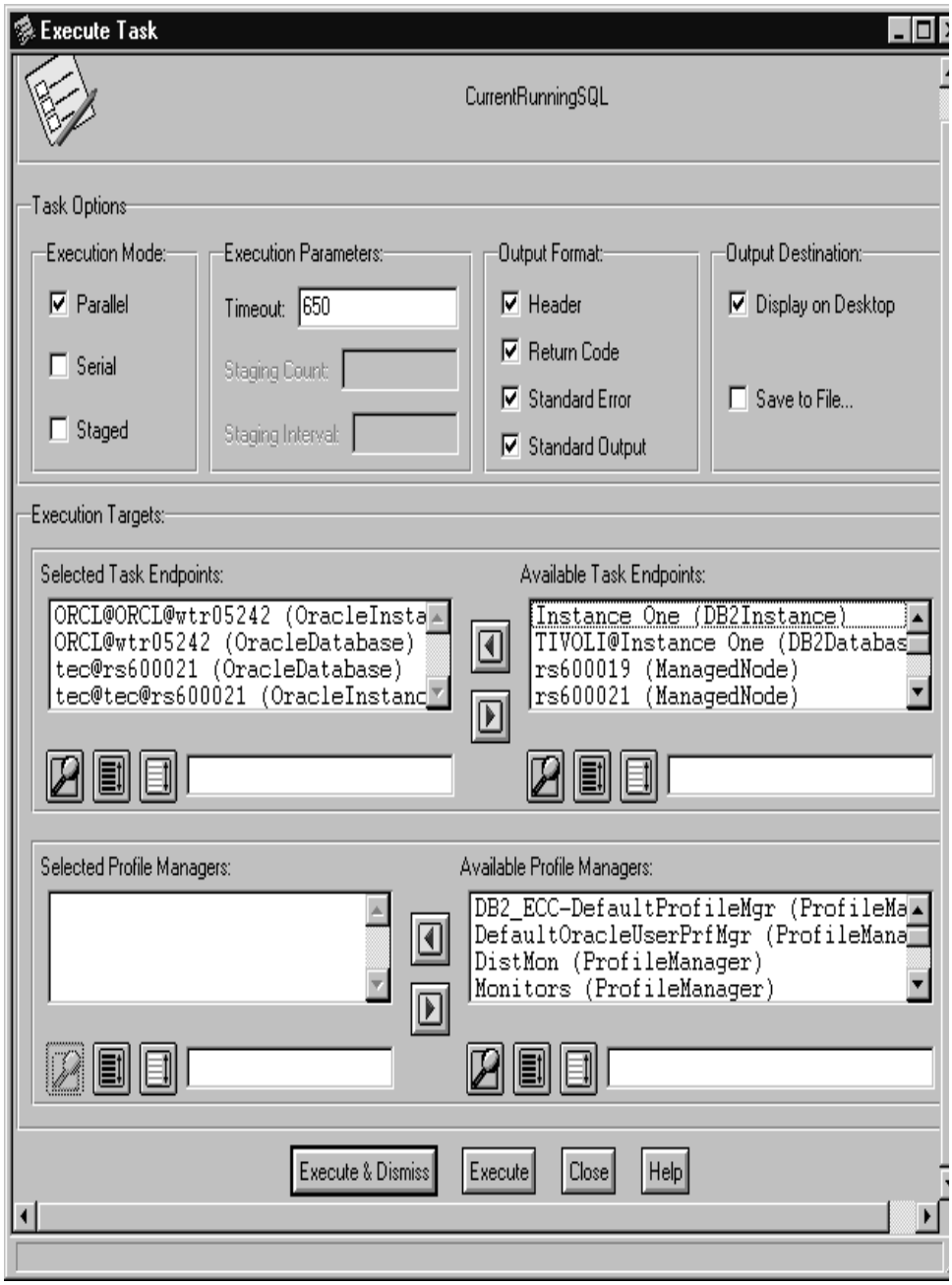


Figure 128. Execute Task Window

After choosing the **Execute & Dismiss** button, we get the CurrentRunningSQL window. In this window, we have to specify the Selection Type we want to work with. The All selection check box is used when we want to retrieve the SQL statements for all connected users and the By User check box to only show the SQL statements for a single user. If we want to work with this check box, we have to type the name of the user in the User Name box.

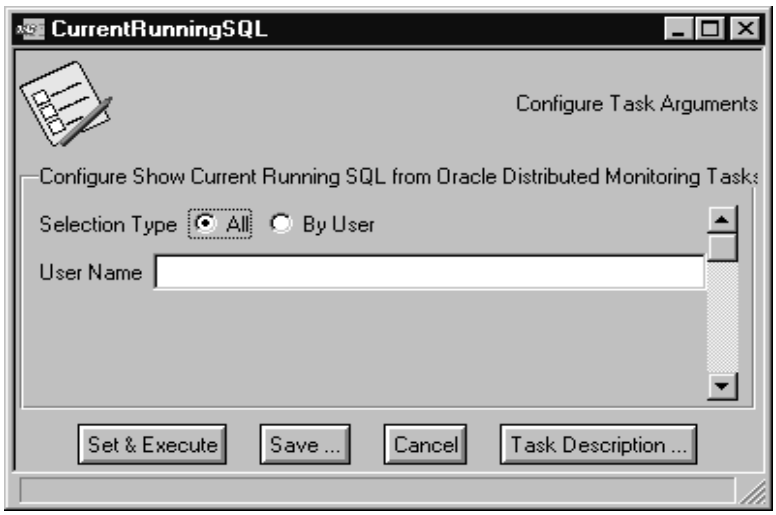


Figure 129. CurrentRunningSQL Window

By clicking the **Set & Execute** button, we start the task. This will display the following window.

Figure 130. CurrentRunningSQL Output Window

2.7.17.4 DisableMonitoring Task

This task interacts directly with the Tivoli Distributed Monitoring engine. This task is used when we want to disable a certain number of monitors that are running on Oracle databases or when we need to shut down the Oracle database. This task prevents us from the necessity of disabling all the monitors one by one. This task updates the Tivoli Distributed Monitoring engine without updating the monitoring profiles. To run this task, we need to have the oracle_dba role and we can run it from the GUI or the CLI.

Double-click on the **DisableMonitoring** icon. This will display the Execute Task window.

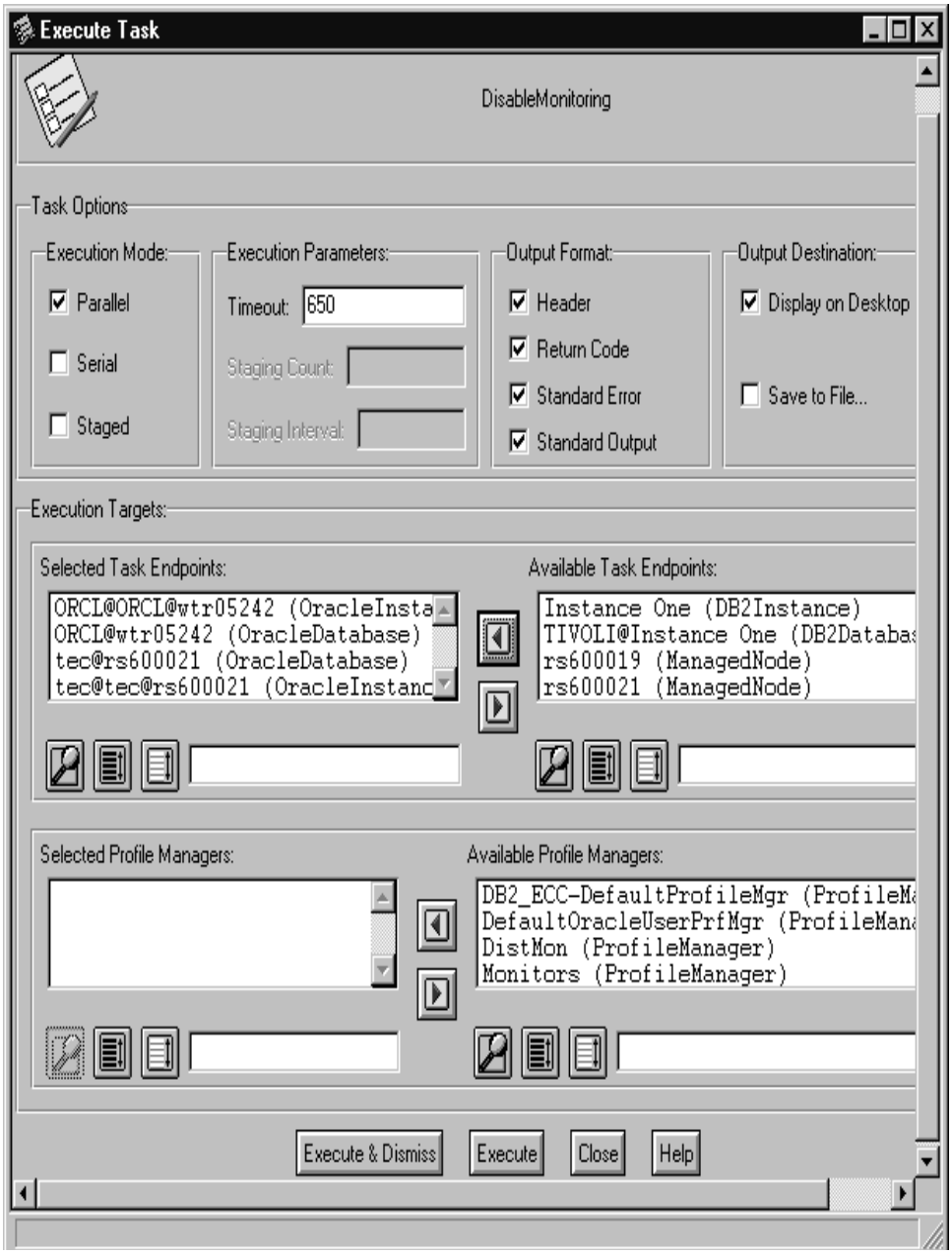


Figure 131. Execute Task Window

Select all the needed parameters and endpoints and click the **Execute & Dismiss** button. This will display the following window.

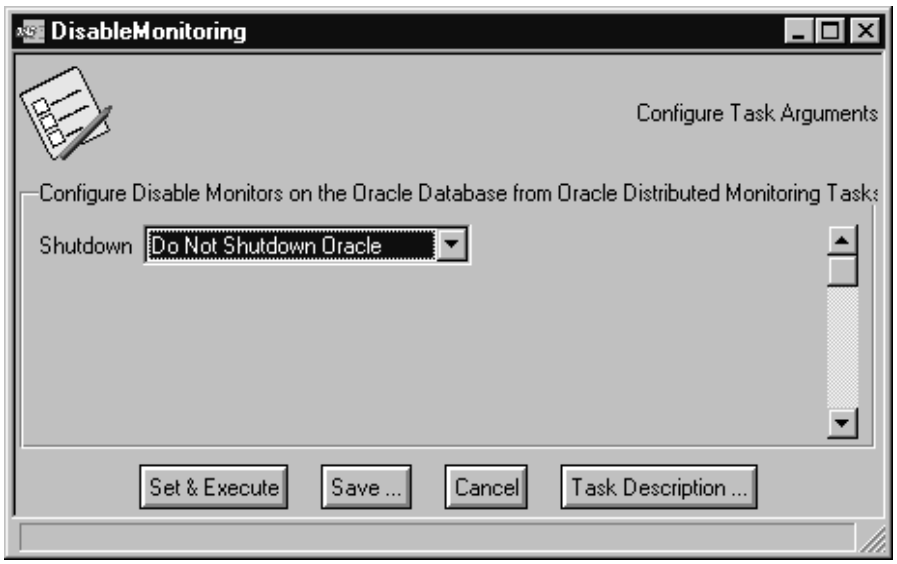


Figure 132. DisableMonitoring Window

Click on the **Shutdown** list box. This will display a list of options. In our example we select the **Do Not Shutdown Oracle** option. This action will only disable all the monitors running on the selected endpoints. Click the **Set & Execute** button to run the task. This will display a task output, as shown in the following figure.

Figure 133. DisableMonitoring Output Window

2.7.17.5 EnableMonitoring Task

This task enables all monitors that were previously disabled by the DisableMonitoring task. This task also can optionally start up the Oracle database if it was also dropped when running the DisableMonitoring task.

To run the task, double-click the **EnableMonitoring** icon. This will display the Execute Task window.

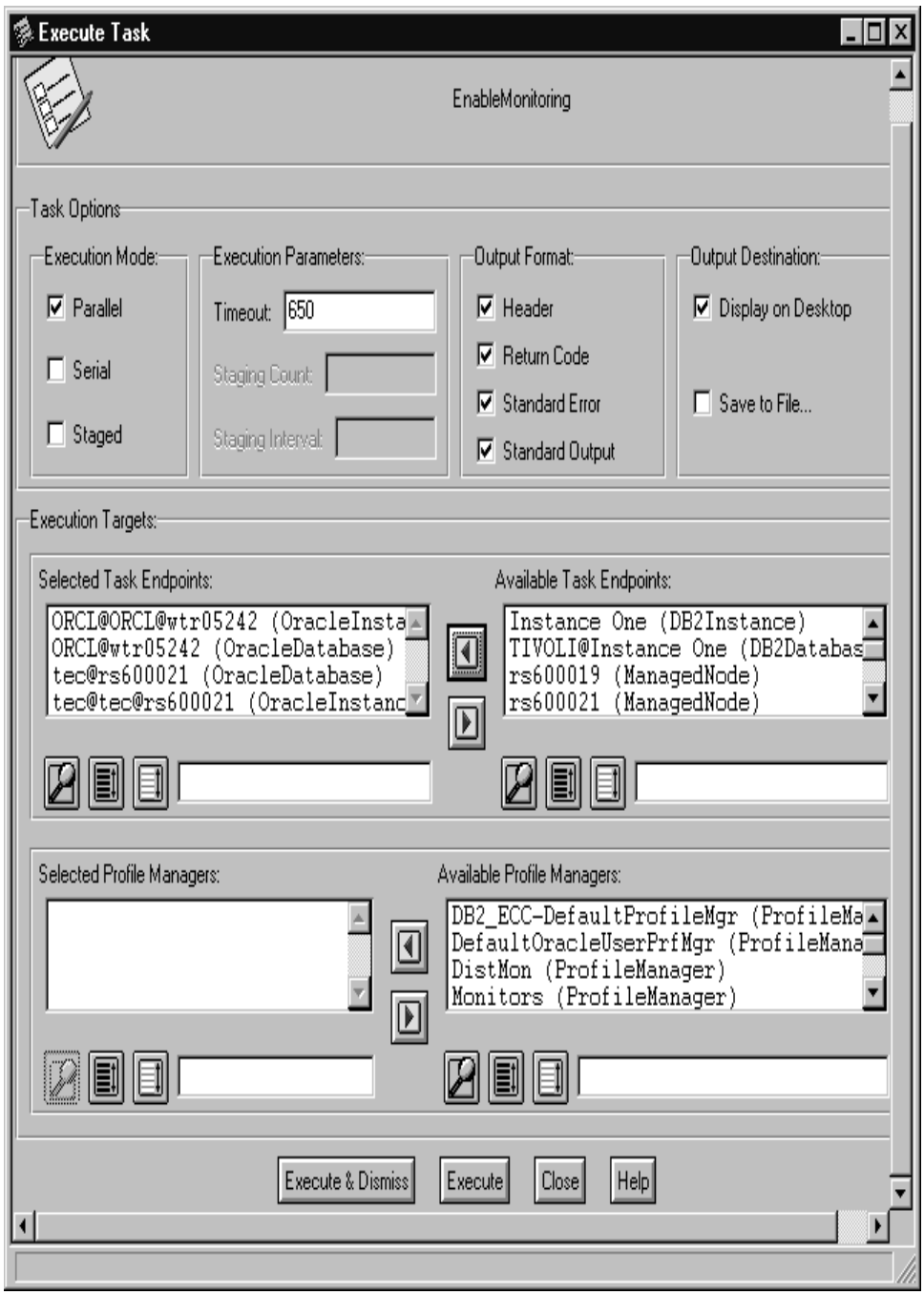


Figure 134. Execute Task Window

Select all the needed parameters and endpoints and select the **Execute & Dismiss** button. This will display the following window.

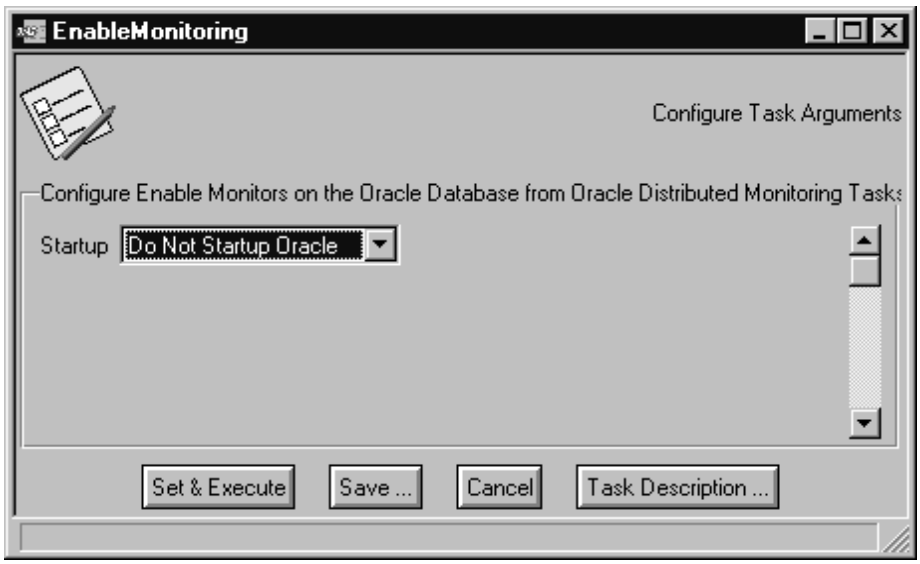


Figure 135. EnableMonitoring Window

Select on the Startup box the option you want and click the **Set & Execute** button. This will initialize the task and will display the output of it.

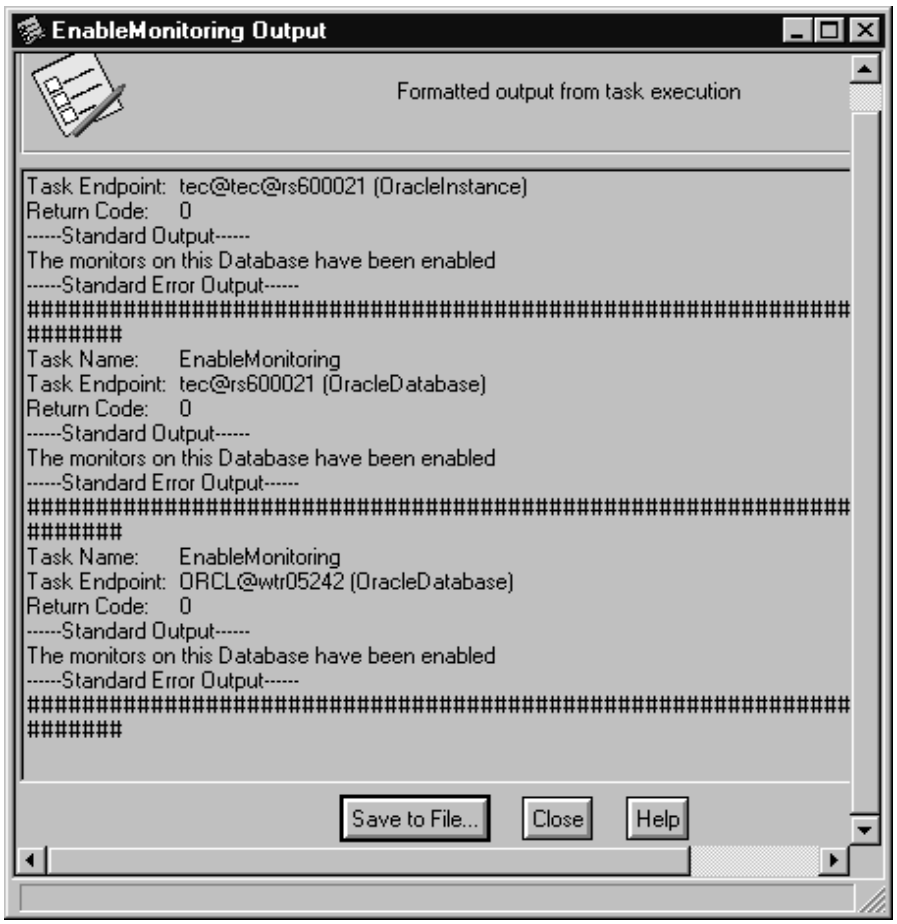


Figure 136. EnableMonitoring Output Window

2.7.18 Working With TEC

Since the TME 10 Module For Oracle - Distributed Monitoring uses the Tivoli Distributed Monitoring engine, we have the same facility to forward all database and instance events generated from every endpoint to the Tivoli Enterprise Console.

To make TEC able to receive and recognize the events forwarded from TME 10 Module For Oracle - Distributed Monitoring, we have to set up a new rule base that contains the newly added event class definitions. There are different event classes that are contained and described in the following files:

- ESMSentry.baroc

- M7OracleDatabase.baroc
- M7OracleInstance.baroc

2.7.18.1 Creating the New Rule Base

Since we should not modify the Default rule base the event server works with, we have to create a new one. This procedure can be performed either from the GUI or the CLI.

To create the new rule base from the GUI we have to use the following steps.

From the Tivoli desktop, we double-click on the **EventServer** icon. This will display the Event Server Rule Bases window that contains all the available rule bases.

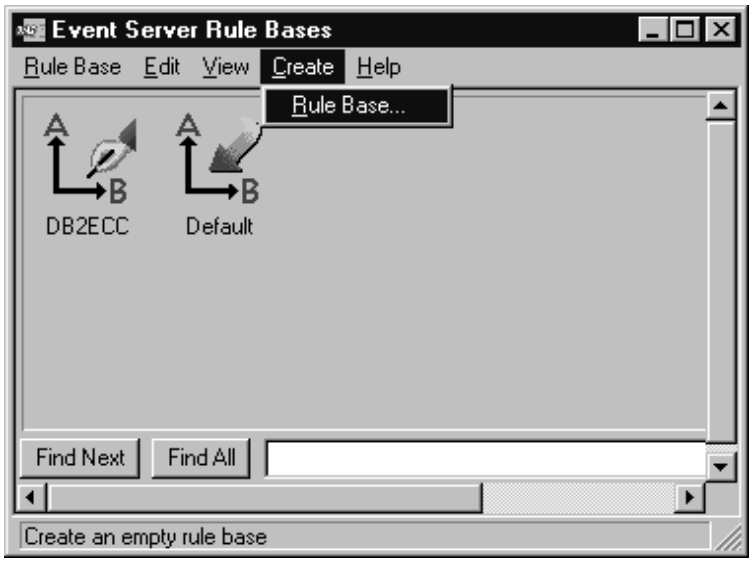


Figure 137. Event Server Rule Bases Window

Select the **Rule Base...** option from the **Create** menu in the Event Server Rule Bases window. This will display the following window.

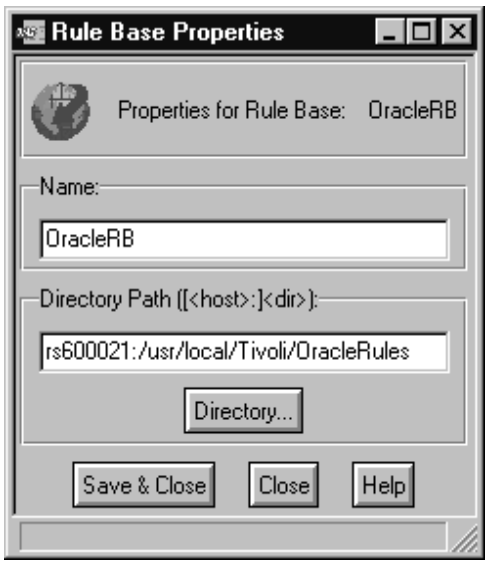


Figure 138. Rule Base Properties Window

Enter the name of the new rule base in the Name field and the path where it will be stored in the Directory Path field. Then select **Save & Close**.

Now that we have the new rule base, we have to copy all the rules and classes the Default rule base has. To do this, right-click on the **Default** icon and select the **Copy...** option from the menu, as shown in the next figure.

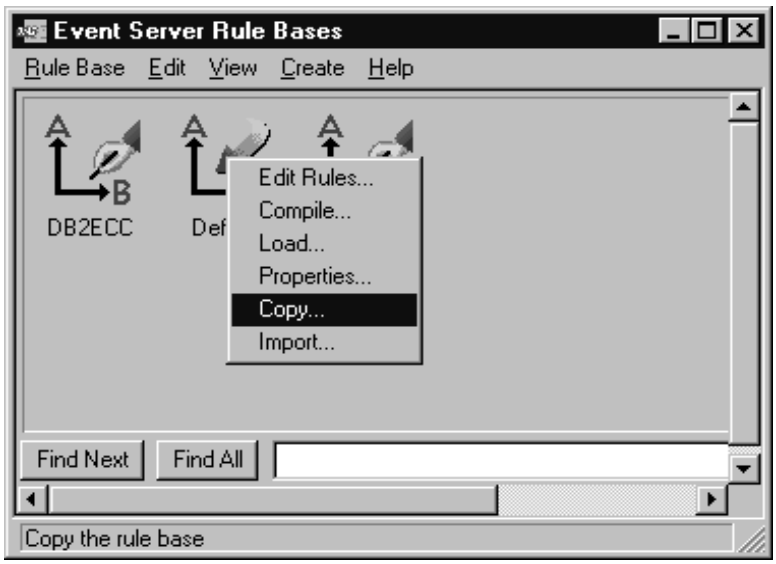


Figure 139. Event Server Rule Bases Window

Selecting the **Copy...** option will display the following window.

Figure 140. Copy Rule Base Window

We have to select the rule base where we want to copy the rules and classes of the Default rule base. We do this by clicking on the rule base we previously created. We also have to specify that we want to copy the rules or the classes or both. Select the **Copy & Close** button to start copying.

We also need to import the event classes for TME 10 Distributed Monitoring into the rule base. Right-click on the new rule base icon and select the **Import...** option from the menu. This will display the following window.

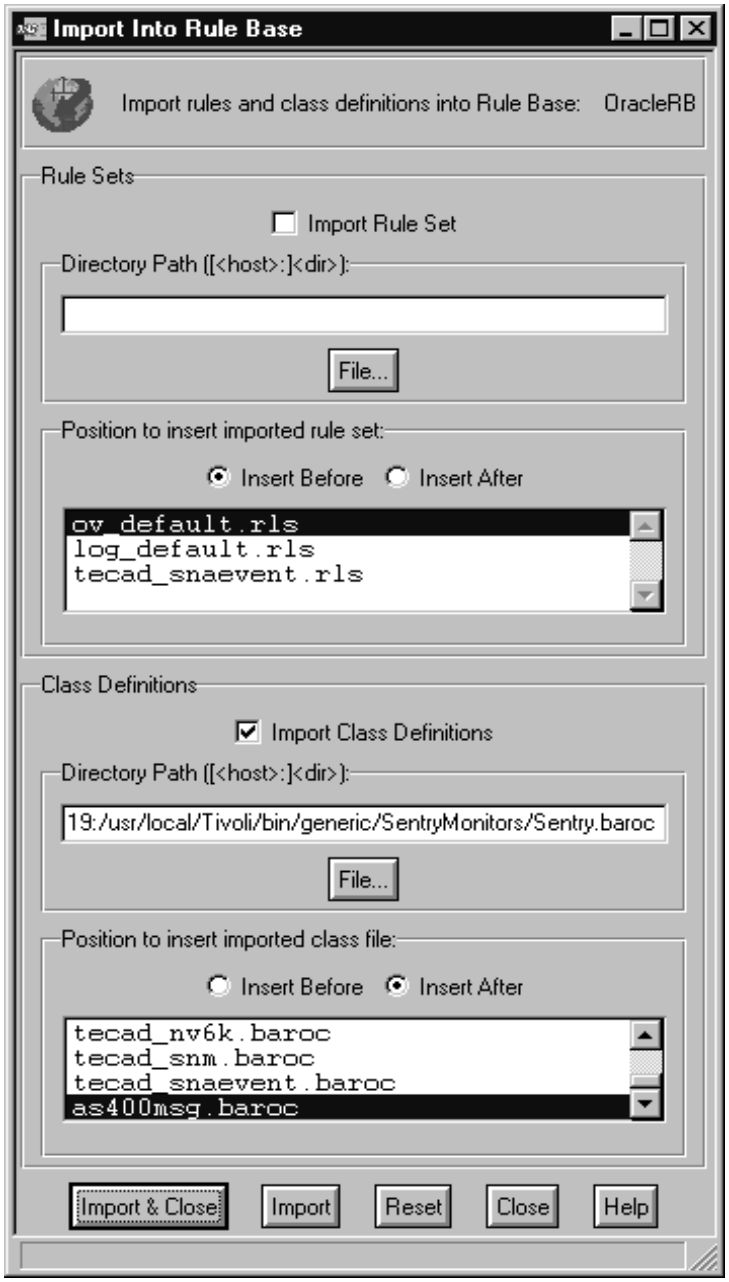


Figure 141. Import Into Rule Base Window

Since the Tivoli Manager for Oracle - Distributed Monitoring is an extension of Tivoli Distributed Monitoring, it interacts with the Sentry engine to forward the events to TEC. Since the Sentry.baroc file contains the class definitions for the events forwarded by the Tivoli Distributed Monitoring, we need to import this file before we import the files that contain the class definitions for the Tivoli Manager for Oracle.

The Sentry.baroc file is located in the /usr/local/Tivoli/bin/generic/SentryMonitors directory (assuming that the Tivoli Distributed Monitoring is installed on an AIX system).

There is another problem we have to solve to make TEC able to recognize the incoming events. Since the Tivoli Manager for Oracle monitors class inherits from Sentry2_0_Base, when using TME 10 Distributed Monitoring 3.5 or later it must inherit from Sentry3_5_Base, as this class has some new slots that are used by the Sentry engine. If you try the unmodified *.baroc files with TME 10 Distributed Monitoring 3.5, you will see an error in your TEC reception log saying that the slot "probe" is undefined in the event class. You can correct the problem yourself by changing Sentry2_0_Base to Sentry3_5_Base in the ESMSentry.baroc file.

The imported files are stored in the rule base as shown in the following figure.

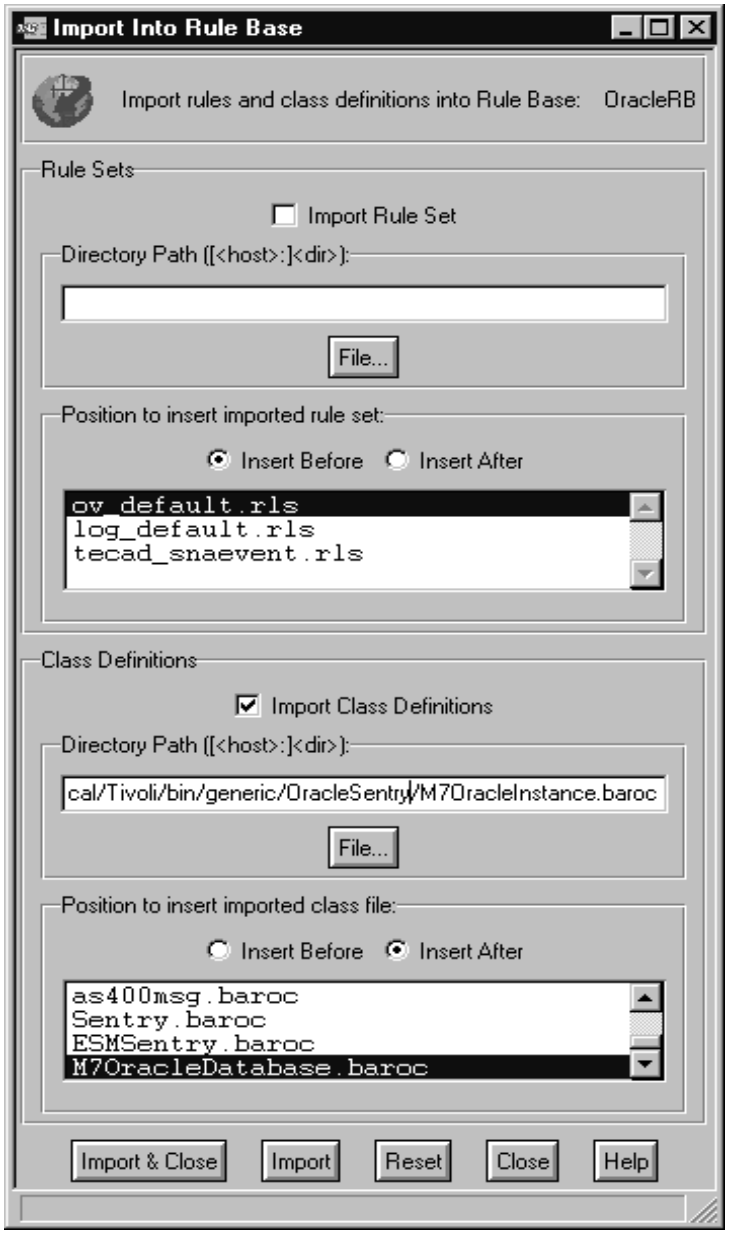


Figure 142. Import Into Rule Base Window

To be able to load the rule base, we first need to compile it. To do this, right-click on the new rule base icon and select the **Compile...** option. This will display the following window.

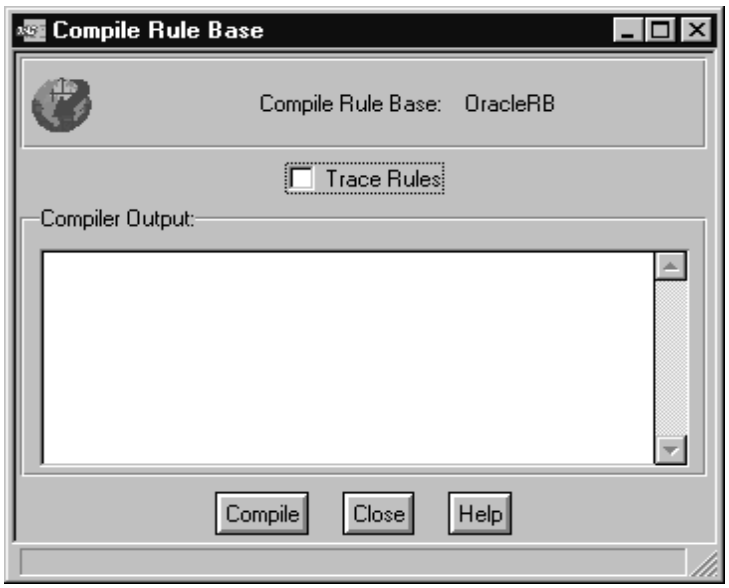


Figure 143. Compile Rule Base Window

We only need to take care of the Trace Rules box when we are working with rules. In our case, we only need to select the **Compile** button to start compiling the new rule base.

If the rule base can be compiled, we will have output like that in the following window.

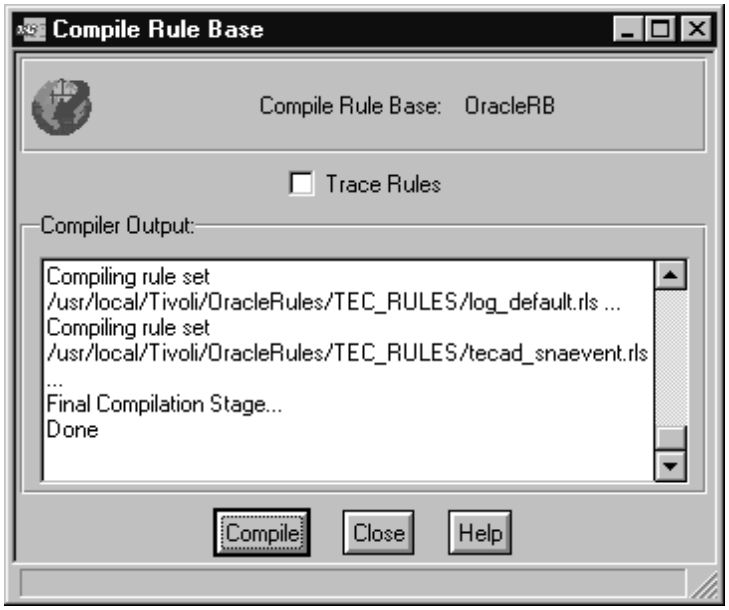


Figure 144. Compile Rule Base Window

Once we have compiled the new rule base, we only need to load it. We do this by right-clicking on the new rule base icon and selecting the **Load, but activate only when server restarts** option as shown in the following window.

Figure 145. Load Rule Base Window

To be able to load the new rule base, we need to restart the event server. We do this by right-clicking on the **EventServer** icon and selecting the **Shut Down** option from the pull-down menu.

We can start the event server in the same way we stopped it: right-click on the **EventServer** icon and select the **Start-up** option. This will automatically load the new rule base.

In the next figure we show the new rule base already loaded.

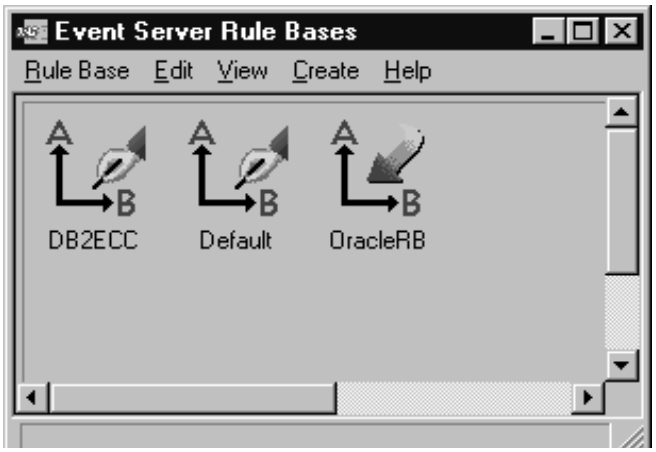


Figure 146. Event Server Rule Bases Window

To be able to send an Oracle database monitor event to TEC, we need to edit the monitor. To do this, we have to double-click on it or mark it and choose the **Edit Monitor...** button. This will display the Edit Monitor window.

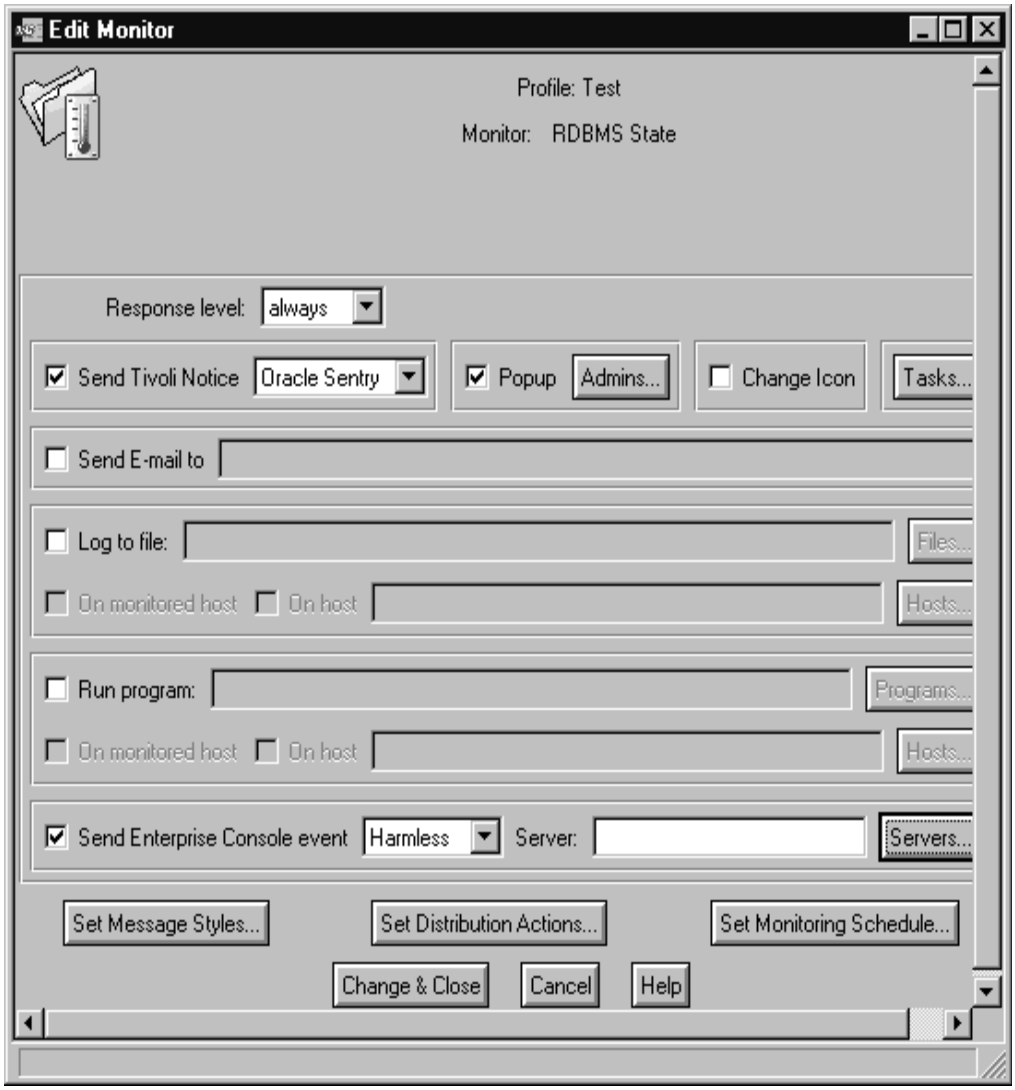


Figure 147. Edit Monitor Window

We need to check the box **Send Enterprise Console event** and select the severity of the event. Click on the **Servers...** button to select the event server. This will display the following window.

Figure 148. Enterprise Console Window

Select **EventServer** and click the **Set & Close** button to set the event server.

This will return us to the Edit Monitor window. Click the **Change & Close** button to set the changes on the monitor. Being in the TME 10 Distributed Monitoring Profile Properties window, we need to save and distribute the just edited monitor.

We also have to add a new event filter on any of the event groups we have. We decide to create a new event group for this filter. To do so, we right-click the **EventServer** icon and select the **Event Groups...** option from the pull-down menu. This will display the Event Group Management window.

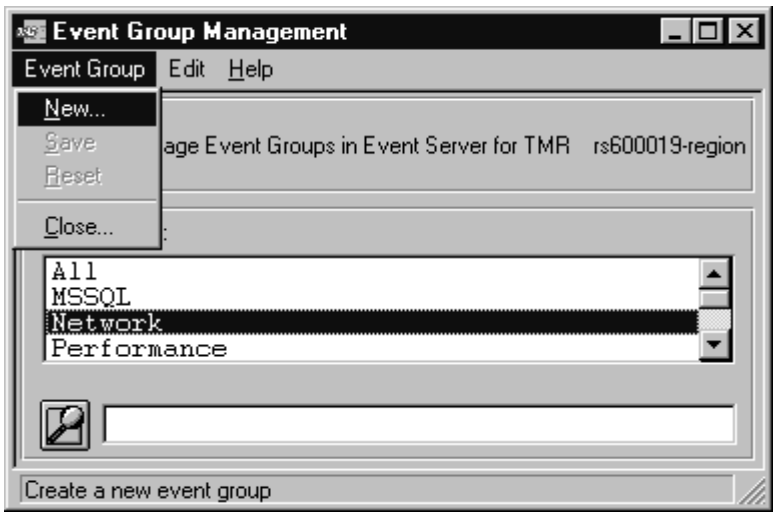


Figure 149. Event Group Management Window

Select the **New...** option from the **Event Group** menu to add a new event group. This will display the New Event Group window.

Figure 150. New Event Group Window

Set the name of the new event group and select the icon from the available bitmaps. Click the **Create** button. This will display the Edit Event Group Filters window.

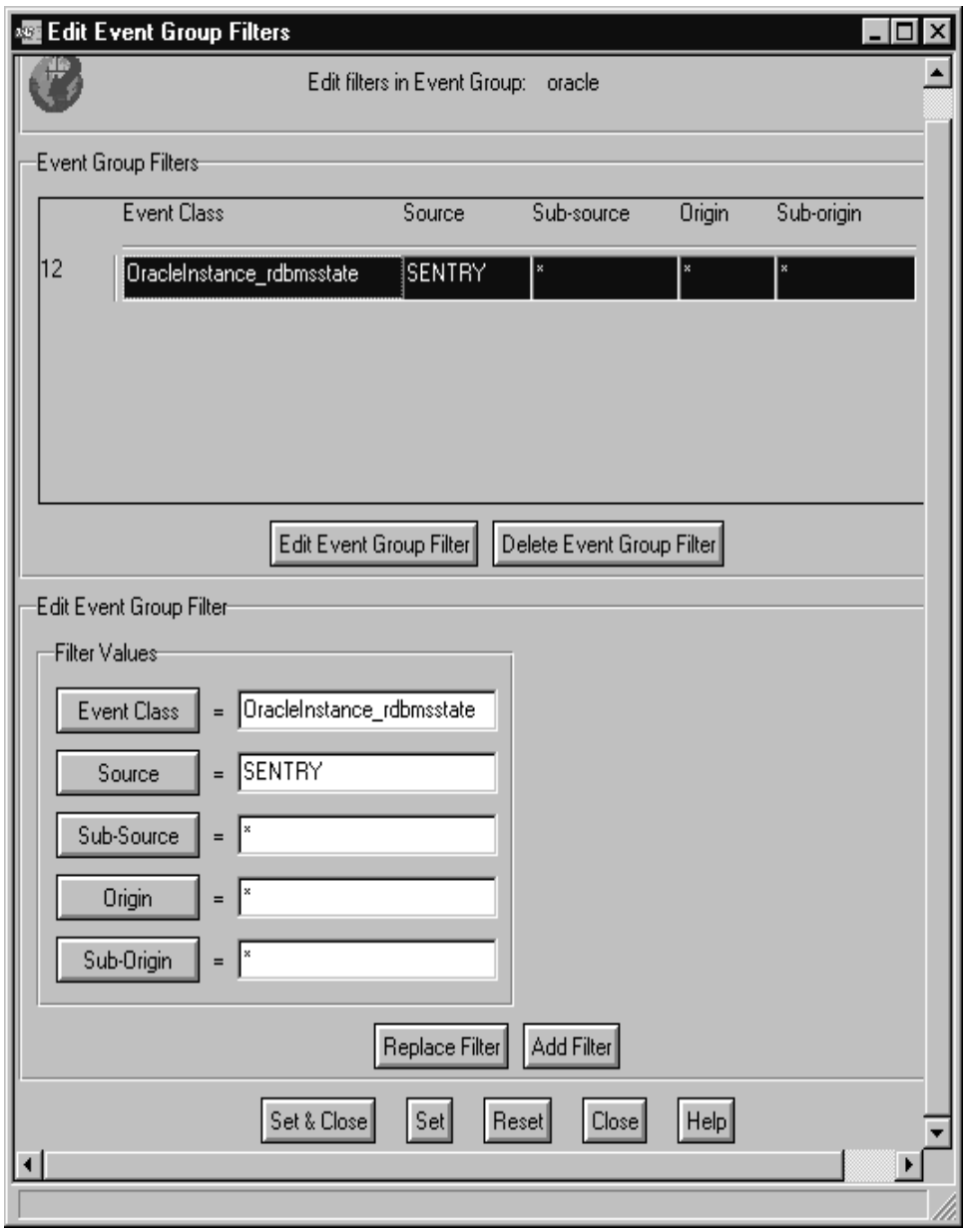


Figure 151. Edit Event Group Filters Window

In this window, we have to select the filter for the event or events the Event Group receives. We do this by setting the filter values.

By selecting the **Event Class** button, we get a menu window that contains all the available event classes. For our example, we select the **OracleInstance_rdbmsstate** event class. Select the event class with a single click and select the **Set Class Value** button.

If we wanted to receive all the Oracle monitors in a single event group, we would have to set the ESMSentry event class on the Event Class field. This is because the ESMSentry event class is a superclass of the Oracle monitors.

The Source button displays all the available sources. Since we are working with Tivoli Distributed Monitoring, we have to set this to the SENTRY source. The rest of the filter values were left empty, which means they will work with default values. Click the **Set & Close** button to set the filter.

Select the **Save** option from the **Event Group** menu on the Event Group Management window.

We now need to assign the new event group. To do this, right-click on the **EventConsole** icon on the TME 10 Desktop. For our example, this is the Root_rs600019-region icon. Select the **Assign Event Groups** option from the menu. This will display the Assign Event Groups window.

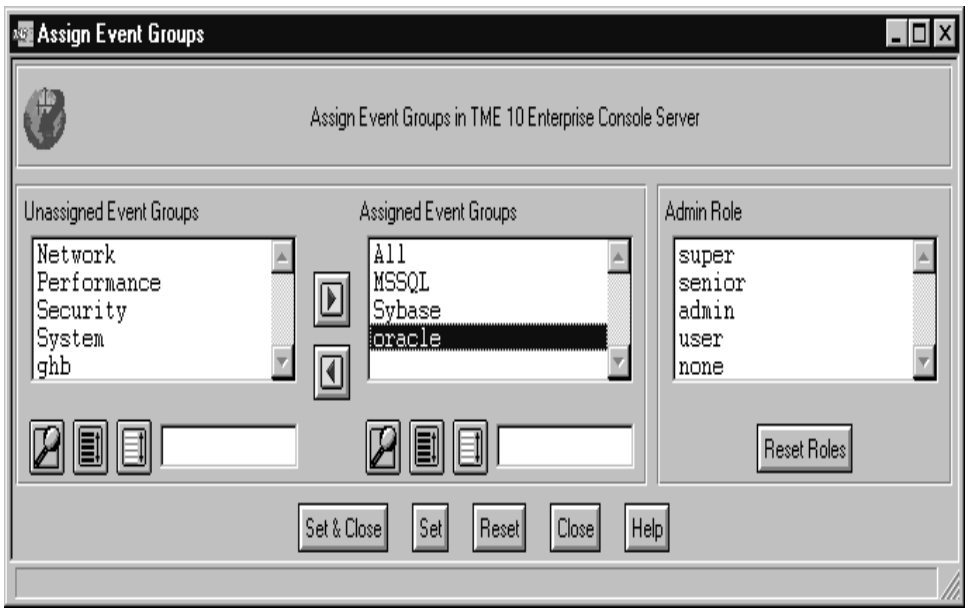


Figure 152. Assign Event Groups Window

Select the new event group from the Unassigned Event Groups with a single click and then select the right arrow. Once the new event group is in the Assigned Event Groups, select the **Set & Close** button.

To view the incoming events on TEC, we have to double-click the **EventConsole** icon on the TME 10 Desktop. This will display two different windows: one that contains the event groups and one that contains the event sources.

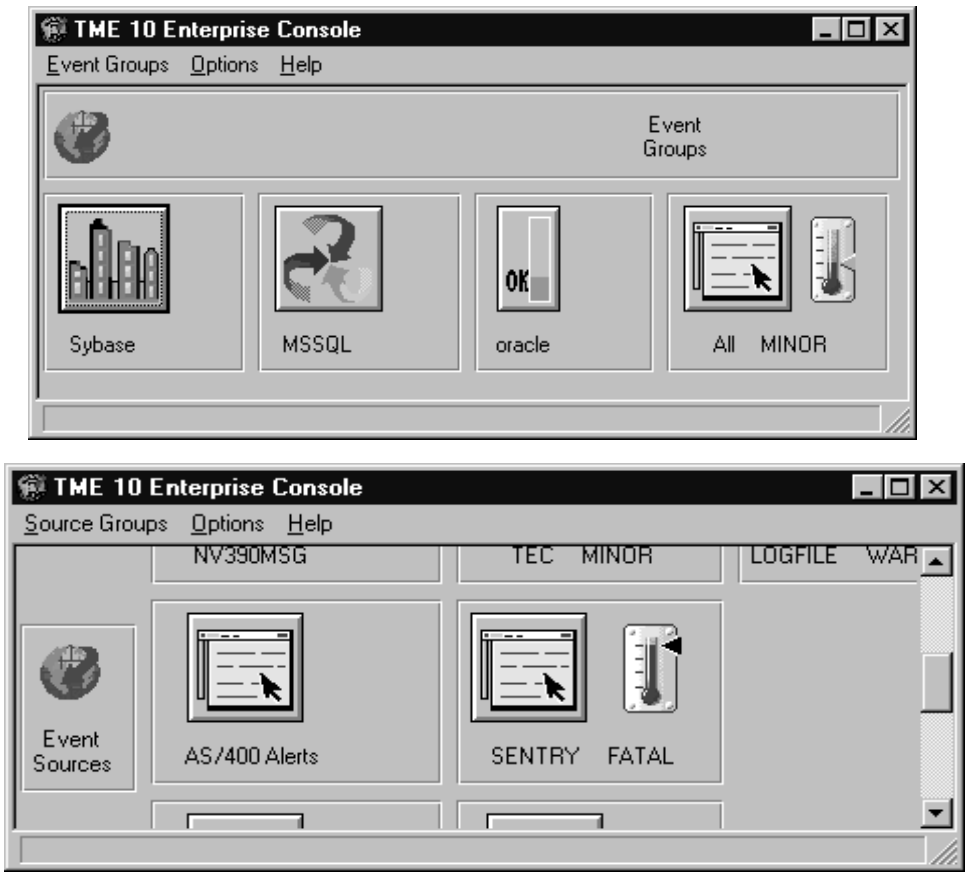


Figure 153. TME 10 Enterprise Console Windows

To check the received events, double-click the event group you have selected to contain the event filter for the Tivoli Manager for Oracle monitors. For our example, it is the oracle icon. This will display the following window.

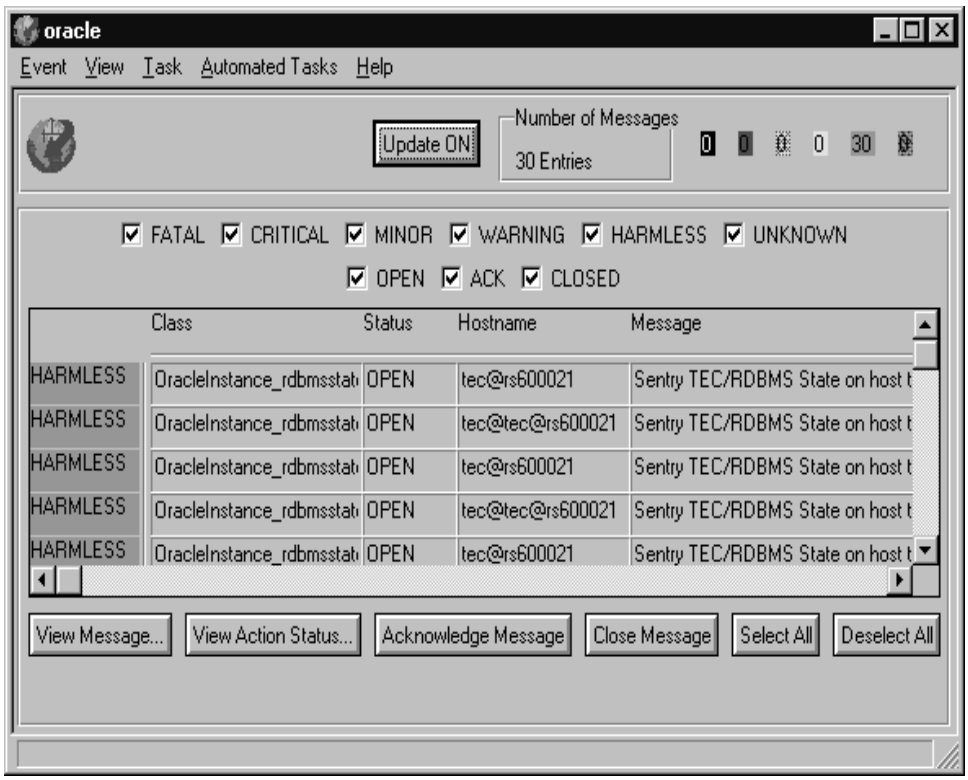


Figure 154. oracle Window

To view the message of the event, we select the event with a single click and select then the **View Message...** button or we can double-click on it. This will display the following window.

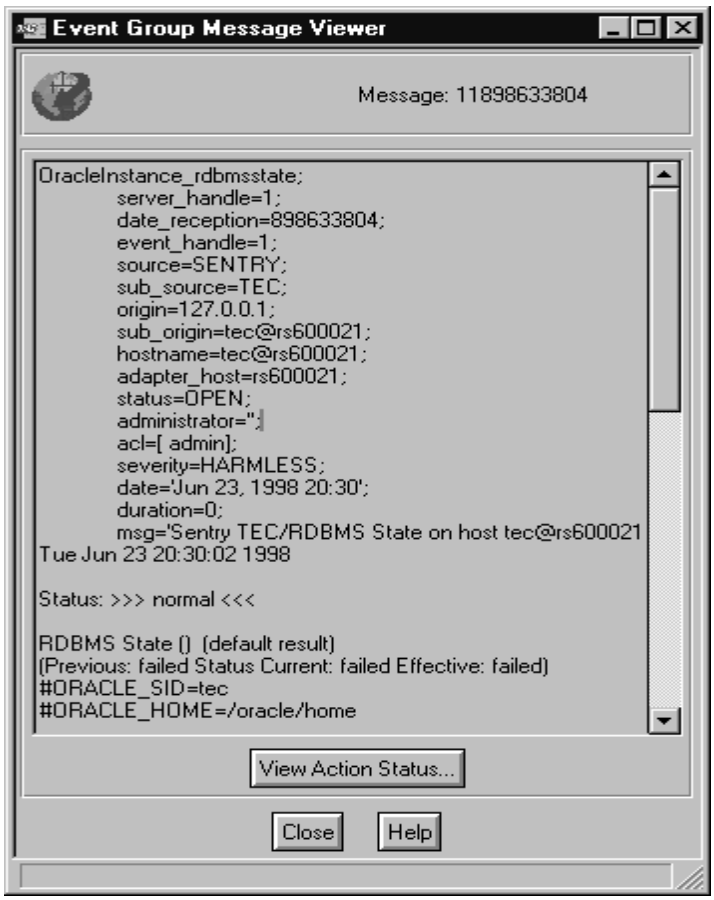


Figure 155. Event Group Message Viewer Window

This window shows the origin and the source of the event and the results of the monitoring action.

2.8 Enhancements in Version 1.1 of Tivoli Manager for Oracle

The main enhancement in Version 1.1 of Tivoli Manager for Oracle support for Oracle Version 8.

Tivoli Manager for Oracle Version 1.1 will be available by the time you read this book.

Chapter 3. Tivoli Manager for Sybase

In this chapter we install Sybase for AIX and Sybase for Windows NT on some of the managed nodes in our environment and then show how to manage these RDBMS servers using Tivoli Manager for Sybase.

3.1 Overview and Objective

We want to extend our environment with a Sybase installation that we can then manage using Tivoli Manager for Sybase. For that purpose, we install a number of Sybase servers in our TMR.

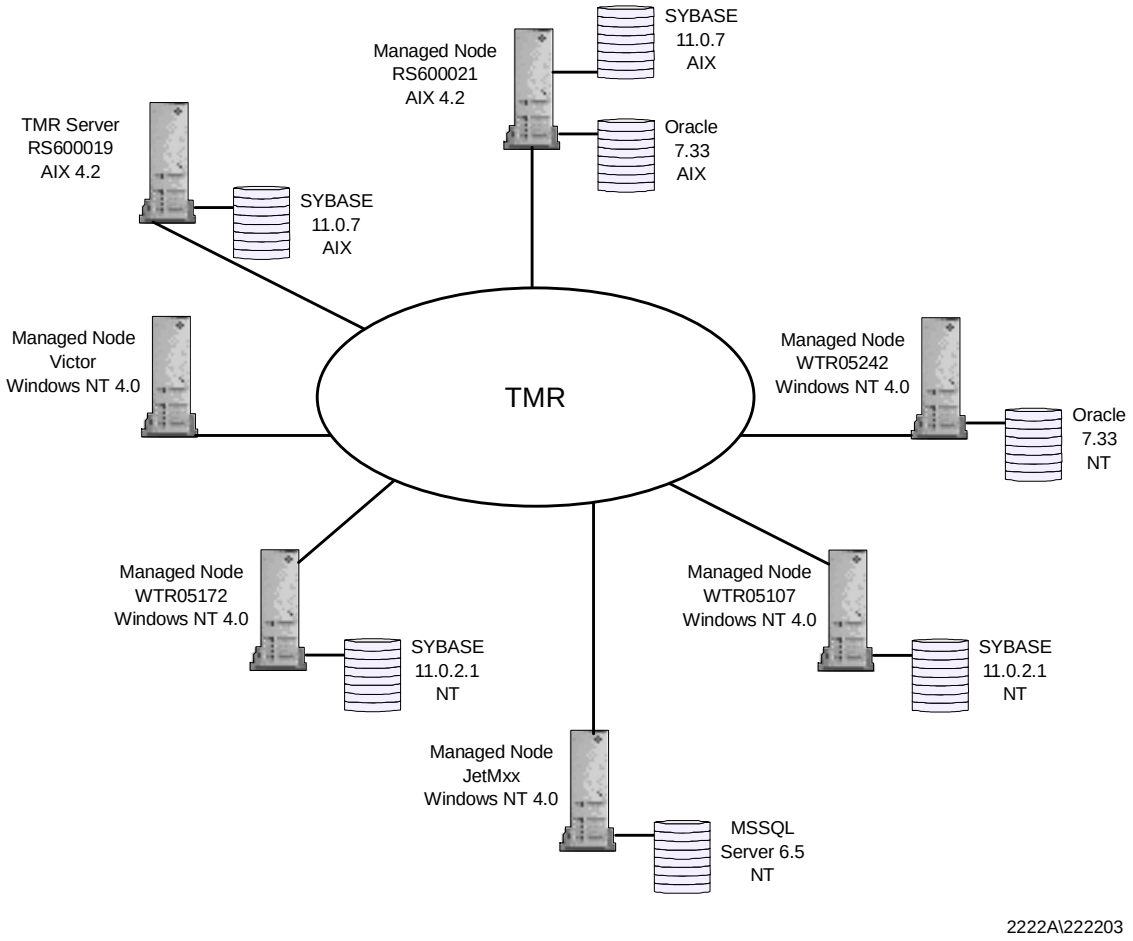


Figure 156. TMR Environment for Sybase Scenario

We perform the following tasks:

- Installing and configuring Sybase for AIX
- Installing and configuring Sybase for Windows NT
- Installing Tivoli Manager for Sybase
- Assigning TMR roles
- Registering Sybase databases
- Managing Sybase databases
- Monitoring Sybase using Tivoli Distributed Monitoring
- Event forwarding to Tivoli Enterprise Console

We install Sybase for AIX on rs600019 (our TMR server) and rs600021 (our TEC server). As shown in Chapter 2, “Tivoli Manager for Oracle” on page 17 where we set up the TEC server to run with Oracle, we need to adjust the RIM object to switch to using the Sybase RDBMS on rs600019 or rs600021.

We decide to switch to rs600021. First of all, we delete the existing RIM object, by typing:

```
wdel @RIM:tec
```

Then we create a new RIM object for TEC, reflecting the new RDBMS setup:

```
wcrtrim -v Sybase -h rs600021 -d database -u tec -H /usr/local/sybase -s
SYBASE tec
```

Note

The above command will ask you for the RDBMS password. Enter `tectec`, as this is the default password for the tec user of the new tec database. The above command assumes that Sybase is installed in /usr/local/sybase and that the server ID is SYBASE (the defaults).

You will also need to create the TEC tables in the new RDBMS, using the $BINDIR/TME/TEC/sql/cr_tec_db.sh script that is supplied with TEC. After adding the tables you can start the event server using the new RDBMS by typing `wstartesvr`.

We also install a Sybase database on two Windows NT machines: wtr05107 and another new managed node, wtr05172. On both machines we install the Tivoli Manager for Sybase.

3.2 Prerequisites

The Tivoli Manager for Sybase Version 1.0 consists of the following components:

- Tivoli Manager for Sybase - Framework
- Tivoli Manager for Sybase - Distributed Monitoring

The Tivoli Manager for Sybase Version 1.0 is compatible with the TME 10 Framework Version 3.1 or higher and all versions of the Tivoli Enterprise Console. The Tivoli Manager for Sybase -Distributed Monitoring requires Tivoli Distributed Monitoring Version 3.0.2.

We suggest that the release notes be reviewed for these products prior to installation.

Tivoli Manager for Sybase manages Sybase Versions 10 and 11.

3.3 Extending Our TMR Setup

For this scenario, we first add another Windows NT machine, wtr05172, as a new element to our TMR environment. To do this, we create a new managed node in our rs600019 policy region.

3.4 Setting Up Sybase

In this section we describe the steps that are necessary in our environment to install the Sybase RDBMS on AIX and Windows NT.

3.4.1 Installing Sybase on AIX

In our environment we install Sybase for AIX on rs600019 and rs600021. We only document the setup steps performed on rs600019 since the setup of rs600021 is very similar.

The installation of Sybase for AIX is very straightforward. A number of prerequisite steps, however, need to be taken before installing Sybase.

The first thing we have to do is to enable asynchronous input/output in the AIX operating system.

To do so we start SMIT be typing:

```
smitty devices
```

In the panel that appears we select **Asynchronous I/O** and in the next panel we select **Change / Show Characteristics of Asynchronous I/O**. This will get us to the panel shown in the following figure.

```
aixterm
                Change / Show Characteristics of Asynchronous I/O

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                      [Entry Fields]
  MINIMUM number of servers                          [1]                  #
  MAXIMUM number of servers                          [10]                 #
  Maximum number of REQUESTS                         [4096]               #
  Server PRIORITY                                    [39]                 #
  STATE to be configured at system restart            available           +

F1=Help             F2=Refresh          F3=Cancel           F4=List
F5=Reset            F6=Command          F7=Edit             F8=Image
F9=Shell            F10=Exit            Enter=Do
```

Figure 157. SMIT - Change / Show Characteristics of Asynchronous I/O Panel

If the STATE to be configured at system restart already shows available, then there is nothing you need to do, because asynchronous I/O is already enabled. If not, perform the following steps:

- Change the STATE to available using the Tab key and press Enter.
- Press F3 two times to get back to the Asynchronous I/O panel.
- Select **Configure Defined Asynchronous I/O**.

These steps will enable asynchronous I/O immediately as well as at the next system reboot. You will not need to reboot the system in order for the change to take effect.

It is advised to create a new file system into which Sybase can be installed.

To do so, we type:

```
smitty crjfs
```

We select **Add a Standard Journaled File System** from the panel that appears and press Enter in the next panel. The panel shown in the following figure appears:

```
aixterm
                    Add a Standard Journaled File System

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                      [Entry Fields]
  Volume group name                                    rootvg
* SIZE of file system (in 512-byte blocks)             [400000]                #
* MOUNT POINT                                          [/usr/local/sybase]
  Mount AUTOMATICALLY at system restart?               yes                     +
  PERMISSIONS                                          read/write              +
  Mount OPTIONS                                        []                      +
  Start Disk Accounting?                               no                      +
  Fragment Size (bytes)                                4096                    +
  Number of bytes per inode                            4096                    +
  Allocation Group Size (MBytes)                       8                       +

F1=Help             F2=Refresh          F3=Cancel           F4=List
F5=Reset            F6=Command          F7=Edit             F8=Image
F9=Shell            F10=Exit            Enter=Do
```

Figure 158. SMIT - Add a Standard Journaled File System Panel

We enter the values as shown and press Enter. This will create a new file system /usr/local/sybase of 200 MB in size that will be mounted at every system boot.

To mount the file system immediately, we type:

```
mount /usr/local/sybase
```

We are now ready to install Sybase for AIX. From the installation CD-ROM or the directory where the Sybase installation image is located, we type:

```
./sybsetup
```

This step must be performed as the UNIX root user. The following window will appear.

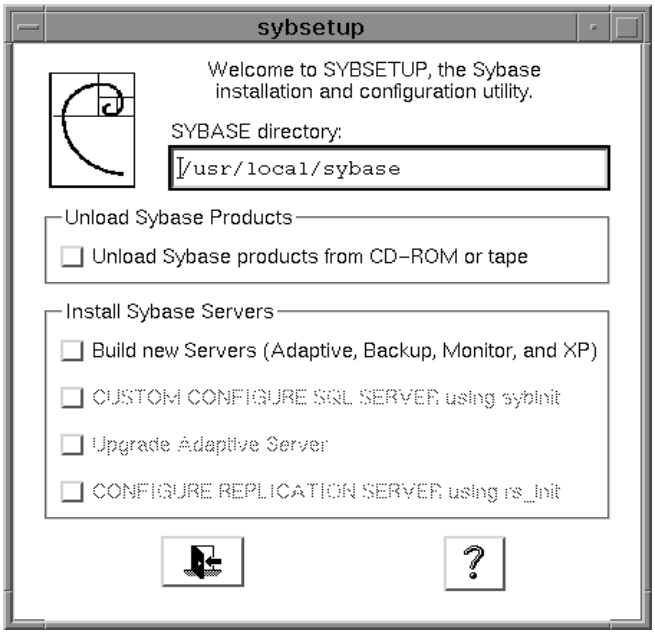


Figure 159. sybsetup Window

We click on **Unload Sybase products from CD-ROM or tape** and the following window appears.

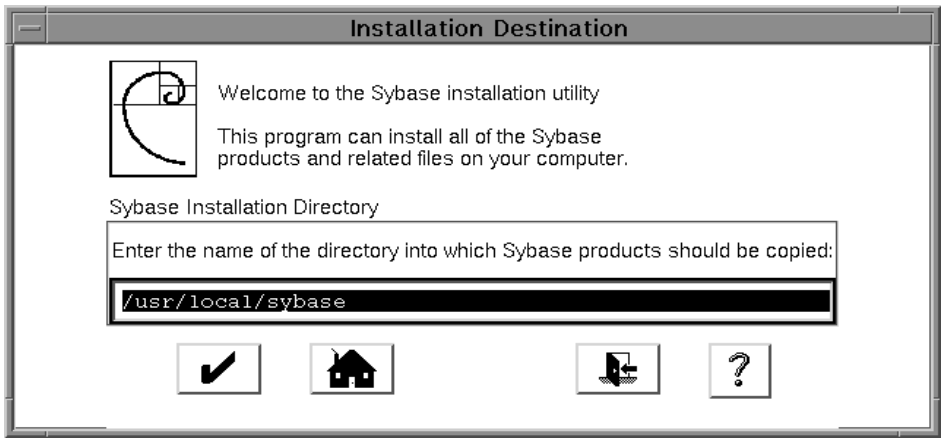


Figure 160. Installation Destination Window

We enter `/usr/local/sybase` which is the name of the file system we have created for Sybase and then click on the check mark button.

The following window appears.

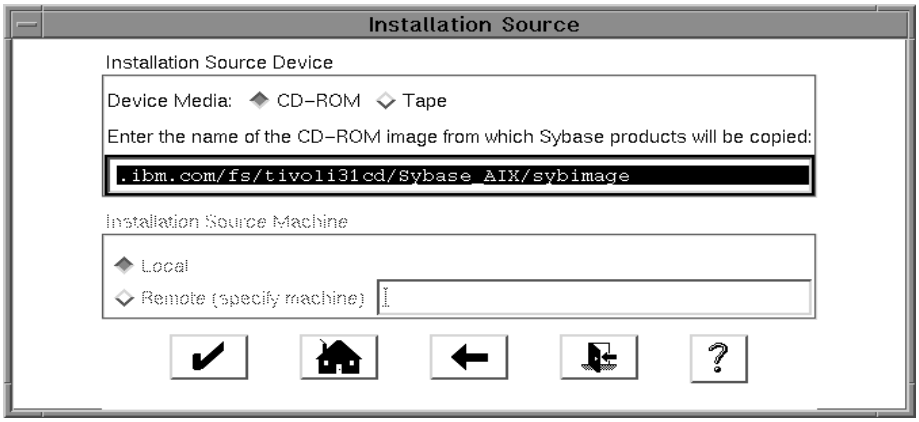


Figure 161. Installation Source Window

The installation source is set automatically to the path from which we started the installation, so we just click on the check mark button again.

The following window will appear.

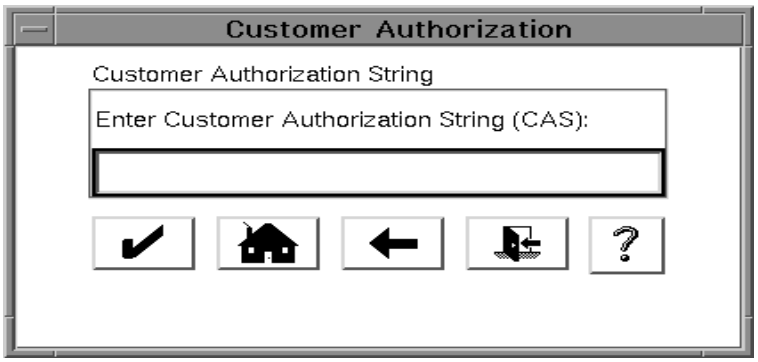


Figure 162. Customer Authorization Window

Enter your Sybase license key in this window and the click the check mark button.

The following window will appear:

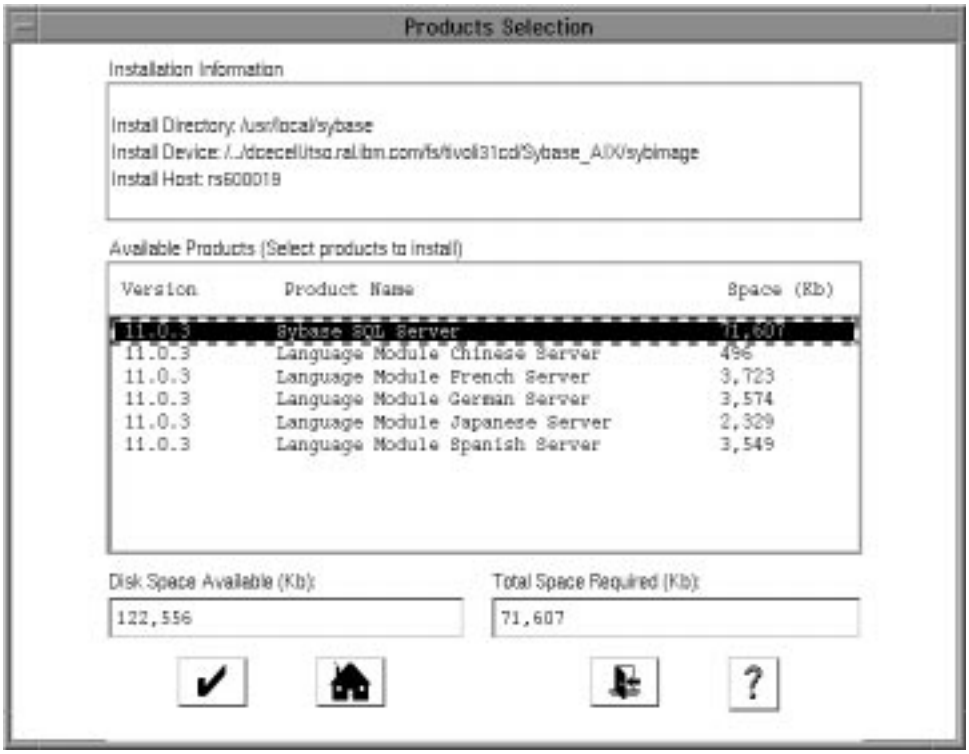


Figure 163. Products Selection WIndow

We select **Sybase SQL Server** and then click the check mark button. This will start the installation.

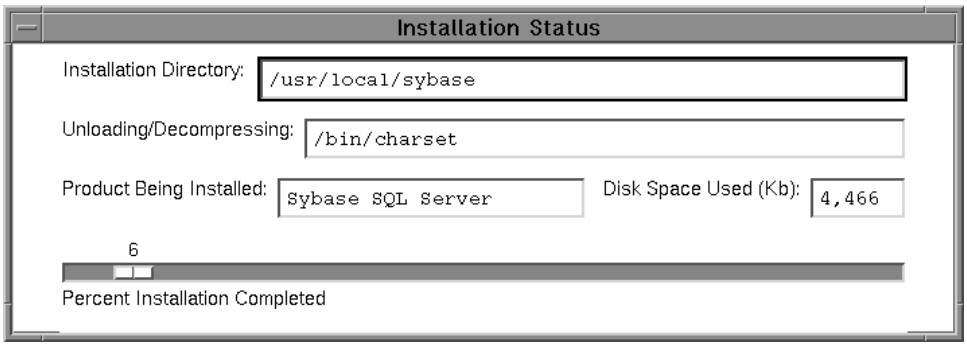


Figure 164. Installation Status Window

The Installation Status window will display the progress of the installation. Once the installation is completed, you can go back to the main installation window as shown in Figure 159 on page 174.

This time we select **Build new Servers**, which will get us to the window displayed in the following figure.

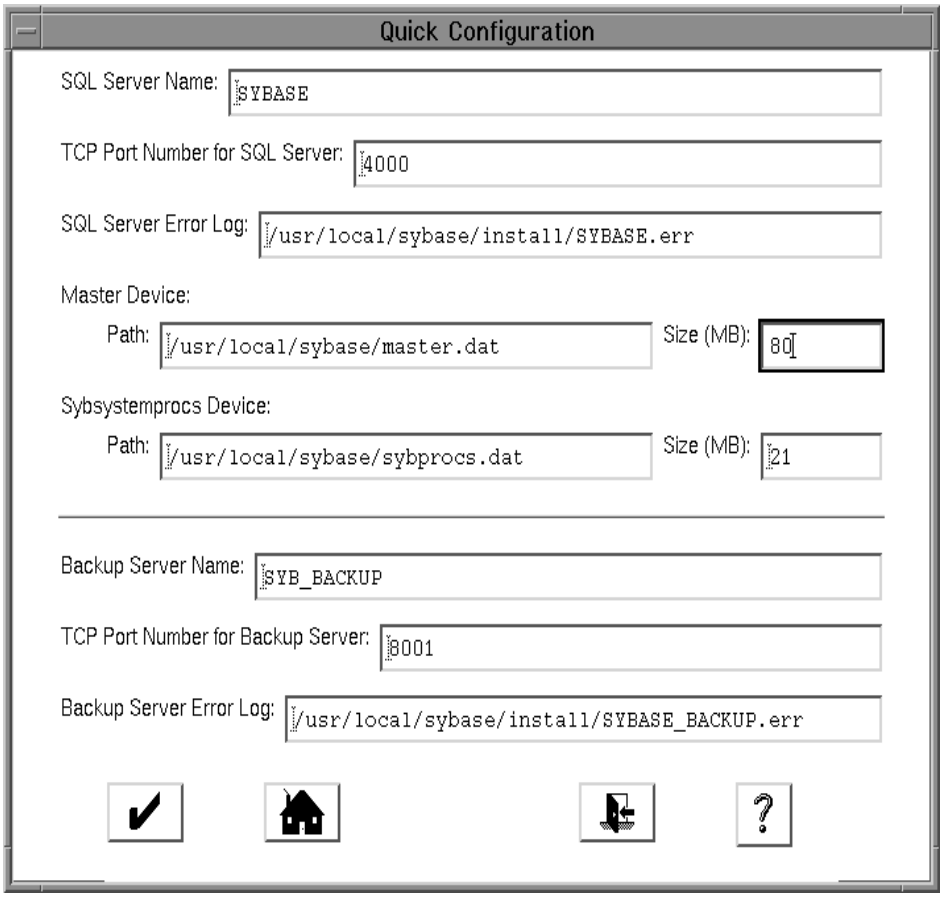


Figure 165. Quick Configuration WIndow

We change the size of the master device to 80 MB and then click the checkmark button. This will start the preparation of the database objects.

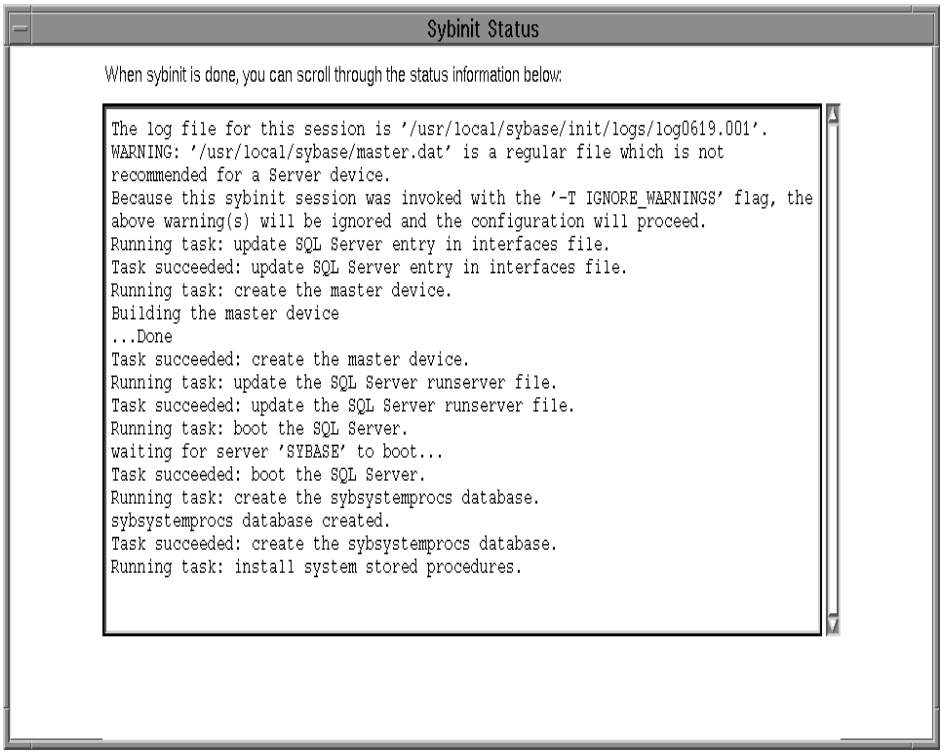


Figure 166. Sybinit Status Window

The messages in the window shown in the above figure will indicate the progress of the initialization process. Once this process is finished, you can leave sybsetup and Sybase should be running.

To test if the database server is running, type:

```
export SYBASE=/usr/local/sybase
PATH=$PATH:/usr/local/sybase/bin:.
export PATH
isql -U sa
```

Press Enter when asked for the password and you should see the isql prompt. This confirms that you can connect to the RDBMS server successfully.

3.4.2 Installing Sybase on Windows NT

We set up a number of Microsoft Windows NT 4.0 machines to run a copy of the Sybase SQL Server. The machines are wtr05107 and wtr05172. The

installation of Sybase under Windows NT is straightforward. Insert the CD and start the setup.exe from the CD. The installation starts and you will be asked for the directory where Sybase will be installed.

Figure 167. Sybase Release Directory Window

We decide to install Sybase on the directory as proposed. The next window shown in Figure 168 on page 179 asks whether to install the 16-bit oder 32-bit version.

Figure 168. Product Set Selection Window

Obviously, we chose to install the NT Product, that is, the 32-bit version. The next window, shown in Figure 169 on page 180, will ask which packages of Sybase to install. The default is to install all packages. The installation takes about 200 MB including the SQL Server Professional components, the Master Device file and Sybsystemprocs. We decide to install all packages and select the **Continue** button.

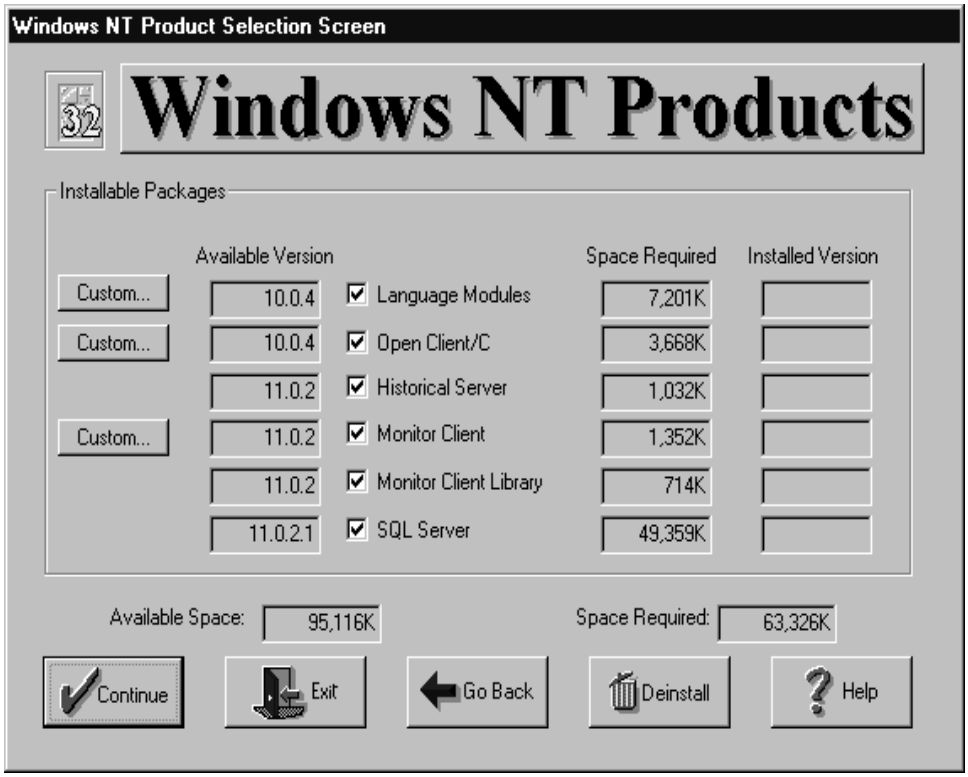


Figure 169. Windows: NT Product Selection Screen Window

The installation will then start to copy the files to the hard drive. The installation will take around 5 minutes. This will depend on the speed of your machine.

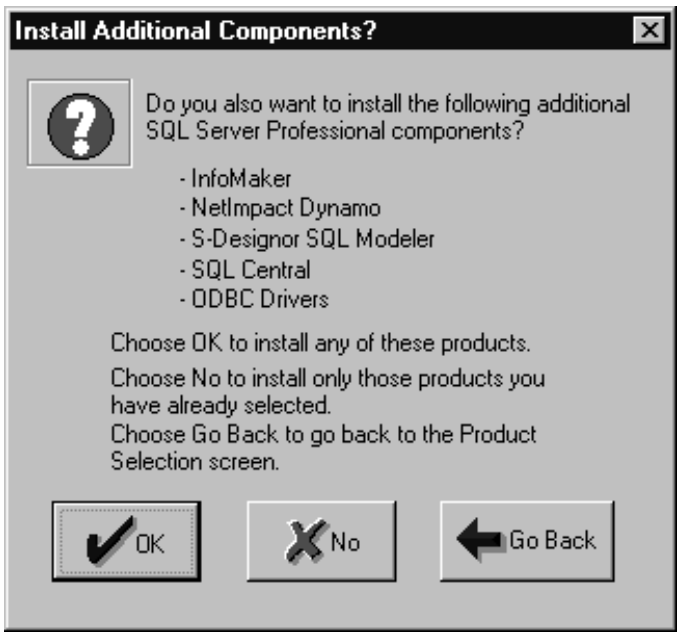


Figure 170. Install Additional Components Window

After that, a new window appears as shown in the figure above, and you can decide whether to install the SQL Server Professional components. We decide to do so, and select the **OK** button. The following window will appear after copying the files is completed.

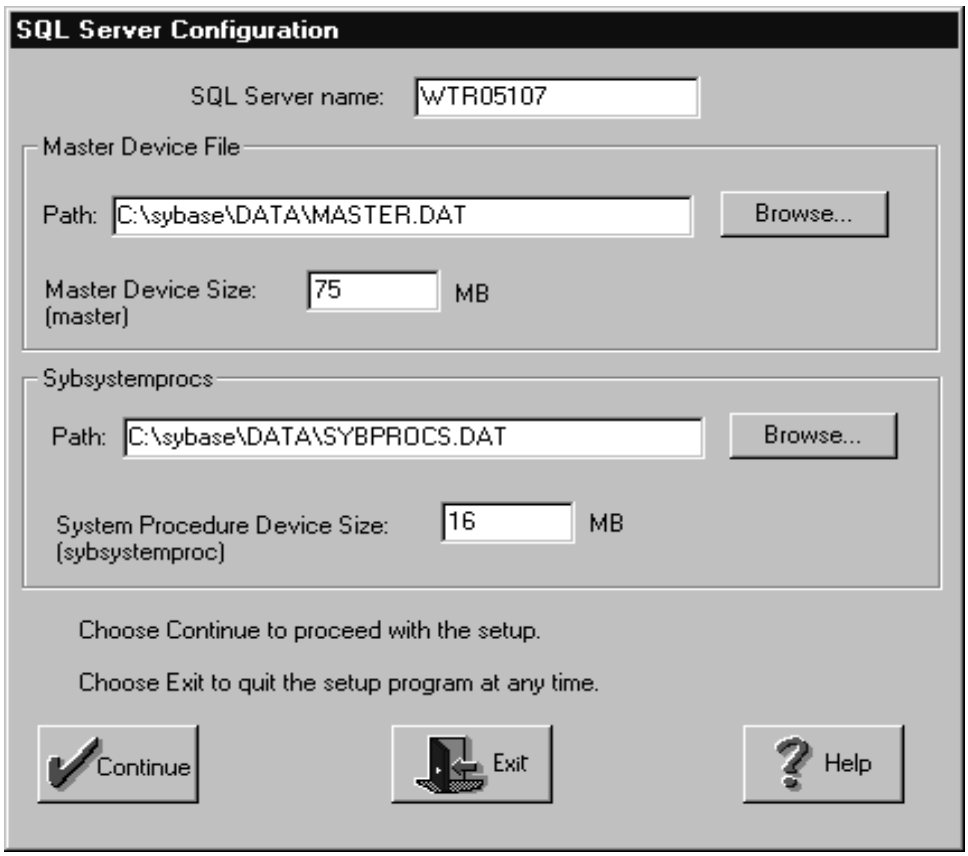


Figure 171. SQL Server Configuration Window

The proposed size of the Master Device Size is 21 MB. We chose to increase this size to 75 MB, because 21 MB is really the minimal size.

Note

Ensure that there is enough space on the drive before you install the SQL Server Configuration. Otherwise you may get the error window as shown in Figure 172 on page 183.

Figure 172. SYBASE Setup Window

For the installation of the SQL Server Professional tools another window as shown in Figure 173 on page 183 will prompt you to specify the directories for the tools. In our example we accept the default and continue the installation by clicking the **Next** button.

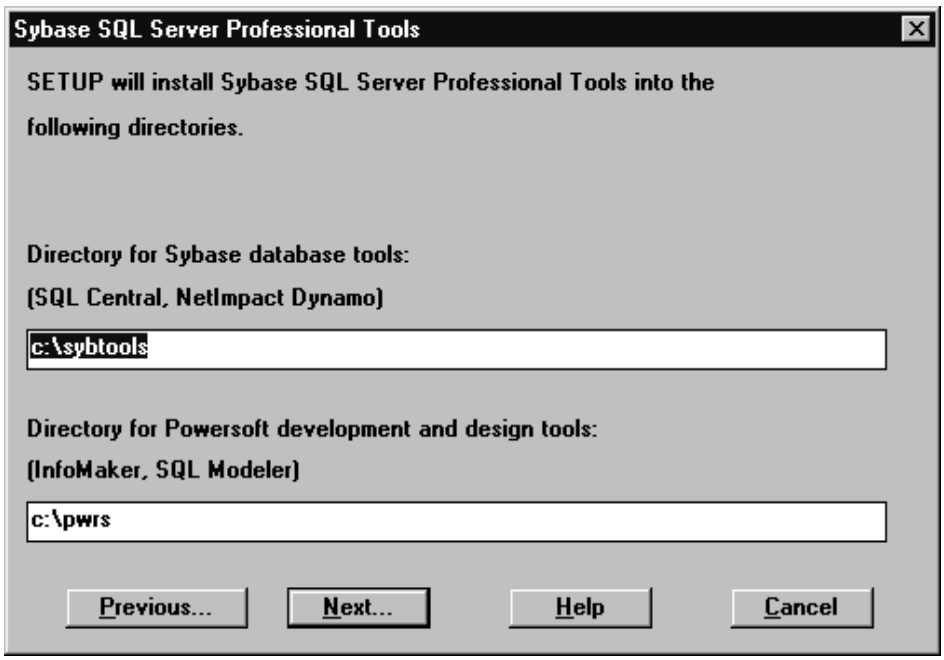


Figure 173. Sybase SQL Server Professional Tools Window

Note

In our installation we got an installation conflict, because there are common files in different versions. The setup procedure proposes you replace files that are a newer version with files that are an older version. We declined and had no problems with the installed database server. In our example the following files were affected: MSCVRT40.DLL, COMPOBJ.DLL, STORAGE.DLL, TYPELIB.DLL, OLE2.DLL and OLE2DISP.DLL.

When this part of installation is complete, the following window will appear.

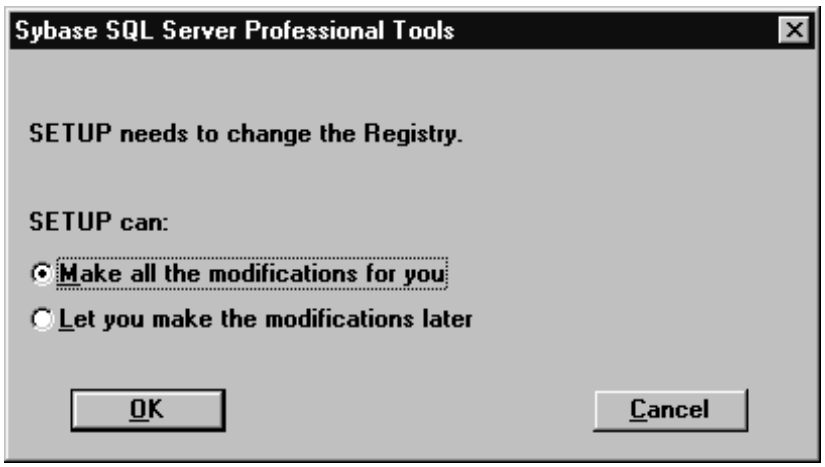


Figure 174. Sybase SQL Server Professional Tools Window

We decide to run the modifications. After the installation is complete, you have to reboot the machine. Most of the Sybase parameters are stored in the NT registry. These values will be used later for registering Sybase databases in a Tivoli policy region.

Note

The Sybase values stored in the NT registry can be found under the key HKEY_LOCAL_MACHINE/SOFTWARE/SYBASE.

3.5 Installing Tivoli Manager for Sybase

Tivoli Manager for Sybase is installed from the Tivoli desktop in the same way as any other Tivoli product.

To open the Install Product window, we select **Desktop** from the menu bar and then **Install Product...** from the cascaded **Install...** pull-down menu item. After you select the right media you should see a window similar to the window shown in Figure 175 on page 185.

Figure 175. Install Product Window

There are two modules for Sybase, the framework and distributed monitoring. We first install the Framework component. Select the **Tivoli Manager for Sybase - Framework, Version 1.0**. We do not want install the module on victor and wtr05242, because we have no Sybase database installed on these machines. Therefore, we remove these two machines from the list Clients to Install On:. To remove a client from the list, select the client and

then click the right arrow button. This will flip the selected item from the list Clients to Install On to the list Available Clients.

Note

Install the framework on all managed nodes that contain Sybase databases, which are managed by Tivoli.

Click on the **Install** button to continue. If the following module dependency doesn't report an error, start the installation by clicking on the **Continue Install** as shown in Figure 176 on page 187.

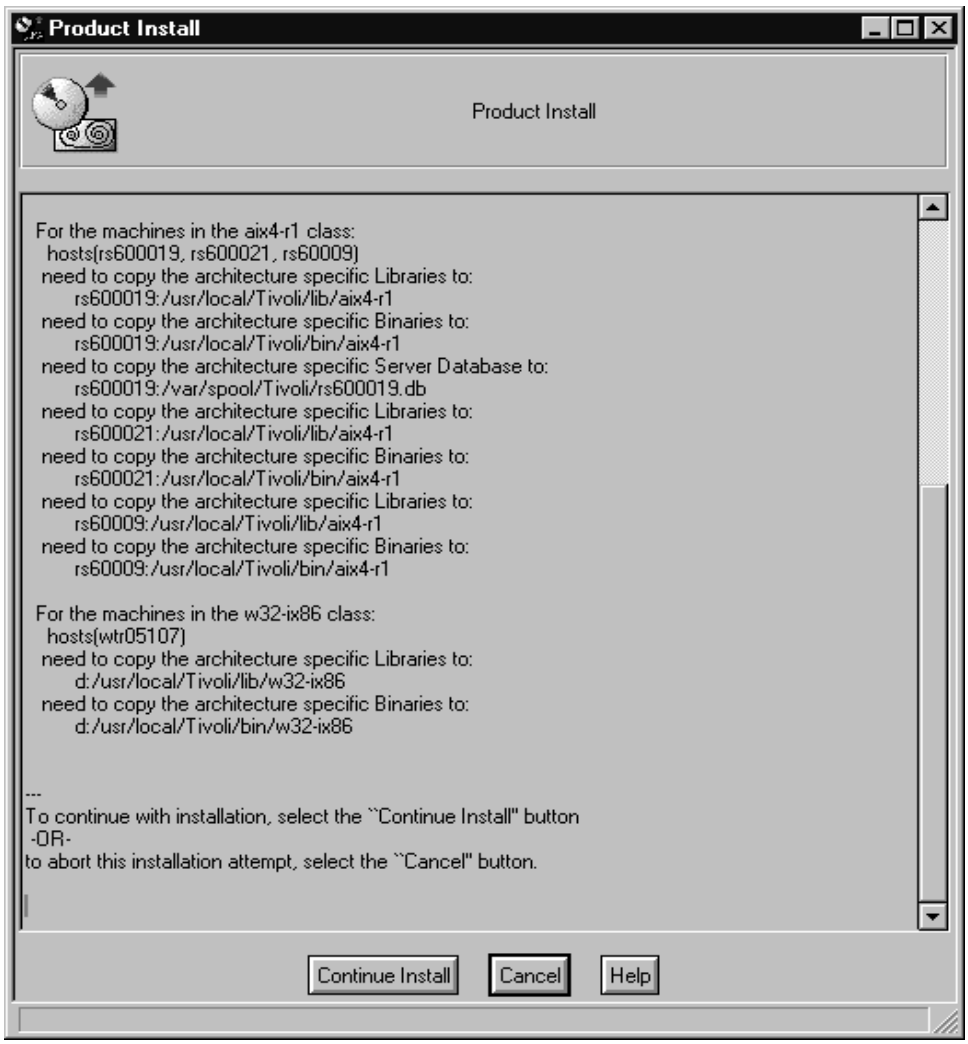


Figure 176. Product Install Window

Click on the **Close** button after the installation has completed. The Cancel button has changed to Close.

Afterwards, we install Tivoli Manager for Sybase - Distributed Monitoring, Version 1.0. The module for distributed monitoring needs only to be installed on the TMR server, which is the AIX machine rs600019 in our example.

Note

You can monitor the installation of the module on the TMR server. In order to do this, login to the TMR server and change to the tempfile directory (usually /tmp). You should see a SybaseSentry_GBIN_after.error file. To monitor the installation process, issue the following command:

```
tail -f SybaseSentry_GBIN_after.error
```

You will see every single step of the installation as shown in Figure 177 on page 188. The last command is the following:

```
mcsl -P cat -Ri M7SybaseServer.col
```

This command installs the monitoring collection specified in M7SybaseServer.col and restarts all Tivoli/Sentry monitoring engines. Sometimes, this restart option may time out, and the last command will not finish. In this situation, kill the process and install the collection without the restart option by issuing the command :

```
mcsl -P cat -i M7SybaseServer.col
```

Afterwards reinitialize all objects dispatchers manually.

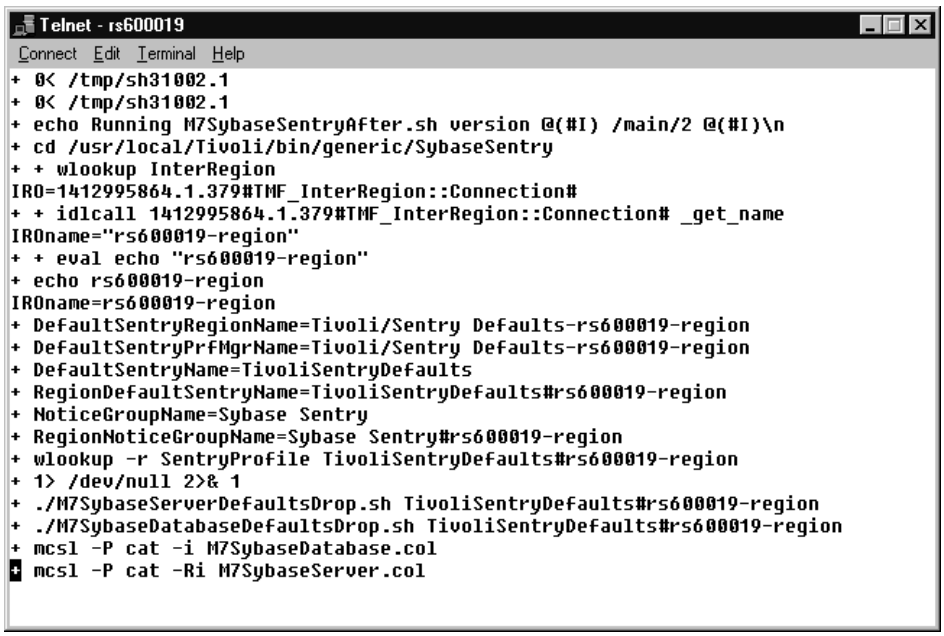


Figure 177. Telnet rs600019 Window

The wlsinst -a command shows two new entries in the Product List:

```
TME 10 Module For Sybase - Framework, Version 1.0
TME 10 Module For Sybase - Distributed Monitoring, Version 1.0
```

If you inspect the SybaseSentry directory on the TMR server, you should find the following files:

```
root@rs600019:/usr/local/Tivoli/bin/generic# ls SybaseSentry/
ESMSentry.baroc                  M7SybaseServer.baroc
M7SybaseDatabase.baroc           M7SybaseServer.col
M7SybaseDatabase.col             M7SybaseServerDefaults.sh
M7SybaseDatabaseDefaults.sh      M7SybaseServerDefaultsDrop.sh
M7SybaseDatabaseDefaultsDrop.sh  SetErrorCategory.sh
```

3.6 Using Tivoli Manager for Sybase

We manage the Sybase databases in their own region. However, before we can register the databases on the Windows NT and the AIX machines, we have to assign the TMR roles to an administrator and create a new policy region.

3.6.1 Assigning the TMR Roles to an Administrator

This step is exactly the same, that was done already for Oracle. Open the Administrators window from the Tivoli desktop by double-clicking on the **Administrators** icon on the desktop. We only have one administrator, Root_rs600019-region. We select the icon with the right mouse button and select **Edit TMR Roles...** from the pop-up menu. The window as shown in Figure 178 on page 190 will appear:

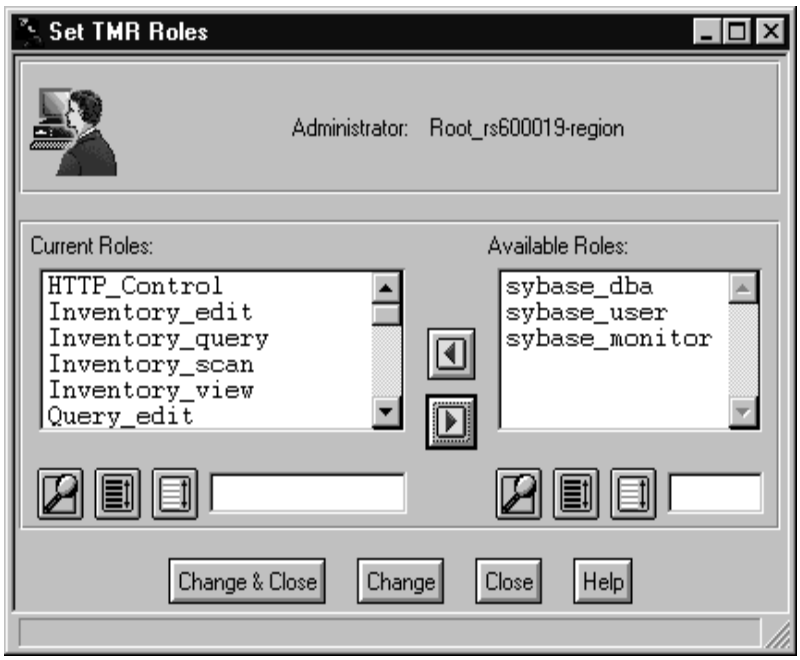


Figure 178. Set TMR Roles Window

There are three available Sybase roles. We select all three items together and add them to Current Roles. To complete the transaction, we select the **Change & Close** button. Then we open the window for the resource roles in the same way. The following window will appear.

Figure 179. Set Resource Roles Window

We add the available Sybase roles to the Administrators and Sybase resources. First, we select the **Administrators** resource, select the Sybase roles, click the left arrow button and select the **Change** button. Then we select the **Sybase** resource, select all roles, and click the left arrow button again. Then, we choose the **Change & Close** button.

Remember that you have to restart the desktop to activate the roles.

3.6.2 Creating a Sybase Region

The Sybase databases will be managed in their own region, separately from other resources. Therefore, we create a new region in the Tivoli desktop main

window. In order to create a new region, we select **Create...** from the menu bar and then **Region...** from the pull-down menu. The following window appears.

Figure 180. Create Policy Region Window

The name of the new region is Sybase. We enter Sybase in the Name field and select the **Create & Close** button to create the region.

3.6.3 Setting Sybase Managed Resources

We have to configure the new region before we can register the Sybase databases. We open the region window by double-clicking the **Sybase** icon on the Tivoli Desktop main window. Then we select **Properties** from the menu bar and then **Managed Resources...** from the pull-down menu to open the Set Managed Resources window. The following window will appear.

Figure 181. Set Managed Resources Window

In the list of available resources you will see a resource entry SybaseDataServer for Sybase databases. We select this entry and click the left button to activate the resources for the new region. Additionally, we add the ManagedNode, ProfileManager and the SentryProfile resources. Then we click the **Set & Close** button and the region is prepared to register Sybase databases.

3.6.4 Registering a Windows NT Sybase Database

The first database we register is on the wtr05107 Windows NT machine. We select **Create** from the menu bar and then **SybaseDataServer...** from the pull-down menu in the policy region window Sybase. The registration window appears and we fill in the values as shown in Figure 182 on page 194.

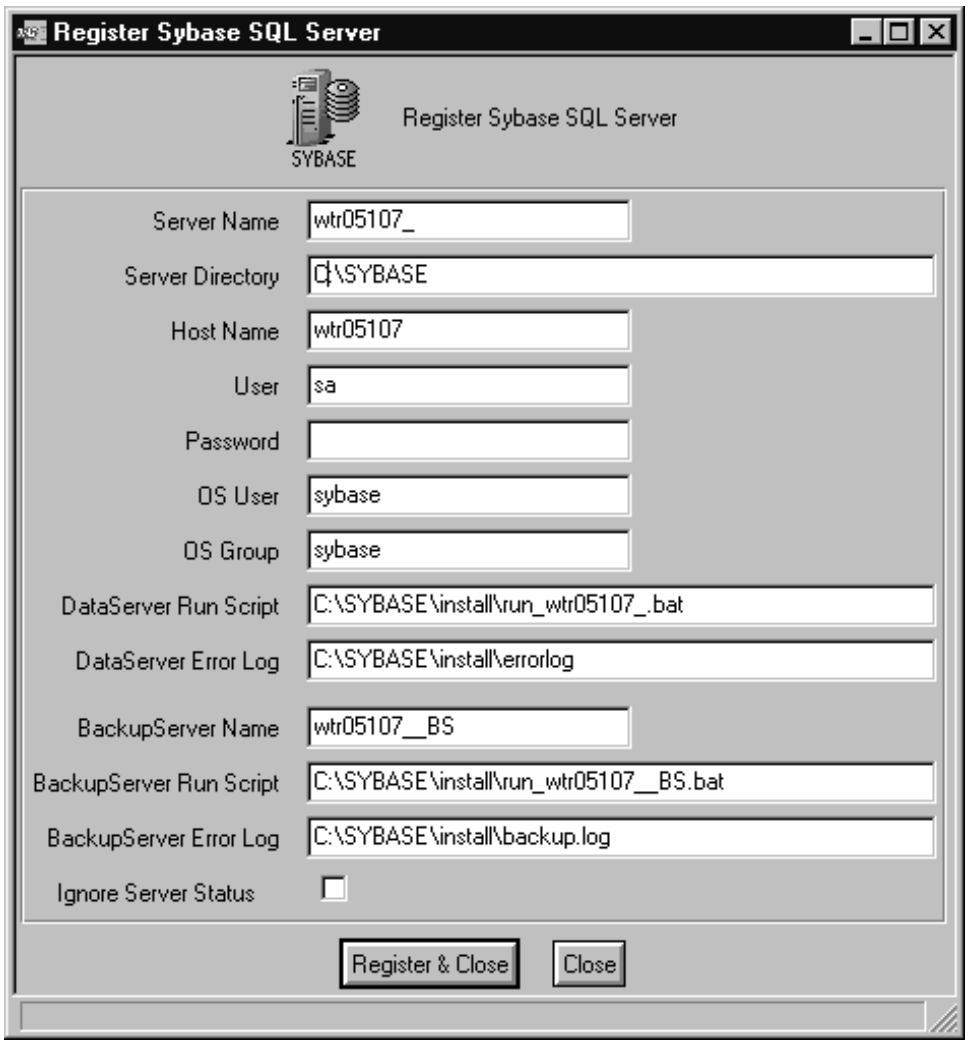


Figure 182. Register Sybase SQL Server Window

The Windows NT registry contains most of the information required for this window. You will find the information below HKEY_LOCAL_MACHINE/SOFTWARE/SYBASE/. We refer in the following list to this path as $SYBASE.

- Server Name is the name of the Sybase SQL server as registered in the Windows NT database registration under $SYBASE/Server.
- Server Directory is the installation directory of the sybase database on the Windows NT machine.

- Host Name is the name of the managed node.
- User is the account name for the database connection. This user must have sybase_dba administration privilege. Normally, you will accept the default sa user.
- Password is the password for database login of the user specified in the User field.
- OS User. Leave the default sybase on Windows NT.
- OS Group. Leave the default sybase on Windows NT.
- DataServer Run Script is the command file to start the database. Typically, this is a generated BAT file in the subdirectory install of the Sybase installation. The name of the file is concatenated from run_ + server name + _.bat. In our example, we fill in run_wtr05172__.bat, because we named our database wtr05172_.
- DataServer Error Log is the file name of the log file of the database server. Normally this is the file errorlog in the install subdirectory. Verify that this file name is used in the DataServer Run script.
- BackupServer Name is the name of the Sybase backup server. This name is also generated during the installation of the database. It is the name of the database server extended with a _BS suffix. You can crosscheck this name with the registry under $SYBASE/Server.
- BackupServer Run Script is the name of the command file to start the backup server. As with the DataServer Run Script this file is located in the install subdirectory.
- BackupServer Error Log is the file name of the log file used by the backup server and is normally located in the install subdirectory. Verify that this file name is used in the BackupServer Run script.
- Ignore Server Status is used to register the database without connecting to the database. You should not select this check box. The installation will then validate the parameter. Ensure that the Backup Server is started; otherwise the registration will fail.

We click the **Register & Close** button. After the registration is completed, the Sybase policy region window contains the database icon as shown in Figure 183 on page 196.

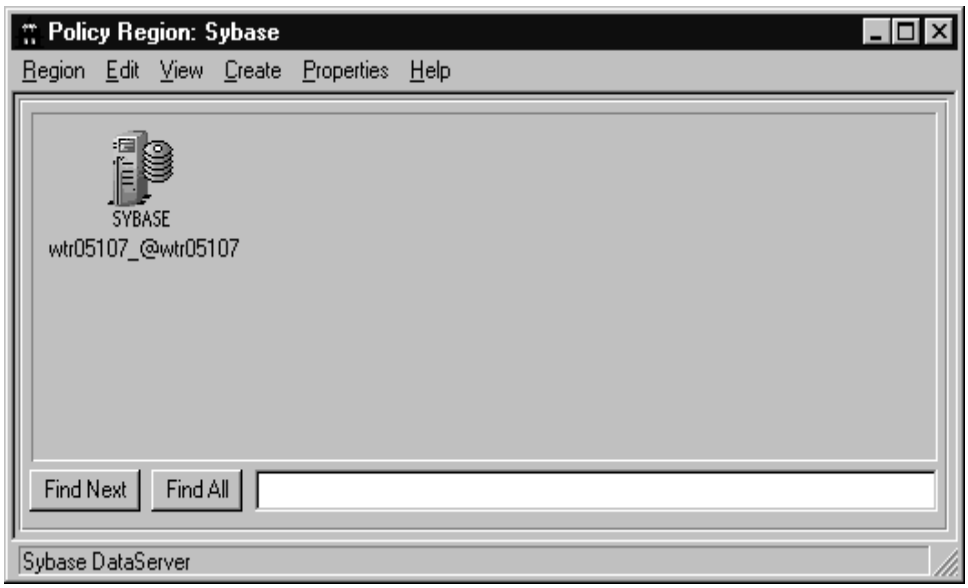


Figure 183. Policy Region: Sybase Window

3.6.5 Registering an AIX Sybase Database

The next database we register is a Sybase database on the AIX machine rs600019. In the registration window shown in Figure 184 on page 197, we fill in the appropriate values.

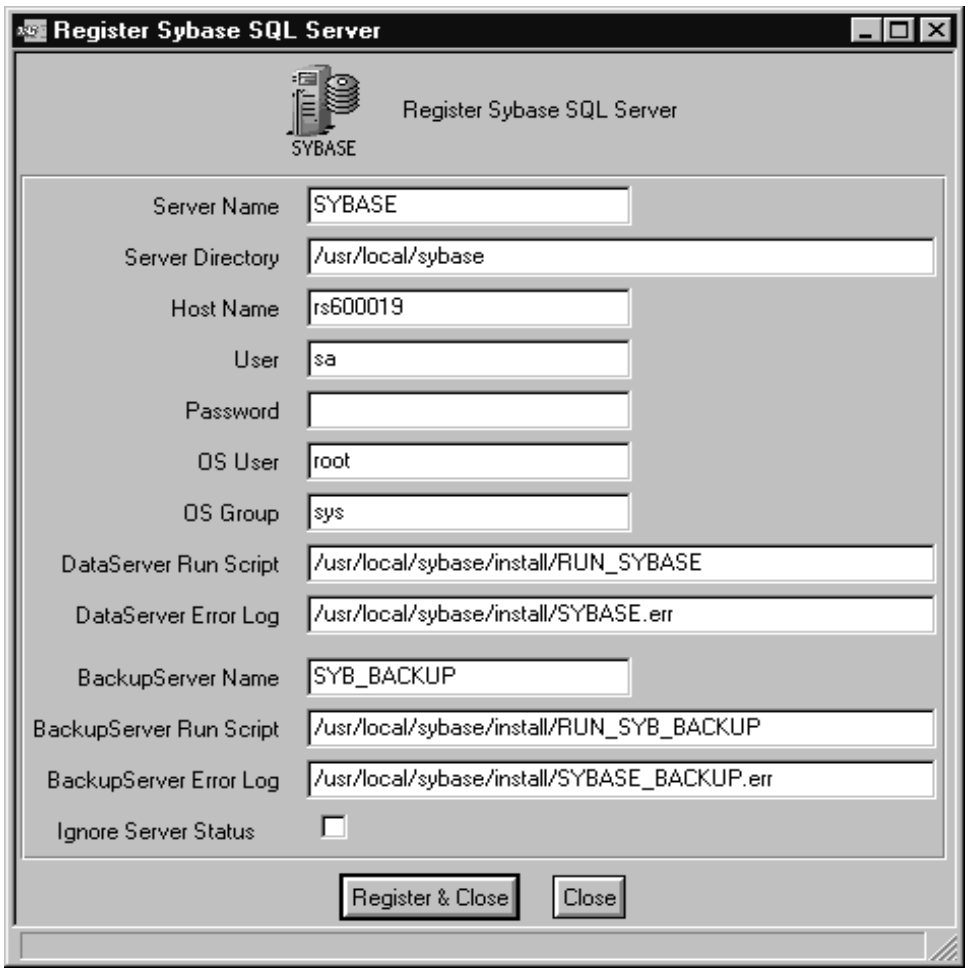


Figure 184. Register Sybase SQL Server Window

To obtain the values, change to the home directory of the Sybase database on the AIX machine. In our example, this is /usr/local/sybase. You will find a subdirectory install that contains both the default startup scripts for the data server and the backup server. Inside these scripts you will find the default values of the log files, the server name and the backup server name. In our example, we did not change any parameter after the Sybase database installation; therefore, we can take the default values. To finish the registration, we select **Register & Close**.

In our example, we populate the Sybase policy regions with two additional databases, one on the Windows NT machine wtr05172 and another on the

AIX machine rs600021. As already mentioned, the Sybase database on rs600021 is used by the TEC server. The policy region window contains four Sybase databases as shown in Figure 185 on page 198.

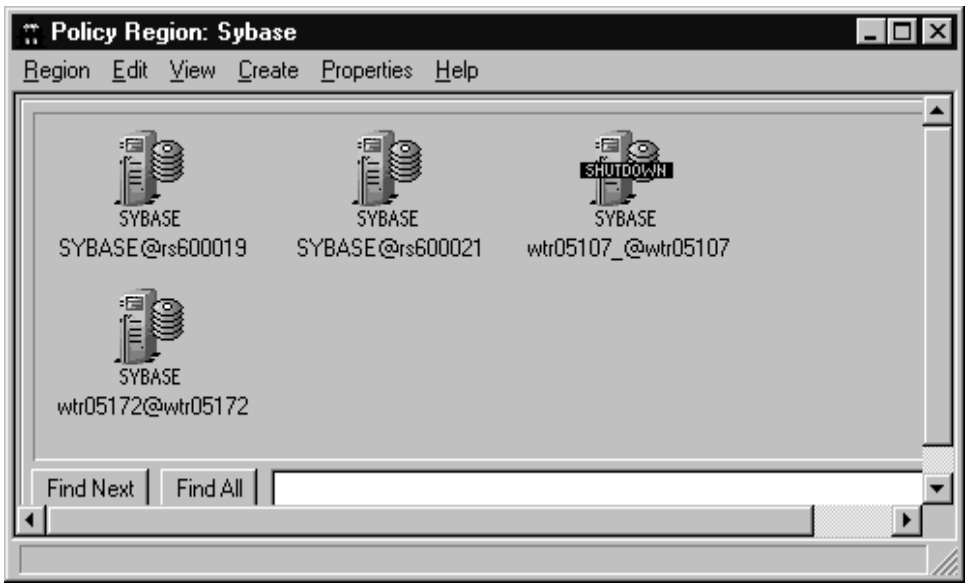


Figure 185. Policy Region: Sybase Window.

The list command of the Sybase collection is following:

```
wls -l Sybase
```

This shows the following output:

```
1412995864.4.66#ESMSybaseDataServer::ESMSybaseDataServerBase#   wtr05107_@wtr05107
1412995864.8.36#ESMSybaseDataServer::ESMSybaseDataServerBase#   wtr05172@wtr05172
1412995864.1.1097#ESMSybaseDataServer::ESMSybaseDataServerBase# SYBASE@rs600019
1412995864.2.115#ESMSybaseDataServer::ESMSybaseDataServerBase#  SYBASE@rs600021
```

The lookup of Sybase related resources in the Tivoli name registry is following:

```
wslookup -lR | grep -i sybase
```

This shows the installed resources that were added to the TMR:

```
SybaseBackupServer:  Wed Jun 24 14:09:43 1998
SybaseBackupServerGUI
SybaseDataServer:  Wed Jun 24 14:09:07 1998
SybaseDataServerGUI
SybaseDatabase:  Wed Jun 24 14:09:28 1998
SybaseDatabaseGUI
```

```
SybaseEngine:  Wed Jun 24 14:09:36 1998
SybaseMonitorServer
SybaseMonitorServerGUI
```

3.6.6 Managing Sybase Databases

With Tivoli Manager for Sybase, you can perform the startup and shutdown of Sybase databases and their backup servers, change the registration parameter and check the state of Sybase databases.

In this version, there are no further configuration management tasks, as you find it in Tivoli Manager for Oracle. To perform configuration management tasks such as the administration of Sybase devices or management of Sybase database users, you will have to use the Sybase tools such as SQL Central.

3.6.6.1 Shutting Down and Starting Up the Database

You can stop a database in the following way. Click with the right mouse button on the database icon in the Sybase policy region as shown in Figure 186 on page 199.

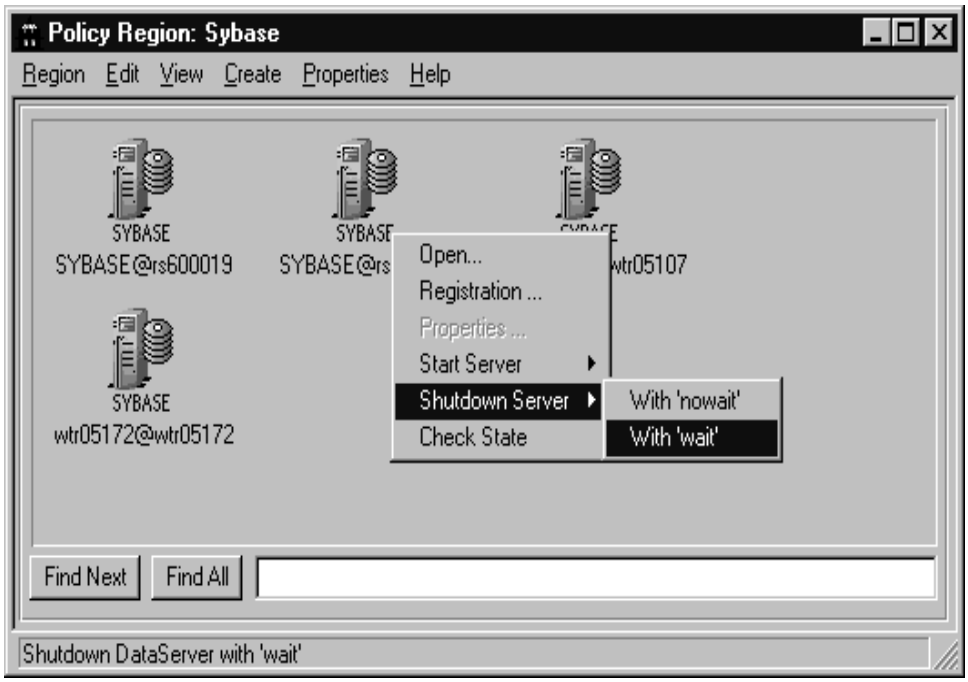


Figure 186. Policy Region: Sybase Window

A cascaded menu appears with two options With 'nowait' and With 'wait'. Select **With 'wait'** for a regular shutdown.

When the shutdown is completed you will see the database in the shutdown state as shown in Figure 187 on page 200.

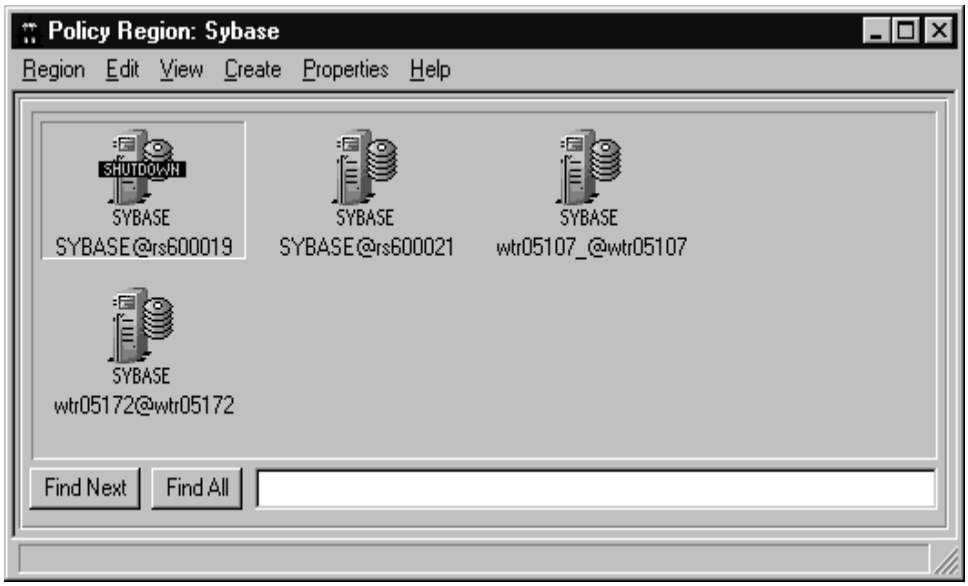


Figure 187. Policy Region: Sybase Window

To start up the database click the right mouse button on the database icon and select **Start Server** from the pop-up menu. A cascaded menu appears with two options Multi-User mode and Single-User mode. On Windows NT the database is always started in multi-user mode. Select **Multi-User mode** to start the database for a normal startup. The Single-User mode is used for administrative tasks. The database icon in the policy region is refreshed after the startup of the database is complete.

3.6.6.2 Checking the State of the Database

To see whether the database is up, check the database state. Select the right mouse button on the database icon and click **Check State** from the pop-up menu as shown in Figure 188 on page 201.

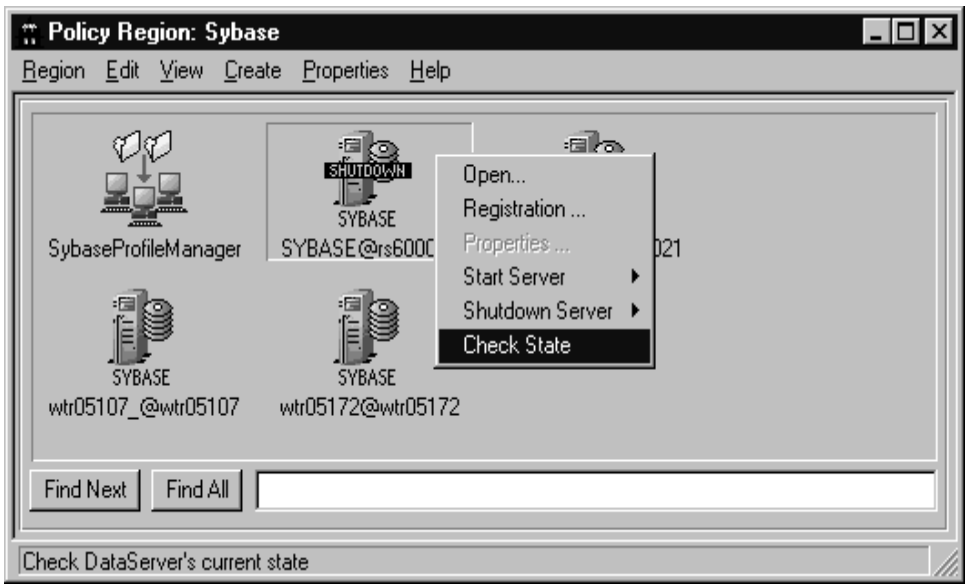


Figure 188. Policy Region: Sybase Window

The refreshed icon will show the actual state.

3.6.6.3 Changing the Registration Parameter

If you want to change any registration parameter of the registered database, select the database icon in the policy region window with the right mouse button and click **Registration...** from the pop-up menu. We do this with the database on rs600019 and the following window appears.

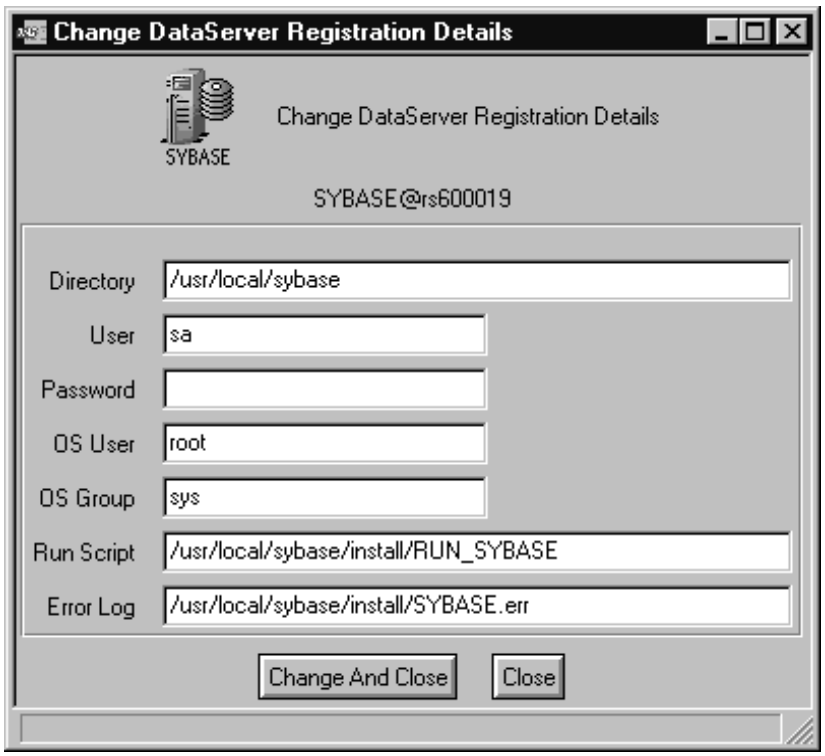


Figure 189. Change DataServer Registration Window

You can change the parameter according to your needs, and select **Change And Close** to perform the changes. You have to set the following values:

- Directory: The home directory where the database resides.
- User: The database user that is used for the administrative tasks.
- Password: The password that is required to connect to the database.
- OS User: The user ID on rs600019 which is used to run the required shell scripts to start up and shut down the data server and the backup server.
- OS Group: The user group on rs600019 that is used together with the user ID.
- Run Script: The executable shell script to start the database.
- Error Log: The file on rs6000019, where the data server logs startup information.

3.6.6.4 Open the Database Collection

You can open the database collection to see the contents of the database. We select the database icon of the AIX machine rs600021 with the right mouse button and select **Open...** from the pop-up menu as shown in Figure 190 on page 203.

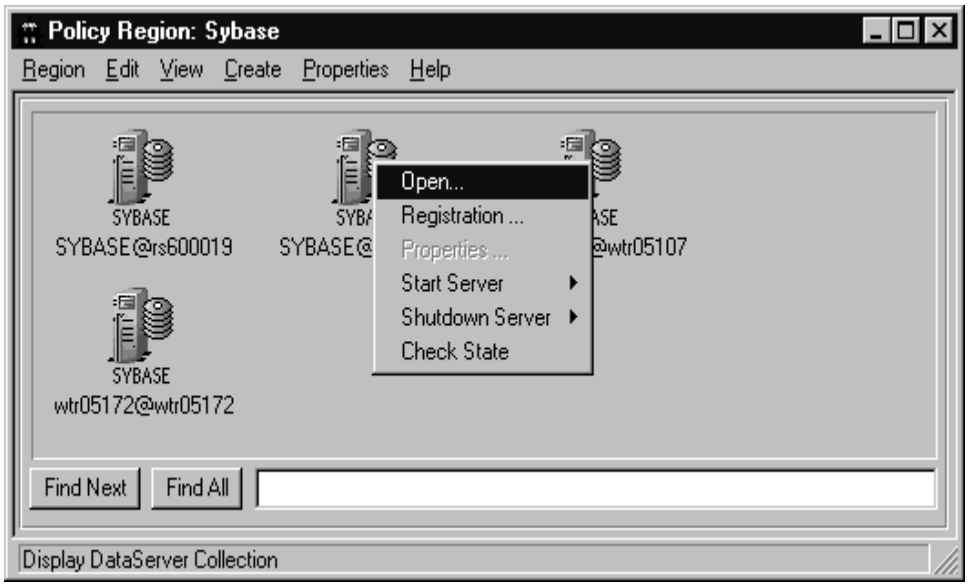


Figure 190. Policy Region: Sybase Window

The following window appears.

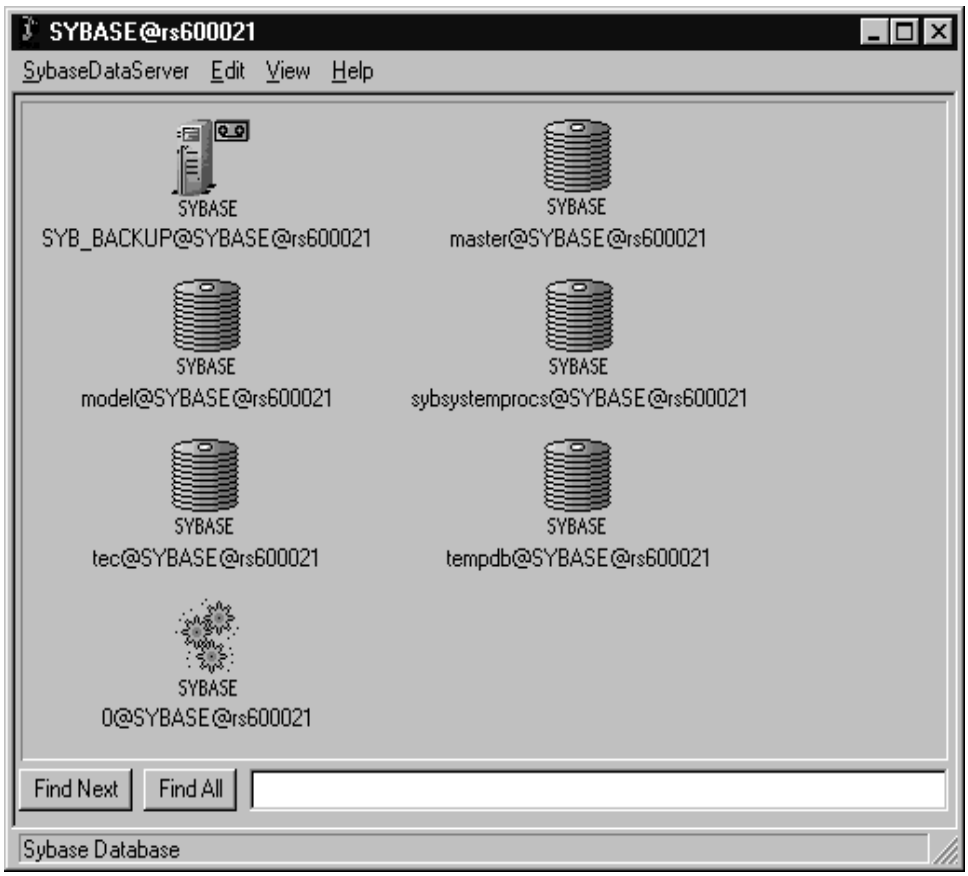


Figure 191. SYBASE@rs600021 Window

You can see one icon each for the backup server SYB_BACKUP for this database and the data server. Additionally, you see the five database instances. Four of these are generated for Sybase itself at installation time and the fifth database is our TEC database.

You can shut down and start up the backup server as shown in Figure 192 on page 205.

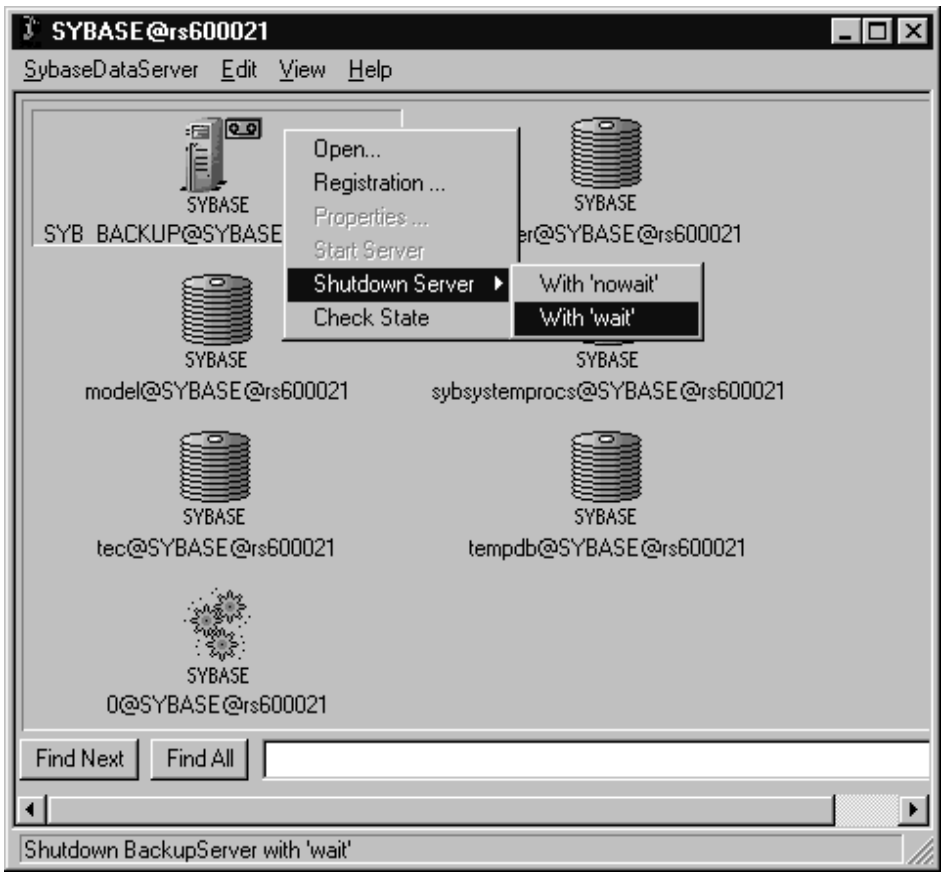


Figure 192. SYBASE@rs600021 Window

When the backup server is shut down the icon changes as shown in Figure 193 on page 206.

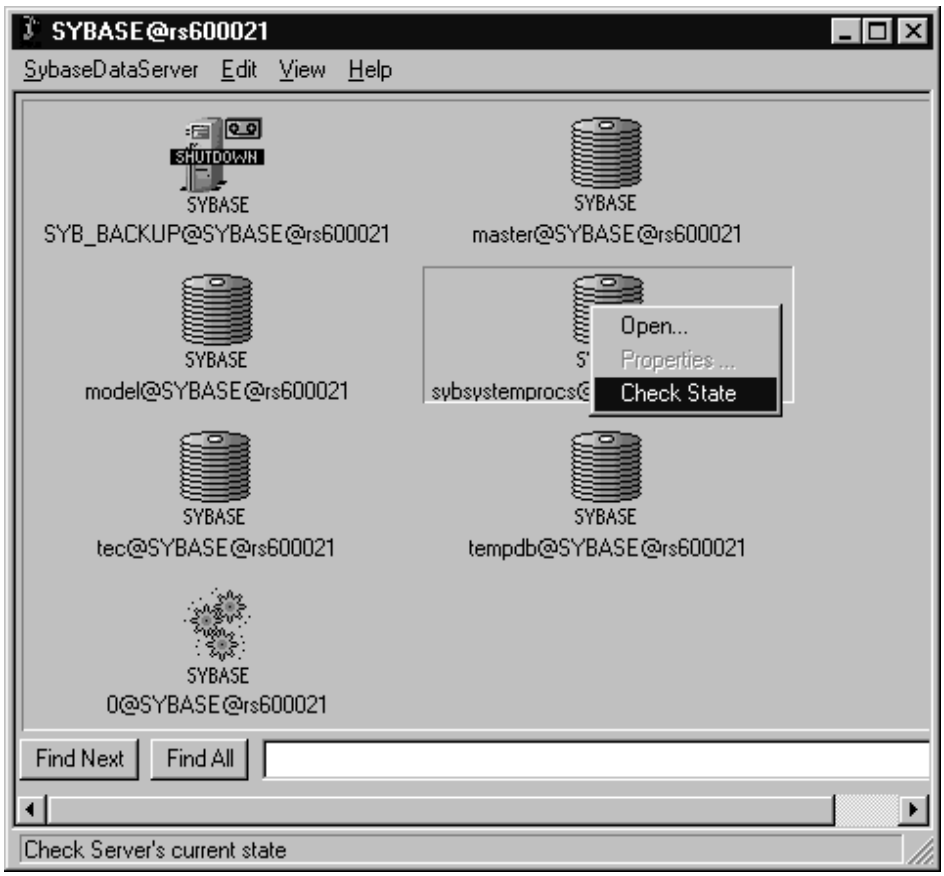


Figure 193. SYBASE@rs600021 Window

You can also see in this window that you can check the state of a database instance when you select a database instance icon with the right mouse button and click the **Check State** menu item from the pop-up menu. When you select **Open...** from this pop-up menu, you will see the collection of monitoring profiles for this database instance.

3.6.7 Using Tivoli Manager for Sybase Monitors

In this section we use the monitoring collections provided by Tivoli Manager for Sybase to monitor our Sybase servers.

3.6.7.1 Sybase Endpoints and Monitoring Collections

Tivoli Manager for Sybase contains four different object classes:

- SybaseDataServer (server endpoint)

- SybaseBackupServer (server endpoint)
- SybaseMonitorServer (server endpoint)
- SybaseDatabase (database endpoint)

Working with different endpoints allows Tivoli Manager for Sybase to provide an icon for each database server on the environment. Tivoli Manager for Sybase - Distributed Monitoring works with two different monitoring collections: SybaseServer for server endpoints and SybaseDatabase for database endpoints.

3.6.7.2 Required Roles

We have different authorization roles that depend on the activity we are going to work with.

Activity	Context	Required Role
Add a monitor to a profile	Profile manager	**admin**
Set user & group ID	Profile	**senior**
Distribute a profile to next level	Profile	**admin**
Distribute a profile to all levels or Distribute from an Oracle endpoint	Profile and Sybase endpoint	**admin** (Profile) and **sybase_dba** (Sybase endpoint).
Run monitor on the Sybase endpoint	Sybase endpoint	**sybase_monitor**

Table 2. Authorization Roles for Tivoli Manager for Sybase - Distributed Monitoring

First, we create a new profile manager inside the Sybase policy region. Select **Create** from the menu bar and then **ProfileManager...** from the pull-down menu as shown in Figure 194 on page 208.

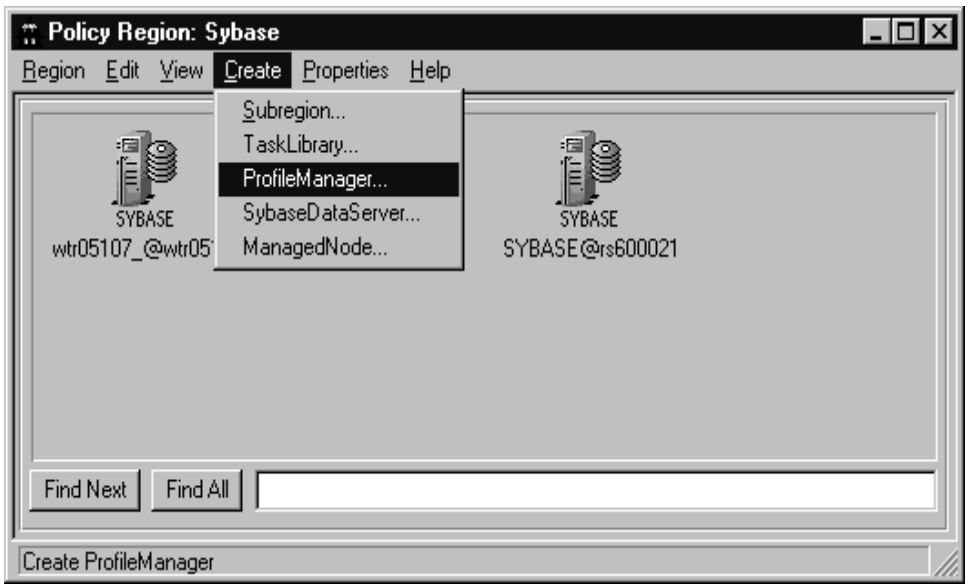


Figure 194. Policy Region: Sybase Window

Enter the name of the new profile manager as shown in the next figure. In our example we enter `SybaseMonitors` as the name of the new profile manager in the Name/Icon Label: field and click **Create & Close** to create the new profile manager.

Figure 195. Create Profile Manager Window

3.6.7.3 Creating an Example Monitor

Inside the Profile Manager window select **Create** from the menu bar and then **Profile...** from the pull-down menu. The following window appears.

Figure 196. Create Profile Window

We enter `AixDatabaseMonitor` as the name of the profile in the Name/Icon Label and click **Create & Close** to create the profile. After the command completes we see a new icon in the profile area as shown in Figure 196 on page 210.

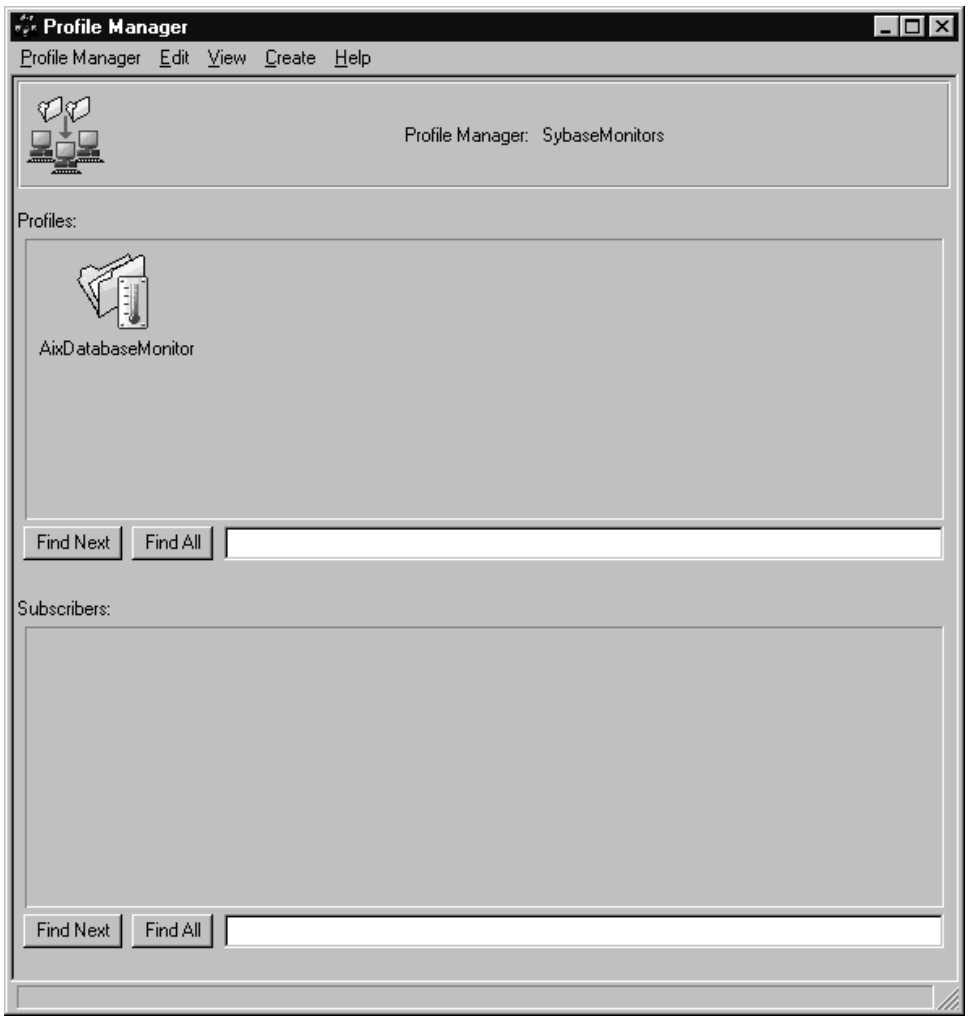


Figure 197. Profile Manager Window

To configure the monitor, double-click on the profile icon. In our example this is the icon named AixDatabaseMonitor. The following window appears.

Figure 198. TME 10 Distributed Monitoring Profile Properties Window

From the TME 10 Distributed Monitoring Profile Properties window, we select the **Add Monitor...** button. The Add Monitor to TME10 Distributed Monitoring Profile window will appear.

Figure 199. Add Monitor to TME 1- Distributed Monitoring Profile Window

Select the appropriate monitoring collection, which is SybaseDatabase or SybaseServer in the list of monitoring collection. In our example we select **SybaseDatabase**. In the list of monitoring sources the associated sources appear. In our example we select **Database State** as shown in Figure 199 on page 213. Then we click the **Add Empty...** button and the following window appears.

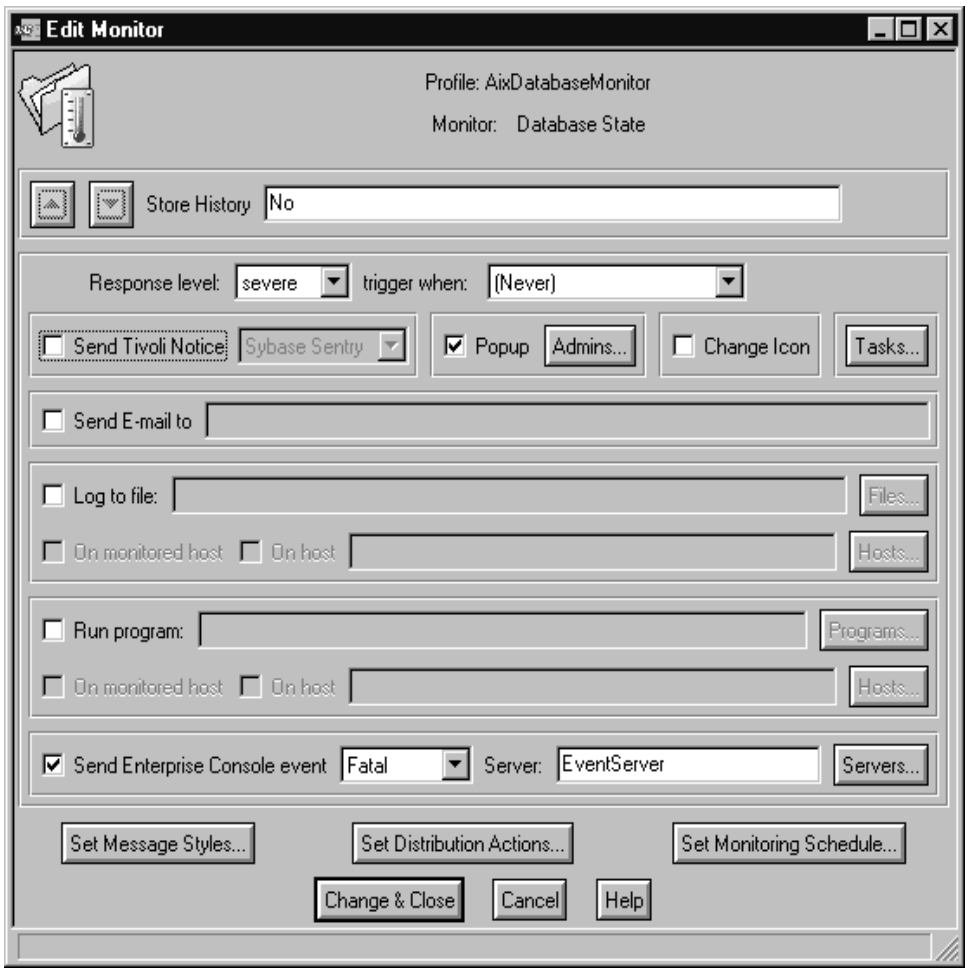


Figure 200. Edit Monitor Window

In our example, we edit the monitor options in the following way:

- We select a response level of **severe**.

- We check the **Popup** property. Then we click the **Admin...** button and the following window appears.

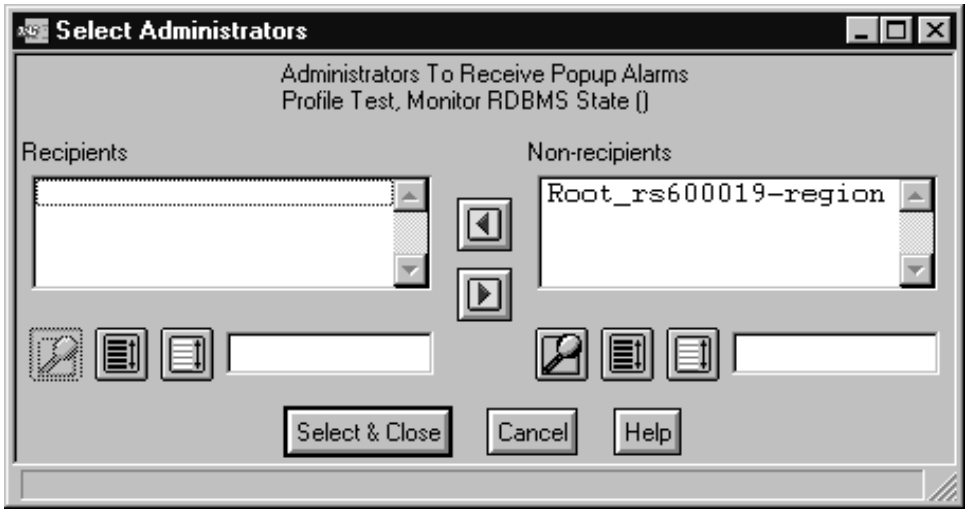


Figure 201. Select Administrators Window

To select the administrator, we click once on it and click on the left arrow. We then click the **Select & Close** button. This will take us back to the Edit Monitor window.

- We check the **Send Enterprise Console** event and set a severity level of fatal. Additionally, we click the **Servers...** button to select the event server

destination. The following window appears.

Figure 202. Enterprise Console Window

We select the only available event server **EventServer** and click the **Set & Close** button.

- At last we also have to set the monitoring schedule. We do this by clicking the **Set Monitoring Schedule...** button. When the new dialog window appears, we have to set the Start Monitoring activity and the Check monitor every fields. As shown in the figure we define a monitor interval of

20 minutes.

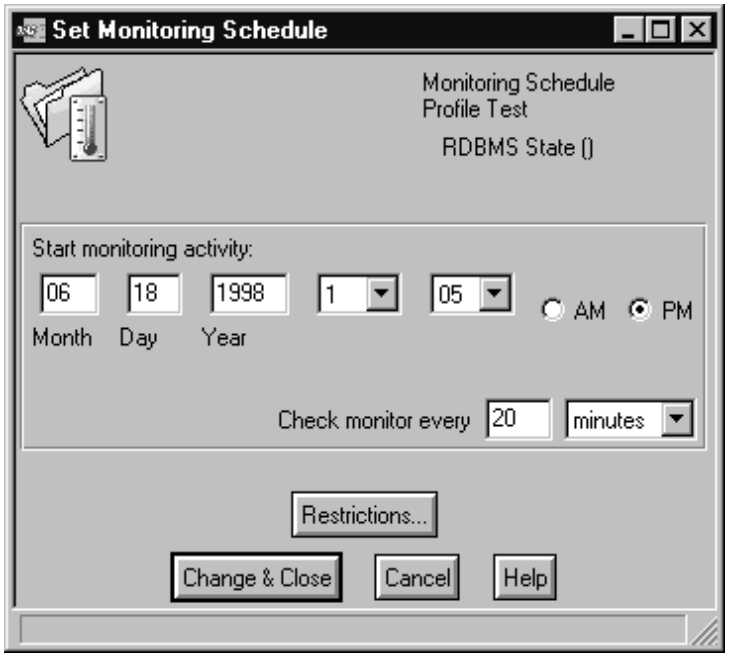


Figure 203. Set Monitoring Schedule Window

By clicking the **Change & Close** button, we go back to the Edit Monitor window and then we can select the **Change & Close** button to finally set the new monitor.

Now, we have to save the monitor we just added. To do this, we select **Profile** from the menu bar and then **Save** from the pull-down menu.

We add a new subscriber database by dragging and dropping a database icon from the Sybase region window to the subscriber area of the Profile Manager window. The profile window looks as shown in the following figure.

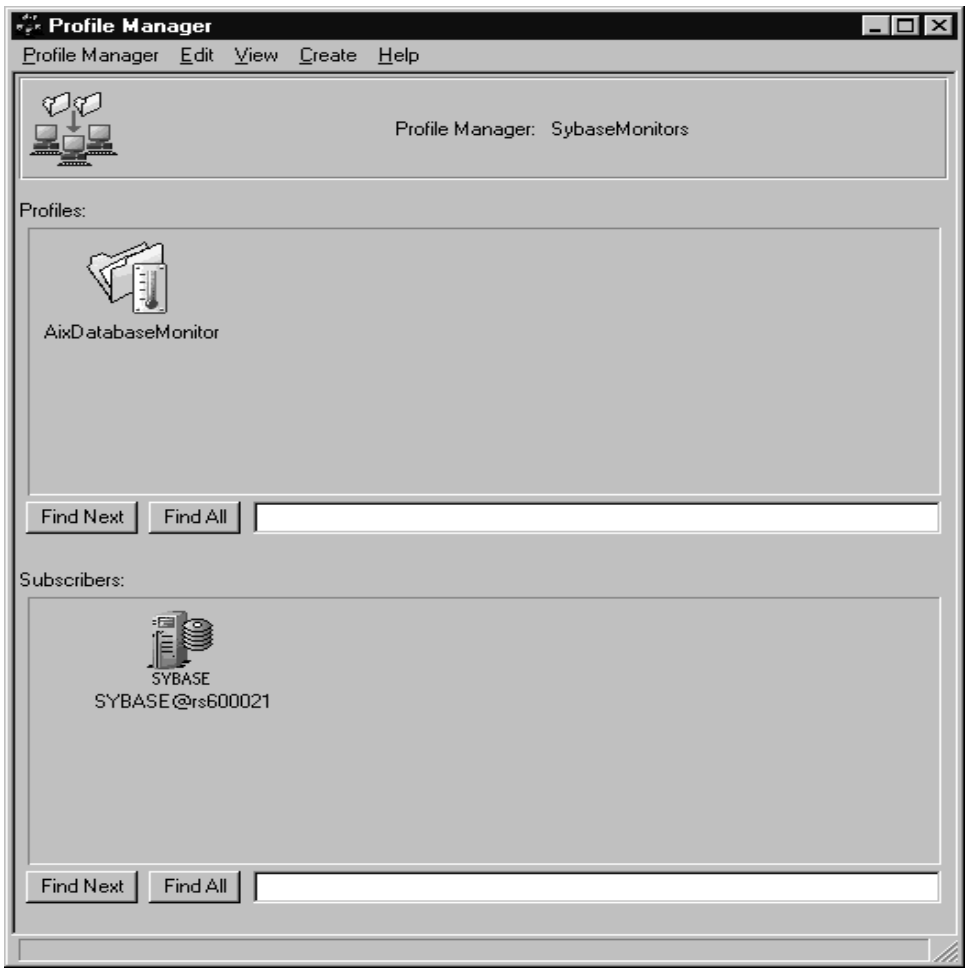


Figure 204. Profile Manager Window

The final part is to distribute the profile to the subscriber. We drag the AixDatabasemonitor profile icon and drop it over the database icon in the Subscribers: area.

The result of this monitor shows the state of the Sybase database in the managed node rs600021 as shown in the following window.

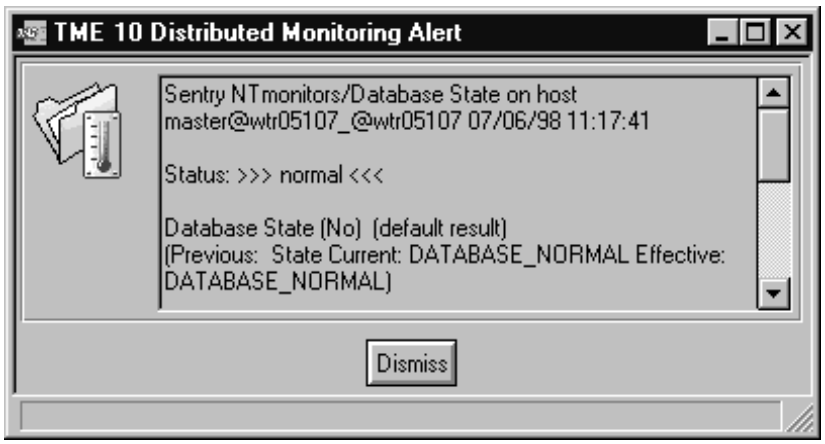


Figure 205. TME 10 Distributed Monitoring Alert Pop-Up Window

3.6.8 Using TEC with Tivoli Manager for Sybase Monitors

As in the other modules, Tivoli Manager for Sybase - Distributed Monitoring also uses Tivoli Distributed Monitoring technology. Therefore, we also can easily forward the Tivoli Manager for Sybase events to the Tivoli Enterprise Console.

We have to create a new rule base to import the files that contain the new event class definitions.

We have three new files with .baroc extensions:

- ESMSentry.baroc
- M7SybaseServer.baroc
- M7SybaseDatabase.baroc

3.6.8.1 Creating the New Rule Base

To create the new rule base from the GUI we use the following steps.

From the Tivoli desktop, double-click on the **EventServer** icon. This action displays the Event Server Rule Bases window. This window contains all the available rule bases.

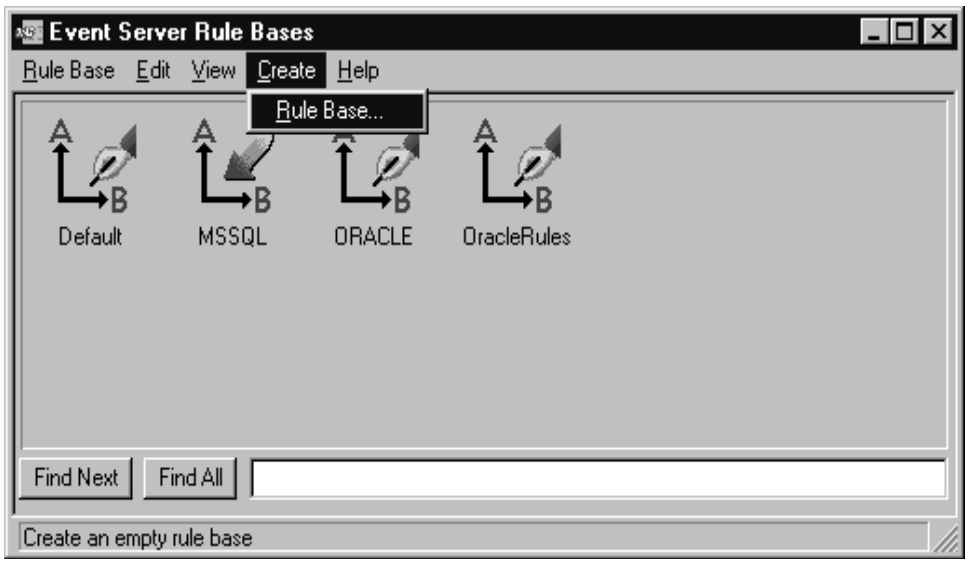


Figure 206. Event Server Rule Bases Window

Selecting the **Rule Base...** option from the **Create** menu displays the Create a Rule Base window. In this window, we set the name of the new rule base and its directory.

Since the new rule base we created is empty, we have to copy all the rules and classes the Default rule base has. To do this, right click on the **Default** icon on the Event Server Rule Bases window. Select the **Copy...** option from the pop-up menu. This will display the following window.

Figure 207. Copy Rule Base Window

We select to copy the rules and classes by clicking on the corresponding check boxes and selecting the **Copy & Close** button.

We now need to import to our new rule base the event classes for Tivoli Distributed Monitoring and the Tivoli Manager for Sybase. To do this, right click on the new rule base icon and select the **Import...** option from the menu.This will display the Import Into Rule Base window.

The first baroc file we have to import is the Sentry.baroc file. We have to import this file first, because it contains all the event class definitions for Tivoli Distributed Monitoring. To do this, in the Import Into Rule Base window we click on the **Import Class Definitions** check box and the **Insert After** check box. We select the last file we have and then we click on the **File...** button to set the path of the Sentry.baroc file. This will display the File Browser window. In this window, we set the path of the file we are importing.

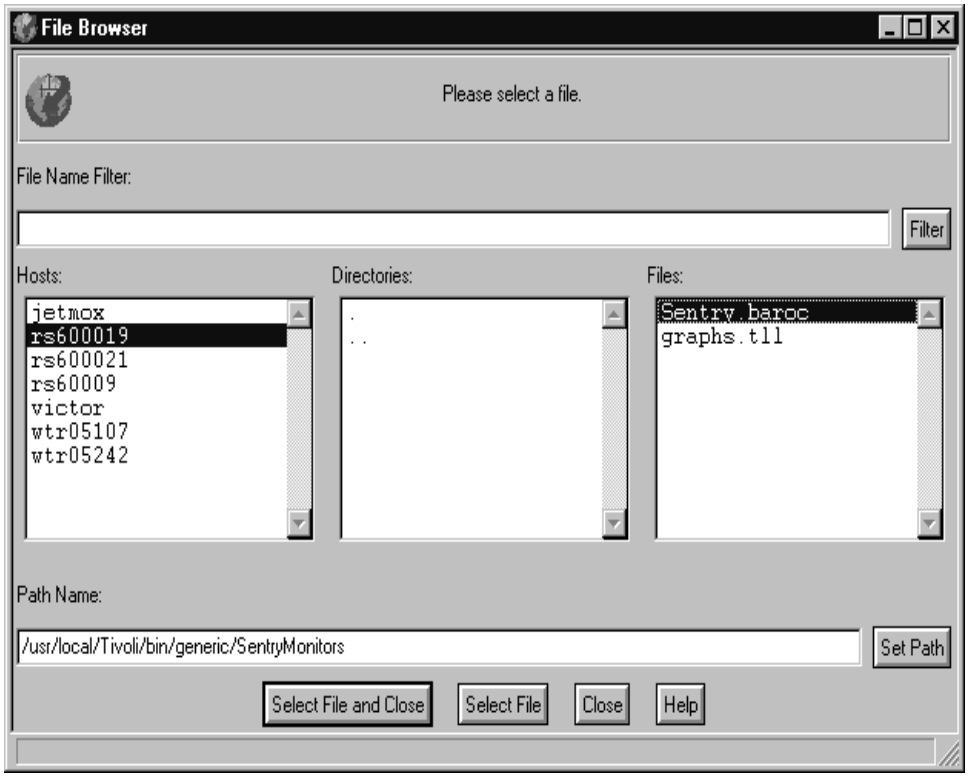


Figure 208. File Browser Window

Once we have imported this file, we follow the same steps to import the Tivoli Manager for Sybase baroc files. Finally, we have imported the baroc files as shown in the following figure.

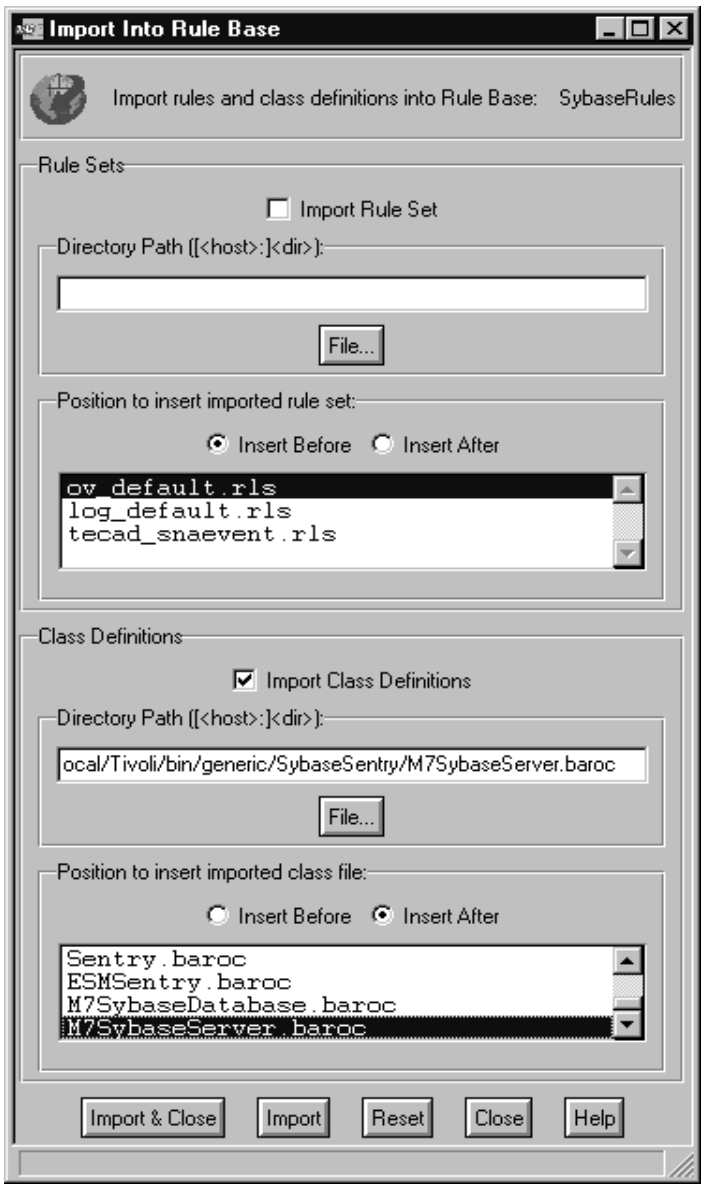


Figure 209. Import Into Rule Base Window

Once we have imported all the necessary baroc files, we have to compile the rule base. To do this, we right click on the rule base icon and select the **Compile...** option. This option displays the Compile Rule Base window. To start compiling the rule base we click the **Compile** button.

If the rule base can be compiled satisfactorily, we will have an output like the one shown in the following window.

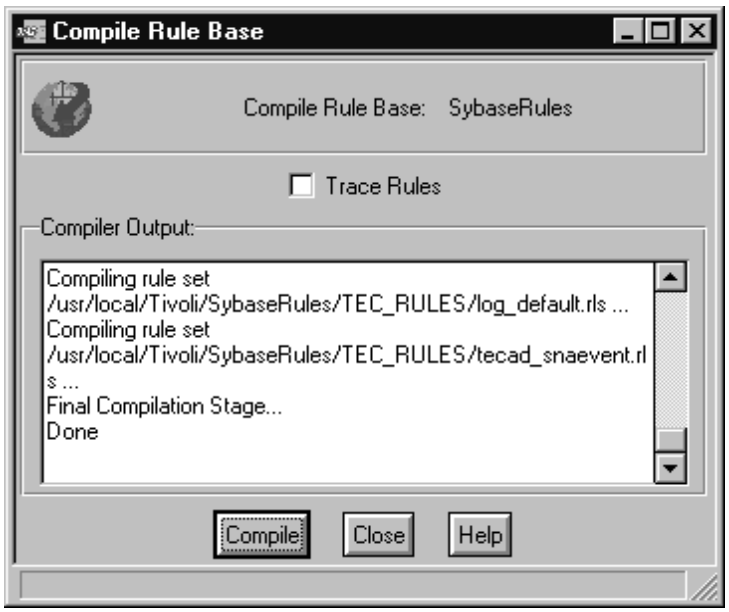


Figure 210. Compile Rule Base Window

With the satisfactory compilation, we now only need to load our new rule base. We do this by right-clicking on the rule base icon and selecting the **Load...** option from the menu. This action will display the Load Rule Base window. On this window we select the **Load but activate only when server restarts** check box option and click the **Load & Close** button as shown in the following window.

Figure 211. Load Rule Base Window

To stop the event server, we right-click on the **EventServer** icon and select the **Shut Down** option from the pop-up menu. This will display the following window.

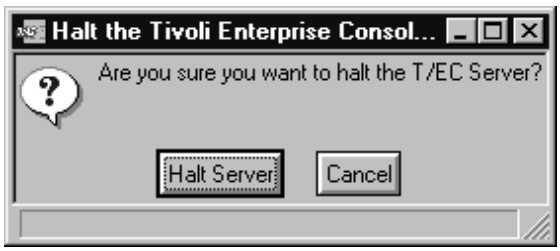


Figure 212. Halt the Tivoli Enterprise Console... Window

Select the **Halt Server** button to stop the event server.

To restart the event server, we right-click on the **EventServer** icon and select the **Start-up** option from the pop-up menu.

3.6.8.2 Creating a New Event Group

We have now our rule base loaded and TEC is ready to receive the events, but we have to select the event group where we want the events to be checked and displayed. We decide to create a new event group. To do so, we right-click on the **EventServer** icon and select the **Event Groups...** option. This option displays the Event Group Management window.

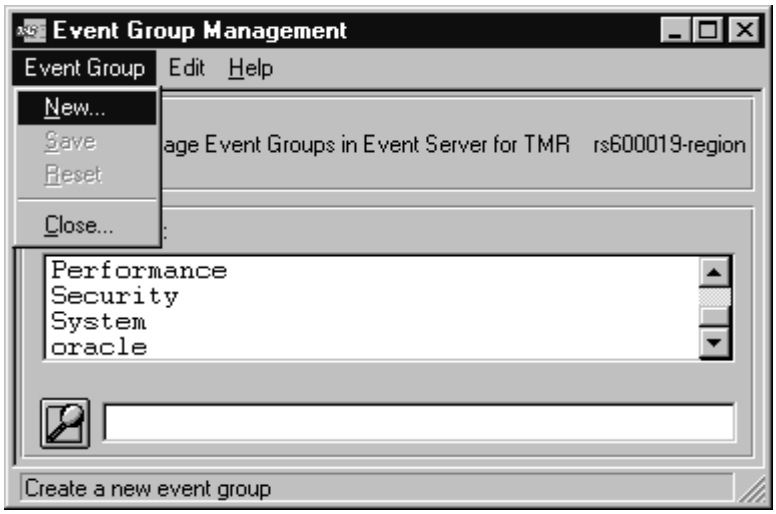


Figure 213. Event Group Management Window

Select the **New...** option from the **Event Group** menu to create a new event group. This will display the following window.

Figure 214. New Event Group Window

In this window, we set the name of the new event group and its icon. Click the **Create** button to create the event group. This will display the Edit Event Group Filters window.

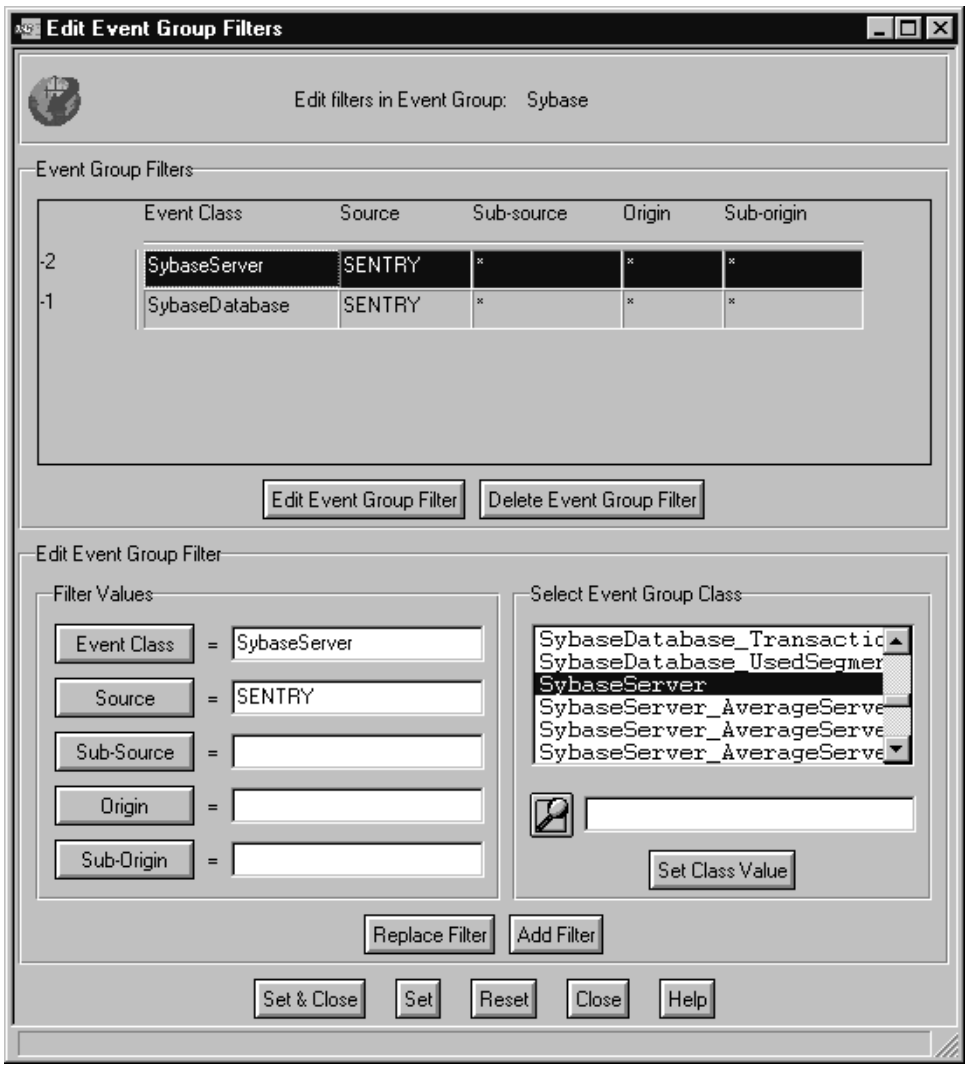


Figure 215. Edit Event Group Filters Window

In this window, we create the filter for the event group. We decide to create a filter each for the Sybase server and the Sybase database event class. In order to do this, we have to select the source first. We click on the **Source** button and on the right side of the window the different sources are listed. We select **SENTRY**, because the classes are defined in this group. Second, we click on the **Event Class** button and then on **SybaseServer** in the right list as shown in Figure 215 on page 227. For the other three filter values, SubSource, Origin and Sub-Origin, we leave the fields blank, which means

that no more filter criteria are specified. Then we click on **Add Filter** to add this filter to the event group Sybase.

We do the same for the SybaseDatabase event class. We click on the **Set&Close** button to commit the filter specification in the Sybase event group.

3.6.8.3 Configuring Sybase Monitors for TEC Events

Now to we have to edit the Sybase-related monitors to forward the events to TEC. Being in the TME 10 Distributed Monitoring Profile Properties window, select the monitor you want to forward to TEC and click the **Edit Monitor...** button as shown in the following figure.

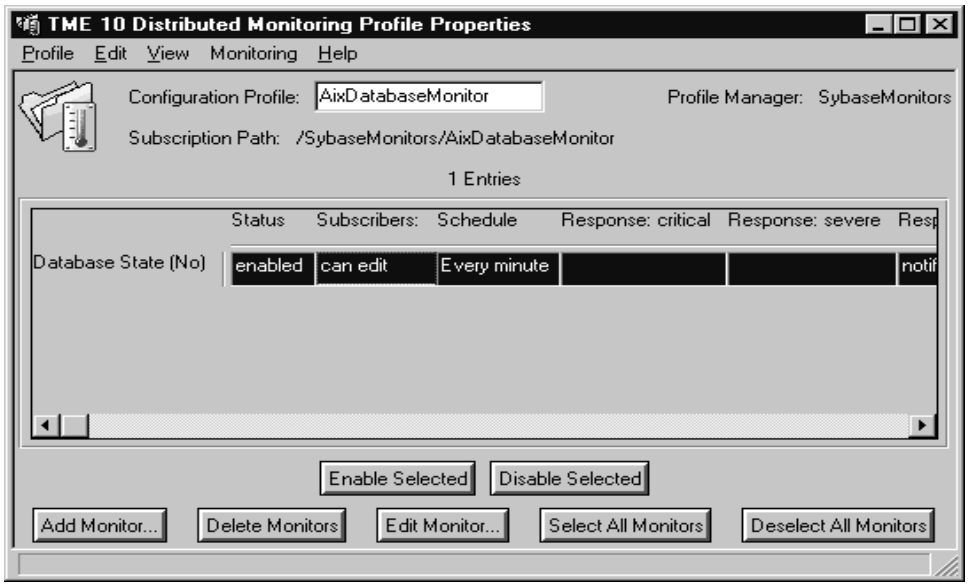


Figure 216. TME 10 Distributed Monitoring Profile Properties Window

This will display the Edit Monitor window. We fill in the appropriate values as shown in the following figure and select the check box **Send Enterprise Console event**. Additionally, we specify our TEC server EventServer as the destination for the events as shown in the following figure.

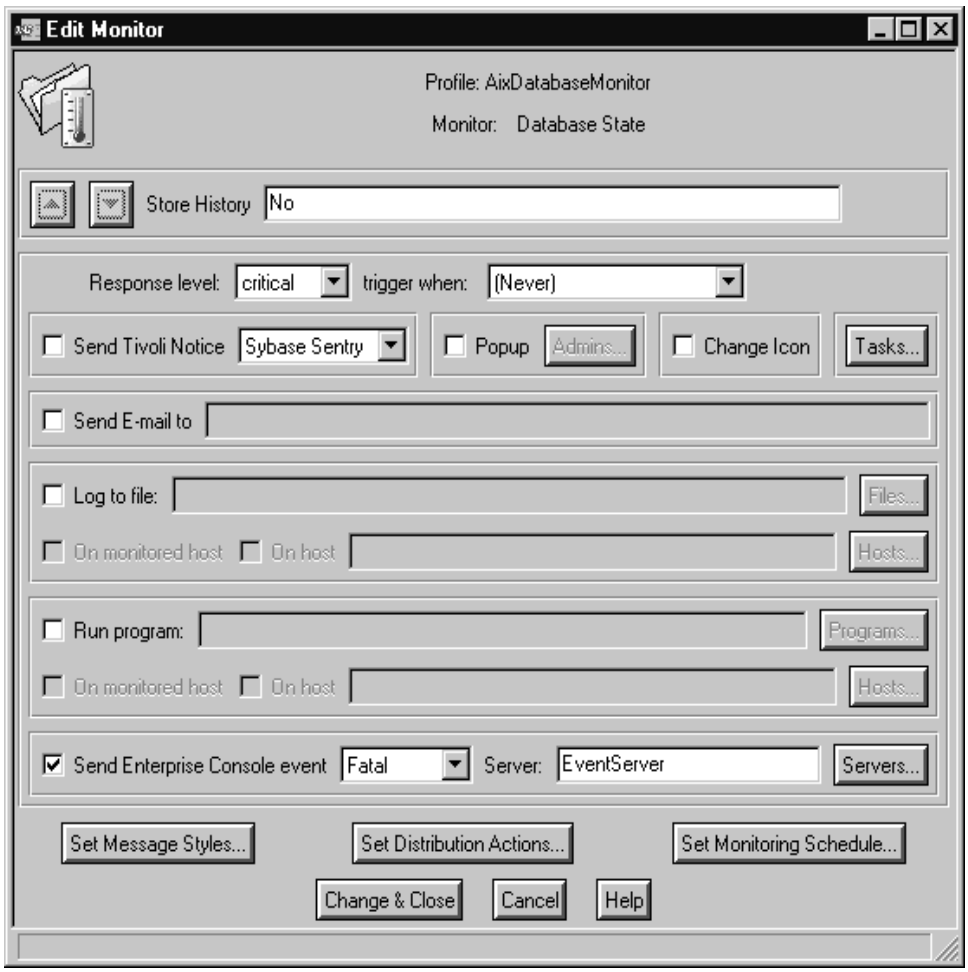


Figure 217. Edit Monitor Window

We select the **Change & Close** button to save the monitor attributes. Afterwards we redistribute the monitor to the Sybase databases to get the changes into effect.

To check if you are receiving the events on TEC, double-click on the event console and then double-click the event group that contains the filter for this monitor (Sybase in our example). If the events were received, your event group will display a window like the following.

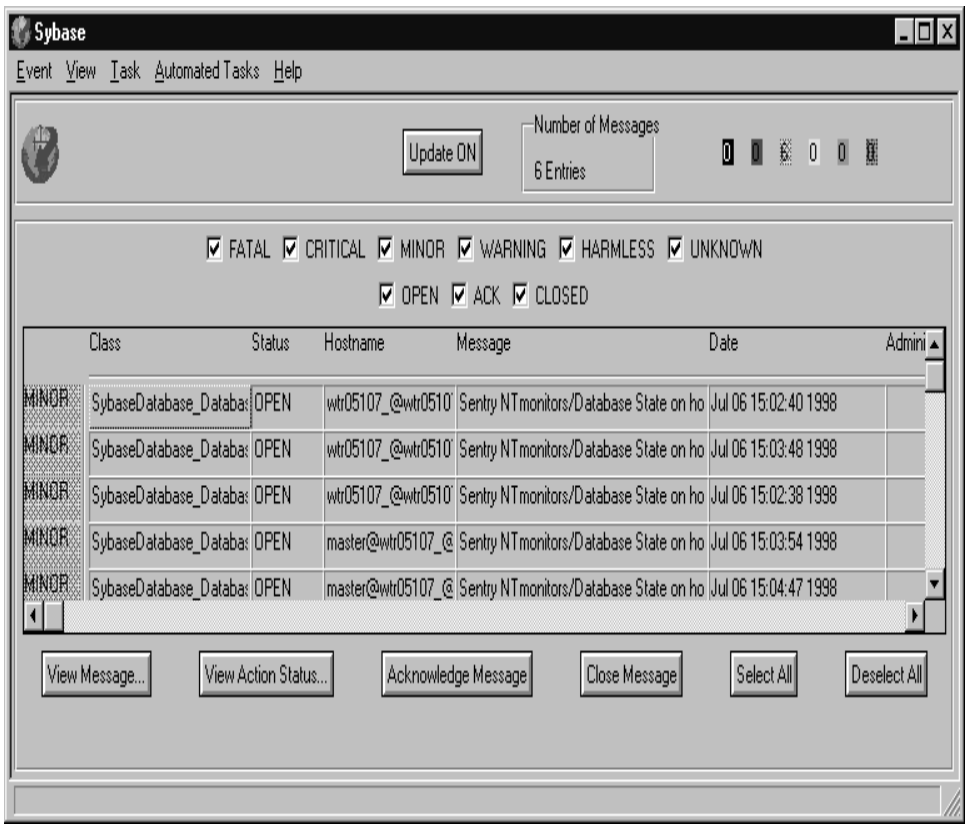


Figure 218. Sybase Window

We have all the events received from Tivoli Manager for Sybase. If we want to check the message of any specific event, we double-click on the message. This will display a window like the following.

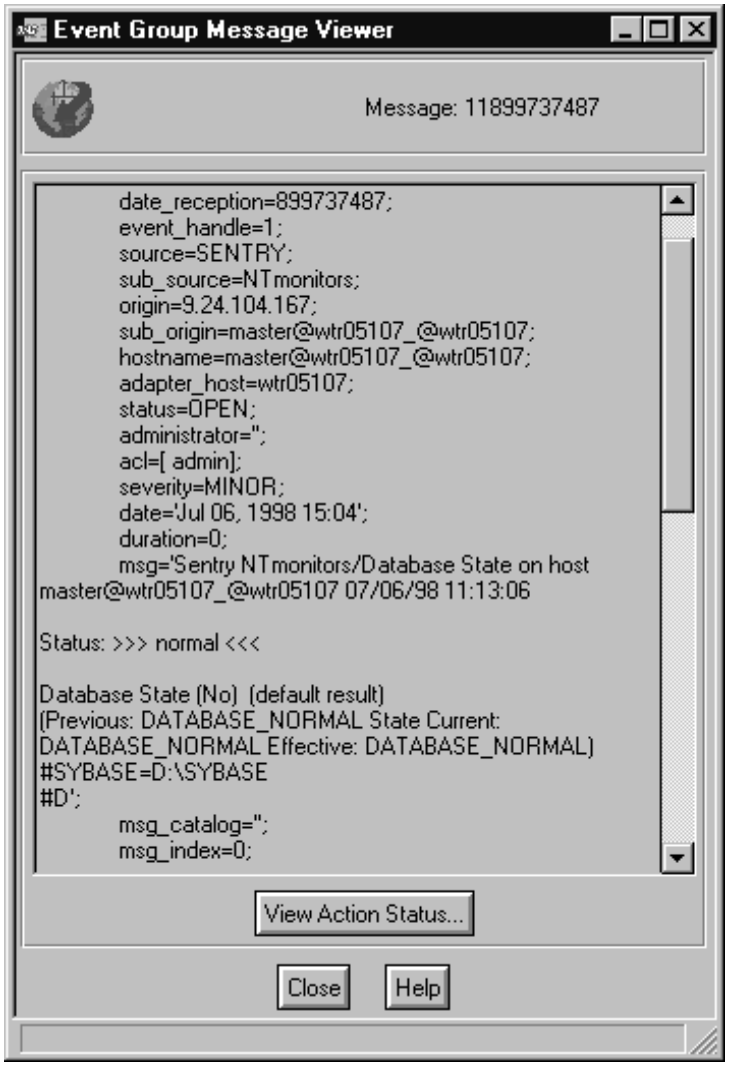


Figure 219. Event Group Message Viewer Window

In this window, we can see the source of our monitor which is SENTRY, and the status of the database.

Chapter 4. Tivoli Manager for MS SQL

In this chapter we introduce the Tivoli Manager for MS SQL. We show how to install the module and then perform database management scenarios in our environment.

In this chapter we assume that you are familiar with the Tivoli Framework and the Tivoli core applications.

4.1 Overview and Objective

In this chapter we perform all the necessary steps to get Tivoli Manager for MS SQL Server up and running. MS SQL Server is installed on an Windows NT system and set up within our environment so it can be managed from the Tivoli Framework.

We perform the following tasks:

- Installing and configuring MS SQL
- Installing Tivoli Manager for MS SQL
- Assigning TMR roles
- Registering MS SQL databases
- Managing MS SQL databases
- Monitoring MS SQL using Tivoli Distributed Monitoring
- Event forwarding to Tivoli Enterprise Console

4.2 Prerequisites

Tivoli Manager for MS SQL Server Version 1.0 consists of the following two modules:

- Tivoli Manager for MS SQL Server - Framework
- Tivoli Manager for MS SQL Server - Distributed Monitoring

Tivoli Manager for MS SQL Server 1.0 is compatible with TME 10 Framework Version 3.1 or higher and all versions of Tivoli Enterprise Console. TME 10 Distributed Monitoring 3.0.2 or higher needs to be installed before the Tivoli Manager for MS SQL Server.

This version of Tivoli Manager for MS SQL Server - Framework can manage MS SQL Server Versions 4.2 6.0 and 6.5

The Windows NT 4.0 managed nodes have Service Pack 3 installed

We suggest that the release notes be reviewed before installation.

4.3 Extending Our TMR Setup

An additional machine is added to the TMR setup. This machine is running MS SQL Server 6.5.

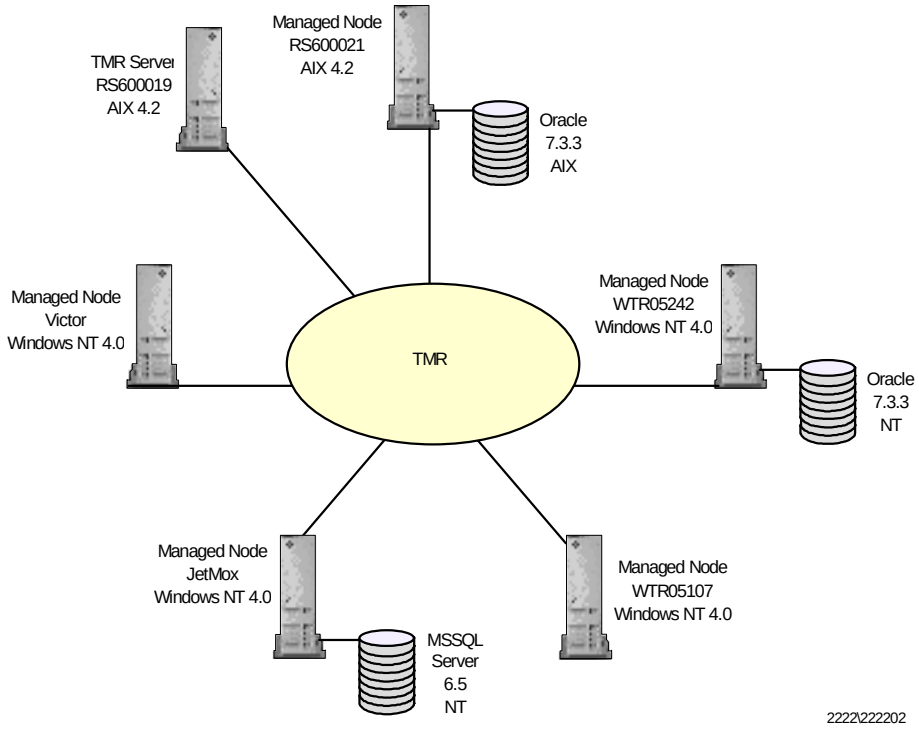


Figure 220. Extended TMR Setup

The configuration of this new managed node is as follows.

Managed Node	jetmox
Platform	Windows NT 4.0
Hardware	Intel Pentium

Managed Node	jetmox
Software	TME 10 Framework 3.2 MS-SQL Server 6.5 for NT
Patches	3.2-TMF-0002 3.2-TMF-0007 Windows NT Service Pack 3

4.4 Setting Up MS SQL

In this section we cover how to install a fresh copy MS SQL Server 6.5 onto a Windows NT 4.0 workstation. In this scenario we are installing MS SQL Server 6.5 from a CD-ROM. Ensure that the Windows NT account, which is being used to install MS SQL Server, has administrative privileges.

From the CD-ROM directory listing change into the i386 directory. Run a file called Setup.exe. After entering some registration details, the window in Figure 221 on page 235 will appear.

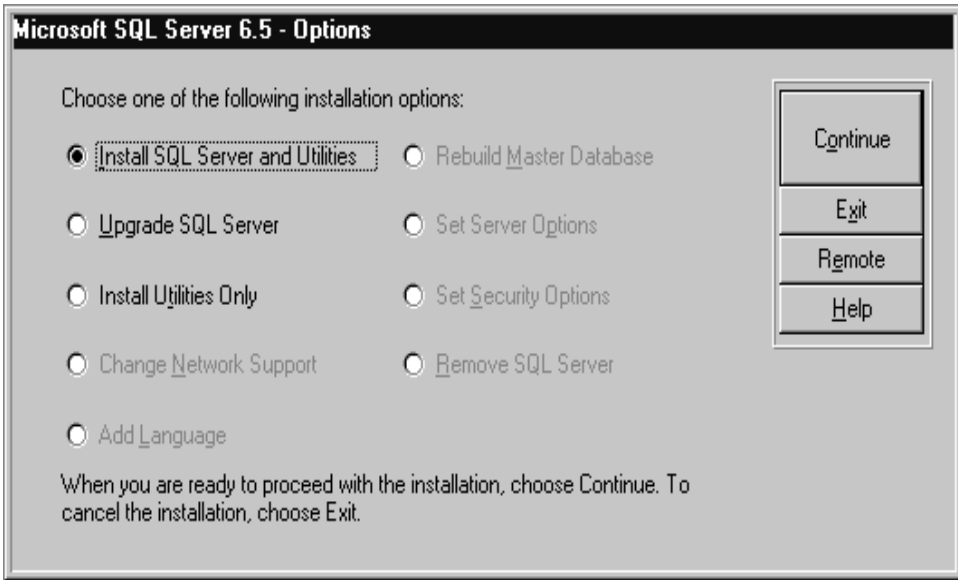


Figure 221. Microsoft SQL Server 6.5 - Options Window

Three types of installation are possible, select the first one **Install SQL Server and Utilities** and select **Continue** to proceed to the next step.

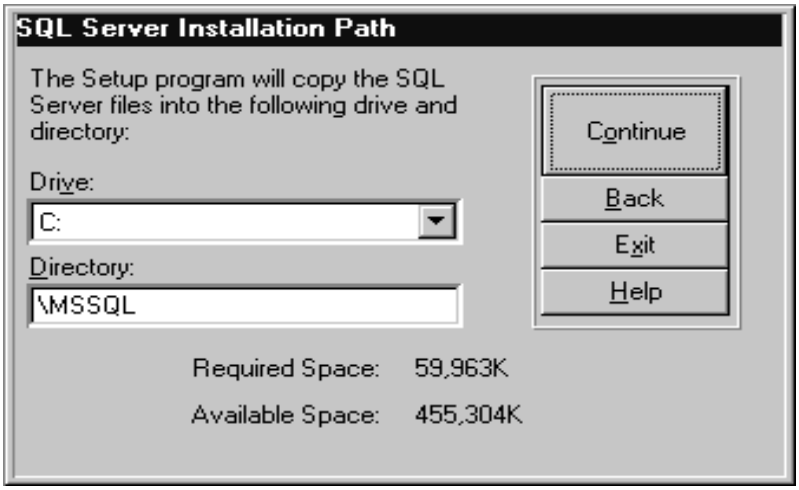


Figure 222. SQL Server Installation Path Window

The installation will then ask for the directory where to install the software. The default is MSSQL. We suggest that the installation should be performed on an NTFS partition. Our installation will be on C:\MSSQL. Select **Continue** to proceed.

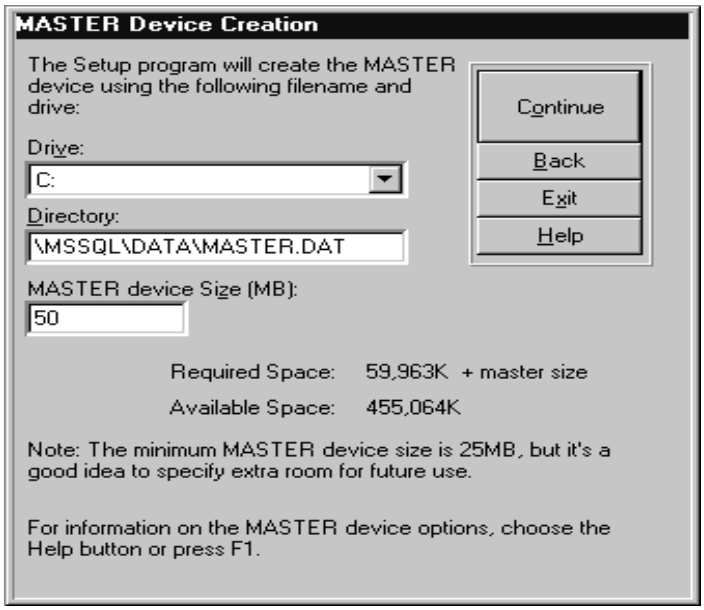


Figure 223. Master Device Creation Window

The next part of the installation will then ask for the drive, directory and site of the master device. We suggest that the defaults be taken here unless you are an experienced database administrator.

The Master Device is a file that contains the databases to be used by MS SQL Server. Note that we did make a change to the default value here from 25 to 50 MB for the size of the Master Device. The next window will ask for a character set and sort order. Take the default here for both the character set and sort order.

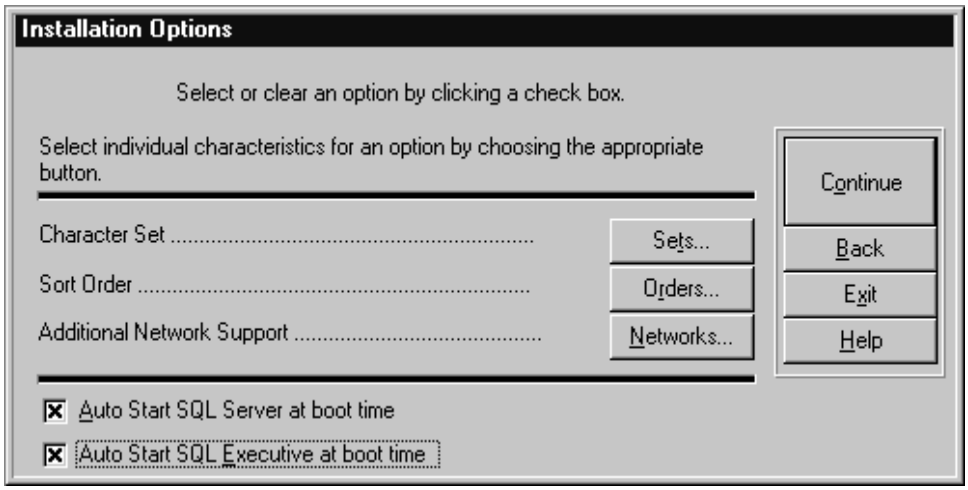


Figure 224. Installation Options Window

Another change will be made here. Select **Networks...**. A selection of protocols will be presented. The default here is Named Pipes. We are running over a TCP/IP network and install this option by selecting the **TCP/IP Sockets** entry.

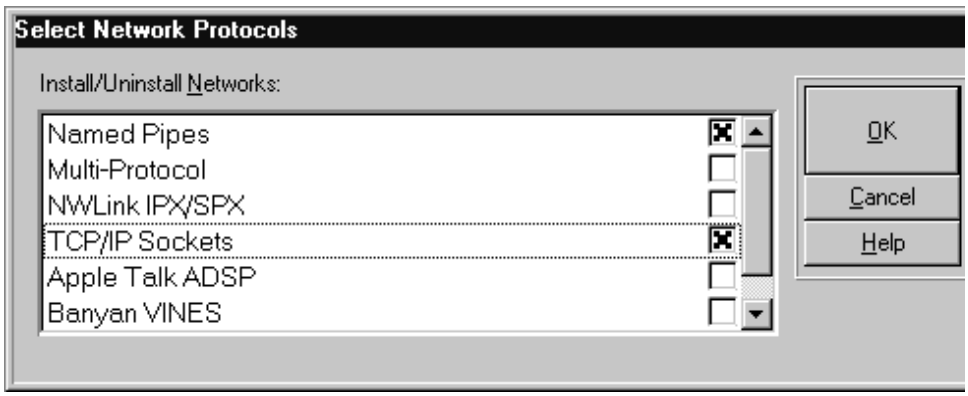


Figure 225. Select Network Protocols Window

The next step is to decide whether to start MS SQL Server as a service on startup or not. We will change the default value here by selecting the **Auto Start SQL Server at boot time** check box in Figure 224 on page 237. The last part of the installation will require that an account be associated with the MS SQL Executive service. Windows NT requires that this service be associated with a user. We have set up a user SQLServAcc, which has administrative access and can be used to start up services. Note that we have also selected **Auto Start SQL Executive at boot time**. Select **Continue** to proceed to the next step.

On completion of this step, the setup program will begin the MS SQL Server installation by copying files from the CD-ROM to the hard disk drive. After installation is completed (as in the Oracle installation 2.5.2, “Setting Up Oracle on Windows NT 4.0” on page 24) there will be new services added. Check and make sure that these services exist from the services applet from the control panel.

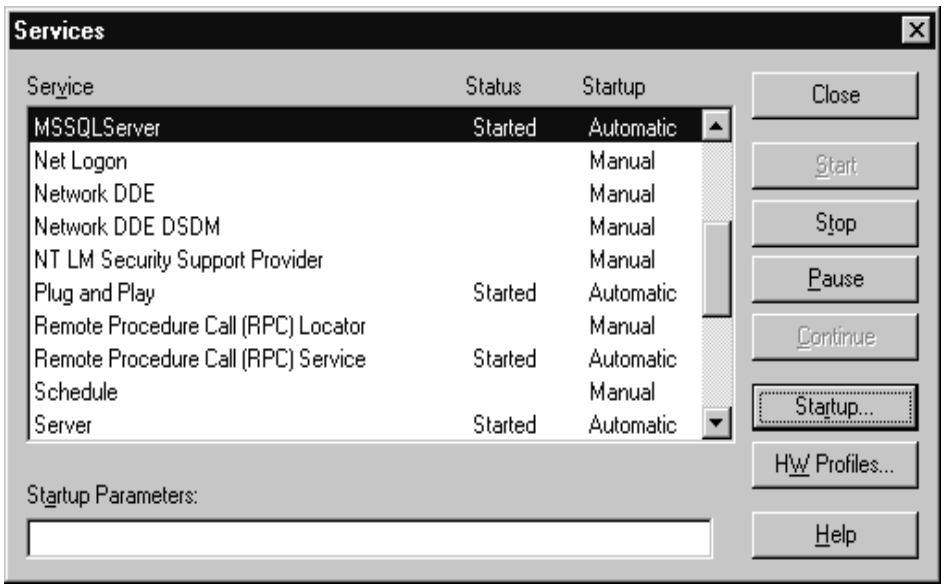


Figure 226. NT Services Window

There should be SQL Server Executive Service and the MSSQL Server services on this list.

Note that these services have been selected to run on startup, automatically. This can be changed by selecting **Startup...** and the appropriate action. If the installation is successful a Microsoft SQL Server 6.5 window will appear.

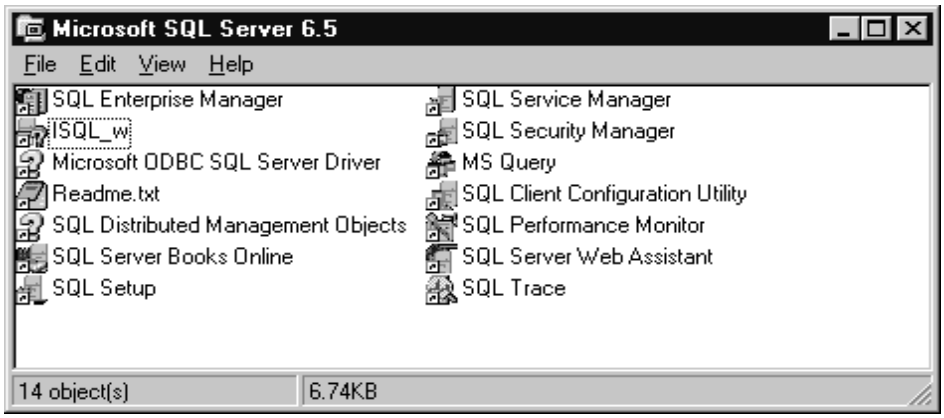


Figure 227. Microsoft SQL Server 6.5 Window

The window above lists the products installed by default for MS SQL Server.

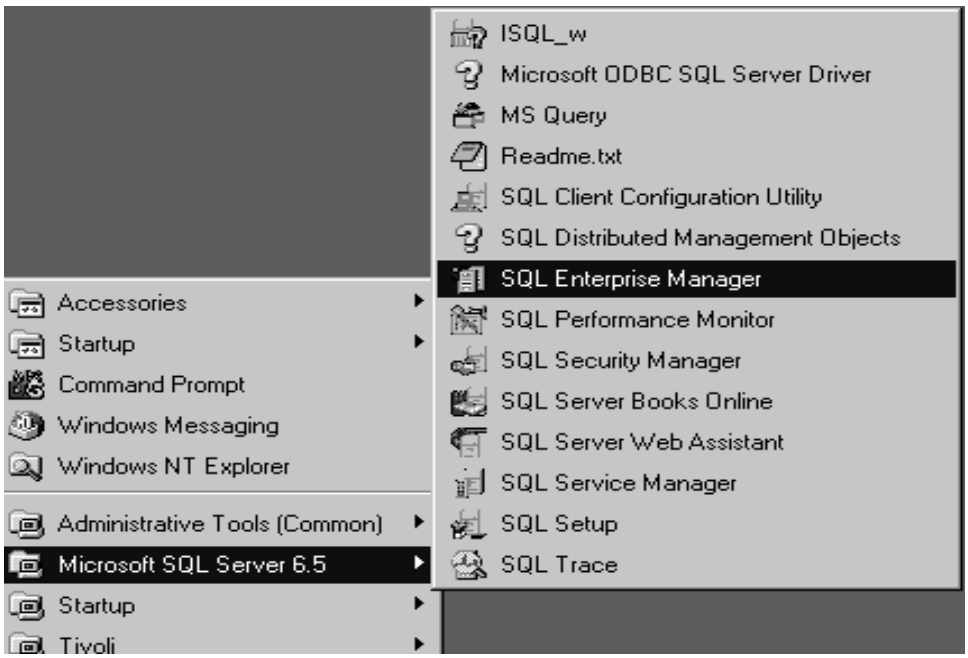


Figure 228. Microsoft SQL Server 6.5 Window

The final step in installing MS SQL Server is to register the server. This is done using the SQL Enterprise Manager. From the Windows NT **Start** menu navigate to the **MS SQL Server 6.5** pull-down box and select the **SQL Enterprise Manager**. The following window will appear.

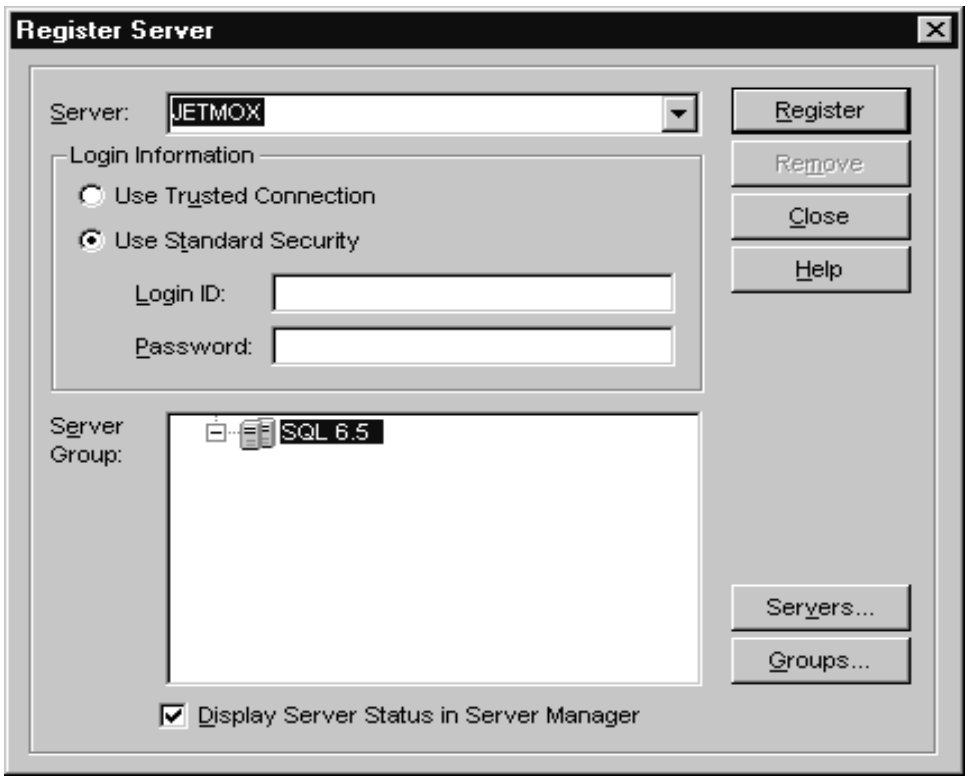


Figure 229. Register Server Window

Enter the name of server on which you have installed the database. In our example the server is called JETMOX. The default signon provided with MSSQL server is the sa signon with no password as default. Select **Register** to continue. The following window will then appear.

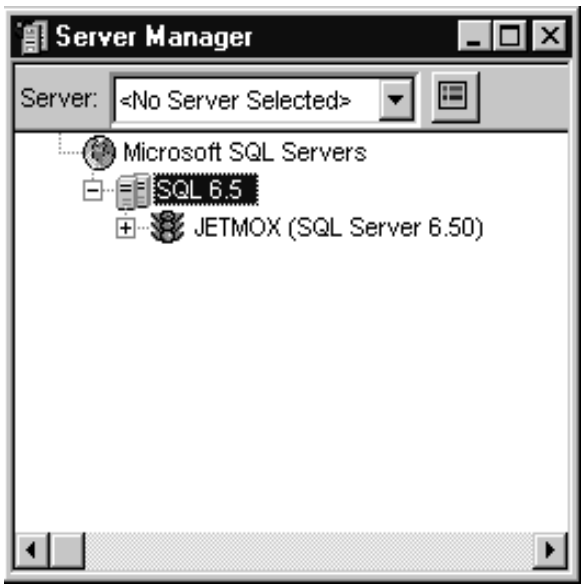


Figure 230. Server Manager Window

In the figure above JETMOX is shown to be running by the green light. There are three states that an SQL server can be in: green is running, red is stopped and yellow is paused.

4.5 Installing Tivoli Manager for MS SQL

In this section we discuss the installation of the Tivoli Manager for MS SQL and its components. Tivoli Manager for MS SQL is installed from the Tivoli Desktop in the same way as any other Tivoli application.

In the Tivoli Desktop main window we select **Desktop** from the menu bar and then **Install -> Install Product...** from the pull-down menu.

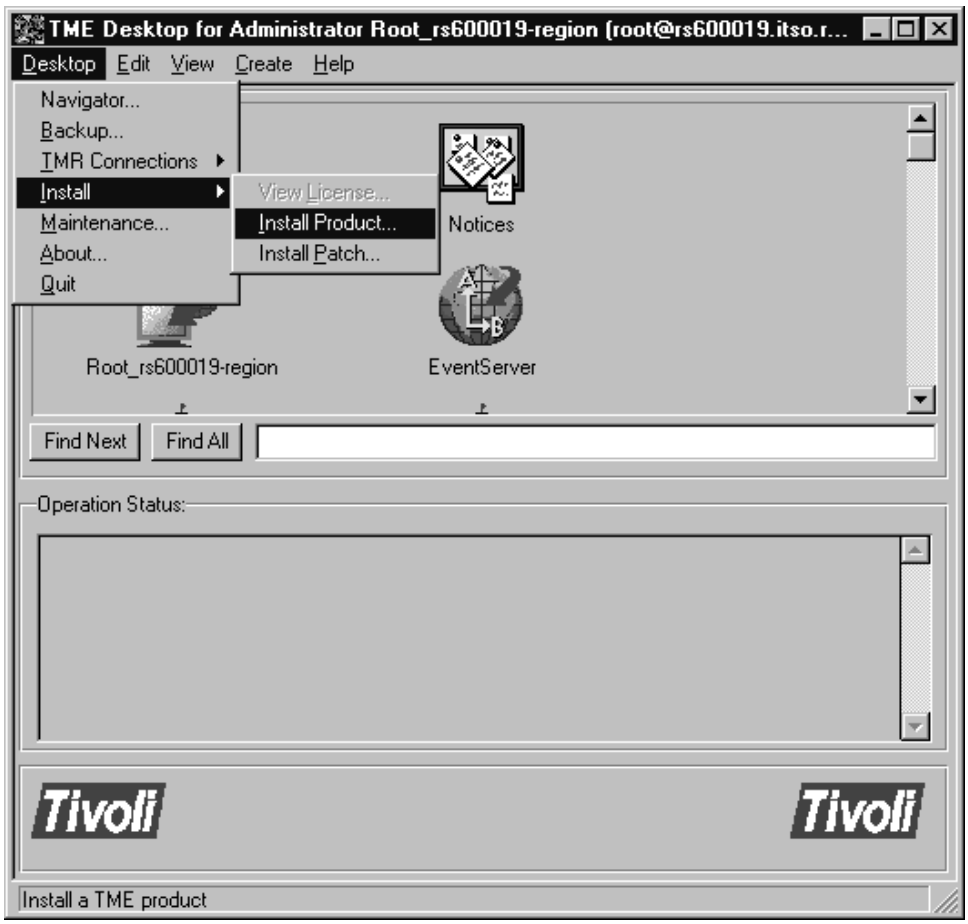


Figure 231. TME Desktop for Administrator Root_rs600019-region Window

The Install Product window will appear. Select the **Install Media...** button and then select the path to the CD-ROM drive or mount point of the Tivoli Manager for MS SQL CD. When finished, select the **Set Media & Close** button which will return the Install Product window as shown in Figure 232 on page 244

Figure 232. Install Product Window

In the Select Product to Install section there are now two components of Tivoli Manager for MS SQL Server. The framework component will need to be installed first. The TME 10 Module for MS SQL Server - Framework must be installed onto the TMR server plus any NT clients that you wish to manage the SQL Server.

Click on **TME 10 Module for Microsoft SQL Server - Framework, Version 1.0**. Then select the TMR server and any managed nodes that need to have this module installed. These managed nodes should either have MS SQL Server installed or be managed nodes that are to be used to administer the

Tivoli Manager for MS SQL Server. After you are satisfied with the selections select the **Install** button. The following window will appear.

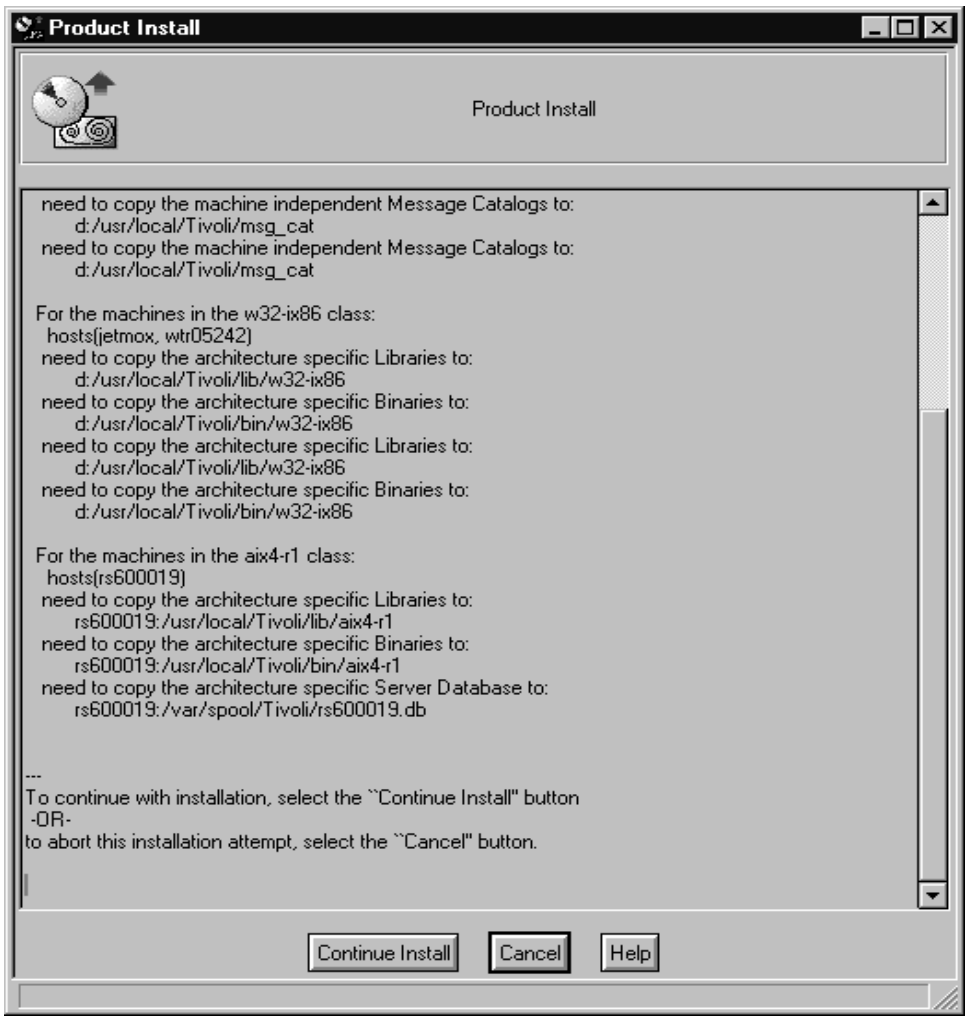


Figure 233. Product Install Window

Review the messages carefully and if no problems are reported, select the **Continue Install** button. This will start the actual installation. Messages will appear in the window showing the status of each step of the installation until eventually the Finished Product installation message appears. Select **Close** to get back to the Install Product window as shown in Figure 232 on page 244.

The same procedure is used to install the TME 10 Module for Microsoft SQL Server - Distributed Monitoring Version 1.0 component. This module needs only to be installed onto the TMR server. A patch will also need to be installed onto the TMR server for the Tivoli Manager for MS SQL Server to work correctly in our environment. This patch is 1.0-MSS-0001. This patch will update the Sentry inheritance names that have changed in Tivoli Distributed Monitoring 3.5. To install this patch download this file 1.0-MSS-0001 from ftp.tivoli.com. Uncompress the file using the tar -xvf from a command line session and install using the install patch option from the Tivoli Desktop. This patch will be used later on when creating rule bases for events in the Tivoli Enterprise Console.

4.6 Using Tivoli Manager for MS SQL Server

In this section we show how to set up and use Tivoli Manager for MS SQL Server.

4.6.1 Assigning TMR Roles to an Administrator

To demonstrate the Tivoli Manager for MS SQL Server in this environment we create a new policy region for MS SQL databases. This new region is called SQLserver. If you are unsure of how to do this refer to Section 2.7.4, “Creating an Oracle Region” on page 38.

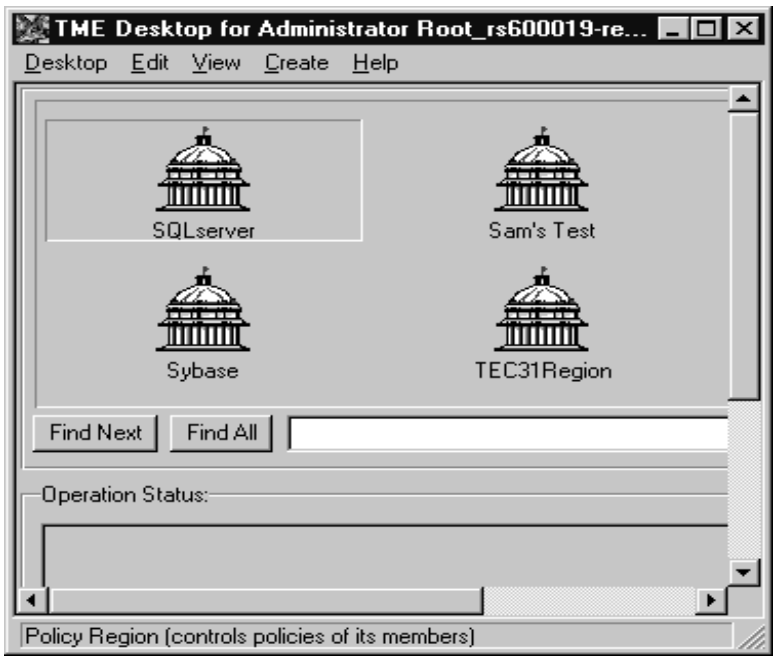


Figure 234. TME Desktop for Administrator

The next step will be to register the server in the SQLserver region. Before we can register the server, we have to assign the TMR roles and resource roles to the administrator. In order to do this open the Administrators window from the Tivoli Desktop. We only have one administrator in our environment. Select the **Root-rs6000-region** administrator with the right mouse button and then select **Edit TMR Roles...** from the pop-up menu as shown in the next figure.

Figure 235. Administrator Window

We select all available roles related to MS SQL Server and assign them to the administrator.

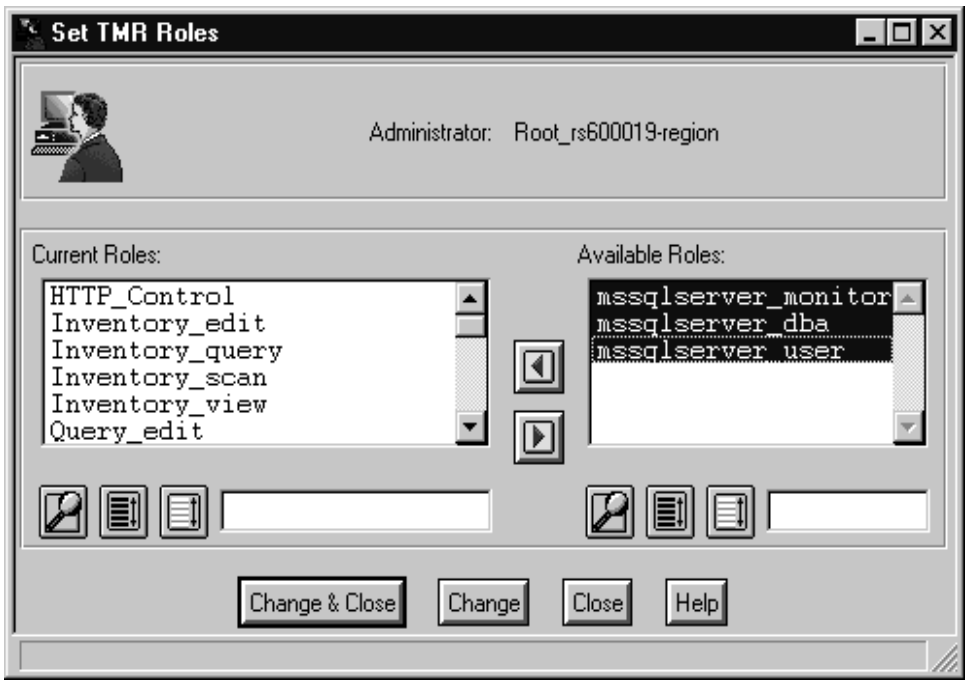


Figure 236. Set TMR Roles Window

There are three roles that can be added mssqlserver_monitor**,** mssqlserver_dba and mssqlserver_user. Each one of these roles has a different function.

- mssqlserver_monitor allows the user with this permission to run the distributed monitoring probe for Tivoli Manager for MS SQL Server.
- mssqlserver_dba allows the user with this permission to query shutdown or start-up a server. This role allows the user to perform all aspects of administration for the Tivoli Manager for MS SQL Server.
- mssqlserver_user allows the user with this permission to open and view the properties of the server only.

Add the role mssqlserver_dba to the list of current roles and then select **Change & Close** to continue.

The resource roles must also be changed. From Figure 235 on page 248 select **Edit Resource Roles...**. The following window will appear.

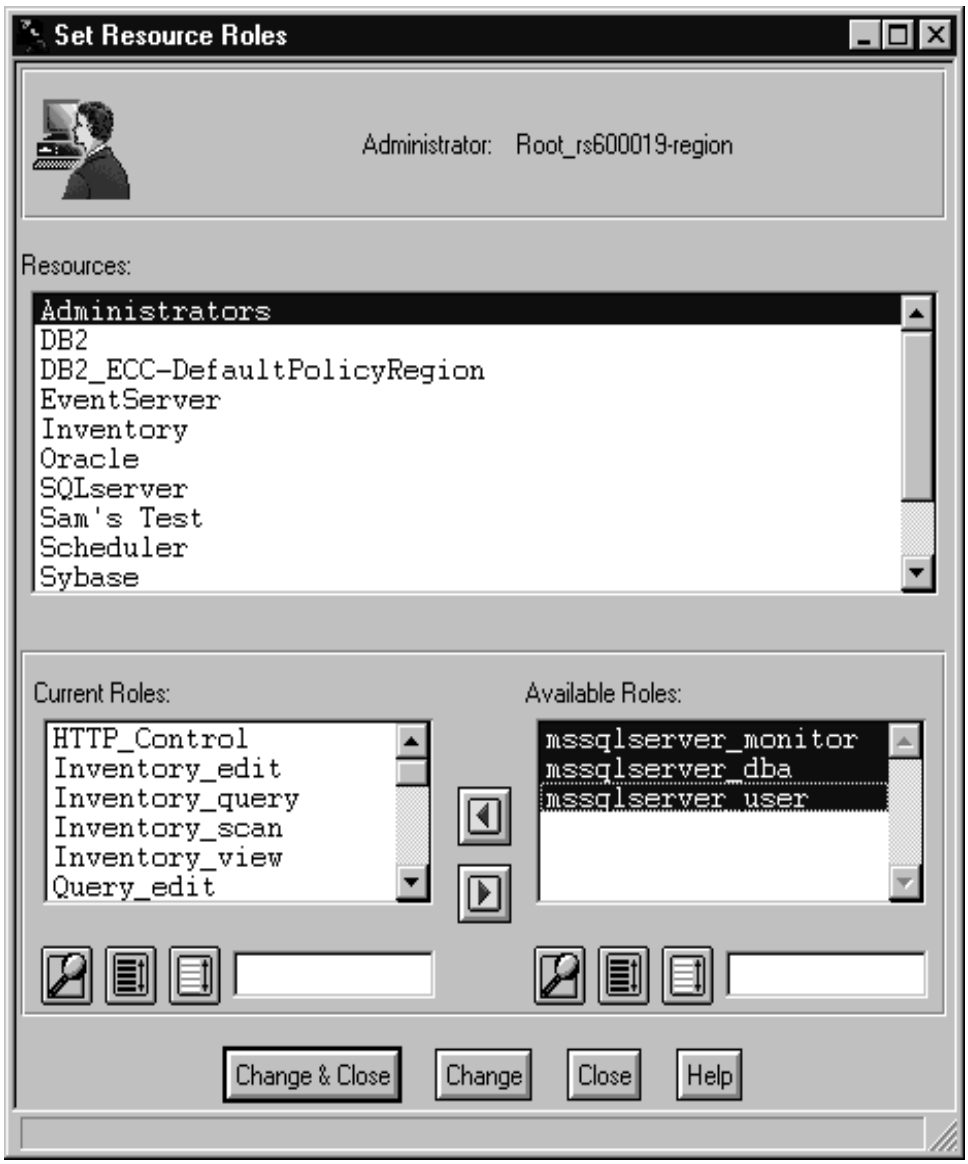


Figure 237. Set Resource Roles

From the Available Roles highlight **mssqlserver_monitor, mssqlserver_dba** and **mssqlserver_user** and any other roles that you want to assign to the administrator and move them into the **Current Roles** box. Then select **Change & Close**.

The final step in setting up this new policy region is to assign the MSSQLServer resource to the policy region. From the Tivoli Desktop open the SQLserver region.

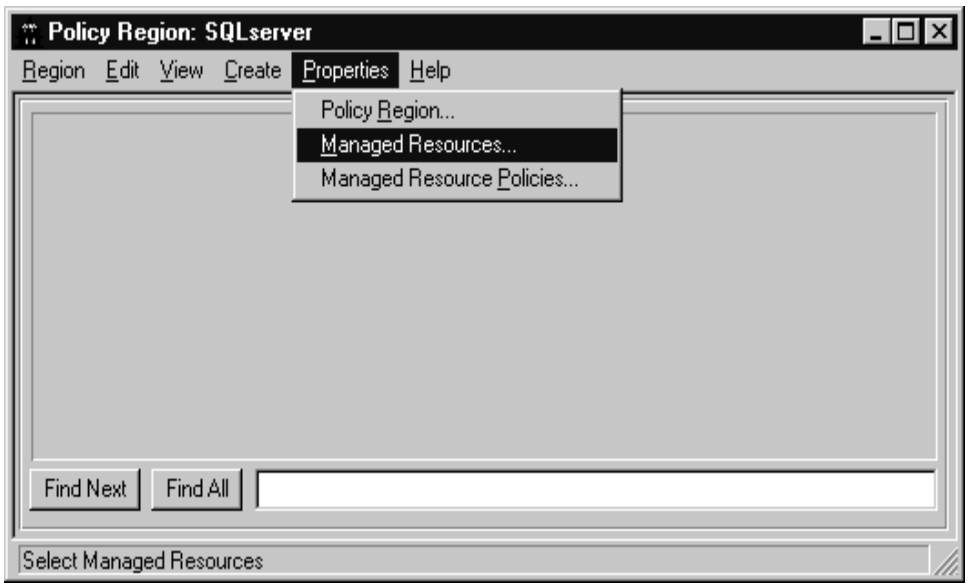


Figure 238. Policy Region SQL Server

Select **Managed Resources...** from the **Properties** pull-down menu. The following window will appear

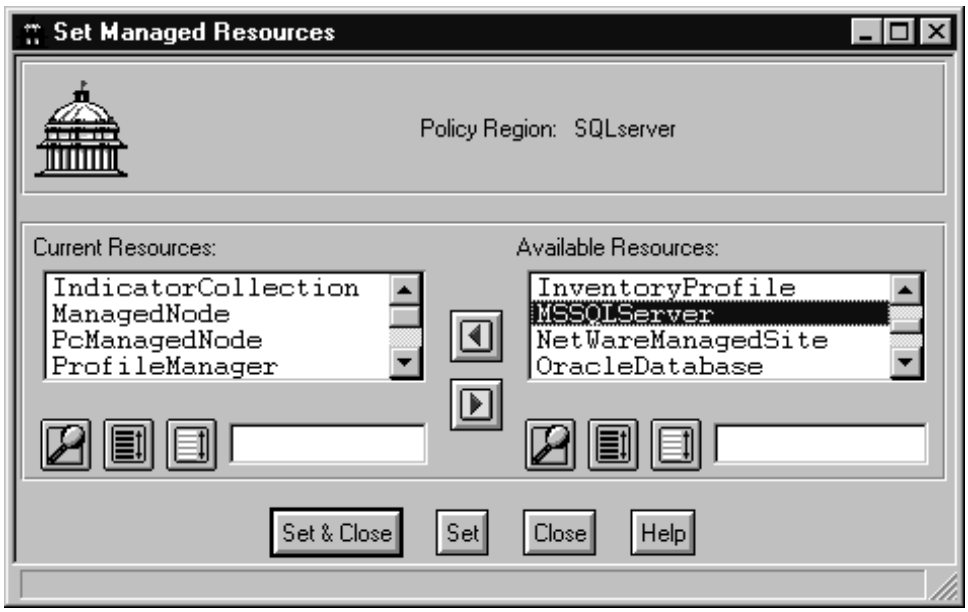


Figure 239. Set Managed Resources Window

From Available Resources select **MSSQLServer** and add it to the Current Resources by highlighting **MSSQLServer** and selecting the left arrow icon.

MSSQLServer will then appear in the list of resources that this policy region has the right to manage.

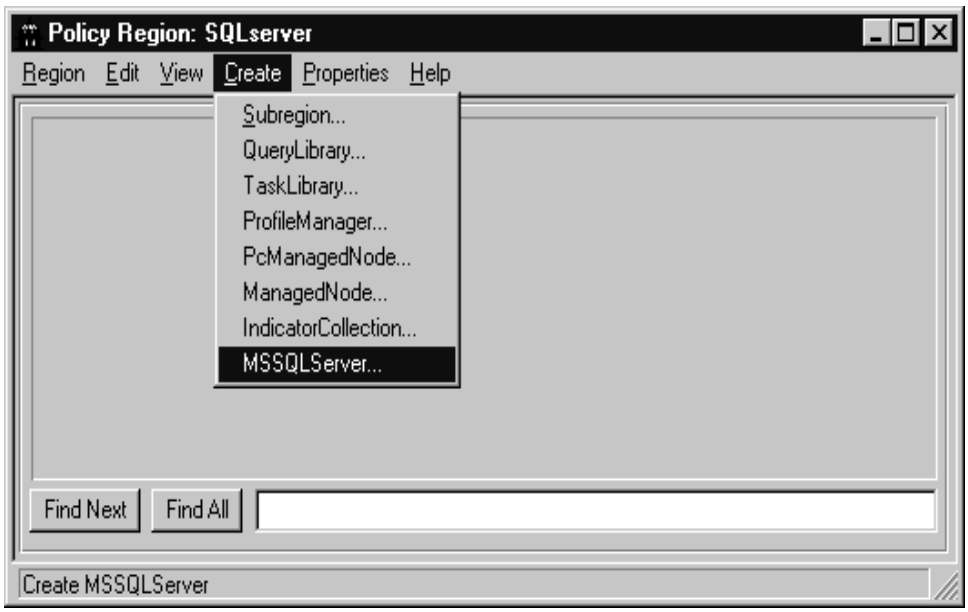


Figure 240. Policy Region: SQL Server

This region is now ready to be used and we can move to the next section where the MS SQL Server database will be registered.

4.6.2 What Is Open Database Connectivity (ODBC)?

Before we discuss how to register an MS SQL Server database we have a brief look into ODBC.

The Tivoli Manager for MS SQL Server uses Open Database Connectivity (ODBC) to connect to the MS SQL Server database. ODBC is an interface programming language that allows the user to connect to data sources conforming to ODBC specifications. ODBC in Windows NT is configured in the Control Panel by selecting the **ODBC** icon. MS SQL Server by default installs an ODBC driver under the System Data Source Name (DSN) with the name of LocalServer**.**

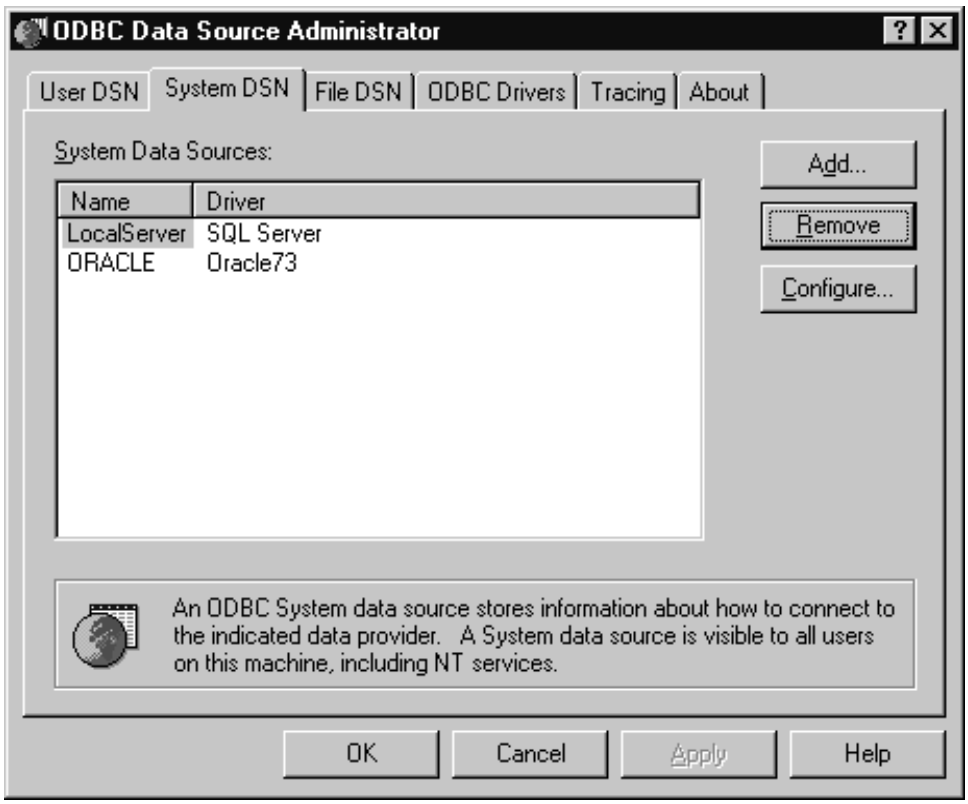


Figure 241. ODBC Data Source Administrator Window

Also shown in this window is an Oracle ODBC driver. By selecting **Configure...** the following window will appear.

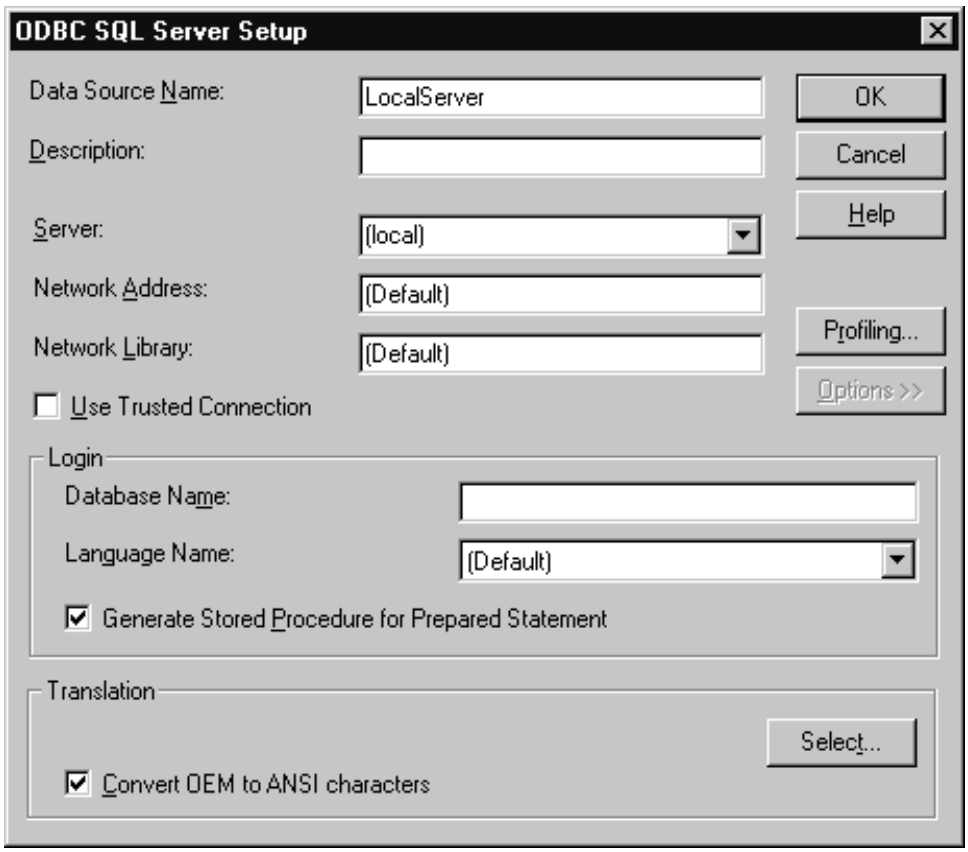


Figure 242. ODBC SQL Server Setup Window

This window summarizes most of the information that is required to get the MS SQL Server registered to the Tivoli Manager for MS SQL Server. Just a few things to note here. Most of the values that are used will be default since the managed node where the Tivoli Desktop is being run will have the MSSQL Server locally. Trusted Connection if selected will use NT integrated security. This allows the user to log in to an SQL server without supplying a separate user name or a password.

Taking these values into account we are now ready to register the MS SQL Server.

4.6.3 Registering an MS SQL Server Database

In this section we register an MS SQL Server Database. To register the database the user must have mssqlserver_dba and a senior or super role within the TMR.

In order to register a server follow these steps. From the Tivoli Desktop select the region in which the MS SQL Server will be registered. In the example here we have selected the SQLserver region.

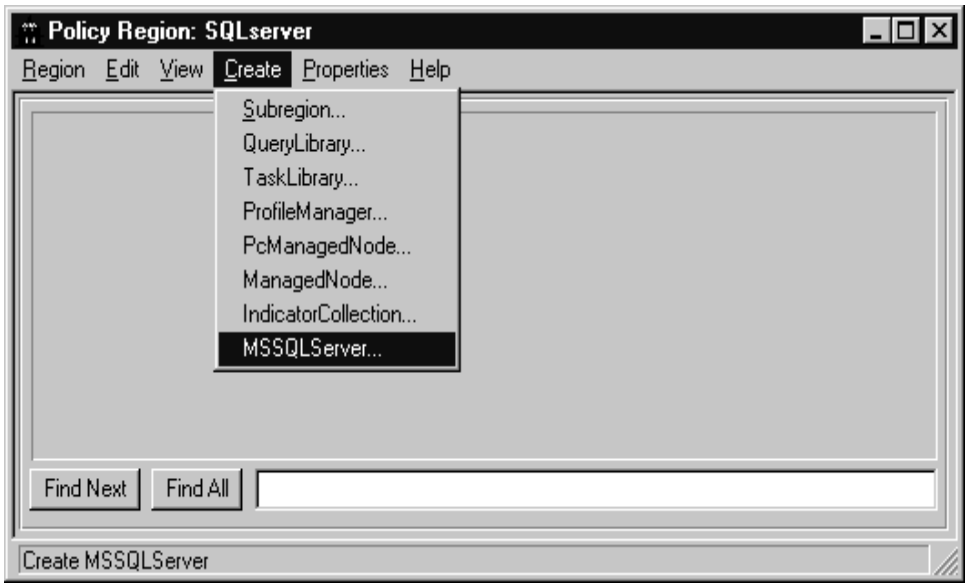


Figure 243. Policy Region: SQL Server Window

From the **Create** menu select **MSSQLServer...**. The following window will appear.

Figure 244. Register SQLServer

Enter values for the Data Source (obtained from the ODBC setup)**,** SQLServer Logon (default), Password (default) and Host Name (name of managed node where SQL Server is installed). In our example we have taken the values localserver, sa, no password and jetmox respectively. It is possible to register an SQL Server without confirmation of a connection. If you wish to do so, select the **Ignore Server Status** check box. This option is not selected for this installation. If a trusted connection is required, leave the SQLServer Login and Password fields blank.

If the installation is successful and the Data Source has been correctly defined, the following window will appear.

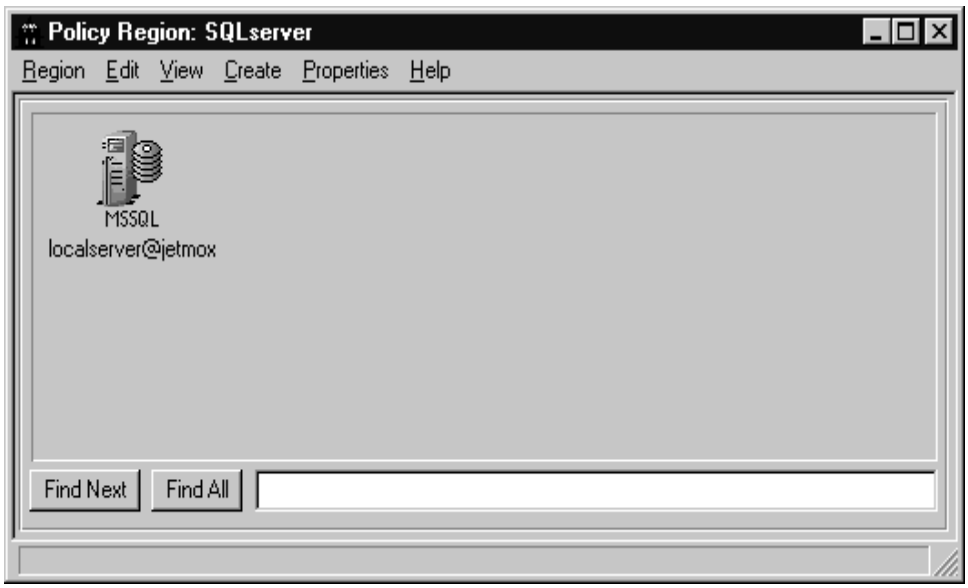


Figure 245. Policy Region: SQLserver Window

In this window the naming format of the icon is that of DataSourceName@Hostname. Here it is localserver@jetmox.

If the installation is unsuccessfu, a similar icon will appear as in Figure 245 on page 258 except that it will have a Shutdown logo across the middle of the icon. This will usually be due to an ODBC configuration problem.

Note

To aid you in troubleshooting connectivity problems there are two very useful tools. The first is ISQL_w. This tool can be used to connect to the default Master database to ensure that the user logon is working correctly and that the tables are available for viewing. This is a GUI interface for ISQL. The second is a utility called SQL Trace. This can be used to see requests made to the database. Both of these tools were used to ensure that the registration of the database under Tivoli was working properly.

4.6.4 Using an MS SQL Endpoint

An SQLServer endpoint has now been installed in the SQLServer policy region. In this section we cover what actions can be performed on this endpoint.

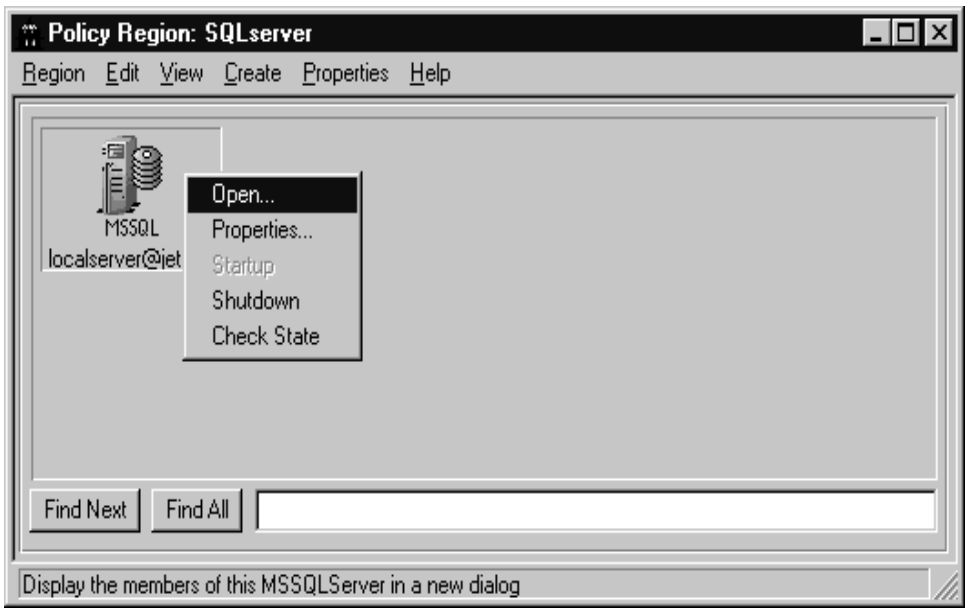


Figure 246. Policy Region: SQLserver

4.6.4.1 Opening an MS SQL Server

From the SQLserver policy region click the right mouse button on the **localserver@jetmox** icon and select **Open..** from the pop-up menu.This feature is available to a signon that has mssqlserver_user access. The next window will appear on the desktop.

Figure 247. localserver@jetmox Window

In this window there is a list of databases in the format DatabaseName@DataSource@Hostname. There are the default databases installed as well as one that we installed using an SQL script. The SQL admin and schema scripts from Tivoli Inventory were taken and executed via the ISQL_w interface. This created a new user called tivoli and a new database called inventory. Note that the Tivoli Manager for MS SQL Server automatically registers all the existing databases associated with this server.

4.6.4.2 Viewing MS SQL Server Properties

The next action that can be performed is that of viewing the properties of an MS SQL Server endpoint. This feature is available to a signon that has mssqlserver_user access. From Figure 246 on page 259 click the right mouse button on **localserver@jetmox** and select **Properties..** from the pop-up menu. The following window should appear on the desktop.

Figure 248. localserver@jetmox Window

In this window we can view the following values:

- DataSource: Name used in the ODBC to connect to this machine. In this case localserver has been used as the system DSN.
- SQL Server Login: User signon. In this case we have used the default system administrators signon: sa.
- Password: Password for the SQL Server User signon.
- Version: Version of SQL server being used.
- Host: Managed Node where SQL Server resides.

4.6.4.3 Shutting Down and Starting Up MS SQL Server

The next action that can be performed is that of shutting down and starting up of MS SQL Server. From Figure 246 on page 259 click the right mouse button on the server that is to be shut down. In our case it is localserver@jetmox. Select **Shutdown..** from the pop-up menu. This next window should appear on the desktop.

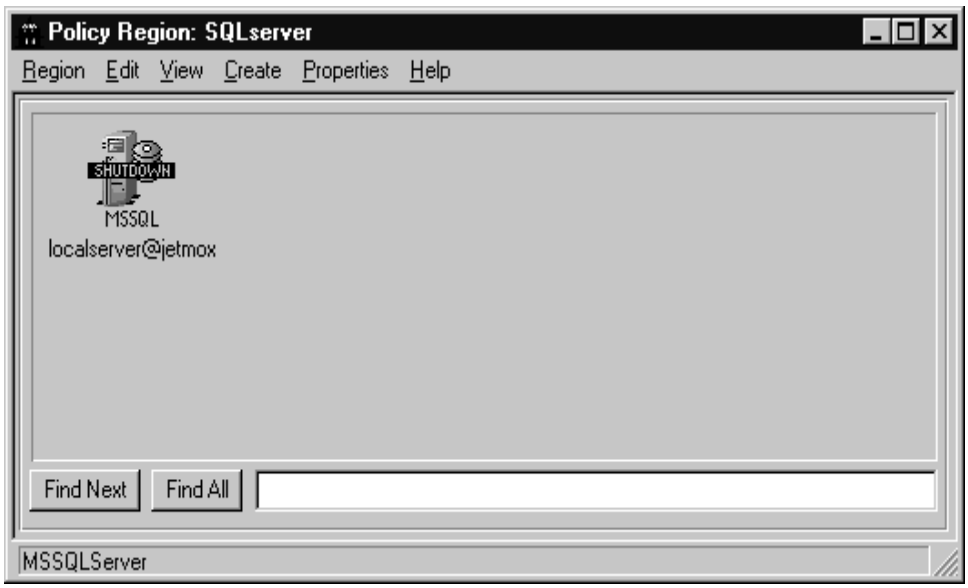


Figure 249. Policy Region: SQLserver

Note that you must have the mssqlserver_dba role in order to do this. If the account that is being used to shut down does not have this access, a general oserv failure will occur.

The next step will be to restart MS SQL Server which is in shutdown state.

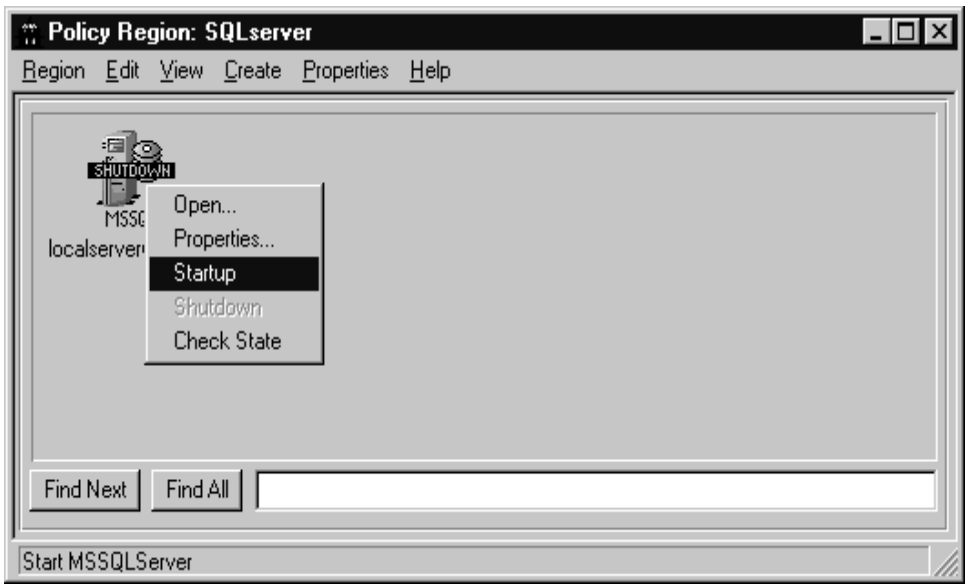


Figure 250. Policy Region: SQLserver

From the policy region window select a database that is in a shutdown state as indicated by the SHUTDOWN logo across this server's icon. Right click on this server and select **Startup..** from the pull-down menu. The user must have the mssqlserver_dba role in order to do this. If the account that is being used to shut down does not have this access, a general oserv failure will occur.

These changes will also be reflected in the MS SQL Service Manager.

Figure 251. SQL Service Manager Window

On a successful startup the server icon shows the up state as shown in the window below.

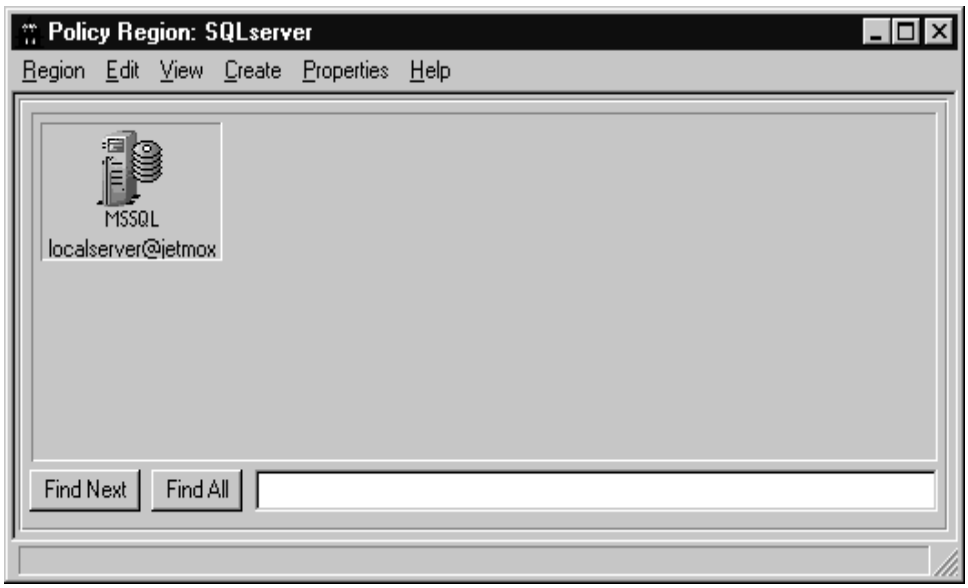


Figure 252. Policy Region: SQL Server

4.6.4.4 Checking the State of MS SQL Server

The next action that can be performed is that of checking the state of a server.

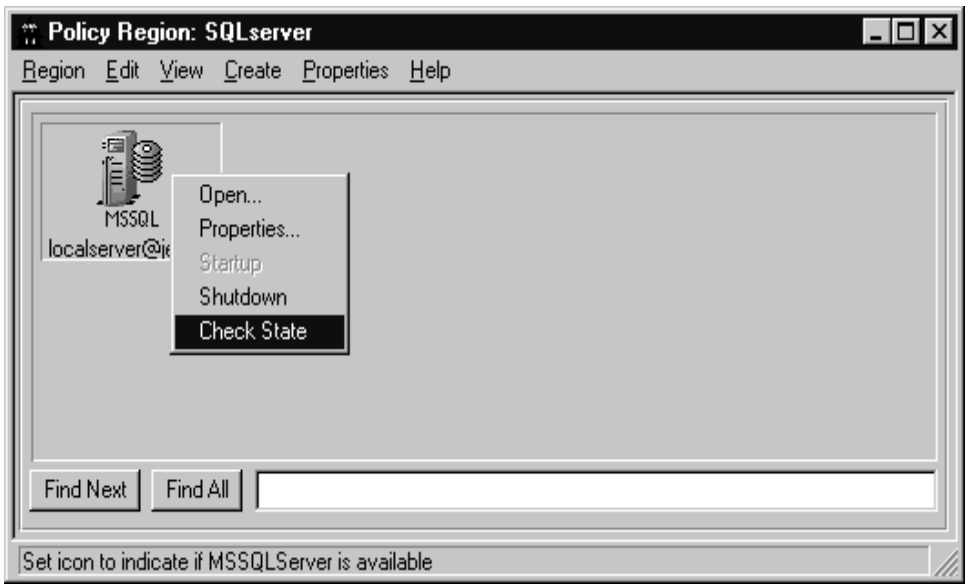


Figure 253. Policy Region SQLserver

As shown in Figure 251 on page 263 it is possible to shut down an MS SQL Server from outside the Tivoli Manager for MS SQL Server. If there is an external shutdown or a server is taken offline unexpectedly, the server icon will not reflect the changes of the new states unless one of the following occurs:

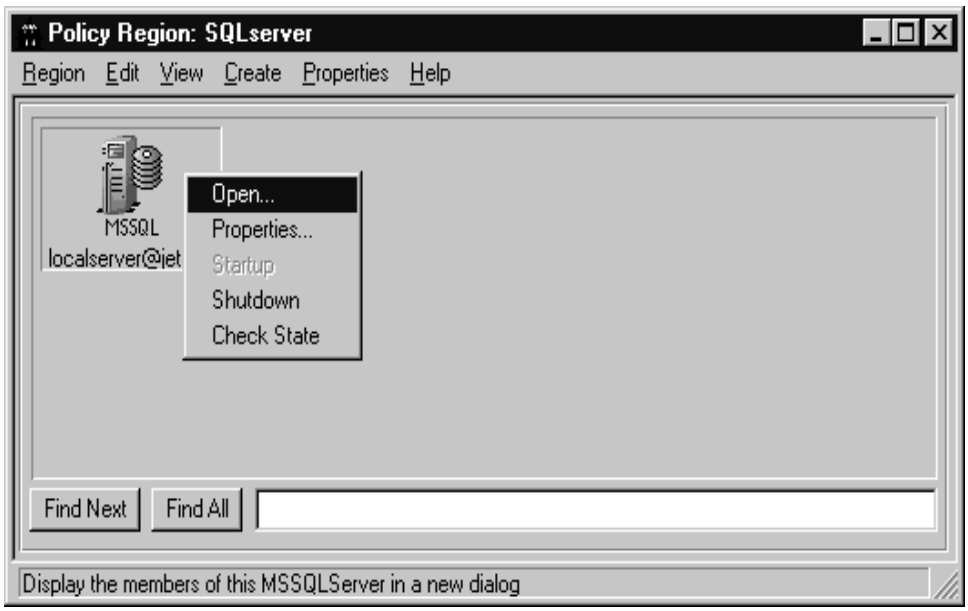
- A user with the mssqlserver_user role selects the **Check State** option by clicking the right mouse button onto the server that is to have the state checked. In our case it is localserver@jetmox. Select **Check State..** from the pop-up menu.
- An SQL Server State monitor checks the server.

4.6.5 Examining MS SQL Server Databases

In this section we briefly cover how to refresh a database and how to open a database endpoint.

The reason to refresh a database is used to keep the information on a registered database current. Using the check state option discussed in the previous section an example of a parallel can be drawn here. If an MS SQL DBA decides to drop or create new databases these changes will not be reflected in the Tivoli environment unless the refresh option is taken.

To refresh a the collection of databases that resides on a server use the following steps.



From the SQLserver policy region click the right mouse button on the **localserver@jetmox** and select **Open....** The following window will appear on the desktop.

Figure 254. localserver@jetmox Window

From the menu bar select **Server** and then **Refresh Databases** from the pull-down menu.

In Figure 254 on page 267 we can examine which profiles these databases have received. From this window select a database that will be examined, right-click on it and select **Open..** from the pull-down menu.

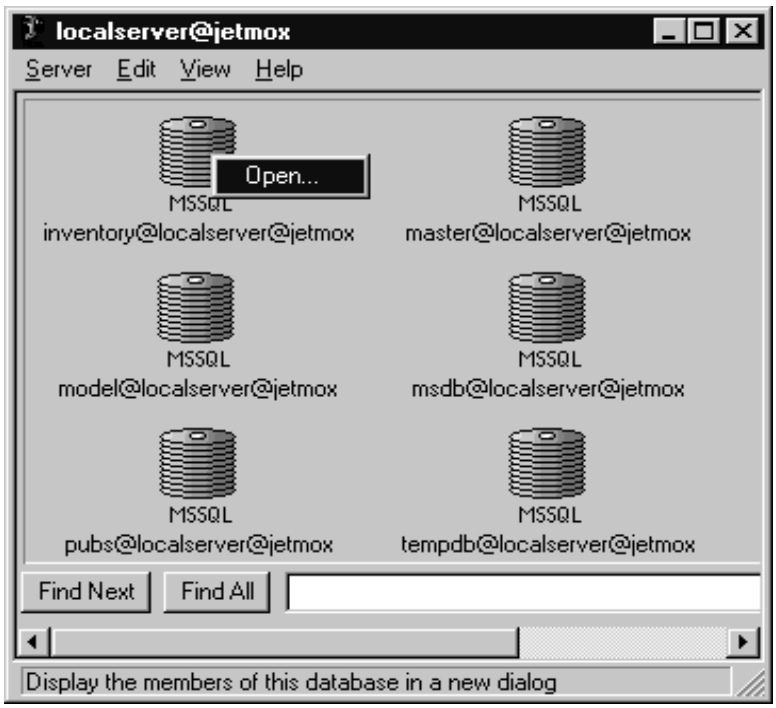


Figure 255. localserver@jetmox Window

The next window is empty as we have nothing distributed to this database endpoint as yet.

Figure 256. inventory@localserver@jetmox

4.6.6 Integrating Distributed Monitoring with MS SQL Server Module

In this section we discuss how to use the distributed monitoring component within the Tivoli Framework environment. We examine how the monitors work as well as the interaction between Tivoli Enterprise Console (TEC) and the Tivoli Manager for MS SQL Server - Distributed Monitoring component.

4.6.6.1 Installing the Distributed Monitoring Component

Installation of the Tivoli Manager for MS SQL Server - Distributed Monitoring component was covered in Section 4.5, “Installing Tivoli Manager for MS SQL” on page 242. Note that the distributed monitoring component need only be installed onto the TMR server.

4.6.6.2 Creating a Profile Manager and a Profile

In order to use the distributed monitoring component we need to create a profile manager under the SQLserver policy region that we have established.

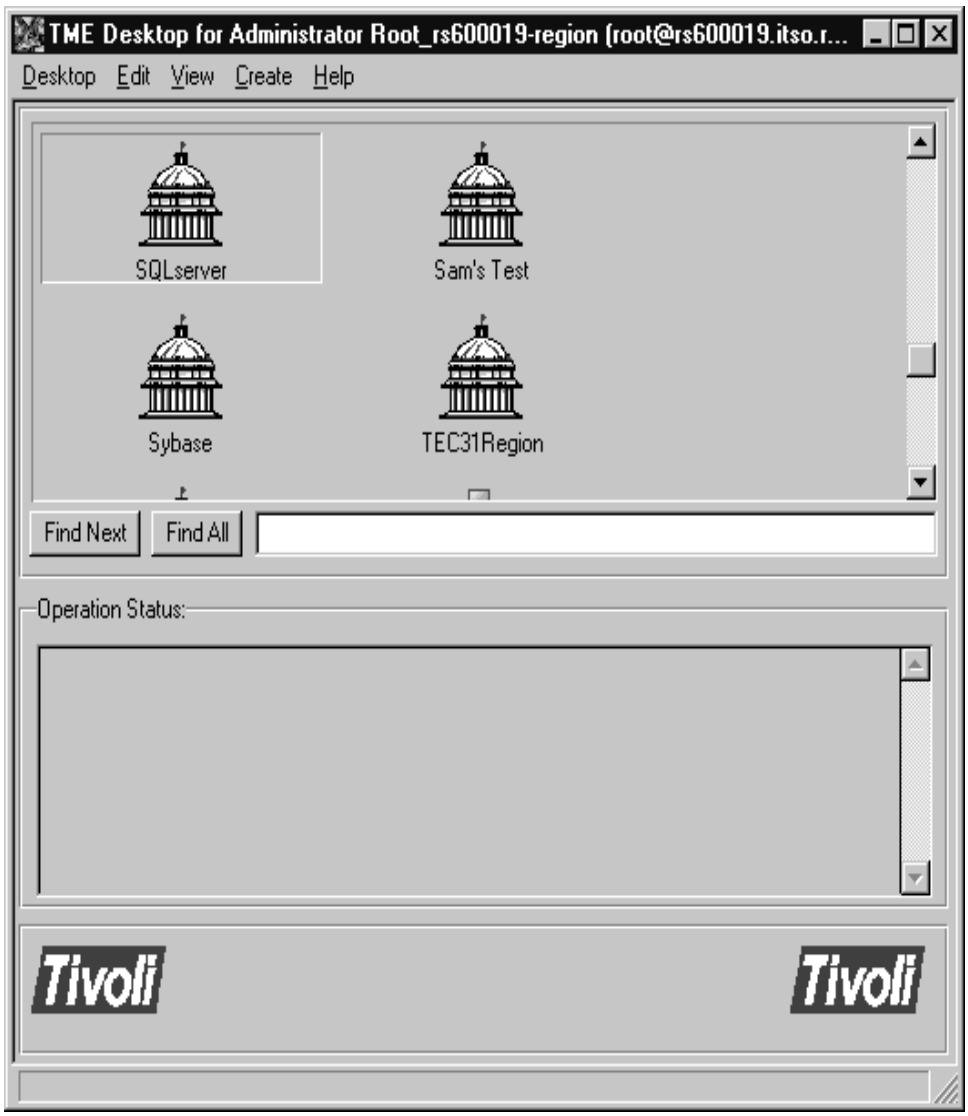


Figure 257. TME Desktop for Administrator Root

To get to this region double-click the **SQLserver** icon from the Tivoli Desktop as shown above. The following window will appear.

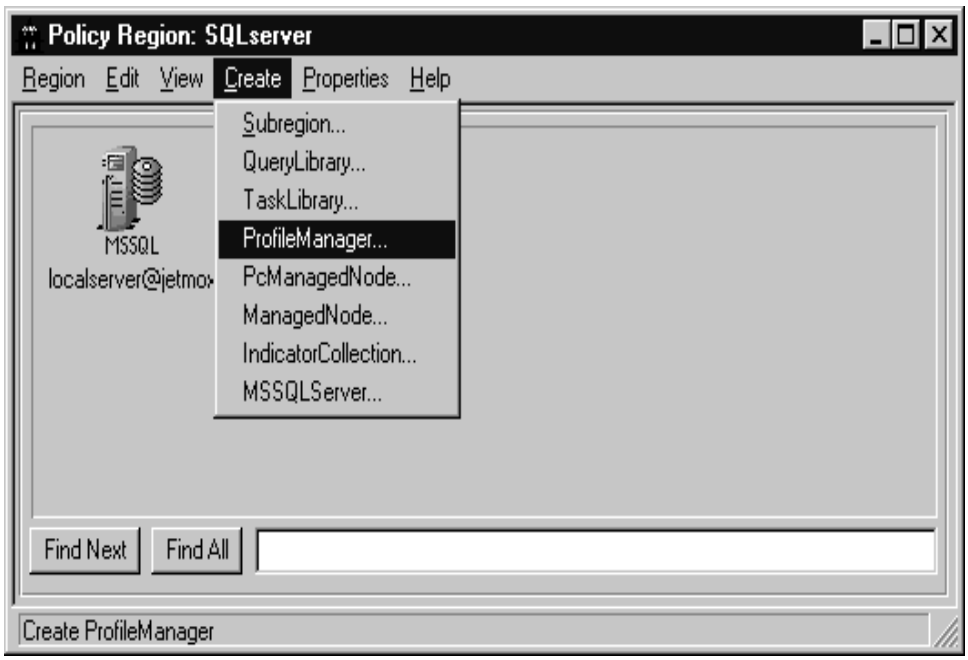


Figure 258. Policy Region: SQLserver

From the SQLserver policy region window select **Create** and then select **ProfileManager..** from the pull-down menu. The following window will appear.

Figure 259. Create Profile Manager

In this window we enter the name of the profile manager. In this profile manager we have selected the name to be MSSQLprofile. Note that we did not select the Dataless Endpoint Mode check box. Select **Create & Close** to continue.

Figure 260. Policy Region: SQLserver

There is a new icon within the policy region MSSQLprofile. Double-click this icon and the following window will appear.

Figure 261. Profile Manager Window

To use the profile manager a profile must be created. From the menu bar in Figure 261 on page 274 select **Create** and then **Profile...** from the pull-down menu. The following window will appear.

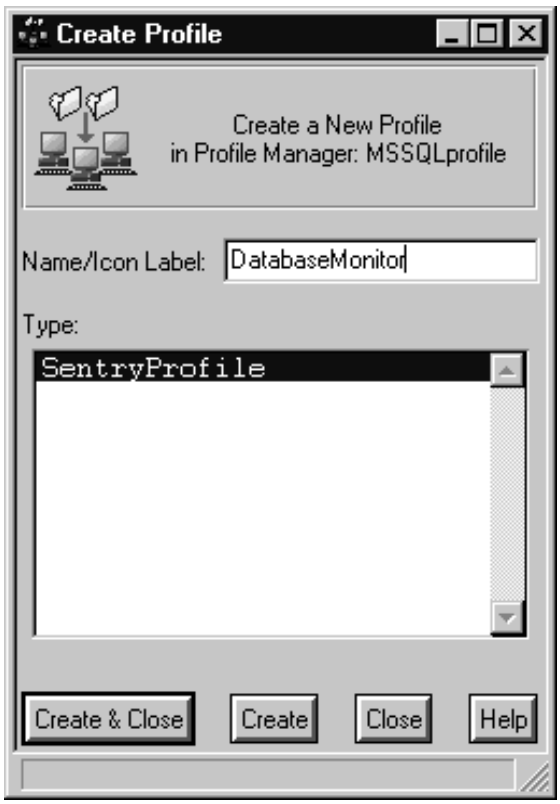


Figure 262. Create Profile Window

Here we have only one type of profile we can use, **SentryProfile**. This is due to the managed resource selection that we made in Section 4.6.1, “Assigning TMR Roles to an Administrator” on page 246 for the SQLserver policy region. Fill in the Name/Icon Label field. In this case DatabaseMonitor has been used. Then select **SentryProfile** as the Type and select **Create & Close** for the new profile to be created. The following window will appear on successful creation.

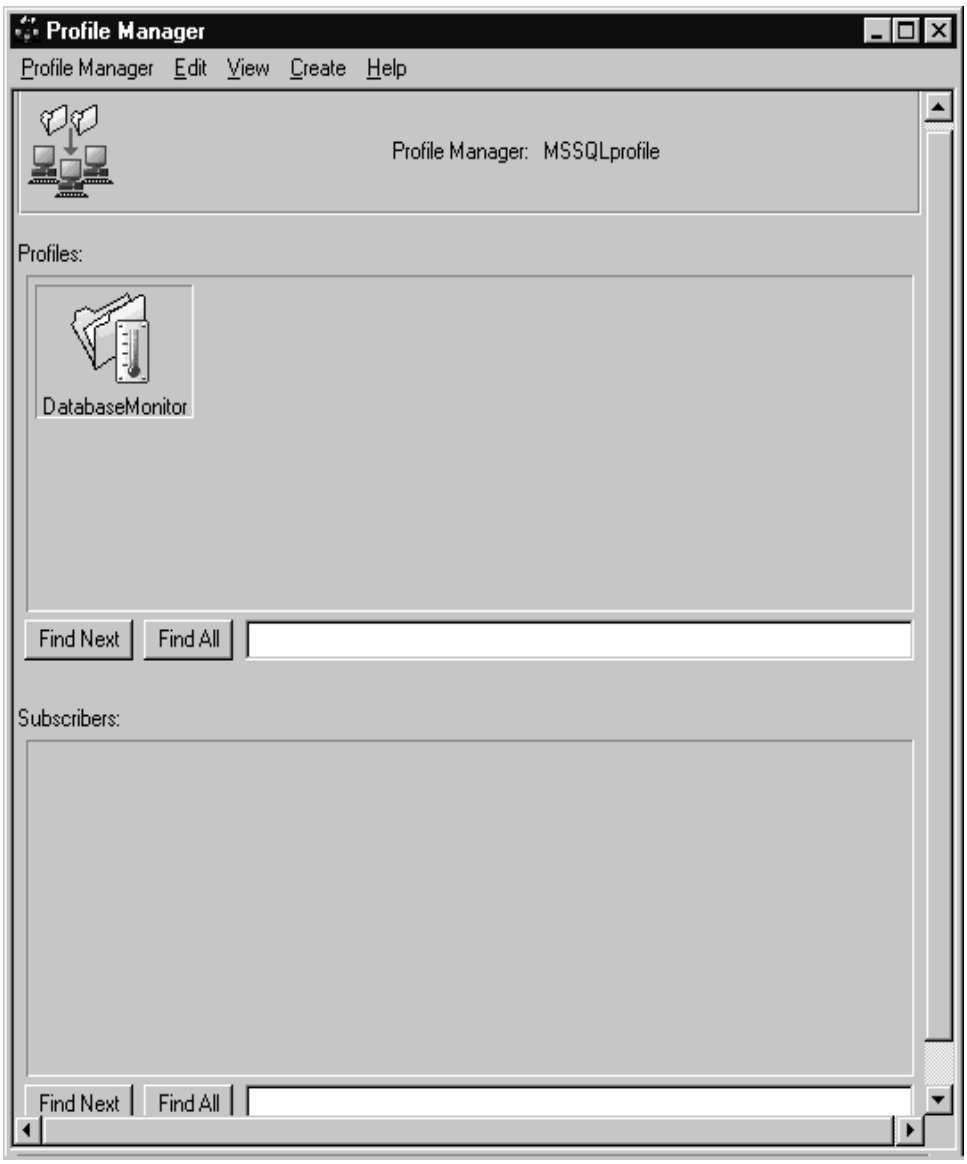


Figure 263. Profile Manager Window

A new icon DatabaseMonitor represents a SentryProfile. This profile can be used to distribute monitors to the subscribers within this profile manager. Finally, subscribers must be added to this profile manager.

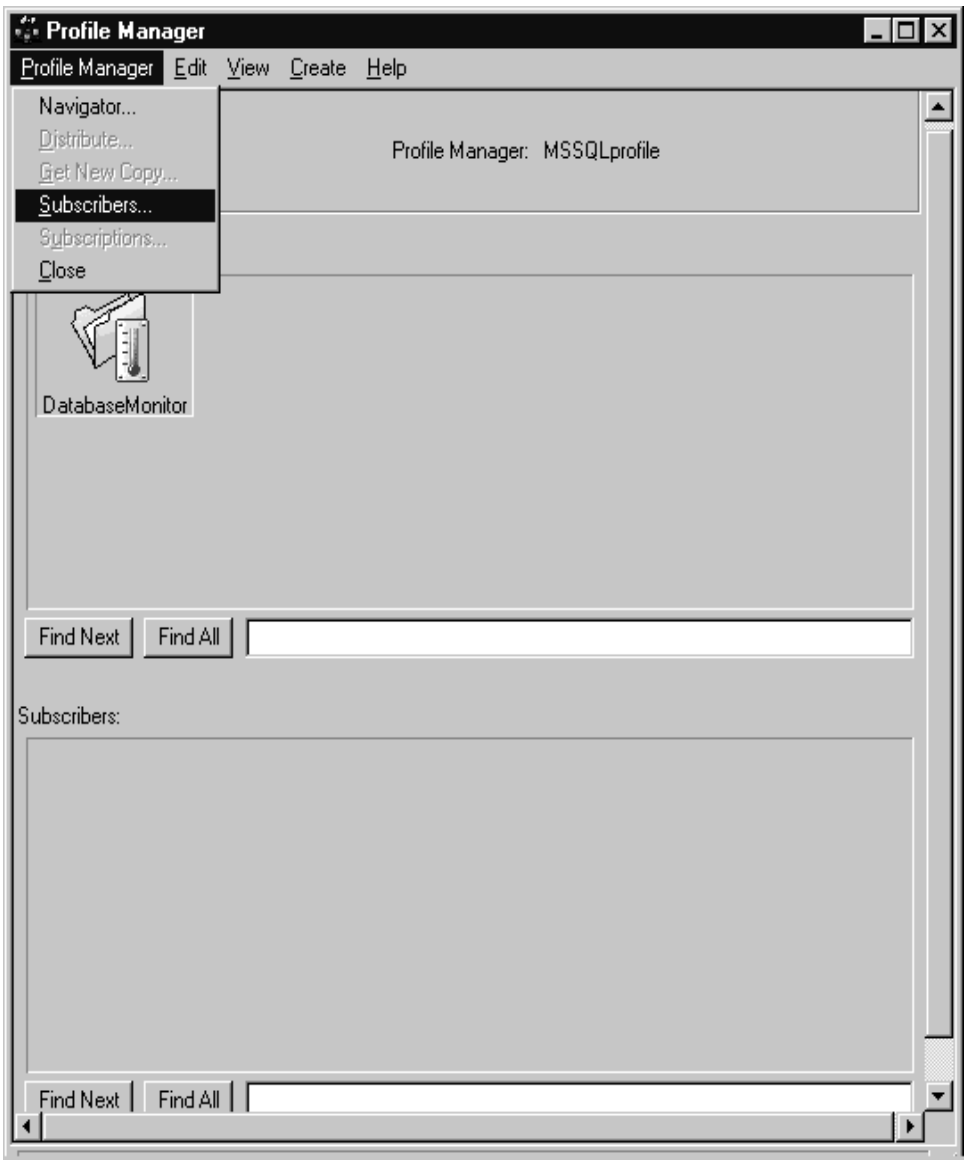


Figure 264. Profile Manager Window

Select **Profile Manager** from the menu bar. From the pull-down menu select **Subscribers**. The following window will appear.

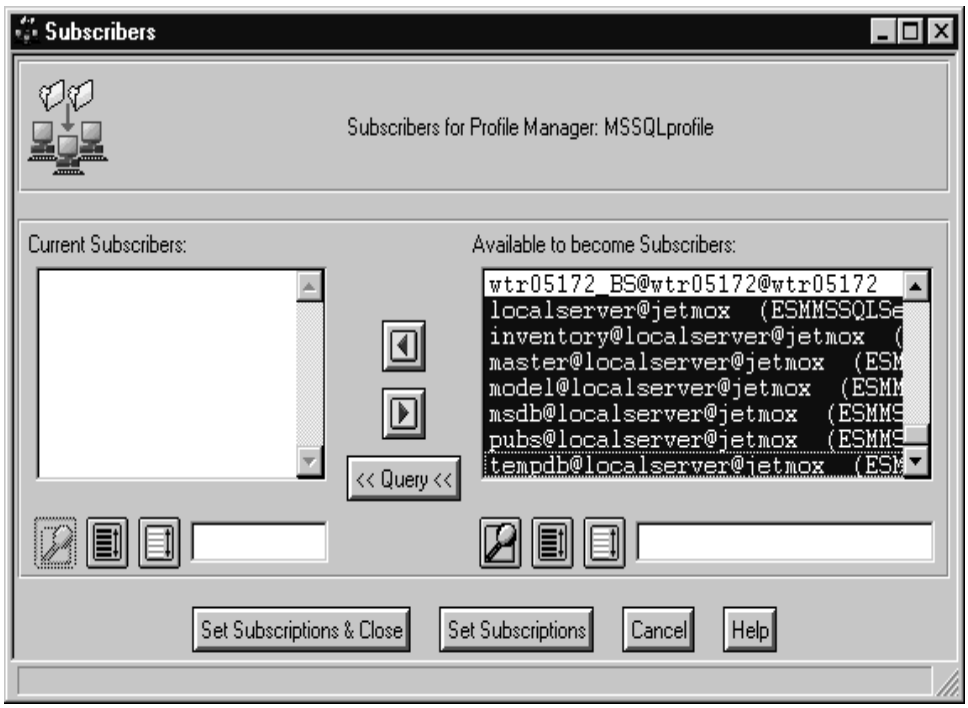


Figure 265. Subscribers Window

From the Available to become Subscribers section select the MS SQL Server and its associated databases and add them to the Current Subscriber list by highlighting them and selecting the left arrow button. Select **Set Subscriptions & Close** after completing the selection.

The profile manager window will now look like this.

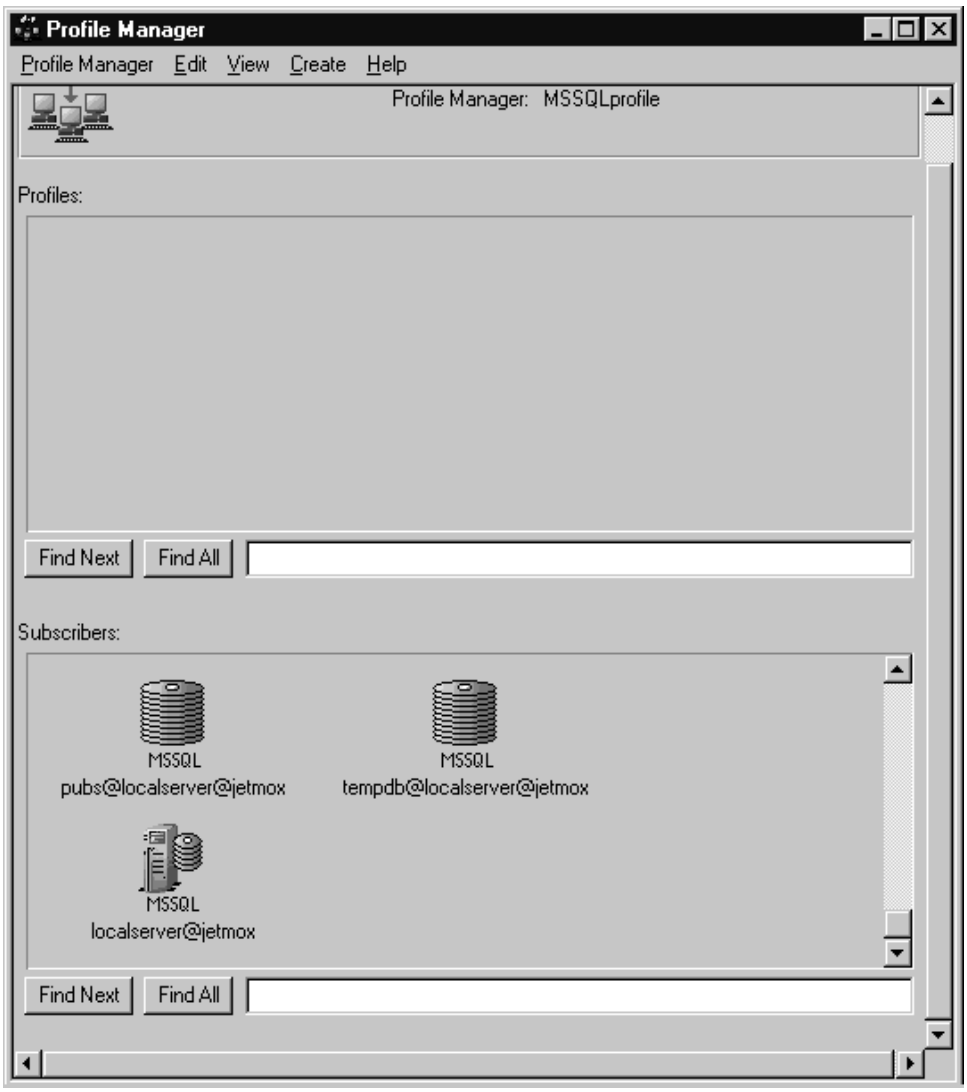


Figure 266. Profile Manager Window

The added subscribers will now appear in the Subscribers: box. Note the difference in icons and naming conventions between the MS SQL Server and the databases

4.6.6.3 Creating and Using Monitors within a Profile

In order to monitor a resource within Tivoli the correct monitoring collection must be installed onto the TMR server.

In order to create and distribute a monitor successfully we suggest that the user should be logged on as an account that has the admin as well as the mssqlserver_dba role assigned to it.

From Figure 263 on page 276 open the new icon **DatabaseMonitor** by right-clicking on the icon and selecting **Edit Properties..** from the pull-down menu. The following window will appear.

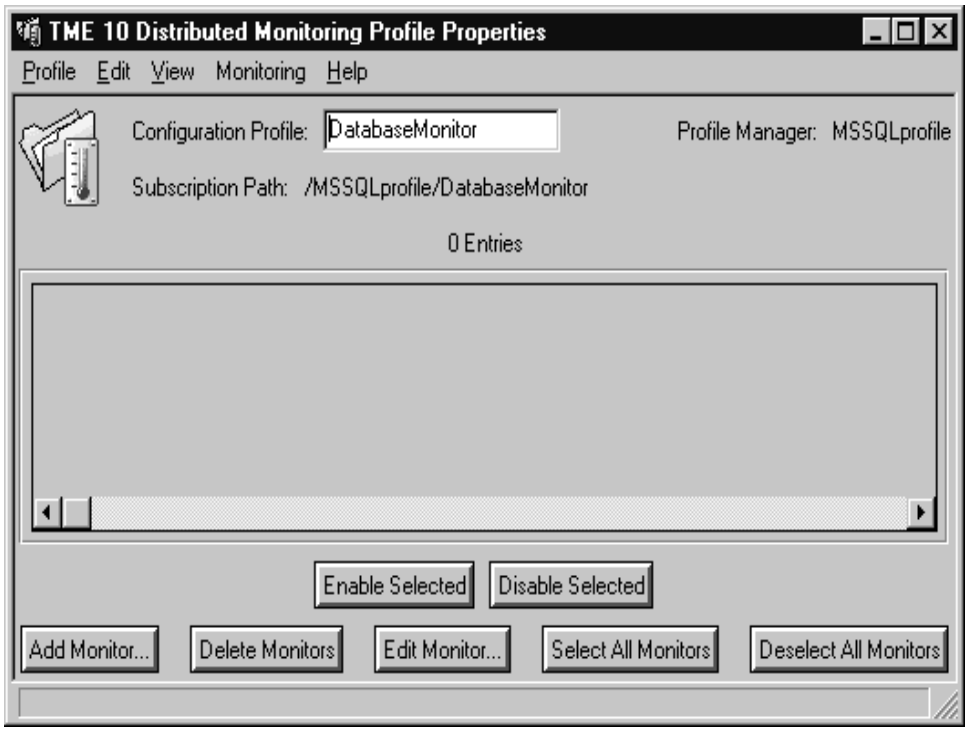


Figure 267. TME 10 Distributed Monitoring Profile Properties Window

There are currently no entries in this profile. To add a profile select the **Add Monitor** button.

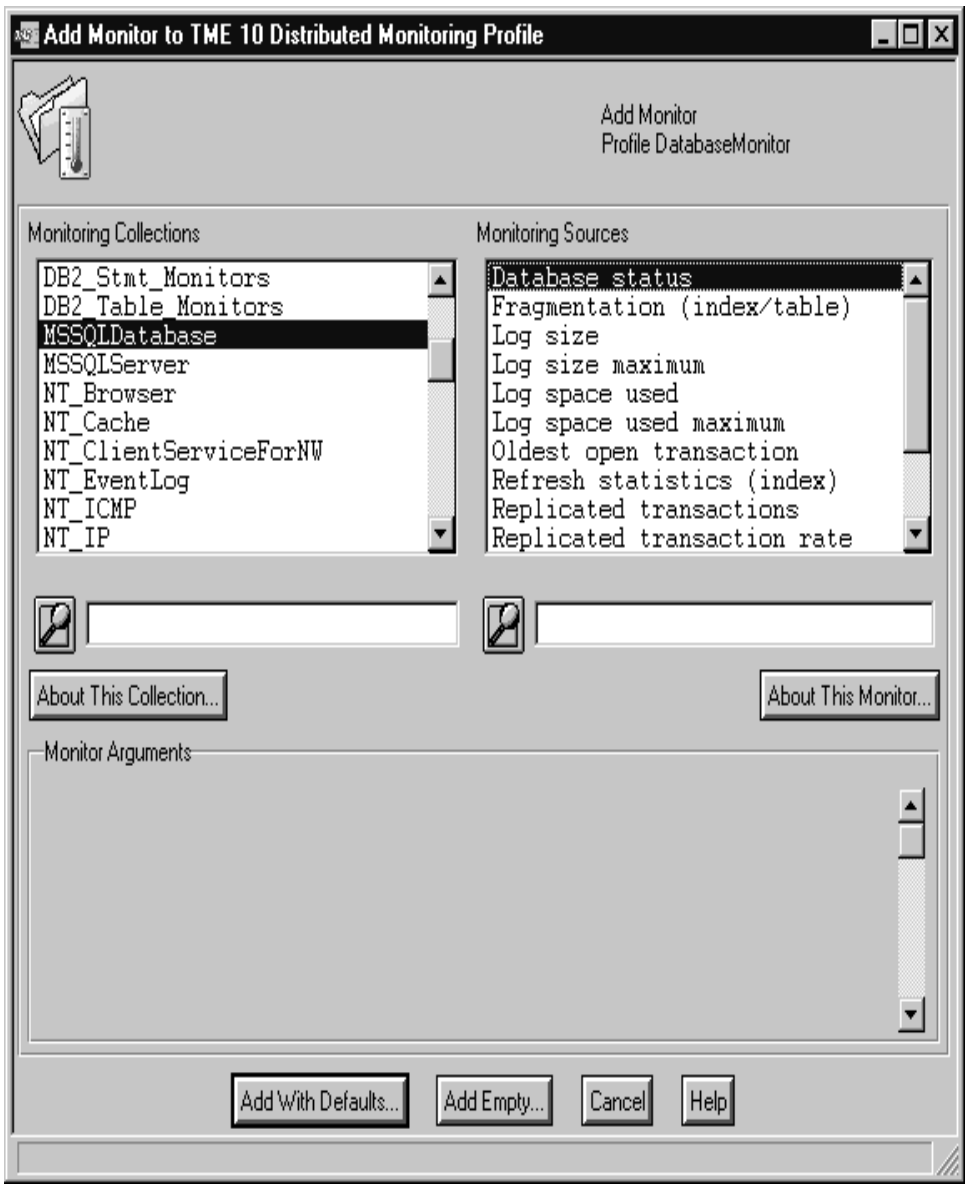


Figure 268. Add Monitor to TME 10 Distributed Monitoring Profile Window

You will see that this TMR has many monitoring collections installed. The two collections that are of interest are MSSQLServer and MSSQLDatabase which were installed by the Tivoli Manager for MS SQL Server - Distributed Monitoring component. The MSSQLServer collection provides global SQL

server availability and performance monitoring whereas the MSSQLDatabase collection provides monitoring sources at the database level. In our example an MSSQLDatabase monitor will be used. We have selected **MSSQLDatabase** from the Monitoring Collections and **Database Status** from the Monitoring Sources. This monitor will respond to whether a database is online or offline. The definition of what each of these monitors do and how they are used can be found in the *TME 10 Module for Microsoft SQL Server - Distributed Monitoring Users Guide*. To continue will select the **Add Empty** button (since whether it is either online or offline there is no default value here). The following window will appear.

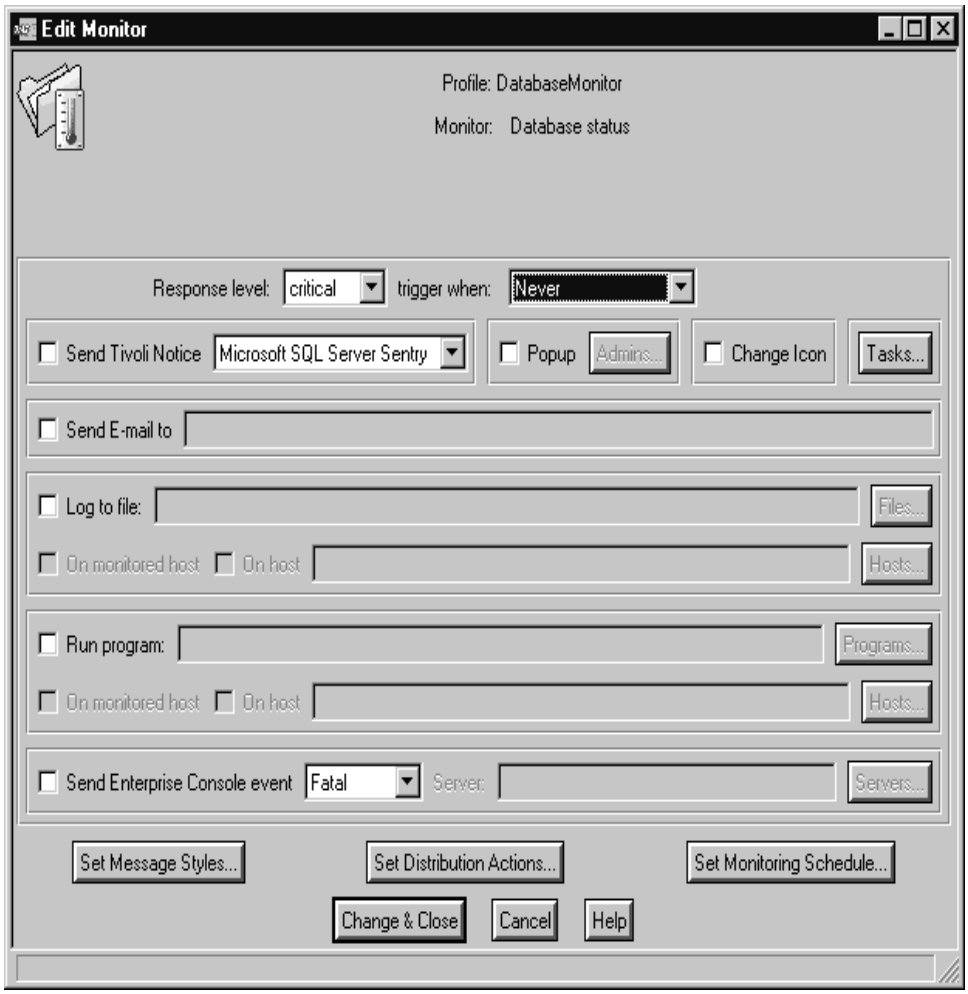


Figure 269. Edit Monitor Window

At the top of Figure 269 on page 282 note that the profile and monitor that is being edited is there. There are many fields here that can be changed. These will be covered briefly. A more detailed description of what each of these fields do are covered in the *TME 10 Distributed Monitoring User's Guide*.

- Response Level: Depending on the severity of a problem the user can set different actions for each level of the severity. There are five levels as default here: Critical, Severe, Warning, Normal and Always.
- Trigger When: The value here determines when and what level of response will be actioned when this condition is met. This will change depending on the monitor.
- Send Tivoli Notice: This check box determines if a notice will be posted to the notice board. Here the default is to the Microsoft SQL Server Sentry notice board.
- Popup: This check box determines which administrators get a pop-up alarm when one of the conditions occur. This is great if the administrator is logged on but if not logged on, the warning will go unheeded.
- Tasks: Task to run when conditions are met.
- Send E-mail to: Send e-mail to user when conditions are met.
- Log to file: Can log the error message to a text file and determine where it is logged.
- Run program: Can run a script or program when the conditions are met either on the monitored host or some other machine.
- Send Enterprise Console event: Send an event to TEC. We examine this later.

For this example we use the defaults shown in the window below.

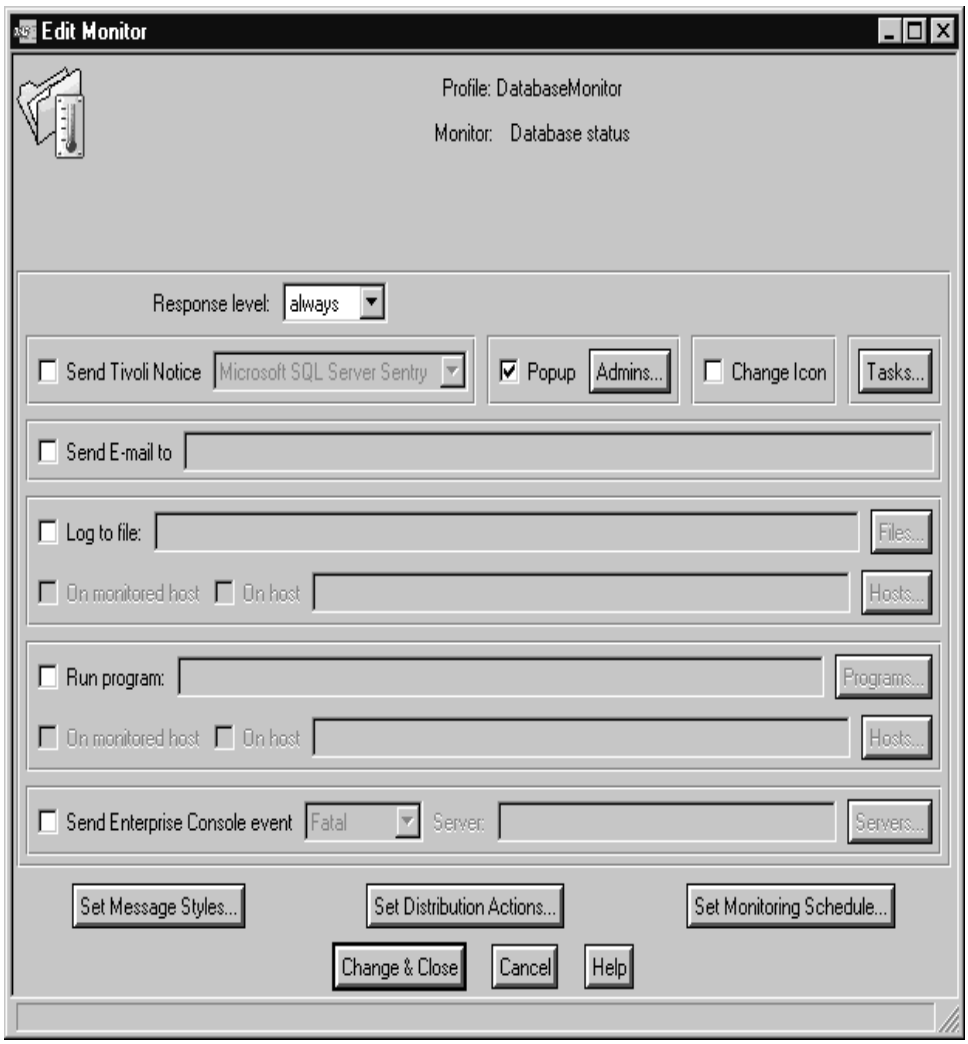


Figure 270. Edit Monitor Window

A pop-up notice will be sent to the accounts selected in the Admin group whenever this monitor runs. The next step is to set how frequently this monitor will run. Select the **Set Monitoring Schedule...** button and a new window will appear.

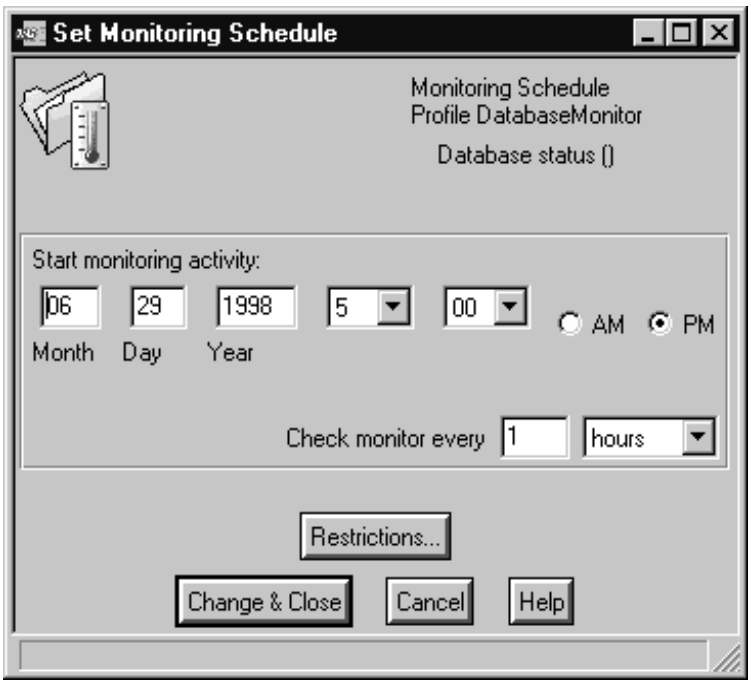


Figure 271. Set Monitoring Schedule Window

Select here when the monitor is to run. There is also an option Restrictions... that can be set to prevent the monitor from running at certain times. Select **Change & Close** to commit these values. This will return the Edit Monitor window (Figure 270 on page 284). If the values here are correct, select **Change & Close** and the following window will appear.

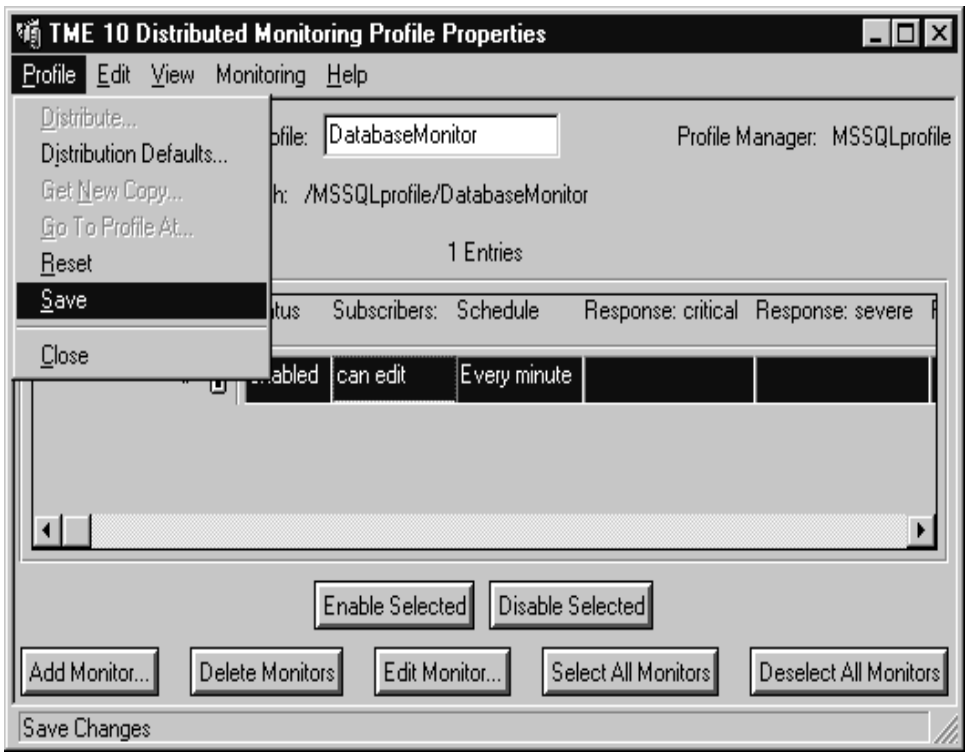


Figure 272. TME 10 Distributed Monitoring Profile Properties

The new monitor must now be saved. From the menu bar select **Profile** and from the pull-down menu select **Save.**

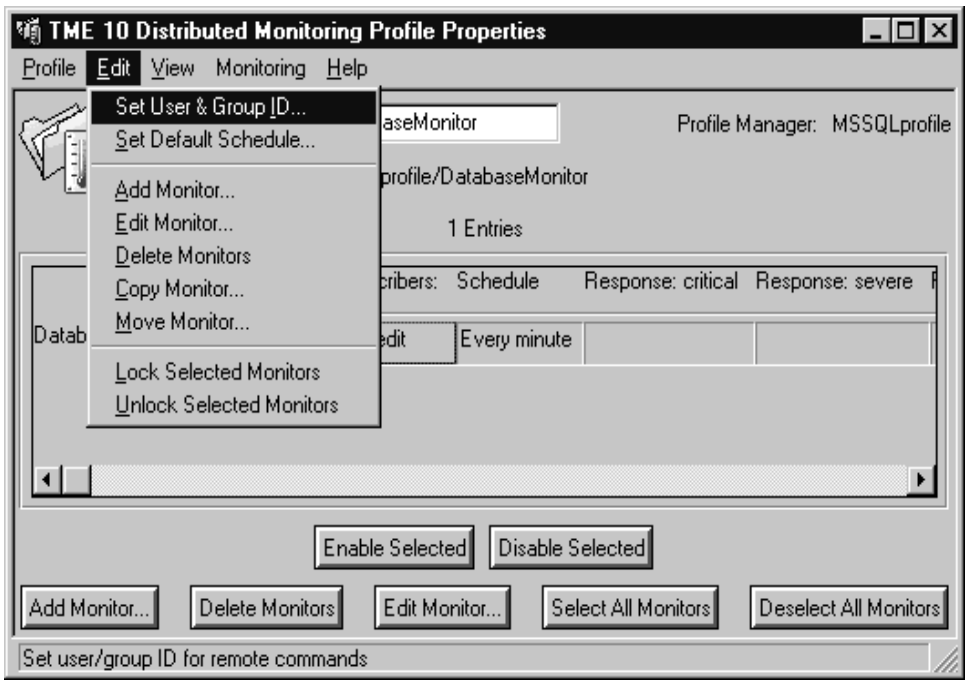


Figure 273. TME 10 Distributed Monitoring Profile Properties

The next step in monitor creation is that of setting a user and group ID. For those familiar with Windows NT it has no concept of a group ID and this value and the user ID must be changed before the monitor will run. The default values for the user and group IDs is nobody.

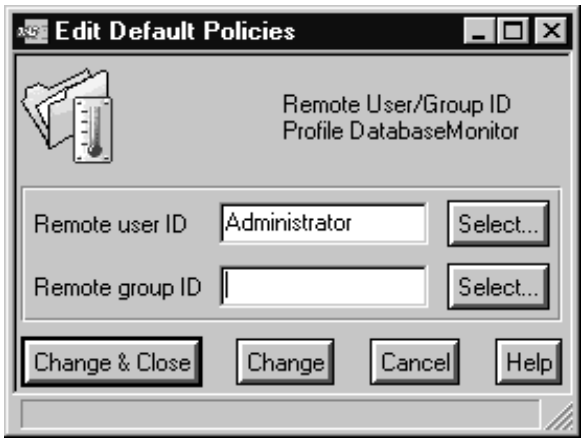


Figure 274. Edit Default Policies Window

The Administrator account has been chosen as the remote user ID to run the monitor. Any account can be chosen here as long as it has NT administrative privileges on the remote machine. Remove the nobody value from the Remote group ID field. Select **Change & Close** when finished. Close the TME 10 Distributed Monitoring Profile Properties window to return to the Profile Manager window.

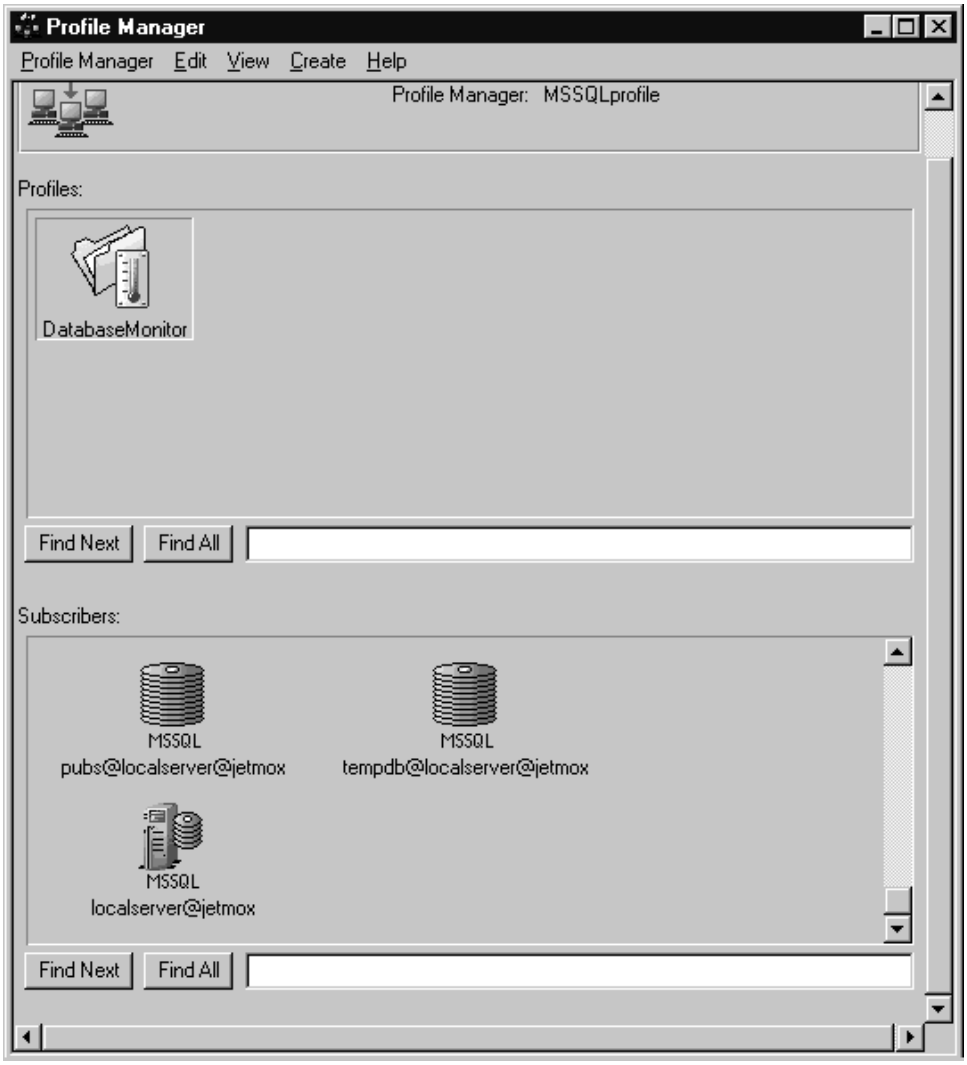


Figure 275. Profile Manager Window

The MSSQLDatabase monitoring collection was chosen in this case. Thus, only databases will have this monitor distributed to it. To distribute the monitor click and drag the DatabaseMonitor profile onto the selected database. Here, we have chosen master@localserver@jetmox. When this is complete open the database window.

Figure 276. master@localserver@jetmox Window

This confirms whether the Database monitor profile has been distributed to the subscriber. If allowed, this monitor can be edited and modified for a specific node.

Note

If the distribution fails here and the TMR server has Tivoli Distributed Monitoring 3.5 or 3.51 installed, you may have forgotten to install the patch. Refer to Section 4.5, “Installing Tivoli Manager for MS SQL” on page 242.

Finally if the monitor has been successfully distributed there should be a result, such as a pop-up message. In our example the following is the window that has been returned.

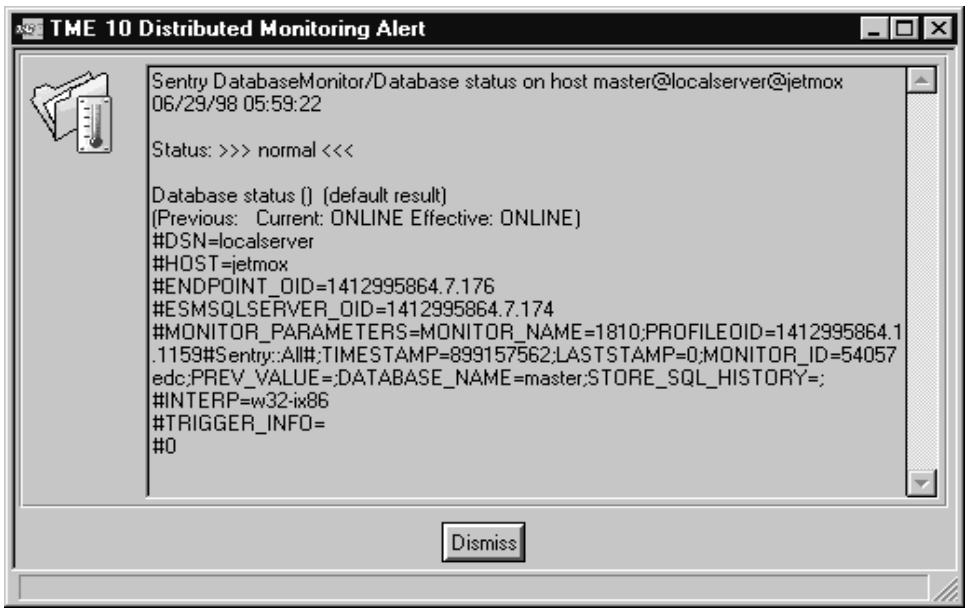


Figure 277. Distributed Monitoring Alert Window

In the next section we cover how these distributed monitors can interact with Tivoli Enterprise Console.

4.6.7 Using Tivoli Manager for MS SQL with TEC

In this section we discuss how the Tivoli Manager for MS SQL Server - Distributed Monitoring interacts with TEC. As noted in Section 4.5, “Installing Tivoli Manager for MS SQL” on page 242 we have installed a patch 1.0-MSS-0001 specifically for this purpose. We also cover the creation of a rule base as well as importing event classes into this rule base.

4.6.7.1 Creating a Rule Base and Importing Event Classes

Since new event classes are to be added and rules that are not part of the Default rule base, the event server must be configured to use the Tivoli Distributed Monitoring class definitions. The following steps are used to create a new rule base.

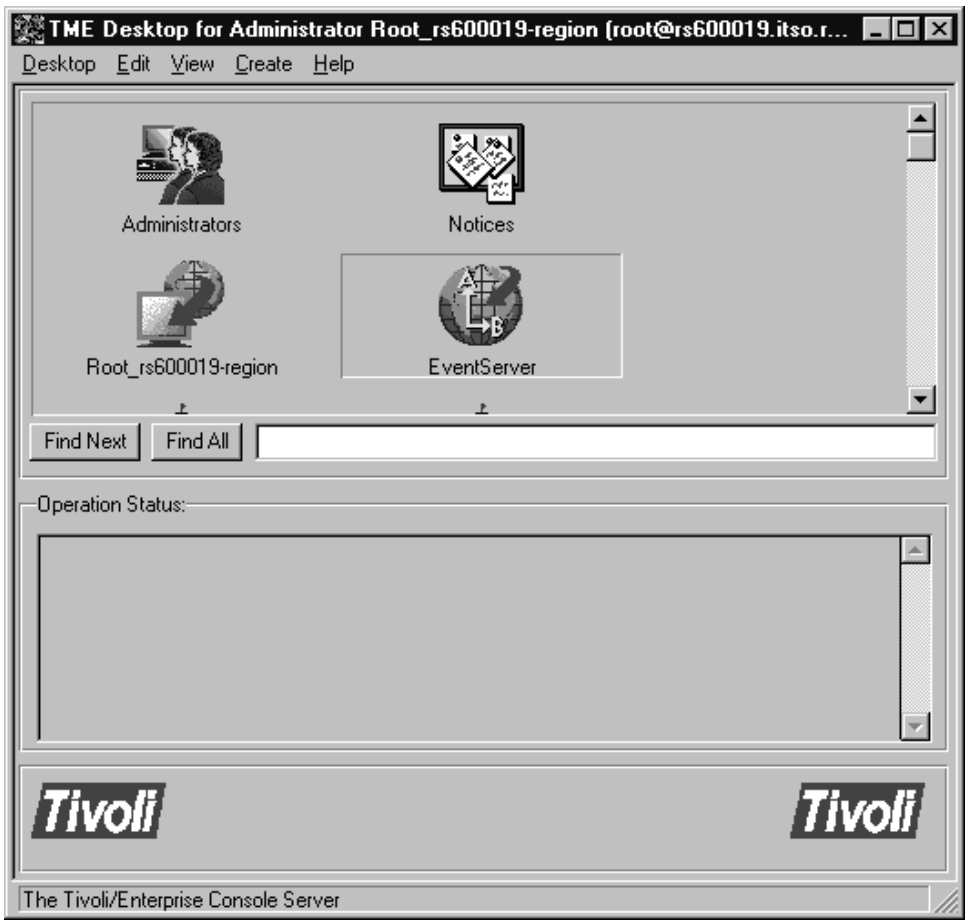


Figure 278. TME Desktop for Administrator Root_rs600019-region Window

From the Tivoli Desktop double-click the **EventServer** icon. This will open the following window.

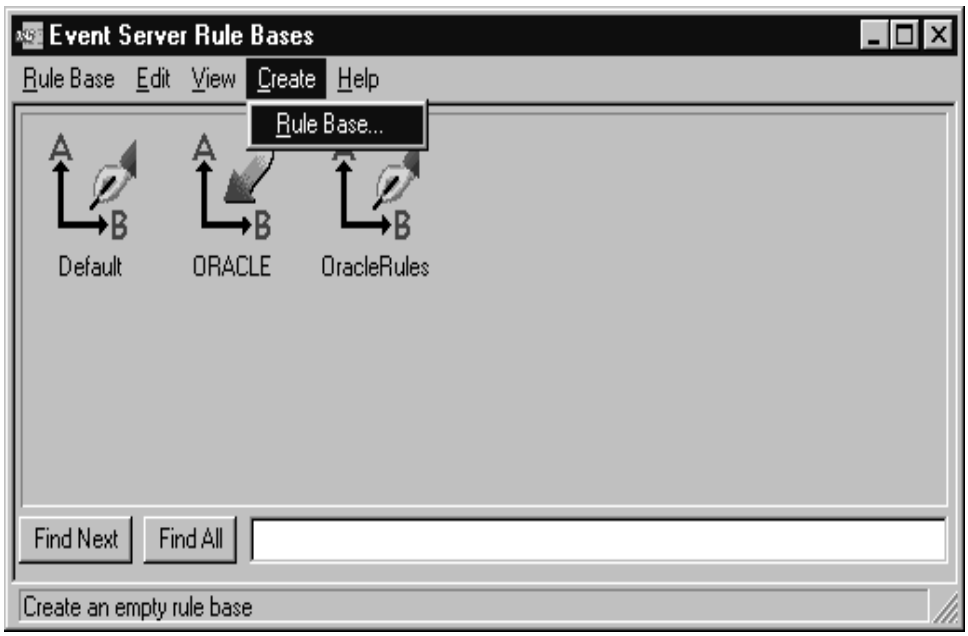


Figure 279. Event Server Rule Bases Window

There are two other rule bases (Oracle & OracleRules) shown here besides the Default. From here we create a new rule base. Select **Create** from the menu bar and **Rule Base...** from the pull-down menu.

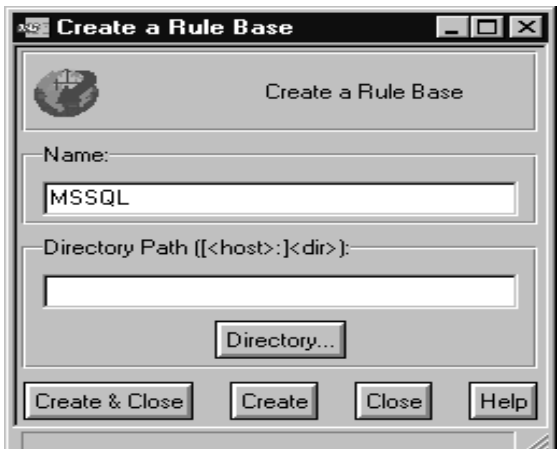


Figure 280. Create a Rule Base Window

We select MSSQL as the name of our new rule base. The next step is to select a directory for where the rule base is to be installed. Select the **Directory...** button and the following window will appear.

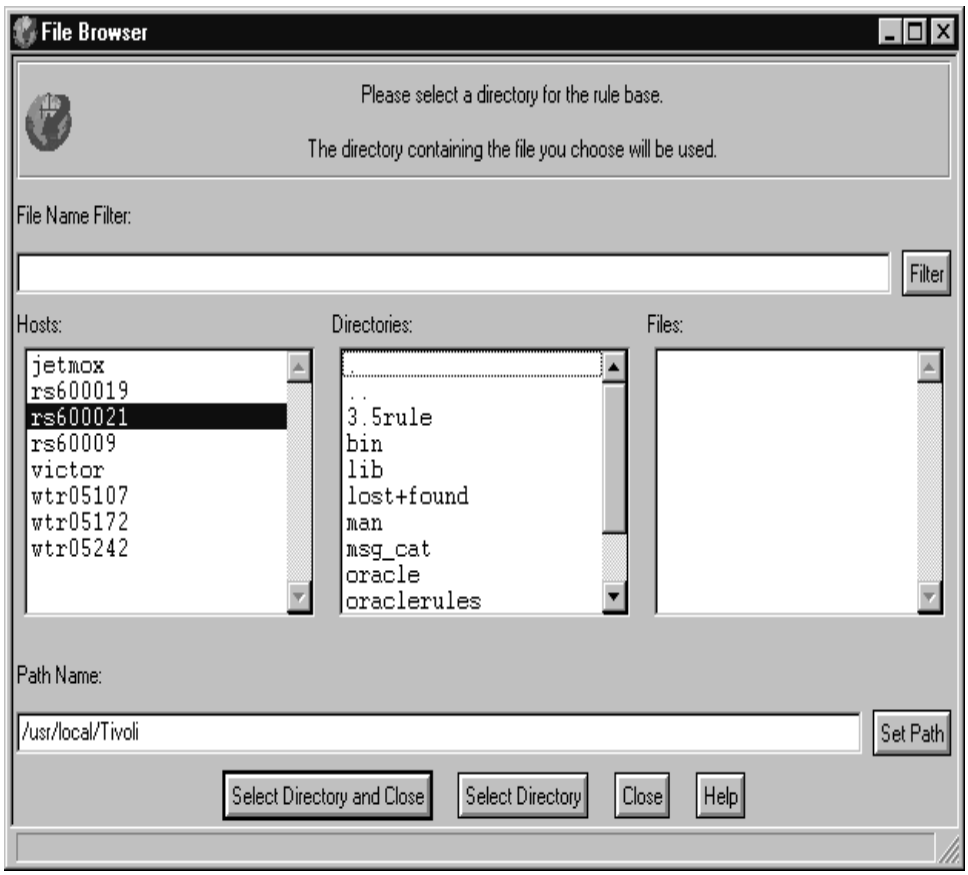


Figure 281. File Browser Window

Here select the machine and the directory where the new rule base is to be created. A new directory can be specified and created here. After this task has been completed select **Directory and Close** to return to the window shown in Figure 280 on page 292. From this window select **Create & Close.**

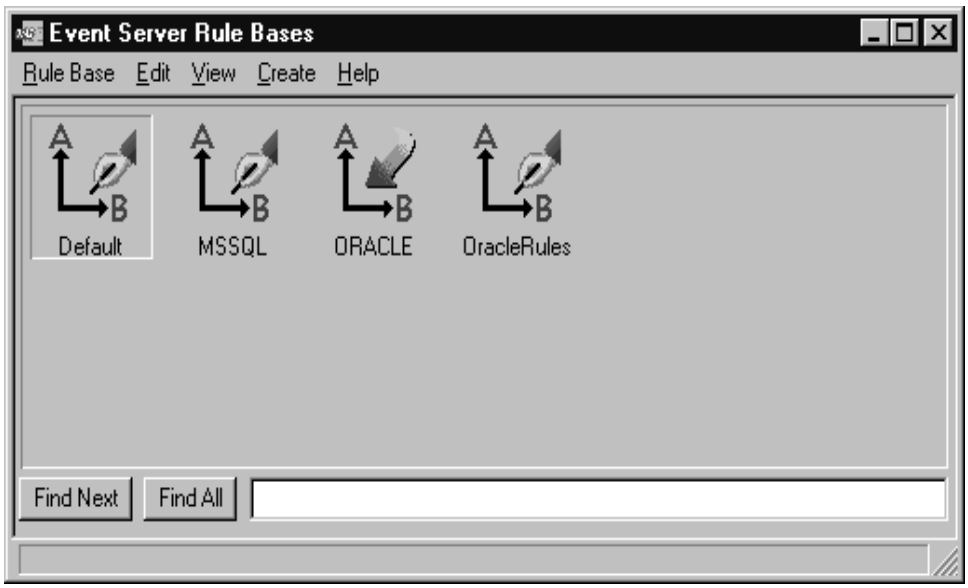


Figure 282. Event Server Rule Bases

A new rule base MSSQL is now available. This rule base is empty. We need to copy the Default rule base into this new rule base.

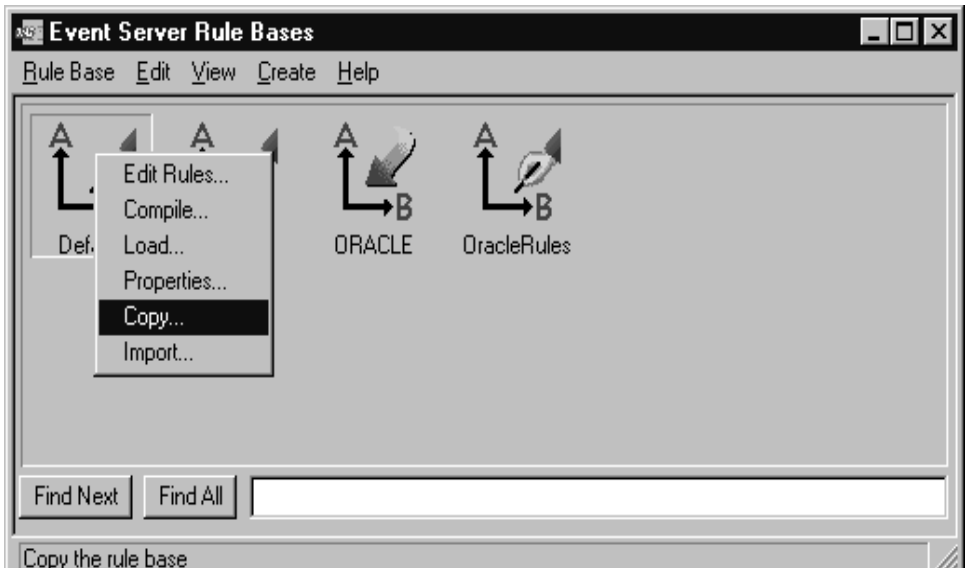


Figure 283. Event Server Rule Bases Window

To copy the Default rule base to the new rule base MSSQL do the following. Right-click on the **Default** rule base icon and then select **Copy...** from the from the pull-down menu. The following window will appear.

Figure 284. Copy Rule Base Window

Select the destination rule base. **MSSQL** is selected here. Select the **Copy rules**, the **Copy classes** and the **Remove files in destination before copying** check boxes. When this has been done select **Copy & Close.**

The next step is to import the event classes for Tivoli Distributed Monitoring into the rule base.

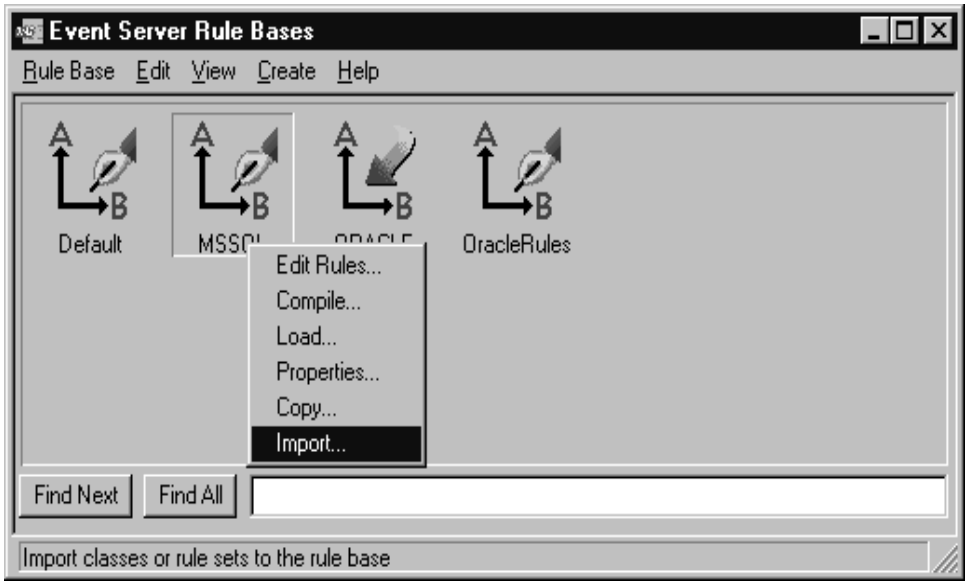


Figure 285. Event Server Rule Bases Window

Right-click on the **MSSQL** rule base and select **Import..** from the pull-down menu.

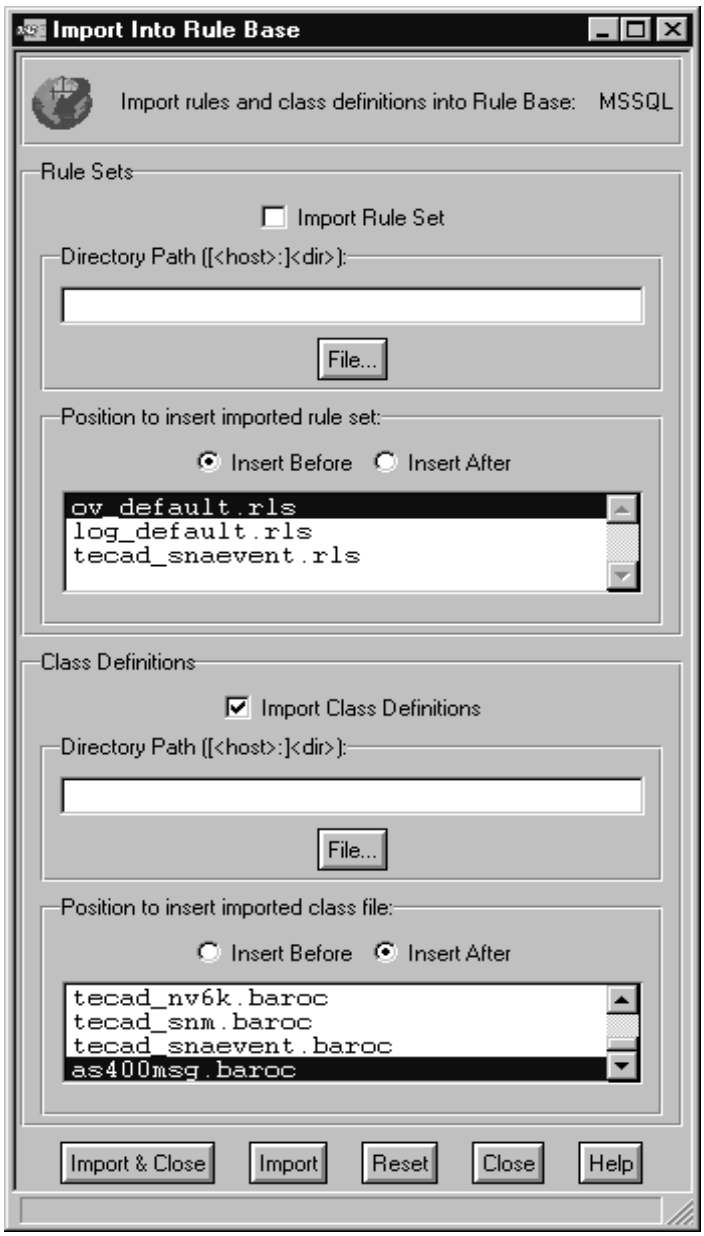


Figure 286. Import Into Rulebase Window

Select **Import Class Definition**. The imported class file will be inserted after the last default event class. Select the last event class in the list (in this case it is as400msg.baroc) and select the **Insert after** radio button. The directory

where the new event classes reside must now be specified. Select the **File...** button to specify this directory.

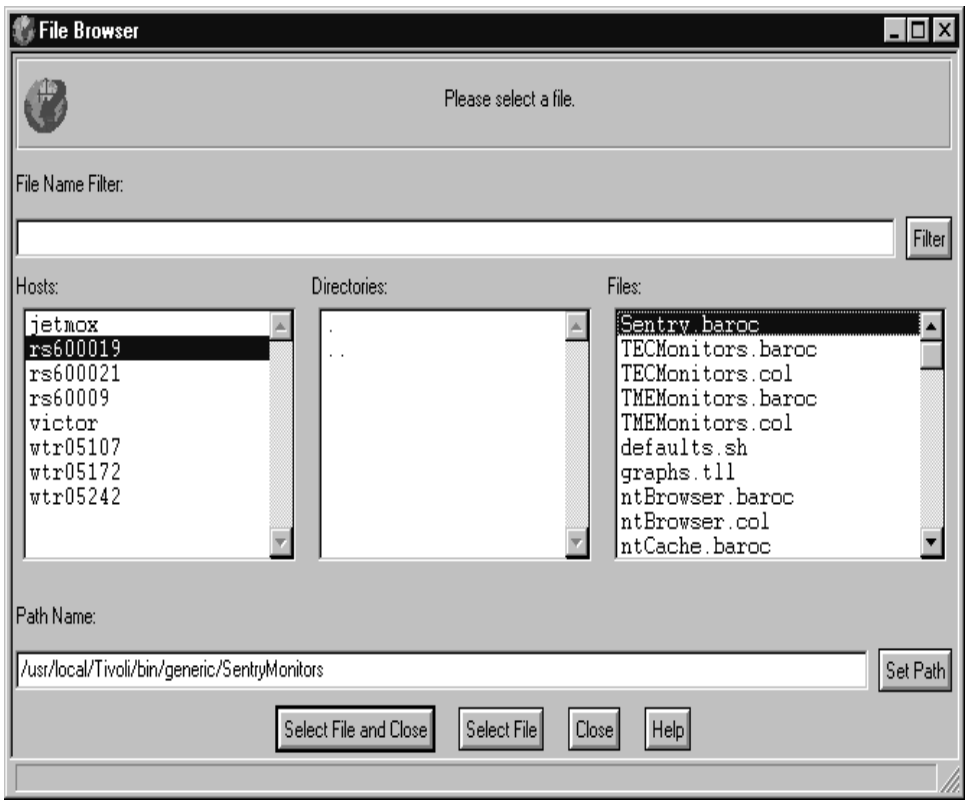


Figure 287. File Browser Window.

The Tivoli Distributed Monitoring event classes are usually stored on the TMR server in the Sentry.baroc file. This file is usually found in /usr/local/Tivoli/bin/generic/SentryMonitors. Highlight the selections and click on **Select File and Close** to commit the changes. This will return the window in Figure 286 on page 297. Select **Import** to add these new class definitions. The event classes for the Tivoli Manager for MS SQL Server - Distributed Monitoring must also be imported. Follow the same procedure.

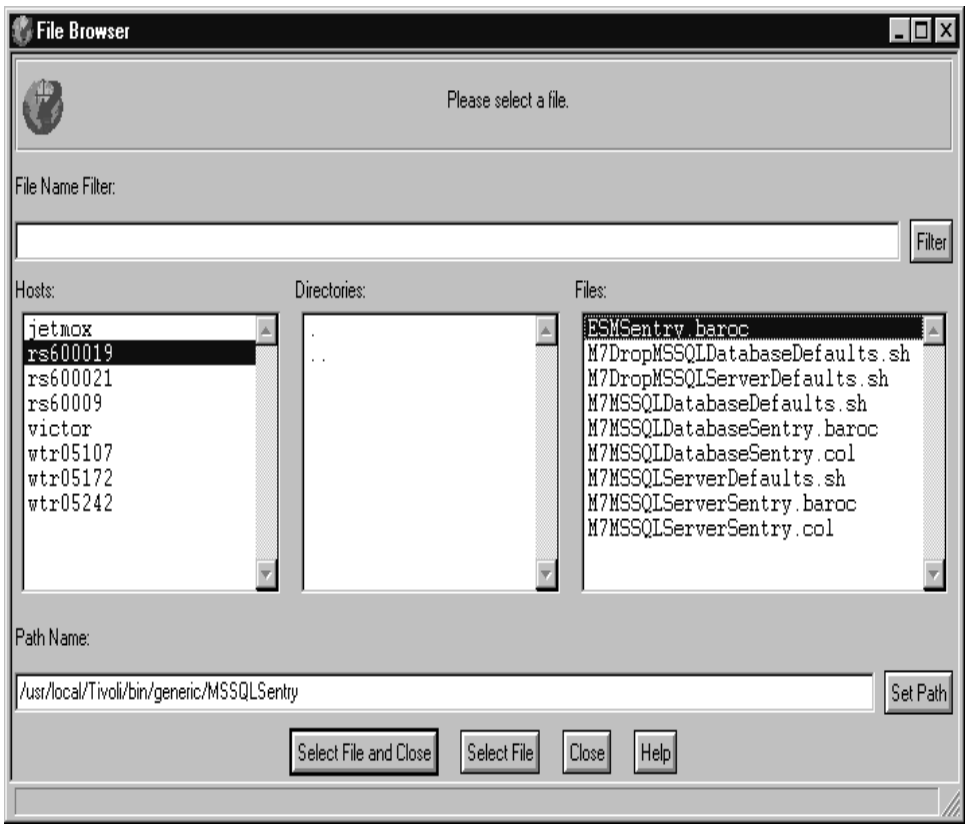


Figure 288. File Browser Window

The directory for these event classes are found on the TMR server. The files are usually found in /usr/local/Tivoli/bin/generic/MSSQLSentry. We will need to import the following three event classes from here:

- ESMSentry.baroc
- M7MSSQLServerSentry.baroc
- M7MSSQLDatabaseSentry.baroc

Highlight **ESMSentry.baroc** and **Select File and Close** to commit the changes. This will return the window in Figure 286 on page 297. Select **Import** to add these new class definitions. Repeat the same steps for M7MSSQLServerSentry.baroc and M7MSSQLDatabaseSentry.baroc. Select **Import & Close** for the last rule base.

Note

Just a reminder that we would advise that each imported class file be inserted after the last entry, that is ESMSentry.baroc should be inserted after Sentry.baroc etc. This is to prevent problems that may occur with the rule base with dependencies.

After the new event classes have been added the rule base needs to be compiled.

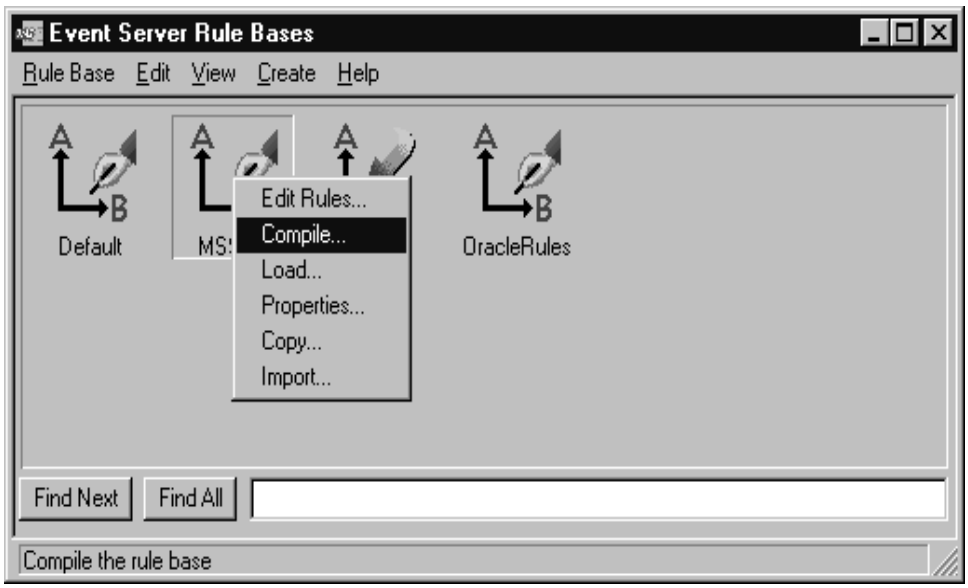


Figure 289. Event Server Rule Base Window

Right-click on the **MSSQL** icon and select **Compile...** from the pull-down menu and on the subsequent window select **Compile.**

On the completion of the compilation the following window will appear.

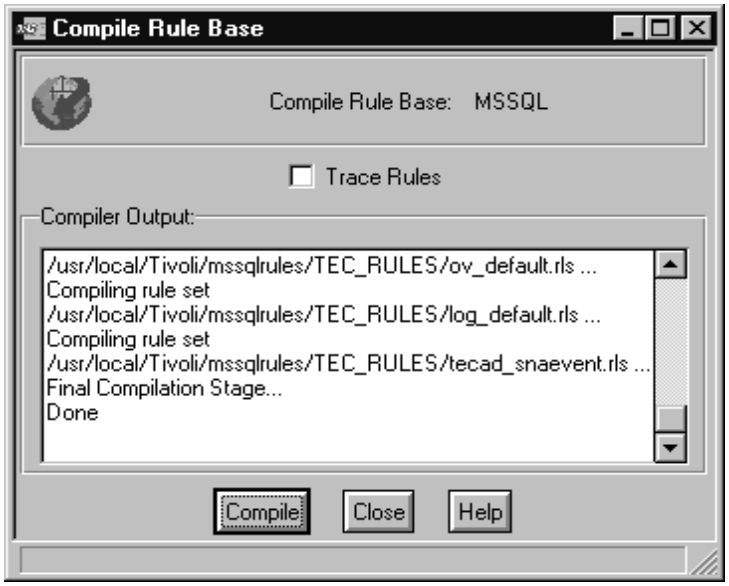


Figure 290. Compile Rule Base Window

After the compilation of the rule base we will need to load the new rule base.

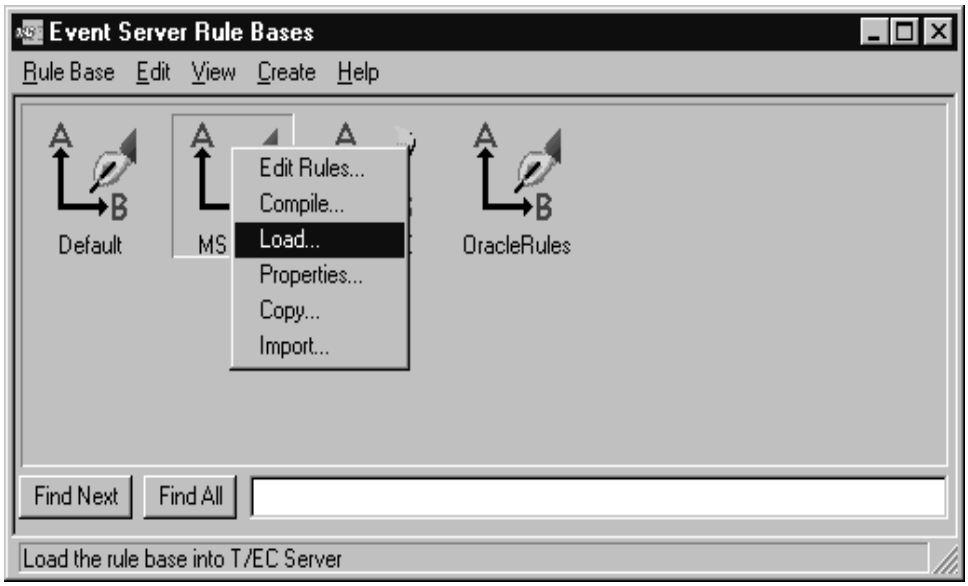


Figure 291. Event Server Rule Bases Window

Right-click onto the **MSSQL** rule base and select **Load...** from the pull-down menu. The following window will appear.

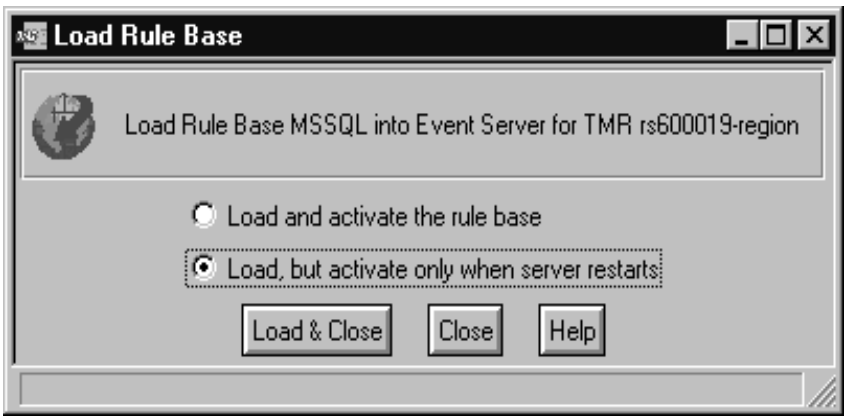


Figure 292. Load Rule Base Window

Select the **Load, but activate only when server restarts** radio button and then click on **Load & Close**.

To activate the new rule base we now need to start and stop the event server. From the desktop in Figure 278 on page 291 highlight the event server icon and select **Shutdown**. After a few moments restart the event server by using the **Start-up** option.

4.6.7.2 Setting Up Event Group Filters

In this section we describe how to set up an event group for the Tivoli Manager for MS SQL Server - Distributed Monitoring to direct events to the appropriate consoles. In the previous section the MSSQL rule base was created. This is the rule base that will be used in this example.

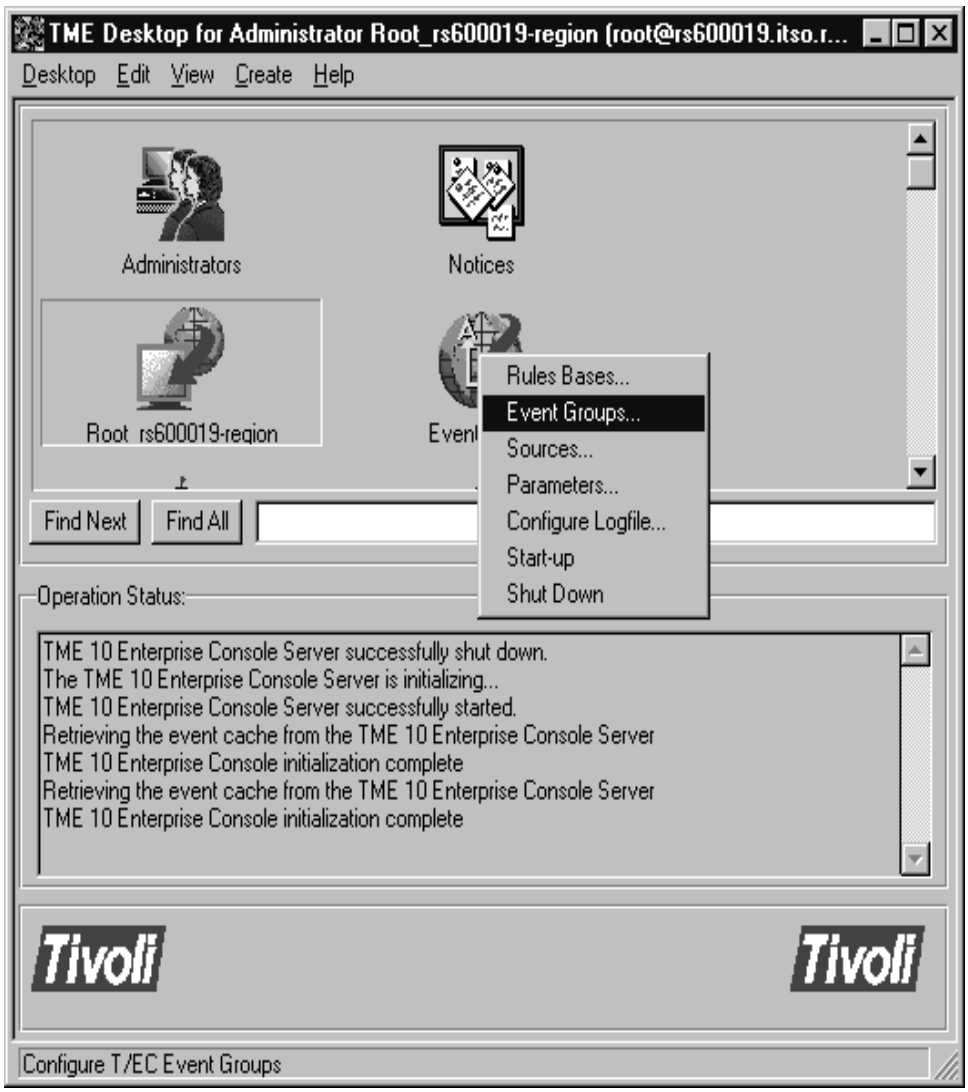


Figure 293. TME Desktop for Administrator Root_rs600019-region Window

From the Tivoli administrator desktop right-click on the **EventServer** icon and select **Event Groups...** from the pull-down menu. The following window will appear.

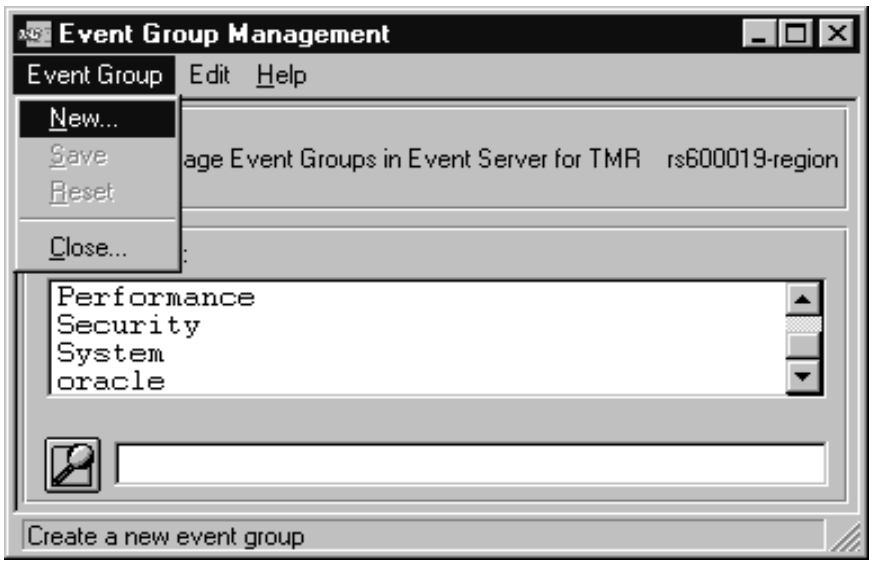


Figure 294. Event Group Management Window

From the menu bar select **Event Group** and **New...** from the pull-down menu. The following window will appear.

Figure 295. New Event Group Window

Fill the in the Enter New Event Group Name: field. Here we have selected MSSQL. A selection may also be made on which bitmap is used for this new event group. Note that custom bitmaps can be imported by selecting the **Import Bitmap...** button. When this is completed select **Create** and the following window will appear.

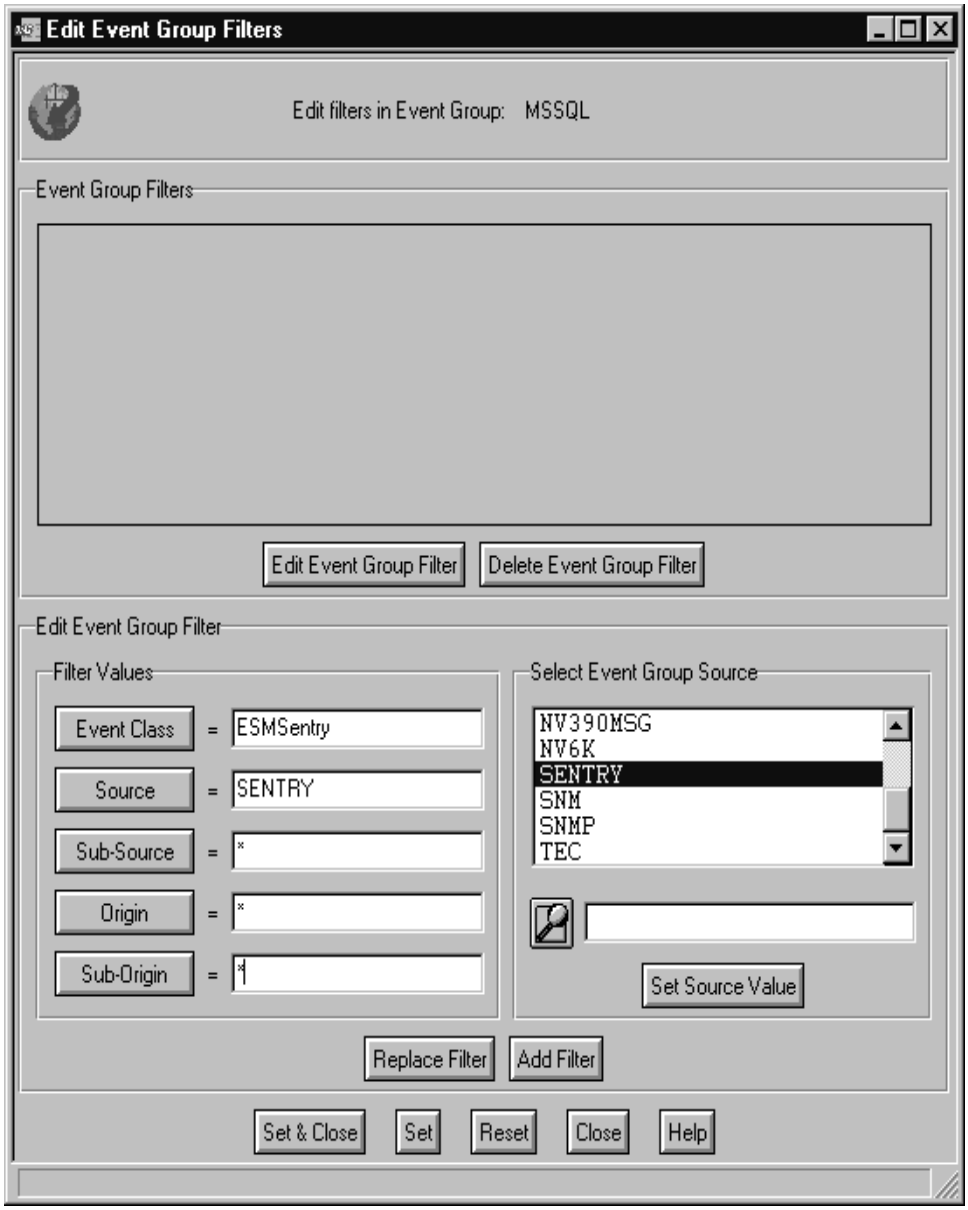


Figure 296. Edit Event Group Filters Window

Enter the Event Class. ESMSentry is chosen here. This class represents a superclass, which is a class that contains all the MSQLServer and MSSQLDatabase monitors. The source for these events will be SENTRY.

Wildcards "*" have been chosen for Sub-Source Origin and Sub-Origin. Then select **Add Filter** when the selections are complete. The following window will appear.

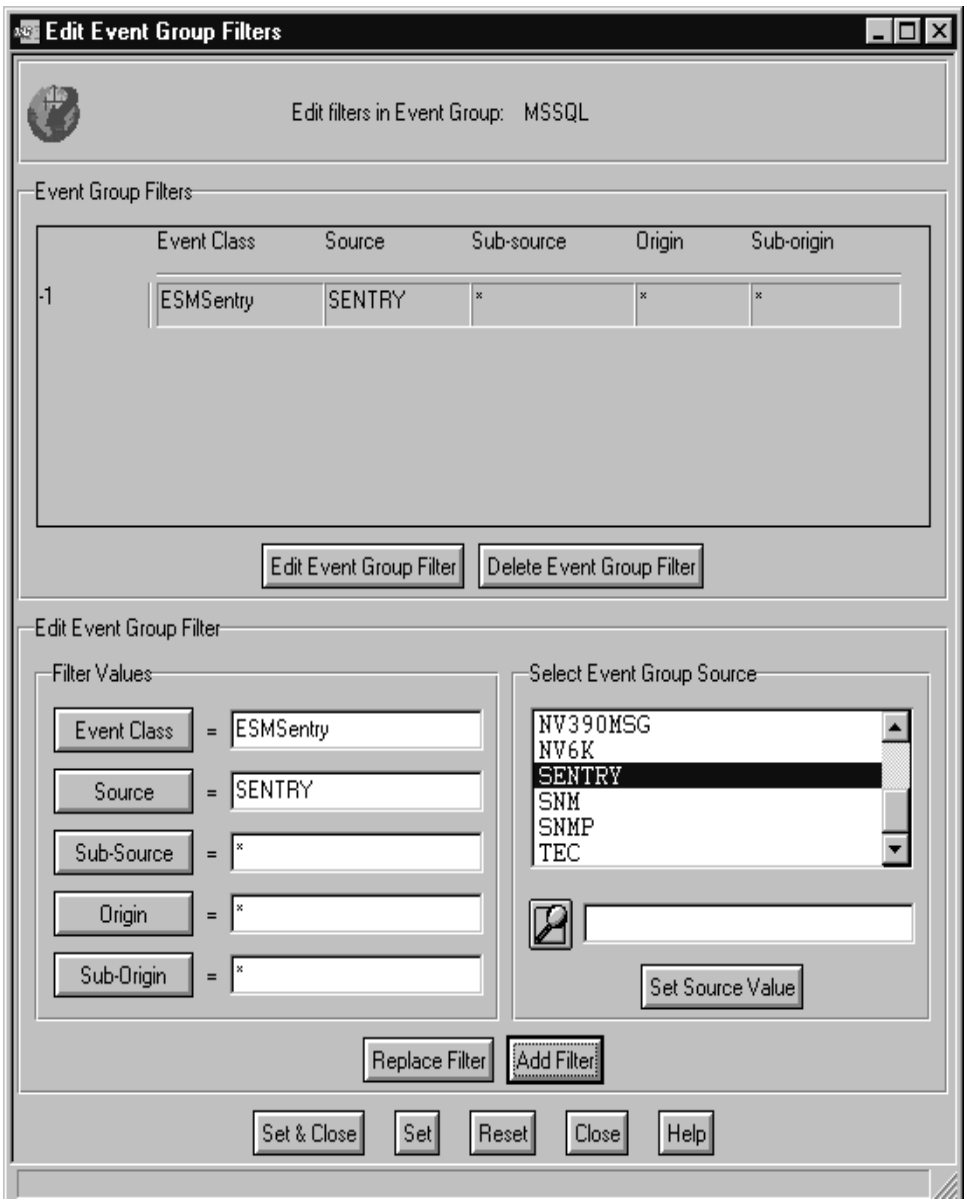


Figure 297. Event Group Filters Window.

Select **Set & Close** to complete the creation of the new event group.

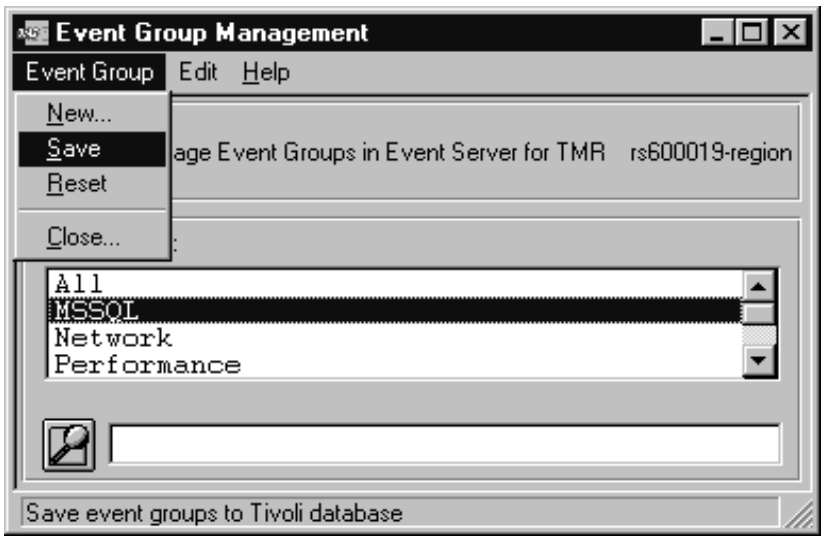


Figure 298. Event Group Management Window

Save your changes by selecting **Event Group** from the menu bar and **Save** from the pull-down menu. Close this window to return to the Tivoli Desktop.

4.6.8 Assigning Event Groups

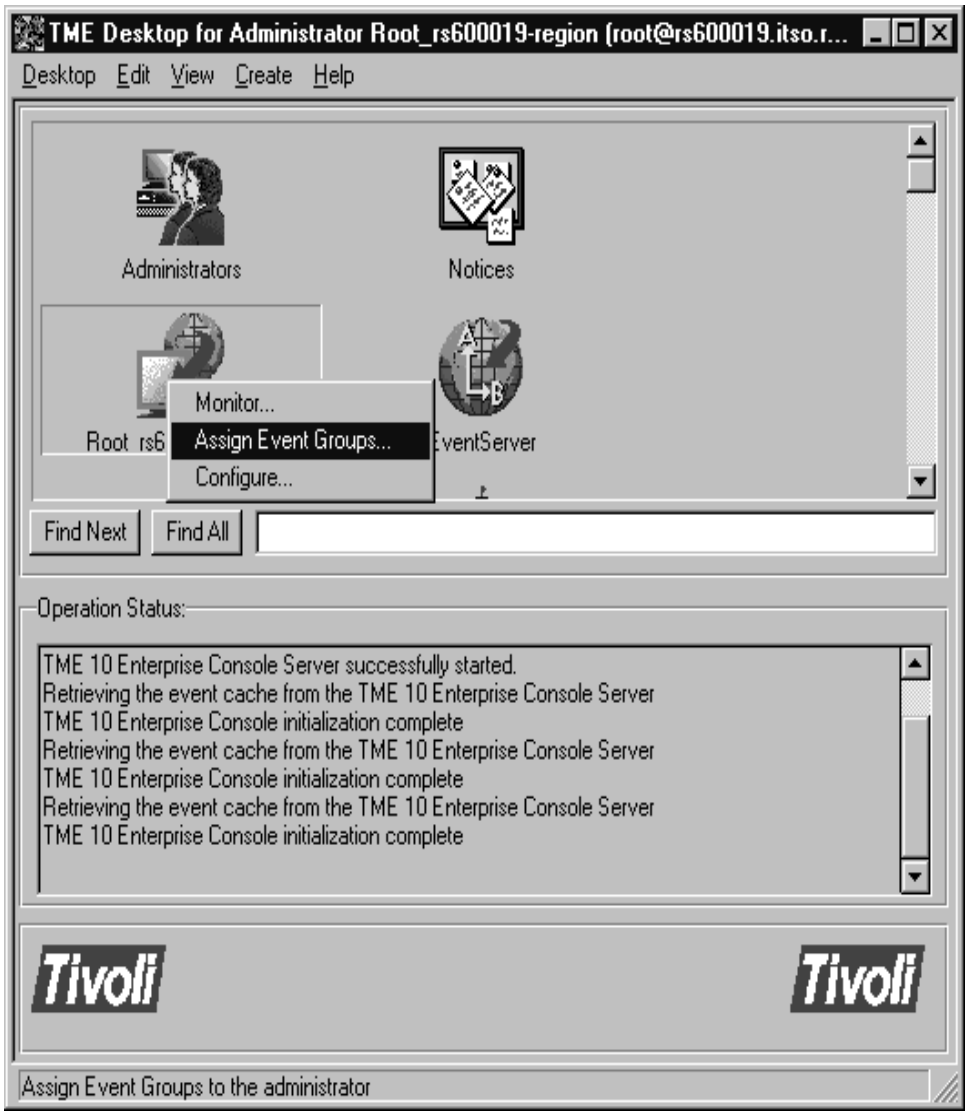


Figure 299. TME Desktop for Administrator Root_rs600019-region Window

This new event group now must be assigned. Select the **Root_rs600019-region** icon with the right mouse button and from the pull-down menu select **Assign Event Groups...**. The following window will appear.

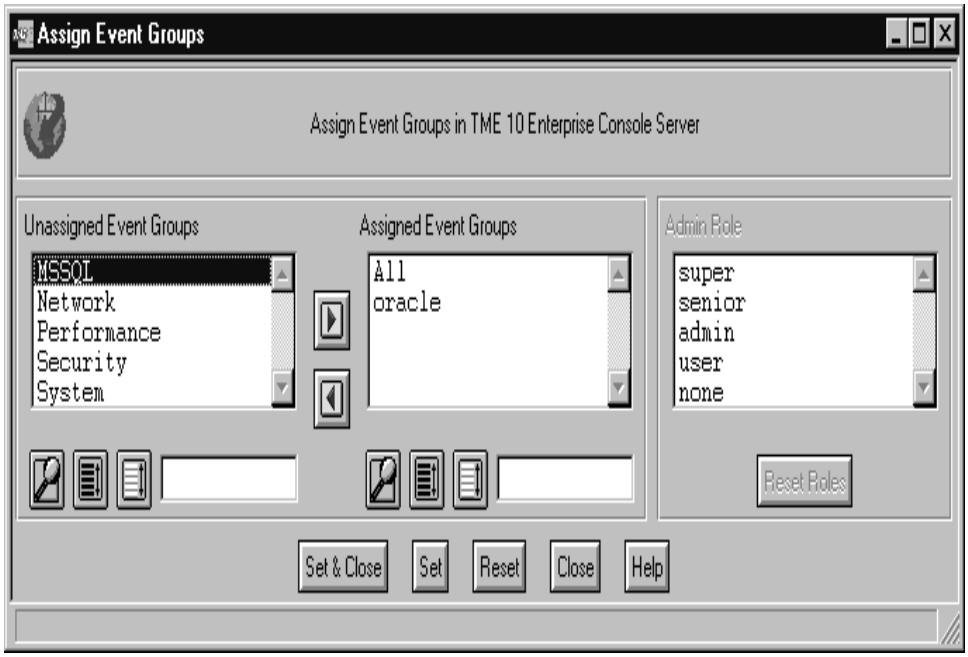


Figure 300. Assign Event Group Window

Move MSSQL from the Unassigned Event Groups to the Assigned Event Groups. Select the Admin Role as **admin** and then click **Set & Close.** Return to the Tivoli Desktop and double-click on **Root_rs600019-region**. The following window will appear.

Figure 301. TME 10 Enterprise Console Window.

Select the **MSSQL** icon to get the following window.

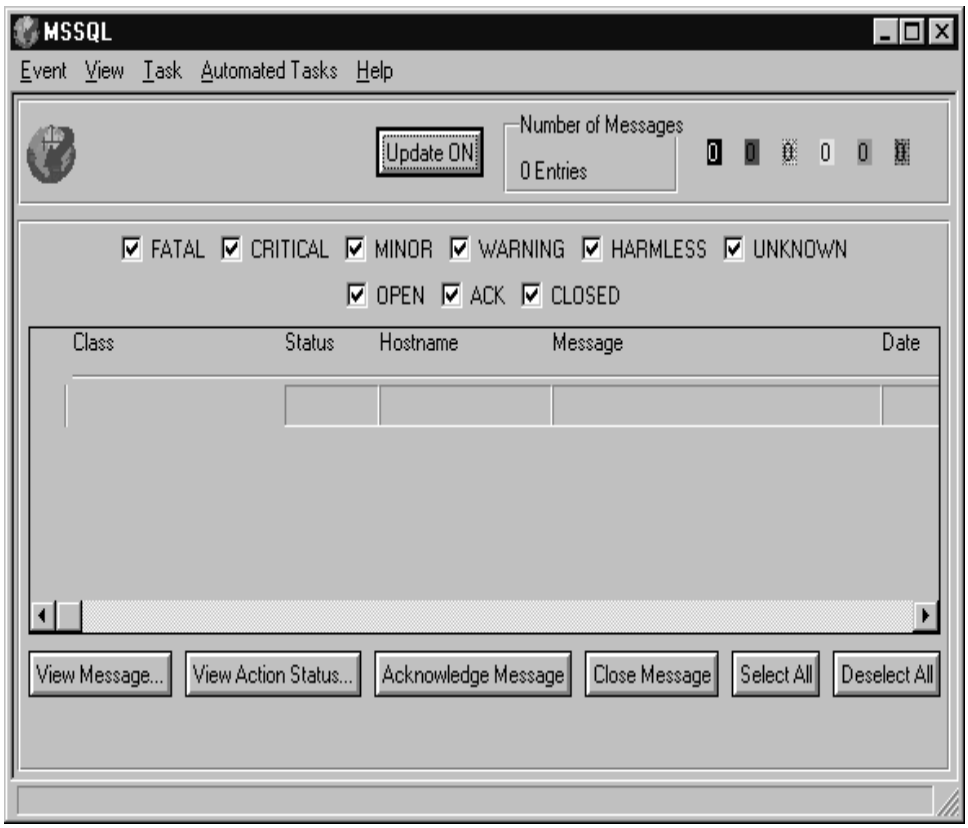


Figure 302. MSSQL Window

This window is where we will receive the Tivoli Manager for MS SQL Server - Distributed Monitoring events.

4.6.8.1 Receiving Events from Distributed Monitoring

Events are now ready to be received. Refer to Section 4.6.6.3, “Creating and Using Monitors within a Profile” on page 279 and the Figure 269 on page 282. As mentioned in this section messages can be sent to a TEC console. An existing monitor is selected for editing in the following window.

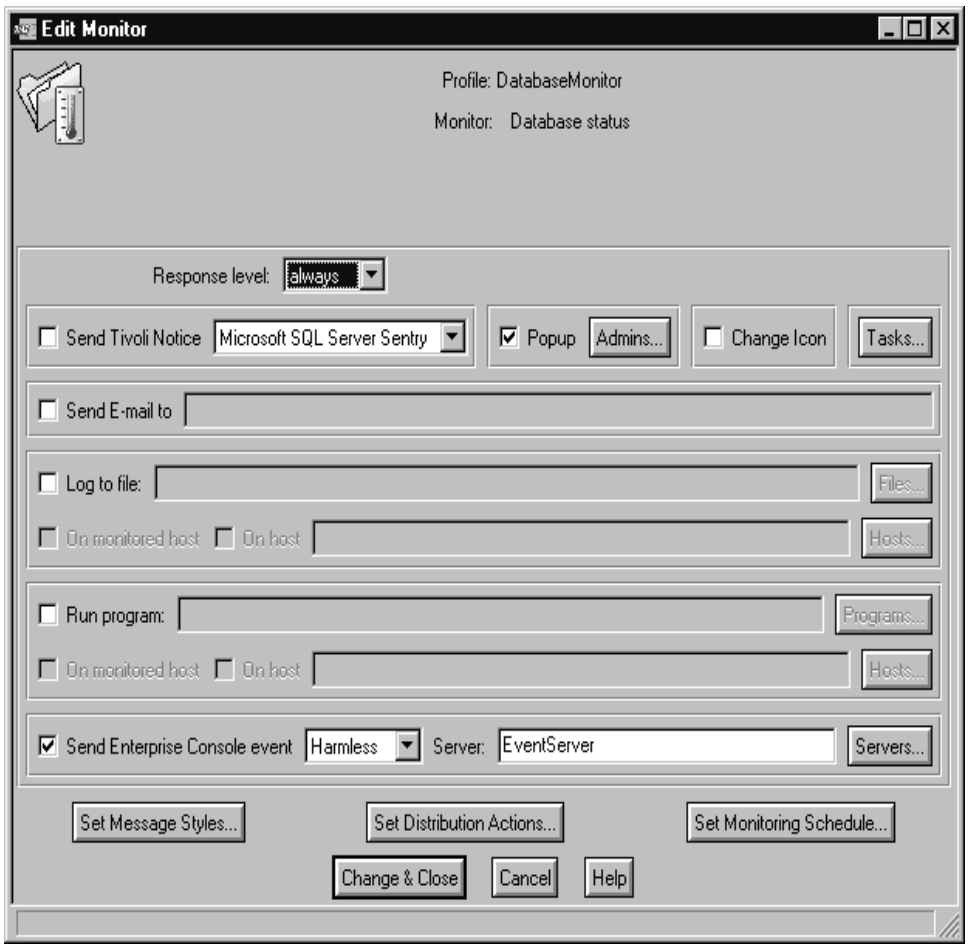


Figure 303. Edit Monitor Window

Select the **Send Enterprise Console events** check box. Select the severity of the event that this monitor will generate. Our selection here is **Harmless** and finally select the server that the events are to be sent to. Our selection here is **EventServer**. Select **Change & Close** and distribute these changes to the subscribers within this profile.

The event should appear in the following window within TEC.

Figure 304. MSSQL Window

More detailed information on the event can be obtained by highlighting the event and selecting the **View Message...** button. The following window will appear.

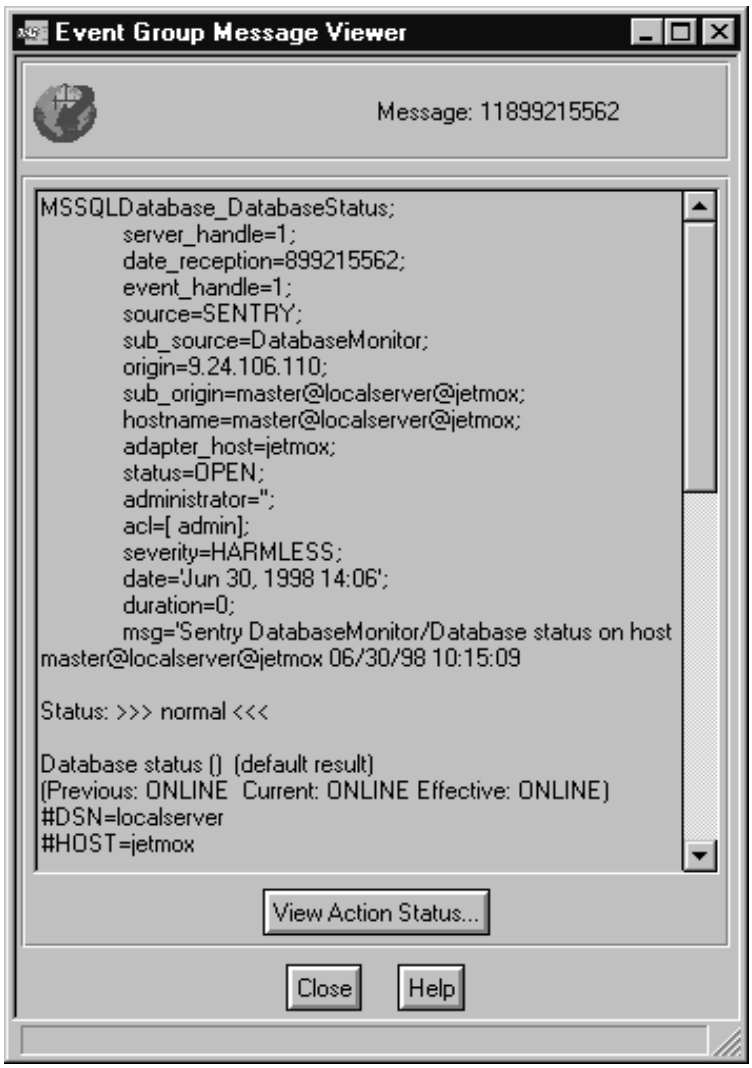


Figure 305. Event Group Message Viewer Window

4.7 New Features in Tivoli Manager for MS SQL Version 1.2

Version 1.2 of Tivoli Manager for MS SQL contains additional monitors for monitoring MS SQL using Tivoli Distributed Monitoring, a number of Tivoli framework tasks to manage MS SQL and additional support for servers and database endpoints.

Version 1.2 of Tivoli Manager for MS SQL will be available by the time you read this book.

Chapter 5. Tivoli Manager for DB2

In this chapter we install DB2 for AIX and DB2 for Windows NT on two of the managed nodes in our environment and then show how to manage these RDBMSs using Tivoli Manager for DB2.

5.1 Overview and Objective

We want to extend our environment with a DB2 installation that we can then manage using Tivoli Manager for DB2. For that purpose, we add an AIX managed node to our environment on which the RDBMS is installed. We also install DB2 for Windows NT on WTR05242 and WTR5172, which are managed nodes in our TMR.

As we are also using an example with DB2 for AIX, we add the AIX machine rs60009 as a managed node to our TMR.

We perform the following tasks:

- Installing and configuring DB2 for AIX
- Installing and configuring DB2 for Windows NT
- Installing Tivoli Manager for DB2
- Assigning TMR roles
- Registering DB2 databases
- Using the DB2 command line processor from the Tivoli desktop
- Launching DB2 control center from the Tivoli desktop
- Working with DB2 tasks and jobs
- Monitoring DB2 using Tivoli Distributed Monitoring
- Event forwarding to Tivoli Enterprise Console

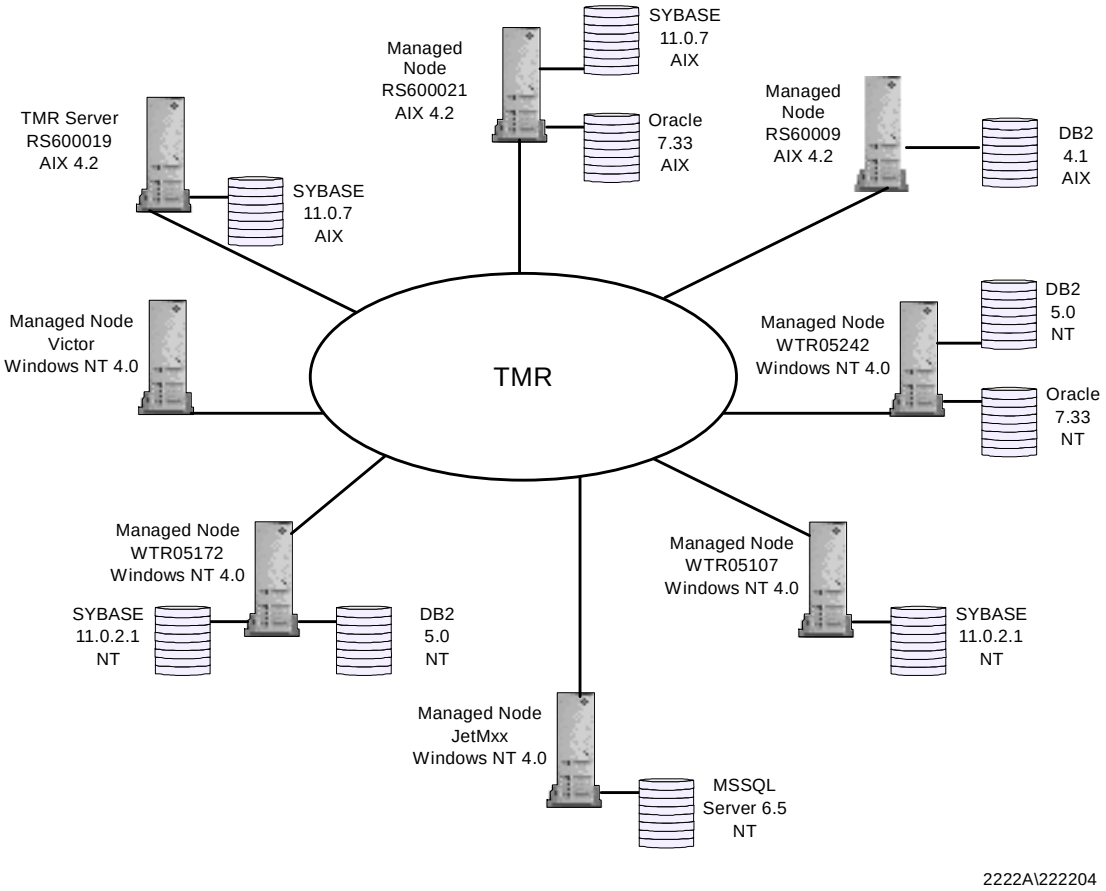


Figure 306. TMR Environment for DB2 Scenario

5.2 Prerequisites

The software prerequisites for Tivoli Manager for DB2 are similar to the prerequisites for the other Tivoli RDBMS modules.

The following Tivoli components are required:

- TME 10 Framework 3.1.2 or later
- Sentry 3.0.2 with patch 3.0.2-SEN-0010 or a later version of Tivoli Distributed Monitoring

As described in 2.2, “Prerequisites” on page 18 we use TME 10 Framework 3.2 with additional patches and TME 10 Distributed Monitoring 3.5 with Maintenance Release 1.

5.3 Extending Our TMR Setup

We add the AIX system rs60009 as a Tivoli managed node to our existing TMR (rs600019-region).

In order to do so, we first create two new file systems on rs60009, /usr/local/Tivoli (100 MB) and /var/spool/Tivoli (50 MB).

Once we have created the file systems using SMIT, we mount them. Then we start the Tivoli desktop and double-click on the **rs600019-region** icon. In the Policy Region: rs600019-region window we select **Create** from the menu bar and then **Managed Node...** from the pull-down menu.

The following window will appear.

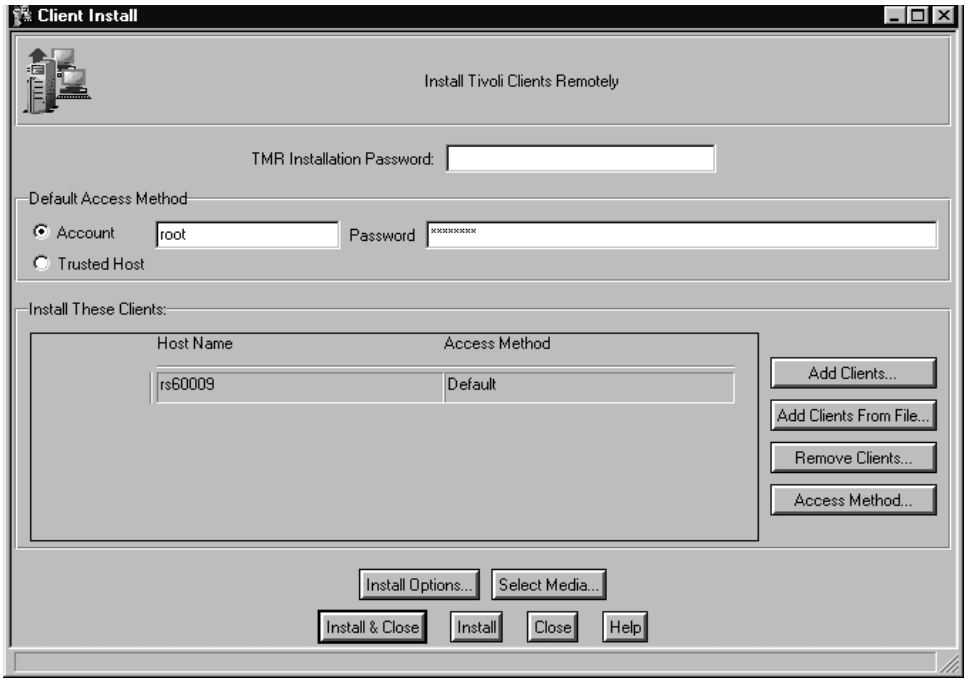


Figure 307. Client Install Window

First, we click the **Account** button and then enter `root` in the Account field and root's password in the Password field. Then we click on **Select Media...** and set the path to the location where the code for the Tivoli Framework is available.

The following window will appear.

Figure 308. Install Options Window

We enter the values as shown above and the click on **Set**.

Back in the Client Install window we click on **Install & Close**. This will start the managed node installation. Once the managed node is installed, we install all framework patches that we previously installed on the other managed nodes. Also, we install Tivoli Distributed Monitoring on the newly created managed node.

5.4 Setting Up DB2

In this section we install and then configure DB2 for AIX on rs60009. Once this is done, we create a sample database. Then we install and configure DB2 for Windows NT.

5.4.1 Installing DB2 for AIX

The DB2 for AIX RDBMS is packaged as a standard AIX installp image and can be installed using the AIX System Management Interface Tool (SMIT).

To start the installation, we type the following as root on rs600019:

```
smitty install_latest
```

The following window will appear:

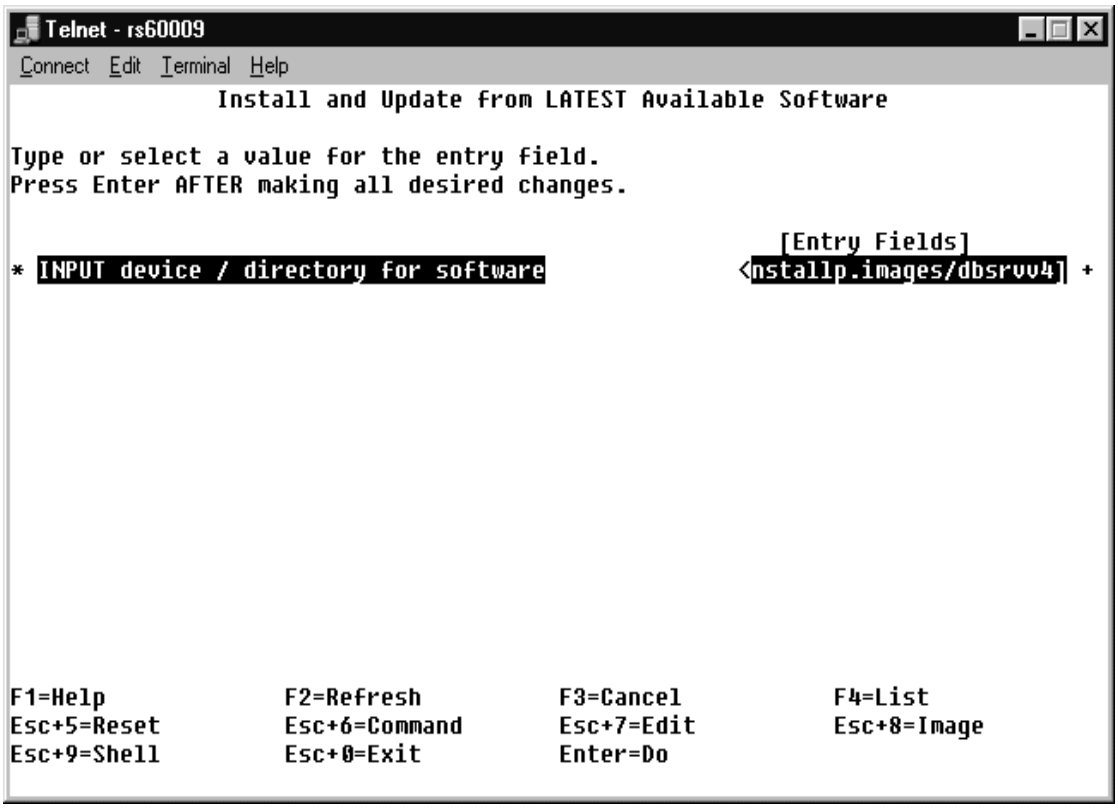


Figure 309. SMIT - Install and Update from LATEST Available Software Panel

We enter the path where the install images for DB2 for AIX are located. This can be, for example, the mount point of the product CD-ROM. Then we press Enter.

```
Telnet - rs60009
Connect  Edit  Terminal  Help
                Install and Update from LATEST Available Software

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                                      [Entry Fields]
* INPUT device / directory for software               /cdrom/installp.images>
* SOFTWARE to install                                [all_latest]            +
  PREVIEW only? (install operation will NOT occur)    no                     +
  COMMIT software updates?                            yes                    +
  SAVE replaced files?                                no                     +
  AUTOMATICALLY install requisite software?           yes                    +
  EXTEND file systems if space needed?                yes                    +
  OVERWRITE same or newer versions?                   no                     +
  VERIFY install and check file sizes?                no                     +
  Include corresponding LANGUAGE filesets?            yes                    +
  DETAILED output?                                    no                     +

F1=Help             F2=Refresh          F3=Cancel           F4=List
Esc+5=Reset         Esc+6=Command       Esc+7=Edit          Esc+8=Image
Esc+9=Shell         Esc+0=Exit          Enter=Do
```

Figure 310. SMIT - Install and Update from LATEST Available Software Panel

We press F4 and a list with available install options will appear.

In our example, we select the following components of DB2 for AIX for installation:

```
4.1.1.2 DB2 C Language Include Files and Samples
4.1.1.2 DB2 Client Application Enabler
4.1.1.2 DB2 Code Page Conversions
4.1.1.2 DB2 Command Line Processor
4.1.1.2 DB2 Communications Support - Base with TCPIP
4.1.1.2 DB2 Database Director
4.1.1.2 DB2 Executables
```

At least, you will need to install DB2 Executables, which is the RDBMS server, and the DB2 Command Line Processor, which allows you to enter commands from the command line.

Note

You do not need to create a new file system to install DB2 for AIX as we did for Oracle and Sybase on AIX, since SMIT will install DB2 for AIX in the /usr file system and automatically increase the size of that file system during installation to fit the size of the DB2 for AIX code.

When the installation has finished, you can exit SMIT.

5.4.2 Configuring DB2 for AIX

Now that DB2 for AIX is installed on rs60009, we can configure it. We briefly summarize the steps required in our environment.

1. Create an instance of the DB2 for AIX product:

   You must have root authority when performing these steps.

   - Create an AIX group that will be the group ID of the instance owner:

     ```
     mkgroup dbsysadm
     ```

   - Create an AIX user which will be the instance owner and therefore will have the highest database priority:

     ```
     mkuser pgrp=dbsysadm groups=dbsysadm home=/home/dbmsadm dbmsadm
     ```

   - Define a password for the newly created user dbmsadm:

     ```
     passwd dbmsadm (Set the password for the user dbmsadm)
     ```

     Note

     The primary group of the instance owner will automatically become the group of the database system administrator while creating the instance. Make sure that the instance owner has the correct primary group set before running the instance creating script db2instance. Otherwise, there is a potential danger of inadvertent authorization to dbsysadm of members of the group staff, for example, which is the default primary group of an AIX user without administrator rights.

   - Execute the shell script db2instance to create a DB2 instance and define dbmsadm as system administrator of the database:

     ```
     /usr/lpp/db2_02_01/instance/db2instance dbmsadm
     ```

     This command creates a directory /home/dbmsadm/sqllib for the dbmsadm user that represents the database instance assigned to this user. Also, this script defines the correct environment for the instance owner.

Note

Make sure that there is enough space left in the /home file system before running the command. You will need 1-2 MB to create the instance. Also, you should be aware that the path to the db2instance script may be different if you are using a different version of DB2 for AIX.

- Set up the environment for using DB2 for AIX:

  Log in as user dbmsadm using the password set before. When you log in the first time, the system will ask you to change the password.

  Edit the $HOME/sqllib/db2profile file and change the appropriate entries to the following:

  ```
  DB2DBDFT=tivoli
  DB2COMM=tcpip
  ```

  The DB2DBDFT variable contains the name of the default database, tivoli in our example.

  To activate the variable DB2COMM, remove the comment sign (#) at the beginning of the appropriate lines in the profile db2profile. To get the database environment activated every time you log in as the dbmsadm user add the following line to the .profile file for the dbmsadm user:

  ```
  . $HOME/sqllib/db2profile
  ```

2. Enter the license information.

   Before you can use the products in the DB2 for AIX family you must add the license passwords. See *Database 2 AIX/6000 Installation Guide*, GC09-1570 for more information about obtaining and registering the license information.

3. Execute the db2ln command.

   This script creates links for libraries and include files for a particular version or release of the product:

   ```
   /usr/lpp/db2_02_01/cfg/db2ln
   ```

   Run this script as root.

4. Configure DB2 for AIX to communicate over TCP/IP.

   In order to provide communication support over TCP/IP you must first have installed and configured the Base Operating System Network Facilities (BOSNET) on the RDBMS server. To configure TCP/IP for DB2 for AIX log in as root and add the following lines to the /etc/services file:

```
db2tivoc 3700/tcp
db2tivoi 3701/tcp
```

The entry db2tivoc is the name of the service that is used for configuration of the database system manager to define the port it will listen to.

5.4.3 Creating an Example Database

After finishing the basic setup, we now create an example database.

We perform the following steps:

1. Configure the database manager for TCP/IP.

   The service name associated with the main connection port is used by the database manager to identify the port it will listen to. To enter the information in the database manager configuration file you have to log in as dbmsadm and execute the following command:

   ```
   db2 update database manager configuration using svcename db2tivoc
   ```

2. Create a new file system for the database.

   Since the creation of a new database requires about 12 MB storage on the database server, we recommend holding the database in a separate file system mounted under the home directory of the instance owner. You must log in as root user to have the authority to be able to create a new file system. To create a new file system enter the following commands:

   ```
   mkdir /home/dbmsadm/database
   ```

   You may either use SMIT or the command line interface to create a new file system. In our example we use the command line interface to create the file system in the volume group rootvg. We are using a size of 100 MB for this file system.

   ```
   crfs -v jfs -g rootvg -a size=204800 -m /home/dbmsadm/database -A yes -p
   rw
   mount /home/dbmsadm/database
   chown dbmsadm.dbsysadm /home/dbmsadm/database
   ```

3. Create the database on the new file system.

   To create the database you have to log in to the AIX operating system as user dbmsadm. Create the database by executing the following commands:

   - Start the DB2 for AIX command line processor by entering the following command:

     ```
     db2
     ```

   - Start the database manager:

To start up the DB2 for AIX database manager, enter the following command in the DB2 command line interface:

```
db2start
```

- Create the database in the directory /home/dbmsadm/database by entering the following command:

  ```
  create database tivoli on /home/dbmsadm/database
  ```

  After this command completes successfully, the database tivoli is ready for use.

5.4.4 Installing DB for Windows NT

In order to install DB2 for Windows NT we start the SETUP.EXE program from the product CD-ROM. The following window will appear.

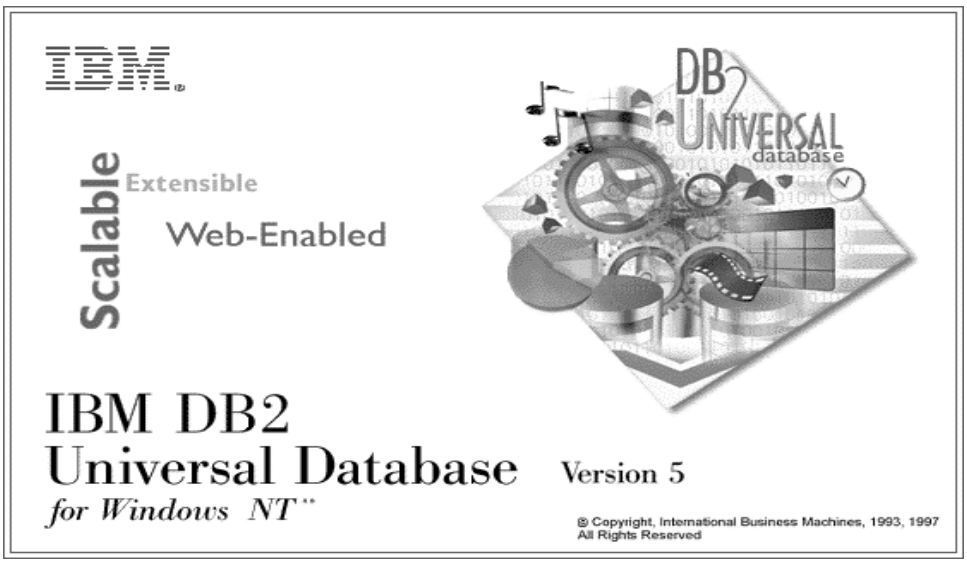


Figure 311. IBM DB2 Universal Database for Windows NT Installation Startup Message

After a few seconds, the following window will appear.

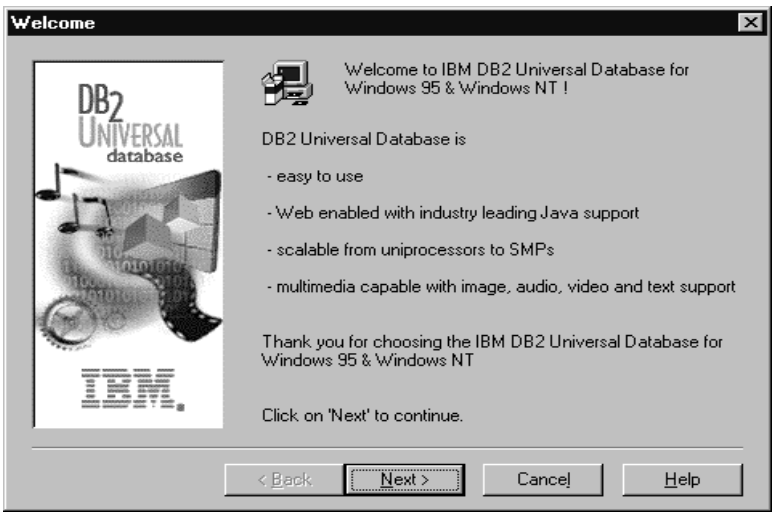


Figure 312. Welcome Window

We click on **Next>** to continue with the installation.

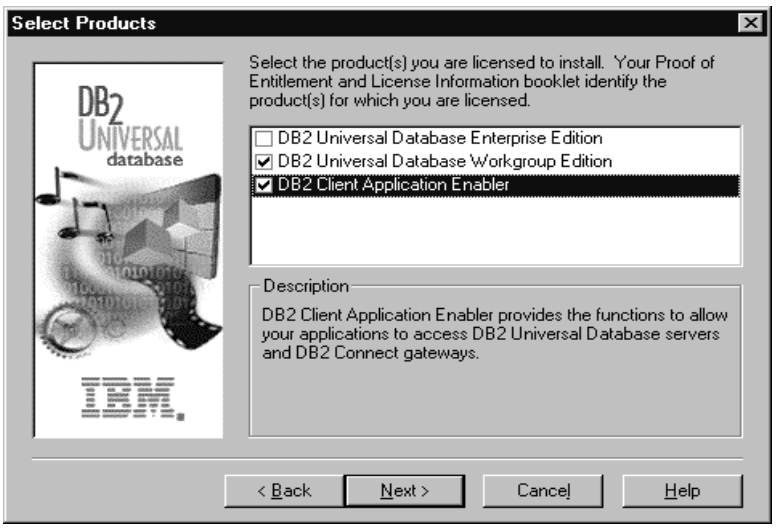


Figure 313. Select Products Window

We select **DB2 Universal Database Workgroup Edition** and **DB2 Client Application Enabler** and then click on the **Next>** button.

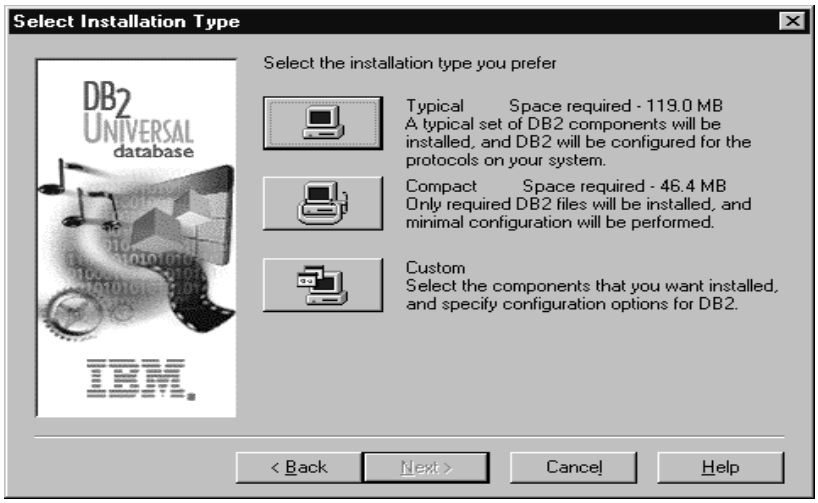


Figure 314. Select Installation Type Window

We click on **Typical** to continue with the installation.

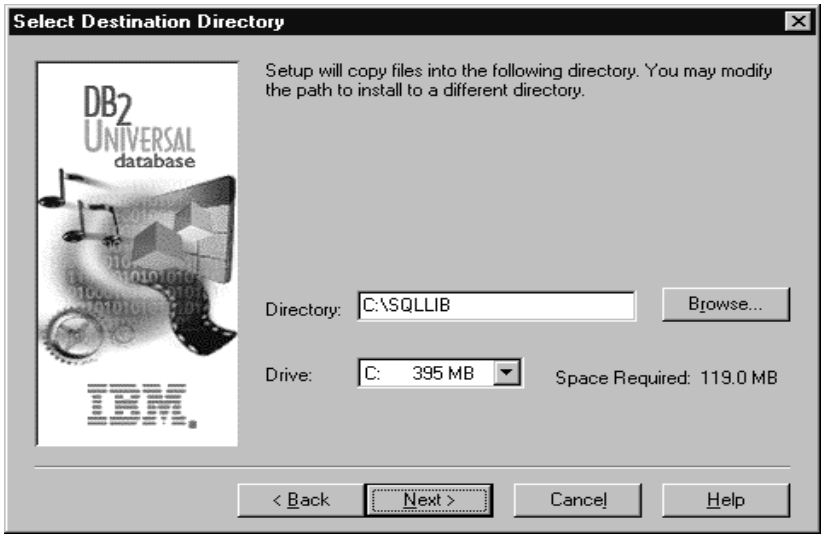


Figure 315. Select Destination Directory

We accept the default destination directory (C:\SQLLIB) and click on the **Next>** button.

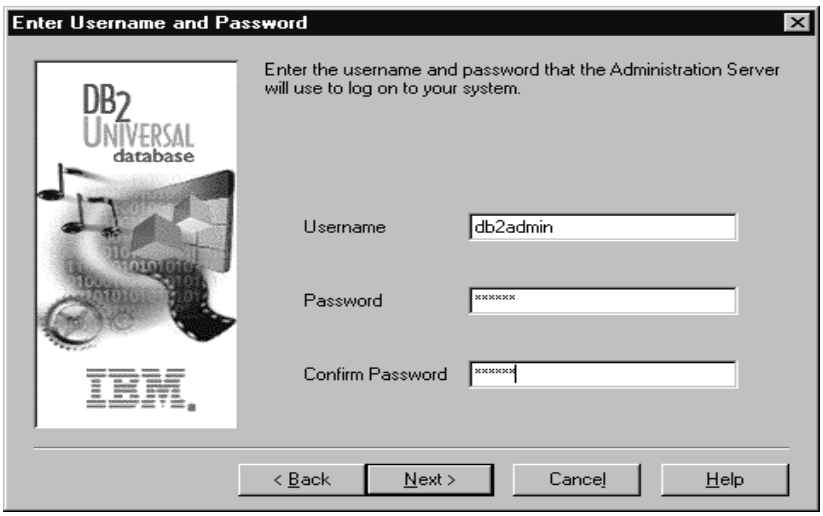


Figure 316. Enter Username and Password

We leave the Username as db2admin and enter `tivoli` in the Password and Confirm Password fields. The installation process will create a Windows NT user ID db2admin with that password.

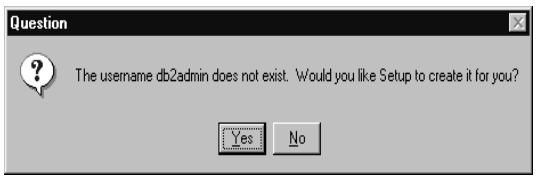


Figure 317. Question Window

The Question window asks us if the installation process should go ahead and create the new user ID. We click on the **Yes** button.

Figure 318. Start Copying Files Window

The above window informs us that the installation is about to start copying files. To start the actual installation we click in the **Install>** button.

The installation process will the start copying files, which takes several minutes. After the installation is finished, a reboot of the machine is required.

After rebooting machine, you can create a sample database on the machine. From the Windows Start menu, select **Start -> Programs -> DB2 for Windows NT -> First Steps.** The db primer program starts up, and you can create the sample database.

5.5 Installing Tivoli Manager for DB2

Before installing the module, you must create an operating system user ID db2ecc on each node in the TMR where you want to install the module. This is very important, as the installation script will fail if this user does not exist.

The user db2ecc must be in the administrator group for DB2, dbsysadm in our specific installation (see 5.4.2, “Configuring DB2 for AIX” on page 323).

In our environment, we also need to create the user on our TMR server, even though rs600019 has no DB2 installed. Nevertheless, the installation will fail if we don’t create the user.

On rs600019 we create the user by typing:

```
mkuser db2ecc
```

On rs60009 we create the user using the command:

```
mkuser pgroup=dbsysadm groups=dbsysadm db2ecc
```

On wtr05172 and wtr05242 we also add db2ecc to the operating system using the Windows NT User Manager and assign the Windows NT groups Administrators and Tivoli_Admin_Privileges to that user. Because this user ID is used to start a service by Tivoli. You also have to assign the advanced user right Log On as Service.

Also, db2ecc must be added inside Tivoli as a login for the Tivoli Root administrator. To do this we double-click on **Administrators** on the Tivoli desktop. Then we select the **Root_rs600019-region** icon with the right mouse button and select **Edit Logins...** from the pull-down menu.

The following window will appear:

Figure 319. Set Login Names Window

We enter db2ecc in the Add Login Name field and press Enter. Then we click the **Change & Close** button.

Tivoli Manager for DB2 is installed from the Tivoli desktop. In order to install the module, we start the Tivoli desktop, select **Desktop** from the menu bar and then **Install -> Install Product...** from the pull-down menu.

In the File Browser window we point the media path to where the install images for Tivoli Manager for DB2 are located, for example, the mount point of the product CD-ROM. When finished, we click the **Set Media & Close** button.

The following window will appear:

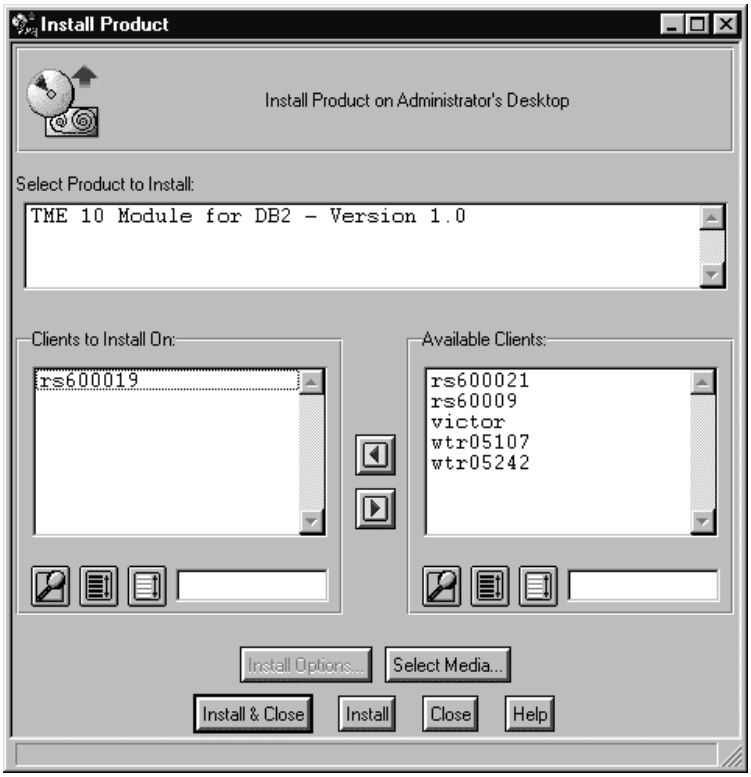


Figure 320. Install Product Window

We select **TME 10 Module for DB2 - Version 1.0**. This will pop up the following window.

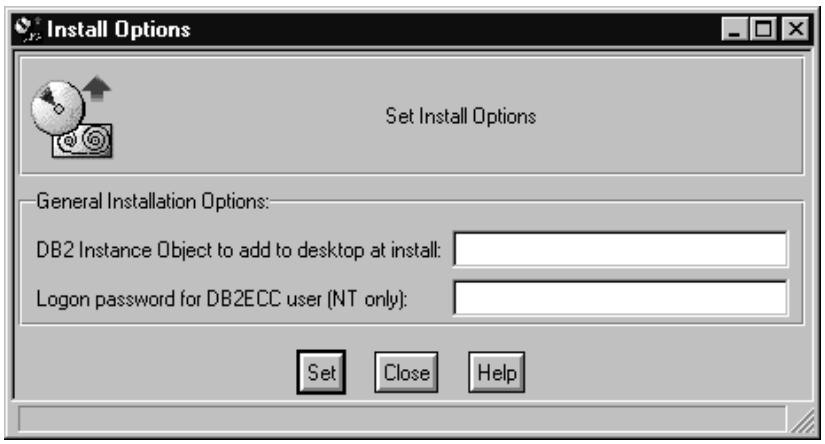


Figure 321. Install Options Window

As we are installing on AIX and do not want to create a DB2 instance now, we just click on **Set**.

We move rs600019 (our TMR server) and rs60009 (our DB2 server) to the Clients to Install on section and then click **Install & Close**. This will open the Product Install window, which displays messages with installation information. Review all messages carefully for any problems and then click **Continue Install**. This will start the installation of Tivoli Manager for DB2.

Note

The *TME 10 Module for DB2 - User's Guide* is not fully precise on where to install the module. In fact, the module needs to be installed on the TMR server and any managed node where DB2 resources are to be managed. However, as an alternative you can install the module only on the TMR server and just copy the necessary binaries from the TMR server to the DB2 nodes. We strongly recommend, however, that you install the module on all DB2 nodes.

While the installation is running, you can trace the progress by typing the following on the TMR server:

```
tail -f DB2ECC_V1R2_ALIDB_after.output
```

You may also look for possible errors in:

```
tail -f DB2ECC_V1R2_ALIDB_after.error
```

Once installation is finished you can look at the log file in /tmp/DB2ECC_V1R2.log. (This is valid for Version 1.0 of the module.)

Note

The installation might run for quite some time, especially when you have a large number of managed nodes in your TMR. In our environment, the installation took around 10 minutes to complete.

Once the installation on rs60009 and rs600019 is finished, we start the installation of Tivoli Manager for DB2 again for wtr05172 and wtr05242. This time we have to enter the password for the db2ecc user that we have created before as shown in the following figure.

Figure 322. Install Options Window

The password we specify is the password we assigned when creating the db2ecc user on Windows NT.

5.6 Using Tivoli Manager for DB2

In this section we show how to set up Tivoli Manager for DB2 and use the most important functions.

Note

All operations we perform using the GUI in this section can also be performed using the command line. An easy way of finding out the commands that relate to Tivoli Manager for DB2 is to type the following command:

```
ls $BINDIR/bin/*db2*
```

This will list the Tivoli commands added during the installation of Tivoli Manager for DB2.

5.6.1 Creating a New Policy Region for DB2

We create a new policy region called DB2 for working with the module. To do so, we select **Create** from the menu bar in the Tivoli desktop main window and then select **Region...** from the pull-down menu.

The following window will appear:

Figure 323. Create Policy Region Window

We enter `DB2` in the Name field and then click on **Create & Close**.

Back in the Tivoli desktop main window we have a new icon for the policy region. We double-click on **DB2** to open the region.

The following window will appear.

Figure 324. Policy Region: DB2 Window

5.6.2 Setting Managed Resources

We select **Properties** from the menu bar and then **Managed Resources...** from the pull-down menu.

The following window will appear:

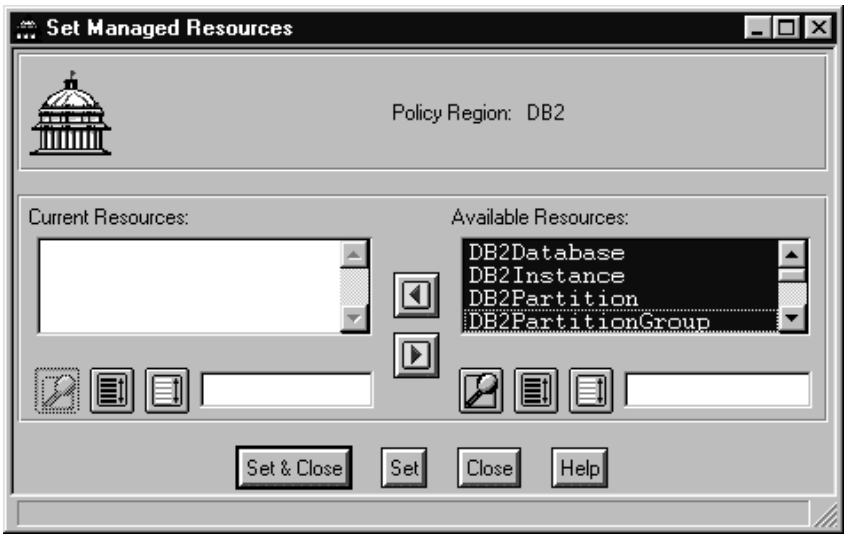


Figure 325. Set Managed Resources Window

The installation of Tivoli Manager for DB2 adds new managed resources to the TMR. We select these resources as shown in the previous figure, then click the left arrow button and **Set & Close**.

After that, we will be able to manage DB2 resources in our DB2 region.

Tivoli Manager for DB2 also adds two notice groups that you should assign to your administrator to get notifications about actions performed by the module. The following figure shows how to add the notice groups.

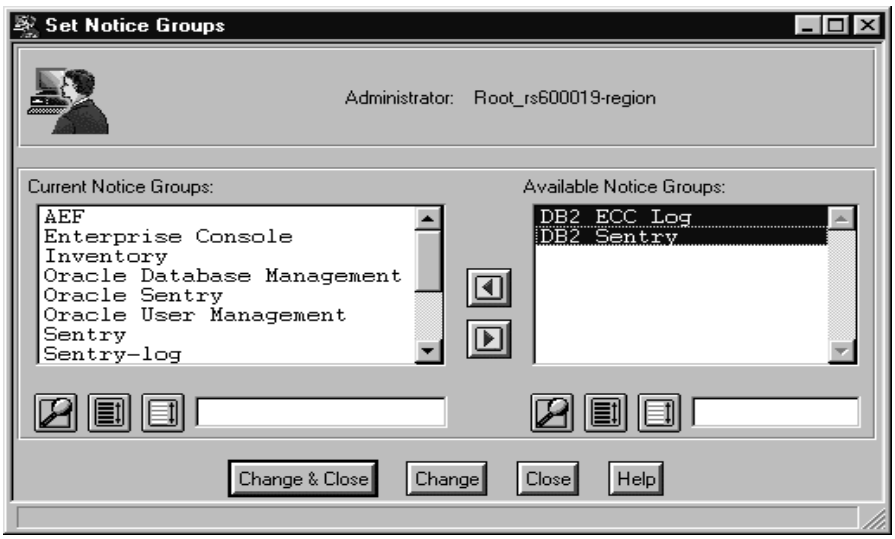


Figure 326. Set Notice Groups Window

You get to this window by selecting your administrator in the Administrators window with the right mouse button and then selecting **Edit Notice Group Suscriptions...** from the pull-down menu.

You can see the groups DB2 ECC Log and DB2 Sentry. DB2 ECC Log is used for log messages from Tivoli Manager for DB2 while DB2 Sentry can be used as an output format in Tivoli Distributed Monitoring profiles.

The following figure shows an example of a new message in the DB2 Sentry notice group. We specified in our monitoring profile to produce a notice posted to this notice group whenever the monitor triggers.

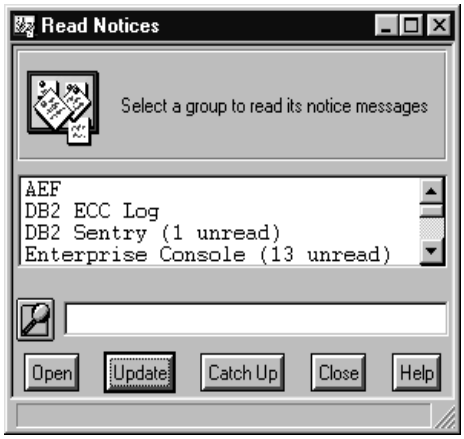


Figure 327. Read Notices Window

To open the message we click on **DB2 Sentry (1 unread)**. The following window will appear.

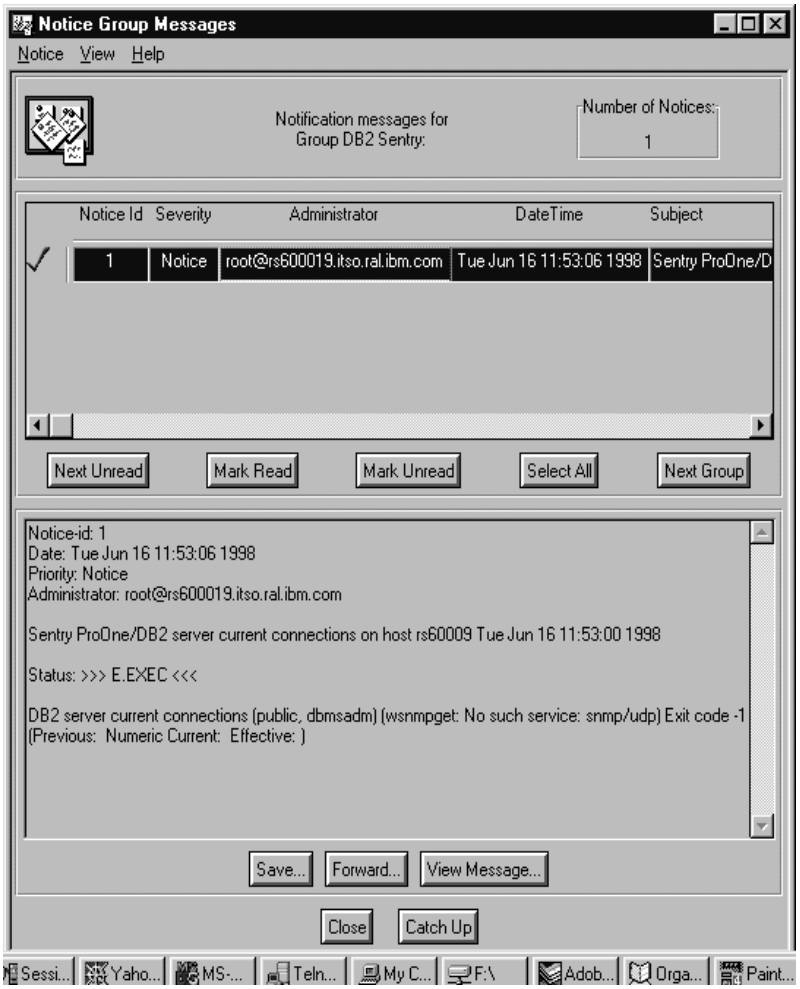


Figure 328. Notice Group Messages Window

You can see the output from the monitor, in this case an E.EXEC error.

5.6.3 Creating a DB2 Instance on the Tivoli Desktop

The first step in managing DB2 resources is to create a DB2 instance. To do so, we select **Create** from the menu bar and then **DB2Instance...** from the pull-down menu as shown in the following figure.

Figure 329. Policy Region: DB2 Window

The following window will appear.

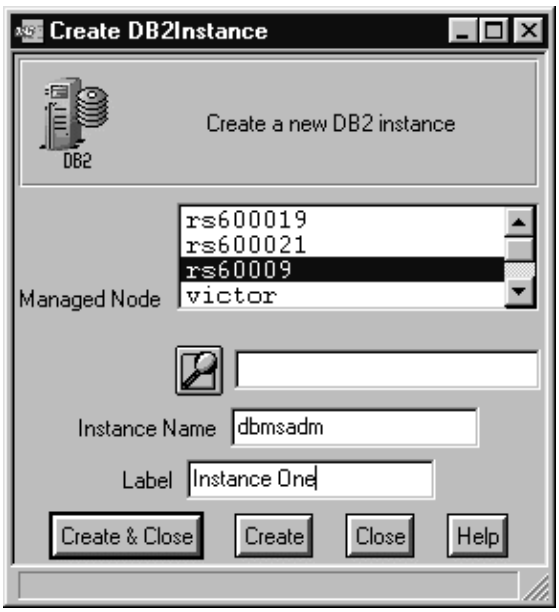


Figure 330. Create DB2Instance Window

We enter the values as shown in Figure 330 on page 341. The managed node on which our DB2 server is running is rs60009. The Instance Name is the instance name and the name of the instance owner that we specified when creating the instance in 5.4.2, “Configuring DB2 for AIX” on page 323. The Label can be text of your choice.

When finished entering the values, we click on **Create & Close**. This will create the database instance on the Tivoli desktop.

In the following we show some common error messages that might occur when trying to create the DB2 instance.

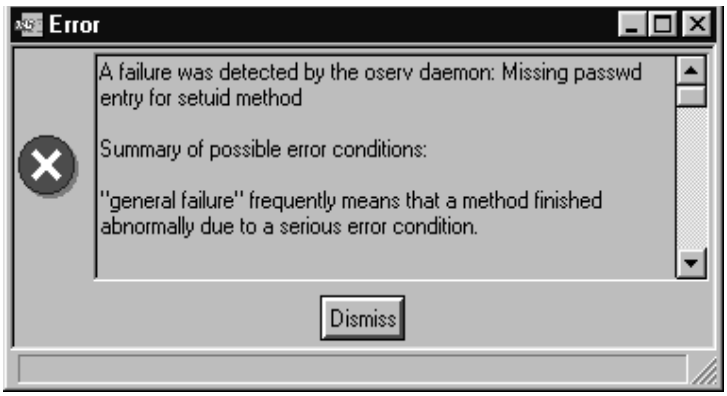


Figure 331. Error Window

The above error message occurs in case you forgot to create the db2ecc user on the node where DB2 resides, rs60009 in our example, or in case db2ecc is not a member of the database administration group, dbsysadm in our example.

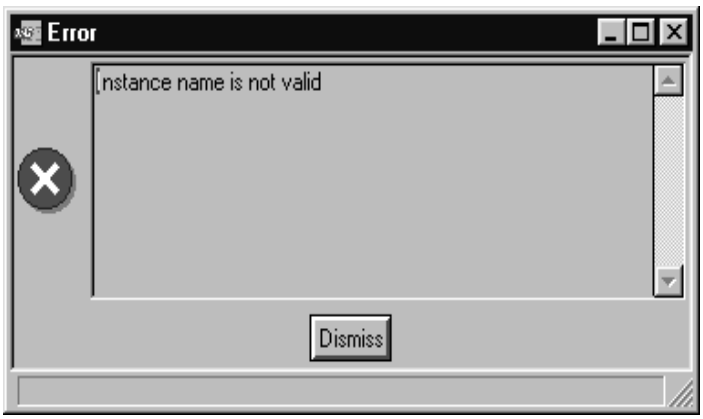


Figure 332. Error Window

The above error occurs in case you enter an instance name that does not exist on the DB2 server.

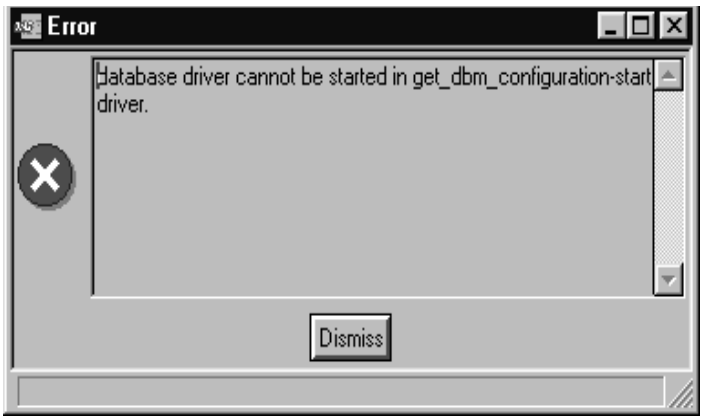


Figure 333. Error Window

The above error message appears in case you did not install the module on the node where DB2 is installed, rs60009 in our example.

After the successful creation of the instance, you will have a new icon in the policy region as shown in the following figure:

Figure 334. Policy Region: DB2 Window

Tivoli Manager for DB2 can now automatically discover the databases that are currently defined in the instance.

To do so, we select **Instance One** with the right mouse button and then select **Discover Databases...** from the pull-down menu. The following window will appear:

Figure 335. Discover Databases Window

The module has automatically discovered the database TIVOLI that we have created in 5.4.3, “Creating an Example Database” on page 325. To manage this database with Tivoli Manager for DB2, we select **TIVOLI** and then click on the left arrow button to move it to the Databases Managed by DB2 ECC section.

When finished we click **Add & Close**.

Back in the Policy Region: DB2 window we can see that a new icon for the database has been added to the policy region as shown in the following figure.

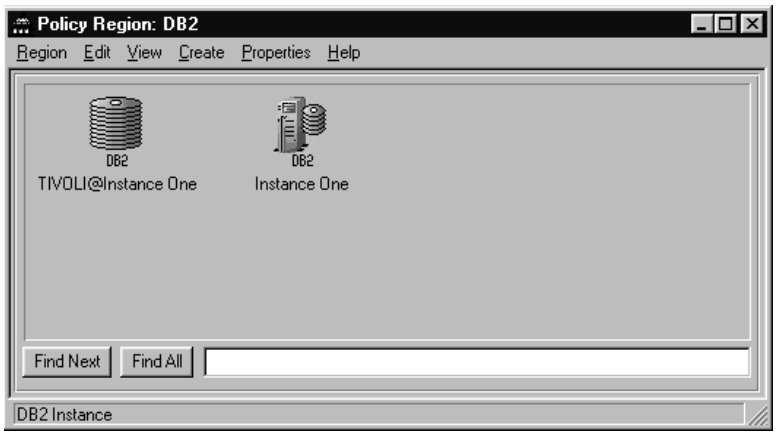


Figure 336. Policy Region: DB2 Window

We can immediately start viewing essential configuration information from the Tivoli desktop, for example, by clicking on **Instance One** with the right mouse button and then selecting **Properties...** from the pull-down menu.

The following window is displayed.

Figure 337. DB2 Instance Properties Window

You can see, for example, the Service Name db2tivoc that we defined previously in 5.4.2, “Configuring DB2 for AIX” on page 323.

You can also display the properties for the database itself by clicking on the database icon and selecting **Properties...** from the pull-down menu.

We are now ready to perform some management operations using Tivoli Manager for DB2.

5.6.4 Using the Command Line Processor from the Desktop

A nice feature of Tivoli Manager for DB2 is that is allows you to run the DB2 command line processor from the Tivoli desktop, so that you can access DB2 from any workstation where the Tivoli desktop is installed.

To start the command line processor, either select the instance or the database with the right mouse button and then select **Start DB2 CLP...** from the pull-down menu.

The following window will appear:

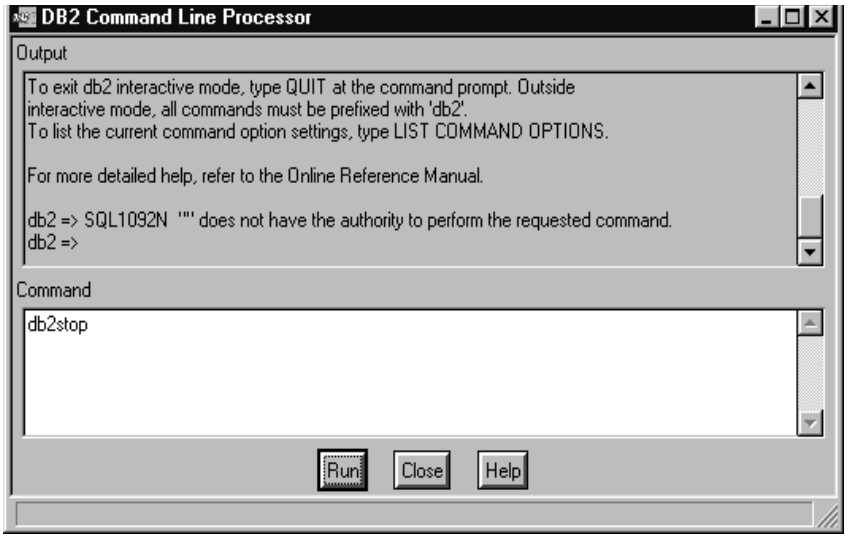


Figure 338. DB2 Command Line Processor on the Tivoli Desktop

In the upper half of the window you can see the responses from the command line processor, which are the same as if you run the db2 command on the UNIX command line.

In the lower half of the window we can enter commands. In the example we have entered the db2stop command and then clicked the **Run** button to start the command. The result is an authorization failure, as we don't have the database authority to stop the database.

To find out which user we are logged on as we enter the following command:

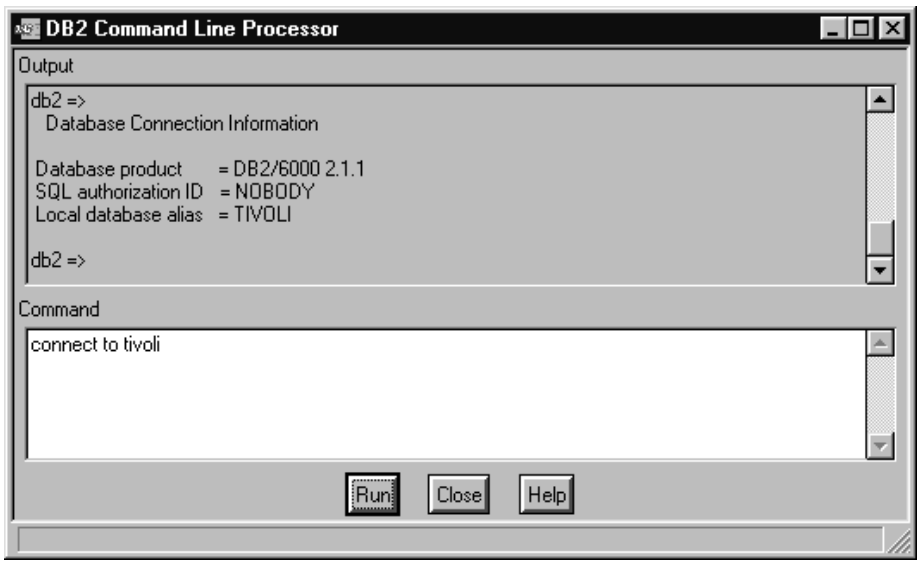


Figure 339. Connecting to the Database

We have entered the command connect to tivoli to connect to the database we have previously defined.

As you can see from the messages in the upper half of the window, we are connected as user NOBODY. This explains why we don't have the authority to shut down the database server.

Note

We tried to connect to the database with a higher priority by typing:

```
connect to tivoli user dbmsadm
```

This works when you use the db2 command supplied with DB2 which will then ask you for the password. From the Tivoli desktop, however, this causes a system error, as it cannot ask for input parameters from the GUI in the Tivoli desktop.

5.6.5 Creating a Windows NT DB2 Instance

The registration of a DB2 instance on Windows NT is done in exactly the same way as with the registration of an AIX DB2 database instance. Select **Create** in the menu bar and then **DB2Instance...** from the pull-down menu. For the registration of the DB2 database on wtr05172 we fill in the values as shown in the following figure.

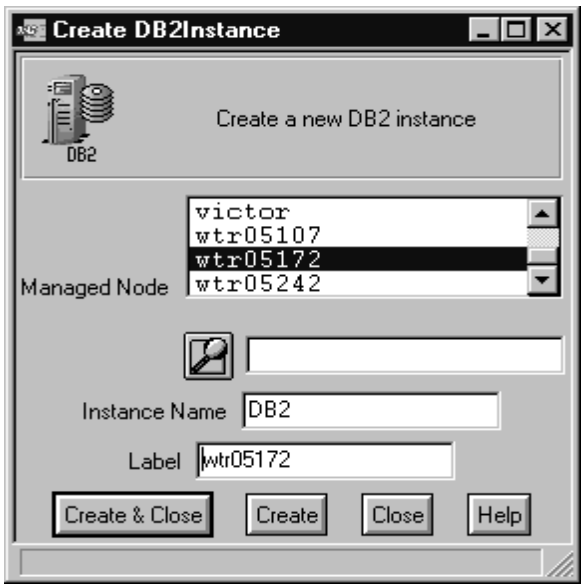


Figure 340. Create DB2Instance Window

The instance name is DB2 on wtr05172, but we give it a different label to visualize the origin of the database instance in the policy region window. After creating the database instance we register the databases inside the database instance of wtr05172. We click the right mouse button on **Discover Databases...** as shown in the following figure.

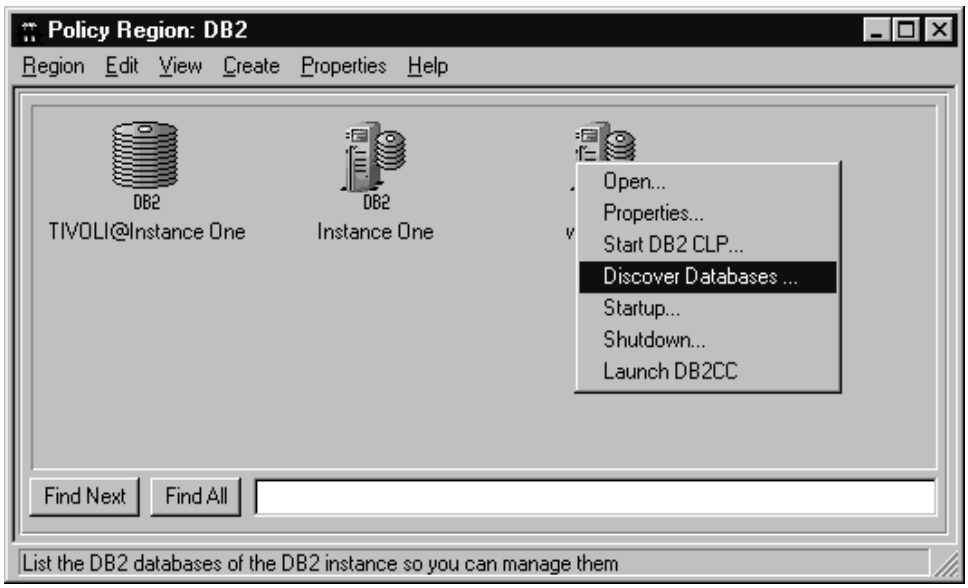


Figure 341. Policy Region: DB2 Window

Now we continue the registration in exactly the same way as we registered the DB2 instance on the AIX machine rs60009. We also register another DB2 database instance on wtr05242. The resulting policy region is shown in the following figure.

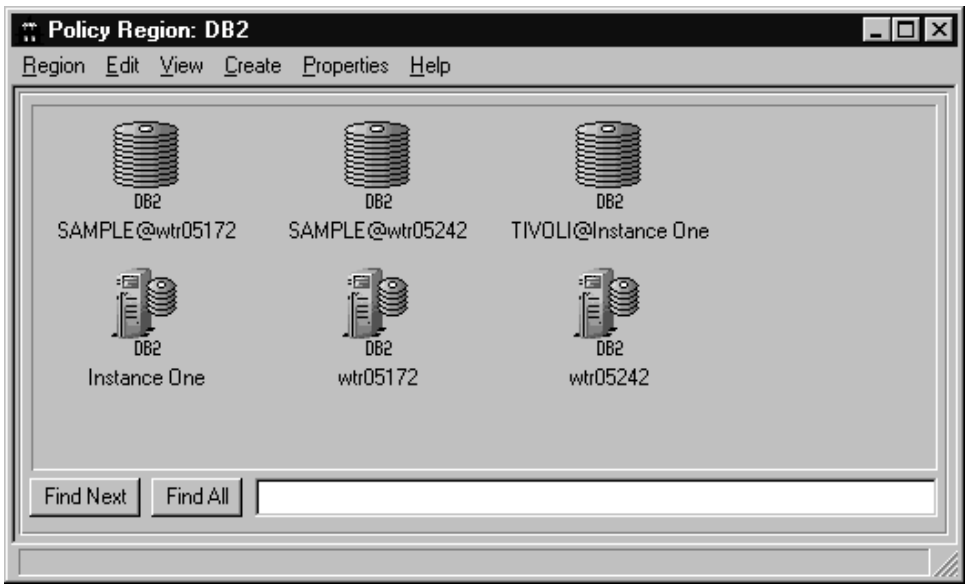


Figure 342. Policy Region: DB2 Window

5.6.6 Launching DB2 Control Center

The DB2 Control Center is a part of the DB2 database for Windows NT. This tool allows you to perform all configuration management tasks for local and remote DB2 database instances from a single Windows NT client. This tool is integrated with Tivoli. When you are running the Tivoli desktop on a Windows NT machine, you can launch the Control Center application from Tivoli. We have to prepare the Control Center as shown in Figure 343 on page 352, so that it knows the three registered database instances.

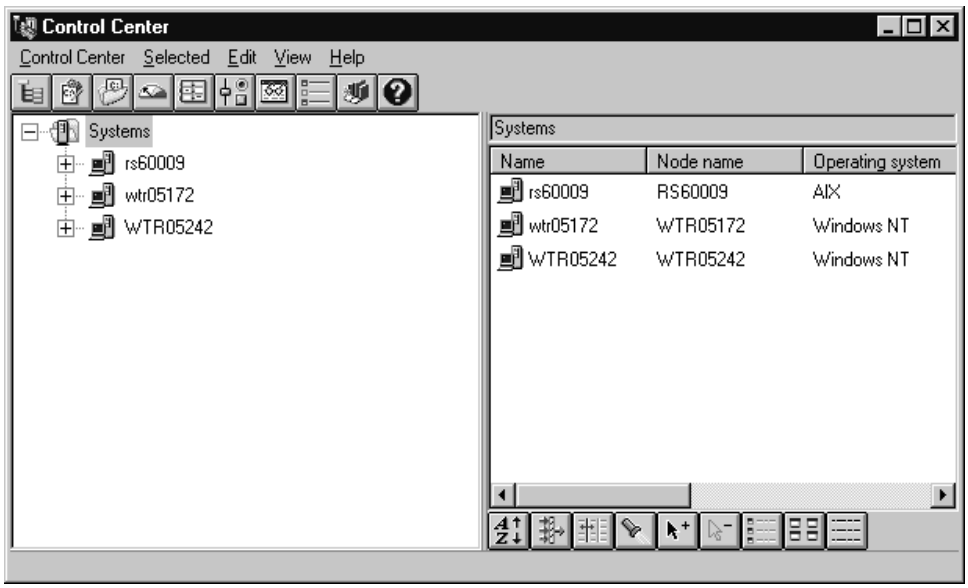


Figure 343. Control Center Window

Now we can launch this Control Center from the Tivoli policy region for a selected database instance. In order to do this, we select with the right mouse button the database icon and click **Launch DB2CC...** as shown in the next figure.

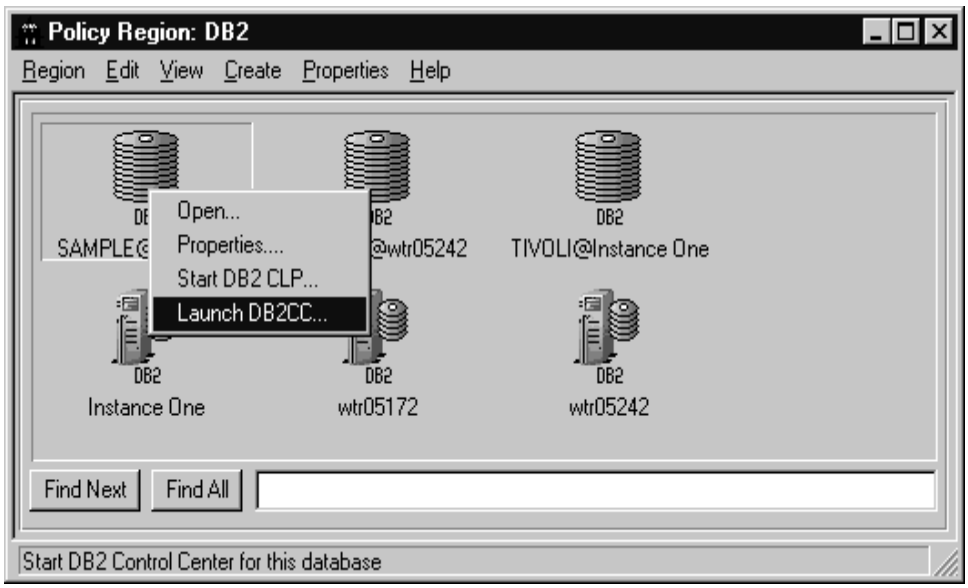


Figure 344. Policy Region: DB2 Window

We are asked to log in as the valid database user and then the Control Center application starts.

5.6.7 Working with DB2 Tasks

After installation of Tivoli Manager for DB2, you should have a new policy region icon called DB2_ECC-DefaultPolicyRegion in the main window of your Tivoli desktop.

If you can not find this icon, select **Desktop** from the menu bar in the Tivoli desktop main window and then select **TMR Connections->Top Level Policy Regions...** from the pull-down menu.

Press the Shift key and click on **DB2_ECC-DefaultPolicyRegion** holding down the left mouse button and moving the icon to the Tivoli desktop main window.

Then double-click on **DB2_ECC-DefaultPolicyRegion** to open the window shown in the following figure.

Figure 345. Policy Region: DB2_ECC-DefaultPolicyRegion Window

You can see that there are three task library icons residing in the policy region: DB2_ECC-AdminTasks, DB2_ECC-DatabaseTasks and DB2_ECC-ReplicatorTasks.

As an example, we double-click on **DB2_ECC-AdminTasks** to open the task library as shown in the following figure.

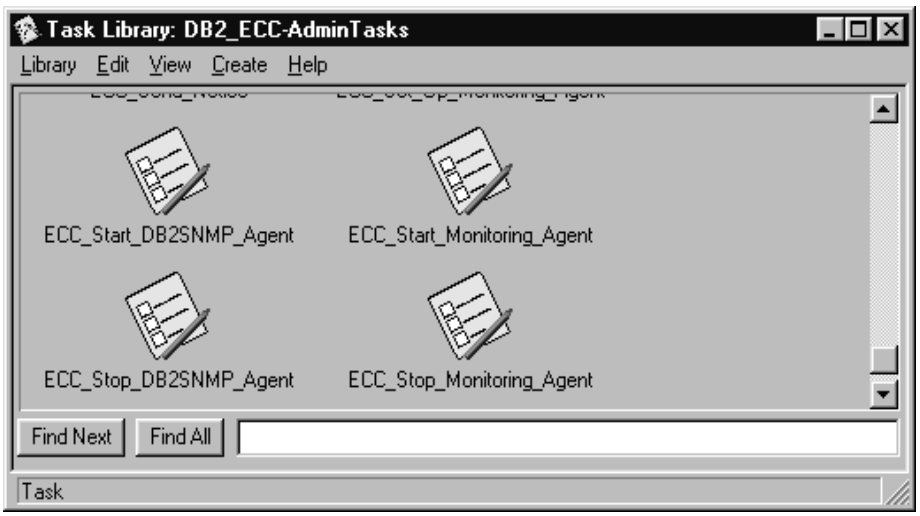


Figure 346. Task Library: DB2_ECC-AdminTasks

As an example, we start the ECC_Start_DB2SNMP_Agent task. To do so, we double-click on the icon, which will open the window shown in the following figure.

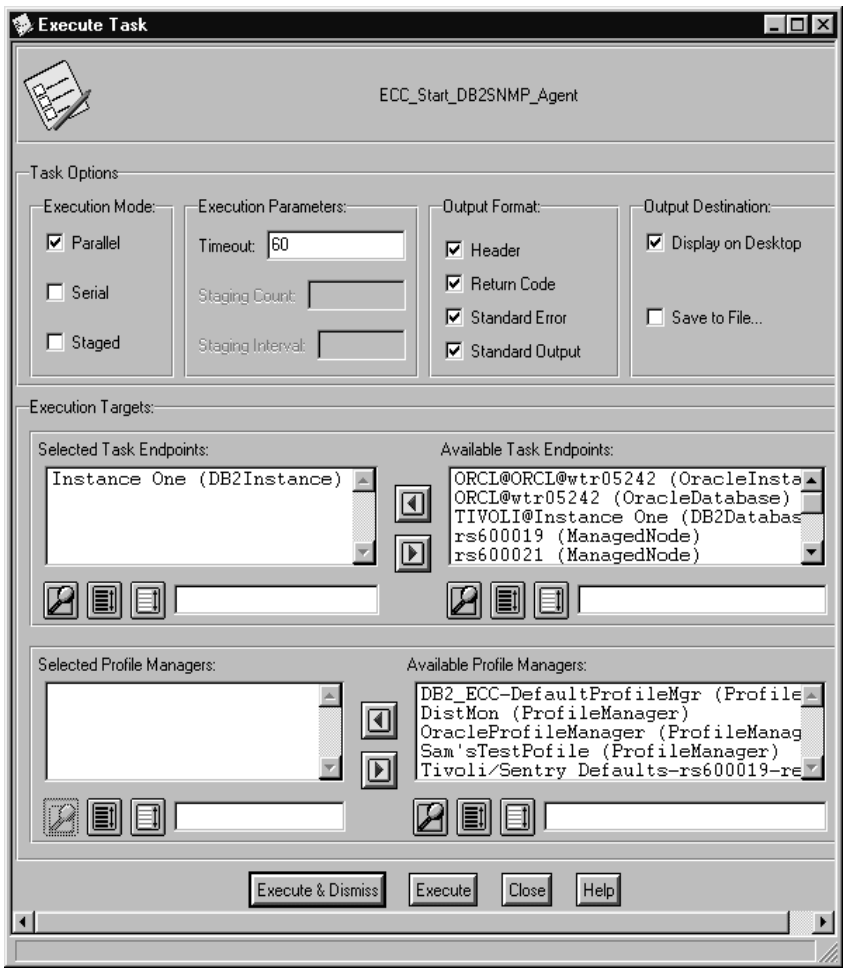


Figure 347. Execute Task Window

We click on **Display on Desktop** and then select the task endpoint. An interesting point to notice here is that we specify the database instance we have previously created (Instance One) as the task endpoint and not a managed node, as you would usually do with a Tivoli task.

When finished, we click on **Execute & Dismiss**. The following window will appear.

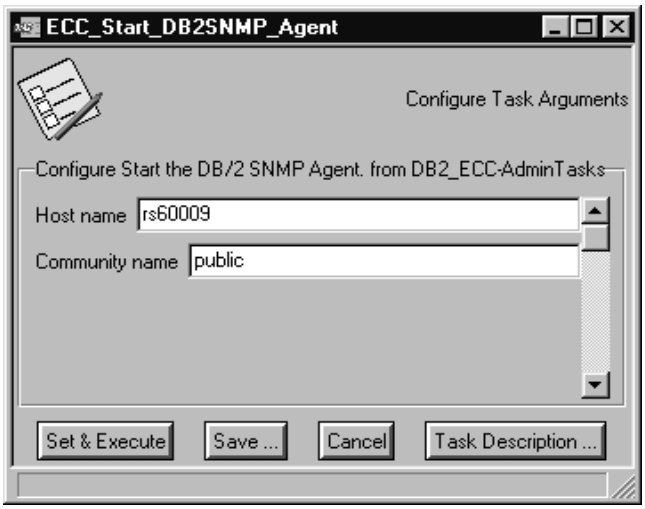


Figure 348. ECC_Start_DB2SNMP_Agent WIndow

We enter `rs60009` (our DB2 server) as the Host name and `public` as the SNMP Community name. When finished, we click on **Set & Execute** to actually start the task. The task output is displayed in the window shown in the following figure.

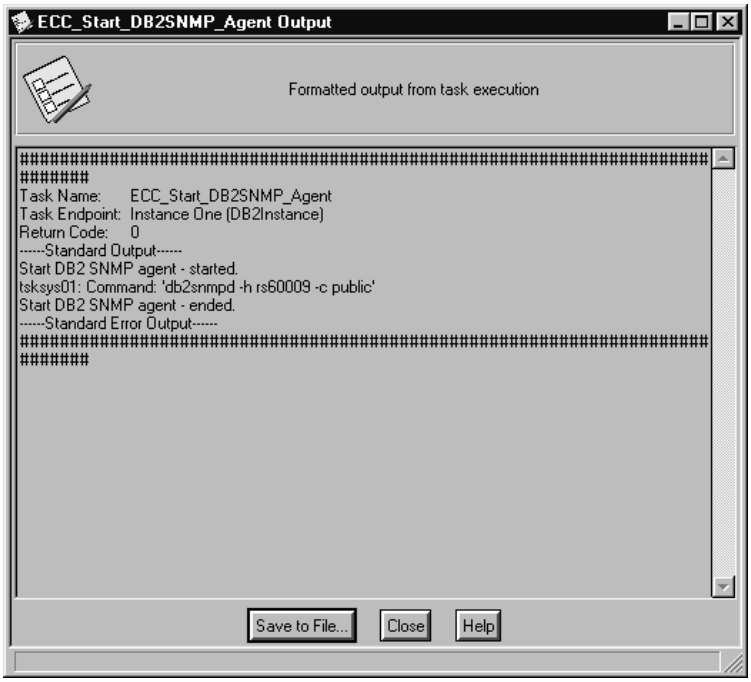


Figure 349. ECC_Start_DB2SNMP_Agent Output Window

As can be seen from the above figure, the task was run successfully.

5.6.8 Working with DB2 Monitors

Tivoli Manager for DB2 provides more than 300 monitors that are organized in 11 monitoring collections. The monitoring collections are added during the installation of Tivoli Manager for DB2.

You can see the monitoring collections when clicking on **Add Monitor...** in a TME 10 Distributed Monitoring profile. This will open the following window.

Figure 350. Add Monitor to TME 10 Distributed Monitoring Profile Window

On the left side of the window you can see the 11 monitoring collections provided by Tivoli Manager for DB2. When you click on one of these collections, you can see the monitors contained in the collection on the right side of the window.

From the names of the collections you can see that the monitors fall into certain categories, for example, DB2 SNMP monitors, buffers, locks, server status, etc.

To make using the monitoring collections easier, Tivoli Manager for DB2 also provides a default profile manager that contains default profiles with the most common monitoring combinations.

To see these, double-click on the **DB2_ECC-DefaultPolicyRegion**. The following window will appear.

Figure 351. Policy Region: DB2_ECC DefaultPolicyRegion Window

You can see the task libraries provided by the module and also the DB2_ECC-DefaultProfileMgr. We are interested in this profile manager, so we double-click on the icon.

The following window will appear.

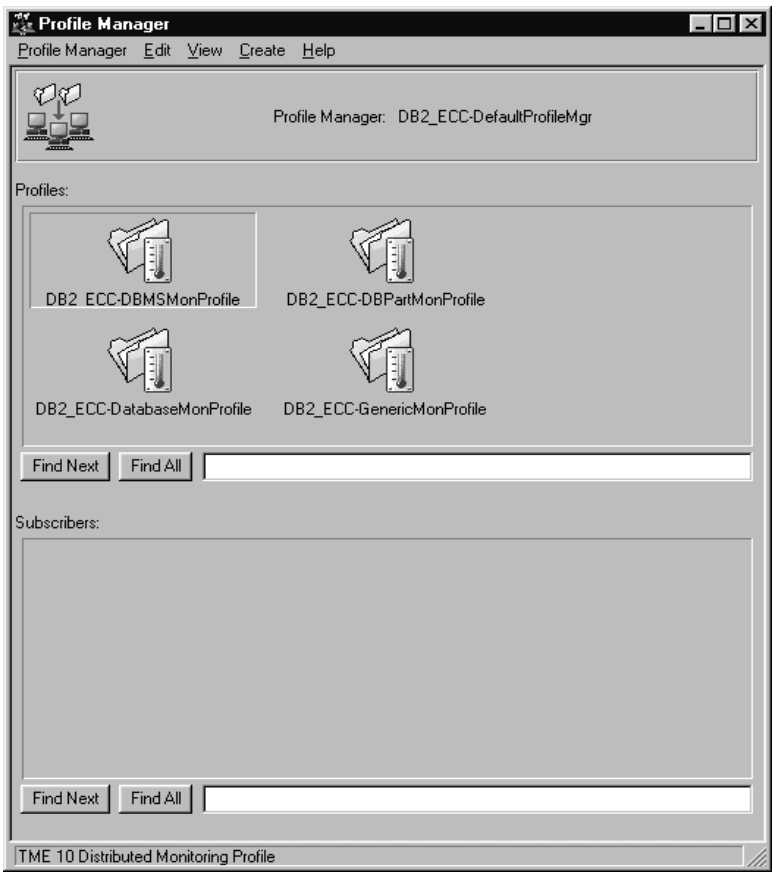


Figure 352. Profile Manager Window

You can see that there are four predefined Tivoli Distributed Monitoring profiles. To see how they are set up, we double-click on **DB2_ECC-DBMSMonProfile**.

The following window will appear.

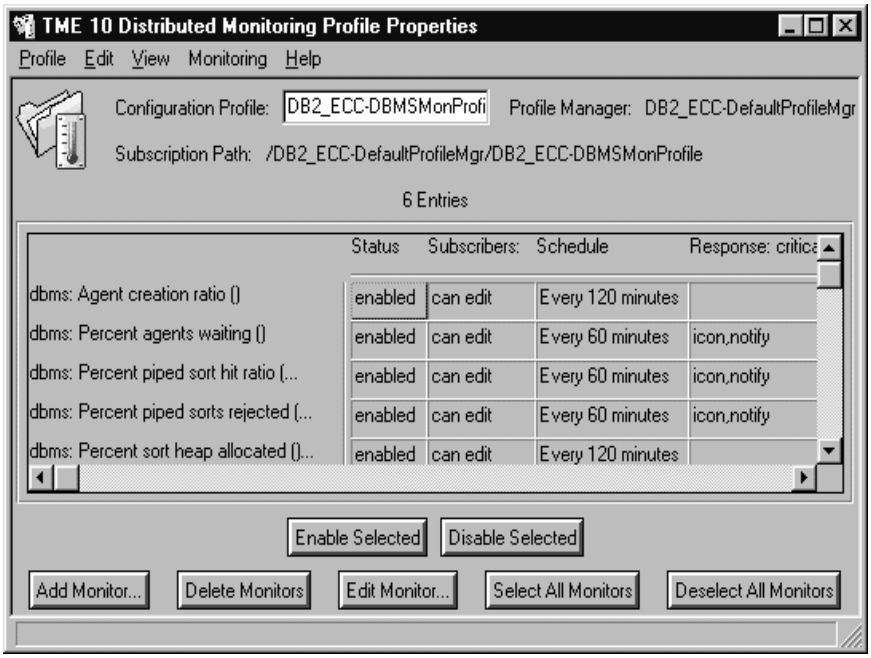


Figure 353. TME 10 Distributed Monitoring Profile Properties Window

You can see the defined monitors for this profile. Most of them are set to run at intervals that are appropriate for a production environment (for example, every 60 minutes). You can also see, that some of the monitors have icons specified as their response. These monitors will modify the indicator collection that you can see in Figure 351 on page 360 (DB2_ECC-IndicatorCollection).

The monitoring collections files for Tivoli Manager for DB2 are located in /usr/local/Tivoli/bin/aix4-r1/TME/DB2ECC/monitoring/collections (assuming that you are running AIX). All collection files have an extension of .col.

You can easily use the predefined profiles by just subscribing your database objects to the default profile manager.

We perform a simple example to illustrate the process of using a DB2 monitor.

5.6.9 Forwarding Events to TEC

In order to forward events from Tivoli Manager for DB2 to Tivoli Enterprise Console, you need to import the class definition files (*.baroc) that come with the modules.

These files are located in the /usr/local/Tivoli/bin/aix4-r1/TME/DB2ECC/monitoring/collections directory (assuming that the module is installed on an AIX system).

To list the files, type the following command while being in this directory:

```
ls *.baroc
```

This should produce the following output:

```
db2Agent.baroc    db2Conf.baroc     db2Query.baroc    db2Table.baroc
db2Basic.baroc    db2DpropR.baroc   db2Sort.baroc     db2snmp.baroc
db2Bufio.baroc    db2Lock.baroc     db2Stmt.baroc
```

When you want to receive TEC events from Tivoli Manager for DB2, you need to import these class definition files into your rule base, however, you need to do this in the right order.

The following figure illustrates the class hierarchy:

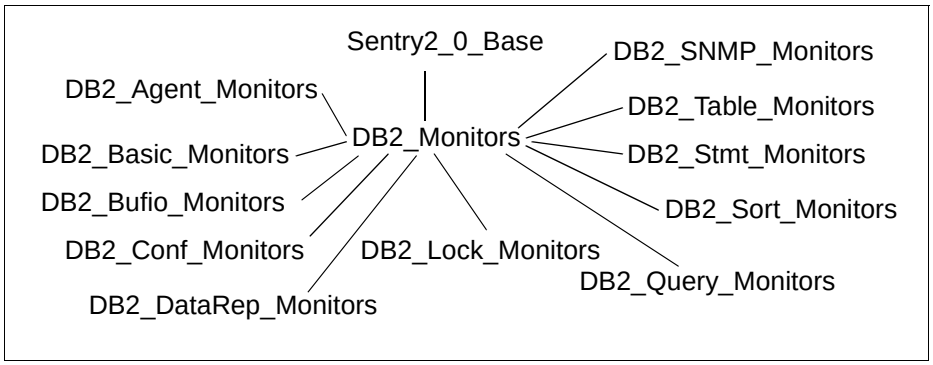


Figure 354. DB2 Event Hierarchy

As you can see, the DB2_Monitors event class is a child of Sentry2_0_Base and all others classes are child classes of DB2_Monitors. Hence, in your rule base, Sentry2_0_Base must be imported before DB2_Monitors and DB2_Monitors must be imported before any other event class. (The class DB2_Monitors is defined in the db2Basic.baroc file.)

You can either do this manually, or use the db2ecc_config_evtsvr.sh script that is located in the /usr/local/Tivoli/bin/aix4-r1/TME/DB2ECC/monitoring/scripts directory.

This script not only imports the DB2 class definition files, but also verifies, that the prerequisite Tivoli Distributed Monitoring (Sentry) class files have been imported.

This script, however, can only be run at the TEC server that caused a problem in our specific setup. The Tivoli Manager for DB2 in our setup is installed on rs600019 (the TMR server) and rs60009 (the DB2 server), however, the TEC server in our environment is rs600021. When we try to execute db2ecc_config_evtsvr.sh on rs600019 it fails, because rs600019 is not the TEC server. On rs600021 on the other hand the script doesn't exist, as the module is not installed there.

To solve this problem, we can either install Tivoli Manager for DB2 also on rs600021 or just copy the necessary files to rs600021 manually. We decided to copy the complete /usr/local/Tivoli/bin/aix4-r1/TME/DB2ECC directory from rs600019 to rs600021.

Note

Figure 354 on page 363 also reveals a possible problem when using TME 10 Distributed Monitoring 3.5 in combination with Tivoli Enterprise Console. The problem is that the DB2_Monitors class inherits from Sentry2_0_Base. However, when using TME 10 Distributed Monitoring 3.5 or later it must inherit from Sentry3_5_Base, as this class has some new slots that are used by the Sentry engine. If you try the unmodified *.baroc files with TME 10 Distributed Monitoring 3.5, you will see an error in your TEC reception log saying that the slot "probe" is undefined in the event class. You can correct the problem yourself by changing Sentry2_0_Base to Sentry3_5_Base in the db2Basic.baroc file.

We run the db2ecc_config_evtsvr.sh on rs600021 with the following parameters:

```
./db2ecc_config_evtsvr.sh DB2ECC Sentry /usr/local/Tivoli/stefan_rules!
```

Before doing that we created a new rule base Sentry on the Tivoli desktop and copied to Default rule base into it. Then we imported the Sentry.baroc file into this rule base, as this is a prerequisite for the DB2 class files.

While the script is running, a log file is created under /tmp/db2ecc_config_evtsvr.log. In our case the script ran successfully until the last step, which is restarting the event server.

However, this is not a problem, as this is only the last step performed by the script and we can simply restart the event server manually, either from the Tivoli desktop or by typing `wstartesvr`.

Once the script has finished, a new rule base named DB2ECC can be seen in the Event Server Rule Bases window as shown in the following figure.

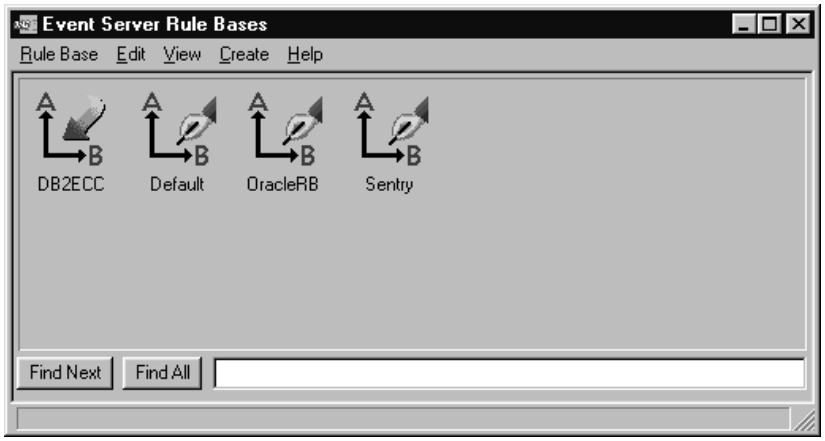


Figure 355. Event Server Rule Bases Window

You can also see that the rule base is active (loaded), indicated by the red arrow. This is because the db2ecc_config_evtsvr.sh script automatically loads the new rule base.

We are now ready to test the new rule base. In order to do so, we create a Tivoli Distributed Monitoring profile that sends a TEC event.

For that purpose we have created a new profile manager Monitors within our policy region DB2 as can be seen in the following figure.

Figure 356. Policy Region: DB2 Window

We double-click on the **Monitors** icon to open the new profile manager. Then we subscribe our DB2 server rs60009 to this profile manager and create a new profile of type SentryProfile.

Note

If SentryProfile is not offered when trying to create a new profile in the profile manager, make sure that SentryProfile is a managed resource in the policy region (DB2 in our case).

After that, the profile manager should look like the following.

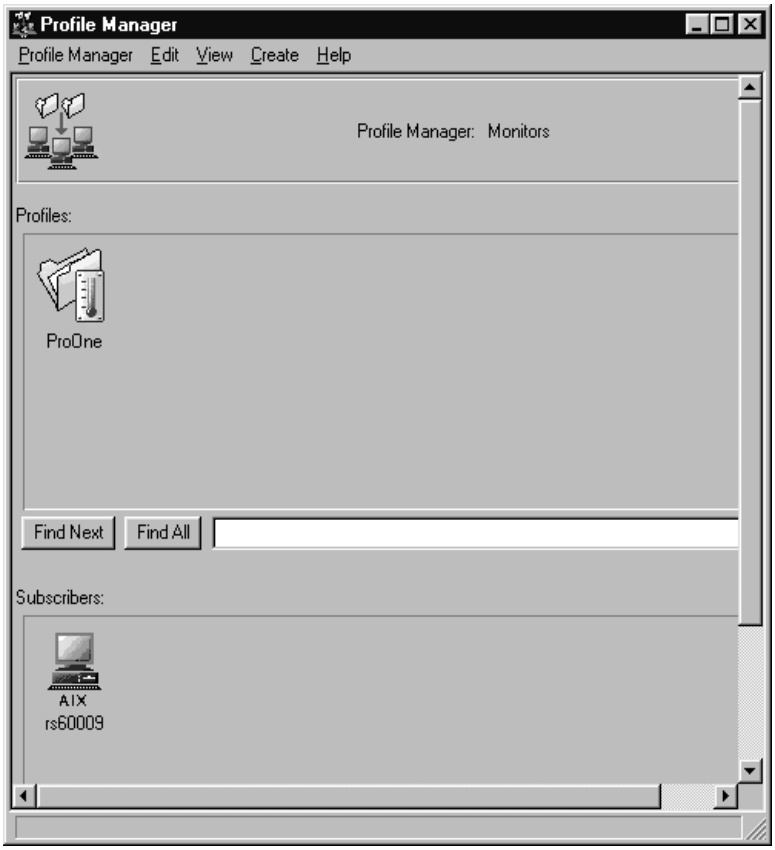


Figure 357. Profile Manager Window

We double-click on **ProOne** (the name of our profile) to open the TME 10 Distributed Monitoring Profile Properties window. We click on **Add Monitor...** to add a new monitor to our profile. In the Add Monitor to TME 10 Distributed Monitoring Profile window we click on the **DB2_Basic_Monitors** collection and then click on the **db: # of applications connected** monitor.

We click on **Add Empty...** and the Edit Monitor window appears.

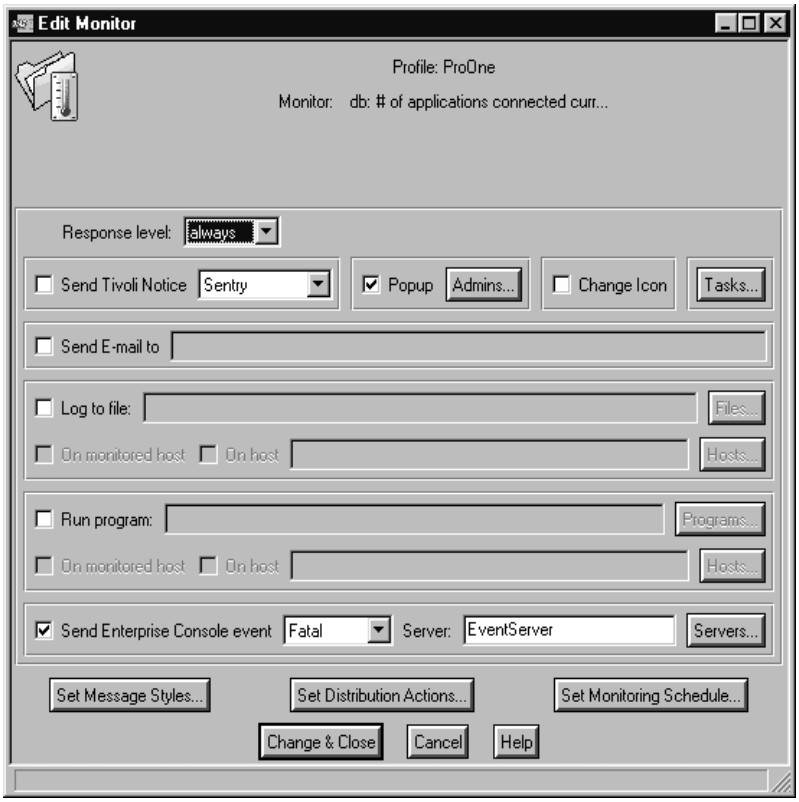


Figure 358. Edit Monitor Window

Since we just want to test the TEC events, we click on the Response level **always**. We select the **Popup** check box and then click the **Admins...** button to specify Root_rs600019-region as the target desktop.

We also check the **Send Enterprise Console event** check box and select **Fatal** from the list box. In the Server field we enter EventServer. Then we click on the **Set Monitoring Schedule...** button and set the monitoring interval to one minute.

When finished, we select **Change & Close**. Back in the previous window, we save the profile and then distribute it to rs60009.

After a short time, you should see the following message pop up on your Tivoli desktop.

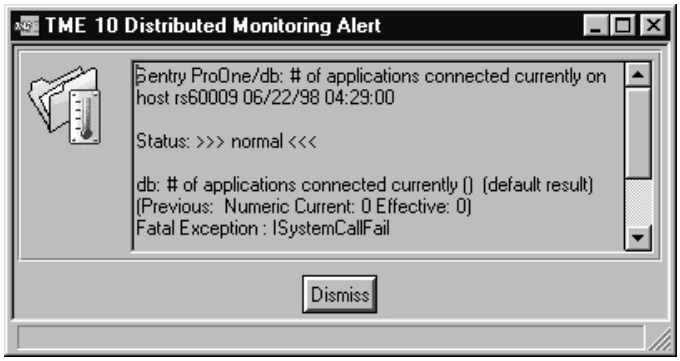


Figure 359. TME 10 Distributed Monitoring Alert Window

Now that we know that the monitor has triggered, we want to see if we have also received a new TEC event. In the Tivoli desktop main window, we double-click on the **Root_rs600019-region** icon (our event console).

This will open the event group and event source windows. In the event group window we click on **All**.

Note

This assumes, that the All event group has been assigned to the event console. If not, select the event console icon with the right mouse button and then select **Assign Event Groups...** from the pull-down menu. In the window that appears you can assign the All event group to the event console.

The following window will appear.

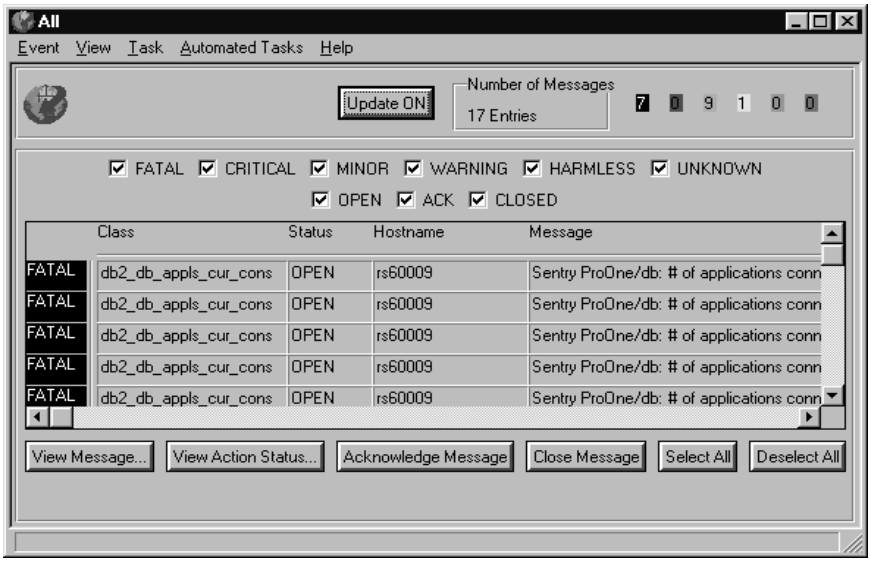


Figure 360. All Window

You can see that there are several new events that were all generated by our monitor (one per minute). To look at the event slots, we select one of the events and then click the **View Message...** button.

The following window will appear.

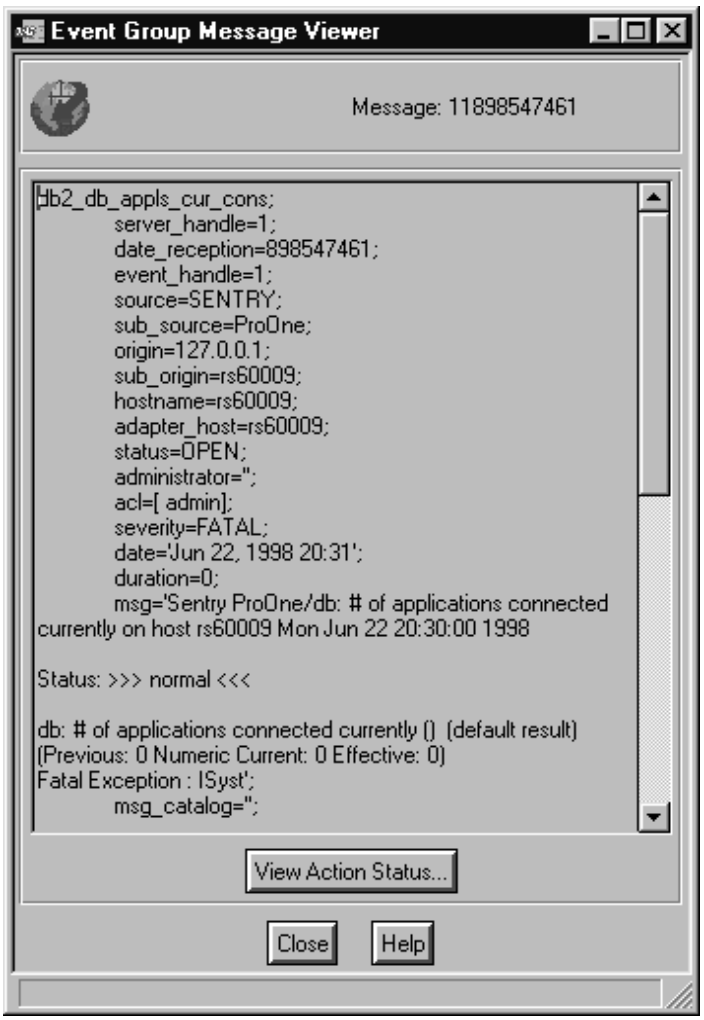


Figure 361. Event Group Message Viewer

You can see that the source used by the DB2 monitors is SENTRY and that the class of our event is db2_db_appls_cur_cons.

Chapter 6. Tivoli Manager for Informix

In this chapter we introduce Tivoli Manager for Informix. We show how to install the module and then perform database management scenarios in our environment.

6.1 Overview and Objective

In this chapter we perform all the necessary steps to get Tivoli Manager for Informix up and running. We install an Informix Dynamic Server on Windows NT and set up our Tivoli environment to manage this server.

We extend our TMR environment as used in the previous chapters with one Windows NT managed node called romeo. The TMR server is rs600019.

We only briefly describe the setup of Tivoli Manager for Informix and how to use its functions in this chapter, as the functions are very similar to the functions of the other Tivoli database management products that were described in full detail in the previous chapters.

If you need more detailed information, for example, on how to set up and use TEC with the Tivoli database management products, you should refer to Chapter 2., “Tivoli Manager for Oracle” on page 17. In this chapter, all functions are described in full detail.

We perform the following tasks:

- Installing Informix on Windows NT
- Installing Tivoli Manager for Informix
- Using basic functions of Tivoli Manager for Informix

6.2 Prerequisites

The Tivoli Manager for Informix Version 1.0 consists of the following components:

- Tivoli Manager for Informix - Framework
- Tivoli Manager for Informix - Distributed Monitoring

The Tivoli Manager for Informix is compatible with the TME 10 Framework, Version 3.1 or higher. Tivoli Manager for Informix - Distributed Monitoring requires Tivoli/Sentry 3.0.2 or TME 10 Distributed Monitoring 3.5 or higher.

Tivoli Manager for Informix can manage Informix Dynamic Server Version 7.1 or higher.

6.3 Installing Informix

We install Informix Dynamic Server on our Windows NT system romeo that we have installed as a managed node in our TMR. To start the installation we simply run the setup.exe program from the product CD-ROM.

The following window will appear.

Figure 362. Installing Informix Dynamic Server Window

The installation of Informix Dynamic Server is performed using a Windows installation wizard. We click on **Next>** to continue.

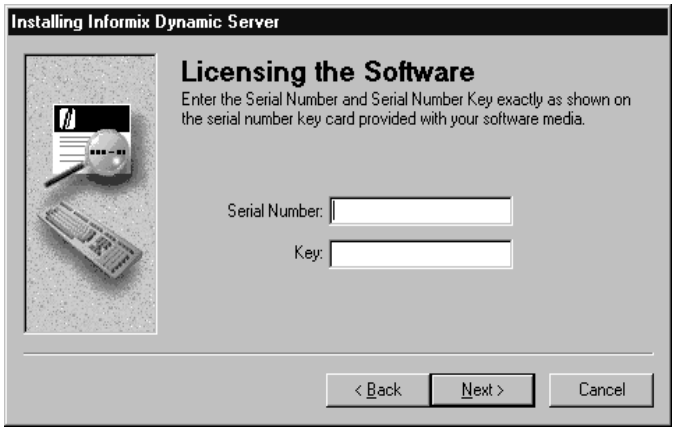


Figure 363. Installing Informix Dynamic Server - Licensing the Software Window

Before the Informix Dynamic Server can be installed we need to enter licensing information. This is performed in the window as shown in the above figure. Once we have finished entering the Serial Number and the Key we click on **Next>** to continue.

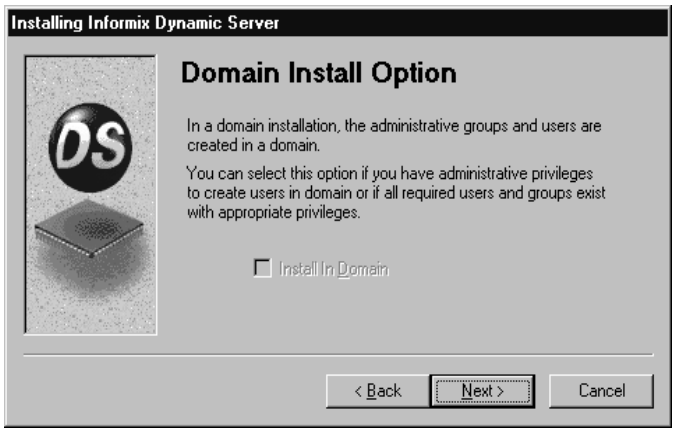


Figure 364. Installing Informix Dynamic Server - Domain Install Option Window

In the Domain Install Option window we just click on **Next>** to continue.

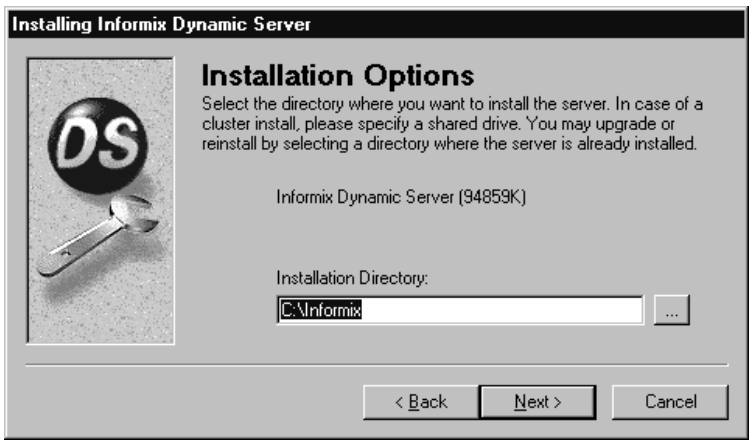


Figure 365. Installing Informix Dynamic Server - Installation Options Window

In the above window you can select the installation directory for the Informix Dynamic Server. In our installation we change the directory to D:\INFORMIX. Then we click on **Next>** to continue.

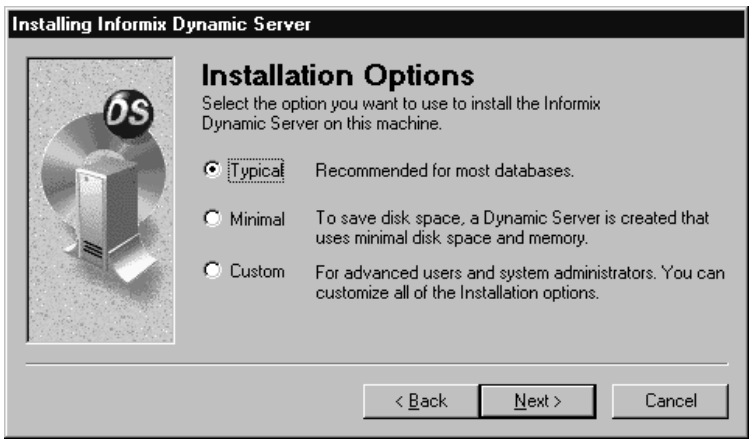


Figure 366. Installing Informix Dynamic Server - Installation Options Window

We click on **Typical** as our installation type and the click on **Next>** to continue.

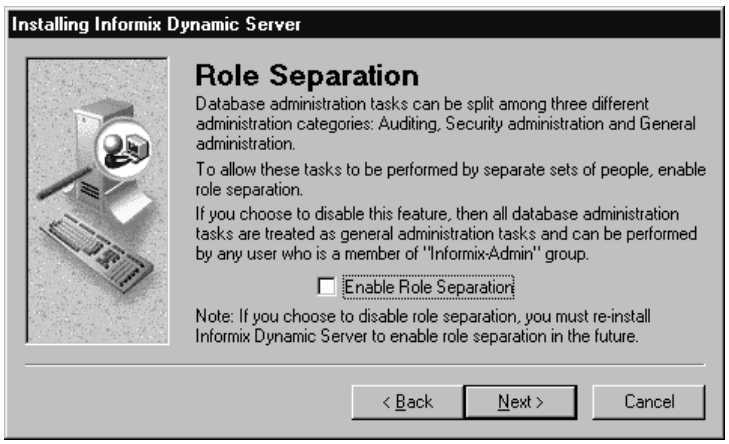


Figure 367. Installing Informix Dynamic Server - Role Separation Window

We decide not to use Role Separation in our example and simply click on **Next>** to continue.

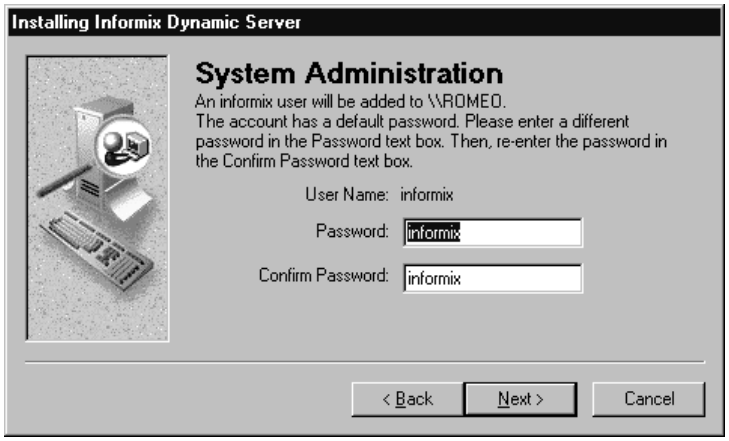


Figure 368. Installing Informix Dynamic Server - System Administration Window

In our example we simply accept the default password informix and click **Next>** to continue. The following warning will be displayed.

Figure 369. Installation Message Window

In a production environment you should not accept the default password but pick a new one, however, in our environment we just click on **Yes** to proceed.

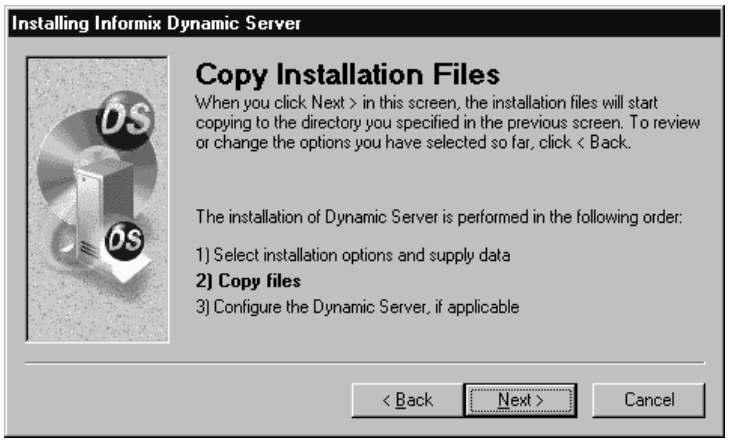


Figure 370. Installing Sybase Dynamic Server - Copy Installation Files Window

The Copy Installation Files dialog informs us that the installation program is about to start copying files to the system. We start the actual installation by clicking on **Next>**. The installation will take several minutes to run. When the installation program has finished copying the files, the following window appears.

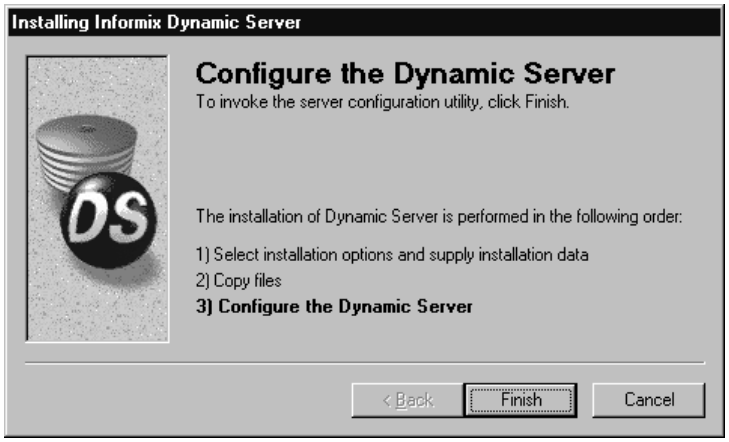


Figure 371. Installing Informix Dynamic Server - Configure the Dynamic Server Window

We click on **Finish** to configure the Informix Dynamic Server.

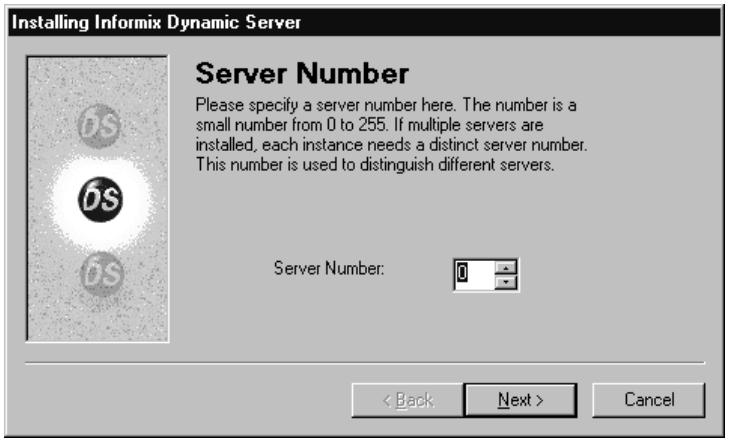


Figure 372. Installing Informix Dynamic Server - Server Number Window

We leave the Server Number as 0 and click on **Next>**.

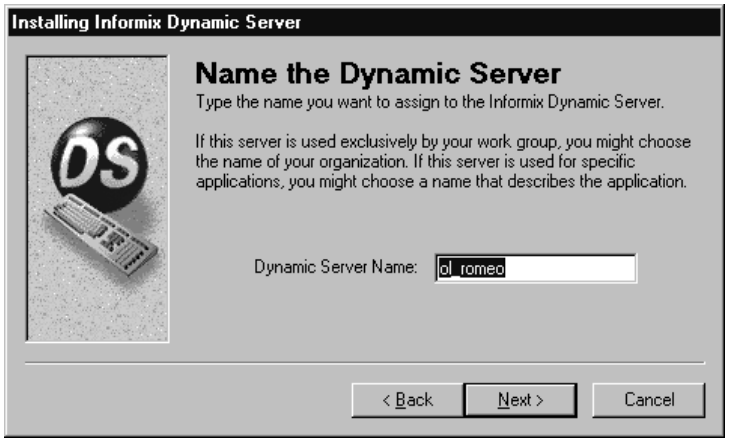


Figure 373. Installing Informix Dynamic Server - Name the Dynamic Server Window

We accept the default name for the Dynamic Server and click on **Next>**.

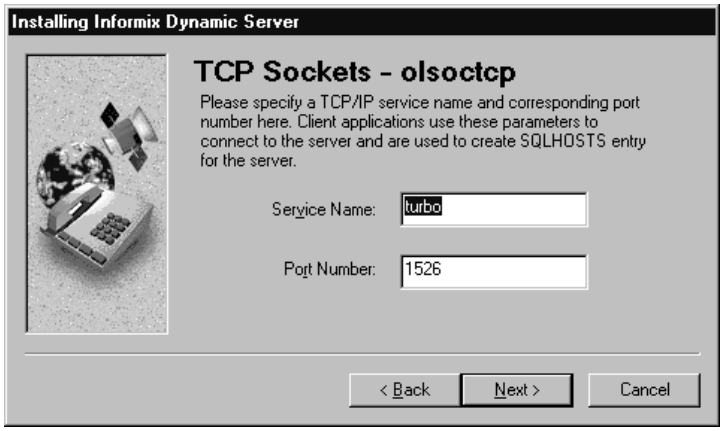


Figure 374. Installing Informix Dynamic Server - TCP Sockets Window

We accept the default Service Name turbo and the default port 1526 and click on **Next>**.

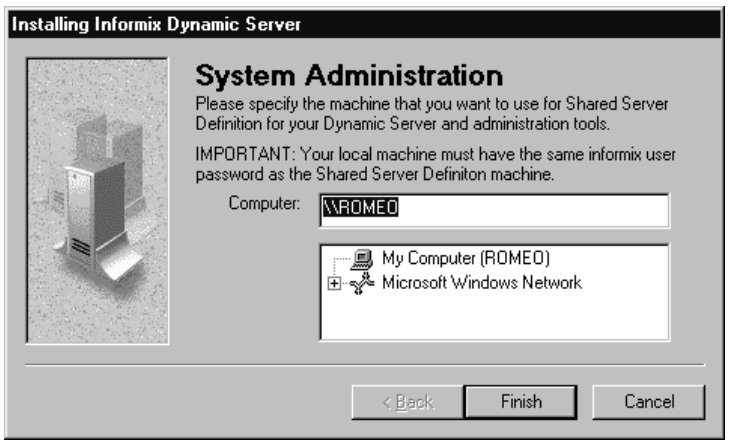


Figure 375. Installing Informix Dynamic Server - System Administration Window

In the above window we also accept the default and click on **Next>**.

Figure 376. Installation Message Window

After the configuration is complete, the above window appears to ask us if we want to initialize the dynamic server. We click on **Yes** to proceed.

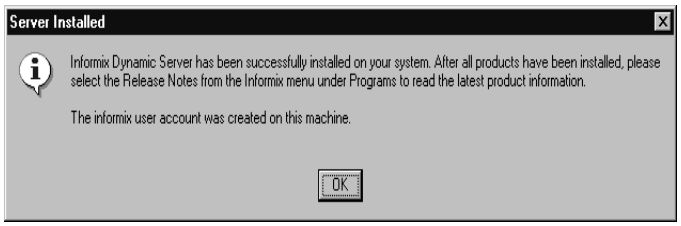


Figure 377. Server Installed Window

After several minutes the above window appears to inform us that the server has been successfully installed and initialized. We click on **OK** to finish the installation.

To verify that the dynamic server is running we open the Windows NT **Services** icon in the Control Panel.

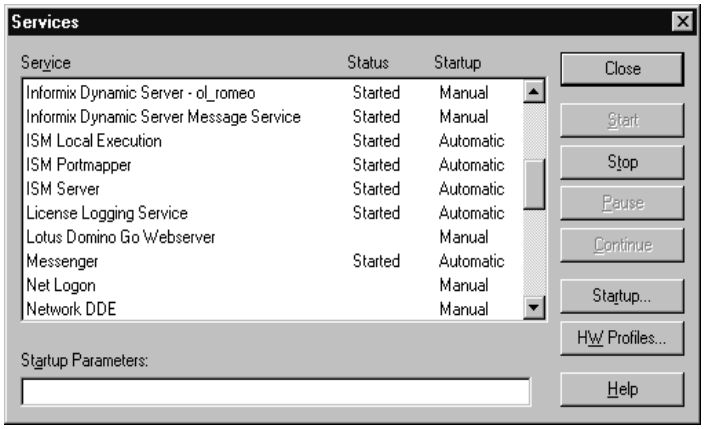


Figure 378. Services Window

As you can see in then previous figure, two new services have been added for Informix and the RDBMS server is running.

6.4 Installing Tivoli Manager for Informix

Like the other Tivoli database management products described in this book, Tivoli Manager for Informix is installed from the Tivoli desktop. In the Tivoli desktop main window select **Desktop** from the menu bar and the **Install -> Install Product...** from the pull-down menu.

The following window will appear.

Figure 379. Install Product Window

Click on the **Select Media...** button and specify the path to the installation media for Tivoli Manager for Informix. Back in the Install Product window, we select **Tivoli Manager for Informix - Framework, Version 1.0** and move rs600019 (our TMR server) and romeo (our Informix server) to the Clients to Install On section.

Then we click on **Install** to install the product. When the installation has finished, we select **Tivoli Manager for Informix - Distributed Monitoring, Version 1.0** and install it on rs600019 and romeo.

To see which new resources have been added to the Tivoli object database you can use the wlookup command as shown in the following figure.

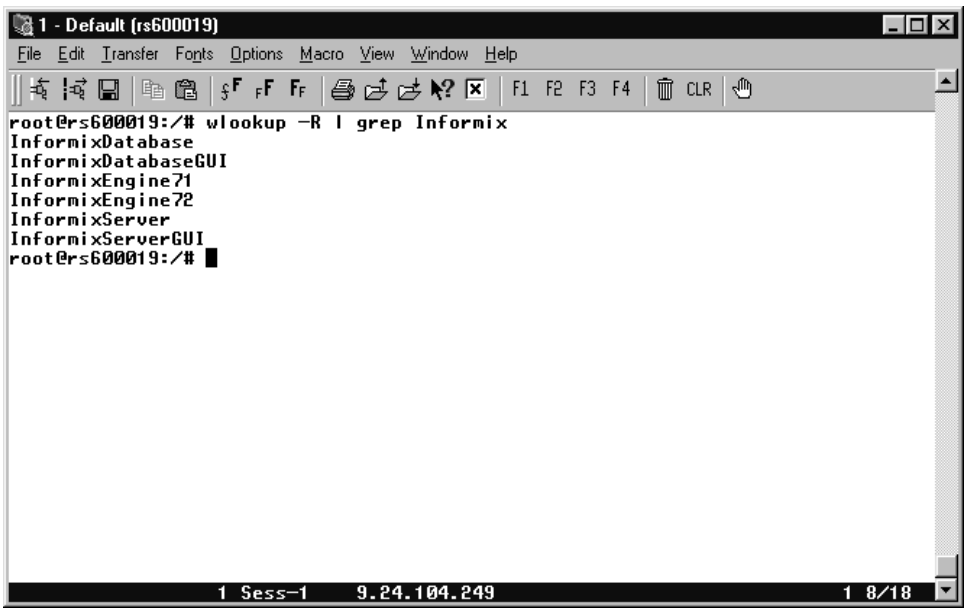


Figure 380. New Resources Added by Tivoli Manager for Informix

6.5 Using Tivoli Manager for Informix

Similar to the other Tivoli database management products, Tivoli Manager for Informix adds new TMR roles to control access to resources and allow for secure delegation.

Tivoli Manager for Informix adds the roles informix_monitor, informix_user and informix_dba. Before we can use Tivoli Manager for Informix, we have to add the appropriate roles to the Tivoli administrator we are using. To do so, we double-click on the **Administrators** icon on the Tivoli desktop.

Then we select our administrator **Root_rs600019-region** with the right mouse button and select **Edit TMR Roles...** from the pull-down menu.

The following window will appear:

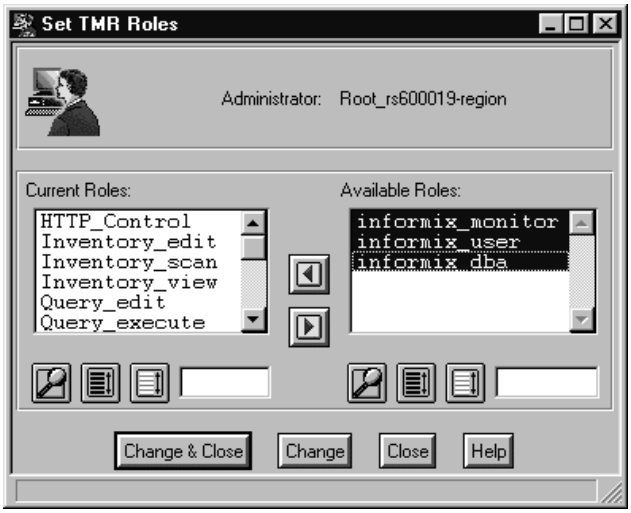


Figure 381. Set TMR Roles Window

In our example we assign all three roles to our administrator, so we select the new roles in the Available Roles section. Then we select the left arrow button to move them to the Current Roles section and then click on **Change & Close**.

We can also set the resource roles as described in 2.7.2, “Assigning Resource Roles” on page 36.

The next step we perform is to create a new policy region called Informix that we will use to manage Informix resources. For a description of how to do that you can refer to 2.7.4, “Creating an Oracle Region” on page 38.

Once we have created the new region, we have to assign the appropriate managed resources. To do so, we select the **Informix** icon with the right mouse button and then select **Managed Resources...** from the pull-down menu as shown in the following figure.

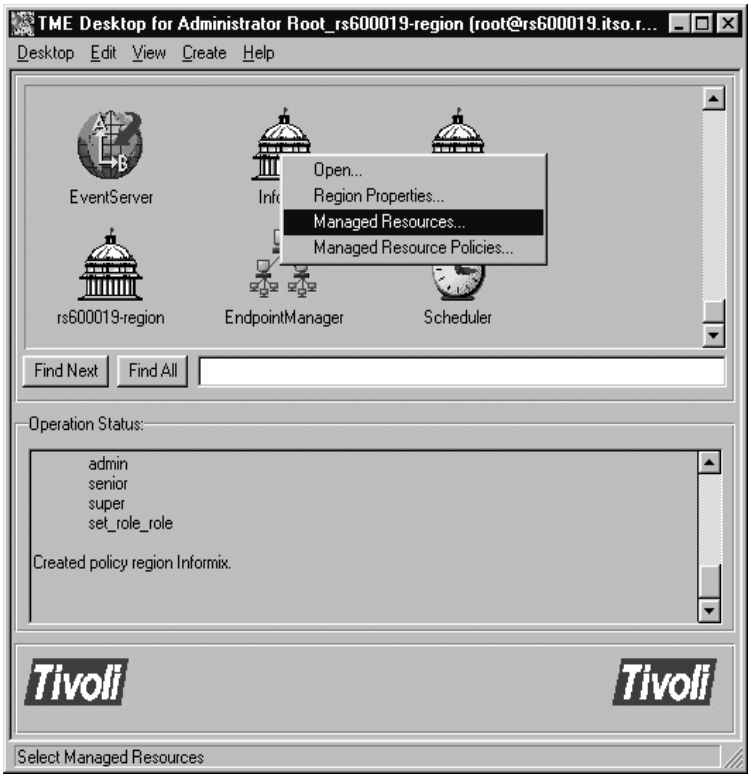


Figure 382. Tivoli Desktop

The Set Managed Resources window will appear.

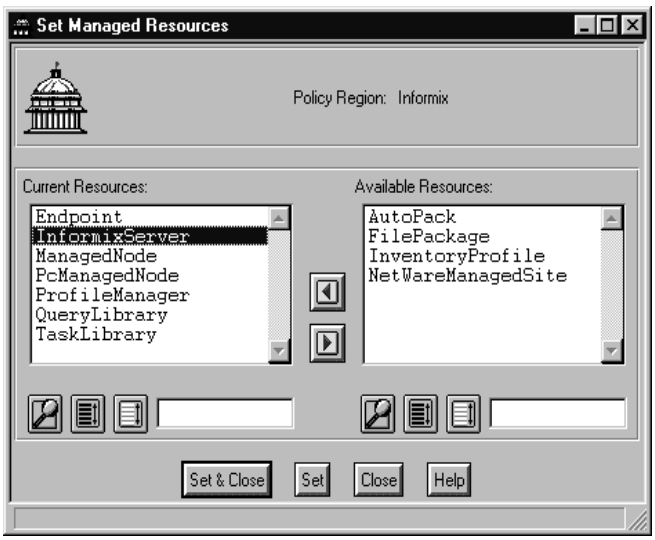


Figure 383. Set Managed Resources Window

We assign the appropriate roles. In order to be able to manage Informix databases, we need to assign the InformixServer managed resource.

Tivoli Manager for Informix also adds a new notice group that we can assign to our administrator as shown below.

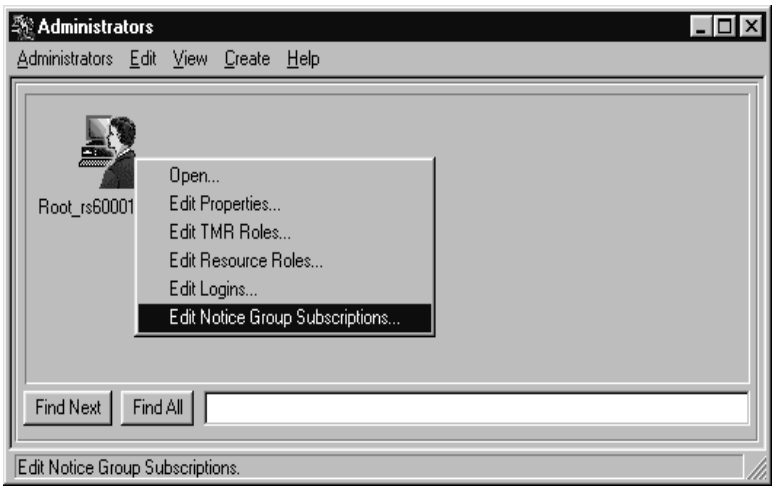


Figure 384. Administrators Window

In the Administrators window we select our administrator with the right mouse button and then select **Edit Notice Group Subscriptions...** from the pull-down menu.

The Set Notice Groups window appears.

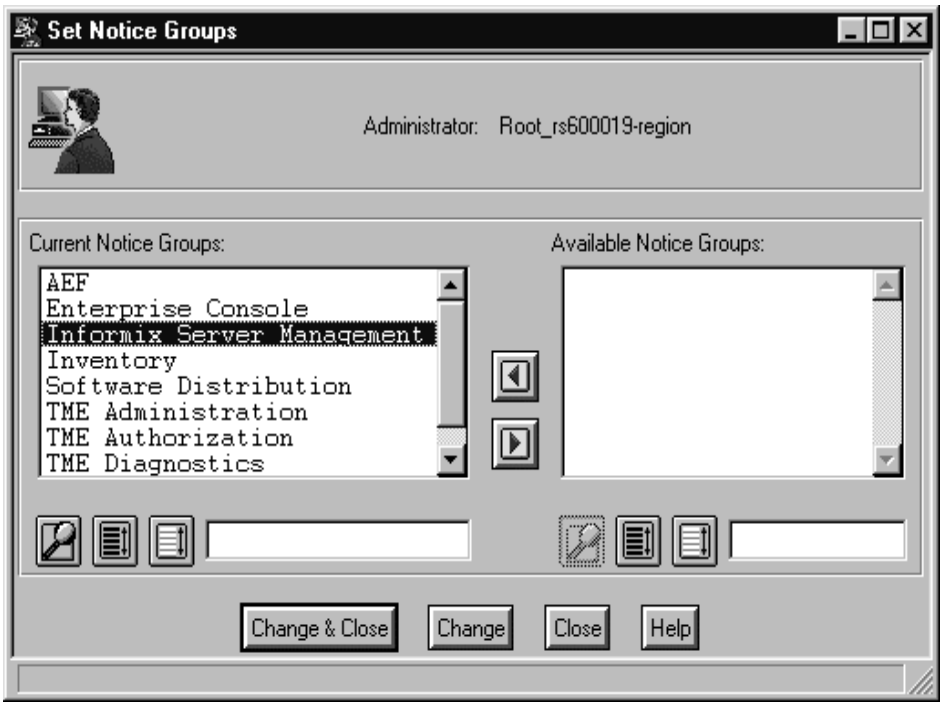


Figure 385. Set Notice Groups Window

As you can see from the previous figure, the Informix Server Management notice group is already assigned to our administrator.

We are now ready to register our Informix server. To do so we double-click on the **Informix** icon in the Tivoli desktop main window.

The following window will appear.

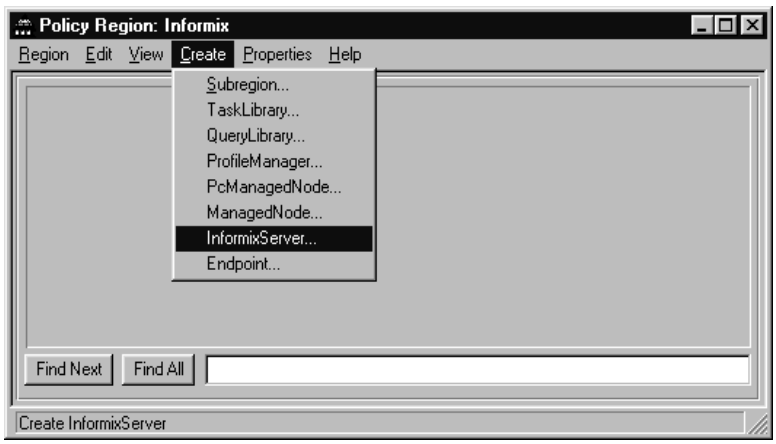


Figure 386. Policy Region: Informix Window

To register our Informix server we select **Create** from the menu bar and then **InformixServer** from the pull-down menu.

The following window will appear.

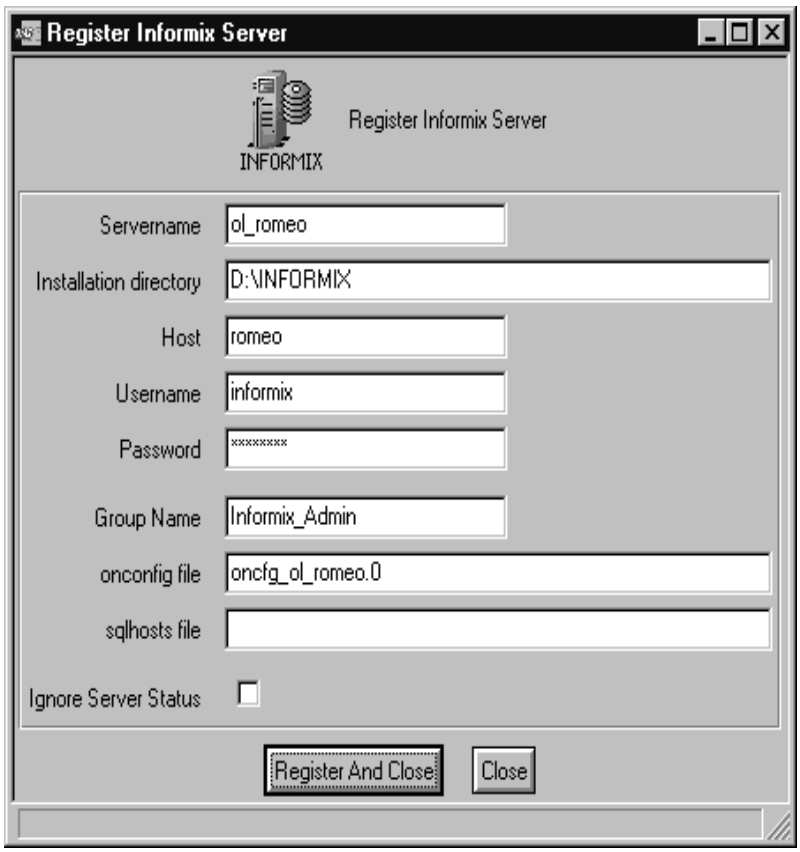


Figure 387. Register Informix Server Window

In the Register Informix Server window we enter the information necessary to register our Informix RDBMS server on romeo. The Servername is ol_romeo, which is the default name assigned during the installation of the Informix Dynamic Server.

The Installation directory is D:\INFORMIX which we specified during the installation of the Informix Dynamic Server as described in 6.3, “Installing Informix” on page 374.

Host is the managed node on which the Informix server resides, romeo in our case. The Username informix is the default user created during the installation of Informix and under Password we have to specify the password that we assigned to the informix user during installation. In our case this is also informix, as we have accepted the default during installation.

The Group Name is Informix_Admin, as we are using Informix on Windows NT and this is the new group that the Informix installation creates.

In the onconfig file we specify the name of our configuration file. The configuration files can be found in D:\INFORMIX\ETC.

Once we have entered the values we click on **Register And Close**.

In case the Informix server is not running, you will get the following error message.

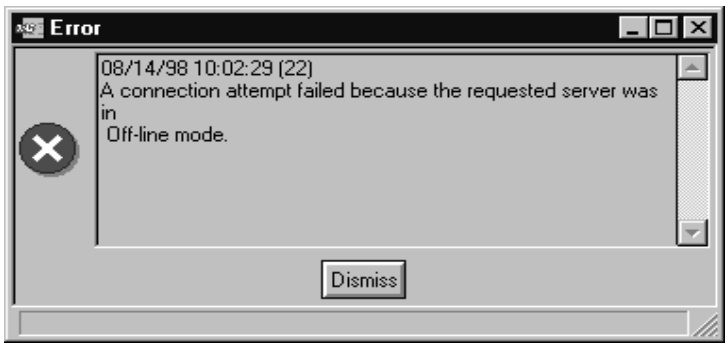


Figure 388. Error

If you get this error you can either start the Informix services from the Windows NT Services window or click the **Ignore Server Status** check box in the window shown in Figure 387 on page 390.

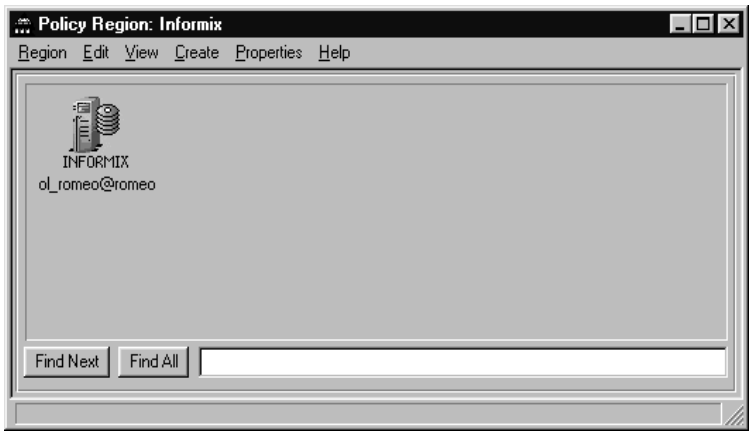


Figure 389. Policy Region: Informix Window

After the registration has completed successfully, a new icon for the database server has been added to the policy region, ol_romeo@romeo in our case.

You can perform the same administration functions now that we have already shown for the other Tivoli database management products, such as in Chapter 2, “Tivoli Manager for Oracle” on page 17. Therefore, we will not explain these functions, such as shutting down or starting the database or instance in detail again.

We just show a simple example of how to create a monitor for Informix.

Figure 390. Policy Region: Informix Window

First, we create a profile manager in our policy region called Monitors. Then we open the profile manager by double-clicking on the **Monitors** icon.

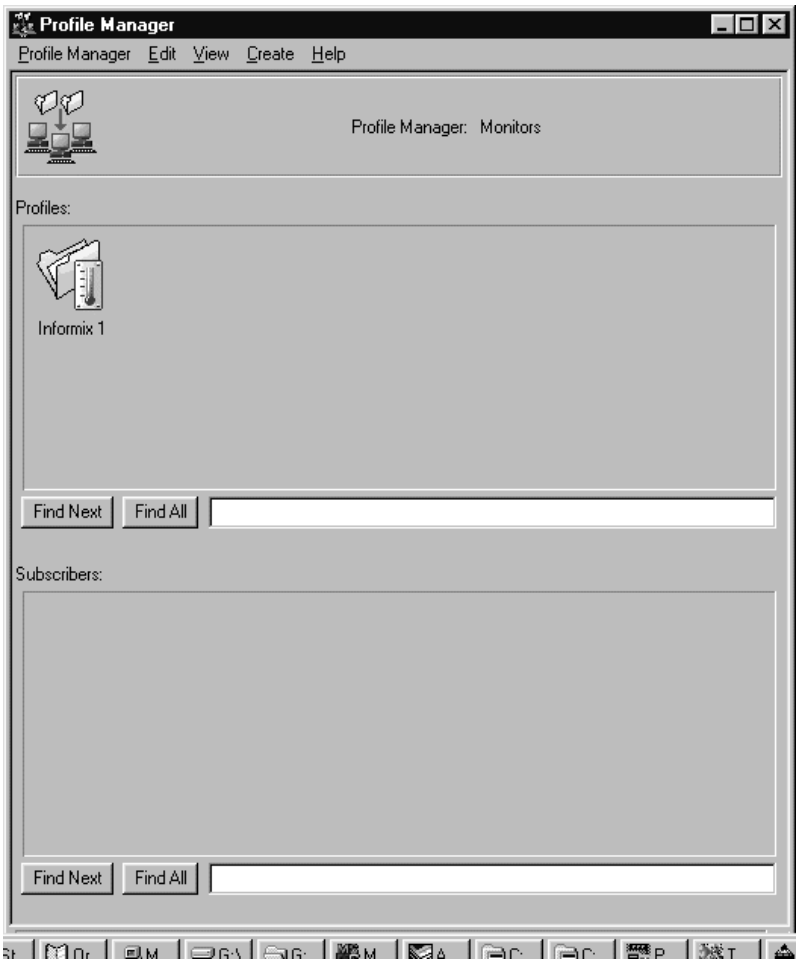


Figure 391. Profile Manager Window

In the profile we have created a new SentryProfile called Informix 1. We open the profile by double-clicking it and then click on the **Add Monitor...** button.

The following window will appear.

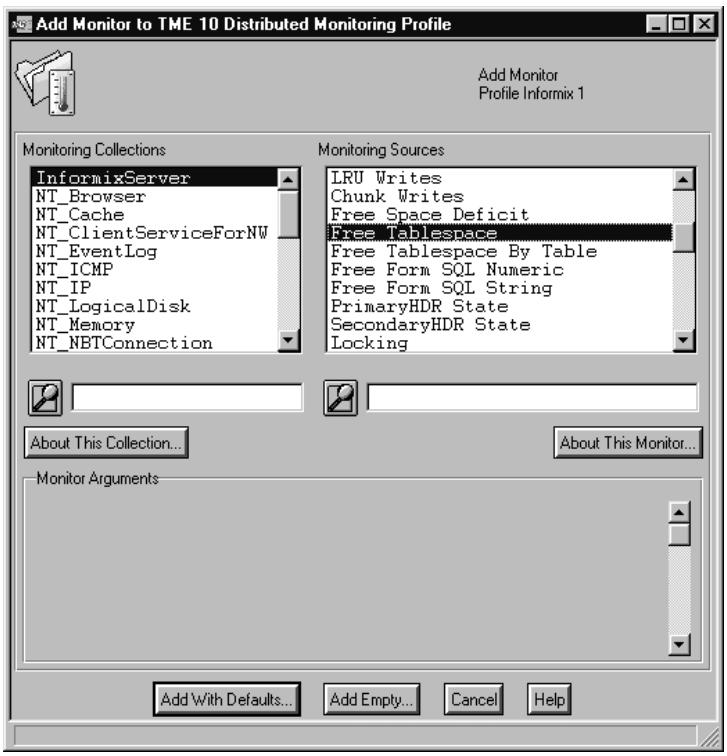


Figure 392. Add Monitor to TME 10 Distributed Monitoring Profile Window

We select the **InformixServer** monitoring collection and select the **Free Tablespace** monitoring source in our example and then click on **Add Empty...**.

In the Monitor Details we specify a Response Level of always and select a pop-up window as the monitoring response. For our example, we set the Monitoring Schedule to 1 minute.

After saving the monitor and the monitoring profile we have to set the Informix database as a subscriber to our profile.

To do this, in the Profile Manager window shown in Figure 391 on page 393 we select **Profile Manager** from the menu bar and then **Subscribers...** from the pull-down menu.

The following window will appear.

Figure 393. Subscribers Window

We select **ol_romeo@romeo** in the Available to become Subscribers section and then click on the left arrow to move it to the Current Subscribers section. When finished, click on **Set Subscriptions & Close**.

We can then distribute the profile to the subscriber to install the new monitor. We don't show this example in full detail here. Refer to 2.7.16, "Using Tivoli Manager for Oracle Monitors" on page 120 for a more detailed description of how to use Tivoli Distributed Monitoring profiles. In 2.7.18, "Working With TEC" on page 148 you can also get detailed information of how to set up TEC to work with the Tivoli database management products. The procedure for Tivoli Manager for Informix is exactly the same.

Chapter 7. Design Considerations Involving Tivoli RDBMS Modules

In this chapter we summarize the experiences from the previous chapters and investigate the implications of deploying a Tivoli solution to manage RDBMS servers in large enterprise environments.

7.1 Setting Up the TMR for Managing RDBMS Servers

In the examples performed in this book we have not made extensive use of the features of the Tivoli Framework as far as, for example, security is concerned.

In fact, the RDBMS management modules provide a number of features that can be used to create an access model to reflect the security setup of your database installation, for example:

- TMR roles
- Managed resources
- Policies

All Tivoli RDBMS modules use TMR roles to control access of managing the RBDMS. While there are slight differences between the modules regarding roles (for example, Tivoli Manager for Oracle provides its own roles, while Tivoli Manager for DB2 uses the standard roles provided by the Tivoli Framework) the approach is identical.

The different TMR roles are used to grant different levels of access in managing the components of the RBDMS.

Access can also be organized on a policy region level, again through the use of roles (resource roles) and through the use of managed resources. The Tivoli RDBMS modules provide new managed resource types that become available in the TMR after the module has been installed.

For example, Oracle resources can only be managed within a policy region if the managed resource types provided by Tivoli Manager for Oracle have been assigned to the policy region.

As all other Tivoli products, the Tivoli RDBMS modules also provided policies, default and validation policies that can be used enforce compliance with predefined rules. It is beyond the scope of this book to discuss Tivoli policies. For a good explanation of how to modify Tivoli policy scripts you can refer to

the redbook *The TME 10 Deployment Cookbook: Courier and Friends*, SG24-4976.

You should notice that in order to make your RDBMS management solution effective, some time should be spent thinking of a good TMR design. That is, how can the features provided by the Tivoli Framework and the Tivoli RDBMS modules be used to create a secure and efficient management solution.

7.2 Registering Large Numbers of RDBMS Servers and Databases

As you have seen in the previous chapters of this redbook, you need to register all database servers, instances, databases, etc. that you want to manage with Tivoli in the Tivoli Framework first.

While in the example in this book we have performed these registrations manually from the Tivoli desktop, it is not feasible to use this approach when trying to register a large number of resources.

Fortunately, the Tivoli RDBMS modules also provide a command line interface, so that most actions that are accessible from the Tivoli desktop can also be performed from the command line.

In order to automate the registration process, you would consequently write a script that triggers the command line interface of the Tivoli RDBMS modules to perform the necessary actions automatically. You could feed the script with a small database of servers or resources to be registered, for example, in form of an input file that lists the names of all database servers to be registered.

The modules have also the capability to discover certain components automatically, for example, Tivoli Manager for DB2 can discover the databases automatically once the instance is registered. The discovery process itself could also be triggered from the command line.

7.3 Deploying RDBMS Components Using Tivoli

You might wonder why there is no component in the Tivoli RDBMS modules that would allow you use Tivoli Software Distribution to deploy RDBMS components, such as the RDBMS server or the clients automatically.

For the RDBMS server part it is usually difficult to provide an automatic deployment solution, as the installation of the RDBMS server requires a number of input parameters during the installation. When looking at the

different RDBMS servers we worked with in this book, however, you will see that there are big differences between the different RDBMS systems.

In the following sections we discuss some of them.

7.3.1 Oracle for UNIX

Oracle on AIX requires a number of preparation steps, as described in Chapter 2, “Tivoli Manager for Oracle” on page 17. For example, we need to create a new file system, create a new UNIX user and group ID, etc. During the installation, we have to supply a number of input parameters. These input parameters, however, can also be supplied in a response file. If we want to automate the deployment of a larger number of Oracle RDBMS servers using Tivoli Software Distribution, we have to at least perform the following steps:

- Create a script to perform the prerequisite tasks.
- Determine the files needed for the Oracle installation.
- Perform a manual installation to create an installation response file.
- Create a script to perform a batch installation of Oracle using the response file.
- Integrate the files and scripts in a Tivoli Software Distribution file package.

The prerequisite tasks can be coded in a shell script, where you pass variables, for example, to specify the size of the file system that is to be created. You also need to determine which files from the Oracle CD-ROM need to be included in the file package that you want to distribute. Then you would perform a manual installation of the product where you specify the typical parameters for your environment. The response file that is created during this installation can then be used to drive future installations in batch mode.

As the installation parameters for Oracle servers probably slightly differ from server to server, you will probably also need to create another script that can take care of necessary installations.

Eventually, you will combine the Oracle product files and your scripts in a Tivoli Software Distribution file package. The reason that such file packages are not supplied as part of Tivoli Manager for Oracle is that the parameters are highly specific and environment-dependent, so that it would be very difficult to provide a generic file package template for that.

When distributing Oracle for UNIX clients, the deployment is a lot easier to implement, as the client component consists of fewer components and files

and also the configuration of the client is easier. Also, if you deploy a number of clients for one server, the configuration of the clients is usually identical, so that the same file package can be used for all clients.

7.3.2 Oracle for Windows NT

Oracle for Windows NT is similar to Oracle for UNIX, however, the configuration of the product is slightly different. Another difference is that since the product runs on Windows NT, the AutoPack component of Tivoli Software Distribution can be used to significantly simplify the file package creation.

It is beyond the scope of this book to investigate into what steps are needed to make an Oracle installation work with an AutoPack. Also, it is far easier to install an Oracle NT client using an AutoPack than installing an Oracle NT server.

For more information about Tivoli Software Distribution and AutoPack you can refer to the following redbooks:

- *The TME 10 Deployment Cookbook: Courier and Friends*, SG24-4976
- *Tivoli Software Distribution 3.6 - Unleashing the Power of Tivoli and LCF*, SG24-2045

7.3.3 DB2 for UNIX

DB2 for UNIX is similar to Oracle for UNIX, however, the configuration process is slightly different. As you can see in Chapter 5, “Tivoli Manager for DB2” on page 317, DB2 for AIX is installed using SMIT and is packaged as a standard AIX installp file package.

The configuration includes the creation of an operating system user and group, creation of a new file system, creation of an instance and so on.

As with Oracle for UNIX, in order to automate the deployment, these configuration tasks need to be coded into scripts. For the deployment of the product files, you need to employ the command line interface of the AIX installation process (installp).

7.3.4 Sybase for UNIX

Sybase for UNIX is similar to Oracle and DB2 for UNIX in that you have to perform a number of prerequisite tasks prior to the installation, for example, creating a new file system and enabling asynchronous I/O as described in Chapter 3, “Tivoli Manager for Sybase” on page 169.

The installation of Sybase, however, is very simple and requires input basically only when specifying the size of the master device file. Hence, it should be quite easily possible to automate the configuration.

7.3.5 Sybase for Windows NT

Sybase for Windows NT is very similar to Sybase for UNIX in regard to the configuration activities. Again, since a product on a Windows platform is to be installed, AutoPack can be employed, especially when deploying Sybase clients on Windows NT.

7.4 Using Monitors in Tivoli Manager for MS SQL Server

In the following section we cover the usage of some of the more useful monitors. We see that MSSQL Server is tightly integrated with Windows NT and many useful monitors are available from the Windows NT Distributed Monitoring collection.

7.4.1 Locks

In most RDBMS locks are of interest to the DBA. Locks protect the integrity of user data. MS SQL server uses the following type of locks.

- Exclusive Lock: Used for write operations.
- Shared lock: Allows other shared locks to access the object but not an exclusive lock. Generally used for write operations.
- Update lock: Like a shared lock and is taken out at a page level during the first part of an update when information is being read.
- Intent lock: Indicates the intention to acquire exclusive or shared access.
- Extent lock: Used during create, drop, insert and update operations.
- Table lock: Used by the SQL Server when a transaction effects an entire table.
- Blocking lock: Any lock which blocks another process that needs to acquire a lock.
- Page lock: Smallest element that can be locked in the SQL Server.

These locks can be monitored using the MSSQLServer collection. If there are insufficient locks, additional locks can be configured using the sp_configure command with the locks parameter from an ISQL session:

```
sp_configure locks, 8000
```

The minimum value here is 5000 (default); the maximum value is 214748364. Remember that more is not better. There is a penalty with assigning locks of 32 bytes of memory whether the lock is being used or not. Monitor the number of locks to get an idea of where peak numbers occur. Using the Total locks and Total locks remaining from the MSSQLServer collection is advised here.

7.4.2 Number of Clients

The number of clients can be monitored here to assist the DBA in either buying more licences or upgrading the server if there are too many users. Select Client count and Client count maximum to monitor. The collection used is MSSQLServer.

7.4.3 Log Monitoring Sources

This collection of monitors is used to monitor the statistics of a transaction log for the database. A transaction log is where the database holds all the uncommitted actions. Select Log size, Log size Maximum, Log space used, Log space used maximum to monitor. The collection used is MSSQLDatabase.

7.4.4 NT Distributed Monitors

Many of the monitors important to examining the functionality of MSSQL Server are located in the NT Distributed Monitoring Collection. Here, we provide a summary on which monitors should be used in conjunction with the ones provided by Tivoli Manager for MS SQL Server.

- Physical I/O (Disk): If there are too many accesses to the disk using the NT_Physical_Disk: Percent Disk Time will help diagnose the cause of the problem. MSSQLServer: I/O page read rate will monitor the amount of disk I/O SQL Server is responsible for.
- Logical I/O (Memory): We can monitor whether we have a memory bottleneck by using the NT_Memory: Page Faults/sec monitor. In conjunction with this we can monitor the two caches SQL Server uses: data cache and procedure cache. Data cache holds the data SQL Server reads when performing disk I/O, usually the bigger the better here. Procedure cache is an area in memory where SQL Server keeps the trees and queries that have been recently used. The two monitors that can be used here are MSSQL Server: Cache hit ratio and MSSQLServer: Procedure cache used.
- CPU: In order to examine whether the CPU is a bottleneck for SQL Server monitor the NT_System: Percent Total Processor Time, NT_System:

Processor Queue Length. To see if the cause of this bottleneck is SQL Server monitor the NT_Process: Percent Processor Time and specify SQL Server as the process.

- Network: SQL Server is a client/server based model. Network traffic may sometimes be the cause of a bottleneck. To monitor if this is a problem use MSSQLServer: Network read rate and Network write rate in conjunction with NT_Server Bytes Received and Bytes Transmitted respectively.

Chapter 8. Product Futures

Here, we give a short overview of the functions that will be added to the Tivoli database management products in future releases.

The following key enhancements will be added:

- Support for the Tivoli Lightweight Client Framework architecture
- Support for Tivoli User Administration and Tivoli Security
- Support for GEM
- NLS enablement
- Integration with Tivoli ADSM and Maestro
- Partnerships for complementary solutions

The next version of the Tivoli database management products will support the Lightweight Client Framework (LCF) that was introduced in TME 10 Framework 3.2 and that is exploited by the Tivoli core applications in Tivoli 3.6.

At this point, the RDBMS servers that you want to manage with the Tivoli database management products need to be Tivoli managed nodes. That is they need to have the Tivoli Framework installed. The next release will also support Tivoli Management Agents (formerly called LCF endpoints), so that the RDBMS servers you want to manage do not need to have the full Tivoli Framework installed but only the Tivoli Management Agent.

The next versions of the Tivoli database management products will also support Tivoli User Administration and Security. While at this point, for example, Tivoli Manager for Oracle uses its own user administration feature, in future versions the user management for databases will be integrated with Tivoli User Administration.

Integration with Tivoli Global Enterprise Manager (GEM) will allow you to include the management of databases in GEM's business systems management. That is database resources can be managed as components of larger applications or business systems.

In a number of areas there will be integration with other systems management products, such as ADSM and Maestro and also, through partnerships, with complementary database management solutions.

Chapter 9. Questions & Answers

In this chapter we provide, in Q&A form some consolidated information regarding the Tivoli RDBMS modules.

Table 3. Questions and Answers Regarding Tivoli RDBMS Modules

Question	Answer
What is the difference between the Tivoli RDBMS modules and RIM?	The Tivoli RDBMS modules provide systems management functions for RDBMS servers, whereas RIM is a component of the Tivoli Framework that shields Tivoli core applications from a physical RDBMS, thus allowing the Tivoli core applications to be RDBMS implementation independent.
Do I need to install Tivoli User Administration in order to manage Oracle users with Tivoli Manager for Oracle 1.0?	No, you don't need to install Tivoli User Administration, as Tivoli Manager for Oracle 1.0 is not based on Tivoli User Administration but provides its own profiles.
Can I use the Tivoli RDBMS modules to install the RDBMS server product?	No, you will still need to install the RDBMS server manually. However, you can use Tivoli Software Distribution to deploy RDBMS servers and clients.
How do DB2 Enterprise Control Center for TME 10 and TME 10 Module for DB2 relate?	TME 10 Module for DB2 1.0 is based on DB2 Enterprise Console Center for TME 10. Future releases will be named Tivoli Manager for DB2.
Do I need TEC in order to use the Tivoli RDBMS modules?	No, TEC is not a prerequisite for the Tivoli RDBMS modules. However, when using TEC you can benefit from the event forwarding mechanisms provided by the Tivoli RDBMS modules and use TEC as your central point for event correlation from all sources in the enterprise, including the RDBMSs.

Question	Answer
Will the Tivoli RDBMS modules allow a systems management administrator to take over the role of a database administrator?	No, but it will allow a Tivoli administrator to perform a number of operational tasks related to the RDBMS servers from his familiar Tivoli environment. For database specific tasks, such as tuning the database, etc. you will still need the expertise of a database administrator. This database administrator can, however, use the Tivoli environment to perform many of these tasks.
Do I need to install Tivoli Distributed Monitoring in order to use the Tivoli RDBMS modules?	Yes, you need to install Tivoli Distributed Monitoring, as all the Tivoli RDBMS modules provide Tivoli Distributed Monitoring collections for database monitoring.
I cannot register databases on Windows NT when using Tivoli Manager for Oracle 1.0. What could be the problem?	If you are using Tivoli Manager for Oracle 1.0, you need to install the patch TME 10 Module For Oracle - Framework, Patch 1.0-ORA-0001.
I don't get the OracleDatabase... option under the Create menu in my policy region window. What do I need to do?	You need to add the new managed resource types added by the Tivoli Manager for Oracle installation as managed resources to the policy region.
When I try to create an Oracle database in my policy region I get an authorization failure. What is wrong?	Check if your administrator has the appropriate TMR roles set. New TMR roles, such as oracle_admin are added to the TMR when installing Tivoli Manager for Oracle.
What values do I need to specify for the Owner and Owner Group fields in the Register a Database window when trying to register an Oracle database on Windows NT?	You need to specify internal as the Owner and the password of the user internal as the Owner Group.
Does Tivoli Manager for DB2 Version 1.0 add new TMR roles to the TMR during installation?	No, the module uses the standard Tivoli roles user, admin, senior and super to control access to DB2 resources.
Does Tivoli Manager for DB2 add managed resources to the TMR?	Yes, the module adds the new managed resource types DB2Database, DB2Instance, DB2Partition and DB2PartitionGroup.

Question	Answer
Does Tivoli Manager for Oracle add managed resources to the TMR?	Yes, the module add the new managed resource types OracleDatabase, OracleResourceProfile, OracleRoleProfile and OracleUserProfile.
Does Tivoli Manager for Oracle add TMR roles to the TMR?	Yes, the module adds the new roles oracle_admin, oracle_dba, oracle_monitor, oracle_operator and oracle_user.
When receiving TEC events from a monitor in Tivoli Manager for DB2 1.0, the wtdumprl command informs me that the slot probe is undefined. What is wrong?	The slot named probe was introduced in TME 10 Distributed Monitoring 3.5. Tivoli Manager for DB2 1.0, however, provides *.baroc files that inherit from the Sentry 2.0 base class. Therefore, when working with TME 10 Distributed Monitoring 3.5, you get an undefined slot. To correct this problem, modify the DB2Basic.baroc file to inherit from the Sentry 3.5 base class.
The monitors in the Tivoli Manager for Oracle module fail with an E.EXEC error, stating an authorization failure. How can I fix this problem?	Set the user ID and the group ID in the monitoring profile to oracle and dba (for UNIX) and add oracle as a login ID to the administrator that has the oracle_monitor TMR role assigned.
The registration of Oracle databases on Windows NT with TME 10 Module for Oracle 1.0 causes problems. What can be done to solve this problem?	The patch 1.0-ORA-0001 should be installed.
How can I see which new object types and resources have been added to the TMR after the installation of Tivoli Manager for Oracle?	You an use the command: `wlookup -lR | grep Oracle`
Do the Tivoli database management products support Tivoli Management Agents?	The 1.0 versions of the Tivoli database management products do not support Tivoli Management Agents (also referred to as LCF endpoints). If you want to manage RDBMS servers with Tivoli, they have to be Tivoli managed nodes. The next versions of the Tivoli database management products will support the Lightweight Client Framework architecture.

Appendix A. Special Notices

This publication is intended to help the reader to understand and use the Tivoli management modules for RDBMSs. The information in this publication is not intended as the specification of any programming interfaces that are provided by Tivoli. See the PUBLICATIONS section of the IBM Programming Announcement for Tivoli for more information about what publications are considered to be product documentation.

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Appendix B. Related Publications

The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this redbook.

B.1 International Technical Support Organization Publications

For information on ordering these ITSO publications see “How To Get ITSO Redbooks” on page 417.

- *An Industry Around the Tivoli Framework: Examples from the 10/Plus Association*, SG24-2122
- *TME 10 Cookbook for AIX*, SG24-4867
- *The TME 10 Deployment Cookbook: Courier and Friends,* SG24-4976
- *TME 10 Deployment Cookbook: Inventory and Company*, SG24-2120
- *TME 10 Inventory 3.2: New Features and Database Support*, SG24-2135
- *A First Look at TME 10 Distributed Monitoring 3.5*, SG24-2112
- *Migrating From Systems Monitor for AIX to TME 10 Distributed Monitoring*, SG24-4936
- *Creating Custom Monitors for Tivoli Distributed Monitoring*, SG24-5211
- *Deploying a Tivoli Infrastructure in Large Enterprise Environments*, SG24-5210
- *TEC Implementation Examples*, SG24-5216
- *New Features in Tivoli Software Distribution 3.6*, SG24-2045 (available 4Q/98)
- *An Introduction to Tivoli’s TME 10*, SG24-4948

B.2 Redbooks on CD-ROMs

Redbooks are also available on CD-ROMs. **Order a subscription** and receive updates 2-4 times a year at significant savings.

CD-ROM Title	Subscription Number	Collection Kit Number
System/390 Redbooks Collection	SBOF-7201	SK2T-2177
Networking and Systems Management Redbooks Collection	SBOF-7370	SK2T-6022
Transaction Processing and Data Management Redbook	SBOF-7240	SK2T-8038

CD-ROM Title	Subscription Number	Collection Kit Number
Lotus Redbooks Collection	SBOF-6899	SK2T-8039
Tivoli Redbooks Collection	SBOF-6898	SK2T-8044
AS/400 Redbooks Collection	SBOF-7270	SK2T-2849
RS/6000 Redbooks Collection (HTML, BkMgr)	SBOF-7230	SK2T-8040
RS/6000 Redbooks Collection (PostScript)	SBOF-7205	SK2T-8041
RS/6000 Redbooks Collection (PDF Format)	SBOF-8700	SK2T-8043
Application Development Redbooks Collection	SBOF-7290	SK2T-8037

B.3 Other Publications

These publications are also relevant as further information sources:

- *Tivoli Manager for Informix Framework User's Guide Version 1.0,* GC31-5119
- *Tivoli Manager for Informix Distributed Monitoring User's Guide Version 1.0*, GC31-5120
- *Sybase SQL Server 11 Unleashed*, SAMS Publishing, ISBN 0-672-30909-2
- *TME 10 Module for DB2 User's Guide Version 1.0*, GC31-5143
- *TME 10 Module for DB2 Monitoring Collection and Task Library Reference Guide Version 1.0*, SC31-5144
- *TME 10 Module for Oracle Distributed Monitoring User's Guide Version 1.0*, GC31-5112
- *TME 10 Module for Oracle Framework User's Guide Version 1.0*, GC31-5111
- *TME 10 Module for Microsoft SQL Server Framework User's Guide Version 1.0*, GC31-5114
- *TME 10 Module for Microsoft SQL Server Distributed Monitoring User's Guide Version 1.0*, GC31-5115
- *TME 10 Module for Sybase Distributed Monitoring User's Guide Version 1.0*, GC31-5117
- *TME 10 Module for Sybase Framework User's Guide Version 1.0*, GC31-5116

How to Get ITSO Redbooks

This section explains how both customers and IBM employees can find out about ITSO redbooks, CD-ROMs, workshops, and residencies. A form for ordering books and CD-ROMs is also provided.

This information was current at the time of publication, but is continually subject to change. The latest information may be found at `http://www.redbooks.ibm.com/`.

How IBM Employees Can Get ITSO Redbooks

Employees may request ITSO deliverables (redbooks, BookManager BOOKs, and CD-ROMs) and information about redbooks, workshops, and residencies in the following ways:

- **Redbooks Web Site on the World Wide Web**

  `http://w3.itso.ibm.com/`

- **PUBORDER** – to order hardcopies in the United States
- **Tools Disks**

  To get LIST3820s of redbooks, type one of the following commands:

  ```
  TOOLCAT REDPRINT
  TOOLS SENDTO EHONE4 TOOLS2 REDPRINT GET SG24xxxx PACKAGE
  TOOLS SENDTO CANVM2 TOOLS REDPRINT GET SG24xxxx PACKAGE (Canadian users only)
  ```

  To get BookManager BOOKs of redbooks, type the following command:

  ```
  TOOLCAT REDBOOKS
  ```

  To get lists of redbooks, type the following command:

  ```
  TOOLS SENDTO USDIST MKTTOOLS MKTTOOLS GET ITSOCAT TXT
  ```

  To register for information on workshops, residencies, and redbooks, type the following command:

  ```
  TOOLS SENDTO WTSCPOK TOOLS ZDISK GET ITSOREGI 1998
  ```

- **REDBOOKS Category on INEWS**
- **Online** – send orders to: USIB6FPL at IBMMAIL or DKIBMBSH at IBMMAIL

Redpieces

For information so current it is still in the process of being written, look at "Redpieces" on the Redbooks Web Site (`http://www.redbooks.ibm.com/redpieces.html`). Redpieces are redbooks in progress; not all redbooks become redpieces, and sometimes just a few chapters will be published this way. The intent is to get the information out much quicker than the formal publishing process allows.

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In Canada	caibmbkz at ibmmail	lmannix@vnet.ibm.com
Outside North America	dkibmbsh at ibmmail	bookshop@dk.ibm.com

- **Telephone Orders**

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Canada (toll free)	1-800-IBM-4YOU
Outside North America	(long distance charges apply)
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(+45) 4810-1420 - Dutch	(+45) 4810-1620 - Italian
(+45) 4810-1540 - English	(+45) 4810-1270 - Norwegian
(+45) 4810-1670 - Finnish	(+45) 4810-1120 - Spanish
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- **Mail Orders** – send orders to:

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- **Fax** – send orders to:

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Canada	1-800-267-4455
Outside North America	(+45) 48 14 2207 (long distance charge)

- **1-800-IBM-4FAX (United States)** or **(+1) 408 256 5422 (Outside USA)** – ask for:

  Index # 4421 Abstracts of new redbooks
  Index # 4422 IBM redbooks
  Index # 4420 Redbooks for last six months

- **On the World Wide Web**

Redbooks Web Site	http://www.redbooks.ibm.com
IBM Direct Publications Catalog	http://www.elink.ibmlink.ibm.com/pbl/pbl

Redpieces

For information so current it is still in the process of being written, look at "Redpieces" on the Redbooks Web Site (`http://www.redbooks.ibm.com/redpieces.html`). Redpieces are redbooks in progress; not all redbooks become redpieces, and sometimes just a few chapters will be published this way. The intent is to get the information out much quicker than the formal publishing process allows.

IBM Redbook Order Form

Please send me the following:

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Telephone number | Telefax number | VAT number

☐ Invoice to customer number

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We accept American Express, Diners, Eurocard, Master Card, and Visa. Payment by credit card not available in all countries. Signature mandatory for credit card payment.

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ITSO Redbook Evaluation

Managing RDBMS Servers with Tivoli
SG24-5240-00

Your feedback is very important to help us maintain the quality of ITSO redbooks. **Please complete this questionnaire and return it using one of the following methods:**

- Use the online evaluation form found at http://www.redbooks.ibm.com
- Fax this form to: USA International Access Code + 1 914 432 8264
- Send your comments in an Internet note to redbook@us.ibm.com

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_ **Customer** _ **Business Partner** _ **Solution Developer** _ **IBM employee**
_ **None of the above**

Please rate your overall satisfaction with this book using the scale:
(1 = very good, 2 = good, 3 = average, 4 = poor, 5 = very poor)

Overall Satisfaction _____

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Was this redbook published in time for your needs? Yes___ No___

If no, please explain:

_____

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_____

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What other redbooks would you like to see published?

_____

_____

_____

Comments/Suggestions: (THANK YOU FOR YOUR FEEDBACK!)

_____

_____

_____

_____

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