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Using the Oracle Grid Control Server with a Database on Linux for System z

There are several ways to manage an Oracle® database running on Linux® on System z®. This paper describes how to use the agent that is shipped with the database. In our example we installed a database on SLES10.

The Oracle Grid Control Server does not run on Linux on System z. You can use a platform such as x86 Linux to run the Grid Control Server to manage the databases and applications running on Linux on System z.

Choices for managing a database on Linux on System z

The choices for managing a database on Linux on System z are:

- ▶ Use Database Control, which is shipped with the database product. It is run on the same Linux guest as the database, but can only be used to manage the database in the same ORACLE_HOME.
- ▶ Use the grid control agent that is available for download from otn.oracle.com under the Enterprise Manager heading. It is part of the mass agent download section. As of October 2008, the agent available is 10.2.0.4, which is supported for SUSE® Linux Enterprise Server (SLES9 and SLES10) and Red Hat Enterprise Linux (RHEL4 and RHEL5) on Linux on z. How to use this is described in detail in Appendix E in *Experiences with Oracle 10g Solutions on Linux for IBM System z*, SG24-7191.
- ▶ Use the Grid Control agent that is shipped with the database code. For the 10.2.0.3 database version the agent that is shipped is the 10.1.0.5 agent. This is supported on the same Linux versions as the database that today is SUSE Linux Enterprise Server 9 (SLES9), SUSE Linux Enterprise Server 10 (SLES10), and Red Hat Enterprise Linux 4 (RHEL4). This option is described in this IBM® Redpaper. Red Hat Enterprise Linux 5 is expected to be certified with 10.2.0.4 patchset in 4Q 2008. This paper describes this option.

Table 1 lists the currently supported options.

Table 1 Currently supported options

Product	DB Level	Red Hat 4	Red Hat 5	SLES 9	SLES 10
DB console	10.2.0.3	Yes	Projected	Yes	Yes
10.2.0.4 agent from otn download	10.2.0.3	Yes	No	Yes	No
10.1.0.5 agent shipped with 10.2.0.3 DB	10.2.0.3	Yes	Projected	Yes	Yes

Using DBConsole and Grid agents

The 10.1.0.5 agent that is part of the 10.2.0.3 database can be used as a remote grid agent on Linux on System z. The following notes describe how to set up a configuration to connect the 10.1.0.5 agent on Linux to the OEM grid on Win XP. The Linux host is linux20.itso.ibm.com and the WIN XP host is psoft01.itso.ibm.com. The steps described are:

1. Install the 10.2.0.3 database on Linux on z.
2. Install Grid Control on Windows® or Linux x86.
3. Configure Grid agent on Linux on z.
4. Add other databases to manage.

Install 10.2.0.3 database on SLES10

The 10.2.0.3 database supported on SLES10 is a patch set that is installed on top of a 10.2.0.2 database. The 10.2.0.2 database zip file, 10202_zlinux_database.zip, is downloaded from OTN, and the 10.2.0.3 patchset, p5337014_10203_LINUX-zSer.zip, is downloaded from metalink.

First step: Install 10.2.0.2

There are two things to note about the 10.2.0.2 install. The first is that the starter database is installed along with the Oracle binaries. This insures that the agent and DBConsole will be configured and running at the end of the 10.2.0.2 database installation.

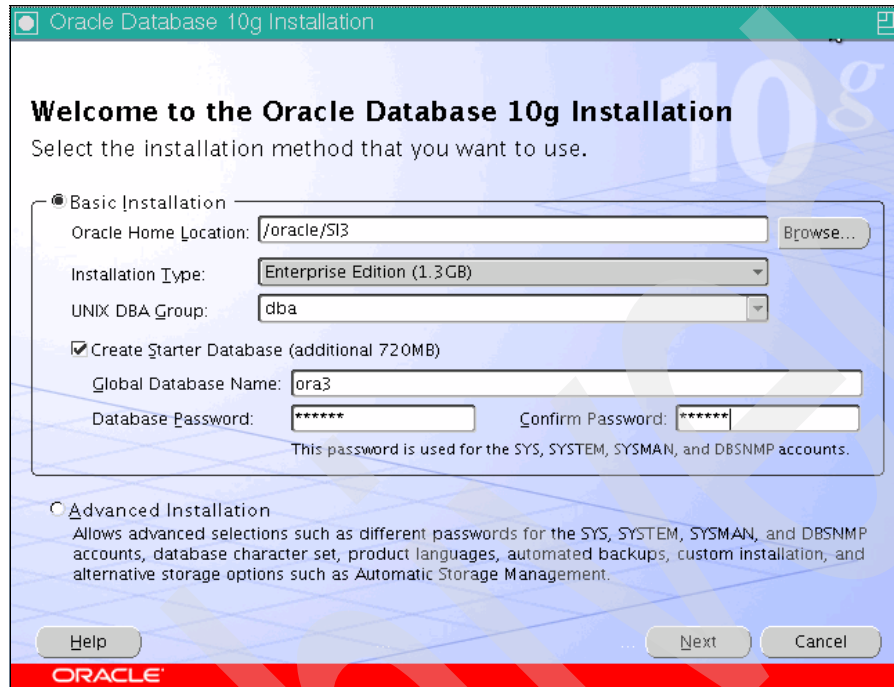


Figure 1 Create a starter database

The second thing to note is that patch 6007358 needs to be installed when the link error is encountered that is shown in Figure 2. Once the patch is installed, select the **Retry** option, and the database installation runs to completion.

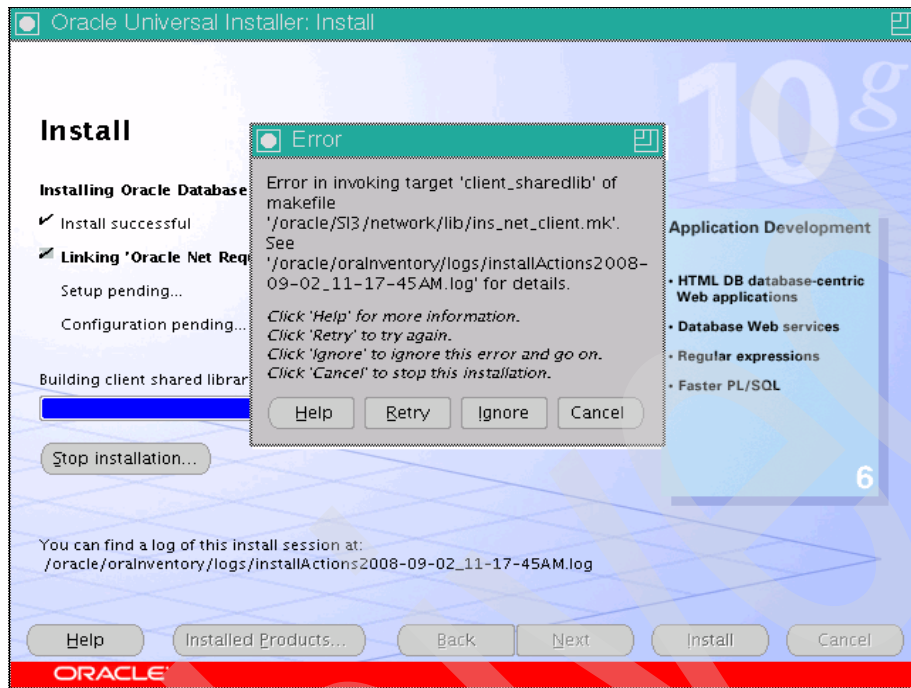


Figure 2 Link error requiring patch 6007358

The 10.2.0.2 End of Installation window (Figure 3) shows that OEM Database Control is available at port 5501.

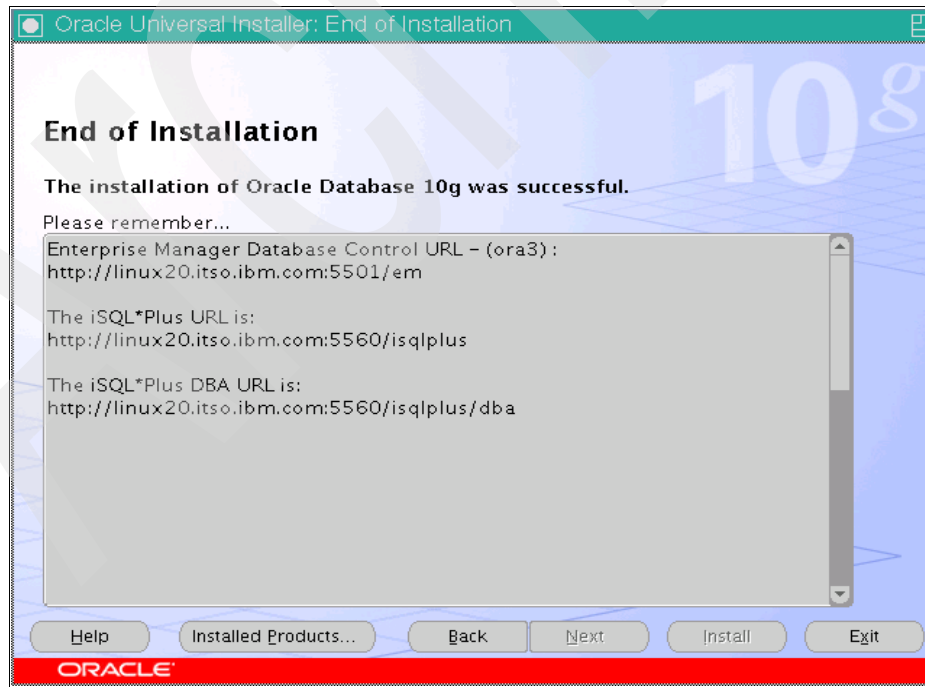


Figure 3 URLs for 10.2.0.2 database

At the completion of the installation, there is an agent running, \$ORACLE_HOME/bin/emagent. Its status is available with the `emctl` command (Example 1).

Example 1 emctl command

```
oracle@linux20:~> emctl status agent
TZ set to US/Eastern
Oracle Enterprise Manager 10g Database Control Release 10.2.0.2.0
Copyright (c) 1996, 2005 Oracle Corporation. All rights reserved.
-----
Agent Version      : 10.1.0.4.1
OMS Version       : 10.1.0.4.0
Protocol Version  : 10.1.0.2.0
Agent Home        : /oracle/SI3/linux20.itso.ibm.com_ora3
Agent binaries    : /oracle/SI3
Agent Process ID  : 15495
Parent Process ID : 14561
Agent URL         : http://linux20.itso.ibm.com:1832/emd/main
Started at       : 2008-09-02 12:04:29
Started by user  : oracle
Last Reload      : 2008-09-02 12:04:29
Last successful upload      : 2008-09-02 13:27:26
Total Megabytes of XML files uploaded so far : 4.96
Number of XML files pending upload          : 4
Size of XML files pending upload(MB)       : 0.04
Available disk space on upload filesystem  : 13.12%
-----
```

Agent is Running and Ready

For the standalone agent discussed in Appendix E in *Experiences with Oracle® 10gR2 Solutions on Linux for IBM System z, SG24-7191*, the agent home is \$AGENT_HOME/agent10g. Here, the agent home is \$ORACLE_HOME/<host><domain>_SID/. This is important later when the agent currently supporting the DBConsole on the local Linux host is changed to connect to the OEM grid.

The status of the DBConsole is also available with the `emctl` command (Example 2).

Example 2 emctl status command

```
oracle@linux20:~> emctl status dbconsole
TZ set to US/Eastern
Oracle Enterprise Manager 10g Database Control Release 10.2.0.2.0
Copyright (c) 1996, 2005 Oracle Corporation. All rights reserved.
http://linux20.itso.ibm.com:5501/em/console/aboutApplication
Oracle Enterprise Manager 10g is running.
-----
```

Logs are generated in directory /oracle/SI3/linux20.itso.ibm.com_ora3/sysman/log

From the status messages, the DBConsole version is 10.2.0.2 and the agent version is 10.1.0.4 after the 10202 database has been installed.

Second step: Install 10.2.0.3

Everything from the 10202 install needs to be stopped, including the listener, the database, the agent, the DBConsole, and the isqlplus server, before installing the 10203 patch set.

Once the patch set installation is complete, start the listener and run **dbua**, the database upgrade assistant, to upgrade the 10202 starter database so that it is usable with a 10203 Oracle system. After the patch set has been installed and the starter database has been upgraded with **dbua**, an agent and DBConsole are running, which can be verified, as seen in Example 3.

Example 3 Checking status on DBConsole

```
oracle@linux20:~> emctl status dbconsole
Oracle Enterprise Manager 10g Database Control Release 10.2.0.3.0
Copyright (c) 1996, 2006 Oracle Corporation. All rights reserved.
http://linux20.itso.ibm.com:5501/em/console/aboutApplication
Oracle Enterprise Manager 10g is running.
-----
Logs are generated in directory /oracle/SI3/linux20.itso.ibm.com_ora3/sysman/log

oracle@linux20:~> emctl status agent
Oracle Enterprise Manager 10g Database Control Release 10.2.0.3.0
Copyright (c) 1996, 2006 Oracle Corporation. All rights reserved.
-----
Agent Version      : 10.1.0.5.1
OMS Version        : 10.1.0.5.0
Protocol Version   : 10.1.0.2.0
Agent Home         : /oracle/SI3/linux20.itso.ibm.com_ora3
Agent binaries     : /oracle/SI3
Agent Process ID   : 28128
Parent Process ID  : 27373
Agent URL          : http://linux20.itso.ibm.com:1832/emd/main
Started at         : 2008-09-02 16:59:53
Started by user    : oracle
Last Reload        : 2008-09-02 16:59:53
Last successful upload      : 2008-09-02 22:17:43
Total Megabytes of XML files uploaded so far :      6.22
Number of XML files pending upload           :          0
Size of XML files pending upload(MB)         :          0.00
Available disk space on upload filesystem    :          9.40%
-----
Agent is Running and Ready
```

From the status messages, the DBConsole version is 10.2.0.3 and the agent version is 10.1.0.5 after the 10203 patch set has been installed. The agent home in the status message is the same as the prior level, but the original agent home has been saved by **dbua** in a directory of the same name with a suffix of *update*.

Install Grid Control Server

Note that when installing Grid Control you must make a certain selection. A 10.2.0.2 Grid install including a new database was done on Win XP. The first window selection is shown in Figure 4.

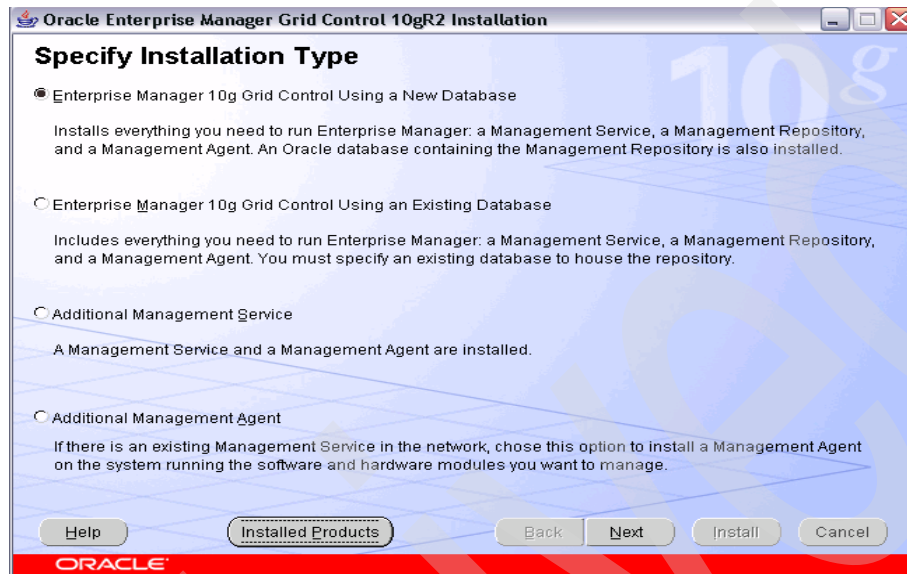


Figure 4 WIN XP Grid install

The default selection of “Require Secure Communication for all agents” was unchecked on the following window during the Grid installation (Figure 5). The default works for the standalone Grid agent, but so far we have not been successful in making a secure connection from the 10105 agent to Win XP Grid.

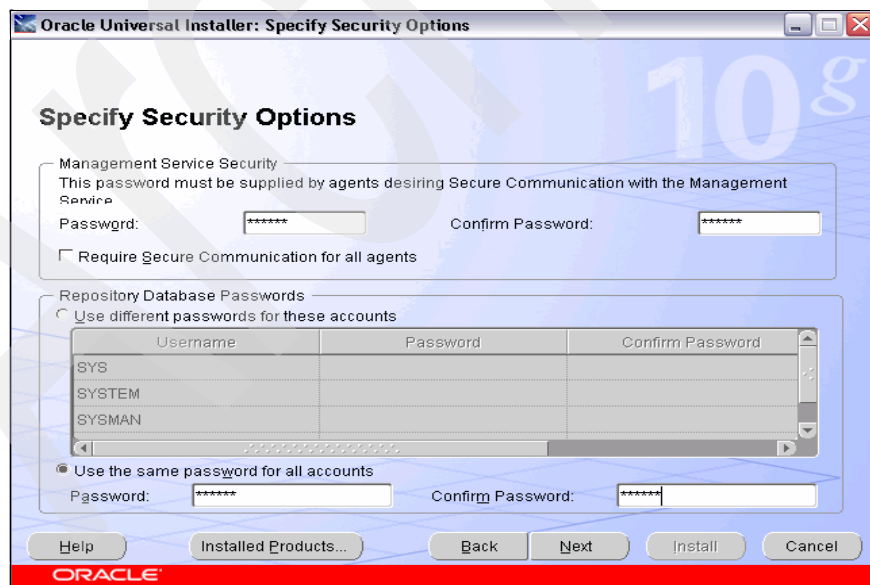


Figure 5 OEM grid security options off

After Grid is installed, a browser is used to access OEM Grid Control at port 4889, as shown in Figure 6.

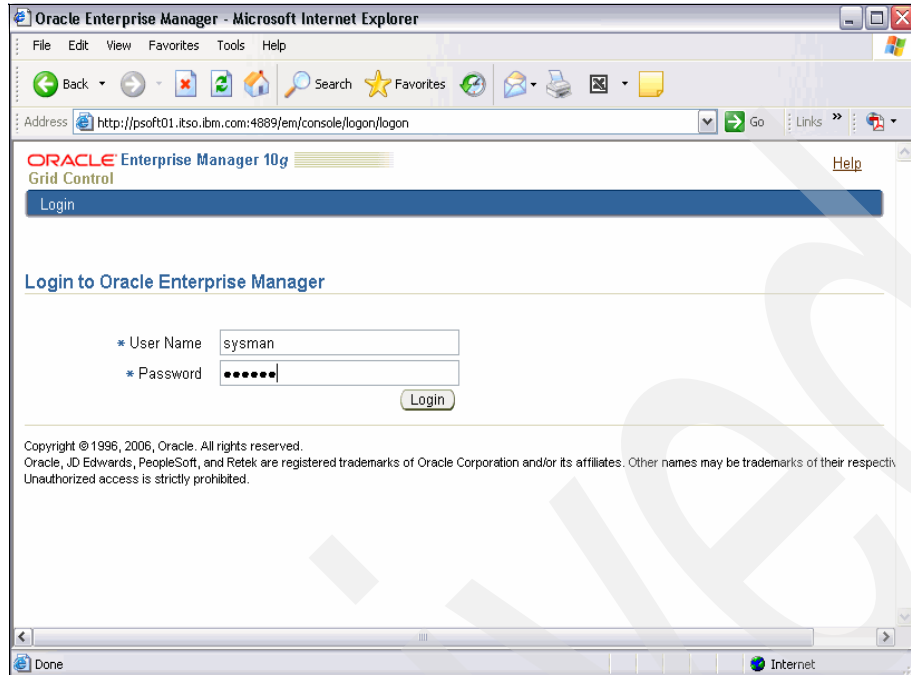


Figure 6 Log in to OEM on Win XP

Displaying the Targets-Hosts shows only the Win XP host where Grid is installed and running (Figure 7).

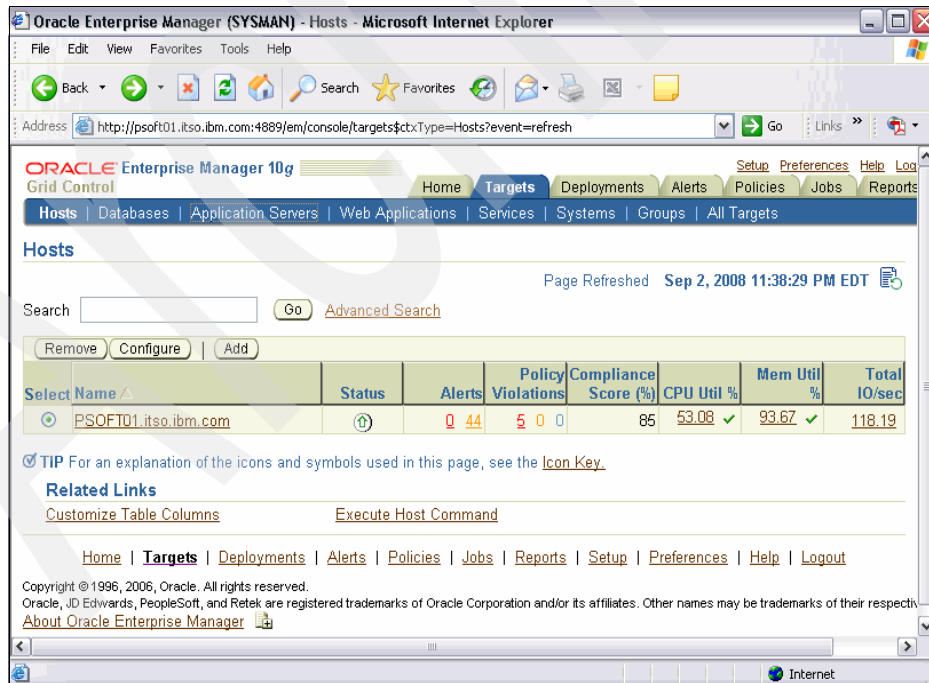


Figure 7 Win XP host

Return to Linux host to configure the agent

After running `dbua` to upgrade the database on Linux, the DBConsole and agent are running, as shown above. At this point OEM DB control can be accessed from Linux, as shown in Figure 8.

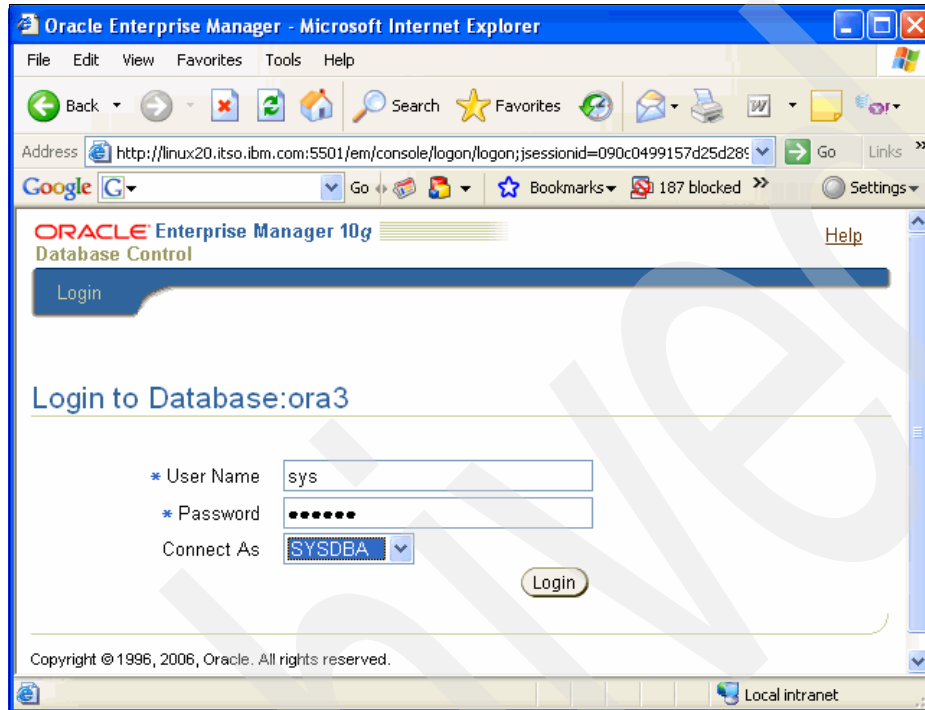


Figure 8 Log in to ora3 Database Control

After selecting **Login**, the OEM Database Control home window is presented and the ora3 10203 starter database can be managed (Figure 9).

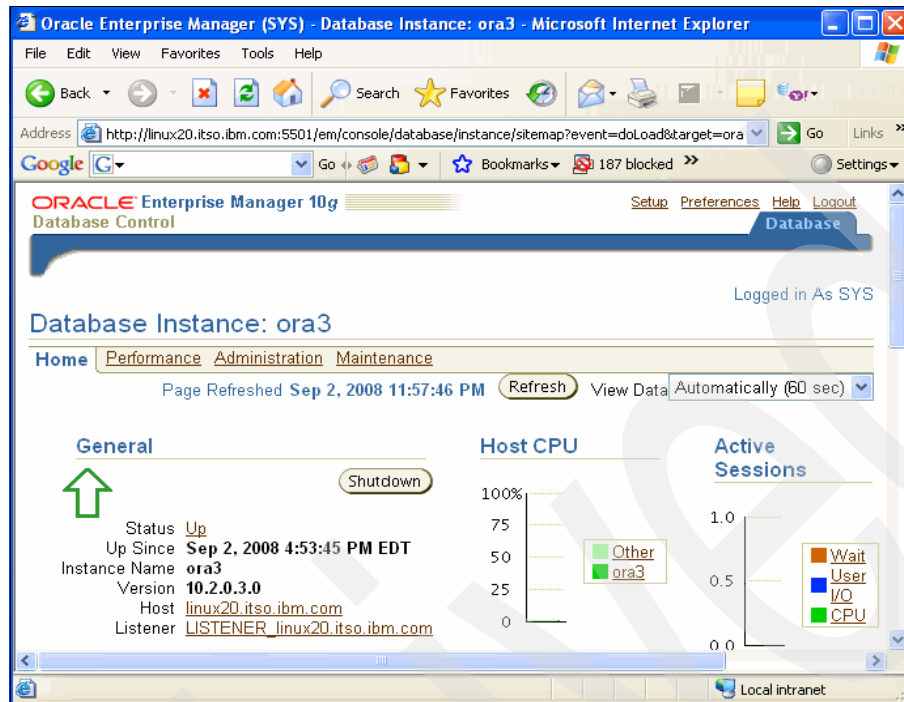


Figure 9 Database Control initial window

Set up agent to connect to Grid on Win XP

The objective here is to connect to OEM Grid Control on Win XP, so the DBConsole and agent will be stopped as shown:

```
oracle@linux20:/oracle/SI3> emctl stop agent
Oracle Enterprise Manager 10g Database Control Release 10.2.0.3.0
Copyright (c) 1996, 2006 Oracle Corporation. All rights reserved.
This will stop the Oracle Enterprise Manager 10g Database Control process.
Continue [y/n] :y
Stopping Oracle Enterprise Manager 10g Database Control ...
... Stopped.
Agent is not running.
```

Moving to the agent home shown above, `/oracle/SI3/linux20.itso.ibm.com_ora3`, and then down two more directories (to the `/oracle/SI3/linux20.itso.ibm.com_ora3/sysman/config/emd.properties` file) needs two lines edited to have the agent connect to OEM grid on Win XP. The file was saved, edited, and then `diff` was run, as shown in Example 4, to show the two changes made to the `emd.properties` file. The Win XP host is `psoft01.itso.ibm.com`.

Example 4 emd.properties file

```
oracle@linux20:/oracle/SI3/linux20.itso.ibm.com_ora3/sysman/config> diff
emd.properties emd.properties.save090208
34c34
< REPOSITORY_URL=http://psoft01.itso.ibm.com:4889/em/upload/
---
> REPOSITORY_URL=http://linux20.itso.ibm.com:5501/em/upload/
```

```
155c155
< emdWalletSrcUrl=http://psoft01.itso.ibm.com:4889/em/wallets/emd
---
> emdWalletSrcUrl=http://linux20.itso.ibm.com:5501/em/wallets/emd
```

4889 is the default port for a OEM Grid Control unsecured connection. If it is unavailable, the next available port in the range 4889 to 4897 is used.

The next step is to start the agent and check the status. A status check was done first, and it shows that the agent is not running. The **emctl** commands are shown in Example 5.

Example 5 emctl command to check status

```
oracle@linux20:~> emctl status agent
Oracle Enterprise Manager 10g Database Control Release 10.2.0.3.0
Copyright (c) 1996, 2006 Oracle Corporation. All rights reserved.
```

Agent is Not Running

```
oracle@linux20:~> emctl start agent
Oracle Enterprise Manager 10g Database Control Release 10.2.0.3.0
Copyright (c) 1996, 2006 Oracle Corporation. All rights reserved.
Starting agent .... started.
```

```
oracle@linux20:~> emctl status agent
Oracle Enterprise Manager 10g Database Control Release 10.2.0.3.0
Copyright (c) 1996, 2006 Oracle Corporation. All rights reserved.
```

```
-----
Agent Version      : 10.1.0.5.1
OMS Version       : 10.2.0.2.0
Protocol Version  : 10.1.0.2.0
Agent Home        : /oracle/SI3/linux20.itso.ibm.com_ora3
Agent binaries    : /oracle/SI3
Agent Process ID  : 12873
Parent Process ID : 12870
Agent URL         : http://linux20.itso.ibm.com:1832/emd/main
Started at       : 2008-09-03 10:06:55
Started by user   : oracle
Last Reload      : 2008-09-03 10:06:55
Last successful upload          : 2008-09-03 10:07:37
Total Megabytes of XML files uploaded so far :      4.51
Number of XML files pending upload           :          0
Size of XML files pending upload(MB)        :          0.00
Available disk space on upload filesystem    :          9.30%
```

Agent is Running and Ready

The agent status message shows that the agent is up and running. Note that the agent status messages do not show the repository URL that is shown in the status messages by the standalone agent. The status also shows that it has recently successfully uploaded data to the repository that is now the OEM Grid Control database. Moving back to the OEM Grid Control on Win XP, the Targets-Hosts window shows that the 10105 agent on Linux on System z has registered the host, linux20.itso.ibm.com, with Grid Control. From above the host, psoft01.itso.ibm.com, is where OEM Grid Control is running and is WIN XP.

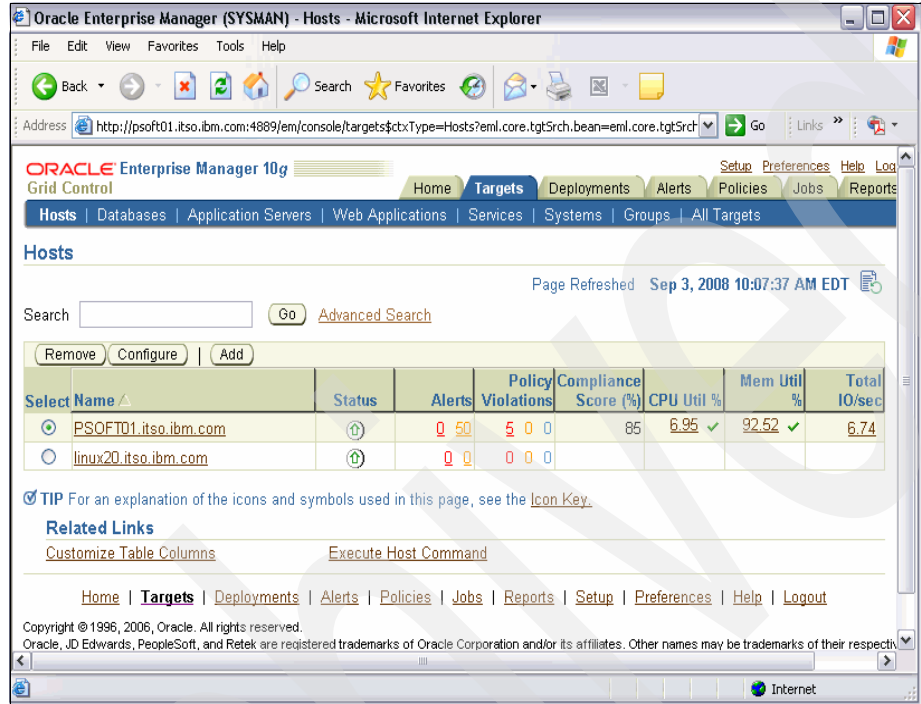


Figure 10 Grid Control after 10105 agent change

Moving on to the OEM Grid Control Targets Databases window, there are two databases displayed (Figure 11). The first one is the repository for OEM grid and the second, ora3, is the 10.2.0.3 starter database installed above on Linux. This is also where the 10105 agent is running.

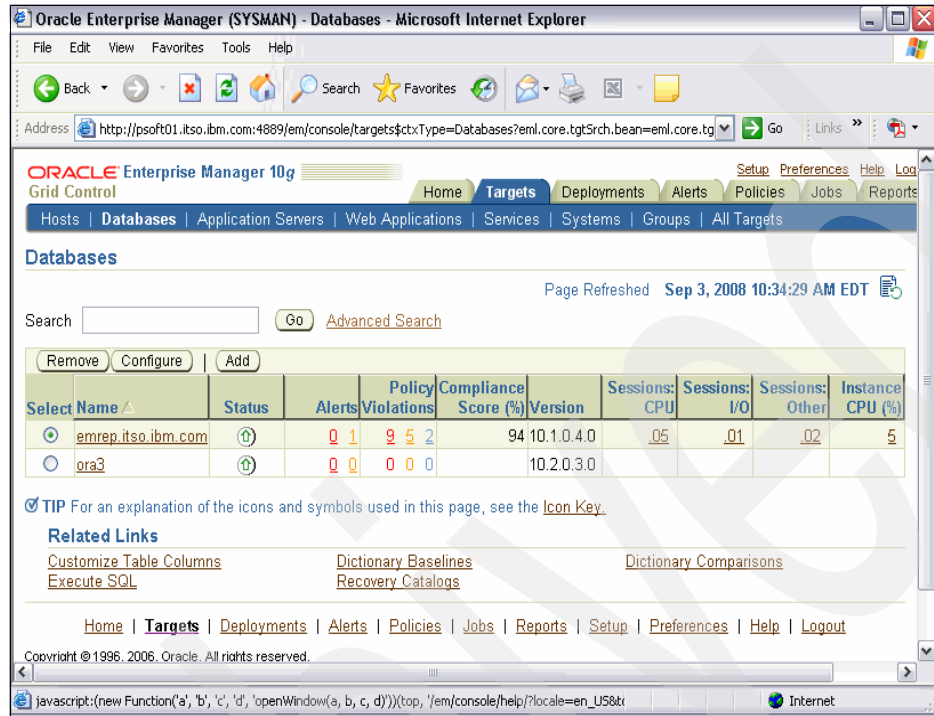
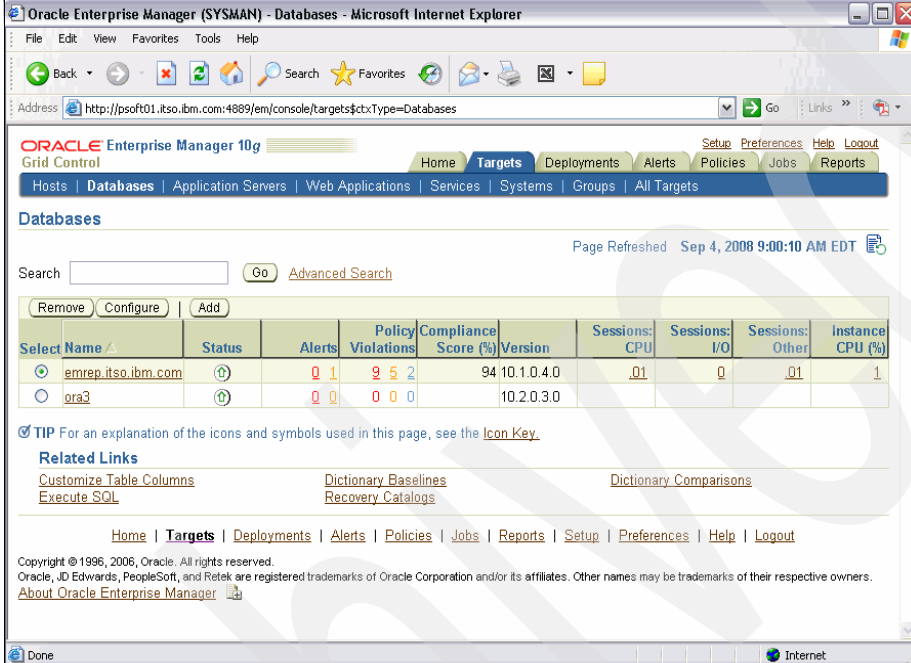


Figure 11 Grid Control targets - databases

Add another database instance to Grid on Win XP

The starter database is easy to manage. Then there are two additional database homes on linux20 where the 10105 agent is now running. One of these will be added to OEM Grid Control, as shown in the following steps. First, go to the OEM Grid Control Targets-Databases window, shown in Figure 12.



Oracle Enterprise Manager 10g
Grid Control

Home | **Targets** | Deployments | Alerts | Policies | Jobs | Reports

Hosts | **Databases** | Application Servers | Web Applications | Services | Systems | Groups | All Targets

Databases

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Select	Name	Status	Alerts	Policy Violations	Compliance Score (%)	Version	Sessions: CPU	Sessions: I/O	Sessions: Other	Instance CPU (%)
<input checked="" type="radio"/>	emrep.itso.ibm.com		0 1	9 5 2	94	10.1.0.4.0	.01	0	.01	1
<input type="radio"/>	ora3		0 0	0 0 0		10.2.0.3.0				

TIP For an explanation of the icons and symbols used in this page, see the [Icon Key](#).

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Figure 12 Grid Control Targets - Databases window

Select the **Add** option above the display of the two existing databases. This brings up the following window (Figure 13), which requests the name of the host where the database to be added is located.

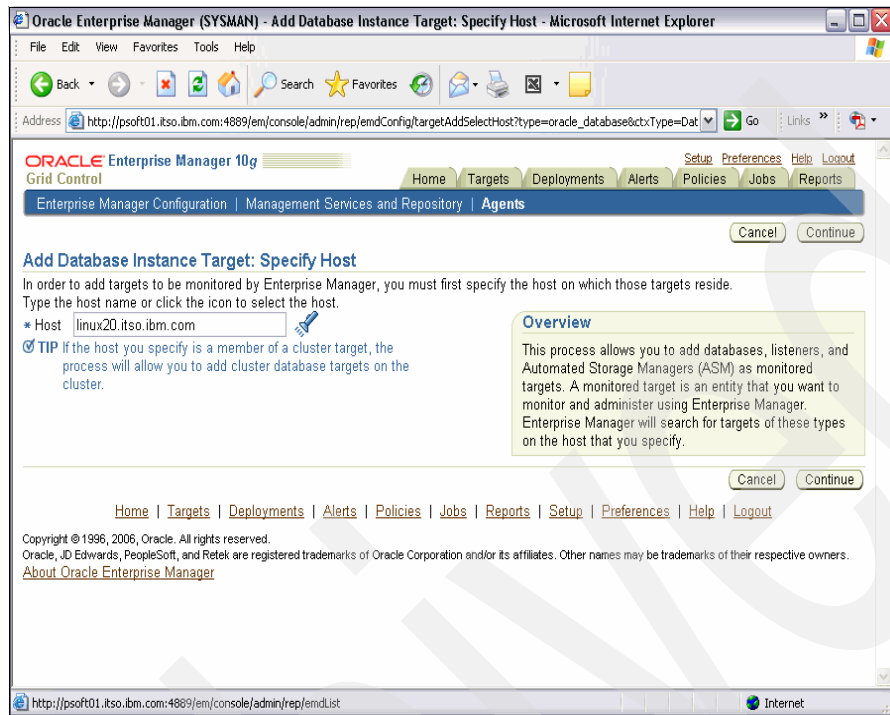


Figure 13 Initial step for adding new database

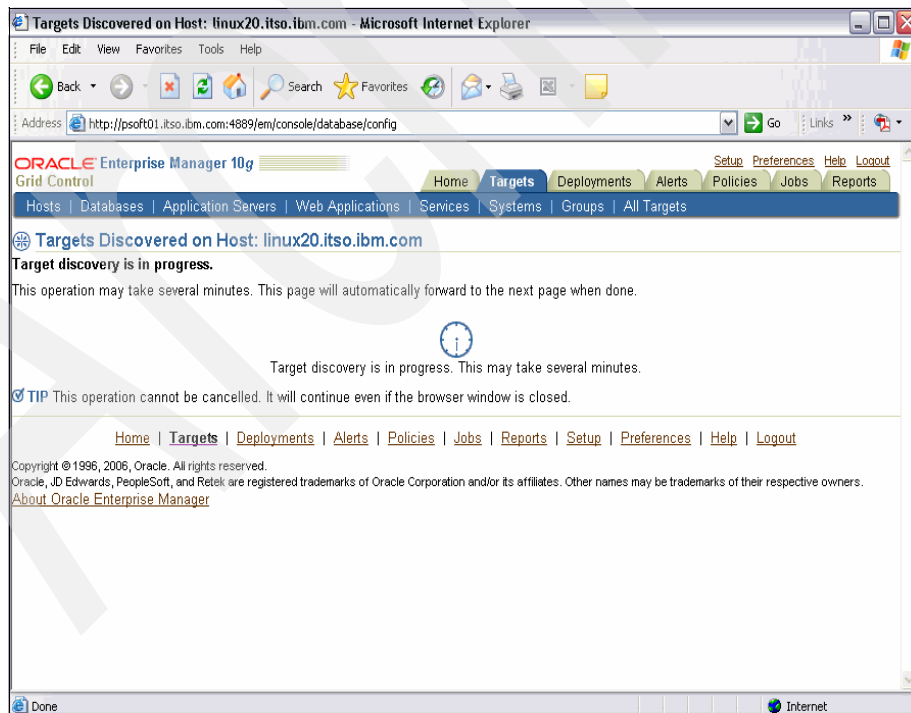


Figure 14 Looking for targets on Linux20 host

It takes a while to discover potential OEM grid targets on linux20 that are not already connected to Grid Control.

Figure 15 shows the targets discovered on the host where the 10105 agent is running. Since the database was discovered on linux20 and is displayed, the configure option will be selected opposite the PSFT1 database. This is a PeopleSoft® HR Demo database that was created from the command line with the create database SQL statement. Since dbca (or emca) has not run, neither the internal agent nor DBConsole has been configured on this database instance. However, the 10105 agent that was set up above for the ora3 starter database can monitor additional databases on Linux where it is running.

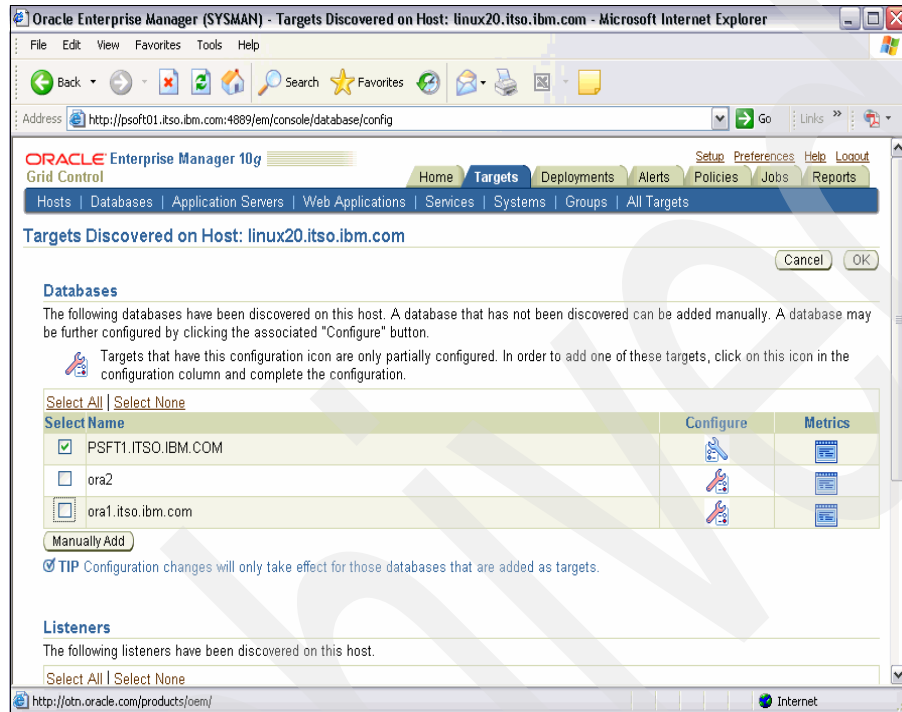


Figure 15 Potential targets discovered on Linux20

Note that the database name, PSFT1, was specified in capital letters when it was created and that is why it shows up on the window above in capital letters. Since OEM grid is on Windows, you can add it in lower case by selecting **Manually Add**. However, if you try to add both OEM, Grid will return a java error on the second one, stating that it has already been added.

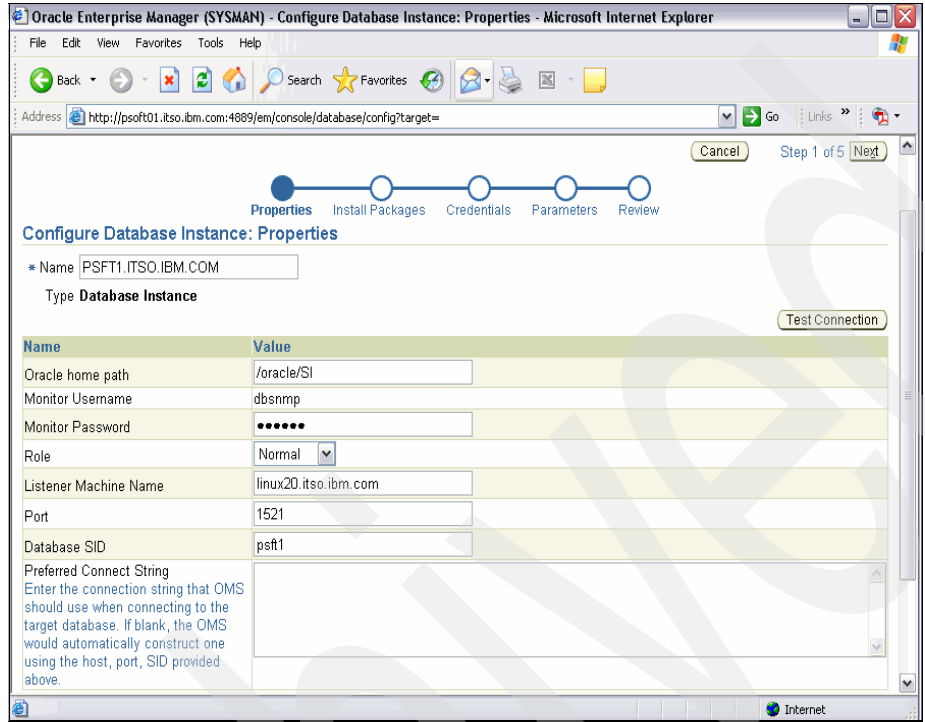


Figure 16 PSFT1 configuration

The connection can be tested to insure that Grid Control can access the PSFT1 database that is running on linux20. Since everything is set up, selecting **Next** results in the window shown in Figure 17.

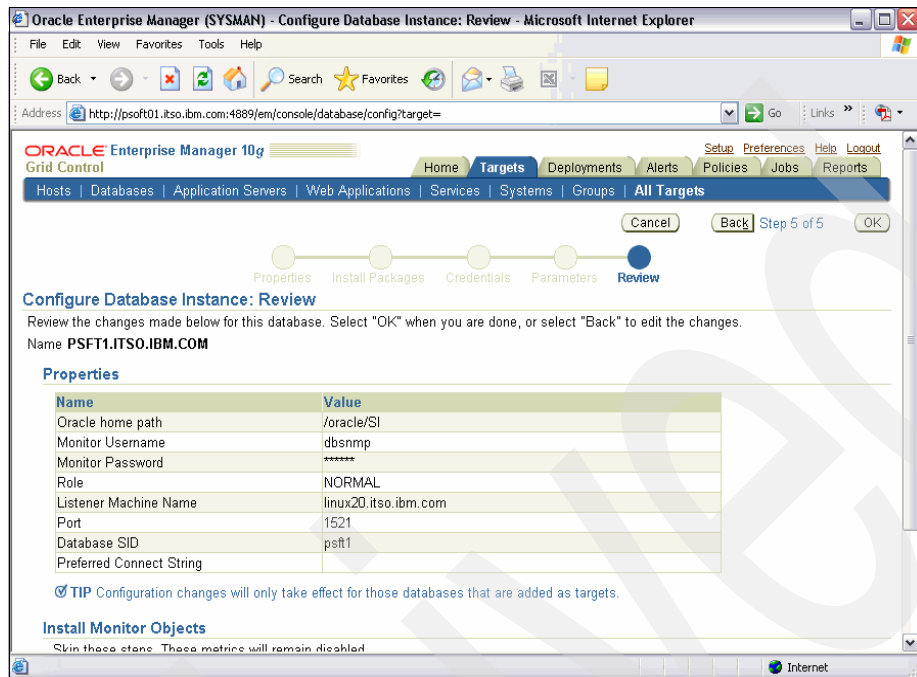


Figure 17 PSFT1 configuration review

Since everything is correct, select **OK** to get to the following window (Figure 18).

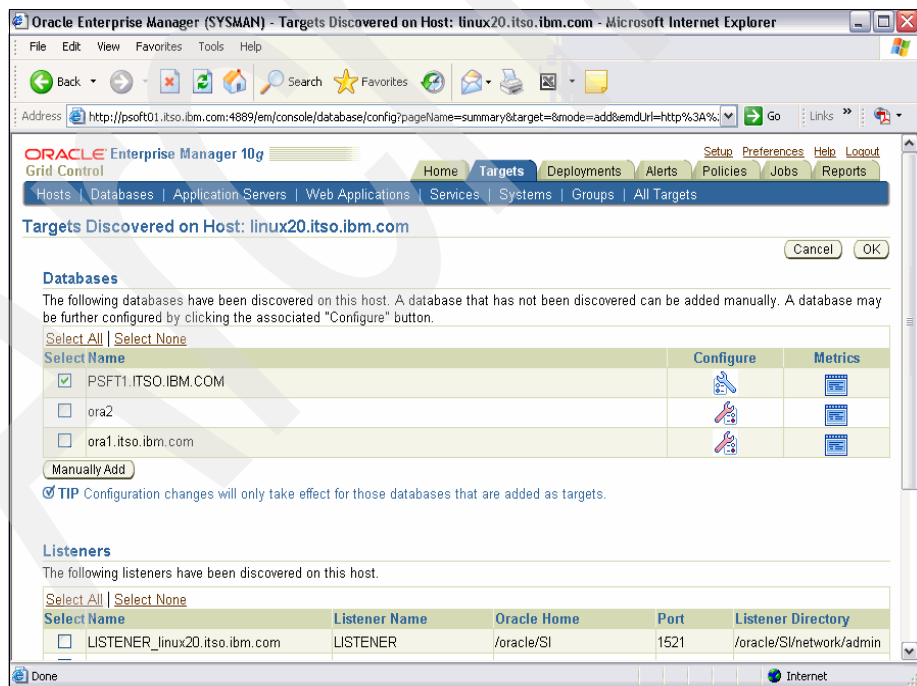


Figure 18 After PSFT1 configuration is verified

Now that the PSFT1 database is configured correctly, check its name in the list above and select **OK** to get it added to OEM Grid Control (Figure 19).

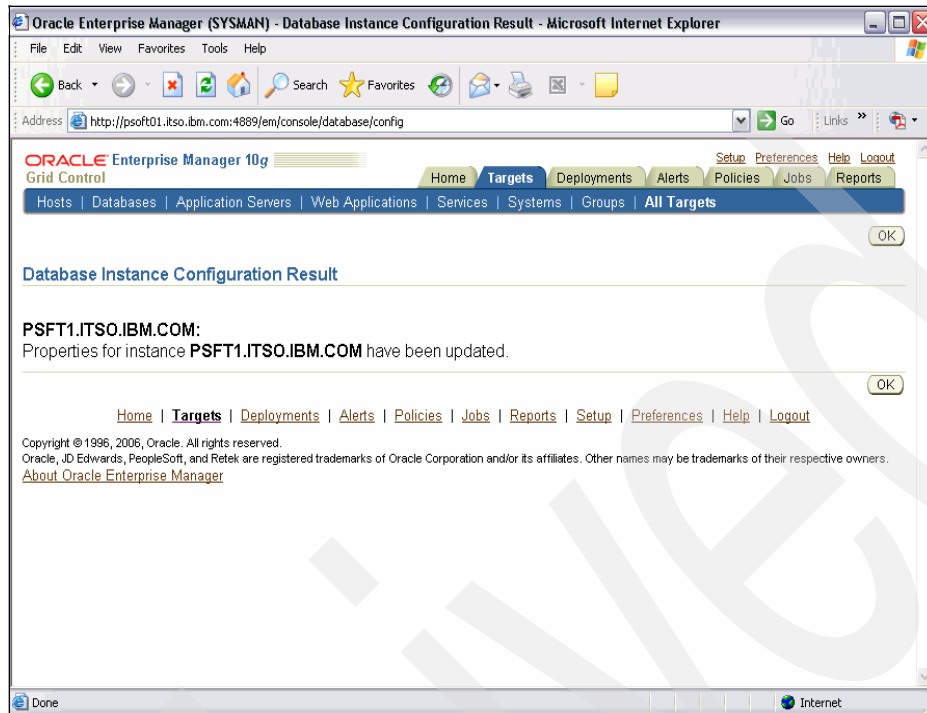


Figure 19 PSFT1 being added as OEM target

The PSFT1 database on Linux is now added to OEM Grid Control (Figure 20).

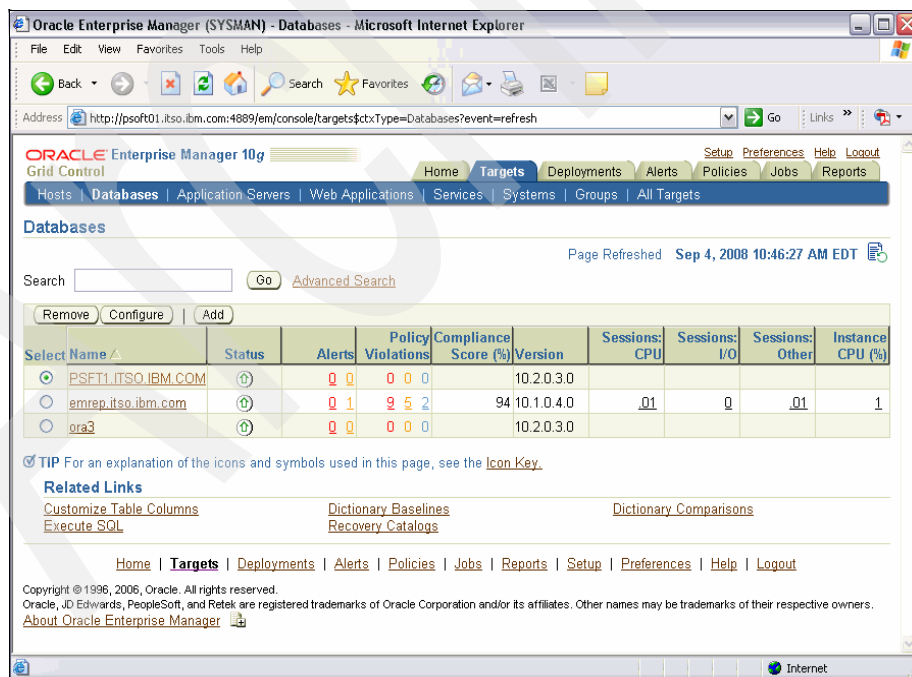


Figure 20 PSFT1 now a Grid Control target - database

Now that PSFT1 is in the OEM Grid Control Targets-Databases, click it to take you to a window that is virtually identical to the database control window. However, you are not the host where the database resides. As can be seen from Figure 21 on page 20, three

databases can be monitored from OEM Grid Control, and more can be added. After selecting **PSFT1**, the window shown in Figure 21 appears.

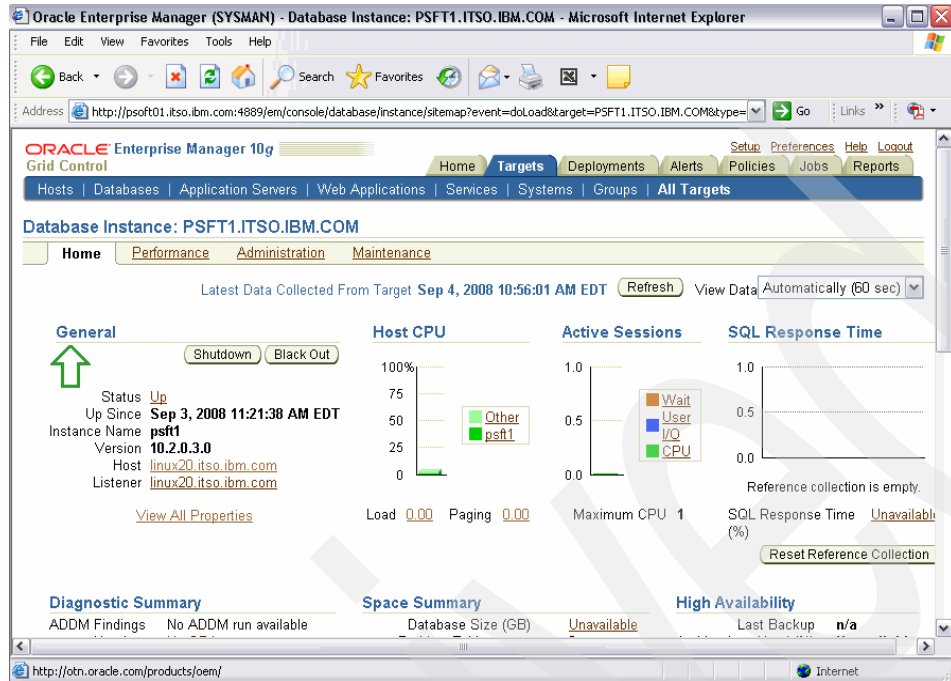


Figure 21 Grid Control for PSFT1 database

Now we present an example to show what is available. In Figure 21, performance was selected. A user and password were specified on a window (not shown) to log on to PSFT1. **Top activity** and **CPU** were selected on a window (also not shown). A heavy CPU load was run against the PSFT1 database on Linux. Then Figure 22 was captured.



Figure 22 Grid Control PSFT1 performance example

Summary

In summary, the choices for managing an Oracle database on Linux for z are:

- ▶ Use Database Control, which is shipped with the database product. It is run on the same Linux guest as the database, but can only be used to manage the database in the same ORACLE_HOME.
- ▶ Use the Grid Control agent that is available for download from otn.oracle.com under the Enterprise Manager heading. It is part of the mass agent download section. Today the agent available is 10.2.0.2, which is supported for SUSE Linux Enterprise Server 9 (SLES9) and Red Hat Enterprise Linux 4 (RHEL4). This has been described in detail in Appendix E in *Experiences with Oracle® 10gR2 Solutions on Linux for IBM System z*, SG24-7191.
- ▶ Use the Grid Control agent that is shipped with the database code. For the 10.2.0.3 database version the agent that is shipped is the 10.1.0.5 agent. This is supported on same Linux versions as the database that today is SUSE Linux Enterprise Server 9 (SLES9), SUSE Linux Enterprise Server 10 (SLES10), and Red Hat Enterprise Linux 4 (RHEL4). This option has been described in this Redpaper.

The author of this Redpaper

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