Testing Virtual Indexes with SQL Performance Analyzer

By Tom Hubbard

SQL Performance Analyzer gives you the ability to use virtual index configurations to calculate the impact that those change might have on the cost of your SQL. SQLPA supports the ability to both virtually drop real indexes and/or create new virtual indexes. This gives you the ability to test the impact on SQL cost of proposed index changes.

For example, to calculate the cost of SQL queries, you can drop a real index virtually, then create and drop many virtual indexes to simulate a different index configuration. The virtual drop of a real index causes the EXPLAIN command to exclude a virtually dropped real index from the cost calculation of SQL queries, but it does not remove the physical index from the Db2 catalog. Creating a virtual index causes the EXPLAIN command to include a virtual index for the cost calculation, but it does not require processor resources to build a virtual index even when the table size of the index target is large. These virtual index features help to design more efficient indexes without having to create and/or dropping the indexes.

To test new index configuration, start by using SQLPA to EXPLAIN the SQL where the index will be tested. For our purposes, we will start with an SQL query saved as a member of a PDS. Keep in mind that SQLPA can also process an entire DBRM or library.

Using the “Process SQL from a sequential data set or PDS member” option, you will see the following screen:

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SQLPA510 -------------------- Process SQL ------------------------------ 14:39
Command ===>                                                Scroll ===> PAGE

 Commands:  EXPLAIN  SQL  TABLES  EDIT  LASTREPORTS       DB2 system: IA1A
                                                          DB2 SQLID : CSTHUB
 Enter the input data set name:

  *Data set name  . . 'CSTHUB.ANLSQL.CNTL(EMPSEL01)'

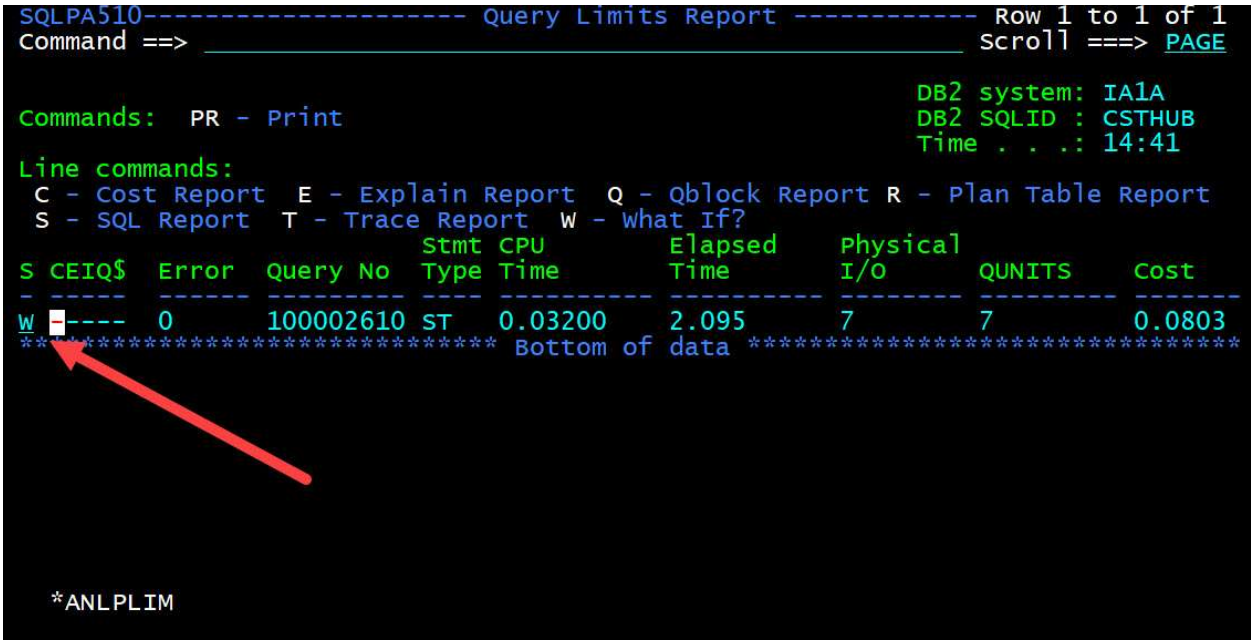
 Enter optional parameters:

   Object qualifier . CQMPERF1                                          >
   Current degree . . 1    (1/Any)
   Remote location  .

 (An * indicates a required field.)

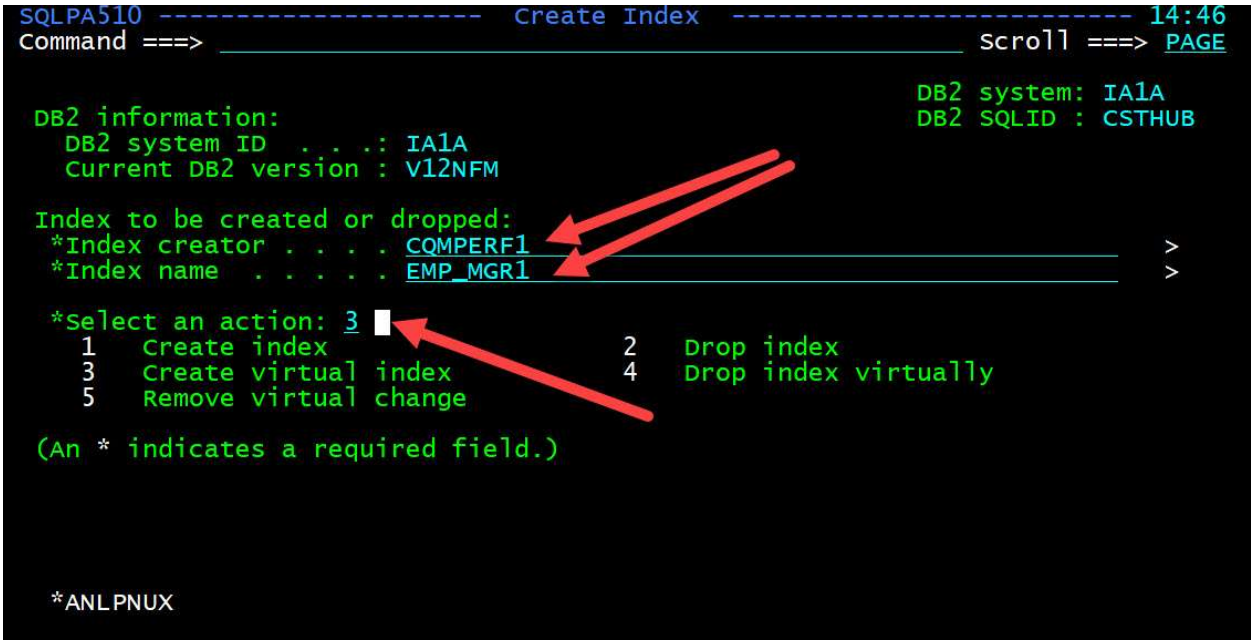
  *ANLPFIL
```

From here, you use the “EXPLAIN” command to invoke the explain function of SQLPA. The Query Limits Report is returned as show here:



Next, you can use the “W” line command to invoke the “What If?” dialog. In this dialog, you can create or drop an index or modify the SQL statement. In this case, we are going to create a new virtual index. So, Change the “Modify SQL statement” value to “N” and press the “Enter” key to continue

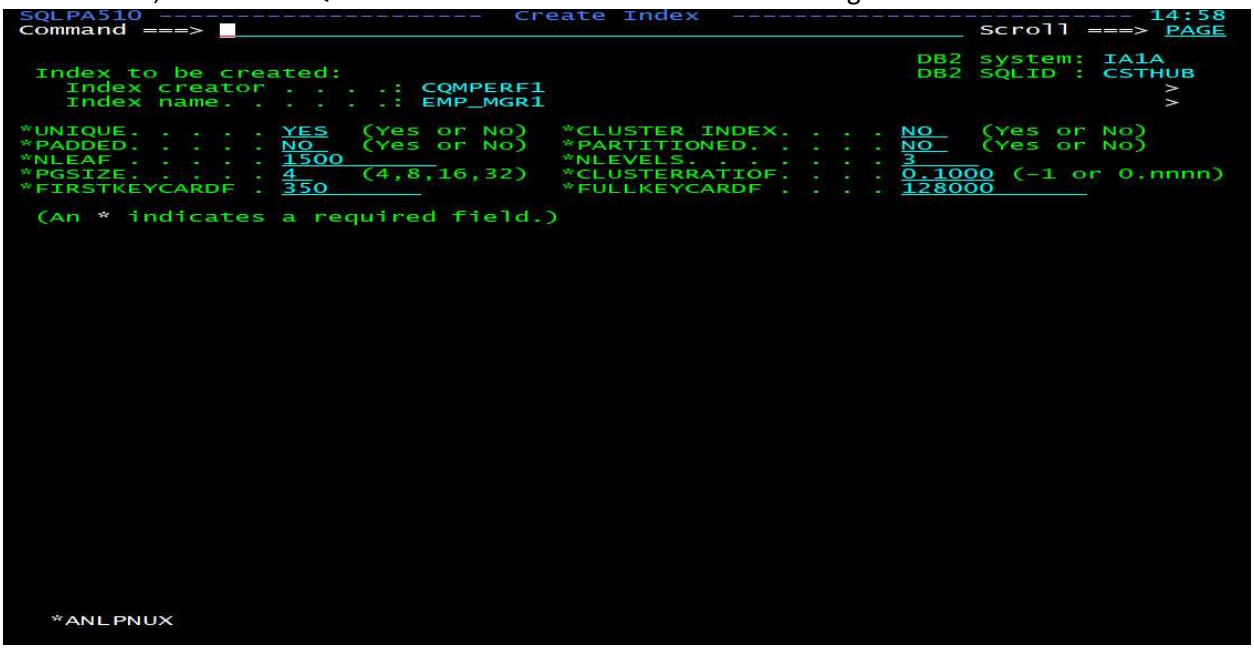
Now, we are presented with the first panel in the “Create index” dialog. On this panel, you need to supply a value for the “index creator”, “Index “name”, and an “Action”. In this case, we are creating a new virtual index. So, when finished, the panel will look as follows:



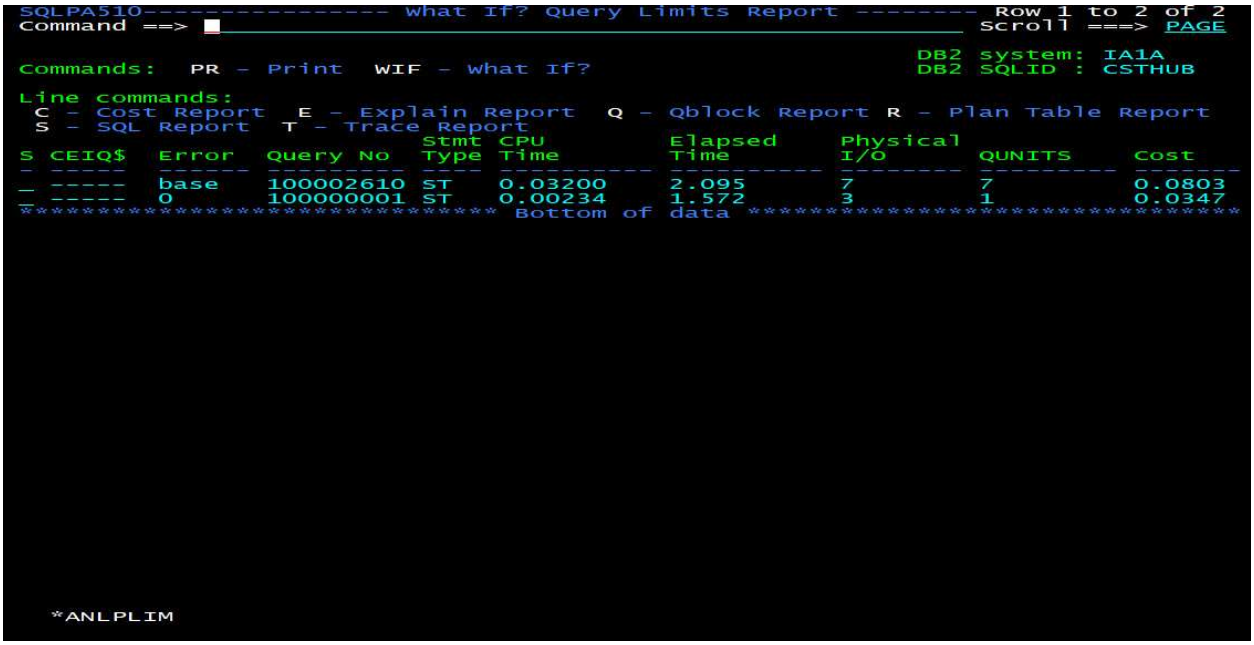
Pres the “Enter” key to process the request. Now, we are presented with the columns in the table that we can use to create the virtual index. To build the index, use a number to indicate the sequence of the columns within the index. This will be a two (2) column index of “Manager” followed by “EMP_NO”. The column specification looks as shown below:

Once the columns have been identified, press the “Enter” key to move to the next panel. On this panel, we are asked to provide some key statistics about the index. The more accurately that you can provide

the statistics, the better SQLPA will be able to calculate the cost of using the new index.



When finished, press the “Enter” key to process the request. You will be back to the “Create Index” panel. You can either create or remove additional indexes or simply press the “PF3” key to complete processing the request. The “What If? Query Limits Report” is displayed. This report shows the base (original query) and the new estimated Query Limits as shown below. You can see that the new index should be very beneficial to the performance of this individual query.



If you need to access additional details about the SQL, the full set of SQLPA reports, Cost, Explain, etc. is available for both configurations.

When you finish using virtual indexes, you should drop them using option 2.3 from the SQLPA main menu.

Additional details for using the What If feature and virtual indexes is available in the SQL Performance Analyzer User's Guide.