Tuning poor performing SQL's Using Oracle 10g Enterprise Manager's Automatic SQL Tuning Advisor

Version 1.0

Table of Contents

Query Optimizer Modes

Before we delve in to how to tune poor performing SQL queries automatically, it will be worth understanding two modes in which Oracle query optimization works:

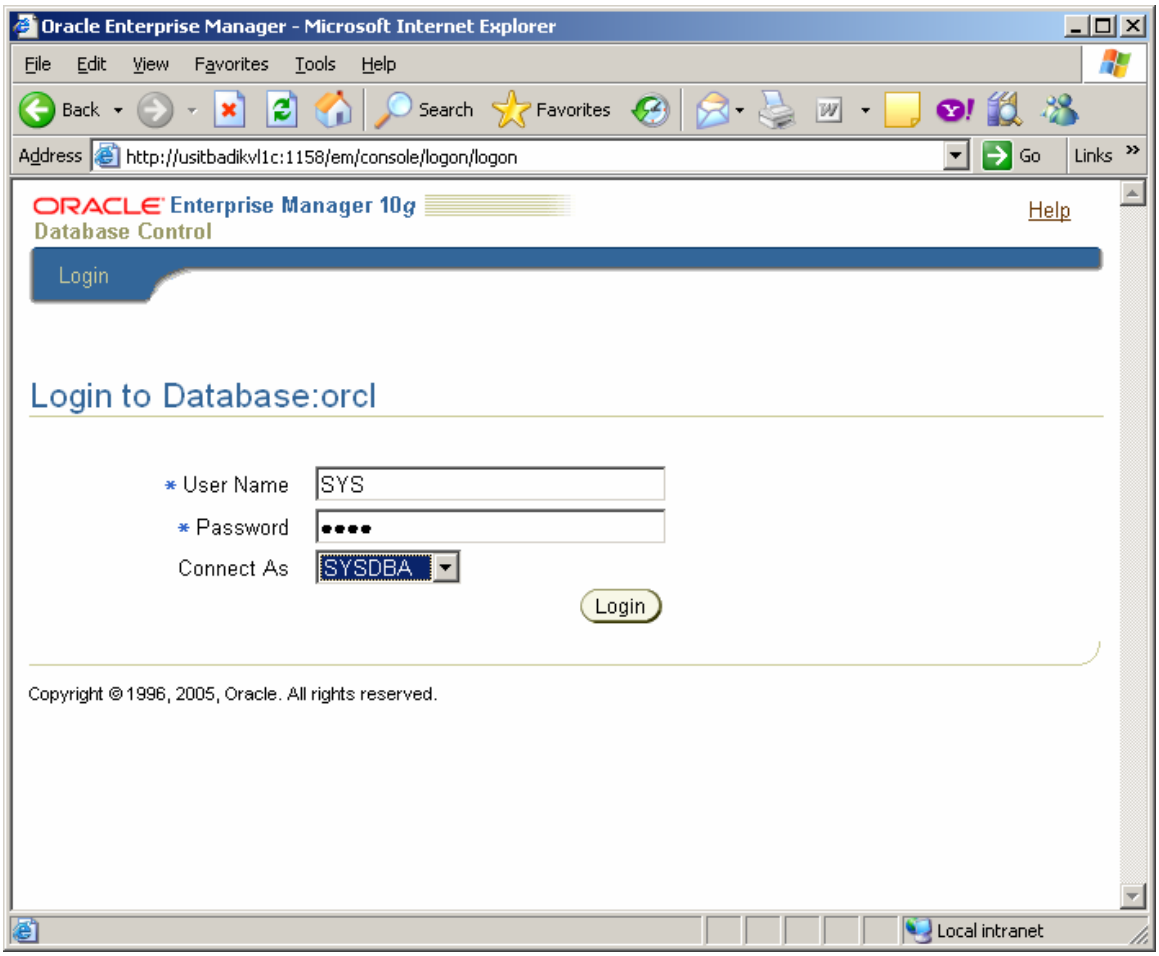
- Normal Mode
  This is the default mode in which query is optimized to get execution plan for vast majority of the SQL statements. Under this mode optimizer works in strict time constraints, mostly in fraction of a second and generates execution plan.
- Tuning Mode
  When Optimizer is invoked under tuning mode it is referred to as Automatic Tuning Optimizer. Tuning performed by automatic tuning optimizer is called Automatic SQL Tuning. Under this mode optimizer can take several minutes to tune one query.

Navigating SQL Tuning Advisor

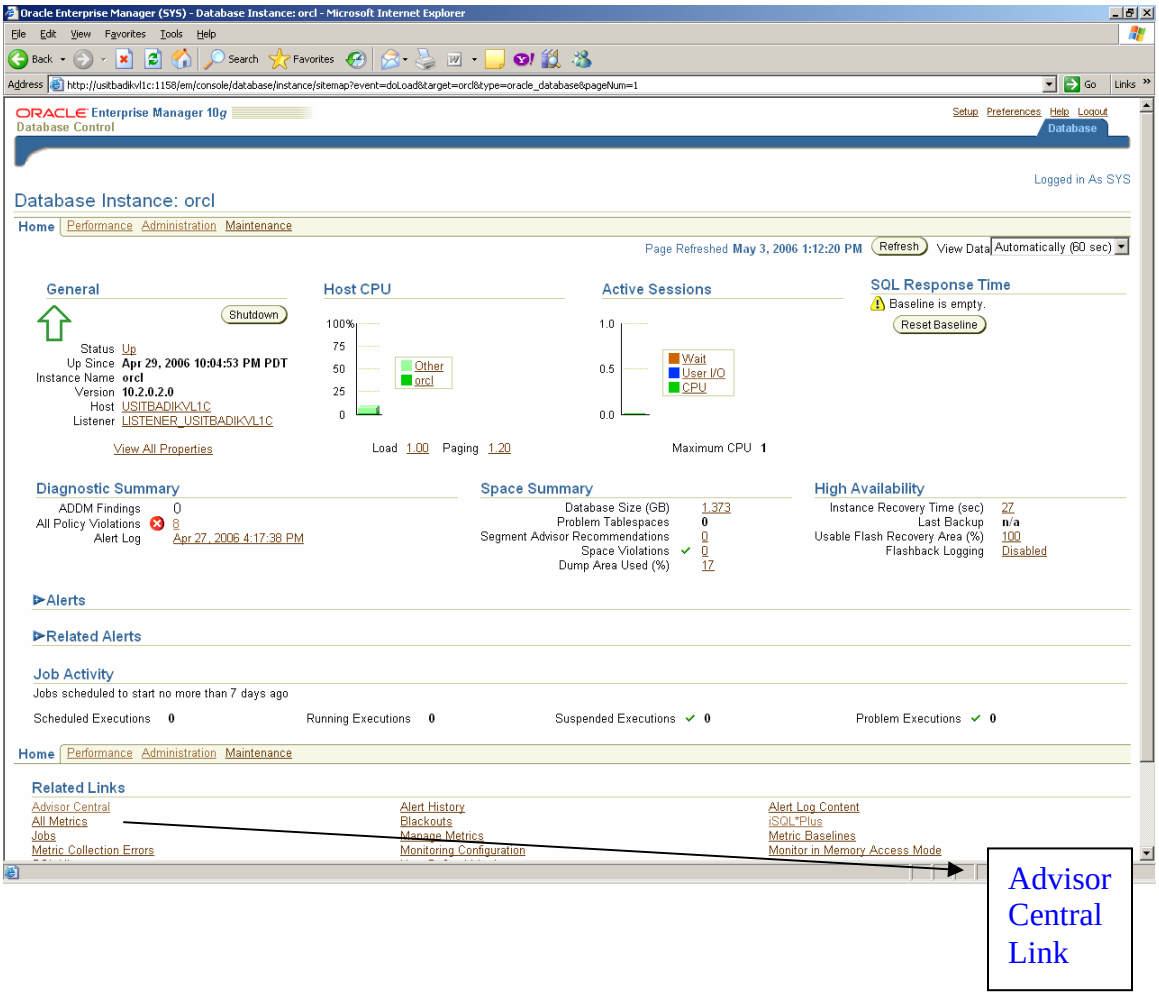
Automatic SQL Tuning can be invoked through a server utility called SQL Tuning Advisor using Oracle Enterprise Manager. The following details step by step instructions on how to get to SQL Tuning Advisor.

Step 1: First logon to Oracle Enterprise Manager 10g by SYS user or equivalent as SYSDBA. By default OEM will be running on 1158 port on the database server unless it was modified at the installation time. To login to OEM use internet explorer and point to your database server as shown in this example:

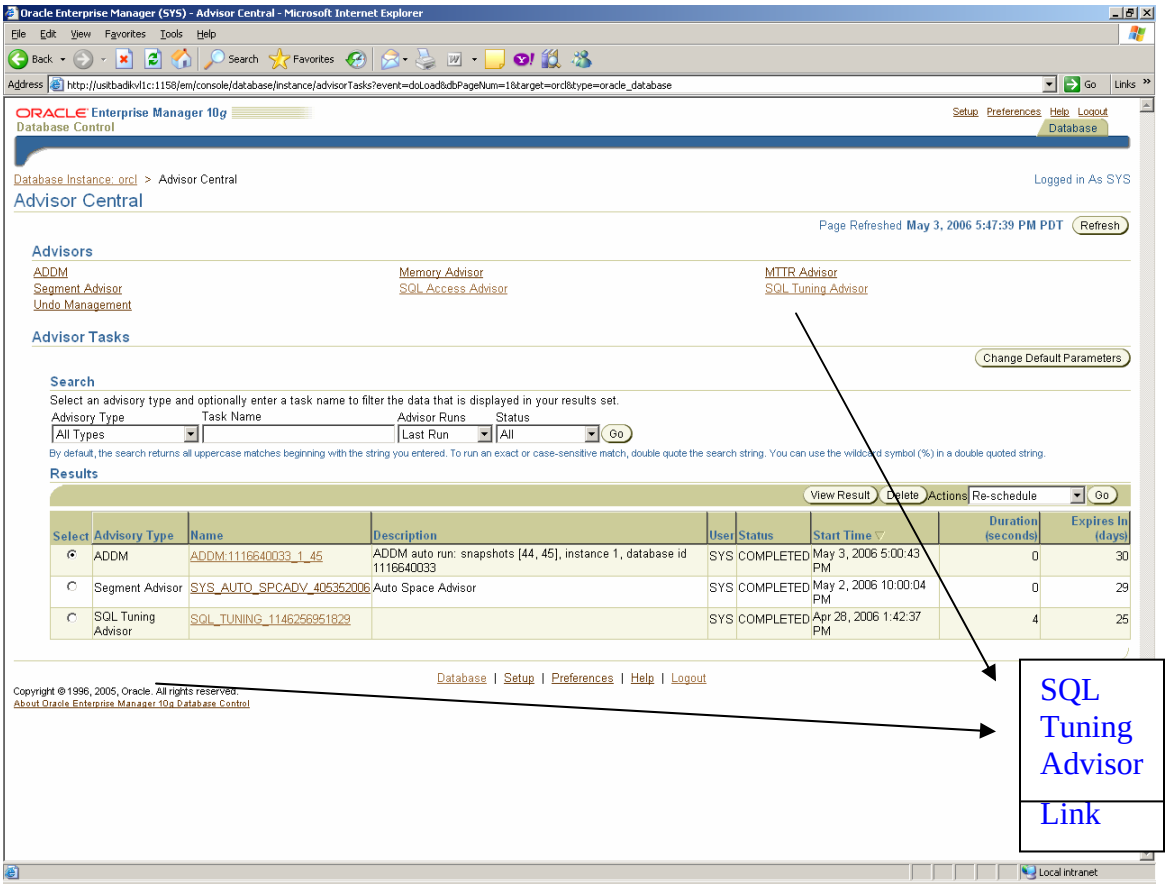
http://usitbadikvl1c:1158/em/console/logon/logon



Step2: Once logged in to OEM you will be presented with a dash board view of your instance. This view is very helpful in understanding the overall performance of the instance.

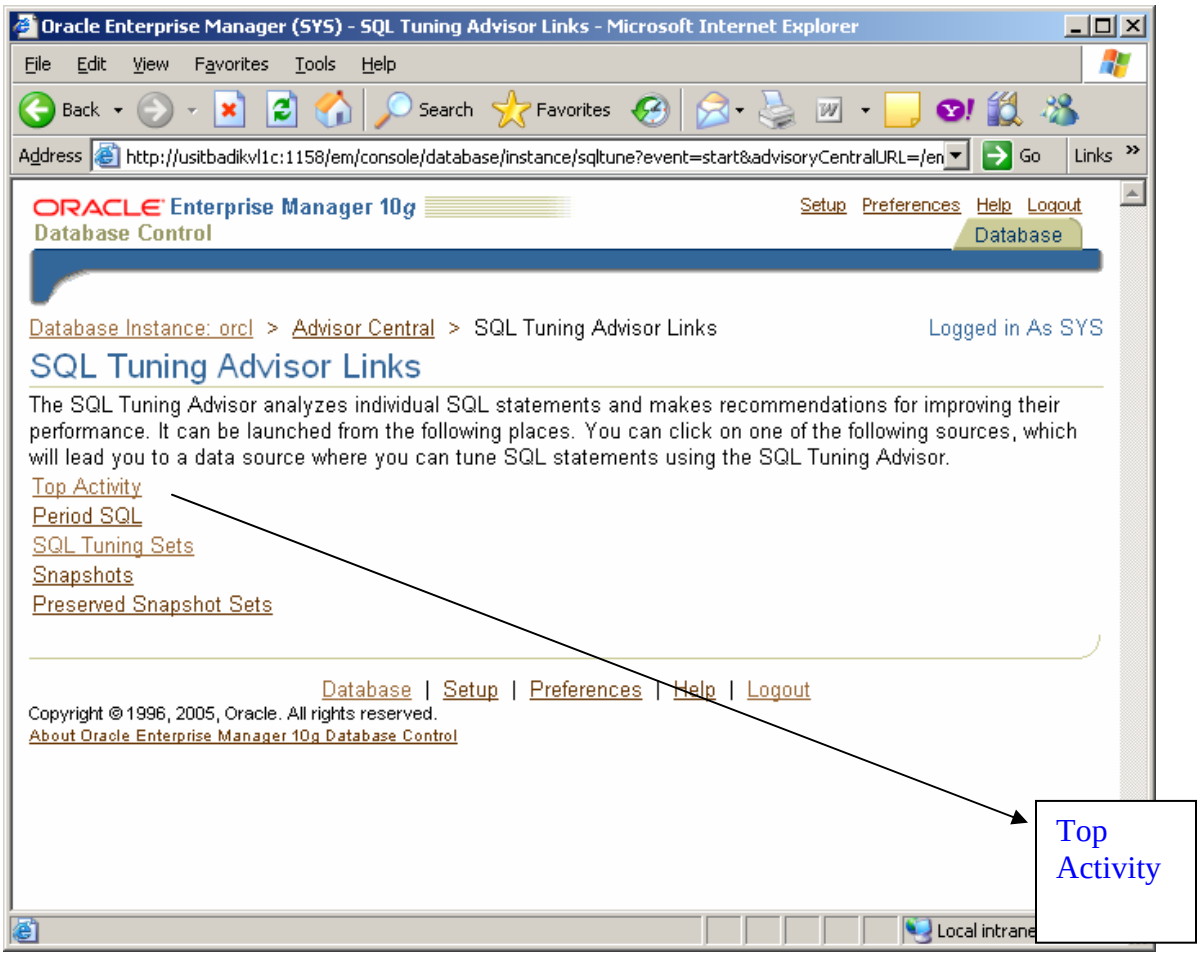


Step3: In the *Related Links* section below click on *Advisor Central* to navigate to the Advisor Central home page.



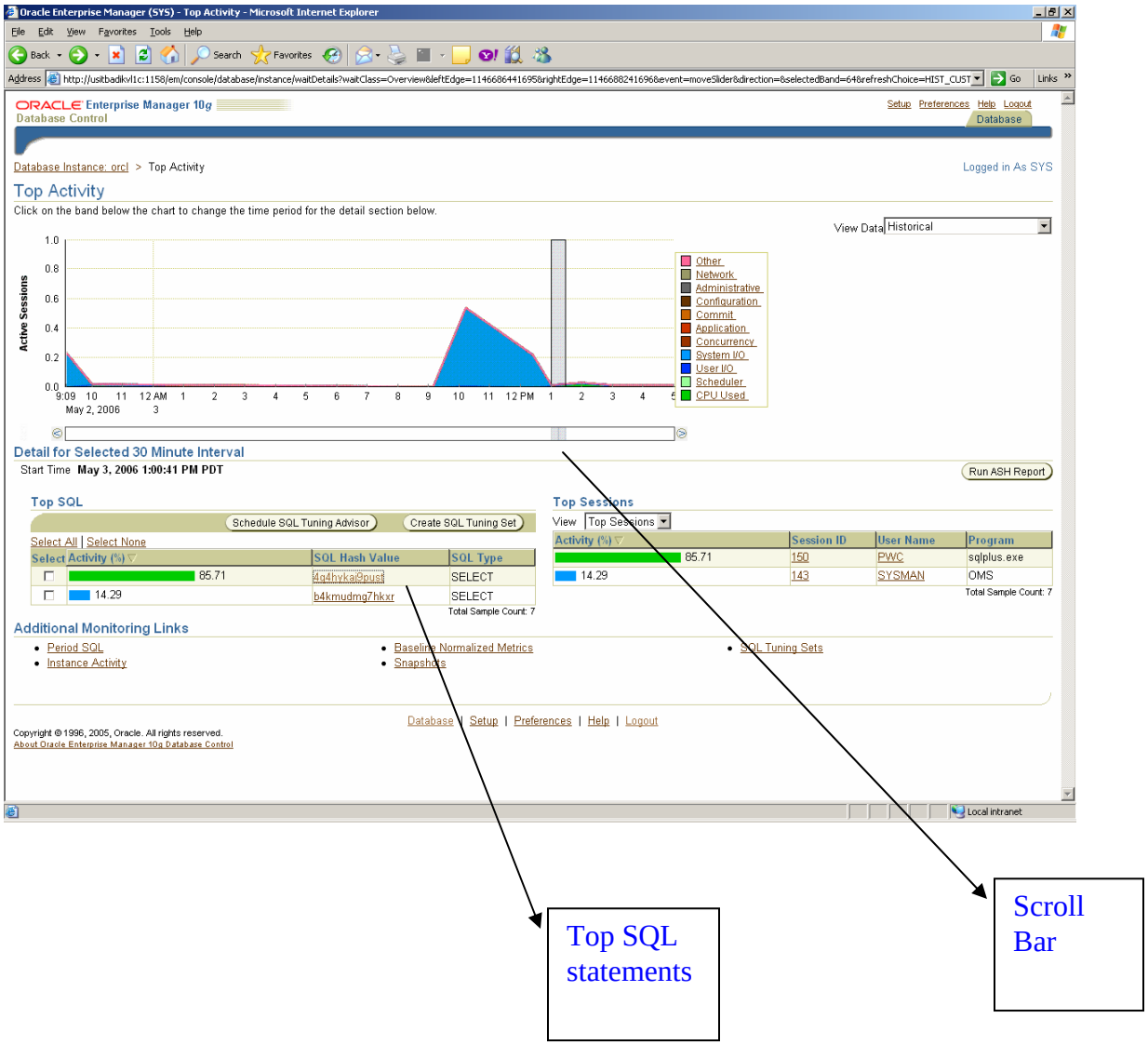
Step4: From the Advisor Central home page, Click on SQL Tuning Advisor link under Advisors to identify all the sources (listed below) that you can use to run SQL Tuning advisor on. There are some more sources that will be discussed later in the document.

Top Activity
Period SQL
SQL Tuning Sets
Snapshots
Preserved Snapshot Sets



Identifying & Tuning poor performing SQL statements

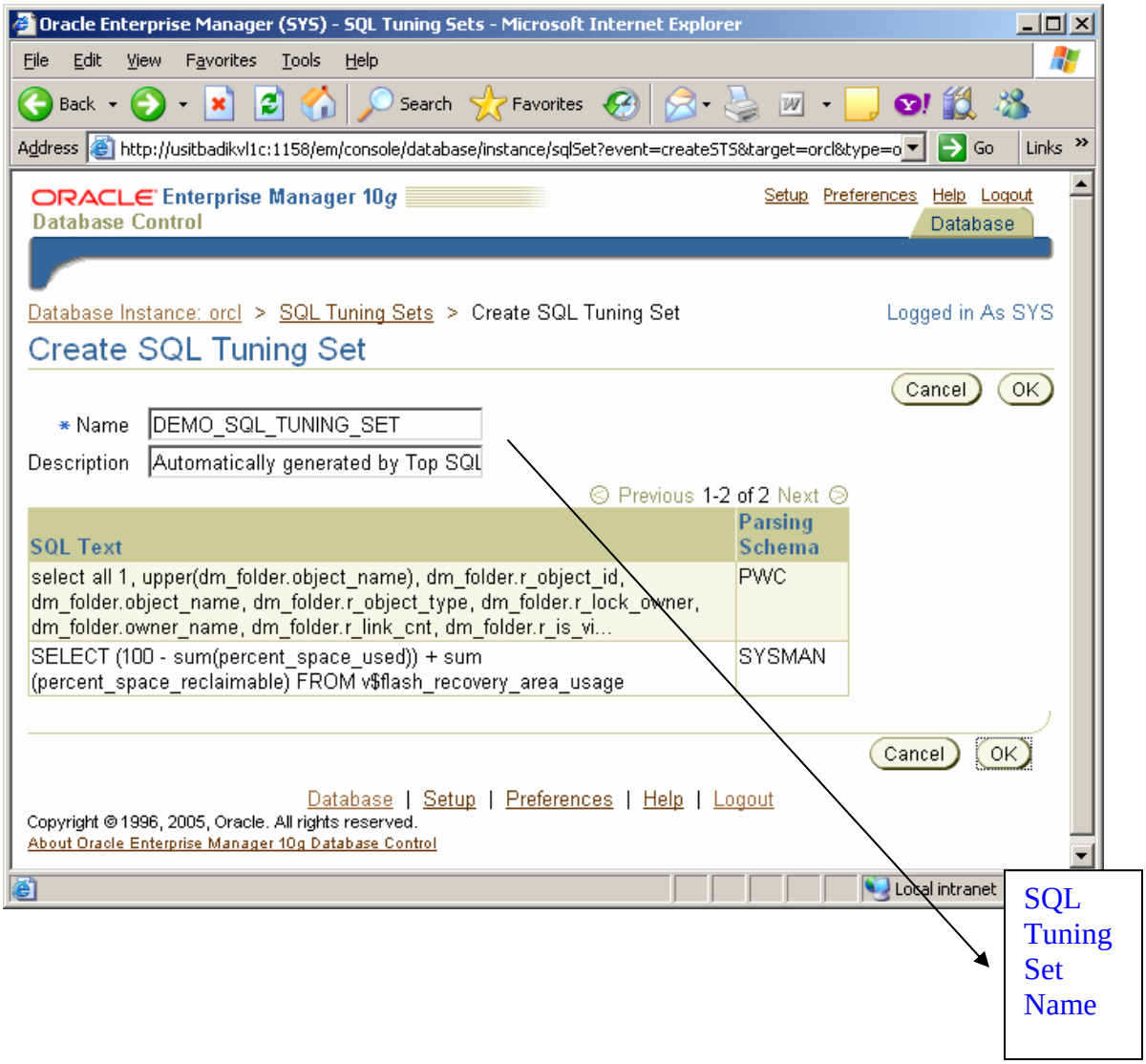
Step1: Click on Top Activity Link to identify Top SQL and Sessions in a given interval of time.



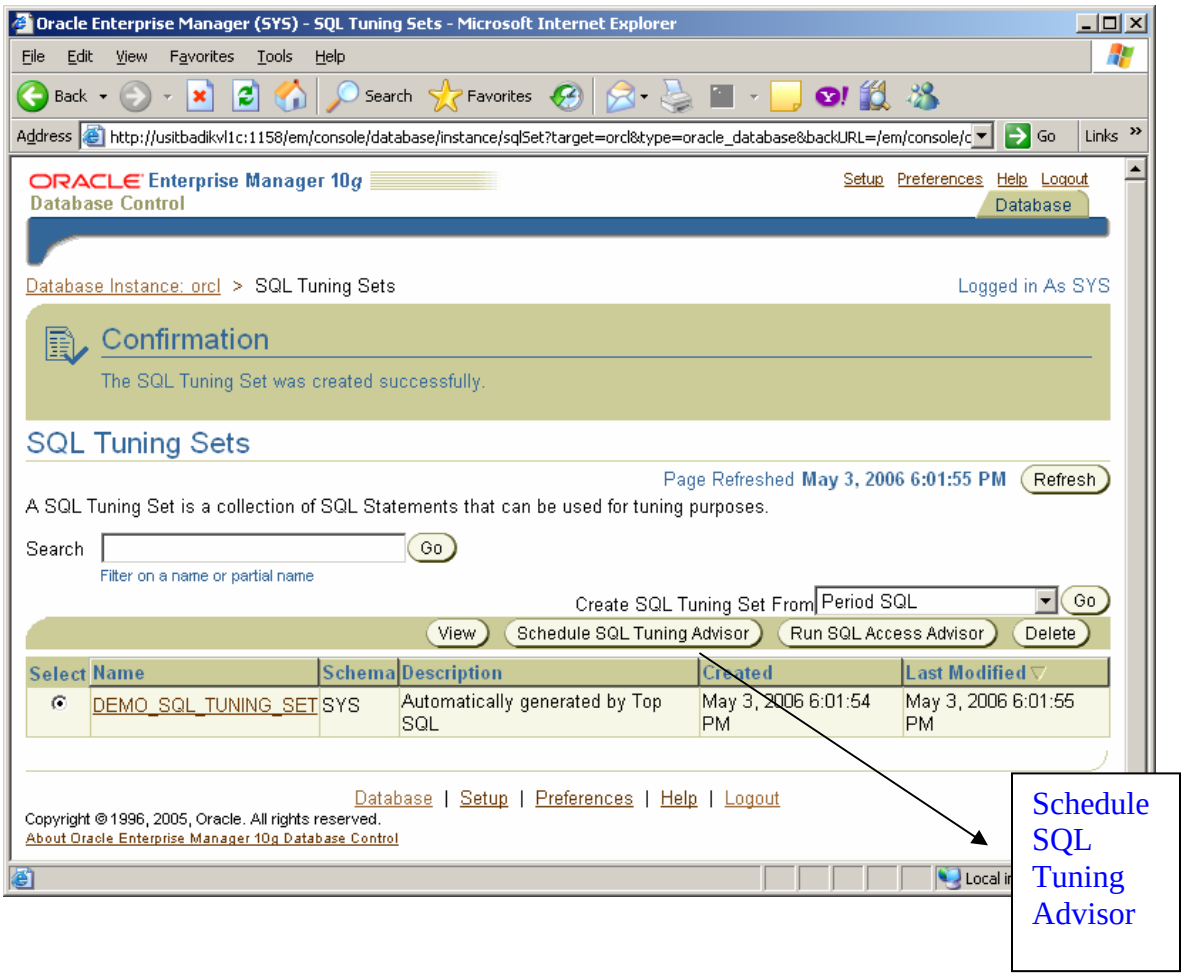
Step2: From the Top Activity page, set the View Data to Historical so that you can identify your time period that you are interested in analyzing.

You can use the scroll bar located right below the graph to move the cursor so that you can select the period interested in monitoring.

Once you identify the SQL Statement or multiple statements that are poorly performing you can either Schedule SQL Tuning Advisor independently or create a SQL Tuning Set to run SQL Tuning Advisor on it.



Step3: To create SQL Tuning set click on all the statements that you are interested in analyzing and click on Create SQL Tuning Set that will present you the screen below.



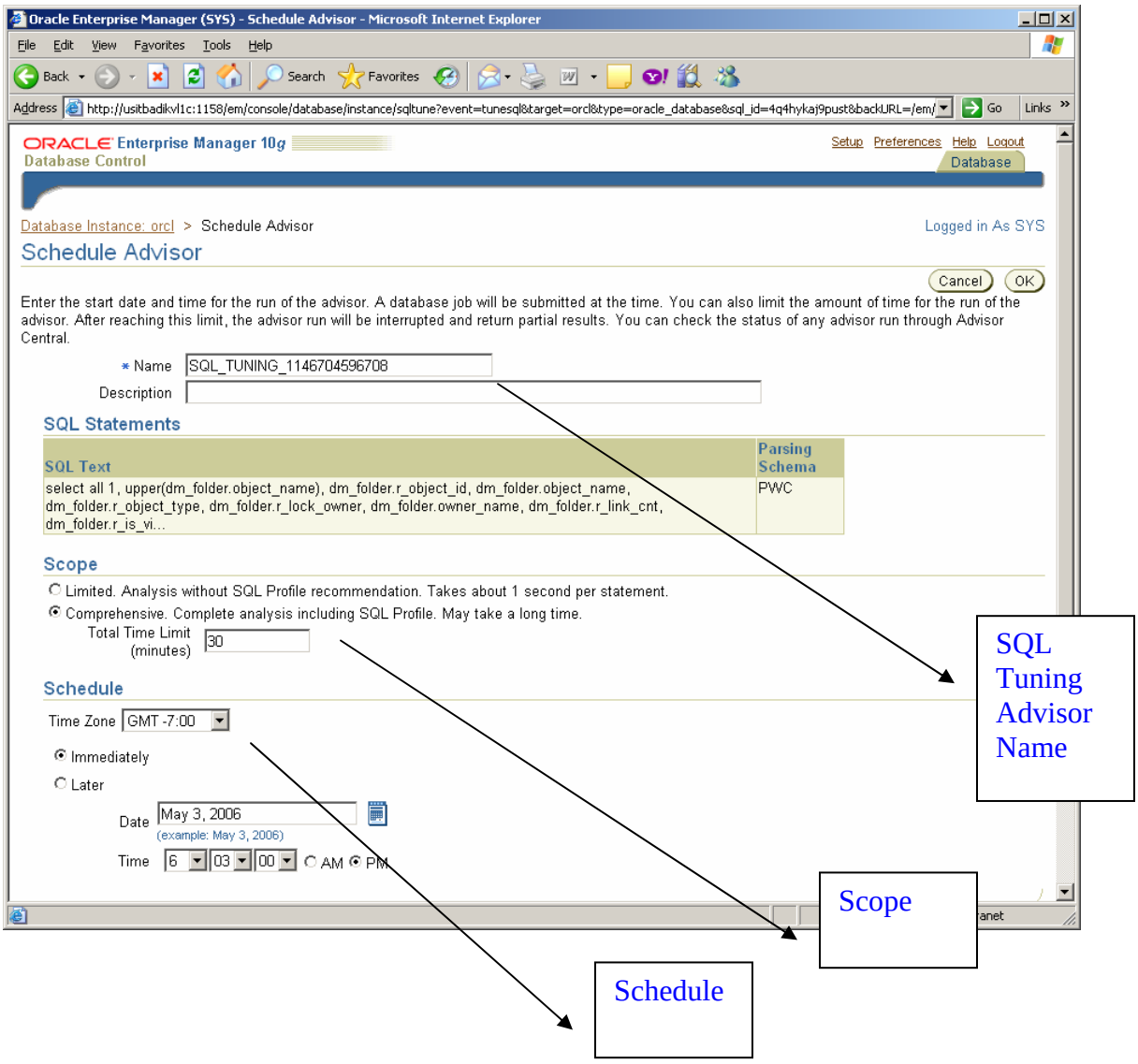
Step4: Once you created SQL Tuning Set you can run SQL Tuning Advisor on it by clicking on "Schedule SQL Tuning Advisor" link.

Step5: If you prefer running SQL Tuning Advisor on single SQL statement then just click the particular SQL and then click Schedule SQL Tuning Advisor to launch the screen below. You can name SQL Tuning session with your custom name or Oracle would create one for you automatically.

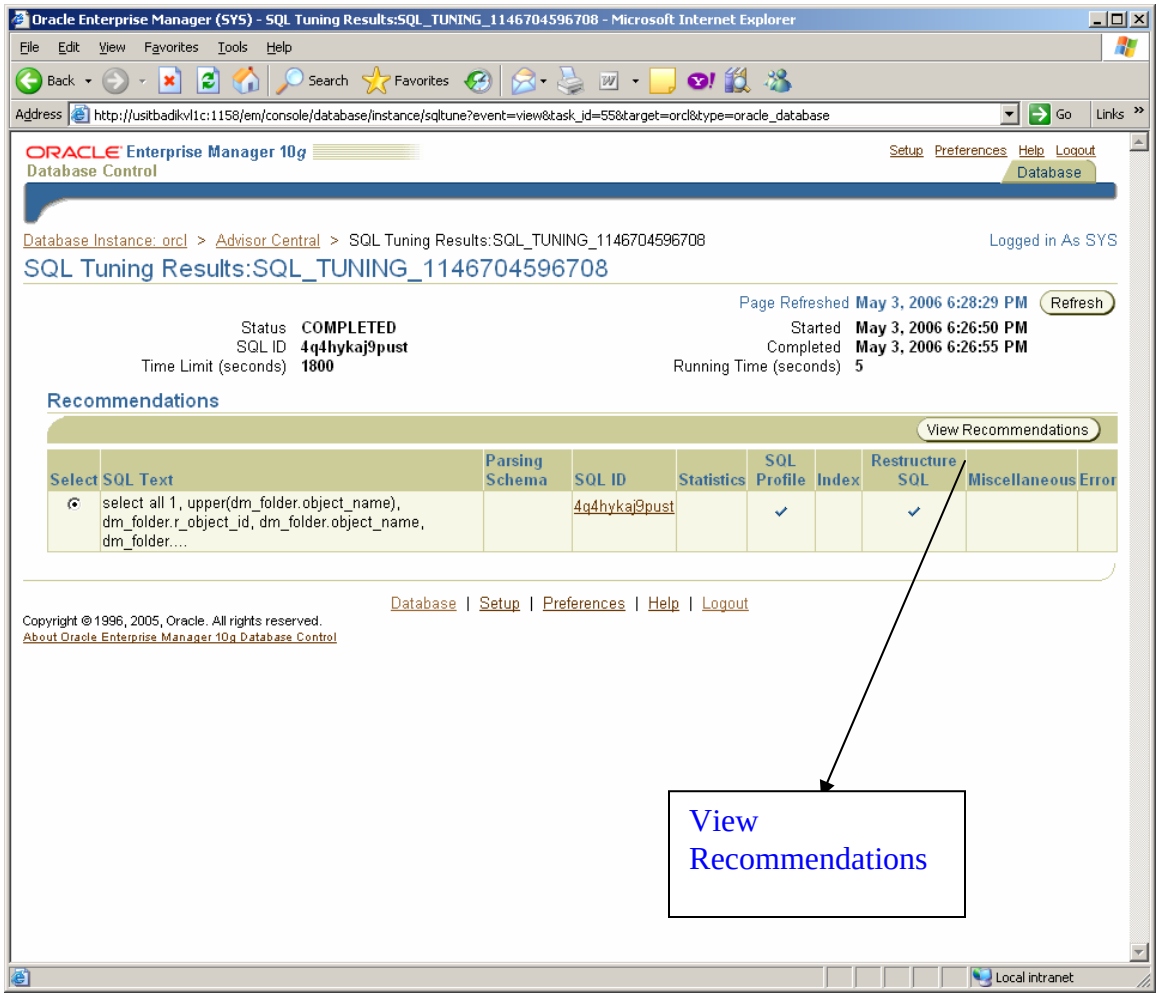
Under the Scope, select the scope of tuning you want optimizer to perform.

- Limited will only take 1 second per statement. This is desired if you have lot of SQL statements that you are running SQL Tuning Advisor on. This mode will not recommend SQL Profile.
- Comprehensive as name states will perform thorough analysis of the query to recommend all the suggestions including SQL Profile. In this mode you can also limit the time you want optimizer to spend on a query.

As shown below, you can also schedule the query at a different time if you prefer so that you will not impact the peak time by running the advisor.

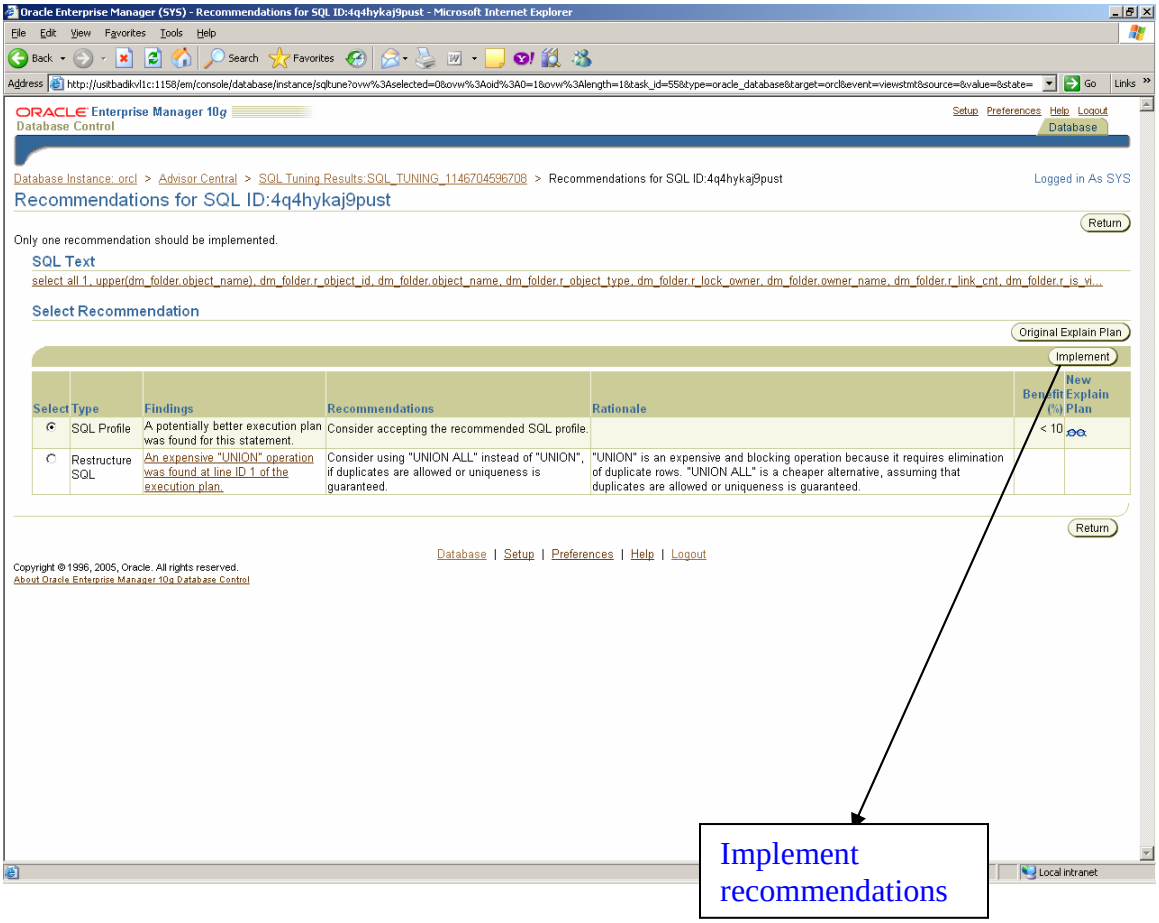


Step6: Once you run the SQL Tuning Advisor it will create a task and give recommendations for the SQL as below. In this case advisor has recommended a SQL Profile and also to restructure the SQL. You can view the recommendations by clicking on View Recommendations link to see them in detail.

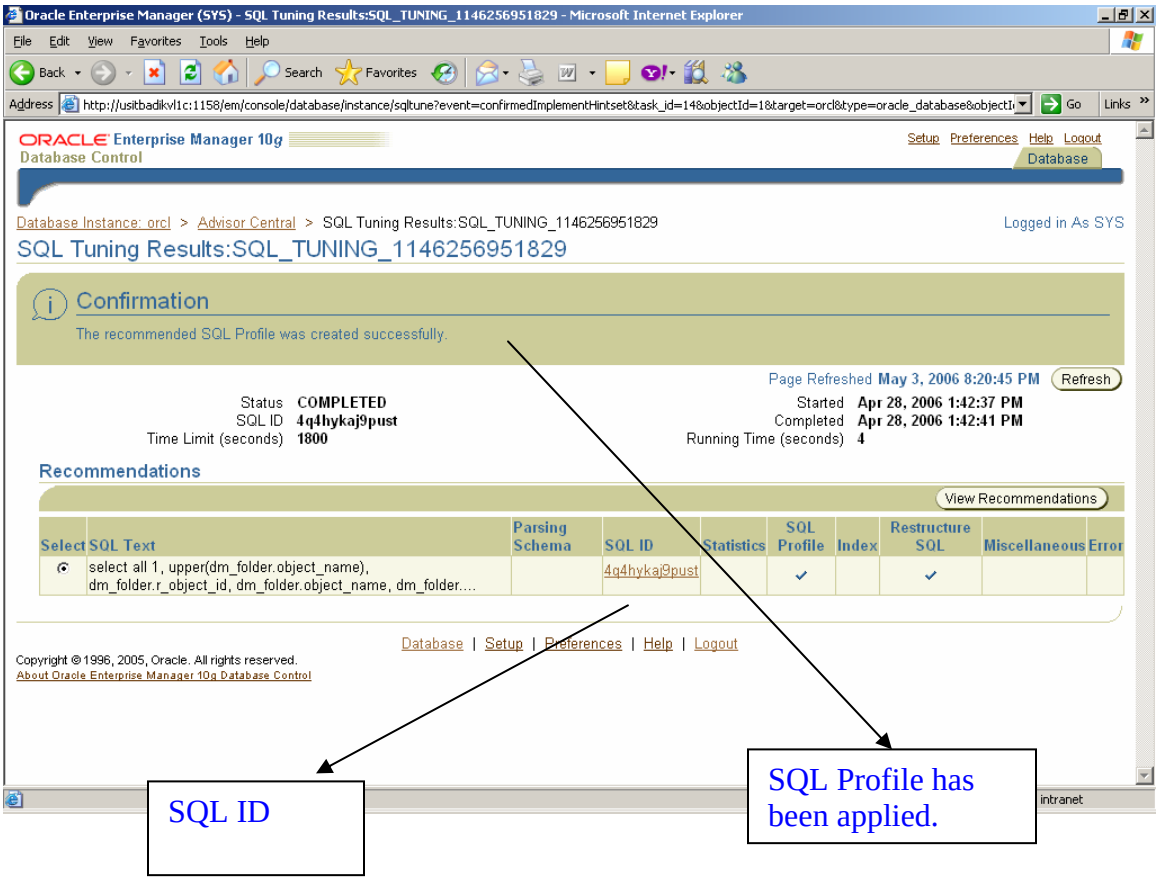


Step7: You can review the recommendations and decide what you want to implement. In this case restructure SQL is suggesting Union All instead of Union. Depending on the query this might not be acceptable. But it also recommends a SQL Profile. You can implement the SQL profile by selecting the SQL profile and then click on Implement link above.

SQL Profile allows optimizer to collect auxiliary statistics specific to the statement that will allow query to run with more information as though we are passing hints. SQL Profile also uses execution history and sampling to set optimizer mode for the particular statement.

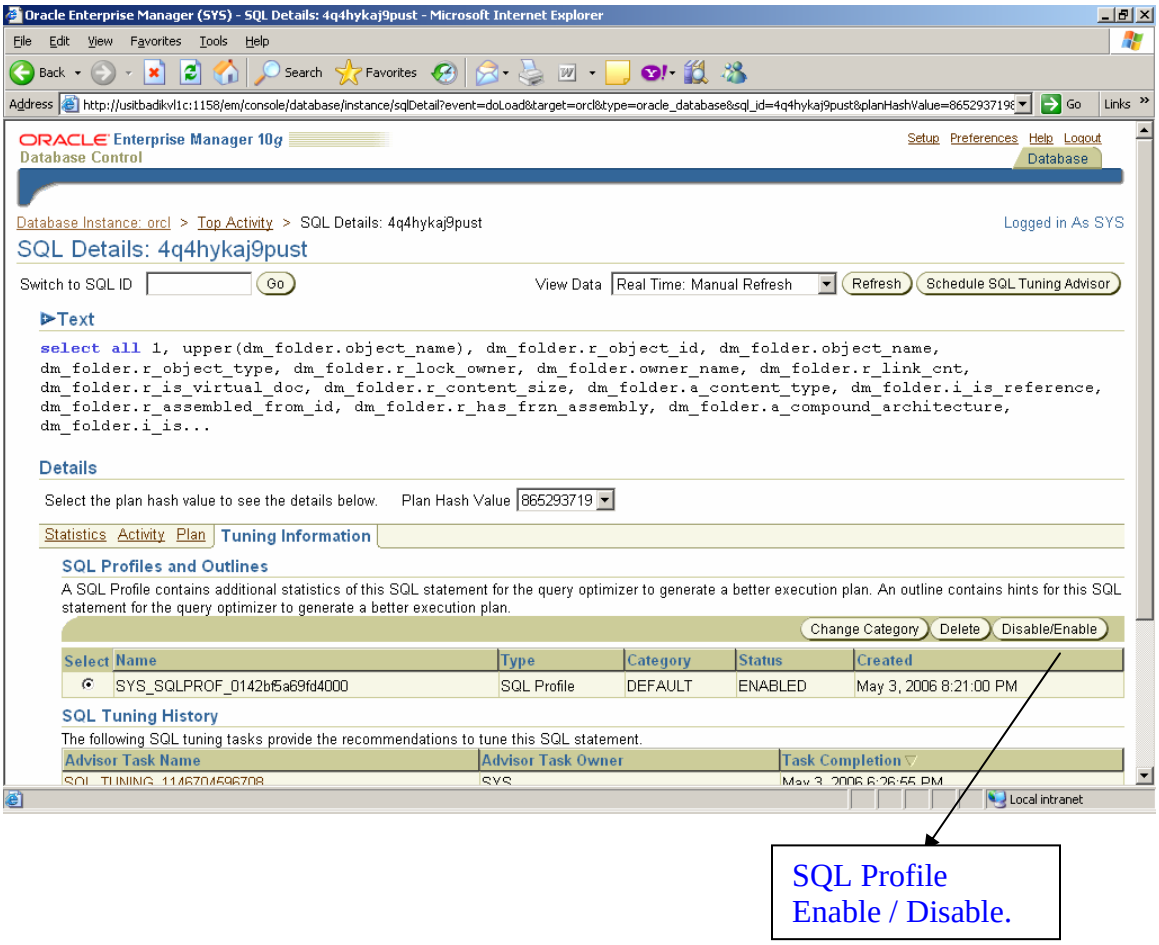


Step8: After implementing the SQL profile you can retest the query to see if it has helped in performance. You can also disable the SQL profile if it did not help performance.



In the query that was tested in this example after applying the SQL profile it executed in less than 5 sec compared to more than 1 minute that it took before.

Step9: To disable the SQL Profile click on the SQL ID and navigate to Tuning Information tab, click on SQL Profile and then click disable.



Other Input sources for SQL Tuning Advisor

- ADDM
  ADDM runs every one hour proactively and analyzes statistics generated by AWR report over the last hour to identify performance problems including poor performing SQL statements and advices to run SQL Tuning Advisor.
- AWR Report
  AWR Report can also be viewed directly to identify poor performing SQL statement and run SQL Tuning Advisor on them.
- SQL Tuning Set
  SQL Tuning Set can include statements that are yet to be deployed, to identify if they could be potential poor performing SQL statements in them that had to be analyzed before deploying.