IDERA® | Precise Case Study

PRECISE FOR ORACLE DATABASE

Professional Services Enterprise Improves Oracle Database Performance

CHALLENGE

A large enterprise professional services company for computer-assisted legal research in the United States of America uses an application based on Oracle Database for online activity. Their online users complained about the slow performance of this business-critical application.

INVESTIGATION

The Findings Section of the 'Overview' tab on the right side of the 'Dashboard' workspace for all monitored instances of Oracle Database (Figure 1) displays the top consumers that Precise automatically identifies. In this case, it automatically identified a heavy SQL statement for 'SELECT *' that consumed 59% of resources for Oracle Database when executed more than 47 thousand times. Selecting the 'Learn more' hyperlink leads to subsequent steps in the context of the heavy SQL statement.

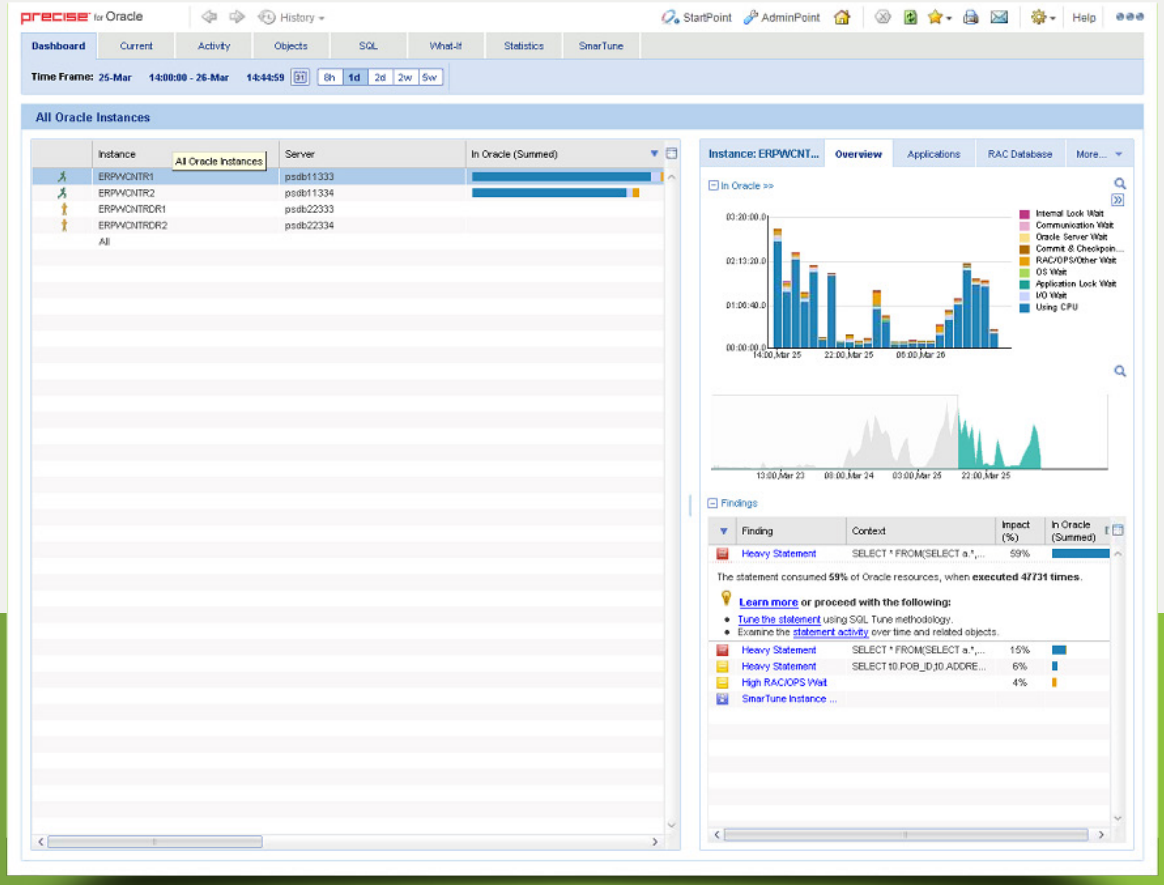

Figure 1 The 'Overview' tab of the 'Dashboard' workspace for all monitored instances of Oracle Database.

The ‘Statements’ area at the bottom part of the ‘Table View’ tab of the ‘Activity’ workspace for the problematic instance of Oracle Database (Figure 2) displays the SQL statements ranked by order of time spent in Oracle Database. The top SQL statement identified by ‘18533’ corresponds to almost 14 hours of CPU time which is a lot for an application with low latency and high throughput where time is money.

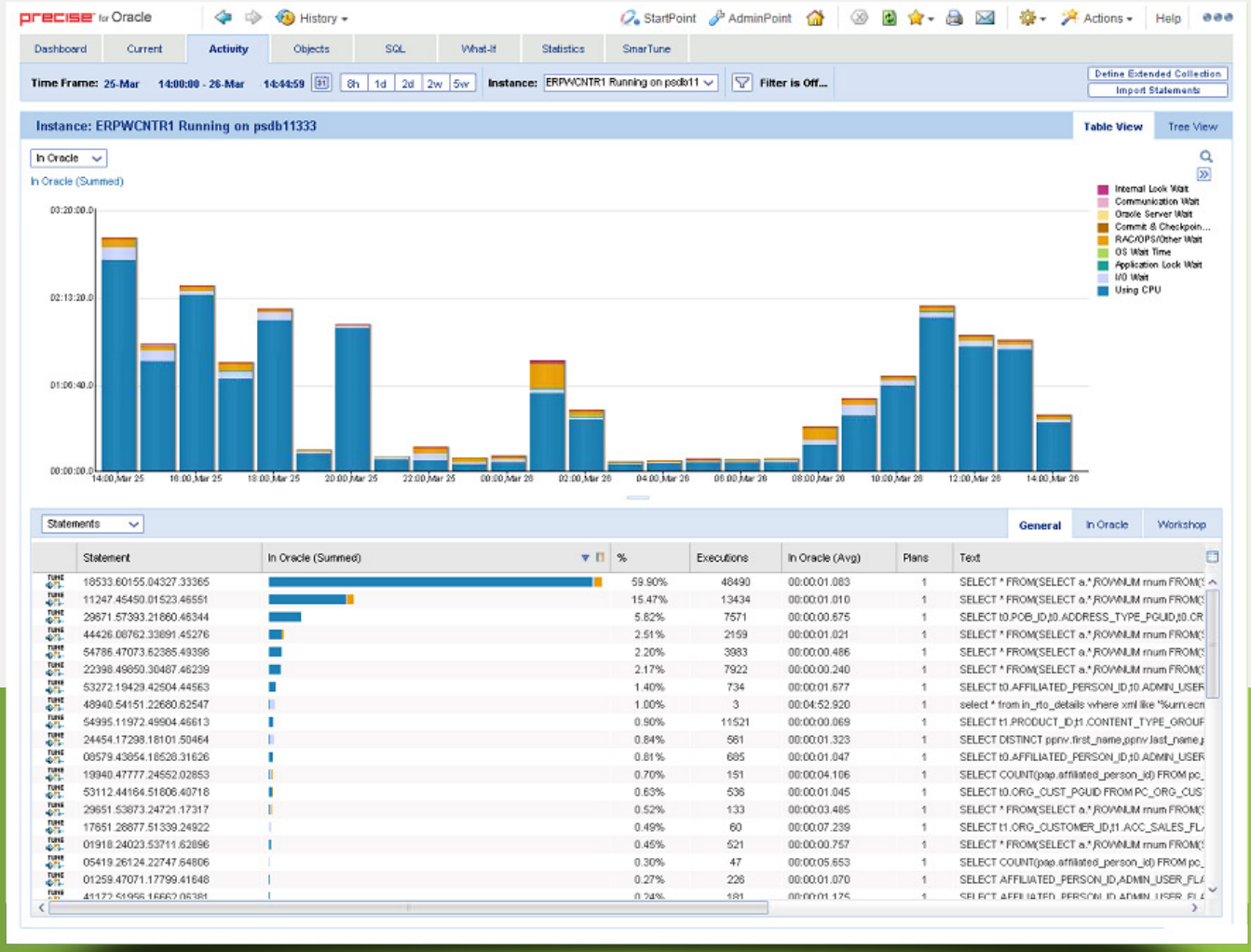

Figure 2 The ‘Statements’ area at the bottom part of the ‘Table View’ tab of the ‘Activity’ workspace for the problematic instance of Oracle Database.

The ‘Plan’ tab of the ‘SQL’ workspace for the top SQL statement (Figure 3) displays the execution plan for the heavy SQL statement identified by ‘18533’. The ‘Text’ subtab shows that for the table ‘PC_AFFILIATED_PERSON’ the ‘WHERE’ clause filters on the column ‘USER_PERM_ID’ via the ‘UPPER()’ function that converts a string to upper-case. The ‘Tables in use’ area in the ‘Objects’ subtab confirms that the SQL statement operates on the table ‘PC_AFFILIATED_PERSON’. The ‘Indexed defined on table’ area shows that the only index that refers to the column ‘USER_PERM_ID’ is the index ‘AFF_PERSON_USERPERMID_IDX’ which does not refer to the ‘UPPER()’ function. The ‘Columns in table’ area shows that the column ‘USER_PERM_ID’ contains data of type ‘Varchar(90)’ with more than 1 million distinct values for a total of almost 100 million characters or bytes in memory.

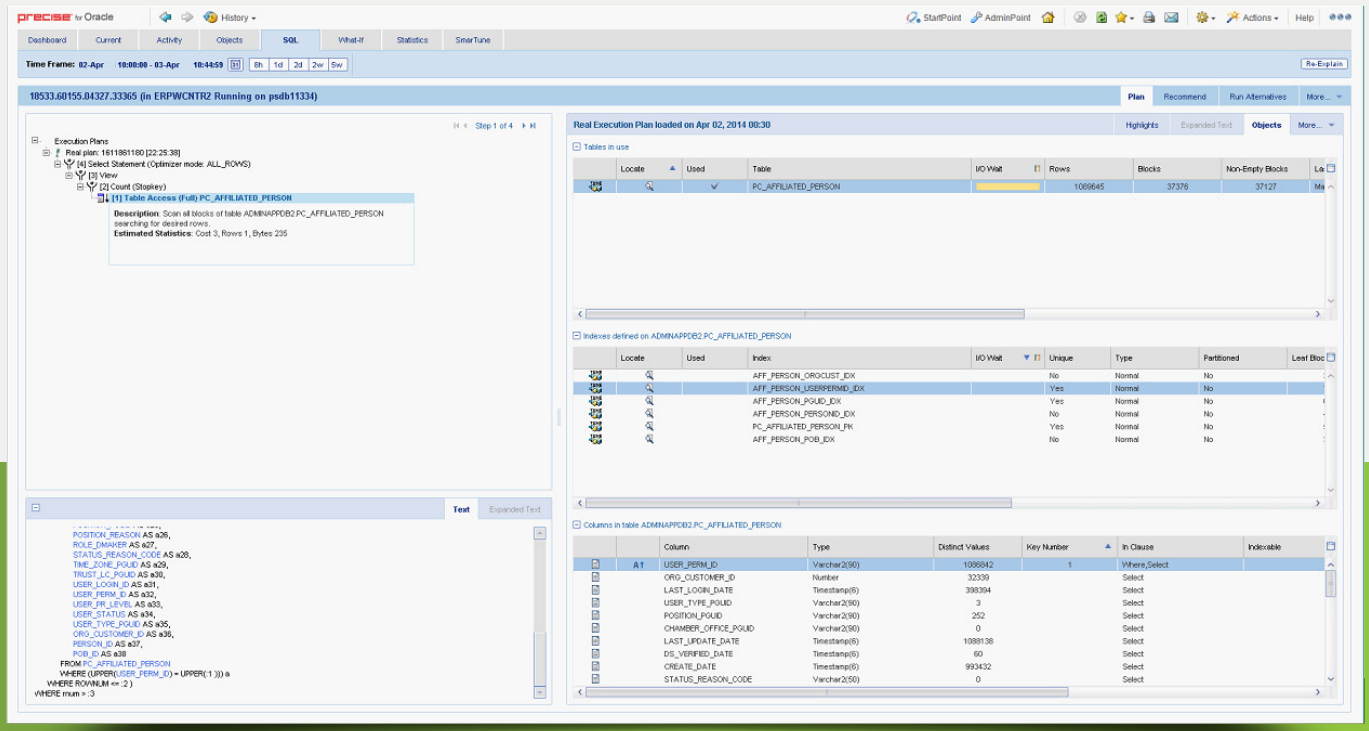

Figure 3 The ‘Plan’ tab of the ‘SQL’ workspace for the top SQL statement before adding the new index.

FINDINGS

To improve the performance of the heavy SQL statement for the table 'PC_AFFILIATED_PERSON', the company created an index with the name of 'USER_PERM_ID_UP' with the content 'UPPER(USER_PERM_ID)'.

The 'Plan' tab of the 'SQL' workspace for the top SQL statement (Figure 4) verifies that the SQL statement uses the new execution plan with the new index 'USER_PERM_ID_UP'.

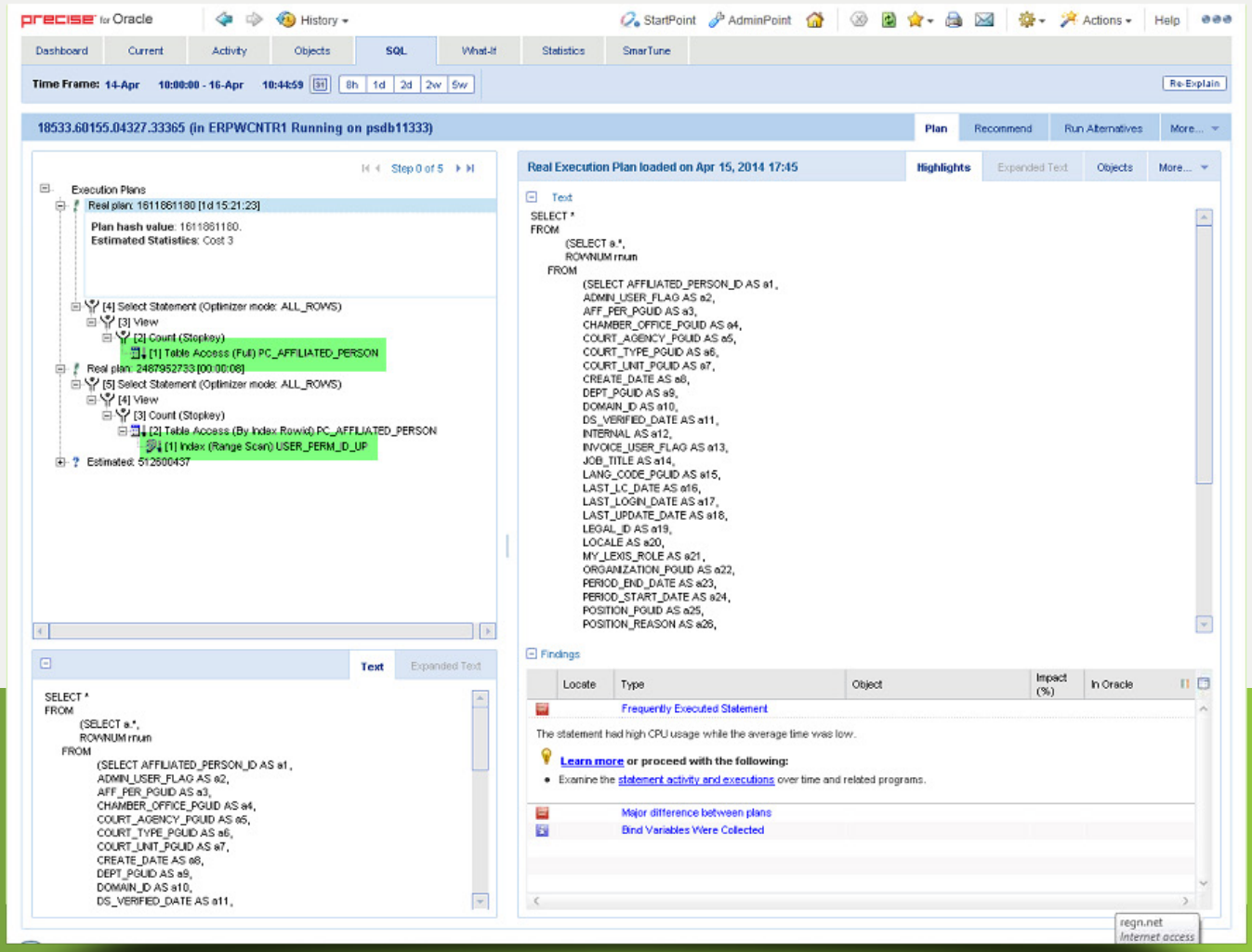

Figure 4 The 'Plan' tab of the 'SQL' workspace for the top SQL statement after adding the new index.

The top part of the 'Table Overview' tab of the 'Activity' workspace for the problematic SQL statement (Figure 5) shows that the average time spent in the Oracle Database was reduced from some 1.2 second to 0.12 millisecond for each execution. That is a performance improvement of almost 10,000 times. Moreover, that reduction corresponds to a savings of some 10 hours of summed time spent in the Oracle Database.

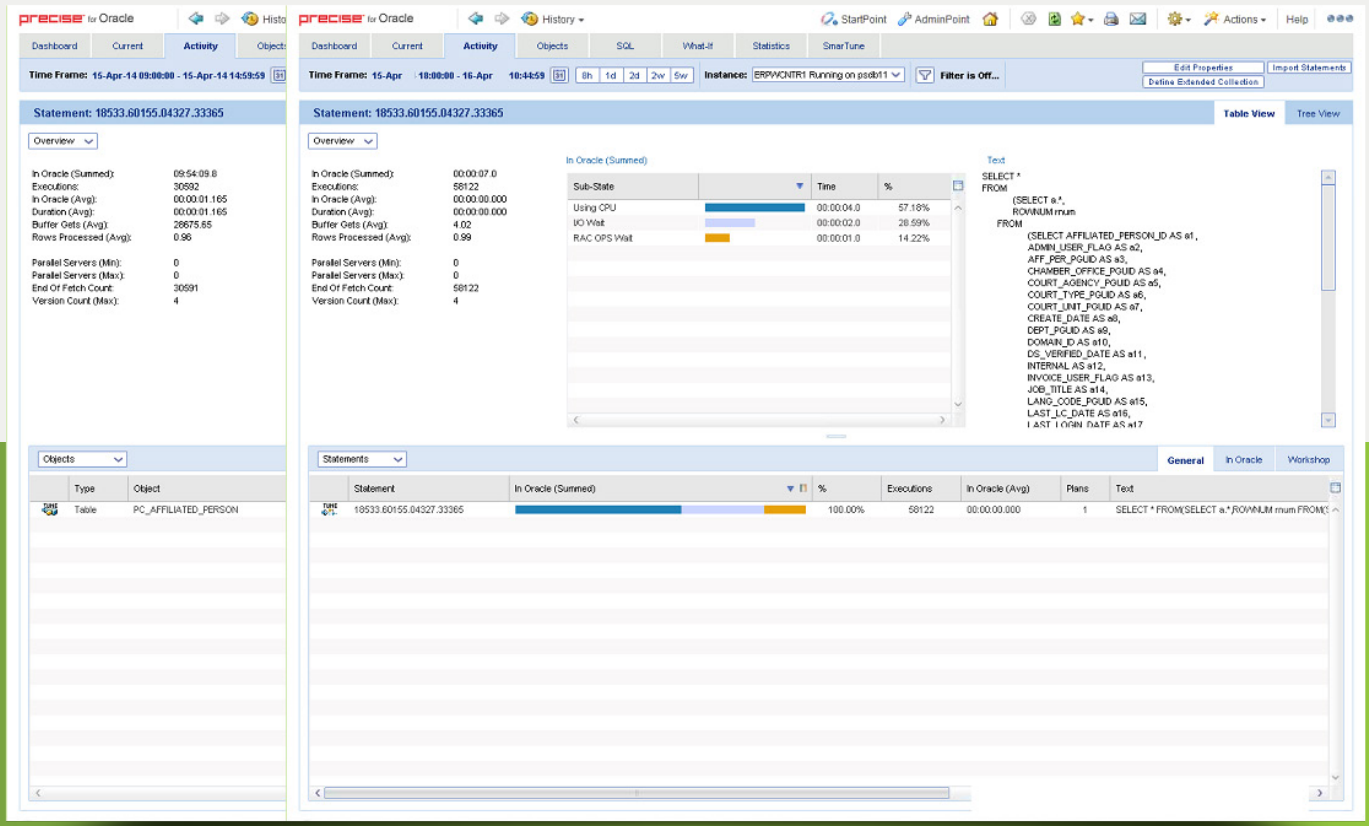

Figure 5 The 'Table View' tab of the 'Activity' workspace for the problematic SQL statement before versus after adding the new index.

The ‘In Oracle’ area at the top of the ‘Table View’ tab of the ‘Activity’ workspace for the problematic instance of Oracle Database (Figure 6) shows the significant reduction of the summed time spent in the Oracle Database after the index change versus before the index change, starting at 6 PM on April 15.

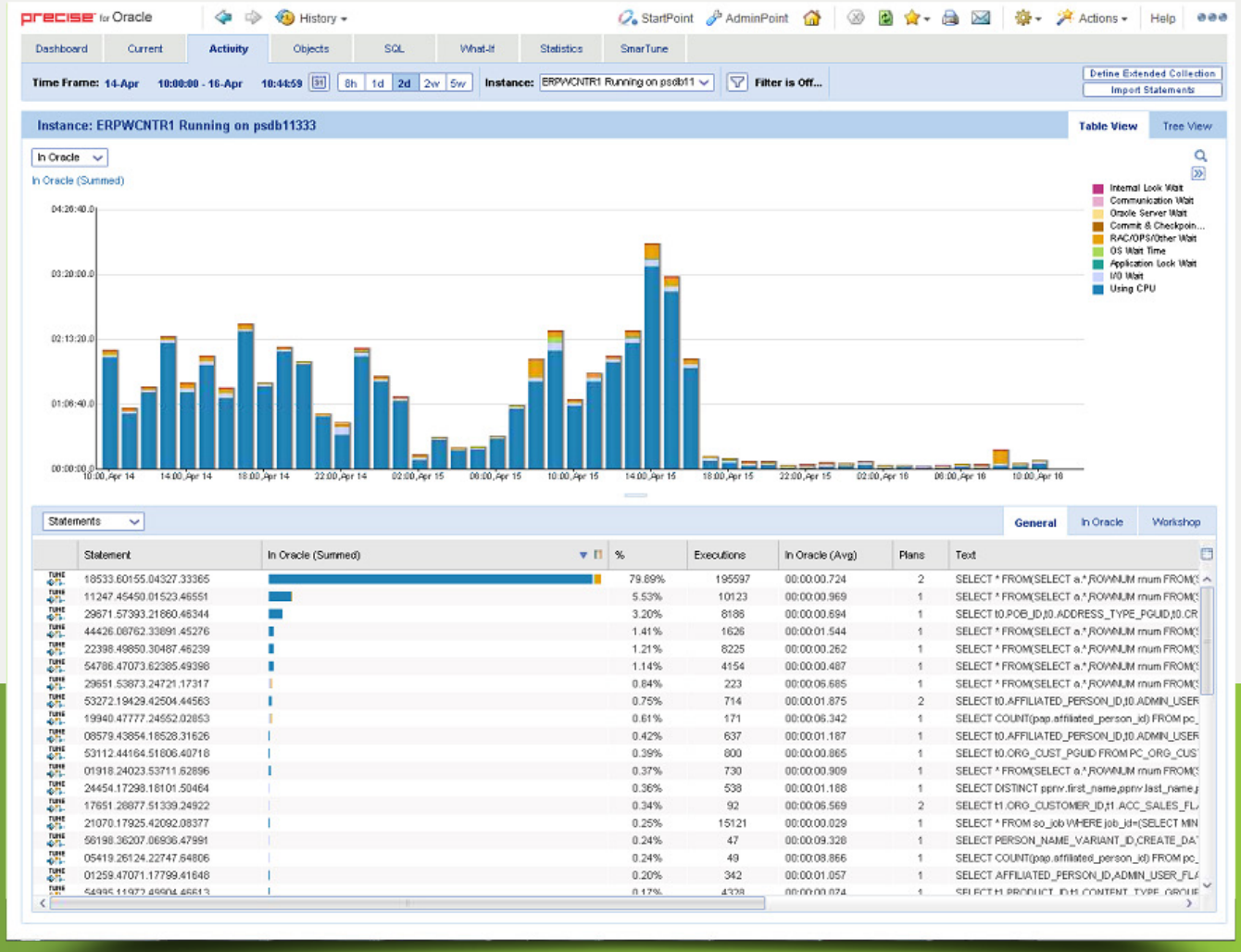

Figure 6 The ‘In Oracle’ area at the top of the ‘Table View’ tab of the ‘Activity’ workspace for the problematic instance of Oracle Database before and after adding the new index.

The left side of the ‘Tune Objects’ tab of the ‘Objects’ workspace for the table ‘PC_AFFILIATED_PERSON’ (Figure 7) shows that the bottom six indexes are under-used. The top part of the ‘Highlights’ subtab shows that these under-used indexes cause significant index overhead. At the same time, the bottom part of the ‘Highlights’ subtab shows that Precise identified an extensive full table scan access. Consequently, it appears that additional improvements in performance may be possible by further optimizing the use of indexes.

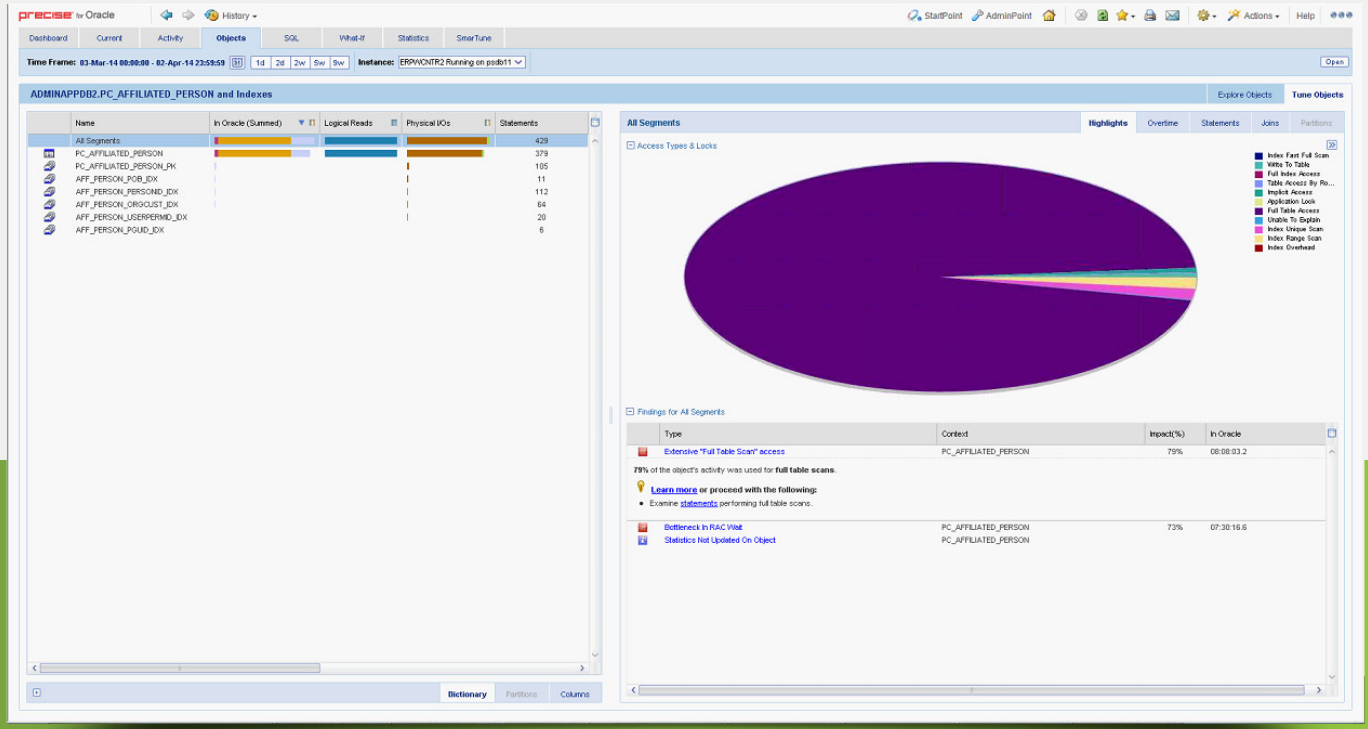

Figure 7 The left side of the ‘Tune Objects’ tab of the ‘Objects’ workspace for the table ‘PC_AFFILIATED_PERSON’ after adding the new index.

SUMMARY

The company identified the problematic SQL statement and explored options for optimization with Precise. It pinpointed the top SQL statement and focused on the resource (that is, CPU time) that it is consuming. The company then considered ideas for making the SQL statement more efficient by creating an index that used the UPPER function. This avoids the need to convert it for every execution of the SQL statement. Subsequently, it verified the results. Precise facilitated a repeatable process of finding, focusing, improving, and verifying. The SQL statement used the new index which resulted in less resources being consumed. This meant that the Oracle instance now consumes much less CPU time. Consequently, the company avoided a refresh of hardware that the company had scheduled for the next budget cycle. By improving the efficiency of what is running, the company extended the life of the hardware while delivering better performance to the end-users of the applications.

PRECISE FOR ORACLE DATABASE

ACCELERATE BUSINESS PERFORMANCE

- Database Performance Fuels Company Performance
- Multiple Platform Database Monitoring and Alerting
- Performance Management Database
- Root Cause Identification
- Tuning Recommendations
- What-if Analysis
- Capacity Planning

SEE IT IN ACTION