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Syncsort Optimize DB2

(EZ-DB2)

Reports Reference

Release 9.10

Version 6.12

March 2015

Syncsort DB2 Reports Reference
(formerly EZ-DB2 Reports Reference)

NOTICE

Syncsort Optimize DB2, formerly called EZ-DB2 is designed to be used by licensed users of IBM Db2 for z/OS, as a supplement to this product.

TABLE OF CONTENTS

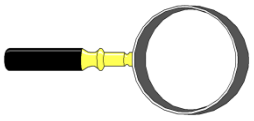
FIGURES

New Features

This section will detail further enhancements implement through on-going maintenance.

Reports

Most reports are common to SQL Warehouse Manager and both EZ-Cache *dynamic statement cache* traces and EZ-Tracer *Performance* traces.



*Depending on which EZ-DB2 component you are in, the report headers will say either **Trace Workload** or **Warehouse Workload**. When viewing Reports in the SQL Warehouse, it is not possible to DRILL down to individual traces, or trace summary intervals. There are also some minor differences in the available data displayed. For example, there is a more detailed breakdown of the DB2 Row statistics when viewing data collected using EZ-Tracer compared to EZ-Cache. This is due to limitations of DB2.*

To display the reports menu in EZ-Cache, select option 1.2.

To display the reports menu in EZ-Tracer, select option 2.2.

To select the reports menu in EZ-SQL Warehouse manager, select option 6.6.

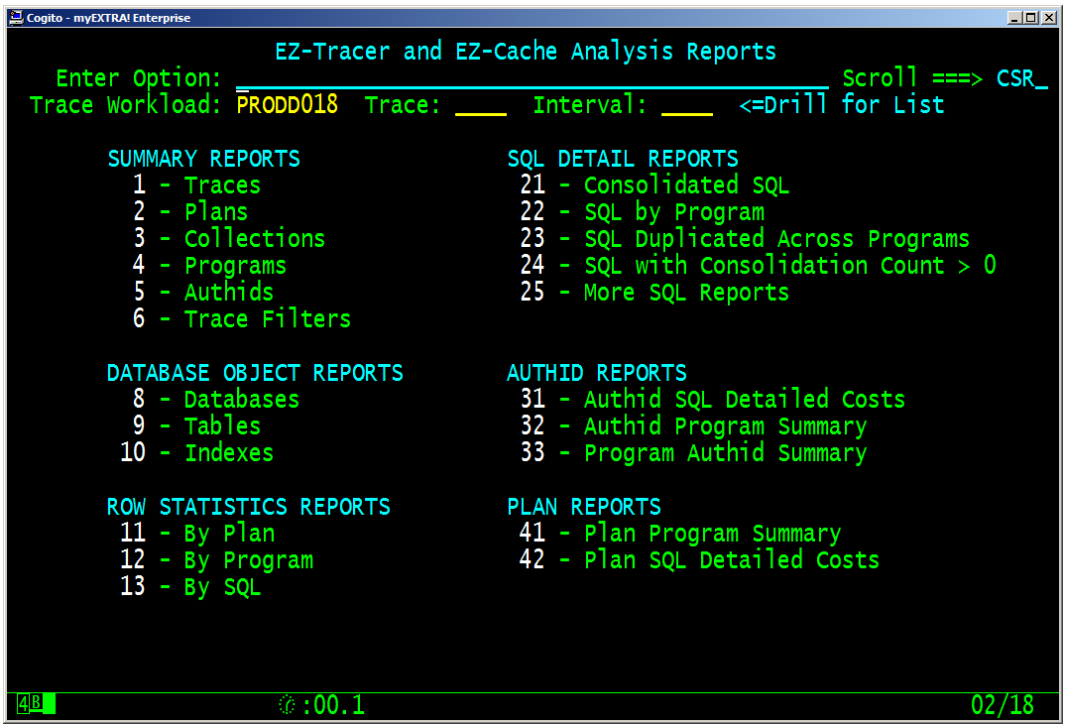


Figure 1 Reports Menu

From this menu you can select the various reports as described later in this section.

Note that for Trace Workloads only, you can display reports for the *entire workload*, a *specific trace number* or a *specific Summary Interval*. The following parameters may be specified on this panel:-

Trace Workload

Specify the Trace or Warehouse Workload name for which reports should be displayed. If you do not qualify with a Trace and/or Interval Number, reports will be displayed at a Workload level.

Trace

Optionally specify a Trace Number if you wish to display reports for a particular trace only.

You may DRILL <PF4> In this field to display a list of available traces for the current Trace Workload.

Interval

Optional specify a Summary Interval Number if you wish to display reports for a particular Summary interval only.

You may DRILL <P4> In this field to display a list of available Summary Intervals for the current Trace Workload.

Note that on the reports screens the following function keys are active:-

KEY	Standard Use	Note, or (2) Alternative Use
Enter	Validate Input	(2) SORT when Cursor positioned on column
PF1/PF13	HELP	Most Panels have field level help
PF2/PF13	START	Start another TSO Session
PF3/PF15	END	Save data input and Exit from Panel
PF4/PF16	DRILL	DRILL when cursor positioned on highlighted field
PF5/PF17	TABUp	Scroll up in multi-scroll operations. For example display previous table in Index/Predicate Set Mismatches.
PF6/PF18	TabDown	Scroll Down in multi-scroll operations. For example display next table in Index/Predicate Set Mismatches.
	EXPAND	(2) Expand cursor positioned field. For example, when positioned on FLAGGED SQL statement number, display FLAG description.
PF7/PF19	UP	Scroll UP in current display.
PF8/PF20	DOWN	Scroll DOWN in current display
PF9/PF21	SWAP/SWAP NEXT	Enter LIST in the command line and press PF9 to list available TSO Sessions. NB. You can name a TSO session by entering SCRNAME {name} in the TSO command line.
PF10/PF22	LEFT	Scroll Left in current display or scroll Left in cursor positioned field.
PF11/PF23	RIGHT	Scroll Right in current display or scroll Right in cursor positioned field.
PF12/PF24	CANCEL	Exit panel without saving data.

Refer to the EZ-DB2 Command Reference Guide for further details about all of the available commands.

1 Workload Trace Summary

Select report 1 to display the Workload Trace Summary as shown in the following figure:-

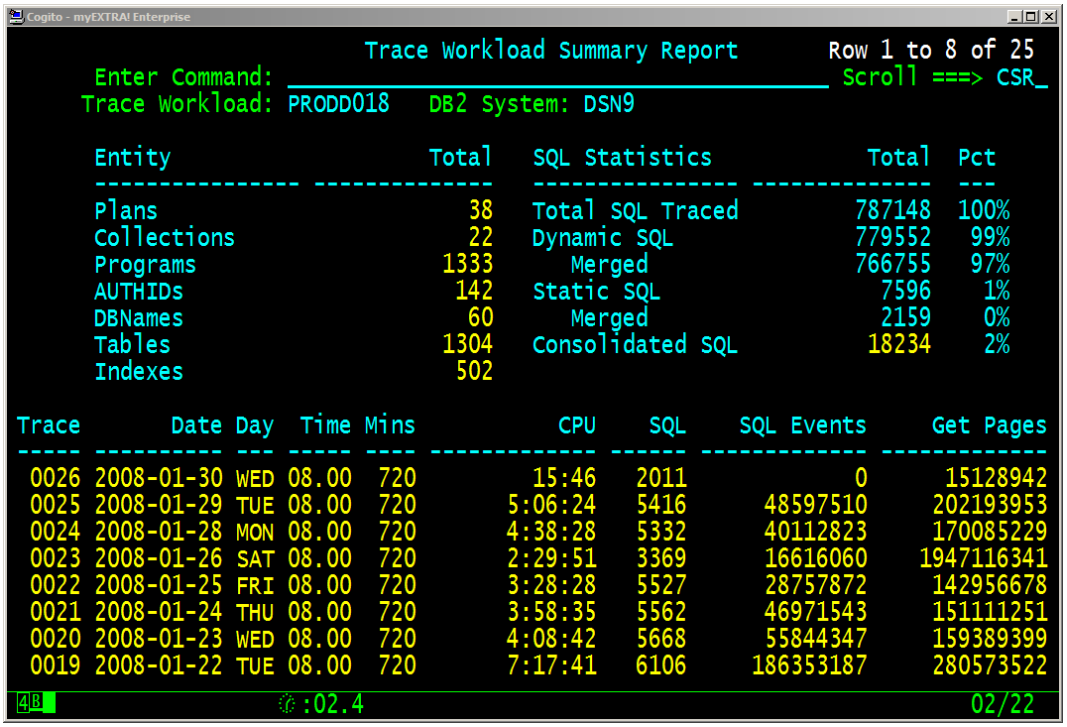


Figure 2 Workload Trace Summary Report

This report summarizes the trace data collected for the current workload including SQL collected in Traces and SQL Loaded from Applications.

Where you have run multiple traces for a particular workload, the trace summary initially shows the cumulative date for all traces. For example, in the above display, the user has executed 26 traces for the workload.

- You can display information relating to a particular trace by cursor selecting a particular trace number and pressing the <PF4> Drill Key. You can also DRILL on a particular trace by entering the trace number in the command line.

- You can obtain more detailed information about the Workload by cursor selecting a particular entity (e.g. DBNames) and pressing the <PF4> Drill key. This will directly invoke the Databases summary report, equivalent to selection report 8 for the workload.

The data displayed when you Drill on an entity will display the cumulative data, or just the data for a particular trace, depending on whether you have previously Drilled on a particular Trace number.

The following fields are displayed on the Workload Summary Screens:-

TRACE SUMMARY INFORMATION

Trace Workload The Current Trace or Warehouse Workload name is displayed.

DB2 System	The name of the DB2 System that was traced.
Plans	The number of distinct Plans included in the trace summary for the Trace Workload, Trace Number or Summary Interval. You can DRILL on the number of Plans to display the Workload Plans Summary.
Collections	The number of distinct Collections included in the trace summary for the Trace Workload, Trace Number or Summary Interval. You can DRILL on the number of Collections to display the Workload Collections Summary.
Programs	The number of distinct Programs included in the trace summary for the Trace Workload, Trace Number or Summary Interval. You can DRILL on the number of Programs to display the Workload Programs Summary.
AUTHIDs	The number of distinct Authids included in the trace summary for the Trace Workload, Trace Number or Summary Interval. You can DRILL on the number of Authids to display the Workload Authids Summary.
DBNames	The number of distinct DBNames included in the trace summary for the Trace Workload, Trace Number or Summary Interval. You can DRILL on the number of DBNames to display the Workload DBNames Summary.
Tables	The number of distinct Tables included in the trace summary for the Trace Workload, Trace Number or Summary Interval. You can DRILL on the number of Tables to display the Workload Tables Summary.
Indexes	The number of distinct Indexes included in the trace summary for the Trace Workload, Trace Number or Summary Interval. You can DRILL on the number of Indexes to display the Workload Index Summary.
Total SQL Traced	The Total number of SQL statements included in the trace summary for the Trace Workload, Trace Number or Summary Interval, before consolidation.
%	The Total SQL as a percentage (always 100%)

Dynamic SQL — The number of Dynamic SQL statements included in the trace summary for the Trace Workload, Trace Number or Summary Interval, before consolidation.

% — The number of Dynamic SQL as a percentage of the Total SQL.

Merged — The number of Dynamic SQL statements included in the trace summary for the Trace Workload, Trace Number or Summary Interval that were merged into one statement (consolidated).

% — The number of Dynamic SQL Merged as a percentage of the Total SQL.

Static SQL — The number of Static SQL statements included in the trace summary for the Trace Workload, Trace Number or Summary Interval, before consolidation.

% — The number of Static SQL as a percentage of the Total SQL.

Merged — The number of Static SQL statements included in the trace summary for the Trace Workload, Trace Number or Summary Interval that were merged into one statement (consolidated).

% — The number of Static SQL Merged as a percentage of the Total SQL.

Consolidated SQL — The number of Consolidated SQL included in the trace summary for the Trace Workload, Trace Number or Summary Interval.

If you have activated SQL Consolidation (see Consolidation and Trend Controls in the Start Trace Options) then this number will usually be less than the Total SQL for the corresponding trace period.

You can DRILL on the Consolidated SQL to display the Consolidated SQL display.

% — The number of Consolidated SQL as a percentage of the Total SQL.

TRACE INFORMATION

Trace — The number of this Trace File

ACT	After DRILLING on specific Trace Number:- Indicates whether a particular Trace Summary Interval is ACTIVE. If the Summary Interval is ACTIVE, you can drill on the Interval to see the summary reports displays for the Interval. If the Summary Interval is NOT ACTIVE, you can still see the summary information for the interval. Only the last n intervals will be marked active, where n is Keep n most recent Summary intervals defined when starting the Trace.
Intvl	The Summary Interval Number.
Date	The Date this Trace Number or Summary Interval started in YYYY-MM-DD format.
Day	The Day of the week this Trace Number or Summary Interval started.
Time	The Time this Trace Number or Summary Interval started, in HH.MM format.
Mins	The duration of this Trace or Summary Interval in minutes.
CPU	The total CPU consumed by all SQL Events in this Trace or Summary Interval.
SQL	The number of distinct SQL in the Trace or Summary Interval.
SQL Events	The number of SQL Events in the Trace or Summary Interval.
Get Pages	The number of Get Pages in the Trace or Summary Interval.

2 Workload Plans Summary

DRILL on Plans on the Workload Trace Summary or select report 2 to display the Workload Plans Summary screen as shown in the following panel:-

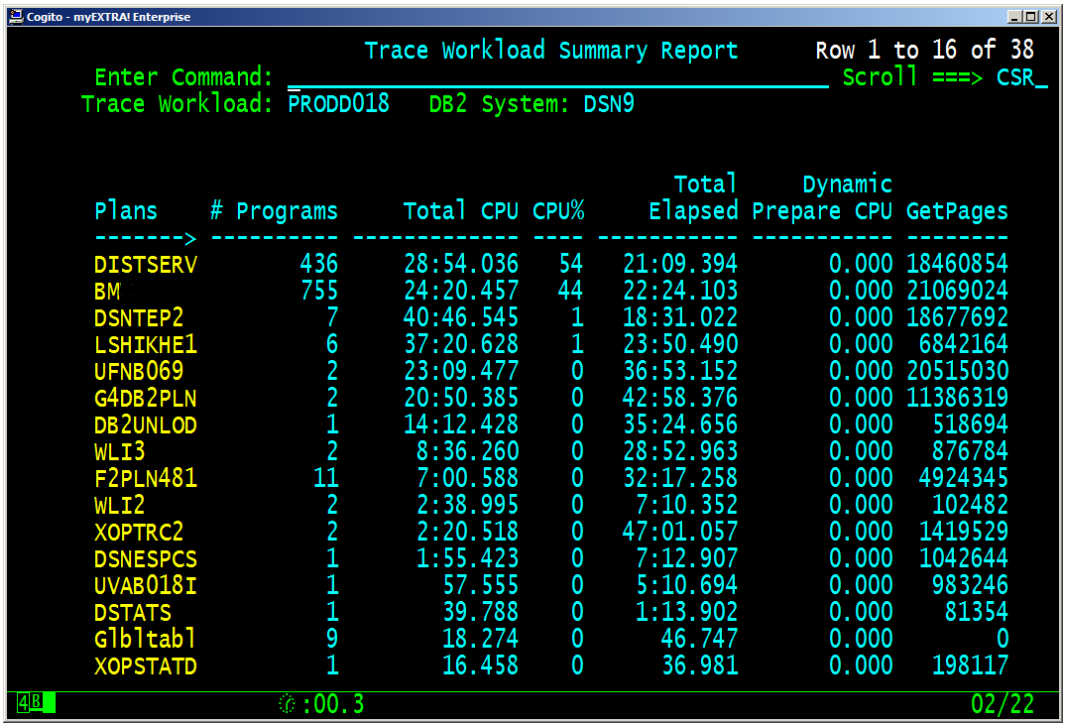


Figure 3 Workload Plans Summary

The display shows all of the Plans referenced in this Workload, Trace or Summary Interval in descending CPU cost.

The following additional information is displayed on this panel:-

Plans	The Names of all of the Plans that were executed.
# Programs	The Number of Programs executed under this Plan name.
Total CPU	The Total CPU for all of the programs for this plan.
CPU%	The CPU% represented by the Programs for this plan.
Total Elapsed	The Total Elapsed time for all of the programs for this plan.
Dynamic Prepare CPU	The Total Dynamic Prepare CPU time for all of the programs for this plan.
GetPages	The number of Getpages for this Plan.

You can DRILL on a particular Plan name to view the Plan Program Summary display as shown in the following figure:-

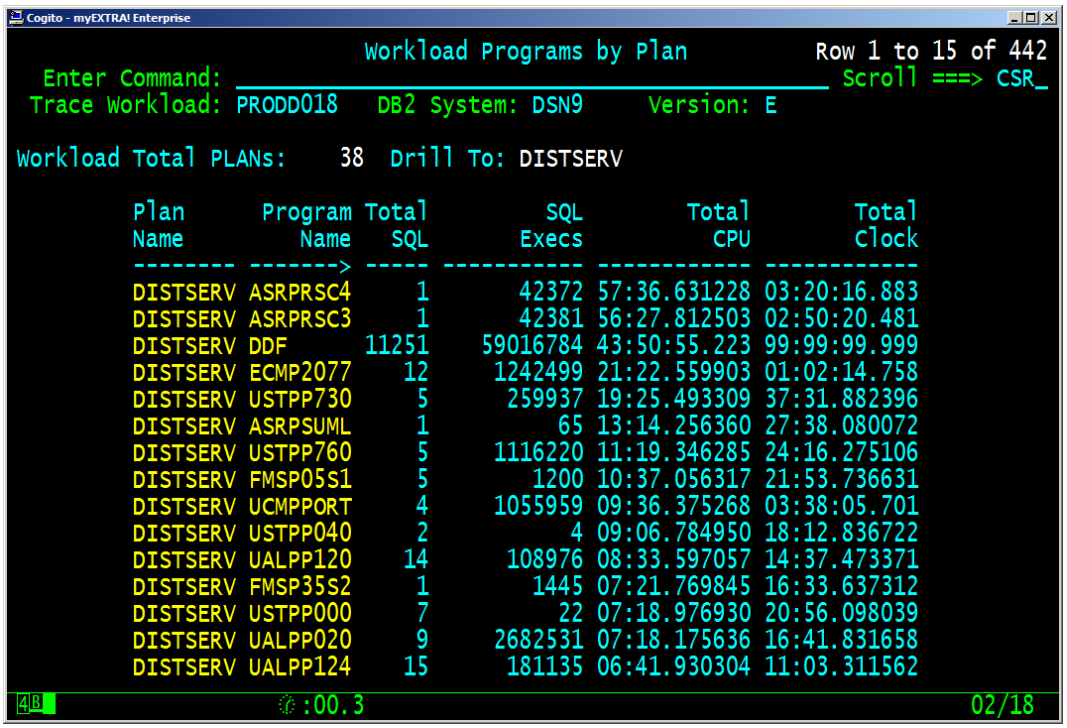


Figure 4 Workload programs by Plan

Refer to Report 41 for further details.

3 Workload Collections Summary

DRILL on Collections on the Workload Trace Summary or select report 3 to display the Workload Collections Summary screen as shown in the following panel:-

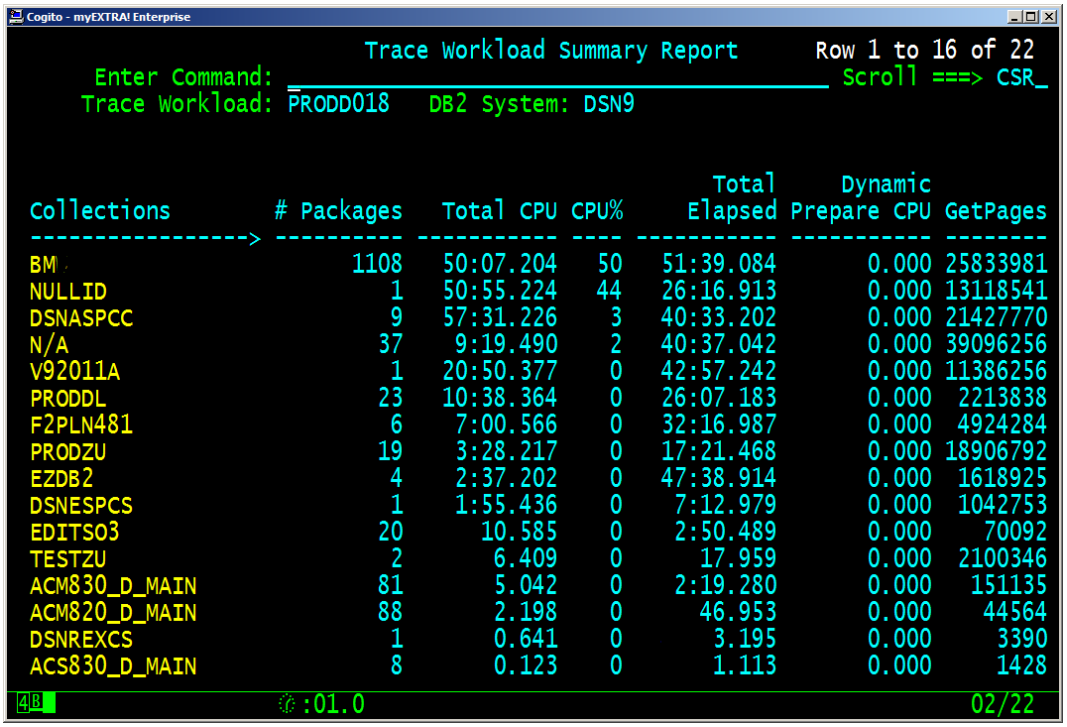


Figure 5 Workload Collections Summary

The display shows all of the Collections referenced in this Workload, Trace or Summary Interval in descending CPU cost.

The following additional information is displayed on this panel.

Collections	The Name of the Collections. You can DRILL on the Collection name to display the Program Summary display for the Packages in the collection.
# Programs	The Number of Programs executed under this Collection.
Total CPU	The Total CPU for all of the programs for this Collection.
CPU%	The CPU% represented by the Programs for this Collection.
Total Elapsed	The Total Elapsed time for all of the programs in this Collection.
Dynamic Prepare CPU	The Total Dynamic Prepare CPU for all of the programs in this Collection.
GetPages	The number of Getpages for this Collection.

The following figure (Figure 6) shows the Workload Packages display for a selected collection.

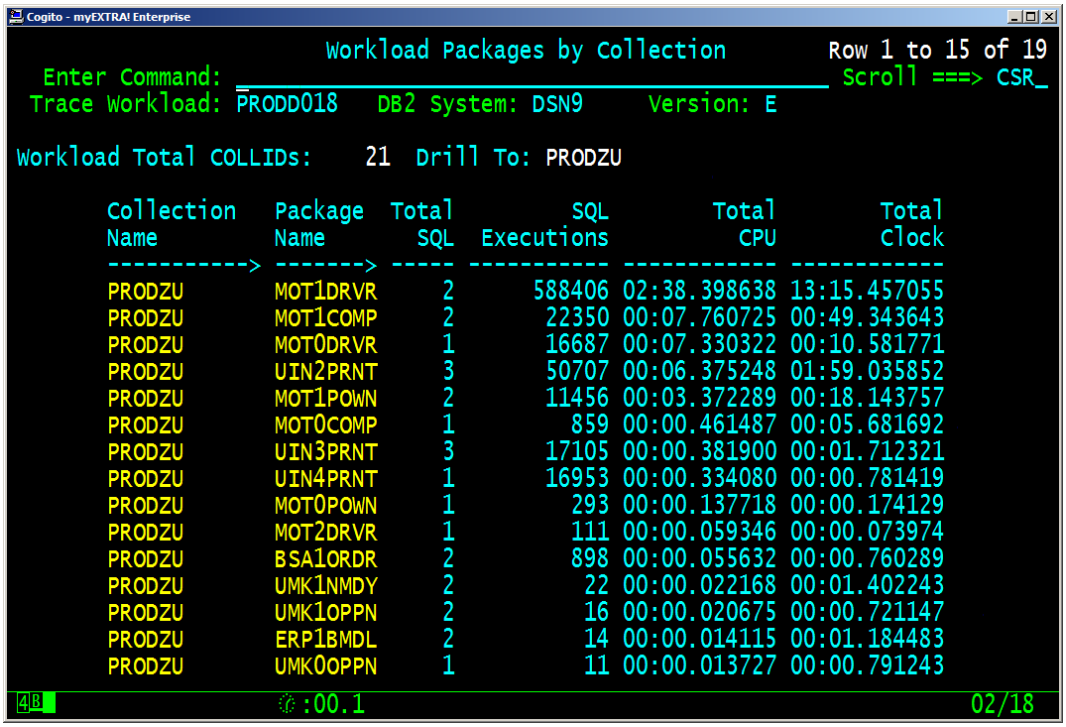


Figure 6 Programs for Collection

You can DRILL on a Package Name to see the SQL By Program display for the program.

Refer to Workload Programs Summary for further information about the panel.

4 Workload Programs Summary

DRILL on Programs on the Workload Trace Summary or select report 4 to display the Workload Programs Summary screen as shown in the following panel:-

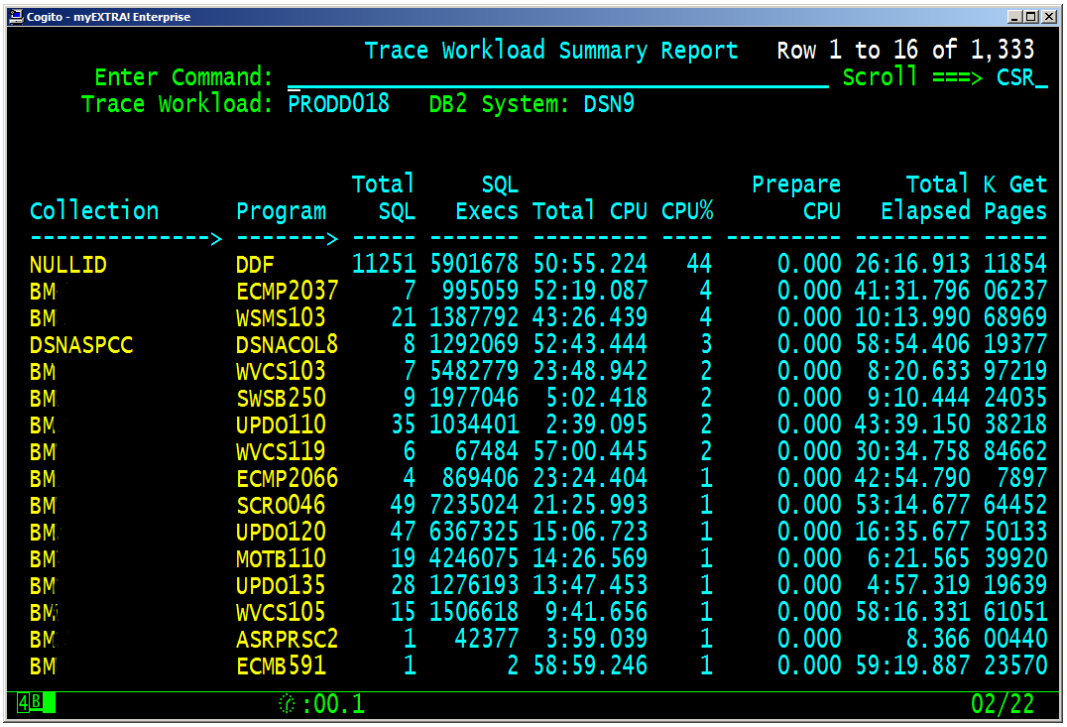


Figure 7 Workload Programs Summary

The display shows all of the Programs referenced in this Workload, Trace or Summary Interval in descending CPU cost. The following additional information is displayed on this panel.

Collection — The name of the Collection for this program if applicable.

You can DRILL on the Collection name to see the Workload Programs display for the selected collection.

Program — The Name of the program.

You can DRILL on the Program name to see the SQL By Program for the selected program.

Total SQL — The Number of distinct SQL executed by this program.

SQL Execs — The number of executions of all of the SQL executed by this program.

Total CPU — The Total CPU for all of the SQL for this Program.

CPU% — The CPU% represented by the SQL for this Program.

Prepare CPU — The Total Dynamic Prepare CPU for this program.

Total Elapsed	The Total Elapsed time for this program.
K Getpages	The number of Getpages for this program in 1000's.

5 Workload Authids Summary

DRILL on Authids on the Workload Trace Summary or select report 5 to display the Workload Authids Summary screen as shown in the following panel:-

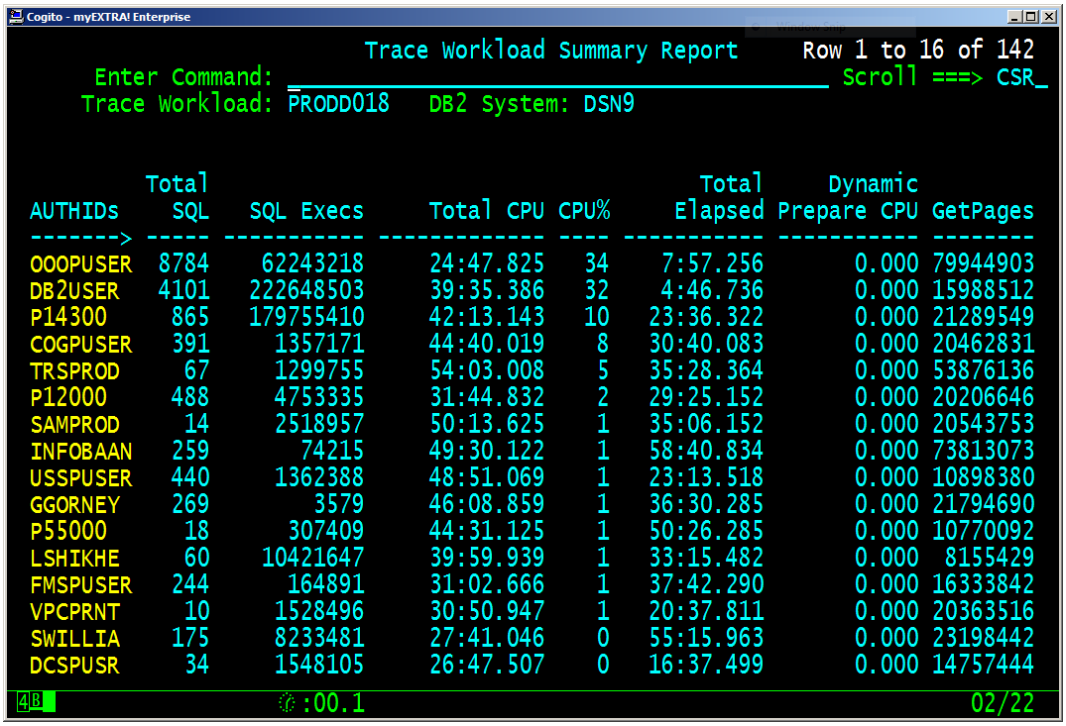


Figure 8 Workload Authids Summary

The display shows all of the AUTHIDs referenced in this Workload, Trace or Summary Interval in descending CPU cost. The following additional information is displayed on this panel.

The following additional information is displayed on this panel.

AUTHIDs	The Names of all of the AUTHIDs that executed SQL. You can DRILL on the AUTHID to see the SQL by Program display for the selected AUTHID.
Total SQL	The Number of distinct SQL executed by this AUTHID.
SQL Execs	The Number of Executions of all of the SQL executed by this AUTHID.
Total CPU	The Total CPU for all of the SQL for this AUTHID.
CPU%	The CPU% represented by the SQL for this AUTHID.
Total Elapsed	The Total Elapsed time for this AUTHID.
Dynamic Prepare CPU	The Total Dynamic Prepare CPU time for this AUTHID.

GetPages	The number of Getpages for this AUTHID.

6 Trace Filter and Consolidation Parameters

Tracer Reports Only

Select report 6 to display the Trace Filter and Consolidation Parameters screen as shown in the following panel:-

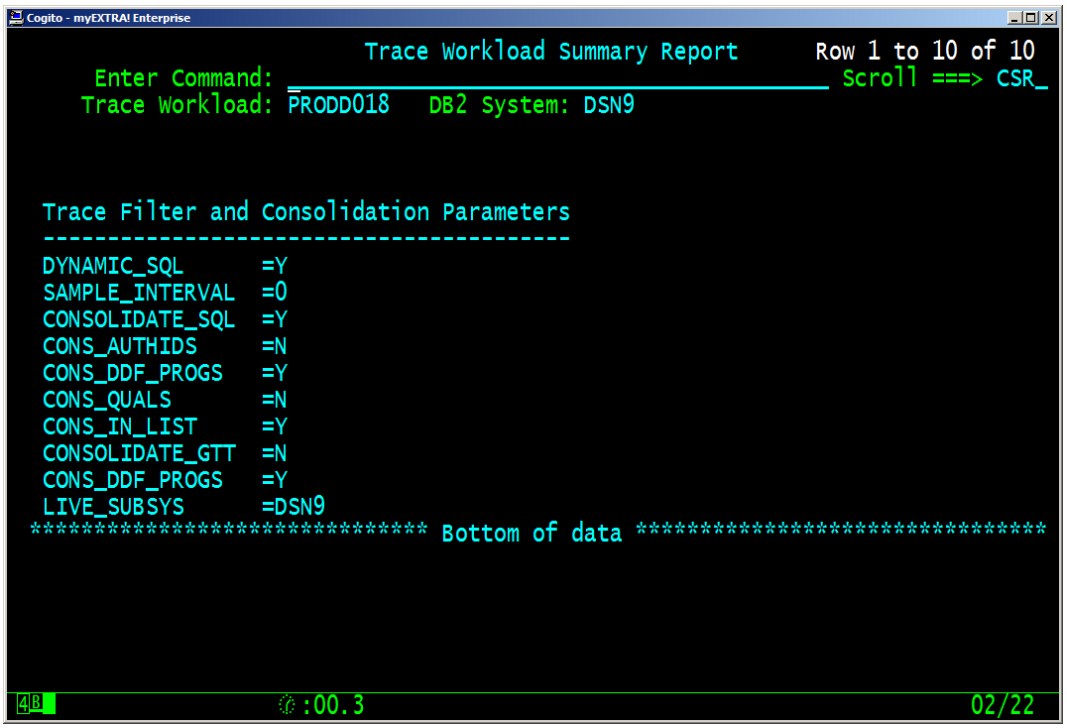


Figure 9 Trace Filter and Consolidation Parameters

The display shows the filter and consolidation parameters that applied to each trace. Refer to the EZ-Tracer/Cache User Guide, for details of the filter and consolidation parameters descriptions.

8 Workload Databases Summary

DRILL on DBNames on the Workload Trace Summary or select report 8 to display the Workload Databases Summary screen as shown in the following panel:-

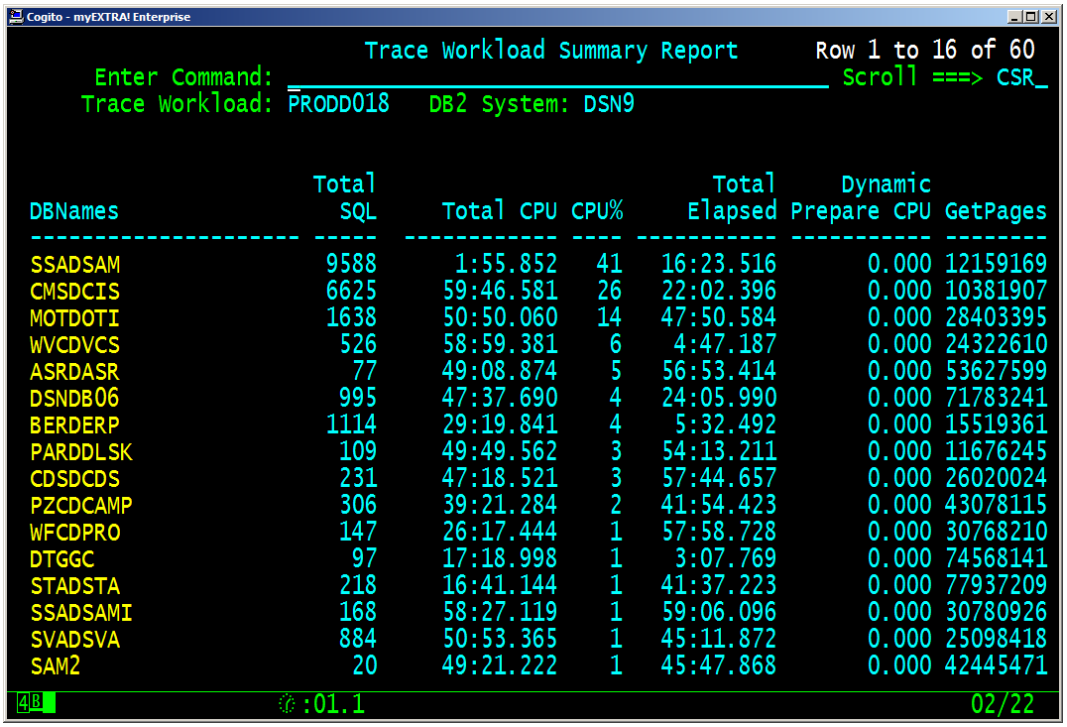


Figure 10 Workload Databases Summary

The display shows all of the databases referenced in this Workload, Trace or Summary Interval in default sort order of descending CPU cost. The following additional information is displayed on this panel.

DBNames The database name.

You can DRILL on the database name to see the Workload Tables Summary for the selected database.

Total SQL The Number of SQL that referenced this database.

Total CPU The Total CPU for all of the SQL that referenced this database.

CPU% The CPU% represented by the SQL against this database.

Total Elapsed The Total Elapsed time for all of the SQL that referenced this database.

Dynamic Prepare CPU The Total dynamic Prepare CPU time for all of the SQL that referenced this database.

GetPages The number of Getpages for this database.

9 Workload Tables Summary

DRILL on Tables on the Workload Trace Summary or select report 9 to display the Workload Tables Summary screen as shown in the following panel:-

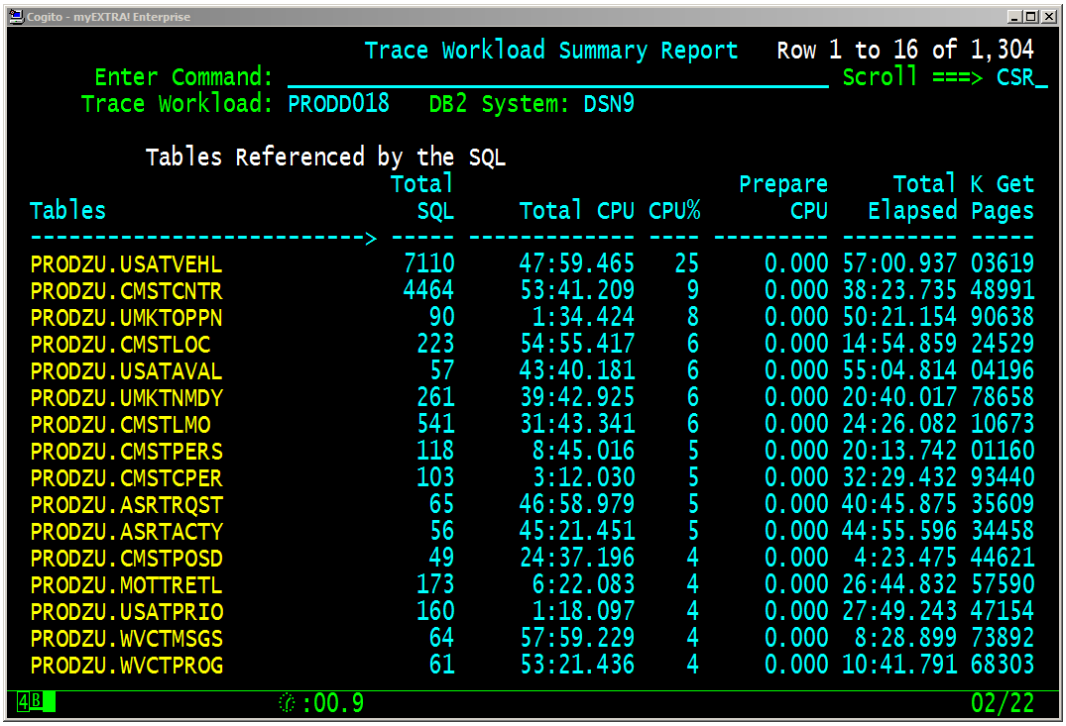


Figure 11 Workload Tables Summary

The display shows all of the tables referenced in this Workload, Trace or Summary Interval in default sort order of descending CPU cost.

The following additional information is displayed on this panel.

Tables	The table name. You can DRILL on the table name to display the SQL By Program display for the selected table.
Total SQL	The Number of SQL that referenced this table.
Total CPU	The Total CPU for all of the SQL that referenced this table.
CPU%	The CPU% represented by the SQL against this table.
Prepare CPU	The Total Prepare CPU time for the SQL against this table.
Total Elapsed	The Total Elapsed time for the SQL against this table.
K Get Pages	The number of Getpages for this table in 1000's.

10 Workload Indexes Summary

DRILL on Indexes on the Workload Trace Summary or select report 10 to display the Workload Indexes Summary screen as shown in the following panel:-

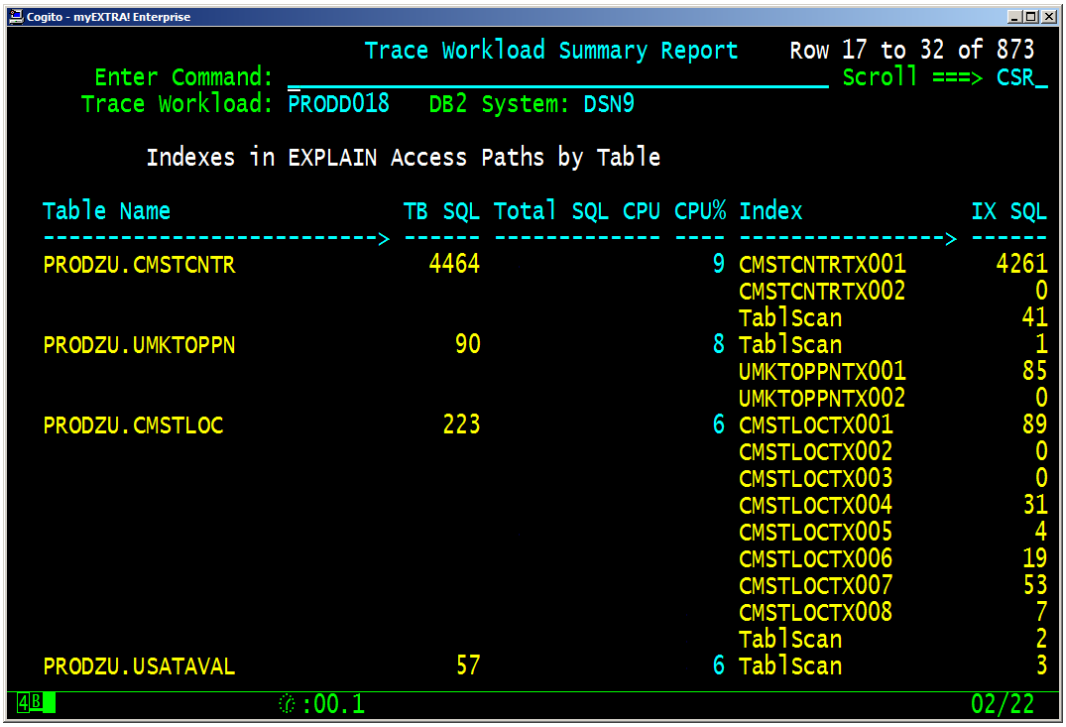


Figure 12 Workload Indexes Summary

The display shows all of the indexes referenced in this Workload, Trace or Summary Interval in default sort order of descending CPU cost.

The following additional information is displayed on this panel.

Tables The Names of all of the tables that were referenced.

You can DRILL <PF4> on the table name to view the catalog statistics display for the table.

TB SQL The Number of SQL that referenced this table using the indexes.

You can DRILL <PF4> on the TB SQL to view the SQL by Program display for the selected table.

Total SQL CPU The Total CPU for all of the SQL that referenced this table using the index

CPU% The CPU% represented by the SQL against this table.

Index

The Names of all the indexes used for the table. An index name of TablScan indicates SQL that perform a table scan of the table (i.e. do not use an index).

You can DRILL <PF4> on the index name to view the catalog statistics display for the index.

IX SQL

The Number of SQL that referenced the table using this index

You can DRILL <PF4> on the IX SQL to view the SQL by Program display for the selected index.

11 Row Statistics by Plan

Select report 11 to display the Row Statistics by Plan display as shown in the following figure:-

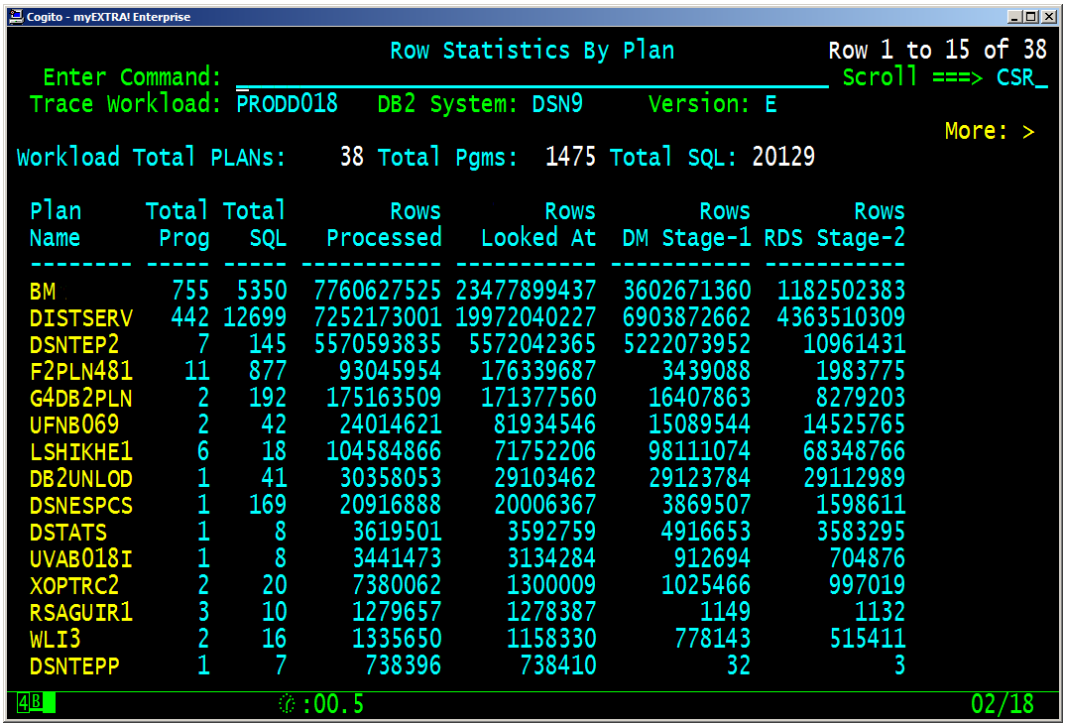


Figure 13 Row Statistics Report by Plan

The following information is displayed on this panel:-

Plan Name	The Names of all of the Plans that executed SQL. You can DRILL on the plan name to display the SQL By Program display for the selected Plan.
Total Prog	The number of Programs executed under this Plan.
Total SQL	The total number of distinct SQL executed by Programs under this Plan.
Rows Processed	The Number of Rows Processed by this Plan.
Rows Looked At	The Number of Rows Look At by this Plan.
Rows DM Stage-1	The Number of DM Stage-1 requests of all of the SQL executed by this Plan.
Rows RDS Stage-2	The Number of RDS Stage-2 requests of all of the SQL executed by this Plan.
Rows Updated	The total number of Rows Updated by this Plan.
Getpages	The total number of GetPage requests by this Plan.

12 Row Statistics by Program

Select report 12 to display the Row Statistics by Program display as shown in the following figure:-

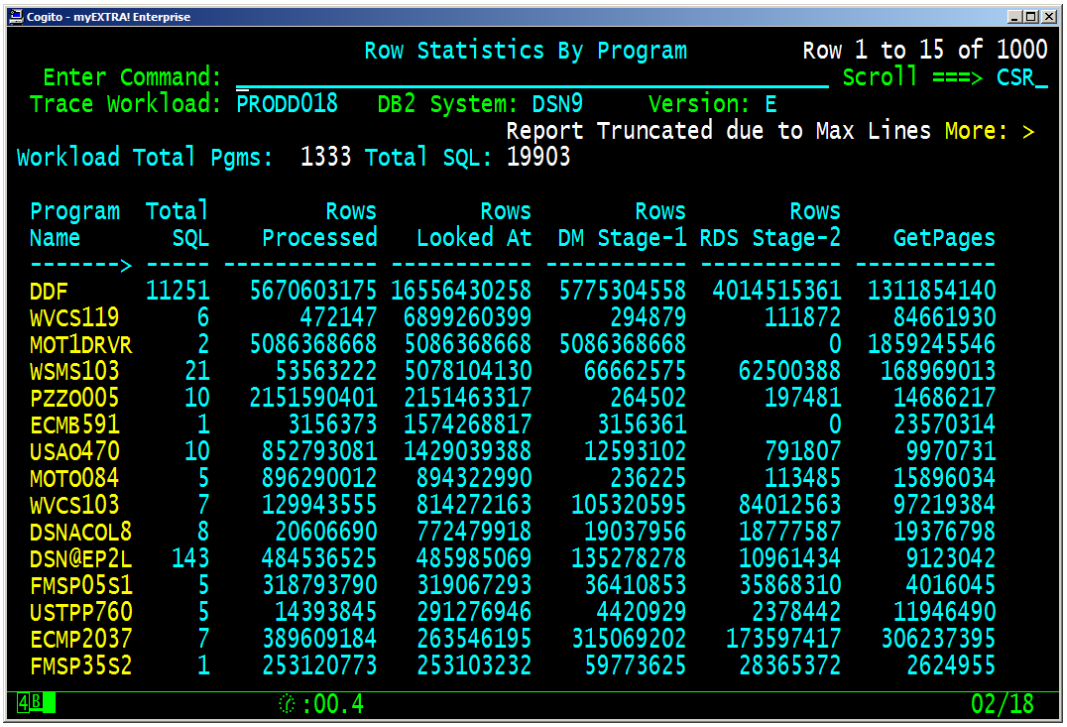


Figure 14 Row Statistics Report by Program

The following information is displayed on this panel:-

Program Name	The Names of all of the Programs that executed SQL. You can DRLL on the Program name to view the SQL By Program display for the selected program.
Total SQL	The total number of distinct SQL executed by this Program.
Rows Processed	The Number of Rows Processed by this Program.
Rows Looked At	The Number of Rows Looked At by this Program..
Rows DM Stage-1	The Number of DM Stage-1 requests of all of the SQL executed by this Program.
Rows RDS Stage-2	The Number of RDS Stage-2 requests of all of the SQL executed by this Program.
Getpages	The total number of Getpage requests by this Program.
Rows Updated	The total number of Rows Updated by this Program.

13 Row Statistics by SQL

Select report 13 to display the Row Statistics by SQL display as shown in the following figure:-

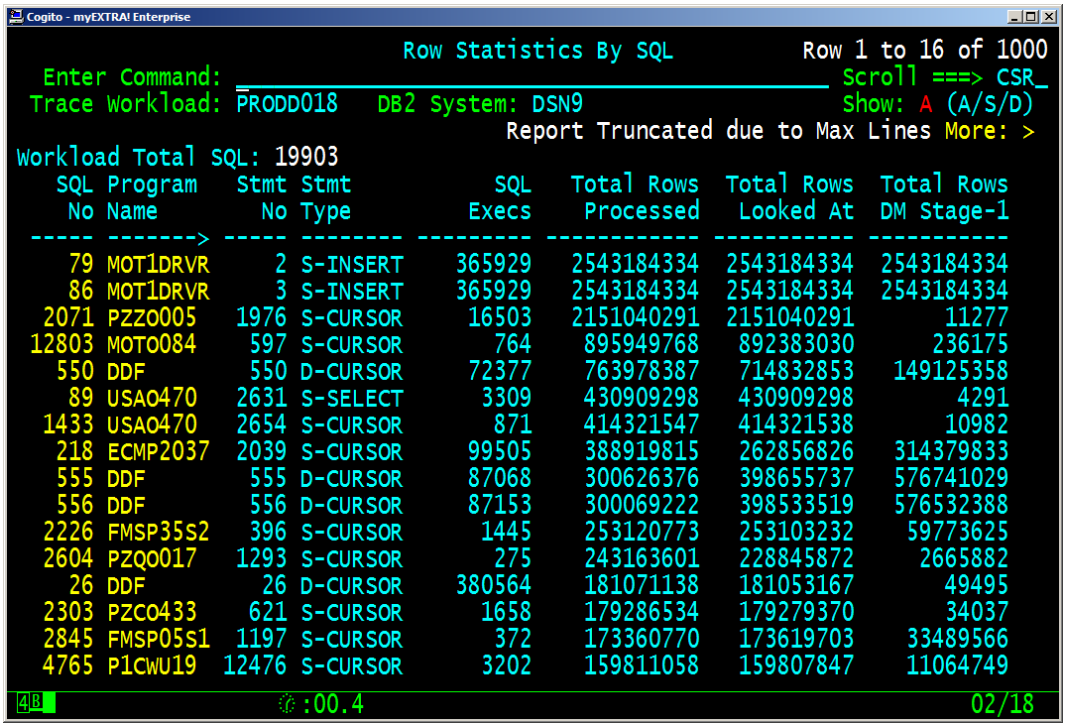


Figure 15 Row Statistics Report by SQL

The following information is displayed on this panel:-

SQL No

SQL No is a unique internal name generated by EZ-DB2 to identify each distinct SQL statement.

You can DRILL on the SQL no to view the SQL Detail display.

Flagged SQL Statements are shown in red. Refer to the FLAG SQL command in the EZ-DB2 Commands Reference Guide.

Program Name

The Name of the Program that executed the SQL.

You can DRILL on the Program name to view the SQL By Program display for the selected program,

Stmt No

The statement number within the Program.

Stmt Type

The statement type, i.e. CURSOR, SELECT, UPDATE, INSERT or DELETE. CURSOR signifies an OPEN CURSOR statement, whereas SELECT indicated a Singleton SELECT. The Type is prefixed with S- or D- to signify Static or Dynamic respectively.

SQL Execs	The number of executions of this SQL statement.
Total Rows Processed	The Total Number of Rows Processed by this SQL.
Total Rows Looked At	The Total Number of Rows Looked At by this SQL.
Total Rows DM Stage-1	The Total Number of DM Stage-1 requests by this SQL..
Total Rows RDS Stage-2	The Total Number of RDS Stage-2 requests by this SQL.
Total Row Updates	The Total number of Rows Updated by this SQL during.
Total GetPages	The Total number of GetPage requests by this SQL.
Avg Rows Processed	The Average Number of Rows Processed by this SQL.
Avg Rows Looked At	The Average Number of Rows Looked At by this SQL.
Avg Rows DM Stage-1	The Average Number of DM Stage-1 requests by this SQL.
Avg Rows RDS Stage-2	The Average Number of RDS Stage-2 requests by this SQL.
Avg Row Updates	The Average number of Rows Updated by this SQL.
Average Getpages	The Average number of GetPage requests by this SQL.

21 Consolidated SQL

DRILL on Consolidated SQL on the Workload Trace Summary or select report 21 to display the Consolidated SQL screen as shown in the following panel:-

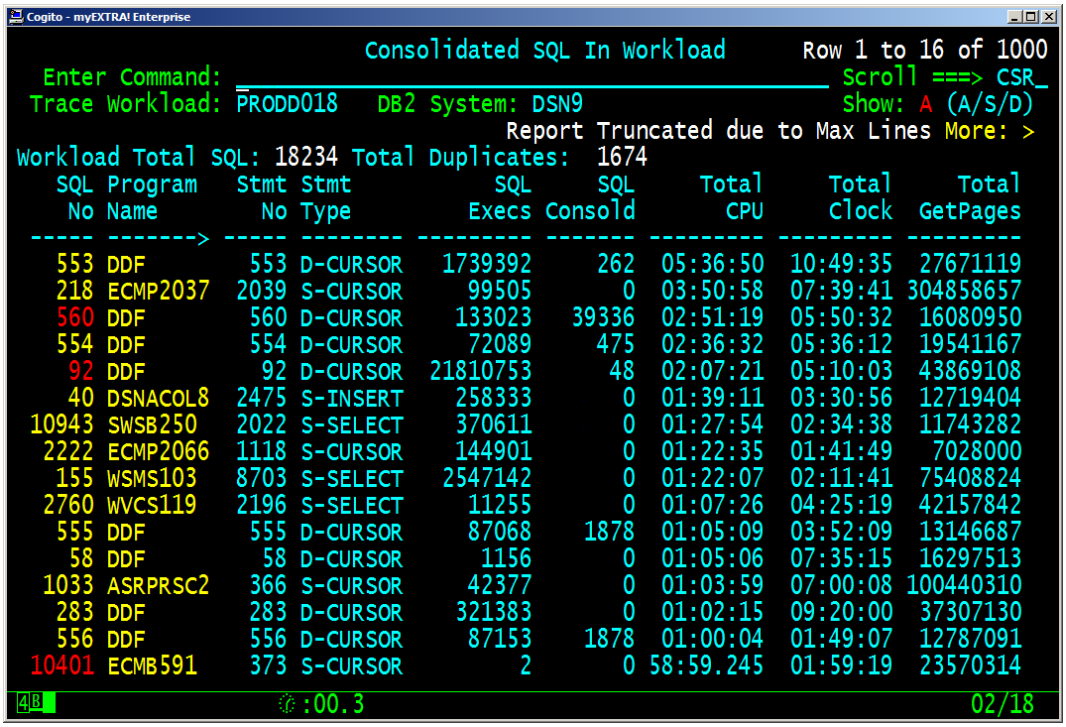


Figure 16 Consolidated SQL

The display shows information for ALL of the SQL (Static and Dynamic if applicable) in the current Trace Workload, Trace Number or Summary Interval.

*This display only shows ONE line for each distinct SQL statement executed, even if the SQL appears in more than one Program. Refer to the **duplicat** name in program name column below. To see SQL reported separately for each Program occurrence, see report 22 -SQL by Program.*

The following information is displayed on this panel:-

Show: Display Toggle field:-

A - Show ALL SQL in Workload
S - Show Static SQL Only
D - Show Dynamic SQL Only

Workload Total SQL The number of SQL in the Workload after Consolidation.

Total Duplicates The number of times the same SQL was repeated in > 1 Program. See Duplicates later.

SQL No

SQL No is a unique internal name generated by EZ-DB2 to identify each distinct SQL statement.

You can DRILL on the SQL no to view the SQL Detail display.

Flagged SQL Statements are shown in red. Refer to the FLAG SQL command in the EZ-DB2 Commands Reference Guide

Program Name

The Program name issuing the SQL statement.

You can DRILL on the Program name to view the SQL By Program display for the selected program,

Note: if the SQL appears in more than one program, the program name will show as duplicat To see the other programs that executed this SQL statement position the cursor on the field and hit the DRILL key <PF4> to show all program occurrences for this statement.

Stmt No

The statement number within the program. If the program name is shown as duplicat then this field will display as #nnnn where nnnn is the number of duplicates.

Stmt Type

The Statement Type:-

i-CURSOR	An Open Cursor Statement
i-SELECT	A Singleton Select
i-INSERT	An INSERT statement
i-DELETE	A DELETE statement

The indicator i - indicates whether the statement is Static(S) or Dynamic(D).

SQL Execs

The number of executions of this SQL statement.

SQL Consold	The number of times this statement has been consolidated. That is, the number of times EZ-Tracer/Cache identified statements that were 'essentially' the same, and merged them into the same SQL no. Thus, a single SQL No may represent many different 'essentially the same' SQL statements.

If you DRILL on the SQL No to see the SQL text, any literal values will represent the first occurrence of the merged statements.

In the above example, SQL No 560 was executed 133023 times and was consolidated 39336 times. In other words, without consolidation those 39336 statements that were consolidated would have been considered as different SQL requests. If you are using Dynamic Statement cache all of these different variations of the same statement could be taking up space in the cache. In this circumstance, its advisable to check if the statement is using Literals anc consider replacing with a host variable. See SQL Literals later in this section.

Total CPU	The Total CPU Cost for this SQL statement.
Total Clock	The Total Elapsed time for this SQL statement.
Total Getpages	The Total number of GetPage requests.
Average CPU	The Average CPU Cost for this SQL statement.
Average Clock	The Average Elapsed time for this SQL statement.
Average Getpages	The Average number of GetPage requests.
Total Timerons	The Total DB2 Timerons for the SQL statement.
Average Timerons	The Average DB2 Timerons for the SQL statement.
Total Rows Processed	The Total Number of Rows Processed by this SQL statement.
Total Rows Looked at	The Total Rows Looked at for the SQL statement.
Total Rows DM Stage-1	The Total Number of DM Stage-1 requests.
Total Rows RDS Stage-2	The Total Number of RDS Stage-2 requests.
Total Row Updates	The Total number of Rows Updated.
Avg Rows Processed	The Average Number of Rows Processed.
Avg Rows Looked at	The Average Rows Looked at for the SQL statement.
Avg Rows DM Stage-1	The Average Number of DM Stage-1 requests.

Avg Rows RDS Stage-2	The Average Number of RDS Stage-2 requests.
Avg Row Updates	The Average number of Rows Updated.
Avg Fetches	The average number of fetches performed per SQL.
SQL Lit	Indicates whether or not the SQL statement used hard coded literal value(s) Y - The SQL had a least one hard-coded literal value. N - The SQL had no hard coded literal values.

SQL Detail (SQL Text)

The SQL Detail display is obtained by selecting a particular SQL No and hitting the DRILL key <PF4>.

Note: you can switch back to the SQL text display from other SQL Detail displays for the current SQL by entering **TX** on the Command Line or DRILLING on the **TX** command in the Command Options pop-up.

The following panel is displayed:-

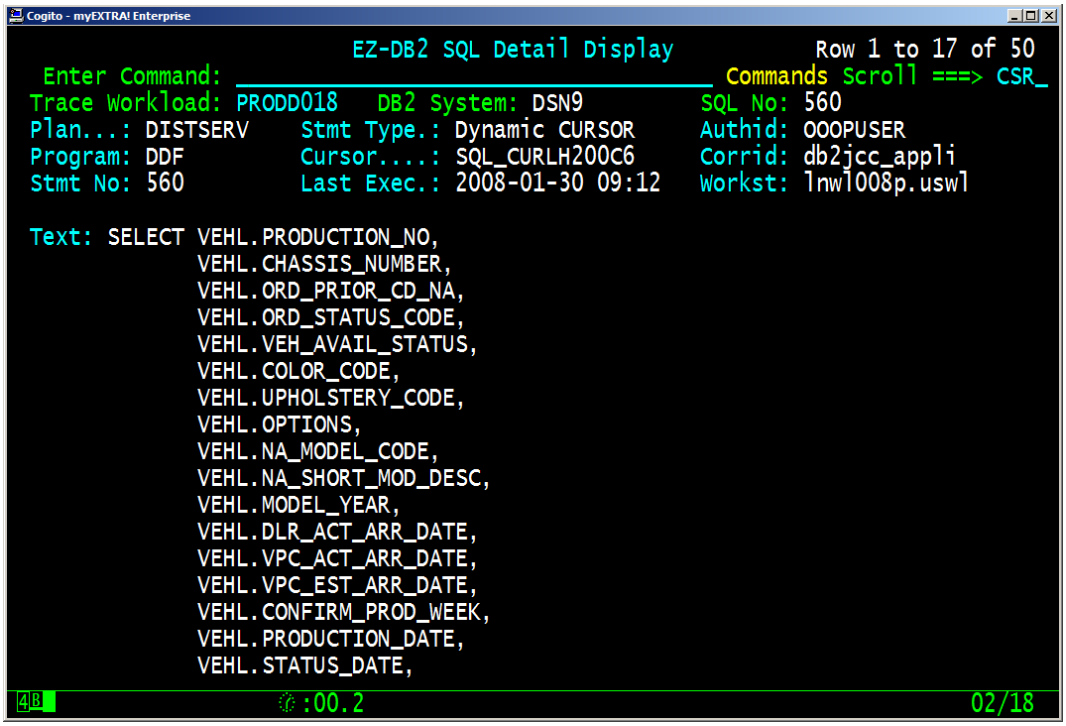


Figure 17 SQL Detail Display (SQL Text)

SQL Detail Commands

From the SQL detail display you can navigate to a number of different detail views for example, the SQL Statistics, the Access Path display or the Edit and Explain option.

To select one of these alternative views, you can enter the applicable two letter command abbreviation in the Command line. You can also enter the command **DO** (Display Options) or DRILL <**PF4**> on the word Commands to display the Commands Option pop-up as shown in the following figure:-

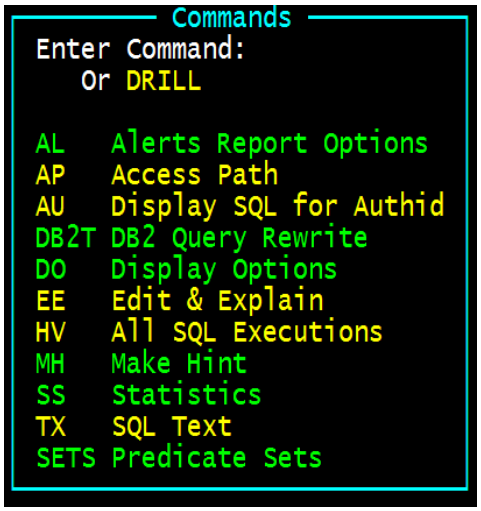


Figure 18 Commands Popup

Note that the commands that are active are highlighted in the DRILL colour.

You can select the required option either by entering the two letter command abbreviation, or cursor positioning on the command and entering the DRILL key <**PF4**>.

For further details of the SQL detail commands refer to the EZ-DB2 Commands Reference Guide.

22 SQL by Program

Select report 22 to display the SQL by Program screen as shown in the following panel:-

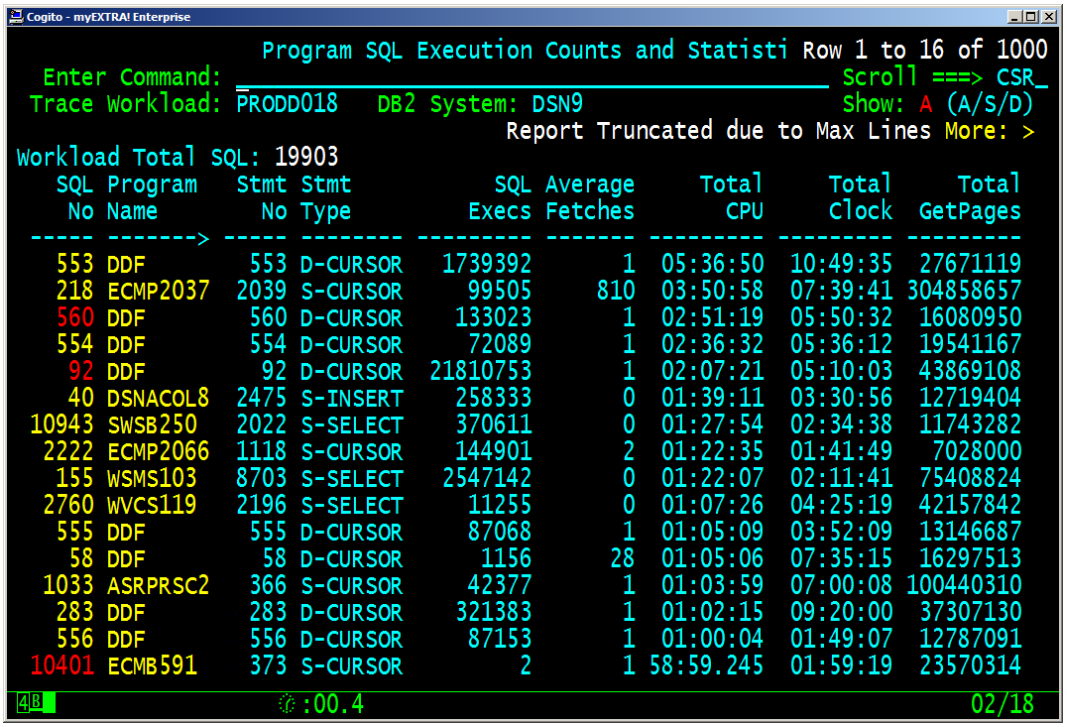


Figure 19 SQL by Program

This display is similar to report 21- Consolidated SQL except that where a SQL appears in more than one program, each Program occurrence is shown separately. The **Duplicate** literal will therefore not appear in the Program name column in this display and Workload Total SQL has increased by the number of duplicates when compared with report 21 . In addition this report will display additional columns for number of RID List Failures and number of RLIM failures.

If you have loaded free form SQL using Tracer Option 2.4 and traced Dynamic SQL in conjunction with the Trace Pre-Loaded SQL Only option in the Trace Filter Specification Screen, the report will show all variations of the SQL that have been captured (i.e. where the literal values are different) and be reported as distinct versions of that SQL. The pre loaded free form SQL will be shown with SQLTEXT in the program name and will not have any values for CPU costs etc. You can issue a SORT HASH command to display the report with all equivalent SQL grouped and in descending sequence based on AVERAGE_CPU. If you have loaded more than 1 free form SQL statement you can position in the report on the next grouping by issuing a find on ASQLTEXT@. This will position you on the pre loaded SQL for the current group and the next group will immediately follow it. In addition you can issue a SORT HASH TOTAL_CPU to display the report with all equivalent SQL grouped and in descending sequence based on TOTAL_CPU. Although you can issue SORT HASH for any type of report it only makes sense to do so for workloads that have been generated to trace Dynamic SQL with the TRACE PRE-LOADED SQL ONLY option and with CONSOLIDATION off.

***Note:** SORT HASH does not refer to any displayed report column. EZ-DB2 when building its reports uses an internal hash key to group similar entities together and also to uniquely identify components of the reports. The SORT HASH command allows us to group equivalent SQL together and then to sort it within that grouping. Refer to EZ-DB2 Commands Reference Guide for further details about SORT HASH.*

The following information is displayed on this panel:-

Show: Display Toggle field:-

A - Show ALL SQL in Workload
S - Show Static SQL Only
D - Show Dynamic SQL Only

Workload Total SQL The number of SQL in the Workload after Consolidation.

SQL No SQL No is a unique internal name generated by EZ-DB2 to identify each distinct SQL statement.

You can DRILL on the SQL no to view the SQL Detail display.

Flagged SQL Statements are shown in red. Refer to the FLAG SQL command in the EZ-DB2 Commands Reference Guide

Program Name The Program name issuing the SQL statement.

You can DRILL on the Program name to view the SQL By Program display for the selected program,

Stmt No The statement number within the program.

Stmt Type The Statement Type:-

i-CURSOR An Open Cursor Statement
i-SELECT A Singleton Select
i-INSERT An INSERT statement
i-DELETE A DELETE statement

The indicator i - indicates whether the statement is Static(S) or Dynamic(D).

SQL Execs The number of executions of this SQL statement.

Average Fetches The average number of fetches performed per SQL.

Total CPU The Total CPU Cost for this SQL statement.

Total Clock The Total Elapsed time for this SQL statement.

Total Getpages The Total number of GetPage requests.

Average CPU The Average CPU Cost for this SQL statement.

Average Clock The Average Elapsed time for this SQL statement.

Average Getpages The Average number of GetPage requests.

Total Timerons The Total DB2 Timerons for the SQL statement.

Average Timerons	The Average DB2 Timerons for the SQL statement.
Total Rows Processed	The Total Number of Rows Processed by this SQL statement.
Total Rows Looked at	The Total Rows Looked at for the SQL statement.
Total Rows DM Stage-1	The Total Number of DM Stage-1 requests.
Total Rows RDS Stage-2	The Total Number of RDS Stage-2 requests.
Total Row Updates	The Total number of Rows Updated.
Avg Rows Processed	The Average Number of Rows Processed.
Avg Rows Looked at	The Average Rows Looked at for the SQL statement.
Avg Rows DM Stage-1	The Average Number of DM Stage-1 requests.
Avg Rows RDS Stage-2	The Average Number of RDS Stage-2 requests.
Avg Row Updates	The Average number of Rows Updated.
RID List Failures	The Number of RID List Failures that occurred for this SQL.
RLIM Failures	The number of times the SQL received an SQLCODE of -905 for exceeding a resource limit
SQL Lit	Indicates whether or not the SQL statement used hard coded literal value(s) Y - The SQL had a least one hard-coded literal value. N - The SQL had no hard coded literal values.
SQL Consold	The number of times this statement has been consolidated. That is, the number of times EZ-Tracer/Cache identified statements that were 'essentially' the same, and merged them into the same SQL no. Thus, a single SQL No may represent many different 'essentially the same' SQL statements.
Stg 2	Whether this SQL performed Stage -2 processing. Y - Stage 2 processing took place. N - Stage 1 Only.
User Ident String	If the User Identity field is added to an SQL, this will now be displayed in the reports for the SQL statement.
Total Wait	The Total Wait time for the SQL.(1)
Tot Wait SYNIO	Accumulated wait time for synchronous IO(1)
Tot Wait Locks	Accumulated wait time for Locks(1)(2)

Tot Wait Switch	Accumulated wait time for Synchronous execution unit switch(1)
Tot Wait Glbl Lock	Accumulated wait time for Global Locks(1)
Tot Wait Agt Read	Accumulated wait time for other agents reads(1)
Tot Wait Agt Write	Accumulated wait time for other agents writes(1)
Tot Wait Latch	Accumulated wait time for latch requests(1)(3)
Tot Wait Pg Latch	Accumulated wait time for page latches(1)(3)
Tot Wait Drain Lck	Accumulated wait time for drain locks(1)(3)
Tot Wait RlseClaim	Accumulated wait time for a drain during wait for claims to be released(1)(3)
Tot Wait Log Write	Accumulated wait time for log writers(1)(3)
Average Wait	The Average Wait time for the SQL.(1)
Avg Wait SYNIO	Average wait time for synchronous IO(1)
Avg Wait Locks	Average wait time for Locks(1)(2)
Avg Wait Switch	Average wait time for Synchronous execution unit switch(1)
Avg Wait Glbl Lock	Average wait time for Global Locks(1)
Avg Wait Agt Read	Average wait time for other agents reads(1)
Avg Wait Agt Write	Average wait time for other agents writes(1)
Avg Wait Latch	Average wait time for latch requests(1)(3)
Avg Wait Pg Latch	Average wait time for page latches(1)(3)
Avg Wait Drain Lck	Average wait time for drain locks(1)(3)
Avg Wait RlseClaim	Average wait time for a drain during wait for claims to be released(1)(3)
Avg Wait Log Write	Average wait time for log writers(1)(3)

(1) These statistics are only available if DB2 Accounting Class 3 is active.
(2) Prior to DB2 10 the timer includes latches as well
(3) Available as of DB2 10

23 SQL Duplicated Across Programs

Select report 23 to display the SQL Duplicated Across Programs display as shown in the following figure:-

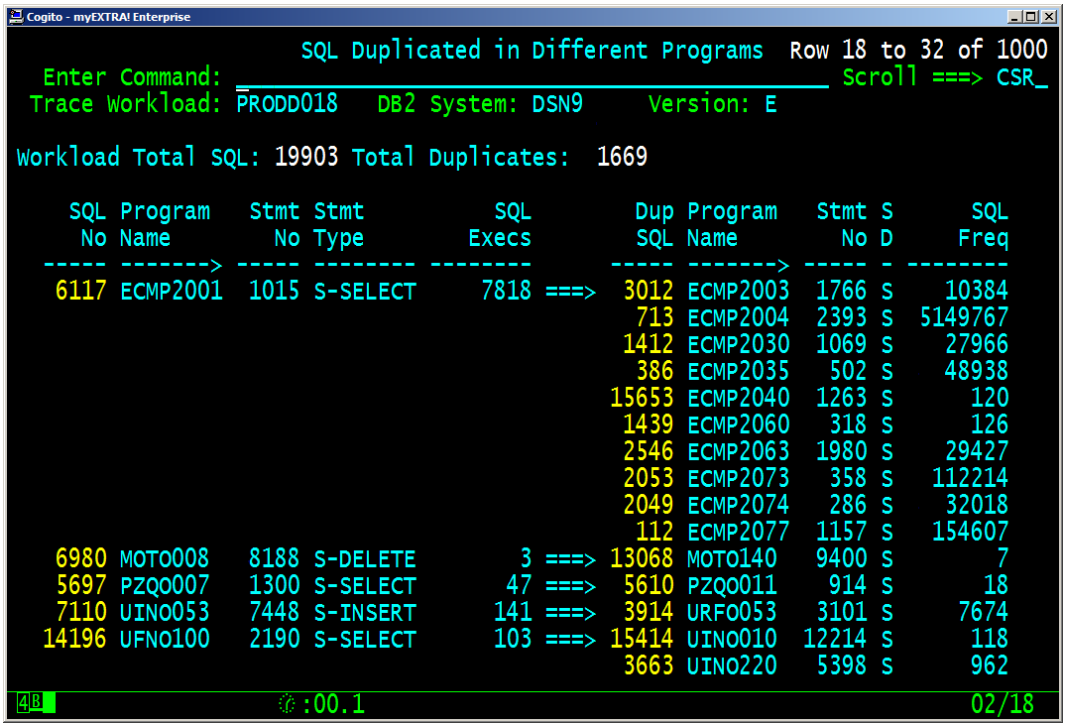


Figure 20 SQL Duplicated across programs

This display lists all of the SQL statements that are included in more than one program. The following information is displayed:-

The following information is displayed on this panel:-

SQL No

SQL No is a unique internal name generated by EZ-Tracer/Cache to identify each distinct SQL statement.

You can DRILL on the SQL no to view the SQL Detail display.

Flagged SQL Statements are shown in red. Refer to the FLAG SQL command in the EZ-DB2 Commands Reference Guide

Program Name

The Program name containing the First occurrence of a particular SQL statement.

Stmt No

The statement number within the program.

Stmt Type

The statement type ie. OPEN, UPDATE, INSERT or DELETE.

SQL Execs	The number of executions of this SQL statement in this program.
Dup SQL	The SQL No of a duplicate SQL statement contained within another program. You can DRILL on the SQL no to view the SQL Detail display. Flagged SQL Statements are shown in red. Refer to the FLAG SQL command in the EZ-DB2 Commands Reference Guide. If more than one duplicate exists, you will see a line for each other program containing this SQL statement.
Program Name	The name of another program containing the identical statement.
Stmt No	The statement no of the duplicate.
SD	The statement type of the duplicate i.e. Static or Dynamic.
SQL Execs	The number of Executions of this SQL statement in the Program.

.

24 SQL with Consolidation Count > 0

Select report 24 to display the SQL with Consolidation Count > 0 display as shown in the following figure:-

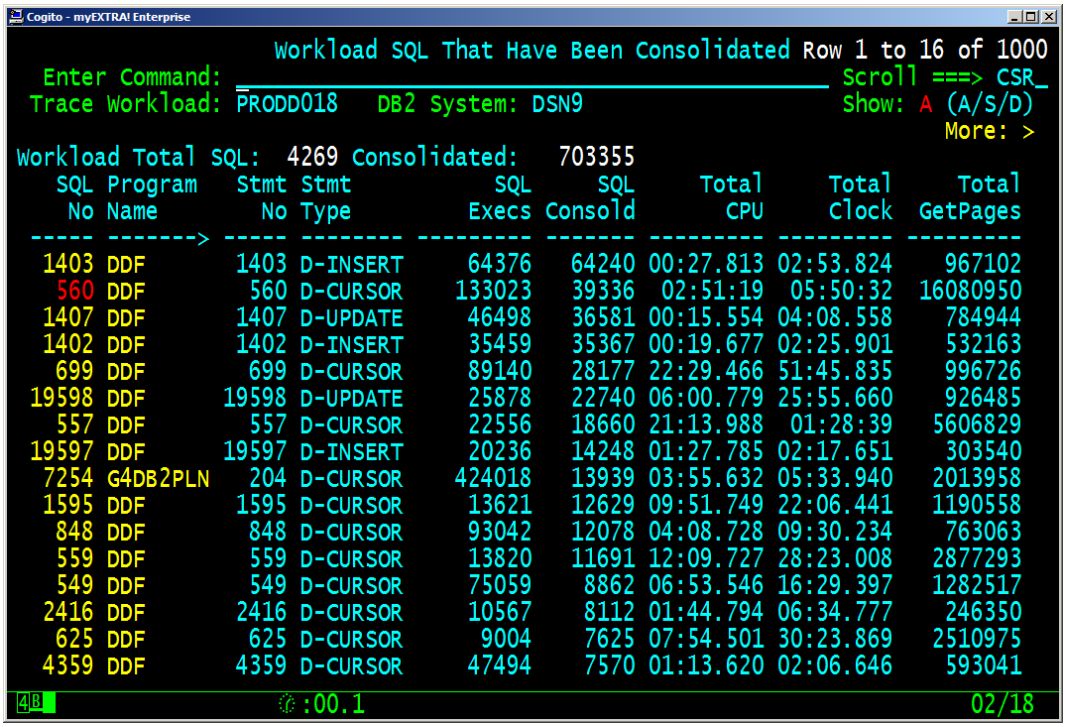


Figure 21 SQL with Consolidation Count > 0

This display is similar to report 21- Consolidated SQL except that only SQL with Consolidation Count greater than Zero are shown.

You could sort the display by SQL Consolidated as shown in the above example. Note that in this example, for most SQL, the number consolidated is almost equal to the number of executions. Eg. For SQL No. 1403 there were 64376 executions and 64240 consolidated. In other words, without consolidation there would have been 64240 different SQL statements in the display rather than just the one as shown by EZ-Tracer/Cache. This example illustrates the value of the consolidation feature. Note that, this also means that if Dynamic Statement Caching were in use, each of these 64240 statements would be a different SQL in the DB2 cache. A prime example of where literal values should be replaced with host variable values.

Refer to report 21 for further details of the information displayed.

25 More SQL Reports

Select report 25 to display the additional SQL reports menu as shown in the following figure:-

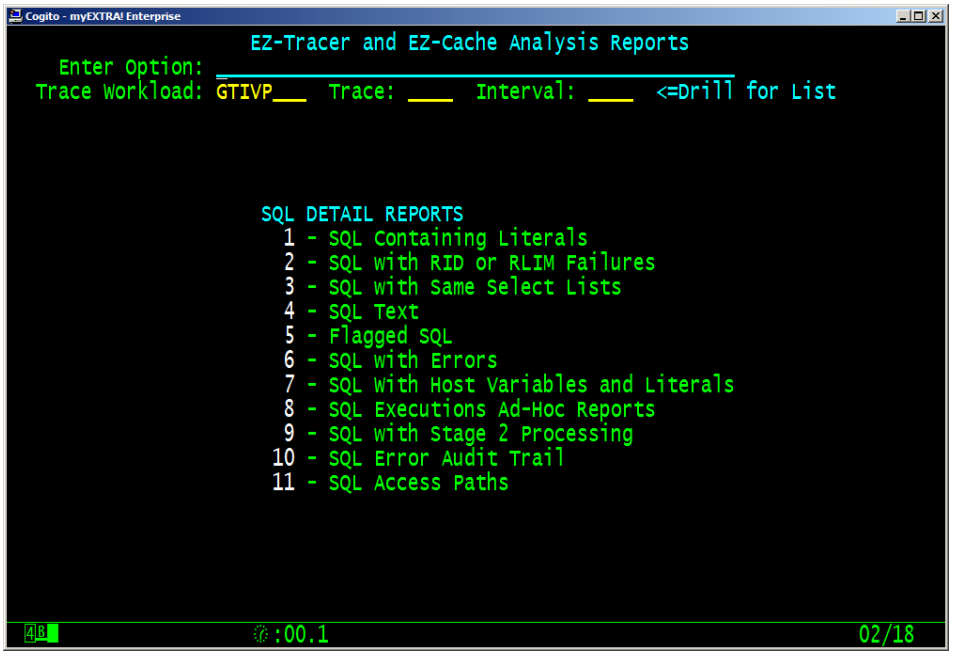


Figure 22 More Reports (Tracer/Cache)

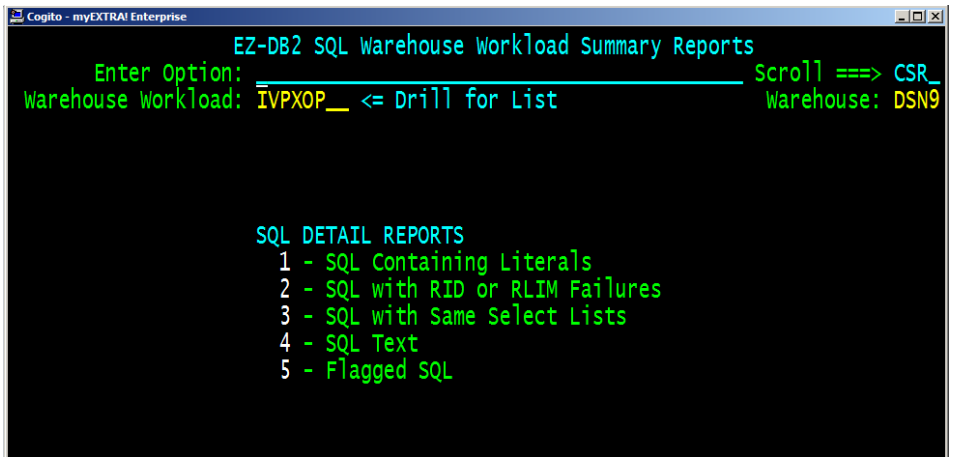


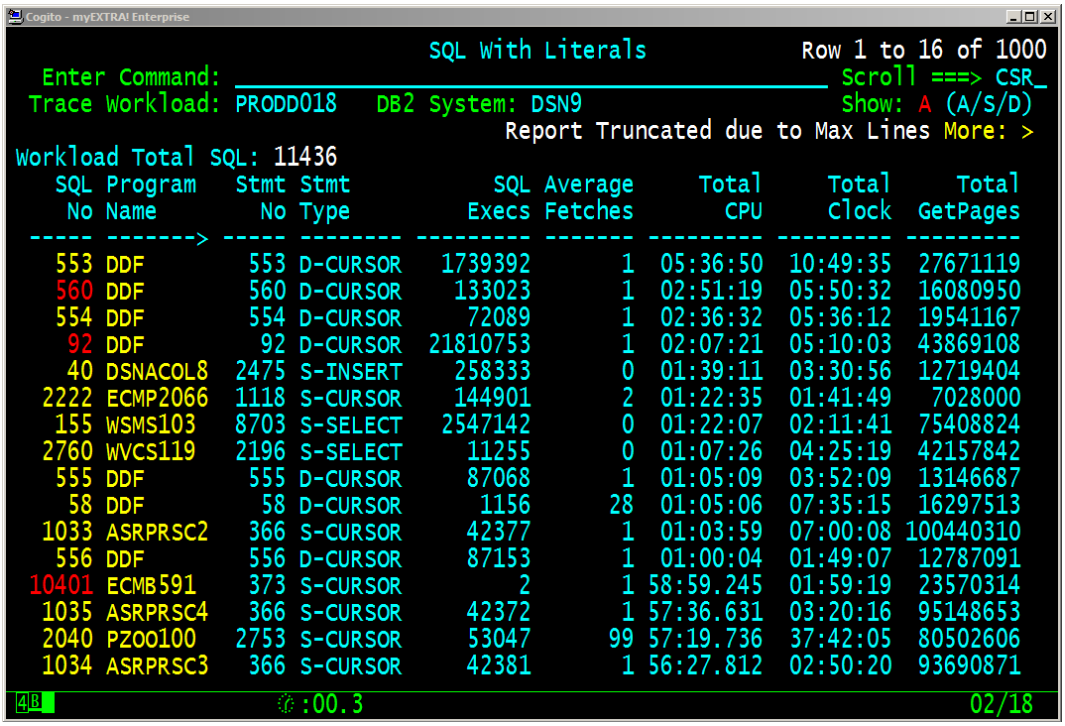
Figure 23 More SQL Reports (Warehouse)

Notice that the menu is different depending on whether you are in EZ-Tracer/Cache or EZ-SQL Warehouse as some of the reports are not available in EZ-SQL Warehouse.

These reports are described on the following pages.

25.1 SQL Containing Literals

Select report 25.1 to display the SQL Containing Literals display as shown in the following figure:-



```
Cogito - myEXTRA! Enterprise
                              SQL With Literals            Row 1 to 16 of 1000
 Enter Command: ____________________________________________ Scroll ===> CSR_
 Trace Workload: PRODD018   DB2 System: DSN9                  Show: A (A/S/D)
                                   Report Truncated due to Max Lines More: >
Workload Total SQL: 11436
   SQL Program   Stmt Stmt          SQL Average     Total     Total     Total
    No Name       No Type         Execs Fetches       CPU     Clock  GetPages
 ----- --------> ----- --------- --------- ------- --------- --------- ---------
   553 DDF         553 D-CURSOR    1739392       1  05:36:50  10:49:35  27671119
   560 DDF         560 D-CURSOR     133023       1  02:51:19  05:50:32  16080950
   554 DDF         554 D-CURSOR      72089       1  02:36:32  05:36:12  19541167
    92 DDF          92 D-CURSOR   21810753       1  02:07:21  05:10:03  43869108
    40 DSNACOL8   2475 S-INSERT     258333       0  01:39:11  03:30:56  12719404
  2222 ECMP2066   1118 S-CURSOR     144901       2  01:22:35  01:41:49   7028000
   155 WSMS103    8703 S-SELECT    2547142       0  01:22:07  02:11:41  75408824
  2760 WVCS119    2196 S-SELECT      11255       0  01:07:26  04:25:19  42157842
   555 DDF         555 D-CURSOR      87068       1  01:05:09  03:52:09  13146687
    58 DDF          58 D-CURSOR       1156      28  01:05:06  07:35:15  16297513
  1033 ASRPRSC2    366 S-CURSOR      42377       1  01:03:59  07:00:08 100440310
   556 DDF         556 D-CURSOR      87153       1  01:00:04  01:49:07  12787091
 10401 ECMB591     373 S-CURSOR          2       1 58:59.245  01:59:19  23570314
  1035 ASRPRSC4    366 S-CURSOR      42372       1 57:36.631  03:20:16  95148653
  2040 PZOO100    2753 S-CURSOR      53047      99 57:19.736  37:42:05  80502606
  1034 ASRPRSC3    366 S-CURSOR      42381       1 56:27.812  02:50:20  93690871
 4B                    :00.3                                          02/18
```

Figure 24 SQL with Literals

This display is similar to report 22 - SQL by Program except that only SQL with Hard Coded Literal values are shown.

Used in conjunction with report 24 - SQL with Consolidation Count > 0, this display can provide valuable assistance in selecting the best candidates for replacing hard coded literal with host variables and thereby improving DB2 Dynamic Statement Cache performance.

Refer to report 22 for further details of the information displayed.

25.2 SQL with RID or RLIM Failures

Select report 25.2 to display the SQL with RID or RLIM Failures display for the Workload as shown in the following figure:-

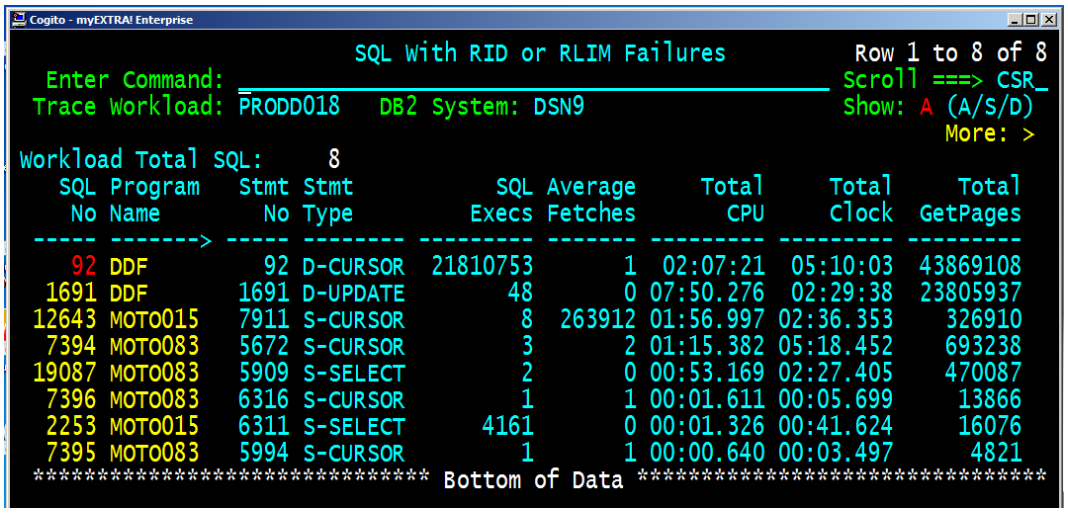


Figure 25 SQL with RID List Failures

This display is equivalent to report 22 - SQL by Program except that only SQL with RID or RLIM Failures are shown, that is where an SQL exceeded a resource limit or a RID list could not be used for one of the following reasons:-

- A RID list was not used because the number of RIDS would have exceeded one or more internal DB2 limits.
- A RID list was not used because not enough storage was available to hold the list of RIDS.

Identifying such SQL is extremely valuable in tuning systems, as the SQL reported are SQL that have been forced to use a non-optimal access path due to some DB2 resource problem. The displays will show you the average and total costs for each statement, and will permit you to decide whether corrective action is justified.

Refer to report 22 for further details of the information displayed.

25.3 SQL with same Select List

Select report 25.3 to display the SQL with same Select List display for the Workload as shown in the following figure:-

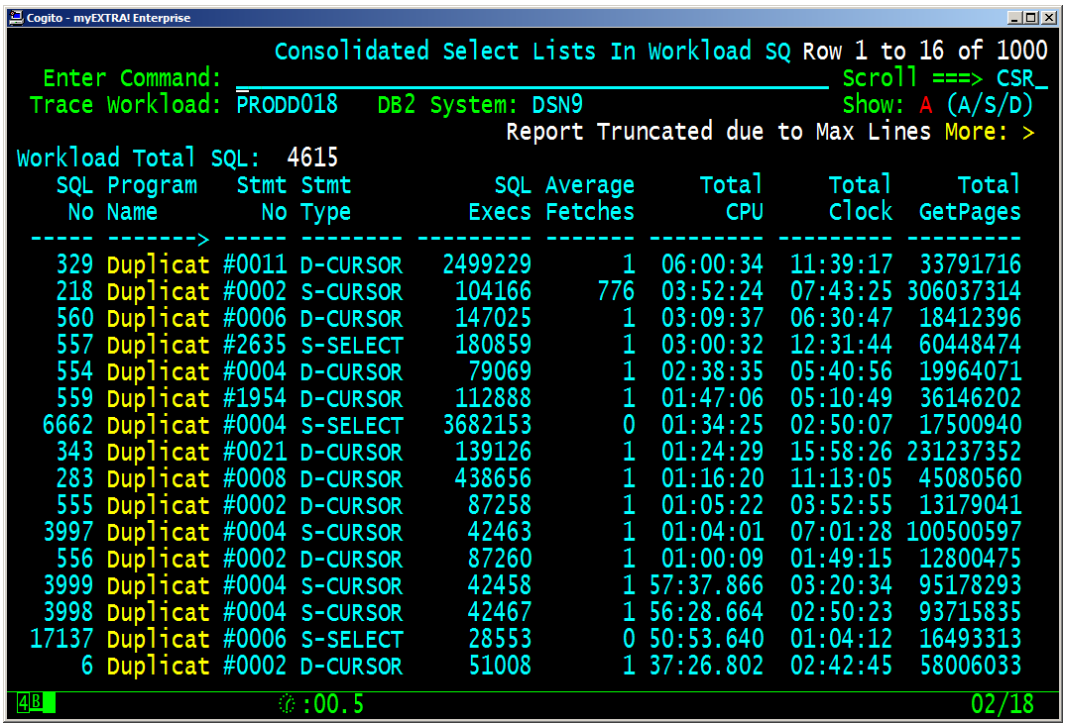


Figure 26 Consolidated Select List SQL

The display shows all SQL statements that have matching SELECT lists with other SQL.

Where a statement has been used in more than one program the Program Name field will display as **duplicat** and the Stmt No field will display as **#nnnn** where nnnn is the number of duplicates. Drilling on the Program Name field will show all of the other SQL that return the same result set. You can DRILL on each statement to see the SQL syntax and performance related data.

This information may be useful in assisting with the design of MQTs.

This display is equivalent to report 22 except that only SQL with matching Select Lists are displayed by this option. Refer to report 22 for further details of the information displayed.

25.4 SQL Text

Select report 25.4 to display the SQL text display for the Workload as shown in the following figure:-

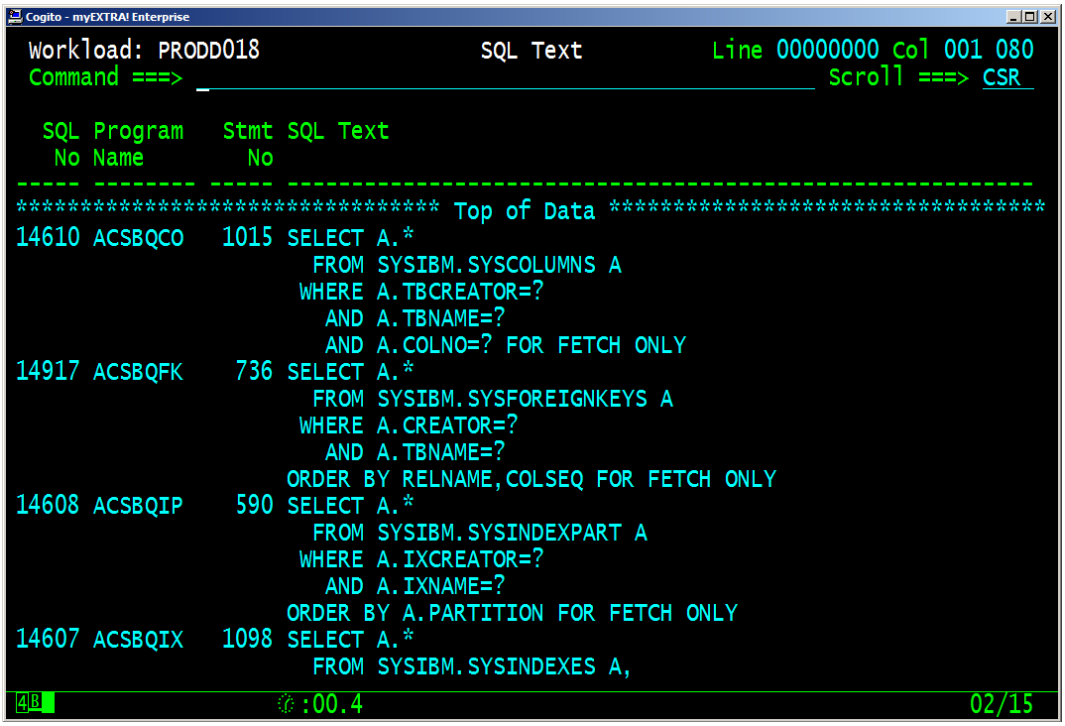


Figure 27 SQL Text

The display shows the text for all of the SQL statements in the Workload.

The following information is displayed on this panel:-

SQL No	SQL No is a unique internal name generated by EZ-Tracer/Cache to identify each distinct SQL statement..
Program Name	The program name containing the SQL statement.
Stmt No	The statement number within the program.
SQL Text	The SQL text

This display is an ISPF browse session on the member hlq.workload.REPORTS(T0030000), where HLQ is the high-level qualifier used by the EZ-DB2 software, and workload is the current Trace Workload name. This may be useful if you would like to extract the SQL in the workload to a flat-file for some purpose.

25.5 Flagged SQL

Select report 25.5 to display the Flagged SQL as shown in the following figure:-

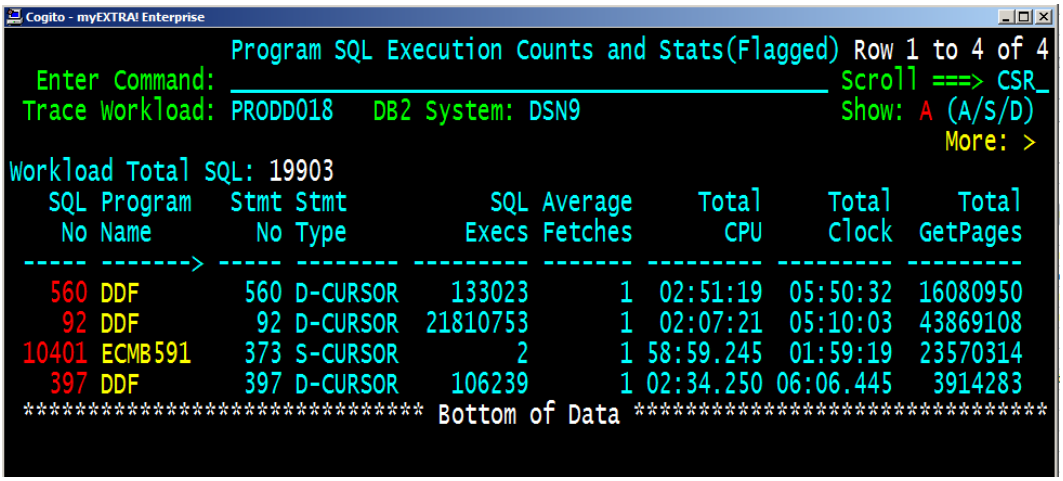


Figure 28 Flagged SQL

This option will show the SQL by Program report, but only for SQL that have been flagged.

This allows a workload to be examined initially to identify potential SQL which may need further investigation. Rather than examine each SQL as it is identified, the SQL can be flagged and then investigated further at a later time or indeed passed onto another user to investigate. The flag remains set across sessions and users.

An SQL statement can be flagged at any time by entering “FLAG SQL nn” where nn is the SQL number. When flagging an SQL, it is also necessary to enter some descriptive text, for example as a reminder as to why the particular SQL has been flagged.

To display the descriptive text, position the cursor on the SQL No and press the expand <**PF6**> Key.

An SQL statement can be un-flagged at any time by entering “FLAG SQL nn OFF” where nn is the SQL number.

A flagged SQL statement will have its SQL No shown in red.

To remove all flags from all SQL statements enter “FLAG SQL RESETALL”

Refer to report 22 for further details about the information shown in this report.

Refer to the EZ-DB2 Commands Reference for further details about the Flag command.

25.6 SQL with Errors

EZ-Tracer/Cache only!

Select report 25.6 to display the SQL with Errors report for the Workload as shown in the following figure:-

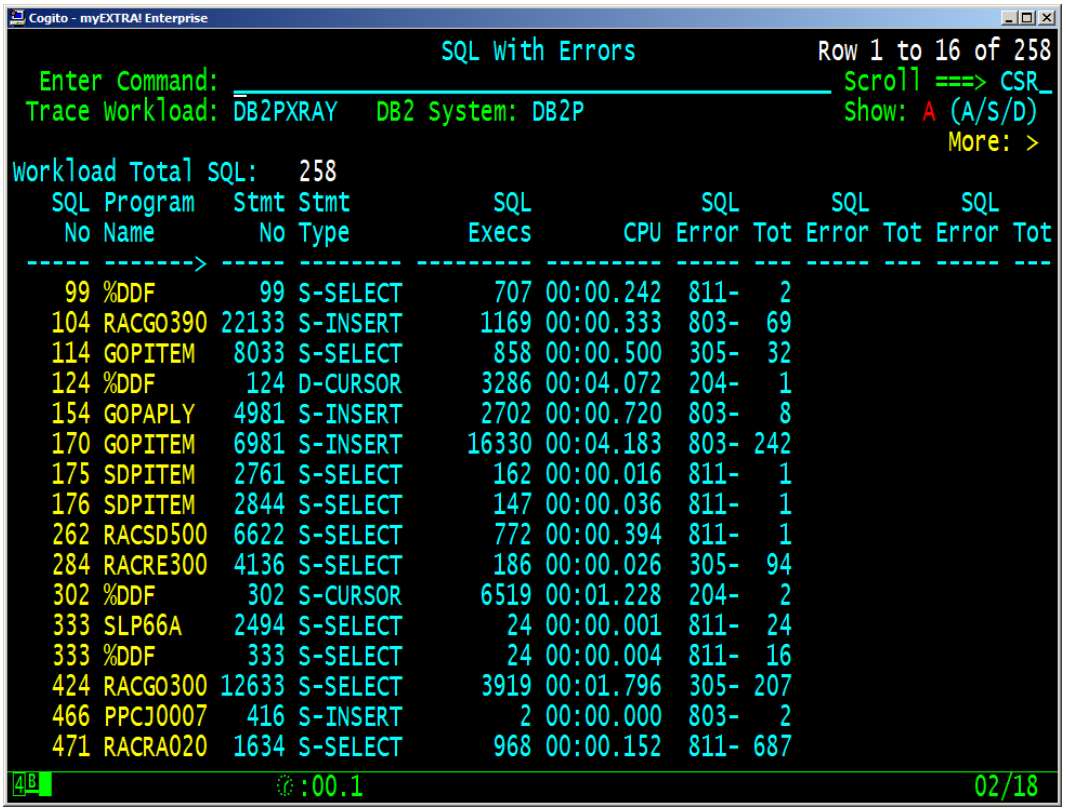


Figure 29 SQL with Errors

This display lists all of the SQL statements that have negative SQL codes. The following information is displayed:-

SQL No

SQL No is a unique internal name generated by EZ-Tracer/Cache to identify each distinct SQL statement.

You can DRILL on the SQL no to view the SQL Error Audit Trail report for the selected SQL number.

Flagged SQL Statements are shown in red. Refer to the FLAG SQL command in the EZ-DB2 Commands Reference Guide

Program Name

The Program name containing the First occurrence of a particular SQL statement.

You can DRILL on the Program Name to view the SQL Error Audit Trail report for the selected program.

Stmt No	The statement number within the program.
Stmt Type	The statement type i.e. OPEN, UPDATE, INSERT or DELETE.
SQL Execs	The number of executions of this SQL statement.
CPU	The Total CPU Cost for this SQL statement.
SQL Error	The negative SQL code.
Tot	The number of occurrences of this SQL code.

Additional SQL error codes associated with this SQL are displayed to the right. Page Right <**PF11**> for additional SQL codes.

25.7 SQL with Captured Host Variables

EZ-Tracer/Cache Only!

Select report 25.7 to display the SQL with Captured Host Variables display as shown in the following figure:-

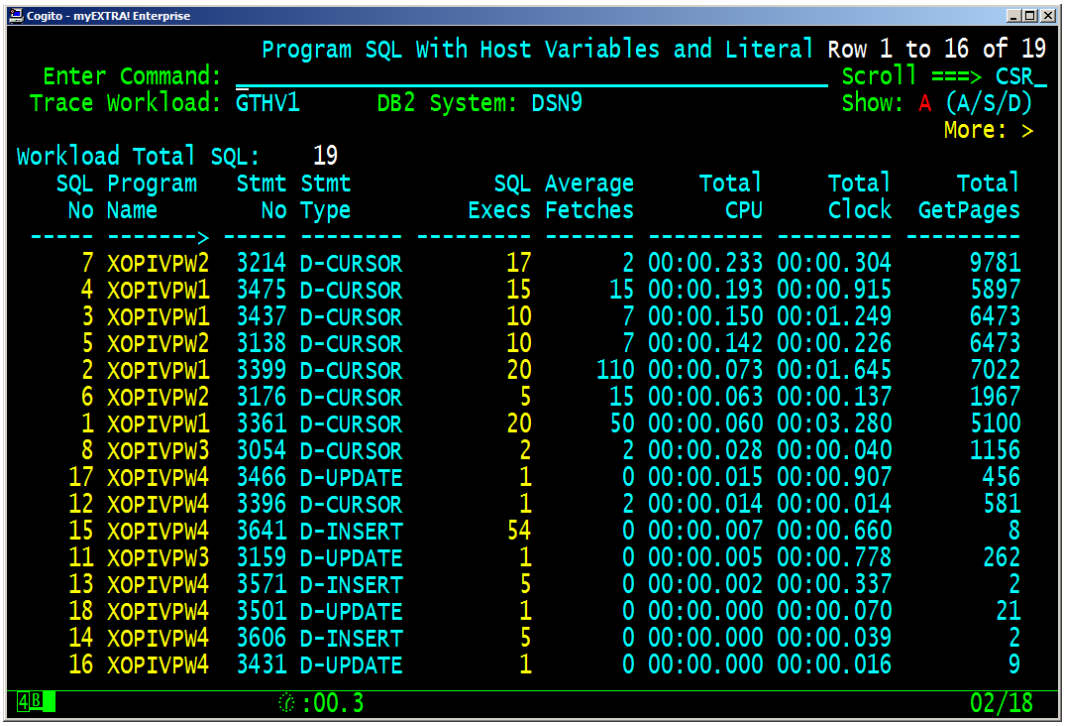


Figure 30 SQL with Captured Host Variables

Refer to EZ-Tracer/Cache User Guide for information about capturing Host Variable and Literal values.

This display is similar to report 22 - SQL by Program except that only SQL with Captured Host Variables are shown. Notice also that the SQL Execs field is DRILLABLE. That means that you can DRILL on this field to see the individual executions for each SQL as shown in Figure 31

The following information is displayed on this panel:-

Show: Display Toggle field:-

A - Show ALL SQL in Workload
S - Show Static SQL Only
D - Show Dynamic SQL Only

Workload Total SQL The number of SQL in the Workload after Consolidation.

SQL No

SQL No is a unique internal name generated by EZ-DB2 to identify each distinct SQL statement.

You can DRILL on the SQL no to view the SQL Detail display.

Flagged SQL Statements are shown in red. Refer to the FLAG SQL command in the EZ-DB2 Commands Reference Guide

Program Name

The Program name issuing the SQL statement.

You can DRILL on the Program name to view the SQL By Program display for the selected program,

Stmt No

The statement number within the program.

Stmt Type

The Statement Type:-

i-CURSOR	An Open Cursor Statement
i-SELECT	A Singleton Select
i-INSERT	An INSERT statement
i-DELETE	A DELETE statement

The indicator i - indicates whether the statement is Static(S) or Dynamic(D).

SQL Execs

The number of executions of this SQL statement. Note that in this report, this is a DRILLABLE field.

DRILL <PF4> on SQL Execs to see the SQL execution report for the selected SQL as shown in Figure 31.

See also the HV Command in the EZ-DB2 Commands Reference Guide.

Average Fetches

The average number of fetches performed per SQL.

Total CPU

The Total CPU Cost for this SQL statement.

Total Clock

The Total Elapsed time for this SQL statement.

Total Getpages

The Total number of GetPage requests.

Average CPU

The Average CPU Cost for this SQL statement.

Average Clock

The Average Elapsed time for this SQL statement.

Average Getpages

The Average number of GetPage requests.

Total Timerons

The Total DB2 Timerons for the SQL statement.

Average Timerons

The Average DB2 Timerons for the SQL statement.

Total Rows Processed	The Total Number of Rows Processed by this SQL statement.
Total Rows Looked at	The Total Rows Looked at for the SQL statement.
Total Rows DM Stage-1	The Total Number of DM Stage-1 requests.
Total Rows RDS Stage-2	The Total Number of RDS Stage-2 requests.
Total Row Updates	The Total number of Rows Updated.
Avg Rows Processed	The Average Number of Rows Processed.
Avg Rows Looked at	The Average Rows Looked at for the SQL statement.
Avg Rows DM Stage-1	The Average Number of DM Stage-1 requests.
Avg Rows RDS Stage-2	The Average Number of RDS Stage-2 requests.
Avg Row Updates	The Average number of Rows Updated.
RID List Failures	The Number of RID List Failures that occurred for this SQL.
RLIM Failures	The number of times the SQL received an SQLCODE of -905 for exceeding a resource limit
SQL Lit	Indicates whether or not the SQL statement used hard coded literal value(s) Y - The SQL had a least one hard-coded literal value. N - The SQL had no hard coded literal values.
SQL Consold	The number of times this statement has been consolidated. That is, the number of times EZ-Tracer/Cache identified statements that were 'essentially' the same, and merged them into the same SQL no. Thus, a single SQL No may represent many different 'essentially the same' SQL statements.
Stg 2	Whether this SQL performed Stage -2 processing. Y - Stage 2 processing took place. N - Stage 1 Only.

You can DRILL on the SQL Execs field to show the Program SQL with Host Variables and Literals for the selected SQL. You may then DRILL down on each distinct execution of the SQL to see the specific Host Variable or literal values for that execution. For example, DRILL on the 17 SQL Execs for SQL No 7 to see the following display:-

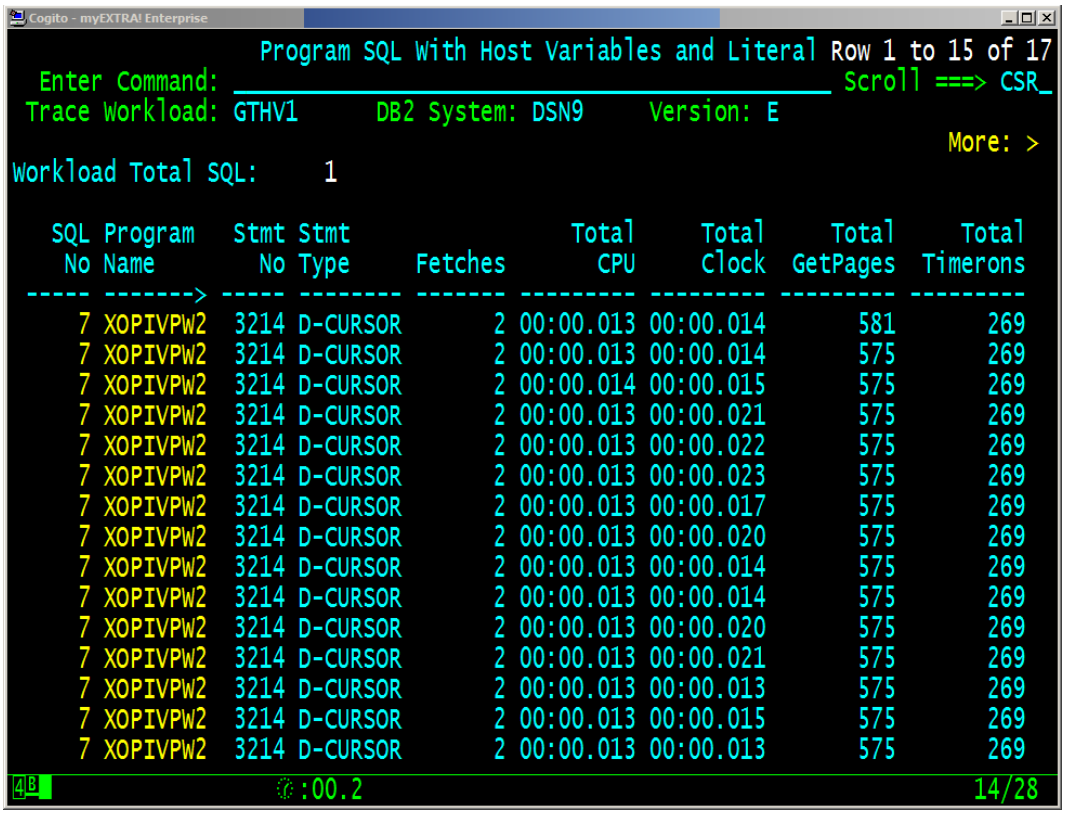


Figure 31 SQL with Captured Host Variables (2)

You can now see all executions of SQL No 7. Note that you can also display this report by entering the command HV 7 in the command line, or entering the command HV while viewing the SQL detail for SQL No 7. Refer to the EZ-DB2 Commands Reference for further information.

The following information is displayed:-

SQL No

SQL No is a unique internal name generated by EZ-DB2 to identify each distinct SQL statement.

You can DRILL on the SQL no to view the SQL Detail display.

Flagged SQL Statements are shown in red. Refer to the FLAG SQL command in the EZ-DB2 Commands Reference Guide

Program Name

The Program name issuing the SQL statement.

You can DRILL on the Program name to view the SQL By Program display for the selected program,

Stmt No

The statement number within the program.

Stmt Type	The Statement Type:- i-CURSOR An Open Cursor Statement i-SELECT A Singleton Select i-INSERT An INSERT statement i-DELETE A DELETE statement The indicator i - indicates whether the statement is Static(S) or Dynamic(D).
Fetches	The number of fetches for this SQL.
Total CPU	The Total CPU Cost for this SQL statement.
Total Clock	The Total Elapsed time for this SQL statement.
Total Getpages	The Total number of GetPage requests.
Total Timerons	The Total Timeron cost for this SQL statement.
Total Rows Processed	The Total Number of Rows Processed by this SQL statement.
Total Rows Looked at	The Total Rows Looked at for the SQL statement.
Total Rows DM Stage-1	The Total Number of DM Stage-1 requests.
Total Rows RDS Stage-2	The Total Number of RDS Stage-2 requests.
Total Row Updates	The Total number of Rows Updated.
Avg Rows Processed	The Average Number of Rows Processed.
Avg Rows Looked at	The Average Rows Looked at for the SQL statement.
Avg Rows DM Stage-1	The Average Number of DM Stage-1 requests.
Avg Rows RDS Stage-2	The Average Number of RDS Stage-2 requests.
Avg Row Updates	The Average number of Rows Updated.
RID List Failures	The Number of RID List Failures that occurred for this SQL.
RLIM Failures	The number of times the SQL received an SQLCODE of -905 for exceeding a resource limit
SQL Code	The SQL code if an SQL error code was returned for this execution.
Timestamp	The date and time for this execution.

You can also generate a report filtered to include only SQL within a certain time range. See report option 25.8.

Threadkey	The Threadkey corresponding to this particular execution. This is a DRILLABLE field. Drill on this field to see the Program SQL with Host Variables and Literals report for all SQL in the same thread.

25.8 SQL Executions Ad Hoc Reports

EZ-Tracer/Cache only!

This option is used to generate Ad Hoc Reports based upon the SQL with Captured Host Variables report, to generate reports based upon selection criteria, such as Plan/ Package name, and time stamp range.

Select Option 25.8 to display the following panel:-

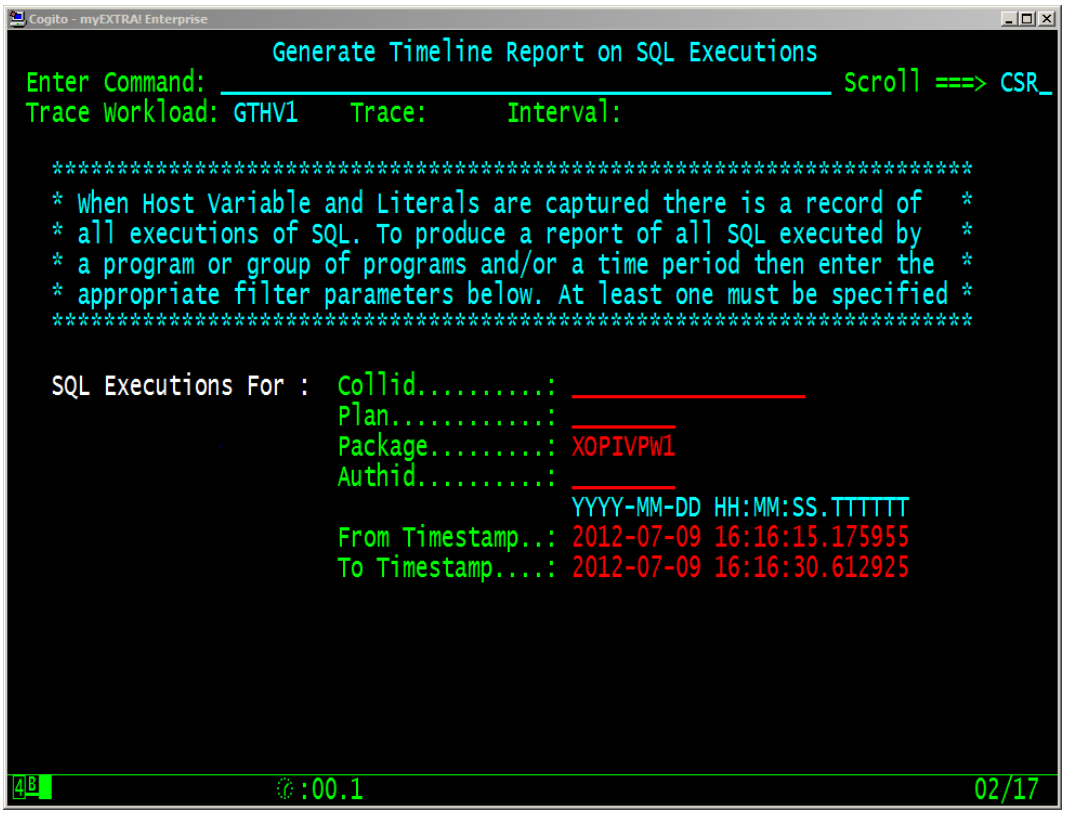


Figure 32 Ad Hoc Report

Collid	Optionally specify a collection ID to be used as a filter.
Plan	Optionally specify a Plan name to be used as a filter.
Package	Optionally specify a Package name to be used as a filter.
Authid	Optionally specify a AUTHID to be used as a filter.
From Timestamp	Optionally specify a FROM timestamp to be used as a filter.
To Timestamp	Optionally specify a TO timestamp to be used as a filter

At Least one filter must be specified. After specifying the filters, press <**enter**> to generate the report. The report generated will be the same as shown in Figure 31

25.9 SQL with Stage 2 processing

EZ-Tracer/Cache only!

Select report 25.9 to display the SQL with Stage 2 processing report as shown in the following figure:-

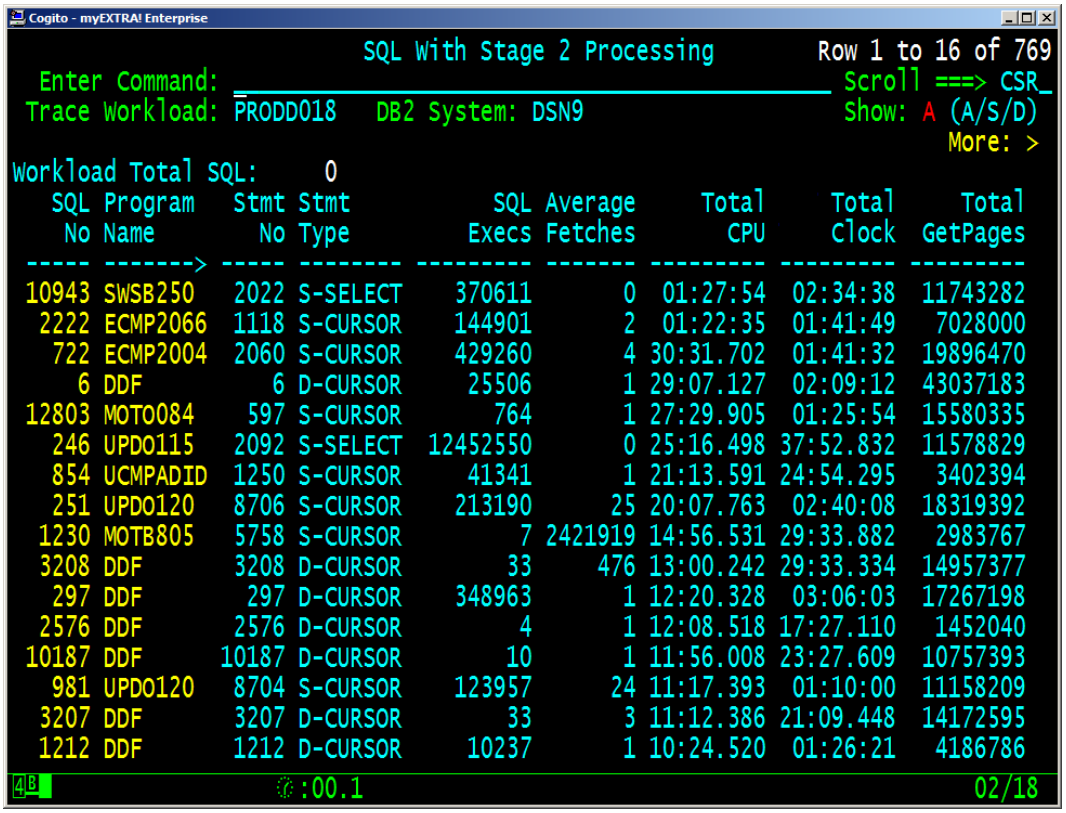


Figure 33 SQL with Stage 2 Processing

This option will show the SQL by Program report, but only for SQL that have stage 2 processing..

Refer to report 22 for further details about the information shown in this report.

25.10 SQL Error Audit Trail

EZ-Tracer/Cache only!

Select report 25.10 to display the SQL Error Audit Trail report as shown in the following figure:-

Note that you can also view this display by DRILLING on a particular SQL No or Program name in report 25.6

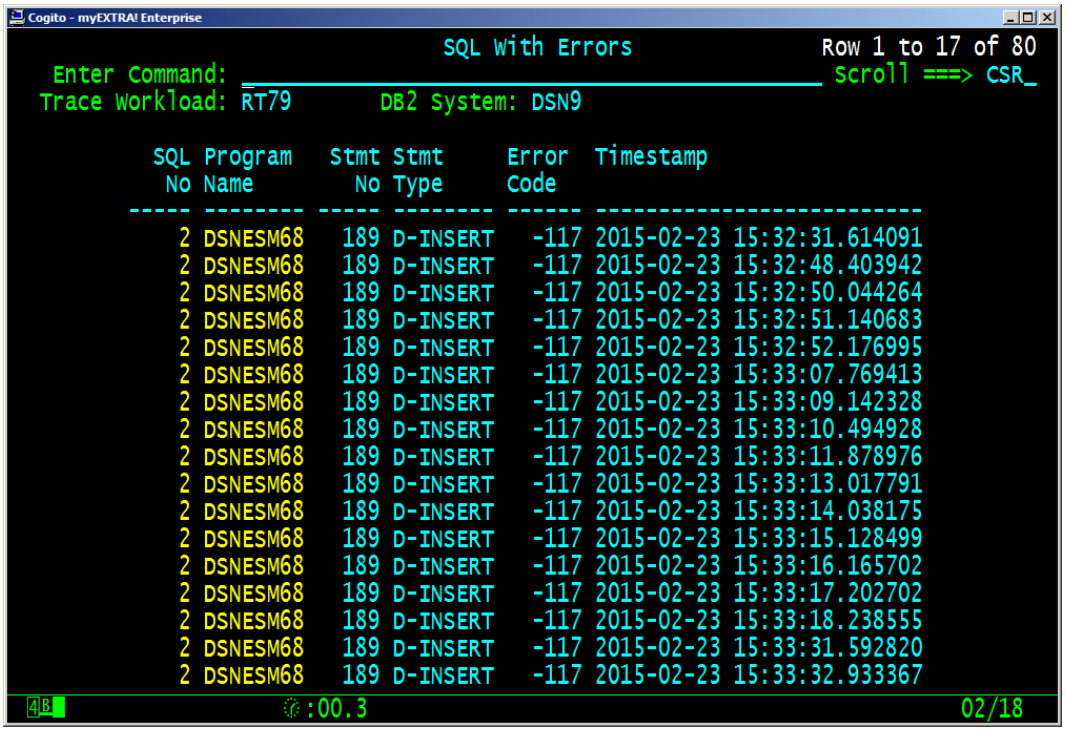


Figure 34 SQL Error Audit trail

SQL No

SQL No is a unique internal name generated by EZ-Tracer/Cache to identify each distinct SQL statement.

You can DRILL on the SQL no to view the SQL Detail display.

Flagged SQL Statements are shown in red. Refer to the FLAG SQL command in the EZ-DB2 Commands Reference Guide

Program Name

The Program name containing the First occurrence of a particular SQL statement.

Stmt No

The statement number within the program.

Stmt Type

The statement type i.e. OPEN, UPDATE, INSERT or DELETE.

SQL Error	The negative SQL code.
Timestamp	The TIMESTAMP when this error occurred.

25.11 SQL Access Paths

EZ-Tracer/Cache only!

Select report 25.11 to display the SQL Access Paths report as shown in the following figure:-

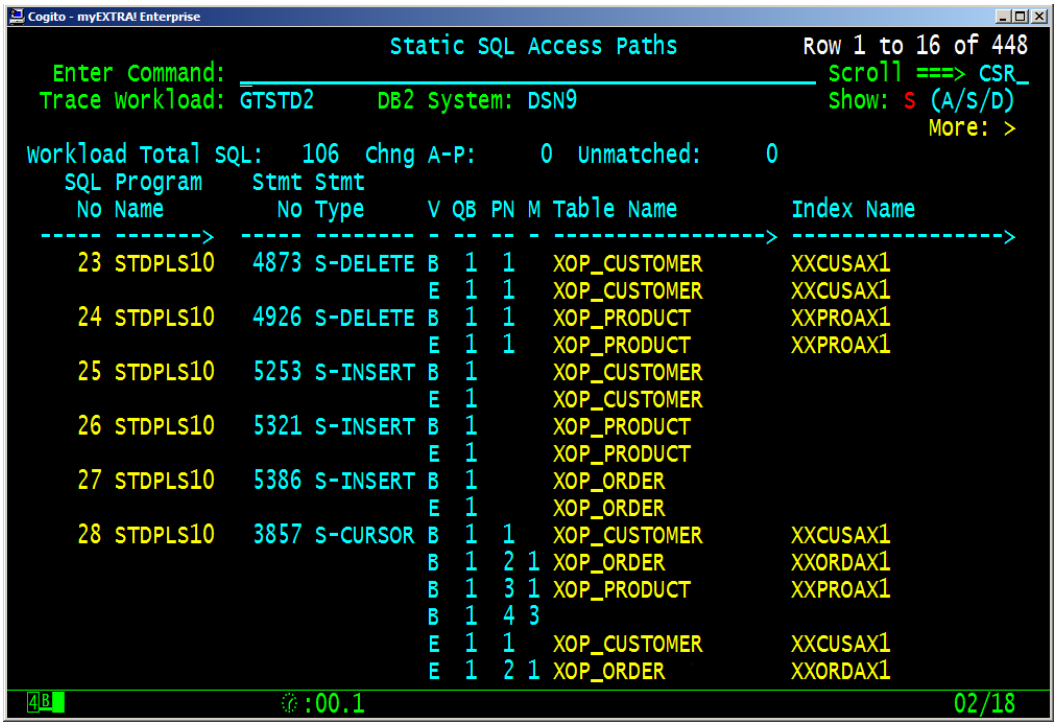


Figure 35 SQL Access Paths

The Access Path report summarizes the Access Paths for each SQL in the Tracer Workload. The following information is displayed on this screen:-

Workload — The Workload name.

Show: _ (A/S/D) — You can filter the report to include

A	All SQL
S	Static SQL
D	Dynamic SQL

Workload Total SQL — The total number of SQL in the Workload.

SQL No — An EZ-DB2 internal identifier used to represent each distinct SQL statement being processed for a particular WORKLOAD.

Program Name — The name of the program containing this SQL statement.

Stmt No — The statement number within the program.

Stmt Type	The statement type ie. i-CURSOR i-SELECT i-INSERT i-DELETE. The indicator i - indicates whether the statement is Static(S) or Dynamic(D).

The following section describes the access path details

Column	Name	Description
V	Version	The Version Identifier that this access path description refers to. E The access path obtained by doing a dynamic explain of the SQL (Dynamic and Static SQL) B The access path obtained from a BIND plan table (Static SQL only).
QB	QBLOCKNO	A number that identifies each query block within a query. The value of the numbers are not in any particular order nor are they necessarily consecutive.
PN	PLANNO	The number of the step in which the query indicated in QBLOCKNO was processed. This Column indicates the order in which the steps were executed.
M	METHOD	A number that indicates the join method used 0, First table accessed, continuation or not used 1, Nested loop join. 2, Merge scan join. 3, Sorts needed. This step does not need a table. 4, Hybrid join
Table Name		The name of a table, MQT, created or declared temp table, materialized view, or materialized table expression. Blank if METHOD=3. Note that you can DRILL on a table name to see the associated catalog statistics for the selected table.
Index Name		The Index Name if applicable. Note that you can DRILL on an Index name to see the associated catalog statistics for the selected index.
AT	ACCESSTYPE	The method of accessing the table I , by an index I1, by a one fetch index scan N , by an index scan matching IN list of values R , tablespace scan M , multiple indexscan, followed by MX, MI or MU

		MX, index scan on the named index MI, an intersection of multiple indexes MU, a union of multiple indexes RW, workfile scan of materialised user-def tab func T, by a sparse index (star join workfile) V, by buffers for an INSERT statement in a select.
P	PREFETCH	blank, No prefetch S, Pure sequential prefetch L, List prefetch D, Optimizer expects dynamic prefetch (V8)
MC	MATCH COL	For ACCESSTYPE I,I1,N or MX the number of index keys used in an index scan; otherwise, 0.
SC	SCREEN COLS	For ACCESSTYPE I,I1,N or MX the number of index keys on top of MATCHCOLS used for index screening.
S2		1 =Stage 1 Only, 2 =Stage 2 processing took place, blank =DSN_FILTER_TABLE unavailable in which case if DMROWS=RDSROWS then probably no Stage 2 processing.
XO	INDEX ONLY	Y index only access, else N
MX	MIXOPSEQ	The sequence number in multiple index operation. 1,2,...n. For the steps of the multiple index procedure (ACCESSTYPE is MX, MI or MU) 0 For any other rows (ACCESSTYPE is I, I1, M, N, R, or blank)
JT	JOIN TYPE	The type of an Outer Join F = Full Outer Join L = Left Outer Join S= Star Join blank = Inner Join or No Join Note: RIGHT OUTER JOIN converts to a LEFT OUTER JOIN when you use it so JT contains L
CF	COLUMN FN EVAL	When SQL column function is to be evaluated R, when data is read from table of index S, during a SORT for GROUPBY blank, after data retrieval and after any sorts
SORTS		Indicates the types of SORT performed UN = SORT to remove duplicate rows JN = SORT for join method 2 or 4 ON = SORT executed for ORDERBY GN = SORT executed for GROUPBY UC = Composite table sorted to remove duplicates JC = Composite table sorted for join method 1,2 or 4 OC = Composite table sorted for ORDERBY or a quantified predicate GC = Composite table sorted for GROUPBY

AD	ACCESS DEGREE	The number of parallel tasks or operations activated by a query. This value is determined at bind time; the actual number of parallel operations used at execution time could be different. This column is blank if there is a host variable.
JD	JOIN DEGREE	The number of parallel operations or tasks used in joining the composite table with the new table. This value is determined at bind time, and can be blank if there is a host variable. The actual number of parallel operations or tasks used at execution time could be different.
PM	PARALLELISM MODE	The kind of parallelism, if any, used at bind time. I Query I/O parallelism C Query CP parallelism X Sysplex query parallelism
LKM	TSLOCKMODE	An indication of the mode of Lock to be acquired IS Intent share lock IX Intent exclusive lock S Share lock U Update lock X Exclusive lock SIX Share with intent exclusive lock N UR isolation; no lock NS For UR isolation, no lock; for CS, RS, or RR an S lock NI For UR isolation, no lock; for CS, RS, or RR an IS lock NSS For UR isolation, no lock; for CS or RS, an IS lock; for RR, an S lock SS For UR, CS, or RS isolation, an IS lock; for RR, an S lock
PR	PAGE RANGE	Indication of whether the table qualifies for page range screening, so that plans scan only the partitions that are needed. Y YES Blank NO
Table Creator		Creator of the new table created in this step blank if method is 3.
Database Name		The name of the database for the table.
Hint Used		If DB2 has used an optimization hint, contains the identifier for that hint (the value of OPTHINT).

Bind Time

The time at which the plan or package for this statement or query block was bound. For static SQL statements, this is a full precision timestamp value. For dynamic SQL, this is the value contained in the TIMESTAMP column appended by 4 zeros.

From the Access Path Detail Report, you can DRILL on a SQL No to see the SQL Detail displays for the Selected SQL.

31 Authid SQL Detailed Costs

Select report 31 to display the Authid SQL Detailed Costs as shown in the following figure:-

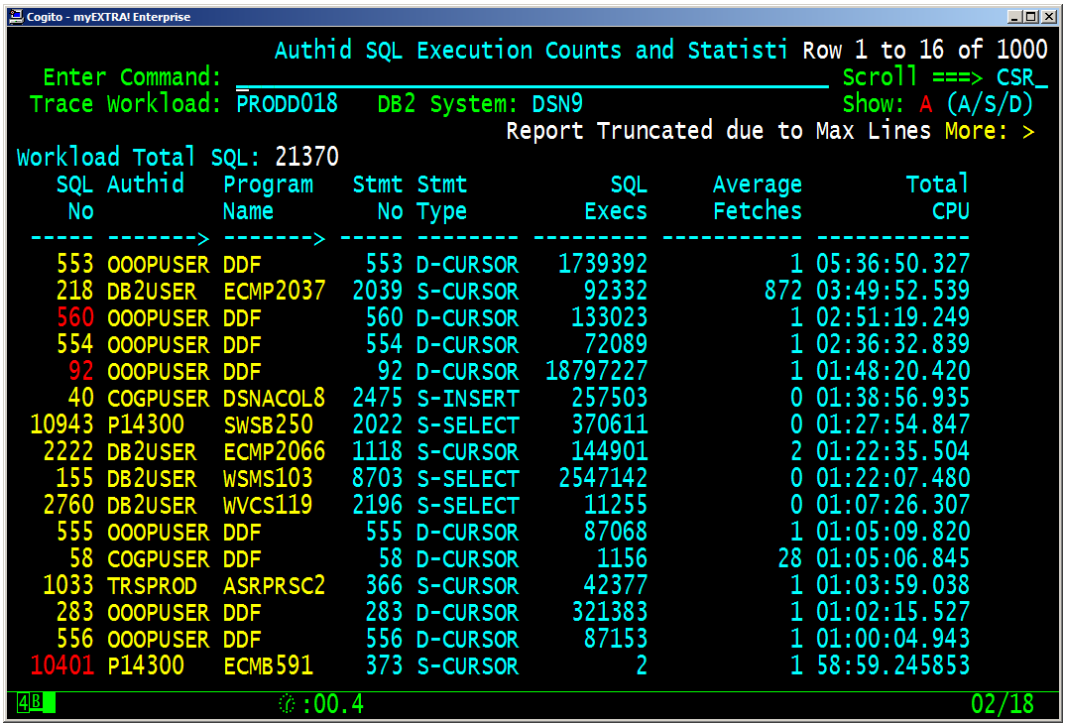


Figure 36 Authid SQL Detailed Costs

The report is similar to the SQL by Program display, except the report is broken down by AUTHID.

If an SQL is executed by multiple AUTHIDS, there will be multiple occurrences of the SQL No in the report.

You can Sort on SQL No to see all of the AUTHIDS that execute a particular SQL. You can DRILL on an AUTHID to see all of the SQL executed by that AUTHID.

The following information is displayed on this panel:-

Show: Display Toggle field:-

A - Show ALL SQL in Workload
S - Show Static SQL Only
D - Show Dynamic SQL Only32

Workload Total SQL The number of SQL in the Workload after Consolidation.

SQL No

SQL No is a unique internal name generated by EZ-DB2 to identify each distinct SQL statement.

You can DRILL on the SQL no to view the SQL Detail display.

Flagged SQL Statements are shown in red. Refer to the FLAG SQL command in the EZ-DB2 Commands Reference Guide

AUTHID

The AUTHID that executed this SQL.

You can DRILL on the AUTHID to filter the report for the selected AUTHID.

Program Name

The Program name issuing the SQL statement.

You can DRILL on the Program name to view the SQL By Program display for the selected program,

Stmt No

The statement number within the program.

Stmt Type

The Statement Type:-

i-CURSOR	An Open Cursor Statement
i-SELECT	A Singleton Select
i-INSERT	An INSERT statement
i-DELETE	A DELETE statement

The indicator i - indicates whether the statement is Static(S) or Dynamic(D).

SQL Execs

The number of executions of this SQL statement.

Average Fetches

The average number of fetches performed per SQL.

Total CPU

The Total CPU Cost for this SQL statement.

Average CPU

The Average CPU Cost for this SQL statement.

Total Clock

The Total Elapsed time for this SQL statement.

Average Clock

The Average Elapsed time for this SQL statement.

Total Rows Processed

The Total Number of Rows Processed by this SQL statement.

Total Rows Looked at

The Total Rows Looked at for the SQL statement.

Total Rows DM Stage-1

The Total Number of DM Stage-1 requests.

Total Rows RDS Stage-2

The Total Number of RDS Stage-2 requests.

Total Row Updates

The Total number of Rows Updated.

Total Getpages	The Total number of GetPage requests.
Avg Rows Processed	The Average Number of Rows Processed.
Avg Rows Looked at	The Average Rows Looked at for the SQL statement.
Avg Rows DM Stage-1	The Average Number of DM Stage-1 requests.
Avg Rows RDS Stage-2	The Average Number of RDS Stage-2 requests.
Avg Rows Updated	The Average number of Rows Updated.
Average Getpages	The Average number of GetPage requests.

32 Authid Program Summary

Select report 32 to display the Authid Program Summary as shown in the following figure:-

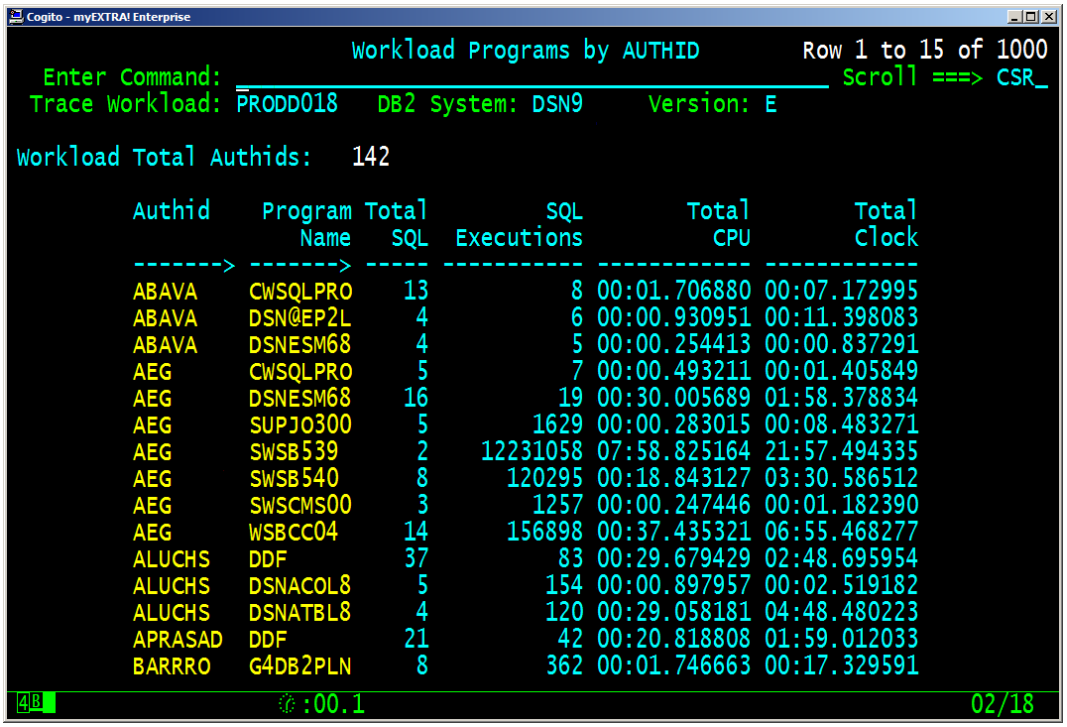


Figure 37 Authid Program Summary

This option summarizes all of the programs executed by each AUTHID for the Workload. By default, the display is sorted by Total CPU, but you could for example Sort by AUTHID to see the summary information for each AUTHID.

The following information is displayed:-

Workload Total Authids — The number of different AUTHIDS encountered in the Workload.

AUTHID — The authorization id. There will be a line for each program executed by each Authid.

You can DRILL on an AUTHID to see the Authid SQL Detailed Costs for the selected AUTHID/Program.

Program Name — The program name executed by this Authid. There will be a line for each program executed by each Authid.

You can DRILL on a Program name to see the Authid SQL Detailed Costs for the selected AUTHID/Program.

Total SQL — The total number of SQL statements executed by this program for this Authid.

SQL Executions	The total Number of Executions of all SQL executed by this program by this Authid.
Total CPU	The total CPU cost of all SQL executed by this program by this Authid.
Total Clock	The total Elapsed time of all SQL executed by this program by this Authid.

33 Program Authid Summary

Select report 33 to display the Program Authid Summary as shown in the following figure:-

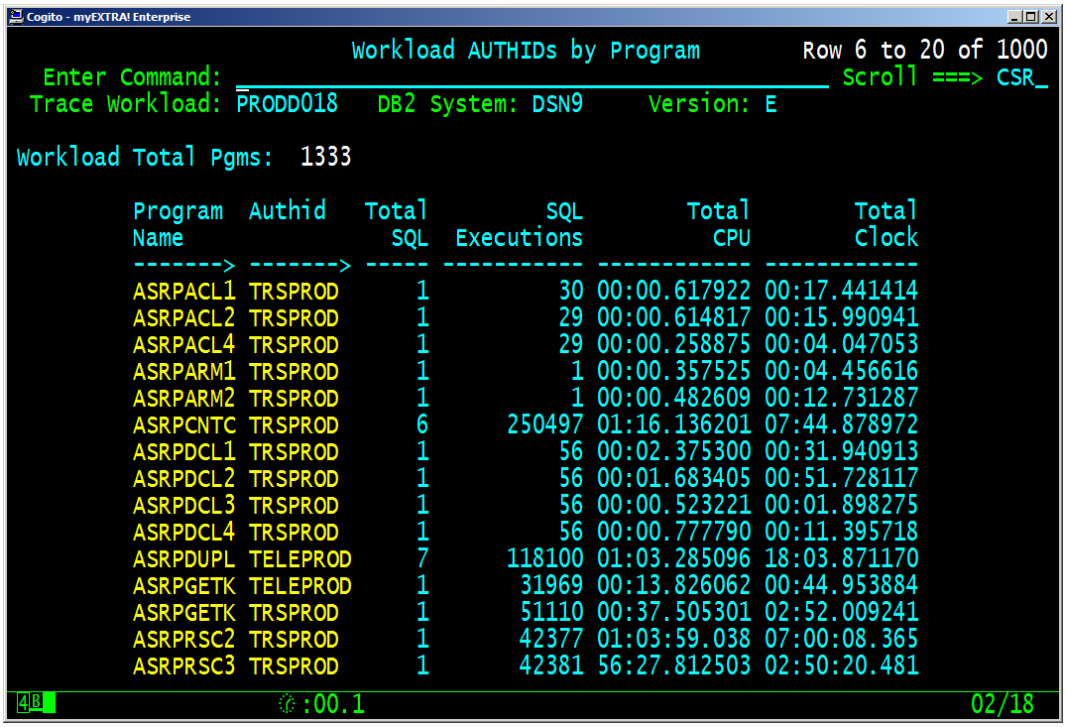


Figure 38 Program Authid Summary

This option summarizes all of the Authids that executed each Program for the Workload. By default, the display is sorted by Total CPU, but you could for example Sort by Program to see the summary information for each Program. The following information is displayed:-

Workload Total Pgms — The number of different Programs encountered in this Workload, Trace Number or Summary Interval.

Program Name — The Program name. There will be a line for each Authid that executed each program.

You can DRILL on the Program name to see the Authid SQL Detailed Costs for the selected Program/Authid.

Authid — The Authid that executed this program. There will be a line for each Authid that executed this program.

You can DRILL on the Authid to see the Authid SQL Detailed Costs for the selected Program/Authid.

Total SQL — The total number of SQL statements executed by this program for this Authid.

SQL Executions — The total Number of Executions of all SQL executed by this program by this Authid.

Total CPU	The total CPU cost of all SQL executed by this program by this Authid.
Total Clock	The total Elapsed time of all SQL executed by this program by this Authid.

41 Plan Program Summary

Select report 41 to display the Plan Program Summary as shown in the following figure:-

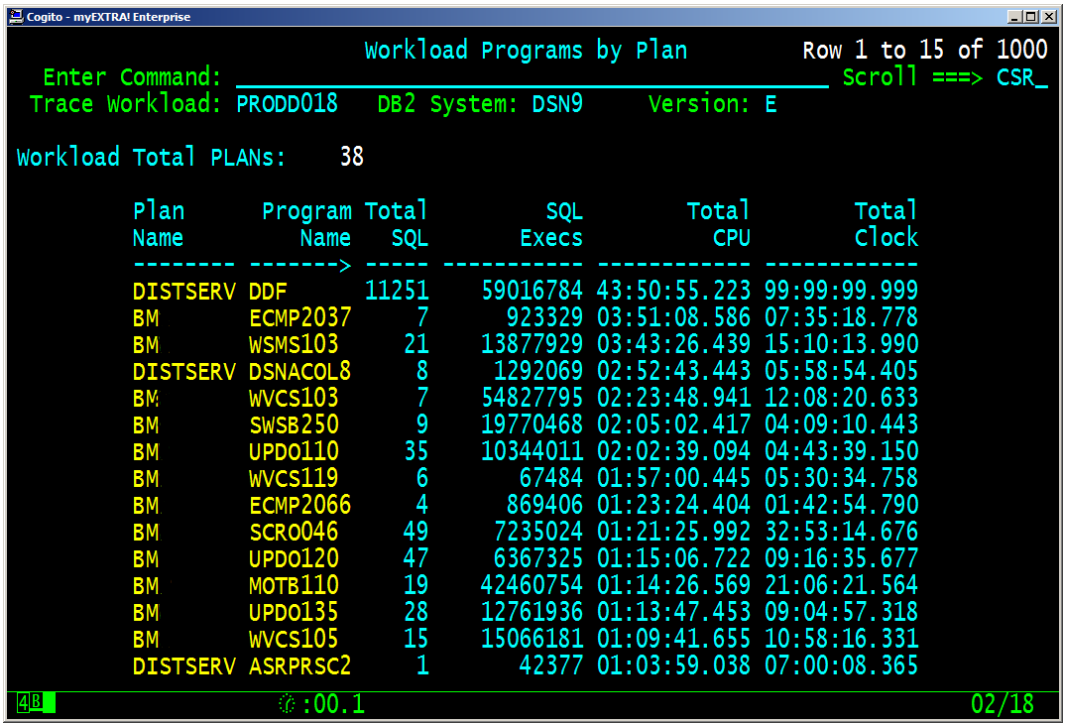


Figure 39 Plan Program Summary

This option summarizes all of the programs executed by each PLAN for the current Workload. By default, the display is sorted by Total CPU, but you could for example Sort by PLAN to see the summary information for each PLAN.

The following information is displayed:-

Workload Total Plans — The number of different Plans encountered in this Workload.

Plan Name — The authorization id. There will be a line for each program executed by each Plan.

You can DRILL on the Plan Name to see the Plan SQL Detailed Costs for the selected Plan Name/ Program name..

Program Name — The program name executed by this Plan. There will be a line for each program executed by each Plan.

You can DRILL on the Program Name to see the Plan SQL Detailed Costs for the selected Plan Name/ Program name.

Total SQL — The total number of SQL statements executed by this program for this Plan.

SQL Execs — The total number of executions of all SQL executed by this program by this Plan.

Total CPU	The total CPU cost of all SQL executed by this program by this Plan.
Total Clock	The total Elapsed time of all SQL executed by this program by this Plan.

42 Plan SQL Detailed Costs

Select report 42 to display the Plan SQL Detailed Costs as shown in the following figure:-

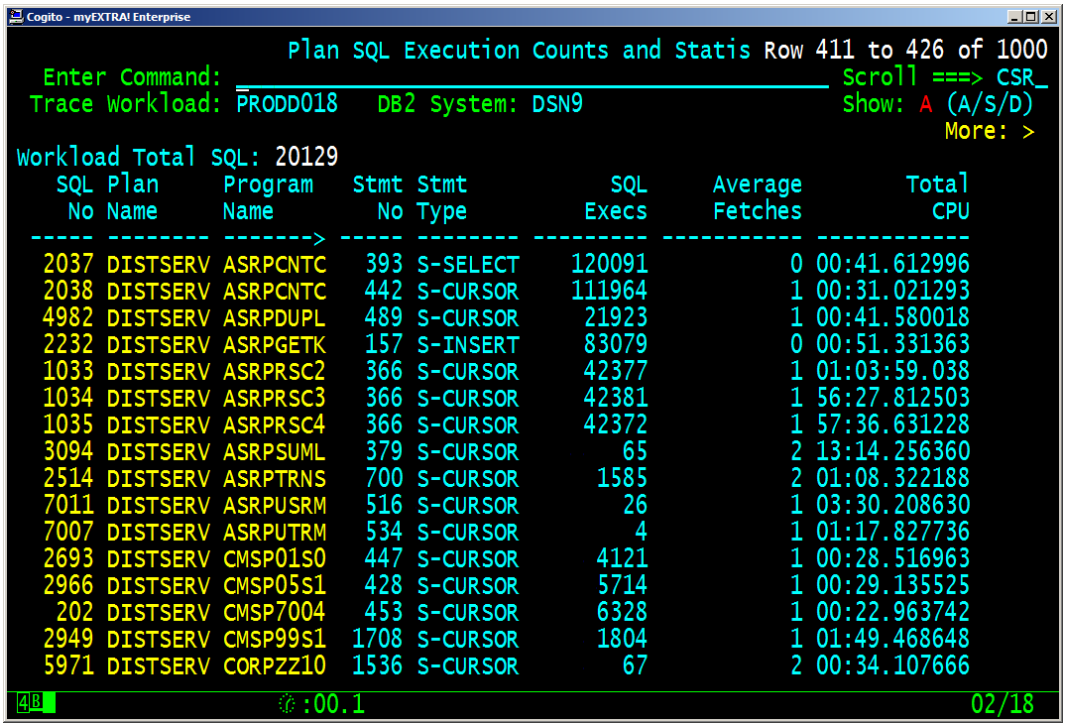


Figure 40 Plan SQL Detailed Costs

The report is similar to the SQL by Program display, except the report is broken down by Plan Name. By default the report is sorted by Total CPU.

The following information is displayed on this panel:-

Show: Display Toggle field:-

A - Show ALL SQL in Workload
S - Show Static SQL Only
D - Show Dynamic SQL Only32

Workload Total SQL The number of SQL in the Workload after Consolidation.

SQL No SQL No is a unique internal name generated by EZ-DB2 to identify each distinct SQL statement.

You can DRILL on the SQL no to view the SQL Detail display.

Flagged SQL Statements are shown in red. Refer to the FLAG SQL command in the EZ-DB2 Commands Reference Guide

Plan Name

The Plan Name that executed this SQL.

You can DRILL on the Plan name to filter the report for the selected Plan.

Program Name

The Program name issuing the SQL statement.

You can DRILL on the Program name to view the SQL By Program display for the selected program,

Stmt No

The statement number within the program.

Stmt Type

The Statement Type:-

i-CURSOR	An Open Cursor Statement
i-SELECT	A Singleton Select
i-INSERT	An INSERT statement
i-DELETE	A DELETE statement

The indicator i - indicates whether the statement is Static(S) or Dynamic(D).

SQL Execs

The number of executions of this SQL statement.

Average Fetches

The average number of fetches performed per SQL.

Total CPU

The Total CPU Cost for this SQL statement.

Average CPU

The Average CPU Cost for this SQL statement.

Total Clock

The Total Elapsed time for this SQL statement.

Average Clock

The Average Elapsed time for this SQL statement.

Total Rows Processed

The Total Number of Rows Processed by this SQL statement.

Total Rows Looked at

The Total Rows Looked at for the SQL statement.

Total Rows DM Stage-1

The Total Number of DM Stage-1 requests.

Total Rows RDS Stage-2

The Total Number of RDS Stage-2 requests.

Total Row Updates

The Total number of Rows Updated.

Total Getpages

The Total number of GetPage requests.

Avg Rows Processed

The Average Number of Rows Processed.

Avg Rows Looked at

The Average Rows Looked at for the SQL statement.

Avg Rows DM Stage-1

The Average Number of DM Stage-1 requests.

Avg Rows RDS Stage-2

The Average Number of RDS Stage-2 requests.

Avg Rows Updated	The Average number of Rows Updated.
Average Getpages	The Average number of GetPage requests.